Guide to Research Database of Acid Rain Assessment and Policy Literature

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CITATION, CONTEXT, AND REPRODUCTION

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The Global Environmental Assessment (GEA) project is a collaborative team study of global environmental assessment as a link between science and policy. The Team is based at Harvard University. The project has two principal objectives. The first is to develop a more realistic and synoptic model of the actual relationships among science, assessment, and management in social responses to global change, and to use that model to understand, critique, and improve current practice of assessment as a bridge between science and policy making. The second is to elucidate a strategy of adaptive assessment and policy for global environmental problems, along with the methods and institutions to implement such a strategy in the real world.

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Publication abstracts of the GEA Project can be found on the GEA Web Page at http://www.environment.harvard.edu/gea. Further information on the Global Environmental Assessment project can be obtained from the Project Associate Director, Nancy Dickson, Belfer Center for Science and International Affairs, Kennedy School of Government, Harvard University, 79 JFK Street, Cambridge, MA 02138, telephone (617) 496-9469, telefax (617) 495-8963, E-mail nancy_dickson@harvard.edu.

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FOREWORD

This paper was written as part of the Global Environmental Assessment Project, a collaborative, interdisciplinary effort to explore how assessment activities can better link scientific understanding with effective action on issues arising in the context of global environmental change. The Project seeks to understand the special problems, challenges and opportunities that arise in efforts to develop common scientific assessments that are relevant and credible across multiple national circumstances and political cultures. It takes a long-term perspective focused on the interactions of science, assessment and management over periods of a decade or more, rather than concentrating on specific studies or negotiating sessions. Global environmental change is viewed broadly to include not only climate and other atmospheric issues, but also transboundary movements of organisms and chemical toxins.

The Project seeks to achieve progress towards three goals: deepening the critical understanding of the relationships among research, assessment and management in the global environmental arena; enhancing the communication among scholars and practitioners of global environmental assessments; and illuminating the contemporary choices facing the designers of global environmental assessments. It pursues these goals through a three-pronged strategy of competitively awarded fellowships that bring advanced doctoral and post-doctoral students to Harvard; an interdisciplinary training and research program involving faculty and fellows; and annual meetings bringing together scholars and practitioners of assessment.

The core of the Project is its Research Fellows. Fellows spend the year working with one another and project faculty as a Research Group exploring histories, processes and effects of global environmental assessment. Academic year 1997-8 focused specifically on the past three decades of climate change, long-range transport and tropospheric air pollution assessment experience with special attention to Europe and North America. These papers look across a range of particular assessments to examine variation and changes in what has been assessed, explore assessment as a part of a broader pattern of communication, and focus on the dynamics of assessment. The contributions these papers provide has been fundamental to the development of the GEA venture. I look forward to seeing revised versions published in appropriate journals.

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ABSTRACT

The purpose of this Guide to Research Databases of Acid Rain Assessment and Policy Literature ("Guide") is to provide a starting point for research regarding acid rain-related environmental assessments and policymaking processes. This Guide presents an annotated bibliography of information resources, focusing on databases and indices of abstracts. It covers academic libraries with on-line catalogs, institutional libraries with on-line catalogs, on-line services, Worldwide Web sites, the Social Learning Project Database, and paper indices.

For research regarding recent publications and events, the investigator should use electronic databases as a starting point, and rerun searches periodically to catch new entries. Most recently published works on acid rain are indexed in electronic databases, and many are provided in full-text in electronic databases. In addition, scientific articles, legislative bills, and a wide variety of other information relevant to the connection between environmental assessment and policymaking are available via the Internet. For research regarding the 1970's and early 1980's, certain paper indices are still useful.

This paper is part of the Global Environmental Assessment ("GEA") Project, which is a collaborative team study of global environmental assessment as a link between science and policy. This Guide will hopefully serve as a tool for the Project's research effort regarding acid rain. This paper should save time and provide guidance for the 1997-98 Global Environmental Assessment Project[1] team members and others interested in similar research. Hopefully the fruits of such research will advance our collective response to the vexing problem of acidifying deposition. [2]

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1.0 HOW TO USE THIS RESEARCH GUIDE

This Discussion Paper presents two matrices linking selected databases (and searches within those databases) to aspects of the acid rain debate: "social actors" and communication pathways. For the first matrix, social actors are categorized as: 1) the executive branch or function of government, 2) the legislative branch or function of government, 3) experts (including academic scientists, economists, and others), 4) industry, 5) other non-governmental organizations ("NGOs") (primarily environmental NGOs), and 6) the media (i.e., the press). For the second matrix, the communication pathways of interested are: 1) scientist to scientist, 2) scientist to policymaker, 3) scientist to public, 4) domestic to international, 5) international to domestic, and 6) domestic to bilateral. Section 2 discusses these matrices, which are presented in the Appendix to allow the reader to refer to both the database descriptions and the matrices at the same time.

Section 3 of the Guide provides details about the various research databases and indices, including scope ("source coverage"), time coverage, and method of access. Section 3 is organized by access, in other words, how the information can be retrieved. This organization is meant to provide the researcher first with information about the most powerful databases to access, which also tend to be the easiest or most efficient (in terms of results per time spent), providing that one has access. The Guide then proceeds to those databases that are less powerful or more difficult to use, such as paper indices. Therefore, the Guide starts with dial-up databases (such as library catalogues), on-line research databases (such LEXIS), and Web sites, and proceeds to old-fashioned paper indices. Specialized databases available on compact disc/read-only-memory ("CD-ROM") or disk are not placed in a separate category because many of the CD products are also on-line products.

The databases and indices are categorized as follows:

1) Academic libraries with on-line catalogues (specializing in coverage of HOLLIS and HOLLIS-Plus because the GEA Project Fellows are at Harvard;
2) Institutional and agency libraries with on-line catalogues;
3) On-line services (such as LEXIS);
4) Worldwide Web sites;
5) Social Learning Project[3] database files; and
6) Paper indices for references published before significant on-line coverage (e.g., Environment Abstracts, Pollution Abstracts, and the GPA Monthly Catalog).

Only a select number of databases and indices presented in Section 3 are also listed in the matrices in Section 2.

The reader may use this Guide in two ways: 1) rely upon one of the matrices as a guide to useful information databases, or 2) review the descriptions of the information databases directly. To further assist the researcher, a number of searches in different databases have been performed.

2.0 MATRICES OF DATABASES

2.1 INTRODUCTION

In an attempt to assist the reader with using the numerous databases discussed in this Guide, the Appendix presents two matrices that link databases to aspects of the relationship between environmental assessments and policymaking processes. Due to space constraints, database names are abbreviated and codes are used to help the reader locate specific databases or indices, and possibly, searches within those databases, as explained in Section 2.4, below. First, it is necessary to understand the coding system.

2.2 CODING SYSTEM

The databases and searches listed in Section 3.0 are assigned arbitrary codes to assist the reader in making the connection between the matrices and the databases. Each database has a two-component code, of the format "A#". The first component, a capital letter, stands for the type of database, arbitrarily abbreviated "A" for academic, "I" for institutional, "O" for on-line, "W" for Worldwide Web, "S" for Social Learning, and "P" for paper. The second component, an arabic numeral, is simply the number of the database or index within its category, i.e., "5" designates the fifth database in a particular category. Databases are listed in alphabetical order in each category. For example, the code "A2" means "academic library," second database.

If an example search is provided in Section 3.0, a decimal number is added to the database code, and the result is of the form: "A#.#". The third decimal number designates the search itself. For example, where only one example search is given for a particular database, the number is "1"; a second search for a particular database is "2", etc.

For example, the code "O2.6" represents an on-line LEXIS database (code "O"), listed second in the "on-line" text section of this Guide (code "2"), sixth search within this LEXIS database (code ".6").

2.3 MATRIX: DATABASES BY SOCIAL "ACTOR"

Table 1 provides a matrix linking selected databases (and searches within those databases) to "social actors," as defined by the Social Learning Project. Social actors are categorized as: 1) the executive branch or function of government, 2) the legislative branch or function of government, 3) experts (including academic scientists, economists, and others), 4) industry, 5) other non-governmental organizations ("NGOs") (primarily environmental NGOs), and 6) the media (i.e., the press). For example, a reader desiring information about legislative acts of governments should read the items in the "Government - Legislative" column. The names of these databases are sometimes abbreviated, and codes shown in parentheses link to a specific database (and, if provided, to a specific search within that database) listed in Section 3.0.

Let us take a more detailed example. Suppose one is looking for scientific studies and papers regarding acid rain assessments. Turning to Table 1, one would use the "Experts" column, because "experts" includes scientists.

As indicated at the top of the column, HOLLIS Plus contains three excellent sources for scientific articles: the Academic Index (code A2.1), Current Contents (code A3), and the Environmental Periodicals Bibliography (code A4). The decimal part of the code, A2.1, indicates that the text discusses a sample search in the Academic Index. One also could use HOLLIS, Harvard's on-line library.

Turning to other sources, under "Institutional Libraries," the Web site of the International Institute for Applied Systems Analysis would be a good source. In addition, the U.S. Environmental Protection Agency and the National Service Center for Environmental Publications would provide listings of many scientific reports, especially those generated by the U.S. government. The U.S. Library of Congress would provide listings of government reports and Congressional hearings in which scientists have given testimony.

Turning to the second page of the matrix, there are two databases and sample searches in LEXIS. One is the NEWS library, NWLTRS file, and the other is the NEWS library, ALLNWS file.

Turning to the Worldwide Web, the matrix provides a number of Web sites with scientific content. Focusing on European sources, Airbase, the European Topics Centre, and the Norwegian Institute for Acid Rain Research, would be useful.

Turning to the third page of the matrix and proceeding down the column, the first three Social Learning Project databases contain references to scientists and their work products. Finally, a number of paper sources would be useful, especially for the years prior to extensive online coverage. These include Environment Abstracts Annual (formerly named Environment Abstracts) and Pollution Abstracts.

As a final simplistic example, suppose the research topic was the relationship between risk assessment and goal and strategy formulation. Scientists generate risk assessments, and communicate the data and the risks to policymakers. Policymakers assess what types of responses might be appropriate, and formulate goals and strategies. Policymakers discover the need for additional data, and communicate their needs to scientists and experts inside and outside of government.

To find information on this question, the researcher should focus on the "Government-Legislative" column, the "Experts" column and (perhaps to lesser extent), the "Government-Executive" column.

2.4 MATRIX: DATABASES BY COMMUNICATION PATHWAY

Table 2 presents a matrix of databases by selected "communication pathways" of interest: 1) scientist to scientist, 2) scientist to policymaker, 3) scientist to public, 4) domestic to international, 5) international to domestic, and 6) domestic to bilateral. For example, a reader wishing to find information about dissemination of information from scientists to government officials would look in the "Scientist to Policymaker" column.

3.0 DATABASES OF ACID RAIN ASSESSMENT AND POLICYMAKING LITERATURE

3.1 INTRODUCTION

This section provides descriptions of databases and indices of acid rain assessment and policymaking literature. The descriptions of the databases and indices should help you understand which databases are more or less useful, based upon their source coverage and time coverage. The abstracts are frequently quoted directly from the database or index, and provide an overview of coverage and purpose. As explained in Section 2.2, the database codes and search codes are intended to help you to find the databases listed in the matrices in the Appendix.

