SUMMARY REPORT

Volume 1

NATIONAL ENVIRONMENTAL INFORMATION SYMPOSIUM

U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL ENVIRONMENTAL RESEARCH CENTER
CINCINNATI, OHIO

NATIONAL ENVIRONMENTAL INFORMATION SYMPOSIUM

An Agenda for Progress

September 24–27, 1972
Cincinnati, Ohio

VOLUME 1. SUMMARY REPORT

U. S. ENVIRONMENTAL PROTECTION AGENCY
National Environmental Research Center
Cincinnati, Ohio 45268

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FOREWORD

Today's concern for the quality of life and the quest for effective means to protect and preserve the environment have led to initiation of many new local, State, and Federal programs. Success of these programs is dependent, in large degree, on efficient dissemination and utilization of environmental information from many sources and disciplines.

The critical role of information technology in support of what has become one of the Nation's highest priority endeavors was the raison d'etre for the National Environmental Information Symposium. On the following pages the results of that meeting are summarized. The general findings and recommendations, and especially the reports from the five major user groups, point the way to an innovative program for improvement in a vital field that affects every citizen. They will be given careful consideration.

I wish to thank every person who worked to make NEIS a success. The exchange of views begun here can help all of us do a better job in moving the Nation toward a better life for all its citizens.

William D. Ruckelshaus
Administrator
U.S. Environmental Protection Agency

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NATIONAL ENVIRONMENTAL INFORMATION SYMPOSIUM:
An Agenda for Progress
SUMMARY REPORT

I – BACKGROUND

The National Environmental Information Symposium (NEIS), held in Cincinnati, Ohio, from September 24 through 27, 1972, was sponsored by the U. S. Environmental Protection Agency (EPA) and hosted by EPA's National Environmental Research Center in Cincinnati. The more than 1700 participants represented a substantial portion of the United States, community of producers and users of environmental information. In addition, about 50 international observers also were present. The program was enriched through the participation of about 125 exhibitors (Appendix A) who gave detailed descriptions and demonstrations of the information sources and services available.

The Symposium was the first general, convocation of the environmental information community. It grew out of the conviction that environmental problems could be more easily solved if the information required were readily available to all segments of society. A widening interest and sharply growing demand for improved organization, processing, and dissemination of environmental information, as expressed in a governmental institutional context, has been reflected in the activities of the Study of Environmental Quality Information Programs (SEQUIP) Committee, activities and programs of the Office of Science and Technology, and the U.N. Conference on the Human Environment held in June 1972, in Stockholm.

The U. S. Environmental Protection Agency, in cooperation with other Government organizations (Appendix B), undertook to organize the Symposium with three basic purposes:

- To bring together concerned citizens, trade associations, professional societies, and governmental bodies to share ideas, interests, and common concerns.

- To identify specific directions which governmental and private organizations could take to strengthen coordination and cooperation, and improve environmental information exchange.
- To provide a forum for producers and processors of environmental data to demonstrate the most up-to-date techniques, methods, and equipment to users in the information science and systems fields.

A fairly complex program was developed and carried out at the Symposium. It divided the types of environmental information into scientific and technical; legal, legislative and regulatory; management and planning; and socioeconomic. Services provided to users in each of these information areas were broken down further into three categories: information and data centers, publications, and document services and referral activities. A moderator for each type of information area was selected and speakers generally knowledgeable in the services provided in each type were asked to present papers in concurrent sessions on Monday afternoon, Tuesday morning and afternoon (Appendix C). The moderator was responsible for avoiding overlap and gaps in coverage and for the conduct of the sessions.

Following each speaker session, the general audience broke into five user group panels, identified as: citizens' action; press and publications; industry and trade associations; academia, research organizations and professional societies; and government (Appendix D). A chairman, co-chairman, and EPA representative and at least four panel members were selected to organize and operate these user group panels.

Interspersed in this structured program of speaker sessions and user group meetings were a number of general sessions (Appendix E) with key speakers, designed to set the tone for the meeting, represent various segments of producers and users at policy-making levels, and address specific issues. In the final plenary session on Wednesday morning, representatives of the five user group panels presented their findings.

The Monday and Tuesday evening forum sessions were designed to provide more detailed and informal discussion of specific aspects of environmental information. Twenty-four of these were held on Monday evening, eight on Tuesday (Appendix F).

The Proceedings of the National Environmental Information Symposium are being issued in two volumes. Volume 1 contains a statement of the background and purpose of the Symposium, a summary of participant comments and recommendations gleaned from verbal and written communications with members of the Symposium committees, as well as the full text of the user panel reports. Volume 2 (Proceedings) includes the papers presented by

the general session speakers, introductory statements by the moderators, papers presented by the session speakers, and any reports submitted from the evening forum sessions. The Proceedings will be published and distributed by the National Technical Information Service, U. S. Department of Commerce.

II – SUMMARY

The most common concern expressed by the Symposium participants, regardless of attitudinal or professional orientation, was the need for improved awareness of, and access to, environmental information. The concept of access ranged from dissemination of bibliographic information to a desire for direct access to raw and interpreted data. The need for interpreted data was modified by a concern that the interpretation should be free from bias.

Much discussion centered around the user fee or other charges levied by organizations, specifically the Federal Government, for information. One user group felt strongly that the Government is obligated to provide information cost-free to all comers, regardless of levels of detail and volume. However, it was more generally agreed that referral services, accurately directing the potential user to sources of information, should be cost-free, even though some referenced sources may charge for their services. Regional information centers and libraries could play a role in making the information available free to local users.

Specific attention was paid to the problems of access to literature and data used by organizations to support Environmental Impact Statements. It was felt that, at present, this supporting information does not become available early enough and that its acquisition by interested parties is too expensive.

Users, whether public or private, experience great difficulties in obtaining accurate and comprehensive information about the location and availability of environmental information resources.

A general desire exists for a climate of open decision-making throughout the environmental field, with all interested groups having full right of access not only to digested position papers, impact statements, and recommendations, but to supporting raw data and background information as well.

Information should be specifically packaged for various user groups or presented in language understandable to all (i.e., laymen in the various disciplines involved).

Growing concerns about the environment have brought about a new interdisciplinary alignment throughout the information producer/user communities. Because of the nature and growth of ecology as a field, there has been a coming together of chemists, biologists, administrators, engineers, and other specialists into common lines of endeavor. As a result, there is a growing recognition of commonality of interest in environmental

information; this calls for decisive action to establish environmentally-oriented national information facilities and services.

A national program is needed to coordinate efforts to handle and disseminate environmental information, whether it be the responsibility of one or of several organizations.

- Channels for information transfer must be opened among Federal, State and local government organizations. These bodies must establish links with private organizations, groups, and individuals. An environmental information network may be needed.
- An intergovernmental joint planning group could strengthen and coordinate environmental information delivery systems. This group should include representation from the Federal, State and local government agencies having significant environmental responsibilities.
- A group representing the private sector, academia, citizens, industry and trade associations should exist, either as part of or similar to the intergovernmental group, to provide a balanced approach to problems and decisions. This group might include producers and handlers of information in the private sector, or their interests might form a third group. User service systems can only be designed with the assistance of users.
- Planning and coordinating groups should be responsible for reviewing the problems existing in the field and for identifying ways to relieve them. These groups should provide a mechanism for sharing, on a national scale, environmental information systems experiences at all levels; they should recommend use of funds as needed to set up user-oriented environmental information systems; and they should provide leadership in establishing standards for such systems that will promote compatability and information exchange.
- A mechanism should be found for establishing evaluation procedures for the data going into environmental data banks.

