DR. 2294

**AN INVENTORY OF
ENVIRONMENTAL IMPACT MODELS
RELATED TO ENERGY TECHNOLOGIES**

MASTER

ORNL/EIS-147
Dist. Categories UC-11,
-13, -20e, -32, -41, -66e

Contract No. W-7405-eng-26

Information Division

**AN INVENTORY OF ENVIRONMENTAL IMPACT MODELS
RELATED TO ENERGY TECHNOLOGIES**

Compiled and edited by

P. T. Owen, N. S. Dailey, C. A. Johnson, and F. M. Martin

**Ecological Sciences Information Center
Information Center Complex**

Date Published: February 1979

**Prepared for the
Department of Energy
Division of Environmental Impact**

**Prepared by the
OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee 37830
operated by
UNION CARBIDE CORPORATION
for the
DEPARTMENT OF ENERGY**

NOTICE
This report was prepared as an account of work sponsored by the United States Government. Neither the United States nor the United States Department of Energy, nor any of their employees, nor any of their contractors, subcontractors, or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product or process disclosed, or represents that its use would not infringe privately owned rights.

249

CONTENTS

Acknowledgments	v
Highlights	vii
Introduction	1
Citation Format	2
Services of the Ecological Sciences Information Center . . .	4
Models Listed by Subject Categories	
Atmospheric Transport	5
Air Quality	127
Aquatic Transport	147
Water Quality	221
Soil Transport	231
Aquatic Food Chains	241
Terrestrial Food Chains	247
Dosimetry and Human Effects	255
Animal Effects	283
Plant Effects	295
Generalized Environmental Transport	301
Contact Person Index	317
Title Index	327
Model Acronym Index	411
Keyword Index	417

ACKNOWLEDGMENTS

The authors extend their thanks to all modelers and managers who provided information for this inventory. The Smithsonian Science Information Exchange and the U.S. Forest Service were extremely helpful in initial search efforts. Special thanks are given to Elinor Trotter, Ecological Sciences Information Center, for secretarial assistance and to Faye Fletcher of the Information Sciences and Operations Department, Information Center Complex (ICC), for computer production of this publication. The authors also appreciate the guidance and suggestions provided by Helen A. Pfuderer, Head of the Energy and Environmental Information Department, ICC, and J. Timothy Ensminger, Director of the Ecological Sciences Information Center.

HIGHLIGHTS

A compilation of 321 computational models related to environmental impacts of energy source development, energy conversion, or energy utilization is presented. Information in 33 data fields was sought for each model. In addition to standard bibliographic information, this inventory includes other data of interest to modelers, such as computer hardware and software requirements, algorithms, applications, and existing model validation information. The models are categorized into eleven subject areas and are arranged alphabetically by the contact person's last name within each of the categories. Subject areas covered are atmospheric transport, air and water quality, aquatic transport, terrestrial and aquatic food chains, soil transport, biological impacts (human, plant, and animal), and generalized environmental transport. Four indexes (contact person, title, keyword, and model acronym) are provided to assist the user in locating models of interest.

AN INVENTORY OF ENVIRONMENTAL IMPACT MODELS RELATED TO ENERGY TECHNOLOGIES

P. T. Owen, N. S. Dailey, C. A. Johnson, and F. M. Martin

INTRODUCTION

The purpose of this inventory is to identify and collect data on computer simulations and computational models related to the environmental effects of energy source development, energy conversion, or energy utilization. Funding for the project was provided by the Department of Energy, Assistant Secretary for the Environment, Division of Environmental Impact.

Information on models developed at Lawrence Berkeley Laboratory, Savannah River Laboratory, and the six national laboratories (Argonne, Los Alamos, Brookhaven, Lawrence Livermore, Battelle Pacific Northwest, and Oak Ridge) was compiled by designated persons at each of the locations and was submitted to a central collection point at Oak Ridge National Laboratory (ORNL). The Ecological Sciences Information Center (ESIC), Information Complex, ORNL, compiled information on models developed by universities, private industries, and governmental agencies. Models obtained by the two task groups were merged to form this data file.

Information for 33 data fields was sought for each model reported. All of the information which could be obtained within the time allotted for completion of the project is presented for each model listed. A few of the models lack necessary information, such as contact person, address, or documentation. However, it is the opinion of the authors that awareness of the existence of a particular model is better than no information at all. Efforts will be continued toward acquiring the needed information. Readers who are interested in these particular models are invited to contact ESIC for assistance in locating them. In addition to the standard bibliographic information, other data fields of interest to modelers, such as computer hardware and software requirements, algorithms, applications, and existing model validation information, are included. Indexes are provided for contact person, acronym, keyword, and title. The models are grouped into the following categories: atmospheric transport, air quality, aquatic

transport, terrestrial food chains, soil transport, aquatic food chains, water quality, dosimetry and human effects, animal effects, plant effects, and generalized environmental transport. Within these categories, the models are arranged alphabetically by last name of the contact person.

The computer-searchable data file will be periodically updated as new models are reported, and additional information on existing models will be added to the inventory as it becomes available. Submission of new information or new models is welcomed. For search requests or further information concerning this project, contact Carol A. Johnson, phone: (615) 574-7753 or FTS 624-7753.

Citation Format

Of the 33 fields in the computerized data base, 31 fields appear in this publication. The models are grouped by the subject category field and an index is provided for the keyword field. Only the address of the first contact person will be listed in records in which two or more contact people are listed. A brief description of the type of data recorded in each of the 31 fields follows:

- <CONT> Contact person who will receive calls and answer questions concerning the model.
- <TITLE> Name of model or title of the model documentation.
- <ACRO> Acronym of the model.
- <ADDR> Contact person's mailing address and organizational affiliation.
- <CITY> City in which organization is located.
- <STATE> State in which organization is located.
- <ZIP> Zip code of the organization.
- <COUNTRY> Country in which organization is located.
- <PHONE> Telephone number of the contact person; both commercial and FTS numbers are given if possible.
- <SOURCE> Name of person or institution from which documentation is available.

<DOC>	The bibliographic citation of documentation or references relating to the model.
<SUB>	A brief statement of the general subject coverage of the model.
<ABST>	Brief description of the model.
<GEO>	Geographical area to which the model is applicable.
<TIME>	Time span of the data utilized.
<STATUS>	Status of the model.
<ACCESS>	Model accessibility.
<MEDIA>	Type of media employed.
<SIZE>	An indication of the size of the model.
<COMP>	Abbreviation for the computer manufacturer on which the model executes.
<CONFIG>	Minimum hardware configuration necessary to execute the model.
<LANG>	Software language or data base management system utilized by the model.
<CHAR>	Character set used by the model.
<ALGO>	General statement of algorithms, computational methods, or theories used by the model.
<CLAS>	Descriptive model classifications.
<APPL>	General problem area to which the model can be applied.
<USERS>	Organizations currently using the model.
<SMD>	Sources(s) of the data utilized by the model.
<MVAL>	Model validation methods, sensitivity analysis, or other related procedures.
<COM>	Any additional information or comments not already stated in other data fields.
<UPDATE>	Date the information was input or the date that information was last entered.

As a result of computer limitations in indicating superscripts or subscripts, certain conventions have been established:

1. Expressions containing subscripts such as X_t will be expressed as X SUB T.
2. Molecular formulas will be expressed as NAlO3 for NaIO_3 , or NOX for NO_x .
3. Exponents other than units of measurement will be expressed as 10(E+3) for 10^3 or Y(E-2) for Y^{-2} .
4. Units of measurement containing exponents will be expressed as 6 CM3 for 6 cm^3 or 15 M2 for 15 m^2 .
5. Atomic mass numbers denoting nuclides will be expressed as CS-137 for ^{137}Cs .

Services of the Ecological Sciences Information Center

The Ecological Sciences Information Center (ESIC) provides a number of specialized services to government, industrial, academic, and foreign requestors. These services include identifying, acquiring, organizing, indexing, abstracting, processing, storing, and maintaining information pertinent to environmental impacts of energy technologies. Customized searches are provided upon submission of requests. Specialized data bases can also be created if a specific subject area has not previously been covered.

A minimum fee of \$30, which covers the charge for most searches, will be assessed for services provided by ESIC. Fees will be charged through the National Technical Information Service in Springfield, Virginia. All inquiries for information services should be addressed to:

Ecological Sciences Information Center
Oak Ridge National Laboratory
P.O. Box X, Building 2029
Oak Ridge, Tennessee 37830

Phone: (615) 574-7764 or FTS 624-7764

ATMOSPHERIC TRANSPORT

<1>
 <CON> REPMAN, P. F.; JORDAN, S. K.;
 KORTZBORN, P. W.; HOLSKY, H. G.

<TITLE> MODEL FOR TIME-DEPENDENT RAINDROPS SIZE
 DISTRIBUTIONS: APPLICATION TO THE
 WASHOUT OF AIRBORNE CONTAMINANTS

<ABST> INTERNATIONAL BUSINESS MACHINES

<DOC> IBM JOURNAL OF RESEARCH AND
 DEVELOPMENT, 16(2), 91-100, 1972

<ABST> A MODEL FOR COMPUTING TIME-DEPENDENT
 BEHAVIOR IN RAINDROPS SIZE DISTRIBUTIONS
 FOR A VARIETY OF INITIAL CONDITIONS IS
 DESCRIBED. THE MODEL PERMITS THE
 INCLUSION OF A SPATIALLY VARYING
 ATMOSPHERIC PROFILE AND TAKES
 EVAPORATION AND COALESCENCE OF
 RAINDROPS INTO ACCOUNT ON A DYNAMIC
 BASIS. IT SIMULATES THE RAIN-WASHOUT
 PROCESS WHEREBY SMALL AIRBORNE
 PARTICULATES ARE REMOVED FROM THE
 ATMOSPHERE AND RETURNED TO THE GROUND
 BY PRECIPITATION.

<CLAS> SIMULATION

<2>
 <CON> ADAIR, D. J.

<TITLE> DISPERSION OF SMOKE FROM AUTO
 EXHAUST: A SIMPLE DIFFUSION MODEL

<ABST> VIRGINIA POLYTECHNIC INSTITUTE AND
 STATE UNIVERSITY

<CITY> BLACKSBURG

<STATE> VA

<YIP> 24061

<DOC> TRANSACTIONS OF THE AMERICAN NUCLEAR
 SOCIETY, 20, 110-111, 1976

<ABST> NONE

<CLAS> SIMULATION

<3>
 <CON> ALBRECHT, D. A.

<TITLE> A TIME-DEPENDENT MODEL OF THE
 TRADE-WIND BOUNDARY LAYER

<ACRO> NIN

<ABST> PENNSYLVANIA STATE UNIVERSITY,
 DEPARTMENT OF METEOROLOGY

<CITY> STATE COLLEGE

<STATE> PA

<YIP> 16801

<FROM> 814-865-6840

<DOC> PR--268 485/OSL

<SUB> TRADE-WIND BOUNDARY LAYER

<ABST> A NUMERICAL MODEL WHICH PREDICTS THE
 TIME VARIATION OF THE CONVECTIVE
 BOUNDARY LAYER IS DEVELOPED.
 HORIZONTALLY HOMOGENEOUS CONDITIONS ARE
 ASSUMED AND THE LARGE-SCALE DIVERGENCE
 FIELD, SEA SURFACE TEMPERATURE, SURFACE
 WIND SPEED, AND VISUAL CLOUD COVER ARE
 SPECIFIED EXTERNALLY. THE MODEL
 PREDICTS THE AVERAGE VALUE OF MIXING
 RATIO AND MOIST STATIC ENERGY IN THE
 SUBCLOUD AND CLOUD LAYER AND THE LAPSE
 RATES OF THESE QUANTITIES IN THE CLOUD
 LAYER. THE MODEL ALSO PREDICTS THE
 HEIGHT OF THE TRANSITION LAYER (THE
 LAYER WHICH DEFINES THE BOUNDARY
 BETWEEN CLOUD AND SUBCLOUD LAYER) AND
 THE HEIGHT OF THE INVERSION. THE
 STEADY-STATE STRUCTURE PREDICTED WITH
 THE MODEL IS IN GOOD AGREEMENT WITH THE
 STRUCTURE OBSERVED DURING THE ATLANTIC
 TRADE-WIND EXPERIMENT (ATEX). THE
 TIME-DEPENDENT CAPABILITY OF THE MODEL
 IS DEMONSTRATED BY SIMULATING THE
 DEFORMATION OF THE TRADE-WIND BOUNDARY
 LAYER IN THE WAKE OF DISTURBED
 CONDITIONS. THE MODEL IS USED TO STUDY
 THE EFFECT OF A DIURNALLY VARYING
 RADIATIVE HEATING AND LARGE-SCALE
 DIVERGENCE ON THE HEIGHT OF THE
 INVERSION.

<GEO> UNITED STATES

<TIME> 1966 TO PRESENT

<STATUS> IN USE

<ACCESS> LIMITED

<MEDIA> PUNCHED CARDS

<SIZE> 800 CARDS

<COMP> CDC; IBM

<CONFIG> CDC 6400 WITH 40 K CORE

<LANG> FORTRAN

<CHAR> UNCODED

<ALGO> BUNGE-KUTTA

<CLAS> PREDICTIVE

<APPL> SIMULATION OF THE TEMPERATURE AND
 MOISTURE STRUCTURE ASSOCIATED WITH THE
 TRADE-WINDS.

<USER> THE PENNSYLVANIA STATE UNIVERSITY
 (NATIONAL SCIENCE FOUNDATION)

<STD> ATLANTIC TRADE-WIND EXPERIMENT (ATEX);
 BARBADOS OCEANOGRAPHIC AND
 METEOROLOGICAL EXPERIMENT (BOMEX)

<NVAL> SENSITIVITY TESTS AND COMPARISONS WITH
 ATEX AND BOMEX DATA.

<CON> MODEL IS ONE-DIMENSIONAL AND GIVES
 VERTICAL STRUCTURE OF THE TEMPERATURE
 AND MOISTURE.

<UPDATE> 780811

<4>
 <CON> ARATO, R. J.

<TITLE> WIND EFFECTED REDISTRIBUTION OF SURFACE
 CONTAMINATION

<ACRO> SDIST

<ABST> NORFOLK STATE COLLEGE

<CITY> NORFOLK

<STATE> VA

<YIP> 23504

<8>

ATMOSPHERIC TRANSPORT

<8> CONT.

<EOC> MONITORING AGENCY REPT. NO. 18;
CONTRACT AT(40-1)-4394; 1973, 5pp.

<ABST> A MATHEMATICAL MODEL WAS DEVELOPED FOR USE FOR COMPUTER CALCULATIONS OF THE REDISTRIBUTION OF SURFACE SOIL CONTAMINANTS AS A FUNCTION OF DOWNWIND DISTRIBUTION AND EROSION OF WEATHERING VARIABLES. A COMPUTER PROGRAM, SOIST, WAS DEVELOPED FOR PLOTTING THE CONCENTRATIONS AS A FUNCTION OF TIME FOR EACH SPACE INTERVAL AND STEADY STATE ISOTOPIES.

<CLAS> SIMULATION

<5>

<CONT> BALLANTI, D.

<TITLE> APPLICATIONS OF PHYSICAL MODELING IN A WIND TUNNEL TO GEOTHERMAL DEVELOPMENT

<DOC> TUCKER, F.L.; ANDERSON, H.D. (EDS.).
GEOTHERMAL ENVIRONMENTAL SEMINAR HELD IN LAKE COUNTY, CALIFORNIA, OCTOBER 27 1976

<ABST> BOUNDARY-LAYER WIND TUNNELS CAN BE A POWERFUL TOOL IN METEOROLOGICAL AND ENGINEERING RESEARCH. THE WIND TUNNEL IS MOST EFFECTIVE IN AREAS WHERE TERRAIN- OR STRUCTURE-INDUCED MECHANICAL TURBULENCE AND TOPOGRAPHIC INFLUENCES DOMINATE. SCALE MODELING IN THE WIND TUNNEL HAS A NUMBER OF APPLICATIONS FOR GEOTHERMAL DEVELOPMENT IN NORTHERN CALIFORNIA. THE ADVANTAGES OF THE BOUNDARY-LAYER WIND TUNNEL ARE ITS ABILITY TO REPRODUCE TERRAIN EFFECTS AND ITS PREDICTIVE CAPABILITY. IT ALLOWS SOLUTIONS TO PROBLEMS TO BE MADE AND EVALUATED AT A VERY LOW COST. THE DISADVANTAGES OF THE WIND TUNNEL ARE THE DIFFICULTIES IN ACCURATELY REPRODUCING TURBULENCE SPECTRA DUE TO VISCOUS EFFECTS, AND IN HANDLING LIGHT AND VARIABLE WINDS (A DRAWBACK SHARED WITH MOST OTHER MODELING TECHNIQUES). WHERE THESE FACTORS ARE IMPORTANT, CARE MUST BE TAKEN TO DEVELOP MEANINGFUL PREDICTIONS FROM WIND TUNNEL DATA.

<CLAS> SIMULATION

<5>

<CONT> PARKER, F. H.

<TITLE> A RAPIDITY BOUNDARY LAYER MODEL FOR THE PREDICTION OF FOG

<ADD> U.S. DEPARTMENT OF THE NAVY,
ENVIRONMENTAL PREDICTION RESEARCH FACILITY

<CITY> MONTEREY

<STATE> CA

<SOURCE> NTIS 84.25/NPS2.25

<DOC> AD-A00P 158/MSL

<ABST> A TWO-DIMENSIONAL BOUNDARY LAYER MODEL IS DESCRIBED. THIS MODEL IS DESIGNED TO PREDICT AND STUDY THE EFFECTS OF METEOROLOGICAL CHANGES ON THE FORMATION AND DISSIPATION OF FOG AND STRATUS. RADIATIONAL HEAT LOSS ALONG WITH THE TRANSPORT OF STATIC ENERGY, MOISTURE AND MOMENTUM ARE TREATED IN THE MODEL.

CLOUD DROPLET DISTRIBUTIONS ARE PARAMETERIZED USING A GAMMA DISTRIBUTION FROM WHICH RADIATIVE PROPERTIES AND DROPLET FALL VELOCITIES ARE COMPUTED. TURBULENT EXCHANGE COEFFICIENTS ARE CALCULATED USING THE BUSH-ORSHOV THEORY OF SIMILITUDE WHICH ACCOUNTS FOR VARIATIONS IN ATMOSPHERIC STABILITY. SEVERAL EXPERIMENTS ARE PRESENTED WHICH DEMONSTRATE THE EFFECTS OF VARIOUS METEOROLOGICAL PARAMETERS ON THE FORMATION AND DISSIPATION OF STRATUS AND FOG. ENERGY BUDGET ANALYSES SHOW THE IMPORTANCE OF EACH OF THE PHYSICAL PROCESSES BEING MODELED.

<CLAS> SIMULATION; PREDICTIVE

<7>

<CONT> BATTEN, E. S.

<TITLE> THE ATMOSPHERIC RESPONSE TO A STRATOSPHERIC DUST CLOUD AS SIMULATED BY A GENERAL CIRCULATION MODEL

<ADD> RAND CORPORATION

<CITY> SANTA MONICA

<STATE> CA

<SOURCE> NTIS 83.00/NPS1.45

<DOC> AD--790 679/7, 1978

<ABST> RESULTS OF USING THE RAND VERSION OF THE MINTZ-ARAKAWA GENERAL CIRCULATION MODEL TO INVESTIGATE THE INITIAL ATMOSPHERIC RESPONSE TO A STRATOSPHERIC DUST CLOUD SPREAD UNIFORMLY IN A ZONE BETWEEN TWENTY-FIVE DEGREES NORTH AND SEVENTY-FIVE DEGREES NORTH. THE DUST PARTICLES, CONSIDERED TO BE TWO MICRONS OR LESS IN DIAMETER, HAVE A TOTAL VOLUME COMPARABLE TO THE EJECTA OF KRAKATOA IN 1883. THE MODEL WAS INTEGRATED FOR A SIMULATED PERIOD CORRESPONDING TO JANUARY AND FEBRUARY. THE RESULTS BEING COMPARED WITH THOSE OF A CONTROL RUN STARTING WITH THE SAME INITIAL CONDITIONS AND SIMULATING THE SAME PERIOD. THE TEMPERATURE BELOW THE DUST CLOUD COOLED TWO TO THREE DEGREES AND THE LAND/OCEAN TEMPERATURE CONTRASTS INCREASED. PRECIPITATION VARIED AS A RESULT OF CHANGES IN THE CIRCULATION AND MOISTURE FLUX. MID-LATITUDE PERREL CIRCULATIONS WERE WEAKENED; BAROCLINICITY DECREASED AT HIGH LATITUDES AND INCREASED AT LOW.

<CLAS> SIMULATION

<9>

<CONT> BEATON, JOHN L.; RANZIERI, ANDREW J.; SHIPLEY, EARL C.; SKOG, JOHN B.

<TITLE> AIR QUALITY MANUAL: MATHEMATICAL APPROACH TO ESTIMATING HIGHWAY IMPACT ON AIR QUALITY

<ABST> HIGHWAY ENGINEERS HAVE TO CONSIDER A VARIETY OF FACTORS IN THE ENVIRONMENTAL IMPACT OF ANY HIGHWAY PROJECT. THIS MANUAL EXPLAINS A METHOD OF PREDICTING POLLUTANT CONCENTRATIONS WITHIN AN AREA OF STUDY WITH AND WITHOUT THE NEW HIGHWAY. THE PREDICTION ANALYSIS INCLUDES BOTH THE HIGHWAY CORRIDOR AND THE MESOSCALE. THE HIGHWAY CORRIDOR IS

ATMOSPHERIC TRANSPORT

<C> CON- DEFINED AS A REGION EXTENDING FROM THE POINT WHERE THE POLLUTANTS ARE GENERATED BY TRAFFIC (THE HIGHWAY) DOWNWIND TO THE POINT WHERE AMBIENT POLLUTANT LEVELS ARE AGAIN REACHED. THE MESOSCALE AREA IS DEFINED AS THE AREA THROUGHOUT WHICH TRAFFIC VOLUMES ON THE SURFACE TRAFFIC NETWORK ARE SIGNIFICANTLY AFFECTED BY THE CONSTRUCTION OF A NEW HIGHWAY.

<CLASS> PREDICTIVE

<C> <CON> BRATON, JOHN L.; BANCHEFF, ANDREW J.; KROG, JOHN B.

<TITLE> AIR QUALITY PARTIAL: METEOROLOGY AND ITS INFLUENCE ON THE DISPERSION OF POLLUTANTS FROM HIGHWAY LINE SOURCES

<ABST> HIGHWAY ENGINEERS NEED TO CONSIDER A VARIETY OF FACTORS IN THE ENVIRONMENTAL IMPACT OF ANY HIGHWAY PROJECT. THIS REPORT EXPLAINS THE BASIC FUNDAMENTALS OF METEOROLOGY AND THEIR EFFECT ON POLLUTANT CONCENTRATIONS ON AND WITHIN THE HIGHWAY CORRIDOR. IT DISCUSSES (1) THE GENERAL RELATIONSHIP BETWEEN METEOROLOGY AND AIR POLLUTION, (2) THE ROLE OF METEOROLOGY IN THE TRANSPORT AND DISPERSION OF AIR POLLUTANTS, (3) A METHOD TO ESTIMATE THE SURFACE STABILITY OF THE ATMOSPHERE, (4) METEOROLOGICAL STUDIES, (5) METEOROLOGICAL FACTORS TO BE CONSIDERED IN HIGHWAY ROUTE LOCATION, (6) A HIGHWAY LINE SOURCE MODEL FOR ANALYZING METEOROLOGICAL DATA, AND (7) SOURCES OF METEOROLOGICAL DATA.

<CLASS> PREDICTIVE

<C> <CON> BENSON, PAUL E.

<TITLE> CALINE2: AN IMPROVED MICROSCALE MODEL FOR THE DISPERSION OF AIR POLLUTANTS FROM A LINE SOURCE

<ACRO> CALINE2

<ACOR> CALIFORNIA DEPARTMENT OF TRANSPORTATION, TRANSPORTATION LABORATORY, 5900 FOLSON BLVD.

<CITY> SACRAMENTO

<STATE> CA

<ZIP> 95819

<PHONE> 916-888-8900

<LOC> ASSESSING TRANSPORTATION RELATED AIR QUALITY IMPACTS, PROCEEDINGS OF THE CONFERENCE ON THE STATE OF THE ART OF ASSESSING TRANSPORTATION-RELATED AIR QUALITY IMPACTS HELD IN WASHINGTON, DC, OCTOBER 22-24, 1975, (P. 97-120), 202 PP.

<SUB> PREDICTION OF INERT POLLUTANT LEVELS NEAR HIGHWAY FACILITIES

<ABST> IN ORDER FOR TRANSPORTATION PLANNERS AND ENGINEERS TO EVALUATE THE AIR QUALITY IMPACT OF A PROPOSED PROJECT, MATHEMATICAL MEANS ARE REQUIRED TO DESCRIBE THE DISPERSION OF AIR POLLUTANTS FROM A LINE SOURCE. CALINE2, THE CALIFORNIA LINE SOURCE DISPERSION MODEL, IS PRESENTED AND DISCUSSED AS ONE SUCH MATHEMATICAL APPROACH. CALINE2 IS BASED ON THE GENERALIZED GAUSSIAN DISPERSION THEORY, AND SIMULATES THE DISPERSION OF CARBON MONOXIDE FROM A UNIFORM LINE SOURCE. A SENSITIVITY ANALYSIS OF THE MODEL RELATES THE BEHAVIOR OF ITS PREDICTIONS AS A FUNCTION OF THE INPUT PARAMETERS. A PRELIMINARY VERIFICATION STUDY USING CARBON MONOXIDE DATA FROM THE LOS ANGELES REGION GIVES THE USER AN ESTIMATE OF CALINE2'S PREDICTIVE CAPABILITIES. AN EARLIER VERSION OF THE MODEL, WHICH WAS DISTRIBUTED NATIONWIDE IN 1972, IS COMPARED WITH THE PRESENT VERSION. COMPUTER PROGRAM LISTINGS OF CALINE2 IN BASIC AND FORTRAN ARE INCLUDED IN THE APPENDICES.

<C> <CON> LOS ANGELES EARTH ATMOSPHERE: AIR POLLUTION; ROADS

<TIME> 1973-74

<STATUS> IN USE

<ACCESS> LIMITED

<MEDIA> PUNCHED CARDS

<SIZE> 650 RECORDS

<CODE> 100

<CONFER> BASIC VERSION CAN BE IMPLEMENTED ON SMALL TIME-SHARE SYSTEM

<LANG> FORTRAN IV; TENEC BASIC

<CHAR> EBCDIC

<ALGO> GAUSSIAN PLUME, MODIFIED PASQUILL-GIFFORD DISPERSION CURVES

<CLASS> STOCHASTIC; PREDICTIVE

<APPL> IMPACT BY HIGHWAY FACILITY ON AIR QUALITY WITHIN 1000 FEET OF EDGE OF ROADWAY.

<USERS> CALIFORNIA DEPARTMENT OF TRANSPORTATION

<SRC> 1973-74 PAT SAMPLING STUDY IN LOS ANGELES

<VAL> LINEAR REGRESSION VALIDATION, SENSITIVITY ANALYSIS: TWO-DIMENSIONAL PLOTS OF EACH INPUT PARAMETER VERSUS OUTPUT

<UPDATED> 740901

<C> <CON> BENSON, PAUL E.

<TITLE> CALIFORNIA LINE SOURCE DISPERSION MODEL, 3RD GENERATION

<ACRO> CALINE3

<ACOR> CALIFORNIA DEPARTMENT OF TRANSPORTATION, TRANSPORTATION LABORATORY, 5900 FOLSON BLVD.

<CITY> SACRAMENTO

<STATE> CA

<ZIP> 95819

<11>

ATMOSPHERIC TRANSPORT

<11> CONT.

<PHONE> 916-888-8800

<DOC> NONE AS YET

<SUB> PREDICTION OF POLLUTANT LEVELS NEAR HIGHWAY FACILITIES

<ABST> CALTHE3 IS A GAUSSIAN PLUME, MESOSCALE MODEL FOR ESTIMATING POLLUTANT LEVELS NEAR THE HIGHWAY. THE CURRENT PROTOTYPE VERSION DIVIDES THE HIGHWAY SOURCE INTO STRIP ELEMENTS ORIENTED NORMAL TO THE WIND DIRECTION AND TREATED AS LINE SOURCES OF FINITE LENGTH. THE ELEMENTS VARY IN SIZE SO THAT FINE RESOLUTION IS OBTAINED CLOSE TO THE RECEPTOR FOR ACCURACY WHILE COARSEER SIZED ELEMENTS ARE USED FARTHER AWAY FOR COMPUTATIONAL EFFICIENCY. A MIXED STABILITY CLASS, COMPUTED AS A FUNCTION OF INCREASED SENSIBLE HEAT FLUX FROM AUTOMOTIVE THERMAL EMISSIONS, IS USED OVER THE HIGHWAY AND ONE HIGHWAY WIDTH DOWNWIND. THERE HAS BEEN SUCCESSFUL, PRELIMINARY VALIDATION WORK COMPLETED USING TRACER DATA FROM THE CH SULFATE EXPERIMENT.

<GEO> LOS ANGELES DIFFUSION

<YR> 1978-75

<STATUS> UNDER DEVELOPMENT

<ACCESS> NOT ACCESSIBLE

<MEDIA> TEXT

<SIZE> 500 RECORDS

<COMP> IBM

<LANG> BASIC

<ALGO> GAUSSIAN PLUME, PASQUILL-GIFFORD DISPERSION CURVES

<CLASS> STOCHASTIC; PREDICTIVE

<APPL> IMPACT BY HIGHWAY FACILITY ON AIR QUALITY WITHIN 1000 FEET OF EDGE OF ROADWAY

<USERS> NONE PRESENTLY

<SRCD> CH SULFATE EXPERIMENT, LOS ANGELES DATA BASE

<VALID> VALIDATION: T-PAIRED ANALYSIS.

<UPDATE> 780901

<12>

<CONT> BRIDGSTON, R. W., JR.; VISWANATH, R.

<TITLE> MODELING OF THE EFFECTS OF GASEOUS AND PARTICULATE POLLUTANTS IN THE URBAN ATMOSPHERE: POLLUTANT DISPERSION

<DOC> JOURNAL OF APPLIED METEOROLOGY, 12(6), 913-918, 1973

<ABST> POLLUTANT DISPERSION IS DISCUSSED AS PREDICTED BY SOLVING NUMERICALLY THE EQUATIONS OF A TRANSIENT, 1-DIMENSIONAL TRANSPORT MODEL. WHILE THE RADIATIVE PROPERTIES OF THE AEROSOLS HAVE ONLY A SLIGHT EFFECT ON THE DAYTIME POLLUTION CONCENTRATION, THEY DO LEAD TO DECREASED INSTABILITY DURING THE DAY. THE GASEOUS POLLUTANTS, HOWEVER, PLAY A MAJOR ROLE BY LIFTING THE ELEVATED

STABLE REGION THEREBY REDUCING POLLUTION BUILDUP. THIS ALTERATION OF AN ELEVATED STABLE REGION IS IMPORTANT SINCE AIR POLLUTION EPISODES USUALLY OCCUR WHEN SUCH ELEVATED INVERSIONS ARE PRESENT.

<13>

<CONT> BHUNBALKAR, C. H.

<TITLE> COMPUTER SIMULATION OF ATMOSPHERIC EFFECTS OF WASTE HEAT REJECTED FROM CONCEPTUAL LARGE POWER PLANTS

<ADDR> STANFORD RESEARCH INSTITUTE

<CITY> MENLO PARK

<STATE> CA

<DOC> AMERICAN SOCIETY OF MECHANICAL ENGINEERS, [PAPER], 76-WA/WT-20, 1-8, 1976

<ABST> PROPOSALS TO INSTALL LARGE POWER COMPLEXES AT SINGLE SITE (GENERATING CAPACITY 10,000 TO 50,000 KW) RAISE CONCERN FOR THE INADVERTENT WEATHER MODIFICATION BY THE ATTENDANT EFFLUENTS. A MESOSCALE MODEL WHICH WAS SPECIFICALLY DESIGNED TO SIMULATE THE INADVERTENT MODIFICATION OF THE ATMOSPHERE CAUSED BY LOCALIZED PERTURBATIONS OF HEAT AND/OR MOISTURE, HAS BEEN APPLIED TO A HYPOTHETICAL DEVELOPMENT AT A SITE NEAR BATON ROUGE, LOUISIANA. NUMERICAL EXPERIMENTS HAVE BEEN PERFORMED TO DETERMINE THE RELATIONSHIPS BETWEEN LOCAL METEOROLOGICAL VARIABLES, ORIENTATION OF COOLING TOWERS TO THE AMBIENT WIND, AND OTHER FACTORS, AND THE RESULTANT ATMOSPHERIC EFFECTS. EVALUATION OF THE PRELIMINARY RESULTS INDICATES THAT THE MODEL'S TREATMENT OF THE TEMPERATURE AND MOISTURE PERTURBATIONS CAUSED BY NATURAL DRAFT WET COOLING TOWERS IS REALISTIC AND PHYSICALLY CONSISTENT. THE PRELIMINARY RESULTS ALSO PROVIDE CLEAR INDICATION THAT SIGNIFICANT WEATHER MODIFICATION CAN RESULT FROM THE TYPE OF POWER PLANT DEVELOPMENT PROPOSED. IT IS BELIEVED THAT THE MODEL, WITH FURTHER REFINEMENT, CAN MAKE VITAL AND VALUABLE CONTRIBUTIONS TO THE DESIGN OF THE FACILITIES FOR DISPOSING WASTE HEAT AT LARGE POWER COMPLEXES. 9 PAGES.

<CLASS> PREDICTIVE

<14>

<CONT> BIRONSKI, FRANCES S.

<TITLE> METEOROLOGICAL SUB-MODELS FOR AQMS - RADIATIVE TRANSFER

<ADDR> U. S. ENVIRONMENTAL PROTECTION AGENCY, ENVIRONMENTAL SCIENCES RESEARCH LABORATORY

<CITY> RESEARCH TRIANGLE PARK

<STATE> NC

<ZIP> 27711

<ABST> THE TERRESTRIAL RADIATION MODEL WILL USE AS ITS BASIC THE 12 INTERVAL MODEL

ATMOSPHERIC TRANSECT

<14> CONT.

OF BINKOWSKI. THE MODEL WILL BE EXTENDED TO INCLUDE CLOUD, FOG AND AEROSOL EFFECTS IN THE 0-13 MICRON WINDOW. SIMPLE SOLAR RADIATION MODELS ARE BEING DEVELOPED AND EXTENDED TO INCLUDE CLOUD AND AEROSOL EFFECTS. THE SOLAR RADIATION MODELS WILL BE TESTED AGAINST OBSERVATIONS OF GLOBAL AND DIRECT BEAM SOLAR RADIATION MADE LOCALLY. THE TERRESTRIAL RADIATION MODELS HAVE BEEN VERIFIED AGAINST CLEAR SKIES, CLEAN AIR TEST DATA, AND WHEN EXTENDED, WILL BE VERIFIED AGAINST APPROPRIATE DATA.

<TIME> 76/10-79/09

<CLASS> PREDICTIVE

<15>

<CONT> BINKOWSKI, FRANCIS S.

<TITLE> METEOROLOGICAL SUB-MODELS FOR AQHQS - TURBULENCE MODELS

<ADDR> U. S. ENVIRONMENTAL PROTECTION AGENCY, ENVIRONMENTAL SCIENCES RESEARCH LABORATORY

<CITY> RESEARCH TRIANGLE PARK

<STATE> NC

<ZIP> 27711

<ABST> THE MODEL WILL USE SECOND ORDER CLOSURE TECHNIQUES IN THEIR SIMPLEST FORM, AND EMPIRICAL INFORMATION ALONG WITH CONVENTIONAL METEOROLOGICAL DATA SUCH AS WINDS, TEMPERATURES, TEMPERATURE DIFFERENCE AND MIXING DEPTHS. THE MODEL FOR THE SURFACE LAYER IS COMPLETE AND PRODUCES EXCELLENT RESULTS WHEN COMPARED WITH TURBULENCE DATA. DEVELOPMENTAL WORK IS UNDER WAY FOR EXTENSION OF THE MODEL TO THE CONVECTIVELY MIXED LAYER. 09/79 FINAL REPORT.

<TIME> 76/10-79/09

<CLASS> PREDICTIVE

<16>

<CONT> BINKOWSKI, FRANCIS S.

<TITLE> METEOROLOGICAL SUB-MODELS FOR AQHQS: WIND AND TEMPERATURE PROFILES

<ADDR> U. S. ENVIRONMENTAL PROTECTION AGENCY, ENVIRONMENTAL SCIENCES RESEARCH LABORATORY, METEOROLOGY DIVISION

<CITY> RESEARCH TRIANGLE PARK

<STATE> NC

<ZIP> 27711

<ABST> THE MODEL USES AS ITS BASIS AN EXISTING MODEL FOR THE WIND PROFILE GIVEN THE GEOSTROPHIC AND THERMAL WINDS, A TEMPERATURE PROFILE, AND THE TIME OF DAY. THE MODEL WILL BE EXTENDED TO INCLUDE A CONVECTIVELY MIXED LAYER IN THE DAY TIME. TEMPERATURE PROFILES IN THE MIXED LAYER WILL ALSO BE MODELED. THE MODEL IS UNDERGOING TESTS AND DEVELOPMENT AT PRESENT. COMPARISONS WITH RAPS DATA ARE PLANNED. (1) 9/77

PROGRESS REPORT. (2) 9/78 FINAL REPORT.

<TIME> 76/10/01-78/09/30

<CLASS> PREDICTIVE

<17>

<CONT> BLAIS, R. E.; COPELAND, G. E.; LEBBER, T. H.

<TITLE> USE OF LABS SYSTEM FOR THE QUANTITATIVE DETERMINATION OF SMOKE PLUME LATERAL DIFFUSION COEFFICIENTS FROM ERTS IMAGES OF VIRGINIA

<ADDR> LABSYS

<ADDR> OLD DOMINION UNIVERSITY, DEPARTMENT OF PHYSICS AND GEOPHYSICAL SCIENCES

<CITY> NORFOLK

<STATE> VA

<DOC> W-76-24601, 1975

<ABST> A TECHNIQUE FOR MEASURING SMOKE PLUME OF LARGE INDUSTRIAL SOURCES OBSERVED BY SATELLITE USING LABSYS IS PROPOSED. A GAUSSIAN PLUME MODEL IS DESCRIBED, INTEGRATED IN THE VERTICAL, AND INVERTED TO YIELD A FORM FOR THE TECHNIQUE IS APPLIED TO A PLUME FROM A POWER PLANT AT CHESTER, VIRGINIA, IMAGED AUGUST 31, 1973 BY LANDSAT 1. THE PLUME BEGINS SLIGHTLY TO THE LEFT 0.3 KM FROM BEYOND THE BEND. MAXIMUM GROUND CONCENTRATIONS ARE ESTIMATED BETWEEN 32 AND 64 MICRO GRAMS/M3. EXISTING METEOROLOGICAL DATA WOULD NOT EXPLAIN SUCH CONCENTRATIONS.

<18>

<CONT> BOCCIO, J. L.; WEILERSTEIN, G.; EDELMAN, P. B.

<TITLE> MATHEMATICAL MODELS FOR ANALYZING ORIGIN AND DISTRIBUTION OF COMBUSTION GENERATED POLLUTANTS IN GAS TURBINES; A MATHEMATICAL MODEL FOR JET ENGINE COMBUSTOR POLLUTANT EMISSIONS

<DOC> REPORT NO. NASA-CR-121209A; GASL-77-781; MONITORING AGENCY REPORT NO. 18; CONTRACT WASH-2235; MARCH 73, 1969.; AVAIL NTIS

<ABST>

MATHEMATICAL MODELING FOR THE DESCRIPTION OF THE ORIGIN AND DISPOSITION OF COMBUSTION-GENERATED POLLUTANTS IN GAS TURBINES IS PRESENTED. A UNIFIED MODEL IN MODULAR FORM IS PROPOSED WHICH INCLUDES KINETICS, RECIRCULATION, TURBULENT MIXING, MULTIPHASE FLOW EFFECTS, SWIRL AND SECONDARY AIR INJECTION. SUBELEMENTS OF THE OVERALL MODEL WERE APPLIED TO DATA RELEVANT TO LABORATORY REACTORS AND PRACTICAL COMBUSTOR CONFIGURATIONS. COMPARISONS BETWEEN THE THEORY AND AVAILABLE DATA SHOW EXCELLENT AGREEMENT FOR BASIC CO/H2/AIR CHEMICAL SYSTEMS. FOR HYDROCARBONS THE TRENDS ARE PREDICTED WELL INCLUDING HIGHER-THAN-EQUILIBRIUM NO LEVELS WITHIN THE FUEL RICH REGIME. ALTHOUGH THE NEED FOR IMPROVED ACCURACY IN FUEL RICH COMBUSTION IS INDICATED, COMPARISONS WITH ACTUAL JET ENGINE DATA IN TERMS OF THE EFFECT OF COMBUSTOR-INLET TEMPERATURE IS

<10>

ATMOSPHERIC TRANSPORT

<10> CONT.

EXCELLENT. IN ADDITION, EXCELLENT AGREEMENT WITH DATA IS OBTAINED REGARDING REDUCED NO EMISSIONS WITH WATER SCOPLET AND STREAM INJECTION.

<CLAS> SIMULATION

<10>

<CONT> BOVIS, J. F.; GARDNER, J. H.; RALESAK, S. T.

<TITLE> ATMOSPHERIC HYDROCODES USING PCT ALGORITHMS

<ACPD> SHAS2D; SHAS3D; PCT2D

<ADDP> NAVAL RESEARCH LABORATORY

<CITY> WASHINGTON

<STATE> DC

<ABST> SEVERAL RECENTLY DEVELOPED MULTIDIMENSIONAL HYDROCODES FOR LOW-ALTITUDE NUCLEAR-EXPLOSION PHENOMENOLOGY ARE DESCRIBED AND THEIR PERFORMANCE CHARACTERISTICS ARE DISCUSSED. THESE CODES ALL USE FLUX-CORRECTED TRANSPORT TECHNIQUES BECAUSE OF THE STRONG SHOCKS AND STEEP GRADIENTS WHICH MUST BE TREATED DURING THE IMPORTANT EARLY AND MIDDLE-TIME PHASE OF SINGLE- AND MULTIPLE-BURST LOW-ALTITUDE PHENOMENOLOGY. THREE TYPES OF CODES HAVE BEEN DEVELOPED: (1) SHAS2D AND SHAS3D ARE SIMPLE-GEOMETRY CARTESIAN CODES FOR STUDYING MICROSCOPIC FLUID DYNAMICS AND TURBULENCE ASSOCIATED WITH LOW-ALTITUDE EXPLOSIONS; (2) PCT2D IS AN R-Z CYLINDRICAL HYDROCODE WITH DETAILED MICROSCOPIC PHYSICS INCLUDING REALISTIC ATMOSPHERIC GRADIENTS, COMPLEX EQUATIONS OF STATE, RADIATION TRANSPORT AND QUASI-LAGRANGIAN DEBRIS CAPABILITIES; AND (3) PCT3D IS A THREE-DIMENSIONAL X-Y-Z CODE DESIGNED TO CARRY OUT COMPLICATED MULTIBURST SIMULATIONS ON TIME SCALES WHERE RADIATION TRANSPORT MAY BE NEGLECTED BUT SHOCKS AND STEEP GRADIENTS MAY NOT. THE STRUCTURE OF ALL THESE CODES ARE IDENTICAL AND THE PCT MODULES WHICH CARRY OUT THE TIME-STEP-SPLIT INTEGRATIONS ARE ESSENTIALLY INTERCHANGEABLE. BECAUSE OF THE HIGH DEGREE OF MODULARITY EXTENSIVE OPTIMIZATION HAS BEEN CARRIED OUT AND WILL BE DESCRIBED.

<CLAS> PREDICTIVE

<20>

<CONT> BOTTENHEIM, J. W.; BRASLAVSKY, S. E.; STPAUSE, G. F.

<TITLE> MODELING STUDY OF SEASONAL EFFECT ON AIR POLLUTION AT 60 DEGREES N LATITUDE

<ACPD> UNIVERSITY OF ALBERTA

<CITY> EDMONTON

<STATE> ALBERTA

<COUNTRY> CANADA

<SOC> ENVIRONMENTAL SCIENCE TECHNOLOGY, 11(8), 801-808, 1977

<ABST>

A COMPUTER MODELING STUDY OF THE EFFECT OF TEMPERATURE AND SOLAR ALTITUDE VARIATION ON THE CHEMICAL PROCESSES WHICH TAKE PLACE IN A GENERAL PHOTOCHEMICAL AIR POLLUTION SYSTEM AT 60 DEGREES N LATITUDE WAS PERFORMED. ELEVEN PHOTOCHEMICAL AND 100 DARK REACTIONS OF 11 INITIAL PREACTANTS WERE CONSIDERED. THE RESULTS INDICATED THAT TEMPERATURE CHANGES CORRESPONDING TO SEASONAL VARIATIONS HAVE LITTLE EFFECT ON THE OVERALL CHEMISTRY, BUT CHANGES IN SOLAR INTENSITY ARE WAVELENGTH DISTRIBUTION ESTIMATED TO CORRESPOND TO SEASONAL VARIATIONS HAVE A MARKED EFFECT ON THE CHEMICAL EVOLUTION OF THE SYSTEM. ONE OF THE KEY FACTORS GOVERNING OVERALL RATES WAS THE CONCENTRATION OF THE PRIMARY RADICALS NO2 AND NO2. THE TEMPORAL BEHAVIORS OF THE MAJOR POLLUTANTS WERE CALCULATED, AND THEIR ROLE IS DISCUSSED.

<CLAS> PREDICTIVE

<21>

<CONT> BOWNE, B. E.

<TITLE> A SIMULATION MODEL FOR AIR POLLUTION OVER CONNECTICUT

<ABST>

A GENERAL MATHEMATICAL MODEL APPLICABLE TO ANY GEOGRAPHICAL AREA IS PRESENTED. THE MODEL'S APPLICABILITY IS CONTROLLED BY SPECIFYING THE INPUT INFORMATION DESCRIBING THE METEOROLOGICAL SITUATION AND POLLUTION SOURCE CONFIGURATION. A RECTANGULAR ARRAY OF GRID POINTS IS USED TO SPECIFY BOTH THE WIND FIELD, BY USING STREAM FUNCTIONS, AND THE AVERAGE SOURCE STRENGTH OF SOME POLLUTANT FOR THE AREA REPRESENTED BY THE GRID. THE DIFFUSION PROBLEM IS DIVIDED INTO 2 AREAS: TRANSPORT BY THE MEAN WIND FIELD, AND DISPERSION BASED ON TRAVEL TIME AND DISTANCE AS DESCRIBED BY EMPIRICAL EQUATIONS. TRAJECTORIES OF POLLUTANTS ARE TRACED BACKWARDS FROM THE POINTS OF INTEREST IN THE COURSE OF THE CALCULATIONS AND THE CONTRIBUTIONS OF ALL SOURCES THAT AFFECT THE POINTS OF INTEREST ARE ACCUMULATED. THE MODEL REQUIRES AN ARRAY OF SOURCE STRENGTH INFORMATION. AN INVENTORY OF POLLUTION SOURCES IN THE STATE OF CONNECTICUT WAS COMPILED AND MAPS OF SOURCE STRENGTHS WERE PREPARED FOR 5 POLLUTANTS ON A 5000-FT GRID-SQUARE ARRAY. MAPS OF SULFUR DIOXIDE AND CARBON MONOXIDE SOURCE STRENGTHS ARE PRESENTED WITH THE RESULTING CONCENTRATION DISTRIBUTION FOR "TYPICAL" METEOROLOGICAL CONDITIONS. THE MODEL PERMITS THE CHANGING OF METEOROLOGICAL OR SOURCE VALUES AT PREDETERMINED INTERVALS SO THAT DIURNAL CHANGES ARE INCORPORATED IN THE CALCULATIONS. THE MODEL HAS NOT BEEN VERIFIED, BUT THE VALUES OF POLLUTION CONCENTRATION ARE THE RIGHT ORDER OF MAGNITUDE AND THE RESULTING PATTERNS ARE AS EXPECTED.

<ACPD> CONNECTICUT

<CLAS> SIMULATION

<22>

<CONT> BOYNTON, F. P.

<TITLE> NUMERICAL CALCULATIONS OF VISCOUS HIGH-ALTITUDE EXHAUST PLUME FLOW FIELDS

ATMOSPHERIC TRANSPORT

<22> CONF.
 <ACRO> SULFATIDE/DOU
 <ADDP> PHYSICAL DYNAMICS, INC.
 <CTTY> LA JOLLA
 <STATE> CA
 <ZIP> 92038
 <PHONE> 714-454-9831
 <DOC> REPORT NO. PIRS-76-19; MONITORING AGENCY REPT. NO. SAHSO-TP-72-106; CONTRACT FOR 701-69-C-0239, ARPA ORDER-1109, DEC. 70, 76 PP. (AVAIL NTIS)
 <SUB> ROCKET EXHAUST FLOW STRUCTURE
 <ABST> THE REPORT DESCRIBES THE RESULTS OF EXHAUST PLUME FLOW FIELD COMPUTATIONS AT ATMOSPHERIC ALTITUDES. VISCOUS TRANSPORT, INCLUDING MULTICOMPONENT AND PRESSURE DIFFUSION, IS INCLUDED IN THE PLUME-ATMOSPHERE SHOCKLAYER. THE SHOCKS ARE TREATED AS DISCONTINUITIES ACROSS WHICH THE RANKINE-HUGONIOT RELATIONS ARE APPLIED. THE INTENT OF THE CALCULATIONS IS TO PROVIDE DETAILED COMPOSITION AND TEMPERATURE DISTRIBUTIONS IN THE ENTIRE FLOW FROM THE HIGH TEMPERATURE NOX REGION TO THE TRAILING WAKE DISC REGION.
 <STATUS> IN USE
 <ACCESS> UNLIMITED
 <MEDIA> PUNCHED CARDS; MAGNETIC TAPE
 <SIZE> 50 CARDS
 <COMP> IER; CDC
 <COMPIG> CDC 6600, 120 K CORE, 2 TAPE DRIVES
 <LANG> FORTRAN IV
 <CRAP> BCF
 <ALGO> FINITE DIFFERENCE
 <CLAS> DETERMINISTIC; SIMULATION
 <APPL> RADIATIVE AND ELECTROMAGNETIC PROPERTIES OF MISSILE PLUMES
 <USERS> PHYSICAL DYNAMICS; AF ROCKET PROPULSION LAB
 <SUB> COSPAR REFERENCE ATMOSPHERE
 <INVAL> COMPARISON WITH WIND-TUNNEL EXPERIMENTS
 <CON> MODEL HAS BEEN FURTHER DEVELOPED (BUT NOT DOCUMENTED) SINCE REPORT
 <UPDATE> 780705
 <23>
 <CONF> BRIGGS, G. A.
 <TITLE> PLUME RISE PREDICTIONS
 <ADDP> NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, ATMOSPHERIC TURBULENCE AND DIFFUSION LABORATORY
 <CTTY> OAK RIDGE
 <STATE> TN

<ZIP> 37830
 <DOC> ADOL--76/74, 1976
 <ABST> ANYONE INVOLVED WITH DIFFUSION CALCULATIONS BECOMES WELL AWARE OF THE STRONG DEPENDENCE OF MAXIMUM GROUND CONCENTRATIONS ON THE EFFECTIVE STACK HEIGHT, $H_{SUB E}(E-2.3)$. IN INVERSION BREAKUP SITUATION, THE EXPONENT IS SOMEWHAT SMALLER; VERY CRUDELY, $H_{SUB E}$ MAY APPROXIMATELY $H_{SUB E}(E-1.5)$. IN ANY CASE, FOR AN ELEVATED EMISSION THE DEPENDENCE OF $H_{SUB E}$ ON $H_{SUB E}$ IS SUBSTANTIAL. IT IS POSTULATED THAT A REALLY CLEVER IGNORANT THEORETICIAN CAN DISGUISE HIS IGNORANCE WITH DIMENSIONLESS CONSTANTS. FOR MOST SITUATIONS THE EFFECTIVE STACK HEIGHT IS CONSIDERABLY LARGER THAN THE ACTUAL SOURCE HEIGHT, $H_{SUB S}$. FOR INSTANCE, FOR POWER PLANTS WITH NO DOWNWASH PROBLEMS, $H_{SUB E}$ IS MORE THAN TWICE $H_{SUB S}$ WHENEVER THE WIND IS LESS THAN 10 M/SEC, WHICH IS MOST OF THE TIME. THIS IS UNFORTUNATE FOR ANYONE WHO HAS TO PREDICT GROUND CONCENTRATIONS, FOR HE IS LIKELY TO HAVE TO CALCULATE THE PLUME RISE, ΔH , ESPECIALLY WHEN USING $H_{SUB E} = H_{SUB S} + \Delta H$ INSTEAD OF $H_{SUB S}$ MAY PERCEIVE $H_{SUB E}$ BY A FACTOR OF ANYWHERE FROM 4 TO INFINITY. FACTORS TO BE CONSIDERED IN MAKING PLUME RISE PREDICTIONS ARE DISCUSSED.
 <CLAS> PREDICTIVE
 <24>
 <CONF> BROWN, G. R.
 <TITLE> AEROSOL MODELING
 <ADDP> 240 CHESTNUT STREET SW
 <CTTY> ATLANTA
 <STATE> GA
 <ZIP> 30314
 <ABST> NUMERICAL SUB-MODELS ARE COMBINED FOR PROCESSES INCLUDING NUCLEATION, CONDENSATION, GAS-AEROSOL CHEMICAL REACTIONS, COAGULATION, DRY DEPOSITION AND DISPERSION. EXTRAMURAL WORK HAS PRODUCED A MODEL THAT INCORPORATES THESE PROCESSES. CALCULATIONS HAVE BEEN PERFORMED FOR THE TRANSPORT OF SULFURIC ACID GENERATED BY CATALYST-EQUIPPED AUTOMOBILES AND THE TRANSPORT OF DUST IN A SOUTHWESTERN CITY. REFINEMENTS TO THE MODEL ARE TO BE MADE AS CHEMICAL RATE DATA FOR GAS-AEROSOL REACTIONS BECOME AVAILABLE. 6/7A REPORT ON GAS AEROSOL REACTIVE RATES.
 <TIME> 76/10/01-81/10/01
 <CLAS> PREDICTION
 <25>
 <CONF> BYRAN, KIM
 <TITLE> A GLOBAL OCEAN-ATMOSPHERE CLIMATE MODEL: THE OCEANIC CIRCULATION
 <ADDP> NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, GEOPHYSICAL FLUID DYNAMICS LABORATORY, PRINCETON UNIVERSITY

<25>

ATMOSPHERIC TRANSPORT

<25> COM-
<CITY> PRINCETON

<STATE> NJ

<ZIP> 08540

<FROM> 609-820-5264

<DOC> DOCUMENTATION INCOMPLETE, EXPECTED DATE: DECEMBER, 1978

<ABST> A NUMERICAL EXPERIMENT HAS BEEN CARRIED OUT WITH A JOINT MODEL OF THE OCEAN AND ATMOSPHERE. THE 12-LEVEL MODEL OF THE WORLD OCEAN PREDICTS THE FIELDS OF HORIZONTAL VELOCITY, TEMPERATURE AND SALINITY. IT INCLUDES THE EFFECTS OF BOTTOM TOPOGRAPHY, AND A SIMPLIFIED MODEL OF POLAR PACK ICE. THE NUMERICAL EXPERIMENT ALLOWS THE JOINT OCEAN-ATMOSPHERE MODEL TO SEEK AN EQUILIBRIUM OVER THE EQUIVALENT OF 270 YEARS IN THE OCEAN TIME SCALE. THE INITIAL STATE OF THE OCEAN IS UNIFORM STRATIFICATION AND COMPLETE REST. ALTHOUGH THE FINAL TEMPERATURE DISTRIBUTION IS NOT SO BALANCED AS IT SHOULD BE, THE MAJOR WESTERN BOUNDARY CURRENTS AND THE EQUATORIAL OVERCURRENENT ARE SUCCESSFULLY PREDICTED. THE CALCULATED SALINITY FIELD WAS THE CORRECT OBSERVED RANGE, AND CORRECTLY INDICATES THAT THE ATLANTIC IS SALTIER THAN THE PACIFIC. IT ALSO PREDICTS THAT THE SURFACE WATERS OF THE NORTH PACIFIC ARE LESS SALINE THAN THE SURFACE WATERS OF THE SOUTH PACIFIC IN ACCORDANCE WITH OBSERVATIONS. THE PACK ICE MODEL PREDICTS HEAVY ICE IN THE ARCTIC OCEAN, AND ONLY VERY LIGHT PACK ICE ALONG THE PERIPHERY OF THE ANTARCTIC CONTINENT. THE POLARWARD HEAT TRANSPORT OF THE MODEL IS VERY SENSITIVE TO THE STRENGTH OF THE CIRCULATION IN THE VERTICAL-MERIDIONAL PLANE. HEAT BALANCE COMPUTATIONS MADE FROM OBSERVED DATA CONSISTENTLY SHOW THAT THE MAXIMUM HEAT TRANSPORT BY OCEAN CURRENTS IS SHIFTED 10-20 DEGREES EQUATORWARD RELATIVE TO THE MAXIMUM POLARWARD HEAT TRANSPORT BY THE ATMOSPHERE IN MIDDLE LATITUDES.

<GEN> GLOBAL

<STATUS> IN USE; UNDOCUMENTED

<ACCESS> LIMITED

<MEDIA> MAGNETIC TAPE

<COMP> TI; TI GRAC

<LANG> FORTHAN

<CLASS> SIMULATION

<26>
<CONT> BUTSCH, REID A.

<TITLE> A NON-EQUILIBRIUM MODEL OF HEMISPHERIC NEAR SURFACE TEMPERATURE

<ADDR> UNIVERSITY OF WISCONSIN, INSTITUTE FOR ENVIRONMENTAL STUDIES, CENTER FOR CLIMATIC RESEARCH

<CITY> MADISON

<STATE> WI

<ZIP> 53706

<DOC> JOURNAL ATMOSPHERIC SCIENCE, 33, 2094-2104, 1976

<SUB> NEAR HEMISPHERIC TEMPERATURE MODEL

<ABST> A SIMPLE NEAR HEMISPHERIC TEMPERATURE MODEL HAS BEEN CONSTRUCTED IN THE FORM OF A DIFFERENTIAL EQUATION WHICH IS A FUNCTION OF THREE INDEPENDENT VARIABLES: CARBON DIOXIDE CONTENT OF THE AIR, VOLCANIC EJECT AND ANTHROPOGENIC PARTICULATE POLLUTION. THIS MODEL APPEARS TO SIMULATE THE BEHAVIOR OF NORTHERN HEMISPHERE NEAR TEMPERATURES AS WELL AS THEY ARE KNOWN AND GIVES A DIFFERENT PATTERN OF BEHAVIOR FOR THE SOUTHERN HEMISPHERE. BY NOW COMPLETELY ACCOUNTING FOR THOSE ANTHROPOGENIC PROCESSES WHICH PRODUCE BOTH LOWER TROPOSPHERIC AEROSOLS AND CARBON STORAGE, SUCH AS FOSSIL FUEL BURNING AND AGRICULTURAL BURNING, WE CALCULATE AN EXPECTED SLIGHT DECREASE IN SURFACE TEMPERATURE WITH AN INCREASE IN CO2 CONTENT. THOUGH AN INVARIANT "SOLAR CONSTANT" WAS ASSUMED, AN OBSERVABLE 20-25 YEAR PERIODICITY WAS FOUND IN THE DIFFERENCE BETWEEN THE CALCULATED AND OBSERVED DIRECT SOLAR FLUX REACHING THE EARTH'S SURFACE, SUGGESTING A DEFINITE BUT SMALL PERIODIC VARIATION IN THE SOLAR CONSTANT.

<GEN> GLOBAL

<STATUS> IN USE

<CLASS> PREDICTIVE

<UPDATE> 780803

<27>
<CONT> BURGHEIER, J. W.; BLIFFORD, I. W., JR.

<TITLE> REINFORCED COAGULATION-SEDIMENTATION MODEL FOR STRATOSPHERIC AEROSOLS

<ADDR> UNIVERSITY OF VERMONT

<CITY> DUBLINGTON

<STATE> VT

<DOC> NATL. AIR, SOIL POLLUTION, 5(2), 133-147, 1975

<ABST> A NUMERICAL MODEL IS CONSTRUCTED TO SIMULATE THE AGING OF THE AEROSOL SIZE DISTRIBUTIONS IN THE STRATOSPHERE IN THE PRESENCE OF SOURCES, AND TO CALCULATE NEAR RESIDENCE TIMES IN THE ABSENCE OF SOURCES. IT INCORPORATES THE MECHANISMS OF THERMAL COAGULATION, GRAVITATIONAL SEDIMENTATION AND GAS REACTIONS. COMPUTATIONS USING THIS MODEL INDICATE THAT FOR THE RATHER DIFFERENT AEROSOL SPECTRA MEASURED BY FIGG, FRIEND AND JUDGE, ONLY THAT OF FIGG IS CONSISTENT WITH THE RESIDENCE TIMES THAT HAVE BEEN DETERMINED FOR STRATOSPHERIC PARTICULATES. AN UPPER LIMIT FOR THE STRATOSPHERIC PRODUCTION RATE OF REACTIVE GASES IS ESTIMATED TO BE THE ORDER OF $10(12-20) \text{ g/cm}^3/\text{s}$.

<CLASS> SIMULATION

ATMOSPHERIC TRANSPORT

- <28>
<CONT> CALDER, K. L.
<TITLE> A CLIMATOLOGICAL MODEL FOR MULTIPLE-SOURCE URBAN AIR POLLUTION
<ADDR> ENVIRONMENTAL RESEARCH LABORATORIES, AIR RESOURCES LABORATORIES
<CITY> PALM BEACH
<STATE> FL
<DOC> MONITORING AGENCY REPT. NO. MOAR-72030635, 1971, 30 PP.
<ABST> THE PAPER DESCRIBES A REVISED FORM OF AN URBAN AIR POLLUTION MODEL FOR ESTIMATING LONG-TERM CONCENTRATIONS OF GASEOUS POLLUTANT IN TERMS OF PRECIPITATE DEPTH AND AREA SOURCE EMISSION INVENTORIES FOR THE URBAN AREA, TOGETHER WITH CLIMATOLOGICAL FREQUENCY DATA RELATING TO WIND SPEED, WIND DIRECTION, ATMOSPHERIC STABILITY, AND MIXING DEPTH. THE MODEL IS ALSO APPLIED TO THE ESTIMATION OF THREE-MONTH AVERAGE SO₂ CONCENTRATIONS IN ST. LOUIS, MISSOURI, DURING THE WINTER OF 1964-65. SOME SHORTCOMINGS OF THE PRESENT MODEL ARE IDENTIFIED AND DISCUSSED.
<GRD> MISCELLANEOUS
<CLASS> SIMULATION
<TIME> 76/01/01-76/12/31
<CLASS> PREDICTIVE
- <29>
<CONT> CALDER, K. L.
<TITLE> MISCELLANEOUS ASPECTS OF CURRENT URBAN POLLUTION MODELS
<ADDR> NATIONAL OCEANIC ATMOSPHERIC ADMINISTRATION, AIR POLLUTION CONTROL OFFICE
<CITY> BOULDER
<STATE> CO
<DOC> AIR POLLUT. CONTR. OFF. PUBL. (HAPP82) (AP-86) 4, 13 PP., 1970
<ABST> THE EXTENSION OF STOCHASTIC SIMULATION MODELS TO VARIABLE CONDITIONS AND LONG TERM PREDICTIONS IS DISCUSSED, INCLUDING CONCENTRATION PATTERNS AND AVERAGE SEASONAL AND ANNUAL DISTRIBUTION. A SENSITIVITY ANALYSIS IS RECOMMENDED TO IDENTIFY THE INPUT PARAMETERS THAT MOST CRITICALLY AFFECT THE CONCENTRATION PREDICTIONS.
<CLASS> SIMULATION
- <30>
<CONT> CALVERT, JACK G.
<TITLE> KINETIC STUDY OF SIMULATED SO₂, NO_x, AND POLLUTED ATMOSPHERES
<ADDR> OHIO STATE UNIVERSITY, RESEARCH FOUNDATION, DEPARTMENT OF CHEMISTRY
<CITY> COLUMBUS
<STATE> OH
<ZIP> 43212
- <31>
<CONT> CAMPBELL, J. E.
<TITLE> AIR TRANSPORT CALCULATIONS USING THE LASL-WUEP AIR FLUX TAPE AND THE WUEP COMPUTED PROGRAM--CWP
<ADDR> CWP
<ADDR> 253050 NAVAL WEAPONS EVALUATION FACILITY
<CITY> ALBUQUERQUE
<STATE> NM
<DOC> REPORT NO. WUEP-1090; CONTRACT ORD-35C-000/212-1/0F311-502, 100 PP., 1972
<ABST> THE RECENT AVAILABILITY OF COUPLED NEUTRON-GAMMA, MULTIGROUP, CROSS-SECTION SETS HAS PROMPTED THE PRODUCTION OF A NEUTRON-GAMMA AIR FLUX TAPE SIMILAR TO THE NEUTRON AIR FLUX TAPE REPORTED PREVIOUSLY. THE AIR FLUX DATA CONSISTS OF COMPLETE TRANSPORT CALCULATIONS IN UNIFORM, SEA-LEVEL AIR FOR ONE SOURCE NEUTRON IN EACH OF 30 ENERGY GROUPS AND ONE SOURCE PHOTON IN EACH OF 12 ENERGY GROUPS. THE COMPUTER PROGRAM CWP (CONSTANT DOSE RANGE) USES THE NEW AIR FLUX TAPE TO PRODUCE RANGES OF CONSTANT DOSE FROM A POINT SOURCE IN THE ATMOSPHERE.
<CLASS> PREDICTIVE
- <32>
<CONT> CAPORALETTI, J. M.; MYRABO, L. M.; SCHLEIFER, P.; STANBROK, A.; WILSON, K. R.
<TITLE> STATISTICAL OXIDANT AIR QUALITY

ATMOSPHERIC TRANSPORT

<32> CONT.

PREDICTION MODEL FOR LAND USE AND TRANSPORTATION PLANNING

<ORDE> UNIVERSITY OF CALIFORNIA

<CTRY> SAN DIEGO

<STAT> CA

<DOC> ATMOSPHERIC ENVIRONMENT, 11(5), 457-458, 1977

<ABST> A STATISTICAL MODEL HAS BEEN DEVELOPED FOR THE PREDICTION OF CHANGES IN OXIDANT AIR QUALITY AS A FUNCTION OF LOCATION RESULTING FROM THE CREATION OF AN INDIRECT SOURCE OR THE IMPLEMENTATION OF A LAND USE OR TRANSPORTATION PLAN. LOS ANGELES AND SAN DIEGO GEOCODED REACTIVE HYDROCARBON EMISSION INVENTORIES FROM MOBILE AND STATIONARY SOURCES FOR 1969 AND 1970 HAVE BEEN USED WITH WIND DATA AND OBSERVED OXIDANT AIR QUALITY IN ORDER TO CALIBRATE A STATISTICAL RELATIONSHIP BETWEEN EMISSIONS AND AIR QUALITY. THIS RELATIONSHIP, APPLIED TO THE SAN DIEGO-TIJUANA REGION, HAS THEN BEEN USED WITH A 1975 BASE CASE GEOCODED EMISSIONS INVENTORY TO GENERATE A BASE CASE 1975 OXIDANT INDEX AS A FUNCTION OF POSITION. AN ALTERED 1975 GEOCODED EMISSIONS PROJECTION INCORPORATING THE EFFECTS OF EMISSIONS EFFECTS OF CHANGED LAND USE CAN THEN BE EMPLOYED TO GENERATE A NEW 1975 OXIDANT FUNCTION. THE DIFFERENCE BETWEEN THE NEW AND OLD OXIDANT FUNCTIONS REPRESENTS THE EFFECT, AREA BY AREA, OF THE CHANGE IN LAND USE ON AIR QUALITY. TO DEMONSTRATE THE POSSIBILITIES OF THIS TYPE OF MODEL, THREE EXAMPLES OF AIR QUALITY IMPACT ASSESSMENTS HAVE BEEN CARRIED OUT: FIRST, THE IMPACT OF A PROPOSED REGIONAL SHOPPING CENTER, SECOND, THE EFFECTS OF A PROPOSED LARGE SCALE DEVELOPMENT, THIRD, AN ANALYSIS OF AN EXISTING TRENDS' 1995 ALTERNATIVE REGIONAL TRANSPORTATION AND LAND USE PLAN FOR THE SAN DIEGO-TIJUANA REGION. THE RESULTING PREDICTED CHANGES IN OXIDANT AIR QUALITY, MEASURED BY THE NUMBER OF ADDITIONAL HOURS PER YEAR THAT THE U.S. FEDERAL OXIDANT STANDARD IS TO BE EXCEEDED, ARE DISPLAYED AS A FUNCTION OF POSITION OVER THE AIR BASIN. GIVEN THE EMISSIONS RESULTING FROM CHANGED LAND USE, THE CALCULATION OF AIR QUALITY CHANGE REQUIRES ONLY A MODEST AMOUNT OF COMPUTED TIME, AND THUS THIS TYPE OF MODEL CAN INEXPENSIVELY AND RAPIDLY BE USED TO EVALUATE THE APPROXIMATE AIR POLLUTION EFFECTS OF PLANNING ALTERNATIVES.

<GEN> CALIFORNIA; MEXICO

<CLAS> PREDICTIVE

<33>
<CCNT> CARPENTER, S. D.; MONTGOMERY, T. L.; LEAVITT, J. W.; COLRAUGH, W. C.; THOMAS, P. W.

<TITLE> PRINCIPAL PLUME DISPERSION MODELS: TWO POWER PLANTS

<DOC> JOURNAL OF THE AIR POLLUTION CONTROL ASSOCIATION, 21(3), 497-499, 1971.

<ABST> THE BODY OF INFORMATION PRESENTED IN THIS PAPER IS DIRECTED TO THOSE

INDIVIDUALS WHO MAY BE CONCERNED WITH PRINCIPAL PLUME DISPERSION MODELS AT COAL-BURNING POWER PLANTS. ABOUT 20 YEARS OF COMPREHENSIVE FIELD SURVEILLANCE AND DOCUMENTATION OF DISPERSION OF POWER PLANT EMISSIONS FOR A VARIOUS RANGE OF UNIT SIZES, STACK HEIGHTS, AND METEOROLOGICAL CONDITIONS HAVE DETERMINED THE TENNESSEE VALLEY AUTHORITY'S INTERPRETATION OF PRINCIPAL PLUME DISPERSION MODELS. THIS EXPERIENCE INDICATES THAT AS UNIT SIZES ARE INCREASED AND TALLER STACKS ARE CONSTRUCTED, THE PLUME DISPERSION MODEL ASSOCIATED WITH MAXIMUM SURFACE CONCENTRATIONS CHANGES. MAXIMUM SURFACE CONCENTRATIONS FOR PRINCIPAL PLUME DISPERSION MODELS WERE APPROXIMATELY EQUAL FOR THE EARLY SMALL PLANTS. HOWEVER, THE CORING MODEL HAS CONSIDERED THE CRITICAL PLUME DISPERSION MODEL BECAUSE THE FREQUENCY OF OCCURRENCE OF SURFACE CONCENTRATIONS FROM THIS MODEL WAS APPRECIABLY GREATER THAN OTHER MODELS. THERE WERE PROGRESSIVE CHANGES BECAUSE OF AN INCREASE IN UNIT SIZES AND STACK HEIGHTS; THE MAGNITUDE OF MAXIMUM SURFACE CONCENTRATIONS FROM THE CORING MODEL DECREASED, AND THE MAGNITUDE (RELATIVE TO THE CORING MODEL) OF CONCENTRATIONS FROM THE INVERSION BREAKUP MODEL INCREASED. HOWEVER, WITH PLUMES FROM FEWER AND LARGER UNITS WITH HIGHER STACKS, THE TRAPPING DISPERSION MODEL BECAME PROMINENT. FINALLY, BY THE TIME UNIT SIZE HAD INCREASED TO 900 MW AND STACK HEIGHT TO ABOUT 245 METERS, AS AT BULL RUN POWER PLANT, THE MAGNITUDE OF SURFACE CONCENTRATIONS ASSOCIATED WITH TRAPPING HAD INCREASED TO SUCH A DEGREE THAT IT BECAME THE CRITICAL DISPERSION MODEL IDENTIFIED WITH POWER PLANTS OF THIS SIZE.

<CLAS> PREDICTIVE

<34>
<CONT> CHALKER, W. D.; PARSONS, J. L.

<TITLE> AIR QUALITY MANAGEMENT OF INDUSTRIAL SITES

<ADDR> E. I. DUPONT DE NEMOURS & COMPANY

<CITY> WILMINGTON

<STATE> DE

<DOC> ENG'G, R.H. AND W.T. DUFFY (EDS.) TWO FINDINGS OF THE INTERNATIONAL CLEAN AIR CONGRESS, VOL. 2. IIV-1354 PP., (PP. 1063-1067), 1971.

<ABST> THERE HAS BEEN SERIOUS EFFORT IN THE PAST FEW YEARS TO DEVELOP POLLUTION DISPERSION MODELS THAT RELIABLY RELATE AMBIENT AIR QUALITY TO EMISSIONS FROM MULTIPLE SOURCES. THESE HAVE BEEN PRINCIPALLY APPLIED TO LARGE URBAN AREAS WHERE THE CONTAMINANTS ARE SULFUR DIOXIDE, PARTICULATES OR NITROGEN OXIDES. DUPONT HAS USED A MODEL FOR MANY YEARS TO EVALUATE THE IMPACT OF ITS EMISSIONS ON AIR QUALITY IN THE VICINITY OF ITS PLANTS FOR A WIDE RANGE OF CONTAMINANTS IN ADDITION TO THOSE CITED. IN THE PAST THREE YEARS WE HAVE ENLARGED THE VALIDATION EFFORTS FOR OUR MODEL. WE CONCLUDE IT IS RELIABLE AND HENCE USEFUL IN PLANNING ABATEMENT EFFORTS FOR EXISTING AND NEW SOURCES TO MEET AIR QUALITY GOALS. WE WILL

ATMOSPHERIC TRANSPORT

- <30> CONT.
DESCRIBE OUR MODEL AND HOW IT SERVES AS ONE OF THE TOOLS WE USE IN AIR QUALITY MANAGEMENT AT OUR INDUSTRIAL SITES.
- <CLASS> PERSPECTIVE
- <35>
<CONT> CHAMBERS, W. L.; STEDMAN, D. R.
- <TITLE> OZONE FORMATION FROM NOX IN "CLEAN AIR"
- <ADDR> UNIVERSITY OF MICHIGAN
- <CITY> ANN ARBOR
- <STATE> MI
- <DOC> ENVIRONMENTAL SCIENCE TECHNOLOGY, 10(2), 154-163, 1976
- <ABST> A THEORETICAL MODEL IS PRESENTED TO EXPLAIN RECENT OBSERVATIONS OF OZONE IN EXCESS OF 50 PPB IN RELATIVELY RURAL AREAS. THE PROPOSED MECHANISM INVOLVES THE INTERACTION OF ANTHROPOGENIC NITROGEN OXIDES FROM URBAN AREAS WITH THE NATURAL PHOTOCHEMICAL METHANE OXIDATION CHAIN. THIS MECHANISM CAN CAUSE THE PRODUCTION OF LARGE QUANTITIES OF OZONE IN THE "RURAL POLLUTION PLUME, LEADING TO HIGH OZONE-AIR POLLUTION EVENTS IN RURAL AREAS DOWNWIND OF THE URBAN POLLUTION SOURCE.
- <CLASS> SIMULATION
- <36>
<CONT> CHAMBERS, W. L.; WALKER, J. C. G.
- <TITLE> TIME-DEPENDENT PHOTOCHEMICAL MODEL FOR OZONE NEAR THE GROUND
- <ADDR> UNIVERSITY OF MICHIGAN
- <CITY> ANN ARBOR
- <STATE> MI
- <DOC> JOURNAL OF GEOPHYSICAL RESEARCH, 81(3), 413-420, 1976
- <ABST> A TIME-DEPENDENT PHOTOCHEMICAL MODEL OF TROPOSPHERIC OZONE IS PRESENTED. IN ACCORDANCE WITH PREVIOUS CALCULATIONS (CHAMBERS AND WALKER, 1973) OZONE IS TREATED AS AN ACTIVE CHEMICAL CONSTITUENT WITH A LOCAL ABUNDANCE THAT IS DETERMINED BY PHOTOCHEMICAL PROCESSES RATHER THAN BY TRANSPORT PROCESSES. THE LOCAL ABUNDANCE OF ODD NITROGEN IS SHOWN TO PLAY A MAJOR ROLE IN DETERMINING THE INTENSITY OF PHOTOCHEMICAL PRODUCTION AND DESTRUCTION OF OZONE. A LARGE LOCAL ABUNDANCE OF NOX (NOX = NO + NO2) LEADING TO LARGE DIURNAL OZONE VARIATIONS. THE PHOTOCHEMICAL MODEL IS SHOWN TO REPRODUCE THE DIURNAL VARIATIONS OF OZONE AND NITROGEN DIOXIDE OBSERVED NEAR THE GROUND AT RESEARCH TRIANGLE PARK IN NORTH CAROLINA.
- <GEO> NORTH CAROLINA
- <CLASS> SIMULATION
- <37>
<CONT> CHATURVEDI, SUSHIL
- <TITLE> THERMAL MODEL FOR ATMOSPHERIC SPRAY COOLING SYSTEMS: ENVIRONMENTAL EFFECTS OF HEAT AND MOISTURE RELEASE
- <ADDR> ILLINOIS INSTITUTE OF TECHNOLOGY
- <CITY> CHICAGO
- <STATE> IL
- <ZIP> 60616
- <DOC> K.E. TORrance AND B.G. WATTS, (EDS.), ENVIRONMENTAL EFFECTS OF ATMOSPHERIC HEAT/MOISTURE RELEASES, THE SECOND AIAA/ASME THERMOPHYSICS AND HEAT TRANSFER CONFERENCE HELD IN PALO ALTO, CALIFORNIA, MAY 24-26, 1978, (PP. 65-74)
- <ABST> THE PRESENT WORK DEALS WITH A SOURCE OF FINITE WIDTH AND HEIGHT WITH A DISTRIBUTED INTERNAL HEAT AND MOISTURE RELEASE CONSISTENT WITH A THERMAL MODEL FOR ATMOSPHERIC SPRAYS INCLUDING HEATING AND HUMIDIFICATION OF DOWNWIND ELEMENTS. THE SELF-CONSISTENT FULLY-DEVELOPED AMBIENT WIND AND TURBULENT DIFFUSIVITY PROFILES DEPENDING ON AERODYNAMIC SURFACE ROUGHNESS AND ATMOSPHERIC STABILITY ARE PRESUMED TO PREVAIL THROUGHOUT THE DOMAIN OF INTEREST. THE CONVECTIVE DIFFUSION EQUATION GOVERNING THE ENTHALPY OF THE AIR-MOISTURE MIXTURE IS INTEGRATED NUMERICALLY CONTINUING THROUGH AND BEYOND THE SOURCE, AND THE LOCAL TEMPERATURE AND VAPOR CONCENTRATION ARE COMPUTED. FOGGING IS DESCRIBED BY AN EQUILIBRIUM MODEL WHICH REQUIRES CONDENSATION OF VAPOR IN EXCESS OF SATURATION. GROUND-LEVEL DISPENSANT CONCENTRATION 500 FEET ARE COMPARED WITH THOSE OF GROUND-LEVEL LINE SOURCES, AND OF FIELD AND WIND-TUNNEL EXPERIMENTS WITH A FINITE SOURCE.
- <38>
<CONT> CHEN, TIO C.; HADCH, P.
- <TITLE> EFFECT OF HIGHWAY CONFIGURATIONS ON ENVIRONMENTAL PROBLEMS--DYNAMICS OF HIGHWAY ASSOCIATED AIR POLLUTION
- <ADDR> PARSONS, BRINCKERHOFF, QUAD & DOUGLAS, INC., ADVANCED TECHNOLOGY DIVISION
- <CITY> NEW YORK
- <STATE> NY
- <DOC> ENGLUND, H.H. AND V.T. DERRY (EDS.) PROCEEDINGS OF THE INTERNATIONAL CLEAR AIR CONGRESS, VOL. 2. ENV-1350 PP., (P.35-38), 1971
- <ABST> FORMULAS TO FORECAST STEADY STATE POLLUTANT DISTRIBUTION UNDER SPECIFIED TRAFFIC DENSITY, SPEED AND TYPE OF VEHICLE, AND TOPOGRAPHIC AND ATMOSPHERIC CONDITIONS, ARE DERIVED FOR 2 HIGHWAY CONFIGURATIONS: DEPRESSIONED HIGHWAY WITH SIDEWALLS AND AN ELEVATED HIGHWAY WITHOUT SIDEWALLS. THE POLLUTANT IS ASSUMED TO BE GASEOUS; THE EQUATIONS OF TURBULENT DIFFUSION ARE USED WITH INTRODUCED DIFFUSION COEFFICIENTS BASED ON CONCEPTS OF STATISTICAL MECHANICS. ALL PARAMETERS

<78>

ATMOSPHERIC TRANSPORT

<78> CONT.

OF THE POLUTION ARE RELATED TO OBSERVABLE METEOROLOGICAL ENTITIES. TYPICAL POLLUTION PROFILES ARE COMPUTED FOR A RANGE OF GEOMETRIC, TRAFFIC, AND ATMOSPHERIC CONDITIONS OF THE HIGHWAY ENVIRONMENT.

<79>

<CONTR> CHESTER, P. O.

<TITLE> A STUDY OF THE FISSION PRODUCT RELEASE FROM A BADLY DAMAGED WATER-COOLED REACTOR

<ADDR> ORNL RIDGE NATIONAL LABORATORY, HEALTH AND SAFETY RESEARCH DIVISION, P.O. BOX 1

<CITY> ORNL RIDGE

<STATE> TN

<ZIP> 37830

<PHONE> 415-483-8611 EXT 3-0330; FTS 850-0330

<SOURCE> DEVELOPED AT ORNL

<DOC> HSIA, P. O., AND CHESTER, P. O., A STUDY OF THE FISSION PRODUCT RELEASE FROM A BADLY DAMAGED WATER-COOLED REACTOR, ORNL-TN-4702, JUNE 1970.

<SUB> POLLUTANTS AND EFFLUENTS OF ENERGY PROCESSES; HUMAN HEALTH, SOMATIC AND GENETIC EFFECTS; ENERGY PRODUCTION; ELECTRIC POWER GENERATION; MATERIAL PROPERTIES.

<ABST> A REALISTIC MODEL FOR FISSION PRODUCT RELEASE FROM A BADLY DAMAGED POWER REACTOR HAS BEEN DEVELOPED. THE VAPORIZATION OF FISSION PRODUCTS BY DECAY HEAT, THE EFFECTS OF THE METAL-WATER REACTION, THE DEPOSITION OF PARTICULATE INVENTORY IN REACTOR VESSELS, AND THE LEAKAGE THROUGH THE MULTIPLE CONTAINMENTS ARE ALL CONSIDERED IN THIS MODEL. THE CALCULATION SHOWS THAT THE VAPORIZATION OF FISSION PRODUCTS CAN LEAD TO A 35 PERCENT REDUCTION OF THE DECAY HEAT OBTAINED WITHIN THE CORE. THIS EFFECT IS GREATEST FOR LOW-VAPOR-PRESSURE FISSION PRODUCTS. THE METAL-WATER REACTION HEAT AVAILABLE TO VAPORIZE UO₂ IS ABOUT 10 PERCENT OF THE DECAY HEAT AVAILABLE. THE REACTION HEAT CAN PRODUCE A REDUCING ATMOSPHERE SURROUNDING THE FUEL LEADING TO AN INCREASE OF BA AND SF RELEASES BY A FACTOR OF 30 OR MORE. THE EFFECT OF CONTAINMENT ON THE FISSION PRODUCT RELEASE DEPENDS OF THE DEPOSITION PROPERTIES OF THE SPECIFIC FISSION PRODUCT. EVEN A BADLY DAMAGED CONTAINMENT CAN LEAD TO A REDUCTION OF THE FISSION PRODUCT RELEASE BY MORE THAN TWO ORDERS OF MAGNITUDE. A RECIRCULATING FILTER-ABSORBER INSIDE THE CONTAINMENT CAN LEAD TO A REDUCTION OF THE PARTICULATE FISSION PRODUCT RELEASE BY MORE THAN ONE ORDER OF MAGNITUDE.

<TIND> 1972-1974

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> PUNCHED CARDS

<CONF> IBM

<CONFIG> IBM 360/91

<LANG> FORTRAN IV

<ALGO> VAPORIZATION MODEL; AEROSOL MODEL

<CLAS> ANALYTICAL

<80>

<CONTR> CHU, D. H.

<TITLE> MATHEMATICAL MODELS FOR SO₂ DISPERSION IN THE METROPOLITAN DETROIT AREA

<ACRO> CDR

<ADDR> WAYNE STATE UNIVERSITY

<CITY> DETROIT

<STATE> MI

<ZIP> 48202

<DOC> WAYNE STATE UNIVERSITY, 1977

<ABST> THE EPA CLIMATOLOGICAL DISPERSION MODEL (CDM) HAS BEEN APPLIED TO THE METROPOLITAN DETROIT AREA TO DETERMINE THE ANNUAL AND 24-HR SO₂ CONCENTRATIONS AT GROUND-LEVEL RECEPTORS, USING EMISSION INVENTORY DATA FROM WAYNE COUNTY IN A COOPERATIVE AGENCY-UNIVERSITY EFFORT. A NUMERICAL MODEL, A MODIFICATION OF THE SAI MODEL INTRODUCED BY REYNOLDS, SEINFELD, ET AL., (1973), HAS BEEN DEVELOPED TO PREDICT THE TIME-DEPENDENT AND THREE-DIMENSIONAL DISPERSION OF CHEMICALLY REACTIVE AIR POLLUTANTS WITH VARIABLE EMISSION RATES SO₂ DISPERSION IN THE DETROIT AREA FOR USE AS A SHORT-TERM (24-HR OR LESS) MODEL. BOTH MODELS ARE VERIFIED BY A REGRESSION ANALYSIS USING THE OBSERVATIONAL DATA OF THE WAYNE COUNTY AIR POLLUTION CONTROL DIVISION'S 18 AIR MONITORING STATIONS. THE BENEFITS OF EACH MODEL, A COMPARISON OF THE TWO MODELS FOR A 24-HR STUDY, THE REQUIREMENTS FOR ACCURACY OF INPUT DATA, AND THE FUTURE IMPROVEMENTS OF THE NUMERICAL MODEL ARE DISCUSSED.

<GEO> MICHIGAN, DETROIT

<81>

<CONTR> CHRISTIANSEN, JOHN W.

<TITLE> TEXAS EPISODIC MODEL

<ACRO> TEN

<ADDR> TEXAS AIR CONTROL BOARD, DATA PROCESSING SECTION

<CITY> AUSTIN

<STATE> TX

<DOC> OTT, W.D. (ED.), PROCEEDINGS OF THE EPA CONFERENCE ON ENVIRONMENTAL MODELING AND SIMULATION, 1976, EPA 600/3-76-016, (P. 77-87), 847 PP.

<SUB> SHORT-TERM AIR POLLUTION DISPERSION MODEL

<ABST> THE TEXAS EPISODIC MODEL (TEN) IS A NEW

ATMOSPHERIC TRANSPORT

<CT> CONT.

SECT-TECH AIR POLLUTION DISPERSION COMPUTER MODEL. THE TECH USES STIRRED-TANK DIAPHRAGM GAUSSIAN PLUME-POINT SOURCE LOGIC, BUT SOLVES THE DISPERSION EQUATION BY INTERPOLATING IN A TABLE OF PRECALCULATED COEFFICIENTS. THE MODEL CALCULATES PLUME RISE VIA ONE OF SIX EQUATIONS, CHOOSING THE APPROPRIATE EQUATION ON THE BASIS OF 1) DOWNWIND DISTANCE, 2) ATMOSPHERIC STABILITY, AND 3) WHETHER THE RISE OF THE PLUME IS DOMINATED BY THERMAL BUOYANCY OR MOMENTUM. IT ALSO TAKES INTO ACCOUNT POLLUTANT DECAY, VARIATION OF WIND SPEED WITH HEIGHT, AND ATMOSPHERIC INVERSION LAYERS. CONCENTRATIONS ARE CALCULATED FOR ONE OR TWO POLLUTANTS AT UP TO 2500 LOCATIONS IN A 2500M GRID OF ARBITRARY DIMENSIONS AND SPACING, FOR A WIDE RANGE OF SAMPLE TIMES FROM 10 MINUTES TO 24 HOURS.

<STATUS> IN USE

<ACCESS> UNLIMITED

<CLASS> PREDICTIVE

<APPD> ANALYSIS OF NEW CONSTRUCTION PERMIT APPLICATIONS FROM INDUSTRIES; ESTABLISH CULPABILITY FOR VIOLATIONS IN THE 24 HOUR AMBIENT AIR QUALITY STANDARDS; INVESTIGATE THE RELATIONSHIPS BETWEEN GASEOUS AND PARTICULATE POLLUTANTS

<FDATE> 780617

<Q2>

<CCAT> CHU, C.

<TITLE> GENERAL ENVIRONMENTAL MODEL OF MICROCLIMING

<ADDP> UNIVERSITY CALIFORNIA, SCHOOL OF ENGINEERING AND APPLIED SCIENCES

<CITY> LOS ANGELES

<STATE> CA

<DOC> CHEMICAL ENGINEERING SCIENCE, 29(3), 925-33, 1973

<ABST> AN ANGLE OF MIXEDNESS WAS USED TO CHARACTERIZE THE FULL RANGE OF MICROCLIMING. BY USING THE GENERAL ENVIRONMENTAL MODEL WITH A CONSTANT THE CONVERSION FOR 1-STATE OF INTERMEDIATE MIXEDNESS COULD BE HIGHER THAN THE CONVERSIONS INCLUDED IN THE 2 EXTREME LIMITS OF MICROCLIMING, COMPLETE SEGREGATION AND MAXIMUM MIXEDNESS. THIS APPLIES TO ALL REACTIONS, INCLUDING UNIMOLECULAR 1ST-ORDER REACTIONS, WITH 0-ORDER REACTIONS AS THE ONLY EXCEPTION.

<CLASS> SIMULATION

<Q3>

<CONT> CHURCH, R. W.

<TITLE> DIFFUSION, MODEL FOR COMPUTATION OF AEROSOL TRANSPORT AND DIFFUSION IN THE ATMOSPHERE

<ACRD> DIFFUSION

<ADDP> SANDIA LABORATORIES, DIVISION 5333,

P.O. BOX 5800

<CITY> ALBUQUERQUE

<STATE> NM

<ZIP> 87105

<PHONE> 505-264-9123; FTS 875-9123

<DOC> SC-74-60-555, 47 PP., 1969

<SUB> ATMOSPHERIC TRANSPORT AND DIFFUSION

<ABST> IN CONJUNCTION WITH POLLED COASTER, A JOINT UNITED STATES-BRITISH KINGDOM PROJECT CONDUCTED AT THE BEVAM TEST SITE IN 1963, A COMPUTER-PROGRAMMED MODEL FOR PREDICTION OF THE ATMOSPHERIC TRANSPORT AND DIFFUSION OF AEROSOLS WAS DEVELOPED. THE PROGRAM WAS A HOLDING OF A U.S. CODE DESCRIBING GRAVITATIONAL FALLOUT OF A LOG-NORMAL TYPE DISTRIBUTION OF PARTICLES IN A VERTICALLY VARYING WIND FIELD AND A U.K. CODE DESCRIBING THE DISPERSION OF A PARTICLE CLOUD BY ATMOSPHERIC TURBULENCE. IN THE PROGRAM, THE AEROSOL CLOUD IS APPROXIMATED BY A SERIES OF CYLINDRICAL LAYERS IN THE VERTICAL DIRECTION CHARACTERIZED BY A SOURCE STRENGTH, LATERAL DIAMETER AND THICKNESS, AND A DISTRIBUTION OF AEROSOL MASS WITH PARTICLE DIAMETER. IN TURN, EACH LAYER IS REPRESENTED BY SEVERAL SUPERPOSED LINE SOURCE ELEMENTS OF EQUI-SIZE PARTICLES TO CONFORM TO THE AEROSOL MASS-DIAMETER DISTRIBUTION FOR THE LAYER. EACH ELEMENT DESCENDS AT ITS GRAVITATIONAL FALL RATE AND IS TRANSPORTED BY ITS MEAN VECTOR WIND WHILE EXPANDING BY THE ACTION OF TURBULENCE DIFFUSION. DEPOSITION AND/OR AIRBORNE DOSAGE IS CALCULATED AT GROUND LEVEL ON A PREDEFINED GRID OF RANGES AND AZIMUTHS WHOSE ORIGIN IS AT THE INITIAL POSITION OF THE CLOUD. DETAILS OF THE DEVELOPMENT OF THE UNIQUE LINE SOURCE EQUATIONS USED IN THE MODEL ARE GIVEN, INDICATING THE ANALYTICAL METHOD USED TO ACCOUNT FOR LINEARLY CHANGING TRANSPORT DIRECTION OVER THE LENGTH OF THE SOURCE. IN ADDITION, THE EXPRESSIONS USED TO CALCULATE TURBULENCE SPREAD, DEPOSITION, PARTICLE FALL RATES AND TRANSPORT VECTORS ARE DISCUSSED IN TERMS OF APPROPRIATE EXPERIMENT AND GAUSSIAN THEORY. VARIOUS INPUT AND OUTPUT OPTIONS ARE DESCRIBED WHICH PERMIT GREAT FLEXIBILITY IN PROGRAM USE, EITHER IN PREDICTION OF THE DISPERSAL FROM A GIVEN CLOUD OR IN THE DETERMINATION OF THE INPUT NECESSARY TO PRODUCE A GIVEN RESULT. DETAILED INSTRUCTIONS ARE GIVEN FOR PREPARING THE INPUT DATA FOR THE PROGRAM. A SAMPLE PROBLEM IS USED TO ILLUSTRATE THE USEFULNESS OF THE PROGRAM IN MODELING A FAIRLY ARBITRARY SELECTION OF INPUTS. BOTH THE INPUT PREPARATION AND OUTPUT INTERPRETATION FOR THE SAMPLE PROBLEM ARE SHOWN IN INSTANTANEOUS RELEASES.

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> AS REQUIRED

<SIZE> 2000 CARDS

<CORP> CDC

<43>

ATMOSPHERIC TRANSPORT

<44> CONT.
<CONF> 15CM; 1 TAPE
<LANG> FORTRAN IV
<CLASS> ANALYTICAL
<APPL> SHORT RANGE DISPERSAL OF PARTICLES
SHALLER THAN 200 KILOMETERS

<45>
<CONF> CLARK, PERRY L.
<TITLE> POINT SOURCE TRANSPORT MODEL
<ADDR> ENVIRONMENTAL RESEARCH CENTER,
ENVIRONMENTAL SCIENCES AND RESEARCH
LABORATORY
<CITY> RESEARCH TRIANGLE PARK
<STATE> NC
<ZIP> 27711
<PHONE> 919-541-4524; PPS 629-4524
<DOC> OTS, U.S. (ED.), PROCEEDINGS OF THE EPA
CONFERENCE ON ENVIRONMENTAL MODELING
AND SIMULATION, 1976, EPA 600/9-76-016,
(P. 718-719), 847 PP.
<SUB> SIMULATES TRANSPORT OF AN INERT GASEOUS
CONTAMINANT IN THE ST. LOUIS AREA
<ABST> A NUMERICAL MODEL WAS USED TO EVALUATE
THE TRANSPORT OF AN INERT GASEOUS
CONTAMINANT IN ST. LOUIS. THE MODEL
CALCULATES, FROM A WIND FIELD, A
TWO-DIMENSIONAL FIELD OF STREAM
FUNCTION VALUES CHARACTERIZING THE AIR
FLOW. THE MODEL WAS DEVELOPED TO APPLY
TO INSTANTANEOUS POINT-SOURCE EMISSIONS
IN THE FORM OF PUFFS.

<GE7> ST. LOUIS, MO
<TIME> AUGUST 1975
<STATUS> IN USE
<ACCESS> UNLIMITED
<MEDIA> MAGNETIC TAPE; DISC
<CONF> OBY
<LANG> FORTRAN IV
<CHAP> BINARY
<ALGO> OBJECTIVE ANALYSIS OF WIND; STREAM
FUNCTION ANALYSIS; TRANSPORT; SIMPLE
DIFFUSION
<CLASS> SIMULATION
<APPL> TRANSPORT OF INERT SPECIES IN URBAN
ATMOSPHERE
<USERS> EPA
<SHD> 1975 REGIONAL AIR POLLUTION STUDY
(RAPPS) DATA
<RVAL> MODEL VALIDATION WITH DETAILED SPK
TRACER STUDY
<UPDA"R> 780725

<46>
<CONF> CLARK, J. P.
<TITLE> A SIMPLE DIFFUSION MODEL FOR
CALCULATING POINT CONCENTRATIONS FROM
MULTIPLE SOURCES
<ABST> FOUR METEOROLOGICAL PARAMETERS ARE
COMBINED WITH SOURCE-EMISSION DATA IN A
SIMPLE DIFFUSION MODEL TO ESTIMATE THE
DIFFUSION OVER AN URBAN AREA. THE
SUCCESS OF THE MODEL IN ESTIMATING AIR
CONCENTRATIONS IS DISCUSSED.

<CLASS> PREDICTIVE

<46>
<CONF> CLARK, JOHN P.; PETERSON, JAMES T.
<TITLE> AN EMPIRICAL MODEL USING EIGENVECTORS
TO CALCULATE THE TEMPORAL AND SPATIAL
VARIATIONS OF THE ST. LOUIS HEAT ISLAND
<ABST> EIGENVECTORS, OR EMPIRICAL ORTHOGONAL
FUNCTIONS, HAVE BEEN USED TO STUDY THE
RELATIONSHIP BETWEEN THE ST. LOUIS HEAT
ISLAND AND LAND USE AND METEOROLOGICAL
PARAMETERS. THE DATA USED IN THIS STUDY
CONSISTED OF OBSERVATIONS OF NOCTURNAL
SURFACE AIR TEMPERATURE OVER ST. LOUIS
ON 17 OCCASIONS DURING WINTER, SPRING,
AND SUMMER OF 1952-53. THE SPATIAL
DISTRIBUTION OF THE HEAT ISLAND WAS
SHOWN TO BE PRIMARILY A FUNCTION OF
LAND USE, BUT METEOROLOGICAL VARIABLES,
ESPECIALLY WIND DIRECTION, ALSO
INFLUENCED THE HEAT ISLAND PATTERNS.
THE MAGNITUDE OF THE HEAT ISLAND HAD A
SIGNIFICANT POSITIVE CORRELATION WITH
THE VERTICAL TEMPERATURE GRADIENT
OUTSIDE THE CITY. AN EMPIRICAL MODEL IS
DEVELOPED FOR ST. LOUIS TO STUDY THE
HEAT ISLAND THAT WOULD RESULT FROM
HYPOTHETICAL LAND-USE PATTERNS AND
METEOROLOGICAL CONDITIONS. EXAMPLES ARE
PRESENTED FOR TWO SUCH LAND-USE
DISTRIBUTIONS. (AUTHOR)

<GE7> ST. LOUIS, MO
<CLASS> SIMULATION

<47>
<CONF> CLEARY, R. W.; ADRIAN, D. D.; KINCH, R.
J.
<TITLE> ATMOSPHERIC DIFFUSION AND DEPOSITION OF
PARTICULATE MATTER
<ADDR> PRINCETON UNIVERSITY, DEPARTMENT OF
CIVIL ENGINEERING
<CITY> PRINCETON
<STATE> NJ
<ZIP> 08540
<PHONE> 609-452-4600
<DOC> JOURNAL OF THE ENVIRONMENTAL
ENGINEERING DIVISION, PROCEEDINGS
AMERICAN SOCIETY CIVIL ENGINEERS,
100/2ET, 187-200, 1974
<SUB> AIR POLLUTION MODELING
<ABST> THE PHYSICAL SITUATION CONSIDERED IS
DESCRIBED BY A HOMOGENEOUS, GRAVITY
MODIFIED, DIMENSIONAL, TIME VARYING,
CONVECTIVE DIFFUSIVE TRANSPORT

ATMOSPHERIC TRANSPORT

<AB> COND.

EQUATION. THIS PARTIAL DIFFERENTIAL EQUATION, SUBJECT TO A NONHOMOGENEOUS BOUNDARY CONDITION AND SOURCE TERM, WAS SOLVED ANALYTICALLY BY INTEGRAL TRANSFORMS FOR A THIRD TYPE (MIXED) BOUNDARY CONDITION WHICH DESCRIBES THE FLUX OF PARTICLES AT THE EARTH SURFACE. BY APPLYING THE TRANSPORT KERNELS PROVIDED, THE ANALYTICAL SOLUTIONS TO THE CASES OF FIRST (DIRICHLET) OR SECOND (NEUMANN) TYPE BOUNDARY CONDITIONS MAY BE OBTAINED DIRECTLY FROM THE GENERAL, NONSLAP SOLUTION PRESENTED. THE INCLUSION OF THE PARTICLE FLUX BOUNDARY CONDITION IS A SIGNIFICANT IMPROVEMENT OVER PREVIOUS THREE DIMENSIONAL STUDIES WHICH EITHER ASSUMED INFINITE GEOMETRY OR USED TILTING BOUNDARY CONDITIONS OR USED TILTING FLUX TECHNIQUES (CORRECTIONS APPLIED TO GASEOUS NO DEPOSIT SOLUTIONS) WHICH DO NOT PROPERLY REPRESENT THE CONCURRENT PROCESSES OF DIFFUSIVE SPREAD AND SETTLING.

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> PHYSICAL CARDS

<SIZE> 500 CARDS

<COMP> IBM

<CONFIG> ANY STANDARD COMPUTER, LESS THAN 100 K

<LANG> FORTRAN IV

<ALGO> STRAIGHT PROGRAMMING

<CLASS> ANALYTICAL; DETERMINISTIC

<UIDENT> 7AC716

<AB>

<COND> COARLEY, J. A.; SCHWEIZER, S. H.;
DICKINSON, P. E.

<TITLE> COMPUTATION OF POSSIBLE CLIMATIC CONSEQUENCES OF PERTURBATIONS TO STRATOSPHERIC AEROSOLS, OZONE AND WATER VAPOR WITH RADIATIVE-CONVECTIVE MODELS

<APPR> NATIONAL CENTER FOR ATMOSPHERIC RESEARCH

<CITY> BOULDER

<STATE> CO

<DOC> PB--204476, 1975

<ABST> PRESENTED IS A SUMMARY OF THE RESULTS OF EXPERIMENTS PERFORMED USING A NEW RADIATIVE-CONVECTIVE MODEL DEVELOPED AS PART OF THE CIAP FUNDED RESEARCH. THE EXPERIMENTS TESTED THE SENSITIVITY OF THE THERMAL STRUCTURE OF THE ATMOSPHERE TO CHANGES IN THE SOLAR 'CONSTANT'; THE STRATOSPHERIC OZONE PROFILE; AND THE CONCENTRATION OF WATER VAPOR IN THE STRATOSPHERE. THE FINDINGS AGREE QUALITATIVELY WITH THE EARLIER RESULTS OBTAINED BY HARADA AND WETHERALD (1967) AND COLLIS ET AL. (1975) AND TO THE EXTENT THAT RESULTS FROM DIFFERENT MODELS SHOULD BE COMPARED, THE QUANTITATIVE AGREEMENT IS ALSO GOOD. IN ADDITION THE RESULTS OF A SIMPLE ENERGY BALANCE MODEL WHICH CAN BE USED TO ESTIMATE THE SENSITIVITY OF THE GLOBAL

MEAN SURFACE TEMPERATURE TO CHANGES IN THE STRATOSPHERIC AEROSOL LAYER ARE REPORTED. THIS MODEL, ALSO DEVELOPED FOR THIS CIAP STUDY, INCLUDES EFFECTS OF THE PARTICLES ON INFRARED AND TERRESTRIAL RADIATION AND COUPLING BETWEEN THE PLANETARY SURFACE AND THE STRATOSPHERIC AEROSOL LAYER. THE SURFACE TEMPERATURE THAT IS OVERLOOKED DURING THE CIAP TIE

<CLASS> PREDICTIVE

<AB>

<COND> COLLINS, D. G.; GILLS, H. B.

<TITLE> MONTE CARLO STUDIES ON THE TIME-DEPENDENT TRANSPORT OF INFRARED RADIATION IN THE ATMOSPHERE

<ACRO> NCAR

<ADDP> RADIATION RESEARCH ASSOCIATES

<CITY> FT. WORTH

<STATE> TX

<SOURCE> NTIS

<DOC> AD-A042 769/05L, 1977

<ABST>

THIS REPORT DESCRIBES MODIFICATIONS THAT WERE MADE TO THE NCAR POLY-TO-TREAT INFRARED ABSORPTION OF GASEOUS MOLECULES IN THE ATMOSPHERE. ALSO DESCRIBED ARE THE RESULTS OF STUDIES PERFORMED WITH THE POLY-TO-TREAT TO COMPUTE TIME-DEPENDENT SCATTERED LIGHT FLUXES AT SATELLITE ALTITUDES FOR (1) 0.4278-, 0.75-, 1.07-MICROMETER WAVELENGTH ANY POINT SOURCES; (2) 0.4278-, 0.75-, 1.07-MICROMETER WAVELENGTH ANY POINT ISOTROPIC SOURCES IN A METEOROLOGICAL RANGE ATMOSPHERE. POINT ISOTROPIC SOURCES EMITTING 2.7-MICROMETER WAVELENGTH BARE POINT ISOTROPIC 0.4278-, 0.75-, 1.07-MICROMETER WAVELENGTH SOURCE MODEL ATMOSPHERES CONTAINING A LAYER. THREE COMPUTER CODES ARE DESCRIBED WHICH WERE DEVELOPED FOR CONVOLVING THE POLY-CALCULATING WAVELENGTH- AND TIME-DEPENDENT ATMOSPHERIC SCATTERING DATA BY WAVELENGTH- AND TIME-DEPENDENT DATA FOR THERMAL RADIATION SOURCE CALCULATIONAL METHOD IS DESCRIBED. CAN BE USED TO COMPUTE THE POLY-POLYNOMIAL COEFFICIENTS REQUIRED DISCRETE ORDINATES CODES FOR THE PHASE FUNCTION FOR LIGHT BY AEROSOLS AND CLOUD PARTICLES.

<CLASS> SIMULATION

<AB>

<COND> CONCAILME, GEORGE A.

<TITLE> AN AIR POLLUTION EVALUATION MODEL

<ACRO> ARL/MIWAY

<ADDP> ARGONNE NATIONAL LABORATORY, ENVIRONMENTAL SYSTEMS DIVISION, CASS AVE.

<CITY> ARGONNE

<50>

ATMOSPHERIC TRANSPORT

<50> COST.

<STAT> IL

<12> 50439

<FROM> RTE 172-3223

<DOC> G. A. CONCAILO, A. S. CORN, D. F. KING, ARL/RIWAY: AN AIR POLLUTION EVALUATION MODEL FOR ROADWAYS, NATIONAL SCIENCE FOUNDATION (FANS) UNDER CONTRACT #S AG-352 & G1329942

<SUB> ENVIRONMENTAL STUDIES

<ABST> THIS REPORT DESCRIBES A COMPUTER PROGRAM CALLED ARL/RIWAY FOR ESTIMATING AIR QUALITY LEVELS OF SUBSTRUCTIVE POLLUTANTS PRODUCED BY VEHICULAR SOURCES. IT IS VALID FOR RECEPTORS AT DISTANCES OF TENS TO HUNDREDS OF METERS, AT ANY ANGLE, DOWNWIND OF A ROADWAY, IN RELATIVELY UNCOMPLICATED TERRAIN. IT MAY BE USED BY PLANNERS TO ANALYZE THE EFFECTS OF A PROPOSED ROADWAY ON ADJACENT AIR QUALITY. THE ARL/RIWAY MODEL EXPANDS THE EVALUATION CAPABILITIES OF THE EPA/RIWAY DISPERSION MODEL. THIS REPORT ALSO SERVES AS A USER'S MANUAL FOR RUNNING THE ARL/RIWAY PROGRAM. ALL COMMAND STRUCTURES ARE DESCRIBED IN DETAIL, WITH SAMPLE PROBLEMS DEMONSTRATING THEIR USE.

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> PUNCH CARDS

<SIZE> APPROXIMATELY 1000 RECORDS EACH 80 BYTES LONG

<COMP> IBM

<CONFIG> IBM 370/195 OS/MVT

<LANG> FORTRAN

<CHAR> EBCDIC

<ALGO> STEADY STATE DISPERSION MODEL FOR LINE SOURCES.

<CLAS> PREDICTIVE

<APPL> TO DETERMINE AIR QUALITY NEAR ROADWAYS.

<PRPS> ARGONNE NATIONAL LABORATORY; CHICAGO AREA TRANSPORTATION AUTHORITY; GOVERNOR STATE UNIVERSITY.

<NRAL> COMPARISON OF ARL/RIWAY WITH EPA/RIWAY. RESULTS OF COMPARISON ARE PART OF DOCUMENTATION.

<UPDATE> 780703

<51>

<CONT> CORTESE, A. D.; SPENGLER, J. D.

<TITLE> DETERMINATION OF ENVIRONMENTAL CARBON MONOXIDE EXPOSURES THROUGH PERSONAL MONITORING: FIXED VS PERSONAL AND TRANSPORTATION MODE RELATIONSHIPS

<ADDR> HARVARD UNIVERSITY

<CITY> CAMBRIDGE

<STATE> MA

<502>

AIR POLLUTION CONTROL ASSOCIATION SIXTY-EIGHTH ANNUAL MEETING AND EXHIBITION, HELD IN PITTSBURGH, PENNSYLVANIA, 1975.

<ABST>

THE ACCURACY OF FIXED LOCATION AMBIENT AIR QUALITY MONITORING STATIONS TO PREDICT PERSONAL ENVIRONMENTAL EXPOSURES TO CARBON MONOXIDE (CO) WAS INVESTIGATED. THE RELATIONSHIP BETWEEN RESIDENTIAL LOCATION, COMMUTING TRANSPORTATION MODE, EMPLOYMENT LOCATION, AND TIME-WEIGHTED AVERAGE HUMAN EXPOSURE TO CO IN THE METROPOLITAN BOSTON, MASSACHUSETTS, AREA ALSO IS EXAMINED. AN EMPIRICAL MODEL RELATING CO AIR QUALITY DATA FROM THE FIXED LOCATION MONITORING STATIONS OPERATED BY THE STATE OF MASSACHUSETTS TO THE CO EXPOSURE OF INDIVIDUALS WAS DEVELOPED. INDIVIDUAL EXPOSURE MEASUREMENTS WERE MADE BY RECOLTERS USING AN ELECTROCHEMICAL SENSING METHOD. THE EXPERIMENTS WERE PERFORMED FOR 3- TO 5-DAY PERIODS DURING COMMUTING AND WORK ACTIVITIES FROM OCT. 1974 THROUGH FEB. 1975. THE COMMUTING, MAXIMUM MORNING AND EVENING 1-HR, AND THE MAXIMUM 8-HR AVERAGE CO EXPOSURES WERE DETERMINED. PARTICIPANTS WERE SELECTED FROM NONOCCUPATIONALLY EXPOSED AREAS TO REPRESENT CONDITIONS OF AMBIENT AIR CONTAMINATION. SOME LIVING AND BEHAVIORAL PATTERNS THAT ARE MOST STRESSFUL IN TERMS OF CO EXPOSURE ALSO WERE ASSESSED.

<GE> MASSACHUSETTS, BOSTON

<CLAS> SIMULATION

<52>

<CONT> CONTINA, D.

<TITLE> MODELLING AND SIMILARITY RELATIONS OF PHYSICAL AND CHEMICAL PROCESSES

<ADDR> UNIVERSITY OF ILLINOIS, DEPARTMENT OF MECHANICAL ENGINEERING

<CITY> URBANA

<STATE> IL

<DOC> BUTTERWORTHS (LONDON), 1970, /21-730

<ABST>

PROPER MODELLING OF CHEMICAL AND PHYSICAL PROCESSES OF POLLUTANTS IN THE ATMOSPHERE AND TESTS UNDER CONTROLLED CONDITIONS MAY BE MADE TO COMPLEMENT FIELD MEASUREMENTS IN REDUCING THE COST AND TIME AND THE UNCERTAINTY DUE TO CHANGING METEOROLOGICAL CONDITIONS IN FIELD MEASUREMENTS. WITH KNOWLEDGE GAINED FROM CORRELATING MODEL AND FIELD TESTS, PROPER MODELLING AND MODEL TESTING PERMIT PREDICTION AND CHECKING OF PERFORMANCE OF A GIVEN DESIGN OF AN EMISSION SOURCE. THE DESIGN PARAMETERS MAY INCLUDE STACK HEIGHT, EJECTION SPEED, AND ITS LOCATION WITH RESPECT TO BUILDINGS AND TOPOGRAPHY. PROPER MODELLING CALLS FOR DESIGN AND TESTING BASED ON ACCURATE SIMILARITY RELATIONS. WITH PROGRAMMED TESTING OF A PROPER MODEL, THE DIFFUSION PHENOMENON, FOR INSTANCE, OVER A YEAR FROM AN ACTUAL INSTALLATION CAN BE CHECKED BY ONE DAY OF TESTING ACCORDING TO THE PARAMETERS OF MODEL AND PROTOTYPE. OBVIOUSLY, THE ABOVE SIMILARITY RELATIONS CANNOT ALL BE SATISFIED AT ONCE. A COMPLETE CHECK ON AN INSTALLATION WOULD TAKE SEVERAL

ATMOSPHERIC TRANSPORT

<52> CONT.

MODEL TESTS. SPECIFIC CASES AND DETAILS DISCUSSED ARE: (A) ACTUAL STACK FLOW RATE BASED ON STATION'S DIFFUSIVITY AS COMPARED WITH WIND TUNNEL TEST RESULTS WHICH SATISFY RELATIONS BASED ON COLLIER'S DIFFUSIVITY; (B) DIFFUSION AND FALLOUT IN RELATION TO RELAXATION TIME; (C) CORRECTIONS FOR CHEMICAL REACTION RATES.

<CLAS> SIMULATION

<53>

<CONT> CONSER, K. E.

<TITLE> A COMPUTER CODE FOR ANALYZING POINT-TO-POINT RELEASES OF SHORT-LIVED RADIOACTIVE NUCLIDES

<PCRD> 22P

<ADDR> OAK RIDGE NATIONAL LABORATORY, COMPUTER SCIENCES DIVISION, P.O. BOX 1

<CITY> OAK RIDGE

<STATE> TN

<CTPD> 37210

<PRDPT> 615-883-0411 EXT 7-1026; PIS 850-1026

<SOURCE> DEVELOPED AT ORNL

<DOC> PEEVES, R., FOWLER, P.G., AND CONSER, K.E., A COMPUTER CODE FOR ANALYZING POINT-TO-POINT RELEASES OF SHORT-LIVED RADIOACTIVE NUCLIDES, ORNL-TN-M13, OCTOBER 1972; CONSER, K.E., PEEVES, R., FOWLER, P.G., CULIKOWSKI, W.S., EVALUATION OF THE POTENTIAL RADIOLOGICAL IMPACT OF GASEOUS EFFLUENTS ON LOCAL ENVIRONMENTS, IN: PROCEEDINGS OF INTERNATIONAL SYMPOSIUM ON RADIOECOLOGY APPLIED TO PROTECTION OF MAN AND HIS ENVIRONMENT, HELD IN POME, ITALY, SEPTEMBER 7-10, 1971.

<SUB> POLLUTANTS AND EFFLUENTS OF ENERGY PROCESSES: ENVIRONMENTAL MONITORING OF THE ATMOSPHERE

<ABST> SAA CALCULATES AVERAGE ANNUAL GROUND LEVEL AIR CONCENTRATIONS, DEPOSITION RATES, AND GROUND CONCENTRATIONS FOR A DECAYING CHAIN OF RADIOACTIVE NUCLIDES. MEMBERS OF THIS CHAIN ARE ASSUMED TO HAVE BEEN EMITTED FROM A STACK UNDER POINT-TO-POINT OPERATING CONDITIONS. AVERAGES ARE PERFORMED RELATIVE TO ATMOSPHERIC STABILITIES, WIND SPEEDS, AND WIND DIRECTIONS.

<GEO> TENNESSEE

<YR> 1970-1972

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> PUNCHED CARDS

<COMP> IBM

<LANG> FORTRAN

<ALGO> GAUSSIAN PLUME MODEL

<CIAS> ANALYTICAL; PREDICTIVE; INTEGRATIVE

<54>

<CONT> CHARR, R. E.; HAMILTON, R. L., JR.; DESANTO, G. M.

<TITLE> ATMOSPHERIC TRANSPORT OF POCKET MOTOR COMBUSTION BY-PRODUCTS

<ADDR> GCA CORPORATION, TECHNOLOGY DIVISION

<CITY> BEDFORD

<STATE> MA

<DOC> TECHNOLOGY DIVISION, GCA CORP., BEDFORD, MASS., 164 PP. DEC. 1965

<ABST> THE TOXICITY-HAZARD PROBLEM AT SAN NICOLAS ISLAND ARISING FROM A PLANNED POCKET MOTOR STATIC TESTING FACILITY IS DISCUSSED IN DETAIL. OXIDATION OF THE SOLID PROPELLANT DURING COMBUSTION PRODUCES A TOXIC PARTICULATE COMPOUND, BERYLLIUM OXIDE. THE DIFFUSION MODELS USED IN EVALUATING THIS HAZARD ARE DESCRIBED. THE RESULTS OBTAINED FROM AN EXPERIMENTAL PROGRAM AND SUPPORTING STUDIES ARE ANALYZED. AN OPERATIONAL MODEL AND TECHNIQUES FOR DIFFUSION PREDICTIONS ARE SUGGESTED. THE PROBLEM OF CLOUD DEPOSITION THROUGH GRAVITATIONAL SETTLING AND OTHER PHENOMENA ARE DISCUSSED.

<CLAS> PREDICTIVE

<55>

<CONT> CREEKHOPE, S. P.; BRIG, E. L.; CHING, B. R.; CHIU, Y. T.

<TITLE> THE POLAR THERMOSPHERE

<ADDR> AEROSPACE CORPORATION

<CITY> EL SEGUNDO

<STATE> CA

<SOURCE> NTIS

<DOC> AD-779 928, 1972

<ABST> ONE- AND THREE-DIMENSIONAL MODELS WERE CONSTRUCTED OF THE EARTH'S THERMOSPHERE FROM 120-500 KM IN ALTITUDE. A SIGNIFICANT ADVANCEMENT OVER PREVIOUS WORK WAS ACCOMPLISHED BY THE USE OF NOVEL MATHEMATICAL METHODS TO TREAT TIME VARIABILITY, WINDS AND THE MOMENTUM EQUATION, WHICH ARE OFTEN APPROXIMATED OR NEGLECTED IN SUCH STUDIES. HEATING AND COOLING STUDIES WERE PERFORMED USING REPRESENTATIVE HEATING DEPOSITION PROFILES FOR EUV AND GEOMAGNETIC HEATING. THESE STUDIES ELUCIDATE REACTION TIMES AND INTENSITIES AS FUNCTIONS OF HEAT DEPOSITION PARAMETERS. THE ONE-DIMENSIONAL MODEL RESULTS HAVE BEEN COMPARED WITH THOSE OF HANSEN, THOMAS, AND THOMAS-CHING. IN ADDITION TO THE MODELING STUDIES, VARIOUS ADVANCED STUDIES WERE CONDUCTED OF HEAT DEPOSITION AND ENERGY TRANSPORT, IN ORDER TO PROVIDE A SOUND PHYSICAL BASIS FOR FUTURE IMPROVEMENTS IN THE EXISTING MODELS.

<CLAS> SIMULATION

TRANSPORT

FERKHOFF, S. P.; STRAUS, J. W.; HARRIS, R.; CHING, S. H.; CHIU, Y. T.

GLOBAL MODEL OF THERMOSPHERIC WINDS, DENSITY AND TEMPERATURE DERIVED FROM A PHENOMENOLOGICAL APPROACH

SPACELAB CORPORATION

SECONDO

IS 81.75/MYS1.45

--779 923/2, 1974

THE PAPER DESCRIBES THE MATHEMATICAL FORMULATION AND IMPLEMENTATION OF A GLOBAL MODEL OF THE UPPER ATMOSPHERE BASED ON THE EQUATIONS OF CONSERVATION OF MASS, MOMENTUM AND ENERGY IN THE ALTITUDE RANGE 120-500 KM. THE MODEL IS 3-DIMENSIONAL AND INCLUDES THE EFFECTS OF VISCOSITY, ION DRAG, THE GRAVITATIONAL FORCE AND THE NONLINEAR TERMS IN THE EQUATIONS OF MOTION. THE FINITE DIFFERENCE METHOD IS USED AS AN EFFICIENT ALTERNATIVE TO FINITE-DIFFERENCE APPROACHES FOR THE SOLUTION OF 3-DIMENSIONAL PARTIAL DIFFERENTIAL EQUATIONS. IN THE COMPUTATIONS DISCUSSED HERE, THE UPPER ATMOSPHERE IS REPRESENTED BY A SINGLE FLUID WITH SPECIFIC WEIGHT AND TEMPERATURE FIELDS DERIVED FROM THE PHENOMENOLOGICAL MODEL OF JACCHIA (1971). THE HORIZONTAL AND VERTICAL WIND FIELDS AND THE DENSITY OF THE THERMOSPHERE ARE DISCUSSED, WITH PARTICULAR ATTENTION TO THE DIURNALLY VARIING WIND FIELDS. COMPARISONS WITH PREVIOUS THEORETICAL AND OBSERVATIONAL INVESTIGATIONS ARE MADE.

PUBLICATION

ANONY, G. T.

EFFECT OF PLUME RISE ON GROUND LEVEL POLLUTION

UNIVERSITY OF WATERLOO

TECHNICAL

REPORT

WATERLOO

ATMOSPHERE ENVIRONMENT, 7(1) 1-16, 1973

A SIMPLE THEORETICAL MODEL OF GROUND LEVEL CONCENTRATIONS OF POLLUTANTS EMITTED BY A TALL CHIMNEY WHICH IS ALSO A LARGE HEAT SOURCE HAS BEEN CONSTRUCTED BY EXPLOITING TWO KEY FEATURES OF BUOYANT PLUME BEHAVIOR. IN MODERATE TO STRONG WINDS WITH LOW RESOLUTION LEVEL THE MODEL MAKES USE OF A 2/3 POWER LAW DESCRIBING NEAR PLUME WINDS. FOR THE CASE OF LIGHT TO MODERATE WINDS AND HIGH TURBULENCE INTENSITY (SUCH AS OCCUR UNDER 'ACTIVE CONDITIONS') A PLUME BREAKUP MODEL IS RECOMMENDED. THE CONSEQUENCES OF THESE MODELS ARE PRESENTED IN A FEW PLOTS IN AN APPROPRIATE 2-DIMENSIONAL FORM. A COMPARISON WITH MEASURED GROUND LEVEL CONCENTRATIONS GIVEN BY MOORE (1969) AND OTHERS

SHOW THAT THE MODEL SUCCESSFULLY PREDICTS THESE UNDER NEUTRAL AND UNSTABLE CONDITIONS. IN PARTICULAR, THE MODEL EXPLAINS WHY IN CONTINENTAL CLIMATES CONVECTIVE CONDITIONS WITH LIGHT TO MODERATE WINDS MAY BE CRITICAL FOR GROUND LEVEL POLLUTION.

<CLASS> SIMULATION

<50>

<CONT> DATA, H. T.

<TITLE> SCAVENGING MODEL INCORPORATING CHEMICAL KINETICS

<ADDR> PATTIETTE-PACIFIC NORTHWEST LABORATORIES, POST OFFICE BOX 999

<CITY> BICHLAND

<STATE> WA

<ZIP> 99352

<PHONE> 509-946-2836; FTS 444-7511 EXT 946-2836

<SIZE> 80K OCTAL

<COMP> OTHER CBL CYBER 73

<CON> GRAPHICS DISPLAY ROUTINE - SIMPLE PRINTER PLOT SHOWS RELATIVE MAGNITUDE OF GROUND LEVEL POLLUTANT CONCENTRATIONS FOR EACH WIND SIZE CLASS.

<59>

<CONT> DANIELS, ANDERS

<TITLE> AIRPORT AIR POLLUTION MODEL

<ADDR> UNIVERSITY OF HAWAII, DEPARTMENT OF METEOROLOGY

<CITY> HONOLULU

<STATE> HI

<ZIP> 96822

<PHONE> 808-949-7577

<DOC> AIR POLLUTION CONTROL ASSOCIATION JOURNAL, 26(4), 339-344, 1976

<SUB> SIMULATES AVERAGE AND MAXIMUM POLLUTANT CONCENTRATIONS AT OR AROUND AIRPORTS

<ABST> A MODEL TO SIMULATE AVERAGE AND MAXIMUM POLLUTANT CONCENTRATIONS AT OR AROUND AIRPORTS WHICH FALL UNDER THE CONTROL OF THE CLEAN AIR ACT WAS DEVELOPED. THE PREDICTED CONCENTRATION PATTERNS CAN BE DIRECTLY USED TO SUPERVISE NATIONAL OR LOCAL AMBIENT AIR QUALITY STANDARDS FOR THE AIRPORT, SINCE THEY RELATE TO SPECIFIC STANDARD SETTING TIMES.

<STATUS> IN USE

<CLASS> PREDICTIVE; SIMULATION

<APPL> AIRPORT PLANNING; ESTIMATING IMPACTS OF AIRPORTS ON AIR QUALITY; ESTIMATING EFFECTIVENESS OF CONTROL PROCEDURES

<60>

<CONT> DANIELS, ANDERS; BACH, W.

ATMOSPHERIC TRANSPORT

<60> CONT.
 <TITLE> PREDICTION MODELS ARE BASIS FOR
 HAWAIIAN AIR QUALITY CONTROL

<ACRO> HONOLULU

<ADPT> UNIVERSITY OF HAWAII, DEPARTMENT OF
 METEOROLOGY

<CTRY> HONOLULU

<STATE> HI

<ZIP> 96822

<PHONE> 808-948-7577

<SOURCE> NOT AVAILABLE FROM EXTERNAL SOURCE

<DOC> JOURNAL OF ENVIRONMENTAL HEALTH, 36(1),
 55-59, 1973

<SUB> AUTOMOBILE POLLUTION

<ABST> THE FOLLOWING SCHEME OF PREDICTION
 MODELS FOR AIR QUALITY CONTROL WERE
 DESIGNED FOR THE HONOLULU AREA, BUT ARE
 ALSO APPLICABLE FOR OTHER AREAS. AIR
 POLLUTION CONTROL LAWS PROVIDE FOR
 SPECIFIC STANDARDS FOR CERTAIN TYPES OF
 POLLUTANTS, AVERAGING TIMES, AND
 GEOGRAPHIC AREAS. THERE ARE
 THEORETICALLY TWO METHODS AVAILABLE FOR
 CONTROLLING SUCH STANDARDS: EITHER BY
 ESTABLISHING A DETAILED MONITORING
 NETWORK, OR BY SIMULATING THE POLLUTANT
 CONCENTRATIONS WITH DIFFUSION MODELS.
 ADEQUATE SAMPLING NETWORKS ARE NOT
 ECONOMICALLY FEASIBLE, BUT THE DETAILED
 SPATIAL AND TEMPORAL POLLUTANT PATTERNS
 NEEDED IN AIR QUALITY CONTROL CAN BE
 OBTAINED FROM A VERIFIED DIFFUSION
 MODEL SUCH AS THE ONE PRESENTED IN THIS
 PAPER. DIFFUSION MODELS ARE USUALLY
 DESIGNED TO PREDICT AVERAGE
 CONCENTRATION PATTERNS FOR CERTAIN TIME
 PERIODS. AMBIENT AIR QUALITY STANDARDS
 HAVE NOT BEEN SET FOR AVERAGE
 CONCENTRATIONS, BUT RATHER FOR MAXIMUMS
 THAT ARE NOT TO BE EXCEEDED MORE THAN
 ONCE A YEAR. IN ORDER TO PREDICT SUCH
 STATISTICS IT IS NECESSARY TO DETERMINE
 THE PROBABILITY FUNCTION OF THE
 CONCENTRATIONS. POLLUTION
 CONCENTRATIONS FROM THE US CAMP
 STATIONS (CONTINUOUS AIR MONITORING
 PROGRAM) HAVE BEEN SHOWN TO BE LOG
 NORMALLY DISTRIBUTED. THIS WAS ALSO
 INDICATED FOR HONOLULU DATA. SUCH
 DISTRIBUTIONS ARE UNIQUELY DETERMINED
 BY TWO STATISTICS SUCH AS THE GEOMETRIC
 MEAN AND THE GEOMETRIC STANDARD
 DEVIATION, WHICH WERE CALCULATED FOR
 EACH SMALL GEOMETRIC AREA, INTO WHICH ONE
 CONVENTIONAL SUBDIVIDES AN URBAN
 CORE. THE DEVELOPMENT OF SCHEMES
 FOR METEOROLOGICAL DIFFUSION, TIME
 AVERAGING, FREQUENCY MODELS, COST
 BENEFIT ANALYSES AND PREDICTION MODELS
 FOR AIR POLLUTION CONTROL IN HONOLULU
 IS PRESENTED AND DISCUSSED IN THIS
 REPORT.

<GRD> HAWAII, HONOLULU

<TIME> 1971-1972

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> TEXT

<SIZE> TEXT PROGRAM APPROXIMATELY 500 CARDS

<COMP> IBM

<CONFIG> IBM 370

<LANG> FORTRAN IV

<CHAR> ANY

<ALGO> GAUSSIAN DIFFUSION, AREA SOURCES,
 WINDSPEED, AND DIRECTION DISTRIBUTIONS

<CLAS> PREDICTIVE

<APPL> PREDICT URBAN CONCENTRATION OF CO IN
 STATISTICS PRESCRIBED BY STANDARDS I.E.
 NOT ONLY AVERAGE CONCENTRATION

<STD> TRAFFIC AND EMISSION DATA

<VAL> EXCELLENT VALIDATION

<UPDATE> 700429

<61>
 <CONT> DARLING, EUGENE H., JR

<TITLE> COMPUTER MODELING OF
 TRANSPORTATION-GENERATED AIR POLLUTION

<ABST> THE REPORT SURVEYS THE STATE-OF-THE-ART
 IN AIR POLLUTION MODELING WITH
 PARTICULAR EMPHASIS ON THE MODELING OF
 DISPERSION FROM TRANSPORTATION SOURCES.
 MODELS WHICH HAVE ACTUALLY BEEN
 IMPLEMENTED ARE STRESSED AND THE
 COMPUTATIONAL ASPECTS OF THESE MODELS
 ARE TREATED IN DETAIL. APPLICATIONS ARE
 DISCUSSED AND VALIDATIONS ARE
 CRITICALLY ASSESSED. IT WAS FOUND THAT
 GAUSSIAN AND CONSERVATION OF MASS
 MODELS ARE CURRENTLY THE MOST WIDELY
 USED TOOLS FOR ANALYZING THE DISPERSION
 OF POLLUTANTS IN THE ATMOSPHERE. MODELS
 PRESENTLY IN OPERATION ARE RUN ON
 MEDIUM TO LARGE-SCALE COMPUTERS OF THE
 IBM 360/50 CLASS OR GREATER AND NEARLY
 ALL OF THESE MODELS ARE PROGRAMMED IN
 FORTRAN IV. ALTHOUGH EXISTING MODELS
 HAVE BEEN APPLIED TO A WIDE VARIETY OF
 AIR POLLUTION PROBLEMS, THEIR
 PERFORMANCE HAS NOT YET BEEN ADEQUATELY
 EVALUATED.

<COMP> IBM

<CONFIG> IBM 360/50

<LANG> FORTRAN IV

<62>
 <CONT> DAVIS, D. F.

<TITLE> INFLUENCE OF SULFUR DIOXIDE ON
 VEGETATION WITH EMPHASIS ON SIMULATION
 MODELS

<ADDR> PENNSYLVANIA STATE UNIVERSITY,
 DEPARTMENT OF PLANT PATHOLOGY

<CITY> UNIVERSITY PARK

<STATE> PA

<ZIP> 16802

<PHONE> 814-865-1689

<ABST> THE IMPACT OF SULFUR DIOXIDE ON
 VEGETATION, PRIMARILY TREES IS BEING
 STUDIED. THE OUTCOME OF THE PROJECT
 WILL BE A COMPUTER SIMULATION MODEL

<62>

ATMOSPHERIC TRANSPORT

<62> CONT.

WHICH WILL ENABLE ONE TO PREDICT THE PROBABILITY OF SULFUR DIOXIDE INJURY OCCURRING AROUND AN EXISTING OR PROPOSED SOURCE. SUCH A MODEL WILL BETTER ENABLE INDUSTRIES TO PREPARE ACCURATE ENVIRONMENTAL IMPACT STATEMENTS WITH REGARDS TO POSSIBLE EFFECTS OF EMISSIONS ON THE TERRESTRIAL ECOSYSTEM. ALSO, IF AN INDUSTRY SUCH AS AN ENERGY PARK HAS A CHOICE OF LOCATING AT SEVERAL SITES, THE PREDICTION OF WHICH SITE WILL HAVE A MINIMAL IMPACT ON SURROUNDING VEGETATION WILL BE MADE.

<TIME> 90/77-INDFINITE

<CLASS> PREDICTIVE

<63>

<CONT> DAVIS, LOREN E.; MACDUFF, ROBERT B.

<TITLE> MULTIPLE CELL MECHANICAL DRAFT COOLING TOWER MODEL

<ACRO> MCKE

<ADDR> OREGON STATE UNIVERSITY, DEPARTMENT OF MECHANICAL ENGINEERING

<CITY> CORVALLIS

<STATE> OR

<ZIP> 97331

<PHONE> 503-754-3861

<DOC> F.E. TOPPANCE AND R.G. WATTS (EDS.), ENVIRONMENTAL EFFECTS OF ATMOSPHERIC HUMIDITY/CLUSTERS RELEASES, THE SECOND ATAA/ASHE THERMOPHYSICS AND HEAT TRANSFER CONFERENCE HELD IN PALO ALTO, CALIFORNIA, MAY 24-26, 1978 (PP. 1-8)

<SUB> MULTIPLE NCIST, THERMAL PLUMES, TRAJECTORIES, AND DECAY RATES

<ABST> AN INTEGRAL ANALYSIS OF MULTIPLE CELL MECHANICAL DRAFT COOLING TOWER PLUMES WHICH ACCOUNTS FOR MOISTURE EFFECTS AND MERGING OF NEIGHBORING PLUMES IS PRESENTED. THE ANALYSIS INCLUDES DETAILED DYNAMICS AND ALLOWS FOR GRADUAL MERGING OF PLUMES WITHOUT DISCONTINUITY OF PLUME PROPERTIES. MERGING IS ALLOWED TO OCCUR ANYWHERE ALONG THE PLUME TRAJECTORY INCLUDING THE ZONE OF FLOW ESTABLISHMENT. MOISTURE EFFECTS ARE MODELED USING THE CLAUSIUS-CLAPEYRON EQUATION. PROPERTY PROFILES ARE ASSURED TO BE GAUSSIAN-LIKE WITH MODIFICATIONS IN THE MERGING ZONE. ENTRAINMENT MODELING IS CONSISTENT WITH MODELS FOUND THROUGHOUT THE FIELD WITH MODIFICATIONS TO ACCOUNT FOR INTERFERENCE OF MERGING PLUMES AND VARYING ENTRAINMENT SURFACE.

<STATUS> UNDER DEVELOPMENT

<ACCESS> LIMITED

<MEDIA> MAGNETIC TAPE; PUNCHED CARDS; TEXT

<SIZE> 20,000 CARDS

<COMP> CDC

<CONFIG> CDC WITH 256K CORE AND 4-7 TRACK TAPE DRIVES

<LANG> FORTRAN IV

<CHAR> UNCODED; BINARY

<ALGO> SOLVES SIMULTANEOUS DIFFERENTIAL EQUATIONS; INPUTS RESULT TO 4TH ORDER MARKING PREDICTOR CORRECTOR (STARTED BY 4TH ORDER RUNGE KUTTA) AND OUTPUTS DIMENSIONLESS TRAJECTORY, JET HEIGHT, VELOCITY, TEMPERATURE, AND CONCENTRATION DECAY INTEGRAL THEORY FOR JET AND PLUMES IS USED.

<CLASS> ANALYTICAL; PREDICTIVE; SIMULATION

<APPL> PLUME LENGTH, TRAJECTORY, DECAY PARAMETERS, AND WIDTH MAY BE PREDICTED BY THIS PROGRAM

<USERS> NONE

<SHD> EXISTING FIELD & LAB DATA ON MULTIPLE THERMAL PLUMES

<REAL> COMPARISON FOR SIMPLE CASES OF SINGLE JETS, PLUMES WITH AND WITHOUT CROSSWINDS ARE INITIALLY USED. FOLLOWING ARE COMPARISONS WITH LIMITED DATA FOR MULTIPLE CELL PLUMES. FINALLY FIELD DATA IS USED TO TEST/VALIDATE ITS EFFECTIVENESS IN THE REAL WORLD.

<COM> CURRENT STATUS IS TESTING PROGRAM, DETERMINING EMPIRICAL COEFFICIENTS AND TUNING.

<UPDATE> 780731

<64>

<CONT> DEARDORFF, JAMES W.

<TITLE> POLLUTANT DISTRIBUTIONS IN THE MIXED LAYER, USING SIMILARITY THEORY

<ACRO> PDINLUST

<ADDR> OREGON STATE UNIVERSITY, DEPARTMENT OF ATMOSPHERIC SCIENCES

<CITY> CORVALLIS

<STATE> OR

<ZIP> 97331

<PHONE> 503-754-8557; FTS 425-8557

<DOC> JOURNAL OF APPLIED METEOROLOGY, 14, 1451-1458, 1975; QUARTERLY JOURNAL OF THE ROYAL METEOROLOGICAL SOCIETY, 102, 427-445, 1976

<SUB> POLLUTANT DISTRIBUTION IN THE DAYTIME MIXED LAYER DOWNSTREAM OF A NEAR-SURFACE SOURCE

<ABST> PDINLUST PREDICTS POLLUTANT DISTRIBUTIONS IN THE MIXED LAYER DOWNSTREAM OF A NEAR-SURFACE SOURCE.

<GEO> FOR USE OVER A FLAT SURFACE HARBOR THAN THE AIR; WINDS LESS THAN 8 MPS; NON-BUOYANT SOURCE; NEAR-SURFACE SOURCE (LABORATORY DATA)

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> TEXT

<SIZE> 156 ENTRIES FROM TABLE 1

<CONFIG> NEED ABOUT 0.25K CORE FOR ONE SOURCE;

ATMOSPHERIC TRANSPORT

<PRO> CONT.
ABOUT 25K CODE FOR A PROBLEM INVOLVING
170 SOURCES

<ALGO> SIMILASTY THEORY

<CLAS> CONTINUOUS; PREDICTIVE; SIMULATION;

<APPL> DAYTIME MIXED LAYER OVER FLAT TERRAIN

<USERS> UNKNOWN

<SRD> BYLLIS' LABORATORY CONVECTION TANK

<REAL> VALIDATED AGAINST FIELD DATA OF
ISLITZKY (1961) AND ISLITZKY AND
DUREAU (1963)

<COM> FROM LABORATORY MODEL;

<UPDATE> 70C022

<65>
<COM> DENERJIAN, R. L.; SCHNEP, R. L.

<TITLE> DEVELOPMENT OF ATMOSPHERIC MODELS AND
MODELING CAPABILITY

<ADDR> U. S. ENVIRONMENTAL PROTECTION AGENCY,
ENVIRONMENTAL SCIENCES RESEARCH
LABORATORY

<CITY> RESEARCH TRIANGLE PARK

<STATE> NC

<ZIP> 27711

<ABST> PARAMETERIZED METEOROLOGICAL FUNCTIONS
FOR MODELING ATMOSPHERIC TRANSPORT
PROCESSES ARE PRESENTED. ATTENTION IS
GIVEN TO THE FUNDAMENTAL CHEMICAL
TRANSPORTATION PROCESS. SEVERAL CHEMICAL
MECHANISMS ARE AVAILABLE FOR
CONSIDERATION. A BOX MODEL APPROACH HAS
BEEN DEVELOPED. EVALUATION STUDIES HAVE
BEEN DEVELOPED AND EVALUATION STUDIES
HAVE BEGUN USING THE ST. LOUIS RAPS
DATA BASE. 09/77-FINAL REPORT.

<PRO> MISSOURI

<INR> 76/10-77/09

<CLAS> SIMULATION

<66>
<COM> DICKERSON, HARVIN H.

<TITLE> A MASS CONSISTENT ATMOSPHERIC FLUX
MODEL FOR REGIONS WITH COMPLEX TERRAIN

<ACRO> NASCON

<ACRD> LAWRENCE LIVERMORE LABORATORY,
6-DIVISION, PHYSICS DEPT., P.O. BOX 900

<CITY> LIVERMORE

<STATE> CA

<ZIP> 94550

<PHONE> 415-422-1806; FTS 532-1806

<SOURCE> DEVELOPED AT LLL

<DOC> H. H. DICKERSON, NASCON--A MASS
CONSISTENT ATMOSPHERIC FLUX MODEL FOR
REGIONS WITH COMPLEX TERRAIN, JOURNAL
APPLIED METEOROLOGY, 176, 241-253,
1978; STULLICH, C. L., HACCACKER, H.,
GRANT, R., USER'S GUIDE TO THE NASCON
MODEL: A MASS CONSISTENT ATMOSPHERIC
FLUX SUB-MODEL TO LIDAR, IN PREPARATION
(1978)

<SRD> ATMOSPHERIC BOUNDARY LAYER NUMERICAL
MODEL

<ABST> NASCON HAS DEVELOPED TO PROVIDE AIR
POLLUTION MODELS FOR THE SAN FRANCISCO
BAY AREA WITH MASS CONSISTENT
METEOROLOGICAL INPUT DATA. MEASUREMENTS
OF INVERSION BASE HEIGHTS ABOVE
TOPOGRAPHY AND REAR WINDS WITHIN THE
MIXED LAYER CALCULATED FROM SURFACE
OBSERVATIONS OF WIND SPEED AND
DIRECTION WERE USED AS INPUT DATA FOR
THE MODEL. VARIATIONAL CALCULUS
TECHNIQUES WERE USED TO ADJUST THE
OBSERVED HORIZONTAL FLUXES SO THEY
SATISFIED THE CONTINUITY EQUATION. IN
CASES WHERE AIR WITHIN THE ELEVATED
INVERSION WAS ENTRAINED INTO THE MIXED
LAYER, WE USED A PARAMETERIZATION OF
THE VERTICAL VELOCITY. THIS MODEL CAN
ALSO ACCEPT SOLID BOUNDARIES IN THE
INTERIOR OF THE GRID SIMULATING
CONDITIONS IN THE BAY AREA WHERE THE
BASE OF THE INVERSION IS BELOW SOME OF
THE TOPOGRAPHIC FEATURES. THIS RESULTS
IN THE HORIZONTAL FLOW FIELDS BEING
FORCED AROUND THESE OBSTACLES.

<GEO> REGIONAL (APPROXIMATELY 90,000 SQ KM)

<STATS> IN USE

<ACCESS> LIMITED TO AUTHORIZED RECIPIENTS

<MEDIA> PUNCHED CARDS; MAGNETIC TAPE

<SIZE> 1,136,200 OCTAL 60 BIT WORDS

<COMP> CDC

<CONFIG> CDC 7600 WITH DISCS

<LANG> FORTRAN PIV VERSION 4.3

<ALGO> THEORY FOR CALCULATING MASS CONSISTENCY
IS BASED ON VARIATIONAL CALCULUS
TECHNIQUES.

<CLAS> NUMERICAL

<APPL> ATMOSPHERIC BOUNDARY LAYER AIR
POLLUTION STUDIES

<USERS> SAN FRANCISCO BAY AREA AIR POLLUTION
CONTROL DISTRICT (SBAAPCD); LLL

<SRD> VARIOUS BAY AREA AGENCIES

<REAL> CODE HAS BEEN RUN FOR TWO 24 HOUR AND
ONE 48 HOUR SETS OF METEOROLOGICAL DATA
FOR THE SAN FRANCISCO BAY AREA.

<UPDATE> 700613

<67>
<COM> DILLEY, J. P.; YEN, K. T.

<TITLE> EFFECT OF A MESOSCALE TYPE WIND ON THE
POLLUTANT DISTRIBUTION FROM A LINE
SOURCE

<ADDR> GENERAL ELECTRIC COMPANY

<CITY> PHILADELPHIA

<STATE> PA

<67>

ATMOSPHERIC TRANSPORT

<67> CONT.

<719> 14101

<DOC> ATMOSPHERIC ENVIRONMENT, 5(10),
443-451, 1971

<ABST> A FAMILY OF ANALYTICAL SOLUTIONS TO A 2-DIMENSIONAL TRANSPORT AND DIFFUSION EQUATION THAT DESCRIBES THE POLLUTANT CONCENTRATION DOWNWIND FROM AN INFINITE CROSSWIND LINE SOURCE ON THE GROUND IS PRESENTED. BOTH LARGE-SCALE AND LOCAL OR MESOSCALE WINDS ARE INCLUDED IN THE ANALYSIS. THE MESOSCALE WIND IS CHOSEN TO SIMULATE A LOCAL WIND PRODUCED BY URBAN HEAT ISLAND EFFECTS. RESULTS FROM A SAMPLE CALCULATION SHOW THE EFFECTS OF THE MESOSCALE WIND ON POLLUTANTS TO BE NON-NEGLECTABLE OVER THE SIMULATED URBAN REGION. DEPENDING ON THE RELATIVE POSITIONS OF THE SOURCE, THE CENTER OF THE MESOSCALE WIND, AND THE OBSERVER, AND THE DIRECTIONS OF THE LARGE-SCALE AND MESOSCALE WINDS, THE CONCENTRATION CAN BE ENHANCED OR REDUCED BY THE MESOSCALE WIND.

<CLASS> PREDICTIVE

<68>

<CONT> DOTSON, W. L.

<TITLE> AIR TRANSPORT MODELING FOR REGIONAL DOSE STUDIES

<ACRO> HANFORD ENGINEERING DEVELOPMENT
LABORATORY

<CITY> RICHLAND

<STATE> WA

<DOC> TRANSACTIONS OF THE AMERICAN NUCLEAR
SOCIETY, 14(2), 450, 1971.

<ABST> A COMPUTER PROGRAM DESIGNED TO CALCULATE THE ATMOSPHERIC TRANSPORT, DIFFUSION AND DEPOSITION OF RADIOACTIVE EFFLUENT FROM THE CONTINUING OPERATION OF A NUMBER OF NUCLEAR FACILITIES WITHIN A REGION HAS BEEN WRITTEN. CALCULATIONS IN THIS PROGRAM ARE MADE FOR THE RADIOISOTOPE CONTAMINATION CONTRIBUTION FROM THE SEVERAL SOURCES AT A SERIES OF GEOGRAPHICAL RECEPTORS DENOTED AS CENTROIDS. THE SOURCES ARE SITES FOR NUCLEAR REACTORS OR REPROCESSING PLANTS REPRESENTATIVE OF A POPULATION GROUP. THE COMPUTER PROGRAM WAS DEVELOPED AS PART OF A REGIONAL MODEL TO ASSESS THE RADIOACTIVE DOSE ATTRIBUTABLE TO A DEVELOPING NUCLEAR POWER INDUSTRY. OTHER PROGRAMS, REPORTED IN COMPANION PAPERS, CALCULATE POPULATION DOSES RESULTING FROM THE ATMOSPHERIC RADIOISOTOPE CONCENTRATIONS CALCULATED AT EACH CENTROID. DOSES DUE TO DEPOSITION AND UPTAKE THROUGH FOOD AND WATER PATHWAYS ARE ALSO CALCULATED.

<CLASS> PREDICTIVE

<69>

<CONT> DRIVAS, PETER J.

<TITLE> TRACE PHOTOCHEMICAL AIR QUALITY
SIMULATION MODEL

<ACRO> TRACE; ERNA

<ACRO> PACIFIC ENVIRONMENTAL SERVICES INC.,
1930 14TH STREET

<CITY> SANTA MONICA

<STATE> CA

<ZIP> 90404

<PHONE> 213-450-1060

<DOC> DRIVAS, P.J., TRACE USER'S GUIDE,
DOCUMENT TR-016, NOVEMBER, 1977.<SUB> PHYSICO-CHEMICAL SIMULATION OF REGIONAL
PHOTOCHEMICAL AIR QUALITY

<ABST> TRACE (TRAJECTORY ATMOSPHERIC CHEMISTRY AND EMISSIONS) IS A REGIONAL PHOTOCHEMICAL AIR QUALITY MODEL WHICH SIMULATES A 76-REACTION PHOTOCHEMICAL MECHANISM IN A LAGRANGIAN (MOVING COORDINATE) FRAME OF REFERENCE. THE BASIS OF THE MODEL IS A MOVING PARCEL OF AIR, WHICH IS BOUNDED BY A STABLE LAYER (INVERSION BASE) ABOVE AND THE GROUND BELOW. POLLUTANTS ENTER THE MOVING AIR PARCEL FROM SOURCES LOCATED RELATIVE TO A FIXED EMISSION GRID, AND CAN DIFFUSE IN AND OUT OF THE MOVING AIR PARCEL FROM SOURCES LOCATED RELATIVE TO A FIXED EMISSION GRID, AND CAN DIFFUSE IN AND OUT OF THE MOVING AIR PARCEL BY HORIZONTAL DIFFUSION. TRACE UTILIZES THE SAME CHEMICAL MECHANISM EMPLOYED IN THE EMPIRICAL KINETIC MODELING APPROACH (EKMA), AND THUS TRACE CAN BE CONSIDERED AS A LOGICAL EXTENSION OF EKMA WITH DETAILED SPATIAL AND TEMPORAL RESOLUTION.

<GEO> MESOSCALE URBAN OR RURAL AREAS

<TIME> 12-HOUR SIMULATION

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE; DISC; PUNCHED CARDS;

<SIZE> 2050 CARDS

<COMP> IBM; UNI; CDC

<CONFIG> 220 K CORE

<LANG> FORTRAN IV

<CHAR> EBCDIC

<ALGO> CONSERVATION-OF-MASS EQUATIONS IN
LAGRANGIAN FRAME OF REFERENCE; GEAR
NUMERICAL INTEGRATION TECHNIQUE

<CLASS> PREDICTIVE; SIMULATION

<APPL> REGIONAL PHOTOCHEMICAL AIR QUALITY
IMPACTS OF POINT SOURCES, HIGHWAYS, AND
OFF-SHORE OIL PRODUCTION; OXIDANT
CONTROL STRATEGY ANALYSES

<USER> ENVIRONMENTAL PROTECTION AGENCY

<SRD> LOCAL EMISSIONS AND METEOROLOGICAL DATA

<VALID> VALIDATION BY COMPARISON OF PREDICTED
CONCENTRATIONS WITH MEASURED
CONCENTRATIONS; TRACE DOES NOT REQUIRE
ANY CALIBRATION BEFORE USE.<CON> THE TRACE PROGRAM IS COMPLETELY
SELF-CONTAINED, REQUIRING NO
SUPPLEMENTARY PROGRAMS OR HARDWARE.

ATMOSPHERIC TRANSPORT

<69> CONT.
<UPDATE> 780925

<70>
<CONT> DUCE, D. A.; NORFMAN, G. L.
<TITLE> ATMOSPHERIC VANADIUM TRANSPORT TO THE OCEAN
<ADDR> UNIVERSITY OF RHODE ISLAND
<CITY> KINGSTON
<STATE> RI
<LOC> ATMOSPHERIC ENVIRONMENT, 10(110), 989-996, 1976
<ABST> THE DISTRIBUTION OF ATMOSPHERIC VANADIUM IN URBAN AND REMOTE MARINE AREAS IS EVALUATED. IT APPEARS THAT MOST OF THE VANADIUM PRESENT IN THE NORTHERN HEMISPHERE WEST LIES OVER THE ATLANTIC AND PACIFIC OCEANS IS FROM ANTHROPOGENIC SOURCES. SEVERAL CRUDE MODELS ARE UTILIZED TO CALCULATE THE FLOW OF VANADIUM FROM THE ATMOSPHERE TO THE OCEANS AND IT IS CONCLUDED THAT APPROX. 10% OF THE ANTHROPOGENIC ATMOSPHERIC VANADIUM PRODUCED IN CONTINENTAL AREAS IS DEPOSITED IN OPEN OCEAN REGIONS. VANADIUM MAY SERVE AS A VARIABLE TRACER IN THEORETICAL AND EXPERIMENTAL MODELS DESIGNED TO EVALUATE TRANSPORT OF ATMOSPHERIC POLLUTANTS TO THE OPEN OCEAN AREAS.
<CLASS> SIMULATION

<71>
<CONT> BOENER, W. R.
<TITLE> A GENERAL KINETICS CODE WITH ATMOSPHERIC APPLICATIONS
<ACTO> GENKIN-1
<ADDR> LAWRENCE LIVERMORE LABORATORY, C DIVISION AND CHEMISTRY, P.O. BOX 800
<CITY> LIVERMORE
<STATE> CA
<ZIP> 94550
<PHONE> 415-422-1807; FTS 532-1807
<SOURCE> DEVELOPED AT LLL
<DOC> GELINAS, R.J. AND DICKINSON, R.P., GENKIN-1, O'ID-16577, AUGUST 1976
<SUB> ATMOSPHERIC MODELING
<ABST> A MULTI-PURPOSE, SEMIAUTOMATIC CODE FOR SETTING UP AND SOLVING LARGE COUPLED SETS OF STIFF, NON-LINEAR KINETIC EQUATIONS, INTERFACED WITH A LIBRARY OF CHEMICAL REACTIONS AND RATE COEFFICIENTS IMPORTANT IN ATMOSPHERIC MODELING. IT USES ADVANCED VARIANTS OF THE GEAR METHOD TO SOLVE THE DIFFERENTIAL EQUATIONS.
<GRD> NIL
<TIME> INDEFINITE
<STATUS> IN USE WEEKLY

<ACCESS> UNLIMITED
<MEDIA> TEXT
<SIZE> CODE STATEMENTS WITH COMMENT CARDS: 7000; CODE STATEMENTS W/O COMMENT CARDS: 1700
<COMP> CDC
<CONFIG> CDC 7600;
<LANG> LBLTRAN
<CHAR> ASCII
<ALGO> EPISODE
<CLASS> ANALYTICAL; PREDICTIVE
<APPL> MODELING OF WELL MIXED CHEMICAL SYSTEMS, E.G. SMOG CHAMBERS.
<USER> LLL
<SRD> INTERNAL LIBRARIES
<VAL> TESTED AGAINST EXACT ANALYTICAL SOLUTIONS TO SIMPLE PROBLEMS. EXCELLENT AGAINST MANY SPECIFIC OBSERVATIONS ON VARIOUS PROBLEMS. RESULTS ARE DISCUSSED IN SEVERAL APPLICATIONS PAPERS - NOT SPECIFICALLY RELEVANT FOR MODEL VERIFICATION HOWEVER.
<CON> RUN TIME IS PROBLEM DEPENDENT;
<UPDATE> 780606

<72>
<CONT> EASTER, R. C.; HOBBS, P. V.
<TITLE> FORMATION OF SULFATES AND THE ENHANCEMENT OF CLOUD CONDENSATION NUCLEI IN CLOUDS
<DOC> JOURNAL OF ATMOSPHERIC SCIENCE, 31(6), 1506-1596, 1974
<ABST> A MATHEMATICAL MODEL IS DEVELOPED FOR PREDICTING THE PRODUCTION OF AMMONIUM SULFATE BY OXIDATION OF DISSOLVED SULFUR DIOXIDE IN CLOUD DROPLETS OF SMALL-AMPLITUDE WAVE CLOUDS AND THE RESULTING ENHANCEMENT OF CLOUD CONDENSATION NUCLEI RELEASED FROM THE CLOUDS ON EVAPORATION. THE CONDENSATIONAL GROWTH OF THE DROPLETS FORMED ON 75 INITIAL CLOUD CONDENSATION NUCLEI SIZES IS CONSIDERED SIMULTANEOUSLY WITH THE PRODUCTION OF SULFATES IN THE DROPLETS OF AN AIR PARCEL MOVING THROUGH A WAVE CLOUD VIA THE SCOTT-HOBBS MECHANISM. SIGNIFICANT INCREASES IN THE CONCENTRATIONS OF CLOUD CONDENSATION NUCLEI ACTIVE AT 0.5 PERCENT SUPERSATURATION CAN BE PRODUCED BY SO₂ OXIDATION IN WAVE CLOUDS WITH SHORT FLOW-THROUGH TIMES (4 MIN) AND WITH CONCENTRATIONS OF SO₂ AND AMMONIA TYPICAL OF UNPOLLUTED AIR (1 AND 3 PPB, RESPECTIVELY). THE SULFATE PRODUCTION DECREASES AS THE SO₂ CONCENTRATION RISES ABOVE 10 PPB DUE TO THE LIMITED BUFFERING CAPACITY OF THE NH₃. IN-CLOUD PRODUCTION OF AMMONIUM SULFATE CAN PROBABLY EXPLAIN PREVIOUS OBSERVATIONS OF HIGHER THAN AMBIENT CLOUD CONDENSATION NUCLEI CONCENTRATIONS IN AIR FROM EVAPORATING CLOUDS, WITH THE AMMONIUM SULFATE PRODUCTION IN CLOUDS BEING SUFFICIENTLY FAST TO ACCOUNT FOR THE MAJOR WORLDWIDE SOURCE OF THESE

<72>

ATMOSPHERIC TRANSPORT

<72> CONT.

PARTICLES.

<CLASS> PREDICTION

<73>

<COM> EBERSTEIN, I. J.; AIXIN, A. C.

<TITLE> BEHAVIOR OF NITRIC OXIDE FORMED BY THE SPACE SHUTTLE IN THE MESOSPHERE

<ABST> A NUMERICAL MODEL OF EDDY DIFFUSIVE TRANSPORT OF EMITTED GASES FROM THE SPACE SHUTTLE BARE, INCLUDING THE EMITTER CONSTITUENTS AND THE AMBIENT ATMOSPHERE, HAS BEEN CONSTRUCTED FOR 75 KM ALTITUDE. THE NUMERICAL METHODS INVOLVE EXPLICIT SOLUTION OF THE DIFFUSION EQUATION AND RUNGE-KUTTA METHOD FOR THE CHEMICAL REACTIONS. THE TIME REQUIRED TO REACH BACKGROUND LEVELS OF NITRIC OXIDE CONCENTRATION OF 7×10^{10} MOLECULES/CM³ HAS BEEN CALCULATED. THIS RELAXATION TIME DEPENDS STRONGLY ON ATMOSPHERIC CONDITIONS.

<CLASS> SIMULATION

<74>

<COM> EDEY, A.

<TITLE> THE AIR POLLUTION COMPONENT OF AN ECOSYSTEM SIMULATION MODEL

<DOC> EDWARDS, P. L. AND W. S. BERNINGHOFF (EDS.), ECOLOGICAL APPROACHES TO AEROCIOLOGY, II, DEVELOPMENT, DEMONSTRATION AND EVALUATION OF MODELS. INTERNATIONAL BIOLOGICAL PROGRAM, AEROCIOLOGY PROGRAM, HANDBOOK NO. 3, UNIVERSITY OF MICHIGAN, ANN ARBOR

<ABST> THE AIR DIFFUSION COMPONENT OF A TOTAL MODEL TO SIMULATE EFFECTS OF AIR POLLUTION ON ENVIRONMENT AND PROVIDE OPTIMAL CONTROL STRATEGIES IS DESCRIBED.

<CLASS> SIMULATION

<75>

<COM> FINNITT, E. C.; HOLMES, D. J.; NOTT, L. B.

<TITLE> SOURCE ASSESSMENT: SEVERITY OF STATIONARY AIR POLLUTION SOURCES-A SIMULATION APPROACH

<ADDR> RESEARCH RESEARCH CORPORATION

<CITY> DAYTON

<STATE> OH

<DOC> PB--256310, 1976

<ABST> THE REPORT GIVES RESULTS OF A STUDY SIMULATING THE ESTABLISHMENT OF THE SEVERITY OF STATIONARY AIR POLLUTION SOURCES. THE POTENTIAL ENVIRONMENTAL IMPACT OF AN EMISSION SOURCE CAN BE DETERMINED FROM THE SOURCE SEVERITY (THE GROUND LEVEL CONCENTRATION CONTRIBUTION OF POLLUTANTS RELATIVE TO SOME POTENTIALLY HAZARDOUS CONCENTRATION OF THE SAME SPECIES). THE FREQUENCY DISTRIBUTION OF THE SEVERITY OF WELL-DOCUMENTED SOURCE TYPES CAN BE EXAMINED DETERMINISTICALLY. A

STATISTICAL APPROACH IS REQUIRED TO SIMULATE THE FREQUENCY DISTRIBUTION OF THE SEVERITY OF SOURCE TYPES THAT ARE COMPLEX OR INVOLVE A LARGE NUMBER OF EMISSION POINTS IN ORDER TO ULTIMATELY ASSESS SUCH SOURCES. A MONTÉ CARLO SIMULATION TECHNIQUE IS DESCRIBED IN THIS REPORT, TOGETHER WITH EFFICIENT ALGORITHMS FOR FITTING THE INVERSE WEIBULL, GAMMA, NORMAL, AND LOG-NORMAL CUMULATIVE DENSITY FUNCTIONS. SIGNIFICANT CORRELATION IS DEMONSTRATED BETWEEN DETERMINISTIC AND SIMULATED SEVERITY RESULTS USING COAL-FIRED STEAM/ELECTRIC UTILITIES AS AN EXAMPLE.

<CLASS> SIMULATION

<76>

<COM> EDNAK, DONALD L.

<TITLE> ANALYTICAL MODEL FOR AIR POLLUTANT TRANSPORT AND DEPOSITION FROM A POINT SOURCE

<ADDR> UNIVERSITY OF CALIFORNIA

<CITY> LIVERMORE

<STATE> CA

<DOC> ATMOSPHERIC ENVIRONMENT, 11, 231-237, 1977

<ABST> AN ATMOSPHERIC TRANSPORT AND DEPOSITION MODEL IS PRESENTED FOR POLLUTANTS EMITTED FROM AN ELEVATED POINT SOURCE OVER FLAT TERRAIN. THE MODEL IS OBTAINED FROM THE ANALYTIC SOLUTION OF THE ATMOSPHERIC DIFFUSION EQUATION WITH THE COEFFICIENTS OF EDDY DIFFUSION TAKEN TO BE FUNCTIONS OF DOWNWIND DISTANCE AND THE AVERAGE WIND VELOCITY TAKEN TO BE CONSTANT. GROUND DEPOSITION OF THE POLLUTANTS IS ACCOUNTED FOR BY (1) INCLUDING A GRAVITATIONAL SETTLING TERM IN THE ATMOSPHERIC DIFFUSION EQUATION AND BY (2) APPLYING AN ABSORPTIVE BOUNDARY CONDITION AT THE GROUND SURFACE. IN ORDER TO FACILITATE APPLICATION OF THE MODEL, THE RESULTS FOR THE GENERAL SITUATION THAT INCLUDES SETTLING AND DEPOSITION (AND WHERE THE DISTRIBUTION IS NO LONGER GAUSSIAN) ARE EXPRESSED IN TERMS OF THE GAUSSIAN PLUME PARAMETERS, AND SPECIFICALLY THE CROSSWIND AND VERTICAL STANDARD DEVIATION FUNCTIONS σ_{YD}/σ_{YD} AND σ_{ZD}/σ_{ZD} . GRAPHS OF THE POLLUTANT AIR CONCENTRATION AND GROUND DEPOSITION FLUX ARE PRESENTED FOR A NUMBER OF DEPOSITION CONDITIONS.

<CLASS> SIMULATION

<77>

<COM> EDNAK, DONALD L.

<TITLE> MULTIPLE SOURCE DISPERSION MODEL

<ADDR> RSDH

<ADDR> LAWRENCE LIVERMORE LABORATORY, ENVIRONMENTAL SCIENCES DIVISION, P.O. BOX 5507

<CITY> LIVERMORE

<STATE> CA

<ZIP> 94550

ATMOSPHERIC TRANSPORT

<77> CONT.

<FROM> 415-422-3089; P'S 532-3980

<SOURCE> DEVELOPED AT LLL

<DOC> DOCUMENT IN PREPARATION

<SUB> ATMOSPHERIC TRANSPORT MODEL

<ABST> HSES IS A COMPUTER CODE FOR CALCULATING POLLUTANT CONCENTRATIONS AND SURFACE DEPOSITION RATES FROM UP TO 100 POINT SOURCES AND WITHIN A SPATIAL RANGE OF APPROXIMATELY 100 KM. THE MODEL IS BASED ON THE GAUSSIAN PLUME CONCEPT WITH MODIFICATIONS TO SIMULATE THE EFFECTS OF PLUME RISE, FIRST ORDER CHEMICAL TRANSFORMATIONS, GRAVITATIONAL SETTLING, SURFACE DEPOSITION, AND AN INVERSION LAYER. TWO MODES OF OPERATION CAN BE EMPLOYED: CLIMATOLOGICAL OR INSTANTANEOUS. IN THE CLIMATOLOGICAL MODE, LONG-TERM (MONTHLY TO YEARLY) AVERAGES ARE CALCULATED USING A JOINT FREQUENCY DISTRIBUTION OF WIND SPEEDS, WIND DIRECTION, AND ATMOSPHERIC STABILITY FOR THE TIME PERIOD OVER WHICH THE AVERAGE IS TO BE TAKEN. SHORT-TERM (HOURLY) AVERAGES FOR A SPECIFIC SET OF METEOROLOGICAL CONDITIONS ARE CALCULATED IN THE INSTANTANEOUS MODE.

<STATUS> UNDER DEVELOPMENT; IN USE MONTHLY

<ACCESS> LIMITED TO AUTHORIZED RECIPIENTS

<MEDIA> PHYSICAL CARDS

<SIZE> APPROX. 2000 CARDS

<COMP> CDC

<CONFIG> CDC 7600, PLOTTER

<LANG> FORTRAN

<CHAR> ASCII

<CLASS> ANALYTICAL; INTEGRATIVE; PREDICTIVE

<APPL> ATMOSPHERIC TRANSPORT STUDIES

<SYSTEMS> LLI

<SWD> PROVIDED BY USER

<VRAL> COMPARISON OF PREDICTION WITH SIMPLE ANALYTICAL SOLUTIONS, AND RESULTS FROM 3-D PARTICLE-IN-CELL CODE. MASS CONSERVATION CHECK ON CHEMICAL TRANSFORMATIONS.

<NUMBER> 76C503

<78>
<COMT> ESKRIDGE, ROBERT E.

<TITLE> LONG RANGE TRANSPORT MODELING

<ADDR> U.S. ENVIRONMENTAL PROTECTION AGENCY,
ENVIRONMENTAL SCIENCES RESEARCH
LABORATORY

<CITY> RESEARCH TRIANGLE PARK

<STATE> NC

<ZIP> 27711

<ABST> THE WINDS, TEMPERATURE, EDDY DIFFUSION COEFFICIENTS AND OTHER METEOROLOGICAL PARAMETERS WILL BE FURNISHED BY A

BOUNDARY LAYER MODEL BEING DEVELOPED BY NOAA. EMISSIONS WILL BE CALCULATED FROM THE NEDS DATA BASE AND WILL INCLUDE PLUME RISE. THE MODEL WILL CALCULATE TRANSPORT OF POLLUTANTS USING A FINE-CORRECTED ADVECTION SCHEME (ENASTA), WHILE DIFFUSION WILL BE CALCULATED USING AN IMPLICIT APPROXIMATION. THE MODEL WILL ALSO INCLUDE DEPOSITION AT THE SURFACE VIA BOUNDARY CONDITIONS. THE PROGRAM HAS BEEN TESTED USING FICTITIOUS DATA TO TEST THE ADVECTION AND DIFFUSION SCHEMES USED. IT IS EXPECTED THAT TESTING OF SULFUR CHEMISTRY USING FICTITIOUS METEOROLOGY AND REAL EMISSIONS WILL BE COMPLETED BY JUNE 1978/6/78 REPORT ON MODEL EVALUATION.

<TIME> 76/10/01-79/01/01

<CLASS> SIMULATION

<79>

<COMT> ESKRIDGE, ROBERT E.; DENEPIAN, K. L.

<TITLE> TWO-DIMENSIONAL, FINITE DIFFERENCE LINE SOURCE MODEL

<ADDR> U.S. ENVIRONMENTAL PROTECTION AGENCY,
ENVIRONMENTAL SCIENCES RESEARCH
LABORATORY

<CITY> RESEARCH TRIANGLE PARK

<STATE> NC

<ZIP> 27711

<ABST> TRANSPORT OF THE POLLUTANTS IS ACCOMPLISHED BY USE AND DISTANCE-FLUX-CORRECTED ALGORITHM DEVELOPED AT THE NAVAL RESEARCH LABORATORIES. THIS ALGORITHM INSURES POSITIVE CONCENTRATIONS AND REDUCES NUMERICAL DIFFUSION. THE MODEL DEVELOPS BACKGROUND EDDY DIFFUSION COEFFICIENTS WHICH ARE THEN PERTURBED BY THE MECHANICAL TURBULENCE INTRODUCED BY VEHICULAR MOTION. THE MODEL CALCULATIONS ARE CURRENTLY BEING COMPARED TO THE SFE EXPERIMENTS CARRIED OUT BY GENERAL MOTORS IN THE GM SULFATE DIFFUSION EXPERIMENT. MODEL DEVELOPMENT IS COMPLETE WITH ONLY FINAL COMPARISONS OF THE PREDICTIONS AND OBSERVATIONS TO BE COMPLETED. A PAPER IS PRESENTLY BEING PREPARED THAT WILL PRESENT THE FINDINGS OF THIS WORK. 09/77 REPORT--DEVELOPMENT OF MODEL. 09/78 REPORT--APPLICATION OF MODEL ON AND NEAR HIGHWAYS.

<TIME> 76/10-77/09

<CLASS> SIMULATION

<80>

<COMT> FAIRHALL, A.

<TITLE> MODEL OF THE ACCUMULATION OF FOSSIL CO2 IN THE ATMOSPHERE AND THE SEA

<ADDR> UNIVERSITY OF WASHINGTON, DEPARTMENT OF
CHEMISTRY

<CITY> SEATTLE

<STATE> WA

<ZIP> 98105

<AC>

ATMOSPHERIC TRANSPORT

<DOC> CONT.
 <ENHSE> 206-543-1476
 <LOC> WASHINGTON UNIV., BLO-2245-?-20-0, 1972
 <SUB> TRANSFER OF FOSSIL CARBON DIOXIDE TO WORLD OCEAN
 <TOP> WORLD OCEAN
 <TIME> 1960-1971
 <STAT> PUBLISHED
 <ACCESS> NOT ACCESSIBLE
 <MEDIA> HAND CALCULATION
 <CLASS> PREDICTIVE
 <APPL> BUILDUP OF FOSSIL CARBON DIOXIDE IN ATMOSPHERE
 <COND> PUBLISHED DATA ON CONSUMPTION OF FOSSIL FUELS DURING PAST CENTURY
 <REVAL> COMPARISON WITH OBSERVATIONS OF ATMOSPHERIC BUILDUP OF CARBON DIOXIDE
 <UPDATE> 780911

<RT>
 <CCNT> PARKER, PAUL S.
 <TITLE> A SOFTWARE SYSTEM TO SIMULATE COAL PLANT PARTICULATE CONTROLS
 <ACRG> PCTCL
 <ACCD> ARGONNE NATIONAL LABORATORY, ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION, 9700 S. CASS AVE.
 <CITY> ARGONNE
 <STATE> IL
 <ZIP> 60439
 <ENHSE> FTS 972-5634
 <SOURCE> ROGER LEVESQUE (FTS 972-3272), ARGONNE NATIONAL LABORATORY, 9700 S. CASS, ARGONNE IL 60439
 <DOC> NONE
 <SUB> PARTICULATE EMISSION CONTROLS FOR COAL-FIRED PLANTS
 <ABST> USING COAL CHARACTERISTICS, EMISSION REGULATIONS, AND COST/PERFORMANCE FIGURES FOR EQUIPMENT AS INPUT, THE MODEL ATTEMPTS TO PREDICT THE PERFORMANCE AND COST OF PARTICULATE CONTROL FOR A COAL-FIRED PLANT. THE FOUR METHODS OF CONTROL THAT THE MODEL SIMULATES ARE ELECTROSTATIC PRECIPITATORS (HOT AND COLD), WIGHOUSES, AND SCRUBBER SYSTEMS.
 <STATUS> UNDER DEVELOPMENT
 <ACCESS> UNLIMITED
 <MEDIA> MAGNETIC TAPE; DISC; TEXT
 <SIZE> 1000 RECORDS EACH 80 BYTES LONG
 <COMP> IUB
 <COMPIG> IBM 370/195 OS/MVT WITH 250K CORE

<LANG> POSTMAN
 <CHAP> ENCDIC
 <ALGO> SPE COMMENTS
 <CLASS> DISCRETE; DETERMINISTIC; PREDICTIVE; ENGINEERING PROCESS
 <AMPL> TO STUDY THE COST/PERFORMANCE EFFECTS OF VARIOUS TYPES OF COAL AND/OR PARTICULATE CONTROL TECHNOLOGIES UPON COAL-FIRED PLANTS.
 <USERS> ARGONNE NATIONAL LABORATORY; TENNESSEE VALLEY AUTHORITY
 <SHD> UNITED STATES BUREAU OF MINES
 <REVAL> COMPARISON OF ACTUAL PLANT PERFORMANCE, CAPITAL COSTS, AND OPERATING/MAINTENANCE COSTS WITH PREDICTED COSTS AND PERFORMANCE.
 <CON> SOME DESCRIPTION GIVEN IN: "EFFECTS OF THE PROPOSED NEW SOURCE PERFORMANCE STANDARDS: A COMPARATIVE ASSESSMENT OF THE ENERGY AND ECONOMIC IMPACTS" BY PAUL S. PARKER AND C. DAVID LIVERWOOD, PAPER AT 71ST ANNUAL APCA MEETING, HOUSTON, TEXAS (JUNE 1978).
 <UPDATE> 780703

<92>
 <CONT> FOX, DOUGLAS G.
 <TITLE> MODELING ATMOSPHERIC EFFECTS - AN ASSESSMENT OF THE PROBLEMS
 <ADDR> U.S. DEPARTMENT OF AGRICULTURE, FOREST SERVICE, ROCKY MOUNTAIN FOREST AND RANGE EXPERIMENT STATION, 240 W. PROSPECT ST.
 <CITY> FORT COLLINS
 <STATE> CO
 <ZIP> 80526
 <PHONE> 303-221-4390; FTS 323-1254
 <DOC> WATER, AIR, AND SOIL POLLUTION, 6(2-4), 173-190, 1976
 <SUB> REGIONAL AIR POLLUTION MODEL
 <ABST> OUR ABILITY TO SIMULATE ATMOSPHERIC PROCESSES THAT AFFECT THE LIFE CYCLE OF POLLUTION IS REVIEWED. THE TRANSPORT PROCESS IS CONSIDERED ON THREE SCALES: (A) THE NEAR-SOURCE OR SINGLE-PLUME DISPERSION PROBLEM, (B) THE MULTIPLE-SOURCE DISPERSION PROBLEM, AND (C) THE LONG-RANGE TRANSPORT. MODELING THE FIRST OF THESE IS SHOWN TO BE WELL WITHIN THE CAPABILITY OF GENERALLY AVAILABLE TECHNIQUES, ALTHOUGH DETERMINING THE INPUT PARAMETERS IS OFTEN DIFFICULT. THE SECOND SCALE HAS BEEN WELL STUDIED WITHIN THE CONTEXT OF URBAN DIFFUSION AND IS A VERY PRODUCTIVE AREA OF CURRENT RESEARCH. FINALLY, LONG RANGE TRANSPORT IS TREATED MAINLY AS A METEOROLOGICAL PROBLEM. THE STATE OF THE ART IN MODELING THE VARIOUS METEOROLOGICAL PROCESSES IS REVIEWED. REMOVAL OF POLLUTANTS IS DISCUSSED IN THE FORM OF BOTH DRY DEPOSITION AND PRECIPITATION SCAVENGING. IT IS SUGGESTED THAT DRY REMOVAL IS ESPECIALLY EFFECTIVE IN

ATMOSPHERIC TRANSPORT

<92> COSP.

FORESTED AREAS, AND THAT THE FORESTS MAY ENHANCE ACCUMULATION OF POLLUTANTS. AN APPROXIMATE TRANSPORT MODEL IS DEVELOPED WHICH IS USED TO CALCULATE THE AMBIENT CONCENTRATION OF SO₂ THROUGHOUT THE UNITED STATES. ASSOCIATED CALCULATIONS INCLUDE NET DEPOSITION AND THE RATIO OF NET TO NET REMOVAL FOR EACH STATE OF THE CONTIGUOUS UNITED STATES.

<GEN> TSA

<YR> 1969

<ALGO> ORDINARY DIFFERENTIAL EQUATIONS

<CLAS> DETERMINISTIC; ANALYTICAL

<APPL> REGIONAL POLLUTION ASSESSMENT

<UPDT> 790901

<93>

<CONT> FREIBERG, J.

<TITL> IRON CATALYZED OXIDATION OF SO₂ TO ACID SULPHATE MIST IN DISPENSING PLUMES

<ADDP> JOHNS HOPKINS UNIVERSITY

<CITY> BALTIMORE

<STATE> MD

<DOC> ATMOSPHERIC ENVIRONMENT, 10(2), 121-130, 1976

<ABST> THE DEVELOPMENT OF A MODEL WHICH DEFECTS THE CATALYTIC OXIDATION OF SO₂ TO SULPHURIC ACID IN DISPENSING STACK PLUMES IS DESCRIBED. IT DESCRIBES THE OXIDATION QUANTITATIVELY AS A FUNCTION OF DISPERSION PARAMETERS, EMISSION CONFIGURATION, AND DIFFERENT ATMOSPHERIC CONDITIONS OF HUMIDITY, TEMPERATURE, STABILITY, ETC. THE MODEL ESTIMATES THE DISPERSION BY MEANS OF A BIVARIATE NORMAL DISTRIBUTION WHOSE VERTICAL AND HORIZONTAL VARIANCES ARE FUNCTIONS OF DOWNWIND DISTANCE DEPENDING UPON THE MAGNITUDES OF TABULATED DISPERSION COEFFICIENTS. A SECOND-ORDER REACTION RATE EXPRESSION FOR THE IRON CATALYZED OXIDATION OF SO₂ WAS COMBINED WITH THE CONSERVATION EQUATION FOR THE EXPANDING VOLUME REACTOR THAT WAS WRITTEN FOR THE DISPENSING PLUME. THE MODEL PREDICTS THE EXISTENCE OF A PEAK IN SULFATE CONCENTRATION AND WHERE THE PEAK IS LOCATED. IT ALSO PREDICTS THE FRACTIONAL CONVERSION OF SO₂ TO H₂SO₄. THIS IS OBTAINED AS AN ASYMPTOTIC LIMIT WHICH IS DEPENDENT ON THE INPUT VARIABLES. THE MODEL SHOWS QUANTITATIVELY THAT RELATIVE HUMIDITY STRONGLY INFLUENCES THE SO₂ OXIDATION, A FACT OBSERVED QUALITATIVELY IN MANY MEASUREMENTS. ADDITIONALLY, THE ROLES OF TEMPERATURE, THE INITIAL SO₂ CONCENTRATION, CATALYST CONCENTRATION AND ATMOSPHERIC AMMONIA CONCENTRATION ARE STUDIED.

<CLAS> PREDICTION

<94>

<CONT> GIESKE, JAMES A.

<TITL> ANALYTICAL STUDIES OF AEROSOL BEHAVIOR

PREDICTIONS FOR FAST REACTOR SAFETY

<ADDP> BATTELLE COLUMBUS LABS., 505 KING AVENUE

<CITY> COLUMBUS

<STATE> OH

<ZIP> 43201

<PHONE> 614-464-6424

<ABST>

IMPROVEMENTS WILL BE MADE FOR AEROSOL BEHAVIOR MODELS USED TO PREDICT THE LEAKAGE OF RADIOACTIVE MATERIALS FROM LWRFP CONTAINMENTS UNDER POSTULATED ACCIDENT CONDITIONS. THESE IMPROVEMENTS WILL BE CONCEIVED WITH BETTER REPRESENTATIONS FOR AEROSOL AGGLOMERATE PROPERTIES SUCH AS SHAPE FACTORS, EFFECTIVE VOLUMES, EFFECTIVE DENSITIES, AND PARTICLE-PARTICLE COLLISION EFFICIENCIES. IN ADDITION, IMPROVED SIZE DISTRIBUTION REPRESENTATIONS WILL BE USED IN THE ANALYSES AND THERMAL WALL DEPOSITION INCLUDED IN A MORE DESCRIPTIVE FASHION. EXPERIMENTAL MEASUREMENTS OF AGGLOMERATE PROPERTIES AND THERMAL FORCE WILL BE MADE TO PROVIDE INFORMATION NEEDED IN THE MODEL IMPROVEMENTS. SENSITIVITY ANALYSES AND MODEL VERIFICATION BY COMPARISON WITH EXPERIMENTAL RESULTS WILL BE USED TO EVALUATE MODEL ADEQUACY AND THE IMPORTANCE OF ASSUMED CONDITIONS ON AEROSOL LEAKAGE FROM CONTAINMENTS. EXPECTED RESULTS ARE THE DEVELOPMENT OR IMPROVEMENT AND VERIFICATION OF ANALYTICAL MODELS FOR PREDICTING AEROSOL BEHAVIOR WITHIN CONTAINMENTS. DETAILED IMPROVEMENTS IN DESCRIPTIONS OF AGGLOMERATE CHARACTERISTICS WILL BE PROVIDED FROM EXPERIMENTAL MEASUREMENTS AND INCORPORATED INTO THE MODEL. VERIFICATION OF BEHAVIOR MODELS WILL BE MADE BY COMPARISONS WITH A CONTINUOUSLY UPDATED DEPEND AND COMPILATION OF EXPERIMENTAL DATA. SENSITIVITY ANALYSES WITH THE DEVELOPED MODELS WILL PROVIDE AN ASSESSMENT OF THE IMPORTANCE OF CONTAINMENT GEOMETRY AND ASSUMED INPUT PARAMETERS. (1) REPORT ON PA20 AGGLOMERATE BEHAVIOR 7-77. (2) BEGIN PO22 AEROSOL EXPERIMENTS 7-77. (3) COMPLETE REFERENCE AEROSOL CODE.

<CLAS> PREDICTIVE

<95>

<CONT> GIFFORD, F. A., JR.

<TITL> THE SIMPLE ATOL URBAN AIR POLLUTION MODEL

<ACRO> ATOL

<ADDP> NOAA, AIR RESOURCES ATMOSPHERIC TURBULENCE AND DIFFUSION LABORATORY

<CITY> OAK RIDGE

<STATE> TN

<ZIP> 37830

<DOC> ATOL CONTRIBUTION FILE 78 REV., 1973, 18 PP.

<ABST>

APPLICATIONS AND VALIDATION ARE PROVIDED FOR THE URBAN AIR POLLUTION MODEL IN USE AT THE ATMOSPHERIC TURBULENCE AND DIFFUSION LABORATORY OF

<05>

ATMOSPHERIC TRANSPORT

<05> CONT.

THE NOAA. THE MODEL IS BASED ON THE EQUATION $X=CQ/u$ WHERE X IS THE POLLUTANT CONCENTRATION AT GROUND LEVEL, Q IS THE NEAR WIND SPEED, Q IS THE SOURCE INVENTORY STRENGTH, AND C IS CONSTANT. THE EQUATION WAS CALIBRATED BY MEANS OF ANNUAL AIR POLLUTION DATA FROM 44 US CITIES AND C AVERAGE APPROXIMATELY 225 FOR NONREACTING POLLUTANTS. COMPARISONS OF THE EQUATION WITH VARIOUS MORE DETAILED POLLUTION MODELS SHOW THAT IT IS A CONSISTENTLY BETTER PREDICTOR OF LONG-TERM AIR POLLUTION PATTERNS. IF THERE HAS BEEN A FAILURE IN DESIGNING COMPLEX MODELS, IT IS ONE OF PUSHING ON TOO RAPIDLY WITH THEORETICAL MODELING WITHOUT ADEQUATE EXPERIMENTAL CHECKS AGAINST THE REAL ATMOSPHERE. THE GROSS INFLUENCES OF VARIATIONS OF SOURCE STRENGTH, NEAR WIND TRANSPORT, AND STABILITY, WHICH ARE THE BASICS OF ATMOSPHERIC POLLUTION, MUST BE ACCOUNTED FOR FIRST, AND ONLY THEN CAN OTHER EFFECTS BE CONSIDERED.

<CLASS> SIMULATION

<06>

<CONT> GIFFORD, F. A., JR.

<TITLE> MODELLING URBAN AIR POLLUTION

<ABST> NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, ATMOSPHERIC TURBULENCE AND DIFFUSION LABORATORY

<CITY> OAK RIDGE

<STATE> TN

<ZIP> 37830

<PHONE> 615-483-0611 EXT-34001; FTS 650-0001

<DOC> ATMOSPHERIC ENVIRONMENT, 7, 131-136, 1973

<SUBJ> AIR POLLUTION

<ABST> FOR THE USUAL CASE OF RECEPTORS WITHIN A CITY, THE AREA SOURCE COMPONENT OF URBAN AIR POLLUTION IS STRONGLY DOMINATED BY THE SOURCE STRENGTH PATTERN AND BY TRANSPORT BY THE NEAR WIND. URBAN AREA SOURCE PATTERNS TEND TO BE FAIRLY UNIFORM AND ATMOSPHERIC DIFFUSION CONDITIONS IN CITIES TEND TO BE OF THE NEAR-NEUTRAL TYPE, WITHOUT THE STRONG DIURNAL VARIATIONS FOUND ELSEWHERE. FOR THESE REASONS A SIMPLE AREA SOURCE FORMULA $X=CQ/u$ WHERE X IS AIR POLLUTION CONCENTRATION, Q IS SOURCE STRENGTH PER UNIT AREA, AND u IS AVERAGE WIND SPEED, IS STUDIED. THE PARAMETER c IS, ACCORDING TO THE AUTHORS' URBAN DIFFUSION MODEL, A WEAK FUNCTION OF CITY SIZE AND SHOULD BE APPROXIMATELY CONSTANT. THIS FORMULA IS COMPARED WITH MEANS DERIVED FROM A LARGE QUANTITY OF AIR POLLUTION DATA, AVERAGE ANNUAL EMISSIONS AND CONCENTRATIONS OF PARTICLES FOR 44 U.S. CITIES AND SO₂ DATA FOR 20 CITIES, IN ORDER TO CALIBRATE THE CONSTANT, c. THE CONSTANT c IS FOUND TO BE ABOUT 225 FOR PARTICLES, AND 50 FOR SO₂. STANDARD DEVIATIONS OF c ARE ROUGHLY HALF THEIR MAGNITUDE. THE VALUE c=225 FOR PARTICLES IS MOST REPRESENTATIVE OF THE PURELY METEOROLOGICAL PROCESSES GOVERNING URBAN DIFFUSION, SINCE c IS

LOW FOR SO₂ BECAUSE OF THE GREATER INFLUENCE OF STRONG ELEVATED POINT SOURCES AND OF SO₂ DECAY. IT IS SUGGESTED THAT THIS SIMPLE FORMULA HAS WIDE APPLICABILITY IN AIR POLLUTION INVESTIGATIONS.

<060> USA; AUSTRALIA; SOUTH AFRICA

<STATUS> IN USE

<MEDIA> TEXT

<CLASS> CONTINUOUS; DETERMINISTIC; ANALYTICAL; PREDICTIVE

<VAL> BY COMPARISON WITH DATA

<07>

<CONT> GIFFORD, F. A., JR.; HANNA, S. B.

<TITLE> URBAN AIR POLLUTION MODELING

<ABST> A SIMPLE BUT PHYSICALLY REALISTIC MODEL OF THE GROUND LEVEL CONCENTRATION DISTRIBUTION RESULTING FROM AREA SOURCES OF POLLUTION IS PRESENTED. THE RESULTS ARE NOT GREATLY DEPENDENT UPON THE FORM OF THE VERTICAL CONCENTRATION DISTRIBUTION. THIS AREA-SOURCE MODEL, WHICH SATISFIES THE 2-DIMENSIONAL EQUATION OF DIFFUSION WITH HEIGHT-VARIABLE WIND AND DIFFUSIVITY, IS WELL ADAPTED TO SIMPLE, HARD CONCENTRATION. THE GROUND LEVEL CONCENTRATION IN ANY GRID SQUARE OF A 2-DIMENSIONAL GRID COVERING THE AREA SOURCES IS GIVEN BY THE SUM OF THE SOURCE STRENGTHS OF ALL THE GRID SQUARES, EACH MULTIPLIED BY A SIMPLE WEIGHTING FACTOR. THIS FACTOR DEPENDS MAINLY ON DISTANCE FROM THE RECEPTOR SQUARE, THE FREQUENCY WITH WHICH THE WIND BLOWS FROM THAT SQUARE TO THE RECEPTOR SQUARE, WIND SPEED, AND ATMOSPHERIC STABILITY. THE MATRIX OF WEIGHTING FACTORS IS INDEPENDENT OF THE LOCATION OF THE RECEPTOR SQUARE. COMPARISONS WITH URBAN AIR POLLUTION COMPUTATIONS BASED ON MORE COMPLEX URBAN DIFFUSION MODELS (E.G. LAND'S MODEL APPLIED TO LOS ANGELES, POPKIN'S MODEL APPLIED TO BUREAU, AND HANSEN AND TIVANT'S MODEL APPLIED TO ATLANTA) ILLUSTRATE THAT THIS SIMPLE MODEL ADEQUATELY REPRESENTS URBAN DIFFUSION FOR MOST AIR POLLUTION PROBLEMS.

<CLASS> SIMULATION

<08>

<CONT> GIFFORD, F. A., JR.; HANNA, S. B.

<TITLE> DISPERSION OF SULFUR DIOXIDE EMISSIONS FROM AREA SOURCES

<ABST> NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, ATMOSPHERIC TURBULENCE AND DIFFUSION LAB.

<CITY> OAK RIDGE

<STATE> TN

<DOC> ATDL--76/10, 1976

<ABST> METHODS USED IN EVALUATING SURFACE CONCENTRATIONS OF SULFUR DIOXIDE EMITTED GENERALLY OVER AN AREA ARE DESCRIBED. THE MOST COMMON EXAMPLE OF AN AREA SOURCE IS PROVIDED BY URBAN

ATMOSPHERIC TRANSPORT

<00> CONT.

DOMESTIC AND INDUSTRIAL HEATING, FOR WHICH IT IS NECESSARY TO CONSIDER THE SUM OF A LARGE NUMBER OF INDIVIDUAL SOURCES OVER AN AREA OF SOME CONVENIENT SIZE. GIVEN AN AREA-SOURCE INVENTORY, A SIMPLE, SYSTEMATIC PROCEDURE FOR CALCULATING THE SURFACE CONCENTRATION AT ANY POINT, AVERAGED OVER AN HOUR, A DAY, OR A YEAR IS PRESENTED. THE BASIC PHYSICAL MODEL OF ATMOSPHERIC DIFFUSION EMPLOYED IS THE SAME AS FOR TALL-STACK EMISSIONS. AREA-SOURCE CONCENTRATION CALCULATIONS ARE A RECENT DEVELOPMENT COMPARED WITH CALCULATIONS OF CONCENTRATIONS FROM ISOLATED SOURCES. THERE ARE DISCUSSIONS OF SOME OF THE METHODS NOW AVAILABLE, BUT THESE ALL REQUIRE THE USE OF A HIGH-SPEED ELECTRONIC COMPUTER. THE METHOD TO BE DESCRIBED, ALTHOUGH VERY SIMPLE, HAS BEEN SHOWN TO PROVIDE RESULTS OF A PRECISION COMPARABLE WITH THAT OF THE MORE ELABORATE COMPUTED CALCULATIONS AND CAN BE USED WITH CONFIDENCE FOR AREA-SOURCE CALCULATIONS IN URBAN AIR POLLUTION AND REGIONAL AIR QUALITY STUDIES. AN EVEN SIMPLER AREA-SOURCE CALCULATION SUITABLE FOR FAST AIR POLLUTION CONTROL PURPOSES IS ALSO DESCRIBED. THE MODEL IS DESCRIBED HERE IN SUCH A WAY THAT ALL THE CALCULATIONS CAN BE DONE BY HAND. FOR THE PURPOSE OF MAKING HARD APPLICATIONS OF THE MODEL, IT HAS ALSO BEEN PROGRAMMED IN FORTRAN.

<LANG> FORTRAN

<CLASS> SIMULATION

<99>
<CONT> GIFFORD, P. A., JR.; HANNA, S. B.

<TITLE> URBAN AIR POLLUTION MODELLING

<ACRO> ATDL

<ADDR> NOAA ATMOSPHERIC TURBULENCE AND DIFFUSION LAB.

<CITY> OAK RIDGE

<STATE> TN

<ZIP> 36823

<DOC> FUGLEND, R.N. AND D.T. DEERY (ED.), PROCEEDINGS OF THE INTERNATIONAL CLEAN AIR CONGRESS, VOL. 2. XIV+1350 PP. (1966-1957), 1971

<ABST> THIS PAPER MENTIONS SEVERAL URBAN DIFFUSION MODELS AND DESCRIBES IN DETAIL ONE SUCH MODEL, THE ATDL AREA-SOURCE MODEL.

<CLASS> SIMULATION

<90>
<CONT> GIFFORD, P. A., JR.

<TITLE> APPLICATIONS OF A SIMPLE URBAN POLLUTION MODEL

<ADDR> NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, AIR RESOURCES ATMOSPHERIC TURBULENCE AND DIFFUSION LAB., OAK RIDGE, TN

<CITY> OAK RIDGE

<STATE> TN

<DOC> PROCEEDINGS OF CONFERENCE ON URBAN ENVIRONMENT AND CONFERENCE ON BIOGEOLOGY, (2ND), HELD IN PHILADELPHIA, PA, OCTOBER 31-NOVEMBER 2, 1972 (P. 62-63)

<ABST> THE FORMULA PROPOSED TO DESCRIBE THE AREA-SOURCE COMPONENT OF URBAN AIR POLLUTION IS GIVEN AS: $Y=C Q/U$ WHERE Y IS THE AIR POLLUTION CONCENTRATION, Q IS AREA SOURCE STRENGTH, U IS AVERAGE WIND SPEED, AND C IS A DIMENSIONLESS CONSTANT. THE AUTHOR CONSIDERS ITS APPLICATION TO THE PROBLEM OF CALCULATING THE TIME VARIATION OF THE CONCENTRATION OF AN INERT POLLUTANT SUCH AS CO. THE CONCLUSION IS THAT, IN ADDITION TO CORRELATING WELL WITH ANNUAL AND SEASONAL URBAN POLLUTION-AREA PATTERNS, AND WITH SHORTER TERM POLLUTION AVERAGES AND PATTERNS DOWN TO AN HOUR, THE EQUATION ALSO SUCCESSFULLY DESCRIBES THE DIURNAL VARIABILITY OF URBAN CO POLLUTION.

<CLASS> SIMULATION

<91>
<CONT> GIFFORD, P. A., JR.

<TITLE> PEAK TO MEAN CONCENTRATION RATIOS ACCORDING TO A 'TOP-HAT' FLUCTUATING PLUME MODEL

<ADDR> NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, AIR RESOURCES ATMOSPHERIC TURBULENCE AND DIFFUSION LAB.

<CITY> OAK RIDGE

<STATE> TN

<DOC> CONFERENCE ON AIR POLLUTION METEOROLOGY, APRIL 1971.; REPORT NO. ATDL-CONF-85; MONITORING AGENCY REPT. NO. NOAA-71071010, NOV 1970, 10 PP.

<ABST> CONCENTRATION FROM TALL-STACK BUOYANT PLUMES IS ORDINARILY CALCULATED USING A GAUSSIAN PLUME DISTRIBUTION THAT INCLUDES AN EFFECTIVE STACK HEIGHT. THE BUOYANT PLUME RISE IS, HOWEVER, CALCULATED ON A DIFFERENT MODEL, HAVING A UNIFORM DISTRIBUTION THROUGH THE PLUME. IN AN ATTEMPT TO OVERCOME THIS AMBIGUITY, A FLUCTUATING UNIFORM OR 'TOP-HAT' MODEL OF BUOYANT PLUMES IS INTRODUCED. MEAN AND PEAK-TO-MEAN CONCENTRATION FORMULAS ARE DERIVED AND COMPARED WITH DATA. OVER THE RANGE FROM ONE TO ABOUT 10 STACK HEIGHTS DOWNWIND, THE VARIATION OF THE PEAK-TO-MEAN RATIO PREDICTED BY THE MODEL IS IN GENERAL AGREEMENT WITH OBSERVED VALUES.

<CLASS> SIMULATION

<92>
<CONT> GIFFORD, P. A., JR.

<TITLE> THE SIMPLE ATDL URBAN AIR POLLUTION MODEL

<ACRO> ATDL MODEL

<ADDR> NATIONAL OCEANIC AND ATMOSPHERIC

<92>

14

ATMOSPHERIC TRANSPORT

<92> CONT.

ADMINISTRATION, ATMOSPHERIC POLLUTION
AND DIFFUSION LABORATORY

<CITY> OAK RIDGE

<STATE> TN

<ZIP> 37830

<FROM> 615-483-0611 EXT-34401; PLS 050-4001

<DOC> PROCEEDINGS 4TH MEETING OF THE EXPERT
PANEL ON AIR POLLUTION MODELING,
NATC-COCHS PIV NO. 30, CH. XVI, 1973

<SUB> URBAN AIR POLLUTION

<ABST> URBAN AIR POLLUTION CONCENTRATION AT
ANY POINT CAN BE INFLUENCED BY SOURCES
IN A WIND-PLANE-SHAPED URBINE SECTION
ONLY. THE AREA-SOURCE MODEL DESCRIBED
INVOLVES AN INTEGRATION IN THE URBINE
DIRECTION OF A CROSS-WIND INFINITE
LINE-SOURCE DIFFUSION FORMULA. AN
EQUATION IS GIVEN FOR CALCULATING
POLLUTANT CONCENTRATION AT GROUND LEVEL
AND USING THIS, PLUS THE POINT SOURCES
AND THE BACKGROUND CONTRIBUTION, THE
TOTAL AMBIENT AIR QUALITY CAN BE
DETERMINED. THE MODEL HAS BEEN
COMPARED WITH ANNUAL PARTICLE POLLUTION
MEAN VALUES, WITH SO₂ AND PARTICLE
POLLUTION PATTERNS, WITH THE VARYING
CO POLLUTION PATTERNS AND WITH
PHOTOCHEMICAL POLLUTION. (PFS)

<GEO> USA; AUSTRALIA; SOUTH AFRICA

<STATUS> IN USE

<MEDIA> TEXT

<CLAS> CONTINUOUS; DETERMINISTIC; ANALYTICAL;
PREDICTIVE

<METH> BY COMPARISON WITH DATA

<CON> FOR APPLICATIONS OF THE MODEL, SEE
ALSO: P. A. GIFFORD, MODELLING URBAN
AIR POLLUTION, ATMOSPHERIC ENVIRONMENT,
7, 124-136, 1973; P. A. GIFFORD,
APPLICATION OF A SIMPLE URBAN POLLUTION
MODEL, IN: PROCEEDINGS OF CONFERENCE
ON URBAN ENVIRONMENT AND SECOND
CONFERENCE OF BIOGEOLOGY, HELD IN
PHILADELPHIA, PA., OCTOBER 31-NOVEMBER
2, 1972; P. A. GIFFORD, FURTHER
COMPARISON OF URBAN AIR POLLUTION
MODELS, HELD IN ROSKID, DENMARK, JUNE
4-6, 1974.

<93>

<CONT> GILL, C. F.

<TITLE> A COMPUTER TECHNIQUE FOR CALCULATING
THE RADIOLOGICAL CONSEQUENCES OF
PRESSURIZED WATER REACTOR POWER PLANT
HYPOTHETICAL ACCIDENTS

<ACRO> DOSES

<ADDR> UNIVERSITY OF MISSOURI-ROLLA,
DEPARTMENT OF MECHANICAL ENGINEERING

<CITY> ROLLA

<STATE> MO

<DOC> PH.D. THESIS, ENGINEERING DEPARTMENT,
1975

<ABST> A CLOSED FORM ANALYTICAL METHOD OF

CALCULATING THE RADIOLOGICAL
CONSEQUENCES OF THE PRESSURIZED WATER
REACTOR (PWR) HYPOTHETICAL ACCIDENTS
WAS DEVELOPED. THIS METHODOLOGY WAS
USED TO DEVELOP A COMPUTER CODE, DOSES,
TO COMPUTE THE GUTTA-WHOLE BODY,
BETA-SKIN AND IODINE INHALATION THYROID
DOSES AT THE SITE BOUNDARY, AT THE LOW
POPULATION ZONE OUTER BOUNDARY AND FOR
CONTROL ROOM OCCUPANCY FOR THE TEN PWR
HYPOTHETICAL ACCIDENTS. THE COMPUTER
CODE DOSES, WAS DEVELOPED TO OPERATE IN
THE CONVERSATIONAL REMOTE TERMINAL MODE
AND TO PROVIDE A MECHANISM FOR
PRODUCING REQUIRED INFORMATION FOR
CHAPTER 15 OF PWR NUCLEAR POWER PLANT
SAFETY ANALYSIS REPORTS. THE
IDENTIFICATION OF CAUSES AND ACCIDENT
DESCRIPTIONS, FISSION PRODUCT RELEASE
AND DOSE ANALYSIS ASSUMPTIONS, DOSE
CALCULATION MODELS, INPUT PARAMETERS
TO THE COMPUTER CODE DOSES, AND THE
DOSE RESULTS AND CONCLUSIONS ARE
PRESENTED FOR EACH OF THE TEN
HYPOTHETICAL PWR ACCIDENTS FOR A
TYPICAL PWR NUCLEAR POWER PLANT. THE
SEVERITY RANK AND THE CONSERVATION
RATIOS OF EACH ACCIDENT WERE
CALCULATED. THE LOSS OF COOLANT
ACCIDENT WAS FOUND TO BE THE MOST
SEVERE. ALL DOSES CALCULATED FOR THE
PLANT CONSIDERED FELL WELL WITHIN THE
LIMITS OF 10CPT00 AND GENERAL DESIGN
CRITERION 19 OF APPENDIX TO 10CPT00.

<CLAS> PREDICTIVE

<CON> SPECIFIC ACCIDENTS ARE ANALYZED. DOSES
IS NOT DESCRIBED AS TO THE COMPUTER
PROVIDED OF INPUT LANGUAGE. PARTIAL
DOCUMENTATION IS PRESENTED.

<94>

<CONT> GOGOLAK, C. F.

<TITLE> MODEL FOR RADIATION EXPOSURE FROM A
BOILING WATER REACTOR PLANT

<ACRO> GAMMA

<ADDR> ENVIRONMENTAL MEASUREMENTS LABORATORY,
U.S. DEPARTMENT OF ENERGY, 376 HUDSON
ST.

<CITY> NEW YORK

<STATE> NY

<ZIP> 10014

<PHONE> 212-620-3635

<SOURCE> CLEARINGHOUSE FOR FEDERAL SCIENTIFIC
AND TECHNICAL INFORMATION, NATIONAL
BUREAU OF STANDARDS, U.S. DEPT OF
COMMERCE, SPRINGFIELD, VIRGINIA 22151

<DOC> HASL-277, 25 PP.; HASL-294, 13 PP.;
CONF-741010, PP. 207-214

<SUB> EVALUATES MOBILE GAS PLUME EXPOSURE FROM
BOILING WATER POWER REACTORS

<ABST> FIELD MEASUREMENTS OF EXPOSURE RATES
FOR MOBILE GASES WERE COMPARED WITH
MODEL PREDICTIONS TO DETERMINE THE
SENSITIVITY TO APPROXIMATIONS FOR
BUILD-UP OF GAMMA RADIATION, PLUME RISE
AND CLOUD SIZE. THE MODEL USED WAS
BASED ON HAY AND STUART (1970), I.E., A
CROSSWIND AVERAGED GAUSSIAN PLUME. THE
VERTICAL DISPERSION COEFFICIENT IS THAT
GIVEN BY DARTON AND GARNHARTSFELDER.

ATMOSPHERIC TRANSPORT

<90> CONT.

HOLLAND'S FORMULA WITH ROSES' CORRECTION FOR STACK EXHAUST IS USED TO CALCULATE SLUPE PISE. GROWTH AND DECAY OF DANGEROUS RADIONUCLIDES IS CONSIDERED. DEPOSITION AND INHALATION ARE NOT TAKEN INTO ACCOUNT. FOR THE BUILDUP FACTOR, CAPO'S FORMULA IS USED FOR GAMMA ENERGIES GREATER THAN 0.5 MEV, AND BERGER'S FORMULA IS USED FOR GAMMA ENERGIES LESS THAN 0.5 MEV. PRECIPITATE RATE IS AVERAGED OVER 4 ATMOSPHERIC STABILITY CLASSES, 16 WIND DIRECTIONS AND 6 WIND SPEED RANGES WEIGHTED BY THEIR FREQUENCY OF OCCURRENCE. GAMMA RAY MEASUREMENTS WERE MADE FOR TWO MONTHS NEAR A BOILING WATER REACTOR WITH IONIZATION CHAMBERS AND THERMOLUMINESCENT DOSIMETERS. MEASURED AND CALCULATED EXPOSURE RATES DIFFER WITHIN A FACTOR OF 2. THE MODEL PREDICTIONS WERE COMPARED WITH THOSE OBTAINED WITH READ, THE GAMMA-RAISED MODEL AND CALCULATIONS MADE AS PART OF THE SAFETY ANALYSIS FOR THE PLANT. THE LINEAR BUILDUP FACTOR APPROXIMATION IS A SENSITIVE FUNCTION OF METEOROLOGY AND GAMMA RAY ENERGY. CALCULATIONS OF DOSE RATES FOR THE DIFFERENT MODELS DIFFERED BY MORE THAN 100% AT LARGE DISTANCES FROM THE STACK UNDER UNSTABLE CONDITIONS. MODELS TREATING OFF-SECTOR EXPOSURES SEPARATELY MATCH THE DATA MORE ACCURATELY THAN THOSE THAT DO NOT.

<COUNTRY> NEW JERSEY; CONNECTICUT

<TIME> 1971-1974

<STATUS> IN USE

<ACCESS> LIMITED

<MEDIA> PUNCH CARDS; TEXT; MAGNETIC TAPE

<SIZE> APPROXIMATELY 600 CARDS

<COMP> CDC

<COPYING> CDC 6600 WITH JOE R CODE AND ONE - TRACK TAPE DRIVE

<LANG> FORTRAN EXTENDED

<OS/AS> BCE

<ALGO> NUMERICAL INTEGRATION

<CLASS> DETERMINISTIC

<APPL> CALCULATION OF EXTERNAL GAMMA-RAY EXPOSURE AND PRIMARY FLUX FROM BUR PLUMES

<USERS> DEPARTMENT OF ENERGY, ENVIRONMENTAL MEASUREMENTS LABORATORY

<SND> JERSEY CENTRAL POWER AND LIGHT; NORTHEAST UTILITIES

<VERIF> CALCULATIONS WERE VERIFIED BY COMPARISON WITH MEASUREMENTS MADE WITH HIGH PRESSURE IONIZATION CHAMBERS

<UPDATED> 780626

<95>
<COPY> GOTAAS, Y.

<TITLE> A MODEL OF DIFFUSION IN A VALLEY FROM A CONTINUOUS POINT SOURCE

<ABST> GIVEN AN ARBITRARY STATIONARY

CONCENTRATION DISTRIBUTION $F(X, Y, Z)$ FROM A CONTINUOUS POINT SOURCE IN FREE SPACE, A GENERAL FORMULA IS DERIVED FOR THE CONCENTRATION AFTER FULL OR PARTIAL REFLECTION FROM THE SIDES OF A STRAIGHT CHANNEL USING A SERIES OF IMAGE SOURCES. SPECIFYING $F(X, Y, Z)$ AS A GAUSSIAN CONCENTRATION DISTRIBUTION THE MODEL IS USED TO OBTAIN NUMERICAL ESTIMATES FOR DIFFUSION IN VALLEY FLOW FROM A CONTINUOUS POINT SOURCE.

<LANG> ENGLISH

<CLASS> SIMULATION

<96>
<COPY> HALLITSKY, J.

<TITLE> TRANSVERSE JET PLUMES

<ADDR> NEW YORK UNIVERSITY, GEOPHYSICAL SCIENCES LABORATORY

<CITY> NEW YORK

<STATE> NY

<DOC> CMO--3697-5, 1970

<ABST> THIS REPORT IS THE FIFTH AND FINAL PROGRESS REPORT OF A 4 YEAR 6 MONTH RESEARCH PROJECT ON THE CHARACTERISTICS OF CHIMNEY SMOKE PLUMES IN A NATURAL ATMOSPHERIC BIRD, AT SHORT DISTANCES FROM THE STACK. THE DISPERSION MODEL AND THE ACCOMPANYING DATA ARE BELIEVED TO BE A VALID AND UNIQUE CONTRIBUTION TO OUR KNOWLEDGE IN THIS AREA. IT IS RECOMMENDED THAT COMPLETION OF THE ANALYTICAL PHASE OF THE STUDY BE FAVORABLY CONSIDERED.

<CLASS> SIMULATION

<97>
<COPY> HALLIDY, L. A.; ANDERSON, J. E.

<TITLE> MODEL FOR THE DISPERSAL OF SULFUR DIOXIDE OVER AN URBAN AREA

<ADDR> BRYN MAWR COLLEGE

<CITY> BRYN MAWR

<STATE> PA

<ZIP> 19010

<DOC> ENVIRONMENTAL LETTERS, 6(1), 55-75, 1974

<ABST> PRESENTATION OF A MODEL FOR THE GENERATION OF SULFUR DIOXIDE BY STATIONARY AND MOVING URBAN SOURCES, ITS DISPERSAL INTO THE ATMOSPHERE, ITS OXIDATION TO SULFATES INCLUDING SULFURIC ACID AND THE PRECIPITATION OF SULFATE PARTICLES AND ACID RAIN. THE MODEL IS DRIVEN BY PARAMETERS DESCRIBING THE SIZE AND METEOROLOGY OF THE URBAN AREA IN BROAD, MACROSCOPIC STROKES, BUT REFLECTS AS WELL CURRENTLY ACCEPTED PHYSICAL-CHEMICAL MECHANISMS FOR THE OXIDATION OF SULFUR DIOXIDE TO SULFATES AND THE PRECIPITATION OF SULFATE PARTICLES AND SULFURIC ACID. THIS MODEL MAY BE USEFUL FOR EXAMINING THE TRENDS IN SULFUR DIOXIDE AND SULFATE CONCENTRATIONS AS FUNCTIONS OF LOCAL WEATHER CONDITIONS; IN PARTICULAR, IT MAY FIND APPLICATION AS

<97>

ATMOSPHERIC TRANSPORT

<97> CONT.

A PROTOTYPE MODEL FOR ADJUSTING
EMISSION STANDARDS TO LOCAL
ENVIRONMENTS.

<CLAS> SIMULATION

<CON> 30 REFERENCES

<98>

<CON> BANAWI, J. V.; LAZDOW, J.

<TITLE> AECOLUS: ATMOSPHERIC DISPERSION AND
TRACE-CLD DENSE DURING NORMAL,
SEA-BREEZE, AND ACCIDENT CONDITIONS

<ACRO> AECOLUS

<ADDR> TANNER ATOMIC ELECTRIC COMPANY

<CITY> WESTBORO

<STATE> MA

<DOC> TRANSACTIONS OF THE AMERICAN NUCLEAR
SOCIETY, 26, 33, 1977

<ABST> NONE

<CLAS> SIMULATION

<99>

<CON> HANZED, S.

<TITLE> A RECEIVED MULTI CELL METHOD FOR
SIMULATION OF ATMOSPHERIC TRANSPORT

<ADDR> NATIONAL AERONAUTICAL SPACE
ADMINISTRATION, INSTITUTE SPACE
STUDIES, GODDARD SPACE FLIGHT CENTER

<CITY> NEW YORK

<STATE> NY

<ZIP> 10025

<DOC> ATMOSPHERE ENVIRONMENT, 8(10)
1003-1008, 1974

<ABST> A MULTI CELL METHOD IN WHICH THE CELLS
ARE ASSUMED TO BE OPEN AT THE TOP (THUS
REMOVING THE NEED FOR THE PRESCRIPTION
OF CELL HEIGHTS) IS PRESENTED. THE
METHOD IS APPLIED TO THE CALCULATION OF
DISPERSION OF SO₂ FOR A 2 HR PERIOD IN
NASHVILLE, TENNESSEE.

<SEC> TENNESSEE, NASHVILLE

<100>

<CON> HANLID, D. A.; SMITH, C. A.; SCHOENOVER,
H. R.; WARD, J. V.

<TITLE> THE ROSCOE MANUAL, HIGH-ALTITUDE
NEUTRAL-PARTICLE MOTION

<ACRO> SAINTD; WRLNTH; ROSCOE

<ADDR> GENERAL RESEARCH CORPORATION

<CITY> SANTA BARBARA

<STATE> CA

<SOURCE> WTIS

<DOC> AB-A043 546/151, 1975

<ABST>

TWO PRELIMINARY, ALTERNATIVE MODELS OF
THE HIGH-ALTITUDE ($H > 90$ KM)
NEUTRAL-PARTICLE MOTION HAVE BEEN
ADOPTED FOR USE IN ROSCOE. BOTH MODELS
ARE ONE-DIMENSIONAL SPHERICAL
LAGRANGIAN MODELS AND DESCRIBE THE
VERTICAL HYDRODYNAMIC MOTION IN EACH
GEOCENTRIC COLUMN AS AN ARRAY OF
PERHAPS 100 SUCH CONTINUOUS BUT
INDEPENDENT COLUMNS COVERING THE
DISTURBED REGION OF INTEREST. THE
MODELS (SAINTD, WRLNTH) DESCRIBE THE
MOTION OF A SET OF EITHER LAGRANGIAN
CELLS OR POINTS BY USING THE METHOD OF
FITTED DIFFERENCE EQUATIONS OR
DIFFERENTIAL QUADRATURE, RESPECTIVELY.
BOTH MODELS HAVE AUTOMATIC REZONE
CAPABILITY. THE GEOCENTRIC COLUMNS
DEFINING THE GEOMETRY FOR THE
CALCULATIONS ARE DESCRIBED IN TERMS OF
AN ARBITRARILY POSITIONED AND ORIENTED
QUADRUPOLE COORDINATE SYSTEM. EACH
LAGRANGIAN CELL OR POINT IS
CHARACTERIZED BY NOT ONLY THE
HYDRODYNAMIC PROPERTIES BUT ALSO A SET
OF CHEMISTRY QUANTITIES. THE CHEMISTRY
IS LOOSELY COUPLED TO THE
HYDRODYNAMICS. HEREIN ARE PRESENTED
DETAILS OF THE QUADRUPOLE COORDINATE
SYSTEM, THE WORKING FORM OF THE
HYDRODYNAMIC EQUATIONS AND THEIR
INITIALIZATION AND METHODS FOR
SOLUTION. THE RESULTS OF A TEST PROBLEM
FOR A LARGE-YIELD EVENT AT 200-KM
ALTITUDE PRODUCING MOTION IN A LINEAR
ARRAY OF SIX COLUMNS.

<CLAS> SIMULATION

<101>

<CON> HANBROW, D. C., JR.; HELLOR, A. H.

<TITLE> INVESTIGATION OF GAS TURBINE COMBUSTORS
WITH HIGH INLET AIR TEMPERATURES,
COMBUSTOR MODELLING

<ADDR> PURDUE UNIVERSITY, JET PROPULSION CENTER

<CITY> LAFAYETTE

<STATE> IN

<DOC> AD-800446, 1971

<ABST>

AN ANALYTICAL MODEL HAS BEEN DEVELOPED
WHICH WILL PREDICT THE PERFORMANCE AND
POLLUTANT EMISSIONS OF GAS TURBINE
COMBUSTORS. THE ENTIRE GAS TURBINE
COMBUSTOR IS APPROXIMATED AS A
COLLECTION OF PERFECTLY STIRRED ZONES.
WITHIN EACH ZONE A GENERAL HYDROCARBON
COMBUSTION MECHANISM IS USED TO PREDICT
THE GAS COMPOSITION AND TEMPERATURE.
THE ZONE VOLUMES AND SIZES ARE ASSIGNED
FROM CONSIDERATION OF THE THEORETICALLY
PREDICTED GAS FLOWS THEREBY
APPROXIMATING THE MIXING BEHAVIOR OF
THE SYSTEM. SELECTED PREDICTIONS OF THE
OVERALL MODEL FOR A 'TYPICAL' AIRCRAFT
COMBUSTOR ARE PRESENTED. THESE RESULTS
ARE SEEN TO BE QUALITATIVELY ACCURATE
AND FALL IN THE RANGE OF VALUES
TYPICALLY OBSERVED IN PRACTICAL SYSTEMS.

<CLAS> SIMULATION

<102>

<CON> HANNA, S. R.

<TITLE> PREDICTED AND OBSERVED COOLING TOWER
PLUME RISE AND VISIBLE PLUME LENGTH AT

ATMOSPHERIC TRANSPORT

<102> CONT.

THE JOHN E. ARON POWER PLANT

<ADDR> NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, ATMOSPHERIC TURBULENCE AND DIFFUSION LABORATORY, P.O. BOX 2

<CITY> OAK RIDGE

<STATE> TN

<ZIP> 37830

<PHONE> 615-483-8611 EXT-34081; FTS 850-4081

<DOC> ATMOSPHERIC ENVIRONMENT, 10(12), 1983-1982

<SUB> COOLING TOWER PLUME DISPERSION

<ABST> A ONE-DIMENSIONAL NUMERICAL CLOUD GROWTH MODEL AND SEVERAL EMPIRICAL MODELS FOR PLUME RISE AND CLOUD GROWTH ARE COMPARED WITH TWENTY-SEVEN SETS OF OBSERVATIONS OF COOLING TOWER PLUMES FROM THE 2900 MW JOHN E. ARON POWER PLANT IN WEST VIRGINIA. THE THREE NATURAL DRAFT COOLING TOWERS ARE 200 M APART. IN A CROSS WIND, THE PLUMES BEGIN TO MERGE AT A DISTANCE OF ABOUT 400 M DOWNWIND. IN CALM CONDITIONS, WITH FREQUENT STAGNATION, THE PLUMES OFTEN DO NOT MERGE UNTIL HEIGHTS OF 1000 M. THE AVERAGE PLUME RISE, 750 M, IS PREDICTED WELL BY THE MODELS, BUT DAY-TO-DAY VARIATIONS ARE SIMULATED WITH A CORRELATION COEFFICIENT OF ABOUT 0.5. MODEL PREDICTIONS OF VISIBLE PLUME LENGTH AGREE, ON THE AVERAGE, WITH OBSERVATIONS FOR VISIBLE PLUMES OF SHORT TO MODERATE LENGTH (LESS THAN ABOUT 1 KM). THE PREDICTION OF LONGER PLUMES IS HAMPED BY OUR LACK OF KNOWLEDGE OF PLUME SPREADING AFTER THE PLUMES LEVEL OFF. CLOUD WATER CONCENTRATIONS PREDICTED BY THE NUMERICAL MODEL AGREE WITH THOSE MEASURED IN NATURAL CUMULUS CLOUDS (ABOUT 0.1 TO 1 G/KG).

<GEO> WEST VIRGINIA

<TIME> 1975-1978

<CLASS> PREDICTIVE; SIMULATION

<UPDATE> 780820

<103>

<COMP> HANNA, S. P.

<TITLE> A SIMPLE METHOD OF CALCULATING DISPERSION FROM URBAN AREA SOURCES

<ADDR> NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, AIR RESOURCES ATMOSPHERIC TURBULENCE AND DIFFUSION LABORATORY, P.O. BOX 2

<CITY> OAK RIDGE

<STATE> TN

<ZIP> 37830

<PHONE> 615-483-8611 EXT-34081; FTS 850-4081

<DOC> JOURNAL AIR POLLUTION CONTROL ASSOCIATION, 21, 12, 1971

<SUB> URBAN AIR POLLUTION DISPERSION

<ABST> A SIMPLE BUT PHYSICALLY REALISTIC MODEL

IS SHOWN TO BE ADEQUATE FOR ESTIMATING POLLUTANT CONCENTRATIONS DUE TO AREA SOURCES IN CITIES. IN THIS MODEL, THE SURFACE CONCENTRATION IS DIRECTLY PROPORTIONAL TO THE LOCAL AREA SOURCE STRENGTH AND INVERSELY PROPORTIONAL TO THE WIND SPEED. THE MODEL PERFORMS NEARLY AS WELL AS MUCH MORE COMPLEX MODELS THAT REQUIRE THE USE OF DIGITAL COMPUTERS.

<GEO> CITIES: UNITED STATES; WEST GERMANY

<TIME> 1950-1970

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> TEXT

<CLASS> PREDICTIVE

<UPDATE> 780804

<104>

<COMP> HANNA, S. P.

<TITLE> A SIMPLE DRIFT DEPOSITION MODEL APPLIED TO THE CHALK POINT DYE TRACER EXPERIMENT

<ADDR> NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, ATMOSPHERIC TURBULENCE AND DIFFUSION LABORATORY, P.O. BOX 2

<CITY> OAK RIDGE

<STATE> TN

<ZIP> 37830

<PHONE> 615-483-8611 EXT-34081; FTS 850-4081

<DOC> COOLING TOWER ENVIRONMENT-1978, UNIVERSITY OF MARYLAND WATER RESOURCES CENTER, COLLEGE PARK, MD

<SUB> COOLING TOWER DRIFT DEPOSITION

<ABST> THE CHALK POINT DYE TRACER EXPERIMENT WHICH PROVIDED ACCURATE MEASUREMENTS OF SODIUM DRIFT DEPOSITION AT THE GROUND DUE TO EMISSIONS FROM THE COOLING TOWER WAS USED TO EVALUATE A NEW MODEL. DRIFT DROP EVAPORATION WAS NEGLECTED IN THE MODEL APPLIED TO THIS EXPERIMENT, BECAUSE THE AMBIENT RELATIVE HUMIDITY WAS 93% OR GREATER FROM THE SURFACE UP THROUGH PLUME HEIGHT. THE PLUME TRAJECTORY WAS CALCULATED BY THE USUAL 2/3 LAW. THE FRACTION OF DRIFT IN EACH DROP SIZE CLASS WHICH BROKE AWAY FROM THE PLUME IN EACH DOWNWIND DISTANCE INCREMENT ΔX IS ASSUMED TO EQUAL $VD (\Delta X/U)/2R$, WHERE VD IS THE FALL VELOCITY OF THE DROPS, R IS PLUME RADIUS, AND U IS WIND SPEED. A STRAIGHT BALLISTIC TRAJECTORY WAS THEN USED TO CALCULATE THE POINT AT WHICH THE DROPS IN A GIVEN CLASS, RELEASED FROM A GIVEN ΔX INTERVAL, STRUCK THE GROUND. BASED ON THE OBSERVED WIND MEASUREMENT, AN ARC WIDTH OF 30 DEGREES IS CHOSEN FOR THE PIE-SHAPED DEPOSITION PATTERN. THE CALCULATED SODIUM DEPOSITION RATE IS 3600 RG/MO KM² AT $X = .5$ KM, AND 800 RG/MO KM² AT $X = 1$ KM, OR ABOUT A FACTOR OF THREE GREATER THAN THE OBSERVED SODIUM DEPOSITION RATE. PREDICTED MASS MEDIAN DROP DIAMETERS ON THE TWO ARCS ARE 470 UM AND 290 UM, RESPECTIVELY, WHICH ARE WITHIN 5% OF THE OBSERVED VALUES.

<100>

ATMOSPHERIC TRANSPORT

<100> CONT.

<SEO> HASTLAND

<TIME> 1977

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> TEXT

<CLASS> PREDICTIVE; SIMULATION

<UPDATE> 780820

<105>

<CONT> HANNA, S. P.

<TITLE> A SIMPLE DISPERSION MODEL FOR THE ANALYSIS OF CHEMICALLY REACTIVE POLLUTANTS

<ADDR> NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, ATMOSPHERIC TURBULENCE AND DIFFUSION LABORATORY, P.O. BOX 2

<CITY> OAK RIDGE

<STATE> TN

<ZIP> 37830

<PHONE> 615-483-8611 EXT-34081; PTS 850-4081

<DOC> ATMOSPHERIC ENVIRONMENT, 7, 403-417, 1973

<SUB> AIR POLLUTION DISPERSION

<ABST> THE SIMPLE ATDL DISPERSION MODEL, IN WHICH THE SURFACE CONCENTRATION IS PROPORTIONAL TO AREA SOURCE STRENGTH DIVIDED BY WIND SPEED, HAS BEEN USED SUCCESSFULLY IN THE PAST TO ESTIMATE CONCENTRATIONS OF CHEMICALLY INERT POLLUTANTS. IN THE ANALYSIS OF CHEMICALLY REACTIVE POLLUTANTS, THE CONCENTRATION PREDICTED BY THE SIMPLE ATDL MODEL CAN BE USED AS A SCALING PARAMETER TO PUT THE GOVERNING EQUATIONS INTO THE DIMENSIONLESS FORM. THE RESULTING SET OF DIFFERENTIAL EQUATIONS FOR THE TIME RATE OF CHANGE OF CONCENTRATION IN A REGION CONTAINS A FEW DIMENSIONLESS GOVERNING PARAMETERS PER EQUATION. BY ANALYZING THE GOVERNING PARAMETERS, THE RELATIVE IMPORTANCE OF CHEMICAL AND METEOROLOGICAL VARIABLES AND SOURCE STRENGTHS CAN BE ASSESSED. AS EXPECTED, THE WIND SPEED AND SOURCE STRENGTH ARE SEEN TO BE THE MAJOR FACTORS DETERMINING THE SERIOUSNESS OF THE POLLUTION PROBLEM IN ANY REGION. USING A SIMPLE KINETIC MECHANISM FOR PHOTOCHEMICAL SMOG AS AN EXAMPLE OF THE APPLICATION OF THE MODEL, IT IS SHOWN THAT THE MODEL IS CAPABLE OF SIMULATING OBSERVED HOUR-TIME CONCENTRATIONS OF NO, NO₂, AND HYDROCARBONS OF RELATIVELY HIGH REACTIVITY (RH) AVERAGED OVER THE LOS ANGELES BASIN ON 29 SEPTEMBER 1969. IT IS ALSO SHOWN THAT THE PREDICTED HOURLY CONCENTRATIONS OF NO, NO₂, AND RH AVERAGED OVER THE LOS ANGELES BASIN ON 30 SEPTEMBER 1969 ARE AS WELL CORRELATED WITH OBSERVED CONCENTRATIONS AS THE PREDICTIONS OF THE MORE COMPLEX PICK MODEL, DEVELOPED BY SHILASH ET AL. (1972).

<GEO> LOS ANGELES, CA

<TIME> 1969

<MEDIA> TEXT

<CLASS> PREDICTIVE

<UPDATE> 780820

<106>

<CONT> HANNA, S. P.

<TITLE> DESCRIPTION OF ATDL COMPUTER MODEL FOR DISPERSION FROM MULTIPLE SOURCES

<ACRO> ATDL MODEL

<ADDR> NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, AIR RESOURCES ATMOSPHERIC TURBULENCE AND DIFFUSION LABORATORY, P.O. BOX 2

<CITY> OAK RIDGE

<STATE> TN

<ZIP> 37830

<PHONE> 615-483-8611 EXT-34081; PTS 850-4081

<DOC> ROLL, R. AND J. DUNCAN, INDUSTRIAL AIR POLLUTION CONTROL, AND AMOR SCIENCE PUBLISHERS INC., (P. 23-32), 1973.

<SUB> AIR POLLUTION

<ABST> THE SIMPLE ATDL MODEL FOR AREA SOURCE AND MULTIPLE POINT SOURCE DIFFUSION IS PROGRAMMED IN FORTRAN IV; EXAMPLES OF ITS APPLICATION TO SPECIFIC PROBLEMS ARE GIVEN. A PROGRAM LISTING IS PROVIDED.

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> PUNCHED CARDS

<SIZE> 200 CARDS

<COMP> IBM

<CONFIG> IBM 360/45 COMPUTER

<LANG> FORTRAN IV

<CLASS> PREDICTIVE; SIMULATION

<UPDATE> 780820

<107>

<CONT> HANNA, S. P.; SWISHER, S. D.

<TITLE> DISCUSSION OF A METHOD FOR CALCULATING THE SIZE OF COOLING TOWER PLUMES

<ADDR> NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, ATMOSPHERIC TURBULENCE AND DIFFUSION LABORATORY

<CITY> OAK RIDGE

<STATE> TN

<ZIP> 37830

<DOC> REPORT NO. ARAATDL-CONTRIB-59; MONITORING AGENCY REPT NO. NOAA-72100628 1972, 3PP; AVAIL, DTIS

ATMOSPHERIC TRANSPORT

<107> CONT.

<ABST> THERE IS PRESENTLY A NEED FOR TECHNIQUES FOR ESTIMATING THE SIZE OF COOLING TOWER VAPOR PLUMES AND THE PROBABILITY OF GROUND FOGGING. VESSELS ARE BY<<107> PROVIDED SEVERAL USEFUL MONOGRAPHS FOR MAKING THESE CALCULATIONS. THE AUTHORS BELIEVE THAT THEIR TECHNIQUE IS RESTRICTED TO PLUMES THAT RISE NO MORE THAN 100 M VERTICALLY, ALTHOUGH THEY IMPLY THAT THEIR TECHNIQUE CAN BE APPLIED TO THE PLUMES FROM LARGE COOLING TOWERS THAT DISCHARGE HUNDREDS OF MEGAWATTS OF HEAT. THE AUTHORS SHOW THAT THE EFFECTIVE SOURCE HEIGHT (TOWER HEIGHT PLUS PLUME RISE) IS LIKELY TO BE SEVERAL HUNDRED METERS.

<CLASS> PREDICTIVE

<109>

<CONT> HAFNER, A. D.

<TITLE> FORMATION OF SULFATE IN THE STRATOSPHERE THROUGH THE GAS PHASE OXIDATION OF SULFUR DIOXIDE

<DOC> JOURNAL OF GEOPHYSICAL RESEARCH, 92(20), 1399-1401, 1975

<ABST> A ONE DIMENSIONAL DIFFUSION MODEL WAS COMBINED WITH LITERATURE VALUES FOR THE RATES OF GAS PHASE SULFUR DIOXIDE OXIDATION REACTIONS TO CALCULATE THE STRATOSPHERIC SULFATE PROFILE. THE REACTIONS OF TRACE SPECIES SUCH AS HYDROPEROXY AND H₂O₂ WITH SO₂ ARE SUFFICIENTLY FAST TO PRODUCE A SULFATE LAYER ABOVE THE TROPOPAUSE SIMILAR TO THE OBSERVED JUDGE LAYER. THE SENSITIVITY OF THE MODEL TO THE SELECTION OF BOUNDARY CONDITIONS AND EDDY DIFFUSION PROFILES WAS INVESTIGATED.

<CLASS> PREDICTIVE

<109>

<CONT> HAFNER, R. J., JR.; LOWENGAU, J. A.; ROSEN, L., JR.

<TITLE> MODELS OF RADIATION TRANSPORT IN AIR - THE ATR CODE

<ACRON> ATR

<ADDR> SCIENCE APPLICATIONS INC.

<CITY> LA JOLLA

<STATE> CA

<SOURCE> DTIC

<DOC> AD-7703 180, 1971

<ABST> THE REPORT DESCRIBES THE WORK TO DATE ON DEVELOPMENT OF THE ATR COMPUTER CODE - A USER-ORIENTED CODE FOR CALCULATING QUICKLY AND SIMPLY RADIATION ENVIRONMENT PROBLEMS AT ALL ALTITUDES IN THE ATMOSPHERE. THE ATR CODE IS BASED ON PARAMETRIC MODELS OF A COMPREHENSIVE DATA BASE OF AIR BASE TRANSPORT RESULTS WHICH WAS GENERATED USING RIGOROUS TRANSPORT TECHNIQUES FOR INFINITE HOMOGENEOUS AIR. THE EFFECTS OF AN AIR-GROUND OF AN AIR-GROUND INTERFACE AND NON-UNIFORM AIR DENSITY ARE TREATED AS PERTURBATION CORRECTIONS

ON HOMOGENEOUS-AIR RESULTS. THE DATA BASE HAS BEEN GENERATED FOR NEUTRONS, SECONDARY GAMMA-RAYS, HIGH-ENERGY PROTONS AND LOW ENERGY PROTONS AS A FUNCTION OF SPACE, ENERGY AND ANGLE OUT TO RANGE OF 550 GM/CM SQUARED OF AIR. PARAMETRIC MODELS HAVE BEEN DEVELOPED FOR ALL OF THIS DATA BASE EXCEPT PROTON ANGULAR DISTRIBUTION AND A VERSION OF ATR HAS BEEN COMPLETED FOR NEUTRON AND SECONDARY GAMMA-RAY TRANSPORT.

<CLASS> SIMULATION

<110>

<CONT> HANSHVADHAN; CESS, R. D.

<TITLE> STRATOSPHERIC AEROSOLS: EFFECT UPON ATMOSPHERIC TEMPERATURE AND GLOBAL CLIMATE

<ADDR> STATE UNIVERSITY OF NEW YORK

<CITY> STONY BROOK

<STATE> NY

<DOC> TELLUS, 28(1), 1-10, 1976

<ABST> A SIGNIFICANT FRACTION OF THE AEROSOL POPULATION OF THE STRATOSPHERE IS BELIEVED TO CONSIST OF SULFATE, PRESUMABLY IN THE FORM OF SULFURIC ACID. AN INCREASE IN STRATOSPHERIC AEROSOLS COULD MODIFY GLOBAL CLIMATE BY AUGMENTING REFLECTION OF SUNLIGHT AS WELL AS ENHANCING THE ATMOSPHERIC GREENHOUSE. TWO COMPETING MECHANISMS WITH REGARD TO CHANGING THE GLOBAL SURFACE TEMPERATURE. ASSUMING THAT THE AEROSOLS CONSIST OF SUPERCOOLED 75 PERCENT AQUEOUS SULFURIC ACID, WE PRESENT A FIRST-ORDER ESTIMATE AS TO THE EFFECT OF AEROSOL CONCENTRATION UPON GLOBAL SURFACE TEMPERATURE. THE MODEL CALCULATIONS ILLUSTRATE THAT THE INCREASE IN REFLECTED SUNLIGHT CONSTITUTES THE DOMINANT CONTRIBUTION BY AEROSOLS; THE NORMAL AEROSOL CONCENTRATION REDUCES THE GLOBAL SURFACE TEMPERATURE BY ROUGHLY 0.7 DEGREES C, AND A DOUBLING OF CONCENTRATION WOULD PROVIDE A FURTHER DECREASE BY THE SAME AMOUNT. INCREASED AEROSOL CONCENTRATION FURTHER RESULTS IN HEATING OF THE STRATOSPHERE THROUGH ABSORPTION OF INFRARED RADIATION EMITTED BY THE EARTH-ATMOSPHERE SYSTEM. THE MODEL INDICATES THAT STRATOSPHERIC TEMPERATURE AT 20 KM COULD BE RAISED BY AS MUCH AS 9 DEGREES K CONSISTENT WITH SOUTHERN HEMISPHERE OBSERVATIONS FOLLOWING THE ERUPTION OF MT. AGUNG.

<CLASS> PREDICTIVE

<111>

<CONT> HEFFTER, J. L.; TAYLOR, A. D.; FENDER, G. J.

<TITLE> A REGIONAL-CONTINENTAL SCALE TRANSPORT, DIFFUSION, AND DEPOSITION MODEL

<ADDR> AIR RESOURCES LABORATORIES, 8060 13TH ST.

<CITY> SILVER SPRING

<STATE> MD

<111>

ATMOSPHERIC TRANSPORT

<111> CONT.

<ZTP> 20C34

<FROM> 741-029-7492

<DOC> ERI ABL-50, 20 PP.; PREPRINT: JOINT CONFERENCE ON APPLICATIONS OF AIR POLLUTION METEOROLOGY, HELD IN SALT LAKE CITY, UT, 1977(, P. 000-007.)

<ABST> THE AIR RESOURCES LABORATORIES HAS DEVELOPED A COMPUTERIZED POST-FACTO TRAJECTORY MODEL INTENDED PRIMARILY FOR CALCULATING THE TRANSPORT, DIFFUSION, AND DEPOSITION OF EFFLUENTS ON REGIONAL AND CONTINENTAL SCALES. A MONTH, SEASON, OR YEAR OF TRAJECTORIES AT 6-HOURLY TIME INTERVALS MAY BE CALCULATED FORWARD OR BACKWARD IN TIME FROM ANY ORIGIN IN THE WORLD FOR DURATIONS UP TO 60 DAYS. TRAJECTORY COMPUTATIONS USE WINDS AT ANY ALTITUDE ABOVE SEA LEVEL OR WINDS AVERAGED THROUGH ANY DESIRED LAYER ABOVE AVERAGE TERRAIN. COMPUTER OUTPUT INCLUDES A LISTING OF INDIVIDUAL TRAJECTORY AND POINTS AFTER SELECTED DURATIONS AND PLOTTED TRAJECTORIES FOR ANY DESIRED MAP SCALE ON EITHER MERCATOR OR POLAR STEREOGRAPHIC PROJECTIONS. A GAUSSIAN PLUME MODEL IS COMBINED WITH THE TRAJECTORY MODEL TO CALCULATE LONG-TERM (MONTHLY, SEASONAL, ANNUAL) MEAN GROUND-LEVEL AIR CONCENTRATIONS AND DEPOSITION AMOUNTS. BOTH WET AND DRY DEPOSITION ARE INCORPORATED IN THE MODEL. ANOTHER MODEL CALCULATES SHORT-TERM (ONCE OR TWICE A DAY) MEAN GROUND-LEVEL AIR CONCENTRATIONS FOR SELECTED SAMPLING STATIONS. COMPUTER OUTPUT INCLUDES PLOTTED MAPS SHOWING LONG-TERM CONCENTRATIONS AND DEPOSITION AMOUNTS, AND TABLES OF SHORT-TERM CONCENTRATIONS WHERE THE CONTRIBUTIONS FROM INDIVIDUAL PLUMES ARE IDENTIFIED.

<GEO> GLOBAL

<YRD> 1970-1970

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE; PUNCHED CARDS

<COMP> IBM

<CONFIG> IBM 360/195 WITH 256 K AND ONE 9-TRACK TAPE DRIVE

<LANG> FORTRAN IV

<CHAR> EBCDIC

<CLAS> LAGRANGIAN

<EVAL> SEE DOCUMENTATION

<CON> UNDER CONTINUAL REVISION BASED ON MODEL VERIFICATION RESULTS.

<UPDATE> 700701

<112>

<CCONT> HEINES, T. S.; PETERS, L. R.

<TITLE> THE EFFECT OF GROUND LEVEL ABSORPTION ON THE DISPERSION OF POLLUTANTS IN THE ATMOSPHERE

<ADDR> CLEVELAND STATE UNIVERSITY, DEPARTMENT OF COMPUTER AND INFORMATION SCIENCE,

DEPARTMENT OF CHEMICAL ENGINEERING

<CITY> CLEVELAND

<STATE> OH

<DOC> ATMOSPHERIC ENVIRONMENT, 8, 1143-1153, 1974

<ABST> THE EMISSION OF AN AIR POLLUTANT SPECIES FROM A POINT OR LINE SOURCE HAS BEEN STUDIED ANALYTICALLY FOR A CASE IN WHICH THE POLLUTANT MAY BE ABSORBED OR DEPOSITED AT GROUND LEVEL. THE SOLUTION OF THE MASS CONSERVATION EQUATION LEADS TO EXPRESSIONS WHICH DESCRIBE THE CONCENTRATIONS DOWNSTREAM FROM THE EMISSION SOURCE. THE GROUND LEVEL CONCENTRATIONS ARE PRESENTED IN THE FORM OF DIMENSIONLESS PLOTS. TYPICAL NUMERICAL VALUES FOR THE PARAMETERS IN THE EQUATIONS WERE USED TO SHOW THAT THE CONCENTRATION PROFILES OVER WATER IN THE VICINITY OF THE EMISSIONS SOURCE WOULD BE APPROPRIATELY AFFECTED ONLY FOR VERY SOLUBLE GASES, SUCH AS SO₂, H₂S AND HCL.

<CLAS> PREDICTIVE

<113>

<CCONT> HENBRY, DALE

<TITLE> COMPUTER MODELING OF SIMULATED PHOTOCHEMICAL SMOG

<ADDR> STANFORD RESEARCH INSTITUTE, 333 PAVENWOOD AVE.

<CITY> MENLO PARK

<STATE> CA

<ZTP> 94025

<ABST> TO MEET THIS OBJECTIVE, WE WILL TEST AND MODIFY THESE MECHANISMS BY COMPARING COMPUTED CONCENTRATION-TIME DEPENDENCE OF VARIOUS REACTANTS AND PRODUCTS WITH THOSE OBSERVED EXPERIMENTALLY IN THE SMOG CHAMBER FACILITY AT THE STATEWIDE AIR POLLUTION RESEARCH CENTER (SAPRC), RIVERSIDE, CALIFORNIA. INDIVIDUAL KINETIC MODELS WILL BE DEVELOPED IN CONJUNCTION WITH DATA FOR THE HYDROCARBONS, ETHYLENE, PROPENE, BUTENE-1, TRANS-2-BUTENE, N-BUTANE, 2,3-DIMETHYL-BUTANE, AND TOLUENE. THE MODELS WILL BE COMBINED AND TESTED IN CONJUNCTION WITH SMOG CHAMBER DATA FOR MIXTURES OF HYDROCARBONS THAT MIMICK HYDROCARBON REACTIVITY IN VARIOUS URBAN ATMOSPHERES. 9/70 FINAL REPORT.

<TIME> 76/00/31-77/00/31

<CLAS> PREDICTIVE

<114>

<CCONT> HICKY, W. B.; KREMKEL, P. A.

<TITLE> ENVIRONMENTAL TRANSPORT PROCESSES

<ACRO> S961

<ADDR> ENVIRONMENTAL PROTECTION AGENCY, OFFICE OF RESEARCH AND DEVELOPMENT

<CITY> WASHINGTON

ATMOSPHERIC TRANSPORT

<110> CONT.
<STATE> DC

<DOC> EPA-400/7-74-012; IN: EPA-ORNI SYMPOSIUM HELD IN WASHINGTON, DC, FEB. 9, 1974

<ABST> THE "MODEL" PROGRAM (SULFUR DIOXIDE EMISSION LIMITATION) POP MEETING ANNEKT SO2 STANDARDS IS DESCRIBED ALONG WITH MODELS APPLIED TO THE DISPERSION OF RADIOISOTOPES FROM NUCLEAR POWER PLANTS AND A STUDY OF THERMAL DISPERSION IN STREAMS AND ESTUARIES.

<CLASS> SIMULATION

<115>
<CONT> WILST, G. S.

<TITLE> AN AIR POLLUTION MODEL OF CONNECTICUT

<ABST> THE MODEL WAS INTENDED TO SIMULATE THE REGIONAL CHARACTER OF AIR POLLUTION VARIABILITY WITHIN THE STATE. THE ABILITY TO SPECIFY THE TIME-SPACE VARIABILITY OF ATMOSPHERIC TRANSPORT AND DIFFUSION AND OF THE SOURCES OF SELECTED POLLUTANTS WERE MAJOR CONSTRAINTS. THE MODEL IS CAPABLE OF SIMULATING AIR POLLUTION CONCENTRATION PATTERNS FOR CONSERVATIVE POLLUTANTS WITHIN THE STATE ON AN HOURLY BASIS, GIVEN THE TIME AND SPACE VARIABILITY OF THE SOURCES OF THAT POLLUTANT WITHIN THE STATE, THE FLOW OF THAT POLLUTANT ACROSS THE STATE BORDER, AND THE TIME AND SPACE VARIABILITY OF ATMOSPHERIC FLOW AND DIFFUSION PATTERNS WITHIN THE STATE. EACH OF THE ABOVE FACTORS IS DISCUSSED IN DETAIL WITH THEORY AND CALCULATIONS AND ANALYSES.

<CLASS> SIMULATION

<116>
<CONT> HYDARI, DAVID S.

<TITLE> A STOCHASTIC MODEL FOR CARBON MONOXIDE CONCENTRATIONS ALONG HIGHWAYS AND STREETS

<ABST> THE PAPER SUGGESTS A MATHEMATICAL MODEL FOR CARBON MONOXIDE (CO) CONCENTRATION NEAR HIGHWAYS AND STREETS. THE CO CONCENTRATION IS TREATED AS A RANDOM VARIABLE WHOSE DISTRIBUTION FUNCTION DEPENDS ON THE TRAFFIC FLOW PATTERN, EMISSION RATES OF PASSING CARS AND DECAY EFFECTS. MEANS AND VARIANCES OF CO CONCENTRATION ARE COMPUTED FOR TWO BASIC TRAFFIC FLOW SITUATIONS. FINALLY, BOUNDS ON THE DISTRIBUTION FUNCTION ARE DERIVED UNDER SUITABLE ASSUMPTION ON EMISSION RATES.

<CLASS> STOCHASTIC

<117>
<CONT> ROBERT, H. I.

<TITLE> GEOSERCS - SEDIMENT DISSOLUTION, MODEL FOR FOSSIL FUEL CARBON DIOXIDE

<ACRO> GEOSERCS

<ADDR> NEW YORK UNIVERSITY, 421 1ST AVENUE

<CITY> NEW YORK

<STATE> NY

<ZIP> 10612

<ABST> THE PROPOSED STUDY WILL FURTHER DEVELOP A MODEL OF THESE TRANSPORT ROUTES THAT WILL SERVE TO PREDICT THE DISTRIBUTION OF CO2 BETWEEN THE OCEAN AND ATMOSPHERE OVER THE NEXT 50 YEARS.

<TIME> 77/05-78/10

<CLASS> PREDICTIVE

<118>
<CONT> HWANG, T. C.

<TITLE> AEROSOL ANALYTICAL MODEL

<ACRO> GALT; HAARM-1; HAARM-2; HAA-3B

<ADDR> GENERAL ELECTRIC COMPANY, ADVANCED REACTOR SYSTEMS DEPARTMENT, R/C 5-50, P.O. BOX 5020

<CITY> SYRACUSE

<STATE> CA

<ZIP> 94086

<PHONE> 408-738-7278

<SOURCE> NATIONAL TECHNICAL INFORMATION SERVICE

<DOC> GEAP-14147, 84 PP., 1976

<SUB> AEROSOL ATTENUATION IN LEAKAGE PATHS OF REACTOR CONTAINMENTS

<ABST> RECENTLY DEVELOPED AEROSOL BEHAVIOR CODES SUCH AS HAARM-1, HAARM-2 AND THE MODIFIED HAA-3B WITH SPRAY REMOVAL WERE REVIEWED. THE MOST SIGNIFICANT MODIFICATIONS INCORPORATED IN THESE MODELS WERE EVALUATED TO DETERMINE THEIR ADEQUACY OF LWR'S SAFETY ANALYSES. A SENSITIVITY ANALYSIS WAS PERFORMED TO STUDY THE DIRECT RELATIONSHIP BETWEEN RADIOLOGICAL DOSES CALCULATED BY THE COMDEX CODE AND ARBITRARILY SELECTED INPUT PARAMETERS TO THE HAA-3 CODE. DOSES CALCULATED BY USING CLEAN-UP FACTORS FROM HAARM-1 WERE COMPARED TO THOSE CALCULATED FROM HAA-3B. A PRELIMINARY MODEL AND ASSOCIATED COMPUTER CODE (GALT) WERE DEVELOPED TO ASSESS THE ATTENUATION OF AEROSOLS IN LEAKAGE PATHS. THE GALT CODE IS ABLE TO DETERMINE THE LEAKAGE PATH SIZE, THE BULK GAS VELOCITY, AND THE FLOW REGIME FOR THREE POSTULATED LEAKAGE GEOMETRIES, I.E. CIRCULAR PIPE, PARALLEL PLATES AND ANNULUS. BROWNIAN DIFFUSION AND SEDIMENTATION ARE CONSIDERED FOR LAMINAR FLOW; TURBULENT DIFFUSIVITY, INERTIAL EFFECTS AND SEDIMENTATION ARE TAKEN INTO ACCOUNT FOR TURBULENT FLOW. THE INPUT INSTRUCTIONS, SAMPLE PROBLEMS AND PROGRAM LISTING FOR THE GALT CODE ARE PRESENTED.

<STATUS> PRELIMINARY; IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE

<SIZE> 366,000 BYTES

<110>

ATMOSPHERIC TRANSPORT

<110> CONT.

<CCFP> CDC

<CCSFIG> CDC-7490; CDC-6600

<LAB> FORT BAE

<CHAP> WYCODES

<CLAS> ANALYTICAL; PREDICTIVE

<APPL> EVALUATES THE ATTENUATION OF RESOLES IN LEAKAGE PATHS RESULTING FROM VARIOUS HYPOTHETICAL ACCIDENTS

<7SPPE> U.S. DEPARTMENT OF ENERGY

<SVRL> NOT VERIFIED

<COM> INPUT TO COMRADEX

<UPDAT> 790626

<111>

<COMT> HUNTER, D. R.

<TITLE> ESTIMATES OF STRATOSPHERIC POLLUTION BY AN ANALYTIC MODEL

<ADDP> KITTE PEAK NATIONAL OBSERVATORY

<CITY> THUCSON

<STATE> AZ

<DOC> PROCEEDINGS NATIONAL ACADEMY SCIENCE, 72(72), 8711-8715, 1975

<ABST> WITH SUITABLE CHOICES OF THE HEIGHT PROFILE OF EDDY DIFFUSION COEFFICIENT, THE VERTICAL FLOW OF AN INERT TRACER IS GIVEN BY AN ANALYTIC SOLUTION. ODD NITROGEN, OR NO₂, FROM AIRCRAFT EXHAUSTS CAN BE REGARDED AS SUCH A TRACER, AND THE AMOUNT IN THE STRATOSPHERE RESULTING FROM A SOURCE OF A GIVEN STRENGTH CAN BE IMMEDIATELY CALCULATED. THE RESULTING DESTRUCTION OF OZONE IS THEN ESTIMATED WITH THE HELP OF A FORMULA OBTAINED FROM EARLIER WORK.

<CLAS> SIMULATION

<120>

<COMT> RUSKAR, L. JR.; RESSELER, L. J.; WOOLSON, W. A.

<TITLE> USER'S GUIDE TO VERSION 2 OF ATR (AIR TRANSPORT OF RADIATION)

<ACPO> ATR

<ADDP> SCIENCE APPLICATIONS INC.

<CITY> LA JOLLA

<STATE> CA

<SOURCE> #15 \$3.75/MS1.05

<DOC> AD-768 818/5, 1973

<ABST> THE DOCUMENT IS INTENDED TO SERVE AS A USER'S MANUAL FOR VERSION 2 OF THE ATR COMPUTER PROGRAM. ATR (DERIVED FROM AIR TRANSPORT OF RADIATION) PROVIDES ACCURATE, INEXPENSIVE AND EASILY UNDERSTOOD SOLUTIONS TO RADIATION ENVIRONMENT PROBLEMS AT ALL ALTITUDES IN THE ATMOSPHERE WITH A SIMPLE SET OF

INPUT COMMANDS. ATR CONTAINS PARAMETRIC MODELS OF A COMPREHENSIVE DATA BASE OF AIR TRANSPORT RESULTS GENERATED BY DISCRETE COORDINATES TECHNIQUES. THE DATA BASE WAS GENERATED FOR NEUTRONS, SECONDARY GAMMA RAYS, PRIMARY GAMMA RAYS, AND X-RAYS AS A FUNCTION OF SOURCE ENERGY, RANGE, DETECTOR ENERGY, AND ANGLE TO A DISTANCE OF 550 G/SQCM. CH OF INFINITE, HOMOGENEOUS AIR. RESULTS AT ALL COMBINATIONS OF DISTANCE AND DENSITY ARE OBTAINED BY INTEGRAL MASS SCALING UPON INFINITE, HOMOGENEOUS AIR RESULTS. EFFECTS OF THE INTERFACE BETWEEN AIR AND GROUND AND OF NONUNIFORM AIR DENSITY ARE IDENTIFIED AS PERTURBATION CORRECTIONS. ATR RESIDES IN LESS THAN 50K OF CORE OF THE CIVAC 1100, USES NO PERIPHERAL STORAGE, FUNCTIONS EFFECTIVELY IN A TIME-SHARING ENVIRONMENT, AND TYPICALLY USES LESS THAN A SINGLE COMPUTATIONAL SECOND PER PROBLEM.

<COMT> TRI

<COMFIG> CIVAC 1100 WITH LESS THAN 50 K CORE OF MEMORY

<CLAS> SIMULATION

<121>

<COMT> INGRAM, G. E.; KROCH, E. A.

<TITLE> SIMULATING THE URBAN AIR POLLUTION ENVIRONMENT

<ADDP> HARVARD UNIVERSITY

<CITY> CAMBRIDGE

<STATE> MA

<DOC> GRAD, P. P. ET. AL., AUTOMOBILE AND THE REGULATION OF ITS IMPACT ON THE ENVIRONMENT, UNIVERSITY OF OKLAHOMA PRESS, NORMAN, OKLAHOMA, 1975

<ABST> THE ANALYSIS PRESENTED REPRESENTS THE DETERMINANTS OF URBAN AIR QUALITY AT A DISAGGREGATED LEVEL AND EMPHASIZES THE SPATIAL VARIATION IN EMISSIONS AND POLLUTANT CONCENTRATIONS WITHIN AN AIR QUALITY CONTROL REGION. THE AGGREGATE APPROACH IS USEFUL FOR INVESTIGATING DIFFERENCES IN AIR POLLUTION LEVELS AMONG CITIES AND FOR ESTIMATING THE PROPORTION OF URBAN AREA RESIDENTS NATIONWIDE THAT ARE SUBJECT TO VARIOUS LEVELS OF POLLUTANT CONCENTRATIONS. HOWEVER, A MORE DETAILED OR MICRO-LEVEL ANALYSIS IS REQUIRED TO ANALYZE AIR QUALITY IMPROVEMENT STRATEGIES THAT ARE APPLIED DIFFERENTIALLY OVER SPACE, OR THAT REDISTRIBUTE EMISSION SOURCES WITHIN METROPOLITAN AREAS. ACCORDINGLY, THE VARIATIONS IN AIR QUALITY WITHIN A METROPOLITAN AREA ARE INVESTIGATED BY DIVIDING THE METROPOLITAN AREA INTO A LARGE NUMBER OF ZONES AND THEN DEVELOPING A SIMULATION MODEL TO FORECAST THE AIR QUALITY IN EACH ZONE AS A FUNCTION OF TRANSPORT, LAND USE, AND METEOROLOGICAL MEASURES. THIS TRANSPORTATION AND AIRSHED SIMULATION MODEL IS SUBSEQUENTLY USED TO ANALYZE SEVERAL POLICIES THAT ARE OFFERED PROPOSED TO IMPROVE AIR QUALITY LEVELS IN METROPOLITAN AREAS.

<CLAS> SIMULATION

ATMOSPHERIC TRANSPORT

<122>

<CONF> ISRAEL, G. B.; OVERCAMP, T. J.

<TITLE> A BRIFT DEPOSITION MODEL FOR NATURAL CRAFT COOLING TOWERS

<DOC> SYMPOSIUM ON COOLING TOWER ENVIRONMENT, HELD IN COLLEGE PARK, MARYLAND, 1976. (ED CITATION: HADBLE HILL)

<CLASS> SIMULATION

<123>

<CONF> JANSEN, P.; JORDAN, S.; SCHIMARSKY, W.

<TITLE> COMPARATIVE MODEL THEORY OF ATMOSPHERIC CONTAMINANT LOADING BY POWER STATIONS

<ABST> ON THE BASIS OF MAXIMUM PERMISSIBLE CONCENTRATIONS SIMPLIFIED BOX MODELS ARE DEVELOPED TO COMPARE AIR POLLUTION FROM NUCLEAR AND FOSSIL FUELED POWER PLANTS. ASSUMING EXPONENTIAL DECAY OF THE ECILITANTS, BODY-BURDEN FUNCTIONS FOR THE MAIN POLLUTANTS FROM DIFFERENT TYPES OF POWER PLANTS ARE CALCULATED AND COMPARED. THE CALCULATIONS ARE BASED ON AN EXTENSIVE ACQUISITION OF EMISSION DATA, VERTICAL PROFILES AND BASIC STANDARDS OF THE POLLUTANTS. RESULTS FOR THE GERMAN POWER PLANTS SHOW WITHIN THE SCOPE OF THE MODEL THAT THE POLLUTANT BODY-BURDEN OF NUCLEAR POWER PLANTS IS MUCH SMALLER THAN THOSE FROM POWER PLANTS FUELED WITH HARD COAL, BROWN COAL AND OIL BUT LARGER THAN THOSE FROM NUCLEAR PLANTS. KRYPTON-85 RELEASED FROM REPROCESSING PLANTS IS THE MAIN POLLUTANT OF NUCLEAR POWER SYSTEMS. WITH COAL AND LIGNITE, THE CONTRIBUTION OF FUMORINE TO AIR POLLUTION WAS SURPRISINGLY LARGE, ESPECIALLY UNDER INVERSION CONDITIONS, AND DESERVES FURTHER STUDY.

<CLASS> PREDICTIVE

<124>

<CONF> JEPSLEY, T. B.; SEINFELD, J. H.

<TITLE> MESOSCALE AIR POLLUTION SIMULATION MODELING: THE FEASIBILITY OF MODELING PHOTOCHEMICAL AEROSOL DYNAMICS

<ADDR> SYSTEMS APPLICATIONS, INC.

<CITY> SAN RAFAEL

<STATE> CA

<ABST> A MATHEMATICAL MODEL OF THE DYNAMICS OF PHOTOCHEMICAL AEROSOLS SHOULD INCLUDE EMISSIONS OF PRIMARY PARTICULATES AND GASEOUS PRECURSORS OF SECONDARY AEROSOLS, HOMOGENEOUS NUCLEATION, HETEROGENEOUS CONDENSATION, HETEROGENEOUS CHEMICAL REACTION, COAGULATION, ADVECTION, DIFFUSION, SETTLING, AND DEPOSITION ON SURFACES. THIS REPORT DISCUSSES THE THEORY OF EACH OF THESE PROCESSES AND ASSESSES THE RELATIVE IMPORTANCE OF EACH IN SHAPING THE VOLUME DISTRIBUTION OF PHOTOCHEMICAL AEROSOLS. THE AUTHORS CONCLUDE THAT IN LOS ANGELES PHOTOCHEMICAL SMOG HETEROGENEOUS CONDENSATION IS THE PRINCIPAL MECHANISM FOR CHANGES OF THE VOLUME DISTRIBUTION IN THE ACCUMULATION SIZE RANGE, THOUGH HOMOGENEOUS NUCLEATION CAN BE IMPORTANT UNDER CERTAIN CONDITIONS FOR FORMING

VERY SMALL PARTICLES (LESS THAN 100 Å DIAMETER). COAGULATION MUST BE CONSIDERED IN RESHAPING THE SIZE DISTRIBUTION OF EMISSIONS AND IN REDUCING THE NUMBER OF PARTICLES FORMED BY HOMOGENEOUS NUCLEATION. AN IN-DEPTH ASSESSMENT IS ALSO PRESENTED OF THE PATHWAYS FOR THE FORMATION OF AEROSOL MATERIAL FROM THE GAS PHASE VIA HOMOGENEOUS AND HETEROGENEOUS CHEMISTRY. FINALLY, THE EQUATIONS GOVERNING THE EVOLUTION OF THE PHOTOCHEMICAL AEROSOL ARE DERIVED AND SIMPLIFIED ON THE BASIS OF ORDER-OF-MAGNITUDE CALCULATIONS OF THE INDIVIDUAL TERMS, AND VARIOUS EQUATIONS FOR DIFFERENT PROPERTIES OF THE AEROSOL ARE DERIVED AND DISCUSSED.

<CLASS> SIMULATION

<125>

<CONF> JONES, J. E., JR.; KENDRICK, P. I.

<TITLE> METHOD FOR SIMULATING PLUME CENTERLINES FROM TALL STACKS

<ADDR> UNIVERSITY OF KENTUCKY

<CITY> LEXINGTON

<STATE> KY

<DOC> ENVIRONMENTAL SCIENCE TECHNOLOGY, 11(5), 471-475, 1977

<ABST> THE TENNESSEE VALLEY AUTHORITY HAS MAINTAINED AN SO₂ MONITORING NETWORK AT THE PASADISE POWER PLANT SINCE 1963 TO RECORD 15 METEOROLOGICAL VARIABLES AT ONE LOCATION IN THE NETWORK, PLUS THE SO₂ CONCENTRATION AT 10 LOCATIONS. THE LARGE NUMBER AND 5-MIN TIME INTERVAL BETWEEN MEASUREMENTS MAKE THESE DATA POTENTIALLY USEFUL FOR DYNAMIC MODELING. THE 5-MIN WIND DIRECTION AND VELOCITY WERE USED TO CONSTRUCT A PLUME CENTERLINE FOR EACH INTERVAL. THIS LINE WAS THEN FIT WITH A POLYNOMIAL, AND THE DISTANCES FROM IT TO EACH OF THE STATIONS WERE COMPUTED. THE RESULTING CONCENTRATION AND DISTANCES WERE THEN USED TO CONSTRUCT A DISTRIBUTION FUNCTION WHICH APPEARED NORMAL IN CHARACTER. THESE CURVES HAD A STANDARD DEVIATION CLOSE TO THOSE PREDICTED FROM THE PASQUILL CURVES. CALCULATED CONCENTRATIONS AT THE STATIONS FOR EACH TIME INTERVAL WERE COMPARED WITH THE ACTUAL DATA TO CALCULATE A SUM OF SQUARES WHICH ASYMPTOTICALLY DECREASED AS MORE POINTS WERE AVERAGED.

<CLASS> SIMULATION

<126>

<CONF> KAO, S. K.; TAYLOR, D. H.

<TITLE> ATMOSPHERIC DIFFUSION IN THE SURFACE TURBULENT BOUNDARY LAYER

<ADDR> UNIVERSITY OF UTAH, DEPARTMENT OF METEOROLOGY

<CITY> SALT LAKE CITY

<STATE> UT

<DOC> COO--2455-16, 1977

<ABST> A STUDY OF TURBULENT DIFFUSION IN THE

<126>

88

ATMOSPHERIC TRANSPORT

<126> CONT.

SURFACE BOUNDARY LAYER HAS MADE TO DETERMINE THE EFFECTS OF WIND SHEAR ON THE DISPERSION OF AIR POLLUTANTS. THREE NUMERICAL MODELS ANALYZED AND COMPARED INCLUDE: CONSTANT WIND VELOCITIES AND DIFFUSION COEFFICIENTS THROUGHOUT THE LAYER ARE ASSUMED; A LOGARITHMIC WIND PROFILE AND CONSTANT DIFFUSION COEFFICIENT; AND LOGARITHMIC WIND PROFILE AND LINEARLY VARYING DIFFUSION COEFFICIENTS. IT WAS FOUND THAT THE LOGARITHMIC WIND PROFILE IN THE SURFACE BOUNDARY LAYER SIGNIFICANTLY AFFECTS AIR POLLUTANT TRANSPORT AND DIFFUSION RESULTING IN GENERALLY LOWER POLLUTANT CONCENTRATION LEVELS THROUGHOUT THE LAYER EXCEPT IN A REGION NEARBY AND CLOSE TO SOURCE LOCATION. IT BECOMES APPARENT THAT WHEN NUMERICALLY MODELING AN AIR POLLUTION SITUATION IN THE SURFACE TURBULENT BOUNDARY LAYER, THE EFFECTS OF THE VELOCITY SHEAR OF THE LOGARITHMIC WIND PROFILE MUST BE CONSIDERED.

<CLASS> SIMULATION

<127>

<CONT> KAC, S. R.; TAYLOR, C. H.

<TITLE> AIRBORNE AIR POLLUTION MONITORING EXERCISES IN AN AREA OF MOUNTAIN-VALLEY TERRAIN

<ADDR> UNIVERSITY OF UTAH

<CITY> SALT LAKE CITY

<STATE> UT

<DOC> COO--2855-7; SYMPOSIUM ON ATMOSPHERIC TURBULENCE, DIFFUSION, AND AIR QUALITY, HELD IN RALEIGH, NORTH CAROLINA, OCTOBER 19, 1976.

<ABST> AN AIRBORNE MONITORING PROGRAM WAS CONDUCTED TO DETERMINE THE ORIGIN OF THE PLUME EMITTED BY A LARGE COPPER SMELTER IN NORTHERN UTAH. USING A CONDUCTIVITY-TYPE ANALYZER, SULFUR DIOXIDE CONCENTRATIONS WERE MEASURED AT VARIOUS LOCATIONS DOWNWIND OF THE SOURCE. A SERIES OF CROSS WIND PASSES WERE FLOWN, AT INCREMENTAL ALTITUDES, TO DETERMINE THE CONCENTRATION DISTRIBUTION OF SULFUR DIOXIDE. MEASURED CONCENTRATIONS IN THE MOUNTAIN-VALLEY TERRAINS WERE, IN GENERAL, MUCH LOWER THAN THOSE PREDICTED BY THE FLAT-SURFACE DIFFUSION MODEL. IT WAS FELT THAT, SINCE THE SMELTER LIES IN AN AREA OF HIGH WINDS, MODELS INTENDED FOR USE OVER A FLAT SURFACE WOULD NOT BE APPLICABLE FOR PREDICTING PLUME CONCENTRATIONS IN MOUNTAIN-VALLEY TERRAIN; MECHANICAL TURBULENCE INDUCED BY MOUNTAIN TERRAIN NEAR THE SOURCE WAS THOUGHT TO BE THE MAJOR CAUSE OF DISCREPANCIES BETWEEN FLAT SURFACE PREDICTIONS AND MEASURED CENTERLINE CONCENTRATIONS. AN ANALYTIC EQUATION BASED ON WIND TUNNEL EXPERIMENTS WAS DEVELOPED FOR USE DURING SOUTHERLY TO EASTERLY FLOW TO PREDICT LATERAL DISPERSION PARAMETERS WITHIN THE PLUME. THE APPROXIMATIONS DERIVED FROM THIS EQUATION WERE A SIGNIFICANT IMPROVEMENT OVER FLAT-TERRAIN MODEL PREDICTIONS. THE EXPERIMENTS SUGGEST THAT THE GAUSSIAN DIFFUSION MODEL MAY BE USED FOR PREDICTING POLLUTION CONCENTRATION IN

MOUNTAIN-VALLEY TERRAINS WITH A MODIFICATION OF THE DISPERSION PARAMETERS.

<CLASS> SIMULATION

<128>

<CONT> KAROL, I. L.

<TITLE> MODEL OF GLOBAL RADIOISOTOPE TRANSPORT IN THE TROPOSPHERE AND LOWER STRATOSPHERE: FUNDAMENTAL EQUATIONS AND BOUNDARY CONDITIONS

<DOC> KAROL, I.L. RADIOISOTOPES AND GLOBAL TRANSPORT IN THE ATMOSPHERE, JERUSALEM, KETER PUBLISHING HOUSE, PP.66-76, 1976

<ABST> A MATHEMATICAL MODEL OF THE TRANSPORT OF FALLOUT RADIOISOTOPES IN THE TROPOSPHERE AND LOWER STRATOSPHERE IS DESCRIBED THAT USES A SERIES OF ASSUMPTIONS TO DERIVE AND SIMPLIFY FUNDAMENTAL EQUATIONS AND BOUNDARY CONSIDERATIONS THAT QUANTITATIVELY DESCRIBE THE PROCESSES INVOLVED IN GLOBAL DISTRIBUTION.

<129>

<CONT> KAROL, I. L.

<TITLE> DIFFERENCE ANALOGUES OF BOUNDARY-VALUE PROBLEMS FOR THE EQUATIONS OF GLOBAL RADIOISOTOPE CONTAMINANT TRANSPORT AND THEIR NUMERICAL SOLUTION: DIFFERENCE APPROXIMATION OF EQUATIONS AND BOUNDARY CONDITIONS IN THE MERIDIONAL PLANE AND THE ZONAL BELT OF THE ATMOSPHERE

<DOC> KAROL, I.L., RADIOISOTOPES AND GLOBAL TRANSPORT IN THE ATMOSPHERE, JERUSALEM, KETER PUBLISHING HOUSE, PP.167-184, 1976

<ABST> MATHEMATICAL MODELS OF GLOBAL FALLOUT RADIOISOTOPE TRANSPORT ARE REVIEWED AND EQUATIONS ARE PRESENTED FOR USE IN CALCULATIONS OF THE EFFECTS OF THE BOUNDARY LAYER ON MIXING IN THE MERIDIONAL PLANE AND THE ZONAL BELT OF THE ATMOSPHERE.

<130>

<CONT> KAROL, I. L.

<TITLE> PLANETARY DISTRIBUTION OF ZONAL MEAN TRANSPORT PARAMETERS OF RADIOISOTOPES IN THE TROPOSPHERE AND LOWER STRATOSPHERE: CLIMATIC DISTRIBUTION OF THE ZONAL MEAN COMPONENTS OF THE MERIDIONAL CIRCULATION VELOCITY

<DOC> KAROL, I.L., RADIOISOTOPES AND GLOBAL TRANSPORT IN THE ATMOSPHERE, JERUSALEM, KETER PUBLISHING HOUSE, PP.127-166, 1976

<ABST> THE DISTRIBUTION OF ZONAL MEAN COMPONENTS OF THE MERIDIONAL CIRCULATION OF AIR MASSES AND THE EFFECTS OF LARGE-SCALE TURBULENT DIFFUSION OF THE MIXING VELOCITY IN THE TROPOSPHERE AND LOWER STRATOSPHERE ARE DISCUSSED. MEASUREMENTS OF SEASONAL VARIATIONS MADE USING FALLOUT RADIOISOTOPES AS TRACERS ARE DESCRIBED.

<131>

<CONT> KAROL, I.L.

ATMOSPHERIC TRANSPORT

<131> CONF.

<TITLE> VERTICAL TRANSPORT AND REMOVAL OF RADIOACTIVE AEROSOLS IN THE ATMOSPHERE: QUANTITATIVE MODELS OF AEROSOL WASHOUT BY PRECIPITATION AND DRY DEPOSITION ON THE UNDERLYING SURFACE

<DOC> KAPOL, I. L., RADIOISOTOPES AND GLOBAL TRANSPORT IN THE ATMOSPHERE, JERUSALEM, KETER PUBLISHING HOUSE, PP. 79-126, 1970

<ABST> QUANTITATIVE MODELS OF THE VERTICAL TRANSPORT OF FALLOUT RADIOISOTOPES AND THE REMOVAL OF RADIOACTIVE AEROSOLS IN THE ATMOSPHERE ARE REVIEWED. ESTIMATES ARE GIVEN FOR THE RATES OF FALLOUT OF RADIOISOTOPES FROM THE GROUND LEVEL LAYER OF THE ATMOSPHERE BY DRY DEPOSITION AND SEASONAL VARIATIONS IN PRECIPITATION WASHOUT AT VARIOUS GEOGRAPHICAL LOCATIONS. EQUATIONS ARE PRESENTED FOR THE VERTICAL DISSIPATION OF CONTAMINANT CONCENTRATION IN THE BOUNDARY LAYER OF THE ATMOSPHERE.

THE STEP IS 4 HRS AND BOTH CASES ARE INTEGRATED UP TO 60 DAYS STARTING FROM AN ISOTHERMAL ATMOSPHERE AT REST. THE RESULTS OF THE 41-70 DAYS OF THE TIME INTEGRATION ARE ANALYZED FOR VARIOUS DIAGNOSTIC STUDIES. SYNOPTIC COMPARISONS OF THE TWO EXPERIMENTS ARE MADE FOR SELECTIVE METEOROLOGICAL VARIABLES TO DISCUSS THE RELATIVE IMPORTANCE OF THE THERMAL AND OROGRAPHIC INFLUENCE UPON THE LARGE-SCALE MOTIONS OF THE ATMOSPHERE. DETAILED STUDIES ARE MADE ON THE BALANCE OF MOMENTUM WATER VAPOUR, HEAT AND ENERGY. THE PRESENT EXPERIMENTS INDICATE THAT THE SIX-LAYER AND 5 DEGREES WASH MODEL CAN SIMULATE SUCCESSFULLY A JANUARY CLIMATE AND THAT THE EARTH'S OROGRAPHY PLAYS A MAJOR ROLE OVER THE THERMAL EFFECT THE CONTINENTALITY IN DETERMINING THE MAJOR FEATURES IN THE TRANSPORT MECHANISM OF MOMENTUM, WATER VAPOUR, HEAT AND ENERGY IN TERMS OF THE ZONAL MEAN STATE. HOWEVER, FOR THE REGIONAL ASPECTS OF GENERAL CIRCULATION THE EFFECTS OF OROGRAPHY ARE SIGNIFICANT.

<132>

<CONF> KUSANABA, AKIRA

<CLASS> SIMULATION

<TITLE> SIX LAYER GLOBAL CIRCULATION MODEL

<ADDR> NATIONAL CENTER FOR ATMOSPHERIC RESEARCH

<CITY> BOULDER

<STATE> CO

<DOC> JOURNAL ATMOSPHERIC SCIENCE, 28(5), 657-701, 1971

<133>

<CONF> KATZ, P. C.

<TITLE> MODELING ATMOSPHERIC DISPERSION OF LEAD FROM AUTOMOTIVE SOURCES

<ADDR> COLORADO STATE UNIVERSITY, DEPARTMENT OF ATMOSPHERIC SCIENCE

<DOC> PROCEEDINGS OF THE FIRST ANNUAL HSP TRACE CONTAMINANTS CONFERENCE, HELD AT OAK RIDGE, TENNESSEE, AUGUST 8-10, 1973

<ABST> SEVERAL EXPERIMENTAL PROGRAMS WERE CONDUCTED FOR THE PURPOSE OF STUDYING AND PARAMETERIZING THE ATMOSPHERIC TRANSPORT OF LEAD FROM AUTOMOTIVE SOURCES. SHORT-RANGE DIFFUSION FROM AN ISOLATED, DIVIDED HIGHWAY HAS BEEN DESCRIBED WITH A GAUSSIAN PLUME MODEL, AND EVALUATED BY A SCHEME TO ACCOUNT FOR VERTICAL WIND PROFILES, YIELDING A NON-GAUSSIAN VERTICAL CONCENTRATION PROFILE. SEVERAL OF THE MODELING PROBLEMS FOR PARTICULATE DIFFUSION WILL BE DISCUSSED. AN EXTENSIVE FIELD PROGRAM WAS CONDUCTED TO MEASURE VERTICAL LEAD CONCENTRATIONS IN A CITY STREET CANYON. RESULTS SHOW SOME VERY STRONG VERTICAL CONCENTRATION GRADIENTS AND COMPLEX FLOW PATTERNS WHICH VARY SIGNIFICANTLY WITH WIND DIRECTION. PHYSICAL MODELING IS PRESENTLY ON-GOING AND WILL BE COMPARED TO FIELD RESULTS. A SAMPLING NETWORK OF 19 STATIONS WAS ESTABLISHED IN AND AROUND FORT COLLINS, COLORADO COVERING AN AREA OF 125 KM². GRAPHITE EMISSION SPECTROMETER CUPS WERE USED AS THE FILTERING MEDIA, WITH FILTERS BEING CHANGED THREE TIMES DAILY. SIMPLE DIFFUSION MODELS WERE COMPLICATED BY HAVING TO ESTIMATE SOURCE STRENGTHS AND PARTICULATE SETTLING.

<CLASS> SIMULATION

<134>

<CONF> KIRSCH, J. E.; HADON, D. P.

<TITLE> EXPLOR-EXAMINATION OF POLLUTION LEVELS

<ABST> THIS PAPER DESCRIBES THE METHOD OF INCORPORATING INTO THE NCAR GLOBAL CIRCULATION MODEL THE DYNAMIC EFFECT OF MOUNTAINS, THE PREDICTION OF CLOUDINESS FOR RADIATION CALCULATIONS, AND THE CALCULATION OF GROUND SURFACE TEMPERATURE USING A HEAT BALANCE EQUATION. FOR THE SIMULATION OF SEASONAL CLIMATE WE SPECIFY TWO PARAMETERS: THE SUN'S DECLINATION AND THE DISTRIBUTION OF OCEAN SURFACE TEMPERATURES. SINCE THE PREDICTION OF CLOUDINESS IS PARAMETERIZED IN TERMS OF THE RELATIVE HUMIDITY AND THE VERTICAL MOTION FIELDS, SOLAR AND ATMOSPHERIC RADIATION PROCESSES INTERACT CLOSELY WITH THE DYNAMICS OF THE ATMOSPHERE THROUGH VARIATIONS IN THE FIELDS OF CLOUDINESS, TEMPERATURE AND WATER VAPOUR. COUPLING BETWEEN RADIATION AND DYNAMICS HELPS TO MAINTAIN STRONGER BAROCLINIC ACTIVITY IN MIDDLE LATITUDES. ALTHOUGH A HYDROLOGIC CYCLE IS INCLUDED IN THE MODEL ATMOSPHERE AND THE GROUND SURFACE TEMPERATURE IS COMPUTED, A HYDROLOGIC CYCLE IN THE GROUND IS NOT TAKEN INTO ACCOUNT. INSTEAD, IT IS ASSUMED THAT THE LATENT HEAT TRANSPORT FROM THE GROUND TO THE ATMOSPHERE AND THE SOIL HEAT TRANSPORT BEHIND THE SURFACE ARE BOTH FUNCTIONS OF THE SENSIBLE HEAT TRANSPORT BETWEEN THE GROUND AND THE ATMOSPHERE. EXPERIMENTS ARE CONDUCTED TO SIMULATE JANUARY CLIMATE WITH AND WITHOUT THE EARTH'S OROGRAPHY. IN BOTH EXPERIMENTS THE BOUNDARY OF CONTINENTS, THE JANUARY MEAN OCEAN SURFACE TEMPERATURES, AND THE SUN'S DECLINATION FOR MID-JANUARY ARE UNCHANGED DURING THE TIME INTEGRATIONS. THE MODEL HAS A SPHERICAL HORIZONTAL MESH SPACING OF 5 DEGREES IN BOTH LONGITUDE AND LATITUDE AND TO VERTICAL LAYERS AT 3-KM HEIGHT INCREMENTS. THE

<134>

ATMOSPHERIC TRANSPORT

<134> CONT.

OF ROADWAYS

<ACRO> SYSTEM

<ADDP> SYSTEMS, SCIENCE AND SOFTWARE

<STATE> CA

<DOC> STIS 24-236 713, JAN 15, 1976 (95)
SPECIAL REPORT<ABST> FREEGO, A CONVERSION OF MASS
MATHEMATICAL MODEL WITH A SECOND ORDER
ADVECTION-DIFFUSION SCHEME, IS USED TO
CALCULATE CFP-ROADWAY, GROUND LEVEL
CARBON MONOXIDE CONCENTRATIONS. EXPLOR
HAS BEEN VALIDATED TO WITHIN THE
EXPERIMENTAL ERROR OF THE SUPPLIED
TRAFFIC DATA.

<CLASS> SIMULATION

<135>

<CONT> KNOX, J. B.

<TITLE> NUMERICAL MODELING OF THE TRANSPORT,
DIFFUSION, AND DEPOSITION OF POLLUTANTS
FOR REGIONS AND EXTENDED SCALES<ADDP> UNIVERSITY OF CALIFORNIA, LAWRENCE
LIVERMORE LABORATORY

<CITY> LAWRENCE

<STATE> CA

<ABST> POP ABSTRACT, SEE NSA 24 04, NUMBER
12623.

<136>

<CONT> KOCH, B. C.

<TITLE> SAMPLED CHRONOLOGICAL INPUT MODEL

<ACRO> SCIN

<ADDP> GEOMET, INC.

<CITY> GAITHERSBURG

<STATE> MD

<ZIP> 20760

<DOC> OTT, W.P. (ED.), PROCEEDINGS OF THE EPA
CONFERENCE ON ENVIRONMENTAL MODELING
AND SIMULATION, 1976, EPA 600/9-76-016,
(P. 92-96), 847 PP.

<CON> MULTIPLE SOURCE URBAN DIFFUSION MODEL

<ABST> SCIN IS A MULTIPLE-SOURCE URBAN
DIFFUSION MODEL BASED ON THE GAUSSIAN
PLUME EQUATION AND HAS BEEN USED TO
ANALYZE SO2 CONTROL REGULATIONS IN
BOSTON AND SAN FRANCISCO. MAXIMUM
1-HOUR, 24-HOUR, AND ANNUAL MEAN
CONCENTRATIONS ARE CALCULATED FROM MEAS
EMISSION OR FUEL USE DATA AND STANDARD
NATIONAL CLIMATIC CENTER DATA. MODEL
VALIDATION RESULTS FOR BOSTON SHOW A
MODEL TO MEASUREMENT CORRELATION OF
0.97 FOR ANNUAL MEANS AND 0.81 FOR
MAXIMUM 24-HOUR CONCENTRATIONS OF SO2
BASED ON COMPARISONS AT 14 STATIONS.
THE ANALYSIS SHOWED THAT FUEL
REGULATIONS WHICH PERMIT INCREASING
FUEL-SULFUR TO 1 PERCENT IN THE BOSTON
CORE AREA WILL NOT MEET NATIONAL
AMBIENT AIR QUALITY STANDARDS (NAAQS).IN SAN FRANCISCO THE ANALYSIS SHOWED
THAT LIMITING SO2 EMISSIONS FROM LARGE
SOURCES IS MORE CRITICAL FOR MEETING
NAAQS THAN IS LIMITING THE SULFUR
CONTENT OF FUELS.<CON> MASSACHUSETTS, BOSTON; CALIFORNIA, SAN
FRANCISCO

<STATUS> IN USE

<ACCESS> UNLIMITED

<CLASS> PREDICTIVE

<APPL> AIR QUALITY PLANNING

<UPDATE> 780615

<137>

<CONT> ROEBIG, L. R.

<TITLE> A NUMERICAL EXPERIMENT ON THE EFFECTS
OF REGIONAL ATMOSPHERIC POLLUTION ON
GLOBAL CLIMATE

<ADDP> RAND CORPORATION, 1700 MAIN STREET

<CITY> SANTA MONICA

<STATE> CA

<DOC> REPORT R-1029-ARPA JUNE 1974; CONTRACT:
DEFENSE ADVANCED RESEARCH PROJECTS
AGENCY DARC15-73-C-0181<ABST> INTRODUCTION OF LARGE QUANTITIES OF
AEROSOL POLLUTANTS INTO THE ATMOSPHERE
MAY CAUSE SIGNIFICANT CHANGES IN THE
EARTH'S CLIMATE, IN THE TRANSMISSION
AND EMISSION OF RADIATION IN THE
EARTH-ATMOSPHERE SYSTEM AND THE
MICROPHYSICAL PROCESSES INVOLVED IN
CLOUD AND RAIN GENERATION AND
DISSIPATION. VERSIONS OF THE
MIXT-ADAKABA GLOBAL ATMOSPHERIC
CIRCULATION MODEL WERE USED IN THE
NUMERICAL EXPERIMENT. EFFECTS WITHIN
THE TROPOSPHERE CAUSED BY CHANGES IN
CLOUD AND RAIN PROCESSES WERE
EMPHASIZED. IN THE 60-DAY SIMULATION,
CLOUDINESS INCREASED OVER THE POLLUTED
AREA AND, IN RESPONSE TO ENHANCED
GREENHOUSE EFFECT, TEMPERATURES AT THAT
SURFACE AND THE LOWER ATMOSPHERE BECAME
WARMER. RAINFALL WAS NOT SIGNIFICANTLY
ALTERED IN THE POLLUTED REGION.
CHANGES IN ATMOSPHERIC DYNAMICS IN THE
POLLUTED REGION CANNOT BE DIRECTLY
ATTRIBUTED TO AEROSOL POLLUTION, AND NO
CONCLUSIVE CAUSE AND EFFECT
RELATIONSHIPS WERE ESTABLISHED. DATA
SUGGEST A POSSIBLE CONNECTION BETWEEN
NORTH AMERICAN POLLUTION AND SOUTH
AMERICAN RAINFALL.

<CLASS> PREDICTIVE

<138>

<CONT> KORNEGAY, FRANCIS C.

<TITLE> A MODEL FOR RADIOLOGICAL DISPERSION
FROM TOXIC ACCIDENTS

<ACRO> TORNADEWE

<ADDP> ARGONNE NATIONAL LABORATORY,
ENVIRONMENTAL IMPACT STUDIES DIVISION,
9700 S. CASS AVE.

<CITY> ARGONNE

ATMOSPHERIC TRANSPORT

<138> CONT.
 <STATE> IL
 <ZIP> 60439
 <PHONE> PLS 572-3204
 <DOC> HARTNER, G.J., AND P.L. MARTIN,
 DYNAMICAL AND PHYSICAL METEOROLOGY,
 MCGRAW-HILL, INC., NEW YORK,
 1957; PROCEEDINGS OF THE SYMPOSIUM ON
 TORNADOES, JUNE 22-24, 1976, TEXAS
 TECHNICAL UNIVERSITY
 <SUB> INDUSTRIAL FACILITIES
 <ABST> TORNADOES WAS DESIGNED TO PREDICT THE
 GROUND-LEVEL CONCENTRATIONS RESULTING
 FROM A TORNADO STRIKING AN UNSHARED
 PLOTION FACILITY.
 <GEN> NATIONAL
 <IMP> 1953-PRESENT
 <STATUS> IN USE
 <ACCESS> LIMITED
 <MEDIA> PUNCHED CARDS
 <SIZE> 150 RECORDS EACH 90 BYTES LONG
 <COMP> IBM
 <COMPTG> IBM 370/145 OS/MVT
 <LANG> FORTRAN
 <CRAP> EBCDIC
 <ALGO> ASSUMES A CYCLOSTROPIC WIND PROFILE,
 WITH VARIABLE TORNADO CHARACTERISTICS.
 MODEL THEN ALLOWS FOR MAXWELLIAN
 DISTRIBUTION DOWNWIND THROUGH 90DEGREE
 ARC.
 <CLAS> PREDICTIVE
 <APPL> REPRESENTATIVE TORNADO WIND FIELDS,
 SMALL LINE CONDITIONS, AND SOURCE TERM.
 <USERS> USNR
 <SND> DATA FROM TORNADO EXPERTS AT THE ARL
 TORNADO SYMPOSIUM
 <REAL> RESULTS COMPARED WITH SIMILAR
 PREDICTIVE MODELS FROM ARL AND SAVANNAH
 RIVER LABORATORY.
 <UPDA> 760703
 <139>
 <CONT> KOPPEGAY, FRANCIS C.
 <TITLE> A MODEL TO PREDICT RADIOLOGICAL
 ENVIRONMENTAL IMPACT RESULTING FROM
 STRAIGHTLINE WIND DAMAGE TO A PLOTION FACILITY
 <ACRO> STRAIGHTWINDS
 <ABST> ARGONNE NATIONAL LABORATORY,
 ENVIRONMENTAL IMPACT STUDIES DIVISION,
 9700 S. CASS AVE.
 <CITY> ARGONNE
 <STATE> IL
 <ZIP> 60439

<PHONE> PLS 472-3206
 <DOC> TURNER, D. BRUCE, WORKSHOP OF
 ATMOSPHERIC DISPERSION ESTIMATES, PHS 6
 999-AP-26, 1967
 <SUB> INDUSTRIAL FACILITIES
 <ABST> THE MODEL IS DESIGNED TO PREDICT
 CONCENTRATIONS RESULTING FROM A
 STRAIGHTLINE WIND STRIKING A FACILITY
 HOUSING PARTICULATE MATERIAL. CASE
 CHARACTERISTIC WINDS ARE DETERMINED AND
 AN APPLICABLE SOURCE TERM IS GENERATED.
 RESULTANT GROUND-LEVEL CONCENTRATIONS
 ARE DETERMINED.
 <GEN> U.S.
 <TIME> 1951 - PRESENT
 <STATUS> IN USE
 <ACCESS> LIMITED
 <MEDIA> PUNCHED CARDS
 <SIZE> 150 RECORDS EACH 90 BYTES LONG
 <COMP> IBM
 <COMPTG> IBM 370/145 OS/MVT
 <LANG> FORTRAN
 <CRAP> EBCDIC
 <ALGO> MODEL USES "PUFF" RELEASES AS BY THE
 METHOD OF TURNER, 1967.
 <CLAS> PREDICTIVE
 <APPL> REPRESENTATIVE WIND DATA
 <USERS> USNR
 <SND> WIND SPEED ESTIMATES FROM NWS OR OTHER
 SUITABLE AGENCY
 <REAL> RESULTS OBTAINED BY TURNER, 1967 HAVE
 BEEN JUDGED TO BE ACCEPTABLE.
 <UPDA> 760703
 <140>
 <CONT> KOSS, WALTER J.
 <TITLE> NUMERICAL INTEGRATION EXPERIMENTS WITH
 VARIABLE-RESOLUTION TWO-DIMENSIONAL
 CARTESIAN GRIDS USING THE BOX METHOD
 <DOC> MONTHLY WEATHER REVIEW, V99 P10
 P725-738 OCT 71, CON-71-50333-10.;
 <ABST> NUMERICAL EXPERIMENTS WERE PERFORMED
 WITH VARIABLE RESOLUTION
 TWO-DIMENSIONAL RECTANGULAR CARTESIAN
 GRIDS. THE SHALLOW-WATER EQUATIONS WERE
 INTEGRATED ON SEVERAL VARIABLE-MESH
 GRIDS AND ON A CONSTANT INCREMENT
 FINE-RESOLUTION GRID; THE METHOD OF
 INTEGRATION USED THE BOX TECHNIQUE
 SPATIAL REPRESENTATION. THE GRIDS WERE
 DESIGNED TO BE USED IN NUMERICAL
 EXPERIMENTS THAT EXAMINE VORTEX-
 TYPE MOTIONS THAT MAY BE EMBEDDED IN A
 FAIRLY UNIFORM BASIC CURRENT. WITH THIS
 IN MIND, TWO SYSTEMS WERE INVESTIGATED:
 A CLOSED SYSTEM CONTAINING A BALANCED
 VORTEX; A SEMIOPEN SYSTEM WITH
 EAST-WEST CYCLIC CONTINUITY CONTAINING
 A MODERATELY STRONG EASTERLY JET. THE
 RESULTS INDICATE THAT, FOR A WEAK

<100>

ATMOSPHERIC TRANSPORT

<101> CONT.

VORTEX EMBEDDED IN A TORNADO CURRENT, A 2-STEP TELESCOPE-TYPE GRID CAN BE USED IN NUMERICAL INTEGRATIONS WITH SUCCESS; THAT IS, THE INCURRED ERROR IS RELATIVELY SMALL AND THE COMPUTATION TIME AND COMPUTER MEMORY REQUIREMENTS ARE NOT EXCESSIVE. FOR AN INTERSE VORTEX, A GRATED-TYPE GRID YIELDS A RELATIVELY BETTER NUMERICAL INTEGRATION AT THE EXPENSE OF AN INCREASE IN COMPUTATION TIME.

<CLASS> PREDICTIVE

<101>

<CONT> KPEY, P. W.; LAGORANSINO, S. J.; PPEY, J. J.

<TITLE> STRATOSPHERIC CONCENTRATIONS OF CCL₃F IN 1970

<ADDR> HEALTH AND SAFETY LABORATORY

<CITY> NEW YORK

<STATE> NY

<DOC> JOURNAL GEOPHYSICAL RESEARCH, 81(9), 1557-1560, 1976

<ABST> FROM MEASURED DISTRIBUTIONS THE INVENTORY OF CCL₃F IN THE TOTAL STRATOSPHERE IN APRIL AND OCTOBER 1970 IS 0.2 Tg. ASSUMING A BOX MODEL OF ATMOSPHERIC TRANSPORT, THE OBSERVED STRATOSPHERIC INVENTORIES AGREE WITH THE MEASURED TROPOSPHERIC CONCENTRATIONS AND THE INDUSTRIAL PRODUCTION RATES WHEN THE PHOTOLYSIS HALF-LIFE OF A CCL₃F IN THE STRATOSPHERE IS 2-4 YR. THIS CORRESPONDS TO A TOTAL ATMOSPHERIC HALF-LIFE OF 15-30 YR.

<CLASS> SIMULATION

<102>

<CONT> KU, P. S.; HOY, W. C.; NSIANG, P.; SIELIGOWSKI, J. J.

<TITLE> AMBIENT EFFECT OF EVAPORATIVE COOLING TOWERS

<ADDR> CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

<CITY> NEW YORK

<STATE> NY

<DOC> BOLINSKI, E.J. (ED.), THIRD NATIONAL CONFERENCE ON ENERGY AND ENVIRONMENT, HELD IN OXFORD, OHIO, SEPTEMBER, 29, 1975

<ABST> HEAT TRANSFER OF WET COOLING TOWERS IS PRIMARILY BY EVAPORATION THUS CREATING A SATURATED PLUME. THE HEAT DISSIPATION FROM THE PLUME TO THE AMBIENT, WHICH IS THE ULTIMATE HEAT SINK, IS DESCRIBED BY MATHEMATICAL MODELS DERIVED FROM PRINCIPLES OF THERMODYNAMICS AND ATMOSPHERIC DISPERSION. PARAMETRIC ANALYSES, INCLUDING EFFECTS OF WIND STRUCTURE, TOPOGRAPHICAL FEATURES AND MOISTURE CONTENT IN THE PLUME ARE PRESENTED.

<CLASS> SIMULATION

<103>

<CONT> LAND, R. G.

<TITLE> THE APPLICATION OF K-THEORY TO DIFFUSION PROBLEMS INVOLVING NONLINEAR CHEMICAL REACTIONS

<ADDR> CALIFORNIA INSTITUTE OF TECHNOLOGY, DEPARTMENT OF CHEMICAL ENGINEERING, 1201 E. CALIFORNIA BOULEVARD

<CITY> PASADENA

<STATE> CA

<DOC> ATMOSPHERIC ENVIRONMENT, 7(3), 257-263, 1973

<ABST> A SIMPLE EXTENSION OF PRANDTL'S MIXING LENGTH THEORY IS DEVELOPED AND USED TO DERIVE A SET OF SUFFICIENT CONDITIONS FOR THE VALIDITY OF THE DIFFUSION EQUATION WHICH IS COMMONLY USED TO MODEL CHEMICALLY REACTIVE POLLUTANTS IN URBAN ATMOSPHERES. THESE CONDITIONS ARE VIOLATED IN THE VICINITY OF STRONG, LOCALIZED SOURCES SUCH AS SMOKE-STACKS AND HIGHWAYS.

<CLASS> SIMULATION

<104>

<CONT> LAND, R. G.

<TITLE> DEVELOPMENT AND TESTING OF A LAGRANGIAN APPROACH TO MIXING MODELING

<ADDR> HIRSH

<ADDR> U.S. ENVIRONMENTAL PROTECTION AGENCY, DIVISION OF METEOROLOGY

<CITY> RESEARCH TRIANGLE PARK

<STATE> NC

<ZIP> 27711

<PHONE> 919-541-8520

<DOC> EPA REPORT (IN PREPARATION)

<SUB> DISPERSION OF AIR POLLUTANTS FROM ROADWAYS

<ABST> LAGRANGIAN DIFFUSION THEORY IS COMBINED WITH EULERIAN TURBULENCE STATISTICS AND MONTE CARLO TECHNIQUES TO SIMULATE MATERIAL CONCENTRATIONS NEAR A ROADWAY.

<GEN> ANY

<TIME> ANY

<STATUS> UNDER DEVELOPMENT

<ACCESS> UNLIMITED

<MEDIA> CARDS; DISK; MAGNETIC TAPE

<SIZE> 150K BYTES

<COMP> CDC

<COPIES> IBM 370/155

<LANG> FORTRAN IV

<CLASS> DISCRETE; STOCHASTIC; SIMULATION

<APPL> ANALYSES OF THE GENERAL ROTORS

ATMOSPHERIC TRANSPORT

<100> CONT.
DISPERSION DATA

<USCPS> EPA

<SUB> METEOROLOGY AND SOURCE EMISSIONS RECORDS

<REAL> COMPARE PREDICTIONS WITH OBSERVATIONS

<105>
<CONT> LAMB, R. C.; WEIDINGER, R.

<TITLE> AN IMPROVED VERSION OF A GENERALIZED URBAN AIR POLLUTION MODEL

<ADDR> ENVIRONMENTAL PROTECTION AGENCY,
DIVISION OF METEOROLOGY

<CITY> RESEARCH TRIANGLE PARK

<STATE> NC

<ZIP> 27711

<PHONE> 919-541-0520

<DOC> ATMOSPHERIC ENVIRONMENT, 5(4), 239-264

<SUB> FIRST ORDER CHEMICAL POLLUTANTS

<ABST> THE DIFFUSION EQUATION IS USED TO DERIVE A MATHEMATICAL MODEL FOR CORRELATING THE CONCENTRATIONS OF ATMOSPHERIC POLLUTANTS RESULTING FROM SPECIFIED ARBITRARY DISTRIBUTIONS AND INTENSITIES OF POINT, FINITE LINE, AND FINITE AREA SOURCES, USING HORIZONTAL WINDS VARIABLE IN SPACE AND TIME, AND ALLOWING FOR VARIATION OF ATMOSPHERIC STABILITY, ABSORPTION AT THE GROUND, CHEMICAL REACTIONS, UPPER LEVEL INVERSIONS, AND VARIABLE DIFFUSION COEFFICIENTS. THE MODEL IS TESTED WITH RESPECT TO ITS DIFFUSION CHARACTERISTICS (IGNORING CHEMICAL REACTIONS) BY COMPUTING THE CO CONCENTRATIONS FOR EACH HOUR ON A PARTICULAR DAY AT 760 LOCATIONS IN THE LOS ANGELES BASIN. THE COMPUTED VALUES AT THE LOCATIONS OF MONITORING STATIONS AGREE REASONABLY WELL WITH OBSERVATIONS. A MORE ADVANCED VERSION OF THE DIFFUSION MODEL IS BEING DEVELOPED.

<GRD> ANY

<TIME> ANY

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> NO LONGER AVAILABLE IN COMPUTER COMPATIBLE MEDIUM

<CLAS> CONTINUOUS; DETERMINISTIC; SIMULATION

<APPL> IMPACT OF MOTOR VEHICLE EMISSIONS ON LOS ANGELES AIR QUALITY

<USERS> NONE

<SUB> METEOROLOGICAL AND POLLUTANT EMISSION RECORDS

<REAL> COMPARISON OF PREDICTIONS WITH MEASUREMENTS

<106>
<CONT> LANES, S. J.

<TITLE> A PROCEDURE TO DETERMINE THE RELATIVE EXTENT OF REACTOR FISSION PRODUCT RELEASES UNDER VARIOUS METEOROLOGICAL CONDITIONS

<ADDR> HEALTH AND SAFETY LABORATORY, NEW YORK OPERATIONS OFFICE

<CITY> NEW YORK

<STATE> NY

<DOC> HASL-140, 45 PP., 1964

<ABST> SEVERAL VERSIONS OF SWINSON'S EQUATIONS EXPRESSING THE ATMOSPHERIC CONCENTRATIONS, DOSES, ETC. DUE TO A FISSION PRODUCT RELEASE HAVE BEEN PROGRAMMED FOR SOLUTION BY AN IBM 1620 COMPUTER, AS AN AID IN EVALUATING THE EFFECTS OF POSTULATED REACTOR ACCIDENTS. IN ADDITION, EACH OF THESE EQUATIONS HAS BEEN SOLVED OVER A WIDE RANGE OF METEOROLOGICAL PARAMETERS, AND THE RESULTS GRAPHED, PROVIDING AN ILLUSTRATION OF THE EFFECTS OF CHANGES IN ONE PARAMETER OR A COMBINATION OF THEM ON THE SOLUTIONS. A PROCEDURE FOR THE APPLICATION OF THESE PROGRAMS AND GRAPHS TO THE REVIEW AND EVALUATION OF REACTOR SAFETY PROBLEMS IS PRESENTED. THE CODE HANDLES BOTH INSTANTANEOUS AND CONTINUOUS POINT SOURCES. CLOUD DEPLETION BY BOTH WET AND DRY PROCESSES ARE INCLUDED USING CHAMBERLAIN'S PROCEDURE. THE ONLY DOSE CALCULATED IS THE INHALATION DOSE TO THE THYROID.

<COMP> IBM

<CONFIG> IBM 1620

<CLAS> SIMULATION

<CON> THIS EARLY REPORT SHOULD BE READ WITH CARE AS THERE IS SOME QUESTION OF THE USE OF THE TERMS YIELD AND DOSE, AND ON THE DERIVATION OF THE THYROID DOSE EQUATION.

<107>
<CONT> LAUTZ, R. B.; COATS, K. N.; KLOPFER, C. V.

<TITLE> THREE-DIMENSIONAL NUMERICAL MODEL FOR CALCULATING THE SPREAD AND DILUTION OF AIR POLLUTANTS

<ADDR> INTERCOMP RESOURCES DEVELOPMENT AND ENGINEERING LTD.

<CITY> HOUSTON

<STATE> TX

<DOC> PROCEEDINGS OF A SYMPOSIUM ON AIR POLLUTION, TURBULENCE AND DIFFUSION (25THAP) 43-9, 1971, 1972

<ABST> A NUMERICAL MODEL IS DESCRIBED FOR CALCULATING POLLUTANT DIFFUSION FROM A SINGLE STACK OR FROM MULTIPLE SOURCES. THE TECHNIQUE INCLUDES MODIFICATION OF THE THREE-DIMENSIONAL WIND FIELD FOR FLOW OVER TOPOGRAPHIC FEATURES AND AROUND BUILDINGS. SIMPLE CHEMICAL REACTION AND REMOVAL BY GROUND ADSORPTION ARE INCLUDED IN THE MATERIAL BALANCE ON POLLUTANT.

<CLAS> PREDICTIVE

<148>

ATMOSPHERIC TRANSPORT

<148>

<CONT>

LEE, J.

<TITLE>

NUMERICAL STUDY OF WET COOLING TOWER PLUME

<DOC>

TRANSACTIONS OF THE AMERICAN NUCLEAR SOCIETY, 16, 32-33, CONF-730611--;

<CLASS>

SIMULATION

<149>

<CONT>

LEE, JIIN-LANG

<TITLE>

COOLING TOWER PLUME MODEL

<ACRO>

CTPH

<ADDR>

ARGONNE NATIONAL LABORATORY, ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION, 9700 S. CASS AVE.

<CITY>

ARGONNE

<STATE>

IL

<ZIP>

60439

<PHONE>

PTS 972-7633

<DOC>

J. LEE, POTENTIAL WEATHER MODIFICATION FROM COOLING TOWER EFFLUENTS AT CONCEPTUAL POWER PLANTS, ATMOSPHERIC ENVIRONMENT, VOLUME 11, 749-759. PERGAMON PRESS 1977.

<SUB>

ENVIRONMENTAL STUDIES

<ABST>

A ONE DIMENSIONAL STEADY-STATE NUMERICAL MODEL IS DEVELOPED FOR PREDICTING COOLING TOWER PLUME BEHAVIOR AND THE ASSOCIATED INDUCED CONVECTIVE CLOUDS. THE SYSTEM IS DESCRIBED BY THE EQUATION OF MOTION FOR A QUASI-INCOMPRESSIBLE FLUID DERIVED FROM THE LAWS GOVERNING THE CHANGE OF MOMENTUM, THE FIRST LAW OF THERMODYNAMICS, AND THE CONSERVATION OF MASS. THE PERTURBED PRESSURE FIELD IS NEGLECTED WITH THE ASSUMPTION THAT THE CONVECTION IS SHALLOW, AND THAT THE BOUSSINESQ APPROXIMATION IS VALID. THE MICROPHYSICAL PROCESSES ARE PARAMETERIZED ACCORDING TO THE WORK OF KESSLER WITH THE DROP SIZE DISTRIBUTION TAKING FROM MEASUREMENTS IN COOLING TOWER PLUMES. THE MODEL HAS BEEN USED FOR ENVIRONMENTAL IMPACT STUDY, AND VALIDATED WITH OPERATING COOLING TOWERS AT EXISTING POWER PLANTS UP TO 3000 MWE CAPACITY. REQUIRED INPUT DATA ARE AMBIENT METEOROLOGICAL SOUNDING AND COOLING TOWER EFFLUENT CONDITIONS (EXIT VELOCITY, TEMPERATURE, RELATIVE HUMIDITY, AND DIAMETER). THE PROGRAM OUTPUT GIVES PLUME VELOCITY, TEMPERATURE, MIXING RATIO, CLOUD AND HYGROMETER WATER CONTENTS, AND PLUME SIZE AT EVERY FINITE GRID INTERVAL, TOGETHER WITH GROUND LEVEL PRECIPITATION RATES AT VARIOUS DISTANCES DOWNWIND.

<STATUS>

IN USE

<ACCESS>

LIMITED

<MEDIA>

PUNCHED CARDS

<SIZE>

1200 RECORDS EACH 80 BYTES LONG

<COMP>

IBM

<CONFIG>

IBM 370/195 OS/WT SYSTEM WITH 150K CORE

<LANG>

FORTRAN

<CHAR>

EBCDIC

<ALGO>

DISCRETE FINITE DIFFERENCE COMPUTATION IN SPACE

<CLASS>

DISCRETE; DETERMINISTIC; PREDICTIVE; SIMULATION

<APPL>

TO STUDY THE BEHAVIOR OF A COOLING TOWER PLUME AND TO ASSESS THE ENVIRONMENTAL EFFECTS RESULTING FROM COOLING TOWER EFFLUENTS.

<USERS>

ARGONNE NATIONAL LABORATORY

<SRD>

MANY ENVIRONMENTAL REPORTS OF NUCLEAR AND FOSSIL-FUELED POWER PLANTS

<RYAL>

THE MODEL PREDICTIONS HAVE BEEN COMPARED WITH FIELD OBSERVATIONS FOR NATURAL DRAFT WET COOLING TOWERS AT THE WEYSTONE POWER PLANT IN PENNSYLVANIA, THE PARADISE PLANT IN KENTUCKY, AND THE JOHN E. AMOS PLANT IN W. VIRGINIA. THE CORRELATION COEFFICIENTS BETWEEN PREDICTED AND OBSERVED PLUME RISE OF THE ABOVE COMPARISONS ARE RANGING FROM 0.91 TO 0.96.

<CON>

THE MODEL CAN BE USED TO STUDY FOR EITHER THE WET OR THE DRY COOLING TOWER PLUMES. IT CAN ALSO BE USED TO PREDICT PRECIPITATION FROM A WET COOLING TOWER DRIFT OR PRECIPITATION OF INDUCED CONVECTIVE CLOUDS FROM EITHER WET OR DRY COOLING TOWERS.

<UPDATE>

700703

<150>

<CONT>

LEE, JIIN-LANG

<TITLE>

NATURAL DRAFT COOLING TOWER PERFORMANCE

<ACRO>

WTUP

<ADDR>

ARGONNE NATIONAL LABORATORY, ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION, 9700 S. CASS AVE.

<CITY>

ARGONNE

<STATE>

IL

<ZIP>

60439

<PHONE>

PTS 972-7633

<SOURCE>

DR. LARRY D. WINIARSKI (503-752-8211 EXT. 370), EPA-WERC, 200 SW 35TH STREET, CORVALLIS, OR 97330

<DOC>

WINIARSKI, L. D., TICHENOR, B. A., DYER, K. V., A METHOD FOR PREDICTING THE PERFORMANCE OF NATURAL DRAFT COOLING TOWERS, EPA WQO PROJECT #16130 GWT.

<SUB>

ENVIRONMENTAL STUDIES

<ABST>

THE MODEL USES A METHOD FOR ANALYZING THE PERFORMANCE OF COUNTERFLOW AND CROSSFLOW NATURAL DRAFT COOLING TOWERS DEVELOPED BY EPA WQO. IT IS CAPABLE OF YIELDING RELIABLE PREDICTIONS OF COOLING TOWER PERFORMANCE AT RELATIVELY LOW COST, AND CAN BE USED TO GENERATE PERFORMANCE DATA REQUIRED FOR INPUT TO CTPH (COOLING TOWER PLUME MODEL).

ATMOSPHERIC TRANSPORT

<150> CONT.

REQUIRED INPUT DATA FOR THE CODE ARE DESIGN DRY BULB AND WET BULB TEMPERATURES, DESIGN RELATIVE HUMIDITY, DESIGN HOT WATER TEMPERATURE, COOLING RANGE, COOLING WATER FLOW RATE, AMBIENT WET BULB TEMPERATURE, AND AMBIENT RELATIVE HUMIDITY. THE PROGRAM OUTPUT GIVES TOWER HEIGHT AND TOWER DIAMETER AT PACKING, AND HOT AND COLD WATER TEMPERATURES, EXIT AIR DRY BULB TEMPERATURE AND RELATIVE HUMIDITY, AND EXIT VOLUMETRIC FLOW RATE OF AIR FOR A GIVEN AMBIENT CONDITION (OFF DESIGN CONDITION).

<STATUS> IN USE
 <ACCESS> UNLIMITED
 <MEDIA> PUNCHED CARDS
 <SIZE> 500 RECORDS EACH 80 BYTES LONG
 <COMP> IBM
 <CONFIG> IBM 370/195 OS/VS1 SYSTEM WITH 150K
 <LANG> FORTRAN
 <CHAR> EBCDIC
 <ALGO> EXTRAPOLATED INTEGRATION AND ITERATION
 <CLASS> DISCRETE; ANALYTICAL; PREDICTIVE; INTEGRATIVE
 <APPL> TO GENERATE GENERIC PERFORMANCE DATA FOR A NATURAL DRAFT COOLING TOWER SYSTEM WHEN DATA ARE NOT AVAILABLE FROM TOWER MANUFACTURER.
 <USERS> ENVIRONMENTAL PROTECTION AGENCY; DEPARTMENT OF ENERGY
 <SRD> TO GENERATE COOLING TOWER PERFORMANCE DATA REQUIRED FOR INPUT TO CTRN (COOLING TOWER PLUME MODEL).
 <NVAL> THE MODEL HAS BEEN CALIBRATED WITH SEVEN SETS OF VENDOR PERFORMANCE DATA FOR NATURAL DRAFT COOLING TOWERS WHICH INCLUDE THOSE AT FERNI 2, ANCILOTE, PERRY AND STD SITES BY HARLEY, MSP-TYRONE BY MCCOYNE, AND DAVIS-BESSE AND SOMERSET SITES BY RESEARCH-COTTELL.
 <UPDATE> 780703

<151>
 <CONT> LEONARD, ELLEN H.
 <TITLE> CLIMATOLOGICAL DISPERSION MODEL
 <ACRO> CEN
 <ADDR> LOS ALAMOS SCIENTIFIC LABORATORY, GROUP 5-2, MS-606, P.O. BOX 1663
 <CITY> LOS ALAMOS
 <STATE> NM
 <ZIP> 87545
 <PHONE> 505-667-7800; FTS 843-7800
 <SOURCE> EPA
 <DOC> NONE
 <SUB> CALCULATION OF AIR POLLUTANT CONCENTRATIONS FROM A GIVEN NUMBER OF

POINT SOURCES

<ABST> THE MODEL CALCULATES CONCENTRATIONS OF SPECIFIED CONSERVATIVE POLLUTANTS AT SPECIFIED RECEPTION LOCATIONS FROM A GIVEN NUMBER OF SOURCES. THE MODEL USES TURNER DISPERSION RELATIONSHIPS AND BRIGGS PLUME RISE FORMULAS. THE MODEL CAN BE USED EITHER FOR SHORT TERM PERIODS ON THE ORDER OF ONE HOUR, OR FOR PERIODS AS LONG AS ONE YEAR. ALSO, IT IS A FLAT TERRAIN MODEL.
 <STATUS> IN USE
 <ACCESS> UNLIMITED
 <MEDIA> DISC; PUNCHED CARDS
 <COMP> CDC
 <CONFIG> CDC 6600 WITH NOS OPERATING SYSTEM
 <LANG> FORTRAN
 <ALGO> GAUSSIAN DISPERSION MODEL
 <CLASS> CONTINUOUS; DETERMINISTIC; PREDICTIVE; SIMULATION
 <APPL> AIR POLLUTION CONCENTRATIONS PRODUCED BY COAL FIRED POWER PLANTS
 <USERS> LASL; NEW MEXICO EIA
 <SRD> NATIONAL CLIMATIC CENTER (STAR) DATA
 <NVAL> EPA STUDIES FOR VALIDATION PURPOSES
 <CON> THE INPUT IS COMPATIBLE WITH THE NATIONAL CLIMATIC CENTER STAR DATA SET.

<152>
 <CONT> LEONARD, ELLEN H.
 <TITLE> SHORT TERM DISPERSION MODELS
 <ACRO> UNHRA
 <ADDR> LOS ALAMOS SCIENTIFIC LABORATORY, GROUP 5-2, MS-606, P.O. BOX 1663
 <CITY> LOS ALAMOS
 <STATE> NM
 <ZIP> 87545
 <PHONE> 505-667-7800; FTS 843-7800
 <SOURCE> EPA
 <SUB> SHORT TERM AIR DISPERSION MODEL
 <ABST> UNIHAPS IS A GAUSSIAN DISPERSION MODEL WHICH TREATS SHORT TERM AIR DISPERSION AS DESCRIBED IN THE TURNER WORKBOOK. SITUATIONS TREATED INCLUDE INVERSION BREAKUP, LIMITED MIXING, AND CONING. IT ALSO USES BRIGGS PLUME RISE. IT IS DESIGNED FOR ESTIMATION OF AIR DISPERSION FROM POINT SOURCES.
 <STATUS> IN USE
 <ACCESS> UNLIMITED
 <MEDIA> DISC; PUNCHED CARDS
 <COMP> CDC
 <CONFIG> CDC 6600 WITH NOS OPERATING SYSTEM

<152>

ATMOSPHERIC TRANSPORT

<152> CONT.

<LANG> FORTRAN

<ALGO> GAUSSIAN DISPERSION MODEL

<CLAS> CONTINUOUS; DETERMINISTIC; PREDICTIVE; SIMULATION

<APPL> AIR POLLUTION CONCENTRATIONS PRODUCED BY COAL FIRED POWER PLANTS; OIL SHALE AND COAL GASIFICATION

<USERS> EASE

<SRD> USED SPECIFIED

<REAL> EPA

<UPDATE> 780405

<153>

<CONT> LEWELLEN, W. S.

<TITLE> SECOND ORDER TURBULENCE MODEL FOR ATMOSPHERIC POLLUTANT DISPERSION

<ADDP> AERONAUTICAL RESEARCH ASSOCIATES OF PRINCETON INC., P.O. BOX 2229, 50 WASHINGTON RD.

<CITY> PRINCETON

<STATE> NJ

<ZIP> 08540

<PHONE> 609-452-2950; FTS 403-2000

<DOC> OTT, W. D. (ED.), PROCEEDINGS OF THE EPA CONFERENCE ON ENVIRONMENTAL MODELING AND SIMULATION, 1976, EPA 600/9-76-014, (P. 710-718), 847 PP.

<SUB> IMPACTS OF POLLUTANT RELEASE ON AIR QUALITY

<ABST> THE MODEL CALCULATES TURBULENT DIFFUSION OF PLUMES IN THE PLANETARY BOUNDARY LAYER BASED ON DONALDSON'S SECOND ORDER CLOSURE APPROACH TO TURBULENT FLOWS. THE MODEL CALLS FOR SOLVING DYNAMIC, PARTIAL DIFFERENTIAL EQUATIONS FOR THE SPECIES FLUX, VARIANCE, AND ITS MEAN CONCENTRATION, AS WELL AS THE SECOND-ORDER TURBULENT VELOCITY AND TEMPERATURE CORRELATIONS TO DETERMINE THE TURBULENCE IN THE AMBIENT ATMOSPHERIC BOUNDARY LAYER IN WHICH THE PLUME IS EMBEDDED. THE MODEL IS CAPABLE OF MAKING CALCULATIONS FOR INDIVIDUAL, NEUTRALLY BUOYANT, NONREACTIVE PLUMES.

<CLAS> PREDICTIVE

<UPDATE> 780725

<154>

<CONT> LEWELLEN, W. S.; TESKE, R. E.

<TITLE> INVARIANT MODEL OF ATMOSPHERIC BOUNDARY LAYER DIFFUSION

<ADDP> AERONAUTICAL RESEARCH ASSOCIATES OF PRINCETON, INC., 50 WASHINGTON RD., P.O. BOX 2229

<CITY> PRINCETON

<STATE> NJ

<ZIP> 08540

<PHONE> 609-452-2950

<DOC> REPORT NO. ARAAP-149; MONITORING AGENCY REPT. NO. 1490-1149, CONTRACT EPA-68-02-0018, OCT. 71, 64 PP.; U.S. LEWELLEN AND R.E. TESKE, SECOND-ORDER CLOSURE MODELING OF DIFFUSION IN THE ATMOSPHERIC BOUNDARY LAYER, JOURNAL BOUNDARY-LAYER METEOROLOGY, 10, 49-90, 1976; U.S. LEWELLEN AND R.E. TESKE, PREDICTION OF THE ROBINSON-SIMPSON SIMILARITY FUNCTIONS FROM AN INVARIANT MODEL OF TURBULENCE, JOURNAL ATMOSPHERIC SCIENCES, 30, 1340-1345, 1973; U.S. LEWELLEN, USE OF INVARIANT MODELING, IN HANDBOOK OF TURBULENCE, VOL. 1, PP. 237-80, 1977; R.E. TESKE, U.S. LEWELLEN AND R. SEGUR, TURBULENCE MODELING APPLIED TO BUOYANT PLUMES, PREPARED FOR ENVIRONMENTAL PROTECTION AGENCY, A.R.A.P. REPORT NO. 303, 1977; E.A. OLIVER, U.S. LEWELLEN, G.C. WILLIAMSON, THE INTERACTION BETWEEN TURBULENT AND RADIATIVE TRANSPORT IN THE DEVELOPMENT OF FOG AND LOW-LEVEL STRATUS, JOURNAL ATMOSPHERIC SCIENCES, 35, 301-316, 1978.

<SUB> TURBULENT TRANSPORT OF MASS, MOMENTUM AND ENERGY IN THE ATMOSPHERIC BOUNDARY LAYER

<ABST> A COMPUTER MODEL OF TURBULENT DIFFUSION IN THE PLANETARY BOUNDARY LAYER HAS BEEN DEVELOPED BASED ON SECOND-ORDER CLOSURE MODELING OF THE TURBULENT CORRELATIONS. COMPARISON OF THE MODEL PREDICTIONS WITH FIELD AND LABORATORY OBSERVATIONS OF DIFFUSION UNDER A NUMBER OF DIFFERENT CONDITIONS IS GOOD. THE MODEL HAS BEEN DEVELOPED IN THE FOLLOWING VERSIONS: A ONE-DIMENSIONAL, UNSTEADY VERSION WHICH PREDICTS THE SPATIALLY AVERAGED DISTRIBUTIONS OF WIND, TEMPERATURE, HUMIDITY AND THE SECOND-ORDER CORRELATIONS OF THE FLUCTUATIONS IN THESE VARIABLES, WHEN SURFACE AND UPPER LEVEL BOUNDARY CONDITIONS ARE GIVEN AS A FUNCTION OF TIME; A TWO-DIMENSIONAL, UNSTEADY VERSION FOR CONDITIONS WHEN IT IS APPROPRIATE TO AVERAGE ACROSS ONE HORIZONTAL DIMENSION SUCH AS ALONG A SHORE LINE; AND PLUME DISPERSAL VERSIONS FOR BOTH POINT AND LINE SOURCES.

<STATUS> UNDER DEVELOPMENT; IN USE

<ACCESS> LIMITED

<MEDIA> DISK

<SIZE> 4000 CARDS

<COMP> DEC

<CONFIG> PDP 11/70

<LANG> FORTRAN

<CHAR> ASCII

<ALGO> CRANK-NICKELSON IMPLICIT TECHNIQUE

<CLAS> SIMULATION; PREDICTIVE

<APPL> PREDICTION OF LOW-LEVEL WIND, TEMPERATURE, HUMIDITY, AND SO2

<USERS> U.S. NAVY; ELECTRIC POWER RESEARCH INSTITUTE; NASA; NUCLEAR REGULATORY COMMISSION;

ATMOSPHERIC TRANSPORT

<154> CONF.

<UPDATE> 70C707

<155>

<CONF> LIU, C. Y.; AGOPIAN, K. G.

<TITLE> MODEL FOR FLUID MECHANICAL STUDIES OF AIR POLLUTION

<ADDR> UNIVERSITY OF CALIFORNIA

<CITY> LOS ANGELES

<STATE> CA

<DOC> RAPPAPORT, E.S. (ED.), PROCEEDINGS FIRST INTERNATIONAL MEETING ON POLLUTION, HELD IN TEL AVIV, ISRAEL, JUNE 12, 1977

<ABST> A SIMPLE MODEL SUITABLE FOR FLUID MECHANICAL STUDIES OF POLLUTANTS DISTRIBUTION IN THE ATMOSPHERE IS CONSTRUCTED, AND IT IS VERIFIED AGAINST SEVERAL SETS OF EXPERIMENTAL DATA. THE MODEL IS SHOWN CAPABLE OF PREDICTING THE BEHAVIOR OF KEY POLLUTANTS. TWO LIMITING CASES EQUIVALENT TO A "STATIC" AND A "CONVECTIVE" SMOG CHAMBER, ARE EXAMINED; THEIR RESULTS SET THE UPPER AND LOWER BOUNDS OF THE POLLUTANTS LEVELS. THE "STATIC" MODEL GIVES GOOD AGREEMENT FOR HYDROCARBONS AND OXIDES OF NITROGEN LEVELS BUT OVERESTIMATES THE OZONE LEVEL. THE "CONVECTIVE" VERSION GIVES GOOD AGREEMENT FOR THE OZONE LEVEL, WHILE UNDERESTIMATING THE HYDROCARBON AND OXIDES OF NITROGEN LEVELS. APPLICATIONS OF THE MODEL TO THE FORMULATION OF SINKER SCALING LAWS AND THE EVALUATION OF VEHICLE ENGINES ARE ALSO PERFORMED. THE MODEL AT ITS PRESENT STAGE OF DEVELOPMENT IS PERHAPS TOO SIMPLE TO DESCRIBE ALL RELEVANT CHEMICAL SPECIES IN THE LOWER ATMOSPHERE, YET IT IDENTIFIES THE IMPORTANCE OF THE PROBLEM AS BEING A CHEMICAL ONE. THE NEXT TASK SHOULD BE THE VERIFICATION OF THE MODEL FOR THE PREDICTION OF POLLUTANTS DISTRIBUTION INCLUDING ALL TRANSFER PROCESSES.

<CLAS> SIMULATION

<156>

<CONF> LIU, C. Y.; GOODIN, W. B.

<TITLE> TWO-DIMENSIONAL MODEL FOR THE TRANSPORT OF POLLUTANTS IN AN URBAN BASIN

<ADDR> UNIVERSITY OF CALIFORNIA

<CITY> LOS ANGELES

<STATE> CA

<DOC> ATMOSPHERIC ENVIRONMENT, 10(7), 513-526, 1976

<ABST> THE DISTRIBUTION OF AN INERT CHEMICAL SPECIES, CARBON MONOXIDE (CO), EMITTED MAINLY FROM AUTOMOBILE EXHAUST IS INVESTIGATED. THE TRANSPORT MODEL, IN ANALOGY WITH THE SHALLOW WATER THEORY IN FLUID DYNAMICS, CONSIDERS VARIATION OF ALL PHYSICAL QUANTITIES IN THE HORIZONTAL DIRECTION BELOW THE TEMPERATURE INVERSION LAYER. POLLUTANTS ARE FOUND TO BE CARRIED PRIMARILY BY THE WIND; TURBULENT DIFFUSION IS A

NORMAL DAY PLAYS ONLY A MINOR ROLE. THE CONCENTRATION OF CO PREDICTED BY THE PRESENT MODEL FOR THE ENTIRE LOS ANGELES BASIN IS COMPARED WITH OBSERVED DATA AT NINE STATIONS. ACCURACY OF FOUR DIFFERENT NUMERICAL SCHEMES, THE EFFECT OF TURBULENT DIFFUSIVITY, AND THE SOURCE STRENGTHS ARE EXAMINED.

<CLAS> SIMULATION

<157>

<CONF> LIU, HEI-KAO

<TITLE> GRID MODEL FOR URBAN AIR POLLUTION

<ADDR> SYSTEMS APPLICATIONS, INC., 950 MORTGATE DR.

<CITY> SAN RAFAEL

<STATE> CA

<ZIP> 94903

<DOC> ATMOSPHERIC ENVIRONMENT, 9, 555-570, 1975

<SUB> URBAN AIR POLLUTION

<ABST> A DYNAMIC URBAN AIR POLLUTION MODEL IS DISCUSSED WHICH EMPLOYS A COORDINATE SYSTEM FIXED WITH RESPECT TO THE GROUND. THE MODEL IS BASED ON THE ATMOSPHERIC DIFFUSION EQUATION AS THE ESSENTIAL DESCRIPTION OF TURBULENT ADVECTION AND DIFFUSION. THE PRIMARY ERRORS IN THE GRID MODEL ARE THOSE ATTRIBUTED TO FINITE-DIFFERENCE APPROXIMATIONS.

<GEN> URBAN AREAS

<CLAS> SIMULATION

<UPDATE> 700803

<158>

<CONF> LIU, HEI-KAO; DURRAN, D.; RUMBLE, P.; YOCKE, MARK A.; ANES, J.

