

# nawdex

NATIONAL WATER DATA EXCHANGE

PUBLICATIONS RELATED TO THE  
NATIONAL WATER DATA EXCHANGE  
(NAWDEX) — 1971-81



U.S. GEOLOGICAL SURVEY  
Open-File Report 82—151

**PUBLICATIONS RELATED TO THE NATIONAL  
WATER DATA EXCHANGE (NAWDEX) — 1971-81**

**Compiled by Beverly M. Myers**

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**UNITED STATES DEPARTMENT OF THE INTERIOR  
JAMES G. WATT, Secretary**

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PUBLICATIONS RELATED TO THE NATIONAL WATER DATA  
EXCHANGE (NAWDEX)--1971-81

Compiled by Beverly M. Myers

ABSTRACT

The National Water Data Exchange (NAWDEX), formally established in January 1976, is a national confederation of water-oriented organizations working together to improve access to water data. Its primary objective is to assist users of water data in the identification, location, and acquisition of needed water data or water-related data. NAWDEX is coordinated by a central Program Office, located within the Water Resources Division of the U.S. Geological Survey, which provides data-exchange policy and guidelines to all participants in the program. In addition to the Program Office, there is a network of Assistance Centers located in 45 States and Puerto Rico which provides direct access to NAWDEX. Membership in NAWDEX is voluntary and open to any water-oriented organization that wishes to participate. This publication contains an alphabetical listing, by author, of the reports that have been produced by the NAWDEX Program Office since 1975, as well as reports from other sources that relate to the development of the NAWDEX program.

INTRODUCTION

The National Water Data Exchange (NAWDEX), formally established in January 1976, is a national confederation of water-oriented organizations working together to improve access to water data. Its primary objective is to assist users of water data in the identification, location, and acquisition of needed water or water-related data.

NAWDEX is coordinated by a central Program Office located within the Water Resources Division of the U.S. Geological Survey. This office provides data-exchange policy and guidelines to all participants in the NAWDEX program. It maintains a close working relationship with the U.S. Geological Survey's Office of Water Data Coordination which implements guidelines for the coordination of Federal activities in the acquisition and storage of water data as prescribed by Circular A-67 issued by the Office of Management and Budget in 1964.

In addition to the Program Office, there is a network of Assistance Centers located in 45 States and Puerto Rico which provides direct access to NAWDEX and makes local-area expertise available to aid in identifying and locating needed data. A directory containing the names, addresses, and telephone numbers of all Assistance Centers is available free from the NAWDEX Program Office.

Membership in NAWDEX is voluntary and open to any water-oriented organization that wishes to take an active role. Membership includes organizations from Federal, State, interstate, and local governments, as well as from the academic and private sectors of the water-data community.

NAWDEX maintains two computerized data bases, the Water Data Sources Directory (WSDS) and the Master Water Data Index (MWDI). The WSDS is a directory which contains information about organizations that collect, store, and disseminate water data. This includes: the type of each organization its major orientation of water-data activities; the names, addresses, and the telephone numbers of offices within each organization from which water data may be obtained; the types of data held by each organization and the geographic locations within which these data have been collected; and alternate sources of an organization's data.

The Master Water Data Index contains detailed information about sites at which water data are collected; the type of data-collection site; the organizations collecting data at each site; the current status of each site; the types of data available; the period of time for which data are available; the frequency at which these parameters are measured; and the media in which the data are available.

#### AVAILABILITY OF REPORTS

As coordinator of the National Water Data Exchange, the Program Office, located in the U.S. Geological Survey's National Center in Reston, Va., has produced numerous reports since its establishment. These include reports dealing with the administration of the NAWDEX program and which concern policies and procedures, program objectives, and status reports; descriptive reports which describe the contents of the computerized data bases; directories of the Assistance Center network and of the NAWDEX membership; and manuals which serve as guidelines for updating or accessing the NAWDEX data bases. Several reports have been published by the Office of Water Data Coordination, U.S. Geological Survey, which also relate to the NAWDEX program.

Most of the reports produced by NAWDEX have been published as open-file reports and were distributed to all NAWDEX member organizations, as well as other interested individuals who requested them. These reports were listed in the monthly publication entitled "New Publications of the Geological Survey," as they became available.

Copies of open-file reports published by NAWDEX prior to July 1979 are available only from the NAWDEX Program Office and may be obtained by writing to:

Program Office  
National Water Data Exchange  
U.S. Geological Survey  
421 National Center  
Reston, VA 22092  
Telephone: (703) 860-6031  
FTS: 928-6031

Open-file reports produced after July 1, 1979, have been entered into the Geological Survey's Open-File Services Section (OFSS) distribution system at Denver, Colo. After the Program Office has made its initial distribution of open-file reports to its members, cooperators, and to the designated depositories, requests for these publications will be referred to OFSS where a charge will be made for each copy requested. The address of OFSS is:

U.S. Geological Survey  
Open-File Services Section  
Branch of Distribution  
Box 25425, Federal Center  
Denver, Colorado 80225

Some of the publications listed in this report are out of print and are no longer available for distribution. They are indicated by an asterisk (\*) preceding the author's name. However, all of the reports listed herein are available for inspection in the NAWDEX Program Office or in the U.S. Geological Survey Library, both of which are located in the U.S. Geological Survey's National Center in Reston, Va.

For easy reference, a summary of the types of reports listed in this publication precedes the annotated list of reports. The number which appears after each entry in the summary indicates the page on which each complete annotated citation appears.

