**User's Guide to a Data Base of
Current Environmental Monitoring
Projects in the U.S.-Canadian
Transboundary Region**

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SUMMARY

This document describes how to use a data base of current transboundary region environmental monitoring projects. The data base was prepared from data provided by Glantz et al. (1986) and Concord Scientific Corporation (1985), and contains information on 226 projects with monitoring stations located within 400 km (250 mi) of the U.S.-Canadian border. The original data base contained the 184 records shown in the appendices of Glantz et al. (1986). The 42 records shown in Appendix A of this report were added in 1987 and cover the Great Lakes Region. They are based on information from Concord Scientific Corporation (1985). The data base is designed for use with the dBASE III PLUS data management systems on IBM-compatible personal computers.

Data-base searches are best accomplished using an accompanying command file called RETRIEVE or the dBASE command LIST. The RETRIEVE file produces a form in which the user enters the project characteristics of interest and indicates whether or not formatted results are to be directed to a screen or to a printer. The RETRIEVE command file is recommended for searches where project characteristics can be linked by conditional .AND. statements, while the LIST command is recommended for searches involving conditional .OR. statements. In both cases, the user must carefully select the substrings on which the search is to be based. Example search requests and subsequent output are presented to illustrate substring selections and applications of the data base.

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1.0 INTRODUCTION

The recently published report entitled An Inventory of Current Environmental Monitoring Projects in the U.S.-Canadian Transboundary Region by Glantz et al. (1986) contained an extensive review of environmental monitoring activities near the U.S.-Canadian border. A data base of transboundary region environmental monitoring activities for use on a personal computer was prepared from the individual project descriptions contained in Appendices B through G of Glantz et al. In 1987, this data base was supplemented with records describing the projects in Concord Scientific Corporation (1985). The data base provides ready access to information characterizing the region's environmental monitoring projects and a simple method for identifying projects with selected characteristics.

The data base currently contains descriptions of the 184 environmental monitoring projects that were presented in the appendices of Glantz et al. (1986) and 42 projects presented in Appendix A of this report. All projects involve sampling conducted at sites within 400 km (250 mi) of the U.S.-Canadian border. These projects encompass environmental studies in the areas of air and water quality; deposition monitoring; soils, forest, and vegetation research; and ecosystem impacts. Entries emphasize studies related to acid deposition although representative projects in other areas of environmental monitoring are also included. Each project description includes such information as the name of the project; its common acronym; program emphasis; monitoring site locations; time period; parameters measured; protocols employed; frequency of sample collection; data storage information; and the name, address, and phone number of the principal contact for the project.

The data base of transboundary region environmental monitoring projects was created using the dBASE III PLUS data-base management system. The data base was created on, and is designed for use with, IBM-compatible personal computers.

This user's guide is designed to provide an overview of the data base of transboundary region environmental monitoring projects. The data-base structure and the major dBASE III PLUS commands needed for typical searches are

described. Examples of actual search procedures (input and output) are presented in the following sections. In preparing the guide we have assumed that readers are familiar with the report of Glantz et al. (1986) and with the use of dBASE III PLUS. If the latter is not true, we strongly urge readers to read the tutorial section of their dBASE manual before continuing with this guide or using the monitoring project data base.

2.0 DATA-BASE STORAGE AND STRUCTURE

The data-base file BORDER holds the project data and is contained on the high-density floppy disk accompanying this manual. A common format was designed for the BORDER data base and the project descriptions in Glantz et al. (1986). The common format represents a compromise between the occasionally conflicting needs of publishing the data in a readable form and achieving optimal data-base performance. By establishing a common format, it was possible to copy formatted text files from the inventory document directly into the BORDER data-base file using a data-processing program. The use of this program ensured correspondence between information presented in the original inventory document (Glantz et al. 1986) and in the data base, thus automatically providing a quality-controlled process for generating the data base. The 43 records added in 1987 and shown in Appendix A were appended to the original data base using dBASE III PLUS. The common format also introduced several minor drawbacks, including the need for extra record fields and blank padding in data-base fields, which can distort screen displays of project data. These drawbacks, and ways to minimize their effect, are discussed in more detail later in this document.

2.1 DATA-BASE STORAGE

The BORDER data-base file contains mostly descriptive information and is therefore very large (~900,000 bytes). One high-density floppy disk or three standard floppy disks are needed to store the entire file; the file can also be transferred to a hard disk. The method of storing the data base is a key factor in determining the length of time needed to perform certain operations; the best performance is obtained with the BORDER file stored on a hard disk. If the personal computer system employed does not have a hard disk, the high-density floppy disk can be used directly. In such situations, make sure the disk is inserted in the high-capacity disk drive (usually Drive A on an IBM PC-AT) and the dBASE III PLUS software diskette is loaded into the standard-capacity drive (usually Drive B on an IBM PC-AT). Errors in reading the BORDER file may occur if the high-density disk is not placed in the proper drive.

The remaining information in this user's guide was written assuming that the user will be employing either a hard disk or a high-density floppy disk to store the BORDER data-base file. Indicated dBASE III PLUS procedures and commands will still work if three standard floppy disks are used for file storage; however, the disks must be manually exchanged whenever the data base is searched. These exchanges greatly increase the length of time required for each search, and this method of storing and using the data base is not recommended.

2.2 DATA-BASE STRUCTURE

Each environmental monitoring project entry in Glantz et al. (1986) comprises a single "record" in the BORDER data base. Individual items of project information (i.e., project name, parameters measured, the name of the principal contact, funding agency) are contained in the project record as "fields." The structure of the BORDER data-base file and a brief description of each field are given in Table 2.1. Note that fields given in this table include several entries that may not appear in individual project descriptions in Glantz et al. (1986). For example, document project descriptions included either the category US or CAN, under which monitoring site locations were listed. In the BORDER data-base file, both US and CAN appear as fields in all records. The "extra" field is a consequence of converting the document project descriptions directly into the BORDER data-base file; the data-processing program performing this conversion requires a consistent set of entry fields, even if no information is included for a particular entry in a given project. Thus, a project with monitoring sites located in the United States will have site location information listed in Glantz et al. under the label US, but the label CAN will not appear in the project description. In the BORDER data-base file, the record corresponding to this particular project will have the same monitoring site information appearing in the field that is labeled US. The CAN field, however, will also be present, but will show blanks. Similarly, blank REFDOC1, REFDOC2, and REFDOC3 fields will appear in records for which the corresponding Glantz et al. description does not contain reference document listings.

TABLE 2.1. Structure of the BORDER Data-Base File

Field	Labels	Type	Width	Description
1	NAME	Character	150	Project Name
2	TYPE	Character	75	Type of project
3	PARAM	Character	225	Parameters monitored
4	US	Character	225	U.S. states where sampling is conducted
5	OFTEN	Character	225	Frequency of sampling
6	DATES	Character	150	Beginning and ending dates of project
7	HOW	Character	225	How samples are collected and/or where analyzed
8	QAQC	Character	150	Type of quality assurance/quality control programs
9	STOR	Character	225	How are data stored
10	CONTACT	Character	75	Name of principal contact
11	ADDRESS	Character	225	Address of principal contact
12	ADDRESS1	Character	225	Continuation of address (if needed)
13	TELEPH	Character	75	Telephone of principal contact
14	FUNDS	Character	225	Funding agency
15	MISC	Character	225	Miscellaneous information
16	REFDOC1	Character	225	First reference document
17	REFDOC2	Character	225	Second reference document
18	REFDOC3	Character	225	Third reference document
19	CODE	Character	40	Project coding [see Section 3.2 of Glantz et al. (1986)]
20	ABREV	Character	225	Acronym or abbreviation for project name
21	CAN	Character	225	Canadian provinces where sampling is conducted

Number of data records: 184

2.3 DISPLAY OF DATA-BASE STRUCTURE

Data-base field labels given in Table 1 are needed in specifying certain search commands, as discussed in Section 3.3. A listing of the data-base structure, similar to that shown in Table 2.1, can be displayed on the video screen by using the dBASE III PLUS command

```
.LIST STRUCTURE <Enter>
```

2.4 RELATING DATA-BASE RECORDS AND REPORT DESCRIPTIONS

The page and appendix number of a project description in Glantz et al. (1986) corresponding to a particular data-base record can be located via the last entry in the CODE field for the original 184 records. Thus, an entry of 4C at the end of the CODE field shown in Figure 2.1 means that the description of the Hydrologic Bench-mark Network will be found on the fourth page of Appendix C (Page C.4) in Glantz et al.

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
STOR : WATSTORE, STORET, NAWDEX
CONTACT : J. SCHORNICK
ADDRESS : U.S. GEOLOGICAL SURVEY
RESTON, VA 22092
TELEPH : (703) 860-6834
FUNOS : 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. MANY
REFERENCE DOCUMENTS AVAILABLE.
REFDOC : SMITH, R. A. AND R. B. ALEXANDER. 1983. A STATISTICAL
SUMMARY OF DATA FROM THE U.S.G.S.'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/V1/4C

FIGURE 2.1. Data-Base Entry

3.0 DATA-BASE SEARCHES

In designing the data base of transboundary region environmental monitoring projects, it was anticipated that users would want to extract listings of projects with certain characteristics (such as a summary of all projects in the province of Ontario that involve measurements of mercury) from the data base. Experimentation with dBASE III PLUS and the BORDER data file led us to develop the command file MENU for data-base access, including appending, editing, deleting, and retrieving information (the MENU program is also known as the Project Tracking System). The following sections illustrate how the MENU program can be used to access information from projects with common characteristics. For detailed instructions on how to use other dBASE III PLUS options not included in MENU, readers are urged to consult the dBASE III PLUS reference manuals.

3.1 ACCESSING THE DATA BASE

To access the BORDER data-base file, the user must first load the data-base management system (dBASE III PLUS) into the computer. (See your dBASE III PLUS reference manual if unfamiliar with this step; look under "Running dBASE III PLUS.")

The following programs must also be loaded to use the MENU program and its options:

- MENU.PRG
- BORD_ADD.PRG
- BORD_DEL.PRG
- BORD_EDIT.PRG
- DISPLAY.PRG
- LISTALL.PRG
- RETRIEVE.PRG
- RTM.PRG

If the user has a hard disk on which all these programs and BORDER.DBF are located, the command

>dBASE MENU <Enter>

will invoke the MENU program. The MENU screen as shown in Figure 3.1 will be displayed. An alternate method of invoking MENU is to use the two commands:

>dBASE <Enter>

.DO MENU <Enter>

An alternate method of using the MENU program and its options is to insert the disk with the MENU and supporting programs and BORDER data-base file into a high-density disk drive (usually drive A on an IBM PC-AT). Invoke dBASE with

>dBASE <Enter>

then set default to the high density disk drive with

.SET DEFAULT TO A: <Enter>

followed by

.DO MENU <Enter>

to invoke MENU.

The MENU program can also be used with a standard floppy disk. However, this method is not recommended since the disks must be continually switched.

3.1.1 Main Control Menu--Program Options

The Project Tracking System has several options available, as shown in Figure 3.1. Options 7 and 8 are system controls; the other options control various data input, manipulation, or reporting procedures.

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

- 1 = Add New Boundary Entries
- 2 = Edit Boundary Entries
- 3 = Delete Boundary Entries

- 4 = Retrieve Information
- 5 = List Entire Border Data Base

- 6 = Remove Deleted Records from Data Base

- 7 = Exit to dBASE
- 8 = Exit to DOS

What is your choice?

FIGURE 3.1. Main Control Menu

3.1.2 Main Option 1--Adding New Data

The main control menu should be displayed on the screen (see Figure 3.1).

The "Add New Boundary Entries" option allows the user to add data on new projects and store this information in the BORDER data-base file. Select this option by entering <1> and <Enter>. Figure 3.2 will appear as shown below. This display allows the user to enter information about a particular project. Because the data-base fields are large, it takes five screens to input information for one project. The user may scroll through the input screens by using the <PgDn> key. The arrow keys on the numeric keypad can be used to move the cursor up, down, left, or right to correct errors at any time prior to hitting the <Enter> key after the last entry.

After information for this project has been keyed in, the user must follow the instructions at the bottom of the last (fifth) screen. See Figure 3.3.

Use the keys:

- <Ctrl> <End> - to save information and return to the main menu as shown in Figure 3.1
- <Esc> - to return to the main menu as shown in Figure 3.1 without saving the current record

Current Environmental Monitoring Projects in the U.S.-Canadian
Transboundary Region--ADD SCREEN

NAME:

ABREV:

TYPE:

PARAM:

Press <PgDn> for additional screens

FIGURE 3.2. Initial Template for Adding New Data

Current Environmental Monitoring Projects in the U.S.-Canadian
Transboundary Region--ADD SCREEN

REFDOC3:

CODE:

<Ctrl> <End> to save/quit or <Esc> to quit or <any other key> to continue

FIGURE 3.3. Last Template for Adding Data

- <any other key> - to add data for next data-base record.

3.1.3 Main Option 2--Editing Data

The main control menu should be displayed on the screen (see Figure 3.1).

The "Edit Boundary Entries" option allows the user to edit a project whose

record already exists in the data base. Select this option by entering <2>. Figure 3.4 will appear as shown below. This display allows the user to select a project by entering its record number. Note that by hitting the <Enter> key before entering a record number the program will skip back to the main menu (Figure 3.1) without editing any data.

Once the user has entered a valid record number (in this example, 21) followed by the <Enter> key, the display shown in Figure 3.5 will appear. Once again, because the data-base fields are large, it takes five screens to display information concerning one project record. The user may scroll through the display screens by using the <PgDn> key.

To edit a project's information, the user hits the arrow keys on the numeric keypad to move the cursor up, down, left, or right throughout the displayed data and at the proper locations to make the editing changes. The <Ins> key can set the editor to insert text and the key will delete the character at the cursor.