<TITLE> THE CHEMISTRY, DISPERSION, AND TRANSPORT OF AIR POLLUTANTS EMITTED FROM FOSSIL FUEL POWER PLANTS IN CALIFORNIA: DATA ANALYSIS AND EMISSION IMPACT MODEL

<ACPO> BPP; BPR; PDN

<ADDR> SYSTEMS APPLICATIONS, INC., 950 MORTGATE DRIVE

<CITY> SAN RAFAEL

<STATE> CA

<DOC> PB--264822, 1976

<ABST> THE CALIFORNIA AIR RESOURCES BOARD SPONSORED A MONITORING AND ANALYSIS PROGRAM TO STUDY THE EFFECTS ON AIR QUALITY OF USING HIGH-SULFUR FUELS IN POWER PLANTS. AS A PART OF THIS EFFORT, THREE MATHEMATICAL MODELS WERE DEVELOPED. THE REACTIVE PLUME MODEL (RPP), ADOPTING A TRAJECTORY APPROACH, ACCOMMODATES VARIATIONS IN WIND SPEED, PLUME SPREAD, AND AMBIENT CONCENTRATIONS. A KINETIC MECHANISM WAS USED TO DESCRIBE GAS-PHASE REACTIONS BETWEEN NOX, SOX, AND HYDROCARBONS. THE

<150>

ATMOSPHERIC TRANSPORT

<150> CONT.

BUOYANT PLUME MODEL (BPM) PREDICTS PLUME RISE AND EFFLUENT DISPERSION NEAR THE STACK. IT INVOKES THE HAVIER-STOKES EQUATION WITH THE ROUSSIERSE APPROXIMATION, AND ALLOWS FOR PLUME-GENERATED TURBULENT DIFFUSION. THE PLUME DISPERSION MODEL (PDM) SIMULATES POLLUTANT DISTRIBUTIONS FAR DOWNWIND. PLI SOLVES THE THREE-DIMENSIONAL ATMOSPHERIC DIFFUSION EQUATION, AND INCORPORATES VARIATIONS IN WIND SPEEDS.

<CLAS> PREDICTIVE

<159>

<CONT> LIU, HUI-KAO; MYERS, TOM

<TITLE> LAND-SEA BREEZE MODEL

<ADDR> SYSTEMS APPLICATIONS INC., 950 MONTGATE DRIVE

<CITY> SAN RAFAEL

<STATE> CA

<ZIP> 94903

<PHONE> 415-472-8011

<SOURCE> SYSTEMS APPLICATIONS, INC.

<DOC> LIU, HUI-KAO, ET AL., ASSESSMENT OF THE FEASIBILITY OF MODELING WIND FIELDS RELEVANT TO THE SPREAD OF BUSH FIRES, P78-15, 23 DECEMBER 1974; LIU, HUI-KAO, T.C. MYERS, AND J.L. MCLEOD, MATHEMATICAL SIMULATION OF LAND AND SEA BREEZES IN THE TAMPA-ST. PETERSBURG AREA, IN PROCEEDINGS OF THE SUMMER COASTAL SIMULATION CONFERENCE, JULY 24-26, 1978.

<SUB> MODEL FOR SIMULATING THERMALLY INDUCED WIND FLOW.

<ABST> THE LAND-SEA BREEZE MODEL IS A PREDICTIVE MODEL FOR SIMULATING THE EFFECT ON LOCAL AIR CIRCULATION OF TEMPERATURE GRADIENTS WHICH ARE THE RESULT OF DIFFERENCES IN TEMPERATURE BETWEEN NEIGHBORING BODIES OF WATER AND LAND MASSES. MODEL EQUATIONS ARE BASED ON THE EQUATIONS OF MOTION, CONSERVATION OF MASS AND ENERGY, THE PERFECT GAS LAW AND THE HYDROSTATIC APPROXIMATION.

<GRD> COASTAL AREAS TEMPERATURE GRADIENTS

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE

<SIZE> 2500 CARDS

<COMP> CDC

<CONFIG> CDC 7600 WITH ONE TAPE DRIVE PORTRAH IV

<ALGO> UPSTREAM AND CENTRAL FINITE DIFFERENCING SCHEMES.

<CLAS> PREDICTIVE; SIMULATION

<APPL> SIMULATING WIND FIELDS IN LOS ANGELES, CALIFORNIA AND TAMPA, FLORIDA.

<USERS> SYSTEMS APPLICATIONS, INC.

<SYNO> METEOROLOGICAL DATA

<CHAL> LOS ANGELES, CALIFORNIA; TAMPA, FLORIDA

<UPDATE> 780811

<MO>

<CONT> LIU, HUI-KAO; MOY, PHILLIP R.

<TITLE> URBAN AIR SHED PHOTOCHEMICAL SIMULATION MODEL STUDY: MICROSCALE MODEL OF LOCAL VEHICULAR CONTRIBUTIONS TO MEASURED POLLUTANT CONCENTRATIONS

<ADDR> SYSTEMS APPLICATIONS

<CITY> SAN RAFAEL

<STATE> CA

<DOC> HTIS PD-234 976 (49) SPECIAL REPORT, 1973

<ABST> TO ESTABLISH A BASIS FOR VALIDATION OF AN URBAN AIRSHED MODEL BASED ON A MICROSCALE GRID, A SUB-CLOUD, OR MICROSCALE, A MODEL WAS UNDERTAKEN CAPABLE OF PREDICTING THE ELEVATION IN CONCENTRATION AT THE MONITORING STATION, ABOVE BACKGROUND LEVELS, THAT IS CONTRIBUTED BY LOCAL AUTOMOTIVE EMISSIONS. THE DEVELOPMENT AND VALIDATION OF A SIMPLE DIFFUSION MODEL FOR CARBON MONOXIDE TO INVESTIGATE THE FEASIBILITY OF MODELING AT TWO SPATIAL SCALES IS DESCRIBED. LIMITED RESULTS ARE REPORTED FOR FOUR LOS ANGELES COUNTY STATIONS. PREVIOUS EFFORTS IN MEASURING AND PREDICTING LOCAL VARIATIONS IN CONCENTRATIONS DUE TO NEARBY SOURCES WERE REVIEWED. A GENERAL DESCRIPTION OF THE MODEL IS GIVEN, DETAILS OF ITS FORMULATION FOR APPLICATION IN THE VICINITY OF LOW STRUCTURES ARE DISCUSSED, AND GRAPHS ARE PRESENTED THAT DISPLAY THE RELATIONSHIP BETWEEN THE MAGNITUDE OF CONCENTRATION ELEVATION AND THE DISTANCE OF THE SAMPLING PROBE FROM THE STREET, THE SPEED AND DIRECTION OF THE LOCAL WIND, AND THE MAGNITUDE OF THE LOCAL TURBULENT EDDY DIFFUSIVITY.

<CLAS> SIMULATION

<161>

<CONT> LIU, HUI-KAO; STEWART, DOUGLAS

<TITLE> REACTIVE PLUME MODEL, VERSION 1

<ACRO> BPM-1

<ADDR> SYSTEMS APPLICATIONS INC, 950 MONTGATE DRIVE

<CITY> SAN RAFAEL

<STATE> CA

<ZIP> 94903

<PHONE> 415-472-8011

<SOURCE> SYSTEMS APPLICATIONS, INC.

<DOC> LIU, H.K., D. BURMAN, P. HENDERSON, R. YOCKE, AND J. ABES, 1976, THE CHEMISTRY, DISPERSION, AND TRANSPORT OF AIR POLLUTANTS EMITTED FROM FOSSIL FUEL POWER PLANTS IN CALIFORNIA: DATA

ATMOSPHERIC TRANSPORT

<161> CONT.
ANALYSIS AND EMISSION IMPACT MODEL,
REPORT BY M-100, SYSTEMS APPLICATIONS,
INC.

<SUB> CHEMISTRY OF REACTIVE POLLUTANT
RELEASED FROM POINT SOURCE

<ABST> EPSTEIN IS A REACTIVE PLUME MODEL
DEVELOPED TO SIMULATE THE BEHAVIOR OF
REACTIVE POLLUTANTS IN A PLUME FROM A
SINGLE POINT SOURCE. THIS MODEL IS A
MOVING PARCEL MODEL BASED ON SIMPLE
MASS BALANCE FOR EACH POLLUTANT SPECIES
WITHIN A SINGLE WELL-MIXED BOX. IT
TREATS CHEMICAL REACTIONS USING A
DETAILED KINETIC MODULE (THE
CARBON-BOND MECHANISM). PROVISIONS ARE
MADE FOR THE MODEL TO ACCOMMODATE
VARIATIONS IN METEOROLOGICAL CONDITIONS
AND AMBIENT POLLUTANT CONCENTRATIONS.

<GEN> USER SPECIFIED

<TIME> USER SPECIFIED

<STATUS> IN USE

<ACCESS> LIMITED

<MEDIA> PUNCHED CARDS

<SIZE> 2000 CARDS

<COMP> CDC

<CONFIG> CDC 7600 WITH 66 K CORE (OCTAL)

<LANG> FORTRAN IV

<CHAP> BCC

<ALGO> GEAR PACKAGE FOR SOLUTION OF STIFF
SYSTEMS OF ORDINARY DIFFERENTIAL
EQUATIONS. ALGORITHM APPLIED TO SET OF
MASS BALANCE EQUATIONS FOR ALL SPECIES.

<CLAS> SIMULATION

<APPL> ANALYSIS OF IMPACT ON ENVIRONMENT FROM
SINGLE POINT SOURCES

<USERS> ERIK; CALIFORNIA STATE AIR RESOURCES
BOARD; SYSTEMS APPLICATIONS, INC.

<SUB> FIELD MEASUREMENTS

<EVAL> COMPARISON OF MODEL SIMULATIONS TO
FIELD OBSERVATIONS AND SHOT CHANGED
EXPERIMENTS. SENSITIVITY ANALYSES HAVE
BEEN PERFORMED WITH VARYING MAGNITUDES
OF AMBIENT HYDROCARBON CONCENTRATIONS,
PHOTOLYSIS RATES, EMISSION INVENTORIES,
PLUME DISPERSION CHARACTERISTICS, AND
METEOROLOGICAL CONDITIONS.

<CON> BCCB

<UPDATE> 780912

<162>
<CONT> LIU, HSI-KAO; STEWART, DOUGLAS

<TITLE> REACTIVE PLUME MODEL, VERSION 2

<ACRO> RPH-II

<ACRD> SYSTEMS APPLICATIONS INC., 950
PORTSMOUTH DRIVE

<CTTY> SAN RAPHAEL

<STATE> CA

<ZIP> 94903

<PHONE> 415-472-0011

<SOURCE> SYSTEMS APPLICATIONS, INC.

<DOC> LIU, H.K., D.A. STEWART, AND P.R. BOTH,
AN IMPROVED VERSION OF THE REACTIVE
PLUME MODEL (RPH-II), IN: TECHNICAL
MEETING ON AIR POLLUTION MODELING AND
ITS APPLICATION, HELD IN TORONTO,
CANADA, 1978

<SUB> CHEMISTRY OF REACTIVE POLLUTANT
RELEASED FROM POINT SOURCE

<ABST> THIS MODEL IS AN EXPANDED FORM OF
RPH-I. THE PLUME IS VISUALIZED AS AN
ARRAY OF CELLS ORIENTED ACROSS THE
PLUME MOVING DOWNSTREAM WITH WIND
VELOCITY. BOUNDARIES BETWEEN CELLS ARE
IMPERMEABLE TO INERT SPECIES BUT
PERMEABLE TO REACTIVE SPECIES.
DIFFUSION BETWEEN CELLS IS
PARAMETERIZED BY AN EQUIVALENT
K-THEORY. CHEMICAL REACTIONS ARE
TREATED IN THE SAME MANNER AS THE
RPH-I (CARBON-BOND MECHANISM).
PROVISIONS ARE MADE FOR THE
ACCOMMODATION OF VARIABLE
METEOROLOGICAL CONDITIONS AND AMBIENT
POLLUTANT CONCENTRATIONS.

<GEN> USER SPECIFIED

<TIME> USER SPECIFIED

<STATUS> DEVELOPMENTAL STAGE

<ACCESS> LIMITED

<MEDIA> PUNCHED CARDS

<SIZE> 2500 CARDS

<COMP> CDC

<CONFIG> CDC 7600 122 K SMALL CORE (OCTAL); CDC
7600 77 K LARGE CORE (OCTAL)

<LANG> FORTRAN IV

<CHAP> BCC

<ALGO> GEAR PACKAGE FOR SOLUTION OF STILL
SYSTEMS OF ORDINARY DIFFERENTIAL
EQUATIONS. ALGORITHM APPLIED TO SET OF
MASS BALANCE EQUATIONS FOR ALL SPECIES.

<CLAS> SIMULATION

<APPL> NONE AT THIS TIME

<USERS> ERIK

<SUB> FIELD MEASUREMENTS

<EVAL> COMPARISON OF MODEL SIMULATIONS TO
FIELD OBSERVATIONS. NO SENSITIVITY
TESTS HAVE BEEN PERFORMED AT THIS TIME.

<CON> NONE

<UPDATE> 780912

<163>
<CONT> LIU, HSI-KAO; STEWART, DOUGLAS

<TITLE> POINT SOURCE PLUME MODEL

<ACRO> RPH

<163>

ATMOSPHERIC TRANSPORT

<163> CONT.
 <ADDR> SYSTEMS APPLICATIONS INC.
 <CITY> SAN RAFAEL
 <STATE> CA
 <ZIP> 94903
 <PHONE> 415-472-0011
 <SOURCE> SYSTEMS APPLICATIONS, INC.
 <DOC> LIU, R.K., D. DUBBAG, P. RUDAKOV, R. YOCHE AND J. AMES, THE CHEMISTRY DISPERSION, AND TRANSPORT OF AIR POLLUTANTS EMITTED FROM FOSSIL FUEL POWER PLANTS IN CALIFORNIA: DATA ANALYSIS AND EMISSION IMPACT MODEL, REPORT EP 76-100, 1976.
 <SUB> PLUME RISE FROM POINT SOURCE
 <ABST> BUOYANT PLUME IS A 2-DIMENSIONAL GRID MODEL WHICH SIMULATES THE RISE OF BUOYANT GASES FROM A POINT SOURCE. INITIALIZATION OF THE MODEL IS ACCOMPLISHED BY AN ENTRAINMENT MODEL SIMILAR TO THAT USED BY HOUTON, TAYLOR, AND TURNER. THE MODEL IS CAPABLE OF SIMULATING PLUME RISE UNDER ANY ARBITRARY THERMAL AND WIND STRUCTURE OF THE ATMOSPHERE.
 <GEO> USER SPECIFIED
 <TIME> USER SPECIFIED
 <STATUS> DEVELOPMENTAL STAGE
 <ACCESS> LIMITED
 <MEDIA> PUNCHED CARDS
 <SIZE> 6400 CARDS
 <COMP> CDC
 <CONFIG> CDC 7600
 <LANG> FORTRAN IV
 <CHAP> DCE
 <ALGO> CHUBIN (1967, 1950, 1970) NUMERICAL SCHEME FOR SOLVING FULL SET OF NAVIER-STOKES EQUATIONS (WITH K-THEORY DIFFUSION PARAMETERIZATION). THE SCHEME APPLIES METHOD OF FRACTIONAL STEPS TO SOLVE MOMENTUM AND THERMODYNAMIC EQUATIONS AND AN ITERATIVE PROCEDURE FOR SOLVING THE PRESSURE FIELD.
 <CLASS> SIMULATION
 <APPL> TO OBTAIN PLUME RISE ESTIMATES FOR POINT SOURCE ENVIRONMENTAL IMPACT STUDIES
 <USERS> CALIFORNIA STATE AIR RESOURCES BOARD, SALT RIVER PROJECT
 <SUB> FIELD MEASUREMENTS
 <EVAL> COMPARISONS OF PLUME RISE AND CONCENTRATION ISOPLETES WITH FIELD MEASUREMENTS. NO SENSITIVITY ANALYSES HAVE BEEN PERFORMED AT THIS TIME.
 <CON> NONE
 <UPDATE> 700920

<164>
 <CONT> LIU, HUI-KAO; DUBJCH, MICHAEL
 <TITLE> REGIONAL SCALE AIR POLLUTION TRANSPORT MODEL
 <ACRO> MESO
 <ADDR> SYSTEMS APPLICATIONS INC., 950 BOUTEFORTE DRIVE
 <CITY> SAN RAFAEL
 <STATE> CA
 <ZIP> 94903
 <PHONE> 415-472-0011
 <SOURCE> SYSTEMS APPLICATIONS, INC.
 <DOC> LIU, R.K., AND D. DUBBAG, THE DEVELOPMENT OF A REGIONAL AIR POLLUTION MODEL AND ITS APPLICATION TO THE NORTHERN GREAT PLAINS, EPA-930/1-77-001, 1977.
 <SUB> ATMOSPHERIC TRANSPORT AND DIFFUSION OF POINT AND AREA SOURCE EMISSIONS
 <ABST> ATMOSPHERIC TRANSPORT AND DIFFUSION OF POLLUTANTS WERE MODELED USING THE DIFFUSION EQUATION AS APPLICABLE IN A VERTICALLY WELL MIXED ATMOSPHERE. POINT AND AREA SOURCE OF EMISSIONS ARE ALLOWED. CHEMICAL REACTIONS CAN BE INCLUDED. DIFFUSION EQUATION SOLVED BY FINITE DIFFERENCE METHOD, THE SMAGTA INTEGRATION TECHNIQUE IS USED. THERE IS A SUB-LAYER THAT ACCOUNTS FOR SURFACE DEPOSITION WHICH IS DEPENDENT UPON SURFACE ROUGHNESS AND SURFACE HEATING. SURFACE WIND SPEEDS, MIXED LAYER WIND FIELD, MIXING HEIGHTS, HORIZONTAL DIFFUSIVITY ARE ALL TIME VARYING. CONCENTRATION FIELDS ARE AVERAGED AND RECORDED OVER TIME INTERVALS THAT THE USER SPECIFIES.
 <GEO> USER SPECIFIED
 <TIME> USER SPECIFIED
 <STATUS> IN USE
 <ACCESS> UNLIMITED
 <MEDIA> PUNCHED CARDS
 <SIZE> 1000 CARDS
 <COMP> CDC
 <CONFIG> CDC 7600 WITH J12 R CORE
 <LANG> FORTRAN IV
 <CHAP> DCE
 <ALGO> SMAGTA NUMERICAL INTEGRATION SCHEME
 <CLASS> SIMULATION
 <APPL> ATMOSPHERIC TRANSPORT AND DIFFUSION OF POINT AND AREA SOURCE EMISSIONS
 <USERS> U.S. ENVIRONMENTAL PROTECTION AGENCY
 <SUB> USER DETERMINED
 <EVAL> MODEL SENSITIVITY TO CONVERSION RATES, MIXING DEPTHS, EMISSION RATES, MIXED LAYER WIND FIELD WAS TESTED ON THE GREAT PLAINS. 502 TO 504 CONVERSION RATE VARIED FROM .3 PERCENT TO 1.

ATMOSPHERIC TRANSPORT

<164> CONT.
PERCENT. ESTIMATED 1976 AND 1984
EMISSIONS USED. MODEL TESTED UNDER
WINTER, SPRING AND SUMMER CONDITIONS.

<UPDATE> 780911

<165>
<COM> LIO, WEI-KAG: YOCHE, MARK A.
<TITLE> COMPLEX TERRAIN WIND MODEL
<ADDR> SYSTEMS APPLICATIONS INC., 950
WILMINGTON DRIVE
<CITY> SAN RAFAEL
<STATE> CA
<ZIP> 94901
<PHONE> 415-472-0011
<DOC> LIO, M.K., M.A. YOCHE, AND J.L.
MCLEOD, 1978, DEVELOPMENT AND
VALIDATION OF A THREE-DIMENSIONAL WIND
MODEL FOR AIR QUALITY ANALYSIS IN
COMPLEX TERRAIN, IN: NATO/CCNS 9TH
INTERNATIONAL TECHNICAL MEETING ON AIR
POLLUTION MODELING AND ITS APPLICATION,
HELD IN TORONTO, CANADA
<SUB> WIND FIELDS IN URBAN AND COMPLEX
TERRAIN AREAS
<ABST> THE THREE-DIMENSIONAL DIAGNOSTIC WIND
MODEL DESCRIBED HERE IS COMPOSED OF
SEVERAL HORIZONTAL LAYERS OF VARIABLE
THICKNESSES. FOR EACH LAYER, A POISSON
EQUATION HAS BEEN FORMULATED WITH THE
WIND CONVERGENCE AS THE FORCING
FUNCTION. PERTURBATION OF THE WIND
FIELD DUE TO COMPLEX TERRAIN HAS BEEN
INCLUDED IN THE MODEL BY PARAMETERIZING
THE FORCING FUNCTION. AMONG THE EFFECTS
OF WIND PERTURBATIONS TREATED ARE THOSE
DUE TO TOPOGRAPHY, THE BOUNDARY LAYER,
URBAN HEAT ISLANDS, AND MOUNTAIN AND
VALLEY WINDS. FOR TESTING AND
VALIDATION, THE MODEL WAS APPLIED TO
PHOENIX, ARIZONA: PREDICTED WIND SPEEDS
AND WIND DIRECTIONS WERE COMPARED WITH
ALL AVAILABLE MEASUREMENTS. EXTENSIVE
STATISTICAL ANALYSIS OF THE RESULTS WAS
PERFORMED TO DETECT POSSIBLE SYSTEMATIC
BIASES AND RANDOM ERRORS OF THE MODEL.

<GEO> USER SPECIFIED
<TIME> ANY
<STATUS> IN USE
<ACCESS> UNLIMITED
<MEDIA> PUNCHED CARDS; MAGNETIC TAPE
<SIZE> 2000 CARDS
<COMP> CDC
<CONFIG> CDC 7600 WITH 170K SEC AND 350K LCH
<LANG> FORTRAN IV
<COND> DCI; REMARK
<ALGO> GAUSS-SEIDEL METHOD FOR SOLVING POISSON
EQUATIONS
<CLASS> INTERMEDIATE; SIMULATION
<APPL> PREDICTION OF GRIDDED WIND FIELDS IN
URBAN AND/OR MOUNTAINOUS AREAS - LOS
ANGELES, CALIFORNIA AND PHOENIX, ARIZONA

<SPSR> U.S. ENVIRONMENTAL PROTECTION AGENCY;
SOUTHERN CALIFORNIA Edison; SOUTHERN
CALIFORNIA ASSOCIATION OF GOVERNMENTS
<SUB> U.S.G.S. TERRAIN AND TOPOGRAPHIC MAPS;
OTHER METEOROLOGICAL DATA
<VAL> MODEL VALIDATION AND SENSITIVITY
ANALYSIS IN LOS ANGELES, CALIFORNIA AND
PHOENIX, ARIZONA
<UPDATE> 780814

<166>
<COM> LIO, S. C.; BOUWME, T. R.; CICEROSE,
R. J.; CHAKRABARTY, N. L.
<TITLE> EFFECT OF WATER VAPOR ON THE
DESTRUCTION OF OZONE IN THE
STRATOSPHERE PERTURBED BY CLX OR NOY
POLLUTANTS
<ADDR> UNIVERSITY OF MICHIGAN
<CITY> ANN ARBOR
<STATE> MI
<DOC> JOURNAL GEOPHYSICAL RESEARCH, 81(18),
3111-3118, 1976
<ABST> RESULTS ARE DESCRIBED FOR A
SELF-CONSISTENT ONE-DIMENSIONAL COUPLED
FLOW CALCULATION FOR O₃, NO₂, NO_x, CLX,
H₂O, H₂, CH₄, H₂O₂ AND H₂O DENSITIES
BETWEEN 10 AND 120 KM. RESULTS AGREE
WELL WITH OBSERVATIONS FOR THE NORMAL
MID-LATITUDE ATMOSPHERE OVER THIS
ALTITUDE RANGE. CLX, NO_x, AND H₂O WERE
VARIED INDEPENDENTLY IN THE MODEL. THE
EFFECT OF DEPLETION OF OZONE BY CLX IS
TO REMOVE OZONE PREFERENTIALLY ABOVE 30
KM AND TO LOWER THE ALTITUDE OF MAXIMUM
OZONE DENSITY. THIS LEADS TO ENHANCED
SOLAR HEATING OF THE LOWER STRATOSPHERE
AND TROPOPAUSE AND SUGGESTS THE
POSSIBILITY OF AN INCREASED FLUX OF
WATER INTO THE STRATOSPHERE.
INCREASING WATER VAPOR IN THE
STRATOSPHERE GREATLY ENHANCES THE RATE
OF DESTRUCTION OF O₃ BY CLX AND ALSO
CAUSES AN INCREASE IN THE RATE OF
DESTRUCTION OF O₃ IN THE NOY-PERTURBED
ATMOSPHERE.

<CLASS> SIMULATION

<167>
<COM> LONG, P. E.
<TITLE> COMPUTATIONAL DIFFUSION IN ATMOSPHERIC
BOUNDARY LAYER MODELS
<DOC> REPORT NUMBER SCIENTIFIC-4; TASK
792204; CONTRACT F19620-69-C-0092;
MONITORING AGENCY REPORT NUMBER
AFRL-72-0401; PROJECT AF-7922, 1972,
58 PP.; AVAIL NTIS
<ABST> A STUDY IS MADE OF THE TRUNCATION ERROR
AND STABILITY OF FINITE DIFFERENCE
ADVECTION/DIFFUSION SCHEMES. THEIR
TRUNCATION ERROR MAY BE CONVENIENTLY
INTERPRETED AS AN ADDITIONAL DIFFUSION
TERM AND A DISPERSIVE PHASE VELOCITY.
BOTH QUANTITIES ARE FUNCTIONS OF THE
GRID SPACING, TIME STEP, WAVELENGTH OF
THE FOURIER COMPONENT AND OF THE

ATMOSPHERIC TRANSPORT

<167> CONT.

DIFFERENCE SCHEME ITSELF. THE TAYLOR SERIES DETERMINATION OF THE COMPUTATIONAL OR EXPLICIT DIFFUSION COEFFICIENT YIELDS THE FIRST TERM OF A PERTURBATION SERIES. RETAINING ONLY THE FIRST TERM IS INVALID FOR SHORT WAVELENGTHS. A SIMPLE, EXACT METHOD IS PRESENTED WHICH CALCULATED THE COMPUTATIONAL DIFFUSION COEFFICIENT FOR ALL WAVELENGTHS FOR EQUATIONS OF CONSTANT COEFFICIENTS. WHEN PHYSICAL, EXPLICIT DIFFUSION IS INTRODUCED INTO AN ADVECTION EQUATION, THE EFFECT OF COMPUTATIONAL AND EXPLICIT DIFFUSION ARE GENERALLY NOT ADDITIVE EXCEPT FOR SCALES ABOUT AN ORDER OF MAGNITUDE LARGER THAN THE GRID INTERVAL. THE SCHEMES STUDIED ARE INTENDED FOR USE IN ONE DIMENSIONAL ATMOSPHERIC BOUNDARY LAYER MODELS, BUT THE ANALYSIS CAN BE EXTENDED TO HIGHER DIMENSIONS.

<CLAS> PREDICTIVE

<169>

<CONT> LOUIS, J. F.

<TITLE> A TWO-DIMENSIONAL TRANSPORT MODEL OF THE ATMOSPHERE

<ADDR> UNIVERSITY OF COLORADO

<CITY> BOULDER

<STATE> CO

<ZIP> 80302

<DOC> PH.D. THESIS, UNIVERSITY OF COLORADO, 1976

<ABST> A TWO-DIMENSIONAL TRANSPORT MODEL OF THE ATMOSPHERE FROM 0 TO 50 KM IS DEVELOPED. THE TRANSPORT INCLUDES ADVECTION BY THE MEAN MERIDIONAL CIRCULATION AND THE DIFFUSION BY THE LARGE SCALE EDDIES. THE MEAN WINDS AND THE DIFFUSION COEFFICIENTS (COMPONENTS OF A SECOND ORDER DIFFUSION TENSOR) VARY WITH LATITUDE, HEIGHT AND SEASON. THE CONTRIBUTIONS OF THE MEAN CIRCULATION AND THE DIFFUSION TO THE TRANSPORT OF TRACERS ARE EQUALLY UNCERTAIN. IN MANY CASES THEY OPPOSE EACH OTHER. OBSERVED MEAN WINDS ARE USED BELOW FIFTEEN KILOMETERS. ABOVE THIS LEVEL THE MEAN WINDS ARE COMPUTED BY SOLVING THE THERMODYNAMIC AND CONTINUITY EQUATIONS. USE IS MADE OF THE OBSERVED DISTRIBUTION OF OZONE AND OF ITS OBSERVED VERTICAL FLUX AT THE GROUND TO DEDUCE THE DIFFUSION COEFFICIENTS CONSISTENT WITH THE MEAN CIRCULATION. THE MODEL IS CAPABLE OF SIMULATING THE TRANSPORT OF TRACERS WITH BOTH LOW AND HIGH LATITUDE SOURCES. IT HAS BEEN TESTED BY SIMULATING THE BEHAVIOR OF TUNGSTEN-185 FROM LOW LATITUDE UNITED STATES NUCLEAR TESTS, AND ZIRCON-95 FROM HIGH LATITUDE CHINESE NUCLEAR TESTS. THE OVERALL DISTRIBUTION OF THE TRACERS, THEIR RATE OF SPREADING, THE RATE OF DECREASE OF THE MAXIMUM CONCENTRATION, THE RESIDENCE TIME OF THE STRATOSPHERIC BURDEN AND THE DEPOSITION BY WET FALL-OUT ARE ALL WELL SIMULATED AND AGREE QUALITATIVELY AND QUANTITATIVELY WITH OBSERVATIONS. IN ORDER TO OBTAIN QUANTITATIVE AGREEMENT WITH OBSERVATIONS, THE MEAN WINDS AND DIFFUSION COEFFICIENTS HAD TO BE

DECREASED BY A FACTOR OF TWO. THE IMPLICATIONS OF THIS REDUCTION ARE DISCUSSED. THIS WORK DEMONSTRATES THAT A FIRST ORDER CLOSURE USING A DIFFUSION COEFFICIENT TENSOR (K THEORY) APPROXIMATES WELL THE EFFECT OF THE EDDIES. IT ALSO SHOWS THAT THE DIFFUSION CANNOT BE TREATED INDEPENDENTLY OF THE MEAN CIRCULATION. AS AN EXAMPLE OF THE USE OF THE MODEL, THE DISTRIBUTIONS OF NITROUS AND NITRIC OXIDES ARE COMPUTED IN THE STRATOSPHERE.

<CLAS> SIMULATION

<CON>

THE MODEL HAS BEEN COMPUTERIZED USING A CDC 7600 COMPUTER BUT NO DETAILS OF THE PROGRAM ARE LISTED. PARTIAL DOCUMENTATION IS PRESENTED.

<169>

<CONT> LUDWIG, P. L.; GASIORER, L. S.; PUFF, P. Z.

<TITLE> SIMPLIFICATION OF A GAUSSIAN PUFF MODEL FOR REAL-TIME MINICOMPUTER USE

<ADDR> STANFORD RESEARCH INSTITUTE

<CITY> MENLO PARK

<STATE> CA

<DOC> ATMOSPHERIC ENVIRONMENT, 11(5), 431-436, 1977.

<ABST>

SIMPLIFICATIONS ARE DESCRIBED THAT WILL SUBSTANTIALLY REDUCE THE COMPUTATION TIME AND MEMORY REQUIREMENTS OF A GAUSSIAN PUFF DIFFUSION MODEL WITHOUT IMPAIRING ITS ABILITY TO SIMULATE TEMPORALLY AND SPATIALLY CHANGING CONDITIONS. AMONG THE MORE IMPORTANT SIMPLIFICATIONS ARE: A VARIABLE PUFF GENERATION RATE, NEPPING OF CLOSELY SPACED PUFFS, NONUNIFORM SPATIAL RESOLUTION OF THE WIND FIELD AND THE USE OF INTEGERS TO REPRESENT SOME OF THE VARIABLES. A MODEL USING THE SIMPLIFICATIONS WAS ABLE TO SIMULATE THE 24-H BEHAVIOR OF EMISSIONS FROM A POWER PLANT; CONCENTRATIONS WERE CALCULATED AT 25 POINTS AND AT 48 DIFFERENT TIMES. THE TIME REQUIRED ON A DATA GENERAL NOVA 1200 MINICOMPUTER IS ABOUT 6 MIN, BUT VARIES WITH DIFFERENT SEQUENCES OF METEOROLOGICAL CONDITIONS. THE MEMORY REQUIRED IS ABOUT 24,000 WORDS.

<SIZE> THE MEMORY REQUIRED IS ABOUT 24,000 WORDS.

<CONFIG> THE TIME REQUIRED ON A DATA GENERAL NOVA 1200 MINICOMPUTER IS ABOUT 6 MIN.

<CLAS> SIMULATION

<170>

<CONT> LUDWIG, P. L.; MARCUSO, R. L.

<TITLE> USER'S MANUAL FOR THE APRAC-2 URBAN DIFFUSION MODEL COMPUTER PROGRAM

<ACRO> APRAC-2

<ADDR> SRI INTERNATIONAL

<CITY> MENLO PARK

<STATE> CA

ATMOSPHERIC TRANSPORT

<170> CONT.
<TID> 94025

<ENQRY> 815-326-6200 EXT.3000 OR EXT.2014

<SOURCE> NATIONAL TECHNICAL INFORMATION SERVICE

<SUB> CONCENTRATION OF CO, SOX AND HYDROCARBON CONCENTRATIONS WITHIN A CITY

<ABST> THE COMPUTER PROGRAM FOR A COMPLETELY REVISED VERSION OF THE APMAC-1A DIFFUSION MODEL IS PRESENTED AND DISCUSSED. THE NEW CODE USES EPA'S EMISSIONS CALCULATION METHODOLOGY FROM SUPPLEMENT NO. 5 TO AP-42. GRIDDED, AND LINK BY LINK EMISSIONS CAN BE OUTPUT FOR HYDROCARBONS, CARBON MONOXIDE OR OXIDES OF NITROGEN. DIFFUSION CALCULATIONS MAKE USE OF A RECEPTOR-ORIENTED GAUSSIAN PLUME MODEL. LOCAL WINDS AT THE RECEPTOR CAN BE USED; THEY ARE INTERPOLATED FROM MULTIPLE WIND INPUTS. MIXING HEIGHTS MAY BE CALCULATED FROM SOUNDING DATA, OR INPUT DIRECTLY. TWO LOCAL SOURCE MODELS ARE AVAILABLE, ONE TREATING POLLUTANT BEHAVIOR IN A STREET CANYON, THE OTHER VEHICLE AND POLLUTANT EFFECTS AT A SIGNALIZED INTERSECTION. A SMALL PROGRAM IS INCLUDED FOR DECODING FEDERAL HIGHWAY ADMINISTRATION DATA TAPES. (AUTH)

<GEO> CITIES

<TID> SYNOPTIC MODEL (< 2 DAYS); CLIMATOLOGICAL MODEL (> 2 DAYS)

<STATES> IN USE

<ACCESS> UNLIMITED

<MEDIA> PUNCHED CARDS

<SIZE> 85,000 WORDS OF MEMORY ON CDC 6400 COMPUTED WHEN USED FOR ST. LOUIS

<COMP> CDC; IBM

<CONFIG> CDC 6400 WITH 85,000 WORD CORE; IBM 360/50

<LANG> FORTRAN IV

<CHAR> DBC; EBCDIC

<ALGO> GAUSSIAN PLUME AND BOX MODELS

<CLAS> ANALYTICAL; PREDICTIVE

<APPL> IMPACT OF TRAFFIC ON AIR QUALITY IN CITIES

<USERS> ENVIRONMENTAL PROTECTION AGENCY

<SRD> CITY TRAFFIC DATA FROM STATE HIGHWAY DEPARTMENTS AND METEOROLOGICAL DATA FROM THE NATIONAL CLIMATIC CENTER

<INVAL> SENSITIVITY ANALYSES AND COMPARISONS WITH OBSERVATION-SEE LUDWIG AND DABBEROT (1972), EVALUATION OF THE APMAC-1A URBAN DIFFUSION MODEL FOR CARBON MONOXIDE, FINAL REPORT, CONTRACT CNA-3-68(1-69) SRI INTERNATIONAL

<CON> REVISION OF APMAC-1A

<UPD&ID> 780761

<171>
<CONT> LUSIS, H. A.; PHILLIPS, C. B.

<TITLE> OXIDATION OF SO2 TO SULFATES IN DISPERSING PLUMES

<CTRY> DOMINICAN

<STATE> ONTARIO

<COUNTRY> CANADA

<DOC> ATMOSPHERIC ENVIRONMENT, 11(3), 239-241, 1977

<ABST> A MATHEMATICAL MODEL IS DERIVED FOR THE OXIDATION OF SO2 IN AQUEOUS AEROSOLS IN THE PRESENCE OF IRON CATALYST. THE PREDICTIONS ARE DISCUSSED IN THE LIGHT OF SOME MEASUREMENTS MADE IN THE PLUME OF A NICKEL SHELTER (LUSIS AND WISE, 1976).

<CLAS> PREDICTIVE

<172>
<CONT> LYONS, W. A.

<TITLE> TURBULENT DIFFUSION AND POLLUTANT TRANSPORT IN SHORELINE ENVIRONMENTS

<ADDR> UNIVERSITY OF WISCONSIN

<CITY> MILWAUKEE

<STATE> WI

<DOC> HAUGEN, D.A., LECTURES ON AIR POLLUTION AND ENVIRONMENTAL IMPACT ANALYSES, HELD IN BOSTON, MASSACHUSETTS, SEPTEMBER 29, 1975; CONF-7509171

<ABST> THE LITERATURE IS REVIEWED FROM MANY SOURCES CONCERNING TURBULENT DIFFUSION AND POLLUTION TRANSPORT IN COASTAL ENVIRONMENTS. EXAMPLES ARE HEAVILY DRAWN FROM THE GREAT LAKES REGION DUE TO MICRO- AND MESOSCALE METEOROLOGICAL PHENOMENA AND ITS HIGH INDUSTRIAL AND POPULATION DENSITY WITH CONCENTRATED POLLUTANT GENERATION.

<CLAS> PREDICTIVE

<173>
<CONT> LYONS, W. A.

<TITLE> MESOSCALE AIR POLLUTION TRANSPORT IN SOUTHEAST WISCONSIN

<ACRO> RDM

<ADDR> AIR POLLUTION ANALYSIS LABORATORY

<CITY> MILWAUKEE

<STATE> WI

<DOC> PB--265382, 1977

<ABST> THIS RESEARCH PROGRAM COMPRISED A COMPREHENSIVE STUDY OF MESOSCALE METEOROLOGICAL REGIMES ON THE WESTERN SHORE OF LAKE MICHIGAN AND THEIR EFFECT UPON AIR POLLUTION DISPERSION AND TRANSPORT. IT IS FELT THAT THE RESULTS ARE APPLICABLE IN A GENERIC WAY TO OTHER MID-LATITUDE COASTAL ZONES. CONTINUOUS FUMIGATION FROM ELEVATED SOURCES IN SHORELINE ZONES DURING STABLE DAYTIME ONSHORE FLOW WAS INTENSIVELY INVESTIGATED BY A LARGE SCALE FIELD PROGRAM. A MODEL WAS

<173>

ATMOSPHERIC TRANSPORT

<173> CONT.

PROPOSED, CONSTRUCTED, VALIDATED AND CALIBRATED. IT WAS SHOWN THAT THE PURIFICATION SPOT, WHILE CAUSING VERY HIGH SURFACE SO₂ CONCENTRATIONS WAS SO HIGHLY HOSTILE AS TO GENERALLY REDUCE DOZAGES BELOW THE THREE-HOUR STANDARD (AT LEAST FOR THE PLANTS STUDIED). AN INTENSIVE CASE STUDY OF A LAKE BREEZE WAS PERFORMED. DATA WERE USED AS INPUT TO A KINEMATIC DIAGNOSTIC MODEL (KDM) WHICH SIMULATED MESOSCALE TRAJECTORIES FOR POLLUTANTS RELEASED WITHIN THE COASTAL ZONE. BOTH MESOSCALE AND SYNOPTIC SCALE TRANSPORT OF PHOTOCHEMICAL OXIDANTS WERE FOUND TO BE A SIGNIFICANT PROBLEM IN THE WILLOW RIVER AREA.

<CLAS> SIMULATION

<174>

<CONT> HACCACKER, MICHAEL C.

<TITLE> ZONAL ATMOSPHERIC MODEL, SECOND GENERATION

<ACF> 2AF2

<ADDR> LAWRENCE LIVERMORE LABORATORY, ATMOSPHERIC AND GEOPHYSICAL SCIENCES DIVISION, P.O. BOX 808

<CITY> LIVERMORE

<STATE> CA

<ZIP> 94550

<PHONE> 415-422-1026; FTS 532-1926

<SOURCE> DEVELOPED AT LLL

<DOC> HACCACKER, M.C., LUTHER, P.H., CLIMATE STUDIES USING A ZONAL ATMOSPHERIC MODEL, PROCEEDINGS OF THE IAPAP/IAPSO INTERNATIONAL CONFERENCE, JANUARY 14-25, 1974; LUTHER, P.H., HACCACKER, M.C., INITIAL VALIDATION STUDIES FOR 2AF2 RADIATION AND LARGE SCALE EDDY TRANSPORT MECHANISMS, PROCEEDINGS OF THIRD CIAP CONFERENCE, FEB. 26-MARCH 1, 1974; HACCACKER, M.C., CLIMATE MODEL RESULTS OF STRATOSPHERIC PERTURBATIONS, PROCEEDINGS OF FOURTH CIAP CONFERENCE, FEB. 6-7, 1975

<SUB> CLIMATE STUDIES

<ABST> THE SECOND GENERATION ZONAL ATMOSPHERIC MODEL 2AF2 IS A TWO-DIMENSIONAL GENERAL CIRCULATION MODEL USING A 10 DEGREE LATITUDE GRID AT NINE PRESSURE LEVELS EXTENDING INTO THE STRATOSPHERE. THE EFFECT OF TERMS LOST BY ZONAL AVERAGING IS SIMULATED BY INTRODUCTION OF AN EDDY TRANSPORT MECHANISM IN WHICH THE EDDY DIFFUSION COEFFICIENT IS A FUNCTION OF INTERNAL MODEL VARIABLES. 2AF2 STRIVES TO MODEL THE THERMODYNAMICS AND DYNAMICS OF A NOIST ATMOSPHERE UNDER THE INFLUENCE OF SOLAR AND LONG WAVE RADIATION, AND INCLUDING PRECIPITATION, CLOUDINESS, CONVECTION AND SURFACE INTERACTIONS. THE PLANETARY SURFACE IS REPRESENTED AS FRACTIONALLY DIVIDED AT EACH LATITUDE BAND BETWEEN OPEN OCEAN, SEA ICE, AND LAND WHICH HAVE MOUNTAINS OF VARIOUS HEIGHTS. A SURFACE ENERGY BALANCE IS MAINTAINED ALLOWING HEAT STORAGE IN THE LAND, THE BUILD-UP AND DECAY OF SNOW COVER, AND THE GROWTH AND MELTING OF SEA ICE. THE MODEL USES A

SHIFTY MINUTE TIME STEP AND MAY BE RUN FOR SEVERAL YEARS WITHOUT SEVERE PENALTIES IN COMPUTATION TIME.

<GEN> GLOBAL

<STATUS> REFINEMENT UNDER DEVELOPMENT; IN USE DAILY

<ACCESS> LIMITED TO AUTHORIZED RECIPIENTS

<MEDIA> PUNCHED CARDS; MAGNETIC TAPE

<SIZE> CODE STATEMENTS WITH COMMENT CARDS: 8000; CODE STATEMENTS W/O COMMENT CARDS: 7050

<COMP> CDC

<CONFIG> CDC 7600 WITH USED TERMINAL AND DISK PACKS; MEMORY REQUIREMENT 360000 OCTAL; TIME REQUIRED FOR AVERAGE RUN (CPU MINUTES); 10 PER MONTH

<LANG> FORTRAN

<CHAR> ASCII

<CLAS> INTEGRATIVE; PREDICTIVE

<APPL> CLIMATE STUDIES; DOT : DOE

<USPRS> LLL

<SRD> MODEL GENERATED

<REAL> COMPARISON WITH OBSERVATIONS AND WITH OTHER MODELS

<CON> CODE WRITTEN IN FORTRAN; WOULD REQUIRE MODIFICATION TO BE COMPILED UNDER FORTRAN IV.

<UPDATE> 700621

<175>

<CONT> HACEY, R. H.

<TITLE> ROSANQUET'S PLUME RISE FORMULA AND THE TVA DATA

<ABST> THE TENNESSEE VALLEY AUTHORITY'S OBSERVATIONS OF PLUME RISE FROM LARGE POWER STATIONS ARE COMPARED WITH VALUES CALCULATED WITH THE WELL KNOWN ROSANQUET FORMULA. GOOD AGREEMENT IS FOUND FOR SINGLE STACKS AT WIND SPEEDS ABOVE ABOUT 4 M SEC (E-1) OR 5 M SEC (E-1), BUT AT LOW WIND SPEEDS THE CALCULATED VALUES ARE TOO HIGH. THE SAME CONCLUSION IS REACHED WITH TWIN STACKS WHEN THEIR EMISSIONS ARE COMBINED AND TREATED AS ONE. AGREEMENT OVER THE WHOLE RANGE OF WIND SPEEDS IS DEFINITELY IMPROVED BY USING A VALUE OF 150 SEC INSTEAD OF THE CONVENTIONAL VALUE OF 200 SEC FOR THE FACTOR τ IN THE ROSANQUET FORMULA.

<CLAS> PREDICTIVE

<176>

<CONT> HACHEA, L.

<TITLE> CARBON DIOXIDE IN THE ATMOSPHERE AND GREENHOUSE EFFECT MODEL

<ADDR> NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, AIR RESOURCES LABORATORY, 8060 13TH STREET

ATMOSPHERIC TRANSPORT

<176> CONT.
 <CITY> SILVER SPRING
 <STATE> MD
 <ZIP> 20910
 <PHONE> 301-427-7645
 <DOC> WOODWELL, G.H. AND EPREVE V. PECAN (ED.), 85 ATOMIC ENERGY COMMISSION SYMPOSIUM SERIES, VOLUME 30. CARBON AND THE TROPOSPHERE PROCEEDINGS OF THE 24TH BROOKHAVEN SYMPOSIUM IN BIOLOGY, HELD IN UPTON, NY, MAY 14-18, 1972 WILL BE 392 (P. 21-37), 1973
 <SUB> PREDICTION OF CARBON DIOXIDE IN THE STRATOSPHERE
 <ABST> ON THE BASIS OF REASONABLE ESTIMATES OF GPCWTH IN THE USE OF FOSSIL FUEL, THE ATMOSPHERIC CO2 CONTENT PREDICTED FOR THE YEAR 2000 IS APPROXIMATELY 305 PPM, COMPARED TO APPROXIMATELY 320 PPM OBSERVED AT PRESENT. THE GREENHOUSE EFFECT, USING A SIMPLIFIED ONE-DIMENSIONAL (VERTICAL) MODEL OF THE ATMOSPHERE CALLS FOR APPROXIMATELY 0.5 DEGREES WARMING FROM THE INCREASE OF CO2 TO 305 PPM, BUT THE ESTIMATE IS QUITE UNCERTAIN.
 <STATUS> IN USE
 <CLASS> PREDICTIVE
 <FORM> 78C701
 <177>
 <CONT> RACK, E. J.; RADIE, W. J.; POGERS, C. W.; KOCOROW, D. C.; PILIE, D. J.
 <TITLE> TWO-DIMENSIONAL NUMERICAL MODEL FOR SIMULATING FORMATION AND DISSIPATION OF REFLECTION FOGS: A FIELD INVESTIGATION AND NUMERICAL SIMULATION OF COASTAL FOG
 <ABST> A FIELD INVESTIGATION OF THE MICROPHYSICAL AND MICROMETEOROLOGICAL FEATURES OF FOGS OCCURRING NEAR LOS ANGELES AND VANDERBURG, CALIFORNIA WAS CONDUCTED. OBSERVATIONS OF WIND SPEED AND DIRECTION, TEMPERATURE, DEW POINT, VERTICAL WIND VELOCITY, DEW DEPOSITION, DROP-SIZE DISTRIBUTION, LIQUID WATER CONTENT, AND NAZE AND CLOUD NUCLEUS CONCENTRATION WERE OBTAINED. THESE OBSERVATIONS WERE INITIATED IN LATE EVENING PRIOR TO FOG FORMATION AND CONTINUED UNTIL THE TIME OF DISSIPATION IN FCN ADVECTION AND RADIATION FOGS. DATA WERE ALSO ACQUIRED IN ONE VALLEY FOG AND SEVERAL DENSE NAZE SITUATIONS. THE BEHAVIOR OF THESE PARAMETERS PRIOR TO AND DURING FOG ARE DISCUSSED IN DETAIL. A TWO-DIMENSIONAL NUMERICAL MODEL WAS DEVELOPED TO INVESTIGATE THE FORMATION AND DISSIPATION OF ADVECTION FOGS UNDER THE INFLUENCE OF HORIZONTAL VARIATIONS IN SURFACE TEMPERATURE. THE MODEL PREDICTS THE EVOLUTION OF POTENTIAL TEMPERATURE, WATER VAPOR CONTENT, AND LIQUID WATER CONTENT IN A VERTICAL PLANE AS DETERMINED BY VERTICAL TURBULENT TRANSFER AND HORIZONTAL ADVECTION. RESULTS ARE DISCUSSED FROM PRELIMINARY NUMERICAL EXPERIMENTS OF THE FORMATION OF WARM-AIR ADVECTION FOG AND DISSIPATION BY NATURAL AND ARTIFICIAL HEATING FROM THE SURFACE.
 <CLASS> SIMULATION
 <178>
 <CONT> MARLINS, J. D.
 <TITLE> A THREE-DIMENSIONAL STRATOSPHERIC POINT-SOURCE TRACER EXPERIMENT AND ITS IMPLICATIONS FOR DISPERSION OF EFFLUENT FROM A FLEET OF SUPERSONIC AIRCRAFT
 <ACRO> GASP
 <ADDP> NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
 <CITY> PRINCETON
 <STATE> NJ
 <ZIP> 08540
 <PHONE> (609) 452-6507
 <DOC> MONITORING AGENCY REPT. NO. NOAA-73071710, 7 PP., 1973;
 <SUB> GLOBAL TRANSPORT OF TRACE CONSTITUENTS (THREE DIMENSIONAL)
 <ABST> A THREE-DIMENSIONAL NUMERICAL MODEL HAS BEEN DEVELOPED WHICH EXECUTES DISPERSION EXPERIMENTS FOR PASSIVE ATMOSPHERIC TRACERS. THE MODEL USES WINDS FROM A GLOBAL GENERAL-CIRCULATION MODEL WHICH CONTAINS REALISTIC TOPOGRAPHY, ACTIVE WATER VAPOR, AND SEASONALLY-VARYING RADIATION. THE HORIZONTAL GRID SPACING IS ABOUT 265 KM. THERE ARE ELEVEN VERTICAL LEVELS, THE HIGHEST AT ABOUT 31 KM. AN EXPERIMENT INVOLVING A DIFFUSE POINT-SOURCE RELEASE OF TRACER INTO THE MID-LATITUDE LOWER STRATOSPHERE IS DESCRIBED. BASED UPON THE CALCULATED TRACER DISPERSION AFTER ELEVEN MONTHS OF INTEGRATION TIME, ESTIMATES OF THE CUMULATIVE EFFECTS AND IMPLICATIONS OF A CONTINUAL BUILDUP OF EFFLUENT FROM A SUPERSONIC AIRCRAFT FLEET ARE PRESENTED. THE CALCULATIONS SHOW THAT LOCAL TRACER ENHANCEMENTS BY A FACTOR OF 3800 OVER THE GLOBAL AVERAGE OF A ONE-DAY SOURCE ARE PREDICTED IN THE SOURCE REGION.
 <GEO> GLOBAL
 <TIME> 1973-1978
 <STATUS> IN USE
 <ACCESS> LIMITED
 <MEDIA> MAGNETIC TAPE
 <SIZE> CODE APPROXIMATELY 7000 CARDS; INPUT APPROXIMATELY 80 1600 BPI TAPES
 <CONF> T I & K ASC
 <CONFIG> UNI 1108, 256K, 4 9 TRACK TAPE DRIVES
 <LANG> FORTRAN
 <ALGO> FINITE DIFFERENCE, 3-LEVEL TIME DIFFERENCING, DATA I/O; WIND FIELD GENERATED BY INPUT TAPES OBTAINED FROM GFDL "ZODIAC" GENERAL CIRCULATION MODEL
 <CLASS> DISCRETE; DETERMINISTIC
 <APPL> INVESTIGATION OF THE GLOBAL TRANSPORT OF ATMOSPHERIC TRACE CONSTITUENTS

<179>

ATMOSPHERIC TRANSPORT

<178> CONT.

<USPS> U.S. DEPARTMENT OF COMMERCE

<SRD> OBSERVED SEA SURFACE TEMPERATURE,
OBSERVED OZONE, "JODIAC" COMPUTED WIND
FIELDS<EVAL> COMPARISON WITH OBSERVED TRACE
CONSTITUENT BEHAVIOR

<UPDATE> 790730

<179>

<CCS> PHELPS, J. D.; HAYABE, SYUKURO

<TITLE> NUMERICAL SIMULATION OF THE
STRATOSPHERE: IMPLICATIONS FOR RELATED
CLIMATE CHANGE PROBLEMS

<ACRO> JODIAC

<ADDR> NATIONAL OCEANIC AND ATMOSPHERIC
ADMINISTRATION

<CITY> PRINCETON

<STATE> NJ

<ZIP> 08540

<FORM> 605-452-6507

<DOC> MONITORING AGENCY REPT. NO.
NOAA-72122922, 9 PP. 1977, DEPARTMENT
OF TRANSPORTATION; CIAP CONFERENCE
PROCEEDINGS (1, 2, 4 8) JOURNAL OF THE
ATMOSPHERIC SCIENCES; VARIOUS GPO
PREFS, 1974-1979.<SUB> GENERAL CIRCULATION OF THE ATMOSPHERE
(THREE DIMENSIONAL)<ABST> CURRENT RESULTS ARE PRESENTED FROM AN
ATMOSPHERIC SIMULATION MODEL WHICH
EXTENDS TO A HEIGHT OF ABOUT 30 KM.
THE MODEL IS GLOBAL AND CONTAINS 11
VERTICAL LEVELS WITH A HORIZONTAL
RESOLUTION OF ABOUT 265 KM. REALISTIC
TOPOGRAPHY, AN ANNUAL BARCH OF
RADIATION, SEA SURFACE TEMPERATURE, AND
WATER VAPOR EFFECTS ARE INCLUDED.
ZONAL-MEAN CROSS-SECTIONS OF
TEMPERATURE AND ZONAL WIND ARE SHOWN
AND COMPARED WITH REALITY. SYNOPTIC
CHARTS FOR THE 30-MILLIBAR PRESSURE
LEVEL ARE SHOWN FOR DIFFERENT SEASONS
OF THE YEAR. SPECIAL ATTENTION IS
DIRECTED TOWARD THE PROBLEMS OF USING
ATMOSPHERIC SIMULATION MODELS TO STUDY
MECHANISMS ACTING TO REDISTRIBUTE
TRACER SUBSTANCES. NUMERICAL AND
PHYSICAL PROBLEMS OF MODELING TRACER
ADVECTION, SUB-GRID-SCALE TRANSFER,
SOURCES, AND SINKS ARE DISCUSSED IN
RELATION TO THE CLIMATE CHANGE PROBLEM.
ON THE BASIS OF CURRENT EXPERIENCE,
SOME SPECULATIONS ARE OFFERED ON
EFFORTS TOWARD SOLVING PROBLEMS IN
WHICH THE DISTRIBUTION OF TRACERS
AFFECTS, AND ITS AFFECTED BY, THE
DYNAMICS OF THE STRATOSPHERE.

<GM> GLOBAL

<TIME> 1970-1978+

<STATUS> IN USE

<ACCESS> LIMITED

<MEDIA> MAGNETIC TAPE

<SIZE> CODE APPROXIMATELY 12,000 CARDS; OUTPUT

APPROXIMATELY 40 1600 BPI TAPES

<CONP> 1 I BY 15C

<CONFER> IRR 76C/91, NOISE CODE, 4 9-TRACK TAPE
DRIVES

<LANG> FORTRAN

<ALGO> FINITE DIFFERENCE, 3 LEVEL TIME
DIFFERENCING, DATA I/O

<CLASS> DISCRETE; DETERMINISTIC

<APPL> INVESTIGATION OF THE DYNAMICS OF THE
LARGE-SCALE ATMOSPHERIC CIRCULATION

<USPS> U.S. DEPARTMENT OF COMMERCE

<SRD> OBSERVED SEA SURFACE TEMPERATURE;
OBSERVED OZONE

<EVAL> COMPARISON WITH CLIMATIC STATISTICS

<UPDATE> 790730

<180>

<CONT> HANOWEY, J. R.; EGAN, D. A.

<TITLE> A MESOSCALE NUMERICAL MODEL OF
ATMOSPHERIC TRANSPORT PHENOMENA IN
URBAN AREAS<DOC> ENGLUND, H.H. AND W.T. BEERY, (ED.).
PROCEEDINGS OF THE INTERNATIONAL CLEAN
AIR CONGRESS, VOL. 2. XIV+1354 PP.
ACADEMIC PRESS: NEW YORK, NY, (P.
1152-1157), 1971<ABST> THE DEVELOPMENT OF EFFICIENT AIR
POLLUTION CONTROL PROGRAMS REQUIRES THE
USE OF RELATIVELY A LUBATE FORECASTING
MODELS WHICH CAN TRANSLATE ANTICIPATED
EMISSION RATES INTO EXPECTED
DISTRIBUTIONS OF CONCENTRATIONS FOR
VARIOUS POLLUTANTS. BOTH SHORT AND
LONG TIME SCALE FORECASTS ARE PROVIDED.
SHORT TERM FORECASTS, FOR PERIODS UP TO
A FEW DAYS, ARE NEEDED FOR THE
OPERATION OF EMERGENCY WARNING AND
CONTROL SYSTEMS. LONG PERIOD (PLANNING
TYPE) FORECASTS ARE USEFUL FOR THE
EVALUATION OF THE EFFECTIVENESS OF
ALTERNATE EMISSION ABATEMENT
STRATEGIES. ALSO, LONG TERM MODEL
PROJECTIONS CAN BE USED AS THE BASIS
FOR PLANNING STUDIES WHICH ESTIMATE THE
EXPECTED AIR POLLUTION PROBLEMS
ASSOCIATED WITH ALTERNATE LAND USE
DEVELOPMENT PROGRAMS.

<CLASS> PREDICTIVE

<181>

<CONT> HAYABE, SYUKURO

<TITLE> THERMAL EQUILIBRIUM OF THE ATMOSPHERE
WITH A GIVEN DISTRIBUTION OF RELATIVE
HUMIDITY<ADDR> NATIONAL OCEANIC AND ATMOSPHERIC
ADMINISTRATION, GEOPHYSICAL FLUID
DYNAMICS LABORATORY, PRINCETON
UNIVERSITY

<CITY> PRINCETON

<STATE> NJ

<ZIP> 08540

ATMOSPHERIC TRANSPORT

<101> COST.

<FROM2> PIS 345-6520

<DOC> JOURNAL ATMOSPHERIC SCIENCES, 24(7), 241-253, 1967

<ABST> VARIATIVE CONVECTIVE EQUILIBRIUM OF THE ATMOSPHERE WITH A GIVEN DISTRIBUTION OF RELATIVE HUMIDITY IS COMPARED AS THE ASYMPTOTIC STATE OF AN INITIAL VALUE PROBLEM. THE RESULTS SHOW THAT IT TAKES ALMOST TWICE AS LONG TO REACH THE STATE OF RADIATIVE CONVECTIVE EQUILIBRIUM FOR THE ATMOSPHERE WITH A GIVEN DISTRIBUTION OF RELATIVE HUMIDITY THAN FOR THE ATMOSPHERE WITH A GIVEN DISTRIBUTION OF ABSOLUTE HUMIDITY. ALSO, THE SURFACE EQUILIBRIUM TEMPERATURE OF THE FORMER IS ALMOST TWICE AS SENSITIVE TO CHANGE OF VARIOUS FACTORS SUCH AS SOLAR CONSTANT, CO₂ CONTENT, O₃ CONTENT, AND CLOUDINESS, THAN THAT OF THE LATTER, DUE TO THE ADJUSTMENT OF WATER VAPOR CONTENT TO THE TEMPERATURE VARIATION OF THE ATMOSPHERE. ACCORDING TO OUR ESTIMATE, A DOUBLING OF THE CO₂ CONTENT IN THE ATMOSPHERE HAS THE EFFECT OF RAISING THE TEMPERATURE OF THE ATMOSPHERE (WHOSE RELATIVE HUMIDITY IS FIXED) BY ABOUT 2 DEGREES. OUR MODEL DOES NOT HAVE THE EXTREME SENSITIVITY OF ATMOSPHERIC TEMPERATURE TO CHANGES OF CO₂ CONTENT WHICH WAS ADVANCED BY HOLLER.

STABILITY OF THE LOWER TROPOSPHERE WHICH LIMITS CONVECTIVE HEATING TO THE LOWEST LAYER. IT IS ALSO SHOWN THAT THE DOUBLING OF CARBON DIOXIDE SIGNIFICANTLY INCREASES THE INTENSITY OF THE HYDROLOGIC CYCLE OF THE MODEL.

<GE2> THE COMPUTATIONAL DOMAIN IS DIVIDED INTO 2 EQUAL AREAS UP TO 665 N LATITUDE, CONTINENT AND OCEAN, RESPECTIVELY. FROM 665 N TO THE POLAR BOUNDARY AT 91.7 N, CONTINENT IS ASSUMED THROUGHOUT.

<UPDATE> 700709

<101>

<COST> HANABE, SHUNROO

<TITLE> A GLOBAL OCEAN-ATMOSPHERE CLIMATE MODEL: THE ATMOSPHERIC CIRCULATION

<ADDR> NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, GEOPHYSICAL FLUID DYNAMICS LABORATORY, PRINCETON UNIVERSITY

<CITY> PRINCETON

<STATE> NJ

<ZIP> 08540

<PHONE> PIS 345-6520

<DOC> JOURNAL PHYSICAL OCEANOGRAPHY, 5(1), 1-29, 1975

<SUB> GLOBAL OCEAN ATMOSPHERIC CLIMATE MODEL

<ABST> THE ATMOSPHERIC PART OF THE JOINT OCEAN-ATMOSPHERE MODEL INCORPORATES THE PRIMITIVE EQUATIONS OF MOTION IN A SPHERICAL COORDINATE SYSTEM. THE NUMERICAL PROBLEMS ASSOCIATED WITH THE TREATMENT OF MOUNTAINS ARE MINIMIZED BY USING THE "SIGMA" COORDINATE SYSTEM IN WHICH PRESSURE, NORMALIZED BY SURFACE PRESSURE, IS THE VERTICAL COORDINATE. FOR THE COMPUTATION OF RADIATIVE TRANSFER, THE DISTRIBUTION OF WATER VAPOR, WHICH IS DETERMINED BY THE PROGNOSTIC SYSTEM OF WATER VAPOR, IS USED. HOWEVER, THE DISTRIBUTIONS OF CARBON DIOXIDE, OZONE AND CLOUDINESS ARE PRESCRIBED AS A FUNCTION OF LATITUDE AND HEIGHT AND ASSUMED TO BE CONSTANT WITH TIME. THE PREDICTION OF SOIL MOISTURE AND SNOW DEPTH IS BASED UPON THE BUDGET OF WATER, SNOW AND HEAT. IN ORDER TO IDENTIFY THE EFFECT OF THE OCEAN CURRENTS UPON CLIMATE, THE JOINT MODEL CLIMATE IS COMPARED WITH ANOTHER CLIMATE OBTAINED FROM THE TIME INTEGRATION OF A SO-CALLED "A-MODEL" IN WHICH OCEANIC REGIONS ARE OCCUPIED BY NET SWAMPY SURFACES WITHOUT ANY HEAT CAPACITY. BASED UPON THE COMPARISON BETWEEN THESE TWO CLIMATES, THE POSSIBLE EFFECTS OF OCEANIC HEAT TRANSPORT ON THE CLIMATE ARE DISCUSSED. THE COMPARISON INDICATES THAT OCEAN CURRENTS SIGNIFICANTLY AFFECT NOT ONLY THE HORIZONTAL DISTRIBUTION OF SURFACE TEMPERATURE OF BOTH OCEANS AND CONTINENTS BUT ALSO THE GLOBAL DISTRIBUTION OF PRECIPITATION.

<GE2> GLOBAL

<102>
<COST> HANABE, SHUNROO

<TITLE> A GENERAL CIRCULATION MODEL SHOWING THE EFFECTS OF DOUBLING THE CO₂ CONCENTRATION ON THE CLIMATE

<ADDR> NATIONAL OCEANIC AND ATMOSPHERIC LABORATORY, GEOPHYSICAL FLUID DYNAMICS LABORATORY, PRINCETON UNIVERSITY

<CITY> PRINCETON

<STATE> NJ

<ZIP> 08540

<PHONE> PIS 345-6520

<DOC> JOURNAL ATMOSPHERIC SCIENCES, 32(1), 3-15, 1975

<ABST> AN ATTEMPT IS MADE TO ESTIMATE THE TEMPERATURE CHANGES RESULTING FROM DOUBLING THE PRESENT CO₂ CONCENTRATION BY THE USE OF A SIMPLIFIED THREE-DIMENSIONAL GENERAL CIRCULATION MODEL. THIS MODEL CONTAINS THE FOLLOWING SIMPLIFICATIONS: A LIMITED COMPUTATIONAL DOMAIN, AN IDEALIZED TOPOGRAPHY, NO HEAT TRANSPORT BY OCEAN CURRENTS, AND FIXED CLOUDINESS. DESPITE THESE LIMITATIONS, THE RESULTS FROM THIS COMPUTATION YIELD SOME INDICATION OF HOW THE INCREASE OF CO₂ CONCENTRATION MAY AFFECT THE DISTRIBUTION OF TEMPERATURE IN THE ATMOSPHERE. IT IS SHOWN THAT THE CO₂ INCREASE RAISES THE TEMPERATURE OF THE MODEL TROPOSPHERE, WHEREAS IT LOWERS THAT OF THE MODEL STRATOSPHERE. THE TROPOSPHERIC WARMING IS SOMEWHAT LARGER THAN THAT EXPECTED FROM A RADIATIVE-CONVECTIVE EQUILIBRIUM MODEL. IN PARTICULAR, THE INCREASE OF SURFACE TEMPERATURE IN HIGHER LATITUDES IS MAGNIFIED DUE TO THE RECESION OF THE SNOW BOUNDARY, AND THE THERMAL

<100>

ATMOSPHERIC TRANSPORT

<100>

<CON> HABABE, SYUKURO

<TITLE> GLOBAL MODEL OF THE ATMOSPHERE WITH SEASONAL VARIATION OF THE HYDROLOGIC CYCLE

<ACRO> NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, GEOPHYSICAL FLUID DYNAMICS LABORATORY, PRINCETON UNIVERSITY

<CITY> PRINCETON

<STATE> NJ

<ZIP> 08540

<PHONE> PPS 345-6520

<DOC> JOURNAL GEOPHYSICAL RESEARCH, 80(12), 1647-1649

<ABST> A NUMERICAL MODEL OF THE ATMOSPHERE WITH A SEASONAL VARIATION OF INSOLATION AND SEA SURFACE TEMPERATURE IS TIME INTEGRATED FOR OVER 3 SIMULATION YEARS ON A FINITE DIFFERENCE GRID NETWORK HAVING A NEARLY UNIFORM HORIZONTAL RESOLUTION OF APPROXIMATELY 265 KM. IN ADDITION TO WIND, TEMPERATURE, PRESSURE AND WATER VAPOR, THE MODEL SIMULATES RAINFALL, SNOWFALL, AND EVAPORATION AT THE SURFACE. TO OBTAIN AN OVERALL IMPRESSION OF THE CLIMATE SIMULATION, A MAP OF TYPICAL CLIMATE TYPES, WHICH IS OBTAINED FROM SIMULATED TEMPERATURES AND PRECIPITATION RATES THROUGHOUT THE YEAR, IS COMPARED WITH A SIMILAR MAP BASED UPON OBSERVED CLIMATIC DATA. IT IS SHOWN THAT THE MODEL LOCATES THE MAJOR ARID REGIONS OF THE EARTH, SUCH AS THE SAHARA DESERT IN NORTHERN AFRICA AND THE DESERTS OF CENTRAL ASIA AND AUSTRALIA. FURTHERMORE, THE TROPICAL RAIN BELT AND ITS SEASONAL MOVEMENT ARE WELL REPRODUCED. THE MODEL APPROXIMATELY SIMULATES THE CHANGEOVER FROM DRY WINTER TO WET SUMMER CONDITIONS IN SOUTHERN ASIA AND THE SEASONAL REVERSAL OF THE MONSOON WIND SYSTEM OVER ASIA. EXAMINATION OF THE DISTRIBUTION OF RUFOFF OVER CONTINENTS OF THE MODEL REVEALS THAT THE WATERSHEDS OF MANY IMPORTANT RIVERS OF THE WORLD ARE CORRECTLY POSITIONED IN THE SIMULATION. THE STUDY DEMONSTRATES THAT THE MODEL IS CAPABLE OF REPRODUCING MANY OF THE BASIC FEATURES OF THE SEASONAL VARIATION OF HYDROLOGY AND CLIMATE ON A GLOBAL SCALE.

<GEO> GLOBAL

<100>

<CON> MARCUSO, R. L.; LUDWIG, P. L.

<TITLE> USER'S MANUAL FOR THE APPAC-1A URBAN DIFFUSION MODEL COMPUTER PROGRAM

<ACRO> APPAC-1A

<ADDR> SRI INTERNATIONAL, 333 DAVENSWOOD

<CITY> REDFORD PARK

<STATE> CA

<ZIP> 94025

<PHONE> 415-326-6200 EXT -3886 OR EXT -2915

<SOURCE> NATIONAL TECHNICAL INFORMATION SERVICE,

SPRINGFIELD, VA 22151; UNHABAP

<DOC>

CONTRACT CAPA-3-68 (1-69) -CBC; MONITORING AGENCY REPT. NO. CBC-CAPA-3-8; PROJ. APPAC-CAPA-3-68, SRI-8563; SUPP. 72, 122 PP.

<SUB>

COMPUTATION OF CO CONCENTRATIONS WITHIN A CITY

<ABST>

THE APPAC-1A DIFFUSION MODEL WAS DEVELOPED AS A VERSATILE AND PRACTICAL MODEL FOR COMPUTING THE CONCENTRATIONS OF POLLUTANTS AT ANY POINT WITHIN A CITY. THE MODEL CALCULATES POLLUTANT CONTRIBUTIONS FROM DIFFUSION ON VARIOUS SCALE, INCLUDING: EXTRAURBAN DIFFUSION, MAINLY FROM SOURCES IN URBAN CITIES; INTRAURBAN DIFFUSION FROM FREEWAY, ARTERIAL, AND FEEDER STREET SOURCES; LOCAL DIFFUSION OF EMISSIONS WITHIN A STREET CANYON. THE MODEL TREATS ONLY CARBON MONOXIDE (CO), A RELATIVELY INERT GAS IN THE ATMOSPHERE BUT AN IMPORTANT POLLUTANT IN TERMS OF HEALTH. MOTOR VEHICLES ARE THE MAJOR SOURCE OF THIS GAS.

<GEO>

CITIES

<TIME>

SYNOPTIC MODEL (<2 DAYS); CLIMATOLOGICAL MODEL (>2 DAYS)

<STATUS>

IN USE BUT LARGELY SUPERSEDED BY APPAC-2

<ACCESS>

UNLIMITED

<MEDIA>

PUNCHED CARDS

<SIZE>

45,000 WORDS OF MEMORY ON CDC 6400 COMPUTER WHEN USED FOR ST. LOUIS

<COMP>

CBC; IBM

<CONFIG>

CBC: 6400 WITH 45,000 WORD CORE; IBM 360/50

<LANG>

FORTRAN IV

<CHAR>

BCD; EBCDIC

<ALGO>

GAUSSIAN PLUME AND BOX MODELS

<CLAS>

ANALYTICAL; PREDICTIVE

<APPL>

IMPACT OF TRAFFIC ON AIR QUALITY IN CITIES

<USERS>

U.S. ENVIRONMENTAL PROTECTION AGENCY

<SRD>

CITY TRAFFIC DATA FROM STATE HIGHWAY DEPARTMENTS AND DEPARTMENT OF TRANSPORTATION; METEOROLOGICAL DATA FROM NATIONAL CLIMATIC CENTER AND U.S. WEATHER SERVICE;

<EVAL>

SENSITIVITY ANALYSES AND COMPARISONS WITH OBSERVATIONS - SEE LUDWIG AND DABBERDT 1972, EVALUATION OF THE APPAC-1A URBAN DIFFUSION MODEL FOR CARBON MONOXIDE, FINAL REPORT, CONTRACT CAPA-3-68 (1-69), SRI INTERNATIONAL; TESTED AGAINST MEASUREMENTS IN ST. LOUIS AND SAN JOSE.

<CON>

REVISED VERSION AVAILABLE, SEE LUDWIG ET AL, 1971, USER'S MANUAL FOR THE APPAC-2 EMISSIONS AND DIFFUSION MODEL, CONTRACT NO 68-01-3867, SRI INTERNATIONAL, REDFORD PARK, CA

<UPDATE> 700701

ATMOSPHERIC TRANSPORT

- <106>
<CONT> HARTIN, W. O.
- <TITLE> AN URBAN AIR DIFFUSION MODEL FOR ESTIMATING LONG TERM AVERAGE VALUES OF AIR QUALITY
- <DESC> JOURNAL AIR POLLUTION CONTROL ASSOCIATION, 21(9), 16-19, 1971
- <ABST> A DIFFUSION MODEL IS DESCRIBED WHICH IS DESIGNED TO PERMIT CALCULATION OF SEASONAL AVERAGE CONCENTRATIONS OF AN AIR POLLUTANT, IN PARTICULAR, SO₂. THE CALCULATIONS CAN ENCOMPASS MULTIPLE SOURCES AND MULTIPLE RECEPTORS. FOR EACH RECEPTOR LOCATION, THE MODEL SHOWS THE EFFECT OF ALL SOURCES OVER A WIDE RANGE OF METEOROLOGICAL CONDITIONS. INPUT DATA INCLUDE SOURCE POLLUTANT EMISSIONS, SOURCE CONFIGURATION AND LOCATION, RECEPTOR LOCATION, AND METEOROLOGICAL DATA EXPRESSED AS A JOINT FREQUENCY DISTRIBUTION OF WIND DIRECTION, WIND SPEED, STABILITY. TO DETERMINE THE MODEL'S ACCURACY, CONCENTRATION ESTIMATES FOR ST. LOUIS ARE COMPARED WITH MEASURED SO₂ CONCENTRATIONS. THE OVERALL CORRELATION WITH OBSERVED DATA IS SATISFACTORY. A COMPUTER PROGRAM TO HANDLE THE NUMEROUS CALCULATIONS WAS WRITTEN IN FORTRAN IV LANGUAGE FOR USE ON AN IBM 1130 COMPUTER.
- <COMP> IBM
- <COMP#> IBM 1130
- <LANG> FORTRAN IV
- <CLASS> PREDICTIVE
- <107>
<CONT> HARTIN, P. L.
- <TITLE> DESCRIPTION OF A RADIATION PACKAGE FOR THE NAVAL POSTGRADUATE SCHOOL GENERAL CIRCULATION MODEL
- <ABST> NAVAL POSTGRADUATE SCHOOL
- <CITY> MCENTER
- <STATE> CA
- <SOURCE> DTIC 63.09/MP60.95
- <DESC> AE--752 875, 1972
- <ABST> A METHOD HAS BEEN DEVISED FOR INTEGRATING THE PRESSURE-SCALED WATER-VAPOR AND CO₂ ABSORBED MASSES FROM THE SURFACE TO THE SIGMA - LEVELS USED FOR PREDICTION IN THE NAVAL POSTGRADUATE SCHOOL PRIMITIVE EQUATION MODEL. USING EMPIRICAL EXPRESSIONS FOR ATMOSPHERIC ABSORPTIVITY, SCATTERING-REFLECTIVITY, CLOUD-REFLECTIVITY AND EARTH-SURFACE REFLECTIVITY, THE USEFUL SOLAR INSOLATIONS ASSUMED AT EARTH AND IN THE KEY ATMOSPHERIC LAYERS ABOVE THE EARTH HAVE BEEN FORMULATED. THE TERRESTRIAL COOLING EFFECT AT EARTH AND IN THESE SAME KEY ATMOSPHERIC LAYERS HAVE ALSO BEEN FORMULATED USING RECENTLY PUBLISHED EMISSIVITIES FOR THE JOINT EFFECTS OF WATER VAPOR AND CO₂. AS A RESULT, THE RADIATIVE HEATING (COOLING) AT KEY LEVELS MAY BE ASCERTAINED FOR INPUT INTO THE ATMOSPHERIC THERMODYNAMIC EQUATION. IN ADDITION, APPLICATION OF ATMOSPHERIC BOUNDARY-LAYER MODELING PERMITS DETERMINATION OF THE SURFACE-LAYER TURBULENT TRANSPORTS (IN THE VERTICAL) OF SENSIBLE AND LATENT HEAT AT THE EARTH'S SURFACE.
- <CLASS> SIMULATION
- <108>
<CONT> MARTINEZ, J. R.
- <TITLE> USER'S GUIDE TO DIFFUSION/KINETICS (DIPKIN) CODE;
- <ACR0> DIPKIN
- <DESC> PD-220 242; VOLUME 1
- <ABST> THE MANUAL IS INTENDED FOR USERS OF THE GRC DIFFUSION/KINETICS (DIPKIN) CODE FOR SIMULATING PHOTOCHEMICAL SMOG. THE GENERAL STRUCTURE AND OPERATIONAL CAPABILITIES OF THE CODE ARE DESCRIBED. DETAILED INSTRUCTIONS FOR PROGRAM USE ARE PROVIDED TO ASSIST PROSPECTIVE USERS IN OPERATING THE CODE.
- <COMP> IBM
- <COMP#> IBM 360
- <LANG> FORTRAN IV
- <CLASS> SIMULATION
- <109>
<CONT> HARTIS, J. J., JR.; GROSE, W. L.
- <TITLE> A REVIEW OF METHODS FOR PREDICTING AIR POLLUTION DISPERSION, AIR POLLUTION MODELS, AND PROBLEM AREAS IN AIR POLLUTION DISPERSION MODELING
- <ABST> NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
- <CITY> LANGLEY STATION
- <STATE> VA
- <DESC> REPORT NO. NASA-SP-322, LC-73-600023; MONITORING AGENCY REP. NO. 10, 1973, 96PP.
- <ABST> AIR POLLUTION MODELING, AND PROBLEM AREAS IN AIR POLLUTION DISPERSION MODELING WERE SURVEYED. EMISSION SOURCE INVENTORY, METEOROLOGICAL DATA, AND TURBULENT DIFFUSION ARE DISCUSSED IN TERMS OF DEVELOPING A DISPERSION MODEL. EXISTING MATHEMATICAL MODELS OF URBAN AIR POLLUTION, AND HIGHWAY AND AIRPORT MODELS ARE DISCUSSED ALONG WITH THEIR LIMITATIONS. RECOMMENDATIONS FOR IMPROVING MODELING CAPABILITIES ARE INCLUDED.
- <CLASS> SIMULATION
- <110>
<CONT> MCLEOD, J. L.
- <TITLE> A NUMERICAL MODEL OF THE NOCTURNAL URBAN BOUNDARY LAYER
- <ABST> NATIONAL ENVIRONMENTAL RESEARCH CENTER
- <CITY> RESEARCH TRIANGLE PARK

<190>

ATMOSPHERIC TRANSPORT

<191> CONT.
<STATE> SC

<DOC> CON--72-10722

<ABST> THE PAPER PRESENTS A NUMERICAL MODEL OF THE NOCTURNAL URBAN BOUNDARY LAYER TESTED IN COLUMBUS, OHIO. THE MODEL IS 2-DIMENSIONAL AND IS SOLVED NUMERICALLY ON A DIGITAL COMPUTER. THE CONSTANT-FLUX AND TRANSITION ATMOSPHERIC LAYERS ARE DETERMINED BY THE SUB-SURFACE LAYER IS DISCARDED. THE SUBSEQUENT THERMAL CHARACTERISTICS ARE SPECIFIED AS BOUNDARY CONDITIONS FOR INCLUSION INTO A SURFACE ENERGY BALANCE EXPRESSION; SURFACE TEMPERATURE IS COMPUTED ITERATIVELY FROM THIS EXPRESSION WHICH INCLUDES AS COMPONENTS LONG-WAVE RADIATION AND SENSIBLE, LATENT, SUB-SURFACE, AND ARTIFICIAL HEAT FLUXES. RADIATION COOLING DUE TO WATER VAPOR AND CARBON DIOXIDE ONLY IS CONSIDERED. LIMITED EVIDENCE INDICATED THAT THE RADIATIVE EFFECTS OF POLLUTANTS MAY BE INSIGNIFICANT DURING NOCTURNAL PERIODS.

<CLASS> SIMULATION

<191>

<CONT> MCGRATH, P. F.; BLOOM, R. H.

<TITLE> ASSESSMENT OF CONSEQUENCES FROM AIRBORNE RELEASES OF RADIOACTIVE MATERIAL

<ADDR> SANDIA LABORATORIES

<CITY> ALBUQUERQUE

<STATE> NM

<DOC> SAND--70-56, 1976; PROCEEDINGS AND WINTER MEETING, HELD IN WASHINGTON, D.C., NOVEMBER 15, 1976; TRANSACTIONS OF THE AMERICAN NUCLEAR SOCIETY, 28:76

<ABST> OVER THE PAST SEVERAL YEARS, THE MANNER IN WHICH ASSESSMENTS HAVE BEEN MADE OF THE CONSEQUENCES OF LARGE AIRBORNE RELEASES OF RADIOACTIVE MATERIAL HAS NOT CHANGED MUCH CONCEPTUALLY. THE MODELS TO DESCRIBE THE ATMOSPHERIC DISPERSION OF THE RADIOACTIVE MATERIAL HAVE GENERALLY BEEN TIME-INVARIANT, I.E., THE METEOROLOGICAL CONDITIONS (THERMAL STABILITY, WIND SPEED, AND PRECIPITATION) ARE INVARIANT DURING RELEASE AND THE SUBSEQUENT PERIOD OF RADIATION EXPOSURE OF THE POPULATION TO THE AIRBORNE MATERIAL. THE FREQUENCY DISTRIBUTION OF THE METEOROLOGICAL CONDITIONS ARE DETERMINED BY ANALYZING SEVERAL YEARS OF WEATHER DATA FROM THE APPROPRIATE GEOGRAPHICAL LOCATION. IN REALITY, WEATHER IS CONTINUOUSLY CHANGING OVER SHORT TIME PERIODS (HOURS) FOLLOWING THE RELEASE. IT IS TO BE EXPECTED THAT THE CHANGING METEOROLOGICAL CONDITIONS WOULD HAVE IMPORTANT EFFECTS ON THE POTENTIAL CONSEQUENCES OF THE RELEASE. A TIME-DEPENDENT ATMOSPHERIC DISPERSION MODEL WAS DEVELOPED AND IMPLEMENTED IN THE REACTOR SAFETY STUDY. THIS PAPER PROVIDES A DESCRIPTION OF THE MODEL AND THE NATURE OF THE RESULTS GENERATED. EMPHASIS IS GIVEN TO AN EXPLANATION OF HOW, AND WHY, THESE RESULTS DIFFER FROM THOSE ESTIMATED WITH TIME-INVARIANT MODELS.

<CLASS> SIMULATION

<192>

<CONT> MELAIS, A. G.; BAC, C. S. S.

<TITLE> HYBRID COMPUTER PROGRAM FOR RAPIDLY SOLVING FLOWING OR STATIC CHEMICAL KINETIC PROBLEMS INVOLVING MANY CHEMICAL SPECIES

<ADDR> NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, LANGLEY RESEARCH CENTER

<DOC> N-76-25392, 1976

<ABST>

A HYBRID CHEMICAL KINETIC COMPUTER PROGRAM WAS ASSEMBLED WHICH PROVIDES A RAPID SOLUTION TO PROBLEMS INVOLVING FLOWING OR STATIC, CHEMICALLY REACTING, GAS MIXTURES. THE COMPUTER PROGRAM USES EXISTING SUBROUTINES FOR PROBLEM SETUP, INITIALIZATION, AND PRELIMINARY CALCULATIONS AND INCORPORATES A STIFF ORDINARY DIFFERENTIAL EQUATION SOLUTION TECHNIQUE. A NUMBER OF CHECK CASES WERE RECOMPUTED WITH THE HYBRID PROGRAM AND THE RESULTS WERE ALMOST IDENTICAL TO THOSE PREVIOUSLY OBTAINED. THE COMPUTATIONAL TIME SAVING WAS DEMONSTRATED WITH A PROPANE-OXYGEN-ARGON SHOCK TUBE COMBUSTION PROBLEM INVOLVING 31 CHEMICAL SPECIES AND 64 REACTIONS. INFORMATION IS PRESENTED TO ENABLE POTENTIAL USERS TO PREPARE AN INPUT DATA DECK FOR THE CALCULATION OF A PROBLEM.

<CLASS> SIMULATION

<193>

<CONT> MCPAR, GREGORY J.

<TITLE> A LAGRANGIAN TRAJECTORY MODEL OF URBAN SCALE PHOTOCHEMICAL AIR POLLUTION

<ADDR> CALIFORNIA INSTITUTE OF TECHNOLOGY, ENVIRONMENTAL QUALITY LABORATORY 318-80, CALIFORNIA BLVD.

<CITY> PASADENA

<STATE> CA

<ZIP> 91125

<PHONE> 213-795-6811 EXT-2451

<DOC>

G.J. MCPAR, W.R. GOODIN AND J.H. SEINFELD, DEVELOPMENT OF A SECOND GENERATION MATHEMATICAL MODEL OF PHOTOCHEMICAL AIR POLLUTION, FINAL REPORT TO CALIFORNIA AIR RESOURCES BOARD UNDER CONTRACT NUMBER A5-046-97, AVAILABLE SEPARATELY AS AN ENVIRONMENTAL QUALITY LABORATORY REPORT (FINAL DOCUMENTATION AVAILABLE OCTOBER 1978)

<SUB> MATHEMATICAL MODELING OF PHOTOCHEMICAL AIR POLLUTION

<ABST>

THIS MODEL IS A MULTI-LAYER, LAGRANGIAN TRAJECTORY FORMULATION OF URBAN SCALE PHOTOCHEMICAL AIR POLLUTION. THE MODEL INCORPORATES THE DIURNAL VARIATIONS IN TURBULENT DIFFUSION, ENTRAINMENT, SURFACE REMOVAL PROCESS, AND DIRECT SOURCE EMISSIONS. CHEMICAL INTERACTIONS AMONG 23 REACTING SPECIES ARE DESCRIBED BY A 50-STEP, LUMPED

ATMOSPHERIC TRANSPORT

<193> COST.

HYDROCARBON REACTION MECHANISM. STIFF ORDINARY DIFFERENTIAL EQUATION AND FINITE DIFFERENCE METHODS ARE USED IN THE MATHEMATICAL SOLUTION PROCEDURES. THE MODEL HAS BEEN EXTENSIVELY USED AS PART OF THE VALIDATION PROCEDURES FOR A LARGE SCALE THREE-DIMENSIONAL AIR SHED MODEL OF THE SOUTH COAST AIR BASIN OF SOUTHERN CALIFORNIA. EXTENSIVE USE HAS BEEN MADE OF DATA GENERATION PROCEDURES TO MINIMIZE USER INPUT REQUIREMENTS.

<GEO> MODEL FORMULATION HAS NO GEOGRAPHIC DEPENDENT FEATURES

<STATUS> IN USE

<ACCESS> LIMITED

<MEDIA> MAGNETIC TAPE

<SIZE> APPROXIMATELY 20,000, SOURCE AND COMMENT STATEMENTS

<COMP> IBM

<CONFIG> IBM 370/150, 256 K BYTES

<LANG> FORTRAN IV, SOME INSTALLATION DEPENDENT PLOTTING FUNCTIONS

<CHAR> EBCDIC

<ALGO> FINITE DIFFERENCES; STIFF ORDINARY DIFFERENTIAL EQUATION METHODS; K-THEORY TURBULENCE MODELS; LUMPED PARAMETER REPRESENTATIONS OF HYDROCARBON REACTIONS.

<CLAS> DETERMINISTIC; SIMULATION

<APPL> AIR QUALITY IMPACT ANALYSES OF ALTERNATIVE EMISSION CONTROL STRATEGIES FROM URBAN SCALE AIRSHEDS

<USERS> ENVIRONMENTAL QUALITY LABORATORY, CALTECH; CALIFORNIA AIR RESOURCES BOARD; PRIVATE COMPANIES.

<SHD> DEPENDS ON PROBLEM BEING ANALYZED

<INVAL> VALIDATION OF MODEL USING DATA AVAILABLE IN SOUTH COAST AIR BASIN OF SOUTHERN CALIFORNIA. EXTENSIVE SENSITIVITY ANALYSES PERFORMED ON CHEMICAL MECHANISM.

<CCO> THE MODEL IS MODULAR IN DESIGN AND CAN BE EASILY CONVERTED TO OTHER COMPUTED SYSTEMS.

<UPDATE> 780822

<190>

<COM> MCRAE, GREGORY J.

<TITLE> A THREE-DIMENSIONAL, URBAN SCALE, MATHEMATICAL MODEL OF PHOTOCHEMICAL AIR POLLUTION

<ADDR> CALIFORNIA INSTITUTE OF TECHNOLOGY, ENVIRONMENTAL QUALITY LABORATORY 374-40, CALIFORNIA BLVD

<CITY> PASADENA

<STATE> CA

<ZIP> 91125

<PHONE> 213-795-6811 EXT-2451

<DOC>

G.J. MCRAE, W.S. GORDIN AND J.H. SEINFELD, DEVELOPMENT OF A SECOND GENERATION MATHEMATICAL MODEL OF PHOTOCHEMICAL AIR POLLUTION, FINAL REPORT TO CALIFORNIA AIR RESOURCES BOARD UNDER CONTRACT NUMBER 45-046-97, AVAILABLE SEPARATELY AS AN ENVIRONMENTAL QUALITY LABORATORY REPORT (FINAL DOCUMENTATION AVAILABLE OCTOBER 1978)

<SUB>

MATHEMATICAL MODELING OF PHOTOCHEMICAL AIR POLLUTION

<ABST>

THIS MODEL IS A MULTI-LAYER, EULERIAN GRID FORMULATION OF URBAN SCALE PHOTOCHEMICAL AIR POLLUTION. THE MODEL INCORPORATES DIURNAL VARIATIONS IN PROCESSES SUCH AS TURBULENT DIFFUSION, ENTRAINMENT, ADVECTIVE TRANSPORT, SURFACE REMOVAL, AREA AND POINT SOURCE EMISSIONS. CHEMICAL INTERACTIONS AMONG 23 REACTING SPECIES ARE DESCRIBED BY A 50-STEP, LUMPED HYDROCARBON REACTION MECHANISM. ADVANCED, FINITE ELEMENT, FINITE DIFFERENCE AND STIFF ORDINARY DIFFERENTIAL EQUATION METHODS ARE USED TO SOLVE THE SYSTEM OF 3-DIMENSIONAL, COUPLED, PARABOLIC, PARTIAL DIFFERENTIAL SPECIES CONTINUITY EQUATIONS. OBJECTIVE ANALYSIS PROCEDURES ARE USED TO GENERATE 3-DIMENSIONAL MASS CONSISTENT WIND AND MIXING DEPTH FIELDS. EXTENSIVE USE HAS BEEN MADE OF DATA GENERATION PROCEDURES TO MINIMIZE USER INPUT REQUIREMENTS. THE MODEL HAS BEEN VALIDATED AGAINST DATA AVAILABLE IN THE SOUTH COAST AIR BASIN OF SOUTHERN CALIFORNIA.

<GEO>

MODEL FORMULATION HAS NO GEOGRAPHIC DEPENDENT FEATURES

<STATUS>

IN USE

<ACCESS>

LIMITED

<MEDIA>

MAGNETIC TAPE

<SIZE>

APPROXIMATELY 20,000 SOURCE AND COMMENT STATEMENTS

<COMP>

IBM

<CONFIG>

IBM 370/150, 256 K BYTES (SIZE DEPENDS ON SCALE OF PROBLEM)

<LANG>

FORTRAN IV, SOME INSTALLATION DEPENDENT PLOTTING FUNCTIONS

<CHAR>

EBCDIC

<ALGO>

FINITE DIFFERENCES; STIFF ORDINARY DIFFERENTIAL EQUATION METHODS; K-THEORY TURBULENCE MODELS; LUMPED PARAMETER REPRESENTATIONS OF HYDROCARBON REACTIONS.

<CLAS>

DETERMINISTIC; SIMULATION

<APPL>

AIR QUALITY IMPACT ANALYSES OF ALTERNATIVE EMISSION CONTROL STRATEGIES FROM URBAN SCALE AIRSHEDS.

<USERS>

ENVIRONMENTAL QUALITY LABORATORY, CALTECH; CALIFORNIA AIR RESOURCES BOARD; PRIVATE COMPANIES.

<SHD>

DEPENDS ON PROBLEM BEING ANALYZED

<INVAL>

VALIDATION OF MODEL USING DATA AVAILABLE IN SOUTH COAST AIR BASIN OF SOUTHERN CALIFORNIA. EXTENSIVE SENSITIVITY ANALYSES PERFORMED ON CHEMICAL MECHANISM.

<190>

ATMOSPHERIC TRANSPORT

<190> CONT.

<CCY> THE MODEL IS MODULAR IN DESIGN AND CAN BE EASILY CONVERTED TO OTHER COMPUTER SYSTEMS.

<UPDATE> 700022

<195>

<CCY> MCRAE, GREGORY J.

<TITLE> A WELL MIXED BOX MODEL OF URBAN SCALE PHOTOCHEMICAL AIR POLLUTION

<ADDR> CALIFORNIA INSTITUTE OF TECHNOLOGY, ENVIRONMENTAL QUALITY LABORATORY 310-80, CALIFORNIA BLVD

<CITY> PASADENA

<STATE> CA

<ZIP> 91125

<PHONE> 213-795-6011 EXT-2451

<DOC> G.J. MCRAE, R.E. COOPER AND J.H. SEINFELD, DEVELOPMENT OF A SECOND GENERATION MATHEMATICAL MODEL OF PHOTOCHEMICAL AIR POLLUTION, FINAL REPORT TO CALIFORNIA AIR RESOURCES BOARD UNDER CONTRACT NUMBER AS-006-B7, AVAILABLE SEPARATELY AS AN ENVIRONMENTAL QUALITY LABORATORY REPORT (FINAL DOCUMENTATION AVAILABLE OCTOBER 1970)

<SUB> MATHEMATICAL MODELING OF PHOTOCHEMICAL AIR POLLUTION

<ABST> THIS SIMPLE MODEL IS A WELL MIXED, BOX REPRESENTATION OF URBAN SCALE PHOTOCHEMICAL AIR POLLUTION. INTENDED TO TEST REACTION MECHANISMS, IT INCORPORATES THE DIURNAL EFFECTS OF TURBULENT ENTRAINMENT, ADVECTIVE TRANSPORT, SURFACE REMOVAL PROCESSES, AND DIRECT SOURCE EMISSIONS. CHEMICAL INTERACTIONS AMONG 23 REACTING SPECIES ARE DESCRIBED BY A 50-STEP, LUMPED HYDROCARBON REACTION MECHANISM. STIFF ORDINARY DIFFERENTIAL EQUATION METHODS ARE USED IN THE NUMERICAL SOLUTION PROCEDURES. EXTENSIVE USE HAS BEEN MADE OF DATA GENERATION PROCEDURES TO MINIMIZE USER INPUT REQUIREMENTS. THE MODEL CAN BE USED FOR SCREENING STUDIES OF PHOTOCHEMICAL CONTROL STRATEGIES FOR BOTH FIXED AND MOVING GRID COORDINATE SYSTEMS. THE MODEL HAS BEEN EXTENSIVELY USED FOR SIMULATING SMOG CHAMBER EXPERIMENTS.

<GEO> MODEL FORMULATION HAS NO GEOGRAPHIC DEPENDENT FEATURES

<STATUS> IN USE

<ACCESS> LIMITED

<MEDIA> MAGNETIC TAPE

<SIZE> APPROXIMATELY 6000 SOURCE AND COMMENT STATEMENTS

<COMP> IBM

<CONFIG> IBM 370/150, 120 K BYTES

<LANG> FORTRAN IV, SOME INSTALLATION DEPENDENT PLOTTING FUNCTIONS

<CARD> BASIC

<ALGO> FINITE DIFFERENCES; STIFF ORDINARY DIFFERENTIAL EQUATION METHODS; LUMPED PARAMETER REPRESENTATIONS OF HYDROCARBON REACTIONS

<CLAS> DETERMINISTIC; SIMULATION

<APPL> AIR QUALITY IMPACT ANALYSES OF ALTERNATIVE EMISSION CONTROL STRATEGIES FROM URBAN SCALE AIRWAYS.

<USERS> ENVIRONMENTAL QUALITY LABORATORY, CALTECH; CALIFORNIA AIR RESOURCES BOARD; PRIVATE COMPANIES.

<SND> DEPENDS ON PROBLEM BEING ANALYZED

<VAL> VALIDATION OF MODEL USING DATA AVAILABLE IN SOUTH COAST AIR BASIN OF SOUTHERN CALIFORNIA. EXTENSIVE SENSITIVITY ANALYSES PERFORMED ON CHEMICAL MECHANISM.

<COM> THE MODEL IS MODULAR IN DESIGN AND CAN BE EASILY CONVERTED TO OTHER COMPUTER SYSTEMS.

<UPDATE> 700022

<196>

<CONT> MEYER, ROYAL, E.

<TITLE> BNL LONG RANGE TRAJECTORY MODEL

<ACRO> BNL TRAJECTORY MODEL

<ADDR> BROOKHAVEN NATIONAL LAB, ATMOSPHERIC SCIENCES, BLDG. 051

<CITY> JPTON

<STATE> NY

<ZIP> 11973

<PHONE> 516-345-2261; PTS 640-2261

<SOURCE> CAN BE EXERCISED AT BNL BY ASD STAFF

<DOC> MEYER, R. E. AND CEDEPALL, R. T., 1975: FOSSIL POLLUTANT TRANSPORT MODEL DEVELOPMENT; AND BNL TRANSPORT MODEL; IN BROOKHAVEN NATIONAL LABORATORY REGIONAL ENERGY STUDIES PROGRAM ANNUAL REPORT, BNL 50478, NOVEMBER, PP 46-61, PP 91-106.

<SUB> ATMOSPHERIC TRANSPORT FROM SPECIFIED LOCATIONS (LAT, LONG)

<ABST> THIS MODEL CALCULATES TRAJECTORIES (UP TO 10 DAYS DURATION) OVER A PERIOD (UP TO 41 DAYS) FROM SPECIFIED LOCATIONS (LATITUDE, LONGITUDE). TRAJECTORY CALCULATIONS USE UPPER AIR OBSERVED WINDS UPDATED EVERY 6 HOURS, AND AVERAGED THROUGH A SPECIFIED LAYER OF THE ATMOSPHERE.

<GEO> ANY SCALE; STATE TO GLOBAL.

<TIME> MAX. TRAJECTORY LENGTH: 10 DAYS; MAX. PERIOD OF TRAJECTORIES: 41 DAYS

<STATUS> IN USE

<ACCESS> LIMITED

<MEDIA> PUNCHED CARDS

<SIZE> 1500 CARDS

<CONFIG> 40,000 WORDS STORAGE

ATMOSPHERIC TRANSPORT

<196> CONT.

<LANG> FORTRAN

<CHAP> 9CB

<ALGO> FINITE DIFFERENCE INTEGRATION.

<CLAS> DISCRETE; DETERMINISTIC

<REF> TRAJECTORY ANALYSIS

<USER> ICCAI

<SRV> NATIONAL CLIMATIC CENTER, ASHEVILLE

<RVL> SCOPE VALIDATION WITH TRACERS OF OPPORTUNITY ON 100-1000 KM SCALE.

<UPDAT> 780607

<CLAS> SIMULATION

<197>

<CONT> MILLER, S. A.; MCCOY, D. S. C.; AMOSWITZ, L.; SCARLOW, J. H.; SIMON C.

<TITLE> DEVELOPING A PRACTICAL DISPERSION MODEL FOR AN AIR QUALITY REGION

<ADDR> GURMAN AEROSPACE CORPORATION

<CITY> BETHPAGE

<STATE> NY

<DOC> JOURNAL AIR POLLUTION CONTROL ASSOCIATION, 21(9), 549-554, 1971

<ABST> IN THE PAPER WE BRIEFLY REVIEW OUR EFFORTS ON COMPUTED MODELING FOR THE NEW YORK/NEW JERSEY/CONNECTICUT AIR QUALITY REGION. ALTHOUGH MUCH MORE DATA MUST BE EXAMINED, INCLUDING THOSE FOR THE WINTER SEASON, THE PROGRESS TO DATE IS ENCOURAGING AND SUPPORTS OUR ORIGINAL BELIEF THAT MUCH CAN AND SHOULD BE LEARNED BY SYSTEMATICALLY ANALYZING THE EFFECTS OF INDIVIDUAL MODEL COMPONENTS. IT SHOULD BE EMPHASIZED THAT NO EMPIRICAL MODIFICATIONS HAVE BEEN MADE IN ANY OF THE RESULTS PRESENTED, ALTHOUGH THE ANALYSIS SUGGESTS SOME OBVIOUS IMPROVEMENTS. THEREFORE THE LEVEL OF AGREEMENT ATTAINED BETWEEN THE MODEL AND THE MEASURED DATA LEADS ONE TO EXPECT THAT SUBSEQUENT ADJUSTMENTS WILL ENABLE THIS SIMPLE MODEL TO BECOME A PRACTICAL WORKING MODEL THAT CAN BE USED ON AN OPERATIONAL BASIS WITH AVAILABLE INPUTS. IT SHOULD ALSO PROVIDE US WITH A SOLID BASIS FOR EVALUATING THE POSSIBLE IMPROVEMENTS AND COMPLICATIONS OF INCREASINGLY SOPHISTICATED MODELS.

<CLAS> SIMULATION

<199>

<CONT> MILLER, T. L.; MOLL, E. E.; ASCE, E.

<TITLE> MEASURED VERSUS PREDICTED AIR QUALITY NEAR HIGHWAYS

<ADDR> EDWINO-MEASURE, INC.

<CITY> KNOXVILLE

<STATE> TN

<DOC> JOURNAL ENVIRONMENTAL ENGINEERING DIVISION, AMERICAN SOCIETY OF CIVIL ENGINEERING, 102(223), 627-643, 1976

<ABST> THIS PAPER PROVIDES A COMPARISON OF CARBON MONOXIDE CONCENTRATIONS MEASURED NEAR A HIGHWAY WITH CONCENTRATION PREDICTIONS FROM TWO DIFFERENT IDEALIZED LINE SOURCE DISPERSION MODELS. THE MODELS ARE BASED ON THE GAUSSIAN DISPERSION EQUATIONS. FIELD MEASUREMENTS WERE MADE OF CARBON MONOXIDE, METEOROLOGICAL CONDITIONS, AND TRAFFIC CONDITIONS SYNCHRONOUSLY. THE METEOROLOGICAL AND SOURCE STRENGTH MEASUREMENTS WERE USED AS INPUT TO THE MODELS AND THE CARBON MONOXIDE DATA WERE COMPARED TO MODEL PREDICTIONS. TWO EMPIRICAL MODELS WERE ALSO DEVELOPED. ONE MODEL RELATES THE AMBIENT CONCENTRATION TO THREE PARAMETERS--THE POLLUTANT'S EMISSION RATE; NORMAL WIND SPEED; AND THE DISTANCE FROM THE HIGHWAY. THE SECOND MODEL RELATES THE AMBIENT CONCENTRATION TO THE POLLUTANT EMISSION RATE, THE INTENSITY OF THE TURBULENT WAKE INDUCED BY MOVING VEHICLES, AND THE TIME OF TRAVEL OF THE WAKE DOWNWIND.

<CLAS> PREDICTIVE

<198>

<CONT> MILLER, H. E.; HOLWORTH, G. C.

<TITLE> AN ATMOSPHERIC DIFFUSION MODEL FOR METROPOLITAN AREAS

<ABST> AN URBAN DIFFUSION MODEL, WHICH DOES NOT REQUIRE THE USE OF AN ELECTRONIC COMPUTER, IS PRESENTED. THE MAIN SIMPLIFYING ASSUMPTIONS ARE THAT CONTINUOUS POLLUTANT SOURCES ARE UNIFORMLY DISTRIBUTED OVER THE URBAN AREA AND VERTICAL DIFFUSION OCCURS UNTIL THE EFFLUENT FROM EACH LINE SOURCE REACHES THE TOP OF THE MIXING

<200>

<CONT> HILLS, H. T.; RECORD, P. A.

<TITLE> COMPREHENSIVE ANALYSIS OF TIME-CONCENTRATION RELATIONSHIPS AND VALIDATION OF A SINGLE-SOURCE DISPERSION MODEL

<ADDR> GCA CORPORATION, GCA TECHNOLOGY DIVISION

<CITY> BEDFORD

<STATE> MA

<DOC> PB--250814, 1975

<ABST> THE REPORT PRESENTS AN ANALYSIS OF SO2

ATMOSPHERIC TRANSPORT

<200> CONT.

TIME CONCENTRATION RELATIONSHIPS IN THE VICINITY OF A POWER PLANT AND A VALIDATION OF THE EPA SINGLE SOURCE MODEL USING CONCENTRATION AND METEOROLOGICAL DATA COLLECTED IN THE SAME AREA. THE CONCENTRATION RELATIONSHIPS STUDIED WERE PEAK 1-HOUR TO AVERAGE 1-HOUR AND PEAK 1 HOUR TO AVERAGE 24-HOUR CONCENTRATION RATIO DISTRIBUTIONS AND THE EFFECT UPON THE STATISTICS OF THESE DISTRIBUTIONS OF VARIABLES SUCH AS WIND SPEED, ATMOSPHERIC STABILITY, HOUR OF THE DAY, AND PEAK 1-HOUR CONCENTRATION ITSELF. THE PRINCIPAL FINDING OF THE VALIDATION EXERCISE WAS THAT THE MODEL OVERPREDICTED SO₂ CONCENTRATIONS FOR ALL 6 RECEPTOR LOCATIONS IN THE STUDY AREA. THE AGREEMENT BETWEEN MEASURED AND CALCULATED CONCENTRATIONS WAS NOT NOTICEABLY IMPROVED BY THE USE OF MORE ACCURATE AND DETAILED EMISSIONS AND METEOROLOGICAL DATA BASES.

<CLAS> SIMULATION

<201>
<CON> WILLS, V. T.; PEEVES, R.

<TITLE> MULTI-SOURCE ATMOSPHERIC TRANSPORT MODEL FOR DEPOSITION OF TRACE CONTAMINANTS

<ABST> AN ATMOSPHERIC TRANSPORT MODEL (ATM) FROM A GAUSSIAN PLUME MODEL WAS DEVELOPED TO CALCULATE THE TOXIC MATERIAL DEPOSITION RATE AT ANY POINT WITHIN A WATERSHED, GIVEN THE LOCATION OF VARIOUS AIR POLLUTION SOURCES. SOURCES PRESENTLY INCLUDE THE POINT SOURCE (STACK), AREA SOURCE (CITY), LINE SOURCE (ROAD OR RAILROAD), AND WINDBLOWN SOURCE (DDY TAILINGS POND). THESE RATES ARE THEN USED BY THE WISCONSIN HYDROLOGICAL TRANSPORT MODEL (WHTM) TO DETERMINE THE SUBSEQUENT TRANSFER OF THE TOXIC MATERIALS TO THE STREAM AND GROUNDWATER.

<CLAS> SIMULATION

<202>
<CON> WILLS, V. T.; STERN, R. W.; VINCENT, L. H.

<TITLE> IMPROVEMENTS TO SINGLE-SOURCE MODEL: TESTING AND EVALUATION OF MODEL IMPROVEMENTS

<ABST> GCA CORPORATION, GCA TECHNOLOGY DIVISION

<CI>D BEPCRB

<STATE> WA

<SOURCE> WIS A00/WP A01

<DOC> PB--271 922/7SL, 1977

<ABST> THE MAIN PURPOSE OF THIS STUDY WAS TO DETERMINE WHETHER ALTERNATE METHODS FOR STABILITY INDEX ASSIGNMENT AND DISPERSION CALCULATION WOULD YIELD BETTER AGREEMENT BETWEEN MEASURED AND CALCULATED CONCENTRATION FREQUENCY DISTRIBUTIONS OF 1-HOUR SO₂ CONCENTRATIONS WHEN USED IN THE EPA SINGLE SOURCE MODEL. THE FOLLOWING DISPERSION CURVES WERE TESTED: PASQUILL-TURNER, GIFFORD-BRIGGS, SMITH-SINGER AND P. B. SMITH. A

FRACTIONAL STABILITY ASSIGNMENT TECHNIQUE BASED UPON THE WORK OF P. B. SMITH WAS ALSO INVESTIGATED. BASED UPON MODEL VALIDATION RESULTS FOR THE CANAL POWER PLANT IN MASSACHUSETTS AND THE HUNTINGTON POWER PLANT IN OHIO, THE PASQUILL-TURNER DISPERSION CURVES AND STABILITY INDEX ASSIGNMENT ALGORITHM CURRENTLY USED IN THE MODEL WERE FOUND TO GIVE THE BEST AGREEMENT WITH MEASURED CONCENTRATION DISTRIBUTIONS. DURING THE COURSE OF THE STUDY THE INCORPORATION OF A VARIABLE STABILITY INDEX VELOCITY WAS EVALUATED AND FOUND NOT TO APPRECIABLY AFFECT THE MODEL PREDICTIONS.

<CLAS> SIMULATION

<203>
<CON> SOLENNHAF, C.

<TITLE> 3-D TWO-DIMENSIONAL CUMULUS DYNAMICS MODEL WITH AEROSOL SCAVENGING

<AC30> PCDMAS-2C

<ADDR> LAWRENCE LIVERMORE LABORATORY, PHYSICS, G-DIV., P.O. BOX 968

<CITY> LIVERMORE

<STATE> CA

<ZIP> 94550

<PHONE> 415-422-1027; FTS 532-1027

<SOURCE> DEVELOPED AT LLL FROM THE 3-D CUMULUS DYNAMICS MODEL

<DOC> ORNL/NSF/EATC-2

<SUB> PRECIPITATION SCAVENGING

<ABST> THE 3-D CUMULUS DYNAMICS MODEL IS A TIME-DEPENDENT TWO-DIMENSIONAL SIMULATION OF THE LIFE-CYCLE OF A CONVECTIVE CLOUD. IT CAN BE RUN IN EITHER AXISYMMETRIC OR RECTILINEAR GEOMETRICAL CONFIGURATIONS. THE CLOUD PHYSICS USES A PSEUDO-LAGRANGIAN CALCULATION OF A KESSLER-TYPE MICROPHYSICAL PARAMETERIZATION THAT DIVIDES CONDENSED WATER INTO NON-FALLING CLOUD DROPLETS AND FALLING RAINDROPS THAT EVENTUALLY PRODUCE RAIN ON THE GROUND. RELEASE OF LATENT HEAT OF CONDENSATION IS THE PREDOMINANT DRIVING TERM IN THE DYNAMICS. THE CUMULUS DYNAMICS MODEL HAS BEEN MODIFIED TO INCLUDE A CALCULATION OF SCAVENGING OF A POLLUTANT AEROSOL. THE AEROSOL PARTICLES ARE COLLECTED BY CLOUD DROPLETS DURING CONDENSATION NUCLEATION OR BY ATTACHMENT TO THE CLOUD. THE POLLUTED DROPLETS SUBSEQUENTLY COALESCE WITH FALLING RAIN DROPS LEADING TO DEPOSITION OF POLLUTANT ON THE GROUND WITH THE RAIN. THE 3-D CUMULUS DYNAMICS MODEL IS A NUMERICAL INTEGRATION IN TIME OF THE EULERIAN VORTICITY EQUATION USING EITHER UPSTREAM OR CENTERED DIFFERENCES. WINDS ARE GENERATED BY DIFFERENTIATION OF THE STREAM FUNCTION WHICH IS OBTAINED BY AN OVER RELAXATION SOLUTION OF POISSON'S EQUATION. ADVECTION FOR THE MICROPHYSICS, POLLUTANT MIXING RATIOS AND FOR TEMPERATURE ARE OBTAINED BY A PSEUDO-LAGRANGIAN INTERPOLATION METHOD; PHYSICAL TRANSFORMATION OF THESE TERMS

ATMOSPHERIC TRANSPORT

<203> CONT.

IS DONE BY EULERIAN INTEGRATION OF APPROPRIATE RATE TERMS. DEPOSITION OF RAIN AND POLLUTANT ON THE GROUND IS VIA INTERCEPTION OF RAIN AND POLLUTED PATHWAYS WITH THE SURFACE BASED ON INTERPOLATION OF VERTICAL VELOCITY AT LOWEST GRID LAYER TO GROUND SURFACE.

<STATUS> UNDER DEVELOPMENT; IN USE

<ACCESS> NOT PRESENTLY AVAILABLE OUTSIDE LL

<MEDIA> PHOTOSTAT

<SIZE> CODE STATEMENTS WITH COMMENT CARDS: 2900; CODE STATEMENTS W/O COMMENT CARDS: 2900

<CODE> CDC

<COMPIG> CDC 7600 WITH CARD READER, MICROFICHE, PRINTER, AND PLOTTER, 520,000 COTAL SPACE REQUIRED;

<LANG> LILLIAN-CHAT

<CHAP> ASCII

<ALGO> SIMULTANEOUS OVER-RELAXATION (SOR); FINITE DIFFERENCING

<CLASS> INTEGRATIVE; PREDICTIVE

<APPL> PRECIPITATION SCAVENGING

<USER> LL

<SM> WEATHER SOUNDING DATA

<CC> 4 CPU MINUTES REQUIRED FOR AVERAGE RUN

<DESCRIBED> 780614

<204>

<CONT> MONTGOMERY, T. L.; MORRIS, W. B.; THOMAS, P. W.; CARPENTER, S. B.

<TITLE> A SIMPLIFIED TECHNIQUE USED TO EVALUATE ATMOSPHERIC DISPERSION OF EMISSIONS FROM LARGE POWER PLANTS

<ADDR> TENNESSEE VALLEY AUTHORITY, 272-401 B

<CITY> CHATTANOOGA

<STATE> TN

<ZIP> 37401

<PHONE> 615-755-3147

<DOC> JOURNAL AIR POLLUTION CONTROL ASSOCIATION, 23(5), 389-394, 1973

<SUB> LARGE POWER PLANTS

<ABST> A SIMPLIFIED METHOD WHICH IS USED BY THE TENNESSEE VALLEY AUTHORITY TO ESTIMATE AMBIENT CONCENTRATIONS OF ATMOSPHERIC EMISSIONS FROM ITS LARGE POWER PLANTS IS PRESENTED. THE TECHNIQUE REQUIRES THE USE OF THREE MONOGRAMS FOR THE RAPID GRAPHIC SOLUTION OF THREE DISPERSION MODELS-COWING, INVERSION BREAKUP, AND TRAPPING. A DISCUSSION OF THE METEOROLOGICAL CONDITIONS THAT ARE ASSOCIATED WITH THESE DISPERSION MODELS, SUPPORTING APPENDICES, AND A WORKED EXAMPLE ARE ALSO PRESENTED.

<GEO> TENNESSEE VALLEY AREA

<TIME> 1957-1970

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> TEXT

<SIZE> 7 PAGES

<ALGO> MONOGRAMS

<CLASS> CONTINUOUS

<APPL> OTHER AIR DISPERSION ESTIMATES

<USER> TENNESSEE VALLEY AUTHORITY

<SM> TENNESSEE VALLEY AUTHORITY DATA

<REAL> MODEL NOT VALIDATED

<UPDATE> 780717

<205>

<CONT> MOORE, R. E.

<TITLE> A COMPUTER CODE FOR ESTIMATING AIR POLLUTANT CONCENTRATIONS FROM DISPERSED SOURCES

<ACRO> AREAS

<ADDR> OAK RIDGE NATIONAL LABORATORY, HEALTH AND SAFETY RESEARCH DIVISION, P. O. BOX 1

<CITY> OAK RIDGE

<STATE> TN

<ZIP> 37830

<PHONE> 615-483-8611 EXT 3-1360; RTS 850-1360

<SOURCE> DEVELOPED AT ORNL

<DOC> R.E. MOORE, AREAS: A COMPUTER CODE FOR ESTIMATING AIR POLLUTANT CONCENTRATIONS FROM DISPERSED SOURCES, ORNL/TN-6364, MAY 1970.

<SUB> POLLUTANTS AND EFFLUENTS OF ENERGY PROCESSES; ENVIRONMENTAL AND ECOLOGICAL SYSTEMS

<ABST> THE AREAS AREA-SOURCE COMPUTER CODE ESTIMATES ANNUAL-AVERAGE CONCENTRATIONS OF AN AIR POLLUTANT AT GROUND LEVEL IN EACH OF 400 GRID SQUARES IN A 20 BY 20 AREA REFERENCE GRID. AREAS CAN BE USED FOR MULTIPLE, DISPERSED SOURCES LOCATED IN EACH OF THE 400 GRID SQUARES BY TREATING THEM AS AREA SOURCES. REQUIRED INPUT INCLUDES 20 BY 20 ARRAYS OF ANNUAL-AVERAGE POINT-SOURCE I/Q VALUES GENERATED BY USE OF A POINT-SOURCE MODEL OR COMPUTER CODE FOR SPECIFIC GRID SIZES RELATIVE TO THE SIZE OF THE AREA REFERENCE GRID. AREAS CAN BE APPLIED TO ANY SIZE AREA FOR WHICH A UNIFORM METEOROLOGY CAN BE ASSUMED. IT HAS BEEN APPLIED TO DISPERSED EMISSIONS OF POSSIL FUEL COMBUSTION PRODUCTS AND AUTOMOBILE EMISSIONS IN ROANE COUNTY, TENNESSEE, AND TO THE ATMOSPHERIC DISPERSION OF RADIOISOTOPES EMITTED FROM THE TAILINGS PILES OF URANIUM MILLS.

<GEO> RADIUS OF 100 MILES

<205>

ATMOSPHERIC TRANSPORT

<205> CONT.

<TYPE> 1976-

<STATUS> IN USE

<ACCESS> LIMITED

<COMP> IBM

<COMPIG> IBM 360/91; 7 SECONDS TO RUN

<LANG> FORTRAN IV

<CLASS> PREDICTIVE; INTEGRATIVE

<206>

<CONT> RODENSTERN, L.

<TITLE> SUMMARY REPORT ON MODELING ANALYSIS OF POWER PLANTS FOR FUEL CONVERSION

<ACRO> ABCO, INC., WALDEN RESEARCH DIVISION

<CITY> CAMBRIDGE

<STATE> MA

<SOURCE> NTIS \$4.00/HP\$2.25

<DOC> PB--246 146/55L, 1975

<ABST> THIS REPORT SUMMARIZES AN AIR QUALITY MODELING ANALYSIS OF A NUMBER OF SELECTED POWER PLANTS. SELECTED UNITS WITHIN SPECIFIC PLANTS WERE CONSIDERED CANDIDATES FOR FUEL CONVERSION FROM OIL TO COAL FIRING AS A RESULT OF THE OIL SHORTAGE AND ENERGY CRISIS OF 1973-1974. THE PURPOSE OF THIS STUDY IS TO EVALUATE THE IMPACT THESE CANDIDATE CONVERSIONS WOULD HAVE ON AMBIENT SULFUR DIOXIDE AND PARTICULATE CONCENTRATIONS.

<CLASS> SIMULATION

<207>

<CONT> ROSCHNIGER, BENEDICTO J.; CHU, ROLAND T.; THAYER, S. D.

<TITLE> A TWO-DIMENSIONAL WARM FOG MODIFICATION MODEL

<ABST> THE PURPOSE OF THIS FIVE-YEAR-LONG STUDY IS TWO-FOLD: (1) TO PERFORM THE NECESSARY RESEARCH TO EXAMINE AND EVALUATE PHYSICAL PROCESSES THAT ARE IMPORTANT IN THE FORMATION AND DISSIPATION OF WARM FOG AND STRATUS, RELATE THEM TO THE NUMBER, AND TYPE OF CONDENSATION NUCLEI IN THE ATMOSPHERE, AND RELATE THEM IN TURN, TO POLLUTION AND ITS PRODUCTS; AND, (2) TO CONDUCT RESEARCH TO DETERMINE THE EFFECTS OF POLLUTION ON THE CONDENSATION NUCLEI THAT ARE RESPONSIBLE FOR FORMATION OF OCEAN AND CONTINENTAL CLOUDS.

<CLASS> SIMULATION

<208>

<CONT> BAFFO, CARREN J.

<TITLE> TENNESSEE VALLEY ASSESSMENT MODEL

<ACRO> TVA

<ADDR> NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, ATMOSPHERIC TURBULENCE

AND DIFFUSION LABORATORY, P.O. BOX 1

<CITY> OAK RIDGE

<STATE> TN

<ZIP> 37930

<PHONE> 615-483-4611 EXT-34001; FTS 850-4001

<DOC> NONE

<SUB> AIR POLLUTION TRANSPORT AND DIFFUSION

<ABST> TVA SIMULATES TRANSPORT AND DIFFUSION OF ATMOSPHERIC POLLUTANTS THROUGH THE REGION OF THE EASTERN TENNESSEE RIVER VALLEY. THE MODEL CONSTRUCTS SIMULTANEOUS TRAJECTORIES FROM SEVERAL SOURCES, SUPER-IMPOSES DIFFUSION AND DEPOSITION, AND CALCULATES TEMPORAL AND SPATIAL CONCENTRATIONS OF EFFLUENT.

<GEO> EASTERN TENNESSEE VALLEY

<TIME> NOT APPLICABLE

<STATUS> UNDER DEVELOPMENT

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE; PUNCHED CARDS

<SIZE> 500 CARDS

<COMP> IBM

<COMPIG> IBM 360/91 WITH 256 K

<LANG> FORTRAN IV

<CHAR> EBCDIC

<ALGO> LINEAR PROGRAMMING

<CLASS> PREDICTIVE

<APPL> EASTERN TENNESSEE RIVER VALLEY

<USERS> NTDL

<SUB> TVA METEOROLOGICAL NETWORK DATA

<EVAL> NONE

<UPDATE> 700816

<209>

<CONT> NELSON, IDAL C.

<TITLE> AQUEOUS REACTOR RELEASE RESULT GENERATOR

<ACRO> ARRG

<ADDR> BATTELLE-PACIFIC NORTHWEST LABORATORIES, POST OFFICE BOX 999

<CITY> RICHLAND

<STATE> WA

<ZIP> 99352

<PHONE> 509-946-5695; FTS 444-7511 EXT 946-5695

<210>

<CONT> NELSON, IDAL C.

<TITLE> GAS RELEASE OF NUCLIDES

<ACRO> GROW

ATMOSPHERIC TRANSPORT

<210> CONT.
 <ADDR> PATTELLE-PACIFIC NORTHWEST
 LABORATORIES, POST OFFICE BOX 999
 <CITY> RICHLAND
 <STATE> WA
 <ZIP> 99352
 <FROM> 409-942-5695; PTS 400-7511 EXT 942-5695

<211>
 <CONT> VEDRIK, L. L.; FRANCIS, W. E.; BALT, R.
 <TITLE> BREMGAT: A CODE FOR THE GENERATION AND
 TRANSPORT OF BREMSSTRAHLUNG THROUGH THE
 ATMOSPHERE
 <ACRO> AUFOSA; POTONG; NCBBEN
 <ACRS> LOCKHEED PALO ALTO RESEARCH LABORATORY,
 DEPT. 5212, 3251 HARVARD STREET
 <CITY> PALO ALTO
 <STATE> CA
 <ZIP> 94304
 <FROM> 415-493-4411, EXT-45520
 <SOURCE> SPACE SCIENCES LABORATORY, DEPARTMENT
 5212, LOCKHEED PALO ALTO RESEARCH
 LABORATORY, 3251 HARVARD STREET, PALO
 ALTO CA., 94304
 <DOC> AD/A--006 149/551; LOCKHEED PALO ALTO
 RESEARCH LABORATORY REPORT LMSC/D407007
 OCT, 1974
 <SUB> DESCRIPTION OF CODE THAT CALCULATES THE
 BREMSSTRAHLUNG ENERGY DEPOSITION
 PRODUCED IN THE ATMOSPHERE BY AN
 INCIDENT FLUX OF ELECTRONS
 <ABST> A COMPUTER CODE IS DESCRIBED WHICH
 DETERMINES THE RATE AT WHICH ENERGY IS
 DEPOSITED IN THE LOWER ATMOSPHERE BY
 THE BREMSSTRAHLUNG EMITTED FROM AN
 INCIDENT FLUX OF AUROREAL ELECTRONS
 INTERACTING WITH THE ATMOSPHERE. THE
 CODE CONSISTS OF THREE MAJOR PROGRAMS
 CALLED AUFOSA, POTONG, AND NCBBEN. THE
 PROGRAMS ARE EXECUTED CONSECUTIVELY IN
 THE ORDER GIVEN. AUFOSA DETERMINES THE
 FLUX OF ELECTRONS PRODUCED IN A MODEL
 ATMOSPHERE BY THE GIVEN INCIDENT
 SPECTRUM OF AUROREAL ELECTRONS. POTONG
 CONVERTS THE RESULTING FLUXES INTO A
 SUITABLE BREMSSTRAHLUNG SOURCE TERM. THE
 BORN APPROXIMATION BREMSSTRAHLUNG CROSS
 SECTION GIVEN BY SAUTER, MULTIPLIED BY
 A COULOMB CORRECTION IN THE FORM OF THE
 ELBERT FACTOR, IS USED IN POTONG TO
 CALCULATE THE EMISSION OF
 BREMSSTRAHLUNG. NCBBEN IS A MONTE
 CARLO PROGRAM WHICH DETERMINES THE
 TRANSPORT AND ENERGY DEPOSITION OF THE
 BREMSSTRAHLUNG PHOTONS, TAKING INTO
 ACCOUNT ABSORPTION AND SCATTERING.

<STATUS> IN USE
 <ACCESS> NOT AVAILABLE
 <MEDIA> PUNCHED CARDS
 <SIZE> 4000 CARDS
 <CONT> UNI

<CONFIG> UNIVAC 1100/40 WITH 65 K CORE AND TWO 9
 TRACK TAPE DEVICES
 <LANG> FORTRAN V; UNIVAC SYSTEM VERSION
 33-03-34
 <CHAP> FIELDATA
 <ALGO> NUMERICAL SOLUTION OF FORKER-PLANCK
 DIFFUSION EQUATION; MONTE CARLO METHOD
 <CLASS> SIMULATION
 <APPL> BREMSSTRAHLUNG PRODUCED BY ELECTRONS
 INCIDENT ON THE ATMOSPHERE
 <USERS> LOCKHEED PALO ALTO RESEARCH LABORATORY
 <INVL> TESTED AGAINST OTHER MODEL CALCULATIONS
 <CON> DOCUMENTATION IS INCOMPLETE
 <UPDATE> 700010

<212>
 <CONT> NICOLL, REGIS H.
 <TITLE> TVA GASEOUS EFFLUENT LICENSING CODE FOR
 URANIUM MINING AND MILLING
 <ACRO> D.U.P.P.
 <ADDR> TENNESSEE VALLEY AUTHORITY,
 ENVIRONMENTAL PLANNING, RIVER OAKS BLDG.
 <CITY> MUSCLE SHOALS
 <STATE> AL
 <ZIP> 35660
 <PHONE> 205-383-4631 EXT2767; PTS 872-8767
 <DOC> NONE
 <SUB> URANIUM MINING AND MILLING
 ENVIRONMENTAL RELEASES
 <ABST> D.U.P.P. CALCULATES ATMOSPHERIC
 CONCENTRATIONS AND INDIVIDUAL DOSES DUE
 TO THE ENVIRONMENTAL RELEASE OF U-238
 DECAY CHAIN RADIOISOTOPES. PATHWAYS TO
 MAN INCLUDE INGESTION, INHALATION AND
 AIR SUBMERSION. INGESTION DOSES ARE
 CALCULATED USING METHODOLOGY SIMILAR TO
 D.G. 1.109 AND THE EFFECT OF THE DECAY
 AND BUILD-UP OF SUBSEQUENT DECAY CHAIN
 PRODUCTS IS FULLY ACCOUNTED FOR. IN
 ADDITION, INHALATION AND AIR SUBMERSION
 DOSES ARE CALCULATED USING D.G. 1.109
 METHODOLOGY. ORGANS FOR WHICH DOSES
 ARE EVALUATED ARE TOTAL BODY, SKIN,
 LIVER, BONE, LUNGS AND BRONCHIAL
 EPITHELIUM, STOMACH, SMALL INTESTINE,
 ULI, AND LLI. THE CODE IS CAPABLE OF
 HANDLING MULTIPLE SOURCES OF RELEASE.

<GE> SOUTHEAST U.S.A.
 <TIME> VARIABLE
 <STATUS> IN USE
 <ACCESS> LIMITED
 <MEDIA> DISC: PUNCHED CARDS
 <SIZE> 240K, 1984 CARDS
 <CONT> IBM
 <CONFIG> IBM 360, 240 K CORE, 1 DISK DRIVE WITH
 57 TRACK

<212>

ATMOSPHERIC TRANSPORT

<212> CONT.

<LANG> PORTMAN IV

<CHAR> ERCDIC

<ALGO> GAUSSIAN PLUME MODEL, P.G. 1.109 MODELS FOR ENVIRONMENTAL TRANSPORT; BRUGG'S EQUATIONS FOR EFFECTIVE RELEASES HEIGHTS; DEPOSITION, JOINT FREQUENCY DISTRIBUTIONS

<CLASS> CONTINUOUS; DETERMINISTIC; ANALYTICAL; PREDICTIVE

<APP> PIS, BR, SAB FOR WINDMILL MIXING AND MILLING

<USERS> TVA-PATHOLOGICAL HYGIENE BRANCH

<END> SUPPLIED BY USER

<FORM> ENVIRONMENTAL SURVEYS; HAND CALCULATIONS

<FORM> 780927

<211>

<CONT> NORBERT, R. G.

<TITLE> A NEW FALLOUT TRANSPORT CODE FOR THE DELPIC SYSTEM: THE DIFFUSIVE TRANSPORT MODULE

<ACRO> DELPIC

<ADD> MOUNT AIRBORNE RESEARCH ASSOCIATES, INC.

<CITY> MONTICELLO FALLS

<STATE> WA

<SOURCE> NTIS

<DOC> AD-751 507, 1972

<ABST> THE DIFFUSIVE TRANSPORT MODULE OF THE NEW DELPIC FALLOUT PREDICTION SYSTEM HAS UNDERGONE ADDITIONAL DEVELOPMENT SINCE PUBLICATION OF ITS DESCRIPTION IN DASA 2669. THIS SUPPLEMENT TO DASA 2669 DESCRIBES THESE DEVELOPMENTS AND PRESENTS AMENDMENTS AND CORRECTIONS TO THE CODE AND ITS DOCUMENTATION. COMPLETE PORTMAN STATEMENT LISTINGS OF SUBROUTINES THAT HAVE BEEN SUBSTANTIALLY CHANGED ARE INCLUDED.

<LANG> PORTMAN

<CLASS> SIMULATION

<210>

<CONT> NORBERT, R. G.

<TITLE> A PRECIPITATION SCAVENGING MODEL FOR STUDIES OF TACTICAL NUCLEAR OPERATIONS

<ADD> MOUNT AIRBORNE RESEARCH ASSOCIATES, INC.

<SOURCE> NTIS 84.25/MP92.25

<DOC> AD-A014 960/95L, 1975

<ABST> A SINGLE, MODULAR CODE HAS BEEN DEVELOPED THAT MODELS THE COMPLETE RANGE OF PHENOMENOLOGY PERTINENT TO GENERATION, TRANSPORT, PRECIPITATION SCAVENGING, AND DEPOSITION OF WET AND/OR DRY NUCLEAR FALLOUT. IT IS DESIGNED TO STUDY THE SIGNIFICANCE OF PRECIPITATION SCAVENGING OF NUCLEAR DEPOSITS TO TACTICAL MILITARY OPERATIONS,

VIA APPLICATION OF STATE-OF-ART KNOWLEDGE. INTERMEDIATE RESULTS ARE IN ACCORD WITH KNOWN CLOUD PHYSICS AND SCAVENGING DATA. ONE CASE STUDY HAS BEEN CARRIED THROUGH TO DEPOSITION PATTERN ANALYSIS. THIS RESULT ILLUSTRATES THE ENORMOUS CONSEQUENCES OF ASSUMING TOTAL SCAVENGING AND IMMEDIATE DEPOSITION IMMEDIATELY BELOW THE STORM CLOUD. ADDITIONAL APPLICATION OF THE MODEL, INCLUDING SENSITIVITY STUDIES OF MODELING ASSUMPTIONS, IS DEFERRED TO FUTURE PROGRAMS.

<215>

<CONT> NOT GIVEN

<TITLE> MATHEMATICAL AND TECHNICAL APPROACH TO DIFFUSION ANALYSIS OF AIR CONTAMINANTS

<ADD> HYSTIC ELECTRIC GENERATING STATION

<CITY> EVERETT

<STATE> WA

<DOC> MONITORING AGENCY REPT NO. ELP-73-1291-D-2 3 117 PP., 1973

<ABST> THE REPORT DESCRIBES THE STORM AND WINTER DISPERSION MODEL, A COMPUTER PROGRAM, WHICH SIMULTANEOUSLY EVALUATES STATION OPERATING DATA AND METEOROLOGICAL CONDITIONS TO DETERMINE THE HOURLY, DAILY AND ANNUAL AVERAGE CONTAMINANT LEVELS FOR 192 FIXED RECEPTOR POINTS IN THE AREA SURROUNDING THE STATION. THESE LOCATIONS LIE ON A 16-POINT COMPASS GRID AND AT SELECTED RADIAL DISTANCES EXTENDING OUTWARD FROM THE STATION SITE.

<CLASS> SIMULATION

<216>

<CONT> NOT GIVEN

<TITLE> DESIGN OF THE SULFATE REGIONAL EXPERIMENT (SURE)

<ACRO> SURE

<ADD> ENVIRONMENTAL RESEARCH AND TECHNOLOGY, INC., WESTERN TECHNICAL CENTER

<CITY> WESTLAKE VILLAGE

<STATE> CA

<SOURCE> NTIS 87.75/MP92.25

<DOC> PB--251 703/55L, 1976

<ABST> THIS PLANNING STUDY - DESIGN OF THE SULFATE REGIONAL EXPERIMENT (SURE) - WAS CONDUCTED ON PROJECT RP 485 TO DETERMINE WAYS OF PREDICTING THE IMPACT OF EMISSIONS FROM FOSSIL FUEL COMBUSTION BY THE ELECTRIC UTILITIES INDUSTRY ON AMBIENT SULFATE, NITRATE AND RELATED CONCENTRATIONS IN A LARGE REGION DOWNWIND OF GROUPS OF MAJOR SOURCES. THE END GOAL OF THE ANALYSIS AND INTERPRETATION OF SEVEN SPECIFIC HYPOTHESES IS THE ADOPTION AND VERIFICATION OF AN AIR QUALITY MODEL WHICH WILL BE USED TO INVESTIGATE THE RELATION BETWEEN SULFUR OXIDE EMISSIONS AND AMBIENT SULFATE CONCENTRATIONS, AND, TO A LESSER EXTENT, THE RELATION BETWEEN NOX EMISSIONS AND AMBIENT

ATMOSPHERIC TRANSPORT

<216> CONT.

SULFATE. THE RESULTS ARE PRESENTED IN FOUR VOLUMES. THIS REPORT (VOLUME 3) IS A COMPILATION OF TECHNICAL APPENDICES. TOPICS CONSIDERED INCLUDE THE FOLLOWING: DESCRIPTION AND EVALUATION OF LABORATORY ANALYTICAL PROCEDURES; ARCHIVE OF AEROSOLIC DATA; INVENTORY OF SULFUR DIOXIDE EMISSIONS; SULFATE MEASUREMENT TECHNOLOGY; AND, USER'S MANUAL TO THE AIR TRAJECTORY BOX MODEL.

<ADDR> SPACE AND MISSILE SYSTEMS ORGANIZATION

<CITY> WASHINGTON

<STATE> DC

<TIME> OCTOBER, 1976-OCTOBER, 1977

<220>

<CONT> NOT GIVEN

<TITLE> THEORETICAL MODELS FOR LUG DISPERSION

<ADDR> WEST VIRGINIA UNIVERSITY

<CITY> MORGANTOWN

<STATE> WV

<ZIP> 26505

<PHONE> 703-524-2000

<ABST> A GREAT DEAL OF ATTENTION HAS BEEN DIRECTED TOWARD THE GROWTH OF HOT BUOYANT PLUMES WHERE THE DYNAMICS ARE DOMINATED BY DISPERSIVE EFFECTS. HOWEVER, IN THE CASE WHEN ONE CONSIDERS THE POSSIBILITY FOR RAPID EVAPORATION OF LUG POOLS, ONE MUST CONSIDER THE GROWTH OF A NON-BUOYANT VAPOR WHERE GRAVITY SPREADING OCCURS SIMULTANEOUSLY, ALONG WITH DISPERSION. WE ARE ATTEMPTING TO DEVELOP ANALYTIC MODELS FOR THE FLOW FIELDS WHICH WILL ALLOW US TO INCORPORATE BOTH THE AVERAGE FLOW AND THE EDDY FLOW, IN ORDER TO PREDICT FLUCTUATIONS IN THE FLOW FIELD PRODUCED BY TURBULENT EFFECTS. AT THE SAME TIME WE ARE STUDYING THE ANALYTIC MODELS OF RADIATION AND FIRE GROWTH FOR COMBUSTIBLE MIXTURES. OUR CONCERN IS FOR THE GROWTH AND DEVELOPMENT OF FIRES IN LARGE MASSES OF GAS. OF PARTICULAR INTEREST IS THE EFFECT OF SOOT FORMATION IN HYDROCARBON RICH MIXTURES, AND ITS INFLUENCE ON THE RADIATION FIELD. WE HOPE TO BE ABLE TO DEVELOP PREDICTIVE MODELS WHICH CAN THEN BE SCALED PROPERLY SO AS TO BE APPLICABLE TO FIELD SITUATIONS.

<TIME> 1976

<221>

<CONT> NOT GIVEN

<TITLE> REGIONAL EMISSION PROJECTION SYSTEM (REPS)

<ACRO> REPS

<ADDR> BOOE, ALLEN AND HAMILTON, INC.

<CITY> BETHESDA

<STATE> MD

<DOC> PB--250680, 1975

<ABST> THIS REPORT DESCRIBES THE REGIONAL EMISSION PROJECTION SYSTEM (REPS) WHICH IS A COMPUTERIZED AIR POLLUTION EMISSIONS PROJECTION MODEL TO PROJECT EMISSIONS AT THE AQCR LEVEL. IT COMBINES NATIONAL AND REGIONAL ECONOMIC FORECASTS WITH POINT AND AREA SOURCE INVENTORIES FROM THE NATIONAL EMISSIONS DATA SYSTEM (NEDS) TO PROJECT AIR POLLUTION EMISSION LEVELS FOR THE FIVE CRITERIA POLLUTANTS, ON AN ANNUAL

<217>

<CONT> NOT GIVEN

<TITLE> INVARIANT MODELING OF ATMOSPHERIC TURBULENCE AND DIFFUSION

<ADDR> AERONAUTICAL RESEARCH ASSOCIATES OF PRINCETON INC., 50 WASHINGTON ROAD

<CITY> PRINCETON

<STATE> NJ

<ZIP> 08540

<ABST> THIS IS CONTINUED DEVELOPMENT OF A MATHEMATICAL MODEL OF ATMOSPHERIC TURBULENCE AND DIFFUSION THAT HAS RESULTED FROM SEVERAL YEARS OF PREVIOUS WORK BY THIS CONTRACTOR (ARAP). THE ADDITIONAL WORK IS URGENTLY REQUIRED AS A BASIS FOR IMPROVED PREDICTION OF URBAN AIR QUALITY. 1978 FINAL REPORT.

<TIME> OCTOBER, 1976-SEPTEMBER, 1978

<218>

<CONT> NOT GIVEN

<TITLE> SOFTWARE DEVELOPMENT AND AIR POLLUTION DISPERSION MODEL TESTING

<ADDR> INPUT OUTPUT COMPUTER SERVICES, INC.,

<CITY> CAMBRIDGE

<STATE> MA

<ZIP> 02114

<ABST> A FORTRAN COMPUTER PROGRAM WILL BE WRITTEN TO MODEL THE DISPERSION OF POLLUTANTS FROM ONE OR MORE MOVING POINT SOURCES. THE TSC/EPA HIGHWAY AIR POLLUTION DISPERSION MODEL WILL BE REPROGRAMMED TO INCORPORATE NEW FEATURES SUCH AS A NEW INTEGRATION METHOD AND NEW CONVERSION CRITERIA TO IMPROVE COMPUTER EFFICIENCY. A COMPARISON WILL BE MADE OF PREDICTIONS OF FIVE HIGHWAY AIR POLLUTION DISPERSION MODELS. MODEL VALIDATION EXPERIMENTS WILL BE CONDUCTED USING TWO HIGHWAY AIR POLLUTION DATA SAMPLES TO COMPUTE MODEL PERFORMANCE MEASURES.

<TIME> MARCH, 1976-OCTOBER, 1977

<LANG> FORTRAN

<219>

<CONT> NOT GIVEN

<TITLE> DEVELOPMENT OF MODEL TO ASSESS ENVIRONMENTAL EFFECT OF COMMERCIAL AVIATION HIGH ALTITUDE CRUISE OPERATIONS

<221>

ATMOSPHERIC TRANSPORT

<221> CONT.

BASED, FROM THE PRESENT TO THE YEAR 2000. PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

<222>

<CONT> NOT GIVEN

<TITLE> CHALK POINT COOLING TOWER PROJECT

<ADDR> ENVIRONMENTAL SYSTEMS CORPORATION, ENGINEERING PROJECTS DIVISION

<CITY> KNOXVILLE

<STATE> TN

<DOC> PPSP-CPCTP--12(VOL. 1), 1977

<ABST> RESULTS OF A FIELD MEASUREMENT PROGRAM CONDUCTED AS PART OF THE CHALK POINT FOSSIL-FUEL POWER PLANT COOLING TOWER PROJECT FOR THE FISCAL YEAR 1976 ARE PRESENTED IN TWO VOLUMES. SOURCE MEASUREMENTS OF DROPLET SIZE AND MINERAL MASS EMISSION WERE CONDUCTED IN THE UNIT 3 NATURAL DRAFT COOLING TOWER AND SCRUBBER STACK TOGETHER WITH DOWNWIND MEASUREMENTS OF A NUMBER OF PARAMETERS INCLUDING DROPLET SIZE DURING TWO INTENSIVE MONITORING PERIODS (SEASONAL TESTS). IN ADDITION, RESULTS ARE PRESENTED OF CONTINUOUS MONITORING MEASUREMENTS WHEREIN DOWNWIND SODIUM CONCENTRATION, COOLING TOWER DROPLET SIZE MEASUREMENTS AND TIME-LAPSE PLUME PHOTOGRAPHY WERE ACQUIRED. ON-SITE METEOROLOGICAL DATA WAS ALSO ACQUIRED OVER THE REPORT PERIOD AND IS PRESENTED IN SUMMARY FORM. A PORTION OF THE FIRST SEASONAL TEST DATA WAS USED AS INPUT TO DRIFT TRANSPORT MODELS AS A FIRST STEP IN MODEL VERIFICATION AND DETERMINATION OF STACK DRIFT INTERFERENCE WITH MEASUREMENTS AIMED AT DETERMINING DOWNWIND COOLING TOWER CONTRIBUTIONS.

<223>

<CONT> NOT GIVEN

<TITLE> MATHEMATICAL MODEL FOR CALCULATION OF LENGTH OF THE VISIBLE PLUME

<ADDR> POTOMAC ELECTRIC POWER COMPANY

<CITY> WASHINGTON

<STATE> DC

<DOC> APPENDIX 5A, DOUGLAS POINT NUCLEAR GENERATING STATION UNITS 1 AND 2 ENVIRONMENTAL REPORT, POTOMAC ELECTRIC POWER CO., 1973.

<ABST> A CONDENSED PLUME DISPERSION MODEL MODIFIED FROM MALITSKY NON-CONDENSING TRANSVERSE JET PLUME MODEL WAS DEVELOPED TO CALCULATE THE VISIBLE LENGTH OF PLUME FOR EACH OF THE HOURS IN A TYPICAL YEAR. MODEL USES TEMPERATURE, HUMIDITY AND WIND DATA MEASURED AT SEVERAL ELEVATIONS ON A METEOROLOGICAL TOWER AT THE DOUGLAS POINT SITE AND TYPICAL COOLING TOWER EMISSION CHARACTERISTICS. PLUME RISE IS CALCULATED ACCORDING TO BRIGGS.

<224>

<CONT> NOT GIVEN

<TITLE> SALT DRIFT MODEL - DESCRIPTION

<ADDR> POTOMAC ELECTRIC POWER COMPANY

<CITY> WASHINGTON

<STATE> DC

<DOC> APPENDIX 5B, DOUGLAS POINT NUCLEAR GENERATING STATION UNITS 1 AND 2 ENVIRONMENTAL REPORT, 1973

<ABST> MODEL IS BASED ON BEHAVIOR OF SINGLE PARTICLES AS THEY TRAVEL FROM THE TOP OF DRIFT ELIMINATOR TO THE GROUND. PLUME GROWTH MEASURED ACCORDING TO SLANSON AND CSABY AND DERIVED FROM PHOTOGRAPHIC OBSERVATIONS. GENERAL MATHEMATICAL EQUATIONS FOR ESTIMATING SINGLE PARTICLE BEHAVIOR ARE DESCRIBED. CALCULATION PROCEDURES FOR SALT DEPOSITION AND WIND INTERACTION WITH TOWER WAKE ARE OUTLINED. ALSO DESCRIBED ARE 3 COMPUTED PROGRAMS USED TO PREDICT AVERAGE SALT DEPOSITION RATES.

<CLASS> SIMULATION

<225>

<CONT> NOT GIVEN

<TITLE> COOLING TOWER MODELS

<ADDR> PUGET SOUND POWER AND LIGHT COMPANY

<CITY> BELLEVUE

<STATE> WA

<DOC> APPENDIX H.2, SKAGIT NUCLEAR POWER PROJECT ENVIRONMENTAL REPORT, OCT. 1976.

<ABST> DETAILED DESCRIPTION OF 3 COOLING TOWER MODELS USED TO PREDICT ENVIRONMENTAL EFFECTS OF COOLING TOWERS AT THE SKAGIT NUCLEAR PROJECT SITE. MODELS INCLUDE DIFFUSION, PLUME DOWNWASH, AND DRIFT. WITH REFERENCES.

<226>

<CONT> NOT GIVEN

<TITLE> FISSION PRODUCTS FIELD RELEASE TEST

<ADDR> AIR FORCE WEAPONS CENTER, AIR FORCE NUCLEAR AIRCRAFT RESEARCH FACILITY

<CITY> KIRTLAND AIR FORCE BASE

<STATE> NM

<DOC> REPORT ARMY 59-327; AFMPC-TR-59-88; SEPTEMBER 1959

<ABST> CONTAINS MODEL FOR DETERMINING CONCENTRATIONS OF RADIOACTIVITY IN SURFACE WATER.

<227>

<CONT> NOT GIVEN

<TITLE> POTENTIAL ENVIRONMENTAL MODIFICATIONS PRODUCED BY LARGE EVAPORATIVE COOLING TOWERS

<ADDR> 28 ADD 6, INC., ENVIRONMENTAL SERVICES OPERATION

ATMOSPHERIC TRANSPORT

- <227> CONT.
 <CITY> BOULDER
 <STATE> CO
 <DOC> WATER POLLUTION CONTROL RESEARCH SERIES, REPORT NO. 16130 DOW 01/71, ENVIRONMENTAL PROTECTION AGENCY WATER QUALITY OFFICE, JAN. 1971.
 <ABST> THE OBJECTIVE OF THE STUDY WAS TO DEVELOP TECHNIQUES FOR EVALUATING THE EXTENT OF PLUMES FROM LARGE EVAPORATIVE COOLING TOWERS. ANALYTICAL TECHNIQUES WERE USED TO DESCRIBE THE DYNAMICS OF THE NET COOLING TOWER PLUME AND ITS INTERACTION WITH THE ENVIRONMENT. PRIMARY EMPHASIS WAS PLACED ON PREDICTING THE HEIGHT OF THE PLUME. CLASSICAL ATMOSPHERE DIFFUSION THEORY WAS USED TO DETERMINE THE DOWNWIND SPREAD. THE STUDY SHOWED THAT THE SATURATION DEFICIT OF THE ATMOSPHERE CLEARLY CONTROLS THE DOWNWIND SPREAD OF THE EJECTED LIQUID WATER. EXCEPT FOR CASES WHERE THE RELATIVE HUMIDITY APPROACHES 100 PERCENT, DOWNWIND PROPAGATION IS LIMITED TO PERIODS WHEN THE AIR TEMPERATURE FALLS BELOW THE FREEZING POINT. FOR A GIVEN SET OF ATMOSPHERIC CONDITIONS, INCREASES IN THE TOWER RADIUS, THE SATURATION TEMPERATURE, AND THE INITIAL VERTICAL VELOCITY OF THE PLUME CONTRIBUTE TO INCREASING THE FINAL PLUME HEIGHT. THE POTENTIAL FOR ADVERSE ATMOSPHERIC EFFECTS DUE TO COOLING TOWERS WAS ANALYZED ON A NATIONAL BASIS AND IS PRESENTED IN THE FORM OF A MAP OF THE UNITED STATES. A COMPUTER PROGRAM WAS DEVELOPED TO PERFORM THE NECESSARY CALCULATIONS. THE APPENDIX CONTAINS A DESCRIPTION OF THE PROGRAM, INCLUDING INPUT SPECIFICATIONS.
- <228>
 <CONT> NOT GIVEN
 <TITLE> COOLING TOWER PLUME-MATHEMATICAL MODEL
 <ADDR> POWER AUTHORITY OF THE STATE OF NEW YORK
 <DOC> FIGURE 5.1-5, GREENE COUNTY NUCLEAR POWER PLANT ENVIRONMENTAL REPORT, POWER AUTHORITY OF THE STATE OF NEW YORK, SEPT. 1975. 1 P.
 <ABST> FIGURE LISTS BASIC ASSUMPTIONS, BASIC EQUATIONS, AND A DEFINITION SKETCH FOR THE TURBULENT JET METHOD OF DETERMINING THE CONFIGURATION OF A VISIBLE COOLING TOWER PLUME. ASSUMPTIONS INCLUDE: 1) PLUME INDUCED TURBULENCE PREVAILS; 2) BOUNDARY LAYER TURBULENT JET THEORY APPLIED; 3) MIXING AND ENTRAINMENT MECHANISM TAKES PLACES OF DISPERSION MECHANISM; 4) GAUSSIAN DISTRIBUTION FOR HEAT, MOISTURE DENSITY AND VELOCITY PROFILES; AND 5) HEAT, MOISTURE, VELOCITY AND MOMENTUM CONSERVED. FIGURE GIVES EQUATIONS FOR CONTINUITY, X-MOMENTUM, Z-MOMENTUM, DENSITY, CONSERVATION OF MASS, AND GEOMETRIC.
- <229>
 <CONT> NOT GIVEN
 <TITLE> ATMOSPHERIC IMPACT MODELS FOR CLOSED CYCLE COOLING SYSTEMS
 <ADDR> PUBLIC SERVICE COMPANY OF INDIANA
- <CITY> PLAINFIELD
 <STATE> IN
 <DOC> APPENDIX 6-A, HADDLEY HILL NUCLEAR GENERATING STATION UNITS 1 & 2 ENVIRONMENTAL REPORT, PUBLIC SERVICE CO. OF INDIANA, INC., SEPT. 1975. 31 PP.
 <ABST> APPENDIX DESCRIBES 3 ATMOSPHERIC IMPACT ASSESSMENT MODELS FOR THE ALTERNATIVE CLOSED CYCLE COOLING SYSTEMS FOR THE HADDLEY HILL STATION. A DETAILED DESCRIPTION AND APPLICATION ARE GIVEN FOR THE COOLING TOWER VISIBLE PLUME MODEL, THE GROUND-LEVEL FOG MODEL, AND THE COOLING TOWER DRIFT MODEL. INCLUDES 4 TABLES, 2 FIGURES AND 12 REFERENCES. THE TABLES REVIEW SPECIFIC COOLING TOWER PARAMETERS WHILE THE FIGURES SHOW PLUME HEIGHT AND DOWNWASH COOLING TOWER PLUME BEGINS.
- <230>
 <CONT> NOT GIVEN
 <TITLE> 1. COMPREHENSIVE MODEL STUDY OF SALT DRIFT DEPOSITS, INDUCED FOGGING AND ICING FROM MECHANICAL DRAFT COOLING TOWER PLUMES AT INDIAN POINT
 <ADDR> CONSOLIDATED EDISON COMPANY OF NEW YORK
 <CITY> NEW YORK
 <STATE> NY
 <DOC> INCLUDED AS APPENDIX C IN "ECONOMIC & ENVIRONMENTAL IMPACTS OF ALTERNATIVE CLOSED-CYCLE COOLING SYSTEM FOR INDIAN POINT UNIT NO. 2," DEC. 1974. 100 PP., AVAILABLE FROM INFORM
- <ABST> APPENDIX DISCUSSES IN DETAIL THE THEORY, IMPLEMENTATION, AND RESULTS OF EXPERIMENTAL MODELING OF THE BEHAVIOR OF MECHANICAL DRAFT COOLING TOWER PLUMES IN THE AREA OF THE INDIAN POINT FACILITY. ENVIRONMENTAL EFFECTS ARE QUANTIFIED IN TERMS OF SALT DRIFT DEPOSITS, INCLUDING FOGGING AND ICING IN AN 18-SQUARE MILE SURROUNDING AREA. THE PRINCIPAL EQUATIONS AND PHYSICS OF DROPLET DISPERSION, AS WELL AS THE CRITERIA FOR FOG AND ICING, ARE INCLUDED. ALL PRIMARY VARIABLES ARE COVERED, INCLUDING INVERSION LAYERS, STACK HEIGHT, TOPOGRAPHY, HUMIDITY, WIND DIRECTION/SPEED, E.C. THERE ARE 6 TABLES, 40 FIGURES, AND 13 REFERENCES.
- <231>
 <CONT> NOT GIVEN
 <TITLE> DRIFT TRANSPORT MODEL
 <ADDR> DROP
 <ADDR> OHAMA PUBLIC POWER DISTRICT
 <CITY> OHAMA
 <STATE> MO
 <DOC> APPENDIX 10.1-A, FORT CALHOUN STATION UNIT NO. 2 ENVIRONMENTAL REPORT, JAN. 1976. 7 PP.
 <ABST> APPENDIX DESCRIBES GIBBS AND HILL'S COMPUTED MODEL DROP USED TO DETERMINE

<231>

ATMOSPHERIC TRANSPORT

<232> CONT.

DISPERSION OF DRIFT FROM EVAPORATIVE MECHANICAL DRAFT COOLING TOWERS OF PORT CALHOUN UNIT 2. MODEL ACCOUNTS FOR ACCELERATION OF THE DROP WHILE IT IS WITHIN THE COOLING TOWER PLUME, INCREASE OF THE PLUME RADIUS DUE TO THE ENTRAINMENT OF AMBIENT AIR, EVAPORATION OF THE DROP AS IT TRAVELS THROUGH THE ATMOSPHERE, AND CHANGE IN VELOCITY OF THE DROP AS IT EVAPORATES. APPENDIX CONTAINS 9 REFERENCES.

<232>

<CONT> NOT GIVEN

<TITLE> PLUME RISE AND DISPERSION MODEL

<ACRO> NREL

<ADDR> OHAMA PUBLIC POWER DISTRICT

<CITY> OHAMA

<STATE> NE

<DOC> APPENDIX 10.1-B, PORT CALHOUN STATION UNIT NO. 2 ENVIRONMENTAL REPORT, JAN. 1976. 9 PP.

<ABST> APPENDIX DESCRIBES PREDICTIONS OF RISE AND DISPERSION OF PLUMES WHICH RESULT FROM OPERATION OF MECHANICAL DRAFT COOLING TOWERS OF PORT CALHOUN UNIT 2, AS MODELED BY GIBBS AND MILL'S COMPUTER MODEL NPLN. LIFE OF THE PLUME IS DIVIDED INTO TWO STAGES. IN STAGE 1 THE RISE AND DISPERSION OF THE PLUME IS DOMINATED BY ITS BUOYANCY AND MOMENTUM. IN STAGE 2 THE DISPERSION OF THE PLUME IS DOMINATED BY ATMOSPHERIC DIFFUSION. VERIFICATION OF THE STAGE 1 MODEL WAS MADE USING OBSERVATIONS TAKEN AT THE FOUR NATURAL DRAFT COOLING TOWERS OF FRYSTONE POWER PLANT, ARMSTRONG COUNTY, PA. APPENDIX CONTAINS 7 REFERENCES, 1 TABLE, AND 1 FIGURE.

<233>

<CONT> PANDOLFO, J. P.; ATWATER, H. A.; ANDERSON, G. E.

<TITLE> PREDICTION BY NUMERICAL MODELS OF TRANSPORT AND DIFFUSION IN AN URBAN BOUNDARY LAYER

<ACRO> CENTER FOR THE ENVIRONMENT AND MAN, INC., HARTFORD, CONN.

<SOURCE> NTIS 43.00/HSFO.95

<DOC> PB--206 939, 1971

<ABST> A THREE-DIMENSIONAL NUMERICAL MODEL BASED ON THE EULERIAN CONSERVATION EQUATIONS FOR MOMENTUM, HEAT, WATER VAPOR, S LIVITY, AND AIR POLLUTANTS WAS USED TO EXAMINE THE TRANSPORT AND DIFFUSION PROCESSES IN THE PLANETARY BOUNDARY LAYER. HORIZONTAL DIFFUSION WAS INCORPORATED THROUGH A STRONGLY AND IMPLICITLY DIFFUSIVE FINITE-DIFFERENCE SCHEME FOR THE HORIZONTAL ADVECTION TERMS, VIZ, UPWIND DIFFERENCING. HOWEVER, TERMS REPRESENTING OTHER TRANSPORT AND DIFFUSION PROCESSES WERE EXPLICITLY INCLUDED IN THE DIFFERENTIAL EQUATIONS. IT IS FEASIBLE TO SIMULATE THE TEMPORAL VARIATION OF METEOROLOGICAL AND POLLUTANT VARIABLES, ON A THREE-DIMENSIONAL ARRAY CONTAINING

SEVERAL THOUSAND GRID POINTS, WITHIN PRACTICAL LIMITS ON A COMPUTER. SIMULATED URBAN-RURAL LOW LEVEL TEMPERATURE DIFFERENCES IN WINTER ARE QUALITATIVELY REALISTIC. THE SIMULATED DAYTIME VERTICAL PROFILE OF POLLUTANTS SHOW A WELL-MIXED SURFACE LAYER WITH QUASI-CONSTANT CONCENTRATIONS. THE NIGHTTIME PROFILES SHOW DEFINITE PEAKS OF CONCENTRATION NEAR THE SOURCE HEIGHT. THREE-DIMENSIONAL FIELDS OF METEOROLOGICAL AND POLLUTANT VARIABLES WERE SIMULATED USING CONNECTICUT SOURCE INVENTORY DATA AND TYPICAL (HYPOTHETICAL) WINTER METEOROLOGICAL CONDITIONS.

<GE>

CONNECTICUT

<234>

<CONT> PASQUILL, E.

<TITLE> THE ESTIMATION OF THE DISPERSION OF WINDBORNE MATERIALS.

<DOC> METEOROLOGICAL MAGAZINE, 40(1963), 3-49, 1961. (ER CITATION: INDIAN POINT PES)

<ABST>

A DIFFUSION MODEL FOR THE DISPERSION OF WINDBORNE MATERIALS IS DESCRIBED. THE MODEL IS USED IN CALCULATING THE LIKELIHOOD OF FOG PRODUCED BY COOLING TOWERS, AND IN CALCULATING SALT DISPERSION.

<235>

<CONT> PATTERSON, H. R.

<TITLE> ATMOSPHERE TRANSPORT AND DIFFUSION MODEL

<ACRO> ATR

<ADDR> OAK RIDGE NATIONAL LABORATORY, COMPUTER SCIENCES DIVISION, P.O. BOX 1

<CITY> OAK RIDGE

<STATE> TN

<ZIP> 37830

<PHONE> 615-483-8611 EXT 3-6502; FTS 850-6502

<SOURCE> DEVELOPED AT ORNL

<DOC> CULKOWSKI, W.R., PATTERSON, H.R., A COMPREHENSIVE ATMOSPHERIC TRANSPORT AND DIFFUSION MODEL, ORNL/RSY/EATC-17, APRIL 1976

<SUB> ATMOSPHERIC TRANSPORT OF POLLUTANTS

<ABST>

A COMPREHENSIVE VERSION OF THE ATMOSPHERIC TRANSPORT MODEL IS DESCRIBED THAT INCLUDES THE EFFECT OF AERODYNAMIC ROUGHNESS ON DISPERSION CONSTANTS, CLARIFIES THE ROLES OF THE TERMINAL VELOCITY AND DEPOSITION VELOCITY, INCORPORATES A TILTING PLUME FOR HEAVY PARTICULATES, AND INCLUDES AN EPISODIC CALCULATION OF EXPOSURE MAXIMA. THIS MODEL ALSO LIMITS THE MAXIMUM VALUE OF THE DISPERSION CONSTANTS IN ORDER TO RETAIN THE EMITTED MATERIAL IN THE PLANETARY BOUNDARY LAYER. THE STRUCTURE OF THE PROGRAM HAS BEEN MODULARIZED IN ORDER TO CLARIFY THE FLOW OF CALCULATION AND ALLOW MORE FLEXIBILITY. VALUES FOR ATMOSPHERIC CONCENTRATION AS WELL AS

ATMOSPHERIC TRANSPORT

<235> CONT.
 BOTH WETFALL AND DRYFALL DEPOSITION ARE CALCULATED. THE MODEL IS APPLIED TO THE VICINITY OF THREE POWER PLANTS, AND CORRELATIONS BETWEEN MODEL PREDICTIONS AND OBSERVED VALUES ARE PRESENTED.

<GW> TERRAFARE NORTHERN HEMISPHERE, RANGE < OR = 100 KM.

<TIME> 1972-1975

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE; PUNCHED CARDS

<SIZE> 1500 CARDS

<COMP> IBM; DEC

<CONFIG> IBM 360/91 WITH 300K CORE AND ONE TAPE DRIVE

<LANG> FORTRAN IV

<CHAR> EBCDIC

<ALGO> GAUSSIAN PLUME

<CLAS> CONTINUOUS; DETERMINISTIC; PREDICTIVE; SIMULATION

<APPL> PARTICULATE AND GASEOUS EMISSIONS FROM POINT, LINE, AND AREA SOURCES

<USERS> ORNL; EPA

<SRCD> NATIONAL OCEANOGRAPHIC AND ATMOSPHERIC ADMINISTRATION; NOAA

<VAL> COMPARED WITH MEASUREMENTS ON TWO ORNL WATERSHEDS AND WITH TVA DATA; AGREEMENT WITHIN FACTOR OF TWO

<CON> ATM HAS BEEN USED EXTENSIVELY AT ORNL FOR REGIONAL POWER PLANT SITING STUDIES AND ENVIRONMENTAL IMPACT STATEMENTS

<UPDATE> 780828

<236>
 <CON> PEPLEY, W. B.; PREEPER, R. J.

<TITLE> NUCLEAR DEBRIS ATTACHMENT TO AIRCRAFT DUE TO ATMOSPHERIC RADIATION ENVIRONMENTS: AIRCRAFT IMPACTION AND ADDRESS COMPUTER MODEL

<ACDP> INDUSTRIAL NUCLEONICS CORP., 650 ACKERMAN RD

<CITY> COLUMBUS

<STATE> OH

<ZIP> 43202

<FROM> 618-261-2000

<SOURCE> HTIS \$9.00/HP\$1.45

<DOC> AD--771 585/7

<SUB> MODEL FOR ATTACHMENT OF PARTICULATE NUCLEAR DEBRIS TO AIRCRAFT WHICH FLY THROUGH ATMOSPHERIC RADIATION ENVIRONMENTS

<ABST> THE REPORT DESCRIBES IN DETAIL THE CLOUDRISE AND SLURRY/PASS PROGRAMS FOR USERS OF THE CODES. THESE CODES WERE DEVELOPED TO AID ANALYTIC STUDIES OF THE CONTAMINATION ACQUIRED BY AN AIRCRAFT WHICH FLIES THROUGH A NUCLEAR DEBRIS CLOUD, AS EXPLAINED IN PART I, GENERAL STUDIES.

<TIME> 1968-1974

<STATUS> OBSOLETE

<ACCESS> LIMITED

<MEDIA> TEXT

<SIZE> 10,000 LINES OF FORTRAN CODE

<COMP> IBM

<CONFIG> IBM 360

<LANG> FORTRAN IV

<CLAS> ANALYTICAL; PREDICTIVE

<APPL> RADIOACTIVITY OF AIRCRAFT PARTS

<USERS> U.S. AIR FORCE

<237>
 <CON> PETERSEN, W. B.

<TITLE> EVALUATION OF HIGHWAY AIR QUALITY SIMULATION MODELS

<ADDR> ENVIRONMENTAL PROTECTION AGENCY, ENVIRONMENTAL SCIENCES RESEARCH LAB.

<CITY> RESEARCH TRIANGLE PARK

<STATE> NC

<ZIP> 27711

<ABST> AVAILABLE DATA FROM RESIDE THE ROADWAY STUDIES WILL BE USED TO MAKE ESTIMATES OF CONCENTRATIONS NEAR ROADWAYS WHICH ARE COMPARED WITH THE FIELD MEASUREMENTS OF CONCENTRATION. DATA ARE BEING OBTAINED FROM THE ROADS STUDY ON LONG ISLAND SUPPORTED BY A GRANT TO THE NEW YORK DEPARTMENT OF ENVIRONMENTAL CONSERVATION. POLLUTANTS MEASURED ARE CARBON MONOXIDE AND PARTICULATES. COMPARISONS OF HWAY MODEL ESTIMATES AND CONCENTRATIONS FROM THE GH TEST TRACK STUDY HAVE BEEN MADE. ADDITIONAL DETAILED METEOROLOGICAL DATA FROM THE GH TEST TRACK STUDY ARE BECOMING AVAILABLE AND WILL BE USED TO ESTIMATE DISPERSION DIRECTLY FROM FLUCTUATION STATISTICS FOR INPUT INTO A HIGHWAY AIR QUALITY SIMULATION MODEL. (1) 09/77 PROGRESS REPORT. (2) 09/78 FINAL REPORT.

<TIME> 75/07-78/09

<238>
 <CON> PETERSON, K.

<TITLE> LAGRANGIAN TRANSPORT AND DIFFUSION CODE TO CALCULATE CONCENTRATIONS AND DEPOSITION AT LONG RANGE OF PARTICLES LESS THAN 10 MICRO METERS DIAMETER

<ACRO> ZBPUFF

<ADDR> LAWRENCE LIVERMORE LABORATORY, L-262, G DIV, PHYSICS DEPT., P.O. BOX 808

<CITY> LIVERMORE

<230>

ATMOSPHERIC TRANSPORT

<230> CONT.
<STATE> CA

<ZIP> 94550

<PHONE> 415-422-1029; FTS 532-1029

<SOURCE> DEVELOPED AT LLL

<DOC> CHAFFORD, T.V., A COMPUTER PROGRAM FOR CALCULATING THE ATMOSPHERIC DISPERSION OF LARGE CLOUDS, UCRL-50179, NOV. 23, 1966

<SUB> CALCULATION AND DEPOSITION OF PARTICLES

<ABST> THE 2DPUFF CODE IS THE LATEST VERSION OF THE ORIGINAL 2DPUFF CODE DEVELOPED AT LLL IN 1966 BY TODD V. CHAFFORD (SEE UCRL-50179, NOV. 23, 1966). THE CODE CALCULATES THE DISPERSION OF POLLUTANTS IN A CYLINDRICAL CLOUD WITH A VERTICAL AXIS OF SYMMETRY USING A COORDINATE SYSTEM FIRED TO THE CLOUD'S CENTER. SIMILARITY THEORY OF ATMOSPHERIC TURBULENCE IS USED TO PREDICT THE HORIZONTAL DIFFUSIVITY AS A FUNCTION OF INITIAL CLOUD SIZE, TURBULENT ATMOSPHERIC DISSIPATION, AND TIME. VERTICAL DIFFUSIVITY IS ENTERED AS A FUNCTION OF HEIGHT AND TIME, ENABLING ENTRY OF DIURNAL VARIATIONS IN THE BOUNDARY LAYER AND TEMPERATURE INVERSIONS. THE MODEL CALCULATES CLOUD CENTER AND SURFACE AIR CONCENTRATIONS, EXPOSURE RATE, DOSE DEPOSITION, WASHOUT, AND THE VERTICAL INTEGRAL OF INDIVIDUAL NUCLIDES AND DOSES TO AN INDIVIDUAL FOR A VARIETY OF PATHWAYS, INCLUDING INHALATION, WHOLE BODY EXTERNAL GAMMA, SUBMERSION, FORAGE-COW-MILK, AND PASTURE- MEAT.

<GEO> NOT TIED TO ANY PARTICULAR GEOGRAPHY; CALCULATED FROM 10 KM TO GLOBAL

<STATUS> IN USE

<ACCESS> LIMITED TO U.S., ONLY

<MEDIA> MAGNETIC TAPE

<SIZE> CODE STATEMENTS WITH COMMENT CARDS: 2000

<COMP> CDC

<CONFIG> CDC 7600 WITH PLOTTER; 2-3 CPU MINUTES REQUIRED FOR AVERAGE RUN

<CLASS> ANALYTICAL; INTEGRATIVE; PREDICTIVE

<APPL> BASED ASSESSMENT; FOR APPLICATION AND DOSE RATES AND DOSES FOLLOWING ATMOSPHERIC NUCLEAR TESTS

<USERS> LLL; LASL; PATRICK AFB; EG&G; NOAA; TRU

<SUB> CURRENT METEOROLOGICAL DATA

<INVAL> VERIFICATION OF THE 2DPUFF CODE AGAINST DATA FROM LATE 1960'S CHATELAIN TESTS AT THE NEVADA TEST SITE INDICATE THE CALCULATIONS USING OBSERVED METEOROLOGICAL DATA ARE, WITH FEW EXCEPTIONS, WITHIN A FACTOR OF TWO OF SURFACE AND AIRCRAFT RADIOACTIVITY MEASUREMENTS.

<CON> DEVELOPED FOR CATERING PREDICTIONS; CURRENTLY USED FOR AIRCRAFT DOSE RATES AND WASHOUT DOSES FOLLOWING CHINESE ATMOSPHERIC NUCLEAR TESTS.

<UPDATED> 700626

<239>
<CONT>

PETERSON, R.

<TITLE> A CODE TO ESTIMATE SYNOPTIC-90 GLOBAL DEPOSITION FROM ATMOSPHERIC NUCLEAR DETONATIONS

<ACRO> CODEP

<ADDR> LAWRENCE LIVERMORE LABORATORY, L-262, C DIVISION, P.O. BOX 808

<CITY> LIVERMORE

<STATE> CA

<ZIP> 94550

<PHONE> 415-422-1029; FTS 532-1029

<SOURCE> NOAA, AIR RESOURCES LAB., SILVER SPRING, MD

<DOC> PETERSON, R.R., AN EMPIRICAL MODEL FOR ESTIMATING WORLD-WIDE DEPOSITION FROM ATMOSPHERIC NUCLEAR DETONATION, HEALTH PHYSICS, 10, 357-370, 1970

<SUB> WORLDWIDE 50-90 DEPOSITION FROM NUCLEAR ATMOSPHERIC TESTING

<ABST> AN EMPIRICAL MODEL IS PRESENTED FOR ESTIMATING THE SURFACE DEPOSITION OF "WORLD-WIDE" RADIOACTIVITY FROM ATMOSPHERIC NUCLEAR DETONATIONS GIVEN THE FIELD, LATITUDE, SEASON AND TYPE OF EACH SUBST. THE PROCEDURE IS READILY ADAPTABLE TO COMPUTER CALCULATION. THE MODEL IS BASED PRIMARILY ON INJECTION-DEPOSITION EXPERIENCE GAINED FROM THE U.S. AND U.S.S. R. NUCLEAR TESTS IN 1950. USE OF THE TECHNIQUE TO ESTIMATE 50-90 DEPOSITION FROM THE 1961-62 TESTS SHOWS THE PREDICTIONS ARE USUALLY WITHIN A FACTOR OF TWO OF THE OBSERVED DEPOSITION.

<GEO> GLOBAL

<TIME> 1950 AND 1962

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDI> TEXT OR MAGNETIC TAPE

CODE STATEMENTS WITH COMMENT CARDS: 600; CODE STATEMENTS W/O COMMENT CARDS: 550

<COMP> CDC

<CONFIG> CDC 7600 WITH USED TERMINAL, DISK PACKS, AND PRINTER; LESS THAN 1 CPU MINUTE REQUIRED FOR AVERAGE RUN

<LANG> LALTRAN

<CHAR> ASCII

<CLASS> INTEGRATIVE; PREDICTIVE

<APPL> PLANNING ASSESSMENTS

<USERS> LLL; DOE; DGS; TRU

<SUB> DEPOSITION DATA FROM 1950 U.S. AND U.S.S.R. NUCLEAR TESTS

<INVAL> CODE DEVELOPED BASICALLY FROM 1950 U.S. & U.S.S.R. NUCLEAR DETONATIONS. TESTED AGAINST 1961-62 TEST SERIES.

ATMOSPHERIC TRANSPORT

<239> CONT.

<CON> MODEL MAY BE USED TO ESTIMATE DEPOSITION OF DEBRIS OTHER THAN SP-90 PROVIDED THAT (1) FRACTIONATION RELATIVE TO SP-90 IS TAKEN INTO ACCOUNT, (2) ADJUSTMENTS ARE MADE FOR THE FRACTIONATION RATIO AND THE RADIOACTIVE HALF-LIFE AND (3) THE DEBRIS PARTICLE SIZE IS SIMILAR TO SP-90. IF THIS LAST PROVISION IS MET, IT IS ALSO POSSIBLE TO PREDICT DEPOSITION OF NON-RADIOACTIVE DEBRIS, E.G., VOLCANIC ASH OR RESIDUE FROM SOLID PROPELLANTS PLANNED FOR ADVANCED ROCKET ENGINES. MODIFIED FROM ORIGINAL NOAA CODE FROM ENGLISH TO METRIC UNITS.

<UPDRT> 700626

<240>

<CON> PIFKE, ROGER A.

<TITLE> UNIVERSITY OF VIRGINIA MESOSCALE MODEL

<ACED> UNIVERSITY OF VIRGINIA, DEPARTMENT OF ENVIRONMENTAL SCIENCES, CLARK HALL

<CTRY> CHARLOTTESVILLE

<STATE> VA

<CTRY> 22903

<PHONE> 804-295-6709

<DOC> IN PREPARATION

<SUB> MESOSCALE ATMOSPHERIC CIRCULATIONS

<ABST> THE MESOSCALE MODEL IS DESIGNED TO SIMULATE ATMOSPHERIC CIRCULATIONS SUCH AS SEA- AND LAND-BREEZES, MOUNTAIN-VALLEY FLOW AND STRONG AIR FLOW OVER MOUNTAINS. THE MODEL EQUATIONS ARE DEVELOPED FROM FIRST PRINCIPLES OF PHYSICS. THE MODEL IS THREE-DIMENSIONAL AND HYDROSTATIC. THE USER INPUTS LATITUDE, GROUND CHARACTERISTICS, TIME OF YEAR AND INITIAL PROFILE OF THE DEPENDENT VARIABLE AND THE RESULTANT CIRCULATIONS OUT TO 12 TO 24 HOURS ARE PREDICTED. THE MODEL WORKS BEST ON CLEAR DAYS AND NIGHTS WHEN THE SYNOPTIC CONDITIONS ARE CHANGING SLOWLY OR NOT AT ALL.

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE; PUNCHED CARDS

<SIZE> APPROXIMATELY 3000 CARDS

<COMP> CRAY

<COMPIG> CRAY COMPUTER WITH UP TO 1 MILLION WORDS OF CENTRAL CORE

<LANG> FORTRAN 66

<ALGO> FINITE DIFFERENCE EQUATIONS; ITERATIVE CONVERGENCE ROUTINES; NEWTON-RAPHSON METHOD

<CLASS> DISCRETE; DETERMINISTIC; PREDICTIVE; SIMULATION

<APPL> INFLUENCE OF DIFFERENTIAL SURFACE CHARACTERISTICS ON MESOSCALE ATMOSPHERIC CIRCULATIONS

<USERS> UNIVERSITY RESEARCHERS; FOREIGN

COMMENTS

<SPD> RADIOSOUND DATA; TOPOGRAPHIC MAPS; SYNOPTIC WEATHER MAPS; SATELLITE

<ENVL> METEOROLOGICAL OBSERVATIONS; SATELLITE; RADAR

<UPDRT> 700625

<241>

<CON> PLATO, P. A.; BENNER, D. F.; DAUER, R.

<TITLE> COMPUTER MODEL FOR THE PREDICTION OF THE DISPERSION OF AIRBORNE RADIOACTIVE POLLUTANTS

<ACED> PARS; ARAES

<ADDP> UNIVERSITY OF MIAMI, SCHOOL OF MEDICINE

<CTRY> MIAMI

<STATE> FL

<DOC> HEALTH PHYSICS, 13, 1105-1115, 1967

<ABST> PRESENTED ARE TWO COMPUTER PROGRAMS WRITTEN FOR AN IBM 1401/7040 DIGITAL COMPUTER IN A FORTRAN IV COMPUTER LANGUAGE. THE PROGRAMS ARE CALLED RADS AND ARAES, ACRONYMS FOR RADIOLOGICAL ATMOSPHERIC DISPERSION STUDY AND ALTERNATE RADS, RESPECTIVELY. BOTH PROGRAMS ARE DESIGNED TO INVESTIGATE THE USE OF VARIOUS EQUATIONS FORMULATED TO PREDICT THE DISPERSION OF RADIOACTIVE EFFLUENTS DEPOSITED INTO THE ATMOSPHERE FROM A SMOKE-STACK. THE RELEASE OF THE EFFLUENTS MAY BE OF EITHER AN INSTANTANEOUS OR CONTINUOUS NATURE. PREDICTIONS OF ATMOSPHERIC CONCENTRATIONS ARE MADE FOR APPROXIMATELY 600 POINTS THROUGHOUT AN OBSERVATION AREA SURROUNDING THE SMOKE SOURCE, ALLOWING CONTOUR LINES OF EQUAL CONCENTRATIONS TO BE DRAWN. THE RADS PROGRAM WAS DESIGNED FOR ONE PARTICULAR EFFLUENT RELEASE. THE PROGRAM PREDICTS THE PATH OF THE SMOKE FROM THE SOURCE TO ONE OF THE BOUNDARIES OF THE OBSERVATION AREA. PREDICTIONS ARE THEN MADE CONCERNING THE DISPERSION OF THE SMOKE. THE ARAES PROGRAM USES AVERAGE METEOROLOGICAL CONDITIONS TO PREDICT THE AIR CONCENTRATIONS RESULTING FROM LONG-TERM RELEASES OF A SMOKESTACK EFFLUENT. THE OUTPUT DATA FOR BOTH PROGRAMS CONTAIN A SCALED MAP OF THE OBSERVATION AREA SHOWING THE LOCATION OF THE PREDICTED CONCENTRATIONS IN ORDER TO SIMPLIFY THE DRAWING OF THE CONTOUR LINES. WHILE THE AUTHENTICITY OF THE PREDICTION EQUATIONS IS NOT CERTAIN, A DEFINITE RELATIONSHIP BETWEEN RELATIVE AIR CONCENTRATIONS WITH RESPECT TO THE LOCATION OF THE SOURCE WAS ESTABLISHED. THE PROGRAMS PERMIT FAST, ACCURATE, AND VOLUMINOUS SOLUTIONS TO THE COMPLEX EQUATIONS, AND PROVIDE A TOOL WITH WHICH TO EXAMINE THE PREDICTION EQUATIONS THEMSELVES.

<COMP> IBM

<COMPIG> IBM 1401/7040

<LANG> FORTRAN IV

<242>

<CON> POLICASINO, ANTHONY J.

<242>

ATMOSPHERIC TRANSPORT

<242> CONT.

<TITLE> A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE AND MULTIPLE NATURAL-DRAFT COOLING TOWERS

<ACPO> PRICE

<ADDR> ARGONNE NATIONAL LABORATORY,
ENVIRONMENTAL IMPACT STUDIES DIVISION,
9700 S. CASS AVE.

<CITY> ARGONNE

<STATE> IL

<ZIP> 60439

<PHONE> PIS 972-3235

<COMPIED> WALTER P. PRICE (PIS 020-0946), U.S.
ENVIRONMENTAL PROTECTION AGENCY,
ASSESSMENT AND CRITERIA DEVELOPMENT
DIV., CORVALLIS OREGON 97330

<DOC> W. E. PRICE, THE INFLUENCE OF
STRATIFICATION ON PLUME STRUCTURE, A
THESIS SUBMITTED TO OREGON STATE
UNIVERSITY, JUNE 6, 1975, (ATMOSPHERIC
SCIENCES DEPT.)

<SUB> COOLING TOWER ENVIRONMENTAL EFFECTS

<ABST> THE PRICE MODEL PREDICTS THE PHYSICAL
CHARACTERISTICS OF THE PLUME FROM A
SINGLE NATURAL-DRAFT COOLING TOWER.
INPUTS TO THE MODEL ARE: (A) TOWER
SOURCE CONDITIONS - PRESSURE AT TOWER
TOP, EXIT VELOCITY, EXIT TEMPERATURE;
(B) AMBIENT METEOROLOGY - PROFILES OF
DRY-BULB TEMPERATURE, RELATIVE HUMIDITY
AND WINDSPEED; (C) SOURCE GEOMETRY - TOWER
GEOMETRY - TOWER DIAMETER. THE MODEL
SOLVES A SET OF EIGHT COUPLED, ORDINARY
NONLINEAR DIFFERENTIAL EQUATIONS
REPRESENTING CONSERVATION OF MASS,
VERTICAL MOMENTUM, HORIZONTAL MOMENTUM,
ENERGY AND TOTAL WATER, AND INCLUDES
TWO EQUATIONS OF PLUME GEOMETRY, AND AN
EQUATION TO INSURE THAT THE PLUME
REMAINS ON THE PREDICTED COURSE. THE
PLUME CROSS-SECTION IS TAKEN AS AN
ELLIPSE, WHOSE ECCENTRICITY DEPENDS ON
STABILITY OF THE AMBIENT ATMOSPHERE.
MODEL PREDICTIONS GIVE CENTERLINE
TRAJECTORY, VERTICAL AND HORIZONTAL
HALF-WIDTH, EXTENT OF VISIBLE PLUME AND
JET CENTERLINE VALUES OF VELOCITY,
RELATIVE HUMIDITY, WATER VAPOR,
TEMPERATURE AND LIQUID WATER. THE MODEL
HAS BEEN EVALUATED AT ANL AND FOUND TO
GIVE A RATHER POOR REPRESENTATION OF
VISIBLE PLUME LENGTH AND FINAL RISE.
THE PLUME TRAJECTORIES ARE TOO STEEP,
THE PREDICTED LENGTH IS TYPICALLY 1/3
OF THE OBSERVED VALUE, AND THE
PREDICTED RISE AVERAGES 60% OF OBSERVED.

<STATS> IN USE

<ACCESS> UNLIMITED

<MEDIA> DISC

<SIZE> 296 RECORDS EACH 80 BYTES LONG

<COMP> IBM

<CONFIG> IBM 370/195 OS/VS1 WITH 122 K CORE

<LANG> FORTRAN

<CHAR> EBCDIC

<ALGO> THE SYSTEM OF EIGHT COUPLED, ORDINARY,
NONLINEAR DIFFERENTIAL EQUATIONS IS

SOLVED BY SIMPLE EULER DIFFERENTIATION
WITH DOUBLE PRECISION ARITHMETIC AND
SMALL SCALES. NO CONVERGENCE TEST IS
INCLUDED.

<CLASS> CONTINUOUS; DETERMINISTIC; PREDICTIVE

<APPL> TO PREDICT THE VISIBLE PLUME AND VAPOR
LIQUID WATER, MOMENTUM AND TEMPERATURE
ADDITIONS TO THE ATMOSPHERE DUE TO A
SINGLE NATURAL-DRAFT COOLING TOWER.

<USERS> ARGONNE NATIONAL LABORATORY

<SND> 39 WPT PLUME DATA SETS FROM 3 SITES.
HEAT RELEASES RANGED FROM 100 TO 325 M
CAL/SEC.

<EVLD> COMPARISONS OF VISIBLE PLUME OUTLINES
FROM 39 SINGLE-TOWER PLUMES, (CHALK
POINT-14, LUTHER-12, PARADISE-13).
MEASURED SOURCE AND AMBIENT CONDITIONS
WERE INPUT FOR VALIDATION TESTS FOR
EACH OF THE 35 VALIDATION RUNS.

<COM> THIS MODEL IS POOR IN PREDICTING PLUME
CONDITIONS WITH A TENDENCY TO PREDICT
HIGH TRAJECTORIES AND MUCH
SHORTER-THAN-ACTUAL VISIBLE PLUMES.

<UPDATE> 780701

<243>

<CONT> POLICASTRO, ANTHONY J.

<TITLE> A MODEL TO PREDICT VAPOR PLUMES FROM
SINGLE NATURAL-DRAFT COOLING TOWERS

<ACPO> GENERIC

<ADDR> ARGONNE NATIONAL LABORATORY,
ENVIRONMENTAL IMPACT STUDIES DIVISION,
9700 S. CASS AVE.

<CITY> ARGONNE

<STATE> IL

<ZIP> 60439

<PHONE> PIS 972-3235

<DOC> ALTHOUGH UNDER DEVELOPMENT, THE MODEL
EQUATIONS ARE PRESENTED IN MODEL
IMPROVEMENT PROGRAM FOR COOLING TOWER
PLUME RISE AND DRIFT DEPOSITION MODELS,
A. J. POLICASTRO, W. E. DUNE, R. A.
CANDART ET. AL., PROGRESS REPORT,
JANUARY 1-MARCH 31, 1978, ANL
(SPONSORED BY EPP1).

<SUB> COOLING TOWER ENVIRONMENTAL EFFECTS

<ABST> THE GENERIC MODEL IS A MODEL
DEVELOPMENT TOOL TO COMPARE EFFECTS OF
DIFFERENT MODELLING ASSUMPTIONS IN
PREDICTING PHYSICAL CHARACTERISTICS
FROM SINGLE NATURAL-DRAFT COOLING
TOWERS. INPUTS TO THE MODEL ARE: (A)
TOWER SOURCE CONDITIONS - PRESSURE AT
TOWER TOP, EXIT VELOCITY, EXIT
TEMPERATURE AND INITIAL LIQUID WATER
(IF AVAILABLE); (B) AMBIENT
METEOROLOGY - PROFILES OF DRY-BULB
TEMPERATURE, RELATIVE HUMIDITY AND WIND
SPEED; (C) SOURCE GEOMETRY - TOWER
RADIUS. THE MODEL SOLVES A SET OF SIX
COUPLED ORDINARY NONLINEAR DIFFERENTIAL
EQUATIONS REPRESENTING CONSERVATION OF
MASS, VERTICAL AND HORIZONTAL MOMENTUM,
ENERGY, TOTAL WATER AND AN EQUATION FOR
THE CHANGE IN LIQUID WATER AS A
FUNCTION OF CENTERLINE DISTANCE. TWO

ATMOSPHERIC TRANSPORT

<243> CONT.
 EQUATIONS OF GEOMETRY ARE ALSO INCLUDED. MODEL PREDICTIONS GIVE CENTERLINE TRAJECTORY, PLUME RADIUS, PERCENT OF VISIBLE PLUME AND CENTERLINE VALUES OF VELOCITY, WATER VAPOR, LIQUID WATER AND DRY-BULB TEMPERATURE.

<STATUS> UNDER DEVELOPMENT

<ACCESS> ACCESSIBLE WHEN VALIDATED

<MEDIA> DISC

<SIZE> 400 RECORDS EACH 80 BYTES LONG

<COMP> IBM

<CONFIG> IBM 370/195 OS/VS1 WITH 128 K CORE

<LANG> FORTRAN

<CHAR> EBCDIC

<ALGO> THE SYSTEM OF EIGHT ORDINARY NONLINEAR COUPLED DIFFERENTIAL EQUATIONS IS SOLVED BY AN ADAMS PREDICTOR-CORRECTOR ALGORITHM WITH INTERNALLY SELECTED STEP SIZE AND INTERPOLATION TO REQUESTED OUTPUT POINTS.

<CLASS> CONTINUOUS; DETERMINISTIC; PREDICTIVE

<APPL> TO PREDICT THE VISIBLE PLUME, AND VAPOR, TEMPERATURE, MOMENTUM AND WATER ADDITIONS TO THE ATMOSPHERE DUE TO A SINGLE TOWER.

<USERS> ARGONNE NATIONAL LABORATORY

<SHD> SEE ABSTRACT

<HVAL> MODEL IS UNDER DEVELOPMENT. DATA FOR 39 SINGLE-TOWER PLUMES AND STACK PLUME ARE SINGLE-PHASE DATA WILL BE USED FOR MODEL VALIDATION.

<CCR> MODEL ALREADY PERFORMS ON A PAR WITH THE BEST OF MODELS PREVIOUSLY EVALUATED AT ANL.

<UPDATE> 790701

<244>
 <COM> POLICASTRO, ANTHONY J.

<TITLE> A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE AND MULTIPLE NATURAL-DRAFT COOLING TOWERS

<ACR> HAPNASDP

<ACOR> ARGONNE NATIONAL LABORATORY, ENVIRONMENTAL IMPACT STUDIES DIVISION, 9700 S. CASS AVE.

<CITY> ARGONNE

<STATE> IL

<ZIP> 60439

<PHONE> PIS 972-3235

<SOURCE> STEVEN R. HANNA, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, AIR RESOURCES ATMOSPHERIC TURBULENCE AND DIFFUSION LABORATORY, OAK RIDGE TERRACE 37030

<DOC> S. R. HANNA, PREDICTED AND OBSERVED COOLING TOWER PLUME RISE AND VISIBLE PLUME LENGTH AT THE JOHN E. AMOS POWER

PLANT, ATMOSPHERIC TURBULENCE DIFFUSION LABORATORY, ANL CON FILE NO. 71/21, OAK RIDGE, TEX 1975

<STP> COOLING TOWER ENVIRONMENTAL EFF

<ABST> THE HANNA MODEL PREDICTS THE PRINCIPAL CHARACTERISTICS OF COOLING TOWER FROM EITHER SINGLE OR MULTIPLE NATURAL-DRAFT COOLING TOWERS. IN THE MODEL ARE: (A) TOWER SOURCE CONDITIONS-EXIT TEMPERATURE, VELOCITY AND INITIAL LIQUID WATER; (B) AND METEOROLOGY-PROFILES OF DRY-BULB TEMPERATURE, RELATIVE HUMIDITY, AND WINDSPEED; (C) SOURCE GEOMETRY-TOWER HEIGHT AND EXIT DIAMETER. PHYSICAL RELATIONS COMMONLY USED IN CLOUD PHYSICS CALCULATIONS ARE USED IN SOLVING CONSERVATION EQUATIONS FOR VERTICAL MOMENTUM, THERMAL ENERGY, WATER VAPOR, CLOUD WATER CONTENT AND HYDROMETER WATER CONTENT. THE BEST-PLUME ASSUMPTION IS MADE TO ACCOUNT DOWN-WIND BOTTION OF THE PLUME. THE EQUATIONS ARE INTEGRATED FROM TOWER EXIT TO THE POINT WHERE THE VERTICAL SPEED OF THE PLUME FALLS TO ZERO. AT THIS POINT THE PLUME IS SAID TO HAVE REACHED MAXIMUM RISE AND MODEL CALCULATIONS STOP. MODEL PREDICTIONS ARE IN TERMS OF PLUME CENTERLINE, PLUME RADIUS (MOMENTUM, TEMPERATURE AND MOISTURE FROM LARGER TO SMALLER RESPECTIVELY), VERTICAL PLUME VELOCITY, PLUME CENTERLINE TEMPERATURE, MIXING RATIO, WATER VAPOR CONTENT AND LIQUID WATER CONTENT. THE MODEL HAS BEEN EVALUATED AT ANL AND FOUND TO PREDICT PLUME HEIGHT ADEQUATELY. HOWEVER, INCOMPLETE PREDICTION OF PLUME LENGTH RESULTS WHEN THE PLUME REACH MAXIMUM RISE

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> DISC

<SIZE> 613 RECORDS EACH 80 BYTES LONG

<COMP> IBM

<CONFIG> IBM 370/195 OS/VS1 130 K CORE

<LANG> FORTRAN

<CHAR> EBCDIC

<ALGO> THE SYSTEM OF ORDINARY, COUPLED, NONLINEAR DIFFERENTIAL EQUATIONS SOLVED BY SIMPLE EULER INTEGRATION-DOUBLE-PRECISION ARITHMETIC WITH STEPSIZE.

<CLASS> CONTINUOUS; DETERMINISTIC; PREDICTIVE

<APPL> TO PREDICT THE VISIBLE PLUME, AND VAPOR MOMENTUM AND TEMPERATURE ADDITIONS TO THE ATMOSPHERE DUE TO SINGLE OR MULTIPLE NATURAL-DRAFT COOLING TOWERS.

<USERS> ARGONNE NATIONAL LABORATORY

<SHD> 39 TOWER PLUME DATA SETS FROM 3 S (CHALK POINT, LUNEN AND PARADISE) INVOLVING A SINGLE TOWER.

<HVAL> COMPARISON OF VISIBLE PLUME OUTLINE FROM 39 SINGLE TOWER PLUMES, (CHALK POINT SITE-14, LUNEN SITE-12, PARADISE SITE-13). COMPARISON OF VISIBLE

[illegible]

181	<4609>
1197 DEC09S EACH 00 8175 L006	<5128>
2517	<V1026>
031101700	<CC52>
250 18	<5575>
100/170-195 05/MT WITH 2508 CO02	<C047>

[illegible]

(625) 110514

ENVIRONMENTAL IMPACT STUDIES DIVISION,
9700 S. CASS AVE.

(CIT) 140281

11 (S) 11 (S)

<PHONE> 815 972-3235

DEPARTMENT OF ENVIRONMENTAL
ENGINEERING, CLETON BRISTOL, 11/1/57

(DOC) 7. J. OVERCAMP, SENSITIVITY ANALYSIS AND

FOR COOLING TOWERS.

(LAST)
THE OVERCAMP-ISRAELI MODEL PRESENTS
SALT-DRIFT DEPOSITION FOR A SINGLE

PRELIMINARY COOLING TOWER.
PREDICTIONS MAY BE MADE FROM THE TOWER
TO SEE IF BOILING. IMPACT TO THE

ROLL RATE (N) SOURCE COORDINATES
EXIT TEMPERATURE, VELOCITY AND PROFILE
SIZE SPECTRUM (N) METEOROLOGICAL

FBI-DOES NOT DISCLOSE AND RELATIVE
 IMMEDIATELY FOR PERIODS OF TIME
 1947-1948

SECRET -- TOWNS WRIGHT AND KITE
DINMITE (M) GROUND SAMPLES -- AS
HAY 15 TO LOCATED INSTANTLY ABOVE

THE LOOK. FOR PLANT HILL, THE MOBILE
EMPLOY A SIMPLE ENVIRONMENT APPROACH
LEAVING TO A CLOSED-POSSIBLE SOLUTION.

THIS SETTING REPRODUCED IN THE
PLATE REPRODUCED IN THE

THE EFFECT OF AMBIENT TEMPERATURE IS

IT WAS FOUND TO BE COMPETITIVE WITH THE OTHERS (BETTER) EXISTING UNIT HOUSES. THE HOUSE WAS FOUND TO LOSE

WAS BELIEVED THAT EMISSION WAS
DEPOSITION WAS TO REACTION OF THE
LAYER FROM THE GROWTH. THE

ATMOSPHERIC TRANSPORT

<246> CONT.

PUBLISHED 9-1977, SEPT. 1972.

<99> COOLING TOWER ENVIRONMENTAL EFFECTS

<ABST> THE STEPHEN-MODEL MODEL PREDICTS THE PHYSICAL CHARACTERISTICS OF COOLING TOWER PLUMES FROM SINGLE OR MULTIPLE NATURAL-DRAFT COOLING TOWERS. BUT THE MULTIPLE TOWER PORTION OF LOGIC AS DESCRIBED IN THE DOCUMENTATION WAS NOT IMPLEMENTED AT ABL. INPUTS TO THE MODEL ARE: (A) TOWER SOURCE CONDITIONS - PRESSURE AT TOWER TOP, EXIT VELOCITY, EXIT TEMPERATURE, AND INITIAL LIQUID WATER (IF AVAILABLE); (B) AMBIENT METEOROLOGY - PROFILES OF DRY-BULB TEMPERATURE, RELATIVE HUMIDITY AND WIND SPEED; (C) SOURCE GEOMETRY - TOWER RADII. THE MODEL SOLVES A SET OF 6 COUPLED NONLINEAR DIFFERENTIAL EQUATIONS EXPRESSING CONSERVATION OF MASS, VERTICAL AND HORIZONTAL MOMENTUM AND ENERGY; THE CHANGE OF LIQUID WATER WITH CENTERLINE DISTANCE AND THE CHANGE OF PLUME AREA WITH DISTANCE. TWO EQUATIONS OF PLUME GEOMETRY ARE ALSO INCLUDED. MODEL PREDICTIONS GIVE CENTERLINE TRAJECTORY, PLUME RADIUS, EXTENT OF VISIBLE PLUME AND CENTERLINE VALUES OF VELOCITY, WATER VAPOR AND DRY-BULB TEMPERATURE.

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> DISC

<SIZE> 419 RECORDS EACH 80 BYTES LONG

<COMP> IBM

<CONFIG> IBM 370/195 OS/MVT WITH 114 K COPE

<LANG> FORTRAN

<CHAP> EDCDIC

<ALGO> "THE SYSTEM OF 7 COUPLED NONLINEAR ORDINARY DIFFERENTIAL EQUATIONS IS SOLVED USING THE DNGC SUBROUTINE OF THE IBM SCIENTIFIC SUBROUTINE PACKAGE WHICH USES A FOURTH-ORDER HARRING PREDICTOR-CORRECTOR METHOD.

<CLAS> CONTINUOUS; DETERMINISTIC; PREDICTIVE

<APPL> TO PREDICT THE VISIBLE PLUME, AND VAPOR, LIQUID WATER, TEMPERATURE AND MOMENTUM ADDITIONS TO THE ATMOSPHERE DUE TO A SINGLE TOWER.

<USERS> ARGONNE NATIONAL LABORATORY

<SHD> SEE ABSTRACT

<REAL> COMPARISON OF VISIBLE PLUME OUTLINES FROM 39 SINGLE DUCT PLUMES (CHALK POINT-10, LOUEN-12, PARADISE-13). MEASURED SOURCE AND AMBIENT CONDITIONS WERE INPUT FOR THE VALIDATION TESTS FOR EACH OF THE 39 VALIDATION RUNS.

<COM> THE MODEL HAS BEEN EVALUATED AT ABL AND FOUND TO BE AVERAGE WITH BETTER-THAN-AVERAGE LENGTH AND SIZE PREDICTIONS IN CASES WHERE THE PLUME DID NOT LEVEL OFF, BUT AN INABILITY TO DESCRIBE THE PLUMES REASONABLY AS THEY REACHED MAXIMUM RISE.

<UPDATE> 780703

<247> POLICASTRO, ANTHONY J.

<TITLE> A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS

<ACRO> NEWUMPH

<ADDR> ARGONNE NATIONAL LABORATORY, ENVIRONMENTAL IMPACT STUDIES DIVISION, 9700 S. CASS AVE.

<CITY> ARGONNE

<STATE> IL

<ZIP> 60439

<PHONE> PIS 972-3235

<SOURCE> DR. LARRY WINIARSKI (PIS: 420-4035), U.S. ENVIRONMENTAL PROTECTION AGENCY; CORVALLIS ENVIRONMENTAL RESEARCH LABORATORY, CORVALLIS, OREGON 97330

<DOC> L. WINIARSKI AND W. PRICE, A SIMPLE COOLING TOWER PLUME MODEL, CORVALLIS ENVIRONMENTAL RESEARCH LABORATORY, CORVALLIS OREGON, USEPA ECOLOGICAL RESEARCH SERIES, EPA 600/3-76-100, 1976 ; W. WINIARSKI AND W. PRICE, "METHODS OF IMPROVING PLUME MODELS", CORVALLIS ENVIRONMENTAL RESEARCH LABORATORY, USEPA, CORVALLIS, OREGON, 1978

<SUB> COOLING TOWER ENVIRONMENTAL EFFECTS

<ABST> SEE DESCRIPTION FOR WINIARSKI MODEL. NEWUMPH IS SAME EXCEPT THAT COSINE DISTRIBUTION FUNCTION IS USED INSTEAD OF AVERAGING PROPERTIES. PREDICTIONS OF LENGTH AND RISE OF PLUME GIVEN BY NEWUMPH SHOWED IMPROVEMENT OVER PREDICTIONS GIVEN BY WINIARSKI.

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> DISC

<COMP> IBM

<CONFIG> IBM 370/195 OS/MVT WITH 250 K COPE

<LANG> FORTRAN

<CHAP> EDCDIC

<ALGO> THE MODEL EMPLOYS THE INTEGRATION OF A SET OF COUPLED NONLINEAR ORDINARY DIFFERENTIAL EQUATIONS BY SIMPLE EULER DIFFERENTIATING.

<CLAS> CONTINUOUS; DETERMINISTIC; PREDICTIVE

<APPL> TO PREDICT THE VISIBLE PLUME AND VAPOR AND MOMENTUM ADDITIONS TO THE ATMOSPHERE DUE TO A SINGLE NATURAL-DRAFT COOLING TOWER.

<USERS> ARGONNE NATIONAL LABORATORY

<SHD> 39 DUCT PLUME DATA SETS FROM 3 SITES (CHALK POINT, PARADISE, AND LOUEN) INVOLVING A SINGLE TOWER.

<REAL> COMPARISON OF VISIBLE PLUME OUTLINES FROM 39 PLUMES (CHALK POINT-10, PARADISE-13, LOUEN-12); MEASURED SOURCE AND AMBIENT CONDITIONS WERE INPUT FOR THE VALIDATION TESTS FOR EACH OF THE 39 RUNS.

<287>

ATMOSPHERIC TRANSPORT

<287> CONT.

<CONT> THIS MODEL IS COMPETITIVE IN PREDICTING PLUME CHARACTERISTICS AND PLUME CONDITIONS. IT HAS POTENTIAL FOR USE IN STUDIES OF PLUME SHADOWING AND THE POTENTIAL TRIGGERING OF SEVERE STORMS.

<UPDATE> 780701

<288>

<CONT> POLICASTRO, ANTHONY J.

<TITLE> A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE OR MULTIPLE NATURAL-DRAFT COOLING TOWERS

<ACRO> MSLER

<ADDP> ARGONNE NATIONAL LABORATORY, ENVIRONMENTAL IMPACT STUDIES DIVISION, 9700 S. CASS AVE.

<CITY> ARGONNE

<STATE> IL

<ZIP> 60439

<PHONE> PIS 972-3235

<SOURCE> JIIN LEE (PIS: 972-7633), ARGONNE NATIONAL LABORATORY, 9700 S. CASS AVE.; ARGONNE IL 60439

<DOC> JIIN LEE, THE LAGRANGIAN VAPOR PLUME MODEL - VERSION 3, ENVIRONMENTAL SAFEGUARDS DIVISION, WMS CORPORATION, A RESEARCH PLACE, ROCKVILLE, MD 20850. JIIN LEE, A NUMERICAL SIMULATION OF ATMOSPHERIC CONVERSION, CAUSED BY HEAT DESIGNATION AT LARGE POWER CENTERS, AND SYNTHESIS ON ATMOSPHERIC TURBULENCE, DISPERSION, AND AIR QUALITY, OCT. 26-29, 1976, BALEIGH, N.C. PUBL. BY AMS.

<SUB> COOLING TOWER ENVIRONMENTAL EFFECT

<ABST> THE WMS MODEL PREDICTS THE PHYSICAL CHARACTERISTICS OF COOLING TOWER PLUMES FROM SINGLE OR MULTIPLE NATURAL-DRAFT COOLING TOWERS. INPUTS TO THE MODEL ARE: (A) TOWER SOURCE CONDITIONS - PRESSURE OF TOWER TOP, EXIT VELOCITY, EXIT TEMPERATURE; (B) AMBIENT METEOROLOGY - PROFILES OF DRY-BULB TEMPERATURE, RELATIVE HUMIDITY AND WIND SPEED; (C) SOURCE GEOMETRY - TOWER DIAMETER, (IF MULTIPLE, THEY MUST HAVE THE SAME DIAMETER), AND TOWER SPACING (IF MORE THAN ONE TOWER, ALL ARE REQUIRED TO BE EQUALLY SPACED). THE MODEL SOLVES A SET OF EIGHT COUPLED ORDINARY NONLINEAR DIFFERENTIAL EQUATIONS REPRESENTING THE HYDROSTATIC EQUATION, RATE OF CHANGE OF HYGROMETER WATER AND CLOUD WATER, AND THE CONSERVATION LAWS FOR MASS, HORIZONTAL AND VERTICAL MOMENTUM, ENERGY AND TOTAL WATER. TWO EQUATIONS OF PLUME GEOMETRY ARE ALSO INCLUDED. MODEL PREDICTIONS GIVE CENTERLINE TRAJECTORY, PLUME RADIUS, EXTENT OF VISIBLE PLUME AND CENTERLINE VALUES OF VELOCITY, WATER VAPOR, HYGROMETER AND CLOUD WATER AND DRY-BULB TEMPERATURE.

<STATUS> IN USE

<ACCESS> PROPRIETARY

<MEDIA> DISC

<SIZE> 737 RECORDS EACH 80 BYTES LONG

<288> FAR

<CONT> IBM 370/155 OS/MVC WITH 246 K CORE

<LANG> FORTRAN

<CHAR> BASIC

<ALGO> THE MODEL USED EULER DIFFERENCING TO SOLVE THE SYSTEM OF COUPLED NONLINEAR ORDINARY DIFFERENTIAL EQUATIONS.

<CLASS> CONTINUOUS; DETERMINISTIC; PREDICTIVE

<APPL> TO PREDICT THE VISIBLE PLUME, AND VAPOR TEMPERATURE MOMENTUM AND WATER ADDITIONS TO THE ATMOSPHERE DUE TO SINGLE OR MULTIPLE NATURAL-DRAFT COOLING TOWERS. WMS HAS BEEN USED TO INVESTIGATE ATMOSPHERIC CONVERSION FROM HYPOTHETICAL POWER PLANTS.

<USER> ARGONNE NATIONAL LABORATORY

<SRC> SEE ABSTRACT

<VAL> COMPARISON OF VISIBLE PLUME OUTLINES FROM 19 SINGLE MDCT PLUMES (CHALM POINT-14, LUMER-12, PARADISE-11; THE MULTIPLE TOWER CAPABILITY HAS NOT VALIDATED). MEASURED SOURCE AND AMBIENT CONDITIONS WERE INPUT FOR THE VALIDATION TESTS FOR EACH OF THE 19 VALIDATION PLUMES.

<CON> THIS MODEL HAS BEEN EVALUATED AT ANL AND FOUND TO BE ONLY AVERAGE AMONG CURRENTLY ACCEPTED MODELS WITH A TENDENCY TO UNDERPREDICT PLUME LENGTH BY A FACTOR OF 0.42 ON THE AVERAGE, BUT TO PREDICT PLUME RISE WELL. THIS MEANS THE MODEL TRAJECTORIES LIE WELL ABOVE THE OBSERVED TRAJECTORIES.

<UPDATE> 780701

<289>

<CONT> POLICASTRO, ANTHONY J.

<TITLE> A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS

<ACRO> ORPADUI9

<ADDP> ARGONNE NATIONAL LABORATORY, ENVIRONMENTAL IMPACT STUDIES DIVISION, 9700 S. CASS AVE.

<CITY> ARGONNE

<STATE> IL

<ZIP> 60439

<PHONE> PIS 972-3235

<SOURCE> R. E. LAVERNE (PIS: 850-8611 136149), OAK RIDGE NATIONAL LABORATORY, ENERGY DIVISION, OAK RIDGE, TENNESSEE 37830

<DOC> R. E. LAVERNE, THE OAK RIDGE POC AND DRIFT CODE (ORPAD) USER'S MANUAL, ORNL/TR-5201, 1977

<SUB> COOLING TOWER ENVIRONMENTAL EFFECTS

<ABST> THIS MODEL WAS EXTRACTED FROM THE MORE COMPREHENSIVE ORPAD CODE, CONTAINING ONLY THE PLUME-PREDICTION LOGIC, AND OMITTING ALL PLOTTING LOGIC, WEATHER-TAPE-READ LOGIC AND THE DRIFT-DEPOSITION PREDICTION LOGIC. (THE

ATMOSPHERIC TRANSPORT

<249> <CT>

WHILE PORTION OF THE CODE IS DOCUMENTED UNDER THE NAME OF APPENDIX AT ARL. THE MODEL PREDICTS THE CENTERLINE TRAJECTORY, EXTENT OF VISIBLE PLUME AND WATER VAPOR EMISSION FROM THE PLUME INITIATED BY A SINGLE NATURAL-DRAFT COOLING TOWER IN A GROUP OF SUCH TOWERS. INPUTS TO THE MODEL ARE: (A) TOWER SOURCE CONDITIONS-HEAT AND DRY; (B) AMBIENT METEOROLOGY-HEAT AND DRY-BULB SURFACE TEMPERATURE, SURFACE WINDSPEED AND RELATIVE HUMIDITY, CLOUD COVER PRESENT, HEIGHT OF MAIN CLOUD LAYER, TIME, TIME ZONE AND DATE. (THE LATTER 5 DATA TO DETERMINE SOLAR INSOLATION); (C) SOURCE GEOMETRY-TOWER HEIGHT DIAMETER, ELEVATION OF BASE ABOVE MEAN SEA LEVEL, AND PLACEMENT OF TOWER (IF MORE THAN ONE). THE MODEL DETERMINES PARQUILL CLASS, WINDS LAPSE RATE AND STABILITY AND USES A HANNING-BRIDGE FORMULA TO DETERMINE CENTERLINE TRAJECTORY. A GAUSSIAN DISPERSION FORMULA IS USED TO MAP THE WATER VAPOR IN THE PLUME. THE MODEL PREDICTS PLUME CENTERLINE AND ATMOSPHERIC ADDITIONS OF WATER VAPOR AT DOWNWIND POINTS; FROM THE LATTER THE SATURATED REGION OF THE VISIBLE PLUME IS EXTRACTED BY A SIMPLE SEARCH ALGORITHM.

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> DISC

<SIZE> 1419 RECORDS EACH 80 BYTES LONG

<COMP> IBM

<CONFIG> IBM 370/195 OS/MVT WITH 159 K CORE

<LANG> FORTRAN

<CRAP> ERCCIC

<ALGO> USES A SET OF ORDINARY ALGEBRAIC EQUATIONS. ONE, FOR ATMOSPHERIC SATURATION, IS TRANSCENDENTAL AND IS SOLVED BY A NON-STANDARD PREDICTOR-CORRECTION ITERATION METHOD.

<CLAS> CONTINUOUS; DETERMINISTIC; PREDICTIVE

<APPL> TO PREDICT THE PLUME CENTERLINE, WATER VAPOR ADDITIONS TO THE ATMOSPHERE AND EXTENT OF VISIBLE PLUME FROM SINGLE OR MULTIPLE NATURAL DRAFT COOLING TOWERS.

<USERS> ARGONNE NATIONAL LABORATORY

<SRD> 65 NOCT PLUME DATA SETS FROM 5 SITES (CHALK POINT, PARADISE, LUNEN, WURATH AND ANOS).

<HVAL> COMPARISON OF VISIBLE PLUME OUTLINES FROM 65 PLUMES, (CHALK POINT-14, LUNEN-12, PARADISE-13, WURATH-7, ANOS-19). MEASURED SOURCE AND AMBIENT CONDITIONS WERE INPUT FOR THE VALIDATION TESTS FOR EACH OF THE 65 VALIDATION RUNS. THE FIRST 35 CASES WERE FOR SINGLE TOWERS, AND THE LAST 26 REPRESENT 3-TOWER CLUSTERS. HEAT RELEASES RANGED FROM 100 TO ABOUT 900 K CAL/SEC.

<COR> THE MODEL IS NOT A VIABLE TOOL FOR PREDICTING ENVIRONMENTAL IMPACTS OF COOLING TOWER PLUMES. OF ALL MODELS EVALUATED AT ARL, ITS PREDICTIONS WERE MOST IN ERROR.

<UPDATE> 780703

<250>

<CON> POLICASTRO, ANTHONY J.

<TITLE> A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWER

<ACRO> PERR

<ADDR> ARGONNE NATIONAL LABORATORY, ENVIRONMENTAL IMPACT STUDIES DIVISION, 9700 S. CASS AVE.

<CITY> ARGONNE

<STATE> IL

<ZIP> 60439

<PHONE> PDS 972-3235

<SOURCE> JOHN D. LEE (PDS: 3-455-7172, COMM: 814-465-7172); DEPARTMENT OF METEOROLOGY, PENNSYLVANIA STATE UNIVERSITY, UNIVERSITY PARK, PA 16801

<DOC> K. T. BATTY, SENSITIVITY TESTS WITH A VAPOR PLUME MODEL APPLIED TO COOLING TOWER EFFLUENTS, A THESIS SUBMITTED TO PENNSYLVANIA STATE UNIVERSITY DEPARTMENT OF METEOROLOGY, NOVEMBER 1976

<STB> COOLING TOWER EMISSION

<ABST> THE LEE-BATTY MODEL PREDICTS THE PHYSICAL CHARACTERISTICS OF COOLING TOWER PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS. INPUTS TO THE MODEL ARE: (A) TOWER SOURCE CONDITIONS - PRESSURE AT TOWER TOP, EXIT VELOCITY, EXIT TEMPERATURE; (B) AMBIENT METEOROLOGY - PROFILES OF DRY-BULB TEMPERATURE, RELATIVE HUMIDITY AND WIND SPEED; (C) SOURCE GEOMETRY - TOWER RADII. THE MODEL SOLVES A SET OF FIVE COUPLED ORDINARY NONLINEAR DIFFERENTIAL EQUATIONS REPRESENTING EVAPORATION OF MASS, VERTICAL AND HORIZONTAL MOMENTUM, ENERGY, TOTAL WATER, AND INCLUDES TWO EQUATIONS OF PLUME GEOMETRY. MODEL PREDICTIONS GIVE CENTERLINE TRAJECTORY PLUME CROSS-SECTION EXTENT OF VISIBLE PLUME, JET CENTERLINE VELOCITY, RELATIVE HUMIDITY, WATER VAPOR AND TEMPERATURE.

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> DISC

<SIZE> 405 RECORDS EACH 80 BYTES LONG

<COMP> IBM

<CONFIG> IBM 370/195 OS/MVT 120 K CORE

<LANG> FORTRAN

<ALGO> A HANNING PREDICTOR - CORRECTOR ALGORITHM IS USED TO INTEGRATE THE SYSTEM OF COUPLED NONLINEAR ORDINARY DIFFERENTIAL EQUATIONS.

<CLAS> CONTINUOUS; DETERMINISTIC; PREDICTIVE

<APPL> TO PREDICT THE VISIBLE PLUME AND VAPOR, MOMENTUM AND TEMPERATURE ADDITIONS TO THE ATMOSPHERE DUE TO SINGLE

<250>

ATMOSPHERIC TRANSPORT

<250> COST.

NATURAL-DRAFT COOLING TOWERS

<USER> ARGONNE NATIONAL LABORATORY

<SND> 39 DATA SETS FROM 3 SITES INVOLVING A SINGLE TOWER.

<NVAL> COMPARISON OF VISIBLE PLUME OUTLINES FROM 39 PLUMES (CHALK POINT-10, LUBER-12, PARADISE-13). MEASURED SOURCE AND AMBIENT CONDITIONS WERE INPUT FOR THE VALIDATION RUNS.

<CON> THE MODEL IS AVERAGE IN PREDICTING PLUME CONDITIONS WITH NO CLEAR TENDENCY TOWARD HIGH OR LOW, LONG OR SHORT. THE SCATTER OF THE RESULTS AROUND OBSERVED VALUES IS SOMEWHAT LARGE, AND SEVERAL EXTREMELY LONG PREDICTIONS WERE OBSERVED.

<UPDATER> 780703

<251>

<COMT> POLICASTRO, ANTHONY J.

<TITLE> A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS

<ACRO> SAME

<ADDR> ARGONNE NATIONAL LABORATORY,
ENVIRONMENTAL IMPACT STUDIES DIVISION,
9700 S. CASS AVE.

<CITY> ARGONNE

<STATE> IL

<ZIP> 60439

<PHONE> PTS 972-3235

<SOURCE> JACK SAARE (415-760-1234); BECHTEL
RESEARCH CORPORATION; SAN FRANCISCO,
CALIFORNIA<DOC> JACK SAARE, AN ANALYTICAL
INVESTIGATION OF THE FORMATION AND
DISPERSION OF FOG PLUMES FROM A NATURAL
DRAFT WATER COOLING TOWER FOR VARIOUS
METEOROLOGICAL CONDITIONS, MASTERS
THESIS, RECH. ENG. DEPT., UNIV. OF
PITTSBURGH, 1971. (REF. ALSO DR.
SOWERS, WESTINGHOUSE R & D CTS., BEVLAR
RD., PITTSBURGH, PA 15235)

<SUB> COOLING TOWER ENVIRONMENTAL EFFECTS

<ABST> THE SAME MODEL PREDICTS THE PHYSICAL
CHARACTERISTICS OF COOLING TOWER PLUMES
FROM SINGLE NATURAL-DRAFT COOLING
TOWERS. INPUTS TO THE MODEL ARE: (A)
TOWER SOURCE CONDITIONS--PRESSURE AT
TOWER TOP, EXIT VELOCITY, EXIT
TEMPERATURE; (B) AMBIENT
METEOROLOGY--DRY-BULB TEMPERATURE AT
TOWER TOP AND 100-FOOT LAPSE RATE,
HUMIDITY AT TOWER TOP, AND PROFILE OF
RELATIVE HUMIDITY; (C) SOURCE
GEOMETRY--TOWER RADIUS. (THE ABL
VERSION OBTAINS (B) FROM COMPLETE
AMBIENT PROFILES OF TEMPERATURE,
WIND-SPEED AND RELATIVE HUMIDITY.) THE
MODEL SOLVES A SET OF ORDINARY
ALGEBRAIC EQUATIONS, INCLUDING ONE
TRANSCENDENTAL EQUATION TO DETERMINE
PLUME OUTLINE. CARSON-ROSEN PLUME RISE
FORMULAS AND SUTTER-DISPERSON THEORY
FORMULAS ARE REPRESENTED, RATHER THAN
FUNDAMENTAL PHYSICAL CONSERVATION LAWS.
THE MODEL DOES NOT PREDICT PLUMETRAJECTORY, BUT ONLY HORIZONTAL EXTENT
OF THE VISIBLE PLUME, WHERE OUTLINE IS
TAKEN AS PURELY HORIZONTAL, BEGINNING
AT A VERTICAL ORIGIN UPWIND OF THE TOWER
AT FIVE-FISE HEIGHT. OTHER PHYSICAL
PLUME PROPERTIES ARE GIVEN BY THE MODEL
IN PRINCIPLE, BUT HAVE LITTLE MEANING
DUE TO THE UNPHYSICAL NATURE OF THE
MODEL ASSUMPTIONS. THE MODEL WAS
EVALUATED AT ABL AND FOUND TO PREDICT
PLUME LENGTH WITHIN A FACTOR OF 2 IN
ONLY 1/3 OF THE CASES PLUME RISE WITHIN
A FACTOR OF 2 IN ONLY ABOUT 1/2

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> DISC

<SIZE> 446 RECORDS EACH 70 BYTES LONG

<COMP> IBM

<CONFIG> IBM 370/195 OS/VS2 WITH 126 K CODE

<LANG> FORTRAN

<CHAR> EBCDIC

<ALGO> THE MODEL USES A SYSTEM OF ORDINARY
ALGEBRAIC EQUATION OF EMPIRICAL TYPE
INCLUDING ONE TRANSCENDENTAL EQUATION,
WHICH IS HANDLED BY A SIMPLE STEP
SEARCH.

<CLAS> CONTINUOUS; DETERMINISTIC; PREDICTIVE

<APPL> TO PREDICT VISIBLE PLUME RISE AND
VISIBLE PLUME LENGTH, AND ATMOSPHERIC
WATER VAPOR INCREASE AT POINTS FAR
DOWNWIND, FOR A NATURAL DRAFT COOLING
TOWER.

<USERS> ARGONNE NATIONAL LABORATORY

<SND> 39 WDCI PLUME DATA SETS FROM 3 SITES
INVOLVING A SINGLE TOWER, 100 TO 325 M
CAL/SEC HEAT DISCHARGE RANGE.<NVAL> COMPARISON OF VISIBLE PLUME OUTLINES
FROM 39 PLUMES, (CHALK POINT-10,
LUBER-12, PARADISE-13). MEASURED SOURCE
AND AMBIENT CONDITIONS WERE INPUT FOR
THE VALIDATION TESTS FOR EACH OF THE 39
VALIDATION RUNS.<CON> A MODEL OF THIS TYPE IS OF GREATEST USE
IN TRYING TO REPRESENT GENERAL FEATURES
OF PLUME ENVIRONMENTAL IMPACT OVER LONG
TIMES. WHILE THIS MODEL WAS NOT THE
WORST MODEL EVALUATED AT ABL OF
EMPIRICAL TYPE, IT CANNOT BE
RECOMMENDED FOR SERIOUS STUDY OF
ENVIRONMENTAL IMPACTS.

<UPDATED> 780703

<252>

<COMT> POLICASTRO, ANTHONY J.

<TITLE> A MODEL TO PREDICT VAPOR PLUMES FROM
SINGLE NATURAL-DRAFT COOLING TOWERS

<ACRO> SLACSDY

<ADDR> ARGONNE NATIONAL LABORATORY,
ENVIRONMENTAL IMPACT STUDIES DIVISION,
9700 S. CASS AVE.

<CITY> ARGONNE

<STATE> IL

ATMOSPHERIC TRANSPORT

<252> CONT.
 <TIP> 60439
 <FROM> PTS 972-3235
 <SYNOPSIS> DR. PETER SLANSON (519-885-1211 X2425), DEPT. OF MECH. ENG., UNIVERSITY OF WATERLOO, WATERLOO, ONTARIO N2L 3G1
 <DOC> P. R. SLANSON, VAPOR PLUME THEORY AND EXAMPLE COMPUTER PROGRAMS, ENVIRONMENTAL LIMITED, UNIVERSITY OF WATERLOO, 1976; P. R. SLANSON, J. N. COLEMAN AND J. P. BLACKWELL, NATURAL DRAFT COOLING TOWER PLUME BEHAVIOR AT PARADISE STEAM PLANT, PART II, TVA, CHATTANOOGA, TENN., 1977
 <SUB> COOLING TOWER ENVIRONMENTAL EFFECTS
 <ABST> THE SLANSON CLOSED-FORM MODEL PREDICTS THE PHYSICAL CHARACTERISTICS OF COOLING TOWER PLUMES FROM SINGLE TOWER INSTALLATIONS. INPUTS TO THE MODEL ARE: (A) TOWER SOURCE CONDITIONS--PRESSURE AT TOWER EXIT, EXIT VELOCITY AND EXIT TEMPERATURE; (B) AMBIENT METEOROLOGY--LARGE RATES OF DRY-BULB TEMPERATURE AND DEW-POINT TEMPERATURE AND AVERAGE WINDSPEED OVER EXPECTED PLUME HEIGHT (BUT MODEL ACCEPTS FULL AMBIENT PROFILES AND GENERATES THE REDUCED VALUES); (C) SOURCE GEOMETRY--TOWER DIAMETER. THE MODEL SOLVES A SET OF ORDINARY ALGEBRAIC EQUATIONS OBTAINED VIA SIMPLIFYING ASSUMPTIONS FROM DIFFERENTIAL EQUATIONS REPRESENTING CONSERVATION OF MASS, MOMENTUM, ENERGY AND TOTAL WATER. THE EQUATIONS POSE NO PARTICULAR MATHEMATICAL DIFFICULTIES. MODEL PREDICTIONS GIVE CENTERLINE TRAJECTORY, PLUME RADIUS, EXTENT OF VISIBLE PLUME AND JET CENTERLINE VALUES OF VELOCITY, TEMPERATURE, RELATIVE HUMIDITY AND WATER VAPOR. THE MODEL HAS BEEN EVALUATED AT ARL AND FORMO TO PREDICT PLUME RISE AND LENGTH AT AN AVERAGE LEVEL, BEING UNABLE TO PREDICT EITHER VISIBLE RISE OR VISIBLE LENGTH CONSISTENTLY WITHIN A FACTOR OF TWO. WHILE THE MODEL CAN GIVE A GENERAL PICTURE OF PLUME RISE, IT SHOULD NOT BE CONSIDERED AS COMPETITIVE WITH THE BEST AVAILABLE MODELS.
 <STATUS> IN USE
 <ACCESS> PROPRIETARY
 <MEDIA> DISC
 <COMP> IBM
 <CONFIG> IBM 370/195 OS/MVT WITH 30 K CORE
 <LANG> FORTRAN
 <CHAR> EBCDIC
 <ALGO> THE MODEL USES A SYSTEM OF ORDINARY ALGEBRAIC EQUATIONS, OBTAINED UNDER SIMPLIFYING ASSUMPTIONS AS SOLUTIONS TO THE SYSTEM OF COUPLED, NONLINEAR, ORDINARY DIFFERENTIAL EQUATIONS USED IN THE SLANSON INTEGRAL MODEL (SLANISDP). NO SPECIAL SOLUTION TECHNIQUES, SUCH AS ITERATIVE METHODS, ARE NEEDED.
 <CLASS> CONTINUOUS; DETERMINISTIC; PREDICTIVE
 <APPL> TO PREDICT THE VISIBLE PLUME, AND THE VAPOR, MOMENTUM, TEMPERATURE AND SOLID PARTICULATE ADDITIONS TO THE ATMOSPHERE DUE TO SINGLE OR MULTIPLE NATURAL-DRAFT COOLING TOWERS. DEVELOPER ASSERTS IT WILL ALSO PREDICT STACK PLUMES.

<ORIGIN> ARGONNE NATIONAL LABORATORY
 <SUB> 39 WDC PLUME DATA SETS FROM 3 SITES INVOLVING A SINGLE TOWER.
 <VAL> COMPARISON OF VISIBLE PLUME OUTLINES FROM 39 PLUMES. (CHALK POINT--VA, LOUIS--12, PARADISE--13). MEASURED SOURCE AND AMBIENT CONDITIONS WERE INPUT FOR THE VALIDATION TESTS FOR EACH OF THE 39 VALIDATION RUNS.
 <CON> THIS MODEL IS AVERAGE IN PREDICTING PLUME CONDITIONS WITH A TENDENCY TO PREDICT HIGH TRAJECTORIES AND SHORTER-THAN-ACTUAL PLUMES. IT HAS POTENTIAL FOR EXTENSION TO STUDIES OF PLUME SHADOWING AND HAS BEEN USED AS THE BASIS FOR A DRIFT-DEPOSITION MODEL.
 <UPDATE> 780703
 <253>
 <CONT> POLICASTRO, ANTHONY J.
 <TITLE> A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE AND MULTIPLE NATURAL-DRAFT COOLING TOWERS
 <ACRO> SLANISDP
 <ADDP> ARGONNE NATIONAL LABORATORY, ENVIRONMENTAL IMPACT STUDIES DIVISION, 9700 S. CASS AVE.
 <CITY> ARGONNE
 <STATE> IL
 <ZIP> 60439
 <FROM> PTS 972-3235
 <SOURCE> DR. PETER SLANSON (519-885-1211 X2425); DEPT. OF MECH. ENG.; UNIVERSITY OF WATERLOO; WATERLOO ONTARIO N2L 3G1
 <DOC> P. R. SLANSON, VAPOR PLUME THEORY AND EXAMPLE COMPUTER PROGRAMS, ENVIRONMENTAL LIMITED, UNIVERSITY OF WATERLOO, 1976; P. R. SLANSON, J. N. COLEMAN AND J. P. BLACKWELL, NATURAL DRAFT COOLING TOWER PLUME BEHAVIOR AT PARADISE STEAM PLANT, PART II, TVA, CHATTANOOGA, TENN., 1977
 <SUB> COOLING TOWER ENVIRONMENTAL EFFECTS
 <ABST> THE SLANSON-WIGLEY MODEL PREDICTS THE PHYSICAL CHARACTERISTICS OF COOLING TOWER PLUMES FROM SINGLE OR MULTIPLE NATURAL-DRAFT COOLING TOWERS. INPUTS TO THE MODEL ARE: VELOCITY, EXIT TEMPERATURE; (B) AMBIENT METEOROLOGY--PROFILES OF DRY-BULB TEMPERATURE, RELATIVE HUMIDITY AND WIND SPEED; (C) SOURCE GEOMETRY--TOWER DIAMETER(S) AND TOWER LOCATIONS (IF MORE THAN ONE). THE MODEL SOLVES A SET OF EIGHT COUPLED ORDINARY NONLINEAR DIFFERENTIAL EQUATIONS REPRESENTING CONSERVATION OF MASS, VERTICAL MOMENTUM, ENERGY, TOTAL WATER, SOLID PARTICULATES, AND INCLUDING TWO EQUATIONS OF PLUME GEOMETRY AND THE HYDROSTATIC EQUATION. AN ALGEBRAIC EQUATION TO FORCE THE PLUME MIXING RATIO TO REMAIN AT SATURATION AS BELOW IS ALSO INCLUDED. MODEL PREDICTIONS GIVE CENTERLINE TRAJECTORY, PLUME RADIUS, EXTENT OF VISIBLE PLUME AND JET CENTERLINE VALUES OF VELOCITY, RELATIVE HUMIDITY, WATER VAPOR, TEMPERATURE AND

<255>

ATMOSPHERIC TRANSPORT

<255> CONT.

SOLID PARTICULATES. THE MODEL HAS BEEN VALIDATED AT ABL AND FOUND TO PREDICT PLUME RISE BETTER THAN VISIBLE PLUME LENGTH, BUT BOTH ONLY AT AN AVERAGE LEVEL COMPARED WITH OTHER MODELS.

<STATUS> IN USE

<ACCESS> PROPRIETARY

<MEDIA> DISC

<SIZE> 274 RECORDS EACH 60 BYTES LONG

<CODE> IBM

<CONFIG> IBM 370/195 OS/VS1 WITH 250 K CORE

<LANG> FORTRAN

<ORIG> EACDIC

<ALGO> THE MODEL USES A FIFTH-ORDER RUNGE-KUTTA INTEGRATION SCHEME TO SOLVE A SET OF COUPLED NONLINEAR ORDINARY DIFFERENTIAL EQUATIONS.

<CLASS> CONTINUOUS; DETERMINISTIC; PREDICTIVE

<APPL> TO PREDICT THE VISIBLE PLUME AND VAPOR MOMENTUM AND SOLID PARTICULATE ADDITIONS TO THE ATMOSPHERE DUE TO SINGLE OR MULTIPLE NATURAL-DRAFT COOLING TOWERS. DEVELOPER CLAIMS IT WILL ALSO PREDICT STRIKE PLUMES.

<USER> ARGONNE NATIONAL LABORATORY

<SRD> 65 NOCT PLUME DATA SETS FROM 5 SITES.

<VAL> COMPARISON OF VISIBLE PLUME OUTLINE FROM 65 PLUMES (CHALK POINT-18, LUNEN-12, PARADISE-11, WENNATH-7, ARCS-10). MEASURED SOURCE AND AMBIENT CONDITIONS WERE INPUT FOR VALIDATION TESTS FOR EACH OF THE 65 VALIDATION RUNS. THE FIRST 39 REPRESENT SINGLE TOWERS, AND THE LAST 26 REPRESENT 3-TOWER CLUSTERS.

<CON> THIS MODEL IS AVERAGE IN PREDICTING PLUME CONDITIONS WITH A TENDENCY TO BE SHORT AND LOW AS TO VISIBLE PLUME OUTLINE. IT HAS POTENTIAL FOR EXTENSION TO STUDIES OF PLUME SHADOWING AND TRIGGERING OF SEVERE STORMS, AND COULD BE USED AS THE BASIS FOR A DRIFT-DEPOSITION MODEL.

<UPDATE> 780703

<256>

<CONT> POLICASTRO, ANTHONY J.

<TITLE> A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS

<ACRO> WEIL

<ADDR> ARGONNE NATIONAL LABORATORY, ENVIRONMENTAL IMPACT STUDIES DIVISION, 9700 S. CASS AVE.

<CITY> ARGONNE

<STATE> IL

<ZIP> 60439

<PHONE> PLS 972-3235

<SOURCE> JEFFREY C. WEIL, MARTIN HARIETTA

LABORATORIES, BALTIMORE, MD 21227

<DOC> JEFFREY C. WEIL, THE RISE OF NOCT, NOCT PLUMES, JOURNAL OF APPLIED METEOROLOGY, 13, 435-443, 1974

<SUB> COOLING TOWER ENVIRONMENTAL EFFECTS

<DESC> THE WEIL MODEL PREDICTS THE PHYSICAL CHARACTERISTICS OF COOLING TOWER PLUMES FROM SINGLE NATURAL DRAFT COOLING TOWERS. INPUTS TO THE MODEL ARE: (A) TOWER SOURCE CONDITIONS - PRESSURE AT TOWER EXIT, EXIT VELOCITY AND EXIT TEMPERATURE (B) AMBIENT METEOROLOGY - AMBIENT ATMOSPHERE PROFILES OF DRY-BULB TEMPERATURE, RELATIVE HUMIDITY AND WIND SPEED; (C) SOURCE GEOMETRY - TOWER RADII. THE MODEL SOLVES A SET OF SIX ORDINARY COUPLED NONLINEAR DIFFERENTIAL EQUATIONS FOR HORIZONTAL AND VERTICAL MOMENTUM, MASS, ENERGY, TOTAL WATER AND SATURATION OF THE PLUME. TWO EQUATIONS OF PLUME GEOMETRY ARE ALSO SOLVED. MODEL PREDICTIONS GIVE CENTERLINE TRAJECTORY, PLUME RADII, EXTENT OF VISIBLE PLUME AND JET CENTERLINE VALUES OF VELOCITY, TEMPERATURE, RELATIVE HUMIDITY, WATER VAPOR AND LIQUID WATER.

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> DISC

<SIZE> 274 RECORDS EACH 60 BYTES LONG

<CODE> IBM

<CONFIG> IBM 370/195 OS/VS1 WITH 122 K CORE

<LANG> FORTRAN

<ALGO> THE MODEL USES EULER'S METHOD TO INTEGRATE THE SYSTEM OF COUPLED, NONLINEAR ORDINARY DIFFERENTIAL EQUATIONS.

<CLASS> CONTINUOUS; DETERMINISTIC; PREDICTIVE

<APPL> TO PREDICT THE VISIBLE PLUME, AND THE VAPOR, MOMENTUM, TEMPERATURE AND MOISTURE ADDITIONS TO THE ATMOSPHERE DUE TO SINGLE NATURAL-DRAFT COOLING TOWERS.

<USER> ARGONNE NATIONAL LABORATORY.

<SRD> 39 NOCT DATA SETS FROM 3 SITES INVOLVING A SINGLE TOWER.

<VAL> COMPARISON OF VISIBLE PLUME OUTLINES FROM 39 DATA SETS (CHALK POINT-18, LUNEN-12, PARADISE-13). MEASURED SOURCE AND AMBIENT CONDITIONS WERE INPUT FOR THE VALIDATION TESTS FOR EACH OF THE 39 VALIDATION RUNS.

<CON> THIS MODEL HAS BEEN VALIDATED AT ABL AND FOUND TO BE COMPETITIVE AMONG THE TOP FOUR STUDIES, WITH A TENDENCY TO PREDICT POINT OF DISAPPEARANCE TO EASILY CHANGE AN OTHERWISE REASONABLE TRAJECTORY.

<UPDATE> 780703

<255>

<CONT> POLICASTRO, ANTHONY J.

<TITLE> A MODEL TO PREDICT PLUMES FROM A SINGLE NATURAL-DRAFT COOLING TOWER

ATMOSPHERIC TRANSPORT

<255> CONT.

<ACRO> WINDPICK

<ADDR> ARCONNE NATIONAL LABORATORY,
ENVIRONMENTAL IMPACT STUDIES DIVISION,
9700 S. CASS AVE.

<CITY> ARCONNE

<STATE> IL

<ZIP> 60639

<PHONE> PYS 972-3235

<SOURCE> DR. LARRY WINDPICK (PYS:
420-8975); U.S. ENVIRONMENTAL PROTECTION
AGENCY; CORVALLIS ENVIRONMENTAL RESEARCH
LABORATORY; CORVALLIS OREGON 97330

<DOC> L. WINDPICK AND D. FRICK, "A SIMPLE
COOLING TOWER PLUME MODEL", CORVALLIS
ENVIRONMENTAL RESEARCH LABORATORY,
CORVALLIS, OREGON, "SEPA ECOLOGICAL
RESEARCH SERIES, EPA-600/3-76-109, 1976.

<SUB> COOLING TOWER ENVIRONMENTAL EFFECTS

<ABST> THE WINDPICK-FRICK MODEL PREDICTS THE
PHYSICAL CHARACTERISTICS OF A COOLING
TOWER PLUME FROM A SINGLE NATURAL-DRAFT
COOLING TOWER. INPUTS TO THE MODEL ARE:
(A) TOWER SOURCE CONDITIONS -- EXIT
TEMPERATURE, VELOCITY, AND LIQUID WATER
CONTENT; (B) AMBIENT METEOROLOGY --
PROFILES OF DRY-BULB TEMPERATURE,
RELATIVE HUMIDITY, AND WIND SPEED; (C)
SOURCE GEOMETRY -- TOWER HEIGHT AND
EXIT DIAMETER. THE MODEL SOLVES A SET
OF COUPLED ORDINARY DIFFERENTIAL
EQUATIONS REPRESENTING CONSERVATION
EQUATIONS OF MASS, HORIZONTAL MOMENTUM,
VERTICAL, LIQUID WATER, AND WATER
VAPOR. MODEL PREDICTIONS ARE IN TERMS
OF PLUME CENTERLINE, VISIBLE PLUME
SIZE, PLUME RADIUS, JET CENTERLINE
TEMPERATURE VELOCITY, MIXING RATIO AND
LIQUID WATER CONTENT. THE MODEL HAS
BEEN EVALUATED AT AUL AND FOUND TO
PREDICT PLUME HEIGHTS ADEQUATELY.
HOWEVER, THE PREDICTION OF VISIBLE
PLUME LENGTHS TEND TO BE TOO SHORT FOR
THE LONGER OBSERVED PLUMES.

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> DISC

<SIZE> 820 RECORDS EACH 80 BYTES LONG

<COMP> IBM

<CONFIG> IBM 370/195 OS/MVT WITH 250 K CORE

<LANG> FORTRAN

<CHAR> EBCDIC

<ALGO> THE MODEL EMPLOYS THE INTEGRATION OF A
SET OF COUPLED NONLINEAR ORDINARY
DIFFERENTIAL EQUATIONS BY SIMPLE EULER
DIFFERENTIATING.

<CLASS> CONTINUOUS; DETERMINISTIC; PREDICTIVE

<APPL> TO PREDICT THE VISIBLE PLUME, AND VAPOR
AND MOMENTUM ADDITIONS TO THE
ATMOSPHERE DUE TO A SINGLE
NATURAL-DRAFT COOLING TOWER.

<USERS> ARCONNE NATIONAL LABORATORY

<SUB> 39 WDC PLUME DATA SETS FROM 3 SITES

(CHALK POINT, PARADISE, AND LUBEN) -
INVOLVING A TOWER TOWER.

<ABST> COMPARISON OF VISIBLE PLUME OUTLINES
FROM 39 PLUMES (CHALK POINT-10,
PARADISE-13, LUBEN-12); MEASURED SOURCE
AND AMBIENT CONDITIONS WERE USED FOR
THE VALIDATION TESTS FOR EACH OF THE 39
VALIDATION PLUMES.

<CON> THIS MODEL IS COMPETITIVE IN PREDICTING
PLUME CHARACTERISTICS, PLUME
CONDITIONS, AND POTENTIAL PLUME
SHADOWING AND THE POTENTIAL TRIGGERING
OF SEVERE STORMS.

<UPDATE> 780703

<256>

<CON> MOLICASTO, ANTHONY J.

<TITLE> A MODEL TO PREDICT VAPOR PLUMES FROM
SINGLE NATURAL-DRAFT COOLING TOWERS

<ACRO> STONE

<ADDR> ARCONNE NATIONAL
LABORATORY, ENVIRONMENTAL IMPACT STUDIES
DIVISION, 9700 S. CASS AVE.

<CITY> ARCONNE

<STATE> IL

<ZIP> 60639

<PHONE> PYS 972-3235

<SOURCE> Y. J. TSAI, STONE AND WEBSTER, INC.,
BOSTON, MA

<DOC> G. ABDANAH, THE FLOW OF BOUNDED BUOYANT
JETS..., DELFT HYDRAULICS LABORATORY
PUBL. NO. 81, DELFT, NETHERLANDS,
1971; P. D. KATLER, J. L. PETRILLO, Y.
J. TSAI, "PREDICTION AND VERIFICATION
OF VISIBLE PLUME BEHAVIOR", AVAILABLE
FROM STONE AND WEBSTER, BOSTON,
MASSACHUSETTS.

<SUB> COOLING TOWER ENVIRONMENTAL EFFECTS

<ABST> THE STONE-WEBSTER MODEL PREDICTS THE
PHYSICAL CHARACTERISTICS OF COOLING
TOWER PLUMES FROM SINGLE NATURAL DRAFT
COOLING TOWERS. INPUTS TO THE MODEL
ARE: (A) TOWER SOURCE CONDITIONS -
PRESSURE AT TOWER TOP, EXIT VELOCITY,
EXIT TEMPERATURE; (B) AMBIENT
METEOROLOGY - PROFILES OF DRY-BULB
TEMPERATURE, RELATIVE HUMIDITY AND WIND
SPEED; (C) SOURCE GEOMETRY - TOWER
RADIUS. THE MODEL SOLVES A SET OF 5
COUPLED ORDINARY NONLINEAR DIFFERENTIAL
EQUATIONS AND TWO EQUATIONS OF PLUME
GEOMETRY FOR THE "ZONE FOR ESTABLISHED
FLOW", AFTER USING A SET OF ALGEBRAIC
EQUATIONS TO FOLLOW THE FLOW IN THE
"ZONE FOR FLOW ESTABLISHMENT" TO SET UP
THE INITIAL CONDITIONS FOR THE
DIFFERENTIAL SYSTEM AT A POINT BEYOND
THE TOWER OUTLET. PHYSICAL PRINCIPLES
REPRESENTED ARE CONSERVATION OF MASS,
VERTICAL AND HORIZONTAL MOMENTUM,
ENERGY AND WATER VAPOR. TWO EQUATIONS
OF JET GEOMETRY ARE ALSO INCLUDED. NO
ENERGETIC EFFECTS OF CONDENSATION AND
EVAPORATION ARE INCLUDED AND LIQUID
WATER IS NOT EXPLICITLY ACCOUNTED FOR.
MODEL PREDICTIONS GIVE CENTERLINE
TRAJECTORY, PLUME RADIUS, EXTEND OF
VISIBLE PLUME AND CENTERLINE VALUES OF
VELOCITY, WATER VAPOR AND DRY-BULB

<256>

ATMOSPHERIC TRANSPORT

<256> CONT.

TEMPERATURE.

<STATUS> IN USE

<ACCESS> PROPRIETARY

<MEDIA> DISC

<SIZE> 200 RECORDS EACH 80 BYTES LONG

<COMP> IBM

<CONFIG> IBM 370/195 OS/MVT WITH 126 K COPE

<LANG> FORTRAN

<CHAR> EBCDIC

<ALGO> RUNGE-KUTTA INTEGRATION IS USED TO SOLVE THE SET OF 7 COUPLED NONLINEAR ORDINARY DIFFERENTIAL EQUATIONS.

<CLASS> CONTINUOUS; DETERMINISTIC; PREDICTIVE

<APPL> TO PREDICT THE VISIBLE PLUME, AND VAPOR TEMPERATURE AND MOMENTUM ADDITIONS TO THE ATMOSPHERE DUE TO A SINGLE SUCT.

<USERS> ARCONUE NATIONAL LABORATORY

<SUB> SEE ABSTRACT

<REAL> COMPARISON OF VISIBLE PLUME OUTLINES FROM 39 SINGLE SUCT PLUMES (CHALK POINT -10, LUNEN-12, PARADISE-13). MEASURED SOURCE AND AMBIENT CONDITIONS WERE INPUT FOR THE VALIDATION TESTS FOR EACH OF THE 39 VALIDATION SUCTS.

<CON> THIS MODEL HAS BEEN EVALUATED AT ARL AND FOUND TO BE COMPETITIVE WITH AN OCCASIONAL TENDENCY TO GIVE EXTREMELY LONG OVERPREDICTIONS IN FULLY WENT-OVER CASES. PLUME RISE IS MORE ACCURATE THAN LENGTH OF VISIBLE PLUME, WHICH TENDED TO BE OVERPREDICTED IN THE AVERAGE.

<UPDATE> 740703

<257>

<CONT> POOLER, P., JR.

<TITLE> A PREDICTION MODEL OF BEAN URDAS POLLUTION FOR USE WITH STANDARD WIND ROSES

<ABST> AN EMPIRICAL DIFFUSION EQUATION WAS USED WITH PUBLISHED SCHEMATICS OF WIND DIRECTION AND SPEED FREQUENCIES OBTAINED AT THE NASHVILLE WEATHER BUREAU STATION TO COMPUTE PATTERNS OF BEAN MONTHLY RELATIVE CONCENTRATIONS. THE PATTERNS CONSISTED OF THE RELATIVE CONCENTRATION CONTRIBUTIONS FROM GRID POINTS AT 1-MILE INTERVALS TO THE CENTRAL GRID POINT. AN ESTIMATE OF 202 EMISSIONS FOR EACH SQUARE MILE OF THE NASHVILLE AREA WAS COMBINED WITH THESE RELATIVE CONCENTRATION PATTERNS, USING AN ELECTRONIC COMPUTER, TO OBTAIN PATTERNS OF BEAN MONTHLY SO2 CONCENTRATIONS. COMPUTATIONS WERE MADE FOR 3 PRINCIPAL SPACE-HEATING MONTHS. A NETWORK OF 123 LEAD PERCHLORATE CABLE MEASUREMENT SITES PROVIDED PATTERNS OF OBSERVED SO2 CONCENTRATIONS. WHILE THE ABSOLUTE MAGNITUDE OF THE CONCENTRATIONS PREDICTED COULD NOT BE VERIFIED, DUE TO CUMULATIVE UNCERTAINTIES IN THE SOURCE INVENTORY, AND IN THE INTERPRETATION OF THE CABLE

MEASUREMENTS, THE ERROR OF PREDICTION IS CONSIDERED TO BE LESS THAN A FACTOR OF 2. PREDICTED AND OBSERVED PATTERNS WERE GENERALLY SIMILAR, WITH A SUPERIMPOSED TOPOGRAPHIC EFFECT ON OBSERVED CONCENTRATIONS. HILLSIDE LOCATIONS FACING TOWARDS THE SOURCES BY INTERVENING TERRAIN, LOWER VALUES. RELATIVE MONTHLY EMISSION RATES DETERMINED FROM A COMPARISON OF PREDICTED AND OBSERVED VALUES FOR THE AREA SHOWED A CLOSE LINEAR RELATIONSHIP TO MONTHLY DEGREE-DAY TOTALS, FOR THE 5 MONTHS CONSIDERED. A SHUT-OFF FROM THE LINEAR TENDENCY COULD BE NOTED FOR NON-HEATING AND TRANSITIONAL MONTHS.

<GEO> TENNESSEE, NASHVILLE

<758>

<CONT> POTTER, G.

<TITLE> GLOBAL CLIMATE MODEL

<AUTH> SELLER

<ADDR> LAWRENCE LIVERMORE LABORATORY, G DIVISION, PHYSICS DEPARTMENT, P.O. BOX 808

<CITY> LIVERMORE

<STATE> CA

<ZIP> 94550

<PHONE> 415-422-1032; PPS 532-1032

<SOURCE> W.D. SELLERS, DEPARTMENT OF ATMOSPHERIC SCIENCES, UNIVERSITY OF ARIZONA

<DOC> SELLERS, W.D., A NEW GLOBAL CLIMATE MODEL, JOURNAL OF APPLIED METEOROLOGY, 12(2), 201-250, 1973

<SUB> GLOBAL CLIMATE

<ABST> THE SELLER MODEL IS A GLOBAL CLIMATE MODEL WITH SEASONED COUPLING AND INTERACTION BETWEEN CONTINENTS AND OCEANS. THE MODEL IS BASED ON THE THERMODYNAMIC ENERGY EQUATION AVERAGED OVER TIME AND SPACE. THE VERTICAL VARIATIONS OF TEMPERATURES, SPECIFIC HUMIDITY AND THE COSAL AND RESIDUAL COMPONENTS OF WIND VELOCITY ARE PARAMETERIZED. THE MODEL WILL BE USED FOR COMPARISONS WITH IAM2 AND LONG INTERACTIONS OF SELECTED CLIMATE CHANGE SCENARIOS.

<GEO> GLOBAL

<STATUS> NOT NOW IN USE AT LLL

<ACCESS> LIMITED TO AUTHORIZED RECIPIENTS

<MEDIA> PHOTOSTONE

<SIZE> CODE STATEMENTS WITH COMMENT CARDS: 950; CODE STATEMENTS W/O COMMENT CARDS: 850

<COMP> CDC

<CONFIG> CDC 7600 WITH USER TERMINAL AND DISK PACKS; MEMORY REQUIREMENT 20000 OCTAL; 3 CPU MINUTES REQUIRED FOR AVERAGE RUN

<LANG> FORTRAN IV

<CHAR> ASCII

ATMOSPHERIC TRANSPORT

<250> CONF.

<CLASS> INTEGRATIVE; PREDICTIVE

<APPL> CLIMATE RESEARCH

<NSFC> FORMERLY LLL

<CON> NOT CURRENTLY IN USE AT LLL

<UPPER> 780622

<250>

<CONF> PAGLAND, E. W.

<TITLE> POINT SOURCE ATMOSPHERIC DIFFUSION MODEL WITH VARIABLE WIND AND DIFFUSIVITY PROFILES

<ACCP> UNIVERSITY OF WISCONSIN, INSTITUTE FOR ENVIRONMENTAL STUDIES

<CITY> MADISON

<STATE> WI

<STP> 53766

<DOC> ATMOSPHERIC ENVIRONMENT, 9, 175-189, 1975

<ABST> NUMERICAL SOLUTIONS OF THE DIFFUSION OF AN ELEVATED POINT SOURCE IN THE EARTH'S BOUNDARY LAYER ARE PRESENTED. THE FLOW FIELD IS SPECIFIED BY INPUTTING THE HEIGHT OF THE MIXING LAYER, THE WIND SPEED AT THE TOP OF THE MIXING LAYER, THE NET HEAT FLUX TO THE AIR AND THE SURFACE ROUGHNESS. POLLUTANT CONCENTRATIONS ARE COMPARED TO THAT PREDICTED BY THE GAUSSIAN PLUME MODEL WHICH ASSUMES CONSTANT WIND AND DISPERSION COEFFICIENTS WITH RESPECT TO THE VERTICAL DIRECTION. THE MAXIMUM GROUND LEVEL CONCENTRATION AGREES WELL WITH THE GAUSSIAN RESULT FOR NEUTRAL ATMOSPHERIC STABILITY, BUT THERE ARE SIGNIFICANT DIFFERENCES IN THE THREE-DIMENSIONAL DISTRIBUTION OF THE PLUME AS COMPARED TO THE GAUSSIAN MODEL. THE SURFACE ROUGHNESS IS SHOWN TO SIGNIFICANTLY INFLUENCE THE CONCENTRATION DISTRIBUTION. THE PRODUCT OF CONCENTRATION TIMES WIND SPEED DOES NOT DEPEND ON WIND SPEED FOR NEUTRAL STABILITY BUT DOES FOR STABLE AND UNSTABLE CONDITIONS.

<260>

<CONF> PAGLAND, E. W.; PRINCE, J. J.

<TITLE> BOUNDARY LAYER MODEL FOR AIR POLLUTANT CONCENTRATIONS DUE TO HIGHWAY TRAFFIC

<ACCP> UNIVERSITY OF WISCONSIN, INSTITUTE FOR ENVIRONMENTAL STUDIES

<CITY> MADISON

<STATE> WI

<STP> 53766

<DOC> JOURNAL AIR POLLUTION CONTROL ASSOCIATION, 25(7), 88-97, 1975

<ABST> A NUMERICAL SOLUTION OF THE THREE-DIMENSIONAL, STEADY-STATE DIFFUSION EQUATION FOR A FINITE RIGTH LINE SOURCE IS PRESENTED. THE WIND SPEED AND EDDY DIFFUSIVITY ARE A FUNCTION OF HEIGHT ABOVE THE ROADWAY

AND ARE OBTAINED FROM THE SURFACE ROUGHNESS, THE NET HEAT FLUX, AND THE UPPER WIND SPEED. VERTICALIZED GROUND LEVEL AND ELEVATED CONCENTRATIONS NEAR A HIGHWAY ARE OBTAINED FOR WINDS PERPENDICULAR TO THE ROADWAY, PARALLEL, AND AT 45 DEGREES TO THE ROADWAY.

<261>

<CONF> RAMAURTIAN, V.

<TITLE> A SIMPLIFIED RADIATIVE-CONVECTIVE MODEL

<ACCP> NASA LANGLEY RESEARCH CENTER

<CITY> HAMPTON

<STATE> VA

<STP> 23665

<DOC> JOURNAL ATMOSPHERIC SCIENCE, 33, 1330-1346, 1976

<SUB> GLOBAL ENERGY BALANCE MODEL

<ABST> A SIMPLIFIED RADIATIVE TRANSFER MODEL FOR THE EARTH'S ATMOSPHERE IS PRESENTED. THE SIMPLIFICATION IS ACHIEVED BY A COMBINATION OF BAND ABSORPTANCE AND EMISSIVITY FORMULATION FOR TREATING RADIATIVE TRANSFER DUE TO H₂O, CO₂ AND O₃. THE MODEL INCORPORATES THE MAJOR AND MINOR RADIATIVE TRANSFER PROCESSES DUE TO H₂O, CO₂ AND O₃. THE RADIATIVE MODEL IS USED TO DEVELOP AN EFFICIENT AND ACCURATE RADIATIVE-CONVECTIVE MODEL. RESULTS FOR THE GLOBAL SURFACE TEMPERATURE, STRATOSPHERIC THERMAL STRUCTURE, AND THE NET OUTGOING LONGWAVE FLUX ARE PRESENTED. THE COMPUTED THERMAL STRUCTURE OF THE STRATOSPHERE AND THE STRATOSPHERIC COOLING RATES ARE IN EXCELLENT AGREEMENT WITH PREVIOUS STUDIES. THE AMPLITUDE OF THE DIURNAL TEMPERATURE DIFFERENCE IN THE UPPER STRATOSPHERE OBTAINED FROM THE PRESENT MODEL IS LARGER BY ABOUT 50% THAN LEUVY'S (1964) RESULTS. THIS DIFFERENCE IS DUE TO THE INCLUSION OF DOPPLER BROADENING EFFECTS AND CO₂ ROT AND MINOR ISOTOPIC BANDS IN THE PRESENT MODEL. THE FLUX CALCULATIONS INDICATE THAT THE RELATIVELY MINOR BANDS LIKE THE CO₂ ROT AND MINOR ISOTOPIC BANDS AND THE E-TYPE ABSORPTION BY THE H₂O CONTINUUM BAND HAVE TO BE INCLUDED IN ORDER TO COMPUTE THE OUTGOING FLUX F TO WITHIN 1% ACCURACY. RESULTS ARE ALSO PRESENTED FOR THE SENSITIVITY OF F TO SURFACE TEMPERATURE. IT IS SHOWN THAT THE H₂O E-TYPE ABSORPTION HAS A SUBSTANTIAL INFLUENCE ON THE SENSITIVITY PARAMETER DF/DT.

<GEN> GLOBAL

<STATUS> IN USE

<CLASS> SIMULATION

<APPL> INVESTIGATE SENSITIVITY OF CLIMATE MODELS

<UPDATED> 780803

<262>

<CONF> RANDERSON, D.; CORNETT, J. S.

<262>

ATMOSPHERIC TRANSPORT

<262> CONT.

<TITLE> NUMERICAL PREDICTION OF THE MESOSCALE TRANSPORT OF ATMOSPHERIC EFFLUENTS: PHILOSOPHY AND MORPHOLOGY OF EXPERIMENTAL MODELS FOR PREDICTING THE WIND AND POTENTIAL RADIOLOGICAL FIELDS OVER THE NEVADA TEST SITE.

<ORGN> NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, AIR RESOURCES LABORATORY

<CITY> LAS VEGAS

<STATE> NV

<SOURCE> NTIS \$6.25/PC\$1.45

<DOC> COR-74-10799/6, 1973

<RES> TWO EXPERIMENTAL NUMERICAL MODELS ARE DESCRIBED AND TENTATIVELY VERIFIED. ONE MODEL PREDICTS THE MESOSCALE WIND FIELD OVER MOUNTAINOUS TERRAIN AND THE OTHER MODEL FORECASTS THE TEMPORAL AND SPATIAL CHANGES IN THE AIRBORNE RADIOACTIVITY FIELD THAT MIGHT BE ASSOCIATED WITH AN ACCIDENTAL RELEASE OF DEBRIS DURING NUCLEAR TESTING ON THE NEVADA TEST SITE. A MESOSCALE WIND-PREDICTION MODEL IS DERIVED FROM THE ASSUMPTION OF THE CONSERVATION OF VERTICAL WIND SHEAR FOR A TIME PERIOD OF AT LEAST 6 HR OVER AN AREA 160 X 160 M PL. THIS ASSUMPTION IS CLOSELY ANALOGOUS TO THE CONSERVATION OF HORIZONTAL VORTICITY. VERIFICATION OF THE WIND-PREDICTION MODEL IS ACCOMPLISHED THROUGH TWO DIFFERENT MODES. THE RADIOLOGICAL-PREDICTION MODEL IS DIFFICULT TO VERIFY, BUT PRELIMINARY RESULTS LOOK REALISTIC.

<GPO> NEVADA TEST SITE

<263>

<ORGN> RAC, K. S.

<TITLE> A NUMERICAL STUDY OF METEOROLOGICAL EFFECTS OF WASTE HEAT AND MOISTURE RELEASES FROM HYPOTHETICAL POWER PLANTS

<ACRQ> RETED

<ORGN> NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, ATMOSPHERIC TURBULENCE AND DIFFUSION LABORATORY, P.O. BOX-2

<CITY> CAM RIDGE

<STATE> TN

<ZIP> 37830

<PHONE> 615-483-0611 EXT. 34081; FTS 850-4081

<SOURCE> SOFT COVER SYMPOSIUM VOLUME FROM THE ASME (PRICE \$9) UNITED ENG. CENTER, 345 EAST 57TH ST., NEW YORK, N.Y. 10017

<DOC> IN: K.E. TORrance AND P.G. WATTS, (EDS.) ENVIRONMENTAL EFFECTS OF ATMOSPHERIC HEAT/MOISTURE RELEASES. THE SECOND AIAA/ASME THERMOPHYSICS AND HEAT TRANSFER CONFERENCE HELD IN PALO ALTO, CALIFORNIA MAY 24-26, 1978, PP. 97-106

<SUB> METEOROLOGICAL EFFECTS OF THERMAL RELEASES FROM HYPOTHETICAL POWER PLANTS

<ABST> A TWO-DIMENSIONAL NONPRECIPITATING SHALLOW CLOUD MODEL HAS BEEN DEVELOPED FOR THE METEOROLOGICAL EFFECTS OF

THERMAL ENERGY RELEASES (INTERIM PROGRAM). THIS SECOND-ORDER-CLOSURE TURBULENCE MODEL UTILIZES A FULL SET OF EQUATIONS FOR MEAN WIND VELOCITIES, POTENTIAL TEMPERATURE, SPECIFIC HUMIDITY, AND LIQUID WATER CONTENT, AS WELL AS EQUATIONS FOR THE CORRESPONDING TURBULENT FLUXES WHICH ARE CLOSED APPROXIMATELY. VAPOUR-LIQUID WATER PHASE CHANGES ARE INCLUDED IN TERMS OF SATURATION ADJUSTMENTS. A HYPOTHETICAL POWER PLANT WAS TREATED AS AN AREA SOURCE WITH IDEALIZED DISTRIBUTIONS OF WASTE HEAT AND WATER VAPOUR FLUXES FROM SEVERAL COOLING TOWERS. THESE FLUXES WERE UTILIZED AS BOUNDARY CONDITIONS TO THE MODEL. NUMERICAL EXPERIMENTS WERE PERFORMED FOR A 10,000 MW POWER PLANT IN A CONVECTIVE ATMOSPHERE WITH VARIABLE SURFACE RELATIVE HUMIDITY AND MEAN WIND DIRECTION. THE TOTAL WASTE HEAT FLUX OVER THE POWER PLANT AREA WAS ALSO ARBITRARILY VARIED. PRELIMINARY RESULTS PRESENTED INCLUDE TYPICAL VERTICAL PROFILES OF MEAN POTENTIAL TEMPERATURE, SPECIFIC HUMIDITY, AND LIQUID WATER IN THE ATMOSPHERE, AS WELL AS PERTURBATIONS IN THE SURFACE TEMPERATURE AND HUMIDITY DUE TO THE POWER PLANT.

<GEN> GENERAL

<TYPE> NOT APPLICABLE

<STATUS> UNDER DEVELOPMENT; FURTHER DEVELOPMENT

<ACCESS> UNLIMITED

<MEDIA> PUNCHED CARDS; TEXT

<SIZE> 13,000 BYTES

<COMP> IBM

<CONFIG> IBM 360/91 WITH 268 K COPE AND DISC STORAGE

<LANG> FORTRAN IV

<CHAR> EBCDIC

<ALGO> GURUNT-FRANKEL FINITE DIFFERENCE METHOD

<CLAS> PREDICTIVE; SIMULATION; NUMERICAL MODELING

<APPL> ENVIRONMENTAL IMPACTS OF WASTE HEAT REJECTION FROM LARGE POWER PLANTS

<USERS> DEPARTMENT OF COMMERCE-NOAA; DEPT. OF ENERGY

<SRD> 1976 PROJECTIONS OF ENERGY GENERATION IN THE U.S. (EEDA, 1976)

<REAL> QUALITATIVE VALIDATION ONLY, SENSITIVITY ANALYSIS WITH 3 WIND DIRECTIONS, 3 RELATIVE HUMIDITIES, AND 3 WASTE HEAT FLUXES

<COM> FURTHER DEVELOPMENT AND VALIDATION OF THE MODEL ARE PLANNED AS DISCUSSED IN CONCLUSIONS OF THE PAPER

<UPDTE> 1978/07/20

<264>

<ORGN> RAO, K. S.; INGENSOLL, C. S.; EGAN, B. A.

<TITLE> NUMERICAL MODEL FOR REGIONAL TRANSPORT OF SULFUR POLLUTANTS IN THE ATMOSPHERE

ATMOSPHERIC TRANSPORT

- <244> CONT.
 <ABST> ENVIRONMENTAL RESEARCH AND TECHNOLOGY
 <CITY> CONCORD
 <STATE> MA
 <DOC> SUMMER COMPUTER SIMULATION CONFERENCE
 HELD IN WASHINGTON, DC, JULY 12, 1976
 <ABST> A NUMERICAL AIR POLLUTION TRANSPORT
 MODEL DUE TO ESKIN AND SHAWNEY HAS BEEN
 ADAPTED TO SIMULATE THE REGIONAL
 TRANSPORT OF SULFUR DIOXIDE AND
 PARTICULATE SULFATES. THIS
 QUASI-LAGRANGIAN, THREE-DIMENSIONAL
 GRID MODEL INCORPORATES A DETAILED SO₂
 EMISSION INVENTORY OF MAJOR
 ANTHROPOGENIC SOURCES IN THE EASTERN U.
 S. REGION, AND ACCOUNTS FOR THE
 HORIZONTAL ADVECTIVE TRANSPORT AS WELL
 AS TURBULENT DIFFUSION OF THE SPECIES.
 THE CHEMICAL TRANSFORMATION OF SO₂ TO
 SO₄ AND THE DEPOSITION OF THE SPECIES
 AT THE EARTH'S SURFACE ARE ASSUMED TO
 BE LINEAR PROCESSES AT SPECIFIED
 CONSTANT RATES. THE MODEL USES DETAILED
 METEOROLOGICAL INPUTS SUCH AS THE
 OBSERVED WIND AND MIXING DEPTH DATA
 DURING AN EPISODE, GRID TOPOGRAPHY AND
 A DIURNALLY-VARYING EDDY DIFFUSIVITY
 PROFILE. THE NUMERICAL METHOD CONSERVES
 THE ZEROTH, FIRST AND SECOND MOMENTS OF
 THE MASS DISTRIBUTION OF THE SO₂ AND
 SOUSUR OF SPECIES IN THE GRID, THUS
 ELIMINATING THE PSEUDO-DIFFUSIVE ERRORS
 ASSOCIATED WITH THE CONVENTIONAL
 FINITE-DIFFERENCE APPROXIMATIONS. BY
 INTEGRATING THE SPECIES CONSERVATION
 EQUATIONS WITH RESPECT TO TIME AND
 APPROPRIATE TIME-AVERAGING, THE
 THREE-DIMENSIONAL NUMERICAL GRID MODEL
 CAN SIMULTANEOUSLY PREDICT THE DAILY
 AVERAGE CONCENTRATIONS OF SO₂ AND SO₄
 AT ALL RECEPTOR LOCATIONS IN THE GRID
 REGION DURING THE EPISODE. THE
 AVERAGING TIME PERIOD CAN BE EASILY
 ADJUSTED TO SUIT THE MODELER'S SPECIFIC
 REQUIREMENTS. FOR THE TURBULENT
 DIFFUSION CALCULATIONS, THE MODEL HAS
 THREE VERTICAL AIR LAYERS OF UNIFORM
 DEPTH OVER THE GRID REGION. BECAUSE OF
 THE SPATIAL RESOLUTION OF THE
 THREE-DIMENSIONAL GRID, THIS MODEL IS
 PARTICULARLY SUITED TO INVESTIGATE THE
 EFFECTS OF TALL STACKS IN REDUCING THE
 AMBIENT CONCENTRATION LEVELS OF SO₂
 AND SO₄. THE PRINCIPLES AND
 POPULATIONS OF THE NUMERICAL REGIONAL
 TRANSPORT MODEL ARE DISCUSSED AS WELL
 AS ITS SIMPLIFYING ASSUMPTIONS. THE
 CALCULATED SPECIES CONCENTRATIONS ARE
 COMPARED WITH THE CORRESPONDING
 OBSERVED VALUES.
- <245>
 <CONT> JAO, R. S.; BYNGAARD, J. C.; COPE, O. P.
 <TITLE> THE STRUCTURE OF THE TWO-DIMENSIONAL
 INTERNAL BOUNDARY LAYER OVER A SUDDEN
 CHANGE OF SURFACE ROUGHNESS
 <ACRO> RPL
 <ABST> NATIONAL OCEANIC AND ATMOSPHERIC
 ADMINISTRATION, AIR TURBULENCE AND
 DIFFUSION LABORATORY, P.O. BOX 2
 <CITY> OAK RIDGE
 <STATE> TN
 <ZIP> 37830
- <PHONE> 615-493-8611, EXT-34001
 <SOURCE> JAO, R.S. ADDRESS AS ABOVE.
 <DOC> AD-780 864/5; JOURNAL OF ATMOSPHERIC
 SCIENCES, 31, 738-744, 1974
 <SUB> INTERNAL BOUNDARY LAYER DUE TO SUDDEN
 CHANGE OF SURFACE ROUGHNESS
 <ABST> THE EFFECTS OF AN ABRUPT CHANGE OF
 SURFACE ROUGHNESS ON THE MEAN FLOW AND
 TURBULENCE STRUCTURE IN THE NEUTRAL
 SURFACE LAYER ARE NUMERICALLY
 INVESTIGATED BY A HIGHER-ORDER
 TURBULENCE CLOSURE THEORY, WHICH
 INCLUDES DYNAMICAL EQUATIONS FOR
 REYNOLDS STRESSES AND THE VISCOUS
 DISSIPATION RATE. THE CLOSED SYSTEM OF
 GOVERNING EQUATIONS, TOGETHER WITH THE
 SPECIFIED INITIAL AND BOUNDARY
 CONDITIONS, IS SOLVED BY AN EXPLICIT
 FINITE-DIFFERENCE METHOD ON A DIGITAL
 COMPUTER. THE NUMERICAL MODEL PREDICTS
 THE DISTRIBUTIONS OF MEAN WIND, SHEAR
 STRESS, TURBULENT ENERGY AND OTHER
 QUANTITIES, WITH NO A PRIORI
 ASSUMPTIONS REGARDING THE DISTRIBUTIONS
 OF ANY OF THESE VARIABLES IN THE
 TRANSITION REGION. THE DISTRIBUTION OF
 THE HORIZONTAL WIND SHEAR, THE
 DISSIPATION AND MIXING LENGTH SCALES,
 AND THE RATIO OF STRESS TO TURBULENT
 KINETIC ENERGY ARE SHOWN TO DIFFER
 SIGNIFICANTLY FROM THEIR EQUILIBRIUM
 FLOW VARIATIONS.
- <GEO> AUSTRALIAN DATA OF E.P. BRADLEY (1969)
 <TIME> NA
 <STATUS> IN USE
 <ACCESS> UNLIMITED
 <MEDIA> PUNCHED CARDS
 <COMP> CDC 6600
 <CONFIG> IBM 360/31 WITH 256 K CODE AND FILE
 STORAGE (DISC/TSO/MAG. TAPE) FACILITY
 <LANG> FORTRAN IV
 <ALGO> DUPONT-FRANKEL FINITE DIFFERENCE METHOD
 <CLAS> NUMERICAL SIMULATION; INTEGRATION;
 PREDICTIVE
 <APPL> MICROMETEOROLOGICAL EXPERIMENT
 PLANNING, MEASUREMENTS, DATA ANALYSIS
 AND INTERPRETATION
 <USERS> UNIVERSITIES
 <SRD> BRADLEY, E.P., QUANT. J. ROYAL METEOR.
 SOC., 96, 361-379, 1968
 <VAL> COMPARISON WITH ATMOSPHERIC DATA
 <CON> SOME KNOWLEDGE OF ATMOSPHERIC
 TURBULENCE REQUIRED
 <UPDATE> 780821
- <246>
 <CONT> REA, KENNETH H.
 <TITLE> ANALYSIS OF WEATHER DATA--WIND
 ANALYSIS, TEMPERATURE ANALYSIS,
 PRECIPITATION ANALYSIS

<266>

ATMOSPHERIC TRANSPORT

<266> CONT.

<ACSD> WINDAHL; TEMPAL; PRECAL; TABLES

<ADDR> LOS ALAMOS SCIENTIFIC LABORATORY, GROUP N-12, MS-490, P.O. BOX 1663

<CITY> LOS ALAMOS

<STATE> NM

<ZIP> 87545

<PHONE> 505-667-3301; FTS 843-3301

<SOURCE> LASE

<DOC> NONE

<SUB> ANALYSIS OF WEATHER DATA

<ABST> WINDAHL, TEMPAL, PRECAL, AND TABLES PROVIDE MONTHLY GRAPHICAL SUMMARY ANALYSES OF WEATHER DATA.

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> DISC; PUNCHED CARDS

<SIZE> 1200 CARDS

<COMP> CDC

<CONFIG> CDC 6600 NOS OPERATING SYSTEM

<LANG> FORTRAN; DISPLAY

<CHAR> ASCII

<ALGO> 3 SIGMA VARIANCE AROUND EACH DATA POINT TO CREATE WIND ROSES

<CLAS> ANALYTICAL; INTEGRATIVE

<APPL> ANALYSIS OF WEATHER DATA

<USERS> LASE

<IND> NET DATA BASE

<INVAL> COMPARISON WITH EXPERIMENTAL DATA

<UPDATE> 780413

<267>

<CONT> REED, RODICAN P.

<TITLE> TVA GASEOUS DISPERSION CODE

<ACRO> BELCH

<ADDR> TENNESSEE VALLEY AUTHORITY, ENVIRONMENTAL PLANNING, RIVER OAKS BLDG.

<CITY> MUSCLE SHOALS

<STATE> AL

<ZIP> 35660

<PHONE> 205-383-4631 EXT2767; FTS 872-8767

<SOURCE> NONE

<DOC> NONE

<SUB> TVA POWER REACTORS

<ABST> THE TVA GASEOUS DISPERSION CODE CALCULATES INDIVIDUAL AND POPULATION DOSES TO THE PUBLIC FROM ROUTINE, GASEOUS RADIOACTIVE RELEASES FROM TVA'S

POWER REACTORS; METHODOLOGY IS THAT SET FORTH IN NRC REG. GUIDES 1.109 AND 1.111; THE CODE USES SITE-SPECIFIC METEOROLOGICAL DATA, AGRICULTURAL DATA, AND POPULATION INFORMATION TO ESTIMATE DOSES TO INDIVIDUALS AT SITE BOUNDARIES, NEAREST RESIDENCES, AND DEAL MILK COW LOCATIONS. POPULATION DOSES TO PERSONS LIVING WITHIN 50 MILES OF THE SITE ARE ALSO CALCULATED. DOSE PATHWAYS CONSIDERED INCLUDE DEPTH AND GAMMA AIR DOSES AT THE SITE BOUNDARY, SKIN AND TOTAL BODY DOSES AT NEAREST RESIDENCES, AND THYROID DOSES AT MILK COW LOCATIONS. THYROID DOSES INCLUDE THE FOLLOWING PATHWAYS: SUBMERSION, GROUND CONTAMINATION, INHALATION, AND INGESTION OF DEEP, VEGETABLES AND MILK. ESTIMATED DOSES ARE CONSIDERED CONSERVATIVE FOR AVERAGE ANIMAL, ROUTINE RADIOACTIVE RELEASES.

<GEO> SOUTHEAST U.S.A.

<TIME> 1970-1978

<STATUS> IN USE

<ACCESS> LIMITED

<MEDIA> DISC; PUNCHED CARDS

<SIZE> 204,672 BYTES; 1,995 CARDS;

<COMP> IBM

<CONFIG> IBM 370 WITH 27 OR CORE AND TWO 3330 DISC DRIVES

<LANG> FORTRAN IV

<CHAR> EBCDIC

<ALGO> GAUSSIAN PLUME MODEL; BRIGGS'S EQUATIONS; EFFECTIVE HEIGHT; RELATIVE DEPOSITION; PLUME RETENTION; WET AND DRY DEPOSITION; JOINT FREQUENCY DISTRIBUTIONS; RADIOACTIVE DECAY

<CLAS> CONTINUOUS; ANALYTICAL; PREDICTIVE

<APPL> ENVIRONMENTAL REPORTS; ENVIRONMENTAL IMPACT STATEMENTS; SITING; EARLY SITE REVIEW; PSAD'S AND PSMD'S; OPERATIONAL REPORTS;

<USERS> TVA - RADIOLOGICAL HYGIENE BRANCH

<SUB> CENSUS DATA; TVA AGRICULTURAL SURVEYS; TVA METEOROLOGICAL DATA; DESIGN SOURCE TERMS

<INVAL> ENVIRONMENTAL SAMPLING AND DOSIMETRY -- TLD'S, PIC;

<CON> NONE

<UPDATE> 780418

<268>

<CONT> REEDY, ROBERT C.

<TITLE> CALCULATION OF PRODUCTION RATES OF NUCLIDES IN SPICE

<ACRO> ISPROD; SCRDE; SCRDAY; FLSDP

<ADDR> LOS ALAMOS SCIENTIFIC LABORATORY, GROUP CRC-11, MS-510, P.O. BOX 1663

<CITY> LOS ALAMOS

<STATE> NM

ATMOSPHERIC TRANSPORT

<268> CONF.
 <TYP> 07505
 <PHONE> 505-667-5006; FTS 803-5006
 <SOURCE> LASL; UNIVERSITY OF CALIFORNIA AT SAN DIEGO
 <DOC> R. C. REEDY AND J. R. ARNOLD, INTERACTION OF SOLAR AND GALACTIC COSMIC-RAY PARTICLES WITH THE MOON, JOURNAL OF GEOPHYSICAL RESEARCH, 77(4) 1972.
 <SUB> CALCULATION OF PRODUCTION RATES OF NUCLIDES IN SPACE
 <ABST> THESE CODES ARE USED TO CALCULATE PRODUCTION RATES OF NUCLIDES BY COSMIC RAYS. ONE CODE IS FOR GALACTIC-COSMIC-RAYS (HSPROD); THE OTHERS ARE FOR SOLAR-COSMIC-RAYS (SCRBX, SCRLAY, FLIDP).
 <CRO> EXTRATERRESTRIAL
 <STATUS> IN USE
 <ACCESS> UNLIMITED
 <MEDIA> PUNCHED CARDS
 <SIZE> 2000 CARDS
 <COMP> CDC
 <CONFIG> CDC 7600; FDP 11/70
 <LANG> FORTRAN IV
 <CHAP> DCE
 <ALGO> CALCULATES SPECTRUM OF COSMIC-RAY PARTICLES AS A FUNCTION OF ENERGY FROM INPUT PARAMETERS. WITH CHEMICAL AND CROSS-SECTION DATA CALCULATES PRODUCTION RATES.
 <CLAS> PREDICTIVE
 <APPL> PRODUCTIONS OF NUCLIDES IN SPACE
 <USERS> LASL; UCSD; NASA
 <SND> NUCLEAR CROSS SECTIONS OF COSMOCHEMICAL DATA AT LASL
 <REAL> OBSERVED DATA IN LUNAR SAMPLES
 <CON> NASA SUPPORTED, APPLIED TO LUNAR STUDIES.
 <UPDATE> 780007
 <269>
 <CONF> REEDY, ROBERT C.
 <TITLE> CALCULATION OF GAMMA-RAY LINE FLUXES FROM THE MOON
 <ACRO> GAMMA; GCRGAM; CAPTURE; SOLAR; NATGAM
 <ABST> LOS ALAMOS SCIENTIFIC LABORATORY, GROUP CDC-11, ES-510, P.O. BOX 1663
 <CITY> LOS ALAMOS
 <STATE> NM
 <ZIP> 87505
 <PHONE> 505-667-5006; FTS 803-5006

<SOURCE> LASL; UCSD
 <DOC> R. C. REEDY, J. R. ARNOLD AND J. I. THORBERG, EXPECTED GAMMA RAY EMISSION SPECTRA FROM THE LUNAR SURFACE AS A FUNCTION OF CHEMICAL COMPOSITION, JOURNAL OF GEOPHYSICAL RESEARCH, 78(26), 1973.
 <SUB> CALCULATION OF GAMMA-RAY LINE FLUXES FROM THE MOON
 <ABST> THESE CODES ARE USED TO CALCULATE FLUXES OF GAMMA-RAY LINES FROM THE LUNAR SURFACE AS A FUNCTION OF CHEMICAL COMPOSITION. SOURCES OF GAMMA-RAY LINES INCLUDE NATURAL RADIOACTIVITY (NATGAM), SOLAR-COSMIC-RAY PRODUCED RADIOISOTOPES (SOLAR), ENERGIZING GALACTIC-COSMIC-RAY PARTICLES (GCRGAM), AND LOW-ENERGY NEUTRONS (CAPTURE). FLUXES AS A FUNCTION OF CHEMISTRY ARE CALCULATED WITH THE CODE GAMMA.
 <CRO> EXTRATERRESTRIAL
 <STATUS> IN USE
 <ACCESS> UNLIMITED
 <MEDIA> PUNCHED CARDS
 <SIZE> 2000 CARDS
 <COMP> IBM; CDC
 <CONFIG> CDC 7600
 <LANG> FORTRAN IV
 <CHAP> DCE
 <ALGO> CALCULATES SOURCE STRENGTH FOR GAMMA RAY LINES AS A FUNCTION OF DEPTH IN THE MOON AND TRANSPORTS THESE LINES TO THE LUNAR SURFACE.
 <CLAS> PREDICTIVE
 <APPL> PLANETARY GAMMA-RAY SPECTROSCOPY
 <USERS> LASL; UCSD; NASA
 <SND> FLUXES OF GAMMA-RAY LINES FROM THE MOON DATA BASE
 <REAL> GAMMA-RAY FLUXES FROM MOON
 <CON> NASA SUPPORTED; APPLIED TO LUNAR STUDIES
 <UPDATE> 780007
 <270>
 <CONF> REIQMAN, H.
 <TITLE> AN ATMOSPHERIC TRANSPORT AND ACCUMULATION MODEL FOR AIRSHEDS
 <ABST> A MATHEMATICAL MODEL OF THE ATMOSPHERE IN AN AIRSHED IS DEVELOPED, WHICH RELATES POLLUTANT CONCENTRATIONS TO POLLUTANT SOURCE DISTRIBUTIONS AND INTENSITIES AND TO THE VOLUME OF AIR AVAILABLE FOR DISPERSION. IN CONTRAST TO DIFFUSION MODELS WHICH OPERATE ON PLUMES EXPANDING UNDER THE INFLUENCE OF TURBULENT EDDIES, THE PRESENT MODEL INVOLVES THE TRANSPORT AND ACCUMULATION OF POLLUTANTS WITHIN AN ENTIRE AIRSHED DURING TYPES OF EPISODES WHICH ARE CHARACTERISTICALLY ASSOCIATED WITH MAXIMUM OBSERVED CONCENTRATIONS. AN AIRSHED IS TREATED AS A SET OF DISCRETE

<270>

90

ATMOSPHERIC TRANSPORT

<270> CONT.

SUB-VOLUMES AND A BASIC ASSUMPTION IS THAT RECTANGLES EXIST WHICH WILL, DURING THE COURSE OF AN AIR POLLUTION EPISODE, EFFECT COMPLETE MIXING RESULTING IN A UNIFORM DISTRIBUTION OF POLLUTANTS WITHIN EACH SUB-VOLUME. BY CONTINUITY CONSIDERATIONS, IT IS POSSIBLE TO DELATE EMISSIONS WITHIN EACH VOLUME TO FINAL CONCENTRATIONS EVERYWHERE IN THE AIRSHED. THE MODEL HAS BEEN EVALUATED USING SIMULATED BUT REALISTIC SOURCE AND METEOROLOGICAL DATA FOR THE WILLAMETTE VALLEY OF WESTERN OREGON. THE CALCULATED PATTERNS OF CONCENTRATION ARE QUALITATIVELY QUITE SIMILAR TO PATTERNS OBSERVED IN THE VALLEY DURING THE ANNUAL PERIOD OF FIELD MEASURING. IN ADDITION, IT HAS BEEN EVALUATED IN A MODIFIED FORM IN A SMALL NORWEGIAN VALLEY IN WHICH A SINGLE POINT SOURCE WAS OPERATING. CALCULATED AND OBSERVED CONCENTRATIONS ARE BOTH QUALITATIVELY AND QUANTITATIVELY VERY SIMILAR.

<GEO> NORWAY; OREGON, WILLAMETTE VALLEY

<271>

<CCN> BILES, J. L.

<TITLE> A MODEL TO ESTIMATE RADIATION DOSE COMMITMENTS TO THE WORLD POPULATION FROM THE ATMOSPHERIC RELEASE OF RADIONUCLIDES

<RED> WESTINGHOUSE ELECTRIC CORPORATION, BETTIS ATOMIC POWER LABORATORY, P.O. BOX 79

<CITY> WEST MIFFLIN

<STATE> PA

<ZIP> 15122

<PHONE> 412-462-5090

<DOC> WAPB-TM-1270

<SUB> GLOBAL RADIATION DOSES

<ABST> A MODEL TO ESTIMATE THE RADIATION DOSE COMMITMENTS RECEIVED BY THE POPULATION OF THE WORLD BEYOND THE IMMEDIATE VICINITY OF A FACILITY WHICH RELEASES RADIONUCLIDES INTO THE ATMOSPHERE IS DESCRIBED. THIS MODEL CONSIDERS THE DOSE COMMITMENTS ARISING FROM INGESTION IN THE ATMOSPHERE CONTAINING THE RELEASED MATERIAL, INGESTION OF CONTAMINATED FOOD, INHALATION OF GASEOUS AND SUSPENDED RADIOACTIVITY AND EXPOSURE TO GROUND DEPOSITS. THE DOSE COMMITMENTS FROM EACH OF THESE PATHWAYS IS EXPLICITLY CONSIDERED FOR EACH RADIONUCLIDE RELEASED INTO THE ATMOSPHERE AND FOR EACH DAUGHTER OF EACH RELEASED NUCLIDE. THIS IS ACCOMPLISHED VIA THE CALCULATION OF THE SPECIFIC AIR AND GROUND CONCENTRATIONS IN THE WORLD REGIONS DIRECTLY AFFECTED BY EACH RELEASED NUCLIDE AND ITS DAUGHTER USING THE RELEASE DATE OF ONLY THE PARENT. THIS IS CONSIDERED TO BE A SIGNIFICANT IMPROVEMENT OVER OTHER MODELS IN WHICH THE EFFECT OF DAUGHTER RADIONUCLIDES MUST BE APPROXIMATED BY SEPARATE RELEASES.

<GEO> GLOBAL

<STATUS> IN USE

<ACCESS> UNLIMITED

<CLAS> PREDICTIVE

<UPDATE> 700816

<272>

<CONT> BILES, J. J.; DELIST, D. P.

<TITLE> SURVEY OF LABORATORY MODELING OF PLUME DYNAMICS

<ADDR> FLOW RESEARCH CO.

<CITY> KENT

<STATE> WA

<ZIP> 98031

<DOC> EPRI-BA--323, 1977

<ABST> THE OBJECTIVES OF THIS STUDY WERE TO DETERMINE THE OVERALL CAPABILITIES OF THE LABORATORY MODELING COMMUNITY TO MODEL THE BEHAVIOR OF FOSSIL-FUEL POWER PLANT STACK PLUMES AND THEIR IMPACT ON AIR QUALITY, AND TO RECOMMEND WHETHER AND HOW THESE CAPABILITIES MAY AFFECT A PLUME MODEL EVALUATION PROGRAM. AN EXTENSIVE LITERATURE SURVEY OF THE LABORATORY STUDIES OF PLUME DISPERSION WAS CONDUCTED TO MEET THESE OBJECTIVES. THIS REPORT CONTAINS AN OVERVIEW OF LABORATORY MODELING, AS WELL AS A DETAILED DESCRIPTION OF THE STATE-OF-THE-ART OF LABORATORY MODELING. THE MAJOR CONCLUSION REACHED IS THAT LABORATORY MODELING CAN SERVE A USEFUL ROLE IN VERIFYING MATHEMATICAL PLUME MODELS; SIMULATING THE PHYSICAL BEHAVIOR OF FULL-SCALE PLUMES, ESPECIALLY WHEN STRUCTURAL EFFECTS, STRATIFICATIONS, AND TOPOGRAPHY ARE IMPORTANT; AND IN COMBINATION WITH MATHEMATICAL MODELS, SIMULATING THE BEHAVIOR OF FULL-SCALE PLUMES. IT IS ALSO CONCLUDED THAT FIELD PROGRAMS DESIGNED TO VERIFY MATHEMATICAL MODELS SHOULD ALSO BE DESIGNED WITH THE ADDITIONAL CONSIDERATION OF VERIFYING LABORATORY MODELING.

<273>

<CONT> BILES, JAMES J.

<TITLE> A NUMERICAL MODEL FOR STABLY STRATIFIED FLOW AROUND COMPLEX TERRAIN

<ADDR> FLOW INDUSTRIES INC. 21016 68TH AVENUE S.

<CITY> KENT

<STATE> WA

<ZIP> 98031

<PHONE> 206-850-1370

<DOC> IN: OTI, D.R. (ED.), PROCEEDINGS OF THE EPA CONFERENCE ON ENVIRONMENTAL MODELING AND SIMULATION, 1976, EPA 600/9-76-016, (P. 503-507), 047 PP.

<SUB> COMPUTES THREE DIMENSIONAL STRATIFIED FLOW AROUND COMPLEX TERRAIN FOR THE CASE OF VERY STRONG STRATIFICATION

<ABST> A COMPUTER PROGRAM HAS BEEN DEVELOPED

ATMOSPHERIC TRANSPORT

<273> CONT.

TO COMPUTE THREE-DIMENSIONAL STRATIFIED FLOW AROUND COMPLEX TERRAIN FOR THE CASE OF VERY STRONG STRATIFICATION. PRELIMINARY COMPARISONS OF THE RESULTS OF THE COMPUTER PROGRAM AND LABORATORY RESULTS INDICATE THAT THE COMPUTED RESULTS ARE IN FAIR AGREEMENT WITH THE EXPERIMENTS. DISCREPANCIES ARE PROBABLY ATTRIBUTABLE MAINLY TO THE SEPARATED NATURE IN THE USE OF THE MODELS.

<STATUS> IN USE

<CLASS> EFFECTIVE

<REVAL> LABORATORY STUDIES OF STRATIFIED FLOWS PAST SIMPLE TERRAIN CONFIGURATIONS

<UPDATE> 700717

<274>

<CONT> ROBERTS, W. S.

<TITLE> WEIGHTED DIGRAPH MODELS FOR THE ASSESSMENT OF ENERGY USE AND AIR POLLUTION IN TRANSPORTATION SYSTEMS

<ACRO> GERSIN

<RECD> BUTGESS UNIVERSITY, DEPARTMENT OF MATHEMATICS

<CITY> NEW BRUNSWICK

<STATE> NJ

<ZIP> 08903

<PHONE> 201-932-2365

<DOC> ENVIRONMENT AND PLANNING, 7, 703-720, 1972

<SUB> ENERGY DEMAND AND AIR POLLUTION

<ABST> THIS PAPER DESCRIBES EXTENSIONS, TO WEIGHTED AND DOUBLE-WEIGHTED DIGRAPHS, OF THE AUTHOR'S EARLIER WORK ON BUILDING AND ANALYZING ENERGY-DEMAND-SIGNED DIGRAPHS. SEVERAL WEIGHTED AND DOUBLE-WEIGHTED DIGRAPHS ARE BUILT TO PROVIDE A TEST OF THE CONSTRUCTION METHODOLOGY, TO PROVIDE A TEST OF THE METHODS OF ANALYSIS OF SUCH DIGRAPHS AND TO ILLUSTRATE THE TYPE OF ANALYSIS ONE CAN MAKE USING SUCH DIGRAPHS AS MODELS OF COMPLEX SYSTEMS. THE DIGRAPHS ARE CONSTRUCTED WITHIN THE CONTEXT OF THE TRANSPORTATION SYSTEM OF A HYPOTHETICAL METROPOLITAN AREA, SIMILAR TO THE COUNTY OF SAN DIEGO, CALIFORNIA. THE DIGRAPHS ARE USED TO COMPARE FUEL CONSUMPTION AND AIR POLLUTION UNDER TWO SCENARIOS: THE BASELINE CASE, WHERE CLEAN AIR STANDARDS ARE SET BY SOME RETROFITTING OF CARS WITH SMOG CONTROL DEVICES; AND THE DCs CASE, WHERE CARS ARE BANNED AND AN EXTENSIVE WIDE-RANGING BUS SYSTEM IS INTRODUCED. IT IS CONCLUDED THAT WEIGHTED AND DOUBLE-WEIGHTED DIGRAPHS CAN BE CONSTRUCTED RELATIVELY INEXPENSIVELY AND THAT AT LEAST WEIGHTED, AND PROBABLY DOUBLE-WEIGHTED, DIGRAPHS CAN BE USED AT AN EARLY STAGE OF A POLICY-MAKING TASK TO SET DIRECTIONS FOR FURTHER RESEARCH.

<GEO> APT; SAN DIEGO COUNTY; SAN DIEGO

<TIME> 1970-?

<STATUS> IN USE

<ACCESS> LIMITED

<MEDIA> DISC

<LANG> APL

<CLASS> DISCRETE; PREDICTIVE; SIMULATION

<APPL> A BROAD SCOPE OF ENVIRONMENTAL IMPACT, DECISION POLICY, OR TECHNOLOGY ASSESSMENT PROBLEMS

<SUB> EXPERT OPINION

<REVAL> SENSITIVITY ANALYSIS

<CON> COMPUTER PROGRAM, GERSIN, BASED ON ABOVE REFERENCED PAPER HAS BEEN DEVELOPED BY BROOKER ALLEN, COMPUTER SCIENCE DEPARTMENT, PUTGESS UNIVERSITY

<UPDATE> 700820

<275>

<CONT> FORBESON, C. D.

<TITLE> A REGIONAL AIR QUALITY SIMULATION MODEL (A DESCRIPTION OF THE CONNECTICUT AIR POLLUTION MODEL AS DEVELOPED BY THE TRAVELERS RESEARCH CENTER)

<ADDR> TRAVELERS RESEARCH CENTER INC.

<CITY> HARTFORD

<STATE> CT

<DOC> WIS, GRA, 72(8), 170-171, APRIL 25, 1972; RESEARCH CORP. OF NEW ENGLAND. PUB. NO. APTD-930, 81P. 1971; (PB-206-930)

<ABST> AN AIR QUALITY MODEL IS DESCRIBED WHICH ASSIGNS A FORM OF SOLUTION FOR A SINGLE SOURCE INSERTS APPROPRIATE EMPIRICAL PARAMETERS, AND SOLVES THE SOLUTIONS OVER ALL SOURCES. THREE SOURCE CATEGORIES ARE RECOGNIZED IN THE MODEL: MAJOR, INTERSE, DISCONTINUOUS SOURCES; VARIOUS MINOR SOURCES WHICH ARE TREATED AS CONTINUOUS AREA SOURCES; AND SOURCES BEYOND THE BOUNDARY OF THE MODEL. SPECIAL DEVICES (SUBMODELS) WHICH WERE NEEDED TO DEAL WITH THE PROXIMITY OF VERY LARGE SOURCES, UNKNOWN IN DETAIL, IN THE AREA OF NEW YORK CITY ARE ALSO DESCRIBED.

<GEO> NEW YORK CITY

<276>

<CONT> POTE, DONALD H.

<TITLE> A MULTIPLE-SOURCE URBAN ATMOSPHERIC DISPERSION MODEL

<ADDR> ARGONNE NATIONAL LABORATORY, ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION, 5700 S. CASS AVE.

<CITY> ARGONNE

<STATE> IL

<ZIP> 60439

<PHONE> PIS 972-3786

<DOC> ROBERTS, J. J., CROKE, E. J., KENNEDY,

<276>

ATMOSPHERIC TRANSPORT

<276> CONT.

A. S., BOGGS, J. E., AND COOLY, L. A., A MULTIPLE-SOURCE URBAN ATMOSPHERIC DISPERSION MODEL, ARL/ES-CC-007, MAY 1970; CRONE, E. J., PROGRAM DIRECTOR, AND J. J. ROBERTS, EDITOR, CHICAGO AIR POLLUTION SYSTEMS ANALYSIS PROGRAM. FINAL REPORT, ARL/ES-CC-009, FEBRUARY 1971.

OF THE CITY OF CHICAGO. FOR EXAMPLE, THE MODEL ACCOUNTS FOR 50% OF THE VARIANCE IN 4-HR AVERAGES OF OBSERVED DATA AND 70% OF THE VARIANCE IN 24-HR AVERAGES.

<UPDATE> 700703

<ABST>

THIS REPORT IS A COMPREHENSIVE DOCUMENTATION OF THE DISPERSION-MODEL DEVELOPMENT PHASE OF THE CHICAGO AIR POLLUTION SYSTEMS ANALYSIS PROGRAM. A MULTIPLE-SOURCE, URBAN ATMOSPHERIC DISPERSION MODEL HAS BEEN DEVELOPED WHICH DESCRIBES TRANSPORTS SUCH AS MOVING TRANSPORTS IN ATMOSPHERIC STABILITY AND MIXING LAYER HEIGHT. THE DISPERSION MODEL HAS BEEN VALIDATED BY COMPARISON WITH OVER 10,000 HOURLY AVERAGES OF SULFUR DIOXIDE MONITORED BY THE DEPARTMENT OF ENVIRONMENTAL CONTROL OF CHICAGO. OF PARTICULAR SIGNIFICANCE IS THE CAPABILITY OF THE MODEL TO DESCRIBE "AREA SOURCES" AS VOLUMETRIC CLOUDS OF POLLUTANT AND EVALUATE THE EFFECT OF THESE SOURCES ON INTERNAL AND EXTERNAL DOSE POINTS.

<277>

<CONT> DOTT, DONALD E.

<TITLE> AIR QUALITY ASSESSMENT MODEL FOR AIR FORCE OPERATIONS

<ACRO> AQAM

<ADDR> ARBORNE NATIONAL LABORATORY, ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION, 9700 S. CASS AVE.

<CITY> ARBORNE

<STATE> IL

<STP> 60439

<PHONE> PLS 972-3706

<GEO> ILLINOIS: CHICAGO.

<YRD> 1966-1970

<STATUS> ARCHIVED

<ACCESS> LIMITED

<MEDIA> PUNCHED CARDS

<SIZE> 2500 RECORDS EACH 40 BYTES LONG

<CCRP> IBM

<CONFIG> IBM 370/195 OS/MVT WITH DYNAMIC STORAGE ALLOCATION OF 1100 K.

<LANG> FORTRAN

<CARD> EBCDIC

<ALGO> A SERIES OF ALGORITHMS ARE ASSEMBLED AROUND A KERNEL WHICH REPRESENTS THE TRANSPORT AND DIFFUSION OF POLLUTANT SPECIES FROM POINT AND AREA SOURCES ACCORDING TO A GAUSSIAN DISTRIBUTION IN THREE DIMENSIONS. THIS KERNEL IS INTEGRATED ACCORDING TO A TIME-SERIES OF PIECEWISE CONSTANT WIND VECTORS AND PIECEWISE CONSTANT ATMOSPHERIC STABILITY PARAMETERS TO SIMULATE THE TRANSPORT BEHAVIOR OF A CONTINUOUS SOURCE PLUME.

<CIAD> PREDICTIVE; SIMULATION

<APPL> AN ATMOSPHERIC DISPERSION MODEL WAS DEVELOPED AND SUCCESSFULLY APPLIED TO THE CHICAGO URBAN AREA. STATISTICAL AND EXPERIMENTAL TESTS OF THE CHICAGO URBAN AREA. STATISTICAL AND EXPERIMENTAL TESTS OF THE MODEL ARE REPORTED. SHORT-TERM STRATEGIES FOR CONTROL OF AIR POLLUTION EPISODES ARE PRESENTED. LONG-RANGE PLANNING FOR AIR POLLUTION ABATEMENT IS SHOWN TO BE FEASIBLE FOR A LARGE DYNAMIC METROPOLITAN AREA.

<USERS> NO CURRENT USERS

<REAL> THE DISPERSION MODEL HAS BEEN VALIDATED BY COMPARISON WITH OVER 10,000 HOURLY AVERAGES OF SULFUR DIOXIDE MONITORED BY THE DEPARTMENT OF ENVIRONMENTAL CONTROL

<DOC> DOTT, D.E., L.E. WAGNER, A GENERALIZED AQAM FOR AIR FORCE OPERATIONS-TECHNICAL REPORT, AIR FORCE WEAPONS LAB. RPT. NO. AFWL-TR-74-304, FEB. 1975; MEDICHECK, D., ROAD DATA REDUCTION AND OPERATIONS GUIDE, AIR FORCE WEAPONS LAB. RPT. NO. AFWL-TR-75-307, OCT. 1976; DINGMAN, D.J., AND L.E. WAGNER, AQAM FOR AIR FORCE OPERATIONS-SOURCE EMISSIONS INVENTORY COMPUTER CODE DOCUMENTATION, AIR FORCE CIVIL ENG. CTR. RPT. NO. AFCEC-TR-76-33, APRIL 1977.

<SUB> IMPACT OF AIR FORCE OPERATIONS ON THE AIR ENVIRONMENT AT THE AIR BASE LEVEL.

<ABST> THE U.S. AIR FORCE HAS DEVELOPED THE AIR QUALITY ASSESSMENT MODEL (AQAM) IN ORDER TO FORMULATE ENVIRONMENTAL IMPACT STATEMENTS AND TO QUANTIFY THE EXTENT TO WHICH AIR BASE OPERATIONS AFFECT THE AIR QUALITY IN THE REGIONS SURROUNDING AIR BASE INSTALLATIONS. COMPUTATIONS ARE DONE FOR EACH OF SEVERAL THOUSAND POSSIBLE EMISSION SOURCES, AND THE RESULTS ARE SUMMED AT EACH OF 312 POSSIBLE RECEPTOR SITES. AMBIENT CONCENTRATIONS AT EACH RECEPTOR SITE ARE CALCULATED FOR FOUR CATEGORIES: AIRCRAFT, AIRBASE, ENVIROUS AND TOTAL. THE MODEL CONSISTS OF FOUR PHYSICALLY SEPARATE COMPUTER PROGRAMS: A SOURCE INVENTORY PROGRAM TO COMPUTE TOTAL EMISSIONS FROM OPERATIONAL INPUT DATA, A SHORT-TERM DISPERSION PROGRAM TO PREDICT CONCENTRATIONS ON AN ANNUAL BASIS, AND A METEOROLOGICAL PROGRAM TO COMPILE THE CLIMATOLOGY FOR USE IN THE LONG-TERM PREDICTIONS. THE FIRST THREE PROGRAMS ARE OPERATED BY THE USER. THE FOURTH PROGRAM IS OPERATED ON REQUEST BY THE USAY ENVIRONMENTAL TECHNICAL APPLICATIONS CENTER IN WASHINGTON, D.C. AND THE RESULTANT CLIMATOLOGICAL INFORMATION, STABILITY-TIME-WIND MODELS, SHIPPED TO THE USER.

<TIED> FEBRUARY 1975-APRIL 1977

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE; PUNCHED CARDS

ATMOSPHERIC TRANSPORT

<277> CONT.

<STED> CAPES (SHORT-TERM INVENTORY-5200; SHORT TERM-3500; LONG TERM-3500)

<COMP> IBM

<COMP16> IBM 370/195 OS/VS1 WITH A MINIMUM OF 100 K CODE

<LANG> FORTRAN

<CHAR> BASIC

<ALGO> BOTH THE LONG-TERM MODEL AND THE SHORT-TERM MODEL PROGRAMS ESSENTIALLY UTILIZE THE BASIC GAUSSIAN PLUME POPULATION FOR CALCULATING THE DISPERSION FROM POINT, AREA AND LINE TYPE SOURCES.

<CLASS> PREDICTIVE; SIMULATION

<APPL> THE AQAR IS USED BY AIR FORCE PERSONNEL TO HELP FORMULATE ENVIRONMENTAL IMPACT STATEMENTS AND TO HELP QUANTIFY THE EXTENT TO WHICH AIR BASE OPERATIONS AFFECT THE AIR QUALITY IN THE REGIONS SURROUNDING AIR BASE INSTALLATIONS.

<SYSTEMS> U.S. AIR FORCE

<SND> ALAMEDA NAVAL AIR STATION; WELLS AIR FORCE BASE. SAMPLE DATA IN THE REQUESTED FORMAT IS PROVIDED IN THE OPERATIONS GUIDE.

<NVAL> AS OF MAY 1970, VALIDATION IS IN PROGRESS USING DATA COMPILED AT WILLIAMS AIR FORCE BASE, N.M.

<UPDATE> 700703

<278>

<COMP> POTR, PHILIP H.; PEDDOLDS, STEVEN D.; FORESTS, PHILIP J. R.; SEIWELD, J. R.

<TITLE> DEVELOPMENT OF A SIMULATION MODEL FOR ESTIMATING GROUND LEVEL CONCENTRATIONS OF PHOTOCHEMICAL POLLUTANTS

<DOC> FINAL REPT., APPENDIX A, PB-206 409.

<ABST> THE DEVELOPMENT AND VALIDATION OF A SIMULATION MODEL FOR ESTIMATING GROUND LEVEL CONCENTRATIONS OF PHOTOCHEMICAL POLLUTANTS IS DESCRIBED. THIS MODEL IS BASED ON THE FINITE DIFFERENCE SOLUTION OF THE EQUATIONS OF CONSERVATION OF MASS, USING THE METHOD OF FRACTIONAL STEPS. THE BULK OF THE EFFORT IS DEVELOPMENTAL, INVOLVING THE CORRELATION OF A COMPREHENSIVE SOURCE EMISSIONS INVENTORY, THE DEVELOPMENT AND VALIDATION OF A KINETIC MECHANISM FOR PHOTOCHEMICAL REACTIONS, THE ADAPTATION OF THE METHOD OF FRACTIONAL STEPS FOR USE IN THE SOLUTION OF THE GOVERNING EQUATIONS, AND THE PREPARATION OF MAPS DISPLAYING SPATIAL AND TEMPORAL VARIATIONS IN WIND SPEED AND DIRECTION AND IN THE HEIGHT OF THE INVERSION BASE. ALTHOUGH A VALIDATED KINETIC MECHANISM HAS BEEN DEVELOPED AND INCORPORATED IN THE SIMULATION MODEL, VALIDATION EFFORTS HAVE THUS FAR BEEN RESTRICTED TO CARBON MONOXIDE. PRELIMINARY VALIDATION RESULTS FOR THE LOS ANGELES BASIN ARE PRESENTED.

<STED> LOS ANGELES

<279>

<COMP> RUSSO, A. J.

<TITLE> REACTOR ACCIDENT PLUME RISE CALCULATIONS

<ADDR> SANDIA LABS., P.O. BOX 5000

<CITY> ALBUQUERQUE

<STATE> NM

<ZIP> 87115

<PHONE> 264-2500

<DOC> SAND--76-0300, JULY 1976.

<SUB> PLUME RISE CALCULATIONS

<ABST> THE EQUATIONS GOVERNING THE RISE OF STEAM AND RADIOACTIVE CONTAMINANT LADEN PLUMES WHICH MIGHT RESULT FROM A NUCLEAR REACTOR ACCIDENT HAVE BEEN NUMERICALLY SOLVED. THE EQUATIONS ARE BASED ON A SIMPLE "TOP HAT" MODEL OF THE PLUME. A PARAMETER SENSITIVITY STUDY WAS PERFORMED IN WHICH THE PLUME AND ATMOSPHERIC HUMIDITY CONTENT, THE RADIOACTIVE HEATING LEVEL, AND THE INITIAL JET EMISSION ANGLE WITH RESPECT TO THE WIND WERE VARIED. THE RESULTS ARE RELATED TO A FORMULA CURRENTLY BEING USED IN CONSEQUENCE MODELING AND SOME CHANGES ARE RECOMMENDED. (EPA CITATION 02:001500)

<STATUS> IN USE

<ACCESS> WFO PERMISSION

<MEDIA> PUNCH CARDS

<SIZE> 300 CARDS

<COMP> CDC

<COMP16> CDC 6600 WITH 50K CORE

<LANG> FORTRAN IV

<CHAR> CDC

<ALGO> INTEGRATION OF ORDINARY DIFFERENTIAL EQUATIONS

<CLASS> ANALYTICAL

<APPL> INFLUENCE OF PLUME RISE ON THE CONSEQUENCES OF RADIOACTIVE MATERIAL RELEASES

<USERS> WFO

<SND> ASSE DISPERSION DATA (1960)

<NVAL> COMPARISON WITH SMOKE STACK DATA

<CON> EPA CITATION 02:001500

<UPDATE> 700726

<280>

<COMP> RUTHERFORD, R. B.

<TITLE> WEPH V CODE MODIFICATIONS FOR WY PROPAGATION AND SYSTEM PERFORMANCE MODELING

<ADDR> WEPH V

<ADDR> GENERAL ELECTRIC CO SANTA BARBARA CALIF TEXPO

<280>

ATMOSPHERIC TRANSPORT

<280> COPY.

<SCORC> DTIC 94.25/AF81.45

<DOC> AD--770 053/7

<ABST> THE REPORT DESCRIBES MODIFICATIONS TO THE WEPH V CODE THAT PERMIT THE USE OF THE CODE FOR EVALUATION OF RF PROPAGATION AND SYSTEM PERFORMANCE IN NUCLEAR-DISTURBED ENVIRONMENTS. THE PROPAGATION AND SYSTEM MODELS ARE AN EXTENSION OF THOSE PRESENTED IN THE WEA RF COMMUNICATION HANDBOOK (DASA 1955-1 AND-2). THE PRINCIPAL DEGRADATION EFFECT MODELED IS D-REGION ABSORPTION. WHILE CHANGES IN SKY-WAVE GEOMETRY DUE TO THE DISTURBED ENVIRONMENT ARE NOT DETERMINED, MODIFICATIONS TO F-REGION CRITICAL FREQUENCIES AT SELECTED POINTS ARE EVALUATED FROM APPROXIMATE MODELS. THE MODIFIED WEPH V CODE IS INTENDED FOR USE IN RAPID EVALUATION OF THE EFFECTS OF PROPAGATION, SYSTEM, AND ENVIRONMENT PARAMETERS ON SYSTEM PERFORMANCE, AND TO IDENTIFY SITUATIONS WHERE ANALYSIS WITH DETAILED RAY TRACING CODES SUCH AS THE WUCON CODE (DASA 2035) IS REQUIRED.

<281>

<CCMT> SAGERDCFF, J. F.

<TITLE> A PROGRAM FOR EVALUATING ATMOSPHERIC DISPERSION FROM A NUCLEAR POWER STATION

<ACRO> SEP

<ADDR> NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, AIR RESOURCES LABORATORY

<CITY> IDAHO FALLS

<STATE> ID

<ZIP> 83401

<PHONE> PIS 583-2702

<DOC> NOAA TN EPL APL-42, 12 PP.

<SUB> ATMOSPHERIC DISPERSION

<ABST> A COMPUTER CODE (SEP FOR SITE EVALUATION PROGRAM) IS DESCRIBED. THE PROGRAM USES A JOINT FREQUENCY DISTRIBUTION OF WINDS AND STABILITY CLASSES TO EVALUATE THE ATMOSPHERIC DISPERSION POTENTIAL FROM A NUCLEAR POWER STATION. THE CODE INCLUDES MODELS FOR SHORT-TERM AND LONG-TERM EFFLUENT RELEASES. A DESCRIPTION OF THE INPUT PARAMETERS IS INCLUDED. THE PROGRAM IS WRITTEN IN FORTRAN IV AND USES 250 K MEMORY OF AN IBM 360/75 COMPUTER. PLUME WISE MAY BE CALCULATED USING FORMULAS FROM BRIGGS, OR IT MAY BE IGNORED.

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> PUNCH CARDS; MAGNETIC TAPE

<SIZE> ABOUT 2100 CARDS

<COMP> IBM

<CONFIG> IBM 360/75 WITH 250 K CORE

<LANG> FORTRAN IV

<CHAR> EBCDIC

<ALGO> WIND ROSE; GAUSSIAN MODEL

<CLAS> PREDICTIVE

<APPL> MODEL HAS BEEN USED TO EVALUATE ATMOSPHERIC DISPERSION FROM NUCLEAR POWER STATIONS.

<SHD> JOINT FREQUENCIES OF WIND SPEEDS AND DIRECTIONS AND ATMOSPHERIC STABILITY CLASSES

<CON> ONLY THE RATIO EFFLUENT CONCENTRATION/SOURCE STRENGTH IS CALCULATED, NOT CONCENTRATIONS OR DOSES. BUILDING WAKE EFFECTS ARE INCLUDED BUT NOT CLOUD DEPOSITION AND DEPLETION.

<UPDAT> 700706

<282>

<COMT> SCHULZE, R. L.; DEMETZIAN, R. L.

<TITLE> CALCULATION OF SELECTED PHOTOLYTIC RATE CONSTANTS OVER A DIURNAL PERIOD: A COMPUTER ALGORITHM

<ADDR> ENVIRONMENTAL SCIENCES RESEARCH LABORATORY, METEOROLOGY AND ASSESSMENT DIVISION

<CITY> RESEARCH TRIANGLE PARK

<STATE> NC

<ABST> A COMPUTER PROGRAM HAS BEEN CREATED AND IS DESCRIBED HEREIN WHICH EMPLOYS THE THEORETICAL FORMULATION OF THE PHOTOLYTIC RATE CONSTANT TO CALCULATE THESE RATE CONSTANTS FOR SPECIFIC CHEMICAL SPECIES OVER A DIURNAL TIME PERIOD IN CLEAR-SKY CONDITIONS. A USER OF THE PROGRAM MUST SPECIFY THE DATE, TIME AND LOCATION FOR WHICH THE RATE CONSTANTS ARE DESIRED. WITH THIS INFORMATION AND SPECIFIC DATA ON Zenith ANGLES, SOLAR IRRADIANCE, AND SPECIES CHARACTERISTICS OF ABSORPTION CROSS-SECTIONS AND PRIMARY QUANTUM YIELDS, WHICH ARE PROVIDED IN THE PROGRAM PACKAGE, THE COMPUTER PROGRAM GENERATES A DIURNAL RANGE OF PHOTOLYTIC RATE CONSTANTS FOR EACH SPECIES. THE SPECIES INCLUDED ARE NO2, O3, NO, NO2, NO2O, N2O, CH3CO, AND N2O2. THE APPENDICES TO THIS REPORT CONTAIN PROGRAM AND DATA LISTINGS AS WELL AS A USER'S GUIDE TO PROGRAM OPERATION. THE PROGRAM-GENERATED PHOTOLYTIC RATE CONSTANTS FOR NO2 ARE COMPARED TO DIRECT MEASUREMENTS OF THIS QUANTITY AS TAKEN AT RESEARCH TRIANGLE PARK, N.C. DURING APRIL 1975. THE TWO METHODS ARE GENERALLY IN CLOSE AGREEMENT AFTER THE THEORETICALLY COMPUTED RATE CONSTANTS ARE SCALED BY A SIMPLISTIC METHOD FOR THE COMPENSATION OF SOLAR RADIATION ATTENUATION BY CLOUDS.

<DOC> RESEARCH TRIANGLE PARK, NC

<283>

<COMT> SCHULZE, R. L.; MOHLER, E. F., JR.

<TITLE> ASSESSMENT OF THE AMBIENT AIR IMPACT OF MULTIPLE STACK INDUSTRIAL PLANTS USING DISPERSION MODELING

<ADDR> TRINITY CONSULTANTS

ATMOSPHERIC TRANSPORT

<28> CONT.

<CITY> DALLAS

<STATE> TX

<DOC> AMERICAN SOCIETY MECHANICAL ENGINEERS, PAP. 74-PET-79, 1-9

<ABST> THIS PAPER DESCRIBES A METHOD THAT CAN BE USED TO DETERMINE THE AMBIENT AIR IMPACT OF MULTI-SOURCE SOURCES, SUCH AS OIL REFINERIES AND CHEMICAL PLANTS. IN THIS APPROACH THE CLIMATOLOGICAL DISPERSION MODEL (CDM) IS USED TO CALCULATE AMBIENT AIR CONCENTRATIONS. THE ACCURACY OF THE PRESENT STATE OF THE ART OF MODELING IS REVIEWED ALONG WITH THE EVOLVING AIR POLLUTION REGULATIONS WHICH REQUIRE MODELING. ALSO DISCUSSED ARE SOME OF THE ENGINEERING APPLICATIONS OF DISPERSION MODELING. THE APPLICATION OF THE METHODS TO A REFINERY IS DESCRIBED. 15 PAGES.

<286>

<CCIT> SPRINGFIELD, J. H.; REYNOLDS, STEVEN D.; POPE, PHILLIP A.

<TITLE> SIMULATION OF URBAN AIR POLLUTION

<ADDP> CALIFORNIA INSTITUTE OF TECHNOLOGY

<CITY> PASADENA

<STATE> CA

<DOC> ADVANCES CHEMISTRY SERIES, 113, 58-103, 1972

<ABST> THE BOX, PLUME, AND PUFF MODELS DESCRIBE THE DISPERSION OF ATMOSPHERIC CONTAMINANTS, BUT NONE ARE SUITABLE FOR DESCRIBING THE COUPLED TRANSPORT AND REACTION PHENOMENA THAT CHARACTERIZE ATMOSPHERES IN WHICH CHEMICAL REACTION PROCESSES ARE IMPORTANT. SIMULATION MODELS THAT HAVE BEEN PROPOSED FOR THE PREDICTION OF CONCENTRATIONS OF PHOTOCHEMICALS FORMED POLLUTANTS IN AN URBAN AIRSHED ARE REVIEWED. THE DEVELOPMENT OF A GENERALIZED KINETIC MECHANISM FOR PHOTOCHEMICAL SMOG SUITABLE FOR INCLUSION IN AN URBAN AIRSHED MODEL. THE TREATMENT OF EMISSIONS FROM AUTOMOBILES, AIRCRAFT, POWER PLANTS, AND DISTRIBUTED SOURCES, AND THE TREATMENT OF TEMPORAL AND SPATIAL VARIATIONS OF PRIMARY METEOROLOGICAL PARAMETERS ARE DISCUSSED.

<285>

<CONT> SELLERS, WILLIAM D.

<TITLE> A TWO DIMENSIONAL GLOBAL CLIMATIC MODEL

<ADDP> UNIVERSITY OF ARIZONA, INSTITUTE OF ATMOSPHERIC PHYSICS

<CITY> TUCSON

<STATE> AZ

<SOURCE> NTIS 84.50/AF92.25

<DOC> AD-A019 253/ASL

<ABST> A TWO-DIMENSIONAL GLOBAL CLIMATIC MODEL HAS BEEN DEVELOPED, USING A 10 DEG LONGITUDE BY 10 DEG LATITUDE BOX GRID AND A ONE-MONTH TIME STEP. THE LARGE

RATES OF TEMPERATURE AND THE MERIDIONAL COMPONENT OF THE FLOW IN THE OCEANS AND ATMOSPHERE AND OF SPECIFIC HUMIDITY IN THE ATMOSPHERE ARE PARAMETERIZED IN TERMS OF THEIR RESPECTIVE SEA-LEVEL VALUES. THE MODEL THEN UTILIZES THE VERTICALLY-AVERAGED THERMODYNAMIC ENERGY EQUATION, THE EQUATION OF MOTION FOR THE BOUNDARY LAYER, THE THERMAL WIND EQUATION, THE HYDROSTATIC EQUATION, THE SURFACE WATER BALANCE EQUATION, AND EMPIRICAL RELATIONS BETWEEN THE SEA-LEVEL TEMPERATURE AND PRESSURE GRADIENT FIELDS AND BETWEEN CLOUD COVER AND PRECIPITATION TO DETERMINE THE GLOBAL DISTRIBUTION BY MONTHS OF SEA-LEVEL PRESSURE, TEMPERATURE, WIND SPEED AND DIRECTION, AND RELATIVE HUMIDITY, PRECIPITATION, EVAPORATION, WINDS, SOIL MOISTURE CONTENT, ICE AND SNOW COVER AND THICKNESS, CLOUD COVER, AND POLAR WAVE ENERGY TRANSPORT. TWO 100 MODEL-YEAR RUNS WERE MADE OF THE YEAR CDC 7600 COMPUTED. THEY DIFFERED ONLY IN THE VALUE OF THE SOLAR CONSTANT USED. BOTH RUNS INDICATE THAT THE MODEL IS EXTREMELY STABLE.

<COMP> CDC

<CONFID> CDC 7600

<286>

<CONT> SELLERS, WILLIAM D.

<TITLE> A NEW GLOBAL CLIMATIC MODEL

<ADDP> UNIVERSITY OF ARIZONA, INSTITUTE OF ATMOSPHERIC PHYSICS

<CITY> TUCSON

<STATE> AZ

<ZIP> 85721

<DOC> JOURNAL OF APPLIED METEOROLOGY, 12(2), 241-250, 1973

<ABST> A GLOBAL CLIMATIC MODEL, ALLOWING FOR SEASONAL COUPLING AND INTERACTION BETWEEN CONTINENTS AND OCEANS, IS DEVELOPED, UTILIZING AN IDEALIZED LAND-WATER DISTRIBUTION SIMILAR TO THAT OBSERVED. THE BASIC EQUATION USED IS THE THERMODYNAMIC ENERGY EQUATION AVERAGED OVER TIME AND SPACE. IT IS WRITTEN AND SOLVED FOR THE MEAN SURFACE TEMPERATURE SEPARATELY FOR CONTINENTS AND OCEANS. A TIME STEP OF ONE MONTH IS USED. THE VERTICAL VARIATIONS OF TEMPERATURE, SPECIFIC HUMIDITY, AND THE ZONAL AND MERIDIONAL COMPONENTS OF THE WIND VELOCITY ARE PARAMETERIZED. THE SURFACE VELOCITY COMPONENTS ARE OBTAINED FROM MODIFIED FORMS OF THE FIRST TWO EQUATIONS OF MOTION. THE MODEL INCLUDES VARIABLE SNOW AND ICE COVER, MERIDIONAL TRANSPORT OF HEAT AND WATER VAPOR BY MEAN AND EDDY ATMOSPHERIC CIRCULATIONS, STORAGE AND TRANSPORT OF HEAT BY THE OCEANS, THE EFFECT OF AEROSOLS ON ATMOSPHERIC TURBIDITY, AND THE CONTRIBUTION OF H₂O, CO₂, O₃, AND CLOUDS TO THE INFRARED BALANCE. CLOUD COVER, THE SURFACE RELATIVE HUMIDITY, AND THE SURFACE ALBEDO OF SNOW- AND ICE-FREE AREAS ARE SPECIFIED. USING PRESENT VALUES FOR THE INPUT PARAMETERS, THE MODEL REPRODUCES QUITE WELL SEVERAL OF THE MAJOR THERMAL AND DYNAMIC

<206>

ATMOSPHERIC TRANSPORT

<206> CONT.

CHARACTERISTICS OF THE EARTH-ATMOSPHERE SYSTEM. IT IS VERY SENSITIVE TO VARIATIONS OF THE OPTICAL THICKNESS OF THE ATMOSPHERE AND OF THE SOLAR CONSTANT. SLIGHT CHANGES IN THESE VARIABLES GREATLY MODIFY THE SURFACE TEMPERATURE FIELD, ESPECIALLY AT HIGH LATITUDES OF THE NORTHERN HEMISPHERE. THERE IS SOME INDICATION OF THE EXISTENCE OF AT LEAST TWO POSSIBLE STEADY-STATE CLIMATES WITH THE SAME SET OF INPUT PARAMETERS.

<GEN> GLOBAL-CONTINENT-OCEAN SYSTEM

<SIZE> REQUIRES ABOUT 10 SECONDS

<COMP> CDC

<CONFIG> CDC 6400

<CLASS> PREDICTIVE

<NOTE> THREE ANALYSES WERE DONE AND THESE WERE TREATED AS A SENSITIVITY TEST OF THE MODEL. THE ANALYSES INVOLVED CHANGING THE ATMOSPHERIC CO₂ CONTENT, THE OPTICAL THICKNESS OF THE ATMOSPHERE, AND THE SOLAR CONSTANT.

<207>

<CONT> SEILERS, WILLIAM D.

<TITLE> GLOBAL CLIMATIC MODEL BASED ON ENERGY BALANCE OF THE EARTH-ATMOSPHERE SYSTEM

<ADDR> UNIVERSITY OF ARIZONA, INSTITUTE OF ATMOSPHERIC PHYSICS

<CITY> TUSCON

<STATE> AZ

<ZIP> 85721

<DOC> JOURNAL APPLIED METEOROLOGY, 8, 392-400, 1969

<SUB> GLOBAL CLIMATE

<ABST> A RELATIVELY SIMPLE NUMERICAL MODEL OF THE ENERGY BALANCE OF THE EARTH-ATMOSPHERE IS SET UP AND APPLIED. THE DEPENDENT VARIABLE IS THE AVERAGE ANNUAL SEA LEVEL TEMPERATURE IN 10 DEGREE LATITUDE BELTS. THIS IS EXPRESSED BASICALLY AS A FUNCTION OF THE SOLAR CONSTANT, THE PLANETARY ALBEDO, THE TRANSPARENCY OF THE ATMOSPHERE TO INFRARED RADIATION, AND THE TURBULENT EXCHANGE COEFFICIENTS FOR THE ATMOSPHERE AND THE OCEANS. THE MAJOR CONCLUSIONS OF THE ANALYSIS ARE THAT REMOVING THE ARCTIC ICE CAP WOULD INCREASE ANNUAL AVERAGE POLAR TEMPERATURES BY NO MORE THAN 7C, THAT A DECREASE OF THE SOLAR CONSTANT BY 2-5% MIGHT BE SUFFICIENT TO INITIATE ANOTHER ICE AGE, AND THAT MAN'S INCREASING INDUSTRIAL ACTIVITIES MAY EVENTUALLY LEAD TO A GLOBAL CLIMATE MUCH WARMER THAN TODAY.

