An Inventory of Current Environmental Monitoring Projects in the U.S.-Canadian Transboundary Region

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May 1986

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SUMMARY

This document presents the results of a study commissioned to survey and summarize major environmental monitoring projects in the U.S.-Canadian trans-boundary region. Projects with field sites located within 400 km (250 mi) of the border and active after 1980 were reviewed. The types of projects included in the survey encompassed six categories: ambient air-quality monitoring, ambient water-quality monitoring, deposition monitoring, forest/vegetation monitoring and research, soil studies, and ecosystem studies. Ecosystem studies included projects involving the measurement of parameters from more than one monitoring category (e.g., studies that measured both water and soil chemistry). Individual descriptions were formulated for 184 projects meeting the spatial and temporal criteria. Descriptions included the official title for the project, its common abbreviation, program emphasis, monitoring site locations, time period conducted, parameters measured, protocols employed, frequency of sample collection, data storage information, and the principal contact for the project. A summary inventory subdivided according to the six monitoring categories was prepared using a computerized data management system. Information on major centralized data bases in the field of environmental monitoring was also obtained, and summary descriptions were prepared. The inventory and data base descriptions are presented in appendices to this document.

To maximize its usefulness, this document should be utilized in conjunction with the Concord Scientific Corporation (CSC) report entitled A Review of Atmospheric Deposition Networks in the Great Lakes Basin (1985). The CSC report details atmospheric deposition monitoring activities throughout the U.S. and Canadian Great Lakes region; together the two documents provide a preliminary survey of major environmental monitoring activities in the trans-boundary region.

Information on monitoring projects for this inventory was obtained by contacting researchers and administrators familiar with the current state of environmental programs, and by reviewing recent data-base source documents and monitoring overview reports. Principal investigators for individual

projects were asked to review and verify inventory entries to ensure as accurate a compilation of projects as possible. Emphasis was placed on obtaining information on large-scale programs, where large geographic regions, long time periods, or extensive measurement programs were involved. Project coverage is thus geared toward federally funded programs, with almost two-thirds of the inventory entries funded in this manner. Emphasis was also placed on including projects related to the acid precipitation phenomenon, particularly in the areas of ecosystem impacts and pollutant transport, scavenging, and deposition.

Inventory coverage cannot be determined exactly, but we believe that the majority of pertinent large-scale, government-funded programs are included. Coverage is not as extensive for small-scale industrial, local government, or university-sponsored projects.

From the inventory entries and a survey of project characteristics it was noted that environmental monitoring is generally more widespread in the eastern transboundary region and Great Lakes Basin than in the western region. In addition, ambient air-quality, ambient water-quality, and deposition monitoring projects tend to have existed longer, be included in more comprehensive data bases, and have more developed field networks than projects in the forest/vegetation, soils, and ecosystem impact areas. However, information obtained on recently initiated and upcoming forest and ecosystem programs suggests that projects in these areas are rapidly increasing in both number and complexity.

Comments received from researchers during preparation of the inventory indicate that there appears to be widespread support throughout the scientific community for formal international cooperation in transboundary monitoring and research. Informal cooperation via technical discussions, data exchanges, and joint publications already exists among individual scientists. There also is apparently a desire to initiate studies of protocol compatibility and laboratory comparability in order to address some of the uncertainties that arise when pooling data sets. We suggest that this atmosphere of informal cooperation continue to be fostered and that opportunities for formal

international cooperation continue to be sought, especially in areas addressing data and protocol compatibility. We further recommend that an in-depth critique of monitoring in the transboundary region be performed to identify specific areas with insufficient coverage and specific programs where joint U.S.-Canadian ventures can be instituted. This document and the Concord Scientific Corporation report (1985) on deposition monitoring in the Great Lakes Basin should provide a starting point for such a critique.

ACKNOWLEDGMENTS

Much of the information on specific environmental monitoring projects presented in this document was obtained from scientists, engineers, and administrators associated with U.S. and Canadian government agencies, universities, and private organizations. The authors gratefully acknowledge the wealth of information provided with patience and good humor by these professionals, for without their cooperation this document could not have been produced.

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1.0 INTRODUCTION

Airborne and waterborne pollutants can cause significant environmental impacts at sites far removed from their point of origin. The problem of a pollutant source within one political realm affecting areas within another political domain is of growing national and international concern. Concurrent with this increased concern has been the realization that efforts must be made to improve and better coordinate environmental monitoring activities in geographic areas split by political boundaries. Situations in which the locations of field sites are restricted by political jurisdiction, rather than optimum scientific design, need to be avoided. Joint programs and the analysis of merged data sets must be encouraged, and the technical problems associated with these efforts minimized by use of compatible protocols. A combined, coordinated approach should aid in increasing the understanding of pollutant transport and impact mechanisms, and lead to the development of better control strategies and mitigation methods.

This report presents the results of a study conducted by Pacific Northwest Laboratory (PNL) for the Office of Research and Development, U.S. Environmental Protection Agency to survey and summarize major environmental monitoring activities in the U.S.-Canadian transboundary region. The report will be submitted to the International Air Pollution Advisory Board of the International Joint Commission to aid in efforts to review and improve transboundary region monitoring programs.

The study was designed to produce an inventory of monitoring projects located within 400 km (250 mi) of the U.S.-Canadian border. The scope of the study in terms of the type and location of projects reviewed is summarized in Table 1.1. Emphasis was placed on gathering information for current projects rather than on conducting a historical review; thus, only projects with field stations in operation after 1980 were included. An outgrowth of inventory preparation was the identification of major centralized data bases for various areas of environmental research and the realization that the versatility of the inventory would be greatly increased by including brief descriptions of

TABLE 1.1. Scope of Transboundary Environmental Monitoring Inventory

Purpose	Prepare a descriptive inventory of current environmental monitoring projects in the U.S.-Canadian transboundary region
Types of Projects Included	<ul style="list-style-type: none">• Ambient air-quality monitoring• Ambient water-quality monitoring• Deposition monitoring• Forest/vegetation monitoring and research• Soil studies• Ecosystem studies (e.g., watershed studies)
Spatial Scale	400 km (250 mi) north and south of the U.S.-Canadian border
Temporal Scale	Post-1980 projects

these data bases. Such data bases not only provide access to actual project data but also provide avenues to similar projects both within and outside the transboundary region. Readers needing actual project data or detailed monitoring information for a specific geographic region are urged to consult organizations maintaining the data bases described in Appendix A and to use the reference documents discussed in the next section.

The environmental monitoring inventory presented in this report is as complete as possible within time and budgetary constraints. Projects related to the acid precipitation phenomenon were emphasized, especially projects studying ecosystem impacts and pollutant transport, scavenging, and deposition. Representative examples of other transboundary pollutant monitoring programs were also included, but topics such as groundwater monitoring, wildlife behavioral patterns, and radioactive-substance monitoring were considered outside the scope of the inventory.

Emphasis was placed on including large-scale environmental monitoring and research efforts within the fields chosen for study. Large-scale efforts were defined as projects exhibiting at least one of the following characteristics:

- involves a large geographic region
- has existed or is likely to exist for a long time period

- involves significant (albeit short-term) fieldwork with extensive measurement programs.

Because of the cost of conducting studies with these characteristics, projects falling into the inventory domain tended to be funded by federal or regional agencies. Inventory coverage is thus geared toward federally, provincially, or state-sponsored projects. Less emphasis was placed on obtaining information on monitoring programs administered by individual industrial firms, local government agencies, or university faculty. Inventory coverage of these smaller scale projects is accordingly less extensive.

The following three sections of the report are designed to aid interpretation of the inventory. The first section describes the methodology employed to obtain information on individual transboundary monitoring projects. The second section describes the inventory format and organization, estimates the probable inventory coverage of projects, summarizes the major characteristics of included projects, and reviews upcoming major programs with sites likely to be located in the transboundary region. Observations and recommendations based on the inventory as a whole are also presented. The third section summarizes the major findings of the study. Appendices A through G present data base and project listings for each environmental category listed in Table 1.1 and comprise the actual transboundary monitoring inventory.

To maximize its usefulness, this document should be used in conjunction with the Concord Scientific Corporation (CSC) report entitled A Review of Atmospheric Deposition Networks in the Great Lakes Basin (1985). The CSC report details atmospheric deposition monitoring activities throughout the U.S. and Canadian Great Lakes region. Frequent reference is made to this report in the deposition monitoring inventory. Projects fully described in the CSC report are not included in this inventory. The two documents together provide a preliminary survey of major environmental monitoring activities in the transboundary region.

2.0 METHODOLOGY

This section comprises three parts: 1) a discussion of the method used in identifying, obtaining, and verifying information on environmental monitoring programs conducted in the U.S.-Canadian transboundary region, 2) a synopsis of the major publications used and a brief mention of some of the people who assisted in the data-collection efforts, and 3) a description of the data-base system used to store the collected information and to prepare the inventory listings given in this document.

2.1 OVERALL PROCEDURE

The search for information on transboundary region projects began with a review of recent data-base source documents and monitoring overview reports. In addition, Canadian and U.S. researchers and administrators known to be well-versed in the current state of environmental programs were consulted. These sources provided background information, additional key references, the names of "essential" contacts, and a list of projects that were candidates for inclusion in the inventory. Next, these contacts were requested, via letters and follow-up telephone calls, to provide general information about their fields of expertise, specifics about their own monitoring work, copies of pertinent publications, and suggestions of other contacts or projects relevant to the study. The process was repeated with these additional contacts. Major publications found to be especially useful in the preliminary stages of inventory compilation are summarized in Table 2.1, and initial contacts are listed in Table 2.2.

In addition to reviewing documents provided by contacts, a literature search of the Energy Data Base was conducted using the Department of Energy (DOE) RECON service. The data base was searched with the primary descriptors "acid rain/Canada" and "acid rain/United States," plus one or more of fifteen possible secondary descriptors. The search resulted in the printing of 560 abstracts that had been entered into the data base since 1980. These abstracts were reviewed to identify monitoring projects with temporal and spatial scales appropriate for inclusion in the inventory.

TABLE 2.1. Major Publications Used in the Inventory Preparation

<u>Publication</u>	<u>Synopsis</u>
Caton, Riordan and Oen (1984)	Details ongoing, recently completed or newly funded projects under the U.S. National Acid Acid Precipitation Assessment Program (NAPAP).
Concord Scientific Corporation (1985)	Reviews atmospheric deposition programs recently completed or currently being conducted in the Great Lakes region. Includes Canadian and U.S. studies.
Environment Canada (1983)	Catalogs Canadian research projects concerned with the long-range transport of air pollutants (LRTAP).
Kemp (1977)	Provides a summary of U.S. biomonitoring programs conducted in the early 1970s.
Olson (1984)	Reviews U.S. data bases that contain environmental monitoring data. Provides names of contacts for data bases relevant to the inventory.
Wisniewski and Kinsman (1982)	Contains basic information on many of the North American acid deposition monitoring programs that were ongoing or recently completed in the early 1980s.

Descriptions of individual monitoring projects were prepared and compiled in a draft inventory. Information obtained from publications and in conversations with technical experts for preparing these descriptions included the following:

- official project title
- number and general location of monitoring sites
- principal parameters measured and the methodology employed
- frequency of measurement
- time period of monitoring (start/end dates)
- data availability, including storage form
- principal contact for the project.

TABLE 2.2. Initial Key Contacts for Preparation of the
Environmental Monitoring Inventory

Contact	Address	Information Provided
Ann Bartuska	North Carolina State University Raleigh, North Carolina 27650	NAPAP Programs U.S. Water Quality Survey Program
Jacque Dupont	Gouvernement du Quebec Ministere de l'Environnement 3900, rue Marley - 5e Sainte-Foy, Quebec G1X 4E4	Quebec programs
William Fallon	Environmental Protection Agency 401 M St. S.W. Washington, DC 20460	Key U.S. contacts; overview documents
Don Faulkner	Atmospheric Environment Service Suite 700, 1200 W. 73 Ave. Vancouver, British Columbia V6P 6H9	British Columbia and other western Canadian programs
Gary Foley	Environmental Protection Agency 401 M St. S.W. Washington, DC 20460	Key U.S. contacts; overview documents
Robert Goldstein	Electric Power Research Institute 3412 Hillview Avenue Palo Alto, California 94304	ILWAS, RILWAS, other EPRI programs
Steven Holzhey	National Soil Survey Laboratory Federal Building Mall North Lincoln, Nebraska 68508	Soil survey information
Larry Lechner	Pollutant Control Branch Saskatchewan Environment 3085 Alberta St. Regina, Saskatchewan S4S 0B1	Saskatchewan and other western programs
Maris Lusi	Ontario Ministry of the Environment 880 Bay Street/4th Floor Toronto, Ontario M5S 1Z8	APIOS Programs; additional Canadian contacts
Susan Milburn	Environment Canada 4905 Dufferin Street Downsview, Ontario M3H 5T4	LRTAP programs

TABLE 2.2. (Continued)

Contact	Address	Information Provided
Richard Olson	Oak Ridge National Laboratory P.O. Box X Oak Ridge, Tennessee 37831	Data bases in ADDNET
Charles Philpot	U.S. Forest Service Forest Environment Research 606-RPE P.O. Box 2417 Washington, DC 20013	Forest Survey Programs
Charles Powers	Environmental Protection Agency Corvallis Environmental Research Lab 200 SW 35th Street Corvallis, Oregon 97333	NAPAP Programs
Keith Puckett	Environment Canada 4905 Dufferin Street Downsview, Ontario M3H 5T4	Key Canadian contacts; overview documents
Peter Van Voris	Battelle Pacific Northwest Laboratories P.O. Box 999 Richland, Washington 99352	Soils, forestry and ecosystem contacts
Charles Watson	Battelle Pacific Northwest Laboratories P.O. Box 999 Richland, Washington 99352	Acid deposition contacts; ADS data base
Owen Williams	U.S. Geological Survey National Center, MS421 Reston, Virginia 20092	NAWDEX, STORET data bases

To verify the accuracy of the compiled information, draft descriptions were sent to principal investigators associated with the projects for their review. An accompanying letter explained the purpose of the inventory and included examples of completed inventory entries. A similar procedure was used for verifying information on centralized data bases. Corrections or modifications indicated by principal investigators were incorporated into the final inventory descriptions included in this report. Several investigators supplied complete information on projects related to their main program, and these additional projects were added to the inventory.

2.2 DATA-BASE STORAGE OF INVENTORY INFORMATION

The project data base was initially stored on a Digital Electronic Corporation VAX 11/780 computer using the DATATRIEVE data-base management system. DATATRIEVE is an interactive data-base system designed for use on VAX computers. It was selected for use in this investigation because of its versatility and compatibility with other VAX software. Use of the system enabled centralized access to information by project staff and helped prevent duplication of effort. It also enabled output of the preliminary inventory data base either in its entirety or in part, in a variety of formats. As work on the data base reached its final stages, the material in the data base was copied to a personal computer and modified for publication using a word processing package.

A readily transferable data base containing the material presented in this document will be prepared for use on a personal computer using dBASE-III^(a) or equivalent data-base management system.

(a) dBASE-III is a registered trademark of Aston-Tate, Culver, Colorado.

3.0 INVENTORY OVERVIEW

The appendices to this document contain an inventory of selected environmental data bases and environmental monitoring programs. In the previous section we described how the information presented there was obtained and verified. This section discusses the organization and structure of the inventory and estimates its representativeness and completeness. This discussion is followed by a survey of inventory project characteristics and a brief description of additional monitoring programs that are scheduled to begin in the near future. Observations and recommendations for future work conclude this section.

3.1 INVENTORY ORGANIZATION

As indicated in Table 1.1, six categories of environmental monitoring in the U.S.-Canadian transboundary region are included in this inventory: ambient air-quality monitoring, ambient water-quality monitoring, deposition monitoring, forest/vegetation monitoring and research, soil studies, and ecosystem studies. Each of the environmental-monitoring programs examined and determined to be appropriate for the inventory was placed into one of these six categories. For purposes of this study, environmental-monitoring programs that involve the measurement of parameters from more than one research category are classified as ecosystem studies.

Ambient air-quality monitoring involves the measurement of airborne pollutant concentrations in the atmosphere. Measurement includes both particulate and gaseous forms of pollutants. "Ambient" implies that the measurements are taken some distance from the direct influence of any local pollution source; emissions monitoring programs and data bases were not reviewed for this inventory. Ambient air-quality monitoring is generally performed on a routine basis by local government agencies throughout the United States and Canada. Data are usually transferred to state, provincial, and/or federal agencies for additional analysis and storage.

Ambient water-quality monitoring is concerned with the measurement of the concentration of pollutants in lakes, ponds, streams, rivers, and other surface

waters. Groundwater studies and additional types of water-quality investigations were not specifically reviewed in this project because of the emphasis on monitoring programs related to acid precipitation impacts. Surface water monitoring is performed on a routine basis by many government agencies, private organizations, and individual researchers throughout the United States and Canada. Many projects in this category were smaller than the large-scale projects emphasized in the inventory. In fact, many studies involve one lake where measurements are made a few times each year. We have attempted to include in the inventory a representative cross section of major ambient water-quality monitoring programs, but readers desiring a detailed listing of transboundary-region water-quality monitoring sites are advised to consult the appropriate centralized data bases described in Appendix A. Readers interested in water-quality monitoring should also review the ecosystem projects described in Appendix G. Many major monitoring programs are designed to study specific aspects of water quality in detail, and also involve the measurement of other parameters, such as fish populations or sediment composition. Such programs were classified as ecosystem studies because they involve parameters from more than one of the defined research categories.

Deposition monitoring is concerned with the measurement of dry and wet depositing pollutants. Wet deposition monitoring includes studies of rain, fog, and cloudwater chemistry, and is typically performed via precipitation chemistry networks. This area of research has received intensive study within the past 10 years. Programs are generally funded by government agencies, although a number of major projects have been funded by private utility organizations. In many precipitation chemistry studies, rain samples are collected using automated samplers that separate wetfall and dryfall. However, some studies use collectors that combine wetfall and dryfall in a bulk sample. The chemical composition of collected samples is later determined by laboratory analysis. Sampling periods vary depending on the emphasis of the study; samples can be collected on a monthly, weekly, daily, or "event" basis.

Dry deposition is another important removal mechanism for atmospheric pollutants; however, fewer field sites for monitoring dry deposition are in operation. Measurement techniques tend to be more difficult to use on a routine

basis than the procedures developed for wetfall measurements. Current dry-deposition research and monitoring efforts are included in the deposition monitoring category.

Forest/vegetation monitoring and research is concerned with the impact of pollutants on plants, with an emphasis on agricultural products and forest resources. Research is conducted both in the field and in laboratory simulations. Only field investigations were included in this inventory. Through tree coring, plot inventories and other techniques, historical data on tree growth, competition, and stress are available. Research in this field is conducted by both government and private organizations.

Soil studies are concerned with the chemical composition of soils and the transport and transformation of pollutants on these soils, including the mobilization of heavy metals. The monitoring of soil chemistry has been conducted on a routine basis for a number of years on agricultural lands. However, with increasing concern about acid precipitation impacts, attention has recently been focused on the effects of pollutants on forest soils. These studies are often coupled with forest-growth monitoring. These combined projects are listed in the ecosystem category.

Ecosystem studies are concerned with biotic-abiotic interactions and how these interactions affect material and energy transport in an ecosystem. Studies often focus on the impact of pollutants on animal and plant life, ranging from impacts on one-celled organisms to impacts on fish and waterfowl. Many investigators are now studying overall watershed ecology and include nutrient budgets and element mass balances in their programs. Such studies may examine precipitation chemistry, lake sediment chemistry, stream and lake water chemistry, fish populations, tree growth, and soil chemistry within a small area. As stated previously, projects that involve measurements of parameters from more than one research category were classified as ecosystem projects.

In many cases, the best method of accessing data from environmental monitoring programs is through one of many centralized data-base systems in existence. Typically, these systems are funded by government agencies, and

data are available to the public. These data bases are structured so that a person can request information from a specific program or request data that meet specific criteria (such as all measurements of lake water pH measured in the state of Maine during the spring of 1984). Some data bases do not contain actual environmental-monitoring results; instead, they provide information on where to obtain a certain type of data. These data bases generally provide the name of organizations or programs that collect certain types of data, information on where and how sampling is conducted, the particular parameters measured and who to contact to obtain actual data. In some cases, actual monitoring data may also be contained in the system.

Appendix A contains an inventory of environmental monitoring data bases arranged in alphabetical order. Data from many of the larger environmental monitoring programs contained in the inventory are accessible through the data bases described in this document.

A sample entry for the data-base inventory is given in Figure 3.1. The entry begins by providing the name of the data base, the popular acronym (if one exists) for the data base, the organization currently sponsoring its maintenance, the type of environmental data it contains, and the geographic area from which data are included. This information is followed by a paragraph describing the data base and providing an overview of its contents and operation. Following this paragraph are entries that provide the location of the data base and the name, address, and telephone number of an individual to contact for additional information.

Appendices B through G comprise the inventory of transboundary-region monitoring projects subdivided according to each of the research categories. Within each inventory, individual monitoring programs are presented as follows:

- national-scale Canadian projects
- national-scale U.S. projects
- eastern region projects (Maritime Provinces, Quebec, New England states, New York, Pennsylvania)

FIGURE 3.1. Sample Entry for Data Base Inventory

Information provided includes: data base name; acronym; sponsoring organization; type of data base; geographic area of sites providing data input; a general description of the data base; the location of the data base; the name, address, and telephone number of a person to contact for additional information; and a reference for a document containing additional information.

NAME : Acidification Chemistry Information Data Base
ACRONYM : ACID
SPONSOR : National Acid Precipitation Assessment Program

TYPE : Water Quality
GEOGRAPHICAL AREA : United States

ACID is a comprehensive data base that combines data from STORET on low alkalinity waters with data sets from a variety of sources. Over 42,000 stations are represented in ACID with over 30,000 from STORET. Data include hydrology, acidity, water chemistry, limited lake and stream morphometry, station location, and other station identifiers. Data from 1900 through 1980 are included. Quality assurance for data entry and modification into the database are described by Hendrey, Hoogendyk, and Gmur (1983).

DATA LOCATION : Brookhaven National Laboratory, Upton, New York
Also in ADDNET

CONTACT NAME : George Hendrey
ADDRESS : Terrestrial and Aquatic Ecology Division
Brookhaven National Laboratory
Building 318
Upton, NY 11973

PHONE : (516) 282-3262

REFERENCE DOC : Hendrey, G. R., C. G. Hoogendyk, and N. F. Gmur. 1983.
Establishing the Acidification Chemistry Information Database (ACID). BNL 51707, Brookhaven National Laboratory, Upton, Long Island, New York.

- central region projects (Ontario to Manitoba, Ohio to South Dakota)
- western region projects (Saskatchewan to British Columbia, Montana to Washington).

A sample entry for a monitoring program in one of these inventories is given in Figure 3.2.

Each entry in the inventory includes such information as the official title for the environmental monitoring program (NAME); the common abbreviation for this name, if one exists, (ABREV); a brief characterization of the emphasis of the program (TYPE); the specific parameters measured (PARAM); the geographic or geopolitical region where monitoring is conducted (CAN or US); the sampling frequency (OFTEN); when the program was initiated and whether or not it is still active (DATES); the sample-collection and analysis methods (HOW); a brief indication if any formal quality assurance/quality control program is followed (QAQC); in what form and where the data are stored (STOR); the name, address, and telephone number of the principal investigator (CONTACT, ADDRESS, TELEPH); and the names of the funding organizations (FUNDS). Following these entries may be several lines of text describing the program in more detail (when further explanation is warranted) or relating the program to other entries (MISC). For projects with many widespread field stations, a map showing the location of monitoring sites is also included. The last line of each entry (CODE) contains a seven-parameter code that identifies the major features of each project. These codes facilitated compilation of the inventory entries and were used in a survey of inventory characteristics. Use of the codes will aid readers interested in quickly identifying interrelated projects or programs with certain characteristics, once an understanding of the codes is attained. Readers interested in using the inventory in this manner are urged to carefully study the next section; casual users of the inventory may wish to bypass the discussion of classification codes.

3.2 CLASSIFICATION CODES

Project features considered in the classification include the project type, the geographic area in which monitoring occurred, the parameters (or

