nawdex

NATIONAL WATER DATA EXCHANGE

PROGRAM OBJECTIVES FOR THE NATIONAL WATER DATA EXCHANGE (NAWDEX) FOR FISCAL YEAR 1978

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By MELVIN D. EDWARDS

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U.S. DEPARTMENT OF THE INTERIOR

CECIL D. ANDRUS, Secretary

GEOLOGICAL SURVEY

V.E. McKelvey, Director

For additional information write to:

Chief Hydrologist
U.S. Geological Survey, WRD
421 National Center
Reston, Virginia 22092

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by

Melvin D. Edwards

ABSTRACT

This report presents the program objectives for the National Water Data Exchange (Nawdex) for Fiscal Year 1978, October 1, 1977 to September 30, 1978. Objectives covered include Nawdex membership, membership participation, Nawdex services, identification of sources of water data, the indexing of water data, systems development and implementation, training, recommended standards for the handling and exchange of water data, and program management. The report provides advance information on Nawdex activities, thereby, allowing the activities to be better integrated into the planning and operation of programs of member organizations.

INTRODUCTION

The National Water Data Exchange (Nawdex) Program of Operation calls for the Program Office to submit program objectives for the forthcoming fiscal year to the Nawdex membership for review and comment. This is to provide participating members of Nawdex the opportunity to participate in the development of program objectives, and to comment on the operation and progress of the program. This also provides advance information on Nawdex activities, thereby, allowing the activities to be better integrated into the planning and operation of programs of member organizations.

This report presents the objectives for the Nawdex program for Fiscal Year 1978, October 1, 1977 to September 30, 1978.

NAWDEX MEMBERSHIP

The Nawdex Program Office will continue to contact as many organizations as possible to acquaint them with the program and to encourage their membership in Nawdex. The Program Office staff will participate in national, regional, and local meetings of technical and professional groups with interests in water resources to describe the program. A Nawdex leaflet is in preparation which is planned for release in the second quarter of Fiscal Year 1978. This leaflet will be available to all members; each member is encouraged to take an active role in promoting Nawdex by distributing the leaflet to other organizations within its area to acquaint them with the program and its benefits. Distribution of the Nawdex Newsletter will be expanded in order to keep as many people as possible aware of current Nawdex activities and significant advancements in the program.

No numeric goals are established for the number of Nawdex members. The larger the membership, however, the more effective communication within the water-resources community will be.

FIRST GENERAL MEMBERSHIP MEETING

The first meeting of Nawdex members is planned for late spring, or early summer, of 1978. Denver, Colorado, is being considered as the site for this meeting. The objectives of the meeting will be to establish personal contact with member representatives, to provide a forum for an open exchange of information on member programs, systems, and services, and to conduct business pertinent to the operation and advancement of Nawdex. Both plenary and working sessions will be held. Potential topics for discussion are: member participation in Nawdex; improving communication within Nawdex; coordination of water-data indexing; development of recommended standards for the handling and exchange of water data; expanding the Water Data Sources Directory; and future needs and priorities within the Nawdex program.

The Nawdex Program Office will arrange for meeting facilities, announce and coordinate the meeting, and provide the administrative and facility costs of the meeting. All travel and subsistence costs for member participants will be borne by each representative member organizations.

NAWDEX SERVICES

Several activities which are either to be expanded or implemented during Fiscal Year 1978 are directed at improving the service capabilities of Nawdex:

Bibliographic Data Services: Large volumes of water and water-related data are available in published form throughout all sectors of the water-data community. A viable and complete bibliographic data service is, therefore, an important part of the Nawdex service capability. The service will be provided through two sources:

(1) The Water Resources Scientific Information Center (WRSIC) of the U.S. Department of Interior's Office of Water Research and Technology became a participating member of Nawdex in April 1977. Since that time, WRSIC has been working closely with the Nawdex Program Office to effectively integrate WRSIC services into the Nawdex Local Assistance Center (LAC) network. Each LAC will receive descriptive material on WRSIC services and will refer requests for bibliographic services to the appropriate WRSIC network center for processing. Each organization serving as a WRSIC network center has been invited to become a member of Nawdex and to participate in this effort. In addition, the Texas Natural Resources Information System (TNRIS) has direct access to the WRSIC computer files. TNRIS will, therefore, provide direct, WRSIC bibliographic services as a part of its Nawdex Local Assistance Center activities.