Current Environmental Monitoring Projects in the U.S.-Canadian
Transboundary Region--EDIT SCREEN

Enter Record Number:

Press <Enter> to quit

FIGURE 3.4. Selecting a Project Record for Editing

Current Environmental Monitoring Projects in the U.S.-Canadian
Transboundary Region--EDIT SCREEN

NAME: EVALUATION OF THE NATURE OF ACIDIFICATION OF LAKES IN
SOUTHERN QUEBEC AND INCIDENCES ON A SAMPLING NETWORK

ABREV:

TYPE: WATER QUALITY

PARAM: pH, ALKALINITY, MAJOR IONS

Press <PgDn> for additional screens

FIGURE 3.5. First Screen for Editing the Selected Project

When the information for this project has been edited, the user must follow the instructions at the bottom of the last (fifth) screen. See Figure 3.6. Use the keys:

- <Ctrl> <End> - to save the changes
- <Esc> - to ignore the changes.

The display shown in Figure 3.4 will reappear on the screen so that the user may continue to edit additional projects if desired. When completed, the user simply hits the <Enter> key instead of a record number. This will return the screen to the main menu shown in Figure 3.1.

3.1.4 Main Option 3--Deleting Data

The main control menu should be displayed on the screen (see Figure 3.1).

The "Delete Boundary Entries" option allows the user to delete a project whose data record already exists in the data base. Select this option by entering <3>. Figure 3.7 will appear as shown below. This display allows the user to select a project by entering its record number. Note that by hitting <Enter> before entering a record number, the program will skip back to the main menu (Figure 3.1) without deleting any data.

Current Environmental Monitoring Projects in the U.S.-Canadian
Transboundary Region--EDIT SCREEN

REFDOC3:

CODE: T3/G2.1/P0/F3.1/L2.1/D0/V0/15C

<Ctrl> <End> to save/exit - <Esc> to no save/exit

FIGURE 3.6. The Last Edit Screen for the Project in Figure 5

Current Environmental Monitoring Projects in the U.S.-Canadian
Transboundary Region--DELETE SCREEN

Enter Record Number:

Press <Enter> to quit

FIGURE 3.7. Selecting a Project Record for Deleting

The selected project will be displayed on the screen (see Figure 3.8). The user is asked to verify if this record is to be deleted by answering the question on the bottom of the screen. If it is deleted, the display shown in Figure 3.7 will reappear on the screen so that the user may continue to delete

Current Environmental Monitoring Projects in the U.S.-Canadian
Transboundary Region--DELETE SCREEN

NAME: EVALUATION OF THE NATURE OF ACIDIFICATION OF LAKES IN
SOUTHERN QUEBEC AND INCIDENCES ON A SAMPLING NETWORK

ABREV:

TYPE: WATER QUALITY

PARAM: pH, ALKALINITY, MAJOR IONS

Delete this record?

FIGURE 3.8. Display of a Project Record for Deleting

additional projects. When completed, the user simply hits the <Enter> key instead of a record number. This will return the screen to the main menu shown in Figure 3.1.

3.1.5 Main Option 4--Retrieving Report

The main control menu should be displayed on the screen (see Figure 3.1).

The "Retrieve Information" option initiates a simple data-base search. This option provides a form in which the user enters the specific information required in a given field for a project to be selected as output in a data-base search. The user may specify substrings up to 30 characters long for each of the 21 fields in a record. Currently, only one substring per field can be made for each search. The program interprets substrings in multiple fields as if they were linked by conditional .AND. statements. For example, Figure 3.9 illustrates the input required to search the data base for ongoing deposition monitoring projects that are located in the providence of Ontario and measure sulfate and are funded by the Ontario Ministry of the Environment. Data-base searches involving .OR. statements (e.g., monitoring in Ontario or Quebec), or

Enter information you want to retrieve:
Press <Ctrl> <End> to continue

NAME	
ABREV	
TYPE	DEP
PARAM	S04
US	
CAN	ONTARIO
OFTEN	
DATES	ONGOING
HOW	
QAQC	
STOR	
CONTACT	
ADDRESS	
ADDRESS1	
TELEPH	
FUNDS	ONTARIO MIN
MISC	
REFDOC1	
REFDOC2	
REFDOC3	
CODE	

FIGURE 3.9. An Example Retrieve-MENU Input, Obtained by Using the RETRIEVE Option of the Project Tracking System

for multiple substrings in one field (e.g., measurement of sulfate and trace metals), must be initiated using the LIST command (see Section 3.2), rather than the retrieve option.

Select this option by entering <4>. Figure 3.9 will appear as shown below. The user enters selected phrases in the fields of interest and exits the form by moving the cursor out of the shaded entry block (either by using the cursor control or repeatedly striking <Enter>).

The program will display the NAME, TYPE, PARAM, US, CAN, CONTACT, and CODE fields of the first entry satisfying the specified conditions. The message

Press <Q> to quit ** <P> to print ** <any other key> to continue search

then appears. If the user decides to continue, the same fields for the next record satisfying the search conditions are displayed and the message is repeated. If the user quits the search, the program returns a blank retrieve form for inputting the next set of search conditions. Figure 3.10 illustrates the screen output obtained for the retrieve program input given in Figure 3.9 during a full data-base search.

If the printer output is selected, a note is made to print the entry and the next entry satisfying the search conditions is displayed. When the user exits the data-base search all selected entries are printed. Output format is very similar to that used in the Glantz et al. (1986) project descriptions and in Appendix A of this report. Figure 3.11 illustrates the printer output obtained from this menu option.

The retrieve option can be exited by entering a null (blank) form or by hitting the <Esc> key while the form is displayed.

3.1.6 Main Option 6--Removing Records Marked for Deletion

The main control menu should be displayed on the screen (see Figure 3.1)

The "Remove Deleted Records from Data Base" option removes all records marked for deletion from the BORDER data-base file. This option can be selected at any time. It should be done whenever a large number of projects have been deleted, because leaving records marked for deletion in the data base increases the response time of the Project Tracking System.

Select this option by entering <6>. The following message will appear on the screen:

Please wait, deleted records are being removed

3.1.7 Main Options 7 and 8--System Controls (exiting the program)

The main control menu should be displayed on the screen (see Figure 3.1).

The "Exit to dBASE" and "Exit to DOS" options are selected when the user wants to quit the MENU program. The user can exit to dBASE by hitting a <7> to

NAME : ACID PRECIPITATION IN ONTARIO STUDY, LIMNOLOGY UNIT NETWORK
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
CONTACT : P. J. DILLON
CODE : T4/G2.2/P1.2/F2.2/L1.2/D1/V1/37D

Press Q to quit ** P to printer ** anything else to continue

NAME : ACID PRECIPITATION IN ONTARIO STUDY (CUMULATIVE NETWORK)
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
CONTACT : MARIS LUSIS
CODE : T4/G2.2/P1.2/F2.3/L1.2/D1/V1/38D

Press Q to quit ** P to printer ** anything else to continue

NAME : ACID PRECIPITATION IN ONTARIO STUDY (EVENT NETWORK)
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
CONTACT : MARIS LUSIS
CODE : T4/G2.2/P0/F2.2/L1.2/D1/V1/39D

Press Q to quit ** P to printer ** anything else to continue

FIGURE 3.10. An Example Screen Output Using the Retrieve Option of the
Project Tracking System

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/V1/370

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 NAAP 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. MANY REFERENCE DOCUMENTS AVAILABLE.
REFDOC : CHAN, W. H., D. B. ORR, AND R. J. VET. 1982. THE ACIDIC PRECIPITATION IN ONTARIO STUDY (APIOS) - AN OVERVIEW: THE CUM. WET/DRY DEP. NETWORK. REPORT ARB-15-82-ARSP, APIOS, OME.
CODE : T4/G2.2/P1.2/F2.3/L1.2/D1/V1/380

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. MANY REFERENCE DOCUMENTS AVAILABLE.
REFDOC : 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 OME.
CODE : T4/G2.2/PD/F2.2/L1.2/D1/V1/390

FIGURE 3.11. Hard-Copy Output Produced by the RETRIEVE Option for the Input Given in Figure 3.9

select option 7. This will stop the Project Tracking System, close all open files, reset all defaults, and return the screen to the dot prompt in dBASE. The user can exit to DOS by hitting a <8> to select option 8. This will stop the program, exit dBASE, and return the screen to DOS.

3.2 DATA-BASE SEARCHES USING MAIN OPTION 5--THE LIST COMMAND

The LIST command with the substring symbol \$ is recommended for complex data-base searches where conditional .OR. statements are required, such as situations where one field must be scanned for more than one specified substring. The LIST command, for example, would be used in a search for projects with sampling sites in New York or Vermont or Maine that monitor mercury or arsenic. The LIST command can also be used in place of the RETRIEVE option in the Program Tracking System. A series of sample LIST commands and resulting screen outputs are presented in Figures 3.12 to 3.14. The commands illustrate how to search the data base for

- projects with monitoring sites in Saskatchewan (Figure 3.12)
- ecosystem projects with sites in Saskatchewan that monitor organochlorines (Figure 3.13)
- ecosystem projects with sites in Saskatchewan or Ontario that monitor either DDT or cadmium (Figure 3.14)

with the commands entered respectively as

- .LIST NAME, PARAM, CODE FOR 'SASK' \$ CAN
- .LIST NAME, CODE FOR 'SASK' \$ CAN .AND. 'ECOS' \$ TYPE .AND. 'ORGANOCHLOR' \$ PARAM
- .LIST NAME, CODE FOR ('SASK' \$ CAN .OR. 'ONTAR' \$ CAN) .AND. 'ECOS' \$ TYPE .AND. ('DDT' \$ PARAM .OR. 'Cd' \$ PARAM)

Note that the first and second data-base searches could have been conducted using the RETRIEVE option.

Detailed information on the LIST command and use of conditional .AND. and .OR. statements can be found in the dBASE III PLUS reference manuals (Ashton-Tate 1984, 1986).

. LIST NAME, PARAM, CODE FOR 'SASK' \$ CAN
Record# NAME

PARAM

9 POPLAR RIVER THERMAL POWER PLANT AMBIENT AIR MONITORING CODE
PROGRAM
SUSPENDED PARTICULATES, SO2, METEOROLOGICAL DATA
T2/G2.3/P2.12/
F4.2/L1.2/D2/V1/9B
39 MONITORING ACTIVITIES AT POPLAR RIVER AND BOUNDARY DAM POWERSTATIONS
pH, SO4, NO3, OTHER MAJOR IONS, ALKALINITY, METALS, CONDUCTIVITY
T3/G2.3/P3.1/F
3.2/L1.2/D2/V1/35C
49 CANADIAN AIR AND PRECIPITATION MONITORING NETWORK
PRECIPITATION: pH, CONDUCTIVITY, ACIDITY, SO4, NO3, NH4, Cl, K, Ca, Mg, Na
AIR: SO4, NO3, Cl, Na, NH4, HNO3, SO2
T4/G2.12/P2.1/
F1.3/L2.2/D1/V1/10D

115 GEOCHEMICAL DATA: CANADIAN SURVEY

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, S
b, W, Ba, Sn AND Au)
T7.36/G2.123/P
1.2/F4.3/L1.2/D2/V1/2G

116 MONITORING ORGANOCHLORINES IN PEREGRINE FALCONS AND THEIR PREY

ORGANOCHLORINES INCLUDING CHLOROBENZENES, HEPTACHLOR EPOXIDE, DIELDRIN, D
DT, ENDRIN, CHLORDANE, TRANS-NONACHLOR, MIREX, PCBs
T7.8/G2.123/P1

.1/F1.2/L1.2/D2/V1/3G

120 ACCUMULATION AND EFFECTS OF CONTAMINANTS IN AQUATIC BIOTA

CHLOROPHENOLS, BENZOTHAZOLE, LINDANE, ORGANOCHLORINES, As, Hg, Pb

T7.368/G2.12/P

1.1/F1.1/L2.1/D2/V1/7G

FIGURE 3.12. Example Data-Base Search Using the LIST Command-Screen Print
to Illustrate the LIST Command Format and Resulting Output in
a Search for Projects with Monitoring Sites Located in
Saskatchewan. Output includes the content of the NAME, PARAM,
and CODE fields, and illustrates the difficulties in reading a
multiple-field output. Compare with screen output format
produced by RETRIEVE program (Figure 3.10).


```
. LIST NAME, CODE FOR 'SASK' $ CAN .AND. 'ECOS' $ TYPE .AND. 'ORGANOCH' $ PARAM
Record#  NAME
```

```
CODE
```

```
116  MONITORING ORGANOCHLORINES IN PEREGRINE FALCONS AND THEIR  PREY
```

```
T7.8/G2.123/P1.1/F1.2/L1.2/D2/V1/3G
```

```
120  ACCUMULATION AND EFFECTS OF CONTAMINANTS IN AQUATIC BIOTA
```

```
T7.368/G2.12/P1.1/F1.1/L2.1/D2/V1/7G
```

FIGURE 3.13. Example Data-Base Search Using the LIST Command-Screen Print to Illustrate the LIST Command Format and Resulting Output in a Search for Saskatchewan Ecosystem Projects Monitoring Organochlorines. Only the name and code fields are displayed, making the output easier to read.

```
. LIST NAME, CODE FOR ('SASK' $ CAN .OR. 'ONTAR' $ CAN) .AND. 'ECOS' $ TYPE .AND
. ('DDT' $ PARAM .OR. 'Cd' $ PARAM)
Record#  NAME
```

```
CODE
```

```
115  GEOCHEMICAL DATA:  CANADIAN SURVEY
```

```
T7.36/G2.123/P1.2/F4.3/L1.2/D2/V1/2G
```

```
116  MONITORING ORGANOCHLORINES IN PEREGRINE FALCONS AND THEIR  PREY
```

```
T7.8/G2.123/P1.1/F1.2/L1.2/D2/V1/3G
```

```
173  CASE STUDY OF SELECTED TOXIC SUBSTANCES IN ESSEX REGION
```

```
T7.2468/G2.2/P1.1/F1.3/L1.1/D2/V0/61G
```

FIGURE 3.14. Example Data-Base Search Using the LIST Command-Screen Print to Illustrate the LIST Command Format and Resulting Output in a Search for Ecosystem Projects Located in Saskatchewan or Ontario that Monitor Either DDT or Cadmium. Only the name and code fields are displayed, making the output easier to read.

