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NATIONAL WATER DATA EXCHANGE

SUMMARY OF THIRD MEMBERSHIP CONFERENCE AND WORKSHOP OF THE NATIONAL WATER DATA EXCHANGE

November 18-19, 1980

Falls Church, Virginia

U.S. GEOLOGICAL SURVEY

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SUMMARY OF THIRD MEMBERSHIP CONFERENCE AND WORKSHOP OF THE NATIONAL WATER DATA EXCHANGE, NOVEMBER 18-19, 1980, FALLS CHURCH, VIRGINIA

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UNITED STATES DEPARTMENT OF THE INTERIOR

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INTRODUCTION

The National Water Data Exchange (NAWDEX) is a program to assist users of water data or water-related data in identifying, locating, and acquiring needed data. NAWDEX is made up of Federal, State, local governmental, academic, and private organizations who wish to facilitate the exchange of water data and to make these data more available to those who need them. The central Program Office is located in the U.S. Geological Survey's National Center in Reston, Va. Melvin D. Edwards, Hydrologist, is the Program Manager.

The third membership conference of the National Water Data Exchange was held on November 18-19, 1980, at the Tysons Corner Ramada Inn in Falls Church, Va., a suburb of Washington, D.C. The conference was convened at 8:30 a.m. on Tuesday, November 18. The morning session began with a welcome by Mr. Russell H. Langford, Associate Chief Hydrologist of the U.S. Geological Survey, followed by a report from the Program Manager on the status of NAWDEX activities and previously established goals, and by the presentations of several NAWDEX members about new systems, services, and NAWDEX-related activities being developed and used. The Program Manager then enumerated the NAWDEX projects and goals which will be given special emphasis during the 1981 fiscal year. Prior to adjournment for lunch, a charge was given to each of the three workshops which were to be held during the afternoon. These workshops were each given specific topics to be considered, and they were asked to make some recommendations for implementing the projected goals during the next 12 to 18 months. The workshops were reconvened on Wednesday morning, November 19, and were concluded at lunchtime. In the final general session on Wednesday afternoon, Mr. C.R. Baskin of the Texas Department of Water Resources, gave a report on the second joint meeting of the NAWDEX advisory subcommittees. This was followed by reports from the chairmen of the three conference workshops. The remainder of the afternoon was devoted to discussion on what the future of NAWDEX should be.

The participants were invited to take a tour of the U.S. Geological Survey's National Center, located in Reston, Va., about 8 miles from the conference hotel, on Thursday morning, November 20. The tour included a slide presentation of the Mount St. Helens eruption in the State of Washington; a tour of the Public Inquiries Office and the National Cartographic Information Center; a talk and slides on the satellite relay of data by the Chief of the Instrumentation Group, Operations Section, of the Water Resources Division; a tour of the USGS Computer Center; and a tour of the NAWDEX Program Office area.

Forty-seven people attended this third membership conference. Of those attending, 35 represented Federal agencies, 5 were from State agencies, 1 was from a local governmental agency, 4 were from private organizations, and 1 person was from a foreign affiliate of NAWDEX, the Water Resources Document Reference Center, Canada Department of the Environment. A list of the participants and a copy of the agenda are given in appendixes A and B of this report.

THE CONTINUING NEED FOR WATER DATA
(Opening Remarks to the Third NAWDEX Membership Conference)

Mr. Edwards, Program Manager, welcomed the participants to the membership conference and then introduced Mr. Russell H. Langford, the Associate Chief Hydrologist and former Chief of the Office of Water Data Coordination, U.S. Geological Survey. Mr. Langford graciously consented to "stand-in" for Mr. Philip Cohen, Chief Hydrologist of the U.S. Geological Survey who was originally scheduled to speak. Important and pressing business prevented Mr. Cohen from attending. Mr. Langford welcomed the NAWDEX conference attendees and stated that he was clearly involved in the development and progress of NAWDEX. He noted that during the 18 months since the last NAWDEX conference, there have been many changes which have affected the program. For example, new legislation, such as the Surface Mining Control and Reclamation Act and the Safe Drinking Water Act, is placing an increased demand on water information of all kinds. He also said that other programs, such as development of energy-rich areas in the country for coal, oil shale, and so forth, and a growing concern over ground-water contamination as a result of toxic waste disposal, are placing a new emphasis on the evaluation of existing data, as well as upon the need for additional data and investigations. He added that owing to all these concerns, and particularly the concern over pollution, the demand for ground-water quality data is burgeoning and is expected to increase dramatically in the future. He noted that the impact of acid rain on the quality of ground and surface waters is a growing concern in the northeast part of the country, as well as in other parts.

These demands and requirements for water information are outpacing our immediate capabilities to acquire the data that are so vitally needed. Therefore, the NAWDEX program, which serves as a mechanism for improving our collective ability to identify and exchange those data that are now in hand and that are being collected, is more important now than ever before. Mr. Langford went on to say that at the last NAWDEX conference, Mr. Cohen stressed two major issues that faced the NAWDEX program: the national goal of indexing all water resources data; and a more forceful integration of Federal, State and local data-exchange activities. These two issues are still valid and NAWDEX is still a viable focal point for resolving these problems. The program represents the largest unified effort currently underway at the interagency level that is directed at achieving goals such as these.

Mr. Langford went on to say he was very pleased with the number of organizations that are participating in the NAWDEX program and by the fact that the number of organizations continues to grow. This improves communications among those who collect and use water data, and increases our collective abilities to reach those organizations that have data resources and services that can be made available to the data user.

The growing number of water-data sites indexed by NAWDEX is a good indication that we are making progress in the goal towards a national water-data-indexing program. Mr. Langford noted that we are now at a stage of implementation of the NAWDEX program where less emphasis can be placed on systems development and more emphasis placed on outreach programs that are directed at bringing cohesiveness to the indexing and exchange of data and the resolution of very basic problems related to those activities.

The Geological Survey's Office of Water Data Coordination (OWDC) has, he stated, made some rather significant progress since its establishment in the mid-sixties towards improving the coordination of water-data-acquisition activities throughout the Nation. The two OWDC advisory committees, the Interagency Advisory Committee on Water Data and the Advisory Committee on Water Data for Public Use, have made invaluable contributions to our efforts to design effective data-monitoring networks and to establish acquisition programs that meet current and future needs of the water-data-using community.

The expertise of these two committees helped in the development of NAWDEX and they continue to provide valuable input to the program through two sub-committees, the Subcommittee on Water Data and Information Exchange and its counterpart, the Subcommittee on Water Data Exchange. Mr. Langford went on to say that a continued close-working relationship between NAWDEX and OWDC helps in achieving the goal of better integration of water-data-exchange activities.

Mr. Langford said that he is pleased to note that we will be using the workshops again to attack some of these basic issues over the next couple of days. Input from the workshops has been used in making decisions relative to the development and growth of the NAWDEX program. The recommendations of this conference will help NAWDEX make the most progress possible over the next year or so with the resources available to us in the Geological Survey.

In summary, Mr. Langford said he did not see the need for water data diminishing in the future. Rather, he said, the need will become more intensive and more diverse. This will place an even greater challenge on all of us as we work with the NAWDEX program. He said the challenge can be met through the support of organizations and people such as those in attendance who support the NAWDEX concept. Interdisciplinary expertise and interest in making the NAWDEX program work will help us to achieve our mutual goals.

Mr. Langford noted that while the resources available to NAWDEX will not be as large as had been hoped for the next year or so, he feels sure that the program will retain a high level of status within the Geological Survey, and will continue to receive the highest possible support. He said that the resources being contributed to the NAWDEX program by other agencies and organizations including Federal, State, local, regional, or others, in terms of services, personnel, and time devoted to the program, have become significantly large and are major keystones to the success of NAWDEX in meeting its goals.

Mr. Langford concluded by expressing his personal appreciation and that of the Geological Survey for the very vital support that has been given this program over the years--it is truly an involvement of the water-data-using community. He stated once again that working-level committees are excellent for getting things out on the table and for developing some good, solid recommendations for the future.

Again, he expressed Mr. Cohen's regrets that he couldn't be at the conference but wished to express his very best wishes for a successful meeting.

STATUS OF THE NAWDEX PROGRAM

Mr. Edwards, Program Manager, briefly reported on the status of the NAWDEX program. He stated that NAWDEX is continuing to grow and gave some statistics which were based on the growth of the program since the last membership conference, that was held in May of 1979. Since that time, membership has grown from 135 to 195 members. This is an increase of over 44 percent. We have been pleased to welcome two new foreign affiliates to the program during that period--one from Brazil and one from India. According to Mr. Edwards the significant increase in membership indicates a growing interest in this program, as well as a sincere belief on behalf of all the member organizations that a program such as NAWDEX is definitely needed.