<GEN> GLOBAL

<CLASS> SIMULATION

<UPPERED> 700020

<208>

<CONT> SHAIR, F. W.; REITHS, K. L.

<TITLE> THEORETICAL MODEL FOR RELATING INDOOR POLLUTANT CONCENTRATIONS TO THOSE OUTSIDE

<ABST> A GENERAL VENTILATION MODEL, WHICH RELATES INDOOR POLLUTANT CONCENTRATIONS TO THOSE OUTSIDE, IS DISCUSSED IN DETAIL. WHEN THE TIME INTERVAL ASSOCIATED WITH CHANGES IN THE OUTDOOR CONCENTRATION IS LONG COMPARED TO THAT REQUIRED EITHER TO CHANGE THE AIR WITHIN THE BUILDING OR TO REMOVE THE POLLUTANT BY INTERNAL MEANS, THE INDOOR CONCENTRATION OF POLLUTANT CAN BE RELATED TO THE OUTDOOR CONCENTRATION BY MEANS OF A SIMPLE EXPRESSION. IN THE CASE OF INDOOR GASES ASSOCIATED WITH BUILDINGS LOCATED IN PHOTOCHEMICALLY SMOGGY REGIONS, THERE IS GOOD AGREEMENT BETWEEN THEORY AND EXPERIMENT. THEORETICAL CONSIDERATIONS SUGGEST THAT THE INDOOR LEVELS OF GASES IN MANY COMMERCIAL BUILDINGS LOCATED IN LOS ANGELES COULD BE SUBSTANTIALLY REDUCED RATHER QUICKLY AND POSSIBLY WITH RELATIVELY LITTLE EFFORT.

<GEN> LOS ANGELES

<209>

<CONT> SHANNON, JACK D.

<TITLE> OBJECTIVE PLACEMENT OF SENSORS

<ADDR> ARGONNE NATIONAL LABORATORY, RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION, 9700 S. CASS AVE.

<CITY> ARGONNE

<STATE> IL

<ZIP> 60439

<PHONE> PTS 972-5807

<DOC> SHANNON, J.D., H.L. BESELY AND P.J. BRADY, 1978: OBJECTIVE SENSOR PLACEMENT FOR SAMPLING REGIONAL TURBIDITY ATMO. ENVIRON. 12, 937-943

<SUB> OBJECTIVE METHOD OF DETERMINING SPATIAL ARRANGEMENT OF NETWORK

<ABST> THE MODEL DESCRIBES THE TEMPORAL AND SPATIAL CORRELATIONS OF AN ATMOSPHERIC PHENOMENON BY A CONTINUOUS MATHEMATICAL FUNCTION, AND THEN USES THAT FUNCTION TO EVALUATE SIMULATED SENSOR POSITIONS. THE EVALUATION IS BASED UPON EXPLANATION OF VARIANCE IN SIMULATED OBJECTIVE ANALYSES. OPTIMIZATION OF SENSOR POSITIONS IS OBTAINED BY A NONLINEAR PROGRAMMING ALGORITHM INVOLVING FLEXIBLE TOLERANCE.

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> DISC

<SIZE> 5000 RECORDS EACH 80 BYTES LONG

<COMP> IBM

<CONFIG> IBM 370/195 OS/VS2 SYSTEM WITH 250K CORE

<LANG> FORTRAN

ATMOSPHERIC TRANSPORT

<209> CONT.

<CHAP> ERCDIC

<ALGO> DOUBLINEAR PROGRAMMING, FLEXIBLE TOLERANCE METHOD

<CLAS> CONTINUOUS; DETERMINISTIC; ANALYTICAL; SIMULATION; OPTIMIZATION

<APPL> GUIDANCE IN DEPLOYING SENSOR ARRAYS

<USERS> ARGONNE NATIONAL LABORATORY

<SUB> 1972-1973 TURBIDITY OBSERVATIONS, ENVIRONMENTAL DATA SERVICE

<HVAL> TO BE VALIDATED AGAINST 1977 DATA

<UPDATE> 700703

<209>

<CONT> SHANNON, JACK B.

<TITLE> ADVANCED STATISTICAL TRAJECTORY REGIONAL AIR POLLUTION MODEL

<ACRO> ASTRAE

<ADDR> ARGONNE NATIONAL LABORATORY, RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION, 9700 S. CASS AVE.

<CITY> ARGONNE

<STATE> IL

<ZIP> 60439

<PHONE> TS 572-1807

<DOC> SWEIN, C.B., 1977: APPLICATION OF A LAGRANGIAN STATISTICAL TRAJECTORY MODEL TO THE SIMULATION OF SULFUR POLLUTION OVER THE NORTHEASTERN UNITED STATES ATPOS. ENVIRON-11, 173-178 ; SHANNON, J.B., 1978: THE ADVANCED STATISTICAL AIR POLLUTION REGIONAL TRAJECTORY MODEL ARL/NER TOPICAL REPORT (IN PROGRESS).

<SUB> REGIONAL SULFUR POLLUTION

<ABST> THE MODEL COMPUTES LONG-TERM REGIONAL SCALE HORIZONTAL DISPERSION COEFFICIENTS FROM THE STATISTICS OF SIMULATED TRACER RELEASES FROM SOURCE LOCATIONS.

<GEO> GREATER NORTHEAST

<STATUS> UNDER DEVELOPMENT; IN USE

<ACCESS> LIMITED

<MEDIA> DISC

<SIZE> 1500 RECORDS EACH 80 BYTES LONG

<COMP> IBM

<CONFIG> IBM 370/195 OS/MVT SYSTEM WITH 350K CORE

<LANG> FORTRAN

<CHAP> ERCDIC

<ALGO> HORIZONTAL DISPERSION, VERTICAL DISPERSION, CONCENTRATIONS

<CLAS> STOCHASTIC; ANALYTICAL; PREDICTIVE; ITERATIVE; SIMULATION

<APPL> PREDICTION OF REGIONAL SULFUR POLLUTION RESULTING FROM CURRENT OR FUTURE

SOURCES AND EMISSION STRATEGIES.

<USERS> ARGONNE NATIONAL LABORATORY; EPA

<SUB> MCC SAUSSURE DATA (FROM ARL); MCC PRECIPITATION DATA (FROM FBI)

<HVAL> RESULTS OF THE MODEL WILL BE COMPARED TO THE FIRST FBI/SURF INTENSIVE OBSERVATION PERIOD.

<UPDATE> 700703

<291>

<CONT> SHAWNER, B. L.; SIDOTT, D. W.; MILST, G. P.

<TITLE> DEVELOPMENT OF VERTICAL DISPERSION COEFFICIENTS FOR ROLLING TERRAIN ENVIRONMENTS

<ADDR> THE RESEARCH CORPORATION OF NEW ENGLAND

<CITY> WETHERSFIELD

<STATE> CT

<ZIP> 06109

<DOC> TRC-COO-8026-1, 120 PP., 1977

<ABST> DATA FROM US ARMY DUGWAY PROVING GROUND TRACED EXPERIMENTS ARE USED TO DEVELOP VERTICAL, DISPERSION COEFFICIENT VALUES FOR A PASQUILL-GIFFORD ATMOSPHERIC DISPERSION MODEL. THE DATA SELECTED FROM 300 FIELD TESTS PROVIDE INFORMATION ABOUT THE VERTICAL COMPONENT OF DISPERSION AND HAVE BEEN APPLIED TO RURAL, ROLLING TERRAIN. OBSERVED INSTANTANEOUS PUFF DIFFUSION AND CALCULATED PUFF RANDBER ARE COMBINED TO COMPRISE TOTAL DISPERSION. DERIVED COEFFICIENTS ARE REPRESENTATIVE OF 10 MINUTE SAMPLING TIME, AND ARE COMPARED WITH PASQUILL-GIFFORD DISPERSION COEFFICIENTS FOR FLAT TERRAIN.

<COMP> IBM; UNIVAC

<CONFIG> UNIVAC 90/30, OS 3.5

<LANG> FORTRAN IV; BASIC FORTRAN

<CON> THE PROGRAM IS WRITTEN IN FORTRAN IV (G) COMPILER FOR THE IBM AND BASIC FORTRAN FOR THE UNIVAC 90/30 OS 3.5. EXTENSIVE DOCUMENTATION IS PRESENTED

<292>

<CONT> SHEPARD, CHRISTINE A.

<TITLE> MASS ADJUSTED THREE DIMENSIONAL WIND FIELD MODEL

<ACRO> MATH20

<ADDR> LAWRENCE LIVERMORE LABORATORY, PHYSICS DEPARTMENT, G DIVISION, P.O. BOX 808

<CITY> LIVERMORE

<STATE> CA

<ZIP> 94540

<PHONE> 415-822-1835; FTS 532-1835

<SOURCE> DEVELOPED AT LLL

<292>

ATMOSPHERIC TRANSPORT

<292> CONT.

<DOC> SHEPHERD, C.A., A MASS CONSISTENT MODEL FOR WIND FIELDS OVER COMPLEX TERRAIN, JOURNAL APPLIED METEOROLOGY, 17(7), 312-319, MARCH 1978; SHEPHERD, C.S., MATHEW: A MASS CONSISTENT WIND FIELD MODEL, PH.D. THESIS, UNIVERSITY OF CALIFORNIA DAVIS, JUNE 1978 (ALSO AVAILABLE AS UCRL-52479)

<SUB> REGIONAL WIND FIELD MODEL

<ABST> MATHEW PROVIDES A POLLUTANT TRANSPORT MODEL WITH INPUT WIND FIELDS WHICH ARE MASS-CONSISTENT, THREE-DIMENSIONAL AND ALSO REPRESENTS THE AVAILABLE METEOROLOGICAL MEASUREMENTS. INTERPOLATED THREE-DIMENSIONAL MEAN WINDS ARE ADJUSTED IN A WEIGHTED LEAST-SQUARES SENSE TO SATISFY THE CONTINUITY EQUATION WITHIN THE VOLUME SPECIFIED. THE UPPER AND LATERAL BOUNDARIES ABOVE TOPOGRAPHY ARE ASSUMED TO BE OPEN AIR AND THUS ALLOW MASS FLOW THROUGH THE BOUNDARIES. THE BOTTOM BOUNDARY IS DETERMINED BY THE TOPOGRAPHIC ELEVATIONS OF THE AREA BEING STUDIED. THE TOPOGRAPHIC BOUNDARY IS ASSUMED TO BE SOLID.

<GEO> REGIONAL OUT TO APPROXIMATELY 40,000 SQ. KM.

<STATUS> UNDER DEVELOPMENT; IN USE

<ACCESS> LIMITED TO AUTHORIZED RECIPIENTS

<MEDIA> MAGNETIC TAPE; PUNCHED CARDS

<SIZE> CODE STATEMENTS WITH COMMENT CARDS: 17200; CODE STATEMENTS W/O COMMENT CARDS: 1785

<COMP> CDC

<CONFIG> CDC 7600 WITH DISK PACKS, MEMORY EQUIPMENT 1,000,000 OCTAL; 2 CPU MINUTES REQUIRED FOR AVERAGE RUN

<LANG> LPLTRAN

<CHAP> ASCII

<ALGO> VARIATIONAL ANALYSIS; FINITE DIFFERENCING

<CIAS> DISCRETE; DIAGNOSTIC; OPTIMIZATION; OBJECTIVE ANALYSIS

<APPL> ARAC WIND FIELDS; WIND ENERGY ASSESSMENTS

<ORIGIN> LIVERMORE LAWRENCE LABORATORY

<SRV> MEASURED WINDS; NATIONAL WEATHER SERVICE OBSERVATIONS

<VRL> CODE HAS BEEN USED WITH THE ADPIC MODEL TO SIMULATE TRANSPORT AND DIFFUSION OF TRACERS. TRACER RELEASES AT INEL AND SRI HAVE BEEN USED AS VERIFICATION TESTS.

<CON> SCHEDULED FOR GENERAL RELEASE IN FY 1979.

<NPDA#> 780620

<293>
<CONT> SHIER, L. J.; HALPERN, P. K.; CLEWENS, B. A.; WANG, H. H.; ABDANAH, P. P.

<TITLE> AIR QUALITY DIFFUSION MODEL;

APPLICATION TO NEW YORK CITY

<ABST> AN EXPERIMENTAL MULTISOURCE AIR POLLUTION DIFFUSION MODEL BASED ON THE GAUSSIAN PLUME FORMULATION IS DESCRIBED. THE MODEL INCORPORATES POINT AND AREA SOURCES, TIME AND SPACE DEPENDENCE OF SOURCE STRENGTHS, AND TIME AND SPACE DEPENDENCE OF METEOROLOGICAL VARIABLES. NUMERICAL SIMULATION OF THE SO₂ CONCENTRATION DISTRIBUTION FOR NEW YORK CITY ON JANUARY 11, 1971, AGREES FAVORABLY WITH EXPERIMENTAL MEASUREMENTS.

<GEO> NEW YORK CITY

<294>
<CONT> SHIMAZAKI, TATSUO

<TITLE> ON THE BOUNDARY CONDITIONS IN THEORETICAL MODEL CALCULATIONS OF THE DISTRIBUTIONS OF HIGH NEUTRAL CONSTITUENTS IN THE UPPER ATMOSPHERE

<ADDR> NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

<DOC> REVISION OF REPORT DATF 23 DEC 71.

<ABST> THE UPPER AND LOWER BOUNDARY CONDITIONS ARE IMPORTANT IN THEORETICALLY MODELING THE HEIGHT DISTRIBUTIONS OF HIGH NEUTRAL CONSTITUENT CONCENTRATIONS IN THE UPPER ATMOSPHERE BY SOLVING CONTINUITY EQUATIONS. THE PAPER DISCUSSES THE EFFECTS OF SUCH BOUNDARY CONDITIONS ON THEIR CONCENTRATIONS. IT IS SHOWN THAT THE UPPER BOUNDARY CONDITION OF NO DIFFUSIVE FLUX AT 150 KM DOES NOT AFFECT SIGNIFICANTLY THE HIGH NEUTRAL CONSTITUENT DENSITY DISTRIBUTIONS EXCEPT FOR H AND NO₂ ABOVE APPROXIMATELY 120 KM, WHERE THE ESCAPE FLUX OF H REDUCES THEIR CONCENTRATIONS SUBSTANTIALLY. IT IS ALSO SHOWN THAT OUR PREVIOUS MODEL CALCULATIONS HAVE USED THE CONDITION OF CONSTANT FLUX WITH HEIGHT AT THE LOWER BOUNDARY. IT IS SUGGESTED THAT RELIABLE MEASUREMENTS OF HIGH CONSTITUENTS IN THE UPPER STRATOSPHERE MAY BE USEFUL IN IMPROVING THE LOWER BOUNDARY CONDITION FOR THE MESOSPHERE MODELS AND IN SIMPLIFYING THE MODELING PROCEDURES.

<295>
<CONT> SHIER, C. C.; SHIER, L. J.

<TITLE> DEVELOPMENT OF AN URBAN AIR QUALITY SIMULATION MODEL WITH COMPATIBLE RAPS DATA

<ACRO> IMPAQ-1; IMPAQ-2

<ADDR> INTERNATIONAL BUSINESS MACHINES CORPORATION, RESEARCH LABORATORY

<CITY> SAN JOSE

<STATE> CA

<DOC> PB--256851

<ABST> AN ADVANCED GENERALIZED URBAN AIR QUALITY MODEL (IMPAQ-2) IS DEVELOPED BASED ON THE THEORY UTILIZED IN AN EXISTING MODEL (IMPAQ-1) AS PRESCRIBED IN REF. 1. THE MODEL, BASED ON NUMERICAL INTEGRATION OF THE CONCENTRATION EQUATION, COMPUTES

ATMOSPHERIC TRANSPORT

<295> CONT.

TEMPORAL AND THREE-DIMENSIONAL SPATIAL CONCENTRATION DISTRIBUTIONS RESULTING FROM SPECIFIED URBAN POINT AND AREA SOURCES BY USING PDS (NATIONAL EMISSION DATA SYSTEM) AND SIMULATED PDS (REGIONAL AIR MONITORING SYSTEM) DATA. THE UTM (UNIVERSAL TRANSVERSE MERTIC) COORDINATES ARE USED IN ALL GEOGRAPHICAL, SOURCE EMISSION, AND MONITORING DATA. A NEW METHOD TO INCORPORATE POINT SOURCES INTO THE GRID COMPUTATION IS DEVELOPED BY USING A LAGRANGE TRAJECTORY METHOD. MANY MODEL OPTIONS ARE PROVIDED WHICH ENABLE USERS TO STUDY CONVENIENTLY THE SIGNIFICANT EFFECTS WHICH THESE OPTIONS HAVE ON THE FINAL CONCENTRATION DISTRIBUTIONS. THE PROGRAM DESCRIPTION IS INCLUDED TO PROVIDE A GUIDE FOR USERS. THE PROGRAM IS CONSTRUCTED IN A MODULAR FORM WHICH ALLOWS USERS TO CHANGE OR IMPROVE EACH COMPONENT CONVENIENTLY. THE INPUT AUXILIARY MODEL, WHICH PROCESSES GEOGRAPHICAL, SOURCE EMISSION, AND MONITORING DATA, IS ALSO INCLUDED.

<296>
<CONT> SIEGEL, B. D.; GULBERG, P. H.; WILTSEE, K. D., JR.; AGOSTINO, B. D.

<TITLE> IMPACT OF ENERGY SHORTAGE ON AMBIENT SULFUR DIOXIDE AND PARTICULATE LEVELS IN METROPOLITAN BOSTON

<ACRO> ADOP

<ADDR> ADOP, INC., WALDEN RESEARCH DIVISION

<CITY> CAMBRIDGE

<STATE> MA

<SOURCEID> DTIS 87.75/MP82.25

<DOC> PB--206 592/051, 1975

<ABST> THE PRESENT DAY OIL SHORTAGE HAS LED TO RELAXATION OF SOME FUEL RESTRICTIONS, ALLOWING CONVERSIONS FROM OIL TO COAL AND THEREBY INCREASING EMISSIONS OF SULFUR DIOXIDE AND PARTICULATES TO THE ATMOSPHERE. THE PURPOSE OF THIS PROJECT WAS TO EVALUATE THE IMPACT OF THE ENERGY SHORTAGE ON AMBIENT SULFUR DIOXIDE (SO₂) AND TOTAL SUSPENDED PARTICULATE (TSP) CONCENTRATIONS IN A MAJOR URBAN AREA, METROPOLITAN BOSTON. A COMBINED APPROACH BASED ON A STATISTICAL ANALYSIS OF MEASURED AIR QUALITY DATA, REGULATORY AND EMISSIONS ANALYSIS, AND DIFFUSION MODELING OF CHANGES IN AMBIENT POLLUTANT CONCENTRATIONS WAS USED TO ATTAIN THIS OBJECTIVE.

<GEO> BOSTON

<297>
<CONT> SKLAROW, R.; WILSON, J. C.; PABRICK, A. J.

<TITLE> AIR QUALITY MAINTENANCE THROUGH PRACTICAL MODELING

<ACRO> TONICS, INC.

<CITY> VAN NUYS

<STATE> CA

<DOC> AIR POLLUTION CONTROL ASSOCIATION SIXTY-EIGHTH ANNUAL MEETING AND EXHIBITION, 1975

<ABST> A SIMPLE METHODOLOGY WAS DEVELOPED TO CALCULATE AREA SPECIFIC LAND USE BASED EMISSIONS FACTORS, AND PRACTICAL APPLICATIONS OF PROPORTIONAL, GAUSSIAN, AND GRID MODELS ARE DESCRIBED FOR GENERAL LAND USE PLANNING, COMPLEX SOURCES, POWER PLANTS, AND HIGHWAYS. THE COMBINATION OF EMISSION FACTORS INTO AIR QUALITY MODELS WAS DEVELOPED FROM SPECIFIC SOURCE ORIENTED AND REGIONAL DISPERSION MODELS, LONG RANGE PLANNING, AND CALCULATIONS OF SHORT-TERM LEVELS TO DETERMINE ANNUAL AVERAGES.

<298>
<CONT> SMITH, B. D.; WINKLER, L. P.; LEVINE, A. R.

<TITLE> AIR POLLUTION BY COMPUTER TRAVEL ON STATEN ISLAND

<DOC> TRAFFIC QUARTERLY, 29(2), 310-312, 1975

<ABST> A COMPUTER MODEL WAS DEVELOPED TO ESTIMATE THE EMISSIONS REPORTED BY COMPUTER USAGE OF THE STATEN ISLAND TRANSPORTATION SYSTEM. FOUR ALTERNATE MEASURES TO REDUCE THE LEVEL OF COMPUTER VEHICLE EMISSIONS WERE ANALYZED. IF BUS SERVICE ON THE ISLAND WERE IMPROVED, 25 PERCENT OF THE COMPUTERS WHO DRIVE AUTOMOBILES WOULD SWITCH TO BUSES; IF, IN ADDITION, THE STATEN ISLAND RAPID TRANSIT (SIRT), WERE EXTENDED TO FORM A CLOSED LOOP AROUND STATEN ISLAND, 40 PERCENT OF COMPUTERS WOULD SWITCH FROM AUTOMOBILES TO BUSES AND 50 PERCENT OF THE SWITCHING COMPUTERS LIVING NEAR THE LOOP WOULD USE IT WHILE OTHERS LIVING A GREATER DISTANCE WOULD SWITCH TO BUSES. IF, IN ADDITION, THE EXTENDED SIRT SYSTEM ALSO INCLUDED A SUBWAY LINK TO MANHATTAN, 80 PERCENT OF THOSE COMMUTING BY BUS WOULD SWITCH TO SIRT. THE FOURTH MEASURE ASSUMES THAT NO CHANGES ARE MADE IN THE TRANSPORTATION SYSTEM, BUT ALL COMPUTER CARS MEET THE ORIGINALLY PROPOSED 1975 AND 1976 NATIONAL STANDARDS FOR HYDROCARBONS, CARBON MONOXIDE, AND NITROGEN OXIDES. THE COMPUTER PROGRAM WAS USED TO ANALYZE EACH OF THESE FOUR MEASURES. THE MOST SIGNIFICANT IMPROVEMENT IS TO REQUIRE AUTOMOBILES TO SATISFY THE 1976 EMISSION STANDARDS.

<GEO> NEW YORK, STATEN ISLAND

<299>
<CONT> SPECHT, E. R.; OTTER, J. W.; HART, R. S.

<TITLE> DESCRIPTION OF THE CONTAINMENT AND METHODOLOGY OF ENVIRONMENTAL RADIATION EXPOSURE (CONRADIX-IV) CODE

<ACRO> CONRADIX-IV

<ADDR> ROCKWELL INTERNATIONAL, ATOMICS INTERNATIONAL DIVISION, P.O. BOX 709

<CITY> CANOGA PARK

<STATE> CA

<ZIP> 91305

<299>

ATMOSPHERIC TRANSPORT

<299> CONT.

<SYNOPSIS> 203-301-1000 EXT.-2722

<SOURCE> ARGONNE CODE CENTER

<DOC> N70711 130047, 47 PP., 1975

<SUB> SITE DOSE FROM ACCIDENTAL RADIOACTIVE RELEASES

<ABST> THE COMRADEX-IV (CONTAINMENT AND METEOROLOGY OF ENVIRONMENTAL RADIATION EXPOSURE) CODE WAS DEVELOPED FOR THE CALCULATION OF RADIOLOGICAL DOSES FROM HYPOTHETICAL POWER REACTOR ACCIDENTS. IT PERMITS THE USER TO ANALYZE AS MANY AS FOUR LEVELS OF CONTAINMENT WITH TIME VARYING LEAKAGE AND FALLOUT RATES IN EACH LEVEL. FILTRATION IN EACH CONTAINMENT REGION MAY BE BY ISOTOPE CLASS (GASES, SOLIDS, OR HALOGENS) SWELLING MAY BE INTRODUCED BETWEEN THE VARIOUS CONTAINMENT SHELLS. THE ENVIRONMENTAL DOSES CALCULATED INCLUDE THE DIRECT GAMMA DOSE FROM THE CONTAINMENT BUILDING, THE INTEGRAL DOSES TO AS MANY AS 12 BODY ORGANS (SUCH AS THE THYROID, BONE, LUNG, ETC.) DUE TO INHALING THE AIRBORNE RADIOACTIVITY, AND THE EXTERNAL GAMMA AND BETA DOSES FROM THE CLOUD. LEAKAGE AND FALLOUT RATES, AND INITIAL INVENTORY MUST BE GIVEN AS INPUT DATA. A DIRECT NUMERICAL TECHNIQUE, DESIGNED ESPECIALLY FOR QUASI-LINEAR DIFFERENTIAL EQUATIONS, IS USED TO SOLVE THE LEAKAGE (AS WELL AS CONTAINMENT REGION FALLOUT) AND DECAY CHAINS. EITHER THE METEOROLOGICAL MODEL OF PASQUILL WITH DRIFT DISPERSION COEFFICIENTS OR SITE SPECIFIC ATTENUATION FACTORS MAY BE USED. THE CLOUD GAMMA DOSE IS OBTAINED BY INTEGRATING OVER AN ANISOTROPIC GAUSSIAN CLOUD. THE EXTERNAL BETA DOSE CALCULATION ASSUMES A SEMI-INFINITE RADIOACTIVE CLOUD. PLUME TILT DUE TO GRAVITY AND DRY DEPOSITION MAY BE CALCULATED.

<GEN> GENERAL

<TIND> GENERAL

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE; PUNCHED CARDS; DISC

<SIZE> 300,000 BYTES

<COMP> IBM

<COMPIED> IBM 370

<LANG> FORTRAN 8 EXTENDED

<CHAND> EDCDIC

<ALGO> NUMERICAL SOLUTION OF QUASI-LINEAR EQUATIONS FOR TIME-DEPENDENT RADIOACTIVITY CONCENTRATIONS; ANISOTROPIC GAUSSIAN CLOUD DISPERSION; DRY DEPOSITION BY UNIFORM SOURCE DEPLETION; GRAVITATIONAL SETTLING OF BOTH ACTUAL AND IMAGE SOURCES; SEMI-INFINITE UNIFORM CLOUD FOR EXTERNAL BETA DOSE

<CLASS> DISCRETE; DETERMINISTIC; STOCHASTIC

<APPL> FAST REACTOR SAFETY SYSTEM DESIGN FOR HYPOTHETICAL CORE DISRUPTIVE ACCIDENTS

<USERS> ATOMICS INTERNATIONAL; WESTINGHOUSE; GENERAL ELECTRIC

<SUB> DOSE FACTORS FROM DDC GUIDES; INITIAL INVENTORIES FROM CODES SUCH AS FIMO2; FALLOUT RATES FROM NAA-30 CODE, LEAKAGE RATES FROM SOPHER, SONIX CODES

<HVEL> DATA TRACE, SEE N09971120005

<CON> SUPERSEDES COMRADEX-II AND COMRADEX-III CODES

<UPDATE> 700706

<300>

<COPY> STAFF, G. E.; WENDALL, L. L.

<TITLE> REGIONAL EFFLUENT DISPERSION CALCULATIONS CONSIDERING SPATIAL AND TEMPORAL METEOROLOGICAL VARIATIONS

<ACRO> MESOSOP

<ADDP> NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, AIR RESOURCES LABORATORIES

<CITY> IDAHO FALLS

<STATE> ID

<DOC> ERL ARL-84, 63 PP., 1974

<ABST> AN OBJECTIVE REGIONAL TRAJECTORY ANALYSIS SCHEME HAS BEEN CONSIDERED WITH A GAUSSIAN DIFFUSION MODEL TO YIELD A TECHNIQUE CALLED MESOSOP (MESOSCALE DIFFUSION). THE TRAJECTORY ANALYSIS SCHEME UTILIZED WIND DATA FROM A NETWORK OF TOWER-MOUNTED WIND SENSORS TO CONSIDER THE EFFECTS OF SPATIAL VARIABILITIES OF HORIZONTAL WIND FLOW NEAR THE SURFACE, INCORPORATED TIME CHANGES IN RATES OF DIFFUSION, AND USED AN UPPER LEVEL LTD TO VERTICAL MIXING. THE MESOSOP CALCULATIONS OF TOTAL INTEGRATED CONCENTRATIONS WERE COMPARED WITH CORRESPONDING CONVENTIONAL CALCULATIONS, USING WIND-ROSE JOINT FREQUENCY STATISTICS (SINGLE WIND STATION). COMPARISONS WERE MADE WITHIN A REGION ABOUT 100 BY 100 KM, AND FOR TIME SPANS FROM 6 HR TO 1 YR. THE DIAGNOSTIC COMPARISONS OF REGIONAL DISPERSION EFFECTS FROM EACH TECHNIQUE SHOWED SIGNIFICANT DIFFERENCES OVER THE RANGE OF SCALES CONSIDERED. EFFLUENT RECIRCULATIONS AND STAGNATIONS, RELATED TO LOCAL WIND VARIABILITIES ABOUT TERRAIN FEATURES, WERE BELIEVED TO PRODUCE LOCALIZED ZONES OF ENHANCED EXPOSURE TO AIRBORNE EFFLUENTS. THESE ZONES WERE NOT RESOLVED BY THE CONVENTIONAL WIND-ROSE MODEL. FOR SHORT OR ACCIDENTAL TYPE OF EMISSIONS, THE GREATEST SHORTCOMING OF THE SINGLE WIND-STATION DISPERSION MODEL WAS ITS FAILURE TO IDENTIFY, WHEN APPLIED WITHIN A REGION OF SPATIALLY VARIABLE WINDS, THE SUBREGION WHICH WOULD BE AFFECTED. AT DISTANCES BEYOND ABOUT 25 TO 50 KM, THE WIND-ROSE MODEL CALCULATIONS WERE SIGNIFICANTLY BIASED TO OVERESTIMATION OF ANNUAL TOTAL INTEGRATED CONCENTRATIONS BY ABOUT AN ORDER OF MAGNITUDE. THE INABILITY OF THE WIND ROSE MODEL TO ACCOMMODATE TIME CHANGES IN STABILITY CATEGORY DURING EFFLUENT TRANSPORT TO THE MORE DISTANT RECEPTORS WAS THE SINGLE MOST INFLUENTIAL FACTOR OF THIS BIAS. CURRENT USAGE OF THE WIND ROSE

ATMOSPHERIC TRANSPORT

<300> CONT.

TECHNIQUE FOR REGIONAL DISPERSION CALCULATIONS, ESPECIALLY AT THE LONGER DISTANCES, INCORPORATES SOME SYSTEMIC BIAS IN THE EVALUATIONS. THESE SHORTCOMINGS ARE POINTS OF CONCERN AND SHOULD BE RECONCILED WITH WHATEVER IMPACT ASSESSMENT SCHEMES ARE TO BE UTILIZED WITHIN THE MESOSCALE OR REGIONAL DOMAIN.

<301>

<CON> STEPHANO, D.; BARNBY, B. V.; THAKUR, P. C.

<TITLE> DIGITAL SIMULATION OF DIESEL EXHAUST CONTAMINATION OF MINE VENTILATION SYSTEMS

<ACPO> PSU/USM DIESEL MODELS

<ACRO> PENNSYLVANIA STATE UNIVERSITY, DEPARTMENT OF MINERAL ENGINEERING

<CITY> UNIVERSITY PARK

<STATE> PA

<ZIP> 16802

<PHONE> 814-863-7621

<SOURCE> NATIONAL TECHNICAL INFORMATION SERVICE; PENNSYLVANIA STATE UNIVERSITY;

<DOC> PB--206 299/251; AMERICAN SOCIETY OF MECHANICAL ENGINEERS, 76-BA/MT-20, 1-5

<SUB> DIESEL EXHAUST DISPERSION IN MINES

<ABST> THIS STUDY CONCEPTED ITSELF SPECIFICALLY WITH THE EFFECTS OF DIESELS ON MINE VENTILATION SYSTEMS. IN VIEW OF THE DIFFICULTIES INVOLVED IN PERFORMING CONTROLLED EXPERIMENTS UNDERGROUND, THIS APPROACH CONSISTED OF THE DEVELOPMENT OF MATHEMATICAL MODELS FOR EMISSIONS, DILUTION, AND DISPERSION. THE MODELS WERE PROGRAMED FOR COMPUTER-BASED OPERATION. THE DIESEL EMISSION AND DILUTION MODELS WERE INCORPORATED INTO A VENTILATION NETWORK PROGRAM FOR ANALYZING EXHAUST CONCENTRATIONS IN ALL THE ROADWAYS. THE VALIDITY OF THE CONCEPTUAL AND COMPUTATIONAL ASPECTS OF THE MODELS WERE ESTABLISHED BY TESTING THE MODEL SCIENTISTS WITH OBSERVED FIELD DATA. MOST OF THE VERIFICATIONS WERE PERFORMED WITH CO MEASUREMENT AS THIS WAS THE ONLY COMPONENT THAT WAS CONTINUOUSLY MONITORED. THIS LIBRARY OF PROGRAMS PROVIDES A MANAGEMENT LABORATORY WHERE THE VARIOUS VENTILATION ALTERNATIVES CAN BE ANALYZED WITH REGARD TO THEIR EFFECT ON VENTILATION SYSTEMS. ALTERNATIVELY, VENTILATION OF MINES CAN BE ENGINEERED TO PROVIDE SAFE WORKING ENVIRONMENT WITH DIESELS IN MINES.

<GEO> KENTUCKY

<TIME> 1970-1970

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> CARDS

<SIZE> 100K; 500 RECORDS

<COMP> IBM

<COMPI> IBM 360/370, 100K

<LANG> FORTRAN IV

<ALGO> TURBULENT FLOW MATH MODEL

<CLASS> PREDICTIVE; DETERMINISTIC

<APPL> JOY DIESEL EQUIPMENT IN MINES

<USERS> PSU; USM

<SHO> FIELD COLLECTION

<EVAL> FIELD DATA

<UPDATE> JULY 20, 1980

<302>

<CON> STEPHEN, D. S.; HOBBS, E. J.

<TITLE> WET PLUME SIZE FROM COOLING TOWERS IN STRONG WINDS

<ACRO> PENNSYLVANIA STATE UNIVERSITY

<CITY> UNIVERSITY PARK

<STATE> PA

<DOC> WATER, AIR, AND SOIL POLLUTION, 6(1), 9-24, 1976

<ABST> A MATHEMATICAL MODEL IS PRESENTED THAT PREDICTS, AS A FUNCTION OF DISTANCE DOWNWIND, THE HEIGHT OF THE CENTER LINE OF A SINGLE VISIBLE PLUME FROM A WET NATURAL-DRAFT COOLING TOWER IN MODERATE TO STRONG WINDS. THE ANALYTIC METHOD IS QUASI-LAGRANGIAN; THAT IS, THE BEHAVIOR OF A SMALL SECTION OF PARCEL OF THE PLUME IS ANALYZED AS A FUNCTION OF TIME. FIRST-ORDER DIFFERENTIAL EQUATIONS DESCRIBE THE PARCEL IN TERMS OF CHANGE IN MASS, VERTICAL VELOCITY, VERTICAL DISPLACEMENT, LENGTH OF SIDE, TEMPERATURE, MASS OF LIQUID WATER, HORIZONTAL VELOCITY, AND HORIZONTAL DISPLACEMENT. THE EQUATIONS ARE TRACTABLE FOR SOLUTION BY WELL-KNOWN COMPUTER INTEGRATION TECHNIQUES. THE MODEL WAS TESTED ON PLUMES FROM FOUR COOLING TOWERS AT AN ELECTRIC GENERATING PLANT, AND ITS PREDICTED PLUME PATH WAS COMPARED WITH DATA INTERPRETED FROM TIME-LAPSE PHOTOGRAPHS OF THE PLUMES. BEST RESULTS WERE OBTAINED BY APPLYING DRY PLUME ENTRAINMENT RATES IN THE EARLY STAGES AND CLOUD ENTRAINMENT RATES IN THE LATER STAGES. THE COMPUTED PREDICTION, EMPLOYING REASONABLE ESTIMATES WHERE NECESSARY, CLOSELY APPROXIMATED THE PHOTOGRAPHIC DATA FOR A DISTANCE OF 1500 M DOWNWIND ON A DAY WITH HIGH RELATIVE HUMIDITY. THE MODEL CAN ALSO BE USED TO ANALYZE THE NATURE OF WET PLUME BEHAVIOR.

<303>

<CON> STEIN, J. J.; KIN, Y. S.

<TITLE> USERS MANUAL FOR CODE EREGAN: A CODE TO CALCULATE GAMMA PHOTON DOSE FROM AN AIRBORNE RADIOACTIVE RELEASE

<ACRO> EREGAN

<ADDR> HUS CORPORATION, 1730 N STREET, N.W.

<M3>

ATMOSPHERIC TRANSPORT

<303> CONT.
 <CITY> WASHINGTON
 <STATE> DC
 <ZIP> 20036
 <DOC> NUS-329, 1966
 <ABST> A FORTRAN IV CODE - PEGAN - FOR USE ON A CDC-3600 DIGITAL COMPUTER HAS BEEN WRITTEN TO PREDICT THE INTEGRATED PHOTON DOSE AT A RECEPTOR EXPOSED TO AN ATMOSPHERIC RELEASE OF RADIOACTIVITY. THE CODE ASSUMES THE SOURCE SPATIAL DISTRIBUTION TO BE GAUSSIAN. INPUT OPTIONS ALLOW THE USER TO CHOOSE SOURCE DECAY MODE, CLOUD THICKNESS, CLOUD WIND SPEED, CLOUD STABILITY CLASS, CLOUD DRIFT DIRECTION, AIR ATTENUATION AND BUILD-UP COEFFICIENTS AND SOURCE PHOTON ENERGIES. THE CODE USER'S REQUIREMENTS ARE FORTRAN LISTING ARE GIVEN, ALONG WITH A SAMPLE INPUT AND OUTPUT. THE CODE HAS BEEN OPTIMIZED WITH RESPECT TO COMPUTER EXECUTION TIME.
 <CCRD> CDC
 <COMPI> CDC 3600
 <LANG> FORTRAN IV
 <CON> THIS CODE WAS DESIGNED TO BE USED AS PART OF THE SPACE NUCLEAR PROPELLION PROGRAM, NOT FOR RELEASES FROM NUCLEAR POWER FACILITIES.
 <CR>
 <CON> STENGLE, DENNIS L.
 <TITLE> LONG TERM ATMOSPHERIC DISPERSION CALCULATION
 <ACRO> LENGTH
 <ADDR> BATTLE-PACIFIC NORTHWEST LABORATORIES, POST OFFICE BOX 999
 <CITY> RICHLAND
 <STATE> WA
 <ZIP> 99352
 <PHONE> 509-942-4323; PTS 444-7511 EXT 942-4323
 <DOC> STENGLE, D.L. AND WATSON, E.C., KRONIC-A COMPUTER PROGRAM FOR CALCULATING ANNUAL AVERAGES..., BURL-8-264, JUNE 1973.
 <ABST> THIS PROGRAM CALCULATES NORMALIZED AIR CONCENTRATIONS AS A FUNCTION OF DISTANCE AND DIRECTION FROM A RELEASE POINT. INPUT DATA INCLUDE THE JOINT FREQUENCY METEOROLOGICAL DATA FOR THE SITE.
 <STATUS> IN USE
 <ACCESS> LIMITED
 <MEDIA> DISC: CARDS
 <SIZE> 150K OCTAL
 <COMP> UBI
 <LANG> FORTRAN
 <CHAR> ASCII
 <UPDATE> 780501
 <305>
 <CON> STUREL, J. J.; SOLOMON, P. L.; HUDSON, J. L.
 <TITLE> MODEL FOR THE DISPERSION OF PARTICULATE OR GASEOUS POLLUTANTS FROM A NETWORK OF STREETS AND HIGHWAYS
 <ADDR> UNIVERSITY OF ILLINOIS
 <CITY> URBANA
 <STATE> IL
 <DOC> ATMOSPHERIC ENVIRONMENT 9(17), 990-996, 1975
 <ABST> A MATHEMATICAL MODEL HAS BEEN DEVELOPED FOR PREDICTING THE ATMOSPHERIC TRANSPORT OF PARTICULATES OF ANY SIZE DISTRIBUTION AND OF GASEOUS POLLUTANTS. THE SOURCES ARE FINITE LENGTH LINE SEGMENTS REPRESENTING A NETWORK OF CITY STREETS AND RURAL HIGHWAYS. THE MODEL CAN BE USED TO PREDICT THE DISPERSION OF POLLUTANTS IN ANY REGION OF FLAT TERRAIN. THE INPUTS REQUIRED FOR THE MODEL ARE THE COORDINATES OF THE HIGHWAY SEGMENTS, TRAFFIC COUNTS, AND METEOROLOGICAL CONDITIONS. THE MODEL HAS BEEN USED TO ESTIMATE THE DISTRIBUTION, IN THE VICINITY OF URBANA-CHAMPAIGN, ILLINOIS, OF LEAD EMITTED FROM AUTOMOBILES. THE REGION HAS AN AREA OF 160 SQ. MILES AND INCLUDES BOTH RURAL AND URBAN SOURCES. THE MODEL IS USED TO INTERPRET RESULTS OF A SAMPLING PROGRAM IN A FOLLOWING PAPER.
 <GPC> ILLINOIS, URBANA-CHAMPAIGN
 <306>
 <CON> SULLIVAN, T.
 <TITLE> GLOBAL ANALYSIS OF A MERCATOR GRID OF SATELLITE DERIVED OZONE DATA
 <ACRO> WERSAT
 <ADDR> LAWRENCE LIVERMORE LABORATORY, C-DIV, P.O. BOX 809
 <CITY> LIVERMORE
 <STATE> CA
 <ZIP> 94550
 <PHONE> 415-422-1030; PTS 532-1030
 <SOURCE> RAW DATA ARE FROM SSN SATELLITE DATA, VEHICLE P-1, DEFENSE METEOROLOGICAL SATELLITE PROGRAM, SATELLITE DATA SERVICES BRANCH, WORLD WEATHER BUILDING, ROOM 606, 5200 AUTH ROAD, WASHINGTON, D.C. 20233
 <DOC> J.E. LOVILL, J. ELLIS, R. ELSAESSER, J. HUBEL, J. KNOX, J. ROYER, F. LUTHER, H. HACCPRACHEN, T. SULLIVAN, R. WEICHEL, GLOBAL OZONE DISTRIBUTION, OCEI-52473, 1978
 <SUB> TOTAL OZONE DISTRIBUTION
 <ABST> THIS MODEL PRODUCES GLOBAL ANALYSIS OF TOTAL OZONE OBSERVATIONS DERIVED FROM THE VINDUS III SPACE CRAFT INIS

ATMOSPHERIC TRANSPORT

<306> CONT.

EXPERIMENT AND THE DMSD (SSM) PROCESSED TOTAL OZONE DATA AND THE DMSD (SSM) PROCESSED TOTAL OZONE DATA. TWO, THREE, AND FOUR DEGREE GRID SPACING VERSIONS HAVE BEEN DEVELOPED. THE METHOD EMPLOYED IS THE CALCULATION OF AVERAGE GRID POINT VALUES IN DATA DENSE REGIONS OF THE GRID AND IN THE DATA VOID REGIONS A SUCCESSIVE CORRECTIONS METHOD (SCM) WITH OPTIONAL SELECTION OF THE NUMBER OF SCANS THROUGH THE DATA SET AND SELECTION OF A SERIES OF SCAN RADII GEOMETRY. SIMPLE SCANNING TWO DELTA FILTERING IS EMPLOYED. OUTPUT OPTIONS AT LLL INCLUDE LINE PRINTED MAPS, CPT AND MICROPLOT CONTOUR MAPS AND THREE-DIMENSIONAL SURFACE VIEWS.

<GEO> GLOBAL

<STATUS> IN USE AS REQUIRED; UNDER CONTINUING DEVELOPMENT AT VERY LOW SUPPORT LEVEL; CURRENTLY PRE-EMPTED BY A GLOBAL BY-CUBIC Spline INTERPOLATION METHOD.

<ACCESS> LIMITED TO AUTHORIZED RECIPIENTS; SUBJECT TO RELEASE BY HIGH ALTITUDE POLLUTION PROGRAM (HAPP) OFFICE, FAA/DOJ (THE FUNDING AGENCY)

<SIZE> CORE STATEMENTS WITH COMMENT CARDS: 50;
CORE STATEMENTS W/O COMMENT CARDS: 750

<COMP> CDC

<COPIES> CDC-6600: CDC 7600 LLL, MEMORY REQUIREMENT 177,000 OCTAL WITH USER TERMINAL AND DISK PACKS; 4 CPU MINUTES REQUIRED FOR AVERAGE RUN

<LANG> FORTRAN IV; LBLTRAN

<ALGO> CROSSHAR SUCCESSIVE CORRECTIONS, MULTIPLE-PASS, WITH SIMPLE SCANNING 2D FILTERING.

<CLASS> ANALYTICAL

<APPL> GLOBAL TOTAL OZONE DISTRIBUTION

<USERS> G-EIV LLL (PHYSICS DEPT)

<SWD> BIRDS III MICHELSON DATA AND DMSD (SSM/HR) FY DATA

<NTVL> COMPARISON WITH HAND ANALYSIS LOOKS GOOD.

<CCN> MODEL GENERATES A RECTANGULAR GRID FROM INPUT AREA SPECIFICATION, SPACING, ETC. ARE DISTORTION FACTORS ARE COMPUTED THEN INPUT DATA READ IN, UNSCALED AND COORDINATES (LAT/LON) CONVERTED TO INTERNAL REFERENCE SYSTEM. DATA SET IS THEN SCANNED AS FREQUENTLY AS SPECIFIED USING THE ENTERED (OR PRESELECTED) SCAN RADII. THE INFLUENCING CORRECTIONS AT A POINT ARE SUMMED, ADDED AND STORED UNTIL A SCAN IS COMPLETED. A SIMPLE TWO-DIMENSIONAL SMOOTHING IS PASSED OVER THE ANALYSIS AND THEN INTERPOLATION BACK TO THE DATA LOCATIONS IS PERFORMED TO DETERMINE THE FIT. UPON COMPLETION OF THE APPROPRIATE NUMBER OF SCANS, THE MODEL OUTPUTS A DISK FILE OF THE TWO DIMENSIONAL TOTAL OZONE ARRAY FOR FURTHER DISPLAY PROCESSING.

<UPDATED> 780606

<307>
<CONT> SUNDQVIST, N.

<TITLE> MULTILEVEL ATMOSPHERIC PREDICTION MODEL BASED ON PRIMITIVE EQUATIONS OF MOTION; THE PRIMITIVE EQUATION MULTI-LEVEL PREDICTION MODEL AT THE INSTITUTE OF METEOROLOGY.

<ADDR> INSTITUTE OF METEOROLOGY

<ABST> MODIFICATIONS OF A MULTILEVEL ATMOSPHERIC PREDICTION MODEL BASED ON THE PRIMITIVE EQUATIONS OF MOTION ARE DISCUSSED. AN EXPLICIT PLANETARY BOUNDARY LAYER TREATMENT WAS INTRODUCED INSTEAD OF THE EARLIER TREATMENT OF FRICTION AND HEAT FLUX AT THE EARTH SURFACE. A WATER VAPOR CONVEYANCE EQUATION AND LARGE SCALE CONDENSATION WERE INCORPORATED. AN INITIALIZATION PROCEDURE WAS DEVELOPED, MAKING IT POSSIBLE TO RUN THE MODEL ON REAL DATA OBJECTIVELY ANALYZED AT THE SWEDISH WEATHER BUREAU.

<309>

<CONT> THOMSON, DENNIS W.

<TITLE> STUDIES OF THE ENVIRONMENTAL IMPACT OF EVAPORATIVE COOLING TOWER PLUMES

<ADDR> PENNSYLVANIA STATE UNIVERSITY,
DEPARTMENT OF METEOROLOGY

<CITY> UNIVERSITY PARK

<STATE> PA

<ZIP> 16802

<PHONE> 717-865-2951

<ABST> (1) MEASUREMENTS WITHIN COOLING TOWER. (2) GROUND BASED MEASUREMENTS SUCH AS WITH THE SODAR EQUIPMENT. (3) USE OF INSTRUMENTED AIRCRAFT FOR PLUME MEASUREMENTS OF TEMPERATURE, VELOCITIES, DRIFT PARTICLE SIZE, AND SO₂ CONCENTRATION. (4) PUBLISHED PLUME DATA FROM OVER 20 FLIGHTS AND OVER 230 PLUME AIRCRAFT. (5) MEASUREMENTS OF PLUME DRIFT DROP SIZE DISTRIBUTIONS AS A FUNCTION OF DISTANCE FROM THE TOWER AND SOME MODEL ESTIMATES OF SALT DEPOSITION. (6) ELUCIDATION OF TWO CRITICAL AND COMPETING MECHANISMS FOR THE FORMATION OF SULFATE IN RISING STACK AND COOLING TOWER PLUMES. (7) THE FIRST CONTINUOUS MEASUREMENTS OF TURBULENCE (TEMPERATURE STRUCTURE CONSTANT) IN PLUMES FROM GROUND BASED SODAR AND DEMONSTRATION OF DESIRABILITY OF THIS APPROACH. (8) THE FIRST LATENT HEAT FLUX MEASUREMENTS IN A COOLING TOWER PLUME. (9) DETAILED PLANT ENERGY BALANCE MODEL FOR KEYSTONE POWER PLANT. (10) SENSITIVITY TESTING ON ONE-DIMENSIONAL PLUME MODEL. (11) PUBLICATION OF VOLUME OF MEASUREMENTS OF PLUME AND ASSOCIATED METEOROLOGICAL DATA FOR 20 FLIGHTS. (12) COMPLETION OF MEASUREMENTS ON COOLING TOWER PLUME AT KEYSTONE-CONNEAU COMPLEX. (13) COMPLETE AND PUBLISHED ANALYSIS OF KEYSTONE-CONNEAU PLUME MEASUREMENTS.

<309>

<CONT> TINGLE, ARTHUR G.

<TITLE> DYNAMIC MODEL OF SEA BREEZE CIRCULATIONS AND POLLUTANT TRANSPORT

<309>

ATMOSPHERIC TRANSPORT

<309> CUFF.

<UPDATE> 780607

<ADDR> BPOCKHAYEN NATIONAL LABORATORY,
ATMOSPHERIC SCIENCES, BLDG. 051

<CITY> WPTON

<STATE> NY

<ZIP> 11973

<PHONE> 516-345-2271; FTS 664-2271

<SOURCE> DEVELOPED AT DRL.

<DOC> D. L. KEEFER AND A. G. TISLER: A
NUMERICAL STUDY OF MESOSCALE TRANSPORT
OF AIR POLLUTANTS IN SEA-BREEZE
CIRCULATIONS., THIRD SYMPOSIUM ON
ATMOSPHERIC TURBULENCE, DIFFUSION AND
AIR QUALITY, OCT. 1976, AMER. METEOR.
SOC., BOSTON, MASS. 02100

<ABST> A NUMERICAL MODEL IS UTILIZED TO
SIMULATE MESOSCALE DISTRIBUTIONS OF AIR
POLLUTANTS FROM LARGE AREA SURFACE
SOURCES IN COASTAL LOCATIONS. MESOSCALE
WIND AND TEMPERATURE FIELDS, IN A PLANE
PERPENDICULAR TO AN INFINITELY LONG AND
STRAIGHT COAST LINE, ARE SIMULATED
USING A TIME DEPENDENT TWO-DIMENSIONAL
PRIMITIVE EQUATION MODEL IN WHICH
CIRCULATIONS ARE INDUCED BY
DIFFERENTIAL HEATING OF LAND AND WATER
SURFACES. THE DISTRIBUTIONS OF AIR
POLLUTANTS IN THREE DIMENSIONS ARE
SIMULATED USING A PARTICLE-IN-CELL
METHOD FOR A CHEMICALLY INERT,
NON-BUOYANT CONTAMINANT. RESULTS HAVE
BEEN OBTAINED FOR SEA-BREEZE
CIRCULATIONS RESULTING FROM DIFFERENT
SYNOPTIC SCALE FLOW CONDITIONS.

<GPO> FED YORK: LARK RICHARD

<TIME> MODEL GENERATES 12-HOUR FORECASTS.

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE

<SIZE> 1560 CARD IMAGES

<COMP> CDC

<CONFIG> CDC 7600 WITH 140 K CORE

<LANG> FORTRAN IV

<CHAR> ASCII

<ALGO> PRIMITIVE EQUATION, EXPLICIT, FOURTH
ORDER FINITE DIFFERENCING FOR SEA
BREEZE; QUASI-LAGRANGIAN FOR POLLUTANT
TRANSPORT AND DIFFUSION.

<CLASS> SIMULATION

<APPL> COASTAL AIR QUALITY AND LOCAL
METEOROLOGY

<USERS> DRL

<SUB> BOUNDARY LAYER METEOROLOGICAL
MEASUREMENTS.

<INVAL> COMPARISONS WITH BOUNDARY LAYER
METEOROLOGICAL MEASUREMENTS.

<310>

<COMP> TURNER, E. B.

<TITLE> CLIMATOLOGICAL DISPERSION MODEL

<ACFO> CMR

<ADDR> U.S. ENVIRONMENTAL PROTECTION AGENCY,
ENVIRONMENTAL MONITORING AND SUPPORT
LABORATORY, ENVIRONMENTAL APPLICATIONS
BRANCH, METEOROLOGY AND ASSESSMENT
DIVISION, MAIL STOP 80

<CITY> RESEARCH TRIANGLE PARK

<STATE> NC

<ZIP> 27711

<SOURCE> NATIONAL TECHNICAL INFORMATION SERVICE

<DOC> JOSE, A.D., AND J.B. EINERMAN, 1973,
USER'S GUIDE FOR THE CLIMATOLOGICAL
DISPERSION MODEL, U.S. EPA,
ENVIRONMENTAL MONITORING SERIES,
EPA-84-73-024, PB 227-306-AS, 131 PP.

<SUB> AIR POLLUTION DISPERSION

<ABST> DETERMINES LONG TERM (SEASONAL OR
ANNUAL) QUASI-STABLE POLLUTANT
CONCENTRATIONS AT ANY GROUND LEVEL
RECEPTOR USING AVERAGE EMISSION RATES
PER POINT AND AREA SOURCES AND A JOINT
FREQUENCY DISTRIBUTION OF WIND
DIRECTION, WIND SPEED, AND STABILITY
FOR THE SAME PERIOD.

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE

<SIZE> 80 BYTES PER RECORD; 10 RECORDS PER
BLOCK

<COMP> UFI

<CONFIG> UNIVAC 1110 WITH 22 K AND 9 TRACK TAPE;
ALSO IN 7 TRACK, BCD CODE

<LANG> FORTRAN V

<CHAR> ASCII OR EBCDIC

<CLASS> PREDICTIVE

<CON> THE SOURCE PROGRAM FOR THIS DISPERSION
MODEL IS AVAILABLE AS PART OF UNAMP
(VERSION 3), PB 277 193, \$350 FROM
COMPUTER PRODUCTS, NTIS, SPRINGFIELD,
VA 22161

<311>

<COMP> TURNER, E. B.

<TITLE> GAUSSIAN-PLUME MULTIPLE SOURCE AIR
QUALITY ALGORITHM

<ACFO> RAN

<ADDR> U.S. ENVIRONMENTAL PROTECTION AGENCY,
ENVIRONMENTAL SCIENCES RESEARCH
LABORATORY, ENVIRONMENTAL APPLICATIONS
BRANCH, MAIL STOP 80

<CITY> RESEARCH TRIANGLE PARK

ATMOSPHERIC TRANSPORT

<311> CONT.
<STATE> NC

<EIP> 27711

<DOC> BOYAK, J.R., AND TURNER, D.B., AN EFFICIENT GAUSSIAN-PLUME MULTIPLE-SOURCE AIR QUALITY ALGORITHM, JOURNAL AIR POLLUTION CONTROL ASSOCIATION, 26(4), 570-575, 1976.

<SUB> URBAN AIR POLLUTION

<ABST> DAB IS A GAUSSIAN-PLUME MULTIPLE SOURCE AIR QUALITY ALGORITHM. THIS SHOOT-TIME GAUSSIAN STEADY-STATE ALGORITHM ESTIMATES CONCENTRATIONS OF STABLE POLLUTANTS FROM URBAN POINT AND AREA SOURCES. HOURLY METEOROLOGICAL DATA ARE USED. HOURLY CONCENTRATIONS AND AVERAGES OVER A NUMBER OF HOURS CAN BE ESTIMATED. BRIGGS PLUME RISE IS USED. PASQUILL-GIFFORD DISPERSION EQUATIONS WITH DISPERSION PARAMETERS THOUGHT TO BE VALID FOR URBAN AREAS ARE USED. CONCENTRATIONS FROM AREA SOURCES ARE DETERMINED USING THE METHOD OF HANBA; THAT IS, SOURCES DIRECTLY UPWIND ARE CONSIDERED REPRESENTATIVE OF AREA SOURCE EMISSIONS AFFECTING THE RECEPTOR. SPECIAL FEATURES INCLUDE DETERMINATION OF RECEPTOR LOCATIONS DOWNWIND OF SIGNIFICANT SOURCES; AND DETERMINATION OF LOCATIONS OF UNIFORMLY SPACED RECEPTORS TO ENSURE GOOD AREA COVERAGE WITH A MINIMUM NUMBER OF RECEPTORS.

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE

<STED> 80 BYTES PER RECORD; 10 RECORDS PER BLOCK

<COMP> GSI

<CONFIG> UNIVAC 1110 81 K CORE, 9 TRACK TAPE; ALSO IN 7 TRACK, BCD CODE

<LANG> FORTRAN V

<CARD> ASCII; EBCDIC

<CLASS> PREDICTIVE

<CON> THE SOURCE PROGRAM FOR THIS DISPERSION MODEL IS AVAILABLE AS PART OF URBANAP (VERSION 3), PD 277 193, 6350 FROM COMPUTER PRODUCTS, HTIS, SPRINGFIELD, VA 22161

<312>
<CONT> TURNER, D. B.

<TITLE> A HIGHWAY AIR POLLUTION MODEL

<ACRO> HIAW

<ABST> U.S. ENVIRONMENTAL PROTECTION AGENCY, ENVIRONMENTAL MONITORING AND SUPPORT LABORATORY, ENVIRONMENTAL APPLICATIONS BRANCH, RAIL DROP 80

<CITY> RESEARCH TRIANGLE PARK

<STATE> NC

<EIP> 27711

<DOC> SIEBERMAN, J.R., AND B.S. THOMPSON,

1975, USER'S GUIDE FOR HIAW, A HIGHWAY AIR POLLUTION MODEL, U.S. ENVIRONMENTAL PROTECTION AGENCY, ENVIRONMENTAL MONITORING SERVICES, EPA-656/a-70-000, PB 279-900/AS, 59 PP.

<SUB> AIR POLLUTION OVER HIGHWAYS

<ABST> AN INTERACTIVE PROGRAM WHICH COMPUTES THE HOURLY CONCENTRATIONS OF NON-REACTIVE POLLUTANTS DOWNWIND OF HIGHWAYS. IT IS APPLICABLE FOR UNIFORM WIND CONDITION AND LEVEL TERRAIN. ALTHOUGH BEST SUITED FOR AT-GRADE HIGHWAYS, IT CAN ALSO BE APPLIED TO DEPRESSIONED HIGHWAYS (CUT SECTIONS). USER SPECIFIES GEOMETRY AND EMISSIONS OF ROADWAY SEGMENT, METEOROLOGICAL CONDITIONS TO BE SIMULATED, AND RECEPTOR COORDINATES AND HEIGHT OF RECEPTOR ABOVE GROUND.

<STATUS> IN USE

<MEDIA> MAGNETIC TAPE

<SIZE> 80 BYTES PER RECORD; 10 RECORDS PER BLOCK

<COMP> GSI

<CONFIG> UNIVAC 1110 WITH 12 K CORE; 9 TRACK TAPE; ALSO IN 7 TRACK, BCD CODE

<LANG> FORTRAN V

<CARD> ASCII; EBCDIC; BCD

<CLASS> PREDICTIVE

<CON> THE SOURCE PROGRAM FOR THIS DISPERSION MODEL IS AVAILABLE AS PART OF URBANAP (VERSION 3) PD-277-193, 6350 FROM COMPUTER PRODUCTS, HTIS, SPRINGFIELD, VA 22161

<313>
<CONT> TURNER, D. B.

<TITLE> URBAN CARBON MONOXIDE MODEL

<ACRO> APRAC

<ABST> U.S. ENVIRONMENTAL PROTECTION AGENCY, ENVIRONMENTAL SCIENCES RESEARCH LABORATORY, ENVIRONMENTAL APPLICATIONS BRANCH, RAIL DROP 80, EPA

<CITY> RESEARCH TRIANGLE PARK

<STATE> NC

<EIP> 27711

<SOURCE> NATIONAL TECHNICAL INFORMATION SERVICE

<DOC> USER'S MANUAL FOR THE APRAC-1A URBAN DIFFUSION MODEL COMPUTER PROGRAM, PD 213-091; DABBERT, W.F., LEWIS, F.L., JOHNSON, W.B., JR., VALIDATION AND APPLICATIONS OF AN URBAN DIFFUSION MODEL FOR VEHICULAR POLLUTANTS, ATMOSPHERIC ENVIRONMENT, 7, 603-610, 1973; JOHNSON, W.B., LEWIS, F.L., DABBERT, W.F., ALLEN, R.J., AN URBAN DIFFUSION SIMULATION MODEL FOR CARBON MONOXIDE, JOURNAL AIR POLLUTION CONTROL ASSOCIATION, 23(6), 690-698, 1973.

<SUB> AIR QUALITY SIMULATION STUDIES FOR VEHICULAR POLLUTANTS

<ABST> STANFORD RESEARCH INSTITUTE'S URBAN

<373>

ATMOSPHERIC "TRANSPC9"

<373> CONT.

CARBON MONOXIDE MODEL FOR VEHICULAR POLLUTANTS COMPUTER HOURLY AVERAGES FOR ANY URBAN LOCATION. IT PROVIDES AN EXTENSIVE TRAFFIC INVENTORY FOR THE CITY OF INTEREST.

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE

<SIZE> 80 BYTES PER RECORD; 10 RECORDS PER BLOCK

<COMP> UBI

<CONFIG> UNIVAC 1110 WITH 32 K CORE AND 9 TRACK TAPE; ALSO IN 7 TRACK (556 OR 900 DPI)

<LANG> FORTRAN V

<CHAR> ASCII; EBCDIC; BCD

<CLASS> PREDICTIVE

<CON> THE SOURCE PROGRAM FOR THIS DISPERSION MODEL IS AVAILABLE AS PART OF UNHAP (VERSION 3), PB 277 193, \$350 FROM COMPUTER PRODUCTS, HTIS, SPRINGFIELD, VA 22161

<374>

<CONT> TURNER, D. B.

<TITLE> A POINT SOURCE MODEL TO ESTIMATE HOURLY CONCENTRATIONS FOR STABLE POLLUTANTS

<ACRO> PTDIS

<ADDR> U.S. ENVIRONMENTAL PROTECTION AGENCY, ENVIRONMENTAL SCIENCES RESEARCH LABORATORY, ENVIRONMENTAL APPLICATIONS BRANCH, MAIL DROP 80, EPA

<CITY> RESEARCH TRIANGLE PARK

<STATE> NC

<ZIP> 27711

<SOURCE> HTIS

<DOC> TURNER, D.B., AND BUSSE, A.D., 1973, USER'S GUIDES TO THE INTERACTIVE VERSIONS OF THREE POINT SOURCE DISPERSION PROGRAMS: PTRAX, PTDIS, AND PTRP PRELIMINARY DRAFT, METEOROLOGY LABORATORY, U.S. EPA

<SUB> ESTIMATES GROUND LEVEL CONCENTRATIONS DIRECTLY DOWNWIND OF POLLUTION SOURCE

<ABST> PTDIS IS AN INTERACTIVE PROGRAM THAT ESTIMATES SHORT-TERM CONCENTRATIONS DIRECTLY DOWNWIND OF A POINT SOURCE AT DISTANCES SPECIFIED BY USER. THE EFFECT OF LIMITING VEHICLE DISPERSION BY A MIXING HEIGHT CAN BE INCLUDED AND GROUND PLANE RISE TO THE POINT OF FINAL RISE IS ALSO CONSIDERED. AN OPTION ALLOWS THE CALCULATIONS OF ISOPLETH HALF-WIDTHS FOR SPECIFIC CONCENTRATIONS AT EACH DOWNWIND DISTANCE. TABLE PRODUCED WITH DISTANCE, HEIGHT OF PLANE, AND GROUND-LEVEL CONCENTRATION GIVEN FOR EACH DISTANCE MAY REITERATE FOR ADDITIONAL METEOROLOGICAL CONDITIONS IN SAME RUN, OR FOR ADDITIONAL SOURCE AND METEOROLOGY IN SAME RUN.

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE

<SIZE> 80 BYTES PER RECORD; 10 RECORDS PER BLOCK

<COMP> UBI

<CONFIG> UNIVAC 1110 WITH 32 K CORE, 9 TRACK TAPE; ALSO IN 7 TRACK, BCD CODE

<LANG> FORTRAN V

<CHAR> ASCII OR EBCDIC

<CLASS> PREDICTIVE

<CON> THE SOURCE PROGRAM FOR THIS DISPERSION MODEL IS AVAILABLE AS PART OF UNHAP (VERSION 3), PB 277 193, \$350 FROM COMPUTER PRODUCTS, HTIS, SPRINGFIELD, VA 22161

<375>

<CONT> TURNER, D. B.

<TITLE> A POINT SOURCE MODEL TO ESTIMATE HOURLY CONCENTRATIONS FOR STABLE POLLUTANTS

<ACRO> PTRAX

<ADDR> U.S. ENVIRONMENTAL PROTECTION AGENCY, ENVIRONMENTAL SCIENCES RESEARCH LABORATORY, ENVIRONMENTAL APPLICATIONS BRANCH, MAIL DROP 80

<CITY> RESEARCH TRIANGLE PARK

<STATE> NC

<ZIP> 27711

<SOURCE> NATIONAL TECHNICAL INFORMATION SERVICE

<DOC> TURNER, D.B., AND BUSSE, A.D., 1973, USER'S GUIDES TO THE INTERACTIVE VERSIONS OF THREE POINT SOURCE DISPERSION PROGRAMS: PTRAX, PTDIS, AND PTRP PRELIMINARY DRAFT, METEOROLOGY LABORATORY, U.S. ENVIRONMENTAL PROTECTION AGENCY

<SUB> ESTIMATES SHORT-TERM GROUND LEVEL CONCENTRATIONS OF AIR POLLUTION FROM A SINGLE POINT SOURCE

<ABST> PTRAX IS AN INTERACTIVE PROGRAM THAT PERFORMS AN ANALYSIS OF THE MAXIMUM SHORT-TERM CONCENTRATIONS FROM A SINGLE POINT SOURCE AS A FUNCTION OF STABILITY AND WIND SPEED. THE FINAL PLANE HEIGHT IS USED FOR EACH COMPUTATION. OUTPUT IS TWO-DIMENSIONAL TABLE GIVING MAXIMUM CONCENTRATION, DISTANCE TO MAXIMUM, AND HEIGHT OF FINAL RISE FOR EACH STABILITY-WIND SPEED COMBINATION.

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE

<SIZE> 80 BYTES PER RECORD; 10 RECORDS PER BLOCK

<COMP> UBI

<CONFIG> UNIVAC 1110 WITH 32 K CORE, 9 TRACK TAPE; ALSO IN 7 TRACK, BCD CODE

ATMOSPHERIC TRANSPORT

<375> COMP.
 <LANG> FORTRAN V
 <CHAR> ASCII; EBCDIC
 <CLASS> PREDICTIVE
 <CONT> ABLE TO RUN ADDITIONAL SOURCES IN SAME RUN. THE SOURCE PROGRAM FOR THIS DISPERSION MODEL IS AVAILABLE AS PART OF UNAHAP (VERSION 3), PB 277 193, 9350 FROM COMPUTER PRODUCTS, NTIS, SPRINGFIELD, VA 22161

<376>
 <CONT> TURNER, D. B.
 <TITLE> A POINT SOURCE MODEL TO ESTIMATE HOURLY CONCENTRATIONS FOR STABLE POLLUTANTS
 <ACRO> FINTP
 <ADDR> U.S. ENVIRONMENTAL PROTECTION AGENCY, ENVIRONMENTAL SCIENCES RESEARCH LABORATORY, ENVIRONMENTAL APPLICATIONS BRANCH, PAUL DRUPP RD
 <CITY> RESEARCH TRIANGLE PARK
 <STATE> NC
 <ZIP> 27711
 <SOURCE> NTIS
 <DOC> TURNER, D.B., BUSSE, A.D., 1977, USER'S GUIDES TO THE INTERACTIVE VERSIONS OF THREE POINT SOURCE DISPERSION PROGRAMS: FTRAI, FTRIS, AND FINTP PRELIMINARY DRAFT, METEOROLOGY LABORATORY, U.S. ENVIRONMENTAL PROTECTION AGENCY
 <SUB> ESTIMATES MULTIPLE HOURLY CONCENTRATIONS AT ARBITRARY HEIGHT FOR MULTIPLE SOURCES OF AIR POLLUTION
 <ABST> FINTP IS AN INTERACTIVE PROGRAM THAT ESTIMATES FOR A NUMBER OF ARBITRARILY LOCATED RECEPTOR POINTS AT OR ABOVE GROUND-LEVEL, THE CONCENTRATION FROM A NUMBER OF POINT SOURCES. PLUME RISE IS DETERMINED FOR EACH SOURCE. DOWNWIND AND CROSSWIND DISTANCES ARE DETERMINED FOR EACH SOURCE-RECEPTOR PAIR. CONCENTRATIONS AT A RECEPTOR FROM VARIOUS SOURCES ARE ASSUMED ADDITIVE. HOURLY METEOROLOGICAL DATA ARE USED. BOTH HOURLY CONCENTRATIONS AND AVERAGES OVER ANY AVERAGING TIME FROM ONE TO 24 HOURS CAN BE OBTAINED.

<STATUS> IN USE
 <ACCESS> UNLIMITED
 <MEDIA> MAGNETIC TAPE
 <SIZE> 80 BYTES PER RECORD; 10 RECORDS PER BLOCK
 <COMP> IBM
 <CONFIG> IBM 360 WITH 12 K CORE, 9 TRACK TAPE; ALSO IN 7 TRACK, BCD CODE
 <LANG> FORTRAN V
 <CHAR> ASCII; EBCDIC
 <CLASS> PREDICTIVE
 <CON> THE SOURCE PROGRAM FOR THIS DISPERSION MODEL IS AVAILABLE AS PART OF UNAHAP

(VERSION 3), PB 277 193, 9350 FROM COMPUTER PRODUCTS, NTIS, SPRINGFIELD, VA 22161

<377>
 <CONT> TURNER, D. B.
 <TITLE> SINGLE SOURCE (CPSTER) MODEL
 <ACRO> CPSTER
 <ADDR> U.S. ENVIRONMENTAL PROTECTION AGENCY
 <CITY> RESEARCH TRIANGLE PARK
 <STATE> NC
 <ZIP> 27711
 <DOC> USER'S MANUAL FOR SINGLE SOURCE (CPSTER) MODEL, OFFICE OF AIR QUALITY PLANNING AND STANDARDS, EPA-650/2-77-013, NTIS PB 271 360, JULY, 1977
 <SUB> AIR POLLUTION CONCENTRATIONS
 <ABST> CPSTER-THIS ALGORITHM ESTIMATES GROUND-LEVEL CONCENTRATIONS RESULTING FROM UP TO 19 COLOCATED ELEVATED STACK EMISSIONS FOR AN ENTIRE YEAR AND PRINTS OUT THE HIGHEST AND SECOND-HIGHEST 1-HOUR, 3-HOUR, AND 24-HOUR CONCENTRATIONS AS WELL AS THE ANNUAL MEAN CONCENTRATIONS AT A SET OF 100 RECEPTORS (5 DISTANCES BY 20 AZIMUTHS). THE ALGORITHM IS BASED ON A MODIFIED FORM OF THE STEADY-STATE GAUSSIAN PLUME EQUATION WHICH USES EMPIRICAL DISPERSION COEFFICIENTS AND INCLUDES ADJUSTMENTS FOR PLUME RISE AND LIMITED MIXING. TERRAIN ADJUSTMENTS ARE MADE AS LONG AS THE SURROUNDING TERRAIN IS PHYSICALLY LOWER THAN THE LOWEST STACK HEIGHT INPUT. POLLUTANT CONCENTRATIONS FOR EACH AVERAGING TIME ARE COMPUTED FOR DISCRETE, NON-OVERLAPPING TIME PERIODS (NO RUNNING AVERAGES ARE COMPUTED) USING MEASURED HOURLY VALUES OF WIND SPEED AND DIRECTION, AND ESTIMATED HOURLY VALUES OF ATMOSPHERIC STABILITY AND MIXING HEIGHT.

<STATUS> IN USE
 <ACCESS> UNLIMITED
 <MEDIA> MAGNETIC TAPE
 <SIZE> 80 BYTES PER RECORD; 10 RECORDS PER BLOCK
 <COMP> IBM
 <CONFIG> IBM 360 WITH 20 K CORE AND 9 TRACK TAPE; ALSO IN 7 TRACK, BCD CODE
 <LANG> FORTRAN V
 <CHAR> ASCII; EBCDIC
 <CLASS> PREDICTIVE
 <CON> THE SOURCE PROGRAM FOR THIS DISPERSION MODEL IS AVAILABLE AS PART OF UNAHAP (VERSION 3), PB 277 193, 9350 FROM COMPUTER PRODUCTS, NTIS, SPRINGFIELD, VA 22161

<378>
 <CONT> TURNER, D. B.

<318>

ATMOSPHERIC TRANSPORT

<318> CONT.

<TITLE> POINT, AREA, LINE SOURCE ALGORITHM

<ACR> PAL

<ADDR> U.S. ENVIRONMENTAL PROTECTION AGENCY-
ENVIRONMENTAL MONITORING AND SUPPORT
LABORATORY, ENVIRONMENTAL APPLICATIONS
BRANCH, MAIL STOP 80

<CITY> RESEARCH TRIANGLE PARK

<STATE> NC

<ZIP> 27711

<NOTES> PETERSON, W.A., 1970, USER'S GUIDE FOR
PAL-A GAUSSIAN-PLUME ALGORITHM FOR
POINT, AREA, AND LINE SOURCES, U.S.
EPA, ENVIRONMENTAL MONITORING SERIES,
EPA-600/4-70-012, 123 PP.; TURNER,
W.B., AND PETERSEN, W.A., 1975, A
GAUSSIAN-PLUME ALGORITHM FOR POINT,
AREA, AND LINE SOURCES, NATO/CCRS SIXTH
INTERDISCIPLINARY TECHNICAL MEETING ON AIR
POLLUTION MODELING AND ITS APPLICATIONS,
82, 105-228<SUB> SMALL SCALE ANALYSIS OF AIR POLLUTION
CONCENTRATION<ABST> THIS SHORT-TERM GAUSSIAN STEADY STATE
ALGORITHM ESTIMATES CONCENTRATIONS OF
STABLE POLLUTANTS FROM POINT, AREA, AND
LINE SOURCES. COMPUTATIONS FROM AREA
SOURCES INCLUDE EFFECTS OF THE EDGE OF
THE SOURCE. LINE SOURCE COMPUTATIONS
CAN INCLUDE EFFECTS FROM A VARIABLE
EMISSION RATE ALONG THE SOURCE. THE
ALGORITHM IS NOT INTENDED FOR
APPLICATION TO ENTIRE URBAN AREAS BUT
FOR SPALLER SCALE ANALYSIS OF SUCH
SOURCES AS SHOPPING CENTERS, AIRPORTS,
AND SINGLE PLANTS. HOURLY
CONCENTRATIONS ARE ESTIMATED AND
AVERAGE CONCENTRATIONS FROM 1 HOUR TO
24 HOURS CAN BE OBTAINED.

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE

<SIZE> 80 BYTES PER RECORD, 10 LOGICAL RECORDS
PER BLOCK

<COMP> UNIV

<CONFIG> UNIVAC 1110 WITH 27 K CODE AND 9 TRACK
TAPE; ALSO IN 7 TRACK, BCD CODE

<LANG> FORTRAN V

<CHAR> ASCII; EBCDIC

<CLASS> PREDICTIVE

<CON> THE SOURCE PROGRAM FOR THIS DISPERSION
MODEL IS AVAILABLE AS PART OF UNANAP
(VERSION 3), PB 277 193, 8350 FROM
COMPUTER PRODUCTS, PTIS, SPRINGFIELD,
VA 22161

<319>

<CONT> TURNER, D. B.

<TITLE> A STEADY-STATE, UNIVARIATE GAUSSIAN
PLUME DISPERSION ALGORITHM

<ACR> VALLEY

<ADDR> U.S. ENVIRONMENTAL PROTECTION AGENCY,

ENVIRONMENTAL MONITORING AND SUPPORT
LABORATORY, ENVIRONMENTAL APPLICATIONS
BRANCH, MAIL STOP 80

<CITY> RESEARCH TRIANGLE PARK

<STATE> NC

<ZIP> 27711

<DOC> BURT, E., VALLEY MODEL USER'S GUIDE,
EPA-650/2-77-010, SEPTEMBER, 1977

<SUB> AIR POLLUTION DISPERSION

<ABST> THIS ALGORITHM IS A STEADY-STATE,
UNIVARIATE GAUSSIAN PLUME DISPERSION
ALGORITHM DESIGNED FOR ESTIMATING
EITHER 24-HOUR OR ANNUAL CONCENTRATIONS
RESULTING FROM EMISSIONS FROM UP TO 50
(TOTAL) POINT AND AREA SOURCES.
CALCULATIONS OF GROUND-LEVEL POLLUTANT
CONCENTRATIONS ARE MADE FOR EACH
FREQUENCY DESIGNATED IN AN AREA* DIVIDED
BY SIX STABILITIES, 16 WIND DIRECTIONS,
AND SIX WIND SPEEDS *AND 112
PROGRAM-DESIGNED RECEPTOR SITES ON A
RADIAL GRID OF VARIABLE SCALE.
EMPIRICAL DISPERSION COEFFICIENTS ARE
USED AND INCLUDE ADJUSTMENTS FOR PLUME
SIZE AND LIMITED MIXING. PLUME HEIGHT
IS ADJUSTED ACCORDING TO TERRAIN
ELEVATIONS AND STABILITY CLASSES.

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE

<SIZE> 80 BYTES PER RECORD; 10 RECORDS PER
BLOCK

<COMP> UNIV

<CONFIG> UNIVAC 1110 WITH 13 K CODE AND 9 TRACK
TAPE; ALSO IN 7 TRACK, BCD CODE

<LANG> FORTRAN V

<CHAR> ASCII; EBCDIC

<CLASS> PREDICTIVE

<CON> THE SOURCE PROGRAM FOR THIS DISPERSION
MODEL IS AVAILABLE AS PART OF UNANAP
(VERSION 3), PB 277 193, 8350 FROM
COMPUTER PRODUCTS, PTIS, SPRINGFIELD,
VA 22161.

<320>

<CONT> VAITKUS, D. B.; EDWARDS, R. W.;
JOHNSON, G. R.<TITLE> MODEL FOR ENVIRONMENTAL TRANSPORT OF
MOTORISTIVE LEAD

<ADDR> COLORADO STATE UNIVERSITY

<CITY> FT. COLLINS

<STATE> CO

<ZIP> 80521

<ABST> DEVELOPMENT OF A MODEL FOR SHORT RANGE
ENVIRONMENTAL TRANSPORT AND
ACCUMULATION OF AUTOMOTIVE LEAD IS PART
OF THE COLORADO STATE UNIVERSITY
INTERDISCIPLINARY STUDY OF
ENVIRONMENTAL CONTAMINATION BY LEAD.
ATMOSPHERIC TRANSPORT OF LEAD FROM A
HIGHWAY AND ITS REMOVAL FROM THE

ATMOSPHERIC TRANSPORT

<320> CONT.

ATMOSPHERE BY GRAVITATIONAL SETTLING, RAINOUT AND RAINWASH ARE COUPLED TO MIGRATION AND DETENTION IN SOIL. THE MATHEMATICAL MODEL CONSISTS OF A SYSTEM OF LINEAR, ORDINARY DIFFERENTIAL EQUATIONS WHICH QUANTITATIVELY INTERRELATES THE TRANSPORT AND ACCUMULATION MECHANISMS. THE MODEL IS DISCUSSED IN TERMS OF PREDICTIVE CAPABILITIES AND CORRELATION WITH EXPERIMENTAL RESULTS FROM FIELD MEASUREMENTS.

<321>

<CONF> VAN DER HOVEN, F.

<TITLE> ATMOSPHERIC TRANSPORT AND DIFFUSION IN THE PLANETARY BOUNDARY LAYER

<ADDR> NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, AIR RESOURCES LABORATORIES

<CITY> SILVER SPRING

<STATE> MD

<DOC> NCAL-78-EDL-ARL--39, PP.84, JUN 1973

<ABST> A COMPUTERIZED MODEL HAS BEEN PROGRAMMED TO CALCULATE THE EFFECTS OF SIMULATED REACTOR ACCIDENT AND ANNUAL AVERAGE ATMOSPHERIC DILUTION FACTORS ON CONTAMINATION OF THE ENVIRONMENT BY NUCLEAR POWER STATIONS. THIS PROGRAM MAKES IT POSSIBLE TO RAPIDLY EVALUATE POTENTIAL NUCLEAR POWER STATION SITES IN A CONSISTENT MANNER. FOR INPUT TO THE PROGRAM, THE APPLICANT MUST PROVIDE A JOINT FREQUENCY DISTRIBUTION OF WIND SPEED AND STABILITY CLASSES FOR EACH DIRECTIONAL SECTOR FROM A REPRESENTATIVE 12-MONTH PERIOD. IN MOST CASES, PERIODS OF CALM ARE INCLUDED SEPARATELY AS THE NUMBER OF CALMS OCCURRING FOR EACH STABILITY CLASS. THE PROGRAM ASSIGNS THE CALMS TO THE VARIOUS SECTORS IN THE SAME RATIO AS THE LOWEST WIND SPEED CLASS AND ADJUS THEN TO THAT CATEGORY. ALSO INCLUDED AS INPUT TO THE PROGRAM ARE THE DISTANCES TO THE SITE BOUNDARY FOR EACH SECTOR, THE CROSS-SECTIONAL AREA AND HEIGHT OF THE REACTOR BUILDING, AND THE DISTANCE TO THE NEAREST POPULATION CENTER. IF THE REACTOR HAS A STACK, THE APPLICANT ALSO INCLUDES THE HEIGHT AND DIAMETER OF THE STACK AND THE EXIT VELOCITY OF EFFLUENT, THE DISTANCE AND BEARING OF THE STACK FROM THE REACTOR, THE DISTANCES FROM THE STACK TO THE SITE BOUNDARIES FOR EACH SECTOR, AND INFORMATION ON TERRAIN. TERRAIN HEIGHTS AND DISTANCES ARE READ INTO THE PROGRAM FOR EACH SECTOR AND THE PROGRAM PERFORMS A LINEAR INTERPOLATION TO OBTAIN THE TERRAIN HEIGHT AT ANY DESIRED LOCATION. PLUME RISE IS DETERMINED BY THE FORMULAS DEVELOPED BY EPIC68 (1969). METHODS USED FOR THE MEASUREMENT OF THE METEOROLOGICAL PARAMETERS REQUIRED ARE DESCRIBED. RESULTS ARE INCLUDED FROM A STUDY OF THE EFFECT OF A CITY ON THE LOW-LEVEL WINDFIELD, CARRIED OUT AT OKLAHOMA CITY AND IN COLORADO. DATA ARE ALSO INCLUDED FROM STUDIES ON THE EFFECTS OF SAMPLING INTERVAL ON TURBULENT ENERGY SPECTRA, DIRECTIONAL WIND SHEAR UNDER LOW WIND SPEED CONDITIONS, THE APPLICABILITY OF GEOSTROPHIC WINDS TO MESOSCALE TRANSPORT, THE USE OF

MESOSCALE WINDFIELD DATA IN THE PREPARATION OF PROGNOSTIC WEATHER CHARTS, DIAGNOSTIC APPLICATIONS OF WIND SPEED AND COMPONENT SPECTRA, AND METHODS FOR THE PREDICTION OF LONG-TERM TRAJECTORIES OF PASSIVE GASEOUS EFFLUENTS USING SINGLE AND MULTI-STACK MODELS AND LONG DISTANCE TRANSPORT AND DIFFUSION OF GASEOUS WASTES.

<322>

<CONF> VEDANTHAN, A.; VISWANATH, R.

<TITLE> RADIATIVE EFFECTS OF POLLUTANTS ON THE PLANETARY BOUNDARY LAYER

<ADDR> PURDUE UNIVERSITY, SCHOOL OF MECHANICAL ENGINEERING

<CITY> LAFAYETTE

<STATE> IN

<DOC> PR--257707, 1976

<ABST>

THE OBJECTIVE OF THIS STUDY WAS TO GAIN A BETTER UNDERSTANDING OF THE EFFECTS OF POLLUTANTS ON THE THERMAL STRUCTURE AND POLLUTANT DISPERSAL IN THE PLANETARY BOUNDARY LAYER. TO THIS END NUMERICAL MODELS OF THE BOUNDARY LAYER WERE CONSTRUCTED. GASEOUS POLLUTANTS IN THE BOUNDARY LAYER WERE CONSIDERED TO ABSORB AND EMIT THERMAL RADIATION, WHILE AEROSOLS WERE ALLOWED TO ABSORB AND SCATTER SOLAR ENERGY. FIRST, A ONE-DIMENSIONAL NUMERICAL MODEL OF THE BOUNDARY LAYER WAS CONSTRUCTED. THE MODEL USED THE TWO-STREAM METHOD FOR THE COMPUTATION OF RADIATIVE FLUXES, AND A TURBULENT KINETIC ENERGY MODEL TO ACCOUNT FOR TURBULENCE. A SERIES OF NUMERICAL EXPERIMENTS WERE PERFORMED TO DETERMINE THE ROLE OF POLLUTANTS IN MODIFYING THERMAL STRUCTURE AND POLLUTANT DISPERSAL IN THE BOUNDARY LAYER. THE RESULTS SHOWED THAT THE PREDOMINANT INFLUENCE OF GASEOUS AND PARTICULATE POLLUTANTS ON SURFACE TEMPERATURE WAS WARMING. THE SECOND PHASE OF THE STUDY INVOLVED THE CONSTRUCTION OF A TWO-DIMENSIONAL NUMERICAL MODEL TO STUDY THE EFFECTS OF POLLUTANTS ON URBAN-RURAL DIFFERENCES IN THERMAL STRUCTURE AND POLLUTANT DISPERSAL. THE EFFECTS OF POLLUTANTS ON POLLUTANT DISPERSAL WERE FOUND TO BE SIGNIFICANT.

<323>

<CONF> VISWANATH, R.; BERGSTRON, P. W., JR.; JOHNSON, R. J.

<TITLE> MODELING OF THE EFFECTS OF POLLUTANTS AND DISPERSION IN URBAN ATMOSPHERES

<ADDR> PURDUE UNIVERSITY, SCHOOL OF MECHANICAL ENGINEERING

<CITY> LAFAYETTE

<STATE> IN

<DOC> PR--251696, 1976

<ABST>

THE SHORT-TERM EFFECTS OF RADIATIVELY PARTICIPATING POLLUTANTS UPON THE THERMAL STRUCTURE AND DISPERSION IN AN URBAN ATMOSPHERE WERE STUDIED BY CONSTRUCTING ONE- AND TWO-DIMENSIONAL

<323>

ATMOSPHERIC TRANSPORT

<323> CONT.

TRANSPORT MODELS FOR THE PLANETARY BOUNDARY LAYER. SPECIAL ATTENTION WAS FOCUSED ON THE INTERACTION OF SOLAR AND THERMAL RADIATION WITH GASEOUS AND PARTICULATE POLLUTANTS AS WELL AS NATURAL ATMOSPHERIC CONSTITUENTS.

<YR> 1971-1975

<324>

<CONT> WASHINGTON, WARREN A.

<TITL> TWO-LAYER GLOBAL CIRCULATION MODEL

<AUTH> GCE

<ALID> NATIONAL CENTER FOR ATMOSPHERIC RESEARCH

<CITY> BOULDER

<STATE> CO

<DOC> MONTHLY WEATHER REVIEW, 98(8), 559-580, 1970

<ABST> RESULTS OF A JANUARY SIMULATION EXPERIMENT WITH THE TWO-LAYER VERSION OF THE NCAR GLOBAL CIRCULATION MODEL ARE DISCUSSED. THE MODEL INCLUDES A HYDROLOGICAL CYCLE, HORIZONTAL AND VERTICAL TURBULENT TRANSPORTS OF MOMENTUM, HEAT, AND WATER VAPOR FROM THE LOWER BOUNDARY AND WITHIN THE ATMOSPHERE, AND CALCULATIONS OF SOLAR AND TERRESTRIAL RADIATION. ALTHOUGH THE WATER VAPOR FIELD INTERACTS WITH THE RADIATION CALCULATIONS, THE CLOUD DISTRIBUTION IS A FUNCTION OF LATITUDE AND SEASON. IN THIS VERSION OF THE MODEL, THE EARTH'S TOPOGRAPHY IS OMITTED AS WELL AS AN EXPLICIT CALCULATION OF SURFACE TEMPERATURE. THIS VERSION OF THE MODEL HAS A SPHERICAL HORIZONTAL GRID SPACING OF 5 DEGREES IN BOTH LONGITUDE AND LATITUDE AND TWO VERTICAL LAYERS AT 6-KM HEIGHT INCREMENTS. THE DETAILS OF THE FINITE-DIFFERENCE SCHEME FOR THE MODEL ARE PRESENTED. THE INITIAL CONDITIONS FOR THIS EXPERIMENT ARE BASED ON AN ISOTHERMAL ATMOSPHERE AT REST. THE ZONAL MEAN CLOUDINESS, THE MEAN SEA LEVEL TEMPERATURE DISTRIBUTION, AND THE SUN'S DECLINATION ARE SPECIFIED FOR JANUARY. THE EARLY STAGE OF THE NUMERICAL INTEGRATION IS CHARACTERIZED BY A HADLEY-TYPE DIRECT CIRCULATION DUE TO THE THERMAL CONTRASTS BETWEEN THE CONTINENTS AND OCEANS. WITHIN 2 WEEKS, THE HADLEY CIRCULATION BREAKS DOWN DUE TO BAROCLINIC INSTABILITY. THIS RESULTS IN THE TYPICAL THREE-CELL MERIDIONAL CIRCULATION. THE COMPARISON BETWEEN COMPUTED AND OBSERVED JANUARY CLIMATOLOGY IS DISCUSSED TOGETHER WITH THE PRESENTATION OF MOMENTUM, MOISTURE, AND ENERGY BUDGETS. THE MAIN RESULT FROM THESE BUDGET CALCULATIONS IS THAT THE HADLEY CELL IS OF DOMINANT IMPORTANCE IN THE TRANSPORT OF VARIOUS QUANTITIES WITHIN THE TROPICS AND THAT BAROCLINIC EDDIES ARE IMPORTANT IN MIDLATITUDES.

<GEO> GLOBAL

<CLASS> SIMULATION

<325>

<CONT> WASHINGTON, WARREN A.

<TITL> THIRD GENERATION NCAR GLOBAL CIRCULATION MODEL

<AUTH> GCE

<ADDR> NATIONAL CENTER FOR ATMOSPHERIC RESEARCH, 1850 TABLE MESA DR., P.O. BOX 3000

<CITY> BOULDER

<STATE> CO

<ZIP> 80307

<PHONE> FTS-322-5151

<DOC> WASHINGTON, D., AND D. WILLIAMSON, A DESCRIPTION OF THE NCAR GLOBAL CIRCULATION MODELS, METHODS IN COMPUTATIONAL PHYSICS, 17, 111-171, 1970

<SUB> GLOBAL CIRCULATION

<ABST> RESULTS OF A JANUARY SIMULATION EXPERIMENT WITH THE TWO-LAYER VERSION OF THE NCAR GLOBAL CIRCULATION MODEL ARE DISCUSSED. THE MODEL INCLUDES A HYDROLOGICAL CYCLE, HORIZONTAL AND VERTICAL TURBULENT TRANSPORTS OF MOMENTUM, HEAT, AND WATER VAPOR FROM THE LOWER BOUNDARY AND WITHIN THE ATMOSPHERE, AND CALCULATIONS OF SOLAR AND TERRESTRIAL RADIATION. ALTHOUGH THE WATER VAPOR FIELD INTERACTS WITH THE RADIATION CALCULATIONS, THE CLOUD DISTRIBUTION IS A FUNCTION OF LATITUDE AND SEASON. IN THIS VERSION OF THE MODEL, THE EARTH'S TOPOGRAPHY IS OMITTED AS WELL AS AN EXPLICIT CALCULATION OF THE SURFACE TEMPERATURE. THIS VERSION OF THE MODEL HAS A SPHERICAL HORIZONTAL GRID SPACING OF 5 DEGREES IN BOTH LONGITUDE AND LATITUDE AND TWO VERTICAL LAYERS AT 6-KM HEIGHT INCREMENTS. THE DETAILS OF THE FINITE-DIFFERENCE SCHEME FOR THE MODEL ARE PRESENTED. THE INITIAL CONDITIONS FOR THIS EXPERIMENT ARE BASED ON AN ISOTHERMAL ATMOSPHERE AT REST. THE ZONAL MEAN CLOUDINESS, THE MEAN SEA LEVEL TEMPERATURE DISTRIBUTION, AND THE SUN'S DECLINATION ARE SPECIFIED FOR JANUARY. THE EARLY STAGE OF THE NUMERICAL INTEGRATION IS CHARACTERIZED BY A HADLEY-TYPE DIRECT CIRCULATION DUE TO THE THERMAL CONTRASTS BETWEEN THE CONTINENTS AND OCEANS. WITHIN 2 WEEKS, THE HADLEY CIRCULATION BREAKS DOWN DUE TO BAROCLINIC INSTABILITY. THIS RESULTS IN THE TYPICAL THREE-CELL MERIDIONAL CIRCULATION. THE COMPARISON BETWEEN COMPUTED AND OBSERVED JANUARY CLIMATOLOGY IS DISCUSSED TOGETHER WITH THE PRESENTATION OF MOMENTUM, MOISTURE, AND ENERGY BUDGETS. THE MAIN RESULT FROM THESE BUDGET CALCULATIONS IS THAT THE HADLEY CELL IS OF DOMINANT IMPORTANCE IN THE TRANSPORT OF VARIOUS QUANTITIES WITHIN THE TROPICS AND THAT BAROCLINIC EDDIES ARE IMPORTANT IN MIDLATITUDES.

<GEO> GLOBAL

<STATUS> IN USE

<ACCESS> LIMITED

<MEDIA> MAGNETIC TAPE; DISC; PUNCHED CARDS

<COMP> CDC; CRAY-1

<LANG> FORTRAN

ATMOSPHERIC TRANSPORT

<325> CONT.

<CLASS> SIMULATION

<UPDATE> 780811

<326>

<CONT> WENCELL, L. L.

<TITLE> PROGRAM DESCRIPTIONS, SUPPLEMENT TO MESOSCALE WIND FIELDS AND TRANSPORT ESTIMATES DETERMINED FROM A NETWORK OF WIND TOWERS

<ADDR> NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, AIR RESOURCES LABORATORIES

<CITY> IDAHO FALLS

<STATE> ID

<DOC> NOAA-TN-ESL-ARL-83, 88 PP., 1974

<ABST> A COMPUTER PROGRAM HAS BEEN DEVELOPED TO ANALYZE OBJECTIVELY TWO-DIMENSIONAL WIND DATA FROM A MESOSCALE NETWORK OF STATIONS. THE RESULT IS A GRAPHIC DISPLAY OF THE NETWORK WIND FIELD AT ANY PARTICULAR TIME AND A PLOT OF COMPUTED AIR TRAJECTORIES AS A FUNCTION OF TIME AND POINT OF ORIGIN. A BRIEF DESCRIPTION, A LIST OF INPUT VARIABLES, AND PROGRAM LISTINGS FOR THE COMPUTER PROGRAM ARE PROVIDED.

<CCN> THIS REPORT REFERS TO WORK IN NOAA-TN-ESL-ARL-25 AS DOES NOAA-TN-ESL-ARL-88 (MESODIP). EXTENSIVE DOCUMENTATION IS PRESENTED.

<327>

<CONT> WETHERALD, RICHARD T.

<TITLE> THE EFFECTS OF CHANGING THE SOLAR CONSTANT ON THE CLIMATE OF A GENERAL CIRCULATION MODEL

<ADDR> NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, GEOPHYSICAL FLUID DYNAMICS LABORATORY, PRINCETON UNIVERSITY

<CITY> PRINCETON

<STATE> NJ

<ZIP> 08540

<PHONE> 609-852-6515; FTS 345-6515

<SOURCE> GFDL/NOAA

<DOC> JOURNAL ATMOSPHERIC SCIENCES, 32(11), 2044-2059, 1975

<SUB> SENSITIVITY OF A MODEL ATMOSPHERE TO A CHANGE OF SOLAR RADIATION

<ABST> A STUDY IS CONDUCTED TO EVALUATE THE RESPONSE OF A SIMPLIFIED THREE-DIMENSIONAL MODEL CLIMATE TO CHANGES OF THE SOLAR CONSTANT. THE MODEL EXPLICITLY COMPUTES THE HEAT TRANSPORT BY LARGE-SCALE ATMOSPHERIC DISTURBANCES. IT CONTAINS THE FOLLOWING SIMPLIFICATIONS: A LIMITED COMPUTATIONAL DOMAIN, AN IDEALIZED TOPOGRAPHY, NO HEAT TRANSPORT BY OCEAN CURRENTS, NO SEASONAL VARIATION, AND FIXED CLOUDINESS. IT IS FOUND THAT THE TEMPERATURE OF THE MODEL TROPOSPHERE

INCREASES WITH INCREASING SOLAR RADIATION. THE GREATEST INCREASE OCCURS IN THE SURFACE LAYER OF HIGHER LATITUDES DUE TO THE EFFECTS OF THE SNOW-COVERED FEEDBACK MECHANISM AS WELL AS THE SUPPRESSION OF VERTICAL MIXING BY A STABLE LOWER TROPOSPHERE. ONE INTERESTING FEATURE IS THE EXTREME SENSITIVITY OF THE INTENSITY OF THE COMPUTED HYDROLOGIC CYCLE TO SMALL CHANGES OF THE SOLAR CONSTANT. CURRENT ESTIMATES INDICATE A 27% INCREASE OF THE PRECIPITATION AS COMPARED WITH A 6% INCREASE OF THE LATTER. IT IS SHOWN THAT THE LATITUDE OF MAXIMUM SNOWFALL RETREATS POLEWARD AS THE SOLAR CONSTANT IS INCREASED. FURTHERMORE, THE TOTAL AMOUNTS OF SNOWFALL AND SNOW ACCUMULATION DECREASE SHARPLY WITH INCREASING INSOLATION DUE TO THE POLEWARD SHIFT OF THE REGION OF SUBSIDIZING SURFACE TEMPERATURE AWAY FROM THE ZONE OF MAXIMUM BAROCLINIC INSTABILITY.

<GEO> GLOBAL (1/6 OF THE GLOBE) - WITH HIGHLY IDEALIZED DISTRIBUTIONS OF OCEAN AND CONTINENT

<TIME> 1971-1974 MODEL INTEGRATION AND ANALYSIS

<STATUS> OUTDATED

<ACCESS> NOT ACCESSIBLE

<MEDIA> MAGNETIC TAPE; PUNCHED CARDS

<SIZE> APPROXIMATELY 10,000 CARDS

<CONF> UFI

<CONFIG> UFI 1108 WITH 64K WORDS WITH 2 TAPE DRIVES

<LANG> FORTRAN IV

<CHAR> 026 BCD

<ALGO> FINITE DIFFERENCE SOLUTION TO NONLINEAR PARTIAL DIFFERENTIAL EQUATIONS, IMPLICIT AND EXPLICIT METHODS

<CLASS> PREDICTIVE

<APPL> SENSITIVITY STUDIES; ATMOSPHERIC AND CLIMATE RESEARCH; RESPONSE OF A MODEL ATMOSPHERE TO A CHANGE OF CO2 CONTENT

<USERS> GFDL/NOAA

<MTH> THEORETICAL CALCULATION

<REVAL> COMPARISON WITH CO2 SENSITIVITY STUDY

<UPDATE> 780526

<328>

<CONT> WETHERALD, RICHARD T.

<TITLE> RESPONSE OF THE JOINT OCEAN-ATMOSPHERE MODEL TO THE SEASONAL VARIATION OF THE SOLAR RADIATION

<ADDR> NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, GEOPHYSICAL FLUID DYNAMICS LABORATORY, BOX 300

<CITY> PRINCETON

<STATE> NJ

<ZIP> 08540

<320>

ATMOSPHERIC TRANSPORT

<320> CONT.

<FROM> 609-452-6515; PTS 354-6515

<SOURCE> GFDL/NOAA

<DOC> MONTHLY WEATHER REVIEW, 100(1), 42-59, 1972

<SUB> RESPONSE OF THE JOINT AIR-SEA MODEL TO SEASONAL CHANGES IN SOLAR ZENITH ANGLE

<ABST> THE EFFECT OF THE SEASONAL VARIATION OF SOLAR RADIATION IS INCORPORATED INTO THE JOINT OCEAN-ATMOSPHERE MODEL DEVELOPED AT THE GEOPHYSICAL FLUID DYNAMICS LABORATORY OF THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, AND THE RESULTING SYSTEM IS INTERPRETED FOR THE 1 1/2-YR MODEL TIME. THE PURPOSE OF THIS STUDY IS TO ANALYZE THE RESPONSE OF THE JOINT AIR-SEA MODEL TO SEASONAL CHANGES IN THE SOLAR ZENITH ANGLE RATHER THAN TO OBTAIN A TRUE EQUILIBRIUM STATE. COMPARISONS ARE ALSO MADE WITH RESULTS PREVIOUSLY PRESENTED FOR THE CASE OF ANNUAL MEAN CONDITIONS. THE MOST IMPORTANT FEATURE THAT EMERGES AS A DIRECT RESULT OF THIS SEASONAL VARIATION IS A SIGNIFICANT WARMING OF THE LOWER TROPOSPHERE IN HIGH LATITUDES. THIS WARMING IS FOUND TO BE CAUSED BY (1) THE REMOVAL OF THE SNOWPACK DURING THE SUMMER SEASON, WHICH INCREASES THE EARTH'S ALBEDO THERE DURING THIS TIME, AND (2) A NET RISE IN THE TEMPERATURE OF THE OCEAN SURFACE IN HIGH LATITUDES AS A RESULT OF THE SEASONAL VARIATION OF CONVECTIVE ACTIVITY IN THE SURFACE LAYER OF THE OCEAN. THE PRESENT RESULTS INDICATE THAT THE SNOW COVER EFFECT IS THE PRIMARY FACTOR RESPONSIBLE FOR THIS WARMING TREND WHEREAS THE OCEAN EFFECT IS OF SECONDARY IMPORTANCE. THE MAIN CONSEQUENCES OF THIS HIGH LATITUDE WARMING INCLUDE A REDUCTION OF THE MEAN ATMOSPHERIC NORTH-SOUTH TEMPERATURE GRADIENT (AND, THEREFORE, A REDUCTION OF BAROCLYTIC INSTABILITY IN MIDDLE LATITUDES), A REDUCTION OF THE MEAN OCEANIC MERIDIONAL CIRCULATION, AND A REDUCTION OF THE ATMOSPHERIC AND OCEANIC POLEWARD HEAT ENERGY TRANSPORTS.

<GEO> GLOBAL

<TIME> 1967-1971, MODEL INTEGRATION AND ANALYSIS

<STATUS> OBSOLETE

<ACCESS> NOT ACCESSIBLE

<MEDIA> MAGNETIC TAPE; PUNCHED CARDS

<SIZE> APPROXIMATELY 10,000 CARDS

<COMP> UNL

<CONFIG> 1108 WITH 64K WORDS WITH 2 TAPE DRIVES

<LANG> FORTRAN IV

<CHAR> 026 BCD

<ALGO> FINITE DIFFERENCE SOLUTION TO NONLINEAR PARTIAL DIFFERENTIAL EQUATIONS; IMPLICIT AND EXPLICIT METHODS

<CLASS> PREDICTIVE

<APPL> AIR-SEA INTERACTION; SENSITIVITY STUDIES; ATMOSPHERIC RESEARCH; CLIMATE STUDIES; SEASONAL VARIATION OF ATMOSPHERIC AND OCEANIC PROCESSES

<USERS> GFDL/NOAA

<SUB> THEORETICAL CALCULATIONS

<REVAL> COMPARISON WITH OBSERVED DATA; COMPARISON OF SEASONAL SIMULATION WITH ANNUAL MEAN SIMULATION

<UPDTE> 700526

<320>

<CONT> WRITTEN, GARY E.

<TITLE> COMPUTER MODELING OF SIMULATED PHOTOCHEMICAL SMOG

<ADDR> SYSTEMS APPLICATIONS, INC., 950 BOWINGATE DRIVE

<CITY> SAN RAFAEL

<STATE> CA

<ZIP> 94903

<ABST> THE PRESENT CONTRACT (NO. 60-02-2420) EXTENDS BOTH THE EXPLICIT AND CONDENSED CHEMISTRY BY COMPUTER MODELING OF WECENT SMOG CHAMBER EXPERIMENTS USING GROUPS OF VARIOUS HYDROCARBONS. ALSO AN ADDENDUM TO THE PRESENT CONTRACT HAS BEEN GRANTED TO MODEL SIMILAR PROFFLENT EXPERIMENTS PERFORMED IN 10 DIFFERENT SMOG CHAMBERS IN ORDER TO ELUCIDATE AND ELIMINATE ANY SYSTEMATIC ERRORS PRESENT IN THE MECHANISMS CAUSED BY THE WALLS OF SMOG CHAMBERS. (1) 9/77 INTERIM REPORT. (2) 9/78 FINAL REPORT.

<TIME> 76/09/23-77/09/23

<330>

<CONT> WILLIAMS, MICHAEL D.

<TITLE> LONG RANGE AIR TRANSPORT MODEL

<ADDR> LOS ALAMOS SCIENTIFIC LABORATORY, GROUP 5-2, MS-606, P.O. BOX 1663

<CITY> LOS ALAMOS

<STATE> NM

<ZIP> 87545

<PHONE> 505-667-2112; PTS 003-2112

<SOURCE> BNL

<DOC> NONE

<SUB> CALCULATES AIR POLLUTANT CONCENTRATIONS DOWNWIND FROM THE MAJOR SOURCE.

<ABST> THE LONG RANGE AIR TRANSPORT MODEL USES WIND SPEED AND WIND DIRECTIONS MEASURED AT AIRPORT UPPER LEVEL STATIONS TO CALCULATE THE TRAJECTORY OF POLLUTANTS EMITTED AT SPECIFIED LOCATIONS. IT ALSO CALCULATES THE CONCENTRATIONS OF THE POLLUTANTS DOWNWIND FROM THE SOURCE.

<GEO> UNITED STATES

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> DISC

ATMOSPHERIC TRANSPORT

<330> CONT.
 <SIZE> 1200 CARDS
 <COMP> CDC
 <CONFIG> CDC 6600
 <LANG> FORTRAN; RCS
 <CHAR> ASCII
 <ALGO> GAUSSIAN PUFF
 <CLAS> DETERMINISTIC; PREDICTIVE; SIMULATION
 <APPL> DISTRIBUTION OF SULFATE CONCENTRATIONS IN THE UNITED STATES
 <USERS> BSI
 <SUB> NATIONAL CLIMATIC CENTER AND UNITED STATES AIR FORCE UPPER LEVEL WIND DATA
 <CON> SOME VERY INFORMAL DOCUMENTATION EXISTS BUT THERE IS NO FORMAL TITLE
 <REFERED> 780581

<331>
 <CONT> WILLIAMS, MICHAEL D.
 <TITLE> PLUME CONCENTRATIONS
 <ACRO> HDBK
 <ADDR> LOS ALAMOS SCIENTIFIC LABORATORY, GROUP S-2, MS-606, P.O. BOX 1663
 <CITY> LOS ALAMOS
 <STATE> NM
 <ZIP> 87545
 <PHONE> 505-667-2112; FTS 803-2112
 <SOURCE> UN
 <DOC> H. D. WILLIAMS, VISIBILITY CODES USER'S MANUAL (DRAFT)
 <SUB> AIR POLLUTION
 <ABST> HDBK COMPUTES SHORT-TERM CONCENTRATIONS OF POLLUTANTS IN IRREGULAR TERRAIN USING GAUSSIAN DISPERSION WITH NOAA TERRAIN ASSUMPTIONS AND NO GROUND REFLECTION. CONVERSION FROM ONE POLLUTANT TO ANOTHER IS HANDLED BY AN EFFECTIVE HALF-LIFE FORMULATION.
 <STATUS> IN USE
 <ACCESS> UNLIMITED
 <MEDIA> DISC
 <SIZE> 200 LINES
 <COMP> CDC
 <CONFIG> CDC 6600, DOS OPERATING SYSTEM
 <LANG> FORTRAN
 <CHAR> ASCII
 <ALGO> GAUSSIAN DISPERSION
 <CLAS> CONTINUOUS; DETERMINISTIC; ANALYTICAL; PREDICTIVE
 <APPL> CALCULATES AIR POLLUTION CONCENTRATIONS

FROM POINT SOURCES

<USERS> UN; LAST
 <SUB> USED SPECIFIED SOURCE, METEOROLOGICAL PARAMETERS, AND TERRAIN CONFIGURATION
 <REAL> COMPARED WITH AIR POLLUTION MEASUREMENTS
 <UPDATE> 780405

<332>
 <CONT> WILLIAMS, MICHAEL D.
 <TITLE> PLUME VISIBILITY
 <ACRO> PVISH
 <ADDR> LOS ALAMOS SCIENTIFIC LABORATORY, GROUP S-2, MS-606, F.C. BOX 1663
 <CITY> LOS ALAMOS
 <STATE> NM
 <ZIP> 87545
 <PHONE> 505-667-2112; FTS 803-2112
 <SOURCE> LAST
 <DOC> H. D. WILLIAMS, VISIBILITY CODES USER'S MANUAL (DRAFT); H. D. WILLIAMS, H. J. DECKSUNG, E. M. LEONARD, COMPUTER SIMULATION OF THE VISUAL EFFECTS OF SMOKE PLUMES, LA-88-70-689, SUBMITTED TO SOCIETY OF PHOTO-OPTICAL INSTRUMENTATION ENGINEERS TECHNICAL SYMPOSIUM, HELD WASHINGTON, DC, MARCH 20-31, 1978.
 <SUB> PLUME VISIBILITY
 <ABST> PVISH IS WRITTEN TO GIVE THE LIGHT TRANSMISSION AND SCATTERED LIGHT INTENSITIES FROM ONE OR MORE AIR CONTAMINANT PLUMES FOR SPECIFIED VIEWING ANGLES (COMPASS BEARING AND ELEVATION ANGLE). IT IS ALSO DESIGNED TO PROVIDE LIGHT INTENSITIES DERIVED FROM THE FOURIER COEFFICIENTS PROVIDED IN READY FOR A UNIFORM ATMOSPHERE.
 <STATUS> UNDER DEVELOPMENT; IN USE
 <ACCESS> UNLIMITED
 <MEDIA> DISC
 <SIZE> 680 LINES
 <COMP> CDC
 <CONFIG> CDC 6600, DOS OPERATING SYSTEM
 <LANG> FORTRAN
 <CHAR> ASCII
 <ALGO> GAUSSIAN PLUME DISPERSION; NUMERICAL INTEGRATION OF INTEGRAL DIFFERENTIAL EQUATIONS
 <CLAS> DISCRETE; DETERMINISTIC; ANALYTICAL; PREDICTIVE
 <APPL> EFFECTS OF SMOKE PLUMES ON SCENIC DISTANCES
 <USERS> LAST
 <SUB> INPUT FROM DRAFT; USED SPECIFIED SOURCE CHARACTERISTICS AND PARTICLE SIZE

<332>

ATMOSPHERIC TRANSPORT

<332> CONT.

DISTRIBUTIONS

<RYAL> IN PROCESS

<UPDATED> 790405

<333>

<CONT> WILLIAMS, MICHAEL B.

<TITLE> PHOTOCHEMICAL CODE

<ACRO> OXIDS

<ADDR> LOS ALAMOS SCIENTIFIC LABORATORY, GROUP
S-2, MS-606, P.O. BOX 1663

<CITY> LOS ALAMOS

<STATUS> IN

<REF> 87545

<INDEX> 505-667-2112; PTS 843-2112

<SOURCE> DEVELOPED AT LASL

<DOC> USER'S GUIDE TO PHOTOCHEMICAL CODES

<SUB> PHOTOCHEMICAL CODE

<ABST> PROGRAM OXIDS USES THE OUTPUT FROM BOUR
TO INTEGRATE THE RATE EQUATIONS FOR A
NUMBER OF CHEMICALLY REACTING SPECIES.
THE INTEGRATION TECHNIQUE RELIES UPON
GEAR'S METHOD FOR STIFF EQUATIONS.

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> DISC

<SIZE> 200 LINES

<COMP> CDC

<CONFIG> CDC-6600, DOS OPERATING SYSTEM

<LANG> FORTRAN

<CHAR> ASCII

<ALGO> GEAR'S METHOD FOR STIFF EQUATIONS

<CLASS> DISCRETE; PREDICTIVE; SIMULATION

<APPL> CALCULATES PRODUCTION OF AEROSOLS AND
W/2 ON SMOKE PLUMES

<USERS> LASL

<END> DATA FROM BOUR

<RYAL> LIMITED COMPARISON WITH PUBLISHED
EXPERIMENTAL DATA AND OTHER COMPUTATIONS

<UPDATED> 780410

<334>

<CONT> WILLIAMS, MICHAEL B.

<TITLE> BACKGROUND RADIATIVE TRANSFER MODEL

<ACRO> WRAFT

<ADDR> LOS ALAMOS SCIENTIFIC LABORATORY, GROUP
S-2, MS-606, P.O. BOX 1663

<CITY> LOS ALAMOS

<STATUS> IN

<REF> 87545

<INDEX> 505-667-2112; PTS 843-2112

<SOURCE> DEVELOPED AT LASL

<DOC> W. D. WILLIAMS, VISIBILITY CODES USER'S
MANUAL (DRAFT)<SUB> DIFFUSE RADIATION IN A MULTILAYERED
ATMOSPHERE<ABST> WRAFT SOLVES THE RADIATIVE TRANSFER
EQUATION FOR SUNLIGHT INCIDENT ON AN
ATMOSPHERE COMPOSED OF 70 PLANE
PARALLEL LAYERS. EACH LAYER IS ASSUMED
HOMOGENEOUS. ONLY RAYLEIGH AND MIE
SCATTERING ARE CONSIDERED. THE GROUND
IS CONSIDERED A LAMBERT REFLECTOR WITH
ALBEDO SPECIFIED BY THE USER. WHILE
PARTICLE DENSITIES VARY FROM LAYER TO
LAYER, THE SIZE DISTRIBUTION FOR ALL
PARTICLES ABOVE THE MIXING LAYER IS
ASSUMED TO BE THE SAME. FOR ALL LAYERS
BELOW THE MIXING HEIGHT, ANOTHER SIZE
DISTRIBUTION IS USED. IN BOTH CASES
THE SIZE DISTRIBUTION IS INPUT BY THE
USER.

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> DISC

<SIZE> 600 LINES

<COMP> CDC

<CONFIG> CDC 6600, DOS OPERATING SYSTEM

<LANG> FORTRAN

<CHAR> ASCII

<ALGO> NUMERICAL INTEGRATION OF INTEGRAL
DIFFERENTIAL EQUATION.<CLASS> DISCRETE; DETERMINISTIC; ANALYTICAL;
PREDICTIVE<APPL> PROVIDES VISIBILITY EFFECTS IN MODEL
ATMOSPHERES. ALSO USED FOR CALCULATING
SUNLIGHT INCIDENT ON A SURFACE.

<USERS> LASL

<END> DATA GENERATED BY LEG1; AIR FORCE
REPORT AFCDL-70-0527

<RYAL> PLANNED

<CON> NORMALLY USES AIR FORCE DATA ON
ATMOSPHERIC PARAMETERS AT SEVERAL
HEIGHTS.

<UPDATED> 780405

<335>

<CONT> WILLIS, C. A.; SPANGLER, G. A.;
HOWARD, S. A.<TITLE> A NEW TECHNIQUE FOR REACTOR SITING DOSE
CALCULATIONS

<ACRO> CONRADEN

<ADDR> MCDONNELL DOUGLAS AERONAUTICS COMPANY

<CITY> SANTA MONICA

AIR QUALITY

<300>
<CONF> MYER, F. H.; CUNNINGHAM, D. H.; PHIN, S. C.

<TITLE> STRATOSPHERIC OZONE DESTRUCTION BY AIRCRAFT-INDUCED NITROGEN OXIDES

<ADDR> MASSACHUSETTS INSTITUTE OF TECHNOLOGY

<CITY> CAMBRIDGE

<STATE> MA

<ZIP> 02139

<DOC> SCIENCE, 188(4404), 117-121, 1975

<ABST> MODEL SIMULATIONS SHOW THAT FOR A CONSIDERABLE NITROGEN OXIDES (NOX) INJECTION RATE OF 1.0×10^{10} METRIC TON FROM A HYPOTHETICAL FLEET OF SUPERSONIC TRANSPORTS FLYING AT AN ALTITUDE OF 20 KM IN THE MID-LATITUDES OF THE NORTHERN HEMISPHERE, A SIGNIFICANT DEPLETION OF ABOUT 12 PERCENT IN TOTAL STRATOSPHERIC OZONE (O₃) WOULD BE REALIZED. THIS DEPLETION IS PARTICULARLY EVIDENT IN THE NORTHERN HEMISPHERE, IN WHICH 16 PERCENT/TON OF THE EXISTING O₃ WOULD BE DESTROYED. ALSO, INTERHEMISPHERIC TRANSPORT OF THE AIRCRAFT-INJECTED NOX WOULD PRODUCE AT LEAST 8 PERCENT/TON DEPLETION OF O₃ IN THE SOUTHERN HEMISPHERE EVEN THOUGH NO AIRCRAFT WERE ASSUMED TO FLY THERE. ESTIMATES OF THE RESULTING PERCENTAGE INCREASES IN UV FLUX ARRIVING AT THE GROUND, IN THE FORM OF APPROXIMATE ERYTHEMAL DOSES, AMOUNT TO ABOUT TWICE THE PERCENTAGE DECREASES IN TOTAL O₃.

<301>
<CONF> ANDERSON, B. S.

<TITLE> USER'S MANUAL, AUTOMATED PROCEDURES FOR ESTIMATING CONTROL COSTS AND EMISSION REDUCTIONS FOR SPECIFIED AIR POLLUTION SOURCES

<ADDR> RESEARCH TRIANGLE INSTITUTE

<CITY> DURHAM

<STATE> NC

<DOC> PB--198779, 1970

<ABST> NONE

<CLASS> PREDICTIVE

<302>
<CONF> WEDGSTON, R. W., JR.

<TITLE> PREDICTIONS OF THE SPECTRAL ABSORPTION AND EXTINCTION COEFFICIENTS OF AN URBAN AIR POLLUTION AEROSOL MODEL

<ADDR> PURDUE UNIVERSITY, SCHOOL OF MECHANICAL ENGINEERING

<CITY> WEST LAFAYETTE

<STATE> IN

<DOC> ATMOSPHERIC ENVIRONMENT, 6(4), 247-258, 1972

<ABST> AN URBAN AIR POLLUTION AEROSOL MODEL WAS DEVELOPED FOR VARIOUS CHEMICAL COMPOSITIONS AND SIZE DISTRIBUTIONS.

THE SPECTRAL ABSORPTION AND EXTINCTION COEFFICIENTS WERE PREDICTED FROM THE MIE THEORY FOR MIXTURES CONSISTING OF NON-ABSORBING (QUARTZ), ABSORBING (CARBON), AND METAL-LIKE (NICKEL) PARTICLES. THE SPECTRAL OPTICAL THICKNESS (TURBIDITY) OF THE ATMOSPHERE DUE TO THE AEROSOL WAS PRESENTED FOR AN EXPONENTIAL VERTICAL DISTRIBUTION. THE EFFECTS OF SIZE DISTRIBUTION AND CHEMICAL COMPOSITION OF THE SPECTRAL ABSORPTION AND EXTINCTION COEFFICIENT WERE DISCUSSED. INCLUSION OF CARBON PARTICLES IMPLIED A WAVELENGTH INDEPENDENT SPECTRAL ABSORPTION COEFFICIENT FOR A SIZE 1 SIZE DISTRIBUTION WHICH WAS IN AGREEMENT WITH EXPERIMENTAL EVIDENCE. THE EFFECTS OF THE METAL-LIKE PARTICLES WERE NEGLIGIBLE SINCE THEY DO NOT EXIST IN LARGE ENOUGH QUANTITIES IN THE TROPOSPHERE. THE DIFFERENCES BETWEEN USING A WAVELENGTH CONSTANT MEAN INDEX OF REFRACTION AND MATERIALS WHOSE INDICES OF REFRACTION ARE WAVELENGTH DEPENDENT WERE DISCUSSED.

<303>
<CONF> BINFORD, F. T.

<TITLE> SOME TECHNIQUES FOR ESTIMATING THE RESULTS OF THE EMISSION OF RADIOACTIVE EFFLUENT FROM ORNL STACKS

<ADDR> STAPEL; PELISH

<ADDR> ORNL RIDGE NATIONAL LABORATORY, OPERATIONS DIVISION, P.O. BOX 1

<CITY> ORNL RIDGE

<STATE> TN

<ZIP> 37830

<PHONE> 615-483-8611 EXT 3-1108; FTS 850-1108

<SOURCE> DEVELOPED AT ORNL

<DOC> BINFORD, F.T., HARRICH, T.P., COPE, B.W., SOME TECHNIQUES FOR ESTIMATING THE RESULTS OF THE EMISSION OF RADIOACTIVE EFFLUENT FROM ORNL STACKS, ORNL-TH-3187, OCTOBER, 1970.

<SUB> ENVIRONMENTAL MONITORING OF THE ATMOSPHERE

<ABST> THERE ARE AT THE ORNL RIDGE NATIONAL LABORATORY FIVE STACKS WHICH FROM TIME TO TIME EMIT SMALL QUANTITIES OF RADIOACTIVE MATERIAL TO THE ATMOSPHERE. THESE STACKS ARE LOCATED AT DIFFERENT POINTS WITHIN THE LABORATORY, HAVE DIFFERENT EMISSION CHARACTERISTICS, AND SERVE A VARIETY OF EQUIPMENT AND PROCESSES. BECAUSE OF THIS THE TASK OF PREDICTING A SAFE UPPER LIMIT TO THE PERMISSIBLE RATE OF RELEASE OF ACTIVITY FROM A GIVEN STACK IS QUITE COMPLEX; THE LIMIT DEPENDS NOT ONLY UPON THE ATMOSPHERIC CONCENTRATIONS GENERATED BY THE STACK UNDER CONSIDERATION BUT ALSO UPON THE CONTRIBUTIONS FROM EACH OF THE OTHER STACKS. HOWEVER, THE ATMOSPHERIC CONCENTRATION PRODUCED AT A GIVEN POINT BY A GIVEN RELEASE RATE IS A COMPLICATED FUNCTION OF THE METEOROLOGICAL CONDITIONS WHICH PREVAIL AT THE TIME OF THE RELEASE. IN MOST PREVIOUS CALCULATIONS AIMED AT THE ESTABLISHMENT OF PERMISSIBLE RELEASE RATES, EACH STACK HAS BEEN REGARDED AS

<303>

AIR QUALITY

<303> CONT.

ISOLATED FROM THE OTHERS AND THE INTERRELATIONSHIP BETWEEN THE SEVERAL STACKS HAS GENERALLY BEEN NEGLECTED. TO COMPENSATE FOR THIS, A MAXIMUM PERMISSIBLE RELEASE RATE, OR ALTERNATIVELY A TOTAL PERMITTED ANNUAL RELEASE FOR ALL OF THE STACKS TAKEN TOGETHER, WAS USUALLY BEEN IMPOSED. ONE OF THE PURPOSES OF THIS STUDY IS TO EXAMINE THE CUMULATIVE EFFECT OF EMISSIONS FROM ALL THE STACKS AND TO DEVELOP A MORE REALISTIC APPROACH TO THE PREDICTION OF MAXIMUM PERMISSIBLE RELEASE RATES FOR EACH OF THEM. PROGRAM STAPL WAS WRITTEN TO COMPUTE CENTERLINE GROUND-LEVEL CONCENTRATION. PROGRAM RELIN CALCULATES THE ISOPLETH COORDINATES OF STACK RELEASES IN THREE COORDINATE SYSTEMS: RECTANGULAR CARTESIAN, LOGARITHMIC POLAR, AND RECTIFIED RECTANGULAR CARTESIAN.

<CRD> LOCAL, ONCE EVIDENCE

<TIME> 1970

<STAT75> IN USE

<ACCESS> UNLIMITED

<MEDIA> PUNCHES CARDS

<COMP> IBM

<CONFIG> IBM 360/75, PEGTIPS BASE

<LANG> FORTRAN IV

<CLAS> ANALYTICAL; PREDICTIVE

<USERS> ONPL OPERATIONS

<CON> 15 SECS.;

<304>

<CONT> BLACKABAR, ALFRED W.

<TITLE> NOCTURNAL BOUNDARY LAYER MODEL

<ADDP> PENNSYLVANIA STATE UNIVERSITY, WALKER BUILDING, ROOM 503

<CITY> UNIVERSITY PARK

<STATE> PA

<ZIP> 16802

<PHONE> 814-856-0070

<DOC> NONE

<SUB> EVOLUTION OF WIND AND TEMPERATURE IN HEIGHT AND TIME DURING THE NIGHT.

<ABST> THE NOCTURNAL BOUNDARY LAYER MODEL PREDICTS THE TIME-HEIGHT EVOLUTION OF WIND COMPONENTS AND TEMPERATURE GIVEN THE INITIAL PROFILES OF WIND AND TEMPERATURE, SOIL CHARACTERISTICS, AND DOWNWARD INFRARED RADIATION FLUX. IT IS ASSUMED THAT THE TERRAIN IS HORIZONTALLY HOMOGENEOUS AND THAT THE GEOSTROPHIC WIND IS A KNOWN FUNCTION OF HEIGHT AND INDEPENDENT OF TIME.

<TIME> UNLIMITED

<STATUS> UNDER DEVELOPMENT

<ACCESS> UNLIMITED

<MEDIA> PUNCHES CARDS

<SIZE> 100 CARDS

<COMP> IBM

<LANG> FORTRAN IV

<CLAS> DETERMINISTIC; PREDICTIVE

<APPL> DIFFUSION TRANSPORT OF POLLUTANTS IN REGIONAL MESOSCALE MODELS

<USERS> NONE

<SUB> RADIOSONDE OBSERVATIONS

<305>

<CONT> DUKHAN, L.; BEISEL, W. S.

<TITLE> EMPIRICAL TECHNIQUES FOR ANALYZING AIR QUALITY AND METEOROLOGICAL DATA: SHORT-TERM CHANGES IN GROUND-LEVEL OZONE CONCENTRATIONS

<ADDP> TECHNOLOGY SERVICE CORPORATION

<CITY> SANTA MONICA

<STATE> CA

<DOC> PB--261008, 1976

<ABST>

AN EMPIRICAL ANALYSIS OF AMBIENT AIR QUALITY DATA FOR THE LOS ANGELES BASIN IS USED TO RELATE THE ONE- AND TWO-HOUR CHANGES IN OXIDANT LEVELS IN THE URBAN ENVIRONMENT TO THE PRECEDING LEVELS OF PRECURSOR POLLUTANTS AND TO METEOROLOGICAL VARIABLES. THE INTENT WAS TO DEMONSTRATE THE FEASIBILITY OF DEVELOPING A SET OF EMPIRICAL DIFFERENCE EQUATIONS FOR THE PREDICTION OF OXIDANT OVER TIME. THE MAIN VARIABLES DETERMINING ONE- AND TWO-HOUR OXIDANT CHANGES WERE IDENTIFIED USING NONPARAMETRIC REGRESSION TECHNIQUES. A MODEL FOR THE OXIDANT CHANGES WAS DEVELOPED USING NONLINEAR REGRESSION TECHNIQUES. THE IMPLICATIONS OF THE MODEL ARE DISCUSSED.

<CLAS> PREDICTIVE

<306>

<CONT> DATE, B. L.

<TITLE> AFMPC AIR STAGNATION MODEL

<ACRO> ASH; BLN; NSC

<ADDP> AIR FORCE GLOBAL WEATHER CENTRAL OFFUTT AFB NEBR 603677

<CITY> OFFUTT AIR FORCE BASE

<STAT75> NO

<DOC> REPORT NO. AFMPC-TN-72-6-1; MAY 72, 15 P.

<ABST>

THE AIR STAGNATION MODEL (ASH) DEVELOPED AT THE AIR FORCE GLOBAL WEATHER CENTRAL (AFMPC) IS DESIGNED TO PROVIDE AIR STAGNATION DATA TO AIR FORCE INSTALLATIONS LOCATED OVERSEAS WHERE MESOSCALE DATA ARE AVAILABLE. PARAMETERS ARE DERIVED FROM THE AFMPC BOUNDARY LAYER MODEL (BLM) DATA AND THE AFMPC MESO-SCALE PREDICTION MODEL DATA. PRECIPITATION FORECASTS FROM THE

AIR QUALITY

<346> CONT.

MACRO-SCALE CLOUD MODEL (MSC) ARE ALSO USED. SINCE THE BLN FORECASTS ARE ONLY AVAILABLE THROUGH 24 HOURS, THE 36-HOUR OUTLOOK USES DATA FROM THE APSRC MACRO-SCALE BAROCLINIC PREDICTION MODEL, THE 45C AND THE 1000-HR PROGNOSTIC MODEL. THE TECHNIQUES USED IN THE ASH ARE SIMILAR TO THOSE USED BY THE NATIONAL WEATHER SERVICE (NWS). THE AIR STAGNATION DATA INCLUDE MIXING DEPTH, TRANSPORT WIND IN THE MIXING LAYER, VENTILATION VALUE IN THE MIXING LAYER, METEOROLOGICAL STAGNATION INDEX (MSI), TIMES OF MAXIMUM AND MINIMUM MSI AND THE MAXIMUM AND MINIMUM MSI.

<347>
<CONT> BREWER, W. H.

<TITLE> LIVERMORE REGIONAL AIR QUALITY MODEL: KINETICS AND TRANSPORT

<ACR> LIBAQ-2

<ADDR> LAWRENCE LIVERMORE LABORATORY, ATMOSPHERIC GEOPHYSICAL SCIENCES DIVISION, P.O. BOX 909

<CITY> LIVERMORE

<STATE> CA

<ZIP> 94550

<PHONE> 415-422-1907; FTS 532-1907

<SOURCE> DEVELOPED AT LL

<DOC> RACCHACKEN, R.C., JAMIEY, G.P., DEVELOPMENT OF AN AIR POLLUTION MODEL FOR THE SAN FRANCISCO BAY AREA, TCEP-51920 VOL. 1 AND 2, OCTOBER 1, 1975; RACCHACKEN, R.C., BUEBLES, D.J., WILTON, J., BREWER, W.H., GRANT, K.E., THE LIVERMORE REGIONAL AIR QUALITY MODEL, I CONCEPT AND DEVELOPMENT, JOURNAL APPLIED METEOROLOGY 17, 258-272, 1978; BREWER, W.H., RACCHACKEN, R.C., WILTON, J.J., THE LIVERMORE REGIONAL AIR QUALITY MODEL II VERIFICATION AND APPLICATION IN THE BAY AREA, JOURNAL APPLIED METEOROLOGY, 17, 273-311, 1978; RACCHACKEN, R.C., SAUTER, G.B., USER'S GUIDE TO THE LIBAQ MODEL, UCRL-51993, DECEMBER 19, 1975.

<SUB> AIR QUALITY MODEL

<ABST> LIBAQ-2 IS AN EULERIAN (FIXED SPATIAL GRID) MULTICELL REGIONAL AIR QUALITY MODEL, INCORPORATING MASS-CONSISTENT ADVECTION, DIFFUSION AND PHOTOCHEMICAL KINETICS. USING AS INPUT DATA THE TOPOGRAPHY, METEOROLOGY, AND POLLUTANT SOURCE INVENTORY FOR THE REGION OF INTEREST, LIBAQ-2 COMPUTES THE TIME AND SPATIAL VARIATIONS OF BOTH THE GROUND LEVEL POLLUTANT CONCENTRATIONS AND THE AVERAGE VERTICAL CONCENTRATIONS BETWEEN GROUND LEVEL AND THE BOTTOM OF THE INVERSION LAYER. THE MODEL IS STRUCTURED IN A MODULAR FASHION, WITH A MODEL (SUBMODEL) FOR EACH OF THE MAJOR CALCULATIONAL STEPS, SUCH AS POLLUTANT TRANSPORT, CHEMICAL KINETICS, AND GENERATION OF MASS-CONSISTENT WIND FIELDS FROM METEOROLOGICAL AND TOPOGRAPHICAL DATA.

<GEO> LOCAL, APPROX. 100 KM X 100 KM

<STATUS> IN USE PERMANENTLY

<ACCESS> UNLIMITED DISTRIBUTION

<MEDIA> TEXT: TAPE

<SIZE> CODE STATEMENTS WITH COMMENT CARDS: 6000; CODE STATEMENTS W/O COMMENT CARDS: 4500

<COMP> CDC

<CONFIG> CDC 7600 WITH 1330 K OCTAL

<LANG> FORTRAN IV

<CHAR> ASCII

<ALGO> GRANT, UPSTREAM DIFFERENCING

<CLASS> ANALYTICAL; INTEGRATIVE; PREDICTIVE

<APPL> DEVELOPMENT; ENVIRONMENTAL STUDIES

<USERS> BAPCO; ARAC; LLL; SPI; EPA, OREGON STATE U

<SUB> VARIOUS

<VAL> A LIMITED NUMBER OF COMPARISONS WITH MEASUREMENTS HAVE BEEN CARRIED OUT. EPA WILL COMPARE LIBAQ WITH THE BAPCO DATA BASE.

<UPDATE> 700606

<348>
<CONT> BREWER, W. H.

<TITLE> MODIFICATION OF LIVERMORE AIR QUALITY MODEL FOR USE IN ST. LOUIS

<ADDR> UNIVERSITY OF CALIFORNIA

<CITY> RIVERSIDE

<STATE> CA

<ZIP> 92539

<PHONE> 617-253-3406

<SOURCE> NATIONAL TECHNICAL INFORMATION SERVICE

<DOC> PB--224 642/9; PB 224 061; PB 224 079; PB 224 006; 1973

<SUB> COLLECTION OF AQUATIC IMPACT DATA AND FORMAT FOR MODEL OF ECONOMIC ENVIRONMENTAL TRADEOFFS IN POWER SYSTEM OPERATION

<ABST> IN ORDER THAT THE EPA HAVE ACCESS TO LIBAQ, ALL COMPUTER CODES ARE BEING TRANSFERRED TO THE LAWRENCE BERKELEY LABORATORY COMPUTER SYSTEM. GRID SYSTEMS AND TOPOGRAPHY UNIQUE TO ST. LOUIS ARE BEING INCORPORATED INTO THE MODEL. INPUT AND OUTPUT ROUTINES ARE BEING MODIFIED TO ACCEPT BAPCO DATA AND DISPLAY RESULTS. THE MODEL WILL BE TESTED FOR SEVERAL DAYS ON DATA SUPPLIED BY EPA. THIS PROJECT IS NEAR COMPLETION. THERE HAS BEEN A NO-COST EXTENSION TO 04/01/77.06/77-CY 1976 DATA REVIEWED; 12/77-ALL DATA REVIEWED.

<TIME> 75/06-77/02

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> PUNCHED CARDS

<300>

AIR QUALITY

<300> CONT.

<SIZE> 2000 CARDS

<COMP> IBM

<COMPG> SYSTEM WITH LINRAD PROGRAMMING PACKAGE

<LANG> FORTRAN IV

<ALGO> LINRAD PROGRAMMING; SIMPLEX METHOD;
HYBRID INTERP PROGRAMMING<CLASS> DETERMINISTIC; ANALYTICAL; PREDICTIVE;
SIMULATION; PROCESS<APPL> REAL-TIME AQUATIC AND ATMOSPHERIC
IMPACT CONTROL THRU POWER SYSTEM
SCHEDULING

<UPDRES> NONE CURRENTLY

<SNO> LITERATURE IN BIBLIOGRAPHY PRESENTED

<REAL> CODE VERIFICATION, PERFORMANCE MEASURE
PARAMETER VARIATIONS AND COMPARISON OF
CHANGES AGAINST UNDERSTANDING<CON> SCHEDULING MODEL IN OTHER DOCUMENTATION
IN ADDITION TO IMPACT MODEL EXAMPLE
PRESENTED

<UPDATE> 700621

<309>

<AUTH> DUBOIS, P.A.; HUCHT, T.A.; WHITTEN, G.E.

<TITLE> MATHEMATICAL MODELING OF SIMULATED
PHOTOCHEMICAL SMOG

<ABSD> SYSTEMS APPLICATIONS, INC.

<CITY> SAN JAVIER

<STATE> CA

<ABST> THE CONTINUED DEVELOPMENT AND TESTING
OF A KINETIC MECHANISM FOR
PHOTOCHEMICAL SMOG FORMATION IS
DESCRIBED. DETAILED MECHANISMS
CONTAINING THE INDIVIDUAL CHEMICAL
REACTIONS OCCURRING IN IRRADIATED
PROPYLENE, N-BUTANE, TOLUENE-BOX, AND
PROPYLENE-BOX-SO2 SYSTEMS WERE
POSTULATED AND USED TO SIMULATE SMO.
CHAMBER DATA. A THEORETICAL EVALUATION
WAS MADE OF THE CONTRIBUTION OF SUCH
CHAMBER EFFECTS AS LIGHT SOURCE
SPECTRUM DECAY AND SURFACE REACTIONS TO
THE REACTIVITY OF THE CHAMBER MIXTURE.
THE APPLICATION OF KINETIC SIMULATION
TO A STUDY OF HYDROCARBON REACTIVITY
AND OZONE PRODUCTION IN SMOG SYSTEMS IS
ALSO DISCUSSED.

<350>

<AUTH> GEIGER, G. E.

<TITLE> DEVELOPMENT OF AN AIR QUALITY SIMULATOR
FOR COAL FIRES

<ABST> THE PURPOSE OF THE REPORTED RESEARCH
WAS TO DEVELOP A COMPUTER SIMULATOR FOR
PREDICTING THE AIR QUALITY IN EXISTING
COAL FIRES AS WELL AS A DESIGN AID FOR
DEVELOPING NEW FIRES. IN ADDITION TO
THE AIR QUALITY FLOW, OTHER VARIABLES
OF TEMPERATURE, MOISTURE, RETURN, AND
RESPIRABLE DUST ARE NECESSARY TO
DETERMINE AIR QUALITY. AN ADDITIONAL
FEATURE OF THIS SIMULATOR ALLOWS
PARAMETRIC STUDIES OF THESE VARIABLES

TO EXPLORE THE EFFECT THAT THESE
VARIABLES HAVE ON THE AIR QUALITY OF AN
OPERATING FIRE SYSTEM. THE REPORT
POINTS OUT AREAS WHERE MORE RESEARCH IS
NEEDED. IT COVERS THE TEMPERATURE
MOISTURE SIMULATOR, WHICH GIVES THE
TEMPERATURE AND MOISTURE CONTENT IN ANY
POINT IN A FIRE; THE RETURN SIMULATOR,
WHICH GIVES THE RETURN CONCENTRATION;
AND THE DUST SIMULATOR, WHICH GIVES THE
DUST CONCENTRATION AT ANY LOCATION IN A
FIRE.

<LANG> FORTRAN IV

<CLASS> SIMULATION

<351>

<AUTH> GIBSON, LUTHER V.

<TITLE> A SHORT-TERM AIR QUALITY MODEL FOR
SULFUR DIOXIDE IN LOUISVILLE, KENTUCKY<ABSD> UNION CARBIDE CORPORATION, NUCLEAR
DIVISION, P.O. BOX 1070

<CITY> PADUCAH

<STATE> KY

<ZIP> 42001

<PHONE> 502-444-6311; FTS 355-6455

<DOC> JOURNAL OF THE AIR POLLUTION CONTROL
ASSOCIATION, 27(3), 210-223, MARCH, 1977<SUB> ESTIMATES HOURLY AVERAGE SULFUR DIOXIDE
CONCENTRATIONS AT GROUND LEVEL

<ABST> THE CONVENTIONAL GAUSSIAN PLUME
EQUATION FOR GROUND LEVEL
CONCENTRATIONS WAS USED TO ESTIMATE
HOURLY AVERAGE SULFUR DIOXIDE
CONCENTRATIONS AT SELECTED POINTS IN
LOUISVILLE, KY, ON SPECIFIC DAYS DURING
1973. AREA EMISSION SOURCES WERE NOT
INCLUDED IN THE MODEL SINCE THEY ARE
NOT SUBSTANTIAL. THE TRAJECTORY OF THE
EMISSIONS FROM EACH CONTINUOUS POINT
SOURCE WAS CALCULATED BY A PROCEDURE
THAT ALLOWED FOR SPATIAL VARIABILITY IN
WIND DIRECTION. ALL OTHER
METEOROLOGICAL PARAMETERS WERE HELD
CONSTANT DURING EACH HOUR. THE
TWENTY-FOUR INDIVIDUAL HOURLY ESTIMATES
AT EACH LOCATION FOR A GIVEN DAY WERE
ARITHMETICALLY AVERAGED YIELDING A
DAILY MEAN. THE MODEL PREDICTIONS WERE
COMPARED TO ACTUAL MEASUREMENTS
CONDUCTED BY JEFFERSON COUNTY AIR
POLLUTION CONTROL DISTRICT PERSONNEL
USING THE BEST-GAME SAMPLING
PROCEDURE. THE SAMPLE CORRELATION
COEFFICIENT FOR ALL PREDICTIONS WAS
LOW, BUT AFTER ONLY ABOUT ONE OF THE
PREDICTIONS WERE ELIMINATED ON
STATISTICAL GROUNDS, THE SAMPLE
CORRELATION COEFFICIENT WAS INCREASED
TO 0.72. THE STATISTICAL ANALYSIS
APPEARED TO DISCARD A REMARKABLE NUMBER
OF PREDICTIONS ON THE BASIS OF OBSERVED
VARIABILITY IN THE MEASURED AIR QUALITY.

<CITY> KENTUCKY, LOUISVILLE

<TYPE> 24 HOURS

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> PUNCHED CARDS

AID QUALITY

<351> CONT.

<STWD> 77,000 BYTES

<COMP> IBM

<CCREFD> IBM 370

<LANG> BASIC

<CLAS> PREDICTIVE

<APPD> ESTIMATE THE EFFECTS OF ERRORS IN THE METEOROLOGICAL DATA AND IN THE PREVIOUS DATA ON THE MODELS

<SNP> JEFFERSON COUNTY AIR POLLUTION CONTROL DISTRICT

<CCW> SOME FURTHER WORK MAY BE IN PROGRESS BY DR. L. R. PETERS, UNIVERSITY OF KENTUCKY, LEXINGTON, KY 40506.

<RPDND> 1979/06/79

<352>

<CONT> JEFFRIES, HARVEY

<TITLE> OUTDOOR SIMULATION OF AIR POLLUTION CONTROL STRATEGIES

<ADPD> UNIVERSITY OF NORTH CAROLINA, SCHOOL OF PUBLIC HEALTH

<CITY> CHAPEL HILL

<STATE> NC

<ZIP> 27510

<ABST> SOME OF THE MAJOR IMPROVEMENTS IN THE MODEL WILL COME FROM THE RESULTS OF OUR PROPOSED SMOG EXPERIMENTS WHICH WILL ISOLATE THE INFLUENCE OF VITRIC AND NITROUS ACID, ALDEHYDES, PAN, CARBON MONOXIDE, AROMATICS AND LESS REACTIVE HYDROCARBON MATERIALS ON SMOG SYSTEMS. SINCE MOST OF THIS WORK WILL BE DONE ON STATIC SMOG CHAMBER SYSTEMS, CONTINUED EFFORT WILL BE MADE TO SIMULATE REAL ATMOSPHERIC SMOG CONDITIONS BY USING SOPHISTICATED PATTERNS OF CONTINUED INJECTION AND DILUTION IN THE CHAMBER. STATIC ANALOG EXPERIMENTS WILL BE CONDUCTED WITH THESE VERY COMPLEX EXPERIMENTS. THIS INFORMATION WILL THEN BE USED TO RECONSTRUCT MODELING RESULTS SO THAT THE DERIVED CONTROL STRATEGY RELATIONSHIPS WILL HAVE IMPLICIT ATMOSPHERIC RELEVANCE. (1) 5/77 REPORT--EFFECTS OF DILUTION. (2) 10/78 REPORT--TEMPERATURE EFFECTS ON PHOTOCHEMICAL SMOG.

<TIME> 75/01/31-75/02/01

<353>

<CONT> JOHNSON, W. B.; LUDWIG, P. L.; DAUBERT, W. P.; ALLEN, W. J.

<TITLE> AN URBAN DIFFUSION SIMULATION MODEL FOR CARBON MONOXIDE

<DOC> JOURNAL AIR POLLUTION CONTROL ASSOCIATION, 23(6), 690-698, 1973

<ABST> A SIMPLE 'SSIAN-TYPE DIFFUSION SIMULATION' MODEL FOR CALCULATING URBAN CARBON MONOXIDE CONCENTRATIONS AS A FUNCTION OF LOCAL METEOROLOGY AND THE DISTRIBUTION OF TRAFFIC IS DESCRIBED. THE MODEL CAN BE USED IN THE SYNOPTIC

MODE, IN WHICH HOURLY CONCENTRATIONS AT ONE OR MANY RECEPTOR POINTS ARE CALCULATED FROM HISTORICAL OR FORECAST TRAFFIC AND METEOROLOGICAL DATA, OR IN THE CLIMATOLOGICAL MODE, IN WHICH CONCENTRATION FREQUENCY DISTRIBUTIONS ARE CALCULATED ON THE BASIS OF LONG-TERM SEQUENCES OF INPUT DATA. FOR MODEL EVALUATION PURPOSES, AN EXTENSIVE FIELD STUDY INVOLVING METEOROLOGICAL AND AIR-QUALITY MEASUREMENTS WAS CONDUCTED DURING NOVEMBER-DECEMBER 1970 IN SAN JOSE, CALIFORNIA, WHICH HAS AN AUTOMATED NETWORK TO PROVIDE TRAFFIC DATA THROUGHOUT THE CENTRAL BUSINESS DISTRICT. MODEL REFINEMENTS MADE ON THE BASIS OF RECEIVED DATA INCLUDED THE ADDITION OF A STREET CANYON SUBMODEL TO COMPENSATE FOR THE AERODYNAMIC EFFECTS OF BUILDINGS ON CO CONCENTRATIONS AT STREETSIDE RECEPTORS. EVALUATION OF THE REVISED MODEL SHOWED THAT CALCULATED AND OBSERVED CONCENTRATION FREQUENCY DISTRIBUTIONS FOR STREET-CANYON SITES WERE IN GOOD AGREEMENT. HOURLY AVERAGE PREDICTIONS WERE WELL CORRELATED WITH OBSERVATIONS (CORRELATION COEFFICIENT ABOUT 0.6-0.7). AND ABOUT 90% OF THE CALCULATED VALUES WERE WITHIN 3 PPM OF THE OBSERVED HOURLY AVERAGE CONCENTRATIONS WHICH RANGED AS HIGH AS 16 PPM.

<CLAS> SIMULATION

<354>

<CONT> KELLY, R. E.

<TITLE> PREDICTING THE EFFECT OF GEOTHERMAL EMISSIONS ON THE TEMPERATURE AND RELATIVE HUMIDITY IN THE IMPERIAL VALLEY OF CALIFORNIA

<ADPD> UNIVERSITY OF CALIFORNIA

<CITY> LIVERMORE

<STATE> CA

<DOC> GEOTHERMAL ENERGY MANAGEMENT, 5(1), 18-21, 1977

<ABST> ESTIMATED VALUES ARE GIVEN FOR TEMPERATURE AND RELATIVE HUMIDITY CHANGES RESULTING FROM PRODUCTION FROM THE SALTON SEA GEOTHERMAL FIELD IN THE IMPERIAL VALLEY OF SOUTHERN CALIFORNIA. STATISTICAL GAUSSIAN EQUATIONS FOR ATMOSPHERIC DISPERSION ARE USED TO OBTAIN INCREMENTAL INCREASES IN RELATIVE HUMIDITY AND TEMPERATURE FOR VARIOUS LOCATIONS WITHIN ABOUT 100 KM OF THE GEOTHERMAL SITES. THE RESULTS SHOW MEASURABLE CHANGES IN BOTH PARAMETERS AT SOME POPULATION CENTERS WITH NIGHTTIME VARIATIONS EXCEEDING DAILY CHANGES. THE ENVIRONMENTAL EFFECTS OF THE RELEASE OF BOTH WATER VAPOR AND HEAT APPEAR TO BE CRITICAL FOR THE ARID CLIMATE OF THE REGION.

<GEO> CALIFORNIA, SALTON SEA

<CLAS> PREDICTIVE

<355>

<CONT> ROOGER, J. D.; SHULTS, R. S.; DAVIS, A. L.; HANFORD, C. I.

<TITLE> A MULTIVARIABLE MODEL FOR ATMOSPHERIC DISPERSION PREDICTIONS

AIR QUALITY

<355> CONT.

<1857> IN CONJUNCTION WITH A 15-MONTH AIR QUALITY STUDY OF JACKSONVILLE, FLORIDA, A MATHEMATICAL MODEL HAS BEEN DEVELOPED TO DESCRIBE THE DISPERSION OF ATMOSPHERIC POLLUTANTS. THE SOURCE INVENTORY USED WITH THE MODEL WAS COMPILED, IN PART, FROM THE DATA OBTAINED FROM THE SAMPLING OF ALL MAJOR SOURCES WITHIN THE AREA. THE MAJOR SOURCES WERE CONSIDERED SEPARATELY FROM THE ONE-MILE SQUARE AREA SOURCES WHICH ACCOUNTED FOR THE REMAINDER OF THE EMISSIONS. METEOROLOGICAL DATA WAS RECORDED CONTINUOUSLY IN THE CITY INCLUDING VERTICAL TEMPERATURE OBSERVATIONS TO 750 FEET THE MODEL WAS COMPILED IN FORTRAN AND CAN BE USED FOR BOTH GASEOUS AND PARTICULATE POLLUTANTS, BY UTILIZING PROPER DECAY RATES. THE VARIANT NATURE OF METEOROLOGICAL PARAMETERS AND EMISSION RATES ARE CONSIDERED. THE GROUND LEVEL CONCENTRATIONS OF SEVERAL POLLUTANTS WHICH WERE DETERMINED FOR 24 HR PERIODS AT 11 SITES AND CONTINUOUSLY AT TWO OTHER SITES WERE USED TO CHECK THE MODEL. A LIMITED TRACER STUDY WAS CARRIED OUT IN CONJUNCTION WITH THE PROJECT.

<GE0> FLORIDA, JACKSONVILLE

<LANG> FORTRAN

<CLAS> PREDICTIVE

<356>

<AUTH> VOZLOUSKI, THOMAS P.

<TITLE> SAPOLUT: ESTIMATING THE AIR QUALITY IMPACT OF VEHICULAR EMISSIONS RESULTING FROM A TRAFFIC ASSIGNMENT

<ACF0> SAPOLUT

<AD0> FEDERAL HIGHWAY ADMINISTRATION, URBAN PLANNING DIVISION, 400 7TH STREET SW

<CITY> WASHINGTON

<STATE> DC

<YIP> 20590

<ENOW> 202-626-4856; FTS 626-4856

<SCMCP> TRANSPORTATION RESEARCH BOARD, SPECIAL REPORT 167

<DOC> ASSESSING TRANSPORTATION-RELATED AIR QUALITY IMPACTS, PROCEEDINGS OF THE CONFERENCE ON THE STATE-OF-THE-ART OF ASSESSING TRANSPORTATION-RELATED AIR QUALITY IMPACTS HELD IN WASHINGTON, D.C. ON OCT. 22-24, 1975, (P. 166-172), 202 PP.

<SUB> ESTIMATES DAILY ATMOSPHERIC LOADING OF THE HIGHWAY-RELATED POLLUTANTS RESULTING FROM THE DAILY TRAVEL ON AN URBAN STREET AND HIGHWAY SYSTEM

<ABST> SPECIAL AREA POLLUTION (SAPOLUT) IS THE NOISE AND AIR QUALITY ANALYSIS PORTION OF SPECIAL AREA ANALYSIS (SAA) DEVELOPED BY THE U.S. DEPARTMENT OF TRANSPORTATION. SAPOLUT IS BEING USED IN MANY AREAS FOR TRANSPORTATION SYSTEM ALTERNATIVES EVALUATION AND TRANSPORTATION AND AIR QUALITY CONSISTENCY DETERMINATIONS. THE TOTAL AMOUNT OF POLLUTANTS MAY BE STRATIFIED

BY HOUR OF DAY, AREA TYPE, FUNCTIONAL CLASSIFICATION, AND POLLUTION DISTRICT. THE PROGRAM CAN ALSO ESTIMATE EXHAUST EMISSIONS FROM INTERNATIONAL TRAVEL AND FROM COLD STARTS.

<GE0> UNITED STATES

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE

<COMP> IBM

<LANG> FORTRAN IV

<CLAS> PREDICTIVE

<APPL> ESTIMATION OF DAILY ATMOSPHERIC LOADING OF THE HIGHWAY-RELATED POLLUTANTS RESULTING FROM THE DAILY TRAVEL ON AN URBAN STREET AND HIGHWAY SYSTEM

<USED> STATE TRANSPORTATION AND HIGHWAY DEPARTMENTS; LOCAL URBAN TRANSPORTATION PLANNING AGENCIES; AIR QUALITY PLANNING AGENCIES

<SHD> VARIOUS AIR QUALITY AND TRANSPORTATION SOURCES

<CON> THE AIR QUALITY ANALYSIS PORTION OF SAPOLUT IS OBSOLETE AND IS BEING REPLACED BY A MODEL NOW UNDER DEVELOPMENT.

<357>

<AUTH> KUMAR, S.; LANG, R. G.; SRIFFELD, J. H.

<TITLE> PREDICTION ON LONG-TERM MEAN AND MEAN SQUARE POLLUTANT CONCENTRATIONS IN AN URBAN ATMOSPHERE

<AD00> CALIFORNIA INSTITUTE OF TECHNOLOGY

<CITY> PASADENA

<STATE> CA

<DOC> ATMOSPHERIC ENVIRONMENT, 10(9), 707-715, 1976

<ABST> TWO GENERAL PROBLEM OF PREDICTING LONG-TERM AVERAGE (SAY YEARLY) POLLUTANT CONCENTRATIONS IN AN URBAN ATMOSPHERE IS FORMULATED. THE POLLUTANT CONCENTRATION CAN BE VIEWED AS A RANDOM PROCESS, THE COMPLETE DESCRIPTION OF WHICH REQUIRES KNOWLEDGE OF ITS PROBABILITY DENSITY FUNCTION, WHICH IS UNKNOWN. THE MEAN CONCENTRATION IS THE FIRST MOMENT OF THE CONCENTRATION DISTRIBUTION, AND AT PRESENT THERE EXIST A NUMBER OF MODELS FOR PREDICTING THE LONG-TERM MEAN CONCENTRATION OF AN IDEAL POLLUTANT. THE SECOND MOMENT, OR MEAN SQUARE CONCENTRATION, INDICATES ADDITIONAL FEATURES OF THE DISTRIBUTION, SUCH AS THE LEVEL OF FLUCTUATIONS ABOUT THE MEAN. IN THE PAPER A MODEL PROPOSED BY LANG FOR THE LONG-TERM MEAN CONCENTRATION IS REVIEWED, AND A NEW MODEL FOR PREDICTION OF THE LONG-TERM MEAN SQUARE CONCENTRATION OF AN IDEAL AIR POLLUTANT IS DERIVED. THE PROPERTIES AND USES OF THE MODEL ARE DISCUSSED, AND THE EQUATIONS DEFINING THE MODEL ARE PRESENTED IN A FORM FOR DIRECT APPLICATION TO AN URBAN AREA.

AIR QUALITY

<957> CONT.

<CLASS> PREDICTIVE

<958>

<CONT> LARSEN, B. I.

<TITLE>

A MATHEMATICAL MODEL FOR RELATING AIR QUALITY MEASUREMENTS TO AIR QUALITY STANDARDS

<ADDR>

U.S. ENVIRONMENTAL PROTECTION AGENCY, NATIONAL ENVIRONMENTAL RESEARCH CENTER

<CITY>

WASHINGTON

<STATE>

DC

<CON>

U.S. ENVIRONMENTAL PROTECTION AGENCY, P.O. BOX 40-09, 5700, 1971

<ABST>

ANALYSES OF AIR POLLUTION DATA INDICATE THAT AIR QUALITY MEASUREMENTS TEND TO FIT A GENERAL MATHEMATICAL MODEL HAVING THE FOLLOWING CHARACTERISTICS: POLLUTANT CONCENTRATIONS ARE LOG-NORMALLY DISTRIBUTED FOR ALL AVERAGING TIMES; MEAN CONCENTRATIONS ARE PROPORTIONAL TO AVERAGING TIME RAISED TO AN EXPONENT; AND MAXIMUM CONCENTRATIONS ARE APPROXIMATELY INVERSELY PROPORTIONAL TO AVERAGING TIME RAISED TO AN EXPONENT. THESE CHARACTERISTICS WERE USED TO DEVELOP EQUATIONS FOR CALCULATING GEOMETRIC MEAN, STANDARD GEOMETRIC DEVIATION, MAXIMUM CONCENTRATION, AND VARIOUS PERCENTILE CONCENTRATIONS OF AIR POLLUTANTS. PARAMETERS WERE CALCULATED FOR ONE AVERAGING TIME FROM ACTUAL DATA AS WELL AS FOR THE AVERAGING TIMES. CALCULATED MAXIMUM CONCENTRATIONS ARE COMPARED WITH MEASURED VALUES FOR 7 GASEOUS POLLUTANTS. THE MODEL CAN BE USED TO COMPARE AMBIENT POLLUTANT CONCENTRATIONS WITH AIR QUALITY STANDARDS AND TO CALCULATE POLLUTANT PARAMETERS FOR VARIOUS AVERAGING TIMES. RESULTING INFORMATION CAN BE USED TO DEVELOP IMPLEMENTATION PLANS AND EMISSION STANDARDS.

<CLASS>

SIMULATION

<959>

<CONT> LARSEN, B. I.

<TITLE>

A NEW MATHEMATICAL MODEL OF AIR POLLUTANT CONCENTRATION AVERAGING TIME AND FREQUENCY

<ADDR>

U.S. ENVIRONMENTAL PROTECTION AGENCY

<CITY>

WASHINGTON

<STATE>

DC

<ABST>

A PREVIOUS MATHEMATICAL MODEL OF AIR POLLUTANT CONCENTRATION, AVERAGING TIME, AND FREQUENCY GAVE RESULTS CLOSE TO ACTUAL MEASUREMENTS FOR THE RELATIVELY SHORT AVERAGING TIMES FOR WHICH IT WAS USED. HOWEVER, RECENT CALCULATIONS SHOW THAT MATHEMATICALLY OBTAINED RESULTS ARE OBTAINED WITH THE MODEL FOR AVERAGING TIMES LONGER THAN ONE HOUR. A NEW MATHEMATICAL MODEL, DESCRIBED HEREIN, GIVES MATHEMATICALLY SOUND RESULTS FOR ALL AVERAGING TIMES. THE TWO DOMINANT FEATURES OF THIS NEW MODEL ARE DERIVED FROM OBSERVATIONS THAT INDICATE: (1) AIR POLLUTANT

CONCENTRATIONS ARE APPROXIMATELY LOG-NORMALLY DISTRIBUTED FOR ALL POLLUTANTS IN ALL CITIES FOR ALL AVERAGING TIMES; AND (2) MEAN CONCENTRATION IS PROPORTIONAL TO AVERAGING TIME TO AN EXPONENT. APPLICATIONS TO PROBLEMS OF AIR POLLUTANT EFFECTS AND AIR QUALITY STANDARDS ARE SHOWN.

<CLASS>

SIMULATION

<960>

<CONT> LEE, Y.

<TITLE>

NUMERICAL MODELS FOR PRECIPITATION SCAVENGING

<ADDR>

MICHIGAN STATE UNIVERSITY

<CITY>

EAST LANSING

<STATE>

MI

<DOC>

M.S. THESIS; CSO--1007-52; F2-96, 1974. THESIS

<ABST>

TWO MODELS ARE DEVELOPED. THE FIRST IS DESIGNED FOR PRECIPITATION SCAVENGING IN STRATIFORM CLOUDS. THIS MODEL INCORPORATES HEURISTIC APPROXIMATIONS OF DIFFUSIVE ATTACHMENT, IMPACT COLLECTION AND ACCRETION, AND INCLUDES CONSIDERATION OF PARTICLE AND CLOUD DROPLET SIZE SPECTRA. AN OVERRIDING, INDEPENDENTLY GENERATED STEADY RAIN REMOVES CONTAMINATED CLOUD DROPLETS AND CONTAMINANT PARTICLES. THE CONSERVATION OF CONTAMINANT MASS IS EXPRESSED BY A SET OF THREE ORDINARY DIFFERENTIAL EQUATIONS FOR WHICH ANALYTIC SOLUTIONS ARE DERIVED. RAINFALL RATIOS AND EFFICIENCIES ARE COMPUTED, AND THE RESULTS COMPARE FAVORABLY WITH AVAILABLE FIELD MEASUREMENTS. IT IS SHOWN THAT THE FRACTION OF THE AIR CONCENTRATION OF CONTAMINANT THAT IS ATTACHED TO THE CLOUD DROPLETS IS AFFECTED BY PROCESS OF PARTICLE ATTACHMENT AND RAINFALL REMOVAL. THE SECOND MODEL ADDRESSES THE PROBLEM OF AIR CLEANSING BY A CONVECTIVE RAIN-GENERATING SYSTEM. IN THIS MODEL, RAINDROPS GROWTH AND MOTION IN SPATIAL CONTAMINANT CONCENTRATION GRADIENTS ARE OF MAJOR CONCERN. NUMERICAL SOLUTIONS FOR RAINDROPS GROWING BY COALESCENCE WITH CLOUD DROPLETS AND MOVING IN A CYLINDRICALLY SYMMETRIC MOTION FIELD WITHIN A STEADY-STATE CLOUD ARE PROVIDED. THE DROOP BREAKUP PROCESS IS FORMALLY ACCOUNTED FOR, AND, IN THE SUB-CLOUD REGION, EVAPORATION IS CONSIDERED. THE CONTAMINANT CONCENTRATIONS OF INDIVIDUAL RAINDROPS ARE COMPUTED. DROPS OF DIFFERENT SIZE CAN HAVE THE SAME CONCENTRATION, AND UNDER THE ASSUMED CONDITIONS A PARTICULAR DROP SIZE IS IDENTIFIED WITH THE MINIMUM CONCENTRATION.

<CLASS>

PREDICTIVE

<961>

<CONT> LUTHER, P.

<TITLE>

SOLAR ULTRAVIOLET AND VISIBLE RADIATIVE TRANSFER MODEL

<ACR0>

PHOTO2

<361>

ATD QUALITY

<361> CONT.

<ADDR> LAWRENCE LIVERMORE LABORATORY, PHYSICS,
6-DIVISION, P.O. BOX 800

<CITY> LIVERMORE

<STATE> CA

<ZIP> 94550

<PHONE> 415-422-1025; FTS 532-1025

<SOURCE> DEVELOPED AT LL

<DOC> LUTHER, P.H., AND GELINAS, R.V., EFFECT
OF MOLECULAR MULTIPLE SCATTERING AND
SURFACE ALBEDO ON ATMOSPHERIC
PHOTODISSOCIATION RATES, UCRL-75160
MARCH 1975

<SUB> RADIATION TRANSFER

<ABST> PHOTO2 COMPUTES SOLAR UV AND VISIBLE
FLUXES AND PHOTODISSOCIATION RATES FOR
A PLANE-PARALLEL CLOUDLESS ATMOSPHERE.
THE MODEL INCLUDES MOLECULAR AND RIE
MULTIPLE SCATTERING ALONG WITH
ABSORPTION BY AEROSOLS, OZONE, OXYGEN
AND NITROGEN DIOXIDE.

<GEO> 1-DIMENSIONAL-VERTICAL

<STATUS> IN USE MONTHLY

<ACCESS> LIMITED TO AUTHORIZED RECIPIENTS

<MEDIA> PUNCHED CARDS; MAGNETIC TAPE

<SIZE> CODE STATEMENTS WITH COMMENT CARDS:
1050; CODE STATEMENTS W/O COMMENT
CARDS: 1360

<COMP> CDC

<CONFIG> CDC 7600, 610,000 (LCH+SCN) OCTAL
MEMORY REQUIREMENT; 20 CPU MINUTES
REQUIRED FOR AVERAGE RUN

<LANG> LLITHAN

<CHAR> ASCII; EBCDIC

<ALGO> GAUSS-SEIDEL SUCCESSIVE ITERATION

<CLASS> DETERMINISTIC

<APPL> ATMOSPHERIC RESEARCH

<USERS> LLL

<SUB> USER SUPPLIED

<NVAL> COMPARED TO SIMILAR MODELS AND STANDARD
PROBLEMS<CON> PHOTO2 COMPUTES DIRECT AND DIFFUSE
SOLAR FLUXES IN THE UV AND VISIBLE
SPECTRA ALONG WITH PHOTODISSOCIATION
COEFFICIENTS AND RATES FOR SEVERAL
REACTIONS. THE SPECTRUM FROM 107 TO 730
NM IS DIVIDED INTO 119 INTERVALS.
CAREFUL ATTENTION IS GIVEN TO THE
SCHWANN-WURGE BANDS OF OXYGEN. THE
MODEL INCLUDES ABSORPTION BY OXYGEN,
OZONE, NO2 AND AEROSOLS, AND MOLECULAR
AND RIE MULTIPLE SCATTERING. THE
GAUSS-SEIDEL ITERATIVE PROCEDURE IS
USED TO SOLVE THE RADIATIVE TRANSFER
EQUATION FOR UP TO 500 LEVELS IN THE
ATMOSPHERE.

<UPDATE> 700620

<362>

<CONT> LUTHER, P.

<TITLE> SOLAR RADIATIVE TRANSFER MODEL

<ACRO> RAD1

<ADDR> LAWRENCE LIVERMORE LABORATORY, PHYSICS,
6-DIVISION, P.O. BOX 800

<CITY> LIVERMORE

<STATE> CA

<ZIP> 94550

<PHONE> 415-422-1025; FTS 532-1025

<SOURCE> NASA

<DOC> LUTHER, P.H., SOLAR RADIATION MODEL
RAD1, LUTHER, P.H., UCRL-16572, 1974;
HACCRACKER, R.C., SECOND ANNUAL REPORT,
DOT-CIAP PROGRAM, UCRL-51336-70 JULY,
1974

<SUB> SOLAR RADIATION TRANSFER

<ABST> THE SOLAR RADIATION MODEL RAD1 SOLVES
THE RADIATIVE TRANSFER EQUATION FOR A
CLOUDLESS, PLANE-PARALLEL ATMOSPHERE.
THE MODEL INCLUDES RAYLEIGH AND RIE
MULTIPLE SCATTERING ALONG WITH
ABSORPTION BY AEROSOLS, OZONE, WATER
VAPOR, CARBON DIOXIDE AND OXYGEN.

<STATUS> IN USE MONTHLY

<ACCESS> ALSO AVAILABLE FROM ORIGINAL SOURCE:
NASA

<MEDIA> PUNCHED CARDS; MAGNETIC TAPE

<SIZE> CODE STATEMENTS WITH COMMENT CARDS:
1150; CODE STATEMENTS W/O COMMENT
CARDS: 1070

<COMP> CDC

<CONFIG> CDC 7600 WITH 670,000 MEMORY
REQUIREMENT; 20 CPU MINUTES REQUIRED
FOR AVERAGE RUN

<LANG> LLITHAN

<CHAR> ASCII

<ALGO> GAUSS-SEIDEL SUCCESSIVE ITERATION

<CLASS> DETERMINISTIC

<APPL> ATMOSPHERIC RESEARCH

<USERS> LLL

<SUB> PROVIDED BY USER

<NVAL> NASA TEST PROBLEM, AGREED.

<CON> THE SOLAR SPECTRUM IS DIVIDED INTO
DISCRETE SPECTRAL INTERVALS (83 IN THE
PRESENT MODEL), AND THE VERTICAL COLUMN
IS DIVIDED INTO UP TO 500 LAYERS
DEPENDENT UPON THE OPTICAL THICKNESS OF
THE ATMOSPHERE. THE DIRECT SOLAR FLUX
AND THE UPWARD AND DOWNWARD DIFFUSE
FLUXES FOR EACH SPECTRAL INTERVAL AT
EACH LEVEL ARE COMPUTED TAKING INTO
ACCOUNT ALL ORDERS OF SCATTERING.
PROGRAM WAS MODIFIED TO RUN ON CDC
EQUIPMENT.

<UPDATE> 700620

AIR QUALITY

<363>
 <COPY> HACCBACKEN, MICHAEL C.
 <TITLE> LIVERMORE REGIONAL AIR QUALITY MODEL-MODE 1
 <ACRO> LIBAQ-1
 <ADDR> LAWRENCE LIVERMORE LABORATORY, ATMOSPHERIC AND GEOPHYSICAL SCIENCES DIVISION, PHYSICS DEPT., P.O. BOX 800
 <CITY> LIVERMORE
 <STATE> CA
 <ZIP> 94550
 <PHONE> 415-472-1824; FTS 532-1424
 <SOURCE> DEVELOPED AT LL
 <DOC> HACCBACKEN, M.C., SAWYER, S.D., EDS., DEVELOPMENT OF AN AIR POLLUTION MODEL FOR THE S.F. BAY AREA, UCRL-51920 (VOL 1 & 2), OCTOBER, 1975; HACCBACKEN, M.C., USEP'S GUIDE TO THE LIBAQ MODEL, UCPL-51903, DECEMBER, 1975; HACCBACKEN, M.C., WALTON, J.J., BUEWER, W.H., GRANT, R.E., THE LIVERMORE REGIONAL AIR QUALITY MODEL: I. CONCEPT AND DEVELOPMENT, JOURNAL APPLIED METEOROLOGY, 17, 254-272, 1978; BUEWER, W.H., HACCBACKEN, M.C., WALTON, J.J., THE LIVERMORE REGIONAL AIR QUALITY MODEL: II VERIFICATION AND SAMPLE APPLICATION IN THE BAY AREA, JOURNAL APPLIED METEOROLOGY, 17, 273-311, 1978
 <SUB> AIR QUALITY
 <ABST> THE LIBAQ-1 MODEL IS A REGIONAL AIR QUALITY MODEL DEVELOPED FOR USE BY AN AIR POLLUTION CONTROL DISTRICT IN STUDYING REGIONAL LAND USE, CONTROL STRATEGY AND AIR QUALITY PROBLEMS. THE MODEL TREATS TEMPORALLY AND SPATIALLY VARYING METEOROLOGY AND SOURCE EMISSIONS, COMPLEX TOPOGRAPHY AND STEEP PHYSICAL SLOPES IN A REGIONAL DOMAIN IN THE WELL MIXED LAYER BELOW THE INVERSION. THE MODEL CAN BE APPLIED TO VARIABLE SIZE GRIDS, TO REGIONS, SUBURBS, OR CITIES, AND TO VARIOUS METEOROLOGICAL SITUATIONS.
 <GEO> REGIONAL
 <TIME> ONE OR TWO DAYS
 <STATUS> IN USE NOW
 <ACCESS> UNLIMITED DISTRIBUTION
 <MEDIA> TAPE; TEXT
 <STR> CODE STATEMENTS WITH COMMENT CARDS: 3000; CODE STATEMENTS W/O COMMENT CARDS: 2000
 <COMP> CDC
 <COPIES> CDC 7600, MEMORY REQUIREMENT: 1,240,000 OCTAL;
 <LANG> FORTRAN IV
 <CHAR> ASCII
 <ALGO> P1.01 CORRECTED TRANSPORT
 <CLAS> INFORMATIONAL; PREDICTIVE
 <APPL> AIR POLLUTION STUDIES, DATA SETS APPLICABLE TO BAY AREA; AQMP PLANNING

<USERS> BAY AREA AIR POLLUTION CONTROL DISTRICT; ASSOCIATION OF BAY AREA GOVERNMENTS
 <SUB> VARIOUS
 <REVL> SEE DOCUMENTATION
 <CON> TIME REQUIRED FOR AVERAGE RUN (CPU MINUTES): 10; AVERAGE RUN (CPU MINUTES): 10
 <UPDATE> 700606
 <364>
 <COPY> MICHAEL, PAUL A.
 <TITLE> BNL LONG-TERM GAUSSIAN DISPERSION MODEL
 <ACRO> BNL WIND ROSE MODEL
 <ADDR> BROOKHAVEN NATIONAL LAB, ATMOSPHERIC SCIENCES, BLDG 51
 <CITY> UPTON
 <STATE> NY
 <ZIP> 11973
 <PHONE> 516-345-2264; FTS 644-2264
 <SOURCE> DEVELOPED AT BNL
 <DOC> BNL 24226 BROOKHAVEN NATIONAL LABORATORY LONG-TERM GAUSSIAN DISPERSION MODEL; POPAZO, C., LEE, H.-H., MICHAEL, P. BROOKHAVEN NATIONAL LABORATORY, UPTON, N.Y., DEC. 1977
 <SUB> EVALUATING IMPACT OF AIR QUALITY EFFECTS
 <ABST> THE LONG-TERM GAUSSIAN DISPERSION MODEL EVALUATES AVERAGE (SEASONAL OR ANNUAL) POLLUTANT CONCENTRATIONS AT GROUND LEVEL RECEPTOR POINTS. THE INPUT PARAMETERS TO THE MODEL ARE: 1) THE JOINT FREQUENCY DISTRIBUTION OF WIND SPEED, WIND DIRECTION AND STABILITY; 2) THE AVERAGE EMISSION RATES FROM BOTH AREA AND POINT SOURCES, AND THEIR GEOMETRIC AND PHYSICAL CHARACTERISTICS; 3) THE RECEPTOR GRID CONFIGURATION; 4) THE ASSUMED HALF-LIFE OF THE PARTICULATE POLLUTANT UNDERGOING LINEAR CHEMISTRY; 5) DEPOSITION RATE; 6) THE AVERAGE CLIMATOLOGICAL MIXING HEIGHT AND THE AVERAGE NOCTURNAL MIXING HEIGHT; 7) THE AVERAGE AIR TEMPERATURE; 8) THE REFERENCE HEIGHT FOR WIND SPEED MEASUREMENTS. THE MAIN DIFFERENCE OF THIS MODEL WITH RESPECT TO THE EPA-COR ARE THE FOLLOWING: A) BNL STABILITY CATEGORIES ARE USUALLY USED INSTEAD OF THE CONVENTIONAL PASQUILL-GIFFORD STABILITY CLASSES. B) THE HIGHEST AND LOWEST CENTRAL WIND SPEEDS ARE SUPPLIED FROM INPUT. C) THE AREA SOURCE CONTRIBUTIONS (DOUBLE INTEGRALS) ARE ANALYTICALLY EVALUATED. EPA-COR RESORTS TO THE NUMERICAL INTEGRATION OF THESE DOUBLE INTEGRALS. D) THE BRIGGS' PLUME RISE FORMULAE USED HERE ARE SLIGHTLY DIFFERENT FROM THOSE USED BY EPA-COR. E) PASQUILL'S LATEST SUGGESTION TO OBTAIN POINT SOURCE CONTRIBUTIONS AS FUNCTIONS OF THE RELEASE HEIGHT AND THE DISTANCE FROM THE SOURCE ARE INCLUDED HERE. F) AREA SOURCES FAR AWAY FROM THE RECEPTOR POINT ARE TREATED AS POINT SOURCES. G) DEPOSITION IS INCLUDED AS A POSSIBLE

<364>

A7D QUALITY

<364> CONT.

MECHANISM FOR POLLUTANT REMOVAL. BY AN AREA SOURCE INVENTORY WITH SEVERAL AREA SOURCE DIMENSIONS CAN BE DIRECTLY TREATED WITHOUT THE NEED FOR FURTHER SUBDIVISIONS OF LARGE AREA SOURCES TO HAVE A UNIQUE ELEMENTARY UNIT AREA.

<GEO> UNRESTRICTED; PORTION OF AVAILABLE INPUT DATA
 <TIN> NOT APPLICABLE
 <STAT> IN USE
 <ACCESS> LIMITED
 <MEDIA> MAGNETIC TAPE
 <SIZE> ABOUT 1000 LINES OF CODE
 <COMP> CDC
 <CONFIG> 16000 CODE ON CDC 6600; RUNS 50 SEC FOR 9 POINT GRID AND 550 AREA SOURCES
 <LANG> FORTRAN
 <CHAR> ASCII; DECOTIC
 <REFD> 780519

<365>
 <CONT> MUCCIARDI, A. M.
 <TITLE> WATERSHED POLLUTION FORECASTING MODEL
 <ACPD> WATER
 <ADDR> AERATIONICS, INC., 7700 OLD SPRINGHOUSE ROAD
 <CITY> MCLEAN
 <STATE> VA
 <ZIP> 22102
 <PHONE> 703-893-5450
 <DOC> WATER SEWAGE WORKS, 121(8), 58-59, 1970
 <SUB> WATERSHED POLLUTION PREDICTION - PHASE PREDICTION
 <ABST> THE MODELING OF POLLUTANTS IN WATERSHEDS AND IN THE ATMOSPHERE MAY BE COMPLICATED BY THE INTRACTABILITY OF PURELY ANALYTICAL MODELS OR THE EXCESSIVE REQUIREMENT FOR COMPUTER UTILIZATION TO BUILD AND INTERROGATE MODELS. CONVENTIONAL MODELS FREQUENTLY ARE UNABLE TO GIVE ACCURATE FORECASTS OF POLLUTANT LEVELS FOR MORE THAN A FEW DAYS INTO THE FUTURE. NEW TECHNOLOGY IN ADAPTIVE TRAINABLE NETWORKS OFFER AN ATTRACTIVE SOLUTION TO THESE PROBLEMS: NO RELIANCE IS PLACED ON PRIOR ASSUMPTIONS; MODELING CAN PROVIDE SOLUTIONS FROM A VERY LIMITED DATA BASE; AND THE METHODOLOGY PROVIDES ACCURATE FORECASTS MANY TIMES FURTHER INTO THE FUTURE THAN PREVIOUSLY REALIZED. THIS PAPER BRIEFLY DESCRIBES SOME RECENT APPLICATIONS OF ADAPTIVE TRAINABLE NETWORK MODELING TECHNIQUES TO FORECASTING TOTAL PHASE CONCENTRATION IN THE POTOMAC RIVER AS A FUNCTION OF SIMPLY MEASURED ENVIRONMENTAL VARIABLES SUCH AS RIVER FLOW RATE, RIVER STAGING, TIDE LEVELS, PRECIPITATION, AND AVERAGE DAILY TEMPERATURE. THE NETWORKS ARE ABLE TO

MAKE THESE FORECASTS WITH AN AVERAGE ACCURACY OF 95.25 THROUGHOUT A 12 DAY FORECASTING PERIOD.

<GEO> DISTRICT OF COLUMBIA, POTOMAC RIVER, WASHINGTON

<TIME> JANUARY 1-MARCH 10, 1971

<STATUS> IN USE

<ACCESS> LIMITED

<MEDIA> MAGNETIC TAPE; PUNCHED CARDS

<SIZE> 50 CARDS

<COMP> CDC

<CONFIG> MINI OR MICRO COMPUTER

<LANG> FORTRAN IV

<CHAR> BCD; DECOTIC

<ALGO> ADAPTIVE LEARNING NETWORK MODEL - WOLINEAR (POLYNOMIAL) MODEL

<CLAS> CONTINUOUS; PREDICTIVE; ENGINEERING

<APPL> WATER POLLUTION FORECASTING

<USERS> WWS, INTERNALLY SPONSORED DEMONSTRATION PROJECT.

<SYN> WEATHER BUREAU

<INVL> PREDICTION ACCURACIES ON INDEPENDENT TEST SET OF DATA

<UPDATE> 780630

<366>

<CONT> NELSON, WILLIAM C.

<TITLE> AIR POLLUTANT HEALTH EFFECTS ESTIMATION MODEL

<ADDR> ENVIRONMENTAL PROTECTION AGENCY, HEALTH EFFECTS RESEARCH LABORATORY

<CITY> RESEARCH TRIANGLE PARK

<STATE> NC

<ZIP> 27711

<DOC> OTT, W.B. (ED.), PROCEEDINGS OF THE EPA CONFERENCE ON ENVIRONMENTAL MODELING AND SIMULATION, 1976, EPA 600/9-76-016, (P. 191-195), 807 PP.

<SUB> PROVIDES AN AGGREGATE ESTIMATE OF HEALTH EFFECTS FROM AIR POLLUTANTS

<ABST> A COMPUTERIZED SYSTEM HAS BEEN DEVELOPED WHICH SEQUENTIALLY UTILIZES ESTIMATES OF AIR POLLUTANT EMISSIONS, AMBIENT LEVELS, HEALTH DAMAGE FUNCTIONS, AND POPULATIONS AT RISK TO PROVIDE AN AGGREGATE ESTIMATE OF HEALTH EFFECTS. ARITHMETIC MEANS ARE USED TO ESTIMATE CHRONIC HEALTH EFFECTS. GEOMETRIC MEANS AND STANDARD GEOMETRIC DEVIATIONS ARE USED TO ESTIMATE ACUTE HEALTH EFFECTS DAILY OR HOURLY AVERAGES ARE ESTIMATED ASSUMING THE LOG NORMAL DISTRIBUTION. THE MODEL CAN CONSIDER COMPOUND EFFECTS SUCH AS THE VARIABLE SHORT-TERM CONTRIBUTION OF MODELS AND STATIONARY SOURCES. HEALTH DAMAGE FUNCTIONS HAVE BEEN DEVELOPED SEPARATELY FOR INPUT TO THE MODEL FOR

AIR QUALITY

<365> COST.
SULFATES, PHOTOCHEMICAL OXIDANTS,
CARBON MONOXIDE, AND NITROGEN DIOXIDE.

<STATUS> IN USE

<ACCESS> UNLIMITED

<CLASS> PREDICTIVE

<APPL> CAN AID IN THE SPECIFIC DEFINITION OF
FEASIBLE ALTERNATIVES AND IN
ENVIRONMENTAL DECISION MAKING.

<UPDATE> 780516

<367>

<CONT> OSVILLE, R. D.; SMITH, P.

<TITLE> NUMERICAL SIMULATION OF THE EFFECTS OF
COOLING TOWER COMPLEXES ON CLOUDS AND
SEVERE STORMS

<ABST> SOUTH DAKOTA SCHOOL OF MINES, AND
TECHNOLOGY

<CITY> RAPID CITY

<STATE> SD

<ZIP> 57701

<DOC> OSVILLE, R.D., A NUMERICAL MODELING
STUDY OF WASTE HEAT EFFECTS ON SEVERE
WEATHER, TO BE PRESENTED AT THE WASTE
HEAT MANAGEMENT AND UTILIZATION
CONFERENCE, MIAMI BEACH, FL, MAY, 1977.

<ABST> A TWO-PART STUDY OF THE EFFECTS OF
ELECTRICAL POWER PLANT COOLING TOWER
COMPLEXES ON THE ENVIRONMENT IS
PROPOSED. WE PLAN TO APPLY A
ONE-DIMENSIONAL, STEADY-STATE NUMERICAL
CONVECTION MODEL WITH PARAMETERIZED
METEOROPHYSICS TO ESTABLISH A CLIMATOLOGY
OF THE EFFECTS OF COOLING TOWERS ON THE
ENVIRONMENT, PARTICULARLY WITH REGARD
TO CLOUD FORMATION. WE ALSO PROPOSE TO
STUDY THE EFFECTS OF COOLING TOWER HEAT
AND VAPOR EFFLUENTS ON SEVERE
CONVECTIVE STORMS VIA NUMERICAL
MODELING TECHNIQUES. TO DO THIS WE PLAN
TO USE A NUMERICAL MODEL OF HAILSTORM
DEVELOPMENT WHICH HAS EVOLVED OVER THE
PAST 18 YEARS FROM A MODEL OF CUMULUS
GROWTH OVER MOUNTAINS.

<TIME> SEPTEMBER, 1976-SEPTEMBER, 1978

<CLASS> SIMULATION

<368>

<CONT> OTT, B.; CLARKE, J. P.; OKOLINS, G.

<TITLE> CALCULATING FUTURE CARBON MONOXIDE
EMISSIONS AND CONCENTRATIONS FROM URBAN
TRAFFIC DATA

<ABST> AN URBAN AREA APPROACH WAS APPLIED IN
WASHINGTON, D.C., TO CALCULATE PRESENT
AND FUTURE EMISSIONS AND AMBIENT
CONCENTRATIONS OF CARBON MONOXIDE.
CALCULATIONS WERE BASED ON 1964 AND
PROJECTED 1985 TRAFFIC VOLUMES,
EMISSION FACTORS, AND A METEOROLOGICAL
DIFFUSION MODEL. WITH NO EMISSION
CONTROL, THE TOTAL CARBON MONOXIDE
EMITTED IN WASHINGTON WILL
APPROXIMATELY DOUBLE IN A NON-UNIFORM
MANNER; THE SMALLEST INCREASES WILL
OCCUR DOWNTOWN AND THE GREATEST

INCREASES AT THE OUTSKIRTS. THE
PRINCIPAL EFFECT OF SUCH NONUNIFORMITY,
ALSO APPARENT IN CHICAGO, IS TO
INCREASE THE AREA OF THE CITY EXPOSED
TO HIGH EMISSION DENSITIES, LEADING TO
CONSEQUENT INCREASES IN THE AREA OVER
WHICH CONCENTRATIONS OCCUR. THE CHANGE
IN CONCENTRATIONS EXPERIENCED AT ONE
SITE IS INFLUENCED MORE BY THE EMISSION
PATTERN OF THE ENTIRE URBAN AREA THAN
BY CHANGES IN THE IMMEDIATE VICINITY OF
THE SITE. WITHOUT CONTROL, THE MEAN
ANNUAL CONCENTRATIONS AT 8 SITES VARIED
FROM 44 PERCENT TO 69 PERCENT OVER 1964
VALUES. WITH 50% CONTROL, THE 1985
CONCENTRATION AT THE CAMP STATION WILL
BE 15% LESS THAN THE 1964 VALUE, AND
VALUES AT THE OTHER SITES WILL DROP
FROM 21% TO 29%. CONCENTRATIONS
CALCULATED FOR THE WEEKDAY PEAK-TRAFFIC
PERIOD (6 TO 8 A.M.) SHOW 2-HOUR
AVERAGE CONCENTRATIONS IN 1985 RANGING
FROM 1.6 PPM TO 25 PPM FOR VARIOUS
METEOROLOGICAL CONDITIONS, REPRESENTING
INCREASES FROM 40% TO 120% OVER THE
1964 VALUES. EVEN WITH 50% CONTROL,
SOME PEAK-TRAFFIC-PERIOD CONCENTRATIONS
WILL INCREASE 10% FOR CERTAIN
METEOROLOGICAL CONDITIONS.

<GE> WASHINGTON, D.C.; CHICAGO, ILLINOIS

<369>

<CONT> POLLACK, R. I.

<TITLE> PREDICTIVE MODEL BASED ON THE
RELATIONSHIP BETWEEN METEOROLOGICAL AND
EMISSION PATTERNS AND AIR QUALITY.

<ABST> FOR ABSTRACT, SEE NSA 28 03, NUMBER
07811.

<370>

<CONT> PORCH, WILLIAM R.

<TITLE> FAST RESPONSE MODEL OF TOXIC AEROSOL
RESUSPENSION BY WIND

<ACRO> PROTR

<ADDR> LAURENCE LIVERMORE LABORATORY, C DIV,
PHYSICS DEPARTMENT, P.O. BOX 808

<CITY> LIVERMORE

<STATE> CA

<ZIP> 94550

<PHONE> 415-422-1031; FTS 532 1031

<SOURCE> DEVELOPED AT LLL

<DOC>

PORCH, WILLIAM R. AND SHINN, JOSEPH R.,
FAST RESPONSE LIGHT SCATTERING
MEASUREMENTS OF THE CHARACTERISTICS OF
WIND SUSPENDED AEROSOLS, UCRL-76016,
AUG. 1970; LANGE, R., ADPIC - A THREE
DIMENSIONAL TRANSPORT - DIFFUSION MODEL
FOR THE DISPERSAL OF ATMOSPHERIC
POLLUTANTS AND ITS VALIDATION,
UCRL-76170, MAY 1975; LANGE, R.,
PATRIC, A 3D PARTICLE-IN-CELL
SEQUENTIAL PUFF CODE FOR MODELING THE
TRANSPORT AND DIFFUSION OF ATMOSPHERIC
POLLUTANTS, UCID-17701 1978

<SUB> RESUSPENSION

<ABST> THIS MODEL IS STILL IN THE INITIAL
STAGES OF DEVELOPMENT TO INCORPORATE

<370>

AIR QUALITY

<370> CONT.

DATA OF DUST SUSPENSION BY WIND INTO AN ADVECTION AND DIFFUSION PARTICLE IN CELL PREDICTIVE MODEL TO ESTIMATE THE DUST WIND HAZARD OF TOXIC AEROSOL SUSPENDED OR RESUSPENDED BY WIND. THIS MODEL WILL BE REGIONAL IN SCALE AND ORIENTED TOWARD FAST RESPONSE HAZARDS DUE TO TOXIC AEROSOL ACCIDENTS.

<GEO> REGIONAL

<STATUS> UNDER DEVELOPMENT

<ACCESS> LIMITED

<SYN> CORE STATEMENTS WITH COMMENT CARDS:
100; CORE STATEMENTS W/O COMMENT CARDS:
1000

<COMP> CDC

<COMPIG> CDC 7600 WITH DISK PACKS, PRINTER, AND PLOTTER, MEMORY REQUIREMENT 1, 000,000 WORDS; APPROX. 5 CPU MINUTES REQUIRED FOR AVERAGE RUN

<LANG> LILLTRAP

<CHAR> ASCII

<ALGO> PARTICLE-IN-CELL

<CLAS> ANALYTICAL; PREDICTIVE

<APPL> RESUSPENSION STUDIES

<USERS> LLL

<SUB> DUST STORM AND SNOW STORM DATA UNDER VARYING CONDITIONS WITH USER SUPPLIED METEOROLOGICAL DATA AND SURFACE CHARACTERISTICS.

<CON> A RESUSPENSION SUB-MODEL WILL BE INCLUDED IN PATRIC, AN ADVECTION DIFFUSION MODEL DESCRIBED IN THE REFERENCES. DUST WILL BE SUSPENDED CONTAINING AN ESTIMATED FRACTION OF TOXIC MATERIAL BY A PRESCRIPTION INCLUDING THE THRESHOLD WIND VELOCITY AND FLOW PROPORTIONAL TO OBSERVATIONS OF ASSOCIATED DUST FLUXES AND FRICTION VELOCITIES UNDER VARYING SOIL TYPES AND WIND CONDITIONS. THIS CODE REQUIRES LARGE CORE MEMORY ON A CDC 7600 AND WILL FOLLOW 30,000 REPRESENTATIVE PARTICLES THROUGH 25,000 CELLS.

<UPDRD> 700619

<371>

<CON> BAC, R. E.; ROFFMAN, A.; TAYLOR, D. E.; BAUER, R. J.

<TITLE> SIMULATION MODEL FOR ENVIRONMENTAL POLLUTION CONTROL FROM FOSSIL FUEL POWER PLANTS

<ABST> WESTINGHOUSE ENVIRONMENTAL SYSTEMS DEPT.

<CITY> PITTSBURGH

<STATE> PA

<DOC> SUMMER COMPUTER SIMULATION CONFERENCE, HELD IN WASHINGTON, D.C., JULY 12, 1976.

<ABST> COMPUTER SIMULATION IS EXPANDING RAPIDLY INTO MANY DISCIPLINES BECAUSE OF ITS USEFULNESS IN SOLVING COMPLEX PROBLEMS THROUGH MATHEMATICAL MODELS.

IN RECENT YEARS ITS APPLICATION IN SOLVING EARTH'S ENVIRONMENTAL PROBLEMS IS ASSUMING INCREASING IMPORTANCE. FOLLOWING THE PASSAGE OF THE CLEAN AIR ACT IN 1970, IT HAS BECOME NECESSARY FOR POWER PLANT INDUSTRIES IN THE UNITED STATES TO CONTROL EMISSIONS FROM THEIR SOURCES IN ORDER TO MEET AND MAINTAIN AMBIENT AIR QUALITY STANDARDS PRESCRIBED BY THE FEDERAL AND STATE GOVERNMENTS. THIS PAPER PRESENTS A SIMULATION MODEL FOR A FOSSIL-FUEL POWER PLANT WHICH INCLUDES "AIR QUALITY DISPERSION PREDICTIVE SCHEME AND AN EFFECTIVE CONTROL SCHEME" WHICH FORECASTS THE PLANT OPERATIONS OF POSSIBLE VIOLATIONS OF AMBIENT AIR QUALITY STANDARDS AND SUGGESTS SEVERAL OPTIONS ON THE BASIS OF ECONOMY OF COST.

<372>

<CON> RECH, BOTH A.

<TITLE>

THERMAL AND RADIATIVE EFFECTS OF ATMOSPHERIC AEROSOLS IN THE NORTHERN HEMISPHERE CALCULATED USING A RADIATIVE CONVECTIVE MODEL

<ABST> GENERAL MOTORS CORPORATION, RESEARCH LABORATORIES

<CITY> WARREN

<STATE> MI

<ZIP> 48090

<DOC> ATMOSPHERIC ENVIRONMENT, 10, 611-617, 1976

<ABST>

A RADIATIVE CONVECTIVE ATMOSPHERIC MODEL HAS BEEN USED TO DEMONSTRATE THAT AT ALL LATITUDES AND AT ALL ATMOSPHERIC ALTITUDES IN THE NORTHERN HEMISPHERE, A LOW-LYING AEROSOL (OF NEAR VISIBLE REFRACTIVE INDEX 1.5 0.1 η) WITH AN OPTICAL DENSITY GREATER THAN 0.065 (GLOBAL BACKGROUND) WILL COOL THE SURFACE WHEN THE UNDERLYING EARTH'S SURFACE HAS AN ALBEDO OF 0.1 OR 0.7. HOWEVER, THE MODEL INDICATES THAT HEATING WILL OCCUR AT ALL LATITUDES OVER A SURFACE WITH AN ALBEDO OF 0.6 FOR AN AEROSOL WITH A VISIBLE EXTINCTION COEFFICIENT 10 TIMES THAT OF THE PRESENT BACKGROUND AEROSOL. THE REDUCTION IN BOTH THE INCOMING SOLAR RADIATION AND THE ATMOSPHERIC RADIATIVE COOLING WAS ALSO CALCULATED. IT WAS ESTIMATED FOR THE LATITUDES SOUTH OF 35 DEGREES NORTH THAT THE PRESENT BACKGROUND LEVEL OF ATMOSPHERIC AEROSOLS WOULD PRODUCE APPROX. 1% DECREASE IN SOLAR RADIATION REACHING THE GROUND (RELATIVE TO THE CASE FOR NO AEROSOLS). THE MOST SIGNIFICANT RELATIVE HEATING OF THE ATMOSPHERE WAS FOUND AT LATITUDES NORTH OF 55 N. AN AEROSOL-RELATED MECHANISM WHICH COULD EXTEND THE LENGTH OF THE WINTER SEASON ABOVE 55 N IS SUGGESTED.

<373>

<CON> BECK, F. A.; PATTERSON, R. E.; STANT, D. A.; CAPTALIN, A. E.

<TITLE>

PHOTOCHEMICAL OXIDANT MODELING, TECHNIQUES APPLICABLE TO HIGHWAY SYSTEM EVALUATION

<ABST> OCA CORPORATION, OCA TECHNOLOGY DIV.

AIR QUALITY

<373> CONT.
<CTRY> SECTION

<STR> NA

<DOC> PB--205915, 1975

<ABST> THIS REPORT PRESENTS A COMPARATIVE DISCUSSION AND EVALUATION OF THE MODELING TECHNIQUES AVAILABLE TO ASSESS THE PHOTOCHEMICAL OXIDANT AIR QUALITY IMPACT OF HIGHWAY SYSTEM MODIFICATION OR DEVELOPMENT. FIVE ATTRIBUTES OF EIGHT MODELING TECHNIQUES ARE DISCUSSED. THE EIGHT METHODS CONSIDERED, IN ORDER OF INCREASING COMPLEXITY, ARE: (1) VEC CHARGE, (2) LINEAR ROLLBACK, (3) NONLINEAR ROLLBACK: APPENDIX J, (4) GIFFORD-BANNA PHOTOCHEMICAL MODEL, (5) STATISTICAL RELATIONSHIPS: DIFFUSION KINETICS MODEL, AND (6) URBAN AIR SMOG PHOTOCHEMICAL SIMULATION MODEL. FOR EACH OF THESE THE FOLLOWING FIVE ATTRIBUTES ARE DISCUSSED: (1) APPLICABILITY AND RELIABILITY, (2) DATA AND SUPPORT REQUIREMENTS, (3) USE OF THE TECHNIQUE, (4) LIMITATIONS, AND (5) SPECIAL FEATURES. THE INFORMATION PRESENTED IN THIS REPORT GIVES GUIDANCE TOWARDS CHOOSING A MODEL BEST SUITED TO A GIVEN NEED, BASED ON COMPATIBILITY WITH THESE ATTRIBUTES.

<374>
<CON> PRIOT, W. P.; DOGGES, T. C.; WEAL, W.

<TITLE> ANALYSIS OF HIGH-ALTITUDE EFFECTS SIMULATION (HAKES)

<ABST> VISIDINE, INC.

<CITY> BURLINGTON

<STATE> NA

<SOURCE> DTIC AOS/MF A01

<DOC> AC-A--033650, 1976

<ABST> INITIAL FORMULATION OF THE ANALYSIS OF THE ENERGY DEPOSITION AND THE ELECTRON DENSITY PROFILES IN AN EXCISE-TYPE EXPERIMENT ARE PRESENTED. ALTITUDE PROFILES ARE GIVEN FOR THE NIGHT TIME ZEEMAN SPECTRAL RADIANCE FOR CO 2 BANDS AT 0.3 MICROMETERS AND 15 MICROMETERS ARE FOR THE OZONE BAND AT 9.6 MICROMETERS. MODEL CALCULATIONS OF THE VIBRATIONAL POPULATION OF THE FIRST EXCITED LEVEL OF THE CO 2 IN 3 VIBRATIONAL MODE ARE ALSO PRESENTED.

<CIAS> SIMULATION

<375>
<CONT> DEISHAN, AND W.

<TITLE> REGIONAL EMISSIONS PROJECTION SYSTEMS

<ACRO> REPS

<ABST> BROOKHAVEN NATIONAL LABORATORY, ENERGY POLICY ANALYSIS DIVISION, ROOM 109

<CITY> UPTON

<STATE> NY

<EXP> 11973

<PROVID> 516-305-2666; FTS 660-2666

<SOURCE> DEVELOPED FOR EPA BY BOGE-ALLEN AND HAMILTON, INC. AND MODIFIED EXTENSIVELY BY DEL.

<DOC> 1. BOGE-ALLEN AND HAMILTON, INC., REGIONAL EMISSION, PROJECTION SYSTEM DOCUMENTATION, WESTESDA, MD., JANUARY, 1977. 2. DEISHAN, AND, ET AL., REGIONAL EMISSION PROJECTION SYSTEM - OVERVIEW AND USER'S GUIDE, BROOKHAVEN NATIONAL LABORATORY, IN PROGRESS.

<SUB> POINT AND AREA SOURCE EMISSIONS OF THE FIVE CRITERIA AIR POLLUTANTS

<ABST> REPS IS AN AIR EMISSIONS PROJECTION MODEL WHICH OPERATES ON A REGIONAL LEVEL AND WHICH PROJECTS THE FIVE CRITERIA AND POLLUTANT EMISSION LEVELS FROM THE PRESENT TO A FUTURE YEAR. THE PROJECTION METHODOLOGY INVOLVES CALCULATING GROWTH FACTORS, USING THESE FACTORS TO PROJECT POLLUTION-PRODUCING ACTIVITY (AT THE LEVEL OF THE SCC-SOURCE CLASSIFICATION CODE) TO A FUTURE YEAR (UP TO AND INCLUDING 2000), AND THEN APPLYING THE COEFFICIENTS ASSUMED OR PROPOSED TO BE IN EFFECT AT THAT TIME. AN INTERFACE PROGRAM EXISTS BETWEEN THE REPS OUTPUT AND THE DEL ENERGY MODEL DATA BASE (EMDB). THIS INTERFACE PERMITS THE CALCULATION OF ADDITIONAL AIR AND GASED POLLUTANTS PRODUCED BY INDUSTRIAL AND UTILITY BOILERS.

<GEN> UNITED STATES; STATES; FEDERAL REGIONS; CENSUS REGIONS; AGENS; COUNTIES

<TIME> 1970-2000

<STATUS> UNDER DEVELOPMENT

<ACCESS> LIMITED

<MEDIA> MAGNETIC TAPE; DISC; TEXT

<COMP> CDC

<CONFID> CDC 7600

<LANG> FORTRAN IV; COMPASS

<CHAR> BINARY; ENCODIC; ASCII

<ALGO> SEE DOCUMENTATION FOR DETAILS. BASICALLY, REPS IS A STRAIGHT FORWARD DATA INTEGRATION AND MANIPULATION TOOL.

<CLAS> DISCRETE; DETERMINISTIC; SIMULATION

<APPL> ANALYSE ENVIRONMENTAL IMPACTS OF ENVIRONMENTAL LAWS AND REGULATIONS AND/OR ENVIRONMENTAL OR ENERGY POLICIES.

<USERS> DEPARTMENT FOR ENERGY; ENVIRONMENTAL PROTECTION AGENCY

<SUB> ORES; REPS; CLEAN AIR ACT; EPA-EMISSION FACTORS; REPS DATA

<INVAL> VALIDATION OF POLLUTANT TOTALS AGAINST THE EPA TOTALS IS UNDERWAY.

<CON> REPS IS A IDEAL TOOL FOR INTEGRATING LARGE ENVIRONMENTAL DATA BASES AT A REGIONAL SCALE.

<UPDATE> 700615

<376>
<CONT> BETHOLS, STEVEN G.

<376>

AIR QUALITY

<376> CONT.

<TITLE> DEVELOPMENT OF A SIMULATION MODEL FOR ESTIMATING GROUND LEVEL CONCENTRATIONS OF PHOTOCHEMICAL POLLUTANTS

<ABST> THE PURPOSE OF THE REPORT IS TO DESCRIBE IN A GENERAL WAY THE VARIOUS FACETS OF A COMPUTER PROGRAM THAT COMPOSES THE URBAN AIRSHED MODEL. EMPHASIS WAS PLACED ON THE PREPARATION OF AN EFFICIENT PROGRAM AND ON INSURING THE APPLICABILITY OF THE PROGRAM IN ANY URBAN AIRSHED. AN AIRSHED IS ESSENTIALLY DEFINED BY ITS TERRAIN, METEOROLOGICAL, AND SOURCE INPUTS. SINCE THESE PARAMETERS ARE ALL TREATED AS INPUT DATA TO THE PROGRAM, NO DIFFICULTY SHOULD BE ENCOUNTERED IN APPLYING THE PROGRAM IN A VARIETY OF URBAN AIRSHEDS. THE MOST CONSIDERABLE ASPECT OF PROGRAM USAGE IS THE LARGE EFFORT REQUIRED IN THE PREPARATION OF THE METEOROLOGICAL INPUT DATA. TWO PROGRAMS ARE USED IN THE LOS ANGELES BASIN SIMULATION EFFORT. THE MAIN PROGRAM, THE ATMOSPHERIC POLLUTION SIMULATION PROGRAM, CALCULATES POLLUTANT CONCENTRATIONS AS A FUNCTION OF PLACE AND TIME USING SOURCE AND METEOROLOGICAL INPUTS. THE STRUCTURAL AND THE OPERATIONAL ASPECTS OF THIS PROGRAM ARE DISCUSSED. AIRCRAFT EMISSIONS ARE TREATED AS INPUT TO THIS PROGRAM VIA MAGNETIC TAPE. THE COMPUTER PROGRAM WHICH GENERATES THIS TAPE, THE AIRCRAFT EMISSIONS PROGRAM, IS ALSO DISCUSSED.

<GEO> CALIFORNIA, LOS ANGELES

<CLASS> SIMULATION

<377>

<CONT> ROBERTS, J. B.; SMITH, D.

<TITLE> ON THE CORRELATION OF GRID-GENERATED TURBULENCE: MODEL FOR CALCULATING CORRELATION FUNCTION FOR ATMOSPHERIC TURBULENCE

<ABST> A THEORETICAL APPROACH HAS BEEN PRESENTED WHICH ALLOWS THE CORRELATION FUNCTION TO BE CALCULATED FROM ANY ARBITRARY POWER SPECTRUM ASSUMING THE TURBULENCE IS HOMOGENEOUS AND ISOTROPIC. THIS IS A FIRST STEP TOWARDS DEVELOPING REALISTIC MODELS OF THE CORRELATION FUNCTION FOR ATMOSPHERIC TURBULENCE. COMPARISONS BETWEEN THEORY AND EXPERIMENT IN THE SPECIAL CASE OF GRID GENERATED TURBULENCE AGREE REASONABLY WELL QUANTITATIVELY. FURTHERMORE, THEY ILLUSTRATE THE IMPORTANT ROLES OF THE MACRO- AND MICROSCALES IN ANY ANALYTICAL MODEL. AN UNDERSTANDING OF THESE RELATIONSHIPS SHOULD ALLOW MORE REALISTIC MODELING OF THE ATMOSPHERIC CORRELATION FUNCTION FOR USE IN THE ANALYSIS OF THE DYNAMIC RESPONSE OF INSTRUMENTATION OF SLENDER STRUCTURES.

<378>

<CONT> ROYE, DONALD H.

<TITLE> AIRPORT VICINITY AIR POLLUTION MODEL

<ACRO> AVAP

<ADDR> ARGONNE NATIONAL LABORATORY, ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION, 9700 S.

CASS AVE.

<CITY> ARGONNE

<STATE> IL

<ZIP> 60439

<PHONE> PYS 972-3706

<DOC> L. T. WANG, D. H. ROYE, L. A. COMLEY, "AIRPORT VICINITY AIR POLLUTION STUDY--MODEL APPLICATION AND VALIDATION AND AIR QUALITY IMPACT ANALYSIS AT WASHINGTON AIRPORT," FEDERAL AVIATION ADMINISTRATION REPORT NUMBER FAA-98-74-132, JULY 1974; L. T. WANG, L. A. COMLEY, D. H. ROYE, "AIRPORT VICINITY AIR POLLUTION MODEL USER GUIDE," FED. AVIATION ADMIN. REP. NO. FAA-98-75-236, DECEMBER 1975.

<SUB> AIR POLLUTION IN THE VICINITY OF AIRPORTS

<ABST> THE AIRPORT VICINITY AIR POLLUTION MODEL (AVAP) WAS DEVELOPED BY THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION OF ARGONNE NATIONAL LABORATORY FOR THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL AVIATION ADMINISTRATION UNDER INTERAGENCY AGREEMENT DOT-FA-74-1-223. THE MODEL IS A COMPREHENSIVE AIRPORT SIMULATION MODEL WHICH CAN SERVE AS A TOOL IN EVALUATING THE TOTAL AIR QUALITY IMPACT OF ALL AIRPORT OPERATIONS OF THE AIRPORT VICINITY. THE MODEL EVALUATES AIRCRAFT, AIRPORT NON-AIRCRAFT, AND ENVIRON SOURCES AND COMPUTES POLLUTANT CONCENTRATIONS DUE TO EACH. INPUT IS REQUIRED FOR AIRPORT CONFIGURATION, AIRCRAFT AND GROUND VEHICLE OPERATION, STATIONARY EMISSION SOURCES, AND METEOROLOGY.

<GEO> WASHINGTON NATIONAL AIRPORT, WASHINGTON, D.C.

<TIME> 1972

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE; PUNCHED CARDS

<SIZE> 3000 RECORDS EACH 80 BYTES LONG

<COMP> IBM

<CONFIG> IBM 370/195 OS/MVT WITH 300 K CORR

<LANG> FORTRAN

<CHAR> EBCDIC

<ALGO> GAUSSIAN PLUME FORMULATION FOR CALCULATING THE DISPERSION FROM POINT, AREA, AND LINE TYPE SOURCES.

<CLASS> PREDICTIVE; SIMULATION

<APPL> AIRPORT AIR QUALITY IMPACT ANALYSIS

<USERS> FEDERAL AVIATION ADMINISTRATION

<SUB> WASHINGTON NATIONAL AIRPORT DATA

<REVAL> APPLICATION AND VALIDATION OF THE MODEL HAVE BEEN CARRIED OUT USING THE AIRPORT ACTIVITY AND AIR QUALITY DATA COLLECTED BY ENVIRONMENTAL RESEARCH AND TECHNOLOGY, INC. AT WASHINGTON NATIONAL AIRPORT. COMPUTED AIR QUALITY

AIR QUALITY

<70> CONT.

CONCENTRATIONS WERE THEN COMPARED WITH THE APPROPRIATE FEDERAL AIR QUALITY STANDARDS FOR A VARIETY OF COMBINATIONS OF AIRPORT ACTIVITY AND METEOROLOGICAL CONDITIONS.

<UPDATE> 700703

<77>

<CON> SCHIRSICK, RONALD C.

<TITLE> AEROSOL SAMPLING DATA PREDICTION MODEL

<ACRO> SIGNATURE

<ADDR> LOS ALAMOS SCIENTIFIC LABORATORY, GROUP M-5, MS-006, P.O. BOX 1663

<CITY> LOS ALAMOS

<STATE> NM

<ZIP> 87545

<PHONE> 505-667-7302; FTS 043-7302

<SOURCE> LASL

<DOC> NONE

<SUB> AEROSOL SAMPLING DATA

<ABST> THIS MODEL USES A LIBRARY OF AEROSOL SAMPLING DATA AND PREDICTS WHERE RELEASES IN A WORKROOM OCCURRED AND THE MAGNITUDE OF THAT RELEASE. THE MODEL IS USED TO DEVELOP A GUIDE FOR WORKBOOBS.

<GEO> ONE ROOM AT LASL

<STATUS> UNDER DEVELOPMENT

<ACCESS> PROPRIETARY

<MEDIA> MAGNETIC TAPE

<SIZE> 1000 LINES

<COMP> CDC

<CONFIG> CDC 6600, NOS OPERATING SYSTEM

<LANG> FORTRAN

<CHAR> ASCII

<CLASS> DISCRETE; PREDICTIVE

<APPL> PREDICT AEROSOL RELEASES IN A WORKROOM

<USERS> LASL

<SUB> AEROSOL SAMPLING DATA BASE

<VAL> COMPARISON WITH EXPERIMENTAL DATA

<CON> APPLICABLE TO A ROOM IN LASL

<UPDATE> 700417

<700>

<CON> STEINFIELD, J. H.; RECHT, THOMAS A.; ROTH, PHILIP H.

<TITLE> DEVELOPMENT OF A SIMULATION MODEL FOR ESTIMATING GROUND LEVEL CONCENTRATIONS OF PHOTOCHEMICAL POLLUTANTS, A KINETIC MECHANISM FOR ATMOSPHERIC PHOTOCHEMICAL REACTIONS

<DOC> PB-296-011; PE-236-009

<ABST>

EXISTING KINETIC MECHANISMS WERE ASSESSED, ARRIVING AT THE CONCLUSION THAT A 'BETTER' MODEL WAS NEEDED. INCLUDED ARE THE RESULTS OF THE VALIDATION STUDY FOR ONE OF THE MORE PROMISING EXISTING MECHANISMS AND A DISCUSSION OF THE DEFICIENCIES OF THIS AND OTHER FORMULATIONS. A NEW KINETIC MECHANISM IS PRESENTED. THE RESULTS OF RECENT VALIDATION STUDIES, WHICH ARE DETAILED, DEMONSTRATE THAT THIS MODEL IS CAPABLE OF PREDICTING WITH ACCEPTABLE ACCURACY THE CONCENTRATION/TIME BEHAVIOR OF SHOG CHAMBER EXPERIMENTS FOR PROPYLENE, ISOBUTYLENE, N-BUTANE, AND A MIXTURE OF PROPYLENE AND N-BUTANE AT INITIAL RATIO TO HYDROCARBON RATIOS OF 1/3 TO 1. THE MECHANISM HAS ALSO BEEN SHOWN TO SIMULATE ACCURATELY THE EFFECT OF PHOTO-OXIDATION RATES OF VARIATIONS IN CO CONCENTRATIONS, AS WELL AS THE INHIBITORY EFFECT OF HIGH INITIAL CONCENTRATIONS OF NITRIC OXIDE ON THE MAXIMUM CONCENTRATION OF OZONE OBTAINED. THE ADAPTATION OF THIS VALIDATED MECHANISM FOR USE IN AN URBAN AIRSHED MODEL IS DISCUSSED.

<GEO> CALIFORNIA

<701>

<CON> SEITZ, LEONARD E.

<TITLE> DIRECT TRAVEL IMPACT MODEL

<ACRO> DTIN

<ADDR> CALIFORNIA DEPARTMENT OF TRANSPORTATION, DIVISION OF TRANSPORTATION PLANNING, 1120 'N' STREET

<CITY> SACRAMENTO

<STATE> CA

<ZIP> 95814

<PHONE> 916-045-7923

<DOC> EPA MOBILE SOURCE EMISSIONS FINAL DOCUMENT, JAN 1970; STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION, PLANNING DIVISION, URBAN PLANNING, TRIP DEV AND NETWORK ANALYSIS HANDBOOK, 2ND EDITION, AUG. 1970;

<SUB> MOBILE SOURCE AIR POLLUTANT EMISSIONS AND FUEL USE

<ABST> DTIN CALCULATES AIR POLLUTANT EMISSIONS FROM AND FUEL USE BY HIGHWAY VEHICLES. THE CALCULATION IS BASED ON TRANSPORTATION MODELING TRIP ASSIGNMENTS AND IMPACT (EMISSIONS AND FUEL USE) RATES COMPARABLE TO EPA'S AP-42 SUPPLEMENT 5, REVISED. DTIN DIFFERS FROM OTHER MOBILE SOURCE EMISSION PROGRAMS IN THAT IT EXPLICITLY TREATS TRIP ENDS AS THE SOURCE OF COLD START AND HOT SOAK IMPACTS AND HIGHWAY LINKS AS THE SOURCE OF HOT STABILIZED IMPACTS. DTIN ALSO PREPARES EMISSION ESTIMATES BY USER DEFINED GEOGRAPHIC GRID CELLS AND HOUR OF THE DAY FOR DIRECT USE BY DIFFUSION TYPE PHOTOCHEMICAL AIR QUALITY MODELS.

<GEO> CALIFORNIA

<301>

AIR QUALITY

<301> CONT.
 <INTD> 1960-1970
 <STATUS> IN USE
 <ACCESS> UNLIMITED
 <MEDIA> MAGNETIC TAPE
 <SIZE> 4400 LINES OF SOURCE
 <COMP> IBM
 <COMPIG> IBM 370/160 WITH 10,000 K CODE AND 11 PERIPHERAL I/O DEVICES (MAXIMUM UNDER VIRTUAL STORAGE BASED ON 100 K 100 CYCLING OF THE STUDY AREA)
 <LANG> FORTRAN IV
 <CBAD> EBCDIC
 <ALGO> VEHICLE EMISSIONS RATES ARE PROVIDED BY EPA MOBILE SOURCE EMISSIONS. RATES ARE COMPUTED FROM TRAFFIC PROFILE AND VEHICLE DISTANCES AND SPEEDS. EMISSIONS = RATE * RATES
 <CLAS> CONTINUOUS; DETERMINISTIC; PREDICTIVE;
 <APPL> TRANSPORTATION PLANNING; ENVIRONMENTAL IMPACT REPORTS
 <USERS> CALIFORNIA DEPARTMENT OF TRANSPORTATION; CALIFORNIA AIR RESOURCES BOARD
 <SUBJ> REGIONAL TRANSPORTATION STUDIES
 <EVAL> COMPARISON OF PREDICTED AND OBSERVED AIR POLLUTANT CONCENTRATIONS; TRAFFIC COUNTS
 <UPDATE> 700921
 <302>
 <CONT> THOMSON, G.; METER, D. W.
 <TITLE> AIRPORT AIR QUALITY MODEL FOR ASSESSMENT OF UNITED STATES NAVAL AVIATION EMISSIONS
 <ADDR> NAVAL POSTGRADUATE SCHOOL
 <CITY> DOWNEY
 <STATE> CA
 <DOC> AD-A--030031, 1976
 <ABST> AN AIR QUALITY ASSESSMENT MODEL FOR U.S. NAVAL AIRCRAFT OPERATIONS WAS DEVELOPED FROM A GENERALIZED AIR QUALITY ASSESSMENT MODEL FOR U.S. AIR FORCE OPERATIONS. DATA WERE OBTAINED BY OBSERVATION OF OPERATIONS AT A NAVAL AIR STATION AND THESE DATA USED TO CONDUCT PARAMETRIC STUDIES TO DEMONSTRATE THE CAPABILITIES OF THE MODEL. MODIFICATIONS TO THE ORIGINAL MODEL AND THESE PARAMETRIC STUDIES ARE DISCUSSED.
 <303>
 <CONT> TRIJONIS, JOHN C.
 <TITLE> ECONOMIC AIR POLLUTION CONTROL MODEL FOR LOS ANGELES COUNTY IN 1975
 <ADDR> TECHNOLOGY SERVICE CORP., BT 3 BOX 120-E

<CITY> SANTA FE
 <STATE> NM
 <ZIP> 87501
 <PHONE> 505-983-6560
 <DOC> TRIJONIS, JOHN C., ECONOMIC AIR POLLUTION CONTROL MODEL FOR LOS ANGELES COUNTY IN 1975, ENVIRONMENTAL SCIENCE AND TECHNOLOGY, 8(9), 1974
 <SUBJ> GENERAL LEAST COST-AIR QUALITY CONTROL MODEL
 <ABST> AN ECONOMIC AIR POLLUTION CONTROL MODEL IS FORMULATED FOR DETERMINING THE LEAST COST OF REACHING VARIOUS AIR QUALITY LEVELS. THE MODEL TAKES THE FORM OF A GENERAL, NONLINEAR, MATHEMATICAL PROGRAMMING PROBLEM. THE TWO BASIC INPUTS TO THIS MODEL ARE THE LEAST COST OF ACHIEVING VARIOUS EMISSION LEVELS AND THE RELATIONSHIP BETWEEN EMISSION LEVELS AND AIR QUALITY. A LINEAR PROGRAMMING SUBMODEL IS PRESENTED FOR DERIVING THE FIRST INPUT, THE CONTROL COST-EMISSION LEVEL RELATIONSHIP. EMPIRICAL-STATISTICAL AIR QUALITY SUBMODELS ARE OUTLINED FOR OBTAINING THE SECOND INPUT, THE EMISSION LEVEL-AIR QUALITY RELATIONSHIP. THE COMBINATION OF THESE TWO INPUTS TO SOLVE THE NONLINEAR PROGRAMMING PROBLEM IS ILLUSTRATED GRAPHICALLY. PART II OF THIS PAPER APPLIES THE MODEL TO PHOTOCHEMICAL SMOG IN LOS ANGELES IN 1975.
 <SUBJ> LOS ANGELES COUNTY
 <TIME> 1975
 <STATUS> IN USE
 <ACCESS> UNLIMITED
 <MEDIA> TEXT
 <ALGO> LINEAR PROGRAMMING
 <CLAS> CONTINUOUS; STOCHASTIC; OPTIMIZATION; ECONOMETRIC; STATISTICAL
 <APPL> COMPUTATION OF LEAST-COST STRATEGIES FOR ACHIEVING GIVEN AIR QUALITY GOALS.
 <SUBJ> LOS ANGELES AIR QUALITY DATA; LOS ANGELES EMISSION AND CONTROL COST DATA
 <UPDATE> 700804
 <304>
 <CONT> WELCH, DONALD R.
 <TITLE> TWO-DIMENSIONAL NUMERICAL SIMULATION OF THE EFFECTS OF AIR POLLUTION UPON THE URBAN-RURAL COMPLEX
 <ADDR> UNIVERSITY OF UTAH, DEPARTMENT OF METEOROLOGY, 819 MINERAL SCIENCE BUILDING
 <CITY> SALT LAKE CITY
 <STATE> UT
 <ZIP> 84112
 <DOC> TELLUS, 30, 136-150, 1978
 <SUBJ> IMPACT OF AIR POLLUTION ON URBAN AREAS

AIR QUALITY

<300> CONT.

AND ON SITES DIRECTLY DOWNWIND OF THE CITY.

<ABST>

A TWO-DIMENSIONAL RADIATIVE-DYNAMIC INTERACTION MODEL IS DEVELOPED TO STUDY THE IMPACT OF AIR POLLUTION ON URBAN AREAS AND ON THE REGIONS DIRECTLY DOWNWIND OF THE CITY. BY ISOLATING COMPONENT EFFECTS, SUCH AS VARIABLE SOIL PARAMETERS AND ROUGHNESS HEIGHTS, IT BECOMES POSSIBLE TO COMPREHEND THE BEHAVIOR OF THE COMPLETE MODEL. THE MODEL INCLUDES LOW AND ELEVATED POLLUTION AS WELL AS ARTIFICIAL URBAN HEAT SOURCES. GEOSTROPHIC WINDS OF 2 AND 5 M/S ARE USED TO MODEL THE WIND FIELD. VERTICAL MIXING IS INCLUDED. STABILITY EFFECTS ON VERTICAL MIXING ARE ACCOUNTED FOR IN TERMS OF THE CIRCULARITY THEORY. THE RADIATIVE TREATMENT IS BASED ON THE EXACT FORMULATION OF THE RADIATIVE TRANSFER EQUATION WHICH ACCOUNTS FOR MULTIPLE SCATTERING OF AEROSOL PARTICLES IN THE SOLAR SPECTRUM AS WELL AS IN THE WATER VAPOR WINDOW. IN ADDITION TO THE RADIATIVE EFFECTS OF WATER VAPOR AND

CARBON DIOXIDE, THE PRESENCE OF SO₂ IS ACCOUNTED FOR. IT IS FOUND THAT AN ARTIFICIAL HEAT SOURCE CAUSES SURFACE HEATING OF 4 DEGREES C, WHILE URBAN SOILS LEAD TO LOWER SURFACE TEMPERATURES UP TO 4 DEGREES C DURING THE DAY AND COLDER TEMPERATURES UP TO 3 DEGREES C DURING THE NIGHT. THE EFFECT OF INCREASED ROUGHNESS IS AN INCREASED TEMPERATURE UP TO 4 DEGREES C AT SURFACE HEIGHT DURING THE DAY AND A DECREASED TEMPERATURE OF 2.5 DEGREES C DURING THE NIGHT. LOW-LEVEL POLLUTION SOURCES LEAD TO 2 DEGREES C SURFACE TEMPERATURE DECREASES DURING THE DAY WHILE UPPER LEVEL SOURCES MAY LEAD TO DECREASES OF 7 DEGREES C UNDER STAGNANT CONDITIONS IN URBAN AREAS.

<STATUS> IN USE

<CLASS> SIMULATION

<UPDATE> 700029

AQUATIC TRANSPORT

<395>
 <CGST> ABOVEK-BOUR, A-PARK A.
 <TITLE> A STATISTICAL METHODOLOGY FOR PREDICTING THE POLLUTANTS IN A RIVER
 <ADDP> MISSISSIPPI STATE UNIVERSITY
 <CITY> MISSISSIPPI STATE
 <STATE> MS
 <ZIP> 39762
 <DOC> WATER RESOUR. BULL., 8(1), 15-23, 1972
 <ABST> URBAN AND INDUSTRIAL AREAS CONTINUE TO EXPAND AND CONSEQUENTLY, TO CREATE SERIOUS WATER POLLUTION PROBLEMS TO NATURAL STREAMS. THE NEED FOR THE DEVELOPMENT OF ACCURATE, RELIABLE, AND SENSITIVE WATER QUALITY PREDICTION MODELS IS MOST DESIRABLE. THE 1ST OBJECTIVE OF THIS RESEARCH IS TO SET GUIDELINES FOR DIVIDING A NATURAL STREAM INTO MORE OR LESS INDEPENDENT REACHES BASED ON SOME CRITERIA. THE 2ND OBJECTIVE IS TO OBTAIN THE PREDICTING EQUATIONS OF THE WATER POLLUTANTS IN A SELECTED STREAM. THE PRELIMINARY PHASE OF THIS RESEARCH EVALUATED WATER QUALITY DATA SAMPLED FROM THE PEARL RIVER WHICH FLOWS SOUTHWEST AND THEN TURNS SOUTH THROUGH THE STATES OF MISSISSIPPI AND LOUISIANA. THIS EVALUATION SERVED AS GUIDELINES TO DIVIDE THE TOTAL RIVER BASIN INTO REACHES (SUBSYSTEMS) APPROPRIATE TO THE OBJECTIVE OF THIS RESEARCH. SUBSEQUENT TO THIS SUBSYSTEM ASSIGNMENT, A STEPWISE MULTIPLE REGRESSION FORTRAN PROGRAM WAS USED TO REGRESS THE POLLUTANTS (DEPENDENT VARIABLES) FOR BOTH TIME AND SPACE ON THEIR WATER CHARACTERISTICS (INDEPENDENT VARIABLES). BASED ON THE RESULTS OBTAINED, THE PROPOSED STATISTICAL APPROACH PROVIDES A PRACTICAL TOOL FOR DEVELOPING REGRESSION EQUATIONS FOR THE PURPOSE OF WATER POLLUTANT PREDICTION.

<LANG> FORTRAN
 <CLAS> PREDICTIVE

<396>
 <CONT> ABOVEK-BOUR, A-PARK A.
 <TITLE> A SYSTEM APPROACH FOR THE STUDY AND CONTROL OF FACTORS AFFECTING WATER POLLUTION
 <ADDP> MISSISSIPPI STATE UNIVERSITY
 <CITY> MISSISSIPPI STATE
 <STATE> MS
 <ZIP> 39762
 <DOC> MISSISSIPPI STATE UNIVERSITY, WATER RESOURCES RESEARCH INSTITUTE, REPORT, 53 P., JULY 1970
 <ABST> THE STUDY REPORTED HEREIN WAS UNDERTAKEN AS AN INQUIRY INTO THE FEASIBILITY OF APPLYING A SYSTEM APPROACH IN DESCRIBING THE FACTORS AFFECTING WATER POLLUTION IN A RIVER OF MODERATE SIZE. THE DRAINAGE SYSTEM SELECTED FOR THE STUDY WAS THE PEARL RIVER AND ITS MAJOR TRIBUTARIES. THE

RIVER SYSTEM WAS DIVIDED INTO DEFINED REACHES APPROPRIATE TO THE PURPOSES OF THIS STUDY. A STEPWISE REGRESSION FORTRAN PROGRAM WAS USED TO FIT REGRESSION EQUATIONS DESCRIBING THE WATER QUALITY IN EACH REACH. THE REPORT CONTAINS SECTIONS INCLUDING REVIEW OF LITERATURE, PURPOSES AND OBJECTIVES, A CASE STUDY, A GENERAL DESCRIPTION OF PEARL RIVER BASIN, FACTS ABOUT PEARL RIVER, STREAM FLOWS, CONNECTED REACHES, REGRESSION PROCEDURE, REGRESSION EQUATIONS, AND CONCLUSIONS. THE PROTOTYPE DATA AND DETAILS OF THE STEPWISE REGRESSION PROCEDURES ARE SO EXTENSIVE AS TO PRECLUDE INCLUSION WITHIN THIS DOCUMENT.

<LANG> FORTRAN

<CLAS> PREDICTIVE

<397>
 <CONT> ADAMO, I. C.; KOPPER, P. L.; WYPP, S. R.
 <TITLE> THERMAL MODEL DEVELOPMENT AND INITIAL SIMULATIONS OF SOME UNITS 2 AND 3
 <ADDP> INTERSEA RESEARCH CORPORATION
 <DOC> JUNE 1972, INCLUDED AS PART 1 OF APPENDIX 5-C, SAN ONOPE NUCLEAR GENERATING STATION UNITS 2 & 3 SUPPLEMENT TO ENVIRONMENTAL REPORT, SOUTHERN CALIFORNIA EDISON CO. AND SAN DIEGO GAS & ELEC. CO., JULY 1972, 130 PP.
 <ABST> REPORT DESCRIBES THERMAL MODELING STUDIES AT THE SAN ONOPE NUCLEAR STATION IN SOUTHERN CALIFORNIA. INCLUDES A GENERAL DESCRIPTION OF INTERSEA RESEARCH CORP.'S DIGITAL COMPUTED MODEL ALONG WITH A DISCUSSION OF EFFORTS TO CALIBRATE THE MODEL AND ITS PREDICTIONS BASED ON FIELD DATA COLLECTED DURING 1972. DESCRIPTION OF THE THERMAL MODEL INCLUDES: 1) INITIAL MIXING; 2) COASTAL MIXING; AND 3) SURFACE COOLING. CALIBRATION EVALUATES PARAMETERS, SIMULATES TEMPERATURES, AND COMPARES SIMULATED TEMPERATURES WITH OBSERVED VALUES. RESULTS AND CONCLUSIONS ARE PRESENTED AS WELL AS DIFFUSION MAPS AND TABLES AND COMPUTER PLOTTED TEMPERATURE MAPS. APPENDICES CONTAINING DATA INVENTORY AND THE THEORETICAL DERIVATION OF THE MODEL ARE INCLUDED.

<CLAS> PREDICTION

<398>
 <CONT> ADAM, A. C.; THOMAS, W. A.
 <TITLE> DIGITAL SIMULATION OF AGGRADATION AND DEGRADATION IN NATURAL STREAMS
 <ADDP> U.S. WATER RESOURCES COUNCIL
 <CITY> WASHINGTON
 <STATE> DC
 <DOC> PROCEEDINGS 3RD FEDERAL INTER-AGENCY SEDIMENTATION CONFERENCE HELD IN DENVER, COLORADO, MARCH 22-25, 1976, (P. 8-26 - 8-36).
 <ABST> THE ANALYSIS OF SCOUR AND DEPOSITION BY MODELING THE INTERACTION BETWEEN THE

BLANK PAGE

<700>

AQUATIC TRANSPORT

<700> CONT.

WATER-SEDIMENT MIXTURE, SEDIMENT MATERIAL FORMING THE STREAM'S BOUNDARY, AND THE HYDRAULIC CHARACTERISTICS OF FLOW WAS PRESENTED USING THE HYDROLOGIC ENGINEERING CENTER'S COMPUTER PROGRAM ENTITLED "SCOUR AND DEPOSITION IN RIVERS AND RESERVOIRS." THIS SIMULATION PROGRAM WAS PARTICULARLY USEFUL FOR ANALYZING THE IMPACT OF CHANGES IN ENERGY GRADIENT, CHANNEL WIDTH, INFLOWING SEDIMENT LOAD, OR BED MATERIAL GRAIN SIZE ON FUTURE TRENDS IN CHANNEL AGGRAVATION OR DEGRADATION. THE RESULTS OF THE ANALYSIS WERE USEFUL FOR ESTIMATING THE IMPACT OF AGGRAVATION ON THE DESIGN PROFILE FOR LEVELS AND THE AMOUNT, FREQUENCY, AND LOCATION OF MAINTENANCE DREDGING, AS WELL AS THE EFFECT OF ALTERNATIVE MEASURES, FOR MAINTAINING A CHANNEL. EXAMPLE APPLICATIONS ILLUSTRATED THE MODEL CALIBRATION AND DEMONSTRATED ITS APPLICABILITY AND USEFULNESS FOR A WIDE RANGE OF HYDRAULIC AND SEDIMENT CONDITIONS.

<CLASS> SIMULATION

<399>

<AUTH> ANDERSON, J. L.; PARKER, P. L.; DESPICK, D. A.

<TITLE> NEGATIVELY BUOYANT JETS IN A CROSS FLOW

<ADDR> VANDERBILT UNIVERSITY, ENVIRONMENTAL AND WATER RESOURCES ENGINEERING

<CITY> NASHVILLE

<STATE> TN

<DOC> EPA-660/2-73-012, OCT. 1973, 220PP.

<ABST> MODIFICATIONS OF FAN'S AND ABRAM'S JET DIFFUSION MODELS WERE USED TO PREDICT THE TRAJECTORY AND DILUTION OF A NEGATIVELY BUOYANT JET. SUCH JETS CAN OCCUR WHEN A CHEMICAL WASTE IS DISCHARGED INTO A LESS DENSE AMBIENT WATER OR WHEN COOL, HYPOLINEPTIC WATER IS USED FOR CONDENSER COOLING WATER AND DISCHARGED INTO LESS DENSE SURFACE WATERS. EXPERIMENTAL INVESTIGATIONS WERE CONDUCTED WITH DIFFERENT COMBINATIONS OF DENSIMETRIC PROBE NUMBER, VELOCITY RATIO, AND INITIAL ANGLE OF DISCHARGE. SALT WAS USED AS THE TRACE, YIELDING A FLUID THAT WAS DENSER THAN THE AMBIENT RECEIVING WATER AND FACILITATED MEASURING CONCENTRATION PROFILES OF THE JET PLUME. THE EXPERIMENTAL DATA WERE FITTED WITH PREDICTED JET DILUTION, TRAJECTORY, AND CROSS-SECTIONAL VALUES FOR EACH MODEL. THE VALUES OF THE ENTRAINMENT COEFFICIENT WERE CHOSEN AS THE ONE WHICH BEST FIT THE EXPERIMENTAL DATA FOR THE PARTICULAR COMBINATION OF DENSIMETRIC PROBE NUMBER, VELOCITY RATIO, AND INITIAL ANGLE OF DISCHARGE. THE VALUE OF THE DRAG COEFFICIENT WAS CHOSEN AS 0 FOR BOTH MODELS SINCE ANY OTHER VALUE WOULD PREDICT A TRAJECTORY WHOSE RISE WOULD BE LESS THAN EXPERIMENTALLY OBSERVED. TYPICALLY, FOR ALL ANGLES OF DISCHARGE THE VALUE OF ENTRAINMENT INCREASED WITH A DECREASE IN THE VELOCITY RATIO AND WITH AN INCREASE IN DENSIMETRIC PROBE NUMBER. THERE WAS A MARKED DECREASE IN THE ENTRAINMENT COEFFICIENT WITH A DECREASE IN THE INITIAL ANGLE OF

DISCHARGE.

<CLASS> PREDICTIVE

<399>

<AUTH> ARMSTRONG, S. E.; CLOYNA, E. P.

<TITLE> MODEL FOR RADIOACTIVITY TRANSPORT IN WATER: NUMERICAL SOLUTIONS OF RADIOISOTOPE TRANSPORT EQUATIONS AND ROLE OF PLANTS IN SR-95 TRANSPORT

<ADDR> UNIVERSITY OF TEXAS, CENTER FOR RESEARCH IN WATER RESOURCES

<CITY> AUSTIN

<STATE> TX

<ZIP> 78712

<DOC> ENE-12-6703E; CWR-23; ORO-74 139 PP.

<SUB> RADIOISOTOPE TRANSPORT

<ABST> THE ROLE OF PLANTS IN SR-95 TRANSPORT IN AQUARIA AND A MODEL RIVER WAS EXAMINED, AND A NUMERICAL SOLUTION TO THE DISPERSION EQUATION WITH CONVECTION WAS DERIVED AND EXTENDED TO INCLUDE PLANT SORPTION. USING THE MACROPHYTE, VALLISNERIA AMERICANA MICHAUX, IT WAS FOUND THAT ALMOST INSTANTANEOUS EQUILIBRIUM WAS REACHED WITH SR-95 IN SOLUTION THROUGH ABSORPTION FOLLOWED BY A SLOWER AND MORE COMPLETE UPTAKE BY ABSORPTION. A CHARACTERISTIC PATTERN OF UPTAKE AND RELEASE WAS OBSERVED AFTER INSTANTANEOUS RELEASES INTO AQUARIA AND AT STATIONS DOWNSTREAM FROM THE POINT OF RELEASE IN A MODEL RIVER. UNDER CONTINUOUS RELEASE, UPTAKE TENDED TOWARD AN EQUILIBRIUM LEVEL WHICH WAS A FUNCTION OF THE AMOUNT OF ATTACHED ALGAE PRESENT. IT WAS CONCLUDED FOR CONDITIONS USED IN THIS STUDY THAT PLANTS PLAYED A NEGLIGIBLE ROLE IN SR-95 TRANSPORT. THE UPTAKE OF SR-95 BY PLANTS AFTER INSTANTANEOUS RELEASE COULD BE MODELED USING A SORPTION-DESORPTION EQUATION. INSTANTANEOUS DYE AND SR-95 RELEASES WERE MADE IN THE MODEL RIVER TO DETERMINE THE DISPERSION COEFFICIENT AND TRACE CLOUD VELOCITY WITH THE TWO STATION METHOD USING ONLY A SELECTED PORTION OF THE CONCENTRATION-TIME CURVES. THE CUT-OFF POINT FOR THIS PORTION WAS THE POINT WHERE ONE-TENTH THE PEAK VALUE WAS OBSERVED. SOLUTIONS OF THE NUMERICAL MODEL USING CONSTANTS CALCULATED IN THIS MANNER GAVE BETTER FIT TO THE OBSERVED DATA THAN METHODS PREVIOUSLY USED. CONSTANT RELEASE DATA COULD ALSO BE PREDICTED WITH THIS MODEL USING REVISED INITIAL CONDITIONS. A NUMERICAL SOLUTION TO THE EQUATIONS RELATING DISPERSION TO PLANT UPTAKE WAS ALSO DERIVED BUT NOT EXTENSIVELY TESTED. IT WAS CONCLUDED THAT NUMERICAL SOLUTIONS WOULD MORE PROMISE IN THIS AREA THAN ANALYTICAL SOLUTIONS BECAUSE OF THEIR VERSATILITY AND EASE OF COMPUTATION.

<GEO> UNIVERSAL

<STATUS> NOT IN USE

<ACCESS> NOT ACCESSIBLE

<MEDIA> PUNCHED CARDS

AQUATIC TRANSPORT

<390> CONF.
 <STYP> APPROXIMATELY 750 CARDS
 <COMP> CDC
 <COMPI> CDC 1604
 <LANG> FORTRAN
 <CLAS> SIMULATION
 <APPL> TRANSPORT OF RADIONUCLIDES IN MODEL SYSTEM ECOSYSTEM.
 <USERS> WDC
 <SUB> EXPERIMENTATION
 <NVAL> EXPERIMENTAL DATA
 <CON> THIS CODE MAY BE APPLIED TO ACCIDENTAL OIL SPILLING RELEASES. IT WAS WRITTEN IN FORTRAN 63 FOR A CDC 1604 COMPUTER
 <UPDATE> 780725

<391>
 <CON> ARNSTROM, R. E.; CLOYM, E. P.
 <TITLE> MATHEMATICAL MODELS FOR THE DISPERSION OF RADIONUCLIDES IN AQUATIC SYSTEMS
 <ADDP> UNIVERSITY OF TEXAS
 <CITY> AUSTIN
 <STATE> TX
 <ZIP> 780712
 <PHONE> 512-471-5602
 <DOC> NELSON, B. J. AND P. C. EVANS (EDS.), PROC. SECOND NAT. SYM. RADIOECOL., (PP. 329-335), 774 PP.; CONF-670503.
 <SUB> RADIONUCLIDE TRANSPORT
 <ABST> MODELS ARE PRESENTED OF EXCHANGE MECHANISMS FOR EXCHANGE OF RADIONUCLIDES BETWEEN WATER AND SUBSTRATES AND DISPERSION BY WATER MOVEMENT.
 <GEO> UNIVERSAL
 <STATUS> NOT IN USE
 <ACCESS> NOT IN USE
 <MEDIA> PUNCH CARDS
 <SIZE> APPROXIMATELY 750 CARDS
 <COMP> CDC
 <COMPI> CDC 6600
 <LANG> FORTRAN
 <CLAS> SIMULATION
 <APPL> TRANSPORT OF RADIONUCLIDES IN MODEL SYSTEM ECOSYSTEM
 <USERS> WDC
 <SUB> EXPERIMENTATION
 <NVAL> EXPERIMENTAL DATA
 <UPDATE> 780725

<392>
 <CON> ABRASON, G.
 <TITLE> ESTUARY MODELING
 <ABST> THE PAPER DESCRIBES MODELS OF ESTUARIES: HYDRAULIC, MATHEMATICAL, DYNAMIC, ETC., WHAT THEY DO, THEIR LIMITATIONS AND POTENTIAL APPLICATIONS.

<393>
 <CON> BALL, J.; REYNOLDS, T. D.; BECKETT, D. E.
 <TITLE> DEEP SEA OCEAN DISPOSAL OF PETROCHEMICAL PLANT WASTES
 <ADDP> TEXAS A AND M UNIVERSITY
 <CITY> COLLEGE STATION
 <STATE> TX
 <DOC> BELL, J. R. (ED.), TWENTY-NINTH INDUSTRIAL WASTE CONFERENCE HELD IN LAFAYETTE, INDIANA, MAY 7, 1978
 <ABST> IN COMPLIANCE WITH RECENT EPA REQUIREMENTS FOR OYE-DISPERSION STUDIES PRIOR TO OBTAINING A PERMIT FOR OCEAN DISPOSAL OF PETROCHEMICAL PLANT WASTES, TWO DISPERSION STUDIES ARE PRESENTED. AN ANALYSIS COMBINES THE CURRENT DATA WITH LITERATURE STUDIES AND ENABLES A FORMULA TO BE DEVELOPED FOR THE DISPERSION PHENOMENON. THE RATE AT WHICH THE WASTE DILUTES WITH SEA WATER APPEARS TO BE A FUNCTION OF THE DIFFERENCE IN SPECIFIC GRAVITY BETWEEN THE WASTE AND THE SEA WATER. DILUTION CONCENTRATION AT AN ARBITRARY TIME AFTER DUMPING OF ONE MINUTE WAS A FUNCTION OF SPEED OF THE BARGE AND THE RATE OF RELEASE. BEFORE OTHER PARAMETERS CAN BE CONSIDERED, MORE COSTLY STUDIES MUST BE UNDERTAKEN.
 <CLAS> SIMULATION

<394>
 <CON> BAUMGARTNER, D. J.; TRENT, D. S.; BYRAN, K. V.
 <TITLE> USER'S GUIDE AND DOCUMENTATION FOR OUTFALL PLUME MODEL
 <ACRO> PLUME
 <ABST> MANY USES HAVE BEEN FOR A COMPUTATIONAL PROGRAM FOR ANALYSIS OF PIPELINE DISCHARGES INTO LAKES, RESERVOIRS, ESTUARIES, OR THE OCEAN. THIS COMPUTER PROGRAM, PLUME, IS OFFERED AS A STANDARD PROCEDURE FOR ANALYSIS OF INDUSTRIAL WASTE, THERMAL, AND SEWAGE STREAMS, INCORPORATING THE MOST RECENT KNOWLEDGE OF JETS AND PLUMES GENERALLY APPLICABLE.
 <CLAS> PREDICTIVE

<395>
 <CON> BENEDICT, BARRY A.
 <TITLE> THERMAL PLUME INVESTIGATIONS FOR UNION ELECTRIC COMPANY'S CALLAWAY PLANT,

<395>

AQUATIC TRANSPORT

<395> CONT.

UNITS 1 AND 2

<ADDR> SWEDESBY & PARCEL AND ASSOCIATES, INC.

<DOC> INCLUDED AS APPENDIX 5A, CALLAWAY PLANT UNITS 1 AND 2 ENVIRONMENTAL REPORT, UNION ELECTRIC CO., MAY 1976.

APPENDIX PRESENTS DATA DEVELOPED TO STUDY THE DISCHARGE OF WASTE HEAT FROM THE FPCPSEB UNION ELECTRIC CO.'S CALLAWAY PLANT INTO THE MISSOURI RIVER.

<ABST> THE MATHEMATICAL MODEL TO BE USED FOR PLUME PREDICTIONS AND THE RESULTS OF THE ANALYSES USING THE MODEL ARE DESCRIBED. AREAS, VOLUMES, AND DISTANCES FOR VARIOUS ISOTHERMS ARE SHOWN. EIGHT TABLES, 5 FIGURES, AND A BIBLIOGRAPHY ARE INCLUDED.

<CIAS> PREDICTIVE

<396>

<CCNT> DUBGER, R. H.

<TITLE> AN ATMOSPHERIC SPRAY COOLING MODEL

<ADDR> TENNESSEE VALLEY AUTHORITY

<CITY> KNOXVILLE

<STAT> TN

<ZIP> 37902

<CC> F.E. TOPPANCE AND P.G. WATTS (EDS.), ENVIRONMENTAL EFFECTS OF ATMOSPHERIC HEAT/MOISTURE RELEASES, THE SECOND CIWA/ASME THERMOPHYSICS AND HEAT TRANSFER CONFERENCE HELD IN PALO ALTO, CALIFORNIA, MAY 24-26, 1970, (P. 59-60)

<ABST> A NEW MATHEMATICAL MODEL OF ATMOSPHERIC SPRAY COOLING IS FORMULATED WITHOUT RELIANCE UPON EXPERIMENTAL THERMAL PERFORMANCE DATA, E.G. STU. REAL EFFECTS SUCH AS DROPLET THERMAL PERSISTENCE, BUOYANCY, BLOCKAGE, AND NET DRY DEGRADATION ARE TREATED. THE FUNDAMENTAL PROBLEM OF TRANSIENT HEAT TRANSFER IN A SPHERE WITH PHASE CHANGE AT THE SURFACE IS SOLVED VIA THE FINITE ELEMENT METHOD. EVALUATION OF NONIDEAL DROPLET MIXING IS MADE BY COMPARISON WITH A LUMPED PARAMETER REPRESENTATION. PREDICTIONS OF THE MODEL WERE FOUND TO BE IN AGREEMENT WITH OBSERVATIONS.

<CIAS> A

<397>

<CCNT> PIGGS, R. B.; MILLER, J. C.; OTLEY, R. J.

<TITLE> A MASS BALANCE MODEL OF TRACE METALS IN SEVERAL DELAWARE WATERSHEDS

<DOC> A MASS BALANCE MODEL OF TRACE METALS IN SEVERAL DELAWARE WATERSHEDS PROGRESS REPORT 7/1/71-63/30/72, UNIVERSITY OF DELAWARE, WATER RESOURCES CENTER, DEWARK, 49PP., 1972.

<ABST> THE GEOCHEMISTRY OF THE SURFACE FRESH WATERS OF SOUTHERN DELAWARE WAS STUDIED. LEVELS OF CD AND PB ARE VERY HIGH IN RAINFALL BUT NOT SO HIGH IN STREAMS. STREAM WATERS CONTAIN LOW METAL CONCENTRATIONS, AND RAINFALL AND STREAM DISCHARGE HAVE LOW NG LEVELS.

THERE IS AN APPARENT RESIDENCE TIME OF ABOUT 45 D FOR TRACE METALS IN UNCONFINED AQUIFERS. AN INPUT-OUTPUT MODEL OF SOURCES AND SINKS OF TRACE METALS IN WATERSHEDS IS PROVIDED.

<CLAS> SIMULATION

<398>

<CCNT> BOOTH, R. S.

<TITLE> A SYSTEMS ANALYSIS MODEL FOR CALCULATING RADIOISOTOPE TRANSPORT BETWEEN RECEIVING WATERS AND BOTTOM SEDIMENTS

<ACRO> AQUARON

<ADDR> ORNL RIDGE NATIONAL LABORATORY, P.O. BOX 1

<CITY> ORNL RIDGE

<STAT> TN

<ZIP> 37830

<DOC> BOOTH, R.S., A SYSTEMS ANALYSIS MODEL FOR CALCULATING RADIOISOTOPE TRANSPORT BETWEEN RECEIVING WATERS AND BOTTOM SEDIMENTS, ORNL-TN-8751, APRIL 1975; ORNL/TN-8404

<ABST> EQUILIBRIUM RADIOISOTOPE CONCENTRATIONS IN WATERS RECEIVING RAD* ACTIVE EFFLUENTS AND IN BOTTOM SEDIMENTS ASSOCIATED WITH THE RECEIVING WATERS WERE CALCULATED SO THAT POTENTIAL DOSES TO MAN AND BIOTA AND RADIOISOTOPE BUILDUP IN THE ENVIRONMENT COULD BE DETERMINED REALISTICALLY. A FOUR-COMPARTMENT SYSTEMS ANALYSIS MODEL WAS DEVELOPED TO PREDICT DYNAMIC RADIOISOTOPE TRANSPORT. THE DEPENDENT VARIABLES OF THE MODEL ARE THE RECEIVING WATER, INTERSTITIAL WATER INTERMIXED WITH THE BOTTOM SEDIMENTS, BOTTOM SEDIMENT PARTICLES THAT UNDERGO SORPTION-DESORPTION REACTIONS WITH THE INTERSTITIAL WATER, AND BOTTOM SEDIMENT PARTICLES THAT UNDERGO ONLY SORPTION REACTIONS WITH THE INTERSTITIAL WATER. THE MODEL WAS USED TO GENERATE TWO TABLES. THE FIRST TABLE GIVES EQUILIBRIUM RADIOISOTOPE CONCENTRATIONS IN THE RECEIVING WATER WHEN RADIOISOTOPE TRANSPORT TO BOTTOM SEDIMENTS ARE POSSIBLE, DIVIDED BY THE RECEIVING WATER CONCENTRATIONS WHEN TRANSPORT TO BOTTOM SEDIMENTS ARE IGNORED. THESE FACTORS ARE ALWAYS LESS THAN UNITY, SINCE RADIOACTIVITY MUST BE CONSERVED, AND ADDING SEDIMENTS TO THE SYSTEM ADDS ANOTHER COMPARTMENT WHERE RADIOISOTOPE CONCENTRATIONS WILL EQUILIBRATE. THE OTHER TABLE LISTS RATIOS OF EQUILIBRIUM RADIOISOTOPE CONCENTRATIONS IN SEDIMENTS, DIVIDED BY THEIR CORRESPONDING RECEIVING WATER CONCENTRATIONS. THESE CONCENTRATIONS IN THE SEDIMENTS CAN BE USED TO CALCULATE EXTERNAL DOSES TO A PERSON SWIMMING OR FISHING. PRELIMINARY RESULTS INDICATE THAT THE USUAL EFFECT OF A NEGLECT OF SEDIMENT INTERACTIONS IS AN OVERESTIMATION OF THE TOTAL POTENTIAL DOSE TO MAN FROM THE RADIOISOTOPES. THIS NEGLECT OF SEDIMENT INTERACTIONS OVERESTIMATES RECEIVING WATER CONCENTRATIONS WHICH, IN TURN, OVERESTIMATES POTENTIAL DOSES FROM IMPORTANT PATHWAYS (DRINKING WATER OR EATING FISH) DIRECTLY RELATED TO THE

AQUATIC TRANSPORT

<390> CONT.

RECEIVING WATER CONCENTRATION. THIS WOULD NOT BE THE CASE, HOWEVER, FOR A SITUATION WHERE EXPOSURE TO RADIONUCLIDES IN SEDIMENTS IS THE CRITICAL PATHWAY. THE RESULTS FOR CS-137 ARE PARTICULARLY INTERESTING SINCE IT OFTEN CAUSES A MAJOR FRACTION OF THE CALCULATED DOSE FOR A TYPICAL PELFAGE. FOR ENVIRONMENTAL PARAMETERS APPROPRIATE TO FRESHWATER LAKES IN THE NORTHEASTERN STATES, NEGLECTING SEDIMENT INTERACTIONS COULD RESULT IN POTENTIAL DOSES APPROXIMATELY 4 TIMES TOO HIGH FROM CS-137 CONTAINED IN POTABLE WATER AND EDIBLE FISH. FURTHER, INCREASING ONLY THE KD VALUE OF A SAMPLE OF SEDIMENT FROM 27,000 TO 270,000 (WHICH REFLECTS MEASURED VARIATIONS BETWEEN VARIOUS FRESHWATER ENVIRONMENTS) INCREASES THIS FACTOR FIVE APPROXIMATELY 4 TO APPROXIMATELY 25.

<TYPE> 1972

<STATUS> IN USE

<MEDIA> PUNCHED CARDS

<SIZE> 20K

<COMP> IBM

<LANG> FORTRAN IV

<ALGO> SYSTEMS ANALYSIS MODEL SOLVED USING AN INTERACTIVE COMPUTER PROGRAM (MODSOV)

<CLASS> CONTINUOUS; DETERMINISTIC; PREDICTIVE; SIMULATION

<APPL> ENVIRONMENTAL IMPACT STATEMENTS; POLLUTION IN AQUATIC SYSTEMS; RADIONUCLIDE TRANSPORT THROUGH AQUATIC SYSTEMS.

<USERS> NATIONAL LABS; UNIVERSITIES

<SUB> ORIGINAL SOURCE PLUS TABLES OF ELEMENTAL CONTENTS

<NOTE> COMPARISONS WITH MEASUREMENTS AND REPORTED IN SYMPOSIUM ON MINERAL CYCLING IN SOUTHEASTERN ECOSYSTEMS HELD IN UNIVERSITY OF GEORGIA, MAY 1974; SYMPOSIUM ON RADIOECOTOLOGY HELD IN CORVALLIS, OREGON, MAY 1975

<CON> OREL-TR-0006

<399>

<CONT> BRAY, D. H.; GEYER, J. C.

<TITLE> DEVELOPMENT OF A GENERAL COMPUTED MODEL FOR SIMULATING THERMAL DISCHARGES IN THREE DIMENSIONS

<ADDR> JOHNS HOPKINS UNIVERSITY, DEPARTMENT OF GEOGRAPHY AND ENVIRONMENTAL ENGINEERING

<CITY> BALTIMORE

<STATE> MD

<DOC> HP--20956, 1972

<ABST> THE DEVELOPMENT OF A GENERAL, THREE-DIMENSIONAL TECHNIQUE FOR COMPUTER SIMULATION OF THERMAL DISCHARGES FROM STEAM ELECTRIC POWER PLANTS IS JUSTIFIED IN TERMS OF THE FUTURE GROWTH OF THERMAL POWER PLANTS,

AND THE SHORTCOMINGS OF ALTERNATIVE TEMPERATURE PREDICTION TECHNIQUES SUCH AS MATHEMATICAL CALCULUS, HYDRAULIC MODELS, AND TWO-DIMENSIONAL COMPUTER MODELS. BASED ON THE FUNDAMENTAL HYDRAULIC FLOW EQUATIONS, INCLUDING THE HYDROSTATIC APPROXIMATION, A DYNAMIC MODEL IS DEVELOPED FOR USE ON DIGITAL COMPUTERS OF MODERATE SIZE. WITH A CORE CAPACITY OF ONLY 1 MILLION BITS, THE MODEL'S MAXIMUM GRID SIZE IS 5430 CELLS, WHICH IS CONSIDERED ADEQUATE FOR THREE-DIMENSIONAL APPLICATIONS.

<CLASS> SIMULATION

<800>

<CONT> BRAY, D. H.; GEYER, J. C.; BOWEN, P. B.

<TITLE> HABINA DEL REY: COMPUTER SIMULATION OF POLLUTANT TRANSPORT IN SEMI-ENCLOSED WATER BODY

<DOC> LOS ANGELES, UNIVERSITY OF SOUTHERN CALIFORNIA, SEA GRANT PROGRAM, PUBLICATION USC-SG-1-73, 128PP.; THIS REPORT CON-73-11063 (OWP JUNE 1973(125) SPECIAL REPORT

<ABST> TIDAL FLOWING CHARACTERISTICS OF HABINA DEL REY WERE INVESTIGATED BY COMPUTER SIMULATION. BECAUSE OF THE SPATIAL GEOMETRY OF HABINA DEL REY WHICH CAN BE APPROXIMATED BY 1-DIMENSIONAL SEGMENTS, THE MODEL DEVELOPED BY FISCHER IS USED FOR THE SIMULATION PROCESS. INDIVIDUAL ELEMENTS OF FLUID ARE FOLLOWED AS THEY MOVE ALONG 1-DIMENSIONAL CHANNELS IN RESPONSE TO FLOWS GENERATED BY TIDAL FLUCTUATIONS. A MASS-CONVERSION EQUATION WAS USED WITH TIDAL DATA TO COMPUTE TIDAL FLOWS. DISPERSION OF POLLUTANTS BETWEEN FLUID ELEMENTS WAS CALCULATED WITH A MODIFIED ELDERS' EQUATION FOR DISPERSION IN WIDE OPEN-CHANNEL FLOW. DATA FOR THE PROGRAM WERE PROVIDED FROM TIDE RECORDINGS MADE AT VARIOUS POINTS IN THE HABINA. THE MOST STRIKING CHARACTERISTIC OF THE HABINA IS ITS SENSITIVITY TO VARIATIONS IN LOCATIONS AND TIME OF POLLUTANT INJECTIONS. THE MAIN CHANNEL HAS A GREAT DEAL MORE FLOWING ACTIVITY THAN THE BASINS. THE TIMING OF POLLUTANT INJECTIONS RELATIVE TO TIDAL PHASES IS IMPORTANT IN DETERMINING WHAT PERCENTAGE OF MATERIAL WILL BE PUSHED OUT IN A GIVEN TIME. POLLUTANTS INJECTED DURING A HIGH TIDE EXPERIENCE MUCH MORE FLOWING THAN WHEN INJECTED AT LOW TIDE.

<GEO> HABINA DEL REY, CALIFORNIA

<CLASS> SIMULATION

<801>

<CONT> BRAY, D. H.; CHAPRA, S. C.

<TITLE> DOCUMENTATION FOR SUSIN1/2, A COMPUTER PROGRAM FOR THE STEADY-STATE WATER QUALITY SIMULATION OF A STREAM NETWORK

<ACRO> SUSIN1/2

<ADDR> U.S. ENVIRONMENTAL PROTECTION AGENCY

<CITY> NEW YORK

<001>

AQUATIC TRANSPORT

<001> CONT.
<001> NY<00100> NATIONAL TECHNICAL INFORMATION SERVICE,
SPRINGFIELD, VA

<001> DE-227 154, 43 PP., 1973

<ABST> A MATHEMATICAL MODEL WAS WRITTEN TO DETERMINE THE LEVELS OF DISSOLVED OXYGEN, CARBONACEOUS BIOCHEMICAL OXYGEN DEMAND, AND NITROGENOUS BIOCHEMICAL OXYGEN DEMAND IN A STREAM. IT WAS DESIGNED TO EVALUATE AND PREDICT THE DISSOLVED OXYGEN, AND THE CARBONACEOUS AND NITROGENOUS BOD PROFILES IN A RIVER OR STREAM WHERE THE EFFECTS OF DISPERSION CAN BE ASSUMED TO BE INEFFECTIVE. THE STREAM NETWORK CONSISTS OF A RIVER AND ITS TRIBUTARIES WHICH ARE SEGMENTED INTO SECTIONS OF CONSTANT HYDROLOGIC, PHYSICAL, CHEMICAL AND BIOLOGICAL PARAMETERS. LOADS MAY BE APPLIED POINTWISE AT THE ENDS OF THE SECTION OR AS DISTRIBUTED SOURCES ALONG ITS LENGTH.

<CLASS> PREDICTIVE

<CON> A REV.

<002>

<00200> BROOKMAN, G. C.

<TITLE> MEASUREMENT AND MODELING OF STORM WATER RUNOFF FROM COAL STORAGE PILES AND THE IMPACT ON RECEIVING WATERS

<ACRO> TPC-55000; RECEIV II

<ADDP> THE RESEARCH CORPORATION OF NEW ENGLAND

<CITY> WETHERSFIELD

<STATE> CT

<ZIP> 06109

<PHONE> 203-563-1431

<DOC> PROCEEDINGS OF THE SYMPOSIUM ON COAL MINE DRAINAGE RESEARCH, HELD IN LOUISVILLE, KY, OCTOBER 18, 1977

<SUB> COAL STORAGE PILE RUNOFF

<ABST> A MATHEMATICAL MODEL WAS DEVELOPED TO PREDICT RUNOFF FROM COAL-FIRED UTILITIES. THE MODEL IS DESCRIBED AND USED TO EVALUATE FIELD DATA.

<GPO> PENNSYLVANIA

<TIME> 1976 - 1977

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> TEXT

<SIZE> APPROXIMATELY 700 K

<CCRP> UNI

<CONFIG> UNIVAC 90/30

<LANG> FORTRAN

<CLAS> PREDICTIVE

<USERS> TPC

<UPDATE> 780829

<003>

<00300> SUCHAK, EDWARD B.

<TITLE> LATERALLY AVERAGED RESERVOIR MODEL

<ACRO> LARN

<ADDP> J.E. EDINGER ASSOCIATES, INC., 37 WEST AVENUE

<CITY> WAYNE

<STATE> PA

<ZIP> 19097

<PHONE> 215-293-0757

<SOURCE> HENRY JACKSON, U.S. ARMY ENGINEER DIVISION, OHIO RIVER, CINCINNATI, OHIO

<DOC> J.E. EDINGER AND E.B. SUCHAK, A HYDRODYNAMIC, TWO-DIMENSIONAL RESERVOIR MODEL: DEVELOPMENT AND TEST APPLICATION TO SUTTON RESERVOIR, Elk River, West Virginia, August 1977; E.B. SUCHAK AND J.E. EDINGER, A HYDRODYNAMIC, TWO-DIMENSIONAL RESERVOIR MODEL: THE USER GUIDE, DECEMBER 1977

<SUB> WATER QUALITY SIMULATION MODEL

<ABST> LARN IS A HYDRODYNAMIC, TWO-DIMENSIONAL (LONGITUDINAL AND VERTICAL) TIME-VARYING, CONSTITUENT TRANSPORT SIMULATION MODEL WHICH CONSIDERS THE EFFECTS OF LONGITUDINAL CHANGES IN DENSITY DUE TO TEMPERATURE VARIATIONS. IT IS INTENDED FOR USE IN RELATIVELY NARROW WATERBODIES WHERE LATERAL VARIATIONS MAY BE NEGLECTED AND WHERE BUOYANCY EFFECTS ARE IMPORTANT. THE CODE IS WRITTEN FOR USE BY THE KNOWLEDGEABLE HYDRODYNAMICIST AND REQUIRES DETAILED BOUNDARY CONDITION DATA AND BATHYMETRIC INFORMATION. LARN HAS BEEN APPLIED TO SIX WATERBODIES SINCE ITS RELEASE TO SELECTED USERS IN DECEMBER 1977.

<STATUS> UNDER DEVELOPMENT; IN USE

<ACCESS> LIMITED

<MEDIA> MAGNETIC TAPE; PUNCHED CARDS; TEXT

<SIZE> 1500 CARDS

<COMP> UNI; CDC

<LANG> FORTRAN IV

<CHAR> ASCII

<ALGO> FINITE DIFFERENCES

<CLAS> DETERMINISTIC; PREDICTIVE; SIMULATION

<APPL> WATER QUALITY SIMULATION IN LAKES, RIVERS, AND RESERVOIRS

<USERS> U.S. ARMY CORPS OF ENGINEERS

<UPDATE> 780707

<004>

<00400> CAMPBELL, D.; KERR, E.; BOBB, D.

<TITLE> IMPACT OF OIL SPILLAGE FROM WORLD WAR

AQUATIC TRANSECT

<000> CONT.

II. TANKER SINKINGS

<ADDR> MASSACHUSETTS INSTITUTE OF TECHNOLOGY,
DEPARTMENT OF OCEAN ENGINEERING

<CITY> CAMBRIDGE

<STATE> MA

<DOC> PR--265957, 1977

<ABST> THE OVERALL EFFECTS OF SPILLED OIL ARE STUDIED THROUGH AVAILABLE DATA ON TANKERS SUNK ALONG THE EAST COAST OF THE UNITED STATES DURING WORLD WAR II. THE BASELINE DATA OF SHIPS SUNK, CARGO, LOCATIONS AND DATA ON SINKINGS WAS ESTABLISHED THROUGH AN EXTENSIVE LITERATURE AND ARCHIVES SEARCH. CAPE HATTERAS, NORTH CAROLINA AND ITS SURROUNDING AREA WAS CHOSEN AS THE PRIMARY SITE OF THE INVESTIGATION ON THE BASIS OF THE VOLUME OF SPILLED OIL. A COMPUTED MODEL WAS DEVELOPED TO ESTIMATE THE TRAJECTORY OF OIL RELEASED FROM EACH SHIP. IN ADDITION, THE ASBURY PARK AREA OF NEW JERSEY WAS INVESTIGATED ON THE BASIS OF SUBSTANTIAL DOCUMENTATION OF SPILLS IN THAT AREA. INTERVIEWS WERE CONDUCTED IN BOTH AREAS TO OBTAIN FIRST HAND INFORMATION ON VISIBLE EFFECTS OF THE OIL. NEWSPAPERS AND RECORDS OF MARINE ACTIVITIES WERE ANALYZED TO DETERMINE ENVIRONMENTAL AND OTHER OIL RELATED EFFECTS FOR THE SELECTED REGIONS. RESULTS INDICATED THAT EFFECTS OF THE OIL SPILLS, AS OBSERVED BY RESIDENTS OF THE AREAS UNDER INVESTIGATION, WERE NEGLIGIBLE. IN BOTH CASES, REGIONAL WILDLIFE AND ECONOMY SURVIVED WITH MINIMAL DIFFICULTY.

<GPO> NORTH CAROLINA; NEW JERSEY

<CLASS> PREDICTIVE

<005>
<CONT> CAPDEN, R. L.; PALMER, S. L.; RODGERS, D. A.; DENRENS, P. J.

<TITLE> CALIBRATION OF A THERMAL ENRICHMENT MODEL FOR SHALLOW, BARRICADED ESTUARIES

<ADDR> UNIVERSITY OF SOUTH FLORIDA, DEPARTMENT OF MARINE SCIENCE

<CITY> ST. PETERSBURG

<STATE> FL

<DOC> PR--262219, 1976

<ABST> A NEW, SEMI-EXPLICIT, NUMERICAL MODEL OF THERMAL DISPERSION HAS BEEN DEVELOPED. IT HAS BEEN LINKED TO AN EXPLICIT, TIDALLY DRIVEN HYDRAULICS MODEL OF A BARRICADED ESTUARY ON THE WEST COAST OF FLORIDA. THE MODEL HAS BEEN USED TO PREDICT THE DISTRIBUTION OF TEMPERATURE RESULTING FROM A SEAWATER-COOLED POWER GENERATION FACILITY NEAR CRYSTAL RIVER, FLORIDA. MIXING NUMBERS AND DIFFUSION COEFFICIENTS HAVE BEEN DETERMINED FOR THE MODELLED BASIN AND VERIFIED BY COMPARING CHARACTERISTICS OF THE CALCULATED PLUME TO THOSE OF THE ACTUAL PLUME. INPUT VARIABLES INCLUDED TIDAL HEIGHT, POWER PLANT LOAD, SOLAR IRRADIANCE, AIR TEMPERATURE, HUMIDITY, PRESSURE, AND WIND SPEED AND DIRECTION.

AFTER FIVE DAYS OF SIMULATION FOR THE PERIOD 6/15/75 TO 6/19/75, THE CALCULATED PLUME AREA WAS WITHIN 15% OF THE MEASURED ACREAGE, AND THE CALCULATED MEAN PLUME TEMPERATURE DIFFERED FROM THE MEASURED VALUE BY ONLY 0.05C.

<GPO> FLORIDA

<CLASS> SIMULATION

<006>
<CONT> CEABRES, A.; COOPER, W. W.; HARRALD, J.; HARRAN, R. P.; WALLACE, W. A.

<TITLE> GOAL INTERVAL PROGRAMMING MODEL FOR RESOURCE ALLOCATION IN A MARINE ENVIRONMENTAL PROTECTION PROGRAM

<ACRO> NEP; GIP

<ADDR> UNIVERSITY OF TEXAS

<CITY> AUSTIN

<STATE> TX

<DOC> JOURNAL OF ENVIRONMENTAL ECONOMICS AND MANAGEMENT, 3(4), 307-352, 1976

<ABST> A MULTIDIMENSIONAL "GOAL PROGRAMMING" MODEL IS DEVELOPED TO AID RESOURCE ALLOCATION DECISIONS IN THE U.S. COAST GUARD'S MARINE ENVIRONMENTAL PROTECTION (NEP) PROGRAM. AN INFORMATION SYSTEM TO ALLOW CONTINUAL EVALUATION OF THIS PROGRAM RELIES ON TWO DATA BASES: (1) THE POLLUTION INCIDENT REPORTING SYSTEM FOR REPORTS OF OIL DISCHARGES, POLLUTION INCIDENTS AND CORRESPONDING PENALTIES; AND (2) THE PORT SAFETY AND SECURITY/MARINE ENVIRONMENTAL PROTECTION FOR REPORTS ON FUNCTIONAL AND MANAGERIAL ACTIVITY. THIS MODEL IS THEN EXTENDED TO A MODEL OF "GOAL INTERVAL PROGRAMMING" (GIP) AND A RANGE OF VALUES FOR INDICATED GOALS REPLACES THE EXACT VALUES USED IN ORDINARY GOAL PROGRAMMING. DEVIATIONS OUTSIDE THESE RANGES ARE ALSO ACCOMMODATED BY PIECEWISE LINEAR FUNCTIONS WITH SLOPES THAT VARY WITH DISTANCE FROM THE GOAL INTERVALS. APPLICATIONS OF THE RESULTING INFORMATION ARE INTENDED FOR ALLOCATING HARBORS AND PLANNING THE ACTIVITIES OF THE COAST GUARD'S NEP PROGRAM. 27 REFERENCES.

<007>
<CONT> CHASSE, J. P.; WINKARSKY, L. D.

<TITLE> LABORATORY EXPERIMENTS OF SUBMERGED DISCHARGES WITH CURRENT

<ADDR> U.S. ENVIRONMENTAL PROTECTION AGENCY

<DOC> ENVIRONMENTAL PROTECTION AGENCY, PUBL. WORKING PAPER 612, JUNE 1970.

<ABST> ANALYTICAL MODEL FOR PREDICTING PLUME PATTERN FROM BOUD JETS AND MULTIPORT DIFFUSERS IN SHALLOW WATER.

<CLASS> PREDICTION

<008>
<CONT> CHEN, C. W.; ORLOV, G. T.

<ACR>

AQUATIC TRANSFORM

<ACR> CONT.

<TITLE> ECOLOGIC SIMULATION FOR AQUATIC ENVIRONMENTS

<ABST> COMPUTER PROGRAMS FOR ECOLOGICAL SIMULATION ARE BEING DEVELOPED FOR APPLICATION TO ESTUARIES AND THPOUNDMENTS. THESE ARE QUITE COMPLEX AND CAPABLE OF TREATING SIMULTANEOUSLY THE CARBON, NITROGEN, AND PHOSPHORUS CYCLES USING 19 WASTE QUALITY PARAMETERS IN TEMPORAL AND SPATIAL DETAIL. PRELIMINARY MODEL TESTING AND VERIFICATION IS PROCEEDING.

<ACR>

<CON> CLARK, G. E.

<TITLE> PREDICTIVE AND POLLUTION ABATEMENT MODEL FOR ACID MINE DRAINAGE

<ADDR> U. S. ENVIRONMENTAL PROTECTION AGENCY, MINING POLLUTION CONTROL BRANCH

<CITY> CINCINNATI

<STATE> OH

<CITY> 45269

<DOC> CTE, R.P. (ED.), PROCEEDINGS OF THE EPA CONFERENCE ON ENVIRONMENTAL MODELING AND SIMULATION, 1976, EPA 600/9-76-016, (P. 596-599), 807 PP.

<ACR>

<CON> CLARK, LEO J.; JAWORSKY, ROBERT A.

<TITLE> NUTRIENT TRANSPORT AND DISSOLVED OXYGEN BUDGET STUDIES IN THE POTOMAC ESTUARY

<ABST> THE PURPOSE OF THIS REPORT IS TO MODEL A PORTION OF THE NITROGEN CYCLE, PHOSPHORUS DEPOSITION, AND THE OCCURRENCE OF ALGAL BLOOMS AS MEASURED BY CHLOROPHYLL A; AS WELL AS THE EFFECTS OF CARBOXYCARBON, NITROGENOUS, AND BENTHIC OXYGEN DEMAND; ALGAL PHOTOSYNTHESIS, RESPIRATION AND DECAY; AND RECAPTATION OF THE DISSOLVED OXYGEN RESOURCES IN THE UPPER POTOMAC ESTUARY.

<GEN> HAPPLAND, POTOMAC RIVER

<CLASS> SIMULATION

<ACR>

<CON> COCHRAN, P. A.; FRASER, J. P.

<TITLE> COMPUTER SIMULATION OF OFFSHORE OIL SPILL CLEANUP OPERATIONS

<DOC> PROCEEDINGS OF THE SEVENTH ANNUAL OFFSHORE TECHNOLOGY CONFERENCE, VOL. 1, HELD IN KINGSTON, ONTARIO, CANADA, JULY 22, 1975.

<ABST> COMPUTER SIMULATION PROVIDES A POWERFUL TOOL FOR USE IN SELECTION AND DESIGN OF OIL SPILL CONTROL EQUIPMENT. THIS PAPER DESCRIBES AN OIL SPILL SIMULATION PROGRAM WHICH ENABLES THE USER TO ASSESS THE EFFECTS OF WEATHER AND OF THE PERFORMANCE CHARACTERISTICS OF OIL SPILL CONTROL EQUIPMENT ON THE RECOVERY OF SPILLED OIL. RESULTS OF A SAMPLE CASE ARE SHOWN WHICH INDICATE THE TRENDS WHICH MIGHT BE EXPECTED FROM VARIATIONS IN THE NUMBER OF SKINNERS

USED, THEIR ABILITY TO OPERATE TO DIFFERENT MAXIMUM WAVE HEIGHTS, OTHER SKINNER PERFORMANCE CHARACTERISTICS, LENGTH OF TIME SPENT ON THE JOB, AND SIZE OF THE SPILL.

<CLASS> SIMULATION

<ACR>

<CON> COBELL, P. D.

<TITLE> DIGITAL COMPUTER SIMULATION OF THERMAL EFFLUENT DISPERSION IN RIVERS, LAKES, AND ESTUARIES

<ADDR> SPECTRONE APSENAL

<STATE> AL

<DOC> AD--771940;RS-TR--73-16, PP.228, 1973

<ABST> THE PURPOSE OF THIS WORK WAS TO ILLUSTRATE THAT THE DISPERSION OF EFFLUENT FROM THERMAL POWER PLANTS DISCHARGING INTO BODIES OF WATER COULD BE REALISTICALLY SIMULATED ON A DIGITAL COMPUTER. THE BASIC EQUATIONS FOR THE CONSERVATION OF MASS, MOMENTUM, AND THERMAL ENERGY IN THREE DIMENSIONS WERE SIMPLIFIED AND VERTICALLY INTEGRATED INTO DIFFERENT FORMS DEPENDING ON WHETHER THE DISCHARGE WAS OF THE THERMALLY STRATIFIED OR WELL MIXED TYPE. NUMERICAL ALGORITHMS WERE DESIGNED TO SOLVE THE FINITE DIFFERENCE REPRESENTATIONS OF THE SIMPLIFIED CONSERVATION EQUATIONS WITHIN THE LIMITS OF PRESENT DAY DIGITAL COMPUTERS. EXTENSIVE LINEAR ANALYSIS WAS PERFORMED TO ASSURE THE VALIDITY AND STABILITY OF THE NUMERICAL SOLUTIONS. THE STRATIFIED FLOW MODEL ASSUMES TWO DISTINCT LAYERS, AN UPPER THERMAL LAYER AND A LOWER AMBIENT LAYER EITHER STAGNANT OR FLOWING. THE NONSTRATIFIED MODEL IS USEFUL FOR CASES OF LARGE BODIES OF WATER WHERE THERE IS SEVERE MIXING AND NO APPRECIABLE STRATIFICATION. IN BOTH MODELS, THE BOUNDARIES OF THE COMPUTATIONAL GRID ARE COMPLETELY GENERAL AND ARE ABLE TO SIMULATE ARBITRARY SHAPES AND DISCHARGE CONFIGURATIONS.

<CLASS> SIMULATION

<ACR>

<CON> COLOMBELL, J. R.

<TITLE> FIELD EVALUATION OF A PREDICTIVE MODEL FOR THERMAL STRATIFICATION IN LAKES AND RESERVOIRS

<ADDR> UNIVERSITY OF MASSACHUSETTS, WATER RESOURCES RESEARCH CENTER

<CITY> AMHERST

<STATE> MA

<ABST> THE MAJOR PORTION OF THIS WORK WAS DEVOTED TO EXPERIMENTAL INVESTIGATION OF THE RESPONSE OF A RESERVOIR TO HYDROLOGIC AND METEOROLOGIC INFLUENCES. FOR THIS PURPOSE AN AUTOMATIC DATA COLLECTION SYSTEM WAS DESIGNED AND CONSTRUCTED. FIVE METEOROLOGIC PARAMETERS (SOLAR AND LONG WAVE RADIATION, WIND SPEED, AIR TEMPERATURE, AND RELATIVE HUMIDITY) WERE MONITORED. SURVEILLANCE OF THE

AQUATIC TRANSPORT

<413> CONT.

THE HYDRODYNAMIC STATE OF THE RESERVOIR WAS MAINTAINED BY THERMAL SURVEYS AT INTERVALS OF SEVEN TO TEN DAYS THROUGHOUT THE FIELD OBSERVATIONAL SEASON. IN ADDITION, EFFORT WAS DEVOTED TO THE EVALUATION OF A MATHEMATICAL MODEL FOR PREDICTION OF THE THERMODYNAMIC AND HYDRODYNAMIC BEHAVIOR OF A RESERVOIR IN RESPONSE TO CLIMATIC INFLUENCES.

<CLASS> PREDICTIVE

<414>

<CONT> COPENHAGEN, T. W.

<TITLE> NUMERICAL TECHNIQUES APPLIED TO PARTICLE DEPOSITION DURING SLOT FLOW

<AUTH> HOWARD UNIVERSITY

<CITY> WASHINGTON

<STATE> DC

<ZIP> 20001

<DOC> WATER RESOURCES BULLETIN, 9(3), 556, 1973

<ABST> A MATHEMATICAL MODEL OF PARTICLE SEDIMENTATION FROM A FLUID-SOLID SLURRY FLOWING THROUGH A VERTICAL SLOT HAS A PRACTICAL APPLICATION TO SOLID WASTE DISPOSAL PROCESSES AND TO PETROLEUM FRESHWATER SEDIMENTATION PROCESSES. THE DIFFERENTIAL EQUATION DESCRIBING THE PROCESS OF PARTICLE SEDIMENTATION CONSIST OF FIRST ORDER, NON-LINEAR, PARTIAL DIFFERENTIAL EQUATION AND A FIRST ORDER, ORDINARY DIFFERENTIAL EQUATION.

<CLASS> SIMULATION

<415>

<CONT> CORE, E. V.; ELROD, A. C.

<TITLE> PREDICTION OF TEMPERATURE PROFILES IN ARBITRARILY SHAPED COOLING LAKES BY FINITE DIFFERENCE TECHNIQUES

<DOC> 1971 INTER-SOCIETY ENERGY CONVERSION ENGINEERING CONFERENCE, HELD IN BOSTON, MASSACHUSETTS, AUGUST, 1971

<ABST> TECHNIQUES FOR SATISFACTORILY PREDICTING THE TEMPERATURE PROFILES IN ARBITRARILY SHAPED COOLING LAKES ARE NECESSARY IN ORDER TO PREDICT THE ECOLOGICAL EFFECTS OF PROPOSED ELECTRIC POWER PLANTS AS WELL AS THE LOCATION OF THE COOLING WATER INLET FOR THESE PLANTS. PRESENT PREDICTION TECHNIQUES REPRESENT A SOLUTION OF THE ENERGY EQUATION BASED ON AN ASSUMED VELOCITY PROFILE

<CLASS> SIMULATION

<416>

<CONT> CRAWFORD, D. B.; LINSLEY, R. K.

<TITLE> A CONCEPTUAL MODEL OF THE HYDROLOGIC CYCLE

<ABST> AT THE 12TH GENERAL ASSEMBLY OF THE I.A.S.H. A PAPER WAS PRESENTED

DESCRIBING A RELATIVELY CRUDE CONCEPTUAL MODEL OF THE HYDROLOGIC CYCLE WHICH COULD BE SOLVED ON A DIGITAL COMPUTER TO YIELD A CONTINUOUS OUTPUT OF MEAN DAILY STREAMFLOW WHEN DAILY PRECIPITATION VALUES WERE USED AS INPUT. SINCE THAT TIME RESEARCH HAS CONTINUED AND A NEW MODEL CALLED THE STANFORD WATERSHED MODEL (MARK II) HAS BEEN DEVELOPED UTILIZING HOURLY ORDINATES OF THE HYDROGRAPH DURING AND IMMEDIATELY AFTER RAIN AND MEAN DAILY ORDINATES FOR THE INTERIM PERIODS. THE POINT-OUT INCLUDES MONTHLY AND ANNUAL FLOW, MONTHLY GROUNDWATER RUNOFF, END OF MONTH SOIL MOISTURE, AND A FLOW DURATION CURVE OF DAILY RUNOFF. THE MODEL INCLUDES AMONG ITS COMPONENTS SURFACE, INTERFLOW, AND GROUNDWATER RUNOFF, AND UTILIZES SOME RATIONAL FUNCTIONS FOR CONTROLLING EVAPOTRANSPIRATION LOSS FROM AND INFILTRATION TO THE SOIL. THE NEW MODEL TESTED ON BASINS ENCOMPASSING A VARIETY OF CLIMATIC, HYDROLOGIC, AND GEOLOGIC CONDITIONS AND APPEARS TO BE A VALID GENERAL MODEL FOR WATERSHEDS SMALL ENOUGH TO BE REASONABLY REPRESENTED BY A SINGLE RAIN GAUGE AND FREE FROM SUBSTANTIAL INFLUENCES BY SNOWFALL. ALTHOUGH DEVELOPED INITIALLY FOR THE PRACTICAL PURPOSE OF DERIVING SYNTHETIC HYDROGRAPHS, THE MODEL APPEARS TO BE SUFFICIENTLY REALISTIC TO SERVE ALSO AS A RESEARCH TOOL IN EXPLORE THE FUNDAMENTAL HYDROLOGY OF THE RAINFALL-RUNOFF PROCESS. A BRIEF DESCRIPTION OF THE MODEL AND A SUMMARY OF THE RESULTS OF THE TESTING COMPLETED ARE PRESENTED. SOME PRELIMINARY CONCLUSIONS ON THE ROLE OF THE VARIOUS PROCESSES IN THE HYDROLOGIC CYCLE ARE ALSO DISCUSSED. AMONG THESE IS THE ROLE OF INTERFLOW (SUB-SURFACE STORE FLOW) IN CAUSING A CHANGE IN SHAPE OF THE UNIT HYDROGRAPH WITH SEASON AND WITH INTENSITY OF RAINFALL. THE EFFECT OF ALTERING THE INFILTRATION ON THE FLOW AND PEAK FLOW CHARACTERISTICS OF THE HYDROGRAPH AND AN EXAMPLE OF THE POTENTIAL HYDROLOGIC WATER YIELD AS A RESULT OF RAINFALL AUGMENTATION ARE ALSO BE PRESENTED. PRELIMINARY RESULTS OF CORRELATIONS BETWEEN KEY PARAMETERS IN THE MODEL AND PHYSICAL CHARACTERISTICS OF THE WATERSHED ARE DISCUSSED.

<CLASS> SIMULATION

<417>

<CONT> CSALLABY, S. C.; MCCLAUGHLIN, V. G.; STRIPPLER, W. D.

<TITLE> SIMULATING EFFECTS OF HARVEST CUTTING ON SNOWMELT IN COLORADO SUBALPINE FOREST

<AUTH> AMERICAN WATER RESOURCES ASSOCIATION

<CITY> URBANA

<STATE> IL

<SOURCE> PSW LIB. GB 651/A5/1972

<DOC>

LEAF, C.F. AND G.E. BRINK, SYMPOSIUM ON WATERSHEDS IN TRANSITION, HELD IN FT. COLLINS, COLORADO, JUNE 19-22, 1972, (P. 191-196).

<ABST> A RECENTLY DEVELOPED DYNAMIC MODEL HAS PRODUCED TENTATIVE RESULTS REGARDING THE PROBABLE EFFECTS OF TIMBER

AQUATIC TRANSPORT

<817> CONT.

HARVESTING ON SMOUWELT IS A CENTRAL COLORADO SUBALPINE WATERSHED. SMOUWELT PATES IN NATURAL LONGLEAF PINE AND ENGELMANN SPRUCE FOREST WERE COMPARED AGAINST A HYPOTHETICAL PATTERN OF 5 TREE-HEIGHT DIAMETER OPENINGS, CUT INTO THE WATERSHED SO THAT TREES ON 40 PERCENT OF THE AREA WERE REMOVED. THE AVERAGE EFFECT FOR THE 8 YEARS SIMULATED WAS TO INCREASE MELT DATES RAPIDLY IN THE MELT SEASON AND DIMINISH SMOUWELT LATER. ALTHOUGH HARVEST CUTTING AFFECTED TIMING BY CAUSING THE ONSET OF THE SMOUWELT TO OCCUR EARLIER, THE DURATION OF THE SMOUWELT SEASON WAS APPARENTLY NOT SIGNIFICANTLY CHANGED. EARLY-SEASON SMOUWELT WAS ACCELERATED IN THE SMALL OPENINGS, BUT IN BOTH NATURAL FOREST AND CUT-OVER AREAS, THE LAST SNOW MELT AT ABOUT THE SAME TIME.

<GEO> COLORADO

<CLASS> SIMULATION

<CON> 33 REFERENCES, 7 FIGURES, 2 TABLES

<818>

<CONT> BELONG N. H.:

<TITLE> PREDICTION OF HEATED EFFLUENT DISPERSION IN A STREAM USING SIMILITUDE TECHNIQUES

<AUTH> YONA STATE UNIVERSITY

<CITY> ARES

<STATE> IA

<DOC> THESIS, 1972; UNIVERSITY MICROFILMS ORDER NO. 72-19, 901, 121 PP.

<ABST> AN EXPERIMENTAL STUDY IS DONE TO DEVELOP PREDICTION EQUATIONS FOR HEATED EFFLUENT DISPERSION USING OPEN CHANNEL MODELS DESIGNED BY SIMILITUDE TECHNIQUES. IN SOME MODELS THE FLOW DEPTH IS INTENTIONALLY DISTORTED COMPARED TO THE HORIZONTAL DIMENSIONS. THE PRINCIPLES OF ENGINEERING SIMILITUDE ARE USED TO ANALYZE OPEN CHANNEL FLOW, AND SIXTEEN DIMENSIONLESS RATIOS, OR PI TERMS, ARE DEVELOPED TO DESCRIBE THE PREDICTION OF HEATED EFFLUENT DISPERSION. DISTORTION FACTORS ARE DEVISED TO CHARACTERIZE THE INTENTIONAL AND UNAVOIDABLE DEVIATIONS OF THE MODEL DESIGN CONDITIONS FROM THOSE OF A TRUE MODEL. SEVEN OPEN CHANNEL SYSTEMS WERE PAIDED IN DIFFERENT COMBINATIONS TO ACHIEVE MODELS WITH DIFFERENT LENGTH SCALES AND DIFFERENT DEGREES OF DEPTH DISTORTION. TEMPERATURE DATA WERE OBTAINED BY USING THERMISTORS. PREDICTION FACTORS WERE DEVELOPED FROM THE EXPERIMENTAL DATA. THE RELATION OF PREDICTION FACTOR WITH DEPTH AND SLOPE DISTORTION FACTORS AND LENGTH SCALE WAS DETERMINED.

<CLASS> PREDICTIVE

<819>

<CONT> BELUCIA, R.

<TITLE> A WATER QUALITY PLANNING MODEL WITH MULTIPLE TIME, POLLUTANT, AND SOURCE CAPABILITIES

<AUTH> MOTA SYSTEMS INC.

<CITY> CAMBRIDGE

<STATE> MA

<ZIP> 02138

<DOC> WATER RESOURCES RESEARCH, 10(1), 9-10, 1970

<ABST> A PLANNING MODEL CAPABLE OF REFLECTING THE IMPLICATIONS OF THE POLLUTANT CONSTRAINTS AND THE SCALE ECONOMICS OF POINT SOURCE ABATEMENT IMPLICIT IN THE LEGISLATION IS DEVELOPED. THE MODEL CAPTURES WITHIN A MATHEMATICAL PROGRAMMATIC FORMAT IMPORTANT CHARACTERISTICS OF DECISIONS ASSOCIATED WITH THE TIME-RELATED WATER POLLUTION CONTROL GOALS OF PUBLIC LAW 92-500. THE MODEL'S UNIQUE FEATURES ARE THE UTILIZATION OF A MASS POTENTIAL PARAMETER AS A MEASURE OF WATER QUALITY AND A SET OF HEURISTIC PROCEDURES INVOLVING LINEARIZATION OF THE WASTE TREATMENT CAPACITY-REMOVAL CURVES. THESE FEATURES ALLOW AVOIDANCE OF NONCONVEXITY PROBLEMS ASSOCIATED WITH ANALOGOUS MODELS. THE MODEL ALSO INCLUDES THE USUAL DOB, DO, B, AND P WATER QUALITY MEASURES. THE MODEL HAS BEEN APPLIED IN A RECENT PLANNING STUDY FOR THE SAINT JOHN BASIN IN MAINE.

<GEO> MAINE, ST. JOHN BASIN

<CLASS> SIMULATION

<820>

<CONT> DEWALLE, D. R.

<TITLE> EFFECT OF ATMOSPHERIC STABILITY ON WATER TEMPERATURE PREDICTIONS FOR A THERMALLY LOADED STREAM

<AUTH> PENNSYLVANIA STATE UNIVERSITY

<CITY> UNIVERSITY PARK

<STATE> PA

<DOC> WATER RESOURCES RESEARCH, 12(2), 239-244, 1966

<ABST> A STEADY STATE ONE-DIMENSIONAL ENERGY BUDGET EQUATION WAS NUMERICALLY INTEGRATED TO PREDICT WATER TEMPERATURES IN A 5.05-KM-LONG THERMALLY LOADED STREAM REACH FOR 131 FIVE- OR SIX-HOUR PERIODS. DOWNSTREAM WATER TEMPERATURE PREDICTION ERRORS (MEASURED MINUS PREDICTED) USING JOHNSON'S LAKE REPAIR EVAPORATION EQUATION AVERAGED -2.115509 05C AND WERE WELL CORRELATED (RSSQ 25 = 86 PERCENT) WITH AN INDEX TO ATMOSPHERIC STABILITY. USE OF A MODIFIED FORM OF MULLYAROVSKY'S EVAPORATION EQUATION, WHICH INCLUDES A TERM FOR EVAPORATION BY FREE CONVECTION, SIGNIFICANTLY REDUCED THE AVERAGE PREDICTION ERROR TO 0.095509 05C AND ELIMINATED THE EFFECTS OF ATMOSPHERIC STABILITY (RSSQ 25 LESS THAN 1 PERCENT). CORRECTION OF WIND VELOCITY DATA FOR THE VELOCITY OF THE AIR RELATIVE TO THE STREAM VELOCITY ALSO REDUCED PREDICTION ERRORS.

<CLASS> PREDICTIVE

AQUATIC TRANSPORT

- (021)
(CONF) D'AMICO, DAVID W.
- (TITLE) ONE-DIMENSIONAL, REGIONAL TEMPERATURE SIMULATION MODEL
- (ACFD) COLBERT
- (ADDR) BATTELLE-PACIFIC NORTHWEST LABORATORIES, POST OFFICE BOX 999
- (CITY) RICHLAND
- (STATE) WA
- (ZIP) 99252
- (PHONE) 509-946-2491; FTS 844-7511 EXT 946-2491
- (DOC) HANFORD ENGINEERING DEVELOPMENT LABORATORY, THE COLBERT RIVER SIMULATION MODEL, HDL-782 (8/72), 72-103, 1972
- (ABST) THE COLBERT SIMULATION MODEL HAS BEEN USED PRIMARILY TO SIMULATE WATER TEMPERATURES IN A FLOWING STREAM. HOWEVER, THE MATHEMATICAL MODEL, ORIGINALLY DEVELOPED TO ESTIMATE THE EFFECT ON THE COLUMBIA OF THE HANFORD PRODUCTION REACTORS, HAS BEEN MODIFIED AND STRUCTURED IN SUCH A MANNER THAT IT CAN BE USED TO SIMULATE THE BEHAVIOR OF POLLUTANTS OTHER THAN WASTE HEAT. TESTING AND APPLICATION OF THE MODEL TO "REAL WORLD" SITUATIONS HAS SPARKED DEVELOPMENT OF SPECIALIZED ROUTINES TO INCLUDE PROVISIONS FOR HANDLING TRANSIENT FLOW, REVERSE FLOW, DIFFUSIONAL TRANSPORT AND DENSITY CURRENTS. IT HAS BEEN TESTED AND HAS GIVEN EXCELLENT RESULTS.
- (GEO) RIVER MILE
- (ACCESS) LIMITED
- (SIZE) 160K
- (CONF) CDC; FBI; IDH
- (COM) PART OF THE COLUMBIA RIVER STUDY. CATEGORIZED AS: POLLUTANTS AND EFFLUENTS OF ENERGY PROCESSES, ENVIRONMENTAL AND ECOLOGICAL SYSTEMS, NATURAL RESOURCES INVENTORY (E.G., WATER, MINERAL, OIL, COAL) AND ELECTRIC POWER GENERATION. AVAILABLE ON EDA-01 COMPUTER NETWORK. GRAPHICAL DISPLAY ROUTINE-CAL COMP PLOTS.
- (022)
(CONF) EISENHARDT, B. A.; LITCH, C. J.; BREISING, B. J.
- (TITLE) VULNERABILITY MODEL: A SIMULATION SYSTEM FOR ASSESSING DAMAGE RESULTING FROM HAZARDOUS SPILLS
- (ACFD) VA
- (ADDR) FRYING CONTROL, INC.
- (CITY) ROCKVILLE
- (STATE) MD
- (ABST) THE VULNERABILITY MODEL (VM) IS A COMPUTERIZED SIMULATION SYSTEM FOR ASSESSING DAMAGE THAT RESULTS FROM HAZARDOUS SPILLS OF DANGEROUS MATERIALS; THE FINAL REPORT, SUBMITTED HERE, DESCRIBES THE RESEARCH BACKGROUND, COMPUTATIONAL TECHNIQUES, AND PRELIMINARY TEST RESULTS ASSOCIATED WITH THE FIRST STAGE OF DEVELOPMENT OF THE VM. THIS FIRST STAGE OF MODEL DEVELOPMENT CONSISTED OF THE DESIGN AND IMPLEMENTATION OF AN OPERATIONAL COMPUTER SIMULATION, THEREBY DEMONSTRATING THE FEASIBILITY OF THE PHILOSOPHY, CONCEPTS, AND APPROACHES PERTAINING TO THE VM. CERTAIN ASPECTS OF THE MODELING, AS NOW OPERATIONAL, ARE SUBJECT TO ENHANCEMENT BY AUGMENTATION, INCREASE IN PRECISION, OR BOTH. ULTIMATELY, THE MODEL IS INTENDED TO BE A COMPREHENSIVE TOOL FOR ASSESSING DAMAGE RESULTING FROM HAZARDOUS SPILLS.
- (CLASS) SIMULATION
- (023)
(CONF) ELLIOTT B.; HANNESS D.
- (TITLE) PHENOMENOLOGICAL MODEL FOR THE PREDICTION OF THERMAL PLUMES IN LARGE LAKES
- (ADDR) HYDRO-ELECTRIC POWER COMMISSION
- (CITY) TORONTO
- (STATE) ONTARIO
- (COUNTRY) CANADA
- (DOC) PROCEEDINGS OF THE FIFTEENTH CONFERENCE ON GREAT LAKES RESEARCH, HELD IN MADISON, WISCONSIN, OCTOBER 5, 1972, (P. 540-564); CONF-72/0051
- (ABST) A MATHEMATICAL MODEL FOR THE PREDICTION OF THE SIZE, SHAPE AND ORIENTATION OF THE THERMAL PLUMES PRODUCED BY THE SURFACE DISCHARGE OF HEATED CONDENSED COOLING WATER HAS BEEN DEVELOPED. THE MODEL IS BASED ON THE STATISTICAL ANALYSIS OF A SERIES OF MEASUREMENTS MADE ON PLUMES PRODUCED BY AN OPERATING GENERATING STATION. ARGUMENTS ARE PRESENTED TO SHOW THAT THE MODEL CAN BE USED FOR PREDICTION PURPOSES AT SITES OTHER THAN WHERE THE MEASUREMENTS WERE MADE.
- (CLASS) SIMULATION
- (024)
(CONF) ENGLAND, C. S.
- (TITLE) MODEL OF WATERSHED HYDROLOGY
- (ACFD) USDA-NL-70
- (ADDR) U.S. DEPARTMENT OF AGRICULTURE, HYDROGRAPH LABORATORY, AGRICULTURAL RESEARCH SERVICE
- (CITY) BELTSVILLE
- (STATE) MD
- (ZIP) 20705
- (DOC) BOLTON, R. D. AND H. C. LOPES, 1971, USDA-NL-70 MODEL OF WATERSHED HYDROLOGY, TECHNICAL BULLETIN NO. 1035, U.S. DEPT. AGR., WASHINGTON, D.C., 110 PP.
- (CLASS) SIMULATION

<425>

AQUATIC TRANSPORT

<425>

<CONTR> EPASLAN, A. R.

<TITLE> UNIFIED TRANSPORT APPROACH MODELS FOR POWER PLANT IMPACT IN ESTUARIES

<ADDR> UNIVERSITY OF TENNESSEE

<CITY> KNOXVILLE

<STATE> TN

<DOC> CCBP-760422--21; AMERICAN NUCLEAR SOCIETY 1976 ANNUAL MEETING HELD IN TORONTO, ONTARIO, CANADA, JUNE 13, 1976.

<ABST> THE ASSESSMENT OF THE ENVIRONMENTAL IMPACT OF POWER PLANT OPERATIONS IN AN ESTUARY REQUIRES THE MODELLING OF BOTH PHYSICAL AND BIOLOGICAL PHENOMENA. IN ADDITION TO THE DIRECT ENTRAPMENT AND IMPINGEMENT OF THE AQUATIC ORGANISMS AT THE INTAKES, POWER PLANTS ALSO INDIRECTLY AFFECT THE BIOTA BY ALTERING THE AMBIENT HYDRODYNAMIC, THERMAL, AND WATER QUALITY CONDITIONS IN AN ESTUARY. THE MODELLING OF BOTH THE PHYSICAL AND THE BIOLOGICAL PHENOMENA CAN BE ACCOMPLISHED BY A UNIFIED TRANSPORT APPROACH WHICH EMPLOYS CONSISTENT BALANCE (HERE GENERAL THEN CONSERVATION) PRINCIPLES, DISCRETE-ELEMENT FORMULATIONS, INPUT DATA, AND COMPUTATIONAL ALGORITHMS FOR THE SOLUTION OF ALL THE REQUIRED PHYSICAL AND BIOLOGICAL VARIABLES. ONE-DIMENSIONAL MODELS WERE DEVELOPED BY OUR ARE OF STAFF FOR BOTH TIDAL-TRANSIENT AND TIDAL-AVERAGED SIMULATIONS OF THE PHYSICAL CONDITIONS AND THE PERMUTATION OF THE AQUATIC POPULATIONS IN ESTUARIES.

<CLASS> PREDICTIVE

<426>

<CONTR> EPASLAN, A. R.

<TITLE> ONE-DIMENSIONAL HYDRODYNAMIC AND WATER QUALITY CONDITIONS IN ESTUARIES AND CONTROLLED RIVERS

<ADDR> ESTONE

<ADDR> UNIVERSITY OF TENNESSEE

<CITY> KNOXVILLE

<STATE> TN

<ZIT> 37916

<DOC> PROCEEDINGS 11TH ANNUAL MEETING, INTERNATIONAL SOCIETY OF ENGINEERING SCIENCE, HELD IN DURHAM, NORTH CAROLINA, NOVEMBER 1974.

<ABST> A FAR-FIELD MATHEMATICAL MODEL FOR NUMERICAL SIMULATION OF SHORT-TIME (WITHIN TIDAL CYCLE) TRANSIENT, ONE-DIMENSIONAL DISTRIBUTIONS OF DEPTH, FLOW RATE, TEMPERATURE AND CONSTITUENT CONCENTRATIONS ALONG ESTUARIES AND CONTROLLED RIVERS HAS DEVELOPED. THE EULERIAN FLUID (FLUID-IN-DISCRETE-ELEMENT) FORMULATION EMPLOYS THE INTEGRAL FORMS OF PHYSICAL LAWS FOR CONSERVATION OF FLUID AND CONSTITUENT MASS, MOMENTUM, AND THERMAL ENERGY IN VARIABLE SIZED DISCRETE ELEMENTS THAT SPAN THE LENGTH OF THE RIVER. THE CONTRIBUTIONS OF VERTICAL AND LATERAL DISTRIBUTIONS OF THE VELOCITY,

AND TEMPERATURE ARE INCORPORATED IN THE DEVELOPMENT OF CROSS-SECTION AVERAGED, ONE-DIMENSIONAL TRANSPORT FLUXES FOR MOMENTUM, MASS, AND ENERGY BY SPATIALLY INTEGRATING THE INTEGRAL EQUATIONS OF THE PHYSICAL LAWS OVER THE ENCLOSURE SURFACES OF THE DISCRETE ELEMENTS. THE APPROPRIATE BOUNDARY CONDITIONS AT THE ENDS OF THE RIVER ARE FORMULATED BOTH FOR GENERAL CONTROLLED RIVER CONDITIONS AND ALSO FOR PERIODIC SURFACE ELEVATION VARIATIONS FOR OCEAN AND TIDAL CONDITIONS. THE GENERAL FORMULATION OF THE MODEL CONSIDERS TRIBUTARY FLOWS, RAINFALL, AND DRAINAGE ALONG THE RIVER AS SPECIFIED INPUTS. POWER PLANT EFFECTS ARE INCLUDED IN THE MODEL BY CONSIDERING DIFFERENT LOCATIONS, FLOW RATES, TEMPERATURE, AND WATER QUALITY CONDITIONS AT THE INTAKES AND DISCHARGES. THE SURFACE HEAT-TRANSFER EFFECT IS FORMULATED ACCORDING TO A SHORT-TIME MODEL (SHORTLY VARIATIONS) WHICH APPROXIMATELY INCORPORATES SOLAR IRRADIATION, BLACK BODY BACK RADIATION, EVAPORATION AND CONVECTION MODES FOR THE CONDITIONS OF THE WATER SURFACE OF WATER. THE MODEL WAS FORMULATED IN A FORTRAN COMPUTER PROGRAM CALLED ESTONE, AND THIS PROGRAM WAS APPLIED TO SIMULATE THE HYDRODYNAMIC, TEMPERATURE, AND SALINITY CONDITIONS IN THE HUDSON RIVER.

<GEN> HUDSON RIVER

<LANG> FORTRAN

<CLASS> SIMULATION

<427>

<CONTR> EPASLAN, A. R.

<TITLE> A TRANSIENT, TWO-DIMENSIONAL, DISCRETE-ELEMENT MODEL FOR FAR-FIELD ANALYSIS OF DISCHARGES IN COASTAL REGIONS

<ADDR> PARROT

<ADDR> UNIVERSITY OF TENNESSEE

<CITY> KNOXVILLE

<STATE> TN

<DOC> PROCEEDINGS THERMAL POLLUTION ANALYSIS CONFERENCE, HELD IN BLACKSBURG, VIRGINIA, MAY 1974. (ALSO TO BE PUBLISHED IN PROGRESS OF ASTRONAUTICS AND AERONAUTICS, VOL. 36, 1975).

<ABST> A FAR-FIELD MATHEMATICAL MODEL FOR NUMERICAL SIMULATION OF SHORT-TIME (WITHIN TIDAL CYCLE) TRANSIENT, TWO-DIMENSIONAL TEMPERATURE DISTRIBUTIONS IN LARGE COASTAL REGIONS RESULTING FROM THE CONDENSED COOLING WATER DISCHARGES OF POWER PLANTS WAS DEVELOPED. THE EULERIAN FLUID (FLUID-IN-DISCRETE-ELEMENT) FORMULATION EMPLOYS THE INTEGRAL FORMS OF THE CONSERVATION PRINCIPLES FOR MASS AND THERMAL ENERGY IN VARIABLE-SIZED DISCRETE ELEMENTS THAT SPAN THE SPECIFIED FLOW REGION. THE CONTRIBUTIONS OF VERTICAL VARIATIONS OF THE VELOCITY COMPONENTS AND TEMPERATURE ARE INCORPORATED IN THE DEVELOPMENT OF DEPTH-AVERAGED, TWO-DIMENSIONAL ENERGY TRANSPORT FLUXES BY SPATIALLY INTEGRATING THE CONSERVATION EQUATIONS

AQUATIC TRANSFERT

<027> CONT.

OVER THE ENCLOSURE SURFACES OF THE DISCRETE ELEMENTS. THE GENERAL MATHEMATICAL FORMULATION CONSIDERS COMPLETELY ARBITRARY, TRANSIENT OCEANIC FLOW CONDITIONS AS LOCALLY SPECIFIED INPUTS TO THE MODEL. THE SURFACE HEAT-TRANSFER EFFECT IS FORMULATED ACCORDING TO A SHORT-TIME MODEL (HOURLY VARIATIONS) WHICH APPROXIMATELY INCORPORATES SOLAR IRRADIATION, BLACK BODY BACK RADIATION, EVAPORATION, AND CONVECTION MODES FOR THE CONDITIONS OF THE OCEAN SURFACE IN COASTAL REGIONS. THIS MODEL WAS FORMULATED IN A FORTRAN COMPUTER PROGRAM CALLED PAROUT, AND THE FINAL VERSION OF THIS PROGRAM WAS EXTENDED TO INCLUDE THE APPROXIMATE REPRESENTATIONS OF THE PLANT INDUCED FLOW CONDITIONS IN THE NEAR-FIELD ZONE.

<LANG> FORTRAN

<CLAS> SIMULATION

<CON> SEE ALSO DOC

<028>

<CON> EVANS, D. B.; INCE, S.; KISIEL, C. C.; QASIM, M. K.; EVERETT, L. G.

<TITLE> EFFECTS OF DEVELOPMENT ON SALINITY AND LIMNOLOGY OF THE LOWER COLORADO RIVER

<ABST> UNIVERSITY OF ARIZONA, DEPARTMENT OF HYDROLOGY AND WATER RESOURCES

<CITY> TUCSON

<STATE> AZ

<SOURCE> WJIS

<DOC> PB--223 907/7, 1973

<ABST> THIS RESEARCH WAS DESIGNED TO ASSEMBLE AND ANALYZE AVAILABLE DATA ON CHEMICAL QUALITY AND LIMNOLOGY OF RESERVOIRS AND RIVER REACHES FROM LEE PERRY TO IMPERIAL DAM, TO DETERMINE THE EFFECTS OF DEVELOPMENT ON SALINITY AND TO INITIATE THE VALIDATION OF MODELS OF INTERACTION OF CHEMICAL IONS, SEDIMENTS, BIOLOGICAL FACTORS AND OTHER LIMNOLOGICAL INPUTS SUCH AS THERMAL STRATIFICATION AND TURBIDITY. THE STUDY WAS COMPLETED A BIOLOGICAL AND CHEMICAL REVIEW OF THE LOWER COLORADO RIVER, A STATISTICAL AND STOCHASTIC EUTROPHICATION MODEL, AN ENERGY-BUDGET MODEL, A CROSS-SPECTRAL ANALYSIS SALINITY MODEL AND SHOWED THE APPLICABILITY OF REMOTE SENSING OF WATER QUALITY. A SPECIFIC CHEMICAL-ION MODEL AND AQUATIC ECOSYSTEM MODEL TO INCORPORATE THE ABOVE SUB-MODELS IS UNDER DEVELOPMENT.

<GEO> COLORADO RIVER; LEE PERRY; IMPERIAL DAM

<CLAS> PREDICTION

<029>

<CON> FALLAN, H. H.; STARR, B. H.

<TITLE> RANDOM DRIFT OF AN IDEALIZED OIL PATCH

<ABST> MATHEMATICA INC.

<CITY> PHILADELPHIA

<STATE> PA

<DOC> OCEAN ENGINEERING, 3(2), 83-97, 1976

<ABST> THE PAPER DEVELOPS A MODEL FOR THE RANDOM DRIFT OF AN IDEALIZED OIL PATCH ON WATER DUE TO INFLUENCES OF WIND AND CURRENTS. PROBABILISTIC DESCRIPTIONS FOR THE DISPLACEMENT OF THE CENTER OF MASS ARE DERIVED. THE MODEL PROVIDES FOR RANDOM SHIFTS IN WIND DIRECTION AND ITS INFLUENCE ON REDUCING THE OIL PATCH.

<CLAS> SIMULATION

<030>

<CON> FEIGNER, K. D.; HARRIS, R. S.

<TITLE> FROA DYNAMIC ESTUARY MODEL

<ABST> REGAN; DYNHYD; DYNQUA; HYDEX; DATAP; QUALEX

<ABST> U.S. ENVIRONMENTAL PROTECTION AGENCY, WATER QUALITY OFFICE

<CITY> WASHINGTON

<STATE> DC

<DOC> 240 PP.

<ABST> THE NECESSARY THEORY, BACKGROUND, AND GUIDELINES FOR APPLYING THE FROA DYNAMIC ESTUARY MODEL TO AN ARBITRARY ESTUARY WAS PRESENTED. THE DISCUSSION REFLECTED FEDERAL WATER QUALITY ADMINISTRATION EXPERIENCE IN APPLYING THE MODEL TO THE SAN FRANCISCO AND SAN DIEGO BAY ESTUARIES. THE MODEL WAS UTILIZED TO SIMULATE A WIDE VARIETY OF HYDRAULIC AND WATER QUALITY CONDITIONS IN THESE TWO SYSTEMS, AND THROUGH THE COURSE OF ITS DEVELOPMENT, TESTING, AND USE, OVERCAME SIGNIFICANT CHANGE. THE MODEL REPRESENTED THE TWO-DIMENSIONAL FLOW AND DISPERSION CHARACTERISTICS OF AN ESTUARY AND COULD BE APPLIED TO ANY ESTUARY WHEREIN VERTICAL STRATIFICATION WAS EITHER ABSENT OR LIMITED TO RELATIVELY SMALL AREAS WITHIN THE ESTUARY. THE MODEL COULD ACCOMMODATE BOTH CONSERVATIVE CONSTITUENTS AND THE INTERRELATIONSHIP BETWEEN BIOCHEMICAL OXYGEN DEMAND (BOD) AND DISSOLVED OXYGEN (DO). TWO SEPARATE, BUT COMPATIBLE COMPONENTS WERE DEVELOPED: A HYDRAULIC PROGRAM (DYNHYD) AND A QUALITY PROGRAM (DYNQUA). A THIRD PROGRAM, A HARMONIC REGRESSION ANALYSIS (REGAN) WAS UTILIZED TO REDUCE INPUT REQUIREMENTS FOR SPECIFYING THE TIDAL CONDITIONS IMPOSED ON THE SYSTEM. A HYDRAULIC EXTRACT PROGRAM (HYDEX) SUMMARIZED THE HYDRAULIC OUTPUT WHILE A QUALITY EXTRACT PROGRAM (QUALEX) SUMMARIZED THE OUTPUT FROM THE QUALITY PROGRAM. A FINAL PROGRAM (DATAP) WAS DEVELOPED TO PREPARE BASIC INPUTS TO THE HYDRAULIC PROGRAM.

<GEO> CALIFORNIA, SAN FRANCISCO BAY, SAN DIEGO BAY

<CLAS> SIMULATION

<CON> 2: REFERENCES, 50 FIGURES, 7 TABLES

<031>

<CON> FONTAINE, D. G.; DONAH, J. F.; GRACE, J.

<831>

AQUATIC TRANSPORT

<831> CONT.
L.

<TITLE> MATHEMATICAL SIMULATION OF THE TURBIDITY STRUCTURE WITHIN AN IMPROVEMENT

<ABST> U.S. ARMY ENGINEER WATERWAYS EXPERIMENT STATION

<CITY> VICKSBURG

<STATE> MS

<DOC> U.S. ARMY ENGINEER WATERWAYS EXPERIMENT STATION. RESEARCH REPORT R-73-2, 22 PP., 1973

<ABST> THE TURBIDITY STRUCTURE OF AN IMPROVEMENT WAS SIMULATED USING A MATHEMATICAL MODEL CAPABLE OF SIMULATING PHYSICAL AND CHEMICAL CHARACTERISTICS. TURBIDITY WAS HANDLED AS A CONSERVATIVE CHEMICAL SUBSTANCE. THE MODEL WAS USED TO PREDICT THE TYPICAL AND TURBIDITY STRUCTURE OF A PROPOSED IMPROVEMENT. THE EFFECTIVENESS OF SELECTIVE WITHDRAWAL AND, IN PARTICULAR, OF A LOW-LEVEL OUTLET IN CONTROLLING THE TURBIDITY STRUCTURE OF AN IMPROVEMENT WAS DEMONSTRATED.

<CLASS> SIMULATION

<832>
<CONT> FRASER, J. P.; COCHRAN, D. A.

<TITLE> COMPUTER SIMULATION AIDS OIL-SPILL CLEANUP DECISIONS

<ABST> SHELL DEVELOPMENT COMPANY

<CITY> NEWTON

<STATE> TX

<DOC> OIL GAS JOURNAL, 74(10) 67-72, 1975

<ABST> NONE

<CLASS> SIMULATION

<833>
<CONT> FRIGO, A. A.

<TITLE> PREDICTION OF SURFACE PLUME AREAS ASSOCIATED WITH HEATED DISCHARGES INTO LARGE LAKES - A PHENOMENOLOGICAL MODEL

<DOC> PROCEEDINGS OF 15TH CONFERENCE ON GREAT LAKES RESEARCH, HELD IN MADISON, WISCONSIN, APRIL 5, 1972, (P. 583-587); CONF-720451 1972. (ED CITATION: PERMI 2)

<ABST> A PHENOMENOLOGICAL MODEL FOR THERMAL DISCHARGE ANALYSIS. THE FRIGO RELATIONSHIP IS A PLOT OF PLUME AREA, DISCHARGE, AND DIMENSIONLESS TEMPERATURE RATIOS REPRESENTING FIELD PLUME MEASUREMENTS IN THE GREAT LAKES WHERE THE LAKE BED SLOPE WAS APPROXIMATELY 1:100.

<CLASS> SIMULATION

<834>
<CONT> GAUD, U. S.; DAVEY, J. R.; STATES, J. S.; JENNINGS, H. I.; GUERREIRO, R. B.

<TITLE> ENVIRONMENTAL IMPACT STUDIES OF THE NAVAJO AND HAIPAWOITS POWER PLANTS

<ABST> NORTHERN ARIZONA UNIVERSITY

<CITY> FLAGSTAFF

<STATE> AZ

<DOC> PB--242046, 1973

<ABST> DURING THE SECOND YEAR OF STUDY, INVESTIGATIVE EFFORTS WERE CONCENTRATED ON ABOVE-GROUND VEGETATION, MICROBIAL SYSTEMS, SMALL MAMMALS, AND LAKE POWELL, AND INCLUDED MONITORING OF RELEVANT BIOTIC AND ABIOTIC FACTORS, THE SUBJECTION OF LABORATORY SYSTEMS TO SIMULATED EFFLUENT, AND THE SYNTHESIS OF DATA THROUGH COMPUTER ANALYSIS AND MODELING. SOILS WERE PRIMARILY COARSE-TEXTURED, SANDY LOAMS WITH LOW MOISTURE HOLDING CAPACITY, ORGANIC MATTER CONTENT, NITROGEN AND SULFUR CONTENT, AND WERE MODERATELY SALINE WITH NEUTRAL TO ALKALINE pH. SULFUR CONTENT OF SOILS AND VEGETATION VARIED WITH ELEVATION. DECOMPOSITION OF SOIL ORGANIC MATTER WAS SLOW, AND RESPIRATION OF SOIL MICROBIAL COMMUNITIES WAS LOW. A DENTLE PARASITE WAS FOUND TO BE A SIGNIFICANT MORTALITY FACTOR OF EPHEMERA. PRELIMINARY EXPOSURE OF NATIVE GRASSES TO SULFUR DIOXIDE SHOWED SEEDLINGS TO BE MORE SENSITIVE THAN NATIVE PLANTS. ANALYSIS OF VEGETATIONAL COMMUNITIES REVEALED HIGH VARIABILITY AMONG SITES AND OVER TIME. DISTURBED LANDS WERE PARTIALLY RECLAIMED, AND PRODUCTIVITY MEASUREMENTS IN A GRASSLAND WERE INITIATED. PONDEPOSA TREES ON NEARBY NAVAJO MOUNTAIN APPEARED TO BE HEAVILY IMPACTED BY NATURAL STRESSES. PHYTOPLANKTON AND ZOOPLANKTON DYNAMICS IN THE LOWER BAYS OF LAKE POWELL WERE INVESTIGATED, AND A PRELIMINARY STUDY OF THE EFFECT OF MERCURY ON NATIVE DIATOMS WAS CARRIED OUT.

<CLASS> SIMULATION

<835>
<CONT> GILLIGAN, P. H.

<TITLE> FORECASTING THE EFFECTS OF POLLUTING DISCHARGES ON ESTUARIES

<DOC> CHEMISTRY AND INDUSTRY (LONDON), 23 909-916, 1972

<ABST> THE ONE DIMENSIONAL COLLECTIVE DIFFUSION EQUATION DERIVED IN PART I IS ONLY ONE OF SEVERAL METHODS FOR MODELLING ESTUARY CONVECTION AND MIXING; THE REASON FOR ITS PRE EMINENCE BEING ITS ANALYTIC FORM AND COMPACTNESS. OTHER APPROACHES, ONE OF WHICH WAS DEVELOPED AT ABOUT THE SAME TIME AS THE DIFFUSION EQUATION (THE EARLY FIFTIES), IS DESCRIBED IN THIS REPORT. ALL MODELS MAKE USE OF THE PRINCIPLE OF MASS CONTINUITY APPLIED TO WATER SALT, OR DISSOLVED SUBSTANCE, BUT DO SO WITH VARYING DEGREES OF COMPLEXITY. THE MOST COMPREHENSIBLE MODEL, AND ALSO THAT WHICH IS POSSIBLY THE MOST WIDELY EMPLOYED, IS THE ONE DIMENSIONAL MIXED SEGMENT APPROACH. THIS IS BASED ON THE IDEA OF DIVIDING UP THE ESTUARY INTO STIRRED WATERMIGHT TANKS OR SEGMENTS, THE BOUNDARY BETWEEN SEGMENTS EXTENDING

AQUATIC TRANSPORT

<035> CONT.

ACROSS THE ESTUARY FROM ONE SIDE TO THE OTHER. THE DISTANCE BETWEEN BOUNDARIES BEING QUITE SMALL COMPARED WITH THE TIDAL EXCURSION DISTANCE. ALL WATER MOVEMENTS BETWEEN SEGMENTS ARE ASSUMED TO FLOW THROUGH PUMPING LOOPS, BUT NO CHANGES IN WATER LEVEL OCCUR SINCE THE ESTUARY IS CONSIDERED.

<CLAS> PREDICTIVE

<CONT> PART II

<036>

<CONT> GOLDSTEIN, R. A.; HARRIS, W. P.

<TITLE> SEWEMIPITY: A WATERSHED LEVEL SIMULATION MODEL OF TREE BIOMASS DYNAMICS

<ACRO> SEWEMIPITY

<ADDR> SIMULATION COUNCILS

<CITY> LA JOLLA

<STATE> CA

<DOC> PROCEEDINGS SUMMER COMPUTER SIMULATION CONFERENCE, HELD IN MONTREAL, CANADA, 1976, (P. 697-696)

<CLAS> SIMULATION, DETERMINISTIC

<037>

<CONT> GOODMAN, A. S.; DOBBINS, W. E.

<TITLE> MATHEMATICAL MODEL FOR WATER POLLUTION CONTROL STUDIES

<ABST> A METHODOLOGY (MODEL) IS PRESENTED FOR ANALYSIS OF THE PHYSICAL, ECONOMIC AND ADMINISTRATIVE RELATIONSHIPS IN WATER POLLUTION CONTROL. THE MODEL IS DEVISED FOR A RIVER AND TRIBUTARIES. THE WATER FROM THE RIVER IS USED AS MUNICIPAL WATER SUPPLY, DISPOSAL OF TREATED SEWAGE, AND RECREATION BY THE POPULATION AND INDUSTRIES ALONG THE RIVER. THE EQUATIONS AND PROCEDURES OF POLLUTION CONTROL ARE DISCUSSED IN DETAIL. THE MODEL MAY BE APPLIED IN ENGINEERING AND PLANNING STUDIES OF POLLUTION CONTROL. NUMEROUS TABLES AND FIGURES ARE GIVEN.

<CLAS> SIMULATION

<038>

<CONT> GRENNEY, W. J.; BELLA, D. A.

<TITLE> FIELD STUDY AND MATHEMATICAL MODEL OF THE SLACK-WATER BUILDUP OF A POLLUTANT IN A TIDAL RIVER

<ADDR> OREGON STATE UNIVERSITY, DEPARTMENT OF CIVIL ENGINEERING

<CITY> CORVALLIS

<STATE> OR

<DOC> LIMNOLOGY OCEANOGRAPHY 17(2), 229-236, 1972

<ABST> THE ACCUMULATION OF A POLLUTANT IN THE VICINITY OF AN OUTFALL DURING SLACK-WATER PERIODS IN A TIDAL RIVER

WAS STUDIED THROUGH A FIELD INVESTIGATION AND A MATHEMATICAL MODEL. A DIFFUSER WAS INSTALLED ACROSS THE MAIN CHANNEL OF THE YAGUINA RIVER WAS ABOUT 35 KM FROM THE MOUTH AT WESPORT, OREGON. BRODARINE-B WAS INJECTED AT A CONSTANT RATE FOR 10 HR AND OVER 400 WATER SAMPLES WERE TAKEN. THE DATA INDICATE A SIGNIFICANT BUILD UP DURING PERIODS OF SLACK WATER. A ONE-DIMENSIONAL, TIME DIMENSIONAL, TIME-DEPENDENT, FINITE-DIFFERENCE MODEL DEVELOPED FOR THE FIELD STUDY SIMULATED AVERAGE TRENDS REASONABLE WELL, BUT CALCULATED PEAK VALUES WERE CONSISTENTLY LOWER THAN FIELD OBSERVATIONS. CONCENTRATION PROFILES FROM THE MODEL WERE SENSITIVE TO THE DISPERSION COEFFICIENT AND THE GRID PARAMETERS WHEN LARGE CONCENTRATION GRADIENTS WERE PRESENT.

<CLAS> PREDICTIVE

<039>

<CONT> GROMEC, R. J.; GLOYA, E. P.

<TITLE> RADIOACTIVITY TRANSPORT IN WATER

<ADDR> UNIVERSITY OF TEXAS, CENTER FOR RESEARCH IN WATER RESOURCES

<CITY> AUSTIN

<STATE> TX

<DOC> REPORT NO. ENE-73-1; CRUR-97; MONITORING AGENCY REPT 50. 10; CONTRACT AT(11-1)-090, 1973, 80 PP.

<ABST>

STUDIES WERE UNDERTAKEN TO OBTAIN A MORE ACCURATE CONCEPT OF THE TRANSPORT OF RADIOISOTOPES IN AQUATIC SYSTEMS. VARIOUS STAGES OF THIS RESEARCH WERE COMPLETED AND PUBLISHED PREVIOUSLY IN PROGRESS REPORTS, AND ARE LISTED IN THE REFERENCES. THESE REPORTS DESCRIBE THE DISPERSION, UPTAKE, RELEASE, AND TRANSPORT OF SR-89, CS-137, MU-103, CO-58, AND CR-51. TRANSPORT DATA WERE OBTAINED BY CONDUCTING LABORATORY, MODEL RIVER, AND FIELD TESTS. CANAL, RIVER, AND ESTUARINE ENVIRONMENTS PROVIDED THE NECESSARY FIELD INFORMATION ON HYDRODYNAMIC DISPERSION AND ON UPTAKE AND RELEASE OF RADIOISOTOPES BY SEDIMENTS. MODEL RIVER DATA PROVIDED MOST OF THE USEFUL UPTAKE AND RELEASE INFORMATION INVOLVING SPECIAL SEDIMENTS, PLANTS, AND AQUATIC ENVIRONMENTS. TOPICS DISCUSSED INCLUDE THE FACTORS AFFECTING RADIOISOTOPES TRANSPORT, THE USE OF MODEL RIVERS TO STUDY CONTINUOUS RELEASE OF RADIOISOTOPES, AND THE INFLUENCE OF VARIOUS ENVIRONMENTAL FACTORS ON THE ACCUMULATION AND DESORPTION OF MERCURIALS BY A FRESH WATER ALGAE. RADIOACTIVE ISOTOPES OF MERCURY IN THE FORM OF MERCURIC MERCURY AND METHYL MERCURY WERE USED AS TRACERS.

<CLAS> PREDICTIVE

<040>

<CONT> GRUEL, J.

<TITLE> QUANTIFICATION OF AQUATIC ENVIRONMENTAL IMPACT OF ELECTRIC POWER GENERATION

AQUATIC TRANSPORT

<440> CONT.