FIGURE 3.2. Sample Entry for Environmental Monitoring Program Inventory

Information provided includes the name of the program; an abbreviation of this name; program type, parameters measured; monitoring location (in the U.S.); measurement frequency; program duration; how sampling is conducted; QA/QC procedures followed; where data are stored; the name, address and telephone number of the person to contact for additional information; the name of the funding organization; other related information, and a coded summary of the information presented above. In this example, a map of site locations and a reference document citation are also given.

```

NAME      : NATIONWIDE URBAN RUNOFF PROGRAM
ABREV     : NURP
TYPE      : WET AND DRY DEPOSITION
PARAM     : pH, CONDUCTIVITY, SO4, NO3, NH4, Cl, P, Po, Na, K, Ca, Mg, Cd, Cu,
           : Pb, Zn; SOME ANALYSIS FOR TRACE METALS, CARBONATE, BICARBONATE,
           : TOTAL ORGANIC CARBON, AND DISSOLVED INORGANIC CARBON (NOT ALL CITIES)
US        : 28 CITIES NATIONWIDE
OFTEN     : WET DEPOSITION -- EVENT BASIS
           : DRY DEPOSITION -- MONTHLY OR BIMONTHLY BASIS
DATES      : SUMMER 1978 - 1984
HOW       : COLLECTED USING AEROCHEM METRICS 201 WET/DRY SAMPLERS ALONG WITH 2
           : SIMILAR MODELS. ANALYZED AT THE EPA LABORATORY IN KANSAS CITY, U.S.
           : GEOLOGICAL SURVEY LABORATORIES IN ATLANTA AND DENVER, AND AT VARIOUS
           : UNIVERSITY AND PRIVATE LABORATORIES
QAQC      : FORMAL FIELD AND LABORATORY PROGRAMS
STOR      : STORET DATABASE
CONTACT   : DENNIS N. ATHAYDE OR MARSHALL JENNINGS
ADDRESS   : ENVIRONMENTAL PROTECTION AGENCY USGS - WATER RESOURCES DIV.
           : 401 M ST. SW GULF COAST HYDROSCIENCE CENTER
           : WASHINGTON DC 20460 BLDG 1100
           : NATIONAL SPACE TECHNOLOGY
           : LABORATORY, MS 39529
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           : VALLEY AUTHORITY; STATE AND LOCAL AGENCIES
REFDOC    : RESULTS OF THE NATIONWIDE URBAN RUNOFF PROGRAM. 1983. WATER PLANNING
           : DIVISION, ENVIRONMENTAL PROTECTION AGENCY, WASHINGTON, D.C.
CODE      : T4/G1.123/P1.2/F1.3/L2.2/D1/V1
  
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analytes) monitored, the funding source and level, the length of time over which monitoring occurred, whether or not monitoring data were placed in a centralized data base, and whether or not a verified project description was returned by the principal investigator. Table 3.1 summarizes the classification codes. As illustrated in this table, an alphanumeric coding system was employed, with letters identifying a particular project feature and numerals indicating its nature or "value." Main classification codes appear to the left of a decimal point and subclassification codes to the right. Subclassification codes are combined when a project involves more than one category. For example, the "Geographic Area" parameter "G" can take on the main classification value of 1 to signify a project with sampling sites in the United States, or a value of 2 to signify locations in Canada. The region in which the sites are located (eastern, central, or western) is indicated by subclassification codes (.1, .2, and .3, respectively). Thus, a value of 1.2 for "G" indicates a project with sampling sites in the central region of the United States, while a value of 2.123 indicates a project with sites located throughout the Canadian transboundary region.

Classification codes associated with certain parameters require additional explanation. For example, when the "Project Type" feature "T" is assigned the value of 7 to indicate an ecosystem project, subclassification values are used to identify the scope of the monitoring effort. This identification is necessary since ecosystem programs were defined as projects involving measurements from more than one of the five major environmental research categories. Subclassification codes correspond to the main classification codes, with the additional value of ".8" to signify a project with biological monitoring (fish counts, plankton tows, bioassays, diatom counts, etc.). For example, a value of 7.348 for the parameter "T" indicates an ecosystem project where water quality, deposition chemistry, and biological monitoring occur. Subclassification codes are not assigned for the remaining research categories, as only one type of monitoring is involved.

The "Parameters Monitored" feature "P" indicates if measurements are made for compounds for which air- or water-quality standards exist. Air-quality

TABLE 3.1. Key to Classification Codes

Project Features	Parameter Abbreviation	Possible Value	Code
Project Type	T(a)	Air	2
		Water	3
		Deposition	4
		Forest/Vegetation	5
		Soils	6
		Ecosystem	7
Geographic Area	G(b)	U.S.	1
		Canada	2
		Eastern	.1
		Central	.2
Parameters Monitored	P	Western	.3
		Non-Criteria Pollutant	0
		Water Quality Criteria Pollutants	1
		Primary Project Objective	.1
		Secondary Project Objective	.2
		Air Quality Criteria Pollutants	2
		Gases	.1
		Particulates	.2
		Possible Criteria Pollutants (Analytes not specified)	3
		Water	.1
Funding Source and Level	F	Air	.2
		Not Available	0
		Federal	1
		State/Provincial	2
		Private	3
		Combined	4
		Not Available	.0
		Small	.1
		Medium	.2
		Large	.3
Duration of Monitoring	L	Very Large	.4
		Currently Operating	1
		Stopped	2
		Total monitoring period <5 yrs	.1
Data Located in Centralized Data Base	D	Total monitoring period ≥5 yrs	.2
		No Information	0
		Yes	1
		No	2
Entry Verified by Project Personnel	V	Yes	1
		No	0

(a) Codes 2-6 available for subclassifying Ecosystem projects, along with "Biological - .8". See text for more information.

(b) Codes combined for multiple regions (e.g., 1.123 for sites across U.S.)

criteria pollutants in the United States include sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), ozone (O_3), nonmethane hydrocarbons, total suspended particulates (TSP), and lead. The U.S. Environmental Protection Agency list of priority pollutants published in the Federal Register (Water Quality Criteria Documents; Availability 1980) was used in identifying water criteria pollutants. This list includes 64 organic compounds and metals for which water-quality standards have been promulgated in the United States, or for which standards may be promulgated once additional toxicity information is available. The water-quality priority pollutants are summarized in Table 3.2. The majority of these compounds have also been designated as either National Priority Issues or Program (Emerging) Issues by the Priority Issues Directorate of the Environmental Protection Service, Environment Canada (Environment Canada 1985), or as materials for which suggested drinking water limits have been established by the Ministry of National Health and Welfare (Federal-Provincial Working Group on Drinking Water 1978). Values for the "P" feature indicate whether air- or water-quality criteria pollutants are monitored, or whether it is likely that one or more such pollutants are monitored. The latter code is applied when available project literature and information supplied by the principal investigator does not identify the specific compounds monitored, but rather uses general terms such as "trace metal analysis" or "air chemistry measurements." Subclassification codes in such cases indicate whether air-quality or water-quality parameters are involved. Subclassification codes for air-quality criteria pollutants indicate whether gases or particulates are monitored. Subclassification codes for water-quality criteria pollutants indicate whether the compounds are monitored strictly because of toxicity concerns or because information on their presence is useful in interpreting other project data. An example of the latter situation occurs frequently with the analysis of trace metals in water-quality, deposition, and soils-monitoring studies. Often lead, mercury, and selenium (all priority pollutants) are included in the analysis list of trace elements. However, information on the concentration of these elements may be collected for other than health reasons and may be of secondary importance compared to pH, alkalinity, or sulfate data. Subclassifications for water-quality criteria pollutants thus indicate whether or not toxicity monitoring is a major project objective.

TABLE 3.2. Compounds Identified as Water Quality Criteria
Pollutants Based on the U.S. Environmental
Protection Agency List of Priority Pollutants
(Water Quality Criteria Documents; Availability
1980)

Acenaphthene	Endosulfan
Acrolein	Endrin
Acrylonitrile	Ethylbenzene
Aldrin/Dieldrin	Fluoranthene
Antimony	Haloethers
Arsenic	Halomethanes
Asbestos	Heptachlor
Benzene	Hexachlorobutadiene
Benzidine	Hexachlorocyclohexane
Beryllium	Hexachlorocyclopentadiene
Cadmium	Isophorone
Carbon tetrachloride	Lead
Chlordane	Mercury
Chlorinated benzenes	Naphthalene
Chlorinated ethanes	Nickel
Chloroalkyl ethers	Nitrobenzene
Chlorinated naphthalene	Nitrophenols
Chlorinated phenols	Nitrosamines
Chloroform	Pentachlorophenol
2-Chlorophenol	Phenol
Chromium	Phthalate esters
Copper	Polychlorinated biphenyls (PCBs)
Cyanides	Polynuclear aromatic hydrocarbons
Dichlorodiphenyltrichloroethane (DDT)	Selenium
Dichlorobenzenes	Silver
Dichlorobenzidine	Tetrachloroethylene
Dichloroethylenes	Thallium
2,4-Dichlorophenol	Toluene
Dichloropropane and dichloropropene	Toxaphene
2,4-Dimethylphenol	Trichloroethylene
Dinitrotoluene	Vinyl chloride
Diphenylhydrazine	Zinc

The "Funding Source" feature "F" is used to indicate whether the project is sponsored by federal, provincial/state, or private organizations, or some combination of these three sources. Subclassification codes are used to indicate the relative size and complexity of the project. In assigning these latter codes, consideration was given to the number of field sites, the planned duration of the project, the type and number of measurements performed, and the instrumentation needed for the monitoring effort. Available information on project budgets and capital equipment outlays was also reviewed. In general, projects designated as "small" have annual budgets under \$50,000 (U.S.) and relatively limited equipment needs. "Very large" projects tend to have budgets exceeding \$500,000 (U.S.) and extensive equipment or sampling requirements. "Medium" and "large" projects fall between these two extremes. Assignment of the subclassification codes was a subjective decision based on information available at the compilation of the inventory. Arguments for different assignments undoubtedly can be made; however, we tried to assign the most appropriate subclassification code based on consistent application of the above criteria.

3.3 ESTIMATES OF INVENTORY COVERAGE

For studies of this type, the question invariably arises as to how complete an inventory may be in its coverage of candidate entries. This question is extremely difficult to answer, as accurate and defensible coverage estimates require knowledge of the total sample domain. For the current study, this estimate implies knowing the total number of post-1980 environmental monitoring programs in the transboundary region for each of the categories considered. Since such figures are not available, it is necessary to use somewhat subjective arguments in trying to address the coverage issue. Because of this subjectivity, it is not appropriate to arbitrarily (and blindly) assign indefensible percentages to each category. Instead, an overview discussion of the likely coverage in each category is presented. Where possible, we indicate what types of projects are well-covered and what types of projects may have been missed. Known small-scale projects and comments by researchers contacted in conjunction with projects listed in the inventory were considered in preparing this following discussion.

Appendix D (deposition monitoring) contains perhaps the most complete coverage of any environmental monitoring research category considered, particularly in its coverage of large-scale programs. Deposition-monitoring networks are relatively well-developed, and information on projects with multiple sites is generally available. An excellent inventory of projects has been published by Wisniewski and Kinsman (1982). A centralized data base (the Acid Deposition System - ADS) for major programs in both the United States and Canada has recently (Watson and Olsen 1984) become operational. The ADS data base is continuing to grow; however, many older, smaller, and nongovernment-sponsored programs have not submitted data.

Actual inventory coverage of ambient air-quality and water-quality projects is not as high as in the deposition category because of the very large number of small projects that fall into these areas. We have attempted to provide a good cross-section of the types of projects conducted and have included the major, national-scale programs operating in each country. Excellent, very complete data bases contain a wealth of environmental monitoring data for these fields. Readers desiring more information are urged to consult such data bases as SAROAD, NAPS, and AQUIS for air-quality data and STORET, ACID, and NAQUADAT for water-quality data. (See Appendix A for descriptions of these data bases.)

Coverage in forest/vegetation, soils, and ecosystems is harder to assess for three reasons: 1) the recent proliferation of field projects, 2) the great number of small projects, and 3) the multitude of organizations sponsoring research in these areas. For more recent projects, open-literature publications were often not yet available. For older programs, unless they were extremely large, knowledge of the project within the scientific community is often limited. The inventory does include, however, the majority of large-scale forest, soil, and ecosystem investigations currently being conducted in the transboundary region.

As indicated throughout this report, emphasis was placed in obtaining information on large-scale, government-funded programs, and the document includes the vast majority of such programs. Although an exact percentage calculation of inventory coverages is not possible, the estimated coverage of

appropriate studies is certainly above 70%. This observation is based on the study of Canadian and U.S. government overview documents describing major environmental programs. However, as discussed previously, such an estimate must be considered subjective. Coverage of smaller programs, such as studies at one site or those programs with infrequent sampling (e.g., seasonal snow pack studies), is less extensive. Such investigations tend to be conducted by universities, colleges, private firms, and various agencies of state, provincial and local governments. Many of these projects are not published in the open literature and are not included in overview documents. Considerable effort would be required to increase the coverage of such projects to levels attained for large-scale, government-funded programs in the inventory.

3.4 SURVEY OF INVENTORY PROJECT CHARACTERISTICS

In addition to externally oriented questions concerning completeness of inventory coverage, internally oriented questions also arise concerning the similarities and differences of projects included in the inventory. To address the most common questions, a survey of inventory entries was conducted using the assigned project classification codes described in Section 3.2. The survey identified common project characteristics and summarized the total number of projects in each environmental monitoring research category. The major characteristics identified in this survey are summarized in Tables 3.3, 3.4, and 3.5. In reviewing these tables, it must be remembered that information contained in them refers only to the projects included in the inventory, and not to all projects in existence.

As indicated in Table 3.3, 184 projects are included in the inventory, with deposition-monitoring and ecosystem projects composing approximately 68% of the total entries. This large percentage reflects not only the inventory emphasis on acid precipitation projects but also the fact that a large number of projects involve integrated measurement programs that encompass more than one environmental monitoring category. The number of projects submitting data to the centralized data bases (61 out of 184, or 33%) appears somewhat small on first consideration, given that such data bases were heavily used in identifying projects for inclusion in the inventory. However, principal

TABLE 3.3. Overview of Inventory Project Characteristics

Project Characteristic	Environmental Monitoring Category						Inventory Total
	Air Quality	Water Quality	Deposition	Forest/ Vegetation	Soils	Ecosystem	
Total Number in Each Category	9	33	55	6	10	71	184
Duration							
In operation <5 years	4	11	16	3	2	29	65
In operation >5 years	4	8	18	1	2	20	53
No longer in operation	1	14	21	2	6	22	66
Criteria Pollutants							
Water							
• Primary Objective	0	7	2	0	1	18	28
• Secondary Objective	0	1	13	0	1	25	40
Air	9	0	7	0	0	3	19
Funding Source							
Federal	6	19	28	4	6	51	114
State/Provincial	2	8	13	0	3	6	32
Private	0	2	8	0	1	8	19
Combined	1	4	6	2	0	6	19
Data Available in Centralized Data Base	6	21	19	2	2	11	61
Entry Verified by Project Personnel	8	25	49	4	6	54	146

TABLE 3.4. Relative Size of Federally Sponsored
Projects Included in the Inventory

<u>Size of Project</u>	<u>Environmental Monitoring Category</u>						<u>Total</u>
	<u>Air Quality</u>	<u>Water Quality</u>	<u>Deposition</u>	<u>Forests/ Vegetation</u>	<u>Soils</u>	<u>Ecosystem</u>	
Small	4	1	4	0	0	5	14
Medium	0	15	15	2	4	34	70
Large	2	2	9	1	1	6	21
Very Large	0	1	0	1	1	2	5
Not Classified Due to Insufficient Information	0	0	0	0	0	4	4

TABLE 3.5. Geographic Distributions and Measurement Emphasis
of Transboundary-Region Monitoring Projects
Included in the Inventory

<u>Measurement Emphasis</u>	<u>Region</u>		
	<u>Eastern</u>	<u>Central</u>	<u>Western</u>
Air Quality	6	9	6
Water Quality	49	27	15
Deposition	49	42	16
Forest/Vegetation	17	11	4
Soils	20	23	13
Biological	32	13	8
Total Inventory Monitoring Efforts in Region	173	125	62

investigators associated with projects initially identified from such data bases often provided information on related programs conducted by their organizations. Results from these related programs often were not submitted to centralized data bases. The substantial number of these related projects is thus an indication of the degree of cooperation provided by Canadian and U.S. scientists in assembling the inventory. This cooperation is also reflected in the large number of draft inventory entries that were reviewed and returned by principal investigators in the verification process. As indicated in Table 3.3, entries for 146 of the 184 projects included in the inventory (or 79%) were verified by cognizant Canadian or U.S. scientists. This return is much higher than that anticipated when the verification process was designed.

Emphasis on including federally sponsored programs in the inventory is reflected in both Tables 3.3 and 3.4. Almost two-thirds of the projects included in the inventory are sponsored by Canadian or U.S. government organizations. As a review of actual inventory entries will indicate, the size of these programs ranges from relatively small, short-term projects to large-scale, extremely complex monitoring efforts.

The geographic distribution of projects included in the inventory is summarized in Table 3.5. Note that this table is organized according to measurement emphasis rather than monitoring categories. Subclassifications of ecosystem projects have been combined with information on single-monitoring category projects to present a balanced picture of the types of monitoring conducted in each of the geographic regions defined in Section 3.1. Totals in Table 3.5 do not correspond to the inventory totals presented in Table 3.3 because all ecosystem projects appear in more than one measurement emphasis classification. Similarly, projects with sites in more than one geographic region are included more than once. For example, an ecosystem project involving measurements of water-quality, deposition, and biological parameters at sites located in the eastern and central regions is counted six times--once for each region and once for each measurement category. This type of breakdown provides more information on the environmental data available in each region than does a breakdown according to monitoring category. The results of the survey illustrate that the majority of projects currently included in the inventory are located in the eastern and central regions. Study of inventory entries further indicates that while eastern projects are fairly well distributed throughout the region, central region projects are concentrated in the Great Lakes Basin.

Readers desiring information on project characteristics not included in Tables 3.3 through 3.5 may generate the figures of interest by adding or subtracting already-compiled totals. Alternatively, the codes listed at the end of each project description can be reviewed and new compilations formulated.

3.5 UPCOMING MAJOR PROJECTS

During preparation of the inventory, information was obtained on a number of upcoming large-scale projects. These projects currently are in the initial planning stages, and project directors are in the process of establishing program protocols. Specific field stations usually have not yet been selected, although tentative areas for sampling may have been identified. Such projects are not in a state where a formal inventory listing can be prepared; however, some mention of the projects is an appropriate and necessary enhancement to

the inventory. Such mention also serves to identify projects where future opportunities for international cooperation in transboundary monitoring may exist, and where such cooperation potentially can be made an integral part of the operational plan. Table 3.6 lists major upcoming projects that fall into one of the six environmental monitoring classifications considered in this investigation and potentially may have monitoring sites located in the U.S.-Canadian transboundary region. A brief description of the planned research and a principal contact for each project are given. This list is not all-inclusive because a complete review of upcoming projects was outside the scope of this investigation. The list does, however, provide an overview of the types of additional projects that are likely to be conducted in the transboundary region within the next few years.

3.6 OBSERVATIONS AND RECOMMENDATIONS

During the preparation and compilation of the environmental monitoring inventory, several observations were made. These observations generally fall into two classes: those that resulted from a review of the inventory as a whole and those that resulted from conversations with Canadian and U.S. researchers.

The inventory observations are not the result of an in-depth critique of monitoring efforts in the transboundary region, which is beyond the scope of the current study, but rather are based on a review of inventory entries and the survey information presented in Section 3.4. The first observation concerns geographic coverage; many more monitoring programs are located in the eastern transboundary region (Maritime Provinces to Quebec and New England States to Pennsylvania) and the Great Lakes Basin than are located in the western region. This observation is especially true for programs emphasizing water quality and deposition measurements. The larger number of programs in the eastern region is not surprising since concern over North American acid precipitation and the identification of potentially sensitive areas originated in this region. The higher population density and greater terrain accessibility of the eastern transboundary region may also contribute to the more extensive monitoring. The second observation concerns project type and duration. Ambient

TABLE 3.6. Major Upcoming Projects Likely to Involve Monitoring Within the Transboundary Region

Project Title	Expected Scope	Principal Contact
Dry Deposition Monitoring	Expansion of the U.S. CORE network for dry deposition monitoring.	Bruce Hicks Atmospheric Turbulence & Diffusion Division P.O. Box E Oak Ridge, Tennessee 37831
National Vegetation Survey	Surveys of U.S. forest health conditions.	Staff Biologist U.S. Forest Service Northeastern Forest Experimental Station 370 Reed Road Broomhall, Pennsylvania 19008
National Early Warning System	Nationwide Canadian system to detect acid rain impacts on forest soil, vegetation and trees.	L. P. Magasi Maritimes Forest Research Centre P.O. Box 4000 Fredericton, New Brunswick E3B 5P7
National Lakes Survey	Multi-phase U.S. program involving lake surveys; long-term stream and lake monitoring. Phase 1 in operation.	William Fallon Environmental Protection Agency 401 M Street SW Washington, DC 20460
Effects of Atmospheric Deposition on Spruce-Fir Forests	Research on the causes and effects of air pollutants and acid precipitation on U.S. northeastern spruce-fir forests.	Staff Biologist U.S. Forest Service Northeastern Forest Experimental Station 370 Reed Road Broomhall, Pennsylvania 19008
Ecological Study of Laurentian Mountain Lakes	Ecological study of 158 lakes in the Laurentian Mountains of southern Quebec. Initiated summer of 1985.	Bob Hellie Lands Directorate Environment Canada Place Vincete Massey Hull, Quebec K1A 0E7
Hardwood Decline in the Great Lakes Hardwood Forest	Establishment of permanent observation plots at 100 sites in southern Ontario.	S. N. Linzon Ontario Ministry of the Environment 880 Bay Street Toronto, Ontario M5S 1Z8
Direct/Delayed Response Project	Soil characterization study in 150 northeastern U.S. watersheds. Initiated summer of 1985.	Robin Church Environmental Protection Agency Corvallis, Oregon 97333

air-quality monitoring, ambient water-quality monitoring, and precipitation chemistry monitoring projects generally have more widespread networks, have more comprehensive data bases, and have been in operation longer than the forest, soil, or biological impact types of projects. However, as evidenced by inventory listings in these latter categories and the future projects discussed in Table 3.6, ecosystem impact projects are increasing both in number and complexity.

Two general observations can be made based on topics that repeatedly arose during conversations with both U.S. and Canadian researchers. The first observation concerns the appearance of widespread support throughout the technical community for formal international cooperation in transboundary monitoring and research. All scientists and administrators contacted throughout the course of this project were extremely helpful, and many expressed satisfaction that there was interest in reviewing the status of transboundary monitoring. Informal cooperation between individual scientists via exchanges of data and ideas is obviously occurring, as recent joint publications attest [e.g., Barrie and Hales (1984)]. The second observation arising from these conversations involves concern over the pooling of data sets without full consideration of protocol compatibility and laboratory comparability. Several scientists expressed the need for co-locating field stations and exchanging samples for analytical laboratory comparisons to address this problem. Limited intercomparability programs have already been conducted in certain fields. For example, the U.S. National Atmospheric Deposition Program (NADP) and the Canadian Network for Sampling Acid Precipitation (CANSAP) have maintained three co-located precipitation monitoring stations. There is strong interest in thoroughly analyzing the collected data and in co-locating selected NADP and Canadian Air and Precipitation Monitoring Network (CAPMoN) sites. Similar comparisons in other fields may also be useful.

Based on these observations and the inventory preparation process as a whole, we suggest that the atmosphere of informal cooperation that currently exists among individual scientists continue to be fostered. We also suggest that opportunities for formal cooperation be sought, especially for co-located stations and sample exchange programs. We further recommend that an in-depth

critique of transboundary monitoring be conducted to identify specific trans-boundary locations where deficient or redundant sampling exists, and to identify projects where potential joint U.S.-Canadian ventures are possible in the near future. This document and the Concord Scientific Corporation report (1985) should provide a starting point for such a critique.

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APPENDIX A

A DESCRIPTION OF SELECTED MAJOR ENVIRONMENTAL RESEARCH DATA BASES

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NAME : Storage and Retrieval of Aerometric Data
ACRONYM : SAROAD
SPONSOR : Environmental Protection Agency

TYPE : Air Quality
GEOGRAPHICAL AREA : United States

SAROAD contains information on concentrations of pollutants in the ambient air. The largest volume of data is for particulate, SO₂, CO, NO₂, hydrocarbons, and ozone. Sampling site information is also included in the data base. Data as early as 1957 have been included for some sites, although 1970 is the earliest date for most states. Reports are published quarterly containing summary statistics for currently operating sites. Data are readily available to the public. Maps illustrating monitoring site locations are given on the next three pages. Maps were provided by the Data Analysis Section, Office of Air Quality Planning and Standards, Environmental Protection Agency.

DATA LOCATION : Environmental Protection Agency, Research Triangle Park,
North Carolina

CONTACT NAME : Jacob Summers
ADDRESS : MD-14
Office of Air Quality, Planning and Standards
Environmental Protection Agency
Research Triangle Park, NC 27711

PHONE : (919) 541-5694

REFERENCE DOC : U.S. Environmental Protection Agency. 1983. Aeros Manual Series, Volume 1: AEROS Overview (Second Edition). EPA-450/2-76-001, U.S. EPA, Office of Air and Radiation, Office of Air Quality Planning and Standards, Research Triangle Park (R.T.P.), North Carolina.

U.S. Environmental Protection Agency. 1983. AEROS Manual Series, Volume II: AEROS User's Manual. EPA-450/2-76-029, U.S. EPA, Office of Air and Radiation, Office of Air Quality Planning and Standards, R.T.P., NC.

U.S. Environmental Protection Agency. 1983. AEROS Manual Series, Volume III: Summary and Retrieval. EPA-450/2-76-009, U.S. EPA, Office of Air and Radiation, Office of Air Quality Planning and Standards, R.T.P., NC.

U.S. Environmental Protection Agency. 1983. AEROS Manual Series, Volume V: AEROS Manual of Codes. EPA-450/2-76-005, U.S. EPA, Office of Air and Radiation, Office of Air Quality Planning and Standards, R.T.P., NC.

U.S. Environmental Protection Agency. 1979. SAROAD, Storage and Retrieval of Aerometric Data, Information. EPA-450/4-79-005, U.S. EPA, Office of Air Quality Planning and Standards, R.T.P., NC.

Maps Depicting Monitoring Sites for SAROAD

TSP MONITORING SITES IN SAROAD, 1981-83

LEAD MONITORING SITES, 1981-83

Maps Depicting Monitoring Sites for SAROAD

1982 SULFUR DIOXIDE MONITORING NETWORK

NITROGEN DIOXIDE MONITORING SITES, 1981-83

Maps Depicting Monitoring Sites for SAROAD

1980-83 OZONE MONITORING NETWORK

1980-83 CARBON MONOXIDE MONITORING NETWORK

NAME : Air Quality Information System
ACRONYM : AQUIS
SPONSOR : Ontario Ministry of the Environment

TYPE : Air Quality
GEOGRAPHICAL AREA : Ontario

The system is used primarily to store and analyze the concentration of various air contaminants measured at locations scattered throughout the Province of Ontario. A portion of the data are acquired through a telemetering system on a real-time basis. Presently, the system processes information on up to 40 pollutants including the meteorological measurements, at up to 700 locations. The system reports on the ambient air quality levels in the Province and assists management in determining the compliance of the ambient air quality levels with criteria levels for desirable air quality set under the Province's Environmental Protection Act, 1971.

DATA LOCATION : Ontario Ministry of the Environment, Rexdale, Ontario

CONTACT NAME : Joel Kurtz
ADDRESS : Air Resources Branch
Ministry of the Environment
125 Resources Road
Rexdale, Ontario M9W 5L1

PHONE : (416) 248-3245

NAME : National Water Quality Data
ACRONYM : NAQUADAT
SPONSOR : Environment Canada

TYPE : Water Quality
GEOGRAPHICAL AREA : Canada

NAQUADAT contains data primarily from the Water Quality Branch of Environment Canada, but also from other provincial, municipal, and private agencies. For each water quality parameter measured, information on the sampling location, date, sampling time, frequency of measurement, and laboratory where the sample was analyzed are included. Sampling locations numbering in the thousands include rivers, lakes, ground water, and waste water.

DATA LOCATION : EMR Computer Science Centre, Ottawa, Canada

CONTACT NAME : Maureen Lamb
ADDRESS : Data Systems Section
Inland Waters Directorate
Water Quality Branch, 10th Floor
Place Vincent Massey
Ottawa, Ontario K1A 0E7

PHONE : (819) 997-3422

REFERENCE DOC : Whitlow, S. and M. Lamb. 1983. NAQUADAT-Guide to Interactive Retrieval. En 39-16/2-1984E, ISBN 0-662-13045-6, Inland Waters Directorate, Water Quality Branch, Ottawa, Canada.

NAME : Storage and Retrieval
ACRONYM : STORET
SPONSOR : Environmental Protection Agency

TYPE : Water Quality
GEOGRAPHICAL AREA : United States

STORET is a massive data base that contains water-quality data for both surface and ground waters. Data are stored for several federal agencies and over 40 state agencies. These data include chemical, physical, biological, and radiochemical analyses of water samples. Most of the major water quality research and monitoring projects in the United States are entered into STORET. It provides a centralized location for water quality data, but has a wide variation in data quality. The data are readily available to the public.

DATA LOCATION : Environmental Protection Agency, Research Triangle Park,
North Carolina

CONTACT NAME : Lee Manning
ADDRESS : U.S. Environmental Protection Agency
Office of Water and Hazardous Materials
Washington, DC 20460

PHONE : (202) 382-7220

REFERENCE DOC : U.S. Environmental Protection Agency. 1982. Water Quality Control Information System STORET User Handbook. U.S. Environmental Protection Agency, Washington, D.C.

Staples, C. A., A. F. Werner, and T. J. Hoogheem. 1984. "Assessment of Priority Pollutant Concentrations in the United States Using STORET Database." Environmental Toxicology and Chemistry. 4:131-142.

U.S. Environmental Protection Agency. Manager's Guide to STORET. U.S. EPA, Washington, D.C.

NAME : Acidification Chemistry Information Data Base
ACRONYM : ACID
