Information Coordination Focal Point

**SURVEY OF
BIOMEDICAL AND ENVIRONMENTAL DATA BASES,
MODELS, AND INTEGRATED COMPUTER SYSTEMS
AT ARGONNE NATIONAL LABORATORY**

Prepared by

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**SURVEY OF BIOMEDICAL AND ENVIRONMENTAL DATA BASES,
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Ishwar P. Murarka, Deborah J. Bodeau,
Janine M. Scott, and Russell H. Ruebner

Abstract

This document contains an inventory (index) of information resources pertaining to biomedical and environmental projects at Argonne National Laboratory--an "information resource" being a data base, model, or integrated computer system. Entries are categorized as models, numeric data bases, bibliographic data bases, or integrated hardware/software systems. Descriptions of the Information Coordination Focal Point (ICFP) program, the system for compiling this inventory, and the plans for continuing and expanding it are given, and suggestions for utilizing the services of the ICFP are outlined.

In late 1977, an activity designated the Information Coordination Focal Point (ICFP) Program was established by the Department of Energy as an inter-laboratory system. The objectives of the program were to identify and characterize in a systematic way all the available computer-oriented information resources so vital to addressing the complex interdisciplinary issues concerning the environment. At each of six major DOE laboratories, focal points were established, with each such focal point to serve as a principal contact within the laboratory for a coordinated survey of all information resources (i.e., data bases, models, data processing systems, and graphical display capabilities) related to biomedical and environmental research and development. Initially, each ICFP was charged with the responsibility for inventorying the resources at its own establishment. This report presents the results of such effort at the Argonne National Laboratory.

A preliminary survey of environmental data bases and models was carried out in the scoping phase of this effort. From this experience a coordinated set of descriptor elements for entries into the survey was agreed upon by ICFP representatives from six laboratories and the Division of Environmental Impacts, ASEP/DOE. Coordination of the ANL work with ICFPs at the other laboratories and with the DOE continued throughout the initial inventory search.

THE ICFP SURVEY

PROCEDURES AND DATA COLLECTION

This report presents the first results of the ICFP survey of biomedical and environmental data bases, models, and integrated computer systems at Argonne National Laboratory. This survey was accomplished by personal contact and interview with follow-up contacts and editing of the responses. An eleven-step procedure was set up for preparing the ICFP central index of data bases, models, and graphics systems. Table 1 gives the schematized design and interrelationships for the procedure.

A questionnaire was distributed by the ICFP to all research scientists known to be computer users working in biomedical and environmental research programs at Argonne. Appendix A shows this questionnaire, the instructions, and a sample form. Individuals were assisted when necessary so that the responses were about 95% complete and accurate. This effort depended critically on the earnest cooperation of many individuals in providing the needed data for each entry. For some individuals heavily involved in automated data processing of environmental information responding to this survey required appreciable time and effort. Their close cooperation is indicative of their recognition of the importance of establishing a comprehensive overview of available information resources.

ORGANIZATION AND ENCODING OF THE DATA

The responses to the questionnaire were keypunched and a physical sequential disc file was created. This file is accessed through the WYLBUR and TSO interactive systems on the IBM 360/75 with OS/MVT. Revisions of the physical sequential file were made interactively as errors in composition and/or text were found. Editing, inserting, and updating the text material in the disc file was a major effort in developing Argonne Index.

The questionnaire can be used as it stands to get the basic minimum information needed for cataloging the entries in the index. Although the present survey data are adequate, certain entries are somewhat incomplete from the standpoint of technical description and coverage. In the future greater emphasis will be placed on reviewing the technical contents, expanding the subject matter covered, and improving the technical description of each entry.

Four PL/I programs were written to implement the standardized ICFP index of models, data bases, and integrated hardware/software systems. Table 1 indicates the steps in which these programs (called CONVERT, ECHO, REPORT, and ALTER) are utilized. CONVERT transforms the raw data from the questionnaires into two formats, one following the design specifications for RECON, the other designed for further use at Argonne. It also flags missing values. The ALTER program completes the preparation of the RECON file by modifying punctuation of certain entries.

The ECHO program generates a facsimile of the original questionnaire for each entry in the ICFP index. Each facsimile was sent to the individual who served as contact for that entry for verification and updating. This iteration

Table 1. Design and Interrelationships Indicating Task Characteristics and Activity Levels for the ICFP at Argonne National Laboratory

	DESCRIPTION OF TASK CHARACTERISTICS AT EACH STEP	ACTIVITY PERFORMED	INPUTS/OUTPUTS AND THEIR INTERRELATIONSHIPS
Step 1	Information gathering with data filled in on questionnaires by respondents.		<p>ICFP QUESTIONNAIRE</p>
Step 2	Automation of input data.	Data keypunched, transferred to physical sequential disc file.	<p>KEYPUNCHED CARDS</p> <p>DISC FILE QUAIRE</p>
Step 3	Checking and correction of data errors.	WYLBUR & TSO interactive systems used for editing.	<p>UPDATED DISC FILE QUAIRE</p>
Step 4	Creation of data bases for use by ANL & RECON.	The PL/I program CONVERT partitions Quaire into four disc files for ANL and into one disc file for RECON.	<p>DISC RESIDENT PROGRAM CONVERT</p> <p>ANL FILES</p> <p>(RECON FILE RECON) (Preliminary)</p>

Table 1. Continued

	DESCRIPTION OF TASK CHARACTERISTICS AT EACH STEP	ACTIVITY PERFORMED	INPUTS/OUTPUTS AND THEIR INTERRELATIONSHIPS
Step 5	Automated generation of questionnaire responses.	The PL/I program ECHO prints a facsimile with edited responses for each entry.	<div> DISC RESIDENT PROGRAM ECHO </div>
Step 6	Verification and corrections.	Facsimiles verified and corrected by respondents.	<div> COMPUTER GENERATED FACSIMILES OF THE ENTRIES </div>
Step 7	Iterative updating and completion of data.	Steps 3-5 repeated to update responses. All new entries included in the Index.	<div> REPEAT STEPS 3-5 ONCE </div>
Step 8	Summary and condensed report for each entry.	The PL/I program REPORT prints condensed summa- ries for Project Report.	<div> DISC RESIDENT PROGRAM REPORT </div> <div> SUMMARY REPORT FOR EACH ENTRY IN THE ICFP INDEX </div>

Table 1. Continued

DESCRIPTION OF TASK CHARACTERISTICS AT EACH STEP	ACTIVITY PERFORMED	INPUTS/OUTPUTS AND THEIR INTERRELATIONSHIPS
Step 9	Interactive/batch retrieval with statistical capabilities.	The PL/I program REPORT used for interactive/ batch access for searching the Index file.
Step 10	Final compositional changes for RECON submission.	The PL/I program ALTER1 and the FORTRAN program ALTER2 modify punctuation for RECON file.
Step 11	Magnetic tape for RECON and backup for ANL	Magnetic tapes prepared for dispatch to ORNL and archiving at ANL.

of the information gathering process provided a high degree of control over the contents of each entry in the index.

The fourth program, REPORT, provides the option of retrieving select subsets of the data in the index through interactive and/or batch querying. The program contains numerous options, including several statistical operations. Complete program documentation and listings are given in a separate report.

SCOPE AND EXTENT OF COVERAGE

Each entry to the ICFP index was categorized into one and only one of the four types. The four categories, somewhat arbitrarily chosen and rather flexibly defined, are (1) model, (2) numeric data base, (3) bibliographic data base, and (4) integrated hardware/software system. Emphasis was placed on indexing of those entries that are computer based, although text material worthy of inventorying was also included.

A "model" is considered to be a mathematical formulation that has been theoretically developed for and adapted to an application to arrive at condensed parameterized results which can be used for prediction and simulation. Most models are implemented by computer codes that accomplish specific numerical operations according to the formulations in the model. Computer programs for nonspecific formulations and which accomplish trivial arithmetic computations were excluded from the Argonne index. In the broadest definition of the term "model", we could qualify any and all computer codes or calculational algorithms that are clearly defined methods for computing end results.

Numerical data bases constituted the bulk of the data that possess numerical values for known variables. The identification information for such numerical data bases may be alphanumeric variables; therefore the corresponding entries may contain alphabetic characters among numeric values. However, the postulated uses of the numeric data bases are primarily to make use of the numeric information to carry out mathematical computations based on models.

The bibliographic data bases are primarily alphabetic character information. Most of the contents are library data and which serve principally as a guide to references.

The integrated hardware/software system category is for those entries which have graphics capabilities and which are bound by the mechanical devices as peripherals to computers. Many of the entries in this category may specifically require a complete duplication of the hardware and/or software before the graphical and/or digital outputs can be locally produced.

Survey questionnaires were sent to 58 ANL staff researchers associated with biomedical and environmental research programs which are conducted principally in the Biological and Medical Research (BIM), Radiological and Environmental Research (RER), Environmental Impact Studies (EIS), and Energy and Environmental Systems (EES) Divisions. Table 2 summarizes the number of individuals who responded to the ICFP survey with entries to be included in the index. Appendix B contains a list of ANL researchers who responded positively to the ICFP survey.

Table 2. Summary of the Extent of ICFP Survey Coverage

Description	Number of Individuals Responding	Models	Approximate Percent of Data from	
			Numerical Models	Biological Models
Biological and Medical Research	1	1	17	1
Biological, Social & Environmental Research	11	1	17	1
Environmental Impact Studies	1	1	17	1
Environmental Engineering Studies	1	1	17	1
Other	1	1	17	1
Total	5	5	17	1

ENVIRONMENTAL MODELS

There are 77 models in the Argonne National Laboratory ICFP index covering a wide cross section of subject matter. In Table 3 the categories and classifications for the models included in the index are summarized. Table 4 profiles the model entries with respect to 30 items that were obtained for each of the entries to the index (for description of the items, see Appendix A).

In general each of the models have unique features tailored to meet program needs. Most of the models have either been developed in response to particular projects or have been acquired to implement state-of-the-art mathematical techniques needed to obtain answers to simulated and/or real postulated questions. Several of the physical/atmospheric models, developed for pollutant dispersion and environmental impact studies, are well documented. However, there are numerous other models in this area that call for much the same type of calculations but which yield incomparable and unflagged end results. The relative advantages or disadvantages of such models depend critically on the specific details of the problem being addressed, the level of accuracy required, and the approximations used in the mathematical formulation.

From Table 3, we see that the models and their uses at Argonne National Laboratory emphasize the areas of meteorology and environmental dispersion, cooling tower plumes and environmental depositions, air quality, water quality and socioeconomics. These models are used for characterization, prediction, simulation and description purposes. Environmental impact calculations require that the models be changed dynamically to incorporate advances in the state-of-the-art.

Table 3. Summary of Classifications and Frequency Distributions of Models in the Argonne National Laboratory ICFP Inventory

Category	No. of Entries	ICFP Inv. No.
Socioeconomic/Environmental Policy	5	1,10,21,26,62
Energy Technology/Environmental Policy	2	2,17
Water Quality/Environmental Regional	5	3,10,11,12,13
Biophysical and Physiological	4	5,6,7,8
Air Quality and Alternative Energy Sources	8	4,9,26,54,55,56,60,61
Transport of Pollutants through Solids/Environmental Transport of Substances	3	14,15,16
Physics	1	18
Dispersion of Radiological Materials and Dose Commitments	4	19,20,31,64
Meteorological and Environmental Dispersion	36	19,20,36-52,54,55,56, 60,61,66-77
Vegetation and Land Reclamation	2	22,24
Cooling Tower Plumes and Environmental Depositions	29	24,25,36-52,67-77
Added Mortality to Human Populations from Environmental Pollutants	1	27
Thermal Plume and Environmental Determinations	3	28,29,39
Time Series and Statistical Modeling	3	33,34,35
Fisheries Biology	2	32,34
Optimization and Simulation of Integrated Systems	1	38
Hydrology and Aquifers	3	57,58,59
Uptake of Gaseous Substances by Vegetation	1	63
Janus Experiments	1	65

Table 4. Summary of the Frequency Distribution of the Completeness of Items in the Model Entries

Keyword	No. Complete	No. No Entry	No. Not Applicable
Title	77	0	0
Acronym	65	12	0
Type	77	0	0
Contact	77	0	0
Telephone	77	0	0
Division	77	0	0
Original source	42	0	35
Documentation	69	8	0
Geographical coverage	20	5	52
Time period	14	5	58
Subject covered	71	5	1
Update	77	0	0
Status	77	0	0
Access	77	0	0
Media	77	0	0
Size	65	11	1
Computer	76	0	1
Configuration	75	1	1
Language	76	0	1
Character set	72	4	1
Abstract	77	0	0
Key words	76	1	0
Comments	44	33	0
Algorithm	73	4	0
Users	67	9	1
Applications	72	5	0
Data used	49	27	1
Model validation	66	10	1
Classification	75	2	0
ICFP/Inv.	77	0	0

ICFP INVENTORY OF MODELS

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TITLE.....: TRANSPORTATION/LAND USE POLICY IMPACT MODEL

TYPE.....: MODEL

CONTACT.....: M. J. BERNARD
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-5625)

SUBJECT COVERED: ENERGY CONSUMPTION

KEY WORDS

TRANSPORTATION SYSTEMS, ENERGY CONSUMPTION, LAND USE

ABSTRACT

A LARGE SCALE, INTEGRATED TRANSPORTATION AND LAND USE COMPUTER SIMULATION SYSTEM WHICH SIMULATES SPATIAL DEVELOPMENT OF A CITY, THE PASSENGER TRAVEL WHICH TAKES PLACE IN THAT CITY DURING A SINGLE DAY, AND THE ENERGY CONSUMPTION RESULTING FROM THAT TRAVEL.

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DOCUMENTATION

P. L. PESKIN AND J. L. SCHOFER, "IMPACT OF URBAN TRANSPORTATION
AND LAND USE POLICIES ON TRANSPORTATION ENERGY CONSUMPTION",
FINAL REPORT FOR U.S. DOT, PROGRAM OF UNIVERSITY RESEARCH,
CONTRACT DOT-05-50118 (1977), APPENDIX A.

SOFTWARE/HARDWARE INFORMATION

ALGORITHMS...: LOWRY-TYPE LAND USE MODEL, INCORPORATED WITHIN
MODEL WHICH SIMULATES (NOT STOCHASTICALLY) THE
RELATIONSHIP BETWEEN TRANSPORTATION AND LAND USE AS
INFLUENCED BY CONGESTION ON HIGHWAY NETWORK, MODEL
CHOICE, GENERAL COST OF TRAVEL -- INCLUDES A
NETWORK MODEL FOR THE HIGHWAY AND TRANSIT NETWORKS.

SIZE.....: 250 K BYTES

LANGUAGE....: FORTRAN

MACHINE CONFIGURATION: IBM 360/75-370/195 OS/MVT WITH 250 K CORE

ACKNOWLEDGMENT

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IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

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(ICFP / OTD / BEP)**

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PAGE 1

TITLE.....: ENERGY TECHNOLOGY ASSESSMENT MODEL

TYPE.....: MODEL

CONTACT.....: JAMES D. CAVALLO
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FIS 972-3280)

SUBJECT COVERED: OIL, GAS AND URANIUM DEPLETION

KEY WORDS

ENERGY MODELS, ENERGY SUPPLIES, ENERGY DEMAND, NONLINEAR
PROBLEMS, MATHEMATICAL MODELS

ABSTRACT

THE ETA MODEL IS A NONLINEAR PROGRAMMING MODEL WHICH APPROXIMATES ENERGY SUPPLY AND DEMAND. IT IS A TOOL WITH WHICH SYSTEMS RESEARCHERS CAN ASSESS THE IMPACTS OF ENERGY GROWTH AND INTERFUEL SUBSTITUTIONS UNDER VARYING ASSUMPTIONS REGARDING AVAILABLE TECHNOLOGIES AND CONSERVATION STRATEGIES. THE MODEL CAN BE USED TO EXPLORE POSSIBLE NATIONAL ENERGY FUTURES. THE SEVENTY-FIVE YEAR TIME HORIZON PERMITS THE MODEL TO ADDRESS THE PROBLEMS OF OIL, GAS, AND NUCLEAR RESOURCE EXHAUSTION. THE USER'S GUIDE DESCRIBES THE MODEL, ITS OBJECTIVE FUNCTION, AND CONSTRAINTS. THE INFORMATION (DATA AND PARAMETERS) WHICH MUST BE SPECIFIED BY THE USER IS PRESENT WITH SAMPLE OUTPUTS.

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DOCUMENTATION

BEVERLY ARNOLDY AND JAMES CAVALLO, "ETA: ENERGY TECHNOLOGY
ASSESSMENT MODEL USER'S GUIDE", TH318, ARGONNE NATIONAL
LABORATORY, AUGUST 1977.

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: SEE BRUCE MURTAGH AND MICHAEL SAUNDERS, "MINOS, A
LARGE SCALE NONLINEAR PROGRAMMING SYSTEM (FOR
PROBLEMS WITH LINEAR CONSTRAINTS) USER'S GUIDE,"
TECHNICAL REPORT SOL-77-9, STANFORD OPTIMIZATION
LABORATORY, DEPARTMENT OF OPERATIONS RESEARCH,
STANFORD UNIVERSITY, STANFORD, CALIFORNIA (FEBRUARY
1977).

SIZE.....: VARIABLE

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 250 K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 65902
IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

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PAGE 1

**TITLE.....: A MODEL TO PREDICT REGIONAL WATER QUALITY IMPACTS
FROM COAL RELATED ENERGY FACILITIES**

TYPE.....: MODEL

**CONTACT.....: SHEN-YANN CHIU
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3762)**

SUBJECT COVERED: WATER QUALITY

KEY WORDS

SURFACE , WATER QUALITY, IMPACTS, ENERGY GENERATION

ABSTRACT

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, SYMFUEL PRODUCTION, AND INDUSTRIAL FUEL USE, WAS ESTIMATED BY INDIVIDUAL SOURCES WITH SPECIFIC CONTROL REQUIREMENTS AND REGIONAL DIFFERENCES CONSIDERED. THE MODEL PERFORMS CUMULATION 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, MN, ZN, AL, AS, BA, CD, CR, HG, NI, PB, P, K, AND SE. ALL THESE POLLUTANTS ARE CONSIDERED CONSERVATIVE.

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DOCUMENTATION

NONE

SOFTWARE/HARDWARE INFORMATION

**ALGORITHM...: EMPIRICAL CALCULATION OF POLLUTANT LOADING BASED ON
ASSUMED LEVEL OF POLLUTION CONTROL, RECEIVING WATER
QUALITY IMPACTS BASED ON MATERIAL BALANCE
CALCULATION AT NODAL POINTS.**

SIZE.....: NONE

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 370K CORE

ACKNOWLEDGEMENT

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PAGE 1

TITLE.....: AN AIR POLLUTION EVALUATION MODEL FOR ROADWAYS

TYPE.....: MODEL

**CONTACT.....: GEORGE ANDREW CONCAILDI
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3223)**

SUBJECT COVERED: ENVIRONMENTAL STUDIES

KEY WORDS

VEHICLES, AIR QUALITY, HIGHWAYS, ROADS

ABSTRACT

THIS REPORT DESCRIBES A COMPUTER PROGRAM CALLED ANL/HIWAY FOR ESTIMATING AIR QUALITY LEVELS OF NONREACTIVE 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 ANL/HIWAY MODEL EXPANDS THE EVALUATION CAPABILITIES OF THE EPA/HIWAY DISPERSION MODEL. THIS REPORT ALSO SERVES AS A USER'S MANUAL FOR RUNNING THE ANL/HIWAY PROGRAM. ALL COMMAND STRUCTURES ARE DESCRIBED IN DETAIL, WITH SAMPLE PROBLEMS EXEMPLIFYING THEIR USE.

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DOCUMENTATION

G. A. CONCAILDI, A. S. COHEN, R. F. KING, "ANL/MINAY: AN AIR
POLLUTION EVALUATION MODEL FOR ROADWAYS", NATIONAL SCIENCE
FOUNDATION (RANN) UNDER CONTRACT #'S AG-352 & GI32989A2

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: STEADY STATE DISPERSION MODEL FOR LINE SOURCES.

SIZE.....: APPROXIMATELY 1000 RECORDS EACH 80 BYTES LONG

LANGUAGE....: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 8K402
IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

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PAGE 1

TITLE.....: CIRCADIAN RESPIRATION DATA SYSTEM

TYPE.....: MODEL

**CONTACT.....: CHARLES F. EHRET
BIOLOGICAL AND MEDICAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(PTS 972-3862)**

**SUBJECT COVERED: LONGITUDINAL RESPIRATION DATA ACQUISITION AND
APPARATUS CONTROL**

KEY WORDS

**DAILY VARIATIONS, ENVIRONMENT, OXYGEN, CARBON DIOXIDE,
INFORMATION RETRIEVAL**

ABSTRACT

**THIS SYSTEM IS DESIGNED TO CONTROL A 40-CHANNEL CIRCADIAN
RESPIROMETER. ENVIRONMENTAL QUES AND CONDITIONS ARE
CONTROLLED. DATA COLLECTED WILL BE OXYGEN CONSUMPTION AND CO2
EVOLUTION, WHICH WILL BE ANALYZED FOR VALIDITY AND TREATED
STATISTICALLY BEFORE BEING STORED ON EITHER PAPER OR MAGNETIC
TAPE FOR FURTHER ANALYSIS. PROGRAMS TO PLOT THE DATA ARE IN
EXISTENCE.**

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DOCUMENTATION

NONE

SOFTWARE/HARDWARE INFORMATION

SIZE.....: ONE PROGRAM

LANGUAGE....: ASSEMBLER, DISSPLA

MACHINE CONFIGURATION: LSI 11-03/EA WITH 20K RAM MEMORY,
PARALLEL & SERIAL INTERFACES, A-D
CONVERTER, TELETYPE WITH PAPER TAPE
READER/PUNCH

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER AML BUDGET ACTIVITY NUMBER 61200
IN THE BIOLOGICAL AND MEDICAL RESEARCH DIVISION

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PAGE 1

TITLE.....: CIRCADIAN TEMPERATURE AND FOOD CONSUMPTION DATA IN
THE RAT

TYPE.....: MODEL

CONTACT.....: CHARLES F. EHRET
BIOLOGICAL AND MEDICAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3662)

SUBJECT COVERED: NONE

KEY WORDS

TELEMETRY, TEMPERATURE, FOOD, RATS, INFORMATION RETRIEVAL

ABSTRACT

THIS SYSTEM OF PROGRAMS USES LONGITUDINAL TEMPERATURE TELEMETRY
DATA COLLECTED ON EITHER PAPER OR MAGNETIC TAPE, STORES AND
DOES SOME ALGEBRAIC-ARITHMETIC MANIPULATIONS, AND ULTIMATELY
PLOTS THE RAW DATA.

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DOCUMENTATION

C.F. EHRET, J.C. MEINERT, J. SCHLABACH, L. LAUDER, & J. WATERS.
CIRCADIAN CYBERNETIC STUDIES OF THE MAMMALIAN CLOCK & A NEW
SYSTEM TO STUDY THE ROLES OF PROGRAMMED FEEDING AND OF
CHRONOBIOLOGICS IN RAPIDLY RESETTING THE PHASE OF THE DEEP-BODY
TEMPERATURE RHYTHM. ANL-77-55, 1976

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: ORTHOGONAL POLYNOMIAL

SIZE.....: SEVERAL PROGRAMS, UP TO 600 CARDS (SOURCE)

LANGUAGE...: FORTRAN, PL/1, DISPLA

MACHINE CONFIGURATION: IBM 370/195 OS/MVT

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 61200
IN THE BIOLOGICAL AND MEDICAL RESEARCH DIVISION

**SURVEY OF BIOMEDICAL AND ENVIRONMENTAL
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PAGE 1

TITLE.....: TIME SERIES ANALYSIS OF CIECADIAN PHYSIOLOGICAL DATA

TYPE.....: MODEL

**CONTACT.....: CHARLES F. PHRET
BIOLOGICAL AND MEDICAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3862)**

SUBJECT COVERED: CIECADIAN RHYTHMS ANALYSIS

KEY WORDS

DAILY VARIATIONS, TELEMETRY, LEAST SQUARE FIT

ABSTRACT

**TO LONGITUDINAL TEMPERATURE TELEMETRY DATA A SINGLE COSINE
FUNCTION IS APPLIED USING THE METHOD OF LINEAR LEAST SQUARES,
INCLUDING CONFIDENCE REGIONS. FROM THIS PROCEDURE THE MESOR,
AMPLITUDE AND ACROPHASE INCLUDING THEIR ERROR ARE DETERMINED
AND PLOTTED.**

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DOCUMENTATION

C. EHRET, J. C. MEINERT, K. GROH. "THE CHRONOPHARMACOLOGY OF L-DOPA: IMPLICATIONS FOR ORTHOCHRONAL THERAPY IN THE PREVENTION OF CIRCADIAN DYSCHRONISM." PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON CHRONOPHARMACOLOGY, FEB., 1978 (IN PRESS).

SOFTWARE/HARDWARE INFORMATION

ALGORITHM.: LINEAR LEAST SQUARES, COSINOR

SIZE.....: SEVERAL PROGRAMS, UP TO 150K

LANGUAGE....: FORTRAN, SAS, DISPLA

MACHINE CONFIGURATION: IBM 370/195 OS/HVT WITH 200K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER AML BUDGET ACTIVITY NUMBER 61200
IN THE BIOLOGICAL AND MEDICAL RESEARCH DIVISION

SURVEY OF BIOMEDICAL AND ENVIRONMENTAL
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TITLE.....: DNA MOLECULAR WEIGHT CALCULATIONS FROM
SEDIMENTATION PROFILES

TYPE.....: MODEL

CONTACT.....: MORTIMER M. ELKIND
BIOLOGICAL AND MEDICAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3939)

SUBJECT COVERED: DNA MOLECULAR WEIGHTS BEFORE OF AFTER REPAIR

KEY WORDS

SCINTILLATION COUNTERS, SCINTILLATION COUNTING, DNA,
SEDIMENTATION

ABSTRACT

USING PAPER TAPE DATA OF COUNTING RATES MEASURED WITH A BECKMAN LS-350 SCINTILLATION COUNTER, THE FRACTIONS COLLECTED FROM AN ULTRACENTRIFUGE SEDIMENTATION TUBE ARE USED TO COMPUTE MOLECULAR WEIGHTS CORRESPONDING TO THE SEDIMENTATION PROFILES OF THE MATERIAL THAT WAS SEDIMENTED. NUMBER AVERAGE AND WEIGHT AVERAGE MOLECULAR WEIGHTS ARE COMPUTED FOR ALL COMBINATIONS OF CONTINUOUS SEQUENTIAL SAMPLES. THE PROGRAM ALSO LISTS THE NORMALIZED FRACTIONAL COUNTING RATE OF EACH SAMPLE AND STEPS-OFF THE MAGNITUDE CORRESPONDING TO EACH TO FACILITATE THE DRAWING OF A CURVE OF THE SEDIMENTATION PATTERN. THE COSEDIMENTATION OF UP TO THREE DIFFERENT ISOTOPES CAN BE ANALYZED, MOLECULAR WEIGHTS COMPUTED, AND SEDIMENTATION PROFILES PLOTTED.

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DOCUMENTATION

B. PALCIC AND L. D. SKARSGAED, "THE EFFECT OF OXYGEN ON DNA SINGLE-STRAND BREAKS PRODUCED BY IONIZING RADIATION IN MAMMALIAN CELLS." INT. J. RADIAT. BIOL., 1972, VOL. 21, NO. 5, 417-433

J. BLOMQUIST AND F. WILLIAMSON, "ERROR DETECTION AND RECOVERY IN PROCESSING EXPERIMENTAL DATA", ANL-76-99, 245-246.

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: SEE DOCUMENTATION

SIZE.....: APPROX. 800 RECORDS EACH 80 BYTES LONG

LANGUAGE...: PL/1, BAL, DISPLA

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 250 K CORE,
PERIPHERAL DATA STORAGE SPACE OF APPROX.
85 K BYTES, AND CALCOMP OR FILM PLOTTING
DEVICE.

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 61300
IN THE BIOLOGICAL AND MEDICAL RESEARCH DIVISION

**SURVEY OF BIOLOGICAL AND ENVIRONMENTAL
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PAGE 1

**TITLE.....: A SOFTWARE SYSTEM TO SIMULATE COAL PLANT
PARTICULATE CONTROLS**

TYPE.....: MODEL

**CONTACT.....: PAUL S. FARBER
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-5634)**

**SUBJECT COVERED: PARTICULATE EMISSION CONTROLS FOR COAL-FIRED
PLANTS**

KEY WORDS

COAL, CONTROL, COST, PERFORMANCE, ENERGY SOURCES, FUEL PARTICLES

ABSTRACT

**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), BAGHOUSES, AND SCRUBBER SYSTEMS.**

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DOCUMENTATION

NOT AVAILABLE

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: SEE COMMENTS

SIZE.....: 1000 RECORDS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 250K COPE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 65903
IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

**SURVEY OF BIOMEDICAL AND ENVIRONMENTAL
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PAGE 1

**TITLE.....: THE FACILITY COST/SCHEDULE MODEL FOR STATE OF
ILLINOIS WATER QUALITY MANAGEMENT PROGRAM**

TYPE.....: MODEL

**CONTACT.....: PHYLLIS M. FUJA
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3980)**

**SUBJECT COVERED: EVALUATION OF ALTERNATIVE STRATEGIES OF WASTE
TREATMENT FACILITIES**

KEY WORDS

**WATER QUALITY, MATHEMATICAL MODEL, WASTE PROCESSING, WASTE
MANAGEMENT, WASTE PROCESSING PLANTS**

ABSTRACT

**THIS COMPUTER MODEL ANALYZES THE COMBINED COSTS OF WASTE
MANAGEMENT STRATEGIES AND EXISTING WASTE MANAGEMENT FACILITIES,
USING APPROPRIATE WASTE LOADS. IT DETERMINES THE PRESENT VALUE
DOLLAR COSTS AND THE FACILITY EFFLUENTS INCURRED BY
IMPLEMENTING A CONTROL STRATEGY FOR A REGION OVER A PLANNING
PERIOD. THE MODEL WAS DEVELOPED TO PROVIDE A TOOL FOR THE
EVALUATION OF ALTERNATIVE STRATEGIES RELATED TO THE
CONSTRUCTION, OPERATION AND MAINTENANCE, UPGRADEING, EXPANSION,
OR REGIONALIZATION OF WASTE COLLECTION AND TREATMENT FACILITIES.**

**SURVEY OF BIO MEDICAL AND ENVIRONMENTAL
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DOCUMENTATION

H. L. DYER, T. A. TANBLIN AND K. G. CROKE, "STATE OF ILLINOIS
WATER QUALITY MANAGEMENT PROGRAM, APPENDIX C, THE FACILITY
COST/SCHEDULE MODEL", ANL/CES REPORT, DECEMBER 1973.

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: COST FUNCTIONS, EXPONENTIAL RELATIONSHIPS, COST
FLOWS, PRESENT VALUE COMPUTATIONS, RIVER FLOWS,
WASTE LOADS

SIZE.....: 1750 SOURCE STATEMENTS EACH 80 BYTES LONG

LANGUAGE....: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 300 K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 84703
IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

SURVEY OF BIOMEDICAL AND ENVIRONMENTAL
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PAGE 1

TITLE.....: RIVER BASIN WATER QUALITY MODEL

TYPE.....: MODEL

CONTACT.....: PHYLLIS M. FUJA
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3980)

SUBJECT COVERED: WATER QUALITY MANAGEMENT FOR RIVER BASINS

KEY WORDS

WATER QUALITY, WATER POLLUTION, HYDROLOGY, THERMAL POLLUTION,
TEMPERATURE EFFECTS, THERMAL EFFLUENTS, WASTE HEAT,
ENVIRONMENTAL EFFECTS

ABSTRACT

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 RUNOFF PHENOMENA), 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.

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DOCUMENTATION

H. L. DYER ET AL., "STATE OF ILLINOIS WATER QUALITY MANAGEMENT
PROGRAM, APPENDIX E, THE WATER QUALITY MODEL, PROGRAM
BASIN", ANL/CES REPORT, DECEMBER 1973.

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: MONTE-CARLO METHOD, STEADY-STATE ONE-DIMENSIONAL
HYDROLOGICAL FLOW MODEL; PUNGE-KUTTA NUMERICAL
INTERGRATIONS, FIRST-ORDER KINETIC PROCESS; VAN'T
HOFF-ARRHENIUS RELATIONSHIP; STEFAN-HOLIZMAN LAW.

SIZE.....: ABOUT 3500 SOURCE STATEMENTS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 350 K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 84703
IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

SURVEY OF BIONEDICAL AND ENVIRONMENTAL
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TITLE.....: THE WASTE CONVERSION MODEL FOR STATE OF ILLINOIS
WATER QUALITY MANAGEMENT PROGRAM

TYPE.....: MODEL

CONTACT.....: PHYLLIS M. FUJA
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3980)

SUBJECT COVERED: LIQUID WASTES CONVERSION; WATER QUALITY

KEY WORDS

WATER QUALITY, LIQUID WASTES, WASTE WATER, MATHEMATICAL MODELS,
WATER POLLUTION

ABSTRACT

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 BURDENS PROVIDED THE NECESSARY DATA EXISTS.

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DOCUMENTATION

H. L. DYER, "STATE OF ILLINOIS WATER QUALITY MANAGEMENT PROGRAM,
APPENDIX B, THE WASTE CONVERSION MODEL", ANL/CES REPORT,
DECEMBER 1973.

SOFTWARE/HARDWARE INFORMATION

ALGORITHM.: LINEAR TRANSFER FUNCTIONS, MULTIPLICATIVE
CONVERSION COEFFICIENTS, MASS BALANCE EQUATIONS,
EMPIRICAL RELATIONS

SIZE.....: 1100 SOURCE STATEMENTS EACH 80 BYTES LONG

LANGUAGE....: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVI WITH 300 K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 64703
IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

SURVEY OF BIONEDICAL AND ENVIRONMENTAL
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PAGE 1

TITLE.....: WATER QUALITY MANAGEMENT PROGRAM HYDROLOGY PACKAGE

TYPE.....: MODEL

CONTACT.....: PHYLLIS M. FUJA
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3980)

SUBJECT COVERED: HYDROLOGY OF RIVER BASINS

KEY WORDS

WATER QUALITY, HYDROLOGY, ENVIRONMENTAL EFFECTS

ABSTRACT

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 DAM 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 RELATING AND FLOW RATE ARE ASSUMED TO BE AVAILABLE AT EVERY POINT WHERE STREAM CROSS-SECTIONS ARE NOT AVAILABLE. IN ADDITION, A REASONABLY LONG CONCURRENT RECORD OF STREAM FLOW MUST BE AVAILABLE AT GAUGES SUFFICIENTLY WIDESPREAD THROUGHOUT THE BASIN TO ADEQUATELY REFLECT THE SPATIAL DISTRIBUTION OF FLOW.

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DOCUMENTATION

R. M. SHANE, "STATE OF ILLINOIS WATER QUALITY MANAGEMENT
PROGRAM, APPENDIX D, THE HYDROLOGY PACKAGE", ANL/CES REPORT,
DECEMBER 1973.

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: MONTE-CARLO METHOD, STEADY STATE ONE DIMENSIONAL
HYDROLOGICAL FLOW, RUNGE-KUTTA NUMERICAL
INTEGRATIONS, FIRST ORDER KINETICS, STATISTICAL
METHOD, MATRIX-ALGEBRAIC MANIPULATIONS, MARKOV
PROCESS, REGRESSION ANALYSIS

SIZE.....: ABOUT 4000 SOURCE STATEMENTS EACH 80 BYTES LONG

LANGUAGE....: FORTRAN, DISPLA

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 350 K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 84703
IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

SURVEY OF BIOMEDICAL AND ENVIRONMENTAL
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TITLE.....: A 2-DIMENSIONAL FINITE ELEMENT MODEL FOR THE
MIGRATION OF CONTAMINANTS IN CONFINED AND
UNCONFINED AQUIFERS

TYPE.....: MODEL

CONTACT.....: BERGE A. GUREGHIAN
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FIS 972-7791)

SUBJECT COVERED: NONE

KEY WORDS

GROUND WATER, RADIONUCLIDE MIGRATION, POLLUTION, FINITE ELEMENT
METHOD, TWO DIMENSIONAL CALCULATIONS

ABSTRACT

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 NON-SYMMETRIC 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 BABYLON LAND FILL (NEW YORK) WERE USED TO CALIBRATE AND VERIFY THE PARAMETERS CONTROLLING THE MOVEMENT OF THE LEACHATE.

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DOCUMENTATION

NONE

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: FINITE ELEMENT: (A) GALERKIN AND UPWIND WEIGHTING;
(B) ISOPARAMETRIC QUADRILATERAL ELEMENTS; (C)
SOLUTION SCHEME: CRANK-NICOLSON WITH MASS LUMPING
OF TIME DERIVATIVE COEFFICIENT MATRIX.

SIZE.....: NONE

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 300K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ARL BUDGET ACTIVITY NUMBER 8M460
IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

SURVEY OF BIOMEDICAL AND ENVIRONMENTAL
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TITLE.....: A 3-DIMENSIONAL FINITE ELEMENT MODEL FOR THE
MIGRATION OF CONTAMINANTS IN CONFINED AND
UNCONFINED AQUIFERS

TYPE.....: MODEL

CONTACT.....: BERGE A. GUREGHIAN
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-7791)

SUBJECT COVERED: NONE

KEY WORDS

GROUND WATER, RADIONUCLIDE MIGRATION, POLLUTION, FINITE ELEMENT
METHOD, THREE DIMENSIONAL CALCULATIONS

ABSTRACT

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.

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DOCUMENTATION

NOT AVAILABLE

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: FINITE ELEMENT: (A) GALERKIN AND UPWIND WEIGHTING;
(B) ISOPARAMETRIC CUBIC ELEMENTS; (C) SOLUTION
SCHEME: CRANK-NICOLSON WITH MASS LUMPING OF TIME
DERIVATIVE COEFFICIENT MATRIX.

SIZE.....: NONE

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 300K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ARL BUDGET ACTIVITY NUMBER 85430
IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

SURVEY OF BIOMEDICAL AND ENVIRONMENTAL
DATA BASES, MODELS, & INTEGRATED COMPUTER SYSTEMS
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PAGE 1

TITLE.....: SIMULTANEOUS TRANSPORT OF WATER AND REACTING
SOLUTES THROUGH MULTILAYERED SOIL UNDER TRANSIENT
UNSATURATED FLOW CONDITIONS

TYPE.....: MODEL

CONTACT.....: PERGE A. GUPEGHIAN
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(PTS 972-7791)

SUBJECT COVERED: NONE

KEY WORDS

SOIL CHEMISTRY, GEOLOGICAL STRATA, WATER, SOLUTIONS, FINITE
DIFFERENCE METHOD, SATURATION, NITROGEN COMPOUNDS, NITROGEN,
NITROGEN CYCLE

ABSTRACT

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 AMMONIUM TO NITRITE, TO NITRATE IS DESCRIBED BY FIRST ORDER
KINETICS WITH LINEAR OR NON-LINEAR ABSORPTION FOR AMMONIUM.
THE PRESSURE BASED MODEL CONSIDERS BOTH INFILTRATION
REDISTRIBUTION AND EVAPORATION. CUBIC SPLINE FUNCTIONS ARE
USED TO DESCRIBE THE SOIL HYDRAULIC PROPERTIES.

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DOCUMENTATION

LONG ISLAND REPORT

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: FINITE DIFFERENCE; (A) PREDICTOR - CORRECTOR
METHOD USED FOR THE FLOW EQUATION; (B)
CRANK-NICOLSON METHOD WAS USED FOR THE MASS
TRANSPORT EQUATION.

