

THE U.S. GEOLOGICAL SURVEY  
FEDERAL-STATE COOPERATIVE  
WATER-RESOURCES PROGRAM  
FISCAL YEAR 1991

by B.K. Gilbert and W.B. Mann IV



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## CONTENTS

	<u>Page</u>
Abstract .....	1
Introduction .....	2
Functions of the Cooperative Program .....	6
Program priorities .....	8
Investigations in coastal and wetlands environments .....	11
Update on investigations related to water-resources contamination .....	14
Examples of current investigations .....	17
Summary and conclusions .....	22
References cited .....	23
Appendix A: List of cooperators by State, fiscal year 1991 .....	25
Appendix B: List of U.S. Geological Survey water-resources investigations and research in coastal and wetlands environments	
Part 1: Investigations conducted by field offices .....	38
Part 2: Investigations conducted by regional centers .....	51
Appendix C: List of selected U.S. Geological Survey investigations and research related to water-resources contamination	
Part 1: Investigations conducted by field offices .....	52
Part 2: Investigations conducted by regional centers .....	86

### Figures

Figure 1: Map showing U.S. Geological Survey Water Resources Division regional boundaries and location of principal offices .....	3
2: Graph showing actual obligations of the U.S. Geological Survey Water Resources Division, fiscal year 1991 .....	4
3: Funding for and number of U.S. Geological Survey water- resources investigations and research in coastal and wetlands environments, by program, fiscal years 1987-91 .....	12
4: Distribution of U.S. Geological Survey water-resources investigations and research in coastal and wetlands environments, fiscal years 1987-91 .....	13
5: Distribution of U.S. Geological Survey investigations and research during fiscal years 1987-91 related to water-resources contamination .....	15
6: Funding for and number of U.S. Geological Survey investigations related to water-resources contamination, by program, fiscal years 1987-91 .....	16

THE U.S. GEOLOGICAL SURVEY FEDERAL-STATE  
COOPERATIVE WATER-RESOURCES PROGRAM,  
FISCAL YEAR 1991

by Bruce K. Gilbert and William B. Mann IV

ABSTRACT

The Federal-State Cooperative Program is a major U.S. Geological Survey activity for the collection, analysis, and reporting of information on the quantity, quality, and use of the Nation's water resources. The fundamental characteristic of the program is that most of the work is undertaken by the U.S. Geological Survey through joint-funding agreements, with State, regional, and local agencies providing at least one-half the funds. The main objectives of the program are to (1) collect, on a systematic basis, data needed for the continuing determination and evaluation of the quantity, quality, and use of the Nation's water resources; and (2) appraise the availability and the physical, chemical, and biological characteristics of surface and ground water through data analysis and interpretive water-resources investigations and research. During fiscal year 1991, Cooperative Program activities were underway in offices in every State, Puerto Rico, and several territories in concert with more than 1,000 cooperating agencies. In fiscal year 1991, Federal funding of almost \$66 million was matched by cooperating agencies, which also provided more than \$16 million unmatched for a total program of about \$148 million. This amounted to more than 44 percent of the total funds for the Geological Survey's water-resources activities.

This report presents examples of current (1991) investigations, as well as updated information on investigations related to water-resources contamination. Information also is provided with respect to water-resources investigations in coastal and wetlands environments.

## INTRODUCTION

Federal, State, regional, and local agencies share keen interests in appraising the Nation's water resources and in seeking solutions to water-related problems. Because of a variety of missions and areas of responsibility, agencies at times have diverse perceptions of need, priorities, and approaches. One of the principal strengths of the U.S. Geological Survey's Federal-State Cooperative Program is that this diversity can be accommodated through joint planning and funding of hydrologic data collection, investigations, and research.

The Cooperative Program, a partnership between the Geological Survey and State and local agencies, provides a balanced approach to water-resources investigations. It is a major part of the Geological Survey's coordinated program of water-resources investigations and research. The principal program objectives are to (1) collect, on a systematic basis, data needed for the continuing determination and evaluation of the quantity, quality, and use of water resources in the United States; and (2) appraise the availability and the physical, chemical, and biological characteristics of surface and ground water through data analysis and interpretive water-resources investigations and research. The resulting information forms the foundation for many of the Nation's water-resources management and planning activities. In addition, the information can help identify emerging water problems at an early stage.

The Cooperative Program has contributed directly to water-resources knowledge for more than 90 years by fostering a working partnership between the Federal and State governments in the advancement of earth science, and by compiling a major part of the Nation's hydrologic information. From its earliest days, the program has been responsible directly for the development of procedures for streamgaging, concepts of surface-water and ground-water flow, and analytical techniques for and investigations of water quality.

The first Geological Survey cooperative water-resource investigation was with the State of Kansas in 1895. In 1905, Congress appropriated funds specifically for cooperative studies, marking the official beginning of the program. In 1928, Congress gave formal recognition to the Federal-State partnership and limited the Federal financial contribution for cooperative water-resources studies to no more than 50 percent of the total funds for each investigation.

During fiscal year (FY) 1991, hydrologic data collection, interpretive investigations, and research were conducted under the provisions of the Cooperative Program by Geological Survey Water Resources Division personnel in offices in every State, in Puerto Rico, and in several territories in concert with more than 1,000 cooperating agencies (see appendix A). The locations of principal Water Resources Division offices are shown in figure 1. State, county, and municipal agencies participate in the program, as do interstate-compact organizations, State universities, conservation districts, sanitary districts, drainage districts, flood-control districts, and other similar organizations. In FY 1991, Federal funding of almost \$66 million was matched by cooperating agencies, which also provided more than \$16 million unmatched, for a total of about \$148 million. This total constituted more than 44 percent of the total funds for the Geological Survey's program of water-resources activities (figure 2).

The fundamental characteristic of the Federal-State Cooperative Program is that local and State agencies provide at least one-half the funds, but the Geological

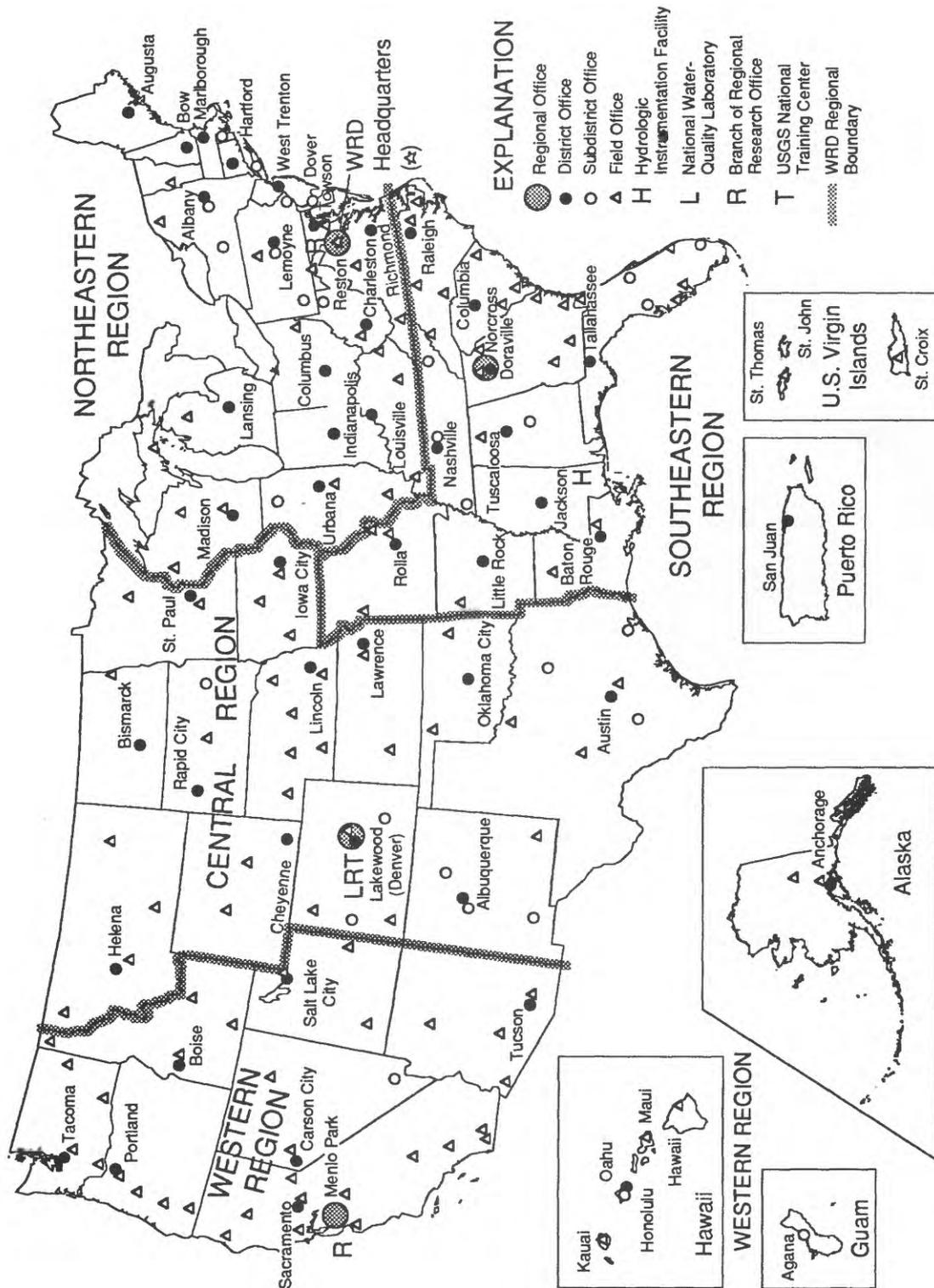


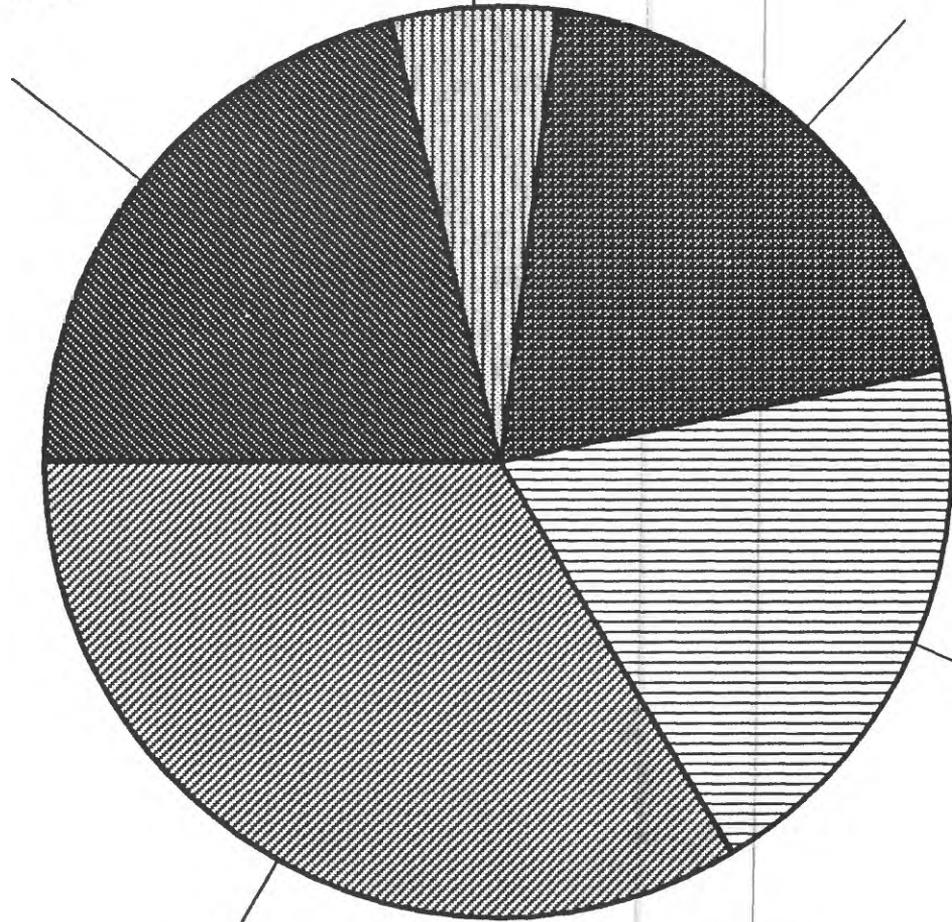
Figure 1.—U.S. Geological Survey Water Resources regional boundaries and location of principal offices.