SPONSOR : National Acid Precipitation Assessment Program

TYPE : Water Quality
GEOGRAPHICAL AREA : United States

ACID is a comprehensive data base that combines data from STORET on low alkalinity waters with data sets from a variety of sources. Over 42,000 stations are represented in ACID with over 30,000 from STORET. Data include hydrology, acidity, water chemistry, limited lake and stream morphometry, station location, and other station identifiers. Data from 1900 through 1980 are included. Quality assurance for data entry and modification into the database are described by Hendrey, Hoogendyk, and Gmur (1983).

DATA LOCATION : Brookhaven National Laboratory, Upton, New York
Also in ADDNET

CONTACT NAME : George Hendrey
ADDRESS : Terrestrial and Aquatic Ecology Division
Brookhaven National Laboratory
Building 318
Upton, NY 11973

PHONE : (516) 282-3262

REFERENCE DOC : Hendrey, G. R., C. G. Hoogendyk, and N. F. Gmur. 1983.
Establishing the Acidification Chemistry Information Database (ACID). BNL 51707, Brookhaven National Laboratory, Upton, Long Island, New York.

NAME : National Water Data Exchange
ACRONYM : NAWDEX
SPONSOR : U.S. Geological Survey

TYPE : Water Data and Information
GEOGRAPHICAL AREA : United States, Canada, Mexico

NAWDEX is a program that assists users of water data in the identification, location, and acquisition of needed data. It contains two data bases. The Water Data Sources Directory identifies over 800 organizations that are sources of water or water-related data and services, types of data available, and locations from which data or services may be obtained. The Master Water Data Index contains information on over 440,000 sites at which water data are collected, locations of the sites, types of data collected, periods of record, frequency of measurement, and identification of the source organizations. Actual hydrologic data are not provided in NAWDEX, although access is provided to WATSTORE, STORET, several bibliographic data services, several state water data systems, and the Water Resources Document Referral Center of the Inland Waters Directorate, Canadian Department of the Environment. NAWDEX is readily available to the public.

DATA LOCATION : U.S. Geological Survey, Reston, Virginia

CONTACT NAME : Owen Williams
ADDRESS : Water Resources Division
U.S. Geological Survey
National Center, MS 421
Reston, VA 22092

PHONE : (703) 648-5684

REFERENCE DOC : Perry, R. A. and O. O. Williams. 1982. Definitions of Components of the Master Water Data Index Maintained by the National Water Data Exchange. Open File Report 82-327, U.S. Geological Survey, Reston, Virginia.

Edwards, Melvin D. 1982. Definitions of Components of the Water Data Sources Directory Maintained by the National Water Data Exchange. Open File Report 82-923, U.S. Geological Survey, Reston, Virginia.

NAME : National Water Data Storage and Retrieval System
ACRONYM : WATSTORE
SPONSOR : U.S. Geological Survey

TYPE : Water Data
GEOGRAPHICAL AREA : United States

WATSTORE contains several files in which extensive hydrologic data collected by the U.S. Geological Survey are entered. The files include a "Daily Values" File with more than 200 million daily observations of stream flow, water quality, sediment discharge, and ground-water level data; a "Water Quality File" that contains more than 1.7 million chemical analyses of both surface and ground water; a "Peak Flow File" that contains over 400,000 annual peak observations of streamflow and river-stage data; and a "Ground Water Site Inventory File" that contains inventory information for over 900,000 wells. Data can be readily obtained through NAWDEX.

DATA LOCATION : U.S. Geological Survey, Reston, Virginia
Also available through NAWDEX, STORET, and ADDNET

CONTACT NAME : Owen Williams
ADDRESS : Water Resources Division
U.S. Geological Survey
National Center, MS 421
Reston, VA 22092

PHONE : (703) 648-5684

REFERENCE DOC : Hutchison, N. E. and others. 1975. WATSTORE User's Guide: Volumes 1-7, U.S. Geological Survey Open File Report 75-426, Reston, Virginia

NAME : National Environmental Data Referral Service
ACRONYM : NEDRES
SPONSOR : National Ocean and Atmospheric Administration

TYPE : Water Quality, Air Quality
GEOGRAPHICAL AREA : United States coastal sites

NEDRES contains lists of programs and data bases containing environmental data. It is a publicly available service that identifies the existence, location, characteristics, and availability of environmental data sets. The following types of data are referenced by NEDRES:

- climatological and meteorological
- oceanographic
- geophysical and geological
- geographic
- hydrological and limnological
- terrestrial resources
- toxic and regulated substances.

NEDRES is in the process of being updated with emphasis on climatic data.

DATA LOCATION : National Oceanic and Atmospheric Administration
Washington, DC

CONTACT NAME : Mona Smith
ADDRESS : NEDRES Program Office, E/AIX3
National Oceanic and Atmospheric Administration
3300 Whitehaven Street, NW
Washington, DC 20235

PHONE : (202) 634-7722

REFERENCE DOC : U.S. Dept. of Commerce, National Oceanic and Atmospheric Administration. 1985. Guidelines for Preparation of Input to the NEDRES Database, Washington, D.C.

U.S. Dept. of Commerce, National Oceanic and Atmospheric Administration. 1983. NEDRES Database User Guide, Washington, D.C.

NAME : Bank Quality Monitoring Aquatic Data Base
ACRONYM : BQMA
SPONSOR : Quebec Ministry of the Environment

TYPE : Water Quality
GEOGRAPHICAL AREA : Quebec

The BQMA data base contains water quality data from the BQMA program. Water chemistry and physical parameters are collected from over 130 water quality stations on rivers, 1000 lakes, and numerous ground water stations in Quebec. A quality assurance program exists in cooperation with Environment Canada. Most of the stations are in the southern part of Quebec. Data have been collected since 1978.

DATA LOCATION : Department of Environment, St. Croix, Quebec
Also available in NAQUADAT

CONTACT NAME : Jacques Deziel
ADDRESS : Quebec Ministry of the Environment
3900, Marly Street
Ste. Foy, Quebec G1X 4E4

PHONE : (418) 644-3306

NAME : Environment Saskatchewan Quality Data
ACRONYM : ESQUADAT
SPONSOR : Saskatchewan Environment

TYPE : Water Quality
GEOGRAPHICAL AREA : Saskatchewan

ESQUADAT includes chemical and bacteriological water quality data for surface water, municipal distributions, waste streams, and ground water stations in the Province of Saskatchewan. Some historical data from as far back as 1970 can be obtained. Data are readily available to the public by writing to the principal contact and explaining what data are required and the purpose for which the data are needed.

DATA LOCATION : Regina, Saskatchewan

CONTACT NAME : Don Fast
ADDRESS : Walter Scott Building
3085 Alberta Street
Regina, Saskatchewan S4S 0B1

PHONE : (306) 787-6178

NAME : Acid Deposition System
ACRONYM : ADS
SPONSOR : Environmental Protection Agency

TYPE : Precipitation Chemistry
GEOGRAPHICAL AREA : North America

ADS includes data from the following networks: NADP, NTN, CAPMON, CANSAP, MAP3S/PCN, APIOS, UAPSP, APN, WISC, and GLAD. Information is stored for each network, site, and sample. Network data include the method of analysis, protocol, type of instruments used, and detection limit. Site data include site history, location, and protocol. Sample data include date, events, quantity of sample, measurements made in the field and in the lab, components analyzed, and observations. Quality assurance procedures include maintenance of written documentation on the monitoring network and verification of data prior to entry into ADS. A user's manual by Watson and Olsen (1984) gives more information on quality assurance procedures for the data base. ADS is updated quarterly with the earliest sampling date 1973 (CANSAP). Data are available to the public.

DATA LOCATION : Pacific Northwest Laboratory, Richland, Washington

CONTACT NAME : Anthony Olsen
ADDRESS : Statistical Information Sciences Section, Sigma 3 Building
Pacific Northwest Laboratory
P.O. Box 999
Richland, WA 99352

PHONE : (509) 376-4179

REFERENCE DOC : Watson, C. R. and A. R. Olsen. 1984. Acid Deposition System (ADS) For Statistical Reporting. System Design and User's Code Manual. EPA-600/8-84-023, Prepared by Battelle Pacific Northwest Laboratories for the U.S. Environmental Protection Agency, Washington, D.C.

SEE INDIVIDUAL PROJECTS IN APPENDIX D FOR SAMPLING LOCATIONS

NAME : Acid Deposition Data Network
ACRONYM : ADDNET
SPONSOR : National Acid Precipitation Assessment Program

TYPE : Integrated
GEOGRAPHICAL AREA : United States

ADDNET is a centralized, integrated data base for data on emissions, deposition, air quality, agriculture, forestry, man-made materials, aquatic resources, control technologies, and human populations. Although specific projects and task groups within NAPAP are responsible for collecting raw data and analyzing data files, the ADDNET project assembles selected files, verifies their contents, conducts quality assurance, maintains documentation, and makes data available to the broad NAPAP community. As of October 1985, 53 data sets were available online and 71 were in the process of being edited. Historical data as far back as 1900 are included.

DATA LOCATION : Oak Ridge National Laboratory, Oak Ridge, Tennessee

CONTACT NAME : Richard J. Olson
ADDRESS : Environmental Sciences Division
Oak Ridge National Laboratory
P.O. Box X
Building 1505
Oak Ridge, TN 37831

PHONE : (615) 574-7819

NAME : Acid Rain National Early Warning System
ACRONYM : ARNEWS
SPONSOR : Canadian Forestry Service

TYPE : Forest/Vegetation
GEOGRAPHICAL AREA : Canada

The ARNEWS program started in 1984 as a forest monitoring program with 60 plots distributed over Canada. The ARNEWS data base stores data collected from that program. Tree data gathered from 10-by-40-m plots include number, species, dominance, diameter, height, condition, and acid rain symptoms as defined by the program. Foliage and soil are also to be sampled at 5 year intervals. Procedures and detailed sampling information are described by L. P. Magasi and M. K. Mahendrappa (1984).

DATA LOCATION : Canadian Forestry Service, New Brunswick

CONTACT NAME : M. K. Mahendrappa
ADDRESS : Canadian Forestry Service
Maritimes Forest Research Centre
P.O. Box 4000
Fredericton, New Brunswick E3B 5P7

PHONE : (506) 452-3549

REFERENCE DOC : Magasi, L. P. and M. K. Mahendrappa. 1984. The Canadian Forestry Service Acid Rain National Early Warning System. Maritimes Forest Research Centre, Fredericton, New Brunswick.

NAME : Forest Plot Inventory Database
ACRONYM :
SPONSOR : U.S. Forest Service

TYPE : Forest/Vegetation
GEOGRAPHICAL AREA : United States

The inventory includes data from selected one-acre forest plots. Data on the area, plot, soil, trees, and other vegetation are taken. Each U.S. Forest Service region maintains its own records and some regions have computerized data base management systems. Regional data are combined for periodic national assessment reports, with the last report published in 1977. Data from 1965 to the present are also available through ADDNET.

DATA LOCATION : Individual USFS Regional offices
Available through ADDNET

CONTACT NAME : David Dixon
ADDRESS : U.S. Forest Service
NE Forest Experiment Station
370 Reed Road
Broomall, PA 19008

PHONE : (215) 461-3025

NAME : National Resources Inventory
ACRONYM : NRI
SPONSOR : Soil Conservation Service

TYPE : Soil
GEOGRAPHICAL AREA : United States

NRI contains data on soil type, land use, characterization of conservation treatment needs, potential cropland, prime farmland, wetlands, susceptibility to flooding, parameters needed to estimate wind and water erosion, vegetation, and wildlife. Combined with SOILS-5, NRI gives soil chemistry by location. Data were collected from 1980 to 1982 for almost 350,000 sampling units on nonfederal lands.

DATA LOCATION : Statistical Laboratory, Iowa State University, Ames, Iowa
Also available through ADDNET

CONTACT NAME : J. Jeffrey Goebel
ADDRESS : Soil Conservation Service
U.S. Department of Agriculture
P.O. Box 2980
Washington, DC 20013

PHONE : (202) 447-8578

NAME : Soils Interpretation Records
ACRONYM : SOILS-5
SPONSOR : Soil Conservation Service

TYPE : Soil
GEOGRAPHICAL AREA : United States

SOILS-5 provides chemical, physical, and other properties of soils based on the analyses of typical samples representing each series. Texture, clay content, bulk density, water capacity, pH, and salinity for each soil layer are some of the parameters measured. Cross-referencing with NRI provides location information. Data were collected during the spring of 1980 through the fall of 1982. Data reliability information can be obtained from the primary contact.

DATA LOCATION : Statistical Laboratory, Iowa State University, Ames, Iowa,
Also Available Through ADDNET

CONTACT NAME : J. Jeffrey Goebel
ADDRESS : Soil Conservation Service
U.S. Department of Agriculture
P.O. Box 2980
Washington, DC 20013

PHONE : (202) 447-8578

REFERENCE DOC : Goran, William D. 1983. An Interactive Soils Information System User's Manual. Technical Report N-163. Construction Engineering Research Laboratory, U.S. Army Corps of Engineers, Champaign, Illinois.

NAME : Fish Information Network
ACRONYM : FIN
SPONSOR : National Acid Precipitation Assessment Program

TYPE : Ecosystem
GEOGRAPHICAL AREA : Adirondack region of New York, Some sites in Maine,
New Hampshire, and Vermont

FIN contains data and information relating to the distribution and status of fish populations in surface waters that are sensitive to, or already impacted by, acidic deposition. Besides data on fish species, water chemistry, station and lake demographics, and sampling descriptions are included. The period of data collection is from 1929 to 1984. Some data that are not quality-assured have been included in FIN.

DATA LOCATION : Available through ADDNET

CONTACT NAME : Joan P. Baker
ADDRESS : Kilkelly Environmental Associates
P.O. Box 31265
Raleigh, NC 27622

PHONE : (919) 781-3150

NAME : Adirondack Watershed Data Base
ACRONYM : AWDB
SPONSOR : National Acid Precipitation Assessment Program

TYPE : Integrated
GEOGRAPHICAL AREA : Adirondack State Park, New York

The AWDB is a collection of data from the New York Department of Environmental Conservation (water chemistry and lake characteristics), Adirondack Park Agency (land cover and soils), State University of New York at Plattsburgh (wetlands, beaver activity, forest cover and disturbances), and several databases such as FIN, ACID, and ADS. The period of data collection is from the early 1900s to the present.

DATA LOCATION : Available through ADDNET

CONTACT NAME : Richard J. Olson
ADDRESS : Environmental Sciences Division
Oak Ridge National Laboratory
P.O. Box X
Building 1505
Oak Ridge, TN 37831

PHONE : (615) 574-7819

NAME : Sample Information System
ACRONYM : SIS
SPONSOR : Ontario Ministry of the Environment

TYPE : Integrated
GEOGRAPHICAL AREA : Ontario

SIS is a system used to store sampling data analyzed at the Ministry of Ontario analytical laboratories. The master file of sample results contains data from many projects including APIOS, Great Lakes, Inland WQ Monitoring, Surface Water, Ground Water, Terrestrial Effects, and AQUIS.

DATA LOCATION : Ontario Ministry of the Environment, Toronto, Ontario

CONTACT NAME : V. R. Roxborough
ADDRESS : Office of Systems Development
Systems Development Section
135 St. Clair Ave. West, 3rd Floor
Toronto, Ontario M4V 1P5

PHONE : (416) 965-6952

REFERENCE DOC : Maddeaux, N. 1985. Province of Ontario, Ministry of the Environment, Sample Information System User's Manual.
Province of Ontario, Ministry of the Environment, Toronto, Ontario.

NAME : Storage of Lake Chemistry, Zooplankton, and Watershed
Characteristics of the Greater Sudbury Area in Digital Form
SPONSOR : Ontario Ministry of the Environment
TYPE : Water Quality, Ecosystem
GEOGRAPHICAL AREA : Greater Sudbury Area, Canada

This database contains the following data (Environment Canada 1983):

1. Lake chemistry - extensive monitoring of lakes in the Greater Sudbury area: 209 lakes; 1974-76 data.
2. Zooplankton data, 187 lakes; 1974-76 data.
3. Lake chemistry data; 250 lakes; 1981, 1983 data.
4. Zooplankton data: 249 lakes; 1981 data.
5. Lake chemistry data; 250 lakes; 1982, 1983 data.
6. Watershed characteristics; 196 lakes/watersheds.

Data is stored on tapes.

DATA LOCATION : Laurentian University, Sudbury, Ontario

CONTACT NAME : J. Roger Pitblado
ADDRESS : Department of Geography
Laurentian University
Sudbury, Ontario P3E 2C6

PHONE : (705) 675-1151

REFERENCE DOC : Environment Canada. 1983. The Canadian Research Activity Catalogue on the Long-Range Transport of Air Pollutants and Acidic Precipitation. Federal LRTAP Liaison Office, Atmospheric Environment Service, Downsview, Ontario.

Pitblado, J. Roger and W. Keller. 1984. Data Report: Monitoring of Northeastern Ontario Lakes, 1981-1983. Ontario Ministry of the Environment, Sudbury, Ontario.

General locations of the 250 study lakes.

NAME : Biological Data
ACRONYM : BIODAT
SPONSOR : Saskatchewan Environment

TYPE : Biological Data
GEOGRAPHICAL AREA : Saskatchewan

BIODAT includes biological data (phytoplankton, Marcophytes, and fish) for waterbodies in Saskatchewan. The biological data has counts and volumes on identified algae species. Data are readily available to the public by writing to the principal contact and explaining what data are required and the purpose for which the data are needed.

DATA LOCATION : Regina, Saskatchewan

CONTACT NAME : Don Fast
ADDRESS : Walter Scott Building
3085 Alberta Street
Regina, Saskatchewan S4S 0B1

PHONE : (306) 787-6178

APPENDIX B

INVENTORY OF TRANSBOUNDARY REGION AMBIENT AIR QUALITY PROJECTS

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NAME : NATIONAL AIR POLLUTION SURVEILLANCE PROGRAM
 TYPE : AIR QUALITY (AIR CHEMISTRY)
 PARAM : SO₂, CO, NO₂, O₃
 SOME STATIONS: SOILING INDEX, SUSPENDED PARTICULATES, PARTICULATE
 LEAD, DUSTFALL, SULPHATION RATE
 CAN : ABOUT 150 STATIONS IN 52 CITIES THROUGHOUT CANADA
 OFTEN : CONTINUOUS SAMPLING
 DATES : 1970 - ONGOING
 HOW : CONTINUOUS GAS ANALYERS USED
 QAQC : FORMAL FIELD AND LABORATORY PROGRAM
 STOR : NAPS DATABASE OF ENVIRONMENT CANADA OR CONTACT INDIVIDUAL
 PROVINCIAL/MUNICIPAL OFFICES
 CONTACT : TECHNICAL SERVICES BRANCH
 ADDRESS : ENVIRONMENT PROTECTION SERVICE
 PLACE VINCENT MASSEY
 ENVIRONMENT CANADA
 RUE ST. JOSEPH
 HULL, QUEBEC K1A 0E7
 TELEPH : (819) 997-1831
 FUNDS : ENVIRONMENT CANADA
 CODE : T2/G2.123/P2.12/F1.3/L1.2/D1/V1

NATIONAL AIR POLLUTION
 SURVEILLANCE NETWORK

RÉSEAU NATIONAL DE SURVEILLANCE
 DE LA POLLUTION ATMOSPHÉRIQUE

NAME : SOURCE STRENGTHS OF NATURAL TERRESTRIAL SULFUR EMISSIONS: INITIAL
ASSESSMENT AND FIELD MEASUREMENTS
TYPE : AIR QUALITY (NATURAL SOURCES)
PARAM : BIOGENIC SULFUR EMISSIONS
US : WASHINGTON, IOWA, OHIO, NORTH CAROLINA
OFTEN : MONTHLY SAMPLES IN WASHINGTON, DAILY SAMPLES FROM OTHER FIELD WORK
DATES : OCTOBER 1982 - ONGOING
HOW : AIR SAMPLES COLLECTED IN FIELD AND ANALYZED VIA GAS CHROMATOGRAPHY.
SOME IMPREGNATED FILTERS ALSO EXPOSED AND COLLECTED.
QAQC : INTERCOMPARISONS OF EQUIPMENT WITH THOSE OF OTHER ORGANIZATIONS
STOR : WILL GO INTO ADDNET DATA BASE
CONTACT : H. WESTBERG, B. LAMB
ADDRESS : WASHINGTON STATE UNIVERSITY
LABORATORY FOR ATMOSPHERIC RESEARCH
PULLMAN, WA 99164
TELEPH : (509) 335-1526
FUNDS : NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
MISC : A GRIDDED SULFUR EMISSION INVENTORY IS PLANNED AS THE FINAL PRODUCT.
RELATED TO PROJECT INVESTIGATING THE VEGETATIVE EMISSIONS OF
ATMOSPHERIC SULFUR COMPOUNDS.
CODE : T2/G1.123/P2.12/F1.1/L1.1/D1/V1

NAME : VEGETATIVE EMISSIONS OF ATMOSPHERIC SULFUR COMPOUNDS
TYPE : AIR QUALITY (NATURAL SOURCES)
PARAM : BIOGENIC SULFUR EMISSIONS
US : WASHINGTON, IOWA, OHIO, NORTH CAROLINA
OFTEN : DAILY SAMPLES FROM FIELD WORK
DATES : OCTOBER 1982 - ONGOING
HOW : AIR SAMPLES COLLECTED IN FIELD AND ANALYZED VIA GAS CHROMATOGRAPHY.
SOME IMPREGNATED FILTERS ALSO EXPOSED AND COLLECTED.
QAQC : INTERCOMPARISONS OF EQUIPMENT WITH THOSE OF OTHER ORGANIZATIONS
STOR : WILL GO INTO ADDNET DATA BASE
CONTACT : H. WESTBERG, B. LAMB
ADDRESS : WASHINGTON STATE UNIV.
LABORATORY FOR ATMOSPHERIC RESEARCH
PULLMAN, WA 99164
TELEPH : (509) 335-1526
FUNDS : NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
MISC : DATA WILL GO INTO GRIDDED SULFUR EMISSION INVENTORY. RELATED TO
PROJECT INVESTIGATING SOURCE STRENGTHS OF NATURAL TERRESTRIAL SULFUR
EMISSIONS.
CODE : T2/G1.123/P2.1/F1.1/L1.1/D1/V1

NAME : SOURCE STRENGTHS OF NATURAL TERRESTRIAL SULFUR EMISSIONS: INITIAL
ASSESSMENT AND FIELD MEASUREMENTS
TYPE : AIR QUALITY (NATURAL SOURCES)
PARAM : BIOGENIC SULFUR EMISSIONS
US : WASHINGTON, IOWA, OHIO, NORTH CAROLINA
OFTEN : MONTHLY SAMPLES IN WASHINGTON, DAILY SAMPLES FROM OTHER FIELD WORK
DATES : OCTOBER 1982 - ONGOING
HOW : AIR SAMPLES COLLECTED IN FIELD AND ANALYZED VIA GAS CHROMATOGRAPHY.
SOME IMPREGNATED FILTERS ALSO EXPOSED AND COLLECTED.
QAQC : INTERCOMPARISONS OF EQUIPMENT WITH THOSE OF OTHER ORGANIZATIONS
STOR : WILL GO INTO ADDNET DATA BASE
CONTACT : H. WESTBERG, B. LAMB
ADDRESS : WASHINGTON STATE UNIVERSITY
LABORATORY FOR ATMOSPHERIC RESEARCH
PULLMAN, WA 99164
TELEPH : (509) 335-1526
FUNDS : NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
MISC : A GRIDDED SULFUR EMISSION INVENTORY IS PLANNED AS THE FINAL PRODUCT.
RELATED TO PROJECT INVESTIGATING THE VEGETATIVE EMISSIONS OF
ATMOSPHERIC SULFUR COMPOUNDS.
CODE : T2/G1.123/P2.1/F1.1/L1.1/D1/V1

NAME : SOURCES OF CLOUD WATER ACIDITY
TYPE : AIR QUALITY (AEROSOLS)
PARAM : PHYSICAL AND CHEMICAL PROPERTIES OF AEROSOLS
US : COLORADO AND NEW YORK
WATER : PACIFIC SEABOARD, ATLANTIC SEABOARD
OFTEN : VARIES FROM EVENT TO ONCE A MONTH
DATES : OCTOBER 1982 - SEPTEMBER 1988 (SCHEDULED)
HOW : PMS SPECTROMETER PROBES USED, DATA ANALYZED AT THE NATIONAL OCEANIC
AND ATMOSPHERIC ADMINISTRATION'S ENVIRONMENTAL RESEARCH LABORATORY
(NOAA-ERL) IN BOULDER, COLORADO AND AT FLORIDA STATE UNIVERSITY
QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
STOR : ON MAGNETIC TAPE AT NOAA-ERL IN BOULDER, ALSO IN REPORT FORM
CONTACT : R.F. PUESCHEL
ADDRESS : NOAA, ENVIRONMENTAL RESEARCH LABORATORY
3100 MARINE ST.
BOULDER, CO 80303
TELEPH : (303) 497-6189
FUNDS : NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
MISC : REPORT ON BACKGROUND ACIDITY OF CLOUDS AND MODIFICATION IN CLOUD
ACIDITY AS CLOUDS ARE EXPOSED TO MAN-MADE EMISSIONS.
CODE : T2/G1.13/P2.2/F1.1/L1.1/D2/V0

NAME : EFFECTS OF LONG RANGE POLLUTANTS IN THE DOMESTIC ENVIRONMENT
TYPE : AIR QUALITY (AIR CHEMISTRY)
PARAM : PARTICULATE ACIDITY, SO₄, AND NO₃ FOR AEROSOLS WITH AERODYNAMIC
DIAMETERS LESS THAN 10 μ m; GASEOUS SO₂, NO₂
CAN : ANTIGONISH COUNTY, NOVA SCOTIA
OFTEN : SOME SAMPLING CONTINUOUS; REMAINING SAMPLING OCCURRED EVERY OTHER DAY
DATES : NOVEMBER 1982 - FEBRUARY 1983
HOW : SIMULTANEOUS SAMPLING INSIDE AND OUTSIDE DOMESTIC RESIDENCES USING
FILTER COLLECTORS AND REAL TIME SENSORS
QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
STOR : HARD COPY
CONTACT : T. SMITH-PALMER OR J.C. DONINI
ADDRESS : ST. FRANCIS XAVIER UNIVERSITY
ANTIGONISH, NOVA SCOTIA B2G 1C0
TELEPH : (902) 867-2124
FUNDS : HEALTH AND WELFARE CANADA
MISC : PROJECT INVESTIGATES EFFECT OF POLLUTANTS ON DOMESTIC ENVIRONMENT.
CODE : T2/G2.1/P2.12/F1.1/L2.1/D2/V1

NAME : AIRBORNE PARTICULATE AND SO2 SAMPLING NETWORK (CUMULATIVE)
TYPE : AIR QUALITY (AIR CHEMISTRY)
PARAM : PARTICULATE SO4, NH4, AND TRACE METALS; GASEOUS SO2; TOTAL NO3
CAN : 23 SITES IN ONTARIO
OFTEN : MONTHLY (4 WEEK INTERVALS)
DATES : NOVEMBER 1981 - ONGOING
HOW : LOW VOLUME SAMPLERS WITH FILTER PACKS, WHATMAN 40 PREFILTER FOR
PARTICULATES, NYLON FILTER FOR HNO3, IMPREGNATED WHATMAN-41 FILTERS
FOR SO2 COLLECTION. ANALYSIS AT ONTARIO MINISTRY OF ENVIRONMENT
LABORATORY SERVICES BRANCH.
QAQC : FORMAL LABORATORY PROGRAM
STOR : ONTARIO MINISTRY OF ENVIRONMENT DATA BASE
CONTACT : MARIS LUSIS
ADDRESS : ONTARIO MINISTRY OF ENVIRONMENT
AIR RESOURCES BRANCH
880 BAY STREET
TORONTO, ONTARIO M5S 1Z8
TELEPH : (416) 965-1634
FUNDS : ONTARIO MINISTRY OF THE ENVIRONMENT
CODE : T2/G2.2/P2.12/F2.3/L1.1/D1/V1

NAME : PARTICULATE AND GASEOUS SULFUR AND NITROGEN COMPOUND SAMPLING NETWORK
(EVENT)
TYPE : AIR QUALITY (AIR CHEMISTRY)
PARAM : PARTICULATE SULFATE, NITRATE AND AMMONIUM IONS, GASEOUS SO₂, HNO₃
CAN : 4 SITES, 3 IN STUDY REGION (DORSET, LONGWOODS, CHARLESTON LAKE)
OFTEN : DAILY
DATES : JULY 1980 - ONGOING
HOW : COLLECTION VIA 47 MM LOW VOLUME FILTER PACKS; PARTICULATES COLLECTED
ON TEFLON PRE-FILTER; HNO₃ COLLECTED ON NYLON FILTER; SO₂ ON
IMPREGNATED WHATMAN FILTERS. ANALYSIS AT ONTARIO MINISTRY OF
ENVIRONMENT LABORATORY SERVICES BRANCH.
QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
STOR : ONTARIO MINISTRY OF ENVIRONMENT DATA BASE
CONTACT : MARIS LUSIS
ADDRESS : ONTARIO MINISTRY OF ENVIRONMENT
AIR RESOURCES BRANCH
880 BAY STREET
TORONTO, ONTARIO M5S 1Z8
TELEPH : (416) 965-1634
FUNDS : ONTARIO MINISTRY OF THE ENVIRONMENT
MISC : SITES CO-LOCATED WITH PRECIPITATION COLLECTORS OF APIOS-DAILY NETWORK
CODE : T2/G2.2/P2.12/F2.2/L1.2/D1/V1

NAME : POPLAR RIVER THERMAL POWER PLANT AMBIENT AIR MONITORING PROGRAM
 TYPE : AIR QUALITY (AIR CHEMISTRY)
 PARAM : SUSPENDED PARTICULATES, SO₂, METEOROLOGICAL DATA
 CAN : 1 SITE NEAR THE POPLAR RIVER THERMAL POWER PLANT, CORONACH, SASKATCHEWAN
 OFTEN : CONTINUOUS SAMPLING FOR SO₂ (CONVERTED TO HOURLY AVERAGES); FILTER SAMPLES ARE COLLECTED EVERY 6 DAYS
 DATES : APPROX. 1975 - ONGOING
 HOW : CONTINUOUS MONITORING OF SO₂ VIA COMMERCIAL ANALYZER; SUSPENDED PARTICULATES COLLECTED ON FILTERS, ANALYZED AT SASKATCHEWAN ENVIRONMENT LABORATORIES
 QAQC : NO FORMAL WRITTEN PROCEDURE, ALTHOUGH MANUFACTURER'S QA/QC AND CALIBRATION PROCEDURES ARE FOLLOWED FOR EQUIPMENT DEPLOYED IN THE FIELD
 STOR : HARD COPY, ALTHOUGH MORE RECENT DATA IS ON A HARD DISK
 CONTACT : L. J. LECHNER
 ADDRESS : POLLUTION CONTROL BRANCH
 SASKATCHEWAN ENVIRONMENT
 3085 ALBERT ST.
 REGINA, SASKATCHEWAN S4S 0B1
 TELEPH : (306) 787-6195
 FUNDS : SASKATCHEWAN ENVIRONMENT AND SASKATCHEWAN POWER CORP.
 REFDOC : POPLAR RIVER BILATERAL MONITORING COMMITTEE. 1985. 1984 ANNUAL REPORT TO THE GOVERNMENTS OF CANADA, UNITED STATES, SASKATCHEWAN, AND MONTANA. SASKATCHEWAN ENVIRONMENT, REGINA, SASKATCHEWAN.
 SHEWCHUK, S. R. 1984. AN AIR AND PRECIPITATION QUALITY STUDY FOR THE AGRICULTURAL MONITORING PROGRAMS OF THE POPLAR RIVER STATION. SASKATCHEWAN RESEARCH COUNCIL, SASKATOON, SASKATCHEWAN.

CODE : T2/G2.3/P2.12/F4.2/L1.2/D2/V1

APPENDIX C

INVENTORY OF TRANSBOUNDARY REGION AMBIENT WATER QUALITY PROJECTS

NAME : LONG TERM ACIDIC DEPOSITION EFFECTS ON SURFACE AND GROUNDWATER SYSTEMS
 TYPE : WATER QUALITY
 PARAM : pH, ALKALINITY, MAJOR CATIONS AND ANIONS
 US : 17 REPRESENTATIVE SENSITIVE AREAS NATIONWIDE.
 OFTEN : MONTHLY
 DATES : 1981 - ONGOING (SCHEDULED TO END IN 1987)
 HOW : SAMPLES COLLECTED IN BEAKERS OR BOTTLES AND ANALYZED AT THE U.S. GEOLOGICAL SURVEY LABORATORY IN DENVER, COLORADO
 QAQC : FORMAL LABORATORY PROGRAM
 STOR : WATSTORE, STORET AND ACID DATABASES
 CONTACT : O. P. BRICKER
 ADDRESS : U.S. GEOLOGICAL SURVEY
 RESTON, VIRGINIA 22092
 TELEPH : (703) 860-6951
 FUNDS : U.S. GEOLOGICAL SURVEY
 MISC : LONG TERM STUDY OF ACID PRECIPITATION EFFECTS ON WATER QUALITY IN SENSITIVE AREAS
 CODE : T3/G1.123/P0/F1.2/L1.2/D1/V0

NAME : NATIONAL STREAM QUALITY ACCOUNTING NETWORK
ABREV : NASQAN
TYPE : WATER QUALITY
PARAM : pH, ALKALINITY, TEMPERATURE, CONDUCTIVITY, MAJOR IONS AND NUTRIENTS,
TRACE ELEMENTS, AND ORGANICS IN WATER SAMPLES; SUSPENDED SEDIMENTS
US : ORIGINALLY 345 STATIONS BASED ON HYDROLOGIC SUBDIVISION OF U.S.,
CURRENTLY 495 STATIONS
OFTEN : MONTHLY, BIMONTHLY, QUARTERLY SCHEDULES FOR VARIOUS SITES
DATES : 1973 - ONGOING
HOW : SEE "QUALITY OF WATER - BRANCH TECHNICAL MEMORANDUMS # 82.03, 82.18,
83.18, 84.16, 85.19" BY R.J. PICKERING, U.S. DEPT. OF INTERIOR,
GEOLOGICAL SURVEY
QAQC : FORMAL FIELD AND LABORATORY PROGRAMS; SEE "QUALITY OF WATER - BRANCH
TECHNICAL MEMORANDUMS # 82.03, 82.18, 83.18, 84.16, AND 85.19" AND
"TECHNIQUES OF WATER RESOURCES INVESTIGATIONS" SERIES
STOR : NAWDEX, WATSTORE, STORET DATA BASES
CONTACT : J. SCHORNICK
ADDRESS : U.S. GEOLOGICAL SURVEY
RESTON, VA 22092
TELEPH : (703) 860-6834
FUNDS : U.S. GEOLOGICAL SURVEY AND OTHER FEDERAL, STATE AND LOCAL AGENCIES
MISC : PROTOCOLS AND GOALS SIMILAR TO "HYDROLOGIC BENCH-MARK NETWORK" PROGRAM
REFDOC : MANY DOCUMENTS AVAILABLE. CONTACT U.S. GEOLOGICAL SURVEY FOR
PUBLICATION LIST. REPRESENTATIVE DOCUMENTS INCLUDE:

SMITH, R. A. AND R. B. ALEXANDER. 1983. A STATISTICAL SUMMARY OF
DATA FROM THE U.S. GEOLOGICAL SURVEY'S NATIONAL WATER QUALITY
NETWORKS. OPEN FILE REPORT 83-533, U.S. GEOLOGICAL SURVEY, RESTON,
VIRGINIA.

SMITH, R. A., R. M. HIRSCH, AND J. R. SLACK. 1982. A STUDY OF
TRENDS IN TOTAL PHOSPHOROUS MEASUREMENTS AT NASQAN STATIONS.
U.S. GEOLOGICAL SURVEY, ALEXANDRIA, VIRGINIA.

WELLS, F. C. AND J. L. SCHERTZ. 1983. STATISTICAL SUMMARY OF DAILY
VALUES DATA AND TREND ANALYSIS OF DISSOLVED-SOLIDS DATA AT NATIONAL
STREAM QUALITY ACCOUNTING NETWORK (NASQAN) STATIONS. WATER-RESOURCES
INVESTIGATIONS REPORT 83-4172, U.S. GEOLOGICAL SURVEY, AUSTIN, TEXAS.

CODE : T3/G1.123/P1.2/F4.4/L1.2/D1/V1

Locations of stations in the National Stream Quality Accounting Network in operation as of January 1, 1975.

NAME : HYDROLOGIC BENCH-MARK NETWORK
ABREV : HBMN
TYPE : WATER QUALITY
PARAM : pH, ALKALINITY, INSTANTANEOUS DISCHARGE, SPECIFIC CONDUCTANCE,
TEMPERATURE, PRESSURE, DISSOLVED O2, PHYSICAL AND BIOLOGICAL
PROPERTIES, COMMON AND TRACE DISSOLVED INORGANICS
US : 59 SITES BASED ON HYDROLOGIC SUBDIVISION OF U.S. RIVER BASINS.
OFTEN : MONTHLY, BIMONTHLY, QUARTERLY SCHEDULES FOR VARIOUS SITES
DATES : NETWORK ESTABLISHED IN 1966; SPECIFIC STARTUP DATE VARIES WITH
LOCATION
HOW : SEE "QUALITY OF WATER - BRANCH TECHNICAL MEMORANDUMS 82.03, 82.18,
83.18, 84.16, AND 85.19," U.S. DEPARTMENT OF THE INTERIOR, GEOLOGICAL
SURVEY, WATER RESOURCES DIVISION
QAQC : FORMAL FIELD AND LABORATORY PROGRAMS. SEE "QUALITY OF WATER - BRANCH
TECHNICAL MEMORANDUMS 82.03, 82.18, 83.18, 84.16, AND 85.19," AND
"TECHNIQUES OF WATER RESOURCES INVESTIGATIONS" SERIES, U.S. DEPARTMENT
OF THE INTERIOR, GEOLOGICAL SURVEY, WATER RESOURCES DIVISION
STOR : WATSTORE, STORET, NAWDEX
CONTACT : J. SCHORNICK
ADDRESS : U.S. GEOLOGICAL SURVEY
RESTON, VA 22092
TELEPH : (703) 860-6834
FUNDS : U.S. GEOLOGICAL SURVEY AND ENVIRONMENTAL PROTECTION AGENCY
MISC : RELATED TO THE "NATIONAL STREAM QUALITY ACCOUNTING NETWORK," BUT SITES
ARE LOCATED IN REMOTE, RELATIVELY PRISTINE ENVIRONMENTS THAT ARE NOT
LIKELY TO BE DEVELOPED.

REFDOC : MANY DOCUMENTS AVAILABLE. CONTACT U.S. GEOLOGICAL SURVEY FOR
PUBLICATION LIST. REPRESENTATIVE PUBLICATIONS INCLUDE:

SMITH, R. A. AND R. B. ALEXANDER. 1983. A STATISTICAL SUMMARY OF
DATA FROM THE U.S. GEOLOGICAL SURVEY'S NATIONAL WATER QUALITY
NETWORKS. OPEN FILE REPORT 83-533, U.S. GEOLOGICAL SURVEY, RESTON,
VIRGINIA.

SMITH, R. A. AND R. B. ALEXANDER. 1983. EVIDENCE FOR
ACID-PRECIPITATION-INDUCED TRENDS IN STREAM CHEMISTRY AT HYDROLOGIC
BENCH-MARK STATIONS. U.S. GEOLOGICAL SURVEY, ALEXANDRIA, VIRGINIA.

CODE : T3/G1.123/P3.1/F1.4/L1.2/D1/V1

Map of "Hydrologic Bench-Mark Network" stations

NAME : MAPPING ACID SENSITIVITY OF SURFACE WATERS IN THE UNITED STATES
TYPE : WATER QUALITY
PARAM : SURFACE WATER ALKALINITY, SUSCEPTIBILITY TO ACIDIFICATION
US : WHOLE COUNTRY - STARTED IN WESTERN STATES
OFTEN : VARIES FROM SINGLE SURVEY AT SOME SITES, TO MONTHLY EXAMINATIONS FOR
A YEAR AT OTHERS, TO 2 OR 3 EXAMINATIONS A YEAR FOR SEVERAL YEARS
DATES : 1981 - ONGOING
HOW : SAMPLING METHODS VARY WIDELY, DATA ANALYZED AT THE ENVIRONMENT
RESEARCH LABORATORY IN CORVALLIS, OREGON
QAQC : NO FORMAL PROGRAM
STOR : WILL GO INTO ADDNET IN MAP FORM
CONTACT : J. M. OMERNIK
ADDRESS : U.S. ENVIRONMENTAL PROTECTION AGENCY
ENVIRONMENTAL RESEARCH LABORATORY-CORVALLIS
200 SW 35TH ST.
CORVALLIS, OR 97333
TELEPH : (503) 757-4666
FUNDS : ENVIRONMENTAL PROTECTION AGENCY
MISC : WILL PRODUCE A NATIONAL MAP OF TOTAL ALKALINITY OF SURFACE WATERS
REFDOC : OMERNIK, J. M. AND A. J. KINNEY. 1985. TOTAL ALKALINITY OF SURFACE
WATERS: A MAP OF THE NEW ENGLAND AND NEW YORK REGION.
EPA-600/D-84-216. CORVALLIS ENVIRONMENTAL RESEARCH LABORATORY,
U.S. ENVIRONMENTAL PROTECTION AGENCY, CORVALLIS, OREGON.

OMERNIK, J. M. AND G. E. GRIFFITH. 1985. TOTAL ALKALINITY OF SURFACE
WATERS: A MAP OF THE UPPER MIDWEST REGION. EPA-600/D-85-043.
CORVALLIS ENVIRONMENTAL RESEARCH LABORATORY, U.S. ENVIRONMENTAL
PROTECTION AGENCY, CORVALLIS, OREGON.

OMERNIK, J. M. AND C. F. POWERS. 1983. "TOTAL ALKALINITY OF SURFACE
WATERS -- A NATIONAL MAP." ANNALS OF THE ASSOCIATION OF AMERICAN
GEOGRAPHERS, 73:133-136.

CODE : T3/G1.123/P0/F1.4/L1.2/D1/V1

Selected Maps of Measurement Locations for "Mapping Acid Sensitivity of Surface Waters in the United States"

LOCATIONS OF LAKES AND STREAM SITES FROM WHICH ALKALINITY DATA WERE OBTAINED

Each of the dots shown represents a lake, stream site, or group of lakes or stream sites. All of these data points are associated with watersheds of less than 2600 square kilometers; about 80% are associated with watersheds of less than 130 square kilometers.

**LOCATIONS OF STREAM SITES AND LAKES
FROM WHICH ALKALINITY DATA WERE OBTAINED**

Each of the dots shown represents a stream site, lake, or group of stream sites or lakes. All of these data points are associated with watersheds of less than 1000 square miles. About 75% are associated with watersheds of less than 50 square miles.

NAME : SURFACE WATER MONITORING FOR LRTAP ASSESSMENT
TYPE : WATER QUALITY
PARAM : pH, SPECIFIC CONDUCTANCE, COLOR, ALKALINITY, MAJOR IONS, Fe, Al, Mn,
DISSOLVED ORGANIC CARBON
CAN : 30-40 RIVERS, ABOUT 150 LAKES IN ONTARIO, QUEBEC AND ATLANTIC REGIONS
OFTEN : WEEKLY SAMPLING IN ONTARIO; 2 TO 6 TIMES A YEAR IN QUEBEC; RIVERS
SAMPLED MONTHLY AND LAKES TWICE A YEAR (SPRING AND FALL) IN THE
ATLANTIC REGION.
DATES : NETWORK FORMALLY ESTABLISHED IN 1983 (ALTHOUGH SOME SAMPLING HAD BEEN
CONDUCTED FOR MANY YEARS) - ONGOING
HOW : ANALYSIS BY WATER QUALITY BRANCH LABORATORIES
QAQC : FORMAL LABORATORY PROGRAM, SOME FORMAL FIELD PROTOCOLS (VARIES FROM
AGENCY TO AGENCY)
STOR : NAQUADAT DATA BASE
CONTACT : PETER BROOKSBANK
ADDRESS : ENVIRONMENT CANADA
WATER QUALITY BRANCH
PLACE VINCENT MASSEY
351 ST. JOSEPH BLVD.
HULL, QUEBEC K1A 0E7
TELEPH : (819) 997-3422
FUNDS : DEPARTMENT OF ENVIRONMENT, ONTARIO MINISTRY OF ENVIRONMENT, DEPARTMENT
OF FISHERIES AND OCEANS, PROVINCE OF QUEBEC AND OTHER ORGANIZATIONS
(THE DEPT. OF ENVIRONMENT COORDINATES THE PROGRAM)
MISC : BIOMONITORING IS PLANNED
REFDOC : BROOKSBANK, P. 1985. LRTAP AQUATIC MONITORING: A DESCRIPTION OF
CANADIAN ACID PRECIPITATION AQUATIC MONITORING PROJECTS. ENVIRONMENT
CANADA, WATER QUALITY BRANCH, OTTAWA, ONTARIO.
CODE : T3/G2.12/P.0/F4.3/L1.1/D1/V1

NAME : QUALITY OF DRINKING WATER IN AREAS IMPACTED BY ACID RAIN
TYPE : WATER QUALITY (TAP WATER)
PARAM : EMPHASIS ON HEAVY METALS IN WATER SAMPLES (IN PARTICULAR: Zn, Cd, Hg)