SIZE.....: NONE

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 350K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 8M460
IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

SURVEY OF BIOMEDICAL AND ENVIRONMENTAL
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PAGE 1

TITLE.....: A METHODOLOGY FOR ASSESMENT OF ENERGY FACILITY
SITING PATTERNS

TYPE.....: MODEL

CONTACT.....: L. J. HABEGGER
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(PTS 972-3753)

SUBJECT COVERED: ENERGY FACILITY SITING PATTERNS

KEY WORDS

ENVIRONMENTAL IMPACTS, SOCIOECONOMICS, ENERGY PRODUCTION, SITING

ABSTRACT

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 ASSESMENT OF CLUSTERED FACILITIES IN ENERGY CENTERS IS ALSO POSSIBLE. SITE PROVIDES A METHODOLOGY FOR COMBINING VARIOUS AVAILABLE GEOPHYSICAL, HYDROLOGICAL, GEOLOGICAL, METEOROLOGICAL, ENVIRONMENTAL, AND SOCIOECONOMIC MODELS WITH REGIONAL ATTRIBUTES TO EVALUATE IMPACTS OF FACILITY SITING WITHIN THAT REGION.

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DOCUMENTATION

FRIGERIO, N.A., L.J. HABEGGER, R.F. KING, L.J. HOOVER, N.A.
CLARK, AND J.M. COBIAN, "SITE: A METHODOLOGY FOR ASSESSMENT OF
ENERGY SITING PATTERNS", ANL/AA-2, ARGONNE NATIONAL LABORATORY,
AUGUST 1975

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: WEIGHTED AVERAGES AND VECTOR CALCULATIONS, USING
RESULTS OF GAUSSIAN, EULERIAN, AND MONTE CARLO
SYSTEMS TO MODEL THE DISPERSION OF AIRBORNE
POLLUTANTS; OKUBO-PRITCHARD AND SIMILAR MODELS FOR
LIQUID-BORNE POLLUTANTS AND FOR THERMAL GRADIENTS;
PROBABILITY MODELS FOR SEVERE NATURAL PHENOMENA.

SIZE.....: 443 RECORDS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 360/75 OR 370/195 OS/1VT WITH 480K
CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER (NOT
AVAILABLE) IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

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TITLE.....: HEAVY ATOM PROPERTIES

TYPE.....: MODEL

CONTACT.....: YONG-KI KIM
RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-4190)

SUBJECT COVERED: ALL HEAVY ATOMS AND IONS (E.G., HG, U, PU)

KEY WORDS

HEAVY IONS, ENERGY LEVELS, TRANSITION PROBABILITY, CROSS SECTION

ABSTRACT

THE PROGRAM COMPUTES ENERGY LEVELS AND WAVE FUNCTIONS FOR HEAVY ATOMS AND IONS BASED ON RELATIVISTIC MULTICONFIGURATION HARTREE-FOCK MODEL. WE ALSO HAVE SATELLITE PROGRAMS THAT CALCULATE, FROM THE RELATIVISTIC WAVE FUNCTIONS, AMONG OTHER THINGS, TRANSITION PROBABILITIES, OSCILLATOR STRENGTHS, AND ELECTRON-IMPACT CROSS SECTIONS.

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DOCUMENTATION

PARTIAL DOCUMENTATION BY J. P. DESCLAUX, IN COMPUTER PHYSICS
COMMUNICATIONS 1, 31-45 (1975).

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: HARTREE-FOCK METHOD

SIZE.....: 500 K BYTES

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 500K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 67100
IN THE RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION

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TITLE.....: A MODEL FOR RADIOLOGICAL DISPERSION FROM TORNADIC
ACCIDENTS

TYPE.....: MODEL

CONTACT.....: FRANCIS C. KORNEGAY
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3206)

SUBJECT COVERED: INDUSTRIAL FACILITIES

KEY WORDS

WIND, GROUND LEVEL, PARTICLES

ABSTRACT

TORNABENE WAS DESIGNED TO PREDICT THE GROUND-LEVEL
CONCENTRATIONS RESULTING FROM A TORNADO STRIKING AN UNHARDENED
PLUTONIUM FACILITY.

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DOCUMENTATION

HALTNER, G.J., AND F.L. MARTIN, DYNAMICAL AND PHYSICAL
METEOROLGY, MCGRAW-HILL, INC., NEW YORK, 1957

PROCEEDINGS OF THE SYMPOSIUM ON TORNADOES, JUNE 22-24, 1976,
TEXAS TECHNICAL UNIVERSITY

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: ASSUMES A CYCLOSTROPHIC WIND PROFILE, WITH VARIABLE
TORNADO CHARACTERISTICS. MODEL THEN ALLOWS FOR
MAXWELLIAN DISTRIBUTION DOWNWIND THROUGH 90DEGREE
ARC.

SIZE.....: 150 RECORDS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT

ACKNOWLEDGMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER SM464
IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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TITLE.....: A MODEL TO PREDICT RADIOLOGICAL ENVIRONMENTAL
IMPACT RESULTING FROM STRAIGHTLINE WIND DAMAGE TO
PLUTONIUM FACILITY.

TYPE.....: MODEL

CONTACT.....: FRANCIS C. KORNEGAY
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3206)

SUBJECT COVERED: INDUSTRIAL FACILITIES

KEY WORDS

TORNADOES, PLUTONIUM, GROUND LEVEL

ABSTRACT

THE MODEL IS DESIGNED TO PREDICT CONCENTRATIONS RESULTING FROM
A STRAIGHTLINE WIND STRIKING A FACILITY HOUSING PARTICULATE
MATERIAL. ONCE CHARACTERISTIC WINDS ARE DETERMINED AND AN
APPLICABLE SOURCE TERM IS GENERATED, RESULTANT GROUND-LEVEL
CONCENTRATIONS ARE DETERMINED.

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DOCUMENTATION

TURNER, D. BRUCE, WORKSHOP OF ATMOSPHERIC DISPERSION ESTIMATES,
PHS # 999-AP-26, 1967

SOFTWARE/HARDWARE INFORMATION

ALGORITHM..: MODEL USES "PUFF" RELEASES AS BY THE METHOD OF
TURNER, 1967.

SIZE.....: 180 RECORDS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER AML BUDGET ACTIVITY NUMBER 8M464
IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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TITLE.....: ARGONNE COAL MARKET MODEL

TYPE.....: MODEL

CONTACT.....: GREGORY C. KROHM
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3759)

SUBJECT COVERED: REGIONAL COAL PRODUCTION AND MARKETS

KEY WORDS

COAL, MARKETS, ALLOCATION

ABSTRACT

THE ARGONNE COAL MARKET MODEL WAS DEVELOPED AS PART OF THE NATIONAL COAL UTILIZATION ASSESSMENT, A COMPREHENSIVE STUDY OF COAL-RELATED ENVIRONMENTAL, HEALTH, AND SAFETY IMPACTS. THE MODEL WAS USED TO GENERATE LONG-TERM COAL MARKET SCENARIOS THAT BECAME THE BASES FOR COMPARING THE IMPACTS OF COAL DEVELOPMENT OPTIONS. THE MODEL HAS A RELATIVELY HIGH DEGREE OF REGIONAL DETAIL CONCERNING BOTH SUPPLY AND DEMAND. COAL DEMANDS ARE FORECAST BY A COMBINATION OF TREND AND ECONOMETRIC ANALYSIS AND THEN INPUT EXOGENOUSLY INTO THE MODEL. COAL SUPPLY IN EACH REGION IS CHARACTERIZED BY A LINEARLY INCREASING FUNCTION RELATING INCREMENTS OF NEW MINE CAPACITY TO THE MARGINAL COST OF EXTRACTION. RAIL TRANSPORTATION COSTS ARE ECONOMETRICALLY ESTIMATED FOR EACH SUPPLY-DEMAND LINK. A QUADRATIC PROGRAMMING ALGORITHM IS USED TO CALCULATE FLOW PATTERNS THAT MINIMIZE CONSUMER COSTS FOR THE SYSTEM.

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DOCUMENTATION

C.D.DUX, G.C. KROHN, J.C. VANKUIKEN, "MODELING LONG-TERM COAL
PRODUCTION WITH THE ARGONNE COAL MARKET MODEL", ANL/AA-13,
AUGUST, 1977

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: NULENKE - QUADRATIC OPTIMIZATION

SIZE.....: NONE ~

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 200K CDFE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 65902
IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

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**TITLE.....: FIRST ESTIMATE OF SEEDING CAPABILITY FOR ULTIMATE
ESTABLISHMENT**

TYPE.....: MODEL

**CONTACT.....: CHARLES R. LAPPANCE
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(PTS 972-3184)**

SUBJECT COVERED: MINE SPOIL RECLAMATION

KEY WORDS

LAND RECLAMATION, REVEGETATION, COAL, SURFACE MINING

ABSTRACT

**PREDICTS THE SUCCESS OF SEEDING ON MINE SPOILS BASED ON
CHEMICAL DATA FOR SPOILS USING PREVIOUS EXPERIENCE. DATA ON
PREVIOUS EXPERIENCE IS ENTERED AND SUMMARIZED SO THAT
PROPRIETARY DATA CANNOT BE RETRIEVED.**

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DOCUMENTATION

NONE

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: POLYNOMIAL REGRESSION

SIZE.....: UNDETERMINED

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 360/75 TSO WITH 120 K COBE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 65902
IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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TITLE.....: VEGETATION COMMUNITIES ALONG GRADIENT

TYPE.....: MODEL

CONTACT.....: CHARLES R. LAPFRANCE
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3184)

SUBJECT COVERED: INDIVIDUALISTIC VEGETATION

KEY WORDS

SIMULATION, PLANTS, MATHEMATICAL MODELS, STATISTICAL MODELS,
COMMUNITIES

ABSTRACT

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.

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DOCUMENTATION

LAFRANCE, C.R. "SAMPLING AND ORDINATION CHARACTERISTICS OF
COMPUTER-SIMULATED INDIVIDUALISTIC COMMUNITIES " ECOLOGY
53(3):387-397

LAFRANCE, C.R. "COMPUTER SIMULATED VEGETATION", PROC. OF THE
FIRST INDIANA UNIV. COMPUTER NETWORK CONF. ON COMPUTER RELATED
CURRICULUM MATERIALS, IND. UNIV. SE, NEW ALBANY, IN, P. 23-26,
1974

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: DEVELOPED ENTIRELY BY AUTHOR FROM ECOLOGIC THEORY

SIZE.....: 23 K WORDS

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: UNIVAC 1107 WITH 32 K CORE, 7 TRACK TAPE
DRIVE, CALCOMP 563 PLOTTER; IBM 1130 WITH
32 K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER (NOT
AVAILABLE) IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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TITLE.....: COOLING TOWER PLUME MODEL

TYPE.....: MODEL

CONTACT.....: JIIN-LANG LEE
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-7633)

SUBJECT COVERED: ENVIRONMENTAL STUDIES

KEY WORDS

COOLING TOWER, ENERGY DISSIPATION, WEATHER

ABSTRACT

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 HYDROMETEOR WATER CONTENTS, AND PLUME SIZE AT EVERY FINITE GRID INTERVAL, TOGETHER WITH GROUND LEVEL PRECIPITATION RATES AT VARIOUS DISTANCES DOWNWIND.

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DOCUMENTATION

J. LEE, "POTENTIAL WEATHER MODIFICATION FROM COOLING TOWER
EFFLUENTS AT CONCEPTUAL POWER PARKS", ATMOSPHERIC ENVIRONMENT,
VOL. 11, PP. 749-759. PERGAMON PRESS 1977.

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: DISCRETE FINITE DIFFERENCE COMPUTATION IN SPACE

SIZE.....: 1200 RECORDS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT SYSTEM WITH 150K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER (NOT
AVAILABLE) IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

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TITLE.....: NATURAL DRAFT COOLING TOWER PERFORMANCE

TYPE.....: MODEL

CONTACT.....: JIIN-LANG LEE
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(PTS 972-7633)

SUBJECT COVERED: ENVIRONMENTAL STUDIES

KEY WORDS

COOLING TOWERS, WATER, COOLING, THERMAL POLLUTION, ENERGY
LOSSES, EVAPORATION

ABSTRACT

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 CTPM (COOLING TOWER PLUME MODEL). 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).

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DOCUMENTATION

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

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: EXTRAPOLATED INTEGRATION AND ITERATION

SIZE.....: 500 RECORDS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT SYSTEM WITH 150K

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER (NOT
AVAILABLE) IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

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TITLE.....: SHAWNEE-LIMESTONE FLUE GAS SCRUBBER DESIGN AND COST
PROGRAM

TYPE.....: MODEL

CONTACT.....: C. DAVID LIVENGOD
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(PTS 972-3737)

SUBJECT COVERED: LIME/LIMESTONE SCRUBBER DESIGN FOR UTILITY
INSTALLATIONS

KEY WORDS

POWER PLANTS, POWER GENERATION, SCRUBBERS, AIR POLLUTION
ABATEMENT, WASTES, COST

ABSTRACT

THE PROGRAM USES SELECTED DESIGN INPUT DATA TO PROJECT
COMPARATIVE INVESTMENT AND OPERATING COSTS FOR LIME/LIMESTONE
SCRUBBING SYSTEMS FOR SO₂ REMOVAL. THE PURPOSE OF THE PROGRAM
IS TO PERMIT THE ESTIMATION OF RELATIVE ECONOMICS OF DIFFERENT
SYSTEM CONFIGURATIONS AND ECONOMIC PARAMETERS. IT IS LIMITED
TO SYSTEMS EMPLOYING ONSITE WASTE DISPOSAL AND INDIRECT STEAM
REHEAT FOR POWER UNIT SIZES FROM 100-1300 MWE. COAL SULFUR
CONTENT IS LIMITED TO 2-5%. CAPITAL AND OPERATING COSTS ARE
GIVEN ON A YEAR-BY-YEAR BASIS TOGETHER WITH RESOURCE AND
UTILITIES CONSUMPTION.

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DOCUMENTATION

R. L. TORSTRICK, "SHAWNEE LIMESTONE-LIME SCRUBBING PROCESS
COMPUTERIZED DESIGN - COST ESTIMATE PROGRAM: SUMMARY
DESCRIPTION REPORT," PRESENTED AT EPA CONFERENCE RESULTS OF EPA
LIME/LIMESTONE WET SCRUBBING TEST PROGRAMS, RALEIGH, N.C.
(OCT. 14, 1976).

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: NOT AVAILABLE (SEE DOCUMENTATION LISTED)

SIZE.....: NONE

LANGUAGE....: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 230K

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 65903
IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

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**TITLE.....: MORTALITY PROJECTION FROM EXPOSURE TO RADIOACTIVE
AND NON-RADIOACTIVE ENVIRONMENTAL POLLUTANTS**

TYPE.....: MODEL

**CONTACT....: ROBERT T. LUNDY
BIOLOGICAL AND MEDICAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3827)**

**SUBJECT COVERED: MORTALITY ESTIMATES, POPULATION PROJECTION, AND
DEMOGRAPHIC ANALYSIS.**

KEY WORDS

**PUBLIC HEALTH, FORECASTING, MORTALITY, AIR POLLUTION, RADIATION
EFFECTS**

ABSTRACT

**GIVEN AN INITIAL POPULATION AND SUFFICIENT DATA TO CONSTRUCT
AGE-SPECIFIC SEX-SPECIFIC BIRTH AND DEATH RATES, AND A HISTORY
OF EXPOSURE TO SO₄, SO₂, TSP, OR ORGAN DOSES IN REM AS A
SEQUENCE OF YEARLY AVERAGES, DEMPAC 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.**

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DOCUMENTATION

LUNDY, R. T. AND D. GRAHN, "PREDICTIONS OF THE EFFECTS OF ENERGY PRODUCTION ON HUMAN HEALTH", PROCEEDINGS OF THE ANNUAL MEETINGS OF THE AMERICAN STATISTICAL ASSOCIATION, 1977
DEMPAK USER'S MANUAL (DRAFT).

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: 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 CALCULATED AS FIRST DIFFERENCES BETWEEN PROJECTED POPULATIONS AT SUCCESSIVE INTERVALS.

SIZE.....: 7000 RECORDS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 400K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 6M430
IN THE BIOLOGICAL AND MEDICAL RESEARCH DIVISION

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TITLE.....: TEMPERATURE DISTRIBUTION MODEL FOR COOLING POND

TYPE.....: MODEL

CONTACT.....: GARY J. HARNER
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3202)

SUBJECT COVERED: HEAT DISSIPATION FROM A COOLING POND

KEY WORDS

MATHEMATICAL MODELS, TEMPERATURE, COOLING POND, POWER PLANT

ABSTRACT

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 MEAN DEPTH OF THE LAKE, THE FLOW-THROUGH TIME, THE EQUILIBRIUM TEMPERATURE AND HEAT EXCHANGE 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.

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DOCUMENTATION

NONE

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: ITERATIONS OF AN ALGEBRAIC EQUATION.

SIZE.....: 80 RECORDS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 250K CORE

ACKNOWLEDGMENT

THE WORK WAS PERFORMED UNDER AML BUDGET ACTIVITY NUMBER 84480
IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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TITLE.....: THERMAL PLUME, SUBMERGED MULTIPORT DIFFUSER MODEL

TYPE.....: MODEL

CONTACT.....: GARY J. HARMER
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3202)

SUBJECT COVERED: SUBMERGED THERMAL PLUME PREDICTIONS

KEY WORDS

MIXING, WATER, SURFACES, LEVEL

ABSTRACT

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.

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DOCUMENTATION

P.C.Y.FOH AND L.N. FAN, "MATHEMATICAL MODELS FOR THE PREDICTION
OF TEMPERATURE DISTRIBUTIONS RESULTING FROM THE DISCHARGE OF
HEATED WATER INTO LARGE BODIES OF WATER", ENVIRONMENTAL
PROTECTION AGENCY, 16130DWC, OCTOBER 1970.

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: INTEGRAL ANALYSIS RESULTS IN COUPLED NON-LINEAR
DIFFERENTIAL EQUATIONS SOLVED BY A FOURTH ORDER
RUNGE-KUTTA SCHEME.

SIZE.....: 350 RECORDS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 250K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 8M480
IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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TITLE.....: THERMAL PLUME, SURFACE DISCHARGE MODEL

TYPE.....: MODEL

CONTACT.....: GARY J. HARMER
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3202)

SUBJECT COVERED: SURFACE THERMAL PLUME PREDICTIONS

KEY WORDS

THREE DIMENSIONAL CALCULATIONS, WATER, HEAT

ABSTRACT

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.

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DOCUMENTATION

M.A. SHIRAZI AND L.R. DAVIS, "WORKBOOK OF THERMAL PLUME
PREDICTION, VOL. 2- SURFACE DISCHARGE", U.S. ENVIRONMENTAL
PROTECTION AGENCY, EPA-R2-72-0056, MAY 1974

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: INTEGRAL ANALYSIS RESULTS IN COUPLED NONLINEAR
DIFFERENTIAL EQUATIONS SOLVED BY THE HAMMING
PREDICTOR - CORRECTOR METHOD.

SIZE.....: 700 RECORDS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/BVT WITH 240K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 8M480
IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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TITLE.....: ARGONNE STEADY STATE URANIUM DISPERSION AND
DOSIMETRY CODE

TYPE.....: MODEL

CONTACT.....: MICHAEL H. MOMENI
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3134)

SUBJECT COVERED: DISPERSION OF RADIOACTIVITY FROM URANIUM
MILLING AND RESULTING HEALTH EFFECTS

KEY WORDS

URANIUM, RADIOACTIVE CLOUDS, RADIOACTIVITY, MORTALITY, PUBLIC
HEALTH, URANIUM MINES

ABSTRACT

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 INGROWTH 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.

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DOCUMENTATION

MOMENI, MICHAEL H., YUCHIEN YUAN, A.J. ZIELEN, AND T. BEISSEL:
"THE ARGONNE STEADY-STATE URANIUM DISPERSION AND DOSIMETRY CODE
-- VOLUME 1" (UDAD), ANL, 1978.

MOMENI, MICHAEL H., S.A. TYLER, A.J. ZIELEN, AND Y. YJAN: "THE
ARGONNE STEADY-STATE URANIUM DISPERSION AND DOSIMETRY CODE --
VOLUME 2", ANL, 1978

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: GAUSSIAN DISPERSION, FIRST ORDER DIFFERENTIAL
RELATIONSHIP FOR TRANSPORT, PROBABILITY WEIGHTING

SIZE.....: 5000 SOURCE STATEMENTS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN, PL/1

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH WITH 400K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER
8M417, 8M477, 8M480 IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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TITLE.....: A MODEL TO PREDICT FISH-IMPINGEMENT AT COOLING
WATER INTAKES

TYPE.....: MODEL

CONTACT.....: ISHWAR P. MURARKA
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(PTS 972-3125)

SUBJECT COVERED: FISHERIES BIOLOGY AND ENVIRONMENTAL STUDIES

KEY WORDS

FISHES, MATHEMATICAL MODELS, ENVIRONMENT, ECOLOGY, IMPINGEMENT

ABSTRACT

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 1974 DATA FROM THE ZION 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.

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DOCUMENTATION

I. P. MURARKA, "A MODEL FOR PREDICTING FISH IMPINGEMENT AT
COOLING WATER INTAKES", ANL/AA-8, JANUARY 1977

I. P. MURARKA, D. J. BODEAU, AND W. K. DERICKSON, "VALIDATION
AND SOFTWARE DOCUMENTATION OF THE ANL FISH-IMPINGEMENT MODEL",
ANL/ES-62, APRIL 1978.

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: DISCRETE FINITE ELEMENT COMPUTATIONS, EMPIRICAL
CALCULATIONS OF PROBABILITY WEIGHTS, MATFIX
ALGEBRAIC MANIPULATIONS.

SIZE.....: 700 RECORDS EACH 80 BYTES LONG

LANGUAGE....: FORTRAN, DISSPLA

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 200K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER
65902, 8M463 IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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TITLE.....: BOX-JENKINS TIME-SERIES MODELLING AND ANALYSIS
SYSTEM

TYPE.....: MODEL

CONTACT.....: ISHWAR P. MURAPKA
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABOPATORY
ARGONNE, IL 60439
(PTS 972-3125)

SUBJECT COVERED: STATISTICAL TIME-SERIES MODELLING AND ANALYSIS.

KEY WORDS

MATHEMATICAL MODELS, TRANSFER FUNCTION, STATISTICS,
ENVIRONMENT, ECOLOGY

ABSTRACT

THE SOFTWARE SYSTEM CONSISTS OF COMPUTER PROGRAMS THAT WERE DEVELOPED AT THE UNIVERSITY OF WISCONSIN FOR THE CONSTRUCTION OF TIME-SERIES MODELS FOR UNIVARIATE TIME-SERIES USING METHODS DESCRIBED BY BOX AND JENKINS. THE METHODOLOGY CONSISTS OF ITERATIVELY MODELLING THE DEPENDENCE AMONG OBSERVATIONS IN A TIME-SERIES. IT IS A MODEL BUILDING PROCESS. THERE ARE THREE STEPS IN THE PROCESS. THE MODEL DETERMINATION STAGE, CALLED IDENTIFICATION, IS FOLLOWED BY PARAMETER ESTIMATION AND THEN DIAGNOSTIC CHECKING TO DETERMINE IF THE MODEL PROVIDES AN ADEQUATE DESCRIPTION OF THE DATA. AS DEFICIENCY IS NOTED IN THE CHECKING STAGE, THE PROCESS IS ITERATIVELY LOOPED BACK TO IDENTIFICATION STAGE. THE END RESULTS OF THE THREE STEPS IS TO PROVIDE A MODEL THAT WE MAY USE TO FORECAST FUTURE OUTCOMES.

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DOCUMENTATION

PACK, D. J., M. L. GOODMAN AND R. B. MILLER, "COMPUJER PROGRAMS
FOR THE ANALYSIS OF UNIVARIATE TIME-SERIES USING THE METHODS OF
BOX AND JENKINS", UNIVERSITY OF WISCONSIN AT MADISON,
TECHNICAL MEMO 296, APRIL 1972.

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: AUTOREGRESSIVE-INTEGRATED-MOVING AVERAGE ALGORITHMS
DEVELOPED BY BOX AND JENKINS. DISCRETE FINITE
ELEMENT DIFFERENCING AND MATRIX ALGEBRAIC
COMPUTATIONAL METHODS ARE USED. LINEAR AND
NON-LINEAR LEAST SQUARES PROCEDURES ARE ALSO
UTILIZED.

SIZE.....: 1600 SOURCE STATEMENTS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 200 K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 8M463
IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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TITLE.....: FISH IMPINGEMENT SAMPLING DESIGN & ESTIMATION
METHOD SOFTWARE SYSTEM.

TYPE.....: MODEL

CONTACT.....: ISHWAR P. MURARKA
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(PTS 972-3125)

SUBJECT COVERED: FISH IMPINGEMENT, STATISTICAL METHODS

KEY WORDS

SAMPLING, FISHES, STATISTICS, IMPINGEMENT, ENVIRONMENT

ABSTRACT

SEVERAL SYSTEMS ARE COMPARED TO DETERMINE STATISTICALLY EFFICIENT SAMPLING DESIGNS AND SCHEMES FOR ESTIMATING FISH-IMPINGEMENT AT COOLING WATER INTAKES. COMPARED TO A SIMPLE RANDOM SAMPLING SCHEME THE STRATIFIED SYSTEMATIC RANDOM SAMPLING SCHEME, THE SYSTEMATIC RANDOM SAMPLING SCHEME, AND THE STRATIFIED RANDOM SAMPLING SCHEME YIELD HIGHER EFFICIENCIES AND ESTIMATORS 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 ESTIMA PROGRAM IS USED TO OBTAIN THE STATISTICAL ESTIMATES OF MEANS, TOTALS, AND THE ASSOCIATED VARIANCES FOR THE SPECIFIED SAMPLING SCHEME. THE SIZECO PROGRAM CALCULATES SAMPLE SIZES SUBJECT TO COST, ERROR AND LOSS RESTRICTIONS.

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DOCUMENTATION

I.P. MURARKA & D.J. BODEAU, "SAMPLING DESIGNS AND METHODS FOR ESTIMATING FISH-IMPINGEMENT LOSSES AT COOLING WATER INTAKES", ANL/ES-60, OCTOBER 1977

I.P. MURARKA & D.J. BODEAU, "SOFTWARE DOCUMENTATION & USER'S MANUAL FOR FISH-IMPINGEMENT SAMPLING DESIGN AND ESTIMATION METHOD COMPUTER PROGRAMS", ANL/ES-61, NOVEMBER 1977

I.P. MURARKA, S.A. SPIGERALLI, & D.J. BODEAU, "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 ENTRAINMENT AND IMPINGEMENT, DECEMBER 1977

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: CONSTRAINED LAGRANGIAN SOLUTIONS, PROBABILITY CALCULATIONS, MATRIX ALGEBRA METHODS, STATISTICAL ESTIMATIONS

SIZE.....: 1565 RECORDS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN, DISSPLA

MACHINE CONFIGURATION: CDC 6400/NOS WITH 100K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 85463 IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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TITLE.....: A UNIVARIATE AND MULTIVARIATE TIME-SERIES MODELLING
SOFTWARE SYSTEM

TYPE.....: MODEL

CONTACT.....: ISHWAR P. MURARKA
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(PIS 972-3125)

SUBJECT COVERED: STATISTICAL TIME-SERIES MODELLING AND ANALYSIS.

KEY WORDS

MATHEMATICAL MODELS, TRANSFER FUNCTION, STATISTICS,
ENVIRONMENT, SPECTRAL ANALYSIS

ABSTRACT

THE OS3-ARAND SYSTEM ALLOWS A USER TO CARRY OUT A LARGE VARIETY OF NUMERICAL CALCULATIONS ON LARGE GROUPS OF RANDOM DATA. THE END RESULT IS TO OBTAIN A PARAMETERIZED MODEL THAT CAN BE USED TO DESCRIBE THE DATA AND MAKE PREDICTIONS FOR FUTURE OUTCOMES. THE SYSTEM IS BASED ON A MODULAR PROGRAMMING APPROACH USING FORTRAN AS A PROGRAMMING LANGUAGE. THE OUTPUTS FROM THE COMPUTATIONS EMPHASIZE GRAPHICS. THE SUBROUTINES TO CARRY OUT GRAPHICS REPRESENTATION ARE DERIVED FROM THE DISPLA PACKAGE. A DETAILED DESCRIPTION OF EACH OF THE SUBROUTINES IN THE ARAND SYSTEM CAN BE FOUND IN THE THREE REPORTS CONTAINING THE DOCUMENTATION AND USER INSTRUCTIONS.

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DOCUMENTATION

"OS-3 ARAND SYSTEM: DOCUMENTATION AND EXAMPLES", VOL. I, VOL. II, AND VOL. III, 1973, COMPUTER CENTER, OREGON STATE UNIVERSITY.

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: DISCRETE FINITE ELEMENT DIFFERENCING AND MATRIX ALGEBRAIC COMPUTATIONAL METHODS ARE USED. LINEAR AND NONLINEAR LEAST SQUARES METHODS ARE USED, FOURIER TRANSFORMATIONS AND TRIGONOMETRIC FUNCTIONS EVALUATIONS, COMPLEX-ALGEBRAIC SEVERAL LINEAR AND NON-LINEAR FILTERING TECHNIQUES.

SIZE.....: 10000 RECORDS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN, DISPLA

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 350 K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ARL BUDGET ACTIVITY NUMBER 85461, 85463 IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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TITLE.....: SUBCELLULAR PARTICLE SEDIMENTATION IN GRADIENTS

TYPE.....: MODEL

CONTACT.....: SHARRON L. NANCE
BIOLOGICAL AND MEDICAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FIS 972-3831)

SUBJECT COVERED: ISOLATION AND CHARACTERIZATION OF PARTICULATE
COMPONENTS OF MAMMALIAN CELLS BY CENTRIFUGATION
TECHNIQUES.

KEY WORDS

CYTOLOGY, ENZYMES, STOKES LAW, CENTRIFUGATION

ABSTRACT

BASED ON A SEDIMENTATION EQUATION DERIVED FROM STOKES'S LAW, THE PROGRAM CALCULATES THE DIAMETER OF OSMOTICALLY ACTIVE PARTICULATES THAT WOULD BE FOUND AT A GIVEN POSITION IN A GRADIENT SOLUTION AS A FUNCTION OF SPEED AND TIME OF CENTRIFUGATION, DENSITY, AND VISCOSITY OF THE SOLUTION, AND DENSITY AND OSMOTIC BEHAVIOR OF THE PARTICULATES. THIS MODEL WAS SPECIFICALLY DESIGNED TO CHARACTERIZE THE SEDIMENTATION PROPERTIES OF MITOCHONDRIA AND PEROXISOMES OF RODENT LIVER IN ORDER TO PROVIDE A BASELINE FOR COMPARISON OF TISSUES FROM NORMAL ANIMALS WITH THOSE EXPOSED TO A VARIETY OF NOXIOUS STIMULI.

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DOCUMENTATION

THOMSON, J. F., NANCE, S. L., AND TOLIAKSEN, S. L., RADIAT.
RES. 45, 629, 1971.

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: DISCRETE FINITE ELEMENT COMPUTATIONS AND ITERATIVE
CALCULATIONS OF DISTANCE, DENSITY, DIAMETER, ETC.

SIZE.....: 100 RECORDS EACH 80 BYTES LONG

LANGUAGE...: PL/1

MACHINE CONFIGURATION: IBM 370/195 OS/MVT SYSTEM WITH 150K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 61100
IN THE BIOLOGICAL AND MEDICAL RESEARCH DIVISION

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TITLE.....: A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE AND
MULTIPLE NATURAL-DRAFT COOLING TOWERS

TYPE.....: MODEL

CONTACT.....: ANTHONY J. POLICASTRO
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3235)

SUBJECT COVERED: COOLING TOWER ENVIRONMENTAL EFFECTS

KEY WORDS

COOLING TOWER, EVAPORATION COOLING, PLUMES, MATHEMATICAL
MODELS, THERMODYNAMICS, AIR POLLUTION

ABSTRACT

THE FRICK 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 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

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ABSTRACT CONTINUED

TYPICALLY 1/3 OF THE OBSERVED VALUE, AND THE PREDICIED RISE
AVERAGES 60% OF OF OBSERVED.

DOCUMENTATION

W. E. FRICK, "THE INFLUENCE OF STRATIFICATION ON PLUME
STRUCTURE", A THESIS SUBMITTED TO OREGON STATE UNIVERSITY, JUNE
6, 1975, (ATMOSPHERIC SCIENCES DEPT.)

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: THE SYSTEM OF EIGHT COUPLED, ORDINARY, NONLINEAR
DIFFERENTIAL EQUATIONS IS SOLVED BY SIMPLE EULER
DIFFERENCING WITH DOUBLE PRECISION ARITHMETIC AND
SMALL STEPSIZE. NO CONVERGENCE TEST IS INCLUDED.

SIZE.....: 206 RECORDS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 122 K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 8M493
IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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TITLE.....: A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE
NATURAL-DRAFT COOLING TOWERS

TYPE.....: MODEL

CONTACT.....: ANTHONY J. POLICASTRO
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ARGONNE, IL 60439
(FTS 972-3235)

SUBJECT COVERED: COOLING TOWER ENVIRONMENTAL EFFECTS

KEY WORDS

COOLING TOWER, EVAPORATION COOLING, PLUMES, MATHEMATICAL
MODELS, THERMODYNAMICS, AIR POLLUTION

ABSTRACT

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 EQUATIONS OF GEOMETRY ARE ALSO INCLUDED. MODEL PREDICTIONS GIVE CENTERLINE TRAJECTORY, PLUME RADIUS, EXTENT OF VISIBLE PLUME AND CENTERLINE VALUES OF VELOCITY, WATER VAPOR, LIQUID WATER AND DRY-BULB TEMPERATURE.

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DOCUMENTATION

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. DUNN, R. A. CARBART ET. AL., PROGRESS REPORT, JANUARY 1-MARCH 31, 1978, ANL (SPONSORED BY EPRI).

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: 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.

SIZE.....: 840 RECORDS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 128 K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 85352 IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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TITLE.....: A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE AND
MULTIPLE NATURAL-DRAFT COOLING TOWERS

TYPE.....: MODEL

CONTACT.....: ANTHONY J. POLICASTRO
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ARGONNE, IL 60439
(FTS 972-3235)

SUBJECT COVERED: COOLING TOWER ENVIRONMENTAL EFFECTS

KEY WORDS

COOLING TOWER, EVAPORATION COOLING, PLUMES, MATHEMATICAL
MODELS, THERMODYNAMICS, AIR POLLUTION

ABSTRACT

THE HANNA MODEL PREDICTS THE PHYSICAL CHARACTERISTICS OF COOLING TOWER PLUMES FROM EITHER SINGLE OR MULTIPLE NATURAL-DRAFT COOLING TOWERS. INPUTS TO THE MODEL ARE : (A) TOWER SOURCE CONDITIONS-EXIT TEMPERATURE, VELOCITY AND INITIAL LIQUID WATER; (B) AMBIENT METEOROLOGY-PROFILES OF DRY-BULB TEMPERATURE, RELATIVE HUMIDITY, AND WINDSPEED; (C) SOURCE GEOMETRY-TOWER HEIGHT AND EXIT DIAMETER. EMPIRICAL 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 BENT-OVER PLUME ASSUMPTION IS MADE TO ACCOUNT FOR DOWN-WIND MOTION 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

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ABSTRACT CONTINUED

HAS BEEN EVALUATED AT ANL AND FOUND TO PREDICT PLUME HEIGHT
ADEQUATELY. HOWEVER, INCOMPLETE PREDICTION OF PLUME LENGTH
OFTEN RESULTS WHEN THE PLUME REA

DOCUMENTATION

S. R. HANNA, "PREDICTED AND OBSERVED COOLING TOWER PLUME RISE
AND VISIBLE PLUME LENGTH AT THE JOHN E. AMOS POWER PLANT",
ATMOSPHERIC TURBULENCE AND DIFFUSION LABORATORY, ATDL
CONTRIBUTION FILE NO. 75/21, OAK RIDGE, TENNESSEE, 1975

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: THE SYSTEM OF ORDINARY, COUPLED, NONLINEAR
DIFFERENTIAL EQUATIONS ARE SOLVED BY SIMPLE EULER
INTEGRATION IN DOUBLE-PRECISION ARITHMETIC WITH
SMALL STEPSIZE.

SIZE.....: 613 RECORDS EACH 80 BYTES LONG

LANGUAGE....: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT 130 K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 8M493
IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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TITLE.....: A MODEL TO PREDICT SALT-DRIFT DEPOSITION FROM A
NATURAL DRAFT COOLING TOWER

TYPE.....: MODEL

CONTACT.....: ANTHONY J. POLICASTRO
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(FTS 972-3235)

SUBJECT COVERED: COOLING TOWER ENVIRONMENTAL EFFECTS

KEY WORDS

DRIFT DEPOSITION, EVAPORATION, BREAKAWAY, PLUME RISE, AMBIENT
TURBULENCE

ABSTRACT

THE OVERCAMP-ISRAEL MODEL PREDICTS SALT-DRIFT DEPOSITION FOR A SINGLE NATURAL-DRAFT COOLING TOWER. PREDICTIONS MAY BE MADE FROM THE TOWER TO 100 KM DOWNWIND. INPUTS TO THE MODEL ARE (A) SOURCE CONDITIONS -- EXIT TEMPERATURE, VELOCITY AND DROPLET SIZE SPECTRUM (B) METEOROLOGICAL CONDITIONS -- AN AVERAGE WIND SPEED, DRY-BULB TEMPERATURE AND RELATIVE HUMIDITY FOR FIXED PERIODS OF TIME (E.G., 10MIN, 30 MIN) (C) SOURCE GEOMETRY -- TOWER WEIGHT AND EXIT DIAMETER (D) GROUND SAMPLERS -- AS MANY AS 50 LOCATED ARBITRARILY ABOUT THE TOWER. FOR PLUME RISE, THE MODEL EMPLOYS A SIMPLE ENTRAINMENT APPROACH LEADING TO A CLOSED-FORM SOLUTION. DROPS BREAK AWAY FROM THE PLUME WHEN THEIR SETTLING VELOCITY JUST EQUALS THE PLUME UPDRAFT VELOCITY. DROPLET EVAPORATION FOLLOWS THE WORK OF MASON. THE EFFECT OF AMBIENT TURBULENCE IS TREATED USING THE IMAGE-DEPLETION METHOD. THE MODEL HAS BEEN EVALUATED AT ANL AND FOUND TO BE COMPETITIVE WITH THE OTHER (BETTER) EXISTING DRIFT MODELS. THE MODEL WAS FOUND TO LOSE MASS BETWEEN SALT EMISSION AND DEPOSITION DUE TO REFLECTION OF THE LARGER DROPS FROM THE GROUND. THE MODEL ALSO TENDS TO UNDERPREDICT DRIFT

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ABSTRACT CONTINUED

DEPOSITION AS OVERPREDICTING THE SIZE OF DROPS STICKING THE
GROUND.

DOCUMENTATION

T.J. OVERCAMP. "SENSITIVITY ANALYSIS AND COMPARISON OF SALT
DEPOSITION MODELS FOR COOLING TOWERS".

SOFTWARE/HAPDWARE INFORMATION

ALGORITHM...: THE MODEL CONTAINS MANY CLOSED-FORM CALCULATIONS.
THE TREATMENT OF EVAPORATION IS THROUGH AN EULERIAN
INTEGRATION OF THE MASS TRANSFER EQUATION (SIMPLE
FORWARD STEP IN TIME). THE NEWTON-RAPHSON METHOD
OF FINDING ROOTS IS USED TWICE IN THE COMPUTER CODE.