The WRSIC bibliographic service of *Selected Water Resources Abstracts* is available for subscription and WRSIC has also agreed to make its computerized storage and retrieval capability for water resources abstracts and bibliographic citations available to Nawdex members.

(2) The Environmental Data Service (EDS) of the National Oceanic and Atmospheric Administration (NOAA), also a member of Nawdex, has bibliographic data services available through its Oceanic and Atmospheric Scientific Information System (OASIS). OASIS has direct access to over 40 computerized, bibliographic data files, including WRSIC. Information on OASIS will be distributed to all Nawdex Local Assistance Centers (LAC's) to prepare them for referring requests for bibliographic services to OASIS in areas not covered by, or in addition to, WRSIC. EDS is also providing a reciprocal referral service to Nawdex for requests for water data received by its data centers.

EDS also provides its Environmental Data Index (ENDEX) services to Nawdex in the same manner as discussed above for its OASIS services. This service permits access to references to nearly 10,000 environmental data files available throughout the environmental community.

Access to Federal Water-Data Bases: Nawdex will provide access to two major Federal water-data bases.

(1) Nearly all Nawdex Local Assistance Centers have direct access to the computerized data files of the Geological Survey's National Water Data Storage and Retrieval System (Watstore). This includes a Station Header File which contains location and descriptive information for nearly 200,000 surface and ground-water sites for which data are stored in Watstore; a Daily Values File containing more than 146 million daily observations of streamflow, water-quality, sediment discharge, and ground-water level data; a Water Quality File containing more than 1,200,000 chemical analyses of both surface and ground waters; a Peak Flow File containing over 390,000 annual peak observations of streamflow and river stage data; and a Ground Water Site Inventory File containing inventory information for over 600,000 wells. These data are available to Nawdex users.

Since January 1976, the Nawdex Program Office has coordinated computerized access to Watstore by Nawdex members and other outside organizations. To date, this access has been restricted to the Header File and Daily Values File of Watstore. Plans are to expand access to the Ground Water Site Inventory File during the first quarter of Fiscal Year 1978 and to the Peak Flow File during the third quarter.

(2) The Nawdex Program Office signed a Memorandum of Understanding with the Office of Water and Hazardous Materials of the U.S. Environmental Protection Agency in July 1977 that formalizes the membership of this office in Nawdex and authorizes Nawdex as a user of the Storage and Retrieval

(Storet) system. Direct access services for the dissemination of data to Nawdex users from the Storet system will be provided by the Nawdex Program Office in Reston, Virginia. Arrangements for direct access to Storet are also being made by the Texas Natural Resources Information System (TNRIS) in Austin, Texas. Direct access services to Storet will also be provided by the TNRIS as a part of its Nawdex Local Assistance Center activities.

Plans are to implement Storet services in Nawdex during the first quarter of Fiscal Year 1978.

IDENTIFICATION OF SOURCES OF WATER DATA

Approximately 350 organizations are currently registered in the Water Data Sources Directory (WDSD). The information stored for these organizations is, in most cases, incomplete. Data encoding forms and instructions for their completion have been developed for the WDSD but cannot be placed into general use until they have been approved by the Office of Management and Budget. This approval is expected to take several months. In the interim, is is planned to provide each registered organization with a copy of the information contained in the WDSD relative to their organization for review, edit, and suggested expansion. This review is scheduled to begin in the second quarter of Fiscal Year 1978 and the WDSD is scheduled for publication about the end of the fourth quarter of Fiscal Year 1978. Plans are to make the WDSD available to the public through the U.S. Government Printing Office.