3.3 SCREEN OUTPUT FROM LIST COMMANDS

As shown in Figures 3.12 to 3.14, the output from the LIST commands includes the number of the projects satisfying the specified search conditions, plus a printing of the fields specified by the user. The output for some

fields, such as the PARAM field in Figure 3.12, is not printed on the screen in a convenient format. This is a drawback of using a similar format for both the document and data base, and is caused by the field lengths in BORDER being multiples of 60 characters. Extensive restructuring and editing of the data base would be required to fully eliminate this condition.

To minimize this problem, we recommend that for most LIST command applications the user request that only the record number, NAME field, and CODE field be displayed on the screen. The user can subsequently review other project fields to extract needed information by either using the Project Tracking System (see Section 3.1) or finding the page in Glantz et al. (1986) or Appendix A that corresponds to a given record (see Section 2.4). The problem can be circumvented if specifications can be reformatted to allow use of the RETRIEVE option.

3.4 SELECTING SUBSTRINGS

Proper substring specifications are vital for proper and efficient use of the data set with both the RETRIEVE option or the LIST command. For most applications, users will want to scan for key substrings rather than for the entire content of a field. For example, to determine which projects monitor in Saskatchewan, the CAN field must be searched for the substring SASKATCHEWAN or a combination of letters within this province name that are not found in another province name (i.e., SASK or SAS).

The RETRIEVE option automatically scans for substrings. However, users employing the LIST command must make sure that they include the substring symbol \$ rather than any dBASE equivalency symbol, such as =, or formats for complete strings. Otherwise, searching the CAN field for the complete string SASKATCHEWAN (i.e., entering the command for Figure 3.12 as .LIST NAME, CONTACT, CODE FOR CAN = 'SASKATCHEWAN') will only identify projects in which Saskatchewan is the first province listed in the field.

Substrings for use in both the RETRIEVE option and the LIST command must be carefully selected and entered to ensure that dBASE selects the programs with the proper characteristics during its search. For example, entering ' SASK' for the CAN field (where a space precedes the first letter) as part of

either a RETRIEVE entry or a LIST command would cause the search to miss any projects where the first word in the CAN field was Saskatchewan, because no blank precedes the letter S in these records. Similarly, specifying 'CON' as a search substring in the US field would not only identify projects with sites in Connecticut, but also those with stations in Wisconsin. The user must also be careful to specify the correct letter case in a substring; entering the string 'PH' in the PARAM field is not equivalent to entering 'pH'. The former substring identifies projects with words such as PHYSICAL in the parameter field, while the latter substring identifies projects where pH measurements are made. Because all entries in all fields (except PARAM) are in capital letters, it is helpful to engage <Caps Lock> while in dBASE.

To minimize confusion in searches involving the US and CAN fields, all state or provincial names are spelled out in the data base; no abbreviations have been used in these fields. Selected key parameters in the PARAM field (as determined through discussions with U.S. Environmental Protection Agency personnel) were reviewed for consistency, and phrases used in the data base for these key parameters are summarized in Table 3.1. Note that a search for projects monitoring ozone should be entered as 'OZONE' rather than 'O3', as the latter phrase would yield projects measuring nitrate ion ('NO3'). Users should also carefully note which analytes use a mixed-case abbreviation (e.g., 'pH', 'Hg').

3.5 CANCELLING SEARCHES

A RETRIEVE option search that is sent to a printer or any LIST command search can be stopped by hitting <Esc>. The MENU screen (Figure 3.1) will then appear.

3.6 SPEED OF SEARCHES

The speed with which the data-base searches are executed is a strong function of the manner in which the data are stored. With the data base stored on a Tallgrass Technologies TG-5025 hard disk and operating from an IBM PC, the typical LIST commands illustrated in Figures 3.12 to 3.14 required 20 to 60 seconds to complete. It took several minutes to complete the simple LIST

TABLE 3.1. Selected Parameter (PARAM Field) Character Strings.
When performing data-base searches involving these
analytes, enter the character string exactly as shown;
do not interchange upper and lower case letters.

<u>Analyte</u>	<u>Character String</u>
Ammonium ion	NH4
Asbestos ^(a)	ASBESTOS
Benzo(α)pyrene	BENZO[A]PYRENE
Dichlorodiphenyltrichloroethane	DDT
Lead	Pb
Mercury	Hg
Mirex	MIREX
Nitrate ion	NO3
Nitric acid	HNO3
Nitrous Oxides	NOx
Ozone	OZONE
pH	pH
Polycyclic aromatic hydrocarbons	PAHs
Polychlorinated biphenyls	PCBs
Sulfate ion	SO4
Sulfur dioxide	SO2
Toxaphene	TOXAPHENE

(a) Does not currently appear as a parameter
monitored in any data-base record; indi-
cated string is recommended for future
use.

operation illustrated in Figure 3.12 with the data base stored on a single, high-density floppy disk on an IBM PC-AT. The use of multiple, regular-density floppy disks would have taken even longer and involved the manual swapping back and forth of data disks. These searches took place on the original 184-record data base and would take a little longer with the addition of 43 records.

3.7 CHECKING SEARCH RESULTS

We strongly recommend that users check the contents of the fields used in formulating the LIST command after dBASE III has identified projects having the characteristics specified in a search request. This step will ensure that identified projects actually have the desired characteristics, rather than simply contain a specified substring in an unexpected place. This check is especially important for new users of the data base, as unexpected appearances of selected substrings may appear. Experience with the system aids the judicious selection of substrings.

3.8 MENU-DRIVEN SEARCHES USING THE ASSIST COMMAND

dBASE III PLUS contains a menu-driven routine for formatting commands obtained through the tutorial ASSIST command. We do not recommend using this feature for formatting LIST command data-base searches, as the menu is not tailored for substring comparison requests. The entire field must be entered for the project to be identified. If a substring is used, the project will not be identified.

4.0 USING THE DATA BASE: CAVEATS

Users of any data base must be aware of the scope, purpose, and limitations under which the data base was compiled. The following sections briefly discuss characteristics of a data base and will, we hope, aid users in interpreting the information obtained from it. Users are urged to consult Glantz et al. (1986) for a more complete discussion of these topics.

4.1 DATA-BASE SCOPE

The data-base file BORDER contains information on projects that were described in Glantz et al. (1986); it is not a data base of all environmental monitoring projects in the transboundary region. In compiling the original inventory, emphasis was placed on obtaining information on large-scale programs involving large geographic regions, long time periods of monitoring, or extensive measurement programs. Project coverage is thus geared toward large-scale, federally funded programs. In addition, the Glantz et al. (1986) document was designed to be used with the Concord Scientific Corporation (CSC) report entitled A Review of Atmospheric Deposition Networks in the Great Lakes Basin (1985). In 1987, the projects described in the CSC report that were not already in Glantz et al. were added to the data base. A more complete discussion of inventory coverage of the original data base can be found in Section 3.3 of Glantz et al. (1986).

4.2 CURRENCY OF ENTRIES

Information on the original 184 projects included in the data base was current as of March 1986. The 43 added projects shown in Appendix A are current as of September 1987 for the entries that were verified. Those that were not verified contain information current as of 1985, when the CSC report was published. Verification is identified in the CODE field of the entries as shown by Table A.1. V1 in the code field denotes verification by the primary contact. V0 denotes no verification. Our experience in compiling the inventory indicates that most projects are continually evolving. Some projects listed as "ongoing" will be terminated in the next few years while new projects

begin periodically. Some existing projects may significantly change in scope, including monitoring site locations or parameters measured. Some data-base entries, such as the name, address, and phone numbers of principal contacts, change frequently as people move to new positions and offices are moved or reorganized. Thus, to maintain the usefulness of this data base, entries must be periodically updated and new projects added. Changes to the data base can be made using the MENU program once the new information is compiled.

Biennial reconfirmation of the material in the BORDER data base is strongly advised. Users opting to edit the data base themselves are urged to keep at least one copy of the original BOROER data-base file.

4.3 OPTIMIZING PERFORMANCE

The structure of the current data base was based on anticipated user needs and influenced by the time and funding available for producing the necessary files. Users desiring to optimize performance may want to modify and edit the structure of the BORDER data base file so that extended features of the dBASE III PLUS management system can be used. We advise undertaking this procedure only after substantial experimentation with the current form of the data base and more complete definitions of the desired applications have been established.

5.0 REFERENCES

- Ashton-Tate. 1984. dBASE III User Manual. Culver City, California.
- Ashton-Tate. 1986. dBASE III PLUS Users Manual. Culver City, California.
- Concord Scientific Corporation (CSC). 1985. A Review of Atmospheric Deposition Networks in the Great Lakes Basin. CSC. J587, Downsview, Ontario.
- Glantz, C. S., M. Y. Ballinger and E. G. Chapman. 1986. An Inventory of Current Environmental Monitoring Projects in the U.S.-Canadian Transboundary Region. PNL-5880, Pacific Northwest Laboratory, Richland, Washington.

APPENDIX A

LIST OF CLASSIFICATION CODES, SUMMARIES, AND DATA BASE RECORDS OF
PROJECTS DESCRIBED IN CONCORD SCIENTIFIC CORPORATION (1985)

TABLE A.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	0.1
		Central	0.2
		Western	0.3
Parameters Monitored	P	Non-Criteria Pollutant	0
		Water Quality Criteria Pollutants	1
		Primary Project Objective	0.1
		Secondary Project Objective	0.2
		Air Quality Criteria Pollutants	2
		Gases	0.1
		Particulates	0.2
		Possible Criteria Pollutants (Analytes not specified)	3
		Water	0.1
		Air	0.2
Funded Source and Level	F	Not Available	0
		Federal	1
		State/Provincial	2
		Private	3
		Combined	4
		Not Available	0.0
		Small	0.1
		Medium	0.2
		Large	0.3
		Very Large	0.4
Duration of Monitoring	L	Currently Operating	1
		Stopped	2
		Total monitoring period <5 yr	0.1
		Total monitoring period >5 yr	0.2

TABLE A.1. (contd)

<u>Project Features</u>	<u>Parameter Abbreviation</u>	<u>Possible Value</u>	<u>Code</u>
Data Located in Centralized Data Base	D	No Information Yes No	0 1 2
Entry Verified by Project Personnel	V	Yes No	1 0
Data Obtained from Concord Scientific Corporation (1985)(b)	CSC	Not Applicable	Not Applicable

-
- (a) Codes 2-6 available for subclassifying Ecosystem projects, along with "Biological - .8". See Glantz, C. S., M. Y. Ballinger, and E. G. Chapman. 1986. An Inventory of Current Environmental Monitoring Projects in the U.S.-Canadian Transboundary Region. PNL-5880. Pacific Northwest Laboratory, Richland, Washington.
- (b) Concord Scientific Corporation (CSC). 1985. A Review of Atmospheric Deposition Networks in the Great Lakes Basin. CSC-J587. Downsview, Ontario.

TABLE A.2. Summary of the Last 42 Projects in the Border Data Base

Entry No.	Project Title	Principal Contact	Page
185	Metals Monitoring	Len Barrie	A.5
186	Quantity and Quality of Urban Storm Runoff in the Irondequoit Creek Basin Near Rochester, New York	Bill Kappel	A.6
187	PCBs in Precipitation in the Lake Michigan Basin	Tom Murphy	A.7
188	Inputs of PCBs from the Atmosphere to Lakes Huron and Michigan	Tom Murphy	A.8
189	Solubility of Metal Ions in Rain Water	Donald Gatz	A.9
190	Source Apportionment of Rain Water Impurities in Central Illinois	Donald Gatz	A.10
191	Field Intercomparison of Sulfate and Dry Deposition Monitoring and Measurement	Donald Gatz	A.11
192	Effects of Chicago Emissions on Local Precipitation Chemistry: A Preliminary Report	Douglas Sisterson	A.12
193	Chemical Differences Between Event and Weekly Precipitation Samples in Northeastern Illinois	Douglas Sisterson	A.13
194	Organic Compounds in Air and Precipitation	Neville Reid	A.14
195	Nanticoke Environmental Management Program	Maris Lusi	A.15
196	Evidence for the Long Distance Atmospheric	R. S. Wingender	A.16
197	Acid Snowpack Chemistry in Pennsylvania	Davis DeWalle	A.17
198	Organochlorines in Precipitation in the Great Lakes Region	William Strachan	A.18
199	Organic Substance in the Rainfall of Lake	William Strachan	A.19
200	Pennsylvania State University Precipitation Collectors Intercomparison Study	Dennis Lamb	A.20
201	Deposition of Nutrients and Major Ions By Precipitation in South Central Ontario	Peter Dillon	A.21
202	Great Lakes Atmospheric Deposition Network	Edward Klappenbach	A.22
203	Wisconsin Acid Deposition Monitoring Research Program	Julian Chazin	A.23
204	A Precipitation Sampler Intercomparison	Walter Chan	A.24
205	Dorset Intercomparison Study of the APIOS, APN, and Ontario Hydro Event Sampling Methodologies	Walter Chan	A.25
206	Sudbury Environmental Studies	Walter Chan	A.26
207	Atmospheric Transport of Toxaphene to Lake Michigan	Cliff Rice	A.27
208	U.S. EPA Region V Monitoring Network	Chuck Elly	A.28
209	National Dry Deposition Network	Barry Martin	A.29
210	Trace Metals and Strong Acid Composition of Rain and Snow in Northern Minnesota	David Thornton	A.30
211	Minnesota Pollution Control Agency Acid	Cliff Twaroski	A.31

TABLE A.2. (contd)