3.2 ACADEMIC LIBRARIES WITH ON-LINE CATALOGS

This section provides an overview of selected academic libraries with on-line services useful for research regarding rain research assessments and policymaking. Because the GEA Project is centered at Harvard University, the Harvard Library's Web site and service, HOLLIS Plus, and the Harvard Library's on-line catalog, HOLLIS, are featured.

3.2.1 Harvard University's HOLLIS Plus

HOLLIS Plus is the Harvard University Library's "online information navigator."[4] HOLLIS Plus provides a Web-based gateway (http://hplus.harvard.edu) to Harvard's online library catalog, named HOLLIS. (See section 3.2.2.) HOLLIS Plus also provides a convenient gateway to a number of other Harvard and non-Harvard resources.

The opening page of the HOLLIS Plus Web site contains links to alphabetical and subject-oriented lists of HOLLIS Plus resources. For example, on the "HOLLIS Plus Resources by Subject" subpage, links of interest to acid rain researchers include, "Environmental Studies," "General Indexes," "Government Resources," "Law," "Library Catalogs," "Sciences," and "Social Sciences." For example, "Environmental Studies" leads the user to twelve links. To most easily reach the resources listed below, select "All other resources;" and "Listed alphabetically."

Of the HOLLIS Plus resources, I recommend the Environmental Periodicals Bibliography and the Academic Index as the best starting places for scientific and policy-related acid rain research. These databases provide abstracts to scientific journal articles that discuss acid rain assessments, including small-scale experiments and regional assessments; economic and policy articles; and a wide variety of other materials.

"Harvard Environmental Resources on-line" (select "by subject;" then "Environmental Studies") provides a Web-based route to a variety of Harvard-based environmental resources, including library holdings, faculty, and other resources. For example, "Reference Guides: International Environmental Policy" lists tutorials, handbooks and compendia, encyclopedias and dictionaries, directories, indices, bibliographies, primary literature, contemporary reporting, and secondary literature. The materials are well-chosen, and the Web page provides links for more details, such as the library's holding information, or even the full text.

ABI-Inform is a particularly strong database for business and industry information and viewpoints. It is available through several sources, including HOLLIS Plus, LEXIS, WESTLAW, and business school libraries.

There are a number of additional resources[5]. For example, the Library of Congress catalog is available through HOLLIS Plus; this resource is discussed in section 3.3.2.

Selected resources are listed in alphabetical order below. The database code "A" stands for "academic," meaning that the database can be accessed through an academic library system.

Database Code:	**Al**
Database Name:	**ABI Inform**
Abstract:	ABI/INFORM is a database which provides summaries and citations from over 1,000 academic management, marketing, and general business journals. It also includes the full text of articles from selected journals.
Format(s):	Worldwide Web; on-line
Access:	HOLLIS Plus (http://hplus.harvard.edu), and other on-line providers
Time coverage:	1971-present
Comments:	Particularly strong database for business and industry information and viewpoints.
Country Coverage:	U.S.A., international
Publisher/Place:	Ovid Technologies, Inc.

Database Code:	**A2**
Database Name:	**Academic Index**
Abstract:	The Academic Index provides indexing for over 1500 scholarly and general interest publications, most of which are held at Harvard. Each Al record is a journal citation. You can search these records by author name, article title, subject heading, and words from the article's source publication, contents notes, and abstracts.
Formats:	Worldwide Web; CD-ROM; on-line; paper
Access:	HOLLIS Plus (http://hplus.harvard.edu)
Time coverage:	1970-present (HOLLIS Plus: 1987 - present)
Source coverage:	Major newspapers, scientific journals, newspapers, policy
Example Sources:	New York Times, Energy Policy, Soil Science Society of America Journal
Country coverage:	USA, W. Europe, E. Europe, Asia
Ex. Search Code:	**A2.1**
Example Search	FIND KSH acid rain
Example Search Meaning:	find keywords in subject heading: acid (and) rain
Ex. Search Results:	476 items, little noise (as of 8/23/97)
Search Recommd:	Combine with other terms, including date restrictors, to limit results.

Database Code:	**A3**
Database Name:	**Current Contents, All Editions (OVID)**
Abstract:	Current Contents is produced by the Institute for Scientific Information ("ISI"). This database displays the tables of contents from about 7,000

	journals and books. Items covered include: articles, corrections, meeting abstracts, commentaries, reviews, and letters to the editor. Author-provided abstracts are available for some articles. The subject areas covered by Current Contents databases include, but are not limited to: Life Sciences; Physical, Chemical, and Earth Sciences; Agriculture, Biology, and Environmental Sciences; and Social Sciences.
Format(s):	Worldwide Web; on-line
Access:	HOLLIS Plus (http://hplus.harvard.edu)
Time coverage:	1993-present
Source coverage:	Depends on file. "Current Contents/Agri, Bio, Environ Sci" contains scientific journals.
Example sources:	Water, Air, & Soil Pollution
Comments:	Time coverage very limited (as provided through HOLLIS Plus). Can send results by e-mail.
Country coverage:	U.S.A., European Union ("EU")
Publisher/Place:	Ovid Technologies, Inc.
Ex. Search Code:	A3.1
Example Search:	acid rain
Ex. Search Meaning:	keywords: acid (and) rain
Ex. Search Results:	74 documents
Search Recommd:	Use "Current Contents/Agri, Bio, Environ Sci," rather than "Current Contents/All Editions" for a greater percentage of "hits." But the "Agri, Bio, Environ Sci" file is limited to the past year only.

Database Code:	**A4**
Database Name:	**Environmental Periodicals Bibliography**
Abstract:	Environmental Periodicals Bibliography ("EPB") is a "broad-based, interdisciplinary database covering more than 500 technical and general environmentally related journals" beginning in 1973 that focuses on the following general topic areas: human ecology, agriculture, industry, science and technology, water resources, air, water management and pollution, energy, nutrition and health, land resources, conservation, wildlife, and nature. New citations are added quarterly. It is made available via HOLLIS Plus using the GLIPH (Graphical Library Interface for Patrons at Harvard) search engine.
Format(s):	Worldwide Web; CD-ROM.
Access:	HOLLIS Plus (http://hplus.harvard.edu)
Time coverage:	1973-present
Country coverage:	U.S.A., at least
Publisher/Place:	International Academy, Santa Barbara, California.

Database Code:	**A5**
Database Name:	**PAIS**
Abstract:	PAIS International indexes public policy literature, with emphasis on contemporary issues and the making and evaluating of public policy. The PAIS database is the online version of three print publications, PAIS Bulletin, PAIS Foreign Language Index, and PAIS International in Print.

	The PAIS database indexes journal articles, books, pamphlets, directories, yearbooks and other types of documents published by public and private agencies, and federal, state, and local governments. More than 1,200 journals and 8,000 monographs are indexed each year.
Format(s):	Worldwide Web; on-line, paper
Access:	HOLLIS Plus (http://hplus.harvard.edu), select "by subject;" then "Indexes to Articles in Periodicals"
Time coverage:	1985-present, updated monthly
Country coverage:	Multinational
Publisher/Place:	Public Affairs Information Service, Inc.
Languages:	English, French, German, Italian, Portuguese, and Spanish.

Database Code:	**A6**
Database Name:	**PolicyFile**[6]
Format(s):	Web
Access:	Subscription required ($995/yr for individual). Worldwide Web; HOLLIS Plus link, select "by subject;" then "Indexes to Articles in Periodicals."
URL Address:	http://ch-profile.Chadwyck.com/
Time coverage:	Unknown
Source coverage:	Articles and reports by public policy "think tanks" and educational institutions. Indexes public policy research, including abstracts, home pages, e-mail addresses. 11,000 abstracts as of August, 1997.
Example sources:	RAND Corporation, World Bank, Environment and Natural Resources Program.
Comments:	Looks interesting, but the homepage of the PolicyFile does not specifically list environmental policy as one of its specific themes.
Country coverage:	U.S.A., U.K., at least
Publisher/Place:	Chadwyck-Healey, Inc.

Database Code:	**A7**
Database Name:	**RLG Bibliographic File**
Abstract:	The RLG Bibliographic File contains information about more than 22 million books, periodicals, recordings, scores, archival collections, and other kinds of material held in major North American and European research and academic libraries, archives and museums, public and corporate libraries, and other institutions.
Format(s):	On-line
Access:	HOLLIS Plus (http://hplus.harvard.edu)
Time coverage:	Undetermined
Comments:	The United Nations Library catalogs its material in the RLG database.
Country coverage:	Multinational
Publisher/Place:	Research Libraries Group, Inc.

3.2.2 Harvard University's HOLLIS

HOLLIS is the Harvard University Library's on-line catalog: HOLLIS provides excellent access to monographs, but otherwise it seems to have a fewer other types of references needed for acid rain assessment and policy research, compared to other databases.

Database Code:	**A8**
Database Name:	**HOLLIS**
Abstract:	HOLLIS (Harvard OnLine Library Information System) is composed of 13 individual databases which include the holdings of the Harvard University libraries, a course reserves database, a guide to Harvard libraries, and nine citation indexes covering a variety of subject areas.
Format(s):	On-line
Access:	Harvard University (must have valid Harvard identification number).
Time coverage:	Entire span of acid rain literature
Comments:	HOLLIS provides excellent access to monographs, but otherwise it seems to have a fewer number of the types of references needed for acid rain assessment and policy research compared to other databases.
Country coverage:	Multinational
Publisher/Place:	Harvard University
Ex. Search Code:	**A8.1**
Example Search:	ind kw acid rain
Ex. Search Meaning:	find keyword acid (and) rain
Ex. Search Results:	188 items

3.2.3 Other Library Catalogs

Other library catalogs can be reached via dial-up connection or, in some cases, through other services. For example, HOLLIS Plus provides access to the Massachusetts Institute of Technology library catalog (BARTON), the Yale University catalog (ORBIS), the University of California's catalog (MELVYL), and the U.S. Library of Congress catalog. The Library of Congress catalog is superb for finding agency documents and Congressional hearings pertaining to U.S. acid rain policy (see section 3.3.2). The library at North Carolina State University also has an excellent collection of acid rain materials, and can be accessed electronically.