US : 273 SITES IN MINNESOTA, VERMONT, NEW HAMPSHIRE, NEW YORK, NEW JERSEY, PENNSYLVANIA, VIRGINIA, WEST VIRGINIA, AND NORTH CAROLINA
OFTEN : GENERALLY ONCE, ALTHOUGH SOME SITES HAVE BEEN REVISITED
DATES : BEGAN IN NOVEMBER 1981, ALL WORK COMPLETED IN JANUARY 1984
HOW : TAP WATER SAMPLES ANALYZED AT THE MUNICIPAL AND ENVIRONMENTAL RESEARCH LABORATORY IN CINCINNATI, OHIO
QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
STOR : HARD COPY REPORTS
CONTACT : F. TAYLOR OR CHARLES COLE
ADDRESS : NEW ENGLAND WATER WORKS ASSOC. DEPT OF ENGINEERING
850 R PROVIDENCE HIGHWAY PENN STATE UNIVERSITY
DEDHAM, MA 02026 MIDDLETOWN, PA 17057
TELEPH : (617) 329-9676 (717) 948-6133
FUNDS : ENVIRONMENTAL PROTECTION AGENCY
MISC : STUDY OF WHETHER ACID PRECIPITATION IS RESULTING IN AN INCREASE IN THE HEAVY METAL CONTENT OF TAP WATER; INVOLVES COMPARISON WITH PAST SAMPLES.
CODE : T3/G1.12/P1.1/F1.2/L2.1/D2/V0

NAME : ADIRONDACK AND LAURENTIDE LAKE WATER QUALITY COMPARISON STUDY
TYPE : WATER QUALITY
PARAM : pH, ALKALINITY, CONDUCTIVITY, COLOR, MAJOR IONS, ALUMINUM, TRACE METALS
US : 4 LAKES IN THE ADIRONDACK AREA
CAN : 4 LAKES IN THE LAURENTIDE AREA
OFTEN : 8 TIMES A YEAR
DATES : SEPTEMBER 1983 - OCTOBER 1984
HOW : ONE INTEGRATED SAMPLE WAS COLLECTED 0 TO 5 METERS BELOW ICE COVER IN THE DEEPEST PART OF THE LAKES. SAMPLES WERE ALSO COLLECTED 1 METER OVER THE LAKE BOTTOM.
QAQC : ANALYTICAL PROCEDURES COMPARISON
STOR : BQMA DATABASE
CONTACT : JACQUES DUPONT OR HOWARD A. SIMONIN
ADDRESS : QUEBEC MINISTRY OF THE ENVIRONMENT N.Y. DEPT. OF ENVIRONMENTAL
3900, MARLY STREET 8314 FISH HATCHERY ROAD
STE. FOY, QUEBEC G1X 4E4 ROME, NEW YORK 13440
TELEPH : (418) 644-3297 (315) 337-0910
FUNDS : MINISTERE DE L'ENVIRONNEMENT DU QUEBEC AND NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
MISC : PROJECT EXAMINED THE COMPARABILITY OF ANALYTICAL PROCEDURES IN USE BY THE QUEBEC AND ROME LABORATORIES. LAKE WATER QUALITY WAS ALSO COMPARED SO AS TO DEFINE THE RELATIVE ACIDIFICATION LEVEL REACHED BY EACH SET OF LAKES. BOTH SETS OF LAKES ARE SITUATED IN AREA SUSCEPTIBLE TO AND AFFECTED BY ACID PRECIPITATION.
CODE : T3/G12.1/P3.1/F2.2/L2.1/D1/V1

NAME : KEJIMKUJIK CALIBRATED BASIN MONITORING NETWORK
TYPE : WATER QUALITY (BOGS)
PARAM : HYDROGEN ION, NO₃, SO₄, ALKALINITY, DISSOLVED ORGANIC CARBON
CAN : 2 SITES IN KEJIMKUJIK NATIONAL PARK, NOVA SCOTIA, AND 2 SITES TO THE EAST OF THE PARK IN THE UPPER MERSEY RIVER BASIN
OFTEN : WEEKLY AND AFTER MAJOR SNOWMELT EVENTS
DATES : FEBURARY 1983 - ONGOING
HOW : STUDIES OF SURFACE WATERS OF A MARINE, BOG DOMINATED ECOSYSTEM. SAMPLES COLLECTED UNDER VARIOUS ANNUAL HYDROLOGIC CONDITIONS. MERSEY RIVER GAUGED FOR STREAM FLOW; SNOWPACK SAMPLED BEFORE AND AFTER MELT EVENTS.
QAQC : FORMAL FIELD AND LABORATORY PROGRAM
STOR : NAQUADAT DATA BASE
CONTACT : T. A. CLAIR
ADDRESS : ENVIRONMENT CANADA
BOX 861
MONCTON, NEW BRUNSWICK E1C 8N6
TELEPH : (506) 857-6606
FUNDS : ENVIRONMENT CANADA
MISC : ANALYTICAL DATA TO BE USED IN HYDROLOGIC MODELS. PROJECT ATTEMPTS TO PREDICT RIVER QUALITY BASED ON CONTAMINANT INPUTS. WATER DISCHARGE DATA USED FOR MODEL INPUT.
CODE : T3/G2.1/P0/F1.2/L1.1/D1/V1

NAME : LRTAP MONITORING NETWORK
TYPE : WATER QUALITY
PARAM : pH, MAJOR IONS, ALKALINITY, NUTRIENTS, PHYSICAL PARAMETERS,
EXTRACTABLE METALS (Al, Fe, Mn)
CAN : 12 RIVERS, 44 LAKES IN SOUTHWESTERN NOVA SCOTIA
OFTEN : RIVERS SAMPLED MONTHLY FROM MAY - DECEMBER, EVERY 2 WEEKS
JANUARY - MAY. LAKES ALSO SAMPLED AT TURNOVER.
DATES : 1983 - ONGOING
HOW : ONE SAMPLE COLLECTED PER SITE VISIT. SAMPLES ANALYZED AT THE WATER
QUALITY BRANCH LABORATORY AT MONCTON, NEW BRUNSWICK.
QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
STOR : NAQUADAT DATA BASE
CONTACT : GEOFF HOWELL
ADDRESS : ENVIRONMENT CANADA
BOX 861
MONCTON, NEW BRUNSWICK E1C 8N6
TELEPH : (506) 857-6606
FUNDS : ENVIRONMENT CANADA
CODE : T3/G2.1/P0/F1.2/L1.2/D1/V1

NAME : BANK QUALITY MONITORING AQUATIC
ABREV : BQMA
TYPE : WATER QUALITY
PARAM : WATER CHEMISTRY AND PHYSICAL PARAMETERS
CAN : QUEBEC (OVER 130 STATIONS ON RIVERS, 1000 STATIONS ON LAKES, AND
NUMEROUS GROUNDWATER STATIONS)
DATES : 1978 - ONGOING
QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
STOR : BQMA DATA BASE, AND IN NAQUADAT
CONTACT : JACQUES DEZIEL
ADDRESS : QUEBEC MINISTRY OF THE ENVIRONMENT
3900 MARLY STREET
STE. FOY, QUEBEC G1X 4E4
TELEPH : (418) 644-3306
FUNDS : PROVINCE OF QUEBEC
CODE : T3/G2.1/P0/F2.3/L1.2/D1/V0

NAME : SURVEILLANCE NETWORK OF LAKE ACIDIFICATION IN QUEBEC
TYPE : WATER QUALITY
PARAM : pH, TEMPERATURE, DISSOLVED OXYGEN, MAJOR IONS, ALUMINUM, AND TRACE METALS
CAN : 26 "BASE" LAKES AND 156 "SATELLITE" LAKES IN QUEBEC (SOUTH OF THE 52ND PARALLEL). THE LAKES COMPROMISE A REPRESENTATIVE SAMPLE OF QUEBEC'S LAKES
OFTEN : SEASONALLY FOR 26 BASE LAKES; WINTER, SPRING, AND SUMMER FOR 52 SATELLITE LAKES
DATES : WINTER 1980 - WINTER 1986
HOW : OVER THE DEEPEST PART OF EACH LAKE, IN SITU MEASUREMENTS OF pH, TEMPERATURE AND DISSOLVED OXYGEN ARE TAKEN AT DIFFERENT DEPTHS. TURBIDITY IS ALSO MEASURED AT DIFFERENT DEPTHS. A SAMPLE INTEGRATED OVER ALL DEPTHS IS OBTAINED AND ANALYZED.
QAQC : FORMAL LABORATORY PROGRAM
STOR : DATA STORED ON MAINFRAME
CONTACT : LEVIS TALBOT
ADDRESS : QUEBEC MINISTRY OF THE ENVIRONMENT
3900, MARLY STREET
STE. FOY, QUEBEC G1X 4A5
TELEPH : (418) 644-3309
FUNDS : SERVICE DE LA QUALITE DES LAUX, MINISTERE DE L'ENVIRONNEMENT DE QUEBEC
MISC : PROJECT FOLLOWS THE PHYSIO-CHEMICAL EVOLUTION AND ACIDIFICATION OF LAKES IN QUEBEC.
CODE : T3/G2.1/P3.1/F2.2/L1.2/D2/V1

NAME : EVALUATION OF THE NATURE OF ACIDIFICATION OF LAKES IN SOUTHERN QUEBEC
AND INCIDENCES ON A SAMPLING NETWORK
TYPE : WATER QUALITY
PARAM : pH, ALKALINITY, MAJOR IONS
CAN : SOUTHERN QUEBEC
OFTEN : ONE TIME SAMPLING
DATES : OCTOBER 1982 - APRIL 1983
HOW : DETERMINE AND CHARACTERIZE ZONES BASED ON THEIR LEVEL OF SENSITIVITY
TO ACIDIFICATION. IDENTIFY PHYSIOGRAPHIC AND GEOMORPHOLOGIC
PARAMETERS THAT INFLUENCE OR CAN EXPLAIN THE SENSITIVITY. DETECT
ZONES THAT ARE AFFECTED OR ARE SUSCEPTIBLE.
CONTACT : BERNARD BOBEE
ADDRESS : COMPLEX SCIENTIFIC 2700
RUE EINSTEIN C.P. 7500
STE. FOY, QUEBEC G1V 4C7
FUNDS : UNIVERSITE DE QUEBEC
MISC : PROJECT EVALUATES AND INTERPRETS THE SPATIAL VARIABILITY OF VARIOUS
PHYSIO-CHEMICAL PARAMETERS AS RELATED TO THE PROCESSES OF
ACIDIFICATION IN LAKE WATERS OF QUEBEC. RESULTS WILL BE COMPARED TO
PRESENT KNOWLEDGE OF CHEMICAL PHENOMENA AND APPLIED TO CHEMICAL
MODELS.
CODE : T3/G2.1/P0/F3.1/L2.1/D0/V0

NAME : SYSTEMATIC STUDY OF ACIDITY IN QUEBEC LAKES
 TYPE : WATER QUALITY
 PARAM : pH, ALKALINITY, COLOR, CONDUCTIVITY, MAJOR IONS, ALUMINUM, TRACE METALS
 CAN : 1091 LAKES SCATTERED IN SOUTHERN QUEBEC, CANADA
 OFTEN : VARIABLE, MOSTLY ONE TIME SAMPLING
 DATES : WINTER 1981 - 1985
 HOW : ONE INTEGRATED SAMPLE WAS COLLECTED 0 TO 5 METERS BELOW ICE COVER IN THE DEEPEST PART OF THE LAKES
 QAQC : NO FORMAL PROGRAM
 STOR : BQMA DATABASE, NADAQUAT
 CONTACT : JACQUES DUPONT OR YVES GRIMARD
 ADDRESS : QUEBEC MINISTRY OF THE ENVIRONMENT
 3900, MARLY STREET
 STE. FOY, QUEBEC G1X 4E4
 TELEPH : (418) 644-3297
 FUNDS : MINISTERE DE L'ENVIRONNEMENT DU QUEBEC, ENVIRONMENT CANADA
 MISC : THE PROJECT IS AN INTER-SYSTEM STUDY RELATING PRECIPITATION QUALITY TO WATER QUALITY WITH REFERENCE TO SENSITIVITY OF THE CATCHMENT. A DESCRIPTIVE MODEL RELATING THESE FACTORS TO LAKE pH WAS PROPOSED.
 CODE : T3/G2.1/P3.1/P4.2/L2.1/D1/V1

NAME : PHYSIO-CHEMICAL EFFECTS OF ACID PRECIPITATION ON THE LAKES OF LA VERENDRYE PARK
 TYPE : WATER QUALITY
 PARAM : pH, ALKALINITY, MAJOR IONS, ALUMINUM, TRACE METALS
 CAN : 22 LAKES IN VERENDRYE PARK, QUEBEC
 OFTEN : ONE TIME SAMPLING
 DATES : FEBRUARY 1982
 HOW : ONE INTEGRATED SAMPLE WAS COLLECTED 0 TO 5 METERS BELOW ICE COVER IN THE DEEPEST PART OF THE LAKES.
 QAQC : NO FORMAL PROGRAM
 STOR : BQMA DATABASE, HARD COPY
 CONTACT : JACQUES DUPONT
 ADDRESS : QUEBEC MINISTRY OF THE ENVIRONMENT
 3900, MARLY STREET
 STE. FOY, QUEBEC G1X 4E4
 TELEPH : (418) 644-3297
 FUNDS : SERVICE DE LA QUALITE DES LAUX, MINISTERE DE L'ENVIRONNEMENT DE QUEBEC
 MISC : PROJECT EXAMINED THE EVOLUTION OF ACIDITY FOR LAKES FOR WHICH HISTORICAL DATA EXISTS. THE LAKES ARE SITUATED CLOSE TO SOURCES OF ACIDITY AND IN GEOLOGICALLY SENSITIVE AREAS.
 CODE : T3/G2.1/P3.1/F2.2/L2.1/D1/V1

NAME : NATURE AND EXTENT OF ACIDIFICATION IN THE PORTNEUF REGION
TYPE : WATER QUALITY
PARAM : pH, ACIDITY, MAJOR ANIONS AND CATIONS, ALUMINUM
CAN : QUEBEC (PORTNEUF REGION)
OFTEN : ONE TIME SAMPLING
DATES : FEBRUARY 1982
HOW : 100 SMALL HEADWATER LAKES SAMPLED BY HELICOPTER. INTEGRATED SAMPLE
COLLECTED AT THE GEOMETRIC CENTER OF EACH LAKE.
QAQC : NO FORMAL PROGRAM
STOR : BQMA DATABASE
CONTACT : JACQUES DUPONT
ADDRESS : QUEBEC MINISTRY OF THE ENVIRONMENT
3900, MARLY STREET
STE. FOY, QUEBEC G1X 4E4
TELEPH : (418) 644-3297
FUNDS : SERVICE DE LA QUALITY DES EAUX, MINISTERE DE L'ENVIRONNEMENT DU QUEBEC
MISC : PROJECT DETERMINES THE AMOUNT OF ACIDIFICATION IN LAKES LOCATED IN
ZONES CLASSIFIED AS SUSCEPTABLE
CODE : T3/G2.1/P0/F2.2/L2.1/D1/V1

Map of the 14 lakes in the Portneuf Region, Quebec studied in "Intra-Annual Variability of Lake Water Quality of Fourteen Lakes Located in Portneuf Area"

NAME : STUDY OF THE SPATIAL VARIABILITY OF LAKE WATER CHEMISTRY FROM THE OUTAOUAIS REGION WITH REFERENCE TO ACIDIFICATION PROCESSES

TYPE : WATER QUALITY

PARAM : pH, ALKALINITY, CONDUCTIVITY, COLOR, MAJOR IONS, ALUMINUM, TRACE METALS

CAN : 82 LAKES IN THE OUTAOUAIS REGION, QUEBEC

OFTEN : ONE TIME SAMPLING

DATES : MARCH 1983

HOW : ONE INTEGRATED SAMPLE WAS COLLECTED 0 TO 5 METERS BELOW ICE COVER IN THE DEEPEST PART OF THE LAKES

QAQC : NO FORMAL PROGRAM

STOR : BQMA DATABASE AND HARD COPY

CONTACT : JACQUES DUPONT

ADDRESS : QUEBEC MINISTRY OF THE ENVIRONMENT
3900, MARLY STREET
STE. FOY, QUEBEC G1X 4E4

TELEPH : (418) 644-3297

MISC : PROJECT EXAMINED THE ACIDITY STATUS OF ONE OF THE QUEBEC REGIONS RECEIVING VERY HIGH ACID DEPOSITION. THE LAKES ARE SITUATED NEAR SOURCES OF ACIDITY.

FUNDS : MINISTERE DE L'ENVIRONNEMENT DU QUEBEC

CODE : T3/G2.1/P3.1/F2.2/L2.1/D1/V1

NAME : ACIDITY STATUS IN THE OUTAOUAIS AREA
TYPE : WATER QUALITY
PARAM : pH, ALKALINITY, CONDUCTIVITY, COLOR, MAJOR IONS, ALUMINUM, TRACE
METALS, DISSOLVED ORGANIC CARBON, DISSOLVED INORGANIC CARBON
CAN : 337 LAKES IN THE HYDROLOGICAL REGION OF THE OUTAOUAIS, QUEBEC
OFTEN : ONE TIME SAMPLING EVERY FIVE YEARS
DATE : MARCH 1986
HOW : ONE INTEGRATED SAMPLE WAS COLLECTED 0 TO 5 METERS BELOW ICE COVER
IN THE DEEPEST PART OF THE LAKES.
QAQC : SAMPLING QUALITY ASSURANCE PROGRAM
STOR : BQMA AND NADAQUAT DATABASES
CONTACT : JACQUES DUPONT
ADDRESS : QUEBEC MINISTRY OF THE ENVIRONMENT
3900, MARLY STREET
STE. FOY, QUEBEC G1X 4E4
TELEPH : (418) 644-3297
FUNDS : MINISTERE DE L'ENVIRONNEMENT DU QUEBEC AND ENVIRONMENT CANADA
MISC : PROJECT REPRESENTED A RANDOM SAMPLING OF 337 LAKES. IT WAS INITIATED
FOR QUANTIFYING AND EXTRAPOLATING THE RESULTS TO THE ENTIRE POPULATION
OF LAKES OF THE AREA SO AS TO ESTIMATE THE PERCENTAGE AND NUMBER OF
ACID LAKES.
CODE : T3/G2.1/P3.1/F4.3/L1.1/D1/V1

NAME : NATURE AND EXTENT OF ACIDIFICATION IN THE ROUYN-NORANDA REGION
 TYPE : WATER QUALITY
 PARAM : pH, ACIDITY, MAJOR CATIONS AND ANIONS, ALUMINUM
 CAN : QUEBEC (NORANDA REGION)
 OFTEN : ONE TIME SAMPLING
 DATES : FEBRUARY 1982
 HOW : 64 SMALL HEADWATER LAKES SAMPLED BY FLOAT PLANE. INTEGRATED SAMPLE COLLECTED AT THE GEOMETRIC CENTER OF EACH LAKE AND JUST UNDER THE ICE COVER.
 QAQC : NO FORMAL PROGRAM
 STOR : BQMA DATABASE, HARD COPY
 CONTACT : JACQUES DUPONT
 ADDRESS : QUEBEC MINISTRY OF THE ENVIRONMENT
 3900, MARLY STREET
 STE. FOY, QUEBEC G1X 4E4
 TELEPH : (418) 644-3297
 FUNDS : SERVICE DE LA QUALITE DES LAUX, MINISTERE DE L'ENVIRONNEMENT DU QUEBEC
 MISC : PROJECT EXAMINES THE CONTRIBUTION OF MINE EMISSIONS IN NORANDA TO THE ACIDIFICATION OF LAKES IN THE REGION.
 CODE : T3/G2.1/P0/F2.1/L2.1/D1/V1

NAME : MIDDLE ATLANTIC VULNERABILITY STUDY
 TYPE : WATER QUALITY
 PARAM : TEMPERATURE, pH, COLOR, ALKALINITY, CONDUCTIVITY, Al, Ca, Cl, K, Mg, Mn, Na, SO4, SECCHI DISK
 US : 278 LAKES AND STREAMS IN NINE MIDDLE ATLANTIC STATES (NEW YORK, PENNSYLVANIA, NEW JERSEY, DELAWARE, MARYLAND, WEST VIRGINIA, VIRGINIA, NORTH CAROLINA, TENNESSEE)
 OFTEN : ONE SAMPLING DATE PER SITE
 DATES : JULY 1980 - AUGUST 1981
 HOW : SAMPLES COLLECTED WITH VANDORN BOTTLE AT SURFACE AND NEAR BOTTOM OF LAKES AND AT MID-DEPTH OF STREAMS
 QAQC : FORMAL LABORATORY PROGRAM, EPA STANDARDS
 STOR : STORED ON COMPUTER AT PENN STATE UNIVERSITY; COMPLETE DATA LISTING IN THE APPENDIX OF THE DOCUMENT REFERENCED BELOW.
 CONTACT : DEAN E. ARNOLD
 ADDRESS : PENNSYLVANIA COOPERATIVE FISH AND WILDLIFE RESEARCH UNIT
 7 FERGUSON BUILDING
 UNIVERSITY PARK, PA 16802
 TELEPH : (814) 865-4511
 FUNDS : ENVIRONMENTAL PROTECTION AGENCY VIA U.S. FISH & WILDLIFE SERVICE
 MISC : COMPANION STUDY TO SURVEY OF NEW ENGLAND STATES BY HAINES & AKIELASZEK (1983)

REFDOC : ARNOLD, D. E., R. W. LIGHT, AND E. A. PAUL. 1985. VULNERABILITY OF SELECTED LAKES AND STREAMS IN THE MIDDLE ATLANTIC STATES TO ACIDIFICATION: A REGIONAL SURVEY. U.S. FISH AND WILDLIFE SERVICE, EASTERN ENERGY AND LAND USE TEAM, BIOL. REP. 80(40.19), 133 PP.

CODE : T3/G1.1/P0/F1.2/L2.1/D2/V1

NAME : MONITORING THE EFFECTS OF ACID RAIN ON THE WATER QUALITY OF LAUREL
RIDGE, SOMERSET COUNTY, PENNSYLVANIA
TYPE : WATER QUALITY
PARAM : pH, ALKALINITY, MAJOR ANIONS AND CATIONS
US : ORIGINALLY 6 SITES, NOW 4 IN LAUREL RIDGE, SOMERSET COUNTY,
PENNSYLVANIA
OFTEN : SAMPLES COLLECTED ON A PRECIPITATION EVENT BASIS AND ON A LONG TERM
(MONTHLY) BASIS
DATES : AUGUST 1983 - ONGOING
HOW : SAMPLES COLLECTED IN BOTTLES BY GRAB METHOD OR AUTOMATIC SAMPLER AND
ANALYZED AT U.S. GEOLOGICAL SURVEY LABORATORIES IN DENVER, COLORADO
QAQC : FORMAL FIELD AND LABORATORY PROGRAM
STOR : STORET, ACID, WATSTORE
CONTACT : J. BARKER
ADDRESS : U.S. GEOLOGICAL SURVEY
PO BOX 1107
HARRISBURG, PA 17108
TELEPH : (717) 782-3812
FUNDS : ENVIRONMENTAL PROTECTION AGENCY AND U.S. GEOLOGICAL SURVEY
MISC : EMPHASIS ON DETERMINING EFFECTS OF INDIVIDUAL STORMS AND SNOWMELT ON
STREAM WATER QUALITY
CODE : T3/G1.1/P0/F1.2/L1.1/D1/V1

NAME : WATER QUALITY MONITORING OF THE OTTAWA RIVER
TYPE : WATER QUALITY
PARAM : POLYCHLORINATED BIPHENYLS (PCBS), CHLOROBENZENE, ORGANOCHLORINES
CAN : LEMIEUX ISLAND, OTTAWA RIVER, ONTARIO
OFTEN : WEEKLY
DATES : SEPTEMBER 1984 - ONGOING
HOW : WATER AND SUSPENDED SEDIMENT SAMPLES COLLECTED, EXTRACTED AND ANALYZED
QAQC : FORMAL LABORATORY PROGRAM
STOR : CONTACT PRINCIPAL INVESTIGATOR
CONTACT : R. C. McCREA
ADDRESS : INLAND WATERS DIRECTORATE
WATER QUALITY BRANCH
P.O. BOX 5050
BURLINGTON, ONTARIO L7R 4A6
TELEPH : (416) 637-4678
FUNDS : INLAND WATERS DIRECTORATE, ENVIRONMENT CANADA
CODE : T3/G2.2/P1.1/F1.2/L1.1/D2/V0

NAME : MONITORING OF ST. LAWRENCE RIVER WATER QUALITY
TYPE : WATER QUALITY
PARAM : ORGANOCHLORINES, PCBs, HEAVY METALS
CAN : WOLFF ISLAND (NEAR KINGSTON, ONTARIO)
OFTEN : MONTHLY
DATES : 1984 - ONGOING
HOW : WATER SAMPLES AND SUSPENDED SEDIMENTS COLLECTED AND ANALYZED VIA GAS
CHROMATOGRAPHY
QAQC : FORMAL LABORATORY PROGRAM
STOR : CONTACT PRINCIPAL INVESTIGATOR
CONTACT : SERGE METIKOSH
ADDRESS : INLAND WATERS DIRECTORATE
867 LAKE SHORE ROAD
P.O. BOX 5050
BURLINGTON, ONTARIO L7R 4A6
TELEPH : (416) 637-4641
FUNDS : ENVIRONMENT CANADA
CODE : T3/G2.2/P1.1/F1.2/L1.1/D2/V1

NAME : MONITORING OF NIAGARA RIVER
TYPE : WATER QUALITY
PARAM : 57 CHEMICALS ON LIST PREPARED BY THE NIAGARA TOXIC COMMITTEE; INCLUDES
ORGANOCHLORINES, PESTICIDES, AND HEAVY METALS (SUCH AS: Hg, Se, As)
CAN : TWO SITES ON NIAGARA RIVER, ONTARIO (FT. ERIE AND AT RIVER MOUTH ON
LAKE ONTARIO)
OFTEN : EVERY 2 WEEKS
DATES : 1977 - ONGOING
HOW : WATER SAMPLES COLLECTED AND ANALYZED VIA HIGH PRESSURE LIQUID
CHROMATOGRAPHY AND GAS CHROMATOGRAPHY. ADDITIONAL WATER SAMPLES
CENTRIFUGED TO OBTAIN SUSPENDED SEDIMENTS. SOXHLET EXTRACTION OF
SEDIMENTS PRIOR TO ANALYSIS BY SIMILAR TECHNIQUES.
QAQC : FORMAL LABORATORY PROGRAM
STOR : CONTACT PRINCIPAL INVESTIGATOR
CONTACT : SERGE METIKOSH
ADDRESS : INLAND WATERS DIRECTORATE
867 LAKE SHORE ROAD
P.O. BOX 5050
BURLINGTON, ONTARIO L7R 4A6
TELEPH : (416) 637-4641
FUNDS : ENVIRONMENT CANADA
CODE : T3/G2.2/P1.1/F1.2/L1.1/D2/V1

NAME : MOBILIZATION OF TOXIC TRACE METALS FROM BOGS TO FRESHWATER FISH
HABITATS
TYPE : WATER QUALITY (BOGS)
PARAM : CHEMICAL COMPOSITON (NITROGEN AND SULFUR IONS; MAJOR CATIONS AND
ANIONS, METALS, ETC.) OF BOG WATERS (INCLUDING INFLOW AND OUTFLOW)
CAN : EXPERIMENTAL LAKE AREAS IN NORTHWESTERN ONTARIO
OFTEN : WEEKLY DURING ICE FREE SEASON
DATES : 1981 - ONGOING
HOW : ANALYZED AT FRESHWATER INSTITUTE AND AT GEOLOGICAL LABORATORY OF
COLUMBIA UNIVERSITY
QAQC : FORMAL LABORATORY PROGRAM
STOR : DATA ON UNIVERSITY OF MANITOBA COMPUTER
CONTACT : R. NEWBURY OR SUZANNE BAYLEY
ADDRESS : FRESHWATER INSTITUTE UNIV. OF MANITOBA
501 UNIVERSITY CRESCENT DEPT. OF BOTANY
WINNIPEG, MANITOBA R3T 2N6 WINNIPEG, MANITOBA R3T 2N6
TELEPH : (204) 949-5219 (204) 949-5196
FUNDS : DEPT. OF FISHERIES AND OCEAN
MISC : MOSTLY AN EXPERIMENTAL PROGRAM WITH A BOG BEING IRRIGATED WITH WATER
OF CONTROLLED pH; HOWEVER THERE ARE SEVERAL CONTROL SITES THAT ARE
RECEIVING ONLY NATURAL RAINFALL.
CODE : T3/G2.2/P1.1/F1.2/L1.1/D2/V1

NAME : ASSESSMENT OF LAKE ACIDIFICATION IN NORTHERN MINNESOTA, WISCONSIN AND MICHIGAN
TYPE : WATER QUALITY
PARAM : Ca, Mg, Na, K, SO₄, Cl, ALKALINITY, pH, COLOR
US : 85 LAKES IN 7 NATIONAL FORESTS IN MINNESOTA, WISCONSIN, AND MICHIGAN
OFTEN : ONCE BETWEEN MID-JUNE AND MID-JULY 1984, AND ONCE AGAIN BETWEEN MID-AUGUST AND MID-SEPTEMBER 1984
DATES : SUMMER 1984
HOW : 6 SAMPLES PER LAKE TAKEN IN DEEP WATER AT ONE STANDARD ARM LENGTH DEEP. ANALYZED AT FORESTRY SCIENCES LABORATORY IN GRAND RAPIDS
STOR : CURRENTLY AVAILABLE FROM PRINCIPAL INVESTIGATOR; EVENTUALLY IN STORET DATA BASE
CONTACT : DALE NICHOLS
ADDRESS : NORTH CENTRAL FOREST EXPERIMENTAL STATION
FORESTRY SCIENCES LABORATORY
1831 HIGHWAY 169E
GRAND RAPIDS, MN 55744
TELEPH : (218) 326-8571
FUNDS : U.S. FOREST SERVICE
REFDOC : NICHOLS, D. S. AND E. S. VERRY. 1985. "EVIDENCE FOR THE CULTURAL ACIDIFICATION OF LAKES IN THE NORTHERN LAKE STATES." CONFERENCE ON AIR POLLUTANTS EFFECTS ON FOREST ECOSYSTEMS. MAY 8-9, 1985, ST. PAUL, MINNESOTA. AVAILABLE FROM USDA FOREST SERVICE, GRAND RAPIDS, MINNESOTA.
CODE : T3/G1.2/P0/F1.2/L2.1/D1/V0

NAME : EFFECTS OF ACIDIC DEPOSITION ON WATER QUALITY IN THE UPPER MIDWEST
OF THE U.S.
TYPE : WATER QUALITY
PARAM : WATER CHEMISTRY - pH, ALKALINITY, COLOR, TURBIDITY, ORGANIC CARBON,
METALS, MAJOR CATIONS AND ANIONS
US : 1000 LAKES AND RIVERS IN THE UPPER MIDWEST
OFTEN : ONE TIME SURVEY (3 TIMES A YEAR - SPRING, SUMMER AND FALL); CONTINUOUS
ON 30 SITES
DATES : 1979 - 1984
HOW : STANDARD ANALYTICAL TECHNIQUES AND METHODOLOGIES EMPLOYED
QAQC : FORMAL FIELD AND LABORATORY PROGRAM (INCLUDES DATA ENTRY CHECKS)
STOR : ADDNET DATABASE, REPORTS AND JOURNAL ARTICLES
CONTACT : GARY E. GLASS
ADDRESS : ENVIRONMENTAL RESEARCH LABORATORY, USEPA
6201 CONGDON BLVD
DULUTH, MN 55084
TELEPH : (218) 720-5526
FUNDS : ENVIRONMENTAL PROTECTION AGENCY
MISC : THIS PROGRAM COMPRISES A LARGE NUMBER OF INDIVIDUAL RESEARCH PROJECTS.
REFDOC : MANY DOCUMENTS AVAILABLE (OVER 60 PUBLICATIONS AS OF FEBRUARY 1986);
CONTACT G. E. GLASS FOR PUBLICATION LIST. REPRESENTATIVE DOCUMENTS
INCLUDE:

RAPP, G. JR., J. D. ALLERT, B. W. LIUKKONEN, J. A. ILSE, O. L. LOUDKS,
AND G. E. GLASS. 1985. "ACID DEPOSITION AND WATERSHED
CHARACTERISTICS IN RELATION TO LAKE CHEMISTRY IN NORTHEASTERN
MINNESOTA." ENVIRONMENT INTERNATIONAL, 11:425-440.

GLASS, G. E. AND O. L. LOUCKS. 1986. "IMPLICATIONS OF A GRADIENT
IN ACID AND ION DEPOSITION ACROSS THE NORTHERN GREAT LAKES STATES."
ENVIRONMENTAL SCIENCE AND TECHNOLOGY, 20:35.

GLASS, N. R., G. E. GLASS, AND P. J. RENNIE. 1980. "EFFECTS OF
ACID PRECIPITATION IN NORTH AMERICA." ENVIRONMENT INTERNATIONAL,
4:443-452.

CODE : T3/G1.2/P3.1/F1.3/L2.2/D1/V1

Map of Monitoring Locations for "Effects of Acidic Deposition on Water Quality in the Upper Midwest of the U.S."

NAME : EXTENT OF ACIDIFICATION AND ACIDIFICATION EFFECTS ON LAKES IN
MINNESOTA, WISCONSIN, AND MICHIGAN
TYPE : WATER QUALITY
PARAM : pH, ALKALINITY, MAJOR IONS
US : 36 SITES IN MINNESOTA, WISCONSIN, AND MICHIGAN
OFTEN : 3 TIMES PER YEAR
DATES : SEPTEMBER 1983 - SEPTEMBER 1990 (SCHEDULED)
HOW : WATER SAMPLES ANALYZED AT THE UNIV. OF MINNESOTA USING STANDARD
TECHNIQUES AND METHODOLOGIES
QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
STOR : STORET AND ADDNET DATA BASES
CONTACT : P. L. BREZONIK
ADDRESS : UNIVERSITY OF MINNESOTA
DEPT. OF CIVIL AND MINERAL ENGINEERING
MINNEAPOLIS, MN 55455
TELEPH : (612) 373-2514
FUNDS : ENVIRONMENTAL PROTECTION AGENCY
MISC : WILL PRODUCE A WATER QUALITY DATA BASE FOR NORTH CENTRAL U.S. LAKES
CODE : T3/G1.2/P0/F1.2/L1.1/D1/V1

NAME : MONITORING ACTIVITIES AT POPLAR RIVER AND BOUNDARY DAM POWER STATIONS
TYPE : WATER QUALITY
PARAM : pH, SO4, NO3, OTHER MAJOR IONS, ALKALINITY, METALS, CONDUCTIVITY
CAN : 11 SITES AROUND POPLAR RIVER THERMAL POWER PLANT, CORONACH,
SASKATCHEWAN AND BOUNDARY DAM POWER STATION, ESTEVAN, SASKATCHEWAN
OFTEN : METALS QUARTERLY, OTHERS FOR PERIODS RANGING FROM MONTHLY TO ANNUALLY
DATES : APPROXIMATELY 1975 - ONGOING
HOW : SAMPLES COLLECTED IN BOTTLES AND ANALYZED AT DIFFERENT LABORATORIES.
QAQC : NO FORMAL FIELD PROGRAM; LABORATORIES FOLLOWED FORMAL QA PROGRAMS
STOR : SOME DATA AVAILABLE FROM SASKATCHEWAN ENVIRONMENT
CONTACT : GEORGE HORSFALL
ADDRESS : SASKATCHEWAN POWER CORP.
2025 VICTORIA AVE
REGINA, SASKATCHEWAN S4P 0S1
TELEPH : (306) 566-2878
FUNDS : SASKATCHEWAN POWER CORP.
REFDOC : POPLAR RIVER BILATERAL MONITORING COMMITTEE. 1985. 1984 ANNUAL
REPORT TO THE GOVERNMENTS OF CANADA, UNITED STATES, SASKATCHEWAN,
AND MONTANA. SASKATCHEWAN ENVIRONMENT, REGINA, SASKATCHEWAN.
CODE : T3/G2.3/P3.1/F3.2/L1.2/D2/V1

NAME : FLATHEAD RIVER WATER QUALITY
TYPE : WATER QUALITY
PARAM : TRACE METALS (PARTICULARLY Hg,Cd,Ba), POLYAROMATIC HYDROCARBONS (PAHs)
IN WATER AND SEDIMENTS; NUTRIENTS (NITRATE, PHOSPHATE, TOTAL DISSOLVED
NITROGEN, TOTAL ORGANIC CARBON) IN WATER
CAN : FLATHEAD RIVER REACH
OFTEN : DEPENDENT ON RIVER FLOW AND MINING OPERATIONS IN AREA
DATES : VARIOUS MONITORING PROGRAMS EMPHASIZING DIFFERENT ASPECTS OF WATER
QUALITY IN OPERATION SINCE 1974
HOW : WATER, SUSPENDED SEDIMENT, AND BOTTOM SEDIMENTS COLLECTED IN SPAWNING
AREAS
QAQC : FORMAL LABORATORY PROGRAM
STOR : DATA AND INTERPRETIVE REPORTS AVAILABLE; CONTACT PRINCIPAL
INVESTIGATOR
CONTACT : D. VALIELA
ADDRESS : INLAND WATERS DIRECTORATE
PACIFIC AND YUKON REGION
4160 MARINE DRIVE
WEST VANCOUVER, BRITISH COLUMBIA V5J 3E5
TELEPH : (604) 666-8007
FUNDS : INLAND WATERS DIRECTORATE
CODE : T3/G2.3/P1.1/F1.1/L1.2/D2/V0

NAME : LONG TERM MONITORING OF NORTHERN ROCKY MOUNTAIN LAKES
TYPE : WATER QUALITY
PARAM : pH, ALKALINITY, MAJOR CATIONS AND ANIONS
US : NORTHERN ROCKY MOUNTAINS IN SOUTHWESTERN MONTANA AND NORTHWESTERN
WYOMING
OFTEN : 3 TIMES A YEAR (JUST AFTER ICE COVER BREAKS UP, AGAIN IN LATE JUNE,
AND AGAIN JUST BEFORE THE SURFACE FREEZES)
DATES : 1983 - ONGOING
HOW : SAMPLES COLLECTED APPROXIMATELY 4 FEET BELOW THE LAKE SURFACE, AT
SITES ROUGHLY 30 TO 40 FEET FROM SHORE. SAMPLES ANALYZED AT THE
MONTANA STATE UNIVERSITY'S DEPARTMENT OF CHEMISTRY.
QAQC : PROGRAM COVERING SOME ASPECTS OF THE FIELD WORK
STOR : STORET DATA BASE
CONTACT : G. K. PAGENKOPF
ADDRESS : MONTANA STATE UNIVERSITY
DEPT. OF CHEMISTRY
BOZEMAN, MT 59717
TELEPH : (406) 994-4801
FUNDS : ENVIRONMENTAL PROTECTION AGENCY
MISC : PROGRAM WILL MONITOR THE CHEMICAL CHARACTERISTICS OF HIGH MOUNTAIN
LAKES OVER A PERIOD OF YEARS
CODE : T3/G1.3/P0/F1.2/L1.1/D1/V0

NAME : VERTICAL TRANSPORT OF HYDROCARBONS IN PUGET SOUND, WASHINGTON STATE
TYPE : WATER QUALITY
PARAM : TOTAL CARBON, TOTAL ORGANIC CARBON, POLYCYCLIC AROMATIC HYDROCARBONS,
ALIPHATIC HYDROCARBONS (C14-C35)
US : CENTRAL BASIN OF PUGET SOUND, WASHINGTON. 1 SITE AT 47⁰ 41.6' N, 122⁰
27.2' W; NORTHWEST OF SEATTLE IN MAIN PUGET SOUND BASIN
OFTEN : WEEKLY
DATES : DECEMBER 1980 - DECEMBER 1981
HOW : AUTOMATIC SEDIMENT TRAPS DEPLOYED AT 50, 100, 160, AND 200 M IN A
WATER DEPTH OF 205 M. NEW SAMPLING TUBE AUTOMATICALLY ROTATED UNDER
COLLECTION FUNNEL EVERY 7 DAYS. TRAPS RECOVERED EVERY 2 MONTHS.
QAQC : FORMAL LABORATORY PROGRAM
STOR : CONTACT PRINCIPAL INVESTIGATOR
CONTACT : TIMOTHY BATES
ADDRESS : NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)
7600 SANDPOINT WAY NE
PACIFIC MARINE ENVIRONMENTAL LABORATORY
SEATTLE, WA 98115
TELEPH : (206) 526-6248
FUNDS : NOAA
MISC : SOXHLET EXTRACTION AND GC AND GC/MS ANALYSIS FOR PAH'S. SEE FOLLOWING
REFERENCE DOCUMENT FOR RESULTS
REFDOC : BATES, T. S., S. E. HAMILTON, AND J. D. CLINE. 1984. "VERTICAL
TRANSPORT AND SEDIMENTATION OF HYDROCARBONS IN THE CENTRAL MAIN
BASIN OF PUGET SOUND, WASHINGTON." ENVIRONMENTAL SCIENCES AND
TECHNOLOGY, 18:299-305.
CODE : T3/G1.3/P1.1/F1.2/L2.1/D2/V1

APPENDIX D

INVENTORY OF TRANSBOUNDARY REGION PRECIPITATION CHEMISTRY PROJECTS

NAME : CANADIAN NETWORK FOR SAMPLING PRECIPITATION
 ABREV : CANSAP
 TYPE : WET DEPOSITION
 PARAM : pH, CONDUCTIVITY, ALKALINITY, ACIDITY, SO4, NO3, NH4, Cl, Na, K, Ca, Mg
 CAN : 59 STATIONS DISTRIBUTED ACROSS CANADA, INCLUDING 9 WMO STATIONS. CANSAP STATIONS ARE NO LONGER ACTIVE, HAVING BEEN REPLACED BY CAPMoN STATIONS
 OFTEN : SAMPLES COLLECTED ON A DAILY BASIS, COMBINED FOR ONE MONTH PERIODS
 DATES : BEGAN IN 1977; TERMINATED DECEMBER 1985
 HOW : SANGAMO TYPE A PRECIPITATION COLLECTORS USED. ANALYSIS AT THE INLAND WATERS DIRECTORATE WATER QUALITY LABORATORY IN BURLINGTON, ONTARIO
 QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
 STOR : NAQUADAT DATABASE
 CONTACT : MALCOLM STILL
 ADDRESS : ATMOSPHERIC ENVIR. SERVICE
 4905 DUFFERIN ST.
 DOWNSVIEW, ONTARIO M3H 5T4
 TELEPH : (416) 667-4988
 FUNDS : ATMOSPHERIC ENVIR. SERVICE, ENVIRONMENT CANADA
 MISC : NETWORK UPGRADED IN EQUIPMENT AND PROTOCOL TO CAPMoN

REFDOC : MANY DOCUMENTS AVAILABLE. REPRESENTATIVE PUBLICATIONS INCLUDE:

SIROIS, A. 1983. THE CANADIAN NETWORK FOR SAMPLING PRECIPITATION ANNUAL REPORT (1981). ATMOSPHERIC ENVIRONMENT SERVICE, ENVIRONMENT CANADA, DOWNSVIEW, ONTARIO.

CODE : T4/G2.123/P0/F1.3/L2.2/D1/V1

Numbers are ADS data base site identification codes

NAME : CANADIAN NETWORK FOR SAMPLING ORGANIC COMPOUNDS IN PRECIPITATION
 ABREV : CANSOC
 TYPE : WET DEPOSITION (ORGANIC)
 PARAM : ORGANOCHLORINES, POLYCHLORINATED BIPHENYLS, CHLOROBENZENES,
 POLYAROMATIC HYDROCARBONS. INCLUDES LINDANE, ALDRIN, DIELDRIN,
 HEPTACHLOR, ENDRIN, CHLORDANE
 CAN : 12 SITES ACROSS CANADA
 OFTEN : MONTHLY COMPOSITES
 DATES : AUGUST 1977 - LATE IN 1981
 HOW : PRECIPITATION COLLECTED IN MODIFIED SANGAMO SAMPLERS. SAMPLES
 ANALYZED AT INLAND WATER DIRECTORATE, ENVIRONMENT CANADA, BURLINGTON,
 ONTARIO
 QAQC : FORMAL LABORATORY PROGRAM
 STOR : NAQUADAT DATABASE
 CONTACT : E. R. WATT OR P. BROOKSBANK
 ADDRESS : WATER QUALITY BRANCH - IWD
 PLACE VINCENT MASSEY
 351 ST. JOSEPH BLVD.,
 HULL, QUEBEC K1A 0E7
 TELEPH : (819) 997-3422
 FUNDS : ENVIRONMENT CANADA
 CODE : T4/G2.123/P1.1/F1.2/L2.1/D1/V1

NAME : NATIONAL TRENDS NETWORK (COORDINATED BY THE NATIONAL ATMOSPHERIC DEPOSITION PROGRAM)
ABREV : NTN (NETWORK-NADP/NTN)
TYPE : WET AND LIMITED DRY DEPOSITION
PARAM : pH, CONDUCTIVITY, SO₄, NO₃, NH₄, Cl, PO₄, Na, K, Ca, Mg
US : 150 SITES NATIONWIDE (196 IN COMBINED NADP AND NTN NETWORKS). 45 SITES ARE WITHIN THE BORDER STUDY AREA. (SOME SITES ARE COLOCATED WITH OTHER NETWORKS; E.G., MAP3S, UAPSP, STATE NETWORKS. NO SITES ARE CURRENTLY COLOCATED WITH CANADIAN NETWORKS.)
OFTEN : WET DEP: WEEKLY DRY DEP: BIMONTHLY
DATES : OCTOBER 1983 - ONGOING (APPROX. 90 SITES DESIGNATED AS NTN IN 1983 WERE EXISTING NADP SITES WITH LONGER OPERATING HISTORY)
HOW : COLLECTOR: EACH SITE USES AEROCHEM METRICS WET/DRY COLLECTOR. CHEMICAL ANALYSIS: ILLINOIS STATE WATER SURVEY. PROCEDURES: NADP SITING, FIELD, AND LABORATORY PROTOCOLS EMPLOYED (MANUALS AVAILABLE)
QAQC : FORMAL FIELD AND LABORATORY PROGRAMS (NADP MANUAL)
STOR : ADS DATABASE AND NADP/NTN DATABASE
CONTACT : J. H. GIBSON, NADP/NTN COORDINATOR
ADDRESS : NATURAL RESOURCE ECOLOGY LABORATORY
COLORADO STATE UNIVERSITY
FT. COLLINS, CO 80523
TELEPH : (303) 491-1978, 491-1975, OR 491-1977
FUNDS : U.S. GEOLOGICAL SURVEY, STATE AGRIC. EXP. STATIONS, U.S. DEPT OF AGR., NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, NATIONAL PARK SERVICE, BUREAU OF LAND MANAGEMENT, AND VARIOUS STATE AGENCIES AND PRIVATE CORPORATIONS
MISC : 150 OF THE 196 SITES ARE DESIGNATED AS NTN BY THE FEDERAL NATIONAL ACID PRECIPITATION ASSESSMENT PROGRAM (NAPAP). THEY ARE ALSO DESIGNATED AS NADP AND THUS IDENTIFIED AS NADP/NTN. THE BALANCE OF 46 SITES ARE SUPPLEMENTARY NADP SITES. ALL 196 NADP/NTN SITES OPERATE WITH IDENTICAL PROTOCOL AND THE DATA ARE FOUND IN A SINGLE DATA BASE. SITE AND PROTOCOL INFORMATION ARE CURRENT AS OF 2/13/86
REFDOC : MANY DOCUMENTS AVAILABLE; CONTACT J. H. GIBSON FOR PUBLICATION LIST. REPRESENTATIVE DOCUMENTS INCLUDE:
ROBERTSON, J. K. AND J. W. WILSON. 1985. DESIGN OF THE NATIONAL TRENDS NETWORK FOR MONITORING THE CHEMISTRY OF ATMOSPHERIC PRECIPITATION. U.S. GEOLOGICAL SURVEY CIRCULAR 964, ALEXANDRIA, VIRGINIA.
NATIONAL ATMOSPHERIC DEPOSITION PROGRAM. 1985. NADP/NTN DATA REPORT: PRECIPITATION CHEMISTRY; FOURTH QUARTER 1983; VOL VI, NO. 4. NATURAL RESOURCE ECOLOGY LABORATORY, COLORADO STATE UNIVERSITY, FORT COLLINS, COLORADO.
CODE : T4/G1.123/P0/F4.4/L1.1/D1/V1

LOCATIONS OF NATIONAL TRENDS NETWORK (NTN) STATIONS

NAME : NATIONAL ATMOSPHERIC DEPOSITION PROGRAM (IR-7) (COORDINATES COMBINED
NATIONAL ATMOSPHERIC DEPOSITION PROGRAM NETWORK AND NATIONAL TRENDS
NETWORK)
ABREV : NADP (NETWORK-NADP/NTN)
TYPE : WET AND LIMITED DRY DEPOSITION
PARAM : pH, CONDUCTIVITY, SO₄, NO₃, NH₄, Cl, PO₄, Na, K, Ca, Mg
US : 196 SITES NATIONWIDE IN COMBINED NADP AND NTN NETWORK (150 NADP/NTN
AND 46 NADP). 59 SITES WITHIN BORDER STUDY AREA. (SITES ARE
COLOCATED WITH OTHER NETWORKS; E.G., MAP3S, UAPSP, STATE NETWORKS.
NO SITES ARE CURRENTLY COLOCATED WITH CANADIAN NETWORKS, ALTHOUGH 3
WERE PREVIOUSLY COLOCATED WITH CANSAP.)
OFTEN : WET DEP: WEEKLY DRY DEP: BIMONTHLY
DATES : MAY 1978 - ONGOING
HOW : COLLECTOR: EACH SITE USES AEROCHEM METRICS WET/DRY COLLECTOR.
CHEMICAL ANALYSIS: ILLINOIS STATE WATER SURVEY. PROCEDURES: NADP
SITING, FIELD, AND LABORATORY PROTOCOLS EMPLOYED (MANUALS AVAILABLE)
QAQC : FORMAL FIELD AND LABORATORY PROGRAMS (NADP MANUAL)
STOR : ADS DATABASE AND NADP/NTN DATABASE
CONTACT : J. H. GIBSON, NADP/NTN COORDINATOR
ADDRESS : NATURAL RESOURCE ECOLOGY LABORATORY
COLORADO STATE UNIVERSITY
FT. COLLINS, CO 80523
TELEPH : (303) 491-1978, 491-1975, OR 491-1977
FUNDS : STATE AGRIC. EXP. STATIONS, U.S. GEOLOGICAL SURVEY, U.S. DEPT OF
AGRICULTURE, ENVIRONMENTAL PROTECTION AGENCY, U.S. FOREST SERVICE,
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, NATIONAL PARK
SERVICE, BUREAU OF LAND MANAGEMENT, AND VARIOUS STATE AGENCIES AND
PRIVATE CORPORATIONS
MISC : 150 OF THE 196 SITES ARE DESIGNATED AS NTN BY THE FEDERAL NATIONAL
ACID PRECIPITATION ASSESSMENT PROGRAM (NAPAP). THEY ARE ALSO
DESIGNATED AS NADP AND THUS IDENTIFIED AS NADP/NTN. THE BALANCE OF
46 SITES ARE SUPPLEMENTARY NADP SITES. ALL 196 NADP/NTN SITES OPERATE
WITH IDENTICAL PROTOCOL AND THE DATA ARE FOUND IN A SINGLE DATA
BASE. DRYFALL COLLECTION WAS MADE OPTIONAL IN 1984. SITE AND
PROTOCOL INFORMATION ARE CURRENT AS OF 2/13/86.
REFDOC : MANY DOCUMENTS AVAILABLE; CONTACT J. H. GIBSON FOR PUBLICATION LIST.
REPRESENTATIVE DOCUMENTS INCLUDE:

NATIONAL ATMOSPHERIC DEPOSITION PROGRAM. 1985. NADP/NTN DATA REPORT:
PRECIPITATION CHEMISTRY; FOURTH QUARTER 1983; VOL VI, NO. 4. NATURAL
RESOURCE ECOLOGY LABORATORY, COLORADO STATE UNIVERSITY, FORT COLLINS,
COLORADO.

PEDEN, M. E. 1983. "SAMPLING, ANALYTICAL AND QUALITY ASSURANCE
PROTOCOLS FOR THE NATIONAL ATMOSPHERIC DEPOSITION PROGRAM." SAMPLING
AND ANALYSIS OF RAIN. S. A. CAMPBELL, ED. ASTM SPECIAL TECHNICAL
PUBLICATION 823, pp. 72-83, AMERICAN SOCIETY FOR TESTING AND
MATERIALS, PHILADELPHIA, PENNSYLVANIA.

CODE : T4/G1.123/P0/F4.4/L1.2/D1/V1

NADP/NTN MONITORING NETWORK

NAME : CANADIAN AIR AND PRECIPITATION MONITORING NETWORK
ABREV : CAPMoN
TYPE : WET AND DRY DEPOSITION
PARAM : DEPOSITION SAMPLES: pH, SO₄, NO₃, Cl, NH₄, Na, K, Ca, Mg,
ACIDITY/ALKALINITY
AIR SAMPLES: AEROSOL SO₄, NO₃, Cl, Na, NH₄; NITRIC ACID AND SO₂
CAN : APPROXIMATELY 20 WET-ONLY SAMPLERS AND 9 REGIONAL AIR SAMPLERS IN
EASTERN AND CENTRAL CANADA
OFTEN : DAILY SAMPLING
DATES : BEGAN IN JULY 1983 - ONGOING
HOW : PRECIPITATION SAMPLES COLLECTED USING MIC TYPE A-M PRECIP COLLECTORS
AND ANALYZED AT THE INLAND WATERS LABORATORY IN BURLINGTON, ONTARIO.
AIR SAMPLES COLLECTED ON FILTERS AND ANALYZED AT ATMOSPHERIC
ENVIRONMENT SERVICE LABORATORY IN DOWNSVIEW
QAQC : FORMAL FIELD AND LABORATORY PROGRAM
STOR : AES CLIMATOLOGICAL DATA MANAGEMENT SYSTEM
CONTACT : ROBERT VET
ADDRESS : ATMOSPHERIC ENVIRON. SERVICE
4905 DUFFERIN ST.
DOWNSVIEW, ONTARIO M3H 5T4
TELEPH : (416) 667-4801
FUNDS : ENVIRONMENT CANADA
MISC : SUPERCEDES CANSAP AND APN NETWORKS

REFDOC : MANY DOCUMENTS AVAILABLE; CONTACT R. VET FOR PUBLICATION LIST.
REPRESENTATIVE DOCUMENTS INCLUDE:

VET, R. J. AND R. GILBERT. 1984. THE CANADIAN AIR AND PRECIPITATION
NETWORK (CAPMoN): A DESCRIPTION. ATMOSPHERIC ENVIRONMENT SERVICE,
ENVIRONMENT CANADA, DOWNSVIEW, ONTARIO.

ENVIRONMENT CANADA. 1985. INSPECTOR'S REFERENCE MANUAL -
PRECIPITATION, CANADIAN AIR AND PRECIPITATION MONITORING NETWORK.
ATMOSPHERIC ENVIRONMENT SERVICE, ENVIRONMENT CANADA, DOWNSVIEW,
ONTARIO.

CODE : T4/G2.12/P2.1/F1.3/L1.1/D1/V1

NAME : CANADIAN AIR AND PRECIPITATION MONITORING NETWORK
 ABREV : APN
 TYPE : WET DEPOSITION AND AIR CHEMISTRY
 PARAM : PRECIPITATION: pH, CONDUCTIVITY, ACIDITY, SO₄, NO₃, NH₄, Cl, K, Ca, Mg, Na
 AIR: SO₄, NO₃, Cl, Na, NH₄, HNO₃, SO₂
 CAN : 8 SITES EAST OF THE ALBERTA-SASKATCHEWAN BORDER
 OFTEN : DAILY AT 1200 GMT
 DATES : 3 SITES BEGAN IN NOVEMBER 1978, CONVERTED TO CAPMoN IN MID-1983
 HOW : PRECIPITATION ANALYZED AT THE INLAND WATERS LABORATORY IN BURLINGTON, ONTARIO; AIR FILTERS ANALYZED AT THE ATMOSPHERIC ENVIRONMENT SERVICE IN DOWNSVIEW
 QAQC : FORMAL LABORATORY PROGRAM
 STOR : ATMOSPHERIC ENVIRONMENT SERVICE APN DATABASE AND ADS DATABASE
 CONTACT : R. VET, M. STILL, L. A. BARRIE
 ADDRESS : ATMOSPHERIC ENVIRONMENT SERVICE
 4905 DUFFERIN ST.
 DOWNSVIEW, ONTARIO M3H 5T4
 TELEPH : (416) 667-4801, 667-4785, 667-4988
 FUNDS : ATMOSPHERIC ENVIR. SERVICE, ENVIRONMENT CANADA
 MISC : APN CONVERTED TO CAPMoN IN MID-1983

REFDOC : MANY DOCUMENTS AVAILABLE. REPRESENTATIVE DOCUMENTS INCLUDE:

BARRIE, L. A., H. A. WIEBE, K. ANLAUF, AND P. FELLIN. 1982. RESULTS OF THE CANADIAN AIR AND PRECIPITATION MONITORING NETWORK APN: JULY 1980 - DECEMBER 1981. REPORT AQRB-82-009-T, ATMOSPHERIC ENVIRONMENT SERVICE, ENVIRONMENT CANADA, DOWNSVIEW, ONTARIO.

BARRIE, L. A., K. ANLAUF, H. A. WIEBE, AND P. FELLIN. "ACIDIC POLLUTANTS IN AIR AND PRECIPITATION AT SELECTED RURAL LOCATIONS IN CANADA." DEPOSITION BOTH WET AND DRY, B. B. HICKS, ED., pp. 15-35, BUTTERWORTH PUBLISHERS, BOSTON, MASSACHUSETTS.

CODE : T4/G2.12/P2.1/F1.3/L2.2/D1/V1

NAME : UTILITY ACID PRECIPITATION STUDY PROGRAM
 ABREV : UAPSP
 TYPE : WET DEPOSITION
 PARAM : pH, ACIDITY, CONDUCTIVITY, SO4, NO3, NH4, Cl, PO4, Na, K, Ca, Mg