Entry No.	Project Title	Principal Contact	Page
212	Atmospheric Deposition of Selected Chemicals and Their Effect on Nonpoint Source Pollution in the Twin Cities Metropolitan Area, Minnesota	Robin Brown	A.32
213	U.S. Inhalable Particulate Network	Dave Hinton	A.33
214	Survey of PCBs in Ambient Air Across the Province of Ontario	Eugene Singer	A.34
215	Relationship Between Pb and Pb210 in Aerosol and Precipitation at a Semiremote Site in Northern Wisconsin		
216	Concentration of Airborne PCBs Over Lake Michigan	Anders Andren	A.36
217	Atmospheric Deposition of Particulate Organic Carbon and Polyaromatic Hydrocarbons to Lake Michigan	Anders Andren	A.37
218	New York State Air Monitoring Network	Donald Gower	A.38
219	USGS New York State Precipitation Monitoring Network	Chuck Barnes	A.39
220	Atmospheric Input of Trace Metals to Lake Michigan	Steven Eisenreich	A.40
221	An Experimental Study of Lake Loading by Aerosol Transport and Dry Deposition in The Lake Erie Basin	Herman Sievering	A.41
222	Pollution From Land Use Activities Reference Group	Marie Sanderson	A.42
223	Chemical Elements in Atmospheric Aerosol Over Southern Lake Michigan: The Contribution of the Lake Source	Herman Sievering	A.43
224	Transport and Dry Deposition of Trace Metals Over Southern Lake Michigan	Herman Sievering	A.44
225	Atmospheric Concentrations and Deposition of PCBs to Lake Superior	Steven Eisenreich	A.45
226	Atmospheric Deposition of Heavy Metals in Central Ontario	Dean Jeffries	A.46

NAME : METALS MONITORING
TYPE : WET DEPOSITION, AIR SAMPLING, AIR CHEMISTRY
PARAM : METALS (Pb-206 & Pb-207 DURING 1986)
CAN : 3 SITES: 1 AT DORSET IN GREAT LAKES BASIN, 1 AT MT. MORENCY
FOREST, AND 1 AT KEJIMKUIK NATIONAL PARK
OFTEN : 70 DAYS IN FALL 1984, 6 WEEKS IN SPRING 1986
DATES : OCTOBER 1 TO DECEMBER 10, 1984, APRIL AND MAY 1986
HOW : AT DORSET- DUPLICATE HIGH-VOLUME COLLECTION FOR 12 HOUR
SAMPLES AND FOR 24 HOUR SAMPLES. ANDERSON CASCADE IMPACTORS
AND DICHOTOMOUS SAMPLERS. DUPLICATE PRECIPITATION
MEASUREMENTS TAKEN IN WET ONLY COLLECTORS.
QAQC : BLANKS USED IN FIELD MEASUREMENTS. SAMPLES ANALYZED AT
ONTARIO MINISTRY OF THE ENVIRONMENT LABS.
STOR : HARDCOPY REPORT. COMPLETE DATA TO BE PUBLISHED IN JOURNAL
OF GEOPHYSICAL RESEARCH.
CONTACT : LEN BARRIE
ADDRESS : ATMOSPHERIC ENVIRONMENT SERVICES
4905 DUFFERIN STREET
DOWNSVIEW, ONTARIO M3H 5T4
TELEPH : (416) 667-4785
FUNDS : TOXIC CHEMICAL FUNDS (ATMOSPHERIC ENVIRONMENT SERVICES)
MISC : FOUND LEAD IN AMBIENT AIR AT ALL 3 SITES
CODE : T24/G2.1/P1.1/P2.1/F1.0/L2.1/D2/V0/CSC

NAME : QUANTITY AND QUALITY OF URBAN STORM RUNOFF IN THE
IRONDEQUOT CREEK BASIN NEAR ROCHESTER, NEW YORK
TYPE : DRY DEPOSITION, WET DEPOSITION
PARAM : TOTAL PHOSPHORUS, TKN, CI, Pb, pH AND CONDUCTIVITY
US : 4 SITES IN THE IRONDEQUOT CREEK BASIN NEAR ROCHESTER,
NEW YORK
OFTEN : MONTHLY AND FOR STORMS
DATES : AUGUST 1980 TO AUGUST 1981
HOW : AEROCHEM METRICS SAMPLER. ANALYZED AT USGS LABORATORY IN
ALBANY AND ATLANTA
QAQC : FORMAL LABORATORY PROGRAM
STOR : HARDCOPY REPORT AND ON COMPUTER FILE IN DENVER OFFICE
CONTACT : BILL KAPPEL
ADDRESS : USGS
521 W. SENECA STREET
ITHACA, NY 14850
TELEPH : (607) 272-8722
FUNDS : EPA
MISC : ATMOSPHERIC DEPOSITION DATA STILL BEING COLLECTED BY MONROE
COUNTY ENVIRONMENTAL HEALTH LABORATORY (CONTACT MR. RICHARD
BURTON 716-271-4817).
REFDOC : ZARRIELLO, P.J., W.E. HARDING, R.M. YAGER, AND W.M. KAPPEL.
1984. QUANTITY AND QUALITY OF STORM RUNOFF IN THE
IRONDEQUOT CREEK BASIN. USGS OPEN-FILE REPORT 84-610. USGS,
ITHACA, NEW YORK.

KAPPEL, W.M., R.M. YAGER, AND P.J. ZARRIELLO. 1985.
QUANTITY AND QUALITY OF URBAN STORM RUNOFF IN THE
IRONDEQUOT CREEK BASIN NEAR ROCHESTER, NEW YORK. USGS,
WRI REPORT 85-4113, ITHACA, NEW YORK.
CODE : T4/G1.1/P1.1/F1.0/L2.1/D2/V1/CSC

NAME : POLYCHLORINATED BIPHENYLS IN PRECIPITATION IN THE LAKE
MICHIGAN BASIN
TYPE : WET DEPOSITION
PARAM : PCBs
US : 2 SITES: CHICAGO AND BEAVER ISLAND, LAKE MICHIGAN
OFTEN : AIR AND EVENT PRECIPITATION
DATES : AIR SAMPLES: JULY 1975 TO JANUARY 1977
RAIN SAMPLES: MAY 1976 TO OCTOBER 1976
HOW : PRECIPITATION WAS COLLECTED IN A GALVANIZED STEEL VESSEL.
AIR SAMPLES WERE COLLECTED BY A STANDARD-VOLUME AIR SAMPLER.
QAQC : FORMAL FIELD AND LABORATORY PROGRAMS, NOT DOCUMENTED
STOR : HARDCOPY REPORT
CONTACT : TOM MURPHY
ADDRESS : DePAUL UNIVERSITY, CHEMISTRY DEPARTMENT
25 E. JACKSON BLVD.
CHICAGO, IL 60604
TELEPH : (312) 341-8191
FUNDS : EPA
MISC : PREDECESSOR TO THE EXPERIMENT "INPUTS OF POLYCHLORINATED
BIPHENYLS FROM THE ATMOSPHERE TO LAKE HURON AND MICHIGAN"
REFDOC : MURPHY, T.J. AND C.P. RZESZUTKO. 1977. "PRECIPITATION
INPUTS OF PCBs TO LAKE MICHIGAN." JOURNAL OF GREAT LAKES
RESOURCES. 3:305-312.
CODE : T24/G1.1/P1.1/P2.1/F1.1/L2.1/D2/V1/CSC

NAME : INPUTS OF POLYCHLORINATED BIPHENYLS FROM THE ATMOSPHERE TO
LAKE HURON AND MICHIGAN
TYPE : WET DEPOSITION
PARAM : PCBs
US : 10 SITES AT LAKES HURON AND MICHIGAN
OFTEN : MONTHLY
DATES : 1976-1980
HOW : HASL WET-DRY COLLECTOR, OTHER WET ONLY COLLECTORS, BULK
COLLECTORS, ALSO ICE CORES WERE COLLECTED DURING 2 WINTERS
IN METAL CONTAINERS
QAQC : FORMAL FIELD AND LAB PROGRAMS DOCUMENTED IN REPORTS
STOR : HARDCOPY REPORT
CONTACT : TOM MURPHY
ADDRESS : DePAUL UNIVERSITY, CHEMISTRY DEPARTMENT
25 E. JACKSON BLVD.
CHICAGO, IL 60604
TELEPH : (312) 341-8191
FUNDS : EPA, 150-200K
REFDOC : MURPHY, T.J., G. PAOLUCCI, A. SCHINSKY, M.L. COMBS AND J.C.
POKOJOWCZYK. 1982. INPUTS OF PCBs FROM THE ATMOSPHERE TO
LAKES HURON AND MICHIGAN. GRANT NO. R-805325, U.S. EPA,
DULUTH, MINNESOTA.
CODE : T4/G1.1/P1.1/F1.2/L2.1/D2/V1/CSC

NAME : SOLUBILITY OF METAL IONS IN RAIN WATER
TYPE : WET DEPOSITION, DRY DEPOSITION
PARAM : pH, CONDUCTIVITY, SO4, NO3, Cl, PO4, NH4, Ca, Mg, Na, K, Fe,
Zn, Cd, Cr, Cu, Pb, Hg, Al
US : 1 SITE IN THE RESIDENTIAL AREA OF GLEN ELLYN, ILLINOIS
OFTEN : 59 SAMPLING PERIODS, WEEKLY
DATES : DECEMBER 1979 TO MARCH 1981
HOW : COLLECTED IN WHITE HIGH-DENSITY POLYETHYLENE BUCKETS IN AN
AEROCHEM METRICS SAMPLER
QAQC : FOLLOWED NADP QAQC PROGRAM
STOR : ON COMPUTER FILE
CONTACT : DONALD GATZ
ADDRESS : ILLINOIS STATE WATER SURVEY, ATM. CHEM. SECTION
2204 GRIFFITH DRIVE
CHAMPAIGN, IL 61820
TELEPH : (217) 333-2512
FUNDS : EPA & DOE
REFDOC : GATZ, D., B. WARNER, AND L. CHU. 1984. "SOLUBILITY
OF METAL IONS IN RAINWATER." IN: DEPOSITION BOTH WET AND
DRY, ACID PRECIPITATION SERIES, V.4, ED. B.B. HICKS,
PP. 131-151. ANN ARBOR PRESS, BOSTON, MA.
CODE : T4/G1.1/P1.2/F1.0/L2.1/D2/V1/CSC

NAME : SOURCE APPORTIONMENT OF RAIN WATER IMPURITIES IN CENTRAL
ILLINOIS
TYPE : WET DEPOSITION
PARAM : Na, Mg, K, Ca, SO4, NO3, NH4, Cl, pH, CONDUCTIVITY
US : 1 SITE AT BONDVILLE ILLINOIS
OFTEN : EVENT BASIS
DATES : SEPTEMBER 30, 1979, TO AUGUST 3, 1981
HOW : AEROCHEM METRICS SAMPLER. ANALYZED AT ILLINOIS STATE WATER
SURVEY
QAQC : FOLLOWED NADP QAQC PROGRAM
STOR : COMPUTER FILE
CONTACT : DONALD GATZ
ADDRESS : ILLINOIS STATE WATER SURVEY, ATM. CHEM. SECTION
2204 GRIFFITH DRIVE
CHAMPAIGN, IL 61820
TELEPH : (217) 333-2512
FUNDS : DOE
REFDOC : GATZ, D. F. 1984. "SOURCE APPORTIONMENT OF RAIN WATER
IMPURITIES IN CENTRAL ILLINOIS." ATMOSPHERIC ENVIRONMENT.
18(9):1895-1904.
CODE : T4/G1.1/P0/F1.0/L2.1/D2/V1/CSC

NAME : FIELD INTERCOMPARISON OF SULFATE AND DRY DEPOSITION
MONITORING AND MEASUREMENT METHODS: PRELIMINARY RESULTS
TYPE : WET DEPOSITION, DRY DEPOSITION
PARAM : COMPARISON OF 5 SULFATE DEPOSITION METHODS
US : 1 SITE SOUTHWEST OF CHAMPAIGN, ILLINIOS
OFTEN : 2 FIELD PROJECTS, 1 MONTH EACH
DATES : SEPTEMBER 1981 AND JUNE 1982
HOW : COMPARED THE 5 METHODS OF SULFATE DEPOSITION OF CARNEGIE-
MELLON UNIVERSITY, OAK RIDGE NATIONAL LABORATORY, MITRE
CORP., DOE ENVIRONMENTAL MEASUREMENT LABORATORY, AND 3
HASL AND 3 AEROCHEM METRICS SAMPLERS
QAQC : FORMAL LABORATORY PROGRAM
STOR : ON COMPUTER FILE
CONTACT : DONALD GATZ
ADDRESS : ILLINOIS STATE WATER SURVEY, ATM. CHEM. SECTION
2204 GRIFFITH DRIVE
CHAMPAIGN, IL 61820
TELEPH : (217) 333-2512
FUNDS : EPA
REFDOC : DOLSKE, D., AND D. GATZ. 1984. "FIELD INTERCOMPARISON OF
SULFATE DRY DEP. MONITORING AND MEAS. METHODS," IN: DEP.
BOTH WET AND DRY, ACID PRECIP. SERIES, V. 4, ED. B. HICKS,
PP. 121-131, ANN ARBOR PRESS, BOSTON, MA.