While the NAWDEX budget has remained stable during fiscal years 1980 and 1981, at about $1.2 to $1.3 million for the Program Office, it has been possible to expand the Program Office staff to include 12 full-time personnel, 2 part-time personnel, and 2 seasonal employees. This is an increase of 3 full-time and 3 part-time employees over the past 18 months. This has been a much needed resource within the program.

Efforts have continued to improve the public awareness of NAWDEX. The staff has exhibited and demonstrated the data bases at conferences of the American Water Resources Association in Minneapolis, Minn., the State of Maryland (Baltimore), and the integrated County-Level Data User's Workshop in Reston, Va. Papers describing the program have been presented also at national sessions of the American Society of Civil Engineers in Atlanta, Ga., and Portland, Ore.; the 11th meeting of the Water Data Coordinating Committee of Louisiana in Baton Rouge; a water-resources information exchange conference sponsored by Cornell University in Ithaca, N.Y.; the Council of State Governments in Washington, D.C.; and the National Convention of the National Water Resources Association in Omaha, Nebr. In addition, the William T. Lorenz Co. included NAWDEX as a topic of discussion in a series of pollution control industry-update conferences which were held in 16 cities nationwide. Also, the Electric Power Research Institute included NAWDEX in a recent workshop it held in Tucson, Ariz. Papers about NAWDEX also have been published in journals of the American Water Resources Association and the American Society of Civil Engineering.

NAWDEX has received publicity in Waterline, the monthly newsletter of the International City Management Association, and several other newsletters during this period. This is a very important way of making NAWDEX known to the public. Mr. Edwards expressed his appreciation to all of these organizations for their support of the program in allowing NAWDEX to be presented at their meetings in in order to make more people aware of the existence of the NAWDEX program.

Efforts have been expanded to assist people in the use of NAWDEX as recommended and approved at the last membership conference. Since that time, eight training sessions have been held, three pertaining to the use of the

NAWDEX data systems, one for Assistance Center personnel, two membership orientation sessions, and two special orientation sessions for the Office of Surface Mining in the Department of the Interior, and the Department of Energy. The last two sessions were held at the request of the respective agency.

In the spring of 1980 a program guide, consisting of five notebook volumes, was distributed to our members which provided a facility for more orderly management and filing of all of the NAWDEX program documents, user guides, indexing instructions, and other materials that are distributed. This guide will ultimately contain more than 30 documents, and at the present time, about 50 percent of all of those documents have been formally approved for publication and have been distributed.

The user services program continues to progress very well. Four new assistance centers have been added to the assistance center network since the last conference, bringing the total now to 60. The new services are provided by the Utah Division of Water Rights in Salt Lake City, Utah; the Center for Water Resources Research in Logan, Utah; the Water Resources Research Institute at the University of Wyoming in Laramie; and the Water Resources Research Institute at Colorado State University in Fort Collins. The contributed support of these organizations is greatly appreciated. The Assistance Centers reported handling over 77,000 request and response transactions during fiscal year 1980, and this shows a continued growth in the user service activities within NAWDEX of about 20 percent. This 20 percent probably is a fairly good reflection of the growth in demand of water data that has come about as a result of the NAWDEX program.

The Program Office has continued to coordinate direct computer access by its members to the data systems of NAWDEX, the U.S. Geological Survey's National Water Data Storage and Retrieval System (WATSTORE), and the U.S. Environmental Protection Agency's Storage and Retrieval System (STORET). Since the last conference, computer service has been expanded to 46 organizations and 56 terminal locations with access to NAWDEX, 56 organizations and 113 terminals with access to WATSTORE; and 5 organizations and 22 terminals with access to STORET. These organizations submitted nearly 5,000 jobs last year for access to WATSTORE, and a little over 160 jobs for access to NAWDEX. This represents about a 50 percent increase in the last 18 months in the number of organizations that have been brought online to use these important data systems.

Good progress has been made in the data indexing program. Also, 112 new organizations have been added to the Water Data Sources Directory, bringing the total number of organizations registered in the directory to 714. Two update cycles have been completed in the Water Data Sources Directory data base, and facilities were implemented in the summer of 1980 for the inclusion of water-related data as well, in that cycle. Over 74,000 new sites have been added to the Master Water Data Index, bringing the total sites indexed to over 377,000. This large increase was due primarily to the implementation of a computerized interface with the Texas Natural Resources Information System (TNRIS) in the summer of 1980. All software for this interface was developed and contributed to the program by TNRIS, and we want to thank John Wilson and his fine staff for making this very valuable contribution to the program.

Approval of the NAWDEX indexing-systems forms now has been received from the Office of Management and Budget, and the indexing procedures have been formally implemented both within NAWDEX and the Office of Water Data Coordination. In addition, a third system for the indexing of areal water data was announced to the membership in September of 1980. Facilities for this system are being contributed by the Geological Survey's Management Information System (MIS) unit. The system is planned for full implementation within the program during fiscal year 1981, and it adds a valuable system necesary for a well-rounded indexing program.

Work on the development of recommended methods for the handling and exchange of water data has progressed reasonably well. The first draft has been written by the working group and is now being put in final form for review. Distribution for the review is scheduled for early 1981.

While new systems development has been limited due to budgetary constraints, work was begun in May 1980 on major revisions to the Master Water Data Index that will improve its efficiency and expand our data indexing capabilities. Also, work was begun in September 1980 on an automated NAWDEX User Accounting System to help improve request-tracking capabilities and to provide better accounting of our user-services activities.

The two NAWDEX advisory committees, the Subcommittee on Water Data Exchange and the Subcommittee on Water Data and Information Exchange, that Hal Langford mentioned earlier have been active and are providing valuable support to the program. Two joint meetings of the subcommittees were held in October of 1979 and again in October of 1980. In addition, there have been two independent meetings of the Subcommittee on Water Data Exchange and one of the Subcommittee on Water Data and Information Exchange. They provided excellent advice and guidance on several administrative and program-objective matters. A report about the activities of these two subcommittees will be given by Mr. C. R. Baskin tomorrow afternoon in our last conference session.

In his summary, Mr. Edwards stated that NAWDEX hasn't achieved all it had hoped to achieve over the past 12 months; however, we have made a lot of progress. He expressed his appreciation for the support of the membership and that of a very dedicated and hard-working Program Office staff. He concluded by saying that with continued member support we expect to make good progress between now and the next conference.

PAPERS BY REPRESENTATIVES OF MEMBER ORGANIZATIONS
ON DATA COORDINATION

Improved Water-Data Coordination at the Local Level

Mr. Jerald F. McCain, who just recently assumed new responsibilities as the U.S. Geological Survey's Northeast Regional Coordinator for the Office of Water Data Coordination in Reston, talked about improved water-data coordination at the local level. He reminded those present of how much we take for granted the water we drink and use. He observed that for much too long we, and much of the rest of the world, have operated under the illusion that water should be provided free to us, or at worst, at relatively little cost. He noted that basically water, as well as other natural resources, is provided free by nature, but it cannot be free at the tap in our homes or offices. We pay for convenience and for universal exploitation of all our resources.

The subject of water resources has received a great deal of attention in the past decade, as evidenced by passage of legislation at all levels of government, examples being Public Law 95-200, the Federal Water Pollution Control Act, amendments of 1972; Public Law 95-219, the Clean Water Act of 1977; Public Law 95-87, and the Surface Mining Control and Reclamation Act of 1977.

Each higher level of convenience or improvement desired, or being mandated by legislation, requires a greater commitment of money and a greater requirement for water data. The eighties are beginning to stack up as an even more critical decade for stresses on our environment, thus on our water resources. The development of synfuels is inevitable and the recent emphasis on ground-water contamination from toxic waste disposal will undoubtedly require much additional water information.

Mr. McCain noted that the recently-published Global 2000 Report to the President by the Council on Environmental Quality and the State Department "paints an alarming picture of the state of the world in the year 2000, if we fail to formulate changes in public policy or to accelerate rates of technology." As always, water is a key element if we are to avoid the despair of ill health and starvation. He reminded us that the demand for water information is drastically increasing while, at the same time, we are being faced with increasing constraints on manpower and travel funds. Although much of the demand for water data will be met through contracts and grants, this adds another dimension to coordination--the requirement for strict monitoring of contracts to maintain quality control of the data.