 US : APPROXIMATELY 20 STATIONS LOCATED AT SITES IN SOUTH DAKOTA SOUTH TO TEXAS AND EAST TO MAINE
 OFTEN : DAILY
 DATES : BEGAN IN JUNE 1980 WITH 7 SITES; EXPANDED NETWORK IN OCTOBER 1981
 HOW : AEROCHEM METRICS SAMPLERS - ANALYSIS BY COMBUSTION ENGINEERING
 QAQC : FORMAL FIELD AND LABORATORY PROGRAMS; EXTERNAL AUDIT SINCE 1982
 STOR : ADS DATABASE
 CONTACT : PETER K. MUELLER
 ADDRESS : ELECTRIC POWER RESEARCH INSTITUTE
 3412 HILLVIEW AVE.
 PALO ALTO, CA 94303
 TELEPH : (415) 855-2586
 FUNDS : PRIVATE ELECTRIC UTILITIES; MANAGED BY ELECTRIC POWER RESEARCH INSTITUTE
 MISC : NETWORK INCLUDES 5 STATIONS FROM THE EASTERN REGIONAL PRECIPITATION CHEMISTRY NETWORK (SURE PROGRAM NETWORK)
 REFDOC : MANY DOCUMENTS AVAILABLE; CONTACT P. K. MUELLER FOR PUBLICATION LIST. REPRESENTATIVE DOCUMENTS INCLUDE:

MUELLER, P. K., J. J. JANSEN, AND M. A. ALLEN. 1984. UAPSP SECOND SUMMARY REPORT. UAPSP 109, UTILITY ACID PRECIPITATION STUDY PROGRAM, EDISON ELECTRIC INSTITUTE, WASHINGTON, D.C.

TOPOL, LEO. 1986. "DIFFERENCES IN IONIC COMPOSITIONS AND BEHAVIOR IN WINTER RAIN AND SNOW." ATMOSPHERIC ENVIRONMENT, 20:347-356.

CODE : T4/G1.12/P0/F3.3/L1.2/D1/V1

Numbers are ADS data base site identification codes

NAME : NORTHEASTERN REGION SNOW CHEMISTRY RECONNAISSANCE STUDY
 TYPE : BULK DEPOSITION
 PARAM : pH, CONDUCTIVITY, SO₄, NO₃, NO₂, NH₄, F, K, Ca, Mg, As, Ba, Be, Cd, Co, Cu, Fe, Hg, Li, Mn, Mo, Ni, Pb, Se, Si, V, Zn, TOTAL INORGANIC CARBON
 US : 180 SITES EXTENDING FROM MAINE TO MINNESOTA AND SOUTH TO WEST VIRGINIA
 OFTEN : 3 MONTH BULK SAMPLERS
 DATES : DECEMBER 1980 - FEBRUARY 1981
 HOW : 6 FOOT HIGH SONOTUBES WITH POLYETHYLENE BAGS; ANALYSIS AT THE NATIONAL WATER QUALITY LABORATORY IN DENVER, COLORADO.
 QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
 STOR : AVAILABLE IN HARDCOPY
 CONTACT : NORMAN E. (JAKE) PETERS
 ADDRESS : USGS - WATER RESOURCES DIV.
 6481-B PEACHTREE INDUSTRIAL BLVD.
 DONAVILLE, GA 30360
 TELEPH : (404) 455-1213
 FUNDS : FUNDED BY WATER RESOURCES DIVISION, U.S. GEOLOGICAL SURVEY

REFDOC : PETERS, N. E. 1982. "REGIONAL SNOW CHEMISTRY RECONNAISSANCE."
 U.S. GEOLOGICAL SURVEY YEARBOOK, FY 1982, p. 63-65, U.S. GEOLOGICAL SURVEY, ALEXANDRIA, VIRGINIA.

PETERS, N. E. AND J. E. BONELLI. 1982. CHEMICAL COMPOSITION OF BULK PRECIPITATION IN THE NORTH-CENTRAL AND NORTHEASTERN UNITED STATES, DECEMBER 1980 THROUGH FEBRUARY 1981. U.S. GEOLOGICAL SURVEY CIRCULAR 874, U.S. GEOLOGICAL SURVEY, ALEXANDRIA, VIRGINIA.

CODE : T4/G1.12/P1.2/F1.3/L2.1/D2/V1

NAME : MAP3S PRECIPITATION CHEMISTRY NETWORK
 ABREV : MAP3S/PCN
 TYPE : WET DEPOSITION
 PARAM : pH, CONDUCTIVITY, SO₄, S(IV), NO₃, NH₄, Cl, PO₄, Na, K, Ca, Mg
 US : 9 SITES (NEW YORK, DELAWARE, VIRGINIA, TENNESSEE, OHIO, ILLINOIS);
 4 IN TRANSBOUNDARY REGION
 OFTEN : MODIFIED EVENT BASIS
 DATES : BEGAN IN 1976, EXPANDED IN 1978 AND 1981 TO CURRENT 9 SITES
 HOW : BATTELLE PRECIPITATION COLLECTORS REPLACED BY AEROCHEM METRIC
 AUTOMATIC SAMPLERS, CIRCA 1980. ANALYZED AT PNL
 QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
 STOR : ADS DATABASE
 CONTACT : M. TERRY DANA
 ADDRESS : BATTELLE, PACIFIC NORTHWEST LABORATORY
 P.O. BOX 999
 RICHLAND, WA 99352
 TELEPH : (509) 375-3820
 FUNDS : ENVIRONMENTAL PROTECTION AGENCY AND DEPARTMENT OF ENERGY

REFDOC : MANY DOCUMENTS AVAILABLE; CONTACT M. T. DANA FOR PUBLICATION LIST.
 REPRESENTATIVE DOCUMENTS INCLUDE:

ROTHERT, J. E. AND M. T. DANA. 1984. THE MAP3S PRECIPITATION
 CHEMISTRY NETWORK: SEVENTH PERIODIC SUMMARY REPORT (1983). PNL-5298,
 PACIFIC NORTHWEST LABORATORY, RICHLAND, WASHINGTON.

MAP3S/RAINE RESEARCH COMMUNITY. 1982. "THE MAP3S/RAINE PRECIPITATION
 CHEMISTRY NETWORK: STATISTICAL OVERVIEW FOR THE PERIOD 1976-1979."
ATMOSPHERIC ENVIRONMENT, 16:1603-1631.

CODE : T4/G1.12/P0/F1.2/L1.2/D1/V1

NAME : OXIDATION SCAVENGING CHARACTERISTICS OF APRIL RAIN INTERMEDIATE DENSITY NETWORK
 ABREV : OSCAR (IDN)
 TYPE : WET DEPOSITION
 PARAM : pH, CONDUCTIVITY, SO₄, NO₃, NO₂, NH₄, CL, PO₄, Na, K, Ca, Mg, Al
 US : 38 SITES IN THE NORTHEAST (INCLUDING MAP3S/PCN SITES)
 OFTEN : SUB-EVENT
 DATES : 4 PRECIPITATION EVENTS IN APRIL 1981
 HOW : SEQUENTIAL SAMPLING USING A MANUAL FUNNEL AND BOTTLE COLLECTION SYSTEM. SAMPLES ANALYZED BY PNL
 QAQC : UTILIZED MAP3S LABORATORY QA/QC PROGRAM
 STOR : ON CDC COMPUTER AT BROOKHAVEN NATIONAL LABORATORY
 CONTACT : CARMEN BENKOVITZ
 ADDRESS : BROOKHAVEN NATIONAL LABORATORY
 UPTON, NY 11973
 TELEPH : (516) 282-2268
 FUNDS : ENVIRONMENTAL PROTECTION AGENCY AND DEPARTMENT OF ENERGY
 MISC : ONE PART OF THE MAP3S/RAINE PROJECT

REFDOC : EASTER, R. C., M. T. DANA, J. M. THORP, K. M. BUSNESS, J. M. HALES, G. S. RAYNOR, C. M. BENKOVITZ, R. L. TANNER, AND J. D. SHANNON. 1984. OVERVIEW OF THE OXIDATION AND SCAVENGING CHARACTERISTICS OF APRIL RAINS (OSCAR) EXPERIMENT. PNL-4869, PREPARED FOR U.S. ENVIRONMENTAL PROTECTION AGENCY BY PACIFIC NORTHWEST LABORATORY, RICHLAND, WASHINGTON.

BENKOVITZ, C. M., V. A. EVANS, J. L. TICHLER, J. V. HAYES, AND K. J. NORDEN. 1984. OXIDIZING AND SCAVENGING CHARACTERISTICS OF APRIL RAINS - OSCAR DATA REPORT. BNL-51881, PREPARED FOR U.S. ENVIRONMENTAL PROTECTION AGENCY BY BROOKHAVEN NATIONAL LABORATORY, UPTON, NEW YORK.

CODE : T4/G1.12/P0/F1.3/L2.1/D2/V0

NAME : CORE RESEARCH SITES
 TYPE : DRY DEPOSITION
 PARAM : SO₂, O₃, NO_x, METEOROLOGICAL AND SURFACE VARIABLES
 US : EASTERN U.S., WITH TWO STATIONS IN TRANSBOUNDARY REGION (AT ARGONNE, ILLINOIS AND STATE COLLEGE, PENNSYLVANIA)
 OFTEN : HOURLY, OR MORE FREQUENT (e.g., DURING PERIODS OF INTENSIVE "BENCHMARKING" EXPERIMENTS)
 DATES : 1983 - ONGOING
 HOW : ALL POLLUTANTS BY CONTINUOUS MONITOR; OTHER POLLUTANTS ARE MEASURED ON A WEEKLY BASIS USING FILTERPACKS (SEE DESCRIPTION OF THE SATELLITE STATIONS). METEOROLOGICAL AND SURFACE VARIABLES ARE SELECTED TO PROVIDE INFORMATION CONCERNING DEPOSITION VELOCITIES. DIRECT MEASUREMENTS OF DRY DEPOSITION ARE PERFORMED AT REGULAR INTERVALS, MOSTLY USING GRADIENT AND COVARIANCE TECHNIQUES. DATA ANALYSIS IS COORDINATED BY THE ATMOSPHERIC TURBULENCE AND DIFFUSION DIVISION, NOAA/ARL, IN OAK RIDGE, TENNESSEE
 QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
 STOR : INTENSIVE DATA ON SITE OPERATORS' INSTITUTIONAL COMPUTERS. ROUTINE HOURLY OBSERVATIONS ON NOAA COMPUTER, AT OAK RIDGE
 CONTACT : BRUCE HICKS, TILDEN MEYERS
 ADDRESS : NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
 ATMOSPHERIC TURBULENCE AND DIFFUSION DIVISION
 PO BOX E
 456 SOUTH ILLINOIS AVENUE
 OAK RIDGE, TN 37831
 TELEPH : (615) 576-1233
 FUNDS : DEPARTMENT OF ENERGY, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, ENVIRONMENTAL PROTECTION AGENCY
 MISC : THIS ACTIVITY PROVIDES DETAILED DIRECT MEASUREMENTS OF DRY DEPOSITION ON A REGULAR BASIS, AT A FEW SPECIALLY-SELECTED LOCATIONS. THE DATA ARE USED TO "BENCHMARK" MEASUREMENTS OBTAINED USING INDIRECT TECHNIQUES AT SATELLITE LOCATIONS.
 CODE : T4/G1.12/P2.1/F1.3/L1.1/D2/V1

NAME : DRY DEPOSITION PILOT PROGRAM -- CORE PROGRAM SATELLITE SITES
TYPE : DRY DEPOSITION
PARAM : SO₂, HNO₃, PARTICULATE ANIONS AND CATIONS, METEOROLOGICAL AND SURFACE VARIABLES
US : INITIALLY FIVE STATIONS IN THE TRANSBOUNDARY REGION: WHITEFACE MOUNTAIN, NEW YORK; WEST POINT, NEW YORK; STATE COLLEGE, PENNSYLVANIA; ARGONNE, ILLINOIS; AND BONDVILLE, ILLINOIS.
OFTEN : FIFTEEN-MINUTE RESOLUTION FOR METEOROLOGICAL AND SURFACE VARIABLES, WEEKLY AVERAGES OF AIR CHEMISTRY
DATES : 1984 - ONGOING
HOW : WEEKLY FILTERPACKS FOR THE AIR CHEMISTRY DATA (ANALYSIS AT THE USGS ATLANTA LABORATORY, GEORGIA), COUPLED WITH A NOAA METEOROLOGICAL AND SURFACE DATA MONITORING SYSTEM (ANALYSIS AT NOAA, OAK RIDGE, TENNESSEE). AIR CHEMISTRY AND DEPOSITION VELOCITY DATA ARE COMBINED AT OAK RIDGE
QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
STOR : ON NOAA COMPUTER, AT OAK RIDGE
CONTACT : BRUCE HICKS; TILDEN MEYERS
ADDRESS : NOAA, ATMOSPHERIC TURBULENCE AND DIFFUSION DIVISION
P.O. BOX E
456 SOUTH ILLINOIS AVENUE
OAK RIDGE, TN 37831
TELEPH : (615) 576-1233 (FTS) 626-1233
FUNDS : DEPARTMENT OF ENERGY, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, U.S. GEOLOGICAL SURVEY
MISC : THIS ACTIVITY IS A FIELD TEST OF METHODS DEVELOPED SPECIFICALLY TO PERMIT DRY DEPOSITION FLUXES TO BE INFERRED FROM AIR AND SURFACE MEASUREMENTS, USING SIMPLE INSTRUMENTATION, POTENTIALLY SUITABLE FOR USE AT NTN AND SIMILAR SITES. THE DEPOSITION DATA INFERRED IN THIS PROGRAM ARE VERIFIED REGULARLY UNDER THE CORE RESEARCH PROGRAM AT A SUBSET OF THESE SITES. AN ADDITIONAL SITE IS PLANNED FOR SOUTHERN ONTARIO.
CODE : T4/G1.12/P2.1/F1.3/L1.1/D2/V1

NAME : BITUMINUS COAL RESEARCH NATIONAL LABORATORY PRECIPITATION QUALITY NETWORK
 TYPE : WET DEPOSITION
 PARAM : pH, CONDUCTIVITY, ACIDITY, SO₄, NO₃, NH₄, Cl, Ca, Na, K, Mg
 US : 32 SITES, 13 IN TRANSBOUNDARY REGION. SITES CONCENTRATED IN ILLINOIS, OHIO, PENNSYLVANIA AND WEST VIRGINIA
 CAN : 1 SITE IN MILTON, ONTARIO
 OFTEN : WEEKLY
 DATES : BEGAN IN EARLY 1981 - ONGOING
 HOW : AEROCHEM METRICS 201 WET/DRY SAMPLERS. ANALYSIS AT LOCAL LABORATORIES PRIOR TO MID-1982; THEREAFTER AT BCR NATIONAL LABORATORY/NEWLINE
 QAQC : FORMAL LABORATORY PROGRAM
 STOR : NOT IN A CENTRALIZED DATA BASE
 CONTACT : ROBERT C. STREETER
 ADDRESS : BCR NATIONAL LABORATORY
 350 HOCHBERG RD.
 PO BOX 278
 MONROEVILLE, PA 15146
 TELEPH : (412) 327-1600
 FUNDS : COAL INDUSTRY
 MISC : NETWORK DECREASED TO 12 SITES IN 1986
 CODE : T4/G1.12/P0/F3.3/L1.1/D2/V1

NAME : ELECTRIC POWER RESEARCH INSTITUTE - EASTERN REGIONAL PRECIPITATION
CHEMISTRY NETWORK (SULFATE REGIONAL EXPERIMENT)
ABREV : SURE
TYPE : WET DEPOSITION
PARAM : pH, CONDUCTIVITY, ACIDITY, SO₄, NO₃, NH₄, Cl, PO₄, Na, K, Ca, Mg,
Al, DISSOLVED ORGANIC CARBON
US : 9 SITES THROUGHOUT NORTHEASTERN UNITED STATES
OFTEN : DAILY
DATES : AUGUST 1978 - JUNE 1980
HOW : TWO AEROCHEM METRICS 201 WET/DRY COLLECTORS AT EACH SITE. ANALYZED
BY ROCKWELL INTERNATIONAL, INC.
QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
STOR : ADS DATABASE
CONTACT : PETER K. MUELLER
ADDRESS : ELECTRIC POWER RESEARCH INSTITUTE
3412 HILLVIEW AVE
PALO ALTO, CA 94303
TELEPH : (415) 855-2586
FUNDS : ELECTRIC POWER RESEARCH INSTITUTE
MISC : FIVE STATIONS BECAME PART OF THE UAPSP NETWORK

REFDOC : MANY DOCUMENTS AVAILABLE; CONTACT P. K. MUELLER FOR PUBLICATION
LIST. REPRESENTATIVE PUBLICATIONS INCLUDE:

MUELLER, P. K. AND G. M. HIDY. 1983. THE SULFATE REGIONAL
EXPERIMENT: REPORT OF FINDINGS. REPORT EA-1901, VOL. 2, ELECTRIC
POWER RESEARCH INSTITUTE, PALO ALTO, CALIFORNIA.

CODE : T4/G1.12/P0/F3.2/L2.1/D1/V1

Numbers are ADS data base site identification codes

NAME : ENVIRONMENTAL PROTECTION SERVICE ATLANTIC PRECIPITATION MONITORING
PROGRAM
TYPE : WET DEPOSITION
PARAM : pH, SO₄, NO₃, NH₃, Cl, Na, Ca, Mg
CAN : 3 IN NOVA SCOTIA, 3 OTHERS OUTSIDE TRANSBOUNDARY REGION
OFTEN : EVENT BASIS
DATES : FIRST SITE ESTABLISHED IN 1978 - ONGOING
HOW : SANGAMO TYPE A PRECIPITATION SAMPLER USED, ANALYZED AT THE BEDFORD
INSTITUTE OF OCEANOGRAPHY IN DARTMOUTH, NOVA SCOTIA
QAQC : FORMAL LABORATORY PROGRAM
STOR : NAQUADAT DATABASE
CONTACT : J. R. MACHELL
ADDRESS : ENVIRONMENT PROTECTION SERVICE - ENVIRONMENT CANADA
45 ALDERNY DR.
DARTMOUTH, NOVA SCOTIA B2Y 2N6
TELEPH : (902) 426-6132
FUNDS : ENVIRONMENT PROTECTION SERVICE, ENVIRONMENT CANADA
MISC : SOME STATIONS INFLUENCED BY HALIFAX EMISSIONS
CODE : T4/G2.1/P0/F1.2/L1.2/D1/V0

NAME : NOVA SCOTIA DEPARTMENT OF THE ENVIRONMENT PRECIPITATION NETWORK
TYPE : WET DEPOSITION
PARAM : pH, CONDUCTIVITY, ALKALINITY, ACIDITY, SO₄, NO₃ + NO₂, NH₃, TOTAL N, Cl, TOTAL P, Na, K, Ca, Mg, Al, As, Cd, Co, Cr, Cu, Fe, Mn, Ni, Pb, Se, Zn, TOTAL ORGANIC CARBON
CAN : CURRENTLY 5 SITES IN NOVA SCOTIA; 9 SITES PRIOR TO DECEMBER 1979
OFTEN : WEEKLY SAMPLES
DATES : BEGAN IN SEPTEMBER 1977 - ONGOING
HOW : SANGAMO WET/DRY COLLECTORS USED. ANALYZED AT THE ENVIR. CHEM. LABORATORY OF THE DEPT. OF HEALTH IN HALIFAX
QAQC : FORMAL LABORATORY PROGRAM; SOME FIELD QA
STOR : ON CDC COMPUTER AT DALHOUSIE UNIVERSITY
CONTACT : J. UNDERWOOD
ADDRESS : NOVA SCOTIA DEPT OF THE ENVIRONMENT
P.O. BOX 2107
HALIFAX, NOVA SCOTIA B3J 3B7
TELEPH : (902) 424-5300
FUNDS : NOVA SCOTIA DEPARTMENT OF THE ENVIRONMENT
CODE : T4/G2.1/P1.2/F2.2/L1.2/D2/V1

NAME : ENVIRONMENT NEW BRUNSWICK PRECIPITATION MONITORING NETWORK
TYPE : WET DEPOSITION
PARAM : pH, CONDUCTIVITY, ALKALINITY, SO4, NO3, NH4, Cl, Na, K, Ca, Mg
CAN : MAXIMUM OF 5 SITES IN NEW BRUNSWICK; 3 CURRENTLY IN OPERATION
OFTEN : COLLECTED DAILY AND COMBINED TO FORM A MONTHLY SAMPLE
DATES : BEGAN IN NOVEMBER 1980 - ONGOING, WITH THE NUMBER OF SITES CHANGING DURING THIS PERIOD
HOW : SANGAMO TYPE A PRECIPITATION COLLECTORS USED. ANALYZED BY LABORATORY SERVICES, ENVIR. NEW BRUNSWICK AT FREDERICTON
QAQC : FORMAL LABORATORY PROGRAM; FORMAL FIELD PROGRAM WILL SOON BE IN PLACE
STOR : NAQUADAT DATA BASE
CONTACT : JANE SPAVOLD TIMS
ADDRESS : ENVIR. SERVICE BRANCH
NEW BRUNSWICK DEPARTMENT OF MUNICIPAL AFFAIRS AND ENVIRONMENT
P.O. BOX 6000
FREDERICTON, NEW BRUNSWICK E3B 5H1
TELEPH : (506) 453-2669
FUNDS : ENVIRONMENT NEW BRUNSWICK, PROVINCE OF NEW BRUNSWICK
CODE : T4/G2.1/P0/F2.2/L1.2/D1/V1

NAME : PROJECT pH
TYPE : WET DEPOSITION
PARAM : pH, SO₄, NO₃
CAN : 42 STATIONS IN SOUTHERN QUEBEC
OFTEN : DAILY RAIN (AROUND 850 SAMPLES COLLECTED)
DATES : BEGAN AUGUST 16, 1982 - ENDED SEPTEMBER 30, 1982
HOW : BULK SAMPLING. WHITE BUCKET (29 CM DIAM.) WITH PLASTIC BAGS CHANGED EVERY DAY. pH ANALYZED IN HOUSE USING METROHM pH METER. SO₄ AND NO₃ ANALYZED AT WATER QUALITY LABORATORY, ONTARIO MINISTRY OF ENVIRONMENT
QAQC : PRECISION STUDY AT FOUR SITES EQUIPPED WITH TWO RAIN COLLECTORS. ONE FOURTH OF THE RAIN SAMPLES WERE SPLIT AND pH MEASURED BY TWO TECHNICIANS USING TWO pH-METERS
STOR : REPORT AVAILABLE: "RESULTATS D'UN RESEAU A MESO-ECHELLE MESURANT L'ACIDITE DES PRECIPITATIONS SUR LE SUD DU QUEBEC"
CONTACT : RICHARD GILBERT (NETWORK) - GILLES DESAUTELS (DATA ANALYSIS)
ADDRESS : 100 ALEXIS NIHON BLVD.
3RD FLOOR
ST. LAURENT, QUEBEC H4M 2N8
TELEPH : (514) 283-1107
FUNDS : ATMOSPHERIC ENVIRONMENT SERVICE, ENVIRONMENT CANADA
MISC : PROJECT EXAMINES THE SPATIAL AND TEMPORAL VARIATION OF pH, NITRATE AND SULFATE LEVELS IN RAINFALL IN QUEBEC.
CODE : T4/G2.1/P0/F1.2/L2.1/D2/V1

NAME : EVALUATION OF THE RATE OF ACID DEPOSITION
TYPE : WET DEPOSITION
PARAM : pH, SO₄, NO₃, Cl, NH₄, Na, K, Ca, Mg, AND OTHER MAJOR IONS RELATED
TO THE ACIDIFICATION OF PRECIPITATION
CAN : 45 SITES IN QUEBEC (SOUTH OF THE 56TH PARALLEL)
OFTEN : WEEKLY SAMPLING
DATES : MARCH 1980 - SEPTEMBER 1983
HOW : AUTOMATIC SAMPLERS MAINTAINED AT METEOROLOGICAL STATIONS
QAQC : FORMAL LABORATORY PROGRAM
CONTACT : LEVIS TALBOT
ADDRESS : QUEBEC MINISTRY OF THE ENVIRONMENT
3900, MARLEY STREET
STE. FOY, QUEBEC G1X 4A5
TELEPH : (418) 644-3309
FUNDS : MINISTERE DE L'ENVIRONNEMENT DU QUEBEC
MISC : PROJECT EVALUATED THE RATE OF ACID DEPOSITION IN QUEBEC WITH EMPHASIS
ON REGIONS NEAR SOURCES AND ZONES SENSITIVE TO ACIDIFICATION.
CODE : T4/G2.1/P0/F2.2/L2.1/D0/V0

NAME : QUEBEC NETWORK FOR THE COLLECTION OF PRECIPITATION
TYPE : WET DEPOSITION
PARAM : pH, CONDUCTIVITY, ALKALINITY, ACIDITY, SO4, NO3, NH4, Cl, F, Na, K,
Ca, Mg
CAN : 46 SITES IN QUEBEC
OFTEN : WEEKLY SAMPLES
DATES : BEGAN IN AUGUST 1980 - EXPANDED IN APRIL 1982
HOW : SAMPLERS SIMILAR TO SANGAMO WET/DRY COLLECTORS ANALYZED AT THE
MINISTRY OF ENVIRONMENT LABORATORIES IN STE. FOY, QUEBEC
QAQC : FORMAL LABORATORY PROGRAM
STOR : ON GOVERNMENT OF QUEBEC COMPUTER
CONTACT : LEVIS TALBOT
ADDRESS : QUEBEC MINISTRY OF THE ENVIRONMENT
3900, MARLEY STREET
STE. FOY, QUEBEC G1X 4A5
TELEPH : (418) 644-3309
FUNDS : FUNDED BY THE QUEBEC MINISTRY OF THE ENVIRONMENT
MISC : SOME STATIONS INFLUENCED BY LOCAL EMISSIONS
CODE : T4/G2.1/P0/F2.3/L1.2/D2/V0

NAME : COASTAL FOG DEPOSITION MONITORING
 TYPE : WET DEPOSITION
 PARAM : FOG, RAIN, AND CANOPY THROUGHFALL CHEMISTRY (pH, CONDUCTIVITY, SO₄, NO₃, NH₄, Cl, Na, K, Ca, Mg, F)
 US : SIX SITES IN MAINE - 4 COASTAL ISLANDS (ROQUE ISLAND, MT. DESERT ROCK, ISLE AU HAUT, DAMARISCOVE ISLAND), SUGAR LOAF MOUNTAIN, AND A SHIP MOORED IN PENOBSCOT BAY
 OFTEN : EVENT BASIS JUNE THROUGH OCTOBER; LIMITED BASIS ON SHIP
 DATES : JUNE - OCTOBER 1985
 HOW : FOG SAMPLES COLLECTED FOR ENTIRE EVENT OR EVERY 5 HOURS, WHICHEVER CAME FIRST. ANALYSIS AT GEOLOGICAL SCIENCES LABORATORY AT UNIV. OF MAINE IN ORONO. NATIONAL ATMOSPHERIC DEPOSITION PROGRAM AND ENVIRONMENTAL PROTECTION AGENCY PROCEDURES USED IN LABORATORY.
 QAQC : FORMAL LABORATORY PROGRAM; SAMPLE EXCHANGES WITH INSTITUTE FOR ENVIRONMENTAL STUDIES/CARY ARBORETUM.
 STOR : AVAILABLE FROM PRINCIPAL CONTACT
 CONTACT : R. JAGELS
 ADDRESS : DEPARTMENT OF FOREST BIOLOGY
 UNIVERSITY OF MAINE
 ORONO, ME 04469
 TELEPH : (207) 581-2881
 FUNDS : UNIVERSITY OF MAINE AND U.S. GEOLOGICAL SURVEY
 CODE : T4/G1.1/P0/F4.2/L2.1/D2/V1

NAME : PRECIPITATION SAMPLING FOR THE HUBBARD BROOK ECOSYSTEM STUDY
TYPE : BULK DEPOSITION AND WET ONLY
PARAM : pH, CONDUCTIVITY, SO₄, NO₃, NH₄, Cl, P, Na, K, Ca, Mg, SiO₃.
OCCASIONALLY Al, DISSOLVED ORGANIC CARBON, DISSOLVED ORGANIC NITROGEN,
TRACE METALS.
US : 1 SITE WITH SEVERAL COLLECTORS NEAR WEST THORTON, NEW HAMPSHIRE
OFTEN : WEEKLY
DATES : PRECIPITATION SAMPLES COLLECTED SINCE 1963 - ONGOING
HOW : HUBBARD BROOK BULK PRECIPITATION COLLECTOR AND AEROCHEM METRICS 201
WET/DRY COLLECTORS USED; pH AND CONDUCTIVITY MEASURED IN FIELD,
OTHER PARAMETERS WERE ANALYZED AT CORNELL UNIVERSITY AND ARE NOW
ANALYZED AT THE INSTITUTE OF ECOSYSTEM STUDIES
QAQC : FORMAL FIELD AND LABORATORY PROGRAMS NOW IN PLACE
STOR : LIMITED ACCESS TO THE DATA STORED AT THE INSTITUTE OF ECOSYSTEM
STUDIES
CONTACT : G. E. LIKENS
ADDRESS : INST. OF ECOSYSTEM STUDIES, CARY ARBORETUM
BOX AB
MILLBROOK, NY 12545
TELEPH : (914) 677-5343
FUNDS : NATIONAL SCIENCE FOUNDATION
MISC : A COMPONENT OF THE HUBBARD BROOK ECOSYSTEM STUDY
CODE : T4/G1.1/P0/F1.1/L1.2/D2/V1

NAME : ENVIRONMENTAL MEASUREMENTS LABORATORY DEPOSITION CHEMISTRY STUDY
 TYPE : WET DEPOSITION
 PARAM : pH, CONDUCTIVITY, SO₄, NO₃, NH₄, Cl, PO₄, Na, K, Ca, Mg; DURING
 1978-1981, TRACE METAL ANALYSIS 4 TIMES PER YEAR
 US : INITIALLY 7 SITES NATIONALLY, NOW 4 SITES IN NEW YORK AND NEW JERSEY
 OFTEN : MONTHLY WET, DRY AND BULK DEPOSITION COLLECTED 1976-1981. DAILY
 SAMPLING OF PRECIPITATION EVENTS SINCE 1981
 DATES : BEGAN IN JULY 1976, RESTRICTED TO NEW YORK-NEW JERSEY AREA AFTER
 JUNE 1981
 HOW : HASL AND AEROCHEM METRICS SAMPLERS - ANALYZED BY COMBUSTION
 ENGINEERING (EMS. INC)
 QAQC : FORMAL PROGRAM FOR LABORATORY QUALITY ASSURANCE
 STOR : ON COMPUTER AT EML OFFICE
 CONTACT : HERB FEELY
 ADDRESS : DEPARTMENT OF ENERGY
 ENVIRONMENTAL MEASUREMENTS LABORATORY
 376 HUDSON STREET
 NEW YORK, NY 10014
 TELEPH : (212) 620-3627
 FUNDS : DEPARTMENT OF ENERGY
 CODE : T4/G1.1/P0/F1.2/L1.2/D2/V1

NAME : USGS NEW YORK STATE PRECIPITATION MONITORING NETWORK
TYPE : CURRENTLY BULK DEPOSITION, CONVERTING TO WET AND DRY DEPOSITION
PARAM : pH, CONDUCTIVITY, SO₄, NO₃, NO₂, NH₃, Cl, ORGANIC NITROGEN, TOTAL
PHOSPHOROUS, BICARBONATE, Na, K, Ca, Mg, Pb
US : 12 SITES CURRENTLY ACTIVE THROUGHOUT NEW YORK STATE
OFTEN : BULK WET DEP: MONTHLY WET/DRY SAMPLERS: EVENT BASIS
DATES : OCTOBER 1964 - ONGOING
HOW : AEROCHEM METRICS 301 WET/DRY SAMPLERS ARE REPLACING BULK SAMPLERS
QAQC : FORMAL LABORATORY PROGRAM
STOR : ON COMPUTER AT U.S. GEOLOGICAL SURVEY OFFICE IN ALBANY, NEW YORK
CONTACT : ROY SCHROEDER
ADDRESS : U.S. GEOLOGICAL SURVEY
5201 RUFFIN RD
SAN DIEGO, CA 92123
TELEPH : (619) 293-6700
FUNDS : U.S. GEOLOGICAL SURVEY

REFDOC : BARNES, C. R., R. A. SCHROEDER, AND N. E. PETERS. 1982. "CHANGES
IN THE CHEMISTRY OF BULK PRECIPITATION IN NEW YORK STATE, 1965-1978."
NORTHEASTERN ENVIRONMENTAL SCIENCE, 1:187-197.

PETERS, N. E., R. A. SCHROEDER, AND D. E. TROUTMAN. TEMPORAL TRENDS
IN THE ACIDITY OF PRECIPITATION AND SURFACE WATERS OF NEW YORK.
U.S. GEOLOGICAL SURVEY WATER SUPPLY PAPER 2188, U.S. GEOLOGICAL
SURVEY, ALEXANDRIA, VIRGINIA.

CODE : T4/G1.1/P1.2/F1.2/L1.2/D2/V1

NAME : PRECIPITATION SAMPLING FOR THE INSTITUTE OF ECOSYSTEM STUDIES
ABREV : IES
TYPE : WET/DRY
PARAM : pH, CONDUCTIVITY, SO4, NO3, NH4, Cl, P, Na, K, Ca, Mg, Al, SiO3.
OCCASIONALLY TRACE METALS
US : ONE SITE NEAR MILLBROOK, NEW YORK
OFTEN : EVENT
DATES : JANUARY 1984 - ONGOING
HOW : AEROCHEM METRICS 301 WET/DRY COLLECTOR USED; ALL PARAMETERS ARE
ANALYZED AT THE INSTITUTE OF ECOSYSTEM STUDIES, MILLBROOK, NEW YORK
QAQC : FORMAL FIELD AND LABORATORY PROGRAMS NOW IN PLACE
STOR : LIMITED ACCESS TO THE DATA STORED AT THE INSTITUTE OF ECOSYSTEM
STUDIES
CONTACT : G. E. LIKENS
ADDRESS : INST. OF ECOSYSTEM STUDIES, CARY ARBORETUM
BOX AB
MILLBROOK, NY 12545
TELEPH : (914) 677-5343
FUNDS : MARY FLAGLER CARY CHARITABLE TRUST
CODE : T4/G1.1/P3.1/F3.1/L1.1/D2/V1

NAME : WEST POINT AREA STUDY
TYPE : DRY DEPOSITION
PARAM : METEOROLOGICAL PARAMETERS, O3, FILTER PACK
US : 2 EPA DRY DEPOSITION STATIONS, AND 1 NOAA DRY DEPOSITION STATION
OFTEN : O3 - CONTINUOUS; FILTER PACK - NOAA WEEKLY, EPA DIURNAL - WEEKLY
(ONE FROM 0600-1800 FOR A WEEK AND ONE FROM 1800-0600 FOR A WEEK);
METEOROLOGICAL PARAMETERS - CONTINUOUS
DATES : NOAA AUGUST 1984; EPA JANUARY 1985 - ONGOING
HOW : STANDARD METEOROLOGICAL INSTRUMENTS; DASIBI O3; FILTER PACK
QAQC : EPA AUDITS; WEEKLY OPERATOR CHECKS
STOR : EPA/NOAA AND COMPUTER AT WEST POINT
CONTACT : MAJOR RICHARD C. GRAHAM AND MAJOR JOHN K. ROBERTSON
ADDRESS : SCIENCE RESEARCH LABORATORY
U.S. MILITARY ACADEMY
WEST POINT, NY 10996-5000
TELEPH : (914) 938-3739
FUNDS : U.S. GEOLOGICAL SURVEY
CODE : T4/G1.1/P2.1/F1.1/L1.1/D2/V1

NAME : WEST POINT STUDY AREA
TYPE : WET DEPOSITION
PARAM : pH, SO₄, NO₃, NH₄, Cl, PO₄, Na, K, Ca, Mg
US : SITES NEAR WEST POINT, NEW YORK
DATES : SEQUENTIAL SUB-EVENT SAMPLER INTERMITTENT SINCE 1976 - 1986
HOW : INTENSITY WEIGHTED SEQUENTIAL SAMPLING (0.25 mm INCREMENT). ANALYSIS
PERFORMED AT SCIENCE RESEARCH LABORATORY, U.S. MILITARY ACADEMY
QAQC : INTERNAL PROGRAM
STOR : ON COMPUTER AT WEST POINT
CONTACT : MAJOR RICHARD C. GRAHAM OR MAJOR JOHN K. ROBERTSON
ADDRESS : SCIENCE RESEARCH LABORATORY
U.S. MILITARY ACADEMY
WEST POINT, NY 10996-5000
TELEPH : (914) 938-3739
FUNDS : U.S. MILITARY ACADEMY, WEST POINT
CODE : T4/G1.1/P0/F1.1/L1.2/D2/V1

NAME : WEST POINT SAMPLER INTERCOMPARISON
TYPE : WET DEPOSITION
PARAM : pH, COND, SO4, NO3, NH4, Ca, Mg, K, Na, Cl
US : 8 WET DEPOSITION SAMPLERS ON THE WEST POINT MILITARY RESERVATION
OFTEN : WEEKLY BASIS
DATES : SEPTEMBER 1984 - ONGOING
HOW : WEEKLY USING AEROCHEM METRICS, GEOTECH AND VIKING. ANALYSIS OF pH
AND CONDUCTANCE AT SCIENCE RESEARCH LABORATORY; BALANCE OF ANALYSIS
AT U.S. GEOLOGICAL SURVEY LABORATORY, ARVADA, COLORADO
QAQC : USGS QAQC PROGRAM
STOR : WATSTORE AND COMPUTER AT WEST POINT
CONTACT : MAJOR RICHARD C. GRAHAM OR MAJOR JOHN K. ROBERTSON
ADDRESS : SCIENCE RESEARCH LABORATORY
U.S. MILITARY ACADEMY
WEST POINT, NY 10996-5000
TELEPH : (914) 938-3739
FUNDS : U.S. GEOLOGICAL SURVEY
CODE : T4/G1.1/P0/F1.2/L1.1/D1/V1

NAME : EFFECTS OF ACID PRECIPITATION ON HEADWATER PENNSYLVANIA TROUT STREAMS
TYPE : BULK DEPOSITION
PARAM : pH, ALKALINITY, ACIDITY, SO4, CONDUCTIVITY
US : 3 SITES IN NORTH CENTRAL PENNSYLVANIA (6 SITES FOR A VERY SHORT TIME)
OFTEN : SAMPLES COLLECTED APPROXIMATELY EVERY 10 DAYS
DATES : OCTOBER 1976 - AUGUST 1980
HOW : SAMPLES COLLECTED WITH A MODIFIED TAYLOR RAIN GAUGE, FUNNEL, AND BUCKET SETUP
QAQC : FORMAL LABORATORY PROGRAM
STOR : STORED ON COMPUTER AT PENNSYLVANIA STATE UNIVERSITY
CONTACT : DEAN ARNOLD
ADDRESS : PENNSYLVANIA STATE UNIVERSITY
7 FERGUSON BLDG.
UNIVERSITY PARK, PA 16802
TELEPH : (814) 865-4511
FUNDS : U.S. FISH AND WILDLIFE SERVICE, PENNSYLVANIA FISH COMMISSION
MISC : PART OF A LARGER PROJECT; WAS DISCONTINUED IN 1980 WHEN SIMILAR DATA FROM OTHER SOURCES BECAME AVAILABLE
CODE : T4/G1.1/P0/F4.1/L2.1/D2/V1

NAME : MAGNITUDE AND DISTRIBUTION OF ACID PRECIPITATION AND ASSOCIATED
TOXIC AND NUTRIENT ELEMENTS IN PENNSYLVANIA
TYPE : MONITORING NETWORK
PARAM : pH, ACIDITY, CONDUCTIVITY, MAJOR CATIONS AND ANIONS
US : 16 SITE NETWORK IN PENNSYLVANIA, INCLUDES 4 NADP SITES
OFTEN : WEEKLY SAMPLING FOLLOWING NADP PROTOCOL
DATES : 1982 - ONGOING
HOW : SAMPLES ANALYZED AT PENNSYLVANIA STATE UNIVERSITY USING NADP PROTOCOL
QAQC : FORMAL FIELD AND LABORATORY PROGRAM
STOR : PUBLICATIONS AVAILABLE; DATA STORED ON IBM COMPUTER AND ON DISKS
CONTACT : J. A. LYNCH
ADDRESS : PENNSYLVANIA STATE UNIVERSITY
311 FOREST RESOURCES LABORATORY
UNIVERSITY PARK, PA 16802
TELEPH : (814) 865-8830
FUNDS : COMMONWEALTH OF PENNSYLVANIA
MISC : REPORTS PREPARED ANNUALLY SHOWING DETAILED SPATIAL VARIABILITY.
SIGNIFICANT DEPOSITION GRADIENTS ASSOCIATED WITH LOCAL EMISSIONS
CODE : T4/G1.1/P0/F2.2/L1.1/D2/V1

NAME : PHILADELPHIA WETFALL CHEMISTRY STUDIES
 TYPE : WET DEPOSITION
 PARAM : pH, CONDUCTIVITY, NH₄, NO₂, SO₄, Cl, Na, Ca, S(IV)
 US : 40 STATIONS ALL WITHIN 20-60 KM OF PHILADELPHIA (GRID NETWORK)
 OFTEN : INTERMITTENT SAMPLING OF SPECIFIC, FRONTAL, NONCONVECTIVE STORMS
 DATES : NOVEMBER 1983 - ONGOING
 HOW : SAMPLES COLLECTED VIA MANUALLY DEPLOYED FUNNEL AND BOTTLE COLLECTORS
 AT 16 SITES. HASL TYPE WETFALL COLLECTORS AT OTHER SITES. ANALYZED
 BY BROOKHAVEN NATIONAL LABORATORY
 QAQC : SELECTED SAMPLES SENT TO PACIFIC NORTHWEST LABORATORY FOR CONCURRENT
 ANALYSIS AS PART OF LABORATORY QA/QC PROGRAM.
 STOR : CONTACT PRINCIPAL INVESTIGATOR
 CONTACT : ARI PATRINOS
 ADDRESS : DEPT. OF APPLIED SCIENCE
 BROOKHAVEN NATIONAL LABORATORY
 UPTON, NY 11973
 TELEPH : (516) 282-3911
 FUNDS : ENVIRONMENTAL PROTECTION AGENCY AND DEPARTMENT OF ENERGY
 REFDOC : PATRINOS, A. A. N. AND R. M. BROWN. 1984. "MESOSCALE WETFALL
 CHEMISTRY AROUND PHILADELPHIA DURING FRONTAL STORMS." GEOPHYSICAL
 RESEARCH LETTERS, 11:561-564.
 CODE : T4/G1.1/P0/F1.2/L1.1/D2/V0

NAME : ORGANIC ATMOSPHERIC RAIN SAMPLING
 includes: ORGANIC SUBSTANCES IN GREAT LAKES RAINFALL
 TYPE : WET DEPOSITION
 PARAM : PCBs, OTHER CHLORINATED ORGANIC PESTICIDES
 CAN : 10 STATIONS LOCATED ACROSS ONTARIO FROM THUNDER BAY TO KINGSTON.
 RESEARCH STATIONS ALSO LOCATED IN TRANSBOUNDARY REGION AT KENAH
 CREEK, BRITISH COLUMBIA AND AT SUFFIELD, ALBERTA. A PREVIOUS LOCATION
 WAS AT KOUCHIBOUQUAC, NEW BRUNSWICK.
 OFTEN : APPROXIMATELY ONCE A MONTH MAY - OCTOBER
 DATES : 1985 - ONGOING
 HOW : ALL STATIONS USING AN XAD-2 RESIN COLUMN COLLECTOR TO CAPTURE ORGANICS
 IN PRECIPITATION; 4 STATIONS ALSO USING A LIQUID-LIQUID EXTRACTION
 SYSTEM. ANALYSIS VIA GAS CHROMATOGRAPHY.
 QAQC : FORMAL LABORATORY PROGRAM, INFORMAL FIELD PROGRAM
 STOR : CONTACT PRINCIPAL INVESTIGATOR, SCIENTIFIC LITERATURE
 CONTACT : WILLIAM M. J. STRACHAN
 ADDRESS : CANADA CENTRE FOR INLAND WATERS
 867 LAKE SHORE ROAD
 P.O. BOX 5050
 BURLINGTON, ONTARIO L7R 4A6
 TELEPH : (416) 336-4775
 FUNDS : ENVIRONMENT CANADA
 CODE : T4/G2.2/P1.1/F1.2/L1.1/D2/V1

NAME : ACID PRECIPITATION IN ONTARIO STUDY, LIMNOLOGY UNIT NETWORK
ABREV : APIOS(LUN)
TYPE : BULK DEPOSITION
PARAM : pH, CONDUCTIVITY, ALKALINITY, SO4, NO3, NH4, Cl, TOTAL P, Na, K,
Ca, Mg, Al, Fe, Mn, Pb, Si, Zn, DISSOLVED ORGANIC CARBON, DISSOLVED
INORGANIC CARBON
CAN : 19 SITES AROUND LAKES IN ONTARIO; CURRENTLY 4 SITES ARE IN OPERATION
APPROXIMATELY 225 KM NORTH OF TORONTO
OFTEN : SAMPLES COLLECTED WHEN THERE IS ENOUGH VOLUME FOR ANALYSIS (7-10
DAYS)
DATES : BEGAN IN JUNE 1976 - ONGOING
HOW : BULK COLLECTORS USED. PERISHABLES MEASURED WITHIN 24 HRS OF
COLLECTION; REST ANALYZED AT ONTARIO MINISTRY OF THE ENVIRONMENT
LABORATORIES IN TORONTO
QAQC : FORMAL LABORATORY PROGRAM; SOME FIELD QA
STOR : SIS DATABASE OF THE ONTARIO MINISTRY OF ENVIRONMENT
CONTACT : P. J. DILLON
ADDRESS : LIMNOLOGY UNIT
ONTARIO MINISTRY OF ENVIRONMENT
DORSET RESEARCH CENTRE
P.O. BOX 39
DORSET, ONTARIO POA 1E0
TELEPH : (705) 766-2412
FUNDS : ONTARIO MINISTRY OF THE ENVIRONMENT
CODE : T4/G2.2/P1.2/F2.2/L1.2/D1/V1

NAME : ACID PRECIPITATION IN ONTARIO STUDY (CUMULATIVE NETWORK)
ABREV : APIOS-C
TYPE : WET DEPOSITION
PARAM : pH, CONDUCTIVITY, ACIDITY, SO₄, NO₃, NH₄, TOTAL KJELDAHL NITROGEN,
P, Na, K, Ca, Mg, Al, Cd, Cu, Fe, Mn, Ni, Rb, Zn
CAN : 36 SITES IN ONTARIO
OFTEN : 28 DAY COMPOSITE, DESIGNED TO MATCH NADP SAMPLING
DATES : BEGAN IN SEPTEMBER 1980 - ONGOING
HOW : SANGAMO TYPE A WET/DRY COLLECTORS USED. ANALYZED AT THE ONTARIO
MINISTRY OF ENVIRONMENTAL LABORATORY SERVICE BRANCH IN TORONTO
QAQC : FORMAL FIELD AND LABORATORY PROGRAM
STOR : MINISTRY OF ENVIRONMENT AND ADS DATABASE
CONTACT : MARIS LUSIS
ADDRESS : AIR RESOURCES BRANCH - ONTARIO MIN. OF THE ENVIRONMENT
880 BAY ST.
TORONTO, ONTARIO M5S 1Z8
TELEPH : (416) 965-1634
FUNDS : AIR RESOURCES BRANCH, ONTARIO MINISTRY OF ENVIRONMENT

REFDOC : MANY DOCUMENTS AVAILABLE. REPRESENTATIVE PUBLICATIONS INCLUDE:

CHAN, W. H., D. B. ORR, AND R. J. VET. 1982. THE ACIDIC
PRECIPITATION IN ONTARIO STUDY (APIOS) - AN OVERVIEW: THE CUMULATIVE
WET/DRY DEPOSITION NETWORK. REPORT ARB-15-82-ARSP, APIOS
CO-ORDINATION OFFICE, ONTARIO MINISTRY OF THE ENVIRONMENT, TORONTO,
ONTARIO.

CODE : T4/G2.2/P1.2/F2.3/L1.2/D1/V1

NAME : ACID PRECIPITATION IN ONTARIO STUDY (EVENT NETWORK)
 ABREV : APIOS-D
 TYPE : WET DEPOSITION
 PARAM : pH, CONDUCTIVITY, ACIDITY, SO₄, NO₃, NH₄, Cl, Na, K, Ca, Mg
 CAN : 16 SITES IN ONTARIO; 4 EACH IN KINGSTON, LONDON, DORSET AND ATIKOKAN
 AREAS
 OFTEN : DAILY
 DATES : BEGAN IN JANUARY 1981 - ONGOING
 HOW : AEROCHEM METRICS 201 WET/DRY SAMPLERS USED. ANALYZED AT THE MINISTRY
 OF ONTARIO LABORATORY SERVICE BRANCH IN TORONTO
 QAQC : FORMAL FIELD AND LABORATORY PROGRAM
 STOR : ONTARIO MINISTRY OF ENVIRONMENT AND ADS DATABASE
 CONTACT : MARIS LUSIS
 ADDRESS : AIR RESOURCES BRANCH - ONTARIO MIN. OF THE ENVIRONMENT
 880 BAY ST.
 TORONTO, ONTARIO M5S 1Z8
 TELEPH : (416) 965-1634
 FUNDS : AIR RESOURCES BRANCH, ONTARIO MINISTRY OF ENVIRONMENT
 REFDOC : MANY DOCUMENTS AVAILABLE. REPRESENTATIVE PUBLICATIONS INCLUDE:
 CHAN, W. H., D. B. ORR, AND R. J. VET. 1982. THE ACIDIC
 PRECIPITATION IN ONTARIO STUDY - AN OVERVIEW: THE EVENT WET/DRY
 DEPOSITION NETWORK. REPORT ARB-11-82-ARSP, APIOS CO-ORDINATION
 OFFICE, ONTARIO MINISTRY OF THE ENVIRONMENT, TORONTO, ONTARIO.
 CODE : T4/G2.2/P0/F2.2/L1.2/D1/V1

NAME : DRY DEPOSITION RESEARCH - ONTARIO HYDRO
 TYPE : DRY DEPOSITION
 PARAM : SO₂, NO, NO₂, HNO₃, WIND DIRECTION AND SPEED, TEMPERATURE, HUMIDITY, FLUXES
 CAN : 1 SITE IN BRADFORD, ONTARIO
 OFTEN : 4 INTENSIVE EXPERIMENTAL STUDIES
 DATES : JUNE 1984 - ONGOING
 HOW : POLLUTANTS MEASURED VIA TUNABLE DIODE LASER SPECTROMETER AT 1 LEVEL; METEOROLOGICAL VARIABLES BY STANDARD METHODS AT THREE LEVELS
 QAQC : FORMAL FIELD PROGRAM
 STOR : ON IBM PERSONAL COMPUTER
 CONTACT : G. C. EDWARDS OR F. N. NORTHRUP
 ADDRESS : ONT. HYDRO RES. DIVISION
 800 KIPLING AVE
 TORONTO, ONTARIO M8Z 5S4
 TELEPH : (416) 231-4111
 FUNDS : ONTARIO HYDRO AND THE CANADIAN ELECTRIC ASSOCIATION

 REFDOC : EDWARDS, G. C. AND G. L. OGRAM. 1984. THE INVESTIGATION OF DRY DEPOSITION PROCESSES - PHASE I: DEVELOPMENT OF AN INSTRUMENT PACKAGE. CANADIAN ELECTRIC ASSOCIATION REPORT 187G294, CANADIAN ELECTRIC ASSOCIATION, TORONTO, ONTARIO.

 CODE : T4/G2.2/P2.1/F3.2/L1.1/D2/V1

NAME : ATIKOKAN AIR QUALITY AND METEOROLOGICAL MONITORING PROGRAM
TYPE : WET DEPOSITION
PARAM : pH, ACIDITY, SO₄, NO₃, CO, NH₄, K, Ca, Na, Mg, Zn, Fe, Ni, Cu, Pb,
Al, Cd, Mn
CAN : 2 AT ATIKOKAN, ONTARIO
OFTEN : MONTHLY CUMULATIVE
DATES : JANUARY 1982 - ONGOING
HOW : SAMPLES COLLECTED WITH SANGAMO WET-ONLY COLLECTORS. SAMPLES ANALYZED
BY LABORATORY SERVICES, ONTARIO MINISTRY OF THE ENVIRONMENT, BY ION
CHROMATOGRAPHY (ANIONS), ATOMIC ABSORPTION (CATIONS), WET CHEMISTRY
(NH₄)
STOR : APIOS DATA BASE
CONTACT : A. HOFFER
ADDRESS : ENVIRONMENTAL STUDIES AND ASSESSMENTS DEPT.
ONTARIO HYDRO, 700 UNIVERSITY AVE.
TORONTO, ONTARIO M5S 1X6
TELEPH : (416) 592-6308
FUNDS : ONTARIO HYDRO
CODE : T4/G2.2/P1.2/F3.1/L1.1/D1/V0

NAME : SUDBURY ENVIRONMENT STUDY - PRECIPITATION MONITORING NETWORK
TYPE : WET AND BULK DEPOSITION
PARAM : pH, ACIDITY, SO₄, NO₃, NH₄, Cl, F, Na, K, Ca, Mg, Al, Cd, Cr, Cu, Fe, Ni, Pb, Si, Zn
CAN : 21 SITES IN SUDBURY AREA
OFTEN : DAILY MONITORING (BULK); MONTHLY MONITORING (WET)
DATES : BEGAN IN DECEMBER 1977, TERMINATED IN MAY 1980
HOW : SANGAMO TYPE A COLLECTORS USED FOR WET DEPOSITION, ANALYZED AT ONTARIO MIN. OF ENVIRONMENT'S LABORATORY SERVICES BRANCH IN TORONTO
QAQC : FORMAL LABORATORY PROGRAM
STOR : HARDCOPY
CONTACT : MARIS LUSIS
ADDRESS : AIR RESOURCES BRANCH - ONTARIO MIN. OF THE ENVIRONMENT
880 BAY ST.
TORONTO, ONTARIO M5S 1Z8
TELEPH : (416) 965-1634
FUNDS : ONTARIO MINISTRY OF THE ENVIRONMENT
CODE : T4/G2.2/P1.2/F2.2/L2.1/D2/V1

NAME : MANITOBA NETWORK FOR PRECIPITATION COLLECTION
ABREV : MNPC
TYPE : WET DEPOSITION
PARAM : SO₄, NO₃, NH₄, Cl, Na, K, Ca, Mg, ACIDITY, pH, CONDUCTANCE
CAN : 5 TOTAL; ONE SITE AT POINTE DU BOIS IN TRANSBOUNDARY REGION
OFTEN : DAILY
DATES : OCTOBER 1980 - ONGOING
HOW : SANGAMO TYPE A PRECIPITATION COLLECTORS USED. SAMPLES ANALYZED AT
MANITOBA GOVERNMENT TECHNICAL SERVICES LABORATORY, WINNIPEG, MANITOBA
QAQC : NADP QC PROGRAM
STOR : HARD COPY AND FOCUS DATABASE
CONTACT : DAVID BEZAK
ADDRESS : ENVIRONMENTAL MANAGEMENT DIVISION
DEPT. OF ENVIRONMENT AND WORKPLACE SAFETY AND HEALTH
P.O. BOX 76, BUILDING 2, 139 TUXEDO AVE.
WINNIPEG, MANITOBA R3C 0V8
TELEPH : (204) 945-7046
FUNDS : PROVINCE OF MANITOBA
CODE : T4/G2.2/P0/F2.2/L1.2/D2/V1

NAME : MONONGAHELA NATIONAL FOREST PRECIPITATION MONITORING
TYPE : WET AND BULK DEPOSITION
PARAM : pH, CONDUCTIVITY, ALKALINITY, ACIDITY, SO4, NO3, NO2, Cl, PO4, Na,
K, Mg, Al, Cu, Mn, Pb, Zn
US : INITIALLY 24 SITES IN WEST VIRGINIA
OFTEN : VARIETY OF SCHEDULES (EVENT THROUGH MONTHLY)
DATES : FIRST SITE BEGAN IN 1972. SINCE LATE 1981 ONLY pH, ALKALINITY, COLD
ACIDITY, CONDUCTIVITY, SO4 MEASURED
HOW : SAMPLES COLLECTED IN PLASTIC PRECIP. COLLECTORS. ANALYZED AT THE
MONO. NAT. FOREST HYDROLOGY LABORATORY AND OUTSIDE LABS
QAQC : FORMAL LABORATORY PROGRAM
STOR : CONTACT PRINCIPLE INVESTIGATOR
CONTACT : FOREST HYDROLOGIST
ADDRESS : MONONGAHELA NATIONAL FOREST
P.O. BOX 1548
ELKINS, WV 26241
TELEPH : (304) 636-1800
FUNDS : U.S. FOREST SERVICE
CODE : T4/G1.2/P1.2/F1.2/L1.2/D2/V1

NAME : OXIDATION SCAVENGING CHARACTERISTICS OF APRIL RAIN HIGH-DENSITY
PRECIPITATION CHEMISTRY EXPERIMENT
ABREV : OSCAR (HDPCE)
TYPE : WET DEPOSITION
PARAM : pH, CONDUCTIVITY, SO₄, NO₃, NH₄, Cl, PO₄, Na, K, Ca, Mg
US : 47 SITES NEAR FT. WAYNE, INDIANA
OFTEN : EVENT SAMPLING IN 9 STAGE SEQUENTIAL COLLECTOR
DATES : 4 PRECIPITATION EVENTS DURING APRIL 1981
HOW : 9 STAGE PRECIPITATION COLLECTOR WITH FIRST 8 STAGES COLLECTING 0.7 mm
INCREMENTS OF RAINFALL WITH FINAL STAGE COLLECTING AN ADDITIONAL 11 mm
INCREMENT. ANALYSES AT PACIFIC NORTHWEST LABORATORY
QAQC : UTILIZED MAP3S LABORATORY QA/QC PROGRAM
STOR : ON MAGNETIC TAPE AT PACIFIC NORTHWEST LABORATORY AND BROOKHAVEN
NATIONAL LABORATORY
CONTACT : RICHARD EASTER
ADDRESS : BATTELLE, PACIFIC NORTHWEST LABORATORY
P.O. BOX 999
RICHLAND, WA 99352
TELEPH : (509) 376-5897
FUNDS : ENVIRONMENTAL PROTECTION AGENCY AND DEPARTMENT OF ENERGY
MISC : ONE PART OF THE MAP3S/RAINE PROJECT. AIR CHEMISTRY MEASUREMENTS
(SO₂, HNO₃, O₃, AEROSOLS) ALSO OBTAINED
REFDOC : MANY DOCUMENTS AVAILABLE; CONTACT R. C. EASTER FOR PUBLICATION LIST.
REPRESENTATIVE DOCUMENTS INCLUDE:

EASTER, R. C., M. T. DANA, J. M. THORP, K. M. BUSNESS, J. M. HALES
G. S. RAYNOR, C. M. BENKOVITZ, R. L. TANNER, AND J. D. SHANNON.
1984. OVERVIEW OF THE OXIDATION AND SCAVENGING CHARACTERISTICS OF
APRIL RAINS (OSCAR) EXPERIMENT. PNL-4869, PREPARED FOR THE U.S.