DOLSKE, D., AND D. GATZ. 1985. "A FIELD INTERCOMPARISON OF
METHODS FOR THE MEASUREMENT OF PARTICLE AND GAS DRY
DEP." JOURNAL OF GEOPHYSICAL RESEARCH. 90(D1)2076-2084.
CODE : T4/G1.1/P0/F1.0/L2.1/D2/V1/CSC

NAME : EFFECTS OF CHICAGO EMISSIONS ON LOCAL PRECIPITATION
CHEMISTRY: A PRELIMINARY REPORT
TYPE : WET DEPOSITION
PARAM : pH, CONDUCTIVITY, Ca, Mg, NH4, NO3, Cl, SO4, K, Na
US : 1 SITE JUST EAST OF DOWNTOWN CHICAGO
OFTEN : EVENT BASIS (JUNE-NOV 1981) AND WEEKLY BASIS (DEC-MAY 1982)
DATES : JUNE 1981 TO MAY 1982
HOW : WET ONLY SAMPLES COLLECTED USING AEROCHEM METRICS SAMPLERS
QAQC : FORMAL PROGRAM
STOR : HARDCOPY AND COMPUTER
CONTACT : DOUGLAS SISTERSON
ADDRESS : ARGONNE NATIONAL LABORATORY, ATMOSPHERIC PHYSICS PROGRAM
BUILDING D-181
9700 S. CASS AVE.
ARGONNE, IL 60439
TELEPH : (312) 972-5836
FUNDS : DOE
MISC : OBJECTIVE OF STUDY WAS TO INVESTIGATE URBAN INFLUENCES ON
LOCAL PRECIPITATION CHEMISTRY
CODE : T4/G1.1/P0/F1.2/L1.1/D2/VO/CSC

NAME : CHEMICAL DIFFERENCES BETWEEN EVENT AND WEEKLY PRECIPITATION
SAMPLES IN NORTHEASTERN ILLINOIS
TYPE : WET DEPOSITION, DRY DEPOSITION
PARAM : EVENT SAMPLES: Na, K, NH4, Cl, SO4, NO3, CONDUCTIVITY
WEEKLY SAMPLES: NH4, Cl, SO4, NO3, CONDUCTIVITY
US : 1 SITE IN NORTHEASTERN ILLINOIS
OFTEN : EVENT AND WEEKLY
DATES : APRIL 1980 TO MARCH 1982
HOW : 2 AEROCHEM METRICS WET-DRY PRECIPITATION COLLECTORS
ACTIVATED BY SAME PRECIPITATION SENSOR
QAQC : MAP3S PROTOCOL AND NADP PROTOCOL
STOR : HARDCOPY AND COMPUTER
CONTACT : DOUGLAS SISTERTON
ADDRESS : ARGONNE NATIONAL LABORATORY, ATMOSPHERIC PHYSICS PROGRAM
BUILDING D-181 9700 S. CASS AVE.
9700 S. CASS AVE.
ARGONNE, IL 60439
TELEPH : (312) 972-5836
FUNDS : DOE
MISC : OBJECTIVES WERE TO EXAMINE THE DIFFERENCES IN ACIDITY AND
OTHER CHEMICAL PROPERTIES IN EVENT AND WEEKLY PRECIPITATION
SAMPLES
REFDOC : SISTERTON, D., B. WURFEL, AND B. LESHT. 1985. CHEMICAL
DIFFERENCE BETWEEN EVENT AND WEEKLY PRECIPITATION SAMPLES IN
NORTHEASTERN ILLINOIS. ARGONNE NATIONAL LABORATORY,
ENV. RES. DIV., ARGONNE, ILLINOIS.
CODE : T4/G1.1/P0/F1.2/L2.1/D2/VO/CSC

NAME : ORGANIC COMPOUNDS IN PRECIPITATION
TYPE : WET DEPOSITION
PARAM : TOXAPHENE, DDT, PCBs, LIMITED SAMPLING OF DIOXINS
CAN : 6 SITES INCLUDING DORSET AND PORT STANLEY
OFTEN : AIR SAMPLING FOR 3 DAY PERIOD EVERY 2 WEEKS. 28 DAY PERIOD
FOR PRECIPITATION SAMPLING
DATES : 1987-ONGOING
HOW : WET ONLY PRECIPITATION COLLECTORS WITH ABSORBENT CARTRIDGES.
ANALYSIS PERFORMED AT ONTARIO MINISTRY OF THE ENVIRONMENT
LABS
QAQC : NOT DOCUMENTED AS OF OCTOBER 1987
STOR : COMPUTER (DATA BASE AT AIR RESOURCES BRANCH)
CONTACT : NEVILLE REID
ADDRESS : ONTARIO MINISTRY OF THE ENVIRONMENT, AIR RESOURCES BRANCH
880 BAY STREET
TORONTO, ONTARIO M5S 1Z
TELEPH : (416) 965-1634
FUNDS : OME
MISC : DRY DEPOSITION SAMPLING TO BEGIN BY DECEMBER 1987. SAME
PARAMETERS AS ABOVE SAMPLED WITH HIVOLS WITH FILTER AND
ABSORBENT CARTRIDGE.
CODE : T4/G2.1/P1.1/F2.3/L1.1/D1/V1/CSC

NAME : NANTICOKE ENVIRONMENTAL MANAGEMENT PROGRAM
ABREV : NEMP
TYPE : WET DEPOSITION, DRY DEPOSITION
PARAM : AL, Ca, Cd, Cr, Cu, Fe, Mg, Mn, Ni, Pb, Ti, V, Zn, Si, SO4,
NO3, NH4Cl, F, Na, K, P, ACIDITY, pH
CAN : 9 STATION HIVOL SITES, 6 STATION WET DEPOSITION SITES WITHIN
40 KM OF NANTICOKE
OFTEN : HIVOLS FOR 24 HOURS EVERY SIXTH DAY. PRECIPITATION SAMPLES
ARE 28-DAY COMPOSITES
DATES : 1977-1983
HOW : HIVOL SAMPLERS USING WHATMAN 41 CELLULOSE FILTERS.
PRECIPITATION SAMPLES ARE 28-DAY COMPOSITES. METAL ANALYSIS
ARE BY AA AND ICP SPECTROMETRY
QAQC : ANALYSIS DONE BY LABORATORY SERVICES BRANCH OF THE OME
STOR : HARDCOPY REPORT
CONTACT : MARIS LUSIS
ADDRESS : ONTARIO MINISTRY OF THE ENVIRONMENT, AIR RESOURCES BRANCH
880 BAY STREET
TORONTO, ONT M5S 1Z
TELEPH : (416) 965-1634
FUNDS : JOINTLY FUNDED BY THE GOVERNMENTS OF ONTARIO AND CANADA,
ONTARIO HYDRO, TEXACO, AND STELCO
CODE : T4/G2.1/P1.1/F123.3/L2.2/D2/V1/CSC

NAME : EVIDENCE FOR THE LONG DISTANCE ATMOSPHERIC TRANSPORT OF
POLYCHLORINATED TERPHENYL
TYPE : WET DEPOSITION, DRY DEPOSITION, AIR SAMPLING
PARAM : PCTs
US : 30 M TOWER ANCHORED IN 20 M OF WATER IN THE MIDDLE OF LAKE
HURON
OFTEN : 48-HOUR PERIODS
DATES : JUNE 11 TO OCTOBER 7, 1980
HOW : PRECIPITATION SAMPLES BY WET ONLY SAMPLER, AIR SAMPLES BY
SEQUENTIAL AIR SAMPLER CONTAINING 24 STAINLESS STEEL TUBES
WITH RESIN. ANALYSIS WITH GC WITH A NI ELECTRON CAPTURE
DETECTOR AND CONFIRMED BY A GC/MS
QAQC : NO FORMAL PROCEDURE
STOR : HARDCOPY REPORT
CONTACT : R.S. WINGENDER
ADDRESS : ARGONNE NATIONAL LABORATORY, BUILDING 205
2700 SOUTH CASS AVE.
ARGONNE, IL 60439
TELEPH : (312) 972-4557
FUNDS : EPA
MISC : OBJECTIVE WAS TO IDENTIFY THE PRESENCE OF PCTs IN THE
ATMOSPHERE
REFDOC : WINGENDER, R. AND R. WILLIAMS. 1984. "EVIDENCE FOR THE
LONG-DISTANCE ATMOSPHERIC TRANSPORT OF POLYCHLORINATED
TERPHENYL." ENVIRONMENTAL SCIENCE & TECHNOLOGY. 18:625-628.
CODE : T24/G1.1/P1.1/F1.2/L2.1/D2/VO/CSC

NAME : ACID SNOWPACK CHEMISTRY IN PENNSYLVANIA 1979-1981
TYPE : WET DEPOSITION
PARAM : pH, SPECIFIC CONDUCTANCE, Cl, SO4, NO3, NO2, TOTAL
NONFILTERABLE RESIDUE, NH4, Cd, Pb, Zn, Ca, Mg, Na
US : 10 STATIONS WITH 3 TRANSECTS EACH IN NORTHWEST,
NORTHEAST, SOUTHWEST SECTORS OF PENNSYLVANIA
OFTEN : SAMPLES TAKEN AFTER FRESH SNOWFALL
DATES : 1979, 1980, 1981
HOW : VERTICAL SNOWPACK CORES WERE COLLECTED USING INERT PLASTIC
TUBES AND PACKED INTO WIDE MOUTH PLASTIC BOTTLES
QAQC : BLANKS AND DUPLICATES
STOR : HARDCOPY REPORT
CONTACT : DAVID DEWALLE
ADDRESS : THE SCHOOL OF FOREST RESOURCES, PENN STATE UNIVERSITY
107 LAND AND WATER RESEARCH BUILDING
UNIVERSITY PARK, PA 16802
TELEPH : (814) 863-0291
FUNDS : U.S. DEPARTMENT OF THE INTERIOR
REFDOC : DEWALLE, D.R., SHARPE, W.E., IZBICKI, J.A., WIRRICS, D.L.
1983. "ACID SNOWPACK CHEMISTRY IN PENNSYLVANIA, 1979-1981."
WATER RESOURCES BULLETIN. 19:993-1001.
CODE : T4/G1.1/P1.2/F1.1/L2.1/D2/V0/CSC

NAME : ORGANOCHLORINES IN PRECIPITATION IN THE GREAT LAKES REGION
TYPE : WET DEPOSITION
PARAM : PCBs AND ORGANOCHLORINES
CAN : 22 SITES ON CANADIAN SIDE OF GREAT LAKES REGION PLUS
5 INLAND SITES
OFTEN : EVENT BASIS
DATES : 1976 TO 1977
HOW : STAINLESS STEEL FUNNEL CHANNELED RAIN INTO 4-LITER GLASS
AMBER BOTTLES. SNOW SAMPLES COLLECTED WITH ALUMINUM COLUMN
AND TIGHTLY PACKED IN WIDE MOUTH 9-LITER GLASS BOTTLES.
ANALYSIS WITH GAS CHROMATOGRAPH.
STOR : HARDCOPY REPORT
CONTACT : WILLIAM STRACHAN
ADDRESS : CANADA CENTER FOR INLAND WATERS, 867 LAKESHORE ROAD
P.O. BOX 5050
BURLINGTON, ONTARIO L7R 4A6
TELEPH : (416) 336-4775
FUNDS : CCIW
MISC : OBJECTIVE WAS TO IDENTIFY INPUT OF PCBs AND ORGANOCHLORINES
IN REGION
REFDOC : STRACHAN, W., H. HUNEULT, W.M. SCHERTZER, AND F.C. ELDER.
1980. "ORGANOCHLORINES IN PRECIP. IN THE GREAT LAKES REG."
IN: HYDROCARBONS AND HALOGENATED HYDROCARBONS IN THE AQUATIC
ENVIRONMENT, EDS. B. AFGHAN AND D. MACKAY,
PP. 387-396. PLENUM PUBLISHING CORP., NEW YORK, NEW YORK.
STRACHAN, W., AND H. HUNEULT. 1979. "POLYCHLORINATED
BIPHENYLS AND ORGANOCHLORING PESTICIDES IN GREAT LAKES
PRECIPITATION." J. GREAT LAKES RES. 5(1):61-68.
CODE : T4/G2.1/P1.1/F1.0/L2.1/D0/V1/CSC

NAME : ORGANIC SUBSTANCE IN THE RAINFALL OF LAKE SUPERIOR
TYPE : WET DEPOSITION
PARAM : TOXAPHENE, ALPHA BHC, LINDANE, HEPTACHLOREPOXIDE, DIELDRIN,
ENDRIN, DDT RESIDUES, METHOXYCHLOR, PCBs, HCB
CAN : 2 SITES ON LAKE SUPERIOR, ISLE ROYALE AND CARIBOU ISLAND
OFTEN : TRIPLICATE SAMPLE TAKEN EVERY 6 WEEKS
DATES : 1983
HOW : PRECIPITATION COLLECTED IN A TEFLON COATED FUNNEL WITH RAIN
SENSITIVE LID AND TEFLON COATED COLUMN WITH RESIN
QAQC : BLANK ANALYSIS AND SPIKED SAMPLE ANALYSIS
CONTACT : WILLIAM STRACHAN
ADDRESS : CANADA CENTER FOR INLAND WATERS, 867 LAKESHORE ROAD
P.O. BOX 5050
BURLINGTON, ONTARIO L7R 4A6
TELEPH : (416) 336-4775
FUNDS : CCIW
REFDOC : STRACHAN, W. 1985. "ORGANIC SUBSTANCES IN THE RAINFALL OF
LAKE SUPERIOR: 1983." ENVIRONMENTAL TOXICOLOGY AND
CHEMISTRY. 4:677-683.
CODE : T4/G2.1/P1.1/F1.0/L2.1/D0/V1/CSC

NAME : PENNSYLVANIA STATE UNIVERSITY PRECIPITATION COLLECTORS
INTERCOMPARISON STUDY
TYPE : WET DEPOSITION
PARAM : pH, SO4, NO2, NO3, Cl, PO4, NH4, Na, K, Ca, Mg
US : AT P.S.U.
OFTEN : EVENT BASIS
DATES : JULY 4, 1978, TO ONGOING
HOW : SANGAMO TYPE A WET/DRY COLLECTOR (AS USED IN CANSAP)
BATTELLE COLLECTOR (AS USED IN MAP3S)
AEROCHEM METRICS COLLECTOR (AS USED IN NADP)
CONTACT : DENNIS LAMB
ADDRESS : PENNSYLVANIA STATE UNIVERSITY
503 WALKER BUILDING
UNIVERSITY PARK, PA 16802
TELEPH : (814) 865-0174
MISC : STUDY DESIGNED TO TEST COMPATIBILITY OF DATA FROM 3
TYPES OF PRECIPITATION CHEMISTRY SAMPLERS
REFDOC : CONCORD SCIENTIFIC CORPORATION. 1981. DETAILED ANALYSIS OF
THE PENNSYLVANIA STATE UNIVERSITY INTERCOMPARISON OF
PRECIPITATION COLLECTORS DATA. REPORT #52-80, CONCORD
SCIENTIFIC CORPORATION, DOWNSVIEW, ONTARIO.
CODE : T4/G1.1/PO/FO/L2.2/D1/V1/CSC