Centralized information programs and services may become under-utilized because of lack of convenience and difficulties in maintaining contact with the managers/shapers of the system. A consensus of belief at the Symposium seemed to be that certain information sources should be readily accessible to the user and that more effective methods of advertising these sources and their services must be developed. Direct regional or state access to information networks, without intermediaries, is preferable to approaches "through organizational channels" to remote national information sources and data banks.

- Decentralized organizations, such as regional environmental centers could serve as local access points.

- Local libraries could play a greater role. The listing of Depository Libraries, which automatically receive Government Printing Office published government documents, should be widely distributed, and a method devised for keeping this listing up to date and well advertised.
- A system of Regional Environmental Libraries similar to the Regional Medical Library network could be established to serve the environmental information users.
- Procedures for obtaining accurate information about the location and availability of environmental information resources should be tailored to local needs and the special conditions affecting regional problems and populations.

Referral activities may be the single most important element in the transfer of vital and timely environmental information. Useful functions of these referral activities are seen as:

- The provision of reliable and comprehensive data on the location, content, form, and availability of environmental information services nationwide, regardless of their sponsorship;
- the provision of referral services at nominal or no cost to the user and with no restrictions placed on their use; and
- the creation, maintenance and low-cost distribution of general or specialized directories of environmental information services, conveniently indexed by subject.

The subject coverage should be well defined and directories limited to responsive systems. Some permanent organization should have the responsibility for preparing and up-dating each directory; items should contain thorough descriptions and be up-dated on a consistent basis. Computers should be used to facilitate the maintenance of the directories.

- Activities of the National Referral Center (NRC), Library of Congress, should be made more widely known. Consideration should be given to adding an "800" number (in-WATS) telephone system to the National Referral Center, and to developing a special environmental unit within the NRC.

The National Environmental Information Symposium was a first big step. Follow-up activities should continue at Federal, State and regional levels, whether through symposia or other mechanisms.

- Emphasis in regional meetings should be placed on dissemination of information about the availability of environmental information resources.
- Regional meetings should involve State and local government personnel, as well as private groups and individual citizens.
- Where appropriate, the regional meetings could include specific training in the use of certain information systems or services to meet planning and decision-making needs.

- The subject matter for regional meetings should be narrower, possibly requiring a lesser level of technical expertise than the national meetings.
- Meetings should be held over week-ends when possible to facilitate attendance.
- Meetings should be free to citizens. Where possible, college and university facilities could be used for inexpensive housing.
- National symposia, perhaps scheduled biannually, should address more general questions of information policy development.

III – USER PANEL REPORTS

Introduction

The five user panels of the National Environmental Information Symposium were designed to bring together representatives of the major interest groups active in environmental affairs. A wide divergence of viewpoint is recorded in the panel reports that follow, but a common interest in improvement of communication is evident in all of them. The differences stem mainly from the activist orientation of each group as reflected in the various priority lists of most important problems affecting the environmental information field.

It is important to note that the reports represent the majority, not necessarily unanimous, views of the panel. Specific points, therefore, are not to be attributed to each panel member listed.

Report of Citizen Action User Group Panel

Chairman:
Charles M. Clusen
Sierra Club
Co-Chairman:
Ms. Alice R. Klavans
League of Women Voters of the United States
EPA Representative:
Edwin Cubbison
Office of Public Affairs
Members:
Edward Lee Rogers
Environmental Defense Fund
William G. Painter
Washington Ecology Center
Barbara Reid
Environmental Policy Center
John L. Franson
National Audubon Society
Dr. Emily Alman
Rutgers University

Introduction

The Citizen Action Panel is encouraged by increasing attempts to organize the exploding volume of information regarding environmental matters. We hope that this information can be made available widely and made easily accessible to the public as a whole, since this is essential to rational public decisionmaking on these very complex issues. Information on environmental, and other cultural, sociological, and scientific matters can be a liberating factor in our society if made freely available. But, if the public does not have access to such information, it will not be able to make judgments, to express its views, and have an impact on the decisionmaking process, to the detriment of the quality of that process and public morale. To limit availability of the relevant data on the basis of one's apparent expertise or one's ability to pay is not in keeping with the concepts of a democratic society.

Recommendations

Legislative

The panel noted with some concern that the presentations relating to congressional and other legislative information services were particularly complex and would be costly to citizens and public interest organizations. Most citizens said that their information needs on day-to-day congressional activities were

served by informal methods such as congressional inquiry, communications with congressional staff members, etc. In addition, much information is obtained from national environmental groups.

Adequate information about municipal and State regulations across the country is particularly hard to locate. No adequate presentation of data base was made at the Symposium to fill this gap. Perhaps legislation will be necessary to remedy this problem.

There should be statutory recognition of a Federal right to a quality environment, enforceable in Federal courts by any aggrieved party, against any offender, whether it be a governmental unit, an individual, a group, or a corporate entity.

There should be a Federal statute prohibiting anyone from interfering with any person attempting lawfully to gather or disseminate environmental information. The threats which would be prohibited would include threats of bodily harm and threats to job security, as already provided in the current Federal pesticide and water pollution control laws.

Tax-exempt environmental organizations, to which contributions are deductible, should be permitted to lobby within the area of their interests without losing their tax-exempt status. This will allow many environmental groups which are presently constrained to transmit information and views to Congress and State legislatures on subjects with which they have concern and expertise.

Regulatory

Governmental regulatory agencies' procedures should provide that the agencies solicit views and information *equally* from citizens with no direct profit-making interest and the private interests to be regulated.

It should be established Federal policy that Federal agencies provide environmental information and expertise in environmental controversies to any interested parties whether or not such data and opinions are in conflict with positions taken by that or any other Federal agency.

Both industry and citizen action groups could assist one another much more than they do now in the use of each other's facilities. This possibility of a cooperative effort between the two should be encouraged, possibly through the active efforts of the relevant Federal agencies.

The Citizen Action Panel praised the summary report of various information sources available from EPA that was prepared and distributed at the Symposium. We recommend that other Federal agencies adopt procedures for doing the same and thus make their reports also readily accessible in a concise form to citizens.

The panel noted with approval that many regional offices of EPA and certain portions of the Federal EPA establishment, notably the

Office of Air Programs, have been very cooperative in providing citizens with relevant Federal technical and scientific documents, copies of proposed and final regulations, reprints of the Federal Register, etc. We urge that other constituent portions of EPA adopt the same distribution policy, particularly important now in the light of the new water and noise pollution control legislation, and other pending legislation. Further, we urge that other Federal agencies concerned with environmental problems also adopt procedures to make their reports readily available to citizens and citizen organizations.

Scientific and Technical Information

Very often citizens and their organizations require the raw data gathered and interpreted by a Federal agency, as well as the final conclusions based on that data. In its information dissemination activities, Federal agencies should continually provide citizens and their organizations with access to that raw or basic data, including details on methodology and the assumptions behind studies being conducted.

We recommend that there be created an independent private corporation, chartered by Congress, and funded both by Federal funds and private foundations, to act as a scientific research source for citizen action groups concerned with environmental quality. This corporation would provide hard scientific, as well as sociological and economic, data to such groups. These centers would also act as training schools for interested citizens to help them interpret and evaluate environmental data.

The panel found that there was apparently a sufficient supply of journals, reference services, abstracting services and the like in the field of scientific and technological information, but that citizen groups and the public in general had not been sufficiently apprised of their existence and the services that they can provide.

Planning and Management

Users should be brought into the preliminary formation and organization of information planning and management systems.

There are often barriers among agencies at the Federal, State, and local levels that impede the free flow of information among them. We therefore recommend that there be instituted reforms to assure a free flow of information among all such agencies so that the planning agencies freely and routinely receive all relevant information – both horizontally and vertically – from all agencies having such information.