Database Code:	**A9**
Database Name:	**BARTON (Massachusetts Institute of Technology's ("MIT") Library Catalog)**
Abstract:	MIT's on-line library catalog contains holdings, locations, and circulation status for the majority of MIT libraries. It may be searched by author, title, author-title, keyword, number, and subject. Contains material acquired from 1963 onward regarding earth sciences, social sciences, and other subjects.
Format(s):	On-line
Access:	Through HOLLIS Plus, select "Other Library Catalogs."
Time coverage:	1963-present

Country coverage: Multinational
Publisher/Place: MIT

Database Code: **A10**
Database Name: **California Digital Library (MELVYL: University of California's Library Catalog)**
Abstract: The University of California's online library catalog contains holdings, locations, and circulation status for the majority of UC libraries. Contains material regarding earth sciences, social sciences, and other subjects.
Format(s): Worldwide Web; on-line
Access: Through HOLLIS Plus, select "Other Library Catalogs."
URL Address: http://www.melvyl.ucop.edu/ (Provides either Web or Telnet access.)
Time coverage: Undetermined.
Example sources: Jo Mullins, 1988. "Acid Deposition and the Environment. The Annual' Grey Literature' Environmental Reference Collection, Containing Material up to 1988."
Comments: Well-constructed site. Searches in MELVYL most useful for monographs and similar documents. Can e-mail results.
Country coverage: Multinational
Publisher/Place: University of California
Ex. Search : subject: acid rain
Ex. Search Meaning: acid rain
Ex. Search Results : 731 documents in entire UC system

Database Code: **A11**
Database Name: **North Carolina State University Libraries Catalog**
Abstract: North Carolina State University is the home of the Southern Oxidant Study and Prof. Ellis Cowling, one of the leading American acid rain scientists. As a result, the NCSU Library contains an extensive acid rain collection.
Format(s): Web site leads to on-line catalog
Access: Worldwide Web
URL Address: http://www.lib.ncsu.edu/
Time coverage: Undetermined.
Country coverage: Multinational
Publisher/Place: North Carolina State University, Raleigh, North Carolina U.S.A.

Database Code: **A12**
Database Name: **ORBIS (Yale University's Library Catalog)**
Abstract: Yale University's online library catalog contains the holdings and location for most of the Yale University library system. It may be searched by author, title, keyword, subject, and call number. It contains material regarding earth sciences, including forestry and ecology.
Access: Worldwide Web; through HOLLIS Plus, select "Other Library Catalogs."
Time coverage: Undetermined.

Country coverage:	Multinational
Publisher/Place:	Yale University

Database Code:	**A13**
Database Name:	**University of Waterloo Library (Canada)**
Abstract:	The library of the University of Waterloo provides a wealth of information about acid rain in Canada and the Canadian/U.S. policy dialog. One can search the Library's catalog via its Web site.
Format(s):	Worldwide Web site
URL Address:	http://library.uwaterloo.ca:80/
Time coverage:	Undetermined
Example sources:	See http://library.uwaterloo.ca:80/discipline/SpecColl/acid/ for the Canadian Coalition on Acid Rain fonds (multiple media; ca. 1979-ca. 1992), which include documentation of the activities and operations of Canada's largest environmental group during the 1980's.
Comments:	Extensive acid rain holdings.
Country coverage:	Canada
Publisher/Place:	University of Waterloo

3.3 INSTITUTIONAL LIBRARIES WITH ON-LINE CATALOGUES

This section provides an overview of selected institutional libraries with on-line catalogs useful for research regarding rain research assessments and policymaking. The database code "I" stands for "institutional," meaning that the database can be accessed through an institutional library system.

3.3.1 International Institutions

International Institute for Applied Systems Analysis

The International Institute for Applied Systems Analysis ("IIASA"), in Luxembourg, Austria, supports state-of-the-art transboundary air pollution policy and economic studies. IIASA has one of the best acid rain libraries in the world. IIASA has a Web-based publications (not full library) catalog containing many publications of interest. Many documents listed in the publications directory can be downloaded in PDF, PS, and/or HTML formats.

Database Code:	**I1**
Website Name:	**International Institute for Applied Systems Analysis ("IIASA")**
Abstract:	IIASA provides an electronic catalog of its publications, with a search engine. One can review lists of publications by project area, such as Transboundary Air Pollution. Many documents listed in the publications directory can be downloaded in PDF, PS, and/or HTML formats.
Format(s):	Worldwide Web site
URL Address:	http://www.iiasa.ac.at , and

	http://www.iiasa.ac.at/Publications for the publications catalog.
Time coverage:	Undetermined
Comments:	Because IIASA performs state-of-the-art transboundary air pollution policy and economic studies, IIASA is a great source of publications of interest.
Country coverage:	Western Europe, Eastern Europe
Publisher/Place:	IIASA, Luxembourg, Austria
Ex. Search Code:	**I1.1**
Example Search:	See Publications Catalog - Summary by Project, select Transboundary Air Pollution Project ("TAP").
Ex. Search Meaning:	Review TAP's publications list.
Ex. Search Results:	http://www.iisas.ac.at/Publications/Catalog/PUB)_TAP.html
Search Recommd:	This is a good place to start.
Ex. Search Code:	**I1.2**
Example Search:	Select "subject" search; acid rain
Ex. Search Meaning:	subject: acid rain
Ex. Search Results:	IIASA publications dealing with acid rain topics
Ex. Search Code:	**I1.3**
Example Search:	Subject: environmental assessment
Ex. Search Meaning:	subject: environmental assessment
Ex. Search Results:	100 IIASA publications dealing with environmental assessment

3.3.2 U.S. Agencies

Environmental Protection Agency Environmental Protection Agency

The U.S. Environmental Protection Agency provides an extensive Web site that provides links to its publications catalog, the Federal Register ("Fed. Reg.") Code of Federal Regulations ("CFR"), and other U.S. government resources. The National Service Center for Environmental Publications is a central repository for all EPA documents, and has its own Web site.

Database Code:	**I2**
Website Name:	**U.S. Environmental Protection Agency**
Abstract:	EPA has a number of useful resources on the Web. The "acid rain" page listed below provides descriptions of the agency's sulfur dioxide emissions trading and nitrogen dioxide reduction programs. The EPA site also provides links to the Federal Register, highlighting environmental rulemakings; the "Federal Register - Environmental Documents" is EPA's selected subset of the entire Federal Register, but only extends back to October 1994.
Format(s):	Worldwide Web site

URL Address: http://www.epa.gov/ttn/ (homepage)
URL Address: http://www.epa.gov/ardpublc/acidrain/ (provides elementary introduction the topic and other links) .
Time coverage: Undetermined
Country coverage: U.S.A.
Publisher/Place: EPA

Database Code: **I3**
Website Name: **U.S. EPA - Acid Rain Permits and Applicability**
Format(s): Worldwide Web site
URL Address: http://www.epa.govYardpublic/acidrain/permit.html
Time coverage: Undetermined
Source coverage: Permit guidance, facts sheets, proposed revisions to rules.
Example sources: Same as above
Comments: Web site to help users comply with U.S. acid rain program
Country coverage: U.S.A.
Publisher/Place: U.S. Environmental Protection Agency

Database Code: **I4**
Website Name: **National Service Center for Environmental Publications ("NSCEP")** (See U.S. Environmental Protection Agency, above.)
Abstract: NSCEP is a central repository for all U.S. EPA documents, with over 5,000 titles in paper and/or electronic format, available for distribution.
Format(s): Worldwide Web site
URL Address: http://www.epa.gov/ncepihom/
Time coverage: Undetermined
Country coverage: U.S.A.
Publisher/Place: U.S. EPA

U.S. Library of Congress

Database Code: **I5**
Database Name: **U.S. Library of Congress**
Abstract: The Library of Congress provides Worldwide Web and gopher access to information about its services, including the online catalog, LOCIS, information about the federal government, and various other resources on the Internet.
Format(s): On-line
Access: Worldwide Web; HOLLIS
URL Address: Plus http://marvel.loc.gov
Time coverage: Undetermined
Example sources: Congressional hearings
Country coverage: U.S.A.
Publisher/Place: U.S. Library of Congress, Washington, D.C.

3.4 ON-LINE SERVICES

Several on-line services, such as ABI Inform, are discussed in Section 3.2, because they are available through HOLLIS Plus. This section discusses LEXIS and WESTLAW, which are not available through HOLLIS Plus. The database code "0" stands for "on-line."

3.4.1 LEXIS

LEXIS is the information service provided by LEXIS-NEXIS, a division of Reed Ellsevier Inc. (formerly Mead Data). LEXIS was created for attorneys, but provides a wealth of information useful to non-attorneys.

The structure of LEXIS is a three-level "library" and "file" hierarchy. When "in" a particular library (top level), the combination files (second level) and individual files (bottom level) within that library are available to be searched. Certain files can be searched simultaneously with other files, while some files cannot be searched in this manner .[7]

The second-level "ALL" or "MEGA" files typically combine many or all files in a particular area. Depending upon the nature of the service contract with LEXIS, such files may not be available to the user. When available, such files are typically substantially more expensive to search than individual files or combination (group) files.

The following libraries and files typically contain information useful for acid rain research. Within the NEWS library and the WORLD library, the ALLNWS and ALLWLD files provide excellent coverage of English-language, major newspapers, magazines, and wire services. Coverage is extensive for the U.S. and European Union ("EU").

One of the most useful newsletters for acid rain research is the Bureau of National Affairs' ("BNA") International Environment Daily. This newsletter is available from January 1991 in the NEWS library's newsletters file (NWLTRS). The International Environment Daily is particularly strong regarding multilateral and bilateral actions.

The following LEXIS (abbreviated "LX" below) libraries and files typically contain information useful for acid rain research .[8]

Database Code:	**O1 (general)** (In the interest of sparing the reader from too many codes, separate libraries and files may or may not be given separate codes below.)
Database Name:	**LEXIS ("Libraries" and "files" listed below)**
Format(s):	On-line; Worldwide Web
Access:	On-line through subscription (For GEAP Fellows, through BCSIA).
Time coverage:	Varies by library and file, see below.
Source coverage:	Varies by library and file, see below.
Example sources:	Varies by library and file, see below.
Comments:	One of the most useful on-line sources, if accessed by a lawyer (expensive) or by a law student (free), but disappointingly limited access for most academic subscriptions.

Country coverage:	Varies by library and file, see below.
Publisher/Place:	Reed Ellsevier Inc.
Language(s):	English (and in some files, certain European languages).

By LEXIS Library:

Database Code:	**O2**
LX library name:	**NEWS**
Source coverage:	"The NEWS library (formerly called NEXIS) contains more than 2,300 full-text information sources from U.S. and overseas newspapers, magazines, journals, newsletters, wire services, and broadcast transcripts. Abstract material from more than 1,000 information sources is also included." (LEXIS, 1997, 181.) Allows custom file selection.

Ex. Search Code:	**O2.1**
LX library name:	**NEWS**
LX file name:	ALLNWS
Source coverage:	All news, a combination file of CURNWS (news less than two years old) and ARCNWS (news more than two years old).
Time coverage:	Start of coverage varies by individual publication.
Example Search:	(acid rain or acid deposition) w/100 assess! and date aft 1995
Ex. Search Meaning:	("acid rain" or "acid deposition") within 100 words of assessment (or words with "assess" as root) and date after 1995
Ex. Search Results:	191 documents
Search Recommd:	Must use date restrictors or exceed the 1,000 document limit in LEXIS. Do not edit above search by using the w/2 connector with "acid." It works better (less false hits) as above.