SUMMARY OF NAWDEX PUBLICATIONS  
BY TYPES OF REPORTS

Data Dictionaries

- 1980 - Definitions of components of the Water Data Sources Directory maintained by the National Water Data Exchange (14)
- 1982 - Definitions of components of the Master Water Data Index maintained by the National Water Data Exchange (19)

Directories

- 1980 - NAWDEX Assistance Center directory (11)
- 1980 - Guide to the Water Data Sources Directory (21)
- 1981 - NAWDEX membership directory (16)

Identification Codes

- 1981 - Identification codes for organizations listed in computerized data systems of the U.S. Geological Survey (14)

Miscellaneous Reports

- 1974 - Support in the overall design development of a National Water Data Exchange (NAWDEX)--Final Report (20)
- 1975 - Support in the implementation of a National Water Data Exchange (NAWDEX)--Final Report (20)
- 1977 - The National Water Data Exchange (8)
- 1978 - NAWDEX: A key to finding water data (11)
- 1979 - Publications related to the National Water Data Exchange (NAWDEX)--1971-79 (15)
- 1981 - Summary of water data indexed by the National Water Data Exchange (21)

Papers Presented at Conferences and Seminars and(or) Published in Other Scientific Journals or Magazines

- 1975 - The National Water Data Exchange--How it will benefit you [Published in proceedings of International Water Resources Association, 1975] (7)
- 1976 - NAWDEX--The National Water Data Exchange [Published in SSIE Science Newsletter and in USGS Water Resources Review] (7)
- 1977 - The National Water Data Exchange (NAWDEX) and its services [Published in Eleventh Biennial Ground Water Conference Proceedings, 1977] (9)
- 1977 - The National Water Data Exchange [Published in EDS--Environmental Data Service magazine, July 1977] (9)
- 1977 - Water data systems and services of the U.S. Geological Survey, in Science Information Exchange in Alaska, 1977 (20)
- 1978 - Identification, indexing, and exchange of data on environmental pollutants, in Fourth Joint Conference on Sensing of Environmental Pollutants, New Orleans, 1978 (21)
- 1979 - NAWDEX--A program to improve access to water data, in Quality Assurance of Environmental Measurements; paper presented at National Conference of Information Transfer, Inc. (10)

- 1980 - The development of computer files for numeric data, in Online '80 National Conference (12)
- 1980 - Water data and information exchange programs of the U.S. Geological Survey, in Conference on Improving Access to Water Information, Cornell University, Ithaca, NY (12)
- 1980 - Water data and services available from participants in the National Water Data Exchange [Published in Water Resources Bulletin] (12)
- 1981 - NAWDEX: Focal point for water data information [Published in ASCE Journal of the Water Resources Planning and Management Division] (13)

Proceedings (or summaries) of NAWDEX Membership Conferences

- 1979 - Proceedings of first NAWDEX membership conference, Denver, Colo., May 9-11, 1978 (15)
- 1980 - Proceedings of second NAWDEX membership conference, New Orleans, La., May 2-4, 1979 (16)
- 1981 - Summary of third NAWDEX membership conference and workshop, Falls Church, Va., Nov. 18-19, 1980 (15)

Program Objectives

- 1977 - Program objectives for the National Water Data Exchange--Fiscal Year 1978 (8)
- 1978 - \_\_\_\_\_ Fiscal Year 1979 (9)
- 1979 - \_\_\_\_\_ Fiscal Year 1980 (10)
- 1980 - \_\_\_\_\_ Fiscal Year 1981 (11)

Program of Operations

- 1977 - Program of operation for the National Water Data Exchange (8)

Publications Related to NAWDEX--Published by the Office of Water Data Coordination (OWDC)

- 1971 - Design characteristics for a national system to store, retrieve, and disseminate water data (14)
- 1975 - Catalog of information on water data--streamflow and stage, quality of surface water, and quality of ground water, 1974 edition [21 volumes] (16)
- 1977 - Catalog of information on water data--Index to stations in coastal areas [4 volumes] (17)
- 1977 - \_\_\_\_\_ National handbook of recommended methods--12 chapters (17)
- 1979 - \_\_\_\_\_ Index to water-data activities in coal provinces of the United States [Vol. I--Eastern Province; Vol. II--Interior Province] (18)
- 1980 - \_\_\_\_\_ Index to water-data activities in coal provinces of the United States [Vol. III--Northern Great Plains and Rocky Mountain Provinces] (18)
- 1980 - \_\_\_\_\_ Index to water-data acquisition [21 volumes by water-resources region] (18)
- 1981 - Interagency Advisory Committee on Water Data, Notes on Sedimentation activities--Calendar year 1980 (19)

Status Reports

- 1976 - Status of the National Water Data Exchange (NAWDEX)--September 1976 (7)
- 1978 - \_\_\_\_\_ September 1977 (10)
- 1979 - \_\_\_\_\_ September 1978 (11)

User Manuals

- 1980 - Instructions for the preparation of data for the Master Water Data Index (13)
- 1980 - Registration of organizations in the Water Data Sources Directory of the National Water Data Exchange (13)
- 1980 - Operational guidelines for Assistance Centers of the National Water Data Exchange (NAWDEX) (14)
- 1981 - National Water Data Exchange (NAWDEX) System 2000 data retrieval manual (22)

## LIST OF REPORTS

Edwards, M. D., 1975, The National Water Data Exchange--How it will benefit you, in International Seminar and Exposition on Water Resources Instrumentation, 1975, Proceedings: Champaign, Ill., International Water Resources Association, v. 2, p. 28-32.

The National Water Data Exchange (NAWDEX) is being established by the U.S. Geological Survey as a coordinating facility to aid in the dissemination of water data. NAWDEX will be managed by a Systems Central located within the U.S. Geological Survey; however, major access to the system will be through a network of local Assistance Centers. Data search assistance, referral, and dissemination services will be provided. A master index of available water data will be maintained by Systems Central and made available to all users of NAWDEX. A directory of identifying sources from which water data may be obtained will also be made available. Whenever possible, interfaces between data bases of participating members will be provided.

Edwards, M. D., 1976, NAWDEX--The National Water Data Exchange: SSIE Science Newsletter, v. 5, no. 8, p. 5, June/July. Smithsonian Science Information Exchange, Washington, D.C. (Also published in the U.S. Geological Survey's Water Resources Review, December 1976, p. 14)

Existing water data are becoming more important in matters related to the appraisal and management of available water resources, pollution surveillance and studies, monitoring of water quality criteria and standards, and the development of energy resources. The National Water Data Exchange (NAWDEX) has been established to help users of water data to locate and acquire needed data. A variety of services are provided by NAWDEX such as: Identification of sources of water data; nationwide indexing of water data; and data search assistance. A central Program Office has been established in the U.S. Geological Survey, and a network of local Assistance Centers has also been established to provide local and convenient access to NAWDEX and its services.