<ADDR> MASSACHUSETTS INSTITUTE OF TECHNOLOGY,
ENERGY LABORATORY

<CITY> CAMBRIDGE

<STATE> MA

<DOC> NTIS

<ABST> THIS PROJECT PROPOSES A METHOD FOR CREATING, TO THE EXTENT OF THEIR PREDICTABILITY THE PROPER AND TIMELY FORECASTS OF THE AQUATIC ECOSYSTEM CONSEQUENCES OF ELECTRIC POWER SYSTEM OPERATION. A PROCEDURE IS DEVELOPED AND INTENDED FOR USE IN QUANTIFYING THE ECOLOGICAL SACRIFICES ASSOCIATED WITH A NUMBER OF DESIRABLE REGIONAL DISPATCH SCHEDULES. WITH THE USE OF THIS TECHNIQUE, ASSOCIATED WITH A GIVEN PREDICTABILITY LEVEL, OPTIMUM SCHEDULING SCENARIOS CAN BE USED TO EVALUATE OPTIMUM DOLLAR COST - ENVIRONMENTAL IMPACT PAIRINGS. A PREREQUISITE OF THE MODEL WAS THAT IT BE FLEXIBLE ENOUGH FOR USE IN THE EVALUATION OF AQUASYSTEM IMPACTS FROM EITHER EXISTING OR HYPOTHETICAL SYSTEMS, THAT IS, THAT IT COULD BE USED EITHER AS AN OPERATIONAL TOOL OR AS A SIMULATION TOOL. SPECIFICALLY DEMONSTRATED IS THE FEASIBILITY OF THE QUANTIFICATION OF VARIOUS ECOLOGICAL IMPACTS AND ITS USEFULNESS IN EFFECTING COMPATIBILITY BETWEEN THE POWER GENERATING FACILITIES AND THE AQUATIC ECOSYSTEM INTO WHICH THEY HAVE BEEN INCORPORATED. THE METHOD OF QUANTIFICATION INVOLVES A PROBABILISTIC SYSTEMS APPROACH WHICH INCLUDES A DUE REGARD FOR THE VAGARIES OF NATURE. ESSENTIALLY CALCULATED IS THE CHANGE IN DESIRABILITY TO HAD OF THE ECOSYSTEM AS INFLUENCED BY THE LOSSES OF ORGANISMS, SUCH LOSSES BEING COMPUTED FROM THE PROBABILISTIC CURVES OF AFFECTED POPULATIONS COMBINED WITH THE PROBABILITY OF IMPACT CURVES. PREDICTIVE TECHNIQUES ARE DEVELOPED FOR THE AVOIDANCE OF MORTALITIES DUE TO THERMOTOXIC SYNERGISMS. A DISCUSSION OF AN ATMOSPHERIC MODEL COUNTERPART IS PRESENTED TO DEMONSTRATE THE EXISTENCE OF COMPATIBLE AND CONSISTENT ATMOSPHERIC QUANTIFICATION PROCEDURES. THIS PROJECT IS PRIMARILY INTENDED AS A STATE-OF-THE-ART SURVEY OF THE RESEARCH AREAS CONTRIBUTING TO THIS AREA WITH PARTICULAR ATTENTION PAID TO THE PRECISE INPUT MODELING TECHNIQUES AVAILABLE. HOWEVER, A NEW METHOD IS PRESENTED FOR COMBINING THESE INPUTS IN A THOROUGH AND CONSISTENT MANNER TO OBTAIN A MEANINGFUL ENVIRONMENTAL IMPACT MEASURE.

<CLASS> SIMULATION; PREDICTIVE

<441>

<CONT> GUNTZ, G. D.; HELOY, T. P.

<TITLE> PARTICULATE OIL SPILL RECOVERY: OIL ADSORPTION PROPERTIES OF PLASTIC FOAMS

<ADDR> HELOY LAB, INC.

<CITY> SPRINGFIELD

<STATE> VA

<DOC> INTERNATIONAL JOURNAL OF MINERAL PROCESSING, 2(2), 151-161, 1975

<ABST>

PRESSURE, RETICULATED, POLYURETHANE FOAMS ARE BROADCAST AT SEA, ABSORB OIL IN THE PRESENCE OF WATER, ARE RECOVERED, OIL REMOVED AND FOAM PARTICLES REBROADCAST. COMBINING DIMENSIONAL AND MATHEMATICAL ANALYSIS WITH EXPERIMENTAL DATA, MATHEMATICAL MODEL OF FOAM ADSORPTION EFFICACY AND RATE IS DEVELOPED SHOWING THE SYSTEM TO BE PRACTICAL. OIL VISCOSITY, WAVE HEIGHT, RECOVERY SHIP SPEED, AND SYSTEM GEOMETRY INFLUENCE FOAM SELECTION. EQUATIONS AND GRAPHS DEMONSTRATE CALCULATIONS. 1 REF.

<CLASS> PREDICTIVE

<442>

<CONT> GUREGHIAN, DERGE A.

<TITLE> A TWO-DIMENSIONAL FINITE ELEMENT MODEL FOR THE MIGRATION OF CONTAMINANTS IN CONFINED AND UNCONFINED AQUIFERS

<ADDR> ARCONNE NATIONAL LABORATORY,
ENVIRONMENTAL IMPACT STUDIES DIVISION,
9700 S. CASS AVE.

<CITY> ARGONNE

<STATE> IL

<ZIP> 60439

<PHONE> PTS 972-7791

<DOC> NONE

<ABST>

THE MODEL IS CAPABLE OF PREDICTING THE TWO DIMENSIONAL MOVEMENT OF A SOLUTE IN A CONFINED OR UNCONFINED AQUIFER UNDER TRANSIENT SATURATED FLOW CONDITIONS. THE FINITE ELEMENT METHOD USING ISOPARAMETRIC ELEMENTS, BASED ON THE GALERKIN FORMULATION AND ON WEIGHTING FUNCTIONS OF MIN-SIMP TRIC FORM, WAS USED TO FORMULATE THE NUMERICAL DESCRIPTION OF THE CORRECTIVE DISPERSIVE MASS TRANSPORT EQUATION. A COMPARISON OF SEVERAL SOLUTION SCHEMES WITH NEW ANALYTICAL SOLUTIONS PERMITTED A THOROUGH CHECK OF THE NUMERICAL MODEL. THE MATRIX EQUATION WAS SOLVED BY THE CRANK-NICOLSON METHOD USING A MASS LUMPING PROCEDURE FOR THE TIME DERIVATIVE. FIELD DATA COLLECTED AT THE SITE OF THE BABYON LAND FILL (NEW YORK) WERE USED TO CALIBRATE AND VERIFY THE PARAMETERS CONTROLLING THE MOVEMENT OF THE LEACHATE.

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> DISC

<COMP> IBM

<CONFIG> IBM 370/195 04/MVT WITH 300K CORE

<LANG> FORTRAN

<CHAR> EBCDIC

<ALGO> FINITE ELEMENT; (A) GALERKIN AND OPTIMUM WEIGHTING; (B) ISOPARAMETRIC QUADRILATERAL ELEMENTS; (C) SOLUTION SCHEME: CRANK-NICOLSON WITH MASS LUMPING OF TIME DERIVATIVE COEFFICIENT MATRIX.

<CLASS> PREDICTIVE; SIMULATION

AQUATIC TRANSPORT

<662> CON*
 <APPL> PREDICTION OF THE MOVEMENT OF RADIOACTIVE WASTE OR OTHER POLLUTANT IN A CONFINED OR UNCONFINED AQUIFER.
 <SRV> FROM THE BABYLON LAND FILL, LONG ISLAND, NEW YORK
 <REAL> TESTED AGAINST ANALYTICAL SOLUTIONS (2D). THE MODEL HAS BEEN USED FOR THE CALIBRATION AND VERIFICATION OF SOME TRANSPORT PARAMETERS CONTROLLING THE MOVEMENT OF THE LEACHATE EMANATING FROM THE SITE OF THE BABYLON SANITARY LANDFILL IN LONG ISLAND, NEW YORK.
 <CON> REPORT SUBMITTED FOR PUBLICATION
 <PRDCT> 700703

<663>
 <CON> GUYRON, G. L.
 <TITLE> A THREE-DIMENSIONAL FINITE ELEMENT MODEL FOR THE MIGRATION OF CONTAMINANTS IN CONFINED AND UNCONFINED AQUIFERS
 <ABST> APPROXIMATE NATIONAL LABORATORY, ENVIRONMENTAL IMPACT STUDIES DIVISION, 9700 S. CASS AVE.
 <CTRY> ARGOVINE
 <STATE> IL
 <ZIP> 60639
 <PHONE> PLS 572-7791
 <DOC> NONE
 <ABST> THE MODEL IS CAPABLE OF PREDICTING THE THREE DIMENSIONAL MOVEMENT OF A SOLUTE IN A CONFINED OR UNCONFINED AQUIFER UNDER TRANSIENT SATURATED FLOW CONDITIONS. THE FINITE ELEMENT METHOD USING ISOPARAMETRIC ELEMENTS, BASED ON THE GALERKIN FORMULATION AND ON WEIGHTING FUNCTIONS OF NONSYMMETRIC FORM, WAS USED TO FORMULATE THE NUMERICAL DESCRIPTION OF THE CONVECTIVE DISPERSIVE MASS TRANSPORT EQUATION. A COMPARISON OF SEVERAL SOLUTION SCHEMES WITH NEW ANALYTICAL SOLUTIONS PERMITTED A THOROUGH CHECK OF THE NUMERICAL MODEL. THE MATRIX EQUATION WAS SOLVED BY THE CRANK-NICOLSON METHOD USING A MASS LUMPING PROCEDURE FOR THE TIME DERIVATIVE. FIELD DATA COLLECTED AT THE SITE OF THE BABYLON LANDFILL (NEW YORK) WERE USED TO CALIBRATE AND VERIFY THE PARAMETERS CONTROLLING THE MOVEMENT OF THE LEACHATE.
 <STATUS> IN USE
 <ACCESS> UNLIMITED
 <MEDIA> DISC; PUNCHED CARDS
 <CONF> IBM
 <CONFIG> IBM 370/195 OS/MVT WITH 300K CORE
 <LANG> FORTRAN
 <CHAP> PUBCIC
 <ALGO> FINITE ELEMENT: (A) GALERKIN AND UPWIND WEIGHTING; (B) ISOPARAMETRIC CUBIC ELEMENTS; (C) SOLUTION SCHEME: CRANK-NICOLSON WITH MASS LUMPING OF TIME DERIVATIVE COEFFICIENT MATRIX.

<CLAS> PREDICTIVE: SIMULATION
 <APPL> PREDICTION OF THE MOVEMENT OF RADIOACTIVE WASTE OR OTHER POLLUTANT IN A CONFINED OR UNCONFINED AQUIFER
 <REAL> TESTED AGAINST ANALYTICAL SOLUTION (2D AND 3D). PRESENTED AT THE AGU CONFERENCE, SAN FRANCISCO, DECEMBER 1976.
 <CON> THIS MODEL IS NOT YET OF THE USER-ORIENTED TYPE. HOWEVER, IT COULD BE USED WITH A MINIMUM EFFORT.
 <UPDATE> 700703

<664>
 <CON> GUYRON, G. L.
 <TITLE> APPLICATION OF THE FINITE-ELEMENT METHOD FOR SIMULATION OF SURFACE WATER TRANSPORT PROBLEMS
 <ABST> UNIVERSITY OF ALASKA, INSTITUTE OF WATER RESOURCES
 <CTRY> FAIRBANKS
 <STATE> AK
 <ZIP> 99701
 <DOC> REPORT NO. IWR-21; MONITORING AGENCY REPORT NO. W72-11866, OWR-A-036-ALAS (2); PROJ. OWR-A-036-ALAS, 1972, 110 PP.
 <ABST> BECAUSE OF CURRENT AND ANTICIPATED NEEDS IN RESOURCES PLANNING AND ENVIRONMENTAL CONSERVATION DECISION PROCESSES, GREATER LEVELS OF SOLUTION PRECISION ARE REQUIRED FOR THE FUNDAMENTALLY COMPLEX PROBLEM OF SIMULATING POLLUTANT MOVEMENT AND FATE IN THE AQUATIC ENVIRONMENT. THE OBJECTIVE WAS TO EXTEND THE TECHNOLOGY FOR A GENERAL ATTACK ON SOLVING SURFACE WATER MASS AND MOMENTUM TRANSPORT PROBLEMS. SPECIFICALLY, ONE CLASS OF THE FINITE-ELEMENT METHODS WAS EXPLORED TO DEVELOP A GENERAL PURPOSE COMPUTER PROGRAM FOR MODELING REGIONAL SURFACE WATER SYSTEMS. A QUASI-LINEAR VARIATION PRINCIPLE AND FINITE-ELEMENT SOLUTION PROCEDURE WAS DEVELOPED FOR THE TWO-DIMENSIONAL EULERIAN EQUATIONS OF FLOID MOTION. CONTINUITY WAS INCLUDED AS A LAGRANGIAN CONSTRAINING CONDITION. THE RESULTING SET OF LINEAR EQUATIONS IS SOLVED IN TIME BY STANDARD INTEGRATION METHODS WHERE THE BASIC NON-LINEARITY OF THE GOVERNING EQUATIONS OF MOTION ARE HANDLED BY A PSEUDO-ITERATIVE TECHNIQUE. ADDITIONALLY, AN IMPROVED FINITE-ELEMENT PROCEDURE FOR THE MASS TRANSPORT EQUATIONS IS PRESENTED.
 <CLAS> SIMULATION

<665>
 <CON> HAINES, Y. Y.
 <TITLE> MODELING AND CONTROL OF THE POLLUTION OF WATER RESOURCES SYSTEMS VIA MULTILEVEL APPROACH
 <ABST> CASE WESTERN RESERVE UNIVERSITY

<485>

AQUATIC TRANSPORT

<485> CONT.

<CITY> CLEVELAND

<STATE> OH

<DOC> WATER RESOURCES BULLETIN, 7(1), 93

<ABST> A MATHEMATICAL MODEL FOR CONTROLLING WATER POLLUTION SITUATION IN WHICH EFFLUENT IS DISCHARGED DIRECTLY INTO RIVER, LAKE OR BYPASS PIPE LEADING TO A TREATMENT PLANT IS GIVEN. THE MODEL DIVIDES THE PLANT INTO SUBSYSTEMS AND THE POLLUTION EFFLUENT INPUT VECTOR TO EACH SUBSYSTEM INCLUDES THE WATER QUANTITY AND CHARACTERISTICS-BOD, DO, PH, CONDUCTIVITY, TEMPERATURE, ALGAE, PHOSPHATE, NITRATE-CONTENT. TREATMENT COST AND QUALITY TRANSITION FUNCTIONS, AND SYSTEM MODEL CONSTRAINTS ARE INCLUDED.

<CLAS> SIMULATION

<486>

<CONT> HARR, ROY W., JR.; YOUNG, P. J.

<TITLE> MATHEMATICAL MODELS OF WATER QUALITY PARAMETERS FOR RIVERS AND ESTUARIES

<ADDR> TEXAS A AND M UNIVERSITY, WATER RESOURCES INSTITUTE

<CITY> COLLEGE STATION

<STATE> TX

<DOC> REPORT NO. TR-85; CONTRACTS DT-14-31-0001-3000, DT-14-31-0001-3200; MONITORING AGENCY REPT NO. W73-06529, OWRP-A-014-TEX(1); PROJ. OWRP-A-014-TEX, 1972, 438PP.

<ABST> THE DEVELOPMENT OF COMPUTER MODELS FOR MASS TRANSPORT IN ESTUARIES HAS BEEN AN IMPORTANT ENGINEERING ACTIVITY FOR THE PAST DECADE. HOWEVER, ONLY A LIMITED AMOUNT OF WORK HAS BEEN DONE IN MODELING THE TWO-DIMENSIONAL CHARACTERISTICS OF PARTIALLY STRATIFIED ESTUARIES. EXPLICIT AND CRANK-NICOLSON FINITE DIFFERENCE MODELS WERE DEVELOPED FOR THE ONE- AND TWO-DIMENSIONAL ESTUARY EQUATIONS WITH VARYING COEFFICIENTS. THE CONCENTRATION PROFILES FOR INSTANTANEOUS RELEASES AND FOR STEADY-STATE CONDITIONS WERE ANALYZED. ACCURACY WAS DETERMINED BY COMPARISON WITH ANALYTICAL CLOSED-FORM SOLUTIONS. MODELS WERE DEVELOPED ALSO TO ANALYZE THE PROFILES FOR BIOCHEMICAL OXYGEN DEMAND AND DISSOLVED OXYGEN UNDER TIME-CHANGING CONDITIONS, FOR BOTH AEROBIC AND ANAEROBIC CONDITIONS. APPLICABILITY OF TYPE MODELS TO PARTIALLY STRATIFIED ESTUARIES WAS ESTABLISHED BY COMPARISONS WITH DYE STUDY DATA FROM THE HOUSTON SHIP CHANNEL.

<CLAS> SIMULATION

<487>

<CONT> HARLEMAN, DONALD B. P.; ADAMS, E. E.; ROESTER, GAROLD

<TITLE> EXPERIMENTAL AND ANALYTICAL STUDIES OF CONDENSED WATER DISCHARGE FOR THE ATLANTIC GENERATING STATION

<ADDR> PUBLIC SERVICE ELECTRIC AND GAS COMPANY

<CITY> NEWARK

<STATE> NJ

<DOC> APPENDIX D.5, ATLANTIC GENERATING STATION UNITS 1 AND 2 ENVIRONMENTAL REPORT, MARCH 1974

<ABST> APPENDIX PRESENTS AN EXPERIMENTAL MODEL USED TO PREDICT TEMPERATURES AND VELOCITIES IN THE NEAR FIELD FOR 2 SURFACE AND 1 SUBMERGED DISCHARGE SCHEME. RECIRCULATION INTO THE PLANT INTAKE AND NEAR FIELD RE-ENTRAINMENT ARE CONSIDERED IN A PARAMETRIC MODEL, AND A TRANSITION MODEL IS USED TO LINK RESULTS OF THE NEAR FIELD MODEL WITH THE FAR FIELD. APPENDIX INCLUDES 37 FIGURES, 2 TABLES, AND 7 REFERENCES.

<CLAS> SIMULATION

<488>

<CONT> HARLEMAN, DONALD B. P.; ADAMS, E. E.; STOLZENBACH, KEITH D.

<TITLE> FAR FIELD STUDIES FOR THE ATLANTIC GENERATING STATION

<ADDR> MASSACHUSETTS INSTITUTE OF TECHNOLOGY, PALPH H. PARSONS LABORATORY FOR WATER RESOURCES AND HYDRODYNAMICS, DEPARTMENT OF CIVIL ENGINEERING

<CITY> CAMBRIDGE

<STATE> MA

<DOC> APPENDIX D.10 (SUPPLEMENT 13, JAN. 30, 1975), ATLANTIC GENERATING STATION UNITS 1 AND 2 ENVIRONMENTAL REPORT, PUBLIC SERVICE ELECTRIC AND GAS CO., MARCH 1974

<ABST> APPENDIX DESCRIBES THE DEVELOPMENT OF A FAR FIELD MODEL AND ITS APPLICATION TO THE ATLANTIC GENERATING STATION SITE. SECTION 1 OF THE APPENDIX IDENTIFIES VARIOUS PROCESSES WHICH ARE INVOLVED IN THE DISPERSION AND DISSIPATION OF HEAT OR OTHER EFFLUENTS IN THE OCEAN AND CATEGORIZES THE PROCESSES IN TERMS OF THE NEAR FIELD, INTERMEDIATE FIELD, FAR FIELD, OR SOME COMBINATION. SECTIONS 2 AND 3 DISCUSS A GOVERNING EQUATION FOR PASSIVE DIFFUSION IN A GENERAL FAR FIELD ENVIRONMENT. SECTION 4 ANALYZES NEAR AND INTERMEDIATE FIELD INFLUENCES AND OUTLINES A STRATEGY FOR COMBINING THESE WITH THE FAR FIELD. SECTION 5 DISCUSSES THE ROLE OF FIELD DATA IN DETERMINING MODEL PARAMETERS. IN SECTION 6 THE MODEL IS RUN FOR SEVERAL REPRESENTATIVE CONDITIONS OBSERVED DURING PRE-OPERATIONAL FIELD STUDIES AT THE ATLANTIC GENERATING STATION SITE. THE CONCLUDING SECTION DISCUSSES THE RESULTS AND SUMMARIZES THE STRENGTHS AND WEAKNESSES OF THIS TYPE OF MODEL. APPENDIX INCLUDES 1 TABLE, 5 REFERENCES AND 9 FIGURES.

<CLAS> SIMULATION

<489>

<CONT> HERRICKS, E. E.; SHAWWOLTZ, V. C.; CONTRATOR, D. H.

<TITLE> MODELS TO PREDICT ENVIRONMENTAL IMPACT OF WINE DRAINAGE ON STREAMS

AQUATIC TRANSPORT

<009> COST.

<DOC> TRANSACTIONS AMERICAN SOCIETY OF AGRICULTURAL ENGINEERS, 10 (4), 647-667, 1974

<ABST> A NUMBER OF STUDIES DIRECTED TOWARD MATHEMATICALLY DESCRIBING THE HYDROLOGY AND WATER QUALITY OF SELECTED SEGMENTS OF A DRAINAGE AREA WERE PRESENTED IN ORDER TO FURTHER APPLY THE MODELS TO STREAMS AFFECTED BY MINING ACTIVITIES. THE STANFORD WATERSHED MODEL WAS USED TO GENERATE CONTINUOUS STREAM FLOW SEQUENCES IN THE INDIAN CREEK BASIN. IN THE STUDY AREA, BOTH SURFACE AND SUB-SURFACE MINING METHODS WERE USED. THE MODEL WAS CALIBRATED IN A SUB-BASIN WITHIN THE WATERSHED WITH A RECORDED STREAM FLOW HISTORY, AND THE FLOW SEQUENCES WERE GENERATED FOR INDIAN CREEK AND SEVERAL OTHER SUB-BASINS. FOR THE MOST PART, FITS TO RECORDED VALUES WERE GOOD. THESE DATA PROVIDED A SYNTHETIC RECORD FOR EVALUATING A STREAM-STATE CONSERVATION SULFATE MODEL. SIMULATED SULFATE CONCENTRATIONS, WHICH GIVE AN INDICATION OF ACID MINE DRAINAGE, SHOWED ACCEPTED AGREEMENT WITH ACTUAL CONCENTRATIONS. THIS PROVIDED GUIDELINES TO ASSESS THE EFFECT OF ACID DRAINAGE ON STREAM BIOLOGY. AN INDICATION OF THE ACTION OF SELECTED STORM DISCHARGES WAS ALSO OBTAINED THROUGH THE USE OF SEDIMENT TRANSPORT THEORY AND HYDROLOGIC MODELS.

<GEO> INDIAN CREEK BASIN

<CLAS> PREDICTIVE

<CON> 17 REFERENCES, 8 FIGURES, 3 TABLES

<050>

<CON> PETLING, L. J.; O'CONNELL, R. L.

<TITLE> A STUDY OF TIDAL DISPERSION IN THE POTOMAC RIVER

<ANOP> FEDERAL WATER POLLUTION CONTROL ADMINISTRATION, MIDDLE ATLANTIC REGION

<CITY> CHARLOTTESVILLE

<STATE> VA

<DOC> REPORT NO. CB-SMDP-TECHNICAL PAPER-7; MONITORING AGENCY REPORT NO. 18 1965, REF; AVAIL NTIS

<ABST> THE CHESAPEAKE BAY-SUSQUEHANNA RIVER BASINS PROJECT OF THE FEDERAL WATER POLLUTION CONTROL ADMINISTRATION HAS AS ITS PRIMARY OBJECTIVE THE DEVELOPMENT OF A COMPREHENSIVE PROGRAM FOR WATER POLLUTION CONTROL IN THE CHESAPEAKE BAY DRAINAGE BASIN. TO PERMIT A BETTER UNDERSTANDING OF THIS COMPLEX BODY OF WATER AND TO PROVIDE A SATISFACTORY MEANS FOR ANALYSIS OF PRESENT AND FUTURE POLLUTION PROBLEMS AND SELECTION OF OPTIMUM CONTROL METHODS, AN ATTEMPT HAS BEEN MADE TO MODEL THE SYSTEM IN MATHEMATICAL TERMS. TO MATHEMATICALLY DESCRIBE THE FATE OF POLLUTANTS ENTERING SUCH A TIDAL SYSTEM, KNOWLEDGE OF ITS TURBULENT DISPERSION PROPERTIES IS REQUIRED. TO GATHER THIS TYPE OF INFORMATION FOR THE UPPER POTOMAC ESTUARY, A DYE TRACER STUDY WAS CARRIED OUT BY THE PROJECT DURING THE 34-DAY PERIOD FROM JUNE 10 TO JULY 14, 1965. THE PURPOSE OF THE REPORT IS TO

DESCRIBE THE PROCEDURE USED IN THIS LARGE SCALE TRACER EXPERIMENT, THE RESULTS OBTAINED, THE METHODS USED IN THE ANALYSIS OF THESE RESULTS, AND, FINALLY, TO PRESENT THE CONCLUSIONS REACHED REGARDING TURBULENT DISPERSION PROPERTIES OF THIS TIDAL SYSTEM.

<CLAS> SIMULATION

<051>

<CON> HILL, P. W.; KARLSEN, F. K.; HOFF, A. L.; BILEY, J. P.

<TITLE> A HYDROLOGIC MODEL OF THE BEAR RIVER BASIN

<ABST> THE DOWNSTREAM CONSEQUENCES RESULTING FROM CHANGES AT SPECIFIC LOCATIONS WITHIN AN HYDROLOGIC SYSTEM ARE CONSIDERED. THE ASSESSMENT OF THESE CHANGES IS APPROACHED BY HYBRID COMPUTER SIMULATION OF THE HYDROLOGIC SYSTEM. MODELING CONCEPTS ARE BASED UPON THE DEVELOPMENT OF BASIC RELATIONSHIPS WHICH DESCRIBE THE VARIOUS HYDROLOGIC PROCESSES. WITHIN A SYSTEM THESE RELATIONSHIPS ARE LINKED BY THE CONTINUITY-OF-MASS PRINCIPLE WHICH REQUIRES A HYDROLOGIC BALANCE AT ALL POINTS. SPATIAL RESOLUTION IS ACHIEVED BY CONSIDERING THE MODELED AREA AS A SERIES OF SUBBASINS. THE TIME INCLEMENT ADOPTED FOR THE MODEL IS ONE MONTH, SO THAT TIME VARYING QUANTITIES ARE EXPRESSED IN TERMS OF MEAN MONTHLY VALUES. THE MODEL IS GENERAL IN NATURE AND IS APPLIED TO A PARTICULAR HYDROLOGIC SYSTEM THROUGH A PROGRAMMED VERIFICATION PROCEDURE WHEREBY MODEL COEFFICIENTS ARE EVALUATED FOR THE PARTICULAR SYSTEM. THE HYBRID COMPUTER IS VERY EFFICIENT FOR MODEL DEVELOPMENT, AND THE VERIFIED MODEL CAN BE READILY PROGRAMMED ON THE ALL-DIGITAL COMPUTER.

<GEO> BEAR RIVER BASIN

<CLAS> SIMULATION

<052>

<CON> HILLS, R. G.

<TITLE> TRANSIENT THREE DIMENSIONAL MODELING OF TEMPERATURE DISTRIBUTIONS IN RIVERS WITH AND WITHOUT THERMAL DISCHARGES

<ADDR> PURDUE UNIVERSITY, SCHOOL OF MECHANICAL ENGINEERING

<CITY> LAFAYETTE

<STATE> IN

<SOURCE> NTIS 95.75/AF42.25

<DOC> PB--240 527/53L, 1974

<ABST> AN ANALYTICAL MODEL WAS DEVELOPED FOR PREDICTING THE TRANSIENT THREE-DIMENSIONAL TEMPERATURE DISTRIBUTION IN A THERMALLY STRATIFIED CHANNEL SIMULATING A RIVER. THE EFFECTS OF THERMAL DISCHARGES AND VARIOUS METEOROLOGICAL CONDITIONS AND CHANNEL PARAMETERS ON THE THERMAL STRUCTURE IN WATER ARE ANALYZED AND DISCUSSED. THE MODEL CONSIDERS THE DIURNAL CYCLE IN WHICH THE INCOMING SOLAR AND ATMOSPHERIC RADIATION ARE FUNCTIONS OF

<452>

AQUATIC TRANSPORT

<452> CONT.

TIME. THE REFLECTION FROM THE AIR-WATER INTERFACE AND THE BOTTOM OF THE CHANNEL ARE ACCOUNTED FOR. SINCE THE INTERACTION OF SOLAR RADIATION WITH WATER IS NOT A SURFACE BUT A VOLUME PHENOMENON, INTERNAL ABSORPTION AND SCATTERING OF RADIATION ARE CONSIDERED AND THE VOLUMETRIC SOLAR HEATING IS DETERMINED. THE EFFECTS OF THERMAL STRATIFICATION ON TURBULENCE ARE INCLUDED IN THE MODEL. THE ANALYTICAL RESULTS INDICATE THAT IN RELATIVELY CLEAR RIVERS WITHOUT THERMAL DISCHARGES, THE RADIATION ABSORBED BY THE BOTTOM CAUSES A THERMAL INSTABILITY.

<CLAS> SIMULATION

<453>

<CONT> MOORE, T. E.; APOLDI, P. A.

<TITLE> COMPUTER MODEL OF CONNECTICUT RIVER POLLUTION

<ABST> THE OBJECT OF THE STUDY WAS TO ADAPT THE DELAWARE RIVER PROGRAM TO PRODUCE A COMPUTER MODEL OF THE CONNECTICUT RIVER WITHIN THE STATE OF CONNECTICUT. THIS MODEL WOULD MAKE USE OF THE BEST INFORMATION AVAILABLE DESCRIBING PHYSICAL CONDITIONS, SUCH AS FLOW VOLUMES AND SOUNDING DEPTHS, AS WELL AS THE LATEST POLLUTION DATA DESCRIBING DO, BOD, AND TEMPERATURE. SUCH A MODEL MADE IT POSSIBLE TO PREDICT THE EFFECT OF WASTEWATER INPUT, ARTIFICIAL AERATION, AND TEMPERATURE ON THE OVERALL WATER PURITY. EQUATIONS DESCRIBING AERATION, PHOTOSYNTHESIS, AND BACTERIAL DECAY WERE USED IN THE MODEL TO CALCULATE CHANGES IN DO AND BOD CONCENTRATIONS IN TIME. FOR MODEL CONSTRUCTION, THE RIVER WAS PARTITIONED ALONG ITS LENGTH INTO 39 SECTIONS, EACH OF WHICH WAS ASSUMED TO BE COMPLETELY MIXED WITH A UNIFORM CONCENTRATION OF DO AND BOD. THIS MADE IT POSSIBLE TO USE A SIMPLE ONE-DIMENSIONAL MATHEMATICAL MODEL SUITED IDEALLY TO DIGITAL COMPUTATION. THE PREDICTED DO AND BOD CONCENTRATIONS IN THE CONNECTICUT ARE REPRESENTED.

<GEO> CONNECTICUT RIVER; DELAWARE RIVER

<CLAS> SIMULATION

<454>

<CONT> MCULT, D. F.

<TITLE> OIL SPREADING ON THE SEA

<ADDR> MASSACHUSETTS INSTITUTE OF TECHNOLOGY

<CITY> CAMBRIDGE

<STATE> MA

<DOC> ANNUAL REVIEW FLUID MECHANICS, 4, 341-368, 1972

<ABST> NONE

<CLAS> SIMULATION

<455>

<CONT> HOFF, D. D.

<TITLE> SIMULATION OF THE HYDROLOGIC TRANSPORT OF RADIOACTIVE AEROSOLS

<ACRO> NTP

<ADDR> OAK RIDGE NATIONAL LABORATORY, BUILDING 1505, P.O. BOX 1

<CITY> OAK RIDGE

<STATE> TN

<ZIP> 37830

<PHONE> 30476

<SOURCE> UNIVERSITY MICROFILMS, ANN ARBOR, MI

<DOC> PH.D. THESIS, STANFORD UNIVERSITY, STANFORD, CA

<SUB> TRANSPORT OF RADIOISOTOPES IN ATMOSPHERIC FALLOUT

<ABST> DEALS WITH HYDROLOGICAL MODELS AS "CAPTURED" SYSTEMS AND SIMULATES MATERIAL FLOW THROUGH THE SYSTEM BY FOLLOWING THE TRANSPORT OF THE DISSOLVED OR SUSPENDED MATERIAL.

<GEO> NORTH-CENTRAL CALIFORNIA

<TIME> 1964-68

<STATUS> OUTDATED

<ACCESS> UNLIMITED

<MEDIA> TEXT

<SIZE> 5408 BYTES

<COMP> IBM

<LANG> PL 1

<CHAR> EBCDIC

<ALGO> DIFFERENCE EQUATIONS; ANALYTICAL SOLUTIONS TO DIFFERENTIAL EQUATIONS

<CLAS> MECHANISTIC; PART-STOCHASTIC; SIMULATION; PREDICTIVE

<APPL> EFFECT OF RADIOACTIVE FALLOUT ON RADIOISOTOPE CONCENTRATIONS IN NATURAL STREAMFLOWS

<USERS> NOT KNOWN

<SHD> WEATHER BUREAU CLIMATIC DATA; RESEARCH RESULTS ON CONCENTRATIONS OF SR 90 AND CS 137 IN RAINFALL, SOILS, AND STREAMFLOW

<IVAL> CALIBRATION FOLLOWED BY INDEPENDENT TESTING.

<UPDATE> 780624

<456>

<CONT> HUNDAL, R. S.; BARTIDEN, P.; NEWSON, E. B.; MCCLAY, R. W.

<TITLE> COMPUTER MODEL FOR PREDICTING THERMAL DISCHARGES IN LARGE LAKES

<ADDR> UNIVERSITY OF VERMONT

<CITY> BURLINGTON

<STATE> VT

AQUATIC TRANSIENT

<056> CONF.

<DOC> PROCEEDINGS OF THE FIFTEENTH CONFERENCE ON GREAT LAKES RESEARCH, ANN ARBOR, MICHIGAN, INTERNATIONAL ASSOCIATION FOR GREAT LAKES RESEARCH, 1972; CONF-720457--.

<ABST> GENERAL MATHEMATICAL MODELS FOR PREDICTING POWER PLANT THERMAL DISCHARGES IN LARGE LAKES ARE PRESENTED. THE MODELS SIMULATE THESE EFFECTS IN THREE REGIONS: AN OPEN CHANNEL CUTFALL, A MIXING ZONE CLOSE TO SHORE, AND A FLOATING PLUME AT A LARGE DISTANCE FROM SHORE. THE EFFECTS OF MASS AND ENERGY EXCHANGE WITH THE ENVIRONMENT ARE INCLUDED. THE MODELS ARE USED TO PREDICT THE EFFECTS OF THERMAL DISCHARGES FROM THE GINNA NUCLEAR POWER PLANT ON LAKE ONTARIO BY USING PUBLISHED METEOROLOGICAL AND LAKE DATA AND FIRST HAND INFORMATION ON POWER PLANT SIZE, ETC. THE TEMPERATURES AND FLOW VELOCITIES ARE COMPUTED FOR THE EXTREMES OF SUMMER AND WINTER; A DECREASE IN TEMPERATURE TO APPROXIMATELY 1 DEGREE C AT 1000 M IS SHOWN. THE RESULTS ARE SHOWN TO COMPARE FAVORABLY WITH ACTUAL TEMPERATURES REPORTED IN A PREVIOUS WORK. THE EFFECTS OF HYPOTHETICAL COOLING TOWERS AND COOLING PONDS ARE COMPUTED AND COMPARED WITH THE EXTREME SUMMER CASE. METEOROLOGICAL CHANGES CLOSE TO THE PLANT ARE PREDICTED FOR EXTREME CASES.

<CLASS> SIMULATION

<057>
<CONF> HUANG, C. L.; FAN, L. T.

<TITLE> MODELING AND OPTIMIZATION OF TRANSIENT COOLING WATER DISCHARGE FROM POWER GENERATING PLANTS, APPLICATIONS TO REGIONAL SITUATIONS

<ADDP> KANSAS WATER RESOURCES RESEARCH INSTITUTE

<CITY> MANHATTAN

<STATE> KS

<ZIP> 66506

<PHONE> 913-532-5606

<DOC> PPRPT NO. CONTRIB-150; CONTRACT DT-14-37-0001-0006; MONITORING AGENCY REPT. NO. W75-02000, OWRP-B-037-KAN(1); PRCJ. OWRP-B-037-KAN; AUG 74, 37 PP.

<ABST> THE PURPOSE WAS TO ESTABLISH A SCIENTIFICALLY SOUND GENERAL DESIGN PROCEDURE WHICH CAN BE USED FOR DETERMINING A COOLING WATER DISCHARGE POLICY FOR A POWER PLANT SO AS NOT TO LEAD TO DEGRADATION OF THE ENVIRONMENTAL QUALITY. THE RESEARCH WAS RESULTED IN A SERIES OF PUBLICATIONS. THEY CONTAIN THE RESULTS OF (1) WATER QUALITY MODELING AND ITS EXPERIMENTAL VERIFICATION FOR THE KANSAS RIVER, (2) OPTIMAL CONFIGURATION OF THE COOLING SYSTEM FOR POWER GENERATION, (3) OPTIMAL ARTIFICIAL AERATION SYSTEMS FOR WATER QUALITY CONTROL OF STREAM RECEIVING THERMAL AND ORGANIC WASTE DISCHARGES, (4) OPTIMAL BASIN-WIDE WATER QUALITY MANAGEMENT UNDER MINIMUM TREATMENT LEVEL REGULATIONS, AND (5) REGIONAL WATER

QUALITY MANAGEMENT THROUGH COORDINATION OF URBAN AND AGRICULTURAL POLLUTION CONTROL. THE SUMMARY OF SIGNIFICANT RESULTS OF ARTICLES ARE PRESENTED.

<ALGO> NONLINEAR PROGRAMMING, GREG

<CLASS> CONTINUOUS; DETERMINISTIC; ANALYTICAL; OPTIMIZATION

<059>
<CONF> ISAKSON, J. S.; STORIE, J. R.; VAGNER, J.; SPICKERSON, G. A.; RYDGER, J. P.

<TITLE> COMPARISON OF ECOLOGICAL IMPACTS OF POSTULATED OIL SPILLS AT SELECTED ALASKAN LOCATIONS

<ADDP> MATHEMATICAL SCIENCES NORTHWEST INC.

<CITY> BELLEVUE

<STATE> WA

<SOURCE> NTIS \$16.25/NT\$2.25

<DOC> AD-A017 600/MSL

<ABST> A RANKING OF POTENTIAL ENVIRONMENTAL IMPACT FOR SPILLS OF CRUDE OIL, DIESEL-2, BUNKER C, AND GASOLINE IN AMOUNTS RANGING FROM 100 TO 50,000 BARRELS WAS MADE FOR SPECIFIC SITES AT YAKUTAT BAY, VALDEZ HARBOR, VALDEZ HARBORS, DELTA RIVER CHANNEL, PORT GRAHAM, KANISHAK BAY, UNYAK PASS, PORT NOLLE, KIVICHAK BAY, ST. MATTHEW ISLAND, OFFSHORE PRODUCE, ONSHORE PRODUCE, BONT, CAPE BLOSSOM CHANNEL, COLVILLE RIVER, RIVER, THRON RIVER, AND DEWALT FAULT. SPILLS WERE ASSUMED TO DISPERSE FROM INERTIAL, VISCOUS, SURFACE TENSION, WIND AND CURRENT FORCES. MOST PROBABLE WIND AND CURRENT CONDITIONS WERE UTILIZED. SITES WERE CHARACTERIZED IN TERMS OF EIGHT SPECIES HABITATS. MOST PROBABLE CASES WERE EVALUATED. A RATING SYSTEM WAS DEVISED TO CHARACTERIZE THE IMPACT BASED UPON ESTIMATED SPECIES ABUNDANCE, IMPORTANCE OF SPECIES, AND THE IMPACT OF OIL ON SUCH SPECIES OVER THE SHORT AND LONG TERM. IMPACTS WERE ESTIMATED WITH THE USE OF THREE-DIMENSIONAL MATRICES. THE SAME FIVE LOCATIONS DOMINATED THE IMPACT RATINGS WHERE CONTAINMENT/CLEANUP WERE ASSUMED TO TAKE PLACE.

<059>
<CONF> JEGLIC, J. R.; PENCE, G. D.

<TITLE> MATHEMATICAL SIMULATION OF THE ESTUARINE BEHAVIOR AND ITS APPLICATIONS

<ADDP> GENERAL ELECTRIC COMPANY

<CITY> PHILADELPHIA

<STATE> PA

<DOC> SOC. ECON PLANNING SCI, 1(3), 363-389, 1968

<ABST> THE CAUSE AND EFFECT RELATIONSHIPS AS APPLIED TO IMPORTANT WATER QUALITY PARAMETERS WERE DESCRIBED. PRESENTED WERE THE STEPS IN THE DEVELOPMENT OF A MATHEMATICAL MODEL REPRESENTING THE DISPERSION AND ADVECTION OF DISSOLVED OXYGEN IN A ONE DIMENSIONAL TIDAL

ROUTINE TRANSECT

<459> TMC.

ENVIRONMENT, USING MASS BALANCES ON FINITE VOLUMES. THE GOAL OF THE STUDY WAS TO DEVELOP A PRACTICAL MEANS OF ESTIMATING THE CAUSE AND EFFECT RELATIONSHIP, SO THAT ACCURATE FORECASTS OF THE RESULTS OF PROPOSED CONTROL SYSTEMS COULD BE OBTAINED AND RECOMMENDATIONS COULD BE MADE THAT A CONTROL PROGRAM HAD A REASONABLE CHANCE OF SUCCESS. THE VERIFICATION OF THE MODEL WAS MADE USING A YEAR OF ACTUAL DATA ON THE DELAWARE ESTUARY. DURING THE 1965 DROUGHT THE SALT WATER INTRUSION IN THE DELAWARE WAS EXAMINED ON A THIRTY-DAY BASIS SO THAT CORRECTIVE MEASURES COULD BE TAKEN. THE MATHEMATICAL MODEL PRESENTED PROVED TO BE A VALUABLE TOOL IN THE ANALYSIS OF ESTUARINE BEHAVIOR.

<CLAS> SIMULATION

<461>

<CONT> JENSEN, R. A.

<TITLE> COMPUTER SIMULATION OF SURFACE WATER HYDROLOGY AND SALINITY WITH AN APPLICATION TO STUDIES OF COLORADO RIVER MANAGEMENT

<ADDR> CALIFORNIA INSTITUTE OF TECHNOLOGY

<CITY> PASADENA

<STATE> CA

<ABST> MANAGEMENT OF A LARGE RIVER BASIN REQUIRES INFORMATION REGARDING THE INTERACTIONS OF VARIABLES DESCRIBING THE SYSTEM. A METHOD HAS BEEN DEVELOPED TO DETERMINE THESE INTERACTIONS SO THAT THE RESOURCES MANAGEMENT WITHIN A GIVEN RIVER BASIN CAN PROCEED IN AN OPTIMAL WAY. THE METHOD CAN BE USED AS A PLANNING TOOL TO DISPLAY HOW DIFFERENT MANAGEMENT ALTERNATIVES AFFECT THE BEHAVIOR OF THE RIVER SYSTEM. DIRECT APPLICATION IS MADE TO THE COLORADO RIVER BASIN. A COMPUTER SIMULATION MODEL WAS DEVELOPED AND USED TO SIMULATE THE EFFECTS OF VARIOUS MANAGEMENT ALTERNATIVES UPON WATER CONSERVATION, WATER QUALITY, AND HYDROELECTRIC POWER PRODUCTION. THE MODEL GENERATES SYNTHETIC SEQUENCES OF STREAMFLOWS AND TOTAL DISSOLVED SOLIDS (TDS) CONCENTRATIONS. THE FLOWS OF WATER AND TDS ARE THEN ROUTED THROUGH THE MAJOR RESERVOIRS OF THE SYSTEM, LAKES POWELL AND MEAD.

<GEN> COLORADO RIVER BASIN

<CLAS> SIMULATION

<461>

<CONT> JIRKA, G. R.; WOOD, D. W.; HABLEMAN, DONALD E. F.

<TITLE> TRANSIENT HEAT RELEASES FROM OFFSHORE NUCLEAR PLANTS

<ADDR> MASSACHUSETTS INSTITUTE OF TECHNOLOGY

<CITY> CAMBRIDGE

<STATE> MA

<DOC> JOURNAL OF THE HYDRAULICS DIVISION, PROCEEDINGS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS, 103(2), 151-168, 1977

<ABST>

A SYNERGICAL PREDICTIVE MODEL FOR PLANTS FLOATING IN SEMI-ENCLOSED BREAKWATER BASINS HAS BEEN DEVELOPED. THE MODEL STRUCTURE IS PROVIDED BY THE SIGNIFICANT VERTICAL STRATIFICATION WHICH OCCURS WITHIN THE BREAKWATER BASIN DURING HEAT RELEASES. AUXILIARY DYNAMIC EQUATIONS ARE FORMULATED FOR THE PROCESSES OF JET IMPINGEMENT AT THE DISCHARGE, STRATIFIED FLOW THROUGH THE BREAKWATER OPENINGS, SELECTIVE WITHDRAWAL AT THE SUBMERGED INTAKES AND HEAT DISSIPATION TO THE ATMOSPHERE. MODEL PREDICTIONS HAVE BEEN COMPARED WITH THE RESULTS OF EXPERIMENTS SIMULATING CONSTANT HEAT RELEASES, TRANSIENT HEAT RELEASES AND VARIABLE TIDAL CONDITIONS, RESPECTIVELY, AND SATISFACTORY AGREEMENT HAS BEEN FOUND. THE PREDICTIVE MODEL HAS BEEN USED TO EVALUATE PLANT AND BREAKWATER DESIGN OPTIONS FOR A PROPOSED FLOATING NUCLEAR PLANT, THE ATLANTIC GENERATING STATION. THE PREDICTIONS DEMONSTRATE THE IMPORTANCE OF THE STRATIFIED FLOW THROUGH THE BREAKWATER OPENINGS AS THE DOMINANT ULTIMATE HEAT SINK MECHANISM, WITH SURFACE HEAT DISSIPATION PLAYING A SECONDARY ROLE.

<CLAS> SIMULATION

<CON> 14 REFERENCES

<462>

<CONT> KEEN, R.

<TITLE> A SURVEY OF DISPERSION COEFFICIENTS FOR ESTIMATING POLLUTANT TRANSPORT

<ADDR> GROOMAN AEROSPACE CORPORATION, RESEARCH DEPARTMENT

<CITY> BETHPAGE

<STATE> NY

<DOC> REPORT NO. BR-562; MONITORING AGENCY REPT. NO. 19 DECEMBER 1972, 40 PP.

<ABST> THE FATE OF POLLUTANTS DISCHARGED INTO ANY BODY OF WATER REPRESENTS ONE OF TODAY'S MOST PRESSING PROBLEMS. ONCE DISCHARGED, THESE POLLUTANTS ARE DISTRIBUTED PRIMARILY BY ADVECTION AND TURBULENT DIFFUSION. TO ESTIMATE THE MAGNITUDE OF THIS LATTER MECHANISM, A DETERMINATION OF A TERM KNOWN AS THE TURBULENT DISPERSION COEFFICIENT IS NECESSARY. THIS MEMORANDUM REPRESENTS A SURVEY OF SOME OF THE MORE RECENT ATTEMPTS (THROUGH MID-1971) MADE TO DEFINE THIS COEFFICIENT FOR COASTAL REGIONS, RIVERS, AND ESTUARIES.

<CLAS> PREDICTIVE

<463>

<CONT> KHALEEL, B.; REDDELL, D. L.

<TITLE> SIMULATION OF POLLUTANT MOVEMENT IN GROUNDWATER AQUIFERS

<ADDR> TEXAS A AND M UNIVERSITY, WATER RESOURCES INSTITUTE

<CITY> COLLEGE STATION

<STATE> TX

GROUNDWATER TRANSPORT

<467> CONF.
<DOC> PB--269835, 1977

<ABST> A THREE-DIMENSIONAL MODEL DESCRIBING THE TWO-PHASE (AIR-WATER) FLUID FLOW EQUATIONS IN AN INTEGRATED SATURATED-UNSATURATED POROUS MEDIUM WAS DEVELOPED. ALSO, A THREE-DIMENSIONAL CONVECTIVE-DISPERSION EQUATION DESCRIBING THE MOVEMENT OF A CONSERVATIVE, NON-INTERACTING TRACER IN A HOMOGENEOUS, ANISOTROPIC POROUS MEDIUM WAS DEVELOPED. FINITE DIFFERENCE FORMS OF THESE TWO EQUATIONS WERE SOLVED USING AN IMPLICIT SCHEME TO SOLVE FOR WATER OR AIR PRESSURES, AN EXPLICIT SCHEME TO SOLVE FOR WATER AND AIR SATURATIONS, AND THE METHOD OF CHARACTERISTICS WITH A NUMERICAL TENSOR TRANSFORMATION TO SOLVE THE CONVECTIVE-DISPERSION EQUATIONS. THE INCLUSION OF AIR AS A SECOND FLUID PHASE CAUSED THE INFILTRATION RATE TO DECREASE RAPIDLY TO A VALUE WELL BELOW THE SATURATED HYDRAULIC CONDUCTIVITY WHEN THE AIR BECAME COMPRESSED. THIS IS IN CONTRAST TO ONE-PHASE FLUID FLOW PROBLEMS IN WHICH THE SATURATED HYDRAULIC CONDUCTIVITY IS CONSIDERED TO BE THE LOWER BOUND FOR THE INFILTRATION RATE. A TYPICAL TWO-DIMENSIONAL DRAINAGE PROBLEM IN AGRICULTURE WAS SOLVED IN A NON-HOMOGENEOUS, INTEGRATED SATURATED-UNSATURATED MEDIUM USING THE TOTAL SIMULATOR OF FLUID FLOW AND CONVECTIVE-DISPERSION EQUATIONS. A VARIETY OF OUTPUTS, SUCH AS AN EQUIPOTENTIAL MAP OR A SOLUTE CONCENTRATION MAP, WERE OBTAINED AT SELECTED TIME STEPS. A FIELD-SIZE PROBLEM DESCRIBING THE MIGRATION OF SEPTIC-TANK WASTES AROUND THE PERIMETER OF A LAKE WAS ALSO CONSIDERED AND SOLVED USING THE TOTAL SIMULATOR.

<468>
<CONF> KLEINECKE, DAVID
<TITLE> PREPARATION, VERIFICATION AND USE OF A DIGITAL GROUNDWATER SIMULATION PROGRAM
<ACRO> TELNA I; TELNA II
<ABST> THE DIGITAL COMPUTER PROGRAMS, TELNA I AND TELNA II, WRITTEN AT GENERAL ELECTRIC-TELNO FOR THE SIMULATION OF GROUNDWATER BASINS ARE DESCRIBED. EXPERIENCE IN ATTEMPTING TO VERIFY THE GROUNDWATER FLOW IN AN ACTUAL BASIN USING TELNA IS PRESENTED. IT WAS CAPABLE OF SIMULATING GROUNDWATER FLOW IN BASINS BY USING AN APPROPRIATE MODEL OF THE BASIN AS INPUT DATA. THE INPUT CORRESPONDED TO THE NETWORK OF RESISTORS AND CAPACITORS WHICH REPRESENT THE BASIN CHARACTERISTICS. THE WATER LEVEL IN THE BASIN CORRESPONDED TO THE VOLTAGE LEVEL IN THE ANALOG-IN TELNA WATER LEVEL WAS A SIMPLE DATA ARRAY. AVAILABLE DATA--BOTH GEOMORPHOLOGICAL AND CONCERNING HISTORIC RECHARGE AND PRODUCTION--WAS SUPPLEMENTED MOST EFFECTIVELY BY USE OF A SIMULATION MODEL TO GUIDE THE COLLECTION OF NEW INFORMATION. EXISTING DATA WAS MORE MEANINGFULLY AND ECONOMICALLY UTILIZED BY THE INTRODUCTION OF MATHEMATICAL OPTIMIZATION TECHNIQUES AS AN AID IN MODEL BUILDING. EXTENSIVE USE OF DIGITAL COMPUTATION IN THE PREPARATION OF MODELS IS ASSURED.

<CLAS> SIMULATION; OPTIMIZATION

<465>
<CONF> KLEINECKE, DAVID

<TITLE> MATHEMATICAL MODELING OF FRESHWATER AQUIFERS HAVING SALTWATER BOTTOMS

<ABST> A METHOD IS DESCRIBED FOR MODELING THE FLOW AND SALINITY OF WATER IN AN AQUIFER WHICH HAS A FRESH WATER LENS OVERLYING SALTWATER. DISPERSION OF SALTS ACROSS THE INTERFACE IS TAKEN INTO ACCOUNT. THE FLOW MODEL IS FOR GENERAL TWO-DIMENSIONAL HORIZONTAL FLOW IN AN AQUIFER WHICH CAN BE EITHER CONFINED OR UNCONFINED AT EACH HORIZONTAL LOCATION AND CAN CHANGE CHARACTER AS THE WATER LEVEL CHANGES. SOME PRELIMINARY CALCULATIONS ARE DESCRIBED. A BIBLIOGRAPHY OF THE LITERATURE ON FRESHWATER-SALTWATER CONFINED FLOWS IS INCLUDED AS AN APPENDIX.

<CLAS> SIMULATION

<466>
<CONF> KON, C. Y.; PAN, LON-SIEN

<TITLE> MATHEMATICAL MODELS FOR THE PREDICTION OF TEMPERATURE DISTRIBUTIONS RESULTING FROM THE DISCHARGE OF HEATED WATER INTO LARGE BODIES OF WATER

<ACRO> TETRA TECH INC.

<CITY> PASADENA

<STATE> CA

<DOC> WATER POLLUTION CONTROL RESEARCH SERIES 16130 DWO 10/70, 1970

<ABST> MATHEMATICAL MODELS FOR HEATED WATER OUTFALLS WERE DEVELOPED FOR THREE FLOW REGIONS. NEAR THE SOURCE, THE SUBSURFACE DISCHARGE INTO A STRATIFIED AMBIENT WATER ISSUING FROM A ROW OF BUOYANT JETS WAS SOLVED WITH THE JET INTERFERENCE INCLUDED IN THE ANALYSIS. THE ANALYSIS OF THE FLOW ZONE CLOSE TO AND AT INTERMEDIATE DISTANCES FROM A SURFACE BUOYANT JET WAS DEVELOPED FOR THE TWO-DIMENSIONAL AND AXISYMMETRIC CASES. FAR AWAY FROM THE SOURCE, A PASSIVE DISPERSION MODEL WAS SOLVED FOR A TWO-DIMENSIONAL SITUATION TAKING INTO CONSIDERATION THE EFFECTS OF SHEAR CURRENT AND VERTICAL CHANGES IN DIFFUSIVITY. A SIGNIFICANT RESULT FROM THE SURFACE BUOYANT JET ANALYSIS IS THE ABILITY TO PREDICT THE ONSET AND LOCATION OF AN INTERNAL HYDRAULIC JUMP. PREDICTION CAN BE MADE SIMPLY FROM THE KNOWLEDGE OF THE SOURCE FROUDE NUMBER AND A DIMENSIONLESS SURFACE EXCHANGE COEFFICIENT. PARAMETRIC COMPUTER PROGRAMS OF THE MODELS ARE ALSO DEVELOPED.

<CLAS> PREDICTIVE

<467>
<CONF> KOLESAR D. C.

<TITLE> NUMERICAL COMPUTATION OF WASTE-HEAT DISPERSION IN A RECEIVING WATER BODY

AQUATIC TRANSPORT

<467> CONT.

<ORIG> WESTINGHOUSE HAWFORD COMPANY

<CITY> BETHLEHEM

<STATE> PA

<DOC> TRANSACTIONS AMERICAN NUCLEAR SOCIETY, 15(2), 651-652; CONF-721109.

<CLASS> PREDICTIVE

<468>

<ORIG> FORNBERG, G. P.

<TITLE> PREDICTING REAERATION COEFFICIENTS FOR A POLLUTED ESTUARY

<DOC> JOURNAL OF ENVIRONMENTAL ENGINEERING, DIV. PROC. ASCE, 1974

<ABST> THE OBJECTIVE OF THIS STUDY WAS TO DETERMINE IF REAERATION RATE COEFFICIENTS IN POLLUTED ESTUARIES COULD BE PREDICTED FROM EQUATIONS THAT PREDICT THESE COEFFICIENTS IN NATURAL STREAMS. MANY OF THE CURRENTLY AVAILABLE EQUATIONS RELATING K_2 WITH THE PHYSICAL AND HYDRODYNAMIC CHARACTERISTICS OF THE WATERWAY WERE LISTED ALONG WITH SOME OF THE CONDITIONS UNDER WHICH THEY WERE DERIVED OR DETERMINED. A REVIEW OF THE EFFECTS OF WIND, TEMPERATURE, AND SURFACE ACTIVE AGENTS ON REAERATION WERE PRESENTED. A NUMBER OF THE GIVEN EQUATIONS WERE APPLIED TO THE HOUSTON SHIP CHANNEL IN AN ATTEMPT TO PREDICT K_2 . IT WAS FOUND THAT THE PREDICTED K_2 WAS USUALLY LESS THAN 1/100 OF THE MEASURED K_2 AS DETERMINED IN PRELIMINARY MEASUREMENTS. IT WAS CONCLUDED THAT NONE OF THESE EQUATIONS ARE APPLICABLE TO THE UPPER HOUSTON SHIP CHANNEL AREA.

<ORIG> TEXAS, HOUSTON SHIP CHANNEL

<CLASS> PREDICTIVE

<469>

<ORIG> KPOL, WASH 9.

<TITLE> THE NUMERICAL SOLUTION OF PARABOLIC EQUATIONS APPLIED TO 'EDDY DIFFUSION' IN THE OCEAN

<ABST> THE PAPER DESCRIBES THE MAIN FEATURES OF THE NUMERICAL SOLUTION OF PARABOLIC PARTIAL DIFFERENTIAL EQUATIONS WITH PARTICULAR APPLICATION TO THE 'EDDY HEAT CONDUCTION' PROBLEM IN THE OCEAN. AS AN EXAMPLE, SOME DIRECT CALCULATIONS ARE MADE OF THE 'EDDY HEAT CONDUCTION' COEFFICIENT FROM THE DATA OF RELOCED 60 UNDER THE ASSUMPTION THAT THERE WERE NO HORIZONTAL GRADIENTS. ALTHOUGH THE ASSUMPTION DOES NOT IN GENERAL HOLD IT SERVES TO PROVIDE A SIMPLIFIED BUT PLausible MODEL TO ILLUSTRATE THE NUMERICAL TECHNIQUES. A RESTRICTED DISCUSSION OF THE RESULTS IS GIVEN. (AUTHOR)

<CLASS> PREDICTIVE

<470>

<ORIG> KURLMAN, J. N.; PRANL, J. N.

<TITLE> MOVANT RECTANGULAR SURFACE THERMAL PLUMES

<ORIG> OLD DOMINION UNIVERSITY

<CITY> NORFOLK

<STATE> VA

<DOC> JOURNAL GREAT LAKES RESEARCH, 2(2), 2340-356, 1976

<ABST> A NEAR-FIELD INTEGRAL MODEL OF A MOVANT SURFACE THERMAL PLUME ENTERING A CROSSFLOW IS DEVELOPED WHICH INCLUDES THE EFFECTS OF BUOYANCY THROUGH THE EMPIRICAL ASSUMPTION THAT THE SLOPE OF THE PLUME THERMOCLINE IS PROPORTIONAL TO THE LOCAL PLUME DEPTH TIMES THE LOCAL PLUME EXCESS TEMPERATURE AND INVERSELY PROPORTIONAL TO THE INITIAL PLUME INTERNAL FROUDE NUMBER, $FR_{SUB} 0$. THE MODEL IS COMPARED WITH LABORATORY DATA TAKEN BY KURLMAN AND PRANL (1974), AND FIELD DATA TAKEN BY PRIGO AND PRYE (1972). DATA GENERALLY BEAR WELL WITH THE MODEL USING SINGLE VALUES OF THE EMPIRICAL CONSTANTS IN THE THEORY, VARYING ONLY THE INITIAL INTERNAL FROUDE NUMBER $FR_{SUB} 0$, AND THE CROSSFLOW-TO-INITIAL-PLUME-VELOCITY RATIO, R , TO MATCH THE DATA VALUES. MATCHING IS ACHIEVED FOR DISTANCES ALONG THE PLUME CENTER LINE OF APPROXIMATELY 20 INITIAL PLUME WIDTHS FOR THE LABORATORY DATA AND 50 WIDTHS FOR THE FIELD DATA.

<CLASS> SIMULATION

<471>

<ORIG> LAIHOFF, S. N.; WACHAP, N.

<TITLE> OCEANIC DIFFUSION OF A SEVERE ACCIDENTAL RADIOACTIVE RELEASE FROM A SUBSEA NUCLEAR POWER PLANT

<ORIG> OFFSHORE POWER SYSTEMS

<CITY> JACKSONVILLE

<STATE> FL

<DOC> ENERGY (OXFORD), 2(2), 179-188, 1977

<ABST> SEALED SITING OF NUCLEAR POWER PLANTS COULD REDUCE SIGNIFICANTLY THE SAFETY PROBLEM POSED BY THE SEVEREST ACCIDENT, CORE MELT FOLLOWED BY CONTAINMENT BREACH, IN WHICH A CONSIDERABLE PORTION OF THE RADIOACTIVE INVENTORY IS RAPIDLY RELEASED TO THE ENVIRONMENT. AT 80 FATHOMS DEPTH, IN ADDITION TO A POSSIBLE SIZEABLE REDUCTION OF ACCIDENT PROBABILITIES, THE ACCIDENT CONSEQUENCES TO HUMAN LIFE ARE LIKELY TO BE GREATLY REDUCED BECAUSE THE MOST DANGEROUS COMPONENTS OF THE RADIOACTIVE CLOUD FROM A LAND-BASED SITE WILL BE DISSOLVED FOR THE SEALED SITE. THE PAPER DEALS SPECIFICALLY WITH THE OCEANIC DIFFUSION OF DISSOLVED RADIOACTIVES FOLLOWING A SEVERE ACCIDENT (THE SPECIFICATIONS FOR THE REFERENCE ACCIDENT PWR-2 OF WASH-1400 ARE TAKEN) AT A SITE CHOSEN OFF THE COAST OF SAN DIEGO, CALIFORNIA.

<ORIG> CALIFORNIA, SAN DIEGO

<CLASS> SIMULATION

AQUATIC TRANSECT

<072>
<CON> LARSEN, D. P.; HEDGECOCK, R. T.

<TITLE> SHAGANA LAKE RECOVERY CHARACTERISTICS AS DEPICTED BY PREDICTIVE MODELING

<ADDR> ENVIRONMENTAL PROTECTION AGENCY, CORVALLIS ENVIRONMENTAL RESEARCH LABORATORY

<CITY> CORVALLIS

<STATE> OR

<DOC> EPA--600/3-76-079, 1976; ANNUAL MEETING OF THE ECOLOGICAL SOCIETY OF AMERICA WITH THE AMERICAN INSTITUTE OF BIOLOGICAL SCIENCES, HELD IN CORVALLIS, OREGON, AUGUST 17, 1975

<ABST> PREDICTIONS OBTAINED USING SEVERAL MASS BALANCE MODELS DESCRIBING CHANGES EXPECTED IN LAKE PHOSPHORUS CONCENTRATIONS RESULTING FROM AN EXTERNAL PHOSPHORUS SUPPLY REDUCTION TO SHAGANA LAKE WERE COMPARED WITH OBSERVATIONS. TWO OF THE MODELS PREDICTED A RAPID RECOVERY OF THE LAKE ARE UNDERESTIMATED PRESENT WINTER-TIME PHOSPHORUS CONCENTRATIONS BY ABOUT 50%. A THIRD MODEL WHICH INCLUDES AN ALGAL BIOMASS COMPONENT PROJECTED SIMILAR WINTER-TIME TOTAL PHOSPHORUS CONCENTRATIONS BUT SHOWED HOW INTERNAL SOURCES OF PHOSPHORUS CAN DELAY THE ATTAINMENT OF THIS LEVEL. TWO OF THESE MODELS WERE USED TO PROJECT LAKE PHOSPHORUS CONCENTRATIONS EXPECTED IF WASTEWATER PHOSPHORUS CONCENTRATIONS WERE ALLOWED TO INCREASE FROM THE PRESENT 50 MICRO G/L TO 400 MICRO G/L AND 1.0 MG/L. BOTH SUGGEST THAT AT EFFLUENT CONCENTRATIONS OF 1.0 MG/L, THE LAKE WOULD EXHIBIT PHOSPHORUS CONCENTRATIONS OFTEN ASSOCIATED WITH A EUTROPHIC STATE.

<CLASS> PREDICTIVE

<073>
<CON> LARSEN, PETER A.; LAUTZ, CLIFFORD R.

<TITLE> BOUYANT JET DISCHARGE MODEL, SEABROOK NUCLEAR STATION

<ADDR> ALLEN RESEARCH LABORATORIES

<CITY> HOVIDEN

<STATE> WA

<DOC> HOVIDEN, WA, FOR EDASCO SERVICES, INC., AUGUST 1969. APPENDIX J, SEABROOK STATION ENVIRONMENTAL REPORT, PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE, JUNE 1973. 67 PP.

<ABST> THE APPENDIX DESCRIBES A HYDRAULIC MODEL SUITABLE FOR STUDYING THE BOUYANT JET DISCHARGE FROM THE PROPOSED SEABROOK STATION FACILITY. THE MODEL WAS DESIGNED TO ACCURATELY REPRODUCE PROTOTYPE OPERATION AND FIELD CONDITIONS. THE RESULTS OF MODEL DATA WERE COLLECTED FOR A HORIZONTAL DISCHARGE FROM A 9.5-FOOT PIPE WITH 30 FT. OF SUBMERGENCE AT NORMAL FLOW RATES (600 AND 900 CFS) AND A TEMPERATURE RISE OF 30 AND 47°F, RESPECTIVELY. DATA WAS ANALYZED TO DETERMINE THE DILUTION OF THE DISCHARGE JET (CONSIDERING BOTH THE VELOCITIES AND THE TEMPERATURE RISE), DISTURBANCES AT THE POINT OF JET FLOW AT THE WATER SURFACE, "FLOW AWAY" VELOCITIES AND TEMPERATURES, AND BOTTOM SCOUR ALONG THE CENTERLINE OF THE DISCHARGE. ONE TABLE, 8 PHOTOGRAPHS, AND 20 FIGURES ARE INCLUDED.

<CITY> NEW HAMPSHIRE, SEABROOK NUCLEAR STATION

<CLASS> SIMULATION

<074>
<CON> LEAF, C. F.; ALEXANDER, P. R.

<TITLE> SIMULATING TIMBER YIELDS AND HYDROLOGIC IMPACTS RESULTING FROM TIMBER HARVEST ON SUBALPINE WATERSHEDS

<ADDR> U.S. DEPARTMENT OF AGRICULTURE, FOREST SERVICE, ROCKY MOUNTAIN FOREST AND RANGE EXPERIMENT STATION

<CITY> FORT COLLINS

<STATE> CO

<SOURCE> PSN LIB.

<DOC> USDA FOREST SERVICE. RESEARCH PAPER RM-133, 62 PP. 1975

<ABST> A DYNAMIC SIMULATION MODEL WHICH HAS BEEN SPECIFICALLY DESIGNED TO DETERMINE THE HYDROLOGIC CHANGES RESULTING FROM TIMBER HARVESTING AND COMPELARY MODELS WHICH SIMULATE TIMBER YIELDS ARE DESCRIBED. EMPHASIS IS PLACED ON THE PLANNING UNIT WHICH IS DEFINED BY ENVIRONMENTAL CHARACTERISTICS, INCLUDING COMBINATIONS OF SLOPE, ASPECT, ELEVATION, AND FOREST COVER. THE MODELS ARE INTENDED FOR USE ON SUBALPINE WATERSHEDS WHERE THE PRIMARY SOURCE OF STREAMFLOW IS FROM MELTING SNOW. THE HYDROLOGIC MODEL SIMULATES WINTER SNOW ACCUMULATION, THE SHORT- AND LONGWAVE RADIATION BALANCE, SNOWPACK CONDITION, SNOWMELT, AND SUBSEQUENT RUNOFF IN TIME AND SPACE. THE TIMBER MODELS SIMULATE PROJECTED TIMBER YIELDS IN RESPONSE TO CHANGES IN CULTURAL TREATMENTS AND/OR VARIATIONS IN ORIGINAL STAND AND SITE CONDITIONS. THE MODELS HAVE BEEN USED TO SIMULATE THE EFFECTS OF FOREST AND WATERSHED MANAGEMENT ON SEVERAL REPRESENTATIVE DRAINAGE BASINS IN THE ROCKY MOUNTAIN REGION OF THE UNITED STATES. PROJECTED HYDROLOGIC CHANGES AND GROWTH AND YIELD SUBSEQUENT TO TIMBER HARVESTING IN LODGEPOLE PINE AND SPRUCE-FIR ARE DESCRIBED.

<CLASS> SIMULATION

<CON> 16 REP.

<075>
<CON> LEE, SAMUEL S.

<TITLE> THREE-DIMENSIONAL NUMERICAL MODELS FOR THE PREDICTION OF THERMAL DISCHARGES

<ADDR> BASUN-I; BASUN-II

<ADDR> UNIVERSITY OF MIAMI, SCHOOL OF ENGINEERING, 208296

<CITY> COPAL GABLES

<STATE> FL

<875>

AQUATIC TRANSPORT

<875> CONT.

<REF> 33126

<FROM> 911-200-2004

<DOC> THREE-DIMENSIONAL THERMAL POLLUTION MODELS, VOL. I & II & III, PREPARED FOR NASA UNDER CONTRACT NAS10-8926

<SUB> POWER PLANT DISCHARGES

<ABST> PREDICTS 3-DIMENSIONAL VELOCITY AND TEMPERATURE FIELDS WITH WIND, CURRENT, SURFACE HEAT TRANSFER AND BOTTOM TOPOGRAPHY TAKEN INTO CONSIDERATION.

<GEO> SOUTH DISCAYNE BAY, FLORIDA; LAKE PLELES, NORTH CAROLINA

<TIME> 1973-1976

<STATUS> IN USE

<ACCESS> LIMITED

<MEDIA> MAGNETIC TAPE; DISC

<SIZE> OVER SIZE

<COMP> NBI

<CONFIG> TRIVAC-1126 WITH 70 K CORE AND TWO 9 TRACK TAPE DRIVES.

<LANG> FORTRAN IV

<ALGO> FINITE DIFFERENCE SCHEME FOR CONTINUITY, MOMENTUM, AND HEAT ENERGY EQUATIONS.

<CLASS> PREDICTIVE

<APPL> PCB PREDICTION OF THE SIZE OF THE THERMAL PLUMES.

<USERS> DUKE POWER COMPANY, NORTH CAROLINA

<SRD> REMOTELY SENSED DATA

<VAL> COMPARISON WITH REMOTELY SENSED DATA.

<UPDATED> 780815

<876>

<CONT> LEENDEPSE, J. J.

<TITLE> WATER-QUALITY SIMULATION MODEL FOR WELL-MIXED ESTUARIES AND COASTAL SEAS

<ADDR> RAND CORPORATION

<CITY> SANTA MONICA

<STATE> CA

<DOC> DR--6230-BC, 1970

<ABST> NONE

<CLASS> SIMULATION

<877>

<CONT> LEENDEPSE, J. J.

<TITLE> NUMERICAL SIMULATION OF WATER QUALITY IN COASTAL WATERS AND ESTUARIES

<ADDR> RAND CORPORATION

<CITY> SANTA MONICA

<STATE> CA

<DOC> DR-6230-BC, 1970

<ABST> ASSESSMENT OF THE INFLUENCE OF WASTE DISCHARGES IN ESTUARIES IS NECESSARY FOR WATER QUALITY MANAGEMENT IN THESE WATERS. THE MODEL DESCRIBED HERE WAS DEVELOPED FOR WELL-MIXED ESTUARIES AND COASTAL SEAS IN WHICH SALINITY DISTRIBUTIONS AT ANY POINT ARE UNIFORM OVER THE VERTICAL. WELL-MIXED REGIONS GENERALLY OCCUR WHEN CONSIDERABLE TIDAL FLOW EXISTS TOGETHER WITH A LIMITED FLOW OF FRESH WATER. THE DISPERSION OF THE FLUID WASTE IS CAUSED MAINLY BY THE TIDAL FLOW, AND CONSEQUENTLY A MODEL WAS DEVELOPED FOR COMPUTATION OF THE FLOW AND TIME-VARYING WATER LEVELS IN THE REGION WHICH IS CONSIDERED. BECAUSE THE TIDE STAGE INFLUENCES THE LOCATION OF THE WATER'S EDGE IN THE TIDAL FLATS, WHICH IN TURN AFFECTS THE SURFACE AREA OF THE ESTUARY AND THE CROSS SECTIONS TO A CONSIDERABLE EXTENT, THESE FUNCTIONAL RELATIONSHIPS WERE ALSO INCLUDED IN THE MODEL. THE DIFFERENT CONSTITUENTS OF THE FLUID WASTE CAN REACT WITH EACH OTHER OR WITH NATURAL SUBSTANCES IN THE WATER; THUS A REACTION MODEL IS INCLUDED. THE WASTE TEMPERATURE AND SOLAR RADIATION INFLUENCE THE REACTION RATES, WHILE THE EXCHANGE OF GASES AT THE WATER SURFACE DEPENDS ON WIND AND WAVES. THE FUNCTIONAL RELATIONSHIPS ARE NOT KNOWN EXACTLY AND MUST BE FOUND FROM THE ADJUSTMENT OF THE MODEL USING FIELD MEASUREMENTS. THE MAIN FEATURES OF THE SIMULATION ARE SHOWN IN FIG. 1. THE MODEL IS NOW BEING EVALUATED AND ADJUSTED FOR CONDITIONS IN JAMAICA BAY UNDER CONTRACT WITH THE CITY OF NEW YORK.

<GEO> NEW YORK, JAMAICA BAY

<CLASS> SIMULATION

<878>

<CONT> LERNAN, A.

<TITLE> SR-90 IN THE GREAT LAKES: CONCENTRATION-TIME MODEL

<ADDR> NORTHWESTERN UNIVERSITY

<CITY> EVANSTON

<STATE> IL

<DOC> JOURNAL GEOPHYSICAL RESEARCH, 77(18), 3256-3260, 1972

<ABST> CONCENTRATION-TIME MODELS FOR SR-90 IN THE GREAT LAKES DEAL WITH TRANSIENT CONCENTRATIONS OF A RADIOISOTOPE IN A CHAIN OF MIXED LAKES AND IN A CHAIN OF PERIODICALLY STRATIFIED LAKES. IN THE MODEL, THE LAKES RECEIVE TIME-DEPENDENT INPUT OF SR-90 FROM ATMOSPHERE AND LAND (0 TO 10% OF ANNUAL DEPOSIT IN THE LAND DRAINAGE BASINS). REMOVAL OF SR-90 FROM LAKE WATER IS BY OUTFLOW AND DECAY. IN THE FIVE GREAT LAKES COMPUTED CONCENTRATIONS OF SR-90 RISE FROM NIL (ASSUMED) IN 1953 TO A MAXIMUM IN 1960 TO 1965, FOLLOWED BY A GRADUAL DECLINE UNTIL 1969. COMPUTED CONCENTRATIONS ARE COMPARABLE TO THE RANGE OF REPORTED VALUES. HOWEVER, A CLOSER AGREEMENT BETWEEN THE MODEL AND REPORTED CONCENTRATIONS REQUIRES THE

AQUATIC TRANSPORT

<479> CONT.

RATES OF INPUT IN 1962 TO 1966 TO BE HIGHER THAN THE MEAN, AS WELL AS THE RATES OF REMOVAL TO BE FASTER (BY 4 TO 8%) THAN THE REMOVAL BY DECAY AND MEAN OUTFLOW. SEASONAL STRATIFICATION OF THE LAKES HAS VIRTUALLY NO EFFECT ON MEAN ANNUAL CONCENTRATIONS OF SP-90.

<CLASS> SIMULATION

<480>

<CONT> LEFMAN, A.; LISTEN, T. A.

<TITLE> UPTAKE AND MIGRATION OF TRACERS IN LAKE SUPERIOR

<ACRO> NORTHWESTERN UNIVERSITY

<CITY> EVANSTON

<STATE> IL

<DOC> LIMNOLOGY AND OCEANOGRAPHY, 27(4), 497-510

<ABST> MATHEMATICAL SOLUTIONS ARE GIVEN FOR AN EQUATION DESCRIBING "TRANSIENT" AND STEADY STATE CONCENTRATIONS IN LAKE WATER AND SEDIMENTS, IN THE PRESENCE OF ADSORPTION, DECAY, SEDIMENTATION, AND DIFFUSION. THE RESULTS OF THE MODEL ARE COMPARED WITH THE DISTRIBUTIONS OF TWO TRACERS, SP-90 AND CS-137, IN THE SEDIMENTS OF LAKES ERIE AND ONTARIO. ADSORPTION OF THE TWO TRACERS BY SEDIMENT PARTICLES, SUPPORTED BY EXPERIMENTAL DATA, CAN BE TREATED AS A LINEAR EXCHANGE REACTION. SP-90 IS ADSORBED LESS STRONGLY THAN CS-137 BY SEDIMENTS, AND THIS FEATURE ACCOUNTS FOR THE GREATER DEPTHS OF SP-90 OCCURRENCE IN LAKE SEDIMENTS. DISTRIBUTION OF THE RADIOISOTOPE ACTIVITIES IN SEDIMENTS IS COMPATIBLE WITH A MODEL BASED ON MEAN STEADY INPUT TO THE LAKES FOR 16 YEARS (1953 TO 1969), AND THE FOLLOWING VALUES OF DIFFUSION COEFFICIENTS IN PORE WATERS: PCP SP-90, 2×10^{-6} TO 4×10^{-6} CM²/S, AND FOR CS-137, 2×10^{-6} TO 4×10^{-6} CM²/S. AN ADDITIONAL TRANSPORT MECHANISM IN SEDIMENTS, SEDIMENTATION, IS MORE SIGNIFICANT IN LAKE ERIE (0.3 TO 0.6 CM/YR ACCORDING TO THE MODEL) THAN IN LAKE ONTARIO (0.05 CM/YR. CONDITIONS ARE OUTLINED UNDER WHICH THE FLUXES FROM LAKE WATER TO SEDIMENTS ARE IMPORTANT IN THE CHEMICAL BALANCE OF MEDIUM AND LARGE LAKES.

<CLASS> SIMULATION

<480>

<CONT> LIMO, R. R.; SCHRIEDGGER, A. E.

<TITLE> A COMPUTER MODEL FOR SOME BRANCHING-TYPE PHENOMENA IN HYDROLOGY

<ABST> IN HYDROLOGY, BRANCHING-TYPE PHENOMENA OCCUR IN SEVERAL INSTANCES, FOR EXAMPLE IN GROUND-WATER FLOW (SPLITTING FLOW CHANNELS IN A POROUS MEDIUM) AND IN THE FORMATION OF A NATURAL RIVER NETWORK (CONSISTING, I.E., INVERSE BRANCHING, OF SMALL RIVERS TO FORM LARGE RIVERS). SUCH PHENOMENA CAN BE TREATED BY THE STATISTICS OF TOPOLOGICAL BIFURCATING ARBORESCENCES. ENSEMBLES OF ARBORESCENCES CAN BE GENERATED ON A COMPUTER AND EXPECTATION VALUES FOR

OBSERVABLES CAN BE CALCULATED. IN THIS FASHION, THE LAWS OF DISPERSION PROCESSES IN FLOW THROUGH POROUS MEDIA AND ROOTCH'S LAW OF STREAM NUMBERS IN DRAINAGE BASINS ARE THE OUTCOME OF VERY SIMPLE STATISTICAL ASSUMPTIONS.

<CLASS> SIMULATION

<481>

<CONT> LIGGETT, JAMES A.

<TITLE> CIRCULATION IN HOMOGENEOUS LAKES

<ADDR> CORNELL UNIVERSITY, ENVIRONMENTAL ENGINEERING, HOLLISTER HALL

<CITY> ITHACA

<STATE> NY

<ZIP> 14853

<PHONE> 607-256-3556

<DOC> FINITE ELEMENT SHALLOW LAKE CIRCULATION ANALYSIS, JOURNAL OF THE HYDRAULICS DIVISION, PROCEEDINGS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS, JULY 1973; TRANSIENT FINITE ELEMENT SHALLOW LAKE CIRCULATION, JOURNAL OF THE HYDRAULICS DIVISION, PROCEEDINGS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS, FEB. 1977

<SUB> LAKES

<ABST> PROGRAM COMPUTES THREE-DIMENSIONAL VELOCITIES IN UNSTRATIFIED LAKES

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> PUNCHED CARDS

<COMP> IBM

<LANG> FORTRAN

<CLASS> ANALYTICAL

<USERS> SEVERAL UNIVERSITIES

<482>

<CONT> LIOW, E. Y.

<TITLE> OPSET: PROGRAM FOR COMPUTERIZED SELECTION OF WATERSHED PARAMETER VALUES FOR THE STANFORD WATERSHED MODEL

<ACRO> OPSET

<ADDR> UNIVERSITY OF KENTUCKY, WATER RESOURCES INSTITUTE

<CITY> LEXINGTON

<STATE> KY

<DOC> UNIVERSITY OF KENTUCKY, WATER RESOURCES INSTITUTE, RESEARCH REPORT 34, 200 PP., 1970

<ABST> THE STANFORD WATERSHED MODEL USES A HYDROLOGIC BUDGET TC MODEL THE LAND PHASE OF THE HYDROLOGIC CYCLE AND THEREBY SIMULATE STREAMFLOW ON A CONTINUOUS BASIS FROM CLIMATOLOGICAL DATA AND WATERSHED PARAMETERS. VALUES FOR KEY PARAMETERS ARE ESTIMATED BY TRIAL-AND-ERROR. SUBJECTIVELY

<402>

176

AQUATIC TRANSPORT

<402> CONT.

ESTIMATING DIFFERENCES HAS MADE IT DIFFICULT TO CORRELATE PARAMETER VALUES WITH KNOWN PHYSICAL CHARACTERISTICS OF THE WATERSHED. THIS STUDY SOUGHT TO COMPUTERIZE A PARAMETER OPTIMIZATION PROCEDURE BASED ON THE POUTRAS VERSION OF THE STAFFORD WATERSHED MODEL KNOWN AS THE KENTUCKY WATERSHED MODEL. THE RESULTANT SELF-CALIBRATING WATERSHED MODEL IS BORNED ONSIT BECAUSE IT DETERMINES AN OPTIMUM SET OF PARAMETER VALUES BY MATCHING SYNTHESIZED FLOWS WITH RECORDS'D FLOWS. THE FIRST STEP IN PROCEDURE DEVELOPMENT USED SENSITIVITY STUDIES TO DETERMINE WHICH WATERSHED PARAMETER VALUES ARE CRITICAL IN SIMULATING FLOW AND ARE DIFFICULT TO MEASURE DIRECTLY. THE SECOND STEP WAS TO ADJUST ESTIMATES OF THE SELECTED PARAMETERS IN A WAY SYSTEMATICALLY IMPROVING FLOW SIMULATION UNTIL THE BEST POSSIBLE MATCHING IS ACHIEVED. INDEPENDENT ADJUSTMENT SCHEMES WERE USED FOR PARAMETERS ASSOCIATED WITH RUNOFF VOLUMES, RECESSION FLOWS, AND FLOOD HYDROGRAPHS. THE THIRD STEP WAS TO EMPIRICALLY IMPROVE THE MODEL BY APPLYING IT TO A NUMBER OF WATERSHEDS IN KENTUCKY. ONSIT ESTIMATES WATERSHED PARAMETERS ON A ONE YEAR YEAR BASIS, AND VALUES BEST DESCRIBING WATERSHED CHARACTERISTICS SHOULD BE AVERAGED FROM SEVERAL ONSIT-SELECTED ONE-YEAR-BASED VALUES.

<CLAS> STOCHASTIC

<COM> 26 SEP.

<403>

<COM> VITTHU, V. J.; SONIGIAN, A. S.

<TITLE> THE NONPOINT SOURCE POLLUTANT LOADING (NPS) MODEL

<ACRO> NPS

<DOC> SIMULATION NETWORK NEWSLETTER, 8(4), 1-4, 1976

<ABST> A COMPUTERIZED MODEL FOR SIMULATING NONPOINT SOURCE POLLUTANT LOADING IS DESCRIBED. THE MODEL CONTINUOUSLY SIMULATES THE HYDROLOGIC PROCESSES, INCLUDING POLLUTANT ACCUMULATION, GENERATION, AND WASHOFF FROM THE LAND SURFACE AS WELL AS SNOW ACCUMULATION AND MELT. THE MODEL IS LIMITED IN THE SENSE THAT ONLY LAND SURFACE CONTRIBUTIONS TO NONPOINT SOURCE POLLUTION ARE EVALUATED. SUBSURFACE AND GROUNDWATER POLLUTANTS AS WELL AS CHANNEL PROCESSES ARE NOT CONSIDERED. THE MODEL IS CONCERNED WITH THE TOTAL LOADING OF POLLUTANT INPUT TO A STREAM CHANNEL OR WATERBODY FROM THE LAND SURFACE. FOR WATER QUALITY EVALUATIONS IN WATERSHEDS WHERE IN-STREAM PROCESSES ARE SIGNIFICANT, THE MODEL MUST BE INTERFACED WITH STREAM WATER QUALITY MODELS. SAMPLE RESULTS OF SIMULATING OVERLAND FLOW QUANTITY AND QUALITY FOR AN URBAN WATERSHED ARE PRESENTED AND INDICATE THAT THE MODEL PROVIDES A VIABLE MEANS FOR ASSESSING LAND SURFACE CONTRIBUTIONS OF NONPOINT POLLUTANTS. CALIBRATION OF CERTAIN MODEL PARAMETERS IS A NECESSARY AND CRITICAL STEP WHEN APPLYING THE MODEL TO A PARTICULAR WATERSHED SINCE THE MODEL IS LIMITED BY SIMPLIFICATIONS DUE TO INCOMPLETE DESCRIPTIONS OF THE PROCESSES

CONTROLLING NONPOINT POLLUTION.

<CLAS> SIMULATION

<COM> 6 REFERENCES, 6 FIGURES

<404>

<COM> LONG, E. C.

<TITLE> KOK AND TAB--PLATE BEHAVIOR FOR BOWEN OF SLOT UNDERWATER DISCHARGE INCLUDING MULTIPORT DISCHARGES

<ACRO> KOKM

<ADDR> OAK RIDGE NATIONAL LABORATORY, COMPUTER SCIENCES DIVISION, P.O. BOX 1

<CITY> OAK RIDGE

<STATE> TN

<ZIP> 37830

<PHONE> 615-483-8611 EXT 3-6149; FTS 850-6149

<SOURCE> DEVELOPED AT CAL TECH, MODIFIED AT ORNL

<DOC> ENVIRONMENTAL PROTECTION AGENCY, WATER POLLUTION CONTROL RESEARCH SERIES-161300ND10/70; R.C.Y. KOK, AND L. TAB, MATHEMATICAL MODELS FOR PREDICTION OF TEMPERATURE DISTRIBUTIONS RESULTING FROM THE DISCHARGE OF HEATED WATER INTO LARGE BODIES OF WATER, OCTOBER 1970. LARGE BODIES OF WATER, R.C.Y. KOK, L. TAB, OCTOBER 1970.

<SUB> THERMAL POLLUTION; THERMAL EFFLUENTS

<ABST> INTEGRAL MIXING MODEL FOR BOWEN AND SLOT BUOYANT JETS USING GAUSSIAN VELOCITY PROFILES WITH ENTAINED COEFFICIENTS PROPORTIONAL TO CENTER LINE VELOCITY.

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE; PUNCHED CARDS; DISC

<SIZE> 770 CARDS

<COMP> IBM

<CONFIG> IBM/91 270K

<LANG> FORTRAN IV

<CHAR> EBCDIC

<CLAS> DETERMINISTIC; ANALYTICAL; PREDICTIVE; ENGINEERING PROCESS

<APPL> ASSESSMENT FOR ENVIRONMENTAL IMPACT STATEMENTS

<USERS> ENERGY DIVISION, OAK RIDGE NATIONAL LABORATORY

<SUB> FROM DESIGN OF DISCHARGE LAYOUT

<UPDATE> 780622

<405>

<COM> LONG, L. L.

<TITLE> WATER TEMPERATURE FORECASTING AND ESTIMATION USING FOURIER SERIES AND COMMUNICATION THEORY TECHNIQUES

AQUATIC TRANSPORT

<845> CONT.
 <ACDP> TENNESSEE TECHNOLOGICAL UNIVERSITY
 <CITY> COCKEVILLE
 <STATE> TN
 <DOC> WATER RESOURCES RESEARCH, 12(5), 881-887, 1976
 <ABST> FOURIER SERIES AND STATISTICAL COMMUNICATION THEORY TECHNIQUES ARE UTILIZED IN THE ESTIMATION OF RIVER WATER TEMPERATURE INCREASES CAUSED BY EXTERNAL THERMAL INPUTS. AN EXAMPLE ESTIMATE ASSUMING A CONSTANT THERMAL INPUT IS DEMONSTRATED. A REGRESSION FIT OF THE FOURIER SERIES APPROXIMATION OF TEMPERATURE IS THEN USED TO FORECAST DAILY AVERAGE WATER TEMPERATURES. ALSO, A 60-DAY PREDICTION OF DAILY AVERAGE WATER TEMPERATURE IS MADE WITH THE AID OF THE FOURIER REGRESSION FIT BY USING SIGNIFICANT FOURIER COMPONENTS.
 <CLASS> PREDICTIVE
 <886>
 <COMT> LYON, R. D.
 <TITLE> BANN: A SYSTEM OF COMPUTER PROGRAMS FOR RADIOISOTOPE PATHWAY ANALYSIS CALCULATIONS
 <ACDP> BREN
 <ABDP> ATOMIC ENERGY OF CANADA LIMITED, WATTSVILLE NUCLEAR RESEARCH ESTABLISHMENT
 <CITY> PINAWA
 <STATE> MANITOBA
 <COUNTRY> CANADA
 <DOC> AECL-5527, 38 PP., 1976
 <ABST> A GENERALIZED SYSTEM OF COMPUTER PROGRAMS, DESIGNATED BANN (RADIOACTIVE MATERIALS MANAGEMENT) SYSTEM, HAS BEEN DEVELOPED TO ASSIST IN THE ANALYSIS OF THE MOVEMENT OF RADIOISOTOPES THROUGH THE ENVIRONMENT TO MAN. BANN INCORPORATES THE GASP IV CONTINUOUS/DISCRETE SIMULATION SYSTEM. A MODAL APPROACH IS USED WHEREBY THE SYSTEM TO BE ANALYZED IS SPLIT UP INTO PARTS SMALL ENOUGH THAT THE DISTRIBUTION OF ISOTOPES WITHIN THE MODE MAY BE TAKEN TO BE HOMOGENEOUS. PATHWAYS ARE DEFINED BETWEEN MODES, AND APPROPRIATE TRANSFER COEFFICIENTS ARE INPUT OR GENERATED. MODES ARE GENERAL "CONTAINERS OF ISOTOPES" AND MAY BE VOLUMES, SUCH AS A VOLUME OF WATER OR A BODY ORGAN, OR SURFACES SUCH AS A SQUARE METRE OF LAND SURFACE. MODES MAY BE DEFINED AS BELONGING TO STREAMS WITHIN WHICH MOVEMENT MAY BE BY TRANSPORTATION AS WELL AS BY DIFFUSION. OUTPUT INCLUDES THE TIME DEPENDENT CONTENTS OF THE MODES AND DOSE RATES, INTEGRATED DOSES AND DOSE COMMITMENTS OF SELECTED MODES.
 <CLASS> SIMULATION
 <887>
 <COMT> MACHENWIL, J. L.; CHAMBERS, R.; BIRD, W.
 <TITLE> FLOW DYNAMICS AND SEDIMENT MOVEMENT IN LOCKWOODS POLLEY INLET, NORTH CAROLINA
 <ADDP> NORTH CAROLINA STATE UNIVERSITY, CENTER FOR MARINE COASTAL STUDIES
 <CITY> RALEIGH
 <STATE> NC
 <ZIP> 27650
 <PHONE> 919-737-2334
 <SOURCE> BURE
 <DOC> PB--273 077/PSL
 <SUB> TIDAL INLETS
 <ABST> A NUMERICAL SIMULATION MODEL FOR THE COMPUTATION OF TIDAL AND FRESH WATER FLOW EXCHANGE THROUGH A COASTAL INLET WAS MODIFIED AND CALIBRATED WITH FIELD DATA (CURRENT, WATER SURFACE ELEVATION AND BOTTOM TOPOGRAPHY) FOR LOCKWOODS POLLY INLET, N.C. THE MODEL WAS THEN USED TO PREDICT THE FLOW PATTERNS IN THE INLET. A GENERALIZED HYPOTHESIS OF THE PATTERNS OF SEDIMENT MOVEMENT THROUGH AND BYPASSING THE INLET WAS FORMULATED FROM AN EVALUATION OF THE FLOW DATA AND FROM AN ANALYSIS OF THE ORIENTATION AND STRUCTURE OF THE BEDFORMS OBSERVED IN THE INLET AND ON THE OFFSHORE BAR. WHEN USED IN CONJUNCTION WITH AN ANALYSIS OF BEDFORM AND TRACED SAND DATA THE NUMERICAL SIMULATION MODEL WAS FOUND TO BE A VALID METHOD OF MONITORING THE HIGH ENERGY INLET ENVIRONMENT.
 <GPC> LOCKWOODS POLLY INLET, N.C.
 <TIME> 1974
 <STATUS> IN USE
 <ACCESS> LIMITED
 <MEDIA> PUNCHED CARDS
 <COMP> IBM
 <CONFIG> IBM 360/65
 <LANG> FORTRAN
 <ALGO> FINITE DIFFERENCE MODEL FOR FLOW IN INLETS WITH JUNCTIONS (MULTIPLE CHANNELS).
 <CLASS> SIMULATION; PREDICTIVE
 <APPL> COMPUTATION OF TIDAL AND FRESH WATER FLOW EXCHANGE THROUGH A COASTAL (TIDAL) INLET.
 <USERS> NORTH CAROLINA STATE UNIVERSITY, COASTAL RESEARCH PROGRAM
 <SUB> 1974 FLOW DATA FOR LOCKWOODS POLLY INLET.
 <VAL> MODEL VERIFIED/VALIDATED WITH FIELD DATA
 <UPDATE> 780730
 <888>
 <COMT> MARGARELLA, P. A.
 <TITLE> ANALYSIS OF SUBMERGED THERMAL DISCHARGE FROM OCEAN-SITED POWER PLANTS

<489>

AQUATIC TRANSPORT

<489> CONT.

<ADDR> UNIVERSITY OF MASSACHUSETTS

<CITY> AMHERST

<STATE> MA

<DOC> SCHWETZ, J.A. (ED.), THERMAL POLLUTION ANALYSIS CONFERENCE, HELD IN BLACKSBURG, VIRGINIA, MAY 13, 1974.

<ABST> THERMAL PLUME CHARACTERISTICS FOR A SUPERHEATED THERMAL DISCHARGE TYPICAL OF AN 1100 MW(2) POWER PLANT ARE PRESENTED BASED ON THE GENERALIZED INTEGRAL ANALYSIS DEVELOPED BY HIRST FOR DISCHARGES FROM A CIRCULAR PORT INTO A FLUID OF INFINITE EXTENT. THE EFFECTS OF ENVIRONMENTAL CONDITIONS (CURRENT, STRATIFICATION) AND ENGINEERING DESIGN (OUTLET DIFFUSER VELOCITY AND GEOMETRY) ON THE THERMAL PLUME ARE PRESENTED. THERMAL INFLUENCE IS JUDGED BASED ON MIXING ZONES DEFINED BY TEMPERATURE EXCESS ISOTHERMS. (AUTH)

<CLAS> SIMULATION

<489>

<ADDR> HARRMAN, D. R.; LEWIS, C. R.

<TITLE> NUMERICAL MODEL FOR A TURBULENT BUOYANT JET IN A SHALLOW OPEN CHANNEL

<ADDR> VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

<CITY> BLACKSBURG

<STATE> VA

<DOC> SCHWETZ, J.A. (ED.), PROCEEDINGS THERMAL POLLUTION ANALYSIS CONFERENCE, HELD IN BLACKSBURG, VIRGINIA, MAY 13, 1974

<ABST> A NUMERICAL MODEL FOR A TURBULENT, THREE-DIMENSIONAL, HEATED JET IS PRESENTED. THE STEADY-STATE NAVIER-STOKES EQUATIONS ARE SOLVED NUMERICALLY USING A VORTICITY-VELOCITY FORMULATION IN ORDER TO PREDICT THE SPREADING OF THE JET AND THE TEMPERATURE DISTRIBUTION IN THE JET MIXING REGION. A VARIABLE EDDY VISCOSITY IS USED WITH THE RETENTION OF THE MORE SIGNIFICANT GRADIENT CONTRIBUTIONS OF IT IN THE GOVERNING EQUATIONS. A BOUSSINESQ APPROXIMATION OF THE BODY FORCE IS USED. THE RESULTS OBTAINED FOR LAMINAR FLOW IN A SQUARE DUCT AND FOR AN UNHEATED TURBULENT JET ARE PRESENTED AS A TEST OF THE MODEL. THE TERM INVOLVING THE GRADIENT OF THE EDDY VISCOSITY IN THE EQUATION FOR THE VERTICAL COMPONENT OF THE VORTICITY IS SHOWN TO SIGNIFICANTLY INCREASE THE SPREAD OF THE JET. THE NUMERICAL MODEL FOR THE TURBULENT, HEATED JET IN A SHALLOW OPEN CHANNEL PRODUCED A REASONABLE PREDICTION FOR THE SPREAD IN THE NEAR JET REGION BUT A LARGE UNDERPREDICTION FOR THE FAR FIELD REGION. THIS RESULTS FROM A GRID SPACING LIMITATION WITH OUR PRESENT COMPUTER. THE TEMPERATURES IN THE JET MIXING REGION WERE HIGHER THAN THOSE OBTAINED EXPERIMENTALLY IN THE FAR FIELD. THE RESULTS ALSO SHOW QUALITATIVE DETAILS, SUCH AS THE JET'S POSTER, SPREAD, RISE, AND ITS ENTRAINMENT OF PRESTREAM FLUID.

<CLAS> SIMULATION

<490>

<ADDR> HARKOPSKY, N.; HARRMAN, D. R. F.

<TITLE> PREDICTIVE MODEL FOR THERMAL STRATIFICATION AND WATER QUALITY IN RESERVOIRS

<ADDR> MASSACHUSETTS INSTITUTE OF TECHNOLOGY

<CITY> CAMBRIDGE

<STATE> MA

<DOC> WATER POLLUTION CONTROL RESEARCH SERIES 16130 JAN 31/71, 1971

<ABST> MODIFICATIONS ARE MADE ON A ONE-DIMENSIONAL ANALYTICAL THERMAL STRATIFICATION PREDICTION METHOD TO INCLUDE THE TIME REQUIRED FOR INFLOWING WATER TO REACH A DAM FACE. A ONE-DIMENSIONAL WATER QUALITY MODEL IS DEVELOPED WHICH INCORPORATES THE INTERNAL FLOW PATTERNS PREDICTED FOR A STRATIFIED RESERVOIR FROM THE TEMPERATURE MODEL. THE WATER QUALITY MODEL IS DESIGNED TO PREDICT THE CONCENTRATION OF PARTICULAR WATER QUALITY PARAMETERS IN THE OUTFLOW WATER AS A FUNCTION OF TIME. IT IS TESTED BY COMPARISONS WITH MEASUREMENTS OF OUTFLOW CONCENTRATIONS RESULTING FROM PULSE INJECTIONS OF A CONSERVATIVE TRACER INTO A LABORATORY RESERVOIR. THE APPLICATION OF THE MATHEMATICAL MODEL TO A FIELD CASE OF PRACTICAL INTEREST IS DEMONSTRATED BY SOLVING THE COUPLED SET OF WATER QUALITY EQUATIONS FOR B.O.D. AND D.O. PREDICTIONS IN FONTANA RESERVOIR. IT IS CONCLUDED THAT THE MODEL IS CAPABLE OF PREDICTING THE EFFECT OF RESERVOIR IMPEDIMENTS ON WATER QUALITY.

<CLAS> SIMULATION

<491>

<ADDR> HAPNER, GARY J.

<TITLE> TEMPERATURE DISTRIBUTION MODEL FOR COOLING POND

<ADDR> FLOWNLP

<ADDR> ARGONNE NATIONAL LABORATORY, ENVIRONMENTAL IMPACT STUDIES DIVISION, 9700 S. CASS AVE.

<CITY> ARGONNE

<STATE> IL

<ZIP> 60439

<PHONE> PTS 972-3202

<DOC> NONE

<SUB> HEAT DISSIPATION FROM A COOLING POND

<ABST> AT ARGONNE NATIONAL LABORATORY, A MATHEMATICAL MODEL HAS BEEN DEVELOPED TO PREDICT THE TEMPERATURE DISTRIBUTION IN A CLOSED CYCLE PLUG-FLOW COOLING POND USED TO DISSIPATE EXCESS HEAT FROM A POWER PLANT (OR OTHER HEAT SOURCE) THROUGHOUT THE YEAR. REQUIRED INPUT DATA ARE THE REAR DEPTH OF THE LAKE, THE FLOW-THROUGH TIME, THE EQUILIBRIUM TEMPERATURE AND HEAT EXCHANGE

AQUATIC TRANSFERT

<491> CONT.

COEFFICIENT FOR EACH MONTH OF THE YEAR, AND THE TEMPERATURE RISE ACROSS THE CONDENSER. SINCE THIS MODEL DOES NOT EMPLOY DAILY METEOROLOGICAL DATA, THE RESULTS ARE AVERAGE OR EXTREME TEMPERATURE VARIATIONS, AND NOT THOSE THAT WOULD BE EXPECTED FROM DAY TO DAY.

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> PUNCHED CARDS

<SIZE> 40 RECORDS EACH 90 BYTES LONG

<COMP> IBM

<CONFIG> IBM 370/195 OS/MVT WITH 250K CORZ

<LANG> FORTRAN

<ALGO> ITERATIONS OF AN ALGEBRAIC EQUATION.

<CLASS> PREDICTIVE

<APPL> TO PREDICT TEMPERATURE DISTRIBUTIONS IN A CLOSED CYCLE PLUG-FLOW COOLING POND

<USER> ARGONNE NATIONAL LABORATORY

<SUB> LAKE MICHIGAN DEPTH, FLOW-THROUGH TIME, FLOW-THROUGH TEMPERATURES, HEAT EXCHANGE COEFFICIENT, AND TEMPERATURE RISE ACROSS THE CONDENSER.

<REAL> COMPARISON OF OBSERVED TEMPERATURES AT BRIDGES NUCLEAR POWER PLANT.

<CON> THIS IS A VERY SIMPLE MODEL THAT DOES NOT INCLUDE ANY HYDRODYNAMICS.

<PRNT> 700701

<492>

<CON> HARNER, GARY J.

<TITLE> THERMAL PLUME, SUBMERGED MULTIPORT DIFFUSER MODEL

<ACFO> IBM

<ADDP> ARGONNE NATIONAL LABORATORY, ENVIRONMENTAL IMPACT STUDIES DIVISION, 9700 S. CASS AVE.

<CITY> ARGONNE

<STATE> IL

<ZIP> 60439

<PHONE> PPS 972-3202

<DOC> S.-C. Y. KIM AND L. W. PAN, "MATHEMATICAL MODELS FOR THE PREDICTION OF TEMPERATURE DISTRIBUTIONS RESULTING FROM THE DISCHARGE OF HEATED WATER INTO LARGE BODIES OF WATER", ENVIRONMENTAL PROTECTION AGENCY, 16130DWO, OCTOBER 1970.

<SUB> SUBMERGED THERMAL PLUME PREDICTIONS

<ABST> THIS MODEL DESCRIBES THE BEHAVIOR OF MIXING INVOLVED IN A SUB-SURFACE DISCHARGE OF HEATED WATER THROUGH A MULTIPORT DIFFUSER FROM THE DISCHARGE TO THE POINT WHEN EITHER THE EFFLUENT REACHES THE SURFACE OR IT REACHES ITS TERMINAL LEVEL OF ASCENT.

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> PUNCHED CARDS

<SIZE> 350 RECORDS EACH 90 BYTES LONG

<COMP> IBM

<CONFIG> IBM 370/195 OS/MVT WITH 250K CORZ

<LANG> FORTRAN

<CHAR> EBCDIC

<ALGO> INTEGRAL ANALYSIS RESULTS IN COUPLED NON-LINEAR DIFFERENTIAL EQUATIONS SOLVED BY A FOURTH ORDER RUNGE-KUTTA SCHEME.

<CLASS> PREDICTIVE

<APPL> TO PREDICT THE EXTENT AND DIMENSIONS OF THE THERMAL PLUME FROM A SUBMERGED MULTIPORT DIFFUSER IN STAGNANT WATER.

<USER> ARGONNE NATIONAL LABORATORY

<SUB> DIAMETER OF JETS, VELOCITY, TEMPERATURE OF DISCHARGE, DENSITY OF DISCHARGE, ANGLE OF DISCHARGE, DEPTH, JET SPACING, AMBIENT TEMPERATURE AND DENSITY

<UPDATE> 700701

<493>

<CON> HARNER, GARY J.

<TITLE> THERMAL PLUME, SURFACE DISCHARGE MODEL

<ACFO> SHIPAZI

<ADDP> ARGONNE NATIONAL LABORATORY, ENVIRONMENTAL IMPACT STUDIES DIVISION, 9700 S. CASS AVE.

<CITY> ARGONNE

<STATE> IL

<ZIP> 60439

<PHONE> PPS 972-3202

<DOC> H.A. SHIPAZI AND L.R. DAVIS, WORKBOOK OF THERMAL PLUME PREDICTION, VOLUME 2- SURFACE DISCHARGE, U.S. ENVIRONMENTAL PROTECTION AGENCY, EPA-600/2-72-0056, MAY 1970

<SUB> SURFACE THERMAL PLUME PREDICTIONS

<ABST> THIS MODEL DESCRIBES THE THREE DIMENSIONAL BEHAVIOR OF A HEATED JET DISCHARGED FROM A RECTANGULAR CHANNEL AT THE SURFACE OF A DEEP AND WIDE BODY OF HOMOGENEOUS WATER THAT IS EITHER AT REST OR MOVING WITH A UNIFORM AND CONSTANT VELOCITY. THE MAGNITUDES OF THE DISCHARGE ANGLE, CHANNEL DIMENSIONS, DISCHARGE VELOCITY AND TEMPERATURE ARE ARBITRARY. THE JET VELOCITY AND TEMPERATURE DISTRIBUTIONS AT THE OUTLET ARE ASSUMED UNIFORM AND CONSTANT.

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> PUNCHED CARDS

<893>

AQUATIC TRANSPORT

<893> COM-
 <SITE> 700 RECORDS EACH 80 BYTES LONG
 <CONF> IBM
 <COMPTC> IBM 370/195 OS/VS1 WITH 240K CORE
 <LANG> FORTRAN
 <CHAD> EPCRIC
 <ALGO> INTEGRAL ANALYSIS RESULTS IN COUPLED NONLINEAR DIFFERENTIAL EQUATIONS SOLVED BY THE HANNING PREDICTOR - CORRECTOR METHOD.
 <CLAS> PREDICTIVE
 <APPL> TO PREDICT EXTENT AND DIMENSIONS OF THE THERMAL PLUME FROM A SURFACE DISCHARGE.
 <USERS> ARGONNE NATIONAL LABORATORY; EPA; OAK RIDGE NATIONAL LABORATORY
 <SM> DISCHARGE DENSIMETRIC FLOWER NUMBER, ASPECT RATIO, RATIO OF EXIT TO AMBIENT VELOCITY, DISCHARGE ANGLE, SURFACE HEAT EXCHANGE COEFFICIENT
 <VAL> COMEARED WITH DATA IN "SURFACE THERMAL PLUMES: EVALUATION OF MATHEMATICAL MODELS FOR THE NEAR AND COMPLETE FIELD" BY W.E. DUFF, A.J. POLICASTRO, R.A. FIEDORCH. ARGONNE NATIONAL LABORATORY ARL/WR-75-3 PART 1, MAY 1975, PART TWO, AUGUST 1975
 <COM> THE MATHEMATICAL MODEL IS GREATLY IDEALIZED, AND IS SUBJECTED TO CONSIDERABLE LIMITATIONS IN THE PROCESS OF ARRIVING AT A MATHEMATICAL SOLUTION.
 <UPDN> 780703

<894>
 <COM> HAPSHALL, RICHARD B.
 <TITLE> RIVER BASIN MODEL
 <ACRO> RYAN
 <ADDR> RAYTECH COMPANY, ENVIRONMENTAL SYSTEMS ANALYSTS
 <CITY> PORTSMOUTH
 <STATE> RI
 <ZIP> 02871
 <PHONE> 401-287-8000
 <DOC> OTT, W.R. (ED.), PROCEEDINGS OF THE EPA CONFERENCE ON ENVIRONMENTAL MODELING AND SIMULATION, 1976, EPA 600/9-76-016, (P. 45-49), 847 PP.
 <SUB> GENERALIZED MODEL FOR RIVER BASIN WATER QUALITY MANAGEMENT PLANNING
 <ABST> RIBAN IS A COMPUTERIZED MATHEMATICAL MODEL WHICH PREDICTS WATER QUALITY FOR 17 CONSTITUENTS. PREDICTED WATER QUALITY PROFILES THROUGHOUT THE BASIN FOR VARYING SETS OF WASTE LOADS AND FLOW REGIMES CAN BE COMPARED WITH EACH OTHER AND WITH DESIRED WATER QUALITY GOALS. RIBAN IS SUITED FOR DETERMINING THE WASTE LOAD LOCATIONS NECESSARY FOR ACHIEVING WATER QUALITY STANDARDS IN RIVERS.
 <STATUS> IN USE

<ACCESS> UNLIMITED
 <CLAS> PREDICTIVE
 <APPL> ANALYSIS OF ALTERNATIVE POLLUTION ABATEMENT STRATEGIES
 <UPDATE> 780615

<895>
 <COM> MARTIN, G. D.
 <TITLE> OPTIMAL CONTROL OF AN OIL REFINERY WASTE TREATMENT FACILITY: A TOTAL ECOSYSTEM APPROACH
 <ADDR> OKLAHOMA STATE UNIVERSITY
 <CITY> STILLWATER
 <STATE> OK
 <DOC> DEPOSIT NO. 73-10, 1972
 <ABST> A MODEL FOR A SYSTEM OF 10 HOLDING PONDS OPERATING AS A TREATMENT SYSTEM TO IMPROVE WATER QUALITY BEFORE RELEASE TO THE ENVIRONMENT IS DESCRIBED. MODELS ARE DEVELOPED FOR EACH POND SYSTEM AND CHANGES IN NUTRIENT LEVEL THROUGH THE SYSTEM. CONTROL VARIABLES INCLUDE AERATION AND CHANGES IN FLOW RATES FROM ONE POND TO ANOTHER. OPTIMIZATION THEN IS APPLIED TO DETERMINE AERATION AND FLOW RATES YIELDING HIGHEST WATER QUALITY.
 <CLAS> PREDICTIVE; DETERMINISTIC
 <896>
 <COM> HATCHNETT, D. L.
 <TITLE> PREDICTION OF TEMPERATURE INCREASES FROM THERMAL DISCHARGES: A SYSTEMS APPROACH
 <ADDR> STONE AND WEBSTER ENGINEERING CORP.
 <CITY> BOSTON
 <STATE> MA
 <DOC> SCHETZ, J.A. (ED.), THERMAL POLLUTION ANALYSIS CONFERENCE, HELD IN BLACKSBURG, VIRGINIA, MAY 13, 1974.
 <ABST> PREDICTION OF TEMPERATURE INCREASES EXPECTED TO OCCUR IN A WATER BODY DUE TO THERMAL DISCHARGES MUST BE MADE TO PROVIDE A BASIS FOR ASSESSMENT OF ENVIRONMENTAL IMPACT. TECHNIQUES AVAILABLE FALL INTO 3 CATEGORIES: (1) EMPIRICAL PROJECTIONS FROM MEASUREMENTS OF EXISTING DISCHARGES, (2) THEORETICAL MODELS DERIVED FROM BASIC PHYSICAL LAWS, AND (3) PHYSICAL MODELS WHICH SIMULATE PROTOTYPE CONDITIONS. A COMBINED APPROACH HAS BEEN DEVELOPED WHICH USES THE BEST FEATURES OF MATHEMATICAL MODELING, HYDRAULIC MODELING AND DIRECT FIELD MEASUREMENTS TO PROVIDE THE INPUT TO A SYSTEM MODEL WHICH CAN PREDICT TRANSIENT TEMPERATURE CHANGES IN THE DISCHARGE AREA OF A STEAM ELECTRIC POWER STATION SITED ON THE COAST AND SUBJECT TO REVERSING TIDAL CURRENTS. THIS APPROACH HAS PROVED TO BE EFFICIENT AND HAS PROVIDED RESULTS WHICH WERE USED TO DEMONSTRATE COMPLIANCE WITH APPLICABLE THERMAL

AQUATIC TRANSPORT

<496> CONT.
DISCHARGE CRITERIA.

<CLASS> SIMULATION

<497>
<CONT> HATSUI, S.; GLOYNE, E. P.

<TITLE> RADIOACTIVITY TRANSPORT IN WATER : BIOLOGICAL ACCUMULATION OF MERCURY (II) AND METHYLMERCURY BY CHLORELLA PYRENOIDOSA

<ADDP> UNIVERSITY OF TEXAS, CENTRAL RESEARCH WATER RESOURCES

<CITY> AUSTIN

<STATE> TX

<DOC> REPORT, OPO-490-22, 251 PP., 1972

<ABST> THE FINDINGS OF HIGH LEVELS OF HG IN MARINE AND FRESH WATER FISH, AND ASSOCIATED BIRNATHA DISEASE, HAVE INITIATED STUDIES TO EVALUATE THE COPPER BEHAVIOR OF HG IN ECOSYSTEMS. A PRIMARY OBJECTIVE OF THIS STUDY WAS TO EVALUATE THE INFLUENCE OF VARIOUS ENVIRONMENTAL FACTORS ON THE ACCUMULATION AND DESORPTION OF MERCURIALS BY THE FRESH WATER ALGA C. PYRENOIDOSA. RADIOACTIVE ISOTOPES OF HG IN THE FORM OF HG(II) AND METHYLMERCURY (HG(CH3)2) WERE USED. THE STUDY HAS RESULTED IN TWO PRINCIPAL FINDINGS: (1) IT WAS DETERMINED THAT A SOLEPHICH ISOOTHERM CAN BE USED TO EVALUATE THE TOXIC EFFECT OF WASTE RELEASES CONTAINING HG ON PHYTOPLANKTON, ESPECIALLY C. PYRENOIDOSA, AND THE INFLUENCE OF ALGAL BIOMASS ON THE TRANSPORT OF MERCURIALS THROUGH THE FOOD CHAIN; (2) IT WAS FOUND THAT 3 TYPES OF MASS TRANSFER MODELS CAN BE USED TO DESCRIBE THE KINETICS OF SORPTION AND DESORPTION. THESE MODELS EMPLOY A UNIFORM FUNCTION, AN EXPONENTIAL FUNCTION, AND A POWER FUNCTION. USING THESE MODELS SORPTIONS AND DESORPTIONS OF HG(II) AND HG(CH3)2 ARE DESCRIBED, RESPECTIVELY, BY THE UNIFORM FUNCTION MODEL AND THE EXPONENTIAL FUNCTION MODEL.

<CLASS> SIMULATION

<498>
<CONT> MCKELLAR, H. W. JR.

<TITLE> METABOLISM AND MODELS OF ESTUARINE BAY ECOSYSTEMS AFFECTED BY A COASTAL POWER PLANT

<ADDP> UNIVERSITY OF FLORIDA

<CITY> GAINESVILLE

<STATE> FL

<ABST> EFFECTS OF COASTAL POWER PLANTS ON AN ADJACENT ESTUARINE BAY ECOSYSTEM AT CRYSTAL RIVER ON THE WEST COAST OF FLORIDA WERE EVALUATED WITH MEASUREMENTS AND MODELS TO HELP UNDERSTAND RELATIONSHIPS AND PREDICT THE CONSEQUENCES OF ADDING AN ADDITIONAL POWER PLANT. THE ENERGY CIRCUIT MODEL INCLUDED METABOLISM, MIGRATIONS, WATER EXCHANGE, AND PROBLEMS CONCERNING INTERFACE OF POWER

PLANTS AND ESTUARINE ECOSYSTEMS. FIELD MEASUREMENTS WERE TAKEN FROM THE DISCHARGE AND CONTROL BAYS. COMPARISONS AND INFERENCES WERE MADE CONCERNING THE EFFECT OF THE POWER PLANT ON ECOSYSTEM STRUCTURE AND FUNCTION, ESPECIALLY PRODUCTION, COMMUNITY RESPIRATION, AND NUTRIENT RELATIONS. PLANKTON POPULATIONS DOMINATED TOTAL METABOLISM IN THE DISCHARGE BAY WHILE BENTHIC SYSTEMS DOMINATED IN THE CONTROL BAYS. ANNUAL AVERAGE GROSS PLANKTONIC PRODUCTION WAS 3.06 AND 1.93 G O2/M2/DAY IN THE DISCHARGE AND CONTROL BAYS, RESPECTIVELY. ANNUAL AVERAGE PLANKTONIC CHLOROPHYLL IN THE DISCHARGE BAY (2.97 G/M3) WAS 34 PERCENT HIGHER THAN IN THE CONTROL BAY (2.21 G/M3). ZOOPLANKTON RESPIRATION WAS BETWEEN 3 AND 9 PERCENT OF TOTAL PLANKTONIC RESPIRATION AND BETWEEN 0.5 AND 1.5 PERCENT OF TOTAL COMMUNITY RESPIRATION. POWER PLANT INFLUENCE ON TOTAL COMMUNITY METABOLISM WAS SMALL WITH LESS THAN 10 PERCENT DIFFERENCE IN ANNUAL AVERAGES (5.22 AND 5.59 G O2/M2/DAY IN THE DISCHARGE AND CONTROL BAYS, RESPECTIVELY).

<CLASS> SIMULATION

<499>
<CONT> MCKIE, W. T.; SHINDALA, A.

<TITLE> TEMPERATURE DISTRIBUTION IN THE VICINITY OF HEATED DISCHARGES FROM POWER PLANTS

<ADDP> MISSISSIPPI STATE UNIVERSITY

<CITY> STATE COLLEGE

<STATE> MS

<DOC> IN: SCHETZ, J. A. (ED.), IN: THERMAL POLLUTION ANALYSIS CONFERENCE, HELD IN BLACKSBURG, VIRGINIA, MAY 13, 1974

<ABST> THIS STUDY WAS CONDUCTED TO DEFINE THE TEMPERATURE PROFILES AND IDENTIFY AND DESCRIBE THE MIXING ZONE BELOW THE HOT WATER OUTLET STRUCTURE IN THE VICINITY OF THE HEATED DISCHARGE FROM THE BAXTER WILSON STEAM ELECTRIC STATION, MISSISSIPPI POWER AND LIGHT COMPANY, LOCATED ON THE MISSISSIPPI RIVER. TEMPERATURE PROFILES WERE PLOTTED AT SEVERAL DEPTHS AND WERE CORRELATED TO THE PLANT OPERATING CONDITIONS AND THE RIVER CHARACTERISTICS. A MATHEMATICAL MODEL RELATING THE DIMENSIONS (LENGTH AND WIDTH) OF THE ISOTHERM FOR THE 5 DEGREES F TEMPERATURE RISE ABOVE AMBIENT TO THE PLANT LOAD AND RIVER CHARACTERISTICS WAS DEVELOPED. A NOMOGRAPH WAS PREPARED RELATING THE WIDTH AND LENGTH OF THE MIXING ZONE TO THE TOTAL PLANT LOAD, DEPTH OF OUTLET STRUCTURE BELOW THE WATER SURFACE, AND THE TEMPERATURE DIFFERENCE BETWEEN AMBIENT AIR AND WATER CONDITIONS.

<CLASS> SIMULATION

<500>
<CONT> MCKINNEY, H.

<TITLE> INVESTIGATION OF SOME FACTORS IN THE BIOCHEMICAL CONVERSION OF MERCURY POLLUTANTS TO TOXIC METHYLMERCURY EFFECTED BY MICRO-ORGANISMS IN A MARINE

<500>

ACQUATIC TRANSPORT

<500> CONT.

SEDIMENT

<ABST> NAVAL ACADEMY

<CITY> ANNAPOLIS

<STATE> MD

<DOC> REPORT NO. USNA-TSPD-32; MONITORING AGENCY REPORT NO. 10, 98 PP., 1972.

<ABST> THE AIM OF THE INVESTIGATION WAS TO FIND SOME OF THE FACTORS INVOLVED IN THE CONVERSION OF MERCURY POLLUTANTS TO TOXIC METHYL-MERCURY BY MICROORGANISMS IN MARINE SEDIMENTS. RESEARCH RESULTED IN THE DEFINITION OF THE TWO PRIMARY PROBLEMS: MODELING AND ANALYSIS. A SUCCESSFUL MODELING TECHNIQUE WAS THEN DEVELOPED, AFTER RESTRICTIONS IN DESIGN WERE FOUND DESIRABLE. A SUCCESSFUL ANALYTICAL TECHNIQUE, WHICH HAD NOT BEEN APPLIED AS SUCH TO BIOLOGICAL SAMPLES, WAS DEVELOPED AND USED WITH GOOD RESULTS. THESE TWO SOLUTIONS WERE THEN COMBINED IN AN INVESTIGATION OF THE CONVERSION FACTORS: POLLUTANT TYPE AND LEVEL; CONVERSION TIME; MOVEMENT OF WATER OVER THE SEDIMENT (REMOVAL OF MERCURY FROM SEDIMENT); CORRELATION; EUTROPHICATION; AND OXYGEN CONTENT OF THE WATER ABOVE THE SEDIMENT.

<CITY> SIMULATION

<501>

<CONT> MCILAIN, R. A.

<TITLE> RYAN-HARLEMAN--COOLING POND TEMPERATURE DISTRIBUTION

<ACR> RYAN

<ADDR> OAK RIDGE NATIONAL LABORATORY, P.O. BOX 1

<CITY> OAK RIDGE

<STATE> TN

<ZIP> 37830

<PHONE> 615-483-8611 EXT 3-6149; PLS 850-6149

<SOURCE> DEVELOPED AT NIT, MODIFIED AT ORNL

<DOC> P.J. RYAN AND D.B.P. HARLEMAN, AN ANALYTICAL AND EXPERIMENTAL STUDY REPORT NO. 161, RALPH M. PARSONS LABORATORY FOR WATER RESOURCES AND HYDRODYNAMICS

<SUB> COOLING PONDS

<ABST> MATHEMATICAL MODEL FOR PREDICTION OF ANNUAL CYCLE OF TEMPERATURE CHANGES IN A STRATIFIED LAKE OR RESERVOIR

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE; PUNCHED CARDS; DISC

<SIZE> 2000 CARDS

<CONF> IBM

<CONFIG> IBM/91 270R

<LANG> FORTRAN IV

<CHAP> ESCDIC

<CLASS> DETERMINISTIC; ANALYTICAL; PREDICTIVE; ENGINEERING PROCESS

<APPL> ASSESSMENT FOR ENVIRONMENTAL IMPACT STATEMENTS

<SECS> ENERGY DIVISION, OAK RIDGE NATIONAL LABORATORY

<SUB> FROM DESIGN OF COOLING POND AND METEOROLOGICAL DATA

<UPDATE> 780622

<502>

<CONT> MCILAIN, R. A.; HUNDAL, H. S.; LANDROSS, R. B.

<TITLE> IMPROVING THE STATISTICAL RELIABILITY OF STREAM HEAT ASSIMILATION PREDICTION

<ADDR> NATIONAL ENVIRONMENTAL RESEARCH CENTER

<CITY> CORVALLIS

<STATE> OR

<DOC> PR--446250, 1975

<ABST> IN RESPONSE TO AN INCREASED INTEREST IN WATER QUALITY BY THE PUBLIC, A LARGE EFFORT HAS BEEN MOUNTED TO DEVELOP MATHEMATICAL MODELS FOR PREDICTING HEAT ASSIMILATION IN BODIES OF WATER. THE ACCURACY OF THESE MODELS HAS RECENTLY COME UNDER SCRUTINY DUE TO THE NEED FOR TEMPERATURE PREDICTIONS WITHIN 1°C OF THE AMBIENT. THIS WORK IS AN EVALUATION OF EXISTING, ONE-DIMENSIONAL STREAM TEMPERATURE PREDICTION TECHNIQUES FOR ACCURACY AND PRECISION. THE APPROACH IS THROUGH ERROR ESTIMATES ON A GENERAL MODEL THAT ENCOMPASSES ALL OF THE MODELS PRESENTLY USED. A SENSITIVITY ANALYSIS OF THIS GENERAL MODEL IS USED IN CONJUNCTION WITH STATISTICAL METHODS TO DETERMINE THE SOLUTION ERRORS.

<CLASS> PREDICTIVE

<503>

<CONT> MCILAIN, R. A.; HUNDAL, H. S.; HARTBERG, P.; NEWSON, E. B.

<TITLE> MATHEMATICAL ANALYSIS OF THERMAL POLLUTION OF LAKES AND ESTUARIES

<ADDR> VERMONT UNIVERSITY, DEPARTMENT OF MECHANICAL ENGINEERING

<CITY> BURLINGTON

<STATE> VT

<DOC> CONTRACT AT(30-1)-4217 (COO--4217-2) MAY 1972.

<ABST> MATHEMATICAL MODELS FOR PREDICTING NUCLEAR POWER PLANT THERMAL DISCHARGES IN LARGE LAKES AND ESTUARIES ARE PRESENTED. THE MODELS SIMULATE THESE EFFECTS IN THREE REGIONS: AN OPEN CHANNEL OUTFALL, A MIXING ZONE CLOSE TO SHORE, AND A FLOATING PLUME AT A LARGE DISTANCE FROM SHORE. THE EFFECTS OF MASS AND ENERGY EXCHANGE WITH THE ENVIRONMENT ARE INCLUDED. PROGRAMS, WRITTEN IN FORTRAN IV, ARE PRESENTED THAT IMPLEMENT THE MODELS. A SAMPLE

AQUATIC TRANSPORT

<503> COST.
PROBLEM IS SHOWN.

<CLASS> SIMULATION

<504>
<CONT> MCQUIVY, R. S.; KEEFER, T. B.

<TITLE> SIMPLE METHOD FOR PREDICTING DISPERSION IN STREAMS

<ADDR> STUBBS, INC., 1925 NORTH LYNN STREET

<CITY> ARLINGTON

<STATE> VA

<ZIP> 22190

<PHONE> 703-522-7000

<DOC> AMERICAN SOCIETY OF CIVIL ENGINEERS, ENVIRONMENTAL ENGINEERING DIVISION, JOURNAL 100(EEB), 997-1011, AUG. 1974

<SUBJ> DYE DISPERSION STUDIES

<ABST> KNOWLEDGE OF POLLUTANT DISPERSAL RATE IS ESSENTIAL TO STREAM MANAGEMENT. A SIMPLE METHOD FOR PREDICTING LONGITUDINAL DISPERSION COEFFICIENTS FROM MEAN FLOW PARAMETERS WAS DEVELOPED. AN ANALOGY WAS USED BETWEEN THE LINEAR 1-DIMENSIONAL FLOW EQUATION AND THE LINEAR 1-DIMENSIONAL DISPERSION EQUATION TO DEFINE A RELATION BETWEEN THE SOLUTE DISPERSION COEFFICIENT AND THE FLOW DISPERSION COEFFICIENT. THE FLOW DISPERSION COEFFICIENT IS CALCULATED FROM MEAN FLOW PARAMETERS, ALLOWING PREDICTIONS OF SOLUTE DISPERSION WHEN THEIR RELATIONSHIP IS KNOWN. THE CALCULATED DISPERSION COEFFICIENTS ARE COMPARED WITH OBSERVED VALUES FOR 19 STREAMS COVERING A WIDE RANGE OF FLOW CONDITIONS. A STANDARD ERROR OF ESTIMATE OF 30% WAS FOUND.

<GEN> DATA FROM THROUGHOUT U.S.

<YRHD> 1960-1974

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> TEXT

<SIZE> < 20 PAGES

<COMP> NP

<CONFIG> 8 TO 12K

<LANG> NP BASIC

<CHAR> ASCII

<ALGO> REGRESSION EQUATION

<CLASS> CONTINUOUS; REGRESSION

<APPL> ESTIMATE OF DISPERSION COEFFICIENTS FOR WATER QUALITY MODELS

<SRCD> USGS RECORDS

<HYAL> COMPARISON OF PREDICTED AND OBSERVED DISPERSION RATES

<CON> MODEL IS ACTUALLY A REGRESSION EQUATION BASED ON A GREAT DEAL OF DATA ON DYE AND PLOD WAVE DISPERSION

<UPDATE> 790712

<505>
<CONT> BERTA, B. M.; ANDREO, R. G.; YU, S. C.

<TITLE> STOCHASTIC VARIATION OF WATER QUALITY OF THE PASSAIC RIVER

<ACRO> APINA

<DOC> WATER RESOURCES RESEARCH, 11(2), 300-308, 1975

<ABST> MOST RECEIVING WATER QUALITY MODELS ARE STEADY-STATE, DETERMINISTIC, ONE-DIMENSIONAL STRUCTURES. YET IT IS CLEAR THAT STREAM QUALITY VARIES IN TIME AND IS NON-DETERMINISTIC. RECEIVING WATER QUALITY IS A STOCHASTIC VARIABLE. A RATIONAL APPROACH TO THE PROBLEM IS TO CONSIDER STOCHASTIC VARIATION AS AN IMPORTANT ASPECT OF WATER QUALITY AND TO INCORPORATE SOME FORM OF THIS CONCEPT INTO WATER QUALITY STANDARDS. IN ADDITION TO AIDING THE DEVELOPMENT OF MANAGEABLE STANDARDS, STOCHASTIC MODELING IS ESPECIALLY IMPORTANT TO SUCCESSFUL QUALITY FORECASTING. THE STOCHASTIC STRUCTURES OF SOME WATER QUALITY TIME SERIES ARE EXAMINED. THESE TIME SERIES INCLUDE DAILY OBSERVATIONS IN STREAMFLOW, WATER TEMPERATURE, BIOCHEMICAL OXYGEN DEMAND, AND DISSOLVED OXYGEN DEFICIT. AUTOREGRESSIVE INTEGRATED MOVING AVERAGE (ARIMA) MODELS HAVE BEEN USED TO DESCRIBE THE RANDOM COMPONENTS OF THESE TIME SERIES. EXCEPT FOR THE BIOCHEMICAL OXYGEN DEMAND, THE ARIMA MODELS PROVIDE VERY SATISFACTORY RESULTS.

<CLASS> STOCHASTIC

<CON> 10 REFERENCES; 2 FIGURES, 12 TABLES

<506>
<CONT> HETRY, ARTH A.

<TITLE> MODELING POLLUTANT MIGRATION IN SUBSURFACE ENVIRONMENTS

<ADDR> WESTON ENVIRONMENTAL CONSULTANTS-DESIGNERS, WESTON WAY

<CITY> WEST CHESTER

<STATE> PA

<ZIP> 19380

<PHONE> 215-692-3030

<DOC> OTT, W.R. (ED.), PROCEEDINGS OF THE EPA CONFERENCE ON ENVIRONMENTAL MODELING AND SIMULATION, 1976, EPA 600/9-76-016, (P. 522-526), 847 PP.

<SUBJ> PREDICTS LEACHATE-POLLUTANT MIGRATION AND FATE IN SUBSURFACE ENVIRONMENTS

<ABST> A MATHEMATICAL MODEL HAS BEEN DEVELOPED WHICH DESCRIBES THE HYDROGEOLOGIC RELATIONS WITHIN A LEACHATE/AQUIFER SYSTEM. IT IS USUALLY IN THE FORM OF A SECOND-ORDER PARTIAL DIFFERENTIAL EQUATION TOGETHER WITH A SET OF AUXILIARY CONDITIONS DESCRIBING THE SYSTEM'S VARIABLES AND CONSTANTS. THE COMPUTER SIMULATION IS EXPRESSED AS

<506>

AQUATIC TRANSPORT

<505> CONT.

TWO-DIMENSIONAL CONCENTRATION PROFILES WHICH CAN BE ORIENTED IN EITHER THE VERTICAL OR THE HORIZONTAL DOMAIN, UNDER TRANSIENT OR STEADY-STATE CONDITIONS. THE MODEL CAN BE USED TO SIMULATE SUBSURFACE CONTAMINATION FROM AREA SOURCES, SUCH AS SOLID WASTE DISPOSAL SITES, WASTEWATER HOLDING BASINS, WASTEWATER OR SLUDGE APPLICATION SITES, RAW MATERIAL STOCKPILES AND RECHARGE OF CONTAMINATED WATERS.

<STATUS> IN USE

<CLASS> PREDICTIVE

<APPL> THE MODEL CAN BE USED AS A TOOL FOR WATER QUALITY STUDIES, DISPOSAL SITE SELECTION AND DESIGN, EVALUATION OF ENVIRONMENTAL IMPACT, RECOVERY OF GROUNDWATER CONTAMINANTS, AND PLANNING RELATED TO SUBSURFACE WATER RESOURCES.

<REFNO> 78C718

<507>

<CONT> MILLER, H. C.; BACON, J. C.; LISSAVER, I. H.

<TITLE> COMPUTER SIMULATION TECHNIQUE FOR OIL SPILLS OFF THE NEW JERSEY-DELAWARE COASTLINE

<ADDR> COAST GUARD RESEARCH AND DEVELOPMENT CENTER

<CITY> GROTON

<STATE> CT

<DOC> AD-A-018987, 1975

<ABST> PREDICTIONS OF THE MOVEMENT OF OIL SLICKS AND THEIR IMPACT LOCATIONS ALONG THE SHORELINE OF NEW JERSEY AND DELAWARE WERE DETERMINED FOR TWO POTENTIAL WRECKAGE PORTS AND TWO POTENTIAL DRILLING SITES. A HYDRODYNAMIC-NUMERICAL MODEL FOR THE NEW YORK BIGHT AREA WAS COUPLED WITH A WIND GENERATING MODEL TO PRODUCE TYPICAL PATTERNS OF CONCENTRATION OF OIL. SHORELINE IMPACT DETERMINATIONS WERE MADE FOR THE FOUR SPILL SITES FOR THE AVERAGE WINTER STORM CONDITIONS AND AVERAGE SUMMER HIGH PRESSURE SYSTEMS GENERATED BY THE MODELS.

<CLASS> PREDICTIVE; SIMULATION

<508>

<CONT> MOORE, C. A.; SILVER, H. L.

<TITLE> NUTRIENT TRANSPORT BY SEDIMENT WATER INTERACTION

<DOC> REPORT NO. UILD-WRC-73-0065; PROJ. OUID-A-053-ILL; CONTRACT DI-14-31-0001-3213; MONITORING AGENCY REPT. NO. W3-09754, OWRN-A-053-ILL(2), 1973, 50 PP.

<ABST> THE REPORT PRESENTS THE RESULTS OF A SERIES OF LABORATORY TESTS TO INVESTIGATE PHOSPHATE TRANSPORT IN SEDIMENTS SUBJECTED TO ONE DIMENSIONAL CONSOLIDATION TYPE LOADING. P-32 TECHNIQUES ARE EMPLOYED. IN ADDITION, THE REPORT DISCUSSES MODELS FOR THE

EXCHANGE OF PHOSPHATES BETWEEN SEDIMENT OR SOIL IN LAKES AND LAKE WATERS. THESE MODELS ARE EXPRESSED IN A FORM THAT ALLOWS THEM TO BE USED TO PREDICT THE ENVIRONMENTAL IMPACT OF CONSTRUCTION OPERATIONS IN AQUATIC ENVIRONMENTS.

<CLASS> PREDICTIVE

<509>

<CONT> MOORE, F. K.; JALOVIA, Y.

<TITLE> A THERMAL FLUID-MECHANICAL MODEL FOR ESTIMATION OF POWER PLANT IMPACT ON A STRATIFIED LAKE

<ABST> THE NATURAL THERMAL CYCLE OF A STRATIFIED WATER BODY USED FOR POWER-PLANT COOLING WILL BE DISTURBED BOTH BY HEAT ADDITION AND THE MIXING EFFECT OF WITHDRAWAL AND RETURN. A PERTURBATION ANALYSIS FOR THESE EFFECTS IS MADE WITH A MODEL BASED ON THE ASSUMPTION THAT A RICHARDSON NUMBER IS CONSTANT AT THE BASE OF ANY STRATIFIED LAYER. OF A FURTHER ASSUMPTION ABOUT THE PROFILES OF WIND-DRIVEN RETURN CURRENTS, CONSTANT HEAT FLOW FROM THE LAYER IS IMPERED. THIS HEAT FLOW, AND THE DIFFUSION COEFFICIENT AT THE THERMOCLINE, ARE THE CRITICAL PARAMETERS OF THE SIMPLE, ONE-DIMENSIONAL, LINE-SEGMENT MODEL, AND ARE CHOSEN TO GIVE GOOD IMITATION OF THE KNOWN NATURAL CYCLE OF CAYUGA LAKE. THE MODEL IS THEN PERTURBED IN TERMS OF BOTH HEAT FLOW AND DIFFUSION OF GIVE POWER-PLANT IMPACT FOR THAT LAKE. BOTH TRANSIENT AND FINAL CYCLE CHANGES OF SUMMER AND WINTER TEMPERATURES AND STRATIFICATION AND OVERTURN ARE CALCULATED.

<CLASS> PREDICTIVE

<510>

<CONT> MOPEL, FRANCIS H. H.

<TITLE> CHEMICAL MODELING OF METALLIC WASTE DISPOSAL

<ADDR> MASSACHUSETTS INSTITUTE OF TECHNOLOGY, 77 MASSACHUSETTS AVENUE

<CITY> CAMBRIDGE

<STATE> MA

<ZIP> 02139

<ABST>

THE METHODOLOGY IS BASED ON GENERAL CHEMICAL MODEL OF THE WASTE AND OF VARIOUS DILUTIONS OF THE WASTE WITH SEAWATER AND HAS BEEN APPLIED TO THE SPECIFIC CASE OF THE LOS ANGELES COUNTY WASTEWATER DISCHARGE. IT IS PROPOSED TO EXTEND AND IMPROVE THIS WORK USING A NEW CASE STUDY SUCH AS THE DUMPING OF CONCENTRATED ACIDIC METALLIC WASTES. THE PROPOSED WORK WILL INVOLVE INCLUSION OF NEW CHEMICAL DATA IN THE MODEL, IMPROVEMENT OF EXISTING COMPUTER PROGRAM FOR EFFICIENCY AND CONVENIENCE, SIMPLIFICATION AND GENERALIZATION OF ABSORPTION SUBROUTINES AND, IF NECESSARY, IMPLEMENTATION OF SPECIFIC KINETIC SUBROUTINES RELATED TO THE ACID WASTE DISPOSAL PROBLEM. THE GOAL OF THE PROJECT IS TO IMPROVE OUR PREDICTIVE CAPABILITIES FOR ROUTINE USE IN THE

AQUATIC TRANSPORT

<510> CONT.
 VARIOUS MONITORING, IMPACT ASSESSMENT
 AND REMEDIATION ACTIVITIES ASSOCIATED
 WITH METALLIC WASTE DISPOSAL. (T) 5/78
 FINAL REPORT ENTITLED, "CHEMICAL
 MODELING OF METALLIC WASTE DISPOSAL."

<TIME> 77/05-78/05

<CLASS> SIMULATION

<511>
 <CONT> MORSE, WILLIAM L.

<TITLE> STREAM TEMPERATURE MODELING

<ACRO> THERMO

<ABDO> BONNEVILLE POWER ADMINISTRATION, POWER
 MANAGEMENT, P.O. BOX 3621

<CITY> PORTLAND

<STATE> OR

<ZIP> 97208

<PHONE> 503-234-3361; FTS 229-4469

<SOURCE> BONNEVILLE POWER ADMINISTRATION

<DOC> WATER RESOURCES RESEARCH, 14(1), 45-51,
 1978

<SUBJ> STREAM TEMPERATURE FORECASTING

<ABST> THE UNIDIMENSIONAL FORM OF THE THERMAL
 ENERGY CONSERVATION PRINCIPLE AS A
 QUASI-LINEAR PARTIAL DIFFERENTIAL
 EQUATION (PDE) HAS BEEN SHOWN ACCURATE
 FOR POINT TEMPERATURE FORECASTS ON
 COMPLETELY MIXED STREAMS AND RIVER-
 RESERVOIR SYSTEMS. TWO METHODS OF
 SOLUTION ARE PRESENTED WHICH LEAD TO A
 UNIQUE SOLUTION. YET THIS NONRANDOM
 SOLUTION IS CONTRARY TO THE BEHAVIOR OF
 NATURE, AND SO A PHILOSOPHIC CHANGE IS
 INTRODUCED. FROM THE PDE SUBSIDIARY
 DIFFERENTIAL SYSTEM A STOCHASTIC
 DIFFERENTIAL EQUATION (SDE) IS OBTAINED
 WITH RANDOM FORCING FUNCTION FROM THE
 HYDROLOGIC AND FORECAST-DEPTH
 ANALYSES. WITH RANDOM INITIAL
 CONDITIONS (TIME-AVERAGED COMPONENTS OF
 THE IN SITU WATER TEMPERATURE VECTOR)
 THE SDE IS THEN RECAST AS A RANDOM
 NONLINEAR VOLTERRA INTEGRAL EQUATION
 (VIE). THEN A SOLUTION TO THE
 RANDOM-INITIAL-CONDITIONS VIE (FIXED
 POINTS OF THE EXPECTATIONS), BY THE
 SO-CALLED DISCRETE METHOD, IS COMPARED
 WITH A SOLUTION OBTAINED BY
 REPETITIVELY SOLVING THE PDE AS A
 RANDOM EQUATION (EXPECTATIONS OF THE
 FIXED POINTS). OF COURSE, THESE
 SOLUTIONS, OBTAINED BY DISCRETE AND
 NONDISCRETE METHODS, ARE NOT NECESSARILY
 UNIQUE, BUT THEY MAY BE SUFFICIENTLY
 CLOSE IN SOME SENSE. HENCE PROPER
 INTERPRETATION AND USE OF THIS VIE
 MODEL WOULD ENABLE WATER RESOURCE
 PLANNERS ECONOMICALLY TO DETERMINE
 STREAM TEMPERATURES IN PROBABILITY
 DURING CRITICAL CLIMATIC OR RIVER FLOW
 CONDITIONS. AND THEN INTELLIGENT
 PLANNING AND SCHEDULING COULD AVOID
 SOME CATASTROPHIC AQUATIC EVENT WHICH
 MIGHT OCCUR AS A RESULT OF EXTREME
 WATER TEMPERATURES.

<GEO> OREGON; WASHINGTON

<TIME> 1966-1969

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE; DISC; PUNCHED CARDS

<SIZE> 100,000 BYTES

<COMP> IBM; CDC

<CONFIG> CDC 6500-DISCS

<LANG> FORTRAN

<CRAP> BCD

<ALGO> DETERMINISTIC AND RANDOM PARTIAL
 DIFFERENTIAL EQUATION WITH STATISTICAL
 SIMULATION

<CLASS> CONTINUOUS; DETERMINISTIC; STOCHASTIC;
 ANALYTICAL; PREDICTIVE; SIMULATION;
 ENGINEERING PROCESS

<APPL> COOLING POND/CANAL FEASIBILITY, FIS,
 ANADROMOUS FISH MIGRATION, RESERVOIR
 MANAGEMENT AND THERMAL COOLING FOR
 WATER QUALITY STANDARDS, AQUACULTURE
 FEASIBILITY

<SEPS> ENVIRONMENTAL PROTECTION AGENCY,
 BRITISH COLUMBIA HYDRO AND POWER
 AUTHORITY

<END> U.S. ARMY CORPS OF ENGINEERS, NATIONAL
 WEATHER SERVICE

<VAL> DETERMINISTIC MODEL VALIDATION (BOTH
 PARAMETRIC AND NONPARAMETRIC),
 STOCHASTIC MODEL CALIBRATION. THE AREA
 OF STOCHASTIC MODEL VALIDATION IS NEW
 AND EMERGENT.

<CON> EITHER DETERMINISTIC OR
 NONDETERMINISTIC FORECASTING

<UPDATE> 780304

<512>
 <CONT> NORTH, A. N.; SMITH, E. E.; SHARATE, R.
 S.

<TITLE> PYRITIC SYSTEMS: A MATHEMATICAL MODEL

<ADDP> OHIO STATE UNIVERSITY RESEARCH
 FOUNDATION

<CITY> COLUMBUS

<STATE> OH

<DOC> PB--213887/7, 1972

<ABST> A MATHEMATICAL MODEL OF AN ACID MINE
 DRAINAGE SYSTEM HAS BEEN DEVELOPED FOR
 UNDERGROUND MINES. THE MODEL RELATES
 THE RATE OF ACID FORMATION TO THE RATE
 OF POLLUTION DISCHARGE FROM THE SYSTEM.
 THE CALCULATIONAL MODEL WAS DEVELOPED
 USING A DIGITAL COMPUTER TO SIMULATE AN
 EXISTING MINE AS THE SUM OF MANY MICRO
 SCALE MINES. THE INPUT TO THE MODEL IS
 A PHYSICAL AND CHEMICAL DESCRIPTION OF
 THE SYSTEM. DAY-TO-DAY SIMULATION
 REQUIRES DATA ON TEMPERATURE, RAINFALL,
 AND OXYGEN CONCENTRATION AT THE EXPOSED
 COAL FACE. THE OUTPUT OF THE MODEL IS
 ESTIMATES OF DAILY ACID LOAD AND
 DRAINAGE FLOW. THE CALCULATIONAL MODEL
 WAS BASED ON A CAREFULLY DESCRIBED
 PHYSICAL MODEL SO THAT A PREDICTIVE
 MODEL CAN BE CONSTRUCTED WITH LITTLE OR

<512>

AQUATIC TRANSPORT

<512> CONT.

NO EXPERIMENTAL DATA. HOWEVER, METHODS FOR CORRECTING THE COMPUTATIONAL MODEL ARE GIVEN WHICH CAN USE THE FIELD DATA AVAILABLE TO INCREASE THE RELIABILITY.

<612> SIMULATION

<513>

<613> WHEAT, G. E.

<713> TURBULENCE DIFFUSION MODEL OF OIL IN THE OCEAN

<800> LOUISIANA STATE UNIVERSITY, COASTAL SCIENCE INSTITUTE

<910> EAST RANGE

<910> 71

<910> 740701

<910> 508-302-2335

<910> NATIONAL TECHNICAL INFORMATION SERVICE, U.S. DEPARTMENT OF COMMERCE, P.O. BOX 1603, SPRINGFIELD, VA 22151

<910> TECHNOLOGY AND OCEANOGRAPHY, 16, 651-660, SEPT. 1972; REPORT NO. TR-140; CONTRACT NO. 014-49-4-1211-0001; MONITORING AGENCY REPT. NO. 12; PROJ. 44-144-002, 72, 14 OF: WIND AND CURRENT EFFECTS ON LARGE-SCALE OIL SLICKS. PREPRINTS, SEVENTH ANNUAL OFFSHORE TECHNOLOGY CONFERENCE, HOUSTON, TEXAS, MAY 5-8, 1975, PP. 521-523, SEPTEMBER 1975, ADA0712 582.

<910> SPREADING OF OIL FROM AN OFFSHORE PLATFORM (CONTINUOUS SOURCE)

<910> OBSERVATIONS OF OIL-SLICK GEOMETRY AND CURRENT SPEED FROM A CONTINUOUSLY EJECTING SOURCE HAVE PERMITTED A COMPARATIVE EVALUATION OF THE ROLE OF LARGE-SCALE TURBULENCE AND EFFECTS OF SURFACE TENSION IN CONTROLLING THE SPREADING OF OIL ON AN OCEAN SURFACE. THE APPROPRIATE SIZE AND SHAPE OF A GIVEN OIL SLICK ARE SHOWN TO BE PREDICTABLE, UTILIZING PICKIAN DIFFUSION THEORY, FROM KNOWLEDGE OF THE SURFACE CURRENT SPEED, HORIZONTAL EDDY DIFFUSIVITY, AND RATE OF OIL DISCHARGE. THE EFFECT OF SURFACE TENSION SEEMS TO BE CONFINED TO THE FIRST FEW HUNDRED METERS DOWNSLICK AND CAN PROBABLY BE IGNORED FOR PRACTICAL PURPOSES UNDER MODERATE OIL DISCHARGE AND WITH CURRENT SPEEDS AS LOW AS 5 CM/SEC. THE USE OF THE MODEL PRESENTED HERE WOULD AID IN ASSESSING THE GENERAL GEOMETRY AND SPEED OF AN OIL SLICK AND ELIMINATE THE NEED FOR LARGE AMOUNTS OF INPUT DATA AND EXPENSIVE CONTINUOUS AERIAL RECONNAISSANCE.

<910> COASTAL WATERS, GULF OF MEXICO

<910> 1972

<910> IN USE

<910> UNINTYPED

<910> TEXT

<910> NP

<910> NP 65

<910> 750003

<910> COMBINATION OF BOTH TAYLOR AND CLASSICAL PICKIAN DIFFUSION THEORIES

<910> ANALYTICAL; PREDICTIVE

<910> UNKNOWN

<910> INTERNAL TECHNICAL REPORTS AND DATA SUPPLIED BY CHEVRON OIL CO.

<910> COMPARED TO FULL SCALE FIELD OBSERVATIONS

<910> 740705

<514>

<614> NEELY, W. B.; BLAY, G. B.; ALFREY, D. C.

<714> MATHEMATICAL MODELS PREDICT CONCENTRATION-TIME PROFILES RESULTING FROM CHEMICAL SPILL IN A RIVER

<800> ENVIRONMENTAL SCIENCE, 10(1), P 72-76, 1976

<910> WITH THE INCREASED USE OF THE NATION'S WATERWAYS FOR THE TRANSPORTATION OF MATERIALS, THERE IS AN INCREASE IN THE PROBABILITY OF SPILLS. ONCE SUCH A SPILL HAS OCCURRED, THERE IS AN IMMEDIATE NEED TO PREDICT THE CONCENTRATION PROFILE OF THE CHEMICAL AS THE SPILL TRAVELS IN ORDER TO ASSESS THE IMPACT TO BOTH HUMANS AND THE ENVIRONMENT. THIS PAPER DISCUSSES THE USE OF A MATHEMATICAL MODEL THAT HAS THIS PREDICTIVE CAPABILITY FOR COMMON SPILLS. ALTHOUGH THE MODEL WAS DERIVED FROM THE ASSUMPTION THAT THE CHEMICALS ARE COMPLETELY WATER SOLUBLE, IT IS ALSO USEFUL FOR PARTIALLY SOLUBLE MATERIALS. THE CREDIBILITY OF THE MODEL WAS DEMONSTRATED BY COMPARING THE CONCENTRATION PROFILE PREDICTED WITH THE ACTUAL PROFILES MEASURED IN TWO DIFFERENT INCIDENTS. THE MODEL FIT THE DATA ADEQUATELY AND PROVIDED A PLAUSIBLE EXPLANATION OF A CHLOROPROP SPILL IN THE MISSISSIPPI RIVER. IT DEMONSTRATES HOW THE SOLUBLE CONTAMINANT CONCEPTS CAN BE MODIFIED VIA AN INTERACTIVE MODEL-BUILDING PROCEDURE TO ARRIVE AT A MODEL SUITABLE FOR DESCRIBING A CONTAMINANT WITH DIFFERENT PHYSICOCHEMICAL PROPERTIES.

<910> 6 REFERENCES, 6 FIGURES, 2 TABLES

<515>

<615> NELSON, R. W.

<715> OBTAINING LOCATION/ARRIVAL-TIME AND LOCATION/OUTFLOW-QUANTITY DISTRIBUTIONS FOR STEADY FLOW SYSTEMS

<800> BCS RICHLAND INC., SCIENTIFIC SYSTEMS DEPARTMENT

<910> RICHLAND

<910> WA

<910> BCSR--6, 1977

<910> A STEADY, TWO-DIMENSIONAL FLOW SYSTEM IS USED TO DEMONSTRATE THE APPLICATION OF LOCATION/ARRIVAL-TIME AND LOCATION/OUTFLOW-QUANTITY CURVES IN

ROMATIC TRANSCRIPT

<515> CONT.

DETERMINING THE ENVIRONMENTAL CONSEQUENCES OF GROUNDWATER CONTAMINATION. THE SUBSURFACE GEOLOGIC AND HYDROLOGIC EVALUATIONS NEEDED TO OBTAIN THE APPRAISAL RESULTS INVOLVE A SEQUENCE OF FOUR PHASES: SYSTEM IDENTIFICATION, NEW POTENTIAL DETERMINATION, FLOW SYSTEMS KINEMATICS, AND CONTAMINANT TRANSPORT ANALYSIS. ONCE THESE PHASES ARE COMPLETED, THEY ARE EFFECTIVELY SUMMARIZED AND EASILY USED TO EVALUATE ENVIRONMENTAL CONSEQUENCES THROUGH THE APPRAISAL DISTRIBUTIONS.

<516>

<CONT>

SCOTTSON, B. J.; ROCKISON, A. E.;
FREDRICKS, A. S. W.

<TITLE>

A BICENERGETICS-BASED MODEL FOR
POLLUTANT ACCUMULATION BY FISH
SIMULATION OF PCB AND METHYLMERCURY
RESIDUE LEVELS IN CATAWBA RIVER YELLOW
PERCH (PERCA FLAVESCENS)

<DOC>

JOURNAL OF THE FISHERIES RESEARCH BOARD
OF CANADA, 33(13), 244-267, 1976

<ABST>

A POLLUTANT ACCUMULATION MODEL IS
DEVELOPED WHICH SUCCESSFULLY PREDICTS
CONCENTRATIONS OF PCB'S AND
METHYLMERCURY IN TISSUE OF YELLOW PERCH
(PERCA FLAVESCENS). THE MODEL IS BASED
ON POLLUTANT BIONOMETRICS COUPLED TO
FISH ENERGETICS. THE EXPRESSION FOR
METABOLIC RATE INCLUDES A GROWTH
DEPENDENT TERM FOR ESTIMATING THE
CONTRIBUTION TO METABOLISM OF SEASONAL
AND ANNUAL GROWTH IN EACH AGE-CLASS.
POLLUTANT CLEARANCE IS RELATED TO BODY
WEIGHT RAISED TO THE POWER OF -.49, BUT
IS INDEPENDENT OF METABOLIC RATE.
UNDER STEADY STATE CONDITIONS OF
CHRONIC EXPOSURE, THE PREDICTED RATIO
OF DECAY TO CLEARANCE IS ROUGHLY
CONSTANT AT ALL WEIGHTS, AND THE SLOPE
OF A CURVE OF LOG POLLUTANT
CONCENTRATION IN TISSUES VERSUS LOG
BODY WEIGHT CAN BE USED TO ESTABLISH
THE EXPONENT OF BODY WEIGHT FOR
CLEARANCE.

<CON>

51 REFERENCES, 7 TABLES, 8 FIGURES

<517>

<CONT>

NOT GIVEN

<TITLE>

DELAWARE ESTUARY AND BAY WATER QUALITY
SAMPLING AND MATHEMATICAL MODELING
PROJECT

<ADD>

DELAWARE RIVER BASIN COMMISSION

<ABST>

AS A RESULT OF A DEMONSTRATION GRANT
FOR WATER QUALITY SAMPLING AND
MATHEMATICAL MODELING, A LARGE-SCALE
SAMPLING PROGRAM WAS UNDERTAKEN IN JULY
1967 IN WHICH CONTRACTS WERE LET TO
ESTABLISH SAMPLING AND ANALYSES OF
IMPORTANT WATER QUALITY PARAMETERS IN
THE DELAWARE ESTUARY. THE SAMPLING
PROGRAM CONTINUED BEYOND THE GRANT,
FINANCIALLY SUPPORTED BY THE DELAWARE
RIVER BASIN COMMISSION. THE DATA THAT
WAS OBTAINED REPRESENTED THE EFFECT OF
THE WASTE DISCHARGE COMING INTO THE
ESTUARY, STORMWATER RUNOFF, AND QUALITY
OF OTHER WATER FROM THE TRIBUTARIES OF
THE RIVER. THE DATA WAS RELATED TO THE
DIFFERENT SEASONS OF THE YEAR, AS WELL

AS TO VARIOUS DISCHARGES. WEEKLY BOAT
TUGS WERE MADE OVER 17 SAMPLING
STATIONS LOCATED BETWEEN FIELDSBORO,
NEW JERSEY AT THE UPPER END AND REEDY
ISLAND, DELAWARE, NEAR THE LOWER END OF
THE ESTUARY. A COMPARISON WAS MADE OF
WATER QUALITY OF THE ESTUARY BETWEEN
THE PRESENT STUDY PERIOD AND A RECORD
FROM 1949 TO 1963. SPECIFIED
MEASUREMENTS OF PARAMETERS SUCH AS
DISSOLVED OXYGEN AND TEMPERATURE WERE
USED IN THE REFINEMENT OF THE STEADY
STATE MODEL USED. THIS MODEL WAS
EXPANDED INTO A TIME-VARYING MODEL TO
THAT PERIODIC DO PROFILES COULD BE
PREDICTED. PROCEDURES WERE SET UP TO
INSERT ALL OF THE DELAWARE BOAT TUG
DATA INTO THE MODEL SYSTEM FOR
COMPUTER STORAGE.

<GEO>

NEW JERSEY, DELAWARE RIVER; DELAWARE,
DELAWARE RIVER

<CLASS>

SIMULATION

<519>

<CONT>

NOT GIVEN

<TITLE>

THE COLNEAT RIVER SIMULATION MODEL

<ADD>

HANFORD ENGINEERING DEVELOPMENT
LABORATORY, P.O. BOX 1970

<CITY>

RICHLAND

<STATE>

WA

<ZIP>

99352

<DOC>

HEDL-TR-72-103, 79 PP., 1972

<ABST>

THE COLNEAT RIVER SIMULATION MODEL HAS
BEEN USED PRIMARILY TO SIMULATE WATER
TEMPERATURES IN A FLOWING STREAM.
HOWEVER, THE MATHEMATICAL MODEL,
ORIGINALLY DEVELOPED TO ESTIMATE THE
EFFECT ON THE COLUMBIA OF THE HANFORD
PRODUCTION REACTORS, HAS BEEN
FORMULATED AND STRUCTURED IN SUCH A
MANNER THAT IT CAN BE USED TO SIMULATE
THE BEHAVIOR OF POLLUTANTS OTHER THAN
WASTE HEAT. TESTING AND APPLICATION OF
THE MODEL TO "REAL WORLD" SITUATIONS
HAS PROMPTED DEVELOPMENT OF SPECIALIZED
ROUTINES TO INCLUDE PROVISIONS FOR
HANDLING TRANSIENT FLOW, REVERSE FLOW,
DIFFUSIONAL TRANSPORT AND DENSITY
CURRENTS. THE MODEL HAS BEEN TESTED
UNDER A VARIETY OF CONDITIONS AND HAS
GIVEN EXCELLENT RESULTS. CONTAINED
WITHIN THIS REPORT ARE DISCUSSIONS OF
THE UNDERLYING THEORY, THE DEVELOPMENT
OF THE COMPUTER MODEL, THE RESULTS OF
VARIOUS MODEL TESTS, AND A BRIEF USER'S
GUIDE.

<COMP>

UNI

<CONFIG>

UNIVAC 1108

<LANG>

FORTRAN IV

<CON>

THE PROGRAM IS WRITTEN IN FORTRAN IV
FOR THE UNIVAC 1108. EXTENSIVE
DOCUMENTATION IS PRESENTED.

<519>

<CONT>

NOT GIVEN

<TITLE>

A MODEL FOR CALCULATING EFFECTS OF
LIQUID WASTE DISPOSAL IN DEEP SALINE

<519>

AQUATIC TRANSPORT

<519> CONT.

RORTSEB

<ADDP> INTERCOMP RESOURCE DEVELOPMENT AND
ENGINEERING, INC.

<CITY> HONOLULU

<STATE> HI

<DOC> ER--256951, 1974

<ABST> A TRANSIENT, THREE-DIMENSIONAL
SURFACE WASTE-DISPOSAL MODEL HAS
BEEN DEVELOPED TO PROVIDE METHODOLOGY
TO DESIGN AND TEST WASTE-DISPOSAL
SYSTEMS. THE MODEL IS A
FINITE-DIFFERENCE SOLUTION TO THE
PRESSURE, ENERGY, AND MASS-TRANSPORT
EQUATIONS. EQUATION PARAMETERS SUCH AS
VISCOSITY AND DENSITY ARE ALLOWED TO BE
FUNCTIONS OF THE EQUATIONS' DEPENDENT
VARIABLES. MULTIPLE USER OPTIONS ALLOW
THE CHOICE OF X, Y, AND Z CARTESIAN OR
R AND Z RADIAL COORDINATES. VARIOUS
FINITE-DIFFERENCE METHODS, ITERATIVE
AND DIRECT MATRIX SOLUTION TECHNIQUES,
PRINT OPTIONS, AND VARIOUS PROVISIONS
FOR OUTPUT DISPLAY. THE ADDITION OF
HEIL-PAGE HEAT AND PRESSURE-LOSS
CALCULATIONS TO THE MODEL MAKES
AVAILABLE TO THE GROUND-WATER
HYDROLOGIST THE MOST RECENT ADVANCES
FROM THE OIL AND GAS RESERVOIR
ENGINEERING FIELD.

<520>

<CONT> NOT GIVEN

<TITLE> THE RIVER BASIN MODEL: COMPUTER OUTPUT

<ADDP> RBN

<DOC> RR-210 809

<ABST> THE RIVER BASIN MODEL IS A MAN-MACHINE
SIMULATION MODEL USED TO DELINEATE THE
INTERACTIONS TAKING PLACE, WITHIN A
REAL OR HYPOTHETICAL AREA, BETWEEN THE
LOCAL WATER SYSTEM AND THE ECONOMIC,
SOCIAL, AND GOVERNMENTAL ACTIVITIES OF
THAT AREA; IT IS A MODEL OF AN ENTIRE
REGIONAL SYSTEM, WITH WATER A SUBSYSTEM
REALISTICALLY INTERACTING WITH ALL THE
OTHER MAJOR SUBSYSTEMS, SUCH AS
TRANSPORTATION AND HOUSING. A GAINING
FORMAT IS EMPLOYED, AND MODEL USEPS
PROVIDE INPUTS TO THE COMPUTER PROGRAMS
WHICH SIMULATE THE MAJOR PROCESSES. THE
FUNCTIONS OF THE COMPUTER ARE
PRESENTED, AND THE COMPUTER PRINTED
OUTPUT IS DESCRIBED IN DETAIL. THE
COMPUTER STORES AND UPDATES ALL
RELEVANT STATISTICS FOR THE AREA,
SIMULATES THE ACTIONS OF THE OUTSIDE
SYSTEMS (SUCH AS A NATIONAL BUSINESS
CYCLE), AND PERFORMS CERTAIN ROUTINE,
OTHERWISE TIME-CONSUMING PROCESSES
(SUCH AS CALCULATING A COMPREHENSIVE
WATER QUALITY INDEX).

<CIAS> SIMULATION

<521>

<CONT> NOT GIVEN

<TITLE> POTOMAC RIVER TEMPERATURE RISE
DISTRIBUTION AND DIFFUSION PARAMETER
EVALUATION

<ADDP> ERASCO SERVICES INC.

<CITY> NEW YORK

<STATE> NY

<DOC> INCLUDED AS APPENDIX 5B (APPENDIX NO.
5, SEPT. 1974) IN DOUGLAS POINT NUCLEAR
GENERATING STATION UNITS 1 AND 2
ENVIRONMENTAL REPORT, POTOMAC ELECTRIC
POWER CO., 1973.

<ABST> AN UNSTEADY-STATE, ONE DIMENSIONAL
MATHEMATICAL MODEL IS DEVELOPED TO
PREDICT LONGITUDE, CROSS-SECTION AND
TIDAL AVERAGE OF TEMPERATURE RISE
DISTRIBUTION IN ESTUARY. A DETAILED
DISCUSSION OF THIS TRANSIENT
ONE-DIMENSIONAL ANALYSIS IS INCLUDED.
LONGITUDINAL DIFFUSION CHARACTERISTICS
FOR MEAN FLOW CONDITIONS ARE ESTIMATED
TO BE ABOUT 2.295 SQUARE FEET PER DAY
AND THE MAXIMUM CROSS-SECTIONAL
AVERAGE TEMPERATURE RISE IS CALCULATED
TO BE LESS THAN 0.15 DEGREE F.

<GE> POTOMAC RIVER

<522>

<CONT> NOT GIVEN

<TITLE> THERMAL DISPERSION MODELING OF THE
PROPOSED MORCO NUCLEAR POWER PLANT

<ADDP> PATHEON COMPANY

<CITY> PORTSMOUTH

<STATE> RI

<ZIP> 02871

<DOC> PREPARED FOR UNITED ENGINEERS AND
CONSULTANTS. INCLUDED AS EXHIBIT 5,
IN, NORTH COAST NUCLEAR PLANT NO. 1
ENVIRONMENTAL REPORT, PUERTO RICO WATER
RESOURCES AUTHORITY, SEPTEMBER 1974.

<ABST> A THERMAL MODEL WAS USED TO CALCULATE
THE PROBABLE DISTRIBUTION OF EXCESS
TEMPERATURE. THE MODEL WAS USED TO
ESTIMATE THERMAL PLUME AREAS AND
LENGTH. RESULTING FROM THE THERMAL
DISCHARGE CHARACTERISTIC FOR A SINGLE
PORT DIFFUSER. THE EXHIBIT CONTAINS 85
FIGURES, 10 TABLES, AND 25 REFERENCES.

<523>

<CONT> NOT GIVEN

<TITLE> MATHEMATICAL MODELING OF TEMPERATURE
EFFECTS IN TIDAL WATERS

<ADDP> LONG ISLAND LIGHTING COMPANY

<STATE> NY

<DOC> APPENDIX 1, JAMESPORT NUCLEAR POWER
STATION UNITS 1 AND 2 ENVIRONMENTAL
REPORT, LONG ISLAND LIGHTING COMPANY,
SEPT. 1974.

<ABST> THE MATHEMATICAL MODEL PROVIDES A
GENERALIZED ANALYTICAL RELATION BETWEEN
THE DIFFUSER AND THE ASSOCIATED
TEMPERATURE EFFECTS IN THE TIDAL WATERS
AT JAMESPORT. PARTICULARLY, IT
CORRELATES THE TEMPERATURE RISE AT THE
WATER SURFACE NEAR THE PROPOSED
DIFFUSER SITE WITH (1) STATION
OPERATING CONDITIONS, (2)
CHARACTERISTICS OF THE DIFFUSER, (3)

AQUATIC TRANSECT

<523> CONT.

NATURAL FLOW AND TEMPERATURE CONDITIONS IN THE BEAR FIELD, AND (4) DISPERSION, WENT TRANSPORT TO ATMOSPHERE, AND PRECIPITATION EFFECTS FROM THE BEAR FIELD. THE MODEL INCORPORATES HYDROTHERMAL FIELD STUDIES PERFORMED AT THE JAMESPORT SITE WHICH DETERMINED THE NATURAL FLOW RATE. THEORETICAL DILUTION FACTORS WERE USED TO DEVELOP CURVES SHOWING PORE SIZE VS. DILUTION FACTORS. APPENDIX CONTAINS 5 FIGURES AND 6 REFERENCES.

<524>

<CONT> NOT GIVEN

<TITLE>

CONCENTRATIONS IN THE SOUTH TEXAS PROJECT COOLING RESERVOIR, BLOW-DOWN AND EVAPORATION

<ADDR>

HOUSTON LIGHTING AND POWER COMPANY

<CITY>

HOUSTON

<STATE>

TX

<DOC>

APPENDIX 5.3-9, SOUTH TEXAS PROJECT UNITS 1 AND 2 ENVIRONMENTAL REPORT, JULY 1978.

<ABST>

CONTAINS MODEL WHICH CALCULATES AVERAGE RADIOISOTOPE CONCENTRATION AS A FUNCTION OF TIME IN THE SOUTH TEXAS PROJECT COOLING RESERVOIR, AND THE RESERVOIR'S BLOWDOWN AND EVAPORATION, RESULTING FROM TWO-UNIT PLANT OPERATION. THE MODEL IS BASED ON A 60-YEAR SIMULATED COOLING RESERVOIR SCHEME, AND INCLUDES VARIABLES OF 27 RADIOISOTOPES, SOURCE TERMS, RADIOISOTOPE DECAY FACTOR, RESERVOIR ELEVATION, BLOWDOWN AND MAKE-UP, AVERAGE AND MAXIMUM RADIOISOTOPE CONCENTRATIONS IN THE RESERVOIR, BLOWDOWN AND EVAPORATION (TYPICAL ONLY) ARE CALCULATED ON MONTHLY, YEARLY AND PERIOD OF RECORD BASIS.

<525>

<CONT> NOT GIVEN

<TITLE>

MATHEMATICAL DISPERSION MODEL FOR HEATED DISCHARGES

<ADDR>

TOLEDO Edison COMPANY

<CITY>

TOLEDO

<STATE>

OH

<DOC>

APPENDIX 6A, DAVIS-BESSE NUCLEAR POWER STATION UNITS 1 AND 2 ENVIRONMENTAL REPORT, AUG. 1978.

<ABST>

APPENDIX CONTAINS A MATHEMATICAL MODEL IMPLEMENTED ON A HIGH-SPEED DIGITAL COMPUTER TO EVALUATE THE PHYSICAL IMPACT OF DAVIS-BESSE THERMAL DISCHARGE TO LAKE ERIE. THE PERFORMANCE EVALUATION OF THE DISCHARGE STRUCTURE HAS BEEN CONDUCTED AND A CODE DESIGNATED HURDUS HAS BEEN DEVELOPED FOR SUMMER DISCHARGES. FOR THE PURPOSE OF MATHEMATICAL MODEL DEVELOPMENT, THE EFFLUENT DISCHARGE IS DIVIDED INTO THE DYNAMIC JET DISCHARGE REGION AND THE PASSIVE DIFFUSION REGION. THE APPENDIX DESCRIBES THIS MODEL IN 3 PARTS: (1) SUBSURFACE JET DISPERSION ANALYSIS, (2) CORRELATION

OF ANALYTICAL PREDICTIONS WITH EXPERIMENTAL RESULTS, (3) PASSIVE TURBULENT DIFFUSION ANALYSIS, (4) ANALYTICAL APPROACH, AND (5) METHOD OF SOLUTION.

<526>

<CONT> NOT GIVEN

<TITLE>

PARAMETERIZED MODEL OF PRECIPITATION AND BEAR FIELD RE-ENTRAPMENT

<ADDR>

PUBLIC SERVICE ELECTRIC AND GAS COMPANY

<CITY>

NEWARK

<STATE>

NJ

<DOC>

FIGURE 5.1-15, ATLANTIC GENERATING STATION UNITS 1 AND 2 ENVIRONMENTAL REPORT, MARCH 1978.

<ABST>

FIGURE DEPICTS OVERALL CIRCULATING WATER FLOW DIAGRAM FOR THE OFFSHORE ATLANTIC GENERATING STATION. PARAMETERS SHOWN IN THE FIGURE INCLUDE VOLUME SPECIFIC HEAT OF WATER, DISCHARGE WATER FLOW, INTAKE WATER TEMPERATURE, AMBIENT WATER TEMPERATURE, AVERAGE TEMPERATURE AT END OF BEAR FIELD, COMBINED CONDENSED WATER AND SERVICE WATER TEMPERATURE RISE, BEAR FIELD DILUTION-RATIO OF MIXED WATER LEAVING BEAR FIELD TO DISCHARGE FLOW, INTAKE PRECIPITATION COEFFICIENT OR FRACTION OF WATER DRAWN FROM THE BEAR FIELD, AND BEAR FIELD RE-ENTRAPMENT OR FRACTION OF WATER DRAWN FROM BEAR FIELD PREVIOUSLY MIXED BEAR FIELD WATER.

<527>

<CONT> NOT GIVEN

<TITLE>

FINAL COASTAL PROCESS REPORT, ATLANTIC GENERATING STATION

<ADDR>

PUBLIC SERVICE ELECTRIC AND GAS COMPANY

<CITY>

NEWARK

<STATE>

NJ

<DOC>

APPENDIX D.13 (SUPPL. 21, DEC. 1975), ATLANTIC GENERATING STATION UNITS 1 & 2 ENVIRONMENTAL REPORT, PUBLIC SERVICE ELEC. & GAS CO., MARCH 1978. 783 PP.

<ABST>

APPENDIX PRESENTS PROCESS-RESPONSE MODEL FOR SEDIMENT TRANSPORT IN NEARSHORE AND OFFSHORE AREAS OF ATLANTIC GENERATING STATION, 2.0 MI. SEABARD OF LITTLE EGGS INLET, NJ. STUDY INVOLVED THE FOLLOWING COMPONENTS: 1) MAPPING AND MONITORING OF GEOMORPHIC ELEMENTS IN NEARSHORE AND OFFSHORE ZONES; 2) REVIEW AND EVALUATION OF RECORDED HISTORICAL CHANGES IN NEARSHORE AND OFFSHORE GEOMORPHOLOGY; 3) SYNTHESIS AND EVALUATION OF DYNAMIC ASPECTS OF ENVIRONMENT; 4) MAPPING DISTRIBUTION OF BOTTOM SEDIMENTS FOR AREA; AND 5) INTERPRETATION OF RESPONSE ELEMENTS, THE GEOMORPHIC COMPONENTS AND THEIR DYNAMIC HISTORIES, AND THE SEDIMENT CHARACTERISTICS WITH CURRENT THEORIES OF SEDIMENT TRANSPORT FOR THIS HYDRAULIC SETTING. TO ASSESS IMPACT ON COASTAL PROCESSES IN VICINITY OF AGS, OFFSHORE STRUCTURES THAT MIGHT BE CONSIDERED SIMILAR WERE INVESTIGATED FOR THEIR IMPACTS ON THEIR OWN LOCAL

<527>

ROTATIC TRANSPORT

<527> CONT.

ENVIRONMENTS. THESE STRUCTURES INCLUDED TUNES AND ESTUARY ISLANDS, CA; BINGON ISLAND, CA; THE CHESAPEAKE BAY BRIDGE AND TUNNEL SYSTEM; AND SHIPBOARDS OFF SHORE OF NEW JERSEY. APPENDIX INCLUDES 126 FIGURES, 31 TABLES, 179 REFERENCES, AND 1 APPENDIX.

<GEN> NEW JERSEY, LITTLE ROCK ISLET

<528>

<CONT> NOT GIVEN

<TITLE> ESTIMATED PLUME SURFACE TEMPERATURES AFTER INTERFERENCE

<DOC> FIGURE 5.1-13, ST. LUCIE PLANT UNIT NO. 2 ENVIRONMENTAL REPORT, FLORIDA POWER & LIGHT CO., 1971, 1 P.

<ABST> FIGURE SHOWS SCHEMATIC DIAGRAM OF MATHEMATICAL MODEL USED TO DETERMINE SYNTHETIC SURFACE WATER TEMPERATURES AFTER INTERFERENCE BETWEEN DISCHARGE PLUMES FROM ST. LUCIE UNITS 1 AND 2. PARAMETERS INCLUDE VOLUME DISCHARGE RATE FROM A JET OF UNIT 2'S DIFFUSER; EXCESS TEMPERATURE OF UNIT 2 DISCHARGE; VOLUMETRIC ENTRAINMENT RATE OF SURFACED WATER; EXCESS TEMPERATURE OF SURFACED WATER; VOLUMETRIC ENTRAINMENT RATE AND EXCESS TEMPERATURE OF UNIT 1 DIFFUSION SLAB (LAYER); VOLUMETRIC FLOW RATE OF UNIT 2 EFFLUENT AT OCEAN SURFACE; DILUTION FACTOR UP TO BOTTOM OF DIFFUSION SLAB; AND DILUTION FACTOR UP TO OCEAN SURFACE.

<GEN> FLORIDA, ST. LUCIE COUNTY

<529>

<CONT> NOT GIVEN

<TITLE> HYDROLOGY MODEL EVALUATION AT THE HANFORD NUCLEAR WASTE FACILITY

<ADDR> INTERA ENVIRONMENTAL CONSULTANTS INC., 1201 DAIRY ASHFORD ROAD, SUITE 200

<CITY> HOUSTON

<STATE> TX

<ZIP> 77079

<PHONE> 713-897-8805

<ABST> ONE AND TWO-DIMENSIONAL FLOW AND CONTAMINANT TRANSPORT COMPUTER MODELS HAVE BEEN DEVELOPED AT HANFORD TO ASSESS THE RATE AND DIRECTION OF CONTAMINANT MOVEMENT FROM WASTE DISPOSAL SITES. THE PRIMARY OBJECTIVE OF THIS WORK WAS TO EVALUATE THE POTENTIAL IMPROVEMENT IN ACCURACY THAT A THREE-DIMENSIONAL MODEL MIGHT OFFER OVER THE SIMPLER ONE AND TWO-DIMENSIONAL MODELS. INTERA'S HYDROLOGY CONTAMINANT TRANSPORT MODEL WAS USED FOR THIS EVALUATION. ALTHOUGH THIS STUDY WAS CONCEPTUAL IN NATURE, AN ATTEMPT WAS MADE TO RELATE IT AS CLOSELY AS POSSIBLE TO HANFORD CONDITIONS. TWO-DIMENSIONAL MODEL RUNS WERE PERFORMED OVER THE PERIOD OF 1960 TO 1973 USING ESTIMATES OF WASTE DISCHARGE FLOWS, TRITIUM CONCENTRATIONS, VERTICALLY AVERAGED VALUES OF AQUIFER PROPERTIES AND BOUNDARY CONDITIONS. THE WELL TEST

INTERPRETATION RUNS CONSIDERED THE APPLICABILITY OF THE AREAL HYDRAULIC CONDUCTIVITY DISTRIBUTIONS. VELOCITY FIELDS CALCULATED BY THE TWO-DIMENSIONAL AND THREE-DIMENSIONAL MODELS AND SURFACE CONCENTRATION PROFILES CALCULATED BY THE TWO-DIMENSIONAL AND THREE-DIMENSIONAL MODELS SHOW SIGNIFICANT DIFFERENCES. VERTICAL CONCENTRATION PROFILES CALCULATED BY A THREE-DIMENSIONAL MODEL SHOW BETTER QUALITATIVE AGREEMENT WITH THE LIMITED OBSERVED CONCENTRATION PROFILE DATA SUPPLIED BY ARRCO.

<530>

<CONT> NOT GIVEN

<TITLE> DOSAG-1, SIMULATION OF WATER QUALITY IN STREAMS AND CANALS: PROGRAM DOCUMENTATION AND USERS MANUAL

<ADDR> DOSAG-1

<ADDR> TEXAS WATER DEVELOPMENT BOARD, SYSTEMS ENGINEERING DIVISION

<CITY> AUSTIN

<STATE> TX

<SOURCE> U.C. BERK. NAT. RES. ARCHIV G/209/XNF; U.C. BERK. EARTH SCI. LIB. G8705/TRA50; NATIONAL TECHNICAL INFORMATION SERVICE, SPRINGFIELD, VA, USA. ORDER NUMBER PB-202 974

<DOC> TEXAS WATER DEVELOPMENT BOARD, REPORT EPA-OWP-TEX-DOSAG-1; 51 PP., 1970

<ABST> A MATHEMATICAL MODEL WAS DEVELOPED TO CALCULATE THE BIOCHEMICAL OXYGEN DEMAND AND THE MINIMUM DISSOLVED OXYGEN CONCENTRATION IN A PARTICULAR STREAM SYSTEM. THE MINIMUM DISSOLVED OXYGEN CONCENTRATION IN THE STREAM SYSTEM MAY BE CHECKED AGAINST A PRESPECIFIED TARGET LEVEL DISSOLVED OXYGEN CONCENTRATION. IF THE MINIMUM DISSOLVED OXYGEN LEVEL IS BELOW THE TARGET DISSOLVED OXYGEN LEVEL, THE PROGRAM WILL COMPUTE THE REQUIRED AMOUNT OF FLOW AUGMENTATION TO BRING THE DISSOLVED OXYGEN LEVEL UP TO THE TARGET LEVEL IN THE ENTIRE SYSTEM. THE USER OF THE PROGRAM SPECIFIES THE LOCATIONS WITHIN THE STREAM SYSTEM AT WHICH DILUTION WATER IS AVAILABLE FOR FLOW AUGMENTATION. THE PROGRAM IS DESIGNED TO BE RUN FOR VARYING CLIMATIC AND HYDROLOGIC CONDITIONS DURING A 12-MONTH PERIOD. THUS, IT IS POSSIBLE TO ENTER UP TO 12 DIFFERENT TEMPERATURES AND CORRESPONDING DISCHARGES TO EACH OF THE HEADWATERS WITHIN THE STREAM SYSTEM BEING MODELED. THIS MODEL (DOSAG-1) IS QUITE FLEXIBLE AND CAN BE ADAPTED TO ANY STREAM SYSTEM. ONE MAJOR RESTRICTION IS THAT LARGE IMPOUNDMENTS SUCH AS RESERVOIRS CANNOT BE CONSIDERED BY THIS PROGRAM.

<CON> 7 REFERENCES; 7 FIGURES; 3 TABLES

<531>

<CONT> NOVOTNY, V.; KREHSEL, P. A.

<TITLE> A WASTE ASSIMILATIVE CAPACITY MODEL FOR A SHALLOW, TURBULENT STREAM

<ADDR> DOSAG1

AQUATIC TRANSPORT

<531> CONT.

<ADDR> MARQUETTE UNIVERSITY, DEPARTMENT OF CIVIL ENGINEERING, 1515 N. WISCONSIN AVENUE

<CITY> GREENBAY

<STATE> WI

<ZIP> 53233

<DOC> WATER RESEARCH, 9(2), 233-241, 1975

<ABST> A MATHEMATICAL WATER QUALITY MODEL (QCSAGM) FOR SELF-PURIFICATION OF SMALL STREAMS WAS MODIFIED AND APPLIED FOR THE WASTE ASSIMILATIVE CAPACITY DETERMINATION OF A SHALLOW TURBULENT STREAM IN TENNESSEE. THE MODEL IS A STEADY STATE DISSOLVED OXYGEN BALANCE MODEL WHICH SOLVES SIMULTANEOUSLY THE THREE BASIC EQUATIONS FOR DEOXYGENATION, NITRIFICATION, AND DISSOLVED OXYGEN CONCENTRATION. VERIFICATION OF THE MODEL, WITH THE DATA FROM TWO WATER QUALITY SURVEYS, DEMONSTRATED THAT THE MODEL CAN BE SUCCESSFULLY APPLIED (INCLUDING THE EFFECT OF PHOTOSYNTHESIS BY AQUATIC WEEDS). THE MODEL REQUIRES DETERMINATION OF DEOXYGENATION AND GRADE OF WASTEWATER TREATMENT. THE SOLUTION RATIO INCLUDES TEMPERATURE, THE DEOXYGENATION COEFFICIENT, STEADY-STATE WASTEWATER LOADS, STREAM DEPTH, AND THE REAERATION COEFFICIENT AS FACTORS FOR THE WASTE ASSIMILATIVE CAPACITY DETERMINATION.

<GEO> TENNESSEE

<532>

<COMP> NOVOTNY, V.; KREHSEL, P. A.

<TITLE> SIMPLIFIED MATHEMATICAL MODEL OF TEMPERATURE CHANGES IN RIVERS

<ADDR> ASSOCIATED WATER AND AIR RESOURCES ENGINEERS, INC.

<CITY> NASHVILLE

<STATE> TN

<DOC> JOURNAL WATER POLLUTION CONTR. FEDERATION; 45(2), 240-248, 1973.

<ABST> A MATHEMATICAL MODEL OF RIVER TEMPERATURE COMPUTATIONS BASED ON THE GENERAL EQUATIONS OF TURBULENT HEAT TRANSFER WAS DEVELOPED AND LABORATORY AND FIELD TESTED. THE MODEL TAKES INTO ACCOUNT THE DYNAMIC CHARACTER OF THE AIR-WATER INTERFACE WHERE BOTH BOUNDARIES ARE MOVING AND TURBULENT. FOR A KNOWN NATURAL WATER TEMPERATURE, THE DETERMINATION AND THE DISSIPATION OF AN IMPOSED HEAT LOAD IS SIGNIFICANTLY SIMPLIFIED, INASMUCH AS MEASUREMENTS OF CLOUD COVER, SOLAR RADIATION, AND HUMIDITY ARE NOT NECESSARY. THE OVERALL HEAT EXCHANGE COEFFICIENT DEPENDS ONLY ON THE WIND VELOCITY, THE STREAM SURFACE VELOCITY, THE AIR TEMPERATURE, AND THE SIZE OF THE WATER SURFACE.

<CLASS> SIMULATION

<533>

<COMP> O'CONNOR, B. J.; JENIS, J. S.;

HATYSTIK, W. T.; FRILEY, K. J.

<TITLE> MATHEMATICAL MODELS OF FATES OF POLLUTANTS IN ESTUARIES

<ADDR> MARQUETTE COLLEGE

<CITY> NEW YORK

<STATE> NY

<ABST> A MATHEMATICAL MODEL WAS DEVELOPED CHARACTERIZING ESTUARINE TRANSPORT. THE MODEL WAS VERIFIED USING FIELD DATA FOR VELOCITY PROFILES AND SALINITY AND SOLIDS DISTRIBUTION. SPECIFIC APPLICATION WILL BE MADE TO THE JAMES RIVER ESTUARY IN ORDER TO ADDRESS KEPORE CONTAMINATION PROBLEMS. (1) 09/77 REPORT ON TRANSPORT OF A TOXIC PESTICIDE IN THE JAMES RIVER ESTUARY; (2) 09/78 REPORT ON ECOSYSTEM UPTAKE AND TRANSPORT OF KEPORE (RATH MODEL); AND (3) 06/79 FINAL REPORT ON RATH MODEL DEVELOPMENT FOR PESTICIDE MOVEMENT.

<GEO> VIRGINIA

<TEMP> JULY, 1976-JANUARY, 1979

<534>

<COMP> O'NEILL, C. A.

<TITLE> PHOSPHORUS CYCLING IN LAKES

<ADDR> UNIVERSITY OF NORTH CAROLINA, WATER RESOURCES RESEARCH INSTITUTE

<CITY> CHAPEL HILL

<STATE> NC

<SOURCE> U.C. DEBN. WATER RES. LIB. 6230/XU2-2; NATIONAL TECHNICAL INFORMATION SERVICE, SPRINGFIELD, VA, USA. ORDER NUMBER PB-210-745

<DOC> UNIVERSITY OF NORTH CAROLINA, WATER RESOURCES RESEARCH INSTITUTE. REPORT 97, 45 PP, 1974

<ABST> A PREDICTIVE MODEL FOR PHOSPHORUS IN LAKES HAS BEEN DEVELOPED AND VERIFIED. THE MODEL SHOWS EXCELLENT AGREEMENT BETWEEN OBSERVED AND PREDICTED AVERAGE PHOSPHORUS CONCENTRATIONS FOR LAKES WITH A WIDE RANGE OF HYDRAULIC DETENTION TIMES (1 TO 700 YEARS) AND DEPTH (10 TO 313 METERS). AT PRESENT THE MODEL SHOULD BE APPLIED ONLY TO LAKES WITH OXYGENATED HYPOLIMNETIC WATERS. THE MODEL HAS BEEN VERIFIED FOR CONDITIONS OF CONSTANT NUTRIENT LOADINGS. THE MODEL PROVIDES AN EXPLANATION FOR THE EFFECTS OF DEPTH ON LAKE DEPTH ON WATER QUALITY NOTED BY SEVERAL LIMNOLOGISTS. VERTICAL EXCHANGE OF PHOSPHORUS FORMS ACROSS THE THERMOCLINE AND NATURAL AGGREGATION WITHIN THE LAKE ARE IMPORTANT PROCESSES FOR THE TRANSPORT AND DEPOSITION OF PHOSPHORUS IN LAKES. THE SIGNIFICANCE OF THESE PROCESSES INCREASES WITH LAKE DEPTH. REQUIRED INFORMATION INCLUDES MEAN LAKE DEPTH AND PHOSPHORUS LOADING PER UNIT OF LAKE SURFACE AREA. PREDICTIONS OF PERMISSIBLE PHOSPHORUS LOADINGS CAN BE MADE FOR LAKES WHICH MEET THE CONDITIONS ASSUMED IN FORMULATING THE MODEL.

<CLASS> PREDICTIVE

<530>

AQUATIC TRANSECT

<530> CONT.

<CON> 42 REFERENCES; 4 TABLES; 8 FIGURES

<535>

<CON> GLESEN, R. G.; BRIGHT, G. P.

<TITLE> OPTIMAL PREVENTION AND DETECTION MODEL FOR POLLUTION PATROL SPILLS

<ADDR> PURDUE UNIVERSITY

<CITY> WEST LAFAYETTE

<STATE> IN

<DOC> CONF-730306; 18; CONFERENCE ON THE PREVENTION AND CONTROL OF OIL SPILLS, HELD IN WASHINGTON, DC, MARCH 13, 1973.

<ABST> THIS PAPER PRESENTS A FLIGHT SCHEDULING MODEL FOR SENSORS (INFRARED AND ULTRA-VIOLET) EQUIPPED AIRCRAFT UNITS. MISSION IS THE DETECTION AND PREVENTION OF HARBOR AND COASTAL OIL AND HAZARDOUS MATERIAL POLLUTION. THE OBJECTIVE OF THE MODEL IS TO MAXIMIZE THE EXPECTED NUMBER OF POLLUTION INCIDENTS DETECTED PER POLLUTION FLIGHT. THE MODEL REQUIRES, AS AN INPUT, PARAMETERS REPRESENTING PROBABILITIES OF POLLUTION INCIDENTS OCCURRING FOR DIFFERENT GEOGRAPHICAL SECTORS. THESE PARAMETERS ARE ESTIMATED USING COASTWISE AND HARBOR, PETROLEUM AND HAZARDOUS MATERIAL SHIPPING STATISTICS. THE SHIPPING STATISTICS CONSIDERED INCLUDE MOVEMENT OF PETROLEUM PRODUCTS ALONG THE ATLANTIC, PACIFIC, AND GULF COASTS AS WELL AS THE MOVEMENT OF SUCH COMMODITIES IN THE INTRA-COASTAL WATERWAY SYSTEM AND THE GREAT LAKES. PARTICULAR FORT CHARACTERISTICS AND PAST POLLUTION INCIDENT STATISTICS ARE ALSO USED TO ESTIMATE REQUIRED PARAMETERS OF THE SCHEDULING MODEL. THE CONSTRAINTS IN THE MODEL CONCERN THE AVAILABILITY OF AIRCRAFT, FLIGHT HOURS, MISSION HOURS, AND THE SIGNIFICANT ENVIRONMENTAL FACTORS WHICH AFFECT THE PERFORMANCE OF THE SENSORS.

<CLASS> SIMULATION

<536>

<CON> OPICH, G. T.

<TITLE> MODELS FOR ENVIRONMENTAL POLLUTION CONTROL

<ADDR> ANN ARBOR SCIENCES PUBLISHERS

<CITY> ANN ARBOR

<STATE> MI

<DOC> DEWINGER, R. A. (ED.), INTRODUCTION TO SIMULATION TECHNIQUES, ANN ARBOR SCIENCES PUB., ANN ARBOR, MICHIGAN, (P. 91-105).

<ABST> A BASIC APPROACH TO SIMULATION OF THE AQUATIC ENVIRONMENT THAT HAS PROVEN TO BE PRACTICAL IN POLLUTION CONTROL PLANNING IS OUTLINED IN DETAIL. THERE ARE THREE FUNDAMENTAL STEPS IN MODEL DESIGN: CONCEPTUAL, FUNCTIONAL, AND COMPUTATIONAL REPRESENTATION. A DISCUSSION OF THE FIRST TWO STEPS SERVES TO ILLUSTRATE THE MODEL DEVELOPMENT PROCEDURE. THE THIRD STEP IS OUT OF THE SCOPE OF THIS PAPER.

UNDER CONCEPTUAL REPRESENTATION, DETERMINING MODEL SCALE AND SUBDIVIDING THE SYSTEM INTO DISCRETE COMPONENTS ARE CONSIDERED. WITHIN THE FUNCTIONAL REPRESENTATION, ADVECTION-DIFFUSION EQUATIONS, THE EFFECTS OF SCALE, MASS CONSERVATION EQUATIONS, AND MOTION AND CONTINUITY ARE DISCUSSED. COMPUTATIONAL REPRESENTATION INCLUDES SELECTING A SOLUTION TECHNIQUE AND FORMING INPUT AND OUTPUT. INCLUDED AS ILLUSTRATIVE EXAMPLES IN THIS SIMULATION STUDY ARE THE TEXAS WATER PLAN, MODEL IDEALIZATION OF A RIVER BASIN, CONCEPTUAL REPRESENTATION OF A RESERVOIR, AND THE SAN FRANCISCO BAY-DELTA ESTUARIAL MATHEMATICAL MODEL NETWORK. FOLLOWING THIS APPROACH, USEFUL MODELS HAVE BEEN DEVELOPED FOR MANY CLASSES OF PROBLEMS AND ARE NOW BEING APPLIED IN PLANNING STUDIES IN THE UNITED STATES. AMONG THOSE THAT MAY BE CITED ARE MODELS FOR STREAM WATER QUALITY, RESERVOIR TEMPERATURE, ESTUARIAL HYDRODYNAMICS AND QUALITY, GROUNDWATER QUALITY, AND AQUATIC ECOLOGY.

<CLASS> SIMULATION

<537>

<CON> PAULY, P. P.; KACAGIO, P. O.

<TITLE> THERMAL RESPONSE OF HEATED STREAMS: SOLUTION BY THE IMPLICIT METHOD

<ADDR> IOWA INSTITUTE OF HYDRAULIC RESEARCH

<CITY> IOWA CITY

<STATE> IA

<DOC> PB--247392, 1974

<ABST> THE THERMAL RESPONSE OF NATURAL STREAMS TO ARTIFICIAL HEAT INPUTS FROM THERMAL POWER STATIONS IS MATHEMATICALLY REPRESENTED BY THE ONE-DIMENSIONAL CONVECTION-DIFFUSION EQUATION, FOR FULLY MIXED FLOW CONDITIONS. THE UNSTEADY ONE-DIMENSIONAL CONVECTION-DIFFUSION EQUATION IS A NONLINEAR PARABOLIC PARTIAL DIFFERENTIAL EQUATION, DUE TO THE PRESENCE OF THE SURFACE HEAT EXCHANGE TERM WHICH IS A COMPLEX FUNCTION OF THE WATER TEMPERATURE. IN GENERAL, IT IS DIFFICULT TO OBTAIN CLOSED-FORM SOLUTIONS OF THIS GOVERNING EQUATION BY ANALYTIC METHODS. IN THIS STUDY, A NUMERICAL SOLUTION, USING A PREDICTOR-CORRECTOR SCHEME, IS DEVELOPED FOR THE GOVERNING EQUATION TO PREDICT THE TRANSIENT PERIOD AS WELL AS THE STEADY-STATE TEMPERATURE DISTRIBUTIONS IN THERMALLY LOADED STREAMS UNDER CHANGING THERMAL INPUT RATES AND METEOROLOGICAL CONDITIONS.

<538>

<CON> PAULY, P. P.; SU, T. Y.; GIAQUINTA, A. P.; KENNEDY, J. P.

<TITLE> THERMAL REGIMES OF THE UPPER MISSISSIPPI AND MISSOURI RIVERS: TRANSIENT AND STEADY-STATE COMPUTATIONAL MODELS FOR THE PREDICTION OF RIVER THERMAL REGIMES; PART TWO: ANALYSIS OF THERMAL REGIMES OF THE MISSISSIPPI AND MISSOURI RIVERS IN THE MID-CONTINENT AREA POWER POOL (MAPP)

AQUATIC TRANSPORT

(539) CONT.

GEOGRAPHICAL AREA

(ADDR) IOWA INSTITUTE OF HYDRAULIC RESEARCH

(CITY) IOWA CITY

(STATE) IA

(DOC) IIR-102, 1974

(ABST) A COMPUTER-BASED, NUMERICAL MODEL FOR CALCULATION OF STREAMWISE DISTRIBUTIONS OF TEMPERATURE IN RIVERS WAS DEVELOPED, VALIDATED, AND UTILIZED TO CALCULATE THE THERMAL REGIMES OF THE REACHES OF THE MISSISSIPPI AND MISSOURI RIVERS LYING WITHIN THE MAPS GEOGRAPHICAL AREA. THE SALIENT FEATURES OF THE COMPUTATIONAL MODEL ARE DESCRIBED AND COMPARED WITH THREE TRANSIENT MODELS. THE THERMAL REGIMES OF THE MISSISSIPPI AND MISSOURI RIVERS IN THE MAPS GEOGRAPHICAL AREA CORRESPONDING TO AVERAGE METEOROLOGICAL AND HYDROLOGICAL CONDITIONS FOR THE MONTHS OF FEBRUARY, MAY, AUGUST, AND NOVEMBER WERE DETERMINED BY MEANS OF THE STEADY-STATE ITPM; THE RESULTS ARE PRESENTED AND DISCUSSED. THE NATURAL THERMAL REGIMES OF THE RIVERS AND THE MODIFIED THERMAL REGIMES RESULTING FROM IMPOSITION OF EXTERNAL HEAT LOADS FROM NUCLEAR AND FOSSIL-FUEL POWERED PLANTS AND OTHER HEAT SOURCES WERE CALCULATED. THE LOCATIONS ALONG THE RIVERS AT WHICH NEW PLANTS OF REASONABLY LARGE SIZE COULD BE INSTALLED IN ACCORDANCE WITH THE EXISTING THERMAL STANDARDS WERE IDENTIFIED. THE CAPACITIES OF THESE PLANTS WERE DETERMINED ON THE BASIS OF THE CALCULATED TEMPERATURE DISTRIBUTIONS WITH THE THERMAL LOADS OF THE EXISTING, PROPOSED, AND PROJECTED ONCE-THROUGH PLANTS IMPOSED ON THE RIVERS.

(GEO) MISSISSIPPI RIVER; MISSOURI RIVER

(540)
(CONT) PAPETSKY, L. C.; NOV, M. C.; GWITT, S. P.; GALVA, D.; STELIGOWSKI, J. J.

(TITLE) EVALUATION OF THERMAL DISCHARGES FROM STEAM ELECTRIC GENERATING STATIONS

(ADDR) CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

(STATE) NY

(DOC) PAPLEY, D. E. (ED.), PROCEEDINGS ON ENERGY AND THE ENVIRONMENT, HELD IN COLLEGE CONFER, OHIO, NOVEMBER 13, 1970

(ABST) ANALYTICAL MODELING, PHYSICAL MODELING, AND FIELD MEASUREMENTS WERE MADE FOR QUANTIFYING THE INTENSITY OF THE THERMAL PLUME EMANATING FROM A STEAM-ELECTRIC GENERATING FACILITY. EACH METHOD HAS ITS VIRTUES AND FAULTS. IF SUFFICIENT HYDROLOGICAL AND METEOROLOGICAL INFORMATION ARE AVAILABLE, ANALYTICAL MODELING COULD BE EMPLOYED. THE RESULTS, HOWEVER, MAY BE SUSPECT UNTIL THE MODEL HAS BEEN VERIFIED, ALTHOUGH NOT NECESSARILY VERIFIED AT THE SITE UNDER CONSIDERATION. IF INSUFFICIENT PHYSICAL DATA ARE AVAILABLE, THE COST TO ACQUIRE SUCH DATA COULD APPROACH THE COST OF ACTUAL FIELD SURVEYS, AND THE LATTER COULD BE THE PREFERRED APPROACH. THE

COST OF DEVELOPING AN ANALYTICAL MODEL ALONG WITH THE ACQUISITION OF THE NECESSARY FIELD DATA FOR THE INPUT PARAMETERS COULD EASILY EXCEED \$250,000. CONSTRUCTION AND OPERATION OF A PHYSICAL MODEL ALSO REQUIRES HYDROLOGICAL DATA. THE COST, WITHOUT VERIFICATION, COULD APPROACH \$500,000.

(540)
(CONT) PARK, J. E.

(TITLE) DE-ENTRAINMENT AND DE-CIRCULATION SIMULATOR FOR FLOW CONDITIONS NEAR SUBMERGED DISCHARGES

(ACRO) ONSHAC

(ADDR) OAK RIDGE NATIONAL LABORATORY, COMPUTER SCIENCES DIVISION, P.O. BOX 1

(CITY) OAK RIDGE

(STATE) TN

(ZIP) 37830

(PHONE) 615-483-0611 EXT 3-3101; FTS 050-3191

(SOURCE) DEVELOPED AT OORL

(DOC) NONE

(SUB) SIMULATION OF HOT WATER DISCHARGE INTO RAYS, RIVERS, ESTUARIES

(ABST) GIVEN INLET TEMPERATURES AND INLET FLOW RATES FOR THE RECEIVING BODY AND THE HOT WATER DISCHARGE, ONSHAC CALCULATES THE TIME-DEPENDENT DEVELOPMENT OF THE TEMPERATURE AND VELOCITY FIELDS NEAR THE DISCHARGE. THE ALGORITHM IS A GENERALIZATION OF THE SIMPLIFIED HANKER AND CELL (SHAC) CONCEPT DEVELOPED AT LANS. PHYSICAL LAWS ARE NAVIER-STOKES, MASS CONSERVATION, ENERGY CONSERVATION, BOUSSINESQ APPROXIMATION FOR BUOYANCY, AND SIMPLE SCALAR EDDY VISCOSITY FOR TURBULENCE.

(STATUS) UNDER DEVELOPMENT

(MEDIA) PUNCHED CARDS

(SIZE) 2000 CARDS

(COMP) IBM

(CONFIG) IBM 360/91-195 WITH 400K CODE

(LANG) FORTRAN IV

(CHAR) EUCDIC

(ALGO) EXTENSION OF SIMPLIFIED HANKER AND CELL (SHAC)

(CLAS) DETERMINISTIC; SIMULATION

(APPL) ENVIRONMENTAL IMPACT OF HOT WATER DISCHARGE

(USERS) DEVELOPMENT BY CES FOR NUCLEAR REGULATORY COMMISSION

(UPDATE) 770425

(541)
(CONT) PAUL, J. P.; LICH, W. J.

(TITLE) NUMERICAL MODEL FOR THERMAL PLUMES AND

<401>

HYDRAULIC TRANSPORT

<561> CONT.

FIFTH DISCHARGES

<ADDP> CASE WESTERN RESERVE UNIVERSITY

<CITY> CLEVELAND

<STATE> OH

<DOC> PROCEEDINGS OF THE SEVENTEENTH
CONFERENCE ON GREAT LAKES RESEARCH, AM
ARROW, MI: INTERNATIONAL ASSOCIATION
FOR GREAT LAKES RESEARCH, P. 445-455,
1970; CONF-740913--P1.

<502>

<CONT> PAULOW, JOSEPH P.

<TITLE> RESERVOIR WATER QUALITY MODEL EPARES

<ACPO> EPARES

<ADDP> U.S. ENVIRONMENTAL PROTECTION AGENCY,
MONITORING AND DATA SUPPORT DIVISION
(WH-553), 401 N ST., S.W.

<CITY> WASHINGTON

<STATE> DC

<ZIP> 20440

<PHONE> 202-426-7770; FTS 426-7770

<SOURCE> U.S. EPA

<DOC> JAMES H. DWKE, JR., "COMPUTER PROGRAM
DOCUMENTATION FOR THE RESERVOIR WATER
QUALITY MODEL EPARES", PREPARED FOR THE
U.S. ENVIRONMENTAL PROTECTION AGENCY,
JANUARY 1970.

<SUB> RESERVOIR WATER QUALITY MODEL

<ABST> THE EPARES MODEL SIMULATES THE MAJOR
INTERACTIONS OF THE NUTRIENT CYCLES,
ALGAE PRODUCTION, BENTHIC OXYGEN
DEMAND, AND CARBONACEOUS OXYGEN UPTAKE
AND THEIR EFFECT ON THE CONCENTRATION
OF DISSOLVED OXYGEN THROUGH ALL
RESERVOIR DEPTHS. THE MODEL SIMULATES
CHLOROPHYLL - A, AMMONIA, NITRITE,
NITRATE, PHOSPHORUS, CARBONACEOUS BOD,
BENTHIC OXYGEN DEMAND, DISSOLVED
OXYGEN, COLIFORMS, TOTAL NITROGEN,
CHLORIDES, AND METAL IONS.

<GEO> ANY AREA

<TIME> NOT APPLICABLE

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE

<SIZE> APPROXIMATELY 3,000 LINES

<COMP> IBM

<CONFIG> IBM 360/150 WITH 200K CORE

<LANG> FORTRAN IV

<CHAR> EBCDIC

<ALGO> STANDARD FORTRAN PROGRAMMING

<CLAS> DETERMINISTIC; ANALYTICAL; SIMULATION;
ENGINEERING PROCESS

<APPL> POLLUTION MIGRATION IN THE ENVIRONMENT

<USERS> U.S. EPA; STATES; LOCAL AGENCIES;
UNIVERSITIES; PRIVATE FIRMS

<SUB> U.S. EPA OR OTHER, FOR THE LOCAL AREA.

<REAL> EXTENSIVELY CALIBRATED AND VERIFIED
USING LOCAL DATA.

<UPDATE> 700720

<503>

<CONT> PAULOW, JOSEPH P.

<TITLE> AUTO-QUAL MODELING SYSTEM

<ACPO> AUTO-QUAL

<ADDP> U.S. ENVIRONMENTAL PROTECTION AGENCY,
MONITORING AND DATA SUPPORT DIVISION
(WH-553), 401 N ST., S.W.

<CITY> WASHINGTON

<STATE> DC

<ZIP> 20440

<PHONE> 202-426-7770; FTS 426-7770

<SOURCE> U.S. EPA

<DOC> CFIN, R. L. AND F. L. LOVELACE, 1973.
AUTO-QUAL MODELING SYSTEM, U.S.
ENVIRONMENTAL PROTECTION AGENCY

<SUB> STREAM WATER QUALITY MODEL

<ABST> AUTO-QUAL IS A STREAM WATER QUALITY
MODEL WHICH CAN SIMULATE CARBONACEOUS
BOD, NITROGENOUS BOD, DISSOLVED OXYGEN,
AND CONSERVATIVE CONSTITUENTS.

<GEO> ANY AREA

<TIME> NOT APPLICABLE

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE; TEXT

<SIZE> APPROXIMATELY 3,000 LINES

<COMP> IBM

<CONFIG> IBM 360/370 WITH 105 K CORE

<LANG> ANSI FORTRAN

<CHAR> EBCDIC

<ALGO> STANDARD FORTRAN PROGRAMMING

<CLAS> DETERMINISTIC; ANALYTICAL; SIMULATION;
ENGINEERING PROCESS

<APPL> POLLUTION MIGRATION IN THE ENVIRONMENT.

<USERS> U.S. EPA; STATES; LOCAL AGENCIES;
UNIVERSITIES; PRIVATE FIRMS

<SUB> U.S. EPA OR OTHER, FOR THE LOCAL AREA.

<REAL> EXTENSIVELY CALIBRATED AND VERIFIED
USING LOCAL DATA.

<UPDATE> 700720

AQUATIC TRANSPORT

<500>
 <COPY> PAULON, JONATHAN B.
 <TITLE> DYNAMIC ESTUARY MODEL, PEARL MARSH
 APPLICATIONS
 <ACRON> DEP
 <ADDR> U.S. ENVIRONMENTAL PROTECTION AGENCY,
 MONITORING AND DATA SUPPORT DIVISION
 (RD-553), 401 N ST. S.W.
 <CITY> WASHINGTON
 <STATE> DC
 <ZIP> 20460
 <PHONE> 202-426-7770; FTS 426-7770
 <SOURCE> U.S. ENVIRONMENTAL PROTECTION AGENCY
 <DOC> WATER RESOURCES ENGINEERS, INC.,
 COMPUTER PROGRAM DOCUMENTATION FOR THE
 DYNAMIC ESTUARY MODEL, PREPARED FOR THE
 U.S. ENVIRONMENTAL PROTECTION AGENCY,
 MAY 1974.
 <SUB> ESTUARY WATER QUALITY MODEL
 <ABST> THE DYNAMIC ESTUARY MODEL REPRESENTS
 TWO-DIMENSIONAL FLOW AND DISPERSION
 CHARACTERISTICS OF ANY ESTUARY WITH
 NEGLECTIBLE VERTICAL STRATIFICATION. IT
 CAN SIMULATE TEMPERATURE, DISSOLVED
 OXYGEN, DOB, CHLOROPHYLL-A, AMMONIA,
 NITRITE, NITRATE, PHOSPHORUS,
 COLIFORMS, TOTAL DISSOLVED SOLIDS,
 TOTAL NITROGEN, HEAVY METALS, AND
 PESTICIDES.
 <GEO> WEST
 <TIME> NOT APPLICABLE
 <STATUS> IN USE
 <ACCESS> UNLIMITED
 <MEDIA> MAGNETIC TAPE; TEXT
 <SIZE> APPROXIMATELY 3,000 LINES
 <COMP> IBM
 <CONFIG> IBM 360/150 WITH 200K CODE
 <LANG> FORTRAN IV
 <CARD> EBCDIC
 <ALGO> STANDARD FORTRAN PROGRAMMING
 <CLAS> DETERMINISTIC; ANALYTICAL; SIMULATION;
 ENGINEERING PROCESS
 <APPL> POLLUTION MIGRATION IN THE ENVIRONMENT
 <USERS> U.S. EPA; STATES; LOCAL AGENCIES;
 UNIVERSITIES; PRIVATE FIRMS
 <SUB> U.S. EPA OR OTHER, FOR LOCAL AREA.
 <EVAL> EXTENSIVELY CALIBRATED AND VERIFIED
 USING LOCAL DATA.
 <UPDATE> 780728
 <505>
 <COPY> PAULON, JONATHAN B.
 <TITLE> RECEIV-II, NEW ENGLAND RIVER BASINS
 MODELING PROJECT

<ACRON> RECEIV-II
 <ADDR> U.S. ENVIRONMENTAL PROTECTION AGENCY,
 MONITORING AND DATA SUPPORT DIVISION
 (RD-553), 401 N ST. S.W.
 <CITY> WASHINGTON
 <STATE> DC
 <ZIP> 20460
 <PHONE> 202-426-7770; FTS 426-7770
 <SOURCE> U.S. ENVIRONMENTAL PROTECTION AGENCY
 (SAME CONTACT, ADDRESS, PHONE AS ABOVE).
 <DOC> DAYTON COMPANY, NEW ENGLAND RIVER
 BASINS MODELING PROJECT, VOL. III, PART
 I: RECEIV-II WATER QUANTITY AND QUALITY
 MODEL, DOCUMENTATION REPORT, PREPARED
 FOR THE U.S. ENVIRONMENTAL PROTECTION
 AGENCY, DECEMBER 1974.
 <SUB> STREAM WATER QUALITY MODEL
 <ABST> RECEIV-II IS A DIRECT DEVELOPMENT OF
 THE STORM WATER MANAGEMENT MODEL (SWMM)
 RECEIVING WATER BLOCK; THE MODEL
 INCORPORATES SEVERAL BASIC FEATURES,
 INCLUDING TIME VARIANCE,
 TWO-DIMENSIONAL, AND SEVERAL
 NONCONSERVATIVE AND CONSERVATIVE
 POLLUTANTS SUCH AS PHOSPHORUS,
 COLIFORMS, AMMONIA, NITRITE, NITRATE,
 TOTAL NITROGEN, CARBONACEOUS DOB
 CHLOROPHYLL-A, DISSOLVED OXYGEN,
 SALINITY, AND METALS.
 <GEO> NORTHEAST, NEW ENGLAND
 <TIME> APPROXIMATELY 1972 - 1974
 <STATUS> IN USE
 <ACCESS> UNLIMITED
 <MEDIA> MAGNETIC TAPE; TEXT
 <SIZE> APPROXIMATELY 3,000 LINES
 <COMP> IBM
 <CONFIG> IBM 360/150 WITH 200 K CODE
 <LANG> FORTRAN IV
 <CARD> EBCDIC
 <ALGO> STANDARD FORTRAN PROGRAMMING
 <CLAS> DETERMINISTIC; ANALYTICAL; SIMULATION;
 ENGINEERING PROCESS
 <APPL> POLLUTION MIGRATION IN THE ENVIRONMENT
 <USERS> U.S. EPA; STATES; LOCAL AGENCIES;
 UNIVERSITIES; PRIVATE FIRMS
 <SUB> U.S. EPA OR OTHER, FOR LOCAL AREA.
 <EVAL> EXTENSIVELY CALIBRATED AND VERIFIED
 USING LOCAL DATA.
 <UPDATE> 780728
 <506>
 <COPY> PAULON, JONATHAN B.
 <TITLE> QUAL-II, UPPER MISSISSIPPI RIVER BASIN
 PROJECT

<546>

AQUATIC TRANSPORT

<546> CONT.

<AC70> QUAL-II

<ADDR> U.S. ENVIRONMENTAL PROTECTION AGENCY,
HOBOKEN AND DATA SUPPORT DIVISION
(HQ-553), 401 N ST. S.W.

<CITY> WASHINGTON

<STATE> DC

<ZIP> 20460

<PHONE> 202-426-7770; 202-426-7770

<SOURCE> U.S. ENVIRONMENTAL PROTECTION AGENCY

<DOC> WATER RESOURCES ENGINEERS, INC.,
COMPUTER PROGRAM DOCUMENTATION FOR THE
STREAM QUALITY MODEL QUAL - II,
PREPARED FOR THE U.S. ENVIRONMENTAL
PROTECTION AGENCY, MAY 1970.

<SP> STREAM WATER QUALITY MODEL

<ABST> QUAL-II IS A STEADY-STATE STREAM WATER
QUALITY MODEL WHICH CAN SIMULATE
CHLOROPHYLL-A, NITROGEN, AMMONIA,
NITRATE, NITRITE, PHOSPHORUS,
CARBONATES AND, BENTHIC OYSTER
DEBRIS, DISSOLVED OXYGEN, COLIFORMS,
RADIOACTIVE MATERIAL, AND CONSERVATIVE
SUBSTANCES.

<GM> RIQUEST

<TIME> APPROXIMATELY 1972 - 1970

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE; TEXT

<SIZE> APPROXIMATELY 3,000 LINES

<COMP> IBM

<COPIES> IBM 360/50 WITH 200 K CODE

<LANG> FORTRAN IV

<CHAR> RECSIC

<ALGO> STANDARD FORTRAN PROGRAMMING

<CLAS> DETERMINISTIC; ANALYTICAL; SIMULATION;
ENVIRONMENTAL PROCESS; STEADY-STATE

<APPL> POLLUTION REMEDIATION IN THE ENVIRONMENT.

<USERS> U.S. EPA; STATES; LOCAL AGENCIES;
UNIVERSITIES; PRIVATE FIRMS

<SUB> U.S. EPA OR OTHER, FOR LOCAL AREA

<DATA> EXTENSIVELY CALIBRATED AND VERIFIED
USING LOCAL DATA.

<OTHER> 700720

<547>

<CONT> PINDER, G. P.

<TITLE> A GALERKIN-FINITE ELEMENT SIMULATION OF
GROUNDWATER CONTAMINATION ON LONG
ISLAND, NEW YORK

<ABST> THE GALERKIN METHOD OF APPROXIMATION IN
CONJUNCTION WITH THE FINITE ELEMENT
METHOD OF ANALYSIS MAY BE USED TO
SIMULATE THE MOVEMENT OF GROUNDWATER
CONTAMINANTS. IN SOLVING THE

COORDINATED FLOW AND MASS TRANSPORT
EQUATIONS THIS APPROACH YIELDS A
FUNCTIONAL REPRESENTATION OF THE
DISPERSION TENSOR, TRANSMISSIVITY
TENSOR, AND FLUID VELOCITY, AS WELL AS
AN ACCURATE REPRESENTATION OF
VARIABLES OF IRREGULAR GEOMETRY. A
FIELD APPLICATION OF THE METHOD TO
GROUNDWATER CONTAMINATION ON LONG ISLAND,
NEW YORK, SHOWS THAT ACCURATE
SIMULATIONS CAN BE OBTAINED BY USING THE
GALERKIN-FINITE ELEMENT APPROACH.

<548> NEW YORK, LONG ISLAND

<549>

<CONT> MITA, F. N.; NYME, R. J.

<TITLE> DEPOSITIONAL ENVIRONMENT OF ZINC, LEAD
AND CADMIUM IN RESERVOIR SEDIMENTS

<ADDR> UNIVERSITY OF TULSA

<CITY> TULSA

<STATE> OK

<DOC> WATER RESEARCH, 9(4), 701-706, 1975

<ABST> A MODEL IS DEVELOPED IN WHICH THE ZINC
AND LEAD ARE TRANSPORTED BY IONIC
AND/OR ORGANIC-METALLIC SOLUTION INTO
RESERVOIRS. BECAUSE OF THE RELATIVELY
LONG RESIDENCY TIME OF WATER IN
RESERVOIRS, THE ZINC AND LEAD IN THE
WATER IS REMOVED BY CLAY MINERALS. MOST
OF THE ZINC AND LEAD CONTENT OF THE
SEDIMENTS IS SHOWN TO BE ASSOCIATED
WITH SEDIMENTS OF SPECIFIC GRAVITY
BETWEEN 2.0 AND 2.9. THE EFFICIENCY OF
THESE RESERVOIRS AS A SINK FOR ZINC AND
LEAD RESULTS IN THE REMOVAL OF AN
AVERAGE 0.3 PPM ZINC AND 0.04 PPM LEAD
FROM WATERS PASSING THROUGH FORT GIBSON
RESERVOIR. 16 REFS.

<549>

<CONT> PRITCHARD, D. W., CARTER, R. E.

<TITLE> DESIGN AND SITING CRITERIA FOR
ONCE-THROUGH COOLING SYSTEMS BASED ON A
FIRST-ORDER THERMAL PLUME MODEL.

<ADDR> JAMES MCKINSEY UNIVERSITY, CHESAPEAKE
NAV INSTITUTE

<CITY> BALTIMORE

<STATE> MD

<DOC> AEC REPORT NO. COO-3042-3, 1972. (20
CITATIONS: SOUTH TEXAS PROJECT)

<ABST> THE PROCESSES WHICH CONTROL THE
DISTRIBUTION OF EXCESS TEMPERATURE IN
THE HEATED PLUME RESULTING FROM THE
DISCHARGE OF HEATED EFFLUENT INTO A
NATURAL WATERBODY ARE DISCUSSED, AND
THE RELATIVE IMPORTANCE OF EACH PROCESS
FOR VARIOUS PLANT DESIGN AND
ENVIRONMENTAL CONDITIONS IS ASSESSED.
THE DISTRIBUTIONS OF EXCESS
TEMPERATURE, AND THE TIME-TEMPERATURE
HISTORY OF EXPOSURE OF ORGANISMS
EXPOSED INTO THE THERMAL PLUME
RESULTING FROM THE DISCHARGE OF A
CONDENSED COOLING WATER FROM A 1000 MW
NUCLEAR POWER PLANT, ARE GIVEN FOR
SEVERAL ALTERNATE SETS OF DESIGN
CRITERIA FOR THE DISCHARGE STRUCTURE.
IT IS SHOWN THAT, IN ORDER TO MINIMIZE

AQUATIC TRANSPORT

<400> CONT.

ADVERSE EFFECTS ON NATURAL WATER BODIES USED TO SUPPLY CONDENSER COOLING WATER FLOW FOR ONCE-THROUGH COOLING SYSTEMS. THE POWER PLANT SHOULD BE LOCATED ON A WATERWAY HAVING LARGE DELTAIC CAPACITY, AND THE DISCHARGE STRUCTURE SHOULD BE DESIGNED TO PROVIDE RAPID DILUTION OF THE HEATED EFFLUENT BY THE COOLER RECEIVING BODIES. INTAKE STRUCTURES SHOULD BE DESIGNED TO PROVIDE FOR LOW INTAKE VELOCITIES, AND TO PROVIDE AN EFFECTIVE MEANS OF DIVERTING FISH AND OTHER AQUATIC ORGANISMS AWAY FROM THE INTAKE. TIME OF TRAVEL OF THE CONDENSER COOLING WATER FROM THE CONDENSERS TO THE POINT OF DISCHARGE SHOULD BE KEPT SMALL, IN ORDER TO MINIMIZE THE TIME OF EXPOSURE OF ENTRAINED ORGANISMS TO THE RAISED TEMPERATURE RISK. (AVAILABLE FROM DTIC.)

<550>

<CONT>

DAME, HADIS S.; LIEB, SAN L.; CHEN, FANG C.

<TITLE>

MATHEMATICAL MODELS TO PREDICT SEEPAGE FROM COOLING RESERVOIRS.

<ABST>

DWS CORPORATION

<CITY>

POCKVILLE

<STATE>

TX

<DOC>

APRIL 1970. INCLUDED AS APPENDIX 6.1-C SOUTH TEXAS PROJECT UNITS 1 AND 2 ENVIRONMENTAL REPORT, HOUSTON LIGHTING AND POWER CO., JULY 1970.

<ABST>

A MATHEMATICAL MODEL IS DESCRIBED WHICH CHARACTERIZES THE NATURE OF THE FLOW FIELD GENERATED BY THE SEEPAGE FROM A COOLING RESERVOIR. THE VARIABLES USED IN THIS MODEL ARE A 7,000 ACRES COOLING RESERVOIR, A 6-FOOT THICK IMPERVIOUS SOLE, FOLLOWED BY A 17-FOOT THICK STRATUM OF SAND SILT WITH THE PIEZOMETRIC SURFACE BEING ABOUT 4 FEET UNDER THE SURFACE. THE FLOWFIELD, SHAPE OF THE RESERVOIR, AND STEADY-STATE SEEPAGE FLOW ARE USED TO PREDICT THE TRANSMITTAL ADVANCE OF THE SEEPAGE FRONT THROUGH THE GROUND LAYERS. OTHER INPUTS INTO THE MODELS ARE THE VISCOSITY, DENSITY AND SURFACE TENSION OF THE RESERVOIR WATER AND SIMILAR PROPERTIES FOR THE GROUNDWATER. THE MODELS PREDICT THE TYPE OF FLOW, TIME AS A FUNCTION OF WATER PENETRATION, GROUNDWATER STEADY STATE, AND DISPERSION IN THE PIEZOMETRIC SURFACE. THE APPENDIX HAS 2 REFERENCES, 8 FIGURES WHICH SHOW PROFILES OF THE SOIL UNDER THE RESERVOIR AND FLOW LINES OUT OF THE RESERVOIR, AND SCHEMATIC DRAWINGS OF THE MODELS USED.

<551>

<CONT>

DAINES, G. E.; BLOOM, S. G.; LEWIS, A. A.

<TITLE>

PREDICTING RESPONSES OF AQUATIC BIOTA TO THERMAL STIMULI

<DOC>

REPORT, BATTILLE COLOMBUS LABORATORIES FOR PRESENTATION AT ATOMIC INDUSTRIAL POWER TOPICAL CONFERENCE, WATER QUALITY CONSIDERATIONS, SITING AND OPERATION OF

NUCLEAR POWER PLANTS.

<ABST>

A GENERAL MODEL LINKING HEAT TRANSFER, MASS TRANSFER AND POPULATION DYNAMICS MODELS HAS CONSTRUCTED TO DEMONSTRATE THE FEASIBILITY OF MODELING RESPONSES TO THERMAL INCREMENTS IN THE AQUATIC ENVIRONMENT. THERE IS AN INTERESTING DEVELOPMENT OF A SYSTEM OF COUPLED PARTIAL DIFFERENTIAL EQUATIONS. MODEL IS IMPLEMENTED WITH LITERATURE DATA ON SEVERAL AQUATIC SYSTEMS AND THE OUTPUT IS PRESENTED AND DISCUSSED.

<CLASS>

DETERMINISTIC; CONTINUOUS; SIMULATION

<552>

<CONT>

ROBERTS, D. B.; STREET, R. L.

<TITLE>

TWO-DIMENSIONAL, HYDROSTATIC SIMULATION OF THERMALLY-INFLUENCED HYDRODYNAMIC FLOWS

<ABST>

STANFORD UNIVERSITY

<CITY>

STANFORD

<STATE>

CA

<ABST>

THE INCREASING DEMANDS FOR ENERGY HAVE LED TO AN EXPANDING NEED FOR COOLING WATER FROM THE NATURAL ENVIRONMENT. THIS WORK IS PART OF AN ONGOING EFFORT TO DEVELOP PREDICTIVE NUMERICAL MODELS FOR THERMALLY INFLUENCED FLOWS LIKELY TO BE INDUCED BY THERMAL DISCHARGES. PREVIOUSLY A THREE-DIMENSIONAL NUMERICAL MODEL CAPABLE OF REPRESENTING COMPLEX PHYSICAL BEHAVIOR SUCH AS STRATIFICATION AND THERMALLY UNSTABLE FLOWS WAS DEVELOPED. THE PRESENT STUDY LED TO A SIMPLIFIED AND TWO-DIMENSIONAL, BUT MORE EFFICIENT, NUMERICAL MODEL CAPABLE OF ADEQUATELY MODELING THE SAME COMPLEX SITUATIONS. THE NUMERICAL REPRESENTATION OF THE MATHEMATICAL MODEL USES A FINITE DIFFERENCE GRID WITH SPACE-STAGGERED DEFINITION OF VARIABLES. CONVECTION IS COMPUTED USING UPWIND DIFFERENCING WHILE DIFFUSION AND OTHER TERMS HAVE A SPACE-CENTERED REPRESENTATION.

<CON>

22 REFERENCES

<553>

<CONT>

ROBERTS, G. O.; PIACER, S. A.; TOONRE, J.

<TITLE>

TWO-DIMENSIONAL NUMERICAL MODEL OF THE NEAR-FIELD FLOW FOR AN OCEAN THERMAL POWER PLANT; THE THEORETICAL APPROACH AND A LABORATORY SIMULATION

<ABST>

UNFLO2

<ABST>

SCIENCE APPLICATIONS, INC., FLUID MECHANICS DIV.

<CITY>

MELBA

<STATE>

VA

<ABST>

THIS REPORT DESCRIBES THE COMPUTER MODEL UNFLO2 WHICH HAS BEEN DEVELOPED TO CALCULATE THE NEAR-FIELD STRATIFIED TURBULENT FLOW DRIVEN BY THE INTAKES AND OUTFLOWS OF AN OCEAN THERMAL POWER PLANT. A TWO-DIMENSIONAL GEOMETRY IS ASSUMED, WITH THE POWER PLANT INTAKES AND JET OUTFLOWS MODELLED BY BOUNDARY

<551>

196

AQUATIC TRANSPORT

<553> CONT.

CONDITIONS ON THE LEFT BOUNDARY OF A RECTANGULAR DOMAIN. HORIZONTAL FLOW THROUGH THE RIGHT BOUNDARY, TO OR FROM THE FAD-FIELD, IS ALLOWED BY ASSUMING A PRESSURE IN HYDROSTATIC EQUILIBRIUM WITH THE AMBIENT DENSITY DISTRIBUTION. THE CODE USES A FIRST-ORDER CLOSEST MODEL TO TREAT THE STRATIFIED TURBULENCE. ADVANCED NUMERICAL METHODS ENABLE CONVERGENT AND ACCURATE SOLUTIONS TO BE OBTAINED RAPIDLY AND ECONOMICALLY. A SIMPLE LABORATORY SIMULATION OF TWO-DIMENSIONAL STRATIFIED TURBULENCE DRIVEN BY INLET AND JET OUTFLOWS IS PROPOSED IN ORDER TO ADDRESS THE GENERAL QUESTION OF HEAD-PLAN RECIRCULATION. SUCH AN EXPERIMENT WOULD ALSO PROVIDE VITAL DATA FOR VERIFYING THE CODE MODEL AND ITS SUCCESSORS, AND FOR TUNING THE TURBULENCE PARAMETERS TO GIVE THE BEST REPRESENT. NUMERICAL RESULTS FROM MODEL ARE PRESENTED FOR THE PROPOSED EXPERIMENTAL SIMULATION. THEY CONFIRM THE ANALYSIS PREDICTION A STABILITY LIMIT ON THE FAD-FIELD HORIZONTAL FLOW, AND DEMONSTRATE THE OCCURRENCE OF RECIRCULATION FOR FAST FLOW CASES.

UNSATURATED BUT STEADY WATER FLOW IN A SERIES OF CONTIGUOUS, HOMOGENEOUS INDEPENDENT VERTICAL COLUMNS. THE TRANSPORT EQUATION IS SOLVED BY A "HOP-SCOTCH" FINITE-DIFFERENCE SCHEME FOR EACH COLUMN. SIMULATED HYDRAULICS AND SOLUTE MIGRATION PATTERNS FOR ALL SEGMENTS AGREE ADAPTABLELY WITH THE AVAILABLE FIELD DATA. THE MODEL CAN BE USED TO PROJECT SUBSURFACE DISTRIBUTIONS OF WASTE SOLUTES UNDER A VARIETY OF ASSUMED CONDITIONS FOR THE FUTURE. ALTHOUGH CLOSURE AND TUNING REACHED THE ACQUIFER SEVERAL YEARS AGO, THE MODEL ANALYSIS SUGGESTS THAT THE MORE EASILY SOGGED SOLUTES, SUCH AS CESIUM 137 AND STRONTIUM 90, WOULD NOT REACH THE ACQUIFER IN DETECTABLE CONCENTRATIONS WITHIN 150 YEARS FOR THE CONDITIONS ASSUMED. HOWEVER, A CHANGE IN CHEMISTRY OR HYDRAULIC CONDITIONS COULD INCREASE THE MOBILITY OF ADSORBED WASTE SOLUTES. SUCH CHANGES MIGHT RESULT FROM CHANGES IN WASTE DISPOSAL PRACTICES AND EFFLUENT CHEMISTRY, FLOODING FROM THE BIG LOST RIVER, OR FUTURE IRRIGATION ACTIVITY.

<554>

<CONT>

ROBERTSON, J. B.

<TITLE>

NUMERICAL MODELING OF SUBSURFACE RADIOACTIVE SOLUTE TRANSPORT FROM WASTE-SEEPAGE PONDS AT THE IDAHO NATIONAL ENGINEERING LABORATORY

<AGENCY>

U.S. GEOLOGICAL SURVEY, NATIONAL CENTER, 12201 SUNRISE VALLEY DR. BOSTON

<CITY>

<STATE>

MA

<ZIP>

22092

<PHONE>

703-666-6976

<DOC>

SPG-22057; USGS OPEN FILE REPORT 76-717, 68 PP., 1977

<SUB>

SUBSURFACE RADIOACTIVE WASTE MIGRATION

<ABST>

AQUOUS CHEMICAL AND LOW-LEVEL RADIOACTIVE EFFLUENTS HAVE BEEN DISPOSED TO SEEPAGE PONDS SINCE 1952 AT THE IDAHO NATIONAL ENGINEERING LABORATORY. THE SOLUTIONS PERCOLATE TOWARD THE SNAKE RIVER PLAIN AQUIFER (135 M BELOW) THROUGH INTERLAYERED BASALTS AND UNCONSOLIDATED SEDIMENTS ARE NO EXTENSIVE LENS OF GROUND WATER PERCHED ON A SEDIMENTARY LAYER ABOUT 40 M DEEPER IN THE POND. A THREE-SEGMENT NUMERICAL MODEL WAS DEVELOPED TO SIMULATE THE SYSTEM, INCLUDING EFFECTS OF CONVECTION, HYDRODYNAMIC DISPERSION, RADIOACTIVE DECAY, AND ADSORPTION. THE FIRST SEGMENT USES AN ANALYTICAL SOLUTION TO SIMULATE TRANSPORT FROM THE POND TO THE 25-M THICK PERCHED-WATER LENS, ASSUMING STEADY VERTICAL FLOW THROUGH A 15-M LONG SATURATED HOMOGENEOUS COLUMN. THE SECOND SEGMENT SIMULATES TWO-DIMENSIONAL HORIZONTAL TRANSPORT IN THE PERCHED-WATER BODY USING FINITE-DIFFERENCE METHODS, ASSUMING COMPLETE VERTICAL MIXING WITH VERTICAL LEAKAGE FROM THE BOTTOM. THE THIRD SEGMENT OF THE MODEL SIMULATES VERTICAL SOLUTE TRANSPORT FROM THE PERCHED-WATER BODY TOWARD THE AQUIFER, BY ASSUMING

<GEN>

IDAHO NATIONAL ENGINEERING LABORATORY, BUTTE COUNTY, IDAHO

<YR>

1952 - 1975

<STATUS>

USE COMPLETED

<ACCESS>

LIMITED

<MEDIA>

PERCHED CARDS; TEXT

<SIZE>

5000 CARDS; 5500 BYTES

<COMP>

IBM

<COPIES>

IBM 360/75 WITH 700K CORE AND NORMAL I/O

<LANG>

FORTRAN IV

<CHAR>

ASCII

<ALGO>

FINITE DIFFERENCE (IMM); FINITE-DIFFERENCE, HOP-SCOTCH; FINITE DIFFERENCE, EXPLICIT.

<CLASS>

DISCRETE; DETERMINISTIC; ANALYTICAL; PREDICTIVE; SIMULATION

<APPL>

BEHAVIOR OF SEEPAGE-POND RADIOACTIVE WASTES IN THE SUBSURFACE

<USERS>

U.S. GEOLOGICAL SURVEY

<SRP>

USGS AND ERDA REPORTS AND FILES

<VAL>

LIMITED FITTING TO FIELD HYDRAULIC AND CHEMICAL DATA; WELL VALIDATED AGAINST FIELD HYDRAULIC AND CHEMICAL DATA

<CON>

PARTIAL DOCUMENTATION IS REPORTED.

<UPDATE>

700000

<555>

<CONT>

ROBERTSON, J. B.

<TITLE>

DIGITAL MODELING OF RADIOACTIVE AND CHEMICAL WASTE TRANSPORT IN THE SNAKE RIVER PLAIN AQUIFER AT THE NATIONAL REACTOR TESTING STATION, IDAHO

<AGENCY>

U.S. GEOLOGICAL SURVEY, NATIONAL CENTER, 12201 SUNRISE VALLEY DR.

<CITY>

BOSTON

AQUATIC TRANSPORT

<553> CONT.
 <STAT> VA
 <CIP> 22092
 <PHONE> 703-650-6976
 <DOC> U.S. GEOLOGICAL SURVEY OPENFILE REPORT, AEC NO. IDO-22050, 41 PP., 1970.
 <SUB> HIGHWAYS OF RADIOACTIVE WASTES IN GROUND WATER
 <ABST> DIGITAL MODELING TECHNIQUES HAVE BEEN APPLIED SUCCESSFULLY TO THE ANALYSIS OF THE COMPLEX WASTE-TRANSPORT SYSTEM AT THE NATIONAL DETECTOR TESTING STATION IN IDAHO, BY UTILIZING NUMERICAL SOLUTION OF THE COUPLED EQUATIONS OF GROUNDWATER MOTION AND MASS TRANSPORT. THE MODEL INCLUDES THE EFFECTS OF CONVECTIVE TRANSPORT, FLOW DIVERGENCE, TWO-DIMENSIONAL HYDRAULIC DISPERSION, RADIOACTIVE DECAY (SR 90 AND CS 137), AND REVERSIBLE LIQUEUR ADSORPTION. THE HYDRAULIC PHASE OF THE MODEL USES THE ITERATIVE, ALTERNATING-DIRECTION, IMPLICIT FINITE-DIFFERENCE SCHEME TO SOLVE THE GROUNDWATER FLOW EQUATIONS, WHILE THE WASTE-TRANSPORT PHASE USES A MODIFIED METHOD OF CHARACTERISTICS TO SOLVE THE SOLUTE TRANSPORT EQUATIONS SIMULATED BY THE MODEL. THE MODELING RESULTS INDICATE THAT HYDRAULIC DISPERSION (ESPECIALLY TRANSVERSE) IS A MUCH MORE SIGNIFICANT INFLUENCE THAN PREVIOUSLY SUGGESTED BY EARLIER STUDIES. THE MODEL HAS BEEN USED TO ESTIMATE FUTURE WASTE HIGHWAY PATTERNS FOR VARIOUS ASSUMED HYDROLOGICAL AND WASTE CONDITIONS UP THROUGH THE YEAR 2000. THE HYDRAULIC EFFECTS OF DISCHARGE FROM THE BIG LOST RIVER HAVE AN IMPORTANT (BUT NOT PREDOMINANT) INFLUENCE ON THE SIMULATED FUTURE HIGHWAY PATTERNS. FOR THE ASSUMED CONDITIONS, THE MODEL INDICATES THAT DETECTABLE CONCENTRATIONS OF WASTE CHLORIDE AND TRITIUM COULD MOVE AS MUCH AS 15 MILES (24 KILOMETERS) DOWNGRADIENT FROM THE ORIGINAL DISCHARGE POINTS BY THE YEAR 2000. HOWEVER, THE MODEL SHOWS SR 90 MOVING ONLY 2 TO 3 MILES (3 TO 5 KILOMETERS) DOWNGRADIENT IN THE SAME TIME. THE MODEL MAY ALSO BE USED TO ESTIMATE THE EFFECTS OF THE VARIOUS FUTURE WASTE DISCHARGE PRACTICES AND HYDROLOGIC CONDITIONS ON SUBSEQUENT MIGRATION OF WASTE PRODUCTS.

<SUB> BUTTE COUNTY, IDAHO
 <TIME> 1952-1972
 <STATUS> COMPLETED; NOT IN USE
 <ACCESS> LIMITED
 <MEDIA> PUNCHED CARDS
 <SIZE> 0,000 CARDS; 500 K BYTES
 <CONF> IBM
 <COMPIG> IBM 360/75 WITH 650 K CODE AND NORMAL I/O.
 <LANG> FORTRAN IV
 <CHAR> ASCII
 <ALGO> FINITE DIFFERENCE, IADI; METHOD OF CHARACTERISTICS

<CLASS> DISCRETE; DETERMINISTIC; ANALYTICAL; PREDICTIVE; SIMULATION
 <APPL> IMPACT OF LOW-LEVEL AQUEOUS RADIOACTIVE WASTE INJECTION ON GROUND WATER RESOURCES
 <USERS> U.S. GEOLOGICAL SURVEY
 <SUB> U.S.G.S. AND AEC REPORTS AND FILES
 <CHAL> WELL VALIDATED AGAINST FIELD HYDRAULIC AND CHEMICAL DATA
 <CON> PARTIAL DOCUMENTATION IS REPORTED.
 <UPDATE> 700000

<554>
 <CONT> ROBINSON, MARK S.
 <TITLE> WATER CODE
 <ACRO> WATER
 <ADDR> TENNESSEE VALLEY AUTHORITY, ENVIRONMENTAL PLANNING, RIVER OAKS BLDG.
 <CITY> MUSCLE SHOALS
 <STATE> AL
 <CIP> 35660
 <PHONE> 205-303-0631 EXT2767; FTS 872-8767
 <DOC> NONE
 <SUB> ENVIRONMENTAL IMPACT OF RADIOISOTOPES IN LIQUID EFFLUENTS
 <ABST> A FORTRAN IV CODE THAT MODELS RADIOISOTOPE RELEASES INTO A FLOWING RIVER AND THE SUBSEQUENT DOSE TO INDIVIDUALS AND THE POPULATION VIA VARIOUS PATHWAYS. THE CODE USES DO 1.109-DOSE FACTORS, RIVER FLOW DATA, AND RELEASE DATA FOR THE SOURCE. THE DOSES ARE CALCULATED AT PUBLIC WATER SUPPLIES AND FOR SWIMMERS AT THE NEAREST PUBLIC USE AREA.

<SUB> TENNESSEE VALLEY; TENNESSEE RIVER; HOLSTON RIVER; CUMBERLAND RIVER
 <TIME> QUARTERLY TO ANNUAL
 <STATUS> IN USE
 <ACCESS> LIMITED
 <MEDIA> MAGNETIC TAPE; DISC; PUNCHED CARDS
 <SIZE> 2000 CARDS
 <CONF> IBM
 <COMPIG> IBM 370 WITH 275 K CORE
 <LANG> FORTRAN IV
 <CHAR> EBCDIC
 <ALGO> LINEAR PROGRAMMING
 <CLASS> CONTINUOUS; ANALYTICAL; PREDICTIVE
 <APPL> LICENSING OF NUCLEAR POWER PLANTS AND ENVIRONMENTAL IMPACT OF RADIOISOTOPES ON THE ENVIRONMENT
 <USERS> TVA-RADIOLOGICAL HYGIENE BRANCH

<556>

NORTH C TRANSPORT

<556> CONT.

<SUB> TVA RIVER FLOW DATA, TVA NUCLEAR PLANT LIQUID RELEASE DATA, TVA POPULATION DYSFUNCTION DATA

<VAL> VALIDATED BY HAND CALCULATIONS, ENVIRONMENTAL MONITORING

<UPD> 790925

<557>

<CON> POLPE, G. L.; CHAMER, A.; SELIN, J.; EWING, B. B.

<TITLE> MODELING LEAD POLLUTION IN A WATERSHED ECOSYSTEM

<ADD> UNIVERSITY OF ILLINOIS

<CITY> URBANA

<STATE> IL

<ABST> AN INTERDISCIPLINARY STUDY IS CURRENTLY IN PROGRESS AT THE UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN UNDER A GRANT FROM THE NATIONAL SCIENCE FOUNDATION BASIC PROGRAM. OBJECTIVES OF THE STUDY INCLUDE UNDERSTANDING AND MODELING THE MOVEMENTS AND EFFECTS OF HEAVY METALS (INITIALLY LEAD) IN THE ENVIRONMENT. A MODEL HAS BEEN CONSTRUCTED WHICH SIMULATES THE MOVEMENTS AND PREDICTS THE ACCUMULATION POINTS OF LEAD IN A 76-SQUARE MILE WATERSHED- ECOSYSTEM IN CHAMPAIGN COUNTY, ILLINOIS. THE MODEL INCLUDES COMPONENTS OF BOTH AQUATIC AND TERRESTRIAL ECOSYSTEMS AND REPRESENTS THE ECOSYSTEM BY A NETWORK OF NODES AND BRANCHES WHERE THE NODES REPRESENT THE COMPONENTS OF THE ECOSYSTEM IN A GENERAL SENSE AND THE BRANCHES INDICATE POSSIBLE TRANSPORT MECHANISMS BETWEEN NODES. RESULTS OF A TWO YEAR SIMULATION USING A NETWORK OF 36 NODES AND 121 BRANCHES IS PRESENTED. THE MODEL PROVIDES A METHOD FOR THE STUDY OF POLLUTANT TRANSPORT AND ACCUMULATION IN ECOSYSTEMS.

<558>

<CON> SARTORIS, J. J.

<TITLE> A MATHEMATICAL MODEL FOR PREDICTING RIVER TEMPERATURES--APPLICATION TO THE GREEN RIVER BELOW FLAMING GORGE DAM

<ADD> BUREAU OF RECLAMATION, ENGINEERING AND RESEARCH CENTER

<CITY> DENVER

<STATE> CO

<ABST> THE PURPOSE WAS TO EVALUATE THE EFFECT OF SELECTIVE WITHDRAWAL MODIFICATIONS AT FLAMING GORGE DAM ON TEMPERATURES IN THE GREEN RIVER DOWNSTREAM. A COMPUTERIZED MATHEMATICAL TEMPERATURE MODEL, INCORPORATING THE CONSERVATION OF HEAT EQUATION AND AN EQUILIBRIUM TEMPERATURE APPROACH TO HEAT EXCHANGE, WAS DEVELOPED. THE MODEL WAS CALIBRATED, USING 1970 AVERAGE DAILY HYDROLOGICAL AND HYDROLOGICAL DATA, TO OBSERVE TEMPERATURES AT THREE RIVER STATIONS, COVERING A TOTAL DISTANCE BELOW THE DAM OF 70.0 KILOMETERS (43.5 RIVER MILES). THE AVERAGE MONTHLY ERROR BETWEEN PREDICTED AND OBSERVED

MEAN DAILY RIVER TEMPERATURES AT THESE STATIONS RANGED FROM 0 TO -1.20 (0 TO -2.2F). THE CALIBRATED MODEL WAS USED TO SIMULATE RIVER TEMPERATURES FOR THE CASE OF ONLY TWO PERSTOCK INTAKE STRUCTURES MODIFIED FOR SELECTIVE WITHDRAWAL AND FOR ALL THREE INTAKES MODIFIED. SIMULATION RESULTS INDICATE THAT, WHILE THE TWO-INTAKE MODIFICATION STRATEGY WOULD RESULT IN RIVER TEMPERATURES SIGNIFICANTLY NEARER THE OPTIMUM FISHERY RANGE THAN THOSE RECORDED IN 1970, OPERATION WITH ALL THREE INTAKES MODIFIED WOULD GENERALLY RESULT IN OPTIMUM FISHERY TEMPERATURES FROM MAY THROUGH SEPTEMBER. THE COMPUTER MODEL DEVELOPED COULD BE ADAPTED TO A VARIETY OF DATA AND STREAM CONDITIONS.

<GEN> GREEN RIVER

<CON> 10 REFERENCES; 6 FIGURES

<559>

<CON> SCHREIBER, CHARLES B.

<TITLE> MODEL FOR THE EFFICIENT ALLOCATION OF ENVIRONMENTAL ASSIMILATIVE CAPACITY: THE CASE OF THERMAL EMISSIONS TO A LARGE BODY OF WATER

<ADD> UNIVERSITY OF CALIFORNIA, CIVIL ENGINEERING, DAVIS HALL

<CITY> BERKELEY

<STATE> CA

<ZIP> 94720

<PHONE> 415-642-1270

<DOC> WATER RESOURCES RESEARCH, 11(1), 100-101, 1975

<ABST> THE OPTIMAL LEVEL OF ASSIMILATIVE CAPACITY AUGMENTATION IN THE CASE OF THERMAL DISCHARGES TO LARGE LAKES-SUBJECT TO TEMPERATURE STANDARDS WAS STUDIED. A MATHEMATICAL MODEL RELATING HEATED EFFLUENT FLOW RATE AND "DEAD-FIELD" TEMPERATURE WAS USED TO DETERMINE MAXIMUM DIFFUSION POOL SIZE. DIFFUSION COSTS WERE DEVELOPED AS A FUNCTION OF DISCHARGE VELOCITY, POOL SIZE BEING GIVEN. COOLING TOWER COSTS WERE ALSO DEVELOPED FOR COMPARISON WITH DIFFUSION COSTS IN SELECTING AN OPTIMAL LEVEL OF THERMAL ASSIMILATIVE CAPACITY. THE RELATIONSHIP BETWEEN THE SELECTION PROCESS AND OPTIMAL POWER PLANT SITING MODEL WAS OUTLINED. IT WAS SHOWN THAT ARBITRARILY FIXING DISCHARGE VELOCITY AT SOME PRACTICAL LEVEL WOULD TEND TO BIAS THE RESULTS OF THE SITING MODELS TOWARD OVERLY CONSERVATIVE USE OF THERMAL ASSIMILATIVE CAPACITY. THAT IS, AVAILABLE CAPACITY WOULD NOT BE FULLY EXPLOITED, AND THE COST OF A GIVEN LEVEL OF POWER OUTPUT WOULD BE GREATER THAN WAS NECESSARY.

<CLASS> CONTINUOUS; DETERMINISTIC; ANALYTICAL; OPTIMIZATION

<560>

<CON> MUEZ, J. A.; PAYNE, J. A.; SILL, B. L.

<TITLE> EFFECTS OF DISCHARGE DESIGN ON THE THERMAL MIXING ZONE IN WATERWAYS

AQUATIC TRANSPORT

<560> CONT.

<ADDR> VIRGINIA POLYTECHNIC INSTITUTE AND
STATE UNIVERSITY

<CITY> BLACKSBURG

<STATE> VA

<DOC> 21ST ANNUAL MEETING OF THE INSTITUTE OF
ENVIRONMENTAL SCIENCES, HELD IN
ANARIN, CALIFORNIA, APRIL 13, 1975;
LEWTON, J.C. AND R.L. AFGAN (EDS.),
FUTURE ENERGY PRODUCTION SYSTEMS,
NEWSWEEK PUBLISHING CO., WASHINGTON,
DC, 1976<ABST> RESULTS ARE PRESENTED OF A
COMPREHENSIVE STUDY OF THE EFFECTS OF
OUTLET GEOMETRY AND OPERATING
CHARACTERISTICS ON THE DEVELOPMENT OF
THE THERMAL MIXING ZONE IN WATERWAYS
PRODUCED BY HEATED DISCHARGES FROM
ELECTRIC POWER PLANTS. THE STUDY
INCLUDED DETAILED LABORATORY
EXPERIMENTS, ANALYTICAL PREDICTIONS AND
FIELD OBSERVATIONS. THE LABORATORY
EXPERIMENTS WERE PERFORMED IN A
SPECIALLY DESIGNED WATER CHANNEL
FACILITY. THE OBSERVATIONS INCLUDED
TEMPERATURE DISTRIBUTIONS OBTAINED WITH
SMALL THERMOCOUPLES, VELOCITY
DISTRIBUTIONS OBTAINED WITH A HOT-FILM
ANEMOMETER, INFRARED PHOTOGRAPHS AND
FLOW VISUALIZATION WITH DYED
INJECTANTS. SPECIAL ATTENTION WAS
DIRECTED AT RECIRCULATION ZONES AND
"HOT SPOTS." THE ANALYSIS DEVELOPED
IS BASED UPON AN INTEGRAL FORMULATION
OF THE EQUATIONS OF MOTION WITH
MATHEMATICAL MODEL OF THE VARIOUS
TRANSPORT PROCESSES. GOOD AGREEMENT
WITH EXPERIMENTAL DATA WAS OBTAINED.
FIELD OBSERVATIONS WERE TAKEN AT A
POWER PLANT ON THE DAN RIVER. THE
PRINCIPAL DATA OBTAINED WERE
TEMPERATURE DISTRIBUTION WITH
THERMISTORS AND AERIAL INFRARED
PHOTOGRAPHS.

THE RIVER SYSTEM CAUSED BY MAINTENANCE
OPENING BY THE U.S. ARMY CORPS OF
ENGINEERS. BASED UPON PHYSICAL AND
HYDROLOGIC CHARACTERISTICS, THE BLACK
RIVER BELOW RIVER MILE 9.0 WAS DIVIDED
INTO THREE SEGMENTS. A ONE-DIMENSIONAL
THERMAL MODELING TECHNIQUE WAS
DEVELOPED AND APPLIED TO EACH SEGMENT
TAKING INTO ACCOUNT RIVER FLOW, LAKE
DILUTION, METEOROLOGICAL DATA, AND HEAT
LOADINGS FROM U.S. STEEL. THE
EQUATIONS WERE VERIFIED WITH MEASURED
DATA AT CRITICAL STREAM FLOWS AND USED
TO COMPUTE THERMAL LOADS WHICH CAN BE
DISCHARGED BY U.S. STEEL AND STILL MEET
APPLICABLE TEMPERATURE STANDARDS.
PRACTICAL CONSIDERATIONS WERE EMPLOYED
IN ARRIVING AT THE FINAL RECOMMENDED
EFFLUENT LIMITATIONS.

<GEN> BLACK RIVER, ON

<STATUS> IN USE

<CLAS> PREDICTIVE

<SEPS> U.S. STEEL CORPORATION

<UPDATE> 700717

<562>
<CONT> SCULTUM, V. W.; NERVA, C.<TITLE> WASTE HEAT UTILIZATION FROM POWER
PLANTS IN AGRICULTURE: WATER TRANSPORT

<DOC> ASAE PAPER 75-3532, 1975

<ABST> A DISTRIBUTION SYSTEM OF THERMAL
DISCHARGES FROM POWER PLANTS FOR USE OF
WASTED HEAT ENERGY IN AGRICULTURE IS
PROPOSED. THE HOT WATER TRANSPORT
SYSTEM IS MODELED AND PUMPING COSTS FOR
THE SOIL HEATING COMPLEX, FISH CULTURE
PONDS AND THE WATER COOLING BASIN ARE
COMPUTED.<561>
<CONT> SCHNEGARDUS, DONALD R.

<TITLE> BLACK RIVER THERMAL MODEL

<ADDR> U.S. ENVIRONMENTAL PROTECTION AGENCY,
REGION V. MICHIGAN-OHIO DISTRICT OFFICE

<CITY> FAIRVIEW PARK

<STATE> OH

<ZIP> 44126

<DOC> OTT, V.B. (ED.), PROCEEDINGS OF THE EPA
CONFERENCE ON ENVIRONMENTAL MODELING
AND SIMULATION, 1976, EPA 600/9-76-016,
(P. 512-516), 447 PP.<SUB> DETERMINES ALLOWABLE THERMAL LOADS FOR
RIVER DISCHARGES<ABST> ONE-DIMENSIONAL TEMPERATURE MODELING
TECHNIQUES WERE EMPLOYED TO DETERMINE
ALLOWABLE THERMAL LOADS FROM UNITED
STATES STEEL CORPORATION LORAIN WORKS
FOR DISCHARGE TO THE BLACK RIVER. THE
BLACK RIVER FROM RIVER MILE 5.0 TO ITS
MOUTH IN LAKE ERIE AT LOUIS, OHIO IS A
COMPLEX SYSTEM AFFECTED BY DILUTION
FROM LAKE ERIE, RECIRCULATION RESULTING
FROM THE LOCATION OF U.S. STEEL WATER
INTAKES AND OUTFALLS, AND ADJUST
CHANGES IN THE PHYSICAL DIMENSIONS OF<563>
<CONT> SENGUPTA, SUBRATA<TITLE> THREE-DIMENSIONAL THERMAL POLLUTION
MODEL<ADDR> UNIVERSITY OF MIAMI, SCHOOL OF
ENGINEERING, MECHANICAL ENGINEERING
DEPARTMENT

<CITY> CORAL GABLES

<STATE> FL

<ZIP> 33124

<PROVD> 305-284-4594, 350-5011; PDS 946-2011

<DOC> OTT, V.B. (ED.), PROCEEDINGS OF THE EPA
CONFERENCE ON ENVIRONMENTAL MODELING
AND SIMULATION, 1976, EPA 600/9-76-016,
(P. 522-526), 447 PP.<SUB> PREDICTS THREE-DIMENSIONAL MOTION AND
TEMPERATURE OF THERMAL PLOWES WITHIN
WATER<ABST> RESEARCHERS AT THE UNIVERSITY OF MIAMI
ARE DEVELOPING A UNIVERSALLY APPLICABLE
THREE-DIMENSIONAL THERMAL POLLUTION
MATHEMATICAL MODEL. THE MODEL WILL
PREDICT THE THREE-DIMENSIONAL MOTION
AND TEMPERATURE OF THERMAL PLOWES
WITHIN WATERS TO WHICH THEY ARE

<567>

HYDRAULIC TRANSPORT

<567> CONT.

DISCHARGES. IT INCLUDES EFFECTS OF WINDS, OCEAN CURRENTS, CYCLIC TIDAL FLOWINGS IN BAYS AND ESTUARIES, VARIABLE WINDS AND REALISTIC BOTTOM TOPOGRAPHIES. THE MODEL CAN BE USED IN THE LOCATION OF FUTURE NUCLEAR POWER PLANTS IN ORDER TO SELECT THE MOST ADVANTAGEOUS SITES.

<567> PISCANE BAY, FLORIDA; LAKE GELENS, NORTH CAROLINA

<TIME> 1975-77

<STATUS> UNDER DEVELOPMENT

<ACCESS> LIMITED

<MEDIA> MAGNETIC TAPE

<COMP> IBM

<CONFIG> UNIVAC 1106, WITH 45K ON ONE MAGNETIC TAPE

<LANG> FORTRAN IV

<ALGO> NAVIER-STOKES EQUATIONS USING FINITE DIFFERENCE TECHNIQUE; ALSO ENERGY EQUATION FOR HEAT TRANSPORT AND ALSO CONSTITUENT TRANSPORT (BOTH DISSOLVED AND SEDIMENTS)

<CLASS> PREDICTIVE

<APPL> ENVIRONMENTAL SURVEILLANCE STUDIES; THERMAL PLUME PREDICTIONS; POWER PLANT SITING EVALUATIONS

<USERS> DUKE POWER COMPANY

<SRM> GROUND TRUTH AND REMOTELY SENSED DATA COLLECTED BY THE UNIVERSITY OF MIAMI TEAMS

<REVAL> REMOTELY SENSED DATA AND INSITU MEASUREMENTS

<NOTE> THERE ARE FOUR DIFFERENT MODELS THAT ARE DEVELOPED AT THE UNIVERSITY OF MIAMI AND ARE BEING VERIFIED

<UPDATE> 1978/07/77

<568>

<CON> SHANKS, JOHN C., JR.

<TITLE> NATIONAL WEATHER SERVICE RIVER FORECAST SYSTEM

<ACRO> NWSRFS

<ADD> NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, HYDROLOGIC RESEARCH LABORATORY

<CITY> SILVER SPRING

<STATE> NC

<ZIP> 20907

<DOC> OTT, W.B. (ED.), PROCEEDINGS OF THE EPA CONFERENCE ON ENVIRONMENTAL MODELING AND SIMULATION, 1976, EPA 600/9-76-016, (P. 522-526), 807 PP.

<SRM> MATHEMATICAL MODELS TO AID RIVER FORECASTERS

<ABST> THE NATIONAL WEATHER SERVICE IS IMPLEMENTING A NEW SYSTEM OF

MATHEMATICAL MODELS TO AID RIVER FORECASTERS THROUGHOUT THE U.S. FORECASTS OF STAGES AND DISCHARGES A FEW DAYS AHEAD ARE PRODUCED ROUTINELY ON A DAILY BASIS AND AT SIX HOUR INTERVALS DURING FLOODS. EXTENDED STREAMFLOW PREDICTIONS FOR SEVERAL MONTHS CAN BE MADE. THE SYSTEM INCLUDES: CONCEPTUAL HYDROLOGIC MODEL OF SNOW, SOIL MOISTURE, AND STREAMFLOW ROUTING; MODELS OF UNSTEADY OPEN CHANNEL FLOW; RESERVOIR OPERATIONS MODELS; AND STOCHASTIC HYDROMETEOROLOGIC MODELS.

<569> UNITED STATES

<STATUS> IN USE

<CLASS> PREDICTIVE

<APPL> POLLUTANT TRANSPORT

<USERS> ENVIRONMENTAL PROTECTION AGENCY

<UPDATE> 780720

<565>

<CON> SHARIR, URI Y.; HARBELMAN, DONALD B. P.

<TITLE> NUMERICAL AND ANALYTICAL SOLUTIONS OF DISPERSION PROBLEMS IN HOMOGENEOUS AND LAYERED AQUIFERS

<ABST> FROM A REVIEW OF PREVIOUS WORK ON DISPERSION IN POROUS MEDIA IT IS CONCLUDED THAT AT PRESENT THE TOOLS FOR SOLVING MOST PRACTICAL PROBLEMS OF MIXING OF FLUIDS IN ARTIFICIAL RECHARGE, WASTE WATER DISPOSAL AND GROUND WATER CONTAMINATION ARE STILL MISSING. A NUMERICAL METHOD IS PROPOSED FOR THE SOLUTION OF DISPERSION PROBLEMS IN STEADY THREE-DIMENSIONAL POTENTIAL FLOW FIELDS IN POROUS MEDIA. THE NUMERICAL SCHEME USES THE CONVECTIVE DISPERSION EQUATION IN CURVILINEAR COORDINATES CONSISTING OF THE FLOW STREAMLINES AND EQUIPOTENTIALS. BY MEANS OF THIS EQUATION ANY PROBLEM OF DISPERSION IN A STEADY POTENTIAL FLOW FIELD, AS WELL AS A SPECIAL TYPE OF PROBLEMS WITH UNSTEADY FLOW, CAN BE SOLVED. THE NUMERICAL SCHEME IS PROGRAMMED FOR A COMPUTER AND APPLIED TO A FEW SIMPLE CASES, FOR WHICH ANALYTICAL SOLUTIONS EXIST.

<566>

<CON> SHIELDS, P. P.; HARKS, D. H.

<TITLE> THERMAL POLLUTION ABATEMENT EVALUATION MODEL FOR POWER PLANT SITING

<DOC> NIT-EL--73-13, PB--228739, PP.351, FEB 1973. FOR NATIONAL SCIENCE FOUNDATION, WASHINGTON, D. C.

<ABST>

A THERMAL POLLUTION ABATEMENT MODEL FOR POWER PLANT SITING IS FORMULATED TO EVALUATE THE ECONOMIC COSTS, RESOURCE REQUIREMENTS, AND PHYSICAL CHARACTERISTICS OF A PARTICULAR THERMAL POLLUTION ABATEMENT TECHNOLOGY AT A GIVEN SITE TYPE FOR A PLANT ALTERNATIVE. THE MODEL ALSO PROVIDES A SCREENING CAPABILITY TO DETERMINE WHICH SITES ARE FEASIBLE ALTERNATIVES FOR DEVELOPMENT BY THE CALCULATION OF THE RESOURCE REQUIREMENTS AND A CHECK OF THE APPLICABLE THERMAL STANDARDS, AND

AQUATIC TRANSPORT

<565> CONT.

DETERMINING WHETHER THE PLANT ALTERNATIVE COULD BE BUILT ON THE AVAILABLE SITE IN COMPLIANCE WITH THEIR THERMAL STANDARDS. THE THERMAL POLLUTION EVALUATION MODEL ANALYZES THE ADAPTED TECHNOLOGIES OF SURFACE DISCHARGE, DIFFUSED, COOLING POND, SPRAY CHAM, AND NET MECHANICAL DRAFT COOLING TOWERS. THE TYPICAL SITE TYPES EVALUATED ARE A RIVER, SMALL LAKE, GREAT LAKE COASTAL ESTUARY, OFFSHORE OCEAN, AND WATER POND SITE. THE MODEL WILL BE USED IN CONJUNCTION WITH A PLANT EVALUATION MODEL, WHICH ANALYZES THE EFFECTS OF FUEL COSTS AND AIR POLLUTION ADAPTEMENT, A PLANT EXPANSION MODEL, AND A GENERATION EXPANSION MODEL TO DETERMINE THE OPTIMAL OPERATING AND GENERATING PLAN FOR AN ELECTRIC UTILITY. THE MODEL MAY ALSO BE USED IN CONJUNCTION WITH THE PLANT EVALUATION MODEL TO EVALUATE THE TRADE OFFS BETWEEN THE DOLLAR COST OF ELECTRIC POWERED GENERATION, RELIABILITY, AND AIR AND THERMAL POLLUTION. THE MODEL MAY ALSO BE USED TO DETERMINE, FOR A SINGLE PLANT SITE ALTERNATIVE, WHICH ADAPTEMENT TECHNOLOGIES WOULD BE FEASIBLE, AND TO MAKE AN ECONOMIC AND RESOURCE REQUIREMENT COMPARISON BETWEEN THESE ALTERNATIVES. FINALLY, THE MODEL COULD BE USED TO EXAMINE THE ECONOMIC AND LOGISTICAL ASPECTS OF THE IMPLEMENTATION OF A PLAN LIMITING THE WASTE HEAT DISCHARGE TO NATURAL BODIES TO ZERO DISCHARGE.

<567>
<CONT> SMITH, C. S.; GLOYNE, E. F.
<TITLE> RADIOACTIVITY TRANSPORT IN WATER - MATHEMATICAL MODEL FOR THE TRANSPORT OF RADIOISOTOPES
<ACRO> UNIVERSITY OF TEXAS, CENTER FOR RESEARCH IN WATER RESOURCES
<CITY> AUSTIN
<STATE> TX
<ZIP> 78712
<PHONE> 415-271-2211
<DOC> ENE-04-6702; CRW-1A, 179 PP.
<ABST> THE PURPOSE OF THIS STUDY WAS TO DEVELOP A MATHEMATICAL MODEL WHICH DESCRIBES THE TRANSPORT OF RADIOISOTOPES INJECTED INSTANTANEOUSLY IN A STREAM. PARTICULAR EMPHASIS WAS DIRECTED TO THE INFLUENCE OF SEDIMENTS ON TRANSPORT. INSTANTANEOUS RELEASE OF SR-85 AND CONTINUOUS RELEASE OF SR-85, RESPECTIVELY, WERE USED TO MEASURE THE DISPERSION AND MASS TRANSFER COEFFICIENTS. AQUARIA AND MODEL RIVER EXPERIMENTS WERE UNDERTAKEN TO DETERMINE VARIOUS PARAMETERS WHICH DEFINE THE MECHANISM OF ADSORPTION AND DESORPTION OF RADIOISOTOPES BY SEDIMENTS. INSTANTANEOUS INJECTION OF SR-85 INTO THE MODEL RIVER PROVIDED DATA FOR ESTABLISHING THE RELATIONSHIP BETWEEN THE ANALYTICAL SOLUTION AND A PROPOSED MATHEMATICAL MODEL. FORTRAN PROGRAMS WERE DESIGNED FOR THE ANALYSIS OF GAMMA SPECTRA, DISPERSION COEFFICIENTS, AND TRANSPORT EQUATIONS. SOME OF THE IMPORTANT FACTORS AFFECTING THE TRANSPORT OF SR-85 IN THE MODEL

RIVER WERE STUDIED. THE MASS TRANSFER COEFFICIENT WAS FOUND TO INCREASE WITH INCREASED VELOCITY. HIGH UPTAKE OF SR-85 BY SEDIMENTS MAY BE PROVIDED BY INCREASED TEMPERATURE AND THE PRESENCE OF AN ORGANIC POLLUTANT. AN EXPONENTIAL RELATIONSHIP WAS ESTABLISHED BETWEEN THE SHERWOOD'S NUMBER AND THE REYNOLD'S NUMBER FOR THE MODEL RIVER.

<COMP> CDC
<CONFIG> CDC 1604
<LANG> FORTRAN 63
<CON> THIS CODE MAY BE APPLIED TO ACCIDENTAL OR ROUTINE RELEASES. IT WAS WRITTEN IN FORTRAN 63 FOR A CDC 1604 COMPUTER.
<568>
<CONT> SMITH, C. S.
<TITLE> ENVIRONMENTAL FATE MODEL FOR AQUATIC SYSTEMS
<ACRO> ENVIR
<ADDR> SRI INTERNATIONAL
<CITY> MENLO PARK
<STATE> CA
<ZIP> 94025
<PHONE> 415-326-6200, EXT. 4706
<SOURCE> WTIS
<DOC> SMITH, J. H. ET. AL., ENVIRONMENTAL PATHWAYS OF SELECTED CHEMICALS IN FRESHWATER SYSTEMS, SRI INTERNATIONAL, SRI PROJECT 4396, 1977; EPA-600/7-77-113, 1977
<SUB> CHEMICAL, PHYSICAL, AND BIOLOGICAL FATE OF CHEMICALS IN AQUATIC SYSTEMS
<ABST> ENVIR IS AN ENVIRONMENTAL FATE MODEL FOR AQUATIC SYSTEMS WHICH CALCULATES CONCENTRATIONS OF CHEMICALS IN WATER AS A FUNCTION OF TIME AND SPATIAL COMPARTMENT. IT CONSIDERS MASS TRANSPORT, EVAPORATION, ADSORPTION TO SEDIMENT AND BIOTA, HYDROLYSIS, PHOTOLYSIS, OXIDATION, BIODEGRADATION. ENVIR HAS BEEN APPLIED TO ABOUT 12 CHEMICALS IN BOTH LENTIC (PONDS AND LAKES) AND LOTIC (RIVERS) SYSTEMS.
<GEO> NOT GEOGRAPHY - SPECIFIC
<TIME> NOT TIME - SPECIFIC
<STATUS> IN USE
<ACCESS> LIMITED
<MEDIA> PUNCHED CARDS
<SIZE> 500 LINES
<COMP> CDC
<CONFIG> CDC 6400, 128 K COPE
<LANG> FORTRAN IV
<CHAR> EBCDIC
<ALGO> SINGLE AND MULTI COMPARTMENT KINETIC

<568>

AQUATIC TRANSPORT

<568> CONT.

SIMULATION

A STRATIFIED LAKE WHICH HAS BEEN DEVELOPED AT THE CANADIAN CENTRE FOR INLAND WATERS.

<CLASS> DISCRETE; DETERMINISTIC; PREDICTIVE; SIMULATION

<APPL> DETERMINATION OF LIKELY FATES OF CHEMICALS IN AQUATIC SYSTEMS FOR FURTHER CONSIDERATION

<ORSPC> ENVIRONMENTAL PROTECTION AGENCY, INT. INTERNATIONAL

<SRCD> LABORATORY EXPERIMENTS; THEORETICAL ESTIMATES; DATA FOR SPECIFIC BODIES OF WATER

<NTAL> PHYSICAL VALIDATION UNDER CONSIDERATION

<UPDTE> 780707

<571>

<CONT>

SONNICHSEN, J. C.

<TITLE>

REGIONAL MODELING OF SURFACE WATER TEMPERATURES FROM PROJECTED POWER GROWTHS

<ACPO>

HAFPOD

<ADDP>

HANFORD ENGINEERING DEVELOPMENT LABORATORY, ENVIRONMENTAL AND ECONOMIC ANALYSIS, P.O. BOX 1970

<CITY>

HANFORD

<STATE>

WA

<ZIP>

99352

<PHONE>

509-942-7157; PIS 844-7157

<DOC>

HOPKINS, P.L., ENVIRONMENTAL ENGINEERING PROGRAMS QUARTERLY TECHNICAL PROGRESS REPORT, APRIL, MAY, JUNE, 1971, HEDL-TN-71-109, JULY, 1971, (PP. 11-40), 44 PP.

<SUB>

REGIONAL MODELING OF SURFACE WATER TEMPERATURES FROM PROJECTED POWER GROWTHS

<ABST>

HANFORD CALCULATES DIRECT COOLING CAPACITIES OF SURFACE WATERS FROM PROJECTED POWER GROWTHS. THE CODE INPUTS AT A GIVEN INCREMENTAL THERMAL RELEASE RATE AND THEN MODERATES THE RESIDUAL TEMPERATURE DIFFERENTIAL IN THE DOWNSTREAM DIRECTION UNTIL A POINT IS REACHED WHERE ANOTHER INCREMENTAL RELEASE RETURNS THE STREAM TO FIVE DEGREES FAHRENHEIT ABOVE AMBIENT. CALCULATIONS OF DIRECT COOLING CAPACITIES OF EIGHT MAJOR RIVERS IN THE NORTH AND MIDDLE ATLANTIC STATES WERE COMPLETED.

<GEO>

NATIONWIDE

<TIME>

1970-1973

<STATES>

IN USE

<ACCESS>

UNLIMITED

<MEDIA>

MAGNETIC TAPE; PUNCHED CARDS

<SIZE>

120,000 BYTES

<COMP>

SBI; CDC

<CONFIG>

UNIVAC 1100 WITH TWO 9 TRACK TAPE DISCS

<LANG>

FORTRAN IV

<ALGO>

SOLUTION TO ADVECTIVE TRANSPORT TERMS IN AN OPEN CHANNEL, FINITE ELEMENT OR CELL APPROXIMATIONS TO CHANNEL CONFIGURATION. HEAT SOURCES ENTER AS POINT SOURCES, HEAT EXCHANGE AT SURFACE.

<CLASS>

PREDICTIVE

<APPL>

TRANSPORT OF THERMAL ENERGY IN A FLOWING ENVIRONMENT (RIVER)

<SRCD>

U.S. GEOLOGICAL SURVEY FOR FLOW DATA HYDROLOGY MAPS FOR CHANNEL CONFIGURATION, TEMPERATURE DATA

<569>

<CONT>

SHUKATE, R. S.; SHIM, E. E.; PICCA, V. T.; CLARK, G. R.

<TITLE>

RESOURCES ALLOCATION TO OPTIMIZE MINING POLLUTION CONTROL

<ADDP>

OHIO STATE UNIVERSITY RESEARCH FOUNDATION

<CITY>

COLUMBUS

<STATE>

OH

<DOC>

PB--264185

<ABST>

A COMPREHENSIVE MODEL FOR RINE DRAINAGE SIMULATION AND OPTIMIZATION OF RESOURCE ALLOCATION TO CONTROL RINE ACID POLLUTION IN A WATERSHED HAS BEEN DEVELOPED. THE MODEL IS CAPABLE OF: (A) PRODUCING A TIME TRACE OF ACID LOAD AND FLOW FROM ACID DRAINAGE SOURCES AS A FUNCTION OF CLIMATIC CONDITIONS, (B) GENERATING CONTINUOUS RECEIVING STREAM PICA DATA FROM PRECIPITATION DATA; (C) PREDICTING ACID LOAD AND FLOW FROM RINE DRAINAGE SOURCES USING PRECIPITATION PATTERNS AND WATERSHED STATES TYPICAL OF 'WORST CASE' CONDITIONS THAT MIGHT BE EXPECTED, E.G., ONCE EVERY 10 OR 100 YEARS; AND (D) PREDICTING OPTIMUM RESOURCE ALLOCATION USING ALTERNATIVE METHODS OF TREATMENT AND/OR ABATEMENT FOR 'WORST CASE' CONDITIONS DURING BOTH WET AND DRY PORTIONS OF THE HYDROLOGIC YEAR.

<570>

<CONT>

SIMONS, T. J.

<TITLE>

MULTI-LAYERED MODELS OF CURRENTS, TEMPERATURE, AND WATER QUALITY PARAMETERS IN THE GREAT LAKES

<ABST>

A REVIEW IS PRESENTED OF THE MORE SALIENT FEATURES OF A MODELLING PROGRAM DESIGNED TO DESCRIBE THE THREE-DIMENSIONAL DISTRIBUTION OF CURRENTS, TEMPERATURE, AND FOREIGN MATTER IN THE GREAT LAKES. THE BASIC PRINCIPLES UNDERLYING THE COMPUTATION OF THE TRANSPORT OF A QUASICONSERVATIVE PARAMETER BY ADVECTION AND DIFFUSION ARE OUTLINED, AND AN EXAMPLE IS SHOWN OF THE DISPERSION OF A POLLUTANT IN LAKE ONTARIO. THE COUPLING OF THE HYDRODYNAMICS AND THE THERMODYNAMICS OF A LAKE IS DISCUSSED, AND A DESCRIPTION IS GIVEN OF THE MULTI-LAYERED MODEL OF

AQUATIC TRANSPORT

<571> COM.
 <INVL> SIMULATED TEMPERATURES FOR SEVERAL RIVERS IN THE UNITED STATES
 <UNDR> 780620
 <572>
 <COMT> SOFFICHSEN, J. C.
 <TITLE> A SIMULATION MODELING OF ENVIRONMENTAL EFFECTS OF THERMAL GENERATION, DOCUMENTATION OF THE COLNEAT MODEL
 <ACPOD> COLNEAT
 <ACED> HANFORD ENGINEERING DEVELOPMENT LABORATORY, ENVIRONMENTAL AND ECONOMIC ANALYSIS, P.O. BOX 1970
 <CITY> RICHLAND
 <STATE> WA
 <ZIP> 99352
 <INDR> 509-942-7157; PLS 844-7157
 <SOURCE> ARGONNE CODE CENTER
 <DOC> NREL-78-172, DUDLEY, G.F., (COMP.), ENVIRONMENTAL ENGINEERING PROGRAMS - QUARTERLY TECHNICAL PROGRESS REPORT, OCTOBER, NOVEMBER, DECEMBER 1971, (P. 1-2)
 <SUB> SIMULATION OF WATER TEMPERATURES IN RIVERS
 <ABST> THE COLNEAT RIVER SIMULATION MODEL GAVE OUT OF THE NEED TO ESTIMATE THE EFFECT ON THE TEMPERATURE OF THE COLUMBIA RIVER OF OPERATING THE HANFORD PRODUCTION REACTORS. THE VERSATILITY OF THE CODE WAS DEMONSTRATED BY SIMULATING THE TIME OF ARRIVAL AND DISPERSION OF AN ACCIDENTAL RELEASE OF RADIOACTIVE IODINE AT VANCOUVER, WASHINGTON, A DISTANCE OF 270 MILES BELOW THE POINT OF RELEASE OF THE COLUMBIA RIVER. MANY MODIFICATIONS HAVE BEEN INTRODUCED INTO THE CODE INCLUDING INCREASED FLEXIBILITY TO HANDLE OTHER CONSERVATIVE AND NON-CONSERVATIVE POLLUTANTS.
 <GEO> NATIONWIDE
 <TIME> 1965-1975
 <STATUS> IN USE
 <ACCESS> UNLIMITED
 <MEDIA> MAGNETIC TAPE; PAPER TAPE; PUNCHED CARDS; TEXT
 <SIZE> 2000 CARDS, 100,000 BYTES
 <COMP> UBI; CDC
 <CONFIG> CEC-CYBER 74; UNIVAC-1108
 <LANG> FORTRAN IV
 <CARD> BINARY
 <ALGO> FINITE ELEMENT
 <CLASS> SIMULATION
 <APPL> THE FATE OF WASTE HEAT DISCHARGED INTO RIVERS OR MOVING WATER BODIES-PAN FIELD

<ORERS> U.S. DEPARTMENT OF ENERGY; U.S. ENVIRONMENTAL PROTECTION AGENCY
 <UNAL> THE MODEL HAS BEEN TESTED ON NUMEROUS RIVERS IN THE UNITED STATES. SIMULATED TEMPERATURES AGREE WELL WITH MEASURED DATA.
 <UPDATE> 780620
 <573>
 <COMT> SPAGGS, L. D.; STREET, R. L.
 <TITLE> THREE-DIMENSIONAL SIMULATION OF THERMALLY-INFLUENCED HYDRODYNAMIC FLOWS
 <ADDR> STANFORD UNIVERSITY, DEPARTMENT OF CIVIL ENGINEERING
 <CITY> STANFORD
 <STATE> CA
 <DOC> PB--247090, 1975
 <ABST> A STUDY WAS UNDERTAKEN TO DEVELOP A THREE-DIMENSIONAL NUMERICAL MODEL FOR PREDICTION OF THE TEMPERATURE REGIME AND ENERGY TRANSFERS IN BODIES OF WATER SUBJECTED TO THERMAL LOADINGS. THE NAVIER-STOKES EQUATIONS, A HEAT ENERGY EQUATION, A PRESSURE EQUATION AND A CONTINUITY EQUATION ARE NON-DIMENSIONALIZED USING THREE CHARACTERISTIC LENGTH SCALES. NEXT, ALL PHYSICAL PROBLEMS ARE TREATED NUMERICALLY, AND MATHEMATICALLY, INSIDE A UNIT CUBE. THE BOUSSINESQ APPROXIMATION IS USED FOR DENSITY VARIATIONS. SUB-GRID-SCALE TURBULENCE SIMULATION IS USED WITH AN EDDY VISCOSITY HYPOTHESIS. THE NUMERICAL MODEL FOLLOWS A MARKER-AND-CELL-STYLE FORMAT IN VARIABLE PLACEMENT, ETC., WAS CODED IN FORTRAN, AND WAS IMPLEMENTED ON IBM 360/160 AND CDC/7600 COMPUTERS. MANY PROBLEMS WERE SUCCESSFULLY SIMULATED, INCLUDING LABORATORY TESTS WITH UDD AND IN/OUT FLOWS, AND IDEALIZED LAKE FORMS.
 <COMP> IBM; CDC
 <CONFIG> IBM 360/160; CDC/7600
 <LANG> FORTRAN
 <574>
 <COMT> SPAULDING, R.
 <TITLE> NUMERICAL MODELING OF POLLUTANT TRANSPORT USING A LAGRANGIAN MARKER PARTICLE TECHNIQUE
 <ADDR> NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, LANGLEY RESEARCH CENTER
 <CITY> LANGLEY STATION
 <STATE> VA
 <DOC> N-76-28602, 1976
 <ABST> A DERIVATION AND CODE WAS DEVELOPED FOR THE THREE DIMENSIONAL MASS TRANSPORT EQUATION, USING A PARTICLE-IN-CELL SOLUTION TECHNIQUE, TO SOLVE COASTAL ZONE WASTE DISCHARGE PROBLEMS WHERE PARTICLES ARE THE MAJOR COMPONENT.

<575>

AGMATIC "TRANSPECT"

<576>

<CON> STANISLAV, J.; BORTADI, R. P.

<TITLE> MATHEMATICAL SIMULATION OF DISPERSIONS OF POLLUTANTS IN A LAKE WITH ICE COVER

<DOC> WATER RESOURCES, 5(7), 401-412, 1971

<ABST> MATHEMATICAL SIMULATION WAS USED TO PREDICT THE MODE OF DISPERSION OF A POINT SOURCE POLLUTANT ENTERING A LAKE. THE MODEL IS BASED ON SIMPLIFYING ASSUMPTIONS BUT IT IS VERSATILE ENOUGH TO ALLOW THE MAGNITUDE OF DIMENSIONLESS PARAMETERS, SOURCE TERMS AND BOUNDARY AND INITIAL CONDITIONS TO BE ALTERED. BY IMPOSING A LAMINAR VELOCITY DISTRIBUTION ON THE SYSTEM THE MODEL CAN BE USED TO SIMULATE THE DISPERSION PATTERN IN A LAKE WHERE THERE IS A SLOW BULK FLOW. THE METHOD CAN BE EMPLOYED AS A USEFUL TOOL FOR THE PREDICTIONS OF THE EXTENT OF POLLUTION IN A LAKE.

<CON> 23 REFERENCES, 7 FIGURES

<576>

<CON> STEELE, TIMOTHY B.

<TITLE> SIMULATION OF MAJOR INORGANIC CHEMICAL CONCENTRATIONS AND LOADS IN STREAMFLOW

<ABST> THE PURPOSE OF THE REPORT IS TO DOCUMENT A COMPUTER PROGRAM FOR SIMULATION OF CONCENTRATIONS AND LOADS OF MAJOR INORGANIC CHEMICAL CONSTITUENTS, BASED UPON (1) CONTINUED DAILY RECORDS OF INDEX VARIABLES SUCH AS SPECIFIC CONDUCTANCE OF STREAM DISCHARGE, AND (2) DERIVED FUNCTIONAL RELATIONSHIPS BETWEEN SOLUTE CONCENTRATIONS AND ONE OR BOTH OF THE INDEX VARIABLES. THE SIMULATION PROGRAM ESTIMATES DAILY CONCENTRATIONS AND LOADS OF THE MAJOR INORGANIC CONSTITUENTS AND COMPUTES WEEKLY, MONTHLY, AND ANNUAL TIME-WEIGHTED AND DISCHARGE-WEIGHTED AVERAGE CONCENTRATIONS. AN IONIC BALANCE IS CALCULATED IN EACH CASE WHERE THE RELATIVE ABUNDANCE OF THE MAJOR IONS IS SIMULATED OR AVERAGED. NUMEROUS INPUT AND OUTPUT OPTIONS ARE PROVIDED. TWO PERIPHERAL PROGRAMS TO THE STREAMFLOW CHEMICAL-QUALITY SIMULATION PROGRAM ARE DESCRIBED FOR OBTAINING THE EARLIER-FORMATTED DAILY CONSTITUENT RECORDS. CARD DECK SETUP AND JOB-CONTROL-LANGUAGE (JCL) CARDS REQUIRED FOR THE SIMULATION PROGRAM ARE ALSO PROVIDED.

<CONF> YES

<CONFID> IDB 340/65

<577>

<CON> STEFAN, R.

<TITLE> ANALYTICAL JET-TYPE MODEL OF HEATED WATER SURFACE PLUMES

<ADDR> UNIVERSITY OF MINNESOTA

<CITY> MINNEAPOLIS

<STATE> MN

<DOC> PROCEEDINGS OF THE FIFTEENTH CONFERENCE ON GREAT LAKES RESEARCH HELD IN MADISON, WISCONSIN, APRIL 5-7, 1972;

CONF-720451

<ABST>

THE STEADY FLOW OF HEATED WATER FROM A STRAIGHT CHANNEL INTO A LAKE HAS BEEN INVESTIGATED ANALYTICALLY AND EXPERIMENTALLY. A THREE-DIMENSIONAL BUOYANT JET-TYPE ANALYTICAL MODEL HAS BEEN DEVELOPED TO PREDICT THE THICKNESS (DEPTH), THE MAIN TRAJECTORY AND THE TEMPERATURE DISTRIBUTION IN THAT PORTION OF A THERMAL PLUME WHERE THE FLOW IS DOMINATED BY THE INITIAL MOMENTUM AND THE BUOYANCY OF THE DISCHARGE AND WHERE IT HAS FREE BOUNDARIES. THE INTERACTION BETWEEN TURBULENT MIXING, BUOYANT SPREADING AND SURFACE COOLING IS REPRESENTED IN THE MODEL. AN INTEGRAL TECHNIQUE USING THE ENTRAINMENT PRINCIPLE AND THE MOMENTUM AND HEAT TRANSFER EQUATIONS ARE USED. EFFECTS OF WEAK CROSSCURRENTS AND WEAK WINDS ARE ALSO INCORPORATED. THE NECESSARY SET OF EQUATIONS IS SOLVED BY FORWARD EXTRAPOLATION BEGINNING AT A MINIMAL AMOUNT OF COMPUTER TIME. THE MODEL IS NOT SUITABLE FOR THERMAL PLUMES WHICH CLING TO A SHORELINE DUE TO PARTICULAR WIND OR CURRENT CONDITIONS.

<578>

<CON> STEFAN, R.; HAYAKAWA, H.; SCHIEDE, F. P.

<TITLE> SURFACE DISCHARGE OF HEATED WATER

<ADDR> MINNESOTA UNIVERSITY, ST. ANTHONY FALLS HYDRAULIC LABORATORY

<CITY> MINNEAPOLIS

<SOURCE> GPO 42.00

<DOC> MN--211 205; WATER POLLUTION CONTROL RESEARCH SERIES 16130 P5012171

<ABST>

A COMPREHENSIVE ANALYTICAL MODEL HAS BEEN DEVELOPED TO DESCRIBE THE FLOW OF HEATED WATER FROM A CHANNEL ONTO THE SURFACE OF A LAKE OR RESERVOIR. THIS ANALYTICAL TOOL CAN BE USED TO PREDICT DEPTH, WIDTH, TEMPERATURE, AND FLOW VELOCITY IN A HEATED WATER SURFACE JET. WEAK CROSS-CURRENTS AND WINDS ARE INCLUDED. THE MODEL ALSO PREDICTS THE TOTAL AMOUNT OF HEAT ACTUALLY LOST TO THE ATMOSPHERE AND THE AMOUNT OF AMBIENT WATER ENTRAINMENT. AS PRESENTED, THE ANALYTICAL METHOD IS SIMPLE AND INEXPENSIVE TO APPLY. IT ASSUMES FULLY ESTABLISHED BUOYANT JET FLOW INTO HOMOGENEOUS ENVIRONMENT. IT CAN BE EXTENDED TO INCLUDE, FOR EXAMPLE, AN OUTLET ZONE (ZONE OF FLOW ESTABLISHMENT) OR STRATIFICATION IN THE AMBIENT WATER. CRITERIA FOR THE EXISTENCE OF THE TWO-DIMENSIONAL MIXING INTERNAL HYDRAULIC JUMP AND THE NATURE OF ENTRAINMENT WHICH IT MAY PRODUCE HAVE BEEN ESTABLISHED THEORETICALLY AND VERIFIED WITH A LIMITED NUMBER OF EXPERIMENTAL DATA. THE RESULTS OF TWO FIELD SURVEYS IN A THERMAL PLUME ARE PRESENTED.

<LANG> FORTRAN

<579>

<CON> STOLZENBACH, R. D.; HARLEMAN, D. R. P.

<TITLE> AN ANALYTICAL AND EXPERIMENTAL INVESTIGATION OF SURFACE DISCHARGE OF

AQUATIC TRANSPORT

<579> CONT.

HEATED WATER

<ABST> THE PREDICTION OF TEMPERATURE WITHIN THE REGION DOMINATED BY TURBULENCE FROM A HEATED DISCHARGE WAS INVESTIGATED. A THREE-DIMENSIONAL THEORY IS DEVELOPED, BASED ON A TURBULENT JET MODEL AND INCLUDING DENSITY GRADIENTS AND SURFACE HEAT LOSS. OF INTEREST IN FORMULATING THE THEORY IS THE DEPENDENCY OF THE TEMPERATURE DISTRIBUTION IN THE RECEIVING WATER ON THE TEMPERATURE DIFFERENCE BETWEEN DISCHARGE AND AMBIENT WATER, THE INITIAL DISCHARGE VELOCITY, THE CHANNEL GEOMETRY, THE BOTTOM SLOPE, THE AMBIENT CROSS FLOW, AND SURFACE HEAT TRANSFER. EXPERIMENTS WERE PERFORMED IN A LABORATORY BASIN IN WHICH ALL OF THE RELEVANT PARAMETERS, INCLUDING CROSS FLOW AND BOTTOM SLOPE, WERE VARIED AND TEMPERATURES WERE MEASURED IN THE HEATED DISCHARGE. THE EXPERIMENTS VERIFY THE THEORETICAL PREDICTIONS.

<580>
<CONT> STOLZENBACH, E. D.; ADAMS, E. E.; HABLEMAN, D. E. P.

<TITLE> A USER'S MANUAL FOR THREE-DIMENSIONAL HEATED SURFACE DISCHARGE COMPUTATIONS

<ADDR> MASSACHUSETTS INSTITUTE OF TECHNOLOGY, DEPARTMENT OF CIVIL ENGINEERING

<CITY> CAMBRIDGE

<STATE> MA

<SOURCE> GPC \$1.25

<DOC> PS--219 203/3, 1973; PB 210 134

<ABST> THE TEMPERATURE DISTRIBUTION INDUCED IN AN AMBIENT BODY OF WATER BY A SURFACE DISCHARGE OF HEATED CONDENSER COOLING WATER MUST BE DETERMINED FOR EVALUATION OF THERMAL EFFECTS UPON THE NATURAL ENVIRONMENT, FOR PREVENTION OF PECIRCULATION OF THE HEATED DISCHARGE INTO THE COOLING WATER INTAKE, FOR IMPROVED DESIGN OF LABORATORY SCALE MODELS AND FOR INSURING THAT DISCHARGE CONFIGURATIONS MEET LOCAL TEMPERATURE REGULATIONS. THIS REPORT PRESENTS A REVIEW OF THE THEORETICAL BACKGROUND FOR A THREE-DIMENSIONAL TEMPERATURE PREDICTION MODEL, A DETAILED DISCUSSION OF THE COMPUTER PROGRAM AND A CASE STUDY ILLUSTRATING THE PROCEDURE FOR OPTIMIZING THE DESIGN OF A SURFACE DISCHARGE CHANNEL. FLOW CHART, PROGRAM LISTING AND A SAMPLE OF THE INPUT AND OUTPUT DATA ARE GIVEN IN THE APPENDICES.

<581>
<CONT> STREET, P. L.

<TITLE> SIMULATION OF THERMALLY-INFLUENCED HYDRODYNAMIC FLOWS

<ADDR> STANFORD UNIVERSITY, DEPARTMENT OF CIVIL ENGINEERING

<DOC> PB--255760, 1976

<ABST> THE WORK LED TO DEVELOPMENT OF (1) A TIME-DEPENDENT, THREE-DIMENSIONAL NUMERICAL MODEL WHICH SIMULATES THE HYDRODYNAMICS AND THERMAL REGIME OF

LAKES AND RESERVOIRS AND (2) A TWO-DIMENSIONAL (HORIZONTAL-VERTICAL) HYDROSTATIC NUMERICAL MODEL FOR SIMULATION OF HYDRODYNAMICS AND THERMAL REGIMES (E.G., THERMOCLINE DEVELOPMENT) IN LONG AND NARROW RESERVOIRS AND LAKES. BOTH MODELS EMPLOY MAC SPACE-STAGGERED GRIDS, EXPLICIT TIME-STEPPING, THE BOUSSINESQ APPROXIMATION, AND A SPATIALLY- AND TIME-VARIANT EDDY VISCOSITY MODEL. A LITERATURE REVIEW ESTABLISHES THE RANGE OF SUCCESSFUL, NUMERICAL FINITE-DIFFERENCE, THREE-DIMENSIONAL MODELS THAT ARE AVAILABLE. THE CONCLUSIONS SUGGEST THAT THREE-DIMENSIONAL HYDROSTATIC MODELS AND LATERALLY-AVERAGED TWO-DIMENSIONAL MODELS PROVIDE THE BEST OPPORTUNITIES FOR ECONOMIC AND QUANTITATIVELY ACCURATE SIMULATIONS.

<582>

<CONT>

SUNSHAN, ALVIN J.

<TITLE>

HYDRA: DYNAMIC MODEL FOR URBAN HYDROLOGIC SYSTEMS

<ACRO>

HYDRA

<ABST>

THE DESIGN AND APPLICATION ARE DESCRIBED OF HYDRA, A NEW PACKAGE OF COMPUTER PROGRAMS DESIGNED FOR THE DETAILED MODELING OF THE ROUTING OF WATER IN CONVERGING CHANNEL NETWORKS. GEOMETRIC CHARACTERISTICS OF INTRICATE SYSTEMS CONSISTING OF ARBITRARILY LARGE NUMBERS OF CHANNEL SEGMENTS CAN BE CONSIDERED. ACCOUNTED FOR IN THE SIMULATION MODEL ARE THE RELATIONSHIPS OF THE CHANNEL SEGMENTS TO EACH OTHER, TO SURROUNDING AREAS, AND TO THE RAINFALL VARIATIONS AND/OR MOVEMENT OF STORMS. STORMS ARE DESCRIBED AS REGIONS ENCLOSED BY BOUNDARIES APPROXIMATED BY ANY ARBITRARY NUMBER OF POLYGON SIDES. THE DEGREE OF DETAIL WITH WHICH EITHER THE NETWORK OR STORM PATTERNS ARE DEFINED MAY BE CHOSEN BY THE USER. RESULTS FROM THIS MODELING PACKAGE INCLUDE, FOR FINITE STORM EVENTS, THE RUNOFF RATE AND ACCUMULATED RAINFALL AT ANY SPECIFIED POINT ON THE NETWORK.

<LANG>

FORTRAN

<583>

<CONT>

THATCHER, H. L.; HABLEMAN, D. E.

<TITLE>

MATHEMATICAL MODEL FOR THE PREDICTION OF UNSTEADY SALINITY INTRUSION IN ESTUARIES

<ADDR>

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, RALPH W. PARSONS LABORATORY FOR WATER RESOURCES AND HYDRODYNAMICS

<CITY>

CAMBRIDGE

<STATE>

MA

<DOC>

MIT--144 2--72-10, FEB 1972

<CLASS>

PREDICTIVE

<584>

<CONT>

THATCHER, H. L.; HABLEMAN, DONALD E. P.; LLEWELLYN, W.

<SUB>

AQUATIC TRANSPORT

<SUB> CONT.

<TITLE> PREDICTION OF UNSTEADY SALINITY
INTRUSION IN ESTUARIES: MATHEMATICAL
MODEL AND USER'S MANUAL

<ALOP> MASSACHUSETTS INSTITUTE OF TECHNOLOGY,
PALPH R PARSONS LABORATORY FOR WATER
RESOURCES AND HYDRODYNAMICS

<CITY> CAMBRIDGE

<STATE> MA

<DOC> INDEX NO. 72-321-CCB.; D-72-10;
DSW-72602; DSW-73079

<ABST> THE REPORT IS INTENDED TO BE A
DOCUMENTATION OF THE COMPUTER PROGRAM
AND A USER'S MANUAL FOR THE
IMPLEMENTATION OF THE MATHEMATICAL
MODEL FOR THE PREDICTION OF UNSTEADY
SALINITY INTRUSION IN ESTUARIES. THE
MODEL IS ONE DIMENSIONAL, ALTHOUGH
VARYING DEGREES OF STRATIFICATION ARE
ACCOUNTED FOR IN THE ASSUMED
LONGITUDINAL DISPERSION RELATIONSHIP.
THIS STUDY IS PART OF THE ESTUARY
MODELING PROGRAM UNDERWAY AT THE
DEPARTMENT OF ENGINEERING OF MIT. THE
PURPOSE OF THE PROGRAM IS TO DEVELOP
ANALYTICAL AND NUMERICAL TECHNIQUES FOR
MODELING THE BEHAVIOR OF ESTUARIES AND
COASTAL ENVIRONMENTS IN ORDER TO EXTEND
THE BASIC UNDERSTANDING OF ESTUARINE
DYNAMICS AND THE ABILITY TO MAKE
PREDICTIONS RELATING TO THE ESTUARINE
ENVIRONMENT.

<COMP> IBM

<CONFIG> IBM 360/65; IBM 370/155

<LANG> FORTRAN

<SUB>
<CONT> TRAYER, GORDON B.

<TITLE> CYCLING OF ELEMENTS IN ESTUARIES

<ALOP> NATIONAL MARINE FISHERIES SERVICE,
ATLANTIC ESTUARINE FISHERIES CENTER

<CITY> BEAUFORT

<STATE> NC

<ZIP> 28516

<PHONE> 919-728-8595

<DOC> FISHERY BULLETIN, 70(3), 959-972, 1977;
DATA RADIOACTIVE CONTAMINATION OF
MARINE ENVIRONMENT, PP. 159-175, 1973;
VEGETATION AND VEGETATION (EDS.), POLLUTION
AND PHYSIOLOGY OF MARINE ORGANISMS,
1970, ACADEMIC PRESS, PP. 79-99; CHOWIN
(ED.), ESTUARINE RESEARCH VOL 1, 1975,
ACADEMIC PRESS, PP. 645-671; CHURCH
(ED.), RADIOECOLOGY AND ENERGY
RESOURCES, 1976, BOWEN HUTCHINSON &
POSS, PP. 256-270

<SUB> METALS CYCLING IN ESTUARIES

<ABST> MEANINGFUL EVALUATION OF THE ECOLOGICAL
STRESSES IMPOSED BY MAN'S RELEASE OF
HEAVY METALS OR RADIOISOTOPES INTO
ESTUARIES REQUIRES AN IMPROVED
UNDERSTANDING OF THE INTERACTIONS
BETWEEN THE WASTE MATERIALS AND THE
FUNCTIONAL COMPONENTS OF THE ECOSYSTEM.
THE TYPE OF INFORMATION REQUIRED FOR
THE DEVELOPMENT OF USEFUL MODELS FOR

THE CYCLING OF CONTAMINANT METALS (BOTH
RADIOACTIVE AND STABLE) IN ESTUARINE
ECOSYSTEMS ARE REVIEWED AND DISCUSSED.
WITH PARTICULAR REFERENCE TO THE
COASTAL PLAIN ESTUARIES OF THE
SOUTHEASTERN UNITED STATES, WE DISCUSS
THE MAJOR RESERVOIRS OF THESE METALS,
THE MECHANISMS AND PATHWAYS OF
ELEMENTAL TRANSFORMATION AND RATES OF
ELEMENTAL TURNOVER AMONG RESERVOIRS,
AND THE RESPONSES OF THESE PROCESSES
AND RESERVOIRS TO ENVIRONMENTAL CHANGE.
A CONCEPTUAL SYSTEMS MODEL IS
PRESENTED AS THE PRELIMINARY PHASE IN
THE DEVELOPMENT OF DYNAMIC MATHEMATICAL
MODELS OF ELEMENTAL CYCLING.

<SUB> SOUTHEASTERN U.S. COASTAL PLAIN
ESTUARIES

<TIME> 1967-1976

<STATUS> UNDER DEVELOPMENT

<ACCESS> UNLIMITED

<MEDIA> TEXT

<CLAS> PREDICTIVE; DESCRIPTIVE

<APPL> TRACE METAL AND RADIOMETAL MOVEMENT
IN THE ESTUARINE/MARINE ENVIRONMENT

<SUB> NWS ATLANTIC ESTUARINE FISHERIES
CENTER NC ESTUARIES

<UPDATED> 700809

<SUB>
<CONT> THEODORE, L.

<TITLE> SIMULATION OF CONTAMINANTS IN BAYS:
APPLICATION TO SAN FRANCISCO BAY COMPLEX

<DOC> THIRD ANNUAL OFFSHORE TECHNOLOGY
CONFERENCE, HELD IN HOUSTON, TEXAS,
APRIL 19, 1971

<ABST> A MATHEMATICAL MODEL HAS BEEN DEVELOPED
TO SIMULATE THE BEHAVIOR OF A
CONTAMINANT IN A SERIES OF BAYS. THE
CONTAMINANT-BAY SYSTEM IS REPRESENTED
BY THE CONCEPTUALLY SIMILAR COMBINATION
OF A REACTANT IN A SERIES OF
CONTINUOUSLY STIRRED TANK REACTORS.
SPECIFICALLY, THE MODEL INCORPORATES
FORWARD FEED AS WELL AS BI-DIRECTIONAL
INTERCHANGE (BACKFLOW), RECYCLE,
FIRST-ORDER REACTION AND INDEPENDENT
AUXILIARY INPUTS TO EACH REACTOR.
ALTHOUGH THE ANALYSIS IS PRESENTED FOR
THREE REACTORS, AN EXTENSION TO A
LARGER SYSTEM IS EASILY ACCOMPLISHED.
ANALYTICAL SOLUTIONS ARE OBTAINED FOR
DIVERSE VARIABLE FEED CONCENTRATION. AN
ANALOG COMPUTER APPROACH IS ALSO
INCLUDED. IN ADDITION, A GENERAL
DIGITAL COMPUTER PROGRAM IS DEVELOPED
WHICH USES THE RUNGE-KUTTA NUMERICAL
INTEGRATION TECHNIQUE TO SOLVE THE
GENERAL SET OF EQUATIONS DICTATED BY
THE MODEL UNDER VARIOUS CONDITIONS.
SYSTEM CONDITIONS INCLUDE TIME VARIABLE
FLOW RATE, FEED CONCENTRATION AND
REACTOR VOLUME, AUXILIARY INPUTS AND
REACTION RATES. THE MODEL IS APPLIED TO
THE SAN FRANCISCO BAY COMPLEX, AND THE
RESULTANT EQUATIONS ARE SOLVED USING
THE GENERAL DIGITAL PROGRAM. TIDAL
EFFECTS ARE SIMULATED BY USING
BI-DIRECTIONAL FEED INTERCHANGES. THE
CALCULATED RESULTS PREDICTED DAILY
CONCENTRATION PROFILES IN QUALITATIVE

AQUATIC TRANSPORT

<506> CONT.

ASSESSMENT WITH WHAT ONE WOULD EXPECT. THE MONTHLY CONCENTRATION PROFILES GENERATED COMPARED FAVORABLY WITH EXISTING EXPERIMENTAL DATA.

AMERICAN NUCLEAR SOCIETY, 10, 54-55, 1976

<520> CALIFORNIA, SAN FRANCISCO BAY

<TITLE> SIMULATION

<589>

<CONT>

TINGLE, ARTHUR G.

<TITLE> OCEAN CURRENT AND POLLUTANT TRANSPORT MODEL

<ACFO> OCAP

<ADDS> BROOKHAVEN NATIONAL LABORATORY, ATMOSPHERIC SCIENCES, BLDG. 051

<CITY> UPTON

<STATE> N Y

<ZIP> 11973

<PHONE> 516-305-2271; FTS 664-2271

<SOURCE> DEVELOPED AT BNL

<DOC> A. G. TINGLE, A COMPUTER ANALYSIS OF THE SPREAD OF POLLUTION ON LONG ISLAND BEACHES, BNL 50651, JULY 1976; A. G. TINGLE AND D. A. MERTZKE, A NUMERICAL OIL TRAJECTORY FORECAST MODEL USED TO ASSESS THE HAZARD TO LONG ISLAND BEACHES, BNL 50649, MARCH 1977.

<SUB> TRANSPORT OF OCEAN POLLUTANTS.

<ABST> THE MODEL CONSISTS OF THREE MAJOR COMPONENTS: (1) AN EULERIAN MODEL THAT COMPUTES, DYNAMICALLY, THE WIND DRIVEN CURRENTS; (2) A LAGRANGIAN MODEL THAT COMPUTES BOTH THE TRAJECTORY OF MATERIAL ON THE SURFACE AND THE TRAJECTORY OF MATERIAL IN THE WATER COLUMN FROM A VARIETY OF SOURCE LOCATIONS. THIS IS A PARTICLE-IN-CELL DIFFUSION MODEL IF SEVERAL HUNDRED "PARTICLES" ARE RELEASED, DEPENDENT ON THE SPILL RATE; (3) VARIOUS GRAPHIC ROUTINES FOR PRESENTING THE RESULTS. THE CURRENT MODEL IS A ONE-LAYER FREE SURFACE NUMERICAL MODEL THAT RESPONDS TO SURFACE WIND STRESS, BOTTOM FRICTION, THE GEOSTROPHIC PRESSURE GRADIENT, THE CORIOLIS FORCE, AND THE BOTTOM TOPOGRAPHY. THE MODEL IS APPLICABLE WHEN THE WATER COLUMN IS OF CONSTANT DENSITY, A SITUATION WHICH EXISTS DURING WINTER IN THE COASTAL REGION. THE MODEL DOES NOT COMPUTE TIDES OR ESTUARINE DISCHARGES. THE GRID SPACING IS 3 MINUTES IN LATITUDE AND 4 MINUTES IN LONGITUDE (ABOUT 5.67 KM).

<GEN> NEW YORK BIGHT; BERING SEA; GULF OF MAINE

<TIME> ONE DAY TO 6 MONTH ASSESSMENTS.

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE

<SIZE> 2500 CARD IMAGES

<CONFIG> CDC 7600 WITH 140 K CORE, AND A PLOTTING DEVICE.

<LANG> FORTRAN IV

<CHAR> ASCII

<ALGO> SHALLOW WATER EQUATIONS, STAGGERED

<590>

<CONT> TILL, W. A.; KALINOWSKI, J. E.

<TITLE> COMPUTER-MODEL FOR THREE-DIMENSIONAL SIMULATION OF THERMAL DISCHARGES INTO RIVERS

<ADDS> UNIVERSITY OF MISSOURI

<CITY> ROLLA

<STATE> MO

<DOC> ANNUAL MEETING OF THE AMERICAN NUCLEAR SOCIETY, HELD IN PHILADELPHIA, PENNSYLVANIA, TRANSACTIONS OF THE

<589>

AQUATIC TRANSPORT

<589> CONT.

GRID, ONE-TIME LEVEL, EXPLICIT DIFFERENCING, QUASI LAGRANGIAN SCHEME FOR POLLUTANT TRANSPORT AND DISCUSSION.

<CLASS> PREDICTIVE; SIMULATION

<APPL> COASTAL CURRENTS AND POLLUTION

<USERS> DRI, NCAL

<SUB> SOURCES FOR BOTTOM TOPOGRAPHY, SURFACE WIND DATA, AND RELEASE LOCATIONS OF POLLUTANTS.

<VAL> COMPARISON AGAINST OBSERVED CURRENTS AND POLLUTANT DISTRIBUTIONS.

<UPDATE> 790607

<590>

<CONT> TORLIN, ALAN

<TITLE> MATHEMATICAL DISPERSION MODELS FOR HEATED DISCHARGES

<ACRO> HOTSUB; HUBSUB

<ABDO> HUS CORPORATION

<CITY> ROCKVILLE

<STATE> MD

<DOC> PREPARED BY HUS CORP. AND INCLUDED IN ENTIRETY AS APPENDIX A5.1, TYBONE ENERGY PARK UNITS 1 AND 2 ENVIRONMENTAL REPORT, NORTHERN STATES POWER COMPANY, JUNE 1976. ALSO INCLUDED AS APPENDIX 6.1-B, SOUTH TEXAS PROJECT UNITS 1 & 2 ENVIRONMENTAL REPORT, HOUSTON LIGHTING AND POWER CO., JULY 1976.

<ABST> STUDY PREPARED BY HUS ENVIRONMENTAL SAFEGUARDS DIVISION TO ANALYZE TEMPERATURE DISTRIBUTION AND EFFECTS IN RECEIVING WATER BODY FROM SUBMERGED DISCHARGE. MODEL IS BASED ON ROH AND PAN APPROACH (SEE 00015) AND ANALYZES TWO DIMENSIONAL SLOT JET OR ROUND JET DISCHARGE FROM SINGLE OR MULTIPLE DIFFUSER. STUDY DESCRIBES VARIOUS EQUATIONS USED IN MODEL DIFFUSION EQUATIONS AND TWO COMPUTER PROGRAMS DEVELOPED BY HUS. COMPUTER CODES ARE: HUBSUB FOR SUBMERGED DISCHARGE AND HOTSUB FOR SURFACE DISCHARGE. INCLUDES TWO TABLES AND SIX FIGURES.

<CON> 2 TABLES, 6 FIGURES

<591>

<CONT> TORLIN, ALAN

<TITLE> MATHEMATICAL MODEL FOR INDUCED VELOCITY DISTRIBUTION AROUND A SUBMERGED INTAKE

<ACRO> INVELD

<ABDO> HUS CORPORATION

<CITY> ROCKVILLE

<STATE> MD

<DOC> INCLUDED AS APPENDIX D5.1, PERRY NUCLEAR POWER PLANT UNITS 1 & 2 ENVIRONMENTAL REPORT, CLEVELAND ELEC. ILLUMINATING CO., JUNE 1973. 8 PP.

<ABST> APPENDIX DESCRIBES A MATHEMATICAL MODEL

FOR ANALYZING THE VELOCITY DISTRIBUTION AROUND A SUBMERGED INTAKE. A COMPUTED PROGRAM, INVELD, WAS DEVELOPED TO ANALYZE EFFECTS OF VARIOUS PARAMETERS UPON THE INDUCED VELOCITY DISTRIBUTION. THE PROGRAM ENABLES THE PLOTTING OF VELOCITY ISOPLATHS, AS WELL AS GIVING THE VOLUMES AND DISTANCES FROM THE INTAKE FACE AS A FUNCTION OF VELOCITY.

<592>

<CONT> TORINO, HARRY C.

<TITLE> STORMWATER MANAGEMENT MODEL

<ACRO> SWRM

<ABDO> U. S. ENVIRONMENTAL PROTECTION AGENCY, OFFICE OF RESEARCH AND DEVELOPMENT (RD 602), 401 M ST. S.W.

<CITY> WASHINGTON

<STATE> DC

<ZIP> 20460

<PHONE> 202-826-0010; PIS 826-0010

<DOC> METCALF AND EDDY, INC., STORM WATER MANAGEMENT MODEL, VOL. I FINAL REPORT, REPORT 110 20 DOC 87/74, PB 203 289, ENVIRONMENTAL PROTECTION AGENCY, WASHINGTON, D.C., JULY 1971; RUBEN, D.C., ET AL., STORM WATER MANAGEMENT MODEL USER'S MANUAL, VERSION II, EPA-670/2-75-017, ENVIRONMENTAL PROTECTION AGENCY, CINCINNATI, OHIO, MARCH 1975

<SUB> URBAN RUNOFF; STORM AND COMBINED SEWERS; RECEIVING WATER QUALITY

<ABST> EPA'S STORMWATER MANAGEMENT MODEL (SWRM) IS A LARGE FORTRAN PROGRAM WHICH MODELS THE COMPLETE URBAN DRAINAGE/RUNOFF CYCLE, INCLUDING FLOW OVERLAND AND IN THE SEWERAGE SYSTEM, IN-LINE AND OFF-LINE STORAGE, TREATMENT (INCLUDING COSTS) OF STORMWATER FLOWS, AND WHICH INCLUDES A RECEIVING WATER MODEL TO ASSESS WATER QUALITY IMPACTS. PROGRAM OUTPUTS CONSIST OF TABLES, HYDROGRAPHS AND PLOTTOGRAPHS, WHICH CAN BE DISPLAYED AT POINTS WITHIN THE SYSTEM AS WELL AS IN THE RECEIVING WATERS. THE SWRM HAS 6 MAJOR COMPUTATIONAL BLOCKS: EXECUTIVE (CONTROL) BLOCK, RUNOFF BLOCK, TRANSPORT BLOCK, EXTEND (EXTENDED TRANSPORT) BLOCK, STORAGE AND TREATMENT BLOCK. THE SWRM IS WELL DOCUMENTED; THE COMPUTED PROGRAM IS AVAILABLE WITHOUT CHARGE; AND EPA IS PROVIDING FOR CONTINUAL MAINTENANCE AND UPDATING OF THE PROGRAM. A USERS GROUP, CONSISTING OF OVER 300 MEMBERS MEETS SEMI-ANNUALLY TO DISCUSS SWRM APPLICATIONS AND THE USE OF OTHER MODELS AS WELL.

<GEO> ANY GEOGRAPHICAL AREA

<TIME> NOT APPLICABLE

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE

<SIZE> 27,000 FORTRAN STATEMENTS

<COMP> AND; IBM; VSI; CDC; PRIME

AQUATIC TRANSPORT

<592> CONT.
 <COMP> IBM 360/370 WITH 512 K CORE AND 2 TAPE DRIVES

<LANG> FORTRAN IV

<CHAR> BASIC

<ALGO> STANDARD FORTRAN PROGRAMMING

<CLAS> DETERMINISTIC; ANALYTICAL; SIMULATION; ENGINEERING PROCESS

<APPL> CALCULATION OF BUOY; STORED WATER FLOWS; COMBINED SEWER OVERFLOWS; TRANSPORT THROUGH A SEWER SYSTEM; IMPACT ON RECEIVING WATERS

<USERS> 350 + USERS (CONSULTANTS, FEDERAL, STATE AND LOCAL GOVERNMENTS, UNIVERSITIES) IN U.S. AND ABROAD

<SUB> PROVIDED BY USER FROM LOCAL SOURCES

<REAL> EXTENSIVELY CALIBRATED AND VERIFIED USING LOCAL DATA

<UFGN> 780720

<593>
 <CONT> TRENT, D. S.; KELTY, J. R.

<TITLE> NUMERICAL THERMAL PLUME MODEL FOR VERTICAL OUTFALLS IN SHALLOW WATER

<ADDP> OREGON STATE UNIVERSITY, DEPARTMENT OF MECHANICAL ENGINEERING

<CITY> CORVALLIS

<STATE> OR

<DOC> PR--221 488/0, 1973

<ABST> A THEORETICAL STUDY OF THE HEAT AND MOMENTUM TRANSFER RESULTS FROM A FLOW OF POWER PLANT CONDENSER EFFLUENT DISCHARGED VERTICALLY TO SKILLON, QUIESCENT COASTAL RECEIVING WATER IS PRESENTED. THE COMPLETE PARTIAL DIFFERENTIAL EQUATIONS GOVERNING STEADY, INCOMPRESSIBLE, TURBULENT FLOW DRIVEN BY BOTH INITIAL MOMENTUM AND BUOYANCY ARE SOLVED USING FINITE-DIFFERENCE TECHNIQUES TO OBTAIN TEMPERATURE AND VELOCITY DISTRIBUTIONS IN THE NEAR FIELD OF THE THERMAL DISCHARGE. RESULTS WERE OBTAINED FOR OVER 100 CASES, USING THE COMPUTER PROGRAM PRESENTED. THESE RESULTS RANGED FROM CASES OF PURE BUOYANCY TO PURE MOMENTUM AND FROM RECEIVING WATER DEPTHS FROM 1 TO 80 DISCHARGE DIAMETERS DEEP. VARIOUS COMPUTED CROSS ASPECTS OF THE FLOW WERE COMPARED TO PUBLISHED DATA AND FOUND TO BE IN EXCELLENT AGREEMENT. DATA FOR SHALLOW WATER FLOWS AND THE ENSUING LATERAL SPREAD ARE NOT READILY AVAILABLE; HOWEVER, ONE COMPUTED SURFACE TEMPERATURE DISTRIBUTION WAS COMPARED TO PROPRIETARY DATA AND FOUND ALSO TO BE IN REASONABLE AGREEMENT.

<594>
 <CONT> TROXLER, R. W.; THACKSTON, E. L.

<TITLE> PREDICTING THE RATE OF WARMING OF RIVERS BELOW HYDROELECTRIC INSTALLATIONS

<ADDP> GEORGIA DEPARTMENT OF NATURAL RESOURCES

<CITY> ATLANTA

<STATE> GA

<DOC> JOURNAL WATER POLLUTION CONTROL FEDERATION, 49(4), 1902-1912, 1977 (5404)

<ABST> THE PURPOSE OF THE STUDY WAS TO CONSTRUCT AND VERIFY AN ENERGY BUDGET MODEL FOR THE ACCURATE PREDICTION OF TEMPERATURE CHANGES IN FLOWING RIVERS, BASED SOLELY ON THE APPROXIMATE GEOMETRY OF THE RIVER AND ON DATA NORMALLY TAKEN AT FIRST ORDER WEATHER STATIONS. THE WARMING OF COLD WATER RELEASED FROM THE HYPOGLIMION OF STRATIFIED RESERVOIRS THROUGH HYDROELECTRIC PLANTS WAS STUDIED. BY COLLECTING AND ANALYZING VARIOUS ATMOSPHERIC CONDITIONS AT NEARBY WEATHER STATIONS, RESULTS SHOWED THAT GENERALLY GOOD AGREEMENT BETWEEN OBSERVED AND PREDICTED TEMPERATURES CAN BE REALIZED IF APPROPRIATE ADJUSTMENTS TO THE WEATHER BUREAU DATA CAN BE MADE.

<595>
 <CONT> TEWSEDELL, ALFRED B.; JONES, BLAIR F.

<TITLE> WATERQ, A COMPUTER PROGRAM FOR CALCULATING CHEMICAL EQUILIBRIA OF NATURAL WATERS

<ACRO> WATERQ

<ABST> THE COMPUTER PROGRAM, WATERQ, CALCULATES THE EQUILIBRIUM DISTRIBUTION OF INORGANIC AQUEOUS SPECIES OF MAJOR AND IMPORTANT MINOR ELEMENTS IN NATURAL WATERS USING THE CHEMICAL ANALYSIS AND IN SITU MEASUREMENTS OF TEMPERATURE, PH AND REDOX POTENTIAL. FROM THIS MODEL, THE STATES OF REACTION OF THE WATER WITH SOLID AND GASEOUS PHASES ARE CALCULATED. THERMODYNAMIC STABILITIES OF AQUEOUS SPECIES, MINERALS AND GASES HAVE BEEN SELECTED FROM A CAREFUL CONSIDERATION OF ALL AVAILABLE EXPERIMENTAL DATA. THE PROGRAM IS WRITTEN IN PL-1 FOR IBM 360 COMPUTERS.

<COMP> IBM

<LANG> PL-1

<CON> USGS

<596>
 <CONT> TSAI, Y. J.; CHANG, Y. C.

<TITLE> TWO DIMENSIONAL TRANSIENT HYDRO-THERMAL MATHEMATICAL MODEL

<ADDP> STONE AND WEBSTER ENGINEERING CORPORATION

<CITY> BOSTON

<STATE> MA

<DOC> CHOW, V. T. (ED.), WATER FOR THE HUMAN ENVIRONMENT, CHAMPAIGN, ILLINOIS, SEPTEMBER 20, 1973, CONF-7309143--P4.

<ABST> THE HEAT CONSERVATION EQUATION IN TWO HORIZONTAL DIRECTIONS WITH THE EQUATIONS OF MOTION AND CONTINUITY IN VERTICALLY INTEGRATED FORM ARE SOLVED FOR THE SPATIAL TRANSIENT TEMPERATURE

<596>

AQUATIC TRANSPORT

<596> CONT.

PISES IN A BODY OF WATER DUE TO THERMAL DISCHARGE OF ARTIFICIAL ORIGIN. FLOW PATTERNS AND WATER LEVEL VARIATIONS INDUCED BY THE PLANT INTAKE AND DISCHARGE, STREAM INFLOW AND OUTFLOW, HYDROLOGICAL PARAMETERS, AND TIDAL AGITATION CAN BE OBTAINED FROM THE MATHEMATICAL MODEL. THE MULTIDIMENSIONAL METHOD (ALTERNATE DEFLECTION IMPLICIT) USED IN THE SOLUTION FOR THE FINITE DIFFERENCE EQUATIONS OF THE GOVERNING PARTIAL DIFFERENTIAL EQUATIONS IS UNCONDITIONALLY STABLE AND APPEARS ECONOMICAL. THE MODEL MAKES IT POSSIBLE TO INVESTIGATE ENVIRONMENTAL DESIGN CONSIDERATIONS IN CONJUNCTION WITH COOLING SYSTEM ALTERNATIVE, PLANT OPERATING MODES, AND HYDROLOGICAL AND METEOROLOGICAL CONDITIONS, AND TO DETERMINE THE EFFECTS OF THERMAL DISCHARGES TO THE ENVIRONMENT. A CASE STUDY IS PRESENTED IN WHICH A MULTIPORT SPREADER DIFFUSER IS EMPLOYED. THE HYDROTHERMAL CONDITION WHICH PREVAILS IN THE STUDY AREA IS NUMERICALLY SIMULATED AND THE RESULTS ARE DEPICTED IN COMPUTER-PLOTTED GRAPHS.

<597>

<CONT> VERIBOGLO, T. M.; LEE, SAMUEL S.

<TITLE> APPLICATION OF REMOTE SENSING FOR PREDICTION AND DETECTION OF THERMAL POLLUTION

<AUTH> MIAMI UNIVERSITY, DEPARTMENT OF MECHANICAL ENGINEERING

<CITY> CORAL GABLES

<STATE> FL

<DOC> W-76-10697, 1975

<ABST> THE DEVELOPMENT OF A PREDICTIVE MATHEMATICAL MODEL FOR THERMAL POLLUTION IN CONNECTION WITH REMOTE SENSING MEASUREMENTS WAS CONTINUED. A RIGID-LID MODEL HAS BEEN DEVELOPED AND ITS APPLICATION TO FAN-FIELD STUDY HAS BEEN COMPLETED. THE VELOCITY AND TEMPERATURE FIELDS HAVE BEEN COMPUTED FOR DIFFERENT ATMOSPHERIC CONDITIONS AND FOR DIFFERENT BOUNDARY CURRENTS PRODUCED BY TIDAL EFFECTS. IN CONNECTION WITH THE THEORETICAL WORK, SIX EXPERIMENTAL STUDIES OF THE TWO SITES IN QUESTION (DISCATWE DAY SITE AND HUTCHINSON ISLAND SITE) HAVE BEEN CARRIED OUT. THE TEMPERATURE FIELDS OBTAINED DURING THE TESTS AT THE DISCATWE DAY SITE HAVE BEEN COMPARED WITH THE PREDICTIONS OF THE RIGID-LID MODEL AND THESE RESULTS ARE ENCOURAGING. THE RIGID-LID MODEL IS ALSO BEING APPLIED TO FAN-FIELD STUDY. PRELIMINARY RESULTS FOR A SIMPLE CASE HAVE BEEN OBTAINED AND EXECUTION OF MORE REALISTIC CASES HAS BEEN INITIATED. THE DEVELOPMENT OF A FREE-SURFACE MODEL HAS ALSO BEEN INITIATED. THE GOVERNING EQUATIONS HAVE BEEN FORMULATED AND THE COMPUTER PROGRAMS HAVE BEEN WRITTEN.

<GEO> FLORIDA, DISCATWE DAY; FLORIDA HUTCHINSON ISLAND

<598>

<CONT>

VARG, R.; VARG, D. C.; HARG, C. P.

<TITLE>

MODELING OF OIL EVAPORATION IN AN AQUEOUS ENVIRONMENT: RESEARCH ON THE EFFECTS OF COOLING OIL TRANSFER AND UPSTREAM ACTIVITIES ON DELAWARE BAY

<AUTH>

UNIVERSITY OF DELAWARE, COLLEGE OF MARINE STUDIES

<DOC>

PB--264 960

<ABST>

THE GOAL OF THE OVERALL RESEARCH PROGRAM IS TO PROVIDE INFORMATION ON THE IMPACT OF OIL TRANSFER OPERATIONS IN DELAWARE BAY FOR DECISION MAKING. THE WORK REPORTED HERE CONSISTS OF THE COMPUTER MODELING OF OIL WEATHERING IN THE EARLY STAGE OF A SPILL. A NUMERICAL MODEL IS DEVELOPED TO PREDICT CHANGES IN OIL CHARACTERISTICS, SPECIFIC GRAVITY, RESIDUES BY WEIGHT AND RESIDUES BY VOLUME OF OIL ON WATER THROUGH EVAPORATION KNOWN TO DOMINATE THE EARLY STAGE OF WEATHERING. THE MAJOR DRIVING FORCES FOR EVAPORATION BEING CONSIDERED INCLUDE AIR TEMPERATURE, WIND SPEED, AND SIZE OF SLICK. LABORATORY EXPERIMENTS WERE CONDUCTED USING NO. 2 FUEL OIL, MEXICAN CRUDE, AND VENEZUELAN CRUDE TO CALIBRATE THE NUMERICAL MODEL AND TO GAIN PHYSICAL INSIGHT INTO THE OIL EVAPORATION PROCESS. BASED ON THE LABORATORY RESULTS, EMPIRICAL RELATIONSHIPS ARE PROPOSED FOR DETERMINING THE DIFFUSION COEFFICIENT DESCRIBED IN THE FIRST-ORDER DECAY FORMULA. BOTH NUMERICAL AND LABORATORY RESULTS SEEMED TO INDICATE THAT THE EFFECT OF TEMPERATURE ON OIL WEATHERING IS SIGNIFICANT IN THE VERY EARLY STAGE OF WEATHERING, BUT DIMINISHES AT A LATER TIME. THE EFFECT OF WIND SPEED IS MORE UNIFORM THROUGHOUT THE TIME EVAPORATION BEING TESTED.

<599>

<CONT>

WANG, S.; HWANG, L.

<TITLE>

NUMERICAL SIMULATION OF OIL SLICK TRANSPORT IN BAYS

<AUTH>

TETRA TECH INC.