Similarly, in five year increments:

Comments:	Note how the searches below provide an overview of the number of stories written in major newspapers and magazines during five year increments.
Search Recommd:	Combine the general search below (with wider time period bands) with other terms to pare down results. Or use the FOCUS command.
Example Search:	(acid rain or acid deposition) w/100 assess! and date aft 1990 and date bef 1996
Time coverage:	1991-1995
Ex. Search Results:	599 documents

Example Search:	(acid rain or acid deposition) w/100 assess! and date aft 1985 and date bef 1991
Time coverage:	1986-1990
Ex. Search Results:	835 documents

Example Search:	(acid rain or acid deposition) w/100 assess! and date aft 1980 and date bef 1986
Time coverage:	1981-1985
Ex. Search Results:	428 documents

Example Search:	(acid rain or acid deposition) w/100 assess! and date aft 1975 and date bef 1981
Time coverage:	1976-1980
Ex. Search Results:	18 documents

Example Search:	(acid rain or acid deposition) w/100 assess! and date aft 1970 and date bef 1976
Time coverage:	1971-1975
Ex. Search Results:	No documents

Example Search:	(acid rain or acid deposition) w/100 assess! and date bef 1971
Time coverage:	pre-1971
Ex. Search Results:	No documents

Other Useful NEWS files:

Database Code:	**O3**
LX library name:	**NEWS**
LX file name:	Country files
Source coverage:	There are groups for files for news in several languages, including Dutch, French, German, and Italian.

Database Code:	**O4**
LX library name:	**NEWS**
LX file name:	MAGS
Source coverage:	Magazines, a combined file of many magazine files, including:

BUSWK	Business Week (from 1/75)
CHEMEN	Chemical Engineering (from 1/81)
CHEMWK	Chemical Week (from 1/75)
COAL	Coal (from 1/81)
ECON	The Economist (from 1/75)
ENRJNL	The Energy Journal (from 1/89)
ENR	Engineering News Record (from 1/8 1)

Database Code: **O5**
LX library name: **NEWS**
LX file name: MAJPAP
Source coverage: Major Papers, a combined file of major U.S. newspaper files, including:

NYT	The New York Times (from 6/80)
WSJ	The Wall Street Journal Abstracts (from 5/73)
WPOST	The Washington Post (from 1/77)

Database Code: **O6**
Ex. Search Code: **O6.1**
LX library name: **NEWS**
LX file name: NWLTRS
Source coverage: Newsletters, a combined file of newsletter files, including:

BNAIED	Bureau of National Affairs ("BNA") International Environment Daily (from 1/91) This is one of the single most useful newsletters for acid rain research.
BNACRD	BNA Chemical Regulation Daily (from 10/91)
EUREN	European Energy (from 1/90)
EURENV	Europe Environment (from 1/91)
EER	European Energy Report (from 1/89)

Database Code: **O7**
LX library name: **NEWS**
LX file name: NON-ENG
Source coverage: A combined file of non-English language publications, including French, German, Italian, Dutch publications.

In the LEXIS "WORLD" Library:

Database Code: **O8**
LX library name: **WORLD**
LX file name: ALLWLD
Source coverage: All World, a combined file of ALLNWS, BUSANL, and LAW files. This combination file is particularly useful for international news on global or regional environmental matters.

Library: **WORLD**
Database Code: **O9**
LX library name: **WORLD**
LX file name: ALLNWS

Source coverage:	All news, a combination of CURNWS (news less than two years old) and ARCNW S (news more than two years old). (Start of coverage varies by individual publication.) *See discussion under NEWS library for particularly useful publications.*

Database Code:	**O10**
LX library name:	**WORLD**
LX file name:	BUSANL
Source coverage:	Business Analysis, a combined file of business analysis and country information sources listed in the LEXIS Directory under BUSANL.

Database Code:	**O11**
LX library name:	**WORLD**
LX file name:	LAW
Source coverage:	Law, a combined file of EELEG, INFO-92, LEGIS, NATPRV, PARLQ, PREP, SOVLEG, and TREATY files. See LEXIS Directory for further information.

3.4.2 WESTLAW

The West Publishing Company, which is the major publisher of hardcopy legal information in the United States, created WESTLAW to compete with LEXIS. Historically, WESTLAW sought to catch up with the breadth and depth of LEXIS, until today the services are roughly comparable for legal research. The user interfaces are different, and people often prefer one service to the other due to the interface.

Nevertheless, there are important differences between WESTLAW and LEXIS in scope and coverage that are relevant to acid rain research. LEXIS is superior in coverage and organization. First, in general, WESTLAW does not match the number of resources available through LEXIS, although there are DIALOG databases available on WESTLAW that are not available on LEXIS. Second, LEXIS combines many useful publications into files such as ALLWLD and ALLNWS, whereas the user must query a variety of WESTLAW databases to obtain similar coverage, if possible at all. Finally, many LEXIS files go back farther in the past than comparable WESTLAW databases.

WESTLAW's "scope" command will provide the following information about a database: scope of coverage, document descriptions, field types, search tips, and related databases. Type "sc" when "in" the particular database, or "sc database name" when not in the database.

Rather than "libraries" and files within those libraries, WESTLAW simply uses the term "databases." Here are a number of potentially useful databases. Unfortunately, the WESTLAW Database List does not provide a detailed list of the contents of combination databases, such as newspapers (NP).

Since WESTLAW is not available to the GEA Project, I list only selected relevant databases below.

Newspapers

Database: NP	Newspapers (Contents not listed.)
Database: CBD	Commerce Business Daily (most recent three months only)
Database: NYT	The New York Times (same day only)
Database: FTI	The Financial Times (from 1993)
Database: FTF	The Financial Times Fulltext (from 1986)
Database: WP	The Washington Post (from 1984)
Database: WASHPOST	The Washington Post Online (DIALOG) (from 4/83)

Newswires and News Services

Database: AP-NEWS	AP News (DIALOG) (from 7/84)

Environmental Law and Information

Database: BNA-IED	Bureau of National Affairs ("BNA") International Environment Daily (from 1991)
Database: BNA-DEN	BNA Daily Environment Report (from 7/92)
Database: BNA-ER	BNA Environment Reporter (from 7/86)
Database: ENV-BIB	Environmental Bibliography (DIALOG) (from 1973)
Database: ENV-COMB	Environmental Data Resources - Combined Materials (varies by database)
Database: GEOARCHIVE	GeoArchive (DIALOG) (from 1974)
Database: GEOBASE	GEOBASE (DIALOG) (from 1980)
Database: INTLENVL	International Environmental Law Documents (varies by document)
Database: POLLUTION	Pollution Abstracts (DIALOG) (from 1970)

International News

Database: INT-NEWS	Textline Global News (DIALOG) (from 1980)
Database: EURONEWS	European and C.I.S. News (from 1/84)

International News

Database CELEX:	CELEX: Legal Database of the European Communities (varies by database)
Database EURONEWS	Environmental Law Reporter - Statutes and International Agreements (from 1971)

Energy News

Database: COALW	Coal Week (from 1988)

Environmental News

Database: EUROENV	Europe Environment (from 1992)

3.4.3 OTHER ON-LINE DATABASES

Besides LEXIS, WESTLAW, and ABI-Inform, discussed above, there are a number of on-line (and/or CD-ROM) databases that are worthwhile for the acid rain researcher. The DIALOG databases are frequently available by other means, but deserve a note here. In addition, the Science Citation Index is a key resource for finding scientific articles.

Database Code:	**O12**
Database Code:	**DIALOG (Various databases)**
Database Name:	**DIALOG**
Format(s):	On-line
Access:	Various; Harvard libraries during library hours (Searcher pays cost.)
Time coverage:	Varies.
Example sources:	Varies by database.
Comments:	Due to lack of access, cost, and that many databases are available elsewhere, DIALOG databases are not further described herein, except under other access routes.
Country coverage:	Varies.
Publisher/Place:	Varies.

Database Code:	**O13**
Database Name:	**Science Citation Index (SCI)**
Abstract:	A key resource for finding scientific articles.
Format(s):	CD-ROM
Access:	CD-ROM at Cabot Sci. Lib., Harvard Univ.; paper at Cabot Sci. Lib., Harvard Univ.;
Time coverage:	Digital (CD-ROM), 1985-present; paper, 1955-present.
Country coverage:	U.S.A. and more

3.5 WORLDWIDE WEB

3.5.1 Introduction

This section provides an overview of selected Worldwide Web sites useful for research regarding rain research assessments and policymaking. Resources on the Internet, available through the Worldwide Web ("Web"), are growing exponentially. There are a number of very useful sites for acid rain research, mixed in with a number of education-oriented sites that are not useful for scholarly research.[9]

Because Web addresses (Uniform Resource Locators or URLs) are sometimes changed, there is no guarantee that the addresses below will be valid. The research for this paper was performed in 1997; therefore, contents of bibliographic resources may have changed. Web site

addresses (i.e., Uniform Resource Locators, or URLs) were checked in early 1999, but the reader should be aware that URLs may change rapidly. The database code "W" stands for "Web."

Because there are a wide variety of search engines, which are constantly being improved, I have not attempted to determine the best searches using such engines. Rather, useful Web sites are listed below. Here is an example Web search:

Database Code:	**W1**
Database Name:	**Hotbot Search Engine**
Abstract:	Indexes more than 54 million documents on the Web.
Format(s):	Worldwide Web search engine available through Netscape Navigator, v.3.0.
Access:	Internet
Time coverage:	Undetermined
Source coverage:	Institutional Web pages, school Web pages
Example sources:	U.S. Environmental Protection Agency Acid Rain Homepage, Stockholm Environment Institute, STAPPA/ALAPCO site (discussed below).
Comments:	General purpose search engine.
Country coverage:	U.S.A., Europe, Asia
Publisher/Place:	WIRED produces HOTBOT.

Ex. Search Code:	**W1.1**
Example Search:	Select "for the exact phrase." Keywords: "acid rain"
Ex. Search Meaning:	Searches Web page descriptions for the exact phrase, "acid rain."
Ex. Search Results:	16,614 matches
Comments:	Examined only a small sample of search results. As with most "surfing," majority of sites not useful, but a few gems, included below.

3.5.2 International –Oriented Sites

International Web sites includes those of international institutions and thinktanks. For example, the International Institute for Applied Systems Analysis (“IIASA”) maintains an excellent Web site, including a publications catalog of its extensive work on transboundary air pollution. In addition, the Stockholm Environment Institute has an excellent site, providing a wide range of publications.

Database Code:	**I1**
Website Name:	**International Institute for Applied Systems Analysis** See description in Section 3.3.1

Database Code:	**W2**
Website Name:	**Stockholm Environment Institute**
Abstract:	The Stockholm Environment Institute provides a list of its publications. The publications list important works of several SEI researchers, such as M. J. Chadwick.
Format(s):	Worldwide Web site
URL Address:	http://www.sei.se/sei/seipubs.nsf/by+year?openview&start=l&expand=l
Time coverage:	Undetermined
Example sources:	Gough, C.A., M.J. Chadwick, B. Biewald, J.C.I. Kuylenstierna, P.D. Bailey, and S.Cinderby. 1995. Developing optimal abatement strategies for the effects of sulfur and nitrogen at European Scale. Water, Air & Soil Pollution. Acid Reign '95? Conf Proc.
Comments:	Limited number but high-interest articles and monographs. Country coverage: Europe
Publisher/Place:	Stockholm Environment Institute, Stockholm

3.5.3 European-Oriented Sites

A number of sites provide information about acid rain in Europe, including IIASA's. Key sites include those provided by the United Nations Economic Commission for Europe, the European Topic Centre on Air Quality, the European Environment Agency (site called Airbase), the RIVM Coordination Center for Effects, and the Norwegian Institute for Acid Rain Research ("NILU"). Most of these sites provide information on scientific assessment of the acid rain problem in Europe, along with policy-related information.