With all existing and anticipated difficulties with water data coordination, we in the Geological Survey's Water Resources Division (WRD) have begun to take a look at the possible means of strengthening our coordination efforts. One approach that seems to have considerble merit is to place more emphasis on coordination

efforts at the district or State level. The Geological Survey's WRD offices throughout the country have been actively involved in water resources planning and investigations for many years. With little additional effort, a formalized cooperative effort could be developed for formulation of hydrologic activities. This procedure could influence a mechanism for advanced planning of integrated investigations that would fill the requirements of water managers at all levels--local, State, regional and national. The coordination efforts could be reported in program reports which are already being published in some districts. A good example is the report "U.S. Geological Survey Activities in New York in 1979," published as Open-File Report 80-51. This report was a joint effort of all WRD offices and all other USGS division offices with projected work in New York, including water studies, geologic mapping, topographic mapping, and activities of the Conservation Division in offshore drilling. Another example is the report "Water Resources Investigations of the U.S. Geological Survey in Colorado, Fiscal Year 1980," which was published as Open-File Report 80-442.

Another type of publication that might be considered very useful in data-coordination efforts would be a State publication with a title such as "Hydrologic Information Needs in Idaho, Fiscal Year 1982." Such a coordination effort would demonstrate responsible management and planning by participating water resources agencies and would be highly beneficial in budget justifications at all levels of government.

Mr. McCain said that an ongoing activity that many WRD districts have started is to conduct State water resources information exchange meetings. These meetings are cosponsored by the WRD and usually the principal State cooperator in each of the districts. Such a meeting was held in Georgia on September 11-12, 1980. This meeting was attended by about 200 people who are involved in water-resources activities in Georgia. The agenda included discussions of agencies' activities and water studies, discussions of emerging water problems in Georgia, and technical sessions on computers and hydrological technology. Anticipated water data needs and an evaluation of the water data community's ability to meet these identified needs was also discussed. A summary report is being prepared about the meeting and will be distributed to all participants and other interested groups. Mr. McCain noted that this type of meeting is not intended to replace the one-on-one method of program planning now used. Rather, it is conducted to accomplish just what the title says--to provide information to all water agencies on activities and plans. Properly planned and conducted, a water information exchange meeting can be very helpful in later one-on-one contacts for program development.

To further address the subject of district-level coordination, the Northeast Region is establishing an ad hoc work group composed of several district chiefs and regional staff members. This group will be charged to (1) review present methods of data coordination, (2) evaluate feasibility and cost of added district participation and coordination, and (3) to make recommendations for future action.

Mr. McCain concluded by saying that we in the water resources profession are faced with a big task in water-data coordination, which is getting larger all the time. The recommendation to shift much of the emphasis to a district level would be a very beneficial move in coordination efforts.

Mr. Edwards, NAWDEX Program Manager, commented that he also felt very strongly that improved coordination at the local level must come about. Contacts have to be strengthened at the local level, particularly with organizations that are collecting water data. Contacts must be strengthened also between those organizations that are collecting data and those that are using data. That is one of the commitments of the National Water Data Exchange. He noted he was very pleased that NAWDEX has been invited on several occasions in the past 2 or 3 years to participate at these local data-exchange conferences. The NAWDEX data bases, particularly the Master Water Data Index, are continuing to play a very important role in various data coordination activities that take place across the Nation.

Recommendations for an Integrated Federal Environmental Data System

Mr. John Ficke, from the President's Council on Environmental Quality (CEQ), was introduced by the NAWDEX Program Manager. Mr. Ficke's area of responsibility in CEQ deals with environmental data and monitoring and he gave a talk on "integrated Federal environmental data and monitoring." He described how, by virtue of the President's 1977 Environmental Message, an Interagency Task Force on Environmental Data and Monitoring was established under the auspices of the CEQ. Approximately 25 to 30 agencies participated, with roughly 200 people at the working level. They considered environmental data and monitoring from five areas of concern: water, air, land, ecology, and socioeconomics.

The group's first task was to identify where the problems were. In doing so they found that the big crosscutting issues were the issues of coordination. The big problem seemed to be that there was no quality assurance — nobody was sure how good the acquired data were.

Another problem was the budget processes. One agency couldn't rely on another to provide data because of the Office of Management and Budget (OMB) structure and the way the agency budgets were examined in independent ways. There were problems with global data. Although in many areas the data were good for the United States (North America) and other developed countries, the programs just weren't there in the lesser developed countries.

In March 1980, the report of the Federal Interagency Task Force on Environmental Data and Monitoring went to the White House. Copies of the report have been rather widely distributed and it is available through the National Technical Information Service, Springfield, Va.

The final recommendations of the group which considered the five media areas were compiled. Seven recommendations dealt with coordination; four had to do with data systems; and one had to do with the budget process. The seven coordination recommendations were (1) establishment of a center or a coordinated program for environmental statistics; (2) improved coordination of ecological programs with the implied statement that they really ought to follow the model of the OMB's A-67 process; (3) improvement of Federal and non-Federal programs on data on land resources and land use; (4) strengthening of the water data coordination program (in other words strengthening A-67); (5) improvement of international cooperation with cooperators such as FAO (Food and Agriculture Organization), UNEP (United Nations Environment Program), and the U.N. Statistical Office; (6) improvement in data on intermedia relationships, with particular emphasis on the relationship between environmental quality and health; and (7) improved monitoring of the quality of atmospheric precipitation for acid rain and other substances from the atmosphere. The subject of acid rain was very much in the forefront at that time and still remains high on everyone's environmental list.

The four recommendations concerning data systems were (1) establishment of an integrated data system, (2) the need for user feedback--a dialogue or a group discussion among the people who collect the data and the people who use it, (3) a need for an ecological data-exchange system, and (4) the need for synthesizing long-term ecological data.

The one recommendation concerning the budget process was that OMB and the Executive Office needed to take a lead role in solving the problem of coordinating programs where several agencies are involved in data collection.

Mr. Ficke advised that as the task force analyzed the problems of environmental data, three options became apparent in dealing with the integration of environmental data systems. They were (1) network referral--which is really the NAWDEX image, (2) the proposal of Representative Dingall for a central "warehouse" or national environmental center, and (3) the pyramidal subset concept. Mr. Ficke went on to point out the advantages and disadvantages of each of these three options. He also stated that generally the pyramidal subset system, combined with NAWDEX-type referrals, was thought to be the best option.

The pyramidal subset system is a plan whereby agencies would put into a central "warehouse" subsets of their data. These would be duplicative subsets. In other words, a small amount of data (for instance 1,500 water quality stations of the Geological Survey) would be warehoused and if a user wanted to get a larger quantity of water quality data he would have to go back to the agency itself for this data. The capability of cross-disciplinary analysis would be there. The user access for parts of the data would be very easy, and for greater amounts of data would be facilitated through a coordinative mechanism; standards of data quality would have to be developed and would have to be in force. System management would be quite practical because most of the people's needs would be served, the technology would be handleable, and the level of authority would remain with the agencies who created and used the individual data bases, so that problems could be handled and it would not impact too adversely on existing organizations. It was felt that all Federal agencies should be required to participate and that State agencies would have incentives for participating also. Mr. Ficke mentioned four subset data bases that have been developed: UPGRADE, which was developed by the Council on Environmental Quality; DIDS (Decision Information Display System) the data base of the Office of Federal Statistical Policy and Standards (Census Bureau, Department of Commerce); the geoecology data base of Oak Ridge National Laboratory; and SEEDIS (a system operated by Lawrence Berkeley Laboratory). Cataloging of the data sets must be done and it must be done in the areas of air, land, ecology, and socioeconomics, just as NAWDEX has done it for water. Lastly, it is felt that the pyramidal system needs to have the capability of doing on-the-spot analyses. Some kinds of analytical capabilities must be built into the central pyramidal system, such as mapping, graphics, or statistical analyses. These things are incorporated in the four systems which were just mentioned.

Mr. Ficke explained that at the same time the Interagency Task Force on Environmental Data and Monitoring was mandated, the Council on Environmental Quality and the State Department were also mandated to prepare the Global 2000

report. This report turned out to be massive. The summary report, some 70 to 80 pages, presented the conclusions that when it gets down to problems with population, forests, diversity of species, and food supply, we have some real problems coming up by the year 2000.

The reports of the CEQ on environmental data and monitoring and the State Department's Global 2000 report precipitated yet another task force. This one, now in gear, is to come up with specific recommendations to the President in December. Among the issues analyzed were how to make the governmental structure and the international structure support the analysis of issues and work toward solutions.