SIZE.....: 1197 RECORDS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM/370-195 OS/MVT WITH 250K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 8M493
IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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**TITLE.....: A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE
NATURAL-DRAFT COOLING TOWERS.**

TYPE.....: MODEL

**CONTACT.....: ANTHONY J. POLICASTRO
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ARGONNE, IL 60439
(FTS 972-3235)**

SUBJECT COVERED: COOLING TOWER ENVIRONMENTAL EFFECTS

KEY WORDS

**COOLING TOWER, EVAPORATIVE COOLING, PLUMES, MATHEMATICAL
MODELS, THERMODYNAMICS, AIR POLLUTION**

ABSTRACT

THE STEPHEN-MOREZ 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 ANL. 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 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.

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DOCUMENTATION

D. W. STEPHEN AND W. J. MOREZ, "PLUME RISE FROM JET COOLING TOWERS IN STRONG WINDS", PENNSYLVANIA STATE UNIVERSITY, COLLEGE OF ENGINEERING, UNIVERSITY PARK, PENN., ENGINEERING RESEARCH BULLETIN B-107, SEPT. 1972.

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: THE SYSTEM OF 7 COUPLED NONLINEAR ORDINARY DIFFERENTIAL EQUATIONS IS SOLVED USING THE DEPCG SUBROUTINE OF THE IBM SCIENTIFIC SUBROUTINE PACKAGE WHICH USES A FOURTH-ORDER HAMMING PREDICTOR-CORRECTOR METHOD.

SIZE.....: 419 RECORDS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/VS1 WITH 118 K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANI BUDGET ACTIVITY NUMBER 84422 IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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**TITLE.....: A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE
NATURAL-DRAFT COOLING TOWERS**

TYPE.....: MODEL

**CONTACT.....: ANTHONY J. POLICASTRO
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ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3235)**

SUBJECT COVERED: COOLING TOWER ENVIRONMENTAL EFFECTS

KEY WORDS

**AIR POLLUTION, COOLING TOWER, EVAPORATIVE COOLING, MATHEMATICAL
MODELS, PLUMES, THERMODYNAMICS**

ABSTRACT

**SEE DESCRIPTION FOR WINFRICK MODEL. NEWWINFR IS SAME EXCEPT
THAT COSINE DISTRIBUTION FUNCTION IS USED INSTEAD OF AVERAGING
PROPERTIES. PREDICTIONS OF LENGTH AND RISE OF PLUME GIVEN BY
NEWWINFR SHOWED IMPROVEMENT OVER PREDICTIONS GIVEN BY WINFRICK.**

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DOCUMENTATION

L. WINIARSKI AND W. FRICK, "A SIMPLE COOLING TOWER PLUME MODEL", CORVALLIS ENVIRONMENTAL RESEARCH LABORATORY, CORVALLIS OREGON, USEPA ECOLOGICAL RESEARCH SERIES, EPA 600/3-76-100, 1976

K. WINIARSKI AND W. FRICK, "METHODS OF IMPROVING PLUME MODELS", CORVALLIS ENVIRONMENTAL RESEARCH LABORATORY, USEPA, CORVALLIS, OREGON, 1978

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: THE MODEL EMPLOYS THE INTEGRATION OF A SET OF COUPLED NONLINEAR ORDINARY DIFFERENTIAL EQUATIONS BY SIMPLE EULER DIFFERENTIATING.

SIZE.....: NONE

LANGUAGE....: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 250 K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER AML BUDGET ACTIVITY NUMBER 8M493
IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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TITLE.....: A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE OR
MULTIPLE NATURAL-DRAFT COOLING TOWERS

TYPE.....: MODEL

CONTACT.....: ANTHONY J. POLICASTRO
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ARGONNE, IL 60439
(FTS 972-3235)

SUBJECT COVERED: COOLING TOWER ENVIRONMENTAL EFFECT

KEY WORDS

COOLING TOWER, EVAPORATIVE COOLING, PLUMES, MATHEMATICAL
MODELS, THERMODYNAMICS, AIR POLLUTION

ABSTRACT

THE NUS 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 DRYBULB 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 HYDROMETER 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, HYDROMETER AND CLOUD WATER AND DRY-BULB TEMPERATURE.

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DOCUMENTATION

JIIN LEE, "THE LAGRANGIAN VAPOR PLUME MODEL - VERSION 3",
ENVIRONMENTAL SAFEGUARDS DIV., MVS CORPORATION, 4 RESEARCH PL.,
ROCKVILLE, MD 20850

JIIN LEE, "A NUMERICAL SIMULATION OF ATMOSPHERIC CONVERSION,
CAUSED BY HEAT DESIGNATION AT LARGE POWER CENTERS", 360 SYMP.
ON ATM. TURB., DIFF., AND AIR QUALITY, OCT. 26-29, 1976,
RALEIGH, N.C. PUBL. BY AMS.

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: THE MODEL USED EULER DIFFERENCING TO SOLVE THE
SYSTEM OF COUPLED NONLINEAR ORDINARY DIFFERENTIAL
EQUATIONS.

SIZE.....: 737 RECORDS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 248 K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER AML BUDGET ACTIVITY NUMBER 85493
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TITLE.....: A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE
NATURAL-DRAFT COOLING TOWERS

TYPE.....: MODEL

CONTACT.....: ANTHONY J. POLICASTRO
ENVIRONMENTAL IMPACT STUDIES DIVISION
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ARGONNE, IL 60439
(FTS 972-3235)

SUBJECT COVERED: COOLING TOWER ENVIRONMENTAL EFFECTS

KEY WORDS

AIR POLLUTION, COOLING TOWER, EVAPORATION COOLING, MATHEMATICAL
MODELS, PLUMES, WATER VAPOR

ABSTRACT

THIS MODEL WAS EXTRACTED FROM THE MORE COMPREHENSIVE ORFAD CODE, CONTAINING ONLY THE PLUME-PREDICTION LOGIC, AND OMITTING ALL PLOTTING LOGIC, WEATHER-TAPE-READ LOGIC AND THE DRIFT-DEPOSITION PREDICTION LOGIC. (THE DRIFT PORTION OF THE CODE IS DOCUMENTED UNDER THE NAME ORFADRFT AT ANL). THE MODEL PREDICTS THE CENTERLINE TRAJECTORY, EXTENT OF VISIBLE PLUME AND WATER VAPOR EXPRESS FROM THE PLUME EMITTED BY A SINGLE NATURAL-DRAFT COOLING TOWER IN A GROUP OF SUCH TOWERS. INPUTS TO THE MODEL ARE: (A) TOWER SOURCE CONDITIONS-WET AND DRY; (B) AMBIENT METEOROLOGY-WET 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 PASQUILL CLASS, INFERS LAPSE RATE AND STABILITY AND USES A HANNA-BRIGGS FORMULA TO DETERMINE CENTERLINE TRAJECTORY. A GAUSSIAN DIFFUSION FORMULA IS USED TO MAP OUT WATER VAPOR IN THE PLUME. THE MODEL PREDICTS PLUME

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ABSTRACT CONTINUED

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

DOCUMENTATION

M. E. LAVERNE, "THE OAK RIDGE FOG AND DRIFT CODE (ORFAD) USER'S
MANUAL", ORNL/TM-5201, 1977.

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: USES A SET OF ORDINARY ALGEBRAIC EQUATIONS. ONE,
FOR ATMOSPHERIC SATURATION, IS TRANSCENDENTAL AND
IS SOLVED BY A NON-STANDARD PREDICTOR-CORRECTION
ITERATION METHOD.

SIZE.....: 1518 RECORDS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 158 K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 8M493
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TITLE.....: A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE
NATURAL-DRAFT COOLING TOWER

TYPE.....: MODEL

CONTACT.....: ANTHONY J. POLICASTRO
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ARGONNE, IL 60439
(FTS 372-3235)

SUBJECT COVERED: COOLING TOWER EMISSION

KEY WORDS

COOLING TOWER, EVAPORATION COOLING, PLUMES, MATHEMATICAL
MODELS, THERMODYNAMICS, AIR POLLUTION

ABSTRACT

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 RADIUS. THE MODEL SOLVES A SET OF FIVE COUPLED ORDINARY NONLINEAR DIFFERENTIAL EQUATIONS REPRESENTING EMANATION 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.

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DOCUMENTATION

K. T. BATTY, "SENSITIVITY TESTS WITH A VAPOR PLUME MODEL
APPLIED TO COOLING TOWER EFFLUENTS", A THESIS SUBMITTED TO
PENNSYLVANIA STATE UNIVERSITY DEPT. OF METEOROLOGY, NOVEMBER 1976

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: A HAMMING PREDICTOR - CORRECTOR ALGORITHM IS USED
TO INTEGRATE THE SYSTEM OF COUPLED NONLINEAR
ORDINARY DIFFERENTIAL EQUATIONS.

SIZE.....: 405 RECORDS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/AVT 120 K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ARL BUDGET ACTIVITY NUMBER 3M493
IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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TITLE.....: A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE
NATURAL-DRAFT COOLING TOWERS

TYPE.....: MODEL

CONTACT.....: ANTHONY J. POLICASTRO
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ARGONNE, IL 60439
(FTS 972-3235)

SUBJECT COVERED: COOLING TOWER ENVIRONMENTAL EFFECTS

KEY WORDS

AIR POLLUTION, COOLING TOWER, DISPERSION, EVAPORATION COOLING,
MATHEMATICAL MODELS, PLUMES, WATER VAPOR

ABSTRACT

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 DRY-BULB LAPSE RATE, WINDSPEED AT TOWER TOP, AND PROFILE OF RELATIVE HUMIDITY; (C) SOURCE GEOMETRY--TOWER RADIUS. (THE AN' 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-MOSES PLUME RISE FORMULAS AND SUTTEN DISPERSION THEORY FORMULAS ARE REPRESENTED, RATHER THAN FUNDAMENTAL PHYSICAL CONSERVATION LAWS. THE MODEL DOES NOT PREDICT PLUME TRAJECTORY, BUT ONLY HORIZONTAL EXTENT OF THE VISIBLE PLUME, WHERE OUTLINE IS TAKEN AS PURELY HORIZONTAL, BEGINNING AT A VIRTUAL ORIGIN UPWIND OF THE TOWER AT FIND-RISE 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

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ABSTRACT CONTINUED

EVALUATED AT ANL 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

DOCUMENTATION

JACK SAAME, "AN ANALYTICAL INVESTIGATION OF THE FORMATION AND
DISPERSION OF FOG PLUMES FROM A NATURAL DRAFT WATER COOLING
TOWER FOR VARIOUS METEOROLOGICAL CONDITIONS", MASTERS THESIS,
MECH. ENG. DEPT., UNIV. OF PITTSBURGH, 1971. (REF. ALSO DR.
SOMENS, WESTINGHOUSE R & D CTS., BEVLAN RD., PITTSBURGH, PA
15235)

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: THE MODEL USES A SYSTEM OF ORDINARY ALGEBRAIC
EQUATION OF EMPIRICAL TYPE INCLUDING ONE
TRANSCENDENTAL EQUATION, WHICH IS HANDLED BY A
SIMPLE STEP SEARCH.

SIZE.....: 446 RECORDS EACH 80 BYTES LONG

LANGUAGE....: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 126 K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 85493
IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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TITLE.....: A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE
NATURAL-DRAFT COOLING TOWERS

TYPE.....: MODEL

CONTACT.....: ANTHONY J. POLICASTRO
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3235)

SUBJECT COVERED: COOLING TOWER ENVIRONMENTAL EFFECTS

KEY WORDS

COOLING TOWER, EVAPORATIVE COOLING, PLUMES, MATHEMATICAL
MODELS, THERMODYNAMICS, AIR POLLUTION

ABSTRACT

THE SLAWSON 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 -- LAPSE 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 ANL AND FOUND 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

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ABSTRACT CONTINUED

GENERAL PICTURE OF PLUME RISE, IT SHOULD NOT BE CONSIDERED AS
COMPETITIVE WITH THE BEST AVAILABLE MODELS.

DOCUMENTATION

P. R. SLAWSON, "VAPOUR PLUME THEORY AND EXAMPLE COMPUTER
PROGRAMS", ENVIRODYNE LIMITED, UNIVERSITY OF WATERLOO, 1976

P. R. SLAWSON, J. H. COLEMAN AND J. P. BLACKWELL, "NATURAL
DRAFT COOLING TOWER PLUME BEHAVIOR AT PARADISE STEAM POINT,
PART II", TVA, CHATTANOOGA, TENN, 1977

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: 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 SLAWSON
INTEGRAL MODEL (SLAWISDF). NO SPECIAL SOLUTION
TECHNIQUES, SUCH AS ITERATIVE METHODS, ARE NEEDED.

SIZE.....: NONE

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 30 K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 85493
IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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**TITLE.....: A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE AND
MULTIPLE NATURAL-DRAFT COOLING TOWERS**

TYPE.....: MODEL

**CONTACT.....: ANTHONY J. POLICASTRO
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SUBJECT COVERED: COOLING TOWER ENVIRONMENTAL EFFECTS

KEY WORDS

**COOLING TOWER, EVAPORATIVE COOLING, PLUMES, MATHEMATICAL
MODELS, THERMODYNAMICS, AIR POLLUTION**

ABSTRACT

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 SOLID PARTICULATES. THE MODEL HAS BEEN EVALUATED AT ANL AND FOUND TO PREDICT PLUME RISE BETTER THAN VISIBLE PLUME LENGTH, BUT BOTH ONLY AT AN AVERAGE LEVEL COMPARED WITH OTHER MODELS.

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DOCUMENTATION

P. R. SLANSON, "VAPOUR PLUME THEORY AND EXAMPLE COMPUTER PROGRAMS", ENVIRODYNE LIMITED, UNIVERSITY OF WATERLOO, 1976

P. R. SLANSON, J. H. COLEMAN AND J. P. BLACKWELL, "NATURAL DRAFT COOLING TOWER PLUME BEHAVIOR AT PARADISE STEAM PLANT, PART II", TVA, CHATTANOOGA, TENN., 1977

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: THE MODEL USES A FIFTH-ORDER RUNGE-KUTIA
INTEGRATION SCHEME TO SOLVE A SET OF COUPLED
NONLINEAR ORDINARY DIFFERENTIAL EQUATIONS.

SIZE.....: 786 RECORDS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 250 K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 6M493
IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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TITLE.....: A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE
NATURAL-DRAFT COOLING TOWERS.

TYPE.....: MODEL

CONTACT.....: ANTHONY J. POLICASTRO
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(FTS 972-3235)

SUBJECT COVERED: COOLING TOWER ENVIRONMENTAL EFFECTS

KEY WORDS

COOLING TOWER, EVAPORATIVE COOLING, PLUMES, MATHEMATICAL
MODELS, THERMODYNAMICS, AIR POLLUTION

ABSTRACT

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
METEOROLGY - AMBIENT ATMOSPHERE PROFILES OF DRY-BULB
TEMPERATURE, RELATIVE HUMIDITY AND WIND SPEED; (C) SOURCE
GEOMETRY - TOWER RADIUS. 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 RADIUS, EXTENT OF VISIBLE PLUME AND JET CENTERLINE VALUES
OF VELOCITY, TEMPERATURE, RELATIVE HUMIDITY, WATER VAPOR AND
LIQUID WATER.

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DOCUMENTATION

JEFFREY C. WEIL, "THE RISE OF MOIST, BUOYANT PLUMES", JOURNAL
OF APPLIED METEOROLOGY, 13, 435-443 (1974).

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: THE MODEL USES EULER'S METHOD TO INTEGRATE THE
SYSTEM OF COUPLED, NONLINEAR ORDINARY DIFFERENTIAL
EQUATIONS.

SIZE.....: 274 RECORDS EACH 80 BYTES LONG

LANGUAGE....: FORTRAN

MACHINE CONFIGURATION: NONE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER AML BUDGET ACTIVITY NUMBER 8M493
IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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**TITLE.....: A MODEL TO PREDICT PLUMES FROM A SINGLE
NATURAL-DRAFT COOLING TOWER**

TYPE.....: MODEL

**CONTACT.....: ANTHONY J. POLICASTRO
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(FTS 972-3235)**

SUBJECT COVERED: COOLING TOWER ENVIRONMENTAL EFFECTS

KEY WORDS

**COOLING TOWER, EVAPORATIVE COOLING, PLUMES, MATHEMATICAL,
MODELS, THERMODYNAMICS, AIR POLLUTION**

ABSTRACT

THE WINIARSKI-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, ENTHALPY, 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 ANL AND FOUND TO PREDICT PLUME HEIGHTS ADEQUATELY. HOWEVER, THE PREDICTION OF VISIBLE PLUME LENGTHS TEND TO BE TOO SHORT FOR THE LONGER OBSERVED PLUMES.

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DOCUMENTATION

L. WINARSKI AND W. FRICK, "A SIMPLE COOLING TOWER PLUME MODEL",
CORVALLIS ENVIRONMENTAL RESEARCH LABORATORY, CORVALLIS, OREGON,
USEPA ECOLOGICAL RESEARCH SERIES, EPA-600/3-76-100, 1976.

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: THE MODEL EMPLOYS THE INTEGRATION OF A SET OF
COUPLED NONLINEAR ORDINARY DIFFERENTIAL EQUATIONS
BY SIMPLE EULER DIFFERENTIATING.

SIZE.....: 820 RECORDS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 250 K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 8M493
IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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TITLE.....: A MODEL TO PREDICT PLUMES FROM A SINGLE
NATURAL-DRAFT COOLING TOWER

TYPE.....: MODEL

CONTACT.....: ANTHONY J POLICASTRO
ENVIRONMENTAL IMPACT STUDIES DIVISION
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ARGONNE, IL 60439
(FTS 972-3235)

SUBJECT COVERED: COOLING TOWER ENVIRONMENTAL EFFECTS

KEY WORDS

COOLING TOWER PLUME, MATHEMATICAL MODEL, IMPINGEMENT,
ASPIRATION, ENTRAINMENT, THERMODYNAMICS

ABSTRACT

THE WINIARSKI-FINK 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 AND VELOCITY (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 MOMENTUM, ENTHALPY, 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 ANL AND FOUND TO PREDICT PLUME HEIGHTS ADEQUATELY. HOWEVER, THE PREDICTION OF VISIBLE PLUME LENGTHS TEND TO BE TOO SHORT FOR THE LONGER OBSERVED PLUMES.

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DOCUMENTATION

L.WINIARSKI AND W. FINK, "A SIMPLE COOLING TOWER PLUME MODEL",
PACIFIC NORTH WEST ENVIRONMENTAL RESEARCH LABORATORY.
CORVALLIS, OREGON, 1976

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: THE MODEL EMPLOYS A RUNGE-KUTTA INTEGRATION OF A
SET OF COUPLED NONLINEAR ORDINARY DIFFERENTIAL
EQUATIONS.

SIZE.....: 820 RECORDS EACH 80 BYTES LONG

LANGUAGE....: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 250K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 8M493
IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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TITLE.....: A MODEL TO PREDICT VAPOR PLUMES FROM SINGLE
NATURAL-DRAFT COOLING TOWERS.

TYPE.....: MODEL

CONTACT.....: ANTHONY J. POLICASTRO
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3235)

SUBJECT COVERED: COOLING TOWER ENVIRONMENTAL EFFECTS

KEY WORDS

COOLING TOWER, EVAPORATION COOLING, PLUMES, MATHEMATICAL
MODELS, THERMODYNAMICS, AIR POLLUTION

ABSTRACT

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 CONSERVATIVE 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

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ABSTRACT CONTINUED

TEMPERATURE.

DOCUMENTATION

G. ABRAHAM, "THE FLOW OF ROUND BUOYANT JETS...", DELFT
HYDRAULICS LAB. PUBL. NO. 81, DELFT, NETHERLANDS, 1971

F. B. KAYLER, J. L. PETRILLO, Y. J. TSAI, "PREDICTION AND
VERIFICATION OF VISIBLE PLUME BEHAVIOR", AVAILABLE FROM STONE
AND WEBSTER, BOSTON, MASSACHUSETTS.

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: EULERIAN INTEGRATION IS USED TO SOLVE THE SET OF 7
COUPLED NONLINEAR ORDINARY DIFFERENTIAL EQUATIONS.

SIZE.....: 288 RECORDS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 126 K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 6M493
IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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TITLE.....: OPTIMIZATION AND SIMULATION OF INTEGRATED SYSTEMS

TYPE.....: MODEL

CONTACT.....: VERONIKA A. RABL
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3976)

SUBJECT COVERED: SIMULATION AND OPTIMIZATION OF CENTRAL PLANT
PERFORMANCE.

KEY WORDS

ICES, TOTAL ENERGY SYSTEMS, COMPUTER-AIDED DESIGN

ABSTRACT

THIS PROGRAM WAS DEVELOPED FOR THE PURPOSE OF SIMULATION AND OPTIMIZATION OF CENTRAL PLANT PERFORMANCE. SINCE IT WAS DESIGNED TO BE APPLICABLE TO A DIVERSE SET OF SYSTEM CONFIGURATIONS AND A LARGE NUMBER OF RUNS WERE ANTICIPATED, THE PRIMARY EMPHASIS WAS PLACED ON FLEXIBILITY, MODULARITY, SHORT RUN TIMES, AND EASE-OF-USE. THE PROGRAM SIMULATES THE QUASI-STEADY STATE OPERATION OF A USER-DEFINED COMPONENT CONFIGURATION FOR A CHOSEN PERIOD OF TIME, GENERALLY IN HOURLY INCREMENTS. PLANT OPERATION IS SIMULATED IN ACCORDANCE WITH EITHER: (A) USER-DEFINED OPERATING RULES, (B) WEIGHTED RESOURCE ENERGY MINIMIZATION, OR (C) OPERATING AND MAINTENANCE COST MINIMIZATION. A LIBRARY OF COMPONENT SUBROUTINES IS PROVIDED WITHIN THE PROGRAM AND CONTAINS PERFORMANCE AND ECONOMIC DATA FOR SEVERAL MAJOR COMPONENTS, E.G., PRIME MOVERS, GENERATORS, BOILERS, CHILLERS, ETC. THIS DATA CAN BE READILY MODIFIED BY THE USER. THE LIBRARY IS BEING CONTINUOUSLY UPDATED AND EXPANDED AS NEW DATA AND SYSTEMS EMERGE.

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DOCUMENTATION

ONLY DRAFT USER'S AND PROGRAMMER'S MANUALS AVAILABLE AT
PRESENT.

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: SIMULATION - BOOLEAN MATRIX IS SET UP TO DETERMINE
ORDER OF EQUIPMENT SIMULATION. LOG'S ARE SOLVED TO
A USER-SPECIFIED ACCURACY. OPTIMIZATION -
HEURISTIC ALGORITHM THAT IDENTIFIES PATHS IN THE
NETWORK REPRESENTED BY THE PLANT AND ALLOCATES
ENERGY FLOW ALONG THE LINKS. EQUIPMENT SUBROUTINES
- BASED ON DATA AVERAGED OVER SEVERAL MANUFACTURERS
AND A RANGE OF SIZES.

SIZE.....: 33,000 RECORDS EACH 80 BYTES LONG

LANGUAGE....: FORTRAN

MACHINE CONFIGURATION: CDC 7600/NOS 64K OF SCM AND 50% OF LCM

ACKNOWLEDGMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 49988
IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

SURVEY OF BIOMEDICAL AND ENVIRONMENTAL
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TITLE.....: A MULTIPLE-SOURCE URBAN ATMOSPHERIC DISPERSION MODEL

TYPE.....: MODEL

CONTACT.....: DONALD M. BOTE
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(PTS 972-3786)

SUBJECT COVERED: NONE

KEY WORDS

DISPERSION RELATIONS, POLLUTION, AIR POLLUTION, AIR QUALITY,
STATIONARY POLLUTANT SOURCES

ABSTRACT

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 TRANSIENTS SUCH AS MORNING TRANSITIONS 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.

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DOCUMENTATION

ROBERTS, J. J., CROKE, E. J., KENNEDY, A. S., NORCO, J. E., AND
CONLEY, I. A., "A MULTIPLE-SOURCE URBAN ATMOSPHERIC DISPERSION
MODEL," ANL/ES-CC-007, MAY 1970

CROKE, E. J., PROGRAM DIRECTOR, AND J. J. ROBERTS, EDITOR,
"CHICAGO AIR POLLUTION SYSTEMS ANALYSIS PROGRAM. FINAL
REPORT," ANL/ES-CC-009, FEBRUARY 1971.

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: 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 TRANSIENT BEHAVIOR OF A
CONTINUOUS SMOKE PLUME.

SIZE.....: 2500 RECORDS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH DYNAMIC STORAGE
ALLOCATION OF 1100 K.

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER (NOT
AVAILABLE) IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

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TITLE.....: AIRPORT VICINITY AIR POLLUTION MODEL

TYPE.....: MODEL

CONTACT.....: DONALD M. ROTE
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3786)

SUBJECT COVERED: AIR POLLUTION IN THE VICINITY OF AIRPORTS

KEY WORDS

AIRPORTS, POLLUTION, DISPERSION RELATIONS, AIRCRAFT, AIR
POLLUTION, AIR QUALITY, STATIONARY POLLUTANT SOURCES,
ENVIRONMENTAL IMPACTS, ENVIRONMENTAL IMPACT STATEMENTS,
ENVIRONMENT

ABSTRACT

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-71W1-223. 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 ON 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.

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DOCUMENTATION

L. T. WANG, D. M. ROTE, L. A. CONLEY, "AIRPORT VICINITY AIR
POLLUTION STUDY--MODEL APPLICATION AND VALIDATION AND AIR
QUALITY IMPACT ANALYSIS AT WASHINGTON AIRPORT," FEDERAL
AVIATION ADMINISTRATION REPORT NUMBER FAA-RD-74-132, JULY 1974

J.T. WANG, L.A. CONLEY, D.M. ROTE, "AIRPORT VICINITY AIR
POLLUTION MODEL USER GUIDE," FED. AVIATION ADMIN. RPT. NO.
FAA-RD-75-230, DECEMBER 1975.

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: GAUSSIAN PLUME FORMULATION FOR CALCULATING THE
DISPERSION FROM POINT, AREA, AND LINE TYPE SOURCES.

SIZE.....: 3000 RECORDS EACH 80 BYTES LONG

LANGUAGE....: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/HVT WITH 340 K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER
86401-10 IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

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**TITLE.....: AIR QUALITY ASSESSMENT MODEL FOR AIR FORCE
OPERATIONS**

TYPE.....: MODEL

**CONTACT....: DONALD M. ROTE
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3786)**

**SUBJECT COVERED: IMPACT OF AIR FORCE OPERATIONS ON THE AIR
ENVIRONMENT AT THE AIR BASE LEVEL.**

KEY WORDS

**AIRCRAFT, AIR POLLUTION, AIR QUALITY, ENVIRONMENT,
ENVIRONMENTAL IMPACT,**

ABSTRACT

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, ENVIRONS 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 USAF ENVIRONMENTAL TECHNICAL APPLICATIONS CENTER IN WASHINGTON, D.C. AND THE RESULTANT CLIMATOLOGICAL INFORMATION,

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ABSTRACT CONTINUED

STABILITY-TIME-WIND ROSES, SHIPPED TO THE USER.

DOCUMENTATION

ROTF, D.M., L.E. WANGEN, "A GENERALIZED AQAM FOR AIR FORCE OPERATIONS-TECHNICAL REPORT," AIR FORCE WEAPONS LAB. RPT. NO. AFWL-TP-74-304, FEB. 1975

MENICUCCI, D., "AQAM DATA REDUCTION AND OPERATIONS GUIDE," AIR FORCE WEAPONS LAB. RPT. NO. AFWL-TP-75-307, OCT. 1976

BINGAMAN, D.J., AND L.E. WANGEN, "AQAM FOR AIR FORCE OPERATIONS-SOURCE EMISSIONS INVENTORY COMPUTER CODE DOCUMENTATION," AIR FORCE CIVIL ENG. CTR. RPT. NO. AFCEC-TR-76-33, APRIL 1977.

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: BOTH THE LONG-TERM MODEL AND THE SHORT-TERM MODEL PROGRAMS ESSENTIALLY UTILIZE THE BASIC GAUSSIAN PLUME FORMULATION FOR CALCULATING THE DISPERSION FROM POINT, AREA AND LINE TYPE SOURCES.

SIZE.....: CARDS (SOURCE INVENTORY-5200, SHORT TERM-3500, LONG TERM-3500)

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH A MINIMUM OF 300 K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 8C402 IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

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TITLE.....: FINITE-DIFFERENCE MODEL FOR AQUIFER SIMULATION IN
TWO DIMENSIONS WITH RESULTS OF NUMERICAL EXPERIMENTS

TYPE.....: MODEL

CONTACT.....: JEFFREY P. SCHUBERT
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3416)

SUBJECT COVERED: GROUNDWATER FLOW SYSTEMS

KEY WORDS

GROUND WATER, FINITE DIFFERENCE METHOD, MATHEMATICAL MODELS

ABSTRACT

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 CORRECTION PROCEDURE TO ACCELERATE CONVERGENCE).

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DOCUMENTATION

P. C. TRESCOTT, 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.

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: DISCRETE FINITE-DIFFERENCE COMPUTATIONS FOR
2-DIMENSIONAL FLOW.

SIZE.....: NONE

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 300K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 65910
IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

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**TITLE.....: FINITE ELEMENT SOLUTIONS FOR THE EQUATIONS OF
GROUNDWATER FLOW**

TYPE.....: MODEL

**CONTACT....: JEFFREY P. SCHUBERT
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABO: ATOFY
ARGONNE, IL 60439
(FTS 972-3416)**

SUBJECT COVERED: GROUNDWATER FLOW IN TWO DIRECTIONS

KEY WORDS

GROUND WATER, FLOW, SATURATION

ABSTRACT

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 MEAN 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

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ABSTRACT CONTINUED

BETWEEN ONE HALF AND ONE ARE STABLE.

DOCUMENTATION

COOLEY, P. L., 1970, "FINITE ELEMENT SOLUTION OF STEADY-STATE
POTENTIAL FLOW PROBLEMS," GENERALIZED COMPUTER PROGRAM 723-440,
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, HYDROLOGY AND WATER RESOURCES PUB.
NO. 18, DESERT RESEARCH INST., UNIV. OF NV, RENO, 133P, 1974

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: SEE ABSTRACT

SIZE.....: NONE

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 350K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER AML BUDGET ACTIVITY NUMBER 65910
IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

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TITLE.....: SELECTED DIGITAL COMPUTER TECHNIQUES FOR
GROUNDWATER RESOURCE EVALUATION

TYPE.....: MODEL

CONTACT.....: JEFFREY P. SCHUBERT
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3416)

SUBJECT COVERED: GROUNDWATER FLOW SYSTEMS

KEY WORDS

GROUND WATER, PROGRAMMING, FLOW

ABSTRACT

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 PUMPAGE FROM WELLS, NATURAL OR ARTIFICIAL RECHARGE RATES, THE RELATIONSHIPS OF WATER EXCHANGE BETWEEN SURFACE WATERS 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 LONNQUIST, 1971)

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DOCUMENTATION

PRICKETT, T. A., AND LOMNQUIST, C. G., 1971, "SELECTED DIGITAL
COMPUTER TECHNIQUES FOR GROUNDWATER RESOURCE EVALUATION," ILL.
STATE WATER SURVEY, BULL. 55, 62P.

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: SEE ABSTRACT

SIZE.....: NONE

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 350K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 65910
IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

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TITLE.....: OBJECTIVE PLACEMENT OF SENSORS

TYPE.....: MODEL

CONTACT.....: JACK D. SHANNON
RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(PTS 972-5807)

SUBJECT COVERED: OBJECTIVE METHOD OF DETERMINING SPATIAL
ARRANGEMENT OF NETWORK

KEY WORDS

METEOROLOGY, TURBIDITY, SENSOR PLACEMENT

ABSTRACT

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.

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DOCUMENTATION

SHANNON, J.D., M.L. WESELY AND P.J. BRADY, 1978: "OBJECTIVE
SENSOR PLACEMENT FOR SAMPLING REGIONAL TURBIDITY" ATMOS.
ENVIRON. 12, 937-943

SOFTWARE/HARDWARE INFORMATION

ALGORITHM..: NONLINEAR PROGRAMMING, FLEXIBLE TOLERANCE METHOD

SIZE.....: 5000 RECORDS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT SYSTEM WITH 250K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ARL BUDGET ACTIVITY NUMBER 66100
IN THE RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION

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TITLE.....: ADVANCED STATISTICAL TRAJECTORY REGIONAL AIR
POLLUTION MODEL

TYPE.....: MODEL

CONTACT.....: JACK D. SHANNON
RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FIS 972-5807)

SUBJECT COVERED: REGIONAL SULFUR POLLUTION

KEY WORDS

METEOROLOGY, AIR POLLUTION, SULFATE

ABSTRACT

THE MODEL COMPUTES LONG-TERM REGIONAL SCALE HORIZONTAL
DISPERSION COEFFICIENTS FROM THE STATISTICS OF SIMULATED TRACER
RELEASES FROM SOURCE LOCATIONS.

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DOCUMENTATION

SHEIH, C.H., 1977: "APPLICATION OF A LAGRANGIAN STATISTICAL TRAJECTORY MODEL TO THE SIMULATION OF SULFUR POLLUTION OVER THE NORTHEASTERN UNITED STATES" ATMOS. ENVIRON-11, 173-176

SHANNON, J.D., 1978: "THE ADVANCED STATISTICAL AIR POLLUTION REGIONAL TRAJECTORY MODEL" ANL/BER TOPICAL REPORT (IN PROGRESS).

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: HORIZONTAL DISPERSION, VERTICAL DISPERSION,
CONCENTRATIONS

SIZE.....: 1500 RECORDS EACH 80 BYTES LONG

LANGUAGE....: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT SYSTEM WITH 350K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 66100
IN THE RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION

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**TITLE.....: SOCIAL ECONOMIC AND ASSESSMENT MODEL: COUNTY
POPULATION, EMPLOYMENT, HOUSING, AND PUBLIC COST
PROJECTIONS**

TYPE.....: MODEL

**CONTACT....: ERIK J. STEENHJEM
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3760)**

**SUBJECT COVERED: FORECAST OF LOCAL SOCIAL AND ECONOMIC EFFECTS
FROM ALL FORMS OF ENERGY DEVELOPMENT**

KEY WORDS

FORECASTING, POPULATION DYNAMICS, OCCUPATIONS, COMMUNITIES

ABSTRACT

**GIVEN EXPECTED ENERGY DEVELOPMENT IN ANY (OR ALL) COUNTY, MODEL
FORECASTS DIRECT AND LAGGED SECONDARY EMPLOYMENT CHANGES BY
YEAR; AVAILABILITY, BY SEX AND SKILL, OF WORKERS IN AND AROUND
AFFECTED COUNTY; TOTAL ANNUAL JOBS TAKEN BY LOCAL AND
COMMUTING WORKERS; ANNUAL IN-MIGRATION OF WORKERS FROM AREAS
OUTSIDE COMMUTING DISTANCE; TOTAL ANNUAL POPULATION AND
POPULATION CHANGE IN COUNTY DUE TO IN-MIGRATION OF NEW WORKERS;
ANNUAL HOUSING NEEDS OF NEW POPULATION; COMMUNITY SETTLEMENT
PATTERNS OF NEW POPULATION; PUBLIC SERVICE NEEDS OF NEW
POPULATION (E.G., POLICE, FIRE, WATER, SEWER, GENERAL
GOVERNMENT, HOSPITALS, ETC.) BY YEAR; AND, ANNUAL PUBLIC COSTS
OF PROVIDING THESE SERVICES.**

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DOCUMENTATION

E.J. STENERJEM, "SUMMARY DESCRIPTION OF SEAM: THE SOCIAL AND
ECONOMIC ASSESSMENT MODEL" IAPF/TH/78-9, APRIL 1978

D.J. BOGUE, "TECHNIQUES FOR MAKING POPULATION PROJECTIONS"
FAMILY PLANNING AND RESEARCH MANUAL NO. 12, UNIVERSITY OF
CHICAGO, JUNE 1974.

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: COHORT-COMPONENT POPULATION PROJECTIONS; ECONOMIC
BASE THEORY EMPLOYMENT MULTIPLIERS; PREFERENCE
MAXIMIZING INCOME CONSTRAINED LINEAR PROGRAMMING
SPATIAL ALLOCATION MODEL.

SIZE.....: PROGRAM 2200 RECORDS EACH 80 BYTES LONG, DATA 6000
RECORDS EACH 3200 BYTES LONG

LANGUAGE....: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/HVT SYSTEM WITH 250K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 65902
IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

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TITLE.....: OZONE AND SO2 UPTAKE OVER VARIOUS SURFACES

TYPE.....: MODEL

CONTACT.....: MARVIN L. WESELY
RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-5827)

SUBJECT COVERED: UPTAKE OF SULFUR DIOXIDE BY VEGETATION.

KEY WORDS

OZONE, SURFACES, POLLUTION, SURFACE PROPERTIES, SULFUR

ABSTRACT

THE UPTAKE 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 DRY DEPOSITION OF THE AND OTHER POLLUTANTS. SURFACES ADDRESSED INCLUDE VARIOUS TYPES OF HEALTHY VEGETATION, DORMANT OR SENESCENT VEGETATION, BARE SOIL, AND WATER. THE FORMULATIONS CAN BE INCORPORATED INTO LARGE-SCALE NUMERICAL MODELS OF THE TRANSPORT, TRANSFORMATION, AND DEPOSITION OF POLLUTANTS IN THE MAP3S REGION.

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DOCUMENTATION

M.L. WESELY AND B.B. HICKS. "SOME FACTORS THAT AFFECT THE
DEPOSITION RATES OF SULFUR DIOXIDE AND SIMILAR GASES ON
VEGETATION" J. AIR POLL. CONTROL ASSOC., 27, 1110-1116 (1977).

SOFTWARE/HARDWARE INFORMATION

SIZE.....: NOT APPLICABLE

LANGUAGE....: NOT APPLICABLE

MACHINE CONFIGURATION: NOT APPLICABLE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ARL BUDGET ACTIVITY NUMBER 66100
IN THE RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION

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PAGE 1

TITLE.....: A MONTE CARLO CODE WITH SUPPORT PROGRAMS FOR DOSE
COMPUTATION

TYPE.....: MODEL

CONTACT.....: FRANK S. WILLIAMSON
BIOLOGICAL AND MEDICAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3864)

SUBJECT COVERED: NOT APPLICABLE

KEY WORDS

MONTE CARLO, SIMULATION, MATHEMATICAL MODELS, DEPTH DOSE, DOSE
PARAMETERS, DOSE RATES, DOSES

ABSTRACT

BIN130 IS A COMPUTER ANALOGUE MONTE CARLO 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 19360M AND
19360GAMMA HISTOGRAMS. TWO GEOMETRIC DESCRIPTIONS OF A
STANDARD MAN ARE PROPOSED. THE RESULTS DIFFER MARKEDLY, IN
MANY REGIONS, FROM THOSE PREVIOUSLY OBTAINED WITH THE SIMPLE,
SYMMETRIC, HOMOGENEOUS SOLIDS USED AS HUMAN PHANTOMS.