<CITY>

PASADENA

<STATE>

CA

<DOC>

PROCEEDINGS OF THE FOURTEENTH INTERNATIONAL COASTAL ENGINEERING CONFERENCE HELD IN COPENHAGEN, DENMARK, JUNE 20, 1976

<ABST>

A COMPUTER MODEL FOR SIMULATING OIL SPREADING AND TRANSPORT HAS BEEN DEVELOPED. THE MODEL CAN BE UTILIZED AS A USEFUL TOOL IN PROVIDING ADVANCE INFORMATION AND THUS MAY GUIDE DECISIONS FOR AN EFFECTIVE RESPONSE IN CONTROL AND CLEAN-UP ONCE AN ACCIDENTAL SPILL OCCURS. THE SPREADING MOTION IS SIMULATED ACCORDING TO THE PHYSICAL PROPERTIES OF OIL AND ITS CHARACTERISTICS AT THE AIR-OIL-WATER INTERFACES. THE TRANSPORT MOVEMENT IS HANDLED BY SUPERIMPOSING THE SPREADING WITH A DRIFT MOTION CAUSED BY WINDS AND TIDAL CURRENTS. BY CONSIDERING AN OIL SLICK AS A SUMMATION OF MANY ELEMENTARY PATCHES AND APPLYING THE PRINCIPLE OF SUPERPOSITION, THE MODEL IS CAPABLE OF

AQUATIC TRANSPORT

<599> CONT.

PREDICTING THE OIL SIZE, SHAPE, MOVEMENT AS A FUNCTION OF TIME AFTER A SPILL OCCURS. FIELD EXPERIMENTS USING EITHER CARBOGARD PAPERS OR SOYBEAN OIL TO SIMULATE A SPILL WERE CONDUCTED AT THE LONG BEACH HARBOR. COMPUTER PREDICTIONS SHOWED GOOD AGREEMENT WITH THE FIELD TRACKS. DATA ARE PRESENTED IN GRAPHICAL FORM. 11 PAGES.

<600>

<CONT>

WAYLAND, J. P.; BAKER, J. W.; IVY, J. T.; BELLINGER, C. A., JR.

<TITLE>

HEAVY METALS IN ESTUARINE BENTHIC ORGANISMS AND SEDIMENTS: DATA AND MODEL

<CITY>

ALBUQUERQUE

<STATE>

NM

<DOC>

THE ERDA ENVIRONMENTAL PROTECTION CONFERENCE HELD IN CHICAGO, ILLINOIS, SEPTEMBER 23, 1975

<ABST>

COASTAL INDUSTRIAL DEVELOPMENT AND SUBSEQUENT HEAVY METAL RELEASE REQUIRES AN UNDERSTANDING OF ENVIRONMENTAL CONTAMINATION THAT CAN RESULT. A DYNAMIC MODEL HAS BEEN DEVELOPED IN CLOSE ASSOCIATION WITH A DETAILED ENVIRONMENTAL SURVEILLANCE PROGRAM OF AN ESTUARINE ECOSYSTEM. THE PROGRAM AND MODEL TRACKS THE HEAVY METALS FROM DEBRIS INTO THE WATER COLUMN AND SUBSEQUENT INTERACTIONS BETWEEN THE AIR-WATER INTERFACE, PELAGIC ZONE, AND SEDIMENTS. THE INTERACTION BETWEEN PHYTOPLANKTON, ZOOPLANKTON, BENTHIC ORGANISMS, AND PREDATORS IS ACCOUNTED FOR. THE RESULTS OF THE CALCULATIONS ARE COMPARED TO MEASUREMENTS TAKEN IN AN ESTUARINE ECOSYSTEM OVER A TWO-YEAR PERIOD.

<601>

<CONT>

WEGNER, B. J.; NELSON, R. E.

<TITLE>

SIMULATION FACTORS INVOLVED IN OCEAN THERMAL POWER PLANTS

<ACRD>

NAVAL ACADEMY

<CITY>

ANNAPOLIS

<STATE>

MD

<DOC>

AD-A-017390, 1975

<ABST>

THE PARAMETERS WHICH CONTROL THE DIFFUSION OF HEAT FROM AN OCEAN SITE NUCLEAR POWER PLANT ARE STUDIED. THIS PROBLEM IS SOMETIMES REFERRED TO AS THE "THERMAL PLUME PROBLEM. DIMENSIONAL ANALYSIS IS APPLIED TO IDENTIFY DIMENSIONLESS GROUPS WHICH ARE INVOLVED IN THE DIFFUSION OF HEAT FROM THE OCEAN SITE PLANT.

<602>

<CONT>

WHALEN, ROBERT W.; BAILEY, DONALD C.; BUTLER, B. L.

<TITLE>

NUMERICAL INVESTIGATION OF THE ATLANTIC GENERATING STATION'S EFFECT ON TIDAL CURRENTS FROM LITTLE EGGS INLET, NEW JERSEY

<ACRD>

DAYTIME

<ADDR>

PUBLIC SERVICE ELECTRIC AND GAS COMPANY

<CITY>

NEWARK

<STATE>

NJ

<DOC>

APPENDIX D-7 (SUPPLEMENT NO. 7, AUG 16, 1974), ATLANTIC GENERATING STATION ENVIRONMENTAL REPORT, MARCH 1974.

<ABST>

THE NUMERICAL MODEL DAYTIME WAS USED TO INVESTIGATE POSSIBLE EFFECTS OF THE ATLANTIC GENERATING STATION ON TIDAL CURRENTS FROM LITTLE EGGS INLET, NEW JERSEY. THE AVERAGE VELOCITY AND TIDAL ELEVATIONS ARE CALCULATED AT LOCATIONS ON A NUMERICAL GRID WITH A 600 FT. STEP SIZE. AFTER VERIFICATION OF THE NUMERICAL MODEL FOR EXISTING CONDITIONS, THE MODEL WAS RUN WITH THE POWER PLANT LOCATED ON THE PROPOSED SITE, USING THE SAME PROTOTYPE TIDAL CONDITIONS AS THOSE USED FOR VERIFICATION. THE VELOCITIES FOR THE ENTIRE TIDAL CYCLE ARE COMPARED WITH THE VELOCITIES OBTAINED FOR EXISTING CONDITIONS. FIGURES SHOW: (1) GRID SYSTEM FOR LITTLE EGGS INLET AREA; (2) LOCATION OF PROTOTYPE TIDE GAGES AND VELOCITY STATIONS USED IN MODEL VERIFICATION; (3) AVERAGE VELOCITY FIELDS IN THE LITTLE EGGS INLET AREA AT VARIOUS TIMES FOR EXISTING CONDITIONS; (4) COMPARISON OF CALCULATED AND MEASURED PROTOTYPE VELOCITY FOR THE ENTIRE TIDAL CYCLE AT THE 6 VELOCITY STATIONS; AND (5) AVERAGE VELOCITY FIELD IN THE LITTLE EGGS INLET AREA AT VARIOUS TIMES WITH THE ATLANTIC GENERATING STATION LOCATED ON ITS PROPOSED SITE.

<603>

<CONT>

WILLEY, R. G.

<TITLE>

WATER QUALITY FOR RIVER - RESERVOIR SYSTEMS

<ACRD>

WQERS

<ADDR>

U.S. ARMY CORPS OF ENGINEERS, THE HYDROLOGIC ENGINEERING CENTER, 609 SECOND STREET, SUITE D

<CITY>

DAVIS

<STATE>

CA

<ZIP>

95616

<PHONE>

916-440-2105; FTS 440-2105

<DOC>

U.S. ARMY CORPS OF ENGINEERS HYDROLOGIC ENGINEERING CENTER, WATER QUALITY FOR RIVER - RESERVOIR SYSTEMS, COMPUTER PROGRAMS 401-PZ-7100, 1977; WILLEY, R.G., WATER QUALITY EVALUATION OF AQUATIC SYSTEMS, HYDROLOGIC ENGINEERING CENTER, TECHNICAL PAPER NO. 30, APRIL 1975

<SUB>

WATER QUALITY FOR RIVER - RESERVOIR SYSTEMS

<ABST>

A DATA EDITOR-GENERATOR PROGRAM TO SIMPLIFY THE INPUT PREPARATION FOR THE RIVER BASIN ECOLOGIC MODEL WAS DEVELOPED IN 1974. THESE TWO PROGRAMS TOGETHER WERE CALLED THE "WATER QUALITY FOR RIVER-RESERVOIR SYSTEMS" (WQERS)

<401>

AQUATIC TRANSPORT

<402> CONT.

MODEL. THE ORIGINAL RIVER PORTIONS IN THIS MODEL ANALYZED DYNAMIC WATER QUALITY CONDITIONS BUT ONLY STEADY STATE HYDRAULIC CONDITIONS. IN 1977, THE DEC (CONTRACTED WITH RESERVOIR MANAGEMENT ASSOCIATES) ADDED STREAMFLOW ROUTING CAPABILITY TO THE RQMS MODEL. THIS PROVIDED THE MODEL WITH CAPABILITY TO ROUTE STREAMFLOWS USING EITHER THE ST. VENANT EQUATIONS, KINEMATIC WAVE, MUSKINGUM, OR MODIFIED PULS ROUTING METHODS. THE MODEL CAN ALSO BE USED IN A STEADY FLOW MODE WITH EITHER BACKWATER ANALYSIS OR A STAGE-FLOW RELATIONSHIP SPECIFIED BY INPUT DATA. THE MODEL CONSISTS OF THREE SEPARATE BUT INTERRELATED MODULES: RESERVOIR MODULE, STEADY HYDRAULIC MODULE, AND STREAM QUALITY MODULE, EACH WITH A DATA EDITOR OR PRE-PROCESSOR PROGRAM. THE SYSTEM ANALYSIS PROCEDURE FOR RIVER BASIN WATER QUALITY MODELING CAN BE PERFORMED WITH THE RESERVOIR RESULTS BEING USED AS INPUT TO THE STEADY MODULE OR VICE VERSA. EACH MODULE IS ALSO FULLY CAPABLE OF RUNNING IN A STAGE ALONE MODE.

<GEN> UNITED STATES; SWEDEN; SPAIN

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE; PUNCHED CARDS

<SIZE> 54 K WORDS; 4000 RECORDS

<COMP> IBM; DEC; CDC; DEC; GENERAL ELECTRIC - MORTWELL

<COMPIG> IBM 1130; IBM 370; OR 6000; DEC 10; CDC 7400, WITH 54 K CORE AND THREE TAPE OR DISK STORAGE LOCATIONS

<LANG> FORTRAN IV

<CRAM> DEC

<ALGO> ONE DIMENSIONAL FINITE DIFFERENCE AND FINITE ELEMENT METHODS; MICHAELIS - MENTON RELATIONSHIPS FOR BIOLOGICAL GROWTH RATE SIMULATIONS

<CLAS> CONTINUOUS; DETERMINISTIC; STOCHASTIC; ANALYTICAL; PREDICTIVE; INTEGRATIVE; SIMULATION

<APPL> WATER QUALITY ANALYSIS FOR RIVER - RESERVOIR SYSTEMS

<USERS> U.S. CORPS OF ENGINEERS; INTERNATIONAL DE INGENIERIA Y ESTUDIOS TECNICOS, S.A. (MADRID, SPAIN); IVL-SWEDISH WATER AND AIR POLLUTION RESEARCH LAB, STOCKHOLM, SWEDEN; LUND UNIVERSITY, LUND, SWEDEN; NATIONAL WEATHER SERVICE; U. OF BRITISH COLUMBIA; UNIVERSITIES; CONSULTANTS

<SMD> USES DATA, NATIONAL WEATHER SERVICE, STATE, LOCAL

<REAL> THORNTON AND LESSER, SENSITIVITY ANALYSIS OF THE WATER QUALITY FOR RIVER - RESERVOIR SYSTEM MODEL, SEPT. 1976. WATER RESOURCES ENGINEERS, ECOLOGIC SIMULATION FOR AQUATIC ENVIRONMENTS, WET, ORLEANS CHIEF, CALIFORNIA, REPORT PREPARED FOR U.S. DEPT. OF INTERIOR, DEC. 1972

<CON> INTERFACIBLE RIVER - RESERVOIR MODULES FOR WATER QUALITY AND HYDRAULICS;

BRANCHING SYSTEMS.

<UPDATE> 700710

<404>

<CONT>

WILLIAMS, GLEN; HARR, BOY W.

<TITLE>

OIL SPILL TRANSPORT AND DIFFUSION PREDICTION

<ADDR>

TEXAS A AND M UNIVERSITY, CENTER FOR MARINE RESOURCES

<CITY>

COLLEGE STATION

<STATE>

TX

<ZIP>

77843

<PHONE>

713-945-3855

<ABST>

(1) THE CAPABILITY TO FORECAST THE TRAJECTORY OF AN OIL SPILL WILL AFFORD OFFSHORE CLEANUP CREWS A BETTER ESTIMATE OF SLICK LOCATION THAN IS NOW AVAILABLE. (2) THE COASTAL AREA MOST LIKELY TO BE AFFECTED BY AN OIL SPILL CAN BE DETERMINED PROBABILISTICALLY, THUS MORE ACCURATELY POSITIONING THE ONSHORE COMBATIVE PERSONNEL. (3) USED COMMUNITIES LIKELY TO BENEFIT FROM THE RESULTS OF THIS PROJECT INCLUDE FEDERAL, STATE AND LOCAL GOVERNMENT ORGANIZATIONS INVOLVED IN COASTAL AND/OR OFFSHORE ENVIRONMENTAL PROTECTION, PETROCHEMICAL COMPANIES ENGAGED IN OFFSHORE DRILLING OPERATIONS, AND GOVERNMENTAL AND/OR INDUSTRIAL GROUPS CONCERNED WITH DEEPWATER PORT FACILITIES. NEW PROJECT.

<TIME>

76/9/1-77/8/31

<CLAS>

PREDICTIVE

<405>

<CONT>

WILLIAMS, J. R.; HARR, D. B.

<TITLE>

HYRO: PROBLEM-ORIENTED COMPUTER LANGUAGE FOR HYDROLOGIC MODELING--USER'S MANUAL

<ADDR>

HYRO

<ADDR>

USDA AGRICULTURAL RESEARCH SERVICE

<CITY>

DIESEL

<STATE>

TX

<DOC>

USDA AGRICULTURAL RESEARCH SERVICE, SOUTHERN REGION REPORT ARS-S-9, 75 PP., 1973

<ABST>

HYRO IS A PROBLEM-ORIENTED COMPUTER LANGUAGE FOR MODELING SURFACE RUNOFF AND SEDIMENT FIELDS FROM WATERSHEDS. HYRO WAS DESIGNED FOR PLANNING FLOOD PREVENTION PROJECTS, FORECASTING FLOODS, AND RESEARCH STUDIES. IT CONSISTS OF A MAIN PROGRAM AND 16 SUBROUTINES WRITTEN IN FORTRAN IV, BUT IT CAN BE USED BY HYDROLOGISTS WITH LITTLE KNOWLEDGE OF COMPUTER PROGRAMMING. THE LANGUAGE PROVIDES 17 COMMANDS FOR THE HYDROLOGIST TO USE IN ANY SEQUENCE FOR APPLICATION TO ANY WATERSHED. HYRO WAS DESIGNED TO TRANSFORM RAINFALL DATA INTO RUNOFF HYDROGRAPHS AND TO ROUTE THESE HYDROGRAPHS THROUGH STREAMS AND VALLEYS

ANALYTIC TRANSPORT

<95> CONT.

OR RESERVOIRS. IT WILL ALSO COMPUTE THE AMOUNT OF SEDIMENT PRODUCED BY A STORM AT ANY POINT ON A WATERSHED. IT WILL BE USEFUL TO RESEARCH HYDROLOGISTS IN STUDYING THE EFFECTS OF WATERSHED AND STORM CHARACTERISTICS ON THE FLOOD HYDROGRAPH. HYMO IS ALSO A GOOD RESEARCH TOOL FOR TESTING HYDROLOGIC PROCEDURES. THE HYDROLOGIC PROCEDURES USED IN HYMO ARE PRACTICAL--REQUIRED INPUTS ARE EASY TO OBTAIN FOR MOST WATERSHEDS. HYMO WAS WRITTEN FOR THE IBM 360-65 COMPUTER, BUT IT COULD BE RUN ON AN IBM 1120 WITH LITTLE MODIFICATION. THE STORAGE REQUIREMENT IS ABOUT 73,000 BYTES.

<SIZE> 73,000 BYTES

<COMP> IBM

<CONFIG> IBM 1120; IBM 360-65

<LANG> FORTRAN IV

<CONT> 4 REFERENCES, 4 FIGURES, 1 TABLE

<606>

<CONT> WINCHESTER, J. B.

<TITLE> CHEMICAL MODEL FOR LAKE MICHIGAN POLLUTION, CONSIDERATIONS ON ATMOSPHERIC AND SURFACE WATER TRACE METAL INPUTS

<AUTH> FLORIDA STATE UNIVERSITY, DEPARTMENT OF OCEANOGRAPHY

<CITY> TALLAHASSEE

<STATE> FL

<DOC> WYTH. WATER. WATERS (262941), 317-32, 1972

<ABST> A CHEMICAL MODEL OF DESCRIPTION OF LAKE MICHIGAN SHOULD INCLUDE AN EVALUATION OF ALL NATURAL AND ANTHROPOGENIC SOURCES OF THE INORGANIC AND THE ORGANIC SUBSTANCES OF INTEREST. FOR EACH SUBSTANCE, THE MAJOR SINKS SHOULD BE DETERMINED, AND BY A COMPARISON OF SOURCES AND SINKS, A RESIDENCE TIME AND STEADY-STATE CONCENTRATION IN THE LAKE CAN BE ASCERTAINED. THE ESTIMATION OF THE SURFACE WATER INPUT OF ZN WAS THE NATURALLY EXPECTED LEVEL, BUT INPUTS OF CU AND NI APPEARED TO BE 90 AND 99%, RESPECTIVELY, POLLUTION DERIVED. ESTIMATES OF TOTAL PARTICULATE EMISSIONS WERE COMBINED WITH AVAILABLE DATA ON TYPICAL ELEMENTAL COMPOS. OF EMISSIONS FROM SEVERAL MAJOR SOURCES TO DETERMINE IF DIRECT FALLOUT OF AIR POLLUTION COULD BE AN IMPORTANT SOURCE OF LAKE WATER CONTAMINATION. ATMOSPHERIC CONTRIBUTIONS OF CU AND NI WERE ESTIMATED TO BE COMPARABLE TO RIVER INPUTS, BUT THE ATMOSPHERIC CONTRIBUTION OF ZN WAS ABOUT AN ORDER OF MAGNITUDE GREATER.

<607>

<CONT> WITTEN, A. J.

<TITLE> TWO-DIMENSIONAL TRANSIENT FAR-FIELD TEMPERATURE DISTRIBUTION IN RIVERS WITH ARBITRARY HEAT SOURCES

<AUTH> TROD

<AUTH> OAK RIDGE NATIONAL LABORATORY, ENERGY DIVISION, P.O. BOX 1

<CITY> OAK RIDGE

<STATE> TN

<ZIP> 37830

<PHONE> 615-493-8611 EXT 3-6149; FTS 850-6149

<DOC> A. WITTEN AND E. LONG, A TWO-DIMENSIONAL TRANSIENT FAR-FIELD ANALYSIS FOR THE EXCESS TEMPERATURE FROM AN ARBITRARY SOURCE, ONSL/TN-5578

<SUB> THERMAL ANALYSIS

<ABST> AN ANALYTIC SOLUTION IS PRESENTED FOR THE TWO-DIMENSIONAL TIME-DEPENDENT ADVECTIVE DIFFUSION EQUATION GOVERNING THE DISTRIBUTION OF EXCESS TEMPERATURE IN A RIVER OF UNIFORM WIDTH, DEPTH, AND DOWNSTREAM FLOW. THIS RESULT IS ALSO APPLICABLE TO A STRAIGHT COASTLINE WITH UNIFORM LONGSHORE FLOW. EXACT SOLUTIONS ARE OBTAINED FOR A POINT HEAT SOURCE AND A PARTICULAR LINE HEAT SOURCE, WHILE AN APPROXIMATE REPRESENTATION IS GIVEN FOR AN ARBITRARY TIME-VARYING HEAT SOURCE. THESE SOLUTIONS ARE INCORPORATED INTO A COMPUTER PROGRAM WHICH CALCULATES EXCESS TEMPERATURE AND TIME RATE-OF-CHANGE OF EXCESS TEMPERATURE IN A RIVER OR COAST AS A RESULT OF WASTE HEAT DISCHARGED FROM VARIOUS TRANSIENT SOURCES.

<STATUS> UNDER DEVELOPMENT; IN EDITING

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE; DISC; PUNCHED CARDS

<SIZE> 900 CARDS

<COMP> IBM

<CONFIG> IBM/91 27X

<LANG> FORTRAN IV

<CHAR> EBCDIC

<CLASS> CONTINUOUS; DETERMINISTIC; ANALYTICAL

<APPL> THERMAL ANALYSIS IN LARGE WATER BODIES

<USERS> ENVIRONMENTAL FLUID DYNAMICS GROUP (OURL); NEW YORK STATE PSC

<NVAL> ANALYTIC SOLUTION-NO VALIDATION

<UPDATE> 700620

<608>

<CONT> WHEX, W. J.; FUCHTBA, E. G.

<TITLE> MATHEMATICAL MODEL FOR FATE OF POLLUTANTS IN NEAR-SHORE WATERS

<DOC> ENVIRONMENTAL SCIENCE AND TECHNOLOGY, 6(8), 331-337, 1972

<ABST> MODIFIED MATHEMATICAL TECHNIQUES HAVE BEEN UTILIZED TO DEVELOP A COMPUTER PROGRAM FOR CALCULATION AND PREDICTION THE FATE OF POLLUTANTS IN THE NEAR-SHORE WATERS OF LAKE MICHIGAN. THE PROGRAM REQUIRES LITTLE COMPUTER TIME AND IS MORE AMENABLE TO PREDICTION

<600>

AQUATIC TRANSPORT

<600> CONT.

OF CONCENTRATION AT GIVEN DISTANCES OF TIMES FROM THE SOURCE. THE EFFECTS OF MULTIPLE SOURCES, BOUNDARIES, AND REACTIONS ON DECAY RATES WERE CONSIDERED IN THE DEVELOPMENT OF THIS PARTICULAR MATHEMATICAL MODEL. THE MODEL ALSO CONSIDERS VARIABLE DIFFUSION COEFFICIENTS AND VARIABLE VELOCITIES. USE OF TRANSPORT AND GREEN'S FUNCTION AVOIDS THE FINITE DIFFERENCES APPROACH, PERMITS RAPID CALCULATION, AND RESULTS IN A STABLE ANSWER FOR LONG DISTANCES FROM THE SOURCE. A SAMPLE CALCULATION INVOLVING THREE SOURCES IS GIVEN.

<609>

<CONT> WOLFE, D. A.

<TITLE> CYCLING OF ELEMENTS IN ESTUARIES MODEL

<ABST> NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, ENVIRONMENTAL RESEARCH LABORATORIES

<CITY> BOULDER

<STATE> CO

<YR> 1976

<DOC> FISHERY BULLETIN, 70(3), 959-972, 1972

<ABST> MEANINGFUL EVALUATION OF THE ECOLOGICAL STRESSES IMPOSED BY MAN'S RELEASE OF HEAVY METALS OR RADIOISOTOPES INTO ESTUARIES REQUIRES AN IMPROVED UNDERSTANDING OF THE INTERACTIONS BETWEEN THE WASTE MATERIALS AND THE FUNCTIONAL COMPONENTS OF THE ECOSYSTEM. IN THIS PAPER, WE REVIEW AND DISCUSS THE TYPES OF INFORMATION REQUIRED FOR THE DEVELOPMENT OF USEFUL MODELS FOR THE CYCLING OF CONTAMINANT METALS (BOTH RADIOACTIVE AND STABLE) IN ESTUARINE ECOSYSTEMS. WITH PARTICULAR REFERENCE TO THE COASTAL PLAIN ESTUARIES OF THE SOUTHEASTERN UNITED STATES, WE DISCUSS THE MAJOR RESERVOIRS OF THESE METALS, THE MECHANISMS AND PATHWAYS OF ELEMENTAL TRANSFORMATION AND RATES OF ELEMENTAL TURNOVER AMONG RESERVOIRS, AND THE RESPONSES OF THESE PROCESSES AND RESERVOIRS TO ENVIRONMENTAL CHANGE. A CONCEPTUAL SYSTEM MODEL IS PRESENTED AS THE PRELIMINARY PHASE IN THE DEVELOPMENT OF DYNAMIC MATHEMATICAL MODELS OF ELEMENTAL CYCLING.

<TIND> 780701

<CON> NATIONAL MARINE FISHERIES SERVICE; ATLANTIC ESTUARIES FISHERIES CENTER; SEASPORT, NC

<610>

<CONT> WOLFF, P. R.; HANSEN, E.; JOSEPH, J.

<TITLE> INVESTIGATION AND PREDICTION OF DISPERSION OF POLLUTANTS IN THE SEA WITH HYDRODYNAMICAL NUMERICAL (NM) MODELS

<ABST> OCEAN DATA SERVICES, INC.

<CITY> BOSTON

<STATE> MA

<ABST> (A) THE HYDRODYNAMICAL NUMERICAL (NM)

MODELS PROVIDE THE VELOCITY FIELD IN SMALL TIME STEPS AND ARE SUITED FOR INCLUSION OF DISPERSION FORMULAE IN DEFINITE DIFFERENCE FORM. (B) THE NM MODELS REPRODUCE THE CHANGES OF SEA LEVELS AND CURRENTS VERY WELL. AS THE TREATMENT OF OPEN BOUNDARIES AS WELL AS MULTIPLE LAYERS HAS BEEN SUCCESSFULLY SOLVED RECENTLY, THESE MODELS HAVE WIDE APPLICATION. (C) THE DISPERSION FORMULAE (INCLUDING DIFFUSION, TRANSPORT AND DECAY) HAVE BEEN PROGRAMMED INTO NM MODELS IN LAGRANGIAN FORM AND SOLVED IN SMALL TIME STEPS. THEY CAN ALSO BE USED IN EULERIAN FORM WHEN THE POLLUTANT FIELD IS SMALL INITIALLY IN RELATION TO GRID SIZE. (D) TEST RESULTS SHOW THAT THIS MODEL CAN BE USED FOR COMPUTATION OF POLLUTANT DISTRIBUTION AT ANY GIVEN TIME AND DETERMINATION OF THE LEVEL OF RELEASE IF A MAXIMUM PERMISSIBLE CONCENTRATION IS GIVEN.

<611>

<CONT> WOOD, KENNETH A., JR.; PIERZ, LAWRENCE J., JR.

<TITLE> AN EMPIRICAL MODEL FOR DETERMINING THE SALINITY DISTRIBUTION IN THE COLORADO RIVER

<ABST> SALT

<ABST> DCS CORPORATION

<CITY> ROCKVILLE

<STATE> MD

<DOC> APPENDIX 6.1-A, SOUTH TEXAS PROJECT UNITS 1 AND 2 ENVIRONMENTAL REPORT, HOUSTON LIGHTING AND POWER CO., JULY 1970.

<ABST> THE APPENDIX GIVES THE BASIS AND COMPLETE DESCRIPTION OF THE ANALYTICAL MODEL, "SALT" USED TO CALCULATE THE SALINITY DISTRIBUTION WITHIN THE ESTUARY PORTION OF THE COLORADO RIVER FOR BOTH AMBIENT AND PLANT OPERATING CONDITIONS, BASED ON U.S. GEOLOGICAL SURVEY CONDUCTIVITY MEASUREMENTS IN THAT RIVER. 14 SAMPLING SITES WERE CHOSEN ABOVE AND BELOW THE SOUTH TEXAS PROJECT SITE, AND THE USGS CONDUCTIVITY VALUES WERE CONVERTED TO TOTAL DISSOLVED SOLIDS CONCENTRATIONS TO OBTAIN THE NEEDED INFORMATION ON SALINITY DISTRIBUTION. THE MODEL DETERMINES THE PERCENT MIXING VALUE FOR A GIVEN FLOW RATE AT A GIVEN DISTANCE AND DEPTH. THE APPENDIX INCLUDES 32 TABLES AND 81 FIGURES.

<CON> COLORADO RIVER

<612>

<CONT> WU, D. S.; GALLAGHER, D. J.

<TITLE> DEVELOPMENT OF A COMPLETE MATHEMATICAL MODEL FOR DESCRIBING THE POINT BEACH NUCLEAR POWER PLANT THERMAL PLOU

<ABST> LINNETICS, INC.

<CITY> MILWAUKEE

<STATE> WI

<DOC> CROW, V.T. (ED.), WATER FOR THE HUMAN

ALPHABETIC TRANSCRIPT

<612> CONT.

ENVIRONMENT, PROCEEDINGS FIRST WORLD CONGRESS ON WATER RESOURCES HELD IN CHICAGO, ILLINOIS, SEP 20, 1973, (P. 319-336); CONF-73091063-P. 8

<ABST> A METHOD FOR SIMULATING THE POINT BEACH NUCLEAR POWER PLANT THERMAL PLUME IS PRESENTED. COMPLETE MATHEMATICAL MODELS HAVE BEEN DEVELOPED TO COVER BOTH THE NEAR FIELD AND THE FAR FIELD REGIONS. EXISTING NEAR FIELD MODELS (STOLLENBACH AND HADLERMAN'S MODEL AND PETER'S MODEL) HAVE BEEN INTEGRATED TO THE FAR FIELD BY SOLVING THE DIFFUSION EQUATION AND TAKING THE PREDICTED CONDITIONS AT THE END OF THE NEAR FIELD MODELS AS THE BOUNDARY CONDITIONS FOR THE FAR FIELD MODELS. FOURIER COSINE TRANSFORMS HAVE BEEN APPLIED FOR THE FAR FIELD SOLUTIONS. THE TWO FIELDS ARE CONNECTED THROUGH THE CONSIDERATION OF THE PLUME CENTERLINE VELOCITY. A SIMPLE CORRECTION OF SHORELINE EFFECT HAS BEEN ATTEMPTED.

<613>
<CONT> TRANSLEY, JOHN B.

<TITLE> A MATHEMATICAL MODEL FOR PREDICTING TEMPERATURES IN RIVERS AND RIVER-BOW RESERVOIRS

<ABST> A ONE-DIMENSIONAL TEMPERATURE PREDICTION MODEL HAS BEEN DEVELOPED AND TESTED ON THE COLUMBIA RIVER. THE MODEL IN ITS PRESENT FORM IS OPERATIONAL FOR USE ON RIVERS FOR WHICH: CROSS-SECTIONAL CHARACTERISTICS, INCLUDING WATER SURFACE WIDTH AND CROSS-SECTIONAL AREA ARE AVAILABLE; ADEQUATE METHODOLOGIC DATA IS AVAILABLE; WATER SURFACE ELEVATION DATA IS AVAILABLE; EVAPORATION AND SENSIBLE HEAT FLOW CAN BE EVALUATED IN TERMS OF REGIONAL WEATHER DATA AND THE RESULTS OF REPRESENTATIVE FIELD STUDIES; LATERAL AND VERTICAL VARIATIONS IN TEMPERATURE ARE NEGLIGIBLE; AND THE FLOW CAN BE CONSIDERED QUASI-STEADY.

<CIAD> PREDICTIVE

<614>
<CONT> YEN, G. T.; TSAI, Y. J.

<TITLE> ANALYTICAL THREE-DIMENSIONAL TRANSIENT MODELING OF EFFLUENT DISCHARGES

<ABST> STONE AND WEBSTER ENGINEERING CORPORATION

<CITY> BOSTON

<STATE> MA

<DOC> WATER RESOURCES RESEARCH, 12(3), 533-540, 1976

<ABST> A TRANSIENT, THREE-DIMENSIONAL TURBULENT DIFFUSION EQUATION DESCRIBING THE CONCENTRATION DISTRIBUTION OF A SUBSTANCE OR HEAT IN A TIME-DEPENDENT FLOW FIELD IS SOLVED ANALYTICALLY. TWO MODELS ARE CONSIDERED: ONE TREATS BOTH THE DEPTH AND THE WIDTH OF A RIVER BODY AS BEING FINITE, WHILE THE OTHER DEALS WITH FINITE DEPTH BUT WITH INFINITE WIDTH. IN THE SEARCH FOR SOLUTIONS THE METHOD OF GREEN'S FUNCTION IS UTILIZED TO THE OPTIMUM ADVANTAGE. THE SOLUTIONS

ARE DEVELOPED FOR CASES IN WHICH THE VELOCITY FIELD CAN BE DESCRIBED AS ANY INTEGRATABLE FUNCTION OF TIME. FOR PRACTICAL APPLICATIONS THE VELOCITY IS ASSUMED TO BE THE SUM OF A CONSTANT AND A HARMONIC COMPONENT. THERE ARE NO LIMITATIONS ON THE TYPE OF SOURCE CONDITIONS. RESULTS ARE COMPARED WITH FIELD MEASUREMENTS AND SUCH THE MODELS TO BE CAPABLE OF SIMULATING THE OYE DISTRIBUTION IN TIDAL WATER BODIES. THE MODELS SHOULD PROVIDE THE ENGINEERING COMMUNITY WITH A QUICK AND EASY WAY OF PREDICTING THE DISTRIBUTION OF EFFLUENT DISCHARGES. THEY SHOULD OBVIATE THE NEED OF USING TENUOUS AND TIME-CONSUMING NUMERICAL MODELS, AS OCCASIONS OFTEN ARISE IN WHICH SUCH COMPLICATED MODELS MAY NOT BE WARRANTED.

<615>
<CONT> YENIG, B. U.

<TITLE> DOCUMENTATION OF FOUR OCEAN-RELATED COMPUTER MODELS

<ABST> NCTRAJ; TIOTRAN; NEARSHORE; TNOPOIL

<ABST> MASSACHUSETTS INSTITUTE OF TECHNOLOGY, DEPARTMENT OF OCEAN ENGINEERING

<CITY> CAMBRIDGE

<STATE> MA

<DOC> PB--264104, 1976

<ABST> THIS REPORT CONTAINS THE DOCUMENTATION OF A SERIES OF OCEAN-RELATED COMPUTER PROGRAMS DEVELOPED RECENTLY AT MIT. THE FIRST PROGRAM NCTRAJ IS THE OFFSHORE OIL-SPILL TRAJECTORY-SIMULATION PROGRAM WHICH IS BASED ON A TRAJECTORY EQUATION. THE CURRENT IS TREATED AS A NON-RANDOM QUANTITY WHICH COULD BE ASSIGNED DIRECTION AND SPEED AS A FUNCTION OF THE GEOGRAPHICAL LOCATION. TIOTRAN IS A PROGRAM WHICH TAKES AS INPUT FORMATTED DATA TAPE PREPARED BY THE NATIONAL CLIMATIC CENTER AND GENERATES AS OUTPUT THE RESULTANT PROBABILISTIC WIND TRANSITION MATRICES TO BE USED BY THE OFFSHORE (NCTRAJ) AND ONSHORE (NEARSHORE) SPILL-TRACKING PROGRAMS. NEARSHORE IS THE NEARSHORE OIL-SPILL TRACKING-SIMULATION PROGRAM BASED ON A TRAJECTORY EQUATION. TNOPOIL IS A PROGRAM WHICH SEEKS THE SOLUTION OF THE TWO-DIMENSIONAL LIFTING FLOW ABOUT TWO SYMMETRIC BODIES. AN EXTENSION OF THE HYAN-GLOVER TECHNIQUE OF VORTICE-DISTRIBUTION IS USED TO SOLVE THE COUPLED INTEGRAL EQUATIONS.

<616>
<CONT> RUTSUKURA, B.

<TITLE> TWO-DIMENSIONAL TEMPERATURE MODEL FOR A THERMALLY LOADED RIVER WITH STEADY DISCHARGE

<ABST> U.S. GEOLOGICAL SURVEY, NATIONAL CENTER, BAILSTOP 830

<CITY> RESTON

<STATE> VA

<REP> 22092

<PHONE> 703-646-6907

<496>

AQUATIC TRANSPORT

<416> CONT.

<CONTR> E.P. BAUER AND R. YOTSURTERA,
TWO-DIMENSIONAL EXCESS TEMPERATURE
MODEL FOR A THERMALLY LOADED STREAM;
USEPA'S HANDBOOK, PG 23912

<DOC> BENNETT, B.A. (ED.), PROCEEDINGS OF
THE 11TH ANNUAL ENVIRONMENTAL AND WATER
RESOURCES ENGINEERING CONFERENCE,
KANSASVILLE, TENNESSEE, JUNE 1-2, 1972,
PP. 13-26; CONF-720692; A.P. JACKMAN
AND R. YOTSURTERA, THERMAL LOADINGS OF
NATURAL STREAMS, U.S. GEOLOGICAL SURVEY
PROFESSIONAL PAPER 991, 1977

<SUB> MODEL FOR TWO-DIMENSIONAL EXCESS-HEAT
PLUMES DOWNSTREAM FROM POWER PLANTS
LOCATED ALONG A STEADY-FLOW RIVER

<GEO> EASTERN UNITED STATES

<TIME> 1969-1970

<STATES> IN USE

<ACCESS> UNLIMITED

<MEDIA> PUNCHED CARDS

<SIZE> APPROXIMATELY 1,000 PUNCHED CARDS

<COMP> IBM

<CONTR> IBM 360/65 WITH 100 K CODE

<LANG> FORTRAN IV

<METHOD> CLOSED-FORM SOLUTIONS OF A
2-DIMENSIONAL DIFFUSION EQUATION WITH
EXPONENTIAL HEAT DECAY TERM AND BASED
ON STREAM-TUBE MIXING CONCEPTS

<CLASS> DETERMINISTIC; PREDICTIVE; SIMULATION

<APPL> PREDICTS TWO-DIMENSIONAL PLUME OF
EXCESS TEMPERATURE DOWNSTREAM FROM
POWER PLANT LOCATED IN A STEADY-FLOW
RIVER. IF AMBIENT TEMPERATURE OF RIVER
IS AVAILABLE, TWO-DIMENSIONAL RIVER
TEMPERATURE CAN BE PREDICTED ALSO.

<USERS> U.S. GEOLOGICAL SURVEY

<SUB> REGULAR RIVER GAGING DATA WITH 4 TO 5
MILE INTERVAL; METEOROLOGICAL WIND
SPEED, AIR TEMPERATURE ETC) WITH 15 TO
30 MIN INTERVAL; WASTE HEAT RELEASE
RATE WITH 1 TO 2 HOUR INTERVAL
(DISCHARGE TEMPERATURE).

<VAL> COMPARISON OF COMPUTED TEMPERATURE WITH
OBSERVED SHOWS THAT ACCURACY OF
PREDICTION IS WITHIN 1 DEGREE C AT 10
MILES DOWNSTREAM FROM POWER PLANTS.

<UPDATE> 780815

<617>

<CONTR> YOUNG, G. K.; TAYLOR, R. S.; SELENOF,
J. S.

<TITLE> SIMULATION AND OPTIMIZATION OF ACID
MINE DRAINAGE ABATEMENT ALTERNATIVES

<ABST> THE REPORT DEVELOPS AN APPROACH FOR
RELIABLY EVALUATING THE IMPACT OF
PROPOSED WATER POLLUTION ABATEMENT
PLANS FOR A RIVER BASIN. A WATER
QUALITY SIMULATION MODEL IS DEVELOPED
WHICH HAS THE CAPABILITY OF ROUTING
ACID MINE DRAINAGE THROUGH A RIVER
BASIN. A COMPUTER PROCEDURE PROVIDING
FOR THE OPTIMIZATION OF ALTERNATIVES IS

ALSO DEVELOPED. THE SIMULATION MODEL IS
USED TO EVALUATE ALTERNATIVES WITHIN A
LARGE FRAMEWORK THAT INVOLVES
OPTIMIZATION. THE APPROACH IS TO USE
THE SIMULATION AS A METHOD OF IMPACT
ASSESSMENT WHICH IS MANIPULATED BY
OPTIMIZATION LOGIC. THUS THE SIMULATION
CAN BE USED IN TWO WAYS: AS A STAND
ALONE MODEL OR AS AN ADJUNCT TO
OPTIMIZATION. THE TIOGA RIVER BASIN IN
PENNSYLVANIA HAS BEEN CHOSEN AS A CASE
STUDY.

<GEO> TIOGA RIVER

<LANG> FORTRAN

<618>

<CONTR> YOUSSEF, Y. A.; GLOYNA, E. P.

<TITLE> TRANSPORT MODEL FOR LONG TERM
RADIOISOTOPE RELEASE INTO A STREAM
ECOSYSTEM

<ADDR> FLORIDA TECHNOLOGICAL UNIVERSITY

<CITY> ORLANDO

<STATE> FL

<DOC> AMERICAN CHEMICAL SOCIETY, DIVISION OF
ENVIRONMENTAL CHEMISTRY, PREPRINTS,
15(1), 108-151, 1975

<ABST> A MATHEMATICAL MODEL WAS DEVELOPED
WHICH CAN BE USED TO PREDICT THE
BEHAVIOR AND TRANSPORT OF RADIOISOTOPES
INTO A STREAM ECOSYSTEM. THE LONG-TERM
EFFECTS RESULTING FROM CONTINUOUS
RELEASES OF CESIUM-134 AND STRONTIUM-90
INTO A STREAM ECOSYSTEM TYPICAL OF THE
LOCAL AREA WERE EVALUATED. THE DATA
OBTAINED WAS USED TO VERIFY A BASIC
PREDICTION TRANSPORT MODEL.

<619>

<CONTR> ZALOSH, P. G.

<TITLE> NUMERICAL MODEL OF DROPLET ENTRAINMENT
FROM A CONTAINED OIL SLICK

<ADDR> MONROE AUBURN RESEARCH ASSOCIATES, INC.

<CITY> NEWTON UPPER FALLS

<STATE> MA

<DOC> AD/A--006600, 1974

<ABST> A THEORETICAL ANALYSIS OF OIL DROPLET
ENTRAINMENT FROM A CONTAINED OIL SLICK
MOVING RELATIVE TO WATER HAS BEEN
PERFORMED AS A FUNCTION OF RELATIVE
OIL-WATER VELOCITY. A NUMERICAL METHOD
INCORPORATING DISCRETE VORTICES IS USED
TO CALCULATE SMOOTH STABLE WAVE
PROFILES AT LOW VELOCITIES AND UNSTABLE
PROFILES AT HIGH VELOCITIES. AN OIL
DROPLET FORMATION CRITERION IS
FORMULATED AND APPLIED TO THE
NUMERICALLY MODELED WAVE REGION.
THE COMPUTED CRITICAL VELOCITY
CORRESPONDING TO THE ONSET OF
SIGNIFICANT DROPLET ENTRAINMENT IS IN
CLOSE AGREEMENT WITH RECENT LABORATORY
MEASUREMENTS. THE COMPUTED ENTRAINMENT
RATES ARE IN APPROXIMATE AGREEMENT WITH
EXPERIMENT, BUT DO NOT EXHIBIT
SYSTEMATIC VARIATION WITH WATER
CURRENT. OIL DROP TRAJECTORIES ARE
CALCULATED USING REALISTIC STARTING

AQUATIC TRANSPORT

<619> CONT.

CONDITIONS, BUT THE PRESENT WORK DOES NOT EXTEND BEYOND THE FIRST INTERSECTION OF THE DROP WITH THE SLICK. RECOMMENDATIONS ARE GIVEN FOR EXTENDING THE WORK TO INCLUDE:

POST-POSITION PROPLED DYNAMICS, WAVE EFFECTS, TURBULENCE EFFECTS, AND BARRIER DESIGN CHANGES.

WATER QUALITY

- <620>
<CON> MURKINSON, B.
- <TITLE> STUDY OF THE IMPACTS OF REDUCED STREAMFLOWS IN THE MIDDLE AND LOWER YELLOWSTONE BASIN
- <ADDR> EASTERN MONTANA COLLEGE
- <CITY> BILLINGS
- <STATE> MT
- <ZIP> 59101
- <DOC> CLARK, W.P. (ED.), PROCEEDINGS OF THE POST-WHITMAN COAL FIELD MEETING IN BILLINGS, MONTANA, APRIL 24, 1975.
- <ABST> NONE
- <CLAS> SIMULATION
- <621>
<CON> BACH, ROBERT G.
- <TITLE> A GENERALIZED WATER QUALITY MODEL FOR EUTROPHIC LAKES AND RESERVOIRS
- <ADDR> LINCOLN
- <ADDR> BATTLE-PACIFIC NORTHWEST LABORATORIES, POST OFFICE BOX 999
- <CITY> RICHLAND
- <STATE> WA
- <ZIP> 99352
- <PHONE> 509-946-2301; FTS 946-7511 EXT 946-2301
- <ABST> A GENERALIZED WATER QUALITY MODEL FOR EUTROPHIC LAKES AND RESERVOIRS.
- <622>
<CON> CAPLOZZI, C. P.; BELLONS, W.; GODFREY, P. J.; HANSON, J. C.; VILKITS, J. P.
- <TITLE> DETERMINATION OF OPTIMAL MULTIPLE USES OF A SMALL WATER RESOURCE
- <ADDR> SYMAP; DIVERSE
- <ADDR> UNIVERSITY OF MASSACHUSETTS
- <CITY> AMHERST
- <STATE> MA
- <SOURCE> FTIS
- <DOC> PB-222524, 168 PP., 1973
- <ABST> SYMAP, A COMPUTER GRAPHIC PROGRAM FOR DATA STORAGE AND RETRIEVAL WITH A MAP PRINT OUT WAS TESTED FOR ITS APPLICABILITY IN PLANNING. THE STUDY AREA CHOSEN WAS THE MILLERS RIVER WATERSHED. A NUMBER OF SUB-PROBLEMS WERE STUDIED INCLUDING OVERALL ECONOMICS, THE ECONOMICS OF THE WOOD USING INDUSTRIES, INDUSTRIAL AND MUNICIPAL WATER USE, THE EFFECTS OF POLLUTION ON AQUATIC BIOTA, THE ROLE OF VEGETATION AND VEGETATION MANAGEMENT AS SEEN BY THE WILDLIFE MANAGER, AND THE AESTHETIC-CULTURAL CHARACTERISTICS OF LAND AND WATER USE. THE ANALYSIS OF THE ROLE OF VEGETATION AND VEGETATION MANAGEMENT INVOLVED THE ONLY EFFORT TO DIRECTLY USE SYMAP. THE RESULTS OF THE STUDY OF AQUATIC BIOTA PRODUCED A NEW PROGRAM, REVERSE, WHICH PROMISES TO HAVE APPLICATION IN THE ANALYSIS OF RIVER SPECIES POPULATIONS. IN AN ADAPTATION OF INPUT-OUTPUT ANALYSIS, WATER DEMAND WAS DEMONSTRATED TO BE A PREDICTABLE FUNCTION OF OUTPUT DATA.
- <623>
<CON> CHADDETON, B. A.
- <TITLE> SIMULATION OF THE EFFECTS OF ACID MINE DRAINAGE IN IMPOUNDMENTS
- <ADDR> PENNSYLVANIA STATE UNIVERSITY
- <CITY> UNIVERSITY PARK
- <STATE> PA
- <DOC> PROCEEDINGS OF THE 1976 SUMMER COMPUTER SIMULATION CONFERENCE, HELD IN WASHINGTON, DC, JULY 12, 1976
- <ABST> WATER RESOURCE SYSTEMS HAVE BEEN SUBJECTED TO ACID POLLUTION SINCE THE FIRST COAL MINES BEGAN OPERATION. THE MINING PROCESS EXPOSES COAL-ASSOCIATED IRON SULFIDES TO AIR AND WATER, THUS CAUSING OXIDATION. THE EFFECTS OF ACID MINE DRAINAGE ON RECEIVING WATERS INCLUDE INCREASED ACIDITY AND TOTAL SOLIDS. THE DEVELOPMENT OF A COMPUTER SIMULATION MODEL OF THE BEHAVIOR OF ACIDITY AND PH PARAMETERS THROUGHOUT A SURFACE IMPOUNDMENT IS DESCRIBED. THE STEADY-STATE MODEL IS BASED UPON PRINCIPLES OF WATER CHEMISTRY. TO DEVELOP THE MODEL, THE IMPOUNDMENT IS DIVIDED INTO A NUMBER OF COMPLETE-MIX ELEMENTS. TWO CONSERVATIVE QUANTITIES, ALKALINITY AND TOTAL INORGANIC CARBON, ARE ROUTED THROUGH THE MODEL TO DETERMINE THE CONCENTRATION OF THESE TWO PARAMETERS IN EACH MODEL ELEMENT. AN ITERATIVE PROCEDURE IS USED TO ACCOUNT FOR THE LOSS OF CARBON DIOXIDE DUE TO GAS TRANSFER. AFTER THE VALUES OF ALKALINITY AND TOTAL INORGANIC CARBON HAVE BEEN FOUND, A SERIES OF INDEPENDENT QUANTIC EQUATIONS IS WRITTEN FOR THE HYDROGEN ION CONCENTRATIONS IN THE LAKE ELEMENTS. THE NEWTON-RAPHSON METHOD IS USED TO SOLVE EACH QUANTIC EQUATION. THEN THE PH IS CALCULATED FOR EACH ELEMENT. RESULTS OF THE MODELLING PROCESS ARE ALKALINITY AND ACIDITY CONCENTRATIONS AND PH FOR EACH LAKE ELEMENT. THE MODEL WAS VERIFIED BY COMPARISON OF SIMULATION RESULTS WITH FIELD DATA COLLECTED FROM FOUR PENNSYLVANIA LAKES FROM SEPTEMBER 1974 THROUGH AUGUST 1975. AN IMPORTANT APPLICATION OF THE MODEL WILL BE THE INVESTIGATION OF CHANGES IN WATER QUALITY WHICH RESULT FROM RESTORATION ACTIVITIES OR FROM NEW MINING RELEASES.
- <CLAS> SIMULATION
- <624>
<CON> CHIU, SHEP-TANN
- <TITLE> A MODEL TO PREDICT REGIONAL WATER QUALITY IMPACTS FROM COAL RELATED

BLANK PAGE

<624>

WATER QUALITY

<624> CONT.

ENERGY FACILITIES

<ACPO> NAQCPET

<ADDR> ARGONNE NATIONAL LABORATORY, ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION, 9700 S. CASS AVE.

<CITY> ARGONNE

<STATE> IL

<ZIP> 60439

<PHONE> 708 472-1767

<DOC> NONE

<SUB> WATER QUALITY

<ABST> THIS MODEL WAS DEVELOPED TO ESTIMATE THE SURFACE WATER QUALITY IMPACTS ON THE REGIONAL LEVEL OF CHEMICAL POLLUTANTS FROM ENERGY-RELATED ACTIVITIES. QUANTITY OF POLLUTANTS EXPECTED TO BE DISCHARGED FROM COAL EXTRACTION, STEAM-ELECTRIC POWER GENERATION, SYNTHETIC FUEL PRODUCTION, AND INDUSTRIAL FUEL USE, WAS ESTIMATED BY INDIVIDUAL SOURCES WITH SPECIFIC CONTROL REQUIREMENTS AND REGIONAL DIFFERENCES CONSIDERED. THE MODEL PERFORMS COMPUTATION OF LOADING FROM UP-TO DOWNSTREAM AND CALCULATION OF IMPACT (IN MG/L) BASED ON DILUTION CAPACITY OF STREAMS. GIVEN DATA ON ENERGY FACILITY SITING, STREAM FLOW, AND LEVEL OF POLLUTION CONTROL, THE MODEL ALLOWS THE USER TO CALCULATE WATER QUALITY IMPACTS AT SPECIFIC POINTS OF INTEREST. IN ITS PRESENT FORM, THE MODEL PREDICTS IMPACTS AT THE WATER RESOURCES COUNCIL AGGREGATED SUBAREA (ASA) LEVEL. BUT ESTIMATION OF IMPACT AT OTHER LEVELS IS POSSIBLE IF ADJUSTMENT OF CERTAIN INPUT INFORMATION IS MADE. PRESENTLY, MORE THAN TWENTY POLLUTANT PARAMETERS ARE INCLUDED, SUCH AS NH₃, TSS, TDS, SO₄, CL, FE, MW, ZP, AL, AS, BA, CB, CR, HG, PT, PB, P, K, AND SE. ALL THESE POLLUTANTS ARE CONSIDERED CONSERVATIVE.

<SPN> U.S.A.

<TIME> 1975-2000

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> DISC

<COMP> IBM

<CONFIG> IBM 370/195 CS/NOT WITH 370R CORE

<LANG> FORTRAN

<CHAD> EBCDIC

<ALGO> EMPIRICAL CALCULATION OF POLLUTANT LOADING BASED ON ASSUMED LEVEL OF POLLUTION CONTROL, RECEIVING WATER QUALITY IMPACTS BASED ON MATERIAL BALANCE CALCULATION AT NODAL POINTS.

<CLAS> DISCRETE; DETERMINISTIC; PREDICTIVE; INTEGRATIVE

<APPL> PREDICTING THE ORDER OF MAGNITUDE OF WATER QUALITY IMPACTS

<USERS> ARGONNE NATIONAL LABORATORY

<SUBD> FACILITY SITING, STREAM FLOWS, AND EFFLUENT FLOWS AND CONCENTRATIONS.

<CON> THIS MODEL SHOULD BE QUITE USEFUL IN PREDICTING THE REGIONAL WATER QUALITY IMPACTS FROM FUTURE ENERGY DEVELOPMENTS. IT SERVES TO IDENTIFY PROBLEM AREAS, TO DETERMINE SIGNIFICANT SOURCES, AND TO HELP SPECIFY LEVELS OF POLLUTION CONTROL.

<UPDATE> 780701

<625>

<CONT> BAILEY, JAMES E.; HARTMAN, DONALD P. F.

<TITLE> NUMERICAL MODEL FOR THE PREDICTION OF TRANSIENT WATER QUALITY IN ESTUARY NETWORKS

<ADDR> MASSACHUSETTS INSTITUTE OF TECHNOLOGY

<CITY> CAMBRIDGE

<STATE> MA

<DOC> CAMBRIDGE REPORT NO. MITSG 72-15, 227 PP., OCT. 30, 1972

<ABST> THE ESTUARY IS REPRESENTED AS A NETWORK OF BRANCHED AND LOOPED, 1-DIMENSIONAL CHANNELS. THE TIME SCALE OF THE MODEL IS OF THE ORDER OF MINUTES AND IS CALLED TIDAL TIME, WHICH IS USED WHEN MODELING A LONGITUDINAL DISPERSION BY NUMERICAL TECHNIQUES. LONGITUDINAL DISPERSION IS A MIXING PROCESS ASSOCIATED WITH THE TIDAL MOTION WHEREBY A CONSTITUENT IS SPREAD OUT BY THE INTERACTION OF EDDY DIFFUSION AND THE VELOCITY DISTRIBUTION IN THE CHANNEL CROSS-SECTION. IN THE NONSALINE TIDAL REGION, THE LONGITUDINAL DISPERSION COEFFICIENT IS A SPECIFIED FUNCTION OF THE INSTANTANEOUS TIDAL VELOCITY. SALINITY, TEMPERATURE, BOD, AND DO, ARE INCLUDED IN THE MATHEMATICAL MODEL. THEIR CONCENTRATION DISTRIBUTIONS ARE OBTAINED BY SOLVING SEQUENTIALLY THE APPROPRIATE CONSERVATION OF MASS EQUATIONS WHICH INCLUDE TRANSPORT, MIXING, AND REACTION PROCESSES. IN SOLVING THESE EQUATIONS, TIDAL TIME PERMITS FORMULATION OF AN OCEAN BOUNDARY CONDITION RELATED TO THE DIRECTION OF TIDAL FLOW. ON EBB TIDE, THE TRANSPORT OF MASS ACROSS THE OCEAN BOUNDARY IS DETERMINED BY SEAWARD ADVECTIVE FLOW AND THE CONCENTRATION DISTRIBUTION WITHIN THE ESTUARY. ON THE FLOOD TIDE, THE CONCENTRATION OF A CONSTITUENT IN THE INFLOWING WATER AT THE OCEAN BOUNDARY IS PRESCRIBED.

<CLAS> SIMULATION

<626>

<CONT> PUJA, PHYLLIS H.

<TITLE> RIVER BASIN WATER QUALITY MODEL

<ACPO> BASIN

<ADDR> ARGONNE NATIONAL LABORATORY, ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION, 9700 S. CASS AVE.

<CITY> ARGONNE

<STATE> IL

WATER QUALITY

<626> CONT.
 <ZIP> 60839

<FROM> PYS 972-3900

<SOURCE> R. LARRY DYER

<DOC> H. L. DYER ET AL., STATE OF ILLINOIS WATER QUALITY MANAGEMENT PROGRAM, APPENDIX E, THE WATER QUALITY MODEL, PROGRAM BASIS, ANALYSIS REPORT, DECEMBER 1977

<SUB> WATER QUALITY MANAGEMENT FOR RIVER BASIN

<ABST> A SERIES OF CODIFIED PROCEDURES HAS BEEN DEVELOPED FOR ANALYZING THE QUANTITY/QUALITY INTERRELATIONSHIPS OF RIVERS. THE MODEL WAS DEVELOPED TO MONITOR POLLUTANTS, ORIGINATING FROM BOTH POINT AND NON-POINT SOURCES, THROUGH A BRANCHED RIVER SYSTEM. THE TIME-VARIANT NATURE OF THE STREAM HYDROLOGY, DISSOLVED-OXYGEN RELATIONSHIPS, TEMPERATURES (ORIGINATING FROM POWER PLANTS, WASTEWATER EFFLUENTS, OR PUMPOUT PRESURE), AND CONSERVATIVE CONSTITUENT CONCENTRATIONS ARE RELATED. BOTH FOR FREE-FLOWING STREAMS AND FOR PORTIONS OF THE STREAM AFFECTED BY PONDS OR POOLS CREATED BY FLOW OBSTRUCTIONS SUCH AS CHANNEL DAMS.

<GEN> STATE OF ILLINOIS

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE; PUNCHED CARDS

<SIZE> ABOUT 3500 SOURCE STATEMENTS EACH 80 BYTES LONG

<COMP> IBM

<CONFIG> IBM 370/195 OS/HVT WITH 350 K CORE

<LANG> FORTRAN

<CRAP> EBCDIC

<ALGO> MONTE-CARLO METHOD, STEADY-STATE ONE-DIMENSIONAL HYDROLOGICAL FLOW MODEL; RUNGE-KUTTA NUMERICAL INTEGRATIONS, FIRST-ORDER KINETIC PROCESS; VAN'T HOFF-ARRHENIUS RELATIONSHIP; STEFAN-WOLTERMAN LAW.

<CLASS> CONTINUOUS; DISCRETE; DETERMINISTIC; STOCHASTIC; PREDICTIVE; SIMULATION

<APPL> WATER QUALITY MANAGEMENT

<USERS> STATE OF ILLINOIS; ARGONNE NATIONAL LABORATORY; U.S. ENVIRONMENTAL PROTECTION AGENCY

<SUBJ> ROCK RIVER BASIN

<REVL> VERIFICATION STUDIES WERE PERFORMED ON THE KISHWAUKEE SEGMENT OF THE ROCK RIVER BASIN.

<UPDATE> 780703

<627>
 <CONT> PUJA, PHYLLIS H.

<TITLE> THE WASTE CONVERSION MODEL FOR STATE OF ILLINOIS WATER QUALITY MANAGEMENT

PROGRAM

<ACRO> WILSON

<ADDR> ARGONNE NATIONAL LABORATORY, ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION, 9700 S. CASS AVE.

<CITY> ARGONNE

<STATE> IL

<ZIP> 60839

<PHONE> PYS 972-3900

<SOURCE> R. LARRY DYER

<DOC> H. L. DYER, STATE OF ILLINOIS WATER QUALITY MANAGEMENT PROGRAM, APPENDIX E, THE WASTE CONVERSION MODEL, ANALYSIS REPORT, DECEMBER 1977

<SUB> LYNCH WASTE CONVERSION; WATER QUALITY

<ABST> A KNOWLEDGE OF THE MAGNITUDE AND THE TYPES OF LIQUID WASTE LOADS IS FUNDAMENTAL TO THE DEVELOPMENT OF ANY WATER QUALITY MANAGEMENT PLAN. SUCH PARAMETERS ARE REQUIRED FOR THE PRESENT AS WELL AS FOR A FORECAST PLANNING PERIOD. THIS COMPUTERIZED PROCEDURE UTILIZES WASTE CONVERSION FACTORS TO ESTIMATE FUTURE LEVELS OF WASTE GENERATING GROWTH ACTIVITIES. THE LEVEL OF THE GROWTH ACTIVITY AND THE CONVERSION FACTORS ARE INPUT TO THE MODEL. THEREFORE, IT MAY BE USED FOR ESTIMATING RESOURCE BORDERS PROVIDED THE NECESSARY DATA EXISTS.

<GEN> STATE OF ILLINOIS

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE; PUNCHED CARDS

<SIZE> 1100 SOURCE STATEMENTS EACH 80 BYTES LONG

<COMP> IBM

<CONFIG> IBM 370/195 OS/HVT WITH 300 K CORE

<LANG> FORTRAN

<CRAP> EBCDIC

<ALGO> LINEAR TRANSFER FUNCTIONS, MULTIPLICATIVE CONVERSION COEFFICIENTS, MASS BALANCE EQUATIONS, EMPIRICAL RELATIONS

<CLASS> DISCRETE; DETERMINISTIC; ANALYTICAL; PREDICTIVE; SIMULATION

<APPL> WATER QUALITY MANAGEMENT

<USERS> STATE OF ILLINOIS; ARGONNE NATIONAL LABORATORY

<SUBJ> STATE OF ILLINOIS WATER SURVEY DATA; AGRICULTURE, INDUSTRIES AND LAND USE DATA.

<UPDATE> 780703

<628>
 <CONT> PUJA, PHYLLIS H.

<TITLE> WATER QUALITY MANAGEMENT PROGRAM

<629>

WATER QUALITY

<629> CONT.

<ACTO> HYDROLOGY PACKAGE

<ACTO> HYDROSPACE

<REPO> ARGONNE NATIONAL LABORATORY, ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION, 9700 S. CASS AVE.

<CITY> ARGONNE

<STATE> IL

<ZIP> 60439

<PHONE> 773 572-3900

<SOURCE> W. LARRY DYER

<DOC> P. H. SHARP, STATE OF ILLINOIS WATER QUALITY MANAGEMENT PROGRAM, APPENDIX D, THE HYDROLOGY PACKAGE, ADL/CES REPORT, DECEMBER 1973

<SUB> HYDROLOGY OF RIVER BASINS

<ABST> A DIGITAL RIVER BASIN SIMULATOR DESIGNED TO BE SUFFICIENTLY GENERAL SO THAT IT MAY BE USED TO ANALYZE ANY RIVER SYSTEM FOR WHICH THE NECESSARY DATA ARE AVAILABLE AND THREE SUBSIDIARY DATA ANALYSIS PROGRAMS ARE USED IN THE PREPARATION OF THE DATA TO BE USED WITH THE RIVER BASIN SIMULATOR. THE SIMULATOR CAN BE USED TO ANALYZE CHANNEL BAR POOLS AS WELL AS ALL FREE-FLOWING PORTIONS OF A STREAM SYSTEM. APPLICATION OF THE PROGRAM FOR HYDROLOGIC SIMULATION REQUIRES THAT DRAINAGE AREA AND RIVER MILE INFORMATION BE AVAILABLE FOR ALL IMPORTANT RIVER POINTS. GENERALIZED EXPRESSIONS DELTAING AND FLOW RATE ARE ASSUMED TO BE AVAILABLE AT EVERY POINT WHERE STREAM CROSS-SECTIONS ARE NOT AVAILABLE. IN ADDITION, A REASONABLY LONG CONSECUTIVE RECORD OF STREAM FLOW MUST BE AVAILABLE AT GAGES SUFFICIENTLY WIDESPREAD THROUGHOUT THE BASIN TO ADEQUATELY REFLECT THE SPATIAL DISTRIBUTION OF FLOW.

<GEO> STATE OF ILLINOIS

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE; PUNCHED CARDS

<SIZE> ABOUT 4000 SOURCE STATEMENTS EACH ON 80 BY 8 LINES

<CCITT> IBM

<COPIES> IBM 376/195 OS/MVT WITH 350 K CODE

<LANG> FORTRAN; DISPLA

<CHAR> EBCDIC

<ALGO> BOUTE-CARLO METHOD, STEADY STATE ONE DIMENSIONAL HYDROLOGICAL FLOW, RUNGE-KUTTA NUMERICAL INTEGRATIONS, FIRST ORDER KINETICS, STATISTICAL METHOD, MATRIX-ALGEBRAIC MANIPULATIONS, MARKOV PROCESS, REGRESSION ANALYSIS

<CLASS> CONTINUOUS; DISCRETE; DETERMINISTIC; STOCHASTIC; ANALYTICAL; PREDICTIVE; SIMULATION

<APPL> STATE OF ILLINOIS WATER QUALITY MANAGEMENT

<USERS> STATE OF ILLINOIS; ARGONNE NATIONAL LABORATORY; U.S. ENVIRONMENTAL PROTECTION AGENCY

<SUB> ILLINOIS STREAM FLOW RECORDS

<CHAL> VERIFICATION STUDIES WERE PERFORMED ON THE ROCK RIVER BASIN.

<UPDATE> 700703

<629>

<CONT> MONTPELIER, A.

<TITLE> POPLAR RIVER WATER QUALITY SYSTEMS MODEL

<ADDR> MONTANA DEPARTMENT OF HEALTH AND ENVIRONMENTAL SCIENCES, WATER QUALITY BUREAU

<CITY> HELENA

<STATE> MT

<ZIP> 59601

<PHONE> 406-449-2406

<DOC> PART OF POPLAR RIVER STUDY, U.S. EPA.

<ABST> THE BASIC OBJECTIVE OF THE MODELING EFFORT IS THE DEVELOPMENT AND APPLICATION OF A WATER QUALITY SYSTEMS MODEL FOR FLOWING WATERS TO PREDICT THE IMPACTS OF COAL-FIRED POWER GENERATING FACILITIES, SURFACE MINING OF COAL, RESERVOIR CONSTRUCTION AND NON-ENERGY RELATED ACTIVITIES OR NATURAL PROCESSES ON THE QUALITY OF THE POPLAR RIVER AND PRINCIPAL TRIBUTARIES DOWNSTREAM OF THE U.S.-CANADIAN INTERNATIONAL BOUNDARY. DATA INPUTS TO THE MODEL WILL CONSIDER, BUT WILL NOT BE NECESSARILY LIMITED TO THE FOLLOWING CRITERIA: (1) POTENTIAL IMPACTS OF POLLUTANTS OF AQUATIC ECOSYSTEMS; (2) SYNERGISTIC EFFECTS OF POLLUTANTS; (3) CONCENTRATION OF POLLUTANT; (4) INTERRELATIONSHIP OF PARAMETERS BEING MODELED; (5) ADAPTABILITY OF POLLUTANT TO MODELING TECHNIQUES; (6) IMPORTANCE OF PARAMETER AS A POLLUTION INDICATOR; AND (7) EASE OF DATA COLLECTION. THE MODEL IS TO HAVE THE CAPABILITY TO PREDICT SOURCE-SPECIFIC IMPACTS AS WELL AS COLLECTIVE IMPACTS UNDER A WIDE RANGE OF FLOW CONDITIONS. EMPHASIS WILL BE PLACED ON THE MODELING OF CONSERVATIVE CONSTITUENTS SUCH AS TSS, BORON, SODIUM, SULFATE, ETC. THE MODEL IS TO CONSIDER GROSS WATER INFLOW AND EXCHANGE, DEPLETION, IRRIGATION RETURN FLOWS, WIND EVAPORATION, GROSS RUN-POINT PROBLEMS, LAND USE, SOIL TYPE, SOIL MOISTURE HOLDING CAPACITY, STREAM TEMPERATURE DYNAMICS AND CROSS ANALYSIS OF THE RESERVOIR (CONDUCH). MODEL OUTPUTS WOULD BE ROUTED FOR SELECTED POINTS IN THE SYSTEM INCLUDING THE INTERNATIONAL BOUNDARY, THE MOUTH OF MAJOR TRIBUTARIES, THE POPLAR RIVER ABOVE AND BELOW TRIBUTARIES AND AT THE MOUTH OF THE POPLAR RIVER.

<GEO> MONTANA, POPLAR RIVER

<TIME> 01/77-CONTINUING

<CLASS> PREDICTIVE

WATER QUALITY

- <630>
<CONT> LEE, E. S.; SWANG, L.
- <TITLE> STREAM QUALITY MODELING BY QUASILINEARIZATION
- <ADDR> KANSAS STATE UNIVERSITY, DEPARTMENT OF INDUSTRIAL ENGINEERING
- <CITY> MANHATTAN
- <STATE> KS
- <ZIP> 66502
- <PHONE> 913-537-4521
- <DOC> JOURNAL OF WATER POLLUTION CONTROL FEDERATION, 43(2), 306-317, 1971
- <ABST> THE QUASILINEARIZATION TECHNIQUE, ALSO KNOWN AS THE GENERALIZED NEWTON-RAPHSON METHOD, CAN BE USED TO IDENTIFY OR ESTIMATE THE PARAMETERS IN RIVER OR STREAM POLLUTION. IN THIS TECHNIQUE, THE PARAMETERS CAN BE ESTIMATED DIRECTLY FROM THE DIFFERENT EQUATIONS REPRESENTING THE POLLUTION MODEL AND FROM MEASURED DATA SUCH AS BIOCHEMICAL OXYGEN DEMAND AND DISSOLVED OXYGEN. BECAUSE OF THE RAPID CONVERGENCE PROPERTY OF THIS APPROACH, IT SEEMS TO BE A POWERFUL TECHNIQUE FOR THE DYNAMIC MODELING OF WATER POLLUTION PROBLEMS. SEVERAL EXAMPLES ARE SOLVED TO ILLUSTRATE THE TECHNIQUE. WITH VERY APPROXIMATE INITIAL GUESSES FOR THE UNKNOWN PARAMETERS, ONLY 3 TO 5 ITERATIONS ARE NEEDED TO OBTAIN A 4- TO 5-DIGIT ACCURACY.
- <GEN> GENERAL
- <CLASS> PREDICTIVE
- <UPDATE> 780701
- <631>
<CONT> MORGAN, J.
- <TITLE> APPLICATION OF STREAM WATER QUALITY MODELS TO ALABAMA
- <ACRON> DOSAG; STVEN
- <ADDR> ALABAMA DEVELOPMENT OFFICE
- <DOC> NTIS REPORT PB-224 426/787, 1973(57)
- <ABST> TWO STEADY-STATE UNIFORM FLOW STREAM WATER QUALITY PREDICTION MODELS, DOSAG AND STVEN WERE APPLIED TO THE UPPER SONGMANTREE CREEK BASIN NEAR MOBILE ALA. THE MODELS WERE VERIFIED AND THEN USED TO FORECAST CONDITIONS THAT WOULD OCCUR DURING PERIODS OF VERY LOW FLOW. RESULTS INDICATED THAT EITHER MODEL COULD BE OF IMMEDIATE USE IN FORECASTING STREAM WATER QUALITY IN ALABAMA GIVEN THE CONSTRAINTS OF MINIMAL MODEL AND COMPUTATIONAL COMPLICATION. THE DEVELOPMENT OF A MORE COMPLEX SYSTEM OF MODELS WAS RECOMMENDED FOR FUTURE USE.
- <CLASS> SIMULATION
- <632>
<CONT> WAIS, R.; SWAB, H. C.; SMITH, W. S.
- <TITLE> CARGO SPILL PROBABILITY ANALYSIS: A BAYESIAN APPROACH
- <DOC> OFFSHORE TECHNOLOGY CONFERENCE HELD IN HOUSTON, TEXAS, MAY 6, 1970.
- <ABST> A PROBABILITY MODEL FOR PREDICTING THE OCCURRENCE OF CARGO SPILLS WAS DEVELOPED AND QUANTIFIED USING A BAYESIAN STATISTICAL APPROACH. THE RESULTS ALLOWED DEFINITION OF THE PROBABLE SIZE, CAUSE, AND LOCATION OF CARGO SPILLS. THE MOST PROBABLE CAUSE AND LOCATION CHARACTERISTICS OF CARGO SPILL CHANGES WITH THE SIZE OF A SPILL. DECISION ON PORT SITES AND REGULATORY MEASURES SHOULD NOT BE MADE SOLELY ON THE PROBABILITY OF THE OCCURRENCE OF SPILLS, BUT SHOULD ALSO CONSIDER THE CONSEQUENCES OF A SPILL. THE NUMERICAL RESULTS PRESENTED WERE BASED ON THE SUBJECTIVE OPINIONS OF 10 EXPERTS. WHILE THIS IS A LARGE SAMPLE TO ESTABLISH PRIOR PROBABILITIES FOR A BAYESIAN ANALYSIS, AVAILABLE DATA SHOULD BE INCORPORATED WITH THE PRIOR INFORMATION TO OBTAIN A POSTERIOR ESTIMATE OF CARGO SPILL PROBABILITIES. USE OF THE NUMERICAL RESULTS SHOULD BE USED WITH CARE UNTIL SUCH POSTERIOR PROBABILITY ESTIMATES ARE OBTAINED. THE COMBINATION OF THE PROBABILITY OF OCCURRENCE OF CARGO SPILLS, THE PROBABLE CONSEQUENCES (DAMAGE) RESULTING FROM THE SPILL, THE COST AND EFFECTIVENESS OF PREVENTIVE MEASURES OF THE OCCURRENCE OF SPILLS, AND THE COST AND EFFECTIVENESS OF MEASURES WHICH WOULD REDUCE OR ELIMINATE THE CONSEQUENCES OF A SPILL ONCE IT OCCURRED (CLEANUP OPERATIONS) ARE NEEDED TO MAKE A PROPER EVALUATION OF AVAILABLE ALTERNATIVES. MANY OF THE CONSEQUENCES OF CARGO SPILLS ARE NOT DIRECTLY MEASURABLE IN MONETARY TERMS. HOWEVER, ALL CONSEQUENCES OF CARGO SPILLS SHOULD BE CONSIDERED. UTILITY THEORY PROVIDES A THEORETICALLY SOUND METHOD BY WHICH NON-MONETARY CONSEQUENCES COULD BE INCORPORATED.
- <633>
<CONT> O'CONNOR, D. J.; BITONO, D. B.; THOMAS, B. V.
- <TITLE> PHYTOPLANKTON MODELS AND EUTROPHICATION PROBLEMS
- <CITY> BALTIMORE
- <DOC> RESOURCES FOR THE FUTURE. WORKING PAPER QE-1, RUSSELL, C.S. (ED.), ECOLOGICAL MODELING IN A RESOURCE MANAGEMENT, HELD IN WASHINGTON, DC, 1976, (P. 169-209)
- <ABST> THIS PAPER PRESENTS THE APPLICATIONS OF A SET OF EQUATIONS WHICH DESCRIBE THE SEASONAL DISTRIBUTION OF PHYTOPLANKTON TO THE ANALYSIS OF EUTROPHICATION PROBLEMS IN VARIOUS LOCATIONS THROUGHOUT THE UNITED STATES. A BRIEF REVIEW OF THE THEORETICAL STRUCTURE OF THE ANALYSIS IS PRESENTED WITH A QUALITATIVE DESCRIPTION OF THE PLANKTONIC EQUATIONS AND A DISCUSSION OF THE GENERAL PROCEDURE OF THE VERIFICATION PROCESS. EXAMPLES FROM VARIOUS NATURAL WATER SYSTEMS ARE PRESENTED TO DEMONSTRATE THE UTILITY OF THIS TYPE OF ANALYSIS IN EVALUATING ALTERNATIVE PLANS TO RESTORE OR MAINTAIN APPROPRIATE LEVELS OF WATER QUALITY. THE SYSTEMS CONSIDERED ARE: (1) THE FRESH WATER SUGGEST OF THE SAN

<633>

WATER QUALITY

<633> CONT.

JOAQUIN RIVER; (2) THE ESTUARINE REGIONS OF THE SACRAMENTO-SAN JOAQUIN DELTA; (3) THE POTOMAC RIVER; (4) WESTERN LAKE ERIE; AND (5) LAKE ONTARIO. SPECIFIC APPLICATIONS INCLUDED PREDICTION OF THE EFFECT OF WATER DIVERSIONS AND INCREASED WASTEWATER DISCHARGES ON PHYTOPLANKTON POPULATIONS.

<635> POTOMAC RIVER; LAKE ERIE; LAKE ONTARIO; SACRAMENTO-SAN JOAQUIN DELTA

<636>

<CONT> RICHARDSON, W. L.; DIEMAN, V. J.

<TITLE> MATHEMATICAL MODEL OF POLLUTANT CAUSE AND EFFECT IN SAGINAW BAY, LAKE MICHIGAN

<AUTH> ENVIRONMENTAL PROTECTION AGENCY

<CITY> CORVALLIS

<STATE> OR

<DOC> EPA--600/3-76-079, 1975; ANNUAL MEETING OF THE ECOLOGICAL SOCIETY OF AMERICA WITH THE AMERICAN INSTITUTE OF BIOLOGICAL SCIENCES HELD IN CORVALLIS, OREGON, AUG 17, 1975.

<ABST> CONCERNING MODEL RESULTS, NO SPECIFIC CONCLUSIONS CAN BE DRAWN AS YET. HOWEVER, THE MODEL HAS REVEALED SAGINAW BAY TO BE QUITE A DIFFERENT SYSTEM THAN LAKE ONTARIO WHICH REINFORCES INTUITIVE CONCLUSIONS MADE FROM OBSERVING THE DATA. DECOMPOSITION RATES USED IN THE MODEL ARE HIGHER AS EXPECTED. THE PHOSPHORUS-CHLOROPHYLL A RATIO APPARENTLY MUST BE LOWER, ESPECIALLY IN THE FALL. THIS INDICATES A POSSIBLE NEED TO ALTER THE MODEL STRUCTURE. PERHAPS THIS RATIO IS TIME-VARIABLE DUE TO A SHIFT IN THE DOMINANT PLANKTON FORMS. PHYTOPLANKTON SETTLING VELOCITY APPEARS TO BE LOWER THAN THAT FOR LAKE ONTARIO. THIS IS REASONABLE BECAUSE THE HYDRODYNAMICS OF THE BAY TEND TO KEEP MATERIALS IN SUSPENSION. THE INITIAL PHYTOPLANKTON GROWTH WAS BETTER USING A SATURATED GROWTH RATE OF .5 PER DAY RATHER THAN .58 USED FOR ONTARIO AND THE POTOMAC MODELS (O'CONNOR ET AL., 1974). THIS MAY BE AN ARTIFICIAL COMPENSATION FOR LACK OF INFORMATION ON EFFECT LEVELS OF SOLAR RADIATION AND LIGHT EXTINCTION IN THE WATER UNDER ICE. ALTERNATIVELY, IT COULD BE ACCOUNTED FOR BY SPECIES DIFFERENCES BETWEEN THE SYSTEMS. THE ZOOPLANKTON KINETICS ARE YET TO BE CONFIRMED BY EXPERIMENTAL RESEARCH SO THE ZOOPLANKTON PARAMETERS REMAIN TO BE ADJUSTED OVER LARGE RANGES. IN CONCLUSION, THIS EFFORT REPRESENTS A FIRST EPA IN-HOUSE ATTEMPT TO APPLY AN EXISTING COMPUTER PROGRAM/MODEL WHICH HAS BEEN DEVELOPED UNDER PREVIOUS AND ONGOING EPA GRANTS. A CLOSE WORKING RELATIONSHIP WAS ESTABLISHED BETWEEN THE GRANTEE STAFF AND THE EPA RESEARCH STAFF WHICH RESULTED IN BETTER COMMUNICATIONS AND AN OVERALL ENHANCED PROGRAM FOR ALL OF THE GREAT LAKES MODELING RESEARCH. THE AVERAGE CHLOROPHYLL A BIOMASS MODEL IS A RELATIVELY ECONOMICAL RESEARCH TOOL WHICH CAN AID IN ANALYZING COMPLEX, LIMNOLOGICAL INTERACTIONS AND HAS BEEN USEFUL IN GUIDING ADDITIONAL RESEARCH AND DATA GATHERING ACTIVITIES.

<639> LAKE ONTARIO; LAKE MICHIGAN

<635>

<CONT> BOSSING, L. S.

<TITLE> ENVIRONMENTAL PARAMETERS OF THE TENNESSEE RIVER IN ALABAMA, THERMAL STRATIFICATION

<AUTH> UNIVERSITY OF ALABAMA, SCHOOL OF GRADUATE STUDIES AND RESEARCH

<CITY> MUSTSVILLE

<STATE> AL

<SOURCE> DTIS 85.50/WR82.25

<DOC> 876--10698/USL, 1976

<ABST> THERMAL STRATIFICATION DATA OF A TRANSECT ACROSS WHEELER RESERVOIR ARE CORRELATED WITH THE CLIMATOLOGICAL DATA AT THE TIME OF SAMPLING. THIS PORTION OF THE TENNESSEE RIVER IS USED AS A HEAT SINK FOR THE EFFLUENT FROM THE THREE REACTOR BROWNS FERRY NUCLEAR POWER PLANT. THE TRANSECT SAMPLING LINE IS 1.3 MILES BELOW THIS POINT OF EFFLUENCE. DATA ARE PRESENTED BY WEEKLY SAMPLINGS FOR ONE YEAR PRIOR TO PLANT OPERATIONS. POST-OPERATIONAL DATA ARE PRESENTED WITH ONE REACTOR IN OPERATION AND WITH TWO REACTORS IN PARTIAL OPERATION. DATA GATHERING WAS TERMINATED WHEN THE PLANT CEASED OPERATIONS. THE RESULTS INDICATE THAT THE EFFLUENT FOR PARTIAL PLANT OPERATION WERE INCONCLUSIVE. AS A RESULT, RECOMMENDATIONS INCLUDE CONTINUING THE SAMPLING WHEN THE PLANT RESUMES OPERATION AT FULL CAPACITY. RECOMMENDATIONS ALSO INCLUDE DEVELOPING MATHEMATICAL MODELS WITH THE PRESENTED THERMAL AND CLIMATOLOGICAL DATA TO BE USED FOR PREDICTING THE EFFLUENT IMPACT IN THE RIVER WITH VARYING CLIMATOLOGICAL CONDITIONS AND ALSO TO PREDICT THE EFFECTIVENESS OF THE COOLING TOWERS.

<636>

<CONT> SARGENT, DONALD H.

<TITLE> WATER QUALITY SIMULATION MODEL

<AUTH> VERBAQ

<AUTH> VERSAR INCORPORATED

<CITY> SPRINGFIELD

<STATE> VA

<ZIP> 22150

<DOC> OTT, R.P. (ED.), PROCEEDINGS OF THE EPA CONFERENCE ON ENVIRONMENTAL MODELING AND SIMULATION, 1976, EPA 600/3-76-015, (P. 126-132), 807 PP.

<SUB> MODELS COMPLEX HYDRAULIC AND WASTE LOAD CHARACTERISTICS OF THE BUFFALO RIVER

<ABST> A WATER QUALITY SIMULATION MODEL, VERBAQ, WAS DEVELOPED FOR THE COMPLEX HYDRAULIC AND WASTE LOAD CHARACTERISTICS OF THE BUFFALO RIVER. THESE CHARACTERISTICS INCLUDE VERY LOW WATER VELOCITIES, OSCILLATING FLOW, UPSTREAM FLOW, INTER-BASIN TRANSFER OF

WATER QUALITY

<636> CONT.

WATER, MANY CRITICAL CONSERVATIVE AND NON-CONSERVATIVE WATER QUALITY PARAMETERS, THERMAL POLLUTION, AND IMPORTANT NON-POINT AS WELL AS POINT SOURCES OF WASTES. THE DEVELOPED AND VERIFIED MODEL WAS USED TO PROJECT WATER QUALITY AND TO ALLOCATE WASTE LOADS.

<637> BUFFALO RIVER

<STATUS> IN USE

<ACCESS> UNLIMITED

<CLASS> SIMULATION

<NUMBER> 780616

<637>

<AUTH> SCHWARTZ, R. L., JR.; THOMPSON, R. G.; REEVE, J. P.; TAYLOR, P. A.

<TITLE> ENVIRONMENTAL ENERGY MODEL OF A PETROLEUM REFINING/CHEMICAL COMPLEX

<ADDR> UNIVERSITY OF HOUSTON

<CITY> HOUSTON

<STATE> TX

<DOC> AICHE SYMPOSIUM SERIES, 6, 89-92, 1975

<ABST> A LINEAR PROGRAMMING MODEL IS DEVELOPED FOR ANALYZING THE EFFECTS OF VARIATIONS IN WATER POLICY OR PRODUCTION COSTS AND WATER USE IN AN INTEGRATED COMPLEX FOR ELECTRIC POWER GENERATION, PETROLEUM REFINING, CLEANS, AROMATICS, SULFURIC ACID, AND AMMONIA. THE RESULTS OF THE ANALYSIS SHOW HOW INCREASINGLY RESTRICTIVE EFFLUENT STANDARDS FOR MAJOR WATER AND AIR POLLUTANTS AND INCREASING SCARCITY OF CRUDE OIL AFFECT PRODUCTION METHODS, RESOURCE USE, WASTE DISCHARGES, AND PRODUCTION COSTS.

<639>

<AUTH> SMITH, C. S.; DEPILOPPI, J. A.

<TITLE> OPTIMIZATION MODELS FOR RIVER BASIN WATER QUALITY MANAGEMENT AND WASTE TREATMENT PLANT DESIGN

<ABST> MATHEMATICAL MODELS WHICH DESCRIBED THE INTERDEPENDENCY OF SYSTEMS COMPONENTS WERE USED TO OPTIMIZE THE OVERALL ECONOMIC RETURN FROM WATER QUALITY MANAGEMENT IN A RIVER BASIN. THE OBJECTIVE OF THIS STUDY WAS TO PRESENT AN OPTIMIZATION MODEL WHICH CONSIDERED THE TOTAL COST TO WATER USERS AND WASTE DISCHARGERS IN A BASIN, AND TO IDENTIFY DIRECT BENEFITS IN TERMS OF REDUCED

TREATMENT COSTS. TWO DYNAMIC PROGRAMMING MODELS WERE PRESENTED. THE FIRST WAS A WATER QUALITY MANAGEMENT MODEL THAT MINIMIZED THE TOTAL COSTS OF BOTH WATER AND WASTE TREATMENT IN THE RIVER BASIN. THE MODEL DESIGNED FOR OPTIMUM WASTE TREATMENT PLANT DESIGN COULD ADD AN EXTRA COST-SAVING REFINEMENT TO THE FIRST MODEL. BETTER WATER QUALITY MANAGEMENT WAS ACHIEVED BY USING FIRST MODEL. THE WASTE TREATMENT PLANT DESIGN MODEL COULD ALSO BE APPLIED INDEPENDENTLY FOR VARIOUS INDUSTRIAL AND MUNICIPAL WASTE TREATMENT DESIGN PROBLEMS.

<639>

<AUTH> YEASTED, J. C.; SHAPE, B.

<TITLE> PH PROFILES IN A RIVER SYSTEM WITH MULTIPLE ACID LOADS

<ADDR> CARNEGIE-MELLON UNIVERSITY

<CITY> PITTSBURGH

<STATE> PA

<DOC> JOURNAL OF THE WATER POLLUTION CONTROL FEDERATION, 48(1), 91-104, 1976

<ABST>

A BASIC APPROACH TO SOLVING THE NINE ACID PROBLEM HAS BEEN TO ATTACK THE PROBLEM AT ITS SOURCE, THAT IS, TO INVESTIGATE WHAT CAN BE DONE AT THE NINE ITSELF TO REDUCE THE VOLUME AND OBJECTIONABLE PROPERTIES OF THE EFFLUENT WATERS. SEVERAL PROCEDURES FOR THIS PURPOSE HAVE BEEN PROPOSED AND IMPLEMENTED AND ARE DISCUSSED IN THE PAPER. TO DATE, HOWEVER, NO PROCEDURE HAS BEEN FOUND TO BE SATISFACTORILY EFFECTIVE, ECONOMICAL, AND PRACTICAL. AS SUBSTANTIAL QUANTITIES OF MONEY ARE POURED INTO RESEARCH TO FIND A RELIABLE METHOD FOR "AT THE NINE" ABATEMENT, A LOGICAL QUESTION ARISES AS TO ITS LONG-RANGE EFFECTS. IN OTHER WORDS, IF IT IS ASSURED THAT A METHOD IS FOUND TO ELIMINATE COMPLETELY ACID WATER DISCHARGE FROM A NINE, WHAT ARE THE OVERALL EFFECTS OF THIS CONTROL ON DOWNSTREAM REACHES OF THE RECEIVING STREAM. SUCH INFORMATION WOULD BE INVALUABLE WHEN WATER-SHED-SCALE ABATEMENT PROJECTS WITH LIMITED FUNDS REQUIRE THE EVALUATION OF ALTERNATE IMPLEMENTATION SCHEDULES. THE PRIMARY OBJECTIVE OF THE WATER QUALITY MODEL BEING PROPOSED IS TO PRESENT A PREDICTION OF THESE LONG-RANGE EFFECTS. 17 PAGES.

<CON> 17 REFERENCES

SOIL TRANSPORT

<640>
 <CONF> COFF, E. L.; SCHUSTER, B. L.
 <TITLE> NEW CONCEPT IN STABILITY ANALYSIS OF
 STEEP HILL-SLOPE ENHANCEMENTS
 <ABDR> SPOKANE MINING RESEARCH CENTER
 <CITY> SPOKANE
 <STATE> WA
 <DOC> 151 SYMPOSIUM ON HINE AND PREPARATION
 PLANT DEPOSE DISPOSAL, HELD IN
 LOUISVILLE, KENTUCKY, OCTOBER 22, 1976
 <ABST> A NEW ANALYSIS CONCEPT USING
 FINITE-ELEMENT METHODS HAS BEEN
 DEVELOPED TO CHOOSE THE EFFECTS OF
 SLOPE STABILITY INTO COMPUTATIONS FOR
 SLOPE STABILITY OF DAMS OR ENHANCEMENTS.
 TERRACE FORCES, SUPERIMPOSED ON GRAVITY
 LOADS, ARE USED IN AN ELASTIC-PLASTIC
 PROGRAM TO COMPUTE SLOPE FACTORS OF
 SAFETY. COMPUTED OUTPUT PROVIDES A
 CROSS-SECTIONAL PLOT OF THE DAM OR
 ENHANCEMENT SHOWING THE SAFETY FACTORS
 FOR EACH ELEMENT. BESIDES HAVING A
 BETTER THEORETICAL BASIS THAN
 CONVENTIONAL LIMITING-EQUILIBRIUM
 METHODS OF ANALYSIS, THE TECHNIQUE HAS
 THE FOLLOWING ADVANTAGES: (1) NO
 ASSUMPTIONS ARE REQUIRED REGARDING THE
 LOCATION OR GEOMETRY OF THE FAILURE
 SURFACE; (2) RESULTS SHOW PROGRESSIVE
 DEVELOPMENT OF A FAILURE ZONE AS THE
 HEIGHT OF THE ENHANCEMENT OR HEIGHT OF
 THE WATER LEVEL INCREASES; (3) FAILURE
 ZONES AND PINPOINT AREAS WHERE SPECIAL
 MEASURES CAN BE TAKEN; (4)
 DRY-NOISELESS CROSS SECTIONS CAN BE
 ANALYZED; AND (5) ZONES OF POTENTIAL
 PIVOT FAILURE ARE OBTAINED. THE METHOD
 WAS FIRST TESTED USING TRIAL
 ENHANCEMENTS, AND THE RESULTS COMPARED
 WITH THOSE OBTAINED FROM CONVENTIONAL
 ANALYSIS. BOTH METHODS PREDICT FAILURE,
 BUT THE FINITE-ELEMENT ANALYSIS SHOWS A
 DIFFERENT MODE OF FAILURE AND
 DEVELOPMENT OF POTENTIAL FAILURE ZONES
 NOT INDICATED BY CONVENTIONAL METHODS.
 TO TEST THE VALIDITY OF THE CONCEPT,
 BOTH NEW AND CONVENTIONAL ANALYSES WERE
 COMPARED FOR THE 1972 BUFFALO CREEK DAM
 FAILURE. FINDINGS OF THE FINITE-ELEMENT
 MODEL CORROBORATE THOSE OF CONVENTIONAL
 METHODS, AND IN ADDITION SHOW AN
 ALTERNATIVE MODE OF FAILURE.
 <CLASS> SIMULATION
 <641>
 <CONF> GROVE, D. D.
 <TITLE> A MODEL FOR CALCULATING EFFECTS OF
 LIQUID WASTE OIL 'SAL IN DEEP SALINE
 AQUIFERS
 <ABDR> GEOLOGICAL SURVEY, WATER RESOURCES
 DIVISION
 <CITY> DENVER
 <STATE> CO
 <DOC> PB--256492 1976
 <ABST> A TRANSIENT, THREE-DIMENSIONAL
 SUBSURFACE & 2-DIMENSIONAL MODEL HAS
 BEEN DEVELOPED TO PROVIDE METHODOLOGY
 TO DESIGN AND TEST WASTE-DISPOSAL
 SYSTEMS. THE MODEL IS A
 FINITE-DIFFERENCE SOLUTION TO THE

PRESSURE, ENERGY, AND MASS-TRANSPORT
 EQUATIONS. EQUATION PARAMETERS SUCH AS
 VISCOSITY AND DENSITY ARE ALLOWED TO BE
 FUNCTIONS OF THE EQUATIONS' DEPENDENT
 VARIABLES. MULTIPLE USER OPTIONS ALLOW
 THE CHOICE OF X, Y, AND Z CARTESIAN OR
 R AND Z RADIAL COORDINATES, VARIOUS
 FINITE-DIFFERENCE METHODS, ITERATIVE
 AND DIRECT MATRIX SOLUTION TECHNIQUES,
 RESTART OPTIONS, AND VARIOUS PROVISIONS
 FOR OUTPUT DISPLAY. THE ADDITION OF
 WELL-BORE HEAT AND PRESSURE-LOSS
 CALCULATIONS TO THE MODEL MAKES
 AVAILABLE TO THE GROUND-WATER
 HYDROLOGIST THE MOST RECENT ADVANCES
 FROM THE OIL AND GAS RESERVOIR
 ENGINEERING FIELD... SOFTWARE
 DESCRIPTION: THE PROGRAM IS WRITTEN IN
 THE FORTRAN PROGRAMMING LANGUAGE FOR
 IMPLEMENTATION ON AN IBM 370/155
 COMPUTED USING THE J5 VERSION 21.0,
 MVS-EXT LEVEL OPERATING SYSTEM. 172K
 BYTES OF CODE STORAGE ARE REQUIRED TO
 OPERATE THE MODEL.

<SIZE> 172 K BYTES OF STORAGE
 <CONF> IBM
 <CONFID> IBM 370/155
 <LANG> FORTRAN
 <CLASS> SIMULATION

<642>
 <CONF> GURENCHAK, SERGE A.
 <TITLE> SIMULTANEOUS TRANSPORT OF WATER AND
 REACTING SOLUTES THROUGH MULTILAYERED
 SOILS UNDER TRANSIENT UNSATURATED FLOW
 CONDITIONS
 <ABDR> ARGONNE NATIONAL LABORATORY,
 ENVIRONMENTAL IMPACT STUDIES DIVISION,
 9700 S. CASS AVE.
 <CITY> ARGONNE
 <STATE> IL
 <ZIP> 60439
 <PHONE> PIS 972-7791
 <DOC> LONG ISLAND REPORT
 <ABST> THE MODEL IS CAPABLE OF PREDICTING THE
 ONE DIMENSIONAL (VERTICAL) MOVEMENT OF
 WATER AND MULTISOLUTES THROUGH
 MULTILAYERED SOIL SYSTEMS UNDER
 TRANSIENT UNSATURATED FLOW CONDITIONS.
 THE MULTILAYERED SYSTEM WAS TREATED AS
 A SERIES OF HOMOGENEOUS LAYERS AND A
 2-STEP IMPLICIT FINITE DIFFERENCE
 METHOD WAS USED TO SOLVE THE RESULTING
 SET OF FLOW EQUATIONS. THE MASS
 TRANSPORT EQUATION WAS SOLVED BY THE
 CRANK-NICOLSON METHOD. ONE OF THE
 MULTISOLUTES SYSTEMS MAY BE AN
 AGRICULTURAL FERTILIZATION PROBLEM IN
 WHICH THE SEQUENTIAL CHEMICAL REACTION
 OF AMMONIA TO NITRITE, TO NITRATE IS
 DESCRIBED BY FIRST ORDER KINETICS WITH
 LIBRARY OF POU-LINER ADSORPTION FOR
 AMMONIA. THE PRESSURE BASED MODEL
 CONSIDERS BOTH INFILTRATION
 REDISTRIBUTION AND EVAPORATION. CUBIC
 SPLINE FUNCTIONS ARE USED TO DESCRIBE
 THE SOIL HYDRAULIC PROPERTIES.

<STATUS> IN USE

BLANK PAGE

<402>

SOIL TRANSPORT

<402> CONT.

<ACCESS> UNLIMITED

<MEDIA> DISC

<COMP> IBM

<COMPIE> IBM 370/195 CS/WT WITH 150K CORE

<LANG> FORTRAN

<CRAP> EBCDIC

<ALGO> FINITE DIFFERENCE: (A) PREDICTOR - CORRECTOR METHOD USED FOR THE FLOW EQUATION; (B) CRANK-NICOLSON METHOD WAS USED FOR THE MASS TRANSPORT EQUATION.

<CLASS> PREDICTIVE; SIMULATION

<APPL> PREDICTION OF WATER AND SOLUTE MOVEMENT IN THE UNSATURATED REGION OF A SOIL PROFILE ABOVE THE WATER TABLE.

<TEST> TESTED AGAINST ANALYTICAL SOLUTIONS AND EXPERIMENTAL DATA. PRESENTED AT THE SSSA'S CONFERENCE, HOUSTON, TEXAS, NOVEMBER 1976; PRESENTED AT THE AGU'S CONFERENCE, WASHINGTON, D.C., JUNE 1977.

<CCN> REPORT SUBMITTED FOR PUBLICATION

<REFNO> 740701

<403>

<CCN> HOLDENAB, JOHNS T., JR.

<TITLE> WATER MOVEMENT THROUGH SATURATED-UNSATURATED POROUS MEDIA: A FINITE-ELEMENT GALERKIN MODEL

<ADDR> OAK RIDGE NATIONAL LABORATORY, P.O. BOX 1

<CITY> OAK RIDGE

<STATE> TN

<ZIP> 37830

<PHONE> 615-403-0611 EXT 3-1933; FTS 850-1933

<SOURCE> DEVELOPED AT ORNL

<DOC> REEVES, W. AND DUGUID, J. O.,
ORNL-4927, 1975

<ABST> A TWO-DIMENSIONAL TRANSPORT MODEL FOR FLOW THROUGH SATURATED-UNSATURATED POROUS MEDIA HAS BEEN DEVELOPED. THIS MODEL NUMERICALLY SOLVES THE GOVERNING PARTIAL DIFFERENTIAL EQUATIONS, WHICH ARE HIGHLY NONLINEAR. THE MODEL CODE USES QUADRILATERAL FINITE ELEMENTS FOR THE GEOMETRICAL ASSEMBLY, BILINEAR GALERKIN INTERPOLATION FOR THE SPATIAL INTEGRATION, AND GAUSSIAN ELIMINATION FOR THE SOLUTION OF THE RESULTING MATRIX EQUATIONS. IN ADDITION TO THE USUAL CONSTANT-FLUX AND CONSTANT-HEAD BOUNDARY CONDITIONS, THE CODE IS CAPABLE OF APPLYING PRESSURE-DEPENDENT BOUNDARY CONDITIONS AT THE GROUND SURFACE. THUS, INFILTRATION INTO OR SEEPAGE FROM THIS SURFACE MAY BE SIMULATED. EACH ELEMENT MAY BE ASSIGNED DIFFERENT MATERIAL PROPERTIES THAT ALLOW THE INVESTIGATION OF LAYERED GEOLOGIC FORMATIONS. THE RESULTS OF A COMPUTER SIMULATION ARE COMPARED WITH EXPERIMENTAL DATA OBTAINED BY J.D. HESLITT AND A.R. HIGGINS FROM AN

INCLINED SOIL SLAB AT COURTESY HYDROLOGIC LABORATORY IN NORTH CAROLINA. THE COMPUTER MODEL GIVES GOOD RESULTS IN THIS SIMULATION. THE GALERKIN FINITE-ELEMENT METHOD IS FOUND TO BE SUPERIOR TO THE FINITE-DIFFERENCE METHOD USED IN PREVIOUS INVESTIGATIONS. WHEN A COMPARISON WITH A FINITE-DIFFERENCE MODEL DEVELOPED BY D.A. FOSTER IS MADE, BY EXPLOITING THE FLEXIBILITY OF THE FINITE-ELEMENT GEOMETRICAL DISCRETIZATION, THE USER MAY EASILY REDUCE COMPUTER RUNNING TIME BY A FACTOR OF TWO.

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE

<COMP> IBM

<COMPIE> IBM 360, 500K BYTES MEMORY, 2 MAGNETIC TAPE DRIVES (MEMORY REQUIREMENTS ARE PROBLEM DEPENDENT)

<LANG> FORTRAN

<CRAP> EBCDIC

<ALGO> FINITE ELEMENT GALERKIN METHOD FOR INTEGRATION OF FLOW EQUATIONS.

<CLASS> DISCRETE; DETERMINISTIC; PREDICTIVE; INTEGRATIVE; SIMULATION

<APPL> ENVIRONMENTAL EFFECTS, IMPACTS, ASSESSMENTS

<USERS> DEPARTMENT OF ENERGY

<404>

<CCN> HOLDENAB, JOHNS T., JR.

<TITLE> MATERIAL TRANSPORT THROUGH POROUS MEDIA: A FINITE-ELEMENT GALERKIN MODEL

<ADDR> OAK RIDGE NATIONAL LABORATORY, P.O. BOX 1

<CITY> OAK RIDGE

<STATE> TN

<ZIP> 37830

<PHONE> 615-403-0611 EXT 3-1933; FTS 850-1933

<SOURCE> DEVELOPED AT ORNL

<DOC> DUGUID, J.O. AND REEVES, W., MATERIAL TRANSPORT THROUGH POROUS MEDIA: A FINITE ELEMENT MODEL. ORNL-4920 1976.

<ABST> A TWO-DIMENSIONAL TRANSPORT MODEL FOR FLOW OF A DISSOLVED CONSTITUENT THROUGH POROUS MEDIA HAS BEEN DEVELOPED. MECHANISMS FOR ADVECTIVE TRANSPORT, HYDRODYNAMIC DISPERSION, CHEMICAL ADSORPTION, AND RADIOACTIVE DECAY ARE INCLUDED IN THE MATHEMATICAL FORMULATION. IMPLEMENTATIONS OF QUADRILATERAL FINITE ELEMENTS, BILINEAR SPATIAL INTERPOLATION, AND GAUSSIAN ELIMINATION ARE USED IN THE NUMERICAL FORMULATION. THE PROGRAMMING LANGUAGE FORTRAN IV IS USED EXCLUSIVELY IN THE COMPUTER IMPLEMENTATION. A LISTING OF THE PROGRAM IS INCLUDED. THIS MATERIAL-TRANSPORT MODEL IS COMPLETELY COMPATIBLE WITH OUR MOISTURE-TRANSPORT MODEL (REEVES AND DUGUID, 1975) FOR

SOIL "TRANSPORT"

<646> CONT.

PREDICTING ADVECTIVE Darcy VELOCITIES FOR POROUS MEDIA WHICH MAY BE PARTLY UNSATURATED. IN ADDITION TO A DESCRIPTION OF THE MATHEMATICAL FORMULATION, THE NUMERICAL TREATMENT AND THE COMPUTER IMPLEMENTATION RESULTS OF TWO COMPUTER SIMULATIONS ARE INCLUDED IN THIS DOCUMENT. ONE IS A COMPARISON WITH A WELL-KNOWN ANALYTICAL TREATMENT (LAPLACE AND ARONSON, 1952) AND IS INTENDED AS A PARTIAL VALIDATION. THE OTHER SIMULATION, A STEPHENSON PROBLEM, IS A MORE REALISTIC DEMONSTRATION OF THE CAPABILITIES OF THE COMPUTER MODEL. COMPLETE LISTINGS OF INPUT AND OUTPUT ARE GIVEN IN THE APPENDICES SO THAT THIS SIMULATION MAY BE USED FOR CHECK-OUT PURPOSES. THIS REPORT, THUS, IS INTENDED TO BE A COMPREHENSIVE DESCRIPTION OF THE MATERIAL-TRANSPORT COMPUTER MODEL.

<STATUS> IN USE
 <ACCESS> UNLIMITED
 <MEDIA> MAGNETIC TAPE
 <COMP> IBM
 <CONFIG> IBM 360, 3008 BYTES MEMORY, TAPE DRIVE (MEMORY REQUIREMENT IS PROBLEM DEPENDENT)
 <LANG> FORTRAN
 <ORIG> DECDEC
 <ALGO> FINITE ELEMENT GALERKIN SOLUTION AT MASS TRANSPORT EQUATIONS
 <CLAS> DISCRETE; DETERMINISTIC; PREDICTIVE; INTEGRATIVE; SIMULATION
 <APPL> ENVIRONMENTAL STUDIES, IMPACTS
 <USERS> DEPARTMENT OF ENERGY
 <COM> REQUIRES TAPE PRODUCED BY WATER TRANSPORT MODEL

<645>
 <COMP> JETER, W. B.; MARTIN, J. D.; SCHULTZ, D. P.

<TITLE> MIGRATION OF GASEOUS RADIOISOTOPES THROUGH SOIL OVERLYING A URANIUM ORE DEPOSIT: A MODELING STUDY

<ADDR> TRIESTE ISOTOPIES

<CITY> WESTWOOD

<STATE> NJ

<DOC> 638--67-77, 1977

<ABST> THIS STUDY PRESENTS SEVERAL ONE-DIMENSIONAL MATHEMATICAL MODELS DESIGNED TO SIMULATE THE DISTRIBUTION OF RADIOISOTOPES IN SOIL OVERLYING URANIUM ORE DEPOSITS. THE MIGRATION OF GASEOUS PRODUCTS AWAY FROM THE ORE IS SIMULATED BY MECHANISMS OF MOLECULAR DIFFUSION AND ADVECTIVE TRANSPORT. A HOMOGENEOUS OVERBURDEN CONTAINING NO URANIUM OR RADIUM IS ASSUMED THROUGHOUT. THE STUDY IS INTENDED TO BE A FIRST STEP IN EVALUATING THE FEASIBILITY OF DETECTING URANIUM ORE BY REMOTE GEOCHEMICAL MEASUREMENTS. A STEADY-STATE DIFFUSION

MODEL PREDICTS THE DETECTABILITY OF URANIUM-222 AND SOME OF ITS DAUGHTER PRODUCTS SEVERAL TENS OF METERS FROM A URANIUM DEPOSIT. IN REALITY THIS RANGE WOULD BE SHORTENED BY THE MASKING EFFECT OF GASES GENERATED IN THE OVERLYING SOIL ITSELF. KRYPTON-85 IS FOUND TO BE ONLY MINORLY DETECTABLE EVEN IN THE IMMEDIATE VICINITY OF THE ORE. XENON-133 WOULD BE DETECTABLE AT HALF THE RANGE OF UR-222. THE EFFECT OF SOIL GAS MOTION AS AN ADDITIONAL TRANSPORT MECHANISM IS EVALUATED USING BOTH STEADY-STATE AND TRANSIENT MODELS. A CONSTANT SOIL GAS VELOCITY OF 1×10^{-4} CM/SEC CAUSES GASEOUS RADIOISOTOPE ACTIVITIES TO CHANGE BY SEVERAL ORDERS OF MAGNITUDE. DETECTABILITY OF URANIUM COULD BE SIGNIFICANTLY INCREASED IF LONG-TERM SOIL GAS MOTION IS CONFIRMED. A TRANSIENT NUMERICAL MODEL IS USED TO SIMULATE BAROMETRIC INFLUENCES ON THE MIGRATION OF UR-222 AWAY FROM AN ORE DEPOSIT. IT WAS FOUND THAT NEAR-SURFACE EFFECTS ARE $\pm 15\%$ WHICH WOULD NOT APPRECIABLY AFFECT THE DETECTABILITY OF URANIUM BY GEOCHEMICAL MEANS.

<CLAS> PREDICTIVE

<646>
 <COMP> LAI, WILLIAM

<TITLE> ONE-DIMENSIONAL TRANSIENT NONISOTHERMAL TWO-PHASE, TWO COMPONENT FLOW OF FLUIDS AND GASES THROUGH LAYERED POROUS MEDIA

<ACRO> CERBERUS

<ADDR> LAWRENCE LIVERMORE LABORATORY, THERMO FLUID MECHANICS GROUP/3E, P.O. BOX 808

<CITY> LIVERMORE

<STATE> CA

<ZIP> 94550

<PHONE> 415-822-9900; FTS 532-9900

<SOURCE> DEVELOPED AT LLL

<DOC> MORRISON, P. A., JR., TRANSIENT MULTIPHASE MULTICOMPONENT FLOW IN POROUS MEDIA, UCRL-51302, JANUARY 2, 1973; MORRISON, P. A., JR., TRANSIENT GAS FLOW IN A POROUS COLUMN, I AND II FUNDAMENTALS, VOL. II, P 191, MAY 1972; D. B. BOWMAN, A COMPUTATIONAL MODEL FOR OIL SHALE RETORTING, UCRL-51700, APRIL 4, 1973; MORRISON, P. A., JR., CERBERUS INPUT AND OUTPUT, ERM-76-21, 1976; PITTS, J. B., FLOW OF RADIOACTIVE FLUID THROUGH THE SOIL SURROUNDING A POWER REACTOR STATION AFTER A CORE MELTDOWN ACCIDENT, UCRL-76233, NOVEMBER 27, 1974

<SUBJ> TWO-PHASE POROUS FLOW

<ABST> THIS MODEL TREATS THE TRANSIENT LOW REYNOLDS NUMBER FLOW OF MULTIPLE PHASE, MULTIPLE COMPONENT FLUIDS THROUGH LAYERED POROUS MEDIUM IN ONE DIMENSION. THE GOVERNING RELATIONSHIP IS GIVEN BY DARCY'S LAW, WHICH APPLIES FOR ALL CONSTITUENTS OF FLOW AND IS COUPLED TO RELEVANT CONSTITUTIVE RELATIONSHIPS. THE VARIABLES: u IS THE VELOCITY, μ IS THE PERMEABILITY OF THE LAYER, η IS THE FLUID VISCOSITY, p THE PRESSURE, AND x THE SPATIAL COORDINATE. THE SOURCE MAY

<606>

SOIL TRANSPORT

<606> CONT.

BE CONSTANT OR VARIABLE WITH TIME. PERMEABILITY MAY BE LAYERED AXIALLY AND RADIIALLY.

<GPO> GLOBAL APPLICATION FOR LOCAL POROUS FLOW ASSESSMENT

<STATUS> IN USE

<ACCESS> LIMITED TO AUTHORIZED RECIPIENTS

<MEDIA> PUNCH CARDS; MAGNETIC TAPE

<SIZE> CODE STATEMENTS WITH COMMENT CARDS: 050

<COMP> CDC

<CONFIG> CDC-7600 AT LLL WITH PLOTTED; REMOV EQUIPMENT 66452 OCTAL; LESS THAN 1 MINUTE REQUIRED FOR 3 X SECOND RUN

<LANG> INTRAN

<CHAR> ASCII

<ALGO> IMPLICIT FINITE DIFFERENCE

<CLASS> ANALYTICAL: PREDICTIVE

<APPL> CONTAINMENT OF RADIOACTIVE GASES-NUCLEAR EXPLOSIVE TESTING; COM GASIFICATION-ENERGY: NUCLEAR RECTOR

<USERS> LLL

<SRM> USED INPUT

<REAL> ONE DIMENSIONAL 2 PHASE -2 COMPONENT (STEAM/W2) IS OVERSTON SAND COLUMN. TEMPERATURE ERROR LESS THAN 5 PER CENT.

<CON> ONE-DIMENSIONAL TRANSIENT TWO-PHASE, TWO-COMPONENT FLOW IN A POROUS MEDIUM IS INVESTIGATED ANALYTICALLY. THE FLOW IS DESCRIBED BY THE USE OF A CONTINUITY EQUATION FOR EACH COMPONENT, A MOMENTUM EQUATION FOR EACH PHASE, THE FIRST LAW OF THERMODYNAMICS, STATE EQUATIONS, AND RELATIONS FOR THE TRANSPORT PROPERTIES. LOCAL THERMODYNAMIC EQUILIBRIUM IS ASSUMED. THE EFFECTS OF CONDENSATION AND EVAPORATION ARE INCLUDED. THE ANALYSIS SHOWS THAT THE FLOW RESULTING FROM A STEP CHANGE IN THE STATE AT THE SURFACE OF A UNIFORM SEMI-INFINITE POROUS MEDIUM MAY BE DESCRIBED BY A SINGLE VARIABLE WHICH IS A SIMPLE FUNCTION OF POSITION AND TIME. UNDER OTHER CONDITIONS, POSITION AND TIME MUST BE SEPARATELY SPECIFIED TO DETERMINE THE STATE OF THE MIXTURE. A COMPUTER PROGRAM TO DESCRIBE THE FLOW OF AN AIR-WATER MIXTURE IS PRESENTED. RESULTS OF CALCULATIONS RELEVANT TO THE FLOW OF CAVITY GAS FOLLOWING AN UNDERGROUND NUCLEAR EXPLOSION ARE GIVEN. CEMENTUS IS NORMALLY RUN AT LLL FROM A PREVIOUSLY COMPILED AND LOADED CONTROLLER. IT OPERATES A 100,000 WORDS PRINTER FILE AND A 50000 WORD GRAPHICS (5000) FILE ON DISK. THESE FILES ARE AUTOMATICALLY FILED AS REQUIRED. THE PROGRAM MAY BE STOPPED AND RESTARTED AT THE USER'S CONVENIENCE FOR EITHER REMOTE OR BATCH USE. UNDER THE NORMAL TIME-SHARED BATCHING MODE AT LLL, EFFECTIVE RUNS CAN BE GAINED AT STANDARD (MINIMUM) PRIORITY.

<UPDATE> 780623

<607>

<CONT> LINDBSTROM, P. T.

<TITLE> PULSED DISPERSION OF TRACE CHEMICAL CONCENTRATIONS IN A SATURATED SOBBING POROUS MEDIUM

<ADDR> OREGON STATE UNIVERSITY

<CITY> CORVALLIS

<STATE> OR

<DOC> WATER RESOURCES RESEARCH, 12(2), 229-230

<ABST> A SIMPLE, YET COMPLETE, MATHEMATICAL MODEL FOR THE PULSED DISPERSION OF TRACE CHEMICAL CONCENTRATIONS IN A WATER-SATURATED SOBBING POROUS MEDIUM IS STATED, AND THE RESULTING INTERMODIFIED DIFFUSION EQUATION OF TRANSPORT IS SOLVED VIA LAPLACE TRANSFORM METHODS. A TYPICAL EXAMPLE OF A SOIL WATER DISPERSION SYSTEM IS DISCUSSED WITH THE AID OF FREE AND SOBBED PHASE CONCENTRATION DISTRIBUTION CURVES.

<CLASS> PREDICTIVE

<608>

<CONT> LINDBSTROM, P. T.

<TITLE> LINEAR DIFFUSION AND CONVECTION OF CHEMICALS IN SOILS

<ADDR> OREGON STATE UNIVERSITY

<CITY> CORVALLIS

<STATE> OR

<ZIP> 97331

<DOC> ENVIRONMENTAL SCIENCE TECHNOLOGY, 1, 561-565, 1967; LAI, S.H., J.J. JUBINAR, AND R.J. WAGNET, SOIL SCIENCE SOCIETY AMERICAN JOURNAL, 82, 200-203, 1970

<SUB> TRANSLOCATION OF CHEMICALS IN SOIL

<ABST> THE MOVEMENT OF SOME CHEMICALS IN SOILS HAS BEEN TREATED THEORETICALLY BY CONSIDERING FOR SATURATED CONDITIONS, THE CHEMICAL DIFFUSION COEFFICIENT, THE PERCOLATION VELOCITY OF THE WATER, THE SORPTIVE PROPERTIES OF THE SOIL, THE AVERAGE PARTICLE SIZE OF THE SOIL, AND THE FRACTIONAL NUMBER OF SOBBING SITES. A MODEL HAS BEEN DEVELOPED FOR THE MOVEMENT OF CHEMICALS IN SATURATED SOIL, BASED ON FICK'S LAW, CONSERVATION OF ENERGY, AND A SORPTION ISOTHERM. THEORETICAL CURVES FOR TWO DIFFERENT BOUNDARY CONDITIONS ARE GIVEN FOR REALISTIC VALUES OF THE WATER VELOCITY IN THE PORES AND THE MEASURED DIFFUSION COEFFICIENT.

<LANG> FORTHAN

<CLASS> PREDICTIVE

<REAL> FIVE-POINT GAUSS QUADRATURE

<UPDATE> 780622

<609>

<CONT> LINDBSTROM, P. T.; BOERSMA, L.

<TITLE> A THEORY ON THE MASS TRANSPORT OF

SOIL TRANSPORT

<649> CONT.

PREVIOUSLY DISTRIBUTED CHEMICALS IN A WATER SATURATED SOILING POISSON MEDIUM

<ADDR> OREGON STATE UNIVERSITY

<CITY> CORVALLIS

<STATE> OR

<DOC> SOIL SCIENCE, 111(3), 192-199, 1971

<ABST> SOILS REPRESENTED POROUS MEDIA OF INTERCONNECTING VOIDS. MODELS ARE PROPOSED TO PREDICT THE MASS TRANSPORT OF CHEMICALS THROUGH SUCH PORE SYSTEMS. USUALLY THE SOIL IS CONSIDERED AS A UNIFORM MEDIUM WITH AN AVERAGE PORE SIZE, REPRESENTING THE PORE SIZE DISTRIBUTION. IT IS PROPOSED THAT DISPERSIVE EQUATIONS INCLUDING A DIFFUSION AND A CONVECTION TERM CAN BE IMPROVED BY TAKING THE ACTUAL PORE SIZE DISTRIBUTION INTO ACCOUNT. AN EQUATION FOR THE GENERAL DISTRIBUTION OF CHEMICAL ALONG THE COLUMN IS GIVEN AND SEVERAL SPECIAL CASES ARE CONSIDERED.

<CLASS> PREDICTIVE

<650> NOVOTNY, V.

<CITY> NOVOTNY, V.

<TITLE> AN OVERLAND POLLUTION TRANSPORT MODEL

<ADDR> LANSFORD

<ADDR> MARQUETTE UNIVERSITY, DEPT. OF CIVIL ENGINEERING, 1515 W. WISCONSIN AVE.

<CITY> MILWAUKEE

<STATE> WI

<ZIP> 53233

<PHONE> 616-226-7382

<SOURCE> WATER RESOURCES CENTER, UNIVERSITY OF WISCONSIN, MADISON, WI; MARQUETTE UNIVERSITY, MILWAUKEE, WI

<DOC> JOURNAL WATER POLLUTION CONTROL FEDERATION, 50(1), 101-112; NOVOTNY, V., CHEN, R. A., AND TIAN, R., NON-POINT OVERLAND POLLUTION TRANSPORT MODEL "LANSFORD" USER'S MANUAL, MARQUETTE UNIVERSITY, DEPT. OF CIVIL ENGINEERING, MILWAUKEE, WISC., 1976

<SUB> NON-POINT POLLUTION GENERATION

<ABST> LANSFORD ANALYZES AND ESTIMATES QUANTITY AND QUALITY OF RUNOFF AND SURFACE EROSION FROM WATERSHED AREAS OF VARIOUS SIZES.

<GEN> RIVERINE

<TIME> 1975-1977

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> CARDS; DISC; TAPE

<SIZE> 2,500 CARDS

<COMP> IBM; ICRON

<COMPIG> SIGNAL WITH FOR CODE AND 3 DISC MEMORY DRIVES

<CLASS> FOURTH IV

<ALGO> FINITE DIFFERENCE; CONVOLUTION

<CLASS> DETERMINISTIC; PREDICTIVE; SIMULATION

<APPL> NON-POINT POLLUTION GENERATION IN URBAN AND NON-URBAN AREAS.

<USER> DEPT. OF NATURAL RESOURCES, MADISON, WISC.; MINISTRY OF ENVIRONMENT, TORONTO, ONTARIO, CANADA; WATER RESOURCES CENTER, UNIV. OF WISCONSIN, MADISON, WISC.; INTERNATIONAL SOURCE COMMISSION

<VAL> CALIBRATION AND VERIFICATION WITH EXTENSIVE MONITORING DATA IN GREAT LAKES WATERSHEDS.

<UPDATE> 700629

<651>

<COMPT> BICCA, V. T.; CLARK, C. R.; SMITH, E. E.

<TITLE> PREDICTIVE AND POLLUTION ABATEMENT MODEL FOR RIVE DRAINAGE

<ADDR> OHIO STATE UNIVERSITY, DEPARTMENT OF CIVIL ENGINEERING

<CITY> COLUMBUS

<STATE> OH

<ZIP> 43221

<PHONE> 614-422-2596

<DOC> (1) PREDICTIVE AND POLLUTION ABATEMENT MODEL ON RIVE DRAINAGE, BY BICCA, SMITH, AND CLARK, FORD REPORT, ENVIRONMENTAL PROTECTION TECHNOLOGY SERIES, US EPA, CINCINNATI, OH OFFICE, PUBLICATION SCHEDULED FOR LATE 1976; (2) DATA DEFICIENCIES IN ACID RIVE DRAINAGE MODELING, BICCA, V.T., PROCEEDINGS, ENVIRONMENTAL PROTECTION AGENCY, CONFERENCE ON ENVIRONMENTAL MODELING AND SIMULATION, CINCINNATI, OH, APRIL 1976.

<ABST> THIS STUDY HAS RESULTED IN A PREDICTIVE AND POLLUTION ABATEMENT MODEL OF RIVE DRAINAGE. THE COMPREHENSIVE MODEL FOR RIVE DRAINAGE SIMULATION AND OPTIMIZATION OF RESOURCE ALLOCATION TO CONTROL RIVE ACID POLLUTION IS A WATERSHED CONSISTS OF FOUR UNIQUE BUT INTEGRATED EFFORTS. (1) APPLICATION AND EVALUATION OF UNIT SOURCE MODELS DEVELOPED BY THE AUTHORS UNDER A PREVIOUS STUDY. THESE MODELS SIMULATE THE RIVE DRAINAGE FLOW RATE AND ASSOCIATED ACID LOADS FOR DEEP RIVE, STRIP RIVES, AND DEFUSE PILES. WORK HEREIN WAS TO TEST, MODIFY AND FULLY DOCUMENT THESE MODELS. (2) DEVELOPMENT OF AN ACID LOAD PREDICTIVE MODEL FOR ANALYZING PROPOSED RIVES. THE MODEL DESIGNED IS CAPABLE OF PREDICTING THE LEVEL OF ACID POLLUTION TO BE EXPECTED AS A FUNCTION OF THE TYPE AND SCALE OF RIVER. (3) VERIFICATION AND MODIFICATION OF THE RESOURCE ALLOCATION MODEL CONSISTED OF AN APPLICATION OF THE RESOURCE ALLOCATION MODEL TO AN EXISTING RIVER COMPLEX TO ASSESS THE MODEL'S UTILITY, SENSITIVITY, AND VALIDITY. (4) DEVELOPMENT OF A PREDICTIVE MODEL FOR POLLUTION CONTROL

<651>

SOIL TRANSPORT

<651> CONT.

IN A WATERSHED TO DETERMINE PREFERRED
MIXING AND POLLUTION CONTROL DECISIONS
FROM THE TOTAL WATERSHED VIEWPOINT.

<IND> 06/78-06/78

<CLAS> PREDICTIVE

<652>

<CONT> BOSS, G. A.

<TITLE> THE STANFORD WATERSHED MODEL: THE
CORRELATION OF PARAMETER VALUES
SELECTED BY A COMPUTERIZED PROCEDURE
WITH MEASURABLE PHYSICAL
CHARACTERISTICS OF THE WATERSHED

<ABST> STEAMFLOW SIMULATION PROVIDES A
POWERFUL TOOL FOR DEVELOPING BETTER
INFORMATION ON FLOW MAGNITUDES AND TIME
PATTERNS FOR THE DESIGN OF WATER
RESOURCES PROJECTS. A SELF-CALIBRATING
SIMULATION MODEL WAS APPLIED TO ABOUT
20 KENTUCKY WATERSHEDS AND SUCCESSFULLY
USED TO ESTIMATE APPROPRIATE VALUES FOR
MODEL PARAMETERS. THE PROCEDURE
REQUIRED TO DEVELOP THE NECESSARY INPUT
DATA IS EXPLAINED IN SUFFICIENT DETAIL
TO ESSENTIALLY BE A USER'S MANUAL FOR
THE PROGRAM. PHYSICAL DESCRIPTIONS OF
THE WATERSHEDS ARE PRESENTED, AND A
NUMBER OF KEY WATERSHED CHARACTERISTICS
(SOIL DEPTH, COVER, PERMEABILITY, ETC.)
WERE MEASURED. RELATIONSHIPS BETWEEN
MODEL PARAMETERS (BASED ON THE STANFORD
WATERSHED MODEL) AND WATERSHED
CHARACTERISTICS WERE EXPLORED. THOSE
WHICH ARE MOST PROMISING IN ESTIMATING
PARAMETER VALUES FOR USE IN MODELING
STEAMFLOW FROM UNGAUGED WATERSHEDS ARE
PRESENTED. PARAMETER VALUES WERE ALSO
ESTIMATED FOR A SERIES OF YEARS
SPANNING A PERIOD OF INTENSIVE
URBANIZATION, AND STATISTICALLY
SIGNIFICANT TRENDS WERE NOTED. THE
RESULTS PROVIDE A FRAMEWORK FOR
MODELING CHANGES IN STEAMFLOW
MAGNITUDES AND TIME PATTERNS ASSOCIATED
WITH URBAN DEVELOPMENT.

<GEO> KENTUCKY

<653>

<CONT> ROYSON, P. C.; SERRE, R. J.

<TITLE> ONE-DIMENSIONAL MODEL OF THE MOVEMENT
OF TRACE RADIOACTIVE SOLUTE THROUGH
SOIL COLUMNS - THE PERCOL MODEL

<ABST> A MATHEMATICAL MODEL IS TESTED ON SOIL
COLUMN EXPERIMENTS. IT ALLOWS FOR
ABSORPTION OF THE POLLUTING SPECIES IN
THE SOIL BY ION EXCHANGE.

<654>

<CONT> SCHUBERT, JEFFREY F.

<TITLE> FINITE-DIFFERENCE MODEL FOR AQUIFER
SIMULATION IN TWO DIMENSIONS WITH
RESULTS OF NUMERICAL EXPERIMENTS

<ADDR> ARGonne NATIONAL LABORATORY, ENERGY AND
ENVIRONMENTAL SYSTEMS DIVISION, 9700 S.
CASS AVE.

<CITY> ARGONNE

<STATE> IL

<217> 60439

<PHONE> FTS 972-3816

<SOURCE> U.S. GEOLOGICAL SURVEY, RESTON, VA 22092

<DOC> P. C. FVESCOTT, G. F. PINDER, AND S. P.
LARSON, 1976, FINITE-DIFFERENCE MODEL
FOR AQUIFER SIMULATION IN TWO
DIMENSIONS WITH RESULTS OF NUMERICAL
EXPERIMENTS, U.S. GEOL. SURVEY, TECH.
OF WATER-RESOURCES INV., BOOK 7, CH.
C1, 116P.

<SUB> GROUNDWATER FLOW SYSTEMS

<ABST> THE MODEL DEVELOPED BY THE U.S.
GEOLOGICAL SURVEY WILL SIMULATE
GROUND-WATER FLOW IN AN ARTESIAN
AQUIFER, A WATER-TABLE AQUIFER, OR A
COMBINED ARTESIAN AND WATER-TABLE
AQUIFER. THE AQUIFER MAY BE
HETEROGENEOUS AND ANISOTROPIC AND HAVE
IRREGULAR BOUNDARIES. THE SOURCE TERM
IN THE FLOW EQUATION MAY INCLUDE WELL
DISCHARGE, CONSTANT RECHARGE, LEAKAGE
FROM CONFINING BEDS IN WHICH THE
EFFECTS OF STORAGE ARE CONSIDERED, AND
EVAPOTRANSPIRATION AS A LINEAR FUNCTION
OF DEPTH TO WATER. THE THEORETICAL
DEVELOPMENT INCLUDES PRESENTATION OF
THE APPROPRIATE FLOW EQUATIONS AND
DERIVATION OF THE FINITE-DIFFERENCE
APPROXIMATIONS (WRITTEN FOR A VARIABLE
GRID). THE DOCUMENTATION EMPHASIZES
THE NUMERICAL TECHNIQUES THAT CAN BE
USED FOR SOLVING THE SIMULTANEOUS
EQUATIONS AND DESCRIBES THE RESULTS OF
NUMERICAL EXPERIMENTS USING THESE
TECHNIQUES. OF THE THREE NUMERICAL
TECHNIQUES AVAILABLE IN THE MODEL, THE
STRONGLY IMPLICIT PROCEDURE, IN
GENERAL, REQUIRES LESS COMPUTER TIME
AND HAS FEWER NUMERICAL DIFFICULTIES
THAN DO THE ITERATIVE ALTERNATING
DIRECTION IMPLICIT PROCEDURE AND LINE
SUCCESSIVE OVERRELAXATION (WHICH
INCLUDES A TWO-DIMENSIONAL CONNECTION
PROCEDURE TO ACCELERATE CONVERGENCE).

<GEO> UNRESTRICTED

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> DISC; PUNCHED CARDS

<CONT> IBM

<CONFIG> IBM 370/195 OS/VS1 WITH 300K CORE

<LANG> FORTRAN

<CHAR> EBCDIC

<ALGO> DISCRETE FINITE-DIFFERENCE COMPUTATIONS
FOR 2-DIMENSIONAL FLOW.

<CLAS> DISCRETE; DETERMINISTIC; PREDICTIVE;
SIMULATION

<APPL> TO SIMULATE ACTUAL OR HYPOTHETICAL
SATURATED GROUNDWATER FLOW IN TWO
DIMENSIONS.

<SUB> SITE-SPECIFIC HYDROLOGICAL AND
HYDROGEOLOGIC DATA.

<HVAL> COMPARISON OF COMPUTER RESULTS TO
ACTUAL POTENTIOMETRIC SURFACE OF
GROUNDWATER IN THE AQUIFER BEING
MODELLED.

SOIL TRANSPORT

<654> CONT.
<UPDATE> 700703

<654>
<CON> SCHUBERT, JEFFREY P.
<TITLE> FINITE ELEMENT SOLUTIONS FOR THE EQUATIONS OF GROUNDWATER FLOW
<ADDR> ARCONUE NATIONAL LABORATORY, ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION, 9700 S. CASS AVE.
<CITY> ARCONUE
<STATE> IL
<ZIP> 60439
<PHONE> P'S 972-3016
<SOURCE> DR. RICHARD COOLEY; NOW WITH U.S. GEOLOGICAL SURVEY
<DOC> COOLEY, P. L., 1970, FINITE ELEMENT SOLUTION OF STEADY-STATE POTENTIAL FLOW PROBLEMS, GENERALIZED COMPUTER PROGRAM 723-049, U.S. ARMY CORPS OF ENG., HYDROLOGIC ENGINEERING CENTER, DAVIS, CA, FINITE-ELEMENT SOLUTIONS FOR THE EQUATIONS OF GROUNDWATER FLOW, TECH. REPT. SER. H-W, HYDROLOGI AND WATER RESOURCES PWB. NO. 15, DESERT RESEARCH INST., UNIV. OF NV, RENO, 133 PP, 1970
<SUB> GROUNDWATER FLOW IN TWO DIRECTIONS
<ABST> RIGOROUS DEVELOPMENT OF THE AERIAL EQUATIONS FOR CONFINED AND UNCONFINED GROUND-WATER FLOW WAS ACCOMPLISHED BY INTEGRATION OF THE THREE-DIMENSIONAL FLOW EQUATIONS OVER THE VERTICAL. AS A RESULT IT WAS FOUND THAT ALL OF THE AERIAL EQUATIONS ARE BEST WRITTEN IN TERMS OF HEAD HEAD IN THE VERTICAL. DISCRETIZATION OF THE EQUATIONS WAS ACCOMPLISHED THROUGH USE OF BOTH A FINITE DIFFERENCE-NUMERICAL INTEGRATION METHOD AND A FINITE ELEMENT TECHNIQUE BASED ON THE SUBDOMAIN COLLOCATION VARIANT OF THE WEIGHTED RESIDUAL METHOD. THE TWO APPROACHES INCORPORATE CONTINUOUSLY OR DISCONTINUOUSLY VARIABLE HYDRAULIC PARAMETERS SUCH AS TRANSMISSIVITY AND STORAGE COEFFICIENT OF THE AQUIFER AND VERTICAL PERMEABILITY AND THICKNESS OF CONFINING BED(S) OR OTHER UNIT(S) THROUGH WHICH LEAKAGE IS OCCURRING; IRREGULAR FLOW REGION GEOMETRY; VARIABLE, HEAD-INDEPENDENT AND HEAD-DEPENDENT SOURCES AND SINKS; AND ALMOST ANY COMBINATION OF TIME VARIANT KNOWN-FLOW AND KNOWN-HEAD BOUNDARY CONDITIONS. APPROXIMATE ANALYSIS OF CONVERGENCE AND STABILITY OF THE MATRIX EQUATIONS RESULTING FROM DISCRETIZATION OF THE FLOW EQUATIONS INDICATES THAT ALL-TIME DISCRETIZATION SCHEMES INCORPORATING WEIGHTING FACTORS BETWEEN ONE HALF AND ONE ARE STABLE.
<STATUS> PLANNED
<ACCESS> UNLIMITED
<MEDIA> DISC; PUNCHED CARDS
<COMP> IBM
<COMPIG> IBM 370/195 OS/VS1 WITH 350K CC'S
<LANG> FORTRAN

<ALGO> SEE ABSTRACT
<CLASS> DETERMINISTIC; PREDICTIVE; SIMULATION
<APPL> TO SIMULATE ACTUAL OR HYPOTHETICAL SATURATED GROUNDWATER FLOW IN ONE OR TWO DIMENSIONS.
<SUB> SITE-SPECIFIC HYDROLOGICAL AND HYDROGEOLOGICAL DATA.
<EVAL> COMPARISON OF COMPUTER SIMULATION RESULTS TO ACTUAL POTENTIOMETRIC SURFACE OF GROUNDWATER IN THE AQUIFER BEING MODELLED.
<UPDATE> 700703
<656>
<CON> SCHUBERT, JEFFREY P.
<TITLE> SELECTED DIGITAL COMPUTER TECHNIQUES FOR GROUNDWATER RESOURCE EVALUATION
<ADDR> ARCONUE NATIONAL LABORATORY, ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION, 9700 S. CASS AVE.
<CITY> ARCONUE
<STATE> IL
<ZIP> 60439
<PHONE> P'S 972-3016
<SOURCE> ILLINOIS STATE WATER SURVEY ; URBANA, IL.
<DOC> PRICKETT, T. A., AND LOUQUIST, C. G., 1971, SELECTED DIGITAL COMPUTER TECHNIQUES FOR GROUNDWATER RESOURCE EVALUATION, ILL. STATE WATER SURVEY, BULL. 55, 62PP.
<SUB> GROUNDWATER FLOW SYSTEMS
<ABST> GENERALIZED DIGITAL COMPUTER PROGRAM LISTINGS ARE GIVEN THAT CAN SIMULATE ONE-, TWO-, AND THREE-DIMENSIONAL NONSTEADY FLOW OF GROUNDWATER IN HETEROGENEOUS AQUIFERS UNDER WATER TABLE, NONLEAKY, AND LEAKY ARTESIAN CONDITIONS. PROGRAMMING TECHNIQUES INVOLVING TIME VARYING POROSITY FROM BELLS, NATURAL OR ARTIFICIAL RECHARGE RATES, THE RELATIONSHIPS OF WATER EXCHANGE BETWEEN SURFACE BODIES AND THE GROUNDWATER RESERVOIR, THE PROCESS OF GROUNDWATER EVAPOTRANSPIRATION, AND THE MECHANISM OF CONVERTING FROM ARTESIAN TO WATER TABLE CONDITIONS ARE ALSO INCLUDED. THE DISCUSSION OF THE DIGITAL TECHNIQUES INCLUDES THE NECESSARY MATHEMATICAL BACKGROUND, DOCUMENTED PROGRAM LISTINGS, THEORETICAL VERSUS COMPUTER COMPARISONS, AND FIELD EXAMPLES. ALSO PRESENTED ARE SAMPLE COMPUTER INPUT DATA AND EXPLANATIONS OF JOB SETUP PROCEDURES. A FINITE DIFFERENCE APPROACH IS USED TO FORMULATE THE EQUATIONS OF GROUNDWATER FLOW. A MODIFIED ALTERNATING DIRECTION IMPLICIT METHOD IS USED TO SOLVE THE SET OF RESULTING FINITE DIFFERENCE EQUATIONS. THE PROGRAMS INCLUDED ARE WRITTEN IN FORTRAN IV AND WILL OPERATE WITH ANY CONSISTENT SET OF UNITS. (FROM PRICKETT AND LOUQUIST, 1971)
<END> UNLIMITED

<656>

SOIL "PAWSPOR"

<656> CONT.
 <STATUS> IN USE
 <ACCESS> UNLIMITED
 <MEDIA> DISC; PUNCHED CARDS
 <COMP> IBM
 <COMPIG> IBM 370/195 OS/MVT WITH 350K CODE
 <LANG> FORTRAN
 <CHAN> EOLIC
 <ALGO> SEE ABSTRACT
 <CLAS> DISCRETE; DETERMINISTIC; PREDICTIVE; SIMULATION
 <APP> GROUNDWATER FLOW SYSTEM MODELING IN ONE-, TWO-, OR THREE-DIMENSIONS.
 <SND> SITE-SPECIFIC HYDROLOGICAL AND HYDROGEOLOGICAL DATA.
 <NVAL> COMPARISON OF COMPUTER SIMULATION RESULTS TO ACTUAL POTENTIAL/STIC SURFACE GROUNDWATER IN THE AQUIFER(S) BEING MODELLED.
 <NDATE> 780703

<657>
 <CON> SHAPIRO, H. W.
 <TITLE> SIMULTANEOUS HEAT AND MASS TRANSFER IN POROUS MEDIA WITH APPLICATION TO SOIL WARMING WITH POWER PLANT WASTE HEAT
 <ADDP> OHIO STATE UNIVERSITY
 <CIY> COLUMBUS
 <STATE> OH
 <ABST> THERE ARE TWO MAJOR ASPECTS TO THIS STUDY: THE MODELING OF SIMULTANEOUS HEAT AND MASS TRANSPORTS IN A POROUS MEDIUM, AND THE PROBLEM OF EVALUATING THE FEASIBILITY OF USING BURIED PIPE SOIL WARMING SYSTEMS TO MEET AGRICULTURAL AND/OR POWER PLANT NEEDS. BOTH SOIL TEMPERATURE AND SOIL MOISTURE HAVE IMPORTANT INFLUENCES UPON MEETING AGRICULTURAL NEEDS FOR HIGH AND UNIFORM TEMPERATURE AND MOISTURE AND THE POWER PLANT NEED TO COOL CONDENSED WATER. ACCORDINGLY, A DETAILED VARIABLE PROPERTY ANALYSIS OF THE SIMULTANEOUS HEAT AND MASS TRANSFER IN SOIL HAS BEEN DERIVED, IN ORDER TO PREDICT TEMPERATURE AND MOISTURE PROFILES IN THE VICINITY OF A BURIED PIPE SYSTEM. DIFFERENTIAL EQUATIONS FOR CONSERVATION OF ENERGY AND MASS IN SOIL HAVE BEEN DERIVED, WHILE THE FORMS OF THE EQUATIONS ARE THE SAME AS ONES APPEARING IN THE SOIL PHYSICS LITERATURE, THE PRESENT DEVELOPMENT BRINGS OUT CLEARLY THE VOLUME-AVERAGED NATURE OF THE EQUATIONS AS WELL AS ILLUMINATES THE UNDERLYING ASSUMPTIONS. WHEN EXISTING THEORIES FOR OBTAINING SOIL TRANSPORT COEFFICIENTS ARE USED IN

THE ANALYSIS, THE RESULTING PREDICTIONS DO NOT AGREE WITH AVAILABLE DATA WITHIN EXPERIMENTAL ACCURACY. CONSEQUENTLY, AN EMPIRICAL METHOD HAS BEEN DEVELOPED IN ORDER TO OBTAIN MORE ACCURATE TRANSPORT COEFFICIENTS FOR SOILS. CONCERNING THE FEASIBILITY OF SOIL WARMING, IT WAS DETERMINED THAT SOIL WARMING IS TECHNICALLY FEASIBLE, WITHOUT THE INTRODUCTION OF MOISTURE NEAR THE WARM PIPES. FOR SOME DESIGNS, WHEN AGRICULTURE IS THE OVERRIDING CONCERN. HOWEVER, WHEN SYSTEMS ARE DESIGNED TO MEET BOTH THE AGRICULTURAL NEEDS AND THE POWER PLANT REQUIREMENT TO OBTAIN SIGNIFICANT WATER COOLING IN THE PIPES, THE LENGTH OF EACH PIPE IS LIKELY TO BE EXCESSIVE.

<658>
 <CON> THORNTWHAITE, C. W.
 <TITLE> MATHEMATICAL MODEL OF STROMTUM MOVEMENT IN SOILS
 <ADDP> C.W. THORNTWHAITE ASSOCIATES, LABORATORY OF CLIMATOLOGY, R. 1 CENTERTON
 <CITY> ELDER
 <STATE> NJ
 <ZIP> 08310
 <PHONE> 609-350-2350
 <DOC> C.W. THORNTWHAITE, J.B. WATERS, AND J.K. KARASUNA, MOVEMENT OF RADIO-STROMTUM IN SOILS, SCIENCE, 131(3406), 1015-1019
 <SND> MATHEMATICAL MODEL OF EXPERIMENTALLY MEASURED DISTRIBUTIONS OF STROMTUM IN SOILS
 <ABST> EXPERIMENTALLY MEASURED DISTRIBUTIONS OF STROMTUM IN VARIOUS SOILS WERE USED TO SET UP A MATHEMATICAL MODEL OF STROMTUM MOVEMENT. THE MODEL ESTABLISHED PARTICULAR LEACHING PATTERNS FOR THE VARIOUS SOLUTIONS UTILIZED. HOWEVER, THE MODEL'S APPLICABILITY IN DIFFERENT NATURAL SOILS IN SITU AFTER LEACHING WITH NATURAL RAIN WATER IS NOT KNOWN. FURTHER TESTS ARE RECOMMENDED. THE MODEL SHOWED THAT A CERTAIN PERCENTAGE OF THE STROMTUM MOVED DOWNWARD TO THE NEXT LOWER LAYER OF SOIL FOR EACH UNIT VOLUME OF SURFACE WATER WHICH IS ADDED TO THE LAYER.

<STATUS> IN USE
 <ACCESS> UNLIMITED
 <MEDIA> TEXT
 <CLAS> SIMULATION
 <UPDATE> 780602

AQUATIC FOOD CHAINS

- <659>
<CON> ADAMS, L. B.; WHITE, G. C.; PETERLE, T. J.
<TITLE> TRITIUM KINETICS IN A FRESHWATER MARSH
<IDOP> OHIO STATE UNIVERSITY
<CITY> COLUMBUS
<STATE> OH
<ZIP> 43210
<DOC> CUSHING, C. E., JR. (ED.), FOURTH NATIONAL SYMPOSIUM ON RADIOECOTOLOGY, HELD IN CORVALLIS, OREGON, MAY 12, 1975.
<ABST> TEN CURIES (CI) OF TRITIUM (AS TRITIATED WATER) WERE APPLIED TO A 2-HA LAKE ERIE MARSH IN NORTHWESTERN OHIO ON 29 OCTOBER 1973. TRITIUM KINETICS IN THE MARSH WATER, BOTTOM SEDIMENT, CRAYFISH (*PROCAMBARDUS BLANDINGII*), AND FISH (*PERCA MACROCHETUS*) WERE DETERMINED OVER AN 8 TO 12-MONTH PERIOD. TRITIUM HALF-LIFE IN THE WATER WAS 64.5 DAYS. APPROXIMATELY 3 PERCENT OF THE INITIAL TRITIUM PRESENT IN THE WATER REMAINED AFTER 332 DAYS. FOLLOWING APPLICATION, PEAK TRITIUM LEVELS IN THE SEDIMENT WERE OBSERVED ON DAY 13 IN THE TOP 1-CM LAYER, ON DAY 27 AT 5-CM DEPTH AND ON DAY 64 AT A 10-CM DEPTH. TRITIUM UPTAKE IN THE FISH WAS RAPID. AFTER THE INITIAL UPTAKE, LOSS OF TRITIUM FROM BLOOD (BODY-WATER) CORRELATED PARALLEL MARSH WATER ACTIVITY. LOSS OF BLOOD TISSUE STRUCTURE) TRITIUM FROM BLUEGILL MUSCLE WAS SIMILAR TO LOSS OF TRITIUM FROM THE MARSH WATER. LOSS OF BLOOD TRITIUM FROM CRAYFISH MUSCLE WAS SLOWER THAN LOSS OF TRITIUM FROM THE MARSH WATER. A MODEL BASED ON DIFFUSION THEORY DESCRIBED TRITIUM MOVEMENT THROUGH THE SEDIMENT. TRITIUM UPTAKE AND LOSS BY THE CRAYFISH AND BLUEGILLS WERE DESCRIBED BY A SET OF SIMPLE LINEAR DIFFERENTIAL EQUATIONS.
<CLAS> SIMULATION
<660>
<CON> PAGERSTROEN, T.; AASELL, B.
<TITLE> METHYL MERCURY ACCUMULATION IN AN AQUATIC FOOD CHAIN: A MODEL AND SOME IMPLICATIONS FOR RESEARCH PLANNING
<DOC> ARBIO, 2(5), 164-171, 1973
<ABST> A MATHEMATICAL MODEL FOR THE ACCUMULATION OF METHYL MERCURY IN AQUATIC FOOD CHAINS IS PRESENTED. THE FOOD CHAIN IS A 3-STEP PROCESS INVOLVING FISH. AREAS THAT SHOULD BE GIVEN RESEARCH PRIORITY ARE IDENTIFIED. THE DIRECT UPTAKE OF METHYL MERCURY FROM WATER IS PROBABLY THE MOST IMPORTANT SUBJECT FOR FURTHER STUDY.
<CLAS> SIMULATION
<661>
<CON> FRIE, A. H.
<TITLE> A MODEL FOR THE APPROXIMATE CALCULATION OF SAFE RATES OF DISCHARGE OF RADIOACTIVE WASTES INTO MARINE ENVIRONMENTS
<DOC> HEALTH PHYSICS, 13,703-750, 1967. (IN CITATION: SOUTH TEXAS PROJECT)
<ABST> CONTAINS INFORMATION ON THE CONCENTRATION FACTOR IN THE ACCUMULATION OF RADIOISOTOPES IN AQUATIC ORGANISMS. DATA USED IN DETERMINING DOSE RATE ESTIMATES.
<CLAS> PREDICTION
<662>
<CON> ISAACS, J. B.
<TITLE> UNSTRUCTURED MARINE FOOD WEBS AND 'POLLUTANT ANALOGUES'
<IDOP> SCHIPPS INSTITUTION OF OCEANOGRAPHY
<CITY> LA JOLLA
<STATE> CA
<ZIP> 92037
<DOC> MONITORING AGENCY REPT. NO. MOAA-72101009 33 9 PP., MAY 72
<ABST> SEVERAL SPECIES OF FISH LIVING IN THE GULF OF CALIFORNIA HAVE BEEN SHOWN TO POSSESS QUITE DIFFERENT CONCENTRATIONS OF CESIUM (AND CESIUM IN RESPECT TO POTASSIUM) THAN THE SAME SPECIES OF FISH LIVING IN THE SALTON SEA. THE SALTON SEA FISH DISPLAY SIMPLER TROPHIC STEPS OF CONCENTRATION, WHEREAS THOSE IN THE GULF ALL SHOW ABOUT THE SAME LEVELS. THESE DIFFERENCES ARE REASONABLE WELL EXPLAINED BY SIMPLIFIED TROPHIC MODELS OF THE TWO ENVIRONMENTS. THE CONCENTRATION FACTOR FOUND IN THE KNOWN AND DESCRIBABLE FOOD CHAIN OF THE SALTON SEA, APPLIED TO A MODEL OF AN ASSUMED UNSTRUCTURED FOOD WEB IN THE GULF, LEADS TO REASONABLE RESULTS. THIS SUGGESTS THAT STUDY OF THE CONCENTRATIONS IN MARINE ORGANISMS OF SUCH NATURAL TRACE SUBSTANCES AS CESIUM MAY LEAD TO AN UNDERSTANDING OF THE TROPHIC POSITION OF THE ORGANISMS, AND HENCE CONSTITUTE 'POLLUTANT ANALOGUES' THAT MAY YIELD A BETTER UNDERSTANDING OF THE EXISTING OR POTENTIAL DISTRIBUTION OF POLLUTANTS IN MARINE ORGANISMS.
<663>
<CON> NOT GIVEN
<TITLE> DOSE CALCULATION MODELS AND ASSUMPTIONS
<IDOP> ARBIO; CHIT; GROW
<IDOP> KANSAS GAS AND ELECTRIC CO
<CITY> WICHITA
<STATE> KS
<DOC> APPENDIX 5.2A, WOLF CREEK GENERATING STATION ENVIRONMENTAL REPORT, MAY 1970.
<ABST> SHOWS EQUATIONS AND ASSUMPTIONS USED TO CALCULATE RADIATION DOSES TO 1) AQUATIC ORGANISMS THROUGH FOOD CHAIN AND UPTAKE OF WATER; 2) MAN THROUGH DRINKING WATER, CONSUMPTION OF AQUATIC FOODS, EXPOSURE TO SHORELINE DEPOSITS, SWIMMING AND BOATING, AND SUBMERSION IN GASEOUS EFFLUENTS. ALL DOSE

<667>

AQUATIC FOOD CHAINS

<663> CONT.

CALCULATIONS WERE PERFORMED BY COMPUTER PROGRAMS APREG, CRIF, AND GROSS. WITH REFERENCES.

<668>

<CONT>

PATZER, P. G.

<TITLE>

CONCENTRATION FACTORS AND TRANSPORT MODELS FOR RADIONUCLIDES IN AQUATIC ENVIRONMENTS-A LITERATURE REPORT

<ADDR>

ENVIRONMENTAL MONITORING AND SUPPORT LABORATORY, OFFICE OF RESEARCH AND DEVELOPMENT, U.S. ENVIRONMENTAL PROTECTION AGENCY, LAS VEGAS, NV 89118

<DOC>

EPA-600/3-76-050, 56 PP., 1976

<DESC>

THE RELATIVE RISKS TO MAN FROM RADIONUCLIDES RELEASED TO THE ENVIRONMENT DEPEND HEAVILY ON THEIR ACCUMULATION TO CONCENTRATION OF AQUATIC ORGANISMS. THE ORGANISMS WHICH ACCUMULATE THOSE RADIONUCLIDES PRESENT IN THE ENVIRONMENT MAY BE USEFUL AS INDICATORS FOR ENVIRONMENTAL MONITORING PURPOSES. IN ADDITION, THESE ORGANISMS MAY BE DIRECTLY IN FOOD CHAIN PATHWAYS TO HUMANS. LITERATURE IS REVIEWED AND SUMMARIZED IN REGARD TO BIOLOGICAL CONCENTRATION OF RADIONUCLIDES IN FRESHWATER AND MARINE ENVIRONMENTS. CONCENTRATION FACTORS FOR ELEMENTS FOUND IN ORGANISMS ARE TABULATED FOR PLANTS, INVERTEBRATES, AND FISH IN MARINE AND FRESHWATER ENVIRON. LITERATURE IS ALSO REVIEWED ON MODELS DEVELOPED TO CALCULATE THE POSSIBLE RADIATION DOSE DELIVERED TO HUMANS FROM RADIONUCLIDES RELEASED INTO AQUATIC ENVIRONMENTS. THE MODEL APPROACHES SUMMARIZED RANGE FROM SINGLE GENERALIZED FORMS WHICH, AT BEST, GIVE ORDERS OF MAGNITUDE ESTIMATES TO DETAILED MODELS FOR A SPECIFIC AREA WHICH MAY BE USED TO GUIDE WASTE DISCHARGE PRACTICES.

<665>

<CONT>

TERHAAR, C. J.

<TITLE>

A LABORATORY MODEL FOR EVALUATING THE BEHAVIOR OF HEAVY METALS IN AN AQUATIC ENVIRONMENT

<ADDR>

PASTHAR KODAK COMPANY, HEALTH AND SAFETY LABORATORY, KODAK PARK, R-306

<CITY>

ROCHESTER

<STATE>

NY

<ZIP>

14650

<PHONE>

716-458-1000 EXT-80701

<DOC>

WATER RESEARCH, 11(1), 101-110, 1977

<SUBJ>

METALS IN AN AQUATIC ENVIRONMENT

<ABST>

A DYNAMIC BIOLOGICAL SYSTEM CAPABLE OF SIMULTANEOUSLY DISTINGUISHING BETWEEN BIOACCUMULATION AND BIOAMPLIFICATION THROUGH SUCCESSIVE TROPHIC LEVELS IN AN AQUATIC ECOSYSTEM IS DESCRIBED. THE ORGANISMS USED IN THE SYSTEM WERE ALGAE, PREDOMINANTLY SCENEDESUS SP., DAPHNIA MAGNA, FRESH WATER MUSSELS (LIGONIA SP. AND MARGARITIFERA SP.) AND THE PATTERNED RIFINOW, PINEPHALES

PHOSPHAS. THIOSULFATE COMPLEXED MERCURY AND SILVER WERE EACH STUDIED AT TWO CONCENTRATIONS. THE WATER AND ORGANISMS WERE ANALYZED FOR THE METALS PERIODICALLY DURING THE 10-WEEK TESTS. BOTH MERCURY AND SILVER CAN BE BIOACCUMULATED BY FISH. THE CONCENTRATION FACTORS FOR MERCURY ARE GREATER THAN FOR SILVER. FURTHER, MERCURY IS BIOAMPLIFIED BY FISH WHEREAS SILVER IS NOT. FRESH WATER MUSSELS WERE FOUND TO BE POOR INDICATOR SPECIES FOR METAL CONTAMINATION.

<STATUS>

IN USE

<ACCESS>

UNLIMITED

<MEDIA>

TEXT

<CLASS>

SIMULATION

<APPL>

METALS IN AN AQUATIC ENVIRONMENT

<SRCD>

LABORATORY DATA

<UPDTE>

198001

<666>

<CONT>

THORANN, ROBERT V.

<TITLE>

A FOOD CHAIN MODEL OF CADMIUM IN WESTERN LAKE ERIE

<ADDR>

PANATHAN COLLEGE, ENVIRONMENTAL ENGINEERING AND SCIENCE

<CITY>

BROOK

<STATE>

NY

<ZIP>

10871

<PHONE>

212-548-1800

<DOC>

WATER RESOURCES 9, 841-919, 1976

<SUBJ>

FOOD CHAIN MODEL

<ABST>

THE SINGLE FOOD CHAIN MODEL ILLUSTRATED HERE COULD PROVE USEFUL IN LARGE SCALE PLANNING APPLICATIONS PROVIDED ADDITIONAL DATA ARE COLLECTED ON THE VARIOUS TROPHIC LEVELS. THE MODEL DEMONSTRATES THE INCREASE IN CONCENTRATION OF POTENTIALLY TOXIC SUBSTANCES, SUCH AS CADMIUM, AS ONE PROCEEDS UP THE FOOD CHAIN. THE FOOD CHAIN MODEL ALSO ILLUSTRATES HOW INTERACTIVE MODELING BETWEEN COMPLEX NON-LINEAR AND LINEAR COMPARTMENT MODEL CAN BE ACCOMPLISHED. THE PROBLEM OF VERIFICATION AND DATA AVAILABILITY ARE HIGHLIGHTED BY THE MODEL: ESTIMATES OF TRANSFER RATES AND BIOASSAY OF DIFFERENT TROPHIC LEVELS MUST BE ON HAND. THIS MODEL THEREFORE IS AN EXAMPLE OF A MODELING STRUCTURE THAT IS STILL IN AN EARLY STAGE OF DEVELOPMENT; HENCE THE RELIANCE ON LINEAR KINETICS RATHER THAN POSSIBLY MORE REALISTIC NON-LINEAR MECHANISMS. NEVERTHELESS, THE SPATIAL-TROPHIC LEVEL STRUCTURE OF THE MODEL INDICATES THE GENERAL BEHAVIOR OF A TOXICANT SUCH AS CADMIUM WHEN RELEASED INTO THE WATER ENVIRONMENT.

<GEO>

NEW YORK, WESTERN LAKE ERIE

<STATUS>

UNDER DEVELOPMENT

<ACCESS>

UNLIMITED

AQUATIC FOOD CHAINS

<666> CONT.

<MEDIA> MAGNETIC TAPE

<COMP> CDC

<LANG> FORTRAN IV

<CLASS> DETERMINISTIC; SIMULATION

<REAL> NOT VALIDATED

<UPDATE> 780727

*TERRESTRIAL FOOD CHAINS

<447>
 <COPY> EFERHART, L. L.; MASON, W. C.
 <TITLE> A SIMULATION MODEL FOR AN ARCTIC FOOD CHAIN
 <DOC> HEALTH PHYSICS, 17, 793-806, 1969
 <ABST> A SIMPLE COMPUTER SIMULATION MODEL HAS BEEN CONSTRUCTED TO REPRESENT THE CONCENTRATION OF CESIUM-137 (CS-137) IN A LICHEN-CARIBOU-REKIND FOOD CHAIN. THE MODEL INCORPORATES EXPONENTIALLY DECREASING FALLOUT DEPOSITION ON LICHENS, SEASONALLY VARYING UPTAKE OF CS-137 BY CARIBOU, AND SPRING AND FALL HARVEST OF MIGRATING CARIBOU BY REKINDS. THE VARIOUS CONSTANTS REQUIRED IN THE MODEL WERE INDEPENDENTLY ESTIMATED, AND OUTCOME OF THE SIMULATION WAS THEN COMPARED WITH ACTUAL DATA ON CS-137 CONCENTRATIONS IN CARIBOU MUSCLE AND REKIND BODY-FLUIDS. THE RESULTS OF SIMULATION RUNS IN WHICH CONSTANTS WERE ARBITRARILY VARIED INDICATE THAT AN IMPROVED FIT (TO OBSERVED DATA) MIGHT BE OBTAINED, BUT THE MODEL'S PRINCIPAL FUNCTION IS CONSIDERED TO BE ANALYTICAL RATHER THAN PREDICTIVE.
 <CLASS> SIMULATION, ANALYTICAL
 <COM> 8 REFERENCES, 1 DIAGRAM, 8 GRAPHS, 3 TABLES

<448>
 <COPY> CALLEGOS, ANTHONY P.
 <TITLE> TRANSURANIC BIOLOGICAL TRANSPORT MODEL
 <ACRON> BIOTRAN
 <ADDR> LOS ALAMOS SCIENTIFIC LABORATORY, GROUP M-12, MS-490, P.O. BOX 1663
 <CITY> LOS ALAMOS
 <STATE> NM
 <ZIP> 87505
 <PHONE> 505-667-5062; FTS 803-5062
 <SOURCE> LANS
 <DOC> A. P. CALLEGOS, W. J. SMITH, L. J. JOHNSON, LAST MODELS FOR ENVIRONMENTAL TRANSPORT OF RADIOISOTOPES IN FORESTS, LA-68-70-1097, SUBMITTED TO 9TH ANNUAL PITTSBURGH CONFERENCE ON MODELING AND SIMULATION; W. J. SMITH, A. P. CALLEGOS, L. J. JOHNSON, LAST MODELS FOR ENVIRONMENTAL TRANSPORT OF RADIOISOTOPES; A. P. CALLEGOS, B. J. GARCIA, C. E. SUTTON, DOCUMENTATION OF THE BIOLOGICAL TRANSPORT MODEL, LAST REPORT; H. B. LANSFORD AND B. J. CHERL, AGRICULTURAL RESOURCE BASE DATA FOR ENVIRONMENTAL EVALUATION OF TOXIC WASTE BURIAL SITES AND THEIR ULTIMATE DISPOSITION, AN AGRICULTURAL EXPERIMENT STATION, SPECIAL REPORT, 1975; W. L. WHEELER, W. J. SMITH, A. P. CALLEGOS, A PRELIMINARY EVALUATION OF THE POTENTIAL FOR PLUTONIUM RELEASE FROM BURIAL GROUNDS AT LANS, LA-6490-MS.
 <SUB> TRANSURANIC BIOLOGICAL TRANSPORT
 <ABST> BIOTRAN SIMULATES ECOSYSTEMS, BIOASS DENSITY, AND THE CYCLING OF TRANSURANICS OF VARIOUS ISOTOPES. THE

MODEL USES BIOMASS AS A VECTOR FOR PREDICTING RADIOISOTOPE UPTAKE AND SURFACE DEPOSITION OF PLUTONIUM IN PLANTS AND ANIMALS.
 <GEN> NORTHERN DEO GRASSHOPPER BATED SHEEP APRA
 <TIME> 1977-PRESENT
 <STATUS> UNDER DEVELOPMENT; IN USE
 <ACCESS> UNLIMITED
 <MEDIA> DISC
 <SIZE> 2000 LINES
 <COMP> CDC
 <COMPIE> CDC 7600 CROS OPERATING SYSTEM
 <LANG> FORTRAN
 <CHAR> BINARY
 <CLASS> CONTINUOUS; STOCHASTIC; PREDICTIVE; INTEGRATIVE; SIMULATION
 <APPL> STUDY THE CYCLING OF RADIOISOTOPES IN ECOSYSTEMS
 <USERS> LANS; COLORADO STATE UNIVERSITY
 <SUB> LANS
 <INVAL> COMPARISON WITH FIELD BIOMASS MEASUREMENTS
 <UPDATE> 700417

<449>
 <COPY> GIST, C. S.; DUNE, R. H.; PATTEN, B. C.
 <TITLE> MODEL FOR RADIOIODINE MOVEMENT IN HOLE DEER
 <ADDR> OAK RIDGE ASSOCIATED UNIVERSITIES
 <CITY> OAK RIDGE
 <STATE> TN
 <ZIP> 37830
 <DOC> NELSON, B.-J. (ED.), THIRD NATIONAL SYMPOSIUM ON RADIOECOTOLOGY HELD IN OAK RIDGE, TN, VOL. 2, MAY 10-12, 1971, (P. 909)
 <SUB> I131 CYCLING; HOLE DEER
 <ABST> A THREE-COMPARTMENT LIVER-DOPOON-CONTROLLED MODEL WAS CONSTRUCTED. THE TRANSFER COEFFICIENTS OF THE MODEL WERE EXPRESSED AS A SINE WAVE FUNCTION WITH TWO PI RADIANS PER YEAR AND VARIOUS PHASE SHIFTS TO SIMULATE SEASONAL EFFECTS ON THESE COEFFICIENTS. THE SYSTEM WAS FORCED BY VARIOUS FUNCTIONS AND THE DYNAMICS OF EACH MANIPULATED. THE MODEL SHOWED A CONCENTRATION OF RADIOIODINE IN THE THYROID GREATER THAN IN THE PLANTS OF $1.293 \times 10^{(2.3)}$ IN THE WINTER AND A CONCENTRATION FACTOR OF 910 IN THE SUMMER. THE CONCENTRATION VALUES OBTAINED FROM THE MODEL AGREE QUITE WELL WITH THE LITERATURE.
 <GEN> ROCKY MOUNTAINS; COLORADO
 <TIME> 1967-1969

BLANK PAGE

<669>

TERRESTRIAL FOOD CHAINS

<669> CONT.
 <STATUS> IN USE
 <ACCESS> UNLIMITED
 <MEDIA> LITERATURE
 <SIZE> SMALL, LESS THAN 10K BYTES
 <COMP> IBM; CSMP
 <COMPIC> IBM 360/65
 <LANG> FORTRAN; CSMP
 <CARD> 30CARD
 <ALGO> VARIABLE STEP RANGE - RUTTA
 <CLASS> DETERMINISTIC
 <APPL> RADIOACTIVE CYCLING IN WILDLIFE
 <SUB> ORIGINAL DATA IN GIST, C.S. AND P.W. SWICKEN, 1971, RADIOACTIVE UPTAKE AND RETENTION BY SLE DEER THYROID, JOURNAL WILDLIFE MANAGEMENT, 35, 461
 <UPDATE> 700702
 <670>
 <CONT> GOLDSTEIN, B. A.; ELWOOD, J. W.
 <TITLE> A TWO-COMPARTMENT, THREE-PARAMETER MODEL FOR THE ABSORPTION AND RETENTION OF INGESTED ELEMENTS BY ANIMALS
 <DOC> ECOLOGY, 52(5), 935-939, 1971
 <ABST> IN RABBIT EXPERIMENTS OF THE ABSORPTION AND RETENTION OF INGESTED ELEMENTS, THE MEASURED RETENTION CURVE IS FITTED TO THE SUM OF TWO EXPONENTIAL FUNCTIONS. THE MODEL USED MOST OFTEN TO INTERPRET RESULTS ASSUMES THAT THE INSTANTANEOUS RATE OF ABSORPTION OF AN ELEMENT IS PROPORTIONAL TO ITS INSTANTANEOUS RATE OF INGESTION. THE AUTHORS PROPOSE INSTEAD A MODEL THAT ASSUMES THE INSTANTANEOUS RATE OF ABSORPTION IS PROPORTIONAL TO THE AMOUNT OF UNABSORBED ELEMENT IN THE GUT. THE MODELS LEAD TO DIFFERENT INTERPRETATIONS OF THE PARAMETERS OF THE RETENTION CURVE ARE TO DIFFERENT FUNCTIONAL DESCRIPTIONS OF THE ACCUMULATION OF ABSORBED ELEMENT IN THE BODY. DATA ARE PRESENTED TO SUPPORT THE AUTHOR'S PROPOSED MODEL OVER THE COMMONLY USED MODEL. SINCE BOTH MODELS ARE OF EQUAL MATHEMATICAL COMPLEXITY, THERE IS NO JUSTIFICATION FOR FAVORING THE COMMONLY USED MODEL. SUGGESTIONS ARE MADE ABOUT HOW MODELING SHOULD BE INCORPORATED INTO ECOLOGICAL STUDIES. MODELS BASED ON MEANINGFUL AND TESTABLE HYPOTHESES SHOULD BE FORMULATED PRIOR TO DATA COLLECTION.
 <CLASS> PREDICTIVE
 <671>
 <CONT> NOILHAN, B. F.; LOICE, J. B.
 <TITLE> TRANSFER OF RADIOCESIUM FROM LICHEN TO REINDEER
 <ADDR> UNIVERSITY OF ALASKA, INSTITUTE OF ARCTIC BIOLOGY
 <CITY> FAIRBANKS

<STATUS> IN
 <REP> 99701
 <PROJ> 907-079-7155
 <SOURCE> UNIVERSITY OF ALASKA, FAIRBANKS, AK
 <DOC> HEALTH PHYSICS, 21(5), 657-666
 <SUB> RADIOCESIUM UPTAKE/ELIMINATION FROM REINDEER
 <ABST> AN EMPIRICAL TWO-COMPARTMENT MODEL IS PRESENTED THAT DESCRIBES THE TRANSFER OF RADIOCESIUM FROM FALLOUT CONTAMINATED LICHEN TO REINDEER. KINETIC PARAMETERS WERE CALCULATED FROM DATA DERIVED FROM RETENTION STUDIES FOLLOWING A SINGLE DOSE OF CS 134 TO REINDEER MAINTAINED ON A NATURAL MOUNTAIN TUNDRA PASTURE AT CANTWELL, ALASKA. CESIUM RETENTION VALUES WERE STATISTICALLY INDISTINGUISHABLE FOR THE AUTUMN AND WINTER PERIOD, HOWEVER CESIUM RETENTION HALF-TIMES WERE REDUCED 2 TO 4 FOLD DURING THE SUMMER MONTHS AS COMPARED TO THE AUTUMN-WINTER STUDIES. CESIUM KINETICS IN THE REINDEER WERE NOT INFLUENCED SIGNIFICANTLY BY ANIMAL SEX ALTHOUGH A SIGNIFICANT INCREASE IN CESIUM RETENTION WITH ANIMAL WEIGHT WAS OBSERVED. RESULTS OBTAINED FROM CONTROLLED LICHEN FEEDING EXPERIMENTS INDICATED THAT ABOUT 20 TO 30% OF THE RADIOCESIUM CONTAMINATING LICHEN IS AVAILABLE FOR ABSORPTION BY THE REINDEER. THE MODEL WAS TESTED BY COMPARING PREDICTED VALUES WITH RESULTS OBTAINED WITH A SINGLE REINDEER MAINTAINED ON A CONSTANT CS 134 INGEST. PREDICTED VALUES ARE COMPARED TO OBSERVED RADIOCESIUM CONCENTRATIONS IN THE LICHEN-CAMOU SEEDS OF THE ARCTIC FOOD CHAIN.
 <DOC> ALASKA (ARCTIC/SUBARCTIC REGIONS)
 <TIME> 1969-1971
 <STATUS> IN USE
 <ACCESS> UNLIMITED
 <MEDIA> TEXT
 <CLASS> DISCRETE
 <APPL> GOVERNMENT OF FALLOUT RADIOCESIUM THROUGH LICHEN--REINDEER FOOD CHAIN
 <USERS> INDIVIDUAL RESEARCHERS
 <VALID> VALIDATED WITH CONTROLLED EXPERIMENTS
 <CON> THE MODEL COULD BE PROGRAMED ON ESSENTIALLY ANY COMPUTER - EQUATIONS ARE GIVEN
 <UPDATE> 700701
 <672>
 <CONT> EAGEL, ROBERT L.
 <TITLE> A PRELIMINARY MODEL OF GASEOUS POLLUTANT UPTAKE BY VEGETATION
 <ADDR> PENNSYLVANIA STATE UNIVERSITY, CENTER FOR AIR ENVIRONMENT STUDIES
 <CITY> UNIVERSITY PARK

INDUSTRIAL FOOD CHAINS

<672> CONT.

<STATE> PA

<TID> 76002

<FNUM> 074-065-2574

<DOC> CAES PUBLICATION NO. 455-76, OCTOBER 10, 1976

<SUB> A QUANTITATIVE METHOD FOR PREDICTING POLLUTANT (SO2) UPTAKE BY VEGETATION

<ABST> VARIOUS MECHANISMS AND FACTORS CONTROLLING GAS UPTAKE BY VEGETATION WERE EVALUATED AND A QUANTITATIVE METHOD FOR PREDICTING THE UPTAKE RATE WAS DEVELOPED. SULFUR DIOXIDE WAS USED AS THE POLLUTANT. THE THREE RESISTANCES (LEAF AERODYNAMIC RESISTANCE, STOMATAL RESISTANCE, AND MESOPHYLLIC RESISTANCE) ARE SUMMED AND DIVIDED INTO ATMOSPHERIC GAS CONCENTRATION DIFFERENCE TO YIELD THE UPTAKE RATE PER UNIT LEAF AREA. POLLUTANT UPTAKE BY VEGETATION WAS ALMOST CONSTANT THROUGHOUT THE DAY, WHEN STOMATA WERE FULLY OPEN. VEGETATION REMOVED SO2 AT A GREATER RATE THAN EITHER SOIL OR WATER ON AN EQUAL SURFACE AREA BASIS.

<STATUS> IN USE

<ACCESS> UNLIMITED

<CLASS> PREDICTIVE

<UPTAKE> 790531

<673>
<CONF> MARTIN, W. E.; RAINES, C. E.; BLOOM, S. G.; LEVIN, A. A.

<TITLE> ECOLOGICAL TRANSFER MECHANISMS - TERRESTRIAL

<DOC> PROCEEDINGS SYMPOSIUM PUBLIC HEALTH ASPECTS OF PEACEFUL USES OF NUCLEAR EXPLOSIVES, LAS VEGAS, NEVADA, 1969

<ABST> LINEAR MODELING IS DISCUSSED IN GENERAL AND SEVERAL MODELS FOR RADIOISOTOPE KINETICS IN HUMAN FOOD CHAINS ARE PRESENTED. EMPHASIS IS ON METHODS AND NOT RESULTS.

<CLASS> DETERMINISTIC

<674>
<CONF> WILLED, P. C.

<TITLE> RESEARCH ON THE DYNAMICS OF ARCTIC TUNDRA ECOSYSTEMS

<ADDR> SAN DIEGO STATE UNIVERSITY, DEPARTMENT OF BIOLOGY

<CITY> SAN DIEGO

<STATE> CA

<DOC> SAN--00716, 1976

<ABST> A QUANTITATIVE MODEL OF TUNDRA ECOSYSTEM DYNAMICS WAS DEVELOPED USING DATA COLLECTED PREVIOUSLY BY THE U.S. TUNDRA BIONE, CAPE THOMPSON, AND OTHER PROJECTS IN ALASKA. THE DATA ON ECOSYSTEM DYNAMICS ARE MOST COMPLETE FOR THE COASTAL WET HEATHEN SYSTEM WHERE

RESEARCH ON PRIMARY PRODUCTION, DECOMPOSITION, SEASONAL CYCLING, AND SMALL ANIMAL DYNAMICS WAS EMPHASIZED. CARIBOU ARE A CONSPICUOUS ELEMENT OF THE TUNDRA ECOSYSTEM AND HAVE BEEN STUDIED IN THE WET HEATHEN AS WELL AS IN OTHER TUNDRA TYPES, ALTHOUGH THE WET HEATHEN CARIBOU SITE WAS AT A LOCATION DIFFERENT FROM THAT OF THE ECOSYSTEM STUDIES. THE MODELING ACTIVITIES UNDERTAKEN IN THIS RESEARCH WERE DIVIDED CONCEPTUALLY INTO TWO APPROACHES, ECOSYSTEM MODELS IN WHICH THE INTERACTIONS AND FEEDBACKS OF THE SYSTEM ARE AREA-BASED, AND SPECIES-BASED MODELS IN WHICH THE NATURAL UNIT OF STUDY IS THE INDIVIDUAL PLANT. FOR THE ECOSYSTEM MODEL, THE MOST TIGHTLY COUPLED COMPONENTS WERE DEEMED TO BE THE VASCULAR PLANT-DEER-SOIL-DECOMPOSITION SYSTEM, AND LICHEN-CARIBOU-ELKING FOOD CHAINS. FALLOUT CS-137 WAS USED AS A TRACER IN SOME STUDIES.

<CLASS> SIMULATION

<675>
<CONF> WILSON, IRAL C.

<TITLE> FALLOUT ON DIET (DOSES FROM RADIOISOTOPE DEPOSITION ON FOOD CHAINS)

<ACRO> FOOD

<ADDR> BATTELLE-PACIFIC NORTHWEST LABORATORIES, POST OFFICE BOX 999

<CITY> RICHLAND

<STATE> WA

<ZIP> 99352

<PHONE> 509-942-5695; FTS 044-7511 EXT 942-5695

<DOC> ENVIRONMENTAL STATEMENT, WASTE MANAGEMENT OPERATIONS, HAWKWOOD RESERVATION, RICHLAND WASHINGTON, WASH-1530, VOL-2, APPENDIX III-A, PART 2, SEPTEMBER, 1974, SOLDAT, J. E., ENVIRONMENTAL BEHAVIOR AND RADIATION DOSES FROM IODINE-129, BNWL-SA-0079, JUNE, 1974.

<ABST> FOOD CALCULATES ANNUAL INDIVIDUAL DOSES FROM THE CONSUMPTION OF GARDEN PRODUCE AND ANIMAL PRODUCTS (MILK, EGGS, MEAT) THAT ARE CONTAMINATED WITH RADIOISOTOPES DEPOSITED FROM AIR (FALLOUT) OR WATER (SPRINKLED IRRIGATION). PRESENTLY 16 FOOD TYPES, 7 ORGANS AND 190 RADIOISOTOPES MAY BE SELECTED TO STUDY.

<TIME> 1972 TO PRESENT

<ACCESS> UNLIMITED

<CONF> ONE

<CON> CATEGORIZED AS: POLLUTANTS AND EFFLUENTS OF ENERGY PROCESSES ENVIRONMENTAL AND ECOLOGICAL SYSTEMS, ENVIRONMENTAL MONITORING OF THE ATMOSPHERE AND WATER RESOURCES. DEPENDENT UPON THE DATABASES: BSL, FOODS, AND ARWIN. AVAILABLE ON A NATIONAL COMPUTER NETWORK-CITS INFOWET.

<676>

ENVIRONMENTAL FOOD CHAINS

<676>

<COPY> PEICHEL, D. E.

<TITLE> TURNOVER AND CONCENTRATION OF RADIOISOTOPES IN FOOD CHAINS

<ADDR> OAK RIDGE NATIONAL LABORATORY, ENVIRONMENTAL SCIENCES DIVISION, P.O. BOX 1

<CITY> OAK RIDGE

<STATE> TN

<ZIP> 37830

<PHONE> 615-483-0611 EXT 3-1937; FTS 959-1937

<SOURCE> DEVELOPED AT ORNL

<DOC> D.E. PEICHEL, P.D. DUMPHY, AND D.J. NELSON, TURNOVER AND CONCENTRATION OF RADIOISOTOPES IN FOOD CHAINS, NUCLEAR SAFETY, 11(7), JAN-FEB. 1970; RADIATION ECOLOGY SECTION, HEALTH PHYSICS DIVISION, PUBLICATION # 327, ORNL.

<SUB> CONSEQUENCES OF ACTIVITY RELEASE IN THE ENVIRONMENT: UPTAKE AND TURNOVER OF RADIOISOTOPES BY MEANS OF THE BIOLOGICAL PROCESSES OCCURRING IN ORGANISMS.

<ABST> PROLIFERATION OF NUCLEAR TECHNOLOGY AND CONCERN FOR RADIOACTIVITY IN THE BIOSPHERE DEMAND MORE SOPHISTICATED EVALUATIONS OF FUTURE NUCLEAR INSTALLATIONS AND PROCEDURES. ADEQUATE ANALYSES OF RADIOISOTOPE DISPERSION IN THE ENVIRONMENT WILL REQUIRE MORE SUBSTANTIAL BIOENVIRONMENTAL INFORMATION THAN IS PRESENTLY AVAILABLE. FREQUENTLY INFORMATION KNOWN FOR ONE ECOLOGICAL SYSTEM (E.G., ARCTIC TUNDRA) WILL NOT BE APPLICABLE TO OTHER ECOSYSTEMS (E.G., TEMPERATE OR TROPICAL FORESTS). ONLY WITH SUFFICIENT ECOLOGICAL DATA CAN PREDICTIVE MODELS BE DEVELOPED THAT WILL ENABLE ASSESSMENT OF THE ENVIRONMENTAL CONSEQUENCES OF RADIOACTIVE CONTAMINATION. A SIMPLE SOURCE-PATHWAY-RECEPTOR MODEL, ANALOGOUS TO THE ECOLOGICAL FOOD CHAIN, REQUIRES PATHWAY IDENTIFICATION, DATA OF ASSIMILATION BY EACH LINK (ORGANISM) IN THE PATHWAY, AND DETERMINATION OF THE BIOLOGICAL TURNOVER OF EACH RADIOISOTOPE. FOR ACUTE RELEASES OF RADIOACTIVITY TO THE ENVIRONMENT, EVALUATION OF THESE VARIABLES IS NEEDED TO PREDICT TIME-DEPENDENT CONCENTRATIONS OF RADIOACTIVITY IN ORGANISMS. FOR CHRONIC RELEASES, CONCENTRATION FACTORS ALONE WILL OFTEN SUFFICE. THE BIOLOGICAL CONCENTRATION AND TURNOVER OF RADIOISOTOPES BY ANIMALS ARE SUMMARIZED IN THIS PAPER. DATA ARE PRESENTED FOR USE IN ENVIRONMENTAL MODELS AND CORRELATION WITH SPECIES CHARACTERISTICS (E.G., BODY SIZE) THAT ALLOW ESTIMATION OF ABSOLUTE VALUES FOR MANY DIFFERENT ANIMAL GROUPS BASED ON EXISTING EXPERIMENTAL DATA.

<GEN> GLOBAL

<TIME> APPROXIMATELY 20 YEARS

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> TEXT

<ALGO> LEAST SQUARES REGRESSION MODELS

<CLAS> DETERMINISTIC; PREDICTIVE; REGRESSION

<APPL> EVALUATION AND ASSESSMENT OF RADIOISOTOPES IN FOOD CHAINS

<USERS> PUBLIC

<SUB> PUBLISHED LITERATURE

<677>

<COPY> TURNER, F. D.

<TITLE> UPTAKE OF FALLOUT RADIOISOTOPES BY MAN AND A STOCHASTIC SIMULATION OF THE PROCESS

<ADDR> UNIVERSITY OF CALIFORNIA AT LOS ANGELES

<CITY> LOS ANGELES

<STATE> CA

<ZIP> 90024

<PHONE> 213-875-4773

<DOC> KLEMENT, A.V. (ED.), RADIOACTIVE FALLOUT FROM NUCLEAR WEAPONS TESTS, USNRC SYMPOSIUM SERIES S 000-020.

<SUB> STOCHASTIC SIMULATION OF UPTAKE OF FALLOUT RADIOISOTOPES BY MAN

<ABST> THE MODEL WAS USED TO PREDICT AMOUNTS OF FALLOUT RADIOISOTOPES IN CONSUMERS AND EVALUATE THE RELATIONSHIP BETWEEN HIGH EXTREMES AND MEAN VALUES.

<GEN> NEVADA, SOUTHERN PART OF STATE

<TIME> 1962-1963

<STATUS> NO LONGER EXISTS

<ACCESS> NOT ACCESSIBLE

<MEDIA> PUNCHED CARDS

<COMP> IBM

<LANG> FORTRAN

<CLAS> STOCHASTIC; PREDICTIVE; SIMULATION

<APPL> PREDICTING AMOUNTS OF FALLOUT RADIOISOTOPES IN CONSUMERS AND THE RELATIONSHIP OF HIGH EXTREMES AND MEAN VALUES

<SUB> MEASUREMENTS OF AMOUNTS OF RADIOISOTOPES IN PLANTS AND ANIMALS IN SOUTHERN NEVADA

<UPDATE> 780725

<678>

<COPY> VOILLEUR, PAUL G.

<TITLE> THE BEHAVIOR OF CS-137 AND OTHER FALLOUT RADIOISOTOPES IN A MICHIGAN DAIRY FARM

<ADDR> SCIENCE APPLICATION INC., 1425 EAST 16TH STREET

<CITY> IDAHO FALLS

<STATE> ID

TERRESTRIAL FOOD CHAINS

<678> CONT.

<ZIP> 03001

<FROM> 200-523-2611

<DOC> HEALTH PHYSICS, 21, 772-792, 1971

<SUB> MOVEMENT OF FALLOUT RADIOISOTOPES IN THE MILK-FOOD CHAIN

<ABST> THE BEHAVIOR OF THE FALLOUT RADIOISOTOPES CS-137, SR-90, CE-144, PP-106 AND SB-90 IN THE MILK-FOOD CHAIN WAS STUDIED AT A COMMERCIAL DAIRY FARM NEAR TECUMSEH, MICHIGAN DURING 1964 AND 1965. THE MAIN PURPOSE OF THE STUDY WAS TO DEVELOP MATHEMATICAL MODELS TO DESCRIBE THE MOVEMENT OF RADIOISOTOPES FROM AIR TO MILK. THREE MODELS ARE PRESENTED: THE FIRST PREDICTS THE TOTAL DEPOSITION ON PRECIPITATION COLLECTORS GIVEN THE AIR CONCENTRATION AND RAINFALL RATE; THE SECOND PREDICTS THE CONCENTRATION IN FORAGE FROM AIR CONCENTRATION, RAINFALL RATE, AND THE RATES AT WHICH THE FORAGE GROWS AND IS CONSUMED BY THE DAIRY HERD; THE THIRD PREDICTS THE MILK CONCENTRATION FROM THE CONCENTRATION IN EACH TYPE OF FEED AND THE RATE AT WHICH EACH FEED TYPE IS CONSUMED BY THE DAIRY HERD. THE FIRST TWO MODELS ARE APPLICABLE TO ALL FOUR RADIOISOTOPES BUT THE MILK MODEL IS VALID ONLY FOR CS-137. MILK CONCENTRATIONS FOR THE OTHER THREE RADIOISOTOPES ARE TREATED INDIVIDUALLY. THE MODEL FOR DEPOSITION ON PRECIPITATION COLLECTORS WAS DEVELOPED INDEPENDENTLY AND IS SHOWN TO PREDICT WEEKLY DEPOSITION RATES TO WITHIN A FACTOR OF THREE (95% OF THE TIME). THIS UNCERTAINTY IS REDUCED AS THE TIME SPAN FOR THE PREDICTION IS INCREASED. DEVELOPMENT OF THE OTHER TWO MODELS WAS BASED IN PART ON DATA FROM THE TECUMSEH STUDY; BOTH STILL REQUIRE INDEPENDENT

VERIFICATION. THE FORAGE MODEL FITS THE WEEKLY EXPERIMENTAL DATA TO WITHIN A FACTOR OF 2.2. THE MILK MODEL FITS THE WEEKLY MEASUREMENTS OF CS-137 CONCENTRATIONS TO WITHIN A FACTOR OF 1.5. THE ERROR OF THE LATTER 2 MODELS ALSO DECREASES AS THE TIME SPAN FOR THE PREDICTION IS INCREASED.

<GEO> TECUMSEH, MICHIGAN

<TIME> 1964-65

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> PUNCHED CARDS

<COMP> IBM

<CONFIG> UNCERTAIN OF "MINIMUM" REQUIREMENT.

<LANG> FORTRAN IV

<CHAR> ASCII

<CLASS> CONTINUOUS; DETERMINISTIC; PREDICTIVE

<APPL> ENVIRONMENTAL RISK ASSESSMENTS.

<USERS> SAI

<SUB> FIELD MEASUREMENTS OF CALCULATED AIR CONCENTRATIONS AND RAINFALL RATES; FORAGE CONCENTRATIONS AND CONSUMPTION RATES.

<VAL> MODEL PARAMETERS BASED ON FIELD MEASUREMENT DATA.

<UPDATE> 701001

DOSE RATE AND HUMAN EFFECTS

<679>
<CON> ARKBOG, L.

<TITLE> PREDICTION MODELS FOR STRONTIUM-90 AND CESIUM-137 LEVELS IN THE HUMAN FOOD CHAIN

<DOC> CHEMICAL AND RADIOLOGICAL FOOD CONTAMINATION, NEW YORK, NRC INFORMATION CORP., PP. 77-107, 1973

<ABST> MATHEMATICAL MODELS FOR THE PREDICTION OF FALLOUT CS-137 AND SR-90 LEVELS IN HUMAN FOOD CHAINS WERE EVALUATED ON THE BASIS OF MEASUREMENTS OF FALLOUT DEPOSITION ON VEGETATION, IN AIR SAMPLES, IN SAMPLES OF PRECIPITATION, AND IN SAMPLES OF THE TOTAL DIET, MILK, CEREALS, POTATOES AND OTHER VEGETABLES, IN MEAT (BEEF, PORK, AND SEAFOOD), AND IN SAMPLES OF ADULT AND INFANT BONES COLLECTED DURING A FIVE-YEAR PERIOD (1962 TO 1967). DURING THIS TIME THE PREDOMINANT SOURCE OF LONG-LIVED FISSION PRODUCTS IN THE ENVIRONMENT WAS THE 1961 AND 1962 WEAPONS TEST SERIES. FOR THE TOTAL DIET AND FOR THE MOST IMPORTANT COMPONENTS IN THE FOOD CHAIN IT WAS POSSIBLE TO PREDICT THE SR-90 AND CS-137 LEVELS MATHEMATICALLY ON THE BASIS OF FALLOUT RATE AND ACCUMULATED DEPOSIT AS INDEPENDENT VARIABLES. THE CS-137 AND SR-90 LEVELS IN HUMAN TISSUES AND WHOLE-BODY COUNTING DATA FOLLOWED EQUATIONS SIMILAR TO THOSE CALCULATED FOR THE DIET. ESTIMATES OF THE SOIL FACTORS IN THE EQUATIONS USED RECEIVED SPECIAL ATTENTION. IT WAS CONCLUDED THAT THE SOIL FACTORS FOR SR-90 WERE RELIABLE BUT THAT MORE RELIABLE DETERMINATIONS ARE NEEDED FOR SOIL FACTORS FOR CS-137 TO DETERMINE THE LONG-TERM RATE OF CS-137 IN THE HUMAN FOOD CHAIN.

<CLASS> PREDICTIVE

<ABST> ARNO, G. N.; BEROIS, P. J.; WILSON, T. P.; WITTHAMS, J. K.

<TITLE> RISC: RADIOLOGICAL INHALATION SAFETY CODE FOR IBM 7090

<ACRO> RISC

<ABST> AEROJET

<DOC> TRANSACTIONS OF THE AMERICAN NUCLEAR SOCIETY, 6, 106-107, 1963

<ABST> RADIOLOGICAL INHALATION SAFETY CODE (RISC) IS A DIGITAL MACHINE PROGRAM USED TO COMPUTE INTERNAL EXPOSURES (ACCORDING TO THE METHODS OF MORGAN AND POPE) TO SEVEN BODY ORGANS OR TISSUES (THYROID, BONE, MUSCLE, LUNGS, GASTRO-INTESTINAL TRACT, SOFT BODY TISSUES, AND TESTES), INCURRED OVER THE FIRST YEAR FOLLOWING SHORT-DURATION INHALATION. DOSES TO THESE BODY ORGANS ARE BASED ON COMPUTATIONS OF UP TO 50 RADIOISOTOPE SOURCES. THESE COMPUTATIONS INCLUDE BOTH RADIOACTIVE AND ATMOSPHERIC SOURCE, STRENGTH DETERMINATION, AND THE DOSE CONTRIBUTIONS FROM ANY OF THE 50 RADIOISOTOPES TO ANY OR ALL OF THE ABOVE-MENTIONED BODY ORGANS. RISC MAY BE USED TO ESTIMATE THE ENVIRONMENTAL CONSEQUENCES FROM REACTOR OPERATIONS AND ACCIDENTAL POWER EXCURSIONS AT STATIONARY POWER PLANTS, VEHICLE LAUNCH

OF TEST FACILITIES, AND FROM IS-FLIGHT VEHICLES. THE BASIC DIFFUSION THEORY OF O.G. SUTTON IS UTILIZED IN DEVELOPING SPECIFIC ATMOSPHERIC DIFFUSION MODELS WITH THE APPROPRIATE INITIAL-VOLUME-SOURCE CORRECTIONS. THE INITIAL CLOUD SIZE AND HEIGHT OF RISE ARE INPUT PARAMETERS, ALONG WITH ISOTOPE-RELEASE FRACTIONS, AND DOWNWIND-DOSE POINTS. THE EFFECTS OF A CAPPING TEMPERATURE INVERSION ARE DETERMINED IN THE PROGRAM FROM A SUBROUTINE APPLICABLE FOR LOW-ALTITUDE RELEASES. ALSO, THE PREDICTION OF THE CLOUD SOURCE MATERIAL DUE TO WASHOUT AND DRY FALLOUT MAY BE TAKEN INTO ACCOUNT BY EXERCISING A SEPARATE OPTION. THE RADIOISOTOPE SOURCE TERM FOR EACH OF 20 SPECIFIED POSITIONS DOWNWIND ARE ALSO COMPUTED IN A SUBROUTINE WHICH CONSIDERS SPECIFIC FISSION AND DECAY TIMES. THIS PART OF THE PROGRAM ALSO PERFORMS DOSE NORMALIZATION SO THAT THE OUTPUT IS IN TERMS OF REM/HR-SRC OR REM/HR.

<COMP> IBM

<CONFIG> IBM 7090

<CLASS> PREDICTIVE

<691>
<CON> ARKBOG, L. P.; PETERSON, R. L.; ROBINSON, R. L.

<TITLE> MODELLING THE DOSE TO MAN FROM EXPOSURE TO TRITIATED WATER VAPOR

<ADDR> UNIVERSITY OF CALIFORNIA

<CITY> LIVERMORE

<STATE> CA

<DOC> PEACEFUL NUCLEAR EXPLOSIONS. IV. VIENNA: INTERNATIONAL ATOMIC ENERGY AGENCY; (P.369-376), 1975. SEE STI/PUB--818; COMP-750109; 4. IAEA PANEL ON PEACEFUL NUCLEAR EXPLOSIVES, VIENNA, AUSTRIA, 20 JAN 1975

<CLASS> SIMULATION

<682>
<CON> BLAINE, R. A.; BRADLETT, P. L.

<TITLE> AISITE II, A DIGITAL COMPUTER PROGRAM FOR INVESTIGATION OF REACTOR SITING

<ACRO> AISITE II

<ADDR> ATOMICS INTERNATIONAL

<CITY> CANOGA PARK

<STATE> CA

<DOC> NAA-SR-9982, 94 PP., 1964

<ABST> AISITE II AUTOMATICALLY VARIES ANY ONE OF 46 PARAMETERS SUCH AS REACTOR POWER, BUILDING LEAK RATE, IODINE CLEANUP RATE, HALOGEN FILTER EFFICIENCY, ETC. THE SITING CRITERIA OF 10CPRI00 ARE USED IN AISITE II WITH COMPUTATION OF THE EXCLUSION AREA, LOW POPULATION BOUNDARY ZONE, AND LOW-POPULATION-CENTER DISTANCES AS FUNCTIONS OF ANY PARAMETER. IN ADDITION, DOSE VERSUS DISTANCE CURVES

BLANK PAGE

<682>

DOSE EFFECTS AND HUMAN EFFECTS

<682> CONT.

ARE OBTAINED FOR INHALATION, DIRECT SWALLOWING, AND DIRECT CLOUD DOSES. THE PRINTED EDIT CONSISTS OF THE DOSE VERSUS DISTANCE DATA, FRACTIONAL CONTRIBUTION BY ISOTOPE GROUP TO THE INHALATION DOSE, AND CRITICAL DISTANCES FOR BOTH A 2 HR AND A 30 DAY RELEASE. GRAPHICAL DISPLAYS CAN BE OBTAINED FOR CRITICAL DISTANCES AS A FUNCTION OF THE VARIABLE PARAMETER AND DOSE VERSUS DISTANCE FOR ANY ORGAN OF THE CRITICAL ORGAN, FOR EACH VALUE OF THE PARAMETER. THREE ISOTOPE RELEASE MODELS WITH UP TO FOUR LEVELS OF CONTAINMENT ARE PROVIDED.

<CLASS> PREDICTIVE

<683>

<CONF> BLOOM, S. G.; RAINES, G. E.

<TITLE> MATHEMATICAL MODELS FOR PREDICTING THE TRANSPORT OF RADIONUCLIDES IN A MARINE ENVIRONMENT

<EOD> BIOSCIENCE, 21, 691-696

<ABST> MODELS FOR DOSE TO MAN FROM UNDERGROUND DETONATION OF NUCLEAR DEVICE ARE DESCRIBED. THE PATHWAY THROUGH THE MARINE SYSTEM AND EATING OF FISH IS ASSUMED. A SIMPLE INITIAL MODEL IS DEVELOPED TO SCREEN FOR IMPORTANT NUCLIDES. THEN A MORE DETAILED MODEL IS USED FOR THOSE NUCLIDES THAT SHOW POTENTIAL FOR SIGNIFICANT CONTRIBUTIONS AND RISKING IN THE MARINE SYSTEM.

<CLASS> DETERMINISTIC; CONTINUOUS; SIMULATION

<684>

<CONF> BOBSON, L. L.

<TITLE> COMPUTATIONAL METHOD FOR CALCULATION OF RADIOLOGICAL DOSE RESULTING FROM HYPOTHETICAL FISSION PRODUCT RELEASE

<ACF> PISPP-CLOUD

<ADDR> SANDIA LABORATORIES, SYSTEMS SAFETY TECHNOLOGY DIVISION 5832

<CITY> ALBUQUERQUE

<STATE> NM

<ZIP> 87185

<PHONE> 505-268-8313; FTS 875-8313

<SOURCE> NTIS; ORNL CODE CENTER

<DOC> SC-RR-70-338, 188 PP.

<SUB> FISSION PRODUCT GENERATION, RELEASE, AND ATMOSPHERIC TRANSPORT; ORGAN DOSE CALCULATIONS

<ABST> AN IMPROVED METHOD FOR THE CALCULATION OF RADIOLOGICAL DOSES RESULTING FROM THE RELEASE OF FISSION PRODUCTS IS PRESENTED, INCLUDING THE DERIVATION OF, AND THE LIMITATIONS ON, THE INHALATION DOSE EQUATION. THE METHOD IS APPLIED IN THE LINKED COMPUTER CODES PISPP AND CLOUD TO THE CALCULATION OF EXTERNAL AND INTERNAL DOSES RESULTING FROM THE HYPOTHETICAL RELEASE AND DISPERSAL OF 326 FISSION PRODUCT NUCLIDES AND METASTABLE STATES. THE SENSITIVITY OF

THE RESULTS TO PARAMETER VARIATION IS REPORTED, INCLUDING A STUDY OF THE INFLUENCE OF UNLISTED MPC VALUES UPON THE INHALATION DOSES.

<TIME> 1965-1970

<STATUS> OBSOLETE

<ACCESS> UNLIMITED

<MEDIA> PUNCHED CARDS

<COMP> CDC; IBM

<LANG> FORTRAN IV

<CLASS> CONTINUOUS; INTEGRATIVE; ENGINEERING

<APPL> FISSION PRODUCT GENERATION AND DECAY; BODY BURDEN AND DOSE CALCULATIONS

<USERS> SANDIA LABORATORIES; LASL

<SRN> WAPD-TR-599

<HVAL> CODE COMPARISONS PRESENTED IN SC-RR-70-338

<UPDATE> 740701

<685>

<CONF> BOONE, J. S.; PARKS, B. L.; KHAZENYCH, B. G.

<TITLE> RUBY, A PROGRAM FOR THE CALCULATION OF ACTIVITY RELEASES AND POTENTIAL DOSES FROM A PRESSURIZED WATER REACTOR PLANT

<ACRO> RUBY

<ADDR> CAROLINA POWER AND LIGHT COMPANY

<CITY> PALM BEACH

<STATE> NC

<DOC> NOT GIVEN

<ABST> THE RUBY PROGRAM IS DESIGNED FOR THE CALCULATION OF RADIATION RELEASES AND DOSES RESULTING FROM THE OPERATION OF A LARGE PRESSURIZED WATER REACTOR. THE APPROACH USED IN RUBY IS SIMILAR TO AN ANALOG SIMULATION OF A REAL SYSTEM. EACH MAJOR COMPONENT OR VOLUME IN THE PLANT CONTAINING RADIOACTIVE MATERIAL IS REPRESENTED BY A SUBROUTINE WHICH KEEPS TRACK OF THE PRODUCTION, TRANSPORT, DECAY, AND REMOVAL OF RADIOACTIVITY IN THAT VOLUME. DURING THE COURSE OF THE ANALYSIS, ACTIVITY IS TRANSFERRED FROM SUBROUTINE TO SUBROUTINE IN THE PROGRAM AS IT WOULD BE TRANSFERRED FROM PLACE TO PLACE IN THE PLANT. THE NECESSARY RATES OF PRODUCTION, TRANSPORT, CLEANUP, LEAKAGE, AND RELEASE ARE READ IN AS INPUT TO THE PROGRAM. SUBROUTINES ARE ALSO INCLUDED WHICH CALCULATE THE OFF-SITE RADIATION EXPOSURES AT VARIOUS DISTANCES, FOR INDIVIDUAL NUCLIDES AND SUMS OF NUCLIDES. THE PROGRAM CONTAINS A LIBRARY OF PHYSICAL DATA FOR THE FIFTY-FIVE NUCLIDES OF MOST INTEREST IN LICENSING CALCULATIONS, AND OTHER NUCLIDES CAN BE ADDED OR SUBSTITUTED. THESE CALCULATIONS CAN BE PERFORMED FOR ANY OF ALL TIME PERIODS DURING THE LIFETIME OF THE PLANT. BOTH EXTERNAL AND THYROID INTERNAL DOSES CAN BE CALCULATED ON AN INDIVIDUAL AND A POPULATION BASIS. VALUES FOR

DOSIMETRY AND HUMAN EFFECTS

<685> CONT.
ATMOSPHERIC DILUTION AT DESIRED
POSSIBLE DISTANCES AND DOSE CONVERSION
FACTORS FOR THE THYROID. DOSES ARE INPUT
BY THE USER.

<CLASS> SIMULATION

<COM> ONE NEBULOUS FEATURE OF BODY IS ITS
SCRAP-PAPER ABILITY. COMPLETE PRINTOUT
OF ALL AVAILABLE INFORMATION RESULTS IN
APPROXIMATELY 175 PAGES OF OUTPUT PER
PERIOD. (SIC)

<686>
<COM> BROWNELL, G. S.; ALPERT, H. H.

<TITLE> USE OF COMPUTERS TO CALCULATE RADIATION
DOSE FROM METABOLIC MODELS

<ADDR> MASSACHUSETTS GENERAL HOSPITAL, PHYSICS
RESEARCH LABORATORY

<CITY> BOSTON

<STATE> MA

<DOC> INTERNATIONAL CONGRESS SERIES NUMBER
779, (PART 2); RADIOLOGY, PROCEEDINGS
OF THE THIRTEENTH INTERNATIONAL
CONGRESS HELD AT MADRID, SPAIN, OCTOBER
15-20, 1973, PP. 523-527

<PFT> COMPUTERS HAVE PLAYED AN INCREASING
ROLE IN THE CALCULATION OF RADIATION
DOSE AS GREATER PRECISION HAS BEEN
PROVIDED. THIS IS PARTICULARLY TRUE
FOR THE DOSIMETRY OF GAMMA RAYS SINCE
THEIR TRANSPORT AND ABSORPTION ARE
COMPLEX. A TECHNIQUE WAS DEVELOPED
USING MONTE CARLO SIMULATION TO YIELD A
FACTOR CALLED "ABSORBED FRACTION" WHICH
CAN BE USED TO OBTAIN RIGOROUS VALUES
OF THE GAMMA RAY DOSE UNDER SPECIFIED
GEOMETRICAL CONDITIONS. THE ABSORBED
FRACTIONS OBTAINED FROM THE MONTE CARLO
CALCULATIONS ARE EXACT AND DO NOT HAVE
THE APPROXIMATIONS INHERENT IN OTHER
POINT SOURCE KERNELS. THE USE OF
BIOLOGICAL MODELS PERMITS MORE PRECISE
ACTIVITY DISTRIBUTIONS TO BE OBTAINED
WHICH, WHEN COMBINED WITH IMPROVED
METHODS OF PHYSICAL DOSIMETRY, YIELD
IMPROVED ESTIMATES OF RADIATION DOSE.
THE CALCULATIONS INVOLVED IN THESE
OPERATIONS ARE DESCRIBED.

<CLASS> SIMULATION

<687>
<COM> CHESTER, R. O.

<TITLE> BIOLOGICAL DOSE AND RADIOLOGICAL
ACTIVITY FROM NUCLEAR REACTOR OR
NUCLEAR WEAPON FISSION PRODUCTS

<ACRO> YIELDS

<ADDR> OAK RIDGE NATIONAL LABORATORY, HEALTH
AND SAFETY RESEARCH DIVISION, P.O. BOX X

<CITY> OAK RIDGE

<STATE> TN

<ZIP> 37830

<PHONE> 615-483-8611 EXT 3-0334; PTS 850-0334

<SOURCE> DEVELOPED AT ORNL

<DOC> CHESTER, R.O., BIOLOGICAL DOSE AND
RADIOLOGICAL ACTIVITY FROM NUCLEAR
REACTOR OR NUCLEAR WEAPON FISSION
PRODUCTS, ORNL-R996, DECEMBER 1974.

<SUB> POLLUTANTS AND EFFLUENTS OF ENERGY
SYSTEMS: HUMAN HEALTH, SOMATIC AND
GENETIC EFFECTS; ENERGY PRODUCTION AND
ELECTRIC POWER GENERATION, AND MATERIAL
PROPERTIES.

<ABST> YIELDS PERFORMS RAPID, ACCURATE
CALCULATION OF DOSE AND ACTIVITY FROM
THE FISSION PRODUCTS IN A NUCLEAR
REACTOR CORE OR FROM A NUCLEAR WEAPON.
FOR EXAMPLE, IF A DISPERSAL MODEL IS
ASSUMED, CALCULATIONS CAN BE MADE OF
CONTAMINATED AREA, DOSE FROM INHALED OR
INGESTED FISSION PRODUCTS TO EACH PART
OF A BIOLOGICAL SYSTEM, OR DOSE FROM
EXTERNAL FISSION PRODUCTS, FROM A
DISPERSED REACTOR CORE, OR NUCLEAR
WEAPON FALLOUT. INDIVIDUAL BETA AND
GAMMA RAY ENERGIES FOR EACH ISOTOPE ARE
INCLUDED, PERMITTING DETAILED
CALCULATION OF BIOLOGICAL DOSE OF OTHER
FUNCTIONS OF THESE ENERGIES VS TIME.
THE CALCULATION METHOD FACILITATES THE
HANDLING OF COMPLICATED RADIOLOGICAL
DECAY CHAINS COUPLED WITH MULTISECTION
BIOLOGICAL SYSTEMS. THE OPTION OF
SORTING THE OUTPUT BY ISOTOPES OR
CHEMICAL SPECIES IS AVAILABLE.

<TIME> 1970-1978

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> PUNCHED CARDS

<COMP> IBM

<COMPIG> IBM 360/91

<LANG> FORTRAN IV

<CLASS> ANALYTICAL

<688>
<COM> CHURCH, H. W.

<TITLE> ATMOSPHERIC DISPERSION MODEL AS USED IN
THE REACTOR SAFETY STUDY, WASH-1400

<ACRO> CONO

<ADDR> SANDIA LABORATORIES

<CITY> ALBUQUERQUE

<STATE> NM

<DOC> THIRD SYMPOSIUM ON ATMOSPHERIC
TURBULENCE, DIFFUSION, AND AIR QUALITY
HELD IN RALEIGH, NORTH CAROLINA,
OCTOBER 19, 1976

<ABST> THE REACTOR SAFETY STUDY, WASH-1400,
WAS PUBLISHED IN FINAL FORM IN OCTOBER,
1975, BY THE U.S. NUCLEAR REGULATORY
COMMISSION. THIS STUDY REPRESENTS AS
COMPLETE AN ASSESSMENT OF ACCIDENT
RISKS IN THE U.S. COMMERCIAL NUCLEAR
POWER PLANTS AS THE STATE-OF-THE-ART
PERMITS. APPENDIX VI OF WASH-1400,
CALCULATION OF REACTOR ACCIDENT
CONSEQUENCES, DESCRIBES THE INPUT DATA
AND MATHEMATICAL MODELS USED TO
CALCULATE THE CONSEQUENCES OF A
POTENTIAL RELEASE OF RADIOACTIVE
MATERIAL TO THE ENVIRONMENT IN THE

<688>

DOSIMETRY AND HUMAN EFFECTS

<689> CONT.

EFFECTS OF A NUCLEAR POWER PLANT ACCIDENT. THE PRIMARY GOAL OF THE STUDY WAS TO ASSESS RISK FROM COMMERCIAL NUCLEAR POWER PLANTS AS REALISTICALLY AS POSSIBLE IN ORDER TO PROVIDE PROPER PERSPECTIVE OF POTENTIAL RISK COMPARISON. THE OBJECTIVE OF PREDICTING CONSEQUENCES OF A GIVEN RADIOACTIVITY RELEASE WAS ACCOMPLISHED THROUGH CONSTRUCTION AND EXECUTION OF A COMPUTERIZED MODEL WHICH ACCOUNTED FOR THE MANNER IN WHICH RADIOACTIVITY IS DISPERSED IN THE ENVIRONMENT, THE NUMBER OF PEOPLE AND AMOUNT OF PROPERTY EXPOSED, THE EFFECTS OF RADIATION EXPOSURE ON PEOPLE, AND PROPERTY CONTAMINATION. THE BASIC ELEMENTS OF THE MODEL, RELEASE CHARACTERISTICS, ATMOSPHERIC DISPERSION, DOSIMETRY, POPULATION, HEALTH EFFECTS, AND PROPERTY DAMAGE ARE SHOWN SCHEMATICALLY. THE COMPUTER CODE (COMO FOR CONSEQUENCE MODEL), USED IN DOSE CALCULATIONS, IS DISCUSSED.

<CLASS> SIMULATION

<689>

<CON> CLARKE, REGINALD H.; STRICKLER, ROBERT F.

<TITLE> SOUTHERN HEMISPHERE PREDICTION EXPERIMENT WITH A FIVE-LEVEL, PRIMITIVE-EQUATION MODEL

<ABST> A FIVE-LEVEL HEMISPHERIC PRIMITIVE-EQUATION MODEL IS APPLIED TO MAKE A 14-DAY EXPERIMENTAL PREDICTION FOR THE SOUTHERN HEMISPHERE; THIS IS THE FIRST NUMERICAL PREDICTION OF THE HEMISPHERIC SCALE FOR THE SOUTHERN HEMISPHERE AND THE FIRST ATTEMPT TO USE THE MODEL FOR SHORT-TERM FORECASTING. THE PREDICTIONS ARE VERIFIED AGAINST HEMISPHERIC DATA, THE INADEQUACY OF WHICH IS CLEAR. THEY ARE ALSO VERIFIED IN THE AUSTRALASIAN SECTOR WHERE THE DATA ARE MORE ADEQUATE. SOME PROPERTIES OF THE MODEL ATMOSPHERE ARE COMPARED WITH THOSE OF THE OBSERVED SOUTHERN HEMISPHERIC ATMOSPHERE, AND DEFICIENCIES IN THE PERFORMANCE OF THE MODEL, AS WELL AS IN THE ANALYSIS AND INITIALIZATION, ARE BROUGHT OUT BY THE COMPARISON.

<GEO> SOUTHERN HEMISPHERE, AUSTRALIA

<CLASS> SIMULATION

<690>

<CON> COATES, R. L.; RORTON, B. R.

<TITLE> RSAC -- A RADIOLOGICAL SAFETY ANALYSIS COMPUTER PROGRAM

<ACRO> PSAC

<ADDR> PHILLIPS PETROLEUM COMPANY, ATOMIC ENERGY DIVISION, IDAHO OPERATIONS OFFICE

<STATE> ID

<DOC> IDO-17151, 200 PP.

<ABST> RSAC IS DESIGNED TO COMPUTE THE POTENTIAL RADIOLOGICAL DOSES RESULTING FROM EITHER A CONTINUOUS OR INSTANTANEOUS RELEASE OF RADIOACTIVE FISSION PRODUCTS TO THE ATMOSPHERE.

THE PROGRAM HAS BEEN DEVELOPED AS PART OF LOFT AND THE GENERAL NUCLEAR SAFETY PROGRAMS TO PROVIDE A GENERALIZED COMPUTER PROGRAM FOR A COMPLETE PARAMETRIC INVESTIGATION OF THE RADIOLOGICAL HAZARDS. THE DOSES CONSIDERED ARE CLOUD GAMMA, DEPOSITION GAMMA, INGESTION, AND INHALATION. THEY ARE BASED UPON THE RELEASE OF UP TO 200 ISOTOPES, THE RELATIVE ABUNDANCE OF EACH ISOTOPE BEING DEPENDENT UPON THE OPERATING HISTORY OF THE NUCLEAR REACTOR UNDER CONSIDERATION. INCLUDED ARE THE MATHEMATICAL MODELS, CONVERSION FACTORS, ASSUMPTIONS, FLOW CHARTS, PROGRAM LISTINGS, AND OTHER DATA CONSIDERED PERTINENT TO THE OVERALL DEVELOPMENT OF THIS PROGRAM. THE PROGRAM IS WRITTEN IN SYMBOLIC LANGUAGE (NAP) FOR THE IBM 7040 COMPUTER AND IS DIVIDED INTO THE FOLLOWING FIVE MAJOR CATEGORIES: (1) CURIE -- THE FISSION PRODUCT INVENTORY GENERATED FOR A GIVEN SET OF OPERATING CONDITIONS (2) CLOUD GAMMA DOSE -- THE EXTERNAL GAMMA DOSE RECEIVED AS A CONSEQUENCE OF EXPOSURE TO AIRBORNE RADIOACTIVE MATERIALS (3) DEPOSITION GAMMA DOSE -- THE EXTERNAL GAMMA DOSE RECEIVED AS A CONSEQUENCE OF EXPOSURE TO DEPOSITED FISSION PRODUCTS (4) INHALATION DOSE -- THE INTERNAL DOSE TO EIGHT CRITICAL ORGANS RECEIVED AS A CONSEQUENCE OF INHALING AIRBORNE RADIOACTIVE MATERIALS (5) INGESTION DOSE -- THE INTERNAL DOSE TO THE THYROID RECEIVED AS A CONSEQUENCE OF INGESTING IODINE CONTAMINATED MILK. THIS DOSE IS CALCULATED USING THE INHALATION DOSE CONVERSION FACTOR AND MULTIPLYING THIS FACTOR TIMES A CORRECTION FACTOR TO ACCOUNT FOR BIOACCUMULATION AND MILK CONSUMPTION.

<CONF> IBM

<CONFIG> IBM 7040

<LANG> SYMBOLIC LANGUAGE (NAP)

<CLASS> SIMULATION

<CON> A FORTRAN VERSION OF THIS CODE HAS BEEN PUBLISHED IN IDO-17261 (1961, JUNE). SUTTON'S EQUATION IS USED FOR ATMOSPHERIC DISPERSION. ALTHOUGH THE DESCRIPTION OF THE CODE REFERS TO THE PREDICTION OF INGESTION DOSES, THESE EXPOSURES ARE ONLY CALCULATED VIA A SINGLE ADJUSTMENT FACTOR CONVERTING THE INHALATION DOSE FACTOR TO AN INGESTION DOSE FACTOR. THE INGESTION PARAMETER IS ONLY DETERMINED FOR EXPOSURE TO THE THYROID.

<691>

<CON> COUCHMAN, R. L.; DEGAZIO, A. D.; KIN, Y. S.

<TITLE> NURSE-1, A NUCLEAR ROCKET SAFETY EVALUATION CODE FOR THE CONTROL DATA 3600

<ACRO> NURSE-1

<ADDR> NUCLEAR UTILITY SERVICES, INC.

<CITY> WASHINGTON

<STATE> DC

<DOC> NUS-100, 202 PP., 1960

<ABST> THE NURSE-1 CODE EVALUATES THE

DOSEMETRY AND HUMAN EFFECTS

(691) CONT.

RADIATION HAZARDS RESULTING FROM THE RAPID RELEASE OF FISSION PRODUCTS FROM A NUCLEAR ROCKET ENGINE. NUSS-1 IS PROGRAMMED IN FORTRAN 3600 FOR USE ON A CONTROL DATA 3600. NUSS-1 REQUIRES 64K MEMORY. SIX TAPES ARE USED IN ADDITION TO THOSE REQUIRED BY THE SCOPE MONITOR SYSTEM. A LIBRARY TAPE CONTAINING NUCLEAR AND ATMOSPHERIC DIFFUSION DATA IS NECESSARY FOR THE OPERATION OF THE CODE. THE LIBRARY TAPE GENERATION ROUTINE AND THE LIBRARY DATA ARE DESCRIBED IN APPENDIX E. THE PROGRAM DETERMINES SEVERAL DIFFERENT DOSES AT POSITIONS DOWN-AND CROSSL-WIND FROM THE POINT OF THE EXCURSION. THIS PROGRAM CONSIDERS ONLY A RELEASE OCCURRING IN THE LOWER ATMOSPHERE (ON OR NEAR THE GROUND). THE CODE HAS SEVERAL OPTIONS WHICH PERMIT SELECTION OF THE KINDS OF DOSES TO BE CALCULATED. THE MODELS AND PARAMETERS EMPLOYED ARE BELIEVED TO REPRESENT THE BEST INFORMATION AVAILABLE AT THE TIME OF PREPARATION. IT IS ANTICIPATED THAT THE MODELS AND PARAMETERS MAY CHANGE AS THE NUCLEAR ROCKET PROGRAM MATURES AND THE NUSS-1 CODE IS DESIGNED FOR EASY REPLACEMENT OF MODELS OR PARAMETERS AS BETTER INFORMATION BECOMES AVAILABLE.

<COMP> CPC

<CONFIG> CPC 3600; REQUIRES 64K MEMORY

<LANG> FORTRAN

<CLASS> SIMULATION

<CONT> WHILE THIS OLD CODE WAS WRITTEN FOR THE NUCLEAR ROCKET PROGRAM, IT COULD BE USED FOR ANY TYPE OF NEAR-GROUND ACCIDENTAL RELEASE.

(692)

<CONT> CRENS, W. B.; TRIMPER, N.

<TITLE> PRELIMINARY MODEL OF THE HUMAN ASSIMILATION OF LEAD AEROSOLS FROM GASOLINE COMBUSTION

<ADDR> UNIVERSITY OF MARYLAND

<CITY> COLLEGE PARK

<STATE> MD

<ABST> THE HUMAN HEALTH HAZARD OF LEAD ANTI-KNOCK ADDITIVES IN GASOLINE WAS EVALUATED USING SIMULATION TECHNIQUES. TWO SIMULATED MODELS WERE DEVELOPED. ONE IS A SIMPLE SOLUTION TO THE MASS CONTINUITY EQUATION. GIVEN INPUT, LONG RESIDENCE TIME AEROSOLS OVER LARGE HOMOGENEOUS AREA SOURCES, THE EQUATION CAN BE REDUCED TO A ONE-DIMENSIONAL BOX MODEL: THE AVERAGE MONTHLY ATMOSPHERIC LEAD CONCENTRATION EQUALS (THE DISCONTINUOUS AVERAGE MONTHLY SOURCE FUNCTION OF LEAD TIMES THE LENGTH OF A SIDE OF THE CONTROL VOLUME OVER THE URBAN AREA) DIVIDED BY THE AVERAGE MONTHLY RESIDENT DIND VELOCITY TIMES THE AVERAGE MONTHLY INVERSION BASE HEIGHT. THE MODEL WAS COMPARED TO ACTUAL LEAD MEASUREMENTS FOR SAN DIEGO AND LOS ANGELES. RESULTS SHOWED THE LIMIT OF 1.5 MICROGRAMS/CM³ FOR A 30-DAY AVERAGE MAY BE VIOLATED IN THE WINTER EVEN WITH ALL LOW-LEAD GASOLINE. A HUMAN LEAD ASSIMILATION MODEL WAS STUDIED USING GASOLINE CONSUMPTION AND

FOOD AS INPUTS OF LEAD EXPOSURE. THE MODEL, COMPARED TO DOSE-RESPONSE DATA FROM LABORATORY AND FIELD STUDIES, APPEARED TO REFLECT THE KINETICS OF LEAD IN MAN. COUPLING OF WORST CASE INPUTS WITH THE MODEL SHOWED BODY BODIES WOULD BE SLIGHTLY ELEVATED, BUT THE CORRUPTION OF LEADED GASOLINES MAY NOT POSE A SIGNIFICANT PUBLIC HEALTH HAZARD IN THE FUTURE. REASONS FOR CAUTION IN EVALUATING THE RESULTS OF THIS PRELIMINARY WORK ARE DISCUSSED. THE CALIFORNIA LIMIT OF 1.5 MICROGRAMS/CM³ FOR A 30-DAY AVERAGE MAY BE CONSERVATIVE, WHILE A 10 MICROGRAMS/CM³ LIMIT PROPOSED MAY BE INADEQUATE TO PROTECT PUBLIC HEALTH.

<CONT> CALIFORNIA, SAN DIEGO, LOS ANGELES

<CLASS> SIMULATION

(693)

<CONT> CUBBIN, R. G.; CHAFMAN, L. B.; WAYLAND, J. P.; DUGAN, V. L.; MCCLELLAN, R. O.

<TITLE> MATHEMATICAL MODEL FOR PREDICTING ENVIRONMENTAL AND HUMAN HEALTH EFFECTS OF DEVELOPING NUCLEAR REACTOR PROGRAMS

<ADDR> LOVELACE FOUNDATION

<CITY> ALBUQUERQUE

<STATE> NM

<DOC>

BOECKE, R. B. AND P. C. SUPPLEMENT (RDS.), INHALATION TOXICOLOGY RESEARCH INSTITUTE ANNUAL REPORT, 1973--1974, LOVELACE FOUNDATION FOR MEDICAL EDUCATION AND RESEARCH, ALBUQUERQUE, N.MEX. (USA), LP--49 (P.00-04), DEC 1974

<ABST>

ANTICIPATED DEVELOPMENT OF NUCLEAR REACTOR SYSTEMS FOR PRODUCTION OF ELECTRICAL POWER WITH ASSOCIATED NORMAL RELEASES OF TRANSURANIC ELEMENTS TO THE ENVIRONMENT MAKES IT NECESSARY TO DEVELOP COMPREHENSIVE ANALYSES OF THEIR POSSIBLE IMPACT UPON HUMAN HEALTH. SUCH ANALYSES MUST ADDRESS POSSIBLE SOURCES FOR RADIOACTIVITY RELEASES, ENVIRONMENTAL TRANSPORT, ACCUMULATION IN BIOLOGICAL SPECIES AND RELATED DEPOSITION AND HEALTH RISKS IN MAN. MATHEMATICAL MODELS OF THESE SYSTEMS ADAPTED TO RAPID COMPUTER SOLUTION ARE BEING DEVELOPED TO AID IN PROJECTING THE TOTAL AND TIME-DEPENDENT HUMAN RISK FACTORS RELATED TO NUCLEAR POWER DEVELOPMENT. THESE STUDIES WILL ALSO ATTEMPT TO IDENTIFY THE MOST SENSITIVE ASPECTS AND ASSUMPTIONS OF THE TOTAL HEALTH RISK ASSESSMENTS AND WILL GENERALLY BE APPLICABLE TO EFFLUENTS FROM NON-NUCLEAR AS WELL AS NUCLEAR SOURCES. IN BOTH CASES, THE RESULTS CAN BE USED TO DEFINE GUIDELINES FOR GENERAL SITING CONSIDERATIONS.

<CLASS> SIMULATION

(694)

<CONT> DEBAARD, P. G.

<TITLE> CSSANE, A CODE FOR SYSTEM SURVIVABILITY ANALYSIS - NUCLEAR EFFECTS

<ADDR> CSSANE

<ADDR> AIR FORCE INSTITUTE OF TECHNOLOGY,

<498>

TOXICITY AND HUMAN EFFECTS

<498> CONT.
SCHOOL OF ENGINEERING

<CONT> NIGHT-PATTERNS AND FORCE BASE

<STATE> OR

<AUTHOR> WIS 91.00/AFPO.94

<DOC> AD-785 520, 1977

<ABST> A COMPUTER CODE HAS BEEN WRITTEN IN THE FORTRAN EXTENDED LANGUAGE TO DETERMINE RESPONSE SYSTEM SURVIVABILITY TO SELECTED NUCLEAR EFFECTS. A SPECIAL CASE OF SURVIVABILITY IS TREATED IN WHICH SYSTEM SURVIVAL IS BASED ON A COMPARISON OF THE STRE-KILL VULNERABILITY LEVEL AND THE COMPUTED FREE FIELD NUCLEAR EFFECTS LEVELS. THE CODE CONSISTS OF TWO FUNCTIONAL PARTS. ONE PART IS THE GUIDING PROGRAM WHICH CONDUCTS THE SURVIVABILITY STUDY; THE OTHER PART CONSISTS OF INDIVIDUAL SYMPTOMES WHICH EVALUATE FREE FIELD NUCLEAR ENVIRONMENT LEVELS. SYMPTOMES HAVE BEEN INCLUDED TO EVALUATE THE BLAST AND THERMAL ENVIRONMENTS.

<LANG> FORTRAN EXTENDED

<CLASS> PREDICTIVE

<AUTH> DICKERSON, HARVEY R.

<TITLE> DOSE CONVERSION CONSTANT CODE USED TO COMPUTE RADIOLOGICAL DOSE THROUGH VARIOUS PATHWAYS

<ACRO> DOSCON

<ADDR> LAWRENCE LIVERMORE LABORATORY, G-DIVISION, PHYSICS DEPARTMENT, P.O. BOX 908

<CITY> LIVERMORE

<STATE> CA

<ZIP> 94550

<PHONE> 415-422-1806; PTS 512-1406

<SOURCE> DEVELOPED AT LLL

<DOC> NONE

<SUB> RADIOLOGICAL DOSE

<ABST> DOSCON WILL BE A COMBINATION OF DOSE CONVERSION MODELS ASSIMILATED TO PROVIDE DOSE ESTIMATES FOR VARIOUS PATHWAY MIXES CALCULATED BY THREE DIMENSIONAL REGIONAL TRANSPORT AND DIFFUSION MODELS. OUR INVOLVEMENT WILL NOT BE THE DEVELOPMENT OF THE INDIVIDUAL DOSE MODELS; WE WILL TAILOR THESE MODELS TO OUR REGIONAL MODEL OUTPUT.

<STATUS> UNDER DEVELOPMENT

<ACCESS> LIMITED TO LLL

<CLASS> CALCULATIONAL

<APPL> RADIOLOGICAL DOSE COMPUTATION

<USERS> LLL

<NOTE> MODEL IS UNDER DEVELOPMENT, NOT YET TESTED.

<COM> CODE IS PRESENTLY UNDER DEVELOPMENT, YET TO BE TESTED.

<UPDATED> 740611

<496>

<CONT> DOTSON, D. L.

<TITLE> A REGIONAL AIR TRANSPORT MODEL FOR RADIOLOGICAL DOSE STUDIES

<ACRO> HEPRES; APTRAM

<ADDR> RANDOLPH ENGINEERING DEVELOPMENT LABORATORY

<CITY> RICHLAND

<STATE> WA

<DOC> CONF-730401-2; HEP-54-516; REALISM IN ENVIRONMENTAL CONTROL, PROCEEDINGS OF THE NINETEENTH ANNUAL TECHNICAL MEETING AND EQUIPMENT EXPOSITION OF THE INSTITUTE OF ENVIRONMENTAL SCIENCES, HELD AT ASHREIN, CA, APRIL 2-5, 1973

<ABST> A COMPUTER CODE, HEPRES, WAS DEVELOPED FOR CALCULATIONS FROM WHICH A REASONABLE ESTIMATE MAY BE DERIVED OF THE POTENTIAL RADIATION DOSE AND DOSE COMMITMENT TO INDIVIDUALS AND POPULATION GROUPS RESIDING IN REGIONS WHERE NUCLEAR POWER REACTORS, AND AUXILIARY ACTIVITIES SUCH AS FUEL REPROCESSING PLANTS AND WASTE STORAGE FACILITIES, ARE LOCATED IN THE YEAR 2000. THE RADIOISOTOPE AIR TRANSPORT MODEL, APTRAM, OF THE CODE IS DESCRIBED. THE THREE TYPES OF DATA USED INCLUDE: SOURCE TO RECEPTOR TRAVEL DISTANCE; EFFLUENT SOURCE RATE AND CONSTITUENT CHARACTERISTICS; AND METEOROLOGICAL VARIABLES INCLUDING WIND SPEED AND DIRECTION, ATMOSPHERIC STABILITY, MIXING DEPTH, AND PRECIPITATION CHARACTERISTICS.

<CLASS> SIMULATION

<497>

<CONT> ECKERT, P. J.

<TITLE> A FORTRAN PROGRAM FOR THE CALCULATION OF THE POTENTIAL HAZARDS FROM AN ACCIDENTAL FISSION PRODUCT RELEASE, NO142

<ACRO> NO142

<ADDR> BETTIS ATOMIC POWER LABORATORY

<CITY> PITTSBURGH

<STATE> PA

<DOC> WAPP-TN-308, 22 PP., 1964

<ABST> A FORTRAN PROGRAM (NO142) HAS BEEN WRITTEN TO PERFORM A DETAILED ANALYSIS OF THE SPACE AND TIME-DEPENDENT RADIATION DOSES RESULTING FROM A POTENTIAL FISSION-PRODUCT RELEASE INCIDENT FROM A NUCLEAR REACTOR. THE PROGRAM PERMITS THE CALCULATION OF THE HAZARDS FROM ANY RADIOACTIVE SOURCE OF KNOWN CONCENTRATION AND ISOTOPIC DISTRIBUTION. THE NUCLIDES WHICH FORM THE RADIOACTIVE CLOUD ARE SPECIFIED AS PROGRAM INPUT. FOR EACH NUCLIDE, AN

DOSE-RESPONSE AND HUMAN EFFECTS

<687> <CON> INITIAL CONCENTRATION, RELEASE RATE, RADIOACTIVE DECAY CONSTANT, AND AVERAGE GAMMA AND BETA EMISSION ENERGY MUST BE SUPPLIED. IN ADDITION, THE EXPOSURE PERIOD, THE DISTANCE FROM THE SOURCE TO THE RECEPTOR POINT, AND THE APPROPRIATE METEOROLOGICAL CONDITIONS MUST BE SPECIFIED. FOR EACH NUCLEIDE IN THE CALCULATION, THE PROGRAM COMPUTES THE EXTERNAL GAMMA AND BETA DOSE AND THE INHALATION DOSE TO SEVERAL CRITICAL ORGANS. THE TOTAL IN EACH CATEGORY IS OBTAINED BY A STRAIGHTFORWARD SUMMATION OF THE INDIVIDUAL NUCLEIDE DOSES. ATMOSPHERIC DISPERSION IS CALCULATED USING SUTTON'S EQUATION AND THE RESULTING AIR CONCENTRATION IS CORRECTED FOR DECAY BEFORE THE DOSE IS CALCULATED. THE PROGRAM ALLOWS FOR A TIME-DEPENDENT RELEASE RATE TO BE USED IF DESIRED.

<LANG> FORTRAN

<CLASS> SIMULATION

<688> <CON> ELLISON, T. W.; DUNHAM, A. P.

<TITLE> A CDC 6600 PROGRAM FOR CALCULATION OF INHALATION AND EXTERNAL DOSE FOR ESTABLISHING REACTOR SITING DISTANCE REQUIREMENTS

<ACRON> DOSE B

<ACQD> GENERAL ELECTRIC COMPANY, KROELS ATOMIC POWER LABORATORY

<CITY> SCHENECTADY

<STATE> NY

<DOC> KAPL-N-45, 24 PP., 1967

<ABST> THE DOSE B PROGRAM HAS BEEN WRITTEN TO FACILITATE THE CALCULATION OF DISTANCE FACTORS FOR NUCLEAR REACTOR SITES AS DESCRIBED IN THE WELL KNOWN USARC DOCUMENT "CALCULATION OF DISTANCE FACTORS FOR POWER AND TEST REACTOR SITES", TID-14903. THE CALCULATIONS ARE ESSENTIALLY AS DESCRIBED IN THIS DOCUMENT EXCEPT THAT THE DOSE CODE ALLOWS FOR ARBITRARY OPERATING POWER HISTORIES AND VARIABLE CONTAINMENT LEAK RATES. THE PROGRAM CALCULATES THE THYROID AND DIRECT GAMMA DOSES RECEIVED BY AN INDIVIDUAL STANDING AT A DISTANCE D FROM THE POINT OF FISSION PRODUCT RELEASE FOR A TIME TAU SUBSEQUENT TO THE TIME OF RELEASE AND BASED UPON A GIVEN REACTOR OPERATING HISTORY.

<COMP> CDC

<COMPIED> CDC 6600

<CLASS> PREDICTIVE

<CON> THIS DOCUMENT DOES NOT CONTAIN A COMPLETE DESCRIPTION OF THE CONCEPTUAL MODEL ON WHICH DOSE B IS BASED.

<689> <CON> FREILANDER, S.

<TITLE> EXPOSURE/DOSE MODELS APPLIED TO ENVIRONMENTAL CARCINOGENS

<ACQD> CALIFORNIA INSTITUTE OF TECHNOLOGY

<CITY> PASADENA

<STATE> CA

<ABST> A COMPREHENSIVE SEARCH OF THE EXISTING LITERATURE WAS CONDUCTED FOR DEVELOPMENT AND APPLICATION OF MATHEMATICAL SIMULATION MODELS DESCRIBING THE SOURCES, ENVIRONMENTAL PATHWAYS, AND EXPOSURE/DOSE RELATIONSHIPS OF ENVIRONMENTAL CARCINOGENS. THESE DOCUMENTS WERE REVIEWED AND EVALUATED FOR APPLICABILITY TO SELECTED ENVIRONMENTAL CARCINOGENS OR GROUPS OF CARCINOGENS. THE APPLICABILITY OF ONE OR MORE OF THE MODELS WAS TESTED. THE GAPS IN KNOWLEDGE IDENTIFIED AND THE LITERATURE RE-SCANNED FOR ADDITIONAL DATA AS REQUIRED. A LITERATURE REVIEW WAS SUBMITTED FOR EVALUATION BY THE PROJECT OFFICER.

<TIME> 77/06-78/01

<690> <CON> GRAHAM, CURTIS L.

<TITLE> COMPUTER CODE FOR CALCULATING PERSONNEL DOSES DUE TO TRITIUM EXPOSURES

<ACRON> TRITDOSE

<ACQD> LAWRENCE LIVERMORE LABORATORY, HAZARD CONTROL, P.O. BOX 808

<CITY> LIVERMORE

<STATE> CA

<ZIP> 94550

<PHONE> 415-822-9149; PDS 532-9149

<SOURCE> DEVELOPED AT LL

<DOC> GRAHAM, C. L., PARLAGRECO, J., A COMPUTER CODE FOR CALCULATING PERSONNEL DOSES DUE TO TRITIUM EXPOSURES, UCRL-52138 REV. 1, FEBRUARY 2, 1977

<SUB> PERSONNEL TRITIUM DOSE CALCULATION

<ABST> THIS COMPUTER CODE IS USED TO CALCULATE PERSONNEL DOSES THAT OCCUR FROM A LARGE VARIETY OF EXPOSURE SITUATIONS. THE CODE WILL MAINTAIN AN UP-TO-DATE RECORD OF DOSES FOR THOSE PERSONNEL WHO HAVE HAD NO RECENT POSITIVE BIOASSAY RESULTS AS WELL AS THOSE PERSONNEL WHO HAVE CHRONIC OR ACUTE EXPOSURES TO TRITIUM. THE EFFECTIVE HALF LIFE IS CALCULATED FOR EACH SET OF BIOASSAY DATA AND IS CHANGED WHEN APPROPRIATE FOR EACH COMPUTER RUN IN ORDER THAT EACH PERSON IS ASSIGNED THE DOSE WHICH CORRESPONDS TO HIS ELIMINATION RATE. THE CODE ALSO CHECKS WHETHER THE BIOASSAY DATA IS CONSISTENT WITH THE EXPOSURE CATEGORY THAT WAS ASSIGNED FOR EACH PERSON. IF THE EXPOSURE CATEGORY IS NOT CONSISTENT WITH THE BIOASSAY DATA, AN ERROR STATEMENT WILL APPEAR ON THE PRINTOUT EXPLAINING THE ERROR. THUS, TWO PRIMARY SOURCES OF ERROR, THE EXPOSURE CATEGORY AND THE EFFECTIVE HALF LIFE ASSUMPTIONS, ARE MINIMIZED. THE CODE WILL ALSO DETECT A VARIETY OF OTHER INPUT ERRORS. THIS CODE OFFERS GOOD FLEXIBILITY WITH GOOD ACCURACY. THE PRINTOUT LISTS THE DOSES FOR THE

<700>

DOSE/RESPONSE AND HUMAN EFFECTS

<700> CONT.

PRESENT AND PREVIOUS YEAR AND QUARTER, THE DOSE RECEIVED BETWEEN SAMPLING PERIODS, THE INGESTION DOSE, THE LIFETIME DOSE DUE TO TOXIC EXPOSURES, THE EFFECTIVE HALF LIFE, THE LAST BIOASSAY RESULTS AND SAMPLE LAT, AND THE EXPOSURE CATEGORY (I.E. CHRONIC OR ACUTE). THE CODE IS WRITTEN IN ALL MODIFIED FORTRAN IV WHICH CAN EASILY BE MODIFIED TO ANSI-FORTRAN IV.

<STATUS> IN USE WEEKLY
 <ACCESS> UNLIMITED DISTRIBUTION
 <MEDIA> PUNCH CARDS
 <STEP> CODE STATEMENTS WITH CORRESPONDING CARDS: 951
 <COMP> CDC
 <COMPIG> CDC 7600 WITH 72 K OF TAL WORDS MEMORY PROVIDED
 <LANG> LLLTRAN
 <CHAR> ASCII
 <CLASS> ANALYTICAL
 <ABST> CALCULATION OF DOSE DUE TO TOXIC EXPOSURE
 <UPDATE> 780516
 <SM> BIOASSAY DATA
 <UPDATE> 780516

<701>

<CONT> MOSES, GLENN P.

<TITLE> ANOMALOUS RELEASE OF RADIOISOTOPES REPORT GENERATOR

<ABST> ABPPG

<ABDP> BATTILLE-PACIFIC NORTHWEST LABORATORIES, POST OFFICE BOX 999

<CITY> RICHLAND

<STATE> WA

<ZIP> 99352

<PHONE> 509-902-3750; PLS 000-7511 EXT 902-3750

<ABST> ABPPG CALCULATES INTERNAL AND EXTERNAL RADIATION DOSES FROM THE ANOMALOUS RELEASE PATHWAYS: ROUTINE FOOD, SWIMMING, BOATING, AND DRINKING WATER. CHRONIC OR ACUTE RELEASES ALLOWED THREE PRECONCENTRATION MODELS OFFERED.

<STATUS> NOT YET OPERATIONAL

<ACCESS> UNLIMITED

<MEDIA> DISC

<STEP> 2%K

<COMP> WBI

<LANG> FORTRAN

<CHAR> ASCII

<UPDATE> 780530

<702>

<CONT> MOSES, GLENN P.

<TITLE> HARI

<ABDP> BATTILLE-PACIFIC NORTHWEST LABORATORIES, POST OFFICE BOX 999

<CITY> RICHLAND

<STATE> WA

<ZIP> 99352

<PHONE> 509-902-3750; PLS 000-7511 EXT 902-3750

<ABST> HARI CALCULATES THE MAXIMUM ANNUAL RADIATION DOSE TO TOTAL BODY AND ORGANS OF INTEREST FOR FOOD INGESTION AND EXTERNAL EXPOSURE PATHWAYS. THE CALCULATION IS A TIME ITERATION ON THE MODELS USED IN THE CODE FOOD.

<STATUS> UNDERGOING MODIFICATION

<MEDIA> DISC

<COMP> WBI

<LANG> FORTRAN

<CHAR> ASCII

<UPDATE> 780531

<703>

<CONT> MOSES, GLENN P.

<TITLE> PARLN

<ABDP> BATTILLE-PACIFIC NORTHWEST LABORATORIES, POST OFFICE BOX 999

<CITY> RICHLAND

<STATE> WA

<ZIP> 99352

<PHONE> 509-902-3750; PLS 000-7511 EXT 902-3750

<ABST> PARLN CALCULATES INTERNAL DOSES AND DOSE COMMITMENTS TO MAN FOR EITHER ACUTE OR CHRONIC INGESTION OF RADIOISOTOPES FOR POPULATION OR MAXIMUM INDIVIDUAL FOR THE AIR PATHWAY.

<STATUS> UNDERGOING MODIFICATION

<ACCESS> UNLIMITED

<MEDIA> DISC

<COMP> WBI

<LANG> FORTRAN

<CHAR> ASCII

<UPDATE> 780531

<704>

<CONT> HONSTEAD, J. P.; ESSIG, T. H.

<TITLE> EVALUATION OF ENVIRONMENTAL FACTORS AFFECTING POPULATION EXPOSURE

<DOC> CONF/S19-72-0, PP. 29-57, SEP. 1972; SOUTHERN CONFERENCE ON ENVIRONMENTAL PROTECTION FROM NUCLEAR POWER PLANTS.

TOXICITY AND OTHER EFFECTS

(TQM) 2000

5. PETERSBURG, FLA. (29 APRIL 1971)

DETAILS ARE PRESENTED ON THE DEVELOPMENT OF A MATHEMATICAL MODEL FOR EVALUATING THE RADIATION DOSE RECEIVED BY INDIVIDUALS IN THE KANFUDU AREA POPULATION DUE TO RADIOACTIVITY RELEASES FROM THE NUCLEAR FACILITIES. THE PARTICULAR RADIOISOTOPE STUDIED WAS ZU-65, ITS RELEASE TO SURFACE WATERS, MIGRATION THROUGH THE FOOD CHAIN, INTAKE BY MAN, AND ACCUMULATION IN THE HUMAN BODY. DATA ARE INCLUDED ON MEASURED ZU-65 BODY BURDEN, ZU-65 CONCENTRATION IN DRINKING WATER, FOOD INTAKE, AND THE EFFECTS OF RECREATIONAL USES OF THE COLUMBIA RIVER. THE DOSE CALCULATION COMPUTER PROGRAM IS DESCRIBED.

<705>

<CONT> JORDEN, WILLIAM P.

(TITLE) PSYCHOLOGICAL MODELS FOR PREDICTING
HEALTH IMPACT OF ENERGY RELATED
FACILITIES

<AEDP> PUERTO RICO NUCLEAR CENTER

SECRET 214 JAN

45172 20

<212> 00015

< PENDING > HQ#-747-0350

THIS PROJECT WILL BE CONCERNED WITH LABORATORY AND FIELD INVESTIGATIONS NECESSARY FOR FORMULATION, CALIBRATION, AND VERIFICATION OF MODELS RELATED TO SPECIFIC DISEASES. IN ADDITION, THE CONFIRMED MODELS WILL BE USED TO EXAMINE ALTERNATE STRATEGIES FOR PREVENTING THE RELATED DISEASES IN PUERTO RICO AND OTHER TROPICAL AREAS. THE MODELS WILL BE DEVELOPED SEQUENTIALLY STARTING WITH SCHISTOSOMIASIS AND WITHIN TWO YEARS MOVING ONTO THE NEXT DISEASE WHICH WILL DEPEND ON AVAILABILITY OF DATA FROM OTHER PROJECTS SUCH AS THE AIR POLLUTION STUDY. THE FOLLOWING SCHEME RELATES SPECIFICALLY TO THE NEXT TWO YEARS AND THE EPIDEMIOLOGICAL MODELLING OF SCHISTOSOMIASIS. THE SPECIFIC OBJECTIVES ARE TO DEVELOP A MODEL OF SCHISTOSOMIASIS TRANSMISSION BASED ON HYDROELECTRIC RESERVOIRS AS THE EPIDEMIOLOGICAL UNIT. THE RESERVOIRS IN PUERTO RICO TO BE MODELLED WILL INCLUDE LAKE LOPEZ AND RIO BLANCO. IN ADDITION, A MODEL WILL BE DEVELOPED FOR VOLTA RESERVOIR IN GHANA, FOR TAVERAS AND SAN RESERVOIRS IN THE DOMINICAN REPUBLIC AND FOR SOME OF THE LARGER POWER RESERVOIRS ON THE RIO FRANCISCO RIVER IN BRAZIL. THE MODELS WILL BE VERIFIED WITH THE FIELD DATA AND USED TO PREDICT EFFECTS OF VARIOUS DESIGNS, OPERATIONAL SCHEDULES AND CONTROL PROGRAMS FOR THESE RESERVOIRS. (1) COMPLETE ANALYSIS OF 1976 SNAIL-TEST SURVEY FOR SCHISTOSOMIASIS 1/10/76. (2) COMPLETE LABORATORY STUDIES OF PATHOGENS 1/1/77. (3) COMPLETE EPIDEMIOLOGICAL STUDIES IN VITAL COMMUNITIES 1/1/77. (4) COMPLETE COMPUTER MODELLING 10/1/77.

**<GPO> PUERTO RICO, LAGO LOIZA; PUERTO RICO,
RIO FLANCO; GAMBIA, VOLTA RESERVOIR;
PORTUGUESE REPUBLIC, TAVERAS RESERVOIR;**

DOMINICAN REPUBLIC, RIO RESERVOIR:
BRAZIL, RIO FRANCISCO RIVER

כ"ה/ט"ו-כ"ז/ט"ו

<CLAS> PREDICTIVE

(TAC)

(COST)	EARN, D.
100	100
200	200
300	300
400	400
500	500
600	600
700	700
800	800
900	900
1000	1000

**(TITLE) ENVIRONMENTAL RADIATION EXPOSURES AND
ASSOCIATED RISKS FROM FUEL REPROCESSING
PLANTS**

<APP> GEORGIA INSTITUTE OF TECHNOLOGY

<CICD> ASLARA

CS-32 6A

(DOC) RAPAN, H.A. (ED.), PROCEEDINGS OF ENERGY AND THE ENVIRONMENT - COST BENEFIT ANALYSIS, HELD IN ATLANTA, GEORGIA, JUNE 23, 1975.

<AR5> RADIONUCLIDE SOURCE AND EFFLUENT
ANALYSIS AND ASSOCIATED POPULATION
RADIATION EXPOSURE ARE REVIEWED FOR
COMMERCIAL PLANTS PROCESSING NUCLEAR
FUEL FROM LIGHT WATER REACTORS IN THE
UNITED STATES. RADIONUCLIDE DATA AND
DOSES COMPUTED FROM EFFLUENT AND
ENVIRONMENTAL RADIONUCLIDE MEASUREMENTS
ARE AVAILABLE FOR THE NUCLEAR FUEL
SERVICES PROCESSING PLANT. ALSO
PRESENTED ARE EFFLUENT AND DOSE
PREDICTIONS FOR THE SAPHIRE NUCLEAR
FUEL PLANT AND FOR MODEL PLANTS
CONSIDERED BY THE AEC AND EPA IN THEIR
ANALYSES OF THE ENVIRONMENTAL IMPACT OF
THE NUCLEAR FUEL CYCLE. THE
RADIONUCLIDES IN AIR-BORNE EFFLUENTS
THAT ARE PREDICTED TO CAUSE MAXIMUM
EXPOSURES OF PERSONS ARE I-129 AND
I-131 TO THYROIDS, K-40 TO SKIN, AND
Pu-106 TO THE GASTROINTESTINAL TRACT.
THE HIGHEST POPULATION DOSE IS
PREDICTED FROM C-14, K-40, AND H-3
DISTRIBUTED WORLDWIDE. ALTHOUGH
DETAILED CALCULATIONAL EVALUATIONS HAVE
BEEN UNDERTAKEN OF THE IN-PLANT
PROCESS, WASTE TREATMENT, ENVIRONMENTAL
TRANSFERS, AND UPTAKE OF RADIONUCLIDES
AS THEY AFFECT RADIATION DOSES TO THE
POPULATION, DIRECT OBSERVATIONS OF
THESE FACTORS AT OPERATING PLANTS ARE
NEEDED TO CONFIRM THESE RESULTS.

<CLASS> SIMULATION

< 707 >

<CONT> KENFIELD, G. F.; LANS, W. R.; SAYER, W. D.; MACADAMS, R. H.; HARRIS, W. A.

**<TITLE> CURIE-DOSE-THUNDERHEAD: A DIGITAL
COMPUTED PROGRAM FOR EXTERNAL AND
INTERNAL RADIATION DOSE CALCULATIONS**

<ACRO> CWIR: DOSE: THUNDERHEAD

**<ADDR> ATOMICS INTERNATIONAL, A DIVISION OF
NORTH AMERICAN AVIATION, INC.**

<CITY> CANOGA PARK

<STATE> CA

<DOC> MA-SR-0000, 39 PP., 1965

**<ADST> THE CURIE-BOSE-THUNDERHEAD PROGRAM IS A
COMBINATION OF THREE BASIC COMPUTER**

<787>

DOSE METRY AND HUMAN EFFECTS

<787> CONT.

PROGRAMS EMPLOYED IN SUCCESSION. THE FIRST, CMPIE, CALCULATES THE FISSION PRODUCT BUILDUP AND DECAY AS A FUNCTION OF REACTOR OPERATING TIME, OPERATING POWER, AND DECAY TIME. THE SECOND, MOSE, USES THE FISSION PRODUCT INVENTORY OBTAINED FROM CMPIE TO CALCULATE THE DOSE TO 14 INTERNAL BODY ORGANS DUE TO INHALATION OF FISSION PRODUCTS RELEASED TO THE ATMOSPHERE. THE THIRD, THUNDERHEAD, ALSO USES FISSION PRODUCT ACTIVITY DATA FROM CMPIE TO CALCULATE THE EXTERNAL CLOUD GAMMA EXPOSURE FROM THE RELEASED FISSION PRODUCTS. CLOUD DIFFUSION IS CALCULATED FROM SUTTON'S EQUATION OR THE CORVARD MODIFICATION. IN CALCULATING THE INTERNAL DOSE IT IS ASSUMED 62.5 PERCENT OF THE INHALED ISOTOPES ARE ULTIMATELY SWALLOWED AND PASS THROUGH THE ENTIRE GASTROINTESTINAL TRACT. AN ACCIDENTAL RELEASE SITUATION IS CONSIDERED.

<CLAS> SIMULATION

<788>

<CON> KERN, C. D.

<TITLE> RADIOLOGICAL DOSE EFFECTS MODEL

<ICRM> JEREMIAN

<ADP> SAVANNAH RIVER LABORATORY, ENVIRONMENTAL TRANSPORT DIVISION

<CITY> Aiken

<STAT> SC

<ZIP> 29801

<PHONE> 903-725-6211 EXT 3325; FTS 239-3325

<SOURCE> SPL SAVANNAH RIVER LABORATORY ENVIRONMENTAL TRANSPORT AND EFFECTS RESEARCH, DP-1449, ANNUAL REPORT 1977

<DOC> THE JEREMIAN ATMOSPHERIC TRANSPORT AND DOSE CONCENTRATION SYSTEM, IN DP-1449, SAVANNAH RIVER LABORATORY ENVIRONMENTAL TRANSPORT AND EFFECTS RESEARCH, ANNUAL REPORT 1977

<SUB> ASSESSMENT OF ROUTINE (LOW-LEVEL) POLLUTANT RELEASES, AND EMERGENCY RESPONSE CAPABILITY FOR ACCIDENTAL (HI-LEVEL) POLLUTANT RELEASES.

<ABST> THE JEREMIAN MODEL SYSTEM OPERATES UNDER JOSHUA JOB AND DATA MANAGEMENT. REGION AND SOURCE CHARACTERIZATION DATA ARE ARBITRARY INPUT. MODULE 'GRIDN' COMBINES SYNOPTIC METEOROLOGICAL DATA WITH SITE SPECIFIC INSTRUMENTED TOWER DATA TO DEVELOP PRESENT AND FORECASTED ADVECTIVE WIND FIELDS. SEGMENTED GAUSSIAN PLUME DIFFUSION IS AUTOMATICALLY PERFORMED BY MODULE 'ADPLN'. IF DESIRED, RADIOACTIVE DOSE COMMITMENT IS CALCULATED BY MODULE 'POPDOS'.

<GEO> SOUTHEASTERN UNITED STATES

<STATUS> IN USE

<ACCESS> LIMITED

<SIZE> 500,000 BYTES CORE REQUIREMENT

<COMP> IBM

<CONFIG> IBM 360; IBM 370

<LANG> FORTRAN IV; JOSHUA

<CHAR> EBCDIC; BINARY

<ALGO> 'GRIDN'-USAF OBJECTIVE ANALYSIS; 'ADPLN'-SEGMENTED GAUSSIAN PLUME; 'POPDOS'-INFINITE LINE SOURCE, INHALATION

<CLAS> QUASI-REAL TIME; PREDICTIVE; DETERMINISTIC; SIMULATION

<APPL> DOSE EFFECTS OF ATMOSPHERIC POLLUTANT RELEASE

<USERS> SRL

<SUB> HAS METEOROLOGICAL OBSERVATIONS; SPL INSTRUMENTED TOWERS

<INVAL> COMPARISON OF NEUTRALLY BOUNDARY SOLUTIONS WITH EXTENSIVE RS KRYPTON OBSERVATIONS AT THE SRP SITE; INTER-MODEL COMPARISONS WITH SEVERAL REGIONAL SCALE MODELS

<UPDATE> 780610

<789>

<CON> KILLOUGH, G. G.

<TITLE> A FORTRAN CODE WHICH IMPLEMENTS ICPP 2 MODELS OF INTERNAL RADIATION TO MAN

<ICRM> ICPPN

<ADP> OAK RIDGE NATIONAL LABORATORY, ENVIRONMENTAL SCIENCES, P.O. BOX 1

<CITY> OAK RIDGE

<STAT> TN

<ZIP> 37830

<PHONE> 615-483-8611 EXT 3-6035; FTS 950-6009

<SOURCE> DEVELOPED AT ORNL

<DOC> KILLOUGH, G.G., BOWEN, P.S., TURNER, W.D., ICPN- A FORTRAN CODE WHICH IMPLEMENTS ICPP 2 MODELS OF INTERNAL RADIATION DOSE TO MAN, ORNL-5003, FEBRUARY 1975; TURNER, W.D., KAYE, S.V., AND BOWEN, P.S., EXPRN AND ICPN COMPUTER CODES FOR ESTIMATING RADIATION DOSES TO POPULATIONS FROM CONSTRUCTION OF A SEA-LEVEL CANAL WITH NUCLEAR EXPLOSIVES, R-1752 SEPTEMBER 1968.

<SUB> POLLUTANTS AND EFFLUENTS OF ENERGY PROCESSES; HUMAN HEALTH; SOMATIC AND GENETIC EFFECTS; ENVIRONMENTAL AND ECOLOGICAL SYSTEMS.

<ABST> ICPN IS A FORTRAN IV COMPUTER CODE TO ESTIMATE THE CUMULATIVE DOSE EQUIVALENTS TO BODY ORGANS OF MAN FOLLOWING A CONTINUOUS INTAKE, THROUGH INHALATION OR INGESTION, OF ONE OR MORE RADIOISOTOPES. DOSEIMETRY PARAMETERS FOR THE ORGANS ARE DEPENDENT OF THE AGE OF THE INDIVIDUAL, AND THE INTAKE RATE IS A FUNCTION OF TIME AND THE INDIVIDUAL'S AGE. THE METHOD OF ESTIMATION IS BASED ON ADAPTATIONS OF MODELS PRESENTED IN PUBLICATION 2 OF THE INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION. THE EQUATIONS FOR THE MODELS ARE DERIVED, AND

DOSE EFFECT AND HUMAN EFFECTS

<709> CONT.

INFORMATION ABOUT THE CODE AND ITS USE IS PROVIDED.

<TERM> 1970-1976

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE; PUNCHED CARDS

<COMP> IBM

<COMPIG> IBM 360/91 WITH 370K BYTES CORE AVAILABLE (OS-NV2)

<LANG> FORTRAN IV; ASSEMBLER

<CHAR> PUNCH

<CHAR> PREDICTIVE

<CHAR> COMPARISON OF NUMERICAL RESULTS WITH VALUES PROVIDED IN THE REFERENCE DOCUMENT, ICRP PUBLICATION 2.

<CON> AVAILABLE FROM RADIATION SHIELDING INFORMATION CENTER.

<710>

<CON> KILLOUGH, G. G.

<TITLE> CONVERSATIONAL COMPUTER CODES TO IMPLEMENT ICRP-10-10A MODELS FOR ESTIMATION OF INTERNAL RADIATION DOSE TO MAN

<ACPO> INFO1; INFO2; INFO3

<ADDR> OAK RIDGE NATIONAL LABORATORY, ENVIRONMENTAL SCIENCES DIVISION, P.O. BOX 1

<CITY> OAK RIDGE

<STATE> TN

<ZIP> 37830

<PHONE> 615-493-0411 EXT 3-6009; FTS 450-4000

<COMPIG> DEVELOPED AT ORNL

<DOC> G.G. KILLOUGH AND P.S. BOWEN, INFO-CONVERSATIONAL COMPUTER CODES TO IMPLEMENT ICRP-10-10A MODELS FOR ESTIMATION OF INTERNAL RADIATION DOSE TO MAN, ORNL-4916 MARCH 1974.

<SUB> POLLUTANTS AND EFFLUENTS OF ENERGY PROCESSES; HUMAN HEALTH; SOMATIC AND GENETIC EFFECTS; ENVIRONMENTAL AND ECOLOGICAL SYSTEMS.

<ABST> INFO1, INFO2, AND INFO3 (THE INFO CODES) ARE CONVERSATIONAL FORTRAN IV PROGRAMS, IMPLEMENTED FOR USE IN TIME-SHARING MODE ON THE ORNL PDP-10 SYSTEM. THESE CODES USE ICRP-10-10A MODELS TO ESTIMATE THE RADIATION DOSE TO AN ORGAN OF THE BODY OF REFERENCE MAN RESULTING FROM THE INGESTION OR INHALATION OF ANY ONE OF VARIOUS RADIOISOTOPES. TWO PATTERNS OF INTAKE ARE SIMULATED: INTAKES AT DISCRETE TIMES AND CONTINUOUS INTAKE AT A CONSTANT RATE. THE INFO CODES PROVIDE TABULAR OUTPUT OF DOSE RATE AND DOSE VS TIME, GRAPHICAL OUTPUT OF DOSE VS TIME, AND PUNCHED-CARD OUTPUT OF ORGAN BURDEN AND DOSE VS TIME. THE MODELS OF INTERNAL DOSE CALCULATION ARE DISCUSSED

AND INSTRUCTIONS FOR THE USE OF THE INFO CODES ARE PROVIDED. THE INFO CODES ARE AVAILABLE FROM THE RADIATION SHIELDING INFORMATION CENTER, OAK RIDGE NATIONAL LABORATORY, P.O. BOX 1, OAK RIDGE, TENNESSEE 37830.

<TERM> 1973-1975

<STATUS> IN USE

<ACCESS> UNLIMITED

<COMP> DEC

<COMPIG> PDP-10 RATIO CPU WITH 96K 36-BIT WORD MEMORY (MINIMUM CONFIGURATION DATA NOT AVAILABLE).

<LANG> FORTRAN IV

<CHAR> ASCII

<CHAR> PREDICTIVE

<CHAR> COMPARISON OF NUMERICAL RESULTS WITH DOSE ESTIMATES PROVIDED IN THE REFERENCE DOCUMENT, ICRP PUBLICATION 10.

<CON> AVAILABLE FROM RADIATION SHIELDING INFORMATION CENTER.

<711>

<CON> KIL, V. S.

<TITLE> MYS EFFECTIVE ENERGY PROGRAM

<ACPO> MEEP

<ADDR> MYS CORPORATION, 8 RESEARCH PLACE

<CITY> ROCKVILLE

<STATE> MD

<ZIP> 20850

<PHONE> 301-948-7010

<SOURCE> MYS CORPORATION

<DOC> MYS-004, 69 PP.

<SUB> FISSION PRODUCT CHAINS (SELECTED)

<ABST> THE MYS PROGRAM FOR EFFECTIVE ENERGY IS AN CDC-6600 COMPUTER PROGRAM WRITTEN FOR THE PURPOSE OF OBTAINING THE EFFECTIVE ENERGIES ABSORBED BY INTERNAL BODY ORGANS DUE TO DISINTEGRATION OF RADIOACTIVE FISSION PRODUCTS INHALED AND INGESTED BY A HUMAN BEING. THE INTERNAL BODY ORGANS CONSIDERED IN THE PROGRAM ARE THYROID, LUNG, GASTROINTESTINAL (G.I.) TRACT, AND LUNG. THE RESULTS ARE PRESENTED IN UNITS OF MEV PER DISINTEGRATION OF THE PARENT NUCLIDE IN A GIVEN CHAIN. THE PROGRAM CONSIDERS A FISSION PRODUCT DECAY CHAIN, EXAMINES WHETHER THE CHAIN ELEMENTS HAVE AFFINITY WITH A PARTICULAR BODY ORGAN, AND COMPUTES EFFECTIVE ENERGIES. THE AVERAGE BETA AND TOTAL GAMMA ENERGIES, THE RADIOACTIVE DECAY CONSTANT, AND THE BIOLOGICAL DECAY CONSTANTS FOR EACH ELEMENT OF A GIVEN CHAIN MUST BE PROVIDED AS THE INPUT TO THE PROGRAM.

<GEN> NOT APPLICABLE

<TERM> PRIOR TO 1971

<711>

DOSIMETRY AND HUMAN EFFECTS

<712> CONT.

<STATUS> IN USE

<ACCESS> PROPRIETARY

<MEDIA> PUNCH CARDS

<SIZE> 500 CARDS

<COMP> CDC

<CONFIG> CDC-6600 FOR OCTAL

<LANG> FORTRAN IV

<CHAP> BCE

<ALGO> ICRP MODEL. RADIOACTIVE DECAY SCHEMES

<CLAS> ANALYTICAL

<APPL> TO GENERATE EFFECTIVE ENERGIES OF FISSION PRODUCTS AND THEIR DAUGHTERS FOR USE IN OTHER PROGRAMS.

<7SEPS> CURRENTLY INACTIVE, WAS USED IN 1971-72 AT BNL.

<SRM> ICRP PUBLICATION NO. 2, 1959.

<FVAL> NOT DONE

<COM> REPORT BNL-404 SUPERSEDES BNL-156.

<UPDATE> 1970/07/15

<712>

<COM> KOCHER, D. C.

<TITLE> THE EXREN VII COMPUTER CODE FOR ESTIMATING EXTERNAL RADIATION DOSES TO POPULATIONS FROM ENVIRONMENTAL RELEASES

<ACRO> EYPEN-III

<ADDR> CAK RIDGE NATIONAL LABORATORY, HEALTH AND SAFETY RESEARCH, P.O. BOX 1

<CITY> ORR RIDGE

<STATE> TN

<ZIP> 37830

<PHONE> 615-483-8611 EXT 3-6009; FTS 850-6009

<SOURCE> DEVELOPED AT ORNL

<DOC> D.R. THURBY AND S.V. KAYE, THE EXREN VII COMPUTER CODE FOR ESTIMATING EXTERNAL RADIATION DOSES TO POPULATIONS FROM ENVIRONMENTAL RELEASES, ORNL-TN-8322 DECEMBER 1973; G.G. KILGORE AND L.A. MCKAY, IN A METHODOLOGY FOR CALCULATING RADIATION DOSES FROM RADIOACTIVITY RELEASED TO THE ENVIRONMENT, ORNL-3882 P. 3-7, MARCH 1976

<SUB> POLLUTANTS AND EFFLUENTS OF ENERGY PROCESSES; HUMAN HEALTH; SOMATIC AND GENETIC EFFECTS; ENVIRONMENTAL AND ECOLOGICAL SYSTEMS

<ABST> EXREN VII IS A COMPUTER CODE TO ESTIMATE THE DOSE EQUIVALENT RATE AND THE TOTAL DOSE EQUIVALENT FROM BETA, POSITRON, ELECTRON, AND GAMMA RADIATION RESULTING FROM SUBMERSION IN CONTAMINATED WATER, SUBMERSION IN CONTAMINATED AIR, AND EXPOSURE TO A CONTAMINATED SURFACE. THERE CAN BE MORE THAN ONE ENVIRONMENTAL RELEASE,

AND EXPOSURE CAN BEGIN AT ANY TIME AFTER THE FIRST RELEASE. EXREN VII CONSIDERS CONTRIBUTIONS FROM ENVIRONMENTAL RELEASES AND FROM NUCLEAR DECAY CHAINS. FOR A PARTICULAR PROBLEM THE USER MAY CHOOSE TO CALCULATE EITHER THE DOSE RATES, OR THE TOTAL DOSES, OR BOTH FOR EACH MODE OF EXPOSURE. EXREN VII IS A REVISED VERSION OF EXREN II WHICH WAS AVAILABLE EARLIER. THE PRINCIPAL REVISIONS INCLUDE TREATMENT OF POSITRON AND ELECTRON RADIATIONS, SELECTION OF NUCLEAR DATA FROM A DATA BASE, VARIABLE DIMENSIONING OF LARGE DATA ARRAYS, AND FREE FIELD INPUT. THE CODE IS AVAILABLE FROM THE RADIATION SHIELDING INFORMATION CENTER.

<TIME> 1972-

<STATUS> IN USE; UNDER REVISION

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE; PUNCHED CARDS

<SIZE> 540,000 BYTES

<COMP> IBM

<CONFIG> IBM 360/91 WITH 540K CORE

<LANG> FORTRAN IV

<CHAP> EBCDIC

<CLAS> PREDICTIVE

<APPL> PATHOLOGICAL ASSESSMENT OF RADIOISOTOPE RELEASES TO THE ATMOSPHERE

<USERS> DEPARTMENT OF ENERGY; NUCLEAR REGULATORY COMMISSION

<FVAL> FAVORABLE COMPARISONS WITH OTHER DOSIMETRY CODES AND SOME PUBLISHED EXPERIMENTAL MEASUREMENTS.

<UPDATE> 700421

<713>

<COM> LEE, E.; MCKE, R. J.; SIEGLEY, D. R.

<TITLE> GADOSE AND DOSET - PROGRAMS TO CALCULATE ENVIRONMENTAL CONSEQUENCES OF RADIOACTIVITY RELEASE

<ACRO> GADOSE; DOSET

<ADDR> GENERAL ATOMIC

<CITY> SAN DIEGO

<STATE> CA

<DOC> GA-6511, 62 PP., 1966

<ABST> GADOSE IS A FORTRAN PROGRAM WHICH CALCULATES THE RADIOACTIVITY IN VARIOUS REACTOR PLANT LOCATIONS AND THE DOSES TO THE PUBLIC RESULTING FROM INSTANTANEOUS ACCIDENTAL RELEASE OF ACTIVITY INTO ANY OF THE PLANT SPACES. THE CALCULATIONS CAN BE PERFORMED FOR ANY COMBINATION OF ISOTOPES AND INCLUDE CONSIDERATION OF DECAY, BUILDUP, FILTRATION, ATMOSPHERIC DILUTION, FALLOUT, AND RAINOUT. THE COMPANION PROGRAM DOSET IS ALSO AVAILABLE TO INCLUDE THE EFFECTS OF A TIME DEPENDENT ACCIDENTAL FISSION PRODUCT RELEASE INTO THE VARIOUS PLANT SPACES. A TYPICAL CALCULATION OF THE ACTIVITIES AND DOSES

DOSEMETRY AND HEALTH EFFECTS

<713> CONF.

AT FIVE TIMES AND FIVE DISTANCES FROM THE PLANT WITH 130 ISOTOPES REQUIRES APPROXIMATELY A CONTINUOUS OF 100 TONS MACHINE TIME FOR THE BASIC CADUCE PROGRAM. THE PROGRAM IS WRITTEN SPECIFICALLY FOR THE HIGH-TEMPERATURE GAS-COOLED REACTOR (HTGR) TYPE OF PLANT.

<COMP> IBM

<CONFIG> IBM 7000

<LANG> FORTRAN

<CIAS> SIMULATION

<714>

<CONF> LUDWIG, HERBERT B.

<TITLE> HEALTH EFFECTS AND COSTS OF FOSSIL-FUEL POLLUTANTS

<PRIN> LOS ALAMOS SCIENTIFIC LABORATORY, GROUP S-2, MS-606, P.O. BOX 1663

<CIAT> LOS ALAMOS

<STATE> NM

<ZIP> 87545

<PHONE> 505-667-7596; FTS 843-7596

<SCOPED> LASEL STAFF

<DOC> A. FORD AND H. B. LUDWIG, METHODOLOGY FOR THE ANALYSIS OF THE IMPACTS OF ELECTRIC POWER PRODUCTION IN THE WEST, LA-6720-PB, P. 16-19).

<SUB> PUBLIC HEALTH COSTS OF AIR POLLUTION

<ABST> A NEW METHOD IS PROPOSED FOR ESTIMATING THE COSTS OF DETERIORATION OF PUBLIC HEALTH DUE TO AIR POLLUTION. THE METHOD FOCUSES ON THE PHENOMENOLOGICAL ASPECTS OF ILL HEALTH, SUCH AS THE NUMBER OF DAYS LOST FROM WORK, RATHER THAN ITS ETIOLOGY. AS A RESULT, THE METHOD AVOIDS RELYING ON POORLY KNOWN CORRELATIONS BETWEEN SPECIFIC DISEASES AND AIR-POLLUTION LEVELS, AND IT EXPRESSES HEALTH COSTS DIRECTLY IN TERMS COMPARABLE TO THE COSTS OF POLLUTION ABATEMENTS.

<GEN> THE APPLICABLE AREA DEPENDS ON THE DATA SUPPLIED.

<STATUS> UNDER DEVELOPMENT; IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE

<COMP> CDC

<CONFIG> CDC 6600 WITH 100 K CORE AND TAPE DRIVES

<LANG> FORTRAN; DISPLA; NETWORK OPERATING SYSTEM

<CIAS> CONTINUOUS; DETERMINISTIC; ANALYTICAL; PREDICTIVE; SIMULATION

<APPL> ESTIMATION OF ADDITIONAL MORBIDITY AND MORTALITY EFFECTS AND COSTS TO THE PUBLIC RESULTING FROM EMISSIONS OF FOSSIL-FUEL, ENERGY-CONVERSION PLANTS.

<USERS> DEPARTMENT OF ENERGY; ENVIRONMENTAL PROTECTION AGENCY

<SRD> OVERS SERIES 2 FOR POPULATION; NATIONAL ENVIRONMENTAL DATA SYSTEMS; ENVIRONMENTAL IMPACT STATEMENTS

<QUAL> APPEAL TO PLAUSIBILITY

<CON> MODEL IS IN DEVELOPMENT STAGE.

<UPDATE> 700419

<715>

<CONF> LUNDY, ROBERT T.

<TITLE> MORTALITY PROJECTION FROM EXPOSURE TO RADIOACTIVE AND NON-RADIOACTIVE ENVIRONMENTAL POLLUTANTS

<ACRO> DENPAK

<ADDR> ARGONNE NATIONAL LABORATORY, BIOLOGICAL AND MEDICAL RESEARCH DIVISION, 9700 S. CASS AVE.

<CIAT> ARGONNE

<STATE> IL

<ZIP> 60439

<PHONE> FTS 972-3827

<DOC> LUNDY, R. T. AND D. GARD, PREDICTIONS OF THE EFFECTS OF ENERGY PRODUCTION ON HUMAN HEALTH, PROCEEDINGS OF THE ANNUAL MEETINGS OF THE AMERICAN STATISTICAL ASSOCIATION, 1977 ;DENPAK USER'S MANUAL (DRAFT).

<SUB> MORTALITY ESTIMATES, POPULATION PROJECTION, AND DEMOGRAPHIC ANALYSIS.

<ABST> GIVEN AN INITIAL POPULATION AND SUFFICIENT DATA TO CONSTRUCT AGE-SPECIFIC SEX-SPECIFIC BIRTH AND DEATH RATE, AND A HISTORY OF EXPOSURE TO SO₂, SO₄, TSP, OR ORGANIC DUSTS IN DEN AS A SEQUENCE OF YEARLY AVERAGES, DENPAK PROJECTS THE POPULATION AND DEATHS BY CAUSE IN 5-YEAR BLOCKS. IN ADDITION, MEASURES OF LIFE SHORTENING ARE CALCULATED. FACILITIES ARE AVAILABLE TO VARY BIRTH AND DEATH RATES OVER TIME INDEPENDENTLY OF POLLUTION EXPOSURE.

<GEN> CAN BE APPLIED TO ANY POPULATION IRRESPECTIVE OF GEOGRAPHY

<TIME> POST WORLD WAR II

<STATUS> UNDER DEVELOPMENT, IN USE

<ACCESS> LIMITED

<MEDIA> MAGNETIC TAPE; DISC; PUNCHED CARDS

<SIZE> 7000 RECORDS EACH 80 BYTES LONG

<COMP> IBM

<CONFIG> IBM 370/195 25/MT WITH 400K CORE

<LANG> FORTRAN

<CHAR> EBCDIC

<ALGO> A STANDARD POPULATION PROJECTION IS PERFORMED IN 5-YEAR INTERVALS. FOR EACH INTERVAL, THE DEATH RATES BY AGE AND SEX ARE RECALCULATED AS A FUNCTION OF LEVEL AND DURATION OF EXPOSURE TO THE EFFLUENT(S) CONSIDERED. DEATHS ARE

COPIES OF THIS REPORT ARE BEING FURNISHED TO THE

DECLASSIFIED BY SP-6 BJS/KSP
ON 08-27-2019

CONTINUED

EXPERIENTS FROM EACH SYSTEM.

211 230004728 01 0350 0120 548 <7444>
 50115151515: 01 0350 0120 548 <585>

700703 <JNGEN> 000000

274196 (67-11)

APPROXIMATE NATIONAL LABORATORY, APPLIED
MATHEMATICS DEPARTMENT, BUILDING 515

AN EXHIBIT

105100 001000 <000000>

< NEXT> THE BUL PSION REACTION
NEUTRONICS/ENERGY
DEPOSITION/ACTIVATION/ DOXAGE TO

THAT COMBINE ENERGY DEPOSIT
ACTIVATION PRODUCT INFECTION
FEEDING RATIONS, AND DOSAGE
PRODUCTION (FOLLOWING WITH) ONE

250 MI (SOLUBLE)
ACIDITY

10-10-68

(COMPIG) ONE 9-THACH ON 7-THA
MIMONY

AI 0001404 (CONT)

NSA
REF ID: A66561

DOSEMETRY AND HUMAN EFFECTS

<719> CONT.

ESTABLISHED PLACES

<ADDP> NUCLEAR REGULATORY COMMISSION

<CITY> WASHINGTON

<STATE> DC

<DOC> HEALTH PHYSICS, 32(4), 305-307, 1977

<ABST> DOSES WHICH COULD BE RECEIVED WHILE EVACUATING A NUCLEAR FACILITY FOLLOWING AN ACCIDENT INVOLVING ATMOSPHERIC RELEASES OF RADIOISOTOPES FROM IRRADIATED FUEL ARE ESTIMATED. THE CASES OF TRANSPORTING UNDER A WELL ESTABLISHED PLUME BOTH WHEN MOVING DOWNWIND AND WHEN MOVING ACROSS WIND ARE CONSIDERED. THE THEORY IS APPLICABLE BOTH TO RADIOACTIVE AND CHEMICAL POLLUTANT CASES.

<CLASS> PREDICTIVE

<722>

<CONT> MARTIN, J. A., JR.; NELSON, C. B.; CURRY, P. A.

<TITLE> ATRIP PROGRAM MANUAL: A COMPUTER CODE FOR CALCULATING DOSES, POPULATION DOSES, AND GROUND DEPOSITIONS DUE TO ATMOSPHERIC EMISSIONS OF RADIOISOTOPES

<ACRO> ATRIP; EGAD

<ADDP> U.S. ENVIRONMENTAL PROTECTION AGENCY, OFFICE OF RADIATION PROGRAMS, FIELD OPERATIONS DIVISION

<CITY> WASHINGTON

<STATE> DC

<ZIP> 20460

<DOC> EPA-520/1-76

<ABST> A COMPUTER CODE USEFUL FOR THE CALCULATION OF DOSES TO THE GENERAL POPULATION DUE TO ATMOSPHERIC EMISSIONS OF RADIOISOTOPES IS PRESENTED AND DISCUSSED. THE CODE IS WRITTEN IN FORTRAN IV, REQUIRES 100K STORAGE, AND RUNS IN ABOUT 20 SECONDS ON AN IBM 370 SYSTEM. A STANDARD SECTOR-AVERAGED GAUSSIAN-DIFFUSION EQUATION IS SOLVED REPEATEDLY FOR EACH RADIOISOTOPE, WIND SECTOR, STABILITY CLASS AND DOWNWIND DISTANCE. RADIOISOTOPE CONTRIBUTIONS TO DOSES OF UP TO FOUR CRITICAL ORGANS ARE SUMMED AND PRINTED BY SECTOR AND DOWNWIND DISTANCE. POPULATION DOSES (PERSON-REM) ARE ALSO CALCULATED. THE CODE ACCOUNTS FOR THE FOLLOWING PHYSICAL PROCESSES: CLOUD DIFFUSION, GROUND AND INVERSION-LID REFLECTIONS, RADIOISOTOPE DECAY BY TIME OF FLIGHT, FIRST DAUGHTER-PRODUCT BUILDUP, GROUND DEPOSITION OF PARTICULATES AND HALOGENS (INDEPENDENTLY), CLOUD DEPLETION, IN-PLANT HOLDUP AND DECONTAMINATION FACTORS, AND SECTOR-TO-SECTOR CONTRIBUTIONS TO EXTERNAL GAMMA DOSE. THE CODE IS DOSE MODEL INDEPENDENT IN THE SENSE THAT DOSE CONVERSION FACTORS, PROVIDED AS INPUT DATA, ARE USED FOR CALCULATIONS OF DOSE THAT ARE PROPORTIONAL TO RADIOISOTOPE CONCENTRATIONS IN THE CLOUD, AND DOSE CONVERSION TABLES OBTAINED FROM A MODEL THAT CONSIDERS THE FINITE EXTENT OF THE OVERHEAD CLOUD, ALSO REQUIRED AS INPUT

DATA, ARE USED FOR CALCULATION OF WHOLE BODY DOSE DUE TO EXTERNAL GAMMA EMISSIONS IN THE CLOUD. A SET OF DOSE TABLES OBTAINED USING ONE FINITE CLOUD MODEL (EGAD) ARE PROVIDED IN THIS MANUAL. UP TO 20 RADIOISOTOPES CAN BE CONSIDERED IN A SINGLE PROBLEM. THE PROGRAM HAS BEEN WRITTEN TO BE USED TO EVALUATE ROUTINE RELEASES, BUT THE AUTHORS STATE THAT IT CAN BE USED, WITH LIMITATIONS, FOR ACCIDENTAL RELEASES, ESPECIALLY THOSE OF SEVERAL HOURS DURATION. ACTIVITY DENSITY ON THE GROUND IS CALCULATED AND PRINTED OUT, WHILE DOSES DUE TO GROUND DEPOSITION ARE CALCULATED.

<SIZE> 100 K STORAGE

<COMP> IBM

<CONFIG> IBM 370

<LANG> FORTRAN IV

<CLASS> SIMULATION-006, 127 PP., 1976

<723>

<CONT> MARTIN, J. A., JR.; FORBES, C.; NELSON, C. B.; COUSINS, P. D., JR.; CULLITON, W. A.

<TITLE> A COMPUTER CODE (RVRDOS) TO CALCULATE POPULATION DOSES FROM RADIOACTIVE LIQUID EFFLUENTS AND AN APPLICATION TO NUCLEAR POWER REACTORS ON THE MISSISSIPPI RIVER BASIN

<ACRO> RVRDOS

<ADDP> U.S. ENVIRONMENTAL PROTECTION AGENCY, OFFICE OF RADIATION PROGRAMS, ENVIRONMENTAL ANALYSIS DIVISION

<CITY> WASHINGTON

<STATE> DC

<ZIP> 20460

<DOC> ORP/EA-76

<ABST> A COMPUTER PROGRAM RVRDOS HAS BEEN DEVELOPED TO CALCULATE POPULATION DOSES DUE TO RELEASES OF RADIOISOTOPES INTO FLOWING STREAMS. CONCENTRATIONS OF THE RADIOISOTOPES DOWNSTREAM TAKE INTO ACCOUNT DILUTION, DECAY, AND THE GROWTH OF A DAUGHTER PRODUCT. POPULATION DOSES TO FOUR ORGANS ARE CALCULATED FOR DRINKING WATER AND FISH INGESTION PATHWAYS. INDIVIDUAL DOSES DUE TO SWIMMING MAY ALSO BE ESTIMATED. A PROGRAM MANUAL FOR RVRDOS IS INCLUDED IN THIS REPORT. RVRDOS HAS BEEN USED TO CALCULATE POPULATION DOSES DUE TO RELEASES FROM NUCLEAR POWER REACTORS ON THE MISSISSIPPI RIVER BASIN DURING 1973. THE DATA BASE FOR THESE CALCULATIONS AND A SUMMARY OF THE CALCULATIONS ARE DISCUSSED.

<GEO> MISSISSIPPI RIVER

<CLASS> SIMULATION-0, 86 PP., 1976

<722>

<CONT> MARTIN, J. A., JR.; NELSON, C. B.

<TITLE> CALCULATIONS OF DOSE AND POPULATION DOSE IN THE GENERAL ENVIRONMENT DUE TO

<722>

DOSEIMETRY AND HUMAN EFFECTS

<722> CONT.

BOILING-WATER NUCLEAR POWER REACTOR
RADIOISOTOPE EMISSIONS IN THE UNITED
STATES IN 1971

<ACRO> AIRPM

<ADDP> ENVIRONMENTAL PROTECTION AGENCY

<CITY> WASHINGTON

<STATE> DC

<DOC> PHYSICAL BEHAVIOR OF RADIOACTIVE
CONTAMINANTS IN THE ATMOSPHERE. HELD IN
VIENNA, AUSTRIA, NOVEMBER 12, 1973,
INTERNATIONAL ATOMIC ENERGY AGENCY;
PP.319-335, 1974; SEE STI/PUB--354;
CONF-731110

<ABST> AIRBORNE EMISSIONS OF RADIOISOTOPES
DURING 1971 REPORTED BY OPERATORS OF
THE BOILING-WATER NUCLEAR POWER
REACTORS IN THE UNITED STATES OF
AMERICA WERE ANALYZED TO CALCULATE
RESULTING DOSES IN THE GENERAL OFF-SITE
ENVIRONMENT. A RECENTLY DEVELOPED
COMPUTER PROGRAM (AIRPM) WAS USED TO
PERFORM THE CALCULATIONS. A
SECTOR-AVERAGED DIFFUSION EQUATION,
USING FACILITY-GENERATED ON-SITE ANNUAL
AVERAGE METEOROLOGY, WAS USED TO
PROPAGATE THE EMISSIONS FROM THE
RELEASE POINT OUT TO 80 KM. UP TO 700
M OF PLUME RISE WAS INCLUDED IN THE
EFFECTIVE HEIGHT OF RELEASE. THE AIRPM
CODE TAKES INTO ACCOUNT THE FINITE
EXTENT OF THE CLOUD, DECAY BY TIME OF
FLIGHT, FIRST DAUGHTER PRODUCT IN-GROWTH
AND GROUND DEPOSITIONS AND CLOUD
DEPLETION OF PARTICULATES AND HALOGENS.

<CLASS> SIMULATION

<723>

<CCNF> ROSEN, MICHAEL N.

<TITLE> ARGONNE STEADY STATE URANIUM
DISPERSION AND DOSEIMETRY CODE

<ACRO> UDAD

<ADDP> ARGONNE NATIONAL LABORATORY,
ENVIRONMENTAL IMPACT STUDIES DIVISION,
9700 S. CASS AVE.

<CITY> ARGONNE

<STATE> IL

<ZIP> 60439

<PHONE> PIS 972-3134

<DOC> ROSEN, MICHAEL N., YUCHEN YUAN, A.J.
TILLY, AND T. BRISSEL: 787 ARGONNE
STEADY-STATE URANIUM DISPERSION AND
DOSEIMETRY CODE -- VOLUME 1 (UDAD), ARL,
1978.; ROSEN, MICHAEL N., S.A. TILLY,
A.J. TILLY, AND Y. YUAN: THE ARGONNE
STEADY-STATE URANIUM DISPERSION AND
DOSEIMETRY CODE -- VOLUME 2, ARL, 1978

<SUB> DISPERSION OF RADIOACTIVITY FROM
URANIUM MINE AND RESULTING HEALTH
EFFECTS

<ABST> THE UDAD IS A COMPUTER CODE TO
CALCULATE AIRBORNE
CONCENTRATIONS, GROUND DEPOSITED
RADIOACTIVITY, DOSE RATES AND DOSES FROM
EMISSIONS FROM URANIUM MINING & MILLING
(VOL. 1) AND INDUCED HEALTH EFFECTS

(VOL. 2). THE ANNUAL AVERAGE
CONCENTRATIONS IN AIR ARE COMPUTED FROM
A SECTOR-AVERAGED GAUSSIAN DIFFUSION
EQUATION. THE CONCENTRATIONS IN AIR,
THE RADIOACTIVE CLOUD DEPLETION AND
DECAY, THE IN-GROWTH RADIOACTIVE
DAUGHTER PRODUCT CONCENTRATIONS AND
WORKING LEVELS, AND THE
GROUND-DEPOSITED ACTIVITIES ARE
COMPUTED FOR 16 WIND DIRECTIONS AND 15
DISTANCES UP TO A RADIUS OF 99 KM.
CONCENTRATIONS ARE ALSO COMPUTED FOR
SPECIFIED RECEPTOR POINTS. DOSE RATES
AND DOSES ARE COMPUTED FOR SELECTED
ORGANS ON THE BASIS OF THE
RECOMMENDATIONS OF THE ICRP II AND TASK
GROUPS. DOSE RATES FROM INHALATION OF
RADON DAUGHTERS ARE COMPUTED FROM
WORKING-LEVEL. HEALTH EFFECTS ARE
PREDICTED FROM COMPETITIVE MORTALITY
FROM RADIATION INDUCED, NATURALLY
INDUCED DEATH, ACCIDENTS AND
NON-RADIATION FORCES OF MORTALITY.

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE; PUNCHED CARDS

<SIZE> 5000 SOURCE STATEMENTS EACH 80 BYTES
LONG

<COMP> IBM

<CONFIG> IBM 370/195 OS/MVT WITH WITH 400K CORE

<LANG> FORTRAN; PL/1

<CHAR> EBCDIC

<ALGO> GAUSSIAN DISPERSION, FIRST ORDER
DIFFERENTIAL RELATIONSHIP FOR
TRANSPORT, PROBABILITY WEIGHTING

<CLASS> CONTINUOUS; DISCRETE; PREDICTIVE;
INTEGRATIVE

<APPL> FOR ESTIMATION OF RADIOLOGICAL AND
HEALTH EFFECTS FROM URANIUM MINING AND
MILLING OPERATIONS.

<USERS> ARGONNE NATIONAL LABORATORY; U.S.
NUCLEAR REGULATORY COMMISSION

<HVAL> CONCENTRATION OF AIRBORNE RADIOISOTOPES
MEASURED AT SELECTED SITES HAVE BEEN
COMPARED WITH PREDICTED CONCENTRATIONS
FROM UDAD CODE. SENSITIVITY ANALYSIS
HAS BEEN USED TO DETERMINE THE
IMPORTANCE OF THE VARIOUS COMPONENTS IN
THE DISPERSION CALCULATION.

<CON> THIS CODE HAS BEEN USED FOR U.S.
NUCLEAR REGULATORY COMMISSION (NRC),
FOR ESTIMATION OF RADIOLOGICAL IMPACTS
OF URANIUM MINING AND MILLING AND WAS
REVIEWED BY EPA. ALSO IT HAS BEEN THE
BASIS FOR GENERIC ENVIRONMENTAL IMPACT
STATEMENT OF URANIUM MILLING FOR NRC.

<UPDATE> 780703

<724>

<CONT> MOORE, B. E.

<TITLE> THE AIRDOS-II COMPUTER CODE FOR
ESTIMATING RADIATION DOSE TO MAN FROM
AIRBORNE RADIOISOTOPES IN AREAS
SURROUNDING NUCLEAR FACILITIES

<ACRO> AIRDOS-II

DOSEMETRY AND HUMAN EFFECTS

<724> CONT.
 <ADDR> OAK RIDGE NATIONAL LABORATORY, HEALTH AND SAFETY RESEARCH DIVISION, P.O. BOX 1
 <CITY> OAK RIDGE
 <STATE> TN
 <ZIP> 37830
 <PHONE> 615-483-0611 EXT 3-1368; PPS 850-1368
 <SOURCE> DEVELOPED AT ORNL
 <DOC> R.E. MOORE, THE AIRBOS-II COMPUTER CODE FOR ESTIMATING RADIATION DOSE TO MAN FROM AIRBORNE RADIONUCLIDES IN AREAS SURROUNDING NUCLEAR FACILITIES, ORNL-5245, APRIL 1977.
 <SUB> POLLUTANTS AND EFFLUENTS OF ENERGY PROCESSES; ENVIRONMENTAL AND ECOLOGICAL SYSTEMS
 <ABST> THE AIRBOS-II COMPUTED CODE ESTIMATES INDIVIDUAL AND POPULATION DOSES RESULTING FROM THE SIMULTANEOUS ATMOSPHERIC RELEASE OF AS MANY AS 36 RADIO-NUCLIDES FROM A NUCLEAR FACILITY. ATMOSPHERIC DISPERSION AND SURFACE DEPOSITION OF RELEASED RADIONUCLIDES ARE ESTIMATED AS A FUNCTION OF DIRECTION AND DISTANCE FROM A NUCLEAR POWER PLANT OR FUEL-CYCLE FACILITY, AND DOSES TO MAN THROUGH INHALATION, AIR INGESTION, EXPOSURE TO CONTAMINATED GROUND, FOOD INGESTION, AND WATER INGESTION ARE ESTIMATED IN THE SURROUNDING AREA. ANNUAL DOSES ARE ESTIMATED FOR TOTAL BODY, GI TRACT, BONE, THYROID, LUNGS, MUSCLE, KIDNEYS, LIVER, SPLEEN, TESTES, AND OVARIES. EITHER THE ANNUAL POPULATION DOSES (MAN-PERMS/YEAR) OR THE HIGHEST ANNUAL INDIVIDUAL DOSES IN THE ASSESSMENT AREA (PERMS/YEAR), WHICHEVER ARE APPLICABLE, ARE SUMMARIZED IN OUTPUT TABLES IN SEVERAL WAYS - BY NUCLIDES, MODES OF EXPOSURE, AND ORGANS. THE LOCATION OF THE HIGHEST INDIVIDUAL DOSES FOR EACH REPERENCE ORGAN ESTIMATED FOR THE AREA IS SPECIFIED IN THE OUTPUT DATA.
 <GEO> WITHIN A RADIUS OF 50 MILES OF ORNL
 <TIME> 1973-
 <STATUS> IN USE
 <ACCESS> UNLIMITED
 <COMP> IBM
 <LANG> FORTRAN IV
 <CLAS> PREDICTIVE; INTEGRATIVE
 <725>
 <CONT> MYERS, DAVID
 <TITLE> COMPUTATIONAL VERSION OF THE ICRP LONG MODEL
 <ACRO> AERIS
 <ADDR> LAWRENCE LIVERMORE LABORATORY, HAZARDS CONTROL, P.O. BOX 808
 <CITY> LIVERMORE
 <STATE> CA
 <ZIP> 94550
 <PHONE> 415-422-5143; PPS 532-5143
 <SOURCE> DEVELOPED AT LL
 <DOC> T. J. POWELL, D.S. MYERS, J.P. PADLAGRECO, G. MAGGIN, AERIS - A UCID-17606, 1976
 <SUB> ICRP LONG MODEL
 <ABST> THE COMPUTER PROGRAM AERIS IS A COMPUTATIONAL VERSION OF THE MODEL FOR THE BEHAVIOR OF INHALED RADIONUCLIDES DEVELOPED BY THE INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION (ICRP) TASK GROUP ON LONG DYNAMICS. TO THIS END, THE PROGRAM WILL COMPUTE AND PLOT THE BURDEN OF RADIOACTIVITY VERSUS TIME IN VARIOUS PORTIONS OF THE LUNG AND LYMPH NODES THAT RESULT FROM CHRONIC AND/OR ACUTE INHALATION OF A RADIONUCLIDE. IN ADDITION TO DESCRIBING THE BASIC ICRP LONG MODEL, THE PROGRAM HAS BEEN EXTENDED TO COMPUTE THE BURDEN OF INHALED PLUTONIUM DEPOSITED IN THE LIVER AND BONES THAT HAS BEEN TRANSPORTED THERE VIA THE LUNGS OR LYMPH NODES AND THE RATE OF PLUTONIUM EXCRETION VIA THE URINE AND FECES. FINALLY, THE PROGRAM WILL COMPUTE THE AVERAGE RADIATION DOSE DELIVERED TO EACH ORGAN BY THE INHALED RADIONUCLIDE.
 <STATUS> IN USE WEEKLY
 <ACCESS> UNLIMITED DISTRIBUTION
 <MEDIA> PUNCHED CARDS; MAGNETIC TAPE
 <SIZE> 1200 CARDS
 <COMP> CDC
 <CONFIG> CDC 7600; CDC 6600
 <LANG> LL'TRAN
 <CHAR> ASCII
 <CLAS> ANALYTICAL; PREDICTIVE
 <USERS> LL
 <SUB> ICRP
 <UPDATE> 780616
 <726>
 <CONT> NOT GIVEN
 <TITLE> MATHEMATICAL MODEL FOR RADIOLOGICAL IMPACT ANALYSIS
 <ADDR> POTOMAC ELECTRIC POWER COMPANY
 <CITY> WASHINGTON
 <STATE> DC
 <DOC> APPENDIX 5E, DOUGLAS POINT NUCLEAR GENERATING STATION UNITS 1 AND 2 ENVIRONMENTAL REPORT. 1973.
 <ABST> A MATHEMATICAL MODEL DEVELOPED TO ESTIMATE DISTRIBUTION OF RADIO- ACTIVE EFFLUENTS AND RESULTANT DOSES TO MAN AND OTHER ORGANISMS. MODEL IS DESCRIBED IN 3 PARTS: 1) DOSE TO MAN FROM ATMOSPHERIC EFFLUENTS FROM 3 YEARS OF EXPOSURE: DIRECT RADIATION, INGESTION AND INHALATION; 2) DOSE TO MAN FROM

<726>

DOSE RATE AND HUMAN EFFECTS

<726> CONT.

LIQUID EFFLUENTS, DIRECT RADIATION FROM WATER AND DEPOSITED RADIOACTIVE MATERIAL, AND INGESTION OF WATER OR FOOD; 3) DOSES TO ORGANISMS OTHER THAN MAN. DIFFERENT METHODS ARE EMPLOYED FOR AQUATIC AND TERRESTRIAL ORGANISMS. EACH CATEGORY IS ALSO REPRESENTED BY A SCHEMATIC CHART WITH ADDITIONAL CALCULATION DESCRIBED IN THE TEXT. REFERENCE INCLUDED.

<727>

<CONT> NOT GIVEN

<TITLE>

DOSES TO MAN FROM ATMOSPHERIC AND LIQUID EFFLUENTS

<REQD>

ROCHESTER GAS AND ELECTRIC CORPORATION

<CTRY>

ROCHESTER

<STATE>

NY

<DOC>

APPENDIX SP, STERLING POWER PROJECT NUCLEAR UNIT NO. 1 ENVIRONMENTAL REPORT, OCT. 1974.

<ABST>

A MATHEMATICAL MODEL DEVELOPED TO ESTIMATE ENVIRONMENTAL DISTRIBUTION OF ATMOSPHERIC AND LIQUID RADIOACTIVE EFFLUENTS AND RESULTANT DOSES TO MAN FROM STERLING POWER PROJECT NUCLEAR UNIT NO. 1 OPERATION. WITH REFERENCES.

<728>

<CONT> O'BRIEN, K.; SANNA, P. S.

<TITLE>

MODEL FOR ABSORBED DOSE RATES IN HUMANS FROM EXPOSURE TO ENVIRONMENTAL GAMMABAYS

<ACRO>

DISDOS

<ADDF>

U.S. ATOMIC ENERGY COMMISSION

<CTRY>

NEW YORK

<STATE>

NY

<ZIP>

10014

<PHONE>

212-620-3632

<DOC>

TRANSACTIONS AMERICAN NUCLEAR SOCIETY, 19, 479-480; HEALTH PHYSICS, 30, 71-78, 1970; HEALTH PHYSICS, 30, 107-112, 1970

<SUB>

HUMAN RADIATION DOSE

<ABST>

THE PROPAGATION OF ENVIRONMENTAL GAMMA RAYS THROUGH THE HUMAN BODY WAS ACCOUNTED FOR BY USING THE 3-D ROUTE-CABLE COMPUTER CODE, DISDOS, WHICH IS BASED ON THE MIRD PHANTOM. THE RADIATION FIELD WAS ASSUMED TO BE ISOTROPICALLY INCIDENT. THE CALCULATION WAS PERFORMED WITH THE AID OF DETERMINING THE DOSE TO THE BODY ORGANS WITH A STATISTICAL ACCURACY OF BETTER THAN 10%. OF THE 32 ORGANS AND GROUPS OF ORGANS TREATED BY DISDOS, THE POOREST STATISTICS WERE ASSOCIATED WITH THE CALCULATION OF DOSE TO THE OVARIES. THE MEAN ANNUAL ABSORBED DOSE TO THE GOALS IN THE UNITED STATES WAS CALCULATED TO BE ABOUT 32 MRAD/YR, AND TO THE RED HARBOR TO BE ABOUT 29 MRAD/YR.

<GEO>

UNITED STATES

<TIME>

CONTEMPORARY

<STATUS>

IN USE

<ACCESS>

UNLIMITED

<MEDIA>

PUNCHED CARDS; DISK FILE

<SIZE>

1,500 CARDS

<COMP>

CDC; IBR

<CONFIG>

IBR 360 WITH PUNCH OUTPUT, CDC 6400

<LANG>

FORTRAN IV

<CHAR>

BCD; EBCDIC

<ALSO>

ROUTE CABLE

<CLASS>

STOCHASTIC

<APPL>

BACKGROUND GAMMA-RAY DOSE TO U.S. HUMAN POPULATION

<USERS>

U.S. DEPARTMENT OF ENERGY

<UPDATE>

780429

<729>

<CONT> OTTER, J. W.; CONNERS, P. A.

<TITLE>

DESCRIPTION OF THE CONTAINMENT AND METEOROLOGY OF ENVIRONMENTAL RADIATION EXPOSURE (CONRAD-III) CODE

<ACRO>

CONRAD-III

<ADDF>

POUGHKEEPS INTERNATIONAL, ATOMICS INTERNATIONAL DIVISION, P.O. BOX 309

<CTRY>

CANOGA PARK

<STATE>

CA

<ZIP>

91304

<DOC>

TI-001-130-053, 22 PP., 1975

<ABST>

THE CONRAD-III (CONTAINMENT AND METEOROLOGY OF ENVIRONMENTAL RADIATION EXPOSURE) CODE IS DESCRIBED BRIEFLY. INPUT INSTRUCTIONS ARE GIVEN, AND TEST CASES AND FORTRAN CODING ARE LISTED. CHANGES FROM THE PREVIOUS VERSION (CONRAD-II) INCLUDE VARIABLE WEATHER MODELING FOR EXTERNAL DOSES, A DIRECT SITE METEOROLOGY OPTION, AND AN IMPROVED DIRECT DOSE FORMULATION. THE CODE WAS DEVELOPED FOR THE CALCULATION OF RADIOLOGICAL DOSES FROM HYPOTHETICAL POWER REACTOR ACCIDENTS. IT PERMITS THE USER TO ANALYZE AS MANY AS FOUR LEVELS OF CONTAINMENT WITH TIME VARYING LEAKAGE AND CLEANUP RATES IN EACH LEVEL. FILTRATION IN EACH CONTAINMENT REGION MAY BE BY ISOPTIC CLASS (POSSIBLE GAS, SOLIDS, OR HALOGENS). SHIELDING MAY BE INTRODUCED BETWEEN THE VARIOUS CONTAINMENT SHELLS. THE ENVIRONMENTAL DOSES CALCULATED INCLUDE THE DIRECT GAMMA DOSE FROM THE CONTAINMENT BUILDING, THE INTERNAL DOSES FROM UP TO 12 BODY ORGANS (THYROID, BONE, LUNG, ETC.) DUE TO INHALING THE AIRBORNE RADIOACTIVITY, AND THE EXTERNAL GAMMA AND BETA DOSES FROM THE CLOUD. LEAKAGE AND CLEANUP RATES, AND INITIAL INVENTORY ARE INPUT DATA. A DIRECT NUMERICAL TECHNIQUE, DESIGNED ESPECIALLY FOR QUASI-LINEAR DIFFERENTIAL EQUATIONS, IS USED TO SOLVE THE TIME DEPENDENT ISOTOPE

DOSE COMMITMENT AND HEALTH EFFECTS

<729> CONT.

POPULATION EQUATIONS. METEOROLOGY MODELS MAY BE THAT OF PASQUILL OR SIMP METEOROLOGY. FACTORS ARE GIVEN IN THIS DOCUMENT FOR CONVERTING INTERNAL DOSES WITH THE ICRP-2 MODEL. THE CLOUD GAMMA DOSE IS OBTAINED BY INTEGRATING OVER AN ANISOTROPIC GAUSSIAN CLOUD FOR PASQUILL METEOROLOGY OR FROM A SEMI-INFINITE CLOUD FOR DIRECT SIZE METEOROLOGY. THE EXTERNAL BETA DOSE CALCULATION ASSUMES A SEMI-INFINITE RADIOACTIVE CLOUD.

<730> DISCRETE; DETERMINISTIC; STOCHASTIC

<731> SUPERSEDED BY COMPADEN-IV

<732>

<733> RICHARDSON, L. C.

<734> USER'S MANUAL FOR THE PORTMAN VERSION OF RSAC: A RADIOLOGICAL SAFETY ANALYSIS COMPUTER PROGRAM

<735> RSAC

<736> PHILLIPS PETROLEUM COMPANY, ATOMIC ENERGY DIVISION, IDAHO OPERATIONS OFFICE

<737> IDO-17261, 136 PP., 1969

<738> THIS REPORT CONSTITUTES A USER'S MANUAL FOR THE PORTMAN VERSION OF THE RSAC COMPUTER CODE. THE MATHEMATICAL MODEL AND EQUATIONS ARE DESCRIBED IN IDO-17151, RSAC -- A RADIOLOGICAL SAFETY ANALYSIS COMPUTER PROGRAM, BY R.L. COOPER AND W.B. WORTON, DATED MAY 1964. THE PROGRAM COMPUTES THE POTENTIAL RADIOLOGICAL DOSES RESULTING FROM EITHER A CONTINUOUS OR INSTANTANEOUS RELEASE OF RADIOACTIVE FISSION PRODUCTS TO THE ATMOSPHERE. THE DOSES CONSIDERED ARE CLOUD GAMMA, DEPOSITION GAMMA, INGESTION, AND INHALATION. THEY ARE BASED UPON THE RELEASE OF UP TO 450 ISOTOPES, THE RELATIVE ABUNDANCE OF EACH ISOTOPE BEING DEPENDENT UPON THE OPERATING HISTORY OF THE NUCLEAR REACTOR UNDER CONSIDERATION. THE PROGRAM IS DIVIDED INTO THE FOLLOWING FIVE MAJOR CATEGORIES. (1) CYCLE -- THE FISSION PRODUCT INVENTORY GENERATED FOR A GIVEN SET OF REACTOR OPERATING CONDITIONS (2) CLOUD GAMMA DOSE -- THE EXTERNAL GAMMA DOSE RECEIVED AS A CONSEQUENCE OF EXPOSURE TO AIRBORNE RADIOACTIVE MATERIALS (3) DEPOSITION GAMMA DOSE -- THE EXTERNAL GAMMA DOSE RECEIVED AS A CONSEQUENCE OF EXPOSURE TO DEPOSITED FISSION PRODUCTS (4) INHALATION DOSE -- THE INTERNAL DOSE TO ONE OF NINE CRITICAL ORGANS RECEIVED AS A CONSEQUENCE OF INHALING AIRBORNE RADIOACTIVE MATERIALS, AND (5) INGESTION DOSE -- THE INTERNAL DOSE TO ONE OF NINE CRITICAL ORGANS RECEIVED AS A CONSEQUENCE OF INGESTING RADIOACTIVE MATERIALS. THIS REPORT CONSTITUTES A USER'S GUIDE FOR A LATER VERSION OF THE CODE WRITTEN FOR THE MOST PART IN PORTMAN IV FOR THE IBM 7090. WITH THE EXCEPTION OF INPUT OPTIONS, INPUT AND OUTPUT FORMAT CHANGES, THE ADDITION OF AN OPTION FOR CALCULATION OF THE HORIZONTAL AND VERTICAL DIFFUSION COEFFICIENTS USING PASQUILL'S PARAMETERS, AND THE INCLUSION OF BUILDING TURBULENCE EFFECTS, THIS VERSION IS THE SAME AS THE ORIGINAL (MACHINE LANGUAGE) VERSION. THE MATHEMATICAL MODELS AND CALCULATIONS ARE THE SAME AS DESCRIBED IN IDO-17151

AND ARE NOT DESCRIBED IN THIS REPORT.

<739> A USER-SUPPLIED MULTIPLIER IS NEEDED IN ORDER TO CONVERT THE INHALATION DOSE TO AN INGESTION DOSE.

<740>

<741> RIDER, J. L.; DEAL, S. K.

<742> A MODEL TO ESTIMATE THE LOCAL RADIATION DOSES TO MAN FROM THE ATMOSPHERIC RELEASE OF RADIONUCLIDES

<743> AIRWAY

<744> BETTIS ATOMIC POWER LABORATORY, P.O. BOX 79

<745> WEST HENRIS

<746> PA

<747> 15122

<748> 412-462-5000 EXT. 394; PTS 721-0394

<749> NATIONAL TECHNICAL INFORMATION SERVICE

<750> NADP-TR-1273, 30 PP.

<751> DOSE COMMITMENTS FROM RADIONUCLIDE RELEASES INTO ATMOSPHERE

<752> A MODEL WAS DEVELOPED TO ESTIMATE THE RADIATION DOSE COMMITMENTS RECEIVED BY PEOPLE IN THE VICINITY OF A FACILITY THAT RELEASES RADIONUCLIDES INTO THE ATMOSPHERE. THIS MODEL CONSIDERS DOSE COMMITMENTS RESULTING FROM INHALATION IN THE PLUME, INGESTION OF CONTAMINATED FOOD, INHALATION OF GASEOUS AND SUSPENDED RADIOACTIVITY, AND EXPOSURE TO GROUND DEPOSITS. THE DOSE COMMITMENTS FROM EACH OF THESE PATHWAYS IS EXPLICITLY CONSIDERED FOR EACH RADIONUCLIDE RELEASED INTO THE ATMOSPHERE AND FOR EACH DAUGHTER OF EACH RELEASED NUCLIDE. USING THE RELEASE RATE OF ONLY THE PARENT RADIONUCLIDE, THE ATM AND GROUND CONCENTRATIONS OF EACH DAUGHTER ARE CALCULATED FOR EACH POSITION OF INTEREST. THIS IS CONSIDERED TO BE A SIGNIFICANT IMPROVEMENT OVER OTHER MODELS IN WHICH THE CONCENTRATIONS OF DAUGHTER RADIONUCLIDES MUST BE APPROXIMATED BY SEPARATE RELEASES. (AUTH)

<753> IN USE

<754> UNLIMITED

<755> DISC; MAGNETIC TAPE; PUNCHED CARDS

<756> 5000 LINES

<757> CDC

<758> PORTMAN IV

<759> BINARY; BCD

<760> ENVIRONMENTAL IMPACT STATEMENTS; ERDA-1501; LIGHT AND HEAVY WATER BREEDERS

<761> U.S. DEPARTMENT OF ENERGY

<762> PARTIAL DOCUMENTATION

<763> 700711

<732>

POSTHEMOPHY AND HUMAN EFFECTS

<732>
 <CCN> SAVILOVIS, BRIAN J.
 <TITLE> DEPOSITION OF ELECTRO-AEROSOLS IN THE LUNG
 <ICN> DEAL
 <ADDP> WISCONSIN COLLEGE, CENTER OF ENGINEERING
 <CITY> CHRISTOP
 <STATE> WI
 <ZIP> 53013
 <PHONE> 215-545-5551
 <SUB> FINITE DIFFERENCE SIMULATION OF ELECTRO-AEROSOL DEPOSITION IN HUMAN LUNG DURING SINGLE BREATH
 <ABST> THIS MODEL USES WEIBEL'S MODEL TO DESCRIBE LUNG DEPOSITION DUE TO REFRACTION, SEDIMENTATION, DIFFUSION, SPACE CHARGE, AND IMAGE CHARGE. INPUT INCLUDES SPHERE SIZE AND SHAPE, PARTICLE DIAMETER(S), AND AVERAGE CHARGE PER PARTICLE. THE MODEL ALSO CALCULATES DEPOSITION FOR MAXIMUM CHARGE AND ESTIMATES DOMINANT DEPOSITION MECHANISM. OUTPUT IS REGIONAL AND TOTAL DEPOSITION.
 <STATUS> IN USE; UNDER REVISION
 <ACCESS> LIMITED
 <MEDIA> PUNCHED CARDS
 <SEED> 201 CARDS (WITHOUT COMMENTS)
 <COMP> IBM
 <CONFIG> 60 K
 <LANG> FORTRAN IV
 <ALGO> FINITE DIFFERENCE
 <CLAS> ANALYTICAL; PREDICTIVE; SIMULATION
 <APPL> USED IN DETERMINING AIR POLLUTION IMPACT; DOSE CURVES FOR AEROSOL THERAPY.
 <USERS> PERSONAL, FURTHER DEVELOPMENT UNDER NSF GRANT.
 <REAL> COMPARED TO LAB RESULTS
 <733>
 <CCN> STRENGE, DENNIS L.
 <TITLE> KRONIC
 <ADDP> BATTELLE-PACIFIC NORTHWEST LABORATORIES, POST OFFICE BOX 999
 <CITY> RICHLAND
 <STATE> WA
 <ZIP> 99352
 <PHONE> 509-942-4323; FTS 444-7511 EXT 942-4323
 <DOC> STRENGE, D.L. AND WATSON, E.C., KRONIC - A COMPUTER PROGRAM FOR CALCULATING ANNUAL AVERAGE EXTERNAL DOSES FROM CHRONIC ATMOSPHERIC RELEASES OF RADIOISOTOPES, BNWL-B-260, JUNE 1973.

<ABST> KRONIC IS A PROGRAM FOR CALCULATION OF ANNUAL AVERAGE BETA AND GAMMA RADIATION DOSES RESULTING FROM CHRONIC RELEASE OF RADIOISOTOPES TO THE ATMOSPHERE. DOSE CALCULATIONS ARE PERFORMED FOR EACH SECTOR ABOUT THE RELEASE POINT AND USE JOINT FREQUENCY DATA FOR ATMOSPHERIC STABILITY AND WIND SPEED FROM A SEPARATE FILE.

<STATUS> OPERATIONAL
 <ACCESS> UNLIMITED
 <MEDIA> DISC
 <COMP> IBM
 <LANG> FORTRAN
 <CHAR> ASCII
 <UPDATE> 700530

<734>
 <CCN> STRENGE, DENNIS L.
 <TITLE> SUBDOSA
 <ADDP> BATTELLE-PACIFIC NORTHWEST LABORATORIES, POST OFFICE BOX 999
 <CITY> RICHLAND
 <STATE> WA
 <ZIP> 99352
 <PHONE> 509-942-4323; FTS 444-7511 EXT 942-4323
 <DOC> STRENGE, WATSON AND HUSTON, SUBDOSA - A COMPUTER PROGRAM FOR CALCULATING EXTERNAL DOSES FROM ACCIDENTAL ATMOSPHERIC RELEASES OF RADIOISOTOPES, BNWL-B-351, JUNE 1975.

<ABST> SUBDOSA CALCULATES THE EXTERNAL DOSE TO HUMANS FOR SKIN, EYE, GONADS, AND TOTAL BODY RESULTING FROM ACCIDENTAL RELEASE OF RADIOISOTOPES TO THE ATMOSPHERE. DOSES ARE CALCULATED AS A FUNCTION OF QUANTITY RELEASED, DURATION OF RELEASE, ATMOSPHERIC CONDITIONS AT THE POINT OF RELEASE, AND HORIZONTAL DISTANCE FROM THE RELEASE POINT. BOTH GAMMA AND BETA DOSES ARE CALCULATED.

<STATUS> UNDERGOING CONVERSION
 <ACCESS> UNLIMITED
 <COMP> IBM
 <LANG> FORTRAN
 <CHAR> ASCII
 <UPDATE> 700530

<735>
 <CCN> STRENGE, DENNIS L.
 <TITLE> ESTIMATING HEALTH EFFECTS OF RADIOISOTOPES
 <ADDP> BATTELLE-PACIFIC NORTHWEST LABORATORIES, POST OFFICE BOX 999
 <CITY> RICHLAND

DOSEMETRY AND HEALTH EFFECTS

<735> CONT.
 <STATE> WA
 <CTRY> 99352
 <PHONE> 509-942-8323; FTS 444-7511 EXT 942-8323
 <DOC> STENGCE, DENNIS, AND KENNEDY, REDIQ - A COMPUTER PROGRAM FOR ESTIMATING HEALTH EFFECTS FROM INHALATION AND INGESTION OF RADIOISOTOPES, DREL-2110, DEC 1974.
 <ABST> REDIQ CALCULATES THE RISK EQUIVALENCE OF DOSEAGE FROM INTERNALLY DEPOSITED RADIOISOTOPES TO DOSEAGE FROM EXTERNAL WHOLE-BODY IRRADIATION. THE CODE USES THE ICRP TASK GROUP AS LONG ETHANICS MODEL FOR INHALATION, THE ICRP GASTROINTESTINAL TRACT MODEL, AND AN ENVIRONMENTAL ORGAN RETENTION MODEL.
 <STATUS> UNDERGOING CONVERSION
 <ACCESS> UNLIMITED
 <MEDIA> DISC
 <COMP> IBM
 <LANG> FORTRAN
 <CHAR> ASCII
 <UPDATE> 700531

<736>
 <CONT> STENGCE, DENNIS L.
 <TITLE> RADIATION DOSES TO POPULATIONS
 <ACRO> STEPOPA
 <ABST> BATTILLE-PACIFIC NORTHWEST LABORATORIES, POST OFFICE BOX 999
 <CTRY> RICHLAND
 <STATE> WA
 <CTRY> 99352
 <PHONE> 509-944-8323; FTS 444-7511 EXT 944-8323
 <ABST> SUBPOPA COMPUTES EXTERNAL RADIATION DOSES TO POPULATIONS DISTRIBUTED AROUND THE POINT OF AN ACUTE ACCIDENTAL RELEASE OF RADIOISOTOPES. DOSES ARE CALCULATED AS A FUNCTION OF QUANTITY RELEASED, DURATION OF RELEASE, ATMOSPHERIC CONDITIONS, AND DISTANCE FROM THE RELEASE POINT. BOTH GAMMA AND BETA DOSES ARE CALCULATED.
 <STATUS> UNDERGOING CONVERSION
 <ACCESS> UNLIMITED
 <MEDIA> DISC
 <COMP> IBM
 <LANG> FORTRAN
 <CHAR> ASCII
 <UPDATE> 700531

<737>
 <CONT> STENGCE, DENNIS L.
 <TITLE> INFO-REPORT GENERATOR

<ABST> BATTILLE-PACIFIC NORTHWEST LABORATORIES, POST OFFICE BOX 999
 <CTRY> RICHLAND
 <STATE> WA
 <CTRY> 99352
 <PHONE> 509-942-8323; FTS 444-7511 EXT 942-8323
 <SOURCE> GENERATED AT PNL
 <ABST> THIS PROGRAM USES PRECALCULATED FACTORS TO GENERATE OUTPUT REPORTS OF INDIVIDUAL AND/OR POPULATION DOSES.
 <STATUS> IN USE
 <ACCESS> LIMITED
 <MEDIA> CARDS
 <SIZE> 30K
 <COMP> IBM
 <LANG> FORTRAN
 <CHAR> ASCII
 <UPDATE> 700607

<738>
 <CONT> STENGCE, DENNIS L.
 <TITLE> COMMERCIAL WASTE MANAGEMENT REPORT GENERATOR
 <ACRO> CWM/INPREP
 <ABST> BATTILLE-PACIFIC NORTHWEST LABORATORIES, POST OFFICE BOX 999
 <CTRY> RICHLAND
 <STATE> WA
 <CTRY> 99352
 <PHONE> 509-942-8323; FTS 444-7511 EXT 942-8323
 <ABST> THE PROGRAM CWM GENERATES RESULT TABLES FOR DOSES FROM RELEASES OF RADIOISOTOPES FROM NUCLEAR FUEL CYCLE FACILITIES. INPUT INCLUDES SOURCE INVENTORY, RELEASE FRACTIONS AND DISPERSION PARAMETERS. THE PROGRAM INPREP IS AN INTERACTIVE PROGRAM TO GENERATE INPUT FOR CWM.
 <STATUS> IN USE
 <ACCESS> LIMITED
 <MEDIA> DISC; CARDS
 <SIZE> 150K FOR CWM; 30K FOR INPREP
 <COMP> IBM
 <LANG> FORTRAN
 <CHAR> BINARY; ASCII
 <UPDATE> 700607

<739>
 <CONT> STENGCE, DENNIS L.

<779>

POTENTIAL AND RYAN EFFECTS

<779> CONT.

<TITLE> CALCULATING ORGAN DOSE FROM
PACIFIC ISLAND

<ACRO> PACIS

<ADDR> BATTLE-PACIFIC NORTHWEST
LABORATORIES, POST OFFICE BOX 999

<CITY> RICHLAND

<STATE> WA

<ZIP> 99352

<PHONE> 509-942-4323; PIS 444-7511 EXT 942-4323

<DOC> ROBERTSON, J.P., STEWART, D.L., AND
WATSON, E.C., PACIS - A COMPUTER
PROGRAM FOR CALCULATING ORGAN DOSE FROM
ACUTE OR CHRONIC RADIOACTIVE
INHALATION, BWL-9-109, APRIL 1976.
STEWART, D.L., A COMPUTER PROGRAM FOR
CALCULATING ORGAN DOSE FROM ACUTE OR
CHRONIC RADIOACTIVE INHALATION;
NOTIFICATIONS FOR G.I. TRACT DOSE,
BWL-9-109, SUPP. (FEBRUARY, 1975).<ABST> PACIS CALCULATES EFFECTIVE RADIATION
DOSE TO THE RYAN RESPIRATORY TRACT AND
OTHER ORGANS RESULTING FROM THE
INHALATION OF RADIOACTIVE AEROSOLS,
USING THE ICRP TASK GROUP LUNG MODEL.
DISPERSION MODELS FOR CHRONIC OR ACUTE
ATMOSPHERIC RELEASE ARE INCLUDED.

<STATUS> OPERATIONAL

<ACCESS> UNLIMITED

<MEDIA> DISC

<COMP> IBM

<LANG> FORTRAN

<CHAR> ASCII

<UPDATE> 780530

<780>

<CONT> SWIFT, J. J.; HADDIN, J. H.; CALLEY, R.
W.<TITLE> POTENTIAL RADIOLOGICAL IMPACT OF
AIRBORNE RELEASES AND DIRECT GAMMA
RADIATION TO INDIVIDUALS LIVING NEAR
INACTIVE URANIUM MILL TAILINGS PILES<ADDR> ENVIRONMENTAL PROTECTION AGENCY, OFFICE
OF RADIATION PROGRAMS

<CITY> WASHINGTON

<STATE> DC

<DOC> EPA--520/1-76-001, 1976

<ABST> AS PART OF A PROGRAM TO DETERMINE WHICH
MEASURES TO USE TO CONTROL
RADIOACTIVITY FROM TAILINGS PILES AT
INACTIVE URANIUM MILLS, THE U. S.
ENVIRONMENTAL PROTECTION AGENCY HAS
PREPARED ESTIMATES OF THE POTENTIAL FOR
EXPOSURE TO RADIOACTIVITY PRESENTED BY
THOSE PILES. THE GAMMA RADIATION FIELD
AND THE RADON-222 RELEASE RATE ARE
ESTIMATED ON THE BASIS OF THE
RADON-226 CONCENTRATION IN EACH PILE.
POTENTIAL EXPOSURES TO AIRBORNE
PARTICULATE URANIUM, THORIUM 230 AND
RADON 226 ARE ESTIMATED FROM FIELD
MEASUREMENTS. DISPERSION OF AIRBORNEMATERIAL HAS CALCULATED WITH
ADAPTATIONS OF COMPUTER CODES WHICH USE
COMMON MODELS FOR ANNUAL-AVERAGE AND
SINGLE-FLUX DISPERSION.

<781>

<CONT> THURMANN, CRAIG L.

<TITLE> ISOTOPIC SAFEGUARDS TECHNIQUES

<ACRO> PISTY

<ADDR> BATTLE-PACIFIC NORTHWEST
LABORATORIES, POST OFFICE BOX 999

<CITY> RICHLAND

<STATE> WA

<ZIP> 99352

<PHONE> 509-942-4650; PIS 444-7511 EXT 942-4650

<SOURCE> PNL

<DOC> CHRISTENSEN, D.E., STEWART, E.B., AND
THURMANN, C.L., CONTINUATION OF THE
DEVELOPMENT AND APPLICATION OF ISOTOPIC
SAFEGUARDS TECHNIQUES TO CHEMICAL
REPROCESSING, ACR-714, US ARMS CONTROL
AND DISARMAMENT AGENCY, AUGUST 29, 1977.<ABST> THIS PROGRAM MANIPULATES ISOTOPIC DATA
TO BE USED IN ISOTOPIC SAFEGUARDS
TECHNIQUES. THE MANIPULATIONS ARE
MATHEMATICALLY FORMING ISOTOPIC
VARIABLES AND THEN FINDING VARIABLES TO
FORM LINEAR ISOTOPIC FUNCTIONS. A
GRAPHICAL PACKAGE IS INCLUDED TO PLOT
THESE FUNCTIONS. A STATISTICAL ROUTINE
WILL PERFORM A PAIRED CONFIDENCE
ANALYSIS OF DUPLICATE SAMPLE
MEASUREMENTS, AND A REGRESSION ANALYSIS
WILL PROVIDE IMPORTANT LINE FITTING
STATISTICS FOR EACH FUNCTION SUCH AS
SLOPE, INTERCEPT, VARIANCES, AND
OUTLIERS.

<STATUS> NEAR COMPLETION (JULY, 1978)

<ACCESS> LIMITED

<MEDIA> TAPE, CARDS

<SIZE> 65K

<COMP> IBM

<LANG> FORTRAN

<CHAR> ASCII

<CON> THIS PROGRAM SHOULD BE COMPLETED AND
SENT TO THE INTERNATIONAL ATOMIC ENERGY
AGENCY FOR USE IN THEIR ISOTOPIC
SAFEGUARDS PROGRAM IN JULY, 1978.

<UPDATE> 780612

<782>

<CONT> TURNER, W. D.

<TITLE> THE EXREN II COMPUTER CODE FOR
ESTIMATING EXTERNAL DOSES TO
POPULATIONS FROM CONSTRUCTION OF A SEA
LEVEL CANAL WITH NUCLEAR EXPLOSIVES

<ACRO> EXREN II

<ADDR> UNION CARBIDE CORPORATION, P.O. BOX 9

DOSE-EFFECT AND HUMAN EFFECTS

<782> COMP.

<CTRY> CAN RIDGE

<STATE> TN

<ZIP> 37830

<LOC> CTC-8, 91 PP. 1969

<ABST> EXFEN II IS A COMPUTER CODE TO ESTIMATE THE DOSE EQUIVALENT RATE AND THE TOTAL DOSE EQUIVALENT FROM BOTH BETA AND GAMMA IRRADIATION RESULTING FROM STEADY-STATE IN CONTAMINATED WATER, SUSPENSION IN CONTAMINATED AIR, AND EXPOSURE TO A CONTAMINATED SURFACE. THERE CAN BE MORE THAN ONE ENVIRONMENTAL RELEASE, AND EXPOSURE CAN BEGIN AT ANY TIME AFTER THE FIRST RELEASE. EXFEN II CONSIDERS CONTAMINANTS FROM ENVIRONMENTAL RELEASES AND FROM NUCLIDE CHAINS. FOR A PARTICULAR PROBLEM THE USER MAY CHOOSE TO CALCULATE EITHER THE DOSE RATES, OR THE TOTAL DOSES, OR BOTH FOR ANY OF THE THREE MODES OF EXPOSURE. A SEPARATE SOLUTION APPARATUS IS PRINTED FOR EACH MODE OF EXPOSURE.

<COM> THIS CODE HAS BEEN UPDATED BY EXFEN XII. EXFEN II HAS EVOLVED FROM EXFEN IV BY CONSIDERING NUCLIDE DECAY SOLVENTS.

<783>

<COMD> VOILLEQUE, PAUL G.

<TITLE> AEPIN, A CODE FOR ACUTE AEROSOL IRRADIATION EXPOSURE CALCULATIONS

<ACR> AEPIN

<ADD> SCIENCE APPLICATIONS, INC., 1025 EAST 16TH STREET

<CTRY> IDAHO FALLS

<STATE> ID

<ZIP> 83401

<FROM> 208-523-2611

<LOC> HEALTH PHYSICS, 19, 427-432, 1970

<SUB> INHALATION OF AEROSOLS

<ABST> AEPIN IS A FORTRAN IV PROGRAM WRITTEN TO SIMPLIFY THE APPLICATION OF EQUATIONS FOR COMPUTING THE ORGAN AND TISSUE BURDENS AND DOSES RESULTING FROM AN ACUTE INHALATION EXPOSURE TO A PARTICULATE AEROSOL. THE MODELS WHICH FORM THE BASIS FOR CALCULATIONS ARE (1) THE DEPOSITION AND CLEARANCE MODELS OF THE INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION (ICRP) TASK GROUP ON LUNG DYNAMICS, (2) THE GASTROINTESTINAL (GI) TRACT MODEL OF EVE (1966) AND (3) A SINGLE EXPONENTIAL MODEL FOR THE "CRITICAL" ORGANS AND TISSUES. THE FUNDAMENTAL DATA FOR THE RESPIRATORY AND GI TRACT MODELS ARE WRITTEN INTO THE PROGRAM. THE USER CAN SELECT SUITABLE DOSIMETRIC PARAMETERS FOR THE RESPIRATORY AND GI TRACT TISSUES, CHOOSE THE APPROPRIATE METABOLIC AND DOSIMETRIC QUANTITIES TO BE USED IN CALCULATIONS FOR THE "CRITICAL" ORGANS AND TISSUES, AND SPECIFY THE NUMBER OF COMPUTATIONS TO BE MADE AND THE TIME INTERVAL BETWEEN THEM. THE OUTPUT CONSISTS OF A COMPLETE LISTING OF THE ASSUMED

PARAMETERS AS WELL AS THE ORGAN AND TISSUE BURDENS AND DOSES AS FUNCTIONS OF TIME POST EXPOSURE.

<STATE> IN USE

<ACCESS> UNLIMITED

<MEDIA> PUNCHED CARDS

<COMP> IBM AND OTHERS ACCEPTING FORTRAN IV

<LANG> FORTRAN IV

<CRD> ASCII

<CLASS> PREDICTIVE

<APPL> SEE ABSTRACT

<USLCS> UNKNOWN

<UPDATE> 780714

<784>

<COMD> WALSH, P. J.