Database Code:	**W3**
Website Name:	**Airbase, the European Air Quality Information System**
Abstract:	Provides information on air quality monitoring networks and stations and raw air quality data.
Format(s):	Worldwide Web site
URL Address:	http://www.etcaq.rivm.nl/airbase/index.html
Time coverage:	Undetermined
Comments:	Interesting scientific site.
Country coverage:	Europe
Publisher/Place:	Rijksinstituut voor Volksgezondheid en Milieu (National Institute of Public Health and the Environment of the Netherlands.) (“RIVM”).

Database Code:	**W4**
Website Name:	**European Commission, DG XI (Environment, Nuclear Safety, and Civil Protection)**
Abstract:	The Website of DG XI provides information, newslettersm guides to environmental legislation, and more.
Format(s):	Worldwide Web site
URL Address:	http://europa.eu.int/comm/dg11/index-en.htm
Time coverage:	Undetermined
Example sources:	Information on the Fifth Environmental Action Programme.

Comments:	Good access to European Commission activities related to the environment.
Country coverage:	European Communities members
Publisher/Place:	DG XI, Brussels
In addition, see:	
URL Address:	http://europa.eu.int/comm/dg11/pubs/access.htm
Example sources:	Provides DG XI documents regarding environmental impact assessment, including assessment in a transboundary context.

Database Code:	**W5**
Website Name:	**European Environment Agency**
Abstract:	Provides reports, articles, brochures, and papers regarding European environmental matters.
Format(s):	Worldwide Web site
URL Address:	http://www.eea.dk/
Time coverage:	Undetermined
Comments:	Link to European Environment Information and Observation NETwork
Country coverage:	Europe
Publisher/Place:	EEA

Database Code:	**W6**
Website Name:	**European Topic Centre on Air Quality**
Abstract:	The Centre was formed in 1994 by the European Environment Agency, and is a combination of four institutes from three countries. The Web site provides newsletters and dispersion modeling information.
Format(s):	Worldwide Web site
URL Address:	http://www.etcaq.rivm.nl/
Time coverage:	Undetermined
Country coverage:	Europe
Publisher/Place:	RIVM: The Netherlands

Database Code:	**W7**
Website Name:	**Norwegian Institute for Acid Rain Research ("NILU")**
Abstract:	NILU performs a wide range of scientific research regarding acid rain, and this site provides fact sheets and press releases.
Format(s):	Worldwide Web site
URL Address:	http://www.nilu.no/first-e.html
Time coverage:	Undetermined
Country coverage:	Europe
Publisher/Place:	NILU: Kjeller, Norway
Languages:	English and Norwegian

Database Code: **W8**
Website Name: **RIVM Coordination Center for Effects**
Abstract: The United Nations Coordination Center for Effects aims to provide scientific and technical support, in collaboration with the Programme Centres under LRTAP, to the Working Group on Effects, and as required, to the Working Group on Strategies.
Format(s): Worldwide Web site
URL Address: http://www.rivm.nl/sector5/cce/index.htm
Time Coverage: Present
Comments: This site does not link to much, but is worth watching because the Coordination Center for Effects is a crucial link between scientists and policymakers (via the Working Group on Strategies) in Europe.
Country coverage: Europe
Publisher/Place: Rijksinstituut voor Volksgezondheid en Milieu (National Institute of Public Health and the Environment of The Netherlands).

Database Code: **W9**
Website Name: **Swedish Environmental Protection Agency**
Abstract: This site covers the activities of the Swedish Environmental Protection Agency, including press releases. The URL address below is an index page.
Format(s): Worldwide Web site
URL Address: http://www.environ.se/www-eng/
Time coverage: Undetermined
Example sources: Swedish E.P.A. press releases.
Comments: The Swedish government has been a major force in the acid rain debate; the publications of its EPA are noteworthy. This site is in English; there are other sites in Swedish. Provides information on ordering documents.
Country coverage: Sweden, Europe in general
Publisher/Place: Swedish E.P.A., Stockholm

Database Code: **W10**
Database Name: **United Nations Economic Commission for Europe**
Abstract: Provides overview of the U.N. ECE and publications list under category "Environment and Human Settlements"
Format(s): Web
Access: http://www.unece.org/pub_cat/lpenviro.htm
Time coverage: Undetermined
Example sources: "Effects and Control of Long-range Transboundary Air Pollution" (Air Pollution Studies #10)
Comments: Useful for documents related to Convention on Long-range Transboundary Air Pollution.
Country coverage: Western Europe, Eastern Europe
Publisher/Place: U.N. ECE

3.5.4 North American-Oriented Sites

Government agencies and NGOs (for NGOs, see section 3.5.6, below) provide interesting Web sites for North American acid rain information. For example, the U.S. Environmental Protection Agency provides an extensive site regarding the federal Acid Rain Program. This site provides guidance to those trying to comply with the 1990 Clean Air Act Amendments (" 1990 CAAA"). In addition, the National Service Center for Environmental Publications (NSCEP) is a central repository for all EPA documents. These sites are discussed in section 3.3.2, above. The State and Territorial Air Pollution Program Administrators and Association of Local Air Pollution Control Officers (STAPPA and ALAPCO) provide a useful site regarding state regulation and their participation in the 1990 CAAA. This site includes many useful links.

Database Code:	**W11**
Website Name:	**Environment Canada Acid Rain Home Page**
Abstract:	The New Brunswick Department of the Environment provides a Web site that includes information on acid rain trends, and the Canadian Clean Air Act. (Search for "acid rain").
Format(s):	Worldwide Web site
URL Address:	http://www.gov.nb.ca/environm/air/index.htm
Time coverage:	Undetermined
Comments:	Limited information, but useful for Canadian data and perspective.
Country coverage:	Canada
Publisher/Place:	New Brunswick Department of the Environment

Database Code:	**W12**
Website Name:	**National Atmospheric Deposition Program/National Trends Network**
Abstract:	The National Atmospheric Deposition Program ("NADP") (and National Trends Network) is a cooperative research program of federal, state, and private organizations. The NADP Web site provides access to data from a network of more than 200 acidifying deposition monitoring sites throughout the U.S. One can obtain precipitation chemistry data and annual and seasonal deposition totals, among other data. The isopleth maps are particularly interesting.
Format(s):	Worldwide Web site
URL Address:	http://www.agnic.org/agdb/nadp.html
Time coverage:	1983-present.
Example sources:	Deposition data for the contiguous 48 states.
Comments:	Isopleth maps are available. See http://h2o.usgs.gov/public/pubs/acid_rain/index.html for a detailed analysis of the program's data from 1983 to 1994.
Country coverage:	U.S.A.
Publisher/Place:	Colorado State

Database Code:	**W13**
Website Name:	**Pennsylvania Department of Environmental Protection**
Abstract:	A site oriented toward the general public, providing ambient air monitoring data and regulatory information.
Format(s):	Worldwide Web site
URL Address:	http://www.dep.state.pa.us
Time coverage:	Undetermined
Example sources:	The state of Pennsylvania Department of Environmental Protection ("DEP") provides pages pertaining to ambient air monitoring data, acidifying deposition, tropospheric ozone, the federal Clean Air Act Amendments of 1990, and Pennsylvania's State Implementation Plan.
Comments:	An example of an acid rain "receptor" state's site.
Country coverage:	U.S.A.
Publisher/Place:	Pennsylvania DEP

Database Code:	**W14**
Website Name:	**STAPPA/ALAPCO**
Abstract:	The State and Territorial Air Pollution Program Administrators ("STAPPA") and the Association of Local Air Pollution Control Officers ("ALAPCO") maintain a Web site that provides links to the U.S. EPA Acid Rain Program (see above) and a variety of links to state, local, university, and regional agencies and research programs.
Format(s):	Worldwide Web site
URL Address:	http://www.4cleanair.org/acidrain.html
Time coverage:	Undetermined
Example sources:	U.S. EPA, National Acid Precipitation Assessment Program ("NAPAP"), Environment Canada Acid Rain Home Page
Comments:	Great for links.
Country coverage:	U.S.A.
Publisher/Place:	STAPPA/ALAPCO, Washington, D.C.

Database Code:	**W15**
Website Name:	**U.S. Department of Energy, Energy Information Administration (EIA Publications)**
Abstract:	The Energy Information Administration's ("EIA") mandate is to collect and disseminate data regarding energy, including demand and supply. The EIA publishes annual energy statistics from 1949, country analysis briefs (short descriptions regarding the largest consuming and producing countries), and various energy forecasts. A publications directory is available through this Web site.
Format(s):	Worldwide Web site
URL Address:	http://www.eia.doe.gov/bookshelf.html
Time coverage:	At least back to 1949.
Example sources:	EIA Monthly Energy Review, EIA Annual Energy Review 1996.
Comments:	Very useful site for energy data, particularly electric power in the U.S. Caution: Much electric utility data is gathered from surveys that are not necessarily accurate. (I have used EIA data extensively and have noted

	frequent and substantial discrepancies with corresponding data provided by the same utilities for other regulatory agencies having more regulatory authority than EIA, such as jurisdiction over rates.)
Country coverage:	U.S.A., international
Publisher/Place:	U.S. EIA.

Database Code:	**W16**
Website Name:	**U.S. Department of Energy, Office of Coal, Nuclear, Electric and Alternate Fuels ("CNEAF")**
Abstract:	Linked from Energy Information Administration site listed above.
Format(s):	Worldwide Web site
URL Address:	http://www.eia.doe.gov/cneaf/
Time coverage:	Undetermined
Example sources:	CNEAF documents; for example, "Electric Power Annual 1994" at http://www.eia.doe.gov/cneaf/pubs_html/epa_1994/homepage.html. Another example is "The Effects of Title IV of the Clean Air Act Amendments of 1990 on Electric Utilities: An Update" at http://www.eia.doe.gov/cneaf/electricity/clean_air_upd97/exec_sum.html
Comments:	See Energy Information Administration site discussion above.
Country coverage:	U.S.A.
Publisher/Place:	U.S. DOE, CNEAF

3.5.5 Asian-Oriented Sites

There are a dearth of sites with acid rain sources for Asia, probably because acid rain is an emerging issue in Asia.