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DOCUMENTATION

FRIGERIO, N.A., AND M.H. BRANSON, "BIM130. A COMPUTER PROGRAM FOR NEUTRON-GAMMA RADIOBIOLOGY", ANL-7469, PP. 243-247, 1967

FRIGERIO, N.A., AND R.F. COLEY, "COMPUTED GAMMA DOSE DISTRIBUTIONS IN MAN-LIKE PHANTOMS", AMER. ASSN. PHYSICS MED. QUART. BULL. 4, P. 66, 1970

FRIGERIO, N.A., R.F. COLEY, AND M.H. BRANSON, "DEPTH DOSE DETERMINATIONS. II. A MONTE CARLO PROGRAM AND A STANDARD MAN PHANTOM FOR NEUTRON AND GAMMA COMPUTATIONS", PHYS. MED. BIOL. 18 53-63, 1973

FRIGERIO, N.A., AND R.F. COLEY, "DEPTH DOSE DETERMINATIONS. III. STANDARD MAN PHANTOM AND VARIOUS GAMMA SOURCES", PHYS. MED. BIOL. 18, 187-194, 1973

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: (1) THE MAXWELL-BOLTZMAN EQUATION FOR VELOCITY AS A FUNCTION OF TEMPERATURE. (2) THE WATTS-RJLE FISSION SPECTRUM FOR U-235 FISSION NEUTRONS. (3) THE DROSDOD APPROXIMATION FOR EFFECTIVE CROSS SECTIONS OF BOUND HYDROGEN AT LOW NEUTRON ENERGIES. (4) THE KLEIN-NISHINA EXPRESSION FOR COMPTON EVENTS.

SIZE.....: 580K WITHOUT TAPE OUTPUT, 720K WITH TAPE OUTPUT

LANGUAGE....: PL/1

MACHINE CONFIGURATION: IBM 360/75 OR 370/195 OS/1VT WITH 580K OR WITH 720K AND A 9-TRACK TAPE DRIVE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 60300 IN THE BIOLOGICAL AND MEDICAL RESEARCH DIVISION

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TITLE.....: LIFE TABLE ANALYSIS USING VARYING INTERVALS FOR USE
WITH JANUS DATA BASES

TYPE.....: MODEL

CONTACT....: FRANK S. WILLIAMSON
BIOLOGICAL AND MEDICAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(PTS 972-3864)

SUBJECT COVERED: SURVIVAL UNDER COMPETING RISKS

KEY WORDS

NONE

ABSTRACT

THIS IS A SET OF PROGRAM MODULES WHICH INTERFACE ANY
PROGRAMMER-SUPPLIED MODEL TO THE JANUS EXPERIMENTAL DATA BASES.
THE MODEL CURRENTLY USED IS THE VARYING-INTERVAL LIFE-TABLE
ANALYSIS OF HCEL AND WALBURG. THE PROGRAM INTERFACE IS UNDER
CONTINUOUS DEVELOPMENT.

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DOCUMENTATION

NONE

SOFTWARE/HARDWARE INFORMATION

SIZE.....: VARIABLE - NOT KNOWN

LANGUAGE...: PL/1

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 250K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 60300
IN THE BIOLOGICAL AND MEDICAL RESEARCH DIVISION

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TITLE.....: 3-D MESOSCALE NUMERICAL MODEL OF THE ATMOSPHERE

TYPE.....: MODEL

CONTACT.....: TETSUJI YAMADA
RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-5831)

SUBJECT COVERED: SIMULATIONS OF WIND, TEMPERATURE, WATER VAPOR
AND TURBULENCE IN THE ATMOSPHERIC BOUNDARY LAYER

KEY WORDS

THREE DIMENSIONAL CALCULATIONS, BOUNDARY LAYER, EARTH
ATMOSPHERE, TURBULENCE, EDDY COEFFICIENTS

ABSTRACT

THIS MODEL PREDICTS METEOROLOGICAL VARIABLES (WIND, TEMPERATURE, ETC.) IN THE ATMOSPHERIC BOUNDARY LAYER. A MAJOR DRIVING FORCE OF THE MODEL IS THE PRESSURE DISTRIBUTION AT THE UPPER BOUNDARY, WHICH MUST BE OBTAINED FROM OBSERVATIONS OR PREDICTIONS BY A GLOBAL ATMOSPHERIC CIRCULATION MODEL. THE MODEL IS BASED ON VARIOUS SECOND-MOMENT TURBULENCE EQUATIONS. ONE VERSION OF THE MODEL, IN WHICH ONLY TIME-DEPENDENT, PARTIAL DIFFERENTIAL EQUATIONS FOR THE TURBULENCE ENERGY BALANCE AND A MASTER LENGTH SCALE ARE SOLVED, IS RECOMMENDED.

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DOCUMENTATION

T. YAMADA, "A THREE-DIMENSIONAL, SECOND-ORDER CLOSURE NUMERICAL
MODEL OF MESOSCALE CIRCULATIONS IN THE LOWER ATMOSPHERE:
DESCRIPTION OF THE BASIC MODEL AND AN APPLICATION TO THE
SIMULATION OF THE ENVIRONMENTAL EFFECTS OF A LARGE COOLING
POND", ANL/RER-78-1, MARCH 1978.

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: NUMERICAL INTEGRATION OF THE FINITE-DIFFERENCE FORM
OF PARTIAL DIFFERENTIAL EQUATION,
ALTERNATING-DIRECTION IMPLICIT METHOD.

SIZE.....: 3400 RECORDS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 360/91 OS/MVT WITH 500K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 65100
IN THE RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION

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TITLE.....: THE OVERCAMP-ISRAEL MODEL FOR THE PREDICTION OF
SALT DRIFT DEPOSITION FROM A NATURAL DRAFT COOLING
TOWER

TYPE.....: MODEL

CONTACT.....: ANTHONY JOSEPH POLICASTRO
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3235)

SUBJECT COVERED: COOLING TOWER ENVIRONMENTAL EFFECTS

KEY WORDS

EVAPORATION, EVAPORATIVE COOLING, MATHEMATICAL MODELS, COOLING
TOWERS, PLUMES, AIR POLLUTION

ABSTRACT

THE OVERCAMP-ISRAEL MODEL PREDICTS SALT-DRIFT DEPOSITION FOR A SINGLE NATURAL-DRAFT COOLING TOWER. PREDICTIONS MAY BE MADE FROM THE TOWER TO 100 KM DOWNWIND. INPUTS TO THE MODEL ARE: (A) SOURCE CONDITIONS--EXIT TEMPERATURE, VELOCITY AND DROPLET SIZE SPECTRUM; (B) METEOROLOGICAL CONDITIONS -- AN AVERAGE WIND SPEED, DRY-BULB TEMPERATURE AND RELATIVE HUMIDITY FOR FIXED PERIODS OF TIME (E.G. 10 MIN. 30 MIN.); (C) SOURCE GEOMETRY -- TOWER HEIGHT AND EXIT DIAMETER; (D) GROUND SAMPLES -- AS MANY AS 50 LOCATED ARBITRARILY ABOUT THE TOWER. FOR PLUME FISE, THE MODEL EMPLOYS A SIMPLE ENTRAINMENT APPROACH LEADING TO A CLOSED-FORM SOLUTION. DROPS BREAK AWAY FROM THE PLUME WHEN THEIR SETTLING VELOCITY JUST EQUALS THE PLUME UPDRAFT VELOCITY. DROPLET EVAPORATION FOLLOWS THE WORK OF MASON. THE EFFECT OF AMBIENT TURBULENCE IS TREATED USING THE IMAGE-DEPOSITION METHOD. THE MODEL HAS BEEN EVALUATED AT ANL AND FOUND TO BE COMPETITIVE WITH THE OTHER (BETTER) EXISTING DRIFT MODELS. THE MODEL WAS FOUND TO LOSE MASS BETWEEN SALT EMISSION AND DEPOSITION DUE TO REFLECTION OF THE LARGER DROPS FROM THE

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ABSTRACT CONTINUED

GROUND. THE MODEL ALSO TENDS TO UNDERPREDICT DRIFT DEPOSITION
AS OVERPREDICTING THE SIZE OF DROPS STRIKING THE GROUND.

DOCUMENTATION

T. J. OVERCAMP, SENSITIVITY ANALYSIS AND COMPARISON OF SALT
DEPOSITION MODELS FOR COGLING TOWERS. PAPER PRESENTED AND
PUBLISHED IN PROCEEDINGS OF THE CONFERENCE ON WASTE HEAT
MANAGEMENT AND UTILIZATION, MIAMI BEACH, FLORIDA, MAY 9-11,
1977.

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: THE MODEL CONTAINS MANY CLOSED-FORM CALCULATIONS.
THE TREATMENT OF EVAPORATION IS THROUGH AN EULERIAN
INTEGRATION OF THE MASS TRANSFER EQUATION (SIMPLE
FORWARD STEP IN TIME). THE NEWTON-RAPHSON METHOD
OF FINDING ROOTS IS USED TWICE IN THE COMPUTER CODE.

SIZE.....: 1197 RECORDS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 600K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER(S)
84493 IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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TITLE.....: THE SLINN II MODEL FOR THE PREDICTION OF SALT DRIFT
DEPOSITION FROM A NATURAL DRAFT COOLING TOWER

TYPE.....: MODEL

CONTACT.....: ANTHONY JOSEPH POLICASTRO
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3235)

SUBJECT COVERED: COOLING TOWER ENVIRONMENTAL EFFECTS

KEY WORDS

EVAPORATION, EVAPORATIVE COOLING, MATHEMATICAL MODELS, COOLING
TOWERS, PLUMES, AIR POLLUTION

ABSTRACT

THE SLINN II MODEL PREDICTS SALT-DRIFT DEPOSITION FOR A SINGLE
NATURAL-DRAFT COOLING TOWER. PREDICTIONS MAY BE MADE FROM THE
TOWER TO 100 KM DOWNWIND. INPUTS TO THE MODEL ARE: (A) SOURCE
CONDITIONS--EXIT TEMPERATURE, VELOCITY AND DROPLET SIZE
SPECTRUM; (B) METEOROLOGICAL CONDITIONS -- AN AVERAGE WIND
SPEED, DRY-BULB TEMPERATURE AND RELATIVE HUMIDITY FOR FIXED
PERIODS OF TIME (E.G. 10 MIN. 30 MIN.); (C) SOURCE GEOMETRY
-- TOWER HEIGHT AND EXIT DIAMETER; (D) GROUND SAMPLES -- AS
MANY AS 50 LOCATED ARBITRARILY ABOUT THE TOWER. THE MODEL
ASSUMES THAT ALL DROPS BREAK AWAY 500M ABOVE THE GROUND AND
EVAPORATE INSTANTANEOUSLY TO DRY PARTICLES BEFORE THEY ARE
DISPERSED IN THE AMBIENT WIND AND DEPOSITED TO THE GROUND. THE
MODEL WAS DEVELOPED TO PROVIDE AN OUTER BOUND TO THE POINT OF
DEPOSITION.

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DOCUMENTATION

PERSONAL COMMUNICATION

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: THE MODEL HAS ALL CLOSED FORM CALCULATIONS.

SIZE.....: 464 RECORDS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 250K COPE

ACKNOWLEDGMENT

**THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER(S)
8M493 IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION**

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TITLE.....: ESC/SCHRECKER MODEL FOR THE PREDICTION OF SALT-DRIFT
DEPOSITION FROM A NATURAL DRAFT COOLING TOWER

TYPE.....: MODEL

CONTACT.....: ANTHONY JOSEPH POLICASTRO
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3235)

SUBJECT COVERED: COOLING TOWER ENVIRONMENTAL EFFECTS

KEY WORDS

EVAPORATION, EVAPORATIVE COOLING, MATHEMATICAL MODELS, COOLING
TOWERS, PLUMES, AIR POLLUTION

ABSTRACT

THE ESC/SCHRECKER MODEL PREDICTS SALT-DRIFT DEPOSITION FOR A SINGLE NATURAL-DRAFT COOLING TOWER. PREDICTIONS MAY BE MADE FROM THE TOWER TO 100 KM DOWNWIND. INPUTS TO THE MODEL ARE: (A) SOURCE CONDITIONS--EXIT TEMPERATURE, VELOCITY AND DROPLET SIZE SPECTRUM; (B) METEOROLOGICAL CONDITIONS -- AN AVERAGE WIND SPEED, DRY-BULB TEMPERATURE AND RELATIVE HUMIDITY FOR FIXED PERIODS OF TIME (E.G. 10 MIN. 30 MIN.); (C) SOURCE GEOMETRY -- TOWER HEIGHT AND EXIT DIAMETER; (D) GROUND SAMPLES -- AS MANY AS 50 LOCATED ARBITRARILY ABOUT THE TOWER. FOR PLUME RISE, THE MODEL EMPLOYS THE WINARSKI-FIRCH PLUME RISE FORMULATION WHICH PERMITS PROFILES OF AMBIENT VARIABLES TO BE INPUTTED. THE PRESENT TREATMENT ALLOWS FOR A POWER LAW AND PROFILE, A CONSTANT LAPSE RATE, AND A CONSTANT RELATIVE HUMIDITY PROFILE. DROPS BREAK AWAY FROM THE PLUME WHEN THEIR SETTLING VELOCITY JUST EQUALS THE PLUME UPDRAFT VELOCITY. DROPLET EVAPORATION FOLLOWS THE WORK OF PROSSLING. THE EFFECT OF AMBIENT TURBULENCE IS TREATED USING A SOURCE-ONLY METHOD (SOLUTION OF CORRECTIVE-DIFFUSION EQUATION BY POINT SOURCE). THE MODEL HAS BEEN EVALUATED AT ANL AND FOUND TO BE COMPETITIVE

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ABSTRACT CONTINUED

WITH THE BETTER EXISTING DRIFT MODELS. THE MODEL TENDS TO
UNDERPREDICT NUMBER DROP DEPOSITION FLUX.

DOCUMENTATION

PERSONAL COMMUNICATION/CODE DEVELOPED AT ANL

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: THE RUNGE-KUTTA TECHNIQUE IS USED TO SOLVE THE
COUPLED ORDINARY DIFFERENTIAL EQUATIONS IN THE
WINAESKI-PIRCK SUBMODEL.

SIZE.....: 1383 RECORDS EACH 80 BYTES LONG

LANGUAGE....: FORTRAN

MACHINE CONFIGURATION: IBM 370/145 OS/MVT WITH 250K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER(S)
8N493 IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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**TITLE.....: THE SLINN I MODEL FOR THE PREDICTION OF SALT-DRIFT
DEPOSITION FROM A NATURAL DRAFT COOLING TOWER**

TYPE.....: MODEL

**CONTACT.....: ANTHONY JOSEPH POLICASTRO
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(ETS 972-3235)**

SUBJECT COVERED: COOLING TOWER ENVIRONMENTAL EFFECTS

KEY WORDS

**EVAPORATION, EVAPORATIVE COOLING, MATHEMATICAL MODELS, COOLING
TOWERS, PLUMES, AIR POLLUTION**

ABSTRACT

THE SLINN I MODEL PREDICTS SALT-DRIFT DEPOSITION FOR A SINGLE NATURAL-DRAFT COOLING TOWER. PREDICTIONS MAY BE MADE FROM THE TOWER TO 100 KM DOWNWIND. INPUTS TO THE MODEL ARE: (A) SOURCE CONDITIONS--EXIT TEMPERATURE, VELOCITY AND DROPLET SIZE SPECTRUM; (B) METEOROLOGICAL CONDITIONS -- AN AVERAGE WIND SPEED, DRY-BULB TEMPERATURE AND RELATIVE HUMIDITY FOR FIXED PERIODS OF TIME (E.G. 10 MIN. 30 MIN.); (C) SOURCE GEOMETRY -- TOWER HEIGHT AND EXIT DIAMETER; (D) GROUND SAMPLES -- AS MANY AS 50 LOCATED ARBITRARILY ABOUT THE TOWER. THE MODEL ASSUMES THAT ALL DROPS BREAK AWAY FROM THE PLUME AT THE TOWER OUTLET AND DO NOT EVAPORATE ON THEIR WAY TO THE GROUND. THE EFFECT OF WIND DIRECTION VARIATION AND ATMOSPHERIC TURBULENCE IS TREATED IN THE MODEL BY A SECTOR-AVERAGING PROCESS. THIS MODEL WAS DEVELOPED TO PROVIDE AN INNER BOUND TO THE DISTANCE OF DEPOSITION FOR GIVEN DROPS.

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PERSONAL COMMUNICATION/CODE DEVELOPED AT ANL

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: THE MODEL HAS ALL CLOSED FORM CALCULATIONS.

SIZE.....: 526 RECORDS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 250 CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER(S)
8M493 IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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TITLE.....: WOLF II MODEL FOR PREDICTING OF SALT DRIFT
DEPOSITION FROM A NATURAL DRAFT COOLING TOWER

TYPE.....: MODEL

CONTACT.....: ANTHONY JOSEPH POLICASTRO
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3235)

SUBJECT COVERED: COOLING TOWER ENVIRONMENTAL EFFECTS

KEY WORDS

EVAPORATION, EVAPORATIVE COOLING, MATHEMATICAL MODELS, COOLING
TOWERS, PLUMES, AIR POLLUTION

ABSTRACT

THE WOLF II MODEL PREDICTS SALT-DRIFT DEPOSITION FOR A SINGLE NATURAL-DRAFT COOLING TOWER. PREDICTIONS MAY BE MADE FROM THE TOWER TO 100 FT DOWNWIND. INPUTS TO THE MODEL ARE: (A) SOURCE CONDITIONS--EXIT TEMPERATURE, VELOCITY AND DROPLET SIZE SPECTRUM; (B) METEOROLOGICAL CONDITIONS -- AN AVERAGE WIND SPEED, DRY-BULB TEMPERATURE AND RELATIVE HUMIDITY FOR FIXED PERIODS OF TIME (E.G. 10 MIN. 30 MIN.); (C) SOURCE GEOMETRY -- TOWER HEIGHT AND EXIT DIAMETER; (D) GROUND SAMPLES -- AS MANY AS 50 LOCATED ARBITRARILY ABOUT THE TOWER. THE MODEL TREATS DROPLET EVAPORATION BY MEANS OF AN INTERPOLATION OF BEARD-PRUPPOANCES FORMULAS FOR DROPLET EVALUATION FOR PURE WATER DROPS. THE MODEL PREDICTS BREAKAWAY WHEN THE DROPLET HAS TRAVELED A HORIZONTAL DISTANCE WITHIN THE PLUME EQUAL TO THE RADIUS OF THE TOWER. PLUME RISE IS PREDICTED BY MEANS OF THE BRIGGS FORMULAS. THE MODEL IS BALLISTIC AND TREATS AND DIRECTION VARIATION AND AMBIENT TURBULENCE BY MEANS OF A SECTOR AVERAGING METHOD.

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PERSONAL COMMUNICATION/CODE DEVELOPED AT ANL

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: THE MODEL HAS ALL CLOSED FORM CALCULATIONS EXCEPT
FOR THE TREATMENT OF DROPLET EVAPORATION WHICH
INTEGRATES A FIRST ORDER DIFFERENTIAL EQUATION BY
EULER'S METHOD WITH THE RIGHT-HAND SIDE COMPUTED
FROM THE INTERPOLATION OF THE BEARD-PRUAPPACHER
EXPERIMENTAL DATA.

SIZE.....: 804 RECORDS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 250 K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER(S)
8M493 IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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TITLE.....: THE ORFAD MODEL FOR THE PREDICTION OF DRIFT
DEPOSITION FROM A NATURAL DRAFT COOLING TOWER

TYPE.....: MODEL

CONTACT.....: ANTHONY JOSEPH POLICASTRO
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3235)

SUBJECT COVERED: COOLING TOWER ENVIRONMENTAL EFFECTS

KEY WORDS

EVAPORATION, EVAPORATIVE COOLING, MATHEMATICAL MODELS, COOLING
TOWERS, PLUMES, AIR POLLUTION

ABSTRACT

THE ORFAD MODEL PREDICTS SALT-DRIFT DEPOSITION FOR A SINGLE
NATURAL-DRAFT COOLING TOWER. PREDICTIONS MAY BE MADE FROM THE
TOWER TO 100 KM DOWNWIND. INPUTS TO THE MODEL ARE: (A) SOURCE
CONDITIONS--EXIT TEMPERATURE, VELOCITY AND DROPLET SIZE
SPECTRUM; (B) METEOROLOGICAL CONDITIONS -- AN AVERAGE WIND
SPEED, DRY-BULB TEMPERATURE AND RELATIVE HUMIDITY FOR FIXED
PERIODS OF TIME (E.G. 10 MIN. 30 MIN.); (C) SOURCE GEOMETRY --
TOWER HEIGHT AND EXIT DIAMETER; (D) GROUND SAMPLES -- AS MANY
AS 50 LOCATED ARBITRARILY ABOUT THE TOWER. FOR PLUME USE, THE
MODEL EMPLOYS THE BRIGGS FORMULAS BUT USING WIND SPEED AT GROUND
LEVEL (WITH NO CORRECTION VERTICALLY). DROPS DO NOT BREAK AWAY
FROM THE PLUME INFLUENCE AT ANY TIME. DROPLET EVAPORATION
FOLLOWS (WITH SOME MODIFICATIONS) THE WORK OF HOSLER, PEYA, AND
PEUA. THE MODEL HAS BEEN EVALUATED AT ANL AND FOUND TO
UNDERPREDICT DRIFT DEPOSITION NEAR THE TOWER. MORE SERIOUS,
HOWEVER, THE MODEL (ORIGINAL ORNL VERSION) HAS FOUR CODING
ERRORS WHICH, FOR THE CASES TESTED, SERIOUSLY AFFECT THE
PREDICTIONS OF THE MODEL. AS A RESULT OF OUR WORK, THE CODE IS
PRESENTLY BEING REVISED AT ORNL.

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DOCUMENTATION

M. E. LAVERNE. THE OAK RIDGE FOG AND DRIFT CODE (OFFAD) USERS
MANUAL ORNL/TM-5201. OAK RIDGE NATIONAL LABORATORY, JANUARY
1977.

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: THE MODEL IS A SERIES OF CLOSED FORM CALCULATIONS
WITH ITERATION REQUIRED TO LOCATE THE CORRECT DRIFT
DROPLET SIZE THAT DEPOSITS AT A GIVEN DISTANCE
DOWNWIND.

SIZE.....: 1145 RECORDS EACH 93 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 250K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER(S)
8M493 IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

SURVEY OF BIOMEDICAL AND ENVIRONMENTAL
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PAGE 1

TITLE.....: THE WIGLEY-SLAWSON MODEL FOR THE PREDICTION OF
DRIFT DEPOSITION FROM A NATURAL DRAFT COOLING TOWER

TYPE.....: MODEL

CONTACT.....: ANTHONY JOSEPH POLICASTRO
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(PTS 972-3235)

SUBJECT COVERED: COOLING TOWER ENVIRONMENTAL EFFECTS

KEY WORDS

EVAPORATION, EVAPORATIVE COOLING, MATHEMATICAL MODELS, COOLING
TOWERS, PLUMES, AIR POLLUTION

ABSTRACT

THE WIGLEY-SLAWSON MODEL PREDICTS SALT-DRIFT DEPOSITION FOR A SINGLE NATURAL-DRAFT COOLING TOWER. PREDICTIONS MAY BE MADE FROM THE TOWER TO 100 KM DOWNWIND. INPUTS TO THE MODEL ARE: (A) SOURCE CONDITIONS--EXIT TEMPERATURE, VELOCITY AND DROPLET SIZE SPECTRUM; (B) METEOROLOGICAL CONDITIONS -- AN AVERAGE WIND SPEED, DRY-BULB TEMPERATURE AND RELATIVE HUMIDITY FOR FIXED PERIODS OF TIME (E.G. 10 MIN. 30 MIN.); (C) SOURCE GEOMETRY -- TOWER HEIGHT AND EXIT DIAMETER; (D) GROUND SAMPLES -- AS MANY AS 50 LOCATED ARBITRARILY ABOUT THE TOWER. FOR PLUME RISE, THE MODEL EMPLOYS THE SOLUTION OF SEVEN COUPLED ORDINARY DIFFERENTIAL EQUATIONS DERIVED FROM CONSERVATION LAWS. DROPLET BREAKAWAY IS TREATED BY ALLOWING EACH DROP TO FALL A SHORT DISTANCE AT EACH TIME STEP DEPENDENT UPON THE LOCAL PLUME UPDRAFT VELOCITY AND THE DROPLET SETTLING VELOCITY WHEN THAT TOTAL FALL IS EQUAL TO THE LOCAL PLUME RADIUS THE DROP BREAKS AWAY. DROPLET EVAPORATION IS TREATED BY MEANS OF A MODIFICATION OF NASON'S FORMULA AND DOES NOT ACCOUNT FOR SOLUTE EFFECTS. THE MODEL IS BALLISTIC IN NATURE AND TREATS AMBIENT TURBULENCE AND WIND DIRECTION VARIATION BY MEANS OF A SECTOR

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ABSTRACT CONTINUED

AVERAGE CONCEPT.

DOCUMENTATION

P. R. SLAWSON AND A. KUMAR. COOLING TOWER DRIFT DEPOSITION
PROGRAM GUIDE TO ENCRIFT II. ENVIRODYNE LIMITED TENNESSEE
VALLEY AUTHORITY. AIR QUALITY BRANCH, APRIL 1976.

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: THE TREATMENTS OF PLUME RISE REQUIRES THE SOLUTION
OF COUPLED NONLINEAR ORDINARY DIFFERENTIAL
EQUATIONS BY MEANS OF A RUNGE-KUTTA SCHEME.

SIZE.....: 1229 RECORDS EACH 80 BYTES LONG

LANGUAGE....: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 250K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER(S)
8M493 IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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PAGE 1

TITLE.....: THE HOSLER-PENA-PENA MODEL FOR THE PREDICTION OF
DRIFT DEPOSITION FROM A NATURAL DRAFT COOLING TOWER

TYPE.....: MODEL

CONTACT.....: ANTHONY JOSEPH POLICASTRO
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3235)

SUBJECT COVERED: COOLING TOWER ENVIRONMENTAL EFFECTS

KEY WORDS

EVAPORATION, EVAPORATIVE COOLING, MATHEMATICAL MODELS, COOLING
TOWERS, PLUMES, AIR POLLUTION

ABSTRACT

THE HOSLER-PENA-PENA MODEL PREDICTS SALT-DRIFT DEPOSITION FOR A
SINGLE NATURAL-DRAFT COOLING TOWER. PREDICTIONS MAY BE MADE
FROM THE TOWER TO 100 KM DOWNWIND. INPUTS TO THE MODEL ARE:
(A) SOURCE CONDITIONS--EXIT TEMPERATURE, VELOCITY AND DROPLET
SIZE SPECTRUM; (B) METEOROLOGICAL CONDITIONS -- AN AVERAGE
WIND SPEED, DRY-BULB TEMPERATURE AND RELATIVE HUMIDITY FOR
FIXED PERIODS OF TIME (E.G. 10 MIN. 30 MIN.); (C) SOURCE
GEOMETRY -- TOWER HEIGHT AND EXIT DIAMETER; (D) GROUND SAMPLES
-- AS MANY AS 50 LOCATED ARBITRARILY ABOUT THE TOWER. THE
PLUME RISE FORMULATION FOLLOWS BRIGGS. DROPLETS BREAKAWAY FROM
THE PLUME WHEN THEIR SETTLING VELOCITY JUST EQUALS THE PLUME
UPDRAFT VELOCITY. DROPLET EVAPORATION IS TREATED BY THE
"EQUILIBRIUM HEIGHT" CONCEPT WHICH IS A SIMPLIFICATION OF THE
FLETCHER EQUATION. SECTOR AVERAGING IS USED TO TREAT THE
EFFECT OF VARIATION OF WIND DIRECTION AND AMBIENT TURBULENCE.

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DOCUMENTATION

PENA, J. AND C. HOSLER. INFLUENCE OF THE CHOICE OF THE PLUME
DIFFUSION FORMULA ON THE SLAT-DEPOSITION-RATE CALCULATION.
COOLING TOWER ENVIRONMENT - 1974. CONF. - 740322, PP. 573-584
(1975).

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: THE MODEL IS A SERIES OF EXPLICIT CALCULATIONS OF
CLOSED FORM EXPRESSIONS.

SIZE.....: 878 RECORDS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 GS/MVT WITH 250 K COPE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER(S)
81493 IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

SURVEY OF BIOMEDICAL AND ENVIRONMENTAL
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PAGE 1

TITLE.....: THE HANNA MODEL FOR THE PREDICTION OF DRIFT DRIFT
DEPOSITION FROM A NATURAL DRAFT COOLING TOWER

TYPE.....: MODEL

CONTACT.....: ANTHONY JOSEPH POLICASTRO
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3235)

SUBJECT COVERED: COOLING TOWER ENVIRONMENTAL EFFECTS

KEY WORDS

EVAPORATION, EVAPORATIVE COOLING, MATHEMATICAL MODELS, COOLING
TOWERS, PLUMES, AIR POLLUTION

ABSTRACT

THE HANNA MODEL PREDICTS SALT-DRIFT DEPOSITION FOR A SINGLE NATURAL-DRAFT COOLING TOWER. PREDICTIONS MAY BE MADE FROM THE TOWER TO 100 KM DOWNWIND. INPUTS TO THE MODEL ARE: (A) SOURCE CONDITIONS--EXIT TEMPERATURE, VELOCITY AND DROPLET SIZE SPECTRUM; (B) METEOROLOGICAL CONDITIONS -- AN AVERAGE WIND SPEED, DRY-BULB TEMPERATURE AND RELATIVE HUMIDITY FOR FIXED PERIODS OF TIME (E.G. 10 MIN. 30 MIN.); (C) SOURCE GEOMETRY -- TOWER HEIGHT AND EXIT DIAMETER; (D) GROUND SAMPLES -- AS MANY AS 50 LOCATED ARBITRARILY ABOUT THE TOWER. FOR PLUME RISE, THE FRIGGS FORMULA ACCOUNTING FOR INITIAL MOMENTUM AND BUOYANCY SOURCE IS USED. DROPLET BREAKAWAY IS TREATED BY ALLOWING EACH DROPLET TO FALL A SHORT DISTANCE AT EACH TIME STEP DEPENDENT UPON THE LOCAL PLUME UPDRAFT VELOCITY AND THE DROPLET SETTLING VELOCITY. WHEN THAT TOTAL FALL IS EQUAL TO THE LOCAL PLUME RADIUS, THE DROP BREAKS AWAY. DROPLET EVAPORATION IS TREATED WITH THE FOSSLING FORMULA BUT THE DROP TEMPERATURE EQUAL TO THE AMBIENT DRY LEVEL TEMPERATURE. THE MODEL IS BALLISTIC IN NATURE AND TREATS AMBIENT TURBULENCE AND WIND DIRECTION BY MEANS OF A SECTOR-AVERAGE CONCEPT.

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DOCUMENTATION

S. R. HANNA. FOG AND DRIFT DEPOSITION FROM EVAPORATIVE COOLING
TOWERS. NUCLEAR SAFETY. VOL. 15, NO. 2, PP. 190-196.
MARCH-APRIL 1974.

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 782 RECORDS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 250K COPE

ACKNOWLEDGMENT

THE WORK WAS PERFORMED UNDER ARL BUDGET ACTIVITY NUMBER(S)
8M403 IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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PAGE 1

TITLE.....: WOLF I MODEL FOR THE PREDICTION OF SALT-DRIFT
DEPOSITION FROM A NATURAL DRAFT COOLING TOWER

TYPE.....: MODEL

CONTACT.....: ANTHONY JOSEPH POLICASTRO
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(PTS 972-3235)

SUBJECT COVERED: COOLING TOWER ENVIRONMENTAL EFFECTS

KEY WORDS

EVAPORATION, EVAPORATIVE COOLING, MATHEMATICAL MODELS, COOLING
TOWERS, PLUMES, AIR POLLUTION

ABSTRACT

THE WOLF I MODEL PREDICTS SALT-DRIFT DEPOSITION FOR A SINGLE
NATURAL-DRAFT COOLING TOWER. PREDICTIONS MAY BE MADE FROM THE
TOWER TO 100 KM DOWNWIND. INPUTS TO THE MODEL ARE: (A) SOURCE
CONDITIONS--EXIT TEMPERATURE, VELOCITY AND DROPLET SIZE
SPECTRUM; (B) METEOROLOGICAL CONDITIONS -- AN AVERAGE WIND
SPEED, DRY-BULB TEMPERATURE AND RELATIVE HUMIDITY FOR FIXED
PERIODS OF TIME (E.G. 10 MIN. 30 MIN.); (C) SOURCE GEOMETRY --
TOWER HEIGHT AND EXIT DIAMETER; (D) GROUND SAMPLES -- AS MANY
AS 50 LOCATED ARBITRARILY ABOUT THE TOWER. THE MODEL ASSUMES
NO DROPLET EVAPORATION AND PREDICTS BREAKAWAY WHEN THE DROPLET
HAS TRAVELED A HORIZONTAL DISTANCE WITHIN THE PLUME EQUAL TO
THE RADIUS OF THE TOWER. PLUME RISE IS PREDICTED WITH THE
BRIGGS FORMULAS. THE MODEL IS BALLISTIC AND TREATS WIND
DIRECTION VARIATION AND AMBIENT TURBULENCE BY MEANS OF A SECTOR
AVERAGING METHOD.

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DOCUMENTATION

PERSONAL COMMUNICATION/CODE DEVELOPED AT ANL

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: THE MODEL HAS ALL CLOSED FORM CALCULATIONS.

SIZE.....: 609 RECORDS EACH 90 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/HVT WITH 250K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER(S)
8M493 IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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TITLE.....: THE GIROUX-MASS (MEI) MODEL FOR THE PREDICTION OF
DRIFT DEPOSITION FROM A NATURAL DRAFT COOLING TOWER

TYPE.....: MODEL

CONTACT.....: ANTHONY JOSEPH POLICASTRO
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3235)

SUBJECT COVERED: COOLING TOWER ENVIRONMENTAL EFFECTS

KEY WORDS

EVAPORATION, EVAPORATIVE COOLING, MATHEMATICAL MODELS, COOLING
TOWERS, PLUMES, AIR POLLUTION

ABSTRACT

THE GIROUX-MASS MODEL PREDICTS SALT-DRIFT DEPOSITION FOR A
SINGLE NATURAL-DRAFT COOLING TOWER. PREDICTIONS MAY BE MADE
FROM THE TOWER TO 100 KM DOWNWIND. INPUTS TO THE MODEL ARE:
(A) SOURCE CONDITIONS--EXIT TEMPERATURE, VELOCITY AND DROPLET
SIZE SPECTRUM; (B) METEOROLOGICAL CONDITIONS -- AN AVERAGE
WIND SPEED, DRY-BULB TEMPERATURE AND RELATIVE HUMIDITY FOR
FIXED PERIODS OF TIME (E.G. 10 MIN. 30 MIN.); (C) SOURCE
GEOMETRY -- TOWER HEIGHT AND EXIT DIAMETER; (D) GROUND SAMPLES
-- AS MANY AS 50 LOCATED ARBITRARILY ABOUT THE TOWER. FOR
PLUME RISE THE BRIGGS FORMULAS ARE USED, BUT SLIGHTLY MODIFIED
TO TREAT BUOYANCY AND MOMENTUM. DROPLET BREAKAWAY OCCURS WHEN
THE PLUME'S VERTICAL VELOCITY IS REDUCED TO THE DROPLET
SETTLING VELOCITY. THE "EQUILIBRIUM WEIGHT CONCEPT IS USED IN
THE MODEL WHERE ADDITIONAL SIMPLIFICATIONS (NEGLECTING AMBIENT
TEMPERATURE, ETC.) ARE MADE. THE MODEL IS BALLISTIC IN NATURE
AND DOES NOT TREAT AMBIENT TURBULENCE EXPLICITLY.

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DOCUMENTATION

MAAS, S. J. SALT DEPOSITION FROM COOLING TOWERS FOR THE SAN
JUANQUIN NUCLEAR PROJECT. HPI 75 FP-1361. SUBMITTED TO LOS
ANGELES DEPARTMENT OF WATER AND POWER. SEPTEMBER 15, 1975.

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: THE COMPUTER CODE IS A SERIES OF CLOSED FORM
CALCULATIONS

SIZE.....: 706 RECORDS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 250K CORE.

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER AML BUDGET ACTIVITY NUMBER(S)
8M493 IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

ENVIRONMENTAL DATA BASES

NUMERIC

There are 65 entries in the ICFP index for numeric data bases at Argonne National Laboratory. Table 5 provides a frequency distribution classification of the numeric data bases by subject matter. From this table, we can see that the numeric data bases emphasize the demographic and human population dynamics and the meteorological subjects. Many of the data sets are obtained from the Bureau of the Census. The numeric data bases on human populations contain census statistics on mortality, natality, age and sex classes for counties, states and the census tracts. In Table 6 we show estimates of the completeness of responses with regard to the 30 questionnaire elements for each of the entries to the ICFP index. We find that the numeric data bases are not well documented and therefore may have accessibility limitations.

BIBLIOGRAPHIC

There are only three bibliographic data bases chosen for the ANL ICFP index. Each is closely related to a national program on coal development and land reclamation activities, for which ANL has special expertise and program needs. In general, however, ANL research personnel can use commercially available bibliographic systems, thus avoiding preparation and maintenance of extensive bibliographic data bases on-site. Because the Librarian Computerized Systems are more generally available with much wider capabilities of searches and research information retrievals, the need for developing or maintaining bibliographic data bases here at Argonne National Laboratory has been small. Only recently have some new programs needed a computerized system to categorize specialized bibliographic material required for the preparation of reports.

Table 5. Classification and Frequency Distribution of Numeric Data Bases in the Argonne National Laboratory ICFP Inventory

Category	No. of Entries	ICFP. Inv. No.
Demographics and Human Population Dynamics	19	201,202,203,204,205, 206,207,210,211,212, 213,215,219,220,221, 222,223,224,237
Agricultural Crop Distribution	1	207
Water Quality Assessment	1	205
Historical and Archeological Sites	1	214
Radiation Toxicity in Dogs	3	215,216,217
Serum Chemistry in Beagles	1	225
Meteorological Data	10	226,227,229,233,234, 235,245,246,250,258
Turbulence Studies with Balloons	1	225
Information on Nuclear Sites	1	230
Molecular Physics	2	231,232
Coal Reserves and Composition	1	236
Surface Mining and Land Reclamation	1	238
Environmental Radiation Measurements	2	239,265
Electrical Energy Production/Consumption	4	240,241,242,243
Nonradiological (Biological) Environmental Monitoring	3	244,254,257
Air Pollution/Emissions	2	247,249
Land Use	1	248
Plant Physiology and Uptake of Substances	1	251
Fish Behavior and Physiology	4	252,253,255,256
Irradiation Experiments with Mice	4	259,261,261,262
Fuel Use at Nuclear Reactors	1	263
Industrial Energy Costs	1	264

Table 6. Summary of the Frequency Distribution of the Completeness of the Items in the Numeric Data Base Entries

Keyword	No. Complete	No. No Entry	No. Not Applicable
Title	65	0	0
Acronym	46	19	0
Type	65	0	0
Contact	65	0	0
Telephone	65	0	0
Division	65	0	0
Original source	31	1	33
Documentation	45	20	0
Geographical coverage	57	1	7
Time period	60	1	4
Subject covered	63	2	0
Update	65	0	0
Status	65	0	0
Access	64	1	0
Media	63	2	0
Size	55	10	0
Computer	62	2	1
Configuration	60	3	2
Language	21	15	29
Character set	62	2	1
Abstract	63	2	0
Key words	65	0	0
Comments	15	50	0
Algorithm	2	63	0
Users	2	63	0
Applications	3	62	0
Data used	1	64	0
Model validation	1	64	0
Classification	1	64	0
ICFP/Inv	65	0	0

ICFP INVENTORY OF NUMERIC DATA BASES

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PAGE 1

TITLE.....: ILLINOIS BIRTH RECORDS 1970, 1971 AND 1972

TYPE.....: NUMERIC DATA BASE

CONTACT....: JANE R. BENSON
BIOLOGICAL AND MEDICAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3824)

SUBJECT COVERED: PUBLIC HEALTH RECORDS

KEY WORDS

ILLINOIS, BIRTH, PREGNANCY, INFORMATION

ABSTRACT

EACH RECORD REPRESENTS A SINGLE BIRTH EVENT DURING THE TIME PERIOD 1970 TO 1972 IN THE STATE OF ILLINOIS. EACH RECORD CONTAINS IDENTIFYING CHARACTERISTICS SUCH AS SEX AND RACE OF CHILD, RACE OF EACH PARENT, AGE OF MOTHER, BIRTH WEIGHT, GESTATIONAL LENGTH, RESIDENCE OF EACH PARENT, BIRTH ORDER, NATIVITY OF MOTHER, MOTHER'S CHILDBEARING HISTORY, EDUCATIONAL ATTAINMENTS OF EACH PARENT, PRENATAL CARE, AND COMPLICATIONS OF PREGNANCY AND CONGENITAL MALFORMATIONS.