<TITLE> A CUMULATIVE HAZARD INDEX FOR ASSESSING LIMITING EXPOSURES TO ENVIRONMENTAL POLLUTANTS

<ACR> CUREX

<ADD> OAK RIDGE NATIONAL LABORATORY, HEALTH AND SAFETY RESEARCH DIVISION, P.O. BOX 1

<CTRY> OAK RIDGE

<STATE> TN

<ZIP> 37830

<PHONE> 615-883-0611 EXT 3-4239; FTS 950-0239

<SOURCE> DEVELOPED AT ORNL

<DOC> WALSH, P.J., KILLOUGH, G.G., PAPETKA, D.C., SCHUER, P.S., PAPP, E.N., WHITFIELD, B.I., MOON, P.S., BARIDON, P.J., CUREX - A CUMULATIVE HAZARD INDEX FOR ASSESSING LIMITING EXPOSURES TO ENVIRONMENTAL POLLUTANTS, ORNL-5263, APRIL 1977.

<SUB> POLLUTANTS AND EFFLUENTS OF ENERGY PROCESSES; HUMAN HEALTH, SONATIC AND GENETIC EFFECTS; ENVIRONMENTAL AND ECOLOGICAL SYSTEMS

<ABST> A HAZARD INDEX METHODOLOGY CALLED CUREX HAS BEEN DEVELOPED FOR LIMITING HUMAN EXPOSURE TO ENVIRONMENTAL POLLUTANTS. HAZARD INDEX IS DEFINED AS Q/QL WHERE Q IS EXPOSURE OR DOSE TO TOTAL-BODY, ORGAN OR TISSUE FROM ALL ENVIRONMENTAL PATHWAYS AND QL IS A LIMIT WHICH SHOULD NOT BE EXCEEDED BECAUSE OF HEALTH RISK TO HUMANS. MATHEMATICAL FORMULATIONS FOR HAZARD INDICES ARE DEVELOPED FOR EACH SAMPLING MEDIUM CORRESPONDING TO EACH EFFLUENT TYPE. THESE HAZARD INDICES ARE ACCUMULATED INTO COMPOSITE INDICES SUCH THAT TOTAL HUMAN INTAKE OR DOSE WOULD NOT EXCEED THE HEALTH RISK LIMIT. MATHEMATICAL FORMULATIONS FOR COMPOSITE HAZARD INDICES OR CUREX INDICES FOR MULTIPLE POLLUTANTS ARE PRESENTED. AN EXAMPLE CUREX APPLICATION TO CADMIUM RELEASE FROM A SHELTER COMPLEX IN EAST NELENA, MONTANA DEMONSTRATES DETAILS OF THE METHODOLOGY FOR A SINGLE POLLUTANT WHERE HUMAN INTAKE OCCURS THROUGH INHALATION AND

<706>

DOSIMETRY AND HUMAN EFFECTS

<706> CONT.
INVESTOR.

<GEN> GENERAL BUT SITE SPECIFIC

<YR> 1975-

<STAT> IN USE

<ACCS> UNLIMITED

<MEDI> TEXT

<SIZE> INVOLVES SEVERAL CODES AND HAND
CALCULATIONS

<COMPG> SINGLE CODE NOT YET IMPLEMENTED

<ALCS> VARIABLE, USES SEVERAL DIFFERENT MODELS
AND HAND CALCULATIONS

<CTRY> PRACTICE

<APPL> GENERAL ASSESSMENT METHODOLOGY

<75CM> DEPARTMENT OF ENERGY

<SPD> VARIABLE

<MVAL> REFERENCE ON MODELS INCORPORATED INTO
CODE<CON> WHEN INVOLVES USING SEVERAL EXISTING
CODES AND HAND CALCULATIONS.

<UPDR> 706560

<706>

<COM> WENZEL, D. P.

<TITLE> A COMPUTER CODE TO CALCULATE DOSES
RESULTING FROM RELEASES OF
RADIOISOTOPES TO THE ATMOSPHERE

<ACRO> RSAC; PSAC-2

<ABDD> ALLIED CHEMICAL CORPORATION

<CTRY> IDAHO FALLS

<STATE> ID

<ZIP> 83401

<DOC> CONF-740792; PROCEEDINGS OF THE 19TH
ANNUAL MEETING OF THE HEALTH PHYSICS
SOCIETY, HELD IN HOUSTON, TEXAS, JULY
7-11, 1974<ABST> THE RADIOLOGICAL SAFETY ANALYSIS
COMPUTER CODE (RSAC) IS USED TO
CALCULATE THE RADIOLOGICAL CONSEQUENCES
OF THE RELEASE OF RADIOISOTOPES TO THE
ATMOSPHERE. A REVISED VERSION OF THE
CODE, PSAC-2, CAN BE USED TO CALCULATE
(1) FISSION PRODUCT INVENTORY SOURCE
TERMS, (2) LUNG DOSES USING EITHER THE
CLEARANCE MODEL DEVELOPED BY THE ICRP
TASK GROUP ON LUNG DYNAMICS OR THE ICRP
COMMITTEE II MODEL, (3)
GASTROINTESTINAL TRACT DOSES USING
EITHER THE MODEL DEVELOPED BY DOLPHIN
AND EVE OR THE ICRP COMMITTEE II MODEL,
(4) DOSES TO VARIOUS INTERNAL ORGANS
USING RECOMMENDATIONS OF THE ICRP
COMMITTEE II, (5) GROUND
DEPOSITION-GAMMA DOSES, AND (6)
CLOUD-GAMMA DOSES USING EITHER A
"FINITE" CLOUD OR THE "SEMI-INFINITE"
CLOUD MODEL. PSAC-2 IS A VERSATILE CODE
WRITTEN IN FORTRAN IV FOR THE IBM
360/75 COMPUTER. SIGNIFICANT FEATURES
AND TYPICAL RESULTS OF THE CODE ARE

PRESENTED.

<COMP> IBM

<COMPG> IBM 360/75

<LANG> FORTRAN IV

<706>

<COM> WILLIAMSON, FRANK S.

<TITLE> A ROUTE CABLE CODE WITH SUPPORT
PROGRAMS FOR DOSE COMPUTATION

<ACRO> BIN130

<ABDD> ARGONNE NATIONAL LABORATORY, BIOLOGICAL
AND MEDICAL RESEARCH DIVISION, 9700 S.
CASS AVE.

<CTRY> ARGONNE

<STATE> IL

<ZIP> 60439

<PROJ> PTS 972-3064

<SOURCE> H. A. FRIGERIO (PTS-972-3210); ARGONNE
NATIONAL LABORATORY; ARGONNE, IL. 60439<DOC> FRIGERIO, H.A., AND H.N. BRANSON,
BIN130. A COMPUTER PROGRAM FOR
NEUTRON-GAMMA RADIOBIOLOGY, ANL-7409,
PP. 243-247, 1967; FRIGERIO, H.A., AND
P.P. COLEY, COMPUTED GAMMA DOSE
DISTRIBUTIONS IN MAN-LIKE PHANTOMS,
AMER. ASSN. PHYSICS MED. QUART. BULL.
4, P. 66, 1970; FRIGERIO, H.A., P.P.
COLEY, AND H.N. BRANSON, DEPTH DOSE
DETERMINATIONS. II. A ROUTE CABLE
PROGRAM AND A STANDARD MAN PHANTOM FOR
NEUTRON AND GAMMA COMPUTATIONS, PHYS.
MED. BIOL. 18 53-63, 1973; FRIGERIO,
H.A., AND P.P. COLEY, DEPTH DOSE
DETERMINATIONS. III. STANDARD MAN
PHANTOM AND VARIOUS GAMMA SOURCES,
PHYS. MED. BIOL. 18, 187-194, 1973<ABST> BIN130 IS A COMPUTED ANALOGUE ROUTE
CABLE PROGRAM FOR THE DETAILED
COMPUTATION OF NEUTRON-PROTON
INTERACTIONS WITH MATTER TO AT LEAST 15
MEV. 45 REGIONS, OF ANY COMPOSITION
CHOSEN FROM 15 ELEMENTS, MAY BE
SPECIFIED, OF ANY SIZE, INTERRELATION,
AND SHAPE EXPRESSIBLE AS ALGEBRAIC
FUNCTIONS. SIMILARLY, A VARIETY OF
SOURCES MAY BE INCLUDED. THE PROGRAM
USES AVAILABLE DATA FOR THE
CALCULATIONS, AND WITH STORAGE AND
OUTPUT FACILITIES GIVES NEUTRON,
PHOTON, AND LET SPECTRA AS WELL AS
N/GAMMA DOSE SPECTRA FOR EACH REGION,
AND DOSES DEPOSITED IN 193608 AND
19360800 HISTOGRAMS. TWO GEOMETRIC
DESCRIPTIONS OF A STANDARD MAN ARE
PROPOSED. THE RESULTS DIFFER MATERIALLY
IN MANY REGIONS, FROM THOSE PREVIOUSLY
OBTAINED WITH THE SIMPLE, SYMMETRIC,
HOMOGENEOUS SOLIDS USED AS HUMAN
PHANTOMS.

<STATUS> CODE RETAINED - NO LONGER SUPPORTED

<ACCESS> LIMITED

<MEDIA> MAGNETIC TAPE; TEXT; PUNCHED CARDS

<SIZE> 500K WITHOUT TAPE OUTPUT; 720K WITH
TAPE OUTPUT

<COMP> IBM

DOSE METRIC AND HUMAN EFFECTS

<786> CONT.

<CONTR> IBM 360/75 OR 370/195 OS/VS2 WITH 500K 09 WITH 720K AND A 9-TRACK TAPE DRIVE

<LANG> PL/1

<CHAP> PRCBIC

<ALGO> (1) THE MAXWELL-BOLTZMANN EQUATION FOR VELOCITY AS A FUNCTION OF TEMPERATURE. (2) THE WATTS-MULE FISSION SPECTRUM FOR U-235 FISSION NEUTRONS. (3) THE DOOSBOD APPROXIMATION FOR EFFECTIVE CROSS SECTIONS OF BOUND HYDROGEN AT LOW NEUTRON ENERGIES. (4) THE KLEIN-FISHMAN EXPRESSION FOR COMPTON EVENTS.

<CLASS> DISCRETE; DETERMINISTIC; ANALYTICAL; PREDICTIVE; SIMULATION

<APPL> ANY PROBLEM INVOLVING NEUTRON AND/OR PHOTON TRANSPORT, ESPECIALLY IN REAL SPACE, E.G. SHIELDING, DOSIMETRY, THERAPY, SPECTROMETRY.

<USERS> NATIONAL BUREAU OF STANDARDS; COMMONWEALTH BRISON CO.; ARCONUE NATIONAL LABORATORY

<SUB> ANY SET OF NEUTRON/PHOTON CROSS SECTIONS, E.G. ENDFB, CIBBA, WGS29, ETC.

<NVAL> SEE DOCUMENTATION

<CON> BIR HAS LOST THE EXPERTISE IN USING AND SUPPORTING THIS CODE DUE TO STAFF TERMINATION. CODE AND LISTINGS ARE RETAINED BUT ANY EFFORT TO USE IT WOULD INVOLVE PROLONGED STUDY.

<990000> 780763

<787>

<CONTR> WITHERSPON, J. P.

<TITLE> A SYSTEMS ANALYSIS METHODOLOGY FOR PREDICTING DOSE TO MAN FROM A RADIOACTIVELY CONTAMINATED TERRESTRIAL ENVIRONMENT

<ACRO> TEPHOD

<ADDR> OAK RIDGE NATIONAL LABORATORY, HEALTH AND SAFETY RESEARCH DIVISION, P.O. BOX 1

<CI> OAK RIDGE

<STAT> TN

<ZIP> 37830

<PHONE> 615-483-8611 EXT 3-6740; PPS 850-6740

<SOURCE> DEVELOPED AT ORNL

<DOC> BOOTH, R.S., KAYE, S.V., ROWEN, P.S., A SYSTEMS ANALYSIS METHODOLOGY FOR PREDICTING DOSE TO MAN FROM A RADIOACTIVELY CONTAMINATED TERRESTRIAL ENVIRONMENT, ENVIRONMENTAL SCIENCES DIVISION PUB. 8 546, 1971; A SYSTEMS ANALYSIS METHODOLOGY FOR PREDICTING DOSE TO MAN FROM A RADIOACTIVELY CONTAMINATED TERRESTRIAL ENVIRONMENT, PROC. THIRD SYMPOSIUM ON RADIOECOLOGY, HELD IN OAK RIDGE, TENNESSEE, MAY 10-12, 1971, AEC-CONF-710501; BOOTH, R.S., KAYE, S.V., A PRELIMINARY TRANSFER TO MAN FROM DEPOSITION IN A TERRESTRIAL ENVIRONMENT, ORNL-TN-3135, OCTOBER 1971.

<SUB> POLLUTANTS AND EFFLUENTS OF ENERGY

PROCESSES, HUMAN HEALTH, SOMATIC AND GENETIC EFFECTS, AND ENVIRONMENTAL AND ECOLOGICAL SYSTEMS.

<ABST> A SYSTEMS ANALYSIS METHODOLOGY HAS BEEN DEVELOPED TO PREDICT INTAKES BY MAN, ESTIMATE DOSE COMMITMENTS, AND IDENTIFY "CRITICAL" EXPOSURE PATHWAYS RESULTING FROM RADIOACTIVITY RELEASES TO A TERRESTRIAL ENVIRONMENT. A MATHEMATICAL MODEL WAS CONSTRUCTED SIMULATING SELECTED TERRESTRIAL PATHWAYS BY WHICH FALLOUT RADIOACTIVITY CAN BE TRANSFERRED ULTIMATELY TO MAN. THIS MODEL IS INTENDED FOR PRELIMINARY PREDICTIONS OF RADIOISOTOPE INTAKES BY MAN THROUGH CONSUMPTION OF MILK, BEEF, AND PLANT PARTS CONTAMINATED DIRECTLY BY FALLOUT AS WELL AS BY UPTAKE FROM THE SOIL. DIFFERENTIAL EQUATIONS WERE WRITTEN DESCRIBING THE RADIOISOTOPE TRANSFERS, AND THE PARAMETERS REQUIRED TO IMPLEMENT THESE EQUATIONS WERE DERIVED. IN VERIFICATION TESTS, MODEL PREDICTIONS OF CESIUM 137 CONCENTRATIONS IN ENVIRONMENTAL COMPARTMENTS AGREED WITHIN A FACTOR OF 2 WITH EXPERIMENTAL DATA. MORE EXTENSIVE VERIFICATION STUDIES INVOLVING OTHER RADIOISOTOPES ARE NEEDED. THE INTAKE RATES AND TOTAL INTAKES OF SEVEN SAMPLE RADIOISOTOPES WERE PREDICTED FOR A "REFERENCE" MAN BASED ON A HYPOTHETICAL FALLOUT OF 1 PCI/CM2 OF EACH RADIOISOTOPE. THESE PREDICTED INTAKES WERE USED AS INPUT TO AN INTERNAL DOSIMETRY MODEL WHICH CALCULATED DOSE COMMITMENTS FOR EACH RADIOISOTOPE AND PATHWAY. THE RESULTS OF THESE CALCULATIONS ARE DISCUSSED IN RELATION TO INDIVIDUAL RADIOISOTOPE CONTRIBUTIONS TO DOSE COMMITMENT. THIS GENERALIZED FOOD-CHAIN MODEL IS SUFFICIENTLY VERSATILE THAT IT CAN BE APPLIED TO MANY TERRESTRIAL ENVIRONMENTS AND TO ALL RADIOISOTOPES. THIS FIRST VERSION OF THE MODEL IS EXPECTED TO UNDERGO FUTURE REFINEMENTS.

<GPO> UNITED STATES

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> DISC

<SIZE> LESS THAN 100,000 BYTES

<COMP> DEC

<CONFIG> DEVELOPED AND IMPLEMENTED ON DEC SYSTEM 10, CPU KA10, 96K WORDS (36 BIT WORDS)

<LANG> BASIC (CONVERSATIONAL FOR REMOTE TERMINAL USE)

<CHAP> ASCII

<ALGO> LINEAR PROGRAMMING, COUPLED COMPARTMENT

<CLASS> PREDICTIVE

<APPL> INTAKE OF RADIOACTIVITY VIA TERRESTRIAL FOOD-CHAIN

<USERS> ORNL, NRC, EPA

<SUB> MULTIPLE, LITERATURE ON MOVEMENT OF RADIOISOTOPES IN AGRICULTURAL SYSTEMS

<NVAL> MODEL HAS BEEN VALIDATED FOR SEVERAL RADIOISOTOPES

<CON> MODEL IS USED AS A SUBROUTINE IN AIRBOS

<707>

POSITIVITY AND HUMAN EFFECTS

<707> CONT.
II

<REFNO> 780424

<709>

<CCS> W296, F.

<TITLE> A FORTRAN PROGRAM TO DETERMINE ABSORBED
ORGAN DOSE DUE TO INHALATION OF
RADIOISOTOPES<ADDR> U.S. NAVAL RADIOLOGICAL DEFENSE
LABORATORY

<CITY> SAN FRANCISCO

<STATE> CA

<ZIP> 94135

<DOC> NSRPRL-TR-67-7, 106 PP., 1967

<ABST> A FORTRAN COMPUTER PROGRAM HAS BEEN
DEVELOPED TO DETERMINE THE MAXIMUM
INTERNAL DOSE RECEIVED BY A GIVEN BODY
ORGAN AS A RESULT OF INHALATION OF
SPECIFIC RADIOISOTOPES. THE PROGRAM,

BASED UPON EQUATIONS REPORTED IN THE
LITERATURE, DETERMINES THE EFFECTIVE
ENERGY ABSORBED BY THE BODY ORGAN PER
DISINTEGRATION OF THE RADIOISOTOPE, AND
COMPUTES THE ABSORBED ORGAN DOSE FOR
VARIOUS PERIODS OF INTAKE FOR SINGLE OR
CONTINUOUS RELEASE AND FOR OR- VARIOUS
PERIODS OF INTERNAL EXPOSURE. THE
ORGAN DOSE INCLUDES EFFECTS FROM ALL
DESCENDANTS OF THE ISOTOPE ORIGINALLY
CONSIDERED TO HAVE ENTERED THE BODY
ORGAN. TABULATED RESULTS FOR 133
RADIOISOTOPES AND THEIR CONTRIBUTIONS
TO THE DOSE TO SEVEN BODY ORGANS AND
THE WHOLE BODY ARE PRESENTED. INPUT TO
THE FORTRAN COMPUTER PROGRAM MAY BE
MODIFIED TO YIELD RESULTS FOR OTHER
RADIOISOTOPES OR BODY ORGANS. THE
COMPUTER PROGRAM MAY ALSO BE USED TO
DETERMINE (BY SUMMING) THE TOTAL
ABSORBED ORGAN DOSE FOR A MIXTURE OF
FISSION PRODUCTS IF THE CONCENTRATION
IN AIR OF EACH MAJOR CONTRIBUTOR AT
INITIAL INTAKE TIME IS KNOWN.

<LANG> FORTRAN

ANIMAL EFFECTS

- <709>
<CON> BRASLAV, A. H.; EIR, E. H.
<TITLE> TECHNIQUES FOR PREDICTING ENTRAINMENT AND IMPINGEMENT AT POWER PLANTS
<ADD> UNIVERSITY TENNESSEE, OFFICE OF THE VICE CHANCELLOR FOR GRADUATE STUDIES AND RESEARCH
<CITY> KNOXVILLE
<STATE> TN
<ZIP> 37916
<PHONE> 615-978-3205
<ABST> ENTRAINMENT, IMPINGEMENT, AND ENTRAPMENT LOSSES CANNOT BE ADEQUATELY PREDICTED PRIOR TO OPERATION OF POWER PLANTS UTILIZING EXISTING ANALYTICAL TECHNIQUES. SUCH LOSSES ARE CONSIDERED TO BE THE MOST SERIOUS IMPACT BY POWER PLANTS ON FISHERY RESOURCES. (1) A REPORT PRESENTING A SYNTHESIS OF THE LITERATURE OF EXISTING METHODOLOGIES AND MODELS RELATING TO THE DEVELOPMENT OF THIS MODEL. (2) A REPORT PRESENTING THE MODELS WITH DOCUMENTATION. (3) A DOCUMENT PRESENTING TECHNIQUES FOR OBTAINING MODEL INPUT.
<TIME> 76/2/17-78/2/17
<CLASS> PREDICTIVE
- <750>
<CON> GODDARD, A. J. H.; HOLMES, R. E.; APFIMON, H.
<TITLE> COMPUTATION AND MAPPING OF THE DISPERSION AND SEDIMENT UPTAKE OF GASEOUS EFFLUENTS FROM INDUSTRIAL PLANTS
<DOC> POLLUTION, ENGINEERING AND SCIENTIFIC SOLUTIONS, PLENUM PRESS (NY) 1973, PP. 548-563.
<ABST> A SUITE OF COMPUTER ROUTINES ARE DESCRIBED WHICH WILL ENABLE RAPID COMPUTATION OF AIR CONTAMINATION DOWNWIND FROM COMPLEX RELEASE PATTERNS. ROUTINES EXIST WHICH BY ISOPLETHS OF GROUND LEVEL AIR CONCENTRATION AVERAGED OVER VARYING TIME INTERVALS ARE AUTOMATICALLY PLOTTED FOR RAPID APPRAISAL. IN ADDITION, INTEGRATED AIR CONCENTRATIONS CAN BE PREDICTED FOR SPECIFIED LOCATIONS, SUCH AS AIR SAMPLING STATIONS, AND THESE RESULTS PRINTED OUT. FURTHER ROUTINES COMPUTE THE LEVELS OF CONTAMINATION WITHIN PLANT AND ANIMAL SPECIES AS A FUNCTION OF TIME DURING THE EXPOSURE. AN ILLUSTRATION OF THE APPLICATION OF THESE ROUTINES IS PRESENTED, USING THE RELEASE OF FLUORIDES FROM ALUMINUM SMELTING AS THE EXAMPLE.
<CLASS> PREDICTIVE
- <751>
<CON> HALFON, E.; BARGHAUD, E. E.
<TITLE> SYSTEM IDENTIFICATION OF RADIOISOTOPE FLOWS IN AQUATIC MICROCOSMS
<ADD> UNIVERSITY OF GEORGIA
<CITY> ATHENS
- <STATD> GA
<DOC> CUSHING, C.E., JR. (ED.), FOURTH NATIONAL SYMPOSIUM ON RADIOECOLOGY HELD IN CORVALLIS, OREGON, MAY 12, 1975.
<ABST> A SYSTEM IDENTIFICATION PROCEDURE FOR A SIX ORDERED LINEAR STATE SPACE MODEL HAS BEEN DEVELOPED. ITS MAIN PURPOSE IS TO FIND THE STRUCTURE AND ESTIMATE THE TRANSFER PARAMETERS OF A MATHEMATICAL MODEL, GIVEN NOISY STATE OBSERVATIONS OF A PULSE RESPONSE. SUCH PROCEDURE HAS BEEN USED TO UNDERSTAND THE BEHAVIOR OF SSOP 137CS IN AQUATIC MICROCOSMS.
<CLASS> PREDICTIVE
- <752>
<CON> HALL, C. A. S.
<TITLE> MODELS AND THE DECISION MAKING PROCESS: THE HUDSON RIVER POWER PLANT CASE
<ADD> CORNELL UNIVERSITY, DEPARTMENT OF ECOLOGY AND SYSTEMATICS
<CITY> ITHACA
<STATE> NY
<ZIP> 14850
<PHONE> 617-256-6503
<DOC> C. HALL AND J. DAY (EDS.), ECOSYSTEM MODELING IN THEORY AND PRACTICE, WILEY INTERSCIENCE, 305-360
<SUB> ENTRAINMENT
<ABST> ESTUARIES HAVE BEEN A CONVENIENT AND ECONOMICAL LOCATION FOR SITING NEW POWER PLANTS, SINCE ABOUT HALF OF OUR NATION'S LARGEST CITIES ARE LOCATED ON OR NEAR ESTUARIES. THE HUDSON RIVER IS AN IMPORTANT SPawning GROUND FOR AN IMPORTANT FISH: THE STRIPED BASS. COMPUTER MODELS WERE AN IMPORTANT PART OF THE ANALYSIS OF THE POTENTIAL EFFECTS OF THE HUDSON RIVER POWER PLANTS ON THE STRIPED BASS, AND IN THE MANY COMPLICATED INTERACTIONS THAT TOOK PLACE AS MODEL BUILDERS OF DIFFERENT PERSUASIONS INTERACTED WITH THE DECISION MAKING PROCESS. THE BIOTIC SIGNIFICANCE OF ESTUARIES, THE LIFE HISTORY OF THE HUDSON RIVER STRIPED BASS, THE HUDSON RIVER AND ITS POWER PLANTS WERE TRANSLATED INTO A COMPUTER MODEL. THE COMPUTER RESULTS INFLUENCED THE INDUSTRIAL AND POLITICAL DECISIONS THAT WERE MADE IN THE HUDSON REGION.
<GEO> NEW YORK, HUDSON RIVER AREA
<TIME> 1960's-1970's
<STATUS> IN USE
<ACCESS> UNLIMITED; AT COST
<MEDIA> PUNCHED CARDS
<SIZE> 500 CARDS
<COMP> IBM
<COPIES> 130 R
<LANG> PORTMAN

<752>

RISAL EFFECTS

<752> CONT.

<CLAS> PREDICTIVE

<APPL> GENERAL MODEL OF ENTRAINMENT IMPACT

<SUB> VARIOUS FIELD STUDIES

<UNCL> GRAPHICAL U.S. DATA

<CON> MORE RECENT UPDATES ARE AVAILABLE.

<UPDATE> 78C809

<753>

<CONT> BESS, C. T.; SMITH, C. W.; PRICE, A. W.

<TITLE> MATHEMATICAL MODEL OF THE ACCUMULATION OF RADIOISOTOPES BY OYSTERS (C. VIRGINICA) AQUACULTURED IN THE EFFLUENT OF A NUCLEAR POWER REACTOR TO INCLUDE MAJOR BIOLOGICAL PARAMETERS

<ADDR> UNIVERSITY OF MAINE

<CITY> OPOUN

<STATE> ME

<DOC> HEALTH PHYSICS, 33(2), 121-130, 1977

<ABST> THE UPTAKE, ACCUMULATION AND LOSS OF RADIOISOTOPES BY THE AMERICAN OYSTER (C. VIRGINICA) AQUACULTURED IN THE EFFLUENT OF A NUCLEAR POWER REACTOR HAS BEEN MEASURED MONTHLY FOR 3 YR AT FOUR FIELD STATIONS IN THE MOUNTWAS ESTUARY OF THE SHEEPSHOTT RIVER AND AT A CONTROL STATION IN THE DEARBY BANABISCOTTA RIVER ESTUARY, SOUTHERN CENTRAL COASTAL MAINE, U.S.A. A MATHEMATICAL MODEL FOR THE TIME VARIATION OF THE SPECIFIC ACTIVITY OF THE OYSTERS HAS BEEN DEVELOPED TO INCLUDE THE PHYSICAL HALF-LIVES OF THE VARIOUS RADIOISOTOPES, THE BIOLOGICAL HALF-LIVES OF THE VARIOUS RADIOISOTOPES (BIOLOGICAL DEGRADATION), THE WATER TEMPERATURE (OYSTER HIBERNATION) AND SHELL GROWTH. THE RESULTING FIRST ORDER LINEAR DIFFERENTIAL EQUATION INCORPORATING THESE PHENOMENA IS DRIVEN BY THE LIQUID RADIOISOTOPE EFFLUENT RELEASE OF THE MAINE YADDER NUCLEAR REACTOR. COMPARISON OF THE MONTHLY MEASUREMENTS OF THE SPECIFIC ACTIVITY FOR CO-58, CO-60, RU-98, CS-130 AND CS-137 IN OYSTERS WITH MODEL CALCULATIONS SHOW CLOSE AGREEMENT OVER ALL RANGES OF VARIATION OBSERVED. A SPECIAL FEATURE OF THIS MATHEMATICAL MODEL IS ITS ABILITY TO DESCRIBE THE NON-CHROMOSTATIC FIELD SITUATION.

<GEO> MAINE, BANABISCOTTA RIVER; MAINE, SHEEPSHOTT RIVER

<CLAS> PREDICTIVE

<754>

<CONT> HETTING, L. J.; AALTO, JOHAN A.; JAWORSKI, ROBERT A.; LEAH, DONALD W., JR.

<TITLE> THE POTOMAC ESTUARY MATHEMATICAL MODEL

<ABST> A SYSTEMS ANALYSIS APPROACH HAS BEEN OVERVIEWED IN INVESTIGATING THE WATER QUALITY RESPONSES IN THE POTOMAC RIVER BASIN. THE ANALYSIS INCLUDED THE EFFECTS OF LOW FLOW AUGMENTATION, WASTEWATER DIVERSIONS, WATER SUPPLY

VITROPHALS, AND INCREASED DEGREES OF WASTEWATER TREATMENT ON WATER QUALITY IN THE UPPER ESTUARY. SEVERAL TECHNIQUES OR MATHEMATICAL MODELS CAPABLE OF SIMULATING THE RESPONSE OF WATER QUALITY IN AN ESTUARY WERE AVAILABLE WHEN THE STUDY OF THE POTOMAC ESTUARY WAS UNDERTAKEN IN 1965. AFTER AN INVESTIGATION OF THE MODELING SYSTEMS AVAILABLE, THE SEGMENTED ESTUARY MODEL DEVELOPED BY DR. ROBERT THOMAS WAS SELECTED AS THE ONE WHICH MOST CLOSELY CONFORMED TO THE REQUIREMENTS OF THE STUDY. IT DISCUSSES THE VERIFICATION AND USES OF THIS MODEL.

<GEO> POTOMAC ESTUARY

<CLAS> SIMULATION

<755>

<CONT> ROGARTH, W.

<ADDR> CAROLINA POWER AND LIGHT COMPANY

<CITY> RALEIGH

<STATE> NC

<ZIP> 27602

<PHONE> 919-836-6238

<ABST> THIS PROJECT WILL DEVELOP MATHEMATICAL MODELS FOR DESCRIBING ENTRAINMENT EFFECTS ON FISH AND SHELLFISH POPULATIONS IN THE CAPE FEAR ESTUARY. A HYDRODYNAMIC MODEL WILL BE DEVELOPED TO COMPUTE TIDAL FLOWS IN THE CAPE FEAR RIVER. THESE FLOWS WILL BE INPUT TO A SECOND MODEL OF LARVAL TRANSPORT PHENOMENA TO COMPUTE SPATIAL AND TEMPORAL DISTRIBUTION OF THE LARVAE.

<TIME> 1976-1979

<CLAS> SIMULATION

<756>

<CONT> ROBERT, T. J.

<TITLE> USE OF THE LESLIE MATRIX FOR ASSESSING ENVIRONMENTAL IMPACT WITH AN EXAMPLE FOR A FISH POPULATION

<ACRO> FISHERIES

<ADDR> STONE AND WEBSTER ENGINEERING CORPORATION, ENVIRONMENTAL DIVISION, P.O. BOX 2325

<CITY> BOSTON

<STATE> MA

<ZIP> 02107

<PHONE> 617-973-2937

<DOC> TRANSACTIONS OF THE AMERICAN FISHERIES SOCIETY, 106(3), 253-257

<SUB> FISH POPULATION DYNAMICS

<ABST> THE LESLIE MODEL FOR DISCRETE POPULATION THEORY IS EXAMINED FOR THE ASSESSMENT OF ENVIRONMENTAL IMPACT OF A SPECIES POPULATION. AN EIGEN VALUE ANALYSIS OF THE POPULATION PROJECTION MATRIX PROVIDES AN ESTIMATE OF POPULATION GROWTH RATE AND STABLE AGE

ANIMAL EFFECTS

<756> CONT.
DISTRIBUTION. ANY ENVIRONMENTAL ALTERATION WHICH IS MANIFESTED IN CHANGES IN FERTILITY OR SURVIVORSHIP CAN BE STUDIED BY THIS TECHNIQUE.

<STATUS> IN USE

<ACCESS> LIMITED

<MEDIA> DYC

<COMP> IBM

<COPIES> 19N 370/165

<LANG> PORTMAN IV

<CHAR> ERCHIC

<ALGO> EIGEN VALUE AND EIGEN VECTOR BY ELSMAC

<CLASS> DISCRETE; DETERMINISTIC

<APPL> POWER PLANTS, WATER INTAKES

<USERS> STONE AND WEBSTER

<NAL> SEE TRANS. AM. FISH SOC., 100(3), 253-257.

<757>
<CONT> LECLARE, P.; HARR, L.; SCHMIDT, L.;

<TITLE> STANDARD METHODOLOGY FOR CALCULATING RADIATION DOSE TO LOWER FOOD BIOTA

<ASBR> ENVIRONMENTAL ANALYSTS, INC.

<SOURCE> NPSR/ATOMIC INDUSTRIAL FORUM, 1747 PENNSYLVANIA AVE., N.W., WASHINGTON, D.C. 20006.

<DOC> PREPARED FOR THE NATIONAL ENVIRONMENTAL STUDIES PROJECT OF ATOMIC INDUSTRIAL FORUM, INC., WASHINGTON, D.C., FEBRUARY 1975.

<ABST> THIS REPORT REVIEWS THE CONSIDERATIONS PERTINENT TO CALCULATING THE RADIATION DOSE TO BIOTA OTHER THAN MAN, AND RECOMMENDS A METHOD FOR USE BY THE NUCLEAR INDUSTRY. A MODEL FOR COMPUTATION OF ABSORBED DOSES TO BIOTA FROM RADIOISOTOPE RELEASE FROM LIGHT WATER REACTORS IS DEVELOPED WITH CONSIDERATIONS OF TYPICAL ECOSYSTEMS WHICH COULD BE ENCOUNTERED IN THE VICINITY OF REACTOR SITES. THE TRANSFER OF RADIOISOTOPES WITHIN THESE SYSTEMS AND THE POTENTIAL FOR DOSES TO BIOTA ARE RELATED THROUGH DEFINITION OF EXPOSURE PATTERNS AND CRITICAL ORGANISMS. COMPUTATIONAL METHODS ARE THEN PROPOSED FOR THE CALCULATION OF DOSES TO BIOTA. DOSE FACTORS ARE COMPUTED FOR A NUMBER OF ORGANISM-EXPOSURE PATHWAY-RADIOISOTOPE COMBINATIONS, AND SITE SPECIFIC APPLICATIONS OF THE MODEL DISCUSSED.

<CLASS> SIMULATION

<758>
<CONT> LINGENHAGEN, P. W.; WENTWORTH, R. A.

<TITLE> PREDICTIVE MODEL FOR RADIOCESIUM INTAKE FROM MILK; ERRORS ASSOCIATED WITH ANOM-COW VARIATION

<ADDR> NEW YORK STATE VETERINARY COLLEGE

<CITY> ITHACA

<STATE> NY

<DOC> HEALTH PHYSICS, 22, 135-141 1972

<ABST> DATA FROM 10 COWS WERE USED TO EVALUATE VARIATIONS IN THE MILK SECRETION CURVES AS A SOURCE OF ERROR WHEN ESTIMATING THE PROJECTED INTAKE OF RADIOCESIUM FROM MILK BY HUMANS AFTER PASTURE CONTAMINATION. THESE DATA INDICATED THAT THE TRANSFER FUNCTION FOR RADIOCESIUM INTO MILK IS VERY SIMILAR AMONG COWS WITH A PERCENTAGE RELATIVE STANDARD ERROR OF ABOUT 10% FOR THE 1ST DAY AND 1% OR LESS BY THE 10TH DAY. USING THESE DATA A PREDICTION MODEL BASED ON THE RATIO OF THE TOTAL AMOUNT SECRETED INTO MILK OVER TIME TO THE AMOUNT IN MILK ON ANY PARTICULAR DAY WAS TESTED. VARIATIONS WERE MADE IN THE VALUES OF DEPOSITION HALF-TIME AND PASTURE LOSS HALF-TIME TO DETERMINE HOW THESE COULD AFFECT THE INTAKE PREDICTION. THE CALCULATIONS SHOWED THE COW CONTRIBUTION TO THE TOTAL DEVIATION FROM THE ASSUMED TRUE VALUE OF THE PROJECTED INTAKE TO BE 40% AT MOST. THE DEVIATION FROM THE TRUE INTAKE VALUE WAS PLUS OR MINUS 60% ON DAY 1 AND PLUS OR MINUS 35% AT DAY 7 WHEN THE DEPOSITION HALF-TIME WAS 4.5, OR 6 DAYS AND THE PASTURE LOSS HALF-TIME RANGED FROM 12 TO 16 DAYS.

<CLASS> PREDICTIVE

<759>
<CONT> LORRA, ERNESTO

<TITLE> A STOCHASTIC FISH LIFE-CYCLE POPULATION MODEL USING A MODIFIED LESLIE MATRIX

<ACRO> LESNAT

<ADDR> UNIVERSITY OF RHODE ISLAND, GRADUATE SCHOOL OF OCEANOGRAPHY, BAY CAMPUS

<CITY> KINGSTON

<STATE> RI

<ZIP> 02801

<PHONE> 401-792-6239

<DOC> NONE

<SUB> FISH POPULATION DYNAMICS

<ABST> THE "LESNAT" MODEL IS A DISCRETE-TIME AGE-SPECIFIC SIMULATOR OF THE DYNAMICS OF THE HUDSON RIVER STRIPED BASS POPULATION UNDER A CHANGING ENVIRONMENT. AGE-SPECIFIC SURVIVAL AND FECUNDITY RATES MAY BE SAMPLED RANDOMLY FROM TRUNCATED NORMAL DISTRIBUTIONS. THE RANDOM GENERATOR ACCEPTS THE INPUT OF PROPER SAMPLING INTERVALS AND DISTRIBUTION PARAMETERS TO SIMULATE ANY GIVEN LEVEL OF UNCERTAINTY. THE CORE OF THE MODEL IS AN ALGORITHM THAT GENERATES YEARLY POPULATION WAVES BY MULTIPLYING A STOCHASTIC VERSION OF LESLIE MATRIX TIMES THE VECTOR OF AGE-SPECIFIC PROPORTIONS OF INDIVIDUALS AT THE END OF THE PRECEDING TIME STEP. TWO SEPARATE SUBROUTINES MAY RECOMPUTE DENSITY-DEPENDENT LARVAL SURVIVAL RATES AND ADULT FISHING MORTALITIES AT EACH TIME STEP. SENSITIVITY ANALYSES MAY BE

<759>

ABNRM EFFECTS

<759> CONT.

CONDUCTED BY COMPARING AVERAGE RATES OF INCREASE RESULTING FROM DIFFERENT SETS OF POPULATION PARAMETERS AND ASSOCIATED LEVELS OF UNCERTAINTY. CRITERIA FOR THE STABILITY OF THE POPULATION ARE GIVEN ON THE BASIS OF LONG TERM POPULATION SIZE AND YEARLY RATE OF CHANGE AVERAGES.

<GEO> NORTHEAST

<TIME> 1970-78

<STATUS> UNDER DEVELOPMENT; TESTING

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE; TEXT; PUNCHED CARDS

<SIZE> 900 RECORDS

<COMP> IBM

<CONFIG> IBM 370/158-III WITH VARIABLE CORE (192-329K) DEPENDENT ON POPULATION BEING SIMULATED

<LANG> FORTRAN IV

<CHAR> ASCII

<ALGO> MATRIX ALGEBRA COMPUTATIONS;
PSEUDO-RANDOM NUMBER GENERATOR;
MULTIPLE BRANCHING

<CLASS> DISCRETE; DETERMINISTIC; STOCHASTIC;
PREDICTIVE; SIMULATION

<APPL> IMPACT ASSESSMENT OF INCREASED
MORTALITY IN SPECIFIC LIFESTAGES OF THE
HUDSON RIVER STRIPED BASS POPULATION.

<USERS> NOT IN USE AS YET

<SUBJ> RECENT LITERATURE ON THE ECOLOGY OF THE
STRIPED BASS.

<INVAL> TESTING FOR THE STABILITY OF THE
POPULATION WITH THE INPUT POPULATION
PARAMETERS.

<CON> DOCUMENTATION AVAILABLE NOVEMBER 1976

<NOTES> 780826

<760>

<CONF> MARTIN, W. E.

<TITLE> TRANSFER OF STROBILUS-90 FROM PLANTS TO
PARASITS

<DOC> WILLYS PHYSICS, 12,621-631, 1966

<CLASS> SIMULATION; DETERMINISTIC

<761>

<CONF> SUBRAMA, ISHVAR P.

<TITLE> A MODEL TO PREDICT FISH-IMPINGEMENT AT
COOLING WATER INTAKES

<ACRO> APINS

<ADDR> ARGONNE NATIONAL LABORATORY,
ENVIRONMENTAL IMPACT STUDIES DIVISION,
9700 S. CASS AVE.

<CITY> ARGONNE

<STATE> IL

<ZIV> 60439

<PROVID> WTS 972-3125

<DOC> I. P. SUBRAMA, A MODEL FOR PREDICTING
FISH IMPINGEMENT AT COOLING WATER
INTAKES, ANL/EA-8, JANUARY 1977; I. P.
SUBRAMA, D. J. BOGARD, AND M. K.
BERICKSON, VALIDATION AND SOFTWARE
DOCUMENTATION OF THE ANL
FISH-IMPINGEMENT MODEL, ANL/ES-42,
APRIL 1978.

<SUBJ> FISHERIES BIOLOGY AND ENVIRONMENTAL
STUDIES

<ABST> AT ARGONNE NATIONAL LABORATORY A
MATHEMATICAL MODEL HAS BEEN DEVELOPED
TO PREDICT FISH IMPINGEMENT AT COOLING
WATER INTAKES. THE MODEL DEPENDS ON
FISH ABUNDANCE FUNCTION, WATER FLOW
RATE FUNCTION AND A PROBABILITY
FUNCTION OBTAINED FROM ENVIRONMENTAL
AND FISH BEHAVIORAL VARIABLES. GIVEN
THE INPUTS ON THE FISH ABUNDANCES,
WATER TEMPERATURE, WATER FLOW RATES,
AND THE RELATIVE LENGTH-FREQUENCY
DISTRIBUTION OF THE FISH IN THE WATER
BODY THE MODEL ALLOWS THE USER TO
CALCULATE FISH IMPINGEMENT RATES FOR
SPECIFIED TIME PERIODS. BY USE OF 1976
DATA FROM THE 2300 NUCLEAR POWER
STATION, IT HAS BEEN SHOWN THAT THE
PRESENT MATHEMATICAL FORM OF THE MODEL
YIELDS REASONABLY GOOD RESULTS IN
CALCULATING THE DAILY FISH-IMPINGEMENT
LOSSES. COMPARISONS CONFIRMED THAT THE
FISH IMPINGEMENT PROCESS DEPENDS
PRIMARILY ON THE ABUNDANCE OF FISH IN
THE VICINITY OF A COOLING WATER INTAKE,
WHEREAS THE TESTS SHOWED THAT THE
PROBABILITY FUNCTION GIVES THE
SUSCEPTIBILITY OF FISHES TO
IMPINGEMENT. IN VIEW OF THE LIMITED
DATA AVAILABLE ON THE INPUT VARIABLES
TO THE MODEL, IT IS CONCLUDED THAT THE
PRESENT MATHEMATICAL FORM OF THE MODEL
IS ADEQUATE.

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE; PUNCHED CARDS

<SIZE> 700 RECORDS EACH 80 BYTES LONG

<COMP> IBM

<CONFIG> IBM 370/195 OS/WT WITH 200K CORE

<LANG> FORTRAN; DISPLA

<CHAR> EBCDIC

<ALGO> DISCRETE FINITE ELEMENT COMPUTATIONS,
EMPIRICAL CALCULATIONS OF PROBABILITY
WEIGHTS, MATRIX ALGEBRAIC MANIPULATIONS.

<CLASS> DISCRETE; DETERMINISTIC; PREDICTIVE;
ITERATIVE

<APPL> TO PREDICT FISH IMPINGEMENTS AT A
COOLING WATER INTAKE AND TO ASSESS THE
ENVIRONMENTAL EFFECTS RESULTING FROM
SUCH IMPINGEMENT LOSSES.

<USERS> ARGONNE NATIONAL LABORATORY

<SUBJ> COMMON WITH EDISON COMPANY REPORTS ON
ENVIRONMENTAL MONITORING IN THE
VICINITY OF KION NUCLEAR PLANT.

<INVAL> COMPARISON OF OBSERVED IMPINGEMENTS

ANNUAL EFFECTS

<761> CONT.

WITH THE PREDICTED IMPINGEMENTS FOR THE COOLING WATER INTAKES AT THE ZION NUCLEAR POWER PLANT FOR THE YEAR 1976. SENSITIVITY ANALYSIS HAS BEEN USED TO DETERMINE THE IMPORTANCE OF THE VARIOUS COMPONENTS IN THE MODEL FORMULATIONS.

<CON> THIS MODEL SHOULD BE QUITE USEFUL IN PREDICTING FISH LOSSES FROM PROPOSED COOLING WATER INTAKES. THE CALCULATED IMPINGEMENT LOSSES SHOULD BE USED TO ASSESS THE RESULTING IMPACT TO THE FISH POPULATIONS IN THE WATER BODY.

<FORMID> 760703

<762>

<CON> HYRANKA, ISHRAH P.

<TITLE> FISH IMPINGEMENT SAMPLING DESIGN & ESTIMATION METHOD SOFTWARE SYSTEM

<ACRO> SANTEL, ESTINA, & STERCO

<ADDR> ARGONNE NATIONAL LABORATORY, ENVIRONMENTAL IMPACT STUDIES DIVISION, 9700 S. CASS AVE.

<CITY> ARGONNE

<STATE> IL

<ZIP> 60439

<PHONE> FTS 972-3125

<DOC> I. P. HYRANKA & D. J. BODZAN, SAMPLING DESIGNS AND METHODS FOR ESTIMATING FISH-IMPINGEMENT LOSSES AT COOLING WATER INTAKES, ARL/ES-60, OCTOBER 1977; I. P. HYRANKA & D. J. BODZAN, SOFTWARE DOCUMENTATION & USER'S MANUAL FOR FISH-IMPINGEMENT SAMPLING DESIGN AND ESTIMATION METHOD COMPUTER PROGRAMS, ARL/ES-61, NOVEMBER 1977; I. P. HYRANKA, S. A. SPIGHERALLI, & D. J. BODZAN, STATISTICAL COMPARISON AND CHOICES OF SAMPLING DESIGNS FOR ESTIMATING FISH IMPINGEMENT AT COOLING WATER INTAKES, PP. 267-280, PROCEEDINGS OF THE FOURTH NATIONAL WORKSHOP ON ENTRAPMENT AND IMPINGEMENT, DECEMBER 1977

<SUB> FISH IMPINGEMENT, STATISTICAL METHODS

<ABST> SEVERAL SYSTEMS ARE COMPARED TO DETERMINE STATISTICALLY EFFICIENT SAMPLING DESIGNS AND SCHEMES FOR ESTIMATING FISH-IMPINGEMENT AT COOLING WATER INTAKES. COMPARED TO A SIMPLE RAUCHE SAMPLING SCHEME THE STRATIFIED SYSTEMATIC RANDOM SAMPLING SCHEME, THE SYSTEMATIC RANDOM SAMPLING SCHEME, AND THE STRATIFIED RANDOM SAMPLING SCHEME YIELD HIGHER EFFICIENCIES AND ESTIMATIONS FOR THE PARAMETERS IN TWO MODELS OF FISH IMPINGEMENT AS A TIME SERIES PROCESS. A SYSTEM OF THREE COMPUTER PROGRAMS IMPLEMENTS THE THEORY OF SAMPLING DESIGNS AND THE METHODS FOR ESTIMATING FISH-IMPINGEMENT AT THE COOLING WATER INTAKES. THE SAMPLE PROGRAM ALLOWS FOR THE USES OF RANDOM SAMPLING SCHEMES AND DRAWS A SAMPLE OF SPECIFIED SIZE FROM A GIVEN POPULATION. THE ESTINA PROGRAM IS USED TO OBTAIN THE STATISTICAL ESTIMATES OF MEANS, TOTALS, AND THE ASSOCIATED VARIANCES FOR THE SPECIFIED SAMPLING SCHEME. THE STERCO PROGRAM CALCULATES SAMPLE SIZES SUBJECT TO COST, ERROR AND LOSS RESTRICTIONS.

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE; PUNCHED CARDS; TEXT

<SIZE> 7565 RECORDS EACH 80 BYTES LONG

<COMP> CDC

<COMPIG> CDC 6400/605 WITH 100K CORE

<LANG> FORTRAN; DISPLAY

<CMAR> ASCII

<ALGO> CONSTRAINED LAGRANGIAN SOLUTIONS, PROBABILITY CALCULATIONS, MATRIX ALGEBRA METHODS, STATISTICAL ESTIMATIONS

<CLAS> DISCRETE; STOCHASTIC; ANALYTICAL; PREDICTIVE; SIMULATION

<APPL> ENVIRONMENTAL MONITORING STUDIES

<USER> ARGONNE NATIONAL LABORATORY

<SUB> ZION POWER PLANT

<REAL> SEVERAL SENSITIVITY ANALYSES WERE PERFORMED TO EXAMINE THE BEHAVIOR OF ERRORS. SIMULATED DATA AND REAL WORLD CASES WERE USED IN ESTABLISHING THE PROPERTIES AND APPLICABILITY OF THE UNDERLYING MODELS AND THE RESULTING SAMPLING DESIGNS.

<UPDATED> 760703

<763>

<CON> NELSON, IRAL C.

<TITLE> CRITH

<ACRO> CRITH

<ADDR> BATTILLE-PACIFIC NORTHWEST LABORATORIES, POST OFFICE BOX 999

<CITY> RICHLAND

<STATE> WA

<ZIP> 99352

<PHONE> 509-946-5695; FTS 808-7511 EXT 946-5695

<ABST> THIS PROGRAM CALCULATES THE ANNUAL INTERNAL TOTAL-BODY RADIATION DOSES TO WATER RELATED ORGANISMS.

<764>

<CON> NOT GIVEN

<TITLE> ANALYTICAL MODELS FOR ENVIRONMENT COST ESTIMATES OF AQUATIC POPULATION

<ADDR> POTOMAC ELECTRIC POWER COMPANY

<CITY> WASHINGTON

<STATE> DC

<DOC> APPENDIX 5C (AMENDMENT NO. 5, SEPT. 1976), DOUGLAS POINT NUCLEAR GENERATING STATION UNITS 1 AND 2 ENVIRONMENTAL REPORT, 1973

<ABST> DESCRIPTION OF 8 MODELS AND UNDERLYING ASSUMPTIONS TO DETERMINE: 1) QUANTITY

<768>

ANIMAL EFFECTS

<768> CONT.

OF PHYTOPLANKTON KILLED IN THE COOLING SYSTEM; 2) ZOOPLANKTON KILLED IN THE COOLING SYSTEM; 3) ICHTHYO- PLANKTON KILLED IN THE COOLING SYSTEM; 4) ECONOMIC LOSS OF HARVESTABLE FISHERY. INCLUDES REFERENCES.

<GEN> POTOMAC RIVER

<765>

<CON> NOT GIVEN

<TITLE> MODELS FOR RADIATION DOSE CALCULATIONS

<ADDR> HOUSTON LIGHTING AND POWER COMPANY

<CITY> HOUSTON

<STATE> TX

<DOC> APPENDIX 5.3-1, SEVEN TEXAS PROJECT UNITS 1 AND 2 ENVIRONMENTAL REPORT, JULY 1974.

<ABST> CALCULATES RADIATION DOSES FOR BIOTA FROM LIQUID AND GASEOUS EFFLUENTS. IN REGARD TO DOSES FROM LIQUID EFFLUENTS, 4 MODELS ARE USED, WITH VARIABLES INCLUDING DENSITY OF WATER, THE CONCENTRATION FACTOR, EFFECTIVE RESORBED ENERGY OF RADIOISOTOPES IN AN ORGANISM, DOSE CONVERSION FACTOR, FILTRATION FACTOR. MODEL 1 CALCULATES INTERNAL DOSE RATE TO BIOTA OTHER THAN MAN. MODEL 2 CALCULATES EXTERNAL DOSE RATE TO ORGANISMS SUBMERGED IN WATER. MODEL 3 CALCULATES INTERNAL DOSE RATE TO WATERFOWL AND BENTHIC FROM DAILY CONSUMPTION OF 100 G OF AQUATIC PLANTS. MODEL 4 CALCULATES INTERNAL DOSE RATE TO MAN FROM CONSUMING BAIT, SEAFOOD, MARINE PLANTS, WATERFOWL. IN REGARD TO GASEOUS EFFLUENTS, MODEL 1 CALCULATES EXTERNAL DOSE RATES TO LARGE ORGANISMS AND MAN FROM INGESTION IN A RADIOACTIVE CLOUD, WITH IODINE AND KRYPTON GASES PRIMARILY CONSIDERED, AND CALCULATING ON THE BASIS OF GAMMA RADIATION ONLY. IN MODEL 2, EXTERNAL EXPOSURE FROM CONTAMINATED LAND SURFACES, ONLY GAMMA RAYS ARE CONSIDERED FOR WHOLE BODY DOSE RATES, FOR A RECEPTOR HEIGHT OF 100 CM. SKIN DOSE IS CALCULATED ON BOTH GAMMA AND BETA RAYS. IN MODEL 2, HALOGENS AND PARTICULATE RADIOISOTOPES ARE PRIMARILY CONSIDERED. MODEL 3 CALCULATES RADIATION DOSE RATES TO THE THYROID GLAND FROM INHALATION AND INGESTION OF GASEOUS RADIOISOTOPES. THIS MODEL CONSIDERS BOTH GAMMA AND BETA RAYS, AND CALCULATES RADIATION WHICH BECOMES LOCALIZED IN THE THYROID THROUGH INHALATION OR EATING PLANTS WHICH HAVE BEEN EXPOSED TO RADIATION. THE APPENDIX INCLUDES THREE TABLES.

<766>

<CON> PORTER, W. P.; TRACY, C. R.

<TITLE> MODELING THE EFFECTS OF TEMPERATURE CHANGES ON THE ECOLOGY OF BAMA PIPERIS AND THAMNOPHIS SIRTALIS.

<ABST> ENERGY BALANCES BETWEEN THE PHYSICAL ENVIRONMENT AND THE GARTER SNAKE THAMNOPHIS SIRTALIS AND THE LEOPARD FROG BAMA PIPERIS WERE USED TO COMPUTE DAILY AND SEASONAL FOOD REQUIREMENTS AND ACTIVITY TIMES FOR NORTHERN

(MICHIGAN) AND SOUTHERN (SOUTH CAROLINA) REGIONS OF THE COUNTRY. THE OVERLAP OF DAILY AND SEASONAL ACTIVITY TIMES OF PREDATOR (GARTER SNAKE) AND PREY (LEOPARD FROG) AND PREDATOR FOOD REQUIREMENTS FOR NORTHERN AND SOUTHERN REGIONS ARE COMPARED. THE EFFECTS ON FOOD REQUIREMENTS AND OTHER MANIPULATIONS OF SPECIFIED ENVIRONMENTAL CHANGES DUE TO THERMAL POLLUTION ARE DISCUSSED.

<767>

<CON> SCHNECKENISE, D. G.; SWICKED, T. B.

<TITLE> MODEL FOR PREDICTING SR-90 LEVELS IN HULE DEER

<ADDR> COLORADO STATE UNIVERSITY

<CITY> FORT COLLINS

<STATE> CO

<DOC> CYSHING, C.E. (ED.), FOURTH NATIONAL SYMPOSIUM ON PATHOECOLOGY, HELD IN CORVALLIS, OREGON, ON MAY 12, 1975

<ABST> A MODEL WAS DEVELOPED TO ESTIMATE THE STRONTIUM-90 LEVELS IN HULE HOLE DEER (ODOCOILEUS REMIUS REMIUS) FROM KNOWN SR-90 INTAKE RATES. THE MODEL WAS POPULATED ON RESULTS FROM A STUDY ON THE EFFECTS OF AGE AND SEASON ON SR KINETICS IN HULE DEER. CAPTIVE DEER OF VARIOUS AGES, AT SELECTED TIMES THROUGHOUT THE YEAR, WERE GIVEN ACUTE ORAL DOSES OF SR-90 AND WHOLE BODY COUNTED TO DETERMINE THE RETENTION FUNCTION. A TWO-COMPONENT EXPONENTIAL EQUATION WAS USED TO MATHEMATICALLY DESCRIBE THE RETENTION OF SR-90. THE AVERAGE FOR THE SLOPES OF THE SHORT COMPONENT (1.09 DAY⁻¹) CORRESPONDED VERY CLOSELY WITH THE MEAN RETENTION TIME FOR INSOLUBLE MATERIAL IN THE GASTROINTESTINAL TRACT. FOR HULE DEER, THE VALUE OF THE FRACTIONAL INTERCEPT OF THE LONG COMPONENT GENERALLY INCREASED WITH AGE. THE FRACTIONAL INTERCEPTS ALSO VARIED WITH THE TIME OF YEAR THE DEER WAS ADMINISTERED THE SR-90, RANGING FROM AN AVERAGE OF 0.0539 DURING ANTLER DORMANCY TO 0.154 DURING PERIODS OF ANTLER GROWTH. THE AVERAGE OF THE OBSERVED VALUES FOR THE SLOPE OF THE LONG COMPONENT WAS 0.00365 DAY⁻¹ FOR ALL DEER. FOR THE DEERS, THE SLOPE OF THE LONG COMPONENT WAS OBSERVED TO DECREASE WITH AGE AT TIME OF SPARKING AND TO VARY FROM A MINIMUM FOR THOSE SPARKED DURING ANTLER DORMANCY TO A MAXIMUM FOR THOSE SPARKED DURING THE ANTLER GROWTH PERIOD. THERE WERE NO APPARENT EFFECTS OF AGE AND SEASON ON THE KINETICS OF SR IN FEMALE DEER. THE MODEL WAS DEVELOPED TO DESCRIBE THE UPTAKE AND RETENTION OF CHRONICALLY INGESTED SR. DUE TO THE VARIATIONS IN THE FRACTIONAL INTERCEPT AND SLOPE OF THE LONG COMPONENT, BOTH ASSOCIATED WITH SKELETAL BONE RENOVATION, THE MODEL UTILIZED VARIOUS PARAMETERS. THE PREDICTED VALUES WERE COMPARED WITH THOSE OBSERVED IN A WILD DEER POPULATION AND THE CLOSE AGREEMENT ADDED CREDIBILITY TO THE COEFFICIENTS OF THE TOTAL BODY RETENTION EQUATIONS UTILIZED IN THE MODEL.

ANIMAL EFFECTS

<769>
 <CONT> SISSENIWE, R. P.
 <TITLE> SIMULATING THE IMPACT OF THE ENTRAINMENT OF WINTER FLOUNDER LARVAE
 <ADDR> NATIONAL MARINE FISHERIES LABORATORY
 <CITY> WOODS HOLE
 <STATE> MA
 <CONT> PART OF FISHERIES AND ENERGY PRODUCTION: A SYMPOSIUM. D.C. REALTY INC. CO., LEXINGTON, MASSACHUSETTS, (PP. 1-29)
 <SUB> EFFECTS OF NUCLEAR POWER PLANT
 <ABST> THE TRANSPORT OF WINTER FLOUNDER LARVAE AROUND THE HILLSTONE POINT, CONN. AREA BY THE ACTION OF TIDAL CURRENTS AND DIFFUSION WAS SIMULATED BY COMPUTER TO PREDICT THE NUMBERS WHICH COULD BE ENTRAINED DURING THE OPERATION OF A LOCAL NUCLEAR POWER STATION. A TIDAL HYDRODYNAMIC MODEL WITH VARIABLE DEPTH WAS EMPLOYED TO SIMULATE CURRENTS AND WATER LEVELS. THESE TECHNIQUES PROVIDED INPUT TO A TRANSPORT MODEL WHICH SIMULATED THE CONCENTRATION OF LARVAE. A LARVAL SOURCE IN A TRIBUTARY RIVER WAS SIMULATED FOR TWENTY TIDAL CYCLES, WITH AND WITHOUT ENTRAINMENT. THE RESULTS INDICATED THAT THE REDUCTION IN WINTER FLOUNDER LARVAE NEAR HILLSTONE POINT AT THE END OF THE PELAGIC STAGE (PERIOD DURING WHICH LARVAE ARE LIKELY TO BE ENTRAINED) WAS LESS THAN IF WHEN IT WAS ASSUMED THAT LARVAE HAVE LITTLE CHANCE OF RETURNING ONCE LOST FROM HILLSTONE POINT. IN ORDER TO ASSESS THE EFFECT OF A 1% REDUCTION IN RECRUITMENT OF WINTER FLOUNDER LARVAE TO THE BENTHIC PHASE OF THEIR LIFE CYCLE, THE LOCAL POPULATION WAS SIMULATED BY A MODEL IN WHICH YEAR-CLASSES AND THE TOTAL EGG PRODUCTION WERE REPRESENTED BY COMPARTMENTS. EACH YEAR-CLASS GREW, PRODUCED EGGS, SUFFERED NATURAL AND FISHING MORTALITY ACCORDING TO INFORMATION DERIVED FROM THE LITERATURE. THE EFFECT OF POWER PLANT ENTRAINMENT WAS INCORPORATED BY REDUCING THE NUMBER OF RECRUITS TO YEAR-CLASS I THAT WOULD NORMALLY RESULT FROM A SPECIFIC LEVEL OF EGG PRODUCTION. FOR A 1% REDUCTION IN RECRUITMENT DUE TO POWER PLANT ENTRAINMENT, A POTENTIAL 6% DECREASE IN TOTAL POPULATION SIZE FOLLOWING 35 YEARS OF OPERATION WAS INDICATED.
 <GEO> HIAWATHA BAY, CONNECTICUT; LONG ISLAND SOUND
 <TIME> 1973-1975
 <STATUS> NOT IN USE
 <ACCESS> LIMITED
 <MEDIA> PUNCHED CARDS
 <SIZE> 2000 CARDS
 <COMP> IBM
 <COPYING> IBM 360, 256K CODE
 <LANG> FORTRAN IV
 <CHAIN> WPCOB28

<ALGO> FINITE DIFFERENCES; ADVECTION; DIFFUSION; CATCH AND RECRUITMENT; YEAR-CLASS MODEL
 <CLASS> PREDICTIVE; INTEGRATIVE; SIMULATION; DISCRETE; HYBRID
 <APPL> ENVIRONMENTAL IMPACT STATEMENT
 <SUB> LITERATURE; FIELD STUDIES; BATTELLE INSTITUTE
 <AVAIL> FIELD STUDIES OF CURRENTS, DYE DIFFUSION; FISH TAGGING STUDIES; MARINE ORGANISM SAMPLING PROGRAM
 <UPDATE> 700727

<769>
 <CONT> SPALDING, G. E.
 <TITLE> DEVELOPMENT OF TRANSPORT MODELS FOR ENVIRONMENTAL POLLUTANTS
 <ADDR> UNIVERSITY OF TENNESSEE, EPDA
 <CITY> OAK RIDGE
 <STATE> TN
 <ZIP> 37830
 <PHONE> 615-483-8611 EXT. 4205; FTS 850-4205
 <ABST> NEONATAL AND WEANLING AND ADULT ROBBERS, SWINE AND SHEEP ARE BEING STUDIED USING INTRAVENOUS AND ORAL ROUTES OF ADMINISTRATION TO DERIVE EXPERIMENTAL TRANSPORT COEFFICIENTS AMONG ANIMALS AND ACROSS SPECIES AND ASSOCIATED ERROR TERMS TO AVOID COMPOUNDING DATA VARIATIONS DUE TO EXPERIMENTAL VARIATION AS OPPOSED TO REAL VARIATIONS IN TRANSPORT COEFFICIENTS FOR VARIOUS SPECIES. SOME TRANSPORT COEFFICIENTS ARE EXPECTED TO BE SPECIES INDEPENDENT AND THEREFORE DIRECTLY APPLICABLE TO MAN. OTHERS WILL BE SHOWN TO BE SPECIES DEPENDENT AND THE ANATOMICAL, PHYSIOLOGICAL AND METABOLIC BASIS WILL BE DEFINED. WHERE ACTUAL HUMAN DATA EXIST, THESE WILL BE INCORPORATED INTO THE MODEL.
 <770>
 <CONT> STENGLE, DENNIS L.
 <TITLE> ESTIMATING RADIATION DOSES
 <ACRO> PREDO
 <ADDR> BATTELLE-PACIFIC NORTHWEST LABORATORIES, POST OFFICE BOX 999
 <CITY> RICHLAND
 <STATE> WA
 <ZIP> 99352
 <PHONE> 509-942-4323; FTS 804-7511 EXT 942-4323
 <ABST> PREDO IS A COMBINATION OF THE CODES SITNET AND UCLIN. SITNET USES NOUPLY, ON-SITE METEOROLOGICAL DATA TO GENERATE TOTAL BODY AND/OR SKIN DOSES FOR SPECIFIED RELEASE INVENTORIES, RELEASE HEIGHTS, AND DOWNWIND DISTANCES. UCLIN GENERATES A STATISTICAL DISTRIBUTION OF DOSES WITH MAGNITUDE AND DIRECTION.

<775>

NATURAL RESOURCES

<775> CONT.

<STATUS> ON LINE

<ACCESS> UNLIMITED

<MEDIA> DISC

<TZ> 1800

<COMP> IBM

<LANG> FORTRAN

<CHAR> ASCII

<UPDATE> 780531

<777>

<CONT> VAN WINKLE, B.

<TITLE> A GENERALIZED FISH LIFE-CYCLE
POPULATION MODEL AND COMPUTER PROGRAM

<ADDR> ENCORE

<ADDR> OAK RIDGE NATIONAL LABORATORY,
ENVIRONMENTAL SCIENCES DIVISION, P.O.
BOX 1

<CITY> OAK RIDGE

<STATE> TN

<ZIP> 37830

<PHONE> 615-493-9611 EXT 30257; FTS 450-0257

<NOTES> DEVELOPED AT ORNL

<AUTH> DEANGELIS, D.L., VAN WINKLE, B.,
CHRISTENSEN, S.W., BLUM, S.R., KIRK,
P.L., POST, B.W., POSS, C., A
GENERALIZED FISH LIFE-CYCLE POPULATION
MODEL AND COMPUTER PROGRAM,
ORNL/TN-6725, ESO 0 1120, MARCH 1970.

<SUBJ> ENVIRONMENTAL AND ECOLOGICAL SYSTEMS

<ABST> A GENERALIZED FISH LIFE-CYCLE
POPULATION MODEL AND COMPUTER PROGRAM
HAVE BEEN PREPARED TO EVALUATE THE
LONG-TERM EFFECT OF CHANGES IN
MORTALITY IN AGE CLASS 0. THE GENERAL
QUESTION CONCERNS WHAT HAPPENS TO A
FISHERY WHEN DENSITY-INDEPENDENT
SOURCES OF MORTALITY ARE INTRODUCED
THAT ACT ON AGE CLASS 0, PARTICULARLY
ENTRAINMENT AND IMPIDEMENT AT POWER
PLANTS. THE POPULATION MODEL CONSISTS
OF A SYSTEM OF DIFFERENCE EQUATIONS
INVOLVING AGE-DEPENDENT FECUNDITY AND
SURVIVAL. THE FECUNDITY FOR EACH AGE
CLASS IS ASSUMED TO BE A FUNCTION OF
BOTH THE FRACTION OF FEMALES SEXUALLY
MATURE AND THE WEIGHT OF FEMALES AS
THEY ENTER EACH AGE CLASS. NATURAL
MORTALITY FOR AGE CLASSES 1 AND OLDER
IS ASSUMED TO BE INDEPENDENT OF
POPULATION SIZE. FISHING MORTALITY IS
ASSUMED TO VARY WITH THE NUMBER AND
WEIGHT OF FISH AVAILABLE TO THE
FISHERY. AGE CLASS 0 IS DIVIDED INTO
SIX LIFE STAGES. THE PROBABILITY OF
SURVIVAL FOR AGE CLASS 0 IS ESTIMATED
CONSIDERING BOTH DENSITY-INDEPENDENT
MORTALITY (NATURAL AND POWER PLANT) AND
DENSITY-DEPENDENT MORTALITY FOR EACH
LIFE STAGE. TWO TYPES OF
DENSITY-DEPENDENT MORTALITY ARE
INCLUDED. THESE ARE (1) CANNIBALISM OF
EACH LIFE STAGE BY OLDER AGE CLASSES
AND (2) INTRA-LIFE-STAGE COMPETITION.
A COMPUTER CODE FOR IMPLEMENTING THISPOPULATION MODEL HAS BEEN WRITTEN IN
FORTRAN. THIS CODE CONSISTS OF A MAIN
PROGRAM AND NUMEROUS SUBROUTINES WHICH
PERFORM CALCULATIONS AND CONTROL INPUT
AND OUTPUT. THE MOST IMPORTANT FEATURE
OF THE COMPUTER CODE IS ITS
FLEXIBILITY. BY APPROPRIATE
SPECIFICATION OF A SET OF INPUT CARDS,
THE USER CAN RUN THE MODEL FOR SEVERAL
YEARS USING ONE SET OF PARAMETER VALUES
AND THEN CHANGE SOME OF THE PARAMETER
VALUES AND CONTINUE RUNNING THE MODEL
USING THE NEW VALUES. THE UNIQUE
POPULATION VECTOR RESULTING IS A
STEADY-STATE SYSTEM FOR FIXED VALUES OF
THE ADJUSTABLE PARAMETERS IS DETERMINED
ANALYTICALLY. COMPARISON OF SIMILAR
CASES VIA GRAPHIC AND TABULAR OUTPUT IS
POSSIBLE.

<TERM> 1973-

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE; PUNCHED CARDS

<COMP> IBM

<LANG> FORTRAN IV

<CLAS> DISCRETE; DETERMINISTIC; STOCHASTIC;
ANALYTICAL; PREDICTIVE; SIMULATION

<772>

<CONT> VANDERBLOOM, R. A.; BOOTH, V. S.;
CLARK, P. R.<TITLE> SPECIFIC ACTIVITY AND CONCENTRATION
MODEL APPLIED TO CS-137 MOVEMENT IN A
EUTROPHIC LAKE<ADDR> NATIONAL OCEANIC AND ATMOSPHERIC
ADMINISTRATION

<CITY> ANN ARBOR

<STATE> MI

<DOC> CUSHING, C.E. JR. (ED.), PROCEEDINGS
4TH NATIONAL SYMPOSIUM OF RADIOECOLOGICAL
FIELD IN CORVALLIS, OREGON, MAY 12, 1975<ABST> A LINEAR SYSTEMS-ANALYSIS MODEL WHICH
SIMULATES TIME-DEPENDENT DYNAMICS OF
SPECIFIC ACTIVITY AND CONCENTRATION OF
RADIOCESIUM IN LAKE ECOSYSTEMS WAS
APPLIED TO A SHALLOW, EUTROPHIC LAKE
THAT HAD RECEIVED A PULSE INPUT OF
CS-137. BEST ESTIMATES OF TRANSFER
COEFFICIENTS FOR ABIOTIC COMPARTMENTS
(SEDIMENT, INTERSTITIAL WATER AND LAKE
WATER) AND THE MACROPHYTE COMPARTMENT
WHICH CONTROLLED THE MASS BALANCE OF
CESIUM IN WATER WERE DETERMINED BY
"TUNING" OUR INITIAL ESTIMATES OF THE
TRANSFER COEFFICIENTS TO OBSERVED DATA
ON CS-137 CONCENTRATIONS AND CONTENTS
OF THESE COMPARTMENTS. IN MOST CASES,
THE OPTIMIZED TRANSFER COEFFICIENTS FOR
THE ABIOTIC COMPARTMENTS WERE NOT
GREATLY DIFFERENT FROM OUR
INDEPENDENTLY DERIVED INITIAL
ESTIMATES, AND THE SIMULATIONS FOR
OPTIMIZED COEFFICIENTS WERE CLOSE TO
THOSE BASED ON INITIAL ESTIMATES. THE
CS-137 CONCENTRATIONS IN WATER AS
PREDICTED BY THE OPTIMIZED TRANSFER
COEFFICIENTS WERE THEN USED TO
CALCULATE CS-137 KINETICS IN BIOTA
OTHER THAN MACROPHYTES. IN GENERAL,
MODEL SIMULATIONS WERE CLOSE TO

ANIMAL EFFECTS

<772> CONT.

CONCENTRATIONS OBSERVED IN THE BIOTA. THE AGREEMENT BETWEEN CS-137 CONCENTRATIONS AND SIMULATIONS IN BOTTOM INVERTEBRATES SUPPORTED THE ASSUMPTION THAT BOTTOM SEDIMENTS ARE NOT A MAJOR SOURCE OF CS TO THE BIOTA. ONE SPECIFIC ACTIVITY AND CONCENTRATION MODEL WAS COMPARED TO THE RADIOCYCLIDE CONTENT MODEL. THE MODEL USED IN TERRESTRIAL ECOSYSTEMS. FOR BIOTIC COMPONENTS OF AQUATIC ECOSYSTEMS, VALUES OF ALPHA SUB 13, THE TRANSFER COEFFICIENTS OF OUR MODEL, ARE EASILY ESTIMATED FROM SUBMERGED BATES OF RADIOCESIUM IN INDIVIDUAL ORGANISMS IN THE LABORATORY.

<773>

<AUTH> MILLER, G. T.; DANIELSON, H. L.; SPARKS, P. E.; CAIRNS, J., JR.

<TITLE> A COMPUTER SIMULATION OF THE EFFECTS OF SUPERIMPOSED MORTALITY DUE TO POLLUTANTS ON POPULATIONS OF FATHEAD MINNOWS (PIMEPHALES PROMELAS)

<ABST> THIS COMPUTER SIMULATION STUDY TESTED THE EFFECTS OF 99 LEVELS OF PROPORTIONAL MORTALITY OF FATHEAD

MINNOW (PIMEPHALES PROMELAS) POPULATIONS, ASSUMING THAT THE PARENT-PROGENY RELATIONSHIP IS OF THE FORM PROPOSED BY HICKER. LIMITED DATA FROM TWO STUDIES ON THREE LAKES WERE AVAILABLE TO FIT THE MODEL AND OBTAIN ESTIMATES OF PARAMETERS FOR FATHEAD MINNOW POPULATIONS. BASED ON THESE ESTIMATES, 25 REPLICATIONS OF A 50-GENERATION CYCLE WERE SIMULATED UNDER TWO LEVELS OF ENVIRONMENTAL VARIABILITY. ARBITRARY EXTINCTION LEVELS OF 5, 100, AND 500 PERCENT HAD LITTLE EFFECT ON THE RESULTS. INCREASING ENVIRONMENTAL VARIATION LOWERED THE PERCENTAGE MORTALITY AT WHICH POPULATION EXTINCTIONS OCCURRED. IN GENERAL, THE RESULTS ARE COMPATIBLE WITH THE RECOMMENDATION OF THE U. S. COMMITTEE ON WATER QUALITY CRITERIA, THAT THE MAXIMUM CONCENTRATION OF ¹³⁷CS TO WHICH FISH COULD BE CONTINUOUSLY EXPOSED SHOULD NOT EXCEED ONE HUNDREDTH THE 96-HOUR TL₅₀ (MEDIAN TOLERANCE LIMIT)--A CONCENTRATION THAT CAUSES A 50 PERCENT REDUCTION IN THE MEAN NUMBER OF EGGS LAID PER FEMALE BY FATHEAD MINNOWS IN A LABORATORY STUDY.

PLANT EFFECTS

(776)
 (COW) ANDERSON, R. B.
 (TITLE) OCEAN FOOD AND ENERGY FARM (OFEF): DEVELOPMENT OF THE KELP GROWTH MODEL
 (ADDR) INTEGRATED SCIENCES CORPORATION
 (CITY) SANTA MONICA
 (STATE) CA
 (DOC) EPPA/USF/1927--76/1(VOL.7), 1976
 (ABST) A MATHEMATICAL MODEL WHICH SIMULATES THE GROWTH OF SINGLE PRODS OF KELP (MACROCYSTIS PYRIFERA) WAS PUBLISHED (ANDERSON, 1974). FURTHER DEVELOPMENT OF THE MODEL WAS UNDERTAKEN TO EXTEND ITS SIMULATION TO THE GROWTH OF A KELP POPULATION AS OPPOSED TO SINGLE PRODS (NORTH AND ANDERSON, 1975). FOLLOWING THIS, EFFORT WAS DIRECTED TOWARD DEVELOPING THE MODEL FOR USE IN THE OCEAN FOOD AND ENERGY FARM PROJECT. THIS ENTAILED GENERALIZING THE MODEL SO THAT IT WAS NOT RESTRICTED TO THE SOUTHERN CALIFORNIA COASTAL REGION. THE MODIFICATIONS WHICH WERE MADE AND THE RESULTS OF PRELIMINARY EXERCISES ARE REPORTED. LIMITS OF THE MODEL AND EXPERIMENTATION AND RESEARCH NECESSARY FOR ITS FURTHER DEVELOPMENT AND APPLICATION ARE DESCRIBED.
 (CLAS) SIMULATION
 (775)
 (COW) KETCHER, J. B.
 (TITLE) MODEL OF PHOTOSYNTHESIS AND GROWTH OF CROPS UNDER POLLUTANT STRESS
 (ACRO) GROWI
 (ADDR) LAWRENCE LIVERMORE LABORATORY, ENVIRONMENTAL SCIENCES DIVISION, P.O. BOX 5507
 (CITY) LIVERMORE
 (STATE) CA
 (ZIP) 94550
 (FROM) 815-822-6812; FTS 532-6812
 (SOURCE) DEVELOPED AT LLL
 (DOC) KETCHER, J.B., GROWI: A CROP GROWTH MODEL FOR ASSESSING IMPACTS OF GASEOUS POLLUTANTS FROM GEOTHERMAL TECHNOLOGIES, UCRL-52207, 1977; KETCHER, J.B., A GENERAL CROP GROWTH MODEL FOR SIMULATING IMPACTS OF GASEOUS EFFLUENTS FROM GEOTHERMAL TECHNOLOGIES, UCRL-81010, 1978
 (SUB) POLLUTION EFFECTS OF CROPS
 (ABST) A PRELIMINARY MODEL OF PHOTOSYNTHESIS AND GROWTH OF FIELD CROPS HAS BEEN DEVELOPED FOR USE IN ASSESSING THE EFFECTS OF GASEOUS POLLUTANTS, PARTICULARLY AIRBORNE SULPHUR COMPOUNDS, FROM GEOTHERMAL ACTIVITIES. THE MODEL SIMULATES PHOTOSYNTHESIS AS A FUNCTION OF VARIABLES SUCH AS IRRADIANCE, CO₂-DIFFUSION RESISTANCE, AND INTERNAL BIOCHEMICAL PARAMETERS. THE MODEL ALLOCATES PHOTOSYNTHETIC AMONG THE PLANT COMPARTMENTS: STRUCTURAL (LEAF, STEM, ROOT, AND FRUIT) AND STORAGE. THE SIMULATIONS ENCOMPASS THE ENTIRE GROWING SEASON FROM GERMINATION TO SENESCENCE. WE DESCRIBE THE MODEL CONCEPTUALLY AND MATHEMATICALLY, ACCOMPANIED BY EXAMPLES OF MODEL OUTPUT FOR VARIOUS LEVELS OF POLLUTANT STRESS. ALSO, WE OUTLINE FUTURE DEVELOPMENTS THAT WOULD IMPROVE THIS PRELIMINARY MODEL AND WE DISCUSS MODEL APPLICATIONS.
 (GEN) LOCAL
 (STATUS) IN USE
 (ACCESS) LIMITED TO AUTHORIZED RECIPIENTS
 (MEDIA) PHOTOSTORE
 (SIZE) 32K WORDS
 (COMP) CDC
 (CONFIG) CDC 7600; 0.75 CPU MINUTES REQUIRED FOR AVERAGE RUN
 (LANG) FORTRAN
 (CHAR) ASCII
 (ALGO) FORTRAN CODED RUNGE-KUTTA USED FOR NON-LINEAR ORDINARY DIFFERENTIAL EQUATIONS. USER COULD USE GEAR PACKAGE INSTEAD.
 (CLAS) ANALYTICAL; INTEGRATIVE; PREDICTIVE; DETERMINISTIC; PARTLY MECHANISTIC; PARTLY PHENOMENOLOGICAL
 (APPL) ASSESSING POLLUTION IMPACT ON CROPS
 (USERS) LLL
 (SND) LITERATURE VALUES
 (VAL) COMPARED WITH FIELD STUDIES. SENSITIVITY ANALYSIS IS CURRENTLY UNDERWAY.
 (UPDATE) 780621
 (776)
 (COW) LAFRANCE, CHARLES B.
 (TITLE) FIRST ESTIMATE OF SEEDING CAPABILITY FOR ULTIMATE ESTABLISHMENT
 (ACRO) PESQUE
 (ADDR) ARGONNE NATIONAL LABORATORY, ENVIRONMENTAL IMPACT STUDIES DIVISION, 9700 S. CASS AVE.
 (CITY) ARGONNE
 (STATE) IL
 (ZIP) 60439
 (PHONE) FTS 972-3184
 (DOC) NONE
 (SUB) NINE SPOIL RECLAMATION
 (ABST) PREDICTS THE SUCCESS OF SEEDING ON NINE SPOILS BASED ON CHEMICAL DATA FOR SPOILS USING PREVIOUS EXPERIENCE. DATA OF PREVIOUS EXPERIENCE IS ENTERED AND SUMMARIZED SO THAT PROPRIETARY DATA CANNOT BE RETRIEVED.
 (GEN) U.S.A.

BLANK PAGE

<776>

PLANT EFFECTS

<776> CONT.
 <STATUS> UNDER DEVELOPMENT
 <ACCESS> NOT ACCESSIBLE
 <MEDIA> DISC
 <SIZE> UNDETERMINED
 <CORD> TAP
 <CONFIG> IBM 360/75 150 WITH 120 K CORE
 <LANG> FORTRAN
 <CPAD> EXECIO
 <ALGO> POLYNOMIAL REGRESSION
 <CLAS> CONTINUOUS; DETERMINISTIC; PREDICTIVE
 <CRD> PROPRIETARY AND/OR PUBLISHED
 <CRD> DEVELOPMENTAL FUNDING HAS BEEN SUSPENDED.
 <CREATED> 780701

<777>
 <CORD> LAPPANCE, CHARLES E.
 <TITLE> VEGETATION COMMUNITIES ALONG GRADIENT
 <ACRO> CNUST
 <ADDR> ARGONNE NATIONAL LABORATORY,
 ENVIRONMENTAL IMPACT STUDIES DIVISION,
 9700 S. CASES AVE.
 <CITY> ARGONNE
 <STATE> IL
 <ZIP> 60439
 <PHONE> PIS 972-1182
 <DOC> LAPPANCE, C.E., SAMPLING AND ORDINATION
 CHARACTERISTICS OF COMPUTER-SIMULATED
 INDIVIDUALISTIC COMMUNITIES, ECOLOGY
 53(3), 387-397, LAPPANCE, C.E.,
 COMPUTER SIMULATED VEGETATION,
 PROCEEDINGS OF THE FIRST INDIANA
 UNIVERSITY COMPUTER NETWORK CONFERENCE
 ON COMPUTER RELATED CURRICULUM
 MATERIALS, UNIVERSITY OF INDIANA NEW
 ALBANY, IN, P. 23-26, 1978
 <SUB> INDIVIDUALISTIC VEGETATION
 <ABST> WITH A MINIMUM OF INPUT PARAMETERS (THE
 LIST OF REQUIRED PARAMETERS VARIES WITH
 THE VERSION USED), THE MODEL GENERATES
 ARTIFICIAL COMMUNITIES COMPOSED OF A
 FINITE NUMBER OF DISCRETE INDIVIDUALS.
 THE UNDERLYING PROBABILITY GENERATING
 FUNCTIONS ARE SPECIES SPECIFIC NORMAL
 DISTRIBUTIONS DESCRIBING THE X-AXIS
 LOCATIONS OF THE INDIVIDUALS, AND
 UNIFORM DISTRIBUTIONS DESCRIBING THE
 Y-AXIS LOCATIONS OF THE INDIVIDUALS.
 STATISTICAL SUMMARIES OF THE PARAMETRIC
 DISTRIBUTIONS OF INDIVIDUALS BY SPECIES
 ARE CALCULATED. OPTIONAL FEATURES
 INCLUDE A MAP SHOWING LOCATIONS OF
 INDIVIDUALS, AUTOMATIC SAMPLING AND
 ANALYSIS. SEVERAL VERSIONS EXIST, WITH
 VARYING USER CONTROL OF PARAMETERS AND
 OPTIONS.
 <STATUS> FULLY DEVELOPED, NOT PRESENTLY IN USE
 <ACCESS> BY ARRANGEMENT

<MEDIA> PUNCHED CARDS
 <SIZE> 23 K WORDS
 <CORD> IBM; FBI
 <CONFIG> UNIVAC 1107 WITH 32 K CORE, 7 TRACK
 TAPE DRIVE, CALCOMP 563 PLOTTER; IBM
 1130 WITH 32 K CORE
 <LANG> FORTRAN
 <CHAR> ASCII; EBCDIC
 <ALGO> DEVELOPED ENTIRELY BY AUTHOR FROM
 ECOLOGIC THEORY
 <CLAS> DISCRETE; STOCHASTIC; SIMULATION
 <APPL> TEACHING
 <USER> UNIVERSITY OF NOTRE DAME
 <AVAIL> IN PREPARATION.
 <UPDATED> 780701

<778>
 <CORD> O'DELL, ROBERT A.
 <TITLE> THE MECHANISM AND PREDICTION OF GASEOUS
 POLLUTANT UPTAKE BY VEGETATION
 <ADDR> PENNSYLVANIA STATE UNIVERSITY,
 DEPARTMENT OF CHEMICAL ENGINEERING
 <CITY> UNIVERSITY PARK
 <STATE> PA
 <ZIP> 16802
 <PHONE> 203-327-7000
 <DOC> M.S. THESIS, PENNSYLVANIA STATE
 UNIVERSITY, MARCH, 1977
 <SUB> A QUANTITATIVE METHOD FOR PREDICTING
 POLLUTANT UPTAKE BY VEGETATION
 <ABST> VARIOUS MECHANISMS AND FACTORS
 CONTROLLING GAS UPTAKE BY VEGETATION
 WERE EVALUATED AND A QUANTITATIVE
 METHOD FOR PREDICTING THE UPTAKE RATE
 WAS DEVELOPED. SULFUR DIOXIDE WAS USED
 AS THE POLLUTANT. THE THREE
 RESISTANCES (LEAF AERODYNAMIC
 RESISTANCE, STOMATAL RESISTANCE, AND
 MESOPHYLLIC RESISTANCE) ARE SUMMED AND
 DIVIDED INTO ATMOSPHERIC GAS
 CONCENTRATION DIFFERENCE TO YIELD THE
 UPTAKE RATE PER UNIT LEAF AREA.
 POLLUTANT UPTAKE BY VEGETATION WAS
 ALMOST CONSTANT THROUGHOUT THE DAY,
 WHEN STOMATA WERE FULLY OPEN.
 VEGETATION REMOVED SO₂ AT A GREATER
 RATE THAN EITHER SOIL OR WATER ON AN
 EARTH SURFACE AREA BASIS.
 <STATUS> IN USE
 <ACCESS> UNLIMITED
 <MEDIA> PUNCHED CARDS
 <SIZE> 100 CARDS
 <CORD> VAR; IBM; BUR; UMI; CDC
 <LANG> FORTRAN IV
 <CHAR> UNCODED

PLANT EFFECTS

<778> CONT.
 <ALGO> ALGEBRAIC SOLUTION
 <CLASS> PREDICTIVE
 <APPV> PREDICTION OF NATURAL POLLUTANT REMOVAL RATES BY VEGETATION
 <END> VARIOUS REFERENCES
 <UPDATED> 1978/06/01

<779>
 <CONT> PIAN, JOHN W.
 <TITLE> A DAMAGE ASSESSMENT MODEL FOR AGRICULTURAL CROPS
 <ADDR> STANFORD RESEARCH INSTITUTE, 331 PAVENWOOD AVE.
 <CITY> MENLO PARK
 <STATE> CA
 <ZIP> 94025
 <PHONE> 650-326-4200
 <DOC> SRI-897-2729, SEPTEMBER, 1978
 <SUB> RADIATION DAMAGE ASSESSMENT MODEL FOR THE AGRICULTURAL CROPS
 <ABST> THE MAJOR FEATURES AND PROGRAM FLOW OF A DAMAGE ASSESSMENT MODEL FOR TEN AGRICULTURAL CROPS ARE DESCRIBED. CROP VULNERABILITY TO RADIATION DAMAGE (BOTH BETA AND GAMMA) IS DIFFERENTIATED BY GROWTH STAGE, TOTAL DOSE RECEIVED, AND DOSE RATE. THE MAJOR INPUTS REQUIRED ARE CROP GROWTH PARAMETERS, PLANTING AND HARVESTING DATES, AND ATTACK DATA DESCRIBING THE RADIATION LEVELS. THE MODEL USES THESE INPUTS TO CALCULATE THE PERCENTAGE OF YIELD SURVIVING THE ATTACK EFFECTS. THE USE OF THE CROP ASSESSMENT PROGRAM AND THE RESULTS OF A SAMPLE RUN ARE DESCRIBED. THE TEN CROPS INCLUDED IN THE MODEL WERE CORN, SOYBEAN, SOYBEANS, PEA, PICE, POTATOES, ALFALFA, SUGAR BEETS, WHEAT AND PAPLEY.
 <GEN> UNITED STATES
 <YER> 1969-1978
 <STATUS> IN USE
 <ACCESS> UNLIMITED
 <MEDIA> PUNCHED CARDS
 <SIZE> 31,000 OCTAL WORDS OF CORE STORAGE
 <COMP> CDC
 <CONFIG> CDC 6400, 31,000 OCTAL WORDS OF CORE STORAGE
 <LANG> FORTRAN; COMPATIBLE WITH THE READY DAMAGE ASSESSMENT SYSTEM OF THE MATHEMATICS AND COMPUTATION LABORATORY OF THE GENERAL SERVICES ADMINISTRATION
 <ALGO> THE ALGORITHMS INTEGRATE THE RADIATION DOSE RECEIVED OVER TIME TO ESTIMATE THE DAMAGE TO GROWING CROPS.
 <CLASS> PREDICTIVE
 <APPL> DAMAGE TO AGRICULTURAL CROPS ARISING FROM Fallout FROM NUCLEAR ATTACK.

<7555> DEFENSE CIVIL PREPAREDNESS AGENCY; U.S. DEPARTMENT OF AGRICULTURE; OFFICE OF PREPAREDNESS
 <CON> UTILIZES THREE SUBMODELS: CROP MORPHOLOGY SUBMODEL; RADIATION DOSE SUBMODEL; AND CROP SURVIVAL SUBMODEL
 <UPDATED> 740601

<780>
 <CONT> SHEPHERD, JACK W.
 <TITLE> DEPOSITION MODEL
 <ADDR> ENVIRONMENTAL PROTECTION AGENCY, ENVIRONMENTAL SCIENCES RESEARCH LABORATORY, METEOROLOGY DIVISION
 <CITY> RESEARCH TRIANGLE PARK
 <STATE> NC
 <ZIP> 27711
 <ABST> THIS MODEL IS ONE DIMENSIONAL AND DIVIDES THE TRANSFER FROM THE FREE ATMOSPHERE TO THE ULTIMATE SINK INTO FOUR PROCESSES: TURBULENT TRANSFER ABOVE THE CANOPY, WITHIN THE CANOPY, MOLECULAR DIFFUSION NEAR THE LEAF SURFACE, AND FINALLY DIFFUSION THROUGH STOMATA TO THE INTERIOR OF THE LEAF. THE BASIC MODEL HAS BEEN TESTED AGAINST WIND TUNNEL DATA WITH CONSIDERABLE SUCCESS. INVESTIGATIONS ARE NOW PROCEEDING TO MODEL CANOPIES TYPICAL OF DECIDUOUS AND CONIFEROUS FORESTS AND GRASSLANDS. 5/78 FINAL REPORT.
 <YER> 76/09/01-78/05/01

<781>
 <CONT> SMITH, ROBERT E.
 <TITLE> MODEL FOR CALCULATION OF CONCENTRATION OF RADIOISOTOPES IN VEGETATION
 <ADDR> U.S. GEOLOGICAL SURVEY
 <CITY> HOUSTON
 <STATE> TX
 <DOC> P.E. PERSONAL COMMUNICATION FROM CHIEF OF HOUSTON SUBDISTRICT, WATER RESOURCES DIVISION, U.S. DEPT. OF INTERIOR, GEOLOGICAL SURVEY, 1978. (EN CITATION: BLUE HILLS)
 <ABST> THE PAPER PROVIDES A SOURCE FOR THE FORMULA USED TO DETERMINE THE CONCENTRATION OF RADIOISOTOPES IN VEGETATION NEAR THE BLUE HILLS STATION UNITS 1 AND 2.

<782>
 <CONT> WESELY, HARVIN L.
 <TITLE> OZONE AND SO2 UPTAKE OVER VARIOUS SURFACES
 <ACRO> OSOVS
 <ADDR> ARGONNE NATIONAL LABORATORY, RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION, 9700 S. CASS AVE.

<782>

294

PLANT RESPONSE

<782> CONT.

<SYN> 800000

<STAT> II

<SUB> 45010

<AUTH> VIC 572-5027

<OBJ> H. L. WHEELER AND G. D. NICKS. THE FACTORS THAT AFFECT THE DEPOSITION RATES OF SULFUR DIOXIDE AND SULFUR GASES ON VEGETATION, J. AIR POLL. CONTROL ASSOC., 27, 199-1996, 1977.

<SUB> EFFECT OF SULFUR DIOXIDE ON VEGETATION.

<ABST> THE EFFECT OF POLLUTANT GASES IS CONTROLLED TO A LARGE EXTENT BY THE NATURE OF THE SURFACE. FIELD MEASUREMENTS OF THE SURFACE RESISTANCE TO OZONE AND SULFUR DIOXIDE WILL

IMPROVE FORMULATIONS FOR DESCRIBING THE SOY DEPOSITION OF OTHER POLLUTANTS. SURFACES STUDIED INCLUDE FOREST TYPES OF VARYING VEGETATION, ROUGHNESS OF SURFACE VEGETATION, SOFT SOIL, AND WATER. THE FORMULATIONS CAN BE INCORPORATED INTO LARGE-SCALE NUMERICAL MODELS OF THE TRANSPORT, TRANSFORMATION, AND DEPOSITION OF POLLUTANTS IN THE NORTH REGION.

<STAT> UNDER DEVELOPMENT

<ACCESS> UNLIMITED

<AUTH> TEST

<UPDATE> 700701

COMPARISON OF FORTHOGRAPHAL TRANSPORT

(701)
(7007) STEVENSON, V.; MILLER, R. C.

(TITLE) EFFECTS OF THE PIPELINE ROAD BOARD ON ROADWAY PONDING AND LAKE ACROSS ALASKA'S NORTH COAST

(ACRON) UNIVERSITY OF ALASKA

(CITY) FAIRBANKS

(STATE) AK

(DOC) WFO/2224/TN-2, 1977

(ABST) THIS RESEARCH PROJECT HAS ATTEMPTED TO DOCUMENT THE EFFECTS OF THE ROAD BOARD ON THE LAKE AND PONDING ACROSS THE NORTH COAST OF THE NORTHWEST TERRITORY, ALASKA. AFTER SURVEYING ALL THE LAKE AND PONDING ALONG THE TUNIA-ALASKA PIPELINE ACCESS ROAD, A SERIES OF COMPARATIVE POND TYPES POTENTIALLY RECEIVING IMPACT BY THE ROADWAY AND ITS OPERATION WERE SELECTED FOR FURTHER STUDY. DISPERSED IN WATER BODIES, INCREASING FROM ROAD FILL AND SETTLING OF ROAD DIRT WERE THE THREE MOST OBVIOUS IMPACTS. IN ADDITION NEW PONDING WERE CREATED BY ROAD CONSTRUCTION AND IN ROADWAY DIRT. THE ROAD DIRT WHICH SETTLED INTO A WATER BODY WOULD PROBABLY PROBABLY BE REMOVED FROM THE POND, EVAPORATING FROM 1.5 TO 12 G/L/DAY TO OTHERS FROM THE ROAD WADGE TO ALAS TO 0.5 G/L/DAY AT 100 METERS DISTANCE. THE QUANTITY OF DIRT WHICH ACCUMULATED ON THE SIDE LANE FROM THE SETTLING WIND, PONDING CREATED BY THE ROAD CONSTRUCTION AND THE HIGHEST PRODUCTION RATES AND RISES RISES. THE LAKEWATER FROM ROAD DIRT ON THE COASTAL FILL PONDING WERE SLIGHTLY MORE SIGNIFICANT TO PLANKTON PRODUCTION AND BIODIVERSITY ACCUMULATION THAN WERE THE LAKEWATER FROM ROAD DIRT IN THE MOUNTAINS OF THE NORTHWEST TERRITORY. DIFFERENCE IN THE ROADWAY DIRT IS OBSERVED. AT THE LEVEL OF THE SETTLEMENT, LITTLE DIRECT EFFECTS CAN BE SEEN IN PONDING NOT DIRECTLY IN CONTACT WITH THE ROAD. ALL OTHER PONDING ARE TAKEN BY POTENTIALLY OLIGOTROPHIC DURING THE SUMMER. THE WINTER LOADING OF ROAD DIRT DIRT WILL BE PROTECTED FROM A COMPLETED ROAD IN PREPARATION.

(CLASS) PRELIMINARY

(TRM) APPENDIX, COMBUSTION E.

(TITLE) FISSION PRODUCT TRANSPORT MODELS

(ACRON) LARC-1; SURVINS; LEAP

(ABST) LOS ALAMOS SCIENTIFIC LABORATORY, GROUP O-11, RM-576, P.O. BOX 1663

(CITY) LOS ALAMOS

(STATE) NM

(TRM) 7505

(DOC) 505-667-5230; PYS 801-5230

(COMED) DEVELOPED AT LANS

(DOC) C. E. APPENDIX, JR., SURVINS- A CIRCULATING AND PLATEAU ACTIVITY PROGRAM FOR GAS COOLED REACTORS WITH ARBITRARY RADIOACTIVE CHAIN, LOS ALAMOS SCIENTIFIC LABORATORY REPORT

LA-7249-MS (SUDDENLY-0040), 1970; C. E. LEV, C. E. APPENDIX, JR., AND J. P. POLY, LEAP- A COMPUTER PROGRAM TO CALCULATE FISSION PRODUCT RELEASE FROM A REACTOR CONTAINMENT BUILDING FOR ARBITRARY RADIOACTIVE DECAY CHAIN, LOS ALAMOS SCIENTIFIC LABORATORY REPORT LA-5006-MS-70-MS, 1974; L. R. CARPENTERS AND C. P. LEV, LARC-1- A LOS ALAMOS RELEASE CALCULATION PROGRAM FOR FISSION PRODUCT TRANSPORT IN NUCLEAR DURING THE LOW ACCIDENT, LOS ALAMOS SCIENTIFIC LABORATORY REPORT LA-5006-MS-70-MS, 1974.

(ABST) CALCULATES FISSION PRODUCT TRANSPORT THROUGH GAS COOLED REACTORS AND CONTAINMENT BUILDINGS

(ABST) LARC-1 IS A CODE WHICH DESCRIBES THE FISSION PRODUCT RELEASE FROM AN NUCLEAR CORE DURING THE LOW ACCIDENT. IT IS A CONSTANT RELEASE-PROBABILISTIC MODEL. INPUT DATA REQUIRED CONSIST OF RELEASE CONSTANTS, TEMPERATURE MODELING, FISSION PRODUCT RELEASE RATES, COOLED FUEL PARTICLE FAILURE FRACTION AND AGED COOLED FUEL PARTICLE FAILURE FRACTIONS. LEAP IS AN ANALYTIC CONTAINMENT BUILDING MODEL THAT IS USED FOR CALCULATING THE LEAKAGE INTO THE ENVIRONMENT OF EACH ISOTOPE OF AN ARBITRARY RADIOACTIVE DECAY CHAIN. THE MODEL ACCOUNTS FOR THE SOURCE, THE BUILDUP, THE DECAY, THE CLEARUP, AND THE LEAKAGE OF ISOTOPES THAT ARE GAS-BORNE INSIDE THE CONTAINMENT BUILDING. SURVINS IS A PRIMARY COOLANT MODEL THAT IS USED TO ESTIMATE THE FUEL BURN, CIRCULATING, PLATEAU, AND FILTER INVENTORY OF A HIGH TEMPERATURE GAS-COOLED REACTOR (HTGR) DURING NORMAL OPERATION. IT ACCOUNTS FOR THE SOURCE, BUILDUP, DECAY, AND CLEARUP OF ISOTOPES THAT ARE GAS-BORNE INSIDE THE PRESTRESSED CONCRETE REACTOR VESSEL (PRCV).

(STATUS) UNDER DEVELOPMENT; IN USE

(ACCESS) UNLIMITED

(MEDIA) DISC

(STEP) APPROXIMATELY 2,000 CARD IMAGES PER CODE

(COMP) CDC

(COMPIG) CDC 7600 WITH LTSS OPERATING SYSTEM

(LANG) FORTRAN

(ALGO) ANALYTIC SOLUTIONS USING MATRIX OPERATOR TECHNIQUES

(CLASS) CONTINUOUS; DETERMINISTIC; ANALYTICAL; PREDICTIVE; SIMULATION; ENGINEERING PROCESS

(APPL) FISSION PRODUCT RELEASE FROM NUCLEAR CORE DISRUPTIONS; CONTAINMENT BUILDING RELEASE; NUCLEAR PRIMARY COOLANT ACTIVITY

(USERS) LANS; ORNL; VARIOUS UNIVERSITIES

(VAL) NUCLEAR AND CHEMICAL DATA FOR ISOTOPES

(UPDATE) 70011

(705)
(7007) BLANKS, L. J.; VAN PINE, G. H.

(TITLE) EVALUATION OF A DIGITAL COMPUTER METHOD

<785>

GENERALIZED ENVIRONMENTAL TRANSPORT

<785> ORNL
FOR ANALYSIS OF COMPARTMENTAL MODELS OF
ECOLOGICAL SYSTEMS

<ACR> COMPRES2

<RED> UNIVERSITY OF WASHINGTON, CENTER FOR
QUANTITATIVE SCIENCE

<CTY> PATTLE

<STATE> WA

<YR> 1977

<ENOM> 204-502-2016

<CHOM> RTIC

<DOC> ORNL-74-2016, 68 PP.

<GEN> PARAMETER ESTIMATION; MODEL VALIDATION

<ABST> THIS REPORT PRESENTS RESULTS OF
DEVELOPMENT AND TESTING OF A FORTRAN
PROGRAM FOR EXPLORATION AND ANALYSIS OF
DATA FROM EXPERIMENTS IN WHICH THE
SYSTEM MAY BE DEPICTED BY A COMPARTMENT
MODEL. BOTH REAL AND ARTIFICIAL DATA
WERE USED TO CHECK FOR RATE AND TYPE OF
CONVERGENCE TOWARD THE MINIMUM SUM OF
SQUARES OF DEVIATIONS OF OBSERVED FROM
PREDICTED DATA VALUES FOR EACH
COMPARTMENT. DATA WITH KNOWN DEGREE
AND KIND OF ERROR WERE GENERATED TO
SIMULATE VARIOUS DEGREES OF NOISE
ENCOUNTERED IN REAL BIOLOGICAL DATA.
RESULTS OF THESE COMPUTER STUDIES ARE
PRESENTED IN GRAPHIC AND TABULAR FORM.
LIMITATIONS OF THE PROGRAM ARE
DISCUSSED, AND PROGRAM AND SUBROUTINE
LISTINGS WITH DIRECTIONS FOR USE ARE
GIVEN IN APPENDICES.

<STATUS> OBSOLETE

<ACCESS> UNLIMITED

<MEDIA> DISC

<STZ> 1000 RECORDS

<COMP> CDC

<CONFIG> CDC 6000 SERIES, 32 K CORE MINIMUM

<LANG> FORTRAN IV

<CHAP> BCI

<ALGO> SECOND ORDER CONTINUOUS VARIABLE METRIC
METHOD (CAVTOUN)

<CLAS> CONTINUOUS; DETERMINISTIC; SIMULATION;
OPTIMIZATION

<APPL> PARAMETER ESTIMATION FOR ANY LINEAR
DIFFERENTIAL EQUATION COMPARTMENT
MODEL, ESPECIALLY ECOLOGICAL MATERIAL
TRANSFER MODELS

<SPD> PATTON, B.C. AND WITHAMP, N., ECOLOGY,
80, 813-820, 1967

<HVAL> MINIMUM ERROR SUM OF SQUARES

<CCD> THE PROGRAM IS WRITTEN IN FORTRAN 63
FOR THE CDC 6400 AND 1600, AND IN
FORTRAN IV FOR THE IBM 360/75 AND 7090.
EXTENSIVE DOCUMENTATION IS PRESENTED.
SUCCEEDED BY RIVARD, D. AND L.J.
BLISSON, 1978, PARAMETER ESTIMATION FOR
THE GENERALIZED STOCK PRODUCTION MODEL
UNDER NON-EQUILIBRIUM CONDITIONS,
FISHERIES BULLETIN, IN PRESS.

<786> 780727

<786>
<CONT> BLOOM, S. G.; PAINES, G. E.

<TITLE> A PRELIMINARY MATHEMATICAL MODEL FOR
PREDICTING THE TRANSPORT OF
RADIOISOTOPES IN THE MARINE ENVIRONMENT

<ADDR> PATELLE RESEARCH INSTITUTE

<CTY> COLUMBUS

<STATE> OH

<DOC> BRI-171-123

<ABST> A DIFFUSION MODEL IS GIVEN FOR FALLOUT
ONTO OCEAN SURFACE, GROUNDWATER AND
SURFACE BOWDOFF FROM THE LAND AND THE
INTERNAL DOSE TO MAN RESULTING FROM
CONSUMPTION OF MARINE ORGANISMS.

<CLAS> DETERMINISTIC; CONTINUOUS; SIMULATION

<787>
<CONT> BUENNING, W. A.

<TITLE> MODEL OF ENVIRONMENTAL IMPACTS FROM
ELECTRICAL GENERATION IN WISCONSIN

<ACR> EIR

<ADDR> WISCONSIN UNIVERSITY

<CTY> MADISON

<STATE> WI

<DOC> UNIVERSITY OF WISCONSIN, MADISON, WI,
1975

<ABST> THE PRIMARY RESULTS OF THE RESEARCH
ARE: A COMPUTERIZED MODEL, THE
ELECTRICITY IMPACT MODEL (EIM), THAT
SIMULATES ON A YEAR TO YEAR BASIS THE
TOTAL QUANTIFIED ENVIRONMENTAL IMPACTS
WITHIN AND OUTSIDE THE REGION BEING
MODELED FOR ELECTRICAL GENERATION IN
THE REGION FROM THE ALTERNATE SOURCES,
APPLICATIONS TO EIR TO THE EVALUATION
OF ENVIRONMENTAL IMPACTS RESULTING FROM
POSTULATED ELECTRICITY GENERATION FOR
WISCONSIN THROUGH THE YEAR 2000, AND
THE APPLICATION OF MULTIATTRIBUTE
DECISION ANALYSIS TO EIR TO PROVIDE A
SYSTEMATIC METHOD FOR ITS USE WITHIN A
DECISION FRAMEWORK. THE QUANTIFIED
IMPACTS CALCULATED BY EIR ARE
ASSOCIATED WITH THE UNIT OF ELECTRICAL
GENERATION AND INCLUDE IMPACTS OF
SUPPORTING FUEL INDUSTRIES AS WELL AS
OF THE POWER PLANT ITSELF. THESE
QUANTIFIED IMPACTS HAVE A MINIMUM OF
VALUE JUDGMENT ASSOCIATED WITH THEM AND
CAN BE CONSIDERED TECHNICAL INPUT TO A
DECISION MAKING PROCESS. THE
CALCULATION OF IMPACTS FROM A
PARTICULAR ENERGY SYSTEM IN A
PARTICULAR YEAR IS BASED UPON IMPACT
FACTORS THAT RELATE IMPACTS TO A UNIT
OF GENERATION FOR A REFERENCE PLANT IN
THE DESIRED YEAR. THE IMPACT FACTORS
CAN BE VARIED AS A FUNCTION OF TIME TO
SIMULATE CHANGES IN TECHNOLOGY OR
REGULATION IF APPROPRIATE INPUT
PARAMETERS ARE ADJUSTED. THE SYSTEMS
INCLUDED IN EIR ARE THE PRESSURIZED
WATER REACTOR, BOILING WATER REACTOR,
HIGH-TEMPERATURE GAS-COOLED REACTOR,

GENERALIZED ENVIRONMENTAL TRANSPORT

<787> COME. LIQUID METAL FAST BREEDER REACTOR, AND COAL. THE COAL SYSTEM CAN INCLUDE PLANTS THAT BURN LOW SULFUR BITUMINOUS COAL AS WELL AS PLANTS THAT USE HIGH SULFUR BITUMINOUS. THE COAL SYSTEM PARAMETERS CAN ALSO BE ADJUSTED TO INCLUDE ADVANCED TECHNOLOGY SYSTEMS, SUCH AS FLUIDIZED BED COMBUSTION. THE BREEDER REACTOR IS INCLUDED ALTHOUGH IT IS NOT A CURRENT ALTERNATIVE AND IS NOT EXPECTED TO BE COMMERCIALLY COMPETITIVE BEFORE THE MID-1990'S. THE OTHER THREE REACTOR SYSTEMS ARE CURRENTLY AVAILABLE.

<GEO> WISCONSIN

<TIME> 1970-2000

<788>
<AUTH> DOUGGETT, S. H.; REYER, R.;
VARHUS-KRNER, H.; MOBLE, S. B.; STERN,
R. J.

<TITLE> MODELING THE ECONOMIC AND ENVIRONMENTAL
CONSEQUENCES OF ALTERNATIVE ENERGY
POLICIES: SEAS-STRATEGIC ENVIRONMENTAL
ASSESSMENT SYSTEM

<ACRO> SEAS

<ADDP> INTERNATIONAL RESEARCH AND TECHNOLOGY

<CITY> ARLINGTON

<STATE> VA

<DOC> PROCEEDINGS OF THE 1976 SUMMER COMPUTER
SIMULATION CONFERENCE, HELD IN
WASHINGTON, DC, JULY 12, 1976.

<ABST> SEAS, THE STRATEGIC ENVIRONMENTAL
ASSESSMENT SYSTEM, WAS ORIGINALLY
CONCEIVED BY THE ENVIRONMENTAL
PROTECTION AGENCY (EPA) AS AN
ANALYTICAL TOOL WHICH COULD INDICATE
THE IMPLICATIONS OF FEDERAL
ENVIRONMENTAL REGULATIONS BY MEASURING
BOTH THE DIRECT IMPACTS ON AIR AND
WATER QUALITY AND THE INDIRECT EFFECTS
OF POLITICAL-CONTROL INVESTMENT ON THE
NATIONAL ECONOMY. THE QUALITIES OF THE
SYSTEM WHICH HAS BEEN DEVELOPED REFLECT
THIS COMMITMENT TO INTEGRATED
ASSESSMENT. SOME OF THE MAJOR
CHARACTERISTICS CAN BE SUMMARIZED. THE
MODEL IS DESIGNED TO CONDUCT ANALYSIS AT
A VERY DETAILED LEVEL, BY EMPLOYING
INFORMATION FROM A NUMBER OF LARGE
EXISTING DATA BASES. A WIDE ARRAY OF
SCENARIO AND OVERRIDE CAPABILITIES ARE
INCLUDED IN THE SYSTEM DESIGN,
PERMITTING THE INVESTIGATION AND
COMPARISON OF ALTERNATIVE FUTURES. AT
THE SAME TIME THE MODEL, THROUGH USE OF
AN INPUT-OUTPUT STRUCTURE, FEEDBACK
MECHANISMS, AND INTERRELATIONSHIPS
BETWEEN SYSTEM SUBMODULES, HAS SOUGHT
TO CREATE AN INTERNAL CONSISTENCY
WITHIN THE PROJECTIVE FRAMEWORK, SO
THAT AN ADJUSTMENT TO A PRIMARY CAUSAL
VARIABLE IS FELT THROUGHOUT THE SYSTEM.
A BRIEF REVIEW OF THESE PRINCIPLES IS
PRESENTED AS AN INTRODUCTION TO THE
CURRENT ENERGY EFFORT.

<CLASS> PREDICTIVE

<789>
<AUTH> DOTSON, W. L.; PETERSON, B. E.

<TITLE> TENNESSEE AND CUMBERLAND RIVER BASINS
RADIOISOTOPE TRANSPORT

<ACRO> NEPHRES

<ADDP> HANFORD ENGINEERING DEVELOPMENT
LABORATORY

<CITY> RICHLAND

<STATE> WA

<DOC> HEDL-SA--1087, 1976

<STY> CALCULATIONS OF RADIATION DOSE TO HUMAN
POPULATIONS FROM CUMULATIVE OPERATION
OF NUCLEAR FACILITIES

<ABST> THE CURRENT ESTIMATES OF INCREASED
UTILIZATION OF NUCLEAR POWER HAVE
BROUGHT INTO FOCUS THE PROBLEM OF THE
CUMULATIVE INTERACTION OF SEVERAL
NUCLEAR FACILITIES WITH THE BIOSPHERE
OF A REGION. AN ENGINEERING ANALYSIS
TOOL TO MAKE THE NECESSARY CALCULATIONS
UPON WHICH REASONABLE ESTIMATES OF
POTENTIAL RADIATION DOSE AND DOSE
COMMITMENT TO INDIVIDUALS AND
POPULATION GROUPS IN SUCH A REGION HAS
BEEN DEVISED BY HANFORD ENGINEERING
DEVELOPMENT LABORATORY (HEDL). THIS
PAPER DISCUSSES THE APPLICATION OF THE
RADIOISOTOPE TRANSPORT ELEMENTS OF THIS
COMPILED CODE TO THE TENNESSEE AND
CUMBERLAND RIVER BASINS. THE
RADIOISOTOPE TRANSPORT SIMULATION CODES
(NEPHRES) WERE DESIGNED TO EVALUATE THE
ENVIRONMENT IMPACT OF NUCLEAR
FACILITIES IN OR NEAR THE YEAR 2000.

<GEO> TENNESSEE

<CLASS> SIMULATION

<790>
<AUTH> BUKOWICZ, JOHN K.

<TITLE> SOLA-PART

<ACRO> SOLA-PART

<ADDP> LOS ALAMOS SCIENTIFIC LABORATORY, GROUP
T-3, MS-216, P.O. BOX 1663

<CITY> LOS ALAMOS

<STATE> NM

<ZIP> 87545

<PHONE> 505-667-0156, FTS 803-0156

<SOURCE> LAL

<DOC> NONE

<SUB> TWO FLUID INTERPENETRATING FLOWS

<ABST> SOLA-PART IS A TWO-INTERPENETRATING
FLUIDS COMPUTER PROGRAM FOR THE
CALCULATION OF TRANSIENT, 2-D FLOWS,
PRIMARILY FOR THE CALCULATIONS OF
DROPLET DYNAMICS IN A CONTINUOUS MEDIA.
THE DROPLETS MAY UNDERGO PHASE CHANGE
AND ARE PERMITTED TO HAVE A SPECTRUM OF
SIZES.

<STATUS> UNDER DEVELOPMENT; IN USE

<ACCESS> NOT ACCESSIBLE

<MEDIA> DISC

<799>

GENERALIZED ENVIRONMENTAL TRANSPORT

<799> CONT.

<CCRP> CDC

<CONFID> CDC 7670 LARGE OR SMALL CODE

<LANG> FORTRAN IV

<ALGO> MODIFIED FORM OF THE MARKER AND CELL (MAC) COMPUTING METHOD

<CLASS> CONTINUOUS; DISCRETE; DETERMINISTIC; STOCHASTIC; ANALYTICAL; PREDICTIVE; INTERACTIVE; SIMULATION; OPTIMIZATION; ECONOMETRIC; ENGINEERING PROCESS

<APPL> REACTOR SAFETY; FUEL SPRAYS

<7SER> LAST

<SMD> DATA GENERATED BY CODE

<NVAL> COMPARISON WITH EXPERIMENTS

<7PDR> 700610

<791>

<CONT> EPPPE, D. C.

<TITLE> SPATIAL ANALYSIS AND SUITABILITY MODELING

<ADDR> OAK RIDGE NATIONAL LABORATORY, P.O. BOX 1

<CITY> OAK RIDGE

<STATE> TN

<ZIP> 37830

<PHONE> 615-493-0611 EXT 3-0106; FTS 850-0106

<SOURCE> DEVELOPED AT ORNL

<DOC> NONE DIRECTLY. RELATED DOCUMENTS ARE: REGIONAL STUDIES PROGRAM ANNUAL REPORT JANUARY 1 THROUGH DECEMBER 31, 1976, D.W. DAVIS, ET AL, OAK RIDGE NATIONAL LABORATORY, ORNL/TN-5039, AUGUST, 1977; TOWARD A REGIONAL POWER PLANT SITING METHOD: ARC-HARTLAND REGIONAL SITING FACTORS STUDY, FY1976 PROGRESS REPORT, S.L. YAFFEE, C.A. MILLER, OAK RIDGE NATIONAL LABORATORY, ORNL-TN-4940, NOVEMBER, 1976; THE HARTLAND POWER PLANT SITING PROJECT: AN APPLICATION OF THE ORNL LANDUSE SCREENING PROCEDURE, J.S. BOSSOW, OAK RIDGE NATIONAL LABORATORY, ORNL/NUREG/TN-79, APRIL, 1977.

<SUB> ROUTINES FOR SUITABILITY, SITING, AND IMPACT ANALYSIS OF POWER PLANT SITING.

<ABST> THE COMPUTER SCIENCES DIVISION HAS DEVELOPED A GROUP OF SPATIAL ANALYSIS ROUTINES FOR SUITABILITY, SITING, AND IMPACT ANALYSIS OF POWER PLANT SITING. THESE PACKAGES COMBINE AND ANALYZE REGIONAL AND NATIONAL DATA BASES TO BUILD INDICES THAT ARE COMBINED TOGETHER TO CALCULATE SUITABILITIES. ONE GROUP OF PACKAGES WORKS WITH POLYGONAL AREAS (COUNTIES, BARS, ETC.) AT THE COUNTY LEVEL WHILE THE OTHER OPERATES ON A GRID CELL SYSTEM AT THE SUB-COUNTY LEVEL. THE DATA BASES REPRESENT MANY VARIABLES SUCH AS WATER AVAILABILITY, POPULATION DENSITY, SIGNIFICITY, COAL RESERVES, DANCE CHANNELS, RAILROADS, ENERGY DEMAND, AIR QUALITY MAINTENANCE AREAS, ETC. A SUBSET OF THE POLYGONAL ANALYSES

OPERATES ON THE PDP-10 INTERACTIVELY. EXISTING AND PLANNED POWER PLANTS ARE INCLUDED IN THE ANALYSIS ALONG WITH NEW CAPACITY THAT MUST BE SITED. WATER QUALITY IMPACT ANALYSES ARE CALCULATED AND MAPPED ALSO FOR SPECIFIC REGIONS, AS A RESULT OF SITING FUTURE FACILITIES. THE CALCULATIONS PERFORMED IN THE SOFTWARE INCLUDE PROXIMITY CALCULATIONS FOR ACCESSIBILITY TO COAL AND ENERGY DEMAND. EXCLUSION FACTORS ARE ALSO INCLUDED TO MEET MINIMAL POWER PLANT REQUIREMENTS. THE USER PLACES IMPORTANCE WEIGHTINGS ON THE SITING FACTORS BEFORE THE COMPOSITE ANALYSIS IS PERFORMED. THE RESULTS OF THE TWO PACKAGES MAY BE PLOTTED WITH THE POLYGON MAPPING SYSTEM OR THE CELL MAPPING SYSTEM, RESPECTIVELY.

<GES> MARYLAND; SOUTHERN U.S.; OHIO RIVER BASIN; U.S.

<STATUS> UNDER DEVELOPMENT; IN USE

<ACCESS> LIMITED

<MEDIA> VISC

<COMP> IBM

<CONFID> IBM 740, .LT. 500K BYTES; PDP-10, .LT. 50K WORDS

<LANG> FORTRAN

<APPL> THESE PACKAGES HAVE BEEN USED IN ENERGY FACILITY SITING PROBLEMS IN MARYLAND, THE SOUTH, THE OHIO RIVER BASIN, AND AT THE NATIONAL LEVEL. A VARIETY OF TECHNOLOGIES HAVE BEEN ANALYZED INCLUDING COAL COMBUSTION, NUCLEAR, AND COAL CONVERSION.

<CON> THESE PACKAGES CONTAIN A SERIES OF MODULES WHICH MUST BE COMBINED BY PERSONNEL EXPERIENCED IN THE SYSTEM FOR ANY PARTICULAR APPLICATION. THE INDIVIDUAL MODULES ARE NOT TRANSPORTABLE TO ANY OTHER FACILITY AT PRESENT. MORE IS PLANNED FOR FY 78-79 TO DEVELOP A GENERALIZED TRANSPORTABLE SYSTEM WITH APPROPRIATE DOCUMENTATION. THE SYSTEM IS STILL UNDER DEVELOPMENT AND IS PRESENTLY ONLY BEING USED IN CONJUNCTION WITH ORNL RESEARCH APPLICATIONS.

<UPDATE> 700615

<792>

<CONT> ELLIS, J. E.; PANTON, D. J.

<TITLE> SIMULATION APPROACH TO THE ANALYSIS OF STRIP-SINING IMPACT ON THE ECOSYSTEM WITH EMPHASIS ON WILDLIFE

<ADDR> COLORADO STATE UNIVERSITY, NATURAL RESOURCES ECOLOGY LABORATORY

<CITY> FORT COLLINS

<STATE> CO

<ZIP> 80523

<PHONE> 303-491-5571

<DOC> ELLIS, J.E., D.J. PANTON, G.W. BUNT, AND D.W. SMITH, PROGRESS REPORT TO THE WESTERN ENERGY AND LAND USE TEAM, OFFICE OF BIOLOGICAL SERVICES, U.S. FISH AND WILDLIFE SERVICE, 1976,

GENERALIZED ENVIRONMENTAL TRANSPORT

<792> CONT.

NATURAL RESOURCE ECOLOGY LABORATORY,
COLORADO STATE UNIVERSITY

<ABST> TO ANTICIPATE AND EVALUATE THE POTENTIAL IMPACTS OF STRIP-MINING ON THE ECOSYSTEM AND THE PROBABLE RESULTS OF ALTERNATIVE REHABILITATION AND MANAGEMENT STRATEGIES, IT IS NECESSARY TO HAVE A BROAD PERSPECTIVE AND UNDERSTANDING OF THE SYSTEM. THIS INCLUDES KNOWLEDGE OF THE INDIVIDUAL COMPONENTS AND PROCESSES WITHIN THE SYSTEM, THE PERTURBING EFFECTS OF STRIP-MINING ON THESE INDIVIDUAL COMPONENTS AND PROCESSES, AND THE PROBABLE INTERACTIVE OR SYSTEM-LEVEL EFFECTS WHICH WILL RESULT FROM THE PERTURBATION. THE MAJOR OBJECTIVE OF THIS RESEARCH IS THE DEVELOPMENT OF A SIMULATION MODEL CAPABLE OF REPLICATING, (1) THE MAJOR ON-SITE ECOSYSTEM EFFECTS OF STRIP-MINING AND (2) THE RESPONSE OF THE PERTURBED ECOSYSTEM TO ALTERNATIVE REHABILITATION STRATEGIES. INITIALLY THE ATTEMPT IS TO SIMULATE THE REHABILITATION PROCESS FOR A PERIOD OF TEN YEARS. TO ACCOMPLISH THIS THE FOLLOWING TASKS WILL BE PERFORMED: (1) AN EXTENSIVE REVIEW AND COMPILATION OF PERTINENT LITERATURE. (2) A SERIES OF MODEL-EXPERIMENTS (SIMULATION GAMES) TO DETERMINE THE APPLICABILITY OF AN EXISTING ECOSYSTEM SIMULATION MODEL (ELM) TO THE STRIP-MINING PROBLEM. (3) MODIFICATION AND REDEVELOPMENT OF THE EXISTING MODEL TO MAKE IT APPLICABLE TO THE PRESENT PROBLEM. (4) TESTING OF THE SIMULATION MODEL. (5) DOCUMENTATION AND EXPLANATION OF THE MODEL AND ITS OPERATION.

<TIME> 08/76-02/77

<CIAS> SIMULATION

<793>
<CONT> FLETCHER, J. P.; DOTSON, U. L.

<TITLE> HERRERS - A DIGITAL COMPUTER CODE FOR ESTIMATING REGIONAL RADIOLOGICAL EFFECTS FROM THE NUCLEAR POWER INDUSTRY

<ACRO> HERRERS; ARTRAD; WTRAD; DOSE

<ACRO> HANFORD ENGINEERING DEVELOPMENT LABORATORY

<CITY> RICHLAND

<STATE> WA

<ZIP> 99252

<PHONE> 509-942-6523; FTS 844-6523

<DOC> HERR-79-71-160; 759 PP., 1971

<SUB> ESTIMATING REGIONAL RADIOLOGICAL EFFECTS RESULTING FROM OPERATION OF NUCLEAR FACILITIES

<ABST> THE HERRERS MODEL IS DESIGNED TO CALCULATE RADIOISOTOPE RELEASE AND RADIATION DOSE OCCURRING WITHIN A STUDY AREA IN A GIVEN YEAR. WHILE CUMULATIVE RADIOISOTOPE RELEASE AS SUCH IS NOT CONSIDERED, THE ACCUMULATED BUILDUP AND DEPOSITION OF KEY RADIOISOTOPIES IS "BACK-CALCULATED" FOR A FIVE-TO-TEN YEAR PERIOD FOR USE IN DOSE CALCULATIONS. THE INITIAL DEVELOPMENT

OF THE HERRERS MODEL WAS BASED ON A STUDY OF THE REGION COMPRISING THE UPPER MISSISSIPPI AND LOWER MISSOURI RIVER BASINS, INCLUDING THE CHICAGO METROPOLITAN AREA. TO ESTIMATE THE EFFECTS ON DOSE IN THE STUDY AREA CAUSED BY AIR TRANSPORT OF RADIOISOTOPES FROM ADJACENT REGIONS, AN "AIR ENVELOPE" SOME 200 MILES IN WIDTH WAS INCLUDED AROUND THE STUDY AREA. CONSIDERATIONS IN THE STUDY INCLUDED THE OPERATION OF 400,000 KW GENERATING CAPACITY POWER PLANTS (NUCLEAR AND FOSSIL) AT 106 SEPARATE SITES, AND REPROCESSING PLANTS AT 9 SITES. THE AIR TRANSPORT CODE (ARTRAD) UTILIZES MONTHLY CLIMATOLOGICAL DATA APPLIED TO STANDARD MATHEMATICAL MODELS FOR DIFFUSION, DEPOSITION, AND TRANSPORT. THE WATER TRANSPORT CODE (WTRAD) CALCULATES DIFFUSION FROM EMISSION POINTS, CONCENTRATIONS IN SEDIMENTS AND SURFACE WATER AT EACH LOCATION REQUESTED, AND GROUND WATER TRANSPORT. THE CODE (DOSE) CONSIDERS EXPOSURE TO THE WHOLE BODY AND SIX SPECIFIC ORGANS IN (1) DIRECT SUBMERSION IN AIR OR WATER (2) INHALATION (3) EXTERNAL EXPOSURE FROM SURFACE CONTAMINATION (4) INGESTION OF FOOD AND WATER OVER NUMEROUS FOOD-CHAIN PATTERNS. LIFE HABITS AND DIETARY DIFFERENCES ARE ALSO CONSIDERED IN THE CODE (LPM). PRESENT STRUCTURE ALLOWS CALCULATIONS FOR UP TO 50 RADIOISOTOPES; 200 RELEASE POINTS; AND 300 RECEPTOR LOCATIONS. MORE RECENT APPLICATIONS HAVE BEEN FOR THE TENNESSEE VALLEY REGION AND SOUTHWEST ENVIRONMENTAL STUDY.

<GEO> ILLINOIS, UPPER MISSISSIPPI, LOWER MISSOURI RIVER BASIN

<TIME> USER DEFINED

<STATUS> OPERATIONAL

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE; PUNCHED CARDS

<SIZE> 230 K WORDS

<COMP> UMI; CDC

<CONFIG> CDC CYBER 74 WITH 256 K CORE AND THREE 9 TRACK TAPE DRIVES UMI 1100 SERIES WITH 256K CORE AND THREE 9 TRACK TAPE DRIVES.

<LANG> FORTRAN IV

<CHAR> BINARY; BCD

<ALGO> NOT APPLICABLE

<CLAS> PREDICTIVE; SIMULATION

<APPL> EVALUATION OF RADIOISOTOPE RELEASE FROM NUCLEAR FACILITIES; TRANSPORT OF THESE ISOTOPES INTO THE ENVIRONMENT; AND RESULTING DOSE TO POPULATION

<USERS> EDEL

<SWD> FURNISHED BY USER.

<MAINT> USER MAY PERFORM SENSITIVITY ANALYSIS BY VARIANCE OF INPUT PARAMETERS.

<CON> EXTENSIVE MODIFICATION OF THE HERRERS MODEL HAS OCCURRED, AND IS BEING PREPARED FOR PUBLICATION. THE CURRENT MODEL DOES NOT CONSIDER NEAR-SITE CONDITIONS, HOWEVER THIS PUBLICATION IS

<793>

GENERALIZED ENVIRONMENTAL TRANSPORT

<793> CONT.

THE PRIMARY DOCUMENTATION FOR MANY PARAMETERS THAT ARE USED IN LATED CODES WHICH ARE DESIGNED TO CALCULATE YEAR-SITE DOSES. THE HERMES MODEL IS LARGE AND COMPLEX IN ORDER TO PROVIDE COMPREHENSIVE ESTIMATES OF POPULATION DOSE OVER REGIONS OF THE SIZE INDICATED.

<999A" D 780729

<794>

<COM> FLETCHER, J. F.; DOTSON, W. L.; PETERSON, C. E.; BETTON, B. P.

<TITLE> MODELLING THE REGIONAL TRANSPORT OF RADIOCLIDES IN A MAJOR UNITED STATES RIVER BASIN

<ACRO> HERMES; APTAN; WTRAN;

<ADDR> RANDOLPH ENGINEERING DEVELOPMENT LABORATORY

<CITY> RICHLAND

<STATE> WA

<DOC> CONF-730503-5; IAEA-SR-172/80; IN: ENVIRONMENTAL BEHAVIOR OF RADIOCLIDES RELEASED IN THE NUCLEAR INDUSTRY, PROCEEDINGS OF A SYMPOSIUM HELD IN AIX-EN-PROVENCE, FRANCE, MAY 14-18, 1973, (P. 849-865)

<ABST> A COMPREHENSIVE STUDY OF THE RADIOLOGICAL IMPLICATIONS OF LARGE-SCALE USE OF NUCLEAR POWER GENERATION, ADDRESSED TO THE TENNESSEE-CUMBERLAND RIVER BASINS IN THE YEAR 2000, IS BEING UNDERTAKEN. IN THE COURSE OF THIS STUDY COMPUTER MODELLING TECHNIQUES HAVE BEEN DEVELOPED TO EVALUATE THE MOVEMENT OF RADIOCLIDES, BY WATER AND AIR TRANSPORT, FROM POINTS OF RELEASE AT A LARGE NUMBER OF PLANT SITES AND TO CALCULATE PATTERNS OF RADIOCLIDE CONCENTRATION THROUGHOUT THE REGION OF STUDY. AIR TRANSPORT CALCULATIONS UTILIZE A MODIFICATION OF THE BIVARIATE NORMAL EQUATION, WITH THE VERTICAL PARAMETER SIGMA(Z) CHARACTERIZED AS A FUNCTION OF DISTANCE FROM THE SOURCE, STABILITY AND MIXING LAYER DEPTH. LOCAL VARIATIONS IN AIR FLOW CAUSED BY MAJOR TERRAIN FEATURES ARE MODELLED. DEFLECTION OF THE AIRBORNE RADIOCLIDES BY WET AND DRY PRECIPITATION PROCESSES IS ACCOUNTED FOR AND THE CONCENTRATIONS OF DEPOSITED RADIOCLIDES ARE CALCULATED. THE MODEL Sums CONTRIBUTIONS FROM ALL SOURCES TO PROVIDE RESULTANT PATTERNS OF CONCENTRATION OF AIRBORNE AND DEPOSITED RADIOCLIDES, INCLUDING CONTRIBUTIONS FROM RADIOCLIDES IN SOLUTION AND ABSORBED ON SEDIMENTS. EFFECTS OF FLOW STRATIFICATION AND SEDIMENT TRAPPING IN RESERVOIRS ARE CONSIDERED. THE SOLUTION OF AIR-DEPOSITED RADIOCLIDES AND THEIR SUBSEQUENT TRANSPORT IN GROUND AND SURFACE WATERS ARE MODELLED. CALCULATIONAL ROUTINES ARE PROVIDED FOR SIMULATING RADIOCLIDE TRANSPORT IN EACH STRAIN IN THE BASIN AND FOR CALCULATING THE RESULTANT CONCENTRATIONS IN SOLUTION AND ASSOCIATED WITH SUSPENDED AND DEPOSITED SEDIMENTS. TOGETHER, THE AIR AND WATER TRANSPORT MODELS ARE DESIGNED TO CALCULATE REGIONAL PATTERNS OF RADIOCLIDE CONCENTRATIONS IN THE

ENVIRONMENT THAT RESULT FROM THE OPERATION OF NUCLEAR FACILITIES IN A REGION. THESE CONCENTRATION PATTERNS CAN THEN BE APPLIED TO THE EVALUATION OF RADIOLOGICAL DOSE TO MAN.

<GEO> TENNESSEE-CUMBERLAND RIVER BASINS

<795>

<COM> GINSON, D. P.

<TITLE> DEVELOPMENT OF A SIMULATION MODEL FOR EVALUATION OF SURFACE MINING OPERATIONS AND RECLAMATION PLANS

<ADDR> MONTANA STATE UNIVERSITY, DEPARTMENT OF INDUSTRIAL ENGINEERING AND COMPUTER SCIENCE

<CITY> BOZEMAN

<STATE> MT

<ZIP> 59715

<ABST> THE ULTIMATE OBJECTIVE OF THE STUDY IS TO PROVIDE THE LAND MANAGER WITH COMPREHENSIVE TOOL FOR USE IN EVALUATING ALTERNATIVE SURFACE COAL MINE PLANS. EVALUATION WOULD INCLUDE THE EXAMINATION OF PROPOSED MINE PLANS RELATIVE TO PRODUCTIVITY AND ENVIRONMENTAL EFFECTS AND THE RESULTING TRADE-OFFS WITH RESPECT TO MINE DESIGN. FINAL OUTPUT OF THE STUDY WILL BE A COMPUTERIZED MINE PLANNING SYSTEM. SPECIFIC OBJECTIVES: (1) USE EXISTING INVENTORY DATA ON TOPOGRAPHY, SOILS, GEOLOGY, ETC. TO MODEL THE PROPOSED MINING SITE; (2) DEVELOP AND USE TECHNIQUES TO OPTIMIZE THE LOCATION OF SPOIL AND TOPSOIL STOCKPILES USING THE CONSTRAINTS OF MATERIAL HANDLING CAPABILITIES OF THE EQUIPMENT AND A GIVEN RECLAMATION PLAN; (3) INTEGRATE INFORMATION ON THE HYDROLOGIC, EROSION, AND MASS STABILITY CHARACTERISTICS OF THE SPOILS AND TOPSOIL MATERIALS INTO THE OPTIMUM LOCATION OF SPOIL PILES; (4) VIEW CUTTING FLARE PROFILES FOR ANY PORTION OF THE MINE SITE; (5) SIMULATE AND VIEW (PLAN VIEW AND CUTTING FLARE PROFILES) THE RESULTS OF REPLACEMENT OF SPOILS AND TOPSOIL ACCORDING TO A RECLAMATION PLAN; AND (6) DESIGN A SIMPLE, ECONOMICAL SYSTEM FOR EVALUATING MINING AND LAND RECLAMATION PLANS.

<TIED> 01/76-12/78

<CLASS> SIMULATION

<796>

<COM> GIST, C. S.; GASH, R.; WILSON, F. D.; WEBER, P.

<TITLE> SIMPLE METHOD FOR EVALUATING ALTERNATIVES TO A PROPOSED ENVIRONMENTAL ALTERATION, ITS HISTORY, AND AN EXAMPLE OF ITS USE IN OIL SHALE DEVELOPMENT

<ACRO> DARS

<ADDR> LINDTICS, INC.

<CITY> DENVER

<STATE> CO

GENERALIZED ENVIRONMENTAL TRANSPORT

- <796> CONT.
 <DOC> QUARTERLY COLORADO SCHOOL OF MINES, 70(4), 29-74;
- <ABST> A SURVEY OF OTHER LITERATURE IS PRESENTED WITH A BRIEF DISCUSSION OF SEVERAL OF THE VARIOUS ENVIRONMENTAL EVALUATION TECHNIQUES. SUBSEQUENTLY, THE DARE (DECISION ALTERNATIVE RATION EVALUATION) MODEL AND ITS USE ARE PRESENTED. THE DARE MODEL WAS USED TO EXAMINE POTENTIAL OF DISPOSAL SITES OF PROCESSED SHALE ON TRACT C-A OPERATED BY THE RIO BLANCO OIL SHALE PROJECT. SIXTEEN ALTERNATE SPENT SHALE DISPOSAL SITES FOR TRACT C-A PROTOTYPE OIL SHALE PROJECT WERE IDENTIFIED. ONE WAS ON-TRACT; 15 WERE OFF-TRACT. AN ENVIRONMENTAL EVALUATION WAS MADE OF THESE DISPOSAL AREAS TO IDENTIFY SITES BEST SUITED FOR THIS PURPOSE. THE DARE MODEL WAS CHOSEN TO BE THE VEHICLE FOR THIS EVALUATION. NINE MAJOR CRITERIA CONTAINING 44 SUBOD CRITERIA WERE IDENTIFIED AS IMPORTANT TO THE DECISION-MAKING PROCESS. THESE WERE EVALUATED BY A NINE-MEMBER EXPERT PANEL USING THE LITERATURE, INPUT FROM NUMEROUS OTHER PROFESSIONALS, AND ON-SITE ASSESSMENTS. A DETAILED DESCRIPTION IS PRESENTED TO ENABLE THE READER TO FOLLOW THE PROCEDURES IN STEP-WISE FASHION SO THAT HE MAY USE THE MODEL. FOUR SITES WERE DETERMINED TO BE ENVIRONMENTALLY SUPERIOR: RISKY DINK GULCH, 94 HESA, DRY FORK, AND YELLOW CREEK.
- <CLAS> PREDICTIVE
- <797>
 <CONT> GUSTAFSON, J. D.; INNIS, G. S.
 <TITLE> SIMCOMP: VERSION 3.0 USERS MANUAL
 <ACRO> SIMCOMP
 <ADDR> COLORADO STATE UNIVERSITY, NATURAL RESOURCE ECOLOGY LABORATORY
 <CITY> FORT COLLINS
 <STATE> CO
 <DOC> INTERNATIONAL BIOLOGICAL PROGRAM TECHNICAL REPORTS 210, 168 PP., 1973
 <COMP> CDC
 <CLAS> SIMULATION
- <798>
 <CONT> GUSTAFSON, J. D.; INNIS, G. S.
 <TITLE> SIMCOMP VERSION 2.1 USER'S MANUAL AND MAINTENANCE DOCUMENT
 <ACRO> SIMCOMP
 <ADDR> COLORADO STATE UNIVERSITY, NATURAL RESOURCE ECOLOGY LABORATORY
 <CITY> FORT COLLINS
 <STATE> CO
 <DOC> INTERNATIONAL BIOLOGICAL PROGRAM, GRASSLAND BICENT. TECHNICAL REPORT 217, 96 PP., 1973
 <COMP> CDC
- <CLAS> SIMULATIONS
 <799>
 <CONT> GUSTAFSON, J. D.; INNIS, G. S.
 <TITLE> SIMCOMP: A SIMULATION COMPILER FOR BIOLOGICAL MODELING
 <ACRO> SIMCOMP
 <ADDR> SIMULATIONS, INC.
 <CITY> LA JOLIA
 <STATE> CA
 <DOC> IN: PROCEEDINGS SUMMER COMPUTER SIMULATION CONFERENCE, HELD IN SAN DIEGO, CA, JUNE 14-16, 1972, (P. 1090-1096)
 <COMP> CDC
 <CLAS> SIMULATION
- <900>
 <CONT> HABEGGER, L. J.
 <TITLE> A METHODOLOGY FOR ASSESSMENT OF ENERGY FACILITY SITING PATTERNS
 <ACRO> SITE
 <ADDR> ARGONNE NATIONAL LABORATORY, ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION, 9700 S. CASS AVE.
 <CITY> ARGONNE
 <STATE> IL
 <ZIP> 60439
 <PHONE> PFS 972-3753
 <DOC> PRIGERIO, W.A., L.J. HABEGGER, R.P. KING, L.J. HOOVER, W.A. CLARK, AND J.R. COBIAN, "SITE: A METHODOLOGY FOR ASSESSMENT OF ENERGY SITING PATTERNS", ARL/AA-2, ARGONNE NATIONAL LABORATORY, AUGUST 1975
 <STP> ENERGY FACILITY SITING PATTERNS
 <ABST> THE COMPUTERIZED SITE METHODOLOGY HAS BEEN DEVELOPED FOR EVALUATING HEALTH, ENVIRONMENTAL, AND SOCIOECONOMIC IMPACTS RELATED TO UTILIZATION OF ALTERNATIVE SITES FOR ENERGY PRODUCTION WITHIN A REGION OF INTEREST. THE COST, IMPACT, AND ATTRIBUTE VECTORS, WHICH ARE GENERATED AND DISPLAYED ON DENSITY MAPS, CAN BE USED IN A MULTIPARAMETER OVERLAY PROCESS TO IDENTIFY PREFERABLE SITING AREAS. THE ASSESSMENT OF CLUSTERED FACILITIES IN ENERGY CENTERS IS ALSO POSSIBLE. SITE PROVIDES A METHODOLOGY FOR COMBINING VARIOUS AVAILABLE GEOPHYSICAL, HYDROLOGICAL, GEOLOGICAL, METHODOLOGICAL, ENVIRONMENTAL, AND SOCIOECONOMIC MODELS WITH REGIONAL ATTRIBUTES TO EVALUATE IMPACTS OF FACILITY SITING WITHIN THAT REGION.
 <GRD> U.S.A.
 <STATUS> IN USE
 <ACCESS> UNLIMITED

<800>

GENERALIZED ENVIRONMENTAL TRANSPORT

<800> CONT.

<MEDIA> PUNCHER CARDS

<SIZE> 843 RECORDS EACH 80 BYTES LONG

<COMP> IBM

<CONFIG> IBM 360/75 OR 370/195 OS/VS1 WITH 400K CORE

<LANG> FORTRAN

<CHAR> EBCDIC

<ALGO> WEIGHTED AVERAGES AND VECTOR CALCULATIONS, USING RESULTS OF GAUSSIAN, EULERIAN, AND ROUTE CAPLO SYSTEMS TO MODEL THE DISPERSION OF AIRBORNE POLLUTANTS; OMSO-PRITCHARD AND SIMILAR MODELS FOR LIQUID-BORNE POLLUTANTS AND FOR THERMAL GRADIENTS; PROBABILITY MODELS FOR SEVERE NATURAL PHENOMENA.

<CLASS> DISCRETE; DETERMINISTIC; ANALYTICAL; PREDICTIVE; SIMULATION; OPTIMIZATION

<APPL> NOAA WEATHER TAPES, U.S. BUREAU OF THE CENSUS, ILLINOIS WATER SURVEY, U.S. SOIL CONSERVATION SERVICE, NATIONAL HISTORICAL REGISTER, EPA NATIONAL DATA EMISSIONS SYSTEM

<USER> ARGONNE NATIONAL LABORATORY

<HVAL> NORTHERN ILLINOIS CASE STUDY AREA

<UPDATE> 780703

<901>

<CONT> HALL, P. W.; WESTERDAHL, M. E.; ELEY, R. L.

<TITLE> APPLICATION OF ECOSYSTEM MODELING METHODOLOGIES TO DREDGED MATERIAL RESEARCH

<ADDR> ARMY ENGINEER WATERWAYS EXPERIMENT STATION

<CITY> VICKSBURG

<STATE> MS

<DOC> AR-A--027207, 1976

<ABST> THE REPORT ADDRESSES THE APPLICABILITY OF PHYSICAL AND MATHEMATICAL ECOSYSTEM MODELING METHODOLOGIES TO ENVIRONMENTAL PROBLEMS ASSOCIATED WITH DREDGING AND DISPOSAL OPERATIONS. THREE CATEGORIES OF PHYSICAL MODELS ARE DISCUSSED: BIOASSAYS, MICROCOSMS, AND SCALED ECOSYSTEM MODELS. MATHEMATICAL MODELS CAN BE DIVIDED INTO A NUMBER OF CLASSES, SUCH AS THOSE PREDICTING THE EFFECT OF ALLOCHTHONOUS LOADINGS ON THE DISSOLVED OXYGEN BUDGET, DETERMINING THE PARTITIONING AND DYNAMICS OF CHEMICAL CONSTITUENTS, PREDICTING EXCESSIVE EUTROPHICATION AND NUISANCE ALGAL BLOOMS DUE TO HIGH NUTRIENT LOADINGS, AND SIMULATING BIOLOGICAL POPULATION DYNAMICS AND ECOLOGICAL INTERACTIONS.

<CLASS> SIMULATION

<802>

<CONT> HUFF, B. D.

<TITLE> DESCRIPTION AND DOCUMENTATION OF THE HYDROLOGIC TRANSPORT MODEL (HTM) DEVELOPED AT THE UNIVERSITY OF WISCONSIN

<ACRO> HTM

<ADDR> OAK RIDGE NATIONAL LABORATORY, BUILDING 1.05, ENVIRONMENTAL SCIENCES DIVISION, P.O. BOX 1

<CITY> OAK RIDGE

<STATE> TN

<ZIP> 37830

<PHONE> 615-883-8611 EXT. 3-0406; FTS 850-0476

<DOC> USIBP (INT. BIOL. PROGRAM) ANNUAL ECOSYST. PROGRAM INTERPHONE ABST., 1(3), 125-126, 1971

<SUB> HYDROLOGIC SIMULATION OF SMALL AND MEDIUM WATERSHEDS

<ABST> THIS REPORT IS INTENDED AS AN INTRODUCTION TO THE HYDROLOGIC TRANSPORT MODEL (HTM) AND A GUIDE TO ITS USE. THE HTM PREDICTS QUANTITATIVELY THE FLOW OF WATER-TRANSPORTED MATERIALS. INCLUDED ARE (A) INTRODUCTION TO THE HYDROLOGIC TRANSPORT MODEL, (B) OUTLINE OF PROCEDURE USED FOR LAND SURFACE AND CHANNEL SIMULATION, (C) HTM PROGRAM ELEMENTS, CONTROL CARDS, INPUT DATA CARDS, (D) A GUIDE TO PORTIONS OF THE HTM LISTING AND (E) A FORTRAN LISTING OF THE HTM (BOUND SEPARATELY).

<GEO> UNITED STATES

<TIME> 1966 TO PRESENT

<STATUS> IN USE

<ACCESS> LIMITED

<MEDIA> TEXT

<SIZE> 540 K BYTES

<COMP> UBI; IBM

<CONFIG> IBM 360/91 WITH 540 K CORE AND SCRATCH DISK; UNIVAC 1108

<LANG> FORTRAN IV; FORTRAN V

<CHAR> EBCDIC

<ALGO> DIFFERENCE EQUATIONS, EQUILIBRIUM CONDITIONS WITHIN A TIME STEP

<CLASS> CONTINUOUS; SEMI-DETERMINISTIC; SIMULATION

<APPL> HYDROLOGIC TRANSPORT OF TRACE MATERIALS

<USER> NEW YORK STATE DEPARTMENT OF CONSERVATION; UNIVERSITY OF WISCONSIN, MADISON; PURDUE UNIVERSITY

<SDO> NOAA; USGS

<HVAL> APPLICATIONS TO WATERSHEDS IN THE MID-WEST AND NORTHEASTERN U.S. ENGINEERING STUDIES

<UPDATE> 780628

<803>

<CONT> LAMBIE, P.; ALLEN, MYRON B.

GENERALIZED ENVIRONMENTAL TRANSPORT

<003> CONT.

<TITLE> ASSESSMENT OF THE ENVIRONMENTAL IMPLICATIONS OF PROJECT INDEPENDENCE

<ADDR> ENERGY RESOURCES COMPANY, INC.

<CITY> CAMBRIDGE

<STATE> MA

<DOC> PB--259660, 1976

<ABST> AN ENVIRONMENTAL RESIDUALS TECHNIQUE WAS DEVELOPED TO QUANTITATIVELY EVALUATE THE ENVIRONMENTAL IMPLICATIONS OF PROJECT INDEPENDENCE. THREE MODELS ARE DISCUSSED THAT COMPARE THE REGIONAL IMPACTS OF DIFFERENT SCENARIOS OF ENERGY DEVELOPMENT: A RESIDUAL ALLOCATION MODEL TO PREDICT THE QUANTITY AND DISTRIBUTION OF 15 ENERGY-ASSOCIATED POLLUTANT LOADINGS, A WATER USE MODEL TO ASSESS THE COMPATIBILITY OF WATER AVAILABLE AND WATER REQUIRED FOR PROJECTED ENERGY USE, AND AN AIR QUALITY MODEL TO COMPARE THE IMPACTS OF THE SCENARIOS ON AMBIENT AIR QUALITY. THE APPROACH IS USEFUL FOR SCENARIO COMPARISON, BUT IS LIMITED IN DEGREE OF DETAIL AND ABSOLUTE ACCURACY. IT IS CONCLUDED THAT THE LEVEL OF CONTROL TECHNOLOGY ACHIEVED IS MORE CRITICAL ENVIRONMENTALLY THAN THE CHOICE OF SCENARIOS. FURTHER WORK SHOULD INCLUDE A REFINEMENT AND EXTENSION OF THE RESIDUALS STUDIED AND A MORE DETAILED SENSITIVITY ANALYSIS, ESPECIALLY WITH RESPECT TO CONTROL TECHNOLOGY AND FACILITY SITING ASSUMPTIONS.

<CLASS> SIMULATION

<AUTH>
<COPI> LEE R.; WONG, P.; BROWN S.

<TITLE> SEER II- A NEW DAMAGE ASSESSMENT FALLOUT MODEL

<ACRO> SEER-II

<ADDR> STANFORD RESEARCH INSTITUTE

<CITY> MENLO PARK

<STATE> CA

<DOC> STANFORD RESEARCH INSTITUTE CONTRACT DASA01-71-C-0121; AD--754184; DWA--3008-P MAY 1972

<ABST> A SIMPLIFIED FALLOUT COMPUTATIONAL SYSTEM WAS DEVELOPED FOR USE IN DAMAGE-ASSESSMENT STUDIES WHERE VERY LARGE NUMBERS OF WEAPONS ARE USED. A STATISTICAL PROCEDURE TO RELATE WIND VARIABILITY TO FALLOUT PATTERNS VARIABILITY WAS ALSO DEVELOPED. BASIC REQUIREMENTS OF THE SIMPLIFIED FALLOUT COMPUTATIONAL SYSTEM ARE THAT IT SIMULATE DELPIC FALLOUT EXPOSURE RATE CONTOURS AND DELPIC ACCUMULATED EXPOSURE DOSES ANYWHERE WITHIN THE AREAS OF SIGNIFICANT FALLOUT FOR IDENTICAL INPUT WINDS AND WEAPON YIELD, AND THAT THE COMPUTER TIME FOR EXERCISING THE SIMPLIFIED FALLOUT COMPUTATIONAL SYSTEM BE MINIMAL. THE WIND VARIABILITY TO BE CONSIDERED WAS LIMITED TO THE STATISTICAL PROBABILITY OF OBSERVING A GIVEN VERTICAL WIND PROFILE OVER A GIVEN GEOGRAPHICAL LOCATION OF ANY INSTANT IN TIME.

BECAUSE THE ORIGINAL SIMPLIFIED OFFFALL COMPUTATIONAL SYSTEM THAT WAS DEVELOPED, SIMPLIFIED ESTIMATION OF EXPOSURE TO RADIATION (SEER), COULD NOT SIMULATE DELPIC OUTPUT FOR SEVERELY SHEARED WINDS, A NEW MODEL, SEER II, WAS DEVELOPED WITH THIS CAPABILITY. THE COMPUTER COMPUTATION TIME REQUIRED BY SEER II ON THE CDC 6400 COMPUTER IS APPROXIMATELY THREE SECONDS FOR WEAPON YIELDS IN THE LOW KILOTON RANGE AND SIX SECONDS FOR WEAPON YIELDS IN THE 10 MEGATON RANGE PER 1200 GRID POINTS, WHICH IS APPROXIMATELY ONE-FIFTEEN TO ONE ONE-HUNDREDTH OF THE COMPUTATION TIME REQUIRED BY DELPIC. THE SEER II OUTPUT SIMULATES DELPIC OUTPUT REASONABLY WELL OVER A WIDE RANGE OF YIELDS (1 KILOTON TO 30 MEGATONS), AND DIVERSE WIND STRUCTURES.

<COMP> CDC

<CONFIG> THE COMPUTING TIME ON THE CDC 6400 COMPUTER IS APPROXIMATELY 3 SECONDS FOR WEAPON YIELDS IN THE LOW KILOTON RANGE AND 6 SECONDS FOR YIELDS IN THE 10 MEGATON RANGE PER 1200 GRID POINTS.

<CLASS> PREDICTIVE

<075>

<COPI> HACKAY, T. F.; ELY, P. F., JR.

<TITLE> COMPUTATION OF RADIOLOGICAL CONSEQUENCES USING INREC COMPUTER PROGRAM

<ACRO> INREC

<ADDR> GILBERT ASSOCIATES INCORPORATED, 525 LANCASTER AVENUE

<CITY> READING

<STATE> PA

<ZIP> 19603

<DOC> GAI-TP-101P, 210 PP., 1974

<ABST> INREC IS A COMPUTER CODE SPECIFICALLY PREPARED FOR PARAMETRIC INVESTIGATION OF RADIOLOGICAL CONSEQUENCES INVOLVED IN THE ACCIDENTAL RELEASE OF RADIOACTIVITY FROM A NUCLEAR POWER PLANT. THE COMPUTER CODE IS DESIGNED TO CALCULATE OFF-SITE DOSES FROM TIME-VARYING RELEASES OF RADIOACTIVITY TO THE ENVIRONMENT WITH AN OPTION TO CALCULATE THE RESULTING ACTIVITY BUILDUP IN A SECONDARY VOLUME (E.G., A NUCLEAR POWER PLANT CONTROL ROOM). THE CODE HAS WIDE APPLICABILITY SINCE IT CAN BE USED IN THE ANALYSIS OF BOTH SINGLE AND DOUBLE CONTAINMENT SYSTEMS WITH VARYING PURGE AND/OR LEAK RATES FROM EITHER CONTAINMENT. ALSO, THE CODE HAS THE FLEXIBILITY OF COMPUTING EITHER INSTANTANEOUS OR TIME-VARYING ACTIVITY RELEASES TO THE INNERMOST LEVEL OF CONTAINMENT AND ACTIVITY REDUCTION FROM INTERNAL CLEANUP SYSTEMS SUCH AS CONTAINMENT SPRAYS AND FILTERING UNITS. THE METHODOLOGY CONTAINED IN REGULATORY GUIDES 1.3 AND 1.4 IS AVAILABLE AS AN INTERNAL DATA TABLE; HOWEVER, OTHER METHODOLOGY MAY BE USED AS DESIRED. THE PRINTED COMPUTED OUTPUT INCLUDES THE OFF-SITE INHALATION DOSES, THE OFF-SITE CLOUD CENTER AND GROUND LEVEL GAMMA DOSES, THE OFF-SITE CLOUD CENTER AND SURFACE

<005>

GENERALIZED ENVIRONMENTAL TRANSPORT

<005> CONT.

BODY BETA DOSES, AND ACTIVITY INVENTORIES IN THE CONTAINMENT(S) AND ON FILTERS. THE PRINTED COMPUTER OUTPUT RESULTING FROM THE SECONDARY VOLUME OPTION INCLUDES INHALATION AND SURFACE BODY BETA DOSES, INTEGRATED ACTIVITY EXPOSURE INSIDE THE SECONDARY VOLUME, AND ACTIVITY INVENTORIES IN THE SECONDARY VOLUME AND ON RELATED FILTERS. ALSO, A GAMMA SOURCE SORT OF EACH ACTIVITY INVENTORY IS PROVIDED TO FACILITATE SHIELDING CALCULATIONS. ALL ACTIVITIES AND DOSES ARE CALCULATED AS A FUNCTION OF TIME AND, WHERE APPLICABLE, AS A FUNCTION OF DISTANCE.

<014> SIMULATION

<006>
<CON> HADLEY, G. P.; SMITH, H. J. P.; TREVE, Y. W.; CARPENTER, J. W.; DEGGES, Y. C.

<TITLE> OPTIR II: SPECIAL SCIENTIFIC REPORT ON VOLUME 1

<ACRO> OPTIR-II

<ADDR> VISIGRAPH INC.

<CITY> WASHINGTON

<STATE> WA

<SOURCE> NTIS 93.00

<DOC> AD-778 006, 1971

<ABST> THE REPORT DOCUMENTS THE SECOND GENERATION VERSION OF THE OPTIR CODE - OPTIR II. THE EFFORT IS AIMED AT ESTABLISHING THE BASIC PHYSICAL PRINCIPLES UNDERLYING THE WIDESPREAD, LONG TERM OPTICAL/INFRARED RADIATION OBSERVED FOLLOWING ATMOSPHERIC NUCLEAR DETONATIONS. THE RESULTS OF SUCH STUDIES ARE CRUCIAL TO THE DESIGN AND EVALUATION OF OPTICAL SURVEILLANCE, DETECTION, DISCRIMINATION, TRACKING AND MONITORING SYSTEMS AND FUTURE LASER COMMUNICATION SYSTEMS, ALL OF WHICH MUST BE ABLE TO FUNCTION IN A NUCLEAR ENVIRONMENT.

<007>
<CON> HCLABER, R. D.; HEISTERLING, H. E.

<TITLE> A CODE FOR ANALYSIS OF NUCLEAR EFFECTS AND SYSTEMS SURVIVABILITY: NEUTRONS AND GAMMAS

<ADDR> AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OHIO SCHOOL OF ENGINEERING

<SOURCE> NTIS 85.50/HP81.05

<DOC> AC-767 890/7, 1973

<ABST> THE REPORT CONTAINS THE DESCRIPTION OF A COMPUTER CODE WHICH CALCULATES EFFECTS DUE TO A NUCLEAR BURST, AND DETERMINES THE SURVIVABILITY OF UP TO 100 SELECTED VEHICLE POSITIONS. THE EFFECTS CALCULATED ARE THOSE DUE TO X-RAYS, NEUTRONS, GAMMAS, INDUCED GAMMAS, BLAST, AND THERMAL. THE CODE ACCEPTS AS INPUT: THE NUMBER AND SPECTRA OF THE NUCLEAR BURSTS; THE VULNERABILITY OF THE VEHICLES (ONE TYPE AT A TIME) TO THE VARIOUS EFFECTS; THE MISSION PROFILE (INITIAL POSITIONS AND

VELOCITY VECTORS). THE CODE THEN COMPUTES THE LEVEL OF EACH EFFECT FROM EACH BURST AT EACH TARGET POSITION. IF ANY EFFECT LEVEL EXCEEDS THE VEHICLE'S GIVEN VULNERABILITY, THAT VEHICLE IS ASSUMED TO BE KILLED. IN THE CASE OF BLAST ONLY A PROBABILITY OF SURVIVAL MAY BE COMPUTED RATHER THAN A KILL/NO KILL DETERMINATION. THE CODE IS WRITTEN IN FORTRAN EXTENDED FOR THE CDC 6600 COMPUTER LOCATED AT WRIGHT-PATTERSON AIR FORCE BASE, OHIO. THE CODE REQUIRES 290 SECONDS OF COMPUTER TIME FOR EACH BURST TO BE ANALYZED, AND A CENTRAL CORE OF 155000 OCTAL REGARDLESS OF THE NUMBER OF BURSTS. THIS REPORT CONTAINS DETAILED DESCRIPTIONS OF THE CALCULATION OF EFFECTS DUE TO NEUTRONS AND GAMMAS.

<COMP> CDC

<CONFIG> CDC 6600

<LANG> FORTRAN

<CLASS> SIMULATION

<008>
<CON> MURRAY, W.; KUPFZ, J.

<TITLE> PREDICTIVE STUDY OF THE DISPERSION OF EMISSIONS FROM THE SYNCRUDE NILDRED LAKE PLANT

<ADDR> SYNCRUDE CANADA LTD.

<CITY> EDMONTON

<STATE> ALBERTA

<COUNTRY> CANADA

<DOC> NP-21646, 1976; ENVIRONMENTAL RESEARCH MONOGRAPH 1976-1

<ABST> THIS PREDICTIVE STUDY IS BASED ON THE RESULTS OF THE FIRST YEAR OF DATA COLLECTION RESPECTING THE METEOROLOGICAL FACTORS THAT MAY INFLUENCE THE DISPERSION OF ATMOSPHERIC EMISSIONS IN AND THROUGH THE AIR OVER THE ATHABASCA TAR SANDS REGION EXECUTED BY NEP UNDER CONTRACT TO SHELL CANADA LTD., SYNCRUDE CANADA LTD., HONEY OIL COMPANY LTD., AND PETROFINA CANADA LTD. THE INITIAL OBJECTIVES OF THAT STUDY WERE: TO OBTAIN A REPRESENTATIVE SAMPLE OF WIND AND TEMPERATURE DATA FOR THE TAR SANDS REGION FOR A PERIOD OF ONE YEAR, TO DETERMINE THE FREQUENCY OF OCCURRENCE OF VARIOUS ATMOSPHERIC DISPERSION PHENOMENA INsofar AS THESE CAN BE INFERRED FROM TEMPERATURE AND WIND DATA, AND TO PREDICT THE AIR QUALITY WHICH WOULD HAVE BEEN ASSOCIATED WITH THE OBSERVED DISPERSION CONDITIONS IF PARTICULAR SOURCES OF EMISSION OF EFFLUENTS INTO THE ATMOSPHERE HAD BEEN PRESENT IN THE AREA. ROUTINE DAILY SOUNDINGS OF THE ATMOSPHERE BEGAN LATE SEPTEMBER, 1974 AT THE SHELL CANADA LEASE (LEASE C-13), AND IN FEBRUARY, 1975 AT THE SYNCRUDE CANADA LEASE (LEASE C-17). INTENSIVE FIELD STUDIES IN FEBRUARY AND AUGUST 1975 PROVIDED ADDITIONAL INFORMATION REGARDING DETAILED REGIONAL VARIATIONS OF THE METEOROLOGICAL VARIABLES WHICH CONTROL DISPERSION. THE DATA WERE ANALYZED WITH PARTICULAR EMPHASIS ON NOCTURNAL INVERSION DEPTHS, MIXING HEIGHTS, WIND AND VERTICAL TEMPERATURE

GENERALIZED ENVIRONMENTAL TRANSPORT

<009> CONT.
GRADIENTS IN THE PLUME LAYER.

<CLASS> PREDICTIVE

EQUATIONS. THE FREE SURFACES ARE LOCATED BY MEANS OF A VOLUME FRACTION FUNCTION, WHICH IS USED TO LOCATE THE POSITION AND ORIENTATION OF ALL FREE SURFACES.

<STATUS> UNDER DEVELOPMENT

<009>
<CONTR> MUSTY, T. S.; KHANDKAR, N. L.

<ACCESS> LIMITED

<TITLE> SIMULATION OF MOVEMENT OF OIL SLICKS IN THE STRAIT OF GEORGIA USING SIMPLE ATMOSPHERE AND OCEAN DYNAMICS

<MEDIA> DISC

<ADDR> DEPARTMENT OF THE ENVIRONMENT

<SIZE> 2000 LINES

<CITY> OTTAWA

<CONTR> CDC

<STATE> ONTARIO

<CONFIG> CDC 7600

<COUNTRY> CANADA

<LANG> FORTRAN

<CRAB> PCO

<DOC> CONFERENCE ON THE PREVENTION AND CONTROL OF OIL SPILLS, HELD IN WASHINGTON, DC, MARCH 13, 1973; CONF-730306

<ALGO> SOLUTION TO NAVIER-STOKES EQUATIONS

<CLASS> DISCRETE; ANALYTICAL; PREDICTIVE; SIMULATION

<ABST> HYDRODYNAMICAL TECHNIQUES WERE USED TO INVESTIGATE THE MOVEMENT OF OIL SLICKS IN THE STRAIT OF GEORGIA BY ASSUMING THAT THE OIL MOVES WITH THE CURRENT AND NOT WITH THE WIND. THE DIVERGENCE OF THE ISOPAINE NEAR ALDEN BANK PROBABLY MAKES THE CURRENT BRANCH WHILE THAT SOUTHEAST OF PT. FORESTIS NARROWS AND INTENSIFIES THE CURRENT. THE EFFECT OF MUTUAL INTERACTION AMONG SEVERAL SLICKS BOTH WITH AND WITHOUT A STEERING CURRENT SUCH AS A TIDAL OR WIND-GENERATED CURRENT IS FOUND TO BE IMPORTANT IN DETERMINING THEIR TRAJECTORIES. FOR OILS WITH LARGE VISCOSITIES, AN OSCILLATORY TIDAL CURRENT COULD GIVE RISE TO AN UNSTABLE SITUATION IN WHICH THE OIL SPREADS IN THE FORM OF LONG LINES RADIATING OUT FROM THE SPILL SIMILAR TO THE SPOKES IN A BICYCLE WHEEL. STRATIFICATION OF THE WATER CAUSES THE OIL PLUME TO BIFURCATE AND DUE TO THIS PHENOMENA, EVEN IF ONE BRANCH OF THE PLUME CARRYING THE OIL GOES AWAY FROM THE COAST, THE SECOND BRANCH CARRIES OIL TO THE COAST.

<APPL> REACTOR SAFETY STUDIES

<USERS> LASL

<SRD> COMPUTED BY CODE

<VAL> COMPARED WITH EXPERIMENTAL DATA

<UPDATE> 780472

<011>

<CONTR> NOT GIVEN

<TITLE> CALCULATION OF RELEASES OF RADIOACTIVE MATERIALS IN GASEOUS AND LIQUID EFFLUENTS FROM BOILING WATER REACTORS (BWR-GALE CODE)

<ACRO> BWR-GALE

<ADDR> NUCLEAR REGULATORY COMMISSION, OFFICE OF STANDARDS DEVELOPMENT

<CITY> WASHINGTON

<STATE> DC

<SOURCE> NTIS \$6.00/NPS\$2.25

<DOC> PB--251 717/55L, 1976

<ABST> THE DOCUMENT DESCRIBES A COMPUTERIZED MATHEMATICAL MODEL FOR CALCULATING THE RELEASE OF RADIOACTIVE MATERIAL IN GASEOUS AND LIQUID EFFLUENTS FROM NUCLEAR POWER PLANTS USING BOILING WATER REACTORS. THE MODEL IS KNOWN AS THE 'BWR-GALE CODE.'

<LANG> FORTRAN

<012>

<CONTR> NOT GIVEN

<TITLE> CALCULATION OF RELEASES OF RADIOACTIVE MATERIALS IN GASEOUS AND LIQUID EFFLUENTS FROM PRESSURIZED WATER REACTORS (PWR-GALE CODE)

<ACRO> PWR-GALE

<ADDR> NUCLEAR REGULATORY COMMISSION, OFFICE OF STANDARDS DEVELOPMENT

<CLASS> SIMULATION

<010>
<CONTR> WICHOLS, BILLY D.

<TITLE> SOLA-VOP

<ACRO> SOLA VOP

<ADDR> LOS ALAMOS SCIENTIFIC LABORATORY, GROUP T-3, 95-216, P.O. BOX 1663

<CITY> LOS ALAMOS

<STATE> NM

<ZIP> 87565

<PHONE> 505-667-4156; PTS 843-4156

<SOURCE> LASL

<DOC> NONE

<SUB> NUMERICAL SOLUTION ALGORITHM FOR HIGHLY COMPRESSED FLUID FLOWS

<ABST> THE SOLA-VOP CODE SOLVES THE FINITE DIFFERENCE INCOMPRESSIBLE NAVIER-STOKES

<912>

GENERALIZED ENVIRONMENTAL TRANSPORT

<912> CONT.

<CITY> WASHINGTON

<STATE> DC

<SOURCE> NTIS 86.00/PP2.25

<DOC> PB--251 718/3SL, 1976

<ABST> THE DOCUMENT DESCRIBES A COMPUTERIZED MATHEMATICAL MODEL FOR CALCULATING THE RELEASE OF RADIOACTIVE MATERIAL IN GASEOUS AND LIQUID EFFLUENTS FROM NUCLEAR POWER PLANTS USING PRESSURIZED WATER REACTORS. THE MODEL IS KNOWN AS THE 'PUG-GALE CODE.'

AND 70 MS-SEC OF MORE WOULD BE DONE WHEN THE SODIUM COLUMN IMPACTS THE COVER (AT 22 MSEC AFTER DISASSEMBLY) AND THAT THE SPATIAL PRESSURE DISTRIBUTION IN THE FUEL BUNDLE WOULD BECOME UNIFORM BETWEEN 4 AND 10 MSEC AFTER DISASSEMBLY. FUEL MIXING AND THERMAL EQUILIBRIUM PRIOR TO EXPANSION GREATLY REDUCES THE AMOUNT OF FUEL VAPORIZED AND THE WORK DONE BY THE FUEL EXPANSION. THE RESULTS INDICATE THAT THE PRESSURE AT THE INSTRUMENT TREE IN THE FFTF REACHED ABOUT 100 ATMOSPHERES AND REMAINS AT THIS VALUE FOR ABOUT 5 MSEC, WHICH COMPARES TO A PEAK PRESSURE AT THE CENTER OF THE CORE DURING THE DISASSEMBLY OF 700 ATMOSPHERES.

<913>

<CONT> NOT GIVEN

<TITLE> WASTE HEAT MANAGEMENT IN THE ELECTRIC POWER INDUSTRY: ISSUES OF ENERGY CONSERVATION AND STATION OPERATION UNDER ENVIRONMENTAL CONSTRAINTS

<ADDR> MASSACHUSETTS INSTITUTE OF TECHNOLOGY, ENERGY LABORATORY

<CITY> CAMBRIDGE

<STATE> MA

<DOC> COO--8118-1, 1976

<ABST> LITERATURE RELATED TO THE ASSESSMENT OF ENVIRONMENTAL IMPACTS AND ENERGY CONSERVATION IN WASTE HEAT MANAGEMENT IN ELECTRIC POWER PLANTS IS REVIEWED. BASED ON THIS REVIEW, CONCLUSIONS ON THE ECONOMIC-ENVIRONMENTAL PERFORMANCE OF COOLING SYSTEMS ARE PRESENTED AND FUTURE STUDY OBJECTIVES ARE OUTLINED. PROGRESS TO DATE INCLUDES REVIEWING WASTE HEAT MANAGEMENT LITERATURE AND DATA AND FORMULATING A GENERAL COMPUTER PROGRAM FOR PLANT-COOLING SYSTEM DESIGN AND PERFORMANCE SIMULATION.

<914>

<CONT> NOT GIVEN

<TITLE> MOLTEN MATERIAL-COOLANT INTERACTION AND PLUTONIUM SOURCE IN LATE ACCIDENT ANALYSIS

<ADDR> PEIRAN

<ADDR> UNIVERSITY OF VIRGINIA, SCHOOL OF ENGINEERING AND APPLIED SCIENCE

<CITY> CHARLOTTESVILLE

<STATE> VA

<DOC> ORG--8313-11, 1975

<ABST> AN ANALYTICAL MODEL WAS DEVELOPED FOR ESTIMATING BOUNDING VALUES OF FUEL-VAPOR GENERATION AND FUEL-EXPANSION WORK IN AN LATE CORE-DISRUPTIVE ACCIDENT. THE TIME-DEPENDENT HYDRODYNAMIC EXPANSION OF FUEL IN SPHERICAL GEOMETRY IS CALCULATED USING THE PEIRAN CODE ON THE CDC-6400 COMPUTER. A CALCULATION WAS MADE FOR A SPECIFIED CORE-DISRUPTIVE ACCIDENT FOR FFTF. FOR A 100 S/SEC, SODIUM-OUT, FFTF DISASSEMBLY FOLLOWED BY EXPANSION WITHOUT FUEL MIXING, THE PEIRAN CALCULATIONS INDICATED THAT 9 PERCENT OF THE FUEL WOULD BE VAPORIZED

<CONT> CDC

<CONT> CDC-6400

<915>

<CONT> PRITCHETT, J. B.; GAGE, S. K.; SPONWELL, D. R., JR.; LEVINE, R. B.

<TITLE> GEOTOPOLOGICAL ENVIRONMENTAL EFFECTS OF GEOTHERMAL POWER PRODUCTION

<ADDR> SYSTEMS, SCIENCE AND SOFTWARE

<CITY> LA JOLLA

<STATE> CA

<SOURCE> NTIS A05/PP A01

<DOC> PB--261 606/OSL, 1975

<ABST> RECENT INTEREST IN THE LARGE SCALE EXPLOITATION OF GEOTHERMAL RESOURCES PROVIDES MOTIVATION FOR THE INVESTIGATION OF ENVIRONMENTAL CONSEQUENCES OF GEOTHERMAL POWER PRODUCTION. THE POTENTIAL ENVIRONMENTAL HAZARDS CAN BE GROUPED INTO TWO BROAD CATEGORIES - ABOVE SURFACE EFFECTS (NOISE, EMISSION OF TOXIC GASES) AND SUBSURFACE OF GEOTOPOLOGICAL EFFECTS (LAND SUBSIDENCE, INDUCED SEISMICITY, AND GROUND-WATER CONTAMINATION). THE PRESENT RESEARCH EFFORT IS INTENDED TO DEVELOP A COMPUTATIONAL CAPABILITY WHEREBY FIELD INFORMATION FOR A SPECIFIC GEOTHERMAL SYSTEM CAN BE USED TO MAKE PREDICTIONS OF SUCH GEOTOPOLOGICAL PHENOMENA AS LAND SURFACE SUBSIDENCE, MIXING OF GEOTHERMAL BRINE INTO FRESH WATER AQUIFERS, AND INDUCED TECTONIC STRESSES NEAR FAULTS DUE TO PRODUCTION AND REINJECTION OF GEOTHERMAL FLUIDS.

<916>

<CONT> BITCHER, L. T.; BROWN, W. D.; WAYLAND, J. W.

<TITLE> EFFECTS OF RAINSTORMS AND RHYTHM ON CONSEQUENCES OF NUCLEAR REACTOR ACCIDENTS

<ADDR> SANDIA LABORATORIES

<CITY> ALBUQUERQUE

<STATE> NM

<REF> 87115

<DOC> SAND--76-0429, 38 PP., 1976

GENERALIZED ENVIRONMENTAL TRANSPORT

<816> CONF.
 <ABST> A PRELIMINARY MODEL DESCRIBING THE EFFECTS OF WASHOFF AND RUNOFF OF THE CONSEQUENCES OF A NUCLEAR REACTOR ACCIDENT IS PRESENTED. THE MOST IMPORTANT NEW FEATURE OF THIS STRATIFIED MODEL RELATIVE TO THE MODEL IN WASH-1400 IS THE SPATIAL STRUCTURE OF RAINSTORMS AND RUNOFF CONSISTING OF FOUR LEVELS OF RAIN ACTIVITY THAT ARE CORRELATED BY RAIN GAGE DATA. THE PREDICTED CONCENTRATIONS OF RADIOACTIVITY AND RESULTANT HEALTH CONSEQUENCES OF THE STRATIFIED MODEL ARE COMPARED WITH THOSE OF THE MODEL IN WASH-1400 FOR SIMPLIFIED RAINSTORMS WITH FIXED METEOROLOGICAL CONDITIONS, AN ACTUAL RAINSTORM, AND A STRATIFIED SAMPLE RUN CONSISTING OF 91 SEPARATE REACTOR ACCIDENTS. IN THE CASE OF INDIVIDUAL STORMS, RUNOFF AND THE SPATIAL STRUCTURE OF THE RAIN IN THE NEW MODEL CAN RESULT IN HEALTH CONSEQUENCES THAT ARE SIGNIFICANTLY DIFFERENT FROM THOSE OF THE WASH-1400 MODEL. THE DIFFERENCES BETWEEN THE PREDICTIONS OF THE TWO MODELS ARE SMALL FOR THE STRATIFIED SAMPLE RUN.

<CON> PARTIAL DOCUMENTATION IS GIVEN. CHANGES IN THE MODEL USED IN WASH-1400 (CONO) ARE DESCRIBED.

<817>
 <CONF> SCHWARTZ, S.

<TITLE> PROBABILISTIC MODELS FOR CALCULATING AIR POLLUTION DAMAGE

<ABST> A DECISION PROCESS THAT WEIGHS THE SOCIAL BENEFITS OF POLLUTION-CONTROL--THE REDUCED INCIDENCE OF UNDESIRABLE EFFECTS--AGAINST THE COSTS OF CONTROL REQUIRES THE PREDICTION OF FUTURE DAMAGE. AN ALTERNATIVE TO A COST-BENEFIT EVALUATION IS THE USE OF DAMAGE STATISTICS WHICH DISPLAY THE EFFECTS OF POLLUTION ON DIFFERENT SEGMENTS OF THE POPULATION. PROBABILISTIC MODELS ARE DEVELOPED TO YIELD BOTH THE EXPECTED VALUE STATISTIC FOR USE IN A COST-BENEFIT EVALUATION AND PERCENTAGE-FREQUENCY RELATIONSHIPS, WHICH SHOW THE DISTRIBUTION OF DAMAGE AS WELL AS THE AMOUNT. THE PROBABILISTIC RESPONSE CHARACTERISTIC, WHICH IS THE KEY TO TRANSFORMATION OF AIR QUALITY INFORMATION TO DAMAGE INFORMATION, IS INTRODUCED. ITS CONSTRUCTION IS ILLUSTRATED WITH ACTUAL EYE IRRITATION DATA. THE SUBMODELS REQUIRED FOR THE COMPLETE DAMAGE CALCULATION ARE IDENTIFIED AND THEIR INTERCONNECTIONS SHOWN. TIME AND GEOGRAPHICAL VARIATIONS IN POLLUTANT CONCENTRATION, AS WELL AS VARIABILITY IN HUMAN RESPONSE TO POLLUTION, ARE ACCOUNTED FOR IN THIS MODEL.

<818>
 <CONF> STEIN, LELAND R.

<TITLE> SOLA-3D: SOLVING TIME DEPENDENT NAVIER-STOKES EQUATIONS

<ACRO> SOLA-3D

<ADDR> LOS ALAMOS SCIENTIFIC LABORATORY, GROUP T-3, MS-216, P.O. BOX 1663

<CITY> LOS ALAMOS

<STATE> NM

<ZIP> 87545

<PHONE> 505-667-8156; PTS 843-8156

<SOURCE> LASL

<DOC> NONE

<SUB> SOLVES TIME-DEPENDENT NAVIER-STOKES EQUATIONS (3-D SOLUTION)

<ABST> SOLA-3D USES A SIMPLIFIED MARKER AND CELL (MAC) TECHNIQUE FOR THE SOLUTION OF THE TIME-DEPENDENT NAVIER-STOKES EQUATIONS IN THE SOLA SPIRIT. IT HAS THE FREE SURFACE CAPABILITY.

<STATUS> UNDER DEVELOPMENT; IN USE

<ACCESS> LIMITED

<MEDIA> MAGNETIC TAPE; DISC

<SIZE> 1 TAPE; 3740 CARDS

<COMP> CDC

<CONFIG> CDC 7600; SCR; LCM

<LANG> FORTRAN

<CHAP> OPL

<ALGO> PERSPECTIVE PLOTTING TECHNIQUES; MARKER PARTICLES

<CLAS> DISCRETE; PREDICTIVE; SIMULATION; OPTIMIZATION; ECONOMETRIC; ENGINEERING PROCESS

<APPL> DESIGNING NEW BUILDINGS WITH EFFICIENT AIR FLOW; FLOW OVER BLUFF BODIES; HYDRODYNAMICS

<USERS> LASL; ORNL; LLL

<SHD> INPUT PARAMETERS (WIND VELOCITY, INPUT-OUTPUT VELOCITIES, BOUNDARY CONDITIONS)

<IVAL> COMPARED FLOW OVER BLUFF BODIES WITH WIND TUNNEL DATA

<UPDATE> 780412

<819>
 <CONF> SUTHERLAND, C. D.

<TITLE> GENERAL ONE-DIMENSIONAL ATMOSPHERIC, CHEMICAL, THERMAL, DIFFUSION, AND RAINFALL MODEL

<ACRO> ATCHRM

<ADDR> LOS ALAMOS SCIENTIFIC LABORATORY, GROUP J-0, MS-660, P.O. BOX 1663

<CITY> LOS ALAMOS

<STATE> NM

<ZIP> 87545

<PHONE> 505-667-6949; PTS 843-6949

<SOURCE> DEVELOPED AT LASL

<DOC> J. ZINN AND C. D. SUTHERLAND, A COUPLED CHEMISTRY, RADIATION TRANSPORT, AND HYDRODYNAMICS MODEL FOR THE TROPOSPHERE

<879>

GENERALIZED ENVIRONMENTAL TRANSPORT

<879> CONT.
 ARE STRATOSPHERE, LOS ALAMOS SCIENTIFIC
 LABORATORY REPORT.

<SUB> GENERAL ONE-DIMENSIONAL ATMOSPHERIC,
 CHEMICAL, THERMAL, DIFFUSION, AND
 RAINFALL MODEL

<ABST> WE HAVE ASSEMBLED A COUPLED 1D
 TIME-DEPENDENT NUMERICAL MODEL OF
 ATMOSPHERIC CHEMISTRY, RADIATION
 TRANSPORT, EDDY DIFFUSION, HEAT
 CONDUCTION, PRECIPITATION, AND VERTICAL
 EXPANSION/CONTRACTION. ON THE ALTITUDE
 RANGE 0 - 60 KM. DURNAL AND SEASONAL
 VARIATIONS ARE INCLUDED, WITH LATITUDE
 AS A PARAMETER.

<STATS> UNDER DEVELOPMENT; IN USE

<ACCESS> UNLIMITED

<MEDIA> MAGNETIC TAPE; PUNCHED CARDS

<SIZE> 1 TAPE; 3000 CARDS

<COMP> CDC

<CONFIG> CDC 7600, 50K LARGE CODE AND 65K SMALL
 CODE

<LANG> FORTRAN IV

<CHAP> BCE

<ALGO> ALGORITHM INDIRECTLY COMPUTES
 TEMPERATURE PROFILE IN THE ATMOSPHERE
 DUE TO RADIATION TRANSPORT INVOLVING
 CO₂, H₂O, AND O₃. ALSO INCLUDES THE
 EFFECT OF RAINFALL AND TEMPERATURE
 PROFILE.

<CLAS> CONTINUOUS; SIMULATION

<APPL> CLIMATELOGY

<USERS> LASL

<SRD> DEAC DATA BASE AT LASL

<NVAL> COMPARISON WITH DATA FROM LITERATURE

<UPDATE> 780405

<820>

<CONT> TAYLOR, J. H.; DANIEL, S. L.

<TITLE> RADTRAN: A COMPUTER CODE TO ANALYZE
 TRANSPORTATION OF RADIOACTIVE MATERIAL

<ACRO> PACTRAN

<ADDR> SANDIA LABORATORIES

<CITY> ALBUQUERQUE

<STATE> NM

<DOC> SAND-76-0243, 1977

<ABST> A COMPUTER CODE IS PRESENTED WHICH
 PREDICTS THE ENVIRONMENTAL IMPACT OF
 ANY SPECIFIC SCHEME OF RADIOACTIVE
 MATERIAL TRANSPORTATION. RESULTS ARE
 PRESENTED IN TERMS OF ANNUAL LATENT
 CANCER FATALITIES AND ANNUAL EARLY
 FATALITY PROBABILITY RESULTING FROM
 EXPOSURE, DURING NORMAL TRANSPORTATION
 OR TRANSPORT ACCIDENTS. THE CODE IS
 DEVELOPED IN A GENERALIZED FORMAT TO
 PERMIT WIDE APPLICATION INCLUDING
 NORMAL TRANSPORTATION ANALYSIS,
 CONSIDERATION OF ALTERNATIVES, AND

DETAILED CONSIDERATION OF SPECIFIC
 SECTORS OF INDUSTRY.

<821>

<CONT> VANDERBORCH, NEIL E.

<TITLE> FINITE ELEMENT HEAT AND MASS TRANSFER
 CODE

<ACRO> PACMO

<ADDR> LOS ALAMOS SCIENTIFIC LABORATORY, GROUP
 CHD-8, MS-738, P.O. BOX 1663

<CITY> LOS ALAMOS

<STATE> NM

<ZIP> 87545

<PHONE> 505-667-4896; FTS 843-4896

<SOURCE> DEVELOPED AT LASL

<DOC> N. E. VANDERBORCH ET AL, HEAT AND MASS
 TRANSFER THROUGH SOUTHWESTERN
 SUBBITUMINOUS COALS, LOS ALAMOS
 SCIENTIFIC LABORATORY REPORT
 LA-77-1341-UP, 1977.

<SUB> HEAT AND MASS TRANSFER IN ANY REACTIVE
 POROUS MEDIA

<ABST> THE MODEL CONSIDERS HEAT TRANSFER IN A
 SPECIFICALLY BOUNDED VOLUME. HEAT IS
 INJECTED INTO THE VOLUME WITH HOT
 GASES. THE MODEL FIRST SOLVES FOR THE
 PRESSURES THAT ARE GENERATED WITHIN THE
 INTERIOR OF THE SEMI-POROUS BLOCK.
 THESE PRESSURE VALUES ARE THEN USED FOR
 THE CALCULATION OF MASS TRANSFER. ONCE
 THESE PRESSURES ARE KNOWN, THE MASS
 TRANSFER WITHIN THE BLOCK IS
 CALCULATED. FROM THESE THE MASS
 TRANSFER TEMPERATURES ARE GENERATED.
 THESE TEMPERATURES ARE THEN COMPARED TO
 EXPERIMENTAL DATA FROM SIMILAR
 GEOMETRIES.

<STATUS> IN USE

<ACCESS> UNLIMITED

<MEDIA> DISC

<SIZE> APP. 2,000 SOURCE STATEMENTS

<COMP> CDC

<CONFIG> CDC 6600 WITH NOS

<LANG> FORTRAN

<ALGO> FINITE ELEMENT MODEL

<CLAS> DISCRETE; DETERMINISTIC; ANALYTICAL;
 PREDICTIVE; INTEGRATIVE; SIMULATION;
 ENGINEERING PROCESS

<APPL> THE CALCULATION OF HEAT TRANSFER IN
 UNDERGROUND COAL PROCESSING; MAPPING OF
 FLUID FLOWS UNDERGROUND

<USERS> LASL

<SRD> LABORATORY DATA

<NVAL> COMPARISON WITH ACTUAL LABORATORY
 EXPERIMENTS

<UPDATE> 780413

CONTACT PERSON INDEX

CONTACT PERSON INDEX

ADELQ, JORAN A. 754
 ADAMS, R. 679
 AASELL, B. 660
 ABOUEL-BOU, A-FREH A. 305, 306
 ABRAHAM, F. F. 1, 293
 ABRAID, D. J. 2
 ADAMO, L. C. 387
 ADAMS, P. E. 447, 449, 580
 ADAMS, L. W. 659
 ACHIM, D. D. 47

 AGOPIAN, R. G. 155
 AHLEPT, P. C. 505
 AIKIN, A. C. 73
 ALBRECHT, E. A. 3
 ALEXANDER, B. B. 470
 ALEXANDER, V. 783
 ALPHEE, D. T. 510
 ALIEM, NYRON B. 803
 ALLEN, R. J. 353
 ALPERT, W. H. 606
 ALYFA, P. F. 300
 AMAN, R. C. 388
 AMATO, A. J. 4
 AMES, J. 158
 ANDERSON, B. 620
 ANDERSON, P. W. 774
 ANDERSON, G. E. 233
 ANDERSON, R. S. 341
 ANDERSON, J. L. 389
 ANDERSON, J. H. 97
 ANNO, G. W. 680
 ANSPACH, L. R. 681
 APPERSON, COURTNEY E. 784
 APSICH, N. 750
 ARMSTRONG, B. E. 396, 397
 ARNOLD, G. 392
 ARNOLD, H. A. 453
 ARONOWITZ, L. 197
 ASCE, H. 199
 ATWATER, H. A. 233
 BACH, ROBERT G. 621
 BACH, W. 60
 BACOR, J. C. 507
 BAKER, J. H. 600
 BALL, J. 393
 BALLANTY, D. 5
 BARGHAW, R. E. 751
 BARKER, E. H. 6
 BATTEN, E. S. 7
 BAUDER, R. J. 371
 BAUGANTHED, D. J. 394
 BEAL, S. K. 731
 BEATON, JOHN L. 8, 9
 BECKETT, D. E. 393
 BEDINGER, C. A., JR. 600
 BENBENS, P. J. 405
 BELLA, D. A. 438
 BELLOWS, W. 622
 BENEDICT, DARRY A. 389, 395
 BENSON, PAUL E. 10, 11
 BERGER, H. H. 396
 BERGSTROM, B. W., JR. 12, 323, 342
 BETSON, R. P. 794
 BHUNBALKAR, C. H. 13
 BIERMAN, V. J. 634
 BIGGS, R. B. 397
 BINFORD, P. T. 343
 BINKOWSKI, FRANCIS S. 14, 15, 16
 BIRD, W. 487
 BLACKADAR, ALFRED K. 344
 BLAINE, R. A. 682
 BLAIS, P. W. 17
 BLAU, G. E. 514
 BLEDSOE, L. J. 785
 BLIFFORD, I. H., JR. 27
 BLOD, R. H. 191
 BLOOM, S. G. 551, 673, 683, 706
 BOCCIO, J. L. 18
 BOERSMA, L. 649
 BOWAN, J. P. 431
 BOWLER, L. L. 684
 BOOZE, J. S. 685
 BOOTH, R. S. 398, 772
 BORIS, J. P. 19
 BOTTENHEIM, J. W. 20
 BOWERMAN, P. B. 490
 BOUZE, H. L. 27
 BOYNTON, P. P. 22
 BRADY, D. K. 399
 BRANBLETT, E. L. 682
 BRANDSHA, H. G. 400
 BRASLAVSKY, S. E. 20
 BRASTER, P. E. 401
 BREEDING, R. J. 422
 BREIG, E. L. 55
 BREYMAN, L. 345
 BRIGGS, C. A. 23
 BROCKMAN, G. T. 402
 BROWN S. 804
 BROWN, G. B. 24
 BROWN, W. D. 816
 BROWNELL, D. H., JR. 815
 BROWNELL, G. S. 686
 BRYAN, KIRK 25
 BRYANT, D. A. 373
 BRYSON, DEID A. 26
 BUCHAN, EDWARD H. 403
 BUCHRING, B. A. 787
 BURCHETER, J. W. 27
 BUTLER, H. L. 502
 BYRAN, K. V. 394
 CAIRDS, J., JR. 773
 CALDER, K. L. 28, 29
 CALLET, H. W. 740
 CALVERT, JACK G. 30
 CAMPBELL, B. 404
 CAMPBELL, J. E. 31
 CAPONALETTI, J. H. 32
 CADDEN, K. L. 405
 CARLOZZI, C. A. 622
 CARPENTER, J. W. 806
 CARPENTER, S. B. 33, 204
 CASTALINE, A. H. 373
 CESS, P. D. 110
 CHADDESTON, R. A. 623
 CHAKER, A. 557
 CHALKER, W. B. 34
 CHANDLER, W. 487
 CHANIDES, P. L. 35, 36, 166
 CHANG, Y. C. 596

BLANK PAGE

CONTACT PERSON INDEX

CHAPMAN, L. E. 693
 CHAPRA, S. C. 491
 CHANNIPS, A. 406
 CHASSEY, J. P. 407
 CHATURVEDI, SUSHIL 37
 CHEN, C. W. 408
 CHEN, FANG C. 550
 CHEN, TIO C. 38
 CHESTER, E. C. 39, 607
 CHING, B. K. 55, 56
 CHIU, SHEN-YANN 620
 CHIN, Y. T. 55, 56
 CHO, P. H. 40
 CHRISTIANSEN, JOHN H. 41
 CHO, C. 42
 CHY, POLAND T. 207
 CHURCH, W. W. 43, 698
 CICENDRY, P. J. 166
 CLARK, F. H. 772
 CLARK, G. H. 409, 569, 651
 CLARK, LEO J. 410
 CLARK, TERRY L. 44
 CLARKE, JOHN P. 45, 46, 368
 CLAPKE, REGINAID H. 689
 CLEARY, P. W. 47
 CLEHENS, B. A. 293
 COAKLEY, J. A. 48
 COATES, P. L. 690
 COATS, K. H. 147
 COCHRAN, R. A. 411, 432
 CODELL, P. B. 412
 COFFEY, T. P. 339
 COLBAUGH, W. C. 33
 COLLINS, D. G. 49
 COLOMBIL, J. W. 413
 CONCATELLI, GEORGE A. 50
 CONNERS, P. A. 729
 CONTINTOR, D. W. 449
 COOPER, W. W. 406
 COPELAND, G. E. 17
 COPELMAYER, T. W. 414
 CORWETT, J. S. 262
 CORP, E. L. 640

CORTESE, A. D. 51
 CORTINA, D. 52
 COTE, O. R. 265
 COUCHMAN, H. L. 691
 COUSINS, R. D., JR. 721
 COUSER, K. E. 53
 COKE, E. F. 415
 CRAHER, E. E. 54
 CRAWFORD, H. H. 416
 CREECHNOPE, S. P. 55, 56
 CREWS, W. B. 692
 CSALLANY, S. C. 417
 CSABADY, G. T. 57
 CUDDINY, R. G. 693
 CULLITON, H. A. 721
 CUMMOLD, D. H. 340
 CNEY, P. A. 720
 D'AGOSTINO, W. B. 296
 DABBERDT, W. P. 353
 DANLBURG, H. L. 773
 DAILEY, JAMES E. 625
 DANA, H. T. 58
 DANIEL, S. L. 820
 DANIELS, ANDERS 59, 60
 DAVIS, A. L. 355
 DARLING, EUGENE H., JR. 61
 DAUER, H. 241
 DAVEY, J. P. 434
 DAVIS, D. D. 62
 DAVIS, LOREN R. 63
 DAYE, W. L. 346
 DEAGAZIO, A. W. 691
 DEARDORFF, JAMES W. 64
 DEBOIS, P. J. 680
 DEFILIPPI, J. A. 638
 DEPREITAS, A. S. W. 516
 DEGGES, T. C. 374, 806
 DELISI, D. P. 272
 DELONG H. H. 418
 DELUCIA, R. 419
 DENENJIAN, K. L. 65, 79, 282
 DERHAAD, H. G. 694
 DESANTO, G. H. 54
 DEWALLS, D. R. 420
 DICKERSON, HARVIN H. 66, 695

DICKINSON, B. E. 44
 DILLEY, J. P. 67
 DITORO, D. H. 633
 DOBBINS, W. E. 437
 DOGGETT, P. H. 788
 DONAHUE, T. R. 166
 DOTSON, W. L. 68, 696, 789, 793, 794
 DPAGNICH, DAVID W. 421
 DRIVAS, PETER J. 69
 DUCE, R. A. 70
 DUEWER, W. W. 71, 347, 348
 DUGAN, V. L. 693
 DUKE, E. H. 669
 DUKOWICZ, JOHN R. 790
 DUNHAM, A. B. 698
 DUPBIL, P. A. 349
 DURPEE, R. C. 791
 DURBAN, P. 158
 EADIE, W. J. 177
 EASTER, R. C. 72
 EBERHARDT, L. L. 647
 EBERSTEIN, I. J. 73
 ECKERT, R. J. 697
 EDDY, A. 74
 EDELHAR, P. B. 18
 EDWARDS, H. W. 320
 EGAN, B. A. 180, 264
 EINOTIS, E. C. 75
 EISENBERG, H. A. 422
 ELEY, R. L. 801
 ELLIOTT R. 423
 ELLIS, J. E. 792
 EILISON, T. W. 698
 ELROD, A. C. 415
 ELWOOD, J. W. 676
 ELY, R. F., JR. 805
 ENGLAND, C. B. 426
 ERASLAN, A. H. 425, 426, 427, 749
 ERICKSON, G. A. 458
 ERNAN, DONALD L. 76, 77
 ESKRIDGE, ROBERT E. 78, 79
 ESSIG, T. J. 704
 EVANS, D. D. 428

CONTACT PERSON INDEX

EVERETT, L. G. 828
 EWING, E. B. 557
 FARFICK, A. J. 297
 FAGERSTROM, T. 660
 FAIRHALL, A. 80
 FALLAN, H. H. 429
 FAN, L. T. 457
 FAN, ICH-HEI 456
 FARRER, PAUL S. 81
 FARLEY, R. J. 533
 FEIGHTER, K. E. 430
 FEHDER, G. J. 111
 FLETCHER, J. F. 792, 794
 FORTMAN, E. G. 608

 FORTNA, D. G. 831
 FOX, DOUGLAS G. 82
 FRANCIS, W. E. 211
 FRASER, J. P. 411, 432
 FREIBERG, J. 83
 FRIEKE, A. H. 661
 FRIEY, J. J. 181
 FRICV, W. L. 336
 FRIEDLANDER, S. 699
 FRIGO, A. A. 833
 FUJA, PHYLLIS H. 626, 627, 628
 GALLAGHER, D. J. 612
 GALLEZOS, ANTHONY P. 668
 GALYA, D. 539
 GARDNER, J. H. 19
 GANG, S. F. 815
 GASH, R. 796
 GASTORFF, L. S. 169
 GAUD, W. S. 838
 GRIGER, G. E. 350
 GREYER, J. C. 399
 GIAQUINTA, A. R. 538
 GIBSON, D. F. 795
 GIBSON, LUTHER V. 351
 GIESKE, JAMES A. 84
 GIFFORD, Y. A., JR. 85, 86, 87,
 88, 89, 90, 91, 92

 GILL, C. F. 93
 GILLMAN, B. H. 835

 GIST, C. S. 669, 796
 GLOVER, E. F. 390, 391, 439, 497,
 567, 619
 GODDARD, A. J. R. 750
 GODFREY, P. J. 622
 GOGOLAK, C. V. 98
 GOLDSTEIN, E. A. 436, 670
 GOODIN, W. P. 156
 GOODMAN, A. S. 437
 GOTHAAS, Y. 95
 GRACE, J. L. 431
 GRANAG, CURTIS L. 700
 GREENEY, W. J. 438
 GRONIEC, H. J. 439
 GROSS, W. L. 189
 GROVE, D. B. 681
 GRUHL, J. 440
 GUERRERO, R. B. 434
 GULDBERG, P. H. 296
 GUNTZ, G. D. 441
 GYREGHIAN, BERGE A. 442, 443, 642
 GUSTAFSON, J. D. 797, 798, 799
 GUTII, S. R. 539
 GUYTON, G. L. 444
 HABEGGER, L. J. 800
 HAINES, Y. Y. 445
 HALFOR, E. 751
 HALITSKY, J. 96
 HALL, C. A. S. 752
 HALL, R. W. 801
 HALLIDY, L. A. 97
 HALPERN, P. K. 293
 HANAWI, J. H. 98
 HANERD, S. 99
 HAMILTON, H. L., JR. 54
 HANLIN, D. A. 100
 HANNOOD, D. C., JR. 101

 HANF, ROY W. 446, 604, 605

 HANNA, S. B. 87, 88, 89, 102, 103,
 104, 105, 106, 107
 HANSEN, H. 610
 HANSON, W. C. 667
 HADDIS, J. H. 740
 HARDING, C. I. 355

 HARKER, A. B. 108
 HARKNESS, D. 423
 HARTMAN, DONALD R. F. 447, 448,
 461, 460, 565, 579, 580, 593,
 584, 625
 HARRALD, J. 406
 HARRIS, H. S. 430
 HARRIS, W. A. 707
 HARRIS, R. J., JR. 109
 HARRIS, R. B. 56
 HARRIS, W. P. 436
 HARSHEVARDHAN 110
 HART, R. S. 299
 HAUB, L. 757
 HAYAKAWA, F. 578

 HECHT, THOMAS A. 349, 380
 HERBY, J. P. 637
 HEFFTER, J. L. 111
 HEINES, T. J. 112
 HEITNER, K. L. 288
 HENDRY, DALEN 113
 HENSON, E. B. 456, 503
 HERNICKS, E. E. 449
 HESS, C. T. 753
 HETLING, L. J. 450, 754
 HICKEY, R. P. 118
 HILL, R. W. 451
 HILLS, R. G. 452
 HILST, G. B. 115, 291
 HINDAWI, DAVID S. 116
 HOBBS, P. V. 72
 HOBBS, GLENN R. 701, 702, 703
 HOFFERT, H. I. 117
 HOFFMAN, G. L. 78
 HOGARTH, W. 755
 HOLLERMAN, JAMES T., JR. 643, 644
 HOLLENBAUM, D. P. 671
 HOLMES, B. J. 75
 HOLMES, R. E. 750
 HOLZWORTH, G. C. 198
 HONSTEAD, J. P. 704
 HOOVER, T. E. 453

CONTACT PERSON INDEX

MCB, D. 404
 MOPPESTAD, A. 629
 MOPPER, P. L. 387
 MOPST, T. J. 756
 MORTON, S. D. 690
 MCVLT, D. P. 454
 MSIANG, P. 142
 HWANG, C. P. 598
 HWANG, T. C. 112
 MUEB, A. L. 451
 HUDSON, J. L. 305
 HUFF, D. D. 455, 802
 HUFFAL, H. S. 456, 502, 503
 HUFFEN, D. H. 119
 HULBERT, H. E. 587

 HUSKAP, L. JR. 109, 120
 HWANG, C. L. 457
 HWANG, I. 630
 HUANG, I. 599
 HYDE, W. J. 548
 INCE, Z. 428
 INGERSOLL, C. S. 264
 INGMAN, G. K. 121
 INWIS, G. S. 797, 799, 799
 ISAACS, J. D. 662
 ISAKSON, J. S. 452
 ISHAEL, G. W. 122
 ISPAELSEN, P. K. 451
 IVY, J. T. 600
 JALUKIA, Y. 509
 JAMEN, P. 123
 JAROMSKI, ROBERT A. 410, 754
 JEFFVIE, HARVEY 352
 JEGLIC, J. W. 459
 JENNES, R. I. 434
 JENSEN, A. R. 460
 JEVIL, J. S. 533
 JERSKEY, T. W. 124
 JETER, H. W. 645
 JIWA, G. W. 461
 JOBIN, WILLIAM R. 705
 JOHNSON, G. R. 320
 JOHNSON, R. O. 323
 JOHNSON, W. R. 353
 JONES, BLAIR F. 595
 JONES, J. E., JR. 125
 JORDAN, J. 123
 JORDAN, S. R. 1
 JOSEPH, J. 610
 KABEL, ROBERT L. 672
 KANE, D. 706
 KALIDORSKI, J. E. 548
 KAO, S. K. 126, 127
 KAPOL, I. L. 128, 129, 130, 131

 KARDAN, K. B. 406
 KASAHARA, AKIRA 132
 KATEH, P. C. 133
 KEEPER, T. B. 504
 KEEB, E. 462
 KELLY, B. E. 354
 KENTFIELD, G. P. 707
 KENNEDY, J. P. 538
 KERCHER, J. R. 775
 KERNODE, B. I. 125
 KEVIN, C. D. 708
 KERN, E. 404
 KHALEEL, R. 463
 KHANDAKAR, H. L. 809
 KIANG, C. S. 338
 KILLOUGH, G. G. 709, 710
 KIN, K. H. 749
 KIN, Y. S. 303, 691, 711
 KIRCH, B. J. 47
 KIRSCH, J. W. 134
 KISIEL, C. C. 428
 KLEINECKE, DAVID 464, 465
 KLOPPER, C. V. 147
 KWIENIEWICZ, B. G. 685
 KWOT, J. B. 135
 KOCH, R. C. 136
 KOCHER, D. C. 712
 KOCHOW, W. C. 177
 KOENIG, L. B. 137
 KOESTER, CAROLD 447
 KON, C. Y. 466
 KOLSAH D. C. 467
 KOLSKY, H. G. 1
 KOOLER, J. B. 355
 KORBEGAY, FRANCIS C. 138, 139
 KORTZENDORF, P. W. 1
 KOSS, WALTER J. 140
 KOZLOWSKY, THOMAS P. 356
 KRAHER, G. R. 468
 KREPKEL, P. A. 114, 531, 532
 KRET, P. W. 141
 KROCH, E. A. 121
 KRUL, HANS R. 469
 KRUGER, J. P. 450
 KU, P. S. 142
 KUHLMAN, J. H. 470
 KUWAR, S. 357
 KUTZ, J. 808
 LAPDANCE, CHARLES B. 776, 777
 LAGONARSINO, B. J. 141
 LAHS, W. B. 707
 LAI, WILLIAM 646
 LAIHOPP, S. H. 471
 LAND, D. G. 143, 144, 145, 357
 LAMBIE, P. 803
 LANBORN, K. R. 502
 LANES, S. J. 146
 LAUTZ, CLIFFORD H. 473
 LAUTZ, R. B. 147
 LARSEN, D. P. 472
 LARSEN, PETER A. 473
 LARSEN, R. I. 358, 359
 LASHOW, J. 98
 LEAP, C. P. 474
 LEAB, DONALD W., JR. 754
 LEAVITT, J. H. 33
 LECLARE, P. 757
 LEE H. 804
 LEE, E. 713
 LEE, E. S. 630
 LEE, J. 148
 LEE, J. J. 400
 LEE, JIUN-LING 149, 150
 LEE, SAMUEL S. 475, 597
 LEE, Y. 360
 LEENDERTSE, J. J. 476, 477
 LEUGENWAND, P. W. 758
 LEONARD, ELLEN H. 151, 152
 LERRAN, A. 478, 479

CONTACT PERSON INDEX

LEHNER, T. H. 17
 LEVINE, D. A. 673
 LEVINE, A. H. 290
 LEVINE, R. B. 815
 LEVINS, A. A. 551
 LEWELLEN, W. S. 153, 158
 LEWIS, C. H. 409
 LIAO, K. H. 480
 LICK, W. J. 561
 LIEN, SYU I. 550
 LIETZKE, T. A. 479
 LISGUTY, JAMES A. 431
 LIT, L. B. 587
 LINDSTROM, P. T. 647, 648, 649
 LINDSEY, P. K. 416
 LICU, E. Y. 482
 LISSNER, I. H. 507
 LITVIN, Y. J. 482
 LIU, C. Y. 155, 156
 LIU, HUI-KAC 157, 158, 159, 160, 161, 162, 163, 164, 165
 LIU, S. C. 166
 LIUWILLIY, H. 594
 LOWENMAN, J. A. 109
 LONG, E. C. 484
 LONG, L. L. 405
 LONG, P. E. 167
 LOEBBE, HERBERT W. 714
 LONGA, ERNESTO 759
 LOUIS, J. P. 168
 LUDWIG, P. L. 169, 170, 185, 353
 LWICK, J. P. 671
 LUDY, ROBERT T. 715
 LUSIS, H. A. 171
 LUTHER, P. 361, 362
 LYNER, C. J. 422
 LYCH, R. B. 886
 LYONS, W. A. 172, 173
 MACADAMS, R. H. 707
 MACAGNO, E. O. 537
 MACBACHER, MICHAEL C. 174, 363
 MACDUFF, ROBERT B. 63
 MACET, W. H. 175
 MACHENHEIL, J. L. 487
 MACHIN, L. 176
 MACK, E. J. 177
 MACK, B. J. 713
 MACKAY, T. P. 905
 MAHLMAN, J. D. 170, 179
 MADONEY, J. B. 180
 MAKOWITZ, HENRY 716
 MAHADE, SYUKURO 179, 181, 182, 183, 184
 MARCUSO, P. L. 170, 185
 MARGABELLA, P. A. 498
 MARLEY, O. P. 806
 MARCH, P. 38
 MARCUS, ALLAN H. 717
 MARKMAN, D. H. 489
 MARKOPSKY, Y. 490
 MARES, D. W. 566
 MARPER, GARY J. 491, 492, 493
 MARSHALL, RICHARD B. 494
 MARTIN, D. O. 186
 MARTIN, P. L. 187
 MARTIN, G. D. 495
 MARTIN, J. A., JR. 718, 719, 720, 721, 722
 MARTIN, J. D. 645
 MARTIN, W. E. 673, 760
 MARTINEK, P. 456, 503
 MARTINEZ, J. R. 188
 MASCH, B. P. 134
 MATHNETT, D. L. 496
 MATNIS, J. J., JR. 189
 MATSUI, S. 497
 MATYSTIK, W. T. 533
 MANSON, J. C. 522
 MCCLAUGHLIN, T. G. 417
 MCCLELLAN, R. O. 693
 MCCOY, D. G. C. 197
 MCCLROY, J. L. 190
 MCGRATH, P. E. 191
 MCKELLAR, H. B. JR. 498
 MCKIE, W. T. 499
 MCKINNEY, H. 500
 MCKINNON, A. E. 516
 MCCLAIN, A. G. 192
 MCCLAIN, H. A. 501
 MCCLAREN, R. D. 807
 MCCLAY, R. W. 456, 502, 503
 MCQUIVET, R. S. 504
 MCRAE, GEORGE J. 193, 194, 195
 MEYER, D. H. 505
 MEISEL, W. S. 345
 MEISTERLING, H. E. 807
 MELIN, J. 557
 MELLON, A. H. 101
 MELOY, T. P. 441
 MENKE, D. P. 241
 MERCER, H. T. 472
 MEYVA, G. 562
 METRY, ABIR A. 506
 MEYER, R. 788
 MEYERS, DONALD E. 196
 MICHAEL, PAUL A. 364
 MILFORD, S. W. 197
 MILLER, J. C. 397
 MILLER, H. C. 507, 783
 MILLER, H. E. 198
 MILLER, P. C. 674
 MILLER, T. L. 199
 MILLS, H. T. 200, 201, 202
 MINOTT, D. H. 291
 MOWLER, E. F., JR. 293
 MOWEN, P. A. 338
 MONTADI, H. P. 575
 MOLENKAMP, C. 203
 MORENI, MICHAEL W. 723
 MONTGOMERY, T. L. 33, 204
 MOORE, C. A. 508
 MOORE, P. K. 509
 MOORE, R. P. 205, 724
 MOREL, FRANCIS H. H. 510
 MORGAN, J. 631
 MORGENTHAU, L. 206
 MOROZ, W. J. 302
 MORSE, WILLIAM L. 511
 MORTH, A. H. 512
 MOSCHANDREAS, DEMETRIOS J. 207
 MOTE, L. B. 75
 MOY, H. C. 142, 539
 MUCCIARDI, A. W. 365
 MUNDKUR, P. 158
 MURARKA, ISHWAR P. 761, 762
 MURRAY, S. P. 513

COMPACT PERSON INDEX

- HUBBARD, W. 890
 HUBBY, T. S. 809
 HYERS, DAVID 725
 HYERS, DON 159
 HYMAN, L. W. 32
 HACHMAN, W. 871
 HAD, R. 632
 HAPPO, CANNON J. 200
 HARKIN-KHAREP, H. 700
 HEAL, W. 374
 HEELY, W. E. 514
 HEIMBERGER, H. 145
 HEISON, C. B. 720, 721, 722
 NELSON, IRAL C. 209, 210, 675, 763
 HEISON, R. E. 601
 NELSON, R. W. 515
 NELSON, WILLIAM C. 366
 HESSELEP, L. J. 120
 HETZER, D. B. 382
 HEUKER, L. L. 211
 HICHOLS, BILLY D. 870
 HICOLL, REGIS H. 212
 HIELSON, P. D. 796
 HOFM, C. P. 788
 HOLL, K. E. 199
 HUGHENT, H. G. 213, 214
 HOBBS, D. B. 204
 HOFSTROM, R. J. 516
 HOPOTNY, V. 531, 532, 650
 O'SPIEN, K. 728
 O'CONNELL, D. L. 450
 O'CONNER, D. J. 633
 O'CONNOR, D. J. 533
 O'BELL, ROBERT A. 778
 O'NEILIA, C. A. 534
 OLSON, D. G. 535
 OBLON, G. T. 408, 536
 ORVILLE, R. E. 367
 OTLEY, H. J. 397
 OTT, V. 368
 OTTER, J. H. 299, 729
 OVERCAMP, T. J. 122
 OZOLINS, G. 360
 PAILEY, P. P. 537, 538
 PALMER, C. L. 405
 PANDOLFO, J. P. 233
 PABETSKY, L. C. 539
 PARK, J. E. 540
 PARKER, P. L. 309
 PARKS, B. L. 685
 PARSONS, J. L. 34
 PARTON, B. J. 792
 PASQUILL, E. 234
 PATTEN, B. C. 669
 PATTERSON, H. B. 235
 PATTERSON, B. H. 373
 PATZER, B. G. 664
 PAUL, J. P. 541
 PAULON, JONATHAN B. 542, 543, 544, 545, 546
 PAYNE, J. A. 560
 PEINCE, J. J. 260
 PENCE, G. D. 459
 PEREZ, LAURENCE J., JR. 611
 PERLEY, H. B. 236
 PETERLE, T. J. 659
 PETERS, L. E. 112
 PETERSEN, W. B. 237
 PETERSON, D. E. 789, 790
 PETERSON, JAMES T. 46
 PETERSON, K. 238, 239
 PETERSON, K. B. 681
 PFEIFER, P. J. 236
 PHILLIPS, C. B. 171
 PIACER, S. A. 553
 PIELKE, ROGER A. 240
 PILIE, R. J. 177
 PINDER, G. P. 547
 PITA, P. V. 548
 PLATO, P. A. 241
 POLICASTRO, ANTHONY J. 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256
 POLLACK, B. I. 369
 POOLER, F., JR. 257
 PORCH, WILLIAM B. 370
 PORTER, W. P. 766
 POTTER, G. 258
 PRAHL, J. B. 470
 PRICE, A. E. 753
 PRIOR, B. G. 340
 PRITCHARD, D. W. 549
 PRITCHETT, J. W. 815
 QASHU, H. E. 420
 RAGLAND, K. W. 259, 260
 RAHBE, HADIS S. 550
 RAINEB, G. E. 551, 673, 683, 706
 RAMANATHAN, V. 261
 RANANI, B. V. 301
 RANDEBSON, D. 262
 RANEY, DONALD C. 602
 RAUZIENI, ANDREW J. 8, 9
 RAO, C. S. B. 192
 RAO, K. S. 263, 264, 265
 RAO, P. K. 371
 REA, KENNETH H. 266
 RECK, RUTH A. 372
 RECORD, P. A. 200, 373
 REDDELL, D. L. 463
 REED, ROSEAN P. 267
 REEDY, ROBERT C. 268, 269
 REEVES, H. 201
 REICHEL, D. E. 676
 REIDY, W. P. 374
 REIQVAN, H. 270
 REISHAN, ANN W. 375
 REYNOLDS, STEVEN D. 278, 284, 376
 REYNOLDS, T. B. 393
 RHOADES, W. A. 335
 PICCA, V. T. 569, 651
 RICHARDSON, L. C. 730
 RICHARDSON, W. L. 634
 RIDER, J. L. 271, 731
 RILEY, J. P. 451
 RILEY, JAMES J. 272, 273
 RITCHIE, L. T. 816
 ROBBINS, C. 721
 ROBERTS, B. B. 552
 ROBERTS, P. S. 278
 ROBERTS, G. O. 553
 ROBERTS, J. B. 377
 ROBERTS, PHILIP J. B. 278
 ROBERTSON, J. B. 554, 555
 ROBINSON, G. B. 275

CONTACT PERSON INDEX

ROBERTSON, PAUL S. 556
 ROBINSON, W. L. 681
 RODGERS, D. A. 405
 ROEFMAN, A. 371
 ROGERS, C. W. 177
 ROLFE, G. L. 557
 ROSTKE, L. H. 635
 ROSS, G. A. 652
 ROY, RONALD H. 276, 277, 378
 ROY, PHILIP M. 160, 278
 284, 380
 RUTSON, P. C. 653
 RUFF, D. E. 169
 RUFF, S. H. 387
 RUSSO, A. J. 279
 RUTHERFORD, D. B. 280
 RYAN, JOHN W. 779
 SAGENDORP, J. P. 281
 SAKKA, W. S. 728
 SARGENT, DONALD H. 636
 SARTORIS, J. J. 558
 SAVILOVIS, BRIM J. 732
 SAYER, W. R. 707
 SCARLOW, J. H. 197
 SCHEIDEGGER, A. C. 880
 SCHEFF, K. L. 65, 282
 SCHENK, CHARLES H. 559
 SCHWITZ, J. A. 560
 SCHWITZ, P. R. 578
 SCHWIMSKI, W. 123
 SCHLEIFER, P. 32
 SCHWIDER, S. H. 48
 SCHWONOVER, H. R. 100
 SCHRECKWITZ, R. G. 767
 SCHREIBER, DONALD B. 561
 SCHUBERT, JEFFREY P. 650, 655, 656
 SCHULTZ, V. H. 562
 SCHULTZ, R. H. 283
 SCHUSTER, R. L. 640
 SCHWITZ, D. P. 645
 SCHWARTZ, A. K., JR. 637
 SCHWARTZ, S. 817
 SCHWISICK, RONALD C. 379
 SIEGLEY, D. B. 713
 SEINFELD, J. H. 120, 278, 284,
 SEINFELD, J. H. 357, 380
 SEITZ, LEONARD E. 381
 SELEKOP, J. S. 617
 SELLERS, WILLIAM D. 285, 286, 297
 SENGUPTA, SUBHATA 563
 SERRE, R. J. 653
 SHANK, JOHN C., JR. 564
 SHARP, P. H. 288
 SHARIR, URI Y. 565
 SHANE, R. 639
 SHANWALTZ, V. C. 449
 SHARROW, JACK D. 289, 290
 SHAPIRO, H. H. 657
 SHARER, D. L. 291
 SHERRAN, CHRISTINE A. 292
 SHIER, L. J. 293, 295
 SHIERS, P. P. 566
 SHIR, C. S. 567, 638
 SHIRAZAKI, TATSUO 298
 SHINDALA, A. 499
 SHIR, C. C. 295
 SHIRLEY, EARL C. 8
 SHOLTES, R. S. 355
 SHOWN, S. L. 568
 SHREPPER, JACK H. 780
 SHWARTZ, K. S. 512, 569
 SIEGEL, P. D. 296
 SILL, B. L. 560
 SILVER, H. L. 508
 SINGH C. 197
 SIMONS, T. J. 570
 SISSENHINE, H. P. 768
 SKLADEN R. 297
 SMOG, JOHN R. 8, 9
 SMITH, C. A. 100
 SMITH, C. H. 753
 SMITH, E. E. 512, 569, 651
 SMITH, H. J. P. 806
 SMITH, P. 367
 SMITH, R. D. 298
 SMITH, ROBERT E. 781
 SMITH, H. S. 632
 SOLONOW, R. L. 305
 SOWIGIAN, A. S. 483
 SONNICHSEN, J. C. 571, 572
 SPAGGS, L. D. 573
 SPALDING, G. E. 769
 SPANGLER, G. A. 335
 SPARKS, R. E. 773
 SPAULDING, H. 574
 SPECHT, E. P. 299
 SPENGLER, J. D. 51
 STANISLAV, J. 575
 STANOWOK, A. 32
 STARK, R. H. 429
 STAFF, G. E. 300
 STAYES, J. S. 838
 STEEDMAN, D. H. 35
 STEELE, TIMOTHY D. 576
 STEFAN, H. 577, 578
 STEPANKO, P. 301
 STEIN, LELAND P. 818
 STEPHEN, D. W. 302
 STERN, H. O. 785
 STERN, H. W. 202
 STEWART, DOUGLAS 161, 162, 163
 STEIN, J. J. 303
 STOLZENBACH, K. D. 448, 579, 580
 STORIE, J. H. 458
 STRAUS, J. H. 56
 STRAUSS, O. P. 20
 STREET, R. L. 552, 573, 581
 STURGE, DENNIS L. 304, 733, 734,
 735, 736, 737, 738, 739, 770
 STRICKLER, ROBERT P. 689
 STRIPPLER, W. D. 417
 STUKEL, J. J. 305
 SU, T. Y. 538
 SULLIVAN, T. 306
 SUNDQVIST, H. 307
 SURKAN, ALVIN J. 582
 SORRY, D. 377
 SUTHERLAND, C. D. 819
 SWIFT, J. J. 740
 SWISHER, S. D. 107
 SZELIGOWSKI, J. J. 142, 539
 TAYLOR, A. D. 111
 TAYLOR, D. H. 126
 TAYLOR, D. R. 371

CONTACT PERSON INDEX

TAYLOR, P. A. 637
 TAYLOR, C. E. 177
 TAYLOR, J. H. 820
 TAYLOR, B. S. 617
 TYPHARD, C. J. 665
 TESKE, R. E. 154
 THACKSTON, E. L. 594
 THAKUR, P. C. 301

 THATCHER, H. L. 583, 584
 THAYER, GORDON W. 505
 THAYER, S. D. 207
 THEODOR, I. 586

 THOMAS, ROBERT V. 633, 646
 THOMAS, P. W. 33, 204
 THOMAS, W. A. 388
 THOMPSON, C. 382
 THOMPSON, J. D. 587
 THOMPSON, R. G. 637
 THOMSON, DENNIS W. 308
 THORNTWHAITE, C. W. 658
 TILL, H. A. 588
 TIPHERAW, CRAIG L. 741
 TINGLE, ARTHUR G. 309, 589
 TOBLIN, ALAN 590, 591
 TOOME, J. 553
 TOMBO, WADY C. 592
 TRACY, C. R. 766
 TRENT, D. S. 394, 593
 TREVE, Y. H. 806
 TRIJONIS, JOHN C. 383
 TROHLER, D. V. 594
 TRUESDELL, ALFRED H. 595
 TRUFFER, H. 692
 TRY, T. J. 596, 614
 TURNER, D. B. 310, 311, 312, 313, 314, 315, 316, 317, 318, 319
 TURNER, P. D. 677
 TURNER, W. B. 742
 VAGNER, J. 458
 VAITRUS, D. F. 320
 VAN DER HOVEN, I. 321
 VAN DYKE, G. H. 705
 VAN WINKLE, W. 771

 VANDERBOURG, NEIL E. 821
 VANDEKIPLODE, H. A. 772
 VENEKATIAN, A. 322
 VERINOGLU, T. H. 597
 VILKITIS, J. R. 622
 VINCENT, L. R. 202
 VISWANATHA, B. 12, 322, 323
 VOILLEQUE, PAUL G. 678, 743
 WALKER, J. C. G. 36
 WALLACE, W. A. 406
 WALLER, W. T. 773
 WALSH, P. J. 744
 WALT, H. 211
 WANG, H. 594
 WANG, H. H. 293
 WANG, J. Y. 100
 WANG, S. 599
 WASHINGTON, WARREN A. 324, 325

 WAYLAND, J. R. 600, 593, 816
 WEBER, P. 796
 WEGNER, B. J. 501
 WEILSTEIN, G. 18
 WELCH, RONALD H. 384
 WELLS, H. B. 49
 WELTY, J. R. 593
 WENDELL, L. L. 300, 326
 WESTWORTH, B. A. 758
 WENZEL, D. R. 745
 WESLEY, HARVIN L. 782
 WESTERDAHL, H. E. 801
 WETHERALD, RICHARD T. 327, 328
 WHALIN, ROBERT W. 602
 WHICKER, P. W. 767
 WHITE, G. C. 659

 WHITTEN, GARY E. 329, 349
 WILCOX, T. P. 688
 WILLEY, R. G. 603
 WILLIAMS, GLEN 604
 WILLIAMS, J. R. 605
 WILLIAMS, MICHAEL D. 330, 331, 332, 333, 334
 WILLIAMSON, FRANK S. 746
 WILLES, C. A. 335

 WILSON, J. C. 297
 WILSON, K. P. 32
 WILTSEE, K. W., JR 296
 WINCHESTER, J. W. 606
 WINIARSKI, L. D. 336, 407
 WINKLER, L. P. 298
 WITHERSPOON, J. P. 747
 WITTE, A. J. 607
 WITTHAUS, J. W. 680
 WYCK, W. J. 608
 WOJCIK, MICHAEL 164
 WOLFE, D. A. 609
 WOLFF, P. R. 610
 WONG, P. 748, 804
 WOOD, D. B. 461
 WOOD, KENNETH A., JR. 611
 WOOLSON, W. A. 120
 WRIGHT, G. P. 535
 WU, D. S. 612
 WYNGAARD, J. C. 265
 YAHADA, TETSUJI 337
 YANG, W. C. 598
 YEARSLEY, JOHN W. 613
 YEASTED, J. G. 639
 YEN, G. T. 614
 YEN, K. T. 67
 YENGG, B. W. 615
 YOCKE, MARK A. 158, 165
 YOTSUKUBA, H. 616
 YOUNG, G. E. 617
 YOUNG, P. J. 446
 YOUSEF, Y. A. 618
 YU, S. C. 505
 YUE, G. H. 338
 ZALESKI, S. T. 19, 339
 ZALOSH, R. G. 619

TITLE INDEX

TITLE INDEX

ABATEMENT

PREDICTIVE AND POLLUTION ABATEMENT MODEL FOR ACID MINE DRAINAGE* (609)
 THERMAL POLLUTION ABATEMENT EVALUATION MODEL FOR POWER PLANT SITING* (566)
 SIMULATION AND OPTIMIZATION OF ACID MINE DRAINAGE ABATEMENT ALTERNATIVES* (617)
 PREDICTIVE AND POLLUTION ABATEMENT MODEL FOR MINE DRAINAGE* (657)

ABSORPTION

MODEL FOR ABSORBED DOSE RATES IN HUMANS FROM EXPOSURE TO ENVIRONMENTAL CARCINOGENS* (726)
 A FORTRAN PROGRAM TO DETERMINE ABSORBED ORGAN DOSE DUE TO INHALATION OF RADIONUCLIDES* (748)

ABSORPTION

THE EFFECT OF GROUND LEVEL ABSORPTION ON THE DISPERSION OF POLLUTANTS IN THE ATMOSPHERE* (112)
 PREDICTIONS OF THE SPECTRAL ABSORPTION AND EXTINCTION COEFFICIENTS OF AN URBAN AIR POLLUTION AEROSOL MODEL* (382)
 A TWO-COMPARTMENT, THREE-PARAMETER MODEL FOR THE ABSORPTION AND RETENTION OF INGESTED ELEMENTS BY ANIMALS* (470)

ACCIDENT

AEOLUS: ATMOSPHERIC DISPERSION AND FINITE-CLOUD DOSES DURING NORMAL, SEA-BREEZE, AND ACCIDENT CONDITIONS* (39)
 REACTOR ACCIDENT PLUME RISK CALCULATIONS* (279)
 MOIST MATERIAL-COOLANT INTERACTION AND PLUTONIUM SOURCE IN LWRDB ACCIDENT ANALYSIS* (919)

ACCIDENTAL

OCEANIC DISPERSION OF A SEVERE ACCIDENTAL RADIONUCLIDE RELEASE FROM A SUBSEA NUCLEAR POWER PLANT* (471)
 A FORTRAN PROGRAM FOR THE CALCULATION OF THE EXISTENTIAL HAZARDS FROM AN ACCIDENTAL FISSION PRODUCT RELEASE, 101820 (487)

ACCIDENTS

A COMPUTER TECHNIQUE FOR CALCULATING THE RADIOLOGICAL CONSEQUENCES OF PRESSURIZED WATER REACTOR POWER PLANT HYPOTHETICAL ACCIDENTS* (53)
 A MODEL FOR RADIOLOGICAL DISPERSION FROM TORNADOIC ACCIDENTS* (138)
 EFFECTS OF RAINSTORMS AND WINDOFF ON CONSEQUENCES OF NUCLEAR REACTOR ACCIDENTS* (816)

ACCUMULATION

MODEL OF THE ACCUMULATION OF FOSSIL CO₂ IN THE ATMOSPHERE AND THE SEA* (40)
 AN ATMOSPHERIC TRANSPORT AND ACCUMULATION MODEL FOR AIRSHEDS* (270)
 RADIOACTIVITY TRANSPORT IN WATER: BIOLOGICAL ACCUMULATION OF MERCURY (II) AND METHYLMERCURY BY CHLORELLA PYRENEIFORMIS* (497)
 A MICRONUTRIENT-BASED MODEL FOR POLLUTANT ACCUMULATION BY FISH: SIMULATION OF PCB AND METHYLMERCURY RESIDUE LEVELS IN OTTAWA RIVER YELLOW PERCH (PERCA FLAVESCENS)* (516)
 METHYLMERCURY ACCUMULATION IN AN AQUATIC FOOD CHAIN: A MODEL AND SOME IMPLICATIONS FOR RESEARCH PLANNING* (560)
 MATHEMATICAL MODEL OF THE ACCUMULATION OF RADIONUCLIDES BY OYSTERS (O. VIRGINICA) AQUACULTURED IN THE EFFLUENT OF A NUCLEAR POWER REACTOR TO INCLUDE MAJOR BIOLOGICAL PARAMETERS* (757)

ACID

IRON CATALYZED OXIDATION OF SO₂ TO ACID SULPHATE MIST IN DISPERSED PLUMES* (27)
 MECHANISM FOR HYPOCHLORIC ACID PRODUCTION IN CLOUDS* (338)
 PREDICTIVE AND POLLUTION ABATEMENT MODEL FOR ACID MINE DRAINAGE* (609)
 SIMULATION AND OPTIMIZATION OF ACID MINE DRAINAGE ABATEMENT ALTERNATIVES* (617)
 SIMULATION OF THE EFFECTS OF ACID MINE DRAINAGE IN ECOTONES* (623)
 FH PROFILES IN A RIVER SYSTEM WITH MULTIPLE ACID LOADS* (639)

ACTIVATION

ENGINEERING-FUSION REACTOR NEUTRONIC/ENERGY DEPOSITION/ACTIVATION /DOSE TO PERSONNEL MODEL* (716)

ACTIVITY

PREV, A PROGRAM FOR THE CALCULATION OF ACTIVITY RELEASES AND POTENTIAL DOSES FROM A PRESSURIZED WATER REACTOR PLANT* (645)
 BIOLOGICAL DOSE AND RADIOLOGICAL ACTIVITY FROM NUCLEAR REACTOR OR NUCLEAR WEAPON FISSION PRODUCTS* (487)
 SPECIFIC ACTIVITY AND CONCENTRATION MODEL APPLIED TO CS-137 NOVENENT IN A EUTROPHIC LAKE* (772)

ACUTE

APRIN, A CODE FOR ACUTE AEROSOL INHALATION EXPOSURE CALCULATIONS* (783)

ADHESION

NUCLEAR DEBRIS ATTACHMENT TO AIRCRAFT DUE TO ATMOSPHERIC RADIATION ENVIRONMENTS: AIRCRAFT IMPACTS AND FISSION COMPUTER MODEL* (236)

ADJUSTED

WASS ADJUSTED THREE DIMENSIONAL WIND FIELD MODEL* (292)

ADVANCED

ADVANCED STATISTICAL TRAJECTORY REGIONAL AIR POLLUTION MODEL* (290)

ADVECTION

TWO-DIMENSIONAL NUMERICAL MODEL FOR SIMULATING FORMATION AND DISSIPATION OF ADVECTION FOGS: A FIELD INVESTIGATION AND NUMERICAL SIMULATION OF COASTAL FOG* (177)
 ADVECTION OF ARTIFICIALLY PRODUCED UPPER ATMOSPHERIC CLOUDS IN EMPIRICALLY DETERMINED WIND FIELDS* (339)

AEROLUS

AEOLUS: ATMOSPHERIC DISPERSION AND FINITE-CLOUD DOSES DURING NORMAL, SEA-BREEZE, AND ACCIDENT CONDITIONS* (39)

AERIN

AERIN, A CODE FOR ACUTE AEROSOL INHALATION EXPOSURE CALCULATIONS* (783)

AEROSOL

AEROSOL MODELING* (28)
 DIFOUT, MODEL FOR COMPUTATION OF AEROSOL TRANSPORT AND DIFFUSION IN THE ATMOSPHERE* (83)
 ANALYTICAL STUDIES OF AEROSOL BEHAVIOR PREDICTIONS FOR FAST REACTOR SAFETY* (98)
 AEROSOL ANALYTICAL MODEL* (118)
 MESOSCALE AIR POLLUTION SIMULATION MODELING: THE FEASIBILITY OF MODELING PHOTOCHEMICAL AEROSOL DYNAMICS* (128)
 VERTICAL TRANSPORT AND REMOVAL OF RADIOACTIVE AEROSOLS IN THE ATMOSPHERE: QUANTITATIVE MODELS OF AEROSOL WASHOUT BY PRECIPITATION AND DRY DEPOSITION ON THE UNDERLYING SURFACE* (131)
 RABD TWO-DIMENSIONAL CUMULUS DYNAMICS MODEL WITH AEROSOL SCAVENGING* (203)
 PREDICTIONS OF THE SPECTRAL ABSORPTION AND EXTINCTION COEFFICIENTS OF AN URBAN AIR POLLUTION AEROSOL MODEL* (382)
 FAST RESPONSE MODEL OF TOXIC AEROSOL RESUSPENSION BY WIND* (379)
 AEROSOL SAMPLING DATA PREDICTION MODEL* (379)
 AERIN, A CODE FOR ACUTE AEROSOL INHALATION EXPOSURE CALCULATIONS* (783)

BLANK PAGE

AIRC INDEX

AEROSOLS

REINFORCED COAGULATION-SEDIMENTATION MODEL FOR STRATOSPHERIC AEROSOLS* (27)
 CONCENTRATION OF POSSIBLE CLIMATIC CONSEQUENCES OF PERTURBATIONS TO STRATOSPHERIC AEROSOLS, OZONE AND WATER VAPOR WITH RADIATIVE-CONVECTIVE MODELS* (48)
 STRATOSPHERIC AEROSOLS: EFFECT UPON ATMOSPHERIC TEMPERATURE AND GLOBAL CLIMATE* (110)
 VERTICAL TRANSPORT AND REMOVAL OF RADIOACTIVE AEROSOLS IN THE ATMOSPHERE: QUANTITATIVE MODELS OF AEROSOL WASHOUT BY PRECIPITATION AND DRY DEPOSITION ON THE UNDERLYING SURFACE* (131)
 THERMAL AND RADIATIVE EFFECTS OF ATMOSPHERIC AEROSOLS IN THE NORTHERN HEMISPHERE CALCULATED USING A RADIATIVE CONVECTIVE MODEL* (172)
 SIMULATION OF THE HYDROLOGIC TRANSPORT OF RADIOACTIVE AEROSOLS* (455)
 PRELIMINARY MODEL OF THE HUMAN ASSIMILATION OF LEAD AEROSOLS FROM GASOLINE COMBUSTION* (692)
 DEPOSITION OF ELECTRO-AEROSOLS IN THE LUNGS* (712)

AFGWC

AFGWC AIR STAGNATION MODEL* (144)

AGGRADATION

DIGITAL SIMULATION OF AGGRADATION AND DEGRADATION IN RITUAL STREAMS* (140)

AGRICULTURAL

A DAMAGE ASSESSMENT MODEL FOR AGRICULTURAL CROPS* (779)

AGRICULTURE

WASTE HEAT UTILIZATION FROM POWER PLANTS IN AGRICULTURE: WATER TRANSPORT* (542)

AIDS

COMPUTER SIMULATION AIDS OIL-SPILL CLEANUP DECISIONS* (432)

AIR

AIR QUALITY MANUAL: MATHEMATICAL APPROACH TO ESTIMATING HIGHWAY IMPACT ON AIR QUALITY* (8)
 AIR QUALITY MANUAL: METEOROLOGY AND ITS INFLUENCE ON THE DISPERSION OF POLLUTANTS FROM HIGHWAY LINE SOURCES* (9)
 CALNET: AN IMPROVED MICROSCALE MODEL FOR THE DISPERSION OF AIR POLLUTANTS FROM A LINE SOURCE* (10)
 MODELING STUDY OF SEASONAL EFFECT ON AIR POLLUTION AT 40 DEGREES N LATITUDE* (20)
 A SIMULATION MODEL FOR AIR POLLUTION OVER CONNECTICUT* (21)
 A CLIMATOLOGICAL MODEL FOR MULTIPLE-SOURCE URBAN AIR POLLUTION* (24)
 AIR TRANSPORT CALCULATIONS USING THE LASL-WHEP AIR FLUX TAPE AND THE WHEP COMPUTER PROGRAM--CCP* (31)
 STATISTICAL OXIDANT AIR QUALITY PREDICTION MODEL FOR LAND USE AND TRANSPORTATION PLANNING* (32)
 AIR QUALITY MANAGEMENT OF INDUSTRIAL SITES* (34)
 OZONE FORMATION SUCH NOT IN "CLEAN AIR"* (35)
 EFFECT OF HIGHWAY CONFIGURATIONS ON ENVIRONMENTAL PROBLEMS--DYNAMICS OF HIGHWAY ASSOCIATED AIR POLLUTION* (39)
 AN AIR POLLUTION EVALUATION MODEL FOR ROADWAYS* (50)
 AIRPORT AIR POLLUTION MODEL* (54)
 PREDICTION MODELS ARE BASIS FOR RATIONAL AIR QUALITY CONTROL* (60)
 COMPUTER MODELING OF TRANSPORTATION-GENERATED AIR POLLUTION* (61)
 AIR TRANSPORT MODELING FOR REGIONAL DOSE STUDIES* (68)
 TRACE PHOTOCHEMICAL AIR QUALITY SIMULATION MODEL* (69)
 THE AIR POLLUTION COMPONENT OF AN ECOSYSTEM SIMULATION MODEL* (74)
 SOURCE ASSESSMENT: SEVERITY OF STATIONARY AIR POLLUTION SOURCES--A SIMULATION APPROACH* (75)
 ANALYTICAL MODEL FOR AIR POLLUTANT TRANSPORT AND DEPOSITION FROM A POINT SOURCE* (76)
 ONE SIMPLE MODEL FOR URBAN AIR POLLUTION MODEL* (84)
 MODELING URBAN AIR POLLUTION* (86)
 URBAN AIR POLLUTION MODELING* (87)
 URBAN AIR POLLUTION MODELING* (89)
 THE SIMPLE MODEL FOR URBAN AIR POLLUTION MODEL* (92)
 INVESTIGATION OF GAS TURBINE COMBUSTORS WITH HIGH INLET AIR TEMPERATURES, COMBUSTION MODELING* (101)
 MODELS OF RADIATION TRANSPORT IN AIR - THE AIR CODE* (109)
 AN AIR POLLUTION MODEL OF CONNECTICUT* (115)
 USER'S GUIDE TO VERSION 2 OF AIR (AIR TRANSPORT OF RADIATION)* (120)
 SIMULATING THE URBAN AIR POLLUTION ENVIRONMENT* (121)
 MESOSCALE AIR POLLUTION SIMULATION MODELING: THE FEASIBILITY OF MODELING PHOTOCHEMICAL AEROSOL DYNAMICS* (124)
 AIRBORNE AIR POLLUTION MONITORING EXPERIMENT IN AN AREA OF MOUNTAIN-VALLEY TERRAIN* (127)
 AN INTERIM VERSION OF A GENERALIZED URBAN AIR POLLUTION MODEL* (145)
 THREE-DIMENSIONAL NUMERICAL MODEL FOR CALCULATING THE SPREAD AND DILUTION OF AIR POLLUTANTS* (147)
 MODEL FOR FLUID MECHANICAL STUDIES OF AIR POLLUTION* (155)
 GRID MODEL FOR URBAN AIR POLLUTION* (157)
 THE CHEMISTRY, DISPERSION, AND TRANSPORT OF AIR POLLUTANTS EMITTED FROM FOSSIL FUEL POWER PLANTS IN CALIFORNIA: DATA ANALYSIS AND EMISSION IMPACT MODEL* (158)
 URBAN AIR WIND PHOTOCHEMICAL SIMULATION MODEL STUDY: MICROSCALE MODEL OF LOCAL VEHICULAR CONTRIBUTIONS TO MEASURED POLLUTANT CONCENTRATIONS* (160)
 REGIONAL SCALE AIR POLLUTION TRANSPORT MODEL* (164)
 MESOSCALE AIR POLLUTION TRANSPORT IN SOUTHEAST WISCONSIN* (173)
 AN URBAN AIR DISPERSION MODEL FOR ESTIMATING LONG TERM AVERAGE VALUES OF AIR QUALITY* (186)
 A REVIEW OF METHODS FOR PREDICTING AIR POLLUTION DISPERSION, AIR POLLUTION MODELS, AND PROBLEM AREAS IN AIR POLLUTION DISPERSION MODELING* (189)
 A LAGRANGIAN TRAJECTORY MODEL OF URBAN SCALE PHOTOCHEMICAL AIR POLLUTION* (193)
 A THREE-DIMENSIONAL, URBAN SCALE, MATHEMATICAL MODEL OF PHOTOCHEMICAL AIR POLLUTION* (194)
 A WELL MIXED BOX MODEL OF URBAN SCALE PHOTOCHEMICAL AIR POLLUTION* (195)
 DEVELOPING A PRACTICAL DISPERSION MODEL FOR AN AIR QUALITY REGION* (197)
 MEASURED VERSUS PREDICTED AIR QUALITY NEAR HIGHWAYS* (199)
 A COMPUTER CODE FOR ESTIMATING AIR POLLUTANT CONCENTRATIONS FROM DISPERSED SOURCES* (205)
 MATHEMATICAL AND TECHNICAL APPROACH TO DISPERSION ANALYSIS OF AIR CONTAMINANTS* (215)
 SOFTWARE DEVELOPMENT AND AIR POLLUTION DISPERSION MODEL TESTING* (216)
 EVALUATION OF HIGHWAY AIR QUALITY SIMULATION MODELS* (237)
 BOUNDARY LAYER MODEL FOR AIR POLLUTANT CONCENTRATIONS DUE TO HIGHWAY TRAFFIC* (240)
 WEIGHTED DIAGRAM MODELS FOR THE ASSESSMENT OF ENERGY USE AND AIR POLLUTION IN TRANSPORTATION SYSTEMS* (274)
 A REGIONAL AIR QUALITY SIMULATION MODEL (A DESCRIPTION OF THE CONNECTICUT AIR POLLUTION MODEL AS DEVELOPED BY THE TRAVELERS RESEARCH CENTER)* (275)
 AIR QUALITY ASSESSMENT MODEL FOR AIR FORCE OPERATIONS* (277)
 ASSESSMENT OF THE AMBIENT AIR IMPACT OF MULTIPLE STACK INDUSTRIAL PLANTS USING DISPERSION MODELING* (283)
 SIMULATION OF URBAN AIR POLLUTION* (284)

TITLE INDEX

A75

ADVANCED STATISTICAL TRAJECTORY REGIONAL AIR POLLUTION MODEL* (290)
 AIR QUALITY DISPERSION MODEL: APPLICATION TO NEW YORK CITY* (293)
 DEVELOPMENT OF AN URBAN AIR QUALITY SIMULATION MODEL WITH COMPATIBLE SAPS DATA* (295)
 AIR QUALITY MAINTENANCE THROUGH PRACTICAL MODELING* (297)
 AIR POLLUTION BY COMPUTER TRAVEL ON STATES ISLAND* (298)
 GAUSSIAN-PLUME MULTIPLE SOURCE AIR QUALITY ALGORITHM* (311)
 A HIGHWAY AIR POLLUTION MODEL* (312)
 LONG RANGE AIR TRANSPORT MODEL* (330)
 USER'S MANUAL, AUTOMATED PROCEDURES FOR ESTIMATING CONTROL COSTS AND EMISSION PREDICTIONS FOR SPECIFIC AIR POLLUTION SOURCES* (341)
 PREDICTIONS OF THE SPECTRAL ABSORPTION AND EXTINCTION COEFFICIENTS OF AN URBAN AIR POLLUTION Aerosol MODEL* (342)
 EMPIRICAL TECHNIQUES FOR ANALYZING AIR QUALITY AND METEOROLOGICAL DATA: SHORT-TERM CHANGES IN SECOND-LEVEL OZONE CONCENTRATIONS* (345)
 REGIONAL AIR STAGNATION MODEL* (346)
 LIVERMORE REGIONAL AIR QUALITY MODEL: KINETICS AND TRANSPORT* (347)
 MODIFICATION OF LIVERMORE AIR QUALITY MODEL FOR USE IN ST. LOUIS* (349)
 DEVELOPMENT OF AN AIR QUALITY SIMULATOR FOR COAL BURN* (350)
 A SHORT-TERM AIR QUALITY MODEL FOR SULFUR DIOXIDE IN LOUISVILLE, KENTUCKY* (351)
 OUTDOOR SIMULATION OF AIR POLLUTION CONTROL STRATEGIES* (352)
 SAFELITE: ESTIMATING THE AIR QUALITY IMPACT OF VEHICULAR EMISSIONS RESULTING FROM A TRAFFIC ASSIGNMENT* (354)
 A MATHEMATICAL MODEL FOR RELATING AIR QUALITY MEASUREMENTS TO AIR QUALITY STANDARDS* (359)
 A NEW MATHEMATICAL MODEL OF AIR POLLUTANT CONCENTRATIONS AVERAGING TIME AND FREQUENCY* (359)
 LIVERMORE REGIONAL AIR QUALITY MODEL V* (363)
 AIR POLLUTANT HEALTH EFFECTS ESTIMATION MODEL* (366)
 PREDICTIVE MODEL BASED ON THE RELATIONSHIP BETWEEN METEOROLOGICAL AND EMISSION PATTERNS AND AIR QUALITY* (369)
 AIRPORT VICINITY AIR POLLUTION MODEL* (379)
 AIRPORT AIR QUALITY MODEL FOR ASSESSMENT OF UNITED STATES NAVAL AVIATION EMISSIONS* (392)
 ECONOMIC AIR POLLUTION CONTROL MODEL FOR LOS ANGELES COUNTY IN 1975* (393)
 TWO-DIMENSIONAL NUMERICAL SIMULATION OF THE EFFECTS OF AIR POLLUTION UPON THE URBAN-RURAL COMPLEX* (394)
 A REGIONAL AIR TRANSPORT MODEL FOR RADIOLOGICAL DOSE STUDIES* (396)
 PROBABILISTIC MODELS FOR CALCULATING AIR POLLUTION DAMAGE* (397)

AIRBORNE

MODEL FOR TIME-DEPENDENT RAINFALL SIZE DISTRIBUTIONS: APPLICATION TO THE WASHOUT OF AIRBORNE CONTAMINANTS* (1)
 AIRBORNE AIR POLLUTION MONITORING EXPERIMENT IN AN AREA OF MOUNTAIN-VALLEY TERRAIN* (127)
 ASSESSMENT OF CONSEQUENCES FROM AIRBORNE RELEASES OF RADIOACTIVE MATERIAL* (131)
 COMPUTER MODEL FOR THE PREDICTION OF THE DISPERSION OF AIRBORNE RADIOACTIVE POLLUTANTS* (241)
 USER'S MANUAL FOR CODE REGAN: A CODE TO CALCULATE GAMMA PHOTON DOSE FROM AN AIRBORNE RADIOACTIVE RELEASE* (171)
 THE AIRDOS-II COMPUTER CODE FOR ESTIMATING RADIATION DOSE TO MAN FROM AIRBORNE RADIOISOTOPES IN AREAS SURROUNDING NUCLEAR FACILITIES* (724)
 POTENTIAL RADIOLOGICAL IMPACT OF AIRBORNE RELEASES AND DIRECT GAMMA RADIATION TO INDIVIDUALS LIVING NEAR INACTIVE URANIUM MILL TAILINGS PILES* (740)

AIRCRAFT

A THREE-DIMENSIONAL STRATOSPHERIC POINT-SOURCE TRACER EXPERIMENT AND ITS IMPLICATIONS FOR DISPERSION OF EFFLUENT FROM A FLEET OF SUPERSONIC AIRCRAFT* (179)
 NUCLEAR JUMP IS ATTACHMENT TO AIRCRAFT DUE TO ATMOSPHERIC RADIATION ENVIRONMENTS: AIRCRAFT IMPACT AND AEROSTIC COHESION MODEL* (234)
 STRATOSPHERIC OZONE DESTRUCTION BY AIRCRAFT-INDUCED NITROGEN OXIDES* (300)

AIRDOS

THE AIRDOS-II COMPUTER CODE FOR ESTIMATING RADIATION DOSE TO MAN FROM AIRBORNE RADIOISOTOPES IN AREAS SURROUNDING NUCLEAR FACILITIES* (724)

AIREN

AIREN PROGRAM MANUAL: A COMPUTER CODE FOR CALCULATING DOSES, POPULATION DOSES, AND GROUND DEPOSITIONS DUE TO ATMOSPHERIC EMISSIONS OF RADIOISOTOPES* (720)

AIRCRAFT

AIRCRAFT AIR POLLUTION MODEL* (59)
 AIRPORT VICINITY AIR POLLUTION MODEL* (379)

AIRCRAFTS

AN ATMOSPHERIC TRANSPORT AND ACCUMULATION MODEL FOR AIRSHELLS* (270)

AISITE

AISITE II, A DIGITAL COMPUTER PROGRAM FOR INVESTIGATION OF REACTOR SITES* (492)

ALABAMA

APPLICATION OF STREAM WATER QUALITY MODELS TO ALABAMA* (637)
 ENVIRONMENTAL PARAMETERS OF THE CHESAPEE RIVER IN ALABAMA, THERMAL STRATIFICATION* (635)

ALASKA

EFFECTS OF THE PIPELINE NAUL ROAD ON NEARBY PONDS AND LAKES ACROSS ALASKA'S NORTH SLOPE* (702)

ALASKAN

COMPARISON OF ECOLOGICAL IMPACTS OF POSTULATED OIL SPILLS AT SELECTED ALASKAN LOCATIONS* (456)

ALGORITHM

CALCULATION OF SELECTED PHOTOLYTIC RATE CONSTANTS OVER A DIURNAL RANGE: A COMPUTER ALGORITHM* (202)
 GAUSSIAN-PLUME MULTIPLE SOURCE AIR QUALITY ALGORITHM* (311)
 POINT, AREA, LINE SOURCE ALGORITHM* (310)
 A STEADY-STATE, UNIVARIATE GAUSSIAN PLUME DISPERSION ALGORITHM* (319)

ALGORITHMS

ATMOSPHERIC HYDROCODES USING PCT ALGORITHM* (19)

ALLOCATION

GOAL INTERVAL PROGRAMMING MODEL FOR RESOURCE ALLOCATION IN A MARINE ENVIRONMENTAL PROTECTION PROGRAM* (406)
 MODEL FOR THE EFFICIENT ALLOCATION OF ENVIRONMENTAL ASSIMILATIVE CAPACITY: THE CASE OF THERMAL EMISSIONS TO A LARGE BODY OF WATER* (559)
 RESOURCES ALLOCATION TO OPTIMIZE RIVER POLLUTION CONTROL* (569)

ALTERATION

SIMPLE METHOD FOR EVALUATING ALTERNATIVES TO A PROPOSED ENVIRONMENTAL ALTERATION, ITS HISTORY, AND AN EXAMPLE OF ITS USE IN OIL SHALE DEVELOPMENT* (795)

TITLE INDEX

ALTERNATIVE

MODELING THE ECONOMIC AND ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVE ENERGY POLICIES: SPAS-STRATEGIC ENVIRONMENTAL ASSESSMENT SYSTEM* (788)

ALTERNATIVES

SIMULATION AND OPTIMIZATION OF ACID RAIN DRAINAGE TREATMENT ALTERNATIVES* (617)
 SIMPLE METHOD FOR EVALUATING ALTERNATIVES TO A PROPOSED ENVIRONMENTAL ALTERATION, ITS HISTORY, AND AN EXAMPLE OF ITS USE IN OIL SHALE DEVELOPMENT* (796)

ALTITUDE

NUMERICAL CALCULATIONS OF VISCOUS HIGH-ALTITUDE EXHAUST PLUME FLOW FIELDS* (22)
 THE ROSCOE MANUAL, HIGH-ALTITUDE NEUTRAL-PARTICLE MOTION* (100)
 DEVELOPMENT OF MODEL TO ASSESS ENVIRONMENTAL EFFECT OF COMMERCIAL AVIATION HIGH ALTITUDE CRUISE OPERATIONS* (219)
 ANALYSIS OF HIGH-ALTITUDE EFFECTS SIMULATION (HAES)* (374)

AMBIENT

AMBIENT EFFECT OF EVAPORATIVE COOLING TOWERS* (142)
 ASSESSMENT OF THE AMBIENT AIR IMPACT OF MULTIPLE STACK INDUSTRIAL PLANTS USING DISPERSION MODELING* (283)
 IMPACT OF ENERGY SHORTAGE ON AMBIENT SULFUR DIOXIDE AND PARTICULATE LEVELS IN METROPOLITAN BOSTON* (296)
 AMBIENT AIR QUALITY MODEL FOR ASSESSMENT OF UNITED STATES NAVAL AVIATION EMISSIONS* (382)

ANOS

PREDICTED AND OBSERVED COOLING TOWER PLUME RISE AND VISIBLE PLUME LENGTH AT THE JOHN E. ANOS POWER PLANT* (102)

ANALOGUES

DIFFERENCE ANALOGUES OF BOUNDARY-VALUE PROBLEMS FOR THE EQUATIONS OF GLOBAL RADIOISOTOPE CONTAMINANT TRANSPORT AND THEIR NUMERICAL SOLUTION: DIFFERENCE APPROXIMATION OF EQUATIONS AND BOUNDARY CONDITIONS IN THE REGIONAL PLANE AND THE ZONAL BELT OF THE ATMOSPHERE* (129)
 UNSTRUCTURED MARINE FOOD WEBS AND 'POLLUTANT ANALOGUES'* (662)

ANALYSIS

A SIMPLE DISPERSION MODEL FOR THE ANALYSIS OF CHEMICALLY REACTIVE POLLUTANTS* (105)
 THE CHEMISTRY, DISPERSION, AND TRANSPORT OF AIR POLLUTANTS EMITTED FROM FOSSIL FUEL POWER PLANTS IN CALIFORNIA: DATA ANALYSIS AND EMISSION IMPACT MODEL* (159)
 COMPREHENSIVE ANALYSIS OF TIME-CONCENTRATION RELATIONSHIPS AND VALIDATION OF A SINGLE-SOURCE DISPERSION MODEL* (200)
 SUMMARY REPORT ON MODELING ANALYSIS OF POWER PLANTS FOR FUEL CONVERSION* (206)
 MATHEMATICAL AND TECHNICAL APPROACH TO DIFFUSION ANALYSIS OF AIR CONTAMINANTS* (215)
 ANALYSIS OF WEATHER DATA--WIND ANALYSIS, TEMPERATURE ANALYSIS, PRECIPITATION ANALYSIS* (266)
 GLOBAL ANALYSIS ON A RECAPTOR GRID OF SATELLITE DERIVED OZONE DATA* (106)
 ANALYSIS OF HIGH-ALTITUDE EFFECTS SIMULATION (HAES)* (374)
 A SYSTEMS ANALYSIS MODEL FOR CALCULATING RADIOISOTOPE TRANSPORT BETWEEN RECEIVING WATERS AND BOTTOM DEPOSITS* (374)
 A TRANSIENT, TWO-DIMENSIONAL, DISCRETE-ELEMENT MODEL FOR FAP-FIELD ANALYSIS OF DISCHARGES IN COASTAL REGIONS* (427)
 PART I: A SYSTEM OF COMPUTER PROGRAMS FOR RADIOISOTOPE PATHWAY ANALYSIS CALCULATIONS* (486)
 ANALYSIS OF SUBMERGED THERMAL DISCHARGE FROM OCEAN-SITED POWER PLANTS* (488)
 MATHEMATICAL ANALYSIS OF THERMAL POLLUTION OF LAKES AND ESTUARIES* (503)
 THERMAL REGIMES OF THE UPPER MISSISSIPPI AND MISSOURI RIVERS: TRANSIENT AND STEADY-STATE COMPUTATIONAL MODELS FOR THE PREDICTION OF RIVER THERMAL REGIMES; PART TWO: ANALYSIS OF THERMAL REGIMES OF THE MISSISSIPPI AND MISSOURI RIVERS IN THE MID-CONTINENT AREA POWER POOL (MAPP) GEOGRAPHICAL AREA* (539)
 CARGO SPILL PROBABILITY ANALYSIS: A BAYESIAN APPROACH* (632)
 NEW CONCEPT IN STABILITY ANALYSIS OF SLEEPED NINE-REPOSE ENDORPHINIS* (640)
 RSAC -- A RADIOLOGICAL SAFETY ANALYSIS COMPUTER PROGRAM* (690)
 RSAC, A CODE FOR SYSTEM SURVIVABILITY ANALYSIS - NUCLEAR EFFECTS* (694)
 MATHEMATICAL MODEL FOR RADIOLOGICAL IMPACT ANALYSIS* (726)
 RSAC'S MANUAL FOR THE FORTRAN VERSION OF RSAC: A RADIOLOGICAL SAFETY ANALYSIS COMPUTER PROGRAM* (730)
 A SYSTEMS ANALYSIS METHODOLOGY FOR PREDICTING DOSE TO MAN FROM A RADIOACTIVELY CONTAMINATED TERRESTRIAL ENVIRONMENT* (747)
 EVALUATION OF A DIGITAL COMPUTER METHOD FOR ANALYSIS OF COMPARTMENTAL MODELS OF ECOLOGICAL SYSTEMS* (785)
 SPATIAL ANALYSIS AND SUITABILITY MODELING* (791)
 SIMULATION APPROACH TO THE ANALYSIS OF STRIP-MINING IMPACT ON THE ECOSYSTEM WITH EMPHASIS ON WILDLIFE* (792)
 A CODE FOR ANALYSIS OF NUCLEAR EFFECTS AND SYSTEMS SURVIVABILITY: NEUTRONS AND GAMMAS* (807)
 HOTLEN MATERIAL-COOLANT INTERACTION AND PLUTONIUM SOURCE IN LMFBR ACCIDENT ANALYSIS* (818)

ANALYTIC

ESTIMATES OF STRATOSPHERIC POLLUTION BY AN ANALYTIC MODEL* (119)

ANALYTICAL

ANALYTICAL MODEL FOR AIR POLLUTANT TRANSPORT AND DEPOSITION FROM A POINT SOURCE* (76)
 ANALYTICAL STUDIES OF AEROSOL BEHAVIOR PREDICTIONS FOR FAST REACTOR SAFETY* (94)
 AEROSOL ANALYTICAL MODEL* (118)
 EXPERIMENTAL AND ANALYTICAL STUDIES OF CONDENSER WATER DISCHARGE FOR THE ATLANTIC GENERATING STATION* (447)
 NUMERICAL AND ANALYTICAL SOLUTIONS OF DISPERSION PROBLEMS IN HOMOGENEOUS AND LAYERED AQUIFERS* (565)
 ANALYTICAL JET-TYPE MODEL OF HEATED WATER SURFACE PLUMES* (577)
 AN ANALYTICAL AND EXPERIMENTAL INVESTIGATION OF SURFACE DISCHARGES OF HEATED WATER* (579)
 ANALYTICAL THREE-DIMENSIONAL TRANSIENT MODELING OF EFFLUENT DISCHARGES* (614)
 ANALYTICAL MODELS FOR ENVIRONMENT COST ESTIMATES OF AQUATIC POPULATION* (764)

ANALYZE

FASTRAW: A COMPUTER CODE TO ANALYZE TRANSPORTATION OF RADIOACTIVE MATERIAL* (820)

ANALYZING

MATHEMATICAL MODELS FOR ANALYZING ORIGIN AND DISTRIBUTION OF COMBUSTION GENERATED POLLUTANTS IN GAS TURBINES:
 A MATHEMATICAL MODEL FOR JET ENGINE COMBUSTION POLLUTANT EMISSIONS* (18)
 A COMPUTER CODE FOR ANALYZING ROUTINE ATMOSPHERIC RELEASES OF SHORT-LIVED RADIOACTIVE NUCLIDES* (53)
 EMPIRICAL TECHNIQUES FOR ANALYZING AIR QUALITY AND METEOROLOGICAL DATA: SHORT-TERM CHANGES IN GROUND-LEVEL OZONE CONCENTRATIONS* (365)

ANGLES

ECONOMIC AIR POLLUTION CONTROL MODEL FOR LOS ANGELES COUNTY IN 1975* (383)

ANIMALS

A TWO-COMPARTMENT, THREE-PARAMETER MODEL FOR THE ABSORPTION AND RETENTION OF INGESTED ELEMENTS BY ANIMALS* (670)

APPLICABLE

PHOTOCHEMICAL OXIDANT MODELING, TECHNIQUES APPLICABLE TO HIGHWAY SYSTEM EVALUATION* (373)

TITLE INDEX

APPROXIMATION

DIFFERENCE ANALOGUES OF BOUNDARY-VALUE PROBLEMS FOR THE EQUATIONS OF GLOBAL RADIOISOTOPE CONTAMINANT TRANSPORT AND THEIR NUMERICAL SOLUTION: DIFFERENCE APPROXIMATION OF EQUATIONS AND BOUNDARY CONDITIONS IN THE HORIZONTAL PLANE AND THE ZONAL BELT OF THE ATMOSPHERE* (129)

APRAC

USER'S MANUAL FOR THE APRAC-2 URBAN DIFFUSION MODEL COMPUTER PROGRAM* (178)

USER'S MANUAL FOR THE APRAC-1A URBAN DIFFUSION MODEL COMPUTER PROGRAM* (185)

AQSHS

METEOROLOGICAL SUB-MODELS FOR AQSHS - RADIATIVE TRANSFER* (14)

METEOROLOGICAL SUB-MODELS FOR AQSHS - TURBULENCE MODELS* (15)

METEOROLOGICAL SUB-MODELS FOR AQSHS: WIND AND TEMPERATURE PROFILES* (16)

AQUACULTURED

MATHEMATICAL MODEL OF THE ACCUMULATION OF RADIONUCLIDES BY OYSTERS (C. VIRGINICA) AQUACULTURED IN THE EFFLUENT OF A NUCLEAR POWER REACTOR TO INCLUDE MAJOR BIOLOGICAL PARAMETERS* (753)

AQUATIC

MATHEMATICAL MODELS FOR THE DISPERSION OF RADIONUCLIDES IN AQUATIC SYSTEMS* (399)

ECOLOGIC SIMULATION FOR AQUATIC ENVIRONMENTS* (408)

QUANTIFICATION OF AQUATIC ENVIRONMENTAL IMPACT OF ELECTRIC POWER GENERATION* (440)

PREDICTING RESPONSES OF AQUATIC BIOTA TO THERMAL STIMULI* (551)

ENVIRONMENTAL RATE MODEL FOR AQUATIC SYSTEMS* (568)

METHYLENECHLORIDE ACCUMULATION IN AN AQUATIC FOOD CHAIN: A MODEL AND SOME IMPLICATIONS FOR RESEARCH PLANNING* (640)

CONCENTRATION FACTORS AND TRANSPORT MODELS FOR RADIONUCLIDES IN AQUATIC ENVIRONMENTS-A LITERATURE REPORT* (668)

A LABORATORY MODEL FOR EVALUATING THE BEHAVIOR OF HEAVY METALS IN AN AQUATIC ENVIRONMENT* (665)

SYSTEM IDENTIFICATION OF RADIOISOTOPE FLOWS IN AQUATIC MICROCOSMS* (759)

ANALYTICAL MODELS FOR ENVIRONMENT COST ESTIMATES OF AQUATIC POPULATION* (764)

AQUEOUS

AQUEOUS REACTOR RELEASE RESULT GENERATOR* (209)

MODELING OF OIL EVAPORATION IN AN AQUEOUS ENVIRONMENT: RESEARCH ON THE EFFECTS OF CRUDE OIL TRANSFER AND UPTAKE IN FISHES OF DELAWARE BAY* (590)

AQUEOUS RELEASE OF RADIONUCLIDES REPORT GENERATOR* (701)

AQUIFER

A MODEL FOR CALCULATING EFFECTS OF LIQUID WASTE DISPOSAL IN DEEP SALINE AQUIFERS* (519)

DIGITAL MODELING OF RADIOACTIVE AND CHEMICAL WASTE TRANSPORT IN THE SNAKE PIVED PLAIN AQUIFER AT THE NATIONAL WASTON TESTING STATION, IDAHO* (555)

FINITE-DIFFERENCE MODEL FOR AQUIFER SIMULATION IN TWO DIMENSIONS WITH RESULTS OF NUMERICAL EXPERIMENTS* (654)

AQUIFERS

A TWO-DIMENSIONAL FINITE ELEMENT MODEL FOR THE MIGRATION OF CONTAMINANTS IN CONFINED AND UNCONFINED AQUIFERS* (442)

A THREE-DIMENSIONAL FINITE ELEMENT MODEL FOR THE MIGRATION OF CONTAMINANTS IN CONFINED AND UNCONFINED AQUIFERS* (443)

SIMULATION OF POLLUTANT MOVEMENT IN GROUNDWATER AQUIFERS* (463)

MATHEMATICAL MODELING OF FRESHWATER AQUIFERS HAVING SALTWATER BOTTOMS* (465)

NUMERICAL AND ANALYTICAL SOLUTIONS OF DISPERSION PROBLEMS IN HOMOGENEOUS AND LAYERED AQUIFERS* (565)

A MODEL FOR CALCULATING EFFECTS OF LIQUID WASTE DISPOSAL IN DEEP SALINE AQUIFERS* (641)

ARCTICALLY

PREDICTION OF TEMPERATURE PROFILES IN ARBITRARILY SHAPED COOLING LAKES BY FINITE DIFFERENCE TECHNIQUES* (415)

ARCTIC

A SIMULATION MODEL FOR AN ARCTIC FOOD CHAIN* (657)

RESEARCH ON THE DYNAMICS OF ARCTIC TUNDRA ECOSYSTEMS* (674)

AREA

MATHEMATICAL MODELS FOR SO₂ DISPERSION IN THE METROPOLITAN DETROIT AREA* (80)

DISPERSION OF SULFUR DIOXIDE EMISSIONS FROM AREA SOURCES* (88)

MODEL FOR THE DISPERSAL OF SULFUR DIOXIDE OVER AN URBAN AREA* (97)

A SIMPLE METHOD OF CALCULATING DISPERSION FROM URBAN AREA SOURCES* (103)

AIRBORNE AIR POLLUTION MONITORING EXPERIMENT IN AN AREA OF MOUNTAIN-VALLEY TERRAIN* (127)

POINT, AREA, LINE SOURCE ALGORITHM* (318)

THERMAL REGIMES OF THE UPPER MISSISSIPPI AND MISSOURI RIVERS: TRANSIENT AND STEADY-STATE COMPUTATIONAL MODELS FOR THE PREDICTION OF RIVER THERMAL REGIMES; PART TWO: ANALYSIS OF THERMAL REGIMES OF THE MISSISSIPPI AND MISSOURI RIVERS IN THE MID-CONTINENT AREA POWER POOL (MAPP) GEOGRAPHICAL AREA* (518)

AREAS

A MESOSCALE NUMERICAL MODEL OF ATMOSPHERIC TRANSPORT PHENOMENA IN URBAN AREAS* (180)

A REVIEW OF METHODS FOR PREDICTING AIR POLLUTION DISPERSION, AIR POLLUTION MODELS, AND PROBLEM AREAS IN AIR POLLUTION DISPERSION MODELING* (189)

AN ATMOSPHERIC DIFFUSION MODEL FOR METROPOLITAN AREAS* (198)

PREDICTION OF SURFACE FLUX AREAS ASSOCIATED WITH HEATED DISCHARGES INTO LARGE LAKES - A PHENOMENOLOGICAL MODEL* (433)

THE ATRIOS-II COMPUTER CODE FOR ESTIMATING RADIATION DOSE TO MAN FROM AIRBORNE RADIONUCLIDES IN AREAS SURROUNDING NUCLEAR FACILITIES* (724)

ARGONNE

ARGONNE STEADY STATE URANIUM DISPERSION AND DOSIMETRY CODE* (723)

ARRIVAL

OBTAINING LOCATION/ARRIVAL-TIME AND LOCATION/OUTFLOW-QUANTITY DISTRIBUTION: - STEADY FLOW SYSTEMS* (515)

ARTIFICIALLY

ADVECTION OF ARTIFICIALLY PRODUCED UPPER ATMOSPHERIC CLOUDS IN EMPIRICALLY DETERMINED WIND FIELDS* (339)

ASSESSMENT

A RETRODLOGY FOR ASSESSMENT OF ENERGY FACILITY SITING PATTERNS* (800)

ASSESS

DEVELOPMENT OF MODEL TO ASSESS ENVIRONMENTAL EFFECT OF COMMERCIAL AVIATION HIGH ALTITUDE CRUISE OPERATIONS* (219)

ASSESSING

VULNERABILITY MODEL: A SIMULATION SYSTEM FOR ASSESSING DAMAGE RESULTING FROM MARINE SPILLS* (422)

A CUMULATIVE HAZARD INDEX FOR ASSESSING LIMITING EXPOSURES TO ENVIRONMENTAL POLLUTANTS* (744)

USE OF THE LESLIE MATRIX FOR ASSESSING ENVIRONMENTAL IMPACT WITH AN EXAMPLE FOR A FISH POPULATION* (756)

ASSESSMENT

SOURCE ASSESSMENT: SEVERITY OF STATIONARY AIR POLLUTION SOURCES-A SIMULATION APPROACH* (75)

TITLE INDEX

ASSESSMENT

- MODELING ATMOSPHERIC EFFECTS - AN ASSESSMENT OF THE PROBLEMS* (92)
 ASSESSMENT OF CONSEQUENCES FROM AIRBORNE RELEASES OF RADIOACTIVE MATERIAL* (191)
 TENNESSEE VALLEY ASSESSMENT MODEL* (209)
 WEIGHTED DIGRAPH MODELS FOR THE ASSESSMENT OF ENERGY USE AND AIR POLLUTION IN TRANSPORTATION SYSTEMS* (274)
 AIR QUALITY ASSESSMENT MODEL FOR AIR FORCE OPERATIONS* (277)
 ASSESSMENT OF THE AMBIENT AIR IMPACT OF MULTIPLE STACK INDUSTRIAL PLANTS USING DISPERSION MODELING* (283)
 AMBIENT AIR QUALITY MODEL FOR ASSESSMENT OF UNITED STATES NAVAL AVIATION EMISSIONS* (302)
 A DAMAGE ASSESSMENT MODEL FOR AGRICULTURAL CROPS* (779)
 MODELING THE ECONOMIC AND ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVE ENERGY POLICIES: SEAS-STRATEGIC ENVIRONMENTAL ASSESSMENT SYSTEM* (784)
 ASSESSMENT OF THE ENVIRONMENTAL IMPLICATIONS OF PROJECT INDEPENDENCE* (803)
 SEER II- A NEW DAMAGE ASSESSMENT FALLOUT MODEL* (804)

ASSIGNMENT

- CAPOLITE: ESTIMATING THE AIR QUALITY IMPACT OF VEHICULAR EMISSIONS RESULTING FROM A TRAFFIC ASSIGNMENT* (356)

ASSIMILATION

- IMPROVING THE STATISTICAL RELIABILITY OF STEAM HEAT ASSIMILATION PREDICTIONS* (502)
 PRELIMINARY MODEL OF THE RYAN ASSIMILATION OF LEAD AEROSOLS FROM GASOLINE COMBUSTION* (592)

ASSIMILATIVE

- A WASTE ASSIMILATIVE CAPACITY MODEL FOR A SHALLOW, TURBULENT STREAM* (531)
 MODEL FOR THE EFFICIENT ALLOCATION OF ENVIRONMENTAL ASSIMILATIVE CAPACITY: THE CASE OF THERMAL EMISSIONS TO A LARGE BODY OF WATER* (559)

ASSOCIATED

- EFFECT OF HIGHWAY CONFIGURATIONS ON ENVIRONMENTAL PROBLEMS--DYNAMICS OF HIGHWAY ASSOCIATED AIR POLLUTION* (39)
 PREDICTION OF SURFACE PLUME AREAS ASSOCIATED WITH HEATED DISCHARGES INTO LARGE LAKES - A PHENOMENOLOGICAL MODEL* (43)
 ENVIRONMENTAL RADIATION EXPOSURES AND ASSOCIATED RISKS FROM FUEL REPROCESSING PLANTS* (706)
 PREDICTIVE MODEL FOR RADIOCESIUM INTAKE FROM MILK: EPDOPS ASSOCIATED WITH ANDS-COW VARIATION* (758)

ASSUMPTIONS

- DOSE CALCULATION MODELS AND ASSUMPTIONS* (463)

ATM

- THE SIMPLE 1D01 URBAN AIR POLLUTION MODEL* (85)
 THE SIMPLE 1D01 URBAN AIR POLLUTION MODEL* (92)
 DESCRIPTION OF 1D01 COMPUTER MODEL FOR DISPERSION FROM MULTIPLE SOURCES* (106)

ATLANTIC

- EXPERIMENTAL AND ANALYTICAL STUDIES OF CONDENSER WATER DISCHARGE FOR THE ATLANTIC GENERATING STATION* (847)
 PAF FIELD STUDIES FOR THE ATLANTIC GENERATING STATION* (888)
 FINAL COASTAL PROCESS REPORT, ATLANTIC GENERATING STATION* (527)
 NUMERICAL INVESTIGATION OF THE ATLANTIC GENERATING STATION'S EFFECT ON TIDAL CURRENTS FROM LITTLE EGGS ISL., NEW JERSEY* (602)

ATMOSPHERE

- MODELING OF THE EFFECTS OF GASEOUS AND PARTICULATE POLLUTANTS IN THE URBAN ATMOSPHERE: POLLUTANT DISPERSION* (12)
 A GLOBAL OCEAN-ATMOSPHERE CLIMATE MODEL: THE OCEANIC CIRCULATION* (25)
 DIFFUSION MODEL FOR COMPUTATION OF AEROSOL TRANSPORT AND DIFFUSION IN THE ATMOSPHERE* (43)
 NORTH CAROL STUDIES OF THE TIME-DEPENDENT TRANSPORT OF OPTICAL AND INFRARED RADIATION IN THE ATMOSPHERE: THERMAL RADIATION TRANSPORT* (49)
 MODEL OF THE ACCUMULATION OF FOSSIL CO₂ IN THE ATMOSPHERE AND THE SPA* (80)
 THE EFFECT OF GROUND LEVEL ABSORPTION ON THE DISPERSION OF POLLUTANTS IN THE ATMOSPHERE* (112)
 DIFFERENCE ANALOGUES OF BOUNDARY-VALUE PROBLEMS FOR THE EQUATIONS OF GLOBAL RADIOISOTOPE CONTAMINANT TRANSPORT AND THEIR NUMERICAL SOLUTION: DIFFERENCE APPROXIMATION OF EQUATIONS AND BOUNDARY CONDITIONS IN THE REGIONAL PLANE AND THE ZONAL BELT OF THE ATMOSPHERE* (129)
 VERTICAL TRANSPORT AND REMOVAL OF RADIOACTIVE AEROSOLS IN THE ATMOSPHERE: QUANTITATIVE MODEL OF AEROSOL WASHOUT BY PRECIPITATION AND DRY DEPOSITION ON THE UNDERLYING SURFACE* (137)
 A TWO-DIMENSIONAL TRANSPORT MODEL OF THE ATMOSPHERE* (168)
 CARBON DIOXIDE IN THE ATMOSPHERE AND GREENHOUSE EFFECT MODEL* (176)
 THERMAL EQUILIBRIUM OF THE ATMOSPHERE WITH A GIVEN DISTRIBUTION OF RELATIVE HUMIDITY* (381)
 A GLOBAL OCEAN-ATMOSPHERE CLIMATE MODEL: THE ATMOSPHERIC CIRCULATION* (183)
 GLOBAL MODEL OF THE ATMOSPHERE WITH SEASONAL VARIATION OF THE HYDROLOGIC CYCLE* (184)
 BRENGAT: A CODE FOR THE GENERATION AND TRANSPORT OF BRENSSTRAHLUNG THROUGH THE ATMOSPHERE* (211)
 ATMOSPHERE TRANSPORT AND DIFFUSION MODEL* (235)
 NUMERICAL MODEL FOR REGIONAL TRANSPORT OF SULFUR POLLUTANTS IN THE ATMOSPHERE* (244)
 GLOBAL CLIMATIC MODEL BASED ON ENERGY BALANCE OF THE EARTH-ATMOSPHERE SYSTEM* (267)
 ON THE BOUNDARY CONDITIONS IN THEORETICAL MODEL CALCULATIONS OF THE DISTRIBUTIONS OF MINOR NEUTRAL CONSTITUENTS IN THE UPPER ATMOSPHERE* (294)
 RESPONSE OF THE JOINT OCEAN-ATMOSPHERE MODEL TO THE SEASONAL VARIATION OF THE SOLAR RADIATION* (328)
 THREE-DIMENSIONAL MESOSCALE NUMERICAL MODEL OF THE ATMOSPHERE* (337)
 PREDICTION OF LONG-TERM MEAN AND MEAN SQUARE POLLUTANT CONCENTRATIONS IN AN URBAN ATMOSPHERE* (357)
 A COMPUTER CODE TO CALCULATE DOSES RESULTING FROM RELEASES OF RADIONUCLIDES TO THE ATMOSPHERE* (745)
 SIMULATION OF MOVEMENT OF OIL SLICKS IN THE STRAIT OF GEORGIA USING SIMPLE ATMOSPHERE AND OCEAN DYNAMICS* (809)

ATMOSPHERES

- KINETIC STUDY OF SIMULATED SO₂, NO_x, NH₃-POLLUTED ATMOSPHERES* (30)
 MODELING OF THE EFFECTS OF POLLUTANTS AND DISPERSION IN URBAN ATMOSPHERES* (323)

ATMOSPHERIC

- THE ATMOSPHERIC RESPONSE TO A STRATOSPHERIC DUST CLOUD AS SIMULATED BY A GENERAL CIRCULATION MODEL* (7)
 COMPUTER SIMULATION OF ATMOSPHERIC EFFECTS OF WASTE HEAT REJECTED FROM CONCEPTUAL LARGE POWER PLANTS* (13)
 ATMOSPHERIC HYDROCODES USING PCF ALGORITHMS* (19)
 THERMAL MODEL FOR ATMOSPHERIC SPRAY COOLING SYSTEMS: ENVIRONMENTAL EFFECTS OF HEAT AND MOISTURE RELEASE* (37)
 ATMOSPHERIC DIFFUSION AND DEPOSITION OF PARTICULATE MATTER* (47)
 A COMPUTER CODE FOR ANALYZING ROUTINE ATMOSPHERIC RELEASES OF SHORT-LIVED RADIOACTIVE NUCLIDES* (53)
 ATMOSPHERIC TRANSPORT OF ROCKET MOTOR COMBUSTION BY-PRODUCTS* (54)
 DEVELOPMENT OF ATMOSPHERIC MODELS AND MODELING CAPABILITY* (63)
 A MASS CONSISTENT ATMOSPHERIC FLUX MODEL FOR REGIONS WITH COMPLEX TERRAIN* (66)
 ATMOSPHERIC VANADIUM TRANSPORT TO THE OCEAN* (70)
 A GENERAL KINETICS CODE WITH ATMOSPHERIC APPLICATIONS* (71)
 MODELING ATMOSPHERIC EFFECTS - AN ASSESSMENT OF THE PROBLEMS* (82)

TITLE INDEX

ATMOSPHERIC

ADOLUS: ATMOSPHERIC DISPERSION AND FINITE-CLOUD DOSES DURING NORMAL, SEA-BREEZE, AND ACCIDENT CONDITIONS* (40)

A MODIFIED MULTI-CELL METHOD FOR SIMULATION OF ATMOSPHERIC TRANSPORT* (99)

STRATOSPHERIC AEROSOLS: EFFECT UPON ATMOSPHERIC TEMPERATURE AND GLOBAL CLIMATE* (110)

COMPARATIVE MODEL THEORY OF ATMOSPHERIC CONTAMINANT LOADING BY POWER STATIONS* (127)

ATMOSPHERIC DIFFUSION IN THE SURFACE TURBULENT BOUNDARY LAYER* (126)

MODELING ATMOSPHERIC DISPERSION OF LEAD FROM AUTOMOTIVE SOURCES* (133)

A NUMERICAL EXPERIMENT ON THE EFFECTS OF REGIONAL ATMOSPHERIC POLLUTION ON GLOBAL CLIMATE* (137)

SECOND ORDER TURBULENCE MODEL FOR ATMOSPHERIC POLLUTANT DISPERSION* (153)

INVARIANT MODEL OF ATMOSPHERIC BOUNDARY LAYER DIFFUSION* (154)

COMPUTATIONAL DIFFUSION IN ATMOSPHERIC BOUNDARY LAYER MODELS* (167)

GLOBAL ATMOSPHERIC MODEL, SECOND GENERATION* (174)

A MESOSCALE NUMERICAL MODEL OF ATMOSPHERIC TRANSPORT PHENOMENA IN URBAN AREAS* (190)

A GLOBAL OCEAN-ATMOSPHERE CLIMATE MODEL: THE ATMOSPHERIC CIRCULATION* (193)

AN ATMOSPHERIC DIFFUSION MODEL FOR METROPOLITAN AREAS* (199)

MULTI-SOURCE ATMOSPHERIC TRANSPORT MODEL FOR DEPOSITION OF TRACE CONTAMINANTS* (201)

A SIMPLIFIED TECHNIQUE USED TO EVALUATE ATMOSPHERIC DISPERSION OF EMISSIONS FROM LARGE POWER PLANTS* (204)

INVARIANT MODELING OF ATMOSPHERIC TURBULENCE AND DIFFUSION* (217)

ATMOSPHERIC IMPACT MODELS FOR CLOSED CYCLE COOLING SYSTEMS* (229)

NUCLEAR DEBRIS ATTACHMENT TO AIRCRAFT DUE TO ATMOSPHERIC RADIATION ENVIRONMENTS: AIRCRAFT IMPACTION AND DEPOSITION COMPUTER MODEL* (236)

A CODE TO ESTIMATE STRONTIUM-90 GLOBAL DEPOSITION FROM ATMOSPHERIC NUCLEAR DETONATIONS* (239)

POINT SOURCE ATMOSPHERIC DIFFUSION MODEL WITH VARIABLE WIND AND DIFFUSIVITY PROFILES* (250)

NUMERICAL PREDICTION OF THE MESOSCALE TRANSPORT OF ATMOSPHERIC EFFLUENTS: PHILOSOPHY AND MORPHOLOGY OF PREDICTIONAL MODELS FOR PREDICTING THE WIND AND POTENTIAL RADIOLOGICAL FIELDS OVER THE NEVADA TEST SITE* (262)

AN ATMOSPHERIC TRANSPORT AND ACCUMULATION MODEL FOR AIRSHEDS* (270)

A MODEL TO ESTIMATE RADIATION DOSE COMMITMENTS TO THE WORLD POPULATION FROM THE ATMOSPHERIC RELEASE OF RADIOISOTOPES* (271)

A MULTIPLE-SOURCE URBAN ATMOSPHERIC DISPERSION MODEL* (276)

A PROGRAM FOR EVALUATING ATMOSPHERIC DISPERSION FROM A NUCLEAR POWER STATION* (281)

LONG TERM ATMOSPHERIC DISPERSION CALCULATIONS* (304)

MULTILEVEL ATMOSPHERIC PREDICTION MODEL BASED ON PRIMITIVE EQUATIONS OF MOTION: THE PRIMITIVE EQUATION FIRST-LEVEL PREDICTION MODEL AT THE INSTITUTE OF METEOROLOGY* (307)

ATMOSPHERIC TRANSPORT AND DIFFUSION IN THE PLANETARY BOUNDARY LAYER* (321)

REJECTION OF ARTIFICIALLY PRODUCED UPPER ATMOSPHERIC CLOUDS IN EMPIRICALLY DETERMINED WIND FIELDS* (319)

A MULTIVARIABLE MODEL FOR ATMOSPHERIC DISPERSION PREDICTIONS* (355)

THERMAL AND RADIATIVE EFFECTS OF ATMOSPHERIC AEROSOLS IN THE NORTHERN HEMISPHERE CALCULATED USING A RADIATIVE CONVECTIVE MODEL* (372)

ON THE COHERENCE OF GRID-GENERATED TURBULENCE: MODEL FOR CALCULATING COHERENCE FUNCTION FOR ATMOSPHERIC TURBULENCE* (377)

DEVELOPMENT OF A SIMULATION MODEL FOR ESTIMATING GROUND LEVEL CONCENTRATIONS OF PHOTOCHEMICAL POLLUTANTS, A KINETIC MECHANISM FOR ATMOSPHERIC PHOTOCHEMICAL REACTIONS* (380)

AN ATMOSPHERIC SPRAY COOLING MODEL* (396)

EFFECT OF ATMOSPHERIC STABILITY ON WATER TEMPERATURE PREDICTIONS FOR A THERMALLY LOADED STREAM* (420)

CHEMICAL MODEL FOR LAKE MICHIGAN POLLUTION, CONSIDERATIONS ON ATMOSPHERIC AND SURFACE WATER TRACE METAL INPUTS* (464)

ATMOSPHERIC DISPERSION MODEL AS USED IN THE REACTOR SAFETY STUDY, WASH-1400* (488)

AIRER PROGRAM MANUAL: A COMPUTER CODE FOR CALCULATING DOSES, POPULATION DOSES, AND GROUND DEPOSITIONS DUE TO ATMOSPHERIC EMISSIONS OF RADIOISOTOPES* (720)

DOSES TO MAN FROM ATMOSPHERIC AND LIQUID EFFLUENTS* (727)

A MODEL TO ESTIMATE THE LOCAL RADIATION DOSES TO MAN FROM THE ATMOSPHERIC RELEASE OF RADIOISOTOPES* (731)

GENERAL ONE-DIMENSIONAL ATMOSPHERIC, CHEMICAL, THERMAL, DIFFUSION, AND RAINFALL MODEL* (819)

ATR

MODELS OF RADIATION TRANSPORT IN AIR - THE ATR CODE* (109)

USER'S GUIDE TO VERSION 2 OF ATR (AIR TRANSPORT OF RADIATION)* (120)

ATTACHMENT

NUCLEAR DEBRIS ATTACHMENT TO AIRCRAFT DUE TO ATMOSPHERIC RADIATION ENVIRONMENT: AIRCRAFT IMPACTION AND ADHESION COMPUTER MODEL* (236)

AUTO

DISPERSION OF BROMINE FROM AUTO EXHAUST: A SIMPLE DIFFUSION MODEL* (2)

AUTO-QUAL MODELING SYSTEM* (543)

AUTOMATED

USER'S MANUAL, AUTOMATED PROCEDURES FOR ESTIMATING CONTROL COSTS AND EMISSION REDUCTIONS FOR SPECIFIED AIR POLLUTION SOURCES* (341)

AUTOMOTIVE

MODELING ATMOSPHERIC DISPERSION OF LEAD FROM AUTOMOTIVE SOURCES* (133)

MODEL FOR ENVIRONMENTAL TRANSPORT OF AUTOMOTIVE LEAD* (320)

AVERAGE

AN URBAN AIR DIFFUSION MODEL FOR ESTIMATING LONG TERM AVERAGE VALUES OF AIR QUALITY* (186)

AVERAGED

LATERALLY AVERAGED RESERVOIR MODEL* (403)

AVERAGING

A NEW MATHEMATICAL MODEL OF AIR POLLUTANT CONCENTRATION AVERAGING TIME AND FREQUENCY* (359)

AVIATION

DEVELOPMENT OF MODEL TO ASSESS ENVIRONMENTAL EFFECT OF COMMERCIAL AVIATION HIGH ALTITUDE CRUISE OPERATIONS* (219)

AMBIENT AIR QUALITY MODEL FOR ASSESSMENT OF UNITED STATES NAVAL AVIATION EMISSIONS* (382)

BACKGROUND

BACKGROUND RADIATIVE TRANSFER MODEL* (334)

BADLY

A STUDY OF THE FISSION PRODUCT RELEASE FROM A BADLY DAMAGED WATER-COOLED REACTOR* (39)

BALANCE

GLOBAL CLIMATIC MODEL BASED ON ENERGY BALANCE OF THE EARTH-ATMOSPHERE SYSTEM* (267)

A MASS BALANCE MODEL OF TRACE METALS IN SEVERAL DELAWARE WATERSHEDS* (397)

BARRICADES

CALIBRATION OF A THERMAL ENRICHMENT MODEL FOR SHALLOW, BARRICADED ESTUARIES* (405)

TITLE INDEX

BASIN

TWO-DIMENSIONAL MODEL FOR THE TRANSPORT OF POLLUTANTS IN AN URBAN BASIN* (756)
 A HYDROLOGIC MODEL OF THE BEAR RIVER BASIN* (451)
 PIVER BASIN MODEL* (494)
 THE PIVER BASIN MODEL: COMPUTER OUTPUT* (522)
 QUALITY, UPPER MISSISSIPPI RIVER BASIN PROJECT* (544)
 STUDY OF THE IMPACTS OF REDUCED STREAMFLOWS IN THE UPPER AND LOWER YELLOWSTONE BASIN* (622)
 RIVER BASIN WATER QUALITY MODEL* (625)
 OPTIMIZATION MODELS FOR RIVER BASIN WATER QUALITY MANAGEMENT AND WASTE TREATMENT PLANT DESIGN* (638)
 A COMPUTER CODE (RIVADIS) TO CALCULATE POPULATION DOSES FROM RADIOACTIVE LIQUID EFFLUENTS AND AN APPLICATION TO NUCLEAR POWER REACTORS ON THE MISSISSIPPI RIVER BASIN* (721)
 MODELLING THE REGIONAL TRANSPORT OF RADIOISOTOPES IN A MAJOR UNITED STATES RIVER BASIN* (794)

BASIN

REACTIV-IT, NEW ENGLAND RIVER BASINS MODELLING PROJECT* (545)
 TENNESSEE AND CUMBERLAND RIVERS: GROSS RADIOISOTOPE TRANSPORT* (765)

BAY

METABOLISM AND MODELS OF ESTUARINE BAY ECOSYSTEMS AFFECTED BY A COASTAL POWER PLANT* (499)
 DELAWARE ESTUARY AND BAY WATER QUALITY SAMPLING AND MATHEMATICAL MODELING PROJECT* (517)
 SIMULATION OF CONTAMINANTS IN BAYS: APPLICATION TO SAN FRANCISCO BAY COMPLEX* (596)
 MODELING OF OIL EVAPORATION IN AN AQUEOUS ENVIRONMENT: RESEARCH ON THE EFFECTS OF CRUDE OIL TRANSFER AND TREATMENT PERFORMANCES ON DELAWARE BAY* (599)
 MATHEMATICAL MODEL OF POLLUTANT CAUSE AND EFFECT IN SAGINAW BAY, LAKE MICHIGAN* (634)

BAYESIAN

CRUDE OIL SPILL PROBABILITY ANALYSIS: A BAYESIAN APPROACH* (632)

BAYS

SIMULATION OF CONTAMINANTS IN BAYS: APPLICATION TO SAN FRANCISCO BAY COMPLEX* (596)
 NUMERICAL SIMULATION OF OIL SPILL TRANSPORT IN BAYS* (599)

BEACH

DEVELOPMENT OF A COMPLETE MATHEMATICAL MODEL FOR DESCRIBING THE POINT BEACH NUCLEAR POWER PLANT THERMAL PLUME* (612)

BEAR

A HYDROLOGIC MODEL OF THE BEAR RIVER BASIN* (451)

BEHAVIOR

BEHAVIOR OF NITRIC OXIDE FORMED BY THE SPACE SHUTTLE IN THE MESOSPHERE* (711)
 ANALYTICAL STUDIES OF AEROSOL BEHAVIOR PREDICTIONS FOR FAST REACTOR SAFETY* (741)
 MATHEMATICAL SIMULATION OF THE ESTUARINE BEHAVIOR AND ITS APPLICATIONS* (459)
 FLOW AND PAV-PAGE BEHAVIOR FOR POUND OR SLOT UNDERWATER DISCHARGE INCLUDING MULTIPORT DISCHARGES* (484)
 A LABORATORY MODEL FOR EVALUATING THE BEHAVIOR OF HEAVY METALS IN AN AQUATIC ENVIRONMENT* (645)
 THE BEHAVIOR OF CS-137 AND OTHER FALL-OUT RADIOISOTOPES ON A MICHIGAN DAIRY FARM* (678)

BFLT

DIFFERENCE APPROXIMATIONS OF BOUNDARY-VALUE PROBLEMS FOR THE EQUATIONS OF GLOBAL RADIOISOTOPE CONTAMINANT TRANSPORT AND THEIR NUMERICAL SOLUTION: DIFFERENCE APPROXIMATION OF EQUATIONS AND BOUNDARY CONDITIONS IN THE REGIONAL PLANE AND THE GLOBAL BELT OF THE ATMOSPHERE* (729)

BENTHIC

HEAVY METALS IN ESTUARINE BENTHIC ORGANISMS AND SEDIMENTS: DATA AND MODEL* (609)

BIOCHEMICAL

INVESTIGATION OF SOME FACTORS IN THE BIOCHEMICAL CONVERSION OF MERCURY POLLUTANTS TO TOXIC METHYL MERCURY EFFECTED BY MICRO-ORGANISMS IN A MARINE SEDIMENT* (500)

BIOENERGETICS

A BIOENERGETICS-BASED MODEL FOR POLLUTANT ACCUMULATION BY FISH: SIMULATION OF PCB AND METHYL MERCURY RESIDUE LEVELS IN OTTAWA RIVER YELLOW PERCH (*PERCA FLAVESCENS*)* (516)

BIOLOGICAL

RADIOACTIVITY TRANSPORT IN WATER, BIOLOGICAL ACCUMULATION OF MERCURY (II) AND METHYL MERCURY BY CHLORELLA PYRENOIDOSA* (497)
 TRANSURANIC BIOLOGICAL TRANSPORT MODEL* (668)
 BIOLOGICAL DOSE AND RADIOLOGICAL ACTIVITY FROM NUCLEAR REACTOR OR NUCLEAR WEAPON FISSION PRODUCTS* (687)
 MATHEMATICAL MODEL OF THE ACCUMULATION OF RADIOISOTOPES BY OYSTERS (*C. VIRGINICA*) AQUACULTURED IN THE EFFLUENT OF A NUCLEAR POWER REACTOR TO INCLUDE MAJOR BIOLOGICAL PARAMETERS* (759)
 SIMCORP: A SIMULATION COMPILER FOR BIOLOGICAL MODELING* (799)

BIOMASS

SEMPROPITY: A WATERSHED LEVEL SIMULATION MODEL OF TREE BIOMASS DYNAMICS* (436)

BIOTA

PREDICTING RESPONSES OF AQUATIC BIOTA TO THERMAL STIMULI* (551)
 STANDARD METHODOLOGY FOR CALCULATING RADIATION DOSE TO LOWER TROPHIC BIOTA* (757)

BLACK

BLACK RIVER THERMAL MODEL* (561)

BLOW

CONCENTRATIONS IN THE SOUTH TEXAS PROJECT COOLING RESERVOIR, BLOW- DOWN AND EVAPORATION* (524)

BOL

BOL LONG RANGE TRAJECTORY MODEL* (196)
 BOL LONG-TERM GAUSSIAN DISPERSION MODEL* (364)

BODIES

MATHEMATICAL MODELS FOR THE PREDICTION OF TEMPERATURE DISTRIBUTIONS RESULTING FROM THE DISCHARGE OF HEATED WATER INTO LARGE BODIES OF WATER* (466)

BODY

HABINA DEL REY: COMPUTER SIMULATION OF POLLUTANT TRANSPORT IN SEMI-ENCLOSED WATER BODY* (400)
 NUMERICAL COMPUTATION OF WASTE-HEAT DISPERSION IN A RECEIVING WATER BODY* (467)
 MODEL FOR THE EFFICIENT ALLOCATION OF ENVIRONMENTAL ASSIMILATIVE CAPACITY: THE CASE OF THERMAL EMISSIONS TO A LARGE BODY OF WATER* (559)
 COMPARTMENT MODELS FOR BODY BURDEN OF POLLUTANTS* (717)

BOILING

MODEL FOR RADIATION EXPOSURE FROM A BOILING WATER REACTOR PLUME* (94)
 CALCULATIONS OF DOSE AND POPULATION DOSE IN THE GENERAL ENVIRONMENT DUE TO BOILING-WATER NUCLEAR POWER REACTOR RADIOISOTOPE EMISSIONS IN THE UNITED STATES IN 1971* (722)
 CALCULATION OF RELEASES OF RADIOACTIVE MATERIALS IN GASEOUS AND LIQUID EFFLUENTS FROM BOILING WATER REACTORS (BWR-GALL CODE)* (811)

TITLE INDEX

- BOSASQUET**
BOSASQUET'S PLUME SIZE FORMULA AND THE TVA DATA* (175)
- BOSTON**
IMPACT OF ENERGY SHORTAGE ON AMBIENT SULFUR DIOXIDE AND PARTICULATE LEVELS IN METROPOLITAN BOSTON* (296)
- BOTTOM**
A SYSTEMS ANALYSIS MODEL FOR CALCULATING RADIONUCLIDE TRANSPORT BETWEEN RECEIVING WATERS AND BOTTOM SEDIMENTS* (390)
- BOTTOMS**
MATHEMATICAL MODELING OF FRESHWATER AQUIFERS HAVING SALINATED BOTTOMS* (665)
- BOWENBAY**
A TIME-DEPENDENT MODEL OF THE TRADE-WIND BOUNDARY LAYER* (3)
A MARITIME BOUNDARY LAYER MODEL FOR THE PREDICTION OF FOG* (6)
ATMOSPHERIC DIFFUSION IN THE SURFACE TURBULENT BOUNDARY LAYER* (126)
MODEL OF GLOBAL RADIONUCLIDE TRANSPORT IN THE TROPOSPHERE AND LOWER STRATOSPHERE: FUNDAMENTAL FORMATIONS AND BOUNDARY CONDITIONS* (128)
DIFFERENCE ANALOGUES OF BOUNDARY-VALUE PROBLEMS FOR THE EQUATIONS OF GLOBAL RADIONUCLIDE CONTAMINANT TRANSPORT AND THEIR NUMERICAL SOLUTION: DIFFERENCE APPROXIMATION OF EQUATIONS AND BOUNDARY CONDITIONS IN THE VERTICAL PLANE AND THE ZONAL BELT OF THE ATMOSPHERE* (129)
INVARIANT MODEL OF ATMOSPHERIC BOUNDARY LAYER DIFFUSION* (154)
COMPUTATIONAL DIFFUSION IN ATMOSPHERIC BOUNDARY LAYER MODELS* (167)
A NUMERICAL MODEL OF THE NOCTURNAL URBAN BOUNDARY LAYER* (190)
PREDICTION BY NUMERICAL MODELS OF TRANSPORT AND DIFFUSION IN AN URBAN BOUNDARY LAYER* (213)
BOUNDARY LAYER MODEL FOR AIR POLLUTANT CONCENTRATIONS NEAR TO HIGHWAY TRAFFIC* (267)
THE STRUCTURE OF THE TWO-DIMENSIONAL INTERNAL BOUNDARY LAYER OVER A STEEP CHANGE OF SURFACE ROUGHNESS* (268)
ON THE BOUNDARY CONDITIONS IN THEORETICAL MODEL CALCULATIONS OF THE DISTRIBUTION OF FIRST NEUTRAL CONSTITUENTS IN THE UPPER ATMOSPHERE* (276)
ATMOSPHERIC TRANSPORT AND DIFFUSION IN THE PLANETARY BOUNDARY LAYER* (321)
RELATIVE EFFECTS OF POLLUTANTS ON THE PLANETARY BOUNDARY LAYER* (322)
NOCTURNAL BOUNDARY LAYER MODEL* (366)
- BOX**
NUMERICAL INTEGRATION EXPERIMENTS WITH VARIABLE-RESOLUTION TWO-DIMENSIONAL CARTESIAN GRIDS USING THE BOX METHOD* (187)
A WELL MIXED BOX MODEL OF TROPIC SCALE PHOTOCHEMICAL AIR POLLUTION* (195)
- BRANCHING**
A COMPUTER MODEL FOR SOME BRANCHING-TYPE PHENOMENA IN HYDROLOGY* (640)
- BREEZE**
REGIONS: ATMOSPHERIC DISPERSION AND FINE-SCALE DOSES DURING NORMAL, SEA-BREEZE, AND ACCIDENT CONDITIONS* (94)
LAND-SEA BREEZE MODELS* (159)
DYNAMIC MODEL OF SEA BREEZE CIRCULATIONS AND POLLUTANT TRANSPORT* (309)
- BREITEN**
BREITEN: A CODE FOR THE GENERATION AND TRANSPORT OF BREITENHILTING THROUGH THE ATMOSPHERE* (211)
- BREITENHILTING**
BREITENHILTING: A CODE FOR THE GENERATION AND TRANSPORT OF BREITENHILTING THROUGH THE ATMOSPHERE* (211)
- BREITENHILTING**
DISPERSION OF POLLUTANT FROM AUTO EXHAUST: A SIMPLE DIFFUSION MODEL* (2)
- BREITENHILTING**
NUTRIENT TRANSPORT AND DISSOLVED OXYGEN BUDGET STUDIES IN THE POTOMAC ESTUARY* (610)
- BREITENHILTING**
FIELD STUDY AND MATHEMATICAL MODEL OF THE SLACK-WATER BUILDUP OF A POLLUTANT IN A TIDAL RIVER* (638)
- BREITENHILTING**
BOYANT PLUME MODEL* (163)
NEGATIVELY BOYANT JETS IN A CROSS FLOW* (393)
BOYANT RECTANGULAR SURFACE INTERNAL PLUMES* (679)
BOYANT JET DISCHARGE MODEL, SEABOARD NUCLEAR STATION* (673)
NUMERICAL MODEL FOR A TURBULENT BOYANT JET IN A SHALLOW OPEN CHANNEL* (686)
- BREITENHILTING**
COMPARIMENT MODELS FOR BODY BODEN OF POLLUTANTS* (717)
- BREITENHILTING**
CALCULATION OF RELEASES OF RADIOACTIVE MATERIALS IN GASEOUS AND LIQUID EFFLUENTS FROM BOILING WATER REACTORS (BWR-GALE CODE)* (911)
- BREITENHILTING**
MATHEMATICAL MODEL OF THE ACCUMULATION OF RADIONUCLIDES BY OYSTERS (C. VIRGINICA) AQUACULTURED IN THE EFFLUENT OF A NUCLEAR POWER REACTOR TO INCLUDE MAJOR BIOLOGICAL PARAMETERS* (753)
- BREITENHILTING**
DEPOSITIONAL ENVIRONMENT OF ZINC, LEAD AND CADMIUM IN RESERVOIR SEDIMENTS* (566)
A FOOD CHAIN MODEL OF CADMIUM IN WESTERN LAKE ERIE* (666)
- BREITENHILTING**
AN EMPIRICAL MODEL USING EIGENVECTORS TO CALCULATE THE TEMPORAL AND SPATIAL VARIATIONS OF THE ST. LOUIS HEAT ISLAND* (66)
LAGRANGIAN TRANSPORT AND DIFFUSION CODE TO CALCULATE CONCENTRATIONS AND DEPOSITION AT LONG RANGE OF PARTICLES LESS THAN 10 MICRON DIAMETER* (238)
USPS MANUAL FOR CODE EXAM: A CODE TO CALCULATE GAMMA PHOTON DOSE FROM AN AIRBORNE RADIOACTIVE RELEASE* (301)
USE OF COMPUTERS TO CALCULATE RADIATION DOSE FROM METABOLIC MODELS* (666)
GROSS AND DOST - PROGRAMS TO CALCULATE ENVIRONMENTAL CONSEQUENCES OF RADIOACTIVITY RELEASE* (713)
A COMPUTER CODE (BUDOS) TO CALCULATE POPULATION DOSES FROM RADIOACTIVE LIQUID EFFLUENTS AND AN APPLICATION TO NUCLEAR POWER REACTORS ON THE MISSISSIPPI RIVER BASIN* (721)
A COMPUTER CODE TO CALCULATE DOSES RESULTING FROM RELEASES OF RADIONUCLIDES TO THE ATMOSPHERE* (745)
- BREITENHILTING**
THERMAL AND RADIATIVE EFFECTS OF ATMOSPHERIC AEROSOLS IN THE NORTHERN HEMISPHERE CALCULATED USING A RADIATIVE CONVECTIVE MODEL* (372)
- BREITENHILTING**
A SIMPLE DIFFUSION MODEL FOR CALCULATING POINT CONCENTRATIONS FROM MULTIPLE SOURCES* (45)
A COMPUTER TECHNIQUE FOR CALCULATING THE RADIOLOGICAL CONSEQUENCES OF PRESSURIZED WATER REACTOR POWER PLANT HYPOTHETICAL ACCIDENTS* (93)
A SIMPLE METHOD OF CALCULATING DISPERSION FROM URBAN AREA SOURCES* (103)

TITLE INDEX

CALCULATING

DISCUSSION OF A METHOD FOR CALCULATING THE SIZE OF COOLING TOWER PLUMES* (107)
 THREE-DIMENSIONAL NUMERICAL MODEL FOR CALCULATING THE SPREAD AND DILUTION OF AIR POLLUTANTS* (107)
 CALCULATING FUTURE CARBON MONOXIDE EMISSIONS AND CONCENTRATIONS FROM URBAN TRAFFIC DATA* (360)
 ON THE CONSEQUENCE OF GRID-GENERATED TURBULENCE: MODEL FOR CALCULATING CORRELATION FUNCTION FOR ATMOSPHERIC TURBULENCE* (377)
 A SYSTEMS ANALYSIS MODEL FOR CALCULATING RADIONUCLIDE TRANSPORT BETWEEN RECEIVING WATERS AND BOTTOM SEDIMENTS* (390)
 A MODEL FOR CALCULATING EFFECTS OF LIQUID WASTE DISPOSAL IN DEEP SALINE AQUIFERS* (519)
 WATER, A COMPUTER PROGRAM FOR CALCULATING CHEMICAL EQUILIBRIA OF NATURAL WATERS* (595)
 A MODEL FOR CALCULATING EFFECTS OF LIQUID WASTE DISPOSAL IN DEEP SALINE AQUIFERS* (644)
 COMPUTER CODE FOR CALCULATING PERSONNEL DOSES DUE TO TRITIUM EXPOSURES* (700)
 AEROP PROGRAM MANUAL: A COMPUTER CODE FOR CALCULATING DOSES, POPULATION DOSES, AND GROUND DEPOSITIONS DUE TO ATMOSPHERIC EMISSIONS OF RADIONUCLIDES* (720)
 CALCULATING ORIGIN DOSE FROM RADIONUCLIDE INHALATION* (739)
 STEWARD METHODOLOGY FOR CALCULATING RADIATION DOSE TO LOWER POPULATIONS* (757)
 PROBABILISTIC MODELS FOR CALCULATING AIR POLLUTION DAMAGE* (817)

CALIBRATION

CALIBRATION OF A THERMAL EFFICIENCY MODEL FOR SHALLOW, BARRICADED ESTUARIES* (405)

CALIFORNIA

CALIFORNIA LINE SOURCE DISPERSION MODEL, 3RD GENERATION* (11)
 THE CHEMISTRY, DISPERSION, AND TRANSPORT OF AIR POLLUTANTS EMITTED FROM FOSSIL FUEL POWER PLANTS IN CALIFORNIA: DATA ANALYSIS AND EMISSION IMPACT MODEL* (150)
 PREDICTING THE EFFECT OF GEOTHERMAL EMISSIONS ON THE TEMPERATURE AND RELATIVE HUMIDITY IN THE IMPERIAL VALLEY OF CALIFORNIA* (350)

CALLWAY

CALLWAY: AN IMPROVED MICROSCALE MODEL FOR THE DIFFUSION OF AIR POLLUTANTS FROM A LINE SOURCE* (10)

CALLWAY

THERMAL FLUX INVESTIGATIONS FOR UNION ELECTRIC COMPANY'S CALLAWAY PLANT, UNITS 1 AND 2* (395)

CANAL

THE EXERCISE COMPUTER CODE FOR ESTIMATING EXTERNAL DOSES TO POPULATIONS FROM CONSTRUCTION OF A SEA LEVEL CANAL WITH NUCLEAR EXPLOSIVES* (702)

CANALS

BOBAG-1, SIMULATION OF WATER QUALITY IN STOWNS AND CANALS: PROGRAM DOCUMENTATION AND USERS MANUAL* (530)

CAPABILITIES

A WATER QUALITY PLANNING MODEL WITH MULTIPLE TIME, POLLUTANT, AND SOURCE CAPABILITIES* (619)

CAPDOX

DETERMINATION OF ENVIRONMENTAL CARBON MONOXIDE EXPOSURES THROUGH PERSONAL MONITORING: FIXED VS PERSONAL AND TRANSPORTATION MODE RELATIONSHIPS* (50)
 A STOCHASTIC MODEL FOR CARBON MONOXIDE CONCENTRATIONS ALONG HIGHWAYS AND STREETS* (116)
 GEOCHEMICAL OCEAN SECTIONS STUDY - GEOSACS - SEDIMENT DISSOLUTION, MODEL FOR FOSSIL FUEL CARBON DIOXIDE* (117)
 CARBON DIOXIDE IN THE ATMOSPHERE AND GREENHOUSE EFFECT MODEL* (176)
 URBAN CARBON MONOXIDE MODEL* (313)
 AN URBAN DIFFUSION SIMULATION MODEL FOR CARBON MONOXIDE* (353)
 CALCULATING FUTURE CARBON MONOXIDE EMISSIONS AND CONCENTRATIONS FROM URBAN TRAFFIC DATA* (360)

CARCINOGENS

EXPOSURE/DOSE MODELS APPLIED TO ENVIRONMENTAL CARCINOGENS* (699)

CARGO

CARGO SPILL PROBABILITY ANALYSIS: A BAYESIAN APPROACH* (632)

CAPLO

ROUTE CAPLO STUDIES ON THE TIME-DEPENDENT TRANSPORT OF OPTICAL AND INFRARED RADIATION IN THE ATMOSPHERE: THERMAL RADIATION TRANSPORT* (49)
 A ROUTE CAPLO CODE WITH SUPPORT PROGRAMS FOR DOSE COMPUTATION* (746)

CAROLINA

PLUM DYNAMICS AND SEDIMENT MOVEMENT IN LOCKWOODS FOLLEY INLET, NORTH CAROLINA* (407)

CAPTESTAN

NUMERICAL INTEGRATION EXPERIMENTS WITH VARIABLE-RESOLUTION TWO-DIMENSIONAL CARTESIAN GRIDS USING THE BOX METHOD* (100)

CATALYZED

TRACE CATALYZED OXIDATION OF SO₂ TO ACID SULPHATE MIST IN DISPERSING PLUMES* (83)

CCL3F

STRATOSPHERIC CONCENTRATIONS OF CCL₃F IN 1970* (101)

CSC

A CDC 6600 PROGRAM FOR CALCULATION OF INHALATION AND EXTERNAL DOSE FOR ESTABLISHING REACTOR SIZING DISTANCE REQUIREMENTS* (598)

CBF

AIR TRANSPORT CALCULATIONS USING THE LAST-HURF AIR FLUX TAPE AND THE HURF COMPUTER PROGRAM--COR* (31)

CELL

MULTIPLE CELL MECHANICAL DRAFT COOLING TOWER MODEL* (63)
 A MODIFIED MULTI CELL METHOD FOR SIMULATION OF ATMOSPHERIC TRANSPORT* (99)

CEM²D

A REGIONAL AIR QUALITY SIMULATION MODEL (A DESCRIPTION OF THE CONNECTICUT AIR POLLUTION MODEL AS DEVELOPED BY THE TRAVELERS RESEARCH CENTER)* (275)

CENTERLINES

METHOD FOR SIMULATING PLUME CENTERLINES FROM TALL STACKS* (125)

CESIUM

PREDICTION MODELS FOR STRONTIUM-90 AND CESIUM-137 LEVELS IN THE HUMAN FOOD CHAIN* (679)

CBM

METHYLMERCURY ACCUMULATION IN AN AQUATIC FOOD CHAIN: A MODEL AND SOME IMPLICATIONS FOR RESEARCH PLANNING* (600)
 A FOOD CHAIN MODEL OF CADMIUM IN WESTERN LAKE ERIE* (666)
 A SIMULATION MODEL FOR AN ARCTIC FOOD CHAIN* (667)
 PREDICTION MODELS FOR STRONTIUM-90 AND CESIUM-137 LEVELS IN THE HUMAN FOOD CHAIN* (679)

CHAIN

TURNOVER AND CONCENTRATION OF RADIONUCLIDES IN FOOD CHAINS* (676)

CHALK

A SIMPLE DRIFT DEPOSITION MODEL APPLIED TO THE CHALK POINT DYE TRACER EXPERIMENT* (100)

TITLE INDEX

CHANNEL

CHALK POINT COOLING TOWER PROJECT* (222)

CHANNEL

HYPERCAL MODEL FOR A TURBULENT BURNING JET IN A SHALLOW OPEN CHANNEL* (489)

CHEMICAL

MODELING AND SIMILARITY RELATIONS OF PHYSICAL AND CHEMICAL PROCESSES* (52)

SCAVENGING MODEL INCORPORATING CHEMICAL KINETICS* (54)

THE APPLICATION OF K-THEORY TO DIFFUSION PROBLEMS INVOLVING NONLINEAR CHEMICAL REACTIONS* (743)

HYBRID COMPUTER PROGRAM FOR RAPIDLY SOLVING FLOWING OR STATIC CHEMICAL KINETIC PROBLEMS INVOLVING MANY CHEMICAL SPECIES* (192)

CHEMICAL MODELING OF METALLIC WASTE DISPOSAL* (514)

MATHEMATICAL MODELS PREDICT CONCENTRATION-TIME PROFILES RESULTING FROM CHEMICAL SPILL IN A RIVER* (514)

DIGITAL MODELING OF RADIOACTIVE AND CHEMICAL WASTE TRANSPORT IN THE SNAKE RIVER PLAIN AQUIFER AT THE NATIONAL REACTOR TESTING STATION, IDAHO* (554)

SIMULATION OF MAJOR INORGANIC CHEMICAL CONCENTRATIONS AND LOADS IN STREAMFLOW* (576)

WATCO, A COMPUTED PROGRAM FOR CALCULATING CHEMICAL EQUILIBRIA OF NATURAL WATERS* (594)

CHEMICAL MODEL FOR LAKE MICHIGAN POLLUTION, CONSIDERATIONS ON ATMOSPHERIC AND SURFACE WATER TRACE METAL INPUTS* (694)

ENVIRONMENTAL ENERGY MODEL OF A PETROLEUM REFINING/CHEMICAL COMPLEX* (637)

PULSED DISPERSION OF TRACE CHEMICAL CONCENTRATIONS IN A SATURATED SORPING POROUS MEDIUM* (647)

GENERAL ONE-DIMENSIONAL ATMOSPHERIC, CHEMICAL, THERMAL, DIFFUSION, AND PARALLEL MODEL* (819)

CHEMISTRIALLY

A SIMPLE DISPERSION MODEL FOR THE ANALYSIS OF CHEMICALLY REACTIVE POLLUTANTS* (705)

CHEMICALS

LINEAR DIFFUSION AND CONVECTION OF CHEMICALS IN SOILS* (648)

A THEORY ON THE MASS TRANSPORT OF PREVIOUSLY DISTRIBUTED CHEMICALS IN A WATER SATURATED SORPING POROUS MEDIUM* (649)

CHEMISTRY

THE CHEMISTRY, DISPERSION, AND TRANSPORT OF AIR POLLUTANTS EMITTED FROM FOSSIL FUEL POWER PLANTS IN CALIFORNIA: DATA ANALYSIS AND EMISSION IMPACT MODEL* (150)

CHLOROPHYLL

RADIOACTIVITY TRANSPORT IN WATER. BIOLOGICAL ACCUMULATION OF MERCURY (II) AND METHYLMERCURY BY CHLOROPHYLL PYRENOIDOSIS* (497)

CHRONOLOGICAL

SAFIRE CHRONOLOGICAL INPUT MODEL* (134)

CIRCULATION

THE ATMOSPHERIC RESPONSE TO A STRATOSPHERIC DUST CLOUD AS SIMULATED BY A GENERAL CIRCULATION MODEL* (7)

A GLOBAL OCEAN-ATMOSPHERE CLIMATE MODEL: THE OCEANIC CIRCULATION* (25)

PLANETARY DISTRIBUTION OF ZONAL MEAN TRANSPORT PARAMETERS OF RADIOISOTOPES IN THE TROPOSPHERE AND LOWER STRATOSPHERE: CLIMATIC DISTRIBUTION OF THE ZONAL MEAN COMPONENTS OF THE MERIDIONAL CIRCULATION VELOCITY* (130)

SIX LAYER GLOBAL CIRCULATION MODEL* (132)

A GENERAL CIRCULATION MODEL SHOWING THE EFFECTS OF DOUBLING THE CO₂ CONCENTRATION ON THE CLIMATE* (182)

A GLOBAL OCEAN-ATMOSPHERE CLIMATE MODEL: THE ATMOSPHERIC CIRCULATION* (183)

DESCRIPTION OF A RADIATION PACKAGE FOR THE NAVAL POSTGRADUATE SCHOOL GENERAL CIRCULATION MODEL* (187)

TWO-LAYER GLOBAL CIRCULATION MODEL* (324)

THIRD GENERATION NCAR GLOBAL CIRCULATION MODEL* (325)

THE EFFECTS OF CHANGING THE SOLAR CONSTANT ON THE CLIMATE OF A GENERAL CIRCULATION MODEL* (327)

CIRCULATION IN HOMOGENEOUS LAKES* (481)

RE-ENTRANCE AND RE-CIRCULATION SIMULATOR FOR FLOW CONDITIONS NEAR SUBMERGED DISCHARGES* (540)

CIRCULATIONS

DYNAMIC MODEL OF SEA BREEZE CIRCULATIONS AND POLLUTANT TRANSPORT* (309)

CITY

AIR QUALITY DIFFUSION MODEL: APPLICATION TO NEW YORK CITY* (293)

CLEAN

OZONE FORMATION FROM NO_x IN "CLEAN AIR"* (39)

CLEANUP

COMPUTED SIMULATION OF OFFSHORE OIL SPILL CLEANUP OPERATIONS* (417)

COMPUTED SIMULATION AIDS OIL-SPILL CLEANUP DECISIONS* (432)

CLIMATE

A GLOBAL OCEAN-ATMOSPHERE CLIMATE MODEL: THE OCEANIC CIRCULATION* (25)

STRATOSPHERIC AEROSOLS: EFFECT UPON ATMOSPHERIC TEMPERATURE AND GLOBAL CLIMATE* (110)

A NUMERICAL EXPERIMENT ON THE EFFECTS OF REGIONAL ATMOSPHERIC POLLUTION ON GLOBAL CLIMATE* (137)

NUMERICAL SIMULATION OF THE STRATOSPHERE: IMPLICATIONS FOR RELATE CLIMATE CHANGE PROBLEMS* (179)

A GENERAL CIRCULATION MODEL SHOWING THE EFFECTS OF DOUBLING THE CO₂ CONCENTRATION ON THE CLIMATE* (182)

A GLOBAL OCEAN-ATMOSPHERE CLIMATE MODEL: THE ATMOSPHERIC CIRCULATION* (183)

GLOBAL CLIMATE MODEL* (250)

THE EFFECTS OF CHANGING THE SOLAR CONSTANT ON THE CLIMATE OF A GENERAL CIRCULATION MODEL* (327)

CLIMATIC

COMPUTATION OF POSSIBLE CLIMATIC CONSEQUENCES OF PERTURBATIONS TO STRATOSPHERIC AEROSOLS, OZONE AND WATER VAPOR WITH RADIATIVE-CONVECTIVE MODELS* (48)

PLANETARY DISTRIBUTION OF ZONAL MEAN TRANSPORT PARAMETERS OF RADIOISOTOPES IN THE TROPOSPHERE AND LOWER STRATOSPHERE: CLIMATIC DISTRIBUTION OF THE ZONAL MEAN COMPONENTS OF THE MERIDIONAL CIRCULATION VELOCITY* (130)

A TWO DIMENSIONAL GLOBAL CLIMATIC MODEL* (285)

A NEW GLOBAL CLIMATIC MODEL* (286)

GLOBAL CLIMATIC MODEL BASED ON ENERGY BALANCE OF THE EARTH-ATMOSPHERE SYSTEM* (287)

CLIMATOLOGICAL

A CLIMATOLOGICAL MODEL FOR MULTIPLE-SOURCE URBAN AIR POLLUTION* (28)

CLIMATOLOGICAL DISPERSION MODEL* (151)

CLIMATOLOGICAL DISPERSION MODEL* (310)

CLOSED

ATMOSPHERIC IMPACT MODELS FOR CLOSED CYCLE COOLING SYSTEMS* (229)

CLOUD

THE ATMOSPHERIC RESPONSE TO A STRATOSPHERIC DUST CLOUD AS SIMULATED BY A GENERAL CIRCULATION MODEL* (7)

FORMATION OF SULFATES AND THE ENHANCEMENT OF CLOUD CONDENSATION NUCLEI IN CLOUDS* (72)

AEROSOLS: ATMOSPHERIC DISPERSION AND FINITE-CLOUD DROPS DURING NORMAL, SEA-BREEZE, AND ACCIDENT CONDITIONS* (79)

TITLE INDEX

- CLOUDS**
FORMATION OF SULFATES AND THE ENHANCEMENT OF CLOUD CONDENSATION NUCLEI IN CLOUDS* (72)
MECHANISM FOR HYPOCHLORIC ACID PRODUCTION IN CLOUDS* (336)
ADVECTION OF ARTIFICIALLY PRODUCED UPPER ATMOSPHERIC CLOUDS IN SPECIFICALLY DETERMINED WIND FIELDS* (339)
NUMERICAL SIMULATION OF THE EFFECTS OF COOLING TOWER COMPLEXES ON CLOUDS AND SEVERE STORMS* (367)
- CLX**
EFFECT OF WATER VAPOR ON THE DESTRUCTION OF OZONE IN THE STRATOSPHERE PERTURBED BY CLX OF SOX POLLUTANTS* (366)
- COAGULATION**
REINFORCED COAGULATION-SEDIMENTATION MODEL FOR STRATOSPHERIC AEROSOLS* (27)
- COAL**
A SOFTWARE SYSTEM TO SIMULATE COAL PLANT PARTICULATE CONTROLS* (21)
DEVELOPMENT OF AN AIR QUALITY SIMULATOR FOR COAL FIRES* (350)
MEASUREMENT AND MODELING OF STORM WATER RHYTHM FROM COAL STORAGE PILES AND THE IMPACT ON RECEIVING WATERS* (402)
A MODEL TO PREDICT REGIONAL WATER QUALITY IMPACTS FROM COAL RELATED ENERGY FACILITIES* (620)
- COASTAL**
TWO-DIMENSIONAL NUMERICAL MODEL FOR SIMULATING FORMATION AND DISSIPATION OF ADVECTION PEGS: A FIELD INVESTIGATION AND NUMERICAL SIMULATION OF COASTAL PEGS* (77)
A TRANSIENT, TWO-DIMENSIONAL, DISCRETE-ELEMENT MODEL FOR FAN-FIELD ANALYSIS OF DISCHARGES IN COASTAL REGIONS* (427)
WATER-QUALITY SIMULATION MODEL FOR WELL-MIXED ESTUARIES AND COASTAL SEAS* (474)
NUMERICAL SIMULATION OF WATER QUALITY IN COASTAL WATERS AND ESTUARIES* (477)
METABOLISM AND MODELS OF ESTUARINE BAY ECOSYSTEMS AFFECTED BY A COASTAL POWER PLANT* (490)
FINAL COASTAL PROCESS REPORT, ATLANTIC GENERATING STATIONS* (527)
- COASTLINE**
COMPUTER SIMULATION TECHNIQUE FOR OIL SPILLS OFF THE NEW JERSEY-DELAWARE COASTLINE* (507)
- CODES**
CONVERSATIONAL COMPUTER CODES TO IMPLEMENT ICRP-10-10A MODELS FOR ESTIMATION OF INTERNAL RADIATION DOSE TO MAN* (710)
- COEFFICIENTS**
USE OF LAPS SYSTEM FOR THE QUANTITATIVE DETERMINATION OF SHORE PLUME LATERAL DIFFUSION COEFFICIENTS FROM ERS IMAGES OF VIRGINIA* (17)
DEVELOPMENT OF VERTICAL DISPERSION COEFFICIENTS FOR ROLLING TERRAIN ENVIRONMENTS* (291)
PREDICTIONS OF THE SPECTRAL ABSORPTION AND EXTINCTION COEFFICIENTS OF AN URBAN AIR POLLUTION AEROSOL MODEL* (342)
A SURVEY OF DISPERSION COEFFICIENTS FOR ESTIMATING POLLUTANT TRANSPORT* (462)
PREDICTING REAPLICATION COEFFICIENTS FOR A POLLUTED ESTUARY* (468)
- CONCEPT**
ON THE CONCEPT OF GRID-GENERATED TURBULENCE; MODEL FOR CALCULATING CONCEPT FUNCTION FOR ATMOSPHERIC TURBULENCE* (777)
- COLLENT**
THE COLLENT RIVER SIMULATION MODEL* (518)
A SIMULATION MODELING OF ENVIRONMENTAL EFFECTS OF THERMAL GENERATION, DOCUMENTATION OF THE COLLENT MODEL* (572)
- COLOPADO**
SIMULATING EFFECTS OF HARVEST CUTTING ON SLOPEST IN COLOPADO SUBALPINE FOREST* (417)
EFFECTS OF DEVELOPMENT ON SALINITY AND LINGUOLOGY OF THE LOWER COLOPADO RIVER* (424)
COMPUTED SIMULATION OF SURFACE WATER HYDROLOGY AND SALINITY WITH AN APPLICATION TO STUDIES OF COLOPADO RIVER MANAGEMENT* (440)
AN EMPIRICAL MODEL FOR DETERMINING THE SALINITY DISTRIBUTION IN THE COLOPADO RIVER* (471)
- COLLUMBS**
ONE-DIMENSIONAL MODEL OF THE MOVEMENT OF TRACE RADIOACTIVE SOLUTE THROUGH SOIL COLLUMBS - THE PERCOL MODEL* (453)
- COMBUSTION**
MATHEMATICAL MODELS FOR ANALYZING ORIGIN AND DISTRIBUTION OF COMBUSTION GENERATED POLLUTANTS IN GAS TURBINES: A MATHEMATICAL MODEL FOR JET ENGINE COMBUSTOR POLLUTANT EMISSIONS* (10)
ATMOSPHERIC TRANSPORT OF ROCKET MOTOR COMBUSTION BY-PRODUCTS* (54)
PRELIMINARY MODEL OF THE HUMAN ASSIMILATION OF LEAD AEROSOLS FROM GASOLINE COMBUSTION* (692)
- COMBUSTION**
MATHEMATICAL MODELS FOR ANALYZING ORIGIN AND DISTRIBUTION OF COMBUSTION GENERATED POLLUTANTS IN GAS TURBINES: A MATHEMATICAL MODEL FOR JET ENGINE COMBUSTOR POLLUTANT EMISSIONS* (10)
INVESTIGATION OF GAS TURBINE COMBUSTORS WITH HIGH INLET AIR TEMPERATURES, COMBUSTOR MODELLING* (101)
- COMBUSTORS**
INVESTIGATION OF GAS TURBINE COMBUSTORS WITH HIGH INLET AIR TEMPERATURES, COMBUSTOR MODELLING* (101)
- COMMERCIAL**
DEVELOPMENT OF MODEL TO ASSESS ENVIRONMENTAL EFFECT OF COMMERCIAL AVIATION HIGH ALTITUDE CRUISE OPERATIONS* (219)
COMMERCIAL WASTE MANAGEMENT REPORT GENERATOR* (738)
- COMMITMENTS**
A MODEL TO ESTIMATE RADIATION DOSE COMMITMENTS TO THE WORLD POPULATION FROM THE ATMOSPHERIC RELEASE OF RADIOISOTOPES* (277)
- COMMUNICATION**
WATER TEMPERATURE FORECASTING AND ESTIMATION USING FOURIER SERIES AND COMMUNICATION THEORY TECHNIQUES* (405)
- COMMUNITIES**
VEGETATION COMMUNITIES ALONG GRADIENT* (777)
- COMPUTER**
AIR POLLUTION BY COMPUTER TRAVEL ON STATED ISLAND* (298)
- COMPARATIVE**
COMPARATIVE MODEL THEORY OF ATMOSPHERIC CONTAMINANT LOADING BY POWER STATIONS* (123)
- COMPARTMENT**
A TWO-COMPARTMENT, THREE-PARAMETER MODEL FOR THE ABSORPTION AND RETENTION OF INGESTED ELEMENTS BY ANIMALS* (670)
COMPARTMENT MODELS FOR BODY BURDEN OF POLLUTANTS* (717)
- COMPARTMENTAL**
EVALUATION OF A DIGITAL COMPUTER METHOD FOR ANALYSIS OF COMPARTMENTAL MODELS OF ECOLOGICAL SYSTEMS* (705)