ENVIRONMENTAL PROTECTION AGENCY BY PACIFIC NORTHWEST LABORATORY,
RICHLAND, WASHINGTON.

EASTER, R. C. "THE OSCAR EXPERIMENT." DEPOSITION BOTH WET AND
DRY. B. B. HICKS, ED., BUTTERWORTH PUBLISHERS, BOSTON, MASSACHUSETTS,
pp. 97-120.

CODE : T4/G1.2/P0/F1.3/L2.1/D2/V1

NAME : DRY DEPOSITION MEASUREMENTS AND PARAMETERIZATION STUDIES
TYPE : DRY DEPOSITION
PARAM : CONTINUOUS CONCENTRATION MEASUREMENTS OF SO₂, O₃, AND NO_x;
INTERMITTENT FLUX MEASUREMENTS OF SUBMICRON PARTICLES, O₃, CO₂, AND
NITROUS OXIDE
US : ONE SITE AT ARGONNE NATIONAL LABORATORY, ARGONNE, ILLINOIS (CHICAGO
AREA)
OFTEN : CONTINUOUS CONCENTRATION MEASUREMENTS SINCE JULY 1983 ; INTERMITTENT
FLUX MEASUREMENTS BETWEEN JULY 1983 AND OCTOBER 1984
DATES : JULY 1983 - ONGOING
HOW : CONTINUOUS MEASUREMENTS BY STANDARD COMMERCIAL INSTRUMENTS; FLUXES
BY EDDY-CORRELATION OR GRADIENT METHOD
QAQC : FORMAL FIELD PROGRAMS
STOR : ON COMPUTER AT ARGONNE
CONTACT : M. L. WESLEY OR D. L. SISTERTSON
ADDRESS : ATMOSPHERIC PHYSICS PROGRAM
BUILDING D-181
ARGONNE NATIONAL LABORATORY
9700 SOUTH CASS AVE
ARGONNE, IL 60439
TELEPH : (312) 972-5825
FUNDS : DEPARTMENT OF ENERGY AND THE U.S. ENVIRONMENTAL PROTECTION AGENCY
MISC : FLUX INFORMATION IS USED TO PARAMETERIZE DEPOSITION VELOCITIES FOR
THE SPECIES MEASURED AND, IN CONJUNCTION WITH ROUTINE AIR QUALITY
MEASUREMENTS, DRY DEPOSITION ESTIMATES OF POLLUTANT SPECIES CAN BE
ROUTINELY CALCULATED. ALSO, ARGONNE IS AN NADP/NTN WET DEPOSITION
SITE AND ESTIMATES OF WET AND DRY DEPOSITION WILL BE CALCULATED
CODE : T4/G1.2/P2.2/F1.2/L1.1/D2/V1

NAME : WISCONSIN ACID DEPOSITION MONITORING PROGRAM
TYPE : WET AND DRY DEPOSITION
PARAM : pH, CONDUCTIVITY, ACIDITY, SO₄, S(IV), NO₃, NH₄, Cl, Na, K, Ca, Mg, PO₄, ALKALINITY
US : 3 SITES IN WISCONSIN
OFTEN : WET DEPOSITION: DAILY
DRY DEPOSITION: BIWEEKLY (1 SITE ONLY)
DATES : MARCH 1982 - JUNE 1984
HOW : AEROCHEM METRICS 301 - ANALYZED AT SITE FOR pH AND CONDUCTIVITY
LABORATORY MEASUREMENTS AT PACIFIC NORTHWEST LABORATORY
QAQC : FORMAL FIELD PROGRAM; LABORATORY PROGRAM UTILIZED MAP3S GUIDELINES
STOR : ADS DATABASE
CONTACT : SUSAN M. TIKALSKY
ADDRESS : WISCONSIN POWER AND LIGHT CO.
P.O. BOX 192
MADISON, WI 53701
TELEPH : (608) 252-5726
FUNDS : WISCONSIN UTILITIES ASSOC.
MISC : AT PROGRAM COMPLETION ROUND LAKE AND LEGEND LAKE SITES JOINED UAPSP
NETWORK AND GENEVA LAKE SITE JOINED NATIONAL TRENDS NETWORK.
CODE : T4/G1.2/P0/F3.1/L2.1/D1/V1

Numbers are ADS data base
site identification codes

NAME : MINNESOTA-NORTH DAKOTA PRECIPITATION MONITORING NETWORK
TYPE : WET AND DRY DEPOSITION
PARAM : pH, CONDUCTIVITY, ALKALINITY, SO₄, NO₃, NH₄, Cl, P, Na, K, Ca, Mg, Al, Cd, Cr, Cu, Fe, Mn, Ni, Pb, Zn
US : 1 SITE IN NORTH DAKOTA (TEWAUKON WILDLIFE REFUGE IN SOUTHEASTERN NORTH DAKOTA) AND 2 SITES IN MINNESOTA (NEAR HOVLAND AND ITASCA STATE PARK)
OFTEN : WET DEP: EVENT BASIS DRY DEP: BIWEEKLY OR MONTHLY
DATES : APRIL 1978 - JUNE 1979
HOW : AEROCHEM METRICS 201 WET/DRY SAMPLER - ANALYSIS AT THE UNIVERSITY OF MINNESOTA
QAQC : NO FORMAL PROGRAM
STOR : DATA ARE IN REPORT FORM
CONTACT : E. GORHAM
ADDRESS : DEPT. OF ECOLOGY AND BEHAVIORAL BIOLOGY
UNIVERSITY OF MINNESOTA
ST. PAUL, MN 55455
TELEPH : (612) 376-1743
FUNDS : DEPARTMENT OF ENERGY AND UNIV OF MINNESOTA COMPUTER CENTER
CODE : T4/G1.2/P1.2/F4.2/L2.1/D2/V1

NAME : NORTH DAKOTA ATMOSPHERIC DEPOSITION PROJECT
 TYPE : WET AND DRY DEPOSITION
 PARAM : pH, CONDUCTIVITY, SO₄, NO₃, NH₄, Cl, F, PO₄, Na, K, ACIDITY, FORMIC ACID, ACETIC ACID, Ca, Mg, Al, As, Cd, Cr, Cu, Fe, Mn, Ni, Pb, Se, Zn
 US : CURRENTLY 9 SITES IN NORTH DAKOTA, HOWEVER EXPECTED TO DECLINE TO 3 DURING 1986
 OFTEN : WET DEP: EVENT BASIS DRY DEP: MONTHLY
 DATES : BEGAN IN JULY 1980, EXPANDED IN MAY AND JUNE 1981, AND IS ONGOING
 HOW : AEROCHEM METRICS COLLECTORS USED. ANALYSIS BY THE NORTH DAKOTA STATE LABORATORY
 QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
 STOR : AVAILABLE ON COMPUTER
 CONTACT : MARK DEUTSCHMAN
 ADDRESS : NORTH DAKOTA STATE DEPARTMENT OF HEALTH
 1200 MISSOURI AVE.
 BOX 5520
 BISMARK, ND 58502-5520
 TELEPH : (701) 224-2366
 FUNDS : STATE OF NORTH DAKOTA AND BUREAU OF LAND MANAGEMENT
 CODE : T4/G1.2/P1.2/F4.2/L1.2/D2/V1

Approximate locations of North Dakota State Department of Health event-based (□) and weekly (O) monitoring stations and NADP/NTN stations in North Dakota.

NAME : PRECIPITATION QUALITY MONITORING PROGRAM
 TYPE : WET DEPOSITION
 PARAM : pH, CONDUCTIVITY, ACIDITY, SO₄, NO₃, NH₄, Cl, PO₄, Na, K, Ca, Mg
 CAN : 6 SITES IN ALBERTA
 OFTEN : MONTHLY SAMPLES
 DATES : BEGAN IN APRIL 1978; EXPANDED TO 9 SITES IN 1985
 HOW : SANGAMO TYPE A PRECIP COLLECTORS USED. ANALYZED AT THE ALBERTA ENVIRONMENTAL CENTRE AT VEGREVILLE, ALBERTA
 QAQC : CURRENT PROGRAM BEING UPGRADED
 STOR : AVAILABLE IN ANNUAL REPORTS
 CONTACT : J. E. TORNEBY OR Y. K. LAU
 ADDRESS : AIR QUALITY CONTROL BRANCH - ALBERTA ENVIRONMENT
 9820-106 ST.
 EDMONTON, ALBERTA T5K 2J6
 TELEPH : (403) 427-5893
 FUNDS : DEPARTMENT OF THE ENVIRONMENT, PROVINCE OF ALBERTA
 REFDOC : LAU, Y. K. 1985. A FIVE YEAR (1978-1982) SUMMARY OF PRECIPITATION CHEMISTRY MEASUREMENTS IN ALBERTA. POLLUTION CONTROL DIVISION, DEPARTMENT OF THE ENVIRONMENT, EDMONTON, ALBERTA.
 CODE : T4/G2.3/P0/F2.2/L1.2/D2/V1

NAME : PRECIPITATION CHEMISTRY OF THE PACIFIC COAST
 TYPE : WET DEPOSITION
 PARAM : pH AND MAJOR IONS
 CAN : BRITISH COLUMBIA - VANCOUVER ISLAND
 OFTEN : EVENT BASIS AND ONE TIME SAMPLING
 DATES : PERIODICALLY FROM 1982 - 1983. MOUNTAIN SITES SAMPLED ONCE IN MARCH 1982
 HOW : ONE SITE AT INST. OF OCEAN SCIENCES. SNOW SAMPLES COLLECTED ON COASTAL MOUNTAINS INCLUDING MT. WASHINGTON. MOUNTAIN SITES REACHED BY HELICOPTER. SOME PRECIPITATION SAMPLES COLLECTED BY SHIPS AT SEA (SHIP SAMPLES WERE OF MIXED QUALITY). SAMPLES ANALYZED AT WATER QUALITY LABORATORY OF INLAND WATERS DIRECTORATE IN VANCOUVER, BRITISH COLUMBIA.
 QAQC : FORMAL LABORATORY PROGRAM
 STOR : ON INSTITUTE OF OCEAN SCIENCES COMPUTER
 CONTACT : G. A. McBEAN
 ADDRESS : INSTITUTE OF OCEAN SCIENCES - ATMOSPHERIC ENV. SERV.
 SIDNEY, BRITISH COLUMBIA V8L 4B2
 TELEPH : (604) 656-8448
 FUNDS : ATMOSPHERIC ENVIRONMENT SERVICE
 MISC : 13 ADDITIONAL MOUNTAIN SITES ON THE LOWER MAINLAND WERE SAMPLED IN 1982 AS PART OF DON FAULKNER'S "SNOWPACK SAMPLING IN SOUTHWESTERN BRITISH COLUMBIA" STUDY
 CODE : T4/G2.3/P0/F1.2/L2.1/D2/V1

NAME : SNOWPACK SAMPLING IN SOUTHWESTERN BRITISH COLUMBIA
TYPE : WET DEPOSITION
PARAM : pH, MAJOR IONS IN SNOW SAMPLES
CAN : 13 MOUNTAIN SITES ON THE LOWER MAINLAND OF BRITISH COLUMBIA PLUS AN
ADDITIONAL 4 SITES WEST OF MANNING PARK
OFTEN : IN 1982 13 MOUNTAIN SITES WERE VISITED ONCE. IN 1985 5 MOUNTAIN
SITES WERE REVISITED PLUS THE 4 ADDITIONAL SITES WERE VISITED
DATES : MARCH 1982 AND MARCH 1985
HOW : SHOVEL COLLECTION OF SNOW SAMPLES. SITES REACHED BY HELICOPTER.
SAMPLES ANALYZED AT INLAND WATERS DIRECTORATE (IWD) LABORATORIES IN
VANCOUVER, BRITISH COLUMBIA.
QAQC : STANDARD LABORATORY PROTOCOLS FOR IWD LABORATORIES
STOR : STORED ON MINI-COMPUTER
CONTACT : DON FAULKNER
ADDRESS : ATMOSPHERIC ENVIRONMENT SERVICE
700-1200 W. 73 AVENUE
VANCOUVER, BRITISH COLUMBIA V6P 6H9
TELEPH : (604) 666-2184
FUNDS : ENVIRONMENT CANADA
MISC : 5 ADDITIONAL MOUNTAIN SITES ON VANCOUVER ISLAND WERE SAMPLED IN
1982 AS PART OF G. A. MCBEAN'S "PRECIPITATION CHEMISTRY OF THE PACIFIC
COAST" STUDY
CODE : T4/G2.3/P0/F1.2/L2.1/D2/V1

Map of Mountain Sites on the Lower Mainland

NAME : LOWER MAINLAND PRECIPITATION CHEMISTRY NETWORK
 TYPE : WET DEPOSITION
 PARAM : pH, CONDUCTIVITY, Cd, Cu, Ca, Mg, NH₄, Fe, Pb, Mn, K, Na, Zn, Cl, SO₄, NO₃
 CAN : 14 SAMPLING LOCATIONS (4 AT HIGH MOUNTAIN ELEVATIONS) ON THE LOWER MAINLAND IN SOUTHWESTERN BRITISH COLUMBIA
 OFTEN : EVENT
 DATES : JANUARY - DECEMBER 1982
 HOW : RAIN SAMPLES WERE COLLECTED USING A 22 cm FUNNEL DRAINING INTO A POLYETHYLENE SAMPLING BOTTLE. SNOW SAMPLES WERE COLLECTED USING PLASTIC CONTAINERS WITH SNAP ON LIDS. SAMPLES ANALYZED AT THE WATER QUALITY LABORATORY, INLAND WATERS DIRECTORATE
 QAQC : FORMAL LABORATORY
 STOR : CONTACT PRINCIPLE INVESTIGATOR
 CONTACT : DON FAULKNER
 ADDRESS : ATMOSPHERIC ENVIRONMENT SERVICE
 700-1200 W. 73 AVE.
 VANCOUVER, BRITISH COLUMBIA V6P 6H9
 TELEPH : (604) 666-2184
 FUNDS : ENVIRONMENT CANADA
 CODE : T4/G2.3/P1.2/F1.2/L2.1/D2/V1

NAME : SOUTHWESTERN BRITISH COLUMBIA PRECIPITATION MONITORING PROJECT
 (SOUTHERN COASTAL NETWORK)
 TYPE : WET DEPOSITION
 PARAM : pH, CONCENTRATION OF VARIOUS IONS
 CAN : APPROXIMATELY 12 SITES IN BRITISH COLUMBIA
 OFTEN : EVENT
 DATES : 1982 - ONGOING
 HOW : PLASTIC CONTAINERS OPERATED BY VOLUNTEERS - ANALYZED AT THE INLAND
 WATERS DIRECTORATE (IWD) LABORATORY IN VANCOUVER, BRITISH COLUMBIA
 THROUGH 1984. STARTING IN 1985 SAMPLES ANALYZED AT INLAND WATERS
 LABORATORY IN BURLINGTON, ONTARIO
 QAQC : FORMAL LABORATORY PROGRAM
 STOR : ON LOCAL COMPUTER, AVAILABLE IN REPORT FORM
 CONTACT : DON FAULKNER
 ADDRESS : ATMOSPHERIC ENVIRONMENT SERVICE
 700-1200 W. 73 AVENUE
 VANCOUVER, BRITISH COLUMBIA V6P 6H9
 TELEPH : (604) 666-2184
 FUNDS : ENVIRONMENT CANADA
 CODE : T4/G2.3/P0/F1.2/L1.1/D2/V1

NAME : PRECIPITATION EVENT SAMPLING - PORT HARDY AND TERRACE,
BRITISH COLUMBIA
TYPE : WET DEPOSITION
PARAM : pH, MAJOR IONS
CAN : PORT HARDY AND TERRACE, BRITISH COLUMBIA
OFTEN : EVENT BASIS
DATES : APRIL 1981 - MARCH 1983
HOW : SAMPLES COLLECTED IN PLASTIC CONTAINERS AND ANALYZED AT WATER QUALITY
LABORATORY OF INLAND WATERS DIRECTORATE IN VANCOUVER,
BRITISH COLUMBIA.
QAQC : FORMAL LABORATORY PROGRAM
STOR : DATA STORED ON LOCAL MINICOMPUTER AND AVAILABLE IN REPORT FORM
CONTACT : DON FAULKNER
ADDRESS : ATMOSPHERIC ENVIRONMENT SERVICE
700 - 1200 W. 73RD AVE.
VANCOUVER, BRITISH COLUMBIA V6P 6H9
TELEPH : (604) 666-2184
FUNDS : ENVIRONMENT CANADA
MISC : SHORT TERM PROJECT TO DETERMINE POTENTIAL LOCAL EFFECTS ON CANSAP
SITES
CODE : T4/G2.3/P0/F1.1/L2.1/D2/V1

NAME : BRITISH COLUMBIA COASTAL SITE PRECIPITATION MONITORING NETWORK
 TYPE : WET DEPOSITION
 PARAM : pH, ACIDITY, SO₄, NO₃, Cl, F, PO₄, Na, K, Ca, Mg, Al
 CAN : 4 COASTAL SITES PLUS 3 NORTHWEST INTERIOR SITES IN BRITISH COLUMBIA
 OFTEN : EVENT BASIS
 DATES : SEPTEMBER 1980 - DECEMBER 1982
 HOW : MODIFIED HUBBARD BROOK TYPE COLLECTOR USED. ANALYZED BY THE BRITISH COLUMBIA MINISTRY OF ENVIRONMENT
 QAQC : FORMAL LABORATORY PROGRAM
 STOR : EQUIS: DATA FILE BC, SYSTEMS CORP.
 CONTACT : M. S. KOTTURI
 ADDRESS : WASTE MANAGEMENT BRANCH, MINISTRY OF ENVIRONMENT
 PARLIAMENT BUILDINGS
 VICTORIA, BRITISH COLUMBIA V8N 1X4
 TELEPH : (604) 387-4321
 FUNDS : WASTE MANAGEMENT BRANCH, MINISTRY OF ENVIRONMENT
 MISC : DATA SUMMARIES AVAILABLE FROM PRINCIPLE INVESTIGATOR

 REFDOC : KOTTURI, M. S. 1984. "CHEMICAL COMPOSITION OF INDIVIDUAL STORMS AS A FUNCTION OF AIR PARCEL TRAJECTORIES FOR THE PREDICTION OF ACID RAIN CHARACTERISTICS." THE BIOSPHERE: PROBLEMS AND SOLUTIONS. T. N. VEZIROGLU, ED., ELSEVIER SCIENCE PUBLISHERS, B. V., AMSTERDAM.

 CODE : T4/G2.3/P0/F2.2/L2.1/D1/V1

NAME : ACID PRECIPITATION MONITORING NETWORK IN THE GEORGIA STRAITS AREA
 TYPE : WET AND DRY DEPOSITION
 PARAM : pH, TOTAL ACIDITY, ACIDITY, ALKALINITY, SO₄, NO₃, NH₄, Cl, K, Ca, Mg
 CAN : WET DEPOSITION - 7 SITES; DRY DEPOSITION - 2 SITES
 OFTEN : WEEKLY
 DATES : 1983 - ONGOING (1988)
 HOW : SANGAMO PRECIPITATION COLLECTOR USED. SAMPLES ANALYZED AT THE
 BRITISH COLUMBIA MINISTRY OF ENVIRONMENTAL LABORATORY, VANCOUVER,
 BRITISH COLUMBIA
 QAQC : LABORATORY PROGRAM
 STOR : CAMUS. DATABASE
 CONTACT : M. S. KOTTURI
 ADDRESS : WASTE MANAGEMENT BRANCH
 810 BLANSHARD STREET
 VICTORIA, BRITISH COLUMBIA V8V 1X5
 TELEPH : (604) 387-4321
 FUNDS : BRITISH COLUMBIA MINISTRY OF ENVIRONMENT
 MISC : DATA SUMMARIES FOR 1984-1985 ARE AVAILABLE, CONTACT M. S. KOTTURI
 CODE : T4/G2.3/P0/F2.2/L1.1/D2/V1

APPENDIX E

INVENTORY OF TRANSBOUNDARY REGION FOREST/VEGETATION PROJECTS

NAME : FOREST PLOT INVENTORY
TYPE : FOREST/VEGETATION
PARAM : VEGETATION TYPE AND SPECIES IN AREA AND SELECTED PLOTS; TREE
CHARACTERISTICS, HEALTH, AND HEIGHT
US : FOREST AREAS NATIONWIDE
OFTEN : INVENTORIES COMPLETED APPROXIMATELY EVERY 12 YEARS
DATES : 1930 - ONGOING
HOW : AERIAL PHOTOGRAPHY ANALYSIS FOLLOWED BY STATISTICAL SELECTION OF 1
ACRE PLOTS FOR ONSITE CHECKS
QAQC : SEE REFERENCE DOCUMENT
STOR : ADDNET DATA BASE
CONTACT : GROUP LEADER - FOREST INVENTORY & ANALYSIS
ADDRESS : FOREST SERVICE - USDA
P.O. BOX 2417
WASHINGTON, DC 20013
TELEPH : (202) 382-9343
FUNDS : U.S. FOREST SERVICE
MISC : INVENTORIES ARE CONDUCTED ON A REGIONAL SCALE. IN SOME REGIONS, SUCH
AS THE NORTHEAST, OLD PLOTS ARE REVISITED TO OBTAIN TREND INFORMATION.

REFDOC : UNITED STATES DEPARTMENT OF AGRICULTURE. 1985. FOREST SERVICE
RESOURCE INVENTORY: AN OVERVIEW. UNITED STATES DEPARTMENT OF
AGRICULTURE, FOREST SERVICE, WASHINGTON, D.C.

CODE : T5/G1.123/P0/F1.4/L1.2/D1/V1

NAME : SPECIAL GRANTS FOR ACID PRECIPITATION
TYPE : FOREST/VEGETATION
PARAM : IMPACTS OF ACID PRECIPITATION ON AGRICULTURAL CROPS AND SOILS
US : ILLINOIS, OHIO, NORTH CAROLINA, CALIFORNIA, TENNESSEE, VIRGINIA
OFTEN : SOME PARAMETERS MONITORED HOURLY DURING INTENSIVE PERIODS, OTHER
PARAMETERS EXAMINED DAILY, WEEKLY OR LESS FREQUENTLY
DATES : 1983 - ONGOING
HOW : VARIES
QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
STOR : ON UNIVERSITY COMPUTERS
CONTACT : A. M. BARTUSKA
ADDRESS : NORTH CAROLINA STATE UNIV.
ACID DEPOSITION PROGRAM
RALEIGH, NC 27606
TELEPH : (919) 757-3520
FUNDS : U.S. DEPARTMENT OF AGRICULTURE, COOPERATIVE STATE RESEARCH SERVICE
MISC : WILL EXAMINE IMPACTS ON PLANTS AND SOILS, MECHANISMS OF SUSCEPTIBILITY
AND RESISTENCE TO ACID DEPOSITION EFFECTS
CODE : T5/G1.123/P0/F4.3/L1.1/D2/V1

NAME : FOREST RESPONSES TO ANTHROPOGENIC STRESS
ABREV : FORAST
TYPE : FOREST/VEGETATION
PARAM : TREE CORES
US : 88 SITES IN MAINE, NEW HAMPSHIRE, VERMONT, NEW YORK, CONNECTICUT,
PENNSYLVANIA, NEW JERSEY, OHIO, WEST VIRGINIA, VIRGINIA,
NORTH CAROLINA, TENNESSEE, ARKANSAS, AND MISSOURI
OFTEN : TWO INCREMENT CORES PER TREE SAMPLED IN 1982 AND 1983
DATES : EARLY 1982 - ONGOING
HOW : COLLECT TREE CORES FROM 15 TREES GREATER THAN 50 YEARS OLD, FOR
EACH OF 6 SPECIES IN EACH OF 6 FOREST STANDS. A TOTAL OF 31 SPECIES
HAVE BEEN SAMPLED. THE TOTAL NUMBER OF CORES IS GREATER THAN 500
FOR EACH OF 12 RESEARCH GROUPS. DATA ANALYSIS PERFORMED AT OAK RIDGE.
QAQC : QA OF TREE RING MEASUREMENTS PROVIDED BY USGS TREE RING LABORATORY
STOR : ADDNET DATA BASE
CONTACT : S. B. MCLAUGHLIN
ADDRESS : OAK RIDGE NATIONAL LAB
PO BOX X - BLDG. 1505
OAK RIDGE, TN 37830
TELEPH : (615) 574-7358
FUNDS : ENVIRONMENTAL PROTECTION AGENCY, U.S. GEOLOGICAL SURVEY, NATIONAL
PARK SERVICE, STATE OF OHIO
MISC : EXPLORATORY ANALYSIS OF TIMING AND MAGNITUDE OF CHANGES IN RADIAL
GROWTH IN RELATION TO CHANGES IN CLIMATE, REGIONAL TRENDS IN
ATMOSPHERIC POLLUTION, AND COMPETITION.
REFDOC : MCLAUGHLIN, S. B., J. J. BLASING, L. K. MANN, AND D. N. DUVICK.
1983. "EFFECTS OF ACID RAIN AND GASEOUS POLLUTANTS ON FOREST
PRODUCTIVITY: A REGIONAL SCALE APPROACH." JOURNAL OF THE AIR
POLLUTION CONTROL ASSOCIATION, 33:1042-1049.
CODE : T5/G1.12/P0/F4.4/L1.1/D1/V1

NAME : DENDROECOLOGICAL ANALYSIS OF FOREST GROWTH RESPONSES
TYPE : FOREST/VEGETATION
PARAM : FOREST GROWTH OVER PAST 50 YEARS
US : 377 COLLECTIONS AT 184 SITES IN VERMONT, NEW HAMPSHIRE, MAINE,
NEW YORK, CONNECTICUT, PENNSYLVANIA, VIRGINIA, WEST VIRGINIA, OHIO,
NORTH CAROLINA, TENNESSEE, MISSOURI, ARKANSAS, AND MARYLAND
OFTEN : ONE INCREMENT CORE PER TREE PER VISIT
DATES : 1982 - 1985
HOW : TREE CORES ANALYZED AT OAK RIDGE AND AT USGS LABS IN RESTON, VIRGINIA
QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
STOR : AVAILABLE ON MAGNETIC TAPE AT OAK RIDGE NATIONAL LABORATORY
CONTACT : S. B. MCLAUGHLIN
ADDRESS : OAK RIDGE NATIONAL LABORATORY
PO BOX X - BLDG. 1505
OAK RIDGE, TN 37830
TELEPH : (615) 574-7358
FUNDS : ENVIRONMENTAL PROTECTION AGENCY, U.S. GEOLOGICAL SURVEY
MISC : DETERMINE FOREST GROWTH RATE AND THE POSSIBLE IMPACT OF ACID
PRECIPITATION ON GROWTH
CODE : T5/G1.12/P0/F1.3/L1.1/D2/V0

NAME : UTILIZATION OF DENDROCHRONOLOGY AS AN INDEX OF AIR POLLUTION
 ORIGINATING FROM QUEBEC ALUMINUM SMELTERS
 TYPE : FOREST/VEGETATION
 PARAM : TREE SPECIES, CONDITIONS AND HEALTH; TREE GROWTH AND CHEMISTRY
 CAN : QUEBEC (48°26'; 71°04')
 OFTEN : ONE TIME SURVEY
 DATES : 1983 (DATA ANALYSIS CONTINUING)
 HOW : TREE CORES OBTAINED TO RECONSTRUCT THE RATE OF TREE GROWTH AS A
 FUNCTION OF TIME AND TO CORRELATE THE THICKNESS OF ANNUAL GROWTH
 WITH THE ESTIMATED POLLUTANT EMISSIONS. SELECTED FOREST PLOTS ARE
 LOCATED NEAR ALUMINUM SMELTERS.
 QAQC : NO FORMAL PROGRAM
 STOR : ON MICROCOMPUTERS AT UNIVERSITY OF QUEBEC
 CONTACT : MARCEL OUELLET
 ADDRESS : INRS-EAU
 2700 RUE EINSTEIN
 C.P. 7500
 STE. FOY, QUEBEC G1V 4C7
 TELEPH : (418) 654-2525
 FUNDS : NATIONAL RESEARCH COUNCIL OF CANADA
 CODE : T5/G2.1/P0/F1.2/L2.1/D2/V1

NAME : FOREST DIEBACK IN THE NORTHEASTERN UNITED STATES
TYPE : FOREST/VEGETATION
PARAM : FOREST CONDITIONS AND SOIL CHEMISTRY
US : 30 SITES IN WEST VIRGINIA, NEW YORK, VERMONT, NEW HAMPSHIRE,
PENNSYLVANIA, CONNECTICUT, MASSACHUSETTS, UTAH, NORTH CAROLINA, AND
VIRGINIA
OFTEN : ONE VISIT PER SITE
DATES : 1982 - 1983
HOW : FOREST AND SOIL SURVEYS CONDUCTED AT SITES; 1 INCREMENT CORE PER TREE
OBTAINED. TREE CORES ANALYZED AT OAK RIDGE NATIONAL LABORATORY
QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
STOR : ON COMPUTER SYSTEM AT OAK RIDGE
CONTACT : S. B. MCLAUGHLIN
ADDRESS : OAK RIDGE NATIONAL LABORATORY
PO BOX X - BLDG. 1505
OAK RIDGE, TN 37830
TELEPH : (615) 574-7358
FUNDS : ENVIRONMENTAL PROTECTION AGENCY, U.S. FOREST SERVICE
MISC : STUDY OF DIEBACK OF RED SPRUCE AND SEARCH FOR CORRELATIONS WITH
ENVIRONMENTAL CHANGES

REFDOC : MCLAUGHLIN, S. B., J. J. BLASING, L. K. MANN, AND D. N. DUVICK.
1983. "EFFECTS OF ACID RAIN AND GASEOUS POLLUTANTS ON FOREST
PRODUCTIVITY: A REGIONAL SCALE APPROACH." JOURNAL OF THE AIR
POLLUTION CONTROL ASSOCIATION, 33:1042-1049.

JOHNSON, ARTHUR H. 1983. "RED SPRUCE DECLINE IN THE NORTHEASTERN
U.S.: HYPOTHESIS REGARDING THE ROLE OF ACID RAIN." JOURNAL OF THE
AIR POLLUTION CONTROL ASSOCIATION, 33:1049-1054.

CODE : T5/G1.1/P0/F1.2/L2.1/D2/V0

APPENDIX F

INVENTORY OF TRANSBOUNDARY REGION SOIL PROJECTS

NAME : NATIONAL COOPERATIVE SOIL SURVEY
ABREV : NCSS
TYPE : SOILS
PARAM : SOIL PROFILE CHARACTERISTICS, SURFACE FEATURES, SLOPE, LANDFORM,
VEGETATIVE COVER, LAND USE. PHYSICAL AND CHEMICAL PROPERTIES AND
MINERALOGY OF SOIL SAMPLES
US : FIELD OBSERVATIONS AT SPACINGS TO IDENTIFY AND DELINEATE SOIL BODIES
AS SMALL AS 5 TO 10 ACRES. LABORATORY ANALYSES OF PROFILE SAMPLES
FROM A FEW THOUSAND POINTS WITHIN THE BORDER REGION
OFTEN : ONE-TIME INVENTORY BUT SOME AREAS HAVE BEEN REMAPPED
DATES : ONGOING NATIONAL PROGRAM BEGAN IN 1899. EACH SURVEY AREA (COUNTY,
IN MOST CASES) HAS SEPARATE SCHEDULE.
HOW : SEE REFERENCE DOCUMENTS
QAQC : SEE REFERENCE DOCUMENTS
STOR : SOIL SURVEY REPORTS WITH SOIL MAPS (SCALES FROM 1:15,840 TO 1:24,000)
PUBLISHED MOSTLY BY COUNTY. LABORATORY DATA PUBLISHED BY STATES
AND AVAILABLE FROM A CENTRAL DATA BASE. LAND USE AND MANAGEMENT
INFORMATION AVAILABLE FROM A CENTRAL DATA BASE OF SOIL INTERPRETATION
RECORDS (SOILS-5). STATUS OF RESOURCES PUBLISHED IN NATIONAL RESOURCE
INVENTORY (NRI).
CONTACT : RICHARD W. ARNOLD
ADDRESS : SOIL CONSERVATION SERVICE
P.O. BOX 2890
WASHINGTON, DC 20013
TELEPH : (202) 382-1819
FUNDS : SOIL CONSERVATION SERVICE
MISC : THE U.S. SOIL CONSERVATION SERVICE HAS PUBLISHED REPORTS ON LABORATORY
DATA AND SOIL DESCRIPTIONS FOR MOST STATES. THESE ARE "SOIL SURVEY
INVESTIGATION REPORTS NO. 2 THROUGH 37" AND CAN BE OBTAINED FROM
THE U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C.
REFDOC : MANY DOCUMENTS AVAILABLE. REPRESENTATIVE PUBLICATIONS INCLUDE:

SOIL SURVEY STAFF. 1951. SOIL SURVEY MANUAL. U.S. DEP. AGR. HANDB.
18. U.S. GOVT. PRINTING OFFICE, WASHINGTON, D.C.

SOIL CONSERVATION SERVICE. 1983. NATIONAL SOILS HANDBOOK. SCS,
USDA, WASHINGTON, D.C.

SOIL CONSERVATION SERVICE. 1984. PROCEDURES FOR COLLECTING SOIL
SAMPLES AND METHODS OF ANALYSIS FOR SOIL SURVEY. SOIL SURVEY
INVESTIGATIONS REPORT NO. 1. U.S. DEP. AGR. U.S. GOVT. PRINTING
OFFICE, WASHINGTON, D.C.

SOIL CONSERVATION SERVICE. 1985. LIST OF PUBLISHED SOIL SURVEYS:
JANUARY 1985. U.S. DEP. AGR. U.S. GOVT. PRINTING OFFICE, WASHINGTON,
D.C.

SOIL CONSERVATION SERVICE. 1985. STATUS OF SOIL SURVEYS AS OF
JANUARY 1, 1984. U.S. DEP. AGR. WASHINGTON, D.C.

CODE : T6/G1.123/P1.2/F1.4/L1.2/D1/V1

NAME : PALEOLIMNOLOGICAL ASSESSMENT OF ACIDIC DEPOSITION IMPACTS ON SELECTED
ACIDIC LAKES IN THE ADIRONDACKS
TYPE : SOILS (SEDIMENTS)
PARAM : CHEMICAL CHARACTERISTICS OF SEDIMENTS AND CLADOCERA CONTENT
US : MAINE AND 10 LAKES IN THE ADIRONDACK MOUNTAINS IN NEW YORK
OFTEN : ONE TIME SAMPLING
DATES : SAMPLES TAKEN IN 1981 AND 1982
HOW : ONE LONG CORE SAMPLE TAKEN FROM EACH OF THE 10 LAKES. SAMPLES
ANALYZED AT THE UNIVERSITY OF MAINE.
QAQC : FORMAL LABORATORY PROGRAM, NO FORMAL FIELD PROGRAM
STOR : HARD COPY REPORTS
CONTACT : STEVEN NORTON
ADDRESS : UNIVERSITY OF MAINE
DEPT. OF GEOLOGICAL SCIENCES
ORONO, ME 04469
TELEPH : (207) 581-1954
FUNDS : ENVIRONMENTAL PROTECTION AGENCY
MISC : EXAMINATION OF LAKE SEDIMENTS TO DETERMINE CHRONOLOGY OF ATMOSPHERIC
DEPOSITION OF METALS AND ACIDS AND STATE OF MECHANICAL DISTURBANCE.

REFDOC : NORTON, S. A., J. J. AKIELASJEK, T. A. HAINES, K. L. STROMBORG, AND
J. R. LONGCORE. BEDROCK GEOLOGIC CONTROL OF SENSITIVITY OF AQUATIC
ECOSYSTEMS IN THE UNITED STATES OF ACIDIC DEPOSITION. UNIVERSITY
OF MAINE, ORONO, MAINE.

CODE : T6/G1.1/P0/F1.2/L2.1/D2/V0

NAME : SOIL CHEMISTRY IN ONTARIO
TYPE : SOILS
PARAM : TEXTURE; pH; EXCHANGEABLE Ca, K, Na, Mg; EXTRACTABLE Fe, Al; TOTAL ORGANIC CARBON, TOTAL INORGANIC CARBON. SITE INFORMATION INCLUDES TOPOGRAPHY, VEGETATION, AND SOIL HORIZON CHARACTERISTICS.
CAN : APPROXIMATELY 450 SITES THROUGHOUT CANADIAN SHIELD AREA OF ONTARIO; MORE THAN 300 IN TRANSBOUNDARY REGION.
OFTEN : ONE-TIME SAMPLING
DATES : 1982
HOW : REPRESENTATIVE MID-SLOPE SITES SOUGHT; PIT DUG AT LEAST INTO C-HORIZON. SAMPLES FROM EACH HORIZON AND PIT BOTTOM OBTAINED.
QAQC : FORMAL LABORATORY PROGRAM (INCLUDES INTERCOMPARISONS WITH GREAT LAKES FOREST RESEARCH CENTER)
STOR : AVAILABLE AT LANDS DIRECTORATE, ENVIRONMENT CANADA, OTTAWA
CONTACT : CLAYTON RUBEC
ADDRESS : ENVIRONMENT CANADA
LANDS DIRECTORATE
PLACE VINCENT MASSEY
HULL, QUEBEC K1A 1C8
TELEPH : (819) 997-2320
FUNDS : ENVIRONMENT CANADA
CODE : T6/G2.2/P0/F1.3/L2.1/D2/V1

NAME : EFFECT OF ACID PRECIPITATION ON SOUTHERN ONTARIO SOILS
TYPE : SOILS
PARAM : 25 SOIL CHEMISTRY PARAMETERS, INCLUDING pH, BASE SATURATION, AND METAL CONTENT
CAN : 300 SITES IN SOUTHERN ONTARIO
OFTEN : GENERALLY ONCE, WITH PLANS TO RECHECK SITES EVERY FIVE YEARS; SOME SITES ARE MONITORED SEASONALLY
DATES : 1981 - ONGOING
HOW : SOIL SAMPLED NEAR PRECIPITATION COLLECTORS; OLD SURVEY SITES HAVE BEEN RESURVEYED. SAMPLES ANALYZED AT ONTARIO MINISTRY OF ENVIRONMENT LABORATORIES.
QAQC : FORMAL LABORATORY PROGRAM, FORMAL FIELD PROGRAM BEING DESIGNED
STOR : ONTARIO MINISTRY OF ENVIRONMENT SIS DATABASE
CONTACT : DIANNE DIMMA
ADDRESS : ONTARIO MIN. OF ENVIRONMENT - AIR RESOURCES
880 BAY STREET, SUITE 347
TORONTO, ONTARIO M5S 1Z8
TELEPH : (416) 965-4516
FUNDS : ONTARIO MINISTRY OF ENVIRONMENT
MISC : INVESTIGATES NATURAL SPATIAL/SEASONAL VARIATION IN SOIL PARAMETERS, ESTABLISHES BASELINE STATUS FOR CHEMICAL AND PHYSICAL PARAMETERS IN UNDISTURBED SOILS. DOCUMENTS CHEMICAL CHANGES IN SOIL INDUCED BY SIMULATED ACIDIC PRECIPITATION
CODE : T6/G2.2/P0/F2.3/L1.1/D1/V1

NAME : OCTACHLOROSTYRENE IN LAKE ONTARIO
TYPE : SOILS (SEDIMENTS)
PARAM : OCTACHLOROSTYRENE (OCS)
CAN : 10 SITES IN LAKE ONTARIO
OFTEN : ONE-TIME SAMPLING AT ALL SITES
DATES : COLLECTION DURING JULY 1981 AND SEPTEMBER 1982
HOW : SUBCORES TAKEN OF SHIPEK BOX-CORE SEDIMENT SAMPLES COLLECTED BY THE CANADA CENTRE FOR INLAND WATERS. SOXHLET EXTRACTION AND GAS CHROMATOGRAPHY/MASS SPECTROSCOPY ANALYSIS ON 2 CM-INTERVALS OF EACH CORE SECTION.
QAQC : NO FORMAL PROGRAM
STOR : CONTACT PRINCIPAL INVESTIGATOR
CONTACT : RONALD HITES
ADDRESS : SCHOOL OF PUBLIC AND ENVIRONMENTAL AFFAIRS
INDIANA UNIVERSITY
BLOOMINGTON, IN 47405
FUNDS : ENVIRONMENTAL PROTECTION AGENCY, WITH COOPERATION FROM CENTRE FOR INLAND WATERS.
MISC : STUDY DETERMINED THAT OCS ORIGINATED FROM WASTE PRODUCTS OF ELECTROLYTIC CHLORINE PRODUCTION. FOR ACTUAL RESULTS AND A DISCUSSION OF THE PROJECT CONSULT THE REFERENCE DOCUMENT.
REFDOC : KAMINSKY, R. AND R. HITES. 1984. "OCTACHLOROSTYRENE IN LAKE ONTARIO: SOURCES AND FATES." ENVIRON. SCI. AND TECH., 18:275-279.
CODE : T6/G2.2/P1.1/F1.2/L2.1/D2/V1

NAME : RECORDS OF ACIDIFICATION IN ONTARIO LAKE SEDIMENTS
TYPE : SOILS (SEDIMENTS)
PARAM : DIATOM AND DIPTERAN REMAINS IN LAKE SEDIMENTS
CAN : 24 SHIELD LAKES IN ONTARIO, ALL WITHIN 200 KM OF SUDBURY
OFTEN : ONE TIME SAMPLING
DATES : SEPTEMBER AND OCTOBER 1981
HOW : ANALYZED AT THE LABORATORIES OF ONTARIO HYDRO IN TORONTO
QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
STOR : HARD COPY AND REPORT FORM
CONTACT : G. L. VASCOTTO OR J. K. KWIK
ADDRESS : ONTARIO HYDRO
BIOLOGICAL RESEARCH SECTION
800 KIPLING AVENUE
TORONTO, ONTARIO M8Z 5S4
TELEPH : (416) 231-4111 (EXT. 6865)
FUNDS : ONTARIO HYDRO
MISC : PROJECT USES DIATOM, CLADOCERAN, AND DIPTERAN SPECIES TO DETERMINE
IF LOW pH LAKES HAVE UNDERGONE RAPID ACIDIFICATION IN RECENT TIMES.
CODE : T6/G2.2/P0/F3.1/L2.1/D2/V0

NAME : CHEMICAL CHARACTERISTICS AND PROPERTIES OF SOILS IN SUDBURY DISTRICT
 TYPE : SOILS
 PARAM : SOIL pH, ALUMINUM SULFATE, BASE SATURATION
 CAN : 3 SITES NEAR SUDBURY, ONTARIO
 OFTEN : ONE TIME SURVEY
 DATES : WORK BEGAN IN APRIL 1982, LABORATORY ANALYSIS IS ONGOING
 HOW : SOIL SAMPLES COLLECTED AT DIFFERENT DEPTHS AND IN DIFFERENT DIRECTIONS
 FROM SUDBURY SMELTER SMOKESTACK. SAMPLES ANALYZED AT AGRICULTURE
 CANADA LABORATORY IN OTTAWA.
 QAQC : FORMAL LABORATORY PROGRAM
 STOR : AVAILABLE IN HARD COPY FROM PRINCIPAL INVESTIGATOR
 CONTACT : S. S. SINGH
 ADDRESS : AGRICULTURE CANADA
 K.W. NEATBY BLDG
 OTTAWA, ONTARIO K1A 0C6
 TELEPH : (613) 995-3700
 FUNDS : AGRICULTURE CANADA
 CODE : T6/G2.2/P0/F1.2/L2.1/D2/V0

NAME : SULFUR BIOCHEMISTRY HISTORIC DEPOSITION
TYPE : SOILS (SEDIMENTS)
PARAM : SULFUR ISOTOPES IN CONTROL AND EXPERIMENTALLY ACIDIFIED LAKES AND
SEDIMENTS, Cs(137) AND Pb (210)
CAN : INCLUDES EXPERIMENTAL LAKES AREA IN NORTHWESTERN ONTARIO
OFTEN : SEVERAL TIMES A SEASON AT SOME FIELD SITES
DATES : 1979 - ONGOING
HOW : Cs AND Pb MEASUREMENTS USED TO DATE SEDIMENT CORES
QAQC : FORMAL LABORATORY PROGRAM
STOR : DATA WITH PRINCIPAL CONTACT. SOME DATA STORED USING dBASE II
CONTACT : RAYMOND HESSLEIN
ADDRESS : FRESHWATER INSTITUTE
501 UNIVERSITY CRESCENT
WINNIPEG, MANITOBA R3T 2N6
TELEPH : (204) 949-5251
FUNDS : DEPT. OF FISHERIES AND OCEANS
MISC : INVESTIGATION OF SULFUR BIOCHEMISTRY AND LAKE HISTORY
CODE : T6/G2.2/P0/F1.2/L1.2/D2/V1

NAME : SENSITIVITY OF SOILS IN ALBERTA TO ACID DEPOSITION
 TYPE : SOILS
 PARAM : Ca, Mg, Mn, NITROGEN, CARBON, PHOSPHOROUS, HYDROGEN ION
 CAN : 8 SITES IN ALBERTA
 OFTEN : 2 SITES ESTABLISHED EACH FALL, SITES WILL BE RESAMPLED EVERY 4 YEARS
 DATES : SEPTEMBER 1981 - ONGOING
 HOW : SOIL SAMPLES OBTAINED FROM SEVERAL LEVELS DOWN TO 60 CM, SAMPLES ARE
 AIR DRIED AND HAND GROUND TO PASS THROUGH A 2 MM SIEVE
 QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
 DATA : AVAILABLE IN HARD COPY FROM PRINCIPAL INVESTIGATOR
 CONTACT : C. PALMER
 ADDRESS : ALBERTA ENVIRONMENT
 PO BOX 3014 - COUSINS BLDG
 LETHBRIDGE, ALBERTA T1J 4B3
 TELEPH : (403) 381-5322
 FUNDS : ALBERTA ENVIRONMENT
 MISC : INVESTIGATES WHETHER 1) SOIL SURVEY INFORMATION CAN BE USED TO ASSESS
 SOIL SENSITIVITY AND 2) WHAT ADDITIONAL ACID LOADINGS CAN BE TOLERATED
 BEFORE SOIL PRODUCTIVITY IS IMPAIRED.

REFDOC : PALMER, C. AND H. REGIER. 1985. LONG-TERM SOIL ACIDIFICATION
 MONITORING SITES IN ALBERTA. EARTH SCIENCES DIVISION, ALBERTA
 ENVIRONMENT, LETHBRIDGE, ALBERTA.

CODE : T6/G2.3/P0/F2.2/L1.1/D2/V1

NAME : BUFFER CAPACITY OF BRITISH COLUMBIA SOILS
TYPE : SOILS
PARAM : BUFFERING CAPACITY, SOIL CHEMICAL AND PHYSICAL CHARACTERISTICS
CAN : 236 SAMPLES COLLECTED IN 14 SURVEY AREAS OF BRITISH COLUMBIA
OFTEN : ONE TIME SAMPLING
DATES : 1970 - 1982
HOW : HORIZON SAMPLES COLLECTED AT EACH SITE; SAMPLES ANALYZED FOR PHYSICAL
CHARACTERISTICS AND THEN ACID TITRATED.
QAQC : COMPARATIVE ANALYSIS OF SAMPLES FROM OTHER PROJECTS; NO FORMAL FIELD
PROGRAM
STOR : CONTACT PRINCIPLE INVESTIGATOR
CONTACT : JOHN H. WIENS
ADDRESS : WASTE MANAGEMENT BRANCH
BRITISH COLUMBIA MINISTRY OF ENVIRONMENT
810 BLANSHARD STREET
VICTORIA, BRITISH COLUMBIA V8V 1X5
TELEPH : (604) 387-4321
FUNDS : BRITISH COLUMBIA MINISTRY OF ENVIRONMENT
MISC : DERIVED RELATIONSHIPS AMONG SOIL CHEMISTRY, GEOGRAPHICAL AREA, SOIL
HORIZON TYPE, INITIAL SOIL pH
CODE : T6/G2.3/P0/F2.2/L2.2/D2/V1

APPENDIX G

INVENTORY OF TRANSBOUNDARY REGION ECOSYSTEM PROJECTS

NAME : ACID RAIN NATIONAL EARLY WARNING SYSTEM
ABREV : ARNEWS
TYPE : ECOSYSTEM (FOREST/VEGETATION, SOILS)
PARAM : NUMBER, TYPE (SPECIES), DOMINANCE, DIAMETER, HEIGHT AND CONDITION OF
TREES IN FOREST PLOTS; FOLIAGE AND SOIL SAMPLES; CORES FROM 10 TREES
OUTSIDE EACH ESTABLISHED PLOT
CAN : 60 FOREST PLOTS THROUGHOUT CANADA
OFTEN : SAMPLING PLANNED AT FIVE YEAR INTERVALS; MAY OCCUR MORE FREQUENTLY
IF CONDITIONS WARRANT
DATES : 1984 - ONGOING
HOW : 10 M X 40 M PLOTS ESTABLISHED IN VARIOUS ACID DEPOSITION REGIMES,
COVERING ECONOMICALLY AND COMMERCIALY IMPORTANT TREE SPECIES.
PLOTS TO BE MONITORED FOR 20 TO 25 YEARS.
QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
STOR : ARNEWS
CONTACT : M. K. MAHENDRAPPA
ADDRESS : CANADIAN FORESTRY SERVICE
MARITIMES FOREST RESEARCH CENTRE
P.O. BOX 4000
FREDERICTON, NEW BRUNSWICK E3B 5P7
TELEPH : (506) 452-3549
FUNDS : CANADIAN FORESTRY SERVICE
MISC : PROGRAM ESTABLISHES NATIONWIDE NETWORK OF PERMANENT FOREST PLOTS FOR
EARLY DETECTION OF ACID DEPOSITION DAMAGE. AN ADDITIONAL 50 PLOTS
ARE PLANNED BEYOND THE 60 CURRENTLY IN PLACE. SITES ARE GENERALLY
LOCATED NEAR DEPOSITION MONITORING STATIONS.
REFDOC : MAGASI, L. P. AND M. K. MAHENDRAPPA. 1984. THE CANADIAN FORESTRY
SERVICE ACID RAIN NATIONAL EARLY WARNING SYSTEM. MARITIMES FOREST
RESEARCH CENTER, FREDERICTON, NEW BRUNSWICK.
CODE : T7.56/G2.123/P0/F1.4/L1.1/D1/V0

NAME : GEOCHEMICAL DATA: CANADIAN SURVEY
TYPE : ECOSYSTEM (WATER QUALITY AND SEDIMENTS)
PARAM : WATER (pH, V, F) SOME SURVEY AREAS ALSO HAVE SEDIMENTS Zn, Cu, Pb,
Ni, Co, Ag, Mn, Cd, Fe, Mo, V, As, Hg, V, AND IONS ON IGNITION AT 500
DEGREES CELSIUS (F, Sb, W, Ba, Sn AND Au)
CAN : SITES IN BRITISH COLUMBIA, SASKATCHEWAN, ONTARIO, NEWFOUNDLAND,
MANITOBA, YUKON AND NORTHWEST TERRITORIES, NEW BRUNSWICK, NOVA SCOTIA
OFTEN : PERIODIC SURVEYS PERFORMED AT VARIABLE TIME INTERVALS
DATES : 1974 - ONGOING
HOW : SAMPLES ANALYZED AT A VARIETY OF LABORATORIES
QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
STOR : DATA STORED ON GEOLOGICAL SURVEY COMPUTERS
CONTACT : E. H. HORN BROOK
ADDRESS : GEOLOGICAL SURVEY OF CANADA
601 BOOTH STREET
OTTAWA, ONTARIO K1A 0E8
TELEPH : (613) 995-4521
FUNDS : GEOLOGICAL SURVEY OF CANADA AND FEDERAL/PROVINCIAL AGREEMENTS
CODE : T7.36/G2.123/P1.2/F4.3/L1.2/D2/V1

NAME : MONITORING ORGANOCHLORINES IN PEREGRINE FALCONS AND THEIR PREY
TYPE : ECOSYSTEM (BIOLOGICAL EFFECTS)
PARAM : ORGANOCHLORINES INCLUDING CHLOROBENZENES, HEPTACHLOR EPOXIDE,
DIELDRIN, DDT, ENDRIN, CHLORDANE, TRANS-NONACHLOR, MIREX, PCBs
CAN : NESTING SITES IN ALBERTA AND NORTHWEST TERRITORIES; PREY SAMPLES
COLLECTED IN ALBERTA, SASKATCHEWAN, ONTARIO, QUEBEC, AND NOVA SCOTIA,
AND WINTERING AREAS OF LATIN AMERICA
OFTEN : CURRENTLY ANNUALLY (EGGS WILL BE MONITORED EVERY 3 YEARS BEGINNING
IN 1986)
DATES : MONITORING OF EGGS 1967 - ONGOING
MONITORING OF PREY 1969 - ONGOING
HOW : UNHATCHED OR ADDLED EGGS COLLECTED AFTER HATCHING COMPLETED. PREY
TRAPPED BY NET OR SHOTGUN. LABORATORY ANALYSIS VIA GAS CHROMATOGRAPHY
(GC) AND GC/MASS SPECTROSCOPY (COMPOUND DEPENDENT).
QAQC : FORMAL LABORATORY PROGRAM
STOR : AVAILABLE IN HARD COPY
CONTACT : J. ELLIOTT
ADDRESS : TISSUE BANK AND REGISTRY BIOLOGIST
NATIONAL WILDLIFE RESEARCH CENTER
CANADIAN WILDLIFE SERVICE
OTTAWA, ONTARIO K1A 0E7
TELEPH : (819) 997-1095
FUNDS : CANADIAN WILDLIFE SERVICE
MISC : PROGRAM DETERMINES ORGANOCHLORINE RESIDUES IN BREEDING PERIGRINE
FALCON POPULATIONS AND IN THEIR PREY IN AN ATTEMPT TO DETERMINE THE
CAUSE OF FALCON POPULATION DECLINE.
CODE : T7.8/G2.123/P1.1/F1.2/L1.2/D2/V1

NAME : SYNOPTIC SURVEY OF CURRENT SURFACE WATER QUALITY AND FISH RESOURCES
TYPE : ECOSYSTEM (WATER QUALITY AND BIOLOGICAL EFFECTS)
PARAM : WATER QUALITY (CHEMICAL COMPOSITON) AND FISH SURVEYS
US : NATIONWIDE
OFTEN : ONE TIME EXAMINATION OF EACH LAKE
DATES : 1984 - 1987
HOW : SEVERAL LABORATORIES INVOLVED IN WATER SAMPLE ANALYSIS
QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
STOR : REPORTS AND DATA BASE PUBLICLY AVAILABLE
CONTACT : DIXON H. LANDER
ADDRESS : ENVIRONMENTAL PROTECTION AGENCY
200 SW 35TH STREET
CORVALLIS, OR 97333
TELEPH : (503) 757-4695
FUNDS : ENVIRONMENTAL PROTECTION AGENCY
MISC : PROJECT IS A NATIONAL-SCALE SYNOPTIC (ONE-TIME) SURVEY OF SURFACE
WATER QUALITY AND FISHERY RESOURCES
CODE : T7.38/G1.123/P0/F1.3/L2.1/D2/V1

NAME : TIME HISTORIES AND TOXIC SUBSTANCES IN ACIDIFIED AQUATIC SYSTEMS
TYPE : ECOSYSTEMS (BIOLOGICAL EFFECTS)
PARAM : TRACE SUBSTANCES (ORGANOCHLORINES AND HEAVY METALS) IN SEDIMENTS
THAT ARE POTENTIALLY TOXIC TO AQUATIC BIOTA AND/OR HUMANS
US : WASHINGTON (OLYMPIC PENINSULA), MASSACHUSETTS, NEW YORK, COLORADO,
UTAH, NORTH CAROLINA, GEORGIA, TENNESSEE
OFTEN : USUALLY EVERY 2 YEARS, ALTHOUGH SOME SITES ARE SAMPLED ONLY ONCE
DATES : 1982 - ONGOING
HOW : MULTIPLE SEDIMENT CORES TAKEN AT SAMPLING SITES. ANALYZED FOR TOXIC
MATERIALS AT DEPARTMENT OF ENERGY ENVIRONMENTAL MEASUREMENTS
LABORATORY.
QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
STOR : AVAILABLE IN VARIOUS REPORTS
CONTACT : M. HEIT
ADDRESS : DEPARTMENT OF ENERGY
ENVIRONMENTAL MEASUREMENTS LABORATORY
376 HUDSON STREET
NEW YORK, NY 10014
TELEPH : (212) 620-3625
FUNDS : DEPARTMENT OF ENERGY
MISC : PROJECT ESTIMATES PAST AND PRESENT RATES OF DEPOSITION AND POLLUTANT
CONCENTRATIONS ASSOCIATED WITH ACID PRECIPITATION, AND ATTEMPTS TO
PREDICT FUTURE DEPOSITION RATES AND CONCENTRATIONS.
CODE : T7.68/G1.123/P1.1/F1.2/L1.1/D2/V0

NAME : ALUMINUM BIOGEOCHEMISTRY STUDY
 ABREV : ALBIOS
 TYPE : ECOSYSTEM (WATERSHED)
 PARAM : DEPOSITION CHEMISTRY; CLIMATE; TREE SPECIES AND GROWTH; SOIL CHEMISTRY; GEOLOGY
 US : EIGHT WATERSHEDS IN EASTERN U.S. (2 IN NEW YORK STATE AND 1 IN WISCONSIN WITH THE REST OUTSIDE THE TRANSBOUNDARY REGION)
 CAN : TWO WATERSHEDS
 OFTEN : VARIABLE, DEPENDING ON THE PARAMETER
 DATES : SPRING 1983 - ONGOING
 HOW : SAMPLES ANALYZED AT SEVERAL LABORATORIES (INCLUDING CORNELL UNIVERSITY, OAK RIDGE NATIONAL LABORATORY, AND COLGATE UNIVERSITY) DEPENDING ON TYPE
 QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
 STOR : ELECTRIC POWER RESEARCH INSTITUTE (EPRI)
 CONTACT : ROBERT GOLDSTEIN
 ADDRESS : ELECTRIC POWER RESEARCH INSTITUTE
 3412 HILLVIEW AVE.
 P.O. BOX 10412
 PALO ALTO, CA 94303
 TELEPH : (415) 855-2593
 FUNDS : EPRI, WISCONSIN DEPT. OF NATURAL RESOURCES, EMPIRE STATE ELECTRIC ENERGY RESEARCH COOPERATIVE, WISCONSIN UTILITIES, NORTHERN STATES POWER, SOUTHERN CALIFORNIA EDISON, UTAH POWER AND LIGHT, U.S. GEOLOGICAL SURVEY