REIMBURSABLE: OTHER FEDERAL AGENCIES  
\$70.6 million  
21.1 percent

MISCELLANEOUS NON-FEDERAL SOURCES  
(includes \$16.6 million unmatched in the Cooperative Program)  
\$19.6 million  
5.9 percent

STATE SHARE COOPERATIVE FUNDS  
\$65.8 million  
19.7 percent

REIMBURSABLE FROM OTHERS  
\$156.0 MILLION



FEDERAL PROGRAM  
\$112.4 million  
33.6 percent

DIRECT APPROPRIATIONS TO GEOLOGICAL SURVEY  
\$178.2 MILLION

FEDERAL SHARE COOPERATIVE FUNDS  
\$65.8 million  
19.7 percent

FY 1991 TOTAL \$334.2 MILLION

Figure 2 - Actual obligations of the U.S. Geological Survey Water Resources Division, fiscal year 1991

Survey does most of the work. At times, the cooperator's contribution to the program may be partly in the form of support known as direct expenditures, rather than funds. This refers to mutually agreed-upon work or material contributions for which dollar-value credit is given by the Geological Survey for services rendered by the cooperator in support of program objectives.

## FUNCTIONS OF THE COOPERATIVE PROGRAM

In fulfilling its water-resources mission, the Geological Survey performs four principal functions:

- It collects data needed for the continuing determination and evaluation of the quantity, quality, and use of the Nation's water resources.
- It conducts analytical and interpretive appraisals to describe the occurrence, availability, and physical, chemical, and biological characteristics of surface and ground water.
- It conducts research in hydraulics, hydrology, and related scientific and engineering fields.
- It disseminates water data and the results of investigations and research.

The collection of surface-water and ground-water data on a systematic basis under the provisions of the Federal-State Cooperative Program is a major part of the Geological Survey's coordinated water-resources activities. The resulting information provides a continuing record of the quantity, quality, and use of the Nation's water resources. In FY 1991, the Federal-State Cooperative Program served as the sole source of funding for the operation of more than 4,000 continuous streamflow stations and partially funded an additional 900 continuous streamflow stations. These stations constitute more than 60 percent of the continuous streamflow stations operated by the Geological Survey. The program also provided funds for the collection of ground-water levels at approximately 29,000 wells and the collection of water-quality data at about 2,200 surface-water stations and 5,400 ground-water well and spring stations. These data provide information necessary for determination of water suitability for various uses, identification of trends, and evaluation of the effects of stresses on the Nation's surface- and ground-water resources.

During FY 1991, the Geological Survey also was involved in about 550 interpretive and research investigations as part of the Cooperative Program. Interpretive investigations encompass areas that range in size from a square mile or less to multistate regions. In these investigations, Geological Survey scientists bring together information to define, characterize, and evaluate the areal extent, quality, and availability of the water resource. Since the early 1970's, these investigations have emphasized water-quality issues, such as aquifer contamination, river quality, storm runoff, and the effects of acid rain, coal mining, and agricultural chemicals and practices on the hydrologic system.

In 1977, the Congress of the United States recognized the need for uniform, current, and reliable information on water use and directed the Geological Survey to establish a National Water-Use Information Program to complement the Survey's data on the availability and quality of the Nation's water resources. Thus, the National Water-Use Information Program became part of the Geological Survey's Federal-State Cooperative Program (Mann and others, 1982). As of 1991, 50 States and Puerto Rico participate in the program at various levels of involvement.

All data and results of analytical studies are made available to cooperating agencies and to the public through published reports (about 1,600 in FY 1991), and through

computerized information programs, such as the National Water Information System and the National Water Data Exchange (NAWDEX) Program. Abstracts of completed reports are made available through the Geological Survey Water Resources Scientific Information Center (WRSIC). Hydrologic data can be accessed by computer terminals at offices in every State.

In many places, the Cooperative Program provides the only source of support for water-data collection and investigations required to assess, on a continuing basis, the status of the Nation's water resources. Information developed in the Cooperative Program has relevance to potential and emerging long-term problems, such as water supply, waste disposal, energy development, and environmental management and protection. Because common analytical methods and techniques are used, the information also is relevant to problems having interstate, regional, national, or international significance. The information furnishes the basis required to abide by interstate and international compacts and Federal law and court decrees, and to carry out congressionally mandated studies, regional and national water-resources assessments, and planning activities. In addition, the Cooperative Program provides support for most of the streamgaging stations used by the National Weather Service for river forecasts and warnings. Within the Cooperative Program, typically about half of the funds support the collection of hydrologic data; the remaining half support hydrologic studies and investigations.

## PROGRAM PRIORITIES

Program priorities are based on national needs that have been identified by the President and Administration advisors, by the Congress, by the Department of the Interior, by other Federal agencies, and from information the Geological Survey has received from cooperating agencies and other interested parties. Issues that are identified through the National Water Summary (U.S. Geological Survey, 1984, 1985, 1986, 1988, 1990 and 1991) also are taken into consideration. As a result, the priorities are developed in response to mutual Federal, regional, State, and local requirements.

Thus, the Geological Survey and its cooperating agencies work together in a continuing process that leads to adjustments in the program each year. The number of requests for scientific and technical assistance continues to grow from State agencies responsible for ground-water protection and for controlling and mitigating contamination. State offerings typically exceed Federal matching funds by \$10 million or more each year and reflect the increasing emphasis on water-quality issues, as well as other concerns regarding the availability, distribution, and use of the resource.

The strong linkage between the Cooperative Program, the Federal Program, and the Other Federal Agency Program is clearly reflected in the issues identified for FY 1992. The National Water-Quality Assessment (NAWQA) Federal Program, for example, will continue to build on water-quality information developed over many decades within the Cooperative Program. In turn, cooperative interests already are developing because of the new information emerging in the pilot NAWQA Program studies. Data collection supported by the Federal Program and by other Federal agencies provides additional information. Ground-water contamination studies funded by military and civilian Federal agencies are providing valuable hydrologic information and research in basic physical processes. The Geological Survey's National Research Program helps develop and refine hydrologic principles and methods for use in the Federal-State Cooperative Program. These are but a few examples of the interdependence among programs.

The Geological Survey is committed to actively supporting the U.S. Department of Agriculture's work under the President's Water Quality Initiative, which emphasizes nonpoint-source contamination of ground water and surface water relative to agriculture. Therefore, one of the principal overall priorities of the Cooperative Program will be to assist cooperating agencies in obtaining information bearing on this critical issue.

The Geological Survey has long assisted in appraising the water resources of Indian lands as part of the Cooperative Program. The protection and management of the Indian tribes' natural resources are essential elements of the Secretary of the Interior's trust responsibility to the tribes. Priorities in the Cooperative Program will continue to emphasize hydrologic data collection and investigations in this regard.

The following issues have been identified as highest priority in developing the FY 1992 Cooperative Program:

**GROUND-WATER QUALITY**--Concern continues over the vulnerability of the Nation's ground water to waste-disposal activities, nonpoint-source contamination, and saltwater intrusion. Of special concern are contamination sources related to agriculture. Further investigation of natural processes, such as flow dynamics, solute-transport and geochemical reactions, and the effects of subsurface biota that can alter, add, or remove contaminants, is needed in addition to studies of the effects of human activities. In some areas, improved definition of present ground-water quality is needed as a baseline for evaluation of future changes.

**WATER SUPPLY AND DEMAND**--The future health and economic welfare of the Nation's population depend on a continuing supply of uncontaminated fresh water. Increasing withdrawals and diversions of water for an ever-growing variety of users stress the quantity and quality of existing supplies. Recent drought in many areas of the country has accentuated the need to seek additional water supplies and to gather new information. Improved water-use information is needed to quantify the stresses on existing supplies and to refine possible demand-management options to supplement the traditional supply options. Improved flow-system definition and simulation also are needed to manage aquifers that serve as important local or regional sources of water supply.

**STREAM QUALITY**--Assessment of the quality of the Nation's streams continues to be a priority component of the Cooperative Program. Improved information is needed on stream quality and sediment chemistry as related to land use, stream biota, ground-water contributions, and overland runoff. The effects of contamination from agricultural and urbanized areas on stream quality are issues of special national concern. Cooperative investigations supporting the Clean Water Act and the President's Water Quality Initiative are expected to receive priority consideration.

**WETLANDS, LAKES, AND ESTUARIES**--These valuable ecosystems merit special attention because of their importance as fish and wildlife habitat, sources of water supply, and recreational areas. Although these areas are particularly sensitive to the effects of human activities, they continue to be subject to development pressures. An improved understanding of the physical, chemical, and biological processes is needed to manage and protect these valuable resources. Investigations and data collection efforts in support of the national policy regarding no net loss of wetlands and the interagency Coastal America Program are especially encouraged.

**HYDROLOGIC HAZARDS**--Economic losses from floods, lake-level changes, mud and debris flows, erosion and sedimentation, and other hydrologic hazards can amount to billions of dollars annually. Studies are needed to improve understanding of the processes underlying these events and likely magnitudes and effects of hydrologic hazards. Studies involving the use of newly available precipitation data from the National Weather Service Next Generation Radar to improve flood modeling and estimating are encouraged.

**HYDROLOGY OF GLOBAL CLIMATE CHANGE** --The potential effects of global climate change on the Nation's water resources continue to be a major concern. Specific issues of concern include changing ocean and lake levels, fluctuations in water availability, and changes in water quality. Better models of the response of water resources to climatic factors and an improved understanding of components of the

hydrologic cycle are needed for accurate prediction of the effects of global climate change.

**NONPOINT-SOURCE POLLUTION**--Nonpoint-source pollution is the by-product of a variety of factors affecting land use, such as urbanization and cultivation for agriculture. The types and extent of nonpoint-source contamination as well as the effectiveness of potential solutions to contamination are poorly understood. Technical information is needed to conduct effective monitoring programs and to identify effective management practices.

**HYDROLOGIC DATA COLLECTION**--The hydrologic data program of the USGS continues to be the foundation for present and future interpretive studies. Large amounts of data and specialized interpretation are required to resolve conflicts among State and Federal agencies regarding Federal reserved water rights, particularly Indian water rights. The NAWQA Program and other Geological Survey initiatives will rely heavily on past, present, and future data-collection efforts. Enhancement of the hydrologic-data program continues to be a high-priority item for the Cooperative Program.

## INVESTIGATIONS IN COASTAL AND WETLANDS ENVIRONMENTS

The Geological Survey has investigated water resources in coastal and wetlands environments since the time the organization was established. For example, Shaler, in 1885, prepared a "Preliminary Report on Seacoast Swamps of the Eastern United States" and, in 1890, prepared a "General Account of the Fresh-Water Morasses of the United States, With a Description of the Dismal Swamp District of Virginia and North Carolina". A report by Clapp (1909) discusses contamination of wells by sea water on the Maine coast; Veatch (1906) provides information on tide-related fluctuations of water levels in wells near the Long Island, New York shore; and Matson and Sanford (1913) described the relations of freshwater and saltwater underground in South Florida. In 1915, Clark discussed the movement of sea water and tidal fluctuations as they affected ground water in wells near the southern end of San Francisco Bay, California. References to these and other coastal ground-water investigations are included in a report by Brown (1925).

In 1937, the Geological Survey participated in an investigation of the location of the freshwater/saltwater front in the Savannah River near Savannah, Georgia, and, in 1939, participated in a study to define the movement of salt water in the tidal reaches of coastal streams and canals near Miami, Florida (Durum, 1978). Subsequent studies of surface and ground water have continued to improve the understanding of the hydrology of coastal, estuarine, and wetland environments. From fiscal year 1987 through 1991, 229 investigations were in progress at some time, with a total funding of almost \$78 million.

Figure 3 shows the funding by sources of support during fiscal year 1987-91, and figure 4 shows the geographic distribution of the 229 investigations and research underway in this period. These investigations are listed in Appendix B. The most studies were conducted in Florida, 37; followed by California, 17; Hawaii, 15; and New Jersey, 12. The annual number of investigations underway during the period ranged from 110 in 1987 to 121 in 1990. The average cost per investigation in fiscal year 1991 was about \$160,000 in the Federal-State Cooperative Program, about \$200,000 in the Federal Program, and about \$140,000 in the Other Federal Agency Program. The overall average cost for each of the 119 investigations was about \$160,000.