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DOCUMENTATION

NONE

SOFTWARE/HARDWARE INFORMATION

SIZE.....: APPROX. 500,000 RECORDS EACH 123 BYTES LONG

LANGUAGE...: NOT APPLICABLE

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH A 9-TPACK TAPE
DRIVE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 68100
IN THE BIOLOGICAL AND MEDICAL RESEARCH DIVISION

SURVEY OF BIOMEDICAL AND ENVIRONMENTAL
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PAGE 1

TITLE.....: MORTALITY DATA TAPE, 1969-1971 FOR MARICOPA COUNTY,
ARIZONA

TYPE.....: NUMERIC DATA BASE

CONTACT.....: JANE R. BENSON
BIOLOGICAL AND MEDICAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3824)

SUBJECT COVERED: SELECTED ASPECTS OF MORTALITY

KEY WORDS

MORTALITY, DEATH, INFORMATION

ABSTRACT

EACH RECORD IS A SINGLE DEATH WITH ACCOMPANYING SELECTED
DESCRIPTIVE DATA OF THE DECEASED. ALL DEATHS ARE OF MARICOPA
COUNTY RESIDENTS DURING 1969-1971. SELECTED DESCRIPTIVE
VARIABLES INCLUDE: RACE, SEX, SPANISH SURNAME, CAUSE OF DEATH
(CODED), CITY AND CENSUS TRACT OF RESIDENCE, AGE, AND
PREMATURITY CODE (INFANTS ONLY).

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DOCUMENTATION

NONE

SOFTWARE/HARDWARE INFORMATION

SIZE.....: APPROX. 24,000 RECORDS EACH 18 BYTES LONG

LANGUAGE...: NOT APPLICABLE

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH A 9-TRACK TAPE
DRIVE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 68100
IN THE BIOLOGICAL AND MEDICAL RESEARCH DIVISION

STRVEY OF BIONEDICAL AND ENVIRONMENTAL
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TITLE.....: 1930-1950 U.S. NET MIGRATION ESTIMATES (BY AGE,
SEX, COLOR, COUNTY)

TYPE.....: NUMERIC DATA BASE

CONTACT.....: JANE R. BENSON
BIOLOGICAL AND MEDICAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3924)

SUBJECT COVERED: U.S. NET MIGRATION ESTIMATES

KEY WORDS

POPULATIONS, MIGRATION, POPULATION DYNAMICS

ABSTRACT

THIS DATA SET IS COMPOSED OF 493 VARIABLES RELATED TO HUMAN
POPULATIONS AND NET MIGRATION ESTIMATES BY AGE, RACE AND SEX
FOR 1930 TO 1950. 3111 COUNTIES (ALASKA AND HAWAII OMITTED)
AND A FEW SPECIALLY AGGREGATED GEOGRAPHIC UNITS ARE DESCRIBED.
THE DATA WAS PROVIDED BY THE CENTER FOR URBAN STUDIES AT THE
UNIVERSITY OF CHICAGO. THE DATA ARE MOST COMPLETE FOR WHITES;
VARYING AMOUNTS OF DATA ARE AVAILABLE FOR THE OTHER RACES.
POPULATIONS ARE TABULATED BY 5 YEAR AGE INTERVALS TO AGE 35,
THEREAFTER BY 10 YEAR AGE INTERVALS.

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DOCUMENTATION

COUNTY-LEVEL DEMOGRAPHIC CHARACTERISTICS OF THE POPULATION OF
THE UNITED STATES, 1930-1950, INTER-UNIVERSITY CONSORTIUM FOR
POLITICAL RESEARCH, ANN ARBOR, MI, NOV. 1971.

SOFTWARE/HARDWARE INFORMATION

SIZE.....: APPROX. 180,000 RECORDS EACH 80 BYTES LONG

LANGUAGE...: NOT APPLICABLE

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH A 9-TRACK TAPE
DRIVE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ARL BUDGET ACTIVITY NUMBER 61800
IN THE BIOLOGICAL AND MEDICAL RESEARCH DIVISION

SURVEY OF BIOMEDICAL AND ENVIRONMENTAL
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PAGE 1

TITLE.....: 1952-1967 U.S. COUNTY AND CITY DATA BOOK TAPE

TYPE.....: NUMERIC DATA BASE

CONTACT.....: JANE P. BENSON
BIOLOGICAL AND MEDICAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3824)

SUBJECT COVERED: DEMOGRAPHIC, ECONOMIC & ELECTOPAL INFORMATION
ON HUMAN POPULATIONS

KEY WORDS

ECONOMICS, HUMAN POPULATIONS, URBAN AREAS, SOCIOLOGY,
INFORMATION, DATA

ABSTRACT

A COMPLETE COPY OF THE COUNTY AND CITY DATA BOOKS FOR 1952-1967. DATA FOR 1952 ARE BY COUNTY, STATE AND CITY-LEVEL ONLY, WHILE 1956, 1962 AND 1967 HAVE ALL OF THE ABOVE AND STANDARD METROPOLITAN STATISTICAL AREAS AND U.S. TOTALS IN ADDITION. SELECTED ELECTORAL, DEMOGRAPHIC AND ECONOMIC DATA FOR COUNTIES, CITIES AND INCORPORATED AREAS OF 25,000 INHABITANTS OR MORE, URBANIZED AREAS, AND SMSA'S IN THE ENTIRE UNITED STATES. THE BULK OF THE DATA IN THIS DATA SET WERE ORIGINALLY COLLECTED AS THE RESULT OF THE 1970 CENSUSES OF POPULATION AND HOUSING, AND INCLUDE INFORMATION SUCH AS EDUCATION, OCCUPATION AND INCOME, WHICH WERE OBTAINED FROM SAMPLE RESPONSES OF INDIVIDUALS ENTHETERED IN 1970.

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DOCUMENTATION

INTER-UNIVERSITY CONSORTIUM FOR POLITICAL RESEARCH, DATA
AVAILABLE 1975-76 BY THE CENTER FOR POLITICAL STUDIES, THE
INSTITUTE FOR SOCIAL RESEARCH, THE UNIVERSITY OF MICHIGAN AND
THE SOCIAL SCIENCE COMMUNITY.

SOFTWARE/HARDWARE INFORMATION

SIZE.....: APPROX. 340,000 RECORDS EACH 80 BYTES LONG

LANGUAGE...: NOT APPLICABLE

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH A 9-TRACK TAPE
DRIVE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANI BUDGET ACTIVITY NUMBER 61800
IN THE BIOLOGICAL AND MEDICAL RESEARCH DIVISION

STUDY OF BIOMEDICAL AND ENVIRONMENTAL
DATA BASES, MODELS, & INTEGRATED COMPUTER SYSTEMS
(ICFP / OTD / BER)

ICFP/INV-205

REVISED 7/ 3/78

PAGE 1

TITLE.....: 1969, 1970, 1971 NATALITY TAPE FOR MARICOPA COUNTY,
ARIZONA

TYPE.....: NUMERIC DATA BASE

CONTACT.....: JANE R. BENSON
BIOLOGICAL AND MEDICAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3324)

SUBJECT COVERED: SELECTED ASPECTS OF NATALITY DATA

KEY WORDS

ARIZONA, BIRTH, WEIGHT, PARTURITION, INFORMATION

ABSTRACT

EACH RECORD REPRESENTS A SINGLE BIRTH IN MARICOPA COUNTY,
ARIZONA, DURING THE THREE YEARS 1969-1971. ACCOMPANYING EACH
BIRTH IS A CODE FOR CITY AND CENSUS TRACT, SEX, RACE, SPANISH
SURNAME, BIRTH WEIGHT GROUP (500 GRAM INCREMENTS), LEGITIMACY
AND BIRTH MONTH AND YEAR.

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PAGE 2

DOCUMENTATION

NONE

SOFTWARE/HARDWARE INFORMATION

SIZE.....: APPROXIMATELY 35,000 RECORDS EACH 13 BYTES LONG

LANGUAGE....: NOT APPLICABLE

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH A 9-TRACK TAPE
DRIVE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 61800
IN THE BIOLOGICAL AND MEDICAL RESEARCH DIVISION

**SURVEY OF BIOMEDICAL AND ENVIRONMENTAL
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REVISED 7/ 3/78

PAGE 1

TITLE.....: 1972 U.S. COUNTY AND CITY DATA BOOK TAPE

TYPE.....: NUMERIC DATA BASE

CONTACT.....: JANE E. BENSON
BIOLOGICAL AND MEDICAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(PTS 972-3824)

SUBJECT COVERED: DEMOGRAPHIC, ECONOMIC AND ELECTORAL DATA

KEY WORDS

HUMAN POPULATIONS, ECONOMICS, INFORMATION, OCCUPATIONS, INCOME

ABSTRACT

CONTAINS "SELECTED ELECTORAL, DEMOGRAPHIC AND ECONOMIC DATA FOR COUNTIES, CITIES AND INCORPORATED AREAS OF 25,000 INHABITANTS OR MORE, URBANIZED AREAS, AND SMSA'S IN THE ENTIRE UNITED STATES. THE BULK OF THE DATA...WERE ORIGINALLY COLLECTED AS A RESULT OF THE 1970 CENSUSES OF POPULATION AND HOUSING AND INCLUDE INFORMATION SUCH AS EDUCATION, OCCUPATION AND INCOME..."

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DOCUMENTATION

INTER-UNIVERSITY CONSORTIUM FOR POLITICAL RESEARCH, DATA
AVAILABLE 1975-76 BY THE CENTER FOR POLITICAL STUDIES AND
OTHERS.

SOFTWARE/HARDWARE INFORMATION

SIZE.....: APPROX. 180,000 RECORDS EACH 80 BYTES LONG

LANGUAGE...: NOT APPLICABLE

MACHINE CONFIGURATION: IBM 370/195 OS/EVI WITH A 9-TRACK TAPE
DRIVE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 61800
IN THE BIOLOGICAL AND MEDICAL RESEARCH DIVISION

SURVEY OF BIOMEDICAL AND ENVIRONMENTAL
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PAGE 1

TITLE.....: SELECTED CROP DISTRIBUTION STATISTICS FOR FOURTEEN
MIDWESTERN STATES

TYPE.....: NUMERIC DATA BASE

CONTACT.....: DEBORAH J. BODEAU
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3221)

SUBJECT COVERED: AGRICULTURAL CROPS LAND USE AND PRODUCTION.

KEY WORDS

AGRICULTURE, CROPS, LAND USE, LAND RECLAMATION, POLLUTION,
ENVIRONMENT

ABSTRACT

WE HAVE COMPILED THE DATA ON PLANTED CROP ACREAGE AND TOTAL
ACREAGE FOR EACH OF THE COUNTIES OF THE FOURTEEN STATE REGION.
THE COMPOSITE LIST OF THE CROP IS THE FOLLOWING: CORN,
SORGHUM, SOYBEANS, WHEAT, OATS, BARLEY, RYE, HAY, DRY BEANS,
SUGAR BEETS, POTATOES, FLAXSEED, RED CLOVER SEED, ALFALFA SEED,
SUNFLOWER SEED, LESPEDEZA SEED, COTTON, PEANUTS, RICE, TOBACCO,
AND PEAS.

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DOCUMENTATION

THERE IS A STATISTICAL REPORT FOR EACH STATE ISSUED BY THE
STATE'S STATISTICAL OFFICE FOR THE U.S. DEPARTMENT OF
AGRICULTURE.

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 1000 RECORDS EACH 80 BYTES LONG

LANGUAGE...: NOT APPLICABLE

MACHINE CONFIGURATION: IBM 370/195 OS/MVT

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 65902
IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

SURVEY OF BIOMEDICAL AND ENVIRONMENTAL
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PAGE 1

TITLE.....: 1975 NATIONAL WATER ASSESSMENT DATA BASE

TYPE.....: NUMEPIC DATA BASE

CONTACT.....: SHEN-YANN CHIU
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(PTS 972-3762)

SUBJECT COVERED: SURFACE WATER AVAILABILITY AND WATER
REQUIREMENTS

KEY WORDS

WATER, WATER AVAILABILITY, WATER REQUIREMENTS

ABSTRACT

THIS DATA BASE CONTAINS THE WATER RELATED DATA GENERATED BY
VARIOUS GOVERNMENT AGENCIES FOR THE 1975 NATIONAL WATER
ASSESSMENT WHICH IS COORDINATED BY THE U.S. WATER RESOURCES
COUNCIL. INCLUDED IN THIS DATA BASE ARE THE ESTIMATED PRESENT
AND FUTURE (1985 AND 2000) CONSUMPTIVE AND WITHDRAWAL NEEDS OF
COMPETING WATER USERS (STEAM ELECTRIC, DOMESTIC, MANUFACTURING
INDUSTRIES, MINERAL INDUSTRIES, IRRIGATION AND OTHERS), AND
SURFACE WATER DISCHARGES AT DIFFERENT PROBABILITY LEVELS. ALSO
INCLUDED ARE THE DATA RELATIVE TO THE GROUND WATER WITHDRAWAL,
INTERBASIN TRANSFER, AND RESERVOIR EVAPORATION. ALL THESE DATA
ARE ORGANIZED BY AGGREGATED SUBAREAS (ASA). ASSOCIATED WITH
THE DATA IS A COMPUTER PROGRAM DEVELOPED AT ANL FOR DOWNSSTREAM
ACCOUNTING OF WATER NEEDS, AND FOR CALCULATION OF CURRENT AND
FUTURE DEPLETION, AND A COMPUTER PROGRAM FOR GENERATION OF
COMPUTER GRAPHICS.

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DOCUMENTATION

NOT AVAILABLE

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: FUTURE WATER REQUIREMENTS BASED ON OTHERS ECONOMIC
PROJECTIONS, PRESENT STREAM FLOW ESTIMATES
REFLECTING EXISTING WATER USE AND RESOURCE
DEVELOPMENTS; FUTURE STREAM FLOW DEPLETION BASED
ON ESTIMATED WITHDRAWAL FROM SURFACE WATER AND
SHALLOW ACQUIPERS.

SIZE.....: NOT AVAILABLE

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 65902
IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

SURVEY OF BIOMEDICAL AND ENVIRONMENTAL
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ICPP/INV-209

REVISED 7/ 3/78

PAGE 1

TITLE.....: 1952-1972 U.S. COUNTY AND CITY DATA BOOK TAPE,
MERGED

TYPE.....: NUMERIC DATA BASE

CONTACT.....: DIANA K. DIXON-DAVIS
BIOLOGICAL AND MEDICAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-7324)

SUBJECT COVERED: SOCIOECONOMIC CHARACTERISTICS

KEY WORDS

POPULATIONS, ECONOMICS, SOCIO-ECONOMIC FACTORS, AGRICULTURE

ABSTRACT

THIS DATA SET MERGES COUNTY-LEVEL STATISTICS PUBLISHED IN THE 1952, 1962, 1967, 1972 COUNTY AND CITY DATA BOOK (CCDB). THE CCDB CONTAINS SELECTED POPULATION, DEMOGRAPHIC, LABOR FORCE, INCOME, HOUSING, ELECTORIAL, BUSINESS, MANUFACTURING, AGRICULTURAL DATA ON ALL U.S. COUNTIES.

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DOCUMENTATION

COMPUTER PRINT OUT (REAP-QUICK QUERY) "REFERENCE DICTIONARY TO
CITY COUNTY DATA BOOK INFORMATION"

U.S. BUREAU OF THE CENSUS, COUNTY AND CITY DATA BOOK 1952,
1962, 1967, 1972 (A STATISTICAL ABSTRACT SUPPLEMENT), U.S.
GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C.

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 6282 RECORDS EACH 2320 BYTES LONG

LANGUAGE...: NOT APPLICABLE

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH A 9-TRACK TAPE
DRIVE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 68100
IN THE BIOLOGICAL AND MEDICAL RESEARCH DIVISION

**SURVEY OF BIOMEDICAL AND ENVIRONMENTAL
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ICFP/INV-210

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PAGE 1

TITLE.....: GROSS MIGRATION BY COUNTY 1965 TO 1970

TYPE.....: NUMERIC DATA BASE

CONTACT.....: DIANA K. DIXON-DAVIS
BIOLOGICAL AND MEDICAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(PTS 972-3824)

SUBJECT COVERED: NET MIGRATION, IMMIGRATION, OUTMIGRATION

KEY WORDS

MIGRATION, ETHNIC POPULATIONS, POPULATION DYNAMICS, AGE GROUPS

ABSTRACT

THIS TAPE CONTAINS DATA ON GROSS MIGRATION BY SELECTED CHARACTERISTIC FOR THE 1965 TO 1970 PERIOD. THESE DATA WERE TABULATED FROM THE 1970 CENSUS OF POPULATION AND HAVE BEEN ADJUSTED FOR CASES IN WHICH RESIDENCE IN 1965 WAS NOT REPORTED. DATA ON GROSS MIGRATION (I.E., IMMIGRATION AND OUTMIGRATION) AND NET MIGRATION ARE INCLUDED FOR PERSONS 5 YEARS OLD AND OVER IN 1970 FOR EACH COUNTY (AND COUNTY EQUIVALENT) IN THE UNITED STATES AS DELINEATED IN THE 1970 CENSUS. THE CHARACTERISTICS FOR THE MIGRANTS INCLUDE SEX (TOTAL, MALE, FEMALE), RACE (WHITE, BLACK), AGE IN 1970 (UNDER 15, 15 TO 19, 20 TO 24, 25 TO 29, 30 TO 34, 35 TO 44, 45 TO 64, AND 65 AND OVER), AND "HIGHER IN THE MILITARY OR COLLEGE IN 1965 OR 1970". THE TOTAL NUMBER OF ALLOCATED IMMIGRANTS AND OUTMIGRANTS FOR EACH COUNTY IS ALSO INCLUDED.

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DOCUMENTATION

U.S. BUREAU OF THE CENSUS, CURRENT POPULATION REPORTS, SERIES
P-25, NO. 601, "GROSS MIGRATION BY COUNTY: 1965 TO 1970," U.S.
GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C., MAY 1977.

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 9558 RECORDS EACH 174 BYTES LONG

LANGUAGE...: NONE

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH A 9-TRACK TAPE
DRIVE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 68100
IN THE BIOLOGICAL AND MEDICAL RESEARCH DIVISION

**SURVEY OF BIO MEDICAL AND ENVIRONMENTAL
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REVISED 7/ 3/78

PAGE 1

**TITLE.....: 1950-1960 U.S. NET MIGRATION RATES (BY AGE, SEX,
COLOR, COUNTY)**

TYPE.....: NUMERIC DATA BASE

**CONTACT.....: DIANA K. DIXON-DAVIS
BIOLOGICAL AND MEDICAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3824)**

**SUBJECT COVERED: NET MIGRATION RATES, POPULATION ESTIMATES,
PARTURITION**

KEY WORDS

**MIGRATION, HUMAN POPULATIONS, POPULATION DYNAMICS, PARTURITION,
AGE GROUPS**

ABSTRACT

THIS FILE CONTAINS 1950-1960 DATA FOR 3069 COUNTIES, 51 STATES (INCLUDING DISTRICT OF COLUMBIA), 9 CENSUS DIVISIONS, 4 CENSUS REGIONS, AND THE UNITED STATES BY 9 SEX/RACE GROUPS (TOTAL, MALE, FEMALE X TOTAL, WHITE, NONWHITE). THE DATA CONSISTS OF (1) NET MIGRATION RATE ESTIMATES FOR 1950-1960 FOR 17 AGE GROUPS (TOTAL, 0-4, ..., 75+); (2) ESTIMATED NET NUMBER OF MIGRANTS FOR 17 AGE GROUPS; (3) EXPECTED 1960 POPULATION (1950 POPULATION SURVIVED FORWARD) FOR 17 AGE GROUPS; (4) 1950 AND 1960 POPULATION COUNTS FOR 20 AGE GROUPS (TOTAL, 0-4, ..., 75+, 75-79, 80-84, 85+); (5) BIRTHS 1950-1955, 1955-1960.

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DOCUMENTATION

ROWLES, GLADYS K., JAMES D. TARVER, "NET MIGRATION OF THE
POPULATION, 1950-60, BY AGE, SEX, AND COLOR" VOLUME 11, U.S.
GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C. (NOVEMBER 1965).

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 3134 RECORDS EACH 7604 BYTES LONG

LANGUAGE....: NONE

MACHINE CONFIGURATION: IBM 370/195 OS/HVI WITH A 9-TRACK TAPE
DRIVE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 68100
IN THE BIOLOGICAL AND MEDICAL RESEARCH DIVISION

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PAGE 1

**TITLE.....: 1960-1970 U.S. NET MIGRATION RATES (BY AGE, SEX,
COLOR, COUNTY)**

TYPE.....: NUMERIC DATA BASE

**CONTACT....: DIANA K. DIXON-DAVIS
BIOLOGICAL AND MEDICAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3824)**

**SUBJECT COVERED: NET MIGRATION RATES, POPULATION ESTIMATES,
PARTURITION**

KEY WORDS

**MIGRATION, HUMAN POPULATIONS, POPULATION DYNAMICS, PARTURITION,
AGE GROUPS**

ABSTRACT

THIS FILE CONTAINS 1960-1970 DATA FOR 3069 COUNTIES, 51 STATES (INCLUDING DISTRICT OF COLUMBIA), 9 CENSUS DIVISIONS, 4 CENSUS REGIONS, AND THE UNITED STATES BY 9 SEX/RACE GROUPS (TOTAL, MALE, FEMALE X TOTAL, WHITE, NONWHITE). THE DATA CONSISTS OF (1) NET MIGRATION RATE ESTIMATES FOR 1960-1970 FOR 17 AGE GROUPS (TOTAL, 0-4, ..., 75+); (2) ESTIMATED NET NUMBER OF MIGRANTS FOR 17 AGE GROUPS; (3) EXPECTED 1970 POPULATION (1960 POPULATION SURVIVED FORWARD) FOR 17 AGE GROUPS; (4) 1960 AND 1970 POPULATION COUNTS FOR 20 AGE GROUPS (TOTAL, 0-4, ..., 75+, 75-79, 80-84, 85+); (5) BIRTHS 1960-1965, 1965-1970.

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DOCUMENTATION

BOWLES, GLADYS K., CALVIN BEALE, EVERETT S. LEE, NET MIGRATION
OF THE POPULATION, 1960-70, BY AGE, SEX AND COLOR, PARTS 1-7,
UNIVERSITY OF GEORGIA PRINTING DEPARTMENT, ATHENS, GEORGIA,
DECEMBER 1975.

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 3134 RECORDS EACH 7604 BYTES LONG

LANGUAGE....: NONE

MACHINE CONFIGURATION: NOT APPLICABLE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 68100
IN THE BIOLOGICAL AND MEDICAL RESEARCH DIVISION

**SURVEY OF BIOMEDICAL AND ENVIRONMENTAL
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TITLE.....: 1970-1975 U.S. COUNTIES POPULATION ESTIMATES TAPE

TYPE.....: NUMERIC DATA BASE

CONTACT.....: DIANA K. DIXON-DAVIS
BIOLOGICAL AND MEDICAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3824)

SUBJECT COVERED: POPULATION ESTIMATES, PER CAPITA INCOME

KEY WORDS

POPULATIONS, HUMAN POPULATIONS, INCOME, MIGRATION, PARTURITION,
MORTALITY

ABSTRACT

THIS DATA FILE CONTAINS CURRENT ESTIMATES OF THE POPULATION AND PER CAPITA MONEY INCOME FOR SELECTED AREAS IN EACH STATE. THE POPULATION ESTIMATES RELATE TO APRIL 1, 1970 (THE 1970 CENSUS), AND TO JULY 1, 1973, 1973 (REVISED), 1974, 1974 (FINAL AVERAGE ESTIMATE), 1975 (PROVISIONAL ESTIMATE), 1975. PER CAPITA INCOME ESTIMATES ARE FOR 1969, 1972 (REVISED), 1974. TOTAL NUMBER OF BIRTHS, DEATHS FOR 4/1/70 - 7/1/75 AND NET MIGRATION 11/1/70 - 7/1/75 ARE INCLUDED. THE AREAS COVERED BY THE DATA BASE INCLUDE ALL COUNTIES AND INCORPORATED PLACES PLUS ACTIVE MINOR CIVIL DIVISIONS.

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DOCUMENTATION

U.S. BUREAU OF THE CENSUS, CURRENT POPULATION REPORTS, SERIES
P-25, "POPULATION ESTIMATES AND PROJECTIONS" U.S. GOVERNMENT
PRINTING OFFICE, WASHINGTON, D.C., 1976.

SOFTWARE/HARDWARE INFORMATION

SIZE.....: FILE 1 IS 40097 RECORDS EACH 114 BYTES LONG; FILE
2 IS 3143 RECORDS EACH 36 BYTES LONG; FILE 3 IS
3143 RECORDS EACH 72 BYTES LONG.

LANGUAGE...: NONE

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH A 9-TRACK TAPE
DRIVE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 68100
IN THE BIOLOGICAL AND MEDICAL RESEARCH DIVISION

**SURVEY OF BIOMEDICAL AND ENVIRONMENTAL
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ICFP/INV-214

REVISED 7/ 3/78

PAGE 1

**TITLE.....: A DATABASE OF HISTORICAL AND ARCHAEOLOGICAL SITES
IN THE U.S.**

TYPE.....: NUMERIC DATA BASE

**CONTACT....: MORTAN A. FRIGERIO
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(PTS 972-3210)**

SUBJECT COVERED: HISTORICAL AND ARCHAEOLOGICAL SITES

KEY WORDS

**ARCHAEOLOGY, ENVIRONMENTAL IMPACTS, ACCIDENTS, NUCLEAR
ACCIDENTS, CONSTRUCTION**

ABSTRACT

**A DATABASE CONSISTING OF ALL THE HISTORICAL AND ARCHAEOLOGICAL
SITES LISTED IN THE FEDERAL REGISTER OVER THE PAST 20 YEARS.
THERE IS AN ASSOCIATED FORTRAN PROGRAM WHICH ALLOWS THE USERS
TO RETRIEVE DATA IN ITS ENTIRETY OR BY STATE, OR BY A GIVEN
RADIUS AREA OR BY A RECTANGULAR BOUNDARY.**

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DOCUMENTATION

NONE

SOFTWARE/HARDWARE INFORMATION

SIZE.....: APPROXIMATELY 5000 RECORDS EACH 80 BYTES LONG

LANGUAGE....: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 250K CORE AND A
9-TRACK TAPE DRIVE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 8M635
IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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REVISED 7/ 3/75

PAGE 1

TITLE.....: RADIATION TOXICITY IN DOGS: CLINICAL PATHOLOGY DATA

TYPE.....: NUMERIC DATA BASE

CONTACT.....: THOMAS E. FRITZ
BIOLOGICAL AND MEDICAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3878)

SUBJECT COVERED: LOW LEVEL IRRADIATIONS AND LATE BIOLOGICAL
EFFECTS.

KEY WORDS

BFAGLE, PATHOLOGY, DEATH

ABSTRACT

THE CLINICAL PATHOLOGY DATA BASE INCLUDES ALL CLINICAL FINDINGS
AND POST MORTEM DATA FOR THE ENTIRE COLONY OF 4000 BEAGLES.

**SURVEY OF BIOMEDICAL AND ENVIRONMENTAL
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REVISED 7/ 3/78

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DOCUMENTATION

FRITZ, T. E., W. P. NORRIS, T. M. SEED, C. M. POOLE, D. V. TOLLE, L. S. LOMBARD, S. M. CULLEN, D. E. DOYLE, L. V. KASPAR, W. G. KEENAN, N. D. KRETZ, P. H. POLK, D. L. GUTZEIT, M. M. SANDERSON, AND P. C. BRENNAN. "RADIATION TOXICITY IN DOGS." DIVISION OF BIOLOGICAL AND MEDICAL RESEARCH, ARGONNE NATIONAL LABORATORY, ANNUAL REPORT ANL-77-55, PP. 31-38, 1976.

FRITZ, T. E., T. M. SEED, C. M. POOLE, D. V. TOLLE, L. S. LOMBARD, D. E. DOYLE, W. G. KEENAN, N. D. KRETZ, P. H. POLK, S. M. CULLEN, L. V. KASPAR, D. L. GUTZEIT, AND M. M. SANDERSON. "RADIATION TOXICITY IN DOGS." DIVISION OF BIOLOGICAL AND MEDICAL RESEARCH, ARGONNE NATIONAL LABORATORY, ANNUAL REPORT, 1977. (IN PRESS)

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 294,000 RECORDS EACH 80 BYTES LONG

LANGUAGE....: PL/1, DATABUS

MACHINE CONFIGURATION: IBM 370/195 OS/MVT PLUS RJE PORT FOR
DATAPOINT 1100 TERMINAL AND PRINTER

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 63103
IN THE BIOLOGICAL AND MEDICAL RESEARCH DIVISION

SURVEY OF BIOMEDICAL AND ENVIRONMENTAL
DATA BASES, MODELS, & INTEGRATED COMPUTER SYSTEMS
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REVISED 7/ 3/78

PAGE 1

TITLE.....: RADIATION TOXICITY IN DOGS: COLONY MAINTENANCE AND HISTORY.

TYPE.....: NUMERIC DATA BASE

CONTACT.....: THOMAS E. FRITZ
BIOLOGICAL AND MEDICAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3978)

SUBJECT COVERED: LOW-LEVEL IRRADIATIONS AND LATE BIOLOGICAL EFFECTS.

KEY WORDS

BEAGLE, COLONIES, PRENATAL IRRADIATION, CHRONIC IRRADIATION,
COBALT 60

ABSTRACT

THIS SUBSET OF THE ENTIRE RADIATION TOXICITY IN DOGS DATA BASE ORCHESTRATES AND SUPPORTS THE ENTIRE OPERATION. THE OBJECTIVE OF THESE STUDIES IS TO DETERMINE THE RESPONSES OF BEAGLE DOGS EXPOSED TO CONTINUOUS IRRADIATION FROM A COBALT-60 GAMMA-RAY SOURCE WITH RESPECT TO THREE MAJOR FACTORS: (1) DOSE RATE, (2) TOTAL ACCUMULATED DOSE, AND (3) AGE AT ONSET OF IRRADIATION. ADDITIONALLY, THE STUDIES HAVE BEEN EXTENDED TO INCLUDE EFFECTS OF IN UTERO FETAL IRRADIATION. SPECIFICALLY, THE DATA BASE CONTAINS ANIMAL MAINTENANCE AND DEATH RELATED DETAILS, EXPERIMENTAL ASSIGNMENTS, BREEDING DATA, MEDICAL TREATMENT DATA, BODY AND ORGAN WEIGHT DATA, ISOTOPE INJECTION AND EXTERNAL IRRADIATION DATA AND OTHER COLONY MANAGEMENT INFORMATION TO INCLUDE ANIMAL LOCATION AND OPERATIONS AND SAMPLE SCHEDULING.

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DOCUMENTATION

FRITZ, T. E., L. S. LOMBARD, S. A. TYLER, AND W. P. NORRIS.
"PATHOLOGY AND FAMILIAL INCIDENCE OF ORCHITIS AND ITS RELATION
TO THYROIDITIS IN A CLOSED BEAGLE COLONY" EXPERIMENTAL AND
MOLECULAR PATHOLOGY 24:142-158, 1976.

FRITZ, T. E., W. P. NORRIS, T. M. SEED, C. M. POOLE, D. V.
TOLLE, L. S. LOMBARD, S. M. CULLEN, D. E. DOYLE, L. V. KASPAR,
W. G. KEENAN, W. D. KRETZ, P. H. POLK, D. L. GUTZEIT, M. M.
SANDERSON, AND P. C. BRENNAN. "RADIATION TOXICITY IN DOGS"
DIVISION OF BIOLOGICAL AND MEDICAL RESEARCH, ARGONNE NATIONAL
LABORATORY, ANNUAL REPORT ANL-77-55, PP.31-38, 1976.

FRITZ, T. E., T. M. SEED, C. M. POOLE, D. V. TOLLE, L. S.
LOMBARD, D. E. DOYLE, W. G. KEENAN, W. D. KRETZ, P. H. POLK, S.
M. CULLEN, L. V. KASPAR, D. L. GUTZEIT, AND M. M. SANDERSON.
"RADIATION TOXICITY IN DOGS" DIVISION OF BIOLOGICAL AND
MEDICAL RESEARCH, ARGONNE NATIONAL LABORATORY, ANNUAL REPORT,
1977. (IN PRESS)

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 294,000 RECORDS EACH 80 BYTES LONG

LANGUAGE....: PL/1, DATABUS

MACHINE CONFIGURATION: IBM 370/195 OS/MVT PLUS RJE PORT FOR
DATAPoint 1100 TERMINAL AND PRINTER

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 63100
IN THE BIOLOGICAL AND MEDICAL RESEARCH DIVISION

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TITLE.....: RADIATION TOXICITY IN DOGS: HEMATOLOGY

TYPE.....: NUMERIC DATA BASE

CONTACT.....: THOMAS E. FRITZ
BIOLOGICAL AND MEDICAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FIS 972-3878)

SUBJECT COVERED: LOW LEVEL IRRADIATIONS AND DATE BIOLOGICAL
EFFECTS

KEY WORDS

HEMATOLOGY, BEAGLE, BLOOD, ERYTHROCYTES, LEUCOCYTES, BLOOD
PLATELETS, HEMOGLOBIN

ABSTRACT

THE DATA BASE CONSISTS OF REGULARLY SCHEDULED BLOOD SAMPLES ON
ALL EXPERIMENTAL ANIMALS AT INTERVALS OF 1 WEEK TO 3 MONTHS AND
ON DESIGNATED AGING AND EXPERIMENTAL CONTROL ANIMALS.
SPECIFICALLY THE DATA INCLUDES ERYTHROCYTE, LEUCOCYTE AND
RETICULOCYTE ABSOLUTE COUNTS; HEMATOCRIT AND HEMOGLOBIN VALUES;
AND COMPLETE DIFFERENTIAL LEUCOCYTE DATA.

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DOCUMENTATION

TOLLE, D.V., T.E. FRITZ, AND W.P. NORRIS. "RADIATION-INDUCED ERYTHRO-LEUKEMIA IN THE BEAGLE DOG: A HEMATOLOGIC SUMMARY OF FIVE CASES." AM. J. PATH.

SEED, T.M., D.V. TOLLE, T.E. FRITZ, R.L. DEVINE, C.M. POOLE, AND W.P. NORRIS. "IRRADIATION-INDUCED ERYTHROLEUKEMIA AND MYELOGENOUS LEUKEMIA IN THE BEAGLE DOG: HEMATOLOGY AND ULTRASTRUCTURE." BLOOD

SEED, T.M., D.V. TOLLE, T.E. FRITZ, S.M. CULLEN, L.V. KASPAR, AND C.M. POOLE. "HEMOPATHOLOGICAL CONSEQUENCES OF PROTRACTED GAMMA IRRADIATION IN THE BEAGLE: PRECLINICAL PHASES OF LEUKEMIA INDUCTION" INT'L SYMP. ON THE LATE BIO. EFFECTS OF IONIZING RAD., IAEA, VIENNA, 1978

FRITZ, T.E., W.P. NORRIS, D.V. TOLLE, ET AL. "RELATIONSHIP OF DOSE RATE AND TOTAL DOSE TO RESPONSES OF CONTINUOUSLY IRRADIATED BEAGLES" INTL. SYM. ON THE LATE BIO. EFFECTS OF IONIZING RAD., IAEA, VIENNA, 1978

FRITZ, T.E., W.P. NORRIS, ET AL. "RADIATION TOXICITY IN DOGS" DIV. OF BIO. AND MED. RES., ARGONNE NAT. LAB., ANN. REPORT ANL-77-55, 1976

FRITZ, T.E., T.M. SEED, ET AL. "RADIATION TOXICITY IN DOGS", DIV. OF BIO. AND MED. RES., ARGONNE NAT. LAB., ANN. REPORT, 1977

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 57,000 RECORDS EACH 80 BYTES LONG

LANGUAGE...: PL/1, DATABUS

MACHINE CONFIGURATION: IBM 370/195 OS/MVT PLUS RJE PORT FOR
DATAPOINT 1103 TERMINAL AND PRINTER

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 63100
IN THE BIOLOGICAL AND MEDICAL RESEARCH DIVISION

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**TITLE.....: 1950, 1960, 1970 U.S. HUMAN POPULATION COUNTS BY
COUNTY**

TYPE.....: NUMERIC DATA BASE

**CONTACT.....: PHYLLIS M. FUJA
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3980)**

**SUBJECT COVERED: U.S. CENSUS POPULATION COUNTS BY 5 YEAR AGE
GROUPS**

KEY WORDS

**HUMAN POPULATIONS, POPULATION DYNAMICS, POPULATION DENSITY, AGE
GROUPS**

ABSTRACT

**THIS TAPE CONTAINS THE U.S. CENSUS BUREAU, 1950, 1960, 1970
DECENNIAL CENSUSES OF THE POPULATION COUNTS BY AGE, SEX, RACE
FOR ALL U.S. COUNTIES. FOR 1950 AND 1960 TOTALS FOR STATES ARE
ALSO INCLUDED. THE AGE AND RACE GROUPS COVERED ARE AS FOLLOWS:
(1) 1950: (0-4, 5-9, ..., 75+), (TOTAL, WHITE, NONWHITE); (2)
1960: (0-4, 5-9, ..., 85+), (TOTAL, WHITE, NONWHITE); (3) 1970:
(0-4, 5-9, ..., 100+), (TOTAL, WHITE, NEGRO).**

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DOCUMENTATION

DERIVED FROM PUBLISHED U.S. BUREAU OF THE CENSUS DATA FROM
1950, 1960, 1970 CENSUS VOLUMES ON TAPES

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 1950 FILE IS 3160 RECORDS EACH 773 BYTES LONG; 1960
FILE IS 3160 RECORDS EACH 869 BYTES LONG; 1970 FILE
IS 3135 RECORDS EACH 1013 BYTES LONG

LANGUAGE....: NOT APPLICABLE

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH A 9-TRACK TAPE
DRIVE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANI BUDGET ACTIVITY NUMBER 68100
IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

**SURVEY OF BIO MEDICAL AND ENVIRONMENTAL
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**TITLE.....: 1970 FOURTH COUNT SUMMARY TAPE U.S. CENSUS (FILE C
POPULATION)**

TYPE.....: NUMERIC DATA BASE

**CONTACT....: PHYLLIS M. FUJA
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3980)**

SUBJECT COVERED: POPULATION STATISTICS

KEY WORDS

**HUMAN POPULATIONS, URBAN POPULATIONS, RURAL POPULATIONS,
SOCIOLOGY**

ABSTRACT

**THE CENSUS BUREAU FOURTH COUNT POPULATION FILE INCLUDES CENSUS
COUNTS BY RACE, URBAN, RURAL, (FARM/NOFARM), AND BY SELECTED
SUBSECTIONS IN EACH STATE. SUBSECTIONS ARE STATE, COUNTY, SMSA
AND URBANIZED AREAS, ETC. RACE IS GIVEN BY TOTAL, WHITE,
NEGRO, SPANISH AMERICAN. COUNTS ARE GIVEN FOR 93 TOPICS WITH
DIFFERENT BREAKDOWNS. ALLOCATIONS AND SUBSTITUTIONS ARE ALSO
INCLUDED.**

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DOCUMENTATION

"1970 CENSUS USER'S GUIDE, PART II", U.S. DEPT OF COMMERCE,
BUREAU OF THE CENSUS.