\*Edwards, M. D., 1976, Status of the National Water Data Exchange (NAWDEX)--September 1976: U.S. Geological Survey Open-File Report 76-719, 23 p.

The National Water Data Exchange (NAWDEX) has been established to assist users of water data in the identification, location, and acquisition of needed data. During its first year of operation, a computerized Water Data Sources Directory (WDS) was developed which identifies more than 300 organizations that collect water data, the types of data they collect, and the locations within these organizations from which data may be obtained. Also, a computerized Master Water Data Index (MWDI) was created that currently identifies more than 61,500 sites for which data are available, the location of these sites, the hydrologic disciplines represented by the data, the media in which the data are available, and the organizations collecting the data. Work has also begun on the interfacing of the MWDI with the data files of two NAWDEX members, the Environmental Protection Agency (STORET System) and Texas Natural Resources Information System (TNRIS). NAWDEX is expanding its services and is establishing a nationwide network of local Assistance Centers for local users' access to these services.

\*Edwards, M. D., 1977, Program objectives for the National Water Data Exchange (NAWDEX) for fiscal year 1978: U.S. Geological Survey Open-File Report 77-791, 8 p.

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.

Edwards, M. D., 1977, Program of operation for the National Water Data Exchange (NAWDEX): U.S. Geological Survey Open-File Report 77-708, 7 p.

The program of operation for the National Water Data Exchange (NAWDEX) is directed at providing guidelines to assure that all member organizations participate equally, that a climate of cooperation and open communication be established among participating members, and that these guidelines also create incentives for member organizations to work together through their designated NAWDEX representatives to improve access to water data, and to improve the technology of water-data handling and the transfer of data between the collector and user communities. Program operations will periodically be critically reviewed and modified, as needed, according to member-organization recommendations, to accurately reflect the evolving needs and missions of the program. Every effort will be made to maintain NAWDEX as a viable and effective program. The topics covered in this report are program coordination, program management and administration, and member participation.

\*Edwards, M. D., 1977, The National Water Data Exchange (NAWDEX): U.S. Geological Survey Open-File Report 77-259, 5 p.

The need for a viable program for the improvement of the transfer of data from collectors to users is acknowledged throughout the water-data community. The National Water Data Exchange (NAWDEX) was established in 1976 in response to this need. The U.S. Geological Survey accepted the lead responsibility for implementing NAWDEX. NAWDEX is centrally managed by a Program Office located within the U.S. Geological Survey's Water Resources Division in Reston, Va. A directory of sources of water data and a nationwide index of available water data are maintained for storage and dissemination of information on available water data. Services are provided through the Program Office and a nationwide network of local Assistance Centers located in 45 States and Puerto Rico.

Edwards, M. D., 1977, The National Water Data Exchange: EDS--Environmental Data Service, July 1977, p. 11-13. [EDS published quarterly by Environmental Data Service, NOAA, Washington, D.C. This article also published in National Climatic Center Newsletter: Asheville, N.C., National Oceanic and Atmospheric Administration, v. 1, no. 3, July 1977.]

Because existing water data are becoming more important in matters related to the appraisal and management of available water resources, pollution surveillance and studies, monitoring of water quality criteria and standards, and the development of energy resources, the National Water Data Exchange (NAWDEX) has been established to help users of water data to locate and acquire needed data. Membership in NAWDEX includes representation from the Federal, State, academic, and private sectors of the water-data community. Through its two computerized data bases, the Water Data Sources Directory and the Master Water Data Index, plus other indexes and reference sources made available by its members, NAWDEX assists its users in locating data of special interest.

Edwards, M. D., 1977, The National Water Data Exchange (NAWDEX) and its services, in Eleventh Biennial Ground Water Conference, Fresno, Calif., September 15-16, 1977, Proceedings: University of California Water Resources Center and State of California Department of Water Resources, p. 126-132.

The National Water Data Exchange (NAWDEX) was established in 1976 to assist users of water data to identify, locate, and acquire needed data. Services are provided through a National Program Office and a nationwide network of 53 local Assistance Centers located in 45 States and Puerto Rico. A directory of sources of water data and a nationwide index of available water data are maintained to assist in providing these services. Large amounts of water data and water-related data are available through organizations that participate as members of the program.

\*Edwards, M. D., 1978, Program objectives for the National Water Data Exchange (NAWDEX) for fiscal year 1979: U.S. Geological Survey Open-File Report 78-975, 7 p.

This report describes proposed program objectives for the National Water Data Exchange for fiscal year 1979. These objectives include increasing NAWDEX membership; improvement of communication within the areas of program administration, management, and coordination; expansion of NAWDEX services; emphasizing the identification of sources of water data; expansion of water data indexing; improved program and systems documentation; development of recommended methods for the handling and exchange of water data; increased training; and providing technical assistance to NAWDEX members, to the extent possible. Many of the program objectives reflect recommendations made at the first NAWDEX membership conference held in Denver, Colorado, May 9-11, 1978.

\*Edwards, M. D., 1978, Status of the National Water Data Exchange (NAWDEX)--September 1977: U.S. Geological Survey Open-File Report 78-154, 26 p.

Major progress in the implementation of the National Water Data Exchange (NAWDEX) took place during fiscal year 1977 (October 1, 1976 through September 30, 1977). This report describes the status of the program at the end of this period. Program advancement is reported in the areas of administration, membership, local Assistance Center facilities, development of the Water Data Sources Directory and the Master Water Data Index data bases, development of systems related to these data bases, and the coordination of services available through member organizations.

Edwards, M. D., 1979, NAWDEX--A program to improve access to water data, in Quality Assurance of Environmental Measurements; National Conference sponsored by Hazardous Materials Control Research Institute of Information Transfer, Inc., November 27-29, 1978, Denver, Colo.: Silver Spring, Md., Information Transfer, Inc., p. 102-107.