**EXPLANATION**

-  OTHER FEDERAL AGENCY PROGRAM
-  FEDERAL PROGRAM
-  FEDERAL-STATE COOPERATIVE PROGRAM

(25) NUMBER OF INVESTIGATIONS

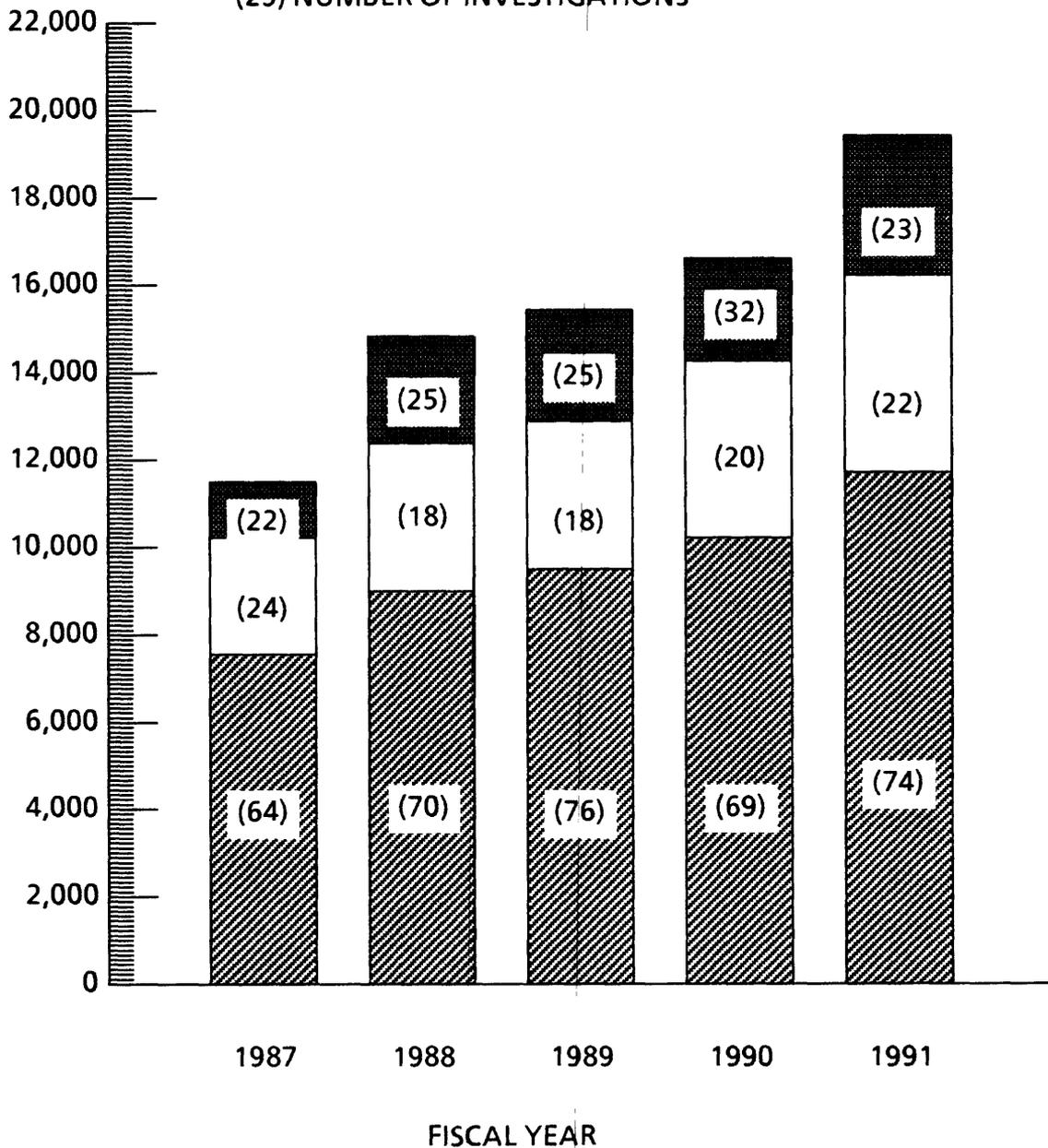


Figure 3 - Funding for and number of U.S. Geological Survey water-resources investigations and research in coastal and wetlands environments, by program, fiscal years 1987-91.

Total number of investigations shown = 214  
 (Not shown are 15 additional investigations conducted by regional centers.)

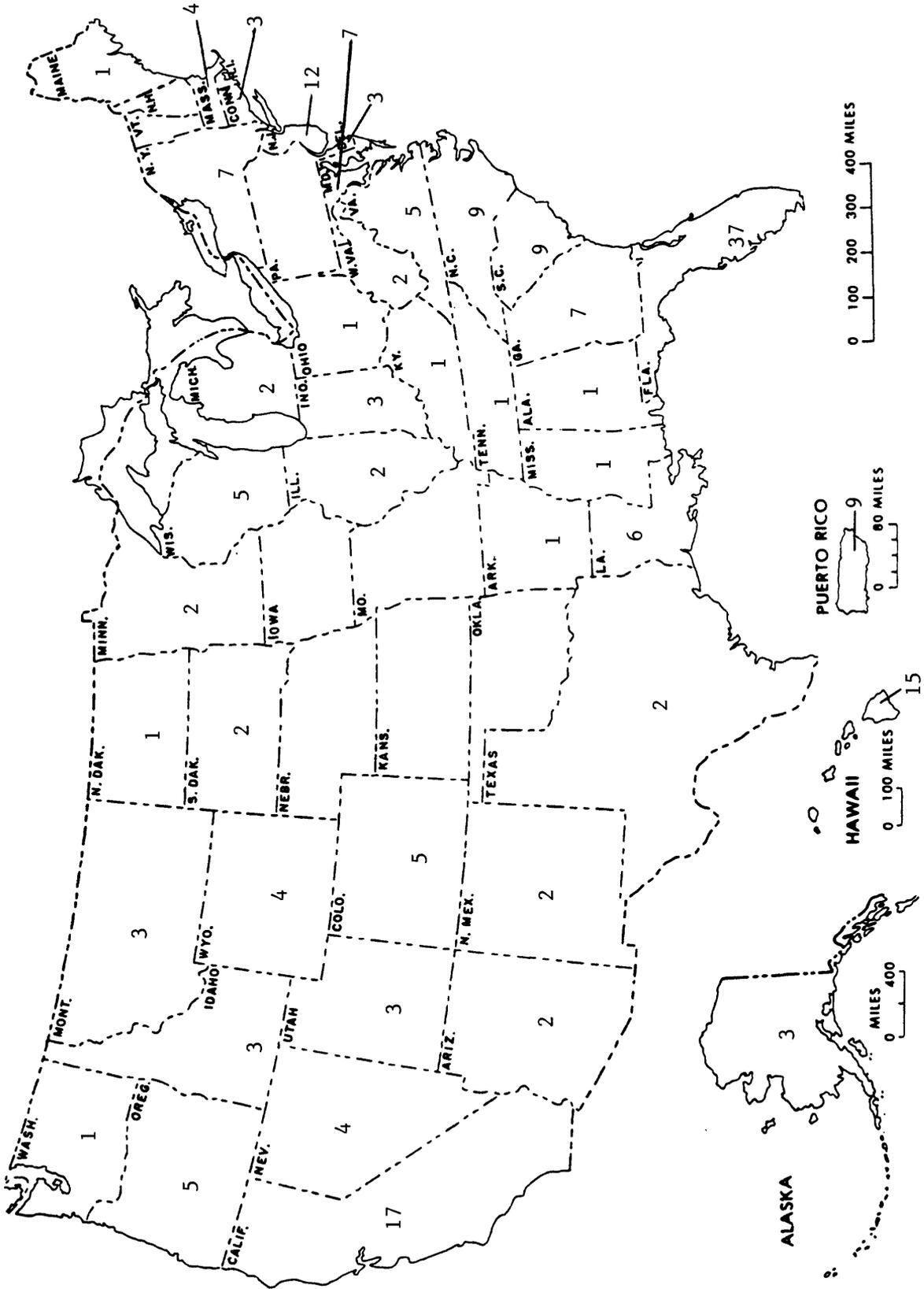


Figure 4--Distribution of U.S. Geological Survey water-resources investigations and research in coastal and wetlands environments, fiscal years 1987-91.

## UPDATE ON INVESTIGATIONS RELATED TO WATER-RESOURCES CONTAMINATION

The Geological Survey had more than 400 investigations related to water-resources contamination in progress at various times during fiscal years 1977-86 (Gilbert and others, 1987); 240 investigations were in progress in 1986. During fiscal years 1987-91 about 590 contamination investigations and research studies were underway; the geographic distribution of these activities is shown in figure 5. The highest number of investigations were conducted in Florida, 37, followed by Pennsylvania, 29; New Jersey, 26; California and New York 23; and Tennessee, 21. The fewest number were Delaware, 2; Maine, 2; Mississippi, 2; and Vermont, 2; and the District of Columbia, 1. The variation in number of investigations does not necessarily reflect the relative incidence of contamination--many governmental, private, and academic entities also conduct hydrologic investigations.

Investigations conducted by the Geological Survey were funded by the Federal, Federal-State Cooperative, and Other Federal Agency Programs. The distribution of funding by source of support for investigations during fiscal years 1987-91 is shown in figure 6. Total expenditures for the investigations related to water-resources contamination during the period amounted to about \$295 million. The average annual cost per investigation in fiscal year 1991 was about \$230,000 in the Federal Program, \$130,000 in the Federal-State Cooperative Program, and \$300,000 in the Other Federal Agency Program.

A list of selected Geological Survey investigations that were related to water-resources contamination for fiscal years 1987-91, is given in Appendix C. In conformance with the format in Gilbert and others (1987), those investigations concerned with the effects of agricultural chemicals and practices on water resources are identified specifically in this list.

Total number of investigations shown = 560  
 (Not shown are an additional 29 investigations conducted by regional centers.)

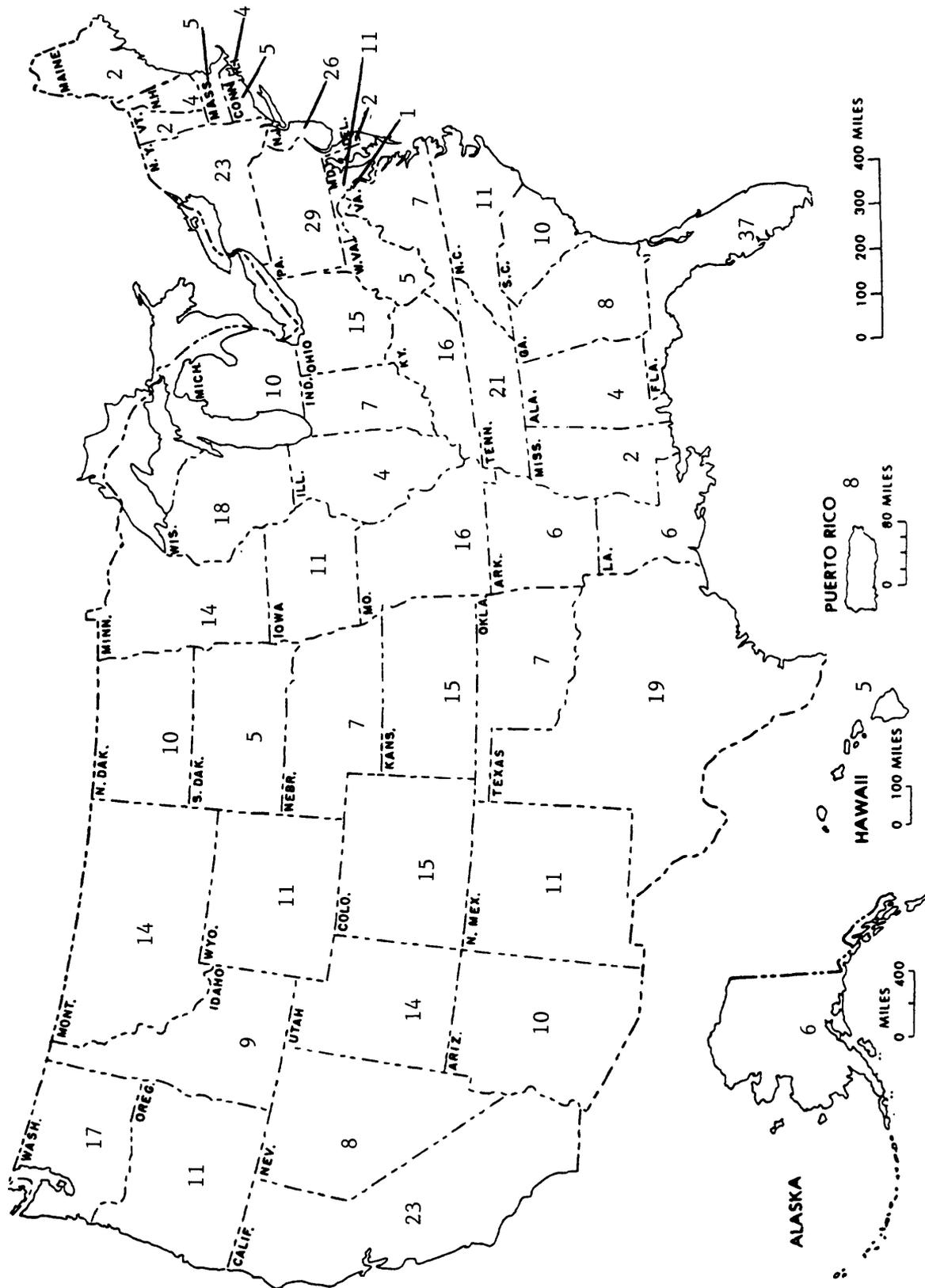


Figure 5--Distribution of U.S. Geological Survey investigations and research during fiscal years 1987-91 related to water-resources contamination.