When projects are first *suggested*, citizens concerned about environmental quality are not made a part of the evaluation of the goals, objectives, and priority of needs. Methods should be devised to assure that a public hearing be held (for example, when the *idea*

of a dam or highway is first conceived) so that concerned citizens, as well as other groups involved, can make their views known at that time.

All systems containing data needed for making environmental planning decisions ought to be made available to citizen groups on a completely equal basis with all other governmental and nongovernmental groups.

The planning process should be broadened to include not only citizens in its initial stages but also the many fields of relevant expertise, training, new techniques and methodologies necessary to attain maximum protection for the environment. For example, in the planning process it is imperative that a *qualitative* analysis of the environment involved be undertaken and included in the data base so that the extent of various factors, such as vegetative blight, pollution sensitivity, and assimilative pollution capacities of plants and animals, etc., will be fully tabulated.

Socioeconomic

There appears to be a lack of information on the social and economic impact of environmental problems, including problems arising from governmental activities and projects. The first priority ought to be the providing of information to answer relevant questions such as why and under what circumstances people resist environmental change and what the effect of current environmental decisions will be on the communities involved (rural, urban, and suburban) and on family life in those communities, including the economic impacts.

There is no satisfactory mechanism for the exchange of relevant information among citizens. The Symposium made little or no mention of existing data banks relating to information about citizen projects, organizing techniques, legal tactics, and fund raising ideas, to list only a few of the many things directly relevant to citizen and citizen groups. However, such matters are of importance and should be included in environmental information services.

Followup to Symposium

There should be extracted from all presentations at the symposium a listing of publications, reference sources, libraries, abstracting services, etc. and the extracts should be distributed to all conference participants and made available to the public at nominal cost.

Environmental data gathered by governmental agencies should be made available free or, if absolutely necessary, at minimal cost. Such data should be provided as a public service paid for out of tax revenues because all citizens benefit from citizen participation and activities directed towards the preservation and enhancement of environmental quality.

The citizen panel has concluded after careful deliberation that several different concepts of information and training are necessary and desirable to facilitate meaningful and responsible citizen participation in environmental planning and decisionmaking.

- There should be regional centers, as indicated above, to supply information to citizens.
- These centers would, in addition to providing information, promote the training of skills and expertise.
- Around these centers, regional conferences for the exchange of information, expertise and ideas would evolve. Conferences would be primarily for citizens and citizen groups. Registration fees should be nominal (less than $5) or non-existent. The conferences should be widely publicized among citizen environmental organizations and the general public. Citizens should be deeply involved in the planning of such conferences. These conferences would apprise citizens of sources of environmental information and help train them in handling and analyzing such information.
- The regional centers would be directly responsible to and under the jurisdiction of the regional offices of EPA; in this way those offices would be responsive to citizens throughout the country.
- The centers would provide EPA some contact with the grass roots; at the same time, the centers would provide encouragement at the grass roots level by assuring people of Federal backing for their efforts to achieve environmental quality.

Environmental Impact Statements Procedures

The draft and final Environmental Impact Statements (EIS) should include a bibliography of all source materials upon which the statements are based, with appropriate references by way of footnotes or other notations, indicating the relevance of such materials.

This data should be located at the district office of the agency involved and at a local library nearest the site of the project or other activities, and should be available upon request to any interested group or individual.

The bibliography should indicate the source where the material may be obtained, and the price therefor.

Each Federal agency should adopt the practice now outlined in the Corps of Engineers Guidelines for Environmental Statements calling for public hearings prior to the preparation of a *preliminary* draft statement which is then followed by a draft statement.

Federal agencies seem to be preparing better environmental impact statements as required by the National Environmental

Policy Act, but all too often the agencies are not fulfilling the full intent of the law by substantially changing their objectives and plan formulations as the result of fully considering the environmental data and assessments obtained from the EIS preparation process. Agencies must increase their environmental sensitivity and make better decisions affecting the environment by fully integrating the EIS process into agency decisionmaking.

Freedom of Information

In keeping with the intent and policies of the Freedom of Information Act, each Federal agency should make available within ten (10) working days of the request therefor, all working papers, whether or not in final form, excluding only policy determinations of a tentative nature, but including all factual data.

Citizens' Right to Sue on Environmental Matters

The Hart-McGovern bill (S.1032), providing for citizens' right to sue on environmental suits, ought to be enacted into law.

Conclusion

For the reasons stated above, we urge that the recommendations we have made be adopted as promptly and fully as possible. We further ask that EPA respond to our recommendations by advising us which recommendations will be accepted and why any recommendations or any part of them are not acceptable.

Report of Press and Publications Panel

Chairman:
Stanley E. Degler
Environment Reporter
Co-Chairman:
Paul Brodeur
New Yorker Magazine
EPA Representative:
Thomas F. Williams
Solid Waste Management Program
Members:
Paul G. Hayes
The Milwaukee Journal
Eliot F. Porter, Jr.
St. Louis Post-Dispatch
Ms. Abbi Foerstner
Scranton Publishing Company
Ralph E. O'Dette
Chemical Abstracts Service

The Symposium was not especially relevant to the information concerns of the press. This opinion was shared by publications over a wide spectrum, ranging from newspapers and popular magazines, through the specialized environmental press, to technical and scientific publications. The relatively small amount of press coverage of the Symposium was some evidence of this. The coverage that did exist was concerned more with some of the personalities who spoke than with the business of the Symposium.

The press is concerned not primarily with information, but with the communication of meaningful information. We suggest that any future meetings on environmental information pay more attention to problems of communication. This distinction between information and communications pervades the rest of our comments.

We suggest birth control procedures to curb the proliferation of new Environmental Protection Agency information systems and those of other government organizations. Our impression is that some systems have been created and some reports have been prepared without sufficient consideration of their intended use. We urge that the user be kept in mind.

Our meaning is not that information should be suppressed, but that proliferation of meaningless information and useless reports be curtailed.

While there is a need for basic and comprehensive information systems, there is a greater need for discrimination. Data must be

processed. It must be interpreted and made meaningful to be communicated. It should not be the property of the elite in any discipline, but should be available to the press and to the public in general. All of us are laymen except in our own specialty, and therefore are dependent on such interpretation and communications for most of our knowledge.

Because of the need to communicate in a variety of ways to a multitude of groups, there is a need for diversity of publications and a number of different ways of communicating by EPA and other agencies. There is a place for commercial publications that should not be preempted by the government, and a place for government communications programs, and for the spectrum in between.

EPA's role should include the accumulation of basic data and its interpretation. The Agency also has an obligation to communicate information about its own activities. This communication should take place in a variety of ways, including ways that can be understood by the general public.

In this connection, it is essential that EPA's Public Affairs Office have access to information about the Agency. It is essential that its employees be knowledgeable about all functions of the Agency and that they know where to obtain all information about its activities. We look with disfavor on the current division of information activities among the Public Affairs Office, the Technology Transfer Program, the research and monitoring activities, and other programs.

EPA's principles of organization are an impediment to communications, both in administering the Agency and in informing the public. These principles are functionalism and regionalization. We pass no judgment on whether these are the best administrative principles in other respects, but we wish to call attention to the fact that both are barriers to the free flow of information.

Functionalism tends to prevent communication between the parts of EPA. To take an obvious example, monitoring information must be communicated to enforcement officials before it becomes meaningful and can be put to use. It is not possible to have either a good monitoring program or a good enforcement program, unless this communication takes place. EPA's organization does not facilitate this communication. The Agency should be aware of this problem, and should take steps to overcome this disadvantage of functionalism.