The National Water Data Exchange (NAWDEX), implemented by the U.S. Geological Survey in January 1976, serves as a central focal point for the identification, location, and acquisition of large volumes of water data available from many organizations. NAWDEX is comprised of member organizations from all sectors of the water-data community including Federal, State, local governmental, interstate, academic, private, and foreign organizations. Membership is voluntary and open to any water-oriented organization that wishes to participate. The NAWDEX program is centrally managed by a Program Office located within the U.S. Geological Survey's Water Resources Division in Reston, Va. NAWDEX maintains two computerized data bases, the Water Data Sources Directory (WDSD) and the Master Water Data Index (MWDI). The WDSD identifies organizations that have water-data holdings, the locations within these organizations from which water data may be obtained, and the types of water data available. The MWDI identifies sites for which water data are available, their geographic location, the collecting organization, the types of data available, and the media in which the data are available. NAWDEX services are available to everyone. Requests may be directed by letter, telephone, or personal visit, to the Program Office in Reston, Va., or to any of its Assistance Centers located throughout the United States and Puerto Rico.

\*Edwards, M. D., 1979, Program objectives for the National Water Data Exchange (NAWDEX) for fiscal year 1980: U.S. Geological Survey Open-File Report 80-11, 6 p.

This report describes the proposed program objectives of the National Water Data Exchange (NAWDEX) for fiscal year 1980. These include NAWDEX program administration, NAWDEX services, water-data indexing activities, systems development, training, and the development of recommended methods for the handling and exchange of water data.

Edwards, M. D. 1979, Status of the National Water Data Exchange (NAWDEX)--  
September 1978: U.S. Geological Survey Open-File Report 79-330, 11 p.

This report describes the activities of NAWDEX during fiscal year 1978 (October 1, 1977 to September 30, 1978), and the status of the program at the end of that period. The NAWDEX program continued to show significant growth during fiscal year 1978. Thirty-six new organizations became members of NAWDEX, a 43 percent increase in membership. Topics discussed include program administration; NAWDEX services; identification of sources of water data; indexing of water data; and the development of systems to be used with the NAWDEX data bases, the Master Water Data Index (MWDI) and the Water Data Sources Directory (WDSI).

Edwards, M. D., 1980, Directory of Assistance Centers of the National Water Data Exchange (NAWDEX): U.S. Geological Survey Open-File Report 80-1193, 10 p. [Supersedes USGS Open-File Reports 76-880, 78-162 and 79-423 of the same title.]

The National Water Data Exchange (NAWDEX) is a nationwide program, managed by the U.S. Geological Survey, to assist users of water data or water-related data in identifying, locating, and acquiring needed data. NAWDEX services are available through a Program Office located at the U.S. Geological Survey's National Center in Reston, Va., and a nationwide network of Assistance Centers established in 45 States and Puerto Rico to provide local and convenient access to NAWDEX facilities. This directory provides the names of organizations and persons to contact, addresses, telephone numbers, and office hours for each of these locations.

Edwards, M. D., 1980, NAWDEX: A key to finding water data: U.S. Geological Survey, National Water Data Exchange pamphlet, 15 p.

A pamphlet, printed by the U.S. Government Printing Office, describes the National Water Data Exchange (NAWDEX) and its services. Details are given on the organization of NAWDEX, membership requirements, local Assistance Center network, types of NAWDEX services and how to obtain them, and charges for NAWDEX services.

Edwards, M. D., 1980, Program objectives for the National Water Data Exchange (NAWDEX) for fiscal year 1981: U.S. Geological Survey Open-File Report 80-1047, 8 p.

The proposed program objectives of the National Water Data Exchange (NAWDEX) are described in this report. Included are program administration, services, water-data indexing activities, systems development, training, and the development of recommended methods for the handling and exchange of water data.

Edwards, M. D., 1980, The development of computer files for numeric data, in Online '80 National Conference, San Francisco, Calif., November 1980, Proceedings: Online, Incorporated.

Computerized numeric data files are used throughout the data community for highly diversified applications and in a wide array of formats and structures. This paper discusses many of the basic concepts and procedures used in the development of numeric files. These include the characteristics of numeric files, design considerations, numeric data attributes, record design, file structures, data archiving, file integrity, and file output.

Edwards, M. D., 1980, Water data and information exchange programs of the U.S. Geological Survey, in Conference on Improving Access to Water Information, April 23-25, 1980, Cornell University Center for Environmental Research, Ithaca, N.Y., Proceedings: Center for Environmental Research, Cornell University, 12 p.

The Water Resources Division of the U.S. Geological Survey has the overall mission of providing the hydrologic information and understanding needed for the best use and management of the Nation's water resources for the benefit of the people of the United States. In response to this mission, the Division annually collects, on a systematic basis, data needed for the determination and evaluation of the quantity, quality, and use of the Nation's water resources. It collects these data in cooperation with several hundred State and local governments and other Federal agencies located nationwide. This paper discusses the systems and services available within the Geological Survey for the storage, retrieval and dissemination of its available data.

Edwards, M. D., 1980, Water data and services available from participants in the National Water Data Exchange: Water Resources Bulletin, v. 16, no. 1, paper no. 79112.

The National Water Data Exchange (NAWDEX) was implemented in January 1976 as an interagency program managed and coordinated by the U.S. Geological Survey. The program is directed at improving access to existing water and water-related data. Almost 150 organizations from the Federal, State-governmental, interstate, academic, private, and foreign sectors currently participate in the program. This article describes the NAWDEX program and contains descriptions of the types of data and services available from organizations participating in NAWDEX. A point of contact for obtaining data and services is provided for each organization.

Edwards, M. D., 1981, NAWDEX: Focal point for water data information; paper presented at ASCE convention and exposition held at Portland, Oreg., April 14-18, 1980: Journal of the Water Resources Planning and Management Division, Proceedings of the American Society of Civil Engineers, v. 107, no. WR1, p. 77-83.