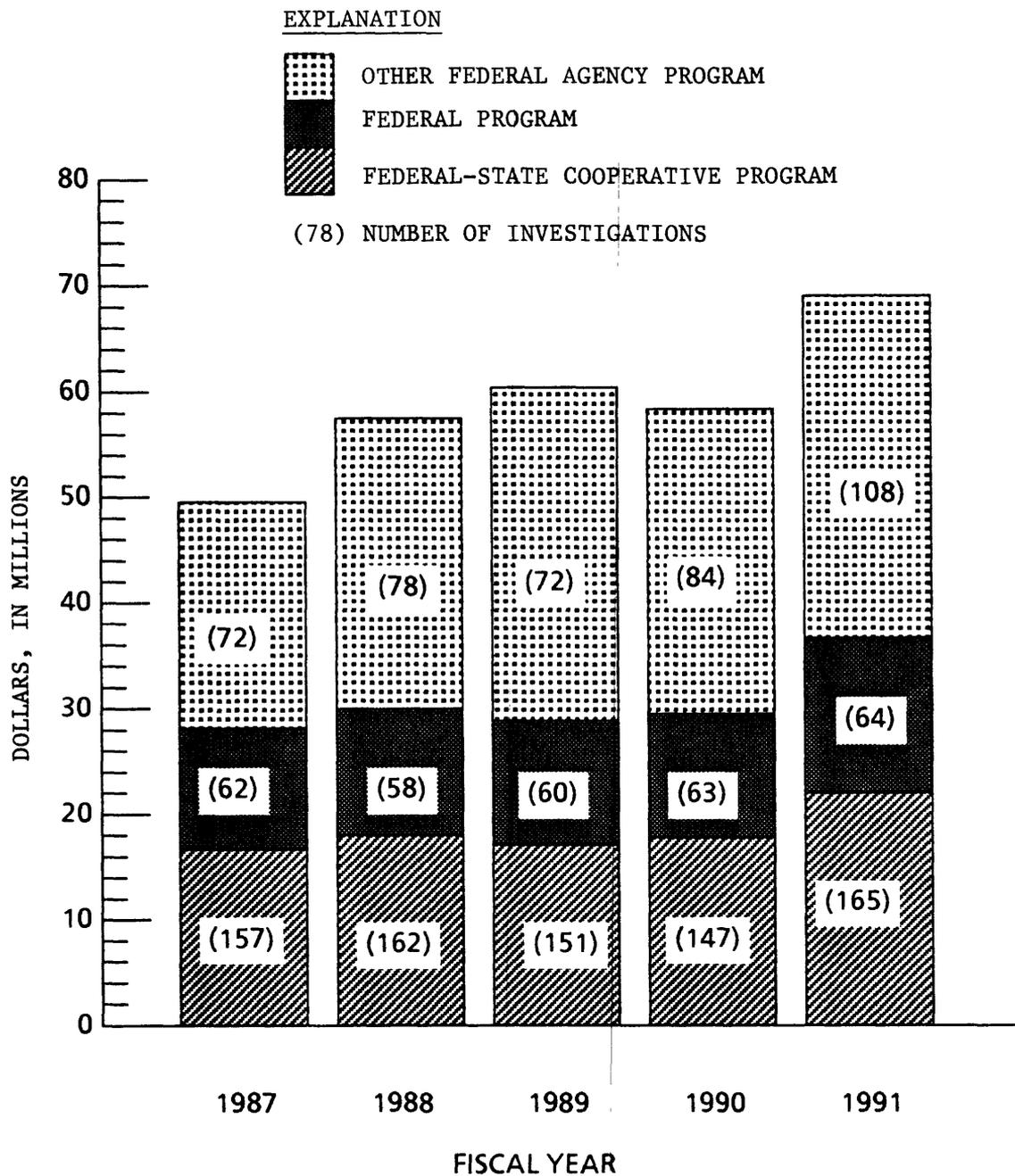


Figure 6--Funding for and number of U.S. Geological Survey investigations related to water-resources contamination, by program, fiscal years, 1987-91.

## EXAMPLES OF CURRENT INVESTIGATIONS

Several examples of recent cooperative investigations follow:

- **Alaska: Water Quality Characteristics of Aquifers on the Kenai Peninsula**  
A 3-year study by the Geological Survey, in cooperation with the Alaska Department of Natural Resources, Division of Water, is designed to assess the ground-water quality in the Kenai Peninsula. Ground water in shallow unconfined aquifers is being sampled and tested to determine whether or not contamination has occurred. Current sources of potential contamination are oil- and gas-exploration activities, leaky underground storage tanks, industrial activities, and some pesticide and fertilizer use in agricultural areas. The study also is designed to characterize and delineate aquifers tapped by wells in the area to determine ground-water levels and flow direction, and to evaluate existing hydrogeologic data.
- **California: Estimating Tidal and Residual Circulation in San Francisco Bay and Sacramento/San Joaquin Delta**  
State and Federal water projects have substantially altered the flow of water through the Sacramento/San Joaquin Delta and San Francisco Bay relative to predevelopment conditions. Freshwater outflows to the Bay-Delta system have decreased and there is concern about adverse effects on fish and shrimp populations. A cooperative study among the Geological Survey, California Department of Water Resources, and the California State Water Resources Control Board is directed towards assessing quantitatively the hydrodynamics of the Bay-Delta system. This study will provide information about water currents and salinity that eventually can be used to aid in the operation of water-delivery systems to improve conditions for aquatic life. Two- and three-dimensional models are being used to improve an understanding of the hydrodynamics of the system.
- **Colorado: Water Quality of Standley Lake**  
Various agencies from five cities and one county disagreed over phosphorus-control regulations for Standley Lake, a source of domestic water in the Denver metropolitan area. Each local agency joined the Geological Survey in a cooperative study to investigate the relations of nutrients and algal growth to undesirable taste and odor of the lake water. The study determined that phosphorus was not the sole source of the problem, led to the withdrawal of the request for phosphorus-control regulations, and contributed to ending the controversy.
- **Florida: Unsaturated Flow and Solute Transport Beneath Rapid Infiltration Basins in Central Florida**  
Land-based disposal of secondary-treated wastewater into rapid-infiltration basins is being investigated as an alternative to stream disposal, which produces eutrophication as a result of high nutrient loads. Soil microbial and adsorptive processes are expected to lower concentrations of nitrogen and phosphorus species as the wastewater moves through the unsaturated zone to underlying aquifers. In cooperation with the Reedy Creek Improvement District, the Geological Survey has installed instrumentation to identify the processes important in nutrient transport and transformation during percolation of wastewater through sandy soils in central Florida. The hydrologic flow regime in the unsaturated zone, in the

surficial aquifer, and in the Floridan aquifer will be defined through a combination of field monitoring and numerical modeling.

- **Florida: Development and Comparison of Alternative Methods for Wetlands Representation in Ground-Water Flow Models.**  
Maintenance of wetland water levels in areas where ground-water withdrawals for public supply are substantial requires an accurate knowledge of the relations between the ground-water and surface-water resources. The ability to accurately predict the effects of ground-water withdrawals on wetland water levels is particularly important in southern Florida, where the wetlands are ecologically sensitive and in direct connection with the principal aquifer. The Geological Survey, in cooperation with the South Florida Water Management District, is conducting a study to develop coupled surface-water and ground-water models capable of accurately representing the entire hydrologic regime. The models will represent the wetlands by means of two alternative methods and will be used to assess the relative merits of each method over a range of wetland-aquifer relations in southern Florida. The results are expected to be applicable to other wetland-aquifer systems throughout the United States.
- **Kansas: Saline Ground-Water Discharge, South Fork Ninnescah River**  
The Geological Survey, in cooperation with the Kansas Water Office, has conducted a study that has increased knowledge regarding the movement of natural salts in an integrated stream-aquifer system. The study has shown that small isolated areas of the aquifer are the sources of chloride to some reaches of the South Fork Ninnescah River. With this information water managers may have an opportunity to mitigate the chloride problem in this stream-aquifer system, which is a potential water supply.
- **Massachusetts: Nitrate Contamination in Ground Water**  
Land application of sewage effluent is increasing in the Northeast as a method of waste treatment. One potential source of contamination in effluent is nitrate, which percolates quickly downward through the soil to the water table. The Geological Survey, in cooperation with the Massachusetts Division of Water Pollution Control, is studying the biological and chemical processes that change nitrate into nitrogen gas--an inert form of nitrogen that is vented harmlessly to the atmosphere. Armed with an improved understanding of these processes, waste-water managers will be able to design land-application facilities that can optimize the treatment of effluent without jeopardizing the quality of ground water.
- **Missouri: Land-Use and Climatic Effects on Stream Geomorphology and Physical Aquatic Habitat in the Ozark Highlands**  
Aggradation of streams of the Missouri Ozarks by gravel has created long reaches with rapidly shifting channels, eroding cut banks, and extensive, unvegetated gravel bars. Gravel aggradation and attendant channel instability may be detrimental to the aquatic ecosystem and to fisheries. Although aggradation is presumed to be related to land-use practices, the phenomenon and processes are not well documented. The Geological Survey, in cooperation with the Missouri Department of Conservation, is conducting a study designed to determine how the streams achieved their present state, to evaluate the effects of aggradation on the aquatic

ecosystem, and to predict how aggradation may affect Ozarks streams under conditions of changing land use and global-scale climate change.

- **New Jersey: Modeling Toxic Contaminants**  
Many hazardous-waste landfills contain a mixture of chemicals that react with each other in complex ways. Because of these complex reactions, an accurate estimate of the movement and fate of these chemicals in the underlying ground-water systems is not always possible. In cooperation with the New Jersey Department of Environmental Protection, the Geological Survey is developing a ground-water model designed to simulate the chemical and biological reactions that occur in contaminated ground water. This model is expected to improve predictions of the eventual movement and fate of various toxic materials and, thereby, to facilitate protection of ground-water quality.
- **North Dakota: Devils Lake Bottom Sediments**  
Devils Lake, typical of many closed-basin lakes, is characterized by large fluctuations in water level and in concentrations of dissolved solids. State and local governments, and water-resource management groups are concerned about the adverse effects of declining water levels and deteriorating water quality on the sport fishing, waterfowl migration, and recreation. In a study undertaken by the Geological Survey in cooperation with the North Dakota State Department of Health, the chemical exchange between the bottom sediments and the water in the lake has been investigated. The data indicate that bottom-sediment processes are an important control on water quality in the lake and that a reduction in dissolved solids concentrations of tributary inflows to the lake would not significantly decrease the lake's salinity. This type of information is essential to water-resource managers in their development of plans for controlling water quality.
- **Ohio: Changes in Aquatic Biota in an Urbanized Watershed**  
Algae and small insect larvae form the basis of food chains in small streams and are used as an index to the ecological health of aquatic environments. Flooding of streams can seriously disrupt these aquatic communities by washing algae and larvae downstream and by delaying their recolonization. The Geological Survey and the Ohio Department of Natural Resources are cooperating on a study in the Big Darby Creek watershed in central Ohio to determine the effects that increasing urbanization and the resulting increases in peak discharges and flooding may have on stream biota. Results of this study will enable planners to improve an understanding of the effect of changes in land-use patterns on the health of aquatic systems.
- **Tennessee: Effects of Agricultural Practices on Water Quality in the Beaver Creek Drainage Basin**  
Agricultural operations have been identified as the largest contributor to water-quality degradation in Tennessee, particularly in the heavily farmed areas of west Tennessee. The purposes of this investigation, conducted by the Geological Survey in cooperation with the Tennessee Department of Agriculture, are to document the effects of various agricultural practices on surface-water and ground-water quality and to assess the effectiveness of implementing various best management practices (BMP's). The study will determine the current quality of surface waters and ground waters in the Beaver Creek drainage basin and document changes in sediment, nutrient,

and pesticide concentrations following BMP implementation. The results will provide direct evidence for the effectiveness of different agricultural BMP's for water-quality improvement that may be transferable to other agricultural areas.

