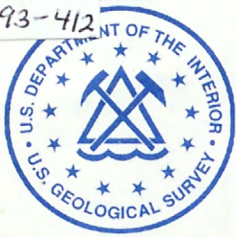


(200)  
R29o  
no. 93-412



# WATER FACT SHEET

U.S. GEOLOGICAL SURVEY, U.S. DEPARTMENT OF THE INTERIOR

## DISTRIBUTED INFORMATION SYSTEM-II

### INTRODUCTION

The U.S. Geological Survey (USGS), the Nation's largest earth-science agency, makes extensive use of computer technology to accomplish its mission. The Water Resources Division (WRD) of the USGS has the principal responsibility within the Federal government for providing hydrologic information and for appraising the Nation's water resources. WRD offices require computer technology for the efficient analysis, interpretation, and management of hydrologic data.

During 1982-88, WRD installed 71 minicomputers in offices across the country to support its mission in the science of hydrology. This computer system, connected by a X.25 based wide-area telecommunications network that allowed information to be shared, was known as the Distributed Information System (DIS).

The DIS-II, implemented beginning in 1991, with a life cycle through 1998, replaces the DIS minicomputer system. Based on advanced workstation/server technology and local-area networks, DIS-II provides a new generation of computer hardware and software and a migration to open-systems technology. In addition, DIS-II has been defined and developed in such a way that all Divisions of the USGS as well as other Bureaus of the U.S. Department of the Interior can procure, use, and interconnect with the system.

### THE DIS-II WORKSTATION/SERVER

Distributed-workstation/server processing is helping to meet the rapidly increasing demand for computing resources. DIS-II workstations/servers are powerful desktop computers with high-resolution graphics monitors and a variety of software and peripheral devices that permit the most advanced tasks to be conducted at the individual workstation.

Each WRD office has its own system of workstations and supporting devices. Most of a user's work is conducted at the workstation; however, information, equipment, and programs can also be shared among all workstations in an office because the workstations are interconnected by an Ethernet local-area network. The DIS-II "system" is configured to meet the needs of each office, from large to small. Identical programs and data are being used on all the DIS-II systems so the staff of one office can develop a program for use in all offices. Office staffs also are able to share data when they are working on problems that are regional or

national in scope. The following hardware and software are a part of the DIS-II system:

<b>Hardware</b>	Data General	AViiON Unix workstations and servers
<b>Software</b>	Ingres	relational data base
	FrameMaker	word processing and electronic report processing
	STATIT	statistics
	Tactician	spreadsheet
	USGS-G2	charting graphics
	ARC/INFO	geographic information system
	CorelDraw	illustration graphics

### COMMUNICATIONS NETWORK

A wide-area Transmission Control Protocol/Internet Protocol (TCP/IP) communications routing-based network connects all offices using DIS-II. Thus, a user of any of the DIS-II systems can connect to any other DIS-II system, move files, or gain access to remote data bases by entering simple commands. The DIS-II communications network shown on the map is based on high performance, TCP/IP routers with speeds of 56 kbps up to T1 (1.5Mbps). Shared-data communication networks are cost effective and enable users at all sites to gain access to the network for electronic mail and sharing of data with universities, research centers, and private organizations.