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 8 FULL 6250 BPI TAPES, ONE FILE FOR EACH STATE

LANGUAGE...: NONE

MACHINE CONFIGURATION: IBM 370/195 OS/HVT WITH A 9-TRACK TAPE
DRIVE OF 6250 BPI DENSITY

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER AML BUDGET ACTIVITY NUMBER 68103
IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

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**TITLE.....: 1970 U.S. CENSUS FOR ARIZONA, AND CALIFORNIA FOURTH
COUNT FILES A, AND B (POPULATION)**

TYPE.....: NUMERIC DATA BASE

**CONTACT....: PHYLLIS M. FUJA
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3980)**

SUBJECT COVERED: POPULATION STATISTICS BY RACE

KEY WORDS

HUMAN POPULATIONS, OCCUPATIONS, EDUCATION, INCOME

ABSTRACT

**CENSUS COUNTS BY RACE FOR CENSUS TRACTS (FILE A) OR BY MCD, CCD
(FILE B) FOR A WIDE VARIETY OF POPULATION STATISTICS, AS
ENUMERATED BY THE CENSUS FOURTH COUNT SUMMARY. TOPICS INCLUDE
INCOME, FAMILY STATUS, EDUCATION AND EMPLOYMENT.**

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DOCUMENTATION

"1970 CENSUS USER'S GUIDE, PART II", U.S. DEPARTMENT OF
COMMERCE, BUREAU OF THE CENSUS

SOFTWARE/HARDWARE INFORMATION

SIZE.....: NONE

LANGUAGE....: NONE

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH A 9-TRACK TAPE
DRIVE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER AML BUDGET ACTIVITY NUMBER 62100
IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

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TITLE.....: VITAL STATISTICS DETAILED MORTALITY DATA TAPES FOR
U.S.

TYPE.....: NUMERIC DATA BASE

CONTACT.....: PHYLLIS M. FUJA
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3980)

SUBJECT COVERED: STATISTICS ON EACH DEATH IN U.S. FOR A GIVEN
YEAR

KEY WORDS

MORTALITY, DEATHS, STATISTICS

ABSTRACT

MORTALITY DATA FOR THE UNITED STATES ARE TAKEN FROM DEATH CERTIFICATES. INFORMATION INCLUDES PLACE OF RESIDENCE, AGE, RACE, SEX, DATE, AND UNDERLYING CAUSE OF DEATH (CLASSIFIED BY THE INTERNATIONAL CLASSIFICATION OF DISEASES). IN THIS DETAILED TAPE THERE IS ONE RECORD FOR EACH DEATH THAT OCCURRED. ORIGINAL TAPES FROM NCHS CONTAIN 160 CHARACTER RECORDS, BUT THESE HAVE BEEN CONDENSED TO 20 CHARACTER RECORDS, PRESERVING NEARLY ALL THE UNIQUE INFORMATION AND MAKING THE FILES MORE MANAGEABLE.

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DOCUMENTATION

"STANDARDIZED MICRO-DATA TAPE TRANSCRIPTS", DHEW NO. (HRA)
74-1213 (REVISED), JUNE 1974

SOFTWARE/HARDWARE INFORMATION

SIZE.....: ABOUT 1,900,000 RECORDS FOR EACH YEAR. EACH RECORD
IS 20 BYTES LONG.

LANGUAGE...: NOT APPLICABLE

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH A 9-TRACK TAPE
DRIVE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER AML BUDGET ACTIVITY NUMBER 68100
IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

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TITLE.....: VITAL STATISTICS DETAILED NATALITY TAPES FOR U.S.

TYPE.....: NUMERIC DATA BASE

CONTACT....: PHYLLIS M. FUJA
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(PTS 972-3980)

SUBJECT COVERED: 50 % SAMPLE OF BIRTH REGISTRATIONS

KEY WORDS

PARTURITION, BIRTH, USA, AGE, WEIGHT, INFORMATION, DATA

ABSTRACT

NATALITY DATA FOR THE UNITED STATES ARE TAKEN FROM BIRTH CERTIFICATES. INFORMATION INCLUDES PLACE OF RESIDENCE AND OCCURRENCE; AGE, RACE AND EDUCATION OF MOTHER AND FATHER; BIRTH DATE, SEX, AND WEIGHT; PRENATAL CARE; ATTENDANT AT BIRTH; GESTATION PERIOD; PREVIOUS LIVE BIRTHS AND FETAL DEATHS; ILLEGITIMACY. DATA ARE A 20% SAMPLE OF ALL BIRTHS.

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DOCUMENTATION

"STANDARDIZED MICRO-DATA TAPE TRANSCRIPTS", DHEW NO. (HRA)
74-1213 (REVISED), JUNE 1974

SOFTWARE/HARDWARE INFORMATION

SIZE.....: ABOUT 1,800,000 RECORDS, EACH 215 BYTES LONG

LANGUAGE...: NONE

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH A 9-TRACK TAPE
DRIVE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 66100
IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

SURVEY OF BIO MEDICAL AND ENVIRONMENTAL
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TITLE.....: VITAL STATISTICS MORTALITY DATA TAPE FOR U.S.
(LOCAL AREA SUMMARY)

TYPE.....: NUMERIC DATA BASE

CONTACT....: PHYLLIS M. PUJA
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3980)

SUBJECT COVERED: ALL DEATHS IN U.S. IN GIVEN YEAR.

KEY WORDS

DEATHS, MORTALITY, HUMAN POPULATIONS

ABSTRACT

MORTALITY DATA FOR THE UNITED STATES SUMMARIZED BY STATES,
COUNTIES, CITY (10,000+), POPULATION SIZE, SMSA, MET/COMMET,
CAUSE OF DEATH. GIVES TOTAL DEATHS FOR EACH COMBINATION.

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DOCUMENTATION

"STANDARDIZED MICRO-DATA TAPE TRANSCRIPTS", DHEW NO. (HRA)
74-1213 (REVISED), JUNE 1974

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 180,000 RECORDS, EACH 28 BYTES LONG

LANGUAGE...: NONE

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH A 9-TRACK TAPE
DRIVE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 68100
IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

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**TITLE.....: VITAL STATISTICS NATALITY TAPE (LOCAL AREA SUMMARY)
FOR U.S.**

TYPE.....: NUMERIC DATA BASE

**CONTACT....: PHYLLIS M. FUJA
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3980)**

SUBJECT COVERED: ALL BIRTHS IN U.S. FOR A GIVEN YEAR

KEY WORDS

**INCOME, EMPLOYMENT, OCCUPATIONS, EDUCATION, HUMAN POPULATIONS,
SOCIOLOGY**

ABSTRACT

**NATALITY DATA FOR THE UNITED STATES SUMMARIZED BY STATES,
COUNTY, CITY (10,000+), POPULATION SIZE, SEX, RACE, MZT/MOCHET,
RACE, AND SEX OF CHILD. GIVES COUNTS BY AGE OF MOTHER,
LIVE-BIRTH ORDER, BIRTH WEIGHT, AND ATTENDANT AT BIRTH FOR EACH
COMBINATION.**

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DOCUMENTATION

"STANDARDIZED MICRO-DATA TAPE TRANSCRIPTS", DHEW NO. (HRA)
74-1213 (REVISED), JUNE 1974

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 340,000 RECORDS FOR EACH YEAR. EACH RECORD IS 160
BYTES LONG.

LANGUAGE....: NONE

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH A 9-TRACK TAPE
DRIVE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 68100
IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

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TITLE.....: SERUM CHEMISTRY VALUES OF BEAGLES

TYPE.....: NUMERIC DATA BASE

CONTACT.....: LILLIAN V. KASPAR
BIOLOGICAL AND MEDICAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3981)

SUBJECT COVERED: SERUM CHEMISTRY VALUES OF BEAGLES

KEY WORDS

BLOOD SERUM, BEAGLES, GLUCOSE, UREA, ALKALINE PHOSPHATASE,
IRON, PROTEIN, ALBUMIN, CHOLESTEROL, SGPT, SGOT, CPK

ABSTRACT

THE DATA INCLUDE SERUM CHEMISTRY VALUES OF BEAGLES RANGING IN AGE FROM 6 WEEKS TO MORE THAN 15 YEARS OF AGE. THE DATA RECORDED FOR EACH DATE FOR EACH DOG ARE THE MEAN OF TWO VALUES, THE STANDARD DEVIATION, AND THE COEFFICIENT OF VARIATION. NORMAL AND EXPERIMENTAL ANIMALS COMPRISE THE POPULATION. THE SERUM CHEMISTRIES ASSAYED ARE GLUCOSE, SERUM GLUTAMIC-PYRUVIC TRANSAMINASE (SGPT), SERUM GLUTAMIC-OXALOACETIC TRANSAMINASE (SGOT), CREATINE PHOSPHOKINASE (CPK), UREA NITROGEN, ALKALINE PHOSPHATASE, TOTAL IRON, TOTAL PROTEIN, ALBUMIN, AND CHOLESTEROL. THE DATA ARE DIVIDED INTO FILES, ONE FOR EACH SERUM CHEMISTRY. FOR CERTAIN CHEMISTRIES, THERE ARE TWO FILES--ONE CONTAINING DATA COLLECTED BY MANUAL MEANS AND THE SECOND, DATA COLLECTED BY AN AUTOMATED PROCEDURE.

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DOCUMENTATION

KASPAR, LILLIAN V. AND MORRIS, WILLIAM P. "SERUM CHEMISTRY
VALUES OF NORMAL DOGS (BEAGLES): ASSOCIATIONS WITH AGE, SEX,
AND FAMILY LINE", LAB. AN. SCI. 27:980-985, 1977.

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 110,057 RECORDS EACH 80 BYTES LONG

LANGUAGE...: PL/1

MACHINE CONFIGURATION: IBM 370/195 OS/MVT

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 63100
IN THE BIOLOGICAL AND MEDICAL RESEARCH DIVISION

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TITLE.....: ANL METEOROLOGICAL TOWER DATA

TYPE.....: NUMERIC DATA BASE

CONTACT.....: PAUL E. HESS
RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(PTS 972-5838)

SUBJECT COVERED: TEMPERATURES, WINDS, SOLAR RADIATION, SOIL
TEMPERATURE, PRECIPITATION

KEY WORDS

METEOROLOGY, CLIMATES, DATA, WEATHER

ABSTRACT

METEOROLOGICAL DATA FOR ARGONNE SITE HAS BEEN COLLECTED. FOR THE PERIOD 1950 TO 1970 DATA INCLUDE MEASUREMENTS ON WINDS AND SOIL TEMPERATURES. THE COMBINED DATA FROM 1975 TO THE PRESENT TIME ARE ALSO ASSEMBLED IN THIS DATA BASE. MOST OF THE STANDARD METEOROLOGICAL VARIABLES ARE RECORDED.

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DOCUMENTATION

H. MOSES AND H. A. BOGNER, "FIFTEEN-YEAR CLIMATOLOGICAL
SUMMARY", ANL-7084

R.L. HART AND J. R. HAUMANN. "AN IMPROVED METEOROLOGICAL DATA
ACQUISITION SYSTEM", ANL-75-3, PART IV

P. E. HESS, PROCESSING ARGONNE WEATHER STATION DATA, ANL-76-88,
PART IV.

SOFTWARE/HARDWARE INFORMATION

SIZE.....: APPROX. 175,000 RECORDS EACH 80 BYTES LONG FOR 1950
TO 1970; ANOTHER APPROX. 26,000 RECORDS EACH 80
BYTES LONG FOR DATA FROM 1975 TO PRESENT.

LANGUAGE...: NOT APPLICABLE

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH A 9-TRACK TAPE
DRIVE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 66100
IN THE RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION

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TITLE.....: ANL METEOROLOGICAL TOWER 15-YEAR SUMMARY

TYPE.....: NUMERIC DATA BASE

CONTACT.....: PAUL E. HESS
RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(PTS 972-5838)

SUBJECT COVERED: ARGONNE METEOROLOGICAL DATA

KEY WORDS

METEOROLOGY, CLIMATES, DATA, WEATHER

ABSTRACT

NONE

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DOCUMENTATION

H. MOSES AND M. A. BOGNER, "FIFTEEN-YEAR CLIMATOLOGICAL
SUMMARY", ANL-7084.

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 671 PAGES

LANGUAGE...: NOT APPLICABLE

MACHINE CONFIGURATION: NOT APPLICABLE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 66100
IN THE RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION

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PAGE 1

TITLE.....: OFFSHORE TURBULENCE STUDIES BY CONSTANT-LEVEL
BALLOON

TYPE.....: NUMERIC DATA BASE

CONTACT....: PAUL E. HESS
RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-5939)

SUBJECT COVERED: COORDINATES OF BALLOON TRAJECTORIES

KEY WORDS

POLLUTION, BALLOONS, COASTAL REGIONS, OFFSHORE NUCLEAR POWER
PLANTS, TURBULENCE

ABSTRACT

COORDINATES OF THE TRAJECTORIES OF CONSTANT-LEVEL BALLOONS OVER
COASTAL AREAS ARE TAKEN WITH DOUBLE THEODOLITES. THE DATA ARE
USED TO COMPUTE PARAMETERS GOVERNING THE DISPERSION OF
POLLUTANTS OVER COASTAL AREAS FOR ASSESSING THE IMPACT OF THE
SITING OF OFFSHORE POWER PLANTS. THE COORDINATES TAKEN AT ONE
SECOND INTERVALS IN CARTESIAN COORDINATES X, Y, AND Z OVER A
1.5 KM RANGE ARE AVAILABLE ON TAPE.

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DOCUMENTATION

NONE

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 1700 RECORDS EACH 1680 BYTES LONG

LANGUAGE...: FORTRAN, PL/1

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 200 K CORE AND A
9-TRACK TAPE DRIVE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 66200
IN THE RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION

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TITLE.....: SANGAMON PBL DATA

TYPE.....: NUMERIC DATA BASE

CONTACT.....: PAUL E. HESS
RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(PTS 972-5838)

SUBJECT COVERED: NONE

KEY WORDS

BOUNDARY LAYER, ATMOSPHERE, ILLINOIS

ABSTRACT

NONE

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DOCUMENTATION

T. YAMADA, D. L. SISTERTSON, AND G. D. HESS, "PRELIMINARY
ANALYSIS OF THE SANGAMON DATA", ANL-76-88, PART IV.

SOFTWARE/HARDWARE INFORMATION

SIZE.....: APPROX. 1200 RECORDS 80 BYTES LONG, INTERPOLATED
DATA

LANGUAGE...: NOT APPLICABLE

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH A 9-TRACK TAPE
DRIVE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 66100
IN THE RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION

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TITLE.....: INFORMATION ON NUCLEAR SITES

TYPE.....: NUMERIC DATA BASE

CONTACT.....: CRAIG C. HUBER
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3276)

SUBJECT COVERED: NUCLEAR PLANTS

KEY WORDS

INSITE, NUCLEAR, DESIGN, PHYSICAL, CHARACTERISTICS DATA,
RETRIEVAL

ABSTRACT

A COMPUTERIZED NUCLEAR SITE DATA SYSTEM (INSITE) HAS BEEN DEVELOPED AT ARGONNE NATIONAL LABORATORY TO SUPPORT EFFORTS OF THE U.S. NUCLEAR REGULATORY COMMISSION (NRC) TO DEVELOP SITE EVALUATION GUIDELINES, AND TO ESTABLISH A GENERAL BASE OF INFORMATION FOR USE BY THE NRC IN OTHER REGULATORY ACTIVITIES. IT ALSO REPRESENTS A USEFUL TOOL FOR STATE AGENCIES, UTILITIES, ARCHITECT-ENGINEERS, AND CONSULTING FIRMS IN CARRYING OUT THEIR INCREASED RESPONSIBILITIES IN THE SITE DESIGNATION AND PLANT LICENSING PROCESSES. AN EXTREMELY LARGE VOLUME OF DATA EXISTS IN PUBLIC DOCUMENTS RELATED TO SITE CHARACTERISTICS, PLANT DESIGN, AND ANTICIPATED ENVIRONMENTAL IMPACTS OF PLANT OPERATION. THE GOAL IN DEVELOPING THE INSITE SYSTEM WAS TO IDENTIFY IMPORTANT PARAMETERS WITHIN THAT BODY OF DATA, EXTRACT THE APPROPRIATE DATA VALUES, AND ORGANIZE THEM IN SUCH A WAY AS TO ALLOW RAPID, SELECTIVE RETRIEVAL AND MANIPULATION. ALL U.S. COMMERCIAL NUCLEAR POWER PLANTS DOCKETED AS OF DECEMBER 31, 1975, ARE INCLUDED, WITH DATA FROM ENVIRONMENTAL IMPACT STATEMENTS, ENVIRONMENTAL REPORTS, AND SAFETY ANALYSIS REPORTS.

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DOCUMENTATION

HUBER, C.C., C.D. LIVENGOD, H.E. SAMSA, AND T.D. WOLSKO:
"INSITE USER'S GUIDE".

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 45 K BYTES

LANGUAGE...: PL/1, SYSTEM 2000

MACHINE CONFIGURATION: VM 370/CMS BATCH ONLY; IB4 370/195 OS/MVT

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ARL BUDGET ACTIVITY NUMBER 3M411
IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

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PAGE 1

TITLE.....: DATA BASE OF APPARENT OSCILLATOR STRENGTH
DISTRIBUTIONS FOR A VARIETY OF MOLECULAR VAPORS

TYPE.....: NUMERIC DATA BASE

CONTACT.....: RUSSELL H. HUEBNER
BIOLOGICAL AND ENVIRONMENTAL RESEARCH PROGRAMS
OFFICE
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3808)

SUBJECT COVERED: TRANSITION PROBABILITIES DERIVED FROM ELECTRON
ENERGY-LOSS SPECTRA

KEY WORDS

ELECTRON COLLISIONS, MOLECULES, PHOTOCHEMICAL REACTIONS,
ABSORPTION SPECTRA, RADIATION ABSORPTION ANALYSIS

ABSTRACT

THIS DATA BASE IS COMPOSED OF SUB-SETS OF DATA CONCERNING THE ENERGY ABSORPTION PROBABILITIES (OSCILLATOR STRENGTHS) VERSUS ENERGY (GIVEN IN ELECTRON VOLT UNITS). THESE VALUES WERE DERIVED FROM AN ANALYSIS OF ELECTRON ENERGY-LOSS MEASUREMENTS BY THE SMALL-ANGLE APPROXIMATION METHOD. THE DATA CAN BE USED TO DERIVE OPTICAL ABSORPTION CROSS SECTIONS FROM THE VISIBLE THROUGH THE VACUUM ULTRAVIOLET SPECTRAL REGIONS. DATA VALUES HAVE BEEN FULLY EVALUATED AND DESCRIBED IN SEVERAL PUBLICATIONS AND REPORTS (SEE COMMENTS). PERIODICALLY ADDITIONAL DATA SETS ARE ADDED. MOLECULAR VAPORS INCLUDED ARE OXYGEN, NITICUS OXIDE, WATER, METHANE, CHLOROFLUOROMETHANES, ALCOHOLS, ACETONE, BENZENE, CARBON TETRACHLORIDE, CARBON TETRAFLUORIDE, N-HEXANE, MERCURY, AND OTHERS.

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DOCUMENTATION

NONE

SOFTWARE/HARDWARE INFORMATION

SIZE.....: APPROXIMATELY 6000 RECORDS EACH 80 BYTES LONG

LANGUAGE...: NOT APPLICABLE

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 250 K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 67100
IN THE BIOLOGICAL AND ENVIRONMENTAL RESEARCH PROGRAMS OFFICE

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TITLE.....: NBS/ANL DATA BASE ON ELECTRON ENERGY-LOSS SPECTRA

TYPE.....: NUMERIC DATA BASE

CONTACT.....: RUSSELL H. HUEBNER
BIOLOGICAL AND ENVIRONMENTAL RESEARCH PROGRAMS
OFFICE
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3308)

SUBJECT COVERED: ELECTRON IMPACT SPECTRA FOR SELECTED MOLECULAR
GASES

KEY WORDS

ELECTRON COLLISIONS, MOLECULES, RADIATION ABSORPTION ANALYSIS,
ABSORPTION SPECTRA

ABSTRACT

THIS DATA BASE WAS OBTAINED FROM ELECTRON ENERGY-LOSS MEASUREMENTS MADE AT NBS WITH THE NBS MODEL AN-1 ELECTRON IMPACT SPECTROMETER IN A SCIENTIFIC COLLABORATIVE AGREEMENT WITH THE ANL CONTACT. INDIVIDUAL DATA SETS FROM INDIVIDUAL NBS RUNS ARE CATALOGUED ACCORDING TO MOLECULAR VAPOR STUDIED, DATE INCIDENT ELECTRON ENERGY, ENERGY-LOSS RANGE COVERED AND RUN NUMBER. PORTIONS OF THIS DATA BASE HAVE BEEN ANALYZED TO YIELD DATA CONTAINED IN THE "DATA BASE OF APPARENT OSCILLATOR STRENGTH DISTRIBUTIONS FOR A VARIETY OF MOLECULAR VAPORS." INDIVIDUAL DATA SETS ARE COMPOSED OF AN ARRAY OF NUMERIC INTENSITY VALUES (COUNTS) VERSUS ENERGY-LOSS VALUES (GIVEN IN ELECTRON VOLT UNITS) IN 10 MILLI-ELECTRON VOLT INCREMENTS AND ARE HEADED BY AN ALPHANUMERIC IDENTIFIER STRING FOR EACH DATA SET THAT CONTAINS IDENTIFYING TECHNICAL PARAMETERS.

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DOCUMENTATION

NONE

SOFTWARE/HARDWARE INFORMATION

SIZE.....: APPROXIMATELY 6000 RECORDS EACH 80 BYTES LONG

LANGUAGE...: NOT APPLICABLE

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 250 K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANI BUDGET ACTIVITY NUMBER 67100
IN THE BIOLOGICAL AND ENVIRONMENTAL RESEARCH PROGRAMS OFFICE

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**TITLE.....: HISTORICAL DATABASE ON ALL WEATHER STATIONS IN THE
U.S.A.**

TYPE.....: NUMERIC DATA BASE

**CONTACT....: FRANCIS C. KORMEGAY
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3206)**

SUBJECT COVERED: NATIONAL CLIMATE

KEY WORDS

WEATHER, CLIMATES, DAILY VARIATIONS

ABSTRACT

**CD-345 THREE HOUR REPORTS OF WEATHER CONDITIONS AT ALL CLASS
"A" STATIONS SINCE 1949. THIS DATA BASE WAS OBTAINED FROM THE
UNITED STATES NATIONAL WEATHER BUREAU. SEVERAL CLIMATIC
VARIABLES ARE ROUTINELY RECORDED ON A DAILY BASIS THROUGHOUT
THE U.S.A. THESE DATA ARE CONDENSED AND CONTAINED IN THE
WEATHER TAPES AT ARGONNE.**

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NATIONAL CLIMATIC CENTER

SOFTWARE/HARDWARE INFORMATION

SIZE.....: NONE

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH A 9-TRACK TAPE
DRIVE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 8M430
IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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**TITLE.....: A HISTORICAL DATABASE FOR TORNADIC STORMS IN THE
U.S.**

TYPE.....: NUMERIC DATA BASE

**CONTACT....: FRANCIS C. KORNEGAY
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(PTS 972-3206)**

SUBJECT COVERED: TORNADO OCCURENCES IN THE U.S.

KEY WORDS

TORNADOES, WEATHER, U.S.A.

ABSTRACT

**A NUMERICAL DATA BASE OF ALL REPORTED TORNADO OCCURENCES IN THE
U.S. SINCE 1951. INCLUDES, WHERE KNOWN, "FPP" SCALE DAMAGE,
LENGTH, AND WIDTH, LATITUDE-LONGITUDE OF OCCURENCE, APPROXIMATE
TIME OF OCCURENCE, AND OTHER PERTINENT DATA.**

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NATIONAL SEVERE STORMS FORECAST CENTER

SOFTWARE/HARDWARE INFORMATION

SIZE.....: NONE

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH A 9-TRACK TAPE
DRIVE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 84480
IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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TITLE.....: DATABASE OF ONSITE MULTIPLE LOCATION CONTINUOUS
MONITOR OF METEOROLOGICAL CHARACTERISTICS AT
ANACONDA URANIUM MILL

TYPE.....: NUMERIC DATA BASE

CONTACT.....: FRANCIS C. KORNEGAY
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3206)

SUBJECT COVERED: METEOROLOGICAL CONDITIONS AT ANACONDA MILL

KEY WORDS

WIND, TEMPERATURE, URANIUM, MILLING

ABSTRACT

A DATA BASE OF 1/2 HR RECORDS OF 10M WIND SPEED, WIND
DIRECTION, TEMPERATURE, AND ATMOSPHERIC STABILITY FROM 6/1977
TO PRESENT AT THE ANACONDA URANIUM MILL, GRANTS, N.M.

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NONE

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 14000 RECORDS EACH 40 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH A 9-TRACK TAPE
DRIVE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 8M477
IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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TITLE.....: COAL DATA BASE FOR BUREAU OF MINES RESERVE AND
ANALYTIC DATA

TYPE.....: NUMERIC DATA BASE

CONTACT.....: C. DAVID LIVENGOD
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(PTS 972-3281)

SUBJECT COVERED: COAL ANALYSIS AND RESERVES DATA

KEY WORDS

COAL, ANALYTIC, RESERVE, DATA, ENERGY SOURCES

ABSTRACT

AS A RESULT OF ITS STUDIES OF ENERGY SOURCES AND TECHNOLOGIES, ARGONNE NATIONAL LABORATORY HAS ACQUIRED ANALYTIC DATA ON MANY COALS IN LOCATIONS THROUGHOUT THE UNITED STATES AS WELL AS DATA ON KNOWN COAL RESERVES, ALSO IN THE UNITED STATES. DUE TO THE VOLUMINOUS NATURE OF THE COMBINED ANALYTIC AND RESERVE DATA, IT HAS BEEN INCORPORATED INTO A SYSTEM 2000 DATABASE TO FACILITATE EASIER, AS WELL AS QUICKER, DATA RETRIEVALS. THE ENTIRE DATA BASE IS ACCESSIBLE IN A BATCH ENVIRONMENT. A SMALLER, INTERACTIVE VERSION OF THIS DATABASE IS ALSO AVAILABLE WITH IBM'S TSO COMMAND LANGUAGE.

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NONE

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 13 MEGABYTES

LANGUAGE....: SYSTEM 2000

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 250K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER (NOT
AVAILABLE) IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

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TITLE.....: UNITED STATES DEATH RATES, 1915 TO PRESENT

TYPE.....: NUMERIC DATA BASE

CONTACT.....: HENRY F. LUCAS
RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-7136)

SUBJECT COVERED: AGE AND SEX SPECIFIC DEATH RATES BY CAUSE

KEY WORDS

DEATH, LIFE SPAN

ABSTRACT

TABLES OF AGE AND SEX SPECIFIC DEATH RATES BY CAUSE FOR AGES IN 5-YEAR INTERVALS FROM 0 TO 75 AND FOR TIME IN 5-YEAR INTERVALS FROM 1915 TO 1970. THIS DATA AND ASSOCIATED COMPUTER PROGRAMS HAVE BEEN ADJUSTED TO RUN UNDER THE STATISTICAL ANALYSIS SYSTEM.

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DOCUMENTATION

R. R. MONSON, COMPUTERS AND BIOMEDICAL RESEARCH 7, 325-332
(1974) .

SOFTWARE/HARDWARE INFORMATION

ALGORITHM...: THE EXPECTED MORTALITY BY CAUSE IS ACCUMULATED AND
THE RATIO OF OBSERVED TO EXPECTED IS PRESENTED FOR
EACH STUDY POPULATION.

SIZE.....: NONE

LANGUAGE....: NOT APPLICABLE

MACHINE CONFIGURATION: IBM 360/1950S/MVT WITH 250K CORE AND 1
DISK OR 1 9-TRACK TAPE DRIVE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER AML BUDGET ACTIVITY NUMBER 63300
IN THE RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION

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**TITLE.....: SURFACE MINING AND LAND RECLAMATION INFORMATION
SYSTEM**

TYPE.....: NUMERIC DATA BASE

**CONTACT.....: RONALD R. MACDONALD
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3266)**

SUBJECT COVERED: SURFACE MINING PERMIT DATA

KEY WORDS

COAL, MINING, MINING LAWS

ABSTRACT

**A SYSTEM 2000 DATA BASE IS BEING DEVELOPED TO STORE AND
RETRIEVE DATA FROM THE STATES ON THEIR SURFACE MINING PERMIT
FORMS.**

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TEST STAGE

SOFTWARE/HARDWARE INFORMATION

SIZE.....: NOT AVAILABLE

LANGUAGE....: SYSTEM 2000

MACHINE CONFIGURATION: IBM 360/75-370/195 OS/MVT WITH 200K COPE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER AML BUDGET ACTIVITY NUMBER 65610
IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

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**TITLE.....: CONCENTRATION OF RADON AND WORKING LEVEL AROUND
URANIUM MILLS AND MINE**

TYPE.....: NUMERIC DATA BASE

**CONTACT.....: MICHAEL H. MOMENI
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3134)**

**SUBJECT COVERED: RADON AND WORKING LEVEL CONCENTRATIONS AT
SELECTED MEASUREMENT LOCATIONS**

KEY WORDS

URANIUM, MILLING, RADON-222

ABSTRACT

**ATMOSPHERIC CONCENTRATION OF Rn-222 AND WORKING LEVEL WERE
MEASURED IN THE VICINITY OF URANIUM MILLING AND MINING-MILLING
COMPLEX AND BACKGROUND OVER ONE MONTH TO ONE YEAR. RADON
CONCENTRATION WAS MEASURED USING CONTINUOUS FLOW THROUGH
SCINTILLATION CELLS AND INTEGRATION TO HOURLY INTERVALS.
WORKING-LEVEL WAS MEASURED USING CONTINUOUS MEASUREMENT OF
AIRBORNE PO-218 AND PO-214 BY SURFACE BARRIER DETECTORS AND
INTEGRATION TO HOURLY INTERVALS.**

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DOCUMENTATION

NONE

SOFTWARE/HARDWARE INFORMATION

SIZE.....: NONE

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/EVT WITH A 9-TRACK TAPE
DRIVE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 8M477
IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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**TITLE.....: FEDERAL POWER COMMISSION MONTHLY ELECTRIC
STATISTICS BY STATE AND BY SECTOR**

TYPE.....: NUMERIC DATA BASE

**CONTACT....: ISHWAR P. MURARKA
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3125)**

**SUBJECT COVERED: MONTHLY SALES OF ELECTRICITY TO ULTIMATE
CONSUMERS**

KEY WORDS

ECONOMETRICS, ELECTRICAL POWER, FORECASTING, ECONOMY

ABSTRACT

**THE DATABASE HAS COLLECTED THE SALES OF ELECTRIC ENERGY TO
ULTIMATE CONSUMERS FROM THE MONTHLY SUMMARIES ISSUED BY THE
FEDERAL POWER COMMISSION. THE DATA CONSISTS OF SALES TO THE
RESIDENTIAL, COMMERCIAL, INDUSTRIAL AND OTHER CUSTOMERS. THE
INFORMATION IS GIVEN FOR EACH OF THE 50 STATES FOR THE FOUR
SECTORS ON A MONTHLY BASIS.**

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DOCUMENTATION

MONTHLY REPORTS ENTITLED "ELECTRIC POWER STATISTICS" PRODUCED
BY FEDERAL POWER COMMISSION FOR YEARS PRECEDING OCTOBER 1976.
NOW THE REPORT IS PUBLISHED BY THE DEPARTMENT OF ENERGY IN THE
FORM OF ENERGY DATA REPORTS.

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 13200 RECORDS EACH 80 BYTES LONG

LANGUAGE....: NOT APPLICABLE

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 250K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 8M461,
8M430 IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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TITLE.....: INVENTORY OF POWER PLANTS IN THE UNITED STATES

TYPE.....: NUMERIC DATA BASE

CONTACT.....: ISHWAR P. MURARKA
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3125)

SUBJECT COVERED: ELECTRIC GENERATING POWER PLANTS

KEY WORDS

ELECTRIC POWER, POWER PLANTS, ELECTRICAL ENERGY

ABSTRACT

THE DEPARTMENT OF ENERGY ASSEMBLES AN INVENTORY OF POWER PLANTS BY SURVEYING THE OPERATORS OF SUCH INSTALLATIONS. A COMPUTER DATA FILE CONSISTING OF SEVERAL CLASSIFICATION VARIABLES AND THE DATA ON CAPACITY AND TYPE OF THE UNITS IS MAINTAINED. PERIODIC UPDATING IS DONE. THE DATA FILE INCLUDES THE PLANNED ADDITIONS IN THE NEXT 7-8 YEARS. INFORMATION IN THIS DATA SET IS ALPHANUMERIC AND CAN BE USED FOR DISTRIBUTION ANALYSIS OF THE POWER PLANTS.

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DOCUMENTATION

U.S. DEPARTMENT OF ENERGY, "INVENTORY OF POWER PLANTS IN THE
UNITED STATES", DECEMBER 1977

SOFTWARE/HARDWARE INFORMATION

SIZE.....: ABOUT ONE MILLION CHARACTERS

LANGUAGE...: NONE

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH A 9-TRACK TAPE
DRIVE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 9M480
IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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TITLE.....: NONRADIOLOGICAL ENVIRONMENTAL DATA FROM SELECTED
NUCLEAR POWER PLANTS.

TYPE.....: NUMERIC DATA BASE

CONTACT.....: ISHWAR P. MURARKA
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(PTS 972-3125)

SUBJECT COVERED: ECOLOGY AND ENVIRONMENT

KEY WORDS

ENVIRONMENTAL IMPACTS, ECOLOGY, BIOLOGICAL EFFECTS, NUCLEAR
POWER PLANTS, ENVIRONMENTAL EFFECTS, MONITORING

ABSTRACT

THESE DATA PROVIDED THE BASIS FOR EVALUATING AND ESTIMATING THE
ENVIRONMENTAL EFFECTS OF THE NUCLEAR POWER PLANT OPERATIONS.
THE DATASETS CONTAIN BIOTIC AND ABIOTIC MEASUREMENTS MADE ON
THE VARIOUS ECOSYSTEMS WHERE THE POWER PLANTS ARE LOCATED. THE
PHYSICAL SEQUENTIAL DATAFILES RELATE TO KEWAUNEE, ZION, PRAIRIE
ISLAND, QUAD CITIES, DUANE ARNOLD, NINE MILE POINT, THREE MILE
ISLAND AND D.C. COCK PLANTS. A TYPICAL DATA SET CONSISTS OF
MEASUREMENTS ON PHYTOPLANKTON, ZOOPLANKTON, BENTHOS, FISH
DISTRIBUTION, FISH IMPINGEMENT, AND HYDROTHERMAL MAPPING.

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DOCUMENTATION

I.P. MURARKA ET AL. "AN EVALUATION OF ENVIRONMENTAL DATA
RELATING TO SELECTED NUCLEAR PLANT SITES", ANL/EIS-1 THROUGH
ANL/EIS-9, ARGONNE NATIONAL LABORATORY, 1976-1977.

SOFTWARE/HARDWARE INFORMATION

SIZE.....: VARIABLE # OF RECORDS FOR EACH CATEGORY

LANGUAGE...: NOT APPLICABLE

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 200K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 84461
IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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TITLE.....: WEEKLY ELECTRICITY OUTPUT DATA FOR THE TEN NATIONAL
RELIABILITY COUNCIL REGIONS IN THE U.S.

TYPE.....: NUMERIC DATA BASE

CONTACT.....: ISHWAR P. MURARKA
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(PTS 972-3125)

SUBJECT COVERED: ELECTRICITY GENERATION DATA

KEY WORDS

ECONOMETRICS, ELECTRICAL ENERGY, FORECASTING MODEL

ABSTRACT

THIS COMPLETE SET OF DATA GIVES THE HISTORICAL WEEKLY
GENERATION OF ELECTRICAL ENERGY FOR THE 10 NATIONAL RELIABILITY
COUNCIL REGIONS. THE DATA ARE GENERATED BY THE EDISON ELECTRIC
INSTITUTE FROM THEIR STANDARD SURVEY CONDUCTED ON A VOLUNTARY
PARTICIPATION BY THE ELECTRIC UTILITY COMPANIES. WE ARE USING
THIS DATA IN ECONOMETRIC ANALYSIS AND MODELLING FOR FORECASTING
OF ELECTRICITY NEEDS.

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DOCUMENTATION

WEEKLY SUMMARY STATISTICS SHEETS ISSUED TO SUBSCRIBERS BY THE
EDISON ELECTRIC INSTITUTE, NEW YORK.

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 1560 RECORDS EACH 90 BYTES LONG

LANGUAGE...: NOT APPLICABLE

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 200K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 8M461,
8M430 IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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TITLE.....: ENVIRONMENTAL CONTROL TECHNOLOGY SYSTEM 2000 DATA
BASE

TYPE.....: NUMERIC DATA BASE

CONTACT.....: JOHN E. REITER
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-7597)

SUBJECT COVERED: ENVIRONMENTAL DATA FROM COAL STRIP MINES

KEY WORDS

COAL MINING, SURFACE MINING, OVERBURDEN, WATER QUALITY, WATER
POLLUTION, WATER POLLUTION CONTROL, ACID MINE DRAINAGE,
ENVIRONMENTAL ENGINEERING, POLLUTION CONTROL EQUIPMENT

ABSTRACT

ENVIRONMENTALLY-RELATED DATA HAS BEEN COLLECTED FROM 22 STRIP
MINES IN THE CENTRAL AND EASTERN U.S. AND IS BEING CONSOLIDATED
INTO A DATA BASE. DATA COLLECTED INCLUDES WATER QUALITY, COAL
CHEMISTRY, OVERBURDEN CHEMISTRY, PRECIPITATION MEASUREMENTS,
AND TYPE OF POLLUTION CONTROL METHODS USED. THIS DATA WILL BE
ANALYZED MAINLY TO DETERMINE WHICH FACTORS AFFECT THE QUALITY
OF MINE EFFLUENTS AND TO DETERMINE THE COST-EFFECTIVENESS OF
VARIOUS EFFLUENT TREATMENT METHODS. THIS DATA BASE MAY BE
EXPANDED TO INCLUDE DATA FROM MANY MORE MINES -- ESPECIALLY
WESTERN U.S. MINES.

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IN PREPARATION AS OF 5/78

SOFTWARE/HARDWARE INFORMATION

SIZE.....: SEVERAL MILLION BYTES

LANGUAGE....: SYSTEM 2000

MACHINE CONFIGURATION: IBM 360/75-370/195 WITH 220K CORE FOR
SYSTEM 2000 NATURAL LANGUAGE OR 360K FOR
PROCEDURAL LANGUAGE, AND DISC STORAGE
EQUIVALENT TO 800 TRACKS ON A 3330 DISC.