Water data are collected and used today by hundreds of organizations involved in diverse missions. Identifying the appropriate organizations and obtaining needed data from them has often been a frustrating and time-consuming process. Valuable data are often not utilized because it is not known that they exist; needed data are frequently difficult to obtain within needed timeframes; and considerable time can be wasted obtaining duplicate data from multiple sources. The National Water Data Exchange (NAWDEX) was established by the United States Geological Survey in 1976 to serve as a national program for cataloging and indexing water data that are available throughout the nation and to improve access to these data. This paper describes the services available through the program and how the program can be used as a focal point for acquiring information on data available from a large number of organizations.

Edwards, M. D., and Knecht, W. A., 1980, Instructions for the preparation of data for the Master Water Data Index: U.S. Geological Survey Open-File Report 80-415, 140 p.

The Master Water Data Index (MWDI) of the U.S. Geological Survey's National Water Data Exchange (NAWDEX) is a computerized data base which contains information about water data collected at specific sites. This manual contains instructions for the encoding of new information for entry into the MWDI, the changing or deletion of information previously stored in the data base, and the keypunching of information encoded for entry into the data base. The manual is divided into five sections to simplify its use. It also contains a set of appendixes containing codes and other information necessary to encode information for entry into the MWDI.

Edwards, M. D., and Landwehr, J. M., 1980, Registration of organizations in the Water Data Sources Directory of the National Water Data Exchange: U.S. Geological Survey Open-File Report 80-409, 60 p.

Instructions for the registration of organizations in the Water Data Sources Directory of the National Water Data Exchange (NAWDEX) are contained in this manual. The Water Data Sources Directory contains information pertinent to organizations that are collectors and sources of water data, major sources of water data collected by other organizations, major users of water data made available by other organizations, or that are active in programs related to water resources. Detailed instructions are presented for the encoding of forms required for registration of an organization in the Directory.

Edwards, M. D., and Myers, B. M., 1981, Identification codes for organizations listed in computerized data systems of the U.S. Geological Survey: U.S. Geological Survey Open-File Report 81-904, 102 p. [Supersedes USGS Open-File Reports 76-855, 78-398, 79-331 and 80-555 of the same title.]

Codes for the identification of public and private organizations listed in computerized data systems are contained in this report. These codes are used by the U.S. Geological Survey's National Water Data Exchange (NAWDEX), the National Water Data Storage and Retrieval System (WATSTORE), the Office of Water Data Coordination (OWDC), and the National Cartographic Information Center (NCIC). The format structure of the codes is discussed and instructions are given for requesting new codes.

Edwards, M. D. and Thompson, G. L., 1980, Operational guidelines for Assistance Centers of the National Water Data Exchange (NAWDEX): U.S. Geological Survey Open-File Report 80-1196, 86 p.

Guidelines are given for the operation of the various functions of NAWDEX. Emphasis is placed on communication between participants and the expeditious flow of water data from holder to user. These guidelines will be modified and supplemented, as needed, to accommodate new concepts and techniques that may be needed.

Federal Advisory Committee on Water Data, 1971, Design characteristics for a national system to store, retrieve and disseminate water data: U.S. Geological Survey, Office of Water Data Coordination, 31 p. (This report, prepared by the Federal Interagency Water Data Handling Work Group, is available from the U.S. Geological Survey, Office of Water Data Coordination, MS 417, National Center, Reston, VA 22092.)

This report, prepared by the Data Handling Work Group and endorsed by the Federal Advisory Committee on Water Data, presents the recommendations for the design characteristics of a national system that will facilitate the exchange of water data between collector and user organizations. It is recommended that such a system be known as the National Water Data Exchange (NAWDEX) and that it should be under the administrative direction of the U.S. Geological Survey's Office of Water Data Coordination. When fully operational, the degree of activity may justify the creation of a separate office to provide for the coordination of data-handling activities.

Knecht, W. A., and Edwards, M. D., 1980, Definitions of components of the Water Data Sources Directory maintained by the National Water Data Exchange: U.S. Geological Survey Open-File Report 79-1541, 106 p. [This report supersedes USGS Open-File Report 77-775 of the same title.]

The Water Data Sources Directory (WDSD) is a computerized data base developed and maintained by the National Water Data Exchange (NAWDEX) Program Office which contains information about organizations that collect, store, and disseminate water data. This includes: the type of each organization; the major orientation of water-data activities conducted by each organization; the names, addresses, and telephone numbers of offices within each organization from which water data may be obtained; the types of data held

by each organization and the geographic locations within which these data have been collected; and alternate sources of an organization's data. This document contains a definition and description of each component of the WSDS data base. For simplicity, it is referred to as a data dictionary. It is intended, primarily, to assist those persons using the WSDS in understanding and clarifying information obtained from the data base. The WSDS is designed to be used independently, or in conjunction with, the Master Water Data Index (MWDI), which is also a computerized data base developed and maintained by the NAWDEX Program Office. The MWDI contains detailed information about sites at which water data are collected.

Myers, B. M., compiler, 1979, Publications related to the National Water Data Exchange (NAWDEX)--1971-79: U.S. Geological Survey Open-File Report 79-1299, 16 p.

This publication contains an alphabetical listing, by author, of the reports that have been produced by the NAWDEX Program Office since 1975, as well as reports from other sources that relate to the development of the NAWDEX program.

Myers, B.M., and Blackwell, C.D., compilers, 1981, Summary of third membership conference and workshop of the National Water Data Exchange, November 18-19, 1980, Falls Church, Virginia: U.S. Geological Survey Open-File Report 81-1122, 41 p.

The National Water Data Exchange (NAWDEX) held its third membership conference in Falls Church, Va., November 18-19, 1980. Forty-seven people attended; 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 in Canada. The membership conference was held to improve communication among the members and to give NAWDEX members a chance to participate in the planning and policymaking activities of NAWDEX. Three workshops were convened and dealt with the topics of program administration, NAWDEX user services, and systems development and water indexing. Summaries of the papers presented and the recommendations of the workshops are included in the conference summary.

