



WATER FACT SHEET

U.S. GEOLOGICAL SURVEY, 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 appropriate computer technology to meet 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 support for the efficient use and management of hydrologic data.

During 1982-88, WRD installed as many as 71 minicomputers in offices across the country to support its mission in the science of hydrology. These computers are connected by a wide-area telecommunications network that allows information to be shared among the computers in each office. The computers and network together are known as the Distributed Information System (DIS).

The Distributed Information System-II (DIS-II) replaces the DIS minicomputer systems and is being implemented in 1991. On the basis of advanced workstation technology and local area networks, DIS-II provides a new generation of computer hardware and software.

During the transition period (1991-1993) from DIS to DIS-II, the local and wide-area networks will also enable full communications between the DIS minicomputers and the DIS-II workstations. Sophisticated software enables the interconnected workstations to function as a single system. DIS-II has been defined and developed in such a way that all Divisions of the USGS and other Bureaus of the Department of the Interior can procure, use, and interconnect with the technology.

COMPUTATIONAL NEEDS

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

- Data-base management;
- Scientific interpretation and simulation;
- Geographic information systems;

- Electronic report processing; and
- Administrative 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. Streamflow is measured at about 7,000 locations, water levels are measured in about 35,000 wells, water quality is sampled at over 14,000 locations, and water-use data are collected throughout the Nation. All these various types of data are stored in computerized data bases.

The scientific interpretation and simulation function is another large part of the computer workload of WRD. Large-scale simulations of hydraulic systems, aided by the use of statistical analyses, visualization systems, and geographic information systems, are used to predict the movement of water and contaminants, both in surface and ground water, and to evaluate water resources relative 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.

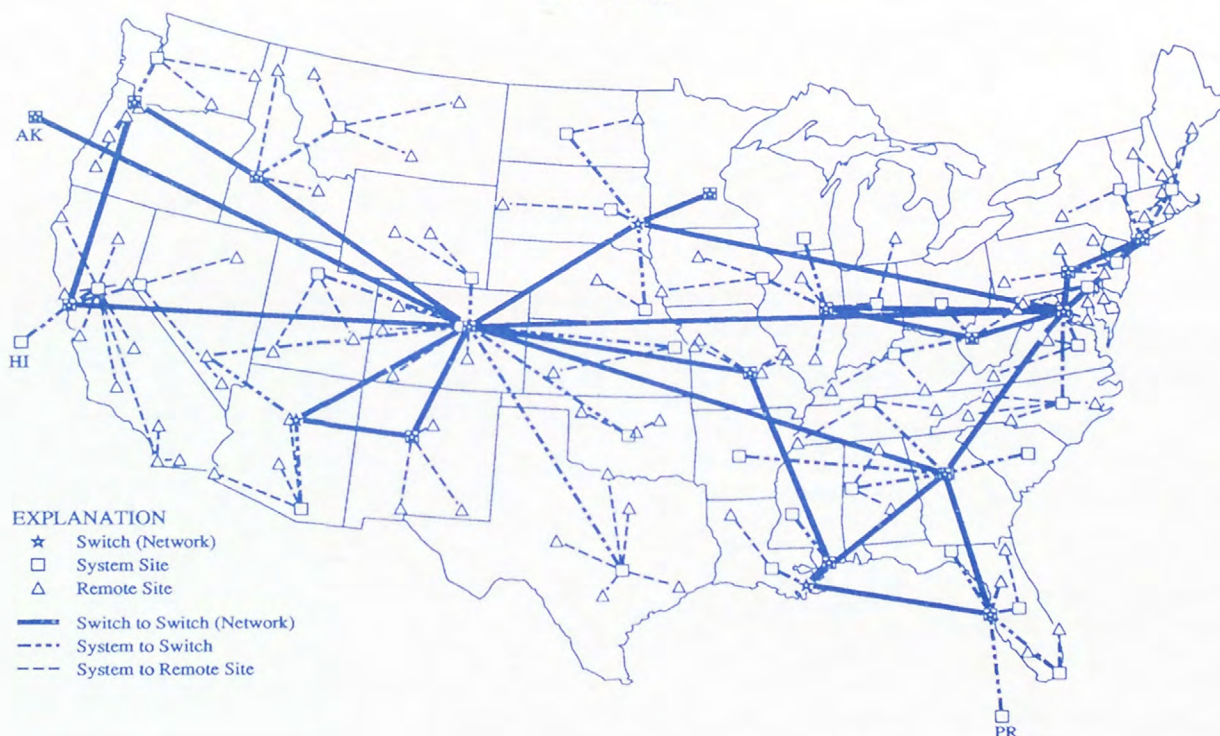
Electronic report processing, electronic mail, and administrative activities, such as cost accounting, payroll, personnel records, and planning for WRD programs, also are a significant part of the computer workload.

THE DIS-II WORKSTATION

DIS-II workstations are powerful desktop computers with high-resolution graphics monitors, a variety of software and peripheral devices that permit the most advanced tasks to be conducted at the individual station. Although much of a user's work can be conducted at his/her workstation, information, equipment, and programs can be shared among all the workstations in an office because the office workstations are interconnected by a local-area network, which is an office-based telecommunications network.

Distributed-workstation processing is helping to meet rapidly increasing demand for computing resources. By

DISTRIBUTED INFORMATION SYSTEM NETWORK



the time DIS-II is completely installed nationwide, each WRD office will have its own collection of DIS-II workstations and supporting devices, which are powerful enough so that most work can be done on site. The DIS-II "systems" can be configured to meet the needs of any office, from large to small. Identical programs and data can be used on all the DIS-II systems, so staff of one office can develop a program for use in all offices. Office staffs also will be able to share data when they are working on problems of regional or national scope.

COMMUNICATIONS NETWORK

The wide-area communications network used for DIS connects all offices using DIS-II. Thus, a user of any of the DIS-II systems can connect to any other DIS-II system by entering a simple command to connect to another system.

The DIS communications network is shown on the map. Many users transmit messages on the same

communications line and a cost-effective network had to be designed. Therefore, distributed switching sites are connected, and each office that has a DIS-II system connects into the nearest switching site. This connection method minimizes the length and number of communications lines and is cost effective.

DIS-II IMPLEMENTATION PLANS

- First systems delivered 1991
- Systems linked to national network 1991
- Training 1991-1992
- DIS-II in all major offices 1991-1993
- System life cycle 1991-1997

For more information about DIS-II, write to:

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