Database Code:	**W17**
Website Name:	**International University of Japan, Center for Global Communications**
Abstract:	This Web page is primarily in Japanese.
Format(s):	Worldwide Web site
URL Address:	http://www.glocom.ac.jp/eco/
Time coverage:	Undetermined
Example sources:	In 1997, this site contained: Gregory R. Carmichael and Richard Arndt, "Deposition of Acidifying Species in Northwest Asia" (an article describing acidifying deposition in Asia and the use of the RAINS model (see IIASA) to study it).
Comments:	As acidifying deposition becomes a greater problem in Asia, watch for further use of RAINS and/or other models to assess it.
Country coverage:	Japan, Asia
Publisher/Place:	International University of Japan, unknown.
Language(s):	Japanese, predominantly; English

3.5.6 NGO-Oriented Sites

EcoNet is an environmental group-oriented Web site that purports to link to a wide variety of resources useful for NGO's. Individual NGO's, such as the Environmental Defense Fund, maintain Web sites.

Database Code:	**W19**
Website Name:	**EcoNet**
Abstract:	EcoNet provides links to action alerts, environmental news, and press releases, many of which are produced by NGOs. Also includes abstracts of scientific journal articles.
Format(s):	Worldwide Web site
URL Address:	http://www.igc.org/igc/econet/
Time coverage:	Undetermined
Comments:	Useful source of NGO publications and positions
Country coverage:	Multinational
Publisher/Place:	EcoNet

Database Code:	**W20**
Website Name:	**Environmental Defense Fund**
Abstract:	Provides EDF's viewpoints through its newsletters
Format(s):	Worldwide Web site
URL Address:	http://www.edf.org/
Time coverage:	Undetermined
Country coverage:	U.S.A., some international
Publisher/Place:	EDF

Database Code:	**W21**
Website Name:	**Greenpeace Atmosphere Page**
Abstract:	Provides information and press releases regarding Greenpeace's current campaigns for action on climate change and stratospheric ozone depletion.
Format(s):	Worldwide Web site
URL Address:	http://xs2.greenpeace.org/
Time coverage:	Undetermined
Example source:	Greenpeace press releases and short articles on climate change and stratospheric ozone depletion. (See "Press Releases.")
Comments:	Tangentially related to acid rain.
Country coverage:	International
Publisher/Place:	Greenpeace

Database Code:	**W22**
Website Name:	**Society of Environmental Journalists**
Abstract:	The stated goal of the Society of Environmental Journalists is to improve the quality, accuracy, and visibility of environmental reporting. The Web

	site is meant to provide links to information useful to environmental journalists.
Format(s):	Worldwide Web site
URL Address:	http://www.sej.org/
Time coverage:	Undetermined
Example sources:	http://www.sej.org/env_airp.htm
Comments:	Lists potentially useful Web sites regarding air pollution.
Publisher/Place:	Society of Environmental Journalists, Philadelphia, PA

3.5.7 General Sites

The upcoming publisher of environmental abstracts, Cambridge Scientific Abstracts, maintains a Web presence that leads to its products, such as the Pollution Index.

Database Code:	**W23**
Website Name:	**Cambridge Scientific Abstracts**
Format(s):	Worldwide Web site
URL Address:	http://www.csa.com
Time coverage:	Undetermined
Source coverage:	CSA publishes and provides a variety of on-line resources.
Example sources:	Pollution Abstracts
Country coverage:	Undetermined
Publisher/Place:	CSA

3.6 SOCIAL LEARNING PROJECT DATABASE

3.6.1 Introduction to the Social

The researcher will find in the Social Learning Project database an eclectic mix of citations to newspaper, magazine, and scientific journal articles, monographs, and interviews with key experts in the acid rain field. These database files are available to the GEA Fellows in a Windows 95-compatible reference database system, Endnote Plus, version 2. The database code "S" stands for "Social Learning."

As background, the project called "Social Learning in the Management of Global Environmental Risks" is an effort to understand whether, and how, societies are getting better at coping with changing global environmental problems. To this end, the Social Learning ("SL") Project team has sought to understand the long term interactions among governments, nongovernmental organizations, the private sector, the scientific community, and the media in shaping the response of ten countries or country groupings to the emerging threats of acid rain, stratospheric ozone depletion, and climate change. [10] As part of this research, various team members entered research notes, including bibliographic information, comments, and special codes pertaining to the Social Learning Project's methodology, in a reference database system.[11]

3.6.2 Contents of the Social Learning Project Database pertaining to Acid Rain

Two aspects of the Social Learning Project methodology should be understood when using the SL database files, because at least some of the information was entered by the researchers along these lines: "social actors" and "management functions."

The SL "social actor" groupings and their SL codes are: executive branches of government ("EX"), legislative or parliamentary branches of government ("P"), the expert communities (including scientists, economists, etc.) ("E"), business and industry groups ("I"), other non-governmental organizations (primarily environmental groups) ("NGO"), and the media ("M").[12] An additional group is international organizations ("IO").

To find records dealing with risk assessment, response assessment, and/or goal and strategy formulation, look for the appropriate code in the field called "Functional field." The original seven SL management functions and their "functional field" codes are: 1) issue framing ("IF"), 2) risk assessment ("RA"), 3) response assessment ("RPA"), 4) goal and strategy formulation ("SF"), 5) implementation ("I"), 6) monitoring ("M"), 7) evaluation ("E"). [13] Another code in the management function field is social learning theory ("SL").

The Social Learning Project database includes four files with acid rain-related information.

Database Code:	**S1**
Database Name:	**IOA#####** (where ##### represents the year, month, and day of the file version, e.g., 71104, meaning 1997, November, 4) Research notes of members of the SL International Institutions team. Contains citations and notes on acid rain assessments by European scientists, publications of the International Institute for Applied Systems Analysis ("IIASA"), U.N. Economic Commission for Europe documents, and interviews with acid rain experts at IIASA and in Scandinavia.
Format(s):	PC-compatible, Endnote Plus 2 software needed Belfer Center for Science and International Affairs ("BCSIA")
Time coverage:	1967-1993
Example sources:	Acid rain assessments by European scientists; interviews with acid rain experts at IIASA and in Scandinavia
Comments:	353 records; last data entered, Sept. 26, 1993, or earlier
Country coverage:	International institutions, Western Europe (with references from Sweden and Norway), Canada
Publisher/Place:	BCSIA
Language(s):	English

Database Code:	**S2**
Database Name:	**USA#####** (where ##### represents the year, month, and day of the file version, e.g., 71104, meaning 1997, November, 4)

Abstract:	Research notes of members of the SL U.S. team in 1993. Contains citations to Congressional hearings, U.S. EPA reports, reports from the National Acid Precipitation and Assessment Program ("NAPAP"), and articles in the press (especially regarding statements by Governors and legislators), Environment Reporter, Ph.D. dissertations, among other items.
Format(s):	PC-compatible, Endnote Plus 2 software needed
Access:	Belfer Center for Science and International Affairs ("BCSIA")
Time coverage:	1960's-1993, and even 1907
Comments:	863 records; last data entered Oct. 17, 1994, or earlier. Most or all of the records in the "NYT#####" file, described below, seem to be incorporated (records 418 through 863 are citations to the New York Times).
Country coverage:	U.S.A.
Publisher/Place:	BCSIA
Language(s):	English

Database Code:	**S3**
Database Name:	**NYT**##### (where ##### represents the year, month, and day of the file version, e.g., 71104, meaning 1997, November, 4)
Abstract:	Research notes of Harvard researchers working on the project called, "The Press and Global Environmental Change," summarizing press coverage of acid rain issues in the New York Times.
Format(s):	PC-compatible, Endnote Plus 2 software needed
Access:	Belfer Center for Science and International Affairs ("BCSIA")
Time coverage:	1970-1992
Comments:	420 records; last data entered March 23, 1995, or earlier
Country coverage:	U.S.A.
Publisher/Place:	BCSIA
Language(s):	English

Database Code:	**S4**
Database Name:	**CAN**##### (where ##### represents the year, month, and day of the file version, e.g., 71104, meaning 1997, November, 4)
Abstract:	Research notes of members of the SL Canadian team. Summarizes press coverage of acid rain issues in The Globe and Mail, a Canadian newspaper.
Format(s):	PC-compatible, Endnote Plus 2 software needed.
Access:	Belfer Center for Science and International Affairs ("BCSIA")
Time coverage:	July 26, 1971 to Dec. 22, 1992.
Comments:	123 records; last data entered Jan. 12, 1994, or earlier.
Country coverage:	Canada, U.S.A.
Language(s):	BCSIA

3.7 PAPER INDEXES OF REFERENCES PRIOR TO SIGNIFICANT DIGITAL COVERAGE

In very rough terms, references from the 1990's are accessible by electronic means; references from the 1980's may be found using a mixture of electronic databases and paper indices, and references from the 1970's may be located by paper indices. There were far fewer documents published about acid rain in the 1970's, so this limited access by paper is not as much of a problem as it may appear at first blush.

One of the most important indices of scientific and policy articles during the late 1970's and early 1980's is the (former) Environment Index, accompanied by the (former) Environment Abstracts. This index later became the Environment Abstracts Annual, described below.

Indices relevant to acid rain research are presented in alphabetic order by title, below. The database code "P" stands for "Paper."

Database Code:	**P1**
Database Name:	**Aquatic Sciences and Fisheries Abstracts**
Abstract:	"An international information journal for the science and technology of marine and freshwater environments. (vol. 7, no. 1) Compiles abstracts from scientific journals regarding aquatic sciences and fisheries.
Format(s):	Digital; paper.
Access:	Digital, Cambridge Sci. Abs. as CD-ROM; paper, call number: QH901.A1.A681.
Time coverage:	Web, undetermined; paper, Jan. 1972-1993.
Comments:	None
Country coverage:	U.S.A., Canada, Europe
Publisher/Place:	Varies: Circa 1977, Food and Agriculture Organization ("FAO") of the United Nations and the Intergovernmental Oceanographic Commission, with the collaboration of numerous institutions; Recently, Cambridge Scientific Abstracts, Bethesda, MD.
Ex. Search Code:	**P1.1**
Example Search:	Paper: Late 1970's, see category, "Pollution" and its subcategories.

Database Code:	**P2**
Database Name:	**Biological Abstracts**
Abstract:	Reports world life sciences research. Covers scientific journals. Indexes over 9,000 journals.
Format(s):	Worldwide Web (through HOLLIS Plus); paper.
Access:	HOLLIS Plus; paper, call number: QH30I.B51.
Time coverage:	1926-present.
Example sources:	Norway Forest Research Institute.
Comments:	Focuses on biology, as opposed to environmental impacts. Early 1970's-not very useful for acid rain-related work.
Country coverage:	U.S.A., Europe
Publisher/Place:	In early 1980's, BioSciences Information Service, Philadelphia, PA.