There may be good reason also for substantial autonomy of

EPA's regions, although we express no opinion about that. However, the regions must be informed of national policies and actions, and Washington must be aware of what actions the regions are taking in carrying out policies. EPA should take steps to make sure that national information is available regionally and that regional information is available nationally.

We are concerned by the cost of information. One of the questions raised during the Symposium was whether the government (that is, the whole public) should bear a greater part of the cost of the public's right to know. The issue has been raised particularly with respect to administrative proceedings, which seem destined to play an increasingly important part in the development of environmental law. Transcripts in such proceedings, and in court proceedings, are costly and put some parties at a disadvantage in terms of access to information. Similar questions arise when government agencies make charges for access to information in their possession.

The press always is concerned about the availability of information. We are happy to endorse EPA Administrator William D. Ruckelshaus' statements about access to information in his keynote speech to the Symposium. The right to information about government activity is basic to American freedoms, and while the press is especially conscious of the right, it is equally important to citizen groups, the academic community, and indeed to the whole public.

The principle we propose is that information anyone may have is information that everyone may have.

We are concerned by the closed meetings of the National Industrial Pollution Control Council, for instance. While we have been told that industrialists would not take part in this group without closed meetings, we are not convinced that secrecy is defensible in such instances, even if the Council could not otherwise exist.

We are concerned by rules of the National Academy of Sciences that require its committee meetings to be closed. While we understand that NAS is not subject to the Freedom of Information Act, and is not a government Agency, it operates under a government charter and is charged with performing work and making important determinations for the government that place its functions in the public sphere.

We are concerned that scientists communicate their knowledge. We believe that there is an obligation on their part to inform the public about the social consequences of scientific information.

We are concerned that EPA has seen fit to communicate advance information about proposed rule making to the representatives of some organizations on advisory committees. While we understand

and accept the need for EPA to receive advice from the technical and scientific community, we believe such information should be available simultaneously to the public and that meetings with advisory groups should be held in public.

Finally, we wish to commend to all bureaucrats, scientists, and writers of reports and proposals, the virtues of using the English language. Too often, we have the impression that verbiage has been used to obscure meaning rather than clarify it. We feel that specialists in a discipline tend to develop a jargon that hides significance, both from the public and from specialists in other disciplines. Too many research reports seem to be written to conceal the fact that nothing significant was learned.

This is an appeal not just for grammar, therefore, but for intellectual honesty. In the information field above all others, there is a need to speak and write the plain, unvarnished fact or opinion. There is a need to communicate.

Report of Industry and Trade Associations Panel

Chairman:
Arne E. Gubrud
American Petroleum Institute
Co-Chairman:
Richard J. Wiechmann
American Paper Institute
EPA Representative:
C. Hoff Stauffer
Office of Planning and Evaluation
Members:
Thomas Boyd
American Stock Exchange
J. Morton Nicholson
Procter and Gamble
William A. Horton
American Telephone and Telegraph Company
Ms. Retha Odom
Shell Oil Company
Wade St. Clair
National Center for Resource Recovery
Stanley Dempsey
American Metals Climax, Inc.

The National Environmental Information Symposium (NEIS) was a worthy attempt to address a difficult subject and provide an opportunity for a much needed stock-taking of available information services in the environmental field. The sponsors are to be congratulated for recognizing the need for such a stock-taking and for attempting to stimulate a dialogue concerning the future course of environmental information services.

The failure of NEIS to achieve the latter objective was a disappointment to the Industry and Trade Association User Group. This failure was, we believe, an inevitable consequence of the Symposium format, which arbitrarily classified information users by the type of organization they represent – the press, academia, industry, government, and citizen action groups – rather than by the types of information they need and use. This segregation of NEIS participants into user groups effectively prevented productive dialogue among people with similar information needs.

Despite this weakness, however, NEIS did serve a useful purpose. The prepared presentations at the general, or plenary, sessions and the concurrent topic sessions were, on the whole, excellent. A wealth of valuable information on current information services was presented. The bringing together of all this information in one place

was, in itself, a useful exercise and probably could not have been accomplished without NEIS.

Unfortunately, because four topic sessions were scheduled concurrently, it was impossible to be exposed to more than 25 percent of the papers, and copies of many of the papers were not readily available. We therefore recommend that all of the NEIS papers be reproduced and disseminated widely.

As a longer-range project, it is recommended that EPA attempt to catalogue the myriad periodicals, referral services, information retrieval systems, indexing and abstracting services, and other information sources described in the NEIS papers, as well as others not covered at NEIS.

For the future, the Industry and Trade Associations User Group favors consolidation and integration of existing EPA information services, as well as the establishment of a central referral directory-type service that would make use of existing government and nongovernment information sources. We do not believe any useful purpose would be served by establishing a Federal super environmental information agency. Moreover, we would have serious reservations concerning any proposal to vest responsibility for development of the environmental data base in the same Agency that develops and enforces environmental regulations.

In general, we believe that if there is a demonstrable market for a given type of information service – or any service, for that matter – the private sector will provide it. In the area of pollution control technology assessment, for example, industry would prefer to retain experts from the private sector, such as engineering consultants, for advice. Government should, we believe, prescribe the performance required to meet environmental goals, but it should leave the determination of means of compliance to the private sector. Competition in the private sector will then tend to favor the use of more cost-effective solutions and to stimulate innovative approaches.

Government, of course, has an obligation to make information obtained with public funds publicly available. We believe that EPA could perform a much needed service by making available, in understandable form, information on air and water quality trends; environmental legislation, regulations, and court decisions; and scientific, technical, and economic documentation on which its own proposed administrative rule makings are based.

A major problem faced by industry is the difficulty of obtaining early warning of changing – and often seemingly arbitrary – regulations. Although legal authority for such regulations may be beyond question, the scientific, technical, and economic justification presented is frequently unconvincing, particularly to those who find that huge capital projects designed to comply with

State requirements may be rendered obsolete overnight by more stringent Federal requirements, or vice-versa. Increasingly, legislators are making scientific and technological judgments and writing them into law, so that even if they prove unsound they cannot be reversed except by further legislation.

The Congress, State legislators, and city and county councilmen – although among the most important users of environmental information – were poorly represented at NEIS. An important question that might be addressed at any follow-up Symposium is: How can legislators obtain the information they need to legislate wisely in the environmental field?

NEIS gave little recognition – except in isolated papers – to the fact that industry is a major *producer* of environmental information, particularly information on control technology, but also on sources and environmental effects of pollution. It is to be hoped that industry will be invited to play some role in the planning of any follow-up Symposium to NEIS. Certainly, the cause of environmental quality can advance no more rapidly than the technical, scientific, and economic expertise of the private sector brought to bear on the problem.

There is a critical need to develop a data base on the economics of pollution control, including data on the relative cost effectiveness of available control options and strategies and data on the incremental benefits of various degrees of environmental improvement. Regulatory or legislative decisions made in the absence of such information may prove unworkable or, at the very least, economically wasteful. Moreover, the public has a right to know what price tag is likely to be associated with a proposed regulation, so that the price tag can be compared with those for other vital programs – such as health care, public housing, education, nutrition, and so on – and some judgment can be made as to its merit and the priority it should receive.

Curiously, the terms "ecology" and "economics," though frequently the battle cries of opposing camps in environmental disputes, are not antithetical. Both are from the same Greek root, "ecos," meaning "house." Ecology is the study of the house: economics is the management of the house, or applied ecology. It must follow, therefore, that bad economics is bad ecology, and vice-versa.