Mr. Ficke noted that this group, with whom he has been dealing, has come right back to the same issues on an international basis that were identified by our task force on a national basis. The problems are the problems of coordination, of making data systems work, of quality assurance, and the whole scheme that fits within this group. In other words, the problems of coordination need to be dealt with on an international level just as well as on the Federal level. We need to deal with FOA and UNEP and other groups. In doing so, we need better schemes of data, better data handling, and coordination among the people who collect the data and those who use the data for analyses.

PAPERS BY REPRESENTATIVES OF MEMBER ORGANIZATIONS ON NEW SYSTEMS, SERVICES, AND NAWDEX-RELATED ACTIVITIES

Description of the U.S. Environmental Protection Agency's River Reach File and Industrial Facilities Discharge File

Mr. Robert Horn, U.S. Environmental Protection Agency (EPA), Washington, D.C., and Mr. Charles Wolfe, SCS Engineers, Reston, Va., jointly gave presentations on two newly developed, computerized data files which are currently operational on an in-house basis within EPA. The two files, the Reach File and the Industrial Facilities Discharge File, are interrelated in that the former provides hydrologic organization for retrieving data from the latter. In a like manner, the Reach File may be used to provide organization for essentially any other surface-water related data base. Present developmental work on the two files is being performed largely by SCS Engineers under contract with EPA. Mr. Horn noted that his office is striving to make the Reach File a standard for exchange of water data among Federal and non-Federal agencies using its unique stream segment identifiers, and he hoped it will be incorporated within NAWDEX and other water data bases.

Mr. Wolfe explained that the Reach File, which was designed for EPA's Water Monitoring Branch, of the Monitoring and Data Support Division, is a computerized data file that contains names and digitized traces of many streams and lakes in the 48 contiguous States. The file is organized within the framework of river basins defined by the U.S. Water Resources Council and the Office of Water Data Coordination of the U.S. Geological Survey. This basin framework consists of cataloging units arranged within accounting units, which in turn will fall within hydrologic subregions and regions.

Digitization of line traces was accomplished by optical scanning techniques involving line-following procedures to reproduce hydrologic features shown on the base maps. The base maps used for the 48 contiguous States were the National Oceanic and Atmospheric Administration (NOAA) sectional aeronautical charts having a scale of 1:500,000. In the file, digitized traces of streams, lakes, coastlines, and basin boundaries are segmented and a separate record is provided for each segment. Each stream segment is a reach, and for the most part, reaches extend between stream junctions or from junction to stream end. Approximately 70,000 reaches, with an average length of 10 miles, are presently in the file. These 700,000 river miles represent most of the significant streams in the continental United States. Records describing and containing the names of lakes and reservoirs are also incorporated in the file with the reach records. Reaches and junctions are numbered and arranged in a cumulative order. This order is a logical arrangement of stream reaches in which water and entrained material may be accumulated from all tributaries progressively in the downstream direction through mathematical modeling. The cumulative ordering system was devised to minimize computer memory requirements and manipulations needed for keeping track of stream reaches during data retrieval and modeling applications. For example, all the reaches for a terminal stream (a stream whose downstream end terminates at an ocean or is land-locked), such as the Mississippi River, are level one reaches; all reaches of the Ohio River, for example, are level two reaches, and so on.

Generally, the first reach identified in the file, for a given terminal stream system, is the most upstream level one reach in that terminal system; the second reach is another tributary to the junction at the lower end of the first reach. Reaches are arranged in the file in the downstream direction with the provision that the reaches downstream of a junction will not be encountered until after all reaches above the junction.

A directory to the file is being developed which will consist of a book of maps cross-referenced to tabular listings of reaches in hydrologic order and in alphabetical order within States and basins. It will be prepared in draft form and distributed to State agencies, EPA regions, and others for review and comment. States will begin using it, in draft form, to help in preparing statewide water quality inventory reports required under Section 305(b) of the Clean Water Act. The directory will be updated occasionally after reaches have been added in sufficient numbers to warrant update.

Mr. Wolfe proceeded to describe briefly another file that was developed for EPA--the IFD (Industrial Facilities Discharge) File which was also developed for EPA's Monitoring and Data Support Division for toxic evaluation.

Mr. Horn concluded the presentation by describing how the Reach File might be incorporated in the data bases of other agencies or in the NAWDEX data bases. To do so would require some type of manual effort to cross-reference reaches with particular points of interest such as streamflow gages and water quality monitoring stations. He further explained that the OWDC-WRC cataloging units are the basis on which the Reach File was established, thus making the interface with NAWDEX more feasible. By using the cataloging unit number (8 digits) and a reach number (3 digits), a specific reach within the United States can be uniquely identified.

Mr. Horn and Mr. Wolfe answered a number of questions from the floor concerning possible applications of the Reach File before concluding their joint presentation. Further information about these files can be obtained by contacting Mr. Horn or Mr. Wolfe whose addresses are given in appendix B of this report.

Description of the On-Line Capabilities of the Nebraska Natural Resources Data Bank

Dr. Mahendra K. Bansal of the Nebraska Natural Resources Information System (NNRIS) talked briefly about a new facility that has been developed to enable direct access to the Nebraska Natural Resources Data Bank. He recalled that in the 1960's natural resources data banks were established in many States; data became more available to local agencies and the general public. In the seventies, use of data banks greatly increased, and development of software to process and analyze data in various forms was on the upswing.

With the advent of the computer technology, various online monitoring devices became available, making it possible to display and exchange information instantantaneously. Many Government agencies began to feel that a small in-house computer terminal was more useful. They preferred direct access to data bank resources, rather than requesting information from a centralized agency. In the eighties, this demand is expected to increase rapidly, when comparably inexpensive computer terminals are available.

Dr. Bansal continued to say that having already experienced this demand, the Nebraska Natural Resources Data Bank now provides direct access to its users. This was accomplished by modifying the data bases and restructuring its programs. A Data Access Manual was published in 1970 to acquaint users with the facility. It contains instructions for persons who have had little or no prior experience in data processing, but would like to list data or summarize information for their immediate needs. It also supplies technical details to experienced programmers who can access and extract information to meet their programming support. Due to a great demand, a revised version of the manual will be released in 1981. All the data files and supporting software developed at the Natural Resources Data Bank are stored and processed on the University of Nebraska's IBM 360/370 Computer System. Persons wishing to access the Data Bank resources must establish a direct communication link with the University of Nebraska, Lincoln Computing Facility.

All executable programs are stored on a direct access device. The job control statements required to execute programs are cataloged and stored in the System's procedure library. All data sets called by the cataloged procedures are also stored in the System's user library. From a single EXECUTE statement you can retrieve a wealth of information. This process greatly reduces programming efforts on the user's part and obviates errors in coding and keypunching job control statements required for running a job. Data can be accessed and retrieved in many ways such as station identification, county, river basin, natural resources district, latitude-longitude, and other location information. For more information and details about the NNRIS, please write to: Nebraska Natural Resources Commission 301 Centennial Mall South, Lincoln, NE 68509, or call the Data Bank during office hours at (402) 471-2081.

A Procedure for Describing Fish and Wildlife

Dr. James M. Brown of the Eastern Energy and Land Use Team, U.S. Fish and Wildlife Service, described a method for organizing and describing State fish and wildlife information in a standard, consistent manner, and with compatibility from State to State. He told how, in 1976, a Fish and Wildlife Service Task Force examined information needs in response to a projected increase in eastern mineral and energy development. This Task Force reported that much of the existing fish and wildlife information was not being used in the planning and assessment processes, and that fish and wildlife agencies were not appropriately involved in the mineral and energy development decisionmaking process. The Task Force identified the need for accurate, comprehensive, and readily accessible fish and wildlife information.

In 1977, the Service established the Eastern Energy and Land Use Team (EELUT) to implement the Task Force's recommendations. In cooperation with FWS Regions 4 and 5, EELUT developed a program to describe the fish and wildlife resources in West Virginia and Alabama, both States with intensive surface mining for coal. Both efforts utilized RUN WILD EAST, a revision of the operational RUN WILD fish and wildlife information system of the U.S. Forest Service. In 1979, a revised system, FAUNA, was tested in Pennsylvania, with assistance from the Tennessee Valley Authority, U.S. Forest Service, Bureau of Land Managment, and the Argonne National Laboratory.