Language(s):	English
Ex. Search Code:	**P2.1**
Example Search:	In early 1980's, paper: See subject index, terms: "environmental studies (external effects)."
Database Code:	**P3**
Database Name:	**Ecological Abstracts (formerly Ecology Abstracts (circa 1980); formerly Applied Ecological Abstracts, from 1975).**
Abstract:	In 1991, coverage included over 600 leading ecological and environmental journals, plus books, conference proceedings, reports, and theses. In 1975, editorial staff drew from 4,300 primary journals. Subject matter: pure ecology, and papers on resource and ecosystem modeling, economics, operations research, systems analysis, and water management.
Format(s):	Digital; paper
Access:	Digital, Cambridge Sci. Abs., as CD-ROM; paper, call number: QH 540 A6 (App. Eco. Abs), E23 (Ecol. Abs).
Time coverage:	Digital, 1990-present; paper, Jan. 1975-1990.
Comments:	Not a great database for acid rain in early years, but many listings recently.
Country coverage:	Western Europe, at least
Publisher/Place:	Varies: around 1991, Elsevier Science Publishers, Ltd., Essex, England, U.K.; present, Cambridge Scientific Abstracts, Bethesda, MD.
Ex. Search Code:	**P3.1**
Example Search:	Paper: See subject index, terms: acid deposition, acid fog, acid precipitation, acid rain, acid soil, acid waters.
Database Code:	**P4**
Database Name:	**Environment Abstracts Annual (formerly Environment Index and Environment Abstracts; formerly Environment Information Access)**
Abstract:	Covers scientific journal articles, conferences, books, and films. In 1978, 50,000 citations. In 1970's, included "yearbook" section summarizing key events regarding environmental movement.
Format(s):	Digital; paper.
Access:	Digital, Cambridge Sci. Abs.; paper, call number: GF.1.A12.E57.
Time coverage:	Digital, as Environment Abstracts Annual, 19??-present; paper, as Environment Abstracts Annual, 1988-1992; paper, as Environment Index, accompanied by Environment Abstracts, 1974-1987; paper, as Environment Information Access, 1971-1974.
Source coverage:	Scientific journals, government documents.
Example sources:	Environment; Ambio; Water, Air & Soil Pollution; OECD reports; (former) Journal of the Air Pollution Control Association; U.S. Congressional hearings; U.S. state agency hearings; NGO-sponsored reports (e.g., Amicus Journal).

Comments:	The early Environment Index ("EI") is one of the most useful bibliographic indices for acid rain references in the 1970's and early 1980's. El covers both technical and news (policy) sources. EI reveals the dearth of publications on acid rain in the 1970's, followed by the surge in publications around 1980. For example, under the subject heading, "acid rain," EI has the following numbers of entries by year: 1974 (9), 1975 (14), 1976 (10), 1977 (18), 1978 (28), 1979 (41), 1980 (53), 1981 (168).... i.e., 1992 (284).
Country coverage:	U.S.A., Canada, Western Europe.
Publisher/Place:	Varies: Early years, Environment Information Center, Inc., New York; around 1992, Bowker A&I Publishing, New Providence, NJ.
Example Search Code:	**P4.1**
Example Search:	In Environment Index, pre-1974, see subject index, "air pollution," "water pollution;" starting in 1974, see subject index, "acid rain."
Ex. Search Results:	See Comments, above.

Database Code:	**P5**
Database Name:	**EPA Publications Bibliography**
Abstract:	Covers U.S. Environmental Protection Agency documents. A EPA document index is now available on-line (see section 3.3.2).
Format(s):	Paper
Access:	Library
Time coverage:	1976-present
Source coverage:	U.S. Environmental Protection Agency publications.
Comments:	Early issues had no keyword listing for "acid rain." By 1982, there is one listing under "acid rain" in the keyword index.
Country coverage:	U.S.A.
Publisher/Place:	U.S. Environmental Protection Agency, Washington, D.C.
Ex. Search Code:	**P5.1**
Example Search:	See "acid rain" in keyword index.

Database Code:	**P6**
Database Name:	**Energy Resources Abstracts**
Abstract:	Provides abstracts and index coverage of scientific and technical reports and patent applications originated by the U.S. Department of Energy, its laboratories, energy centers, and contractors. Also covers energy information prepared in report form by federal and state governmental organizations, foreign governments, and domestic and foreign universities and research organizations. The purpose is to announce documents not otherwise readily available as journal articles, books, or patents. (Source: ERA, vol. 20, no. 12, preface.)
Format(s):	Paper
Access:	Paper, call number Q I E23
Time coverage:	Unknown if continued past 1995; paper, as Energy Research Abstracts, 19??- Dec. 1995; paper, as ERDA Reports Abstracts, March 1975-1992.
Example sources:	DOE contractor reports.

Comments:	Strong regarding coal-fired power plants and modeling of long-range transport of their emissions.
Country coverage:	Mainly U.S.A., some foreign.
Publisher/Place:	U.S. Department of Energy, Oak Ridge, TN; started by the now-defunct U.S. Energy Research and Development Administration.
Ex. Search Code:	**P6.1**
Example Search:	In mid-1980's editions, see subject category 50, "Environmental Sciences, Atmospheric" and its subcategories, particularly subcategory 02, "Chemicals Monitoring and Transport." By 1978, had added subject category, "Coal--Environmental Aspects."

Database Code:	**P7**
Database Name:	**GPO Monthly (U.S. Government Printing Office)**
Abstract:	Index of U.S. government publications, including Congressional hearings.
Format(s):	Worldwide Web, microfiche, paper.
Access:	No longer at this site in an obvious way. Therefore "see also" microfiche; paper, call number, J69.A25, see also GPO website (http://www.access.gpo.gov/sv-docs/dbsearch.html)
Time coverage:	Web, Jan. 1994-present; microfiche, ?-1993-?; paper,19??-1992.
Country coverage :	U.S.A.
Publisher/Place:	U.S. Government Printing Office, Washington, D.C.
Ex. Search Code:	**P7.1**
Example Search:	Paper, see subject index, "air pollution."

Database Code:	**P8**
Database Name:	**Pollution Abstracts**
Abstract:	"Pollution Abstracts organizes, summarizes, and indexes worldwide technical literature on environmental pollution." (Pollution Abstracts, 1996, vol. 27, no.10, iii.)
Format(s):	Digital; paper.
Access:	Digital, Cambridge Sci. Abs., WESTLAW; paper, call number: TD. I 72.P65
Time coverage:	Digital, 1981-present; paper, 1970-present.
Source coverage:	Scientific journals, conference proceedings.
Example sources:	Acid Reign '95: Proceedings from the 5th International Conference on Acidic Deposition: Science and Policy, held in Goteborg, Sweden, 26-30 June 1995 (indexed in Oct. 1996, illustrating lag time).
Comments:	Pollution Abstracts is one of the oldest relevant indices, dating back to 1970. Early 1970's issues quite general; lots of advertising.
Country coverage:	USA, Europe, Asia
Publisher/Place:	Varies: Early 1970's, institute in La Jolla, CA; mid-1970's, Data Courier, Louisville, KY; present, Cambridge Scientific Abstracts, Bethesda, MD

Ex. Search Code:	**P8.1**
Example Search:	Paper: See subject index, terms: acid deposition, acid rain, acidification. Acidity.

Database Code:	**P9**
Database Name:	**Research Centers Directory**
Abstract:	Provides index to academic and non-governmental research institutions.
Format(s):	Paper
Access:	Library
Time coverage:	1960-present
Comments:	Useful for finding names of thinktanks.
Country coverage:	U.S.A., Europe
Publisher/Place:	Gale Research, Inc., Detroit, MI.
Ex. Search Code:	**P9.1**
Example Search:	acid rain
Ex. Search Meaning:	subject index: acid rain, and cross-references

Database Code:	**P10**
Database Name:	**Water Resources Abstracts –** Note: Several titles, only one shown here.
Abstract:	Covers scientific journals related to water quality issues.
Format(s):	CD-ROM
Access:	Undetermined
Time coverage:	1976-present (unknown how much on CD)
Country coverage:	U.S.A.
Publisher/Place:	SilverPlatter Information, Dublin, OH

4.0 CONCLUSION

The computer revolution has brought a dramatic change in the accessibility of information about the environment. Acidifying deposition was recognized as a pollution problem about three decades ago, when there were a few nascent indices of pollution-oriented articles. By the 1980's, a researcher at a U.S. university had access to a wider range of materials, but was still generally limited to U.S. sources. Today, most recently published works on acid rain are indexed in electronic databases, and many are provided in full-text in electronic databases. Far more international materials are available, particularly European materials. In addition, scientific articles, legislative bills, and a wide variety of other information relevant to the connection between environmental assessment and policymaking is available via the Internet.

For research regarding recent publications and events, the investigator should use electronic databases as a starting point, and rerun searches periodically to catch new entries. For research regarding the 1970's and early 1980's, certain paper indices are still useful.

ENDNOTES

[1] The Global Environmental Assessment ("GEA") Project is a collaborative team study of global environmental assessment as a link between science and policy. The team is based at Harvard University, but includes significant contributions from the International Institute for Applied Systems Analysis ("IIASA"), Cornell University, Duke University, and the Center for Integrated Study of the Human Dimensions of Global Change Integrated Assessment Center at Carnegie Mellon University.

[2] The term, "acid rain,"-is commonly used to refer to what scientists call "acidifying deposition." Acidifying deposition more accurately encompasses forms of deposition that are acid or tend to form acid. Such deposition can be either wet (e.g., sulfuric acid droplets) or dry (sulfate particles). For ease of reading, this paper frequently uses "acid rain" to refer to acidifying deposition.

[3] See section 3.6 for information about the Social Learning Project.

[4] Harvard University Library, 1996.

[5] For example, the "PolicyFile (1990-)" seems to be a fascinating Web site, containing 11,000 abstracts from policy-related journals, but I was unable to access this database remotely.

[6] Since I was unable to access the PolicyFile from a remote location, no further information is given.

[7] Documentation from LEXIS does not use this three-level paradigm.

[8] Unfortunately, the printing and downloading permissions for the Belfer Center for Science and International Affairs Library are rather restricted. For example, the files "CURNWS" and "ALLNWS" are not available as "group" files; one must search the individual component files. Second, downloading and printing are restricted. "Downloading" under the BCSIA contract is running a search and choosing to download all your search results to disk. A download is also printing a single document (i.e., printing from LEXIS, as opposed to using DOS "print-screen," i.e., printing one screen at a time). Finally, downloading is also saving one document to disk. In sum, any single download or print command, for any number of documents, counts as a download. BCSIA is charged for every download above a small monthly allowance. Source: Ms. Anne Cushing, BCSIA Librarian, email messages to the author, July 14, 1997.

[9] The education-oriented sites tend to be those constructed by elementary or secondary school teachers (with or without help from their students), for the benefit of elementary or secondary students. (See, e.g., http://wfs.vub.ac.be/schools/timeline/acidrain/jorpe/index.htm, from Norway.) One interesting example is a site where students measure rainfall acidity and post the results daily.

[10] The project began in January 1991 with a grant from the John D. and Katherine T. MacArthur Foundation, and subsequently was expanded to included 17 research associates from eight countries. The main findings will be published in 1998 in William C. Clark, *et al.*, 1998, *Learning to Manage Global Environmental Risks: A Comparative History of Social Responses to Climate Change, Ozone Depletion and Acid Rain.* MIT Press.