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 65908
IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

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TITLE.....: DRESDEN FOG OBSERVATIONS, WINTER 76-77

TYPE.....: NUMERIC DATA BASE

CONTACT.....: JACK D. SHANNON
RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-5807)

SUBJECT COVERED: STEAM FOG OVER COOLING PONDS

KEY WORDS

METEOROLOGY, COOLING POND, STEAM FOG

ABSTRACT

THE DATA CONSIST OF WEEKLY HYGROTHERMOGRAPH STRIP CHARTS, WATER TEMPERATURE STRIP CHARTS, AND TWICE-DAILY OBSERVATIONS OF FOG CONDITIONS OVER THE COOLING PONDS AT THE COMMONWEALTH EDISON DRESDEN STATION. THE DATA (PARTLY INCOMPLETE) WERE TAKEN FROM LATE NOVEMBER 1976 THROUGH APRIL 1977.

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DOCUMENTATION

SHANNON, J.D. AND R.G. EVERET, 1978: EFFECT OF THE SEVERE
WINTER UPON A COOLING POND FOG STUDY. BULLETIN OF THE AMERICAN
METEOROLOGICAL SOCIETY, 59, 60-61

SOFTWARE/HARDWARE INFORMATION

SIZE.....: NONE

LANGUAGE....: NONE

MACHINE CONFIGURATION: NONE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 66250
IN THE RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION

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**TITLE.....: METEOROLOGICAL AND POLLUTANT PROFILES FROM PNL
AIRCRAFT, MAP3S-DACSE-I**

TYPE.....: NUMERIC DATA BASE

**CONTACT....: JACK D. SHANNON
RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(PTS 972-5807)**

SUBJECT COVERED: METEOROLOGICAL AND AIR QUALITY PROFILES

KEY WORDS

METEOROLOGY, AIR POLLUTION, CROSS-SECTION

ABSTRACT

**THE DATA ARE ONE-SECOND VALUES OF TEMPERATURE, HUMIDITY, WIND,
PRESSURE, ULTRA-VIOLET RADIATION, B-SCDT, AND CONCENTRATIONS OF
OZONE, SULFUR DIOXIDE, AND NITRIC OXIDES, TAKEN DURING 4
FLIGHTS WITH NUMEROUS VERTICAL SOUNDINGS.**

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DIAGNOSTIC ATMOSPHERIC CROSS-SECTION EXPERIMENT, ANL/BER
TOPICAL REPORT (IN PROGRESS)

SOFTWARE/HARDWARE INFORMATION

SIZE.....: ONE 9-TRACK TAPE

LANGUAGE...: NOT APPLICABLE

MACHINE CONFIGURATION: IBM 370/195 OS/EVI WITH A 9-TRACK TAPE
DRIVE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER (NOT
AVAILABLE) IN THE RADIOLOGICAL AND ENVIRONMENTAL RESEARCH
DIVISION

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TITLE.....: SORE EMISSION INVENTORY

TYPE.....: NUMERIC DATA BASE

CONTACT.....: JACK D. SHANNON
RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-5807)

SUBJECT COVERED: EMISSIONS OF SO₂, NO_x, AND PARTICULATES.

KEY WORDS

SULFUR DIOXIDE, AIR POLLUTION, PARTICLES

ABSTRACT

THE TAPE CONTAINS EMISSIONS OF SO₂, NO_x, AND PARTICULATES FOR A GRID OF 80KM SQUARE BLOCKS; FOR EACH OF THREE LAYERS (0-300M, 300-700M, AND 700M-1000M). EMISSIONS ARE GIVEN FOR UTILITY SOURCES AND FOR ALL SOURCES.

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DOCUMENTATION

NONE

SOFTWARE/HARDWARE INFORMATION

SIZE.....: NONE

LANGUAGE....: NOT APPLICABLE

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH A 9-TRACK TAPE
DRIVE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 66100
IN THE RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION

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TITLE.....: LAND USE AND SURFACE ROUGHNESS OVER U.S. AND
SOUTHERN CANADA

TYPE.....: NUMERIC DATA BASE

CONTACT.....: CHING-MING SHEIH
RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-5828)

SUBJECT COVERED: LAND USE AND SURFACE ROUGHNESS

KEY WORDS

LAND USE, U.S.A., CANADA

ABSTRACT

LAND-USE DATA ARE ASSIGNED IN AN AREA OF 0.5 DEGREE LONGITUDE
AND LATITUDE RESOLUTION AND COVERING THE REGION FROM 58.0 TO
106.5 WEST LONGITUDE AND FROM 24.0 TO 50.5 NORTH LATITUDE.

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DOCUMENTATION

NOT AVAILABLE

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 197 RECORDS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT

ACKNOWLEDGMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 66103
IN THE RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION

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TITLE.....: DEPOSITION VELOCITY MAPS OF SO₂ AND SO₄ OVER U.S.
AND PART OF CANADA

TYPE.....: NUMERIC DATA BASE

CONTACT....: CHING-MING SHEIH
RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-5828)

SUBJECT COVERED: ATMOSPHERIC POLLUTANT DISPERSION

KEY WORDS

AIR POLLUTION, METEOROLOGY, DEPOSITION VELOCITY

ABSTRACT

A REGIONAL-SCALE SURFACE DEPOSITION VELOCITY DATA BANK FOR SO₂ AND SO₄ HAS BEEN DEVELOPED FOR THE REGION EAST OF THE ROCKY MOUNTAINS OVER THE U.S. AND SOUTHERN CANADA. THE SURFACE DEPOSITION VELOCITIES ARE COMPUTED FROM THE EQUATIONS AVAILABLE IN THE LITERATURES TOGETHER WITH LAND-USE MAP, A LIST OF SURFACE RESISTANCES OF VARIOUS VEGETATIONS AND ASSIGNED ATMOSPHERIC CONDITIONS. THE LAND-USE MAP AND CONSEQUENTLY THE LIST OF SURFACE RESISTANCES ARE CLASSIFIED INTO WINTER AND SUMMER; WHEREAS THE ATMOSPHERIC CONDITIONS ARE DIVIDED INTO TRADITIONAL A TO F PASQUILL CATEGORIES. COMPUTATIONS ARE MADE FOR EACH COMBINATION OF THE ABOVE VARIABLES. THE SPATIAL RESOLUTION IS 0.5 DEGREE LONGITUDE AND LATITUDE COVERING THE REGION FROM 68.0 TO 106.5 WEST LONGITUDE AND FROM 24.0 TO 50.5 NORTH LATITUDE. THE RESULTS CAN BE USED IN A NUMERICAL MODEL FOR PREDICTING REGIONAL-SCALE SURFACE DEPOSITION OF SO₂ AND SO₄.

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DOCUMENTATION

C.M. SHEIH AND M.L. WESELY, "SURFACE DEPOSITION VELOCITY MAPS OF
SO2 AND SO4 OVER U.S. AND SOUTHERN CANADA", SUBMITTED TO APCA.

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 14227 RECORDS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH A 9-TRACK TAPE
DRIVE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 66100
IN THE RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION

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TITLE.....: ATMOSPHERIC SOUNDINGS ALONG A CROSS-SECTION MO-NY

TYPE.....: NUMERIC DATA BASE

CONTACT.....: DOUGLAS L. SISTEPSON
RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(PTS 972-5836)

SUBJECT COVERED: NWS RAWINSONDE SOUNDINGS

KEY WORDS

METEOROLOGY, CROSS SECTION, ATMOSPHERE

ABSTRACT

THE DATA CONSISTS ATMOSPHERIC SOUNDINGS TO 500MB OF
TEMPERATURE, HUMIDITY, WIND, AND PRESSURE, TAKEN FIVE TIMES
DAILY (0800, 1200, 1500, 2000, AND 0000Z) AT SALEM, ILL., DAYTON,
O. AND PITTSBURGH, PA. AND TWICE DAILY (1200 AND 0000Z) AT
MONET, MO. AND NEW YORK CITY. THE TOPICAL REPORT IN PROGRESS
CONTAINS ANALYSES OF THE DATA.

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DOCUMENTATION

SISTERSON, D.L., 1978: THE FIRST MAP3S DIAGNOSTIC ATMOSPHERIC
CROSS-SECTION EXPERIMENT (DACSE-I) 1-10 AUGUST 1977. ANL/PER
TOPICAL REPORT (IN PROGRESS)

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 10000 RECORDS EACH 80 BYTES LONG

LANGUAGE...: NOT APPLICABLE

MACHINE CONFIGURATION: NONE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 66100
IN THE RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION

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TITLE.....: PHOTOSYNTHESIS RATES, DIFFUSION RESISTANCES, &
ENVIRONMENTAL PARAMETERS OF FIELD-GROWN SOYBEANS
UNDER SO₂ STRESS

TYPE.....: NUMERIC DATA BASE

CONTACT....: DOUGLAS G. SPRUGEL
RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FIS 972-4212)

SUBJECT COVERED: AIR POLLUTION EFFECTS ON PLANTS

KEY WORDS

SULFUR DIOXIDE, PHOTOSYNTHESIS, SOYBEAN PLANTS, SOYBEANS

ABSTRACT

FIELD-GROWN SOYBEANS WERE FUMIGATED WITH ELEVATED LEVELS OF
SULFUR DIOXIDE ON 24 DATES IN 1977. DURING SOME OF THE
FUMIGATIONS PHOTOSYNTHETIC RATES, ETC. WERE MONITORED AMONG THE
FUMIGATED PLANTS. EACH OBSERVATION INCLUDES DATE, TIME, SO₂
CONCENTRATION, LEAF NUMBER, INSOLATION, AIR TEMPERATURE,
DIFFUSIVE RESISTANCE, AND PHOTOSYNTHETIC RATE FOR ONE LEAF.
EACH SET OF DATA FOR FUMIGATED PLANTS IS MATCHED BY
SIMULTANEOUS DATA FOR CONTROL PLANTS IN AN UNFUMIGATED AREA.
SO₂ CONCENTRATIONS RANGE FROM 60 TO 1150 PPB IN THE FUMIGATED
PLOTS.

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DOCUMENTATION

MULLER, R.M., J.E. MILLER, D.G. SPRUGEL, AND H.J. SMITH:
:"PHOTOSYNTHETIC RESPONSE OF FIELD-GROWN SOYBEANS TO
FUMIGATIONS WITH SULFUR DIOXIDE", ANL 77-65-III (RER DIVISION
ANNUAL REPORT FOR 1977, ECOLOGICAL SCIENCES SECTION).

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 1500 CARDS EACH 80 BYTES LONG

LANGUAGE...: NOT APPLICABLE

MACHINE CONFIGURATION: NONE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 65100
IN THE RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION

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TITLE.....: BODY TEMPERATURES OF FISHES CAUGHT IN A THERMAL
DISCHARGE AREA OF LAKE MICHIGAN

TYPE.....: NUMERIC DATA BASE

CONTACT....: MICHAEL M. THOMMES
RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FIS 972-4207)

SUBJECT COVERED: FISH BODY TEMPERATURES

KEY WORDS

LAKE MICHIGAN, THERMAL POLLUTION, FISHES, TEMPERATURE EFFECTS,
WATER POLLUTION, TEMPERATURE MONITORING

ABSTRACT

DATA BASE CONSTRUCTED FROM SPORT FISHING SURVEY CONDUCTED
1972-1973 AT POINT BEACH NUCLEAR PLANT, TWO RIVERS, WISCONSIN.
INPUT CONTAINS SPECIES NAME, YEAR, DATE & HOUR OF CAPTURE,
TOTAL LENGTH, WEIGHT, SEX, BODY TEMPERATURE, INTAKE AND
DISCHARGE TEMPERATURES AT PLANT AT TIME OF CAPTURE.

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DOCUMENTATION

S.A. SPIGARELLI ET AL, "BODY TEMPERATURE CHARACTERISTICS OF
FISH AT A THERMAL DISCHARGE ON LAKE MICHIGAN, THERMAL ECOLOGY",
AEC SYMPOSIUM SERIES NO. CONF-730505, PP. 119-132.

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 2000 CARDS EACH 80 BYTES LONG

LANGUAGE...: NONE

MACHINE CONFIGURATION: IBM 370/195 OS/MVT

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 65222
IN THE RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION

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TITLE.....: RATES OF CHANGE IN BODY TEMPERATURE OF EIGHT
SPECIES OF LAKE MICHIGAN FISHES

TYPE.....: NUMERIC DATA BASE

CONTACT....: MICHAEL M. THOMMES
RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(TEL 972-4267)

SUBJECT COVERED: HEATING AND COOLING RATES IN FISH

KEY WORDS

FISHES, TEMPERATURE, WEIGHT, HEAT

ABSTRACT

DATA BASE CONSISTS OF HEATING AND COOLING RATES OF VARIOUS LAKE MICHIGAN FISHES. INPUT CONFIGURATION IS SPECIES NAME, DATE, DIRECTION OF CHANGE, TOTAL LENGTH, WEIGHT, GIRTH, CONDITION FACTOR, TIME CHANGE, & TEMPERATURE CHANGE.

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PAGE 2

DOCUMENTATION

S.A. SPISARELLI ET AL (1977). "THE INFLUENCE OF BODY WEIGHT ON
HEATING AND COOLING OF SELECTED LAKE MICHIGAN FISHES", J. COMP.
BIOCHEM. PHYSIOL. 56A, 51-57

T.L. BEITINGER ET AL (1977). "RELATIVE ROLES OF CONDUCTION AND
CONVECTION IN THE BODY TEMPERATURE CHANGE OF GIZZARD SHAD", J.
COMP. BIOCHEM. PHYSIOL. 57A, 275-279

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 200 CARDS EACH 80 BYTES LONG

LANGUAGE....: NONE

MACHINE CONFIGURATION: IBM 370/195 OS/MVT

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 65222
IN THE RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION

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TITLE.....: FISH DENSITY BY ECHOLOCATION TECHNIQUE:
COMPARISONS BETWEEN THERMAL PLUMES AND AMBIENT
TEMPERATURE AREAS IN LAKE MICHIGAN

TYPE.....: NUMERIC DATA BASE

CONTACT.....: MICHAEL M. THOMNES
RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 372-4207)

SUBJECT COVERED: FISH DENSITIES IN THERMAL/REFERENCE AREAS

KEY WORDS

LAKE MICHIGAN, FISHES, POPULATION DENSITY, TEMPERATURE
MONITORING

ABSTRACT

DATA BASE CONSTRUCTED FROM SIMULTANEOUS ECHO LOCATION AND PLUME
MAPPING CONSISTING OF FISH DENSITIES SUBDIVIDED BY THREE MAJOR
CATEGORIES: DISTANCE, DEPTH, AND TEMPERATURE

SURVEY OF BIOMEDICAL AND ENVIRONMENTAL
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DOCUMENTATION

S. A. SPIGARELLI ET AL (1973). "A TECHNIQUE FOR SIMULTANEOUS
ECHO LOCATION OF FISH AND THERMAL PLUME MAPPING", TRANS. AM.
FISH. SOC. 102, 462-466

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 6000 CARDS EACH 80 BYTES LONG

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 65222
IN THE RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION

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TITLE.....: RECORDS OF INTERNAL (BODY) AND EXTERNAL (WATER)
TEMPERATURES FOR BROWN AND RAINBOW TROUT RESIDING
IN THERMAL EFFLUENT AREAS OF LAKE MICHIGAN

TYPE.....: NUMERIC DATA BASE

CONTACT.....: MICHAEL M. THOMMES
RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-4207)

SUBJECT COVERED: SALMONID THERMOREGULATION NEAR THERMAL
DISCHARGES

KEY WORDS

LAKE MICHIGAN, TELEMETRY, FISHES, TEMPERATURE MONITORING, DATA
TRANSMISSION

ABSTRACT

THIS DATA BASE CONSISTS OF TWO DISTINCT PARTS. PART ONE IS RAW
FIELD DATA COLLECTED ON MAGNETIC TAPE. SINCE MONITORING
STATION WAS PERMANENTLY LOCATED FISH TRACKS CAN VARY FROM
MINUTES TO SEVERAL DAYS. ALSO FREQUENCY OF OBSERVATIONS FOR
EACH FISH CAN VARY FROM 6/MIN TO 0.5/MIN DEPENDING ON HOW MANY
FISH ARE BEING TRACKED AT ONE TIME. PART 2 CONSISTS OF PUNCHED
CARDS CONSTRUCTED FROM FIELD DATA OF FISH WITH REASONABLE
LENGTH TRACKS. EACH RECORD CONTAINS IDENTIFICATION NUMBER,
TIME+DATE, REFERENCE, AND CROSS CHECKS ON BODY AND EXTERNAL
WATER TEMPERATURES.

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DOCUMENTATION

NONE

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 20 TAPES. PART I: 30000 RECORDS/TAPE; PART II:
10000 CARDS

LANGUAGE....: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 250K CORE AND ONE
9 TRACK TAPE DRIVE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER AML BUDGET ACTIVITY NUMBER 65222
IN THE RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION

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TITLE.....: SALMONID MIGRATION IN LAKE MICHIGAN RELATIVE TO
THERMAL EFFLUENTS

TYPE.....: NUMERIC DATA BASE

CONTACT....: MICHAEL M. THOMMES
RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(PTS 972-4207)

SUBJECT COVERED: NONE

KEY WORDS

LAKE MICHIGAN, FISHES, MIGRATION, POPULATION DYNAMICS

ABSTRACT

DATA BASE CONSISTS OF TWO PARTS. PART ONE IS TAGGING
INFORMATION: TAG NUMBER, DATE AND TIME, FISH SPECIES, WEIGHT,
TOTAL LENGTH, AND TAGGING LOCATION. PART TWO IS FISH RECAPTURE
INFORMATION: SPECIES, DAYS OUT, DISTANCE TRAVELED, METHOD OF
CAPTURE AND DIRECTION HEADING.

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DOCUMENTATION

G.P. ROMBERG ET AL (1974). "MIGRATORY BEHAVIOR OF FISH TAGGED
AT A NUCLEAR POWER PLANT DISCHARGE INTO LAKE MICHIGAN", PROC
17TH CONF. ON GREAT LAKE RESEARCH. HAMILTON, ONTARIO. PART 1,
PP 68-77.

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 3000 CARDS EACH 80 BYTES LONG

LANGUAGE....: NONE

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 250K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 65222
IN THE RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION

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TITLE.....: SPORT FISHING CENSUS AT THE POINT BEACH N.P.P.,
LAKE MICHIGAN

TYPE.....: NUMERIC DATA BASE

CONTACT....: MICHAEL M. THOMMES
RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-4207)

SUBJECT COVERED: SPORT FISHING CENSUS AT THERMAL DISCHARGE

KEY WORDS

LAKE MICHIGAN, FISHES, HARVESTING, FISHING INDUSTRY

ABSTRACT

A SPORT FISHING SURVEY WAS CONDUCTED DURING 1973 AT POINT BEACH
NUCLEAR POWER PLANT, DATA CONSISTS OF DATE, INTAKE TEMPERATURE,
DISCHARGE TEMPERATURE, TOTAL MAN-HOURS/DAY, VARIOUS SPECIES OF
FISH (TOTAL AND CREELED NUMBER/DAY).

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DOCUMENTATION

S.A. SPIGARELLI AND M.M. THOMMES (1976). SPORT FISHING AT A
THERMAL DISCHARGE INTO LAKE MICHIGAN. J. GREAT LAKES RES. 2:
99-110.

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 300 CARDS EACH 80 BYTES LONG

LANGUAGE...: NONE

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 250K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 65222
IN THE RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION

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TITLE.....: TURBIDITY OBSERVATIONS IN THE NORTHEAST - 1977

TYPE.....: NUMERIC DATA BASE

CONTACT.....: MARVIN L. WESELY
RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-5327)

SUBJECT COVERED: MEASUREMENTS OF AEROSOL EXTINCTION COEFFICIENT

KEY WORDS

TURBIDITY, SOLAR RADIATION, AEROSOL MONITORING

ABSTRACT

HAZE OCCURS ON A REGIONAL SCALE IN THE MIDWEST AND THE NORTHEAST, ON AN EPISODIC BASIS CLOSELY ASSOCIATED WITH SYNOPTIC CONDITIONS. TEN STATIONS PROVIDE DATA ON THE INTENSITY OF THE HAZE IN THE MAP3S REGION (NORTHEASTERN QUARTER OF THE U.S.) AND SOUTHERN ONTARIO. A MEASURE OF THE INTENSITY IS GIVEN BY THE AEROSOL OPTICAL DEPTH, OR EXTINCTION COEFFICIENT, DETERMINED AT EACH SITE BY USE OF MEASUREMENTS OF THE DIRECT-BEAM SOLAR IRRADIANCE. DATA FOR 1 APR. - 1 NOV. OF 1977 AND 1978 ARE TO BE STORED FOR USE IN THE MAP3S DATA BANKS.

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DOCUMENTATION

J.D. SHANNON, M.L. WESELY, AND P.J. BRADY. "OBJECTIVE SENSOR
PLACEMENT FOR SAMPLING REGIONAL TURBIDITY", ATMOSPHERIC
ENVIRONMENT 12, 937-943, 1978

SOFTWARE/HARDWARE INFORMATION

SIZE.....: NOT AVAILABLE

LANGUAGE....: NOT APPLICABLE

MACHINE CONFIGURATION: IBM 370/195 OS/MVT

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 66100
IN THE RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION

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TITLE.....: GROSS AUTOPSY DATA OF CONTROL AND
NEUTRON-IRRADIATED B6C3F1 MICE

TYPE.....: NUMERIC DATA BASE

CONTACT....: FRANK S. WILLIAMSON
BIOLOGICAL AND MEDICAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3964)

SUBJECT COVERED: LIMITED AUTOPSY OBSERVATIONS AND INTERIM
DIAGNOSES

KEY WORDS

MICE, IRRADIATION, AUTOPSY, DEATH

ABSTRACT

EACH RECORD CONTAINS: (1) ANIMAL ID; (2) AUTOPSY NUMBER; (3)
AUTOPSY DATE; (4) EXIT CODE; (5) PROSECTOR ID; (6) TISSUE
NUMBER; (7) TUMOR (PRESENT/NOT PRESENT); (8) CAUSE OF DEATH;
(9) VARYING NUMBER OF 3 AND 4-LETTER DIAGNOSTIC CODES; (10)
COMMENT.

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DOCUMENTATION

NONE

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 9152 RECORDS FOR A TOTAL OF 764.5 K BYTES AND
GROWING

LANGUAGE....: NOT APPLICABLE

MACHINE CONFIGURATION: IBM 360/75-370/195 OS/MVT

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 60300
IN THE BIOLOGICAL AND MEDICAL RESEARCH DIVISION

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**TITLE.....: HISTOPATHOLOGY DATA AND FINAL AUTOPSY DECISION ON
CONTROL AND IRRADIATED B6C3F1 MICE**

TYPE.....: NUMERIC DATA BASE

**CONTACT.....: FRANK S. WILLIAMSON
BIOLOGICAL AND MEDICAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3864)**

SUBJECT COVERED: HISTOPATHOLOGY AND FINAL DIAGNOSES

KEY WORDS

MICE, IRRADIATION, AUTOPSY, HEMATOLOGY, HISTOLOGY

ABSTRACT

**EACH RECORD CONTAINS: (1) ANIMAL ID; (2) TISSUE NUMBER; (3)
AUTOPSY NUMBER; (4) EXAM DATE; (5) PROSECTOR ID; (5)
TUMOR/NOT TUMOR CAUSE OF DEATH; (7) HEMATOLOGY FLAG; (8)
CAUSE OF DEATH; (9) VARYING NUMBER OF FINDINGS: 4-LETTER
CODES, PLUS LETHAL/NON-LETHAL/CONTRIBUTORY INDICATOR, PLUS
(DETERMINED BY HISTOLOGY) FLAG; (10) COMMENT. THIS RECORD
CONTAINS GROSS AUTOPSY DIAGNOSES WHICH HAVE BEEN CONFIRMED.**

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DOCUMENTATION

NONE

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 6510 RECORDS FOR A TOTAL OF 877.5 K BYTES

LANGUAGE....: NOT APPLICABLE

MACHINE CONFIGURATION: IBM 360/75-370/195 OS/HVT

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 60300
IN THE BIOLOGICAL AND MEDICAL RESEARCH DIVISION

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TITLE.....: IRRADIATION AND DOSIMETRY AUDIT TRAILS, 56CF1
NEUTRON AND GAMMA IRRADIATED MICE

TYPE.....: NUMERIC DATA BASE

CONTACT....: FRANK S. WILLIAMSON
BIOLOGICAL AND MEDICAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3864)

SUBJECT COVERED: DOSIMETRY DATA

KEY WORDS

IRRADIATION, MICE, DOSIMETRY, NEUTRON DOSIMETRY, GAMMA DOSIMETRY

ABSTRACT

EACH RECORD REPRESENTS 1 IRRADIATION, OR SHAD IRRADIATION, ON 1
CAGE OF ANIMALS. THE PHYSICAL LOCATION OF THE ANIMALS IN THE
TREATMENT EXPERIMENTAL FACILITY IS RECORDED, TOGETHER WITH THE
CAGE ID AND THE DATE. EVENTUALLY PROGRAMS WILL BE WRITTEN
WHICH MERGE EXPOSURE MONITORING DATA WITH THE RECORDS AND
COMPUTE DOSES RECEIVED.

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DOCUMENTATION

NONE

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 129704 RECORDS FOR A TOTAL OF 8301.1 K BYTES AND
GROWING

LANGUAGE....: NOT APPLICABLE

MACHINE CONFIGURATION: IBM 360/75-370/195 OS/EVT

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER AML BUDGET ACTIVITY NUMBER 60300
IN THE BIOLOGICAL AND MEDICAL RESEARCH DIVISION

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TITLE.....: SURVIVAL DATA FROM CONTROL, GAMMA IRRADIATION, AND
NEUTRON-IRRADIATED B6CF1 MICE

TYPE.....: NUMERIC DATA BASE

CONTACT.....: FRANK S. WILLIAMSON
BIOLOGICAL AND MEDICAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3864)

SUBJECT COVERED: EXPERIMENTAL RAW DATA

KEY WORDS

IRRADIATION, SURVIVAL TIME, MICE

ABSTRACT

A WORKING DATA BASE CONTAINING DATA ON BOTH PAGES OF ANIMALS
AND INDIVIDUAL ANIMALS: (1) DATES OF BIRTH, EXPERIMENTAL
IRRADIATION, RELOCATION AND (2) EXIT FROM THE EXPERIMENT; (3)
PHYSICAL LOCATIONS IN ANIMAL QUARTERS; (4) MODE OF EXIT FROM
THE EXPERIMENT; (5) SPECIES/STRAIN.

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DOCUMENTATION

NONE

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 62024 RECORDS FOR A TOTAL OF 4465.8 K BYTES AND
GROWING

LANGUAGE....: NOT APPLICABLE

MACHINE CONFIGURATION: IBM 360/75-370/195 OS/MVT

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER AML BUDGET ACTIVITY NUMBER 60300
IN THE BIOLOGICAL AND MEDICAL RESEARCH DIVISION

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TITLE.....: PROJECTED FUEL USAGE FOR NUCLEAR REACTORS

TYPE.....: NUMERIC DATA BASE

CONTACT.....: ALBIN J. ZIELEN
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(PTS 972-3132)

SUBJECT COVERED: PROJECTED FUEL USAGE SCHEME FOR EACH YEAR OF
THE ASSUMED 30-YEAR LIFE FOR 225 COMMERCIAL
NUCLEAR REACTORS PLANNED FOR U.S.

KEY WORDS

NUCLEAR POWER PLANTS, NUCLEAR FUELS, FUEL ELEMENTS, SPENT FUEL
STORAGE, SPENT FUEL ELEMENTS

ABSTRACT

SYSTEM 2000 DATA BASE FOR ALL 225 COMMERCIAL 'B' AND 'P'
REACTORS PLANNED FOR U.S. PRIMARY INFORMATION STORED IS A
PROJECTED FUEL USAGE SCHEME FOR EACH REACTOR FOR EACH YEAR OF A
30-YEAR LIFE. APPROXIMATELY 150 DATA ITEMS ARE AVAILABLE FOR
EACH REACTOR. AMONG THEM ARE: DESIGN MEGAWATTS, TYPE, STATUS
(ON-LINE, IN CONSTRUCTION, PLANNED), YEAR GOING COMMERCIAL,
LOCATION (COUNTY AND STATE), AND SUBSET CLASS (FJSS, FEA, AND
TOTAL).

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DOCUMENTATION

NONE

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 613,000 CHARACTERS (BYTES)

LANGUAGE...: SYSTEM 2000

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 300K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 8M479,
8M481 IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

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**TITLE.....: SELECTED DATA ON VARIOUS INDUSTRIAL ENERGY COSTS
AND USES**

TYPE.....: NUMERIC DATA BASE

**CONTACT.....: ALBIN J. ZIELEN
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3132)**

SUBJECT COVERED: INDUSTRIAL ENERGY COSTS AND ECONOMIC DATA

KEY WORDS

INDUSTRY, ECONOMICS, PRODUCTION, ENERGY COSTS, EMPLOYEES

ABSTRACT

**SYSTEM 2000 DATA BASE ORGANIZED ON BASIS OF STANDARD INDUSTRIAL
CODES. CONTAINS 1966-1975 ANNUAL VALUES FOR VARIOUS ECONOMIC
QUANTITIES SUCH AS: PER PRODUCTION INDEX, ENERGY COSTS,
EMPLOYEES, PAYROLL, PRODUCTION DATA, VALUE ADDED, COST OF
MATERIALS, VALUE OF SHIPMENTS.**

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NONE

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 873,000 CHARACTERS (BYTES)

LANGUAGE....: SYSTEM 2000

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 300K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 85430
IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

SURVEY OF BIOMEDICAL AND ENVIRONMENTAL
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TITLE.....: STORAGE AND ACCESS OF AVAILABLE DATA ON RADIATION
AND RADIOACTIVITY LEVELS IN THE U.S.

TYPE.....: NUMERIC DATA BASE

CONTACT.....: ALBIN J. ZIELEN
ENVIRONMENTAL IMPACT STUDIES DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3132)

SUBJECT COVERED: RADIOACTIVITY MEASUREMENTS MADE BY FEDERAL AND
STATE MONITORING STATIONS.

KEY WORDS

RADIATION MONITORING, RADIOACTIVITY, MONITORING

ABSTRACT

THE MONITOR PROGRAM SERVES AS A READY-ACCESS DATA BANK FOR ALL
MONITORING DATA ACQUIRED OVER THE PAST TWO DECADES ON RADIATION
AND RADIOACTIVITY LEVELS IN THE U.S. THE DATA BANK CONTAINS
MONITORING LOCATIONS, TYPES OF MONITORING EFFORTS, AND TYPES OF
MONITORING DATA REPORTED IN "RADIATION DATA AND REPORTS" BY THE
VARIOUS STATE AND FEDERAL NETWORKS. THE PROGRAM RETRIEVES
INFORMATION WITHIN A SEARCH RADIUS OF RECTANGLE, CIRCUMSCRIBED
BY PARAMETERS OF LATITUDE AND LONGITUDE, AND LISTS OR MAPS THE
DATA AS REQUESTED.

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DOCUMENTATION

ECKEPHAN, K.P., R.S. STONE, AND M.A. FRIGERIO: "THE ARGONNE
RADIOLOGICAL IMPACT PROGRAM (ARIP), PART II, MONITOR: A
PROGRAM AND DATA BASE FOR RETRIEVAL AND UTILIZATION OF
POLLUTANT MONITORING DATA", ARGONNE NATIONAL LABORATORY,
ANL/ES-26, PART II, FEBRUARY 1977.

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 10950 RECORDS EACH 80 BYTES LONG

LANGUAGE....: NOT APPLICABLE

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 450K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 8M636
IN THE ENVIRONMENTAL IMPACT STUDIES DIVISION

ICFP INVENTORY OF BIBLIOGRAPHIC DATA BASES

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**TITLE.....: 1971-1976 BIBLIOGRAPHY, ENVIRONMENTAL STUDIES WITH
STABLE ISOTOPES**

TYPE.....: BIBLIOGRAPHIC DATA BASE

**CONTACT....: PETER D. KLEIN
BIOLOGICAL AND MEDICAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3930)**

SUBJECT COVERED: ENVIRONMENTAL APPLICATIONS OF STABLE ISOTOPES

KEY WORDS

STABLE ISOTOPES, ENVIRONMENT, TRACER TECHNIQUES

ABSTRACT

THE ISOTOPIC RATIOS OF $2H/1H$, $13C/12C$, $15N/14N$, $18O/16O$ AND $34S/32S$ ARE NOT CONSTANT IN ENVIRONMENTAL SAMPLES, BUT REFLECT A VARIETY OF PROCESSES CONTRIBUTING TO THE PRODUCTION, MOVEMENT AND FATE OF ATMOSPHERIC, HYDROLOGICAL AND GEOLOGICAL CONSTITUENTS. STABLE ISOTOPE RATIO MEASUREMENTS THUS PROVIDE AN ENVIRONMENTALLY SAFE TRACER CAPABILITY THAT HAS GLOBAL APPLICABILITY IN STUDIES OF ATMOSPHERIC MIXING, CO_2 PRODUCTION, GROUND WATER MOVEMENT, PETROLEUM ORIGINS, ETC. THIS DATA BASE LISTS REFERENCES TO SUCH STUDIES FOR THE PERIOD 1971-1976. ANNUAL UPDATES OF THIS INFORMATION ARE ANTICIPATED.

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DOCUMENTATION

E.R. KLEIN AND P.D. KLEIN, "PART I: DEUTERIUM 1971-1976",
BIOMEDICAL MASS SPECTROMETRY, 5:91-111, FEB. 1976

E.R. KLEIN AND P.D. KLEIN, "PART II: CARBON-13 1971-1976",
BIOMEDICAL MASS SPECTROMETRY, 5: 321-330, MAY 1973

E.R. KLEIN AND P.D. KLEIN, "PART III: NITROGEN-15 1971-1976",
BIOMEDICAL MASS SPECTROMETRY, 5: 375-379, JUNE 1976

E.R. KLEIN AND P.D. KLEIN, "PART IV: OXYGEN-17, OXYGEN-18, AND
SULPHUR-34 1971-1976", BIOMEDICAL MASS SPECTROMETRY, 5:425-432,
JULY 1978

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 200 REFERENCES

LANGUAGE: NOT APPLICABLE

MACHINE CONFIGURATION: NOT APPLICABLE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 61202
IN THE BIOLOGICAL AND MEDICAL RESEARCH DIVISION

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TITLE.....: BIBLIOGRAPHIC INFORMATION RETRIEVAL SYSTEM

TYPE.....: BIBLIOGRAPHIC DATA BASE

CONTACT....: RONALD R. MACDONALD
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3266)

SUBJECT COVERED: ENERGY BIBLIOGRAPHY

KEY WORDS

BIBLIOGRAPHIES, INFORMATION RETRIEVAL, ENERGY, COAL

ABSTRACT

AT ARGONNE NATIONAL LABORATORY A BIBLIOGRAPHIC DATA BASE WAS
DEVELOPED WITH SYSTEM 2000 TO STORE AND RETRIEVE BIBLIOGRAPHIC
INFORMATION ON ENERGY RESEARCH WITH SPECIAL ATTENTION TO COAL.

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DOCUMENTATION

NONE

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 6500 ENTRIES

LANGUAGE....: SYSTEM 2000

MACHINE CONFIGURATION: IBM 360/75-370/195 OS/MVT WITH 200K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 65910
IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

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**TITLE.....: A SELECTIVE BIBLIOGRAPHY OF SURFACE COAL MINING AND
RECLAMATION LITERATURE, VOLUME 1, EASTERN COAL
PROVINCE**

TYPE.....: BIBLIOGRAPHIC DATA BASE

**CONTACT....: ANDREW A. SOBER
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-3358)**

SUBJECT COVERED: SURFACE COAL MINING AND RECLAMATION

KEY WORDS

COAL MINING, LAND RECLAMATION, SURFACE MINING

ABSTRACT

**AN EXTENSIVE LITERATURE SEARCH WAS TAKEN ON SURFACE COAL MINING
AND RECLAMATION REFERENCES. A SELECTIVE BIBLIOGRAPHY WAS
COMPILED DEALING WITH THE EASTERN COAL PROVINCE. THE ENTRIES
WERE COMPUTERIZED AND ALL EDITING WAS DONE ON THE WYLBUR
SYSTEM. AN INTRODUCTION AND AUTHOR INDEX WERE COMPILED
SEPARATELY AND ADDED TO THE UPPER AND LOWER CASE PRINTOUT OF
THE BIBLIOGRAPHY PRODUCED FROM WYLBUR. RESEARCH WAS COMPLETED
IN SEPTEMBER 1977 FOR THE EASTERN PROVINCE AND PUBLISHED IN
NOVEMBER 1977.**

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DOCUMENTATION

N. WEISS, A. A. SOBEK, AND D. L. STREIB, "A SELECTIVE
BIBLIOGRAPHY OF SURFACE COAL MINING AND RECLAMATION LITERATURE,
VOLUME I, EASTERN COAL PROVINCE", ANL/IRP-1, NOVEMBER 1977.

SOFTWARE/HARDWARE INFORMATION

SIZE.....: NOT AVAILABLE

LANGUAGE....: WYLBUR TEXT PROCESSOR

MACHINE CONFIGURATION: WYLBUR SEQUENTIAL TEXT FILE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 65910
IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

INTEGRATED HARDWARE/SOFTWARE SYSTEMS

There are 11 graphics packages which are hardware-constrained and somewhat limited by portability criteria. These systems include a mixture of commercially obtained proprietary software systems that have been used locally in programs and general packages for preparing maps, diagrams and graphics displays. By nature such systems are machine-dependent and peripheral-devices dependent. In general the driver programs and the utility software systems are also locally developed. However, the majority of the systems can be transported through front-end arrangement with personnel involved in the preparation and development of these systems.

The entry on the ALICE system at Argonne is worthy of special attention. The hardware and software developments for this system make it a unique image-processing computer system. Further advances on this system are becoming very important in terms of its uses in biomedical and environmental programs at Argonne.

JCFP INVENTORY OF INTEGRATED COMPUTER HARDWARE/SOFTWARE SYSTEMS

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TITLE.....: CONTOUR MAPPING GRAPHICS SYSTEM

TYPE.....: INTEGRATED HARDWARE/SOFTWARE SYSTEM

CONTACT.....: M. K. BUTLER
APPLIED MATHEMATICS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-7172)

SUBJECT COVERED: BLACKBOX IS A GENERAL PURPOSE CONTOURING
PROGRAM.

KEY WORDS

MAPS, DATA PROCESSING, COMPUTER GRAPHICS, COMPUTER-AIDED DESIGN

ABSTRACT

BLACKBOX IS A COMPUTER PROGRAM WHICH PRODUCES CONTOUR MAPS FROM ARBITRARILY SPACED DATA. BLACKBOX MAKES USE OF CALCOMP-STYLE CALLS TO PLOT, SYMBOL AND NUMBER; THESE ROUTINES MUST BE SUPPLIED BY THE INSTALLATION AT WHICH BLACKBOX IS TO RUN. BLACKBOX ACCEPTS UP TO 7500 DATA POINTS AS INPUT AND PRODUCES A MAP CONFORMING TO USER-SPECIFIABLE OUTPUT FORMATTING OPTIONS.

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DOCUMENTATION

HALON, D., "CONTOUR BLACKBOX, A CONTOUR MAPPING PROGRAM," AND
TM-277 (1975).

SOFTWARE/HARDWARE INFORMATION

SIZE.....: NONE

LANGUAGE....: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVI WITH 250 K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER AML BUDGET ACTIVITY NUMBER (NOT
AVAILABLE) IN THE APPLIED MATHEMATICS DIVISION

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**TITLE.....: SIMPLE GRAPHICS PACKAGE FOR INTERACTIVE PUBLISHABLE
QUALITY GRAPHS**

TYPE.....: INTEGRATED HARDWARE/SOFTWARE SYSTEM

**CONTACT....: M. K. BUTLER
APPLIED MATHEMATICS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-7172)**

SUBJECT COVERED: GENERAL PURPOSE PLOTTING OF TECHNICAL DATA.