These early tests of prototype fish and wildlife information systems demonstrated the utility of statewide computer-based information systems and identified problems inherent in both the RUN WILD EAST and FAUNA programs. Accordingly, the Eastern Energy and Land Use Team undertook an intensive effort to determine fish and wildlife information needs and coordinate development of an improved methodology. This effort included the conduct of 178 meetings with Federal and State agencies, industry, university, and private organizations. In response to this information needs assessment, the Eastern Energy and Land Use Team has developed a new methodology, "A Procedure for Describing Fish and Wildlife."

The increasing need for fish and wildlife information to satisfy various State and Federal mandates requires ready availability of accurate data. In addition, most small-to-medium-sized development projects rely heavily on existing data for planning and evaluation. Since the cumulative effects of small- and medium-sized projects have great impact upon the resource, information must be readily available for planning and assessment if it is to influence the decisionmaking process. Therefore, the "Procedure" is formatted to facilitate data entry into computerized storage and retrieval systems. The key to the methodology is the species description booklet, where each line represents an 80-column computer card. Each data category includes standardized information, comments, and most importantly, references. The remainder of the "Procedure" materials consist of coding instructions and appendixes to ensure standardization and consistency of definitions, terminology, and data entry. The Pennsylvania "Procedure" utilizes 25 such appendixes. Utilizing these tools, 10 general categories of information are available for each species: taxonomy, distribution, legal status or use, origin of species, population descriptors, habitat association, food habits,

niche requirements, management practices, and references. These categories contain 54 descriptors, with the capability for "comments" on 33 of the descriptors, for a total of 87 fields of information per species. Additionally, the source of each descriptor entry is referenced.

When a State, or other agency, has decided to implement the "Procedure," the usual first step is the establishment of a steering committee. We recommend that the steering committee include representatives from all interested, potential information users. This not only ensures that the compiled information will meet user needs, but also provides an avenue for increased efficiency through cost sharing of an activity currently mandated for several Federal agencies. The steering committee, as user representatives, determine the species to be included, and the scope of information to be entered. Typically, the steering committee will then select and contract with recognized authorities for data gathering evaluation and entry. This process helps ensure the credibility and acceptability of the completed data base. The role of the steering committee may also include responsibility for assistance and administration of the completed data base.

When the "Procedure" data base is combined with a data base management system (DBMS) to store, retrieve, and manipulate the data set, a powerful information system is obtained. The DBMS currently being used is MANAGE, developed by the Fish and Wildlife Service's Western Energy and Land Use Team. This flexible system permits the user to structure questions related to the data set, or the system will prompt the user. MANAGE permits multiple record retrieval and includes access to graphic programs for data display. The format of the "Procedure" also permits ready manipulation by other DBMS's, such as System 2000.

The establishment of fish and wildlife information systems at the State level is consistent with the legal authority for most fish and wildlife species. By assuring consistency and compatibility between State systems, it is possible to obtain the information necessary for interstate management units and development project planning and assessment, and to aggregate information for national assessments such as those required by the Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA) and the Soil and Water Resources Conservation Act of 1977 (RCA). However, fish and wildlife information is most frequently required on the local level for both resource management and development project planning and assessment.

Today, the prototype RUN WILD EAST information system is operational in West Virginia, containing information on 824 species and in Alabama with 1,008 common and resident vertebrates and selected invertebrates. The "Procedure" is being implemented in Pennsylvania with 212 species currently completed, and completion of the 850 species information system scheduled for mid-1981. An additional test of the "Procedure" is underway in Colorado in cooperation with the Bureau of Land Management and with the guidance of the five-way Interagency Task Force. The States of Minnesota and Missouri are currently implementing the "Procedure" with assistance from the U.S. Forest Service and the Fish and Wildlife Service. We anticipate that several additional States will implement the "Procedure" during 1981. For further information about the procedure and how it is implemented, you may contact Dr. Brown at the Eastern Energy and Land Use Team, Route 3, Box 44, Kearneysville, WV 25430.

Water Use Information System

Mr. J. F. Fletcher of the Hanford Engineering Development Laboratory, Richland, Wash., presented a brief description of the Water Use Information System (WUIS) which contains data on water use requirements for thermal electric powerplants and on water resources. The system provides a means whereby data can be retrieved in an expedient and orderly manner for purposes of performing environmental assessments and reviewing the potential impacts associated with proposed energy resources development on water resources. Retrieval and use of the data contained within WUIS provides data which allows planners to make initial assessments on water-usage considerations.

The water-resources data available for retrieval are organized and stored for each water resource cataloging unit defined by the U.S. Geological Survey. Each cataloging unit represents all or a portion of a natural hydrologic drainage basin. Data may be aggregated to form data bases for larger areas such as hydrologic accounting units and hydrologic subregions. Data are included for the 48 contiguous States.

The WUIS was developed under the sponsorship of the Advanced Nuclear Systems and Projects Division of the U.S. Department of Energy as part of the Powerplant Cooling System Development and Evaluation Program and was placed into operation in the spring of 1978. The system is available for use by both public and private organizations. Fees for retrieval of data are on a cost-recovery basis according to established Department of Energy policies.

Basically, three types of data are contained in the WUIS. First, for each of the 1875 water resource cataloging units, generic type data, such as surface area, population, dominant State and county, are compiled. A second type of data consists of information on specific water resources. Data on surface-water resources, ground-water resources, and saline-water sources, including oceans and bays (where applicable), are included. The third type of data contained in the WUIS pertains to data on electrical powerplants and power generation. The cataloging units are used to organize and retrieve all water resources and powerplant data contained in the system. Data may be retrieved by utilizing common governmental subdivisions, that is, State names and(or) county (county equivalent) names. A "dominant" county or county equivalent name is provided as an aid in visualizing the approximate physical location of each cataloging unit. The term "dominant" is used since water resource cataloging boundaries do not follow governmental boundaries.

Surface-water resources consist of rivers, lakes and reservoirs. The system is designed to permit data for up to four rivers and four lakes and reservoirs to be included for each cataloging unit. The basic data on flow and quality are obtained from the National Water Data Storage and Retrieval System (WATSTORE) and the National Water Data Exchange (NAWDEX), and are supplemented by data from State water-resources publications.

Ground-water aquifers presently supply approximately 25 percent of the total water demand in the United States, and although ground water is difficult to

inventory it has been estimated that the total storage exceeds the volume of the five Great Lakes.

A maximum of four ground-water sources may be entered for each water resource cataloging unit. To date, primary emphasis has been directed towards first delineating and then obtaining data on high-yield aquifers which are defined as those aquifers capable of yielding in excess of 500 gal/min (31.50 L/s). Specific well data for each of 250 potentially high-yield aquifers were obtained from the WATSTORE ground-water site inventory file.

The direct use of saline water for purposes of energy development is expected to grow in future years. In 1978, approximately 15 percent of the water used for energy development was withdrawn from saline water sources. Most of the saline water that is withdrawn today is used for the purpose of industrial process and steam-electric power condenser cooling. Saline water is also used to produce freshwater through desalting processes. The majority of desalinated water is used for industrial purposes; however, in recent years the number of municipal installations using desalinated water has increased.

Most electric power generation in this country relies upon the use of water either directly or indirectly. For the case of hydroelectric power generation, the use is direct and usually instream. For the case of steam electric power, its usage is more indirect and largely results from the use of water to cool steam condensers. Massive volumes of water may be required to carry away the waste heat from the thermal powerplants. Next to agriculture, steam-electric powerplant cooling is the largest user of water resources in the United States.

The System 2000 data base management system is used to store and retrieve the data in WUIS. The system allows for data to be arranged in a hierarchical relationship. It also allows for multiple online retrievals, online and batch data updates, user defined reports, and for data base backup and recovery. For additional information about the WUIS, you may contact Mr. J. C. Sonnichsen or Mr. J. F. Fletcher of the Hanford Engineering Development Laboratory, P.O. Box 1970, Richland, WA 99352.

NAWDEX PROGRAM THRUSTS FOR FISCAL YEAR 1981

Mr. Edwards briefly outlined the major program thrusts which this year will be directed at improving our operations, making our information more readily available to the user community, and strengthening our national data-indexing activities. We will strive to improve our operations primarily through improved communication. The Program Office is already taking steps to reduce the volume of program documentation by presenting more facts with less elaboration. We are trying to make our documents shorter and more readable. The Newsletter will be used more frequently to keep members aware of the status of the program. The use of printed "data alerts" and electronic conferencing are being explored as mechanisms for improving communication between our Assistance Centers, as well as the membership. Work has also begun on an automated user accounting system that will better enable us to track requests received and referred throughout the program, to improve our fiscal accounting procedures, and to keep track of growth in the user-services program.

