



WATER FACT SHEET

U.S. GEOLOGICAL SURVEY, DEPARTMENT OF THE INTERIOR

FEDERAL-STATE COOPERATIVE WATER RESOURCES PROGRAM: GROUND-WATER ACTIVITIES

INTRODUCTION

The U.S. Geological Survey's (USGS) Federal-State Cooperative Water Resources Program began in 1895. During fiscal year (FY) 1987, hydrologic data collection, studies, and research were conducted as part of this 50:50 cost-sharing program in every State, Puerto Rico, and several U.S. Territories. Cooperating in the program are some 940 local, State, and regional agencies that provide at least half the funds. The USGS provides the remainder and performs most of the work. In FY 1987, in return for \$55 million in Federal funds, cooperating agencies provided \$60 million for a total Cooperative Program expenditure of about \$115 million.

The Cooperative Program provides much of the ground-water information available to the United States, and responds in a timely manner to the increasing demands of agencies at all levels of government that have responsibilities for water resources. Recent changes of emphasis in the program reflect a growing number of requests for scientific and technical assistance in the areas of ground-water quality and the effects of contamination on ground water.

GROUND-WATER DATA COLLECTION

Virtually all of the USGS data collection stations serve several purposes. In addition to serving the needs of the cooperating agencies, the information satisfies requirements of many Federal agencies, the private sector, and the general public as well. Data collected on ground-water availability, distribution, and quality are essential to a wide variety of users. These users are concerned, for example, with water-supply planning, development, and management, storage of solid and liquid waste, the interactions of surface runoff, streamflow, and ground-water recharge and discharge, reclamation of mined land, and extraction of fossil fuels and minerals. From 1983 through 1987, the Cooperative Program supported the collection of data on ground-water levels from between 28,300 and 30,800 public and privately owned wells each year. Water-level data are used to assess changes in ground-water storage that result from natural causes or from human activities. During the same period, selected water-quality constituents were determined annually from samples collected from 5,000 to 8,500 wells. These data are necessary to determine suitability of water for various uses, to identify trends, and to evaluate effects of stresses on aquifers.

GROUND-WATER STUDIES

The Cooperative Program plays a major part in the Survey's coordinated water-resources studies. Key hydrologic concerns and issues for study are determined through discussions with cooperators, with Federal agency officials, by guidance from the Congress and the Department of the Interior, and through awareness of the concerns of the general public. The Nation's ability to cope with new and challenging problems in ground-water development and management rests in large measure on information from investigations made under the Cooperative Program. Historically, ground water was studied almost entirely through this program. For example, underground waste storage and saltwater intrusion were recognized as problems of grave concern in the Cooperative Program long before rising to national attention. As a result, many of the major scientific advances achieved by the pioneers in hydrology were also the direct result of work conducted in this program. Following are selected national ground-water issues and examples of where and when they were first identified as part of the Cooperative Program.

<i>Issue</i>	<i>Where and when identified</i>
Acid mine drainage	Kentucky, 1955 Pennsylvania, 1964
Deep-well waste-water injection	Florida, 1966
Ground-water mining	New Mexico, 1926 Utah, 1950 Colorado, 1960
Hazardous waste disposal	Georgia, 1963
Land subsidence	California, 1940
Oil shale development	Colorado, 1962
Plumes of contaminated ground water	New York, 1949
Radioactive waste disposal	New York, 1961
Saltwater intrusion	New Jersey, 1923 California, 1940 Florida, 1945
Solid waste disposal	Florida, 1970
Streamflow depletion by wells	New Mexico, 1941 Colorado, 1963

GROUND-WATER CONTAMINATION

As early as the late 1890's, the USGS was investigating ground-water contamination problems. Until 10 years ago, most

of these efforts were concentrated in the Federal-State Cooperative Program where it has been recognized that the quality of water supplies for domestic, industrial, and agricultural uses can affect human health as well as the economy. Considerable progress has been made in the identification and solution of complex water problems, but many activities continue to have the potential for degrading the quality of water. Disposal of toxic wastes has made ground water unsafe for use in some places. At an isolated source of contamination, such as an industrial disposal pond, the consequences may be severe in magnitude, but only local in extent. In other places, however, many separate agricultural and industrial activities located over a large area are contributing to widespread ground-water contamination.