WATER-DATA INDEXING

The indexing of available water data is one of the most critical program elements within Nawdex. The computerized Master Water Data Index (MWDI) has been developed and implemented for this purpose. To date, the indexing of data has been restricted to information contributed to the "Catalog of Information on Water Data" maintained by the Geological Survey's Office of Water Data Coordination (OWDC) and the Management Information System of the Geological Survey's Water Resources Division. The input of information to the Master Water Data Index will be expanded to all Nawdex members and continued by contributors to the OWDC cataloging activity during Fiscal Year 1978. This will be accomplished by the following procedures:

Nawdex Developed Computerized Interfaces: During the 1977 Fiscal Year, the NAWDEX Program Office has been developing computerized interfaces between the Master Water Data Index (MWDI), the Storet system of the U.S. Environmental Protection Agency and the National Water Data Storage and Retrieval System (Watstore) of the U.S. Geological Survey. By the end of the fiscal year, work is scheduled to be completed on the software for both of these interfaces as well as the indexing of all surface-water quality and other data contained in an online environment in the Storet system. (This also includes the surface-water quality data of the Geological Survey's Watstore system.) During the second quarter of Fiscal Year 1978, work will be completed on the

indexing of all data archived offline in the Storet system. This will include the ground-water quality data contained in the Geological Survey's Watstore system. At least one additional update of the MWDI from the Storet system will take place before the end of the 1978 Fiscal Year. Work is also scheduled to be completed on the indexing of all data contained in the Daily Values File and Peak Flow File of the Geological Survey's Watstore system during the second quarter of Fiscal Year 1978. One additional update of the MWDI from these files will take place before the end of the fiscal year.

Member Developed Computerized Interfaces: Member organizations maintaining water-data storage and retrieval systems may elect to develop their own computerized interfaces with the Master Water Data Index. A standardized, machine-readable format has been developed for this purpose. Documentation on this procedure will be available from the Nawdex Program Office in the first quarter of Fiscal Year 1978 and the Program Office will provide technical assistance to those members wishing to develop interfaces.

Manual Encoding of Data: Encoding forms and instructions for their use have been developed for the preparation and entry of information into the Master Water Data Index (MWDI). These forms cannot be placed into inter-organizational use outside the Geological Survey, however, until approval has been obtained from the Office of Management and Budget. This approval is expected to take several months. Until such time that OMB approval is obtained for the new encoding forms, the data-encoding forms currently in use by the Geological Survey's Office of Water Data Coordination will continue to be utilized. Work is underway on translation software that will allow data prepared using the OWDC procedures to be converted to formats compatible for direct input to the data-processing software of the MWDI. This software is scheduled for completion in December 1977. The OWDC encoding forms and instructions will be made available to those Nawdex members not currently utilizing them during the second quarter of Fiscal Year 1978, and the processing of data prepared in these formats will begin at that time.

The new data-encoding procedures developed by Nawdex will be implemented for use within the Geological Survey's Water Resources Division during the first quarter of Fiscal Year 1978. This use will allow the appraisal and testing of these procedures by the Program Office until required OMB approvals are obtained. The finalized encoding procedures will be made available for use by all Nawdex members at that time.

SYSTEMS DEVELOPMENT

The following software systems, or system-related products, are scheduled for completion by the end of Fiscal Year 1977 and are planned to be made available to Nawdex members and users during the first quarter of Fiscal Year 1978:

(1) A generalized retrieval system for the Master Water Data Index (MWDI) designed for large-volume batch oriented retrievals from the data base. This system will include two major applications:

(a) A report generator that will permit information retrieved from the data base to be tabulated in any order of data elements as specified by the requester. The information may be printed with or without column headings to facilitate the use of preprinted forms. User-provided table headings and limited, user-specified column spacing will generally be accommodated.

(b) A digital plotting interface that will produce location maps for all sites identified in the MWDI by latitude and longitude. This system is designed to produce overlays to be used with a variety of map scales.