TITLE INDEX

COMPLEXITY

DEVELOPMENT OF AN URBAN AIR QUALITY SIMULATION MODEL WITH COMPATIBLE RAPS DATA* (295)

COMPLEXITY

SIMCOVE: A SIMULATION COMPILER FOR BIOLOGICAL MODELING* (799)

COMPLEXITY

A BASE CONSISTENT ATMOSPHERIC FLUX MODEL FOR REGIONS WITH COMPLEX TERRAIN* (45)

COMPLEX TERRAIN WIND MODEL* (165)

A NUMERICAL MODEL FOR STABLY STRATIFIED FLOW ABOVE COMPLEX TERRAIN* (273)

TWO-DIMENSIONAL NUMERICAL SIMULATION OF THE EFFECTS OF AIR POLLUTION UPON THE URBAN-RURAL COMPLEX* (300)

SYNTHESIS OF CONTAMINANTS IN BAY: APPLICATION TO SAN FRANCISCO BAY COMPLEX* (504)

ENVIRONMENTAL ENERGY MODEL OF A PETROLEUM REFINING/CHEMICAL COMPLEX* (517)

COMPLEXITY

NUMERICAL SIMULATION OF THE EFFECTS OF COOLING TOWER COMPLEXES ON CLOUDS AND SEVERE STORMS* (767)

COMPLEXITY

THE AIR POLLUTION COMPONENT OF AN ECOSYSTEM SIMULATION MODEL* (74)

ONE-DIMENSIONAL TRANSIENT MONISOTHERMAL TWO-PHASE, TWO-COMPONENT FLOW OF FLUIDS AND GASES THROUGH LAYERED POROUS MEDIA* (466)

COMPLEXITY

PLANETARY DISTRIBUTION OF LOCAL NEAR TRANSPORT PARAMETERS OF RADIONUCLIDES IN THE TROPOSPHERE AND LOWER STRATOSPHERE: CLIMATIC DISTRIBUTION OF THE LOCAL NEAR COMPONENTS OF THE REGIONAL CIRCULATION VELOCITY* (139)

COMPREHENSIVE

COMPREHENSIVE ANALYSIS OF TIME-CONCENTRATION RELATIONSHIPS AND VALIDATION OF A SINGLE-SOURCE DISPERSION MODEL* (203)

A COMPREHENSIVE MODEL STUDY OF SALT DRIFT DEPOSITION, INDUCED FOGGING AND ICEING FROM MECHANICAL DRAFT COOLING TOWER PLUMES AT INDIAN POINT* (210)

COMPUTATION

NUMERICAL MODEL FOR COMPUTATION OF AEROSOL TRANSPORT AND DIFFUSION IN THE ATMOSPHERE* (43)

COMPUTATION OF POSSIBLE CLIMATIC CONSEQUENCES OF PERTURBATIONS TO STRATOSPHERIC AEROSOLS, OZONE AND WATER VAPOR WITH RADIATIVE-CONVECTIVE MODELS* (39)

NUMERICAL COMPUTATION OF BASE-LEVEL DISPERSION IN A RECEIVING WATER BODY* (407)

A WASTE CANAL CLOSURE WITH STOPFORD PROGRAMS FOR DOSE COMPUTATIONS* (746)

COMPUTATION AND MAPPING OF THE DISPERSION AND EXPOSURE RISK OF GASEOUS EFFLUENTS FROM INDUSTRIAL PLANTS* (750)

COMPUTATION OF RADIOLOGICAL CONSEQUENCES USING INTEL COMPUTER PROGRAM* (415)

COMPUTATIONAL

COMPUTATIONAL DIFFUSION IN ATMOSPHERIC BOUNDARY LAYER MODELS* (167)

INTERNAL REGIMES OF THE UPPER MISSISSIPPI AND MISSOURI RIVERS: TRANSIENT AND STEADY-STATE COMPUTATIONAL MODEL FOR THE PREDICTION OF RIVER THERMAL REGIMES: PART TWO: ANALYSIS OF THERMAL REGIMES OF THE MISSISSIPPI AND MISSOURI RIVERS IN THE MID-CONTINENT AREA DATED 1900 (1900) GEOGRAPHICAL AREA* (399)

COMPUTATIONAL METHOD FOR CALCULATION OF RADIOLOGICAL DOSE RESULTING FROM HYPOTHETICAL PLEISTOCENE PRODUCT RELEASE* (498)

COMPUTATIONAL VERSION OF THE TOWN LUNG MODEL* (725)

COMPUTATIONS

A USER'S MANUAL FOR THREE-DIMENSIONAL HEATED SURFACE DISCHARGE COMPUTATIONS* (500)

COMPUTE

DOSE CONVERSION CONVERT CODE USED TO COMPUTE RADIOLOGICAL DOSE THROUGH VARIOUS PATHWAYS* (695)

COMPUTERIZED

CRATIC PROGRAM FOR COMPUTERIZED SELECTION OF WATERSHED PARAMETER VALUES FOR THE STANFORD WATERSHED MODEL* (402)

THE STANFORD WATERSHED MODEL: THE CORRELATION OF PARAMETER VALUES SELECTED BY A COMPUTERIZED PROCEDURE WITH MEASURABLE PHYSICAL CHARACTERISTICS OF THE WATERSHED* (652)

COMPUTERS

USE OF COMPUTERS TO CALCULATE RADIATION DOSE FROM METABOLIC MODELS* (604)

CONCEPT

DESCRIPTION OF THE CONTAINMENT AND METEOROLOGY OF ENVIRONMENTAL RADIATION EXPOSURE (CONRADER-III) CODE* (299)

CONCENTRATION

DESCRIPTION OF THE CONTAINMENT AND METEOROLOGY OF ENVIRONMENTAL RADIATION EXPOSURE (CONRADER-III) CODE* (729)

PEARL TO PEAK CONCENTRATION RATIOS ACCORDING TO A "STATIONARY" FLUCTUATING PLUME MODEL* (41)

A GENERAL CIRCULATION MODEL SHOWING THE EFFECTS OF DOUBLING THE CO₂ CONCENTRATION ON THE CLIMATE* (192)

COMPREHENSIVE ANALYSIS OF TIME-CONCENTRATION RELATIONSHIPS AND VALIDATION OF A SINGLE-SOURCE DISPERSION MODEL* (200)

A NEW MATHEMATICAL MODEL OF AIR POLLUTANT CONCENTRATION AVERAGING TIME AND FREQUENCY* (359)

SP-90 IS THE GREAT LAKES: CONCENTRATION-TIME MODEL* (478)

MATHEMATICAL MODELS PREDICT CONCENTRATION-TIME PROFILES RESULTING FROM CHEMICAL SPILL IN A RIVER* (514)

CONCENTRATION FACTORS AND TRANSPORT MODELS FOR RADIONUCLIDES IN AQUATIC ENVIRONMENTS-A LITERATURE REPORT* (460)

IMPROVED AND CONCENTRATION OF RADIONUCLIDES IN FOOD CHAINS* (676)

SPECIFIC ACTIVITY AND CONCENTRATION MODEL APPLIED TO CS-137 MOVEMENT IN A EUTROPHIC LAKE* (772)

MODEL FOR CALCULATION OF CONCENTRATION OF RADIOISOTOPES IN VEGETATION* (781)

CONCENTRATIONS

A SIMPLE DIFFUSION MODEL FOR CALCULATING POINT CONCENTRATIONS FROM MULTIPLE SOURCES* (45)

A STOCHASTIC MODEL FOR CARBON MONOXIDE CONCENTRATIONS ALONG HIGHWAYS AND STREETS* (116)

STRATOSPHERIC CONCENTRATIONS OF CCL₃F IN 1970* (149)

URBAN AIR SHED PHOTOCHEMICAL SIMULATION MODEL STUDY: MICROSCALE MODEL OF LOCAL VEHICULAR CONTRIBUTIONS TO MEASURED POLLUTANT CONCENTRATIONS* (160)

A COMPUTER CODE FOR ESTIMATING AIR POLLUTANT CONCENTRATIONS FROM DISPENSED SOURCES* (205)

LAGRANGIAN TRANSPORT AND DIFFUSION CODE TO CALCULATE CONCENTRATIONS AND DEPOSITION AT LONG RANGE OF PARTICLES LESS THAN 10 MICRON METERS DIAMETER* (230)

BOUNDARY LAYER MODEL FOR AIR POLLUTANT CONCENTRATIONS DUE TO HIGHWAY TRAFFIC* (260)

DEVELOPMENT OF A SIMULATION MODEL FOR ESTIMATING GROUND LEVEL CONCENTRATIONS OF PHOTOCHEMICAL POLLUTANTS* (278)

THEORETICAL MODEL FOR RELATING INDOOR POLLUTANT CONCENTRATIONS TO THOSE OUTSIDE* (288)

A POINT SOURCE MODEL TO ESTIMATE HOURLY CONCENTRATIONS FOR STABLE POLLUTANTS* (314)

A POINT SOURCE MODEL TO ESTIMATE HOURLY CONCENTRATIONS FOR STABLE POLLUTANTS* (315)

A POINT SOURCE MODEL TO ESTIMATE HOURLY CONCENTRATIONS FOR STABLE POLLUTANTS* (316)

PLUME CONCENTRATIONS* (331)

TITLE INDEX

CONCENTRATIONS

- EMPIRICAL TECHNIQUES FOR ANALYZING AIR QUALITY AND METEOROLOGICAL DATA: SHORT-TERM CHANGES IN GROUND-LEVEL OZONE CONCENTRATIONS* (345)
 PREDICTING OF LONG-TERM MEAN AND SEAN SQUARE POLLUTANT CONCENTRATIONS IN AN URBAN ATMOSPHERE* (357)
 CALCULATING FUTURE CARBON MONOXIDE EMISSIONS AND CONCENTRATIONS FROM URBAN TRAFFIC DATA* (360)
 DEVELOPMENT OF A SIMULATION MODEL FOR ESTIMATING GROUND LEVEL CONCENTRATIONS OF PHOTOCHEMICAL POLLUTANTS* (376)
 DEVELOPMENT OF A SIMULATION MODEL FOR ESTIMATING GROUND LEVEL CONCENTRATIONS OF PHOTOCHEMICAL POLLUTANTS, A KINETIC MECHANISM FOR ATMOSPHERIC PHOTOCHEMICAL REACTIONS* (380)
 CONCENTRATIONS IN THE SOUTH TEXAS PROJECT COOLING RESERVOIR, BLOW-DOWN AND EVAPORATION* (520)
 SIMULATION OF MAJOR INORGANIC CHEMICAL CONCENTRATIONS AND LOADS IN STREAMFLOW* (576)
 MIXED DISPERSION OF TRACE CHEMICAL CONCENTRATIONS IN A SATURATED SOILING POROUS MEDIUM* (607)

CONCEPT

- NEW CONCEPT IN STABILITY ANALYSIS OF STEEP RINE-REFUSE EMBALEMENTS* (400)

CONCEPTUAL

- COMPUTER SIMULATION OF ATMOSPHERIC EFFECTS OF WASTE HEAT REJECTED FROM CONCEPTUAL LARGE POWER PLANTS* (13)
 A CONCEPTUAL MODEL OF THE HYDROLOGIC CYCLE* (436)

CONDENSATION

- FORMATION OF SULFATES AND THE ENHANCEMENT OF CLOUD CONDENSATION NUCLEI IN CLOUDS* (72)

CONDENSED

- EXPERIMENTAL AND ANALYTICAL STUDIES OF CONDENSED WATER DISCHARGE FOR THE ATLANTIC OCEANOGRAPHIC STATION* (444)

CONNECTIONS

- EFFECT OF HIGHWAY CONFIGURATIONS ON ENVIRONMENTAL PROBLEMS--DYNAMICS OF HIGHWAY ASSOCIATED AIR POLLUTION* (79)

CONTAMINANTS

- A TWO-DIMENSIONAL FINITE ELEMENT MODEL FOR THE MIGRATION OF CONTAMINANTS IN CONFINED AND UNCONFINED AQUIFERS* (402)
 A THREE-DIMENSIONAL FINITE ELEMENT MODEL FOR THE MIGRATION OF CONTAMINANTS IN CONFINED AND UNCONFINED AQUIFERS* (403)

CONNECTICUT

- A SIMULATION MODEL FOR AIR POLLUTION OVER CONNECTICUT* (21)
 AN AIR POLLUTION MODEL OF CONNECTICUT* (22)
 A REGIONAL AIR QUALITY SIMULATION MODEL (A DESCRIPTION OF THE CONNECTICUT AIR POLLUTION MODEL AS DEVELOPED BY THE TRAVELERS RESEARCH CENTER)* (275)
 COMPUTER MODEL OF CONNECTICUT RIVER POLLUTION* (351)

CONSERVATION

- WASTE HEAT MANAGEMENT IN THE ELECTRIC POWER INDUSTRY: ISSUES OF ENERGY CONSERVATION AND STATION OPERATION UNDER ENVIRONMENTAL CONSTRAINTS* (813)

CONSIDERING

- REGIONAL EFFLUENT DISPERSION CALCULATIONS CONSIDERING SPATIAL AND TEMPORAL METEOROLOGICAL VARIATIONS* (300)

CONSISTENT

- A MASS CONSISTENT ATMOSPHERIC FLUX MODEL FOR REGIONS WITH COMPLEX TERRAIN* (45)

CONSTANT

- THE EFFECTS OF CHARGING THE SOLAR CONSTANT ON THE CLIMATE OF A GENERAL CIRCULATION MODEL* (327)
 DOS* CONVERSION CONSTANT CODE USED TO COMPUTE RADIOLOGICAL DOSE THROUGH VARIOUS PATHWAYS* (495)

CONSTANTS

- CALCULATION OF SELECTED PHOTOLYTIC RATE CONSTANTS OVER A DIURNAL RANGE: A COMPUTED ALGORITHM* (202)

CONSTRAINTS

- ON THE BOUNDARY CONDITIONS IN THEORETICAL MODEL CALCULATIONS OF THE DISTRIBUTIONS OF MINOR NEUTRAL CONSTITUENTS IN THE UPPER ATMOSPHERE* (294)

CONSTRAINTS

- WASTE HEAT MANAGEMENT IN THE ELECTRIC POWER INDUSTRY: ISSUES OF ENERGY CONSERVATION AND STATION OPERATION UNDER ENVIRONMENTAL CONSTRAINTS* (813)

CONSTRUCTION

- THE PAPER II COMPUTER CODE FOR ESTIMATING INTERNAL DOSES TO POPULATIONS FROM CONSTRUCTION OF A SEA LEVEL CANAL WITH NUCLEAR EXPLOSIVES* (742)

CONTAMINANT

- DESCRIPTION OF THE CONTAMINANT AND METEOROLOGY OF ENVIRONMENTAL RADIATION EXPOSURE (CONRADII-IV) CODE* (299)
 DESCRIPTION OF THE CONTAMINANT AND METEOROLOGY OF ENVIRONMENTAL RADIATION EXPOSURE (CONRADII-III) CODE* (729)

CONTAMINANT

- COMPARATIVE MODEL THEORY OF ATMOSPHERIC CONTAMINANT LOADING BY POWER STATIONS* (123)
 DIFFERENCE ANALOGUES OF BOUNDARY-VALUE PROBLEMS FOR THE EQUATIONS OF GLOBAL RADIOISOTOPE CONTAMINANT TRANSPORT AND THEIR NUMERICAL SOLUTION: DIFFERENCE APPROXIMATION OF EQUATIONS AND BOUNDARY CONDITIONS IN THE REGIONAL PLANE AND THE ZONAL BELT OF THE ATMOSPHERE* (129)

CONTAMINANTS

- MODEL FOR TIME-DEPENDENT RAINBOW SIZE DISTRIBUTIONS: APPLICATION TO THE WASHOUT OF AIRBORNE CONTAMINANTS* (1)

- MULTI-SOURCE ATMOSPHERIC TRANSPORT MODEL FOR DEPOSITION OF TRACE CONTAMINANTS* (201)
 MATHEMATICAL AND TECHNICAL APPROACH TO DIFFUSION ANALYSIS OF AIR CONTAMINANTS* (215)
 A TWO-DIMENSIONAL FINITE ELEMENT MODEL FOR THE MIGRATION OF CONTAMINANTS IN CONFINED AND UNCONFINED AQUIFERS* (402)
 A THREE-DIMENSIONAL FINITE ELEMENT MODEL FOR THE MIGRATION OF CONTAMINANTS IN CONFINED AND UNCONFINED AQUIFERS* (403)
 SIMULATION OF CONTAMINANTS IN BAYS: APPLICATION TO SAN FRANCISCO BAY COMPLEX* (504)

CONTAMINATED

- A SYSTEMS ANALYSIS METHODOLOGY FOR PREDICTING DOSE TO MAN FROM A RADIOACTIVELY CONTAMINATED TERRESTRIAL ENVIRONMENT* (707)

CONTAMINATION

- WIND EFFECTED REDISTRIBUTION OF SURFACE CONTAMINATION* (4)
 DIGITAL SIMULATION OF DIESEL EXHAUST CONTAMINATION OF WINE VENTILATION SYSTEMS* (301)
 A GALERKIN-FINITE ELEMENT SIMULATION OF GROUNDWATER CONTAMINATION ON LONG ISLAND, NEW YORK* (507)

CONTINENT

- THERMAL REGIMES OF THE UPPER MISSISSIPPI AND MISSOURI RIVERS: TRANSIENT AND STEADY-STATE COMPUTATIONAL MODELS FOR THE PREDICTION OF RIVER THERMAL REGIMES; PART TWO: ANALYSIS OF THERMAL REGIMES OF THE MISSISSIPPI AND MISSOURI RIVERS IN THE MID-CONTINENT AREA POWER POOL (MAPP) GEOGRAPHICAL AREA* (538)

CONTINENTAL

- A REGIONAL-CONTINENTAL SCALE TRANSPORT, DIFFUSION, AND DEPOSITION MODEL* (119)

TITLE INDEX

CONTENTS

- WREAS AIR SHED PHOTOCHEMICAL SIMULATION MODEL STUDY: MICROSCALE MODEL OF LOCAL VEHICULAR CONTRIBUTIONS TO MEASURED POLLUTANT CONCENTRATIONS* (165)
- CONTROL**
- PREDICTION MODELS ARE BASIS FOR NATIONAL AIR QUALITY CONTROL* (64)
- USEPA'S MANUAL, AUTOMATED PROCEDURES FOR ESTIMATING CONTROL COSTS AND EMISSION REDUCTIONS FOR SPECIFIED AIR POLLUTION SOURCES* (341)
- OPTIMUM SIMULATION OF AIR POLLUTION CONTROL STRATEGIES* (352)
- SIMULATION MODEL FOR ENVIRONMENTAL POLLUTION CONTROL FROM FOSSIL FUEL POWER PLANTS* (371)
- STOCHASTIC AIR POLLUTION CONTROL MODEL FOR LOS ANGELES COUNTY IN 1975* (381)
- A SYSTEM APPROACH FOR THE STUDY AND CONTROL OF FACTORIES AFFECTING WATER POLLUTION* (384)
- MATHEMATICAL MODEL FOR WATER POLLUTION CONTROL STUDIES* (437)
- MODELING AND CONTROL OF THE POLLUTION OF WATER RESOURCES SYSTEMS VIA MULTILEVEL APPROACH* (444)
- OPTIMAL CONTROL OF AN OIL SPILL TREATMENT FACILITY: A TOTAL ECOSYSTEM APPROACH* (475)
- MODELS FOR ENVIRONMENTAL POLLUTION CONTROL* (536)
- RESOURCES ALLOCATION TO OPTIMIZE MIXING POLLUTION CONTROL* (561)
- WREAS-1, A NUCLEAR POWER SAFETY EVALUATION CODE FOR THE CONTROL DATA 3400* (591)
- CONTROLLED**
- ONE-DIMENSIONAL HYDRODYNAMIC AND WATER QUALITY CONDITIONS IN ESTUARIES AND CONTROLLED RIVERS* (421)
- CONTROL***
- A SOFTWARE SYSTEM TO SIMULATE COAL PLANT PARTICULATE CONTROLS* (81)
- CONVECTION**
- LINEAR DIFFUSION AND CONVECTION OF CHEMICALS IN SOILS* (448)
- CONVECTIVE**
- COMPUTATION OF POSSIBLE CLIMATIC CONSEQUENCES OF PERTURBATIONS TO STRATOSPHERIC AEROSOLS, GASES AND WATER VAPOR WITH RADIATIVE-CONVECTIVE MODELS* (44)
- A SIMPLIFIED RADIATIVE-CONVECTIVE MODEL* (171)
- THERMAL AND RADIATIVE EFFECTS OF ATMOSPHERIC AEROSOLS IN THE NORTHERN HEMISPHERE CALCULATED USING A RADIATIVE CONVECTIVE MODEL* (172)
- CONVERSIONAL**
- CONVERSIONAL COMPUTER CODES TO IN LENSEN IC92-12-11A MODELS FOR ESTIMATION OF INTERNAL RADIATION DOSE TO MAN* (710)
- CONVERSION**
- SUMMARY REPORT ON MODELING ANALYSIS OF POWER PLANTS FOR FUEL CONVERSION* (204)
- INVESTIGATION OF SOME FACTORS IN THE BIOCHEMICAL CONVERSION OF MERCURY POLLUTANTS TO TOXIC METHYLMERCURY EFFECTED BY MICRO-ORGANISMS IN A MARINE SEDIMENT* (500)
- THE WASTE CONVERSION MODEL FOR STATE OF ILLINOIS WATER QUALITY MANAGEMENT PROGRAM* (527)
- DOSE CONVERSION CONSTANT CODE USED TO COMPUTE RADIOLOGICAL DOSE THROUGH VARIOUS PATHWAYS* (695)
- COOLANT**
- MOLIER MATERIAL-COOLANT INTERACTION AND PLUTONIUM SOURCE IN INER accident ANALYSIS* (114)
- COOLED**
- A STUDY OF THE FISSION PRODUCT RELEASE FROM A BADLY DAMAGED WATER-COOLED REACTOR* (39)
- COOLING**
- THERMAL MODEL FOR ATMOSPHERIC SPRAY COOLING SYSTEMS: ENVIRONMENTAL EFFECTS OF HEAT AND MOISTURE RELEASE* (17)
- MULTIPLE CELL MECHANICAL DRAFT COOLING TOWER MODEL* (43)
- PREDICTED AND OBSERVED COOLING TOWER PLUME RISE AND VISIBLE PLUME LENGTH AT THE JOHN E. AMOS POWER PLANT* (102)
- DISCUSSION OF A METHOD FOR CALCULATING THE SIZE OF COOLING TOWER PLUMES* (107)
- A DRIFT DEPOSITION MODEL FOR NATURAL DRAFT COOLING TOWERS* (122)
- ANALYTICAL EFFECT OF EVAPORATIVE COOLING TOWER* (142)
- NUMERICAL STUDY OF WET COOLING TOWER PLUME* (146)
- COOLING TOWER PLUME MODEL* (149)
- NATURAL DRAFT COOLING TOWER PERFORMANCE* (150)
- CHALK POINT COOLING TOWER PROJECT* (222)
- COOLING TOWER MODELS* (225)
- POTENTIAL ENVIRONMENTAL MODIFICATIONS PRODUCED BY LARGE EVAPORATIVE COOLING TOWERS* (227)
- COOLING TOWER PLUME-MATHEMATICAL MODEL* (228)
- ATMOSPHERIC IMPACT MODELS FOR CLOSED CYCLE COOLING SYSTEMS* (229)
- A COMPREHENSIVE MODEL STUDY OF SALT DRIFT DEPOSITS, INDUCED FOGGING AND ICING FROM MECHANICAL DRAFT COOLING TOWER PLUMES AT INDIAN POINT* (230)
- A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE AND MULTIPLE NATURAL-DRAFT COOLING TOWERS* (242)
- A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (243)
- A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE AND MULTIPLE NATURAL-DRAFT COOLING TOWERS* (244)
- A MODEL TO PREDICT SALT-DRIFT DEPOSITION FROM A NATURAL DRAFT COOLING TOWER* (245)
- A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (246)
- A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (247)
- A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE OR MULTIPLE NATURAL-DRAFT COOLING TOWERS* (248)
- A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (249)
- A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWER* (250)
- A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (251)
- A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (252)
- A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE AND MULTIPLE NATURAL-DRAFT COOLING TOWERS* (253)
- A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (254)
- A MODEL TO PREDICT PLUMES FROM A SINGLE NATURAL-DRAFT COOLING TOWER* (255)
- A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (256)
- WET PLUME RISE FROM COOLING TOWERS IN STRONG WINDS* (302)
- STUDIES OF THE ENVIRONMENTAL IMPACT OF EVAPORATIVE COOLING TOWER PLUMES* (309)
- COOLING TOWER PLUME MODEL* (336)
- NUMERICAL SIMULATION OF THE EFFECTS OF COOLING TOWER COMPLEXES ON CLOUDS AND SEVERE STORMS* (367)
- AN ATMOSPHERIC SPRAY COOLING MODEL* (396)
- PREDICTION OF TEMPERATURE PROFILES IN ARBITRARILY SHAPED COOLING LAKES BY FINITE DIFFERENCE TECHNIQUES* (415)
- MODELING AND OPTIMIZATION OF TRANSIENT COOLING WATER DISCHARGE FROM POWER GENERATING PLANTS, APPLICATIONS TO REGIONAL SITUATIONS* (457)
- TEMPERATURE DISTRIBUTION MODEL FOR COOLING POND* (491)
- STAN-HARLEMAN--COOLING POND TEMPERATURE DISTRIBUTION* (501)
- CONCENTRATIONS IN THE SOUTH TEXAS PROJECT COOLING RESERVOIR, BLOW-DOWN AND EVAPORATION* (520)

TITLE INDEX

- COOLING**
DESIGN AND SITING CRITERIA FOR ONCE-THROUGH COOLING SYSTEMS BASED ON A FIRST-ORDER THERMAL PLANE MODEL* (549)
MATHEMATICAL MODELS TO PREDICT STEEPAGE FROM COOLING RESERVOIRS* (548)
A MODEL TO PREDICT FISH-INTOLERANT AT COOLING WATER INTAKES* (744)
- CORRELATION**
THE STAFFORD UNIVERSITY MODEL: THE CORRELATION OF PARAMETER VALUES SELECTED BY A COMPUTERIZED PROCEDURE WITH MEASURABLE PHYSICAL CHARACTERISTICS OF THE BAYESTED* (652)
- COST**
ANALYTICAL MODELS FOR ENVIRONMENT COST ESTIMATES OF AQUATIC POPULATION* (764)
- COSTS**
USEP'S MANUAL, AUTOMATED PROCEDURES FOR ESTIMATING CONTROL COSTS AND EMISSION REDUCTIONS FOR SPECIFIED AIR POLLUTION SOURCES* (747)
HEALTH EFFECTS AND COSTS OF FOSSIL-FUEL POLLUTANTS* (716)
- COUNTY**
ECONOMIC AIR POLLUTION CONTROL MODEL FOR LOS ANGELES COUNTY IN 1975* (103)
- COVER**
MATHEMATICAL SIMULATION OF DISPERSION OF POLLUTANTS IN A LAKE WITH ICE COVER* (574)
- COB**
PREDICTIVE MODEL FOR RADIOCESIUM INTAKE FROM MILK: RANGES ASSOCIATED WITH ANNUAL-COB VARIATION* (758)
- CO2**
MODEL OF THE ACCUMULATION OF FOSSIL CO2 IN THE ATMOSPHERE AND THE SEA* (804)
A GENERAL CIRCULATION MODEL SHOWING THE EFFECTS OF DOUBLING THE CO2 CONCENTRATION ON THE CLIMATE* (102)
- COTTON**
DESIGN AND SITING CRITERIA FOR ONCE-THROUGH COOLING SYSTEMS BASED ON A FIRST-ORDER THERMAL PLANE MODEL* (549)
- COTR**
COTR* (744)
- CROPS**
MODEL OF PHOTOCHEMICALS AND GROWTH OF CROPS UNDER POLLUTANT STRESS* (775)
A DAMAGE ASSESSMENT MODEL FOR AGRICULTURAL CROPS* (779)
- CROSS**
NEGATIVELY INSTANT JETS IN A CROSS FLOW* (149)
- CROSSER**
SINGLE SOURCE (CROSSER) MODEL* (317)
- CROUD**
MODELING OF OIL EVAPORATION IN AN AQUATIC ENVIRONMENT: RESEARCH ON THE EFFECTS OF CROUD OIL TRANSFER AND UPSTREAM REPERIES ON DELAWARE BAY* (598)
- CROUSE**
DEVELOPMENT OF MODEL TO ASSESS ENVIRONMENTAL EFFECT OF COMMERCIAL AVIATION HIGH ALTITUDE CROUSE OPERATIONS* (279)
- CS**
THE BEHAVIOR OF CS-137 AND OTHER FALLOUT RADIOISOTOPES ON A MICHIGAN DAIRY FARM* (678)
SPECIFIC ACTIVITY AND CONCENTRATION MODEL APPLIED TO CS-137 MOVEMENT IN A EUTROPHIC LAKE* (772)
- CSHAW**
CSHAW, A CODE FOR SYSTEM SURVIVABILITY ANALYSIS - NUCLEAR EFFECTS* (694)
- CUNDELAND**
TENNESSEE AND CUNDELAND RIVER BASINS RADIOISOTOPES TRANSPORT* (789)
- CUMULATIVE**
A CUMULATIVE HAZARD INDEX FOR ASSESSING LIFETIME EXPOSURES TO ENVIRONMENTAL POLLUTANTS* (744)
- CUMULUS**
PAND TWO-DIMENSIONAL CUMULUS DYNAMICS MODEL WITH AEROSOL SCAVENGING* (203)
- CURIE**
CURIE-ROSE-THUNDERHEAD: A DIGITAL COMPUTER PROGRAM FOR EXTERNAL AND INTERNAL RADIATION DOSE CALCULATIONS* (707)
- CURRENT**
MISCELLANEOUS ASPECTS OF CURRENT URBAN POLLUTION MODELS* (29)
LABORATORY EXPERIMENTS OF SUBMERGED DISCHARGES WITH CURRENT* (407)
OCEAN CURRENT AND POLLUTANT TRANSPORT MODEL* (589)
- CURRENTS**
MULTI-LAYERED MODELS OF CURRENTS, TEMPERATURE, AND WATER QUALITY PARAMETERS IN THE GREAT LAKES* (570)
NUMERICAL INVESTIGATION OF THE ATLANTIC GENERATING STATION'S EFFECT ON TIDAL CURRENTS FROM LITTLE EGGS ISLAND, NEW JERSEY* (602)
- CUTTING**
SIMULATING EFFECTS OF HARVEST CUTTING ON SNOWBELL IN COLORADO SUBALPINE FOREST* (417)
- CYCLING**
PHOSPHORUS CYCLING IN LAKES* (534)
CYCLING OF ELEMENTS IN ESTUARIES* (505)
CYCLING OF ELEMENTS IN ESTUARIES MODEL* (609)
- DAIRY**
THE BEHAVIOR OF CS-137 AND OTHER FALLOUT RADIOISOTOPES ON A MICHIGAN DAIRY FARM* (678)
- DAM**
A MATHEMATICAL MODEL FOR PREDICTING RIVER TEMPERATURES--APPLICATION TO THE GREEN RIVER BELOW FLAMING CORSE DAM* (558)
- DAMAGE**
A MODEL TO PREDICT RADIOLOGICAL ENVIRONMENTAL IMPACT RESULTING FROM STRAIGHTLINE WIND DAMAGE TO A PLUTONIUM FACILITY* (139)
VULNERABILITY MODEL: A SIMULATION SYSTEM FOR ASSESSING DAMAGE RESULTING FROM NUCLEAR SPILLS* (422)
A DAMAGE ASSESSMENT MODEL FOR AGRICULTURAL CROPS* (779)
SEE IT- A NEW DAMAGE ASSESSMENT FALLOUT MODEL* (804)
PROBABILISTIC MODELS FOR CALCULATING AIR POLLUTION DAMAGE* (817)
- DAMAGED**
A STUDY OF THE FISSION PRODUCT RELEASE FROM A BADLY DAMAGED WATER-COOLED REACTOR* (39)
- DEBRIS**
NUCLEAR DEBRIS ATTACHMENT TO AIRCRAFT DUE TO ATMOSPHERIC RADIATION ENVIRONMENTS: AIRCRAFT IMPACTION AND ADVESIC COMPUTER MODEL* (236)
- DECISION**
MODELS AND THE DECISION MAKING PROCESS: THE HUDSON RIVER POWER PLANT CASE* (752)

TITLE INDEX

PREFACE

CONTINUED SIMULATION AIDS OIL-SPILL CLEANUP DECISIONS* (812)

DEEP

DEEP SEA OCEAN DISPOSAL OF PETROCHEMICAL PLANT WASTES* (199)

A MODEL FOR CALCULATING EFFECTS OF LIQUID WASTE DISPOSAL IN DEEP SALINE AQUIFERS* (164)

A MODEL FOR CALCULATING EFFECTS OF LIQUID WASTE DISPOSAL IN DEEP SALINE AQUIFERS* (161)

DEEP

MODEL FOR SUBOCEANOGRAPHIC CURRENTS IN OIL DEEPS* (154)

MODEL FOR PREDICTING SO-92 LEVELS IN OIL DEEPS* (167)

DEGRADATION

DIGITAL SIMULATION OF AGGRAVATION AND DEGRADATION IN NATURAL SYSTEMS* (194)

DETECT

MODELING STUDY OF SPATIAL EFFECT ON AIR POLLUTION IN AN OCEANIC ENVIRONMENT* (21)

DEE

DEE DEE DEE DEE: CONTINUED SIMULATION OF POLLUTANT TRANSPORT IN CONT-ENCLOSED WATER BODIES* (812)

DEVELOPMENT

A MASS RELEASE MODEL OF TRACE METALS IN SEVERAL DELTAIC WATERSHEDS* (167)

COMPUTER SIMULATION TECHNIQUES FOR OIL SPILLS OFF THE NEW JERSEY-DELAWARE COAST* (121)

DELAWARE ESTUARY AND GULF WATER QUALITY SAMPLING AND MATHEMATICAL MODELING PROGRAM* (167)

MODELS OF OIL TRANSPORT IN AN ESTUARINE ENVIRONMENT: EVIDENCE ON THE EFFECTS OF CRUDE OIL TRANSPORT AND DEGRADATION PROCESSES ON DELTAIC BAY* (164)

DEVELOPMENT

A NEW FALLOUT TRANSPORT CODE FOR THE DELTAIC SYSTEM: THE DIFFUSIVE TRANSPORT MODEL* (21)

DENSITY

A GLOBAL MODEL OF THERMOCIRCULAR DYNAMICS, WIND AND DENSITY FIELDS DERIVED FROM A PHYSIOLOGICAL TEMPERATURE* (16)

DEVELOPMENT

MODEL FOR TIME-DEPENDENT BRINCHER SIZE DISTRIBUTIONS: APPLICATION TO THE WASHOFT OF AIRBORNE CONTAMINANTS* (1)

A TIME-DEPENDENT MODEL OF THE TRADE-WIND BOUNDARY LAYER* (7)

TIME-DEPENDENT PHYSIOLOGICAL MODEL FOR GASES NEAR THE GROUND* (16)

POWELL CABLE CABLES ON THE TIME-DEPENDENT TRANSPORT OF OPTICAL AND THERMAL RADIATION IN THE ATMOSPHERE: THERMAL RADIATION TRANSPORT* (16)

SOIL-TO-TOE TOWING TIME DEPENDENT NAVIER-STOKES EQUATIONS* (16)

DEVELOPMENT

SHAGARA LATE SHAGARA CHARACTERISTICS AS DETERMINED BY PREDICTIVE MODELING* (167)

DEVELOPMENT

VIBRATION OF GROUND VIBROMETERS THROUGH SOIL DURING A MASSIVE ONE DEGREE: A MODELING STUDY* (164)

DEPOSITION

ATMOSPHERIC DIFFUSION AND DEPOSITION OF PARTICULATE MATTER* (167)

ANALYTICAL MODEL FOR AIR POLLUTANT TRANSPORT AND DEPOSITION FROM A POINT SOURCE* (74)

A SIMPLE DRIFT DEPOSITION MODEL APPLIED TO THE CHAIR POINT BY SPACES EXPERIMENT* (164)

A REGIONAL-CONTINENTAL SCALE CIRCULAR, DIFFUSION, AND DEPOSITION MODEL* (11)

A DRIFT DEPOSITION MODEL FOR NATURAL DRAFT COOLING TOWERS* (122)

VERTICAL TRANSPORT AND REMOVAL OF PARTICULATE AEROSOLS IN THE ATMOSPHERE: QUANTITATIVE MODELS OF AEROSOL WASHOUT BY PRECIPITATION AND FRY DEPOSITION ON THE UNDERLYING SURFACE* (11)

NUMERICAL MODELING OF THE TRANSPORT, DIFFUSION, AND DEPOSITION OF POLLUTANTS FOR REGIONAL AND EXTENDED SCALES* (115)

MULTI-SOURCE ATMOSPHERIC TRANSPORT MODEL FOR DEPOSITION OF TRACE CONTAMINANTS* (201)

LAGRANGIAN TRANSPORT AND DIFFUSION CODE TO CALCULATE CONCENTRATIONS AND DEPOSITION AT LONG RANGE OF PARTICLES LESS THAN 10 MICRON METERS DIAMETER* (239)

A CODE TO ESTIMATE THROUGH-TO-GROUND GLOBAL DEPOSITION FROM ATMOSPHERIC NUCLEAR DEPOSIT* (164)

A MODEL TO PREDICT SALT-DRIFT DEPOSITION FROM A NATURAL DRAFT COOLING TOWER* (245)

NUMERICAL TECHNIQUES APPLIED TO PARTICLE DEPOSITION DURING SLOT FLOW* (164)

FALLOUT ON DIRT (DOES FROM RADIOISOTOPE DEPOSITION ON FOOD BODIES)* (167)

ENGINEERING-DESIGN REACTION KINETICS/ENERGY DEPOSITION/ACTIVATION /DOSE TO PERSONNEL MODEL* (714)

DEPOSITION OF ELECTRO-APPROX: IN THE LUNG* (712)

DEPOSITION MODEL* (740)

DEPOSITIONAL

DEPOSITIONAL ENVIRONMENT OF ZINC, LEAD AND CADMIUM IN RESERVOIR SEDIMENTS* (164)

DEPOSITIONS

DEEP PROGRAM MANUAL: A COMPUTER CODE FOR CALCULATING DOSES, POPULATION DOSES, AND GROUND DEPOSITIONS DUE TO ATMOSPHERIC EMISSIONS OF RADIOISOTOPES* (720)

DEPOSITS

A COMPREHENSIVE MODEL STUDY OF SALT DRIFT DEPOSITS, INDUCED FOGGING AND ICING FROM MECHANICAL DRAFT COOLING TOWER FLOWES AT INDIAN POINT* (230)

DESCRIPTING

DEVELOPMENT OF A COMPLETE MATHEMATICAL MODEL FOR DESCRIBING THE POINT BEACH NUCLEAR POWER PLANT THERMAL FLOWES* (162)

DESCRIPTORS

PROGRAM DESCRIPTIONS, SUPPLEMENT TO MESOSCALE WIND FIELDS AND TRANSPORT ESTIMATES DETERMINED FROM A NETWORK OF WIND TOWERS* (126)

DESIGN

DESIGN OF THE SULFATE REGIONAL EXPERIMENT (SPRE)* (216)

DESIGN AND SITING CRITERIA FOR ONCE-THROUGH COOLING SYSTEMS BASED ON A FIRST-ORDER THERMAL PLUME MODEL* (163)

EFFECTS OF DISCHARGE DESIGN ON THE THERMAL MIXING ZONE IN WATERWAYS* (160)

OPTIMIZATION MODELS FOR RIVER BASIN WATER QUALITY MANAGEMENT AND WASTE TREATMENT PLANT DESIGN* (630)

FISH INDIAGNEMENT SAMPLING DESIGN & ESTIMATION METHOD SOFTWARE SYSTEM* (762)

DESTRUCTION

EFFECT OF WATER VAPOR ON THE DESTRUCTION OF OZONE IN THE STRATOSPHERE PERTURBED BY CLX OR NOX POLLUTANTS* (166)

STRATOSPHERIC OZONE DESTRUCTION BY AIRCRAFT-INDUCED NITROGEN OXIDES* (160)

DETECTION

OPTIMAL PREVENTION AND DETECTION MODEL FOR POLLUTION PATROL SPLLS* (135)

APPLICATION OF REMOTE SENSING FOR PREDICTION AND DETECTION OF THERMAL POLLUTION* (167)

TITLE INDEX

- DETERMINE**
A PROCEDURE TO DETERMINE THE RELATIVE EXTENT OF REACTOR FISSION PRODUCT RELEASES UNDER VARIOUS METEOROLOGICAL CONDITIONS* (146)
A FORTRAN PROGRAM TO DETERMINE ABSORBED ORGAN DOSE DUE TO INHALATION OF RADIONUCLIDES* (748)
- DETERMINED**
PROGRAM DESCRIPTIONS, SUPPLEMENT TO MESOSCALE WIND FIELDS AND TRANSPORT ESTIMATES DETERMINED FROM A NETWORK OF WIND TOWERS* (324)
ADVECTION OF ARTIFICIALLY PRODUCED UPPER ATMOSPHERIC CLOUDS IN EMPIRICALLY DETERMINED WIND FIELDS* (339)
- DETONATIONS**
A CODE TO ESTIMATE STRONTIUM-90 GLOBAL DEPOSITION FROM ATMOSPHERIC NUCLEAR DETONATIONS* (239)
- DETROIT**
MATHEMATICAL MODELS FOR SO₂ DISPERSION IN THE METROPOLITAN DETROIT AREA* (49)
- DEVELOPED**
A REGIONAL AIR QUALITY SIMULATION MODEL (A DESCRIPTION OF THE CONNECTICUT AIR POLLUTION MODEL AS DEVELOPED BY THE TRAVELERS RESEARCH CENTER)* (175)
DESCRIPTION AND DOCUMENTATION OF THE HYDROLOGIC TRANSPORT MODEL (HMT) DEVELOPED AT THE UNIVERSITY OF WISCONSIN* (932)
- DEVELOPING**
DEVELOPING A PRACTICAL DISPERSION MODEL FOR AN AIR QUALITY REGION* (197)
MATHEMATICAL MODEL FOR PREDICTING ENVIRONMENTAL AND HUMAN HEALTH EFFECTS OF DEVELOPING NUCLEAR REACTOR PROGRAMS* (693)
- DIAMETER**
LAGRANGIAN TRANSPORT AND DIFFUSION CODE TO CALCULATE CONCENTRATIONS AND DEPOSITION AT LONG RANGE OF PARTICLES LESS THAN 10 MICRO METERS DIAMETER* (238)
- DIESEL**
DIGITAL SIMULATION OF DIESEL EXHAUST CONTAMINATION OF FINE VENTILATION SYSTEMS* (307)
- DIET**
FALLOUT ON DIET (DOSES FROM RADIONUCLIDE DEPOSITION ON FOOD CROPS)* (675)
- DIFFERENCE**
TWO-DIMENSIONAL, FINITE DIFFERENCE LINE SOURCE MODEL* (79)
DIFFERENCE ANALOGUES OF BOUNDARY-VALUE PROBLEMS FOR THE EQUATIONS OF GLOBAL RADIOISOTOPE CONTAMINANT TRANSPORT AND THEIR NUMERICAL SOLUTION: DIFFERENCE APPROXIMATION OF EQUATIONS AND BOUNDARY CONDITIONS IN THE HORIZONTAL PLANE AND THE ZONAL BELT OF THE ATMOSPHERE* (129)
PREDICTION OF TEMPERATURE PROFILES IN ARBITRARILY SHAPED COOLING LAKES BY FINITE DIFFERENCE TECHNIQUES* (415)
FINITE-DIFFERENCE MODEL FOR AQUIFER SIMULATION IN TWO DIMENSIONS WITH RESULTS OF NUMERICAL EXPERIMENTS* (654)
- DIFFUSED**
THERMAL PLUME, SUBMERGED MULTIPORT DIFFUSED MODEL* (492)
- DIFFUSION**
DISPERSION OF BROMINE FROM AUTO EXHAUST: A SIMPLE DIFFUSION MODEL* (2)
CALIBER: AN IMPROVED MESOSCALE MODEL FOR THE DIFFUSION OF AIR POLLUTANTS FROM A LINE SOURCE* (16)
USE OF LAPS SYSTEM FOR THE QUANTITATIVE DETERMINATION OF SMOKE PLUME LATELAL DIFFUSION COEFFICIENTS FROM ERIS IMAGES OF VIRGINIA* (17)
DIPORT, MODEL FOR COMPUTATION OF AEROSOL TRANSPORT AND DIFFUSION IN THE ATMOSPHERE* (43)
A SIMPLE DIFFUSION MODEL FOR CALCULATING POINT CONCENTRATIONS FROM MULTIPLE SOURCES* (45)
ATMOSPHERIC DIFFUSION AND DEPOSITION OF PARTICULATE MATTER* (47)
A MODEL OF DIFFUSION IN A VALLEY FROM A CONTINUOUS POINT SOURCE* (95)
A REGIONAL-CONTINENTAL SCALE TRANSPORT, DIFFUSION, AND DEPOSITION MODEL* (111)
ATMOSPHERIC DIFFUSION IN THE SURFACE TURBULENT BOUNDARY LAYER* (126)
NUMERICAL MODELING OF THE TRANSPORT, DIFFUSION, AND DEPOSITION OF POLLUTANTS FOR REGIONS AND EXTENDED SCALES* (135)
THE APPLICATION OF K-THEORY TO DIFFUSION PROBLEMS INVOLVING NONLINEAR CHEMICAL REACTIONS* (143)
INVARIANT MODEL OF ATMOSPHERIC BOUNDARY LAYER DIFFUSION* (154)
COMPUTATIONAL DIFFUSION IN ATMOSPHERIC BOUNDARY LAYER MODELS* (167)
USEP'S MANUAL FOR THE APPAC-2 URBAN DIFFUSION MODEL COMPUTER PROGRAM* (170)
TURBULENT DIFFUSION AND POLLUTANT TRANSPORT IN SHORELINE ENVIRONMENTS* (172)
USEP'S MANUAL FOR THE APPAC-1A URBAN DIFFUSION MODEL COMPUTER PROGRAM* (185)
AN URBAN AIR DIFFUSION MODEL FOR ESTIMATING LONG TERM AVERAGE VALUES OF AIR QUALITY* (186)
USEP'S GUIDE TO DIFFUSION/KINETICS (DIPKIN) CODE,;* (188)
AN ATMOSPHERIC DIFFUSION MODEL FOR METROPOLITAN AREAS* (198)
MATHEMATICAL AND TECHNICAL APPROACH TO DIFFUSION ANALYSIS OF AIR CONTAMINANTS* (215)
INVARIANT MODELING OF ATMOSPHERIC TURBULENCE AND DIFFUSION* (217)
PREDICTION BY NUMERICAL MODELS OF TRANSPORT AND DIFFUSION IN AN URBAN BOUNDARY LAYER* (233)
ATMOSPHERE TRANSPORT AND DIFFUSION MODEL* (235)
LAGRANGIAN TRANSPORT AND DIFFUSION CODE TO CALCULATE CONCENTRATIONS AND DEPOSITION AT LONG RANGE OF PARTICLES LESS THAN 10 MICRO METERS DIAMETER* (238)
POINT SOURCE ATMOSPHERIC DIFFUSION MODEL WITH VARIABLE WIND AND DIFFUSIVITY PROFILES* (259)
AIR QUALITY DIFFUSION MODEL: APPLICATION TO NEW YORK CITY* (293)
ATMOSPHERIC TRANSPORT AND DIFFUSION IN THE PLANETARY BOUNDARY LAYER* (321)
AN URBAN DIFFUSION SIMULATION MODEL FOR CARBON MONOXIDE* (353)
THE NUMERICAL SOLUTION OF PARABOLIC EQUATIONS APPLIED TO "SMOKE DIFFUSION" IN THE OCEAN* (469)
OCEANIC DIFFUSION OF A SEVERE ACCIDENTAL RADIONUCLIDE RELEASE FROM A SUBSEA NUCLEAR-POWER PLANT* (471)
TURBULENT DIFFUSION MODEL OF OIL IN THE OCEAN* (513)
POTOMAC RIVER TEMPERATURE RISE DISTRIBUTION AND DIFFUSION PARAMETER EVALUATION* (521)
OIL SPILL TRANSPORT AND DIFFUSION PREDICTION* (604)
LINEAR DIFFUSION AND CONVECTION OF CHEMICALS IN SOILS* (648)
GENERAL ONE-DIMENSIONAL ATMOSPHERIC, CHEMICAL, THERMAL, DIFFUSION, AND RAINFALL MODEL* (819)
- DIFFUSION**
A NEW FALLOUT TRANSPORT CODE FOR THE DELTA SYSTEM: THE DIFFUSIVE TRANSPORT MODULE* (213)
- DIFFUSIVITY**
POINT SOURCE ATMOSPHERIC DIFFUSION MODEL WITH VARIABLE WIND AND DIFFUSIVITY PROFILES* (259)
- DIPKIN**
USER'S GUIDE TO DIFFUSION/KINETICS (DIPKIN) CODE,;* (188)
- DIPORT**
DIPORT, MODEL FOR COMPUTATION OF AEROSOL TRANSPORT AND DIFFUSION IN THE ATMOSPHERE* (43)
- DIGITAL**
DIGITAL SIMULATION OF DIESEL EXHAUST CONTAMINATION OF FINE VENTILATION SYSTEMS* (307)
DIGITAL SIMULATION OF AGGREGATION AND DEGRADATION IN NATURAL STREAMS* (388)

TITLE INDEX

DIGITAL

DIGITAL COMPUTER SIMULATION OF THERMAL EFFLUENT DISPERSION IN RIVERS, LAKES, AND ESTUARIES* (412)
 PREPARATION, VERIFICATION AND USE OF A DIGITAL GROUNDWATER SIMULATION PROGRAM* (464)
 DIGITAL MODELING OF RADIOACTIVE AND CHEMICAL WASTE TRANSPORT IN THE SHARE RIVER PLAIN AQUIFER AT THE NATIONAL PETROBRAS TESTING STATION, IDAHO* (555)
 SELECTED DIGITAL COMPUTER TECHNIQUES FOR GROUNDWATER RESOURCE EVALUATION* (656)
 ASITE II, A DIGITAL COMPUTER PROGRAM FOR INVESTIGATION OF REACTOR SITES* (682)
 CURIE-ROSE-THOMPSON: A DIGITAL COMPUTER PROGRAM FOR EXTERNAL AND INTERNAL RADIATION DOSE CALCULATIONS* (707)
 EVALUATION OF A DIGITAL COMPUTER METHOD FOR ANALYSIS OF COMPARTMENTAL MODELS OF ECOLOGICAL SYSTEMS* (785)
 NEPHES - A DIGITAL COMPUTER CODE FOR ESTIMATING REGIONAL RADIOLOGICAL EFFECTS FROM THE NUCLEAR POWER INDUSTRY* (793)

DIGRAPH

WEIGHTED DIGRAPH MODELS FOR THE ASSESSMENT OF ENERGY USE AND AIR POLLUTION IN TRANSPORTATION SYSTEMS* (274)

DILUTION

THREE-DIMENSIONAL NUMERICAL MODEL FOR CALCULATING THE SPREAD AND DILUTION OF AIR POLLUTANTS* (147)

DIMENSIONAL

ONE-DIMENSIONAL, FINITE DIFFERENCE LINE SOURCE MODEL* (79)
 NUMERICAL INTEGRATION EXPERIMENTS WITH VARIABLE-RESOLUTION TWO-DIMENSIONAL CARTESIAN GRIDS USING THE POI METHOD* (140)
 THREE-DIMENSIONAL NUMERICAL MODEL FOR CALCULATING THE SPREAD AND DILUTION OF AIR POLLUTANTS* (147)
 TWO-DIMENSIONAL MODEL FOR THE TRANSPORT OF POLLUTANTS IN AN URBAN BASIN* (156)
 A TWO-DIMENSIONAL TRANSPORT MODEL OF THE ATMOSPHERE* (169)
 TWO-DIMENSIONAL NUMERICAL MODEL FOR SIMULATING FORMATION AND DISSIPATION OF ADVECTION FOGS: A FIELD INVESTIGATION AND NUMERICAL SIMULATION OF COASTAL FOG* (177)
 A THREE-DIMENSIONAL STRATOSPHERIC POINT-SOURCE TRACER EXPERIMENT AND ITS IMPLICATIONS FOR DISPERSION OF EFFLUENT FROM A FLEET OF SUPERSONIC AIRCRAFT* (178)
 A THREE-DIMENSIONAL, URBAN SCALE, MATHEMATICAL MODEL OF PHOTOCHEMICAL AIR POLLUTION* (194)
 RAIN TWO-DIMENSIONAL CIRCULUS DYNAMICS MODEL WITH AEROSOL SCAVENGING* (203)
 A TWO-DIMENSIONAL WARM FOG MODIFICATION MODEL* (207)
 THE STRUCTURE OF THE TWO-DIMENSIONAL INTERNAL BOUNDARY LAYER OVER A SUDDEN CHANGE OF SURFACE ROUGHNESS* (255)
 A TWO DIMENSIONAL GLOBAL CLIMATIC MODEL* (285)
 MASS ADJUSTED THREE DIMENSIONAL WIND FIELD MODEL* (292)
 THREE-DIMENSIONAL MESOSCALE NUMERICAL MODEL OF THE ATMOSPHERE* (337)
 TWO-DIMENSIONAL NUMERICAL SIMULATION OF THE EFFECTS OF AIR POLLUTION UPON THE URBAN-RURAL COMPLEX* (384)
 ONE-DIMENSIONAL, REGIONAL TEMPERATURE SIMULATION MODEL* (421)
 ONE-DIMENSIONAL HYDRODYNAMIC AND WATER QUALITY CONDITIONS IN ESTUARIES AND CONTROLLED RIVERS* (426)
 A TRANSIENT, TWO-DIMENSIONAL, DISCRETE-ELEMENT MODEL FOR FAR-FIELD ANALYSIS OF DISCHARGES IN COASTAL REGIONS* (427)
 A TWO-DIMENSIONAL FINITE ELEMENT MODEL FOR THE MIGRATION OF CONTAMINANTS IN CONFINED AND UNCONFINED AQUIFERS* (442)
 A THREE-DIMENSIONAL FINITE ELEMENT MODEL FOR THE MIGRATION OF CONTAMINANTS IN CONFINED AND UNCONFINED AQUIFERS* (443)
 TRANSIENT THREE DIMENSIONAL MODELING OF TEMPERATURE DISTRIBUTIONS IN RIVERS WITH AND WITHOUT THERMAL DISCHARGES* (452)
 THREE-DIMENSIONAL NUMERICAL MODELS FOR THE PREDICTION OF THERMAL DISCHARGES* (475)
 TWO-DIMENSIONAL, HYDROSTATIC SIMULATION OF THERMALLY-INFLUENCED HYDRODYNAMIC FLOWS* (552)
 TWO-DIMENSIONAL NUMERICAL MODEL OF THE NEAR-FIELD FLOW FOR AN OCEAN THERMAL POWER PLANT: THE THEORETICAL APPROACH AND A LABORATORY SIMULATION* (553)
 THREE-DIMENSIONAL THERMAL POLLUTION MODEL* (563)
 THREE-DIMENSIONAL SIMULATION OF THERMALLY-INFLUENCED HYDRODYNAMIC FLOWS* (573)
 A USER'S MANUAL FOR THREE-DIMENSIONAL HEATED SURFACE DISCHARGE COMPUTATIONS* (580)
 COMPUTER-MODEL FOR THREE-DIMENSIONAL SIMULATION OF THERMAL DISCHARGES INTO RIVERS* (588)
 TWO DIMENSIONAL TRANSIENT HYDRO-THERMAL MATHEMATICAL MODEL* (596)
 TWO-DIMENSIONAL TRANSIENT FAR-FIELD TEMPERATURE DISTRIBUTION IN RIVERS WITH ARBITRARY HEAT SOURCES* (607)
 ANALYTICAL THREE-DIMENSIONAL TRANSIENT MODELING OF EFFLUENT DISCHARGES* (614)
 TWO-DIMENSIONAL TEMPERATURE MODEL FOR A THERMALLY LOADED RIVER WITH STEADY DISCHARGE* (616)
 ONE-DIMENSIONAL TRANSIENT NONISOTHERMAL TWO-PHASE, TWO COMPONENT FLOW OF FLUIDS AND GASES THROUGH LAYERED POROUS MEDIA* (646)
 ONE-DIMENSIONAL MODEL OF THE MOVEMENT OF TRACE RADIOACTIVE SOLUTE THROUGH SOIL COLUMNS - THE PERCOL MODEL* (653)
 GENERAL ONE-DIMENSIONAL ATMOSPHERIC, CHEMICAL, THERMAL, DIFFUSION, AND RAINFALL MODEL* (819)

DIMENSIONS

DEVELOPMENT OF A GENERAL COMPUTER MODEL FOR SIMULATING THERMAL DISCHARGES IN THREE DIMENSIONS* (399)
 FINITE-DIFFERENCE MODEL FOR AQUIFER SIMULATION IN TWO DIMENSIONS WITH RESULTS OF NUMERICAL EXPERIMENTS* (654)

DIOXIDE

INFLUENCE OF SULFUR DIOXIDE ON VEGETATION WITH EMPHASIS ON SIMULATION MODELS* (62)
 DISPERSION OF SULFUR DIOXIDE EMISSIONS FROM AREA SOURCES* (88)
 MODEL FOR THE DISPERSAL OF SULFUR DIOXIDE OVER AN URBAN AREA* (97)
 FORMATION OF SULFATE IN THE STRATOSPHERE THROUGH THE GAS PHASE OXIDATION OF SULFUR DIOXIDE* (108)
 GEOCHEMICAL OCEAN SECTIONS STUDY - GROSSCS - SEDIMENT DISSOLUTION, MODEL FOR FOSSIL FUEL CARBON DIOXIDE* (117)
 CARBON DIOXIDE IN THE ATMOSPHERE AND GREENHOUSE EFFECT MODEL* (176)
 IMPACT OF ENERGY SHORTAGE ON AMBIENT SULFUR DIOXIDE AND PARTICULATE LEVELS IN METROPOLITAN BOSTON* (296)
 A SHORT-TERM AIR QUALITY MODEL FOR SULFUR DIOXIDE IN LOUISVILLE, KENTUCKY* (351)

DISCHARGE

EXPERIMENTAL AND ANALYTICAL STUDIES OF CONDENSED WATER DISCHARGE FOR THE ATLANTIC GENERATING STATION* (447)
 MODELING AND OPTIMIZATION OF TRANSIENT COOLING WATER DISCHARGE FROM POWER GENERATING PLANTS, APPLICATIONS TO REGIONAL SITUATIONS* (457)
 MATHEMATICAL MODELS FOR THE PREDICTION OF TEMPERATURE DISTRIBUTIONS RESULTING FROM THE DISCHARGE OF HEATED WATER INTO LARGE BODIES OF WATER* (466)
 BUOYANT JET DISCHARGE MODEL, SEABROOK NUCLEAR STATION* (473)
 KCH AND PAR-PLUME BEHAVIOR FOR ROUND OR SLOT UNDERWATER DISCHARGE INCLUDING MULTIPORT DISCHARGES* (484)
 ANALYSIS OF SUBMERGED THERMAL DISCHARGE FROM OCEAN-SITED POWER PLANTS* (488)
 THERMAL PLUME, SURFACE DISCHARGE MODEL* (493)
 EFFECTS OF DISCHARGE DESIGN ON THE THERMAL MIXING ZONE IN RIVERWAYS* (560)
 SURFACE DISCHARGE OF HEATED WATER* (578)
 A USER'S MANUAL FOR THREE-DIMENSIONAL HEATED SURFACE DISCHARGE COMPUTATIONS* (580)

TITLE INDEX

DISCHARGE

TWO-DIMENSIONAL TEMPERATURE MODEL FOR A THERMALLY LOADED RIVER WITH STEADY DISCHARGES* (456)
A MODEL FOR THE APPROXIMATE CALCULATION OF SAFE RATES OF DISCHARGE OF RADIOACTIVE WASTES INTO MARINE ENVIRONMENTS* (461)

DISCHARGES

DEVELOPMENT OF A GENERAL COMPUTER MODEL FOR SIMULATING THERMAL DISCHARGES IN THREE DIMENSIONS* (391)
LABORATORY EXPERIMENTS OF SUBMERGED DISCHARGES WITH CURRENT* (407)
A TRANSIENT, TWO-DIMENSIONAL, DISCRETE-ELEMENT MODEL FOR FAR-FIELD ANALYSIS OF DISCHARGES IN COASTAL REGIONS* (427)
PREDICTION OF SURFACE PLUME AREAS ASSOCIATED WITH HEATED DISCHARGES INTO LARGE LAKES - A PHENOMENOLOGICAL MODEL* (433)
FOREGOING THE EFFECTS OF POLLUTING DISCHARGES ON ESTUARIES* (435)
TRANSIENT THREE-DIMENSIONAL MODELLING OF TEMPERATURE DISTRIBUTIONS IN RIVERS WITH AND WITHOUT THERMAL DISCHARGES* (452)
COMPUTER MODEL FOR PREDICTING THERMAL DISCHARGES IN LARGE LAKES* (456)
THREE-DIMENSIONAL NUMERICAL MODELS FOR THE PREDICTION OF THERMAL DISCHARGES* (475)
KOH AND FAR-PLUME BEHAVIOR FOR PUMPED OR SLOTT UNDERPUMPED DISCHARGE INCLUDING MULTIPLE DISCHARGES* (484)
PREDICTION OF TEMPERATURE INCREASES FROM THERMAL DISCHARGES: A SYSTEMS APPROACH* (496)
TEMPERATURE DISTRIBUTION IN THE VICINITY OF HEATED DISCHARGES FROM POWER PLANTS* (499)
MATHEMATICAL DISPERSION MODEL FOR HEATED DISCHARGES* (525)
EVALUATION OF THERMAL DISCHARGES FROM TREAT ELECTRIC GENERATING STATIONS* (539)
DECONTAMINATION AND RECIRCULATION SIMULATOR FOR FLOW CONDITIONS NEAR SUBMERGED DISCHARGES* (540)
NUMERICAL MODEL FOR THERMAL PLUMES AND RIVER DISCHARGES* (541)
AN ANALYTICAL AND EXPERIMENTAL INVESTIGATION OF SURFACE DISCHARGES OF HEATED WATER* (579)
COMPUTER MODEL FOR THREE-DIMENSIONAL SIMULATION OF THERMAL DISCHARGES INTO RIVERS* (588)
MATHEMATICAL DISPERSION MODELS FOR HEATED DISCHARGES* (590)
ANALYTICAL THREE-DIMENSIONAL TRANSIENT MODELING OF EFFLUENT DISCHARGES* (614)

DISPERSE

A TRANSIENT, TWO-DIMENSIONAL, DISCRETE-ELEMENT MODEL FOR FAR-FIELD ANALYSIS OF DISCHARGES IN COASTAL REGIONS* (427)

DISPERSED

MODEL FOR THE DISPERSAL OF SULFUR DIOXIDE OVER AN URBAN AREA* (17)

DISPERSION

A COMPUTER CODE FOR ESTIMATING AIR POLLUTANT CONCENTRATIONS FROM DISPERSED SOURCES* (205)

DISPERSED

IRON CATALYZED OXIDATION OF CO₂ TO ACID SULFATE MIST IN DISPERSING PLUMES* (43)
OXIDATION OF CO₂ TO SULFATES IN DISPERSING PLUMES* (171)

DISPERSION

DISPERSION OF SO₂ FROM AUTO EXHAUST: A SIMPLE DISPERSION MODEL* (2)
AIR QUALITY MANUAL: METEOROLOGY AND ITS INFLUENCE IN THE DISPERSION OF POLLUTANTS FROM HIGHWAY LINE SOURCES* (4)
CALIFORNIA LINE SOURCE DISPERSION MODEL, 190 GENERATION* (11)
MODELLING OF THE EFFECTS OF GASEOUS AND PARTICULATE POLLUTANTS IN THE URBAN ATMOSPHERE: POLLUTANT DISPERSION* (12)
PRINCIPAL PLUME DISPERSION MODELS: TVA POWER PLANTS* (33)
MATHEMATICAL MODELS FOR SO₂ DISPERSION IN THE METROPOLITAN DETROIT AREA* (40)
MULTIPLE SOURCE DISPERSION MODEL* (77)
DISPERSION OF SULFUR DIOXIDE EMISSIONS FROM AREA SOURCES* (94)
REGIONAL ATMOSPHERIC DISPERSION AND FINITE-CLOUD DOSES DURING NORMAL, SEA-BREEZE, AND ACCIDENT CONDITIONS* (99)
A SIMPLE METHOD OF CALCULATING DISPERSION FROM URBAN AREA SOURCES* (103)
A SIMPLE DISPERSION MODEL FOR THE ANALYSIS OF CHEMICALLY REACTIVE POLLUTANTS* (105)
DESCRIPTION OF ADEL COMPUTER MODEL FOR DISPERSION FROM MULTIPLE SOURCES* (106)
THE EFFECT OF GROUND LEVEL ABSORPTION ON THE DISPERSION OF POLLUTANTS IN THE ATMOSPHERE* (112)
MODELLING ATMOSPHERIC DISPERSION OF LEAD FROM AUTOMOTIVE SOURCES* (133)
A MODEL FOR RADIOLOGICAL DISPERSION FROM TORNADO ACCIDENTS* (138)
CLIMATOLOGICAL DISPERSION MODEL* (141)
SHORT TERM DISPERSION MODELS* (152)
SECOND ORDER TURBULENCE MODEL FOR ATMOSPHERIC POLLUTANT DISPERSION* (151)
THE CHEMISTRY, DISPERSION, AND TRANSPORT OF AIR POLLUTANTS EMITTED FROM FOSSIL FUEL POWER PLANTS IN CALIFORNIA: DATA ANALYSIS AND EMISSION IMPACT MODEL* (154)
A THREE-DIMENSIONAL STRATOSPHERIC POINT-SOURCE TRACER EXPERIMENT AND ITS IMPLICATIONS FOR DISPERSION OF EFFLUENT FROM A FLEET OF SUPERSONIC AIRCRAFT* (178)
A REVIEW OF METHODS FOR PREDICTING AIR POLLUTION DISPERSION, AIR POLLUTION MODELS, AND PROBLEM AREAS IN AIR POLLUTION DISPERSION MODELING* (189)
DEVELOPING A PRACTICAL DISPERSION MODEL FOR AN AIR QUALITY REGION* (197)
COMPREHENSIVE ANALYSIS OF TIME-CONCENTRATION RELATIONSHIPS AND VALIDATION OF A SINGLE-SOURCE DISPERSION MODEL* (200)
A SIMPLIFIED TECHNIQUE USED TO EVALUATE ATMOSPHERIC DISPERSION OF EMISSIONS FROM LARGE POWER PLANTS* (204)
SOFTWARE DEVELOPMENT AND AIR POLLUTION DISPERSION MODEL TESTING* (218)
THEORETICAL MODELS FOR LNG DISPERSION* (220)
PLUME RISE AND DISPERSION MODEL* (232)
THE ESTIMATION OF THE DISPERSION OF WINDBORNE MATERIALS* (234)
COMPUTER MODEL FOR THE PREDICTION OF THE DISPERSION OF AIRBORNE RADIOACTIVE POLLUTANTS* (241)
TVA GASEOUS DISPERSION CODE* (257)
A MULTIPLE-SOURCE URBAN ATMOSPHERIC DISPERSION MODEL* (276)
A PROGRAM FOR EVALUATING ATMOSPHERIC DISPERSION FROM A NUCLEAR POWER STATION* (281)
ASSESSMENT OF THE AMBIENT AIR IMPACT OF MULTIPLE STACK INDUSTRIAL PLANTS USING DISPERSION MODELING* (283)
DEVELOPMENT OF VERTICAL DISPERSION COEFFICIENTS FOR ROLLING TERRAIN ENVIRONMENTS* (291)
REGIONAL EFFLUENT DISPERSION CALCULATIONS CONSIDERING SPATIAL AND TEMPORAL METEOROLOGICAL VARIATIONS* (300)
LONG TERM ATMOSPHERIC DISPERSION CALCULATION* (304)
MODEL FOR THE DISPERSION OF PARTICULATE OR GASEOUS POLLUTANTS FROM A NETWORK OF STREETS AND HIGHWAYS* (305)
CLIMATOLOGICAL DISPERSION MODEL* (310)
A STEADY-STATE, UNIVARIATE GAUSSIAN PLUME DISPERSION ALGORITHM* (319)
MODELLING OF THE EFFECTS OF POLLUTANTS AND DISPERSION IN URBAN ATMOSPHERES* (323)
A MULTIVARIABLE MODEL FOR ATMOSPHERIC DISPERSION PREDICTIONS* (355)
SRI LONG-TERM GAUSSIAN DISPERSION MODEL* (364)
MATHEMATICAL MODELS FOR THE DISPERSION OF RADIOISOTOPES IN AQUATIC SYSTEMS* (391)

TITLE INDEX

DISPERSION

DIGITAL COMPUTER SIMULATION OF THERMAL EFFLUENT DISPERSION IN RIVERS, LAKES, AND ESTUARIES* (412)
 PREDICTIONS OF HEATED EFFLUENT DISPERSION IN A STREAM USING SIMILARITY TECHNIQUES* (418)
 A STUDY OF TIDAL DISPERSION IN THE POTOMAC RIVER* (459)
 A SURVEY OF DISPERSION COEFFICIENTS FOR ESTIMATING POLLUTANT TRANSPORT* (462)
 NUMERICAL COMPUTATION OF WASTE-HEAT DISPERSION IN A RECEIVING WATER BODY* (467)
 SIMPLE METHOD FOR PREDICTING DISPERSION IN STREAMS* (504)
 THERMAL DISPERSION MODELING OF THE PROPOSED MONROE NUCLEAR POWERED PLANT* (522)
 MATHEMATICAL DISPERSION MODEL FOR HEATED DISCHARGES* (525)
 NUMERICAL AND ANALYTICAL SOLUTIONS OF DISPERSION PROBLEMS IN HOMOGENEOUS AND LAYERED AQUIFERS* (545)
 MATHEMATICAL SIMULATION OF DISPERSION OF POLLUTANTS IN A LAKE WITH ICE COVER* (574)
 MATHEMATICAL DISPERSION MODELS FOR HEATED DISCHARGES* (590)
 INVESTIGATION AND PREDICTION OF DISPERSION OF POLLUTANTS IN THE SEA WITH HYDRODYNAMICAL NUMERICAL (HNM) MODELS* (610)
 PULSED DISPERSION OF TRACE CHEMICAL CONCENTRATIONS IN A SATURATED SORBING POROUS MEDIUM* (607)
 ATMOSPHERIC DISPERSION MODEL AS USED IN THE REACTOR SAFETY STUDY, WASH-1400* (608)
 APPROXIMATE STEADY STATE TRANSPORT DISPERSION AND DOSIMETRY CODE* (723)
 COMPUTATION AND MAPPING OF THE DISPERSION AND DEBRIDGE UPTAKE OF GASEOUS EFFLUENTS FROM INDUSTRIAL PLANTS* (750)
 PREDICTIVE STUDY OF THE DISPERSION OF EMISSIONS FROM THE SYNOUDE WILDBED LAKE PLANT* (808)

DISPOSAL

DEEP SEA OCEAN DISPOSAL OF PETROCHEMICAL PLANT WASTES* (393)
 CHEMICAL MODELING OF METALLIC WASTE DISPOSAL* (510)
 A MODEL FOR CALCULATING EFFECTS OF LIQUID WASTE DISPOSAL IN DEEP SALINE AQUIFERS* (519)
 A MODEL FOR CALCULATING EFFECTS OF LIQUID WASTE DISPOSAL IN DEEP SALINE AQUIFERS* (604)

DISSIPATION

TWO-DIMENSIONAL NUMERICAL MODEL FOR SIMULATING FORMATION AND DISSIPATION OF ADVECTION FOOT: A FIELD INVESTIGATION AND NUMERICAL SIMULATION OF COASTAL FOG* (177)

DISSOLUTION

GEOCHEMICAL OCEAN SECTIONS STUDY - GEOSecs - SEDIMENT DISSOLUTION, MODEL FOR FOSSIL FUEL CARBON DIOXIDE* (177)

DISSOLVED

NUTRIENT TRANSPORT AND DISSOLVED OXYGEN BUDGET STUDIES IN THE POTOMAC ESTUARY* (410)

DISTANCE

A CDC 5600 PROGRAM FOR CALCULATION OF INHALATION AND EXTERNAL DOSE FOR ESTABLISHING REACTOR Siting DISTANCE REQUIREMENTS* (698)

DISTRIBUTION

A THEORY OF THE MASS TRANSPORT OF PREVIOUSLY DISTRIBUTED CHEMICALS IN A WATER SATURATED SORBING POROUS MEDIUM* (449)

DISTRIBUTION

MATHEMATICAL MODELS FOR ANALYZING ORIGIN AND DISTRIBUTION OF COMBUSTION GENERATED POLLUTANTS IN GAS TURBINES: A MATHEMATICAL MODEL FOR JET ENGINE COMBUSTOR POLLUTANT EMISSIONS* (14)
 EFFECT OF A MESOSCALE TYPE WIND ON THE POLLUTANT DISTRIBUTION FROM A LINE SOURCE* (67)
 PLANETARY DISTRIBUTION OF ZONAL NEAR TRANSPORT PARAMETERS OF RADIOISOTOPES IN THE TROPOSPHERE AND LOWER STRATOSPHERE: CLIMATIC DISTRIBUTION OF THE ZONAL NEAR COMPONENTS OF THE REGIONAL CIRCULATION VELOCITY* (133)
 THERMAL EQUILIBRIUM OF THE ATMOSPHERE WITH A GIVEN DISTRIBUTION OF RELATIVE HUMIDITY* (181)
 TEMPERATURE DISTRIBUTION MODEL FOR COOLING PONDS* (49)
 TEMPERATURE DISTRIBUTION IN THE VICINITY OF HEATED DISCHARGES FROM POWER PLANTS* (499)
 RYAN-HARRIS--COOLING POND TEMPERATURE DISTRIBUTION* (501)
 POTOMAC RIVER TEMPERATURE RISE DISTRIBUTION AND DIFFUSION PARAMETER EVALUATION* (524)
 MATHEMATICAL MODEL FOR INDUCED VELOCITY DISTRIBUTION AROUND A SUBMERGED INTAKE* (591)
 TWO-DIMENSIONAL TRANSIENT PAR-FIELD TEMPERATURE DISTRIBUTION IN RIVERS WITH ARBITRARY HEAT SOURCES* (607)
 AN EMPIRICAL MODEL FOR DETERMINING THE SALINITY DISTRIBUTION IN THE COLORADO RIVER* (611)

DISTRIBUTIONS

MODEL FOR TIME-DEPENDENT RAINFALL SIZE DISTRIBUTIONS: APPLICATION TO THE WASHOUT OF AIRBORNE CONTAMINANTS* (1)
 POLLUTANT DISTRIBUTIONS IN THE MIXED LAYER, USING SIMILARITY THEORY* (64)
 ON THE BOUNDARY CONDITIONS IN THEORETICAL MODEL CALCULATIONS OF THE DISTRIBUTIONS OF RIMOP NEUTRAL CONSTITUENTS IN THE UPPER ATMOSPHERE* (244)
 TRANSIENT THREE DIMENSIONAL MODELING OF TEMPERATURE DISTRIBUTIONS IN RIVERS WITH AND WITHOUT THERMAL DISCHARGES* (452)
 MATHEMATICAL MODELS FOR THE PREDICTION OF TEMPERATURE DISTRIBUTIONS RESULTING FROM THE DISCHARGE OF HEATED WATER INTO LARGE BODIES OF WATER* (466)
 OBTAINING LOCATION/ARRIVAL-TIME AND LOCATION/OUTFLOW-QUANTITY DISTRIBUTIONS FOR STEADY FLOW SYSTEMS* (515)

DIURNAL

CALCULATION OF SELECTED PHOTOLYTIC RATE CONSTANTS OVER A DIURNAL RANGE: A COMPUTER ALGORITHM* (282)

DOCUMENT

SIMCORP VERSION 2.1 USER'S MANUAL AND MAINTENANCE DOCUMENT* (798)

DOCUMENTATION

NEPR'S GUIDE AND DOCUMENTATION FOR OUTFALL PLUME MODEL* (394)
 DOCUMENTATION FOR SUBINT/2, A COMPUTER PROGRAM FOR THE STEADY-STATE WATER QUALITY SIMULATION OF A STREAM NETWORK* (401)
 DOSAG-1, SIMULATION OF WATER QUALITY IN STREAMS AND CANALS: PROGRAM DOCUMENTATION AND USERS MANUAL* (530)
 A SIMULATION MODELING OF ENVIRONMENTAL EFFECTS OF THERMAL GENERATION, DOCUMENTATION OF THE COLHEAT MODEL* (572)
 DOCUMENTATION OF FOUR OCEAN-RELATED COMPUTER MODULES* (615)
 DESCRIPTION AND DOCUMENTATION OF THE HYDROLOGIC TRANSPORT MODEL (HNM) DEVELOPED AT THE UNIVERSITY OF WISCONSIN* (802)

DOSAGE

DOSAG-1, SIMULATION OF WATER QUALITY IN STREAMS AND CANALS: PROGRAM DOCUMENTATION AND USERS MANUAL* (530)

DOSAGE

ENGINEERING-POSITION REACTOR NEUTRONIC/ENERGY DEPOSITION/ACTIVATION /DOSAGE TO PERSONNEL MODEL* (716)

DOSE

AIR TRANSPORT MODELING FOR REGIONAL DOSE STUDIES* (68)
 A MODEL TO ESTIMATE RADIATION DOSE COMMITMENTS TO THE WORLD POPULATION FROM THE ATMOSPHERIC RELEASE OF RADIOISOTOPES* (271)

TITLE INDEX

DOSE

USERS MANUAL FOR CODE EGAR: A CODE TO CALCULATE GAMMA PHOTON DOSE FROM AN AIRBORNE RADIOACTIVE RELEASE* (333)
 A NEW TECHNIQUE FOR REACTOR SITING DOSE CALCULATIONS* (335)
 DOSE CALCULATION MODELS AND ASSUMPTIONS* (463)
 MODELLING THE DOSE TO MAN FROM EXPOSURE TO INITIATED WATER VAPOR* (497)
 CONVENTIONAL METHOD FOR CALCULATION OF RADIOLOGICAL DOSE RESULTING FROM HYPOTHETICAL FISSION PRODUCT RELEASE* (494)
 THE USE OF COMPUTERS TO CALCULATE RADIATION DOSE FROM METABOLIC MODELS* (495)
 BIOLOGICAL DOSE AND RADIOLOGICAL ACTIVITY FROM NUCLEAR REACTOR OR NUCLEAR WEAPON FISSION PRODUCTS* (527)
 DOSE CONVERSION CONSTANT CODE USED TO COMPUTE RADIOLOGICAL DOSE THROUGH VARIOUS PATHWAYS* (495)
 A REGIONAL AIR TRANSPORT MODEL FOR RADIOLOGICAL DOSE STUDIES* (496)
 A CDC 4600 PROGRAM FOR CALCULATION OF INHALATION AND EXTERNAL DOSE FOR ESTABLISHING REACTOR SITING DISTANCE REQUIREMENTS* (499)
 EXPOSURE/DOSE MODELS APPLIED TO ENVIRONMENTAL CARCINOGENS* (499)
 CURIE-DOSE-THRESHOLD: A DIGITAL COMPUTER PROGRAM FOR EXTERNAL AND INTERNAL RADIATION DOSE CALCULATIONS* (737)
 RADIOLOGICAL DOSE EFFECTS MODEL* (704)
 CONVENTIONAL COMPUTER CODES TO IMPLEMENT ICRP-10-10A MODELS FOR ESTIMATION OF INTERNAL RADIATION DOSE TO MAN* (712)
 DOSE MODELING FOR NUCLEAR FACILITIES* (714)
 CALCULATION OF DOSE AND POPULATION DOSE IN THE GENERAL ENVIRONMENT DUE TO BOILING-WATER NUCLEAR POWER REACTOR RADIONUCLIDE EMISSIONS IN THE UNITED STATES IN 1971* (722)
 THE AIRDOS-II COMPUTER CODE FOR ESTIMATING RADIATION DOSE TO MAN FROM AIRBORNE RADIONUCLIDES IN AREAS SURROUNDING NUCLEAR FACILITIES* (724)
 MODEL FOR ASSUMED DOSE PATTERNS IN MAN FROM EXPOSURE TO ENVIRONMENTAL GAMMABAYS* (726)
 CALCULATING ORGAN DOSE FROM RADIONUCLIDE INHALATION* (739)
 A MONTE CARLO CODE WITH SUPPORT PROGRAMS FOR DOSE COMPUTATION* (746)
 A SYSTEMS ANALYSIS METHODOLOGY FOR PREDICTING DOSE TO MAN FROM A RADIOACTIVELY CONTAMINATED TERRESTRIAL ENVIRONMENT* (767)
 A FORTRAN PROGRAM TO DETERMINE ABSORBED ORGAN DOSE DUE TO INHALATION OF RADIONUCLIDES* (748)
 STANDARD METHODOLOGY FOR CALCULATING RADIATION DOSE TO LOWER FORM BIOTA* (757)
 MODELS FOR RADIATION DOSE CALCULATIONS* (765)

DOSES

APCIS: ATMOSPHERIC DISPERSION AND FINITE-CLOUD DOSES DURING NORMAL, SEA-BREEZE, AND ACCIDENT CONDITIONS* (94)
 FALLOUT OF DIET (DOSES FROM RADIONUCLIDE DEPOSITION ON FOOD DROPS)* (475)
 DRY, A PROGRAM FOR THE CALCULATION OF ACTIVITY RELEASES AND POTENTIAL DOSES FROM A PRESSURIZED WATER REACTOR PLANT* (485)
 COMPUTER CODE FOR CALCULATING PERSONNEL DOSES DUE TO TERTIARY EXPOSURES* (704)
 THE EXH II COMPUTER CODE FOR ESTIMATING EXTERNAL RADIATION DOSES TO POPULATIONS FROM ENVIRONMENTAL RELEASES* (712)
 DOSES WHILE TRAVELING UNDER WELL ESTABLISHED PLANES* (719)
 AFTER PROGRAM MANUAL: A COMPUTER CODE FOR CALCULATING DOSES, POPULATION DOSES, AND GROUND DEPOSITIONS DUE TO ATMOSPHERIC EMISSIONS OF RADIONUCLIDES* (720)
 A COMPUTER CODE (BYRPOS) TO CALCULATE POPULATION DOSES FROM RADIOACTIVE LIQUID EFFLUENTS AND AN APPLICATION TO NUCLEAR POWER REACTORS OF THE MISSISSIPPI RIVER BASIN* (721)
 DOSES TO MAN FROM ATMOSPHERIC AND LIQUID EFFLUENTS* (727)
 A MODEL TO ESTIMATE THE LOCAL RADIATION DOSES TO MAN FROM THE ATMOSPHERIC RELEASE OF RADIONUCLIDES* (731)
 RADIATION DOSES TO POPULATIONS* (736)
 THE EXH II COMPUTER CODE FOR ESTIMATING EXTERNAL DOSES TO POPULATIONS FROM CONSTRUCTION OF A SEA LEVEL CANAL WITH NUCLEAR EXPLOSIVES* (742)
 A COMPUTER CODE TO CALCULATE DOSES RESULTING FROM RELEASES OF RADIONUCLIDES TO THE ATMOSPHERE* (745)
 ESTIMATING RADIATION DOSES* (770)

DOSE*

GADOSE AND DOSEY - PROGRAMS TO CALCULATE ENVIRONMENTAL CONSEQUENCES OF RADIOACTIVITY RELEASE* (713)

DOSE****PY

APGCHRE STEADY STATE URBAN DISPERSION AND DOSIMETRY CODE* (723)

DOUBLING

A GENERAL CIRCULATION MODEL SHOWING THE EFFECTS OF DOUBLING THE CO₂ CONCENTRATION ON THE CLIMATE* (102)

DRAFT

MULTIPLE CELL MECHANICAL DRAFT COOLING TOWER MODEL* (63)
 A DRIFT DEPOSITION MODEL FOR NATURAL DRAFT COOLING TOWERS* (122)
 NATURAL DRAFT COOLING TOWER PERFORMANCE* (156)
 A COMPREHENSIVE MODEL STUDY OF SALT DRIFT DEPOSITS, INDUCED FOGGING AND ICING FROM MECHANICAL DRAFT COOLING TOWER PLUMES AT INDIAN POINT* (230)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE AND MULTIPLE NATURAL-DRAFT COOLING TOWERS* (242)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (243)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE AND MULTIPLE NATURAL-DRAFT COOLING TOWERS* (244)
 A MODEL TO PREDICT SALT-DRIFT DEPOSITION FROM A NATURAL DRAFT COOLING TOWER* (245)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (246)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (247)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE OR MULTIPLE NATURAL-DRAFT COOLING TOWERS* (248)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (249)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (250)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (251)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (252)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE AND MULTIPLE NATURAL-DRAFT COOLING TOWERS* (253)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (254)
 A MODEL TO PREDICT PLUMES FROM A SINGLE NATURAL-DRAFT COOLING TOWER* (255)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (256)

DRAINAGE

PREDICTIVE AND POLLUTION ABATEMENT MODEL FOR ACID MINE DRAINAGE* (409)
 MODELS TO PREDICT ENVIRONMENTAL IMPACT OF MINE DRAINAGE OF STREAMS* (449)
 SIMULATION AND OPTIMIZATION OF ACID MINE DRAINAGE ABATEMENT ALTERNATIVES* (417)
 SIMULATION OF THE EFFECTS OF ACID MINE DRAINAGE IN INDOORWATERS* (423)
 PREDICTIVE AND POLLUTION ABATEMENT MODEL FOR MINE DRAINAGE* (457)

TITLE INDEX

- DREDGED**
APPLICATION OF ECOSYSTEM MODELING METHODOLOGIES TO DREDGED MATERIAL RESEARCH* (801)
- DRIFT**
A SIMPLE DRIFT DEPOSITION MODEL APPLIED TO THE CHALK POINT DYE TRACER EXPERIMENT* (104)
A DRIFT DEPOSITION MODEL FOR NATURAL DRIFT COOLING TOWERS* (122)
SALT DRIFT MODEL - DESCRIPTION* (224)
A COMPREHENSIVE MODEL STUDY OF SALT DRIFT DEPOSITS, INDUCED FOGGING AND ICING FROM MECHANICAL DRIFT COOLING TOWER PLUMES AT INDIAN POINT* (230)
DRIFT TRANSPORT MODEL* (231)
A MODEL TO PREDICT SALT-DRIFT DEPOSITION FROM A NATURAL DRIFT COOLING TOWER* (245)
RANDOM DRIFT OF AN IDEALIZED OIL PATCH* (479)
- DRIFT***
EMERGENCY MODEL OF DRIFT ENTRAINMENT FROM A CONTAINED OIL SLICK* (619)
- DRIPS**
FALLOUT OF DIRT (DROPS FROM RADIOISOTOPE DEPOSITION ON FOOD DROPS)* (675)
- DYE**
VERTICAL TRANSPORT AND REMOVAL OF RADIOACTIVE AEROSOLS IN THE ATMOSPHERE: QUANTITATIVE MODELS OF AEROSOL WASHOUT BY PRECIPITATION AND DRY DEPOSITION ON THE UNDERLYING SURFACE* (131)
- DUST**
THE ATMOSPHERIC RESPONSE TO A STRATOSPHERIC DUST CLOUD AS SIMULATED BY A GENERAL CIRCULATION MODEL* (7)
- DYE**
A SIMPLE DRIFT DEPOSITION MODEL APPLIED TO THE CHALK POINT DYE TRACER EXPERIMENT* (104)
- DYNAMIC**
DYNAMIC MODEL OF SEA SURFACE CIRCULATIONS AND POLLUTANT TRANSPORT* (304)
TIDE DYNAMIC ESTUARY MODEL* (430)
DYNAMIC ESTUARY MODEL, PEARL HARBOR APPLICATIONS* (544)
HYVA: DYNAMIC MODEL FOR URBAN HYDROLOGIC SYSTEMS* (582)
- DYNAMICS**
EFFECT OF HIGHWAY CONFIGURATIONS ON ENVIRONMENTAL PROBLEMS--DYNAMICS OF HIGHWAY ASSOCIATED AIR POLLUTION* (38)
A GLOBAL MODEL OF THE ATMOSPHERIC DYNAMICS, WIND AND DENSITY FIELDS DERIVED FROM A PHENOMENOLOGICAL TEMPERATURE* (56)
MESOSCALE AIR POLLUTION SIMULATION MODELING: THE FEASIBILITY OF MODELING PHOTOCHEMICAL AEROSOL DYNAMICS* (124)
3-D TWO-DIMENSIONAL CUMULUS DYNAMICS MODEL WITH AEROSOL SCAVENGING* (203)
SIMPLY OF LABORATORY MODELING OF PLUME DYNAMICS* (272)
DEPENDENCY: A WATERSHED LEVEL SIMULATION MODEL OF TREE BIOMASS DYNAMICS* (336)
FLOW DYNAMICS AND SEDIMENT MOVEMENT IN LOCKWOODS POLLEY INLET, NORTH CAROLINA* (487)
RESEARCH ON THE DYNAMICS OF ARCTIC TUNDRA ECOSYSTEMS* (674)
SIMULATION OF MOVEMENT OF OIL SLICKS IN THE STRAIT OF GEORGIA USING SIMPLE ATMOSPHERE AND OCEAN DYNAMICS* (409)
- E**
PREDICTED AND OBSERVED COOLING TOWER PLUME RISE AND VISIBLE PLUME LENGTH AT THE JOHN E. ABRAHAM POWER PLANT* (102)
- EARTH**
GLOBAL CLIMATIC MODEL BASED ON ENERGY BALANCE OF THE EARTH-ATMOSPHERE SYSTEM* (287)
- ECOLOGIC**
ECOLOGIC SIMULATION FOR AQUATIC ENVIRONMENTS* (408)
- ECOLOGICAL**
COMPARISON OF ECOLOGICAL IMPACTS OF POSTULATED OIL SPILLS AT SELECTED ALASKAN LOCATIONS* (458)
ECOLOGICAL TRANSFER MECHANISMS - TERRESTRIAL* (674)
EVALUATION OF A DIGITAL COMPUTER METHOD FOR ANALYSIS OF COMPARTMENTAL MODELS OF ECOLOGICAL SYSTEMS* (745)
- ECOLOGY**
MODELING THE EFFECTS OF TEMPERATURE CHANGE ON THE ECOLOGY OF BARRA PIPES AND THALASSIUS SIBIALIS* (766)
- ECONOMIC**
ECONOMIC AIR POLLUTION CONTROL MODEL FOR LOS ANGELES COUNTY IN 1975* (383)
MODELING THE ECONOMIC AND ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVE ENERGY POLICIES: SEAS-STRATEGIC ENVIRONMENTAL ASSESSMENT SYSTEM* (700)
- ECOSYSTEM**
THE AIR POLLUTION COMPONENT OF AN ECOSYSTEM SIMULATION MODEL* (74)
OPTIMAL CONTROL OF AN OIL REFINERY WASTE TREATMENT FACILITY: A TOTAL ECOSYSTEM APPROACH* (895)
MODELING LEAD POLLUTION IN A WATERSHED ECOSYSTEM* (557)
TRANSPORT MODEL FOR LONG TERM RADIOISOTOPE RELEASE INTO A STREAM ECOSYSTEM* (610)
SIMULATION APPROACH TO THE ANALYSIS OF STRIP-MINING IMPACT ON THE ECOSYSTEM WITH EMPHASIS ON WILDLIFE* (752)
APPLICATION OF ECOSYSTEM MODELING METHODOLOGIES TO DREDGED MATERIAL RESEARCH* (801)
- ECOSYSTEMS**
METABOLISM AND MODELS OF ESTUARINE BAY ECOSYSTEMS AFFECTED BY A COASTAL POWER PLANT* (498)
RESEARCH ON THE DYNAMICS OF ARCTIC TUNDRA ECOSYSTEMS* (674)
- EDY**
THE NUMERICAL SOLUTION OF PARABOLIC EQUATIONS APPLIED TO 'EDDY DIFFUSION' IN THE OCEAN* (469)
- EFFECTED**
WIND EFFECTED REDISTRIBUTION OF SURFACE CONTAMINATION* (4)
INVESTIGATION OF SOME FACTORS IN THE BIOCHEMICAL CONVERSION OF MERCURY POLLUTANTS TO TOXIC METHYLMERCURY EFFECTED BY MICRO-ORGANISMS IN A MARINE SEDIMENT* (500)
- EFFECTIVE**
FWS EFFECTIVE ENERGY PROGRAM* (717)
- EFFECTIVE***
MODEL FOR THE EFFICIENT ALLOCATION OF ENVIRONMENTAL ASSIMILATIVE CAPACITY: THE CASE OF THERMAL EMISSIONS TO A LARGE BODY OF WATER* (559)
- EFFLUENT**
A THREE-DIMENSIONAL STRATOSPHERIC POINT-SOURCE TRACER EXPERIMENT AND ITS IMPLICATIONS FOR DISPERSION OF EFFLUENT FROM A FLEET OF SUPERSONIC AIRCRAFT* (170)
TVA GASEOUS EFFLUENT LICENSING CODE FOR URANIUM MINING AND MILLING* (212)
REGIONAL EFFLUENT DISPERSION CALCULATIONS CONSIDERING SPATIAL AND TEMPORAL METEOROLOGICAL VARIATIONS* (300)
SOME TECHNIQUES FOR ESTIMATING THE RESULTS OF THE EMISSION OF RADIOACTIVE EFFLUENT FROM ORE STACKS* (343)
DIGITAL COMPUTER SIMULATION OF THERMAL EFFLUENT DISPERSION IN RIVERS, LAKES, AND ESTUARIES* (812)
PREDICTION OF HEATED EFFLUENT DISPERSION IN A STREAM USING SIMILITUDE TECHNIQUES* (818)

TYPE THREE

EFFLUENT

ANALYTICAL THREE-DIMENSIONAL TRANSIENT MODELING OF EFFLUENT DISCHARGES* (614)
 MATHEMATICAL MODEL OF THE ACCUMULATION OF RADIOISOTOPES BY OYSTERS (CL. VIRGINICA) AQUACULTURED IN THE
 EFFLUENT OF A NUCLEAR POWER REACTOR TO INCLUDE MAJOR BIOLOGICAL PARAMETERS* (753)

EFFLUENTS

NUMERICAL PREDICTION OF THE MESOSCALE TRANSPORT OF ATMOSPHERIC EFFLUENTS: PHILOSOPHY AND MORPHOLOGY OF
 EXPERIMENTAL MODELS FOR PREDICTING THE WIND AND POTENTIAL RADIOLOGICAL FIELDS OVER THE NEVADA TEST
 SITE* (264)
 A COMPUTER CODE (BYRBOG) TO CALCULATE POPULATION DOSES FROM RADIOACTIVE LIQUID EFFLUENTS AND AN APPLICATION
 TO NUCLEAR POWER REACTORS ON THE MISSISSIPPI RIVER BASIN* (721)
 DOSES TO MAN FROM ATMOSPHERIC AND LIQUID EFFLUENTS* (727)
 COMPUTATION AND MAPPING OF THE DISPERSION AND HERBAGE UPTAKE OF GASEOUS EFFLUENTS FROM INDUSTRIAL
 PLANTS* (750)
 CALCULATION OF RELEASES OF RADIOACTIVE MATERIALS IN GASEOUS AND LIQUID EFFLUENTS FROM BOILING WATER REACTORS
 (BWB-GALE CODE)* (811)
 CALCULATION OF RELEASES OF RADIOACTIVE MATERIALS IN GASEOUS AND LIQUID EFFLUENTS FROM PRESSURIZED WATER
 REACTORS (PWR-GALE CODE)* (812)

EGG

NUMERICAL INVESTIGATION OF THE ATLANTIC GENERATING STATION'S EFFECT ON TIDAL CURRENTS FROM LITTLE EGG INLET,
 NEW JERSEY* (602)

EIGENVECTORS

AN EMPIRICAL MODEL USING EIGENVECTORS TO CALCULATE THE TEMPORAL AND SPATIAL VARIATIONS OF THE ST. LOUIS WHEAT
 ISLAND* (86)

ELECTRIC

THERMAL FLUX INVESTIGATIONS FOR UNION ELECTRIC COMPANY'S CALLAWAY PLANT, UNITS 1 AND 2* (395)
 QUANTIFICATION OF AQUATIC ENVIRONMENTAL IMPACT OF ELECTRIC POWER GENERATION* (840)
 EVALUATION OF THERMAL DISCHARGES FROM STEAM ELECTRIC GENERATING STATIONS* (539)
 WASTE HEAT MANAGEMENT IN THE ELECTRIC POWER INDUSTRY: ISSUES OF ENERGY CONSERVATION AND STATION OPERATION
 UNDER ENVIRONMENTAL CONSTRAINTS* (811)

ELECTRICAL

MODEL OF ENVIRONMENTAL IMPACTS FROM ELECTRICAL GENERATION IN WISCONSIN* (747)

ELECTRO

DEPOSITION OF ELECTRO-AEROSOLS IN THE LUNG* (732)

EMBARKMENTS

NEW CONCEPT IN STABILITY ANALYSIS OF SLOPED WIDE-REFUSE EMBARKMENTS* (640)

EMISSION

THE CHEMISTRY, DISPERSION, AND TRANSPORT OF AIR POLLUTANTS EMITTED FROM FOSSIL FUEL POWER PLANTS IN
 CALIFORNIA: DATA ANALYSIS AND EMISSION IMPACT MODEL* (750)
 REGIONAL EMISSION PROJECTION SYSTEM (REPS)* (427)
 USER'S MANUAL, AUTOMATED PROCEDURES FOR ESTIMATING CONTROL COSTS AND EMISSION REDUCTIONS FOR SPECIFIED AIR
 POLLUTION SOURCES* (347)
 SOME TECHNIQUES FOR ESTIMATING THE RESULTS OF THE EMISSION OF RADIOACTIVE EFFLUENT FROM OBBE STACKS* (343)
 PREDICTIVE MODEL BASED ON THE RELATIONSHIP BETWEEN METEOROLOGICAL AND EMISSION PATTERNS AND AIR
 QUALITY* (369)

EMISSIONS

MATHEMATICAL MODELS FOR ANALYZING ORIGIN AND DISTRIBUTION OF COMBUSTION GENERATED POLLUTANTS IN GAS TURBINES:
 A MATHEMATICAL MODEL FOR JET ENGINE COMBUSTOR POLLUTANT EMISSIONS* (18)
 DISPERSION OF SULFUR DIOXIDE EMISSIONS FROM AREA SOURCES* (88)
 A SIMPLIFIED TECHNIQUE USED TO EVALUATE ATMOSPHERIC DISPERSION OF EMISSIONS FROM LARGE POWER PLANTS* (208)
 PREDICTING THE EFFECT OF GEOTHERMAL EMISSIONS ON THE TEMPERATURE AND RELATIVE HUMIDITY IN THE IMPERIAL VALLEY
 OF CALIFORNIA* (754)
 SAFOLUT: ESTIMATING THE AIR QUALITY IMPACT OF VEHICULAR EMISSIONS RESULTING FROM A TRAFFIC ASSIGNMENT* (356)
 CALCULATING FUTURE CARBON MONOXIDE EMISSIONS AND CONCENTRATIONS FROM URBAN TRAFFIC DATA* (360)
 REGIONAL EMISSIONS PROJECTION SYSTEMS* (375)
 MODEL FOR THE EFFICIENT ALLOCATION OF ENVIRONMENTAL ASSIMILATIVE CAPACITY: THE CASE OF THERMAL EMISSIONS TO A
 LARGE BODY OF WATER* (559)
 AIRP PROGRAM MANUAL: A COMPUTER CODE FOR CALCULATING DOSES, POPULATION DOSES, AND GROUND DEPOSITIONS DUE TO
 ATMOSPHERIC EMISSIONS OF RADIOISOTOPES* (720)
 CALCULATIONS OF DOSE AND POPULATION DOSE IN THE GENERAL ENVIRONMENT DUE TO BOILING-WATER NUCLEAR POWER
 REACTOR RADIOISOTOPE EMISSIONS IN THE UNITED STATES IN 1971* (722)
 PREDICTIVE STUDY OF THE DISPERSION OF EMISSIONS FROM THE SYNCHROTRON WILDEED LAKE PLANT* (806)

EMITTANTS

AMBIENT AIR QUALITY MODEL FOR ASSESSMENT OF UNITED STATES NAVAL AVIATION EMITTANTS* (302)

EMITTED

THE CHEMISTRY, DISPERSION, AND TRANSPORT OF AIR POLLUTANTS EMITTED FROM FOSSIL FUEL POWER PLANTS IN
 CALIFORNIA: DATA ANALYSIS AND EMISSION IMPACT MODEL* (750)

EMPHASIS

INFLUENCE OF SULFUR DIOXIDE ON VEGETATION WITH EMPHASIS ON SIMULATION MODELS* (67)
 SIMULATION APPROACH TO THE ANALYSIS OF STRIP-MINING IMPACT ON THE ECOSYSTEM WITH EMPHASIS ON WILDLIFE* (742)

EMPIRICAL

AN EMPIRICAL MODEL USING EIGENVECTORS TO CALCULATE THE TEMPORAL AND SPATIAL VARIATIONS OF THE ST. LOUIS WHEAT
 ISLAND* (86)
 EMPIRICAL TECHNIQUES FOR ANALYZING AIR QUALITY AND METEOROLOGICAL DATA: SHORT-TERM CHANGES IN GROUND-LEVEL
 OZONE CONCENTRATIONS* (345)
 AN EMPIRICAL MODEL FOR DETERMINING THE SALINITY DISTRIBUTION IN THE COLORADO RIVER* (617)

ENVIRONMENTALLY

ADVECTION OF ARTIFICIALLY PRODUCED UPPER ATMOSPHERIC CLOUDS IN ENVIRONMENTALLY DETERMINED WIND FIELDS* (339)

ENCLOSED

NAVIDA DEL REY: COMPUTER SIMULATION OF POLLUTANT TRANSPORT IN SEMI-ENCLOSED WATER BODIES* (400)

ENERGY

WEIGHTED DIAGRAM MODELS FOR THE ASSESSMENT OF ENERGY USE AND AIR POLLUTION IN TRANSPORTATION SYSTEMS* (270)
 GLOBAL CLIMATIC MODEL BASED ON ENERGY BALANCE OF THE EARTH-ATMOSPHERE SYSTEM* (207)
 IMPACT OF ENERGY SHORTAGE ON AMBIENT SULFUR DIOXIDE AND PARTICULATE LEVELS IN METROPOLITAN BOSTON* (294)
 A MODEL TO PREDICT REGIONAL WATER QUALITY IMPACTS FROM COAL RELATED ENERGY FACILITIES* (824)
 ENVIRONMENTAL ENERGY MODEL OF A PETROLEUM REFINING/CHEMICAL COMPLEX* (837)
 EPIDEMIOLOGICAL MODELS FOR PREDICTING HEALTHY IMPACT OF ENERGY RELATED FACILITIES* (705)
 FOR EFFECTIVE ENERGY PROGRAM* (717)
 ENGINEERING-FUSION REACTOR NEUTRONIC/ENERGY DEPOSITION/ACTIVATION/DOSEAGE TO PERSONNEL MODEL* (716)

TITLE INDEX

ENERGY

OCEAN FLOOD AND ENERGY PAPER (OFEP): DEVELOPMENT OF THE Kelp GROWTH MODEL* (774)
 MODELING THE ECONOMIC AND ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVE ENERGY POLICIES: SAS-STRATEGIC ENVIRONMENTAL ASSESSMENT SYSTEM* (788)
 A METHODOLOGY FOR ASSESSMENT OF ENERGY FACILITY SITING PATTERNS* (800)
 WASTE HEAT MANAGEMENT IN THE ELECTRIC POWER INDUSTRY: ISSUES OF ENERGY CONSERVATION AND STATION OPERATION UNDER ENVIRONMENTAL CONSTRAINTS* (813)

ENGINE

MATHEMATICAL MODELS FOR ANALYZING ORIGIN AND DISTRIBUTION OF COMBUSTION GENERATED POLLUTANTS IN GAS TURBINES: A MATHEMATICAL MODEL FOR JET ENGINE COMBUSTION POLLUTANT EMISSIONS* (18)

ENGINEERING

NUMERICAL MODELING OF SUBSURFACE RADIOACTIVE SOLUTE TRANSPORT FROM WASTE-SEEPAGE PONDS AT THE IDAHO NATIONAL ENGINEERING LABORATORY* (554)
 FUELED-NUCLEON REACTOR SPECTROSCOPY/ENERGY DEPOSITION/ACTIVATION /DOSAGE TO PERSONNEL MODEL* (716)

ESTUARY

PECIV-II, NEW ENGLAND RIVER BASINS MODELLING PROJECT* (545)

ENVIRONMENT

FORMATION OF SULFATES AND THE ENHANCEMENT OF CLOUD CONDENSATION NUCLEI IN CLOUDS* (72)

ENVIRONMENT

CALIBRATION OF A THERMAL ENRICHMENT MODEL FOR SHALLOW, BARRICADED ESTUARIES* (805)

ENVIRONMENT

PARAMETERIZED MODEL OF RECIRCULATION AND NEAR FIELD RE-ENTRAPMENT* (525)
 RE-ENTRAPMENT AND RE-CIRCULATION SIMULATOR FOR FLOW CONDITIONS NEAR SUBMERGED DISCHARGES* (540)
 NUMERICAL MODEL OF DROPLET ENTRAINMENT FROM A CONTAINED OIL SLICK* (519)
 TECHNIQUES FOR PREDICTING ENTRAINMENT AND IMPINGEMENT AT POWER PLANTS* (749)
 SIMULATING THE IMPACT OF THE ENTRAINMENT OF WINTER FLOWING LARVAE* (764)

ENVIRONMENT

SIMULATING THE URBAN AIR POLLUTION ENVIRONMENT* (721)
 DEPOSITIONAL ENVIRONMENT OF ZINC, LEAD AND CADMIUM IN RESERVOIR SEDIMENTS* (544)
 MODELING OF OIL EVAPORATION IN AN AQUEOUS ENVIRONMENT: RESEARCH ON THE EFFECTS OF CRUDE OIL TRANSFER AND RESERVOIR REFINEMENTS ON DELAWARE BAY* (595)
 A LABORATORY MODEL FOR EVALUATING THE BEHAVIOR OF HEAVY METALS IN AN AQUATIC ENVIRONMENT* (665)
 MATHEMATICAL MODELS FOR PREDICTING THE TRANSPORT OF RADIOISOTOPES IN A MARINE ENVIRONMENT* (683)
 CALCULATION OF DOSE AND POPULATION DOSE IN THE GENERAL ENVIRONMENT DUE TO BOILING-WATER NUCLEAR POWER REACTOR RADIOISOTOPE EMISSIONS IN THE UNITED STATES IN 1971* (722)
 A SYSTEMS ANALYSIS METHODOLOGY FOR PREDICTING DOSE TO MAN FROM A RADIOACTIVELY CONTAMINATED TERRESTRIAL ENVIRONMENT* (747)
 ANALYTICAL MODELS FOR ENVIRONMENT COST ESTIMATES OF AQUATIC POPULATIONS* (764)
 A PRELIMINARY MATHEMATICAL MODEL FOR PREDICTING THE TRANSPORT OF RADIOISOTOPES IN THE MARINE ENVIRONMENT* (784)

ENVIRONMENTAL

THERMAL MODEL FOR ATMOSPHERIC SPRAY COOLING SYSTEMS: ENVIRONMENTAL EFFECTS OF HEAT AND MOISTURE RELEASE* (37)
 EFFECT OF HIGHWAY CONFIGURATIONS ON ENVIRONMENTAL PROBLEMS: DYNAMICS OF HIGHWAY ASSOCIATED AIR POLLUTION* (39)
 GENERAL ENVIRONMENTAL MODEL OF MICRONITRUS* (42)
 DETERMINATION OF ENVIRONMENTAL CARBON MONOXIDE EXPOSURES THROUGH PERSONAL MONITORING: FIXED VS PERSONAL AND TRANSPORTATION MODE RELATIONSHIPS* (51)
 ENVIRONMENTAL TRANSPORT PROCESSES* (114)
 A MODEL TO PREDICT RADIOLOGICAL ENVIRONMENTAL IMPACT RESULTING FROM STRAIGHTLINE WIND DAMAGE TO A PLUTONIUM FACILITY* (139)
 DEVELOPMENT OF MODEL TO ASSESS ENVIRONMENTAL EFFECT OF COMMERCIAL AVIATION HIGH ALTITUDE CRUISE OPERATIONS* (219)
 POTENTIAL ENVIRONMENTAL MODIFICATIONS PRODUCED BY LARGE EVAPORATIVE COOLING TOWERS* (227)
 DESCRIPTION OF THE CONTAINMENT AND METHODOLOGY OF ENVIRONMENTAL RADIATION EXPOSURE (CONRAD-IV) CODE* (299)
 STUDIES OF THE ENVIRONMENTAL IMPACT OF EVAPORATIVE COOLING TOWER SITES* (304)
 MODEL FOR ENVIRONMENTAL TRANSPORT OF AUTOMOTIVE LEAD* (320)
 SIMULATION MODEL FOR ENVIRONMENTAL POLLUTION CONTROL FROM FOSSIL FUEL POWER PLANTS* (371)
 GOAL INTEGRAL PROGRAMMING MODEL FOR RESOURCE ALLOCATION IN A MARINE ENVIRONMENTAL PROTECTION PROGRAM* (404)
 ENVIRONMENTAL IMPACT STUDIES OF THE SAVANNAH AND WATFORDS POWER PLANTS* (434)
 QUANTIFICATION OF AQUATIC ENVIRONMENTAL IMPACT OF ELECTRIC POWER GENERATION* (443)
 MODELS TO PREDICT ENVIRONMENTAL IMPACT OF RIBE DRAINAGE OF STREAMS* (449)
 MODELS FOR ENVIRONMENTAL POLLUTION CONTROL* (536)
 MODEL FOR THE EFFICIENT ALLOCATION OF ENVIRONMENTAL ASSIMILATIVE CAPACITY: THE CASE OF THERMAL EMISSIONS TO A LARGE BODY OF WATER* (559)
 ENVIRONMENTAL RATE MODEL FOR AQUATIC SYSTEMS* (568)
 A SIMULATION MODELING OF ENVIRONMENTAL EFFECTS OF THERMAL GENERATION, DOCUMENTATION OF THE COLLEAT MODEL* (572)
 NUMERICAL OCEAN MODEL OF THE GULF OF MEXICO FOR EVALUATION OF THE ENVIRONMENTAL IMPACT OF OCEAN THERMAL POWER PLANTS* (587)
 ENVIRONMENTAL PARAMETERS OF THE TENNESSEE RIVER IN ALABAMA, THERMAL STRATIFICATION* (635)
 ENVIRONMENTAL ENERGY MODEL OF A PETROLEUM REFINING/CHEMICAL COMPLEX* (637)
 MATHEMATICAL MODEL FOR PREDICTING ENVIRONMENTAL AND HUMAN HEALTH EFFECTS OF DEVELOPING NUCLEAR REACTOR PROGRAMS* (693)
 EXPOSURE/DOSE MODELS APPLIED TO ENVIRONMENTAL CARCINOGENS* (699)
 EVALUATION OF ENVIRONMENTAL FACTORS AFFECTING POPULATION EXPOSURE* (700)
 ENVIRONMENTAL RADIATION EXPOSURES AND ASSOCIATED RISKS FROM FUEL REPROCESSING PLANTS* (706)
 THE EBERN III COMPUTER CODE FOR ESTIMATING EXTERNAL RADIATION DOSES TO POPULATIONS FROM ENVIRONMENTAL RELEASES* (712)
 GROSS AND DOSET - PROGRAMS TO CALCULATE ENVIRONMENTAL CONSEQUENCES OF RADIOACTIVITY RELEASE* (713)
 HOSPITALITY PROJECTION FROM EXPOSURE TO RADIOACTIVE AND NON-RADIOACTIVE ENVIRONMENTAL POLLUTANTS* (715)
 MODEL FOR ABSORBED DOSE RATES IN HUMANS FROM EXPOSURE TO ENVIRONMENTAL GAMMABEAMS* (720)
 DESCRIPTION OF THE CONTAINMENT AND METHODOLOGY OF ENVIRONMENTAL RADIATION EXPOSURE (CONRAD-III) CODE* (729)
 A CUMULATIVE RISK INDEX FOR ASSESSING LIMITING EXPOSURES TO ENVIRONMENTAL POLLUTANTS* (740)
 USE OF THE LESLIE MATRIX FOR ASSESSING ENVIRONMENTAL IMPACT WITH AN EXAMPLE FOR A FISH POPULATION* (756)
 DEVELOPMENT OF TRANSPORT MODELS FOR ENVIRONMENTAL POLLUTANTS* (769)
 MODEL OF ENVIRONMENTAL IMPACTS FROM ELECTRICAL GENERATION IN WISCONSIN* (787)
 MODELING THE ECONOMIC AND ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVE ENERGY POLICIES: SAS-STRATEGIC ENVIRONMENTAL ASSESSMENT SYSTEM* (788)

TITLE INDEX

ENVIRONMENTAL

SIMPLE METHOD FOR EVALUATING ALTERNATIVES TO A PROPOSED ENVIRONMENTAL ALTERATION, ITS HISTORY, AND AN EXAMPLE OF ITS USE IN OIL SHALE DEVELOPMENT* (794)
 ASSESSMENT OF THE ENVIRONMENTAL IMPLICATIONS OF PROJECT INDEPENDENCE* (808)
 WASTE WENT MANAGEMENT IN THE ELECTRIC POWER INDUSTRY: ISSUES OF ENERGY CONSERVATION AND STATION OPERATION UNDER ENVIRONMENTAL CONSTRAINTS* (813)
 GEONTOLOGICAL ENVIRONMENTAL EFFECTS OF GEOTHERMAL POWER PRODUCTION* (815)

ENVIRONMENTS

TURBULENT DIFFUSION AND POLLUTANT TRANSPORT IN SUBURBANE ENVIRONMENTS* (172)
 NUCLEAR DEBRIS ATTACHMENT TO AIRCRAFT DUE TO ATMOSPHERIC RADIATION ENVIRONMENTS: AIRCRAFT IMPACTION AND AEROSOL COMPUTER MODEL* (236)
 DEVELOPMENT OF VERTICAL DISPERSION COEFFICIENTS FOR POLLING TERNARY ENVIRONMENTS* (291)
 ECOLOGIC SIMULATION FOR AQUATIC ENVIRONMENTS* (308)
 MODELING POLLUTANT MIGRATION IN SUBSURFACE ENVIRONMENTS* (506)
 A MODEL FOR THE APPROXIMATE CALCULATION OF SAFE RATES OF DISCHARGE OF RADIOACTIVE WASTES INTO MARINE ENVIRONMENTS* (661)
 CONCENTRATION FACTORS AND TRANSPORT MODELS FOR RADIOISOTOPES IN AQUATIC ENVIRONMENTS-A LITERATURE REPORT* (668)

EPAPES

RESERVOIR WATER QUALITY MODEL EPAPES* (542)

EPIDEMIOLOGICAL

EPIDEMIOLOGICAL MODELS FOR PREDICTING HEALTH IMPACT OF ENERGY RELATED FACILITIES* (705)

EPISODIC

PPRAS EPISODIC MODEL* (81)

EQUATION

MULTILEVEL ATMOSPHERIC PREDICTION MODEL BASED ON PRIMITIVE EQUATIONS OF MOTION: THE PRIMITIVE EQUATION MULTI-LEVEL PREDICTION MODEL AT THE INSTITUTE OF METEOROLOGY* (307)
 SOUTHERN HEMISPHERE PREDICTION EXPERIMENT WITH A BISE-LEVEL, PRIMITIVE- EQUATION MODEL* (699)

EQUATIONS

MODEL OF GLOBAL RADIOISOTOPE TRANSPORT IN THE TROPOSPHERE AND LOWER STRATOSPHERE: FUNDAMENTAL EQUATIONS AND BOUNDARY CONDITIONS* (128)
 DIFFERENCE ANALOGUES OF BOUNDARY-VALUE PROBLEMS FOR THE EQUATIONS OF GLOBAL RADIOISOTOPE CONTAMINANT TRANSPORT AND THEIR NUMERICAL SOLUTIONS: DIFFERENCE APPROXIMATION OF EQUATIONS AND BOUNDARY CONDITIONS IN THE REGIONAL PLANE AND THE ZONAL BELT OF THE ATMOSPHERE* (129)
 MULTILEVEL ATMOSPHERIC PREDICTIONS MODEL BASED ON PRIMITIVE EQUATIONS OF MOTION: THE PRIMITIVE EQUATION MULTI-LEVEL PREDICTION MODEL AT THE INSTITUTE OF METEOROLOGY* (307)
 MODEL FOR RADIOACTIVITY TRANSPORT IN WATER: NUMERICAL SOLUTIONS OF RADIOISOTOPE TRANSPORT EQUATIONS AND POLY OF PLANTS IN SE-95 TRANSPORT* (390)
 THE NUMERICAL SOLUTION OF PARABOLIC EQUATIONS APPLIED TO "EDDY DIFFUSION" IN "THE OCEAN" (669)
 FIVE-TERM ELEMENT SOLUTIONS FOR THE EQUATIONS OF GROUNDWATER FLOW* (655)
 SCIN-3B: SOLVING TIME DEPENDENT SAVIER-STOKES EQUATIONS* (819)

EQUILIBRIA

WATER, A COMPUTER PROGRAM FOR CALCULATING CHEMICAL EQUILIBRIA OF NATURAL WATERS* (595)

EQUILIBRIUM

A NON-EQUILIBRIUM MODEL OF HEMISPHERIC REAR SURFACE TEMPERATURE* (26)
 THERMAL EQUILIBRIUM OF THE ATMOSPHERE WITH A GIVEN DISTRIBUTION OF RELATIVE HUMIDITY* (181)

EPIE

A FOOD CHAIN MODEL OF CADMIUM IN WESTERN LAKE ERIE* (666)

EPMOPS

PREDICTIVE MODEL FOR RADIOCESIUM INTAKE FROM MILK: ERRORS ASSOCIATED WITH ANOM-COM VARIATION* (758)

EPTS

USE OF LARS SYSTEM FOR THE QUANTITATIVE DETERMINATION OF SNOW PLUME LATERAL DIFFUSION COEFFICIENTS FROM EPTS IMAGES OF VIRGINIA* (17)

ESTABLISHMENT

FIRST ESTIMATE OF SEEDING CAPABILITY FOR ULTIMATE ESTABLISHMENT* (776)

ESTIMATE

A CODE TO ESTIMATE STRONTIUM-90 GLOBAL DEPOSITION FROM ATMOSPHERIC NUCLEAR DETONATIONS* (239)
 A MODEL TO ESTIMATE RADIATION DOSE COMMITMENTS TO THE WORLD POPULATION FROM THE ATMOSPHERIC RELEASE OF RADIOISOTOPES* (271)
 A POINT SOURCE MODEL TO ESTIMATE MOBILE CONCENTRATIONS FOR STABLE POLLUTANTS* (314)
 A POINT SOURCE MODEL TO ESTIMATE MOBILE CONCENTRATIONS FOR STABLE POLLUTANTS* (315)
 A POINT SOURCE MODEL TO ESTIMATE MOBILE CONCENTRATIONS FOR STABLE POLLUTANTS* (316)
 A MODEL TO ESTIMATE THE LOCAL RADIATION DOSES TO MAN FROM THE ATMOSPHERIC RELEASE OF RADIOISOTOPES* (731)
 FIRST ESTIMATE OF SEEDING CAPABILITY FOR ULTIMATE ESTABLISHMENT* (776)

ESTIMATED

ESTIMATED PLUME SURFACE TEMPERATURES AFTER INTERFERENCE* (526)

ESTIMATES

ESTIMATES OF STRATOSPHERIC POLLUTION BY AN ANALYTIC MODEL* (119)
 PROGRAM DESCRIPTION, SUPPLEMENT TO MESOSCALE WIND FIELDS AND TRANSPORT ESTIMATES DETERMINED FROM A NETWORK OF WIND TOWERS* (326)
 ANALYTICAL MODELS FOR ENVIRONMENT COST ESTIMATES OF AQUATIC POPULATION* (760)

ESTIMATING

AIR QUALITY MANUAL: MATHEMATICAL APPROACH TO ESTIMATING HIGHWAY IMPACT ON AIR QUALITY* (8)
 AN URBAN AIR DIFFUSION MODEL FOR ESTIMATING LONG TERM AVERAGE VALUES OF AIR QUALITY* (186)
 A COMPUTER CODE FOR ESTIMATING AIR POLLUTANT CONCENTRATIONS FROM DISPERSED SOURCES* (205)
 DEVELOPMENT OF A SIMULATION MODEL FOR ESTIMATING GROUND LEVEL CONCENTRATIONS OF PHOTOCHEMICAL POLLUTANTS* (278)
 USER'S MANUAL, AUTOMATED PROCEDURES FOR ESTIMATING CONTROL COSTS AND EMISSION REDUCTIONS FOR SPECIFIED AIR POLLUTION SOURCES* (347)
 SOME TECHNIQUES FOR ESTIMATING THE RESULTS OF THE EMISSION OF RADIOACTIVE EFFLUENT FROM ORNL STACKS* (303)
 SAPOLUT: ESTIMATING THE AIR QUALITY IMPACT OF VEHICULAR EMISSIONS RESULTING FROM A TRAFFIC ASSIGNMENT* (356)
 DEVELOPMENT OF A SIMULATION MODEL FOR ESTIMATING GROUND LEVEL CONCENTRATIONS OF PHOTOCHEMICAL POLLUTANTS* (376)
 DEVELOPMENT OF A SIMULATION MODEL FOR ESTIMATING GROUND LEVEL CONCENTRATIONS OF PHOTOCHEMICAL POLLUTANTS, A KINETIC MECHANISM FOR ATMOSPHERIC PHOTOCHEMICAL REACTIONS* (388)
 A SURVEY OF DISPERSION COEFFICIENTS FOR ESTIMATING POLLUTANT TRANSPORT* (442)
 THE SUPER III COMPUTER CODE FOR ESTIMATING EXTERNAL RADIATION DOSES TO POPULATIONS FROM ENVIRONMENTAL RELEASES* (712)

TITLE INDEX

ESTIMATE

THE AIRDOOS-II COMPUTER CODE FOR ESTIMATING RADIATION DOSE TO MAN FROM AIRBORNE RADIONUCLIDES IN AREAS SURROUNDING NUCLEAR FACILITIES* (720)
 ESTIMATING HEALTH EFFECTS OF RADIONUCLIDES* (735)
 THE ERREN II COMPUTER CODE FOR ESTIMATING EXTERNAL DOSES TO POPULATIONS FROM CONSTRUCTION OF A SEA LEVEL CANAL WITH NUCLEAR EXPLOSIVES* (742)
 ESTIMATING RADIATION DOSES* (770)
 NEMUS - A DIGITAL COMPUTER CODE FOR ESTIMATING REGIONAL RADIOLOGICAL EFFECTS FROM THE NUCLEAR POWER INDUSTRY* (793)

ESTIMATION

THE ESTIMATION OF THE DISPERSION OF AIRBORNE MATERIALS.* (234)
 AIR POLLUTANT HEALTH EFFECTS ESTIMATION MODEL* (364)
 WATER TEMPERATURE FORECASTING AND ESTIMATION USING FOURIER SERIES AND COMMUNICATION THEORY TECHNIQUES* (405)
 A THERMAL FLOID-MECHANICAL MODEL FOR ESTIMATION OF POWER PLANT IMPACT ON A STRATIFIED LAKE* (509)
 CONVERSATIONAL COMPUTER CODES TO IMPLEMENT ICRP-10-10A MODELS FOR ESTIMATION OF INTERNAL RADIATION DOSE TO MAN* (710)
 FISH IMPINGEMENT SAMPLING DESIGN & ESTIMATION METHOD SOFTWARE SYSTEM* (762)

ESTUARIES

CALIBRATION OF A THERMAL EFFLUENT MODEL FOR SHALLOW, BARRICADED ESTUARIES* (405)
 DIGITAL COMPUTER SIMULATION OF THERMAL EFFLUENT DISPERSION IN RIVERS, LAKES, AND ESTUARIES* (412)
 MIXED TRANSPORT APPROACH MODELS FOR POWER PLANT IMPACT IN ESTUARIES* (425)
 ONE-DIMENSIONAL HYDRODYNAMIC AND WATER QUALITY CONDITIONS IN ESTUARIES AND CONTROLLED RIVERS* (426)
 FORECASTING THE EFFECTS OF POLLUTING DISCHARGES ON ESTUARIES* (435)
 MATHEMATICAL MODELS OF WATER QUALITY PARAMETERS FOR RIVERS AND ESTUARIES* (446)
 WATER-QUALITY SIMULATION MODEL FOR WELL-MIXED ESTUARIES AND COASTAL SEAS* (476)
 NUMERICAL SIMULATION OF WATER QUALITY IN COASTAL WATERS AND ESTUARIES* (477)
 MATHEMATICAL ANALYSIS OF THERMAL POLLUTION OF LAKES AND ESTUARIES* (503)
 MATHEMATICAL MODELS OF FATES OF POLLUTANTS IN ESTUARIES* (533)
 MATHEMATICAL MODEL FOR THE PREDICTION OF UNSTEADY SALINITY INTRUSION IN ESTUARIES* (543)
 PREDICTION OF STEADY SALINITY INTRUSION IN ESTUARIES: MATHEMATICAL MODEL AND USER'S MANUAL* (544)
 CYCLING OF ELEMENTS IN ESTUARIES* (545)
 CYCLING OF ELEMENTS IN ESTUARIES MODEL* (609)

ESTUARINE

MATHEMATICAL SIMULATION OF THE ESTUARINE BEHAVIOR AND ITS APPLICATIONS* (459)
 METABOLISM AND MODELS OF ESTUARINE BAY ECOSYSTEMS AFFECTED BY A COASTAL POWER PLANT* (498)
 HEAVY METALS IN ESTUARINE BENTHIC ORGANISMS AND SEDIMENTS: DATA AND MODEL* (609)

ESTUARY

ESTUARY MODELING* (392)
 WINTER-TIME TRANSPORT AND DISSOLVED OXYGEN BUDGET STUDIES IN THE POTOMAC ESTUARY* (410)
 FROM A J-THANK ESTUARY MODEL* (430)
 PREDICTING REGENERATION COEFFICIENTS FOR A POLLUTED ESTUARY* (468)
 DELTA-2 ESTUARY AND BAY WATER QUALITY SAMPLING AND MATHEMATICAL MODELING PROJECT* (517)
 DYNAMIC ESTUARY MODEL, PEARL HARBOR APPLICATIONS* (544)
 NUMERICAL MODEL FOR THE PREDICTION OF TRANSPORT WATER QUALITY IN ESTUARY NETWORKS* (625)
 THE POTOMAC ESTUARY MATHEMATICAL MODEL* (754)

EUTROPHIC

A GENERALIZED WATER QUALITY MODEL FOR EUTROPHIC LAKES AND RESERVOIRS* (627)
 SPECIFIC ACTIVITY AND CONCENTRATION MODEL APPLIED TO CS-137 MOVEMENT IN A EUTROPHIC LAKE* (772)

EUTROPHICATION

PHYTOPLANKTON MODELS AND EUTROPHICATION PROBLEMS* (633)

EVALUATE

A SIMPLIFIED TECHNIQUE USED TO EVALUATE ATMOSPHERIC DISPERSION OF EMISSIONS FROM LARGE POWER PLANTS* (204)

EVAPORATION

CONCENTRATIONS IN THE SOUTH TEXAS PROJECT COOLING RESERVOIR, BLOW-DOWN AND EVAPORATION* (524)
 MODELING OF OIL EVAPORATION IN AN AQUEOUS ENVIRONMENT: RESEARCH ON THE EFFECTS OF CRUDE OIL TRANSFER AND WEATHER REFINEMENTS ON DELAWARE BAY* (548)

EVAPORATIVE

AMBIENT EFFECT OF EVAPORATIVE COOLING TOWERS* (142)
 POTENTIAL ENVIRONMENTAL MODIFICATIONS PRODUCED BY LARGE EVAPORATIVE COOLING TOWERS* (227)
 STUDIES OF THE ENVIRONMENTAL IMPACT OF EVAPORATIVE COOLING TOWER PLUMES* (308)

EXGAM

USERS MANUAL FOR CODE EXGAM: A CODE TO CALCULATE GAMMA PHOTON DOSE FROM AN AIRBORNE RADIOACTIVE RELEASE* (303)

EXHAUST

DISPERSION OF BROMINE FROM AUTO EXHAUST: A SIMPLE DIFFUSION MODEL* (2)
 NUMERICAL CALCULATIONS OF VISCOUS HIGH-ALTITUDE EXHAUST PLUME FLOW FIELDS* (22)
 DIGITAL SIMULATION OF DIESEL EXHAUST CONTAMINATION OF FINE VENTILATION SYSTEMS* (301)

EXFLO

EXFLO-EXAMINATION OF POLLUTION LEVELS OF ROADWAYS* (134)

EXPLOSIVES

THE ERREN II COMPUTER CODE FOR ESTIMATING EXTERNAL DOSES TO POPULATIONS FROM CONSTRUCTION OF A SEA LEVEL CANAL WITH NUCLEAR EXPLOSIVES* (742)

EXPOSURE

MODEL FOR RADIATION EXPOSURE FROM A BOILING WATER REACTOR PLUME* (94)
 DESCRIPTION OF THE CONTAINMENT AND METEOROLOGY OF ENVIRONMENTAL RADIATION EXPOSURE (CONRADEN-IV) CODE* (299)
 MODELING THE DOSE TO MAN FROM EXPOSURE TO TRITIATED WATER VAPOR* (481)
 EXPOSURE/DOSE MODELS APPLIED TO ENVIRONMENTAL CARCINOGENS* (699)
 EVALUATION OF ENVIRONMENTAL FACTORS AFFECTING POPULATION EXPOSURE* (704)
 MORTALITY PROJECTION FROM EXPOSURE TO RADIOACTIVE AND NON-RADIOACTIVE ENVIRONMENTAL POLLUTANTS* (715)
 MODEL FOR ABSORBED DOSE RATES IN HUMANS FROM EXPOSURE TO ENVIRONMENTAL GAMMABAYS* (720)
 DESCRIPTION OF THE CONTAINMENT AND METEOROLOGY OF ENVIRONMENTAL RADIATION EXPOSURE (CONRADEN-III) CODE* (729)
 AERIN, A CODE FOR ACUTE AEROSOL INHALATION EXPOSURE CALCULATIONS* (743)

EXPOSURES

DETERMINATION OF ENVIRONMENTAL CARBON MONOXIDE EXPOSURES THROUGH PERSONAL MONITORING: FIXED VS PERSONAL AND TRANSPORTATION MODE RELATIONSHIPS* (5)
 COMPUTER CODE FOR CALCULATING PERSONAL DOSES DUE TO TRITIUM EXPOSURES* (700)
 ENVIRONMENTAL RADIATION EXPOSURES AND ASSOCIATED RISKS FROM FUEL REPROCESSING PLANTS* (706)
 A CUMULATIVE HAZARD INDEX FOR ASSESSING LIFETIME EXPOSURES TO ENVIRONMENTAL POLLUTANTS* (744)

TITLE INDEX

- EXPER**
THE EXPER IVI COMPUTER CODE FOR ESTIMATING EXTERNAL RADIATION DOSES TO POPULATIONS FROM ENVIRONMENTAL RELEASES* (772)
THE EXPER II COMPUTER CODE FOR ESTIMATING EXTERNAL DOSES TO POPULATIONS FROM CONSTRUCTION OF A SEA LEVEL CANAL WITH NUCLEAR EXPLOSIVES* (762)
- EXTENDED**
NUMERICAL MODELING OF THE TRANSPORT, DIFFUSION, AND DEPOSITION OF POLLUTANTS FOR REGIONS AND EXTENDED SCALES* (135)
- EXTER**
A PROCEDURE TO DETERMINE THE RELATIVE EXTENT OF REACTOR FISSION PRODUCT RELEASES UNDER VARIOUS METEOROLOGICAL CONDITIONS* (186)
- EXTERNAL**
A CDC 6600 PROGRAM FOR CALCULATION OF INHALATION AND EXTERNAL DOSE FOR ESTABLISHING REACTOR SITING DISTANCE REQUIREMENTS* (598)
CUMUL-DOSE-THRESHOLD: A DIGITAL COMPUTER PROGRAM FOR EXTERNAL AND INTERNAL RADIATION DOSE CALCULATIONS* (707)
THE EXPER III COMPUTER CODE FOR ESTIMATING EXTERNAL RADIATION DOSES TO POPULATIONS FROM ENVIRONMENTAL RELEASES* (772)
THE EXPER II COMPUTER CODE FOR ESTIMATING EXTERNAL DOSES TO POPULATIONS FROM CONSTRUCTION OF A SEA LEVEL CANAL WITH NUCLEAR EXPLOSIVES* (762)
- EXTINCTION**
PREDICTIONS OF THE SPECTRAL ABSORPTION AND EXTINCTION COEFFICIENTS OF AN URBAN AIR POLLUTION AEROSOL MODEL* (362)
- FACILITIES**
A MODEL TO PREDICT REGIONAL WATER QUALITY IMPACTS FROM COAL RELATED ENERGY FACILITIES* (628)
EPIDEMIOLOGICAL MODELS FOR PREDICTING HEALTH IMPACT OF ENERGY RELATED FACILITIES* (705)
DOSE MODELING FOR NUCLEAR FACILITIES* (718)
THE AIRDOS-II COMPUTER CODE FOR ESTIMATING RADIATION DOSE TO MAN FROM AIRBORNE RADIONUCLIDES IN AREAS SURROUNDING NUCLEAR FACILITIES* (724)
- FACILITY**
A MODEL TO PREDICT RADIOLOGICAL ENVIRONMENTAL IMPACT RESULTING FROM STRAIGHTLINE WIND DAMAGE TO A PLUTONIUM FACILITY* (139)
OPTIMAL CONTROL OF AN OIL REFINERY WASTE TREATMENT FACILITY: A TOTAL ECOSYSTEM APPROACH* (895)
HYDROLOGY MODEL EVALUATION AT THE HANFORD NUCLEAR WASTE FACILITY* (529)
A METHODOLOGY FOR ASSESSMENT OF ENERGY FACILITY SITING PATTERNS* (800)
- FALLOUT**
A NEW FALLOUT TRANSPORT CODE FOR THE DELFIC SYSTEM: THE DIFFUSIVE TRANSPORT MODULE* (213)
FALLOUT ON DIET (DOSES FROM RADIONUCLIDE DEPOSITION ON FOOD CROPS)* (675)
UPSTATE OF FALLOUT RADIONUCLIDES BY HARBORS AND A STOCHASTIC SIMULATION OF THE PROCESS* (677)
THE BEHAVIOR OF CS-137 AND OTHER FALLOUT RADIONUCLIDES ON A MICHIGAN DAIRY FARM* (678)
SPER II- A NEW DAMAGE ASSESSMENT FALLOUT MODEL* (804)
- FAR**
KON AND FAR-PLANE BEHAVIOR FOR POND OR SLOT UNDERWATER DISCHARGE INCLUDING MULTIPORT DISCHARGES* (884)
- FARM**
THE BEHAVIOR OF CS-137 AND OTHER FALLOUT RADIONUCLIDES ON A MICHIGAN DAIRY FARM* (678)
OCEAN FOOD AND ENERGY FARM (OFEF): DEVELOPMENT OF THE KELF GROWN MODEL* (774)
- FATE**
ENVIRONMENTAL FATE MODEL FOR AQUATIC SYSTEMS* (568)
MATHEMATICAL MODEL FOR FATE OF POLLUTANTS IN NEAR-SHORE WATERS* (608)
- FATES**
MATHEMATICAL MODELS OF FATES OF POLLUTANTS IN ESTUARIES* (533)
- PATHEAD**
A COMPUTER SIMULATION OF THE EFFECTS OF SUPERIMPOSED MORTALITY DUE TO POLLUTANTS ON POPULATIONS OF FATHEAD MINNOWS (PIMEPHALES PROMELAS)* (773)
- PCT**
ATMOSPHERIC HYDROCODES USING PCT ALGORITHMS* (19)
- FEASIBILITY**
MESOSCALE AIR POLLUTION SIMULATION MODELING: THE FEASIBILITY OF MODELING PHOTOCHEMICAL AEROSOL DYNAMICS* (124)
- FIELD**
TWO-DIMENSIONAL NUMERICAL MODEL FOR SIMULATING FORMATION AND DISSIPATION OF ADVECTION FOGS: A FIELD INVESTIGATION AND NUMERICAL SIMULATION OF COASTAL FOG* (177)
FISSION PRODUCTS FIELD RELEASE TEST* (226)
MASS ADJUSTED THREE DIMENSIONAL WIND FIELD MODEL* (292)
FIELD EVALUATION OF A PREDICTIVE MODEL FOR THERMAL STRATIFICATION IN LAKES AND RESERVOIRS* (413)
A TRANSIENT, TWO-DIMENSIONAL, DISCRETE-PLANE MODEL FOR FAR-FIELD ANALYSIS OF DISCHARGES IN COASTAL REGIONS* (427)
FIELD STUDY AND MATHEMATICAL MODEL OF THE SLACK-WATER BUILDUP OF A POLLUTANT IN A TIDAL RIVER* (438)
FAR FIELD STUDIES FOR THE ATLANTIC GENERATING STATION* (448)
PARAMETERIZED MODEL OF RECIRCULATION AND NEAR FIELD RE-ENTRAINMENT* (526)
TWO-DIMENSIONAL NUMERICAL MODEL OF THE NEAR-FIELD FLOW FOR AN OCEAN THERMAL POWER PLANT: THE THEORETICAL APPROACH AND A LABORATORY SIMULATION* (553)
TWO-DIMENSIONAL TRANSIENT FAR-FIELD TEMPERATURE DISTRIBUTION IN RIVERS WITH ARBITRARY HEAT SOURCES* (607)
- FIELDS**
NUMERICAL CALCULATIONS OF VISCOUS HIGH-ALTITUDE EXHAUST PLUME FLOW FIELDS* (22)
A GLOBAL MODEL OF THERMOSPHERIC DYNAMICS, WIND AND DENSITY FIELDS DERIVED FROM A PHENOMENOLOGICAL TEMPERATURE* (54)
NUMERICAL PREDICTION OF THE MESOSCALE TRANSPORT OF ATMOSPHERIC EFFLUENTS: PHILOSOPHY AND MORPHOLOGY OF EXPERIMENTAL MODELS FOR PREDICTING THE WIND AND POTENTIAL RADIOLOGICAL FIELDS OVER THE NEVADA TEST SITE* (263)
PROGRAM DESCRIPTIONS, SUPPLEMENT TO MESOSCALE WIND FIELDS AND TRANSPORT ESTIMATES DETERMINED FROM A NETWORK OF WIND TOWERS* (326)
ADVECTION OF ARTIFICIALLY PROMOTED UPPER ATMOSPHERIC CLOUDS IS EMPIRICALLY DETERMINED WIND FIELDS* (339)
- FINDAL**
FINDAL COASTAL PROCESS REPORT, ATLANTIC GENERATING STATION* (527)
- FINITE**
TWO-DIMENSIONAL, FINITE DIFFERENCE LINE SOURCE MODEL* (79)

TITLE INDEX

WIND

AROLUS: ATMOSPHERIC DISPERSION AND FINITE-CLOUD DOSES DURING NORMAL, SEA-BREEZE, AND ACCIDENT CONDITIONS* (14)

PREDICTION OF TEMPERATURE PROFILES IN ARBITRARILY SHAPED COOLING LAKES BY FINITE DIFFERENCE TECHNIQUES* (415)

A TWO-DIMENSIONAL FINITE ELEMENT MODEL FOR THE MIGRATION OF CONTAMINANTS IN CONFINED AND UNCONFINED AQUIFERS* (442)

A THREE-DIMENSIONAL FINITE ELEMENT MODEL FOR THE MIGRATION OF CONTAMINANTS IN CONFINED AND UNCONFINED AQUIFERS* (443)

APPLICATION OF THE FINITE-ELEMENT METHOD FOR SIMULATION OF SURFACE WATER TRANSPORT PROBLEMS* (444)

A GALERKIN-FINITE ELEMENT SIMULATION OF GROUNDWATER CONTAMINATION OF LONG ISLAND, NEW YORK* (547)

WATER FLOW THROUGH SATURATED POROUS MEDIA: A FINITE-ELEMENT GALERKIN MODEL* (643)

MATERIAL TRANSPORT THROUGH POROUS MEDIA: A FINITE-ELEMENT GALERKIN MODEL* (644)

FINITE-DIFFERENCE MODEL FOR AQUIFER SIMULATION IN TWO DIMENSIONS WITH RESULTS OF NUMERICAL EXPERIMENTS* (654)

FINITE ELEMENT SOLUTIONS FOR THE EQUATIONS OF GROUNDWATER FLOW* (655)

FINITE ELEMENT HEAT AND MASS TRANSFER CODE* (621)

FISH

A BICENERGETICS-BASED MODEL FOR POLLUTANT ACCUMULATION BY FISH SIMULATION OF PCB AND METHYLCHLORIDE RESIDUE LEVELS IN OTTAWA RIVER YELLOW PERCH (PERCA FLAVESCENS)* (514)

USE OF THE LESLIE MATRIX FOR ASSESSING ENVIRONMENTAL IMPACT WITH AN EXAMPLE FOR A FISH POPULATION* (756)

A STOCHASTIC FISH LIFE-CYCLE POPULATION MODEL USING A MODIFIED LESLIE MATRIX* (759)

A MODEL TO PREDICT FISH-IMPINGEMENT AT COOLING WATER INTAKES* (761)

FISH IMPINGEMENT SAMPLING DESIGN & ESTIMATION METHOD SOFTWARE SYSTEM* (762)

A GENERALIZED FISH LIFE-CYCLE POPULATION MODEL AND COMPUTER PROGRAM* (771)

FISSION

A STUDY OF THE FISSION PRODUCT RELEASE FROM A BADLY DAMAGED WATER-COOLED REACTOR* (39)

A PROCEDURE TO DETERMINE THE RELATIVE EXTENT OF REACTOR FISSION PRODUCT RELEASES UNDER VARIOUS METEOROLOGICAL CONDITIONS* (146)

FISSION PRODUCT FIELD RELEASE TEST* (224)

COMPUTATIONAL METHOD FOR CALCULATION OF RADIOLOGICAL DOSE RESULTING FROM HYPOTHETICAL FISSION PRODUCT RELEASES* (644)

BIOLOGICAL DOSE AND RADIOLOGICAL ACTIVITY FROM NUCLEAR REACTOR OR NUCLEAR WEAPON FISSION PRODUCTS* (647)

A FORTRAN PROGRAM FOR THE CALCULATION OF THE POTENTIAL HAZARDS FROM AN ACCIDENTAL FISSION PRODUCT RELEASE, NOLAND* (647)

FISSION PRODUCT TRANSPORT MODELS* (744)

PIPED

DETERMINATION OF ENVIRONMENTAL CARBON DIOXIDE EXPOSURES THROUGH PERSONAL MONITORING: FIXED VS PERSONAL AND TRANSPORTATION MODE RELATIONSHIPS* (51)

PLANNING

A MATHEMATICAL MODEL FOR PREDICTING RIVER TEMPERATURES--APPLICATION TO THE GREEN RIVER BELOW PLANNING GORGE, ILL* (55)

PLAVESCENS

A BICENERGETICS-BASED MODEL FOR POLLUTANT ACCUMULATION BY FISH SIMULATION OF PCB AND METHYLCHLORIDE RESIDUE LEVELS IN OTTAWA RIVER YELLOW PERCH (PERCA FLAVESCENS)* (514)

PLEST

A THREE-DIMENSIONAL STRATOSPHERIC POINT-SOURCE TRACER EXPERIMENT AND ITS IMPLICATIONS FOR DISPERSION OF EFFLUENT FROM A FLEET OF SUBSONIC AIRCRAFT* (179)

PLOTINER

SYNTHESIZING THE IMPACT OF THE ENTRAPMENT OF WINTER PLOINED LARVAE* (764)

PLCS

NUMERICAL CALCULATIONS OF VISCOUS HIGH-ALTITUDE BURNOUT PLUME FLOW FIELDS* (22)

A NUMERICAL MODEL FOR STABLY STRATIFIED FLOW AROUND COMPLEX TERRAIN* (773)

NEGATIVELY BUOYANT JETS IN A CROSS FLOW* (399)

NUMERICAL TECHNIQUES APPLIED TO PARTICLE DEPOSITION DURING SLOT FLOW* (414)

PLUM DYNAMICS AND SEDIMENT FLOW IN LOCKWOODS FOLLY INLET, NORTH CAROLINA* (447)

OBTAINING LOCATION/ARRIVAL-TIME AND LOCATION/OUTFLOW-QUANTITY DISTRIBUTIONS FOR STEADY FLOW SYSTEMS* (515)

RE-ENTRANCEMENT AND RE-CIRCULATION SIMULATION FOR FLOW CONDITIONS NEAR SUBMERGED DISCHARGES* (500)

TWO-DIMENSIONAL NUMERICAL MODEL OF THE NEAR-FIELD FLOW FOR AN OCEAN THERMAL POWER PLANT: THE THEORETICAL APPROACH AND A LABORATORY SIMULATION* (553)

SIMULTANEOUS TRANSPORT OF WATER AND REACTING SOLUTES THROUGH MULTILAYERED SOILS UNDER TRANSIENT UNSATURATED FLOW CONDITIONS* (642)

ONE-DIMENSIONAL TRANSIENT NONISOTHERMAL TWO-PHASE, TWO COMPONENT FLOW OF FLUIDS AND GASES THROUGH LAYERED POROUS MEDIA* (646)

FINITE ELEMENT SOLUTIONS FOR THE EQUATIONS OF GROUNDWATER FLOW* (655)

FLOWING

HYBRID COMPUTER PROGRAM FOR RAPIDLY SOLVING FLOWING OR STATIC CHEMICAL KINETIC PROBLEMS INVOLVING MANY CHEMICAL SPECIES* (192)

FLOWS

TWO-DIMENSIONAL, HYDROSTATIC SIMULATION OF THERMALLY-INFLUENCED HYDRODYNAMIC FLOWS* (552)

THREE-DIMENSIONAL SIMULATION OF THERMALLY-INFLUENCED HYDRODYNAMIC FLOWS* (573)

SIMULATION OF THERMALLY-INFLUENCED HYDRODYNAMIC FLOWS* (581)

SYSTEM IDENTIFICATION OF RADIOISOTOPE FLOWS IN AQUATIC MICROCOSMS* (751)

FLOUWATING

PEAR TO NEAR CONCENTRATION RATIOS ACCORDING TO A 'TOP-HAT' FLOUWATING PLUME MODEL* (91)

FLUID

MODEL FOR FLUID MECHANICAL STUDIES OF AIR POLLUTION* (155)

A THERMAL FLUID-MECHANICAL MODEL FOR ESTIMATION OF POWER PLANT IMPACT ON A STRATIFIED LAKE* (509)

FLOIDS

ONE-DIMENSIONAL TRANSIENT NONISOTHERMAL TWO-PHASE, TWO COMPONENT FLOW OF FLUIDS AND GASES THROUGH LAYERED POROUS MEDIA* (646)

FLUX

AIR TRANSPORT CALCULATIONS USING THE LASL-WUEP AIR FLUX TAPE AND THE WUEP COMPUTER PROGRAM--COR* (31)

A MASS CONSISTENT ATMOSPHERIC FLUX MODEL FOR REGIONS WITH COMPLEX TERRAIN* (66)

FLUXES

CALCULATION OF GAMMA-RAY LINE FLUXES FROM THE MOON* (247)

FOAMS

PARTICULATE OIL SPILL RECOVERY: OIL ADSORPTION PROPERTIES OF PLASTIC FOAMS* (441)

FOG

A HABITINE BOUNDARY LAYER MODEL FOR THE PREDICTION OF FOG* (6)

TITLE INDEX

- FOG**
TWO-DIMENSIONAL NUMERICAL MODEL FOR SIMULATING FORMATION AND DISSIPATION OF ADVECTION FOGS: A FIELD INVESTIGATION AND NUMERICAL SIMULATION OF COASTAL FOG* (177)
A TWO-DIMENSIONAL WAVE FOG MODIFICATION MODEL* (207)
- FOGGING**
A COMPREHENSIVE MODEL STUDY OF SALT DRIFT DEPOSITS, INDUCED FOGGING AND ICING FROM MECHANICAL DRAFT COOLING TOWER FLOWS AT INDIAN POINT* (230)
- FOGS**
TWO-DIMENSIONAL NUMERICAL MODEL FOR SIMULATING FORMATION AND DISSIPATION OF ADVECTION FOGS: A FIELD INVESTIGATION AND NUMERICAL SIMULATION OF COASTAL FOG* (177)
- FOLLY**
FLOW DYNAMICS AND SEDIMENT MOVEMENT IN LOCKWOODS FOLLY INLET, NORTH CAROLINA* (687)
- FOOD**
METHYLMERCURY ACCUMULATION IN AN AQUATIC FOOD CHAIN: A MODEL AND SOME IMPLICATIONS FOR RESEARCH PLANNING* (460)
PREDICTIVE MARINE FOOD WEBS AND "POLLUTANT ANALOGUES"* (462)
A FOOD CHAIN MODEL OF CANNING IN WESTERN LAKE ERIE* (466)
A SIMULATION MODEL FOR AN ARCTIC FOOD CHAIN* (467)
FALLOUT ON BIST (DOSES FROM RADIOISOTOPE DEPOSITION ON FOOD CROPS)* (473)
TRANSFER AND CONCENTRATION OF RADIOISOTOPES IN FOOD CHAINS* (476)
PREDICTION MODELS FOR STRONTIUM-90 AND CESIUM-137 LEVELS IN THE HUMAN FOOD CHAIN* (479)
OCEAN FOOD AND ENERGY FLOW (OFER): DEVELOPMENT OF THE SELF-GROWTH MODEL* (774)
- FORCE**
AIR QUALITY ASSESSMENT MODEL FOR AIR FORCE OPERATIONS* (277)
- FORECAST**
NATIONAL WEATHER SERVICE FIFTEEN FORECAST SYSTEM* (544)
- FORECASTING**
WATERSHED POLLUTION FORECASTING MODEL* (365)
FORECASTING THE EFFECTS OF POLLUTING DISCHARGES ON ESTUARIES* (415)
WATER TEMPERATURE FORECASTING AND ESTIMATION USING FOURIER SERIES AND COMMUNICATION THEORY TECHNIQUES* (485)
- FOREST**
SIMULATING EFFECTS OF HARVEST CUTTING ON SNOWBELT IN COLORADO SUBALPINE FOREST* (417)
- FORM**
STANDARD METHODOLOGY FOR CALCULATING RADIATION DOSE TO LOWER FOUR BIOTA* (757)
- FORMATION**
GLOBE FORMATION FROM PURE IN "CLEAN AIR"* (75)
FORMATION OF SULFATES AND THE ENHANCEMENT OF CLOUD CONDENSATION NUCLEI IN CLOUDS* (72)
FORMATION OF SULFATE IN THE STRATOSPHERE THROUGH THE GAS PHASE OXIDATION OF SULFUR DIOXIDE* (178)
TWO-DIMENSIONAL NUMERICAL MODEL FOR SIMULATING FORMATION AND DISSIPATION OF ADVECTION FOGS: A FIELD INVESTIGATION AND NUMERICAL SIMULATION OF COASTAL FOG* (177)
- FOURTH**
BEHAVIOR OF NITRIC OXIDE FORMED BY THE SPACE SHUTTLE IN THE MESOSPHERE* (73)
- FOURTH**
WATER MOVEMENT THROUGH SATURATED POROUS MEDIA: A FINITE-ELEMENT GALERKIN MODEL* (543)
- FORMULA**
BOISSEAU'S FLYING WING FORMULA AND THE TVA DATA* (175)
- FORTRAN**
A FORTRAN PROGRAM FOR THE CALCULATION OF THE POTENTIAL HAZARDS FROM AN ACCIDENTAL FISSION PRODUCT RELEASE, N0142* (497)
A FORTRAN CODE WHICH IMPLEMENTS ICRP 2 MODELS OF INTERNAL RADIATION TO MAN* (709)
USER'S MANUAL FOR THE FORTRAN VERSION OF PSAC: A BIOLOGICAL SAFETY ANALYSIS COMPUTER PROGRAM* (730)
A FORTRAN PROGRAM TO DETERMINE ABSORBED ORGAN DOSE DUE TO INHALATION OF RADIOISOTOPES* (748)
- FOSSIL**
MODEL OF THE ACCUMULATION OF FOSSIL CO₂ IN THE ATMOSPHERE AND THE SEA* (80)
GEOCHEMICAL OCEAN SECTIONS STUDY - GEOSSECS - SEDIMENT DISSOLUTION, MODEL FOR FOSSIL FUEL CARBON DIOXIDE* (177)
THE CHEMISTRY, DISPERSION, AND TRANSPORT OF AIR POLLUTANTS EMITTED FROM FOSSIL FUEL POWER PLANTS IN CALIFORNIA: DATA ANALYSIS AND EMISSION IMPACT MODEL* (158)
SIMULATION MODEL FOR ENVIRONMENTAL POLLUTION CONTROL FROM FOSSIL FUEL POWER PLANTS* (377)
HEALTH EFFECTS AND COSTS OF FOSSIL-FUEL POLLUTANTS* (710)
- FOURTH**
WATER TEMPERATURE FORECASTING AND ESTIMATION USING FOURIER SERIES AND COMMUNICATION THEORY TECHNIQUES* (485)
- FRANCISCO**
SIMULATION OF CONTAMINANTS IN BAYS: APPLICATION TO SAN FRANCISCO BAY COMPLEX* (504)
- FREQUENCY**
A NEW MATHEMATICAL MODEL OF AIR POLLUTANT CONCENTRATION AVERAGING TIME AND FREQUENCY* (359)
- FRESHWATER**
MATHEMATICAL MODELING OF FRESHWATER AQUIFERS HAVING SALINATED BOTTOMS* (465)
TITRATION KINETICS IN A FRESHWATER MARSH* (649)
- FUEL**
GEOCHEMICAL OCEAN SECTIONS STUDY - GEOSSECS - SEDIMENT DISSOLUTION, MODEL FOR FOSSIL FUEL CARBON DIOXIDE* (177)
THE CHEMISTRY, DISPERSION, AND TRANSPORT OF AIR POLLUTANTS EMITTED FROM FOSSIL FUEL POWER PLANTS IN CALIFORNIA: DATA ANALYSIS AND EMISSION IMPACT MODEL* (158)
SUMMARY REPORT OF MODELING ANALYSIS OF POWER PLANTS FOR FUEL CONVERSION* (200)
SIMULATION MODEL FOR ENVIRONMENTAL POLLUTION CONTROL FROM FOSSIL FUEL POWER PLANTS* (377)
ENVIRONMENTAL RADIATION EXPOSURES AND ASSOCIATED RISKS FROM FUEL REPROCESSING PLANTS* (706)
HEALTH EFFECTS AND COSTS OF FOSSIL-FUEL POLLUTANTS* (710)
- FUNCTION**
ON THE COHERENCE OF GRID-GENERATED TURBULENCE; MODEL FOR CALCULATING COHERENCE FUNCTION FOR ATMOSPHERIC TURBULENCE* (377)
- FUNDAMENTAL**
MODEL OF GLOBAL RADIOISOTOPE TRANSPORT IN THE TROPOSPHERE AND LOWER STRATOSPHERE: FUNDAMENTAL EQUATIONS AND BOUNDARY CONDITIONS* (128)
- FUSION**
ENGINEERING-FUSION REACTOR NEUTRONIC/ENERGY DEPOSITION/ACTIVATION /DOSAGE TO PERSONNEL MODEL* (716)
- FUTURE**
CALCULATING FUTURE CARBON MONOXIDE EMISSIONS AND CONCENTRATIONS FROM URBAN TRAFFIC DATA* (360)

TITLE INDEX

FOUR FOUR-DYNAMIC ESTUARY MODEL* (836)

FOUR FURGE AND DOSTY - PROGRAMS TO CALCULATE ENVIRONMENTAL CONSEQUENCES OF RADIOACTIVITY RELEASE* (713)

GALL CALCULATION OF RELEASES OF RADIOACTIVE MATERIALS IN GASEOUS AND LIQUID EFFLUENTS FROM BOILING WATER REACTORS (FUR-GALL CODE)* (811)
CALCULATION OF RELEASES OF RADIOACTIVE MATERIALS IN GASEOUS AND LIQUID EFFLUENTS FROM PRESSURIZED WATER REACTORS (FUR-GALL CODE)* (812)

GALILEO A GALILEO-FINITE ELEMENT SIMULATION OF GROUNDWATER CONTAMINATION ON LONG ISLAND, NEW YORK* (567)
WATER MOVEMENT THROUGH SATURATED POROUS MEDIA: A FINITE-ELEMENT GALILEO MODEL* (603)
RADIATION TRANSPORT THROUGH POROUS MEDIA: A FINITE-ELEMENT GALILEO MODEL* (804)

GAMMA CALCULATION OF GAMMA-RAY LINE FLUXES FROM THE SOIL* (269)
USERS MANUAL FOR CODE EGAM: A CODE TO CALCULATE GAMMA PHOTON DOSE FROM AN AIRBORNE RADIOACTIVE RELEASE* (733)
POTENTIAL RADIOLOGICAL IMPACT OF AIRBORNE RELEASES AND DIRECT GAMMA RADIATION TO INDIVIDUALS LIVING NEAR INACTIVE URANIUM MILL TAILINGS PILES* (760)

GAMMABAYS MODEL FOR ABSORBED DOSE RATES IN HUMANS FROM EXPOSURE TO ENVIRONMENTAL GAMMABAYS* (729)

GAMMAS A CODE FOR ANALYSIS OF NUCLEAR EFFECTS AND SYSTEMS SURVIVABILITY: NEUTRONS AND GAMMAS* (807)

GAS MATHEMATICAL MODELS FOR ANALYZING ORIGIN AND DISTRIBUTION OF COMBUSTION GENERATED POLLUTANTS IN GAS TURBINES: A MATHEMATICAL MODEL FOR JET ENGINE COMBUSTOR POLLUTANT EMISSIONS* (79)
INVESTIGATION OF GAS TURBINE COMBUSTORS WITH HIGH INLET AIR TEMPERATURES, COMBUSTOR MODELLING* (164)
FORMATION OF SULFATE IN THE STRATOSPHERE THROUGH THE GAS PHASE OXIDATION OF SULFUR DIOXIDE* (104)
GAS RELEASE OF NUCLEIDES* (219)

GASEOUS MODELING OF THE EFFECTS OF GASEOUS AND PARTICULATE POLLUTANTS IN THE URBAN ATMOSPHERE: POLLUTANT DISPERSION* (12)
TVA GASEOUS EFFLUENT LICENSING CODE FOR URANIUM MINING AND MILLING* (212)
TVA GASEOUS DISPERSION CODE* (267)
MODEL FOR THE DISPERSION OF PARTICULATE OR GASEOUS POLLUTANTS FROM A NETWORK OF STREETS AND HIGHWAYS* (165)
MIGRATION OF GASEOUS RADIONUCLEIDES THROUGH SOIL OVERLYING A URANIUM ORE DEPOSIT: A MODELING STUDY* (605)
A PRELIMINARY MODEL OF GASEOUS POLLUTANT UPTAKE BY VEGETATION* (672)
CORRELATION AND MAPPING OF THE DISPERSION AND HERBAGE UPTAKE OF GASEOUS EFFLUENTS FROM INDUSTRIAL PLANTS* (750)
THE MECHANISM AND PREDICTION OF GASEOUS POLLUTANT UPTAKE BY VEGETATION* (770)
CALCULATION OF RELEASES OF RADIOACTIVE MATERIALS IN GASEOUS AND LIQUID EFFLUENTS FROM BOILING WATER REACTORS (FUR-GALL CODE)* (811)
CALCULATION OF RELEASES OF RADIOACTIVE MATERIALS IN GASEOUS AND LIQUID EFFLUENTS FROM PRESSURIZED WATER REACTORS (FUR-GALL CODE)* (812)

GASES ONE-DIMENSIONAL TRANSIENT NONISOTHERMAL TWO-PHASE, TWO COMPONENT FLOW OF FLUIDS AND GASES THROUGH LAYERED POROUS MEDIA* (606)

GASOLINE PRELIMINARY MODEL OF THE HUMAN ASSIMILATION OF LEAD AEROSOLS FROM GASOLINE COMBUSTION* (692)

GAUSSIAN SIMPLIFICATION OF A GAUSSIAN PUFF MODEL FOR REAL-TIME MINICOMPUTER USE* (169)
GAUSSIAN-PLUME MULTIPLE SOURCE AIR QUALITY ALGORITHM* (311)
A STEADY-STATE, UNIMODAL GAUSSIAN PLUME DISPERSION ALGORITHM* (319)
941 LONG-TERM GAUSSIAN DISPERSION MODEL* (364)

GENERALIZED AN INTERIM VERSION OF A GENERALIZED URBAN AIR POLLUTION MODEL* (785)
A GENERALIZED WATER QUALITY MODEL FOR EUTROPHIC LAKES AND RESERVOIRS* (621)
A GENERALIZED FISH LIFE-CYCLE POPULATION MODEL AND COMPUTER PROGRAM* (777)

GENERATED MATHEMATICAL MODELS FOR ANALYZING ORIGIN AND DISTRIBUTION OF COMBUSTION GENERATED POLLUTANTS IN GAS TURBINES: A MATHEMATICAL MODEL FOR JET ENGINE COMBUSTOR POLLUTANT EMISSIONS* (78)
COMPUTER MODELING OF TRANSPORTATION-GENERATED AIR POLLUTION* (61)
ON THE CORRELATION OF GRID-GENERATED TURBULENCE: MODEL FOR CALCULATING CORRELATION FUNCTION FOR ATMOSPHERIC TURBULENCE* (377)

GENERATING EXPERIMENTAL AND ANALYTICAL STUDIES OF CONDENSED WATER DISCHARGE FOR THE ATLANTIC GENERATING STATION* (807)
FAR FIELD STUDIES FOR THE ATLANTIC GENERATING STATION* (808)
MODELING AND OPTIMIZATION OF TRANSIENT COOLING WATER DISCHARGE FROM POWER GENERATING PLANTS, APPLICATIONS TO REGIONAL SITUATIONS* (857)
FINAL COASTAL PROCESS REPORT, ATLANTIC GENERATING STATION* (527)
EVALUATION OF THERMAL DISCHARGES FROM STEAM ELECTRIC GENERATING STATIONS* (539)
NUMERICAL INVESTIGATION OF THE ATLANTIC GENERATING STATION'S EFFECT ON TIDAL CURRENTS FROM LITTLE EGGS INLET, NEW JERSEY* (802)

GENERATION CALIFORNIA LINE SOURCE DISPERSION MODEL, 3RD GENERATION* (11)
GLOBAL ATMOSPHERIC MODEL, SECOND GENERATION* (174)
BREMEN: A CODE FOR THE GENERATION AND TRANSPORT OF BREMSSTRAHLUNG THROUGH THE ATMOSPHERE* (211)
THIRD GENERATION WEAR GLOBAL CIRCULATION MODEL* (325)
QUANTIFICATION OF AQUATIC ENVIRONMENTAL IMPACT OF ELECTRIC POWER GENERATION* (800)
A SIMULATION MODELING OF ENVIRONMENTAL EFFECTS OF THERMAL GENERATION, DOCUMENTATION OF THE COLNEAT MODEL* (572)
MODEL OF ENVIRONMENTAL IMPACTS FROM ELECTRICAL GENERATION IN WISCONSIN* (707)

GENERATOR AQUEOUS REACTOR RELEASE RESULT GENERATOR* (209)
AQUEOUS RELEASE OF RADIONUCLEIDES REPORT GENERATOR* (701)
IPOP-REPORT GENERATOR* (737)
COMMERCIAL WASTE MANAGEMENT REPORT GENERATOR* (730)

TITLE INDEX

- GEOCHEMICAL**
GEOCHEMICAL OCEAN SECTIONS STUDY - GEOSERCS - SEDIMENT DISSOLUTION, MODEL FOR FOSSIL FUEL CARBON DIOXIDE* (117)
- GEOGRAPHICAL**
THERMAL REGIMES OF THE UPPER MISSISSIPPI AND MISSOURI RIVERS: TRANSIENT AND STEADY-STATE COMPUTATIONAL MODELS FOR THE PREDICTION OF RIVER THERMAL REGIMES: PART TWO: ANALYSIS OF THERMAL REGIMES OF THE MISSISSIPPI AND MISSOURI RIVERS IN THE MID-CONTINENT AREA POWER POOL (MAPP) GEOGRAPHICAL AREA* (530)
- GEOHYDROLOGICAL**
GEOHYDROLOGICAL ENVIRONMENTAL EFFECTS OF GEOTHERMAL POWER PRODUCTION* (815)
- GEOLOGICAL**
SIMULATION OF MOVEMENT OF OIL SLICKS IN THE STRAIT OF GEORGIA USING SIMPLE ATMOSPHERE AND OCEAN DYNAMICS* (609)
- GEOSERCS**
GEOCHEMICAL OCEAN SECTIONS STUDY - GEOSERCS - SEDIMENT DISSOLUTION, MODEL FOR FOSSIL FUEL CARBON DIOXIDE* (117)
- GEO-THERMAL**
APPLICATIONS OF PHYSICAL MODELING IN A WIND TUNNEL TO GEOTHERMAL DEVELOPMENT* (3)
PREDICTING THE EFFECT OF GEOTHERMAL EMISSIONS ON THE TEMPERATURE AND RELATIVE HUMIDITY IN THE IMPERIAL VALLEY OF CALIFORNIA* (350)
GEOHYDROLOGICAL ENVIRONMENTAL EFFECTS OF GEOTHERMAL POWER PRODUCTION* (815)
- GLOBAL**
A GLOBAL OCEAN-ATMOSPHERE CLIMATE MODEL: THE OCEANIC CIRCULATION* (25)
A GLOBAL MODEL OF THERMOSPHERIC DYNAMICS, WIND AND DENSITY FIELDS DERIVED FROM A PREPOTENTIAL TEMPERATURE* (54)
STRATOSPHERIC AEROSOLS: EFFECT UPON ATMOSPHERIC TEMPERATURE AND GLOBAL CLIMATE* (116)
MODEL OF GLOBAL RADIOISOTOPE TRANSPORT IN THE TROPOSPHERE AND LOWER STRATOSPHERE: FUNDAMENTAL EQUATIONS AND BOUNDARY CONDITIONS* (120)
DIFFERENCE ANALOGUES OF BOUNDARY-VALUE PROBLEMS FOR THE EQUATIONS OF GLOBAL RADIOISOTOPE CONTAMINANT TRANSPORT AND THEIR NUMERICAL SOLUTION: DIFFERENCE APPROXIMATION OF EQUATIONS AND BOUNDARY CONDITIONS IN THE NEQUATORIAL PLANE AND THE POLAR BELT OF THE ATMOSPHERE* (129)
SIX LAYER GLOBAL CIRCULATION MODEL* (132)
A NUMERICAL EXPERIMENT ON THE EFFECTS OF REGIONAL ATMOSPHERIC POLLUTION ON GLOBAL CLIMATE* (137)
A GLOBAL OCEAN-ATMOSPHERE CLIMATE MODEL: THE ATMOSPHERIC CIRCULATION* (143)
GLOBAL MODEL OF THE ATMOSPHERE WITH SEASONAL VARIATION OF THE HYDROLOGIC CYCLE* (160)
A CODE TO ESTIMATE STRONTIUM-90 GLOBAL DEPOSITION FROM ATMOSPHERIC NUCLEAR DETONATIONS* (239)
GLOBAL CLIMATE MODEL* (250)
A TWO DIMENSIONAL GLOBAL CLIMATIC MODEL* (295)
A NEW GLOBAL CLIMATIC MODEL* (206)
GLOBAL CLIMATIC MODEL BASED ON ENERGY BALANCE OF THE EARTH-ATMOSPHERE SYSTEM* (207)
GLOBAL ANALYSIS ON A MERCATOR GRID OF SATELLITE DERIVED OZONE DATA* (306)
TWO-LAYER GLOBAL CIRCULATION MODEL* (320)
THIRD GENERATION WIND GLOBAL CIRCULATION MODEL* (325)
- GOAL**
GOAL INTERVAL PROGRAMMING MODEL FOR RESOURCE ALLOCATION IN A MARINE ENVIRONMENTAL PROTECTION PROGRAM* (6)
- GOUGE**
A MATHEMATICAL MODEL FOR PREDICTING RIVER TEMPERATURES--APPLICATION TO THE GREEN RIVER BELOW FLARING GORGE DAM* (550)
- GRADIENT**
VEGETATION COMMUNITIES ALONG GRADIENT* (77)
- GREEN**
A MATHEMATICAL MODEL FOR PREDICTING RIVER TEMPERATURES--APPLICATION TO THE GREEN RIVER BELOW FLARING GORGE DAM* (550)
- GREENHOUSE**
CARBON DIOXIDE IN THE ATMOSPHERE AND GREENHOUSE EFFECT MODEL* (176)
- GRID**
GRID MODEL FOR URBAN AIR POLLUTION* (157)
GLOBAL ANALYSIS ON A MERCATOR GRID OF SATELLITE DERIVED OZONE DATA* (306)
ON THE CONCEPT OF GRID-GENERATED TURBULENCE: MODEL FOR CALCULATING CORRECTION FUNCTION FOR ATMOSPHERIC TURBULENCE* (377)
- GRIDS**
SPHERICAL INTEGRATION EXPERIMENTS WITH VARIABLE-RESOLUTION TWO-DIMENSIONAL CARTESIAN GRIDS USING THE BOX METHOD* (100)
- GROWN**
TIME-DEPENDENT PHOTOCHEMICAL MODEL FOR OZONE NEAR THE GROUND* (36)
EFFECT OF FLAME SIZE ON GROUND LEVEL POLLUTION* (57)
THE EFFECT OF GROUND LEVEL ABSORPTION ON THE DISPERSION OF POLLUTANTS IN THE ATMOSPHERE* (112)
DEVELOPMENT OF A SIMULATION MODEL FOR ESTIMATING GROUND LEVEL CONCENTRATIONS OF PHOTOCHEMICAL POLLUTANTS* (270)
EMPIRICAL TECHNIQUES FOR ANALYZING AIR QUALITY AND METEOROLOGICAL DATA: SHORT-TERM CHANGES IN GROUND-LEVEL OZONE CONCENTRATIONS* (305)
DEVELOPMENT OF A SIMULATION MODEL FOR ESTIMATING GROUND LEVEL CONCENTRATIONS OF PHOTOCHEMICAL POLLUTANTS* (376)
DEVELOPMENT OF A SIMULATION MODEL FOR ESTIMATING GROUND LEVEL CONCENTRATIONS OF PHOTOCHEMICAL POLLUTANTS, A KINETIC MECHANISM FOR ATMOSPHERIC PHOTOCHEMICAL REACTIONS* (380)
RIVEN PROGRAM: A COMPUTER CODE FOR CALCULATING DOSES, POPULATION DOSES, AND GROUND DEPOSITIONS DUE TO ATMOSPHERIC EMISSIONS OF RADIOISOTOPES* (720)
- GROUNDMATER**
SIMULATION OF POLLUTANT MOVEMENT IN GROUNDWATER AQUIFERS* (463)
PREPARATION, VERIFICATION AND USE OF A DIGITAL GROUNDWATER SIMULATION PROGRAM* (464)
A GALERKIN-FINITE ELEMENT SIMULATION OF GROUNDWATER CONTAMINATION ON LONG ISLAND, NEW YORK* (547)
FINITE ELEMENT SOLUTIONS FOR THE EQUATIONS OF GROUNDWATER FLOW* (654)
SELECTED DIGITAL COMPUTER TECHNIQUES FOR GROUNDWATER RESOURCE EVALUATION* (656)
- GROWTH**
OCEAN FOOD AND ENERGY FARM (OFEF): DEVELOPMENT OF THE HELP GROWTH MODEL* (770)
MODEL OF PHOTOSYNTHESIS AND GROWTH OF CROPS UNDER POLLUTANT STRESS* (775)
- GROWTHS**
REGIONAL MODELING OF SURFACE WATER TEMPERATURES FROM PROJECTED POWER GROWTHS* (577)

TITLE INDEX

- STORM**
USFR'S GUIDE TO VERSION 2 OF ATN (AIR TRANSPORT OF RADIONUCLIDES)* (123)
USFR'S GUIDE TO DIFFUSION/KINETICS (DIFFKIN CODE)* (189)
USFR'S GUIDE AND DOCUMENTATION FOR OUTFALL PLUME MODEL* (398)
- SWF**
NUMERICAL OCEAN MODEL OF THE GULF OF MEXICO FOR EVALUATION OF THE ENVIRONMENTAL IMPACT OF OCEAN THERMAL POWER PLANTS* (547)
- TAET**
ANALYSIS OF HIGH-ALTITUDE EFFECTS SIMULATIONS (HRES)* (374)
- WAMPORD**
HYDROLOGY MODEL EVALUATION AT THE WAMPORD NUCLEAR WASTE FACILITY* (529)
- WASPOD**
DYNAMIC ESTUARY MODEL, PEARL HARBOR APPLICATIONS* (588)
- WASLEWAS**
RYAN-WASLEWAS--COOLING POND TEMPERATURE DISTRIBUTIONS* (501)
- WAPVES**
SIMULATING EFFECTS OF HARVEST CUTTING ON SMOKELESS COLORADO SUBALPINE FOREST* (817)
SIMULATING TIMBER YIELDS AND HYDROLOGIC IMPACTS RESULTING FROM TIMBER HARVEST ON SUBALPINE WATERSHEDS* (872)
- WBT**
PEAK TO PEAK CONCENTRATION RATIOS ACCORDING TO A "TOP-HAT" FLUCTUATING PLUME MODEL* (91)
- WAVE**
EFFECTS OF THE PIPELINE SAGE ROAD ON BEARBY PONDS AND LAKES ACROSS ALASKA'S NORTH SLOPE* (793)
- WAZAPD**
A CUMULATIVE HAZARD INDEX FOR ASSESSING LIMITING EXPOSURES TO ENVIRONMENTAL POLLUTANTS* (784)
- WAZAPDS**
A PORTMAN BRANCH FOR THE CALCULATION OF THE POTENTIAL HAZARDS FROM AN ACCIDENTAL FISSION PRODUCT RELEASE, WAZAPD* (697)
- WYALTE**
RFD POLLUTANT HEALTH EFFECTS ESTIMATION MODEL* (364)
MATHEMATICAL MODEL FOR PREDICTING ENVIRONMENTAL AND HUMAN HEALTH EFFECTS OF DEVELOPING NUCLEAR REACTOR PROGRAMS* (593)
EPIDEMOLOGICAL MODELS FOR PREDICTING HEALTH IMPACT OF ENERGY RELATED FACILITIES* (705)
HEALTH EFFECTS AND COSTS OF FOSSIL-FUEL POLLUTANTS* (718)
ESTIMATING HEALTH EFFECTS OF RADIOISOTOPES* (735)
- WZAT**
COMPUTER SIMULATION OF ATMOSPHERIC EFFECTS OF WASTE HEAT REJECTED FROM CONCEPTUAL LARGE POWER PLANTS* (13)
THERMAL MODEL FOR ATMOSPHERIC SPRAY COOLING SYSTEMS: ENVIRONMENTAL EFFECTS OF HEAT AND MOISTURE RELEASE* (17)
AN EMPIRICAL MODEL USING EIGENVECTORS TO CALCULATE THE TEMPORAL AND SPATIAL VARIATIONS OF THE ST. LOUIS HEAT ISLAND* (86)
A NUMERICAL STUDY OF METEOROLOGICAL EFFECTS OF WASTE HEAT AND MOISTURE RELEASES FROM HYPOTHETICAL POWER PLANTS* (263)
TRANSIENT HEAT RELEASES FROM OFFSHORE NUCLEAR PLANTS* (461)
NUMERICAL COMPUTATION OF WASTE-HEAT DISPERSION IN A RECEIVING WATER BODY* (467)
IMPROVING THE STATISTICAL RELIABILITY OF STREAM HEAT ASSIMILATION PREDICTIONS* (502)
WASTE HEAT UTILIZATION FROM POWER PLANTS IN AGRICULTURE: WATER TRANSPORT* (562)
TWO-DIMENSIONAL TRANSIENT FAR-FIELD TEMPERATURE DISTRIBUTION IN RIVERS WITH ARBITRARY HEAT SOURCES* (567)
SIMULTANEOUS HEAT AND MASS TRANSFER IN POROUS MEDIA WITH APPLICATION TO SOIL WARMING WITH POWER PLANT WASTE HEAT* (557)
WASTE HEAT MANAGEMENT IN THE ELECTRIC POWER INDUSTRY: ISSUES OF ENERGY CONSERVATION AND STATION OPERATION UNDER ENVIRONMENTAL CONSTRAINTS* (813)
FINITE ELEMENT HEAT AND MASS TRANSFER CODE* (821)
- WZATD**
PREDICTION OF HEATED EFFLUENT DISPERSION IN A STREAM USING SIMILITUDE TECHNIQUES* (418)
PREDICTION OF SURFACE PLUME AREA ASSOCIATED WITH HEATED DISCHARGES INTO LARGE LAKES - A PHENOMENOLOGICAL MODEL* (711)
TEMPERATURE DISTRIBUTION IN THE VICINITY OF HEATED DISCHARGES FROM POWER PLANTS* (893)
MATHEMATICAL DISPERSION MODEL FOR HEATED DISCHARGES* (525)
THERMAL RESPONSE OF HEATED STREAMS: SOLUTION BY THE IMPLICIT METHOD* (537)
ANALYTICAL JET-TYPE MODEL OF HEATED WATER SURFACE PLUMES* (577)
SURFACE DISCHARGE OF HEATED WATER* (578)
AN ANALYTICAL AND EXPERIMENTAL INVESTIGATION OF SURFACE DISCHARGES OF HEATED WATER* (579)
A USER'S MANUAL FOR THREE-DIMENSIONAL HEATED SURFACE DISCHARGE COMPUTATIONS* (580)
MATHEMATICAL DISPERSION MODELS FOR HEATED DISCHARGES* (580)
- WZATER**
MATHEMATICAL MODELS FOR THE PREDICTION OF TEMPERATURE DISTRIBUTIONS RESULTING FROM THE DISCHARGE OF HEATED WATER INTO LARGE BODIES OF WATER* (866)
- WZAVY**
HEAVY METALS IN ESTUARINE BENTHIC ORGANISMS AND SEDIMENTS: DATA AND MODEL* (600)
A LABORATORY MODEL FOR EVALUATING THE BEHAVIOR OF HEAVY METALS IN AN AQUATIC ENVIRONMENT* (665)
- WZISPHERE**
THERMAL AND RADIATIVE EFFECTS OF ATMOSPHERIC AEROSOLS IN THE NORTHERN HEMISPHERE CALCULATED USING A RADIATIVE CONVECTIVE MODEL* (372)
SOUTHERN HEMISPHERE PREDICTION EXPERIMENT WITH A NINE-LEVEL, PRIMITIVE-EQUATION MODEL* (869)
- WZISPHERIC**
A NON-EQUILIBRIUM MODEL OF HEMISPHERIC HEAT SURFACE TEMPERATURE* (26)
- WZPAGES**
COMPUTATION AND MAPPING OF THE DISPERSION AND HERBAGE UPTAKE OF GASEOUS EFFLUENTS FROM INDUSTRIAL PLANTS* (750)
- WZPHYS**
WZPHYS - A DIGITAL COMPUTER CODE FOR ESTIMATING REGIONAL RADIOLOGICAL EFFECTS FROM THE NUCLEAR POWER INDUSTRY* (793)
- WZ**
WZ V CODE MODIFICATIONS FOR WZ PROPAGATION AND SYSTEM PERFORMANCE MODELING* (280)
- WZHIGHWAY**
AIR QUALITY MANUAL: MATHEMATICAL APPROACH TO ESTIMATING HIGHWAY IMPACT ON AIR QUALITY* (8)
AIR QUALITY MANUAL: METEOROLOGY AND ITS INFLUENCE ON THE DISPERSION OF POLLUTANTS FROM HIGHWAY LINE SOURCES* (9)

TITLE INDEX

- HIGHWAY**
EFFECT OF HIGHWAY CONFIGURATIONS ON ENVIRONMENTAL PROBLEMS--DYNAMICS OF HIGHWAY ASSOCIATED AIR POLLUTION* (38)
EVALUATION OF HIGHWAY AIR QUALITY SIMULATION MODELS* (237)
BOUNDARY LAYER MODEL FOR AIR POLLUTANT CONCENTRATIONS DUE TO HIGHWAY TRAFFIC* (260)
A HIGHWAY AIR POLLUTION MODEL* (312)
PHOTOCHEMICAL OXIDANT MODELING, TECHNIQUES APPLICABLE TO HIGHWAY SYSTEM EVALUATION* (373)
- HIGHWAY***
A STOCHASTIC MODEL FOR CARBON MONOXIDE CONCENTRATIONS ALONG HIGHWAYS AND STREETS* (116)
MEASURED VERSUS PREDICTED AIR QUALITY NEAR HIGHWAYS* (194)
MODEL FOR THE DISPERSION OF PARTICULATE OR GASEOUS POLLUTANTS FROM A NETWORK OF STREETS AND HIGHWAYS* (354)
- HISTORY**
SIMPLE METHOD FOR EVALUATING ALTERNATIVES TO A PROPOSED ENVIRONMENTAL ALTERATION, ITS HISTORY, AND AN EXAMPLE OF ITS USE IN OIL SHALE DEVELOPMENT* (796)
- HUARY**
DEVELOPMENT AND TESTING OF A LAGRANGIAN APPROACH TO HUARY MODELING* (104)
- HS**
INVESTIGATION AND PREDICTION OF DISPERSION OF POLLUTANTS IN THE SEA WITH HYDRODYNAMICAL NUMERICAL (HN) MODELS* (610)
- HOMOGENEOUS**
CIRCULATION IN HOMOGENEOUS LAKES* (481)
NUMERICAL AND ANALYTICAL SOLUTIONS OF DISPERSION PROBLEMS IN HOMOGENEOUS AND LAYERED AQUIFERS* (565)
- HOMOTRY**
A POINT SOURCE MODEL TO ESTIMATE HOURLY CONCENTRATIONS FOR STABLE POLLUTANTS* (314)
A POINT SOURCE MODEL TO ESTIMATE HOURLY CONCENTRATIONS FOR STABLE POLLUTANTS* (315)
A POINT SOURCE MODEL TO ESTIMATE HOURLY CONCENTRATIONS FOR STABLE POLLUTANTS* (316)
- HTR**
DESCRIPTION AND DOCUMENTATION OF THE HYDROLOGIC TRANSPORT MODEL (HTR) DEVELOPED AT THE UNIVERSITY OF WISCONSIN* (802)
- HUDSON**
MODELS AND THE DECISION MAKING PROCESS: THE HUDSON RIVER POWER PLANT CASE* (752)
- HUMAN**
PREDICTION MODELS FOR STRONTIUM-90 AND CESIUM-137 LEVELS IN THE HUMAN FOOD CHAIN* (679)
PRELIMINARY MODEL OF THE HUMAN ASSIMILATION OF LEAD AEROSOLS FROM GASOLINE COMBUSTION* (692)
MATHEMATICAL MODEL FOR PREDICTING ENVIRONMENTAL AND HUMAN HEALTH EFFECTS OF DEVELOPING NUCLEAR REACTOR PROGRAMS* (693)
- HUMANS**
MODEL FOR ABSORBED DOSE RATES IN HUMANS FROM EXPOSURE TO ENVIRONMENTAL GAMMABEAMS* (726)
- HUMIDITY**
THERMAL EQUILIBRIUM OF THE ATMOSPHERE WITH A GIVEN DISTRIBUTION OF RELATIVE HUMIDITY* (181)
PREDICTING THE EFFECT OF GEOTHERMAL EMISSIONS ON THE TEMPERATURE AND RELATIVE HUMIDITY IN THE IMPERIAL VALLEY OF CALIFORNIA* (354)
- HURON**
MATHEMATICAL MODEL OF POLLUTANT CAUSE AND EFFECT IN SAGINAW BAY, LAKE HURON* (638)
- HYBRID**
HYBRID COMPUTER PROGRAM FOR RAPIDLY SOLVING FLOWING OR STATIC CHEMICAL KINETIC PROBLEMS INVOLVING MANY CHEMICAL SPECIES* (192)
- HYDRA**
HYDRA: DYNAMIC MODEL FOR URBAN HYDROLOGIC SYSTEMS* (582)
- HYDRO**
THE DISPERSIONAL TRANSIENT HYDRO-THERMAL MATHEMATICAL MODEL* (596)
- HYDROCHEMOTIC**
MECHANISM FOR HYDROCHLORIC ACID PRODUCTION IN CLOUDS* (338)
- HYDROCODES**
ATMOSPHERIC HYDROCODES USING PCT ALGORITHMS* (19)
- HYDRODYNAMIC**
ONE-DIMENSIONAL HYDRODYNAMIC AND WATER QUALITY CONDITIONS IN ESTUARIES AND CONTROLLED RIVERS* (426)
TWO-DIMENSIONAL, HYDROSTATIC SIMULATION OF THERMALLY-INFLUENCED HYDRODYNAMIC FLOWS* (552)
THREE-DIMENSIONAL SIMULATION OF THERMALLY-INFLUENCED HYDRODYNAMIC FLOWS* (573)
SIMULATION OF THERMALLY-INFLUENCED HYDRODYNAMIC FLOWS* (581)
- HYDRODYNAMICAL**
INVESTIGATION AND PREDICTION OF DISPERSION OF POLLUTANTS IN THE SEA WITH HYDRODYNAMICAL NUMERICAL (HN) MODELS* (610)
- HYDROELECTRIC**
PREDICTING THE RATE OF WARMING OF RIVERS BELOW HYDROELECTRIC INSTALLATIONS* (594)
- HYDROLOGIC**
GLOBAL MODEL OF THE ATMOSPHERE WITH SEASONAL VARIATION OF THE HYDROLOGIC CYCLE* (184)
A CONCEPTUAL MODEL OF THE HYDROLOGIC CYCLE* (416)
A HYDROLOGIC MODEL OF THE BEAR RIVER BASIN* (451)
SIMULATION OF THE HYDROLOGIC TRANSPORT OF RADIOACTIVE AEROSOLS* (455)
SIMULATING TIMBER YIELDS AND HYDROLOGIC IMPACTS RESULTING FROM TIMBER HARVEST ON SUBALPINE WATERSHEDS* (474)
HYDRA: DYNAMIC MODEL FOR URBAN HYDROLOGIC SYSTEMS* (582)
HYDRO: PROBLEM-ORIENTED COMPUTER LANGUAGE FOR HYDROLOGIC MODELING--USER'S MANUAL* (605)
DESCRIPTION AND DOCUMENTATION OF THE HYDROLOGIC TRANSPORT MODEL (HTR) DEVELOPED AT THE UNIVERSITY OF WISCONSIN* (802)
- HYDROLOGY**
MODEL OF WATERSHED HYDROLOGY* (424)
COMPUTER SIMULATION OF SURFACE WATER HYDROLOGY AND SALINITY WITH AN APPLICATION TO STUDIES OF COLORADO RIVER MANAGEMENT* (460)
A COMPUTER MODEL FOR SOME BRANCHING-TYPE PHENOMENA IN HYDROLOGY* (480)
HYDROLOGY MODEL EVALUATION AT THE HANFORD NUCLEAR WASTE FACILITY* (529)
WATER QUALITY MANAGEMENT PROGRAM HYDROLOGY PACKAGE* (628)
- HYDROSTATIC**
TWO-DIMENSIONAL, HYDROSTATIC SIMULATION OF THERMALLY-INFLUENCED HYDRODYNAMIC FLOWS* (552)
- HYDRO**
HYDRO: PROBLEM-ORIENTED COMPUTER LANGUAGE FOR HYDROLOGIC MODELING--USER'S MANUAL* (605)

TITLE INDEX

HYPOTHETICAL

A COMPUTER TECHNIQUE FOR CALCULATING THE RADIOLOGICAL CONSEQUENCES OF PRESSURIZED WATER REACTOR POWER PLANT HYPOTHETICAL ACCIDENTS* (73)
 A NUMERICAL STUDY OF METEOROLOGICAL EFFECTS OF WASTE HEAT AND MOISTURE RELEASES FROM HYPOTHETICAL POWER PLANTS* (26)
 COMPUTATIONAL METHOD FOR CALCULATION OF RADIOLOGICAL DOSE RESULTING FROM HYPOTHETICAL FISSION PRODUCT RELEASES* (494)

IDP

DISC: RADIOLOGICAL INHALATION SAFETY CODE FOR IDP 7090* (600)

ICE

MATHEMATICAL SIMULATION OF DISPERSION OF POLLUTANTS IN A LAKE WITH ICE COVER* (575)

ICING

A COMPREHENSIVE MODEL STUDY OF SALT DRIFT DEPOSITS, INDUCED FOGGING AND ICING FROM MECHANICAL DRAFT COOLING TOWER PLANTS AT INDIAN POINT* (230)

ICRP

A FORTRAN CODE WHICH IMPLEMENTS ICRP 2 MODELS OF INTERNAL RADIATION TO MAN* (709)
 CONVERSATIONAL COMPUTER CODES TO IMPLEMENT ICRP-10-10A MODELS FOR ESTIMATION OF INTERNAL RADIATION DOSE TO MAN* (710)
 COMPUTATIONAL VERSION OF THE ICRP LUNG MODEL* (725)

IDARG

NUMERICAL MODELING OF SUBSURFACE RADIOACTIVE SOLUTE TRANSPORT FROM WASTE-SEPARATION PONDS AT THE IDAHO NATIONAL ENGINEERING LABORATORY* (554)
 DIGITAL MODELING OF RADIOACTIVE AND CHEMICAL WASTE TRANSPORT IN THE SHARKE RIVER PLAIN AQUIFER AT THE NATIONAL REACTION TESTING STATION, IDAHO* (555)

IDEALIZED

RANDOM DRIFT OF AN IDEALIZED OIL PATCH* (429)

IDENTIFICATION

SYSTEM IDENTIFICATION OF RADIOISOTOPE FLOWS IN AQUATIC MICROCOSMS* (757)

ILLINOIS

THE WASTE CONVERSION MODEL FOR STATE OF ILLINOIS WATER QUALITY MANAGEMENT PROGRAM* (627)

IMAGES

USE OF LARS SYSTEM FOR THE QUANTITATIVE DETERMINATION OF SMOKE PLUME LATERAL DIFFUSION COEFFICIENTS FROM ERTS IMAGES OF VIRGINIA* (17)

IMPACT

AIR QUALITY MANUAL: MATHEMATICAL APPROACH TO ESTIMATING HIGHWAY IMPACT ON AIR QUALITY* (8)
 A MODEL TO PREDICT RADIOLOGICAL ENVIRONMENTAL IMPACT RESULTING FROM STRAIGHTLINE WIND DAMAGE TO A PLUTONIUM FACILITY* (739)
 THE CHEMISTRY, DISPERSION, AND TRANSPORT OF AIR POLLUTANTS EMITTED FROM FOSSIL FUEL POWER PLANTS IN CALIFORNIA: DATA ANALYSIS AND EMISSION IMPACT MODEL* (150)
 ATMOSPHERIC IMPACT MODELS FOR CLOSED CYCLE COOLING SYSTEMS* (229)
 ASSESSMENT OF THE AMBIENT AIR IMPACT OF MULTIPLE STACK INDUSTRIAL PLANTS USING DISPERSION MODELING* (203)
 IMPACT OF ENERGY SHORTAGE ON AMBIENT SULFUR DIOXIDE AND PARTICULATE LEVELS IN METROPOLITAN BOSTON* (296)
 STUDIES OF THE ENVIRONMENTAL IMPACT OF EVAPORATIVE COOLING TOWER PLOUMES* (300)
 SMOGNET: ESTIMATING THE AIR QUALITY IMPACT OF VEHICULAR EMISSIONS RESULTING FROM A TRAFFIC ASSIGNMENT* (356)
 DIRECT TRAVEL IMPACT MODEL* (381)
 MEASUREMENT AND MODELING OF STORE WATER RUNOFF FROM COAL STORAGE PILES AND THE IMPACT ON RECEIVING WATERS* (402)
 IMPACT OF OIL SPILLAGE FROM WORLD WAR II TANKER SINKINGS* (404)
 MODIFIED TRANSPORT APPROACH MODELS FOR POWER PLANT IMPACT IN ESTUARIES* (425)
 ENVIRONMENTAL IMPACT STUDIES OF THE NAVAJO AND NAIPAHONITS POWER PLANTS* (430)
 QUANTIFICATION OF AQUATIC ENVIRONMENTAL IMPACT OF ELECTRIC POWER GENERATION* (446)
 MODELS TO PREDICT ENVIRONMENTAL IMPACT OF RIVER DRAINAGE ON STREAMS* (449)
 A THERMAL FLUID-MECHANICAL MODEL FOR ESTIMATION OF POWER PLANT IMPACT ON A STRATIFIED LAKE* (509)
 NUMERICAL OCEAN MODEL OF THE GULF OF MEXICO FOR EVALUATION OF THE ENVIRONMENTAL IMPACT OF OCEAN THERMAL POWER PLANTS* (507)
 EPIDEMIOLOGICAL MODELS FOR PREDICTING HEALTH IMPACT OF ENERGY RELATED FACILITIES* (705)
 MATHEMATICAL MODEL FOR RADIOLOGICAL IMPACT ANALYSIS* (726)
 POTENTIAL RADIOLOGICAL IMPACT OF AIRBORNE RELEASES AND DIRECT GAMMA RADIATION TO INDIVIDUALS LIVING NEAR INACTIVE URANIUM MINE TAILINGS PILES* (740)
 USE OF THE LESLIE MATRIX FOR ASSESSING ENVIRONMENTAL IMPACT WITH AN EXAMPLE FOR A FISH POPULATION* (756)
 SIMULATING THE IMPACT OF THE ENTRAPMENT OF WINTER FLOUNDER LARVAE* (764)
 SIMULATION APPROACH TO THE ANALYSIS OF STRIP-MINING IMPACT ON THE ECOSYSTEM WITH EMPHASIS ON WILDLIFE* (792)

IMPACTS

NUCLEAR WEAPONS ATTACHMENT TO AIRCRAFT DUE TO ATMOSPHERIC RADIATION ENVIRONMENTS: AIRCRAFT IMPACTION AND AEROSOLIC COMPUTER MODEL* (236)

IMPACTS

COMPARISON OF ECOLOGICAL IMPACTS OF POSTULATED OIL SPILLS AT SELECTED ALASKAN LOCATIONS* (450)
 SIMULATING TIMBER YIELDS AND HYDROLOGIC IMPACTS RESULTING FROM TIMBER HARVEST ON SUBALPINE WATERSHEDS* (473)
 STUDY OF THE IMPACTS OF REDUCED STREAMFLOWS IN THE MIDDLE AND LOWER YELLOWSTONE BASIN* (620)
 A MODEL TO PREDICT REGIONAL WATER QUALITY IMPACTS FROM COAL RELATED ENERGY FACILITIES* (624)
 MODEL OF ENVIRONMENTAL IMPACTS FROM ELECTRICAL GENERATION IN WISCONSIN* (707)

IMPERIAL

PREDICTING THE EFFECT OF GEOTHERMAL EMISSIONS ON THE TEMPERATURE AND RELATIVE HUMIDITY IN THE IMPERIAL VALLEY OF CALIFORNIA* (354)

IMPERIMENT

TECHNIQUES FOR PREDICTING ENTRAPMENT AND IMPINGEMENT AT POWER PLANTS* (749)
 A MODEL TO PREDICT FISH-IMPINGEMENT AT COOLING WATER INTAKES* (761)
 FISH IMPINGEMENT SAMPLING DESIGN & ESTIMATION METHOD SOFTWARE SYSTEM* (762)

IMPLEMENT

CONVERSATIONAL COMPUTER CODES TO IMPLEMENT ICRP-10-10A MODELS FOR ESTIMATION OF INTERNAL RADIATION DOSE TO MAN* (710)

IMPLEMENT

A FORTRAN CODE WHICH IMPLEMENTS ICRP 2 MODELS OF INTERNAL RADIATION TO MAN* (709)

IMPLICATIONS

A THREE-DIMENSIONAL STRATOSPHERIC POINT-SOURCE TRACER EXPERIMENT AND ITS IMPLICATIONS FOR DISPERSION OF EFFLUENT FROM A FLEET OF SUPERSONIC AIRCRAFT* (170)
 NUMERICAL SIMULATION OF THE STRATOSPHERE: IMPLICATIONS FOR RELATED CLIMATE CHANGE PROBLEMS* (179)

TITLE INDEX

IMPLICATIONS

BIOTRANSFORMATION ACCUMULATION IN AN AQUATIC FOOD CHAIN: A MODEL AND SOME IMPLICATIONS FOR RESEARCH
FISHING* (660)
ASSESSMENT OF THE ENVIRONMENTAL IMPLICATIONS OF PROJECT INDEPENDENCE* (603)

IMPLICIT

THERMAL RESPONSE OF HEATED STREAMS: SOLUTION BY THE IMPLICIT METHOD* (517)

IMPOUNDMENT

MATHEMATICAL SIMULATION OF THE TURBIDITY STRUCTURE WITHIN AN IMPOUNDMENT* (611)

IMPROVEMENTS

SIMULATION OF THE EFFECTS OF ACID MINE DRAINAGE IN IMPOUNDMENTS* (623)

IMPACT

POTENTIAL RADIOLOGICAL IMPACT OF AIRBORNE RELEASES AND DIRECT GAMMA RADIATION TO INDIVIDUALS LIVING NEAR
UNACTIVE GRANITE HILL TAILINGS PILES* (740)

INCLUDE

MATHEMATICAL MODEL OF THE ACCUMULATION OF RADIONUCLIDES BY OYSTERS (C. VIRGINICA) AQUACULTURED IN THE
WILLIAMS OF A NUCLEAR POWER REACTOR TO INCLUDE MAJOR BIOLOGICAL PARAMETERS* (753)

INDEPENDENCE

ASSESSMENT OF THE ENVIRONMENTAL IMPLICATIONS OF PROJECT INDEPENDENCE* (603)

INDEX

A CUMULATIVE HAZARD INDEX FOR ASSESSING LITIGATING EXPOSURES TO ENVIRONMENTAL POLLUTANTS* (744)

INITIAL

A COMPREHENSIVE MODEL STUDY OF SALT DIRT DEPOSITS, INDUCED FOGGING AND ICING FROM MECHANICAL DRAFT COOLING
TOWER FLYWHEEL AT INDIAN POINT* (230)

INDIVIDUALS

POTENTIAL RADIOLOGICAL IMPACT OF AIRBORNE RELEASES AND DIRECT GAMMA RADIATION TO INDIVIDUALS LIVING NEAR
UNACTIVE GRANITE HILL TAILINGS PILES* (740)

INDOOR

THEORETICAL MODEL FOR RELATING INDOOR POLLUTANT CONCENTRATIONS TO THOSE OUTSIDE* (288)

INDUSTRIAL

AIR QUALITY MANAGEMENT OF INDUSTRIAL SITES* (74)
ASSESSMENT OF THE AMBIENT AIR IMPACT OF MULTIPLE STACK INDUSTRIAL PLANTS USING DISPERSION MODELING* (283)
COMPUTATION AND MAPPING OF THE DISPERSION AND DEPOSITION UPTAKE OF GASEOUS EFFLUENTS FROM INDUSTRIAL
PLANTS* (750)

INDUSTRY

HEPES - A DIGITAL COMPUTER CODE FOR ESTIMATING REGIONAL RADIOLOGICAL EFFECTS FROM THE NUCLEAR POWER
INDUSTRY* (793)
WASTE HEAT MANAGEMENT IN THE ELECTRIC POWER INDUSTRY: ISSUES OF ENERGY CONSERVATION AND STATION OPERATION
UNDER ENVIRONMENTAL CONSTRAINTS* (913)

INFRARED

WIDE-ANGLE STUDIES ON THE TIME-DEPENDENT TRANSPORT OF OPTICAL AND INFRARED RADIATION IN THE ATMOSPHERE:
THERMAL RADIATION TRANSPORT* (89)

INGESTED

A TWO-COMPARTMENT, THREE-PARAMETER MODEL FOR THE ABSORPTION AND RETENTION OF INGESTED ELEMENTS BY
ANIMALS* (670)

INHALATION

RISC: RADIOLOGICAL INHALATION SAFETY CODE FOR ICR 7090* (699)
A CDC 6600 PROGRAM FOR CALCULATION OF INHALATION AND EXTERNAL DOSE FOR ESTABLISHING REACTOR SITING DISTANCE
REQUIREMENTS* (598)
CALCULATING ORGAN DOSE FROM RADIONUCLIDE INHALATION* (739)
AEPH, A CODE FOR ACUTE AEROSOL INHALATION EXPOSURE CALCULATIONS* (743)
A FORTRAN PROGRAM TO DETERMINE ABSORBED ORGAN DOSE DUE TO INHALATION OF RADIONUCLIDES* (748)

INNEC

COMPUTATION OF RADIOLOGICAL CONSEQUENCES USING INNEC COMPUTER PROGRAM* (805)

INITIAL

THERMAL MODEL DEVELOPMENT AND INITIAL SIMULATIONS OF SOGGY UNITS 2 AND 3* (187)

INLET

INVESTIGATION OF GAS TURBINE COMBUSTORS WITH HIGH INLET AIR TEMPERATURES, COMBUSTOR MODELLING* (101)
FLOW DYNAMICS AND SEDIMENT MOVEMENT IN LOCKWOODS POLLEY INLET, NORTH CAROLINA* (887)
NUMERICAL INVESTIGATION OF THE ATLANTIC GENERATING STATION'S EFFECT ON TIDAL CURRENTS FROM LITTLE EGG INLET,
NEW JERSEY* (622)

INORGANIC

SIMULATION OF MAJOR INORGANIC CHEMICAL CONCENTRATIONS AND LOADS IN STREAMFLOW* (576)

INPUT

ISOPH-REPORT GENERATOR* (717)

INPUT

SAMPLED CHRONOLOGICAL INPUT MODEL* (136)

INPUTS

CHEMICAL MODEL FOR LAKE MICHIGAN POLLUTION, CONSIDERATIONS ON ATMOSPHERIC AND SURFACE WATER TRACE METAL
INPUTS* (606)

INSTALLATIONS

PREDICTING THE RATE OF WARMING OF RIVERS BELOW HYDROELECTRIC INSTALLATIONS* (594)

INSTITUTE

MULTILEVEL ATMOSPHERIC PREDICTION MODEL BASED ON PRIMITIVE EQUATIONS OF MOTION; THE PRIMITIVE EQUATION
MULTI-LEVEL PREDICTION MODEL AT THE INSTITUTE OF METEOROLOGY* (307)

INTAKE

MATHEMATICAL MODEL FOR INDUCED VELOCITY DISTRIBUTION AROUND A SUBMERGED INTAKE* (591)
PREDICTIVE MODEL FOR RADIOCESIUM INTAKE FROM MILK: ERRORS ASSOCIATED WITH ANNUAL-COUNT VARIATION* (750)

INTAKES

A MODEL TO PREDICT FISH-IMPINGEMENT AT COOLING WATER INTAKES* (767)

INTEGRATION

NUMERICAL INTEGRATION EXPERIMENTS WITH VARIABLE-RESOLUTION TWO-DIMENSIONAL CARTESIAN GRID USING THE BOX
METHOD* (140)

INTERACTION

NUTRIENT TRANSPORT BY SEDIMENT WATER INTERACTION* (500)
WATER MATERIAL-COOLANT INTERACTION AND PLUTONIUM SOURCE IN LWR ACCIDENT ANALYSIS* (818)

INTERFERENCE

ESTIMATED PLANE SURFACE TEMPERATURES AFTER INTERFERENCE* (520)

TITLE INDEX

- INTERIM**
AN INTERIM VERSION OF A GENERALIZED URBAN AIR POLLUTION MODEL* (105)
- INTERFAC**
THE STRUCTURE OF THE TWO-DIMENSIONAL INTERNAL BOUNDARY LAYER OVER A SUDDEN CHANGE OF SURFACE ROUGHNESS* (255)
CODE-EPSE-THUNDERHEAD: A DIGITAL COMPUTER PROGRAM FOR EXTERNAL AND INTERNAL RADIATION DOSE CALCULATIONS* (707)
A FORTRAN CODE WHICH IMPLEMENTS ICRP 2 MODELS OF INTERNAL RADIATION TO MAN* (701)
CONVERSATIONAL COMPUTER CODES TO IMPLEMENT ICRP-10-10A MODELS FOR ESTIMATION OF INTERNAL RADIATION DOSE TO MAN* (710)
- INTERVAL**
GOAL INTERVAL PROGRAMMING MODEL FOR RESOURCE ALLOCATION IN A MARINE ENVIRONMENTAL PROTECTION PROGRAM* (406)
- INTRUSION**
MATHEMATICAL MODEL FOR THE PREDICTION OF UNSTEADY SALINITY INTRUSION IN ESTUARIES* (503)
PREDICTION OF UNSTEADY SALINITY INTRUSION IN ESTUARIES: MATHEMATICAL MODEL AND USER'S MANUAL* (504)
- INVARIANT**
INVARIANT MODEL OF ATMOSPHERIC BOUNDARY LAYER DIFFUSION* (154)
INVARIANT MODELING OF ATMOSPHERIC TURBULENCE AND DIFFUSION* (217)
- IRON**
IRON CATALYZED OXIDATION OF SO₂ TO ACID SULPHATE MIST IN DISPERSING PLUMES* (43)
- ISLAND**
AN EMPIRICAL MODEL USING EIGENVECTORS TO CALCULATE THE TEMPORAL AND SPATIAL VARIATIONS OF THE ST. LOUIS HEAT ISLAND* (46)
AIR POLLUTION BY COMPUTER TRAVEL ON STATER ISLAND* (290)
A GALERKIN-FINITE ELEMENT SIMULATION OF GROUNDWATER CONTAMINATION ON LONG ISLAND, NEW YORK* (547)
- ISOTOPIC**
ISOTOPIC SAFEGUARDS TECHNIQUES* (744)
- ISSUE**
WASTE HEAT MANAGEMENT IN THE ELECTRIC POWER INDUSTRY: ISSUES OF ENERGY CONSERVATION AND STATION OPERATION UNDER ENVIRONMENTAL CONSTRAINTS* (813)
- JERSEY**
COMPUTER SIMULATION TECHNIQUE FOR OIL SPILLS OFF THE NEW JERSEY-DELAWARE COASTLINE* (507)
EMPIRICAL INVESTIGATION OF THE ATLANTIC GENERATING STATION'S EFFECT ON TIDAL CURRENTS FROM LITTLE EGGS INLET, NEW JERSEY* (402)
- JET**
MATHEMATICAL MODELS FOR ANALYZING ORIGIN AND DISTRIBUTION OF COMBUSTION GENERATED POLLUTANTS IN GAS TURBINES: A MATHEMATICAL MODEL FOR JET ENGINE COMBUSTOR POLLUTANT EMISSIONS* (18)
TRANSVERSE JET PLUMES* (96)
BUOYANT JET DISCHARGE MODEL, SEABROOK NUCLEAR STATION* (473)
NUMERICAL MODEL FOR A TURBULENT BUOYANT JET IN A SHALLOW OPEN CHANNEL* (489)
ANALYTICAL JET-TYPE MODEL OF HEATED WATER SURFACE PLUMES* (577)
- JETS**
NEGATIVELY BUOYANT JETS IN A CROSS FLOW* (389)
- JOHN**
PREDICTED AND OBSERVED COOLING TOWER PLUME RISE AND VISIBLE PLUME LENGTH AT THE JOHN F. ANDROS POWER PLANT* (102)
- JOINT**
RESPONSE OF THE JOINT OCEAN-ATMOSPHERE MODEL TO THE SEASONAL VARIATION OF THE SOLAR RADIATION* (320)
- K**
THE APPLICATION OF K-THEORY TO DIFFUSION PROBLEMS INVOLVING NONLINEAR CHEMICAL REACTIONS* (143)
- KAIAPAROWITS**
ENVIRONMENTAL IMPACT STUDIES OF THE HAWAII AND KAIAPAROWITS POWER PLANTS* (434)
- KELP**
OCEAN FOOD AND FERTILITY FARM (OFFP): DEVELOPMENT OF THE KELP GROWTH MODEL* (774)
- KENTUCKY**
A SHORT-TERM AIR QUALITY MODEL FOR SULFUR DIOXIDE IN LOUISVILLE, KENTUCKY* (351)
- KINETIC**
KINETIC STUDY OF SIMULATED SO₂, NO_x, AND PM-POLLUTED ATMOSPHERES* (30)
HYBRID COMPUTER PROGRAM FOR RAPIDLY SOLVING FLOWING OR STATIC CHEMICAL KINETIC PROBLEMS INVOLVING MANY CHEMICAL SPECIES* (192)
DEVELOPMENT OF A SIMULATION MODEL FOR ESTIMATING GROUND LEVEL CONCENTRATIONS OF PHOTOCHEMICAL POLLUTANTS, A KINETIC MECHANISM FOR ATMOSPHERIC PHOTOCHEMICAL REACTIONS* (380)
- KINETICS**
SCAVENGING MODEL INCORPORATING CHEMICAL KINETICS* (58)
A GENERAL KINETICS CODE WITH ATMOSPHERIC APPLICATIONS* (71)
USEP'S GUIDE TO DIFFUSION/KINETICS (DIFKIM) CODE, I* (104)
LIVERMORE REGIONAL AIR QUALITY MODEL: KINETICS AND TRANSPORT* (347)
TRITIUM KINETICS IN A FRESHWATER BASIN* (659)
- KON**
KON AND FAN-PLANE BEHAVIOR FOR ROUND OR SLOT UNDERWATER DISCHARGE INCLUDING MULTIPORT DISCHARGES* (880)
- KINETIC**
KINETIC* (733)
- LABORATORY**
SURVEY OF LABORATORY MODELING OF PLUME DYNAMICS* (272)
LABORATORY EXPERIMENTS OF SUBMERGED DISCHARGES WITH CURRENT* (407)
TWO-DIMENSIONAL NUMERICAL MODEL OF THE NEAR-FIELD FLOW FOR AN OCEAN THERMAL POWER PLANT: THE THEORETICAL APPROACH AND A LABORATORY SIMULATION* (553)
NUMERICAL MODELING OF SUBSURFACE RADIOACTIVE SOLUTE TRANSPORT FROM WASTE-SERPENTINE POUNDS AT THE IDAHO NATIONAL ENGINEERING LABORATORY* (554)
A LABORATORY MODEL FOR EVALUATING THE BEHAVIOR OF HEAVY METALS IN AN AQUATIC ENVIRONMENT* (465)
- LAGRANGIAN**
DEVELOPMENT AND TESTING OF A LAGRANGIAN APPROACH TO WIND MODELING* (144)
A LAGRANGIAN TRAJECTORY MODEL OF URBAN SCALE PHOTOCHEMICAL AIR POLLUTION* (193)
LAGRANGIAN TRANSPORT AND DIFFUSION CODE TO CALCULATE CONCENTRATIONS AND DEPOSITION AT LONG RANGE OF PARTICLES LESS THAN 10 MICRON METERS DIAMETER* (238)
NUMERICAL MODELING OF POLLUTANT TRANSPORT USING A LAGRANGIAN MARKER PARTICLE TECHNIQUE* (574)
- LAKE**
SHAGAWA LAKE RECOVERY CHARACTERISTICS AS DEPICTED BY PREDICTIVE MODELING* (472)

TITLE INDEX

LAKE

UPRAKE AND MIGRATION OF TRACEES IN LAKE SEDIMENTS* (679)
 A THERMAL FLUID-MECHANICAL MODEL FOR ESTIMATION OF POWER PLANT IMPACT ON A STRATIFIED LAKE* (509)
 MATHEMATICAL SIMULATION OF DISPERSION OF POLLUTANTS IN A LAKE WITH ICE COVER* (577)
 CHEMICAL MODEL FOR LAKE MICHIGAN POLLUTION, CONSIDERATIONS ON ATMOSPHERIC AND SURFACE WATER TRACE METAL INPUTS* (564)
 MATHEMATICAL MODEL OF POLLUTANT CAUSE AND EFFECT IN SAGINAW BAY, LAKE MICHIGAN* (434)
 A FOOD CHAIN MODEL OF CASHIUM IN WESTERN LAKE ERIE* (646)
 SPECIFIC ACTIVITY AND CONCENTRATION MODEL APPLIED TO CS-137 MOVEMENT IN A EUTROPHIC LAKE* (772)
 PREDICTIVE STUDY OF THE DISPERSION OF EMISSIONS FROM THE SYNCHROBIOLIZED LAKE PLANTS* (908)

LAKES

DIGITAL COMPUTER SIMULATION OF THERMAL EFFLUENT DISPERSION IN RIVERS, LAKES, AND ESTUARIES* (412)
 FIELD EVALUATION OF A PREDICTIVE MODEL FOR THERMAL STRATIFICATION IN LAKES AND RESERVOIRS* (413)
 PREDICTION OF TEMPERATURE PROFILES IN ARBITRARILY SHAPED COOLING LAKES BY FINITE DIFFERENCE TECHNIQUES* (415)
 PHENOMENOLOGICAL MODEL FOR THE PREDICTION OF THERMAL FLUXES IN LARGE LAKES* (423)
 PREDICTION OF SURFACE FLUX AREAS ASSOCIATED WITH HEATED DISCHARGES INTO LARGE LAKES - A PHENOMENOLOGICAL MODEL* (437)
 COMPUTER MODEL FOR PREDICTING THERMAL DISCHARGES IN LARGE LAKES* (454)
 SE-90 IN THE GREAT LAKES: CONCENTRATION-TIME MODEL* (478)
 CIRCULATION IN HOMOGENEOUS LAKES* (491)
 MATHEMATICAL ANALYSIS OF CHRONAL POLLUTION OF LAKES AND ESTUARIES* (503)
 PROSOPHIC CYCLING IN LAKES* (534)
 MULTI-LAYERED MODELS OF CURRENTS, TEMPERATURE, AND WATER QUALITY PARAMETERS IN THE GREAT LAKES* (570)
 A GENERALIZED WATER QUALITY MODEL FOR EUTROPHIC LAKES AND RESERVOIRS* (621)
 EFFECTS OF THE PIPELINE HAZEL ROAD ON NEARBY WOODS AND LAKES ACROSS ALASKA'S NORTH SLOPE* (705)

LAND

STATISTICAL OXYDANT AIR QUALITY PREDICTION MODEL FOR LAND USE AND TRANSPORTATION PLANNING* (11)
 LAND-SEA FREEZE MODEL* (154)

LANGUAGE

HYPER: FRONTIER-ORIENTED COMPUTER LANGUAGE FOR HYDROLOGIC MODELING--USER'S MANUAL* (405)

LARS

THE OF LARS SYSTEM FOR THE QUANTITATIVE DETERMINATION OF SMOKE PLUME LATERAL DIFFUSION COEFFICIENTS FROM SPOT IMAGES OF VIRGINIA* (17)

LARTAY

ESTIMATING THE IMPACT OF THE ENTRAPMENT OF WINTER FLOWING LARVAE* (764)

LASE

AIR TRANSPORT CALCULATIONS USING THE LASE-WHEP AIR PLUM TAP AND THE WHEP COMPUTER PROGRAM--CODE* (31)

LATERAL

THE OF LARS SYSTEM FOR THE QUANTITATIVE DETERMINATION OF SMOKE PLUME LATERAL DIFFUSION COEFFICIENTS FROM SPOT IMAGES OF VIRGINIA* (17)

LATERALLY

LATERALLY ATTACHED RESERVOIR MODEL* (401)

LATE TYPE

MODELING STUDY OF SEASONAL EFFECT ON AIR POLLUTION AT 60 DEGREES N LATITUDE* (26)

LAYER

A TIME-DEPENDENT MODEL OF THE TRADE-WIND BOUNDARY LAYER* (3)
 A PARTICULATE BOUNDARY LAYER MODEL FOR THE PREDICTION OF PM₁₀* (4)
 POLLUTANT DISTRIBUTIONS IN THE MIXED LAYER, USING A SIMILARITY THEORY* (44)
 ATMOSPHERIC DIFFUSION IN THE SURFACE TURBULENT BOUNDARY LAYER* (124)
 SIX LAYER GLOBAL CIRCULATION MODEL* (132)
 INVARIANT MODEL OF ATMOSPHERIC BOUNDARY LAYER DIFFUSION* (154)
 COMPUTATIONAL DIFFUSION IN ATMOSPHERIC BOUNDARY LAYER MODELS* (167)
 A NUMERICAL MODEL OF THE NOCTURNAL URBAN BOUNDARY LAYER* (190)
 PREDICTION BY NUMERICAL MODELS OF TRANSPORT AND DIFFUSION IN AN URBAN BOUNDARY LAYER* (213)
 BOUNDARY LAYER MODEL FOR AIR POLLUTANT CONCENTRATIONS DUE TO HIGHWAY TRAFFIC* (260)
 THE STRUCTURE OF THE TWO-DIMENSIONAL INTERNAL BOUNDARY LAYER OVER A SHARP CHANGE OF SURFACE ROUGHNESS* (265)
 ATMOSPHERIC TRANSPORT AND DIFFUSION IN THE PLANETARY BOUNDARY LAYER* (321)
 RADIATIVE EFFECTS OF POLLUTANTS ON THE PLANETARY BOUNDARY LAYER* (322)
 TWO-LAYER GLOBAL CIRCULATION MODEL* (324)
 NOCTURNAL BOUNDARY LAYER MODEL* (344)

LAYERED

NUMERICAL AND ANALYTICAL SOLUTIONS OF DISPERSION PROBLEMS IN HOMOGENEOUS AND LAYERED AQUIFERS* (565)
 MULTI-LAYERED MODELS OF CURRENTS, TEMPERATURE, AND WATER QUALITY PARAMETERS IN THE GREAT LAKES* (570)
 ONE-DIMENSIONAL TRANSIENT NONISOTHERMAL TWO-PHASE, TWO COMPONENT FLOW OF FLUIDS AND GASES THROUGH LAYERED POROUS MEDIA* (646)

LEAD

MODELING ATMOSPHERIC DISPERSION OF LEAD FROM AUTOMOTIVE SOURCES* (133)
 MODEL FOR ENVIRONMENTAL TRANSPORT OF AUTOMOTIVE LEAD* (320)
 DEPOSITIONAL ENVIRONMENT OF ZINC, LEAD AND CADMIUM IN RESERVOIR SEDIMENTS* (540)
 MODELING LEAD POLLUTION IN A WATERSHED ECOSYSTEM* (557)
 PRELIMINARY MODEL OF THE HUMAN ASSIMILATION OF LEAD AEROSOLS FROM GASOLINE COMBUSTION* (692)

LENGTH

PREDICTED AND OBSERVED COOLING TOWER PLUME SIZE AND VISIBLE PLUME LENGTH AT THE JOHN F. KOS POWER PLANT* (102)
 MATHEMATICAL MODEL FOR CALCULATION OF LENGTH OF THE VISIBLE PLUME* (213)

LESLIE

USE OF THE LESLIE MATRIX FOR ASSESSING ENVIRONMENTAL IMPACT WITH AN EXAMPLE FOR A FISH POPULATION* (756)
 A STOCHASTIC FISH LIFE-CYCLE POPULATION MODEL USING A MODIFIED LESLIE MATRIX* (759)

LICENSING

TWA GASEOUS EFFLUENT LICENSING CODE FOR URBAN RISING AND RILLING* (212)

LICHEN

TRANSFER OF RADIOCESIUM FROM LICHEN TO REINDEER* (471)

LIFE

A STOCHASTIC FISH LIFE-CYCLE POPULATION MODEL USING A MODIFIED LESLIE MATRIX* (759)
 A GENERALIZED FISH LIFE-CYCLE POPULATION MODEL AND COMPUTER PROGRAM* (771)

LIMITING

A CUMULATIVE HAZARD INDEX FOR ASSESSING LIMITING EXPOSURES TO ENVIRONMENTAL POLLUTANTS* (744)

TITLE NUMBER

LYNCOLOGY

EFFECTS OF DEVELOPMENT ON SALINITY AND LYNCOLOGY OF THE LOWER COLORADO RIVER* (424)

LINE

AIR QUALITY MODEL: METEOROLOGY AND ITS INFLUENCE ON THE DISPERSION OF POLLUTANTS FROM HIGHWAY LINE SOURCES* (9)
 CALIBER: AN IMPROVED MICROSCALE MODEL FOR THE DISPERSION OF AIR POLLUTANTS FROM A LINE SOURCE* (10)
 CALIFORNIA LINE SOURCE DISPERSION MODEL, 3RD GENERATION* (11)
 EFFECT OF A RESONANCE TYPE WIND ON THE POLLUTANT DISTRIBUTION FROM A LINE SOURCE* (67)
 TWO-DIMENSIONAL, FINITE DIFFERENCE LINE SOURCE MODEL* (79)
 CALCULATION OF GAMMA-RAY LINE FLUXES FROM THE ROOM* (269)
 POINT, AREA, LINE SOURCE ALGORITHM* (310)

LINEAR

LYSEAN DISPERSION AND CONVECTION OF CHEMICALS IN SOILS* (640)

LIQUID

A MODEL FOR CALCULATING EFFECTS OF LIQUID WASTE DISPOSAL IN DEEP SALINE AQUIFERS* (519)
 A MODEL FOR CALCULATING EFFECTS OF LIQUID WASTE DISPOSAL IN DEEP SALINE AQUIFERS* (641)
 A COMPUTER CODE (WVSDOS) TO CALCULATE POPULATION DOSES FROM RADIOACTIVE LIQUID EFFLUENTS AND AN APPLICATION TO NUCLEAR POWER REACTORS ON THE MISSISSIPPI RIVER BASIN* (721)
 DOSES TO MAN FROM ATMOSPHERIC AND LIQUID EFFLUENTS* (727)
 CALCULATION OF RELEASES OF RADIOACTIVE MATERIALS IN GASEOUS AND LIQUID EFFLUENTS FROM BOILING WATER REACTORS (BWR-GALE CODE)* (811)
 CALCULATION OF RELEASES OF RADIOACTIVE MATERIALS IN GASEOUS AND LIQUID EFFLUENTS FROM PRESSURIZED WATER REACTORS (PWR-GALE CODE)* (812)

LITERATURE

CONCENTRATION FACTORS AND TRANSPORT MODELS FOR RADIONUCLIDES IN AQUATIC ENVIRONMENTS-A LITERATURE REPORT* (664)

LITTLE

MEDICAL INVESTIGATION OF THE ATLANTIC GENERATING STATION'S EFFECT ON TIDAL CURRENTS FROM LITTLE EGG INLET, NEW JERSEY* (602)

LIVED

A COMPUTER CODE FOR ANALYZING ROUTINE ATMOSPHERIC RELEASES OF SHORT-LIVED RADIOACTIVE NUCLIDES* (53)

LIVERMORE

LIVERMORE REGIONAL AIR QUALITY MODEL: KINETICS AND TRANSPORT* (347)
 MODIFICATION OF LIVERMORE AIR QUALITY MODEL FOR USE IN ST. LOUIS* (348)
 LIVERMORE REGIONAL AIR QUALITY MODEL-MODE 1* (363)

LIVING

POTENTIAL RADIOLOGICAL IMPACT OF AIRBORNE RELEASES AND DIRECT GAMMA RADIATION TO INDIVIDUALS LIVING NEAR NUCLEAR REACTOR WASTE TAILINGS PILES* (749)

LMPDP

MOLTEN NUCLEAR-COOLANT INTERACTION AND PLUTONIUM SOURCE IN LMPDP ACCIDENT ANALYSIS* (814)

LUG

THEORETICAL MODELS FOR LUG DISPERSION* (229)

LOADED

EFFECT OF ATMOSPHERIC STABILITY ON WATER TEMPERATURE PREDICTIONS FOR A THERMALLY LOADED STREAM* (420)
 TWO-DIMENSIONAL TEMPERATURE MODEL FOR A THERMALLY LOADED RIVER WITH STEADY DISCHARGE* (616)

LOADING

COMPARATIVE MODEL THEORY OF ATMOSPHERIC CONTAMINANT LOADING BY POWER STATIONS* (123)
 THE POINT-SOURCE POLLUTANT LOADING (PPL) MODEL* (493)

LOADS

SIMULATION OF MAJOR INORGANIC CHEMICAL CONCENTRATIONS AND LOADS IN STREAMFLOW* (576)
 PH PROFILES IN A RIVER SYSTEM WITH MULTIPLE ACID LOADS* (639)

LOCAL

URBAN AIR SHED PHOTOCHEMICAL SIMULATION MODEL STUDY: MICROSCALE MODEL OF LOCAL VEHICULAR CONTRIBUTIONS TO MEASURED POLLUTANT CONCENTRATIONS* (160)
 A MODEL TO ESTIMATE THE LOCAL RADIATION DOSES TO MAN FROM THE ATMOSPHERIC RELEASE OF RADIONUCLIDES* (731)

LOCATION

OBTAINING LOCATION/ARRIVAL-TIME AND LOCATION/OUTFLOW-QUANTITY DISTRIBUTIONS FOR STEADY FLOW SYSTEMS* (515)

LOCATIONS

COMPARISON OF ECOLOGICAL IMPACTS OF POSTULATED OIL SPILLS AT SELECTED ALASKAN LOCATIONS* (458)

LOCKWOODS

FLUX DYNAMICS AND SEDIMENT MOVEMENT IN LOCKWOODS FOLLY INLET, NORTH CAROLINA* (497)

LOS

ECONOMIC AIR POLLUTION CONTROL MODEL FOR LOS ANGELES COUNTY IN 1975* (383)

LOUIS

AN EMPIRICAL MODEL USING EIGENVECTORS TO CALCULATE THE TEMPORAL AND SPATIAL VARIATIONS OF THE ST. LOUIS HEAT ISLAND* (46)
 MODIFICATION OF LIVERMORE AIR QUALITY MODEL FOR USE IN ST. LOUIS* (348)

LOUISVILLE

A SHORT-TERM AIR QUALITY MODEL FOR SULFUR DIOXIDE IN LOUISVILLE, KENTUCKY* (351)

LUNG

COMPUTATIONAL VERSION OF THE ICRP LUNG MODEL* (725)
 DEPOSITION OF ELECTRO-AEROSOLS IN THE LUNG* (732)

MAINTENANCE

AIR QUALITY MAINTENANCE THROUGH PRACTICAL MODELING* (297)
 SYNCHRO VERSION 2.1 USER'S MANUAL AND MAINTENANCE DOCUMENT* (798)

MANUALS

ESTIMATE OF FALLOUT RADIONUCLIDES BY MANUALS AND A STOCHASTIC SIMULATION OF THE PROCESS* (677)

MAN

MODELLING THE DOSE TO MAN FROM EXPOSURE TO INITIATED WATER VAPOR* (681)
 A FORTRAN CODE WHICH IMPLEMENTS ICRP 2 MODELS OF INTERNAL RADIATION TO MAN* (709)
 CONVERSATIONAL COMPUTER CODES TO IMPLEMENT ICRP-10-10A MODELS FOR ESTIMATION OF INTERNAL RADIATION DOSE TO MAN* (710)
 THE AIRDOX-II COMPUTER CODE FOR ESTIMATING RADIATION DOSE TO MAN FROM AIRBORNE RADIONUCLIDES IN AREAS SURROUNDING NUCLEAR FACILITIES* (724)
 DOSES TO MAN FROM ATMOSPHERIC AND LIQUID EFFLUENTS* (727)
 A MODEL TO ESTIMATE THE LOCAL RADIATION DOSES TO MAN FROM THE ATMOSPHERIC RELEASE OF RADIONUCLIDES* (731)

TITLE INDEX

- BAV**
A SYSTEMS ANALYSIS METHODOLOGY FOR PREDICTING DOSE TO MAN FROM A RADIOACTIVELY CONTAMINATED TERRESTRIAL ENVIRONMENT* (747)
- MANAGEMENT**
AIR QUALITY MANAGEMENT OF INDUSTRIAL SITES* (34)
COMPUTER SIMULATION OF SURFACE WATER HYDROLOGY AND SALINITY WITH AN APPLICATION TO STUDIES OF COLORADO RIVER MANAGEMENT* (460)
STORMWATER MANAGEMENT MODEL* (532)
THE WASTE CONVERSION MODEL FOR STATE OF ILLINOIS WATER QUALITY MANAGEMENT PROGRAM* (627)
WATER QUALITY MANAGEMENT PROGRAM HYDROLOGY PACKAGE* (528)
OPTIMIZATION MODELS FOR RIVER BASIN WATER QUALITY MANAGEMENT AND WASTE TREATMENT PLANT DESIGN* (630)
COMMERCIAL WASTE MANAGEMENT REPORT GENERATOR* (730)
WASTE HEAT MANAGEMENT IN THE ELECTRIC POWER INDUSTRY: ISSUES OF ENERGY CONSERVATION AND PLANT OPERATION UNDER ENVIRONMENTAL CONSTRAINTS* (813)
- MANUAL**
AIR QUALITY MANUAL: MATHEMATICAL APPROACH TO ESTIMATING HIGHWAY IMPACT ON AIR QUALITY* (8)
AIR QUALITY MANUAL: METEOROLOGY AND ITS INFLUENCE ON THE DISPERSION OF POLLUTANTS FROM HIGHWAY LINE SOURCES* (9)
THE BOSCOY MANUAL, HIGH-ALTITUDE NEUTRAL-PARTICLE MOTION* (100)
USER'S MANUAL FOR THE APAC-2 URBAN DIFFUSION MODEL COMPUTER PROGRAM* (170)
USER'S MANUAL FOR THE APAC-1A URBAN DIFFUSION MODEL COMPUTER PROGRAM* (185)
USERS MANUAL FOR CODE ENGAN: A CODE TO CALCULATE GAMMA PHOTON DOSE FROM AN AIRBORNE RADIOACTIVE RELEASE* (393)
USER'S MANUAL, APPROVED PROCEDURES FOR ESTIMATING CONTROL COSTS AND EMISSION REDUCTIONS FOR SPECIFIED AIR POLLUTION SOURCES* (341)
DISAC-1, SIMULATION OF WATER QUALITY IN STREAMS AND CANALS: PROGRAM DOCUMENTATION AND USER'S MANUAL* (530)
A USER'S MANUAL FOR THREE-DIMENSIONAL HEATED SURFACE DISCHARGE COMPUTATIONS* (500)
PREDICTION OF UNSTEADY SALINITY INTRUSION IN ESTUARIES: MATHEMATICAL MODEL AND USER'S MANUAL* (504)
HYEC: FORTRAN-ORIENTED COMPUTER LANGUAGE FOR HYDROLOGIC MODELING--USER'S MANUAL* (605)
ATPEP PROGRAM MANUAL: A COMPUTER CODE FOR CALCULATING DOSES, POPULATION DOSES, AND GROUND DEPOSITIONS DUE TO ATMOSPHERIC EMISSIONS OF RADIOISOTOPES* (720)
USER'S MANUAL FOR THE POSTPAC VERSION OF PSAC: A RADIOLOGICAL SAFETY ANALYSIS COMPUTER PROGRAM* (730)
SINCOMP: VERSION 3.0 USER'S MANUAL* (797)
SINCOMP VERSION 2.1 USER'S MANUAL AND MAINTENANCE DOCUMENT* (798)
- MAPP**
THERMAL REGIMES OF THE UPPER MISSISSIPPI AND MISSOURI RIVERS: TRANSIENT AND STEADY-STATE COMPUTATIONAL MODELS FOR THE PREDICTION OF RIVER THERMAL REGIMES; PART TWO: ANALYSIS OF THERMAL REGIMES OF THE MISSISSIPPI AND MISSOURI RIVERS IN THE MID-CONTINENT AREA POWER POOL (MAPP) GEOGRAPHICAL AREA* (530)
- MAPPING**
COMPUTATION AND MAPPING OF THE DISPERSION AND HERPAGE UPTAKE OF GASEOUS EFFLUENTS FROM INDUSTRIAL PLANTS* (750)
- MARINE**
MARINA DEL PEY: COMPUTER SIMULATION OF POLLUTANT TRANSPORT IN SEMI-ENCLOSED WATER BODIES* (400)
- MARINE**
GOAL INTERVAL PROGRAMMING MODEL FOR RESOURCE ALLOCATION IN A MARINE ENVIRONMENTAL PROTECTION PROGRAM* (404)
VULNERABILITY MODEL: A SIMULATION SYSTEM FOR ASSESSING DAMAGE RESULTING FROM MARINE SPILLS* (422)
INVESTIGATION OF SOME FACTORS IN THE BIOCHEMICAL CONVERSION OF MERCURY POLLUTANTS TO TOXIC METHYLMERCURY EFFECTED BY MICRO-ORGANISMS IN A MARINE SEDIMENT* (500)
A MODEL FOR THE APPROXIMATE CALCULATION OF SAFE RATES OF DISCHARGE OF RADIOACTIVE WASTES INTO MARINE ENVIRONMENTS* (561)
UNSTRUCTURED MARINE FOOD WEBS AND POLLUTANT ANALOGUES* (662)
MATHEMATICAL MODELS FOR PREDICTING THE TRANSPORT OF RADIOISOTOPES IN A MARINE ENVIRONMENT* (683)
A PRELIMINARY MATHEMATICAL MODEL FOR PREDICTING THE TRANSPORT OF RADIOISOTOPES IN THE MARINE ENVIRONMENT* (706)
- MARITIME**
A MARITIME BOUNDARY LAYER MODEL FOR THE PREDICTION OF FOG* (6)
- MARKEP**
NUMERICAL MODELING OF POLLUTANT TRANSPORT USING A LAGRANGIAN MARKED PARTICLE TECHNIQUE* (574)
- MARSH**
TRITIUM KINETICS IN A FRESHWATER MARSH* (659)
- MASS**
A MASS CONSISTENT ATMOSPHERIC FLUX MODEL FOR REGIONS WITH COMPLEX TERRAIN* (66)
MASS ADJUSTED THREE DIMENSIONAL WIND FIELD MODEL* (292)
A MASS BALANCE MODEL OF TRACE METALS IN SEVERAL DELAWARE WATERSHEDS* (397)
A THEORY OF THE MASS TRANSPORT OF PREVIOUSLY DISTRIBUTED CHEMICALS IN A WATER SATURATED SORBING POROUS MEDIUM* (509)
SIMULTANEOUS HEAT AND MASS TRANSFER IN POROUS MEDIA WITH APPLICATION TO SOIL WARMING WITH POWER PLANT WASTE HEAT* (657)
FINITE ELEMENT HEAT AND MASS TRANSFER CODE* (821)
- MATERIAL**
ASSESSMENT OF CONSEQUENCES FROM AIRBORNE RELEASES OF RADIOACTIVE MATERIAL* (191)
MATERIAL TRANSPORT THROUGH POROUS MEDIA: A FINITE-ELEMENT GALERKIN MODEL* (644)
APPLICATION OF ECOSYSTEM MODELING METHODOLOGIES TO PREDICTED MATERIAL RESPONSE* (807)
NOTES ON MATERIAL-COOLANT INTERACTION AND PLUTONIUM SOURCE IN LWRDB ACCIDENT ANALYSIS* (814)
PACTRAN: A COMPUTER CODE TO ANALYZE TRANSPORTATION OF RADIOACTIVE MATERIAL* (820)
- MATERIALS**
THE ESTIMATION OF THE DISPERSION OF WINDBORNE MATERIALS* (234)
CALCULATION OF RELEASES OF RADIOACTIVE MATERIALS IN GASEOUS AND LIQUID EFFLUENTS FROM BOILING WATER REACTORS (BWR-GALE CODE)* (811)
CALCULATION OF RELEASES OF RADIOACTIVE MATERIALS IN GASEOUS AND LIQUID EFFLUENTS FROM PRESSURIZED WATER REACTORS (PWR-GALE CODE)* (812)
- MATRIX**
USE OF THE LESLIE MATRIX FOR ASSESSING ENVIRONMENTAL IMPACT WITH AN EXAMPLE FOR A FISH POPULATION* (756)
A STOCHASTIC FISH LIFE-CYCLE POPULATION MODEL USING A MODIFIED LESLIE MATRIX* (759)
- MATTER**
ATMOSPHERIC DIFFUSION AND DEPOSITION OF PARTICULATE MATTER* (47)
- MATE**
MATE* (702)

TITLE INDEX

WEAR

A NON-EQUILIBRIUM MODEL OF HEMISPHERIC WEAR SURFACE TEMPERATURE* (26)
 WEAR TO WEAR CONCENTRATION RATIOS ACCORDING TO A "TOP-HAT" FLUCTUATING PLUME MODEL* (97)
 PLANETARY DISTRIBUTION OF ZONAL WEAR TRANSPORT PARAMETERS OF RADIOISOTOPES IN THE TROPOSPHERE AND LOWER STRATOSPHERE: CLIMATIC DISTRIBUTION OF THE ZONAL WEAR COMPONENTS OF THE HEMISPHERIC CIRCULATION VELOCITY* (139)
 A PREDICTION MODEL OF WEAR URBAN POLLUTION FOR USE WITH STANDARD WIND MODELS* (257)
 PREDICTION OF LONG-TERM WEAR AND WEAR SQUARE POLLUTANT CONCENTRATIONS IN AN URBAN ATMOSPHERE* (357)

WATERSHED

THE STANFORD WATERSHED MODEL: THE CORRELATION OF PARAMETER VALUES SELECTED BY A COMPUTERIZED PROCEDURE WITH MEASURABLE PHYSICAL CHARACTERISTICS OF THE WATERSHED* (652)

WATERSHED

URBAN AIR SHED PHOTOCHEMICAL SIMULATION MODEL STUDY: MICROSCALE MODEL OF LOCAL VEHICULAR CONTRIBUTIONS TO MEASURED POLLUTANT CONCENTRATIONS* (160)
 MEASURED VERSUS PREDICTED AIR QUALITY NEAR HIGHWAYS* (199)

WATERSHED

MEASUREMENT AND MODELING OF STORM WATER RUNOFF FROM COAL STORAGE PILES AND THE IMPACT ON RECEIVING WATERS* (402)

WATERSHED

A MATHEMATICAL MODEL FOR RELATING AIR QUALITY MEASUREMENTS TO AIR QUALITY STANDARDS* (319)

WEATHER

MULTIPLE CELL MECHANICAL DRAFT COOLING TOWER MODEL* (63)
 MODEL FOR FLUID MECHANICAL STUDIES OF AIR POLLUTION* (155)
 A COMPREHENSIVE MODEL STUDY OF SALT DRAFT DEPOSITS, INDUCED FOGGING AND ICING FROM MECHANICAL DRAFT COOLING TOWER PLUMES AT INDIAN POINT* (210)
 A THERMAL FLUID-MECHANICAL MODEL FOR ESTIMATION OF POWER PLANT IMPACT ON A STRATIFIED LAKE* (509)

WEATHER

MECHANISM FOR HYDROCHLORIC ACID PRODUCTION IN CLOUDS* (334)
 DEVELOPMENT OF A SIMULATION MODEL FOR ESTIMATING GROUND LEVEL CONCENTRATIONS OF PHOTOCHEMICAL POLLUTANTS, A KINETIC MECHANISM FOR ATMOSPHERIC PHOTOCHEMICAL REACTIONS* (340)
 THE MECHANISM AND PREDICTION OF GASEOUS POLLUTANT UPTAKE BY VEGETATION* (776)

WEATHER

ECOLOGICAL TRANSFER MECHANISMS - TERRESTRIAL* (673)

WEATHER

WATER MOVEMENT THROUGH SATURATED POROUS MEDIA: A FINITE-ELEMENT GALERKIN MODEL* (443)
 WATER TRANSPORT THROUGH POROUS MEDIA: A FINITE-ELEMENT GALERKIN MODEL* (444)
 ONE-DIMENSIONAL TRANSIENT NONISOTHERMAL TWO-PHASE, TWO COMPONENT FLOW OF FLUIDS AND GASES THROUGH LAYERED POROUS MEDIA* (446)
 STATIONARY HEAT AND MASS TRANSFER IN POROUS MEDIA WITH APPLICATION TO SOIL WARMING WITH POWER PLANT WASTE HEAT* (447)

WEATHER

TRACED DISPERSION OF TRACE CHEMICAL CONCENTRATIONS IN A SATURATED SOBBING POROUS MEDIUM* (647)
 A THEORY OF THE MASS TRANSPORT OF PREVIOUSLY DISTRIBUTED CHEMICALS IN A WATER SATURATED SOBBING POROUS MEDIUM* (443)

WEATHER

GLOBAL ANALYSIS ON A REGULATOR GRID OF SATELLITE DERIVED OZONE DATA* (306)

WEATHER

METHYLBENZOYL TRANSPORT IN WATER, BIOLOGICAL ACCUMULATION OF MERCURY (II) AND METHYLBENZOYL BY CHLORELLA PYRENOIDOSA* (497)
 INVESTIGATION OF SOME FACTORS IN THE BIOCHEMICAL CONVERSION OF MERCURY POLLUTANTS TO TOXIC METHYLBENZOYL EFFECTED BY MICRO-ORGANISMS IN A MARINE SEDIMENT* (500)

WEATHER

DIFFERENCE ANALOGUES OF BOUNDARY-VALUE PROBLEMS FOR THE EQUATIONS OF GLOBAL RADIOISOTOPE CONTAMINANT TRANSPORT AND THEIR NUMERICAL SOLUTION: DIFFERENCE APPROXIMATION OF EQUATIONS AND BOUNDARY CONDITIONS IN THE HEMISPHERIC PLANE AND THE ZONAL BELT OF THE ATMOSPHERE* (129)
 PLANETARY DISTRIBUTION OF ZONAL WEAR TRANSPORT PARAMETERS OF RADIOISOTOPES IN THE TROPOSPHERE AND LOWER STRATOSPHERE: CLIMATIC DISTRIBUTION OF THE ZONAL WEAR COMPONENTS OF THE HEMISPHERIC CIRCULATION VELOCITY* (139)

WEATHER

EFFECT OF A MESOSCALE TYPE WIND ON THE POLLUTANT DISTRIBUTION FROM A LINE SOURCE* (67)
 MESOSCALE AIR POLLUTION SIMULATION MODELING: THE FEASIBILITY OF MODELING PHOTOCHEMICAL ATMOSPHERIC DYNAMICS* (124)
 MESOSCALE AIR POLLUTION TRANSPORT IN SOUTHEAST WISCONSIN* (173)
 A MESOSCALE NUMERICAL MODEL OF ATMOSPHERIC TRANSPORT PHENOMENA IN URBAN AREAS* (180)
 UNIVERSITY OF VIRGINIA MESOSCALE MODEL* (240)
 NUMERICAL PREDICTION OF THE MESOSCALE TRANSPORT OF ATMOSPHERIC EFFLUENTS: PHILOSOPHY AND MORPHOLOGY OF EXPERIMENTAL MODELS FOR PREDICTING THE WIND AND POTENTIAL BIOLOGICAL FIELDS OVER THE NEVADA TEST SITE* (262)
 PROGRAM DESCRIPTIONS, SUPPLEMENT TO MESOSCALE WIND FIELDS AND TRANSPORT ESTIMATES DETERMINED FROM A NETWORK OF WIND TOWERS* (326)
 THREE-DIMENSIONAL MESOSCALE NUMERICAL MODEL OF THE ATMOSPHERE* (137)

WEATHER

BEHAVIOR OF NITRIC OXIDE FORMED BY THE SPACE SHUTTLE IN THE MESOSPHERE* (77)

WEATHER

USE OF COMPUTERS TO CALCULATE RADIATION DOSE FROM METABOLIC MODELS* (446)

WEATHER

METABOLISM AND MODELS OF ESTUARINE BAY ECOSYSTEMS AFFECTED BY A COASTAL POWER PLANT* (490)

WEATHER

CHEMICAL MODEL FOR LAKE MICHIGAN POLLUTION, CONSIDERATIONS ON ATMOSPHERIC AND SURFACE WATER TRACE METAL INPUTS* (606)

WEATHER

CHEMICAL MODELING OF METALLIC WASTE DISPOSAL* (513)

WEATHER

A MASS BALANCE MODEL OF TRACE METALS IN SEVERAL DELAWARE WATERSHEDS* (397)
 HEAVY METALS IN ESTUARINE BENTHIC ORGANISMS AND SEDIMENTS: DATA AND MODEL* (600)
 A LABORATORY MODEL FOR EVALUATING THE BEHAVIOR OF HEAVY METALS IN AN AQUATIC ENVIRONMENT* (645)

TITLE INDEX

METEOROLOGICAL

- METEOROLOGICAL SUB-MODELS FOR AQHNS - RADIATIVE TRANSFER* (14)
- METEOROLOGICAL SUB-MODELS FOR AQHNS - TURBULENCE MODELS* (14)
- METEOROLOGICAL SUB-MODELS FOR AQHNS: WIND AND PERMEABILITY PROFILES* (16)
- A PROCEDURE TO DETERMINE THE RELATIVE EXTENT OF REACTOR FISSION PRODUCT RELEASES UNDER VARIOUS METEOROLOGICAL CONDITIONS* (144)
- A NUMERICAL STUDY OF METEOROLOGICAL EFFECTS OF WASTE HEAT AND MOISTURE RELEASES FROM HYPOTHETICAL POWER PLANTS* (26)
- REGIONAL EFFLUENT DISPERSION CALCULATIONS CONSIDERING SPATIAL AND TEMPORAL METEOROLOGICAL VARIATIONS* (302)
- EMPIRICAL TECHNIQUES FOR ANALYZING AIR QUALITY AND METEOROLOGICAL DATA: SHORT-TERM CHANGES IN GROUND-LEVEL OZONE CONCENTRATIONS* (345)
- PREDICTIVE MODEL BASED ON THE RELATIONSHIP BETWEEN METEOROLOGICAL AND EMISSION PATTERNS AND AIR QUALITY* (369)

METEOROLOGY

- AIR QUALITY HANDBOOK: METEOROLOGY AND ITS INFLUENCE ON THE DISPERSION OF POLLUTANTS FROM HIGHWAY LINE SOURCES* (9)
- DESCRIPTION OF THE CONTAINMENT AND METEOROLOGY OF ENVIRONMENTAL RADIATION EXPOSURE (CONRADY-IV) CODE* (299)
- MULTILEVEL ATMOSPHERIC PREDICTION MODEL BASED ON PRIMITIVE EQUATIONS OF MOTION: THE PRIMITIVE EQUATION MULTILEVEL PREDICTION MODEL AT THE INSTITUTE OF METEOROLOGY* (307)
- DESCRIPTION OF THE CONTAINMENT AND METEOROLOGY OF ENVIRONMENTAL RADIATION EXPOSURE (CONRADY-VII) CODE* (729)

METERS

- LAGRANGIAN TRANSPORT AND DIFFUSION CODE TO CALCULATE CONCENTRATIONS AND DEPOSITION AT LONG RANGE OF PARTICLES LESS THAN 10 MICRON METERS DIAMETER* (230)

METHODOLOGIES

- APPLICATION OF ECOSYSTEM MODELING METHODOLOGIES TO DREDGED MATERIAL RESEARCH* (867)

METHODOLOGY

- A STATISTICAL METHODOLOGY FOR PREDICTING THE POLLUTANTS IN A RIVER* (385)
- A SYSTEMS ANALYSIS METHODOLOGY FOR PREDICTING DOSE TO MAN FROM A PROBABLY CONTAMINATED TERRESTRIAL ENVIRONMENT* (707)
- STANDARD METHODOLOGY FOR CALCULATING RADIATION DOSE TO LOWER FOOD BIOTA* (757)
- A METHODOLOGY FOR ASSESSMENT OF ENERGY FACILITY SIZING PATTERNS* (800)

METHYLMERCURY

- RADIOACTIVITY TRANSPORT IN WATER. BIOLOGICAL ACCUMULATION OF MERCURY (II) AND METHYLMERCURY BY CHLOROPHYTES* (497)
- INVESTIGATION OF SOME FACTORS IN THE BIOCHEMICAL CONVERSION OF MERCURY POLLUTANTS TO TOXIC METHYLMERCURY EFFECTED BY MICRO-ORGANISMS IN A MARINE SEDIMENT* (500)
- A BIOENERGETICS-BASED MODEL FOR POLLUTANT ACCUMULATION BY FISH SIMULATION OF PCB AND METHYLMERCURY RESIDUE LEVELS IN COTEAU RIVER YELLOW PERCH (PERCA FLAVESCENS)* (516)
- METHYLMERCURY ACCUMULATION IN AN AQUATIC FOOD CHAIN: A MODEL AND SOME IMPLICATIONS FOR RESEARCH PLANNING* (540)

METROPOLITAN

- MATHEMATICAL MODELS FOR SO₂ DISPERSION IN THE METROPOLITAN DETROIT AREA* (40)
- AN ATMOSPHERIC DIFFUSION MODEL FOR METROPOLITAN AREA* (198)
- IMPACT OF ENERGY SHORTAGE ON AMBIENT SULFUR DIOXIDE AND PARTICULATE LEVELS IN METROPOLITAN BOSTON* (296)

MEXICO

- SURFICIAL OCEAN MODEL OF THE GULF OF MEXICO FOR EVALUATION OF THE ENVIRONMENTAL IMPACT OF OCEAN THERMAL POWER PLANTS* (47)

MICHIGAN

- CHEMICAL MODEL FOR LAKE MICHIGAN POLLUTION, CONSIDERATIONS ON ATMOSPHERIC AND SURFACE WATER TRACE METAL INPUTS* (604)
- THE PERMIT OF CS-137 AND OTHER FALLOUT RADIOISOTOPES ON A MICHIGAN DAIRY FARM* (679)

MICO

- LAGRANGIAN TRANSPORT AND DIFFUSION CODE TO CALCULATE CONCENTRATIONS AND DEPOSITION AT LONG RANGE OF PARTICLES LESS THAN 10 MICRON METERS DIAMETER* (230)
- INVESTIGATION OF SOME FACTORS IN THE BIOCHEMICAL CONVERSION OF MERCURY POLLUTANTS TO TOXIC METHYLMERCURY EFFECTED BY MICRO-ORGANISMS IN A MARINE SEDIMENT* (500)

MICROCOSMS

- SYSTEM IDENTIFICATION OF RADIOISOTOPE FLOWS IN AQUATIC MICROCOSMS* (751)

MICROMIXING

- GENERAL ENVIRONMENTAL MODEL OF MICROMIXING* (42)

MICROSCALE

- CAHNEZ: AN IMPROVED MICROSCALE MODEL FOR THE DIFFUSION OF AIR POLLUTANTS FROM A LINE SOURCE* (10)
- UPDOWN AND SWED PHOTOCHEMICAL SIMULATION MODEL STUDY: MICROSCALE MODEL OF LOCAL VEHICULAR CONTRIBUTIONS TO MEASURED POLLUTANT CONCENTRATIONS* (160)

MIE

- THERMAL REGIMES OF THE UPPER MISSISSIPPI AND MISSOURI RIVERS: TRANSIENT AND STEADY-STATE COMPUTATIONAL MODELS FOR THE PREDICTION OF RIVER THERMAL REGIMES; PART TWO: ANALYSIS OF THERMAL REGIMES OF THE MISSISSIPPI AND MISSOURI RIVERS IN THE MID-CONTINENT AREA POWER POOL (HAPP) GEOGRAPHICAL AREA* (538)

MIDDLE

- STUDY OF THE IMPACTS OF DREDGED STREAMFLOWS IN THE MIDDLE AND LOWER YELLOWSTONE BASIN* (620)

MIGRATION

- A TWO-DIMENSIONAL FINITE ELEMENT MODEL FOR THE MIGRATION OF CONTAMINANTS IN CONFINED AND UNCONFINED AQUIFERS* (402)
- A THREE-DIMENSIONAL FINITE ELEMENT MODEL FOR THE MIGRATION OF CONTAMINANTS IN CONFINED AND UNCONFINED AQUIFERS* (403)
- UPTAKE AND MIGRATION OF TRACERS IN LAKE SEDIMENTS* (479)
- MODELING POLLUTANT MIGRATION IN SUBSURFACE ENVIRONMENTS* (506)
- MIGRATION OF GASEOUS RADIOISOTOPES THROUGH SOIL OVERLYING A URANIUM ORE DEPOSIT: A MODELING STUDY* (645)

MILBRO

- PREDICTIVE STUDY OF THE DISPERSION OF EMISSIONS FROM THE SYNCRUDE MILBROD LAKE PLANT* (808)

MILK

- PREDICTIVE MODEL FOR RADIOCESIUM INTAKE FROM MILK: ERRORS ASSOCIATED WITH ANOM-COW VARIATION* (758)

MILL

- POTENTIAL RADIOLOGICAL IMPACT OF AIRBORNE RELEASES AND DIRECT GAMMA RADIATION TO INDIVIDUALS LIVING NEAR INACTIVE URANIUM MILL TAILINGS PILES* (740)

MILLING

- UVA GASEOUS EFFLUENT LICENSING CODE FOR URANIUM MINING AND MILLING* (212)

TITLE INDEX

- RTBE**
DIGITAL SIMULATION OF DIESEL EXHAUST CONTAMINATION OF RINE VENTILATION SYSTEMS* (307)
PREDICTIVE AND POLLUTION ADAPTMENT MODEL FOR ACID RINE DRAINAGE* (409)
MODELS TO PREDICT ENVIRONMENTAL IMPACT OF RINE DRAINAGE ON STREAMS* (449)
SIMULATION AND OPTIMIZATION OF ACID RINE DRAINAGE ADAPTMENT ALTERNATIVES* (517)
SIMULATION OF THE EFFECTS OF ACID RINE DRAINAGE IN IMPROVEMENTS* (623)
NEW CONCEPT IN STABILITY ANALYSIS OF SLOPED RINE-DEPOSED EMBANKMENTS* (640)
PREDICTIVE AND POLLUTION ADAPTMENT MODEL FOR RINE DRAINAGE* (651)
- RIBES**
DEVELOPMENT OF AN AIR QUALITY SIMULATOR FOR COAL MINES* (350)
- RISCORPTEP**
SIMPLIFICATION OF A GAUSSIAN PUFF MODEL FOR REAL-TIME MINICOMPUTER USE* (169)
- RISING**
TVA GASEOUS EFFLUENT LICENSING CODE FOR VARIATION SIZING AND BILLING* (212)
RESOURCES ALLOCATION TO OPTIMIZE MINING POLLUTION CONTROL* (567)
SIMULATION APPROACH TO THE ANALYSIS OF STRIP-MINING IMPACT ON THE ECOSYSTEM WITH EMPHASIS ON WILDLIFE* (792)
DEVELOPMENT OF A SIMULATION MODEL FOR EVALUATION OF SURFACE MINING OPERATIONS AND RECLAMATION PLANS* (795)
- RISCHUS**
A COMPUTER SIMULATION OF THE EFFECTS OF SUPERIMPOSED MORTALITY DUE TO POLLUTANTS ON POPULATIONS OF PATHEAD RYBONS (PINEHALES PHELEAS)* (773)
- RISOP**
ON THE BOUNDARY CONDITIONS IN THEORETICAL MODEL CALCULATIONS OF THE DISTRIBUTIONS OF RINOR NEUTRAL CONSTITUENTS IN THE UPPER ATMOSPHERE* (294)
- RISCELLANEUS**
RISCELLANEUS ASPECTS OF CURRENT URBAN POLLUTION MODELS* (29)
- RISMISSISSIPPI**
THERMAL REGIMES OF THE UPPER MISSISSIPPI AND MISSOURI RIVERS: TRANSIENT AND STEADY-STATE COMPUTATIONAL MODELS FOR THE PREDICTION OF RIVER THERMAL REGIMES; PART TWO: ANALYSIS OF THERMAL REGIMES OF THE MISSISSIPPI AND MISSOURI RIVERS IN THE MID-CONTINENT AREA POWER POOL (HAPP) GEOGRAPHICAL AREA* (538)
QUAL-II, UPPER MISSISSIPPI RIVER BASIN PROJECT* (546)
A COMPUTER CODE (HYRDO5) TO CALCULATE POPULATION DOSES FROM RADIOACTIVE LIQUID EFFLUENTS AND AN APPLICATION TO NUCLEAR POWER REACTORS ON THE MISSISSIPPI RIVER BASIN* (721)
- RISMISSOURI**
THERMAL REGIMES OF THE UPPER MISSISSIPPI AND MISSOURI RIVERS: TRANSIENT AND STEADY-STATE COMPUTATIONAL MODELS FOR THE PREDICTION OF RIVER THERMAL REGIMES; PART TWO: ANALYSIS OF THERMAL REGIMES OF THE MISSISSIPPI AND MISSOURI RIVERS IN THE MID-CONTINENT AREA POWER POOL (HAPP) GEOGRAPHICAL AREA* (538)
- RIST**
IRON CATALYZED OXIDATION OF SO₂ TO ACID SULPHATE RIST IN DISPERSING PLUMES* (83)
- RITED**
POLLUTANT DISTRIBUTIONS IN THE MIXED LAYER, USING SIMILARITY THEORY* (64)
A WELL MIXED BOX MODEL OF URBAN SCALE PHOTOCHEMICAL AIR POLLUTION* (195)
WATER-QUALITY SIMULATION MODEL FOR WELL-MIXED ESTUARIES AND COASTAL SEAS* (476)
- RITING**
EFFECTS OF DISCHARGE DESIGN ON THE THERMAL MIXING ZONE IN WATERWAYS* (560)
- ROE**
DETERMINATION OF ENVIRONMENTAL CARBON MONOXIDE EXPOSURES THROUGH PERSONAL MONITORING: FIXED VS PERSONAL AND TRANSPORTATION MODE RELATIONSHIPS* (51)
LIVESTOCK REGIONAL AIR QUALITY MODEL-MODE 1* (363)
- ROELLING**
MODELLING AND SIMILARITY RELATIONS OF PHYSICAL AND CHEMICAL PROCESSES* (52)
MODELLING URBAN AIR POLLUTION* (86)
URBAN AIR POLLUTION MODELLING* (49)
INVESTIGATION OF GAS TURBINE COMBUSTORS WITH HIGH INLET AIR TEMPERATURES, COMBUSTOR MODELLING* (101)
PECEIV-II, NEW ENGLAND RIVER BASINS MODELLING PROJECT* (545)
MODELLING THE DOSE TO MAN FROM EXPOSURE TO TRITIATED WATER VAPOR* (681)
MODELLING THE REGIONAL TRANSPORT OF RADIOISOTOPES IN A MAJOR UNITED STATES RIVER BASIN* (794)
- ROFILE**
A NEW FALLOUT TRANSPORT CODE FOR THE DELPIC SYSTEM: THE DIFFUSIVE TRANSPORT MODULE* (213)
- RODULES**
DOCUMENTATION OF FOUR OCEAN-RELATED COMPUTER MODULES* (615)
- ROISTURE**
THERMAL MODEL FOR ATMOSPHERIC SPRAY COOLING SYSTEMS: ENVIRONMENTAL EFFECTS OF HEAT AND MOISTURE RELEASE* (37)
A NUMERICAL STUDY OF METEOROLOGICAL EFFECTS OF WASTE HEAT AND MOISTURE RELEASES FROM HYPOTHETICAL POWER PLANTS* (263)
- ROLTEN**
WRITTEN MATERIAL-COOLANT INTERACTION AND PLUTONIUM SOURCE IN LWRP ACCIDENT ANALYSIS* (814)
- ROITORING**
DETERMINATION OF ENVIRONMENTAL CARBON MONOXIDE EXPOSURES THROUGH PERSONAL MONITORING: FIXED VS PERSONAL AND TRANSPORTATION MODE RELATIONSHIPS* (51)
AIRBORNE AIR POLLUTION MONITORING EXPERIMENT IN AN AREA OF MOUNTAIN-VALLEY TERRAIN* (127)
- ROMONIDE**
DETERMINATION OF ENVIRONMENTAL CARBON MONOXIDE EXPOSURES THROUGH PERSONAL MONITORING: FIXED VS PERSONAL AND TRANSPORTATION MODE RELATIONSHIPS* (51)
A STOCHASTIC MODEL FOR CARBON MONOXIDE CONCENTRATIONS ALONG HIGHWAYS AND STREETS* (116)
URBAN CARBON MONOXIDE MODEL* (313)
AN URBAN DIFFUSION SIMULATION MODEL FOR CARBON MONOXIDE* (353)
CALCULATING FUTURE CARBON MONOXIDE EMISSIONS AND CONCENTRATIONS FROM URBAN TRAFFIC DATA* (368)
- ROUTE**
ROUTE CARLO STUDIES ON THE TIME-DEPENDENT TRANSPORT OF OPTICAL AND INFRARED RADIATION IN THE ATMOSPHERE: THERMAL RADIATION TRANSPORT* (29)
A ROUTE CARLO CODE WITH SUPPORT PROGRAMS FOR DOSE COMPUTATION* (746)
- ROOM**
CALCULATION OF GAMMA-RAY LINE FLUXES FROM THE ROOM* (269)
- ROPHNOLOGY**
NUMERICAL PREDICTION OF THE MESOSCALE TRANSPORT OF ATMOSPHERIC EFFLUENTS: PHILOSOPHY AND MORPHOLOGY OF EXPERIMENTAL MODELS FOR PREDICTING THE WIND AND POTENTIAL RADIOLOGICAL FIELDS OVER THE NEVADA TEST SITE* (262)

TITLE INDEX

MORTALITY

MORTALITY PROJECTION FROM EXPOSURE TO RADIOACTIVE AND NON-RADIOACTIVE ENVIRONMENTAL POLLUTANTS* (715)
A COMPUTER SIMULATION OF THE EFFECTS OF SUPERIMPOSED MORTALITY DUE TO POLLUTANTS ON POPULATIONS OF FATHEAD
SILVER (PIMEPHALES PROMELAS)* (773)

MOTION

THE BOSCOE MANUAL, HIGH-ALTITUDE NEUTRAL-PARTICLE MOTION* (100)
MULTILEVEL ATMOSPHERIC PREDICTIONS MODEL BASED ON PRIMITIVE EQUATIONS OF MOTION; THE PRIMITIVE EQUATION
MULTI-LEVEL PREDICTION MODEL AT THE INSTITUTE OF METEOROLOGY.* (307)

MOTOR

ATMOSPHERIC TRANSPORT OF ROCKET MOTOR COMBUSTION BY-PRODUCTS* (54)

MOUNTAIN

AIRBORNE AIR POLLUTION MONITORING EXPERIMENT IN AN A. L. OF MOUNTAIN-VALLEY TERRAINS* (127)

MOVEMENT

SIMULATION OF POLLUTANT MOVEMENT IN GROUNDWATER AQUIFERS* (443)
FLOW DYNAMICS AND SEDIMENT MOVEMENT IN LOCKBOOM POLLEY INLET, NORTH CAROLINA* (497)
WATER MOVEMENT THROUGH SATURATED POROUS MEDIA: A FINITE- ELEMENT GALERKIN MODEL* (643)
ONE-DIMENSIONAL MODEL OF THE MOVEMENT OF TRACE RADIOACTIVE SOLUTE THROUGH SOIL COLUMNS - THE PERCOL
MODEL* (653)
MATHEMATICAL MODEL OF STRONTIUM MOVEMENT IN SOILS* (656)
MODEL FOR RADIOIODINE MOVEMENT IN HULE DEER* (669)
SPECIFIC ACTIVITY AND CONCENTRATION MODEL APPLIED TO CS-137 MOVEMENT IN A EUTROPHIC LAKE* (772)
SIMULATION OF MOVEMENT OF OIL SLICKS IN THE STRAIT OF GEORGIA USING SIMPLE ATMOSPHERE AND OCEAN
DYNAMICS* (809)

NO142

A PORTMAN PROGRAM FOR THE CALCULATION OF THE POTENTIAL HAZARDS FROM AN ACCIDENTAL FISCOR PRODUCT RELEASE,
NO142* (697)

RULE

MODEL FOR RADIOIODINE MOVEMENT IN RULE DEER* (669)
MODEL FOR PREDICTING SR-90 LEVELS IN RULE DEER* (767)

NO171

A MODIFIED MULTI CELL METHOD FOR SIMULATION OF ATMOSPHERIC TRANSPORT* (99)
MULTI-SOURCE ATMOSPHERIC TRANSPORT MODEL FOR DEPOSITION OF TRACE CONTAMINANTS* (201)
MULTILEVEL ATMOSPHERIC PREDICTIONS MODEL BASED ON PRIMITIVE EQUATIONS OF MOTION; THE PRIMITIVE EQUATION
MULTI-LEVEL PREDICTION MODEL AT THE INSTITUTE OF METEOROLOGY.* (307)
MULTI-LAYERED MODELS OF CURRENTS, TEMPERATURE, AND WATER QUALITY PARAMETERS IN THE GREAT LAKES* (570)

MULTILAYERED

SIMULTANEOUS TRANSPORT OF WATER AND REACTING SOLUTES THROUGH MULTILAYERED SOILS UNDER TRANSIENT UNSATURATED
FLOW CONDITIONS* (642)

MULTILEVEL

MULTILEVEL ATMOSPHERIC PREDICTIONS MODEL BASED ON PRIMITIVE EQUATIONS OF MOTION; THE PRIMITIVE EQUATION
MULTI-LEVEL PREDICTION MODEL AT THE INSTITUTE OF METEOROLOGY.* (307)
MODELING AND CONTROL OF THE POLLUTION OF WATER RESOURCES SYSTEMS VIA MULTILEVEL APPROACH* (845)

MULTIPLE

A CLIMATOLOGICAL MODEL FOR MULTIPLE-SOURCE URBAN AIR POLLUTION* (28)
A SIMPLE DIFFUSION MODEL FOR CALCULATING POINT CONCENTRATIONS FROM MULTIPLE SOURCES* (45)
MULTIPLE CELL MECHANICAL DRAFT COOLING TOWER MODEL* (63)
MULTIPLE SOURCE DISPERSION MODEL* (77)
DESCRIPTION OF A TDE COMPUTER MODEL FOR DISPERSION FROM MULTIPLE SOURCES* (106)
A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE AND MULTIPLE NATURAL-DRAFT COOLING TOWERS* (242)
A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE AND MULTIPLE NATURAL-DRAFT COOLING TOWERS* (244)
A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE OR MULTIPLE NATURAL-DRAFT COOLING TOWERS* (248)
A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE AND MULTIPLE NATURAL-DRAFT COOLING TOWERS* (253)
A MULTIPLE-SOURCE URBAN ATMOSPHERIC DISPERSION MODEL* (276)
ASSESSMENT OF THE AMBIENT AIR IMPACT OF MULTIPLE STACK INDUSTRIAL PLANTS USING DISPERSION MODELING* (283)
GAUSSIAN-PLUME MULTIPLE SOURCE AIR QUALITY ALGORITHM* (311)
A WATER QUALITY PLANNING MODEL WITH MULTIPLE TIME, POLLUTANT, AND SOURCE CAPABILITIES* (419)
DETERMINATION OF OPTIMAL MULTIPLE USES OF A SMALL WATER RESERVOIR* (622)
PH PROFILES IN A RIVER SYSTEM WITH MULTIPLE ACID LOADS* (639)

MULTIPOINT

KOR AND PAN-PLUME BEHAVIOR FOR ROUND OR SLOT UNDERWATER DISCHARGE INCLUDING MULTIPOINT DISCHARGES* (484)
THERMAL PLUME, SUBMERGED MULTIPOINT DIFFUSER MODEL* (492)

MULTIVARIABLE

A MULTIVARIABLE MODEL FOR ATMOSPHERIC DISPERSION PREDICTIONS* (355)

N

MODELING STUDY OF SEASONAL EFFECT ON AIR POLLUTION AT 60 DEGREES N LATITUDE* (20)

NATIONAL

NUMERICAL MODELING OF SUBSURFACE RADIOACTIVE SOLUTE TRANSPORT FROM WASTE-SEEPAGE PONDS AT THE IDAHO NATIONAL
ENGINEERING LABORATORY* (554)
DIGITAL MODELING OF RADIOACTIVE AND CHEMICAL WASTE TRANSPORT IN THE SHAKE RIVER PLAIN AQUIFER AT THE NATIONAL
REACTION TESTING STATION, IDAHO* (554)
NATIONAL WEATHER SERVICE RIVER FORECAST SYSTEM* (564)

NATURAL

A DRIFT DEPOSITION MODEL FOR NATURAL DRAFT COOLING TOWERS* (122)
NATURAL DRAFT COOLING TOWER PERFORMANCE* (150)
A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE AND MULTIPLE NATURAL-DRAFT COOLING TOWERS* (242)
A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (243)
A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE AND MULTIPLE NATURAL-DRAFT COOLING TOWERS* (244)
A MODEL TO PREDICT SALT-DRIFT DEPOSITION FROM A NATURAL DRAFT COOLING TOWER* (245)
A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (246)
A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (247)
A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE OR MULTIPLE NATURAL-DRAFT COOLING TOWERS* (248)
A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (249)
A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWER* (250)
A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (251)
A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (252)
A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE AND MULTIPLE NATURAL-DRAFT COOLING TOWERS* (253)
A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (254)

TITLE INDEX

- NATURAL**
A MODEL TO PREDICT PLUMES FROM A SINGLE NATURAL-DRAFT COOLING TOWER* (255)
A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (256)
DIGITAL SIMULATION OF ASSIMILATION AND DEGRADATION IN NATURAL STREAMS* (310)
WATSEC, A COMPILED PROGRAM FOR CALCULATING CHEMICAL EQUILIBRIA OF NATURAL WATERS* (595)
- NAVAL**
ENVIRONMENTAL IMPACT STUDIES OF THE NAVAJO AND KAIPADOWITS POWER PLANTS* (436)
- NAVAL**
DESCRIPTION OF A RADIATION PACKAGE FOR THE NAVAL POSTGRADUATE SCHOOL GENERAL CIRCULATION MODEL* (187)
HARBOR AIR QUALITY MODEL FOR ASSESSMENT OF UNITED STATES NAVAL AVIATION EXHIBITS* (302)
- NAVIER**
SOIA-3D: SOLVING TIME DEPENDENT NAVIER-STOKES EQUATIONS* (818)
- NCAR**
TRIPB GENERATION NCAR GLOBAL CIRCULATION MODEL* (325)
- NEARBY**
EFFECTS OF THE PIPELINE HAIL ROAD ON SHADY PONDS AND LAKES ACROSS ALASKA'S NORTH SLOPE* (783)
- NEGATIVELY**
NEGATIVELY BOWING JETS IN A CROSS FLOW* (389)
- NETWORK**
MODEL FOR THE DISPERSION OF PARTICULATE OR GASEOUS POLLUTANTS FROM A NETWORK OF STREETS AND HIGHWAYS* (305)
PROGRAM DESCRIPTIONS, SUPPLEMENT TO RESOSCALE MIX FIELDS AND TRANSPORT ESTIMATES DETERMINED FROM A NETWORK OF MIX TOWERS* (326)
DOCUMENTATION FOR LSHIR/2, A COMPUTER PROGRAM FOR THE STEADY-STATE WATER QUALITY SIMULATION OF A STREAM NETWORK* (601)
- NUMERICAL**
NUMERICAL MODEL FOR THE PREDICTION OF TRANSIENT WATER QUALITY IN ESTUARY NETWORKS* (624)
- NEUTRAL**
THE POSCOE NATURAL, HIGH-ALTITUDE NEUTRAL-PARTICLE MOTIONS* (100)
ON THE BOUNDARY CONDITIONS IN THEORETICAL MODEL CALCULATIONS OF THE DISTRIBUTIONS OF MINOR NEUTRAL CONSTITUENTS IN THE UPPER ATMOSPHERE* (294)
- NUCLEAR**
ENGINEERING-FUSION REACTOR NEUTRONIC/ENERGY DEPOSITION/ACTIVATION/DOSE TO PERSONNEL MODEL* (716)
- NUCLEAR**
A CODE FOR ANALYSIS OF NUCLEAR EFFECTS AND SYSTEMS SURVIVABILITY: SECTIONS AND GAMMAS* (607)
- NUCLEAR**
SYNTHETICAL PREDICTION OF THE RESOSCALE TRANSPORT OF ATMOSPHERIC EFFLUENTS: PHILOSOPHY AND MORPHOLOGY OF DIFFERENTIAL MODELS FOR PREDICTING THE MIX AND POTENTIAL RADIOLOGICAL FIELDS OVER THE NEVADA TEST SITE* (262)
- NITRIC**
BEHAVIOR OF NITRIC OXIDE FORMED BY THE SPACE SHUTTLE IN THE MESOSPHERE* (73)
- NITROGEN**
STRATOSPHERIC OZONE DESTRUCTION BY AIRCRAFT-INDUCED NITROGEN OXIDES* (360)
- NOCTURNAL**
A SYNTHETICAL MODEL OF THE NOCTURNAL URBAN BOUNDARY LAYER* (198)
NOCTURNAL BOUNDARY LAYER MODEL* (384)
- NON**
A NON-EQUILIBRIUM MODEL OF MENISPERIC NEAR SURFACE TEMPERATURES* (26)
MORTALITY PROJECTION FROM EXPOSURE TO RADIOACTIVE AND NON-RADIOACTIVE ENVIRONMENTAL POLLUTANTS* (716)
- NONISOTHERMAL**
ONE-DIMENSIONAL TRANSIENT NONISOTHERMAL TWO-PHASE, TWO COMPONENT FLOW OF FLUIDS AND GASES THROUGH LAYERED POROUS MEDIA* (566)
- NONLINEAR**
THE APPLICATION OF K-THEORY TO DIFFUSION PROBLEMS INVOLVING NONLINEAR CHEMICAL REACTIONS* (163)
- NONPOINT**
THE NONPOINT SOURCE POLLUTANT LOADING (NPS) MODEL* (483)
- NSCFO**
THERMAL DISPERSION MODELING OF THE PROPOSED NSCFO NUCLEAR POWER PLANT* (522)
- NSCFO**
AEROLS: ATMOSPHERIC DISPERSION AND FINITE-CLOUD DOSES DURING NSCFO, SEA-BREEZE, AND ACCIDENT CONDITIONS* (98)
- NORTH**
FLOW DYNAMICS AND SEDIMENT MOVEMENT IN LOCKWOODS FOLLY INLET, NORTH CAROLINA* (847)
EFFECTS OF THE PIPELINE HAIL ROAD ON SHADY PONDS AND LAKES ACROSS ALASKA'S NORTH SLOPE* (783)
- NORTHWEST**
THERMAL AND RADIATIVE EFFECTS OF ATMOSPHERIC AEROSOLS IN THE NORTHERN HEMISPHERE CALCULATED USING A RADIATIVE CONVECTIVE MODEL* (372)
- NOX**
KINETIC STUDY OF SIMULATED SO₂, NO_x, NH₃-POLLUTED ATMOSPHERES* (30)
ORCAI FORMATION FROM NO_x IN "CLEAN AIR"* (35)
EFFECT OF WATER VAPOR ON THE DESTRUCTION OF OZONE IN THE STRATOSPHERE PERTURBED BY CLX OR NO_x POLLUTANTS* (166)
- NPS**
THE NONPOINT SOURCE POLLUTANT LOADING (NPS) MODEL* (483)
- NUCLEAR**
A PRECIPITATION SCAVENGING MODEL FOR STUDIES OF TACTICAL NUCLEAR OPERATIONS* (216)
NUCLEAR DEBRIS ATTACHMENT TO AIRCRAFT DUE TO ATMOSPHERIC RADIATION ENVIRONMENTS: AIRCRAFT IMPACTION AND ABRASION COMPUTER MODEL* (236)
A CODE TO ESTIMATE STROMTIN-90 GLOBAL DEPOSITION FROM ATMOSPHERIC NUCLEAR DETONATIONS* (239)
A PROGRAM FOR EVALUATING ATMOSPHERIC DISPERSION FROM A NUCLEAR POWER STATION* (241)
TRANSIENT HEAT RELEASES FROM OFFSHORE NUCLEAR PLANTS* (441)
OCEANIC DIFFUSION OF A SEVERE ACCIDENTAL RADIOISOTOPE RELEASE FROM A SUBSEA NUCLEAR POWER PLANT* (471)
PROYANT JET DISCHARGE MODEL, SEABROOK NUCLEAR STATION* (473)
THERMAL DISPERSION MODELING OF THE PROPOSED NSCFO NUCLEAR POWER PLANT* (522)
HYDROLOGY MODEL EVALUATION AT THE HANFORD NUCLEAR WASTE FACILITY* (529)
DEVELOPMENT OF A COMPLETE MATHEMATICAL MODEL FOR DESCRIBING THE POINT BEACH NUCLEAR POWER PLANT THERMAL PLUME* (612)
RADIOLOGICAL DOSE AND RADIOLOGICAL ACTIVITY FROM NUCLEAR REACTION OR NUCLEAR WEAPON FISSION PRODUCTS* (687)
NUSS-1, A NUCLEAR ROCKET SAFETY EVALUATION CODE FOR THE CONTROL DATA 3600* (697)

TITLE INDEX

NUCLEAR

MATHEMATICAL MODEL FOR PREDICTING ENVIRONMENTAL AND HUMAN HEALTH EFFECTS OF DEVELOPING NUCLEAR REACTOR PROCESSES* (693)
 CSSAPT, A CODE FOR SYSTEM SURVIVABILITY ANALYSIS - NUCLEAR EFFECTS* (694)
 DOSE MODELING FOR NUCLEAR FACILITIES* (710)
 A COMPUTER CODE (NUVDOOS) TO CALCULATE POPULATION DOSES FROM RADIOACTIVE LIQUID EFFLUENTS AND AN APPLICATION TO NUCLEAR POWER REACTORS ON THE MISSISSIPPI RIVER BASIN* (721)
 CALCULATIONS OF DOSE AND POPULATION DOSE IN THE GENERAL ENVIRONMENT DUE TO BOILING-WATER NUCLEAR POWER REACTOR RADIONUCLIDE EMISSIONS IN THE UNITED STATES IN 1971* (722)
 THE AIRPOS-II COMPUTER CODE FOR ESTIMATING RADIATION DOSE TO MAN FROM AIRBORNE RADIONUCLIDES IN AREAS SURROUNDING NUCLEAR FACILITIES* (724)
 THE ERER II COMPUTER CODE FOR ESTIMATING EXTERNAL DOSES TO POPULATIONS FROM CONSTRUCTION OF A SEA LEVEL CANAL WITH NUCLEAR EXPLOSIVES* (742)
 MATHEMATICAL MODEL OF THE ACCUMULATION OF RADIONUCLIDES BY OYSTERS (*C. VIRGINICA*) AQUACULTURED IN THE EFFLUENT OF A NUCLEAR POWER REACTOR TO INCLUDE MAJOR BIOLOGICAL PARAMETERS* (753)
 NEPHES - A DIGITAL COMPUTER CODE FOR ESTIMATING REGIONAL RADIOLOGICAL EFFECTS FROM THE NUCLEAR POWER INDUSTRY* (793)
 A CODE FOR ANALYSIS OF NUCLEAR EFFECTS AND SYSTEMS SURVIVABILITY: NEUTRONS AND GAMMAS* (807)
 EFFECTS OF RAINSTORMS AND RUDOFF ON CONSEQUENCES OF NUCLEAR REACTOR ACCIDENTS* (816)

NUCLEI

FORMATION OF SULFATES AND THE ENHANCEMENT OF CLOUD CONDENSATION NUCLEI IN CLOUDS* (72)

NUCLIDES

A COMPUTER CODE FOR ANALYZING ROUTINE ATMOSPHERIC RELEASES OF SHORT-LIVED RADIOACTIVE NUCLIDES* (53)
 GAS RELEASE OF NUCLIDES* (210)
 CALCULATION OF PRODUCTION RATES OF NUCLIDES IN SPACE* (268)

NUSES

NUSES-1, A NUCLEAR ROCKET SAFETY EVALUATION CODE FOR THE CONTROL DATA 3600* (691)

NUS

NUS EFFECTIVE ENERGY PROGRAM* (711)

NUTRIENT

NUTRIENT TRANSPORT AND DISSOLVED OXYGEN BUDGET STUDIES IN THE POTOMAC ESTUARY* (410)
 NUTRIENT TRANSPORT BY SEDIMENT WATER INTERACTIONS* (508)

NUF

AIR TRANSPORT CALCULATIONS USING THE LAST-NUF AIR FLUX TAPE AND THE NUF COMPUTER PROGRAM--1.0B* (31)

OBJECTIVE

OBJECTIVE PLACEMENT OF SENSORS* (209)

OCEAN

A GLOBAL OCEAN-ATMOSPHERE CLIMATE MODEL: THE OCEANIC CIRCULATION* (25)
 ATMOSPHERIC VANADIUM TRANSPORT TO THE OCEAN* (70)
 GEOPHYSICAL OCEAN SECTIONS STUDY - GEOSICS - SEDIMENT DISSOLUTION, MODEL FOR FOSSIL FUEL CARBON DIOXIDE* (117)
 A GLOBAL OCEAN-ATMOSPHERE CLIMATE MODEL: THE ATMOSPHERIC CIRCULATION* (183)
 RESPONSE OF THE JOINT OCEAN-ATMOSPHERE MODEL TO THE SEASONAL VARIATION OF THE SOLAR RADIATION* (328)
 DEEP SEA OCEAN DISPOSAL OF PETROCHEMICAL PLANT WASTES* (393)
 THE NUMERICAL SOLUTION OF PARABOLIC EQUATIONS APPLIED TO 'EDDY DIFFUSION' IN THE OCEAN* (469)
 ANALYSIS OF SUBMERGED THERMAL DISCHARGE FROM OCEAN-SITED POWER PLANTS* (488)
 TURBULENT DIFFUSION MODEL OF OIL IN THE OCEAN* (513)
 TWO-DIMENSIONAL NUMERICAL MODEL OF THE NEAR-FIELD FLOW FOR AN OCEAN THERMAL POWER PLANT: THE THEORETICAL APPROACH AND A LABORATORY SIMULATION* (553)
 NUMERICAL OCEAN MODEL OF THE GULF OF MEXICO FOR EVALUATION OF THE ENVIRONMENTAL IMPACT OF OCEAN THERMAL POWER PLANTS* (567)
 OCEAN CURRENT AND POLLUTANT TRANSPORT MODEL* (589)
 SIMULATED FACTORS INVOLVED IN OCEAN THERMAL POWER PLANTS* (601)
 DOCUMENTATION OF FOUR OCEAN-RELATED COMPUTER MODELS* (615)
 OCEAN FLOOD AND ENERGY FARM (OFEF): DEVELOPMENT OF THE KELP GROWTH MODEL* (774)
 SIMULATION OF MOVEMENT OF OIL SLICKS IN THE STRAIT OF GEORGIA USING SIMPLE ATMOSPHERE AND OCEAN DYNAMICS* (809)

OCEANIC

A GLOBAL OCEAN-ATMOSPHERE CLIMATE MODEL: THE OCEANIC CIRCULATION* (25)

OFEF

OCEANIC DIFFUSION OF A SEVERE ACCIDENTAL RADIONUCLIDE RELEASE FROM A SUBSEA NUCLEAR POWER PLANT* (471)

OFFSHORE

OCEAN FLOOD AND ENERGY FARM (OFEF): DEVELOPMENT OF THE KELP GROWTH MODEL* (774)

OIL

COMPUTER SIMULATION OF OFFSHORE OIL SPILL CLEANUP OPERATIONS* (411)
 TRANSIENT HEAT RELEASES FROM OFFSHORE NUCLEAR PLANTS* (461)
 IMPACT OF OIL SPILLAGE FROM WORLD WAR II TANKER SINKINGS* (404)
 COMPUTER SIMULATION OF OFFSHORE OIL SPILL CLEANUP OPERATIONS* (411)
 RANDOM DRIFT OF AN IDEALIZED OIL PATCH* (429)
 COMPUTER SIMULATION AIDS OIL-SPILL CLEANUP DECISIONS* (432)
 PARTICULATE OIL SPILL RECOVERY: OIL ADSORPTION PROPERTIES OF PLASTIC FOAMS* (441)
 OIL SPREADING ON THE SEA* (454)
 COMPARISON OF ECOLOGICAL IMPACTS OF POSTULATED OIL SPILLS AT SELECTED ALASKAN LOCATIONS* (458)
 OPTIMAL CONTROL OF AN OIL REFINERY WASTE TREATMENT FACILITY: A TOTAL ECOSYSTEM APPROACH* (495)
 COMPUTER SIMULATION TECHNIQUE FOR OIL SPILLS OFF THE NEW JERSEY-DELAWARE COASTLINE* (507)
 TURBULENT DIFFUSION MODEL OF OIL IN THE OCEAN* (513)
 MODELING OF OIL EVAPORATION IN AN AQUEOUS ENVIRONMENT: RESEARCH ON THE EFFECTS OF CRUDE OIL TRANSFER AND UPSTREAM REFINERIES ON DELAWARE BAY* (598)
 NUMERICAL SIMULATION OF OIL SLICK TRANSPORT IN BAYS* (599)
 OIL SPILL TRANSPORT AND DIFFUSION PREDICTIONS* (604)
 NUMERICAL MODEL OF DROPLET ENTRAINMENT FROM A CONTAINED OIL SLICK* (619)
 SIMPLE METHOD FOR EVALUATING ALTERNATIVES TO A PROPOSED ENVIRONMENTAL ALTERATION, ITS HISTORY, AND AN EXAMPLE OF ITS USE IN OIL SHALE DEVELOPMENT* (796)
 SIMULATION OF MOVEMENT OF OIL SLICKS IN THE STRAIT OF GEORGIA USING SIMPLE ATMOSPHERE AND OCEAN DYNAMICS* (809)

ONCE

DESIGN AND SITING CRITERIA FOR ONCE-THROUGH COOLING SYSTEMS BASED ON A FIRST-ORDER THERMAL PLUME MODEL* (549)

TITLE INDEX

- OPEN**
NUMERICAL MODEL FOR A TURBULENT BUBBLANT JET IN A SHALLOW OPEN CHANNEL* (809)
- OPERATION**
WASTE HEAT MANAGEMENT IN THE ELECTRIC POWER INDUSTRY: ISSUES OF ENERGY CONSERVATION AND STATION OPERATION UNDER ENVIRONMENTAL CONSTRAINTS* (813)
- OPERATIONS**
A PRECIPITATION SCAVENGING MODEL FOR STUDIES OF TACTICAL NUCLEAR OPERATIONS* (214)
DEVELOPMENT OF MODEL TO ASSESS ENVIRONMENTAL EFFECT OF COMMERCIAL AVIATION HIGH ALTITUDE CRUISE OPERATIONS* (219)
AIR QUALITY ASSESSMENT MODEL FOR AIR FORCE OPERATIONS* (217)
COMPUTER SIMULATION OF OFFSHORE OIL SPILL CLEANUP OPERATIONS* (419)
DEVELOPMENT OF A SIMULATION MODEL FOR EVALUATION OF SURFACE MINING OPERATIONS AND RECLAMATION PLANS* (795)
- OPTIC**
OPTIC: PROGRAM FOR COMPUTERIZED SELECTION OF WATERSHED PARAMETER VALUES FOR THE STANFORD WATERSHED MODEL* (482)
- OPTICAL**
NONE CARLC STUDIES ON THE TIME-DEPENDENT TRANSPORT OF OPTICAL AND INFRARED RADIATION IN THE ATMOSPHERE: THERMAL RADIATION TRANSPORT* (49)
- OPTIMAL**
OPTIMAL CONTROL OF AN OIL REFINERY WASTE TREATMENT FACILITY: A TOTAL ECOSYSTEM APPROACH* (495)
OPTIMAL PREVENTION AND DETECTION MODEL FOR POLLUTION PATROL SPILLS* (535)
DETERMINATION OF OPTIMAL MULTIPLE USES OF A SMALL WATER RESOURCE* (622)
- OPTIMIZATION**
MODELING AND OPTIMIZATION OF TRANSIENT COOLING WATER DISCHARGE FROM POWER GENERATING PLANTS, APPLICATIONS TO REGIONAL SITUATIONS* (657)
SIMULATION AND OPTIMIZATION OF ACID RAIN WEATHER ABATEMENT ALTERNATIVES* (617)
OPTIMIZATION MODELS FOR DIVERSE BASIN WATER QUALITY MANAGEMENT AND WASTE TREATMENT PLANT DESIGN* (638)
- OPTIMIZE**
RESOURCES ALLOCATION TO OPTIMIZE MINING POLLUTION CONTROL* (569)
- OPTYP**
OPTYP II: SPECIAL SCIENTIFIC REPORT ON VOLUME 1* (806)
- OPEN**
SECOND ORDER TURBULENCE MODEL FOR ATMOSPHERIC POLLUTANT DISPERSION* (153)
DESIGN AND SITING CRITERIA FOR ONCE-THROUGH COOLING SYSTEMS BASED ON A FIRST-ORDER THERMAL PLUME MODEL* (589)
- OR**
MIGRATION OF GASEOUS RADIONUCLIDES THROUGH SOIL OVERLYING A URANIUM ORE DEPOSIT: A MODELING STUDY* (645)
- ORGAN**
CALCULATING ORGAN DOSE FROM RADIONUCLIDE INHALATION* (739)
A FORTRAN PROGRAM TO DETERMINE ASSORBED ORGAN DOSE DUE TO INHALATION OF RADIONUCLIDES* (748)
- ORGANISMS**
INVESTIGATION OF SOME FACTORS IN THE BIOCHEMICAL CONVERSION OF MERCURY POLLUTANTS TO TOXIC METHYLMERCURY EFFECTED BY MICRO-ORGANISMS IN A MARINE SEDIMENT* (500)
HEAVY METALS IN ESTUARINE BENTHIC ORGANISMS AND SEDIMENTS: DATA AND MODEL* (600)
- ORIENTED**
HYRO: FORTRAN-ORIENTED COMPUTER LANGUAGE FOR HYDROLOGIC MODELING--USER'S MANUAL* (605)
- ORIGIN**
MATHEMATICAL MODELS FOR ANALYZING ORIGIN AND DISTRIBUTION OF COMBUSTION GENERATED POLLUTANTS IN GAS TURBINES: A MATHEMATICAL MODEL FOR JET ENGINE COMBUSTOR POLLUTANT EMISSIONS* (78)
- ORNL**
SOME TECHNIQUES FOR ESTIMATING THE RESULTS OF THE EMISSION OF RADIOACTIVE EFFLUENT FROM ORNL STACKS* (343)
- OTTAWA**
A BIOENERGETICS-BASED MODEL FOR POLLUTANT ACCUMULATION BY FISH: SIMULATION OF PCB AND METHYLMERCURY RESIDUE LEVELS IN OTTAWA RIVER YELLOW PERCH (*PERCA FLAVESCENS*)* (516)
- OUTDOOR**
OUTDOOR SIMULATION OF AIR POLLUTION CONTROL STRATEGIES* (352)
- OUTFALL**
USER'S GUIDE AND DOCUMENTATION FOR OUTFALL PLUME MODEL* (394)
- OUTFALLS**
NUMERICAL THERMAL PLUME MODEL FOR VERTICAL OUTFALLS IN SHALLOW WATER* (593)
- OUTFLOW**
OBTAINING LOCATION/ARRIVAL-TIME AND LOCATION/OUTFLOW-QUANTITY DISTRIBUTIONS FOR STEADY FLOW SYSTEMS* (515)
- OUTPUT**
THE RIVER BASIN MODEL: COMPUTER OUTPUT* (520)
- OUTSIDE**
THEORETICAL MODEL FOR RELATING INDOOR POLLUTANT CONCENTRATIONS TO THOSE OUTSIDE* (288)
- OVERLAND**
AN OVERLAND POLLUTION TRANSPORT MODEL* (650)
- OVERLYING**
MIGRATION OF GASEOUS RADIONUCLIDES THROUGH SOIL OVERLYING A URANIUM ORE DEPOSIT: A MODELING STUDY* (645)
- OXIDANT**
STATISTICAL OXIDANT AIR QUALITY PREDICTION MODEL FOR LAND USE AND TRANSPORTATION PLANNING* (32)
PHOTOCHEMICAL OXIDANT MODELING, TECHNIQUES APPLICABLE TO HIGHWAY SYSTEM EVALUATION* (373)
- OXIDATION**
IRON CATALYZED OXIDATION OF SO₂ TO ACID SULPHATE MIST IN DISPERSING PLUMES* (83)
FORMATION OF SULFATE IN THE STRATOSPHERE THROUGH THE GAS PHASE OXIDATION OF SULFUR DIOXIDE* (108)
OXIDATION OF SO₂ TO SULFATES IN DISPERSING PLUMES* (171)
- OXIDE**
BEHAVIOR OF NITRIC OXIDE FORMED BY THE SPACE SHUTTLE IN THE MESOSPHERE* (73)
- OXIDES**
STRATOSPHERIC OZONE DESTRUCTION BY AIRCRAFT-INDUCED NITROGEN OXIDES* (340)
- OXYGEN**
NUTRIENT TRANSPORT AND DISSOLVED OXYGEN BUDGET STUDIES IN THE POTOMAC ESTUARY* (810)
- OYSTERS**
MATHEMATICAL MODEL OF THE ACCUMULATION OF RADIONUCLIDES BY OYSTERS (*C. VIRGINICA*) AQUACULTURED IN THE EFFLUENT OF A NUCLEAR POWER REACTOR TO INCLUDE MAJOR BIOLOGICAL PARAMETERS* (753)

TITLE INDEX

OZONE

OZONE FORMATION FROM NO_x IN "CLEAN AIR" (33)
 TIME-DEPENDENT PHOTOCHEMICAL MODEL FOR OZONE NEAR THE GROUND (76)
 COMPUTATION OF POSSIBLE CLIMATIC CONSEQUENCES OF PERTURBATIONS TO STRATOSPHERIC AEROSOLS, OZONE AND WATER VAPOR WITH RADIATIVE-CONVECTIVE MODELS (84)
 EFFECT OF WATER VAPOR ON THE DESTRUCTION OF OZONE IN THE STRATOSPHERE PERTURBED BY CL₂ OR SO₂ POLLUTANTS (166)
 GLOBAL ANALYSIS OF A MERCATOR GRID OF SATELLITE DERIVED OZONE DATA (386)
 STRATOSPHERIC OZONE DESTRUCTION BY AIRCRAFT-INDUCED NITROGEN OXIDES (388)
 EMPIRICAL TECHNIQUES FOR ANALYZING AIR QUALITY AND METEOROLOGICAL DATA: SHORT-TERM CHANGES IN GROUND-LEVEL OZONE CONCENTRATIONS (393)
 OZONE AND SO₂ UPTAKE OVER VARIOUS SURFACES (702)

PARLN

PARLN (703)

PACKAGE

DESCRIPTION OF A RADIATION PACKAGE FOR THE NAVAL POSTGRADUATE SCHOOL GENERAL CIRCULATION MODEL (707)
 WATER QUALITY MANAGEMENT PROGRAM HYDROLOGY PACKAGE (628)

PARABOLIC

THE NUMERICAL SOLUTION OF PARABOLIC EQUATIONS APPLIED TO "EDDY DIFFUSION" IN THE OCEAN (469)

PARAMETER

OSPEY: PROGRAM FOR COMPUTERIZED SELECTION OF WATERSHED PARAMETER VALUES FOR THE STANFORD WATERSHED MODEL (402)
 POTOMAC RIVER TEMPERATURE WISE DISTRIBUTION AND DIFFUSION PARAMETER EVALUATION (524)
 THE STANFORD WATERSHED MODEL: THE CORRELATION OF PARAMETER VALUES SELECTED BY A COMPUTERIZED PROCEDURE WITH REASONABLE PHYSICAL CHARACTERISTICS OF THE WATERSHED (652)
 A TWO-COMPARTMENT, THREE-PARAMETER MODEL FOR THE ADSORPTION AND DETENTION OF INGESTED ELEMENTS BY ANIMALS (670)

PARAMETERIZED

PARAMETERIZED MODEL OF PRECIPITATION AND NEAR FIELD DE-CONTAMINATION (526)

PARAMETERS

PLANETARY DISTRIBUTION OF ZONAL NEAR TRANSPORT PARAMETERS OF RADIOISOTOPES IN THE TROPOSPHERE AND LOWER STRATOSPHERE: CLIMATIC DISTRIBUTION OF THE ZONAL NEAR COMPONENTS OF THE MERIDIONAL CIRCULATION VELOCITY (170)
 MATHEMATICAL MODELS OF WATER QUALITY PARAMETERS FOR RIVERS AND ESTUARIES (404)
 MULTI-LAYERED MODELS OF CURRENTS, TEMPERATURE, AND WATER QUALITY PARAMETERS IN THE GREAT LAKES (570)
 ENVIRONMENTAL PARAMETERS OF THE TENNESSEE RIVER IN ALABAMA, THERMAL STRATIFICATION (635)
 MATHEMATICAL MODEL OF THE ACCUMULATION OF RADIOISOTOPES BY OYSTERS (*C. VIRGINICA*) AQUACULTURED IN THE EFFLUENT OF A NUCLEAR POWER REACTOR TO INCLUDE MAJOR BIOLOGICAL PARAMETERS (753)

PARKS

COMPUTER SIMULATION OF ATMOSPHERIC EFFECTS OF WASTE HEAT REJECTED FROM CONCEPTUAL LARGE POWER PARKS (13)
 A NUMERICAL STUDY OF METEOROLOGICAL EFFECTS OF WASTE HEAT AND ROCKET RELEASES FROM HYPOTHETICAL POWER PARKS (263)

PARTICLE

THE BOSQUE MANUAL, HIGH-ALTITUDE NEUTRAL-PARTICLE MOTION (708)
 NUMERICAL TECHNIQUES APPLIED TO PARTICLE DEPOSITION DURING SLOT FLOW (814)
 NUMERICAL MODELING OF POLLUTANT TRANSPORT USING A LAGRANGIAN MARKER PARTICLE TECHNIQUE (574)

PARTICLES

LAGRANGIAN TRANSPORT AND DIFFUSION CODE TO CALCULATE CONCENTRATIONS AND DEPOSITION AT LONG RANGE OF PARTICLES LESS THAN 10 MICRON DIAMETER (220)

PARTICULATE

MODELING OF THE EFFECTS OF GASEOUS AND PARTICULATE POLLUTANTS IN THE URBAN ATMOSPHERE: POLLUTANT DISPERSION (12)
 ATMOSPHERIC DIFFUSION AND DEPOSITION OF PARTICULATE MATTER (87)
 A SOFTWARE SYSTEM TO SIMULATE COAL PLANT PARTICULATE CONTROLS (81)
 IMPACT OF ENERGY SHORTAGE ON AMBIENT SULFUR DIOXIDE AND PARTICULATE LEVELS IN METROPOLITAN BOSTON (294)
 MODEL FOR THE DISPERSION OF PARTICULATE OR GASEOUS POLLUTANTS FROM A NETWORK OF STREETS AND HIGHWAYS (305)
 PARTICULATE OIL SPILL RECOVERY: OIL ADSORPTION PROPERTIES OF PLASTIC FOAMS (441)

PASSAIC

STOCHASTIC VARIATION OF WATER QUALITY OF THE PASSAIC RIVER (505)

PATCH

RANDOM DRIFT OF AN IDEALIZED OIL PATCH (429)

PATHWAY

PARH: A SYSTEM OF COMPUTER PROGRAMS FOR RADIOCLIDE PATHWAY ANALYSIS CALCULATIONS (404)

PATHWAYS

DOSE CONVERSION CONSTANT CODE USED TO COMPUTE RADIOLOGICAL DOSE THROUGH VARIOUS PATHWAYS (695)

PATROL

OPTIMAL PREVENTION AND DETECTION MODEL FOR POLLUTION PATROL SPILLS (539)

PATTERNS

PREDICTIVE MODEL BASED ON THE RELATIONSHIP BETWEEN METEOROLOGICAL AND EMISSION PATTERNS AND AIR QUALITY (369)
 A METHODOLOGY FOR ASSESSMENT OF ENERGY FACILITY SITING PATTERNS (800)

PCB

A BIOENERGETICS-BASED MODEL FOR POLLUTANT ACCUMULATION BY FISH SIMULATION OF PCB AND METHYLMERCURY RESIDUE LEVELS IN OTTAWA RIVER YELLOW PERCH (*PERCA FLAVESCENS*) (516)

PERCH

PEAK TO MEAN CONCENTRATION RATIOS ACCORDING TO A "TOP-HAT" FLUCTUATING FLOW MODEL (91)

PEARL

DYNAMIC ESTUARY MODEL, PEARL HARBOR APPLICATIONS (544)

PERCA

A BIOENERGETICS-BASED MODEL FOR POLLUTANT ACCUMULATION BY FISH SIMULATION OF PCB AND METHYLMERCURY RESIDUE LEVELS IN OTTAWA RIVER YELLOW PERCH (*PERCA FLAVESCENS*) (516)

PERCH

A BIOENERGETICS-BASED MODEL FOR POLLUTANT ACCUMULATION BY FISH SIMULATION OF PCB AND METHYLMERCURY RESIDUE LEVELS IN OTTAWA RIVER YELLOW PERCH (*PERCA FLAVESCENS*) (516)

PERCOL

ONE-DIMENSIONAL MODEL OF THE MOVEMENT OF TRACE RADIOACTIVE SOLUTE THROUGH SOIL COLUMNS - THE PERCOL MODEL (453)

TITLE INDEX

- PERSONAL**
DETERMINATION OF ENVIRONMENTAL CARBON MONOXIDE EXPOSURES THROUGH PERSONAL MONITORING: FIELD VS PERSONAL AND TRANSPORTATION MODE RELATIONSHIPS* (57)
- PERSONNEL**
COMPUTER CODE FOR CALCULATING PERSONNEL DOSES DUE TO TRITICUM EXPOSURES* (700)
ENGINEERING-DESIGN REACTOR NEUTRONIC/THERMODYNAMIC DEPOSITION/ACTIVATION /DOSAGE TO PERSONNEL MODEL* (716)
- PERTURBATIONS**
COMPUTATION OF POSSIBLE CLIMATIC CONSEQUENCES OF PERTURBATIONS TO STRATOSPHERIC AEROSOLS, OZONE AND WATER VAPOR WITH RADIATIVE-CONVECTIVE MODELS* (80)
- PETROLEUM**
EFFECT OF WATER VAPOR ON THE DESTRUCTION OF OZONE IN THE STRATOSPHERE PERTURBED BY CLIM OF SOI POLUTANTS* (164)
- PETROCHEMICAL**
DEEP SEA OCEAN DISPOSAL OF PETROCHEMICAL PLANT WASTES* (303)
- PETROLEUM**
ENVIRONMENTAL ENERGY MODEL OF A PETROLEUM REFINING/CHEMICAL COMPLEX* (677)
- PH**
PH PROFILES IN A RIVER SYSTEM WITH MULTIPLE ACID LOADS* (639)
- PHASE**
FORMATION OF SULFATE IN THE STRATOSPHERE THROUGH THE GAS PHASE OXIDATION OF SULFUR DIOXIDE* (100)
ONE-DIMENSIONAL TRANSIENT NONISOTHERMAL TWO-PHASE, TWO COMPONENT FLOW OF FLUIDS AND GASES THROUGH LAYERED POROUS MEDIA* (646)
- PHENOMENA**
A MESOSCALE STATISTICAL MODEL OF ATMOSPHERIC TRANSPORT PHENOMENA IN URBAN AREAS* (100)
A COMPUTED MODEL FOR SOME BRANCHING-TYPE PHENOMENA IN NEOLOGY* (800)
- PHENOMENOLOGICAL**
A GLOBAL MODEL OF THERMOSPHERIC DYNAMICS, WIND AND DENSITY FIELDS DERIVED FROM A PHENOMENOLOGICAL TEMPERATURE* (56)
PHENOMENOLOGICAL MODEL FOR THE PREDICTION OF THERMAL FLUXES IN LARGE LAKES* (423)
PREDICTION OF SURFACE FLUX AREAS ASSOCIATED WITH HEATED DISCHARGES INTO LARGE LAKES - A PHENOMENOLOGICAL MODEL* (833)
- PHILOSOPHY**
ANALYTICAL PREDICTIONS OF THE MESOSCALE TRANSPORT OF ATMOSPHERIC EFFLUENTS: PHILOSOPHY AND MORPHOLOGY OF ENVIRONMENTAL MODELS FOR PREDICTING THE WIND AND POTENTIAL RADIOLOGICAL FIELDS OVER THE NEVADA TEST SITE* (262)
- PHOSPHORUS**
PHOSPHORUS CYCLING IN LAKES* (514)
- PHOTOCHEMICAL**
TIME-DEPENDENT PHOTOCHEMICAL MODEL FOR OZONE NEAR THE GROUND* (36)
TRACE PHOTOCHEMICAL AIR QUALITY SIMULATION MODEL* (69)
COMPUTER MODELING OF SIMULATED PHOTOCHEMICAL SMOG* (113)
MESOSCALE AIR POLLUTION SIMULATION MODELING: THE FEASIBILITY OF MODELING PHOTOCHEMICAL AEROSOL DYNAMICS* (124)
URBAN AIR SHED PHOTOCHEMICAL SIMULATION MODEL STUDY: MICROSCALE MODEL OF LOCAL VEHICULAR CONTRIBUTIONS TO RESIDUAL POLLUTANT CONCENTRATIONS* (160)
A LAGRANGIAN TRAJECTORY MODEL OF URBAN SCALE PHOTOCHEMICAL AIR POLLUTION* (193)
A THREE-DIMENSIONAL, URBAN SCALE, MATHEMATICAL MODEL OF PHOTOCHEMICAL AIR POLLUTION* (194)
A WELL MIXED BOX MODEL OF URBAN SCALE PHOTOCHEMICAL AIR POLLUTION* (195)
DEVELOPMENT OF A SIMULATIONS MODEL FOR ESTIMATING GROUND LEVEL CONCENTRATIONS OF PHOTOCHEMICAL POLLUTANTS* (270)
COMPUTER MODELING OF SIMULATED PHOTOCHEMICAL SMOG* (329)
PHOTOCHEMICAL CODE* (333)
MATHEMATICAL MODELING OF SIMULATED PHOTOCHEMICAL SMOG* (349)
PHOTOCHEMICAL OXIDANT MODELING, TECHNIQUES APPLICABLE TO HIGHWAY SYSTEM EVALUATION* (373)
DEVELOPMENT OF A SIMULATION MODEL FOR ESTIMATING GROUND LEVEL CONCENTRATIONS OF PHOTOCHEMICAL POLLUTANTS* (376)
DEVELOPMENT OF A SIMULATION MODEL FOR ESTIMATING GROUND LEVEL CONCENTRATIONS OF PHOTOCHEMICAL POLLUTANTS, A KINETIC MECHANISM FOR ATMOSPHERIC PHOTOCHEMICAL REACTIONS* (386)
- PHOTOLYTIC**
CALCULATION OF SELECTED PHOTOLYTIC RATE CONSTANTS OVER A DIURNAL RANGE: A COMPUTER ALGORITHM* (202)
- PHOTON**
ISPS MANUAL FOR CODE EXAM: A CODE TO CALCULATE GAMMA PHOTON DOSE FROM AN AIRBORNE RADIOACTIVE RELEASE* (393)
- PHOTOSYNTHESIS**
MODEL OF PHOTOSYNTHESIS AND GROWTH OF CROPS UNDER POLLUTANT STRESS* (774)
- PHYSICAL**
APPLICATIONS OF PHYSICAL MODELING IN A WIND TUNNEL TO GEOTHERMAL DEVELOPMENT* (5)
MODELING AND SIMILARITY RELATIONS OF PHYSICAL AND CHEMICAL PROCESSES* (52)
THE STAMFORD WATERSHED MODEL: THE CORRELATION OF PARAMETER VALUES SELECTED BY A COMPUTERIZED PROCEDURE WITH MEASURABLE PHYSICAL CHARACTERISTICS OF THE WATERSHED* (652)
- PHYTOPLANKTON**
PHYTOPLANKTON MODELS AND EUTROPHICATION PROBLEMS* (633)
- PILES**
MEASUREMENT AND MODELING OF STORM WATER RUNOFF FROM COAL STORAGE PILES AND THE IMPACT OF RECEIVING WATERS* (402)
POTENTIAL RADIOLOGICAL IMPACT OF AIRBORNE RELEASES AND DIRECT GAMMA RADIATION TO INDIVIDUALS LIVING NEAR INACTIVE URANIUM MILL TAILINGS PILES* (700)
- PINEWHALES**
A COMPUTER SIMULATION OF THE EFFECTS OF SUPERIMPOSED MORTALITY DUE TO POLLUTANTS ON POPULATIONS OF PATHEAD WHICUS (PINWHALES PROWELAS)* (773)
- PIPELINE**
EFFECTS OF THE PIPELINE MAIL ROAD ON NEARBY PONDS AND LAKES ACROSS ALASKA'S NORTH SLOPE* (703)
- PIPIENS**
MODELING THE EFFECTS OF TEMPERATURE CHANGES ON THE ECOLOGY OF RAPA PIPIENS AND TRANSPORTS SITALIS* (766)
- PLACEMENT**
OBJECTIVE PLACEMENT OF SENSORS* (209)

TITLE INDEX

- PLANS**
DIGITAL MODELING OF RADIOACTIVE AND CHEMICAL WASTE TRANSPORT IN THE SHAWNEE RIVER PLAIN ACQUIRED AT THE NATIONAL REACTOR TESTING STATION, IDAHO* (555)
- PLANT**
DIFFERENCE ANALOGUES OF BOUNDARY-VALUE PROBLEMS FOR THE EQUATIONS OF GLOBAL RADIOISOTOPE CONTRIBANT TRANSPORT AND THEIR NUMERICAL SOLUTION: DIFFERENCE APPROXIMATION OF EQUATIONS AND BOUNDARY CONDITIONS IN THE NEUTRONIC PLANE AND THE TOTAL BOLT OF THE ATMOSPHERE* (729)
- PLANETARY**
PLANETARY DISTRIBUTION OF GLOBAL WIND TRANSPORT PARAMETERS OF RADIOISOTOPES IN THE TROPOSPHERE AND LOWER STRATOSPHERE: CLIMATIC DISTRIBUTION OF THE GLOBAL WIND COMPONENTS OF THE REGIONAL CIRCULATION VELOCITY* (130)
ATMOSPHERIC TRANSPORT AND DIFFUSION IN THE PLANETARY BOUNDARY LAYER* (324)
SARVATIVE EFFECTS OF POLLUTANTS ON THE PLANETARY BOUNDARY LAYER* (322)
- PLANNING**
STATISTICAL OXIDANT AIR QUALITY PREDICTION MODEL FOR LAND USE AND TRANSPORTATION PLANNING* (32)
A WATER QUALITY PLANNING MODEL WITH MULTIPLE TIME, POLLUTANT, AND SOURCE CAPABILITIES* (419)
HYDROLOGICAL ACCUMULATION IN AN AGRICULTURAL FOOD CHAIN: A MODEL AND SOME IMPLICATIONS FOR RESEARCH PLANNING* (460)
- PLANT**
DEVELOPMENT OF A SIMULATION MODEL FOR EVALUATION OF SURFACE MINING OPERATIONS AND RECLAMATION PLANS* (795)
- PLANT**
A SOFTWARE SYSTEM TO SIMULATE COAL PLANT PARTICULATE CONTROLS* (91)
A COMPUTER TECHNIQUE FOR CALCULATING THE RADIOLOGICAL CONSEQUENCES OF PRESSURIZED WATER REACTOR POWER PLANT HYPOTHETICAL ACCIDENTS* (91)
PREDICTED AND OBSERVED COOLING TOWER PLUME RISE AND VISIBLE PLUME LENGTH AT THE JOHN E. AROS POWER PLANT* (102)
DEEP SEA OCEAN DISPOSAL OF PETROCHEMICAL PLANT WASTES* (398)
THERMAL PLUME INVESTIGATIONS FOR NEW ELECTRIC COMPANY'S CALLAWAY PLANT, UNITS 1 AND 2* (395)
WINDY TRANSPORT APPROACH MODELS FOR POWER PLANT IMPACT IN ESTUARIES* (425)
OCEANIC DISPERSION OF A SEVERE ACCIDENTAL RADIOACTIVE RELEASE FROM A SEASIDE NUCLEAR POWER PLANT* (471)
METABOLISM AND MODELS OF ESTUARINE BAY ECOSYSTEMS AFFECTED BY A COASTAL POWER PLANT* (494)
A THERMAL PLUME-MECHANICAL MODEL FOR ESTIMATION OF POWER PLANT IMPACT ON A STRATIFIED LAKE* (509)
THERMAL DISPERSION MODELING OF THE PROPOSED BOWEN NUCLEAR POWER PLANT* (522)
TWO-DIMENSIONAL NUMERICAL MODEL OF THE DEEP-FIELD FLOW FOR AN OCEAN THERMAL POWER PLANT: THE THEORETICAL APPROACH AND A LABORATORY SIMULATION* (551)
THERMAL POLLUTION ABATEMENT: EVALUATION MODEL FOR POWER PLANT SITES* (546)
DEVELOPMENT OF A COMPLETE MATHEMATICAL MODEL FOR DESCRIBING THE POINT SOURCE NUCLEAR POWER PLANT THERMAL PLUME* (612)
OPTIMIZATION MODELS FOR RIVER BASIN WATER QUALITY MANAGEMENT AND WASTE TREATMENT PLANT DESIGN* (630)
SYNTHETIC HEAT AND MASS TRANSFER IN POROUS MEDIA WITH APPLICATION TO SOIL WASHING WITH POWER PLANT WASTE WATER* (657)
PUMP, A PROGRAM FOR THE CALCULATION OF ACTIVITY RELEASES AND POTENTIAL DOSES FROM A PRESSURIZED WATER REACTOR PLANT* (689)
MODELS AND THE DECISION MAKING PROCESS: THE HANSON RIVER POWER PLANT CASE* (752)
PREDICTIVE STUDY OF THE DISPERSION OF EMISSIONS FROM THE SYNCRUDE REFINED LAKE PLANT* (804)
- PLANTS**
PRINCIPAL PLUME DISPERSION MODELS: TVA POWER PLANTS* (33)
THE CHEMISTRY, DISPERSION, AND TRANSPORT OF AIR POLLUTANTS EMITTED FROM FOSSIL FUEL POWER PLANTS IN CALIFORNIA: DATA ANALYSIS AND EMISSION IMPACT MODEL* (150)
A SIMPLIFIED TECHNIQUE USED TO EVALUATE ATMOSPHERIC DISPERSION OF EMISSIONS FROM LARGE POWER PLANTS* (204)
SUMMARY REPORT ON MODELING ANALYSIS OF POWER PLANTS FOR FUEL CONVERSION* (206)
ASSESSMENT OF THE AMBIENT AIR IMPACT OF MULTIPLE STACK INDUSTRIAL PLANTS USING DISPERSION MODELING* (208)
SIMULATION MODEL FOR ENVIRONMENTAL POLLUTION CONTROL FROM FOSSIL FUEL POWER PLANTS* (371)
MODEL FOR RADIOACTIVITY TRANSPORT IN WATER: NUMERICAL SOLUTIONS OF RADIOACTIVE TRANSPORT EQUATIONS AND ROLE OF PLANTS IN SO-OS TRANSPORT* (390)
ENVIRONMENTAL IMPACT STUDIES OF THE HAVASAI AND HAIPAPORIS POWER PLANTS* (430)
MODELING AND OPTIMIZATION OF TRANSIENT COOLING WATER DISCHARGE FROM POWER GENERATING PLANTS, APPLICATIONS TO VARIOUS SITUATIONS* (457)
TRANSIENT HEAT RELEASES FROM OFFSHORE NUCLEAR PLANTS* (461)
ANALYSIS OF SUBMERGED THERMAL DISCHARGE FROM OCEAN-SITED POWER PLANTS* (480)
TEMPERATURE DISTRIBUTION IN THE VICINITY OF HEATED DISCHARGES FROM POWER PLANTS* (499)
WASTE HEAT UTILIZATION FROM POWER PLANTS IN AGRICULTURE: WATER TRANSPORT* (542)
NUMERICAL OCEAN MODEL OF THE GULF OF MEXICO FOR EVALUATION OF THE ENVIRONMENTAL IMPACT OF OCEAN THERMAL POWER PLANTS* (587)
SIMULATION FACTORS INVOLVED IN OCEAN THERMAL POWER PLANTS* (601)
ENVIRONMENTAL RADIATION EXPOSURES AND ASSOCIATED RISKS FROM FUEL REPROCESSING PLANTS* (706)
TECHNIQUES FOR PREDICTING ENTRAINMENT AND IMPINGEMENT AT POWER PLANTS* (749)
COMPUTATION AND MAPPING OF THE DISPERSION AND HERDAGE SPARE OF GASEOUS EFFLUENTS FROM INDUSTRIAL PLANTS* (750)
TRANSFER OF STRONTIUM-90 FROM PLANTS TO H. VETS* (760)
- PLASTIC**
PARTICULATE OIL SPILL RECOVERY: OIL ADSORPTION BY TYPES OF PLASTIC FOAMS* (401)
- PLUME**
USE OF LABS SYSTEM FOR THE QUANTITATIVE DETERMINATION OF SHORE PLUME LATERAL DIFFUSION COEFFICIENTS FROM ERTS IMAGES OF VIRGINIA* (17)
NUMERICAL CALCULATIONS OF VISCOUS HIGH-ALTITUDE SHIMUST PLUME FLOW FIELDS* (12)
PLUME RISE PREDICTIONS* (23)
PRINCIPAL PLUME DISPERSION MODELS: TVA POWER PLANTS* (33)
EFFECT OF PLUME RISE ON GROUND LEVEL POLLUTION* (57)
PEAK TO MEAN CONCENTRATION RATIOS ACCORDING TO A 'TOP-HAT' FLUCTUATING PLUME MODEL* (91)
MODEL FOR RADIATION EXPOSURE FROM A BOILING WATER REACTOR PLUME* (94)
PREDICTED AND OBSERVED COOLING TOWER PLUME RISE AND VISIBLE PLUME LENGTH AT THE JOHN E. AROS POWER PLANT* (102)
METHOD FOR SIMULATING PLUME CENTERLINES FROM TALL STACKS* (125)
NUMERICAL STUDY OF WET COOLING TOWER PLUMES* (140)
COOLING TOWER PLUME MODEL* (149)
REACTIVE PLUME MODEL, VERSION 1* (161)

TITLE 18-29

PLUME

PUNCTURE PLUME MODEL, VERSION 2* (162)
 PUNCTURE PLUME MODEL* (163)
 ROSENQUIST'S PLUME RISE FORMULA AND THE TVA DATA* (175)
 MATHEMATICAL MODEL FOR CALCULATION OF LENGTH OF THE VISIBLE PLUME* (223)
 COOLING TOWER PLUME-MATHEMATICAL MODEL* (226)
 PLUME RISE AND DISPERSION MODEL* (232)
 SURVEY OF LABORATORY MODELING OF PLUME DYNAMICS* (272)
 REACTOR ACCIDENT PLUME RISE CALCULATIONS* (279)
 NET PLUME RISE FROM COOLING TOWERS IN STRONG WINDS* (302)
 GAUSSIAN-PLUME MULTIPLE SOURCE AIR QUALITY ALGORITHM* (311)
 A STEADY-STATE, UNIVARIATE GAUSSIAN PLUME DISPERSION ALGORITHM* (319)
 PLUME CONCENTRATIONS* (331)
 PLUME VISIBILITY* (332)
 COOLING TOWER PLUME MODEL* (336)
 USER'S GUIDE AND DOCUMENTATION FOR OFFSHORE PLUME MODEL* (394)
 THERMAL PLUME INVESTIGATIONS FOR UNION ELECTRIC COMPANY'S CALLAWAY PLANT, WHITE ' AND 2* (395)
 PREDICTION OF SURFACE PLUME AREAS ASSOCIATED WITH HEATED DISCHARGES INTO LARGE LAKES - A METEOROLOGICAL MODEL* (403)
 FOG AND FOG-PLUME BEHAVIOR FOR POINT OR SLOT UNDERWATER DISCHARGE INCLUDING MULTIPLE DISCHARGES* (444)
 THERMAL PLUME, SCATTERED MULTIPLE DIFFUSER MODEL* (492)
 THERMAL PLUME, SURFACE DISCHARGE MODEL* (493)
 ESTIMATED PLUME SURFACE TEMPERATURES AFTER INTERFERENCE* (528)
 DESIGN AND SIZING CRITERIA FOR ONCE-THROUGH COOLING SYSTEMS BASED ON A FIRST-ORDER THERMAL PLUME MODEL* (549)
 SPHERICAL THERMAL PLUME MODEL FOR VERTICAL OFFFALLS IN SHALLOW WATERS* (593)
 DEVELOPMENT OF A COMPLETE MATHEMATICAL MODEL FOR DESCRIBING THE POINT BEACH NUCLEAR POWER PLANT THERMAL PLUME* (612)

PLUME

FOG CATALYZED OXIDATION OF SO₂ TO ACID SULPHATE MIST IN DISPERSING PLUMES* (84)
 TRANSPORT JET PLUMES* (94)
 DISCUSSION OF A METHOD FOR CALCULATING THE SIZE OF COOLING TOWER PLUMES* (107)
 ORIGIN OF SO₂ TO SULFATES IN DISPERSING PLUMES* (171)
 A COMPREHENSIVE MODEL STUDY OF SALT DRIFT DEPOSITS, INDUCED FOGGING AND ICING FROM MECHANICAL DRAFT COOLING TOWER PLUMES AT NUCLEAR POWER* (210)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE AND MULTIPLE NATURAL-DRAFT COOLING TOWERS* (242)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (243)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE AND MULTIPLE NATURAL-DRAFT COOLING TOWERS* (244)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (246)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (247)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE OR MULTIPLE NATURAL-DRAFT COOLING TOWERS* (248)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (249)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (250)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (251)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (252)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE AND MULTIPLE NATURAL-DRAFT COOLING TOWERS* (253)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (254)
 A MODEL TO PREDICT PLUMES FROM A SINGLE NATURAL-DRAFT COOLING TOWER* (255)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (256)
 STUDIES OF THE ENVIRONMENTAL IMPACT OF EVAPORATIVE COOLING TOWER PLUMES* (308)
 METEOROLOGICAL MODEL FOR THE PREDICTION OF THERMAL PLUME IN LARGE LAKES* (423)
 UNIFORM RECTANGULAR SURFACE THERMAL PLUMES* (470)
 SPHERICAL MODEL FOR THERMAL PLUMES AND RIVER DISCHARGES* (541)
 ANALYTICAL JET-TYPE MODEL OF HEATED WATER SURFACE PLUMES* (577)
 DOSES WHILE TRAVELING UNDER WELL ESTABLISHED PLUMES* (719)