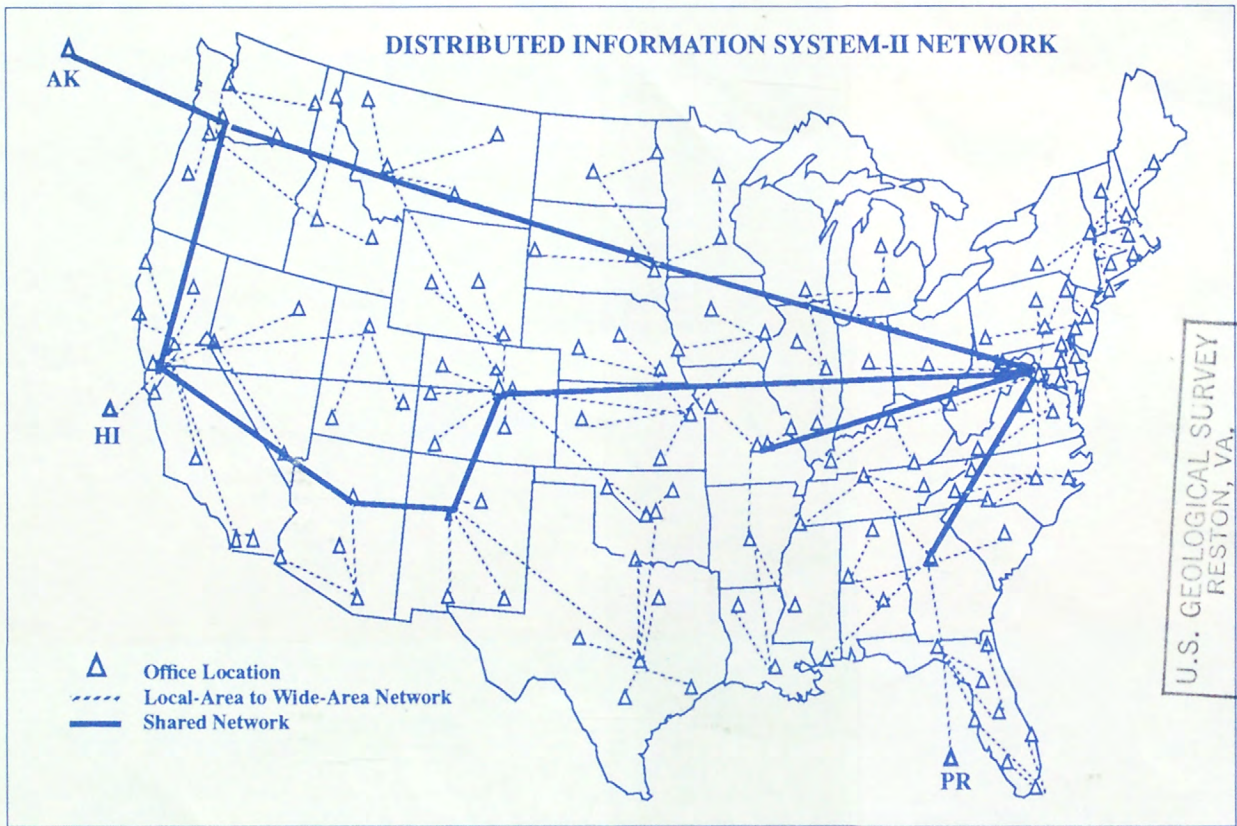
### DIS-II IMPLEMENTATION ACTIVITIES

The contract for DIS-II hardware and software was awarded November 1990 through a competitive process. The WRD began to implement DIS-II in February 1991. The life-cycle of the contract is 7 years with ability to purchase equipment through February 1995. DIS-II system deliveries through July 1993 have been made as follows:

Year	Workstations	Servers
1991	1,007	75
1992	630	11
1993	266	7
<b>Total</b>	<b>1,903</b>	<b>93</b>

The workstation/server approach implemented by WRD has dramatically improved the computing response times for scientists and researchers. Computer window technology offers increased efficiency. Successful implementation of DIS-II has been expedited because of the following:





- Bi-monthly user-group meetings are held to discuss software, hardware and new products; guests from outside organizations attend meetings, and the meetings conclude with question and answer sessions.
- A planning and implementation committee of technical users and management from across the country has been established and meets regularly to determine the direction of DIS-II.
- Extensive training opportunities have been made available to users; courses are taught by vendors and USGS personnel teach in-house courses.
- An on-line help facility supported by a group of DIS-II experts has been developed so a user can ask a question and receive an answer through electronic mail.
- A team of technical experts is available to visit field offices and provide assistance.
- A National Computer Technology Meeting has been held approximately every 2 years since 1984. Training and technical sessions on computer related activities are available to meeting participants.

### COMPUTATIONAL NEEDS MET BY DIS-II

A study of major WRD activities identified 42 functional requirements to be supported by DIS-II details of which are published in USGS Open-File Report 89-274. The requirements were assembled into five groups:

- Data-base management;
- Scientific interpretation and simulation;
- Geographic information systems;
- Administration information processing, and
- Electronic report processing.

Data-base management is a large part of the computational workload of WRD because hydrologic data are collected in all 50 States, Puerto Rico, and the Pacific Islands Trust Territory.

Open-File Report 93-412

Streamflow is measured at about 10,000 locations, water levels are measured in about 31,000 wells, water quality is sampled at over 11,000 locations, and water-use data are collected throughout the Nation. All of these data are stored in computerized data bases that are being modernized concurrently with the implementation of DIS-II.

The scientific interpretation and simulation function is another large part of the computer workload of WRD. Large-scale simulations of hydrologic systems and geographic information systems are used to predict the movement of water and contaminants in surface and ground water and to relate water resources to environmental features.

Geographic information systems (GIS) support spatial data-base management and analyses. The links between GIS, data-base management systems, and simulation systems are powerful tools in the evaluation of water resources and environmental issues.

Administrative information processing, which includes software for cost accounting, payroll, and personnel records, also is being modernized. In addition to these activities, electronic report processing and electronic mail are a significant part of the computer workload.

For more information about DIS-II, contact:

Chief, Distributed Information System Program Office  
 Water Resources Division  
 U.S. Geological Survey  
 445 National Center  
 Reston, Virginia 22092

(703) 648-5616

(The use of brand, company, or trade names in this report is for identification purposes only and does not constitute endorsement by the U.S. Geological Survey.)

G.J. Stiltner, 1993