- **Utah: Investigation of Springs In and Adjacent to Utah Lake, Utah County**  
Diversion of high-quality inflow water by the Central Utah Project is predicted to result in deterioration of the water quality in Utah Lake. This deterioration will impair the use of the lake as a source of water for irrigation. The Central Utah Water Conservancy District (CUWCD) would like to minimize the deterioration by diverting saline spring discharge from the lake. The Geological Survey, in cooperation with the CUWCD, is conducting a study to locate and characterize the springs, using marine-seismic, bathymetric, and thermal-imagery techniques, and by measurements of spring discharges and collection of water samples for chemical and isotope analyses. A thermal-imagery survey has been done using an aircraft and remote sensor provided by the National Aeronautics and Space Administration.
- **Washington: Quality of Ground Water in the Toppenish Basin, Yakima Indian Reservation**  
The Geological Survey, in cooperation with the Yakima Indian Nation, is assessing the quality of ground water and the effects of pesticides and fertilizers on ground water in the Toppenish Creek basin. Data being collected for this study include nitrate-nitrogen and bacterial concentrations on a basinwide scale over time, as well as concentrations of common chemicals, pesticides, and trace elements during irrigation and nonirrigation seasons. The data collected to date indicate that nitrate concentrations approach or exceed the maximum permissible contaminant level in several areas of the basin. However, the seasonal variations are small in the relatively high nitrate concentrations; therefore, the relatively high nitrate concentrations may be due to natural causes rather than to agricultural practices.
- **Wisconsin: Using Artificial Wetlands to Improve Water-Quality**  
Recent studies have shown that vegetation in natural wetlands is effective in removing dissolved and suspended material from contaminated water that flows through them. In some places, construction techniques are being used to produce water-saturated conditions in artificial wetlands that simulate the characteristics of natural wetlands. The Geological Survey, in cooperation with the Wisconsin Department of Natural Resources, is conducting a study to determine whether or not artificially created wetlands also will improve water quality. If successful, this approach promises to provide enhanced flexibility in treating contaminated water in a cost-effective manner.
- **Wyoming: Determination of Long-Term Atmospheric Depositional Chemistry and Climatic Change through Ice-Core Analysis**  
Continuous ice cores, obtained from mid-continent mountain glaciers in Wyoming, may produce useful information on the 300- to 500- year history of precipitation chemistry and climatic change in the area. The proximity of the study areas to contamination sources in the western United States may provide the data needed for developing conclusions with respect to the effects of manmade inputs to the atmosphere and climate change issues.

Information also will be used to estimate long-term streamflow records for north-central Wyoming. The study is being conducted by the Geological Survey in cooperation with the Wyoming State Engineer, the Wyoming Water Development Commission, and the Shoshone and Arapaho Tribes.

## SUMMARY AND CONCLUSIONS

The Geological Survey's Federal-State Cooperative Program has responded to national needs for hydrologic information since 1895. During FY 1991, water-resources data collection, investigations, and research were conducted in cooperation with more than 1,000 State, regional, and local agencies in every State, Puerto Rico, and several Territories. Cooperative Program funding in FY 1991 totaled about \$148 million and accounted for more than 44 percent of the total obligations for the Geological Survey's Water Resources Division. The Cooperative Program provides much of the information required by those responsible for water-resources planning and management, water-supply development, and environmental improvement through hydrologic data collection, investigations, and research. The program is a unique activity in that, although the cooperating agencies provide more than half the funds, the Geological Survey performs most of the work. The program is also a primary source for knowledge concerning techniques for collecting and analyzing data on the quantity, quality, use, and movement of surface water and ground water.

Because the availability of high-quality water is a fundamental limiting factor to population growth, a comprehensive and forward-looking program of hydrologic data collection and investigations is needed to provide the information necessary for the wise development and use of the Nation's water resources. The job is too large to be supported at either Federal or State level alone. The jointly planned and funded Cooperative Program provides convincing assurance that the work is designed to meet national and local needs.

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## Appendix A -- Cooperators By State, Fiscal Year 1991

### Alabama:

Alabama Department of--  
    Economic and Community Affairs  
    Environmental Management  
    Highways  
Anniston, City of  
Birmingham, City of  
Butler County  
Coffee County Commission  
Fayette County Commission  
Florida Dept. of Env. Regulation  
Geological Survey of Alabama  
Greenville, City of  
Huntsville, City of,  
Jefferson County  
Mobile, City of  
Montgomery, City of,  
N. Sumter Water Authority  
Prattville, City of  
Sumter County  
Sylacauga, City of  
Tuscaloosa, City of  
University of Alabama, Tuscaloosa

### Alaska:

Alaska Department of--  
    Fish and Game  
    Natural Resources, Division of--  
        Geological and Geophysical Surveys  
    Transportation  
Alaska Energy Authority  
Alaska Industrial Development and Export Authority  
Fairbanks North Star Borough  
Juneau, City and Borough of  
Kenai Peninsula Borough  
Kenai Soil and Water Cons. Dist.  
Matanuska - Susitna Borough  
Municipality of Anchorage  
Sitka, City and Borough of

### Arizona:

Arizona Department of--  
    Environmental Quality  
    Water Resources  
Colorado Department of Highways  
Gila Valley Irrigation District  
Gila Water Commissioner, Office of  
Maricopa County--  
    Flood Control District  
    Water District  
Metropolitan Water District of Southern California  
Navajo Nation

### Arizona--continued

Pima County Dept. of Transportation  
Safford, City of, Water, Gas & Sewer Department  
Salt River Project  
Scottsdale, City of, Water Resources Department  
Show Low Irrigation Company  
Tucson, City of

### Arkansas:

Arkansas Department of--  
    Highway and Transportation  
    Parks and Tourism  
    Pollution Control and Ecology  
Arkansas Game and Fish Commission  
Arkansas Geological Commission  
Arkansas-Oklahoma Arkansas River Compact  
    Commission  
Arkansas Soil and Water Conservation Commission  
Independence County  
Little Rock Municipal Water Works  
Public Works Dept. of Little Rock  
Rogers, City of  
University of Arkansas at Fayetteville  
University of Arkansas at Little Rock

### California:

Alameda County --  
    Flood Control and Water Conservation District  
    Water District  
Antelope Valley - East Kern Water Agency  
California Department of --  
    Boating and Waterways  
    Parks and Recreation  
    Pesticide Regulation  
    Transportation  
    Water Resources  
California Water Resources Control Board  
California Department of Water Resources  
Carpinteria County Water District  
Casitas Municipal Water District  
Coachella Valley Water District  
Contra Costa County Flood Control and Water  
    Conservation District  
Crestline - Lake Arrowhead Water Agency  
Desert Water Agency  
East Bay Municipal Utility District  
East Valley Water District  
Eastern Municipal Water District  
Georgetown Divide Public Utility District  
Humboldt Bay Municipal Water District  
Imperial County Department of Public Works  
Imperial Irrigation District

California--Continued

Indian Wells Valley Water District  
Los Angeles County Dept. of Public Works  
Madera Irrigation District  
Marin Municipal Water District  
Mendocino County Water Agency  
Merced, City of  
Merced Irrigation District  
Metropolitan Water Dist.  
Mojave Water Agency  
Mono County  
Montecito Water District  
Monterey County Water Resources Agency  
Monterey Peninsula Water Mgmt. District  
N Kern Water Storage Dist.  
Orange County Water District  
Pala Band of the Mission Indians  
Palo Alto, City of  
Panoche Water and Drainage District  
Pechanga Indian Reservation  
Rancho California Water District  
Riverside County Flood Control and Water  
Conservation District  
Sacramento County Dept. of Public Works  
Sacramento Municipal Utility District  
San Benito County Water District  
San Bernardino County Flood  
Control District  
San Bernardino Valley Municipal Water District  
San Diego, City of  
San Diego County, Department of  
Public Works  
San Francisco, City and County of,  
San Francisco Water Department  
San Luis Obispo County Engineering Dept.  
San Mateo County Department of Public Works  
Santa Barbara, City of, Department of Public Works  
Santa Barbara County--  
Flood Control and Water Conservation District  
Water Agency  
Santa Clara Valley Water District  
Santa Cruz, City of,  
Santa Cruz County Flood Control and Water  
Conservation District  
Santa Maria Valley Water Conservation District  
Santa Ynez River Water Conservation District  
Scotts Valley Water District  
Sonoma County--  
Planning Department  
Water Agency  
Tahoe Regional Planning Agency  
Tulare County Flood Control District  
Turlock Irrigation District  
United Water Conservation District

California--Continued

Ventura County Public Works Agency  
Woodbridge Irrigation District  
Yolo County Flood Control and Water Conservation  
District  
Yuba County Water Agency

Colorado:

Arkansas River Compact Administration  
Arvada, City of  
Arapahoe County Water and Wastewater  
Aspen, City of  
Aurora, City of  
Bent County  
Boulder, City of  
Boulder County  
Breckenridge, Town of  
Centennial Water and Sanitation District  
Cherokee Water and Sanitation District  
Colorado Department of --  
Health  
Transportation  
Colorado Division of Wildlife  
Colorado Office of the State Engineer  
Colorado Oil and Gas Conservation Commission,  
Department of Natural Resources  
Colorado River Water Conservation District  
Colorado Springs, City of--  
City Engineering Division  
Department of Public Utilities  
Department of Public Works  
Colorado Water Conservation Board  
Delta County Board of County Commissioners  
Denver, Board of Water Commissioners  
Eagle County Board of Commissioners  
East Grand County Water Quality Board  
Englewood, City of,  
Evergreen Metropolitan District  
Freemont Sanitation District  
Fort Collins, City of, Water and Waste Water Utility  
Fountain Valley Authority  
Garfield County  
Glendale, City of  
Glenwood Springs, City of  
Golden, City of  
Jefferson County, Board of County Commissioners  
Lakewood, City of  
Lamar, City of  
LaPlata County  
Las Animas, City of  
Longmont, City of  
Loveland, City of  
Lower Fountain Water-Quality Management Assoc.

Colorado--Continued

Metropolitan Wastewater Reclamation District  
Moffat County  
Northern Colorado Water Conservancy District  
Northglenn, City of  
Pueblo, City of--  
    Board of Water Works  
    Dept. of Utilities  
Pueblo County Commissioners  
Pueblo West Metropolitan District  
Rio Blanco County  
Rio Grande Water Conservation District  
Rocky Ford, City of  
Southern Ute Indian Tribe  
Southeastern Colorado Water Conservancy District  
Southwestern Colorado Water Conservancy District  
St. Charles Mesa Water District  
Steamboat Springs, City of, Public Works Dept.  
Thornton, City of  
Trinchera Water Conservancy District  
Uncompahgre Valley Water Users Association  
Upper Arkansas Area Council of Governments  
Upper Arkansas River Water Conservation District  
Upper Eagle Regional Water Authority  
Upper Yampa Water Conservancy District  
Urban Drainage and Flood Control District  
Ute Mountain Ute Indian Tribe  
Vail Valley Conservation Water District  
Westminster, City of  
Yellow Jacket Water Conservancy District

Connecticut:

Connecticut Department of--  
    Environmental Protection  
    Transportation  
Fairfield, Town of, Conservation Department  
New Britain, City of, Board of Water  
    Commissioners  
Norwich Sewer Authority  
South Central Connecticut Regional Water Authority  
Torrington, City of

Delaware:

Geological Survey

District of Columbia:

Department of Public Works  
Metropolitan Washington Council of Governments

Florida:

Bay County Utilities  
Boca Raton, City of  
Bradenton, City of

Florida--Continued

Broward County--  
    Water Resources Management Division  
    Environmental Quality Board  
Cape Coral, City of  
Collier County  
Cocoa, City of  
Daytona Beach, City of  
Florida Department of--  
    Environmental Regulation  
    Natural Resources  
    Transportation  
Florida Game and Freshwater Fish Commission  
Florida Institute of Phosphate Research  
Florida Keys Aqueduct Authority  
Fort Lauderdale, City of  
Hallendale, City of  
Highland Beach, Town of  
Hillsborough County  
Hollywood, City of  
Institute of Food and Agricultural Sciences  
Jacksonville, City of  
Jacksonville Electric Authority  
Lake County  
Lake Mary, City of  
Lee County  
Manatee County, --  
    Board of County Commissioners  
    Environmental Action Commission  
Marion County  
Martin County  
Metropolitan Dade County,  
Miami-Dade Water and Sewer Authority  
North Port, City of  
Northwest Florida Water Management District  
Ocala, City of  
Palm Beach County  
Perry, City of  
Pinellas County  
Polk County  
Pompano Beach, City of,  
Port Orange, City of  
Reedy Creek Improvement District  
Sarasota, City of  
Sarasota County  
South Florida Water Management District  
South Indian River Water Control District  
Southwest Florida Water Management District  
St. Johns County  
St. Johns River Water Management District  
St. Lucie County  
St. Petersburg, City of  
Stuart, City of  
Suwannee River Water Management District

Florida--Continued

Tallahassee, City of --  
Electric Department  
Water Quality Lab  
Tampa Bay Regional Planning Council  
Tampa, City of  
Tampa Port Authority  
Volusia County  
Walton County  
West Coast Regional Water Supply Authority  
Winter Park, City of

Georgia:

Albany, City of  
Albany Water, Gas, and Light Commission  
Bibb County  
Blairsville, Town of  
Brunswick, City of  
California Air Resources Board  
Chatham County - Savannah  
Clayton County Water Authority  
Covington, City of  
DeKalb County Roads & Drainage Dept.  
Georgia Department of--  
Natural Resources--  
Environmental Protection Division--  
Water Quality Mgmt. Program  
Geological Survey  
Transportation  
Office of Materials Research  
Georgia Mountain Regional Development Center  
Georgia State University, Dept. of Geology  
Gwinnett County  
Helena, City of  
Macon-Bibb County Water and Sewage Authority  
Moultrie, City of  
Springfield, City of  
Thomaston, City of  
Thomasville, City of  
Tift County Commission  
Tifton, City of  
Valdosta, City of  
Zebulon, City of

Hawaii:

Hawaii Department of--  
Agriculture, Agricultural Resource Management  
Division  
Land and Natural Resources--  
Division of Water Resource Mgmt.  
Transportation  
Honolulu, City and County of, --  
Department of Public Works  
Board of Water Supply

Hawaii--Continued

Hawaii, County of, Dept. of Water Supply  
Kauai, County of, Department of Water Supply  
Maui, County of, Department of Water Supply

Idaho

Bonner County Commissioners  
College of Southern Idaho  
Coeur D'Alene Tribe of Idaho  
Idaho Department of--  
Fish and Game  
Health and Welfare  
Water Resources  
Nez Perce Tribe  
Shoshone- Bannock Indian Tribes  
Shoshone County  
Southwest Irrigation District  
Teton County  
Water District No. 1--Idaho Falls  
Water District No. 32D (Dubois)

Illinois:

Bloomington and Normal Sanitary District  
Cook County Forest Preserve District  
Decatur, City of  
De Kalb, City of, Public Works Dept.  
Du Page County, --  
Department of Environmental Concerns  
Forest Preserve, Planning and Development Section  
Illinois Department of--  
Energy and Natural Resources  
Transportation, Division of Water Resources  
Illinois Environmental Protection Agency  
Illinois State Geological Survey  
Illinois State Water Survey  
Lake County, Dept. of Planning, Zoning, Environmental  
Quality  
Metropolitan Water Reclamation District of Greater  
Chicago  
Northern Illinois University  
Springfield, City of

Indiana:

Carmel Utilities  
Elkhart Water Works  
Indiana Department of--  
Environmental Management  
Natural Resources, Bureau of Land, Forest, and  
Wildlife  
Transportation  
Indianapolis Department of Public Works

Iowa:

Ames, City of

Iowa--Continued

Carroll County--  
Auditor  
Soil and Water  
Cedar Rapids, City of, Engineering Dept.  
Davenport, City of  
Des Moines, City of  
Fort Dodge, City of  
Iowa Department of--  
Natural Resources, Geological Survey Bureau  
Transportation, Highway Division  
Iowa State University-Ames  
University of Iowa--  
Department of Preventive Medicine  
Institute of Hydraulic Research  
University Hygenic Laboratory

Kansas:

Arkansas River Compact Administration  
Emporia Dept. of Public Works  
Geary County Board of County Commissioners  
Harvey County  
Hays, City of  
Iowa Tribe of Kansas and Nebraska  
Kansas City-Wyandotte County Health Dept.  
Kansas Department of--  
Health and Environment  
Transportation  
Kansas Geological Survey  
Kansas State Board of Agriculture, Division of  
Water Resources  
Kansas State University  
Department of Agronomy  
Kansas University  
Center for Research, Inc.  
Kansas Water Office  
Kickapoo Tribe of Kansas  
Linn County  
McPherson County  
Olathe, City of  
Prairie Band of Potawatomie Tribe  
Reno County  
Sac and Fox Tribe of Missouri  
Sumner County  
Wichita, City of--  
Dept. of Public Works  
Water and Water Pollution Control

Kentucky:

Campbellsville Municipal Water and Sewer System  
Elizabethtown, City of  
Fulton, City of

Kentucky--Continued

Glasgow Water Company  
Jefferson County Dept. of Public Works and  
Transportation  
Kentucky Department of--  
Natural Resources and Environmental Protection  
Cabinet  
Kentucky Geological Survey  
Kentucky State University  
Lewisburg, City of  
Metropolitan Sewer District  
Owensboro, City of  
Purchase Area Development District  
University of Louisville

Louisiana:

Capital-Area Groundwater Conservation Commission  
East Baton Rouge Parish  
Jefferson Parish Department of Public Utilities  
Louisiana Department of--  
Environmental Quality  
Health and Hospitals  
Natural Resources  
Transportation and Development  
Wildlife and Fisheries  
Plaquemines Parish  
Sabine River Compact Administration  
St. John the Baptist Parish  
St. John the Baptist Water Works  
Terrebonne Parish  
West Monroe, City of

Maine:

Androscoggin Valley Council of Governments  
Cobbossee Watershed District  
Greater Portland Council of Governments  
Maine Geological Survey  
Maine Low Level Radioactive Waste Authority  
North Kennebec Valley Regional Planning Commission  
North Maine Regional Planning Commission  
Penobscot Valley Council of Governments  
University of Maine at Orono

Maryland:

Delaware Geological Survey  
Delaware Dept. of Natural Resources and Environmental  
Control  
Delaware River Basin Commission  
Hyndman, Borough of  
Maryland Department of--  
Environment, Water Mgmt. Admin.  
Natural Resources, Energy Admin.  
Maryland Geological Survey  
Salisbury, City of

Massachusetts:

Cape Cod Commission  
Massachusetts Department of--  
Environmental Management, Division of Resource  
Conservation  
Environmental Protection Division of Water Pollution  
Control  
Fisheries, Wildlife and Environmental Law  
Enforcement, Division of Fisheries and Wildlife  
Public Works  
Mashpee Water District  
Metro District Commission --  
Parks Engineering and Construction Division  
Watershed Management Division

Michigan:

Adrian, City of  
Ann Arbor, City of  
Battle Creek, City of  
Board of Water and Light, Water & Steam Planning  
Cadillac, City of, Wastewater Treatment Plant  
Clare, City of  
Consumers Power Company  
Elsie, Village of, Dept. of Public Works  
Flint, City of  
Huron-Clinton Metropolitan Authority  
Imlay, City of  
Kalamazoo, City of, Department of Public Works  
Keweenaw Bay Indian Community  
Macomb County  
Mason, City of  
Michigan Department of--  
Natural Resources, Office of Budget and Federal Aid  
Sanitary Sewers and Engineering  
Transportation  
Michigan Power Company  
Monroe County Health Department, Environmental  
Health Division  
Negaunee, City of, Water and Wastewater Treatment  
Plant  
Norway, City of  
Oakland County Drain Commission  
Otsego County Road Commission  
Portage, City of  
Portland, City of  
Tri-County Regional Planning Commission  
Wayne County Environmental Health Division  
Ypsilanti, Community Utility Authority

Minnesota:

Beltrami County Soil and Water Conservation  
District  
Dakota County Soil and Water Conservation District

Michigan--Continued

Elm Creek Conservation Management and Planning  
Commission  
Fond du Lac Reservation Business Commission  
Grand Portage Reservation  
Hennepin County Conservation District  
Leech Lake Reservation Division  
of Resources Management  
Lower Red River Watershed Management Board  
Metropolitan Waste Control Commission  
Mille Lacs Reservation Business Commission  
Minneapolis Water Works  
Minnesota Department of--  
Health  
Natural Resources  
Transportation  
Minnesota Pollution Control Agency  
NW Minnesota Ground Water Steering Committee  
Red Lake Reservation Business Committee  
Red Lake Watershed District  
Rochester Public Utilities  
St. Paul Board of Water Commissioners  
University of Minnesota  
Vadnais Lake Area Watershed Management  
Organization  
White Earth Reservation Business Committee  
Whitewater Joint Powers Board

Mississippi:

Harrison County Development Commission  
Jackson, City of  
Jackson County Port Authority  
Mississippi Department of--  
Agriculture and Commerce  
Environmental Quality--  
Office of Geology  
Office of Land and Water Resources  
Office of Pollution Control  
Highways  
Pat Harrison Waterway District  
Pearl River Basin Development District  
Pearl River Valley Water Supply District  
Sabine River Compact Admin.  
Yazoo Mississippi Delta

Missouri:

Cape Girardeau, City of  
City Utilities, Springfield, Engineering Dept.  
Illinois Environmental Protection Agency  
Jackson County Parks and Recreation  
Mid-America Regional Council  
Missouri Department of--  
Conservation

Missouri--Continued

Health  
Natural Resources--  
    Division of Environmental Quality  
    Division of Geology and Land Survey  
    Land Reclamation Commission  
Missouri Highway and Transportation Commission  
Rolla, City of  
Rolla Municipal Utility  
St. Francois County Environmental Corporation  
St. Louis, City of, Metropolitan Sewer District  
Sullivan, City of  
University of Missouri-Columbia  
Watershed Committee of the Ozarks

Montana:

Blackfeet Nation  
Bozeman, City of  
Fort Belknap Community Council  
Fort Peck Reservation  
Helena, City of  
Lewis and Clark City/County Health Department  
Montana Bureau of Mines and Geology  
Montana Department of--  
    Agriculture  
    Fish, Wildlife, and Parks  
    Health and Environmental Sciences  
    Highways  
    Natural Resources and Conservation  
Salish and Kootenai Tribes of Flathead Reservation  
Wyoming State Engineer

Nebraska:

Central Platte Natural Resources District  
Kansas-Nebraska Blue River Compact  
    Administration  
Lincoln, City of, Water System  
Little Blue Natural Resources District  
Lower Platte North Natural Resources District  
Lower Platte South Natural Resources District  
Lower Republican Natural Resources District  
Nebraska Natural Resources Commission  
Nebraska Department of--  
    Environmental Control  
    Roads  
    Water Resources  
Nemaha Natural Resources District  
North Platte Natural Resources District  
Panhandle Resource Conservation and Development  
    Project  
Papio-Missouri Natural Resources District  
South Platte Natural Resources District

Nebraska--Continued

Twin Platte Natural Resources District  
University of Nebraska, Conservation and Survey Division  
Upper Elkhorn Natural Resources District  
Upper-Niobrara White Natural Resources District  
Upper Republican Natural Resources District

Nevada:

Carson City/County Dept. of Public Works  
Clark County --  
    Regional Flood Control District  
    Sanitation District  
Douglas County  
Duck Valley Reservation  
Henderson, City of  
Las Vegas, City of  
Las Vegas Valley Water District  
Nevada Department of--  
    Conservation and Natural Resources--  
        Division of Environmental Protection  
        Division of Water Resources, State Engineers Office  
    Transportation  
South Tahoe, Public Utility District  
Summit Lake Paiute Indian Tribe  
Tahoe Regional Planning Agency  
Washoe County Regional Water Planning Advisory Board

New Hampshire:

New Hampshire Department of  
    Environmental Services

New Jersey

Bergen County Department of Public Works  
Brick Township Municipal Utility Authority  
Gloucester County Planning Commission  
Morris County Municipal Utilities Authority  
New Brunswick, City of  
New Jersey Department of Environmental Protection  
North Jersey District Water Supply Commission  
Passaic Valley Water Commission  
Pinelands Commission  
Rutgers University  
Somerset County Board of Chosen Freeholders  
Washington Township Municipal Utilities Authority  
West Windsor Township

New Mexico:

Albuquerque, City of--  
    Hydrology Division  
    Utilities Planning Division  
    Waste Water Utility

New Mexico--Continued

Albuquerque Metropolitan Arroyo Flood Control Authority  
Bernalillo, County of  
Canadian River Municipal Water Authority  
Costilla Creek Compact Commission  
Elephant Butte Irrigation District  
Highlands University School of Technology  
La Cienega Acequia Association  
Las Cruces, City of  
Las Vegas, City of  
Navajo Indian Nation, Dept. of Environmental Protection  
Navajo Forestry Department  
New Mexico Bureau of Mines and Mineral Resources,  
Division of Mining and Technology  
New Mexico Department of Highways and Transportation  
New Mexico Environment Department  
New Mexico State University Agricultural Experiment Station  
New Mexico Water Resources Research Institute  
Office of New Mexico State Engineer  
Pecos River Commission  
Pueblo of Zuni  
Raton, City of  
Rio Grande Compact Commission  
Rio San Jose Flood Control District  
Ruidoso, Village of  
Santa Fe Metropolitan Water Board  
Santa Rosa, City of

New York:

Academy of Natural Sciences  
Amherst, Town of, Engineering Department  
Auburn, City of  
Chautauqua County Department of Planning and Development  
Cheektowaga, Town of  
Chenango County Board of Supervisors  
Cornell University--  
Electric Power Search Institute  
Cortland County  
Essex County Planning Department  
Hudson-Black River Regulating District  
Kiryas Joel, Village of  
Long Island Regional Planning Board  
Monroe County Department of Environmental Health  
Nassau, County of--  
Department of Health  
Department of Public Works  
New York City--  
Department of Environmental Protection--  
Bureau of Water Supply  
Division of Water Quality Planning

New York--Continued

New York State Department of--  
Environmental Conservation Planning and Restoration, Bureau of Monitoring and Assessment  
Transportation  
New York State Power Authority  
Nyack, Village of, Board of Water Commissioners  
Onondaga County--  
Department of Drainage and Sanitation  
Water Authority  
Orange County Water Authority  
Putnam County Department of Planning  
Rockland, Town of  
Schuyler County Dept. Planning and Economic Development  
State University of New York  
Suffolk County--  
Department of Health Services  
Water Authority  
Tompkins County Department of Planning  
Ulster County

North Carolina:

Asheville, City of  
Bethel, Town of  
Brevard, City of  
Chapel Hill, Town of  
Charlotte, City of  
Durham, City of  
Fayetteville, City of  
Forsyth County  
Greensboro, City of  
Guilford County Soil and Water Conservation District  
High Point, City of  
Lexington, City of  
Mecklenburg County  
North Carolina Agricultural Extension Service  
North Carolina State Department of --  
Environment, Health, and Natural Resources  
Transportation  
North Carolina Wildlife Resources Commission  
Raleigh, City of  
Rocky Mount, City of  
Triangle Area Water Supply Monitoring, Project Steering Committee

North Dakota:

Dickinson, City of  
Lower Heart River Water Resources District  
Minot, City of  
North Dakota Dept. of --  
Game and Fish  
Health, Water Supply and Pollution Control

North Dakota--Continued

Parks and Recreation  
Transportation  
North Dakota Geological Survey  
Public Service Commission  
Standing Rock Sioux Tribe  
State Water Commission  
Three Affiliated Tribes

Ohio:

Akron, City of  
Canton, City  
Columbus, City of  
Eastgate Development Company  
Freemont, City of  
Lima, City of  
Miami Conservancy District  
Ohio Department of--  
    Natural Resources  
    Transportation  
Ohio State University  
Ross County  
Seneca Soil and Water District  
Summit County Engineers  
Toledo Metropolitan Area Council of Governments  
University of Cincinnati  
University of Toledo

Oklahoma:

Ada, City of  
Enid, City of  
McGee Creek Authority  
Oklahoma Conservation Commission  
Oklahoma Department of--  
    Health  
    Transportation  
Oklahoma Geological Survey  
Oklahoma Water Resources Board  
Sac and Fox Nation

Oregon:

Ashland, City of  
Clark County, Washington, Intergovernmental Resources  
    Center  
Coos Bay-North Bend Water Board  
Douglas County  
Eugene City Water and Electric Board  
Jackson County  
Lane Council of Governments  
McMinnville, City of  
Department Environmental Quality

Oregon--Continued

Oregon Department of--  
    Energy  
    Environmental Quality  
    Human Resources State Health  
    Transportation, Highway Commission  
    Water Resources  
Oregon Executive Department  
Portland, City of--  
    Bureau of Environmental Services  
    Bureau of Water Works  
Oregon Executive Department  
Tualatin Valley Irrigation District  
Unified Sewerage Agency  
Warm Springs Tribal Council  
Washington Department of Wildlife

Pennsylvania:

Allentown, City of, Engineering Dept.  
Bethlehem, City of  
Bucks County  
Chester County Water Resources Authority  
Delaware River Basin Commission  
Geological Survey  
Harrisburg City Department of Public Works  
Hazleton City Authority Water Dept.  
Joint Planning Commission of Lehigh - Northampton  
    Counties  
Letort Regional Authority  
Media Borough Water Department  
New York State Department of Environmental  
    Conservation  
North Penn Water Authority  
North Wales Water Authority  
Pennsylvania State Dept. of Environmental Resources --  
    Bureau of Community Environmental Control  
    Bureau of Mining and Reclamation  
    Bureau of Soil and Water Conservation  
    Bureau of Topographic and Geologic Survey  
    Bureau of Water Quality Management  
    Bureau of Water Resources Management  
Pennsylvania State University  
Philadelphia City Water Department  
Pike County Planning Commission  
Susquehanna River Basin Commission  
Tinicum, Township of  
West Bradford, Township of  
University Area Joint Authority  
Williamsport, City of

Rhode Island:

Governor's Office of Housing, Energy, and  
    Intergovernmental Relations  
New Shoreham, Town of

Rhode Island--Continued

Rhode Island Department of Environmental  
Management, Division of Water Resources  
State Water Resources Board

South Carolina:

Beaufort-Jasper County Water and Sewer Authority  
Charleston Commission of Public Works  
Myrtle Beach, City of  
Oconee County Sewer Commission  
Pageland, Town of  
Pickens County  
South Carolina State Department of--  
Health and Environmental Control  
Highways and Public Transportation  
South Carolina Public Service Authority  
South Carolina Sea Grant Consortium  
South Carolina Water Resources Commission  
Spartanburg, City of, Sanitary Sewer District Water  
System  
University of South Carolina  
Waccamaw Regional Planning and Development  
Commission  
Western Carolina Regional Sewer Authority  
York County

South Dakota:

Area II Minnesota River Basin  
Belle Fourche Irrigation District  
Cheyenne River Sioux Tribe  
East Dakota Water Development District  
Lawrence County  
Oglala Sioux Tribe, Pine Ridge  
Rapid City, City of, Public Works Dept.  
Rosebud Sioux Tribe  
Sioux Falls, City of, Utilities Dept.  
Sisseton-Wahpeton Sioux Tribe  
South Dakota Department of--  
Environment and Natural Resources--  
Geological Survey Division  
Water Resource Management  
Water Quality Division  
Water Rights Division  
Game, Fish, and Parks  
Transportation  
South Dakota School of Mines and Technology  
South Dakota State University  
Stanley County Conservation Dist.  
Watertown, City of  
West Dakota Water Development District  
West River Water Development District

Tennessee:

Alcoa, City of  
Alpha Talbot Utility District  
Bartlett, City of  
Cedar Grove Utility District  
Chattanooga, City of, Dept. of Public Works  
Columbia, City of  
Dickson, City of  
Eastside Utility District  
Franklin, City of  
Germantown, City of  
Hixson Utility District  
Humphreys County  
Jasper, City of  
Johnson City, City of  
Knoxville, City of  
Lawrenceburg, City of  
Lebanon, City of  
Lewisburg, City of, Wastewater Treatment Plant  
Memphis, City of--  
Division of Public Works  
Light, Gas, and Water Division  
Murfreesboro Water and Sewer Department  
Nashville-Davidson County Metropolitan Government  
Red Boiling Springs, Town of  
Rogersville, Town of  
Savannah Valley Utility District  
Shelby County  
Suck Creek Utility District Office of Planning and  
Development  
Tennessee Department of--  
Agriculture  
Environment and Conservation  
Transportation  
Tennessee State Planning Office  
Tennessee Wildlife Resources Agency  
Townsend, Town of  
Union City, City of  
University of Tennessee--  
Transportation Center  
Upper Duck River Development Agency  
Wartrace, City of

Texas:

Abilene, City of  
Arlington, City of  
Austin, City of--  
Regulatory Affairs and Quality Control  
Bexar-Medina-Atacosa Counties  
Brazos River Authority  
Coastal Water Authority  
Colorado River Municipal Water District  
Corpus Christi, City of  
Dallas, City of, Public Works Department

Texas--Continued

Edwards Underground Water District  
El Paso City Public Service Board  
Fort Worth, City of, Water Pollution Control  
Franklin County Water District  
Gainesville, City of  
Galveston County  
Garland, City of, Dept. of Public Works  
Georgetown, City of  
Graham, City of  
Greenbelt Municipal and Industrial Water Authority  
Guadalupe-Blanco River Authority  
Harris County Flood Control District  
Harris-Galveston Coastal Subsidence District  
Houston, City of  
Lavaca-Navidad River Authority  
Lower Colorado River Authority  
Lower Neches Valley Authority  
Lubbock, City of  
Nacogdoches, City of  
North Central Texas Council of Governments  
North Central Texas Municipal Water Authority  
Northeast Texas Municipal Water Authority  
North Texas Municipal Water District  
Orange County  
Pecos River Commission  
Red River Authority  
Sabine River Authority of Texas  
Sabine River Compact Administration  
San Angelo, City of  
San Antonio, City of--  
    Environmental Development Service  
    Public Service Board  
    River Authority  
    Water Board  
San Jacinto River Authority  
Tarrant County Water Control and Improvement District  
    No 1  
Texas Soil and Water Conservation Board  
Texas State Department of Highways and Transportation  
Texas Water Development Board  
Titus County Fresh Water Supply District  
Trinity River Authority  
Upper Guadalupe River Authority  
Upper Neches River Municipal Water Authority  
West Central Texas Municipal Water District  
Wichita County Water Improvement District No 2  
Wichita Falls, City of

Utah:

Bear River Commission  
Central Utah Water Conservancy District  
Ogden River Water Users Association  
Salt Lake County Division of Flood Control

Utah--Continued

Utah Department of--  
    Agriculture, Environmental Quality Section  
    Natural Resources--  
        Water Resources Division  
        Water Rights Division  
Tooele, City of  
Utah Geological and Mineral Survey  
Washington County Water Conservancy District  
Weber Basin Water Conservancy District  
Weber River Water Users Association

Vermont:

Vermont Department of--  
    Environmental Conservation  
    Health, Division of Environmental Health

Virginia:

Accomack, Northampton Planning District Commission  
Alexandria, City of  
Delaware Geological Survey  
Hampton Roads Planning District Comm.  
Henrico County Department of Public Utilities  
James City, County of  
James City Service Authority  
Maryland Department of the Environment  
Maryland State Highway Administration  
Metropolitan Washington Council of Governments  
Newport News, City of  
Northern Virginia Planning District Commission  
Prince William Health District  
Rappahannock-Rapidan Planning District Commission  
Roanoke, City of  
Southeastern Public Service Authority of Virginia  
University of Virginia, Department of  
    Environmental Sciences  
Virginia Beach, City of, Water Resources Division  
Virginia Department of--  
    Public Works  
    Transportation  
Virginia Institute of Marine Science  
Virginia State Water Control Board  
Williamsburg, City of  
York County

Washington:

Aberdeen, City of  
Bellevue, City of  
Chelan County Public Utilities District # 1  
Douglas County Public Utilities District # 1  
Hoh Indian Tribe  
King County Department of Public Works  
Kitsap County Public Utility District No. 1

Washington--Continued

Lewis County Board of Commissioners Public Works  
Department  
Nisqually Indian Tribe  
Okanogan County Dept. of Public Works  
Pacific County Commissioners  
Pierce County Public Works Dept.  
Quinault Indian Business Committee  
Seattle Department of Lighting  
Seattle Water Department  
Seattle-King County Department of Public Health  
Skagit Conservation District  
Skagit County Department of Public Works  
Snohomish County, Board of Commissioners  
Snohomish County-Public Utility District  
Swinomish Tribal Community  
Tacoma, Dept. of--  
Public Utilities  
Public Works  
Thurston County Department of--  
Health  
Public Works  
Umatilla Tribal Council  
Washington Department of--  
Administration, Capitol Buildings and Grounds  
Facilities  
Ecology  
Emergency Management  
Fisheries  
Natural Resources  
Whatcom County  
Yakima Tribal Council