As any good ecologist knows, diversity, rather than dominance of a single species, is a sign of a vigorous, healthy ecosystem. Our NEIS User Group believes the present diversity in environmental information systems is also a healthy sign – a sign of the growing vigor with which the nation is attacking its environmental problems.

Report of Academia, Research Organizations, and Professional Societies Panel

Chairman:
Dr. John E. Ross
Institute for Environmental Studies
University of Wisconsin
Co-Chairman:
James E. Freeman
Denver Research Institute
EPA Representative:
Luther E. Garrett
Research Information Division
Members:
Dr. Morton J. Klein
IIT Research Institute
Dr. Fred Lundberg
Institute for Urban Information Systems
James B. MacDonald
University of Wisconsin Law School
Dr. Michael V. Nevitt
Argonne National Laboratory
H. Floyd Sherrod, Jr.
University of Georgia
Dr. Jack R. Van Lopik
Louisiana State University

Environmental Information

In its deliberations and summary discussions, the panel developed the following description of environmental information and set of user problems.

Environmental information may be divided conveniently into two broad categories, data and report summary information.

Data include remote sensing measurements (usually covering geographical areas) and monitoring measurements (usually focused on point sources); "raw" measurements gathered in research projects. Data may be time dependent or time independent.

Report summary information includes research project results; synthesis reports of disciplinary information; synthesis of reports in an interdisciplinary mode; and information on information sources and systems.

User Problems

It appears that formal information systems include a minimum of three elements or dimensions: producers, handlers, and users.

Handlers or system managers seem to view the information dissemination process as follows:

Producers ⟶ Handlers ⟶ Users

To the research interest group, such a view is not adequate. Academic and other research user groups suggest that more adequate information services include additional mechanisms for feeding the information they generate back into the system, and techniques for relating information they draw from the services to the information they generate during the course of their work. Frequently, the failure of information services to address these requirements limits their usefulness.

Most academic research has progressed from trial and error to more sophisticated research methods. Implied in the operation of many computer-based information delivery systems, however, are some additional changes that will have to occur in the way such research is conducted. For example, a researcher drawing data from the ERTS satellite program typically did not participate in conceptualizing, designing, or operating the hardware; nor did he design the information delivery system used to distribute ERTS-generated data. The occurrence of such conditions has serious implications for the way research projects are designed and managed. Thus, researchers are asked frequently to use data they have not generated when they become involved in environmental research problems. Changes in research methodologies are being required as well by the interdisciplinary nature of the work involved in environmental problem areas.

This panel recognizes that technical problems in the operation of information services have been listed and defined many times in the recent past. It seems important, however, that some attention be given the following technical difficulties:

Awareness of what services are available

Knowledge of how to access those centers

Time and cost issues limiting access

The role of information specialists at the interface between users and complex systems

Certain facets of coding (e.g., methodology, key word indices)

Quality assurance or control

Preservation of non-replaceable point source data

System response to user orientation

Aggregation and disaggregation capabilities

Social problems in the management and use of environmental information services appear to be a source of great frustration to

researchers. Researchers beginning to use information systems experience difficulties understanding the complex system languages often used; in addition, novices entering interdisciplinary environmental research experience fundamental problems understanding the languages of different disciplines. Complicating the adoption and use of environmental information systems even more is the fact that many of the computerized information services are experimental or have only recently been made operational. Thus, the research community is really in an "early adopter" state in its use of many newly emerging services.

Sorting out Environmental Information to the Problem at Hand

Environmental information is applicable in analysis and the broad categorization of decisionmaking. Decisionmaking may involve policymakers, planners, and managers; communicators; intervenors; and citizens (often uninformed but not uninformable). The level of decision often determines the kind and form of information. Researchers will in some cases be interested in analyzing the decisionmaking process. The point here is that the condition of use *does* determine how the information is stored and processed.

Gaps in Environmental Information

Our collective judgment is that information systems are generally well developed to encode and/or deliver material on discipline-oriented research results. There are probably some research areas not well covered. It also appears that systems are well developed to gather and synthesize data. But we do not have adequate systems for many environmental monitoring categories, or for that matter, basic information such as topography and natural resources. There appear to be more gaps in storage and delivery of socio-economic information, with the exception of census data. For example, changing land use patterns are not recorded, let alone understood. There are virtually no systems devised to interrelate different classes of information brought to bear on a geographic case or a generic problem.

Research Organization Response

It is incumbent on research organizations to make some organizational changes to deal with environmental problems if not with information systems. Organizations to conduct interdisciplinary studies are not well developed. This is *not* a proposal to supplant disciplines or departments, rather to provide flexibility in research organizations to bring talent together representing the disciplines and to deal with environmental problems. The universities lag behind research laboratories in this capability. On the other hand, they possess a much wider range of needed expertise than do the labora-

tories. Organizational response in both is needed. Funding flexibility is one base for such adjustment.

Research Organizations and Public Responsibility

Public research laboratories (and universities) have a public responsibility. Universities are (or should be) a microcosm of society. They have multiple missions including a responsibility to provide the public with information and insights. Many universities are taking a new look at their public communication responsibilities. This is a more complicated problem than the dissemination of technical information which is a traditional role of universities. Environmental decisionmaking requires consensus and/or constraint or regulation. The process of environmental decisionmaking is complex and usually controversial. Researchers must consider the differentials between advocacy and analysis. In spite of these difficulties, universities must develop and modify their points of public contact on environmental issues.

Summary

Academia, research organizations, and professional societies are beginning to use information available from environmental information systems, usually in an interdisciplinary mode. As these programs develop they will insist that the information systems be more relevant to their needs than they now are. The speed, efficiency and competence with which this is done will depend in large part on the researchers' knowledge of and confidence in the systems. The volume and complexity of data seem mind-boggling until one zeros in on the environmental issue at hand. Then it seems less staggering and even possible. The key to it all is to ask the right question.

Following are some generalizations about information problems of researchers:

1. Research people are generators of information as well as users. Therefore, information systems should be in a position to encode and receive information from the researcher and to transmit information that will relate to the information researchers generate. There needs to be more flexibility within the research organizations to organize for interdisciplinary studies. This does not mean that one abandons disciplines and departments, but there need to be experimental modes in research organizations so people can come together to work on these problems. While we are experimenting with new ways of using information, we should be experimenting with methods in the ways we organize research. We need more flexibility than we have.

There was considerable discussion in our panel on the research organization's role in dealing with public agencies. Research organizations have been extremely important in the past in the

dissemination of technology. There are some different conditions on environmental problems and issues; to resolve many of these problems public consensus, and in many cases constraint, are required. This is a different information transmittal problem than just the dissemination of technology. Controversy abounds. People in research organizations must deal with the role of advocacy versus the role of analysis and how they can move back and forth in this arena. The problems are complex and controversial and yet the mission is clear cut, and so we would expect research organizations in the future to be developing new kinds of programs of extension of information.

2. The capability of the systems to deliver information is ahead of the research organization's ability to accept it. Many research organizations are still in the early awareness stage of how they might use remotely generated information.

3. When the user seeks an element of information, he wants a good product that fits neatly into his model. He wants high quality. He is not basically interested in the intricacy of the delivery system, only to the extent that he can use it and interface with it.

4. There are some gaps in information content in delivery systems. Categorical coverage of research projects appears fairly well recorded. There appears to be far less field data encoded. There are large gaps in social data. There are few attempts to relate field data to social data. There appear to be gaping holes in the collation of information on some significant environmental problems. For example, it is extremely difficult to get local, legal legislative information as compared to regional, as compared to national, or natural data that can be brought to bear on these issues.

5. It is incumbent on universities and research laboratories to make some adjustments in their organization to respond to information delivery systems.