Several mechanisms for making our information more readily available to the user community are being explored. We are in the final phases of making our Water Data Sources Directory publicly available in printed and microfiche forms. A summary of the large volume of water data indexed by NAWDEX is also being prepared for publication and will be available within the next few weeks. We are also studying the feasibility of other "off-the-shelf" products such as one-page indexes of available data, state-level catalogs, and special indexes of frequently requested information. These products would allow for better amortization of costs, thereby reducing overall costs to the user, as well as making them immediately available to the user. Mr. Edwards stated that extensive changes are being made to the Master Water Data Index and its associated software systems that will improve the efficiency of its use, reduce the overall cost of use, and allow for the indexing of new types of data. In addition, we are working with the Management Information System (MIS) Unit of the Geological Survey toward full implementation this year of a system for the indexing of areal-related data that will be more readily available to both the membership and the user community.

Although funding for new systems development is limited this year, we will be developing cursory specifications for automated graphic systems to be used with the data bases, revising the Water Data Sources Directory to include more information on data-indexing liaison personnel, and proceeding with one or more automated interfaces with member data systems.

Mr. Edwards concluded by saying that the program thrusts for this year will be reevaluated after the conference, where possible, to incorporate those major thrusts identified over the next 2 days that need immediate or near-future attention. Throughout the year we will make every effort to achieve maximum results from the resources available to the program.

INSTRUCTIONS TO WORK GROUPS

A charge was given by the Program Manager to each of the three workshops that were to be convened in the afternoon of the first day of the membership conference, November 18, 1980. He introduced the chairmen of the work groups and instructed each group as to some of the topics he wanted them to consider in their workshops.

1. Workshop on Program Administration, Norman Miller, Soil Conservation Service, Chairman.--This group was asked to look at such topics as guidelines for uniform user charges within NAWDEX; mechanisms for improving utilization of the advisory subcommittees, the selection criteria established for assistance centers, considering a definition of water data as applied to the NAWDEX program; suggestions for program thrusts for 1982; discussion of the benefits of NAWDEX membership and how we can better promote this information to the potential member community; defining the current deficiencies in the NAWDEX program; and what role NAWDEX should play in handling the large volumes of data that are now being collected by contractors and other organizations and that are not being made publicly available.

2. Workshop on User Services, John Wilson, Texas Natural Resources Information Service, Chairman.--This group was asked to look at the development of uniform guidelines for uniform user charges within the NAWDEX program, as well as the selection criteria for assistance centers. They were also asked to review and evaluate the proposed new user accounting system, to look at some of the new information products such as the Water Data Sources Directory and the Summary of the Master Water Data Index, and to offer suggestions on other items or approaches that can be taken in the way of information products to improve the dissemination of NAWDEX information to the public.

3. Workshop on Systems Development and Data Indexing, Charles D. Wolfe, SCS Engineers, Inc., Chairman.--This group was asked to look at the validity of some current changes that are being made in the Master Water Data Index, to look at the areal investigations file and its possible use within the program; to take a close look at the EPA river reach file, which was described during the morning session, in terms of its applicability to the NAWDEX program; to evaluate the planned modifications for the Water Data Sources Directory; and to look forward at systems development that they feel will be needed over the next two fiscal years, 1982 and 1983.

The Program Manager invited all the conference attendees to participate in one of the workshops. He explained where each of the groups would meet for the afternoon workshop and then adjourned the conference for lunch.

REPORT OF THE SECOND JOINT MEETING OF THE NAWDEX ADVISORY SUBCOMMITTEES

Mr. C. R. Baskin was introduced by Mr. Edwards, NAWDEX Program Manager. Mr. Baskin is Director of the Data and Engineering Services Division of the Texas Department of Water Resources. He also serves as Chairman of the Texas Natural Resources Information System Task Force. He is a member of the Advisory Committee on Water Data for Public Use, and Chairman of the NAWDEX oversight subcommittee, the Subcommittee on Water Data Exchange. Mr. Baskin reported on the second joint meeting of the two NAWDEX advisory subcommittes, the Subcommittee on Water Data and Information Exchange, made up of members representing Federal agencies, and the Subcommittee on Water Data Exchange, its non-Federal counterpart. The two subcommittees held a joint meeting in October in Washington, D.C. There were representatives of 14 Federal agencies and 5 non-Federal entities present, as well as USGS support persons. A draft report on guidelines for user charges within NAWDEX had been distributed for review in advance of the meeting.

At the meeting, objections were voiced on the draft's expressed concept of total cost recovery as applied to proposed guidelines for user charges within NAWDEX. Specific concern was raised about recommending charges for permanent personnel, amortization of equipment, and other fixed costs. The subcommittees strongly emphasized that guidelines should be developed that will facilitate providing information and services at the lowest reasonable cost. Majority consensus was given to a brief position statement prepared by a subgroup of the Subcommittee on Water Data Exchange directed at these points. The NAWDEX Program Manager was asked to redraft the guidelines using the position statement as a base and the redrafted guidelines as supporting documentation.

It was agreed that the new draft should be reviewed by the subcommittees prior to this membership conference. Unfortunately, such has not proven possible.

A statement concerning selection criteria for NAWDEX Assistance Centers was reviewed by members of both subcommittees prior to the joint meeting. The statement, as amended subsequent to the review, was approved by the subcommittees for adoption. The NAWDEX program objectives for FY 1981 were also reviewed prior to the meeting, and these objectives, as revised pursuant to that review, were also approved.

Several procedures were approved by the group to reduce the volume of information output from the NAWDEX Program Office. The quarterly report on Assistance Center activities is to be eliminated. The annual status report will be eliminated, and statements pertinent to current status will be carried in the NAWDEX Newsletter. The Newsletter will be condensed and produced more frequently. The annual program objectives will be presented in a less formal manner and in summary form. A system of numbered memoranda will be instituted by the Program Office to reduce the volume of material that must be repeated in correspondence.

After considering means to foster input by NAWDEX members to the Advisory Subcommittees, the subcommittees agreed that a list of their members should be distributed to the NAWDEX membership, with a statement of encouragement to

utilize members on the subcommittees for input to NAWDEX programs. A copy of the final report of the joint meeting of the subcommittees is also to be distributed to the NAWDEX membership to communicate the types of subjects considered by the subcommittees.

Concerning unresolved matters from their October 1979 joint meeting, the subcommittees concluded the following:

First, a definition of water data as applied to NAWDEX is needed. It should be all-inclusive, with special attention to the inclusion and definition of water-related data. The Program Manager was asked to draft such a definition and distribute it to the subcommittees for comment.

Secondly, mechanisms should be developed for handling water data collected but not made publicly available. NAWDEX should coordinate efforts to identify entities willing to undertake this mission and refer sources of such unpublished data to these entities. The Program Manager was requested to develop a briefing paper on this issue.

Thirdly, the basic approach of employing a code to reflect the use of recommended methods in the acquisition of water data, as a first step approach in indicating the accuracy and quality assurance of data, is acceptable.

A NAWDEX Program Office response to the Nuclear Regulatory Commission's request of a year ago for improved accesses to available radionuclide and waste management data was favorably received by the NRC. The subcommittees decided further clarification was required on the proposed use of computer conferencing for the exchange of real-time and crisis information. It was agreed that there should be assurance that this approach will not conflict with existing systems designed for this purpose.

The Program Office will attempt to develop improved materials explaining the benefits of NAWDEX membership. Consideration of a primer on the use of NAWDEX was recommended by the subcommittees.

It was agreed that the Water Data Sources Directory will be used to develop a combined directory of OWDC (Office of Water Data Coordination) and NAWDEX liaison officials as a further step in improving communication between varying levels of indexing and coordination activities.

The subcommittees responded favorably to a printed copy of the Water Data Sources Directory and a summary of the index to water data, as new procedures for disseminating NAWDEX and OWDC information. The subcommittees felt that less emphasis should be placed on the use of printed detailed indexes, and the proposed use of abbreviated one-page index listings received a positive reaction.

It was recommended by the subcommittees that the subjects of user charges, new information products, the handling of nonpublicly available data, and procedures for reflecting the quality assurance of data be given priority for consideration at this membership conference.

It was suggested that care should be given to assure that growth in the NAWDEX membership does not interfere with the goal of many States to establish a single focal point within their State for water data information activities.

Mr. Baskin concluded his report on the joint meeting of the subcommittees by asking if there were any questions. When there was no show of hands, he turned the meeting back to the NAWDEX Program Manager.