 REFDIC : GOLDSTEIN, R. A. 1984. "RESPONSE OF TREES TO MULTIPLE POLLUTANTS." PRESENTED AT THE WORKSHOP ON ALUMINUM TOXICITY TO TREES, UPPSALA, SWEDEN, MAY 14-17, 1984.

 CODE : T7.456/G12.12/P1.2/F4.3/L1.1/D2/V1

NAME : ACCUMULATION AND EFFECTS OF CONTAMINANTS IN AQUATIC BIOTA
TYPE : ECOSYSTEM (WATER QUALITY, SEDIMENTS, BIOLOGICAL EFFECTS)
PARAM : CHLOROPHENOLS, BENZOTHAZOLES, LINDANE, ORGANOCHLORINES, As, Hg, Pb
CAN : CANAGAGIGUE CREEK, ONTARIO; OTTAWA RIVER, ONTARIO; SHUBENACADIE
HEADWATER LAKES, NOVA SCOTIA; ONE SITE OUTSIDE TRANSBOUNDARY REGION
ON NORTH SASKATCHEWAN RIVER, ALBERTA
OFTEN : SAMPLING FREQUENCY VARIES WITH LOCATION: CANAGAGIGUE CREEK - MONTHLY,
SPRING TO FALL IN 1981, 1984; OTTAWA RIVER - ANNUALLY, 1984 - ONGOING;
NORTH SASKATCHEWAN RIVER - ANNUALLY IN 1984, 1985; SHUBENACADIE
LAKES - TWICE ANNUALLY IN 1984, 1985
DATES : VARIES WITH LOCATION (SEE ABOVE)
HOW : CLAMS, LEECHES, AND OTHER BENTHIC ORGANISMS COLLECTED FROM FOUR
POLLUTED AREAS. ANALYZED AND COMPARED BIOCONCENTRATIONS FOR VARIOUS
CONTAMINANTS.
STOR : CONTACT PRINCIPAL INVESTIGATOR
CONTACT : J. L. METCALFE
ADDRESS : INLAND WATERS DIRECTORATE
867 LAKESHORE ROAD
P.O. BOX 5050
BURLINGTON, ONTARIO L7R 4A6
TELEPH : (416) 336-4685
FUNDS : ENVIRONMENT CANADA
MISC : IDENTIFIES ORGANISMS SUITABLE FOR USE AS INDICATOR ORGANISMS WHEN
MONITORING ENVIRONMENTAL CONTAMINANTS IN AQUATIC ECOSYSTEMS. INCLUDES
BOTH FIELD AND LABORATORY STUDY COMPONENTS.
CODE : T7.368/G2.12/P1.1/F1.1/L2.1/D2/V1

NAME : REGIONAL INTEGRATED LAKE-WATERSHED ACIDIFICATION STUDY
ABREV : RILWAS
TYPE : ECOSYSTEM (WATERSHED)
PARAM : PRECIPITATION CHEMISTRY, CLIMATE, TREE SPECIES, SOILS, LAKE CHEMISTRY
AND GEOLOGY
US : WATERSHEDS IN WISCONSIN, NORTH CAROLINA AND ADIRONDACK PARK, NEW YORK
OFTEN : PRECIPITATION COLLECTED ON AN EVENT BASIS; OTHER PARAMETERS MEASURED
ON A VARIABLE BASIS.
DATES : 1982 - ONGOING
HOW : SAMPLES ANALYZED AT A VARIETY OF LABORATORIES DEPENDING ON SAMPLE
TYPE
QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
STOR : ELECTRIC POWER RESEARCH INSTITUTE
CONTACT : ROBERT GOLDSTEIN
ADDRESS : ELECTRIC POWER RESEARCH INSTITUTE
3412 HILLVIEW AVE.
P.O. BOX 10412
PALO ALTO, CA 94303
TELEPH : (415) 855-2593
FUNDS : ELECTRIC POWER RESEARCH INSTITUTE
CODE : T7.456/G1.12/P1.2/F3.2/L1.1/D2/V1

NAME : MONITORING ORGANOCHLORINES IN SEABIRDS
 TYPE : ECOSYSTEM (BIOLOGICAL EFFECTS)
 PARAM : ORGANOCHLORINES INCLUDING CHLOROBENZENES, HEPTACHLOR EPOXIDE, DIELDRIN, DDT, ENDRIN, CHLORDANE, TRANS-NONACHLOR, MIREX, PCBs
 CAN : 2 BREEDING COLONIES EACH OF 3 BIRD SPECIES ON BOTH WEST (BRITISH COLUMBIA) AND EAST COASTS (NEW BRUNSWICK, NEWFOUNDLAND)
 OFTEN : EACH COLONY SAMPLED EVERY 4 YEARS
 DATES : EAST COAST: 1972 - ONGOING (SOME SITES DATA FROM 1968)
 WEST COAST: 1985 - ONGOING (SOME SITES DATA FROM 1970)
 HOW : RANDOM COLLECTION OF 10 EGGS FROM 10 CLUTCHES OF NESTING DOUBLE-CRESTED CORMORANTS, COMMON PUFFINS, AND LEACH'S PETRELS ON EAST COAST AND DOUBLE-CRESTED CORMORANTS, LEACH'S PETRELS AND RHINOCEROS AULDETS ON WEST COAST.
 QAQC : FORMAL LABORATORY PROGRAM
 STOR : AVAILABLE IN HARD COPY
 CONTACT : J. ELLIOTT
 ADDRESS : TISSUE BANK AND REGISTRY BIOLOGIST
 NATIONAL WILDLIFE RESEARCH CENTER
 CANADIAN WILDLIFE SERVICE
 OTTAWA, ONTARIO K1A 0E7
 TELEPH : (819) 997-1095
 FUNDS : CANADIAN WILDLIFE SERVICE
 MISC : PROJECT MONITORS TEMPORAL TRENDS OF ORGANOCHLORINES IN THE MARINE ENVIRONMENT BY USING SEABIRDS AS INDICATOR SPECIES. DATA ON ORGANOCHLORINE LEVELS IN GANNET EGGS ALSO AVAILABLE FOR 1968-1984.
 CODE : T7.8/G2.13/P1.1/F1.2/L1.2/D2/V1

(Other Sites Visited Sporadically)

Geographical locations of Seabird Monitor Colonies on the Atlantic Coast of Canada.

NAME : INTEGRATED FOREST STUDY
 TYPE : ECOSYSTEM (DEPOSITION, FORESTS)
 PARAM : ATMOSPHERIC DEPOSITION AND CHEMISTRY, THROUGHFALL, LITTERFALL; SOIL CHEMISTRY; VEGETATION
 US : 2 SITES IN WASHINGTON STATE (THOMPSON RESEARCH CENTER, FINDLEY LAKE) AND 2 IN NEW YORK (WHITEFACE MOUNTAIN, HUNTINGTON FOREST). THERE ARE OTHER U.S. SITES OUTSIDE THE TRANSBOUNDARY REGION.
 CAN : 1 SITE IN ONTARIO (TURKEY LAKES WATERSHED)
 OFTEN : PRECIPITATION SAMPLING ON AN EVENT BASIS, OTHER SAMPLING VARIES DEPENDING ON SEASON AND LOCATION
 DATES : ONGOING 4 YEAR STUDY
 HOW : MOST OF THE PROCEDURES AND PROTOCOLS ARE STANDARDIZED ACROSS ALL SITES. DIFFERENCES ARE THE EXCEPTION; CONTACT PRINCIPAL INVESTIGATOR.
 QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
 STOR : DATA STORED ON PERSONAL COMPUTERS, EVENTUALLY WILL BE MADE PUBLICALLY AVAILABLE
 CONTACT : LOU PITELKA
 ADDRESS : ELECTRIC POWER RESEARCH INSTITUTE
 3412 HILLVIEW AVE.
 P.O. BOX 10412
 PALO ALTO, CA 94303
 TELEPH : (415) 855-2969
 FUNDS : ELECTRIC POWER RESEARCH INSTITUTE
 CODE : T7.456/G1.13/P1.2/F3.3/L1.1/D2/V1

NAME : EFFECTS OF ACID RAIN, NATURAL ACIDIFICATION AND HARVESTING ON CATION
REMOVAL FROM FOREST SOILS
TYPE : ECOSYSTEM (WATER QUALITY, DEPOSITION MONITORING, SOILS)
PARAM : IMPORT AND EXPORT OF H, Ca, K, AND Mg IONS; IN ADDITION THERE IS
MONITORING OF PRECIPITATION AND WATING (SOME SITES DATA FROM 1970)
US : MAINE, NEW HAMPSHIRE, WASHINGTON, TENNESSEE, SOUTH CAROLINA,
NORTH CAROLINA, CONNECTICUT
OFTEN : SOIL SAMPLED ONCE PER MONTH, STREAM WATER SAMPLES AND PRECIPITATION
SAMPLES COLLECTED WEEKLY, THROUGHFALL COLLECTED SPORADICALLY
DATES : 1980 - ONGOING; ENDED IN ALL STATES BUT MAINE IN 1984; SAMPLING
BEGAN IN 1978 IN NEW HAMPSHIRE
HOW : DATA ANALYZED AT FOREST SCIENCE LABORATORY IN DURHAM, NEW HAMPSHIRE
QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
STOR : ON COMPUTER AT OAK RIDGE NATIONAL LABORATORY
CONTACT : D. W. JOHNSON OR JIM HORNBECK
ADDRESS : OAK RIDGE NATIONAL U.S. FOREST SERVICE
LABORATORY P.O. BOX 640
P.O. BOX X - BLDG. 1505 DURHAM, NH 03824
OAK RIDGE, TN 37830
TELEPH : (615) 574-7362 (603) 834-0797
FUNDS : ENVIRONMENTAL PROTECTION AGENCY
MISC : EXAMINATION OF CATION EXPORT DUE TO TREE HARVESTING AND AIR POLLUTION
CODE : T7.346/G1.13/P0/F1.0/L1.2/D2/V0

NAME : NEW BRUNSWICK AND NOVA SCOTIA HEADWATER LAKE SURVEY
TYPE : ECOSYSTEM (WATER QUALITY, BIOLOGICAL EFFECTS)
PARAM : WATER CHEMISTRY, FISH CONTAMINANT LEVELS (Cu, Zn, Pb, Hg, Cd, AND
SEVERAL ORGANICS), PLANKTON SURVEYS, FISH SPECIES (PRESENCE-ABSENCE)
CAN : 145 LAKES IN NEW BRUNSWICK AND NOVA SCOTIA
OFTEN : ONE TIME SAMPLE
DATES : 1981 - 1982
HOW : COLLECTION INCLUDED ONE VERTICAL PLANKTON TOW AND FIVE BENTHIC GRAB
SAMPLES PER LAKE
QAQC : WATER CHEMISTRY AND FISH SAMPLING PROTOCOLS SAME AS FOR ONTARIO
HEADWATERS STUDY
STOR : DATA AVAILABLE IN REPORT FORM
CONTACT : R. H. PETERSON OR S. RAY
ADDRESS : DEPT. OF FISHERIES AND OCEANS
ST. ANDREWS BIOLOGICAL STATION
ST. ANDREWS, NEW BRUNSWICK E0G 2X0
TELEPH : (506) 529-8854
FUNDS : CANADA FISHERIES AND OCEANS
CODE : T7.38/G2.1/P1.1/F1.2/L2.1/D2/V1

NAME : AMBIENT AGRICULTURAL PESTICIDE LEVELS IN THE ANNAPOLIS VALLEY OF NOVA SCOTIA
 TYPE : ECOSYSTEM (WATER QUALITY, TOXIC COMPOUNDS)
 PARAM : 15 COMMON AGRICULTURAL PESTICIDES
 CAN : 11 SITES IN NOVA SCOTIA, INCLUDING SITES ON ANNAPOLIS AND CORNWALLIS RIVERS
 OFTEN : 3 TIMES A YEAR
 DATES : MAY 1984 - OCTOBER 1984
 HOW : WATER, SEDIMENT AND FISH SAMPLES COLLECTED USING STANDARD METHODS AND ANALYZED FOR PESTICIDES
 QAQC : RIGOROUS FIELD AND LABORATORY PROTOCOLS FOLLOWED
 STOR : NAQUADAT DATA BASE
 CONTACT : T. A. CLAIR
 ADDRESS : ENVIRONMENT CANADA
 BOX 861
 MONCTON, NEW BRUNSWICK E1C 8N6
 TELEPH : (506) 857-6606
 FUNDS : ENVIRONMENT CANADA
 CODE : T7.368/G2.1/P1.1/F1.2/L2.1/D1/V1

NAME : TOXIC CHEMICALS MEASUREMENT STUDIES IN THE ATLANTIC REGION
TYPE : ECOSYSTEM (WATER QUALITY, SEDIMENTS, BIOLOGICAL EFFECTS)
PARAM : NATIONAL PRIORITY ISSUE CONTAMINANTS OR METALS; Pb, Hg, As, Zn
CAN : 5 SITES ON EACH OF ANNAPOLIS, CORNWALLIS, MIRAMICHI, AND EXPLOITS
RIVERS IN NOVA SCOTIA AND NEW BRUNSWICK
OFTEN : MONTHLY
DATES : 1983 - 1985
HOW : WATER SEDIMENTS AND BIOTA SAMPLES OBTAINED AND ANALYZED
QAQC : FORMAL LABORATORY PROGRAM
STOR : AVAILABLE IN HARD COPY
CONTACT : T. A. CLAIR
ADDRESS : ENVIRONMENT CANADA
WATER QUALITY BRANCH
INLAND WATERS DIRECTORATE
P.O. BOX 861
MONCTON, NEW BRUNSWICK E1C 8N6
TELEPH : (506) 857-6606
FUNDS : INLAND WATERS DIRECTORATE, ENVIRONMENT CANADA
CODE : T7.368/G2.1/P1.1/F1.2/L1.1/D2/V1

NAME : MONITORING OF ACID RIVERS
TYPE : ECOSYSTEM (WATER QUALITY, FISH SURVEYS)
PARAM : pH, MAJOR IONS, METALS, FISH POPULATIONS
CAN : 8 SITES IN NOVA SCOTIA, REDUCING TO 5 SITES IN 1986
OFTEN : MOST RIVERS SAMPLED MONTHLY FOR WATER QUALITY (1 RIVER SAMPLED ONCE OR TWICE A WEEK), FISH POPULATIONS SURVEYED ONCE A YEAR
DATES : 1984 - ONGOING; INITIAL SURVEY WORK BEGAN IN 1980
HOW : 3 LABORATORY BOTTLES FILLED AT EACH SITE. SOME LABORATORY ANALYSES PERFORMED INHOUSE, THE REST PERFORMED AT THE ENVIR. CHEM. SECTION OF VICTORIA GENERAL HOSPITAL.
QAQC : FORMAL LABORATORY PROGRAM
STOR : NAQUADAT DATA BASE
CONTACT : WALTON D. WATT
ADDRESS : FISHERIES AND OCEANS, FRESHWATER & ANADROMOUS DIVISION
P.O. BOX 550
HALIFAX, NOVA SCOTIA B3J 2S7
TELEPH : (902) 426-3606
FUNDS : CANADA FISHERIES AND OCEANS
MISC : CONCENTRATES ON LONG TERM MONITORING
REFDOC : WATT, W. D., C. D. SCOTT, AND W. J. WHITE. 1983. "EVIDENCE OF ACIDIFICATION OF SOME NOVA SCOTIAN RIVERS AND ITS IMPACT ON ATLANTIC SALMON." CAN. J. FISH. AQUAT. SCI., 40:462-473.
CODE : T7.38/G2.1/P1.2/F1.0/L1.1/D1/V1

NAME : KEJIMKUJIK CATCHMENTS STUDY
TYPE : ECOSYSTEM (WATERSHED)
PARAM : SPECIES COMPOSITION, DENSITY, PRIMARY PRODUCTIVITY, NUTRIENT DATA
FOR VEGETATION; PRECIPITATION CHEMISTRY; SOIL WATER CHEMISTRY; SOIL
CHEMISTRY; STEMFLOW AND THROUGHFALL PRECIPITATION CHEMISTRY
CAN : 2 SITES; BEAVERSKIN AND PEBBLELOGGITCH CATCHMENTS, KEJIMKUJIK NATIONAL
PARK, NOVA SCOTIA
OFTEN : WEEKLY PRECIPITATION COLLECTION; DAILY IN SUMMER
DATES : AUGUST 1979 - ONGOING
HOW : INTENSIVE FOREST INVENTORY OF TREES, SHRUBS, HERBS, AND MOSS-LICHEN
TYPES OF VEGETATION; COLLECTION OF PRECIPITATION, STEMFLOW AND
THROUGHFALL.
QAQC : FORMAL FIELD AND LABORATORY PROGRAM
STOR : CONTACT PRINCIPAL INVESTIGATOR
CONTACT : K. E. PERCY
ADDRESS : CANADIAN FOREST SERVICE
BOX 4000
FREDERICTON, NEW BRUNSWICK E3B 5P7
TELEPH : (506) 452-3532
FUNDS : CANADIAN FOREST SERVICE
MISC : CHARACTERIZES BASELINE CONDITION OF FOREST VEGETATION AND SOILS IN
CATCHMENTS. EVIDENCE EXISTS THAT GROUNDWATER HAD A SIGNIFICANT
IMPACT ON SURFACE WATERS IN THE STUDY AREA.
CODE : T7.456/G2.1/P1.2/F1.2/L1.2/D2/V0

NAME : FIELD STUDIES ON AQUATIC MACROPHYTES, AMPHIBIANS AND STEMFLOW AND THROUGHFALL CHEMISTRY
 TYPE : ECOSYSTEM (WATERSHED)
 PARAM : STEMFLOW AND THROUGHFALL CHEMISTRY IN DIFFERENT FORESTS; SURVEY 11 TREE SPECIES IN 4 FOREST TYPES IN DIFFERENT WATERSHEDS; SURVEY AMPHIBIAN HABITAT TO DETERMINE MAJOR CHARACTERISTICS, PERFORM LABORATORY BIOASSAYS TO DETERMINE pH EFFECTS ON AMPHIBIANS; IDENTIFY AQUATIC MACROPHYTES IN LAKES OF DIFFERENT ACIDITIES.
 CAN : KEJIMKUJIK NATIONAL PARK, NOVA SCOTIA
 OFTEN : SAMPLING EVERY WEEK FOR PRECIPITATION
 DATES : MAY - OCTOBER 1981
 HOW : PRECIPITATION SAMPLES COLLECTED IN BUCKETS; ANALYZED AT DALHOUSIE UNIVERSITY.
 QAQC : NO FORMAL PROGRAM
 STOR : DATA AVAILABLE IN HARD COPY REPORTS
 CONTACT : BILL FREEDMAN
 ADDRESS : DEPT. OF BIOLOGY
 DALHOUSIE UNIVERSITY
 HALIFAX, NOVA SCOTIA B3H 4J1
 TELEPH : (902) 424-3829
 FUNDS : MARITIME FOREST RESEARCH CENTER - CANADIAN FORESTRY SERVICE, CANADIAN WILDLIFE SERVICE
 REFDOC : DOLE, J., B. FREEDMAN, AND J. KESEKEV. 1985. "ACIDITY AND ASSOCIATED WATER CHEMISTRY OF AMPHIBIAN HABITATS IN NOVA SCOTIA." CAN. J. ZOO., 63:97-105.
 KESEKEV, J., B. FREEDMAN, G. HOWELL, AND P. CLIFFORD. 1984. "COMPARISON OF THE CHARACTERISTICS OF AN ACIDIC EUTROPHIC AND AN ACIDIC OLIGOTROPHIC LAKE NEAR HALIFAX, NOVA SCOTIA." WATER POLL. RES. J. CAN., 19:1-10.
 CODE : T7.48/G2.1/P0/F1.2/L2.1/D2/V1

NAME : INTERACTIONS OF ACID RAIN AND NITROGEN TRANSFORMATION PROCESSES
 TYPE : ECOSYSTEM (DEPOSITION, VEGETATION, AND SOILS)
 PARAM : SOIL CHEMISTRY; PRECIPITATION - pH, NO₃, SO₄, CATIONS (THAT CAN BE MEASURED VIA INDUCTIVELY COUPLED PLASMA SPECTROSCOPY); TREE CORES, FOLIAGE, LITTER SAMPLES, STEMFLOW, AND THROUGHFALL CHEMISTRY
 CAN : 8 FOREST STANDS AT ACADIA FOREST EXP. STATION, NEW BRUNSWICK
 OFTEN : PRECIPITATION EVENT
 DATES : 1971 - ONGOING
 HOW : NUTRIENT CYCLING DATA COLLECTED AT FOREST STANDS. OPEN-RAIN SAMPLES COLLECTED AT THE ACADIA FOREST EXPERIMENT STATION, NEW BRUNSWICK.
 QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
 STOR : DATA ARE STORED ON COMPUTER; ALSO AVAILABLE IN HARDCOPY
 CONTACT : M. K. MAHENDRAPPA
 ADDRESS : CANADIAN FORESTRY SERVICE
 BOX 4000
 FREDERICTON, NEW BRUNSWICK E3B 5P7
 TELEPH : (506) 452-3549
 FUNDS : CANADIAN FORESTRY SERVICE
 MISC : INVESTIGATES NITROGEN TRANSFORMATION PROCESSES IN FOREST ECOSYSTEMS.
 CODE : T7.456/G2.1/P1.2/F1.2/L1.2/D2/V1

NAME : CHEMISTRY OF SURFACE WATER AND PRECIPITATION FROM A SECTOR OF THE
RIVER OF ESCOUMINS
TYPE : ECOSYSTEM (WATER QUALITY, WET DEPOSITION)
PARAM : PRECIPITATION -- pH, CONDUCTIVITY, SO₄, OTHER MAJOR IONS;
SURFACE WATER -- pH, CONDUCTIVITY, ALKALINITY, SO₄, COLOR, TURBIDITY,
Ca, Mg, Na, K, Al (TOTAL AND SOLUBLE), AND Cu (TOTAL AND SOLUBLE)
CAN : 4 SUB-BASINS NEAR LAKE BOUCHES AT THE HEAD OF THE ESCOUMINS RIVER
IN QUEBEC
OFTEN : DAILY SAMPLING FOR PRECIPITATION
DATES : MARCH AND APRIL 1982
HOW : MOST ANALYSES PERFORMED AT LABORATORY OF THE FISH HABITAT DIVISION,
DEPT. OF FISHERIES AND OCEANS
QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
STOR : ON MICROCOMPUTERS AT FISH HABITAT DIVISION OFFICE
CONTACT : GHISLAIN VERREAULT
ADDRESS : CHAMPLAIN HARBOUR STATION
BOX 15500
QUEBEC, QUEBEC G1K 7Y7
TELEPH : (418) 648-2508
FUNDS : DEPARTMENT OF FISHERIES AND OCEANS, FISH HABITAT DIVISION
MISC : PROJECT EVALUATES THE SENSITIVITY OF THE ESCOUMINS RIVER TO
ACIDIFICATION AND ATTEMPTS TO PREDICT THE IMPACT OF ACIDIFICATION ON
SITES OPEN TO ATLANTIC SALMON.
CODE : T7.34/G2.1/P0/F1.1/L2.1/D2/V1

NAME : ECOLOGICAL MONITORING OF NORTH SHORE SALMON RIVERS
 TYPE : ECOSYSTEM (WATER QUALITY, BIOLOGICAL IMPACTS)
 PARAM : CHEMISTRY; SURFACE AND GROUND (ON TWO RIVERS) WATER pH.....BIOLOGY;
 RESPIROMETRY (BACTERIA - FUNGUS), DIVERSITY AND DENSITY OF BENTHIC
 ORGANISM, DEVELOPMENT ON SURVIVAL OF EGGS AND SALMON FRY
 CAN : 15 RIVERS OF ST. LAWRENCE NORTH SHORE (2 RIVERS FOR BIOLOGICAL STUDY)
 OFTEN : 15 RIVERS: WATER QUALITY, SEASON SAMPLING
 2 RIVERS: BIOLOGY ON WATER QUALITY, DAILY SAMPLING DURING SPRING
 SNOWMELT
 DATES : START 1984 - ONGOING
 HOW : MOST ANALYSIS PERFORMED AT FISH HABITAT DIVISION, LABORATORY (DEPT.
 OF FISHERIES AND OCEANS)
 QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
 STOR : ON MICROCOMPUTERS AT FISH HABITAT DIVISION OFFICE
 CONTACT : GHISLAIN VERREAULT
 ADDRESS : CHAMPLAIN HARBOUR STATION
 BOX 15,500
 QUEBEC, QUEBEC G1K 7Y7
 TELEPH : (418) 648-2508
 FUNDS : FISHERIES AND OCEANS, FISH HABITAT DIVISION
 MISC : MONITORING CHEMICAL AND BIOLOGICAL CHANGES THAT HAVE OCCURRED AS A
 RESULT OF ACIDIFICATION AND TO OBSERVE THE RATE OF PROGRESS
 CODE : T7.38/G2.1/P0/F1.3/L1.1/D2/V1

NAME : HYDROLOGIC BALANCE OF THE LAKE LAFLAMME BASIN
 TYPE : ECOSYSTEM (WATER QUALITY, DEPOSITION)
 PARAM : PRECIPITATION, INTERCEPTION; WATER FLUX THROUGH ORGANIC MATTER AND SOIL OZONE ABOVE WATER TABLE
 CAN : LAKE LAFLAMME, QUEBEC
 OFTEN : WEEKLY
 DATES : 1980 - ONGOING
 HOW : PRECIPITATION AND GROUNDWATER SAMPLER COLLECTED AND ANALYZED.
 QAQC : FORMED FIELD PROGRAM
 STOR : DATA STORED ON COMPUTER, HARDCOPY
 CONTACT : ANDRE P. PLAMONDON
 ADDRESS : UNIVERSITE LAVAL
 PAVILLON VACHON
 BUREAU 0868
 STE. FOY, QUEBEC G1K 7P4
 TELEPH : (418) 656-7120
 FUNDS : DEPARTMENT DES SCIENCES FORESTIERES, FACULTE DE FORESTEREE ET DE GEODESIE
 MISC : PROJECT ATTEMPTS TO QUANTIFY AND MODEL EACH ELEMENT OF THE HYDROLOGIC CYCLE WITHIN THE LAKE LAFLAMME BASIN DURING THE SUMMER.
 CODE : T7.34/G2.1/P0/F3.2/L1.2/D2/V1

NAME : CHEMICAL CHARACTERISTICS OF SNOWFALL AND SEASONAL SNOWCOVERS
 TYPE : ECOSYSTEM (WATERSHED, WINTER DEPOSITION AND SPRING RUNOFF)
 PARAM : SNOWFALL CHEMICAL BUDGETS, CHEMICAL DYNAMICS OF SNOWCOVERS, SNOWMELT
 PROCESSES, FOREST CANOPY - SNOWPACK INTERACTIONS MAJOR IONS, ORGANICS,
 METALS
 CAN : LAURENTIAN PARK QUEBEC (LAKE LAFLAMME)
 OFTEN : WEEKLY (WINTER COLD PERIODS) OR DAILY (SPRING MELT)
 DATES : MARCH 1983 - ONGOING
 HOW : FIELD MEASUREMENTS (PHYSICAL CHARACTERISTICS OF SNOWFALL AND
 SNOWCOVERS). LABORATORY ANALYSIS AT INRS-EAU, QUEBEC (pH,
 CONDUCTIVITY, MAJOR IONS, Fe, Al, Mn, ORGANICS)
 QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
 STOR : MAINFRAME COMPUTERS I) CYBER 830, UNIVERSITE DU QUEBEC, QUEBEC; II)
 VAX/VMS, INRS, QUEBEC
 CONTACT : H. GERALD JONES
 ADDRESS : INRS-EAU,
 2700, RUE EINSTEIN
 C.P. 7500
 STE. FOY, QUEBEC G1V 4C7
 TELEPH : (418) 654-2533
 FUNDS : NSERC (CAN), ENVIRONMENT CANADA (IWD, AES)
 CODE : T7.45/G2.1/P1.2/F1.2/L1.1/D2/V1

NAME : PHYSICAL CHEMICAL CHARACTERISTICS AND BIOLOGY OF 67 LAKES OF THE
REGION NEAR SCHEFFERVILLE, QUEBEC
TYPE : ECOSYSTEM (WATER QUALITY, BIOLOGICAL EFFECTS)
PARAM : WATER CHEMISTRY (INCLUDING pH, ALKALINITY, MAJOR IONS, ALUMINUM, AND
TRACE METALS); BIOLOGICAL PRODUCTIVITY AND ACTIVITY (INCLUDING AQUATIC
AND AVIAN SPECIES)
CAN : 67 LAKES NEAR SCHEFFERVILLE, QUEBEC
OFTEN : ONE TIME SAMPLING
DATES : SUMMER 1981 - SPRING 1982
HOW : LAKES EXHIBITED VARIOUS LEVELS OF ACIDITY AND WERE ALSO SURROUNDED
BY HABITATS FAVORABLE FOR WATERFOWL. EACH LAKE WAS CLASSIFIED
ACCORDING TO ITS MORPHOLOGY, ACIDITY AND AQUATIC PLANTLIFE. AN
INTEGRATED WATER SAMPLE WAS COLLECTED IN DEEPEST PART OF EACH LAKE
AND FIVE TURBIDITY MEASUREMENTS MADE TO WITHIN 1 M OF THE LAKE BOTTOM.
THE TYPE AND ACTIVITIES OF BIRDS IN THE AREA WERE OBSERVED.
QAQC : NO FORMAL PROGRAM
STOR : BQMA DATABASE
CONTACT : YVES GRIMARD OR PAUL POTVIN
ADDRESS : QUEBEC MINISTRY OF THE ENVIRONMENT
3900, MARLY STREET
STE. FOY, QUEBEC
TELEPH : (418) 644-3303
MISC : PROJECT CHARACTERIZES LAKES VIA PHYSICAL CHEMISTRY AND BIOLOGICAL
PARAMETERS AND ATTEMPTS TO ESTABLISH THE EFFECT OF ACIDIFICATION ON
BIRDS RELATIVE TO THE LEVEL OF LAKE ACIDIFICATION.
CODE : T7.38/G2.1/P1.2/F2.2/L2.1/D0/V0

NAME : EFFECTS OF ACIDIC PRECIPITATION AND SPRING pH CHANGE ON ATLANTIC SALMON
 TYPE : ECOSYSTEM (BIOLOGICAL EFFECTS)
 PARAM : CHEMISTRY OF STREAMS (EMPHASIS ON pH, ALKALINITY, AND A1)
 US : 8 SALMON STREAMS IN MAINE, 1 IN VERMONT
 OFTEN : DAILY TO EVERY TWO WEEKS DEPENDING UPON THE SEASON
 DATES : MAY 1981 - DECEMBER 1983
 HOW : DATA ANALYZED AT UNIVERSITY OF MAINE IN ORONO
 QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
 STOR : AVAILABLE FROM PRINCIPAL INVESTIGATOR
 CONTACT : T. A. HAINES
 ADDRESS : FISH AND WILDLIFE SERVICE
 COLUMBIA NATIONAL FISHERIES RESEARCH LABORATORY
 UNIVERSITY OF MAINE, ZOOLOGY DEPT.
 ORONO, ME 04469
 TELEPH : (207) 581-2578
 FUNDS : FISH AND WILDLIFE SERVICE; ENVIRONMENTAL PROTECTION AGENCY
 MISC : STREAM CHEMISTRY DATA WILL BE COMPARED WITH WHAT IS KNOWN ABOUT SENSITIVITY OF SALMON SPECIES. PROJECTS IN NOVA SCOTIA ARE ALSO ADDRESSING THIS ISSUE.

REFDOC : HAINES, T. AND J. AKIELASZEK. 1984. EFFECTS OF ACIDIC PRECIPITATION ON ATLANTIC SALMON RIVERS IN NEW ENGLAND. U.S. FISH AND WILDLIFE SERVICE, EASTERN ENERGY AND LAND USE TEAM, FWS/OBS-80/40.18.

CODE : T7.38/G1.1/P0/F1.2/L2.1/D2/V1

NAME : PREDICTING AND EVALUATING THE EFFECTS OF ACIDIC PRECIPITATION ON
WATER CHEMISTRY AND ENDEMIC FISH
TYPE : ECOSYSTEMS (BIOLOGICAL EFFECTS)
PARAM : WATER CHEMISTRY (pH, MAJOR IONS); FISH SURVEYS
US : 22 SITES IN MAINE
OFTEN : 3 TIMES (WATER), ONCE (FISH)
DATES : 1982 - 1984
HOW : WATER SAMPLES AND FISH SURVEY DATA ANALYZED AT UNIVERSITY OF MAINE
IN ORONO.
QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
STOR : AVAILABLE FROM PRINCIPAL INVESTIGATOR
CONTACT : T. A. HAINES
ADDRESS : FISH AND WILDLIFE SERVICE
COLUMBIA NATIONAL FISHERIES RESEARCH LABORATORY
UNIVERSITY OF MAINE, ZOOLOGY DEPT.
ORONO, ME 04469
TELEPH : (207) 581-2578
FUNDS : ENVIRONMENTAL PROTECTION AGENCY
MISC : PROGRAM ALSO USES FISH SURVEY DATA PREVIOUSLY COLLECTED FOR MAINE.

REFDOC : HAINES. T, S. PAUWELS, AND C. JOGUE. 1986. PREDICTING AND EVALUATING
THE EFFECTS OF ACIDIC PRECIPITATION ON WATER CHEMISTRY AND ENDEMIC
FISH POPULATIONS IN THE NORTHEASTERN UNITED STATES. U.S. FISH AND
WILDLIFE SERVICE, EASTERN ENERGY AND LAND USE TEAM, BIOL. REP.
80(40.23).

CODE : T7.38/G1.1/P0/F1.2/L2.1/D2/V1

NAME : LONG-TERM CHEMICAL AND BIOLOGICAL MONITORING OF MAINE LAKES
TYPE : ECOSYSTEMS (AQUATIC EFFECTS)
PARAM : WATER CHEMISTRY (pH, ALKALINITY AND MAJOR IONS); BIOLOGICAL VARIABLES
US : 6 SITES IN MAINE
OFTEN : 3 TIMES A YEAR
DATES : 1982 - ONGOING
HOW : SAMPLES ANALYZED AT UNIVERSITY OF MAINE IN ORONO.
QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
STOR : STORET AND ACID DATA BASES
CONTACT : T. A. HAINES
ADDRESS : FISH AND WILDLIFE SERVICE
COLUMBIA NATIONAL FISHERIES RESEARCH LABORATORY
UNIV. OF MAINE, ZOOLOGY DEPT.
ORONO, ME 04469
TELEPH : (207) 581-2578
FUNDS : ENVIRONMENTAL PROTECTION AGENCY
MISC : PROJECT STUDIES THE EFFECTS OF ACIDIC PRECIPITATION ON THE CHEMICAL
AND BIOLOGICAL QUALITY OF SENSITIVE LAKES IN MAINE. PROJECT ALSO
EXAMINES RATES OF CHANGE OF ACIDITY AND CHEMISTRY, AND ALSO STUDIES
THE LONG-TERM SUBLETHAL EFFECTS ON FISH POPULATIONS.
CODE : T7.38/G1.1/P0/F1.2/L1.1/D1/V1

NAME : EFFECTS OF ACID PRECIPITATION ON THE AQUATIC HABITAT AND ECOLOGY OF
WATERFOWL AND FISH
TYPE : ECOSYSTEM (BIOLOGICAL EFFECTS)
PARAM : BIOTIC SURVEY
US : 4 LAKES IN MAINE
OFTEN : GENERALLY EVERY TWO WEEKS
DATES : MAY 1982 - JUNE 1985
HOW : NETS, SAMPLING TUBES, FISH EXCLOSURE BOXES USED TO COLLECT FISH AND
OTHER BIOTIC SAMPLES. SAMPLES ANALYZED AT THE UNIVERSITY OF MAINE
IN ORONO.
QAQC : NO FORMAL PROGRAM
STOR : AVAILABLE IN REPORT FORM
CONTACT : M. HUNTER
ADDRESS : UNIVERSITY OF MAINE
WILDLIFE RESOURCES
ORONO, ME 04469
TELEPH : (207) 581-2865
FUNDS : ENVIRONMENTAL PROTECTION AGENCY; FISH AND WILDLIFE SERVICE
MISC : PROJECT EXAMINES THE EFFECT OF ACIDIFICATION ON THE ECOLOGICAL
INTERACTIONS OF MACROPHYTES, INVERTEBRATES, FISH AND WATERFOWL
CODE : T7.8/G1.1/P0/F1.2/L2.1/D2/V1

NAME : EFFECTS OF ACID PRECIPITATION ON FOREST SOILS AND WATERSHED
BIOGEOCHEMISTRY IN NEW ENGLAND
TYPE : ECOSYSTEM (SOIL CHEMISTRY AND BIOLOGICAL EFFECTS)
PARAM : CATION TRANSPORT, PRECIPITATION CHEMISTRY, NUTRIENT LEACHING
US : WHITE MOUNTAINS OF NEW HAMPSHIRE AND AMHERST, MAINE
OFTEN : EVENT BASIS
DATES : 1981 - 1985
HOW : SAMPLES ANALYZED AT UNIVERSITY OF MAINE IN ORONO
QAQC : FORMAL LABORATORY PROGRAM
STOR : AVAILABLE ON UNIVERSITY OF MAINE COMPUTER
CONTACT : C. S. CRONAN
ADDRESS : UNIVERSITY OF MAINE
DEPT. OF BOTANY AND PLANT PATHOLOGY
DEERING HALL
ORONO, ME 04469
TELEPH : (207) 581-3235
FUNDS : DEPARTMENT OF ENERGY
MISC : EXAMINATION OF THE IMPACT OF ACID PRECIPITATION IN FOREST PRODUCTIVITY
CODE : T7.468/G1.1/P1.2/F1.2/L1.1/D2/V1

NAME : BIOLOGICAL FIELD SURVEY OF NORTHEASTERN ACIDIFIED LAKES
TYPE : ECOSYSTEM (BIOLOGICAL EFFECTS)
PARAM : SUB-LETHAL STRESSES ON FISH POPULATIONS AND METABOLIC AND TROPHIC INDICATORS
US : 20 LAKES IN NEW HAMPSHIRE
OFTEN : EACH LAKE SAMPLED TWICE
DATES : SEPTEMBER AND OCTOBER 1983
HOW : MAJORITY OF LABORATORY WORK PERFORMED AT RENSSELAER POLYTECHNIC INSTITUTE (RPI), TROY, NEW YORK
QAQC : FORMAL FIELD AND LABORATORY PROGRAM
STOR : DATA STORED ON COMPUTER AT RPI, REPORT ALSO PUBLISHED BY RPI
CONTACT : R. SINGER OR C. BOYLEN
ADDRESS : RENSSELAER POLYTECHNIC INSTITUTE
DEPT. OF BIOLOGY
FRESH WATER INSTITUTE
TROY, NY 12181
TELEPH : (518) 270-6392
FUNDS : ENVIRONMENTAL PROTECTION AGENCY
MISC : SEE REFERENCE DOCUMENT FOR INFORMATION ON THIS PROJECT AND ADDITIONAL INVESTIGATIONS CONDUCTED BY THIS GROUP

REFDOC : ROBERTS, D. A., R. SINGER, AND C. BOYLEN. 1985. "THE SUBMERSED MACROPHYTE COMMUNITIES OF ADIRONDACK LAKES, NEW YORK, U.S.A. OF VARYING DEGREES OF ACIDITY." AQUATIC BOTANY, 21:219-236.

CODE : T7.8/G1.1/P0/F1.1/L1.1/D2/V0

NAME : ASSESSMENT OF THE IMPACT OF ACID DEPOSITION ON AQUATIC ECOSYSTEMS
IN VERMONT
TYPE : ECOSYSTEM (WATER QUALITY, BIOLOGICAL EFFECTS)
PARAM : pH, ALKALINITY, COLOR, Ca, Mg, NO3, SO4, Na, P, Al, Cl, CONDUCTIVITY.
LIMITED BIOLOGICAL DATA ALSO AVAILABLE.
US : VERMONT - 36 LAKES BEING EXAMINED IN THIS LONG TERM STUDY
OFTEN : WATER QUALITY SAMPLED 4 TIMES PER YEAR (ONCE EACH SEASON) FOR 12
LAKES AND ONCE EVERY TWO YEARS FOR THE REMAINING LAKES
DATES : 1982 - ONGOING
HOW : SAMPLES ANALYZED AT THE VERMONT STATE DEPARTMENT OF WATER RESOURCES
AND ENVIRONMENTAL ENGINEERING LABORATORIES AND AT THE ENVIRONMENTAL
PROTECTION AGENCY LABORATORY IN CORVALLIS, OREGON.
QAQC : FORMAL FIELD PROGRAM UPGRADED IN 1985; LABORATORY PROTOCOLS ALSO
EXIST
STOR : STORET DATABASE
CONTACT : W. MCLEAN
ADDRESS : VERMONT STATE GOVERNMENT
DEPARMENT OF WATER RESOURCES AND ENVIRONMENTAL ENGINEERING
WATER QUALITY DIVISION, MONITORING AND SURVEILLANCE
MONTPELIER, VT 05602
TELEPH : (802) 828-2761
FUNDS : ENVIRONMENTAL PROTECTION AGENCY
MISC : STUDY OF EFFECTS OF ACID PRECIPITATION ON THE CHEMICAL AND BIOLOGICAL
WATER QUALITY OF SENSITIVE LAKES IN VERMONT
CODE : T7.38/G1.1/P0/F1.2/L1.1/D1/V1

Location of 25 of the Monitoring Sites

NAME : FISHERIES STATUS IN RELATION TO ACIDITY IN SELECTED VERMONT WATERS
TYPE : ECOSYSTEM (BIOLOGICAL EFFECTS)
PARAM : MACROINVERTEBRATE, ZOOPLANKTON, PHYTOPLANKTON AND FISH POPULATIONS
US : 29 LAKES IN VERMONT; SELECTED STREAMS EXAMINED AS WELL
OFTEN : GENERALLY ONE TIME SAMPLING OF FISH POPULATION ALTHOUGH SOME SITES
REVISITED. MACROINVERTEBRATE, ZOOPLANKTON AND PHYTOPLANKTON SAMPLED
3 TIMES BETWEEN MAY AND SEPTEMBER OF STUDY YEAR.

DATES : AUGUST 1985
HOW : LAKES QUALITATIVELY SAMPLED WITH NETS AND TRAPS. STREAMS
QUALITATIVELY SAMPLED WITH ELECTROSHOCKING UNIT. SAMPLES ANALYZED
AT DEPARTMENT OF WATER RESOURCES AND ENVIRONMENTAL ENGINEERING
LABORATORY AND AT NORTH CAROLINA STATE UNIVERSITY.

QAQC : FORMAL FIELD AND LABORATORY PROTOCOLS
STOR : DATA AVAILABLE IN HARD COPY REPORTS
CONTACT : R. LANGDON
ADDRESS : VERMONT AGENCY OF ENVIRONMENTAL CONSERVATION
DEPT. OF WATER RESOURCES AND ENVIRONMENTAL ENGINEERING
STATE OFFICE BUILDING
MONTPELIER, VT 05602

TELEPH : (802) 828-2761
FUNDS : ENVIRONMENTAL PROTECTION AGENCY
MISC : PROGRAM COMPLEMENTS SIMILAR SURVEYS IN OTHER NORTHEASTERN STATES
CODE : T7.8/G1.1/P0/F1.2/L1.1/D2/V1

NAME : IMPACT OF FOREST MANAGEMENT AND ACID PRECIPITATION ON NUTRIENTS IN SOIL AND WATER
 TYPE : ECOSYSTEM (SOILS, FOREST IMPACTS)
 PARAM : CYCLING OF WATER, NUTRIENTS, ENERGY IN FOREST ECOSYSTEMS; WEATHERING OF MINERALS; TOXIC METALS; SOIL FERTILITY; TREE CORES; VEGETATION; TERRESTRIAL AND AQUATIC ORGANISMS
 US : 5 SITES IN NEW ENGLAND (NEW HAMPSHIRE, MAINE, CONNECTICUT, VERMONT) INCLUDES A NADP SITE
 OFTEN : DEPENDENT ON THE PARAMETER; SAMPLE COLLECTION COORDINATED WITH OTHER SPECIFIC FIELD PROJECTS
 DATES : 1978 - 1985
 HOW : SAMPLES ANALYZED AT FORESTRY SCIENCES LABORATORY, NEW YORK BOTANICAL GARDEN (CARY ARBORETUM), YALE UNIVERSITY. SOME PARAMETERS MEASURED AT OTHER LABORATORIES.
 QAQC : FORMAL FIELD AND LABORATORY PROGRAM
 STOR : DATA AVAILABLE ON COMPUTER
 CONTACT : R. S. PIERCE
 ADDRESS : NE FOREST EXPR. STA. - FORESTRY SCI. LAB
 CONCORDE-MAST RD - BOX 640
 DURHAM, NH 03824
 TELEPH : (603) 868-5576
 FUNDS : U.S. DEPARTMENT OF AGRICULTURE, U.S. FOREST SERVICE
 MISC : EXAMINES LONG TERM DATA ON GROUNDWATER AND STREAMFLOW IN VARIOUS WATERSHEDS OF THE HUBBARD BROOK EXPERIMENTAL FOREST
 CODE : T7.56/G1.1/P1.2/F1.2/L1.2/D2/V1

• Ecosystem Study Sites
 ⊙ Small Watershed/Ecosystem Study Sites

Tree cores taken throughout all New England States and New York

NAME : MONITORING THE WATER QUALITY OF SIX STREAMS IN THE CATSKILL MOUNTAINS,
 NEW YORK
 TYPE : ECOSYSTEM (WATER QUALITY, DEPOSITION)
 PARAM : WATER AND PRECIPITATION CHEMISTRY (INCLUDING pH, CONDUCTIVITY,
 ALKALINITY AND Al), MAJOR AND MINOR IONS
 US : 7 SITES IN NEW YORK
 OFTEN : 9 TIMES A YEAR FOR STREAMS; WEEKLY PRECIPITATION SAMPLING, WITH
 OCCASIONAL HOURLY SAMPLING DURING STORMS
 DATES : 1983 - ONGOING
 HOW : SAMPLES ANALYZED AT THE U.S. GEOLOGICAL SURVEY LABORATORIES IN ALBANY,
 NEW YORK AND ATLANTA, GEORGIA.
 QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
 STOR : WATSTORE AND ACID DATA BASES
 CONTACT : PETER MURDOCH
 ADDRESS : U.S. GEOLOGICAL SURVEY
 P.O. BOX 1397
 ALBANY, NY 12201
 TELEPH : (518) 472-3108
 FUNDS : ENVIRONMENTAL PROTECTION AGENCY, U.S. GEOLOGICAL SURVEY
 MISC : WILL ALSO EXAMINE INTERACTION OF ACIDIC ATMOSPHERIC DEPOSITION WITH
 WATERSHED SYSTEMS.
 CODE : T7.34/G1.1/P0/F1.2/L1.1/D1/V1

NAME : LAKE ACIDIFICATION MITIGATION PROJECT
ABREV : LAMP
TYPE : ECOSYSTEM (WATER QUALITY, SOILS, BIOLOGICAL EFFECTS)
PARAM : HYDRAULIC AND CHEMICAL LOADING; LAKE MEASUREMENTS (CHEMICAL, BIOLOGICAL, SEDIMENTS, AND PHYSICAL); FISH POPULATION DYNAMICS; SEDIMENT CHARACTERISTICS
US : ADIRONDACK MOUNTAINS, NEW YORK
OFTEN : LOADING MEASURED CONTINUOUSLY; LAKE MEASUREMENTS TAKEN EVERY 3 WEEKS EXCEPT DURING INTENSIVE STUDIES
DATES : 1983 - ONGOING
STOR : PAPERS AND INTERIM REPORTS PUBLISHED. FINAL REPORT TO BE PUBLISHED AT THE END OF 1987
CONTACT : D. PORCELLA
ADDRESS : ELECTRIC POWER RESEARCH INSTITUTE
3412 HILLVIEW AVENUE
PALO ALTO, CA 94304
TELEPH : (415) 855-2723
FUNDS : ELECTRIC POWER RESEARCH INSTITUTE
MISC : CHEMICAL MEASUREMENTS INCLUDE pH, Al, Ca, F, NUTRIENTS, DISSOLVED ORGANIC CARBON, DISSOLVED INORGANIC CARBON AND TRACE METALS.
CODE : T7.368/G1.1/P1.2/F3.2/L1.1/D2/V0

NAME : INTEGRATED LAKE-WATERSHED ACIDIFICATION STUDY
 ABREV : ILWAS
 TYPE : ECOSYSTEM (WATERSHED)
 PARAM : PRECIPITATION CHEMISTRY; (pH, CONDUCTIVITY, SO₄, NO₃, NH₄, Cl, Na, K, Ca, Mg, Al, P, DISSOLVED ORGANIC CARBON) CLIMATE; TREE SPECIES; SOILS; LAKE CHEMISTRY AND GEOLOGY
 US : THREE FORESTED WATERSHEDS IN ADIRONDACK PARK AND OTHER SITES IN THE AREA OF SYRACUSE, NEW YORK. INCLUDED 4 SITES OF UP TO 7 PRECIPITATION CHEMISTRY SAMPLERS
 OFTEN : PRECIPITATION COLLECTED ON AN EVENT BASIS; DRY DEPOSITION WEEKLY MEASUREMENT OF OTHER PARAMETERS VARIED. SEVERAL FIELD INTENSIVES PERFORMED
 DATES : 1977 - 1981
 HOW : PRECIPITATION COLLECTED WITH AEROCHEM METRICS 201 WET/DRY SAMPLERS AND BULK SAMPLERS. PRECIPITATION CHEMISTRY ANALYZED AT RENSSELAER POLYTECHNIC INSTITUTE. OTHER TYPES OF SAMPLES ANALYZED AT UNIVERSITY LABORATORIES, INCLUDING UNIVERSITY OF VIRGINIA AND CORNELL UNIVERSITY.
 QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
 STOR : ELECTRIC POWER RESEARCH INSTITUTE
 CONTACT : ROBERT GOLDSTEIN
 ADDRESS : ELECTRIC POWER RESEARCH INSTITUTE
 3412 HILLVIEW AVE.
 P.O. BOX 10412
 PALO ALTO, CA 94303
 TELEPH : (415) 855-2593
 FUNDS : ELECTRIC POWER RESEARCH INSTITUTE
 REFDOC : MANY DOCUMENTS AVAILABLE; CONTACT R. GOLDSTEIN FOR PUBLICATION LIST. REPRESENTATIVE DOCUMENTS INCLUDE:

GOLDSTEIN, R. A., S. A. GHERINI, C. W. CHEN, L. MOK, AND R. J. M. HUDSON. 1984. "INTEGRATED ACIDIFICATION STUDY (ILWAS): A MECHANISTIC ECOSYSTEM ANALYSIS." PHIL. TRANS. R. SOC. LOND., 305:409-425.

GOLDSTEIN, R. A. AND S. A. GHERINI. 1984. THE INTEGRATED LAKE - WATERSHED ACIDIFICATION STUDY, VOL. 4: SUMMARY OF MAJOR RESULTS. EPRI EA-3221 VOL. 2, ELECTRIC POWER RESEARCH INSTITUTE, PALO ALTO, CALIFORNIA.

CODE : T7.456/G1.1/P1.2/F3.2/L2.1/D2/V1

NAME : ALUMINUM STREAM STUDY
ABREV : ALSS
TYPE : ECOSYSTEM (WATER QUALITY; BIOLOGICAL EFFECTS)
PARAM : STREAM FLOW; pH, MAJOR IONS, Al, Fe, DISSOLVED ORGANIC CARBON,
DISSOLVED INORGANIC CARBON AND NUTRIENTS IN WATER SAMPLES; SOIL
CHARACTERISTICS; VEGETATION SURVEYS; MICROBIAL, INVERTEBRATE,
EPITHILIC AND FISH CUMMUNITIES SURVEYED
US : ADIRONDACK MOUNTAINS, NEW YORK; GREAT SMOKY MOUNTAINS IN TENNESSEE
AND NORTH CAROLINA
OFTEN : CONTINUOUS FOR STREAM FLOW AND pH. VARIES FOR OTHER PARAMETERS FROM
HOURS TO WEEKS
DATES : 1983 - ONGOING
HOW : CONTINUOUS pH AND STREAM FLOW MONITORING. CHEMICAL PARAMETERS
ANALYZED INCLUDED Al, F, DISSOLVED ORGANIC CARBON, DISSOLVED INORGANIC
CARBON, NUTRIENTS. MICROBIAL, INVERTEBRATE, EPITHILIC, AND FISH
COMMUNITIES MONITORED.
QAQC : FORMAL FIELD AND LABORATORY PROGRAM
STOR : PAPERS AND INTERIM REPORTS WILL BE PUBLISHED AND AVAILABLE TO THE
PUBLIC. FINAL REPORT WITH TABLES OF DATA AVAILABLE BY MID-1986.
CONTACT : D. PORCELLA
ADDRESS : ELECTRIC POWER RESEARCH INSTITUTE
3412 HILLVIEW AVENUE
P.O. BOX 10412
PALO ALTO, CA 94304
TELEPH : (415) 855-2723
FUNDS : ELECTRIC POWER RESEARCH INSTITUTE
CODE : T7.3568/G1.1/P1.2/F3.2/L1.1/D2/V0

NAME : EXTENSIVE EVALUATION OF LAKE LIMING, RESTOCKING STRATEGIES AND FISH
POPULATION RESPONSE IN ACID LAKES FOLLOWING NEUTRALIZATION BY LIMING
TYPE : ECOYSYTEM (BIOLOGICAL EFFECTS)
PARAM : WATER CHEMISTRY AND FISH POPULATIONS
US : NEW YORK
OFTEN : WATER QUALITY SAMPLED ONCE A MONTH; FISH POPULATIONS SURVEYED IN THE
SPRING AND FALL
DATES : SEPTEMBER 1983 - SEPTEMBER 1987 (SCHEDULED)
HOW : SAMPLES ANALYZED IN THE FIELD AND AT THE COOPERATIVE FISHERIES UNIT
LABORATORY AT CORNELL UNIVERSITY.
QAQC : FORMAL FIELD AND LABORATORY PROGRAM
STOR : REPORT
CONTACT : S. P. GLOSS OR C. L. SCHOLFIELD
ADDRESS : CORNELL UNIVERSITY - COOPERATIVE FISHERIES UNIT
204 FERNOW HALL
ITHACA, NY 14853
TELEPH : (607) 255-2014
FUNDS : ENVIRONMENTAL PROTECTION AGENCY
MISC : PROJECT EXAMINES VARIATION IN THE RESPONSE OF FISH POPULATIONS TO
LIMING AND EVALUATES SUCCESS OF VARIOUS RESTOCKING STRATEGIES.
CODE : T7.38/G1.1/P0/F1.1/L1.1/D2/V1

NAME : TOXIC SUBSTANCES IN THE BIOTA OF ACIDIFIED AQUATIC ECOSYSTEMS
TYPE : ECOSYSTEM (WATER QUALITY, BIOLOGICAL EFFECTS)
PARAM : MEASUREMENTS OF TOXIC AND POTENTIALLY TOXIC SUBSTANCES IN BIOTA
(PRIMARILY FISH)
US : LAKES IN ADIRONDACK MOUNTAINS, NEW YORK AND RESERVOIRS IN SMOKEY
MOUNTAINS OF TENNESSEE, GEORGIA AND NORTH CAROLINA
OFTEN : ONCE AT EACH SITE
DATES : 1982 - ONGOING
HOW : FISH AND OTHER BIOTA COLLECTED AND ANALYZED FOR TOXIC COMPOUNDS AT
THE DEPARTMENT OF ENERGY ENVIRONMENTAL MEASUREMENTS LABORATORY.
SOME ANALYSES ALSO PERFORMED BY OTHER LABORATORIES.
QAQC : FORMAL LABORATORY PROGRAM; NO FORMAL FIELD PROGRAM
STOR : HARD COPY PUBLICATIONS AVAILABLE
CONTACT : M. HEIT
ADDRESS : DEPARTMENT OF ENERGY
ENVIRONMENTAL MEASUREMENTS LABORATORY
376 HUDSON ST.
NEW YORK, NY 10014
TELEPH : (212) 620-3625
FUNDS : DEPARTMENT OF ENERGY
MISC : PROJECT EXAMINES THE HEALTH IMPACT TO HUMANS FROM INGESTING BIOTA
FROM ACIDIFIED LAKES.
CODE : T7.38/G1.1/P1.1/F1.1/L1.1/D2/V0

NAME : A FIELD SURVEY OF BIOTA AND SELECTED WATER CHEMISTRY PARAMETERS IN
 ACIDIFIED WATERS OF THE ADIRONDACK MOUNTAIN REGION OF NEW YORK STATE
 TYPE : ECOSYSTEM (BIOLOGICAL EFFECTS)
 PARAM : WATER CHEMISTRY (MAJOR IONS); PHYTOPLANKTON, ZOOPLANKTON, MACROPHYTES
 AND FISH POPULATION SURVEYS
 US : 50 LAKES AND PONDS IN NEW YORK
 OFTEN : 20 WATERS 3 TIMES; 30 WATER 1 TIME
 DATES : MAY 1984 - NOVEMBER 1984
 HOW : CHEMISTRY SAMPLES ANALYZED AT NEW YORK STATE DEPARTMENT OF HEALTH;
 BIOLOGICAL SAMPLES ANALYZED AT NEW YORK STATE DEPARTMENT OF
 ENVIRONMENTAL CONSERVATION AND NEW YORK STATE MUSEUM AND SCIENCE
 SERVICE
 QAQC : PROJECT FOLLOWS ENVIRONMENTAL PROTECTION AGENCY GUIDELINES
 STOR : DATA BEING PLACED INTO A FORM COMPATIBLE WITH STORET DATA BASE
 CONTACT : J. W. SUTHERLAND
 ADDRESS : NEW YORK STATE DEPT. OF ENVIRONMENTAL CONSERVATION
 BUREAU OF TECHNICAL SERVICES AND RESEARCH
 50 WOLF ROAD
 ALBANY, NY 12233-0001
 TELEPH : (518) 457-7470
 FUNDS : NATIONAL ACID PRECIPITATION ASSESSMENT PROGRAM (ENVIRONMENTAL
 PROTECTION AGENCY)
 MISC : PROJECT STUDIES THE RELATIONSHIP BETWEEN WATER CHEMISTRY AND