Report of Government Panel

Chairman:
Dr. Sidney R. Galler
Department of Commerce
Co-Chairman:
Allen E. Pritchard, Jr.
National League of Cities
EPA Representative:
Francis M. Middleton
National Environmental Research Center, Cincinnati
Members:
Dr. Clyde M. Burch
Former Assistant Attorney General of Missouri
Dr. Thomas Fox
Science Adviser to Governor of Pennsylvania
Dr. Frank Hersman
National Science Foundation
Dr. Roy Young
Science Adviser to Governor of Oregon
Dr. Douglas H. K. Lee
Department of Health, Education and Welfare
Dr. Jack Posner
National Aeronautics and Space Administration

Since, in many ways, the Government Users Panel was the most heterogeneous of all the users panels, representing several levels of government, each with a diversity of constituencies, it felt that it had to search first for a commonality of perceptions of the environmental data and information issues.

The Panel's perceptions of the central issues were as follows: The Government Users Panel recognizes that Federal, State, and municipal interrelationships with regard to environmental improvement responsibilities are undergoing rapid and substantial changes for several reasons:

- Presidential policies and legislative mandates expressed through EPA's operational directives assign increasing responsibilities for environmental standard setting, monitoring and regulatory control to the States.
- A direct consequence of the passage of Public Law 91.190, the National Environmental Policy Act, is the increased sharing of responsibility among the cities, States, and Federal government for assessing the environmental impacts of planned major actions. The responsibilities of municipal and State governments for environmental impact statements are becoming of prime importance. A case in point is the plan of

the Cincinnati Gas and Electric Company to construct a nuclear power plant with all of the associated responsibilities for assessing the potential impact on the environment and initiating the Environmental Impact Statement in a manner that is acceptable to both Cincinnati and Ohio State agencies.

- The General Revenue Sharing Bill which will provide States and cities with greater responsibilities for ordering their environmental priorities and implementing new initiatives will accelerate the changing relationships among municipalities, State and Federal environmental agencies.

Also, the Panel perceives a growing local citizen demand for improved public understanding of complex environmental issues. Indeed, the increasingly important role of local citizens' groups in environmental decisionmaking imposes a heavy responsibility on State and local public educational curricula for both teacher training and public school education. The consensus of the Panel is that these rapidly changing interrelationships focus attention not only on the need for increased availability and accessibility of environmental data and information but also on the need to improve the translatability and the utility of environmental data and information.

The Panel was able to identify two categories of need:

1. Data and information required for the establishment and compliance with environmental control regulations.
2. Environmental data and information needed in the planning and management of public programs which require an understanding of both potential environmental impacts and environmental constraints.

With regard to the first category, the Panel felt that the data and information as well as the delivery systems must be designed to facilitate:

- Accurate assessment of the condition of the environment;
- selection of the optimum choice from a number of identifiable options; and
- the ability to evaluate the rate and the quality of progress towards achieving environmental corrective goals.

Also within this category, the data and the information must have certain functional characteristics:

- They must be useful in evaluating and authenticating the underlying scientific assumptions for both environmental diagnosis and corrective prescriptions.
- They must be useful in identifying and assessing the status of the technology which would be required to implement corrective plans.
- They must be useful in determining with reasonable accuracy

the socio-economic costs and benefits associated with each potential option for corrective action.

- The data and information must be useful in achieving public comprehension of the nature of the problem and the proposed corrective action to permit implementation in a politically acceptable manner. Mayor Luken's excellent presentation gave special emphasis to the issue of political acceptability.

With regard to the second category of needs, the Panel felt:

- Information, as well as the delivery system, must be "broad band" to be fully responsive to user needs at all levels of government.
- Then it must be "tailored" to meet the specifications and criteria presented by the potential user or "customer." The Panel took note of the likelihood that the specifications and requirements for data and information may extend beyond the current capacity and limits of responsibilities of any single mission-oriented Federal agency, including EPA.
- The retrieval system must be capable of selecting and delivering unexpurgated, accurate, primary scientific data directly to the customer without any interpretive evaluation except on demand.

In summary, the Panel offers the following general recommendations.

- A joint planning mechanism should be established to facilitate consultation among all levels of government. Hopefully, this would lead to the development of a communications feedback loop to insure that user requirements at all levels are made known to the suppliers of environmental data and information. All too frequently information may be scientifically valid but not in a format to be useful to the ultimate user.
- In context of the foregoing, the Federal agencies should pilot a project for developing user oriented information systems.
- The Panel recommended the establishment of an integrated Federal environmental data and information delivery system that would be sensitive to the diversity of user needs at all levels of government as well as the requirements of their respective constituencies. This would help insure Federally supplied environmental information that would be compatible with other types of information needed by the ultimate users.
- The Panel strongly recommended the development of a mechanism for the lateral transfer of data and information to optimize the sharing of experiences and knowledge gained by one municipality with other cities and local governmental entities.

In addition, a number of other thoughtful specific recommendations formulated by a group of some 50 librarians and

others attending the Symposium were delivered by the Panel chairman to the sponsors of the Symposium for consideration in the final publication.*

In closing, the Panel wishes to congratulate Mr. William Ruckelshaus and his associates for assuming the initiative in sponsoring this Symposium as a pioneering effort to identify and address the basic issues and pressing problems confronting the developing area of environmental data and information management and delivery.

*The Librarian's report is included in Volume 2 as one of the Informal Session papers.

Appendix A
List of Exhibitors

Addison-Wesley Publishing Co., Inc.
Reading, Massachusetts 01867

Agricultural Stabilization and
Conservation Service, USDA
14th and Independence Avenue, S. W.
Washington, D.C. 20250

Air Plastics, Inc.
1030 Summer Street
Cincinnati, Ohio 45204

Air Pollution Control Association
4400 Fifth Avenue
Pittsburgh, Pennsylvania 15213

American Chemical Society Publications
1155 Sixteenth Street, N.W.
Washington, D.C. 20036

Anderson 2000 Inc.
2000 Sullivan Road
College Park, Georgia 30337

Battelle Memorial Institute
Columbus Laboratories
505 King Avenue
Columbus, Ohio 43201

Bee Publishing Corporation
National Pest Control Operators NEWS
4347 Pampas Road
Woodland Hills, California 91364

The Bendix Corporation
Process Instruments Division
P.O. Drawer 477
Ronceverte, West Virginia 24970

BIOSIS (BioSciences Information Service)
2100 Arch Street
Philadelphia, Pennsylvania 19103

Boeing Computer Services, Inc.
P.O. Box 708
Dover, New Jersey 07801

The Bureau of National Affairs, Inc.
1231 25th Street, N.W.
Washington, D.C. 20037

Center for Information Science
Lehigh University
Bethlehem, Pennsylvania 18015

Cincinnati Bell
602 Main Street
Cincinnati, Ohio 45202

Congressional Information Service
600 Montgomery Building
Washington, D.C. 20014

The Coordinating Research Council, Inc.
30 Rockefeller Plaza
New York, New York 10020

CRC Press Division of the Chemical Rubber Co.
18901 Granwood Parkway
Cleveland, Ohio 44128

Data Corporation
3481 Dayton Xenia Road
Dayton, Ohio 45432

E.B.S. Inc., Book Service
290 Broadway
Lynbrook, New York 11563

Ellison Instrument Div.
Dieterich Standard Corp.
Drawer M
Boulder, Colorado 80302