REPORTS OF THE WORKSHOP CHAIRMAN

The chairmen of the three ad hoc workshops, which were convened during the afternoon of November 18 and the morning of November 19, reported briefly on the activities of their respective work groups. The reports of the three workshop chairmen were submitted to the NAWDEX Program Manager in final form within a few weeks after the membership conference and these reports are presented in their entirety in appendixes C, D, and E of this report.

CLOSING REMARKS

Following the workshop reports, Mr. Edwards, Program Manager, expressed appreciation to the three chairmen for their willingness to chair the workshop sessions and for a job well done. He then opened up the conference for discussion or comments relating to the workshops or to the NAWDEX program in general. At approximately 3 p.m., November 19, 1981, the discussion was closed. Mr. Edwards invited all attendees to join the tour of the Geological Survey's National Center in Reston, Va., at 9 a.m. the following morning. He then thanked all those in attendance for their participation and support, after which he adjourned the conference.

APPENDIX A

AGENDA--THIRD NAWDEX MEMBERSHIP CONFERENCE AND WORKSHOP
WASHINGTON, D.C.
NOVEMBER 18-20, 1980

November 18, 1980

A.M.

8:00 - 9:00	- Registration
9:00 - 9:15	- Welcome and Opening Remarks: Russell H. Langford, Associate Chief Hydrologist, U.S. Geological Survey
9:15 - 9:30	- NAWDEX Status Report: M. D. Edwards, Program Manager, NAWDEX
9:30 - 9:50	- Improved Water-Data Coordination at the Local Level: Jerald F. McCain, U.S. Geological Survey
9:50 - 10:10	- Recommendations for an Integrated Federal Environmental Data System: John Ficke, President's Council on Environmental Quality.
10:10 - 10:25	- Coffee Break
10:25 - 10:45	- Members' Statements on New Systems, Services and NAWDEX-Related Activities: Robert Horn - U.S. Environmental Protection Agency Charles D. Wolfe, Jr. - SCS Engineers Mahendra K. Bansal - Nebraska Natural Resources Commission James Brown - U.S. Fish and Wildlife Service J. F. Fletcher - Hanford Engineering Development Laboratory
11:45 - 12:00	- Program Thrusts for Fiscal Year 1981 and Charge to the Workshops: M. D. Edwards, Program Manager, NAWDEX
12:00 - 1:15	- Lunch

P.M.

1:15 - 5:00	- Workshop Sessions
2:30 - 2:45	- Coffee Break
6:00 - 7:30	- Social Gathering

November 19, 1980

A.M.

8:30 - 11:30	- Continuation of Workshop Sessions
10:00 - 10:15	- Coffee Break
11:30 - 12:30	- Lunch

P.M.

12:30 - 1:00	- Report of the Second Joint Meeting of the NAWDEX Advisory Subcommittees: C. R. Baskin, Texas Department of Water Resources.
1:00 - 2:30	- Reports of Workshop Chairmen: Program Administration - Norman Miller, Soil Conservation Service User Services - John Wilson, Texas Natural Resources Information Service Systems Development and Data Indexing - Charles Wolfe, SCS Engineers
2:30 - 2:45	- Coffee Break
2:45 - 3:30	- Member Comments and Discussion Group Discussion: What Should be the Future of NAWDEX?
3:30	- Adjournment

November 20, 1980

A.M.	- Tour of U.S. Geological Survey National Center: Van will leave Ramada Inn at 8:20 a.m. for USGS National Center Tour
9:00 - 9:40	- Slide presentation of the Mount St. Helens Eruption
9:40 - 10:40	- Public Inquiries Office National Cartographic Information Center
10:40 - 11:10	- Satellite Relay of Data
11:15 - 11:45	- Computer Center Division
11:50 - 12:20	- NAWDEX Program Office

APPENDIX B

LIST OF ATTENDEES

THIRD MEMBERSHIP CONFERENCE OF THE
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APPENDIX C

REPORT OF THE
WORKSHOP ON PROGRAM ADMINISTRATION

Discussion topics were taken from a recommended outline included in the conference registration packet.

1. Definition of water data as applied to NAWDEX.--Doug Edwards, NAWDEX Program Manager, was requested to write a definition of water data as applied to NAWDEX. He submitted a draft for consideration and comment. The draft was amended by the group to include water-related data. The definition as agreed to by the workshop members is:

A Definition of Water Data and Water Related Data
The National Water Data Exchange (NAWDEX)

Water data, as pertaining to the activities of the National Water Data Exchange (NAWDEX), shall be defined as all physical, observed, and derived measurements and determinations of the quantity, quality, and use of surface and ground waters. Water-related data shall be defined as precipitation, evaporation, snow accumulation, soil moisture, subsidence, oceanographic, and other data measurements and determinations stored by, and available from, systems of NAWDEX participants.

2. Function and Mission Statements for NAWDEX.--Mr. Edwards developed function and mission statements for NAWDEX which had been approved by the Chief Hydrologist of the U.S. Geological Survey. The workshop members amended and added a fifth item to the function statement.

2.1 The statement of function for the National Water Data Exchange is as follows:

The National Water Data Exchange (NAWDEX) maintains an index of water and water-related data held by its members and participants, which provides a central source of information on data available from a large number of organizations representing all sectors of the water-data community. (NAWDEX is not a repository of water data.) NAWDEX is charged with the following principal functions:

(a) Develop and provide central management of a national confederation of water-oriented organizations in both the Federal and non-Federal sectors, whose objective is the continuing improvement of access to water data.

(b) Develop and operate a national program of water data identification and indexing, which includes the maintenance of a Water Data Sources Directory and a Master Water Data Index.

(c) Develop and operate a national user service program. Develop operational guidelines for a national network of assistance centers which provide data-search assistance, data referral services, and acquisition of water data from NAWDEX participating systems. Estab-

lish and maintain liaison with appropriate data systems that support the NAWDEX mission.

(d) Design, develop, and implement all systems and data bases necessary to support the overall operations of the program. Provide a membership-wide training program in the use of the systems and data bases.

(e) Assist data managers to develop quality assurance programs through fostering and supporting of mechanisms such as Recommended Methods. To the extent possible, indicate compatibility, comparability, and quality of data from various sources.

2.2 The statement of mission for the National Water Data Exchange is as follows:

The mission of the National Water Data Exchange (NAWDEX) is to improve access to water data; to assist users in identifying, locating, and obtaining needed water data and information; and to foster improvements in data handling and exchange processes that will enhance the availability and utility of water data and water-related data.

3. Relationships with data systems and centers in other disciplines.--The workshop recommends that NAWDEX should accelerate, increase, and strengthen relationships with data systems centers in other appropriate disciplines.

4. More assertive program of member involvement.--At the second NAWDEX membership conference the panel recommended "that the U.S. Geological Survey, as well as other agencies and organizations which compile and publish water data, include a statement in their publications to the effect that the NAWDEX Master Water Data Index should be queried for additional data sources." This group reiterates this, and recommends that the NAWDEX program office provide sample material to all members.

5. Guidelines for user charges within NAWDEX.--At their meeting in October the Federal and non-Federal advisory subcommittees drafted a summary supplement to the original document Mr. Edwards had submitted. The work group recommended that the guidelines be rewritten, by Mr. Edwards, to incorporate the subcommittees' input and be resubmitted back to the subcommittees. Then, the guidelines should be sent to the membership. The main concern of the committees centered around "total cost recovery" or "minimum cost recovery."

6. Mechanisms for improving utilization of subcommittees.--Federal and non-Federal subcommittees were organized in January 1979 to act as oversight groups for the NAWDEX program. In regard to these subcommittees the workshop recommends the following:

(a) That the Program Manager develop a roster of subcommittee members to send to the membership with an explanation of the role and function of subcommittees. He should indicate that NAWDEX members can communicate directly with subcommittee members if they wish to contribute to the special subjects being considered by the subcommittees.

(b) Subcommittee reports should be abstracted and included in the newsletter. More detailed information can be requested from the Program Office.

7. Selection criteria for assistance centers.--Workshop group accepted criteria as is. This criteria will be sent to the membership shortly.

8. Suggestions for reducing paper output from the Program Office.--Mr. Edwards discussed the recommendations of the subcommittees for elimination of the following publications:

   (a) Summary of Data Requests
   (b) NAWDEX Status Report
   (c) Program Objectives Report. Program objectives should be distributed in summary form to the membership.

The work group accepted these recommendations. Recommendation was also accepted for numbering of memoranda. This will eliminate repetition of information.

9. Discussion of NAWDEX benefits to members.--Mr. Edwards submitted a first rough draft and suggestions were made to amend it. He will redraft paper and send to the subcommittees.