PLUTONIUM

A MODEL TO PREDICT RADIOLOGICAL ENVIRONMENTAL IMPACT RESULTING FROM STRAIGHTLINE WIND DANGER TO A PLUTONIUM FACILITY* (139)
 POLYMER MATERIAL-COOLANT INTERACTION AND PLUTONIUM SOURCE IN LWRD ACCIDENT ANALYSIS* (814)

POLAR

THE POLAR THERMOSPHERE* (55)

POLICY

MODELING THE ECONOMIC AND ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVE ENERGY POLICIES: SENS-STRATEGIC ENVIRONMENTAL ASSESSMENT SYSTEM* (749)

POLLUTANT

MODELING OF THE EFFECTS OF GASEOUS AND PARTICULATE POLLUTANTS IN THE URBAN ATMOSPHERE: POLLUTANT DISPERSION* (12)
 MATHEMATICAL MODELS FOR ANALYZING ORIGIN AND DISTRIBUTION OF COMBUSTION GENERATED POLLUTANTS IN GAS TURBINES: A MATHEMATICAL MODEL FOR JET ENGINE COMBUSTION POLLUTANT EMISSIONS* (18)
 POLLUTANT DISTRIBUTIONS IN THE MIXED LAYER, USING SIMILARITY THEORY* (44)
 EFFECT OF A MESOSCALE TYPE WIND ON THE POLLUTANT DISTRIBUTION FROM A LINE SOURCE* (67)
 ANALYTICAL MODEL FOR AIR POLLUTANT TRANSPORT AND DEPOSITION FROM A POINT SOURCE* (76)
 SECOND ORDER TURBULENCE MODEL FOR ATMOSPHERIC POLLUTANT DISPERSION* (153)
 URBAN AIR SHED PHOTOCHEMICAL SIMULATION MODEL STUDY: MICROSCALE MODEL OF LOCAL VEHICULAR CONTRIBUTIONS TO MEASURED POLLUTANT CONCENTRATIONS* (160)
 TURBULENT DIFFUSION AND POLLUTANT TRANSPORT IN SHORELINE ENVIRONMENTS* (172)
 A COMPUTER CODE FOR ESTIMATING AIR POLLUTANT CONCENTRATIONS FROM DISPERSED SOURCES* (205)
 ROADSIDE LAYER MODEL FOR AIR POLLUTANT CONCENTRATIONS DUE TO HIGHWAY TRAFFIC* (260)
 THEORETICAL MODEL FOR RELATING INDOOR POLLUTANT CONCENTRATIONS TO THOSE OUTSIDE* (280)
 DYNAMIC MODEL OF SEA BREEZE CIRCULATIONS AND POLLUTANT TRANSPORT* (309)
 PREDICTION OF LONG-TERM MEAN AND MEAN SQUARE POLLUTANT CONCENTRATIONS IN AN URBAN ATMOSPHERE* (357)
 A NEW MATHEMATICAL MODEL OF AIR POLLUTANT CONCENTRATION AVERAGING TIME AND FREQUENCY* (359)
 AIR POLLUTANT HEALTH EFFECTS ESTIMATION MODEL* (366)
 HABITAT DEL RAY: COMPUTER SIMULATION OF POLLUTANT TRANSPORT IN SEMI-ENCLOSED WATER BODY* (408)
 A WATER QUALITY PLANNING MODEL WITH MULTIPLE TIME, POLLUTANT, AND SOURCE CAPABILITIES* (419)
 FIELD STUDY AND MATHEMATICAL MODEL OF THE SLACK-WATER BUILDUP OF A POLLUTANT IN A TIDAL RIVER* (438)
 A SURVEY OF DISPERSION COEFFICIENTS FOR ESTIMATING POLLUTANT TRANSPORT* (462)
 SIMULATION OF POLLUTANT MOVEMENT IN GROUNDWATER AQUIFERS* (463)

TITLE THREE

POLLUTANT

- THE SHORTEST SOURCE POLLUTANT LOADING (WPS) MODEL* (443)
- MODELING POLLUTANT MIGRATION IN SUBSURFACE ENVIRONMENTS* (544)
- A PROBABILISTIC-BASED MODEL FOR POLLUTANT ACCUMULATION BY FISH: SIMULATION OF PCB AND METHYLMERCURY RESIDUE LEVELS IN OTTAWA RIVER YELLOW PERCH (*PERCA FLAVESCENS*)^o (534)
- SYNTHETIC MODELING OF POLLUTANT "PASSPORT" USING A LAGRANGIAN MARKED PARTICLE TECHNIQUE^o (574)
- OCEAN CURRENT AND POLLUTANT "PASSPORT" MODEL* (589)
- MATHEMATICAL MODEL OF POLLUTANT CAUSE AND EFFECT IN SAGINAW BAY, LAKE MICHIGAN* (634)
- STRUCTURED MARINE FOOD WEBS AND "POLLUTANT" ANALOGUES^o (642)
- A PRELIMINARY MODEL OF GASEOUS POLLUTANT UPTAKE BY VEGETATION^o (672)
- MODELS OF PHOTOSYNTHESIS AND GROWTH OF CROPS UNDER POLLUTANT STRESS^o (774)
- THE MECHANISM AND PREDICTION OF GASEOUS POLLUTANT UPTAKE BY VEGETATION^o (774)

POLLUTANTS

- AIR QUALITY MODEL: METHODOLOGY AND ITS INFLUENCE ON THE DISPERSION OF POLLUTANTS FROM HIGHWAY LINE SOURCES^o (9)
- CALIBRE: AN IMPROVED MICROSCALE MODEL FOR THE DISPERSION OF AIR POLLUTANTS FROM A LINE SOURCE^o (10)
- EFFECTS OF THE EFFECTS OF GASEOUS AND PARTICULATE POLLUTANTS IN THE URBAN ATMOSPHERE: POLLUTANT DISPERSION^o (12)
- MATHEMATICAL MODELS FOR AMBITIOUS ORIGIN AND DISTRIBUTION OF COMBUSTION GENERATED POLLUTANTS IN GAS TURBINES: A MATHEMATICAL MODEL FOR JET ENGINE COMBUSTOR POLLUTANT EMISSIONS^o (10)
- A SIMPLE DISPERSION MODEL FOR THE ANALYSIS OF CHEMICALLY REACTIVE POLLUTANTS^o (104)
- THE EFFECT OF GROUND LEVEL ABSORPTION ON THE DISPERSION OF POLLUTANTS IN THE ATMOSPHERE^o (112)
- NUMERICAL MODELING OF THE TRANSPORT, DIFFUSION, AND DEPOSITION OF POLLUTANTS FOR REGIONS AND EXTENDED SCALES^o (135)
- THREE-DIMENSIONAL NUMERICAL MODEL FOR CALCULATING THE SPREAD AND DILUTION OF AIR POLLUTANTS^o (147)
- ONE-DIMENSIONAL MODEL FOR THE TRANSPORT OF POLLUTANTS IN AN URBAN BASIN^o (154)
- THE CHEMISTRY, DISPERSION, AND TRANSPORT OF AIR POLLUTANTS EMITTED FROM FOSSIL FUEL POWER PLANTS IN CALIFORNIA: DATA ANALYSIS AND EMISSION IMPACT MODEL^o (154)
- EFFECT OF WATER VAPOR ON THE DESTRUCTION OF OZONE IN THE STRATOSPHERE PERTURBED BY CFC OR NOX POLLUTANTS^o (164)
- COMPUTER MODEL FOR THE PREDICTION OF THE DISPERSION OF AIRBORNE RADIOACTIVE POLLUTANTS^o (204)
- REGIONAL MODEL FOR REGIONAL TRANSPORT OF SULFUR POLLUTANTS IN THE ATMOSPHERE^o (244)
- DEVELOPMENT OF A SIMULATION MODEL FOR ESTIMATING GROUND LEVEL CONCENTRATIONS OF PHOTOCHEMICAL POLLUTANTS^o (274)
- MODEL FOR THE DISPERSION OF PARTICULATE OR GASEOUS POLLUTANTS FROM A NETWORK OF STREETS AND HIGHWAYS^o (304)
- A POINT SOURCE MODEL TO ESTIMATE NOXLY CONCENTRATIONS FOR STABLE POLLUTANTS^o (314)
- A POINT SOURCE MODEL TO ESTIMATE NOXLY CONCENTRATIONS FOR STABLE POLLUTANTS^o (314)
- A POINT SOURCE MODEL TO ESTIMATE NOXLY CONCENTRATIONS FOR STABLE POLLUTANTS^o (314)
- RADIATIVE EFFECTS OF POLLUTANTS ON THE PLANETARY BOUNDARY LAYER^o (322)
- MODELING OF THE EFFECTS OF POLLUTANTS AND DISPERSION IN URBAN ATMOSPHERES^o (323)
- DEVELOPMENT OF A SIMULATION MODEL FOR ESTIMATING GROUND LEVEL CONCENTRATIONS OF PHOTOCHEMICAL POLLUTANTS^o (374)
- DEVELOPMENT OF A SIMULATION MODEL FOR ESTIMATING GROUND LEVEL CONCENTRATIONS OF PHOTOCHEMICAL POLLUTANTS, A STATISTICAL RECURSIVE FOR ATMOSPHERIC PHOTOCHEMICAL REACTIONS^o (384)
- A STATISTICAL METHODOLOGY FOR PREDICTING THE POLLUTANTS IN A RIVER^o (385)
- INVESTIGATION OF SOME FACTORS IN THE BIOCHEMICAL CONVERSION OF MERCURY POLLUTANTS TO TOXIC METHYLMERCURY EFFECTED BY MICRO-ORGANISMS IN A MARINE SEDIMENT^o (500)
- MATHEMATICAL MODELS OF RATES OF POLLUTANTS IN ESTUARIES^o (533)
- MATHEMATICAL SIMULATION OF DISPERSION OF POLLUTANTS IN A LAKE WITH ICE COVER^o (575)
- MATHEMATICAL MODEL FOR FATE OF POLLUTANTS IN BEACH-SHORE WATERS^o (600)
- INVESTIGATION AND PREDICTION OF DISPERSION OF POLLUTANTS IN THE SEA WITH HYDRODYNAMICAL NUMERICAL (RM) MODELS^o (610)
- HEALTH EFFECTS AND COSTS OF FOSSIL-FUEL POLLUTANTS^o (714)
- MORTALITY PROJECTION FROM EXPOSURE TO RADIOACTIVE AND NON-RADIOACTIVE ENVIRONMENTAL POLLUTANTS^o (715)
- COMPARATIVE MODELS FOR BODY BURDEN OF POLLUTANTS^o (717)
- A CUMULATIVE HAZARD INDEX FOR ASSESSING LIFETIME EXPOSURES TO ENVIRONMENTAL POLLUTANTS^o (744)
- DEVELOPMENT OF TRANSPORT MODELS FOR ENVIRONMENTAL POLLUTANTS^o (744)
- A COMPUTER SIMULATION OF THE EFFECTS OF SUPERIMPOSED MORTALITY DUE TO POLLUTANTS ON POPULATIONS OF FATHEAD MINNOWS (*PIMEPHALES PROMELAS*)^o (773)

POLLUTED

- KINETIC STUDY OF SIMULATED SO₂, NO_x, OR POLLUTED ATMOSPHERES^o (30)
- PREDICTING REAURATION COEFFICIENTS FOR A POLLUTED ESTUARY^o (448)

POLLUTING

- FORECASTING THE EFFECTS OF POLLUTING DISCHARGES ON ESTUARIES^o (434)

POND

- TEMPERATURE DISTRIBUTION MODEL FOR COOLING POND^o (497)
- RYAN-HARLEMAN-COOLING POND TEMPERATURE DISTRIBUTION^o (507)

POND

- NUMERICAL MODELING OF SUBSURFACE RADIOACTIVE SOLUTE TRANSPORT FROM WASTE-SEEPAGE PONDS AT THE IDAHO NATIONAL ENGINEERING LABORATORY^o (554)
- EFFECTS OF THE PIPELINE HAUL ROAD ON BEARWY PONDS AND LAKES ACROSS ALASKA'S NORTH SLOPE^o (703)

POOL

- THERMAL REGIMES OF THE UPPER MISSISSIPPI AND MISSOURI RIVERS: TRANSIENT AND STEADY-STATE COMPUTATIONAL MODELS FOR THE PREDICTION OF RIVER THERMAL REGIMES; PART TWO: ANALYSIS OF THERMAL REGIMES OF THE MISSISSIPPI AND MISSOURI RIVERS IN THE MID-CONTINENT AREA POWER POOL (MAPP) GEOGRAPHICAL AREA^o (530)

POPUL

- POPUL RIVER WATER QUALITY SYSTEMS MODEL^o (619)

POPULATION

- A MODEL TO ESTIMATE RADIATION DOSE COMMITMENTS TO THE WORLD POPULATION FROM THE ATMOSPHERIC RELEASE OF RADIOISOTOPES^o (274)
- EVALUATION OF ENVIRONMENTAL FACTORS AFFECTING POPULATION EXPOSURE^o (704)
- AIRBORNE RADIATION: A COMPUTER CODE FOR CALCULATING DOSES, POPULATION DOSES, AND GROUND DEPOSITIONS DUE TO ATMOSPHERIC EMISSIONS OF RADIOISOTOPES^o (724)
- A COMPUTER CODE (HYDROS) TO CALCULATE POPULATION DOSES FROM RADIOACTIVE LIQUID EFFLUENTS AND AN APPLICATION TO NUCLEAR POWER REACTORS OF THE MISSISSIPPI RIVER BASIN^o (724)
- CALCULATIONS OF DOSE AND POPULATION DOSE IN THE GENERAL ENVIRONMENT DUE TO BOILING-WATER NUCLEAR POWER REACTOR RADIOISOTOPE EMISSIONS IN THE UNITED STATES IN 1971^o (722)
- USE OF THE LEBESGUE MATRIX FOR ASSESSING ENVIRONMENTAL IMPACT WITH AN EXAMPLE FOR A FISH POPULATION^o (734)

TITLE INDEX

POPULATION

A STOCHASTIC FISH LIFE-CYCLE POPULATION MODEL USING A MODIFIED LESLIE MATRIX* (759)
ANALYTICAL MODELS FOR ENVIRONMENT COST ESTIMATES OF AQUATIC POPULATIONS* (764)
A GENERALIZED FISH LIFE-CYCLE POPULATION MODEL AND COMPUTER PROGRAM* (779)

POPULATIONS

THE EISEN III COMPUTER CODE FOR ESTIMATING EXTERNAL RADIATION DOSES TO POPULATIONS FROM ENVIRONMENTAL RELEASES* (712)
RADIATION DOSES TO POPULATIONS* (736)
THE EISEN II COMPUTER CODE FOR ESTIMATING EXTERNAL DOSES TO POPULATIONS FROM CONSTRUCTION OF A SEA LEVEL CANAL WITH NUCLEAR EXPLOSIVES* (762)
A COMPUTER SIMULATION OF THE EFFECTS OF SUPERIMPOSED MORTALITY DUE TO POLLUTANTS ON POPULATIONS OF FRESHWATER SNOUTS (SPERMATOPHYTES) (773)

POISSON

INTERFACIAL TRANSPORT THROUGH POROUS MEDIA: A FINITE-ELEMENT CALIBRIN MODEL* (604)
ONE-DIMENSIONAL TRANSIENT ISOTHERMAL TWO-PHASE, TWO-COMPONENT FLOW OF FLUIDS AND GASES THROUGH LAYERED POROUS MEDIA* (606)
POLYMER DISPERSION OF TRACE CHEMICAL CONCENTRATIONS IN A SATURATED SOBBING POROUS MEDIUM* (607)
A THEORY OF THE MASS TRANSPORT OF PREVIOUSLY DISTRIBUTED CHEMICALS IN A WATER SATURATED SOBBING POROUS MEDIUM* (609)
SIMULTANEOUS HEAT AND MASS TRANSFER IN POROUS MEDIA WITH APPLICATION TO SOIL WARMING WITH POWER PLANT WASTE HEAT* (657)

POSTGRADUATE

DESCRIPTION OF A RADIATION PACKAGE FOR THE BRUAL POSTGRADUATE SCHOOL GENERAL CIRCULATION MODEL* (107)

POSTULATED

COMPARISON OF ECOLOGICAL IMPACTS OF POSTULATED OIL SPILLS AT SELECTED ALASKAN LOCATIONS* (454)

POTENTIAL

POTENTIAL ENVIRONMENTAL MODIFICATIONS PRODUCED BY LARGE EVAPORATIVE COOLING TOWERS* (227)
TYPICAL PREDICTION OF THE MESOSCALE TRANSPORT OF ATMOSPHERIC EFFLUENTS: PHILOSOPHY AND METHODOLOGY OF EXPERIMENTAL MODELS FOR PREDICTING THE WIND AND POTENTIAL RADIOLOGICAL FIELDS OVER THE DEWAM TEST SITE* (242)
1979, A PROGRAM FOR THE CALCULATION OF ACTIVITY RELEASES AND POTENTIAL DOSES FROM A PRESSURIZED WATER REACTOR PLANT* (404)
A POSTHOC PROGRAM FOR THE CALCULATION OF THE POTENTIAL HAZARDS FROM AN ACCIDENTAL FISSION PRODUCT RELEASE, 1979* (497)
POTENTIAL RADIOLOGICAL IMPACT OF AIRBORNE RELEASES AND DIRECT GAMMA RADIATION TO INDIVIDUALS LIVING NEAR INDUSTRIAL WASTE TAILINGS PILES* (700)

POTOMAC

SUBSTRATE TRANSPORT AND DISSOLVED OXYGEN BUDGET STUDIES IN THE POTOMAC ESTUARY* (410)
A STUDY OF TIDAL DISPERSION IN THE POTOMAC RIVER* (450)
POTOMAC RIVER TEMPERATURE RISE DISTRIBUTION AND DIFFUSION PARAMETER EVALUATION* (529)
THE POTOMAC ESTUARY MATHEMATICAL MODEL* (754)

POWER

COMPUTER SIMULATION OF ATMOSPHERIC EFFECTS OF WASTE HEAT REJECTED FROM CONCEPTUAL LARGE POWER PLANTS* (13)
POTENTIAL PLUME DISPERSION MODELS: TWO POWER PLANTS* (33)
A COMPUTER TECHNIQUE FOR CALCULATING THE RADIOLOGICAL CONSEQUENCES OF PRESSURIZED WATER REACTOR POWER PLANT HYPOTHETICAL ACCIDENTS* (93)
PREDICTED AND OBSERVED COOLING TOWER PLUME RISE AND VISIBLE PLUME LENGTH AT THE JOHN E. AMOS POWER PLANT* (102)
COMPARATIVE MODEL THEORY OF ATMOSPHERIC CONTAMINANT LOADING BY POWER STATIONS* (121)
THE CHEMISTRY, DISPERSION, AND TRANSPORT OF AIR POLLUTANTS EMITTED FROM FOSSIL FUEL POWER PLANTS IN CALIFORNIA: DATA ANALYSIS AND EMISSION IMPACT MODEL* (150)
A SIMPLIFIED TECHNIQUE USED TO EVALUATE ATMOSPHERIC DISPERSION OF EMISSIONS FROM LARGE POWER PLANTS* (204)
SUMMARY REPORT ON MODELING ANALYSIS OF POWER PLANTS FOR FUEL CONVERSION* (204)
A NUMERICAL STUDY OF METEOROLOGICAL EFFECTS OF WASTE HEAT AND MOISTURE RELEASES FROM HYPOTHETICAL POWER PLANTS* (263)
A PROGRAM FOR EVALUATING ATMOSPHERIC DISPERSION FROM A NUCLEAR POWER STATION* (207)
SIMULATION MODEL FOR ENVIRONMENTAL POLLUTION CONTROL FROM FOSSIL FUEL POWER PLANTS* (377)
UNIFIED TRANSPORT APPROACH MODELS FOR POWER PLANT IMPACT IN ESTUARIES* (425)
ENVIRONMENTAL IMPACT STUDIES OF THE SAVANNAH AND SAIPADONIS POWER PLANTS* (434)
QUANTIFICATION OF AQUATIC ENVIRONMENTAL IMPACT OF ELECTRIC POWER GENERATION* (440)
MODELING AND OPTIMIZATION OF TRANSIENT COOLING WATER DISCHARGE FROM POWER GENERATING PLANTS, APPLICATIONS TO REGIONAL SITUATIONS* (457)
OCEANIC DISPERSION OF A SEVERE ACCIDENTAL RADIOACTIVE RELEASE FROM A SUBSEA NUCLEAR POWER PLANT* (477)
ANALYSIS OF SUBMERGED THERMAL DISCHARGE FROM OCEAN-SITED POWER PLANTS* (480)
METABOLISM AND MODELS OF ESTUARINE BAY ECOSYSTEMS AFFECTED BY A COASTAL POWER PLANT* (490)
TEMPERATURE DISTRIBUTION IN THE VICINITY OF HEATED DISCHARGES FROM POWER PLANTS* (499)
A THERMAL FLUID-MECHANICAL MODEL FOR ESTIMATION OF POWER PLANT IMPACT ON A STRATIFIED LAKE* (509)
THERMAL DISPERSION MODELING OF THE PROPOSED WOODS NUCLEAR POWER PLANT* (522)
THERMAL REGIMES OF THE UPPER MISSISSIPPI AND MISSOURI RIVERS: TRANSIENT AND STEADY-STATE COMPUTATIONAL MODELS FOR THE PREDICTION OF RIVER THERMAL REGIMES; PART TWO: ANALYSIS OF THERMAL REGIMES OF THE MISSISSIPPI AND MISSOURI RIVERS IN THE MID-CONTINENT AREA POWER POOL (MAPP) GEOGRAPHICAL AREA* (530)
TWO-DIMENSIONAL NUMERICAL MODEL OF THE NEAR-FIELD FLOW FOR AN OCEAN THERMAL POWER PLANT: THE THEORETICAL APPROACH AND A LABORATORY SIMULATION* (553)
WASTE HEAT UTILIZATION FROM POWER PLANTS IN AGRICULTURE: WATER TRANSPORT* (562)
THERMAL POLLUTION AMBIENT EVALUATION MODEL FOR POWER PLANT SITING* (564)
REGIONAL MODELING OF SURFACE WATER TEMPERATURES FROM PROJECTED POWER GROWTH* (577)
NUMERICAL OCEAN MODEL OF THE GULF OF MEXICO FOR EVALUATION OF THE ENVIRONMENTAL IMPACT OF OCEAN THERMAL POWER PLANTS* (587)
SIMULATION FACTORS INVOLVED IN OCEAN THERMAL POWER PLANTS* (601)
DEVELOPMENT OF A COMPLETE MATHEMATICAL MODEL FOR DESCRIBING THE POINT BEACH NUCLEAR POWER PLANT THERMAL PLUME* (612)
SIMULTANEOUS HEAT AND MASS TRANSFER IN POROUS MEDIA WITH APPLICATION TO SOIL WARMING WITH POWER PLANT WASTE HEAT* (657)
A COMPUTER CODE (PROTON) TO CALCULATE POPULATION DOSES FROM RADIOACTIVE LIQUID EFFLUENTS AND AN APPLICATION TO NUCLEAR POWER REACTORS OF THE MISSISSIPPI RIVER BASIN* (721)
CALCULATIONS OF DOSE AND POPULATION DOSE IN THE GENERAL ENVIRONMENT DUE TO BOILING-WATER NUCLEAR POWER REACTOR RADIOACTIVE EMISSIONS IN THE UNITED STATES IN 1971* (722)
TECHNIQUES FOR PREDICTING ESTUARIAN AND INFLUENT AT POWER PLANTS* (769)

TITLE INDEX

POWER

MODELS AND THE DECISION MAKING PROCESS: THE HONOLULU RIVER POWER PLANT CASE* (752)
 MATHEMATICAL MODEL OF THE ACCUMULATION OF RADIOISOTOPES BY OYSTERS (M. VIRGINICA) AQUACULTURED IN THE
 EFFLUENT OF A SWEEP POWER REACTOR TO INCLUDE MAJOR BIOLOGICAL PARAMETERS* (753)
 REACTOR - A DIGITAL COMPUTER CODE FOR ESTIMATING REGIONAL RADIOLOGICAL EFFECTS FROM THE NUCLEAR POWER
 INDUSTRY* (754)
 RASTE WITH MANAGEMENT IN THE ELECTRIC POWER INDUSTRY: ISSUES OF ENERGY CONSERVATION AND STATION OPERATION
 UNDER ENVIRONMENTAL CONSTRAINTS* (755)
 GEOMORPHOLOGICAL ENVIRONMENTAL EFFECTS OF GEOTHERMAL POWER PRODUCTION* (756)

PRECIPITATION

VERTICAL TRANSPORT AND REMOVAL OF RADIOACTIVE AEROSOLS IN THE ATMOSPHERE: QUANTITATIVE MODELS OF AEROSOL
 GROWTH BY PRECIPITATION AND JET DEPOSITION ON THE UNDERLYING SURFACES* (757)
 A PRECIPITATION SCOURING MODEL FOR STUDIES OF FACTICAL NUCLEAR OPERATIONS* (758)
 ANALYSIS OF WEATHER DATA--WIND ANALYSIS, TEMPERATURE ANALYSIS, PRECIPITATION ANALYSIS* (759)
 MATHEMATICAL MODELS FOR PRECIPITATION SCOURING* (760)

PREDICTIONS

PREDICTION MODELS ARE BASIC FOR NATIONAL AIR QUALITY CONTROL* (761)

PREDICT

A MODEL TO PREDICT RADIOLOGICAL ENVIRONMENTAL IMPACT RESULTING FROM STRAIGHTLINE WIND DAMAGE TO A PLUTONIUM
 FACILITY* (762)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE AND MULTIPLE NATURAL-DRAFT COOLING TOWERS* (763)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (764)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE AND MULTIPLE NATURAL-DRAFT COOLING TOWERS* (765)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (766)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (767)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (768)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (769)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (770)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (771)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (772)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (773)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (774)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (775)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (776)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (777)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (778)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (779)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (780)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (781)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (782)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (783)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (784)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (785)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (786)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (787)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (788)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (789)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (790)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (791)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (792)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (793)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (794)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (795)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (796)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (797)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (798)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (799)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (800)

PREDICTED

PREDICTED AND OBSERVED COOLING TOWER PLUME WIND AND VISIBLE PLUME LENGTH AT THE JOHN F. AMOS POWER
 PLANT* (792)

PREDICTING

RESEARCH WORKS PREDICTED AIR QUALITY NEAR HIGHWAYS* (793)

PREDICTIVE

A REVIEW OF METHODS FOR PREDICTING AIR POLLUTION DISPERSION, AIR POLLUTION MODELS, AND PROBLEM AREAS IN AIR
 POLLUTION DISPERSION MODELING* (794)
 NUMERICAL PREDICTION OF THE MESOSCALE TRANSPORT OF ATMOSPHERIC EFFLUENTS: PHILOSOPHY AND MORPHOLOGY OF
 EXPERIMENTAL MODELS FOR PREDICTING THE WIND AND POTENTIAL RADIOLOGICAL FIELDS OVER THE KEVADIN TEST
 SITE* (795)
 PREDICTING THE EFFECT OF GEOTHERMAL EMISSIONS ON THE TEMPERATURE AND RELATIVE HUMIDITY IN THE IMPERIAL VALLEY
 OF CALIFORNIA* (796)
 A STATISTICAL METHODOLOGY FOR PREDICTING THE POLLUTANTS IN A RIVER* (797)
 COMPUTER MODEL FOR PREDICTING THERMAL DISCHARGES IN LARGE LAKES* (798)
 PREDICTING REACTIONS COEFFICIENTS FOR A POLLUTED ESTUARY* (799)
 SIMPLE METHOD FOR PREDICTING DISPERSION IN STREAMS* (800)
 PREDICTING RESPONSES OF AQUATIC BIOTA TO THERMAL STIMULI* (801)
 A MATHEMATICAL MODEL FOR PREDICTING RIVER TEMPERATURES--APPLICATION TO THE GREEN RIVER BELOW PLAINING GORGE
 PARK* (802)
 PREDICTING THE RATE OF WARMING OF RIVERS BELOW HYDROELECTRIC INSTALLATIONS* (803)
 A MATHEMATICAL MODEL FOR PREDICTING TEMPERATURES IN RIVERS AND POND-BAY SYSTEMS* (804)
 MATHEMATICAL MODELS FOR PREDICTING THE TRANSPORT OF RADIOISOTOPES IN A MARINE ENVIRONMENT* (805)
 MATHEMATICAL MODEL FOR PREDICTING ENVIRONMENTAL AND HUMAN HEALTH EFFECTS OF DEVELOPING NUCLEAR REACTOR
 PROGRAMS* (806)
 EPIDEMIOLOGICAL MODELS FOR PREDICTING HEALTH IMPACT OF ENERGY RELATED FACILITIES* (807)
 A SYSTEMS ANALYSIS METHODOLOGY FOR PREDICTING DOSE TO MAN FROM A RADIOACTIVELY CONTAMINATED TERRESTRIAL
 ENVIRONMENT* (808)
 TECHNIQUES FOR PREDICTING ENTRAPMENT AND IMPINGEMENT AT POWER PLANTS* (809)
 MODEL FOR PREDICTING SP-90 LEVELS IN RYLE DEEP* (810)
 A PRELIMINARY MATHEMATICAL MODEL FOR PREDICTING THE TRANSPORT OF RADIOISOTOPES IN THE MARINE
 ENVIRONMENT* (811)

PREDICTOR

A MARITIME BOUNDARY LAYER MODEL FOR THE PREDICTION OF FOG* (812)
 STATISTICAL ORIGIN AIR QUALITY PREDICTION MODEL FOR LAND USE AND TRANSPORTATION PLANNING* (813)
 PREDICTION BY NUMERICAL MODELS OF TRANSPORT AND DIFFUSION IN AN URBAN BOUNDARY LAYER* (814)
 COMPUTER MODEL FOR THE PREDICTION OF THE DISPERSION OF AIRBORNE RADIOACTIVE POLLUTANTS* (815)
 A PREDICTION MODEL OF NEAR URBAN POLLUTION FOR USE WITH STANDARD WIND PROFILES* (816)
 NUMERICAL PREDICTION OF THE MESOSCALE TRANSPORT OF ATMOSPHERIC EFFLUENTS: PHILOSOPHY AND MORPHOLOGY OF
 EXPERIMENTAL MODELS FOR PREDICTING THE WIND AND POTENTIAL RADIOLOGICAL FIELDS OVER THE KEVADIN TEST
 SITE* (817)
 MULTILEVEL ATMOSPHERIC PREDICTION MODEL BASED ON PRIMITIVE EQUATIONS OF MOTION; THE PRIMITIVE EQUATION
 MULTILEVEL PREDICTION MODEL AT THE INSTITUTE OF METEOROLOGY* (818)
 PREDICTION OF LONG-TERM NEAR AND NEAR SQUARE POLLUTANT CONCENTRATIONS IN AN URBAN ATMOSPHERE* (819)
 AEROSOL SAMPLING DATA PREDICTION MODEL* (820)
 PREDICTION OF TEMPERATURE PROFILES IN ARBITRARILY SHAPED COOLING LINES BY FINITE DIFFERENCE TECHNIQUES* (821)
 PREDICTION OF HEATED EFFLUENT DISPERSION IN A STREAM USING SIMILITUDE TECHNIQUES* (822)
 PNEUMOLOGICAL MODEL FOR THE PREDICTION OF THERMAL PLUMES IN LARGE LAKES* (823)

TITLE INDEX

PREDICTION

- PREDICTION OF SURFACE PLUME ADVECT ASSOCIATED WITH HEATED DISCHARGES INTO LARGE LAKES - A PHYSIOLOGICAL MODEL (637)
- MATHEMATICAL MODELS FOR THE PREDICTION OF TEMPERATURE DISTRIBUTIONS RESULTING FROM THE DISCHARGE OF HEATED WATER INTO LARGE BODIES OF WATER (644)
- THESE-ENVIRONMENTAL MATHEMATICAL MODELS FOR THE PREDICTION OF THERMAL DISCHARGES (679)
- PREDICTION OF TEMPERATURE INCREASES FROM THERMAL DISCHARGES: A SYSTEMS APPROACH (694)
- IMPROVING THE STATISTICAL RELIABILITY OF STREAM HEAT ASSIMILATION PREDICTIONS (502)
- TEMPERAL REGIMES OF THE UPPER MISSISSIPPI AND MISSOURI RIVERS: TRANSIENT AND STEADY-STATE COMPUTATIONAL MODELS FOR THE PREDICTION OF RIVER THERMAL REGIMES: PART TWO: ANALYSIS OF TEMPORAL REGIMES OF THE MISSISSIPPI AND MISSOURI RIVERS IN THE MID-CONTINENT AREA POWER POOL (RAFT) GEOGRAPHICAL AREA (540)
- MATHEMATICAL MODEL FOR THE PREDICTION OF UNSTEADY SALINITY INTRUSION IN ESTUARIES (503)
- PREDICTION OF UNSTEADY SALINITY INTRUSION IN ESTUARIES: MATHEMATICAL MODEL AND USFWS MANUAL (544)
- APPLICATION OF SENSITIVITY ANALYSIS FOR PREDICTION AND DETECTION OF THERMAL POLLUTION (597)
- AIR SPILL TRANSPORT AND DIFFUSION PREDICTIONS (634)
- INVESTIGATION AND PREDICTION OF DISPERSION OF POLLUTANTS IN THE SEA WITH HYDRODYNAMICAL MATHEMATICAL MODELS (615)
- MATHEMATICAL MODEL FOR THE PREDICTION OF TRANSIENT WATER QUALITY IN ESTUARY NETWORKS (625)
- PREDICTION MODELS FOR STATIONARY AND CEILING-117 LEVELS IN THE NORTH FORD CHAIN (674)
- SOUTHERN HEMISPHERE PREDICTION EXPERIMENT WITH A SIDE-LEVEL, PRIMITIVE- EQUATION MODEL (649)
- THE STRUCTURE AND PREDICTION OF GASEOUS POLLUTANT UPTAKE BY VEGETATION (770)

PREDICTIONS

- PLUME WISE PREDICTIONS (23)
- ANALYTICAL STUDIES OF REPOSEL BEHAVIOR PREDICTIONS FOR FAST REACTION SAFETY (94)
- PREDICTIONS OF THE SPECTRAL ABSORPTION AND EXTINCTION COEFFICIENTS OF AN URBAN AIR POLLUTION REMOVAL MODEL (342)
- A MULTIVARIABLE MODEL FOR ATMOSPHERIC DISPERSION PREDICTIONS (355)
- EFFECT OF ATMOSPHERIC STABILITY ON WATER TEMPERATURE PREDICTIONS FOR A THERMALLY LOADED STREAM (640)

PREDICTIVE

- PREDICTIVE MODEL BASED ON THE RELATIONSHIP BETWEEN METEOROLOGICAL AND EMISSION PATTERNS AND AIR QUALITY (149)
- PREDICTIVE AND POLLUTION ABATEMENT MODEL FOR ACID RAIN DRAINAGE (604)
- FIELD EVALUATION OF A PREDICTIVE MODEL FOR THERMAL STRATIFICATION IN LAKES AND RESERVOIRS (613)
- SHADOWN LAKE RECOVERY CHARACTERISTICS AS DEPICTED BY PREDICTIVE MODELING (672)
- PREDICTIVE MODEL FOR THERMAL STRATIFICATION AND WATER QUALITY IN RESERVOIRS (690)
- PREDICTIVE AND POLLUTION ABATEMENT MODEL FOR SIDE DRAINAGE (651)
- PREDICTIVE MODEL FOR RADIOCESIUM INTAKE FROM MILK: ERRORS ASSOCIATED WITH BROWN-COW VARIATION (754)
- PREDICTIVE STUDY OF THE DISPERSION OF EMISSIONS FROM THE SYNOBIDE RELOADED LAKE PLANT (608)

PREDICTIONS

- A PRELIMINARY MODEL OF GASEOUS POLLUTANT UPTAKE BY VEGETATION (672)
- PRELIMINARY MODEL OF THE HEAT ASSIMILATION OF LEAD BYBOLLS FROM GASOLINE COMBUSTION (542)
- A PRELIMINARY MATHEMATICAL MODEL FOR PREDICTING THE TRANSPORT OF RADIOISOTOPES IN THE MARINE ENVIRONMENT (704)

PRESSURIZED

- A COMPUTED TECHNIQUE FOR CALCULATING THE RADIOLOGICAL CONSEQUENCES OF PRESSURIZED WATER REACTOR POWER PLANT NUCLEAR ACCIDENTS (93)
- PROG, A PROGRAM FOR THE CALCULATION OF ACTIVITY RELEASES AND POTENTIAL DOSES FROM A PRESSURIZED WATER REACTOR PLANT (689)
- CALCULATION OF RELEASES OF RADIOACTIVE MATERIALS IN GASEOUS AND LIQUID EFFLUENTS FROM PRESSURIZED WATER REACTORS (FOR-GATE CODE) (612)

PREVENTION

- OPTIMAL PREVENTION AND DETECTION MODEL FOR POLLUTION PATROL SPILLS (535)

PREVIOUSLY

- A THEORY ON THE MASS TRANSPORT OF PREVIOUSLY DISTRIBUTED CHEMICALS IN A WATER SATURATED SORBING POROUS MEDIUM (649)

PRIMITIVE

- MULTILEVEL ATMOSPHERIC PREDICTION MODEL BASED ON PRIMITIVE EQUATIONS OF MOTION: THE PRIMITIVE EQUATION MULTI-LEVEL PREDICTION MODEL AT THE INSTITUTE OF METEOROLOGY (307)
- SOUTHERN HEMISPHERE PREDICTION EXPERIMENT WITH A SIDE-LEVEL, PRIMITIVE- EQUATION MODEL (649)

PROBABILISTIC

- PROBABILISTIC MODELS FOR CALCULATING AIR POLLUTION DAMAGES (617)

PROBABILITY

- CARGO SPILL PROBABILITY ANALYSIS: A BAYESIAN APPROACH (632)

PRODUCTS

- ATMOSPHERIC TRANSPORT OF ROCKET MOTOR COMBUSTION BY-PRODUCTS (54)
- FISSION PRODUCTS FIELD RELEASE TEST (220)
- BIOLOGICAL DOSE AND RADIOLOGICAL ACTIVITY FROM NUCLEAR REACTOR OR NUCLEAR WEAPON FISSION PRODUCTS (687)

PROFILES

- METEOROLOGICAL SUB-MODELS FOR PQRS: WIND AND TEMPERATURE PROFILES (16)
- POINT SOURCE ATMOSPHERIC DIFFUSION MODEL WITH VARIABLE WIND AND DIFFUSIVITY PROFILES (259)
- PREDICTION OF TEMPERATURE PROFILES IN ARBITRARILY SHAPED COOLING LAKES BY FINITE DIFFERENCE TECHNIQUES (615)
- MATHEMATICAL MODELS PREDICT CONCENTRATION-TIME PROFILES RESULTING FROM CHEMICAL SPILL IN A RIVER (510)
- PH PROFILES IN A RIVER SYSTEM WITH MULTIPLE ACID LOADS (639)

PROGRAMMING

- GOAL INTERVAL PROGRAMMING MODEL FOR RESOURCE ALLOCATION IN A MARINE ENVIRONMENTAL PROTECTION PROGRAM (606)

PROGRAMS

- RAHM: A SYSTEM OF COMPUTER PROGRAMS FOR RADIOISOTOPE PATHWAY ANALYSIS CALCULATIONS (686)
- MATHEMATICAL MODEL FOR PREDICTING ENVIRONMENTAL AND HUMAN HEALTH EFFECTS OF DEVELOPING NUCLEAR REACTOR PROGRAMS (693)
- GADDOSE AND DOSET - PROGRAMS TO CALCULATE ENVIRONMENTAL CONSEQUENCES OF RADIOACTIVITY RELEASE (713)
7. MONTE CARLO CODE WITH SUPPORT PROGRAMS FOR DOSE COMPUTATION (706)

PROJECT

- CHALK POINT COOLING TOWER PROJECT (22)
- DELAWARE ESTUARY AND BAY WATER QUALITY SAMPLING AND MATHEMATICAL MODELING PROJECT (517)
- CONCENTRATIONS IN THE SOUTH TEXAS PROJECT COOLING RESERVOIR, BLOW-DOWN AND EVAPORATION (520)
- DECEMBER-11, NEW ENGLAND RIVER BASINS MODELING PROJECT (545)
- QUAL-11, UPPER MISSISSIPPI RIVER BASIN PROJECT (546)
- ASSESSMENT OF THE ENVIRONMENTAL IMPLICATIONS OF PROJECT INDEPENDENCE (603)

TITLE INDEX

- PROJECTION**
REGIONAL MODELING OF SURFACE WATER TEMPERATURES FROM PROJECTED POWER GENERATION* (519)
- PROJECTION**
REGIONAL EMISSIONS PROJECTION SYSTEM (REPS)* (329)
REGIONAL EMISSIONS PROJECTION SYSTEMS* (379)
MORTALITY PROJECTION FROM EXPOSURE TO RADIOACTIVE AND NON-RADIOACTIVE ENVIRONMENTAL POLLUTANTS* (719)
- PROCESSES**
A COMPUTER SIMULATION OF THE EFFECTS OF SUPERIMPOSED MORTALITY DUE TO POLLUTANTS ON POPULATIONS OF FRESHWATER FISHES (FRESHWATER PROCESSES)* (779)
- PROTECTION**
USE OF CODE MODIFICATIONS FOR 2D PLACEMENT AND SYSTEM PERFORMANCE MODELING* (299)
- PROTECTION**
COAL INTERNAL PROGRAMMING MODEL FOR RESOURCE ALLOCATION IN A BASIC ENVIRONMENTAL PROTECTION PROGRAM* (609)
- PUMP**
IDENTIFICATION OF A CRUSTAL PUMP MODEL FOR REAL-TIME RECOMPUTED USE* (369)
- POLLUTANT**
POLLUTANT DISPERSION OF TRACE CHEMICAL CONCENTRATIONS IN A SATURATED SOILING POREOUS MEDIUM* (649)
- PUR**
CALCULATION OF RELEASES OF RADIOACTIVE MATERIALS IN GASEOUS AND LIQUID EFFLUENTS FROM PRESSURIZED WATER REACTORS (PWR-CALC CODE)* (819)
- PYRETHROIDS**
RADIOACTIVITY TRANSPORT IN WATER. BIOLOGICAL ACCUMULATION OF DENDROCYT (II) AND METHYLCHLORIDE BY CHLORELLA PYRETHROIDIS* (999)
- PYRETHROIDS**
PYRETHROIDS: A MATHEMATICAL MODEL* (512)
- QUAL**
AUTO-QUAL MODELING SYSTEM* (509)
QUAL-II, UPPER MISSISSIPPI RIVER BASIN PROJECT* (506)
- QUALITY**
AIR QUALITY ANALYSIS: MATHEMATICAL APPROACH TO ESTIMATING HIGHWAY IMPACT ON AIR QUALITY* (49)
AIR QUALITY ANALYSIS: METEOROLOGY AND ITS INFLUENCE ON THE DISPERSION OF POLLUTANTS FROM HIGHWAY LINE SOURCES* (7)
STATISTICAL CRITERIA AND QUALITY PREDICTION MODEL FOR LAND USE AND TRANSPORTATION PLANNING* (32)
AIR QUALITY MANAGEMENT OF INDUSTRIAL SITES* (36)
PREDICTION MODELS AND BASIS FOR NATIONAL AIR QUALITY CONTROL* (60)
TRACE PHOTOCHEMICAL AND QUALITY SIMULATION MODEL* (69)
AN URBAN AIR DIFFUSION MODEL FOR ESTIMATING LONG TERM AVERAGE VALUES OF AIR QUALITY* (706)
DEVELOPING A PRACTICAL DISPERSION MODEL FOR AIR QUALITY DESIGN* (199)
MEASURED VERSUS PREDICTED AIR QUALITY NEAR HIGHWAYS* (799)
EVALUATION OF REGIONAL AIR QUALITY SIMULATION MODELS* (237)
A REGIONAL AIR QUALITY SIMULATION MODEL (A DESCRIPTION OF THE CONNECTICUT AIR POLLUTION MODEL AS DEVELOPED BY THE TRAVELERS RESEARCH CENTER)* (279)
AIR QUALITY ASSESSMENT MODEL FOR AIR FORCE OPERATIONS* (277)
AIR QUALITY DIFFUSION MODEL: APPLICATION TO NEW YORK CITY* (293)
DEVELOPMENT OF AN URBAN AIR QUALITY SIMULATION MODEL WITH COMPATIBLE DATA DATA* (299)
AIR QUALITY MAINTENANCE THROUGH PRACTICAL MODELING* (297)
GAUSSIAN-PLUME MULTIPLE SOURCE AIR QUALITY ALGORITHM* (319)
EMPIRICAL TECHNIQUES FOR ANALYZING AIR QUALITY AND METEOROLOGICAL DATA: SHORT-TERM CHANGES IN GROUND-LEVEL OZONE CONCENTRATIONS* (349)
LIVERMORE REGIONAL AIR QUALITY MODEL: KINETICS AND TRANSPORT* (347)
MODIFICATION OF LIVERMORE AIR QUALITY MODEL FOR USE IN ST. LOUIS* (348)
DEVELOPMENT OF AN AIR QUALITY SIMULATOR FOR COAL FIRES* (350)
A SHORT-TERM AIR QUALITY MODEL FOR SULFUR DIOXIDE IN LOUISVILLE, KENTUCKY* (351)
SAFOLIT: ESTIMATING THE AIR QUALITY IMPACT OF VEHICULAR EMISSIONS RESULTING FROM A TRAFFIC ASSIGNMENT* (356)
A MATHEMATICAL MODEL FOR RELATING AIR QUALITY MEASUREMENTS TO AIR QUALITY STANDARDS* (359)
LIVERMORE REGIONAL AIR QUALITY MODEL-NO. 2* (363)
PREDICTIVE MODEL BASED ON THE RELATIONSHIP BETWEEN METEOROLOGICAL AND EMISSION PATTERNS AND AIR QUALITY* (369)
MILWAUKEE AIR QUALITY MODEL FOR ASSESSMENT OF UNITED STATES CIVIL AVIATION INITIATIVE* (302)
DOCUMENTATION FOR SWIN/2, A COMPUTER PROGRAM FOR THE STEADY-STATE WATER QUALITY SIMULATION OF A STREAM NETWORK* (801)
A WATER QUALITY PLANNING MODEL WITH MULTIPLE TIME, POLLUTANT, AND SOURCE CAPABILITIES* (819)
ONE-DIMENSIONAL HYDRODYNAMIC AND WATER QUALITY CONDITIONS IN ESTUARIES AND CONTROLLED RIVERS* (826)
MATHEMATICAL MODELS OF WATER QUALITY PARAMETERS FOR RIVERS AND ESTUARIES* (840)
WATER-QUALITY SIMULATION MODEL FOR WELL-MIXED ESTUARIES AND COASTAL SEAS* (870)
NUMERICAL SIMULATION OF WATER QUALITY IN COASTAL WATERS AND ESTUARIES* (877)
PREDICTIVE MODEL FOR THERMAL STRATIFICATION AND WATER QUALITY IN RESERVOIRS* (890)
STOCHASTIC PREDICTION OF WATER QUALITY OF THE MISSISSIPPI RIVER* (909)
DELTAHUE ESTUARY AND BAY WATER QUALITY SAMPLING AND MATHEMATICAL MODELING PROJECT* (517)
DOSS-1, SIMULATION OF WATER QUALITY IN STREAMS AND CANALS: PROGRAM DOCUMENTATION AND USER MANUAL* (530)
RESERVOIR WATER QUALITY MODEL EXPANSION* (542)
MULTI-LAYERED MODELS OF CURRENTS, TEMPERATURES, AND WATER QUALITY PARAMETERS IN THE GREAT LAKES* (570)
WATER QUALITY FOR RIVER - RESERVOIR SYSTEMS* (609)
A GENERALIZED WATER QUALITY MODEL FOR EUTROPHIC LAKES AND RESERVOIRS* (629)
A MODEL TO PREDICT REGIONAL WATER QUALITY IMPACTS FROM COAL RELATED ENERGY FACILITIES* (630)
NUMERICAL MODEL FOR THE PREDICTION OF TRANSIENT WATER QUALITY IN TROPICAL RIVERS* (635)
FIVE DAY WATER QUALITY MODEL* (636)
THE BASTE CONVERSION MODEL FOR STATE OF ILLINOIS WATER QUALITY MANAGEMENT PROGRAM* (627)
WATER QUALITY IMPROVEMENT PROGRAMS HYDROLOGY PACKAGE* (628)
POLAR RIVER WATER QUALITY SYSTEM MODEL* (629)
STREAM QUALITY MODELING IN QUANTIFICATION* (630)
APPLICATION OF STREAM WATER QUALITY MODELS TO ALABAMA* (637)
WATER QUALITY REGULATION MODEL* (638)
OPTIMIZATION MODELS FOR RIVER BASIN WATER QUALITY MANAGEMENT AND WASTE TREATMENT PLANT DESIGN* (639)
- QUANTIFICATION**
QUANTIFICATION OF AQUATIC ENVIRONMENTAL IMPACT OF ELECTRIC POWER GENERATION* (800)

TITLE INDEX

0 QUANTITATIVE

USE OF LAPS SYSTEM FOR THE QUANTITATIVE DETERMINATION OF SMOKE PLUME LATERAL DIFFUSION COEFFICIENTS FROM THIS TRACES OF VIRGINIA* (17)

VERTICAL TRANSPORT AND REMOVAL OF RADIOACTIVE AEROSOLS IN THE ATMOSPHERE: QUANTITATIVE MODELS OF AEROSOL WASHOUT BY PRECIPITATION AND DRY DEPOSITION ON THE UNDERLYING SURFACE* (131)

QUANTILIZATION

STEPPED QUALITY MODELING BY QUANTILIZATION* (613)

RADIATION

TRANSFER OF STRONTIUM-90 FROM PLANTS TO RABBITS* (769)

RADIATION

ROUTE CASE STUDIES ON THE TIME-DEPENDENT TRANSPORT OF OPTICAL AND INFRARED RADIATION IN THE ATMOSPHERE:

- "THERMAL RADIATION TRANSPORT" (109)
- MODEL FOR RADIATION EXPOSURE FROM A BOILING WATER REACTOR PLUME* (194)
- MODELS OF RADIATION TRANSPORT IN AIR - THE AIR CODE* (109)
- OSWALD'S GUIDE TO VOLUME 2 OF AIR AND THERMAL RADIATION* (1720)
- DESCRIPTION OF A RADIATION PACKAGE FOR THE NAVAL POSTGRADUATE SCHOOL GENERAL CIRCULATION MODEL* (107)
- WELFARE OF RADIATION EXPOSURE TO AIRCRAFT DUE TO ATMOSPHERIC RADIATION ENVIRONMENTS: AIRCRAFT IMPACTS AND DEFENSE COMPUTER MODEL* (234)
- A MODEL TO ESTIMATE RADIATION DOSE COMMITMENTS TO THE WORLD POPULATION FROM THE ATMOSPHERIC RELEASE OF RADIOISOTOPES* (279)
- DESCRIPTION OF THE CONTINENT AND METEOROLOGY OF ENVIRONMENTAL RADIATION EXPOSURE (CONRAD-K-IV) CODE* (299)
- RESPONSE OF THE JOINT OCEAN-ATMOSPHERE MODEL TO THE SEASONAL VARIATION OF THE SOLAR RADIATION* (320)
- USE OF COMPUTERS TO CALCULATE RADIATION DOSE FROM METABOLIC MODELS* (504)
- ENVIRONMENTAL RADIATION EXPOSURES AND ASSOCIATED RISKS FROM FUEL REPROCESSING PLANTS* (706)
- CIVIL-ENGINEERING: A DIGITAL COMPUTER PROGRAM FOR EXTERNAL AND INTERNAL RADIATION DOSE CALCULATIONS* (707)
- A PROGRAM CODE WHICH IMPLEMENTS ICRP-2 MODELS OF INTERNAL RADIATION DOSE* (709)
- CONVENTIONAL COMPUTER CODES TO IMPLEMENT ICRP-2-10A MODELS FOR ESTIMATION OF INTERNAL RADIATION DOSE TO MAN* (710)
- THE EXCEL-III COMPUTER CODE FOR ESTIMATING EXTERNAL RADIATION DOSES TO POPULATIONS FROM ENVIRONMENTAL SOURCES* (712)
- THE AIRDOSE-III COMPUTER CODE FOR ESTIMATING RADIATION DOSE TO MAN FROM AIRBORNE RADIOISOTOPES IN AREAS SURROUNDING NUCLEAR FACILITIES* (714)
- DESCRIPTION OF THE CONTINENT AND METEOROLOGY OF ENVIRONMENTAL RADIATION EXPOSURE (CONRAD-K-III) CODE* (719)
- A MODEL TO ESTIMATE THE LOCAL RADIATION DOSES TO MAN FROM THE ATMOSPHERIC RELEASE OF RADIOISOTOPES* (731)
- RADIATION DOSES TO POPULATIONS* (734)
- POTENTIAL BIOLOGICAL IMPACT OF AIRBORNE RELEASES AND DIRECT GAMMA RADIATION TO INDIVIDUALS LIVING NEAR NUCLEAR REACTOR SITES* (740)
- STANDARD METEOROLOGY FOR CALCULATING RADIATION DOSE TO LOWER FOSSIL BODIES* (757)
- MODELS FOR RADIATION DOSE CALCULATIONS* (755)
- ESTIMATING RADIATION DOSES* (771)

RADIATION

- METEOROLOGICAL MODELS FOR RADIATION DOSE* (109)
- COMPARISON OF POSSIBLE CLIMATIC CONSEQUENCES OF PERTURBATIONS TO STRATOSPHERIC AEROSOLS, GASES AND WATER VAPOR WITH RADIATION-CONVECTIVE MODELS* (109)
- A SIMPLIFIED RADIATION-CONVECTIVE MODEL* (261)
- RADIATION EFFECTS OF POLLUTANTS ON THE PLANETARY BOUNDARY LAYER* (322)
- BACKGROUND RADIATION TRANSPORT MODEL* (334)
- ULTRAVIOLET AND VISIBLE RADIATION TRANSPORT MODEL* (361)
- SOLAR RADIATION TRANSPORT MODEL* (362)
- NETHEMAL AND RADIATION EFFECTS OF ATMOSPHERIC AEROSOLS IN THE NORTHERN HEMISPHERE CALCULATED USING A RADIATION CONVECTIVE MODEL* (372)

RADIATION

- A COMPUTER CODE FOR ANALYSING ROUTINE ATMOSPHERIC RELEASES OF SHORT-LIVED RADIOACTIVE ISOTOPES* (53)
- VERTICAL TRANSPORT AND REMOVAL OF RADIOACTIVE AEROSOLS IN THE ATMOSPHERE: QUANTITATIVE MODELS OF AEROSOL WASHOUT BY PRECIPITATION AND DRY DEPOSITION ON THE UNDERLYING SURFACE* (131)
- ASSESSMENT OF CONSEQUENCES FROM AIRBORNE RELEASES OF RADIOACTIVE MATERIAL* (197)
- COMPUTER MODEL FOR THE PREDICTION OF THE DISPERSION OF AIRBORNE RADIOACTIVE POLLUTANTS* (209)
- USERS MANUAL FOR CODE EIGAR: A CODE TO CALCULATE GAMMA PHOTON DOSE FROM AN AIRBORNE RADIOACTIVE RELEASE* (303)
- SOME TECHNIQUES FOR ESTIMATING THE RESULTS OF THE EMISSION OF RADIOACTIVE EFFLUENT FROM OIL STACKS* (309)
- SIMULATION OF THE HYDROLOGIC TRANSPORT OF RADIOACTIVE AEROSOLS* (455)
- NUMERICAL MODELING OF SUBSURFACE RADIOACTIVE SOLUTE TRANSPORT FROM WASTE-SETBACK PONDS AT THE IDAHO NATIONAL ENGINEERING LABORATORY* (550)
- DIGITAL MODELING OF RADIOACTIVE AND CHEMICAL WASTE TRANSPORT IN THE SNAKE RIVER PLAIN ACQUIRED AT THE NATIONAL REACTOR TESTING STATION, IDAHO* (555)
- ONE-DIMENSIONAL MODEL OF THE MOVEMENT OF TRACE RADIOACTIVE SOLUTE THROUGH SOIL COLUMNS - THE PERCOL MODEL* (653)
- A MODEL FOR THE APPROXIMATE CALCULATION OF SAFE RATES OF DISCHARGE OF RADIOACTIVE WASTES INTO MARINE ENVIRONMENTS* (667)
- MORTALITY PROJECTION FROM EXPOSURE TO RADIOACTIVE AND NON-RADIOACTIVE ENVIRONMENTAL POLLUTANTS* (715)
- A COMPUTER CODE (HYDROS) TO CALCULATE POPULATION DOSES FROM RADIOACTIVE LIQUID EFFLUENTS AND AN APPLICATION TO NUCLEAR POWER REACTORS ON THE MISSISSIPPI RIVER BASIN* (717)
- CALCULATION OF RELEASES OF RADIOACTIVE MATERIALS IN GASEOUS AND LIQUID EFFLUENTS FROM BOILING WATER REACTORS (BWR-GALE CODE)* (811)
- CALCULATION OF RELEASES OF RADIOACTIVE MATERIALS IN GASEOUS AND LIQUID EFFLUENTS FROM PRESSURIZED WATER REACTORS (PWR-GALE CODE)* (812)
- PARTRAM: A COMPUTER CODE TO ANALYZE TRANSPORTATION OF RADIOACTIVE MATERIAL* (820)

RADIATION

A SYSTEM ANALYSIS METHODOLOGY FOR PREDICTING DOSE TO MAN FROM A RADIOACTIVELY CONTAMINATED TERRESTRIAL ENVIRONMENT* (707)

RADIATION

- MODEL FOR RADIOACTIVITY TRANSPORT IN WATER: NUMERICAL SOLUTIONS OF RADIOISOTOPE TRANSPORT EQUATIONS AND ROLE OF FLUXES IN SO-65 TRANSPORT* (190)
- RADIOACTIVITY TRANSPORT IN WATER* (199)
- RADIOACTIVITY TRANSPORT IN WATER, BIOLOGICAL ACCUMULATION OF MERCURY (II) AND METHYLMERCURY BY CHLOROKLETTA PYRENOIDOSA* (197)

TITLE INDEX

RADIOACTIVITY

RADIOACTIVITY TRANSPORT IN WATER - MATHEMATICAL MODEL FOR THE TRANSPORT OF RADIOISOTOPES (547)
GADGET AND DOSET - PROGRAM TO CALCULATE ENVIRONMENTAL CONSEQUENCES OF RADIOACTIVITY RELEASES (713)

RADIOISOTOPES

TRANSFER OF RADIOISOTOPES FROM LICHENS TO DEER (677)
PREDICTIVE MODEL FOR RADIOISOTOPES INTAKE FROM MILK: EFFECTS ASSOCIATED WITH ANOMALOUS VARIATIONS (754)

RADIOISOTOPE

MODEL FOR RADIOISOTOPES MOVEMENT IN SOIL DEEP (649)

RADIOISOTOPES

MODEL OF GLOBAL RADIOISOTOPES TRANSPORT IN THE TROPOSPHERE AND LOWER STRATOSPHERE: FUNDAMENTAL EQUATIONS AND BOUNDARY CONDITIONS (124)
DIFFERENCE ANALOGUES OF BOUNDARY-VALUE PROBLEMS FOR THE EQUATIONS OF GLOBAL RADIOISOTOPES CONTAMINANT TRANSPORT AND THEIR NUMERICAL SOLUTIONS: DIFFERENT APPROXIMATIONS OF EQUATIONS AND BOUNDARY CONDITIONS IN THE PERIODICAL PLANE AND THE ZONAL BELT OF THE ATMOSPHERE (124)
SYSTEM IDENTIFICATION OF RADIOISOTOPES FLOWS IN AQUATIC ECOSYSTEMS (751)

RADIOISOTOPES

PLANETARY DISTRIBUTION OF ZONAL MEAN TRANSPORT PARAMETERS OF RADIOISOTOPES IN THE TROPOSPHERE AND LOWER STRATOSPHERE: CLIMATIC DISTRIBUTION OF THE ZONAL MEAN COMPONENTS OF THE PERIODICAL CIRCULATION VELOCITY (79)

MODEL FOR CALCULATION OF CONCENTRATION OF RADIOISOTOPES IN VEGETATION (781)

RADIOLOGICAL

A COMPUTER TECHNIQUE FOR CALCULATING THE RADIOLOGICAL CONSEQUENCES OF HYPOTHETICAL WATER REACTOR POWER PLANT SYNTHETICAL ACCIDENTS (73)

A MODEL FOR RADIOLOGICAL DISPERSION FROM THERMOCORE ACCIDENTS (116)

A MODEL TO PREDICT RADIOLOGICAL ENVIRONMENTAL IMPACT RESULTING FROM STRAIGHTLINE WIND DAMAGE TO A FERTILITY FACILITY (179)

NUMERICAL PREDICTION OF THE MESOSCALE TRANSPORT OF ATMOSPHERIC POLLUTANTS: PHILOSOPHY AND METHODOLOGY OF EXPERIMENTAL MODELS FOR PREDICTING THE WIND AND POTENTIAL RADIOLOGICAL FIELDS OVER THE STREAN CITY SITE (242)

PIEC: RADIOLOGICAL EVALUATION SAFETY CODE FOR DOE (749) (647)

COMPUTATIONAL METHOD FOR CALCULATION OF RADIOLOGICAL DOSE RESULTING FROM HYPOTHETICAL REACTOR POWER RELEASE (688)

BIOLOGICAL DOSE AND RADIOLOGICAL ACTIVITY FROM NUCLEAR REACTOR OR NUCLEAR WEAPON FISSION PRODUCTS (547)

BSAC - A RADIOLOGICAL SAFETY ANALYSIS COMPUTER PROGRAM (722)

DOSE CONVERSION CONSTANT CODE USED TO COMPUTE RADIOLOGICAL DOSE THROUGH VARIOUS PATHWAYS (695)

A REGIONAL AIR TRANSPORT MODEL FOR RADIOLOGICAL DOSE STUDIES (596)

RADIOLOGICAL DOSE EFFECTS MODEL (709)

MATHEMATICAL MODEL FOR RADIOLOGICAL IMPACT ANALYSIS (724)

NEPAC: A MODEL FOR THE PARTIAL VERSION OF BSAC: A RADIOLOGICAL SAFETY ANALYSIS COMPUTER PROGRAM (719)

POTENTIAL RADIOLOGICAL IMPACT OF REACTOR RELEASES AND DIRECT GAMMA RADIATION TO INDIVIDUALS LIVING NEAR INACTIVE NUCLEAR WASTE TAILINGS PILES (743)

NEPAC - A DIGITAL COMPUTER CODE FOR ESTIMATING REGIONAL RADIOLOGICAL EFFECTS FROM THE NUCLEAR POWER INDUSTRY (793)

COMPARISON OF RADIOLOGICAL CONSEQUENCES USING INEC COMPUTER PROGRAM (645)

RADIOISOTOPES

MODEL FOR RADIOACTIVITY TRANSPORT IN WATER: NUMERICAL SOLUTIONS OF RADIOISOTOPES TRANSPORT EQUATIONS AND ROLE OF PLANTS IN SR-95 "RADIOISOTOPES" (190)

A SYSTEMS ANALYSIS MODEL FOR CALCULATING RADIOISOTOPES TRANSPORT BETWEEN RECEIVING WATERS AND BOTTOM CHANNELS (190)

OCEANIC DISPERSION OF A SEVERE ACCIDENTAL RADIOISOTOPES RELEASE FROM A SUBSEA NUCLEAR POWER PLANT (671)

PARK: A SYSTEM OF COMPUTER PROGRAMS FOR RADIOISOTOPES PATHWAY ANALYSIS CALCULATIONS (646)

TRANSPORT MODEL FOR LONG TERM RADIOISOTOPES RELEASE INTO A STREAM ECOSYSTEM (514)

FALLOUT AS DIET DOSES FROM RADIOISOTOPES DEPOSITION ON FOOD CROPS (675)

CALCULATIONS OF DOSE AND POPULATION DOSE IN THE GENERAL EQUIPMENT DUE TO MILLING-WATER NUCLEAR POWER PLANT RADIOISOTOPES EMISSIONS IN THE UNITED STATES IN 1971 (722)

CALCULATING OCEAN DOSE FROM RADIOISOTOPES INHALATION (739)

THAMES AND CUMBERLAND RIVER BASINS RADIOISOTOPES TRANSPORT (784)

RADIOISOTOPES

A MODEL TO ESTIMATE RADIATION DOSE COMMITMENTS TO THE WORLD POPULATION FROM THE ATMOSPHERIC RELEASE OF RADIOISOTOPES (271)

MATHEMATICAL MODELS FOR THE DISPERSION OF RADIOISOTOPES IN AQUATIC SYSTEMS (791)

RADIOACTIVITY TRANSPORT IN WATER - MATHEMATICAL MODEL FOR THE TRANSPORT OF RADIOISOTOPES (547)

RIGHTING OF GASEOUS RADIOISOTOPES THROUGH SOIL OVERLYING A URANIUM ORE DEPOSIT: A MODELING STUDY (645)

CONCENTRATION FACTORS AND TRANSPORT MODELS FOR RADIOISOTOPES IN AQUATIC ENVIRONMENTS-A LITERATURE SURVEY (64)

IMPROVED AND CONCENTRATION OF RADIOISOTOPES IN FOOD CHAINS (674)

UPTAKE OF FALLOUT RADIOISOTOPES BY HUMANS AND A STOCHASTIC SIMULATION OF THE PROCESS (677)

THE REMOVAL OF CS-137 AND OTHER FALLOUT RADIOISOTOPES ON A MICHIGAN DAIRY FARM (670)

MATHEMATICAL MODELS FOR PREDICTING THE TRANSPORT OF RADIOISOTOPES IN A MARINE ENVIRONMENT (603)

NOVENUS RELEASE OF RADIOISOTOPES REPORT GENERATOR (701)

AIDEN PROGRAM MANUAL: A COMPUTER CODE FOR CALCULATING DOSES, POPULATION DOSES, AND GROUND DEPOSITIONS DUE TO ATMOSPHERIC EMISSIONS OF RADIOISOTOPES (720)

THE AIRBORNE-II COMPUTER CODE FOR ESTIMATING RADIATION DOSE TO MAN FROM AIRBORNE RADIOISOTOPES IN AREAS SURROUNDING NUCLEAR FACILITIES (720)

A MODEL TO ESTIMATE THE LOCAL RADIATION DOSES TO MAN FROM THE ATMOSPHERIC RELEASE OF RADIOISOTOPES (731)

ESTIMATING HEALTH EFFECTS OF RADIOISOTOPES (735)

A COMPUTER CODE TO CALCULATE DOSES RESULTING FROM RELEASES OF RADIOISOTOPES TO THE ATMOSPHERE (705)

A THERMAL PROGRAM TO DETERMINE ABSORBED ORGAN DOSE DUE TO INHALATION OF RADIOISOTOPES (740)

MATHEMATICAL MODEL OF THE ACCUMULATION OF RADIOISOTOPES BY OYSTERS (C. VIRGINICA) AQUACULTURED IN THE EFFLUENT OF A NUCLEAR POWER REACTOR TO INCLUDE MAJOR BIOLOGICAL PARAMETERS (753)

A PRELIMINARY MATHEMATICAL MODEL FOR PREDICTING THE TRANSPORT OF RADIOISOTOPES IN THE MARINE ENVIRONMENT (706)

MODELING THE REGIONAL TRANSPORT OF RADIOISOTOPES IN A MAJOR UNITED STATES RIVER BASIN (794)

RADIOISOTOPES

PARTIAL: A COMPUTER CODE TO ANALYZE TRANSPORTATION OF RADIOACTIVE MATERIAL (620)

RADIOISOTOPES

MODEL FOR TIME-DEPENDENT RADIATION SIZE DISTRIBUTIONS: APPLICATION TO THE WASHOUT OF AIRBORNE CONTAMINANTS (7)

TITLE INDEX

RECEIVING

A SYSTEMS ANALYSIS MODEL FOR CALCULATING RADIOUCLIDE TRANSPORT BETWEEN RECEIVING WATERS AND BOTTOM SEDIMENTS* (1700)
 REASSESSMENT AND MODELING OF STORM WATER RUNOFF FROM COAL STORAGE PILES AND THE IMPACT ON RECEIVING WATERS* (642)
 NUMERICAL COMPUTATION OF WASTE-HEAT DISPERSION IN A RECEIVING WATER BODY* (667)

RECIRCULATION

PARAMETERIZED MODEL OF RECIRCULATION AND NEAR FIELD RE-ENTRAINMENT* (526)

DECLARATION

DEVELOPMENT OF A SIMULATION MODEL FOR EVALUATION OF SURFACE MINING OPERATIONS AND RECLAMATION PLANS* (795)

RECTANGULAR

BOUOYANT RECTANGULAR SURFACE THERMAL PLUMES* (470)

REDISTRIBUTION

WIND EFFECTED REDISTRIBUTION OF SURFACE CONTAMINATION* (4)

REDUCED

STUDY OF THE IMPACTS OF REDUCED STREAMFLOWS IN THE MIDDLE AND LOWER YELLOWSTONE BASIN* (620)

REDUCTIONS

USER'S MANUAL, AUTOMATED PROCEDURES FOR ESTIMATING CONTROL COSTS AND FISSION REDUCTIONS FOR SPECIFIED AID POLLUTION SOURCES* (347)

REFINERY

MODELING OF OIL EVAPORATION IN AN AQUEOUS ENVIRONMENT: RESEARCH ON THE EFFECTS OF CRUDE OIL TRANSFER AND UPSTREAM REFINERIES ON DELTAHABE BAY* (590)

REFINERY

OPTIMAL CONTROL OF AN OIL REFINERY WASTE TREATMENT FACILITY: A TOTAL ECOSYSTEM APPROACH* (495)

REFINING

ENVIRONMENTAL ENERGY MODEL OF A PETROLEUM REFINING/CHEMICAL COMPLEX* (637)

REFUSE

NEW CONCEPT IN STABILITY ANALYSIS OF SKEWED WIND-REFUSE ENTRAINMENTS* (640)

REGIMES

THERMAL REGIMES OF THE UPPER MISSISSIPPI AND MISSOURI RIVERS: TRANSIENT AND STEADY-STATE COMPUTATIONAL MODELS FOR THE PREDICTION OF RIVER THERMAL REGIMES: PART TWO: ANALYSIS OF THERMAL REGIMES OF THE MISSISSIPPI AND MISSOURI RIVERS IN THE MID-CONTINENT AREA POWER POOL (HAPP) GEOGRAPHICAL AREA* (570)

REGION

DEVELOPING A PRACTICAL DISPERSION MODEL FOR AN AIR QUALITY REGION* (197)

REGIONAL

AIR TRANSPORT MODELING FOR REGIONAL DOSE STUDIES* (60)
 A REGIONAL-CONTINENTAL SCALE TRANSPORT, DIFFUSION, AND DEPOSITION MODEL* (111)
 A NUMERICAL EXPERIMENT ON THE EFFECTS OF REGIONAL ATMOSPHERIC POLLUTION ON GLOBAL CLIMATE* (137)
 REGIONAL SCALE AIR POLLUTION TRANSPORT MODEL* (160)
 DESIGN OF THE SULFATE REGIONAL EXPERIMENT (SURE)* (216)
 REGIONAL EMISSION PROJECTION SYSTEM (REPS)* (221)
 NUMERICAL MODEL FOR REGIONAL TRANSPORT OF SULFUR POLLUTANTS IN THE ATMOSPHERE* (260)
 A REGIONAL AIR QUALITY SIMULATION MODEL (A DESCRIPTION OF THE CONNECTICUT AIR POLLUTION MODEL AS DEVELOPED BY THE TRAVELER'S RESEARCH CENTER)* (274)
 ADVANCED STATISTICAL TRAJECTORY REGIONAL AIR POLLUTION MODEL* (290)
 REGIONAL EFFLUENT DISPERSION CALCULATIONS CONSIDERING SPATIAL AND TEMPORAL METEOROLOGICAL VARIATIONS* (300)
 LIVERMORE REGIONAL AIR QUALITY MODEL: KINETICS AND TRANSPORT* (307)
 LIVERMORE REGIONAL AIR QUALITY MODEL-MODE 1* (363)
 REGIONAL EMISSIONS PROJECTION SYSTEMS* (375)
 ONE-DIMENSIONAL, REGIONAL TEMPERATURE SIMULATION MODEL* (421)
 MODELING AND OPTIMIZATION OF TRANSIENT COOLING WATER DISCHARGE FROM POWER GENERATING PLANTS, APPLICATIONS TO REGIONAL SITUATIONS* (457)
 REGIONAL MODELING OF SURFACE WATER TEMPERATURES FROM PROJECTED POWER GROWTHS* (571)
 A MODEL TO PREDICT REGIONAL WATER QUALITY IMPACTS FROM COAL RELATED ENERGY FACILITIES* (620)
 A REGIONAL AIR TRANSPORT MODEL FOR RADIOLOGICAL DOSE STUDIES* (696)
 REGENES - A DIGITAL COMPUTER CODE FOR ESTIMATING REGIONAL RADIOLOGICAL EFFECTS FROM THE NUCLEAR POWER INDUSTRY* (793)
 MODELING THE REGIONAL TRANSPORT OF RADIOUCLIDES IN A MAJOR UNITED STATES RIVER BASIN* (790)

REGIONS

A MASS CONSISTENT ATMOSPHERIC FLUX MODEL FOR REGIONS WITH COMPLEX TERRAIN* (66)
 NUMERICAL MODELING OF THE TRANSPORT, DIFFUSION, AND DEPOSITION OF POLLUTANTS FOR REGIONS AND EXTENDED SCALES* (135)
 A TRANSIENT, TWO-DIMENSIONAL, DISCRETE-ELEMENT MODEL FOR FAN-FIELD ANALYSIS OF DISCHARGES IN COASTAL SYSTEMS* (427)

REINFORCED

TRANSFER OF RADIOCESIUM FROM LICHEN TO REINDEER* (671)

REINFORCED

REINFORCED COAGULATION-SEDIMENTATION MODEL FOR STRATOSPHERIC AEROSOLS* (27)

REJECTED

COMPUTER SIMULATION OF ATMOSPHERIC EFFECTS OF WASTE HEAT REJECTED FROM CONCEPTUAL LARGE POWER PLANTS* (13)

RELATIONSHIPS

DETERMINATION OF ENVIRONMENTAL CARBON MONOXIDE EXPOSURES THROUGH PERSONAL MONITORING: FIXED VS PERSONAL AND TRANSPORTATION MODE RELATIONSHIPS* (57)
 COMPREHENSIVE ANALYSIS OF TIME-CONCENTRATION RELATIONSHIPS AND VALIDATION OF A SINGLE-SOURCE DISPERSION MODEL* (200)

RELEASE

THERMAL MODEL FOR ATMOSPHERIC SPRAY COOLING SYSTEMS: ENVIRONMENTAL EFFECTS OF HEAT AND MOISTURE RELEASE* (37)
 A STUDY OF THE FISSION PRODUCT RELEASE FROM A HEAVILY DAMAGED WATER-COOLED REACTOR* (39)
 AQUEOUS REACTOR RELEASE RESOLVING GENERATOR* (209)
 GAS RELEASE OF NUCLIDES* (210)
 FISSION PRODUCTS FIELD RELEASE TEST* (226)
 A MODEL TO ESTIMATE RADIATION DOSE COMMITMENTS TO THE WORLD POPULATION FROM T. ' ATMOSPHERIC RELEASE OF RADIOUCLIDES* (271)
 USER'S MANUAL FOR CODE REGAN: A CODE TO CALCULATE GAMMA PHOTON DOSE FROM AN AIRBORNE RADIOACTIVE RELEASE* (303)
 OCEANIC DIFFUSION OF A SEVERE ACCIDENTAL RADIOUCLIDE RELEASE FROM A SUBSEA NUCLEAR POWER PLANT* (471)
 TRANSPORT MODEL FOR LONG TERM RADIOUCLIDE RELEASE INTO A STREAM ECOSYSTEM* (610)

TITLE INDEX

RELEASE

COMPUTATIONAL METHOD FOR CALCULATION OF RADIOLOGICAL DOSE RESULTING FROM HYPOTHETICAL FISSION PRODUCT RELEASES* (684)
 A FORTRAN PROGRAM FOR THE CALCULATION OF THE POTENTIAL HAZARDS FROM AN ACCIDENTAL FISSION PRODUCT RELEASE, 1974* (697)
 AIRBORNE RELEASE OF RADIOISOTOPES REPORT GENERATOR* (701)
 GADGET AND GCEIT - PROGRAMS TO CALCULATE ENVIRONMENTAL CONSEQUENCES OF RADIOACTIVITY RELEASES* (713)
 A MODEL TO ESTIMATE THE LOCAL RADIATION DOSES TO MAN FROM THE ATMOSPHERIC RELEASE OF RADIOISOTOPES* (731)

RELEASES

A COMPUTER CODE FOR ANALYZING ROUTINE ATMOSPHERIC RELEASES OF SHORT-LIVED RADIOACTIVE ISOTOPES* (53)
 A PROCEDURE TO DETERMINE THE RELATIVE EXTENT OF REACTOR FISSION PRODUCT RELEASES UNDER VARIOUS METEOROLOGICAL CONDITIONS* (704)
 ASSESSMENT OF CONSEQUENCES FROM AIRBORNE RELEASES OF RADIOACTIVE MATERIAL* (791)
 A NUMERICAL STUDY OF METEOROLOGICAL EFFECTS OF WASTE HEAT AND MOISTURE RELEASES FROM HYPOTHETICAL POWER PLANTS* (263)
 TRANSIENT HEAT RELEASES FROM OFFSHORE NUCLEAR PLANTS* (641)
 RUBY, A PROGRAM FOR THE CALCULATION OF ACTIVITY RELEASES AND POTENTIAL DOSES FROM A PRESSURIZED WATER REACTOR PLANT* (605)
 THE EXPER III COMPUTER CODE FOR ESTIMATING EXTERNAL RADIATION DOSES TO POPULATIONS FROM ENVIRONMENTAL RELEASES* (712)
 POTENTIAL RADIOLOGICAL IMPACT OF AIRBORNE RELEASES AND DIRECT GAMMA RADIATION TO INDIVIDUALS LIVING NEAR INACTIVE WASTE TAILINGS PILES* (700)
 A COMPUTER CODE TO CALCULATE DOSES RESULTING FROM RELEASES OF RADIOISOTOPES TO THE ATMOSPHERE* (745)
 CALCULATION OF RELEASES OF RADIOACTIVE MATERIALS IN GASEOUS AND LIQUID EFFLUENTS FROM BOILING WATER REACTORS (BWR-GALE CODE)* (811)
 CALCULATION OF RELEASES OF RADIOACTIVE MATERIALS IN GASEOUS AND LIQUID EFFLUENTS FROM PRESSURIZED WATER REACTORS (PWR-GALE CODE)* (812)

RELIABILITY

IMPROVING THE STATISTICAL RELIABILITY OF STREAM HEAT ASSIMILATION PREDICTIONS* (502)

REMOTE

APPLICATION OF REMOTE SENSING FOR PREDICTION AND DETECTION OF THERMAL POLLUTION* (597)

REPROCESSING

ENVIRONMENTAL RADIATION EXPOSURES AND ASSOCIATED RISKS FROM FUEL REPROCESSING PLANTS* (706)

RISKS

REGIONAL EMISSION PROJECTION SYSTEM (REPS)* (227)

RESEARCH

A REGIONAL AIR QUALITY SIMULATION MODEL (A DESCRIPTION OF THE CONNECTICUT AIR POLLUTION MODEL AS DEVELOPED BY THE TRAVELERS RESEARCH CENTER)* (275)
 MODELING OF OIL EVAPORATION IN AN AQUEOUS ENVIRONMENT: RESEARCH ON THE EFFECTS OF CRUDE OIL TRANSFER AND UPSTREAM DEPOSITIONS ON DELAWARE BAY* (173)
 METHYLMEQUY ACCUMULATION IN AN AQUATIC FOOD CHAIN: A MODEL AND SOME IMPLICATIONS FOR RESEARCH PLANNING* (660)
 RESEARCH ON THE DYNAMICS OF ARCTIC TUNDRA ECOSYSTEMS* (674)
 APPLICATION OF ECOSYSTEM MODELING TECHNOLOGIES TO DREDGED MATERIAL RESEARCH* (607)

RESERVOIR

LATERALLY AVERAGED RESERVOIR MODEL* (403)
 CONCENTRATIONS IN THE SOUTH TEXAS PROJECT COOLING RESERVOIR, BLOW-DOWN AND EVAPORATION* (520)
 RESERVOIR WATER QUALITY MODEL SPARES* (502)
 DEPOSITIONAL ENVIRONMENT OF ZINC, LEAD AND CADMIUM IN RESERVOIR SEDIMENTS* (500)
 WATER QUALITY FOR RIVER - RESERVOIR SYSTEMS* (603)

RESERVOIRS

FIELD EVALUATION OF A PREDICTIVE MODEL FOR THERMAL STRATIFICATION IN LAKES AND RESERVOIRS* (613)
 PREDICTIVE MODEL FOR THERMAL STRATIFICATION AND WATER QUALITY IN RESERVOIRS* (490)
 MATHEMATICAL MODELS TO PREDICT SEEPAGE FROM COOLING RESERVOIRS* (550)
 A MATHEMATICAL MODEL FOR PREDICTING TEMPERATURES IN DIVERS AND PIER-BURN RESERVOIRS* (613)
 A GENERALIZED WATER QUALITY MODEL FOR EUTROPHIC LAKES AND RESERVOIRS* (627)

RESIDUE

A BIOENERGETICS-BASED MODEL FOR POLLUTANT ACCUMULATION BY FISH: SIMULATION OF PCB AND METHYLBECY RESIDUE LEVELS IN OTTAWA RIVER YELLOW PERCH (PERCA FLAVESCENS)* (576)

RESOLUTION

NUMERICAL INTEGRATION EXPERIMENTS WITH VARIABLE-RESOLUTION TWO-DIMENSIONAL CARTESIAN GRIDS USING THE BOX METHOD* (700)

RESOURCE

GOAL INTERVAL PROGRAMMING MODEL FOR RESOURCE ALLOCATION IN A MARINE ENVIRONMENTAL PROTECTION PROGRAM* (406)
 DETERMINATION OF OPTIMAL MULTIPLE USES OF A SMALL WATER RESOURCE* (622)
 SELECTED DIGITAL COMPUTER TECHNIQUES FOR GROUNDWATER RESOURCE EVALUATION* (656)

RESOURCES

MODELING AND CONTROL OF THE POLLUTION OF WATER RESOURCES SYSTEMS VIA MULTILEVEL APPROACH* (445)
 RESOURCES ALLOCATION TO OPTIMIZE MINING POLLUTION CONTROL* (569)

RESPONSE

THE ATMOSPHERIC RESPONSE TO A STRATOSPHERIC DUST CLOUD AS SIMULATED BY A GENERAL CIRCULATION MODEL* (7)
 RESPONSE OF THE JOINT OCEAN-ATMOSPHERE MODEL TO THE SEASONAL VARIATION OF THE SOLAR RADIATION* (328)
 FAST RESPONSE MODEL OF TOXIC AEROSOL RESUSPENSION BY WIND* (370)
 THERMAL RESPONSE OF HEATED STREAMS: SOLUTION BY THE IMPLICIT METHOD* (537)

RESPONSES

PREDICTING RESPONSES OF AQUATIC BIOTA TO THERMAL STIMULI* (551)

RESUSPENSION

FAST RESPONSE MODEL OF TOXIC AEROSOL RESUSPENSION BY WIND* (370)

RETENTION

A TWO-COMPARTMENT, THREE-PARAMETER MODEL FOR THE ABSORPTION AND RETENTION OF INGESTED ELEMENTS BY ANIMALS* (570)

REVIEW

A REVIEW OF METHODS FOR PREDICTING AIR POLLUTION DISPERSION, AIR POLLUTION MODELS, AND PROBLEM AREAS IN AIR POLLUTION DISPERSION MODELING* (189)

REY

RAPIRA DEL REY: COMPUTER SIMULATION OF POLLUTANT TRANSPORT IN SEMI-ENCLOSED WATER BODY* (600)

RM

KINETIC STUDY OF SIMULATED SO₂, NO_x, PH-POLLUTED ATMOSPHERES* (30)

TITLE INDEX

DISC

DISC: BIOLOGICAL INHALATION SAFETY CODE FOR INH 7090* (496)

FIRE

PLUME RISE PREDICTIONS* (23)
EFFECT OF PLUME RISE ON GROUND LEVEL POLLUTION* (57)
PREDICTED AND OBSERVED COOLING TOWER PLUME RISE AND VISIBLE PLUME LENGTH AT THE JOHN F. AROS POWER PLANT* (102)
DESAIGNET'S PLUME RISE FORMULA AND THE TVA DATA* (175)
PLUME RISE AND DISPERSION MODEL* (232)
PREDICTOR ACCIDENT PLUME RISE CALCULATIONS* (279)
WET PLUME RISE FROM COOLING TOWERS IN STRONG WINDS* (302)
POTOMAC RIVER TEMPERATURE RISE DISTRIBUTION AND DIFFUSION PARAMETER EVALUATION* (527)

FISKS

ENVIRONMENTAL RADIATION EXPOSURES AND ASSOCIATED RISKS FROM FUEL REPROCESSING PLANTS* (706)

RIVER

A STATISTICAL METHODOLOGY FOR PREDICTING THE POLLUTANTS IN A RIVER* (385)
EFFECTS OF DEVELOPMENT ON SALINITY AND LITHOLOGY OF THE LOWER COLORADO RIVER* (426)
FIELD STUDY AND MATHEMATICAL MODEL OF THE SLACK-WATER BUILDUP OF A POLLUTANT IN A TIDAL RIVER* (430)
A STUDY OF TIDAL DISPERSION IN THE POTOMAC RIVER* (450)
A HYDROLOGIC MODEL OF THE BEAR RIVER BASIN* (451)
COMPUTED MODEL OF CONNECTICUT RIVER POLLUTION* (453)
COMPUTER SIMULATION OF SURFACE WATER HYDROLOGY AND SALINITY WITH AN APPLICATION TO STUDIES OF COLORADO RIVER MANAGEMENT* (460)
RIVER BASIN MODEL* (494)
STOCHASTIC VARIATION OF WATER QUALITY OF THE PASSAIC RIVER* (505)
MATHEMATICAL MODELS PREDICT CONCENTRATION-TIME PROFILES RESULTING FROM CHEMICAL SPILL IN A RIVER* (514)
A DICENOPTICS-BASED MODEL FOR POLLUTANT ACCUMULATION BY FISH: SIMULATION OF PCB AND METHYL MERCURY RESIDUE LEVELS IN OTTAWA RIVER YELLOW PERCH (*PERCA FLAVESCENS*) * (516)
THE COLBERT RIVER SIMULATION MODEL* (519)
THE RIVER BASIN MODEL: COMPUTED OUTPUT* (522)
POTOMAC RIVER TEMPERATURE RISE DISTRIBUTION AND DIFFUSION PARAMETER EVALUATION* (527)
THERMAL REGIMES OF THE UPPER MISSISSIPPI AND MISSOURI RIVERS: TRANSIENT AND STEADY-STATE COMPUTATIONAL MODELS FOR THE PREDICTION OF RIVER THERMAL REGIMES: PART TWO: ANALYSIS OF THERMAL REGIMES OF THE MISSISSIPPI AND MISSOURI RIVERS IN THE MID-CONTINENT AREA POWER POOL (HAPP) GEOGRAPHICAL AREA* (519)
MATHEMATICAL MODEL FOR THERMAL PLUMES AND RIVER DISCHARGES* (541)
PERCIV-II, NEW ENGLAND RIVER BASINS MODELLING PROJECT* (545)
QUAL-II, UPPER MISSISSIPPI RIVER BASIN PROJECT* (546)
DIGITAL MODELING OF RADIOACTIVE AND CHEMICAL WASTE TRANSPORT IN THE SNAKE RIVER PLAIN AQUIFER AT THE NATIONAL REACTOR TESTING STATION, IDAHO* (555)
A MATHEMATICAL MODEL FOR PREDICTING RIVER TEMPERATURES--APPLICATION TO THE GREEN RIVER BELOW FLARING GORGE DAM* (554)
BLACK RIVER THERMAL MODEL* (567)
NATIONAL WEATHER SERVICE RIVER FORECAST SYSTEM* (564)
WATER QUALITY FOR RIVER - RESERVOIR SYSTEMS* (603)
AN EMPIRICAL MODEL FOR DETERMINING THE SALINITY DISTRIBUTION IN THE COLORADO RIVER* (617)
A MATHEMATICAL MODEL FOR PREDICTING TEMPERATURES IN RIVERS AND RIVER-BUN RESERVOIRS* (613)
TWO-DIMENSIONAL TEMPERATURE MODEL FOR A THERMALLY LOADED RIVER WITH STEADY DISCHARGE* (616)
RIVER BASIN WATER QUALITY MODEL* (626)
POPLAR RIVER WATER QUALITY SYSTEMS MODEL* (629)
ENVIRONMENTAL PARAMETERS OF THE TENNESSEE RIVER IN ALABAMA, THERMAL STRATIFICATION* (635)
OPTIMIZATION MODELS FOR RIVER BASIN WATER QUALITY MANAGEMENT AND WASTE TREATMENT PLANT DESIGN* (630)
PH PROFILES IN A RIVER SYSTEM WITH MULTIPLE ACID LOADS* (639)
A COMPUTER CODE (RIVDOOS) TO CALCULATE POPULATION DOSES FROM RADIOACTIVE LIQUID EFFLUENTS AND AN APPLICATION TO NUCLEAR POWER REACTORS OF THE MISSISSIPPI RIVER BASIN* (721)
MODELS AND THE DECISION MAKING PROCESS: THE HUDSON RIVER POWER PLANT CASE* (752)
TENNESSEE AND CUMBERLAND RIVER BASINS RADIOACTIVE TRANSPORT* (769)
MODELLING THE REGIONAL TRANSPORT OF RADIOISOTOPES IN A MAJOR UNITED STATES RIVER BASIN* (794)

RIVERS

DIGITAL COMPUTER SIMULATION OF THERMAL EFFLUENT DISPERSION IN RIVERS, LAKES, AND ESTUARIES* (412)
ONE-DIMENSIONAL HYDRODYNAMIC AND WATER QUALITY CONDITIONS IN ESTUARIES AND CONTROLLED RIVERS* (426)
MATHEMATICAL MODELS OF WATER QUALITY PARAMETERS FOR RIVERS AND ESTUARIES* (464)
TRANSIENT THREE DIMENSIONAL MODELLING OF TEMPERATURE DISTRIBUTIONS IN RIVERS WITH AND WITHOUT THERMAL DISCHARGES* (452)
SIMPLIFIED MATHEMATICAL MODEL OF TEMPERATURE CHANGES IN RIVERS* (532)
THERMAL REGIMES OF THE UPPER MISSISSIPPI AND MISSOURI RIVERS: TRANSIENT AND STEADY-STATE COMPUTATIONAL MODELS FOR THE PREDICTION OF RIVER THERMAL REGIMES: PART TWO: ANALYSIS OF THERMAL REGIMES OF THE MISSISSIPPI AND MISSOURI RIVERS IN THE MID-CONTINENT AREA POWER POOL (HAPP) GEOGRAPHICAL AREA* (519)
COMPUTER-MODEL FOR THREE-DIMENSIONAL SIMULATION OF THERMAL DISCHARGES INTO RIVERS* (500)
PREDICTING THE RATE OF WARMING OF RIVERS BELOW HYDROELECTRIC INSTALLATIONS* (594)
TWO-DIMENSIONAL TRANSIENT FAR-FIELD TEMPERATURE DISTRIBUTION IN RIVERS WITH ARBITRARY HEAT SOURCES* (601)
A MATHEMATICAL MODEL FOR PREDICTING TEMPERATURES IN RIVERS AND RIVER-BUN RESERVOIRS* (613)

ROAD

EFFECTS OF THE PIPELINE AND ROAD ON BEADY PONDS AND LAKES ACROSS ALASKA'S NORTH SLOPE* (703)

ROADWAYS

AN AIR POLLUTION EVALUATION MODEL FOR ROADWAYS* (50)
EXPLOR-EXAMINATION OF POLLUTION LEVELS OF ROADWAYS* (134)

ROCKET

ATMOSPHERIC TRANSPORT OF ROCKET MOTOR COMBUSTION BY-PRODUCTS* (54)
NUSE-1, A NUCLEAR ROCKET SAFETY EVALUATION CODE FOR THE CONTROL DATA 3600* (697)

ROLLING

DEVELOPMENT OF VERTICAL DISPERSION COEFFICIENTS FOR ROLLING TERRAIN ENVIRONMENTS* (297)

ROSCOE

THE ROSCOE MANUAL, HIGH-ALTITUDE NEUTRAL-PARTICLE MOTION* (100)

ROSES

A PREDICTION MODEL OF NEAR URBAN POLLUTION FOR USE WITH STANDARD WIND ROSES* (257)

ROUGHNESS

THE STRUCTURE OF THE TWO-DIMENSIONAL INTERNAL BOUNDARY LAYER OVER A SUDDEN CHANGE OF SURFACE ROUGHNESS* (265)

TITLE INDEX

- SCUD
RCH AND FIB--PHONE BEHAVIOR FOR POUND OR SLOT UNDERWATER DISCHARGE INCLUDING MULTIPORT DISCHARGES* (684)
- SCAC
SCAC -- A RADIOLOGICAL SAFETY ANALYSIS COMPUTER PROGRAM* (699)
USER'S MANUAL FOR THE PORTMAN VERSION OF SCAC: A RADIOLOGICAL SAFETY ANALYSIS COMPUTER PROGRAM* (730)
- SDOT
SDOT, A PROGRAM FOR THE CALCULATION OF ACTIVITY RELEASES AND POTENTIAL DOSES FROM A PRESSURIZED WATER REACTOR PLANT* (685)
- SDS
A MATHEMATICAL MODEL FOR PREDICTING TEMPERATURES IN RIVERS AND RIVER-BUN RESERVOIRS* (613)
- SDOFF
MEASUREMENT AND MODELING OF STORM WATER SDOFF FROM COAL STORAGE PILES AND THE IMPACT ON RECEIVING WATERS* (622)
EFFECTS OF RAINSTORMS AND SDOFF ON CONSEQUENCES OF NUCLEAR REACTOR ACCIDENTS* (816)
- SDOT
TWO-DIMENSIONAL NUMERICAL SIMULATION OF THE EFFECTS OF AIR POLLUTION UPON THE URBAN-RURAL COMPLEX* (384)
- SDPDC
A COMPUTER CODE (SDPDC) TO CALCULATE POPULATION DOSES FROM RADIOACTIVE LIQUID EFFLUENTS AND AN APPLICATION TO NUCLEAR POWER REACTORS ON THE MISSISSIPPI RIVER BASIN* (721)
- SDS
SDS-HANIPHAN--COOLING POND TEMPERATURE DISTRIBUTION* (501)
- SDS
A MODEL FOR THE APPROPRIATE CALCULATION OF SAFE PATES OF DISCHARGE OF RADIOACTIVE WASTES INTO MARINE ENVIRONMENTS* (661)
- SAFEGUARDS
ISOTOPIE SAFEGUARDS TECHNIQUES* (761)
- SAFETY
ANALYTICAL STUDIES OF DISPOSAL BEHAVIOR PREDICTIONS FOR FAST REACTOR SAFETY* (84)
RISC: RADIOLOGICAL INHALATION SAFETY CODE FOR ICR 7090* (680)
ATMOSPHERIC DISPERSION MODEL AS USED IN THE REACTOR SAFETY STUDY, WASH-1400* (680)
SCAC -- A RADIOLOGICAL SAFETY ANALYSIS COMPUTER PROGRAM* (699)
SDPSE-1, A NUCLEAR POWER SAFETY EVALUATION CODE FOR THE CONTROL DATA 3400* (691)
USER'S MANUAL FOR THE PORTMAN VERSION OF SCAC: A RADIOLOGICAL SAFETY ANALYSIS COMPUTER PROGRAM* (730)
- SAGINAW
MATHEMATICAL MODEL OF POLLUTANT CAUSE AND EFFECT IN SAGINAW BAY, LAKE HURON* (634)
- SALINE
A MODEL FOR CALCULATING EFFECTS OF LIQUID WASTE DISPOSAL IN DEEP SALINE AQUIFERS* (519)
A MODEL FOR CALCULATING EFFECTS OF LIQUID WASTE DISPOSAL IN DEEP SALINE AQUIFERS* (641)
- SALINITY
EFFECTS OF DEVELOPMENT ON SALINITY AND LIMNOLOGY OF THE LOWER COLORADO RIVER* (820)
COMPUTED SIMULATION OF SURFACE WATER HYDROLOGY AND SALINITY WITH AN APPLICATION TO STUDIES OF COLORADO RIVER MANAGEMENT* (660)
MATHEMATICAL MODEL FOR THE PREDICTION OF UNSTEADY SALINITY INTRODUCTION IN ESTUARIES* (583)
PREDICTION OF UNSTEADY SALINITY INTRODUCTION IN ESTUARIES: MATHEMATICAL MODEL AND USER'S MANUAL* (584)
AN EMPIRICAL MODEL FOR DETERMINING THE SALINITY DISTRIBUTION IN THE COLORADO RIVER* (611)
- SALT
SALT DRIFT MODEL - DESCRIPTION* (224)
A COMPREHENSIVE MODEL STUDY OF SALT DRIFT DEPOSITS, INDUCED FOGGING AND ICING FROM MECHANICAL DRAFT COOLING TOWER PLANTS AT INDIAN POINT* (230)
A MODEL TO PREDICT SALT-DRIFT DEPOSITION FROM A NATURAL DRAFT COOLING TOWER* (245)
- SALTWATER
MATHEMATICAL MODELING OF FRESHWATER AQUIFERS HAVING SALTWATER BOTTOMS* (665)
- SAMPLED
SAMPLED CHRONOLOGICAL INPUT MODEL* (736)
- SAMPLING
DEPOSIT SAMPLING DATA PREDICTION MODEL* (379)
DELAWARE ESTUARY AND BAY WATER QUALITY SAMPLING AND MATHEMATICAL MODELING PROJECT* (517)
FISH IMPINGEMENT SAMPLING DESIGN & ESTIMATION METHOD SOFTWARE SYSTEM* (762)
- SAN
SIMULATION OF CONTAMINANTS IN BAYS: APPLICATION TO SAN FRANCISCO BAY COMPLEX* (586)
- SAPOLYT
SAPOLYT: ESTIMATING THE AIR QUALITY IMPACT OF VEHICULAR EMISSIONS RESULTING FROM A TRAFFIC ASSIGNMENT* (366)
- SATELLITE
GLOBAL ANALYSIS OF A MERCATOR GRID OF SATELLITE DERIVED OZONE DATA* (386)
- SATURATED
WATER MOVEMENT THROUGH SATURATED POROUS MEDIA: A FINITE-ELEMENT GALERKIN MODEL* (643)
PULSED DISPERSION OF TRACE CHEMICAL CONCENTRATIONS IN A SATURATED SOBBING POROUS MEDIUM* (607)
A THEORY OF THE MASS TRANSPORT OF PREVIOUSLY DISTRIBUTED CHEMICALS IN A WATER SATURATED SOBBING POROUS MEDIUM* (649)
- SCALE
A REGIONAL-CONTINENTAL SCALE TRANSPORT, DIFFUSION, AND DEPOSITION MODEL* (114)
REGIONAL SCALE AIR POLLUTION TRANSPORT MODEL* (164)
A LAGRANGIAN TRAJECTORY MODEL OF URBAN SCALE PHOTOCHEMICAL AIR POLLUTION* (193)
A THREE-DIMENSIONAL, URBAN SCALE, MATHEMATICAL MODEL OF PHOTOCHEMICAL AIR POLLUTION* (194)
A WELL MIXED BOX MODEL OF URBAN SCALE PHOTOCHEMICAL AIR POLLUTION* (194)
- SCALES
NUMERICAL MODELING OF THE TRANSPORT, DIFFUSION, AND DEPOSITION OF POLLUTANTS FOR REGIONS AND EXTENDED SCALES* (139)
- SCAVENGING
SCAVENGING MODEL INCORPORATING CHEMICAL KINETICS* (50)
TWO-DIMENSIONAL CUMULUS DYNAMICS MODEL WITH ATMOSPHERIC SCAVENGING* (203)
A PRECIPITATION SCAVENGING MODEL FOR STUDIES OF TACTICAL NUCLEAR OPERATIONS* (210)
NUMERICAL MODELS FOR PRECIPITATION SCAVENGING* (360)
- SCHOOL
DESCRIPTION OF A NAVIGATION PACKAGE FOR THE NAVAL POSTGRADUATE SCHOOL GENERAL CIRCULATION MODEL* (187)
- SCIENTIFIC
OPTED II: SPECIAL SCIENTIFIC REPORT ON VOLUME 1* (806)

TITLE INDEX

- SFE**
 MODEL OF THE ACCUMULATION OF FOSSIL CO₂ IN THE ATMOSPHERE AND THE SEA* (80)
 AEROLS: ATMOSPHERIC DISPERSION AND FINITE-CLUST DOSES DURING SOFHAL, SEA-BREEZE, AND ACCIDENT CONCENTRATIONS* (94)
 LAND-SEA EXCHGE MODEL* (154)
 DYNAMIC MODEL OF SEA BREEZE CIRCULATIONS AND POLLUTANT TRANSPORT* (309)
 DEEP SEA OCEAN DISPOSAL OF PETROCHEMICAL PLANT WASTES* (393)
 OIL SPREADING ON THE SEA* (454)
 INVESTIGATION AND PREDICTION OF DISPERSION OF POLLUTANTS IN THE SEA WITH HYDRODYNAMICAL NUMERICAL MODELS* (474)
 THE SEVEN IF COMPUTER CODE FOR ESTIMATING RESIDUAL DOSES TO POPULATIONS FROM CONSTRUCTION OF A SEA LEVEL CANAL WITH NUCLEAR EXPLOSIVES* (742)
- SEABROOM**
 SUBMANT JET DISCHARGE MODEL, SEABROOM NUCLEAR STATION* (473)
- SEAS**
 WATER-QUALITY SIMULATION MODEL FOR WELL-MIXED ESTUARIES AND COASTAL SEAS* (476)
 MODELING THE ECONOMIC AND ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVE ENERGY POLICIES: SEAS-STRATEGIC ENVIRONMENTAL ASSESSMENT SYSTEM* (744)
- SEASONAL**
 MODELING STUDY OF SEASONAL EFFECT ON AIR POLLUTION AT 60 DEGREES N LATITUDE* (20)
 GLOBAL MODEL OF THE ATMOSPHERE WITH SEASONAL VARIATION OF THE HYDROLOGIC CYCLE* (184)
 RESPONSE OF THE JOINT OCEAN-ATMOSPHERE MODEL TO THE SEASONAL VARIATION OF THE SOLAR RADIATION* (128)
- SEDEXIM**
 GEOCHEMICAL OCEAN SECTIONS STUDY - GEOSSECS - SEDIMENT DISSOLUTION, MODEL FOR FOSSIL FUEL CARBON DIOXIDE* (117)
 FLOW DYNAMICS AND SEDIMENT MOVEMENT IN LOCKWOODS FILLEY INLET, NORTH CAROLINA* (497)
 INVESTIGATION OF SOME FACTORS IN THE BIOCHEMICAL CONVERSION OF MERCURY POLLUTANTS TO TOXIC METHYLMERCURY EFFECTED BY MICRO-ORGANISMS IN A MARINE SEDIMENT* (500)
 NUTRIENT TRANSPORT BY SEDIMENT WATER INTERACTIONS* (500)
- SEDIMENTATION**
 REINFORCED COAGULATION-SEDIMENTATION MODEL FOR STRATOSPHERIC DEPOSITS* (27)
- SEDIMENTS**
 A SYSTEMS ANALYSIS MODEL FOR CALCULATING RADIOCLIDE TRANSPORT BETWEEN RECEIVING WATERS AND BOTTOM SEDIMENTS* (194)
 UPTAKE AND MIGRATION OF TRACERS IN LAKE SEDIMENTS* (479)
 DEPOSITIONAL ENVIRONMENT OF ZINC, LEAD AND CADMIUM IN RESERVOIR SEDIMENTS* (544)
 HEAVY METALS IN ESTUARINE BENTHIC ORGANISMS AND SEDIMENTS: DATA AND MODEL* (600)
- SEEDING**
 FIRST ESTIMATE OF SEEDING CAPABILITY FOR ULTIMATE ESTABLISHMENT* (774)
- SEEPAGE**
 MATHEMATICAL MODELS TO PREDICT SEEPAGE FROM COOLING RESERVOIRS* (550)
 NUMERICAL MODELING OF SUBSURFACE RADIOACTIVE SOLUTE TRANSPORT FROM WASTE-SEEPAGE PONDS AT THE IDAHO NATIONAL ENGINEERING LABORATORY* (554)
- SEEPED**
 NEW CONCEPT IN STABILITY ANALYSIS OF SEEPED HIVE-REFUSE EMBARKMENTS* (640)
- SEER**
 SEER II- A NEW DAMAGE ASSESSMENT FALLOUT MODEL* (804)
- SELECTED**
 CALCULATION OF SELECTED HYDROLYTIC RATE CONSTANTS OVER A DIURNAL RANGE: A COMPUTER ALGORITHM* (282)
 COMPARISON OF ECOLOGICAL IMPACTS OF POSTULATED OIL SPILLS AT SELECTED ALASKAN LOCATIONS* (454)
 THE STAFFORD WATERSHED MODEL: THE CORRELATION OF PARAMETER VALUES SELECTED BY A COMPUTERIZED PROCEDURE WITH MEASURABLE PHYSICAL CHARACTERISTICS OF THE WATERSHED* (652)
 SELECTED DIGITAL COMPUTER TECHNIQUES FOR GROUNDWATER RESOURCE EVALUATION* (656)
- SELECTION**
 OPSET: PROGRAM FOR COMPUTERIZED SELECTION OF WATERBODIED PARAMETER VALUES FOR THE STAFFORD WATERSHED MODEL* (482)
- SEMI**
 MADIRA DEL REY: COMPUTER SIMULATION OF POLLUTANT TRANSPORT IN SEMI-ENCLOSED WATER BODY* (400)
- SENSING**
 APPLICATION OF REMOTE SENSING FOR PREDICTION AND DETECTION OF THERMAL POLLUTION* (597)
- SENSORS**
 OBJECTIVE PLACEMENT OF SENSORS* (284)
- SENEBIPITY**
 SENEBIPITY: A WATERSHED LEVEL SIMULATION MODEL OF TREE BIOMASS DYNAMICS* (436)
- SERIES**
 WATER TEMPERATURE FORECASTING AND ESTIMATION USING FOURIER SERIES AND COMMUNICATION THEORY TECHNIQUES* (444)
- SERVICE**
 NATIONAL WEATHER SERVICE RIVER FORECAST SYSTEM* (544)
- SEVERE**
 NUMERICAL SIMULATION OF THE EFFECTS OF COOLING TOWER COMPLEXES ON CLOUDS AND SEVERE STORMS* (367)
 OCEANIC DIFFUSION OF A SEVERE ACCIDENTAL RADIOCLIDE RELEASE FROM A SUBSEA NUCLEAR POWER PLANT* (471)
- SEVERITY**
 SOURCE ASSESSMENT: SEVERITY OF STATIONARY AIR POLLUTION SOURCES-A SIMULATION APPROACH* (75)
- SHAGAWA**
 SHAGAWA LAKE RECOVERY CHARACTERISTICS AS PREDICTED BY PREDICTIVE MODELING* (472)
- SHALE**
 SIMPLE METHOD FOR EVALUATING ALTERNATIVES TO A PROPOSED ENVIRONMENTAL ALTERATION, ITS HISTORY, AND AN EXAMPLE OF ITS USE IN OIL SHALE DEVELOPMENT* (794)
- SHALLOW**
 CALIBRATION OF A THERMAL EFFICIENCY MODEL FOR SHALLOW, BARRICADED ESTUARIES* (404)
 NUMERICAL MODEL FOR A TURBULENT SUBMANT JET IN A SHALLOW OPEN CHANNEL* (487)
 A WASTE ASSIMILATIVE CAPACITY MODEL FOR A SHALLOW, TURBULENT STREAM* (531)
 NUMERICAL THERMAL PLUME MODEL FOR VERTICAL OUTFALLS IN SHALLOW WATER* (593)
- SHAPED**
 PREDICTION OF TEMPERATURE PROFILES IN ARBITRARILY SHAPED COOLING LAKES BY FINITE DIFFERENCE TECHNIQUES* (413)

TITLE INDEX

- SRP
URBAN AIR SHED PHOTOCHEMICAL SIMULATION MODEL STUDY: MICROSCALE MODEL OF LOCAL VENTILATION COEFFICIENTS AND PERSONAL POLLUTANT CONCENTRATIONS* (160)
- SRP
WATERPOLLUTION MODEL FOR PATH OF POLLUTANTS IN REAR-SHORE WATERS* (604)
- SRP
THERMAL DIFFUSION AND POLLUTANT TRANSPORT IN STRATIFIED ENVIRONMENTS* (172)
- SRP
IMPACT OF ENERGY SHORTAGE ON AIR-TO-SOIL SULFUR DIOXIDE AND PARTICULATE LEVELS IN OFFSHORE OIL PLATFORMS* (111)
- SRP
A GENERAL CIRCULATION MODEL SHOWING THE EFFECTS OF DOWLING THE CO₂ CONCENTRATION IN THE ATMOSPHERE* (140)
- SRP
EFFECTS OF STRONG WINDS CAUSED BY THE SPACE SHUTTLE IN THE MESOSPHERE* (73)
- SRP
SYNOPSIS: SECTION 1.7: TREAT WATER* (700)
SYNOPSIS: SECTION 2.1: TREAT WATER AND WASTEWATER DOCUMENT* (704)
SYNOPSIS: A SIMULATION COMPILER FOR BIOLOGICAL MODELS* (709)
- SRP
MODELING AND SIMULATION RELATIONS OF PHYSICAL AND CHEMICAL PROCESSES* (52)
POLLUTANT DISTRIBUTION IN THE MIXED LAYER, USING SIMILARITY THEORY* (64)
- SRP
PREDICTION OF HEAT-RELEASING DISCHARGES IN A STREAM USING SIMILARITY TECHNIQUES* (619)
- SRP
SIMILARITY
SIMILARITY OF A JACOBI-PHILLIPS MODEL FOR REAL-TIME ENVIRONMENTAL USE* (119)
- SRP
A SOFTWARE SYSTEM TO SIMULATE COAL PLANT PARTICULATE CONTROL* (47)
- SRP
THE ATMOSPHERIC RESPONSE TO A STRATOSPHERIC DUST CLOUD AS SIMULATED BY A GENERAL CIRCULATION MODEL* (7)
KINETIC STUDY OF SIMULATED CO₂, NO₂, AND SO₂-POLLUTED ATMOSPHERES* (10)
COMPUTER MODELING OF SIMULATED PHOTOCHEMICAL CLOUD* (113)
COMPUTER MODELING OF SIMULATED PHOTOCHEMICAL CLOUD* (124)
WATERPOLLUTION MODELING OF SIMULATED PHOTOCHEMICAL CLOUD* (140)
- SRP
SIMULATING THE URBAN AIR POLLUTION ENVIRONMENT* (121)
METHOD FOR SIMULATING PLUME CENTERLINES FROM TALL STACKS* (125)
TWO-DIMENSIONAL NUMERICAL MODEL FOR SIMULATING POLLUTION AND DISTRIBUION OF ADVECTION PLOTS: A FIELD INVESTIGATION AND NUMERICAL SIMULATION OF COASTAL FOG* (177)
DEVELOPMENT OF A GENERAL COMPUTER MODEL FOR SIMULATING THERMAL DISCHARGES IN THREE DIMENSIONS* (309)
EVALUATING EFFECTS OF HARVEST CUTTING ON SNOWMELT IN COLORADO SUBALPINE FORESTS* (417)
SIMULATING WIND FIELDS AND HYDROLOGIC IMPACTS RESULTING FROM WINDFARM HARVEST ON SUBALPINE WATERSHEDS* (470)
SIMULATING THE IMPACT OF THE ENTRAINMENT OF WINTER FLOWDOWN LARVAE* (769)
- SRP
THERMAL MODEL DEVELOPMENT AND INITIAL SIMULATIONS OF SORETS TESTS 2 AND 3* (387)
- SRP
DEVELOPMENT OF AN AIR QUALITY SIMULATOR FOR COAL FIRES* (316)
RE-ENTRANCEMENT AND RE-CIRCULATION SIMULATOR FOR FLOW CONDITIONS NEAR SUBMERGED DISCHARGES* (580)
- SRP
STEADY-STATE TRANSPORT OF WATER AND REACTING SOLUTES THROUGH MULTILAYERED SOILS UNDER TRANSIENT UNSATURATED FLOW CONDITIONS* (442)
SIMULATING HEAT AND MASS TRANSFER IN POROUS MEDIA WITH APPLICATION TO SOIL WARMING WITH POWER PLANT WASTE HEAT* (647)
- SRP
COMPREHENSIVE ANALYSIS OF TIME-CONCENTRATION RELATIONSHIPS AND VALIDATION OF A SINGLE-SOURCE DISPERSION MODEL* (200)
IMPROVEMENTS TO SINGLE-SOURCE MODEL: TESTING AND EVALUATION OF MODEL IMPROVEMENTS* (202)
A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE AND MULTIPLE NATURAL-DRAFT COOLING TOWERS* (202)
A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (203)
A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE AND MULTIPLE NATURAL-DRAFT COOLING TOWERS* (204)
A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (206)
A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (207)
A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE OR MULTIPLE NATURAL-DRAFT COOLING TOWERS* (208)
A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (209)
A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (250)
A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (251)
A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (252)
A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE AND MULTIPLE NATURAL-DRAFT COOLING TOWERS* (253)
A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (254)
A MODEL TO PREDICT VAPOR PLUMES FROM A SINGLE NATURAL-DRAFT COOLING TOWER* (255)
A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (256)
SINGLE SOURCE (CRITERIA) MODEL* (117)
- SRP
IMPACT OF OIL SPILLAGE FROM WORLD WAR II TANKER SINKINGS* (604)
- SRP
MODELING THE EFFECTS OF TEMPERATURE CHANGES ON THE ECOLOGY OF BANA FISHES AND THANNOPHIS SITALIS* (764)
- SRP
NUMERICAL PREDICTION OF THE MESOSCALE TRANSPORT OF ATMOSPHERIC EFFLUENTS: PHILOSOPHY AND MORPHOLOGY OF EXPERIMENTAL MODELS FOR PREDICTING THE WIND AND POTENTIAL RADIOLOGICAL FIELDS OVER THE NEVADA TEST SITE* (262)
- SRP
ANALYSIS OF SUBMERGED THERMAL DISCHARGE FROM OCEAN-SITED POWER PLANTS* (688)
- SRP
AIR QUALITY MANAGEMENT OF INDUSTRIAL SITES* (30)
- SRP
A NEW TECHNIQUE FOR REACTOR SITING DOSE CALCULATIONS* (335)
DESIGN AND SITING CRITERIA FOR ONCE-THROUGH COOLING SYSTEMS BASED ON A FIRST-ORDER THERMAL PLUME MODEL* (589)
THERMAL POLLUTION ABATEMENT EVALUATION MODEL FOR POWER PLANT SITING* (566)

TITLE INDEX

SYSTEM

ASTUTE II, A DIGITAL COMPUTER PROGRAM FOR INVESTIGATION OF REACTOR SITING* (642)
 A CDC 6400 PROGRAM FOR CALCULATION OF INHALATION AND EXTERNAL DOSE FOR ESTABLISHING REACTOR SITING DISTANCE REQUIREMENTS* (690)
 A METHODOLOGY FOR ASSESSMENT OF ENERGY FACILITY SITING PATTERNS* (800)

SITUATIONS

MODELING AND OPTIMIZATION OF TRANSIENT COOLING WATER DISCHARGE FROM POWER GENERATING PLANTS, APPLICATIONS TO REGIONAL SITUATIONS* (457)

SLACK

FIELD STUDY AND MATHEMATICAL MODEL OF THE SLACK-WATER BUILDUP OF A POLLUTANT IN A TICAL RIVER* (438)

SLICK

NUMERICAL SIMULATION OF OIL SLICK TRANSPORT IN BAYS* (594)
 NUMERICAL MODEL OF DROPLET ENTRAPMENT FROM A CONTAINED OIL SLICK* (619)

SLICKS

SIMULATION OF MOVEMENT OF OIL SLICKS IN THE STRAIT OF GEORGIA USING SIMPLE ATMOSPHERE AND OCEAN DYNAMICS* (809)

SLOPE

EFFECTS OF THE PIPELINE HAIL ROAD ON BEADY PONDS AND LAKES ACROSS ALASKA'S NORTH SLOPE* (703)

SLYT

NUMERICAL TECHNIQUES APPLIED TO PARTICLE DEPOSITION DURING SLOT FLOW* (414)
 NOW AND FLOW-PLANE BEHAVIOR FOR SOUND OF SLOT UNDERWATER DISCHARGE INCLUDING MULTIPORT DISCHARGES* (404)

SMOG

COMPUTER MODELING OF SIMULATED PHOTOCHEMICAL SMOG* (113)
 COMPUTER MODELING OF SIMULATED PHOTOCHEMICAL SMOG* (329)
 MATHEMATICAL MODELING OF SIMULATED PHOTOCHEMICAL SMOG* (369)

SMOKE

USE OF LARS SYSTEM FOR THE QUANTITATIVE DETERMINATION OF SMOKE PLUME LATERAL DIFFUSION COEFFICIENTS FROM PFTS TRACES OF VIRGINIA* (17)

SMOKE

DIGITAL MODELING OF RADIOACTIVE AND CHEMICAL WASTE TRANSPORT IN THE SHARKE RIVER PLAIN ACQUIRED AT THE NATIONAL REACTOR TESTING STATION, IDAHO* (554)

SNOWMELT

SIMULATING EFFECTS OF HARVEST CUTTING ON SNOWMELT IN COLORADO SUBALPINE FOREST* (617)

SUSIM

DOCUMENTATION FOR SUSIM/2, A COMPUTER PROGRAM FOR THE STEADY-STATE WATER QUALITY SIMULATION OF A STREAM NETWORK* (407)

SOFTWARE

A SOFTWARE SYSTEM TO SIMULATE COAL PLANT PARTICULATE CONTROLS* (87)
 SOFTWARE DEVELOPMENT AND AIR POLLUTION DISPERSION MODEL TESTING* (210)
 FISH IMPINGEMENT SAMPLING DESIGN & ESTIMATION METHOD SOFTWARE SYSTEM* (762)

SOIL

MIGRATION OF GASEOUS RADIONUCLIDES THROUGH SOIL OVERLYING A URANIUM ORE DEPOSIT: A MODELING STUDY* (645)
 ONE-DIMENSIONAL MODEL OF THE MOVEMENT OF TRACE RADIOACTIVE SOLUTE THROUGH SOIL COLUMNS - THE PERCOL MODEL* (653)
 SIMULTANEOUS HEAT AND MASS TRANSFER IN POROUS MEDIA WITH APPLICATION TO SOIL BARRING WITH POWER PLANT WASTE HEAT* (657)

SOILS

SIMULTANEOUS TRANSPORT OF WATER AND REACTING SOLUTES THROUGH MULTILAYERED SOILS UNDER TRANSIENT UNSATURATED FLOW CONDITIONS* (642)
 LINEAR DIFFUSION AND CONVECTION OF CHEMICALS IN SOILS* (640)
 MATHEMATICAL MODEL OF STROMTUM MOVEMENT IN SOILS* (658)

SOLA

SOLA-PART* (790)
 SOLA-POP* (810)
 SOLA-JD: SOLVING TIME DEPENDENT NAVIER-STOKES EQUATIONS* (810)

SOLAR

THE EFFECTS OF CHANGING THE SOLAR CONSTANT ON THE CLIMATE OF A GENERAL CIRCULATION MODEL* (327)
 RESPONSE OF THE JOINT OCEAN-ATMOSPHERE MODEL TO THE SEASONAL VARIATION OF THE SOLAR RADIATION* (320)
 SOLAR ULTRAVIOLET AND VISIBLE RADIATIVE TRANSFER MODEL* (361)
 SOLAR RADIATIVE TRANSFER MODEL* (362)

SOLUT

NUMERICAL MODELING OF SUBSURFACE RADIOACTIVE SOLUTE TRANSPORT FROM WASTE-SEEPAGE PONDS AT THE IDAHO NATIONAL ENGINEERING LABORATORY* (554)
 ONE-DIMENSIONAL MODEL OF THE MOVEMENT OF TRACE RADIOACTIVE SOLUTE THROUGH SOIL COLUMNS - THE PERCOL MODEL* (653)

SOLUTS

SIMULTANEOUS TRANSPORT OF WATER AND REACTING SOLUTES THROUGH MULTILAYERED SOILS UNDER TRANSIENT UNSATURATED FLOW CONDITIONS* (642)

SOLUTION

DIFFERENCE ANALOGUES OF BOUNDARY-VALUE PROBLEMS FOR THE EQUATIONS OF GLOBAL RADIOISOTOPE CONTAMINANT TRANSPORT AND THEIR NUMERICAL SOLUTION: DIFFERENCE APPROXIMATION OF EQUATIONS AND BOUNDARY CONDITIONS IN THE REGIONAL PLANE AND THE LOCAL DELTA OF THE ATMOSPHERE* (129)
 THE NUMERICAL SOLUTION OF PARABOLIC EQUATIONS APPLIED TO 'EDDY DIFFUSION' IN THE OCEAN* (609)
 THERMAL RESPONSE OF HEATED STREAMS: SOLUTION BY THE IMPLICIT METHOD* (537)

SOLUTIONS

MODEL FOR RADIOACTIVITY TRANSPORT IN WATER: NUMERICAL SOLUTIONS OF RADIONUCLIDE TRANSPORT EQUATIONS AND ROLE OF PLANTS IN SE-OS TRANSPORT* (390)
 NUMERICAL AND ANALYTICAL SOLUTIONS OF DISPERSION PROBLEMS IN HOMOGENEOUS AND LAYERED AQUIFERS* (545)
 FIVE EIGHT SOLUTIONS FOR THE EQUATIONS OF GROUNDWATER FLOW* (659)

SOLVING

HYBRID COMPUTER PROGRAM FOR RAPIDLY SOLVING FLOWING OR STATIC CHEMICAL KINETIC PROBLEMS INVOLVING MANY CHEMICAL SPECIES* (192)
 SOLA-JD: SOLVING TIME DEPENDENT NAVIER-STOKES EQUATIONS* (810)

SOLUS

THERMAL MODEL DEVELOPMENT AND INITIAL SIMULATIONS OF SOLUS UNITS 2 AND 3* (307)

SOLUTING

POISED DISPERSION OF TRACE CHEMICAL CONCENTRATIONS IN A SATURATED SORBING POROUS MEDIUM* (647)

TITLE INDEX

- SOPPING**
A THEORY ON THE MASS TRANSPORT OF PREVIOUSLY DISTRIBUTED CHEMICALS IN A WATER SATURATED SOBBING POROUS MEDIUM* (649)
- SORPTION**
PARTICULATE OIL SPILL RECOVERY: OIL SORPTION PROPERTIES OF PLASTIC FOAMS* (669)
- SOURCE**
CUBES2: AN IMPROVED MICROSOURCE MODEL FOR THE DIFFUSION OF AIR POLLUTANTS FROM A LINE SOURCE* (10)
CALIFORNIA LINE SOURCE DISPERSION MODEL, 3RD GENERATION* (19)
A CLIMATOLOGICAL MODEL FOR MULTIPLE-SOURCE URBAN AIR POLLUTION* (20)
POINT SOURCE TRANSPORT MODEL* (64)
EFFECT OF A MESOSCALE TYPE WIND ON THE POLLUTANT DISTRIBUTION FROM A LINE SOURCE* (67)
SOURCE ASSESSMENT: SEVERITY OF STATIONARY AIR POLLUTION SOURCES-A SIMULATION APPROACH* (75)
ANALYTICAL MODEL FOR AIR POLLUTANT TRANSPORT AND DEPOSITION FROM A POINT SOURCE* (76)
MULTIPLE SOURCE DISPERSION MODEL* (77)
TWO-DIMENSIONAL, FINITE DIFFERENCE LINE SOURCE MODEL* (79)
A MODEL OF DIFFUSION IN A VALLEY FROM A CONTINUOUS POINT SOURCE* (95)
A THREE-DIMENSIONAL STRATOSPHERIC POINT-SOURCE TRACED EXPERIMENT AND ITS IMPLICATIONS FOR DISPERSION OF EFFLUENT FROM A FLEET OF SUPERSONIC AIRCRAFT* (170)
COMPARATIVE ANALYSIS OF TIME-CONCENTRATION RELATIONSHIPS AND VALIDATION OF A SINGLE-SOURCE DISPERSION MODEL* (200)
MULTI-SOURCE ATMOSPHERIC TRANSPORT MODEL FOR DEPOSITION OF TRACE CONTAMINANTS* (207)
IMPROVEMENTS TO SINGLE-SOURCE MODEL: TESTING AND EVALUATION OF MODEL IMPROVEMENTS* (202)
POINT SOURCE ATMOSPHERIC DIFFUSION MODEL WITH VARIABLE WIND AND DIFFUSIVITY PROFILES* (259)
A MULTIPLE-SOURCE URBAN ATMOSPHERIC DISPERSION MODEL* (276)
Gaussian-Puff Multiple Source Air Quality Algorithm* (319)
A POINT SOURCE MODEL TO ESTIMATE HOURLY CONCENTRATIONS FOR STABLE POLLUTANTS* (310)
A POINT SOURCE MODEL TO ESTIMATE HOURLY CONCENTRATIONS FOR STABLE POLLUTANTS* (315)
A POINT SOURCE MODEL TO ESTIMATE HOURLY CONCENTRATIONS FOR STABLE POLLUTANTS* (316)
SINGLE SOURCE (Puff) Model* (317)
POINT, AREA, LINE SOURCE ALGORITHMS* (310)
A WATER QUALITY PLANNING MODEL WITH MULTIPLE TIME, POLLUTANT, AND SOURCE CAPABILITIES* (619)
THE NONPOINT SOURCE POLLUTANT LOADING (NPS) MODEL* (683)
MOLDED MATERIAL-COOLANT INTERACTION AND PLUTONIUM SOURCE IN LIFE ACCIDENT ANALYSIS* (610)
- SOURCE?**
AIR QUALITY MANUAL: METEOROLOGY AND ITS INFLUENCE ON THE DISPERSION OF POLLUTANTS FROM HIGHWAY LINE SOURCES* (9)
A SIMPLE DIFFUSION MODEL FOR CALCULATING POINT CONCENTRATIONS FROM MULTIPLE SOURCES* (65)
SOURCE ASSESSMENT: SEVERITY OF STATIONARY AIR POLLUTION SOURCES-A SIMULATION APPROACH* (75)
DISPERSION OF SULFUR DIOXIDE EMISSIONS FROM AREA SOURCES* (88)
A SIMPLE METHOD OF CALCULATING DISPERSION FROM URBAN AREA SOURCES* (103)
DESCRIPTION OF APL COMPUTER MODEL FOR DISPERSION FROM MULTIPLE SOURCES* (106)
MODELING ATMOSPHERIC DISPERSION OF LEAD FROM AUTOMOTIVE SOURCES* (123)
A COMPUTER CODE FOR ESTIMATING AIR POLLUTANT CONCENTRATIONS FROM DISPERSED SOURCES* (205)
USER'S MANUAL, AUTOMATED PROCEDURES FOR ESTIMATING CONTROL COSTS AND EMISSION REDUCTIONS FOR SPECIFIED AIR POLLUTION SOURCES* (307)
TWO-DIMENSIONAL TRANSIENT FAN-FIELD TEMPERATURE DISTRIBUTION IN RIVERS WITH ARBITRARY HEAT SOURCES* (607)
- SOUTH**
CONCENTRATIONS IN THE SOUTH TEXAS PROJECT COOLING RESERVOIR, DICH- DOWN AND EVAPORATION* (520)
- SOUTHEAST**
MESOSCALE AIR POLLUTION TRANSPORT IN SOUTHEAST WISCONSIN* (173)
- SOUTHERN**
SOUTHERN HEMISPHERE PREDICTION EXPERIMENT WITH A MINE-LEVEL, PRIMITIVE- EQUATION MODEL* (609)
- SO2**
KINETIC STUDY OF SIMULATED SO2, NOX, ON-POLLUTED ATMOSPHERES* (30)
MATHEMATICAL MODELS FOR SO2 DISPERSION IN THE METROPOLITAN DETROIT AREA* (60)
IRON CATALYZED OXIDATION OF SO2 TO ACID SULPHATE RIST IN DISPERSING PLUMES* (83)
OXIDATION OF SO2 TO SULFATES IN DISPERSING PLUMES* (171)
OZONE AND SO2 OPTAKE OVER VARIOUS SURFACES* (702)
- SPACE**
BEHAVIOR OF NITRIC OXIDE FORMED BY THE SPACE SHUTTLE IN THE MESOSPHERE* (73)
CALCULATION OF PRODUCTION RATES OF RADIOLIS IN SPACE* (260)
- SPATIAL**
AN EMPIRICAL MODEL USING EIGENVECTORS TO CALCULATE THE TEMPORAL AND SPATIAL VARIATIONS OF THE ST. LOUIS WHEAT ISLAND* (66)
REGIONAL EFFLUENT DISPERSION CALCULATIONS CONSIDERING SPATIAL AND TEMPORAL METEOROLOGICAL VARIATIONS* (300)
SPATIAL ANALYSIS AND SUITABILITY MODELING* (797)
- SPECIES**
HYBRID COMPUTER PROGRAM FOR RAPIDLY SOLVING FLOWING OR STATIC CHEMICAL KINETIC PROBLEMS INVOLVING MANY CHEMICAL SPECIES* (792)
- SPECIFIED**
USER'S MANUAL, AUTOMATED PROCEDURES FOR ESTIMATING CONTROL COSTS AND EMISSION REDUCTIONS FOR SPECIFIED AIR POLLUTION SOURCES* (307)
- SPECTRAL**
PREDICTIONS OF THE SPECTRAL ABSORPTION AND EXTINCTION COEFFICIENTS OF AN URBAN AIR POLLUTION AEROSOL MODEL* (302)
- SPILL**
COMPUTER SIMULATION OF OFFSHORE OIL SPILL CLEANUP OPERATIONS* (619)
COMPUTER SIMULATION AIDS OIL-SPILL CLEANUP DECISIONS* (622)
PARTICULATE OIL SPILL RECOVERY: OIL SORPTION PROPERTIES OF PLASTIC FOAMS* (661)
MATHEMATICAL MODELS PREDICT CONCENTRATION-TIME PROFILES RESULTING FROM CHEMICAL SPILL IN A RIVER* (510)
OIL SPILL TRANSPORT AND DIFFUSION PREDICTIONS* (600)
CARGO SPILL PROBABILITY ANALYSIS: A BAYESIAN APPROACH* (632)
- SPILLAGE**
IMPACT OF OIL SPILLAGE FROM WORLD WAR II TANKER SINKINGS* (600)
- SPILLS**
VULNERABILITY MODEL: A SIMULATION SYSTEM FOR ASSESSING DAMAGE RESULTING FROM MARINE SPILLS* (622)
COMPARISON OF ECOLOGICAL IMPACTS OF POSTULATED OIL SPILLS AT SELECTED ALASKAN LOCATIONS* (650)
COMPUTER SIMULATION TECHNIQUE FOR OIL SPILLS OFF THE NEW JERSEY-DELAWARE COASTLINE* (507)

TITLE INDEX

- SPILLS**
OPTIMAL PREVENTION AND DETECTION MODEL FOR POLLUTION PATROL SPILLS* (515)
- SPRAY**
THERMAL MODEL FOR ATMOSPHERIC SPRAY COOLING SYSTEMS: ENVIRONMENTAL EFFECTS OF HEAT AND MOISTURE RELEASE* (17)
AN ATMOSPHERIC SPRAY COOLING MODEL* (194)
- SPREAD**
THREE-DIMENSIONAL SPHERICAL MODEL FOR CALCULATING THE SPREAD AND DILUTION OF AIR POLLUTANTS* (147)
- SPREADING**
OIL SPREADING ON THE SEA* (454)
- SQUARE**
PREDICTION OF LONG-TERM MEAN AND MEAN SQUARE POLLUTANT CONCENTRATIONS IN AN URBAN ATMOSPHERE* (357)
- SP**
MODEL FOR RADIOACTIVITY TRANSPORT IN WATER: NUMERICAL SOLUTIONS OF RADIOISOTOPE TRANSPORT EQUATIONS AND ROLE OF PLANTS IN SR-95 TRANSPORT* (399)
SR-90 IN THE GREAT LAKES: CONCENTRATION-TIME MODEL* (470)
MODEL FOR PREDICTING SR-90 LEVELS IN HOLE OCEAN* (767)
- ST**
AN EMPIRICAL MODEL USING EIGENFUNCTIONS TO CALCULATE THE TEMPORAL AND SPATIAL VARIATIONS OF THE ST. LOUIS HEAT ISLAND* (46)
MODIFICATION OF LIVERMORE AIR QUALITY MODEL FOR USE IN ST. LOUIS* (349)
- STABILITY**
EFFECT OF ATMOSPHERIC STABILITY ON WATER TEMPERATURE PREDICTIONS FOR A THERMALLY LOADED STREAM* (420)
NEW CONCEPT IN STABILITY ANALYSIS OF SHEEP RISK-REVERSE HYDRAULICS* (440)
- STABLE**
A POINT SOURCE MODEL TO ESTIMATE HOURLY CONCENTRATIONS FOR STABLE POLLUTANTS* (314)
A POINT SOURCE MODEL TO ESTIMATE HOURLY CONCENTRATIONS FOR STABLE POLLUTANTS* (315)
A POINT SOURCE MODEL TO ESTIMATE HOURLY CONCENTRATIONS FOR STABLE POLLUTANTS* (316)
- STABLY**
A NUMERICAL MODEL FOR STABLY STRATIFIED FLOW AROUND COMPLEX TERRAINS* (273)
- STACK**
ASSESSMENT OF THE AMBIENT AIR IMPACT OF MULTIPLE STACK INDUSTRIAL PLANTS USING DISPERSION MODELING* (20)
- STACKS**
METHOD FOR SIMULATING PLUME CENTERLINES FROM TALL STACKS* (125)
SOME TECHNIQUES FOR ESTIMATING THE RESULTS OF THE EMISSION OF RADIOACTIVE EFFLUENT FROM ORE STACKS* (343)
- STAGNATION**
REGION AIR STAGNATION MODEL* (346)
- STANDARD**
A PREDICTION MODEL OF NEAR URBAN POLLUTION FOR USE WITH STANDARD WIND ROSES* (257)
STANDARD METHODOLOGY FOR CALCULATING RADIATION DOSE TO LOWER FORM BIOTA* (757)
- STANDARDS**
A MATHEMATICAL MODEL FOR RELATING AIR QUALITY MEASUREMENTS TO AIR QUALITY STANDARDS* (354)
- STANDFORD**
ORSET: PROGRAM FOR COMPUTERIZED SELECTION OF WATERSHED PARAMETER VALUES FOR THE STANFORD WATERSHED MODEL* (442)
THE STANFORD WATERSHED MODEL: THE CORRELATION OF PARAMETER VALUES SELECTED BY A COMPUTERIZED PROCEDURE WITH MEASURABLE PHYSICAL CHARACTERISTICS OF THE WATERSHED* (452)
- STATEN**
AIR POLLUTION BY COMMUTER TRAVEL ON STATEN ISLAND* (298)
- STATIC**
HYBRID COMPUTER PROGRAM FOR RAPIDLY SOLVING FLOWING OR STATIC CHEMICAL KINETIC PROBLEMS INVOLVING MANY CHEMICAL SPECIES* (192)
- STATION**
A PROGRAM FOR EVALUATING ATMOSPHERIC DISPERSION FROM A NUCLEAR POWER STATION* (287)
EXPERIMENTAL AND ANALYTICAL STUDIES OF CONDENSER WATER DISCHARGE FOR THE ATLANTIC GENERATING STATION* (447)
FAP FIELD STUDIES FOR THE ATLANTIC GENERATING STATION* (444)
BOUYANT JET DISCHARGE MODEL, SEABROOK NUCLEAR STATION* (473)
FINAL COASTAL PROCESS REPORT, ATLANTIC GENERATING STATION* (527)
DIGITAL MODELING OF RADIOACTIVE AND CHEMICAL WASTE TRANSPORT IN THE SNAKE RIVER PLAIN AQUIFER AT THE NATIONAL REACTOR TESTING STATION, IDAHO* (554)
NUMERICAL INVESTIGATION OF THE ATLANTIC GENERATING STATION'S EFFECT ON TIDAL CURRENTS FROM LITTLE EGGS ISLET, NEW JERSEY* (442)
WASTE HEAT MANAGEMENT IN THE ELECTRIC POWER INDUSTRY: ISSUES OF ENERGY CONSERVATION AND STATION OPERATION UNDER ENVIRONMENTAL CONSTRAINTS* (413)
- STATIONARY**
SOURCE ASSESSMENT: SEVERITY OF STATIONARY AIR POLLUTION SOURCES-A SIMULATION APPROACH* (75)
- STATISTICS**
COMPARATIVE MODEL THEORY OF ATMOSPHERIC CONTAMINANT LOADING BY POWER STATIONS* (123)
EVALUATION OF THERMAL DISCHARGES FROM STEAM ELECTRIC GENERATING STATIONS* (539)
- STATISTICAL**
STATISTICAL OXIDANT AIR QUALITY PREDICTION MODEL FOR LAND USE AND TRANSPORTATION PLANNING* (32)
ADVANCED STATISTICAL TRAJECTORY RESIDUAL AIR POLLUTION MODEL* (290)
A STATISTICAL METHODOLOGY FOR PREDICTING THE POLLUTANTS IN A RIVER* (385)
IMPROVING THE STATISTICAL RELIABILITY OF STREAM HEAT ASSIMILATION PREDICTIONS* (502)
- STEADY**
A STEADY-STATE, UNIVARIATE GAUSSIAN PLUME DISPERSION ALGORITHM* (319)
DOCUMENTATION FOR SUBINT/2, A COMPUTER PROGRAM FOR THE STEADY-STATE WATER QUALITY SIMULATION OF A STREAM NETWORK* (441)
OBTAINING LOCATION/ARRIVAL-TIME AND LOCATION/OUTFLOW-QUANTITY DISTRIBUTIONS FOR STEADY FLOW SYSTEMS* (515)
THERMAL REGIMES OF THE UPPER MISSISSIPPI AND MISSOURI RIVERS: TRANSIENT AND STEADY-STATE COMPUTATIONAL MODELS FOR THE PREDICTION OF RIVER THERMAL REGIMES; PART TWO: ANALYSIS OF THERMAL REGIMES OF THE MISSISSIPPI AND MISSOURI RIVERS IN THE MID-CONTINENT AREA POWER POOL (HAPP) GEOGRAPHICAL AREA* (530)
TWO-DIMENSIONAL TEMPERATURE MODEL FOR A THERMALLY LOADED RIVER WITH STEADY DISCHARGE* (416)
ADVERSE STEADY STATE VARIATION DISPERSION AND DENSITY CODE* (723)
- STEAM**
EVALUATION OF THERMAL DISCHARGES FROM STEAM ELECTRIC GENERATING STATIONS* (539)
- STIMULI**
PREDICTING RESPONSES OF AQUATIC BIOTA TO THERMAL STIMULI* (551)

TITLE INDEX

STOCHASTIC

- A STOCHASTIC MODEL FOR CARBON MONOXIDE CONCENTRATIONS ALONG HIGHWAYS AND STREETS* (116)
 STOCHASTIC VARIATION OF WATER QUALITY OF THE PASSAIC RIVER* (505)
 UPTAKE OF FALLOUT RADIONUCLIDES BY MARSHALS AND A STOCHASTIC SIMULATION OF THE PROCESS* (677)
 A STOCHASTIC FISH LIFE-CYCLE POPULATION MODEL USING A MODIFIED LESLIE MATRIX* (759)

STORM

- SOIA-3D: SOLVING TIME DEPENDENT NAVIER-STOKES EQUATIONS* (810)

STORMS

- MEASUREMENT AND MODELING OF STORM WATER RUNOFF FROM COAL STORAGE PILES AND THE IMPACT ON RECEIVING WATERS* (802)

STORM

- MEASUREMENT AND MODELING OF STORM WATER RUNOFF FROM COAL STORAGE PILES AND THE IMPACT ON RECEIVING WATERS* (822)

STORMS

- NUMERICAL SIMULATION OF THE EFFECTS OF COOLING TOWER COMPLEXES ON CLOUDS AND SEVERE STORMS* (367)

STORMWATER

- STORMWATER MANAGEMENT MODEL* (592)

STRAIGHTLINE

- A MODEL TO PREDICT RADIOLOGICAL ENVIRONMENTAL IMPACT RESULTING FROM STRAIGHTLINE WIND DAMAGE TO A PLUTONIUM FACILITY* (339)

STRAIT

- SIMULATION OF MOVEMENT OF OIL SLICKS IN THE STRAIT OF GEORGIA USING SIMPLE ATMOSPHERE AND OCEAN DYNAMICS* (909)

STRATEGIC

- MODELING THE ECONOMIC AND ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVE ENERGY POLICIES: SENS-STRATEGIC ENVIRONMENTAL ASSESSMENT SYSTEM* (789)

STRATEGIES

- OUTDOOR SIMULATION OF AIR POLLUTION CONTROL STRATEGIES* (352)

STRATIFICATION

- FIELD EVALUATION OF A PREDICTIVE MODEL FOR THERMAL STRATIFICATION IN LAKES AND RESERVOIRS* (413)
 PREDICTIVE MODEL FOR THERMAL STRATIFICATION AND WATER QUALITY IN RESERVOIRS* (490)
 ENVIRONMENTAL PARAMETERS OF THE TENNESSEE RIVER IN ALABAMA, THERMAL STRATIFICATION* (635)

STRATIFIED

- A NUMERICAL MODEL FOR STABLY STRATIFIED FLOW AROUND COMPLEX TERRAIN* (273)
 A THERMAL FLUID-MECHANICAL MODEL FOR ESTIMATION OF POWER PLANT IMPACT ON A STRATIFIED LAKE* (509)

STRATOSPHERE

- FORMATION OF SULFATE IN THE STRATOSPHERE THROUGH THE GAS PHASE OXIDATION OF SULFUR DIOXIDE* (108)
 MODEL OF GLOBAL RADIOISOTOPE TRANSPORT IN THE TROPOSPHERE AND LOWER STRATOSPHERE: FUNDAMENTAL EQUATIONS AND BOUNDARY CONDITIONS* (128)
 PLANETARY DISTRIBUTION OF ZONAL MEAN TRANSPORT PARAMETERS OF RADIOISOTOPES IN THE TROPOSPHERE AND LOWER STRATOSPHERE: CLIMATIC DISTRIBUTION OF THE ZONAL MEAN COMPONENTS OF THE MERIDIONAL CIRCULATION VELOCITY* (130)
 EFFECT OF WATER VAPOR ON THE DESTRUCTION OF OZONE IN THE STRATOSPHERE PERTURBED BY CLX OR NOX POLLUTANTS* (166)
 NUMERICAL SIMULATION OF THE STRATOSPHERE: IMPLICATIONS FOR RELATED CLIMATE CHANGE PROBLEMS* (179)

STRATOSPHERIC

- THE ATMOSPHERIC RESPONSE TO A STRATOSPHERIC DUST CLOUD AS SIMULATED BY A GENERAL CIRCULATION MODEL* (7)
 PREPREDICTED COAGULATION-SEDIMENTATION MODEL FOR STRATOSPHERIC AEROSOLS* (27)
 COMPUTATION OF POSSIBLE CLIMATIC CONSEQUENCES OF PERTURBATIONS TO STRATOSPHERIC AEROSOLS, OZONE AND WATER VAPOR WITH RADIATIVE-CONVECTIVE MODELS* (84)
 STRATOSPHERIC AEROSOLS: EFFECT UPON ATMOSPHERIC TEMPERATURE AND GLOBAL CLIMATE* (110)
 ESTIMATES OF STRATOSPHERIC POLLUTION BY AN ANALYTIC MODEL* (119)
 STRATOSPHERIC CONCENTRATIONS OF CCL₄ IN 1974* (140)
 A THREE-DIMENSIONAL STRATOSPHERIC POINT-SOURCE TRACED EXPERIMENT AND ITS IMPLICATIONS FOR DISPERSION OF EFFLUENT FROM A FLEET OF SUPERSONIC AIRCRAFT* (170)
 STRATOSPHERIC OZONE DESTRUCTION BY AIRCRAFT-INDUCED NITROGEN OXIDES* (340)

STREAM

- DOCUMENTATION FOR SWIN1/2, A COMPUTER PROGRAM FOR THE STEADY-STATE WATER QUALITY SIMULATION OF A STREAM NETWORK* (41)
 PREDICTION OF HEATED EFFLUENT DISPERSION IN A STREAM USING SIMILITUDE TECHNIQUES* (418)
 EFFECT OF ATMOSPHERIC STABILITY ON WATER TEMPERATURE PREDICTIONS FOR A THERMALLY LOADED STREAM* (820)
 IMPROVING THE STATISTICAL RELIABILITY OF STREAM HEAT ASSIMILATION PREDICTIONS* (562)
 STREAM TEMPERATURE MODELING* (519)
 A WASTE ASSIMILATION CAPACITY MODEL FOR A SHALLOW, TURBULENT STREAM* (531)
 TRANSPORT MODEL FOR LONG TERM RADIOISOTOPE RELEASE INTO A STREAM ECOSYSTEM* (610)
 STREAM QUALITY MODELING BY QUASILINEARIZATION* (630)
 APPLICATION OF STREAM WATER QUALITY MODELS TO ALABAMA* (631)

STREAMFLOW

- SIMULATION OF MAJOR INORGANIC CHEMICAL CONCENTRATIONS AND LOADS IN STREAMFLOW* (576)

STREAMFLOWS

- STUDY OF THE IMPACTS OF REDUCED STREAMFLOWS IN THE MIDDLE AND LOWER YELLOWSTONE BASIN* (620)

STREAMS

- DIGITAL SIMULATION OF AGGRAVATION AND DEGRADATION IN NATURAL STREAMS* (308)
 MODELS TO PREDICT ENVIRONMENTAL IMPACT OF WIDE DRAINAGE ON STREAMS* (409)
 SIMPLE METHOD FOR PREDICTING DISPERSION IN STREAMS* (504)
 BOSAG-1, SIMULATION OF WATER QUALITY IN STREAMS AND CANALS: PROGRAM DOCUMENTATION AND USERS MANUAL* (530)
 THERMAL RESPONSE OF HEATED STREAMS: SOLUTION BY THE IMPLICIT METHOD* (537)

STREETS

- A STOCHASTIC MODEL FOR CARBON MONOXIDE CONCENTRATIONS ALONG HIGHWAYS AND STREETS* (116)
 MODEL FOR THE DISPERSION OF PARTICULATE OR GASEOUS POLLUTANTS FROM A NETWORK OF STREETS AND HIGHWAYS* (304)

STRESS

- MODEL OF PHOTOSYNTHESIS AND GROWTH OF CROPS UNDER POLLUTANT STRESS* (775)

STRIP

- SIMULATION APPROACH TO THE ANALYSIS OF STRIP-MINING IMPACT ON THE ECOSYSTEM WITH EMPHASIS ON WILDLIFE* (792)

STROMS

- WET PLANE WISE FROM COOLING TOWERS IN STRONG WINDS* (302)

TITLE INDEX

STROTIUM

A CODE TO ESTIMATE STROTIUM-90 GLOBAL DEPOSITION FROM ATMOSPHERIC NUCLEAR DETONATIONS* (239)
 MATHEMATICAL MODEL OF STROTIUM MOVEMENT IN SOILS* (458)
 PREDICTION MODELS FOR STROTIUM-90 AND CESIUM-137 LEVELS IN THE HUMAN FOOD CHAIN* (479)
 TRANSFER OF STROTIUM-90 FROM PLANTS TO RABBITS* (760)

STRUCTURE

THE STRUCTURE OF THE TWO-DIMENSIONAL INTERNAL BOUNDARY LAYER OVER A SUDDEN CHANGE OF SURFACE ROUGHNESS* (265)
 MATHEMATICAL SIMULATION OF THE TURBIDITY STRUCTURE WITHIN AN IMPULSION* (431)

SUB

HYDROLOGICAL SUB-MODELS FOR AGRES - RADIATIVE TRANSFER* (74)
 HYDROLOGICAL SUB-MODELS FOR AGRES - TURBULENCE MODELS* (15)
 HYDROLOGICAL SUB-MODELS FOR AGRES: WIND AND TEMPERATURE PROFILES* (76)

SUDALPINE

SIMULATING EFFECTS OF HARVEST CUTTING ON SUDALPINE IN COLORADO SUDALPINE FOREST* (417)
 SIMULATING TIMBER YIELDS AND HYDROLOGIC IMPACTS RESULTING FROM TIMBER HARVEST ON SUDALPINE WATERSHEDS* (474)

SUBSOLAR

SUBSOLAR* (730)

SUBMERGED

LABORATORY EXPERIMENTS OF SUBMERGED DISCHARGES WITH CURRENT* (407)
 ANALYSIS OF SUBMERGED THERMAL DISCHARGE FROM OCEAN-SITED POWER PLANTS* (429)
 THERMAL PLUME, SUBMERGED MULTIPORT DIFFUSER MODEL* (492)
 RE-ENTRANCEMENT AND RE-CIRCULATION SIMULATOR FOR PLUM CONDITIONS NEAR SUBMERGED DISCHARGES* (500)
 MATHEMATICAL MODEL FOR INDUCED VELOCITY DISTRIBUTION AROUND A SUBMERGED INTAKE* (574)

SUBSEA

OCEANIC DIFFUSION OF A SEVERE ACCIDENTAL RADIOACTIVE RELEASE FROM A SUBSEA NUCLEAR POWER PLANT* (477)

SUBSURFACE

MODELING POLLUTANT MIGRATION IN SUBSURFACE ENVIRONMENTS* (506)
 MATHEMATICAL MODELING OF SUBSURFACE RADIOACTIVE SOLUTE TRANSPORT FROM WASTE-SEEPAGE PONDS AT THE IDAHO NATIONAL ENGINEERING LABORATORY* (550)

SUDALPINE

THE STRUCTURE OF THE TWO-DIMENSIONAL INTERNAL BOUNDARY LAYER OVER A SUDDEN CHANGE OF SURFACE ROUGHNESS* (255)

SUITABILITY

SPATIAL ANALYSIS AND SUITABILITY MODELING* (791)

SULFATE

FORMATION OF SULFATE IN THE STRATOSPHERE THROUGH THE GAS PHASE OXIDATION OF SULFUR DIOXIDE* (109)
 DESIGN OF THE SULFATE REGIONAL EXPERIMENT (SOREX)* (214)

SULFATES

FORMATION OF SULFATES AND THE ENHANCEMENT OF CLOUD CONDENSATION NUCLEI IN CLOUDS* (72)
 OXIDATION OF SO₂ TO SULFATES IN DISPERSING PLUMES* (179)

SULFUR

INFLUENCE OF SULFUR DIOXIDE ON VEGETATION WITH EMPHASIS ON SIMULATION MODELS* (62)
 DISPERSION OF SULFUR DIOXIDE EMISSIONS FROM AREA SOURCES* (80)
 MODEL FOR THE DISPERSION OF SULFUR DIOXIDE OVER AN URBAN AREA* (97)
 FORMATION OF SULFATE IN THE STRATOSPHERE THROUGH THE GAS PHASE OXIDATION OF SULFUR DIOXIDE* (109)
 NUMERICAL MODEL FOR REGIONAL TRANSPORT OF SULFUR POLLUTANTS IN THE ATMOSPHERE* (244)
 IMPACT OF ENERGY SHORTAGE ON AMBIENT SULFUR DIOXIDE AND PARTICULATE LEVELS IN METROPOLITAN BOSTON* (296)
 A SHORT-TERM AND QUALITY MODEL FOR SULFUR DIOXIDE IN LOUISVILLE, KENTUCKY* (359)

SULPHATE

IRON CATALYZED OXIDATION OF SO₂ TO ACID SULPHATE MIST IN DISPERSING PLUMES* (83)

SUMMARY

SUMMARY REPORT ON MODELING ANALYSIS OF POWER PLANTS FOR FUEL CONVERSION* (206)

SUPERIMPOSED

A COMPUTED SIMULATION OF THE EFFECTS OF SUPERIMPOSED MORTALITY DUE TO POLLUTANTS ON POPULATIONS OF FATHEAD MINNOWS (PIRENELES PROMELAS)* (773)

SUPERSONIC

A THREE-DIMENSIONAL STRATOSPHERIC POINT-SOURCE TRACKER EXPERIMENT AND ITS IMPLICATIONS FOR DISPERSION OF EFFLUENT FROM A FLEET OF SUPERSONIC AIRCRAFT* (170)

SUPPORT

A FORTE CARLO CODE WITH SUPPORT PROGRAMS FOR DOSE COMPUTATION* (746)

SURE

DESIGN OF THE SULFATE REGIONAL EXPERIMENT (SOREX)* (214)

SURFACE

WIND EFFECTS REDISTRIBUTION OF SURFACE CONTAMINATION* (4)
 A NON-EQUILIBRIUM MODEL OF HEMISPHERIC MEAN SURFACE TEMPERATURE* (26)
 ATMOSPHERIC DIFFUSION IN THE SURFACE TURBULENT BOUNDARY LAYER* (126)
 VERTICAL TRANSPORT AND REMOVAL OF RADIOACTIVE AEROSOLS IN THE ATMOSPHERE: QUANTITATIVE MODELS OF AEROSOL WASHOUT BY PRECIPITATION AND NET DEPOSITION ON THE UNDERLYING SURFACE* (117)
 THE STRUCTURE OF THE TWO-DIMENSIONAL INTERNAL BOUNDARY LAYER OVER A SUDDEN CHANGE OF SURFACE ROUGHNESS* (265)
 PREDICTION OF SURFACE FLUX AREAS ASSOCIATED WITH HEATED DISCHARGES INTO LARGE LAKES - A PNEUMATOLOGICAL MODEL* (433)
 APPLICATION OF THE FINITE-ELEMENT METHOD FOR SIMULATION OF SURFACE WATER TRANSPORT REGIMES* (440)
 COMPUTED SIMULATION OF SURFACE WATER HYDROLOGY AND SALINITY WITH AN APPLICATION TO STUDIES OF COLORADO RIVER MANAGEMENT* (460)
 POINT-TO-RECTANGULAR SURFACE THERMAL PLUMES* (470)
 THERMAL PLUME, SURFACE DISCHARGE MODEL* (494)
 ESTIMATED PLUME SURFACE TEMPERATURES AFTER INTERFERENCE* (520)
 REGIONAL MODELING OF SURFACE WATER TEMPERATURES FROM PROJECTED POWER GROWTH* (574)
 ANALYTICAL JET-TYPE MODEL OF HEATED WATER SURFACE PLUMES* (577)
 SURFACE DISCHARGE OF HEATED WATER* (578)
 AN ANALYTICAL AND EXPERIMENTAL INVESTIGATION OF SURFACE DISCHARGES OF HEATED WATER* (579)
 A USER'S MANUAL FOR THREE-DIMENSIONAL HEATED SURFACE DISCHARGE COMPUTATIONS* (580)
 CRITICAL MODEL FOR LAKE NICHOLSON POLLUTION, CONSIDERATIONS OF ATMOSPHERIC AND SURFACE WATER TRACE METAL INPUTS* (601)
 DEVELOPMENT OF A SIMULATION MODEL FOR EVALUATION OF SURFACE HEATING OPERATIONS AND DECONTAMINATION PLANS* (795)
 OZONE AND SO₂ UPTAKE OVER VARIOUS SURFACES* (702)

SURVIVAL

TITLE INDEX

SUBCOMMITTEE

THE AIRDOC-11 COMPUTER CODE FOR ESTIMATING RADIATION DOSE TO MAN FROM AIRBORNE RADIOISOTOPES IN AREAS SURROUNDING NUCLEAR FACILITIES* (1724)

SURVEY

SURVEY OF LABORATORY MODELING OF PLUME DYNAMICS* (272)
A SURVEY OF DISPERSION COEFFICIENTS FOR ESTIMATING POLLUTANT TRANSPORT* (462)

SUMMARY

ESSAY, A CODE FOR SYSTEM SURVIVABILITY ANALYSIS - NUCLEAR EFFECTS* (694)
A CODE FOR ANALYSIS OF NUCLEAR EFFECTS AND SYSTEMS SURVIVABILITY: NEUTRONS AND GAMMAS* (807)

SYSTEM

PREDICTIVE STUDY OF THE DISPERSION OF EMISSIONS FROM THE SYCAMORE WILDED LAKE PLANT* (800)

SYSTEM

USE OF LAPS SYSTEM FOR THE QUANTITATIVE DETERMINATION OF SMOKE PLUME LATERAL DIFFUSION COEFFICIENTS FROM ERTS IMAGES OF VIRGINIA* (17)
A SOFTWARE SYSTEM TO SIMULATE COAL PLANT PARTICULATE CONTROLS* (84)
A NEW FAILURE TRANSPORT CODE FOR THE DELFC SYSTEM: THE DIFFUSIVE TRANSPORT MODULE* (213)
REGIONAL EMISSION PROJECTION SYSTEM (REPS)* (224)
WPP-4 CODE MODIFICATIONS FOR RF PROPAGATION AND SYSTEM PERFORMANCE MODELING* (200)
GLOBAL CLIMATIC MODEL BASED ON ENERGY BALANCE OF THE EARTH-ATMOSPHERE SYSTEM* (207)
PHOTOCHEMICAL OXIDANT MODELING, TECHNIQUES APPLICABLE TO HIGHWAY SYSTEM EVALUATION* (373)
A SYSTEM APPROACH FOR THE STUDY AND CONTROL OF FACTORS AFFECTING WATER POLLUTION* (304)
VULNERABILITY MODEL: A SIMULATION SYSTEM FOR ASSESSING DAMAGE RESULTING FROM NARINE SPILLS* (422)
PARR: A SYSTEM OF COMPUTER PROGRAMS FOR RADIOISOTOPE PATHWAY ANALYSIS CALCULATIONS* (486)
AUTO-QUAL MODELING SYSTEM* (543)
NATIONAL WEATHER SERVICE RIVER FORECAST SYSTEM* (544)
PM PROFILES IN A RIVER SYSTEM WITH MULTIPLE ACID LOADS* (639)
ESSAY, A CODE FOR SYSTEM SURVIVABILITY ANALYSIS - NUCLEAR EFFECTS* (694)
SYSTEM IDENTIFICATION OF RADIOISOTOPE FLOWS IN AQUATIC MICROCOSMS* (751)
FISH IMPINGEMENT SAMPLING DESIGN & ESTIMATION METHOD SOFTWARE SYSTEM* (762)
MODELING THE ECONOMIC AND ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVE ENERGY POLICIES: SEAS-STRATEGIC ENVIRONMENTAL ASSESSMENT SYSTEM* (788)

SYSTEMS

THERMAL MODEL FOR ATMOSPHERIC SPRAY COOLING SYSTEMS: ENVIRONMENTAL EFFECTS OF HEAT AND MOISTURE RELEASE* (37)
ATMOSPHERIC IMPACT MODELS FOR CLOSED CYCLE COOLING SYSTEMS* (229)
WEIGHTED DIGRAPH MODELS FOR THE ASSESSMENT OF ENERGY USE AND AIR POLLUTION IN TRANSPORTATION SYSTEMS* (274)
DIGITAL SIMULATION OF DIESEL EXHAUST CONTAMINATION OF RIVE VENTILATION SYSTEMS* (307)
REGIONAL EMISSIONS PROJECTION SYSTEMS* (375)
MATHEMATICAL MODELS FOR THE DISPERSION OF RADIOISOTOPES IN AQUATIC SYSTEMS* (354)
A SYSTEMS ANALYSIS MODEL FOR CALCULATING RADIOISOTOPE TRANSPORT BETWEEN RECEIVING WATERS AND BOTTOM SEDIMENT* (390)
MODELING AND CONTROL OF THE POLLUTION OF WATER RESOURCES SYSTEMS VIA MULTILEVEL APPROACH* (405)
PREDICTION OF TEMPERATURE INCREASES FROM THERMAL DISCHARGES: A SYSTEMS APPROACH* (496)
PUBTIC SYSTEMS: A MATHEMATICAL MODEL* (512)
OBTAINING LOCATION/ADDITIONAL-TIME AND LOCATION/OUTFLOW-QUANTITY DISTRIBUTIONS FOR STEADY FLOW SYSTEMS* (515)
DESIGN AND SITING CRITERIA FOR ONCE-THROUGH COOLING SYSTEMS BASED ON A FIRST-ORDER THERMAL PLUME MODEL* (549)
ENVIRONMENTAL RATE MODEL FOR AQUATIC SYSTEMS* (540)
HYDRA: DYNAMIC MODEL FOR URBAN HYDROLOGIC SYSTEMS* (592)
WATER QUALITY FOR RIVER - RESERVOIR SYSTEMS* (603)
POPULAR RIVER WATER QUALITY SYSTEMS MODEL* (624)
A SYSTEMS ANALYSIS METHODOLOGY FOR PREDICTING DOSE TO MAN FROM A RADIOACTIVELY CONTAMINATED TERRESTRIAL ENVIRONMENT* (707)
EVALUATION OF A DIGITAL COMPUTER METHOD FOR ANALYSIS OF COMPARTMENTAL MODELS OF ECOLOGICAL SYSTEMS* (705)
A CODE FOR ANALYSIS OF NUCLEAR EFFECTS AND SYSTEMS SURVIVABILITY: NEUTRONS AND GAMMAS* (807)

TACTICAL

A PRECIPITATION SCAVENGING MODEL FOR STUDIES OF TACTICAL NUCLEAR OPERATIONS* (214)

TRAILINGS

POTENTIAL RADIOLOGICAL IMPACT OF AIRBORNE RELEASES AND DIRECT GAMMA RADIATION TO INDIVIDUALS LIVING NEAR INACTIVE URANIUM MILL TRAILINGS PILES* (704)

TALL

METHOD FOR SIMULATING PLUME CENTERLINES FROM TALL STACKS* (125)

TANKER

IMPACT OF OIL SPILLAGE FROM WORLD WAD II TANKER SINKINGS* (404)

TAPE

AIR TRANSPORT CALCULATIONS USING THE LAST-SURF AIR FLUX TAPE AND THE SURF COMPUTER PROGRAM--CDB* (37)

TECHNICAL

MATHEMATICAL AND TECHNICAL APPROACH TO DIFFUSION ANALYSIS OF AIR CONTAMINANTS* (215)

TEMPERATURE

METEOROLOGICAL SUB-MODELS FOR AGGREGATE WIND AND TEMPERATURE PROFILES* (14)
A NON-EQUILIBRIUM MODEL OF THERMOSPHERIC HEAT SURFACE TEMPERATURE* (24)
A GLOBAL MODEL OF THERMOSPHERIC DYNAMICS, WIND AND DENSITY FIELDS DERIVED FROM A PHYSICALLY LOGICAL TEMPERATURE* (34)
STATIONARY ATMOSPHERIC AEROSOLS: EFFECT UPON ATMOSPHERIC TEMPERATURE AND GLOBAL CLIMATE* (110)
ANALYSIS OF WENTHER DATA--WIND ANALYSIS, TEMPERATURE ANALYSIS, PRECIPITATION ANALYSIS* (244)
PREDICTING THE EFFECT OF GEOTHERMAL EMISSIONS ON THE TEMPERATURE AND RELATIVE HUMIDITY IN THE IMPERIAL VALLEY OF CALIFORNIA* (354)
PREDICTION OF TEMPERATURE PROFILES IN ARBITRARILY SHAPED COOLING LINES BY FINITE DIFFERENCE TECHNIQUES* (414)
EFFECT OF ATMOSPHERIC STABILITY ON WATER TEMPERATURE PREDICTIONS FOR A THERMALLY LOADED STREAM* (434)
ONE-DIMENSIONAL, REGIONAL TEMPERATURE SIMULATION MODEL* (421)
TRANSIENT THREE DIMENSIONAL MODELING OF TEMPERATURE DISTRIBUTIONS IN RIVERS WITH AND WITHOUT THERMAL DISCHARGES* (432)
MATHEMATICAL MODELS FOR THE PREDICTION OF TEMPERATURE DISTRIBUTIONS RESULTING FROM THE DISCHARGE OF HEATED WATER INTO LARGE BODIES OF WATER* (444)
WATER TEMPERATURE PREDICTING AND ESTIMATION USING FOURIER SERIES AND CORRELATION THEORY TECHNIQUES* (445)
TEMPERATURE DISTRIBUTION MODEL FOR COOLING POND* (474)
PREDICTION OF TEMPERATURE INCREASES FROM THERMAL DISCHARGES: A SYSTEMS APPROACH* (496)
TEMPERATURE DISTRIBUTION IN THE VICINITY OF HEATED DISCHARGES FROM POWER PLANTS* (499)

TITLE INDEX

HYDRO-HEAT

HYDRO-HEAT--COOLING POND TEMPERATURE DISTRIBUTION* (501)
 STREAM TEMPERATURE MODELING* (511)
 POTENTIAL RIVER TEMPERATURE RISE DISTRIBUTION AND DIFFUSION PARAMETER EVALUATION* (521)
 MATHEMATICAL MODELING OF TEMPERATURE EFFECTS IN TIDAL RIVERS* (522)
 SIMPLIFIED MATHEMATICAL MODEL OF TEMPERATURE CHANGES IN RIVERS* (532)
 MULTI-LAYERED MODELS OF CURRENTS, TEMPERATURE, AND WATER QUALITY PARAMETERS IN THE GREAT LAKES* (570)
 TWO-DIMENSIONAL TRANSIENT FLOW-FIELD TEMPERATURE DISTRIBUTION IN RIVERS WITH ARBITRARY HEAT SOURCES* (667)
 TWO-DIMENSIONAL TEMPERATURE MODEL FOR A THERMALLY LOADED RIVER WITH STEADY DISCHARGE* (676)
 MODELING THE EFFECTS OF TEMPERATURE CHANGES ON THE ECOLOGY OF RARA PIPIENS AND THERMOPHILIC BACTERIA* (766)

HYDRO-HEAT

INVESTIGATION OF GAS TURBINE COMBUSTORS WITH HIGH INLET AIR TEMPERATURES, COMBUSTOR MODELING* (101)
 ESTIMATED PLUME SURFACE TEMPERATURES AFTER INTERFERENCE* (528)
 A MATHEMATICAL MODEL FOR PREDICTING RIVER TEMPERATURES--APPLICATION TO THE GREEN RIVER BELOW FLARING GORGE DAM* (558)
 REGIONAL MODELING OF SURFACE WATER TEMPERATURES FROM PROJECTED POWER GROWTH* (577)
 A MATHEMATICAL MODEL FOR PREDICTING TEMPERATURES IN RIVERS AND RIVER-RUN RESERVOIRS* (613)

TEMPORAL

AN EMPIRICAL MODEL USING RIGOROUS TO CALCULATE THE TEMPORAL AND SPATIAL VARIATIONS OF THE ST. LOUIS HEAT ISLAND* (66)
 REGIONAL EFFLUENT DISPERSION CALCULATIONS CONSIDERING SPATIAL AND TEMPORAL METEOROLOGICAL VARIATIONS* (300)

TENNESSEE

THE TENNESSEE VALLEY ASSESSMENT MODEL* (204)
 ENVIRONMENTAL PARAMETERS OF THE TENNESSEE RIVER IN ALABAMA, THERMAL STRATIFICATION* (615)
 TENNESSEE AND CUMBERLAND RIVER BASINS RADIOACTIVE TRANSPORT* (704)

TEMP

SHORT TERM DISPERSION MODELS* (152)
 AN URBAN AIR DIFFUSION MODEL FOR ESTIMATING LONG TERM AVERAGE VALUES OF AIR QUALITY* (706)
 LONG TERM ATMOSPHERIC DISPERSION CALCULATIONS* (304)
 EMPIRICAL TECHNIQUES FOR ANALYZING AIR QUALITY AND METEOROLOGICAL DATA: SHORT-TERM CHANGES IN GROUND-LEVEL OZONE CONCENTRATIONS* (345)
 A SHORT-TERM AIR QUALITY MODEL FOR SULFUR DIOXIDE IN LOUISVILLE, KENTUCKY* (351)
 PREDICTION OF LONG-TERM MEAN AND MEAN SQUARE POLLUTANT CONCENTRATIONS IN AN URBAN ATMOSPHERE* (357)
 ONE LONG-TERM GROSSER DISPERSION MODEL* (364)
 TRANSPORT MODEL FOR LONG TERM RADIOACTIVE RELEASE INTO A STREAM ECOSYSTEM* (610)

TERRAIN

A MASS CONSISTENT ATMOSPHERIC FLUX MODEL FOR REGIONS WITH COMPLEX TERRAIN* (66)
 AIRBORNE AIR POLLUTION MONITORING EXPERIMENT IN AN AREA OF MOUNTAIN-VALLEY TERRAIN* (127)
 COMPLEX TERRAIN WIND MODEL* (165)
 A NUMERICAL MODEL FOR STABLY STRATIFIED FLOW AROUND COMPLEX TERRAIN* (273)
 DEVELOPMENT OF VERTICAL DISPERSION COEFFICIENTS FOR ROLLING TERRAIN ENVIRONMENTS* (297)

TERRESTRIAL

ECOLOGICAL TRANSFER MECHANISMS - TERRESTRIAL* (673)
 A SYSTEMS ANALYSIS METHODOLOGY FOR PREDICTING DOSE TO MAN FROM A RADIOACTIVELY CONTAMINATED TERRESTRIAL ENVIRONMENT* (747)

TEXAS

TEXAS EPISCOPIC MODEL* (41)
 CONCENTRATIONS IN THE SOUTH TEXAS PROJECT COOLING RESERVOIR, BLOW-DOWN AND EVAPORATION* (520)

THERMOPHILS

MODELING THE EFFECTS OF TEMPERATURE CHANGES ON THE ECOLOGY OF RARA PIPIENS AND THERMOPHILIC BACTERIA* (766)

THEORETICAL

THEORETICAL MODELS FOR LUG DISPERSION* (227)
 THEORETICAL MODEL FOR RELATING INDOOR POLLUTANT CONCENTRATIONS TO THOSE OUTSIDE* (280)
 ON THE BOUNDARY CONDITIONS IN THEORETICAL MODEL CALCULATIONS OF THE DISTRIBUTIONS OF HIGH NEUTRAL CONSTITUENTS IN THE UPPER ATMOSPHERE* (294)
 TWO-DIMENSIONAL MATHEMATICAL MODEL OF THE FLOW-FIELD FLOW FOR AN OCEAN THERMAL POWER PLANT: THE THEORETICAL APPROACH AND A LABORATORY SIMULATION* (553)

THERM

POLLUTANT DISTRIBUTIONS IN THE MIXED LAYER, USING SIMILARITY THEORY* (64)
 COMPARATIVE MODEL THEORY OF ATMOSPHERIC CONTAMINANT LOADING BY POWER STATIONS* (123)
 THE APPLICATION OF K-THEORY TO DIFFUSION PROBLEMS INVOLVING NONLINEAR CHEMICAL REACTIONS* (703)
 WATER TEMPERATURE FORECASTING AND ESTIMATION USING FORCED SERIES AND COMMUNICATION THEORY TECHNIQUES* (805)
 A THEORY ON THE MASS TRANSPORT OF PREVIOUSLY DISTRIBUTED CHEMICALS IN A WATER SATURATED SORBING POROUS MEDIUM* (649)

THERMAL

THERMAL MODEL FOR ATMOSPHERIC SPRAY COOLING SYSTEMS: ENVIRONMENTAL EFFECTS OF HEAT AND MOISTURE RELEASE* (37)
 NORTH CAROLINA STUDIES ON THE TIME-DEPENDENT TRANSPORT OF OPTICAL AND INFRARED RADIATION IN THE ATMOSPHERE: THERMAL RADIATION TRANSPORT* (49)
 THERMAL EQUILIBRIUM OF THE ATMOSPHERE WITH A GIVEN DISTRIBUTION OF RELATIVE HUMIDITY* (101)
 THERMAL AND RADIATIVE EFFECTS OF ATMOSPHERIC AEROSOLS IN THE NORTHERN HEMISPHERE CALCULATED USING A RADIATIVE CONVECTIVE MODEL* (372)
 THERMAL MODEL DEVELOPMENT AND INITIAL SIMULATIONS OF SOME UNITS 2 AND 3* (307)
 THERMAL PLUME INVESTIGATIONS FOR UNION ELECTRIC COMPANY'S CALLAWAY PLANT, UNITS 1 AND 2* (395)
 DEVELOPMENT OF A GENERAL COMPUTER MODEL FOR SIMULATING THERMAL DISCHARGES IN THREE DIMENSIONS* (399)
 CALIBRATION OF A THERMAL EFFLUENT MODEL FOR SHALLOW, BARRIAGED ESTUARIES* (605)
 DIGITAL COMPUTER SIMULATION OF THERMAL EFFLUENT DISPERSION IN RIVERS, LAKES, AND ESTUARIES* (612)
 FIELD EVALUATION OF A PREDICTIVE MODEL FOR THERMAL STRATIFICATION IN LAKES AND RESERVOIRS* (613)
 PHENOMENOLOGICAL MODEL FOR THE PREDICTION OF THERMAL PLUMES IN LARGE LAKES* (623)
 TRANSPORT THREE DIMENSIONAL MODELING OF TEMPERATURE DISTRIBUTIONS IN RIVERS WITH AND WITHOUT THERMAL DISCHARGES* (653)
 COMPUTER MODEL FOR PREDICTING THERMAL DISCHARGES IN LARGE LAKES* (654)
 DYNAMIC RECTANGULAR SURFACE THERMAL PLUMES* (670)
 THREE-DIMENSIONAL NUMERICAL MODELS FOR THE PREDICTION OF THERMAL DISCHARGES* (673)
 ANALYSIS OF THERMAL DISCHARGE FROM OCEAN-SITED POWER PLANTS* (680)
 PREDICTIVE MODEL FOR THERMAL STRATIFICATION AND WATER QUALITY IN RESERVOIRS* (690)
 THERMAL PLUME, SOURCE-ORIENTED MULTIPART DIFFUSION MODEL* (672)
 THERMAL PLUME, SOURCE-ORIENTED MODEL* (673)
 PREDICTION OF TEMPERATURE INCREASES FROM THERMAL DISCHARGES: A SYSTEMS APPROACH* (670)

TITLE INDEX

*0829

COOLING TOWER FLUME-MATHEMATICAL MODEL* (229)
 A COMPREHENSIVE MODEL STUDY OF SALT DRIFT DEPOSITS, INDUCED FOGGING AND ICING FROM MECHANICAL DRAFT COOLING TOWER PLUMES AT INDIAN POINT* (230)
 A MODEL TO PREDICT SALT-DRIFT DEPOSITION FROM A NATURAL DRAFT COOLING TOWER* (245)
 A MODEL TO PREDICT WAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (250)
 A MODEL TO PREDICT PLUMES FROM A SINGLE NATURAL-DRAFT COOLING TOWER* (255)
 STUDIES OF THE ENVIRONMENTAL IMPACT OF EVAPORATIVE COOLING TOWER PLUMES* (300)
 COOLING TOWER PLUME MODEL* (336)
 NUMERICAL SIMULATION OF THE EFFECT OF COOLING TOWER COMPLEXES ON CLOUDS AND SEVERE STORMS* (367)

*TCWTS

A DRIFT DEPOSITION MODEL FOR NATURAL DRAFT COOLING TOWERS* (122)
 AMBIENT EFFECT OF EVAPORATIVE COOLING TOWERS* (142)
 POTENTIAL ENVIRONMENTAL MODIFICATIONS PRODUCED BY LARGE EVAPORATIVE COOLING TOWERS* (227)
 A MODEL TO PREDICT WAPOR PLUMES FROM SINGLE AND MULTIPLE NATURAL-DRAFT COOLING TOWERS* (242)
 A MODEL TO PREDICT WAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (243)
 A MODEL TO PREDICT WAPOR PLUMES FROM SINGLE AND MULTIPLE NATURAL-DRAFT COOLING TOWERS* (244)
 A MODEL TO PREDICT WAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (245)
 A MODEL TO PREDICT WAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (247)
 A MODEL TO PREDICT WAPOR PLUMES FROM SINGLE OF MULTIPLE NATURAL-DRAFT COOLING TOWERS* (248)
 A MODEL TO PREDICT WAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (249)
 A MODEL TO PREDICT WAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (250)
 A MODEL TO PREDICT WAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (252)
 A MODEL TO PREDICT WAPOR PLUMES FROM SINGLE AND MULTIPLE NATURAL-DRAFT COOLING TOWERS* (253)
 A MODEL TO PREDICT WAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (254)
 A MODEL TO PREDICT WAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (256)
 NET FLUX RISE FROM COOLING TOWERS IN STRONG WINDS* (302)
 PROGRAM DESCRIPTIONS, SUPPLEMENT TO MESOSCALE WIND FIELDS AND TRANSPORT ESTIMATES DETERMINED FROM A NETWORK OF WIND TOWERS* (326)

*TOXIC

PAST RESPONSE MODEL OF TOXIC AEROSOL RESUSPENSION BY WIND* (370)
 INVESTIGATION OF SOME FACTORS IN THE BIOCHEMICAL CONVERSION OF MERCURY POLLUTANTS TO TOXIC METHYLMERCURY EFFECTED BY MICRO-ORGANISMS IN A MARINE SEDIMENT* (500)

*TRACE

TRACE PHOTOCHEMICAL AIR QUALITY SIMULATION MODEL* (69)
 MULTI-SOURCE ATMOSPHERIC TRANSPORT MODEL FOR DEPOSITION OF TRACE CONTAMINANTS* (201)
 A MASS BALANCE MODEL OF TRACE METALS IN SEVERAL DELAWARE WATERSHEDS* (377)
 CHEMICAL MODEL FOR LAKE MICHIGAN POLLUTION, CONSIDERATIONS ON ATMOSPHERIC AND SURFACE WATER TRACE METAL INPUTS* (606)
 PULSED DISPERSION OF TRACE CHEMICAL CONCENTRATIONS IN A SATURATED SOBBING POROUS MEDIUM* (647)
 ONE-DIMENSIONAL MODEL OF THE MOVEMENT OF TRACE RADIOACTIVE SOLUTE THROUGH COIL COLUMNS - THE PERCOL MODEL* (653)

*TRACEP

A SIMPLE DRIFT DEPOSITION MODEL APPLIED TO THE CHALK POINT DYE TRACER EXPERIMENT* (104)
 A THREE-DIMENSIONAL STRATOSPHERIC POINT-SOURCE TRACER EXPERIMENT AND ITS IMPLICATIONS FOR DISPERSION OF EFFLUENT FROM A FLEET OF SUPERSONIC AIRCRAFT* (170)

*TRACERS

UPTAKE AND MIGRATION OF TRACERS IN LAKE SEDIMENTS* (479)

*TRADE

A TIME-DEPENDENT MODEL OF THE TRADE-WIND BOUNDARY LAYER* (7)

*TRAFFIC

BOUNDARY LAYER MODEL FOR AIR POLLUTANT CONCENTRATIONS DUE TO HIGHWAY TRAFFIC* (260)
 SAFOLUT: ESTIMATING THE AIR QUALITY IMPACT OF VEHICULAR EMISSIONS RESULTING FROM A TRAFFIC ASSIGNMENT* (354)
 CALCULATING FUTURE CARBON MONOXIDE EMISSIONS AND CONCENTRATIONS FROM URBAN TRAFFIC DATA* (364)

*TRAJECTORY

A LAGRANGIAN TRAJECTORY MODEL OF URBAN SCALE PHOTOCHEMICAL AIR POLLUTION* (193)
 ARI LONG RANGE TRAJECTORY MODEL* (196)
 ADVANCED STATISTICAL TRAJECTORY REGIONAL AIR POLLUTION MODEL* (290)

*TRANSFER

METEOROLOGICAL SUB-MODELS FOR AQSNs - RADIATIVE TRANSFER* (14)
 BACKSCATTER RADIATIVE TRANSFER MODEL* (334)
 SOLAR ULTRAVIOLET AND VISIBLE RADIATIVE TRANSFER MODEL* (361)
 SOLAR RADIATIVE TRANSFER MODEL* (362)
 MODELING OF OIL EVAPORATION IN AN AQUEOUS ENVIRONMENT: RESEARCH ON THE EFFECTS OF CRUDE OIL TRANSFER AND UPSTREAM DIFFUSION ON DELAWARE BAY* (590)
 SIMULTANEOUS HEAT AND MASS TRANSFER IN POROUS MEDIA WITH APPLICATION TO SOIL WARMING WITH POWER PLANT WASTE HEAT* (657)
 TRANSFER OF RADIOCESIUM FROM LICHEN TO REINDEER* (671)
 ECOLOGICAL TRANSFER MECHANISMS - TERRESTRIAL* (673)
 TRANSFER OF STRONTIUM-90 FROM PLANTS TO RABBITS* (760)
 FINITE ELEMENT HEAT AND MASS TRANSFER CODE* (827)

*TRANSIENT

A TRANSIENT, TWO-DIMENSIONAL, DISCRETE-ELEMENT MODEL FOR PAR-FIELD ANALYSIS OF DISCHARGES IN COASTAL REGIONS* (427)
 TRANSIENT THREE DIMENSIONAL MODELING OF TEMPERATURE DISTRIBUTIONS IN RIVERS WITH AND WITHOUT THERMAL DISCHARGES* (452)
 MODELING AND OPTIMIZATION OF TRANSIENT COOLING WATER DISCHARGE FROM POWER GENERATING PLANTS, APPLICATIONS TO REGIONAL SITUATIONS* (457)
 TRANSIENT HEAT RELEASES FROM OFFSHORE NUCLEAR PLANTS* (461)
 THERMAL REGIMES OF THE UPPER MISSISSIPPI AND MISSOURI RIVERS: TRANSIENT AND STEADY-STATE COMPUTATIONAL MODELS FOR THE PREDICTION OF RIVER THERMAL REGIMES; PART TWO: ANALYSIS OF THERMAL REGIMES OF THE MISSISSIPPI AND MISSOURI RIVERS IN THE MID-CONTINENT AREA POWER POOL (MAPP) GEOGRAPHICAL AREA* (530)
 TWO DIMENSIONAL TRANSIENT TWO-THERMAL MATHEMATICAL MODEL* (596)
 TWO-DIMENSIONAL TRANSIENT PAR-FIELD TEMPERATURE DISTRIBUTION IN RIVERS WITH ARBITRARY HEAT SOURCES* (607)
 ANALYTICAL THREE-DIMENSIONAL TRANSIENT MODELING OF EFFLUENT DISCHARGES* (610)
 NUMERICAL MODEL FOR THE PREDICTION OF TRANSIENT WATER QUALITY IN ESTUARY NETWORKS* (625)
 SIMULTANEOUS TRANSPORT OF WATER AND REACTING SOLUTES THROUGH MULTILAYERED SOILS UNDER TRANSIENT UNSATURATED FLOW CONDITIONS* (642)

TITLE INDEX

TRANSPORT

ONE-DIMENSIONAL TRANSPORT: SUBSURFACE TWO-PHASE, TWO COMPONENT FLOW OF FLUIDS AND GASES THROUGH LAYERED POROUS MEDIA* (546)

AIR TRANSPORT: CALCULATIONS USING THE LAST-STEP AIR FLUX TAPE AND THE WEST COMPUTER PROGRAM--CDP* (31)
 PIPON*, MODEL FOR COMPUTATION OF AEROSOL TRANSPORT AND DIFFUSION IN THE ATMOSPHERE* (43)

POINT SOURCE TRANSPORT MODEL* (44)

THE CABLE STUDIES ON THE TIME-DEPENDENT TRANSPORT OF OPTICAL AND INFRARED RADIATION IN THE ATMOSPHERE:
 "RADIATION TRANSPORT" (49)

ATMOSPHERIC TRANSPORT OF JACKET MOTOR COMBUSTION BY-PRODUCTS* (54)

AIR TRANSPORT MODELING FOR REGIONAL DOSE STUDIES* (60)

ATMOSPHERIC VARIATION TRANSPORT TO THE OCEAN* (70)

ANALYTICAL MODEL FOR AIR POLLUTANT TRANSPORT AND DEPOSITION FROM A POINT SOURCE* (74)

LONG RANGE TRANSPORT MODELING* (78)

A MODIFIED MULTI CELL METHOD FOR SIMULATION OF ATMOSPHERIC TRANSPORT* (99)

MODELS OF RADIATION TRANSPORT IN AIR - THE AIR CODE* (109)

A REGIONAL-CONTINENTAL SCALE TRANSPORT, DIFFUSION, AND DEPOSITION MODEL* (111)

ENVIRONMENTAL TRANSPORT PROCESSES* (114)

USEPA'S GUIDE TO VERSION 2 OF AIR (AIR TRANSPORT OF RADIATION)* (120)

MODEL OF GLOBAL RADIOISOTOPE TRANSPORT IN THE TROPOSPHERE AND LOWER STRATOSPHERE: FUNDAMENTAL EQUATIONS AND
 BOUNDARY CONDITIONS* (120)

DIFFERENCE ANALOGUES OF BOUNDARY-VALUE PROBLEMS FOR THE EQUATIONS OF GLOBAL RADIOISOTOPE CONTAMINANT
 TRANSPORT AND THEIR NUMERICAL SOLUTIONS: DIFFERENCE APPROXIMATION OF EQUATIONS AND BOUNDARY CONDITIONS IN THE
 REGIONAL PLANE AND THE ZONAL BELT OF THE ATMOSPHERE* (129)

PLANETARY DISTRIBUTION OF ZONAL MEAN TRANSPORT PARAMETERS OF RADIOISOTOPES IN THE TROPOSPHERE AND LOWER
 STRATOSPHERE: CLIMATIC DISTRIBUTION OF THE ZONAL MEAN COMPONENTS OF THE REGIONAL CIRCULATION
 VELOCITY* (130)

VERTICAL TRANSPORT AND REMOVAL OF RADIOACTIVE AEROSOLS IN THE ATMOSPHERE: QUANTITATIVE MODELS OF AEROSOL
 WASHOUT BY PRECIPITATION AND DRY DEPOSITION ON THE UNDERLYING SURFACE* (137)

NUMERICAL MODELING OF THE TRANSPORT, DIFFUSION, AND DEPOSITION OF POLLUTANTS FOR REGIONS AND EXTENDED
 SCALES* (135)

TWO-DIMENSIONAL MODEL FOR THE TRANSPORT OF POLLUTANTS IN AN URBAN BASIN* (156)

THE CHEMISTRY, DISPERSION, AND TRANSPORT OF AIR POLLUTANTS EMITTED FROM FOSSIL FUEL POWER PLANTS IN
 CALIFORNIA: DATA ANALYSIS AND EMISSION IMPACT MODEL* (158)

REGIONAL SCALE AIR POLLUTION TRANSPORT MODEL* (164)

A TWO-DIMENSIONAL TRANSPORT MODEL OF THE ATMOSPHERE* (164)

TRACER DIFFUSION AND POLLUTANT TRANSPORT IN SHORELINE ENVIRONMENTS* (172)

MESOSCALE AIR POLLUTION TRANSPORT IN SOUTHEAST WISCONSIN* (173)

A MESOSCALE NUMERICAL MODEL OF ATMOSPHERIC TRANSPORT PHENOMENA IN URBAN AREAS* (180)

MULTI-SOURCE ATMOSPHERIC TRANSPORT MODEL FOR DEPOSITION OF TRACE CONTAMINANTS* (201)

OVERCAST: A CODE FOR THE GENERATION AND TRANSPORT OF DROPS/STRAINING THROUGH THE ATMOSPHERE* (211)

A NEW PALLONE TRANSPORT CODE FOR THE DELTA SYSTEM: THE DIFFUSIVE TRANSPORT MODEL* (213)

DRIFT TRANSPORT MODEL* (231)

PREDICTION BY NUMERICAL MODELS OF TRANSPORT AND DIFFUSION IN AN URBAN BOUNDARY LAYER* (233)

ATMOSPHERIC TRANSPORT AND DIFFUSION MODEL* (235)

LAGRANGIAN TRANSPORT AND DIFFUSION CODE TO CALCULATE CONCENTRATIONS AND DEPOSITION AT LONG RANGE OF PARTICLES
 LARGER THAN 10 MICRON METERS DIAMETER* (238)

NUMERICAL PREDICTION OF THE MESOSCALE TRANSPORT OF ATMOSPHERIC EFFLUENTS: PHILOSOPHY AND MORPHOLOGY OF
 EXPERIMENTAL MODELS FOR PREDICTING THE WIND AND POTENTIAL RADIOLOGICAL FIELDS OVER THE SEVAM TEST
 SITE* (242)

NUMERICAL MODEL FOR REGIONAL TRANSPORT OF SULFUR POLLUTANTS IN THE ATMOSPHERE* (264)

AN ATMOSPHERIC TRANSPORT AND ACCUMULATION MODEL FOR AIRSHEDS* (276)

DYNAMIC MODEL OF SEA BREEZE CIRCULATIONS AND POLLUTANT TRANSPORT* (309)

MODEL FOR ENVIRONMENTAL TRANSPORT OF AUTOMOTIVE LEAD* (320)

ATMOSPHERIC TRANSPORT AND DIFFUSION IN THE PLANETARY BOUNDARY LAYER* (327)

PROGRAM DESCRIPTIONS, SUPPLEMENT TO MESOSCALE WIND FIELDS AND TRANSPORT ESTIMATES DETERMINED FROM A NETWORK
 OF WIND TOWERS* (326)

LONG RANGE AIR TRANSPORT MODEL* (330)

LIVERMORE REGIONAL AIR QUALITY MODEL: KINETICS AND TRANSPORT* (347)

MODEL FOR RADIOACTIVITY TRANSPORT IN WATER: NUMERICAL SOLUTIONS OF RADIOISOTOPE TRANSPORT EQUATIONS AND ROLE
 OF PLANTS IN SR-95 TRANSPORT* (350)

A SYSTEMS ANALYSIS MODEL FOR CALCULATING RADIOISOTOPE TRANSPORT BETWEEN RECEIVING WATERS AND BOTTOM
 SEDIMENTS* (390)

NAPIVA DEL PEY: COMPUTER SIMULATION OF POLLUTANT TRANSPORT IN SEMI-ENCLOSED WATER BODY* (400)

NUTRIENT TRANSPORT AND DISSOLVED OXYGEN BUDGET STUDIES IN THE POTOMAC ESTUARY* (410)

UNIFIED TRANSPORT APPROACH MODELS FOR POWER PLANT IMPACT IN ESTUARIES* (425)

RADIOACTIVITY TRANSPORT IN WATER* (439)

APPLICATION OF THE FINITE-ELEMENT METHOD FOR SIMULATION OF SURFACE WATER TRANSPORT PROBLEMS* (444)

SIMULATION OF THE HYDROLOGIC TRANSPORT OF RADIOACTIVE AEROSOLS* (455)

A SURVEY OF DISPERSION COEFFICIENTS FOR ESTIMATING POLLUTANT TRANSPORT* (462)

RADIOACTIVITY TRANSPORT IN WATER. BIOLOGICAL ACCUMULATION OF MERCURY (II) AND METHYLMERCURY BY CHLORELLA
 PYRENOSIDA* (497)

NUTRIENT TRANSPORT BY SEDIMENT WATER INTERACTION* (500)

NUMERICAL MODELING OF SUBSURFACE RADIOACTIVE SOLUTE TRANSPORT FROM WASTE-SEEPAGE PONDS AT THE IDAHO NATIONAL
 ENGINEERING LABORATORY* (550)

DIGITAL MODELING OF RADIOACTIVE AND CHEMICAL WASTE TRANSPORT IN THE SNAKE RIVER PLAIN AQUIFER AT THE NATIONAL
 REACTOR TESTING STATION, IDAHO* (555)

WASTE HEAT UTILIZATION FROM POWER PLANTS IN AGRICULTURE: WATER TRANSPORT* (562)

RADIOACTIVITY TRANSPORT IN WATER - MATHEMATICAL MODEL FOR THE TRANSPORT OF RADIOISOTOPES* (567)

NUMERICAL MODELING OF POLLUTANT TRANSPORT USING A LAGRANGIAN MARKER PARTICLE TECHNIQUE* (570)

OCEAN CURRENT AND POLLUTANT TRANSPORT MODEL* (584)

NUMERICAL SIMULATION OF OIL SLICK TRANSPORT IN BAYS* (599)

OIL SPILL TRANSPORT AND DIFFUSION PREDICTION* (500)

TRANSPORT MODEL FOR LONG TERM RADIOISOTOPE RELEASE INTO A STREAM ECOSYSTEM* (610)

SIMULTANEOUS TRANSPORT OF WATER AND REACTING SOLUTES THROUGH MULTILAYERED SOILS UNDER TRANSIENT UNSATURATED
 FLOW CONDITIONS* (642)

WATERFLOWS TRANSPORT THROUGH POROUS MEDIA: A FINITE-ELEMENT GALERKIN MODEL* (644)

TITLE INDEX

TRANSPORT

- A THEORY ON THE MASS TRANSPORT OF PREVIOUSLY DISTRIBUTED CHEMICALS IN A WATER SATURATED SOBBING POROUS MEDIUM* (649)
- AN OVERLAND POLLUTION TRANSPORT MODEL* (654)
- CONCENTRATION FACTORS AND TRANSPORT MODELS FOR RADIOISOTOPES IN AQUATIC ENVIRONMENTS-A LITERATURE REPORT* (664)
- TRANSMEMBRANE BIOLOGICAL TRANSPORT MODEL* (669)
- MATHEMATICAL MODELS FOR PREDICTING THE TRANSPORT OF RADIOISOTOPES IN A MARINE ENVIRONMENT* (667)
- A REGIONAL AIR TRANSPORT MODEL FOR RADIOLOGICAL DOSE STUDIES* (696)
- DEVELOPMENT OF TRANSPORT MODELS FOR ENVIRONMENTAL POLLUTANTS* (767)
- FISSION PRODUCT TRANSPORT MODELS* (768)
- A PRELIMINARY MATHEMATICAL MODEL FOR PREDICTING THE TRANSPORT OF RADIOISOTOPES IN THE MARINE ENVIRONMENT* (766)
- TEMPERATE AND CUMBERLAND RIVER BASINS RADIOISOTOPE TRANSPORT* (789)
- MODELLING THE REGIONAL TRANSPORT OF RADIOISOTOPES IN A MAJOR UNITED STATES RIVER BASIN* (790)
- DESCRIPTION AND DOCUMENTATION OF THE HYDROLOGIC TRANSPORT MODEL (HTM) DEVELOPED AT THE UNIVERSITY OF WISCONSIN* (802)

TRANSPORTATION

- STATISTICAL ORIGIN AIR QUALITY PREDICTION MODEL FOR LAND USE AND TRANSPORTATION PLANNING* (32)
- DETERMINATION OF ENVIRONMENTAL CARCINOGEN EXPOSURES THROUGH PERSONAL MONITORING: FIXED VS PERSONAL AIR TRANSPORTATION MODE RELATIONSHIPS* (51)
- COMBINED MODELING OF TRANSPORTATION-GENERATED AIR POLLUTION* (67)
- WEIGHTED DIAGRAM MODELS FOR THE ASSESSMENT OF ENERGY USE AND AIR POLLUTION IN TRANSPORTATION SYSTEMS* (274)
- RAILROAD: A COMPUTED CODE TO ANALYZE TRANSPORTATION OF RADIOACTIVE MATERIAL* (820)

TRANSMEMBRANE

- TRANSMEMBRANE BIOLOGICAL TRANSPORT MODEL* (669)

TRANSVERSE

- TRANSVERSE JET PLUMES* (96)

TRAVEL

- AIR POLLUTION BY COMPUTER TRAVEL ON STATES ISLAND* (290)
- DIRECT TRAVEL IMPACT MODEL* (367)

TRAVELERS

- A REGIONAL AIR QUALITY SIMULATION MODEL (A DESCRIPTION OF THE CONNECTICUT AIR POLLUTION MODEL AS DEVELOPED BY THE TRAVELERS RESEARCH CENTER)* (273)

TRAVELING

- POSTS WHILE TRAVELING UNDER WELL ESTABLISHED PLUMES* (719)

TREE

- SPERMOPHYTES: A WATERSHED LEVEL SIMULATION MODEL OF TREE BIOMASS DYNAMICS* (36)

TRITIATED

- MODELLING THE DOSE TO MAN FROM EXPOSURE TO TRITIATED WATER VAPOR* (607)

TRITIUM

- TRITIUM KINETICS IN A FRESHWATER POND* (659)
- COMPUTER CODE FOR CALCULATING PERSONNEL DOSES DUE TO TRITIUM EXPOSURES* (700)

TROPOSPHERE

- MODEL OF GLOBAL RADIOISOTOPE TRANSPORT IN THE TROPOSPHERE AND LOWER STRATOSPHERE: FUNDAMENTAL EQUATIONS AND BOUNDARY CONDITIONS* (120)
- PLANETARY DISTRIBUTION OF LOCAL HEAT TRANSPORT PARAMETERS OF RADIOISOTOPES IN THE TROPOSPHERE AND LOWER STRATOSPHERE: CLIMATIC DISTRIBUTION OF THE LOCAL HEAT COMPONENTS OF THE REGIONAL CIRCULATION VELOCITY* (130)

TUNDRA

- PERSPECTIVE ON THE DYNAMICS OF ARCTIC TUNDRA ECOSYSTEMS* (674)

TUNNEL

- APPLICATIONS OF PHYSICAL MODELING IN A RIND TUNNEL TO GEOTHERMAL DEVELOPMENT* (2)

TURBIDITY

- MATHEMATICAL SIMULATION OF THE TURBIDITY STRUCTURE WITHIN AN IMPOUNDMENT* (311)

TURBINE

- INVESTIGATION OF GAS TURBINE COMBUSTORS WITH HIGH INLET AIR TEMPERATURES, COMBUSTOR MODELLING* (101)

TURBINES

- MATHEMATICAL MODELS FOR ANALYSING ORIGIN AND DISTRIBUTION OF COMBUSTION GENERATED POLLUTANTS IN GAS TURBINES: A MATHEMATICAL MODEL FOR JET ENGINE COMBUSTOR POLLUTANT EMISSIONS* (10)

TURBULENCE

- METEOROLOGICAL SUB-MODELS FOR AGNES - TURBULENCE MODELS* (15)
- SECOND ORDER TURBULENCE MODEL FOR ATMOSPHERIC POLLUTANT DISPERSION* (157)
- INVARIANT MODELING OF ATMOSPHERIC TURBULENCE AND DIFFUSION* (217)
- ON THE CORRELATION OF GRID-GENERATED TURBULENCE; MODEL FOR CALCULATING CORRELATION FUNCTION FOR ATMOSPHERIC TURBULENCE* (377)

TURBULENT

- ATMOSPHERIC DIFFUSION IN THE SURFACE TURBULENT BOUNDARY LAYER* (126)
- TURBULENT DIFFUSION AND POLLUTANT TRANSPORT IN SHALLOW ENVIRONMENTS* (172)
- NUMERICAL MODEL FOR A TURBULENT SUBSTANT JET IN A SHALLOW OPEN CHANNEL* (409)
- TURBULENT DIFFUSION MODEL OF OIL IN THE OCEAN* (513)
- A WASTE ASSIMILATIVE CAPACITY MODEL FOR A SHALLOW, TURBULENT STREAM* (531)

TURNOVER

- TURNOVER AND CONCENTRATION OF RADIOISOTOPES IN FOOD CHAINS* (676)

TVA

- PRINCIPAL PLUME DISPERSION MODELS: TVA POWER PLANTS* (33)
- DOUGHERTY'S PLUME RISE FORMULA AND THE TVA DATA* (175)
- TVA GASEOUS EFFLUENT LICENSING CODE FOR STATION MIXING AND BILLING* (212)
- TVA GASEOUS DISPERSION CODE* (267)

ULTIMATE

- FIRST ESTIMATE OF FLOODING CAPABILITY FOR ULTIMATE ESTABLISHMENT* (776)

ULTRAVIOLET

- SOLAR ULTRAVIOLET AND VISIBLE RADIATIVE TRANSFER MODEL* (267)

UNCONFINED

- A TWO-DIMENSIONAL FINITE ELEMENT MODEL FOR THE MIGRATION OF CONTAMINANTS IN CONFINED AND UNCONFINED AQUIFERS* (842)
- A THREE-DIMENSIONAL FINITE ELEMENT MODEL FOR THE MIGRATION OF CONTAMINANTS IN CONFINED AND UNCONFINED AQUIFERS* (803)

TITLE INDEX

- ATMOSPHERIC**
VERTICAL TRANSPORT AND REMOVAL OF RADIOACTIVE AEROSOLS IN THE ATMOSPHERE: QUANTITATIVE MODELS OF AEROSOL REMOVAL BY PRECIPITATION AND DRY DEPOSITION ON THE UNDERLYING SURFACE* (737)
- BIOMONITORING**
RCH AND PAH-PLUME BEHAVIOR FOR POND OR SLIT UNDERSTUDY DISCHARGE INCLUDING MULTIPART DISCREPANCIES* (400)
- ENVIRONMENTAL**
Simplified Transport Approach Models for Power Plant Impact in Estuaries* (425)
- ENVIRONMENTAL**
Thermal Plume Investigations for Union Electric Company's Callaway Plant, Units 1 and 2* (395)
- ENVIRONMENTAL**
Ambient Air Quality Model for Assessment of United States Naval Aviation Effluents* (302)
Calculations of Dose and Population Dose in the General Environment Due to Boiling-Water Nuclear Power Reactor Radionuclide Emissions in the United States in 1970* (722)
Modeling the Regional Transport of Radionuclides in a Major United States River Basin* (790)
- ENVIRONMENTAL**
Thermal Model Development and Initial Simulations of Sonco Units 2 and 3* (307)
Thermal Plume Investigations for Union Electric Company's Callaway Plant, Units 1 and 2* (395)
- ENVIRONMENTAL**
A Steady-State, Univariate Gaussian Plume Dispersion Algorithm* (319)
- ENVIRONMENTAL**
University of Virginia Mesoscale Model* (200)
Description and Documentation of the Hydrologic Transport Model (HTM) Developed at the University of Wisconsin* (672)
- ENVIRONMENTAL**
Simultaneous Transport of Water and Reactive Solutes Through Multilayered Soils Under Transport Unsaturated Flow Conditions* (602)
- ENVIRONMENTAL**
Mathematical Model for the Prediction of Unsteady Salinity Intrusion in Estuaries* (503)
Prediction of Unsteady Salinity Intrusion in Estuaries: Mathematical Model and User's Manual* (400)
- ENVIRONMENTAL**
Unstructured Marine Food Webs and Pollutant Analogues* (662)
- ENVIRONMENTAL**
On the Boundary Conditions in Theoretical Model Calculations of the Distributions of Minor Neutral Constituents in the Upper Atmosphere* (290)
Advection of Artificially Produced Upper Atmospheric Clones in Empirically Determined Wind Fields* (339)
Thermal Regimes of the Upper Mississippi and Missouri Rivers: Transient and Steady-State Computational Models for the Prediction of River Thermal Regimes; Part Two: Analysis of Thermal Regimes of the Mississippi and Missouri Rivers in the Mid-Continent Area Power Pool (MAPP) Geographical Area* (530)
QWEL-II, Upper Mississippi River Basin Project* (546)
- ENVIRONMENTAL**
Modeling of Oil Evaporation in an Aqueous Environment: Research on the Effects of Crude Oil Transport and Upstream Pipelines on Delaware Bay* (590)
- ENVIRONMENTAL**
Uptake and Migration of Tracers in Lake Sediments* (479)
A Preliminary Model of Gaseous Pollutant Uptake by Vegetation* (672)
Uptake of Pollutants Radionuclides by Animals and a Stochastic Simulation of the Process* (677)
Computation and Mapping of the Dispersion and Herbage Uptake of Gaseous Effluents from Industrial Plants* (750)
The Mechanism and Prediction of Gaseous Pollutant Uptake by Vegetation* (770)
Ozone and SO₂ Uptake over Various Surfaces* (702)
- ENVIRONMENTAL**
TVA Gaseous Effluent Licensing Code for Uranium Mining and Milling* (212)
Migration of Gaseous Radionuclides through Soil overlying a Uranium Ore Deposit: A Modeling Study* (605)
Regional Steady State Uranium Dispersion and Dosimetry Code* (723)
Potential Radiological Impact of Airborne Releases and Direct Gamma Radiation to Individuals Living Near Inactive Uranium Mill Tailings Piles* (740)
- ENVIRONMENTAL**
Modeling of the Effects of Gaseous and Particulate Pollutants in the Urban Atmosphere: Pollutant Dispersion* (12)
A Climatological Model for Multiple-Source Urban Air Pollution* (20)
Miscellaneous Aspects of Current Urban Pollution Models* (29)
The Simple APL Urban Air Pollution Model* (85)
Modeling Urban Air Pollution* (86)
Urban Air Pollution Modeling* (87)
Urban Air Pollution Modeling* (89)
Applications of a Simple Urban Pollution Model* (90)
The Simple APL Urban Air Pollution Model* (92)
Model for the Dispersion of Sulfur Dioxide over an Urban Area* (97)
A Simple Method of Calculating Dispersion from Urban Area Sources* (103)
Simulating the Urban Air Pollution Environment* (121)
An Interim Version of a Generalized Urban Air Pollution Model* (145)
Two-Dimensional Model for the Transport of Pollutants in an Urban Basin* (156)
Grid Model for Urban Air Pollution* (157)
Urban Air Shed Photochemical Simulation Model Study: Microscale Model of Local Vehicular Contributions to Measured Pollutant Concentrations* (160)
User's Manual for the APLAC-2 Urban Diffusion Model Computer Program* (170)
A Mesoscale Numerical Model of Atmospheric Transport Phenomena in Urban Areas* (180)
User's Manual for the APLAC-1A Urban Diffusion Model Computer Program* (185)
An Urban Air Diffusion Model for Estimating Long Term Average Values of Air Quality* (186)
A Numerical Model of the Nocturnal Urban Boundary Layer* (192)
A Lagrangian Trajectory Model of Urban Scale Photochemical Air Pollution* (193)
A Three-Dimensional, Urban Scale, Mathematical Model of Photochemical Air Pollution* (190)
A Well Mixed Box Model of Urban Scale Photochemical Air Pollution* (195)
Prediction by Numerical Models of Transport and Diffusion in an Urban Boundary Layer* (233)
A Prediction Model of Mean Urban Pollution for Use with Standard Wind Roses* (257)
A Multiple-Source Urban Atmospheric Dispersion Model* (274)
Simulation of Urban Air Pollution* (280)

*TITLE INDEX

URBAN

DEVELOPMENT OF AN URBAN AIR QUALITY SIMULATION MODEL WITH COMPATIBLE RAPS DATA* (295)
 OVERSEAS CHINESE SUMMER MODEL* (315)
 MODELING OF THE EFFECTS OF POLLUTANT 1 AND DISPERSION IN URBAN ATMOSPHERES* (323)
 PREDICTIONS OF THE SPECTRAL ABSORPTION AND EXTINCTION COEFFICIENTS OF AN URBAN AIR POLLUTION AEROSOL MODEL* (332)
 AN URBAN DIFFUSION SIMULATION MODEL FOR CARBON MONOXIDE* (353)
 PREDICTION ON LONG-TERM MEAN AND MEAN SQUARE POLLUTANT CONCENTRATIONS IN AN URBAN ATMOSPHERE* (357)
 CALCULATING FUTURE CARBON MONOXIDE EMISSIONS AND CONCENTRATIONS FROM URBAN TRAFFIC DATA* (368)
 TWO-DIMENSIONAL NUMERICAL SIMULATION OF THE EFFECTS OF AIR POLLUTION UPON THE URBAN-RURAL COMPLEX* (384)
 HYTRA: HYBRID MODEL FOR URBAN HYDROLOGIC SYSTEM* (582)

USER

USER'S GUIDE TO VERSION 2 OF RTD (AIR TRANSPORT OF RADIATION)* (120)
 USER'S MANUAL FOR THE APPAC-2 URBAN DIFFUSION MODEL COMPUTER PROGRAM* (170)
 USER'S MANUAL FOR THE APPAC-1A URBAN DIFFUSION MODEL COMPUTER PROGRAM* (185)
 USER'S GUIDE TO DIFFUSION/KINETICS (DIPKIN) CODE,* (188)
 USER'S MANUAL, AUTOMATED PROCEDURES FOR ESTIMATING CONTROL COSTS AND EMISSION REDUCTIONS FOR SPECIFIED AIR POLLUTION SOURCES* (341)
 USER'S GUIDE AND DOCUMENTATION FOR COTTELL PLUME MODEL* (394)
 A USER'S MANUAL FOR THREE-DIMENSIONAL HEATED SURFACE DISCHARGE COMPUTATIONS* (500)
 PREDICTION OF UNSTEADY SALINITY INTRUSION IN ESTUARIES: MATHEMATICAL MODEL AND USER'S MANUAL* (504)
 HYTO: FORTRAN-CRIBED COMPUTER LANGUAGE FOR HYDROLOGIC MODELING--USER'S MANUAL* (665)
 USER'S MANUAL FOR THE POSTRAP VERSION OF HSAC: A RADIOLOGICAL SAFETY ANALYSIS COMPUTER PROGRAM* (730)
 SINCORP VERSION 2.1 USER'S MANUAL AND MAINTENANCE DOCUMENT* (790)

USERS

USERS MANUAL FOR CODE ECHAN: A CODE TO CALCULATE GAMMA PHOTON DOSE FROM AN AIRBORNE RADIOACTIVE RELEASE* (303)
 MOSAG-1, SIMULATION OF WATER QUALITY IN STREAMS AND CANALS: PROGRAM DOCUMENTATION AND USERS MANUAL* (530)
 SINCORP: VERSION 3.0 USERS MANUAL* (797)

V

VEEN V CODE MODIFICATIONS FOR RF PROPAGATION AND SYSTEM PERFORMANCE MODELING* (200)

VALIDATION

COMPREHENSIVE ANALYSIS OF TIME-CONCENTRATION RELATIONSHIPS AND VALIDATION OF A SINGLE-SOURCE DISPERSION MODEL* (200)

VALLEY

A MODEL OF DIFFUSION IN A VALLEY FROM A CONTINUOUS POINT SOURCE* (95)
 HYPERCUBE AIR POLLUTION MONITORING EXPERIMENT IN AN AREA OF MOUNTAIN-VALLEY TERRAIN* (127)
 "EXPRESSWAY VALLEY ASSESSMENT MODEL" (200)
 PREDICTING THE EFFECT OF GEOTHERMAL EMISSIONS ON THE TEMPERATURE AND RELATIVE HUMIDITY IN THE IMPERIAL VALLEY OF CALIFORNIA* (354)

VALUE

DIFFERENCE ANALOGUES OF BOUNDARY-VALUE PROBLEMS FOR THE EQUATIONS OF GLOBAL RADIOISOTOPE COMPARISON: TRANSPORT AND THEIR NUMERICAL SOLUTION: DIFFERENCE APPROXIMATION OF EQUATIONS AND BOUNDARY CONDITIONS IN THE REGIONAL PLANE AND THE ZONAL BELT OF THE ATMOSPHERE* (129)

VALUES

AN URBAN AIR DIFFUSION MODEL FOR ESTIMATING LONG TERM AVERAGE VALUES OF AIR QUALITY* (186)
 OPTSET: PROGRAM FOR COMPUTERIZED SELECTION OF BATTERED PARAMETER VALUES FOR THE STANFORD WATERSHED MODEL* (482)
 THE STAFFORD WATERSHED MODEL: THE CORRELATION OF PARAMETER VALUES SELECTED BY A COMPUTERIZED PROCEDURE WITH MEASURABLE PHYSICAL CHARACTERISTICS OF THE WATERSHED* (652)

VARIABLE

ATMOSPHERIC VANADIUM TRANSPORT TO THE OCEAN* (70)

VAPOR

COMPUTATION OF POSSIBLE CLIMATIC CONSEQUENCES OF PERTURBATIONS TO STRATOSPHERIC AEROSOLS, OZONE AND WATER VAPOR WITH RADIATIVE-CONVECTIVE MODELS* (40)
 EFFECT OF WATER VAPOR ON THE DESTRUCTION OF OZONE IN THE STRATOSPHERE PERTURBED BY CFC OR NOX POLLUTANTS* (164)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE AND MULTIPLE NATURAL-DRAFT COOLING TOWERS* (242)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (243)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE AND MULTIPLE NATURAL-DRAFT COOLING TOWERS* (244)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (246)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (247)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE OR MULTIPLE NATURAL-DRAFT COOLING TOWERS* (248)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (249)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (250)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (251)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (252)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE AND MULTIPLE NATURAL-DRAFT COOLING TOWERS* (253)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (254)
 A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE NATURAL-DRAFT COOLING TOWERS* (256)
 MODELING THE DOSE TO MAN FROM EXPOSURE TO INITIATED WATER VAPOR* (607)

VARIABLE

NUMERICAL INTEGRATION EXPERIMENTS WITH VARIABLE-RESOLUTION TWO-DIMENSIONAL CARTESIAN GRIDS USING THE BOX METHOD* (100)
 POINT SOURCE ATMOSPHERIC DIFFUSION MODEL WITH VARIABLE WIND AND DIFFUSIVITY PROFILES* (259)

VEGETATION

INFLUENCE OF SULFUR DIOXIDE ON VEGETATION WITH EMPHASIS ON SIMULATION MODELS* (62)
 A PRELIMINARY MODEL OF GASEOUS POLLUTANT UPTAKE BY VEGETATION* (672)
 VEGETATION COMMUNITIES ALONG GRADIENT* (771)
 THE MECHANISM AND PREDICTION OF GASEOUS POLLUTANT UPTAKE BY VEGETATION* (770)
 MODEL FOR CALCULATION OF CONCENTRATION OF RADIOISOTOPES IN VEGETATION* (781)

VEHICULAR

URBAN AIR SHED PHOTOCHEMICAL SIMULATION MODEL STUDY: MICROSCALE MODEL OF LOCAL VEHICULAR CONTRIBUTIONS TO MEASURED POLLUTANT CONCENTRATIONS* (160)
 SAPOLLOT: ESTIMATING THE AIR QUALITY IMPACT OF VEHICULAR EMISSIONS RESULTING FROM A TRAFFIC ASSIGNMENT* (364)

TITLE WORDS

VELOCITY

PLANETARY DISTRIBUTION OF ZONAL MEAN TRANSPORT PARAMETERS OF BAROCINETONES IN THE TROPOSPHERE AND LOWER STRATOSPHERE: CLIMATIC DISTRIBUTION OF THE ZONAL MEAN COMPONENTS OF THE MERIDIONAL CIRCULATION VELOCITY* (130)

MATHEMATICAL MODEL FOR INDUCED VELOCITY DISTRIBUTION AROUND A SUBMERGED INTAKE* (591)

VENTILATION

DIGITAL SIMULATION OF MERSE EXHAUST CONTAMINATION OF RISE VENTILATION SYSTEMS* (309)

VENTILATION

PREPARATION, VERIFICATION AND USE OF A DIGITAL CIRCUMSCRIBED SIMULATION PROGRAM* (464)

VERSION

USER'S GUIDE TO VERSION 2 OF AIR (AIR TRANSPORT OF RADIATION)* (120)

AN INTERIM VERSION OF A GENERALIZED URBAN AIR POLLUTION MODEL* (145)

REACTIVE PLUME MODEL, VERSION 1* (167)

REACTIVE PLUME MODEL, VERSION 2* (162)

COMPUTATIONAL VERSION OF THE ICAP LONG MODEL* (725)

USER'S MANUAL FOR THE FORTY-SEVEN VERSIONS OF ESAC: A RADIOLOGICAL SAFETY ANALYSIS COMPUTER PROGRAM* (730)

SINCEP: VERSION 3.0 USER'S MANUAL* (797)

SINCEP VERSION 2.1 USER'S MANUAL AND MAINTENANCE DOCUMENT* (790)

VERTICAL

VERTICAL TRANSPORT AND REMOVAL OF RADIOACTIVE AEROSOLS IN THE ATMOSPHERE: QUANTITATIVE MODELS OF AEROSOL REMOVAL BY PRECIPITATION AND DRY DEPOSITION ON THE UNDERLYING SURFACE* (131)

DEVELOPMENT OF VERTICAL DISPERSION COEFFICIENTS FOR ROLLING TERRAIN ENVIRONMENTS* (297)

NUMERICAL THERMAL PLUME MODEL FOR VERTICAL OUTFALLS IN SHALLOW WATER* (593)

VIRGINIA

USE OF LARS SYSTEM FOR THE QUANTITATIVE DETERMINATION OF SMOKE PLUME LATERAL DIFFUSION COEFFICIENTS FROM ERTS IMAGES OF VIRGINIA* (17)

UNIVERSITY OF VIRGINIA MESOSCALE MODEL* (244)

VIRGINIA

MATHEMATICAL MODEL OF THE ACCUMULATION OF RADIOISOTOPES BY SYSTEMS (C. VIRGINIA) AQUACULTURED IN THE EFFLUENT OF A NUCLEAR POWER REACTOR TO INCLUDE MAJOR BIOLOGICAL PARAMETERS* (753)

VISCOS

NUMERICAL CALCULATIONS OF VISCOUS HIGH-ALTITUDE EXHAUST PLUME FLOW FIELDS* (22)

VISIBILITY

PLUME VISIBILITY* (332)

VISIBLE

PREDICTED AND OBSERVED COOLING TOWER PLUME RISE AND VISIBLE PLUME LENGTH AT THE JOHN E. AMOS POWER PLANT* (102)

MATHEMATICAL MODEL FOR CALCULATION OF LENGTH OF THE VISIBLE PLUME* (223)

SOLAR ULTRAVIOLET AND VISIBLE RADIATIVE TRANSFER MODEL* (367)

VCP

SCIA-VCP* (810)

VOLUME

OPTID II: SPECIAL SCIENTIFIC REPORT ON VOLUME 1* (806)

VULNERABILITY

VULNERABILITY MODEL: A SIMULATION SYSTEM FOR ASSESSING DAMAGE RESULTING FROM MARINE SPILLS* (422)

WAB

IMPACT OF OIL SPILLAGE FROM WORLD WAR II TANKER SINKINGS* (404)

WAPW

A TWO-DIMENSIONAL WAPW FOG MODIFICATION MODEL* (207)

WAPPING

PREDICTING THE DATE OF WAPPING OF RIVERS BELOW HYDROELECTRIC INSTALLATIONS* (574)

SIMULTANEOUS HEAT AND MASS TRANSFER IN POROUS MEDIA WITH APPLICATION TO SOIL WARMING WITH POWER PLANT WASTE HEAT* (657)

WASH

ATMOSPHERIC DISPERSION MODEL AS USED IN THE REACTOR SAFETY STUDY, WASH-1400* (606)

WASHOUT

MODEL FOR TIME-DEPENDENT DRAINAGE SIZE DISTRIBUTIONS: APPLICATION TO THE WASHOUT OF AIRBORNE CONTAMINANTS* (7)

VERTICAL TRANSPORT AND REMOVAL OF RADIOACTIVE AEROSOLS IN THE ATMOSPHERE: QUANTITATIVE MODELS OF AEROSOL WASHOUT BY PRECIPITATION AND DRY DEPOSITION ON THE UNDERLYING SURFACE* (131)

WASTE

COMPUTER SIMULATION OF ATMOSPHERIC EFFECTS OF WASTE HEAT REJECTED FROM CONCEPTUAL LARGE POWER PLANTS* (13)

A NUMERICAL STUDY OF METEOROLOGICAL EFFECTS OF WASTE HEAT AND MOISTURE RELEASES FROM HYPOTHETICAL POWER PLANTS* (263)

NUMERICAL COMPUTATION OF WASTE-HEAT DISPERSION IN A RECEIVING WATER BODY* (467)

OPTIMAL CONTROL OF AN OIL REFINERY WASTE TREATMENT FACILITY: A TOTAL ECOSYSTEM APPROACH* (495)

CHEMICAL MODELING OF METALLIC WASTE DISPOSAL* (510)

A MODEL FOR CALCULATING EFFECTS OF LIQUID WASTE DISPOSAL IN DEEP SALINE AQUIFERS* (519)

HYDROLOGY MODEL EVALUATION AT THE HANFORD NUCLEAR WASTE FACILITY* (529)

A WASTE ASSIMILATIVE CAPACITY MODEL FOR A SHALLOW, TURBULENT STREAM* (531)

NUMERICAL MODELING OF SUBSURFACE RADIOACTIVE SOLUTE TRANSPORT FROM WASTE-SEWAGE POUNDS AT THE IDAHO NATIONAL ENGINEERING LABORATORY* (554)

DIGITAL MODELING OF RADIOACTIVE AND CHEMICAL WASTE TRANSPORT IN THE SNARE RIVER PLAIN AQUIFER AT THE NATIONAL REACTOR TESTING STATION, IDAHO* (555)

WASTE HEAT UTILIZATION FROM POWER PLANTS IN AGRICULTURE: WATER TRANSPORT* (562)

THE WASTE CONVERSION MODEL FOR STATE OF ILLINOIS WATER QUALITY MANAGEMENT PROGRAM* (627)

OPTIMIZATION MODELS FOR RIVER BASIN WATER QUALITY MANAGEMENT AND WASTE TREATMENT PLANT DESIGN* (630)

A MODEL FOR CALCULATING EFFECTS OF LIQUID WASTE DISPOSAL IN DEEP SALINE AQUIFERS* (641)

SIMULTANEOUS HEAT AND MASS TRANSFER IN POROUS MEDIA WITH APPLICATION TO SOIL WARMING WITH POWER PLANT WASTE HEAT* (657)

COMMERCIAL WASTE MANAGEMENT REPORT GENERATOR* (730)

WASTE HEAT MANAGEMENT IN THE ELECTRIC POWER INDUSTRY: ISSUES OF ENERGY CONSERVATION AND STATION OPERATION UNDER ENVIRONMENTAL CONSTRAINTS* (813)

WASTES

DEEP SEA OCEAN DISPOSAL OF PETROCHEMICAL PLANT WASTES* (393)

A MODEL FOR THE APPROXIMATE CALCULATION OF SAFE RATES OF DISCHARGE OF RADIOACTIVE WASTES INTO MARINE ENVIRONMENTS* (461)

FILE INDEX

WATER

WATER

WATER, A COMPUTER PROGRAM FOR CALCULATING CHEMICAL EQUILIBRIA OF NATURAL WATERS* (599)

- A STUDY OF THE FISSION PRODUCT RELEASE FROM A DAMLY DAMAGED WATER-COOLED REACTOR* (39)
 COMPUTATIONS OF POSSIBLE CLIMATIC CONSEQUENCES OF PERTURBATIONS TO STRATOSPHERIC AEROSOLS, OZONE AND WATER VAPOR WITH RADIATIVE-CONVECTIVE MODELS* (48)
 A COMPUTER TECHNIQUE FOR CALCULATING THE RADIOLOGICAL CONSEQUENCES OF PRESSURIZED WATER REACTOR POWER PLANT THEORETICAL ACCIDENTS* (93)
 SOILS FOR RADIATION EXPOSURE FROM A BOILING WATER REACTOR PLUME* (90)
 EFFECT OF WATER VAPOR ON THE DESTRUCTION OF OZONE IN THE STRATOSPHERE PERTURBED BY CFC OR DON POLLUTANTS* (166)
 A SYSTEM APPROACH FOR THE STUDY AND CONTROL OF FACTORS AFFECTING WATER POLLUTION* (306)
 MODEL FOR RADIOACTIVITY TRANSPORT IN WATER: NUMERICAL SOLUTIONS OF RADIONUCLIDE TRANSPORT EQUATIONS AND ROLE OF PLANTS IN SO-85 TRANSPORT* (390)
 HANDBOOK DEL DEV: COMPUTER SIMULATION OF POLLUTANT TRANSPORT IN SEMI-ENCLOSED WATER BODY* (409)
 DOCUMENTATION FOR SUSIN/2, A COMPUTER PROGRAM FOR THE STEADY-STATE WATER QUALITY SIMULATION OF A STREAM BETWEEN* (407)
 MEASUREMENT AND MODELING OF STORM WATER RUNOFF FROM COAL STORAGE PILES AND THE IMPACT ON RECEIVING WATERS* (462)
 A WATER QUALITY PLANNING MODEL WITH MULTIPLE TIME, POLLUTANT, AND SOURCE CAPABILITIES* (479)
 EFFECT OF ATMOSPHERIC STABILITY ON WATER TEMPERATURE PREDICTIONS FOR A THERMALLY LOADED STREAM* (420)
 ONE-DIMENSIONAL HYDRODYNAMIC AND WATER QUALITY CONDITIONS IN ESTUARIES AND CONTROLLED RIVERS* (426)
 MATHEMATICAL MODEL FOR WATER POLLUTION CONTROL STUDIES* (437)
 FIELD STUDY AND MATHEMATICAL MODEL OF THE SLACK-WATER OUTFLOW OF A POLLUTANT IN A TIDAL RIVER* (438)
 RADIOACTIVITY TRANSPORT IN WATER* (439)
 APPLICATIONS OF THE FINITE-ELEMENT METHOD FOR SIMULATION OF SURFACE WATER TRANSPORT PROBLEMS* (444)
 MODELING AND CONTROL OF THE POLLUTION OF WATER RESOURCES SYSTEMS VIA MULTILEVEL APPROACH* (445)
 MATHEMATICAL MODELS OF WATER QUALITY PARAMETERS FOR RIVERS AND ESTUARIES* (446)
 EXPERIMENTAL AND ANALYTICAL STUDIES OF CONDENSED WATER DISCHARGE FOR THE ATLANTIC GENERATING STATION* (447)
 MODELING AND OPTIMIZATION OF TRANSIENT COOLING WATER DISCHARGE FROM POWER GENERATING PLANTS, APPLICATIONS TO REGIONAL SITUATIONS* (457)
 COMPUTER SIMULATION OF SURFACE WATER HYDROLOGY AND SALINITY WITH AN APPLICATION TO STUDIES OF COLORADO RIVER MANAGEMENT* (469)
 MATHEMATICAL MODELS FOR THE PREDICTION OF TEMPERATURE DISTRIBUTIONS RESULTING FROM THE DISCHARGE OF HEATED WATER INTO LARGE BODIES OF WATER* (466)
 NUMERICAL COMPUTATION OF WASTE-HEAT DISPERSION IN A RECEIVING WATER BODY* (467)
 WATER-QUALITY SIMULATION MODEL FOR WELL-MIXED ESTUARIES AND COASTAL SEAS* (476)
 NUMERICAL SIMULATION OF WATER QUALITY IN COASTAL WATERS AND ESTUARIES* (477)
 WATER TEMPERATURE FORECASTING AND ESTIMATION USING POWERED SERIES AND COMMUNICATION THEORY TECHNIQUES* (485)
 PREDICTIVE MODEL FOR THERMAL STRATIFICATION AND WATER QUALITY IN RESERVOIRS* (499)
 RADIOACTIVITY TRANSPORT IN WATER. BIOLOGICAL ACCUMULATION OF MERCURY (II) AND METHYLMERCURY BY CHLORRELLA PYRENIDIOSA* (497)
 STOCHASTIC VARIATION OF WATER QUALITY OF THE PASSAIC RIVER* (505)
 WASTEWATER TRANSPORT BY SEDIMENT WATER INTERACTION* (508)
 DELAWARE ESTUARY AND BAY WATER QUALITY SAMPLING AND MATHEMATICAL MODELING PROJECT* (517)
 DCSAG-1, SIMULATION OF WATER QUALITY IN STREAMS AND CANALS: PROGRAM DOCUMENTATION AND USERS MANUAL* (530)
 RESERVOIR WATER QUALITY MODEL SPARS* (542)
 WATER CODE* (544)
 MODEL FOR THE EFFICIENT ALLOCATION OF ENVIRONMENTAL ASSIMILATIVE CAPACITY: THE CASE OF THERMAL EMISSIONS TO A LARGE BODY OF WATER* (559)
 WASTE HEAT UTILIZATION FROM POWER PLANTS IN AGRICULTURE: WATER TRANSPORT* (562)
 RADIOACTIVITY TRANSPORT IN WATER - MATHEMATICAL MODEL FOR THE TRANSPORT OF RADIONUCLIDES* (567)
 MULTI-LAYERED MODELS OF CURRENTS, TEMPERATURE, AND WATER QUALITY PARAMETERS IN THE GREAT LAKES* (570)
 REGIONAL MODELING OF SURFACE WATER TEMPERATURES FROM PROJECTED POWER GROWTHS* (571)
 ANALYTICAL JET-TYPE MODEL OF HEATED WATER SURFACE PLUMES* (577)
 SURFACE DISCHARGE OF HEATED WATER* (578)
 AN ANALYTICAL AND EXPERIMENTAL INVESTIGATION OF SURFACE DISCHARGES OF HEATED WATER* (579)
 NUMERICAL THERMAL PLUME MODEL FOR VERTICAL OUTFALLS IN SHALLOW WATER* (593)
 WATER QUALITY FOR RIVER - RESERVOIR SYSTEMS* (603)
 CHEMICAL MODEL FOR LAKE MICHIGAN POLLUTION, CONSIDERATIONS ON ATMOSPHERIC AND SURFACE WATER TRACE METAL INPUTS* (606)
 A GENERALIZED WATER QUALITY MODEL FOR ESTUARINE LAKES AND RESERVOIRS* (627)
 DETERMINATION OF OPTIMAL MULTIPLE USES OF A SMALL WATER RESOURCE* (622)
 A MODEL TO PREDICT REGIONAL WATER QUALITY IMPACTS FROM COAL RELATED ENERGY FACILITIES* (624)
 NUMERICAL MODEL FOR THE PREDICTION OF TRANSIENT WATER QUALITY IN ESTUARY NETWORKS* (625)
 RIVER BASIN WATER QUALITY MODEL* (626)
 THE WASTE CONVERSION MODEL FOR STATE OF ILLINOIS WATER QUALITY MANAGEMENT PROGRAM* (627)
 WATER QUALITY MANAGEMENT PROGRAM HYDROLOGY PACKAGE* (628)
 POPLAR RIVER WATER QUALITY SYSTEMS MODEL* (629)
 APPLICATIONS OF STREAM WATER QUALITY MODELS TO ALABAMA* (637)
 WATER QUALITY SIMULATION MODEL* (636)
 OPTIMIZATION MODELS FOR RIVER BASIN WATER QUALITY MANAGEMENT AND WASTE TREATMENT PLANT DESIGN* (638)
 SIMULTANEOUS TRANSPORT OF WATER AND REACTIVE SOLUTES THROUGH MULTILAYERED SOILS UNDER TRANSIENT UNSTATED FLOW CONDITIONS* (642)
 WATER MOVEMENT THROUGH SATURATED POROUS MEDIA: A FINITE-ELEMENT GALERKIN MODEL* (643)
 A THEORY OF THE MASS TRANSPORT OF PREVIOUSLY DISTRIBUTED CHEMICALS IN A WATER SATURATED SORBING POROUS MEDIUM* (649)
 MODELLING THE DOSE TO MAN FROM EXPOSURE TO TRITIATED WATER VAPOR* (681)
 BUT, A PROGRAM FOR THE CALCULATION OF ACTIVITY RELEASES AND POTENTIAL DOSES FROM A PRESSURIZED WATER REACTOR PLANT* (683)
 CALCULATIONS OF DOSE AND POPULATION DOSE IN THE GENERAL ENVIRONMENT DUE TO BOILING-WATER NUCLEAR POWER REACTOR RADIONUCLIDE EMISSIONS IN THE UNITED STATES IN 1974* (722)
 A MODEL TO PREDICT FISH-IMPAIRMENT AT COOLING WATER INTAKES* (761)
 CALCULATION OF RELEASES OF RADIOACTIVE MATERIALS IN GASEOUS AND LIQUID EFFLUENTS FROM BOILING WATER REACTORS (SWR-GALE CODE)* (811)
 CALCULATION OF RELEASES OF RADIOACTIVE MATERIALS IN GASEOUS AND LIQUID EFFLUENTS FROM PRESSURIZED WATER REACTORS (PWR-GALE CODE)* (812)

TITLE INDEX

- WATERS**
 A SYSTEMS ANALYSIS MODEL FOR CALCULATING RADIONUCLIDE TRANSPORT BETWEEN RECEIVING WATERS AND BOTTOM SEDIMENTS* (390)
 MEASUREMENT AND MODELING OF STORM WATER RUNOFF FROM COAL STORAGE PILES AND THE IMPACT ON RECEIVING WATERS* (402)
 MATHEMATICAL SIMULATION OF WATER QUALITY IN COASTAL WATERS AND ESTUARIES* (477)
 MATHEMATICAL MODELS OF TEMPERATURE EFFECTS IN TIDAL WATERS* (523)
 WATER, A COMPUTER PROGRAM FOR CALCULATING CHEMICAL EQUILIBRIA OF NATURAL WATERS* (595)
 MATHEMATICAL MODEL FOR FATE OF POLLUTANTS IN NEAR-SHORE WATERS* (600)
- WATERSHEDS**
 WATERSHED POLLUTION FORECASTING MODEL* (365)
 MODEL OF WATERSHED HYDROLOGY* (420)
 SENSIBILITY: A WATERSHED LEVEL SIMULATION MODEL OF TREE STOMAS DYNAMICS* (436)
 QST: PROGRAM FOR COMPUTERIZED SELECTION OF WATERSHED PARAMETER VALUES FOR THE STAFFORD WATERSHED MODEL* (442)
 MODELING LEAD POLLUTION IN A WATERSHED ECOSYSTEM* (557)
 THE STAFFORD WATERSHED MODEL: THE CORRELATION OF PARAMETER VALUES SELECTED BY A COMPUTERIZED PROCEDURE WITH MEASUREMENT PHYSICAL CHARACTERISTICS OF THE WATERSHED* (652)
- WATERSHEDS**
 A MASS BALANCE MODEL OF TRACE METALS IN SEVERAL DELAWARE WATERSHEDS* (397)
 SIMULATING TINDER FIELDS AND HYDROLOGIC IMPACTS RESULTING FROM TINDER HARVEST ON SUBALPINE WATERSHEDS* (470)
- WATERWAYS**
 EFFECTS OF DISCHARGE DESIGN ON THE THERMAL MIXING ZONE IN WATERWAYS* (540)
- WATERS**
 BIOLOGICAL DOSE AND RADIOLOGICAL ACTIVITY FROM NUCLEAR REACTOR OR NUCLEAR WASTE FISSILE PRODUCTS* (487)
- WEATHER**
 ANALYSIS OF WEATHER DATA--WIND ANALYSIS, TEMPERATURE ANALYSIS, PRECIPITATION ANALYSIS* (266)
 NATIONAL WEATHER SERVICE RIVER FORECAST SYSTEM* (540)
- WETS**
 UNSTRUCTURED MARINE FOOD WEBS AND POLLUTANT ANALOGUES* (462)
- WIGHTED**
 WIGHTED DIGRAPH MODELS FOR THE ASSESSMENT OF ENERGY USE AND AIR POLLUTION IN TRANSPORTATION SYSTEMS* (270)
- WIND**
 WIND V CODE MODIFICATIONS FOR RF PROPAGATION AND SYSTEM PERFORMANCE MODELING* (200)
- WINDS**
 A FOOD CHAIN MODEL OF CADMIUM IN WESTERN LAKE ERIE* (666)
- WIND**
 TYPICAL STUDY OF WET COOLING TOWER PLUMES* (308)
 WET PLUME RISE FROM COOLING TOWERS IN STRONG WINDS* (302)
- WIND**
 DOSES WHILE TRAVELING UNDER WELL ESTABLISHED PLUMES* (719)
- WINDS**
 SIMULATION APPROACH TO THE ANALYSIS OF STRIP-MIXING IMPACT ON THE ECOSYSTEM WITH EMPHASIS ON WILDLIFE* (792)
- WIND**
 A TIME-DEPENDENT MODEL OF THE TRADE-WIND BOUNDARY LAYER* (3)
 WIND EFFECTED REDISTRIBUTION OF SURFACE CONTAMINATION* (4)
 APPLICATIONS OF PHYSICAL MODELING IN A WIND TUNNEL TO GEOTHERMAL DEVELOPMENT* (5)
 METEOROLOGICAL SUB-MODELS FOR AQMS: WIND AND TEMPERATURE PROFILES* (16)
 A GLOBAL MODEL OF THERMOSPHERIC DYNAMICS, WIND AND DENSITY FIELDS DERIVED FROM A PHENOMENOLOGICAL REPRESENTATION* (46)
 EFFECT OF A MESOSCALE TYPE WIND ON THE POLLUTANT DISTRIBUTION FROM A LINE SOURCE* (67)
 A MODEL TO PREDICT RADIOLOGICAL ENVIRONMENTAL IMPACT RESULTING FROM STRAIGHTLINE WIND DAMAGE TO A PLUTONIUM FACILITY* (139)
 COMPLEX TERRAIN WIND MODEL* (165)
 A PREDICTIVE MODEL OF NEAR URBAN POLLUTION FOR USE WITH STANDARD WIND ROSES* (257)
 POINT SOURCE ATMOSPHERIC DIFFUSION MODEL WITH VARIABLE WIND AND DIFFUSIVITY PROFILES* (259)
 NUMERICAL PREDICTION OF THE MESOSCALE TRANSPORT OF ATMOSPHERIC EFFLUENTS: PHILOSOPHY AND MORPHOLOGY OF EXPERIMENTAL MODELS FOR PREDICTING THE WIND AND POTENTIAL RADIOLOGICAL FIELDS OVER THE NEVADA TEST SITE* (262)
 ANALYSIS OF WEATHER DATA--WIND ANALYSIS, TEMPERATURE ANALYSIS, PRECIPITATION ANALYSIS* (266)
 MASS ADJUSTED THREE DIMENSIONAL WIND FIELD MODEL* (292)
 PROGRAM DESCRIPTIONS, SUPPLEMENT TO MESOSCALE WIND FIELDS AND TRANSPORT ESTIMATES DETERMINED FROM A NETWORK OF WIND TOWERS* (326)
 ADVECTION OF ARTIFICIALLY PRODUCED UPPER ATMOSPHERIC CLOUDS IN EMPIRICALLY DETERMINED WIND FIELDS* (339)
 PAST RESPONSE MODEL OF TOXIC AEROSOL RESUSPENSION BY WIND* (370)
- WINDBORNE**
 THE ESTIMATION OF THE DISPERSION OF WINDBORNE MATERIALS* (230)
- WINDS**
 WET PLUME RISE FROM COOLING TOWERS IN STRONG WINDS* (302)
- WIND**
 SIMULATING THE IMPACT OF THE ENTRAINMENT OF WINTER FLOEDEL LARVAE* (760)
- WISCONSIN**
 MESOSCALE AIR POLLUTION TRANSPORT IN SOUTHEAST WISCONSIN* (173)
 MODEL OF ENVIRONMENTAL IMPACTS FROM ELECTRICAL GENERATION IN WISCONSIN* (747)
 DESCRIPTION AND DOCUMENTATION OF THE HYDROLOGIC TRANSPORT MODEL (HTM) DEVELOPED AT THE UNIVERSITY OF WISCONSIN* (802)
- WORLD**
 A MODEL TO ESTIMATE RADIATION DOSE COMMITMENTS TO THE WORLD POPULATION FROM THE ATMOSPHERIC RELEASE OF RADIOISOTOPES* (273)
 IMPACT OF OIL SPILLAGE FROM WORLD WAR II SUNKEN SINKINGS* (400)
- YELLOW**
 A BICENTENARIAL-BASED MODEL FOR POLLUTANT ACCUMULATION BY FISH SIMULATION OF PCB AND METHYLMERCURY RESIDUE LEVELS IN OTTAWA RIVER YELLOW PERCH (PERCA FLAVESCENS)* (516)
- YELLOWSTONE**
 STUDY OF THE IMPACTS OF REDUCED STEADYFLOWS IN THE MIDDLE AND LOWER YELLOWSTONE BASIN* (623)
- WINDS**
 SIMULATING TINDER FIELDS AND HYDROLOGIC IMPACTS RESULTING FROM TINDER HARVEST ON SUBALPINE WATERSHEDS* (470)

TITLE INDEX

YOUN

AIR QUALITY DIFFUSION MODEL: APPLICATION TO NEW YORK CITY* (273)
A GAUSSIAN-PUFF MODEL SIMULATION OF CHLORINATED CONTAMINATION ON LONG ISLAND, NEW YORK* (547)

YINC

DETERMINATION OF ENVIRONMENT OF YINC, LEAD AND CADMIUM IN RESERVOIR SEDIMENTS* (548)

YOUNI

DIFFERENCE ANALYSIS OF BOUNDARY-VALUE PROBLEMS FOR THE EQUATIONS OF GLOBAL RADIOISOTOPE CONTAMINANT TRANSPORT AND THEIR NUMERICAL SOLUTION: DIFFERENCE APPROXIMATION OF EQUATIONS AND BOUNDARY CONDITIONS IN THE HEMISPHERIC PLANE AND THE GLOBAL BELT OF THE ATMOSPHERE* (129)
PLANETARY DISTRIBUTION OF GLOBAL WIND TRANSPORT PARAMETERS OF RADIOISOTOPES IN THE TROPOSPHERE AND LOWER STRATOSPHERE: CLIMATIC DISTRIBUTION OF THE GLOBAL WIND COMPONENTS OF THE HEMISPHERIC CIRCULATION VELOCITY* (130)
GLOBAL ATMOSPHERIC MODEL, SECOND GENERATION* (174)

YOUN

EFFECTS OF DISCHARGE DESIGN ON THE THERMAL MIXING ZONE IN WATERWAYS* (546)

MODEL ACRONYM INDEX

ACCOMPLISH INDEX

ACOLUS 90
ACORN 725, 703
ACORN 761
ACORN 265
ACORN-11 720
ACORN 710, 720, 722
ACORN 731
ACORN II 602
ACORN/ACORN 50
ACORN 313
ACORN-1A 105
ACORN-2 170
ACORN 277
ACORN 296
ACORN 100
ACORN 201
ACORN 205
ACORN 505
ACORN 209, 661, 701
ACORN 696, 793, 790
ACORN 700
ACORN 290
ACORN 919
ACORN 95, 89, 92, 106

ACORN 235
ACORN 109, 120
ACORN 211
ACORN-QUAL 503
ACORN 370
ACORN-1A 212
ACORN 626
ACORN 602
ACORN 267
ACORN 706
ACORN 668
ACORN 306
ACORN TRAJECTORY MODEL 196
ACORN WIND ROSE MODEL 360
ACORN 150, 163
ACORN-1A 811
ACORN 10
ACORN 11
ACORN 269
ACORN 710

ACORN 80, 150, 310
ACORN 31
ACORN 606
ACORN 777
ACORN 621, 572
ACORN 600
ACORN 335
ACORN-11 729
ACORN-1A 299
ACORN 105
ACORN 663, 761
ACORN 317
ACORN 690
ACORN 100
ACORN 700
ACORN 701
ACORN/IMPRES 719
ACORN 719
ACORN 700
ACORN 810
ACORN 732
ACORN 213
ACORN 500
ACORN 715
ACORN 100
ACORN 43
ACORN 729
ACORN 622
ACORN 631
ACORN-1 530
ACORN 531
ACORN 695
ACORN 707, 793
ACORN 698
ACORN 93
ACORN 713
ACORN 231
ACORN 361
ACORN 410
ACORN 430
ACORN 720
ACORN 707
ACORN 69
ACORN 500
ACORN 502
ACORN 762

ACORN 626
ACORN 303
ACORN 130
ACORN II 702
ACORN-11 712
ACORN 427
ACORN 19
ACORN 776
ACORN 810
ACORN 716
ACORN-CLOUD 600
ACORN 691
ACORN 269
ACORN 675
ACORN 211
ACORN 202
ACORN 270
ACORN 713
ACORN 110
ACORN 90, 209
ACORN 170
ACORN 120
ACORN 269
ACORN 210, 663
ACORN 775
ACORN-1A 110
ACORN-1 110
ACORN-2 110
ACORN-1A 200
ACORN 696, 709, 793, 790
ACORN 100
ACORN 50, 312
ACORN 60
ACORN 590
ACORN 3, 455, 802
ACORN 430
ACORN 502
ACORN 620
ACORN 605

BLANK PAGE

ACIDWATER 10001

ALABAMA 252

ALABAMA 253

ALABAMA 254

ALABAMA 255

ALABAMA 256

ALABAMA 257

ALABAMA 258

ALABAMA 259

ALABAMA 260

ALABAMA 261

ALABAMA 262

ALABAMA 263

ALABAMA 264

ALABAMA 265

ALABAMA 266

ALABAMA 267

ALABAMA 268

ALABAMA 269

ALABAMA 270

ALABAMA 271

ALABAMA 272

ALABAMA 273

ALABAMA 274

ALABAMA 275

ALABAMA 276

ALABAMA 277

ALABAMA 278

ALABAMA 279

ALABAMA 280

ALABAMA 281

ALABAMA 282

ALABAMA 283

ALABAMA 284

ALABAMA 285

ALABAMA 286

ALABAMA 287

ALABAMA 288

ALABAMA 289

ALABAMA 290

ALABAMA 291

ALABAMA 292

ALABAMA 293

ALABAMA 294

ALABAMA 295

ALABAMA 296

ALABAMA 297

ALABAMA 298

ALABAMA 299

ALABAMA 300

ALABAMA 301

ALABAMA 302

ALABAMA 303

ALABAMA 304

ALABAMA 305

KEYWORD INDEX

SYNONYM INDEX

A COMES 99

ABSORPTION 89, 105, 302

ABSORPTION HEAT 107

ACCELERATED RELEASES 805

ACCIDENTS 39, 90, 130, 146, 303,
697, 698, 726, 723, 724, 700, 610

ACCPACT 705

ACETALDEHYDE 202

ACID WIRE DRAINAGE 409, 409, 512,
509, 517, 623, 439, 651

ACID PAID 97

ADAPTIVS 692

ADAPTATION 147, 479, 554, 653

ADULTS 709

ADVECTION 6, 130, 156, 157, 167,
168, 177, 659, 662

AFC 201, 369, 764

ADRIATION 457, 468

AERIAL MONITORING 17, 172

AERODYNAMICS 70, 120, 129, 130,
131, 809AEROSOL MONITORING 133, 160, 300,
308AEROSOLS 1, 12, 10, 20, 27, 87,
88, 89, 70, 81, 80, 101, 110,
120, 137, 171, 172, 170, 203,
206, 222, 235, 237, 206, 253,
272, 282, 206, 305, 322, 323,
329, 333, 330, 302, 350, 360,
361, 362, 370, 372, 379, 692,
732, 739

AGE EXPERIENCE 767, 769, 793

AGRICULTURE 463, 562, 657, 779

AIR 33, 120, 270, 200, 305, 350,
420, 557, 712

AIR FILTRERS 216

AIR POLLUTION 8, 9, 10, 11, 12,
17, 20, 21, 20, 20, 29, 30, 32,
33, 35, 30, 40, 41, 40, 45, 48,
50, 51, 53, 57, 58, 59, 60, 61,
62, 64, 66, 67, 69, 70, 71, 72,
74, 75, 76, 77, 78, 79, 82, 85,
86, 87, 88, 89, 90, 91, 92, 95,
96, 97, 99, 101, 103, 105, 106,
110, 112, 113, 114, 115, 116,
119, 121, 123, 124, 126, 127,
133, 130, 135, 136, 137, 141,
143, 144, 145, 147, 151, 152,
153, 154, 155, 156, 157, 158,
160, 161, 162, 163, 164, 165,
166, 169, 170, 172, 173, 176,
178, 179, 182, 185, 186, 188,
189, 190, 192, 193, 194, 195,
196, 197, 198, 199, 200, 201,
202, 203, 204, 205, 206, 207,
208, 210, 215, 217, 218, 219,
221, 222, 223, 224, 228, 229,
233, 234, 235, 241, 242, 243,
244, 246, 247, 248, 249, 250,
251, 252, 253, 254, 255, 256,
257, 259, 260, 262, 264, 267,
270, 271, 272, 274, 275, 276,
277, 278, 279, 282, 283, 280,
287, 288, 290, 292, 291, 295,
296, 297, 298, 301, 304, 300,
309, 310, 311, 312, 313, 310,AIR POLLUTION 315, 316, 317, 310,
319, 320, 322, 323, 329, 310,
331, 332, 333, 336, 341, 342,
343, 345, 346, 349, 350, 352,
353, 354, 355, 356, 357, 358,
359, 364, 366, 368, 369, 371,
372, 373, 375, 376, 378, 380,
381, 382, 383, 384, 366, 397,
406, 637, 672, 675, 699, 705,
706, 713, 714, 715, 717, 719,
720, 722, 737, 750, 775, 770,
780, 781, 803, 800, 817AIR POLLUTION ABATEMENT 5, 276,
352

AIR POLLUTION CONTROL 81, 136, 180

AIR POLLUTION MONITORS 30, 145,
350AIR QUALITY 8, 10, 11, 14, 15, 29,
32, 34, 41, 40, 50, 51, 60, 65,
69, 92, 96, 123, 144, 145, 153,
157, 161, 162, 193, 194, 195,
197, 199, 200, 217, 273, 275,
276, 277, 280, 295, 296, 297,
310, 311, 312, 314, 315, 330,
333, 345, 346, 347, 348, 350,
355, 356, 358, 359, 363, 364,
367, 371, 370, 382, 383, 780,
791, 800

AIR TEMPERATURE 159

AIR TRANSPORT 133

AIRCRAFT 59, 61, 119, 219, 236,
277, 284, 291, 340, 376, 378,
382, 535

AIRPORTS 59, 310, 330, 378

ALABAMA 631

ALASKA 450, 671, 670

ALASKA OIL PIPELINE 703

ALBINO 206, 334

ALBERTA 20

ALGAE 400, 410, 439, 445, 472,
497, 645, 770, 703, 801

ALGORITHMS 202

ALKALIES 637

ALLOCATIONS 569

ALTITUDE 126

ALUMINUM 753

AMBIENT TEMPERATURE 26, 46, 320,
340, 510, 531, 550, 554

AMERICUM 696

AMINOACIDS 79, 83, 112, 330, 637

ANIONIC COMPOUNDS 72

ANALOG SYSTEMS 352

ANIMALS 495, 551, 557, 660, 670,
673, 677, 683, 750, 750, 760,
769, 785, 793

ANNUAL VARIATIONS 501

ANTHROPOGENIC 692

AQUACULTURE 562, 753

AQUATIC ECOSYSTEMS 365, 390, 391,
419, 429, 440, 455, 458, 459,AQUATIC ECOSYSTEMS 474, 495, 498,
500, 504, 511, 533, 536, 551,
568, 593, 600, 603, 610, 618,
620, 629, 633, 640, 642, 645,
755, 763, 765, 771, 772, 801AQUATIC ORGANISMS 425, 622, 661,
663, 664, 665, 749, 751AQUIFERS 463, 465, 506, 519, 554,
545, 641, 654, 656, 815

ARCTIC REGIONS 117, 647, 671

ARSON 192, 696

AROMATIC 516, 627

ARTESIAN BASINS 656

ATMOSPHERIC DEPOSIT 800

ATLANTIC OCEAN 70, 404, 527

ATLANTIC-1 FRAC TION 461

ATLANTIC-2 FRAC TION 461

ATMOSPHERIC EXPLOSIONS 19, 239,
339, 370, 800ATMOSPHERIC PRECIPITATIONS 1, 7,
72, 97, 131, 149, 183, 184, 191,
246, 285, 306, 360, 416, 569,
605, 679, 681, 790, 816

ATTENUATION 7

AUDIOL 211, 370

AUTOMATION 341

AUTOMOBILES 2, 51, 61, 79, 116,
121, 133, 155, 156, 170, 185,
199, 204, 290, 305, 313, 320

AVAILABILITY 620

BACHHOUSES 81

BASELINE ECOLOGY 117, 800

BATS 400, 498, 500, 506

BEHAVIOR 51, 425

BENTHOS 400, 600

BERYLLIUM OXIDES 50

BETA PARTICLES 299, 729, 779

BIBLIOGRAPHIES 61, 465

BIODIVERSITY 117

BIODIVERSITY 725

BIOCHEMICAL OXYGEN DEMAND 392,
401, 400, 410, 420, 445, 446,
477, 505, 530, 542, 543, 544,
545, 603, 625, 630BIOCHEMICAL REACTION KINETICS 202,
717

BIODEGRADATION 560

BIOLOGICAL ACCUMULATION 497, 516,
557, 660, 661, 662, 662, 664,
665, 666, 670, 676, 677, 678,
704, 703, 751, 757, 765BIOLOGICAL EFFECTS 62, 366, 390,
434, 449, 458, 645, 677, 680,
699, 709, 715, 720, 740, 750,
759, 817

BIOLOGICAL HALF-LIFE 659

KEYWORD INDEX

- BIOLOGICAL INDICATORS 665
 BIOLOGICAL MODELS 499, 649, 674, 681, 690, 717, 749, 753, 764, 767, 769, 799
 BIOLOGICAL VARIABILITY 769
 BIRCHES 419, 434, 472, 495, 551, 669, 772, 783
 BIRCHES PLANTATIONS 774
 BISCAYNE BAY 597
 BLOWDOWN 395, 524
 BODY 791
 BOEY BURDEN 123, 600, 667, 674, 687, 692, 702, 704, 717, 724, 734, 735, 743, 770
 BOILERS 215
 BOUNDARY CONDITIONS 15, 47, 294
 BOUNDARY LAYERS 5, 6, 16, 66, 70, 126, 128, 129, 130, 131, 153, 167, 172, 190, 233, 265, 307, 322, 323, 324, 337, 344, 377
 BREEMING BLANKETS 716
 BREMSSTRAHLUNG 211
 BRINES 415
 BUCKING 2
 BUILDINGS 147, 284
 BUILDUP 40, 793
 BUSES 294
 BUTANE 329, 349
 BUT TYPE REACTIONS 722, 811
 C COMES 684
 CADMIUM 666, 717, 744, 769
 CALCIUM 717
 CALCULATION METHODS 13, 283
 CALIFORNIA 5, 150, 345, 348, 354
 CANADA 20, 809
 CAPE PEAR RIVER 755
 CARBON 342, 401, 408
 CARBON DIOXIDE 26, 80, 117, 174, 176, 181, 182, 183, 187, 261, 286, 338, 374, 384
 CARBON MONOXIDE 10, 11, 21, 51, 60, 90, 92, 116, 121, 124, 134, 145, 156, 168, 170, 185, 199, 221, 237, 278, 290, 301, 313, 353, 366, 368, 380, 382, 717, 803
 CARBON 14 176, 696, 706, 794
 CARCINOGENESIS 699
 CARCINOGENS 699
 CARTESIAN COORDINATES 140
 CATALYSTS 171
 CATTLE 605
 CEREALS 679
 CESSION 555, 642, 671, 674
 CESTUM 134 670, 671, 753
 CFSIUM 137 394, 439, 479, 554, 647, 671, 674, 679, 747, 751, 753, 754, 772
 CHANNELING 582
 CHEMICAL ANALYSIS 216, 500
 CHEMICAL COMPOSITION 342, 576, 583, 754
 CHEMICAL EFFLUENTS 24, 30, 70, 80, 126, 217, 222, 329, 352, 375, 476, 510, 515, 647, 693
 CHEMICAL INDUSTRY 637
 CHEMICAL PROPERTIES 124, 219
 CHEMICAL REACTION KINETICS 50, 65, 100, 192, 307, 513
 CHEMICAL REACTIONS 24, 30, 35, 52, 73, 78, 79, 83, 143, 144, 147, 161, 162, 164, 264, 370, 595, 639, 647
 CHEMILUMINESCENCE 836
 CHERISORPTION 647
 CHIMREYS 215
 CHLORINATED ALIPHATIC HYDROCARBONS 141
 CHLORINE 766
 CHLORINE COMPOUNDS 166
 CHLOROPHAN 514
 CHLOROPHYLL 410, 634
 CHROMIUM 547
 CHROMIUM 51 439
 CLAYS 544
 CLEAN AIR ACT 371
 CLEANING 411
 CLYATES 7, 16, 25, 26, 40, 170, 175, 182, 187, 187, 173, 174, 179, 182, 183, 184, 250, 261, 264, 285, 286, 287, 320, 325, 327, 328, 353, 365, 367, 372, 450, 569, 764
 CLOUDS 3, 6, 14, 49, 54, 72, 102, 111, 137, 146, 149, 181, 182, 187, 203, 207, 220, 241, 285, 286, 291, 299, 303, 330, 360, 367, 602, 640, 690, 691, 696, 698, 707, 729, 730, 794
 COAL 75, 81, 117, 123, 204, 402, 776, 787
 COAL MINES 350, 512, 549, 623, 640
 COAL MINING 301, 624, 639, 795
 COAL PREPARATION 624
 COAL-FIRED RHD GENERATORS 81
 COASTAL REGIONS 172, 222, 309, 427, 504, 674
 COASTAL STATES 406, 471, 476, 477, 496, 498, 535, 574, 604
 COBALT 717
 COBALT 50 439, 753
 COBALT 60 753
 CODES 615, 615, 615
 COHERENCE LENGTH 377
 COLIFORMS 476, 477
 COLORADO RIVER 611
 COLORADO RIVER BASIN 468
 COLUMBIA RIVER 613
 COMBUSTION 80, 80, 220, 692, 797
 COMBUSTION CHAMBERS 101
 COMBUSTION KINETICS 192
 COMBUSTION PRODUCTS 10, 75, 101, 150, 197, 202, 205, 206, 216, 221, 295, 296, 803
 COMMUNICATIONS 200, 405
 COMMUNITIES 777
 COMPARATIVE EVALUATIONS 123, 199, 679, 753, 769
 COMPUTER CALCULATIONS 20, 22, 33, 70, 192, 210, 321, 329, 371, 399, 415, 425, 434, 440, 553, 573, 586, 615, 623, 640, 757, 780, 784, 789, 795, 804, 814
 COMPUTER CODES 4, 9, 79, 22, 33, 49, 59, 60, 75, 84, 93, 94, 99, 109, 111, 113, 118, 120, 144, 149, 170, 185, 186, 188, 192, 202, 213, 215, 216, 218, 227, 237, 273, 281, 282, 291, 298, 299, 300, 303, 326, 328, 335, 341, 344, 350, 365, 373, 390, 394, 444, 446, 456, 464, 482, 486, 503, 506, 512, 513, 518, 554, 564, 567, 568, 573, 596, 613, 615, 619, 634, 640, 644, 682, 684, 685, 688, 690, 691, 694, 696, 697, 698, 707, 711, 713, 718, 720, 721, 722, 728, 729, 730, 731, 742, 745, 748, 749, 750, 785, 789, 793, 802, 804, 805, 811, 812, 813, 820
 COMPUTER GRAPHICS 741, 791
 COMPUTER PROGRAMS 595, 677
 COMPUTER-AIDED DESIGN 432
 COMPUTERS 62, 169, 271, 412
 CONDENSATION NUCLEI 207
 CONDENSER COOLING SYSTEMS 407
 CONDENSERS 549
 CONNECTICUT 115
 CONSERVATION LAWS 134
 CONSTRUCTION 703
 CONTAINED EXPLOSIONS 681
 CONTAINMENT 39, 299, 646
 CONTAINMENT BUILDINGS 744
 CONTAINMENT SYSTEMS 84

REPROD INDEX

- CONTAMINATION 101, 321, 340, 515, 600, 655, 671, 772, 876
- CONTINUITY EQUATIONS 290
- CONTROL 01, 301, 371, 011, 022, 032, 090
- CONTROL EQUIPMENT 032
- CONTROLLED ATOMSFERES 329, 352
- CONNECTION 3, 55, 035, 552, 609
- CONVERSION 205
- COULOMTS 011
- COOLING 3, 6, 150, 190, 570, 612
- COOLING POWDS 329, 396, 015, 091, 501, 509, 520, 590
- COOLING SYSTEMS 37, 229, 399, 057, 066, 073, 509, 500, 590, 672, 613, 657, 709, 760, 013
- COOLING TOWERS 5, 102, 104, 107, 102, 100, 109, 150, 223, 220, 225, 220, 229, 230, 231, 232, 230, 202, 203, 200, 206, 207, 200, 209, 210, 251, 252, 253, 254, 255, 256, 263, 302, 300, 330, 307, 056, 552, 559
- COPPER 127, 606
- COROLIS FORCE 56
- COSMIC RADIATION 55, 260, 269
- COST 01, 301, 022, 562, 617, 637, 710, 762, 707
- COST BENEFIT ANALYSIS 219, 539, 630, 017
- COWS 670, 750, 793
- CRITICAL ORGANS 690, 697, 730
- CROPS 557, 675, 775, 779
- CROSS SECTIONS 31
- CRUSTACEANS 659
- CUMBERLAND RIVER 799
- CUTION 696
- CURVEPTS 25
- D CODES 000
- DAILY VARIATIONS 3, 16, 36, 00, 102, 190, 222, 200, 260, 202, 305, 300, 300
- DAMAGE 022, 690, 779, 017
- DAMS 550, 600
- DAPHNIA 665
- DATA 125, 307, 056, 070, 560, 751, 772
- DATA ACQUISITION 302, 629, 709, 755
- DATA ANALYSIS 290, 379, 620, 755, 765, 700
- DATA COMPILATION 060, 699
- DATA PROCESSING 307
- DAUGHTER PRODUCTS 271, 605
- DECAY 00, 303, 550, 600, 700
- DECISION MAKING 50, 270, 019, 520, 563, 752
- DECOMPOSITION 560, 630, 607
- DEEP WATER OIL TERMINALS 507
- DEER 667, 669, 671, 670, 707
- DELAWARE 507
- DELAWARE RIVER 053
- DETAILED FACTORS 622
- DENSITY 23
- DEPOSITION 20, 03, 50, 60, 76, 70, 02, 100, 111, 122, 135, 106, 109, 201, 200, 200, 220, 230, 230, 205, 299, 300, 070, 530, 660, 670, 690, 696, 713, 710, 720, 730, 732, 702, 793, 790
- DEPTH 530, 501
- DEPTH DOSE DISTRIBUTIONS 706
- DESERTS 100
- DESIGN 101, 032, 536, 509, 596, 013
- DESCRIPTION 397
- DIAGRAMS 061
- DIATOMS 030
- DIESEL FUELS 307
- DIET 670, 679, 793
- DIFFERENTIAL CALCULUS 000
- DIFFERENTIAL EQUATIONS 19, 55, 71, 100, 100, 107, 192, 210, 265, 301, 010, 000, 069, 537, 593, 612, 007
- DIFFUSERS 092, 522, 523
- DIFFUSION 2, 6, 8, 9, 11, 20, 33, 30, 30, 01, 00, 05, 07, 52, 50, 59, 60, 67, 60, 70, 00, 03, 06, 00, 09, 92, 95, 90, 105, 106, 100, 111, 126, 127, 120, 129, 130, 131, 133, 130, 135, 130, 102, 103, 100, 105, 107, 100, 153, 155, 157, 161, 162, 160, 167, 160, 169, 172, 105, 100, 109, 191, 190, 202, 206, 200, 210, 210, 233, 230, 201, 250, 200, 263, 260, 279, 203, 295, 297, 300, 321, 322, 323, 331, 336, 353, 360, 367, 360, 309, 393, 399, 007, 012, 010, 062, 065, 066, 067, 069, 071, 075, 076, 507, 500, 513, 515, 521, 552, 559, 567, 570, 593, 599, 610, 610, 616, 609, 601, 707, 722, 732, 793, 019
- DIGITAL SYSTEMS 620
- DILUTION 393, 509
- DISCHARGE CAPALS 590
- DISEASES 097, 717
- DISPERSION RELATIONS 12, 60, 69, 90, 100, 111, 110, 151, 152, 153, 150, 177, 105, 109, 200, 223, 220, 260, 267, 273, 276, 201, 291, 299, 300, 350, 359, 370, 390, 010, 033, 039, 000, 513,
- DISPERSION RELATIONS 561, 565, 500, 610, 600, 713, 710, 721, 720
- DISPENSIOUS 20, 03, 07, 99, 122, 160, 197, 199, 202, 220, 226, 232, 251, 300, 305, 310, 311, 312, 313, 310, 315, 316, 370, 319, 326, 331, 030, 050, 059, 500, 500, 525, 575, 590, 600, 607, 609, 600, 720, 731, 730, 739, 705, 005
- DISSOLVED OXYGEN 392
- DISTANCE 690
- DISTRIBUTION 0, 70, 270, 521, 509, 562, 611, 720, 009
- DISTRIBUTION FUNCTIONS 100
- DIURNAL VARIATIONS 90, 233
- DNA 717
- DOB 210
- DOMESTIC ANIMALS 675
- DOSE COMMITMENTS 230, 700, 703, 700, 725, 700, 707, 709
- DOSE RATES 31, 109, 230, 390, 675, 607, 600, 695, 700, 702, 709, 710, 712, 723, 720, 733, 730, 736, 737, 700
- DOSE-RESPONSE RELATIONSHIPS 699, 769
- DOSES 51, 267, 556
- DOSIMETRY 706, 712
- DRINKING WATER 663, 660, 701, 700, 721, 793
- DROPLETS 1, 222, 205, 330, 360, 390, 619, 790
- DROPS 6
- DUSTS 7, 20, 123, 329, 350, 370, 703
- DYES 610
- DYNAMIC FUNCTION STUDIES 377
- EARTH ATMOSPHERE 7, 10, 11, 13, 10, 15, 16, 21, 26, 20, 35, 03, 07, 00, 55, 56, 60, 65, 70, 72, 70, 00, 90, 111, 113, 110, 120, 126, 120, 129, 130, 131, 132, 137, 105, 100, 155, 160, 170, 179, 101, 102, 103, 107, 193, 190, 195, 196, 200, 200, 211, 210, 219, 233, 200, 201, 261, 205, 270, 270, 201, 205, 200, 207, 291, 290, 295, 299, 300, 303, 307, 300, 321, 322, 320, 325, 326, 320, 326, 337, 339, 300, 300, 351, 370, 376, 377, 020, 600, 602, 600, 605, 600, 691, 696, 697, 713, 710, 720, 722, 729, 730, 731, 702, 705, 793, 790, 005, 019
- ECOLOGICAL CONCENTRATION 0, 53, 50, 76, 77, 02, 05, 95, 100, 112, 110, 127, 139, 205, 215, 237, 259, 260, 300, 310, 311, 312, 313, 310, 315, 316, 317, 310, 319, 321, 303, 307, 072, 600, 667, 607, 723, 750
- ECOLOGIST 117, 030, 036, 070, 670, 761, 766, 797, 790, 799, 007

EXTENDED INDEX

- ECODIAGNOSTICS 303, 437
 ECONOMIC ANALYSIS 529
 ECONOMIC INTERACT 700
 ECONOMICS 559, 566, 592, 613
 ECOSYSTEMS 70, 400, 430, 557, 505,
 609, 640, 705, 765
 EDDY CURRENTS 469
 EFFICIENCY 61, 301
 EGGS 764
 EIGENVECTORS 46
 ELECTRIC GENERATORS 215, 707
 ELECTRIC POWER 215, 302, 400, 635,
 707
 ELECTRON DENSITY 270, 370
 ELECTRON EMISSION 211
 ELECTROPLATING 510
 ELECTROSTATIC PRECIPITATORS 61
 ELEMENTS 397, 420, 505, 595, 600,
 609
 EMISSION 61, 210, 301, 369
 EMPLOY 117, 420, 766
 ENERGY ABSORPTION 716
 ENERGY BALANCE 26, 132, 170, 250,
 261, 207, 320, 325
 ENERGY CONSUMPTION 375
 ENERGY DENSITY 700, 791
 ENERGY LOSSES 150, 370
 ENERGY MODELS 700
 ENERGY PARTS 62
 ENERGY SOURCE DEVELOPMENT 700, 800
 ENERGY SOURCES 21
 ENERGY SUPPLIES 700
 ENERGY TRANSFER 456
 ENGINEERING 203
 ENTHALPY 37
 ENTRAINMENT 73, 63, 193, 790, 195,
 225, 205, 302, 309, 425, 461,
 404, 520, 509, 619, 752, 755, 749
 756, 764, 760, 771
 ENVIRONMENT 70, 100, 191, 201,
 277, 321, 370, 456, 460, 476,
 502, 566, 471, 601, 600, 690,
 700, 762, 709, 701, 816
 ENVIRONMENTAL EFFECTS 5, 13, 17,
 23, 32, 33, 36, 37, 39, 40, 110,
 110, 119, 122, 101, 102, 106,
 104, 223, 260, 263, 283, 290,
 300, 350, 375, 393, 399, 406,
 425, 430, 450, 472, 496, 490,
 502, 515, 519, 539, 552, 572,
 507, 590, 590, 602, 612, 620,
 623, 626, 620, 630, 635, 639,
 641, 603, 600, 660, 693, 705,
 706, 709, 773, 775, 763, 767,
 ENVIRONMENTAL EFFECTS 709, 796,
 797, 790, 820
 ENVIRONMENTAL EXPOSURE PATHWAY
 271, 556, 610, 731, 757, 750
 ENVIRONMENTAL IMPACT STATEMENTS
 277, 370
 ENVIRONMENTAL IMPACTS 0, 9, 10,
 50, 62, 75, 79, 117, 176, 206,
 219, 220, 229, 230, 290, 300,
 367, 380, 400, 400, 510, 553,
 620, 629, 756, 759, 700, 791,
 792, 795, 800, 803, 800, 811,
 812, 813
 ENVIRONMENTAL PROTECTION AGENCY
 170
 ENVIRONMENTAL TRANSPORT 2, 9, 12,
 21, 22, 20, 25, 30, 30, 40, 43,
 40, 47, 49, 61, 67, 60, 70, 73,
 76, 77, 70, 79, 82, 86, 91, 92,
 95, 96, 90, 99, 99, 100, 106,
 100, 109, 111, 110, 117, 120,
 135, 103, 152, 150, 156, 157,
 164, 160, 172, 173, 180, 191,
 192, 193, 190, 195, 196, 199,
 200, 212, 210, 217, 210, 219,
 222, 223, 227, 231, 232, 233,
 235, 237, 201, 259, 260, 260,
 267, 270, 272, 200, 290, 292,
 305, 300, 305, 300, 309, 310,
 311, 312, 310, 315, 316, 317,
 310, 319, 329, 330, 336, 306,
 307, 308, 355, 350, 359, 360,
 365, 367, 391, 400, 403, 420,
 421, 429, 439, 455, 463, 469,
 406, 497, 500, 506, 510, 511,
 510, 527, 529, 533, 530, 502,
 503, 500, 505, 506, 500, 550,
 550, 555, 556, 557, 567, 560,
 570, 572, 570, 575, 509, 592,
 603, 600, 609, 610, 610, 625,
 600, 607, 600, 609, 650, 650,
 670, 683, 600, 690, 690, 699,
 700, 726, 700, 706, 793, 790,
 802, 809
 EPIDEMIOLOGY 705
 EQUATIONS 23, 36, 56, 63, 67, 127,
 120, 129, 130, 131, 101, 260,
 420, 500, 577, 610, 609, 609
 EQUATIONS OF MOTION 6, 167, 307,
 400
 EROSION 370, 300, 407, 650
 ERRORS 167, 420
 ESTIMOS 667
 ESTUARIES 392, 390, 405, 409, 410,
 412, 425, 425, 430, 435, 439,
 446, 450, 450, 462, 460, 470,
 477, 407, 490, 503, 517, 521,
 533, 500, 500, 503, 503, 500,
 505, 600, 609, 625, 633, 752, 755
 EUTROPHICATION 400, 410, 500, 633
 EVALUATION 136, 165, 379, 650, 705
 EVAPORATION 150, 231, 205, 420,
 455, 520, 500, 810
 EVAPORATIVE COOLING 102, 202, 203,
 200, 200, 207, 200, 209, 250,
 251, 252, 259, 250, 255, 256
 EXCITATION 370
 EXCRETION 671, 725, 753
 EXHAUST GASES 2, 22, 40, 59, 60,
 61, 73, 79, 101, 116, 110, 155,
 EXHAUST GASES 156, 160, 170, 170,
 179, 185, 199, 205, 210, 210,
 200, 200, 290, 301, 305, 312,
 313, 320, 356, 373, 301, 557, 603
 EXPERIMENT PLANNING 461
 EXPLOSION 605
 EXPLOSIONS 702, 806
 EXTERNAL IRRADIATION 700
 EYES 730, 817
 F CODES 19
 F REGION 200
 FAILURES 600
 FALLOUT 120, 129, 130, 131, 213,
 210, 230, 262, 299, 667, 671,
 675, 677, 679, 600, 726, 779,
 706, 800
 FALLOUT DEPOSITS 670, 679, 712,
 800
 FEASIBILITY STUDIES 306
 FFT REACTOR 810
 FINITE DIFFERENCE METHOD 100, 167,
 270, 415, 406, 452, 503, 602,
 650, 655, 656, 610, 615, 610
 FINITE ELEMENT METHOD 402, 403,
 400, 401, 655, 615
 FISHES 400, 450, 497, 516, 562,
 459, 460, 662, 660, 665, 603,
 717, 721, 709, 752, 755, 756,
 759, 761, 762, 760, 771, 773, 793
 FISSION PRODUCT RELEASE 471, 690,
 707, 700
 FISSION PRODUCTS 117, 106, 600,
 691, 697, 690, 706, 730
 FLOCCULATION 27
 FLOOD CONTROL 605
 FLOODS 560, 605
 FLORIDA 490
 FLOW MODELS 126, 200, 272, 465,
 553, 577, 492
 FLOW RATE 220, 309, 400, 456, 401,
 500, 510, 501, 506, 619, 603, 652
 FLOW GAS 17, 91, 367
 FLUID FLOW 10, 399, 412, 410, 460,
 461, 462, 463, 464, 465, 407,
 515, 565, 575, 570, 570, 500,
 655, 650, 790, 810, 815, 821
 FLUID MECHANICS 155, 790
 FLUIDS 790
 FLUORINATED ALIPHATIC HYDROCARBONS
 101
 FLOORING 123, 123
 FOAMS 801
 FOS 6, 14, 37, 177, 207, 227, 230
 FOKER-PLACK EQUATION 211
 POLAR OPTICS 672, 770, 700

RETURN INDEX

- FOOD 69, 117, 675, 692, 701, 702, 793
 FOOD CHAINS 406, 497, 533, 640, 642, 643, 644, 646, 647, 649, 671, 673, 674, 675, 676, 678, 679, 681, 704, 721, 731, 747, 750, 760, 793, 801
 FOODS 670, 700, 793
 FORCED CONVECTION 420
 FORECASTING 6, 29, 32, 38, 69, 81, 84, 102, 120, 127, 140, 155, 169, 172, 180, 187, 221, 241, 262, 303, 307, 341, 346, 347, 354, 357, 363, 365, 373, 381, 409, 413, 420, 435, 440, 447, 459, 473, 507, 550, 564, 569, 579, 580, 590, 604, 610, 627, 633, 635, 651, 651, 609, 695, 715, 749, 757, 760, 783, 800
 FORESTS 62, 417, 436, 474, 557, 700
 FORMALDEHYDE 202
 FORTUNE 106, 211, 350, 406, 573, 811, 812
 FOSSIL FUELS 80, 80, 114, 117, 176, 205, 216, 714
 FOSSIL-FUEL POWER PLANTS 17, 33, 62, 174, 123, 150, 216, 222, 272, 300, 347, 371, 399, 402, 405, 629, 637, 705, 707
 FOWLER ANALYSIS 405
 FRESH WATER 470, 487, 721
 FROGS 706
 FROVE NUMBER 470
 FUEL CONSUMPTION 274
 FUEL CYCLE 706, 730
 FUEL OIL 206
 FUEL REPROCESSING PLANTS 706
 FUEL-COOLANT INTERACTIONS 810
 FUELS 216
 FUNCTIONAL MODELS 134, 169, 366, 402, 440, 636
 GALVESTON BAY 406
 GAMMA RADIATION 94, 109, 120, 269, 299, 690, 690, 720, 729, 730, 746, 779, 807
 GAMMA SOURCES 700
 GAMMA SPECTRA 31
 GAS ANALYSIS 301
 GAS CHROMATOGRAPHY 500
 GAS FLOW 5
 GAS TURBINES 10, 101
 GASEOUS DIFFUSION 73, 154, 193, 194, 195
 GASEOUS WASTES 12, 23, 24, 30, 40, 80, 111, 140, 140, 163, 172, 175, 192, 204, 204, 210, 217, 222,
 GASEOUS WASTES 235, 260, 267, 271, 272, 283, 290, 340, 341, 345, 317, 321, 330, 351, 354, 354, 350, 359, 361, 672, 750, 757, 775, 770, 811, 812
 GASES 330, 350, 406, 790
 GASOLINE 450, 692
 GASTROINTESTINAL TRACT 711, 735, 739, 745, 767
 GAVIS FUNCTION 43, 104, 199, 200, 201, 291, 293, 300, 303, 340, 691, 697, 707, 713, 720
 GAUSSIAN PROCESSES 94, 151, 152, 169, 335, 354, 600, 690, 729
 GENETIC DIVERSITY EFFECTS 710
 GEOCHEMICAL SURVEYS 605
 GEOCHEMISTRY 117
 GEOGRAPHY 139, 135
 GEOLOGIC STRATA 553, 642
 GEOLOGY 515, 527, 550, 795
 GEOMETRY 126
 GEOMORPHOLOGY 527
 GEOTHERMAL ENERGY 5, 775
 GEOTHERMAL POWER PLANTS 5, 354
 GEOTHERMAL SYSTEMS 815
 GINSENG-1 REACTOR 456
 GLOBAL ASPECTS 20, 110, 137, 170, 104, 250, 206, 306, 324
 GLOBAL POLLUTION 230, 239
 GOATS 730
 GOVERNMENT POLICIES 121, 437, 520, 796
 GRAPHIC 266
 GRASS 750
 GREENHOUSE EFFECT 137, 176, 181, 182, 372
 GROUND LEVEL 57, 130, 139, 139, 305, 351, 355, 360
 GROUND SUBSIDENCE 815
 GROUND WATER 201, 416, 442, 443, 463, 464, 465, 483, 486, 506, 515, 519, 507, 550, 554, 555, 641, 642, 643, 644, 650, 650, 655, 656, 706, 793, 794
 GROWTH 400, 436, 516
 GULF OF MEXICO 507
 H CODES 237, 709
 HALF-LIFE 710, 721
 HALOGEN COMPOUNDS 765
 HARBORS 406, 450
 HARVESTING 417, 474, 774
 HAZARDOUS MATERIALS 535
 HAZARDS 54, 422
 HEALTH HAZARDS 346, 600, 692, 704, 714, 717, 740, 707, 709, 816, 817
 HEAT 25, 37, 103, 190, 327, 396, 446, 493, 570, 579, 580, 613, 614
 HEAT FLUX 190, 307, 509, 613
 HEAT LOSSES 570
 HEAT RECOVERY 562, 657
 HEAT SINKS 142, 461
 HEAT SOURCES 46, 304
 HEAT TRANSFER 3, 6, 102, 107, 420, 427, 452, 469, 532, 550, 562, 571, 577, 593, 657, 821
 HEATING 55, 562, 657
 HEIGHT 23, 107, 294, 302, 304
 HIGHWAYS 13
 HOT-WATER SYSTEMS 354
 HIGH TYPE REACTORS 704
 HUDSON RIVER 425, 752
 HUMAN POPULATIONS 60, 601, 600, 696, 499, 736, 722, 737, 740, 709
 HUMIDITY 83, 105, 101, 263, 354, 413
 HYDRAULICS 392, 430, 466, 570, 579, 580, 603
 HYDROCARBONS 10, 32, 101, 113, 121, 155, 150, 170, 192, 221, 290, 329, 345, 352, 373, 300, 382, 803
 HYDROCHLORIC ACID 112, 330
 HYDRODYNAMICS 100, 399, 403, 426, 444, 460, 507, 541, 552, 554, 570, 570, 581, 599, 614, 609, 610, 610, 610, 619
 HYDROELECTRIC POWER PLANTS 460, 594, 705
 HYDROGEN 166, 294
 HYDROGEN PEROXIDE 166, 202
 HYDROLOGY 132, 182, 104, 324, 325, 327, 300, 390, 391, 401, 413, 416, 420, 451, 453, 455, 460, 464, 474, 480, 482, 486, 487, 490, 504, 515, 517, 527, 529, 530, 550, 555, 560, 565, 569, 570, 571, 582, 592, 596, 605, 617, 626, 620, 630, 603, 604, 654, 754, 706, 802
 ICE 25, 204, 575
 ICRP 725
 ILLINOIS 627
 IMPERIAL VALLEY 354
 IMPINGEMENT 425, 591, 709, 761, 762, 771
 IMPURITIES 201
 INDIAN POINT-2 REACTOR 230

INDEX

- INDUSTRIAL PLANTS 171, 203, 310
 INDUSTRIAL WASTES 75, 123, 202, 221, 390, 437, 510, 603
 INERTITY 70, 301, 375, 630, 750
 INSURANCE 769
 INFORMATION THEORY 405
 INVISIBLE RADIATION 49, 206, 370, 606
 INVISIBLE SPECTRA 370
 INSULATION 212, 230, 271, 390, 443, 660, 670, 675, 677, 685, 690, 702, 703, 710, 711, 721, 726, 730, 731, 703, 700, 705, 707, 700, 760, 765, 767, 766, 753
 IRRADIATION 93, 106, 212, 230, 271, 299, 335, 643, 600, 602, 600, 605, 690, 691, 697, 690, 702, 703, 707, 710, 711, 713, 710, 720, 723, 725, 726, 729, 730, 731, 732, 735, 739, 700, 03, 704, 705, 700, 765, 793, 005
 ISOBARIC CONDENSATION 576
 INSULATION 327, 770
 IONIC 526, 509, 660, 720, 700, 707, 752
 IONIC STRUCTURES 550, 591, 756, 761, 762
 INTERFACES 465
 INTERNAL IRRADIATION 601, 606, 700
 INTERMEDIATE INJECTION 769
 INVENTORIES 795
 INVERSIONS 123
 INVENTORIES 450, 495, 660, 772
 IONIC 93, 106, 226, 031, 572, 669, 605, 696, 701
 IONIC 129 706
 IONIC 131 706
 ION EXCHANGE 500, 653
 IONIZATION 55, 211
 IONIZING RADIATIONS 200
 IONOSPHERE 22, 55
 IONS 576
 IRON 171, 510
 IRON SULFIDES 623
 IRRADIATION 110, 707
 IRRIGATION 793
 ISOTHERM 395, 520, 590
 ITERATIVE METHODS 306, 362
 JETS 407, 466, 473, 409, 553
 KINETIC EQUATIONS 71
 KINETICS 647, 692
 KRYPTON 656, 765, 790
 KRYPTON 85 123, 605, 706
 L CODES 300
 LABORATORY EQUIPMENT 216
 LACTATION 750
 LAGRANGIAN FUNCTION 100
 LAKE ERIE 479, 525, 501, 659
 LAKE MICHIGAN 173, 501, 606, 600
 LAKE ONTARIO 456, 479
 LAKES 390, 403, 400, 413, 423, 433, 430, 445, 463, 466, 472, 470, 479, 481, 501, 503, 500, 509, 530, 551, 559, 570, 575, 577, 581, 606, 600, 621, 633, 772, 703
 LAND POLLUTION 507, 600, 706, 703
 LAND RECLAMATION 776, 795
 LAND USE 32, 46, 121, 100, 257, 363, 417, 470, 520, 622
 LAPLACE TRANSFORMATION 607
 LARVAE 755, 760
 LATITUDE EFFECT 129, 200, 207
 LAYERS 550
 LEACHING 402, 506, 510, 650
 LEAD 133, 305, 320, 500, 557, 692, 717
 LEAKS 39, 550, 600, 690, 700
 LEAVES 700
 LEGENDRE POLYNOMIALS 09
 LEGISLATION 422
 LET DOSE RATES 706
 LEVELS 600
 LICHENS 667, 670, 670
 LIGHT TRANSMISSION 332
 LIGHTS 123
 LIMNOLOGY 420, 500, 509, 621
 LINEAR MOMENTUM 100, 321
 LIQUEFIED NATURAL GAS 220
 LIQUID FLOW 553, 573
 LIQUID METAL COOLED REACTORS 110, 271, 299
 LIQUID WASTES 405, 463, 477, 519, 556, 592, 610, 627, 641, 601, 720, 757, 811, 812
 LISARDS 766
 LIQUID TYPE REACTORS 00, 010
 LOCAL FALLOUT 016
 LONGITUDINAL MOMENTUM 129, 130
 LUNAR ATMOSPHERE 269
 LUNUS 711, 725, 732, 735, 739, 705
 LYRIS MOSES 725
 MAGNETOSPHERE 55
 MAJOR VASKEE REACTOR 753
 MARSHALS 677, 760
 MAR 51, 70, 212, 267, 271, 299, 679, 680, 692, 693, 690, 690, 700, 705, 711, 713, 726, 720, 729, 731, 732, 703, 750, 765, 700, 790
 MANAGEMENT 70, 117, 406, 417, 422, 436, 460, 470, 551, 622, 630, 795
 MANGANESE 50 670, 753
 MAPPOWER 406
 MANUALS R. 9, 120, 170, 705, 100, 213, 301, 500, 500, 730, 006
 MAPS 270, 520, 622, 000
 MARINE DISPOSAL 117, 510
 MARITIME TRANSPORT 535
 MARSHES 476, 659
 MASS 054
 MASS BALANCE 397
 MASS TRANSFER 2, 429, 400, 406, 500, 570, 593, 657, 021
 MASSACHUSETTS 51
 MAXIMUM CREDIBLE ACCIDENT 471
 MAXIMUM PERMISSIBLE CONCENTRATION 773
 MAXIMUM PERMISSIBLE LEVEL 303
 MEASURING INSTRUMENTS 127
 MEASURING METHODS 17, 00, 107, 321, 351
 MEAT 670, 675, 679, 707
 MECHANICAL DRAFT COOLING TOWERS 63, 230, 231, 232
 MELTING 417
 MERCURY 430, 439, 497, 660, 665
 MERCURY COMPOUNDS 500
 MESOSPHERE 73
 METABOLISM 490, 769
 METAL INDUSTRY 510
 METALS 70, 397, 500, 510, 502, 500, 505, 505, 600, 606, 609, 642, 605
 METEOROLOGY 1, 0, 5, 6, 7, 0, 9, 15, 16, 17, 21, 23, 20, 30, 40, 45, 40, 40, 52, 60, 61, 65, 60, 70, 70, 00, 09, 97, 100, 115, 117, 121, 125, 126, 129, 130, 131, 131, 102, 105, 106, 130, 150, 161, 162, 170, 172, 173, 170, 177, 100, 109, 191, 197, 199, 200, 200, 207, 217, 227, 233, 200, 201, 200, 250, 262, 260, 270, 279, 289, 290, 292, 293, 200, 305, 300, 321, 320, 337, 300, 305, 353, 350, 355, 363, 365, 360, 369, 370, 013, 010, 000, 090, 530, 540, 590

KEYWORD INDEX

- METEOROLOGY 600, 601, 606, 697,
700, 729, 766, 800, 816
 METHANE 35, 101, 166, 350
 METHYLENE 497, 516, 660
 MICROMERIS 830, 550
 MICHIGAN 74, 551, 760, 819
 MILITARY FACILITIES 277
 MILK 675, 670, 679, 685, 707, 750
 MILLING 212, 740
 MINY BORING 651
 MINERAL CYCLING 117, 495, 530,
505, 609, 673
 MINERALIZATION 604
 MINING 049
 MISSILES 22
 MISSOURI 295, 300
 MIXING 3, 8, 42, 63, 129, 130,
152, 233, 270, 300, 306, 435,
462, 466, 482, 509, 501, 565,
571, 570, 579, 580, 616, 625
 MOBILITY 210
 NOTIFICATIONS 13
 NOISE 3, 6, 37, 63, 350, 416,
657
 NOVELTY 645
 NGUYEN 51, 125, 127, 150, 199,
200, 219, 222, 301, 305, 371,
411, 487, 535, 597
 NORMAN 629
 NORTE CARLO NITRO 09, 75, 211,
620, 606, 720, 706
 NOTALITY 000, 715, 723, 759, 760,
820
 NOSES 670
 NOTION 135, 201, 339, 593, 609
 NOVEMBER 200
 NOVEMBER 653
 NOVELS 659
 NATURAL DRAFT COOLING TOWERS 122,
150, 222, 227, 202, 203, 200,
205, 206, 207, 200, 209, 250,
251, 252, 253, 250, 255, 256
 NATURAL GAS 123
 NAVIER-STOKES EQUATION 573, 810,
810
 NEARNESS 769
 NEOPHANS 020
 NEUTRON FLOW 109, 120, 007
 NEUTRON SPECTRA 31, 109
 NEUTRON TRANSPORT THEORY 31
 NEUTRONS 706
 NEW JERSEY 507, 602
 NEW YORK 230, 237, 290, 507, 509
 NICKEL 171, 302, 606
 NIGON 769
 NITRATES 005
 NITRIC ACID 202
 NITRIC OXIDE 10, 73, 105, 290
 NITROGEN 001, 000, 010, 531, 602
 NITROGEN COMPOUNDS 352, 602
 NITROGEN CYCLE 602
 NITROGEN DIOXIDE 105, 202, 333,
361, 366, 300
 NITROGEN OXIDES 30, 35, 36, 113,
119, 121, 123, 124, 155, 150,
166, 170, 210, 221, 290, 300,
345, 349, 373, 300, 302, 003
 NITROUS ACID 202
 NITROUS OXIDE 166
 NOISE 16
 NOISE POLLUTION 356
 NOYERMAN 107
 NORTH CAROLINA 36
 NORTHWEST TERRITORIES 20
 NUCLEAR ENGINEERING 716
 NUCLEAR EXPLOSIONS 19, 31, 100,
213, 210, 230, 239, 262, 200,
339, 370, 601, 603, 600, 007
 NUCLEAR EXPLOSIVES 702
 NUCLEAR FACILITIES 60, 110, 606,
719, 709, 700
 NUCLEAR FIREBALLS 200
 NUCLEAR FALTS 13, 263
 NUCLEAR POWER 700
 NUCLEAR POWER PLANTS 53, 10, 110,
110, 123, 229, 229, 203, 201,
321, 307, 309, 090, 502, 503,
530, 539, 501, 563, 591, 635,
600, 603, 706, 722, 720, 729,
757, 761, 760, 707, 709, 011, 012
 NUCLEAR RADIATION 120
 NUCLEAR WEAPONS 236, 607, 000
 NUCLEATION 20
 NUMERICAL ANALYSIS 3, 55, 75, 120,
125, 150, 167, 707, 203, 265,
270, 295, 005, 009, 553, 007
 NUMERICAL SOLUTION 071
 NUTRIENTS 010, 095, 500, 530, 633
 OCEAN THERMAL POWER PLANTS 553,
507
 OCEANOGRAPHY 117, 393, 000
 OCEANS 159
 OFFSHORE NUCLEAR POWER PLANTS 061,
071, 601
 OFFSHORE SITES 000, 520, 527, 602
 OIL SAND INDUSTRY 000
 OIL SHALE INDUSTRY 796
 OIL SPILLS 000, 006, 011, 022,
029, 032, 001, 050, 050, 507,
513, 535, 509, 590, 599, 600,
615, 619, 632, 009
 OIL-THROUGH COOLING SYSTEMS 539,
509
 ONE-DIMENSIONAL CALCULATIONS 605,
606
 OPTICAL EQUIPMENT 006
 OPTIMIZATION 209, 057, 060, 095,
500, 617
 ORAL ADMINISTRATION 769
 ORG PROCESSING 700
 ORGANIC CHLORINE COMPOUNDS 101,
516
 ORGANIC FLUORINE COMPOUNDS 101
 ORGANISMS 763
 ORGANS 675, 602, 702, 707, 710,
720, 720, 735, 739, 765, 793
 ORNL 303
 ORARDS 720
 OXIDATION 72, 03, 97, 100, 171,
329, 330, 300, 512, 623, 639
 OXIDIZERS 32
 OXYGEN 192, 001, 010, 030, 015,
006, 505, 509, 517, 530, 531,
603, 630
 OYSTERS 753
 OZONE 35, 36, 00, 69, 119, 155,
160, 160, 101, 103, 201, 202,
206, 200, 306, 300, 305, 361,
362, 373, 370, 300, 702
 PACIFIC OCEAN 70, 307, 527
 PARTICLE IDENTIFICATION 133
 PARTICLE RESUSPENSION 373
 PARTICLE SIZE 1, 20, 27, 222, 329,
330, 302
 PARTICLES 1, 27, 07, 01, 06, 101,
120, 130, 201, 206, 216, 221,
235, 237, 253, 296, 323, 330,
303, 010, 570, 725, 700, 003
 PHYTOGENESIS 717
 PENNSYLVANIA 300, 617
 PERFORMANCE 01, 032, 013
 PERFORMANCE TESTING 30, 210, 352
 PERMEABILITY 063, 606, 652, 021
 PEROXY RADICALS 30
 PERSONNEL 700, 716
 PERSONNEL MONITORING 51
 PESTICIDES 530
 PETROCHEMICALS 203, 393
 PETROLEUM 117, 011, 010, 050, 535,

WORD INDEX

- PETROLEUM 590
- PETROLEUM INDUSTRY 393
- PETROLEUM PRODUCTS 450, 495, 600
- PETROLEUM REFINERIES 203, 637
- PH VALUE 330, 409, 595, 617, 639
- PHANTOMS 720
- PHOSPHATES 445, 500
- PHOSPHORUS 400, 410, 472, 530, 630
- PHOTOCHEMICAL CATALYSTS 30, 69, 113, 193, 190, 195, 329, 373, 381
- PHOTOCHEMICAL REACTIONS 69, 100, 193, 194, 195, 290, 329, 333, 347, 352, 300
- PHOTOCHEMISTRY 20, 35, 36, 65, 105, 120, 270, 262, 200, 309, 373, 819
- PHOTOLYSIS 101
- PHOTON TRANSPORT 31
- PHOTONS 303, 700
- PHOTOSYNTHESIS 392, 670, 774
- PHYSICAL PROPERTIES 120
- PHYSIOLOGY 717, 769
- PHYTOPLAKTON 400, 495, 497, 551, 633, 760
- PIERCING 150
- PILES 417
- PIPELINES 390
- PILES 655
- PLANNING 420, 430, 450, 490, 610, 703, 801
- PLANNING 5, 276, 297, 422, 457, 460, 549, 620, 717, 800
- PLANT GROWTH 470, 770, 775, 779
- PLANTS 62, 390, 431, 439, 495, 551, 557, 622, 640, 648, 649, 672, 673, 674, 678, 679, 750, 760, 772, 777, 778, 780, 781, 782, 785
- PLANTS 17, 22, 23, 33, 41, 47, 52, 57, 63, 77, 83, 91, 92, 94, 96, 102, 100, 104, 107, 110, 125, 127, 133, 142, 140, 149, 151, 152, 153, 154, 158, 161, 162, 163, 169, 171, 172, 173, 175, 200, 202, 217, 218, 220, 222, 223, 225, 227, 228, 229, 231, 232, 230, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 259, 271, 272, 276, 279, 281, 291, 299, 302, 300, 310, 311, 314, 315, 316, 317, 319, 321, 331, 332, 336, 340, 343, 395, 405, 407, 412, 410, 423, 433, 454, 470, 480, 522, 525, 528, 539, 541, 543, 577, 578, 579, 580, 590, 593, 596, 601, 612, 719, 722, 800, 809
- PLUTONIUM 84, 139, 640, 696, 810
- PLUTONIUM REACTORS 130
- PLUTONIUM 239 370
- POINT BEACH-1 REACTOR 612
- POINT BEACH-2 REACTOR 612
- POINT POLLUTANT SOURCES 112, 331, 364, 626
- POINT SOURCES 76, 77, 105, 104, 210, 293, 575
- POLAR REGIONS 55
- POLLUTANTS 64, 600
- POLLUTION 34, 117, 127, 145, 166, 215, 230, 276, 370, 378, 402, 403, 472, 510, 717, 725, 700, 782
- POLLUTION CONTROL 74, 270, 360, 393, 499, 535, 651, 817
- POLLUTION CONTROL EQUIPMENT 352
- POLLUTION REGULATIONS 136, 203, 375, 393, 419, 539, 717
- POLYNOMIALS 125
- POLYMERASES 401
- POLYMS 551, 703
- POPULATION DENSITY 602, 791
- POPULATION DYNAMICS 551, 715, 752, 754, 759, 764, 771, 801
- POPULATIONS 492, 605, 710, 720, 721, 766, 791
- POROSITY 647, 449
- POROUS MATERIALS 643, 640, 446
- POTATOES 679
- POTOMAC RIVER 410, 450, 750
- POWER GENERATION 707
- POWER PLANTS 13, 102, 110, 125, 161, 162, 163, 169, 172, 175, 202, 204, 206, 216, 235, 240, 240, 297, 302, 412, 423, 425, 426, 427, 430, 440, 447, 448, 457, 473, 475, 491, 499, 559, 566, 570, 571, 580, 593, 596, 602, 709, 752, 754, 771, 793
- POWER REACTORS 267
- PRASEODYMIUM 140 670
- PRECIPITATION 397
- PRECIPITATION SCAVENGING 203, 210, 300, 360, 816
- PREDICTION EQUATIONS 27, 109, 213, 305, 420, 496, 511, 614, 672, 770
- PRESSURE GRADIENTS 205, 810
- PROBABILITY 632, 817
- PRODUCTION 551, 637
- PRODUCTIVITY 420, 470
- PROGRAMMING 22, 31, 41, 59, 61, 60, 90, 136, 149, 170, 185, 188, 211, 273, 280, 301, 356, 366, 376, 400, 446, 473, 490, 545, 571, 576, 579, 582, 588, 636, 650, 779, 802, 800, 807
- PROPANE 192
- PROPELLANTS 22
- PROPYLENE 329, 349
- PUBLIC HEALTH 710, 714, 715, 723, 744
- PWR TYPE REACTORS 93, 812
- PTERIDES 512
- QUADRUPOLE MOMENTS 100
- QUANTITY RATIO 83, 91, 125, 199, 283, 290, 350, 351, 431, 500
- QUANTIZ 342
- R CODES 237, 820
- RABBITS 760
- RADAR 100
- RADIANT FLUX DENSITY 220
- RADIATION ACCIDENTS 43, 111, 110, 271, 281, 299, 390, 400, 600, 707, 708, 711, 713, 719, 729, 736, 742
- RADIATION DOSE 212, 675, 779
- RADIATION DOSE DISTRIBUTIONS 93
- RADIATION DOSES 64, 93, 94, 98, 146, 230, 271, 299, 303, 335, 390, 461, 463, 464, 481, 482, 483, 484, 485, 486, 487, 488, 490, 491, 495, 496, 497, 498, 700, 701, 702, 703, 704, 707, 708, 709, 710, 711, 712, 713, 714, 718, 719, 720, 722, 723, 724, 727, 728, 729, 730, 731, 733, 734, 736, 737, 738, 739, 740, 742, 743, 745, 747, 748, 757, 758, 760, 763, 765, 770, 786, 789, 793, 794, 805
- RADIATION EFFECTS 715, 720, 779, 806
- RADIATION HAZARDS 100, 109, 471, 690, 691, 693, 694, 697, 704, 740, 750
- RADIATION INJURIES 750
- RADIATION MONITORING 262, 679
- RADIATION PROTECTION 706
- RADIATION TRANSPORT 19
- RADIATIVE DECAY 470, 710, 721
- RADIOACTIVE AEROSOLS 40, 110, 131, 303, 455, 703, 816
- RADIOACTIVE CLOUDS 43, 94, 98, 238, 339, 497, 713, 715, 720, 723, 745
- RADIOACTIVE EFFLUENTS 60, 94, 98, 191, 201, 279, 281, 390, 520, 610, 601, 753, 765, 789
- RADIOACTIVE MATERIALS 811, 812, 820
- RADIOACTIVE WASTE DISPOSAL 117, 529, 554, 722
- RADIOACTIVE WASTES 236, 321, 350, 555, 653, 693, 710, 720, 721, 727, 757, 811, 812
- RADIOACTIVITY 0, 90, 191, 226, 520, 610, 661, 679, 680, 722,

VERTEBRATE INDEX

PARACETIVIT 723, 740, 763, 709,
816

PARACOLOGICAL CONCENTRATION 271,
670, 669, 671, 670, 679, 753, 772

PARACOLOGICAL 669

PARACISOPTES 64, 123, 131, 226,
394, 431, 439, 471, 470, 457,
520, 506, 567, 505, 609, 470,
650, 661, 660, 675, 676, 603,
605, 600, 497, 700, 729, 730,
731, 701, 757, 700, 701, 700,
706, 791, 794, 819

PARACIPEIC ANALYSIS 679

PARACIPEIC KINETICS 610, 659,
661, 660, 649, 673, 674, 675,
676, 677, 670, 679, 680, 607,
608, 702, 703, 700, 700, 709,
711, 720, 725, 726, 733, 730,
734, 736, 739, 702, 703, 705,
700, 751, 752, 763, 767, 769,
770, 772

PARACIPEIC MIGRATION 4, 39, 43,
53, 109, 120, 120, 129, 130, 131,
205, 209, 210, 212, 262, 267,
321, 303, 290, 391, 390, 402,
403, 459, 471, 470, 479, 529,
550, 555, 556, 610, 600, 605,
650, 673, 674, 679, 603, 607,
600, 695, 701, 700, 712, 722,
720, 727, 733, 730, 736, 730,
707, 757, 770, 772, 706, 016

PARACIPEIC VARIATION 200

RADIUM 226 700

PAROS 212 645, 700

RAIN 1, 137, 203, 360, 426, 502,
592, 670, 816, 819

RAPID TRANSMIT SYSTEMS 121

RARE GASES 93, 94

RAYLEIGH SCATTERING 49, 330

REACTION KINETICS 10, 42, 110,
150, 270, 309, 373, 380, 506

REACTIVITY 113

REACTOR ACCIDENTS 80, 93, 191,
279, 321, 335, 600, 816

REACTOR COOLING SYSTEMS 461

REACTOR CORE DISRUPTION 810

REACTOR CORES 700

REACTOR OPERATION 321

REACTOR SAFETY 80, 335, 716, 741

REACTOR SITES 509, 561, 602, 690

REACTORS 106, 209, 520, 572, 605,
607, 696, 697, 690, 730, 707

RECOVERY 411

REFERENCE MAN 700

REFINING 495

REFLECTIVITY 452

REGIONAL ANALYSIS 221, 375, 460,
520

REGULATIONS 290, 301, 406, 79,

RELIABILITY 351, 705

REMOTE SENSING 17, 535

REMOVAL 411, 432, 441, 450

REPROCESSING 706

REPRODUCTION 759

RESEARCH PROGRAMS 813

RESERVOIR ENGINEERING 815

RESIDUAL FORCES 205

RESOURCES 470

RESPIRATORY SYSTEM 739

RETENTION 80, 471, 767

REVEGETATION 776, 792

REVIEWS 61, 172, 336, 406, 536,
660

RHODANINES 430

RIO BLANCO OIL SHALE PROJECT 776

RISK ASSESSMENT 406

RIVERS 305, 306, 300, 401, 402,
403, 412, 426, 435, 437, 430,
439, 445, 451, 452, 450, 462,
400, 494, 510, 517, 510, 521,
532, 530, 500, 541, 506, 551,
560, 571, 572, 500, 590, 603,
607, 616, 625, 620, 629, 630,
635, 639, 752, 760, 790

ROADS 2, 8, 9, 11, 30, 40, 50, 51,
79, 116, 130, 104, 105, 199, 210,
237, 240, 297, 305, 312, 320,
356, 373, 301, 783

ROCKET ENGINES 22, 50, 691

ROCKETS 22

ROBERTS 769

ROBINANTS 660

RURAL AREAS 35, 70, 233, 305, 80

RUTHENIUM 703 439

RUTHENIUM 106 706

S CODES 19, 800

SAFEGUARDS 805

SAFETY 106, 350, 600, 730, 700

SAFETY ENGINEERING 701

SALINITY 25, 205, 392, 390, 426,
420, 460, 465, 469, 77, 519,
533, 500, 611, 625, 601

SALTON SEA GEOTHERMAL FIELD 350

SALTS 230, 503

SAMPLERS 209

SAMPLING 101, 379, 517, 635, 679,
762

SAN FRANCISCO BAY 66

SAND 550

SATELLITES 17, 306

SATURATION 602, 607, 609, 655

SCHISTOSOMIASIS 705

SCORBER? 81, 222

SEA BED 471

SEAFOOD 679

SEAS 3, 25, 70, 80, 90, 117, 205,
206, 320, 393, 390, 406, 411,
435, 440, 450, 450, 462, 469,
476, 477, 480, 520, 513, 563,
507, 509, 610, 611, 662, 603,
757, 770, 706

SEASONAL VARIATIONS 20, 130, 131,
132, 170, 179, 180, 207, 222,
233, 257, 370, 323, 329, 491,
501, 557, 633, 669, 692, 767

SEASONS 671

SEAWATER 80, 510, 500

SEAWAYS 770

SEDIMENTATION 27, 131, 300, 390,
391, 410, 527, 500, 605, 732

SEDIMENTS 390, 391, 390, 439, 400,
479, 487, 500, 527, 567, 560,
600, 603, 659, 702, 793, 790

SEEDLINGS 776

SEEPS 550

SEISMOLOGY 791, 815

SENSITIVITY 759

SENSITIVITY ANALYSIS 10

SEWAGE 390, 510, 592

SEX 671

SHEEP 769

SHOCK WAVES 19, 22, 690

SHORES 291, 400, 509, 793

SIGNALS 200

SILT 550

SILVER 665

SIMULATION 5, 7, 13, 19, 62, 65,
67, 69, 70, 75, 81, 100, 113,
115, 121, 120, 125, 141, 163,
165, 177, 180, 207, 213, 237,
272, 202, 205, 295, 309, 350,
353, 371, 370, 376, 302, 400,
403, 400, 417, 422, 425, 432,
436, 440, 451, 453, 455, 450,
459, 461, 463, 460, 465, 473,
470, 476, 476, 477, 482, 483,
480, 489, 495, 496, 499, 512,
520, 536, 533, 576, 501, 502,
500, 506, 500, 599, 601, 615,
617, 623, 620, 636, 639, 650,
667, 677, 690, 706, 759, 760,
773, 774, 777, 707, 795, 797,
790, 799, 801, 809, 811, 812

SIMULATORS 135

SITE SELECTION 5, 62, 235, 300,
321, 471, 559, 566, 602, 602,
693, 690, 752, 791, 800

SIZE 790

SKELETON 711

SKINNERS 411

KEYWORD INDEX

- ATMOSPHERIC POLLUTION 13, 170, 180,
 190, 215, 250, 352, 399, 403,
 405, 412, 413, 470, 420, 423,
 452, 456, 457, 466, 467, 470,
 475, 480, 485, 486, 489, 490,
 494, 503, 509, 511, 537, 539,
 540, 551, 560, 561, 566, 571,
 577, 579, 581, 588, 596, 597,
 607, 612, 613, 616, 616, 626,
 634, 636, 766, 813
- THERMAL POWER PLANTS 75, 200, 415,
 408, 496, 499, 537, 539, 540,
 562, 590, 657, 803, 813
- THERMAL RADIATION 49, 107, 322,
 721, 690
- THERMODYNAMICS 3, 102, 100, 202,
 203, 204, 206, 207, 208, 250,
 252, 253, 254, 255, 256, 205
- THERMONUCLEAR REACTORS 716
- THERMOSPHERE 56
- THROMBIN 230 740
- THREE-DIMENSIONAL CALCULATIONS 19,
 292, 337, 339, 403, 461, 493,
 429, 477, 570, 590, 531, 655
- THYROID 106, 663, 685, 690, 690,
 701, 765
- TIME 345, 400, 429, 476, 477, 496,
 512, 552, 586, 610, 625
- TIME DEPENDENCE 326, 471, 515,
 506, 576, 690, 753, 750, 805,
 814, 818
- TIME-SERIES ANALYSIS 90
- TISSUE DISTRIBUTION 711, 720, 703,
 769
- TOLUENE 309
- TOPOGRAPHY 70, 66, 107, 172, 257,
 291, 407, 793, 795
- CORRIDORS 130, 139
- TOTAL FLOW SYSTEMS 350
- TOXIC MATERIALS 370, 510, 516, 769
- TOXICITY 500, 717, 803
- TRACE AMOUNTS 261, 330, 397, 420,
 500, 555, 600, 607
- TRACER TECHNIQUES 130, 290, 407,
 671, 670
- TRAINS 290
- TRAJECTORIES 196, 321, 600
- TRANSFORMATIONS 55
- TRANSMITS 790
- TRANSPORT 133, 212, 527, 590, 700,
 820
- TRANSPORTATION SYSTEMS 32, 61,
 274, 290
- TREATMENT 529, 550, 650, 700, 706
- TRITIUM COMPOUNDS 601
- TROPICAL REGIONS 3, 704
- TROPOSPHERE 166
- TROPOSPHERE 10, 36, 120, 120, 131,
- TROPOSPHERE 101, 102, 261, 327,
 819
- TUBOSA 670
- TUNNELS 105 160
- TURBIDITY 209
- TURBULENCE 3, 6, 15, 16, 19, 23,
 70, 79, 10, 127, 100, 153, 194,
 165, 167, 172, 109, 199, 217,
 222, 205, 263, 265, 201, 201,
 326, 337, 377, 469, 513, 543,
 577, 610, 696, 720, 730, 730
- TURBULENT DIFFUSION 159
- TURBULENT FLOW 5, 10, 193, 190,
 195, 265, 553, 579, 580, 593
- TWO-DIMENSIONAL CALCULATIONS 70,
 79, 205, 306, 309, 402, 553, 501,
 596, 616
- TWO-PHASE FLOW 606
- ULTRAVIOLET RADIATION 300, 806
- ULTRAVIOLET SPECTRA 361
- UNDERGROUND 821
- UNDERGROUND EXPLOSIONS 606, 601,
 603
- UNDERGROUND MINING 301, 512, 651
- UNDERGROUND SPACE 301
- UNDERWATER 596
- UNDERWATER FACILITIES 471
- UPTAKE 60, 439, 479, 533, 502,
 659, 660, 660, 677, 717, 750,
 760, 767
- URBAN 212, 723, 740, 803
- URANIUM DEPOSITS 645
- URANIUM MINES 723
- URANIUM ORES 205, 740
- URBAN AREAS 12, 20, 29, 35, 40,
 44, 45, 46, 51, 60, 67, 70, 85,
 86, 87, 88, 89, 90, 92, 97, 103,
 106, 113, 121, 120, 136, 103,
 157, 160, 170, 100, 105, 109,
 190, 190, 233, 257, 270, 270,
 270, 200, 293, 295, 296, 305,
 311, 313, 310, 322, 323, 302,
 345, 353, 355, 357, 359, 360,
 376, 380, 380, 357, 502, 592
- URBAN POPULATIONS 51
- US EPA 630
- USES 5, 406, 657
- VALIDATION 10, 11
- VALLEYS 95, 127, 200
- VANADIUM 70
- VAPOR CONDENSATION 20, 72, 307
- VAPORS 220
- VARIATIONS 126, 191, 339, 309,
 500, 800
- VEGETABLES 679, 793
- VEHICLES 32, 30, 40, 50, 130, 100,
- VEHICLES 105, 260, 270, 290, 301,
 312, 313, 356, 360, 370, 361
- VELOCITY 15, 16, 23, 70, 96, 155,
 126, 191, 202, 217, 222, 225,
 252, 279, 295, 321, 309, 420,
 476, 481, 509, 591, 597, 600, 800
- VENTILATION 260, 350, 811, 812
- VIBRATIONAL STATES 370
- VISCOSITY 56, 809
- VISIBILITY 223, 332, 330
- VISIBLE SPECTRA 361
- VOICES 619
- WASHOUT 1, 131, 230, 320, 360
- WASTE DISPOSAL 221, 393, 390, 410,
 423, 437, 490, 510, 519, 560,
 560, 570, 612, 630, 640, 641,
 796, 801
- WASTE HEAT 13, 102, 263, 354, 367,
 410, 421, 423, 456, 461, 467,
 490, 510, 530, 539, 560, 562,
 566, 667, 612, 610, 616, 626,
 657, 813
- WASTE MANAGEMENT 457, 477, 490,
 495, 555, 610, 730, 813
- WASTE PROCESSING 419, 495, 492,
 630, 750
- WASTE STORAGE 740
- WASTE WATER 407, 453, 457, 472,
 506, 510, 531, 627, 750
- WATER 102, 120, 150, 407, 477,
 405, 492, 493, 523, 507, 557,
 590, 596, 590, 599, 619, 600,
 653, 475, 712, 709, 763, 706
- WATER CHEMISTRY 595, 623
- WATER COOLED REACTORS 39
- WATER CURRENTS 103, 205, 429, 450,
 460, 471, 513, 570, 509, 602, 609
- WATER POLLUTION 110, 201, 365,
 375, 385, 306, 392, 393, 394,
 390, 400, 401, 402, 400, 407,
 419, 420, 421, 422, 420, 429,
 431, 435, 437, 430, 400, 401,
 400, 405, 406, 409, 453, 450,
 457, 462, 463, 466, 460, 470,
 473, 475, 476, 477, 470, 479,
 483, 484, 480, 409, 490, 490,
 490, 499, 500, 503, 500, 506,
 507, 500, 509, 511, 512, 513,
 515, 516, 510, 519, 531, 533,
 535, 542, 543, 540, 505, 506,
 507, 500, 509, 556, 559, 561,
 563, 565, 566, 560, 570, 572,
 570, 575, 576, 570, 579, 500,
 505, 506, 509, 502, 503, 506,
 597, 599, 600, 600, 606, 607,
 600, 609, 610, 612, 613, 610,
 617, 610, 620, 626, 627, 630,
 633, 630, 637, 639, 641, 650,
 651, 661, 662, 665, 666, 699,
 701, 706, 773, 703, 801, 803, 815
- WATER POLLUTION ABATEMENT 520, 617
- WATER POLLUTION CONTROL 406, 437,
 450, 509, 809
- WATER QUALITY 226, 392, 401, 461,
 400, 410, 419, 425, 426, 420,
 430, 405, 406, 453, 457, 459,
 460, 476, 477, 403, 490, 490

NEWBORN INDEX

WATER QUALITY 505, 506, 510, 516,
517, 520, 530, 531, 530, 536,
542, 543, 544, 545, 546, 550,
575, 576, 603, 608, 617, 621,
624, 625, 626, 627, 628, 629,
630, 631, 633, 636, 638, 650,
754, 773, 780

WATER REQUIREMENTS 460, 637

WATER RESERVOIRS 300, 370, 403,
408, 413, 420, 432, 480, 490,
501, 542, 548, 550, 564, 581,
590, 603, 609, 621, 705

WATER RESOURCES 460, 520, 620,
675, 791

WATER VAPOR 100, 144, 183, 187,
203, 204, 205, 206, 207, 209,
250, 251, 252, 253, 254, 255,
256, 307, 354, 362, 380, 601

WATER WAVES 011

WATERSHEDS 100, 365, 416, 417,
424, 436, 444, 449, 474, 482,
483, 557, 569, 605, 622, 650,
651, 652

WEATHER 6, 13, 130, 100, 109, 107,
199, 207, 321, 306, 367, 411,
420, 590

WEATHERING 590

WEIGHT 516, 671

WHOLE BODY IRRADIATION 765

WHOLE-BODY COUNTING 679

WHOLE-BODY IRRADIATION 735

WILD ANIMALS 192

WIND 3, 6, 8, 9, 10, 21, 23, 28,
37, 41, 55, 56, 57, 67, 70, 70,
80, 92, 96, 98, 103, 105, 106,
120, 125, 126, 130, 139, 147,
156, 150, 159, 160, 162, 163,
164, 165, 175, 180, 185, 191,
196, 199, 201, 202, 217, 222,
220, 233, 240, 257, 259, 260,
262, 263, 264, 264, 270, 279,
283, 286, 297, 295, 300, 302,
309, 310, 321, 326, 330, 339,
340, 346, 361, 370, 380, 396,
405, 420, 425, 450, 460, 507,
577, 590, 600, 692, 719, 733,
804, 800, 809

WIND TUNNELS 5, 37, 52

WORKING CONDITIONS 379

X RADIATION 120

YIELD 696, 765, 790

YIELD 133 123, 605

ZINC 500, 606, 717, 773

ZINC 65 700

ZINCUM 95 160

ZOOPLANKTON 400, 495, 551, 760

ORNL/EIS-147
Dist. Categories UC-11,
-13, -20a, -32, -41, -66e

INTERNAL DISTRIBUTION

1. S. I. Auerbach	28. R. J. Olson
2. T. J. Blasing	29. P. T. Owen
3. R. W. Brocksen	30. D. C. Parzyck
4. R. L. Burgess	31. H. A. Pfuderer
5. W. S. Chern	32. D. E. Reichle
6. R. O. Chester	33. C. R. Richmond
7. S. W. Christensen	34. G. D. Robbins
8. H. S. Dailey	35. T. H. Row
9. D. L. De Angelis	36. D. L. Shaeffer
10. R. C. Durfee	37. C. R. Shriner
11. J. T. Ensminger	38. B. C. Talmi
12. W. Fulkerson	39. T. Tamura
13. C. T. Garten	40. C. C. Travis
14. H. B. Gerstner	41. D. S. Ward
15. F. O. Hoffman	42. A. P. Watson
16. D. G. Jacobs	43. J. P. Witherspoon
17. C. A. Johnson	44. G. T. Yeh
18. F. B. Kaz	45. Biology Library
19. G. G. Killough	46-47. Central Research Library
20. A. S. Loebal	48. Document Reference Section
21. R. J. Lumore	49-148. Ecological Sciences Information Center
22. F. M. Martin	149. EERC Resource Center, 2028
23. B. F. Maskewitz	150. ICC Publications Office, 2030
24. C. W. Miller	151. ICC Resource Center, 2001
25. F. R. O'Donnell	152-153. Laboratory Records
26. R. V. O'Neil	154. Laboratory Records, RC
27. J. S. Olson	155. ORNL Patent Office

EXTERNAL DISTRIBUTION

156. T. M. Albert, Director's Office, United States Geological Survey National Center, Mail Stop 115, Reston, Virginia 20092.
157. Paul E. Benson, California Department of Transportation, Transportation Laboratory, 5900 Folsom Blvd., Sacramento, California 95819.
158. Sanford G. Bloom, 6132-A, Battelle Memorial Institute, 505 King Avenue, Columbus, Ohio 43201.
159. W. A. Buehring, Argonne National Laboratory, Building 12, 9700 South Cass Avenue, Argonne, Illinois 60439.
160. K. L. Calder, Division of Meteorology, Environmental Protection Agency, Davis Drive, Research Triangle Park, North Carolina 27711.
161. John R. Campbell, GRP WX8, Mail Stop 928, Los Alamos Scientific Laboratory, Los Alamos, New Mexico 87545.

162. Hugh W. Church, Environmental Research Division, Sandia Laboratories, P.O. Box 5800, Albuquerque, New Mexico 87115.
163. H. E. Cramer, H. E. Cramer Company, P. O. Box 8049, Salt Lake City, Utah 84108.
164. Anders Daniels, Department of Meteorology, University of Hawaii, Honolulu, Hawaii 96822.
165. P. J. Dionne, Battelle-Pacific Northwest Laboratory, P.O. Box 999, Richland, Washington 99352.
166. W. L. Dotson, P.O. Box 39, Blind Bay, British Columbia, Canada V0E1H0.
167. Paul Dyke, Room 428, GHI Building, 500 12th Street, SW, Washington, D. C. 20250.
168. J. F. Fletcher, Hanford Engineering Development Laboratory, P.O. Box 1970, Richland, Washington 99352.
169. J. W. Frey, Tennessee Valley Authority, Air Quality Branch, 100D ROB, Muscle Shoals, Alabama 35660.
170. F. A. Gifford, National Oceanic and Atmospheric Administration, Air Resources Atmospheric Turbulence and Diffusion Laboratory, P.O. Box E, Oak Ridge, Tennessee 37830.
171. E. F. Gloyna, University of Texas, College of Engineering, Cockell Hall, Austin, Texas 78712.
172. James Gruhl, c/o Energy Lab, Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, Massachusetts 02139.
173. C. A. S. Hall, Cornell University, Ecology and Systematics, Ithaca, New York 14850.
174. D. R. F. Harleman, Department of Civil Engineering, Building 48, Room 311, Massachusetts Institute of Technology, Cambridge, Massachusetts 02139.
175. R. H. Huebner, Argonne National Laboratory, 9700 South Cass Avenue, Argonne, Illinois 60439.
176. C. D. Kolstad, Energy Modeling Forum, Department of Operations Research, Stanford University, Stanford, California 94305.
177. R. G. Lamb, Environmental Protection Agency, Division of Meteorology, Research Triangle Park, North Carolina 27711.
178. D. Layton, University of California, Lawrence Livermore Laboratory, P.O. Box 808, Livermore, California 94550.
179. Samuel S. Lee, Department of Mechanical Engineering, Room 204, McArthur Building, University of Miami, Coral Gables, Florida 33124.
180. W. S. Lewellen, Aeronautical Research Associates of Princeton, Inc., 50 Washington Road, P.O. Box 2229, Princeton, New Jersey 08540.
181. Mei-Kao Liu, Systems Applications, Inc., 950 Northgate Drive, San Rafael, California 94903.
182. G. J. Marmer, Argonne National Laboratory, Environmental Impact Studies Division, 9700 South Cass Avenue, Argonne, Illinois 60439.
183. J. A. Martin, Environmental Protection Agency, 401 M. Street SW, Washington, D. C. 20460.
184. H. F. Martz, University of California, Los Alamos Scientific Laboratory, P.O. Box 1663, Los Alamos, New Mexico 97545.

185. B. MacArthur, Hydraulic Engineering Center, Corps of Engineers, 609 2nd Street, Davis, California 95616.
186. Gregory J. McRae, Environmental Quality Laboratory, California Institute of Technology, Pasadena, California 91109.
187. C. E. Miller, Mail Stop E-201, Room E-256, Department of Energy, Washington, D. C. 20545.
188. V. Novotny, Department of Civil Engineering, Marquette University, 1515 West Wisconsin Avenue, Milwaukee, Wisconsin 53233.
189. Jonathan R. Pawlow, Environmental Protection Agency, Monitoring and Data Support Division (MH-553), 401 M Street SW, Washington, D. C. 20460.
190. L. Peck, Science Applications, Inc., Jackson Plaza, Oak Ridge, Tennessee 37830.
191. Peter J. Pelto, Battelle-Pacific Northwest Laboratories, P.O. Box 999, Richland, Washington 99352.
192. A. J. Policastro, Argonne National Laboratory, Environmental Impact Studies Division, 9700 South Cass Avenue, Argonne, Illinois 60439.
193. R. V. Ramani, 126 A, Mineral Sciences Building, Department of Mineral Engineering, Pennsylvania State University, University Park, Pennsylvania 16802.
194. A. Ranzieri, California Air Resources Board, Modeling Section, P.O. Box 2815, Sacramento, California 95812.
195. K. S. Rao, National Oceanic and Atmospheric Administration, Air Resources Atmospheric Turbulence and Diffusion Laboratory, P.O. Box E, Oak Ridge, Tennessee 37830.
196. F. Record, G. C. A. Corporation, Bedford, Massachusetts 01730.
197. S. D. Reynolds, Systems Applications, 950 North Gate Drive, San Rafael, California 94903.
198. R. E. Rice, Aerospace Corporation, P.O. Box 92957, Los Angeles, California 90009.
199. J. L. Rider, Westinghouse Electric Corporation, Bettis Atomic Power Laboratory, P.O. Box 79, West Mifflin, Pennsylvania 15122.
200. J. B. Robertson, United States Geological Survey, National Center, Mail Stop 430, Reston, Virginia 22092.
201. Lew Robinson, Chief of Research and Planning, Bay Area Pollution Control District, 939 Ellis Street, San Francisco, California 94109.
202. J. C. Rodgers, Health Division, M.S. 490, Los Alamos Scientific Laboratory, P.O. Box 1663, Los Alamos, New Mexico 87545.
203. Charles R. Scherer, University of California, Civil Engineering, Davis Hall, Berkeley, California 94720.
204. A. B. Scott, Brookhaven National Laboratory, Upton, New York 11973.
205. N. Serrajian, Division of Environmental Impacts, Department of Energy, Washington, D. C. 20545.
206. J. C. Sonnichsen, Hanford Engineering Development Laboratory, P.O. Box 1970, Richland, Washington 99352.
207. D. L. Strenge, Battelle-Pacific Northwest Laboratories, P.O. Box 999, Richland, Washington 99352.
208. Thomas Tucker, Office of Air Pollution Control, State of Ohio Environmental Protection Agency, Box 1049, 361 East Broad Street, Columbus, Ohio 43216.

- 209. D. Bruce Turner, Environmental Monitoring & Support Laboratory,
Environmental Applications Branch, Environmental Protection Agency,
Mail Drop 80, Research Triangle Park, North Carolina 27711.
- 210. G. Ulrickson, Science Applications, Inc., Jackson Plaza,
Oak Ridge, Tennessee 37830.
- 211. P. G. Voilleque, Science Applications, Inc., 1425 East 16th Street,
Idaho Falls, Idaho 83401.
- 212. John Wilson, Division of Environmental Impacts, Department of
Energy, Washington, D. C. 20545.
- 213. K. W. Wilson, Pacific Environmental Services, Inc., 1930 14th
Street, Santa Monica, California 90404.
- 214. Walter D. Wunderlich, Division of Water Management, Tennessee
Valley Authority, 105 Daylight Building, 501-507 Union Avenue,
Knoxville, Tennessee 37902.
- 215. J. E. Edinger & Associates, 37 West Avenue, Wayne, Pennsylvania,
19807. Attn: Ed Buchak.
- 216. Assistant Manager, Energy Research and Development, DOE-ORO
- 217. Systems Dynamics Group, Thayer School of Engineering, Dartmouth
College, Hanover, New Hampshire 03785. Attn: Dennis Meadows.
- 218-1057. Given distribution as shown in TID-4500 under Distribution
Categories UC-11, -13, -20e, -32, -41, -66e.