NAME : DEPOSITION OF NUTRIENTS AND MAJOR IONS BY PRECIPITATION IN
SOUTH CENTRAL ONTARIO
TYPE : BULK DEPOSITION
PARAM : TOTAL PHOSPHORUS, TKN, NO3, NH4, pH, DOC, Si, CONDUCTIVITY,
Fe, H, Ca, Mg, Na, K, SO4, Cl
CAN : 8 SITES IN SOUTH CENTRAL ONTARIO
OFTEN : CUMULATIVE SAMPLES COLLECTED AFTER EVENTS
DATES : AUGUST 1976 TO ONGOING
HOW : COLLECTED WET DEPOSITION WITH BATTERY OPERATED, MOISTURE
ACTIVATED SAMPLERS FROM 1976-78. BULK RAIN SAMPLERS USED
SINCE 1976 WITH TEFLON COATED STAINLESS STEEL FUNNELS
LEADING INTO GLASS BOTTLES.
QAQC : FORMAL PROGRAM
STOR : HP COMPUTER
CONTACT : PETER J. DILLON
ADDRESS : MANAGER, LIMNOLOGY SECTION
ONTARIO MINISTRY OF THE ENVIRONMENT
P.O. BOX 39
DORSET, ONTARIO POA 1E0
TELEPH : (705) 766-2418
FUNDS : OME
REFDOC : SCHEIDER, W.A., W.R. SNYDER AND B. CLARK. 1979. "DEPOSITION
OF NUTRIENTS AND MAJOR IONS BY PRECIPITATION IN SOUTH
CENTRAL ONTARIO." WATER AIR AND SOIL POLLUTION. 12:171-185.
CODE : T4/G2.1/PO/F2.1/L1.2/D1/V1/CSC

NAME : GREAT LAKES ATMOSPHERIC DEPOSITION NETWORK
ABREV : GLAD
TYPE : WET ONLY DEPOSITION
PARAM : pH, CONDUCTIVITY, NO2/NO3 AS N, NH3 AS N, TKN, TOTAL P, TOC,
S04, Cl, SiO2, Cd, Cu, Fe, Pb, Ni, Ca, Mg, Na, K, As, Al,
Ba, Be, Co, Cr, Li, V Ti, B, Zn, Mn, Sr
US : GREAT LAKES REGION, 35 SITES, 1982-1985;
19 SITES, 1986-PRESENT
OFTEN : WEEKLY
DATES : 1982-ONGOING
HOW : AEROCHEM METRICS SAMPLER; ANALYZED AT US EPA CENTRAL
REGIONAL LABORATORY, CHICAGO
STOR : PDP 1170 AT REGION V, CHICAGO; NATIONAL COMPUTER CENTER
(NCC) IBM MAINFRAME AT RESEARCH TRIANGLE PARK; ADS
CONTACT : EDWARD W. KLAPPENBACH
ADDRESS : U.S. EPA, GREAT LAKES NATIONAL PROGRAM OFFICE
230 SOUTH DEARBORN STREET
CHICAGO, IL 60604
C. CHAN-CANADA CENTER FOR INLAND WATERS
867 LAKESHORE ROAD
P.O. BOX 5050
BURLINGTON, ONTARIO L7R 4A6
TELEPH : (312) 353-1378 KLAPPENBACH; (416) 336-4960 CHAN
FUNDS : EPA
REFDOC : CHAN, C. H. AND E. W. KLAPPENBACH. 1983. GREAT LAKE
ATMOSPHERIC DEPOSITION SURVEILLANCE ACTIVITIES, NOVEMBER
1983. US EPA, CHICAGO, ILLINOIS.
CODE : T4/G12.1/P0/F1.4/L1.2/D1/V1/CSC

NAME : WISCONSIN ACID DEPOSITION MONITORING RESEARCH PROGRAM
ABREV : WADRP
TYPE : WET DEPOSITION, DRY DEPOSITION
PARAM : pH, CONDUCTIVITY, TOTAL ACIDITY, SO4, NO3, Cl, Na, NH4, Ca, Mg
US : 3 SITES IN WISCONSIN
OFTEN : EVENT BASIS
DATES : JANUARY 1980 TO JUNE 1984
HOW : AEROCHEM METRICS SAMPLER, PRECIPITATION AMOUNT MEASURED WITH BELFORT RAIN GAUGE. ANALYZED AT BATTELLE PACIFIC NORTHWEST LABORATORIES.
QAQC : FORMAL LABORATORY PROGRAM
STOR : HARDCOPY REPORT
CONTACT : JULIAN CHAZIN
ADDRESS : WISCONSIN DEPARTMENT OF NATURAL RESOURCES
CHIEF, AIR MONITORING SECTION
P.O. BOX 7921
MADISON, WI 53707
TELEPH : (608) 266-1902
FUNDS : WISCONSIN UTILITIES ASSOCIATION, WISCONSIN DEPARTMENT OF NATURAL RESOURCES
REFDOC : STATE OF WISCONSIN. 1985. DATA SUMMARY REPORT ON ACID DEPOSITION MONITORING IN WISCONSIN FOR THE PERIOD JANUARY 1980 TO JUNE 1984. ANNUAL REPORT, DEPT. OF NAT. RES., BUREAU OF AIR MANAGEMENT, MADISON, WISCONSIN.
CODE : T4/G1.1/P0/F2.0/L2.1/D2/V0/CSC

NAME : A PRECIPITATION SAMPLER INTERCOMPARISON
TYPE : WET DEPOSITION
PARAM : pH, SO4, NO3, Cl, NH4, F, Na, K, Mg, Ca, CONDUCTIVITY
CAN : 1 SITE AT WOODBRIDGE, ONTARIO
OFTEN : 24 HOUR SAMPLING PERIOD
DATES : AUGUST 1979 TO NOVEMBER 1979
HOW : AUTOMATIC AEROCHEM METRICS WET ONLY TYPE (A) FUNNEL AND
BOTTLE TYPE (F), AND LARGE MOUTH PLASTIC BUCKET WITH A
SPECIALLY FABRICATED POLYETHYLENE BAG INSERT. ION CONC.
AND pH WITH A DIONEX ION CHROMATOGRAPH.
QAQC : DUPLICATES OF EACH SAMPLER USED
CONTACT : WALTER CHAN
ADDRESS : AIR RESOURCES BRANCH, ONTARIO MINISTRY OF THE ENVIRONMENT
880 BAY STREET, 4TH FLOOR
TORONTO, ONTARIO, CANADA M5S 1Z8
TELEPH : (416) 965-4081
MISC : OBJECTIVE WAS TO EVALUATE THE RELATIVE PERFORMANCE OF 3
DIFFERENT "EVENT" PRECIPITATION CHEMISTRY SAMPLERS
REFDOC : CHAN, W., M. LUSIS, R. STEVENS, AND R. VET. 1984. "A
PRECIPITATION SAMPLER INTERCOMPARISON." WATER, AIR, AND SOIL
POLLUTION. 23:1-13.
CODE : T4/G2.1/P0/F2.1/L2.1/D2/V1/CSC

NAME : DORSET INTERCOMPARISON STUDY OF THE APIOS, APN, AND ONTARIO
HYDRO EVENT SAMPLING METHODOLOGIES
TYPE : WET DEPOSITION, DRY DEPOSITION
PARAM : pH, CONDUCTIVITY, SO4, NO3, Cl, NH4, Ca, Na, K, Mg
CAN : DORSET, ONTARIO
OFTEN : EVENT BASIS FOR PRECIP SAMPLES, 24 HOUR BULK SAMPLES
DATES : FEBRUARY 16 TO APRIL 29, JULY 27 TO OCTOBER 8, 1981
HOW : COMPARED THE PRECIPITATION AND AIR SAMPLING PROGRAMS OF 3
DIFFERENT ORGANIZATIONS. SANGAMO TYPE A AND AEROCHEM
METRICS WET/DRY COLLECTORS USED. ALSO SES TYPE BULK
COLLECTOR USED FOR 24-HOUR BULK SAMPLES.
STOR : HARDCOPY REPORT
CONTACT : WALTER CHAN
ADDRESS : ONTARIO MINISTRY OF THE ENVIRONMENT
880 BAY STREET, 4TH FLOOR
TORONTO, ONTARIO, CANADA M5S 1Z8
1Z8
TELEPH : (416) 965-4081
FUNDS : ONTARIO MINISTRY OF THE ENVIRONMENT
MISC : AN INTERCOMPARISON STUDY OF 3 NETWORKS RUN BY OME, AES,
AND OH
REFDOC : CONCORD SCIENTIFIC CORPORATION. 1982. THE DORSET
INTERCOMPARISON OF PRECIPITATION AND AIR SAMPLING
METHODOLOGIES. CSC 110.J181-1, CONCORD SCIENTIFIC CORP.,
DOWNSVIEW, ONTARIO.
CODE : T4/G2.1/PO/F2.1/L2.1/D2/V1/CSC

NAME : SUDBURY ENVIRONMENTAL STUDIES
ABREV : SES
TYPE : WET DEPOSITION
PARAM : pH, CONDUCTIVITY, SO4, NO3, NH4, Ca, K, Mg, Cl, F, Fe, Ni,
Cu, Pb, Zn, Al, Cr, Cd
CAN : 22 SITES IN SUDBURY BASIN, ONTARIO
OFTEN : CUMULATIVE NETWORK: MONTHLY
DAILY NETWORK: DAILY
DATES : CUMULATIVE NETWORK: DECEMBER 1977 TO MAY 1980
EVENT NETWORK: JUNE 1978 TO MAY 1980
HOW : CUM. SAMPLES COLLECTED WITH A SANGAMO TYPE (A) COLLECTOR OR
AEROCHEM METRICS SAMPLER WITH A POLYETHYLENE CONTAINER.
DAILY SAMPLES COLLECTED INTO POLYETHYLENE BAGS INSERTED INTO
PLASTIC CONTAINERS. ANALYSIS AT OME LAB.
STOR : HARDCOPY REPORT
CONTACT : WALTER CHAN
ADDRESS : AIR RESOURCES BRANCH, ONTARIO MINISTRY OF THE ENVIRONMENT
880 BAY STREET, 4TH FLOOR
TORONTO, ONTARIO, CANADA M5S 1Z8
TELEPH : (416) 965-4081
FUNDS : OME
MISC : CHAN, W., C. RO, M. LUSIS, AND R. VET. 1982. "IMPACT OF THE
INCO NICKEL SMELTER EMISSIONS ON PRECIPITATION QUALITY IN
THE SUDBURY AREA." ATMOSPHERIC ENVIRONMENT. 16(4):801-814.
REFDOC : CHAN, W., R. VET, C. RO, A. TANG, AND M. LUSIS. 1984.
"IMPACT OF THE INCO SMELTER EMISSIONS ON WET AND DRY
DEPOSITION IN THE SUDBURY AREA." ATMOSPHERIC ENVIRONMENT.
18(5):1001-1008.

CHAN, W., R.J. VET, C. RO, A. TANG, AND M. LUSIS. 1982.
PRECIP. QUALITY AND WET DEP. IN THE SUDBURY BASIN: SUDBURY
ENV. STUDY CUM. PRECIP. NET. RESULTS. SES 007/82,
ARB-04-81-ARSP, OME, TORONTO, ONTARIO.

CHAN, W., R. VET, C. RO, A. TANG, AND M. LUSIS. 1984.
"LONG-TERM PRECIPITATION QUALITY AND WET DEPOSITION FIELDS
IN THE SUDBURY BASIN." ATMOSPHERIC ENVIRONMENT.
18(6):1175-1188.
CODE : T4/G2.1/P0/F2.1/L2.1/D1/V1/CSC

NAME : ATMOSPHERIC TRANSPORT OF TOXAPHENE TO LAKE MICHIGAN
TYPE : DRY DEPOSITION
PARAM : TOXAPHENE
US : 4 SITES: GREENVILLE, MISSISSIPPI; ST. LOUIS, MISSOURI;
BRIDGEMAN, MICHIGAN; BEAVER ISLAND, MICHIGAN
OFTEN : HIGH-VOLUME SAMPLERS OPERATED FOR 2-4 DAYS. 3 SAMPLES
COLLECTED EACH 2-WEEK PERIOD.
DATES : SUMMER AND FALL OF 1981
HOW : HIGH-VOLUME AND LOW-VOLUME AIR SAMPLERS. TOXAPHENE ANALYZED
USING ELECTRON GAS CHROMATOGRAPH.
QAQC : FORMAL PLAN
STOR : HARDCOPY REPORTS, SOME COMPUTER FILES MAY BE AVAILABLE.
CONTACT : CLIFF RICE
ADDRESS : U.S. DEPARTMENT OF INTERIOR, FISH AND WILDLIFE SERVICE
PATUXENT WILDLIFE RESEARCH LAB
LAUREL, MD 20708
TELEPH : (301) 498-0278
FUNDS : EPA
REFDOC : RICE, C.P., P.J. SAMSON, AND G. NOGUCHI. 1984. ATMOSPHERIC
TRANSPORT OF TOXAPHENE TO LAKE MICHIGAN. EPA-600/S3-84-101,
US EPA, WASHINGTON, D. C.
CODE : T4/G1.1/P1.1/F1.2/L2.1/D2/V0/CSC

NAME : U.S. EPA REGION V MONITORING NETWORK
TYPE : WET DEPOSITION, DRY DEPOSITION
PARAM : NUTRIENTS, METALS
US : 30 SITES IN U.S. EPA REGION V
OFTEN : MONTHLY
DATES : AUGUST 1978 TO JULY 1979
HOW : 3 MODULE MODIFIED BULK SAMPLER
QAQC : STANDARD EPA PROCEDURES USED FOR ANALYSIS (EPA PUBLICATION
NO. EPA-625/6-74-003)
STOR : HARDCOPY REPORT
CONTACT : CHUCK ELLY
ADDRESS : EPA REGION V
CENTRAL REGIONAL LABORATORY
CHICAGO, IL 60605
TELEPH : (312) 353-9087
FUNDS : EPA REGION V
MISC : THIS PROJECT IS A PRECURSOR TO GLAD
REFDOC : ELLY, C.T. 1980. ATMOSPHERIC LOADING TO WATER AT THE FOUR
UPPER GREAT LAKES, A STATUS REPORT, SURVEILLANCE AND
ANALYSIS DIVISION, EPA REGION V, CHICAGO, ILLINOIS.
CODE : T4/G1.1/P3.1/F1.0/L2.1/DD/V1/CSC