Myers, B. M., and Nokes, J. M., compilers, 1979, Proceedings of the first membership conference of the National Water Data Exchange, May 9-11, 1978, Denver, Colorado: U.S. Geological Survey Open-File Report 79-206, 217 p.

The National Water Data Exchange (NAWDEX) held its first membership conference May 9-11, 1978, in Denver, Colo. The purpose of the conference was to acquaint participants in the NAWDEX program with systems, data resources, and services available throughout the membership, and to serve as a forum for the exchange of ideas and expertise on matters relating to improving the operation of NAWDEX and identifying the needs of the water-data community. Eighty-four participants were registered at the conference. Sixteen papers were presented at the conference and are published in their entirety in the proceedings. Also included are the reports and conclusions of the four working panels dealing with the following subjects: (1) program administration, management, and coordination; (2) recommended standards for

the handling and exchange of water data; (3) water data indexing and technical systems development; and (4) request, response, and service activities. A copy of the conference agenda and a list of attendees are included in the appendixes.

Myers, B. M., and Nokes, J. M., compilers, 1980, Proceedings of the second membership conference of the National Water Data Exchange, May 2-4, 1979, New Orleans, Louisiana: U.S. Geological Survey Open-File Report 80-966, 70 p.

The National Water Data Exchange (NAWDEX), a national confederation of water-oriented organizations working together to improve access to water data, held its second membership conference in New Orleans, La., on May 2-4, 1979. The purpose of the conference was to acquaint new members with the systems, resources, and services available within the program. It also served as a means of establishing and improving personal relationships within the membership, as a forum for the exchange of ideas on matters pertaining to improving the operation of NAWDEX, and identifying the needs of the water-resources community. Thirty-nine participants, representing 20 organizations, were registered at the conference. Three working panels were convened at the conference, each dealing with a specific subject as follows: (1) Program Administration, Management and Coordination; (2) Water Data Indexing and Technical Systems Development; and (3) NAWDEX Services and Assistance Center Activities. The reports and conclusions of these panels were presented orally on the last day of the conference and are included in the proceedings.

Nokes, J. M., and Blackwell, C. D., 1981, Directory of member organizations of the National Water Data Exchange (NAWDEX): U.S. Geological Survey Open-File Report 81-497, 54 p. (Supersedes USGS Open-File Reports 78-872, 79-1075, and 80-556 of the same title.)

This directory provides the names, addresses, telephone numbers and designated representatives of all organizations who are members of the National Water Data Exchange (NAWDEX). NAWDEX is a national confederation consisting of member organizations from all sectors of the water-data community including Federal, State, local governmental, academic, interstate, and private organizations. Foreign organizations are also invited to become affiliated with the program.

\*Office of Water Data Coordination, 1975, Catalog of information on water data, 1974 edition [21 volumes]: U.S. Geological Survey, Office of Water Data Coordination.

The Catalog of Information on Water Data contains information about water-data-acquisition activities, supplemented by station-location maps. It is a catalog of information about water-data-acquisition activities and not a file of the actual water data which must be obtained from the reporting agencies. Agencies that reported water data activities listed in this report and their identifying agency codes are shown in table 1. Federal, State, and local agencies, and private organizations that acquire water data directly in the field and laboratory have contributed. The catalog is published in 21

volumes, and each volume is divided into three parts: A - streamflow and stage; B - quality of surface water; and C - quality of ground water. Each volume covers a water-resources region as established by the Water Resources Council in July 1970.

\*Office of Water Data Coordination, 1977, Catalog of information on water data-- Index to coastal areas [4 volumes]: U.S. Geological Survey, Office of Water Data Coordination.

This special report provides information about water data stations located in the coastal areas. Four separate volumes present the information, respectively, for the Atlantic Coast (including Puerto Rico), and the Gulf Coast, the Pacific Coast (including Alaska, Hawaii, and other Pacific Islands), and the Great Lakes. This information should be useful both in planning for additional data needs and in planning for the best use of coastal resources. Each volume consists of three parts containing information about stations in a particular category, as follows: Part A - Streamflow and stage; Part B - Quality of surface water; and Part C - Quality of ground water.

Office of Water Data Coordination, 1977, National Handbook of recommended methods--12 chapters: U.S. Geological Survey. [Chapter 1--Surface water, 2--ground water, 3--sediment, 5--chemical quality, 7--basin characteristics, 9--snow and ice, and 10--hydrometeorological, have been completed. Chapters 4--biology and microbiology, 6--soil water, 8--evaporation and transpiration, 11--water use data, and 12--data handling are in preparation.]

The "National Handbook" presents the water-data acquisition methods recommended by a large sector of major U.S. water-data collectors and users. This continuously updated handbook includes field, laboratory, and office methods for acquiring and handling data related to the quantity and quality of water underground, and in streams, lakes, reservoirs, estuaries, and the atmosphere. Methods of acquiring data related to fluvial sediment, soil water, drainage-basin characteristics, evaporation and transpiration, and snow and ice are presented also. The handbook consists of an introduction, 12 technical chapters, and an appendix. The development of this handbook was coordinated by the U.S. Geological Survey's Office of Water Data Coordination and resulted from two circulars (A-62 and A-67) issued by the Office of Management and Budget in 1963 and 1964, respectively, which prescribed policies and procedures for coordination of Federal meteorological services and which prescribed guidelines for coordinating Federal activities related to acquiring hydrologic data. The purpose of the "handbook" is to assure greater comparability, compatibility, and usability of water data by documenting the methodologies that collectors and users of hydrologic data agree are most suitable.

Office of Water Data Coordination, 1979, Catalog of information on water data--  
Index to water-data activities in coal provinces of the United States  
(Vol. I - Eastern Province; Vol. II - Interior Province): U.S. Geological  
Survey.