Environment Information Center, Inc.
124 E. 39th Street
New York, New York 10016

Environmental Law Reporter
1346 Connecticut Avenue, N.W.
Washington, D.C. 20036

Environmental Management Association
1710 Drew Street
Clearwater, Florida 33515

Environmental Studies Institute of the
International Academy at Santa Barbara
2048 Alameda Padre Serra
Santa Barbara, California 93103

Eric Center for Science
Mathematics and Environmental Education
1460 W. Lane Avenue
Columbus, Ohio 43221

Esterline Angus
1201 Main Street
Indianapolis, Indiana 46224

The Franklin Institute
20th & The Parkway
Philadelphia, Pennsylvania 19103

General Electric Company
Room M3041 – P.O. Box 8555
Philadelphia, Pennsylvania 19101

Geological Survey of Alabama
and State Oil & Gas Board
P. O. Drawer O
University, Alabama 35486

Glass Innovations, Inc.
P. O. Box B
Addison, New York 14801

Incre-Data Corporation
6405 Acoma Road, S.W.
Albuquerque, New Mexico 87108

Informatics Inc., Systems and Services Co.
6000 Executive Boulevard
Rockville, Maryland 20852

Informatics Inc.
6000 Executive Boulevard
Rockville, Maryland 20852

Institute of Environmental Sciences
940 E. Northwest Highway
Mt. Prospect, Illinois 60056

The Institute of Paper Chemistry
1043 E. South River Street
Appleton, Wisconsin 54911

ISI – Institute for Scientific Information
325 Chestnut Street
Philadelphia, Pennsylvania 19106

MC & B Manufacturing Chemists
2909 Highland Avenue
Norwood, Ohio 45212

Meloy Laboratories, Inc.
6631 Iron Place
Springfield, Virginia 22151

Micro-Gen Corporation
4318 Woodcock Drive
San Antonio, Texas 78228

National Bureau of Standards
Room A600 Building 101
Washington, D.C. 20234

National Library of Medicine – MEDLINE
Rockville, Maryland 20851

The National Planning Association
1606 New Hampshire Avenue, N.W.
Washington, D.C. 20009

National Referral Center, Library of Congress
10 First Street, S.E.
Washington, D.C. 20540

National Technical Information Service
U. S. Department of Commerce
Washington, D.C. 20230

Neoterics, Inc.
2800 Euclid Avenue
Cleveland, Ohio 44115

North American Rockwell
1700 E. Imperial Highway
El Segundo, California 90245

Nuclear Safety Information Center
Oak Ridge National Laboratory
P. O. Box Y
Oak Ridge, Tennessee 37830

Oak Ridge National Laboratory
Environmental Information System
P. O. Box X, Building 3017
Oak Ridge, Tennessee 37830

Parker Hannifin Corp. – Fueling Division
18321 Jamboree Boulevard
Irvine, California 92664

Philips Electronic Instruments
750 South Fulton Avenue
Mt. Vernon, New York 10550

Pollution Abstracts, Inc.
P. O. Box 2369
LaJolla, California 92037

Predicasts, Inc.
11001 Cedar Avenue
Cleveland, Ohio 44106

The Procter & Gamble Company
301 East Sixth Street
Cincinnati, Ohio 45202

Right to Life, Greater Cincinnati, Inc.
5715 Scarborough
Cincinnati, Ohio 45238

Rossnagel & Associates
1999 Route 70
Cherry Hill, New Jersey 08003

Roy G. Scarfo, Inc.
P. O. Box 217
Thorndale, Pennsylvania 19372

Scranton Publishing Co.
434 South Wabash Avenue
Chicago, Illinois 60619

Smithsonian Science Information Exchange
1730 M Street, N.W., Room 300
Washington, D.C. 20036

State University College at Fredonia
Fredonia, New York 14063

3M Company, Microfilm Products Division
3M Center, 220-9E
St. Paul, Minnesota 55101

U. S. Army Mobility Equipment
Research & Development Center
Gunston Road & 23rd Street
Fort Belvoir, Virginia 22060

U. S. Atomic Energy Commission
Washington, D.C. 20545

U. S. Department of Commerce
National Oceanic and Atmospheric Administration
Washington, D.C. 20235

U. S. Environmental Protection Agency
ENVIRON

U. S. EPA
General Information

U. S. EPA
Libraries

U. S. EPA
National Emissions Data Systems (NEDS)
National Aerometric Data Bank (SAROAD)
Air Pollution Technical Information Center (APTIC)
Technical Publications Branch (4 EPA Groups)

U. S. EPA
Contracts Management Division
4th & M Streets, N.W.
Washington, D.C. 20460

U. S. EPA
Office of Federal Activities
401 M Street, S.W.
Washington, D.C. 20460

U. S. EPA
Monitoring & Data Support Division
Crystal Mall #2, Room 916
Washington, D.C. 20460

U. S. EPA
National Environmental Research Center
Cincinnati, Ohio 45268

U. S. EPA
Division of Pesticide Community Studies
4770 Buford Highway
Chamblee, Georgia 30341

U. S. EPA
Office of Radiation Programs
5600 Fishers Lane
Rockville, Maryland 20852

U. S. EPA
Solid Waste Information Retrieval Services
1835 K Street, N.W.
Washington, D.C. 20460

U. S. EPA
Solid Waste Management Program
Cincinnati, Ohio 45268

U. S. Geological Survey
Exhibits Section B-212, G.S.A. Building
18th & E Streets, N.W.
Washington, D.C. 20242

U. S. National Committee
for the International Hydrological Decade
National Academy of Sciences/National
Research Council
2101 Constitution Avenue
Washington, D.C. 20418

Water Pollution Control Federation
3900 Wisconsin Avenue
Washington, D.C. 20016

Westinghouse Electric Corporation
Westinghouse Building, 6 Gateway Center
Pittsburgh, Pennsylvania 15230

Xerox Education Publications
245 Long Hill Road
Middletown, Connecticut 06457

Appendix B
Steering and Program Committees

Steering:

Dr. Forest W. Horton, Jr., Chairman	EPA Hqs.
William J. Benoit	EPA/NERC Cincinnati
Dr. J. Clarence Davies, III	Council on Environmental Quality
Melvin S. Day	National Science Foundation
Dr. Murray Felsher	EPA Hqs.
Luther E. Garrett	EPA Hqs.
Charles Gentry	EPA Hqs.
Nicholas Golubin	EPA Hqs.
Dr. Henry M. Kissman	National Library of Medicine
George Lehnert	EPA Hqs.
Dr. A. Michael Noll	Office of Science and Technology
Norman E. Ross	Office of Management and Budget
David B. Walker	Advisory Commission of Intergovernmental Relations

Program/Agenda/Speakers:

Sarah M. Thomas, Chairman	EPA Hqs.
Andrew A. Aines	National Science Foundation
Dr. Andrew W. Breidenbach	EPA/NERC Cincinnati
Richard Carpenter	National Academy of Sciences
Melvin S. Day	National Science Foundation
Morton H. Friedman	EPA/NERC Cincinnati
Willis E. Greenstreet	EPA/NERC Cincinnati
Dr. Henry M. Kissman	National Library of Medicine
Barbara Pedrini	EPA Hqs.