 BIOLOGICAL POPULATIONS.
 CODE : T7.38/G1.1/P1.2/F1.2/L1.1/D2/V1

NAME : IN SITU BIOASSAYS OF FISH IN ACID WATER
 TYPE : ECOSYSTEM (BIOLOGICAL EFFECTS)
 PARAM : WATER CHEMISTRY (MAJOR IONS, TRACE METALS); IN SITU VERIFICATIONS
 OF IMPACT OF LOW pH/HIGH ALUMINUM WATERS ON FISH
 US : NORTH BRANCH OF BIG MOOSE WATERSHED SYSTEM IN NEW YORK (10 SITES IN
 STREAMS, 6 IN LAKE)
 OFTEN : VARIED FROM ONCE A WEEK TO TRI-WEEKLY
 DATES : AUGUST 1983 - AUGUST 1985
 HOW : FISH EXPOSED IN EGG CHAMBERS, PLASTIC JUGS, MINNOW TRAPS, AND NETS.
 MORTALITY ASSESSED IN SITU. WATER CHEMISTRY ANALYZED BY SYRACUSE
 UNIVERSITY AND NEW YORK STATE DEPT. OF ENVIRONMENTAL CONSERVATION.
 QAQC : ENVIRONMENTAL PROTECTION AGENCY PROTOCOLS FOLLOWED
 STOR : REPORT AND JOURNAL ARTICLES PUBLICLY AVAILABLE
 CONTACT : HOWARD SIMONIN
 ADDRESS : NEW YORK STATE DEPT. OF ENVIRONMENTAL CONSERVATION
 8314 FISH HATCHERY ROAD
 ROME, NY 13440
 TELEPH : (315) 337-0910
 FUNDS : ENVIRONMENTAL PROTECTION AGENCY AND NEW YORK STATE DEPT. OF
 ENVIRONMENTAL CONSERVATION
 MISC : STUDY DETERMINES SENSITIVITY OF DIFFERENT FISH SPECIES, AS WELL AS
 SENSITIVITY WITHIN A SPECIES AT VARIOUS STAGES IN LIFE, TO TOXICANT(S)
 IN ACIDIFIED WATERS. PROGRAM SUPPLEMENTS OTHER NEW YORK STATE
 DEPARTMENT OF ENVIRONMENTAL CONSERVATION STUDIES.
 CODE : T7.38/G1.1/P1.1/F4.2/L1.1/D2/V1

NAME : EFFECT OF ACIDIC PRECIPITATION ON TEMPORARY POND READINGS AND
AMPHIBIANS IN PENNSYLVANIA
TYPE : ECOSYSTEM (BIOLOGICAL EFFECTS)
PARAM : WATER CHEMISTRY (pH AND MAJOR IONS); BIOTA SURVEYS
US : 76 SITES IN THE EASTERN PART OF PENNSYLVANIA AND THE PINE BARRENS OF
NEW JERSEY
OFTEN : VARIED
DATES : JUNE 1982 - JULY 1985
HOW : STANDARD EQUIPMENT USED ACCORDING TO ENVIRONMENTAL PROTECTION AGENCY
GUIDELINES
QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
STOR : AVAILABLE FROM PRINCIPAL INVESTIGATOR
CONTACT : W. A. DUNSON
ADDRESS : PENNSYLVANIA STATE UNIVERSITY
DEPARTMENT OF BIOLOGY
208 MUELLER LABORATORY
UNIVERSITY PARK, PA 16802
TELEPH : (814) 865-2461
FUNDS : FISH AND WILDLIFE SERVICE; ENVIRONMENTAL PROTECTION AGENCY
MISC : PROJECT INCLUDED A SURVEY OF TEMPORARY FOREST PONDS TO DETERMINE
THE EXTENT OF ACIDIFICATION AND ITS IMPACT. LABORATORY STUDIES OF
IMPACTS ON AMPHIBIANS WERE ALSO CONDUCTED.

REFDOC : THE EFFECT OF ACIDIC PRECIPITATION ON AMPHIBIAN BREEDING IN TEMPORARY
PONDS IN PENNSYLVANIA. 1985. U.S. FISH AND WILDLIFE SERVICE,
BIOLOGICAL REPORT 80(40.22).

FREDA, J. AND W. A. DUNSON. 1984. "SODIUM BALANCE OF AMPHIBIAN
LARVAE DURING ACUTE AND CHRONIC EXPOSURE TO LOW ENVIRONMENTAL pH."
PHYSIOL. ZOOL., 57(4):435-443.

FREDA, J. AND W. A. DUNSON. 1985. "FIELD AND LABORATORY STUDIES
OF RANID TADPOLES CHRONICALLY EXPOSED TO LOW pH." COPEIA,
1985(2):415-423.

CODE : T7.38/G1.1/P3.1/F1.2/L2.1/D2/V1

NAME : BIOLOGICAL AND CHEMICAL IMPACT OF ACID PRECIPITATION ON POCONO MOUNTAIN LAKES
 TYPE : ECOSYSTEM (WATER QUALITY, BIOLOGICAL EFFECTS)
 PARAM : pH, ALKALINITY, CONDUCTIVITY, NO₃, Cl, HARDNESS, Ca, Fe, SOL. Al, Mg, Mn, SO₄, K, DISSOLVED ORGANIC CARBON, PO₄, SECCHI DISK, PHYTOPLANKTON, ZOOPLANKTON, MACROPHYTES, ZOOBENTHOS, FISH, WATERSHED FACTORS
 US : TEN LAKES IN PRELIMINARY SURVEY, THREE LAKES IN MAIN STUDY
 OFTEN : MOST FACTORS SAMPLED SEASONALLY (CA. 3X/YR)
 DATES : NOVEMBER 1980 - AUGUST 1983
 HOW : STANDARD SAMPLING METHODS; SURFACE, MID-DEPTH, AND BOTTOM WATER SAMPLED FOR CHEMISTRY.
 QAQC : STANDARDS AND REPLICATES
 STOR : ON FILE AT LEHIGH UNIVERSITY EXCEPT FISH - ON COMPUTER AT PENNSYLVANIA STATE UNIVERSITY
 CONTACT : PATRICIA T. BRADT
 ADDRESS : CHANDLER-ULLMANN #17
 LEHIGH UNIVERSITY
 BETHLEHEM, PA 18015
 TELEPH : (215) 861-3650
 FUNDS : PENNSYLVANIA POWER AND LIGHT COMPANY
 MISC : THREE-YEAR CHARACTERIZATION OF LAKES OF HIGH, MEDIUM, AND LOW SENSITIVITY TO ACIDIFICATION

 REFDOC : BRADT, P. T., M. B. BERG, D. S. BARRASSO, J. L. DUDLEY, D. E. ARNOLD, E. A. PAUL, J. F. P. COTTER, P. B. MYERS JR., P. SITKOWSKI, AND R. N. WEISMAN. 1984. THE BIOLOGICAL AND CHEMICAL IMPACT OF ACID PRECIPITATION ON POCONO MOUNTAIN LAKES. DEPARTMENT OF BIOLOGY, LEHIGH UNIVERSITY, BETHLEHEM, PENNSYLVANIA, 215 PP.

 CODE : T7.38/G1.1/P0/F3.2/L2.1/D2/V1

NAME : CYCLING OF MATERIALS FROM ATMOSPHERIC DEPOSITION IN URBAN FOREST ECOSYSTEMS
 TYPE : ECOSYSTEM (WATER QUALITY, DEPOSITION, FOREST)
 PARAM : MAJOR IONS IN PRECIPITATION AND RUNOFF; PLANT NUTRIENTS, METALS IN SOIL; TREE GROWTH
 US : SITE IN CENTRAL PENNSYLVANIA NEAR UNIVERSITY PARK
 OFTEN : SPECIFIC STORMS SELECTED FOR PRECIPITATION COLLECTION AND ANALYSIS
 DATES : 1982 - ONGOING
 HOW : ALL CHEMICAL ANALYSES OF PRECIPITATION, RUNOFF, AND SOIL SAMPLES PERFORMED AT PENNSYLVANIA STATE UNIVERSITY.
 QAQC : FORMAL LABORATORY PLAN; NO FORMAL FIELD PLAN
 STOR : DATA SETS PUBLICLY AVAILABLE, PUBLICATIONS AVAILABLE
 CONTACT : H. G. HALVERSON
 ADDRESS : NORTHEAST FOREST EXPERIMENTAL STATION
 PENNSYLVANIA STATE UNIVERSITY
 ROOM 104 - ACADEMIC PROJECTS BUILDING
 UNIVERSITY PARK, PA 16802
 TELEPH : (814) 863-1933
 FUNDS : U.S. FOREST SERVICE
 MISC : STUDY OF ATMOSPHERIC DEPOSITION ON URBAN FORESTS

REFDOC : MANY DOCUMENTS AVAILABLE; CONTACT H. G. HALVERSON FOR PUBLICATION LIST. REPRESENTATIVE DOCUMENTS INCLUDE:

HALVERSON, H. G., D. R. DEWALLE AND W. E. SHARPE. 1984. "CONTRIBUTION OF PRECIPITATION TO QUALITY OF URBAN STORM RUNOFF." WATER RESOURCES BULLETIN, 20(6):859-864.

HALVERSON, H. G., E. S. CORBETT AND G. M. HEISLER. 1983. "USDA STUDIES URBAN FORESTS AND MUNICIPAL WATERSHEDS." SCI. AGRIC., 30(2):13.

CODE : T7.45/G1.1/P0/F1.1/L2.1/D2/V1

NAME : THE IMPACT OF ATMOSPHERIC DEPOSITION AND LAND USE PRACTICES ON WATER
QUALITY FROM FORESTED MUNICIPAL WATERSHEDS
TYPE : ECOSYSTEM (WATERSHEDS)
PARAM : INFLUENCE OF ATMOSPHERIC DEPOSITION ON WATER QUALITY; EXTREME
FLUCTUATION IN STREAM WATER pH AND ACIDITY
US : 3 WATERSHEDS AND SEVERAL OTHER SITES IN PENNSYLVANIA
OFTEN : WEEKLY SAMPLING; SELECTED STORM FLOW SAMPLES ALSO TAKEN
DATES : 1978 - ONGOING
HOW : SAMPLES ANALYZED AT PENNSYLVANIA STATE UNIVERSITY
QAQC : FORMAL FIELD AND LABORATORY PROGRAM
STOR : PUBLICATIONS AVAILABLE; NO SINGLE DATA FILE CURRENTLY AVAILABLE
CONTACT : E. S. CORBETT
ADDRESS : U.S. FOREST SERVICE
NORTHEASTERN FOREST EXPERIMENT STATION
RM. 104 - ACADEMIC PROJECTS BUILDING
PENNSYLVANIA STATE UNIVERSITY
UNIVERSITY PARK, PA 16802
TELEPH : (814) 863-1933
FUNDS : U.S. FOREST SERVICE
MISC : REPORTS WILL BE PRODUCED ON STREAMFLOW TREND ANALYSIS, EPISODE CHANGE
IN STREAMFLOW pH AND VARIATIONS IN PRECIPITATION CHEMISTRY WITHIN
PENNSYLVANIA.
REFDOC : MANY DOCUMENTS AVAILABLE; CONTACT E. S. CORBETT FOR PUBLICATION
LIST. REPRESENTATIVE DOCUMENTS INCLUDE:

LYNCH, J. A., E. S. CORBETT, AND G. B. RISHELL. 1984. ATMOSPHERIC
DEPOSITION: SPATIAL AND TEMPORAL VARIATION IN PENNSYLVANIA, 1983.
LW-8405, INSTITUTE FOR RESEARCH ON LAND AND WATER RESOURCES,
UNIVERSITY PARK, PENNSYLVANIA.

HANNA, C. M., J. A. LYNCH, AND E. S. CORBETT. 1983. "WATERSHED
RESPONSES AND STORM FLOW CHEMISTRY CHANGES FOLLOWING PRECIPITATION."
RES. BRIEFS, 16(1):15-16.

CODE : T7.48/G1.1/P0/F1.2/L1.2/D2/V1

NAME : GREAT LAKES NEAR SHORE CONTAMINANT ANALYSIS
TYPE : ECOSYSTEM (BIOLOGICAL EFFECTS)
PARAM : PCBs, ORGANOCHLORINES, PESTICIDES, Cd, Pb, Hg
US : 14 TOTAL SAMPLING LOCATIONS ON LAKE ONTARIO, LAKE ERIE, NIAGARA
RIVER, AND ST. LAWRENCE RIVER
OFTEN : ANNUALLY
DATES : 1984 - ONGOING
HOW : FISH COLLECTED VIA SEINES ALONG THE SHORELINE. CONDITION OF FISH
(INCLUDING LIPID CONCENTRATION) AND CONCENTRATIONS OF ORGANICS AND
METALS IN 10 COMPOSITES OF 10 FISH DETERMINED.
QAQC : FORMAL LABORATORY PROGRAM
STOR : CONTACT PRINCIPAL INVESTIGATOR
CONTACT : LARRY SKINNER OR EDWARD HORN
ADDRESS : NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
50 WOLFF ROAD
ALBANY, NY 12233
TELEPH : (518) 457-1769
FUNDS : ENVIRONMENTAL PROTECTION AGENCY; NEW YORK STATE
MISC : PROGRAM IS IN AN EVALUATION STAGE; PROTOCOLS AND METHODOLOGY MAY
CHANGE
CODE : T7.8/G1.1/P1.1/F4.2/L1.1/D2/V1

NAME : LAKE ONTARIO CONTAMINENT TREND ANALYSIS
TYPE : ECOSYSTEM (BIOLOGICAL EFFECTS)
PARAM : PCBs, ORGANOCHLORINES, PESTICIDES; DIOXIN AND Hg IN SELECTED SAMPLES
US : 4 SITES IN LAKE ONTARIO, NEW YORK
OFTEN : ONCE A YEAR IN EITHER FALL OR SPRING (SPECIFIC DEPENDENT)
DATES : SPRING 1977 - ONGOING
HOW : 6 SPECIES OF FISH COLLECTED (INCLUDING RAINBOW TROUT, BROWN TROUT
LAKE TROUT, COHO SALMON, AND RAINBOW SMELT). CONCENTRATIONS OF
ORGANICS AND METALS IN ORGANISMS DETERMINED
QAQC : FORMAL LABORATORY PROGRAM
STOR : CONTACT PRINCIPAL INVESTIGATOR
CONTACT : LARRY SKINNER OR EDWARD HORN
ADDRESS : NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
50 WOLFF ROAD
ALBANY, NY 12233
TELEPH : (518) 457-1769
FUNDS : ENVIRONMENTAL PROTECTION AGENCY; NEW YORK STATE
CODE : T7.8/G1.1/P1.1/F4.2/L1.2/D2/V1

NAME : GEOCHEMICAL DATA - EASTERN ONTARIO INTENSIVE STUDY
TYPE : ECOSYSTEM (WATER QUALITY, SEDIMENTS)
PARAM : IN WATER - pH, MAJOR IONS, METALS AND OTHER COMPONENTS
IN SEDIMENTS - CHEMICAL COMPOSITION
CAN : EASTERN ONTARIO; ABOUT 2500 LOCATIONS
OFTEN : ONE SAMPLE PER 13 SQUARE KILOMETERS
DATES : 1982 - 1983
HOW : LAKE SEDIMENT AND WATER SURVEY OF A 38,000 SQUARE KM AREA OF EASTERN
ONTARIO ACID-ALKALI TERRAIN. VARIOUS COMPONENTS OF SAMPLES ANALYZED
BY CHEMEX AND ACME LABORATORIES IN BRITISH COLUMBIA, X-RAY ASSAY
LABS IN TORONTO, ONTARIO AND THE GEOCHEMICAL LABORATORIES OF THE
GEOLOGICAL SURVEY.
QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
STOR : ELEMENT VALUE MAPS AVAILABLE
CONTACT : E. H. HORNBROOK
ADDRESS : GEOLOGICAL SURVEY OF CANADA
601 BOOTH STREET
OTTAWA, ONTARIO K1A 0E8
TELEPH : (613) 995-4521
FUNDS : GEOLOGICAL SURVEY OF CANADA
CODE : T7.36/G2.2/P1.2/F1.4/L2.1/D2/V1

NAME : ONTARIO HEADWATER LAKES ASSESSMENT
TYPE : ECOSYSTEM (WATER QUALITY, BIOLOGICAL EFFECTS)
PARAM : WATER BUFFERING CAPACITY; ORGANICS AND METALS IN WATER AND FISH;
COMMUNITY STRUCTURE (PLANKTON, BENTHOS, FISH); TOTAL BODY LIPID,
METAL AND ORGANIC LEVELS
CAN : 179 LAKES IN ONTARIO
OFTEN : ONE TIME SURVEY; REPEATED 54 LAKES IN 1982, 1985
DATES : CONDUCTED DURING 1979 - 1980
HOW : WATER CHEMISTRY ANALYZED AT INLAND WATERS LABORATORY; BIOLOGICAL
SAMPLES ANALYZED INHOUSE
QAQC : FORMAL LABORATORY PROGRAM
STOR : A REPORT WILL BE PUBLISHED IN THE CANADIAN JOURNAL OF FISHERIES AND
AQUATIC SCIENCES; DATA STORED ON COMPUTER AT THE UNIVERISTY OF ALBERTA
CONTACT : JOHN KELSO
ADDRESS : DEPT. OF FISHERIES AND OCEANS
GREAT LAKES FISHERIES RES. BRANCH
1219 QUEEN ST. EAST
SAULT ST. MARIE, ONTARIO P6A 5M7
TELEPH : (705) 942-2848
FUNDS : DEPARTMENT OF FISHERIES AND OCEANS
CODE : T7.38/G2.2/P1.2/F1.2/L2.1/D2/V1

NAME : ONTARIO HYDRO ATMOSPHERIC DEPOSITION MONITORING NETWORK
 TYPE : ECOSYSTEM (WET DEPOSITION AND AIR QUALITY)
 PARAM : IN PRECIPITATION - pH, SO₄, NO₃, NH₄, Cl, Na, K, Ca, Mg
 IN AIR - MEASURED PARAMETERS INCLUDED SO₂, HNO₃ AND PARTICULATE
 SO₄, NO₃
 CAN : 6 STATIONS IN ONTARIO
 OFTEN : EVENT BASIS
 DATES : BEGAN IN 1975 - MAY 1983
 HOW : WET-ONLY SANGAMO COLLECTORS USED. SAMPLES ANALYZED AT THE ONTARIO
 HYDRO LABORATORY. FILTER SAMPLING OF AIRBORNE POLLUTANTS.
 QAQC : FORMAL LABORATORY PROGRAM
 STOR : ON UNIVAC COMPUTER
 CONTACT : O. T. MELO
 ADDRESS : CHEMICAL RESEARCH DEPT., ONTARIO HYDRO RESEARCH DIVISION
 800 KIPLING AVENUE
 TORONTO, ONTARIO M8Z 5S4
 TELEPH : (416) 231-4111
 FUNDS : CHEMICAL RESEARCH DEPT., RESEARCH DIVISION, ONTARIO HYDRO
 CODE : T7.24/G2.2/P2.1/F3.2/L2.2/D2/V1

NAME : NORTH BAY ACID SNOW PROJECT
 TYPE : ECOSYSTEM (WET DEPOSITION AND AIR QUALITY)
 PARAM : pH, MAJOR IONS, GAS CONCENTRATIONS (O3, NO2, SO2, PAN, HC)
 CAN : SAMPLING IN NORTH BAY AREA, ONTARIO (LESS THAN 10 FIXED SITES PER EVENT)
 OFTEN : EVENT BASIS AT THE SURFACE, AIRBORNE SAMPLING USING AIRCRAFT
 DATES : JANUARY AND FEBRUARY 1984
 HOW : SOME SAMPLES ANALYZED ON SITE; OTHER PARAMETERS MEASURED AT ATMOSPHERIC ENVIRONMENT SERVICE LABORATORIES.
 QAQC : NO FORMAL PROGRAM
 STOR : DATA STORED ON MAGNETIC TAPE AT ATMOSPHERIC ENVIRONMENT SERVICE OFFICE AT DOWNSVIEW
 CONTACT : GEORGE ISAAC
 ADDRESS : CHIEF OF CLOUD PHYSICS RESEARCH DIVISION
 ATMOSPHERIC ENVIRONMENT SERVICE
 4905 DUFFERIN ST
 DOWNSVIEW, ONTARIO M3H 5T4
 TELEPH : (416) 667-4683
 FUNDS : ATMOSPHERIC ENVIRONMENT SERVICE
 MISC : TWO INSTRUMENTED AIRCRAFT AND A HELICOPTER USED TO OBTAIN MEASUREMENTS ALOFT.
 CODE : T7.24/G2.2/P2.1/F1.2/L2.1/D2/V1

NAME : WATER QUALITY MONITORING OF LAKES IN GREATER SUDBURY AREA
 TYPE : ECOSYSTEM (WATER QUALITY, BIOLOGICAL EFFECTS)
 PARAM : pH, ALL MAJOR IONS, METALS, FISH POPULATIONS, PHYTOPLANKTON,
 ZOOPLANKTON
 CAN : 250 LAKES WITHIN 250 KM OF SUDBURY ONTARIO
 OFTEN : SINGLE MIDSUMMER SAMPLING
 DATES : 1981 - 1983 (50 LAKES CONTINUED ANNUALLY, 1984 - PRESENT)
 HOW : SOME WATER QUALITY PARAMETERS MEASURED IN THE FIELD, OTHER PARAMETERS
 ANALYZED AT THE MINISTRY'S SUDBURY AND TORONTO LABORATORIES.
 QAQC : FORMAL FIELD AND LABORATORY PROGRAM
 STOR : ON COMPUTER AT LAURENTIAN UNIVERSITY, SUDBURY
 CONTACT : W. KELLER
 ADDRESS : ONTARIO MINISTRY OF ENVIRONMENT
 199 LARCH STREET
 SUDBURY, ONTARIO P3E 5P9
 TELEPH : (705) 675-4501
 FUNDS : ONTARIO MINISTRY OF THE ENVIRONMENT
 MISC : RESULTS COMPARED WITH SURVEY CONDUCTED IN 1974-1976
 CODE : T7.38/G2.2/P1.2/F2.2/L2.1/D2/V1

NAME : EFFECTS OF ACIDIFICATION ON LAKE AND STREAM CHEMISTRY AND BIOLOGY
 TYPE : ECOSYSTEM (WATER QUALITY AND BIOLOGICAL EFFECTS)
 PARAM : pH, ALKALINITY, MAJOR IONS, NUTRIENTS, DISSOLVED ORGANIC CARBON,
 DISSOLVED INORGANIC CARBON, Al, Fe, Mn, Zn IN WATER; PLANKTON
 COMMUNITIES SURVEYED
 CAN : 8 STUDY LAKES AND 24 STREAMS IN ONTARIO
 OFTEN : LAKE WATER CHEMISTRY EXAMINED EVERY 2 WEEKS (ONLY ONCE A MONTH DURING
 THE ICE SEASON). FISH POPULATIONS SURVEYED EVERY FEW YEARS; STREAM
 CHEMISTRY EXAMINED WEEKLY TO 3 TIMES PER WEEK DEPENDING ON SITE
 DATES : 1976 - ONGOING
 HOW : WATER CHEMISTRY ANALYZED AT THE ONTARIO MINISTRY OF ENVIRONMENT
 LABORATORIES IN TORONTO; PHOTOPLANKTON STUDIED INHOUSE; ANALYSIS
 FOR ZOOPLANKTON PERFORMED BY EXTERNAL CONTRACTORS; FISH STUDIES
 PERFORMED BY UNIVERSITY AND MINISTRY OF NATURAL RESOURCES PERSONNEL.
 QAQC : FORMAL FIELD AND LABORATORY PROGRAM
 STOR : WATER QUALITY DATA IN ONTARIO MINISTRY OF ENVIRONMENT SIS DATABASE;
 BIOLOGICAL DATA STORED INHOUSE ON AN HP 1000 COMPUTER
 CONTACT : P. DILLON
 ADDRESS : ONTARIO MIN. OF ENVIRONMENT
 DORSET RESEARCH CENTRE
 P.O. BOX 39
 DORSET, ONTARIO POA 1E0
 TELEPH : (705) 766-2412
 FUNDS : ONTARIO MINISTRY OF THE ENVIRONMENT
 CODE : T7.38/G2.2/P3.1/F2.3/L1.2/D1/V1

The 24 streams in this study drain into the 8 study lakes (o).

NAME : WATERSHED MASS BALANCES
 TYPE : ECOSYSTEM (WATERSHED)
 PARAM : ATMOSPHERIC DEPOSITION, STREAM CHEMISTRY, BEDROCK GEOLOGY AND SOIL CHARACTERISTICS
 CAN : 24 WATERSHEDS IN SOUTHERN ONTARIO WITHIN A 50 KM RADIUS OF DORSET
 OFTEN : VARIABLE; DAILY DURING PARTS OF THE YEAR, SOMETIMES WEEKLY
 DATES : 1976 - ONGOING
 HOW : NET AND GROSS WATERSHED BUDGETS CALCULATED
 QAQC : FORMAL FIELD AND LABORATORY PROGRAM
 STOR : SIS DATABASE, ADDITIONAL PROCESSING OF DATA ON HP 1000 AT ONTARIO MINISTRY OF THE ENVIRONMENT, DORSET
 CONTACT : P. DILLON
 ADDRESS : ONTARIO MINISTRY OF THE ENVIRONMENT
 DORSET RESEARCH CENTRE
 P.O. BOX 39
 DORSET, ONTARIO POA 1E0
 TELEPH : (705) 766-2412
 FUNDS : ONTARIO MINISTRY OF THE ENVIRONMENT
 MISC : WATERSHEDS ARE SMALL, GENERALLY LESS THAN 10 SQ KM
 CODE : T7.346/G2.2/P1.2/F2.3/L1.2/D1/V1

The 4 precipitation monitoring sites (a,b,c, and d) are depicted.
 The 24 watersheds are located within 50 km of Dorset.

NAME : MONITORING CONTAMINANTS IN GREAT LAKES HERRING GULLS
 TYPE : ECOSYSTEM (BIOLOGICAL EFFECTS)
 PARAM : ORGANOCHLORINES (INCLUDING CHLOROBENZENES, HEPTACHLOR EPOXIDE, DIELDRIN, DDT, ENDRIN, CHLORDANE, MIREX, TRANS-NONACHLOR, PCBs, DIOXINS, FURANS); Hg
 CAN : 2 STANDARD COLONIES ON EACH OF THE GREAT LAKES AND 3 SPECIAL MONITORING COLONIES AT SAGINAW BAY (LAKE HURON), FIGHTING ISLAND (DETROIT RIVER), AND ON THE NIAGARA RIVER
 OFTEN : ANNUALLY IN APRIL AND MAY (EARLY IN NESTING/LAYING PERIOD)
 DATES : 1974 - ONGOING; DATA FROM 1970 EXIST FOR SOME COLONIES.
 HOW : RANDOM COLLECTION OF 10 EGGS FROM 10 CLUTCHES DURING A TRANSECT OF THE COLONY. ANALYSIS OF ORGANICS IN EGGS PERFORMED VIA GAS CHROMATOGRAPHY (GC) AND GC/MASS SPECTROMETRY (EXACT TECHNIQUE COMPOUND DEPENDENT). MERCURY LEVELS DETERMINED VIA FLAMELESS ATOMIC ABSORPTION SPECTROSCOPY.
 QAQC : FORMAL LABORATORY PROGRAM
 STOR : AVAILABLE IN HARD COPY
 CONTACT : J. ELLIOTT
 ADDRESS : TISSUE BANK AND REGISTRY BIOLOGIST
 NATIONAL WILDLIFE RESEARCH CENTER
 CANADIAN WILDLIFE SERVICE
 OTTAWA, ONTARIO K1A 0E7
 TELEPH : (819) 997-1095
 FUNDS : CANADIAN WILDLIFE SERVICE
 MISC : REMAINS OF ALL SAMPLES STORED AT CANADIAN WILDLIFE SERVICE NATIONAL SPECIMEN BANK. ANALYSIS FOR OTHER MATERIALS OCCASIONALLY PERFORMED. PROJECT USES THE HERRING GULL AS AN INDICATOR SPECIE TO DETERMINE TEMPORAL TRENDS AND SPATIAL VARIATION IN CONCENTRATIONS OF CERTAIN ORGANOCHLORINES AND MERCURY IN THE GREAT LAKES ECOSYSTEM.
 CODE : T7.8/G2.2/P1.1/F1.2/L1.2/D2/V1

NAME : ACIDIC PRECIPITATION IN ONTARIO STUDY, TERRESTRIAL WATERSHED
 BIOGEOCHEMISTRY
 ABREV : APIOS-BGC
 TYPE : ECOSYSTEM (WATERSHED)
 PARAM : PRECIPITATION, THROUGHFALL, STEMFLOW CHEMISTRY; LITTER FALL ELEMENT
 CONTRIBUTIONS AND DECOMPOSITION; BIOMASS; ELEMENT STORE IN STANDING
 CROP AND SOIL; SOIL CHEMISTRY; SOIL WATER PERCOLATE CHEMISTRY;
 GROUNDWATER CHEMISTRY
 CAN : TWO LAKE SUB-WATERSHEDS IN MUSKOKA AND HALIBURTON AREAS, ONE LAKE
 SUB-WATERSHED NEAR HAWKEYE LAKE IN THUNDER BAY, AND ANOTHER LAKE
 SUB-WATERSHED NEAR HIGH FALLS, WEST OF SUDBURY. ALL SITES ARE IN
 ONTARIO.
 OFTEN : PRECIPITATION, THROUGHFALL AND STEMFLOW SAMPLED ON AN EVENT BASIS
 (WEEKLY IN THE WINTER); SOIL PERCOLATE COLLECTED WHEN SUFFICIENT
 WATER IS PRESENT; BIOMASS AND SOIL CHEMISTRY WERE SURVEYED ONCE,
 LITTERFALL AND DECOMPOSITION BAGS SEASONALLY
 DATES : 1982 - ONGOING
 HOW : LITTER TRAPS/DECOMPOSITON BAGS USED TO COLLECT LITTER FALL; FOREST
 INVENTORY/TREE HARVEST INFORMATION REVIEWED FOR ELEMENT STORE
 ESTIMATES; DISC AND ZERO TENSION LYSIMETERS EMPLOYED FOR SOIL WATER
 PERCOLATE, SOIL SURVEY AND SAMPLING; PRECIPITATION AND THROUGHFALL
 COLLECTED BY BULK FUNNELS; STEMFLOW COLLECTED BY TREE COLLARS;
 CHEMICAL ANALYSIS ONTARIO MINISTRY OF ENVIRONMENT LABORATORY.
 QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
 STOR : ONTARIO MINISTRY OF ENVIRONMENT SIS DATABASE
 CONTACT : W. I. GIZYN
 ADDRESS : ONTARIO MINISTRY OF THE ENVIRONMENT
 AIR RESOURCES BRANCH
 880 BAY STREET, SUITE 347
 TORONTO, ONTARIO M5S 1Z8
 TELEPH : (416) 965-4516
 FUNDS : ONTARIO MINISTRY OF THE ENVIRONMENT
 MISC : THE PROJECT CONSTRUCTS ELEMENT BUDGETS AND FLUX RATES AND ESTIMATES
 THE EFFECT OF ACID PRECIPITATION ON THESE BUDGETS. WORK IS PERFORMED
 BY THE FORESTRY DEPARTMENT FACULTY OF THE UNIVERSITY OF TORONTO
 (MUSKOKA-HALIBURTON SITES), SENES CONSULTANTS LTD (HAWKEYE) AND
 NORTHERN TERRESTRIAL CONSULTANTS (HIGH FALLS).
 CODE : T7.4568/G2.2/P1.2/F2.3/L1.1/D1/V1

NAME : DECLINE OF SUGAR MAPLE IN ONTARIO
TYPE : ECOSYSTEM (VEGETATION EFFECTS)
PARAM : SOIL CHARACTERISTICS (TEXTURE, pH, BASE SATURATION, ETC.); ELEMENTAL CONCENTRATIONS IN SOIL AND VEGETATION SAMPLES
CAN : SITES IN MUSKOKA, ONTARIO AREA
OFTEN : ONCE FOR INITIAL SAMPLING PROGRAM; REPEAT SAMPLING PLANNED AT PERMANENT OBSERVATION PLOTS
DATES : 1984 - ONGOING
HOW : INTENSIVE SAMPLING OF TREE CORES AND DISKS, ROOTS, LEAVES AND SURROUNDING SOIL AT FIELD SITES. METAL ANALYSIS VIA ATOMIC ABSORPTION, OTHER ELEMENTS BY INDUCTIVELY COUPLED ARGON PLASMA SPECTROMETRY. PERMANENT OBSERVATION PLOTS ESTABLISHED AT SELECTED SITES.
QAQC : LABORATORY PROGRAM
STOR : AVAILABLE FROM PRINCIPAL CONTACT
CONTACT : S. N. LINZON
ADDRESS : MANAGER, PHYTOTOXICOLOGY SECTION
AIR RESOURCES BRANCH
ONTARIO MINISTRY OF THE ENVIRONMENT
880 BAY STREET
TORONTO, ONTARIO M5S 1Z8
TELEPH : (416) 965-4516
FUNDS : ONTARIO MINISTRY OF THE ENVIRONMENT
CODE : T7.56/G2.2/P1.2/F1.2/L1.1/D2/V1

NAME : BIOLOGICAL PRODUCTION, COMMUNITY STRUCTURE, AND SUCCESS IN A
 CALIBRATED WATERSHED
 TYPE : ECOSYSTEM (WATERSHED)
 PARAM : ATMOSPHERIC INPUTS; GROUND WATER CHEMISTRY; WATER FLOW; BIOLOGICAL
 COMMUNITY TYPES AND PRODUCTION, ESPECIALLY FISH
 CAN : 4 LAKES IN THE ALGOMA DISTRICT OF ONTARIO - 60 KM NORTHEAST OF SAULT
 STE. MARIE
 OFTEN : DAILY ATMOSPHERIC MEASUREMENTS, BIWEEKLY WATER CHEMISTRY MEASUREMENTS
 AND ANNUAL BIOLOGICAL SURVEYS
 DATES : 1980 - ONGOING
 HOW : WET DEPOSITION SAMPLED WITH SANGAMO COLLECTORS - ANALYZED AT INLAND
 WATERS LABORATORIES IN BURLINGTON; WATER CHEMISTRY ANALYZED AT THE
 GREAT LAKES FOREST RESEARCH CENTER IN SAULT STE. MARIE; BIOLOGICAL
 SAMPLES ANALYZED IN-HOUSE.
 QAQC : FORMAL LABORATORY PROGRAM
 STOR : WATER CHEMISTRY IN NAQUADAT DATA BASE, OTHER DATA AVAILABLE FROM
 PRINCIPAL INVESTIGATORS
 CONTACT : JOHN KELSO
 ADDRESS : DEPARTMENT OF FISHERIES AND OCEANS
 1219 QUEEN ST. EAST
 SAULT STE. MARIE, ONTARIO P6A 5M7
 TELEPH : (705) 942-2848
 FUNDS : DEPARTMENT OF ENVIRONMENT, DEPARTMENT OF AGRICULTURE, AND DEPARTMENT
 OF FISHERIES AND OCEANS
 MISC : PROJECT EMPHASIZES IDENTIFICATION OF HEAVY METALS THAT INFLUENCE
 BIOTA AND IDENTIFICATION OF BIOTIC STRESSES CAUSED BY LOW pH. LAKE
 SYSTEM HAS A pH SENSITIVE HEADWATER LAKE AND WEAKLY BUFFERED
 DOWNSTREAM LAKES.
 CODE : T7.348/G2.2/P1.2/F1.3/L1.1/D1/V1

NAME : IMPACT OF ACID DEPOSITION ON BIOGEOCHEMISTRY OF FOREST ECOSYSTEMS
 TYPE : ECOSYSTEM (WATERSHED)
 PARAM : pH, MAJOR IONS, TRACE METALS, NUTRIENTS
 CAN : ONE SITE IN THE TURKEY LAKE WATERSHED - 60 KM NORTH OF SAULT ST. MARIE, ONTARIO
 OFTEN : WEEKLY (EVERY 2 WEEKS IN WINTER, MORE INTENSIVE DURING SPRING SNOWMELT)
 DATES : JULY 1980 - ONGOING
 HOW : COLLECT AND ANALYZE PRECIPITATION, THROUGHFALL, STEMFLOW, FOREST FLOOR PERCOLATE, MINERAL SOIL PERCOLATE, GROUNDWATER AND STREAMFLOW. SAMPLES ANALYZED AT THE GREAT LAKES FOREST RESEARCH CENTER IN SAULT ST. MARIE.
 QAQC : FORMAL LABORATORY PROGRAM
 STOR : SOME DATA IN NAQUADAT DATA BASE; OTHER DATA ON CANADIAN FORESTRY SERVICE COMPUTER
 CONTACT : N. W. FOSTER
 ADDRESS : CANADIAN FORESTRY SERVICE
 BOX 490
 SAULT STE. MARIE, ONTARIO P6A 5M7
 TELEPH : (705) 949-9461
 FUNDS : CANADIAN FORESTRY SERVICE
 MISC : STUDY CONDUCTED IN OLD GROWTH HARD MAPLE - YELLOW BIRCH FOREST
 REFDOC : FOSTER, N. W. 1985. "ACID PRECIPITATION AND SOIL SOLUTION CHEMISTRY WITHIN A MAPLE-BIRCH FOREST IN CANADA." FOR. ECOL. MANAGE, 12:215-231.

PLEXMAN, C. A. 1983. "ACID PRECIPITATION - FOREST ECOSYSTEM STUDIES AT TURKEY LAKES WATERSHED." FORESTRY RESEARCH NEWSLETTER, GREAT LAKES FOREST RESEARCH CENTER, SAULT STE. MARIE, ONTARIO.

CODE : T7.346/G2.2/P1.2/F1.2/L1.2/D1/V1

NAME : CASE STUDY OF SELECTED TOXIC SUBSTANCES IN ESSEX REGION
 TYPE : ECOSYSTEM (DEPOSITION, WATER QUALITY)
 PARAM : PCBs, OCTACHLOROSYTRENE, Pb, AND Cd IN ATMOSPHERE, SOIL, SURFACE
 AND GROUND WATERS, AND BIOTA
 CAN : 100 LAKES AND RIVERS IN ESSEX REGION, ONTARIO.
 OFTEN : EVENT AND MONTHLY SAMPLING FOR PRECIPITATION. SAMPLING FOR OTHER
 PARAMETERS VARIES.
 DATES : NOVEMBER 1982 - NOVEMBER 1985
 HOW : SEPARATE SAMPLERS USED FOR DETERMINING METALS AND ORGANICS IN
 PRECIPITATION; GROUNDWATER SAMPLES OBTAINED FROM WELLS. ANALYSIS
 PERFORMED AT CHEMICAL AND GEOGRAPHY DEPARTMENT, UNIVERSITY OF WINDSOR.
 QAQC : FORMAL FIELD AND LABORATORY PROTOCOLS
 STOR : DATA PUBLISHED IN ANNUAL REPORTS; ALSO STORED ON COMPUTER AT THE
 UNIVERSITY OF WINDSOR
 CONTACT : MARIE SANDERSON OR DOUG HEWETT
 ADDRESS : UNIVERSITY OF WINDSOR ENVIRONMENT CANADA
 WINDSOR, ONTARIO 55 ST. CLAIR AVE EAST
 TORONTO, ONTARIO M4T 1M2
 TELEPH : (519) 253-4232
 FUNDS : DEPARTMENT OF ENVIRONMENT
 CODE : T7.2468/G2.2/P1.1/F1.3/L1.1/D2/V1

NAME : EFFECTS OF ATMOSPHERIC ACID DEPOSITION ON WATERSHED/LAKE ECOSYSTEMS
 OF ISLE ROYALE AND MICHIGAN'S KEWEENAW PENINSULA
 TYPE : ECOSYSTEM (WATERSHED)
 PARAM : SNOWPACK DYNAMICS, INPUT/OUTPUT MINERAL NUTRIENT BUDGETS, ANION
 MOBILITY, FOREST AND VEGETATION PRODUCTIVITY
 US : MICHIGAN - 3 WATERSHED SITES AND 2 NATIONAL ATMOSPHERIC DEPOSITION
 PROGRAM (NADP) SITES
 OFTEN : WEEKLY (EVERY 2 WEEKS IN WINTER)
 DATES : SEPTEMBER 1982 - ONGOING
 HOW : MOST ANALYSIS PERFORMED AT MICHIGAN TECHNICAL UNIVERSITY
 QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
 STOR : ON MICROCOMPUTERS AT MICHIGAN TECH; THERE ARE PLANS TO PUT DATA ON
 A MAINFRAME COMPUTER
 CONTACT : R. STOTTLEMYER
 ADDRESS : NATIONAL PARK SERVICE
 DEPT. OF BIOLOGICAL SCIENCES
 MICHIGAN TECHNICAL UNIVERSITY
 HOUGHTON, MI 49931
 TELEPH : (906) 487-2478
 FUNDS : DEPARTMENT OF INTERIOR, NATIONAL PARK SERVICE, AND ENVIRONMENTAL
 PROTECTION AGENCY
 CODE : T7.45/G1.2/P0/F1.3/L1.1/D2/V0

*Lake/watershed ecosystem study sites. **Small watershed study sites.

NAME : ATMOSPHERIC DEPOSITION-RELATED CHANGES WITHIN THE RIPARIAN AND
 TERRESTRIAL REMOTE NATURAL ENVIRONMENTS MANAGED BY THE NATIONAL PARK
 SERVICE
 TYPE : ECOSYSTEM (PRISTINE ENVIRONMENT)
 PARAM : PHYSICAL, CHEMICAL AND BIOLOGICAL CHANGES CAUSED BY ACID DEPOSITION
 US : 4 SITES IN ISLE ROYALE NATIONAL PARK IN MICHIGAN, 5 OTHER SITES
 OUTSIDE TRANSBOUNDARY AREA IN NATIONAL PARKS IN COLORADO AND
 CALIFORNIA
 OFTEN : WEEKLY PRECIPITATION SAMPLING
 DATES : 1982 - ONGOING
 HOW : SAMPLES ANALYZED AT MICHIGAN TECHNICAL UNIVERSITY AND UNIVERSITY OF
 WASHINGTON
 QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
 STOR : DATA SHARED BY GOVERNMENT AGENCIES
 CONTACT : W. GREGG
 ADDRESS : OPERATIONS SUPPORT STAFF
 DEPARTMENT OF THE INTERIOR
 NATIONAL PARK SERVICE
 P.O. BOX 37127
 WASHINGTON, DC 20013-7127
 TELEPH : (202) 343-8122
 FUNDS : DEPARTMENT OF INTERIOR, NATIONAL PARK SERVICE
 MISC : STUDY ASSESSES CHANGES CAUSED BY ACID DEPOSITION WITHIN REPRESENTATIVE
 NATURAL ECOSYSTEMS.
 CODE : T7.34568/G1.2/P1.2/F1.2/L1.1/D2/V1

NAME : FACTORS CONTROLLING WATER CHEMISTRY AND SENSITIVITY TO ACIDIFICATION
 OF LAKES IN UPPER MICHIGAN
 TYPE : ECOSYSTEM (WATERSHED-LAKE CHEMISTRY INTERACTIONS)
 PARAM : HYDROLOGIC TYPOLOGY OF LAKES, WATERSHED MINERALOGY, RATES AND KINETICS
 OF CHEMICAL WEATHERING
 US : 53 LAKE SITES ON THE UPPER PENINSULA OF MICHIGAN
 OFTEN : ONCE OR TWICE BEFORE AND AFTER SNOWMELT
 DATES : 1980 - 1983
 HOW : DATA ANALYZED ON SITE AND AT EPA ENVIRONMENTAL RESEARCH LABORATORY
 IN DULUTH, MINNESOTA.
 QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
 STOR : AVAILABLE IN HARD COPY REPORTS
 CONTACT : J. SCHNOOR
 ADDRESS : UNIVERSITY OF IOWA
 ENERGY ENGINEERING DIVISION
 IOWA CITY, IO 52242
 TELEPH : (319) 353-7262
 FUNDS : ENVIRONMENTAL PROTECTION AGENCY
 CODE : T7.36/G1.2/P1.2/F1.2/L2.1/D2/V1

Distribution of sites and alkalinity clusters for 53 lakes in upper peninsula of Michigan.
 (●=0-40µeq/L; ○=40-200µeq/L; □=200-500µeq/L, and Δ=500µeq/L)

NAME : STATUS OF FISHERY RESOURCES IN SUSCEPTIBLE AND NONSUSCEPTIBLE SURFACE
WATERS IN NORTHERN WISCONSIN
TYPE : ECOSYSTEM (BIOLOGICAL EFFECTS)
PARAM : WATER CHEMISTRY (pH, MAJOR IONS); LAKE SEDIMENT COMPOSITION; FISH
SURVEYS
US : 12 LAKES IN WISCONSIN
OFTEN : WATER CHEMISTRY ANALYZED REGULARLY EVERY QUARTER; SPECIAL SAMPLING
ALSO CONDUCTED AS DEEMED NECESSARY. FISH SURVEYS CONDUCTED IN THE
SUMMER OF 1980; ADDITIONAL FISH SAMPLING IN 1981.
DATES : SUMMER 1980 - SUMMER 1983
HOW : SAMPLES ANALYZED AT THE UNIVERSITY OF WISCONSIN-LA CROSSE, RIVER
STUDIES CENTER
QAQC : FORMAL FIELD PROGRAM
STOR : AVAILABLE FROM PRINCIPAL INVESTIGATOR
CONTACT : J. WIENER
ADDRESS : FISH AND WILDLIFE SERVICE
COLUMBIA NATIONAL FISHERIES RESEARCH LABORATORY
ROUTE 1
COLUMBIA, MO 65201
TELEPH : (314) 875-5399
FUNDS : FISH AND WILDLIFE SERVICE; ENVIRONMENTAL PROTECTION AGENCY; UNIVERSITY
OF WISCONSIN-LA CROSSE
MISC : PROJECT WAS DESIGNED TO ASSESS EFFECTS OF ACID PRECIPITATION AND
TRACE METALS ON FISHERY RESOURCES IN NORTH CENTRAL WISCONSIN.
REFDOC : WIENER, J. G. 1983. COMPARATIVE ANALYSES OF FISH POPULATIONS IN
NATURALLY ACIDIC AND CIRCUMNEUTRAL LAKES IN NORTHERN WISCONSIN.
U.S. FISH AND WILDLIFE SERVICE, KEARNEYSVILLE, WEST VIRGINIA.
CODE : T7.368/G1.2/P1.1/F1.2/L2.1/D2/V1

NAME : MARCELL EXPERIMENTAL FOREST WATERSHED STUDY
 TYPE : ECOSYSTEM (WATER AND SOIL CHEMISTRY)
 PARAM : PRECIPITATION, SOIL AND WATER CHEMISTRY (pH, ALKALINITY, MAJOR IONS)
 US : 6 INSTRUMENTED WATERSHEDS IN THE MARCELL EXPERIMENTAL FOREST, MINNESOTA
 OFTEN : SOIL SURVEYED ONCE; STREAMFLOW MONITORED CONTINUOUSLY; WATER SAMPLED EVERY TWO WEEKS, MORE FREQUENTLY DURING PERIODS OF HEAVY FLOW; PRECIPITATION SAMPLED WEEKLY (NADP)
 DATES : 1978 - ONGOING
 HOW : SAMPLES ANALYZED AT THE FORESTRY SCIENCE LABORATORY OF THE NORTH CENTRAL FOREST EXPERIMENTAL STATION; PRECIPITATION SAMPLES AT ILLINOIS STATE WATER SURVEY
 QAQC : FORMAL LABORATORY PROGRAM, SOME FORMAL PROTOCOLS FOR FIELD WORK
 STOR : DATA SETS PUBLICLY AVAILABLE
 CONTACT : E. S. VERRY
 ADDRESS : NORTH CENTRAL FOREST EXPERIMENTAL STATION
 FORESTRY SCIENCE LABORATORY
 1831 HWY 169 E.
 GRAND RAPIDS, MN 55744
 TELEPH : (218) 326-8571
 FUNDS : U.S. FOREST SERVICE
 MISC : PROJECT STUDIES CHANGES IN FOREST SOIL CHEMISTRY, EXAMINES THE IMPORTANCE OF UPLAND WETLAND ECOSYSTEM LINKAGES TO DELIVER ACID LOADS TO RECEIVING WATERS, AND INTERPRETS THE CHEMISTRY OF PRECIPITATION. ALSO EVALUATES SO4 LOADING AND IMPACT ON LAKES IN NATIONAL FOREST OF MINNESOTA, WISCONSIN, AND MICHIGAN. PROJECT IS PART OF THE "WATER QUALITY MANAGEMENT IN NORTHERN LAKE STATE FORESTS" PROGRAM.
 REFDOC : NICHOLS, D. S. AND E. S. VERRY. 1985. "EVIDENCE FOR THE CULTURAL ACIDIFICATION OF LAKES IN THE NORTHERN LAKE STATES." REPORT OF THE U.S. FOREST SERVICE, GRAND RAPIDS, MINNESOTA.
 CODE : T7.346/G1.2/P1.2/F1.2/L1.2/D2/V1

NAME : CHEMICAL RESIDUES IN FISH IN ALBERTA
TYPE : ECOSYSTEM (BIOLOGICAL EFFECTS)
PARAM : 43 KINDS OF PESTICIDES, PCBs, OTHER ORGANOCHLORINES, Hg
CAN : 25 LAKES AND RIVERS IN SOUTH AND CENTRAL ALBERTA
OFTEN : ONE TIME SAMPLING
DATES : 1980 - ONGOING
HOW : 10 SPECIMENS OF EACH MAJOR FISH SPECIES ARE COLLECTED, EXTRACTED AND
ANALYZED
QAQC : FORMAL FIELD AND LABORATORY PROGRAMS
STOR : HARD COPY RESEARCH REPORTS (PUBLICLY AVAILABLE)
CONTACT : JIM MOORE
ADDRESS : ALBERTA ENVIRONMENT CENTRE
VEGREVILLE, ALBERTA T0B 4L0
TELEPH : (403) 632-6761
FUNDS : ALBERTA ENVIRONMENT
CODE : T7.8/G2.3/P1.1/F2.2/L1.1/D2/V1

NAME : COLUMBIA RIVER WATER QUALITY
 TYPE : ECOSYSTEM (WATER QUALITY, SEDIMENTS, BIOLOGICAL EFFECTS)
 PARAM : HEAVY METALS (Hg, Pb, Cd, Zn, Cu, Ni, As, Se); NUTRIENTS (NO₃, PO₄, DISSOLVED N, DISSOLVED ORGANIC CARBON)
 CAN : COLUMBIA RIVER BETWEEN BIRCHBANK AND WANITA, BRITISH COLUMBIA
 OFTEN : PERMANENT MONITORING STATIONS AT BIRCHBANK AND WANITA; OTHER SAMPLING VIA INTENSIVE FIELD STUDIES BASED ON RIVER FLOWS
 DATES : FIELD MEASUREMENTS 1978 - PRESENT
 HOW : WATER, SUSPENDED SEDIMENT AND FISH SAMPLES COLLECTED AND ANALYZED.
 QAQC : FORMAL LABORATORY PROGRAM
 STOR : DATA AND INTERPRETIVE REPORTS AVAILABLE; CONTACT PRINCIPAL INVESTIGATOR
 CONTACT : S. W. SHEEHAN
 ADDRESS : INLAND WATERS DIRECTORATE
 PACIFIC AND YUKON REGION
 RM 502-1001 WEST PENDER STREET
 VANCOUVER, BRITISH COLUMBIA V6E 2M9
 TELEPH : (604) 666-8007
 FUNDS : ENVIRONMENT CANADA
 MISC : PROGRAM INVESTIGATES THE SPATIAL AND TEMPORAL VARIATION OF METALS AND NUTRIENTS IN THE COLUMBIA RIVER. FIELD STUDIES INCLUDE CROSS-SECTION SAMPLING AT VARIOUS POINTS.
 CODE : T7.368/G2.3/P1.1/F1.2/L1.2/D2/V1

NAME : OKANAGAN RIVER WATER QUALITY
TYPE : ECOSYSTEM (WATER QUALITY, SEDIMENTS, BIOLOGICAL EFFECTS)
PARAM : PESTICIDES, PCBs, AND CHLORINATED ORGANICS PRESENT IN BIOTA, SUSPENDED
SEDIMENTS, AND WATER; WATER NUTRIENTS (NO3, PO4, DISSOLVED N,
DISSOLVED ORGANIC CARBON)
CAN : OSOYOOS REACH OF OKANAGAN RIVER, BRITISH COLUMBIA
OFTEN : INTERMITTENT; COORDINATED WITH PESTICIDE SPRAYING IN REGION, RIVER
FLOWS, ETC.
DATES : 1983 - ONGOING
HOW : SPECIALLY DEVELOPED MIXED RESIN COLUMN PLACED IN WATER FOR COLLECTION
OF ORGANICS
QAQC : FORMAL LABORATORY PROGRAM
STOR : DATA AND REPORTS BEING COMPILED
CONTACT : G. Y. P. KAN
ADDRESS : INLAND WATERS DIRECTORATE
PACIFIC AND YUKON REGIONAL OFFICES
1305 WELCH ST.
NORTH VANCOUVER, BRITISH COLUMBIA V7P 1B3
TELEPH : (604) 987-3543
FUNDS : ENVIRONMENT CANADA
MISC : PROJECT INVESTIGATES THE FATE OF PESTICIDES APPLIED IN THE OKANAGAN
VALLEY, A MAJOR AGRICULTURAL DISTRICT.
CODE : T7.368/G2.3/P1.1/F1.2/L1.1/D2/V1

NAME : CHEMICAL POLLUTANTS IN SEDIMENTS AND DISEASES OF BOTTOM-DWELLING FISH IN PUGET SOUND, WASHINGTON
TYPE : ECOSYSTEM (WATER QUALITY, SOILS, BIOLOGICAL EFFECTS)
PARAM : 25 AROMATIC HYDROCARBONS (INCLUDING ANTHRACENE, BENZO[A]PYRENE, FLUORENE); 26 CHLORINATED ORGANICS (INCLUDING ALDRIN, HEPTACHLOR, LINDANE); 27 METALS AND OTHER ELEMENTS (INCLUDING As, Cd, Pb, Hg, Se, Zn)
US : 43 SAMPLING SITES IN 5 URBAN AND 4 NON-URBAN EMBAYMENTS IN PUGET SOUND, WASHINGTON
OFTEN : VARY Rb ONE FIXED SCHEDULE
DATES : 1979 - ONGOING
HOW : SEDIMENTS AND TISSUE SAMPLES FROM 3 SPECIES OF FISH COLLECTED. PATHOLOGICAL CONDITION OF FISH ALSO DETERMINED (LENGTH, WEIGHT, VISIBLE ABNORMALITIES OR LESIONS). ORGANIC ANALYSIS VIA SOLVENT EXTRACTION AND GAS CHROMATOGRAPHY (GC) AND GC/MASS SPECTROSCOPY (GC/MS); METAL ANALYSIS VIA ACID DEGESTION AND ATOMIC ABSORPTION OR PLASMA EMISSION SPECTROSCOPY
QAQC : FORMAL LABORATORY PROGRAM
STOR : CONTACT PRINCIPAL INVESTIGATOR
CONTACT : DONALD MALINS OR BRUCE MCCAIN
ADDRESS : ENVIRONMENTAL CONSERVATION DIVISION
NATIONAL MARINE FISHERIES SERVICE
SEATTLE, WA 98112
TELEPH : (206) 442-7737
FUNDS : FEDERAL AGENCIES INCLUDING NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
MISC : ELLIOT BAY NEAR SEATTLE AND COMMENCEMENT BAY NEAR TACOMA MOST HEAVILY SAMPLED. FOR COMPLETE LIST OF PARAMETERS ANALYZED AND RESULTS SEE REFERENCE DOCUMENT.
REFDOC : MALINS, D. C., B. B. MCCAIN, D. W. BROWN, S. CHAN, M. S. MYERS, J. T. LANDAHL, P. G. PROHASKA, A. J. FRIEDMAN, L. D. RHODES, D. G. BURROWS, W. D. GRONLUND, AND H. O. HODGINS. 1984. "CHEMICAL POLLUTANTS IN SEDIMENTS AND DISEASES OF BOTTOM - DWELLING FISH IN PUGET SOUND, WA." ENVIRON. SCI. & TECH., 18:705-713.
CODE : T7.368/G1.3/P1.1/F1.3/L1.2/D2/V0

NAME : PAHS IN WASHINGTON COASTAL SEDIMENTS
 TYPE : ECOSYSTEM (AIR QUALITY, SEDIMENTS)
 PARAM : POLYCYCLIC AROMATIC HYDROCARBONS (INCLUDING BENZO [A] PYRENE AND FLUORANTHENE); Pb
 US : AEROSOLS COLLECTED AT QUILLAYUTE, SEQUIM AND SEATTLE, WASHINGTON. RIVERBORNE SUSPENDED PARTICULATES COLLECTED AT TONGUE POINT ON COLUMBIA RIVER, WASHINGTON
 OFTEN : MONTHLY FOR BOTH AIR AND RIVER SEDIMENTS (SUSPENDED PARTICULATE MATTER)
 DATES : JANUARY 1979 - JANUARY 1980
 HOW : AEROSOL COLLECTION VIA HIGH VOLUME AIR SAMPLERS; COLLECTION ON GLASS FIBER FILTERS. RIVER WATER COLLECTED AT MIDCHANNEL AT 1-2 M DEPTH; FILTERED TO OBTAIN PARTICULATES (26 LITERS MINIMUM VOLUME FILTERED). ANALYSIS VIA GAS CHROMATOGRAPHY AND HIGH PRESSURE LIQUID CHROMATOGRAPHY.
 QAQC : FORMAL FIELD PROGRAM
 STOR : CONTACT PRINCIPAL INVESTIGATOR
 CONTACT : FREDRICK PRAHL
 ADDRESS : SCHOOL OF OCEANOGRAPHY
 OREGON STATE UNIVERSITY
 CORVALLIS, OR 97331
 TELEPH : (503) 754-0123
 FUNDS : ENVIRONMENTAL PROTECTION AGENCY
 MISC : STUDY EVALUATES EROSIONAL PROCESS AND DIRECT ATMOSPHERIC DEPOSITION CONTRIBUTIONS TO SEDIMENT PAHS.
 REFDOC : PRAHL, F. G., E. CRECELLUS, AND R. CARPENTER. 1984. "PAHS IN WASHINGTON COASTAL SEDIMENTS: AN EVALUATION OF ATMOSPHERIC AND RIVERINE ROUTES OF INTRODUCTION." ENVIRON. SCI. & TECH., 18:687-693.
 CODE : T7.26/G1.3/P2.1/F1.2/L2.1/D2/V1

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