As a part of the U.S. Geological Survey's program to implement Circular A-67 of the U.S. Office of Management and Budget, the Office of Water Data Coordination has prepared an index to water-data activities in coal provinces of the United States. The purpose of the special index is to assist those involved in developing, managing, and regulating the Nation's coal resources by providing information on the availability of water-resources data in the major coal provinces of the United States. The information presented will aid in obtaining data for evaluating the effects of coal mining on water resources and in developing plans for meeting additional water-data needs. The listings in each volume are arranged according to four principal data categories. These categories are streamflow and stage (Part A), quality of surface water (Part B), quality of ground water (Part C), and areal investigations and miscellaneous activities (Part D). The index is published by province, of which there are five.

Office of Water Data Coordination, 1980, Catalog of information on water data--  
Index to water-data activities in coal provinces of the United States [Vol.  
III - Northern Great Plains and Rocky Mountain Provinces]: U.S. Geological  
Survey, 3 books.

As a part of the U.S. Geological Survey's program to implement Circular A-67 of the U.S. Office of Management and Budget, the Office of Water Data Coordination has prepared an index to water-data activities in coal provinces of the United States. The purpose of the special index is to assist those involved in developing, managing, and regulating the Nation's coal resources by providing information on the availability of water-resources data in the major coal provinces of the United States. The information presented will aid in obtaining data for evaluating the effects of coal mining on water resources and in developing plans for meeting additional water-data needs. The listings in each volume are arranged according to four principal data categories. These categories are streamflow and stage (Part A), quality of surface water (Part B), quality of ground water (Part C), and areal investigations and miscellaneous activities (Part D). The index is published by province, of which there are five.

\*Office of Water Data Coordination, 1980, Index to water-data acquisition--  
A 21 volume index to the catalog of information on water data: U.S.  
Geological Survey, Office of Water Data Coordination. (Each volume corre-  
sponds to one of the water resources regions of the United States.)

The Catalog of Information on Water Data is a computerized file of information about water-data acquisition activities in the United States and its possessions, as well as some activities in Canada and Mexico. The catalog does not contain the data but provides information on where and by whom data are being collected, the types of data acquired, and how these data can be obtained. The index presents selected information from the Catalog.

The listings are for all active stations in the Catalog as of December 1978, and those stations discontinued since 1974. The listings in each volume of the index are arranged according to four principal data categories. These categories are streamflow and stage (Part A), quality of surface waters (Part B), quality of ground waters (Part C), and areal investigations and miscellaneous activities (Part D). The catalog is maintained jointly by the Office of Water Data Coordination and the National Water Data Exchange.

Office of Water Data Coordination, 1981, Interagency Advisory Committee on Water Data, Notes on sedimentation activities--Calendar year 1980: U.S. Geological Survey, 284 p.

This report, prepared by the U.S. Department of Agriculture for the Interagency Advisory Committee on Water Data, is a digest of information furnished by Federal agencies conducting sedimentation investigations on work in progress or planned, important findings, new methods, new publications, laboratory and other research activities, and other pertinent information. The material has been organized by major drainage regions in the conterminous United States, Alaska, Hawaii, Puerto Rico, and in foreign areas. There is also a section on research and other activities. In the past, each issue of "Notes on Sedimentation Activities" contained a list of stations at which sediment data have been obtained, giving the station location, drainage area, and other related information. This list of stations is prepared by the National Water Data Exchange (NAWDEX) from its Master Water Data Index. Because the station list does not change significantly from year to year, it was decided to include the listing every other year in the interest of economizing. Therefore, the station list in the 1979 issue is considered to be still current. A new, updated station listing will be included in the 1981 calendar year issue.

Perry, R. A., and Williams, O. O., 1982, Definitions of components of the Master Water Data Index maintained by the National Water Data Exchange: U.S. Geological Survey Open-File Report 82-327, 275 p. [Supersedes USGS Open-File Report 78-183.]

The Master Water Data Index (MWDI) is a computerized data base, developed and maintained by the National Water Data Exchange (NAWDEX) Program Office, which contains information about water-data collection sites of NAWDEX members and participants. It contains information on the identification and location of sites for which water data are available, the type of data-collection site, the organizations collecting data at each site, the current status of each site, the types of data available, the period of time for which data are available, the major water-data parameters for which data are available, the frequency at which these parameters are measured, and the media in which the data are available. This document contains a definition and description of each component of the MWDI data base. For simplicity, it is referred to as a data dictionary. It is intended, primarily, to assist those persons using the MWDI in understanding and clarifying information obtained from the data base. The MWDI is designed to be used independently or in conjunction with the Water Data Sources Directory (WDS), which is also a computerized data base developed and maintained by the NAWDEX Program Office. It contains information about organizations that are sources of water data.

\*PRC Systems Sciences Company, 1974, Support in the overall design development of a National Water Data Exchange (NAWDEX) -- Final Report: McLean, Va., PRC Systems Sciences Company Contract Report R-1696, 165 p. [Final report for period January-December 1973, prepared under the U.S. Geological Survey contract 14-08-0001-13499.]

A system design for NAWDEX was prepared based on previous efforts of the U.S. Geological Survey, internal expertise in water-data systems, and the results of a national survey of the water-data community. The NAWDEX design includes an organizational structure featuring a Systems Central with overall management responsibility for linking together participants from throughout the water data community. Systems Central will provide an index to water data and certain limited data services with the bulk of the actual data exchange being effected by member agencies.

\*PRC Systems Sciences Company, 1975, Support in the implementation of a National Water Data Exchange (NAWDEX) -- Final Report, June 1974-May 1975): McLean, Va., PRC Systems Sciences Company Contract Report 1824. (Report prepared under contract 14-08-0001-1401 with the U.S. Geological Survey.)

This document is the final report of a study to support the U.S. Geological Survey in the implementation of a National Water Data Exchange (NAWDEX). The report is divided into three sections: Participation in NAWDEX; water data exchange (which presents the details of the Master Water Data Index (MWDI) and the Water Data Sources Directory (WDSO); and preliminary directory to allied water data.