NAME : NATIONAL DRY DEPOSITION NETWORK
ABREV : NDDN
TYPE : DRY DEPOSITION
PARAM : PARTICULATE SULFATE, PARTICULATE NITRATE, SO2, NITRIC ACID,
OZONE, WINDSPEED, WIND DIRECTION, TEMPERATURE, DELTA
TEMPERATURE, RELATIVE HUMIDITY, SOLAR RAD., RAINFALL
US : 6 SITES IN 1984-86 PROTOTYPE, 18 IN 1987 AND INCREASING TO
100 OVER NEXT 4 YEARS. 60 PERCENT OF STATIONS EAST
OF THE MISSISSIPPI WITH HEAVY NORTHEAST PLACEMENT.
OFTEN : HOURLY OZONE AND METEOROLOGICAL MEASUREMENTS, INTEGRATED
WEEKLY MEASUREMENTS OF OTHER AEROSOLS
DATES : PROTOTYPE IN 1984-86. NETWORK STARTUP IN 1987-ONGOING.
HOW : INTEGRATED SAMPLING TECHNIQUES USING LOW-VOLUME FILTER
HOLDERS. THERMO ELECTRON UV ANALYZER FOR OZONE.
QAQC : FORMAL PROGRAM IN PLACE
STOR : DATA IN DATA BASE AT EPA RESEARCH TRIANGLE PARK. EVENTUALLY
TO BE PLACED IN ADS
CONTACT : BARRY MARTIN
ADDRESS : MD-76
EPA ANNEX
RESEARCH TRIANGLE PARK, NC 27711
TELEPH : (919) 541-4386
FUNDS : U.S. EPA
MISC : NETWORK INTENDED AS DRY DEPOSITION TRENDS MONITORING
REFDOC : MARTIN, B., AND J. SUGGS. 987. "THE ESTABLISHMENT OF THE NAT.
DRY DEP. NETWORK," IN: PROC. OF THE EPA/APCA SYMP. ON THE
MEAS. OF TOXIC AND REL. AIR POL., MAY 3-6, PITTSBURG, PA.
CODE : T4/G1.123/P2.12/F1.4/L1.2/D1/V1/CSC

NAME : TRACE METALS AND STRONG ACID COMPOSITION OF RAIN AND SNOW IN
NORTHERN MINNESOTA
TYPE : WET DEPOSITION
PARAM : Al, Mn, Fe, Ni, Cu, Zn, Cd, Cr, Pb, Ca, Mg, SO4, NO3, NH4
US : 3 WET EVENT AND 7 SNOW CORE SITES IN NORTHERN MINNESOTA AND
SW NORTH DAKOTA
OFTEN : SNOW CORE SAMPLES COLLECTED ONCE IN LATE JANUARY, 1979 AND
ONCE AGAIN IN MARCH 1979; WET EVENT SAMPLES COLLECTED AFTER
EACH EVENT.
DATES : JANUARY 1979 AND MARCH 1979
HOW : AEROCHEM METRICS WET ONLY SAMPLER
QAQC : LABORATORY QUALITY CONTROL
STOR : HARDCOPY REPORT
CONTACT : DAVID THORNTON
ADDRESS : MINNESOTA POLLUTION CONTROL AGENCY, ACID RAIN COORDINATOR
520 LAFAYETTE RD.
ST. PAUL, MN 55155
S.J. EISENREICH
UNIVERSITY OF MINNESOTA
122 CIUMINE BLDG.
MINNEAPOLIS, MN 55455
TELEPH : (612) 296-7265
REFDOC : THORNTON, J., S. EISENREICH, J. MUNGER, AND E. GORHAM. 1981.
"TRACE METAL AND STRONG ACIDIC COMP. OF RAIN AND SNOW IN
N. MINN." IN: ATM. POLL. IN NAT. WATERS, ED. S. EISENREICH,
PP. 261-284. ANN ARBOR PRESS, BOSTON, MA.
CODE : T4/G1.1/P1.1/F0/L2.1/D0/V1/CSC

NAME : MINNESOTA POLLUTION CONTROL AGENCY ACID PRECIPITATION
PROGRAM
TYPE : WET DEPOSITION, DRY DEPOSITION
PARAM : SO4, NO2, NO3, PO4, Cl, F, Br, Ca, K, NH4, Mn, Al, Pb, Fe,
V, Zn, As, Ba, Si, Hg, Na, pH, CONDUCTIVITY
US : CURRENTLY 10 WET DEPOSITION SITES IN MINNESOTA INCLUDING 4
NADP SITES, 5 MPCA SITES, AND 1 GREAT LAKES SITE. 6 DRY
DEPOSITION SITES (4MPCA AND 2 NADP).
OFTEN : WEEKLY AND SOME EVENT
DATES : 1972 ONGOING
HOW : AEROCHEM METRICS SAMPLER, LOW-LEVEL SO2 PARTICULATE
COLLECTOR
QAQC : FOLLOWS BOTH NADP AND POLLUTION CONTROL AGENCY PROCEDURES
STOR : VAX
CONTACT : CLIFF TWAROSKI
ADDRESS : MINNESOTA POLLUTION CONTROL AGENCY
520 LAFAYETTE ROAD
ST. PAUL, MN 55155
TELEPH : (612) 296-7800
FUNDS : 60 PERCENT UTILITIES, 40 PERCENT STATE, SLIGHT FEDERAL FUNDS
REFDOC : MINNESOTA POLLUTION CONTROL AGENCY. 1985. STATEMENT OF
NEED AND REASONABLENESS PERTAINING TO AN ACID DEPOSITION
STANDARD AND CONTROL PLAN. DIVISION OF AIR QUALITY, MPCA,
ST. PAUL, MN.

MINNESOTA POLLUTION CONTROL AGENCY. 1986. 1986 BIENNIAL
REPORT TO THE LEGISLATURE. DIVISION OF AIR QUALITY, MPCA,
ST. PAUL, MN.
CODE : T4/G1.1/P1.1/F0/L2.1/D0/V1/CSC

NAME : ATMOSPHERIC DEPOSITION OF SELECTED CHEMICALS AND THEIR
EFFECT ON NONPOINT-SOURCE POLLUTION IN THE TWIN CITIES
METROPOLITAN AREA, MINNESOTA
TYPE : WET DEPOSITION, DRY DEPOSITION
PARAM : TKN, NN, TOTAL PHOSPHORUS, SO4, C1, Pb
US : 4 SITES IN TWIN CITIES METROPOLITAN AREA, MINNESOTA
OFTEN : VARIES ON FREQUENCY OF PRECIPITATION, APPROXIMATELY 2-4
WEEKS
DATES : APRIL 1 TO OCTOBER 31, 1980
HOW : AEROCHEM METRICS SAMPLER. ANALYZED AT U.S. GEOLOGICAL
SURVEY LABORATORY IN ATLANTA
STOR : HARDCOPY REPORT
CONTACT : ROBIN BROWN
ADDRESS : U.S.GEOLOGICAL SURVEY
6520 MERCANTILE WAY, SUITE 5
LANSING, MICHIGAN 48911
TELEPH : (517) 377-1608
REFDOC : BROWN, R.G. 1984. ATMOSPHERIC DEPOSITION OF SELECTED
CHEMICALS AND THEIR EFFECT ON NONPOINT-SOURCE POLLUTION IN
THE TWIN CITIES METROPOLITAN AREA, MINNESOTA. WRI 83-4195,
USGS, LANSING, MI.
CODE : T4/G1.1/P1.1/F0/L2.1/D1/V1/CSC

NAME : U.S. INHALABLE PARTICULATE NETWORK
ABREV : IPN
TYPE : AIR QUALITY
PARAM : MASS
US : 157 STATIONS AROUND THE U.S. IN 44 STATES
OFTEN : 1 IN 6 DAY SCHEDULE
DATES : APRIL 1979 TO DECEMBER 1984
HOW : SIZE SELECTIVE HIGH-VOLUME SAMPLERS AND DICHOTOMOUS SAMPLES
QAQC : IPN OPERATIONS AND QUALITY ASSURANCE MANUAL, MARCH 1983
STOR : DATA BASE
CONTACT : DAVE HINTON
ADDRESS : ENVIRONMENTAL MONITORING SYSTEMS, MD-76
EPA
RESEARCH TRIANGLE PARK, NC 27711
TELEPH : (919) 541-3075
FUNDS : EPA
MISC : HINTON, D., J. SUNE, J. SUGGS, W. BARNARD. 1984. INHALABLE
PARTICULATE NETWORK REPORT: OPERATION AND DATA SUMMARY (MASS
CONC. ONLY) VOL. I, APR 1979-DEC 1982. NTIS PB85 148 682/AS,
NTIS, SPRINGFIELD, VA.
REFDOC : HINTON, D., J. SUNE, J. SUGGS, W. BARNARD. 1984. INHALABLE
PARTICULATE NETWORK REPORT: DATA LISTING (MASS CONC. ONLY)
VOL. II, APR 1979-DEC 1982. NTIS PB 85-148 690/AS, NTIS,
SPRINGFIELD, VA.

HINTON, D., J. SUNE, J. SUGGS, W. BARNARD. 1984. INHALABLE
PARTICULATE NETWORK REPORT: DATA SUMMARY (MASS CONC. ONLY)
VOL. III, JAN 1983-DEC 1984. NTIS PB 96-184546, NTIS,
SPRINGFIELD, VA.

HINTON, D. 1986. "ENVIRONMENTAL PROTECTION AGENCY INHALABLE
PARTICULATE NETWORK REPORT." AIR POLLUTION CONTROL
ASSOCIATION JOURNAL. 36(10):1154-1155.
CODE : T2/G1.123/P2.1/F1.4/L2.2/D1/V1/CSC

NAME : SURVEY OF POLYCHLORINATED BIPHENYLS IN AMBIENT AIR ACROSS
THE PROVINCE OF ONTARIO
TYPE : AIR QUALITY
PARAM : PCBs
CAN : 25 SITES IN ONTARIO
OFTEN : DAILY AVERAGES
DATES : SEPTEMBER TO OCTOBER 1979 (4 WEEKS)
JUNE 1980 (2 WEEKS)
HOW : LOW-VOLUME GAS SAMPLER AND FLORISIL CARTRIDGES
QAQC : FORMAL PROCEDURE
STOR : ECLIPSE AND HARDCOPY
CONTACT : EUGENE SINGER
ADDRESS : ONTARIO MINISTRY OF THE ENVIRONMENT, AIR RESOURCE BRANCH
880 BAY STREET
TORONTO, ONTARIO M5S 1Z8
TELEPH : (416) 965-4081
FUNOS : OME
REFDOC : SINGER E., T. JARV, AND M. SAGE. 1983. "SURVEY OF POLYCHLOR.
BIPHENYLS IN AMBIENT AIR ACROSS THE PROVINCE OF ONTARIO."
IN: PHYS. BEHAVIOR OF PCBs IN THE GREAT LAKES, ED. MACKAY,
pp. 367-383. ANN ARBOR SCIENCE, BOSTON, MA.

SINGER E., M. SAGE, T. JARV, AND R. CORKUM. 1984. "DETECTION
AND DETER. OF PCBs IN AMBIENT AIR." PROCEEDINGS: NAT. SYMP.
ON RECENT ADV. IN POLL. MONIT. OF AMB. AIR AND STATIONARY
SOURCES. EPA-600/9-84-001, EPA, RTP, NC.

MONITEQ LTD., NUCRO TECHNICS, AND OME. 1981. A SURVEY OF
PCBs IN AMBIENT AIR IN ONTARIO. PHASE I, PHASE II-VOLUME I,
PHASE II-VOLUME II, PHASE III, AND ADDENDUM TO PHASE III.
ONTARIO MIN. OF THE ENV., TORONTO, ONTARIO
CODE : T2/G2.1/P2.1/F2.3/L2.1/D2/V1/CSC

NAME : RELATIONSHIP BETWEEN Pb AND Pb210 IN AEROSOL AND
PRECIPITATION AT A SEMIREMOTE SITE IN NORTHERN WISCONSIN
TYPE : DRY DEPOSITION, WET DEPOSITION
PARAM : Al, Pb, Pb210, Po
US : 1 SEMIREMOTE SITE IN NORTHERN WISCONSIN
OFTEN : EVERY 38 HOURS
DATES : AEROSOL SAMPLES: JUNE 1979 TO JUNE 1980
PRECIPITATION SAMPLES: JUNE TO SEPTEMBER 1979
HOW : HIGH-VOLUME AIR SAMPLER, HIGH-VOLUME CASCADE IMPACTOR,
MODIFIED WONG RAIN SAMPLER
CONTACT : ANDERS ANDREN
ADDRESS : UNIVERSITY OF WISCONSIN, WATER CHEMISTRY PROGRAM
660 N. PARK STREET
MADISON, WI 53706
TELEPH : (608) 262-2470
REFDOC : TALBOT, R.W. AND A.W. ANDREN. 1983. "RELATIONSHIPS BETWEEN
Pb AND Pb210 IN AEROSOL AND PRECIPITATION AT A SEMIREMOTE
SITE IN NORTHERN WISCONSIN." J. GEOPHYS. RES.
88(11):6752-6760.
CODE : T24/G1.1/P1.1/P2.12/F0/L2.1/D0/V1/CSC

NAME : CONCENTRATION OF AIRBORNE PCBs OVER LAKE MICHIGAN
TYPE : DRY DEPOSITION
PARAM : PCBs
US : 4 CRUISES IN THE SOUTHERN BASIN OF LAKE MICHIGAN
DATES : SPRING, SUMMER, FALL 1977
HOW : HIGH-VOLUME AIR SAMPLER
CONTACT : ANDERS ANDREN
ADDRESS : UNIVERSITY OF WISCONSIN, WATER CHEMISTRY PROGRAM
660 N. PARK STREET
MADISON, WI 53706
TELEPH : (608) 262-2470
FUNDS : NOAA/EPA
REFDOC : DOSKEY, P. V., AND A. W. ANDREN. 1981. "CONCENTRATIONS OF
AIRBORNE PCBs OVER LAKE MICHIGAN." J. GREAT LAKES RES.
7(1):15-20.
CODE : T2/G1.1/P2.2/F1.0/L2.1/D0/V1/CSC