KEY WORDS

**DATA PROCESSING, COMPUTER GRAPHICS, COMPUTER-AIDED DESIGN,
GRAPHIC**

ABSTRACT

**DRAFTMAN IS A COMPUTER PROGRAM USED TO PRODUCE SIMPLE GRAPHS OF
PUBLISHABLE QUALITY INTERACTIVELY. DRAFTMAN USES THE DISPLA
PLOTTING LANGUAGE, A COMMERCIALY AVAILABLE PROPRIETARY PACKAGE
OF INTEGRATED SOFTWARE SYSTEMS CORPORATION; THIS PACKAGE MUST
BE AVAILABLE AT THE INSTALLATION AT WHICH DRAFTMAN IS TO RUN.
DRAFTMAN ALLOWS LINEAR OR LOGARITHMIC AXES, MULTIPLE CURVES PER
GRAPH, AND A VARIETY OF INTERPOLATION METHODS, AS WELL AS
NUMEROUS OUTPUT FORMATTING OPTIONS.**

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DOCUMENTATION

GAWLIK, M., "DRAFTMAK--A ROUTINE FOR DRAWING PUBLISHABLE
QUALITY FIGURES," AND TM-295 (1976).

SOFTWARE/HARDWARE INFORMATION

SIZE.....: NONE

LANGUAGE....: FORTRAN

MACHINE CONFIGURATION: IBM 370/195 OS/MVI WITH 250K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ARL BUDGET ACTIVITY NUMBER (NOT
AVAILABLE) IN THE APPLIED MATHEMATICS DIVISION

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PAGE 1

**TITLE.....: A SOFTWARE PACKAGE FOR CONSTRUCTION OF TEXT SLIDES
AND POSTERS**

TYPE.....: INTEGRATED HARDWARE/SOFTWARE SYSTEM

**CONTACT.....: M. K. BUTLER
APPLIED MATHEMATICS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-7172)**

**SUBJECT COVERED: CONSTRUCTION OF TEXT SLIDES AND POSTERS FOR
PRESENTATION.**

KEY WORDS

DATA PROCESSING, COMPUTER GRAPHICS, GRAPHIC, PHOTOGRAPHIC FILMS

ABSTRACT

**SLIDES IS A COMPUTER PROGRAM FOR THE CONSTRUCTION OF
PRESENTATION-QUALITY TEXT SLIDES AND POSTERS. SLIDES USES
DISSELA PLOTTING LANGUAGE, A COMMERCIALY AVAILABLE PROPRIETARY
PACKAGE OF INTEGRATED SOFTWARE SYSTEMS CORPORATION; THIS
PACKAGE MUST BE AVAILABLE AT THE INSTALLATION AT WHICH SLIDES
IS TO RUN. OUTPUT CAN BE PLOTTED IN COLOR OR IN BLACK AND
WHITE, AND MAY MAKE USE OF ANY OF THE DISSELA PLOTTING
LANGUAGE'S TWELVE CHARACTER FONTS AND EIGHT ALPHABETS.**

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PAGE 2

DOCUMENTATION

BERTRAND, R. AND SCHOFIELD, J., "SLIDES: A PROGRAM TO DRAW
SLIDES AND POSTERS," ANL-77-26 (1977).

SOFTWARE/HARDWARE INFORMATION

SIZE.....: NONE

LANGUAGE...: FORTRAN, DISSPLA

MACHINE CONFIGURATION: IBM 370/195 OS/HVT WITH 200 K CORE

ACKNOWLEDGMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER (NOT
AVAILABLE) IN THE APPLIED MATHEMATICS DIVISION

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TITLE.....: SPEAKEASY

TYPE.....: INTEGRATED HARDWARE/SOFTWARE SYSTEM

CONTACT.....: STANLEY COHEN
PHYSICS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-4111)

SUBJECT COVERED: LANGUAGE TRANSLATOR FOR COMPUTERS

KEY WORDS

DATA PROCESSING, COMPUTER CODES, PROGRAMMING LANGUAGES,
COMPUTER GRAPHICS

ABSTRACT

SPEAKEASY IS A LANGUAGE THAT PROVIDES EFFECTIVE ACCESS TO THE CAPABILITIES OF A LARGE COMPUTER COMPLEX. IT IS DESIGNED WITH AN EASILY LEARNED, HUMANIZED LANGUAGE SO THAT EVEN COMPLETE NOVICES CAN MASTER ITS BASIC CONCEPTS. IN ITS PRIMITIVE MODE OF OPERATION IN AN INTERACTIVE SYSTEM, IT PERFORMS THE FUNCTIONS OF A DESK CALCULATOR, BUT ONE WITH A VERY LARGE AND VERY POWERFUL SET OF OPERATIONS. INCLUDED IN THE BASIC VOCABULARY ARE OPERATIONS RELATED TO MANY DIFFERENT DISCIPLINES INCLUDING ECONOMETRICS, STATISTICS, PHYSICS, AND MATHEMATICS. ALL OF THE COMMON SPECIAL FUNCTIONS ARE PROVIDED ALONG WITH ALL OF THE OPERATIONS OF MATRIX ALGEBRA. A WIDE VARIETY OF DATA BASE ACCESSES ARE ALSO AVAILABLE. THIS IS A COMPLETE SOFTWARE PACKAGE AND REQUIRES NO ADDITIONAL SOFTWARE SYSTEMS. EXTENSIONS TO THE SYSTEM ARE WRITTEN IN FORTRAN. A BASIC SET OF PRIMITIVE GRAPHICS COMMANDS COMBINED WITH THE MATHEMATICAL CAPABILITIES PROVIDES ONE OF THE MOST EASILY USED AND UNDERSTOOD INTERACTIVE GRAPHICS PACKAGES TODAY. THE REAL POWER OF SPEAKEASY IS THE CAPABILITY OF GROWTH BUILT INTO THE SYSTEM. INTERFACES TO EXISTING PACKAGES AND ENTIRELY NEW PROCESSES CAN BE ADDED TO THE LANGUAGE BY ITS USERS.

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DOCUMENTATION

SPEAKEASY-3 REFERENCE MANUAL (REV 3) ANL-8000, AUGUST 1977.

**SPEAKEASY - A WINDOW INTO A COMPUTER, AFIPS - CONFERENCE
PROCEEDINGS VOLUME 45 (1976), PP. 1039.**

SOFTWARE/HARDWARE INFORMATION

SIZE.....: NONE

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 360/75-370/195 OS/MVT

ACKNOWLEDGEMENT

**THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER (NOT
AVAILABLE) IN THE PHYSICS DIVISION**

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**TITLE.....: CALCOMP FORMS FOR CONFORMANT MAPS WITH DATA ZONES
SHADING**

TYPE.....: INTEGRATED HARDWARE/SOFTWARE SYSTEM

**CONTACT.....: D. M. MALON
APPLIED MATHEMATICS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-7216)**

SUBJECT COVERED: COMPUTER ASSISTED MAPPING & ZONED SHADING.

KEY WORDS

**DATA PROCESSING, MAPS, COMPUTER GRAPHICS, COMPUTER-AIDED
DESIGN, GRAPHIC**

ABSTRACT

**CALFORM IS A COMPUTER PROGRAM PRODUCING CONFORMANT MAPS WITH
DATA ZONES SHADED ACCORDING TO USER-ASSIGNED VALUES. CALFORM
MAKES USE OF CALCOMP-STYLE CALLS TO PLOT, SYMBOL AND NUMBER;
THESE ROUTINES MUST BE SUPPLIED BY THE INSTALLATION AT WHICH
CALFORM IS TO RUN. CALFORM IS CAPABLE OF PRODUCING CALCOMP
GENERATED MAPS WITH DATA ZONES SHADED ACCORDING TO
USER-ASSIGNED VALUES.**

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DOCUMENTATION

CAIFORM MANUAL, HARVARD UNIVERSITY, 1972.

SOFTWARE/HARDWARE INFORMATION

SIZE.....: NONE

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: IBM 370/158 WITH 130K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER A BUDGET ACTIVITY NUMBER (NOT
AVAILABLE) IN THE APPLIED MATHEMATICS DIVISION

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TITLE.....: POLYGON CONVERTER

TYPE.....: INTEGRATED HARDWARE/SOFTWARE SYSTEM

CONTACT.....: D. M. MALON
APPLIED MATHEMATICS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-7216)

SUBJECT COVERED: GENERAL PROCESSING AND MAPPING OF GEOGRAPHIC
BOUNDARY DATA.

KEY WORDS

DATA PROCESSING, COMPUTER GRAPHICS, MAPS, GRAPHIC

ABSTRACT

POLYVRT IS A COMPUTER PROGRAM TO PROCESS GEOGRAPHIC BASE FILES OF A VARIETY OF TYPES, INCLUDING WORLD DATA BANK I, DIME, AND CHAIN-ENCODED FORMATS. DISTRIBUTED WITH THE PROGRAM ARE DIME FILES WITH STATE AND COUNTY BOUNDARIES, AND WORLD DATA BANK I FILES WITH WORLD COASTAL AND NATIONAL BOUNDARIES. POLYVRT MAKES USE OF CALCOMP-STYLE CALLS TO PLOT, SYMBOL AND NUMBER; THESE ROUTINES MUST BE SUPPLIED BY THE INSTALLATION AT WHICH POLYVRT IS TO RUN. POLYVRT IS CAPABLE OF SELECTIVE POLYGON RETRIEVAL, DETAIL FILTERING, FILE EDITING, AND COORDINATE TRANSFORMATIONS; ITS OUTPUT IS A NEW FILE IN USER-SPECIFIED FORMAT, OR PLOTS OF USER-SELECTED PORTIONS OF THE INPUT FILE.

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DOCUMENTATION

POLYVPT USER'S MANUAL, HARVARD UNIVERSITY, 1974.

SOFTWARE/HARDWARE INFORMATION

SIZE.....: NONE

LANGUAGE....: FORTRAN, CALCOMP

MACHINE CONFIGURATION: IBM 370/168 WITH 200 K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER AML BUDGET ACTIVITY NUMBER (NOT
AVAILABLE) IN THE APPLIED MATHEMATICS DIVISION

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TITLE.....: SOFTWARE SISTER TO DISPLAY THREE-DIMENSIONAL
SURFACES

TYPE.....: INTEGRATED HARDWARE/SOFTWARE SYSTEM

CONTACT.....: D. M. MALON
APPLIED MATHEMATICS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-7216)

SUBJECT COVERED: GENERAL CONTOUR SURFACE PLOTTING.

KEY WORDS

DATA PROCESSING, COMPUTER GRAPHICS, MAPS, GRAPHIC

ABSTRACT

SYNVU IS A COMPUTER PROGRAM FOR DISPLAYING THREE-DIMENSIONAL SURFACES WITH HIDDEN LINES REMOVED. SYNVU MAKES USE OF CALCOMP-STYLE CALLS TO PLOT, SYMBOL AND NUMBER; THESE ROUTINES MUST BE SUPPLIED BY THE INSTALLATION AT WHICH SYNVU IS TO RUN. IT CAN BE USED AS A COMPANION TO THE SYMAP PROGRAM (AVAILABLE FROM HARVARD UNIVERSITY'S LABORATORY FOR COMPUTER GRAPHICS AND SPATIAL ANALYSIS), PRODUCING THREE-DIMENSIONAL VIEWS OF SYMAP MATRIX OUTPUT.

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DOCUMENTATION

SYNVU MANUAL, HARVARD UNIVERSITY, 1975.

SOFTWARE/HARDWARE INFORMATION

SIZE.....: NONE

LANGUAGE...: CALCOMP

MACHINE CONFIGURATION: IBM 370/168 WITH 225 K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER (NOT
AVAILABLE) IN THE APPLIED MATHEMATICS DIVISION

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TITLE.....: SYNAGRAPHIC MAPPING SYSTEM

TYPE.....: INTEGRATED HARDWARE/SOFTWARE SYSTEM

CONTACT.....: D. H. SALON
APPLIED MATHEMATICS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-7216)

SUBJECT COVERED: GENERAL GEOGRAPHIC MAPPING.

KEY WORDS

DATA PROCESSING, MAPS, COMPUTER GRAPHICS, GRAPHIC

ABSTRACT

SYMAP IS A COMPUTER MAPPING PROGRAM PRODUCING GRAPHICAL OUTPUT ON A STANDARD LINE PRINTER. NO SPECIALIZED SOFTWARE IS REQUIRED. SYMAP IS CAPABLE OF CONSTRUCTING CONFORMANT, PROXIMAL, CONTOUR, TREND SURFACE, AND RESIDUAL MAPS WITH A WIDE VARIETY OF OUTPUT FORMATTING OPTIONS.

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DOCUMENTATION

SYMAP USER'S REFERENCE MANUAL, HARVARD UNIVERSITY, 1975.

SOFTWARE/HARDWARE INFORMATION

SIZE.....: NONE

LANGUAGE....: FORTRAN

MACHINE CONFIGURATION: IBM 370/168 WITH 128 K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER (NOT
AVAILABLE) IN THE APPLIED MATHEMATICS DIVISION

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TITLE.....: THE ALICE IMAGE PROCESSING SYSTEM

TYPE.....: INTEGRATED HARDWARE/SOFTWARE SYSTEM

CONTACT....: CECIL B. SHELMAN
APPLIED MATHEMATICS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-5430)

SUBJECT COVERED: COMPUTER BASED IMAGE PROCESSING

KEY WORDS

IMAGE PROCESSING, IMAGE SCANNERS, DATA PROCESSING, DIGITIZERS,
ELECTRONIC EQUIPMENT

ABSTRACT

THE ALICE IMAGE PROCESSING SYSTEM WAS DEVELOPED AS A GENERAL PURPOSE, COMPUTERIZED IMAGE PROCESSOR WITH PROVISIONS FOR THE EFFICIENT AND ECONOMICAL DIGITIZATION AND ENCODING OF VISUAL, GRAPHIC AND MAPPED INFORMATION. IMAGE PROCESSING IS THE ACT OF COMPUTERIZING AN OBJECT OF VISUAL OCCURRENCE - AN IMAGE - SO THAT DATA CAN BE OBTAINED FROM THE OBJECT OF OCCURRENCE AND ANALYSES PERFORMED ON THE DATA WHICH IS REPRESENTATIVE OF THE ORIGINAL IMAGE. ALICE OPERATES WITH THE SINGLE-USER MONITOR INSTALLED ON THE PDP-10. DIGITIZATION, ENCODING AND ANALYSIS ROUTINES ARE WRITTEN IN FORTRAN IV AND ARE STORED ON DEC TAPES FOR USE BY THE OPERATOR. SENSE SWITCHES AT THE CONTROLLER PROVIDE ANY DIGITIZATION, ENCODING AND ANALYSIS OPTIONS FOR THE OPERATOR TO CHOOSE FROM IN THE PROCESSING OF MAPPED AND GRAPHIC DATA. ALICE IS A GENERAL PURPOSE SYSTEM FOR DIGITIZATION, ENCODING AND ANALYSIS OF MAPPED AND GRAPHIC INFORMATION. A CHARACTER RECOGNITION MODE EXISTS IN ALICE WHICH READS AND INTERPRETS TYPE-SET IDENTIFIERS RECORDED ON THE INFORMATION SOURCES.

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DOCUMENTATION

BUTLER, J. W., HAASL, J. K., HODGES, D., KROUPA, E., SRELMAN,
C. B., AND WEHMAN, R. H., "ALICE REFERENCE MANUAL", TECHNICAL
MEMORANDUM NO. 231 (AUGUST 1972), ARGONNE NATIONAL LABORATORY,
APPLIED MATHEMATICS DIVISION.

SOFTWARE/HARDWARE INFORMATION

SIZE.....: NONE

LANGUAGE...: FORTRAN

MACHINE CONFIGURATION: 64 K MAGNETIC CORE STORAGE, 2 MAGNETIC
TAPE UNITS, CARD READER, LINE PRINTER,
TELETYPE AND 5 MILLION WORD DISK; GENERAL
PURPOSE CONTROLLER; 3 OPTICAL SCANNING
STATIONS

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER (NOT
AVAILABLE) IN THE APPLIED MATHEMATICS DIVISION

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**TITLE.....: A PROGRAM FOR REGIONAL STUDIES OF POWER PLANT
SITING PATTERNS**

TYPE.....: INTEGRATED HARDWARE/SOFTWARE SYSTEM

**CONTACT....: MARY A. SNIDER
ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FIS 972-3979)**

**SUBJECT COVERED: AIR QUALITY ISOPLETHS PLOTTED FOR THE REGION
SUPERIMPOSED ON THE STATE OUTLINES.**

KEY WORDS

DATA PROCESSING, MAPS, COMPUTER GRAPHICS, GRAPHIC

ABSTRACT

**THE ISOMERGE PROGRAM IS A FORTRAN PROGRAM THAT MERGES DATA
ARRAYS WHICH OCCUPY A COMMON SPACE ONTO A BASE ARRAY WHICH
COVERS THAT SPACE. THE PROGRAM THEN CALCULATES AND PLOTS
ISOPLETH VALUES OF THE BASE ARRAY. THE PROGRAM IS WRITTEN IN
FORTRAN AND CALLS GRAPHICS SUBROUTINES AVAILABLE IN THE DISPLA
PACKAGE. THE PROGRAM CAN BE USED, IN GENERAL, TO COMBINE DATA
ARRAYS WHICH SHARE A BASIC SPACE BUT DO NOT HAVE POINTS LOCATED
ON THE SAME COORDINATE SYSTEM WITHIN THIS SPACE. FOR INSTANCE,
IT WAS ALSO USED TO COMBINE POPULATION DATA WITH AIR QUALITY
DATA.**

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DOCUMENTATION

NOT AVAILABLE

SOFTWARE/HARDWARE INFORMATION

SIZE.....: NONE

LANGUAGE....: FORTRAN, DISPLA

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 250 K CORE

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ARL BUDGET ACTIVITY NUMBER 65902
IN THE ENERGY AND ENVIRONMENTAL SYSTEMS DIVISION

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**TITLE.....: A GENERAL PURPOSE GRAPHICS SOFTWARE PACKAGE FOR
PUBLISHABLE QUALITY PLOTS**

TYPE.....: INTEGRATED HARDWARE/SOFTWARE SYSTEM

**CONTACT....: R. E. TOOHEY
RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION
ARGONNE NATIONAL LABORATORY
ARGONNE, IL 60439
(FTS 972-4132)**

SUBJECT COVERED: RAPID PRODUCTION OF HIGH-QUALITY X-Y PLOTS.

KEY WORDS

DATA PROCESSING, COMPUTER GRAPHICS, MAPS, GRAPHIC

ABSTRACT

MYPLOT IS A GRAPHICS SOFTWARE PACKAGE WHICH ENABLES A USER TO PRODUCE PUBLISHABLE-QUALITY PLOTS OF SCIENTIFIC DATA WITH LITTLE OR NO PROGRAMMING EFFORT. A LEAST-SQUARES FITTING ROUTINE ALSO ENABLES FITTED CURVES TO BE DRAWN WITH THE DATA. MOST USERS ACCESS MYPLOT VIA A DATA-READING ROUTINE CALLED PLOTIN, AND THE TWO NAMES ARE USED INTERCHANGEABLY. THE MOST IMPORTANT PART OF THE PACKAGE IS THAT IT HAS BUILT-IN DEFAULT VALUES FOR ALL ITS AVAILABLE OPTIONS. THESE ARE DESIGNED TO PRODUCE AN ACCEPTABLE-QUALITY PLOT. THE USER MAY OVERRIDE THE DEFAULT VALUES. NO PROGRAMMING KNOWLEDGE IS REQUIRED FOR THE VAST MAJORITY OF PLOTS, AND ALL DATA AND KEYWORDS ARE READ IN "FREE" FORMAT. MYPLOT MAY ALSO BE CALLED BY A USER FROM HIS OWN PROGRAM IN ORDER TO PRODUCE AUTOMATICALLY A PLOT FROM A ROUTINE WHICH, FOR EXAMPLE, READS THE OUTPUT OF A MULTI-CHANNEL ANALYZER. X-Y PLOTS, INCLUDING HISTOGRAMS, ERRORBARS, LOGARITHMIC SCALES, ALPHA-NUMERIC LABELLING, ETC. ARE AVAILABLE.

**SURVEY OF BIOMEDICAL AND ENVIRONMENTAL
DATA BASES, MODELS, & INTEGRATED COMPUTER SYSTEMS
(ICFP / OTD / BER)**

ICFP/INV-611

REVISED 7/ 3/78

PAGE 2

DOCUMENTATION

JOHN RUNDO, "A GENERAL-PURPOSE PLOTTING ROUTINE FOR USE WITH
THE 360/95," RER ANNUAL REPORT JULY 1970-JUNE 1971, ANL-7850,
PART II, PP. 284-285

R. E. TOOHEY, J. RUNDO, AND T. J. KOTEK, "IMPROVEMENT OF THE
GENERAL-PURPOSE PLOTTING ROUTINE, 'XYPLOT'," RER ANNUAL REPORT
JULY 1976-JUNE 1977.

SOFTWARE/HARDWARE INFORMATION

SIZE.....: 20000 SOURCE STATEMENTS EACH 80 BYTES LONG

LANGUAGE....: FORTRAN, CALCOMP

MACHINE CONFIGURATION: IBM 370/195 OS/MVT WITH 250 K BYTES OF
CORE.

ACKNOWLEDGEMENT

THE WORK WAS PERFORMED UNDER ANL BUDGET ACTIVITY NUMBER 63300
IN THE RADIOLOGICAL AND ENVIRONMENTAL RESEARCH DIVISION

SUMMARY

Revision and expansion of the ANL Index on Environmental Information Resources will require continuation of both technical and clerical effort. It is anticipated that a fully automated information system will be developed with an entry report generator programmed so that computer-printed survey forms, including all required data elements, can be periodically distributed for updating and revision. This system will incorporate a remotely accessible and searchable data base for all environmental information resource users at ANL. However, all system revisions and entries will be handled by the ICFP.

Increased emphasis in two areas is anticipated--resource coordination and environmental information evaluation. As the identification of information resources becomes systematized and a central file is established, the ICFP activity will more strongly emphasize interlaboratory coordination and the development of initiatives to assist full utilization of available resources. As deficiencies in available information resources are identified, new initiatives will be developed to meet programmatic needs. For example, a greater involvement is anticipated in completing and fully documenting partially developed resources, so that these can be made readily available and usable. A greater degree of communication and involvement with information exchange standards and networks will be required. Close liaison with the Interlaboratory Working Group for Data Exchange is anticipated.

Evaluation and synthesis of environmental information contained in the data bases, models and graphics resources is also an area that poses increased involvement for the ICFP. Although in some instances the ICFP may take the lead in evaluating environmental data resources, it is more likely that the ICFP will play a supportive role to ongoing environmental assessment and policy analysis activities. However, the broad overview of available resources held by the ICFP will greatly facilitate the location, exchange, and use of such resources and promote a more comprehensive structuring of regional efforts. The synthesis or accumulation of scattered deposits of environmental information resources for use by activities analyzing environmental impacts will be a prime responsibility of the ICFP. Special tasks or assignments in this area will be considered within the scope and capability of the ICFP provided these are consistent with the level of effort supported.

APPENDIX A. ICFP SURVEY QUESTIONNAIRE

The ICFP questionnaire contains 33 elements for each entry selected for the index file. Table A-1 shows the questionnaire as used at Argonne National Laboratory. The first two pages of the questionnaire are common to Databases Models and Integrated Hardware/software Systems. There is a third page of questions which is to be used when the entry is a model. Table A-2 gives the instructions for completing the questionnaire along with a sample completed form.

The questionnaire contains descriptive elements for identifying the title of the entry, the contact, the original source and address, the documentation and subject matter information, the hardware/software technical details, an abstract, key words, and the supporting budget activities numbers. These elements are considered to be the minimum amount of detail required to evaluate the potential usefulness of a specific entry for application to a related research program.

The limit on the number of characters in the length of an element was necessary to minimize the amount of unnecessary information collected from the respondents, although several elements are adequately described by brief responses. Whenever possible a simple check-list of probable values was provided to limit the variability of response. The additional model data elements included a description of the algorithm, users, applications, data used for validation of the model, and the types of categories into which the model can be classified.

(25) ABSTRACT

Blank lined paper with horizontal ruling lines.

(26) KEY WORDS

(27) COMMENTS

ADDITIONAL MODEL DATA ELEMENTS

(28) **ALGORITHM**

(29) USERS

(30) APPLICATIONS

(31) DATA USED

(32) MODEL VALIDATION

(33) CLASSIFICATION

___ Continuous	___ Integrative
___ Discrete	___ Simulation
___ Deterministic	___ Optimization
___ Stochastic	___ Econometric
___ Analytical	___ Engineering Process
___ Predictive	___ Other _____

(Specify)

Table A-2. Instructions and Example of a Completed Form

INSTRUCTIONS FOR FILLING OUT ANSL/ICFP INDEX OF
DATABASES, MODELS, AND GRAPHICS PACKAGES QUESTIONNAIRE

1. **TITLE**
 Format: Short descriptive title with a maximum of 100 characters. Syntax should be similar to a title syntax.
 Example: ENERGY SYSTEM NETWORK SIMULATOR
2. **ACRONYM**
 Format: A short name or the abbreviation for the entry in TITLE with a maximum of 25 characters.
 Example: ESSS
3. **TYPE**
 Format: Description of entry type -- check one of the following: Numeric Data Base, Bibliographic Data Base, Model, Integrated hardware/Software System.
 Example: ☒ Model
5. **CONTACT**
 Format: Name of a single contact person at the Laboratory who will receive calls and answer questions concerning the entry. Syntax should be last name, first name, and middle initial. This person may or may not be the person who is responsible for the theory and uses of the data bases or models.
 Examples: SMITH, JOHN R.
 JONES, FR., BOB, S.
6. **TELEPHONE**
 Format: Telephone number of the Laboratory contact [person listed in item (5) above]. Indicate the FIS extension.
 Example: 3125
7. **DIVISION** (at the Laboratory)
 Format: ANSL Division affiliation of the contact person listed in item (5) above.
 Example: ☒ EIS
11. **ORIGINAL SOURCE**
 Format: Unrestricted but less than 300 characters. Source of the entry; include organization, contact, and address if available from an external source. Please identify the scientists who have developed the models (or modified them) and the data bases. These persons may only be reached through the contact person names in item (5) above. This entry is included for proper credit of the title indexed in this inventory.
 Example: Illinois EPA, Chicago, Illinois
12. **DOCUMENTATION**
 Format: Unrestricted but less than 500 characters. The entry should be a bibliographic citation of documentation or references relating to the item. If no documentation exists, enter "none". Delimit multiple citations with a semicolon. Limit entries to five citations or less.
 Example: ASSOCIATED UNIVERSITIES, INC., ENERGY MODEL DATA BASE: USERS MANUAL, BNL 19200, P. EMDB-1; KENNETH HOFFMAN, ENERGY SYSTEMS ANALYSIS PROGRAM, BROOKHAVEN NATIONAL LABORATORY, BNL 19113-R, p. 2, JAN. 1975.

13. GEOGRAPHICAL COVERAGE

Format: Geographical coverage of the data utilized. Includes countries, regions, states, counties, cities, etc. Unrestricted but less than 200 characters. Delimit each geographic region with a semicolon.

Example: SOUTHEAST; TENNESSEE; KNOX COUNTY; KNOXVILLE.

14. TIME PERIOD

Format: The time span of the data utilized. Unrestricted but less than 200 characters.

Example: 1970-1978

15. SUBJECT COVERED

Format: Unrestricted but less than 200 characters. The general subject coverage of the entry.

Example: MAJOR TEL. WORKING INSTALLATIONS

17. STATUS

Format: Information concerning the status of the entry. Enter one of the following: Under Development, In Use, Planned, Other (specify other appropriate terms). Entry should be less than 90 characters.

Example: A. In Use

18. ACCESS

Format: Information concerning the accessibility of the entry. Enter one of the following: Unlimited, Limited, Proprietary, Not Accessible, Other (specify other appropriate terms). Entry should be less than 90 characters.

Example: A. Limited

19. MEDIA

Format: Information concerning the media on which the entry is available. Enter one of the following: Magnetic Tape, Paper Tape, Printed Card, Disc, Text, Other (specify other appropriate terms). If more than one is appropriate, Entry should be less than 90 characters.

Example: A. Magnetic Tape

X. Disc

20. SIZE

Format: An indication of the size of the entry. Unrestricted but less than 100 characters (cards, the number of cards, lines, bytes, records, etc.). Delimit multiple entries with a semicolon.

Example: 100,000 Bytes; 20 Records.

21. COMPUTER (Generic)

Format: A generic code for the computer manufacturer on which the entry (data base, model, or graphics package) executes. Enter one or more of the following codes:

AMD - AMDahl
IBM - International Business Machines
ENI - Univac
CDC - Control Data Corporation
VAR - Varian
BUR - Burroughs
HP - Hewlett Packard
DEC - Digital Equipment Corporation
TI - Texas Instruments

21. COMPUTER (Continued)Format (Continued):

If the above codes do not apply, enter the appropriate manufacturer designation. Mark more than one, if appropriate.

Example: X IBM
X DEC

22. CONFIGURATION

Format: The minimum hardware configuration necessary to execute the entry (data base, model, or graphics package). Should be less than 200 characters.

Example: IBM 360/91 with 256 k core and two 9 track tape drives.

23. LANGUAGE

Format: The software language(s) and/or data base management systems utilized by the entry. Should be less than 200 characters. Enter one of the following: FORTRAN, PL/I, BAL, System 2000, Other (specify other appropriate terms). Mark more than one, if appropriate.

Example: X FORTRAN
X System 2000

24. CHARACTER SET

Format: Character set used by the entry. Unrestricted but less than 100 characters. Enter one of the following: ASCII, BCD, EBCDIC, Uncoded, Other (specify other appropriate terms). Mark more than one, if appropriate.

Example: X ASCII
X EBCDIC

AN. BUDGET ACTIVITY NO.

Format: Provide the cost code identifying the source of funding supporting the activities on the data base, model or graphics package.

Example: 65225

25. ABSTRACT

Format: A brief description of the entry. Unrestricted but less than 1300 characters.

Example: Given the availability of the fuel resources and the levels of demand for each of consuming sectors as a function of time, the model simulates the process in which supply production capacity is constructed and the resources are depleted, the process whereby different fuels are chosen to satisfy demand and resolves these processes into prices and the market shares for each form of supply.

26. KEYWORDS

Format: Must be permissible term from ERDA Energy Information Data Base, Subject Thesaurus, June 77, TID-7000-R2, et seq. Subset from Subject Thesaurus may be selected for use at laboratory. A minimum of three and a maximum of ten keywords. Category or discipline may be included. Keywords should be all caps and delimited with a semicolon. Note that keywords should be chosen to represent what the data base, graphics package, or model is "about" or is concerned with.

Example: KEYWORD 1; KEYWORD 2; KEYWORD 3

27. COMMENTS

Format: Unrestricted but less than 300 characters. A general comment concerning the entry for additional information not already stated.

ADDITIONAL MODEL DATA ELEMENTS

(The following data elements should only be included for models)

28. ALGORITHM

Format: Unrestricted but less than 300 characters. Should include general statement of algorithms, computational methods, and theories used by the model.

Example: LINEAR PROGRAMMING, SIMPLEX METHOD

29. USERS

Format: Unrestricted but less than 300 characters. Organizations currently using the model. Delimit multiple entries with a semicolon.

Example: DEPARTMENT OF TRANSPORTATION; DEPARTMENT OF ENERGY.

30. APPLICATIONS

Format: Unrestricted but less than 200 characters. Indicate the sources of the data utilized by the model.

Example: 1970 CENSUS DATA

31. MODEL VALIDATION

Format: Unrestricted but less than 300 characters. Indicate model validation methods, sensitivity analysis, and procedures.

32. CLASSIFICATION

Format: Unrestricted but less than 200 characters. General classification of the model. Enter one of the following: Continuous, Discrete, Deterministic, Stochastic, Analytical, Predictive, Integrative, Simulation, Optimization, Econometric, Engineering Process, Other (Specify). Mark more than one, if appropriate.

Example: ☒ Discrete
☒ Analytical

ARGONNE NATIONAL LABORATORY
ICFP CENTRAL INDEX OF DATA BASES, MODELS, AND
GRAPHICS PACKAGES QUESTIONNAIRE

- (1) TITLE (Not to exceed 100 characters in length) Fish Impingement Sampling Design and Estimation Method Computer Programs
- (2) ACRONYM SAMPLE, ESTIMA, and SIZECO
- (3) TYPE ☒ Numeric Data Base ☐ Bibliographic Data Base
☒ Model ☐ Integrated Hardware/Software System
- (5) CONTACT Murarka Ishwar P.
(Last Name) (First Name) (Middle)
- (6) TELEPHONE FTS 972- 3125
- (7) DIVISION ☐ EES ☒ EIS ☐ BIM ☐ REK ☐ BEK ☐ Other _____
- (11) ORIGINAL SOURCE (If different from contact) N/A (Specify)
Name _____ Telephone _____
Organization _____
Address _____
City _____ State _____ Zip _____
- (12) DOCUMENTATION I. P. Murarka and D. J. Bodeau, Sampling Designs and Methods for Estimating Fish-Impingement Losses at Cooling Water Intakes, ANL/ES-60, October 1977; I. P. Murarka and D. J. Bodeau, Software Documentation and User's Manual for Fish-Impingement Sampling Design and Estimation Method Computer Programs, ANL/ES-61, November 1977.
- (13) GEOGRAPHICAL COVERAGE N/A
- (14) TIME PERIOD N/A
- (15) SUBJECT COVERED Fish Impingement, Statistical Methods
- (17) STATUS ☐ Under Development ☒ In Use
☐ Planned ☐ Other _____ (Specify)
- (18) ACCESS ☒ Unlimited ☐ Limited ☐ Proprietary
☐ Not Accessible ☐ Other _____ (Specify)
- (19) MEDIA ☒ Magnetic Tape ☐ Paper Tape ☒ Punched Cards
☐ Disc ☒ Text ☐ Other _____ (Specify)
- (20) SIZE 1565 records each 80 bytes long
- (21) COMPUTER ☐ AMD ☐ IBM ☐ CNI ☒ CDC
☐ VAR ☐ BUR ☐ HP ☐ DEC
☐ TI
(Other appropriate codes for computer manufacturer)
- (22) CONFIGURATION CDC 6400/MOS with 100 K Core
- (23) LANGUAGE ☒ FORTRAN ☐ PL/I ☐ BAL ☐ System 2000 ☐ Other _____ (Specify)
- (24) CHARACTER SET ☒ ASCII ☐ BCD ☐ EBCDIC ☐ Uncoded ☐ Other _____ (Specify)

ANL BUDGET ACTIVITY NO. BM463

(25) **ABSTRACT** Several systems for estimating fish impingement at cooling-water intakes are compared to determine the most statistically efficient sampling designs and methods. Compared to a simple random sampling scheme the stratified systematic random sampling scheme, the systematic random sampling scheme, and the stratified random sampling scheme yield higher efficiencies and better estimators 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 draw a sample of specified size from a given population. The ESTIMA program is used to obtain the statistical estimates of means, totals, and the associated variances for the specified sampling scheme. The SIZECO program calculates sample sizes subject to cost, error and loss restrictions.

(26) **KEY WORDS** Sampling, Impingement, Programming, Statistics, Fishes

(27) **COMMENTS**

APPENDIX C MODEL DATA SUMMARY

- (28) ALGORITHM Constrained Lagrangian Solutions, probability calculations, matrix algebra methods, statistical estimations.

- (29) DATA Argonne National Laboratory

- (30) APPLICATION Environmental Monitoring Studies

- (31) DATA USED Zion Power Plant

- (32) MODEL VALIDATION 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.

(33) CLASSIFICATION	Continuous	Discrete
	Deterministic	Stochastic
	Analytical	Predictive
	Iterative	Simulation
	Optimization	Stochastic
	Engineering Process	Other

APPENDIX B. RESPONDENTS TO THE ICFP SURVEY

Name	Division	No. of Models	No. of Super-Data Bases	No. of Bibliographic Data Bases	No. of Inter-related Hardware/Software Systems	ICFP Inv. No.
Jane R. Benson	BIM		6			201,202,203,204,205,206
M. J. Bernard	EES	1				1
Deborah J. Bodeau	EIS		1			207
M. K. Butler	AMD				3	601,602,603
James D. Cavallo	EES	1				2
Shen-Yann Chiu	EES	1	1			3,208
Stanley Cohen	PHY				1	604
George E. Concauld	EES	1				4
Diana K. Dixon-Davis	BIM		5			209,210,211,212,213
Charles F. Ehret	BIM	3				5,6,7
Mortimer M. Elkind	BIM	1				8
Paul S. Farber	EES	1				9
Norman A. Frigerio	EIS		1			214
Thomas E. Fritz	BIM	3				215,216,217
Phyllis N. Fuja	EES	4	7			10,11,12,13,218 through 224
Berge A. Gureghian	EIS	3				14,15,16
L. J. Habegger	EES	1				17
Paul E. Hess	NER		4			226,227,228,229
Craig C. Huber	EES		1			230
Russell H. Huebner	NER		2			231,232
Lillian V. Kaspar	BIM		1			225
Yong-Ki Kim	NER	1				18
Peter D. Klein	BIM			1		401
Francis C. Kornegay	EIS	2	3			19,20,233,234,235
Gregory C. Krohn	EES	1				21
Charles LaFrance	EIS	2				22,23
Jiin-Lang Lee	EES	2				24,25
C. David Livengood	EES	1	1			26,236
Henry F. Lucas	NER		1			237
Robert T. Lundy	BIM	1				27
Ronald R. MacDonald	EES		1	1		238,402
David M. Malon	AMD				4	605,606,607,608
Gary J. Marmer	EIS	3				28,29,30
Michael H. Momeni	EIS	1	1			31,239
Ishwar P. Murarka	EIS	4	4			32,33,34,35,240,241,242,243
Sharron L. Nance	BIM	1				36
Anthony J. Pollicastro	EIS	27				37 through 52, 67 through 77
Veronika A. Rabl	EES	1				53
John E. Reiter	EES		1			244
Donald M. Rote	EES	3				54,55,56
Jeffrey P. Schubert	EES	3				57,58,59
Jack D. Shannon	NER	2	3			60,61,245,246,247
Ching-Ming Sheih	NER		2			248,249
Cecil B. Shelman	AMD				1	609
Douglas L. Sisterson	NER		1			250
Mary A. Snider	EES				1	610
Andrew A. Sobek	EES			1		403
Douglas G. Sprugel	NER		1			251
Erik J. Stenehjem	EES	1				62
Michael M. Thomas	NER		6			252,253,254,255,256,257
R. E. Toohy	NER				1	611
Marvin L. Wesley	NER	1	1			63,258
Frank S. Williamson	BIM	2	4			64,65,259,260,261,262
Tetsuji Yamada	NER	1				66
Albin J. Zielen	EIS		3			263,264,265

Acknowledgements

This extensive compilation of environmental information resources at Argonne National Laboratory required the advice and cooperation of many research scientists, most of whom are listed in Appendix B. To these individuals we express our sincere appreciation for their help. The initiation and structuring of this survey at its beginning was greatly assisted by Mr. Robert Lima, consultant. His planning and preliminary survey simplified our subsequent efforts, and we thank him for this.

We also thank Mr. John Wilson and Mr. Theodore Albert, DOE, for their support and guidance and acknowledge the many discussions with other individuals conducting coordinated ICFP surveys at the other National Laboratories.

We express our thanks to Dr. Warren K. Sinclair, Associate Laboratory Director for Biomedical and Environmental Research, for his encouragement and interest. Special thanks are also due Mr. John Martens for his efforts in editing this report.

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