Showen, C. R., and Edwards, M. D., 1977, Water-data systems and services of the U.S. Geological Survey, in Science Information Exchange in Alaska, Volume 1- Research Design and Data Management, Technical Session Papers of the 28th Alaska Science Conference, September 22-24, 1977, Anchorage: Alaska Division of American Association of the Advancement of Science and the Arctic Environmental Information and Data Center, University of Alaska, p. 23-32.

The U.S. Geological Survey investigates the occurrence, quantity, quality, distribution, and movement of the surface and underground waters that comprise the water resources of the United States. As a part of the Geological Survey's program of releasing water data to the public, a large-scale computerized system, the National Water Data Storage and Retrieval System (WATSTORE), was developed to provide more effective and efficient management of data-releasing activities. The WATSTORE system provides for the processing, storage, and retrieval of water data pertaining to surface water, quality of water and ground water.

Existing water data are becoming more important in matters related to the appraisal and management of available water resources, pollution surveillance and studies, monitoring of water quality criteria and standards, and development of energy resources. The National Water Data Exchange (NAWDEX) has been established by the U.S. Geological Survey to assist users of water data in locating and acquiring needed data. NAWDEX is not a large depository of water data. Its objective is to provide the user with sufficient information to define what data are available and where these data may be obtained.

Thompson, G. L., 1978, Identification, indexing, and exchange of data on environmental pollutants, in Fourth Joint Conference on Sensing of Environmental Pollutants, New Orleans, November 6-11, 1977, Proceedings: American Chemical Society Proceedings, Paper 067, p. 238-240.

NAWDEX has amassed a large amount of environmental information on available water data and has access to extensive data resources and services available through its member organizations. Although NAWDEX is responding to environmental data needs primarily within the water-data community, the NAWDEX conceptual design could be expanded and adapted to include other areas of environmental monitoring and data indexing, beyond that of water data. An expanded system design could provide a comprehensive mechanism that would be well suited for the overall accessibility of a wide spectrum of environmental data, and it could provide more effective support for activities related to the monitoring and sensing of environmental pollutants.

U.S. Geological Survey, 1980, Catalog of information on water data--A guide to the Water Data Sources Directory of the National Water Data Exchange: Office of Water Data Coordination and the National Water Data Exchange, U.S. Geological Survey, 38 p.

This report serves as a guide to the Water Data Sources Directory maintained by the National Water Data Exchange (NAWDEX). The Directory is a computerized data base which contains information about organizations that are sources of water data as well as those involved in water-related activities. For each organization, information is provided on the types of data or services provided, locations from which the data or services may be obtained, the media in which the data are available, the areas in which data have been collected, and alternate sources of the organization's data. This guide contains a description of the Water Data Sources Directory, a description of its output, appendixes defining codes used, and instructions for obtaining a copy of the Directory.

U.S. Geological Survey, 1981, Catalog of information on water data--Summary of water data indexed by the National Water Data Exchange: Office of Water Data Coordination and the National Water Data Exchange, 415 p.

This report summarizes the Master Water Data Index (MWDI) of the National Water Data Exchange. The MWDI indexes holdings of water-data organizations in the United States and its territories, Canada, and Mexico. Tables are presented which summarize the types of data indexed, the types of sites from which data are obtained, the major parameters measured, the periods of record for which data have been indexed, and the drainage areas of stream sites. The tables further summarize the data geographically by country, State, county, and hydrologic region; by the number of sites that are currently active or have been discontinued; by source organization; and by the frequency of measurement of the data indexed. Summaries are presented for both surface and ground waters and represent the data indexed for over 400 organizations.

Williams, O. O., and Knecht, W. A., 1981, National Water Data Exchange (NAWDEX) System 2000 data retrieval manual: U.S. Geological Survey Open-File Report 81-419, 196 p.

This manual is designed to teach the reader how to retrieve data stored in a computer by using the System 2000 Data Base Management System. The manual offers general instructions on the use of System 2000 to retrieve any type of data, and specific instructions on how to retrieve data from the U.S. Geological Survey's Water Data Sources Directory (WSDS) and Master Water Data Index (MWDI) data bases. The manual is divided into five major sections plus six appendixes for reference. Section I contains introductory material, including the purpose and scope of the manual, instructions on how to use the manual, basic computer concepts, and basic System 2000 concepts. Section II contains basic instructions on retrieving and displaying data, and section III goes into more complex retrievals. Section IV explains how to make efficient use of techniques developed in sections II and III. Section V summarizes and discusses practical applications, and section VI contains all the appendixes required for reference.

### Preliminary Documents:

The following manuals were prepared as preliminary drafts for review. They are in the process of revision and will be published as open-file reports as they are completed.

Gillingham, G. G., 1978, Guidelines for the use of NAWDEX data systems: Reston, Va., U.S. Geological Survey, 80 p.

This report was prepared in order to identify the NAWDEX (National Water Data Exchange) data systems and their respective documentation. It discusses the operation of the systems, as well as tools that have been developed to enhance or facilitate their use.

Knecht, W. A., and Harding, John, 1977, MWDI retrieval system user's manual: Reston, Va., U.S. Geological Survey, 58 p. [Prepared under contract by CACI, Inc., Reston, Va.].

The Master Water Data Index (MWDI) is a computerized file developed and maintained by the National Water Data Exchange (NAWDEX) which identifies sites for which data are available, the periods of time for which data are available, and the frequency of measurement of each of the major parameters. The MWDI retrieval system extracts data from the MWDI data base; sorts the extracted records, if requested by the user; and displays the data either as a report or in plotted form.

U.S. Geological Survey, 1977, Instructions for the submission of data to the Master Water Data Index: Reston, Va., U.S. Geological Survey, 28 p.

These instructions are provided for the computerized processing of data prepared for entry into the Master Water Data Index of the Geological Survey's National Water Data Exchange (NAWDEX), as discussed in the manual entitled "Instructions for the Preparation of Data for the Master Water Data Index." Two processing procedures are provided: (1) The preedit of data, and (2) the submission of data for storage in the Master Water Data Index. These instructions include both new data being submitted for storage and update transactions for data previously processed and stored.



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