Appendix C
Speakers at Environmental Information Sessions

	A – Scientific and Technical	B – Legal, Legislative, Regulatory	C – Management and Planning	D – Socioeconomic
Moderator	Dr. Henry M. Kissman Nat'l Library Medicine	Ms. Louise Giovane Becker Cong. Research Service, LC	J. Clarence Davies, III Council on Envt'l Quality	Dr. Myer M. Kessler National Foundation for Environmental Control
Information Centers and Data Centers Speakers (Mon. p.m.)	Dr. William B. Cottrell Oak Ridge Nat'l Lab Dr. Edward L. Brady Nat'l Bur. Standards Arnold R. Hull NOAA	L. Clark Hamilton Library of Congress Lawrence H. Berul Aspen Systems Corp.	Claude G. Gurley Office of Economic Oppty Dr. John R. Totter Atomic Energy Commission	David L. Edgell Dept. of Labor John Rowe Bureau of the Census William B. DeVille Gulf South Research Institute
Publications Speakers (Tues. a.m.)	D. H. Michael Bowen (ed.) Environmental Science & Technology, American Chemical Society Bernard D. Rosenthal Pollution Abstracts, Inc.	George Grossman Univ. of Utah Law Library Frederick R. Anderson (ed.) Environmental Law Reporter	Ms. Ramure Kubiliunas Predicasts, Inc. Robert D. Shriner Indiana University Dr. Leonard Lund The Conference Board	Ivars Gutmanis National Planning Assn. James G. Kollegger Environmental Access
Document Services; Referral Activities Speakers (Tues. p.m.)	William T. Knox National Technical Information Service Marvin W. McFarland Library of Congress	James B. Adler Congressional Information Service Victor John Yannacone, Jr. N. Y. State Travelers Assn. Environmental Law Committee	Arthur S. Jenkins Computer Sciences Corp. Joseph E. Sizer Minnesota Environmental Planning Division	Herbert N. Cantor Public Technology, Inc. Dr. Robert W. Howe ERIC Center for Science, Mathematics & Environmental Education, Ohio State University

Appendix D
Speakers at User Group Panel Sessions*

	1 – Citizen Action Groups	2 – Press & Publications	3 – Industry & Trade Associations	4 – Academia, Research Orgs., Professional Societies	5 – Government
Chairman	Charles M. Clusen Sierra Club	Stanley E. Degler (ed.) Environment Reporter	Arne E. Gubrud American Petroleum Institute	Dr. John Ross Inst. for Environmental Studies, Univ. of Wisconsin	Dr. Sidney R. Galler Deputy Asst. Secty. for Environmental Affairs, Commerce
Co-Chairman	Alice R. Klavans League of Women Voters of the United States	Paul Brodeur New Yorker Magazine	Richard J. Wiechmann American Paper Inst.	James E. Freeman Denver Research Institute	Allen E. Pritchard, Jr. National League of Cities
NEIS EPA Representative	Edwin Cubbison Office of Public Affairs	Thomas F. Williams Director, Technical Info Solid Waste Mgmt Program	C. Hoff Stauffer Office of Planning and Evaluation	Luther E. Garrett Acting Director Research Information Div.	Francis M. Middleton EPA NERC, Cincinnati
Members	Edward Lee Rogers Environmental Defense Fund William G. Painter Washington Ecology Center Barbara Reid Environmental Policy Center John L. Franson National Audubon Society Emily Alman Rutgers University	Paul G. Hayes The Milwaukee Journal Eliot Porter St. Louis Post-Dispatch Ralph E. O'Dette Chemical Abstract Serv. Ms. Abbi Foerstner Scranton Publishing Co.	Neil H. Anderson New York Board of Trade, Inc. Thomas Boyd American Stock Exchange J. M. Nicholson Proctor & Gamble William A. Horton American Telephone & Telegraph Co. Ms. Retha Odom Shell Oil Company Wade St. Clair National Center for Resource Recovery Robert Waring American Metal Climax, Inc.	Dr. Morton J. Klein IIT Research Institute Dr. Fred Lundberg Institute for Urban Information Systems James B. MacDonald University of Wisconsin Law School Dr. Michael V. Nevitt Argonne National Lab H. Floyd Sherrod, Jr. University of Georgia Dr. Jack R. Van Lopik Louisiana State University	Dr. Clyde M. Burch Former Asst. Attorney General of Missouri Dr. Jack Posner NASA Dr. Thomas Fox Science Adviser to Gov. of Pennsylvania Dr. Frank Hersman National Science Fdn. Dr. Roy Young Science Adviser to Gov. of Oregon Dr. Douglas H. K. Lee NIEHS/DHEW

*These User Group Panels met following each of the speaker sessions on Monday Afternoon, Tuesday Morning and Tuesday Afternoon.

Appendix E
Speakers at General Sessions

Monday, September 25:

William D. Ruckelshaus, Administrator
Environmental Protection Agency
Keynote Address

Dr. John W. Townsend, Jr.
National Oceanographic Atmospheric Administration

Mr. Albert C. Trakowski
EPA Office of Research and Monitoring
Luncheon Address

Tuesday, September 26:

Honorable Richard R. Lugar
Mayor of Indianapolis

Shirley Temple Black
Council on Environmental Quality
Luncheon Address

Andrew A. Aines
National Science Foundation

Wednesday, September 27:

W. A. Radlinski
U. S. Geological Survey

Honorable Peter G. Peterson
Secretary of Commerce

Davis B. McCarn
National Library of Medicine

Thomas E. Carroll
EPA Office of Planning and Management

Reports by User Panel Chairmen

Citizen Action Groups – William G. Painter
Press and Publications – Stanley E. Degler
Industry and Trade Associations – Arne E. Gubrud
Academia, Research Orgs., Professional Societies – John E. Ross
Government – Sidney R. Galler

Jules Bergman
ABC News Science Editor

Appendix F
Moderators for Informal Forum Sessions

Monday, September 25:

Environmental Subject Category Listing
Phil Arberg
Research Information Division, EPA

Noise Information Systems and Services
David Bach
Noise Abatement and Control, EPA

Aspen Legislative System
Lawrence H. Berul
Aspen Systems Corporation

Monitoring Systems
M. W. Bloch
Research and Monitoring, EPA

Radiation Information Systems and Services
J. R. Buchanan
Oak Ridge National Laboratory

Solid Waste Information Systems and Services
John Connolly
SWIRS, EPA

Water Information Systems and Services
Logan Cowgill
WRSIC, Department of the Interior

Environmental Reporter
(Bureau of National Affairs, Inc.)
Stanley E. Degler, Editor

DCASR's Role in Environmental Protection
(w/DOD Contractors)
Commander John Derr
DCASR, Cleveland, Ohio

Information Impact
James E. Freeman
University of Denver Research Institute

SEQUIP Report Review
Robert R. Freeman
NOAA

International Exchanges
Dolores Gregory
International Activities, EPA

Air Information Systems and Services
Peter Halpin
APTIC, EPA

Computerized Information Services in the Environmental and Biological Sciences
Thomas H. Hogan
BioSciences Information Service

Atlas for Presentation of Complex Data for Costal Zone Planners
James Hunt
New York Ocean Science Laboratory

Science Information Association Group Associate Program
Robert M. Landau
Science Information Association

Pesticides Information Systems and Services
Claudia Lewis
Division of Pesticide Community Studies, EPA

Use of the Computer
John Pruden, Kermit Day
Management Information & Data Systems, EPA

NEEDS (Neighborhood Environmental Evaluation and Decision System) Program
Lee Tate
Community Management Studies, HEW, Cincinnati

Need for a National Economic Water Model
Russell G. Thompson
University of Texas

Environmental Thesaurus
Gerald U. Ulrikson, Gloria Caton, Jerry Olson
Oak Ridge National Laboratory
Environmental Information System

Public Perceptions and Attitudes Relating to Environmental Pollution
C. Michael York
Georgia Institute of Technology

NASA Regional Dissemination Centers
Representatives from four of the Centers

University Science Information Centers under NSF Grants
Representatives from five of the Centers

Tuesday, September 26:

Environmental Law Reporter
(Environmental Law Institute)
Frederick R. Anderson, Editor

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