[11] For an explanation of the Social Learning Project Database, see Dietrich, William F. 1992. *Guide to the Social Learning Project Database.* Version 2.1 (August 14, 1992). Cambridge, Mass.: Center for Science and International Affairs, Harvard University.

[12] One of the matrices in Section 2 uses these social actor groups as a key to the databases discussed in this paper.

[13] In SL parlance, "evaluation" means self-conscious efforts of actors to evaluate performance in contributing to management of the risk at issue. The SL Project later reduced the functions to six, by eliminating "issue framing."

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APPENDIX

Table 1: Acid Rain Research Databases by Social Actor

Table 2: Acid Rain Research Databases by Communication Pathway

Table 1: Acid Rain Research Databases by Social Actor

DATABASE/INDEX	Government-Executive	Government-Legislative	Experts (includes scientists)	Industry	Other Non-Gov. Organizations (NGOs)	The Media
Academic Libraries ("A")						
Harvard – HOLLIS Plus	PAIS Intl DB (A5)	PAIS Intl DB (A5)	Current Contents (A3)	ABI Inform (A1)	RLG Bibl. File (A7)	
	Env. Per. Bib. (A3)	Env. Per. Bib. (A3)	Env. Period Bib. (A4)			
		Academ. Indx (A2.1)	Academ. Indx (A2.1)			Academ. Indx (A2.1)
	RLG Bibl. File (A7)	RLG Bibl. File (A7)				
Harvard – HOLLIS	HOLLIS (A8)	HOLLIS (A8)	HOLLIS (A8)		HOLLIS (A8)	HOLLIS (A8)
Other			NCSU Lib. (A11)		Univ. Waterloo (A13)	
Institutional Libraries ("I")						
Inter'l Inst. Applied Sys. An.	IIASA Pub. (Il)	IIASA Pub. (Il)	IIASA TAP Pub. (Il.1)			
	(Re: U.N. ECE)	(Re: U.N. ECE)				
U.S. Envir. Prot. Agency	US EPA Pubs (I2)	US EPA Pubs (I2)	US EPA Pubs (I2)			
			NCEPI (I4)			
U.S. Library of Congress		Lib. Cong. (I5)	Lib. Cong. (I5)			

Legend:
Codes shown in matrix provide link to descriptions of databases in the text. First letter represents type of database or index, as follows:

A = Academic
I = Institutional Libraries
O = On-line Services
S = Social Learning
P = Paper Sources

Number is simply an arbitrary number of the database within its category in the main text.
Decimal number specifies a particular search in a particular database or index, as discussed in text.

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Table 1: Acid Rain Research Databases by Social Actor

DATABASE/INDEX	Government-Executive	Government-Legislative	Experts (includes scientists)	Industry	Other Non-Gov. Organizations (NGOs)	The Media
On-line Services ("O")						
LEXIS	LAW (O11)	LEGIS (not coded)	NEWS/nwltrs (O6.1)	NEWS/nwltrs (O6.1)	NEWS/nwltrs (O6.1)	NEWS/allnws(O2.1)
	EURENV (not coded)	EURENV (not coded)	NEWS/allnws(O2.1)	NEWS/mags (O4)	NEWS/mags (O4)	WORLD/allwld (O8)
	ECLAW (not coded)	ECLAW (not coded)		NEWS/majpap (O5)	NEWS/bnaied (see O6)	NEWS/mags (O4)
		USCODE (not coded)		NEWS/bnaied (see O6)		NEWS/majpap (O5)
WESTLAW (not indexed)	BNA-ER	BNA-ER		CBD (Cmc.Bus.Daily)	BNA-IED	NP
	INTLENVL	INTLENVL				
Worldwide Web ("W")						
International –Oriented Sites		U.N. ECE (W10)	IIASA TAP Pub. (I1.1)		Econet (W19)	
			Stockh.Env.Inst. (W2)		Stockh.Env.Inst. (W2)	
European – Oriented Sites	Eur. C.-DG XI (W4)	U.N. ECE (W10)	Airbase (W3)			
	Eur. Env. Ag. (W5)		Eur. Topic Centre (W6)			
			IIASA (I1)			
			RIVM (W8)			
			NILU (W7)			
North – American	U.S. EPA Pubs (I2)		U.S. EPA Pubs (I2)			
	STAPPA (W14)		NADP (W12)			
	Env. Canada (W11)		Env. Canada (W11)			

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Table 1: Acid Rain Research Databases by Social Actor

DATABASE/INDEX	Government-Executive	Government-Legislative	Experts (includes scientists)	Industry	Other Non-Gov. Organizations (NGOs)	The Media
Asian – Oriented Sites			Ctr. Glo. Com. (W17)			
NGO – Oriented Sites					Env. Def. Fund (W20)	
					EcoNet (W19)	
General Sites			Camb. Sci. Abs (W23)			
Social Learning DB ("S")						
SL – Intern'tl Inst. File	(S1)		(S1): assessments		(S1)	
SL – U.S.A. file	(S2): EPA, governors	(S2): Cong. Hearings	(S2)	(S2):EPRI, EEI	(S2)	(S2): NY Times
SL – New York Times file	(S3)	(S3)	(S3)	(S3)	(S3)	(S3)
SL – Canada file	(S4)			(S4): smelters	(S4)	(S4)
Paper Sources ("P")						
	GPO Mo. Cat. (P7)	GPO Mo. Cat. (P7)	Env.Abs.Ann. (P4.1)		Env.Abs.Ann. (P4.1)	
	Env.Abs.Ann. (P4.1)	Env.Abs.Ann. (P4.1)	(or Envir. Index(P4))			
	EPA Pubs. Bib. (P5)		Pollution Abs. (P8.1)			
			Water Res. Abs. (P10)			
			Biological Ab. (P2)			
			Energy Res. Abs. (P6.1)			
			Aquatic Sci. (P1)			
			Ecol. Abs. (P3.1)			

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Table 2: Acid Rain Research Databases by Communication Pathway

DATABASE/INDEX	Scientist to Scientist	Scientist to Policymaker	Scientist to Public	Domestic to International	International to Domestic	Domestic to Bilateral
Academic Libraries ("A")						
Harvard – HOLLIS Plus	Current Contents (A3)	PAIS Intl DB (A5)		RLG Bibl. File (A7)	RLG Bibl. File (A7)	
	Env. Per. Bib. (A4)			PAIS Intl DB (A5)	PAIS Intl DB (A5)	
	Academ. Indx (A2.1)	Academ. Indx (A2.1)		Academ. Indx (A2.1)	Academ. Indx (A2.1)	Academ. Indx(A2.1)
Harvard – HOLLIS	HOLLIS (A8)	HOLLIS (A8)	HOLLIS (A8)			
Other	NCSU Lib. (A11)					
Institutional Libraries ("I")						
Inter'l Inst. Applied Sys. An.	IIASA TAP Pub. (Il.1)	IIASA Pub. (Il)	IIASA TAP Pub. (Il.1)			
		(Re: U.N. ECE)				
U.S. Envir. Prot. Agency	U.S. EPA Pubs (I2)	US EPA Pubs (I2)				
	NCEPI (I4)	NCEPI (I4)				
U.S. Library of Congress		Lib. Cong. (I5)	Lib. Cong. (I5)	Lib. Cong. (I5)		

Legend:
Codes shown in matrix provide link to descriptions of databases in the text. First letter represents type of database or index, as follows:

A = Academic
I = Institutional Libraries
O = On-line Services
S = Social Learning
P = Paper Sources

Number is simply an arbitrary number of the database within its category in the main text. Decimal number specifies a particular search in a particular database or index, as discussed in text.

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DATABASE/INDEX	Scientist to Scientist	Scientist to Policymaker	Scientist to Public	Domestic to International	International to Domestic	Domestic to Bilateral
On-line Services ("O")						
LEXIS			NEWS/nwltrs (O6.1)	NEWS/nwltrs (O6.1)	NEWS/nwltrs (O6.1)	NEWS/non-eng (O7)
				WORLD/allwld (O8)	WORLD/allwld (O8)	WORLD/allwld (O8)
			NEWS/allnws (O2.1)	NEWS/majpap (O5)	NEWS/majpap (O5)	NEWS/majpap (O5)
				NEWS/bnaied (see O6)	NEWS/bnaied (see O6)	NEWS/bnaied (see O6)
WESTLAW (not coded)		BNA-ER (not coded)		BNA-IED (not coded)	BNA-IED (not coded)	NP (not coded)
Worldwide Web ("W")						
International –Oriented Sites	IIASA TAP Pub. (I1.1)	U.N. ECE (W10)				
	Stockh.Env.Inst. (W2)				Stockh.Env.Inst. (W2)	
European – Oriented Sites	Eur. Topic Centre (W6)	U.N. ECE (W10)		Swedish EPA (W9)	Eur. C.-DG XI (W4)	
	IIASA TAP Pub. (I1.1)	IIASA (I1)				
	RIVM (W8)	RIVM (W8)				
	NILU (W7)	NILU (W7)				
North – American	U.S. EPA Pubs (I2)	STAPPA (W14)	U.S. EPA Pubs (I2)	EcoNet (W19)		U.S. EPA Pubs (I2)
	NADP (W12)	Env. Canada (W11)		Env. Canada (W11)		

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Table 2: Acid Rain Research Databases by Communication Pathway

DATABASE/INDEX	Scientist to Scientist	Scientist to Policymaker	Scientist to Public	Domestic to International	International to Domestic	Domestic to Bilateral
Asian – Oriented Sites			Ctr.Glob.Com. (W17)			
NGO – Oriented Sites			Env. Def. Fund (W20)	Env.Def. Fund (W20)	Env. Def. Fund (W20)	Env. Def. Fund (W20)
	Env. Per. Bib. (A3)	Env. Per. Bib. (A3)	Env. Period Bib. (A4)			
			EcoNet (W19)		EcoNet (W19)	
General Sites	Camb.Sci.Abs (W23)	Camb.Sci.Abs (W23)	Camb.Sci.Abs (W23)	Camb.Sci.Abs (W23)	Camb.Sci.Abs (W23)	Camb.Sci.Abs (W23)
Social Learning DB ("S")						
SL – Intern'tl Inst. File	(S1): assessments	(S1)	(S1)	(S1)	(S1): UN, UN-ECE	(S1)
SL – U.S.A. file	(S2)	(S2): Cong. hearings	(S2)			
SL – NYT file	(S3)	(S3)	(S3)	(S3)	(S3)	(S3)
SL – Canada file			(S4)	(S4)	(S4)	(S4)
Paper Sources ("P")						
	Environ.Abs.Ann. (P4	GPO Mo. Cat. (P7)	Environ.Abs.Ann.(P4)	Environ.Abs.Ann.(P4)	Environ.Abs.Ann.(P4)	
	(or Envir. Index (P4))	Environ.Abs.Ann. (P4)	(or Envir.Index (P4))			
	Pollution Abs. (P8)					
	Water Res. Abs. (P10)					
	Biological Abs. (P2)					
	Energy Res. Abs. (P6)					
	Aquatic Sci. (P1)					
	Ecol. Abs (P3)					

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