(2) Data dictionaries are being prepared which will define the structure and provide definitions of all data components contained in both the Water Data Sources Directory and Master Water Data Index data bases. Copies of these dictionaries will be made available to all Nawdex members by the Program Office and will also be made available for public distribution.

The following systems are scheduled for development beginning in the first quarter of Fiscal Year 1978:

(1) The existing Water Data Sources Directory data base will be modified to accommodate the storage and retrieval of information on organizations having water-related data available. The redesigned system will allow any organization registered in the Directory to report information on the various types of water-related data (meteorological, land-use, etc.) that it has available. The existing retrieval software will be modified to provide for generalized retrieval capability to produce a Water Data Sources Directory, a Directory of Sources of Water-Related Data or a combined Directory of Sources of Water and Water-Related Data. This system is scheduled for completion during the fourth quarter of Fiscal Year 1978.

(2) The Geological Survey's Office of Water Data Coordination (OWDC) is developing a digitized, computerized file defining the boundaries of hydrologic units as delineated on the USGS State Hydrologic Unit Maps prepared by OWDC in cooperation with the U.S. Water Resources Council. Software is also being developed for the computerized assignment of hydrologic unit codes to sites identified by latitude and longitude. This work is scheduled to be completed in the first quarter of Fiscal Year 1978.

Upon availability of the digitized hydrologic unit files and the associated software, the data-storage software for the Master Water Data Index will be modified to automatically assign a hydrologic unit code to all added sites identified by latitude and longitude. Also, all sites

previously stored in the MWDI will be assigned hydrologic unit codes. This work is planned to be completed in the third quarter of Fiscal Year 1978.

The following system development will be undertaken in Fiscal Year 1978 depending upon the availability of funding:

(1) An interface is planned between the Ground Water Site Inventory File (GWSI) of the Geological Survey's National Water Data Storage and Retrieval System (Watstore) and the Master Water Data Index (MWDI). The GWSI currently (July 1977) contains inventory information for more than 600,000 ground-water sites. The interface will provide for the retrieval of data from the GWSI in a format compatible with that of the MWDI. This will allow data retrieved from both data bases to be combined for reporting purposes and will, therefore, establish the GWSI as a software-linked extension of the MWDI.

(2) Software development is planned for providing summaries of data available from the Master Water Data Index (MWDI). Examples of summaries could include listings of sites for which data are available by collecting organizations and geographic areas, listings of types of data available and the frequencies of collection, and many other combinations. This software will allow the publication of a summary of the MWDI on a periodic basis.

TRAINING

At least two training sessions (one in Denver, Colorado, and one in Reston, Virginia) are planned during Fiscal Year 1978 to train Local Assistance Center personnel in new software systems that have been made available and in Local Assistance Center operating procedures. This training will be conducted by the staff of the Program Office assisted by contractor personnel. Costs of travel and subsistence for these sessions will be paid by the Program Office.

RECOMMENDED STANDARDS FOR THE HANDLING AND EXCHANGE OF WATER DATA

A major objective of Nawdex is to develop recommended standards to simplify and improve tha handling and exchange of water data. This will require the review and possible endorsement of existing standards, procedures, and techniques currently in use or under development by Nawdex members, or, where needed, the development of new recommendations. These recommendations, in general, should cover data encoding, storage, retrieval, exchange, output products and indexing techniques, procedures, and, if applicable, formats.

Initial work on this activity is scheduled to begin at the first general membership meeting. Guidelines for the continuation of the activity will be developed at that time.

PROGRAM MANAGEMENT

It is the intention of the Nawdex Program Office to conduct the management of the Nawdex program in a responsive, flexible, and dynamic manner. The objectives presented in this report are, therefore, considered to be major goals for the forthcoming fiscal year. Objectives and tasks will be amended, as deemed necessary, to achieve maximum benefit from program resources and to meet short-term and unanticipated needs.