The number of water-resources contamination investigations that were conducted in the Cooperative Program from fiscal year 1977 through 1986 is shown in figure 1. Ground-water contamination investigations numbered near 30 annually in fiscal years 1977-82. In FY 1982, the number began to increase, reaching about 85 studies in FY 1986.

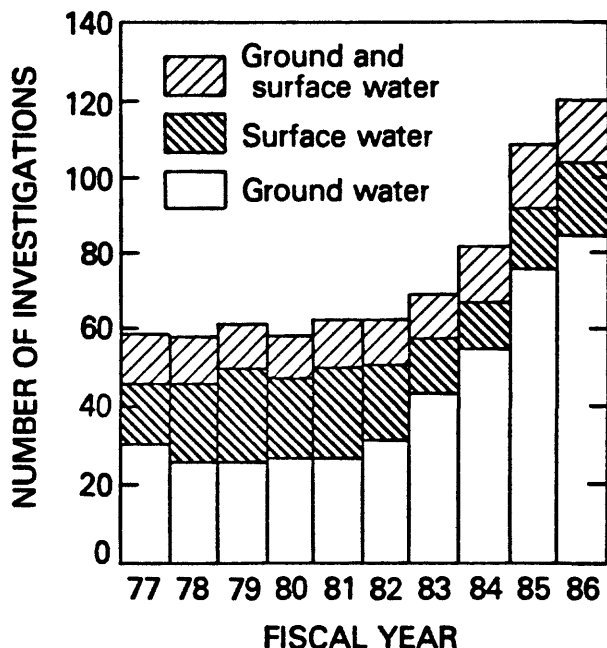


Figure 1. Number of USGS Federal-State Cooperative Program investigations related to water-resources contamination that were ongoing each fiscal year, 1977 through 1986.

Following are a few examples of studies of ground-water contamination that were underway in FY 1987.

- Ground-water contamination, lower Miami Wash and Pinal Creek basins near Globe, Arizona—This study has identified

a plume of contaminated ground water more than 10 miles long and 250 feet thick. The plume is believed to be the result of the intensive copper mining and ore processing in the area during the past 70 years.

- Ground-water contamination vulnerability in South Florida—The objective of this study is to assess the potential for contamination of local aquifers by the use of hydrogeologic data, ground-water flow characteristics, and information on land use and known sources of contamination.
- Pesticides in soil and ground water, Iowa River basin, Iowa—The objectives of this study are to determine the distribution of selected pesticides in the soil, and the movement of pesticides from the land surface to shallow ground water.
- Effects of agricultural best management practices, Patuxent River basin, Maryland—This study is evaluating nutrients in runoff from agricultural areas, and the effects of best management practices on ground-water flow and nitrogen concentrations in ground water.
- Pesticides at North Hollywood dump, Memphis, Tennessee—The objectives of this study are to describe the present extent of contamination at this closed municipal-industrial landfill, and to estimate the potential for the migration of toxic constituents beyond the landfill.
- Highway deicing and ground-water quality in Ohio—This study is evaluating the long-term effects of salt that is used to deice highways on nearby shallow aquifers.
- Radioactivity in ground water, southeastern Pennsylvania—The objectives of this study are to map the extent and magnitude of radium and radon in public water-supply wells and to assist in identifying alternative sources of supply.

Investigations such as these provide fundamental information on the extent and effects of wastes in the water-resources environment, and facilitate the development of plans for remedial actions. They can also serve as the basis for pollution-control and waste-reduction efforts. Investigations that characterize levels of contamination are essential for evaluating the effectiveness of each approach and for compliance monitoring.

For additional information on technical reports and hydrologic data, contact:

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