NAME : ATMOSPHERIC DEPOSITION OF PARTICULATE ORGANIC CARBON AND
POLYAROMATIC HYDROCARBONS TO LAKE MICHIGAN
TYPE : WET DEPOSITION
PARAM : TOC AND PAH
US : 15 CRUISES IN LAKE MICHIGAN
OFTEN : 15 TIMES
DATES : SPRING, SUMMER, FALL SEASONS FROM JUNE 1975 TO AUGUST 1977
HOW : 3 RESEARCH VESSELS WITH CASCADE IMPACTORS AND HIGH-VOLUME
SAMPLERS
CONTACT : ANDERS ANDREN
ADDRESS : UNIVERSITY OF WISCONSIN, WATER CHEMISTRY PROGRAM
660 N. PARK STREET
MADISON, WI 53706
TELEPH : (608) 262-2470
FUNDS : EPA
REFDOC : ANDREN, A. W., AND J. W. STRAND. 1981. "ATMOSPHERIC DEP. OF
PART. ORGANIC CARBON AND POLYAROMATIC HYDROCARBONS TO LAKE
MICHIGAN." IN: ATM. POLL. IN NAT. WATERS, ED. S. EISENREICH,
PP. 460-479. ANN ARBOR PRESS, BOSTON, MA.
CODE : T2/G1.1/P2.2/F0/L2.1/D0/V1/CSC

NAME : NEW YORK STATE AIR MONITORING NETWORK - ACID DEPOSITION
TYPE : WET DEPOSITION
PARAM : pH, CONDUCTIVITY, F, Cl, NO2, NO3, HPO4, Br, SO4, Na, K, NH4,
Ca, Mg
US : 13 SITES IN NEW YORK
OFTEN : WEEKLY
DATES : 1986
HOW : WET/DRY COLLECTOR
QAQC : FORMAL WRITTEN QA/QC PROGRAM
STOR : DATA ON HARD COPY AND PC (AS OF 10/87). WILL BE ON MAINFRAME
COMPUTER EVENTUALLY
CONTACT : DONALD GOWER
ADDRESS : NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
50 WOLF ROAD, RM. 140
ALBANY, NY 12233-3256
TELEPH : (518) 457-3676
FUNDS : NEW YORK STATE
MISC : NETWORK WILL BE EXPANDED TO 25 STATIONS LOCATED ACROSS THE
STATE. CONTINUOUS GASEOUS SAMPLERS AND METEOROLOGICAL
INSTRUMENTS TO BE ADDED IN 1988. FUTURE PLANS TO MEASURE OR
CALCULATE DRYFALL AND MEASURE VISIBILITY.
CODE : T4/G1.1/P3.12/F2.4/L1/D1/V1/CSC

NAME : USGS NEW YORK STATE PRECIPITATION MONITORING NETWORK
TYPE : WET DEPOSITION, DRY DEPOSITION
PARAM : Na, K, Ca, Mg, pH, NH4, NO3, NO2, Cl, SO4, HCO3,
CONDUCTIVITY
US : 9 SITES; 8 IN NEW YORK, 1 IN PENNSYLVANIA NEAR NEW YORK
BORDER
DATES : 1965 TO 1977
HOW : GLASS FUNNEL INTO A PLOYETHYLENE BUCKET
STOR : HARDCOPY REPORT
CONTACT : CHUCK BARNES
ADDRESS : USGS
P.O. BOX 1397
ALBANY, NY 12201
TELEPH : (518) 472-2453
FUNDS : USGS
REFDOC : PETERS, N.E., R.A. SCHROEDER, AND D.E. TROUTMAN. 1982.
TEMPORAL TRENDS IN THE ACIDITY OF PRECIPITATION AND SURFACE
WATERS OF NEW YORK. USGS WATER SUPPLY PAPER 2188, USGS,
ALBANY, NY.

BARNES, C.R., R.A. SCHROEDER, AND N.E. PETERS. 1982.
"CHANGES IN THE CHEMISTRY OF BULK PRECIPITATION IN NEW YORK
STATE, 1965-78." NORTHEASTERN ENVIRONMENT SCIENCE
1:187-197.
CODE : T4/G1.1/PO/F1.0/L2.2/D2/V0/CSC

NAME : ATMOSPHERIC INPUT OF TRACE METALS TO LAKE MICHIGAN
TYPE : WET DEPOSITION, DRY DEPOSITION
PARAM : Al, Fe, Mn, Zn, Cu, Cd, Pb, Co, Ca, Mg, Na, K
US : 21 LOCATIONS IN THE LAKE MICHIGAN AREA
OFTEN : MONTHLY
DATES : SEPTEMBER 1975 TO DECEMBER 1976
HOW : COLLECTED IN A POLYETHYLENE LINER WHICH DRAINED INTO A
POLYETHYLENE FUNNEL.
CONTACT : STEVEN EISENREICH
ADDRESS : UNIVERSITY OF MINNESOTA
122 CUIMINE BLDG.
MINNEAPOLIS, MN 55455
TELEPH : (919) 728-2111 (612) 373-2507
FUNDS : EPA
REFDOC : EISENREICH, S.J. 1980. "ATMOSPHERIC INPUT OF TRACE METALS
TO LAKE MICHIGAN." WATER, AIR AND SOIL POLLUTION.
13:287-301.
CODE : T4/G1.1/P1.1/F1.0/L2.1/D0/VO/CSC

NAME : AN EXPERIMENTAL STUDY OF LAKE LOADING BY AEROSOL TRANSPORT
AND DRY DEPOSITION IN THE LAKE ERIE BASIN
TYPE : AIR QUALITY AND DRY DEPOSITION
PARAM : Al, Ba, Cd, Cu, Cr, Fe, Mn, Ni, Pb, Ti, Zn
US : LAKE ERIE
OFTEN : 3 CRUISES
DATES : SUMMER OF 1979
HOW : HIGH-VOLUME SAMPLERS AND CASCADE IMPACTORS. ANALYSIS USING
ICAP
QAQC : YES
CONTACT : HERMAN SIEVERING
ADDRESS : SENIOR ASSOC., CERES, AIR QUAL. GROUP/GMCC/NOAA, R/E/R4
325 BROADWAY
BOULDER, CO 80303
TELEPH : (303) 497-6189
MISC : PART OF A SERIES- SEE OTHER PROJECTS BY HERMAN SIEVERING
REFDOC : SIEVERING, H., D.A. DOLSKE, V. JENSON, AND R.L. HUGHES.
1984. AN EXPERIMENTAL STUDY OF LAKE LOADING BY AEROSOL
TRANSPORT AND DRY DEPOSITION IN THE LAKE ERIE BASIN, EPA-90
5/2-84-002, U.S. EPA, WASHINGTON, D.C.
CODE : T2/G1.1/P1.1/F0/L2.1/D0/V0/CSC

NAME : POLLUTION FROM LAND USE ACTIVITIES REFERENCE GROUP
ABREV : PLUARG
TYPE : WET DEPOSITION
PARAM : SO4, N, PO4, Cl, Na, K, Mg, PESTICIDES, PCBs, HEAVY METALS
CAN : SIX WATERSHEDS IN SOUTHERN ONTARIO
OFTEN : MONTHLY
DATES : JUNE 1975 TO JUNE 1977
HOW : GLASS FUNNEL INTO GLASS BOTTLE. ANALYZED AT UNIVERSITY OF WINDSOR
QAQC : YES
STOR : HARDCOPY REPORT
CONTACT : MARIE SANDERSON
ADDRESS : UNIVERSITY OF WINDSOR
DEPARTMENT OF GEOGRAPHY
WINDSOR, ONTARIO N9B 3P4
TELEPH : (519) 253-4232
FUNDS : CANADIAN DEPARTMENT OF AGRICULTURE
REFDOC : SANDERSON, M. AND P.D. LAVALLE. 1979. "SURFACE LOADING FROM POLLUTANTS IN PRECIPITATION IN SOUTHERN ONTARIO: SOME CLIMATIC AND STATISTICAL ASPECTS." J. GREAT LAKES RES. 5(1):51-60.
CODE : T4/G2.1/P1.1/F1.2/L2.1/D2/V1/CSC

NAME : CHEMICAL ELEMENTS IN ATMOSPHERIC AEROSOL OVER SOUTHERN LAKE
MICHIGAN: THE CONTRIBUTION OF THE LAKE SOURCE
TYPE : AIR QUALITY
PARAM : Al, Ca, Cd, Cu, Fe, Mg, Mn, Mo, Na, Ni, Pb, Ti, Sn, V, Zn
US : 1 SITE IN THE CITY OF CHICAGO WATER INTAKE CRIB
DATES : MAY 1978 TO JANUARY 1979
HOW : 5 STAGE CASCADE IMPACTOR. ANALYSIS WITH ICAP
QAQC : DUPLICATE ANALYSIS OF REPLICATE SAMPLES AND SPIKED SAMPLES
CONTACT : HERMAN SIEVERING
ADDRESS : SENIOR ASSOC., CERES, AIR QUAL. GROUP/GMCC/NOAA, R/E/A/R4
325 BROADWAY
BOULDER, CO 80303
TELEPH : (303) 497-6189
FUNDS : EPA
MISC : PART OF A SERIES- SEE OTHER PROJECTS BY HERMAN SIEVERING
REFDOC : SIEVERING, H., AND D. DOLSKE. 1984. CHEMICAL ELEMENTS IN A
ATMOSPHERIC AEROSOL OVER SOUTHERN LAKE MICHIGAN: THE
CONTRIBUTION OF THE LAKE SOURCE, EPA-904-84-001, APPENDIX D,
US EPA, WASHINGTON, D. C.
CODE : T2/G1.1/P2.1/F0/L2.1/D0/V0/CSC

NAME : TRANSPORT AND DRY DEPOSITION OF TRACE METALS OVER SOUTHERN
LAKE MICHIGAN
TYPE : DRY DEPOSITION
PARAM : Al, Ca, Fe, Mg, Mn, Mo, Pb, Ti, Zn
US : MIDLAKE REGION OF SOUTHERN LAKE MICHIGAN
OFTEN : 2-4 DAYS IN EACH MONTH
DATES : MAY, JUNE, JULY, AUGUST, SEPTEMBER OF 1977
HOW : CASCADE IMPACTOR AND HIGH-VOLUME SAMPLERS. ANALYSIS USING
ARGON PLASMA ATOMIC EMISSION SPECTROMETER
QAQC : YES
STOR : EPA CHICAGO
CONTACT : HERMAN SIEVERING
ADDRESS : AIR QUALITY GROUP/GMCC/NOAA, R/E/AR4
325 BROADWAY
BOULDER, CO 80303
DEPARTMENT OF PHYSICS, UNIVERSITY OF COLORADO, DENVER
1100 14TH STREET
DENVER, CO 80202
TELEPH : (303) 497-6189
MISC : PART OF A SERIES- SEE OTHER PROJECTS BY HERMAN SIEVERING
REFDOC : SIEVERING, H., M. DAVE, D. DOLSKE, D. McCOY. 1981.
"TRANSPORT AND DRY DEP. OF TRACE METALS OVER SOUTHERN LAKE
MICHIGAN." IN: ATM. POLL. IN NAT. WATERS, ED. S. EISENREICH,
pp. 286-325. ANN ARBOR PRESS, DULUTH, MN.
CODE : T2/G1.1/P2.1/F0/L2.1/DO/VO/CSC

NAME : ATMOSPHERIC CONCENTRATIONS AND DEPOSITION OF POLYCHLORINATED
BIPHENYLS TO LAKE SUPERIOR
TYPE : AIR QUALITY
PARAM : PCBs
US : 2 CRUISES OVER LAKE SUPERIOR
OFTEN : 13 AIR SAMPLES TOTAL
DATES : JULY 21 TO AUGUST 7, 1978
HOW : HIGH VOLUME AIR SAMPLER
CONTACT : STEVEN EISENREICH
ADDRESS : PROFESSOR OF ENV. ENGR., UNIVERSITY OF MINNESOTA
122 CIUMINE BLDG.
MINNEAPOLIS, MN 55455
TELEPH : (612) 373-2507
FUNDS : EPA
REFDOC : EISENREICH, S., G. HOLLOD, AND T. JOHNSON. 1981. "ATM.
CONC. AND DEP. OF PCBs TO LAKE SUPERIOR," IN: ATMOSPHERIC
POLLUTANTS IN NATURAL WATERS, ED. S. EISENREICH, PP. 425-443
ANN ARBOR PRESS, DULUTH, MN.
CODE : T2/G1.1/P2.1/F1.0/L2.1/D0/VO/CSC

NAME : BULK AND ATMOSPHERIC DEPOSITION OF HEAVY METALS IN CENTRAL
ONTARIO
TYPE : WET DEPOSITION
PARAM : Pb, Cu, Ni, Zn, Al, Mn, Fe
CAN : 15 SITES IN THE MUSKOKA-HALIBURTON AND SUDBURY REGIONS
OFTEN : COLLECTION PERIODS VARIED FROM 1 TO 83 DAYS, GENERALLY LESS
THAN 1 WEEK
DATES : 1976 TO 1978
HOW : BULK DEPOSITION COLLECTED IN VARIANTS OF A HUBBARD BROOK
COLLECTOR
CONTACT : DEAN S. JEFFRIES
ADDRESS : RESEARCH SCIENTIST, NATIONAL WATER RESEARCH INSTITUTE
RIVERS RESEARCH BRANCH
P.O. BOX 5050
BURLINGTON, ONTARIO, CANADA L7R 4A6
TELEPH : (416) 336-4781
FUNDS : OME
REFDOC : JEFFRIES, D., AND W. SNYDER. 1981. "ATMOSPHERIC DEPOSITION
OF HEAVY METALS IN CENTRAL ONTARIO." WATER, AIR, AND SOIL
POLLUTION. 15:127-152.

SCHEIDER, W., D. JEFFRIES, AND P. DILLON. 1981. "BULK
DEPOSITION IN THE SUDBURY AND MUSKOKA-HALIBURTON AREAS OF
ONTARIO DURING THE SHUTDOWN OF INCO LTD. IN SUDBURY."
ATMOSPHERIC ENVIRONMENT. 15(6):945-956.
CODE : T4/G2.1/P1.1/F2.0/L2.1/D0/V1/CSC

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