10. What are current deficiencies in the NAWDEX program?--The work group recommends that NAWDEX clarify use and access of NAWDEX services.

11. Suggested program thrusts for FY82.

   (a) High consideration should be given to a National Ground Water Data Base and how NAWDEX is going to interact.

   (b) Action should be initiated for NAWDEX to explore indexing of water use data and information.

   (c) Explore linkage and liaison activities with international affiliates and existing mechanisms.

12. Fourth membership conference.--The following recommendations were made concerning a fourth NAWDEX membership conference:

   (a) Time - Spring of 1982.
   (b) Place - Midcountry. Final location to be selected by Program Manager.
   (c) Format - Stay with current format (workshops).

Respectfully Submitted

Norman Miller, Chairman

Participants:

Norman Miller, Soil Conservation Service, USDA
M. D. Edwards, NAWDEX Program Office, USGS
J. B. Burford, Science Education Adminstration (USDA)
L. O. Drury, Environmental Data and Information Service, NOAA
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J. F. McCain, U.S. Geological Survey, Water Resources Division, NE Region
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L. Boychuk1/, Water Resources Document Reference Center,
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1/ Attended on 11/19/80.

APPENDIX D

REPORT FROM THE WORKSHOP ON
NAWDEX USER SERVICES

Participants in the Workshop on NAWDEX User Services began their deliberation by reviewing the recommendations made by the panel which addressed the same topic at the second NAWDEX Membership Conference, held in May 1979. It was generally agreed that the Program Office should continue its efforts to implement the recommendations from the second conference. In addition, the following specific recommendations are submitted:

(1) The NAWDEX Program Office should consider developing a general bibliography to include publications of the Program Office and the membership. The bibliography should include material which is not ordinarily included in the Office of Water Research and Technology's Selected Water Resource Abstracts data base.

(2) Members of the panel concur with the proposed "Guidelines for User Charges within The National Water Data Exchange," developed jointly by the Subcommittee on Water Data and Information Exchange and the Subcommittee on Water Data Exchange. It is recommended that the guidelines be used for 3 to 4 years or until problems occur that require changes.

(3) Selection of new NAWDEX Assistance Centers (AC's) should, in part, be guided by experienced or anticipated user demand in the area to be served by a proposed new AC. AC's should be established where the need is greatest.

(4) The Program Office should implement a request-response charging policy within the guidelines provided by oversight committees. A mechanism to allow cash payment by users should be established if possible. This might be accomplished by having a bonded employee who is authorized to accept cash in payment for data.

(5) The Program Office should continue its policy to develop "off-the-shelf" general appeal computer products which result in amortized cost savings to individual requesters. Assistance Center staff should provide input to the Program Office regarding new products which, if available, would be useful to user clientele. The Program Office should consider sending a questionnaire to the membership seeking input on products for "off-the-shelf" availability. Example products should be provided with the questionnaire to generate ideas or responses.

(6) Current System 2000 capabilities available to NAWDEX users as "strings" (as in "Guidelines for the Use of NAWDEX Data Systems") should be better publicized by the Program Office.

(7) It is recommended that the use of NAWDEX numbered memoranda be continued as a vehicle for alerting Assistance Centers and members to requests for information and data beyond that which is available through the Program Office. Such memoranda should be color coded for ease of identification.

(8) The Program Office should establish procedures to use the MULTICS System CONTINUUM feature to make information available to Assistance Centers and other members in an on-line environment. Cost/benefit information should be provided to attendees at the next membership conference for further discussion.

(9) The Program Office policy of providing an article in the Newsletter on each new Assistance Center should be continued. Additionally, the membership should be made aware of major new capabilities and data files that become available from existing Assistance Centers and from member organizations.

(10) The Program Office should continue its policy of providing a training schedule to all designated representatives as early as possible after the schedule is determined. A reminder should be mailed 2 to 3 months prior to each training session.

(11) It is suggested that NAWDEX encourage Federal agencies establishing contracts that include collection of water data to require that all collected data be indexed in NAWDEX.

(12) To encourage Assistance Center use, NAWDEX should bear as much of the cost as possible for entry of information in the NAWDEX User Accounting System (NUAS) currently under development.

(13) Assistance Centers that have automated user accounting systems should be provided information (system documentation) and consultation to support establishment of automated interface between their systems and NUAS.

(14) Regarding NUAS output products, emphasis should be placed on general and ad hoc summary reports, computer generated billings, and computer graphics displays.

(15) Assistance Centers should promptly report any changes of the contact person to the Program Office to facilitate the referral of user requests. The Program Office should provide the membership with a list of changes on a frequent basis and should solicit regular updates of Assistance Center changes.

(16) The Workshop participants see the NAWDEX Program Objectives for FY 1981 as a good mix of new development and continuing operation. The Program Office should develop FY 1982 objectives based on those used in 1981, with minor modifications, as required.

(17) Examples of several types of transmittal memoranda imprinted with the NAWDEX logo were examined by the work group, and it was agreed that NAWDEX should provide samples to the entire Assistance Center network for review and comment. The idea of identifying NAWDEX in responding to user requests for data that are indexed in the system is a good idea.

Respectfully Submitted,

John Wilson, Chairman

Participants:

Mahendra Bansal, Nebraska Natural Resources Information System
Don-Edward Donaldson, U.S. Department of Interior, Office of Water Research and Technology
Marian Guckert, U.S. Geological Survey, NAWDEX Program Office
Ron Kuhlman, Bureau of Land Management, USDI
Daniel McConnell, Federal Energy Regulatory Commission
Stuart Ross, U.S. Environmental Protection Agency
Paul Summers, Bureau of Land Management, USDI
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Gerald L. Thompson, U.S. Geological Survey, NAWDEX Program Office
John Wilson, Texas Natural Resources Information System

APPENDIX E

REPORT OF THE WORKSHOP ON SYSTEMS DEVELOPMENT AND WATER DATA INDEXING

The Workshop on Systems Development and Data Indexing for the third NAWDEX NAWDEX Membership Conference attracted many members from Federal, State and local agencies, as well as private organizations. Discussion began with a review of the recommendations proposed by the ad hoc panel on systems development and water data indexing, which was convened during the second NAWDEX Membership Conference in May 1979.

A report from Owen Williams of the NAWDEX Program Office indicated that many of the recommendations proposed during the previous conference had been acted on or were currently under contract. The recommendations involved the QW (quality of water) Parameters Repeating Group for Chemicals (700) and the development of a visible list of benefits to members (or prospective members) relating to NAWDEX indexing activities and use of computerized interfaces. These subjects still seem to be of concern since continued discussion and recommendations arose from this conference.

Many topics were discussed during the two half-day workshop sessions and resulted in the following recommendations to the NAWDEX Program Office:

1. To study the possibility of including the minimum of a yes/no category in the Water Data Sources Directory to represent whether or not quality assurance or quality control methods were used in the collection and recording of water data.

2. To regroup the QW Parameters Repeating Group for Chemicals (700) to anticipate current data requests. The new groups should be monitored for adjustment needs as further usage mandates.

3. To propose to OWDC possible expansion and modification of the Areal Investigations File along with an investigation of the file's compatibility with other data bases such as STORET. In addition, the file should be publicized more to increase usage.

4. To study the advantages and disadvantages of NAWDEX's use of EPA's River Reach File for expansion of graphics display capabilities, and (or) retrieval capabilities for the user. The liabilities incurred by continued EPA control of the file as they effect NAWDEX users should also be looked at. The study and final decisionmaking process should involve NAWDEX users.

5. The use of CONTINUUM for the exchange of information should be introduced on a 1 year trial basis within the 60 NAWDEX Assistance Centers. An evaluation of the system should be made at the end of the trial period.

6. To present to the NAWDEX members which major data systems are currently being considered for interface software development. The support of the Program Office for this development should be publicized to attempt to increase future demand for such capabilities. If additional requests for support are received, the Program Office should review its present and future priorities to provide this support.

7. To improve data indexing by expanding the direct processing capabilities to include menu displays, that is, forms display, on data terminal screens. The displays should include a section for comments on data indexing procedures.

8. To promote incentives for the data holder to encourage the use of remote job entry terminals for the indexing of their data.

9. To develop, or expand, a highly visible list of the benefits of NAWDEX indexing activities which may be derived by data holders. This list should be presented to members for their review and feedback.

10. To examine the means by which agencies or companies which hold flood-insurance data can be encouraged to have their water data indexed in the WDSD.

Respectfully Submitted,

Charles D. Wolfe, Chairman

Participants:

C. R. Showen, U.S. Geological Survey, Water Resources Division
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