West Virginia:

Eastern Panhandle Regional Planning and  
Development Council  
Morgantown Utility Board  
New Martinsville, City of  
Washington Public Service District  
West Virginia Department of--  
Commerce, Tourism & Parks Section  
Highways  
Natural Resources,  
Water Resources Section  
Wildlife Division  
West Virginia Geological and Economic Survey

Wisconsin:

Bad River Tribal Council  
Balsam Lake Protection and Rehabilitation District  
Barron, City of  
Beaver Dam, City of  
Big Muskego Lake District  
Brown County Planning Commission

Wisconsin--Continued

Dane County --  
Department of Public Works  
Lakes and Watershed Management  
Regional Planning Commission  
Delavan, Town of  
Druid Lake Inland Protection and Rehabilitation Dist.  
Eagle Springs Lake Sanitary District  
Fond du Lac, City of  
Forest County Potawatomi Community  
Fowler Lake Management District  
Galena, City of  
Green Bay Metropolitan Sewage District  
Green Lake Sanitary District  
Hillsboro, City of  
Hubbard, Township of  
Illinois Dept. of Transportation  
Lac Courte Oreilles Governing Board  
Lac Du Flambeau Indians  
Lac La Belle Management Dist.  
Little Arbor Vitae Protection and Rehabilitation District  
Little Green Lake Protection and Rehabilitation District  
Little Muskego Lake District  
Little St. Germain Lake District  
Loon Lake/Wescot Management District  
Madison Metropolitan Sewage District  
Marquette County Land Conservation  
Mead, Township of  
Menominee Indian Tribe of Wisconsin  
Merton, Township of  
Muskego, City of  
Norway, Town of  
Oconomowoc Lake, Village of  
Okauchee Lake Management District  
Oneida Tribe of Indians  
Peshtigo, City of  
Powers Lake Management District  
Red Cliff Indians  
Rock County Public Works Department  
Southeastern Wisconsin Regional Planning  
Commission  
Stockbridge-Munsee Indians  
Thorp, City of  
Waukesha Water Utility  
Waupun, City of  
Wind Lake Management District  
Whitewater-Rice Lake management District  
Wisconsin Department of--  
Justice  
Natural Resources  
Transportation  
Wisconsin Geological Survey  
Wisconsin Winnebago Business Committee  
Wittenberg, Village of

Wyoming:

Cheyenne, City of  
Evanston, City of  
Evansville, Town of  
Freemont County Weed and Pest Control  
Gillette, City of  
Laramie County  
Medicine Bow Conservation District  
Midvale Irrigation District  
Northern Arapahoe Tribe  
Pinedale, City of  
Sheridan Area Water Supply Joint Power Board  
Shoshone Tribe  
Teton County  
Uinta County  
Water Development Commission  
Wind River Environmental Quality Commission  
Wyoming Department of--  
    Agriculture  
    Environmental Quality  
    Game and Fish  
    Highways  
Wyoming State--  
    Attorney General  
    Governor's Office

Wyoming--continued

State Engineer  
Water Research Center

Commonwealth and Territories:

Commonwealth of N. Mariana Islands,  
    Dept. of Public Health and Environmental Services  
Commonwealth Utility Commission  
Government of --  
    American Samoa, Dept. of Public Works  
    Guam, Environmental Protection Agency  
Republic of Palau  
Municipality of Rota, Luta Soil and Water Conservation  
Municipality of Tinian  
Phonpei State Government

Puerto Rico:

Aqueduct and Sewer Authority  
Dept. of Natural Resources  
Economic Development and Stability Board  
Electric Power Authority  
Environmental Quality Board  
Industrial Development Company

Virgin Islands:

Virgin Islands Water and Power Authority

**Appendix B--U.S. Geological Survey Water-Resources  
Investigations And Research in Coastal and Wetlands Environments**

**Part 1. Investigations conducted by field offices.**

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Alabama	AL057	Ground-Water Management Techniques for Dauphin Island	10/01/84 - 09/30/90
Alaska	AK 169	Hydrologic and Sediment Transport Characteristics of the Lower Copper River Delta	10/01/86 - 09/30/87
	AK171	Estuarine Hydrodynamics of Turnagain Arm	10/01/86 - 09/30/91
	AK174	Fiord-Closure Potential of Hubbard Glacier	10/01/87 - 09/30/91
Arizona	AZ088	Reconnaissance Investigation of the Hydrologic System in the San Bernadino Valley, Southeast Arizona	01/01/85 - 02/28/91
	AZ097	Irrigation Drainage Quality Activities for the Lower Colorado and Gila River Valley Projects	09/01/85 - 09/30/88
Arkansas	AR058	Wetland Research Project, Black Swamp, Cache River, Woodruff County	10/01/86 - 09/01/92
California	CA324	Computer Models for Computation of Tidal River Discharge	07/01/75 - 09/30/89
	CA342	Ground-Water Resources of the Santa Barbara Area	07/01/77 - 09/01/93
	CA382	Development of a Moving Boat Discharge-Measuring System Using an Acoustic Doppler Current Profiler	01/01/87 - 09/30/91
	CA419	Estimating Tidal and Residual Circulation in San Francisco Bay	10/01/83 -
	CA429	Saltwater Intrusion at Santa Barbara	10/01/85 - 09/30/89
	CA432	Stable Carbon Isotope Study of Primary Carbon Sources and Food Chain Network for Striped Bass in the Sacramento-San Joaquin Delta Aquatic Ecosystem	10/01/83 - 09/30/88
	CA443	Evaluation of Techniques for Measuring Currents in the San Francisco Bay	10/01/83 - 02/09/90
	CA448	Hydrogeology and Water Resources of the Los Osos Valley Ground-Water Basin, San Luis Obispo County	10/01/84 - 09/30/88
	CA452	Regional-Effects Monitoring in San Francisco Bay	10/01/86 - 09/30/90
	CA453	Irrigation Drainage Field-Screening Study of Sacramento Refuge Complex	10/01/87 - 09/30/89

## Appendix B--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
California	CA460	Irrigation Drainage Field-Screening Study of Klamath Basin Refuge Complex	10/01/87 - 12/26/90
	CA462	Irrigation Drainage Field-Reconnaissance Study, Salton Sea Area	05/01/86 - 07/20/89
	CA463	Irrigation Drainage Field Reconnaissance Study, Tulare Lake	05/01/86 - 09/30/88
	CA470	Detailed Study and Assessment of Irrigation Drainage in the Salton Sea Area, Imperial Valley	10/01/87 - 09/01/94
	CA475	Effects of Nonpoint-Source Urban Runoff from Alameda County on South San Francisco Bay	10/01/88 - 09/01/92
	CA483	Optimum Control of Seawater Intrusion, Oxnard Plain, Ventura County	10/01/89 - 09/01/93
	CA484	Sources and Fate of Agricultural Pesticides in the San Francisco Bay Estuary	03/01/90 - 10/01/95
Colorado	CO193	Wetland, Ground Water, and Surface-Water Relationships in a Subalpine Valley in Grand County	10/01/84 - 11/13/90
	CO230	Irrigation Drainage Field-Screening Study of the Middle Arkansas River, Colorado and Kansas	11/01/87 - 09/30/91
	CO231	DOI Irrigation Drainage Field Screening of Gunnison River and Sweitzer Lake	11/ 1/87 - 09/01/93
	CO236	Irrigation Drainage Reconnaissance of the Pine River Area, Southern Ute Reservation, Southwestern Colorado	10/01/88 - 09/30/90
	CO250	DOI Irrigation Drainage Reconnaissance Investigation of the Dolores Project, Southwestern Colorado	04/01/90 - 03/01/92
Delaware	DE020	Water Levels and Salinity, Coastal Aquifers of Delaware and Maryland	04/01/85 - 09/30/87
	DE023	Potential Effects of Climate Change on the Water Resources of the Delaware River Basin	10/01/88 - 10/01/90
	DE025	Geochemistry of Ground Water in the Coastal Plain Aquifers of Southern New Castle County	01/01/91 - 09/01/93
Florida	FL325	Appraisal of the Shallow Aquifers of the Lower East Coast of Florida	10/01/79 - 07/02/90
	FL377	Environmental Assessment of the Charlotte Harbor Estuarine System, Southwest Florida	05/01/81 - 06/30/89

## Appendix B--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Florida	FL393	Flow Characteristics and Water Quality of Nassau River Basin and Estuary	10/01/81 - 07/25/91
	FL400	Saltwater-Intrusion Models for Selected Areas, West-Central Florida	10/01/82 - 09/16/88
	FL413	Impact of Reduced Freshwater Inflow on the Salinity Characteristics of the Withlacoochee River Estuary and the Coastal River Estuarine Zone of Citrus and Hernando Counties	10/01/83 - 03/31/88
	FL414	Impact of Altered Freshwater Flow on the Salinity Characteristics of the Anclote River Estuary	10/01/83 - 03/16/89
	FL415	Assessment of Hydrogeologic Conditions and Alternatives for Safeguarding Water Quality in Southwest Sarasota County	10/01/83 - 01/09/90
	FL416	Effects of Highway Runoff on the Water Quality of Wetlands and Ground Water	10/01/83 - 09/30/89
	FL438	Tide-Induced Circulation and Flushing Using Tide Gates in Residential Canals at Cape Coral	06/01/85 - 08/12/91
	FL445	Assessment of Water-Quality Processes Affecting Nutrients in Wetlands Stream	10/01/85 - 09/30/90
	FL446	Water-Resource Evaluation of the Freshwater Lens on Key West	10/01/85 - 07/12/90
	FL447	Salinity Characteristics and Effects of Freshwater Withdrawals, Myakka River	10/01/85 - 04/04/90
	FL449	Simulation of a Saltwater Plume from a Flowing Well in a Surficial Aquifer, Dade County	10/01/85 - 09/30/89
	FL454	Procedure for Assessing Contamination Probability in the Sole-Source Surficial Aquifer System, Southeast Florida, Using a Geographical Information System	10/01/86 - 09/30/89
	FL455	Feasibility of Storing Freshwater in Subsurface Formation, Cape Coral, Lee County,	10/01/86 - 09/30/89
	FL456	Impact of Pumping at the Northwest Wellfield on Adjacent Wetlands, Dade County	10/01/86 - 08/17/90
	FL458	Monitoring the Transition Zone Between Saltwater and Freshwater in the Major GW Producing Zones in the Coastal Area of Southwest Florida	10/01/86 - 09/30/91
	FL464	Saltwater Intrusion in Springs along the Coastal Margin of Citrus and Hernando Counties	10/01/86 - 09/30/90

## Appendix B--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Florida	FL468	Water Resources of Duval County	10/01/86 - 09/30/89
	FL476	Importance of Hydrologic and Vegetative Factors to Fish Ecology in a Seasonally Inundated Flood-Plain Forest	09/01/87 - 09/06/90
	FL477	Hydrologic Evaluation of Various Physical and Biological Indicators Used to Delineate Wetland Boundaries on North Florida Streams	10/01/87 - 09/30/91
	FL478	Occurrence and Significance of Saline Water in the Floridan Aquifer, Northeast Florida	10/01/87 - 09/30/91
	FL482	Fine Sediment Resuspension Processes and Light Attenuation in Shallow Estuarine Environments	10/01/87 - 09/01/92
	FL483	Application of Acoustical-Velocity Meter (AVM) System to Discharge Measurements in Low-Velocity Flow Conditions of South Florida Canals	10/01/87 - 12/31/91
	FL485	Saline Ground-Water Resources in the Uppermost Part of the Floridan Aquifer System, Pinellas County	01/01/88 - 09/13/91
	FL488	Freshwater Inflow to the Indian River Lagoon	10/01/88 - 09/01/92
	FL491	Assessment of Saltwater Intrusion in Coastal Broward County	10/01/88 - 09/01/93
	FL494	Assessment of Canal-Aquifer Interaction in the Surficial Aquifer System Using a Coupled Surface-Water and Ground-Water Flow Model, Broward County	10/01/88 - 09/01/92
	FL495	Water Motion and Retention Times in Kings Bay	10/01/88 - 09/30/91
	FL497	Light Attenuation in Estuarine and Coastal Waters of Southwestern Florida--Causes and Implications	10/01/89 - 09/01/92
	FL498	Circulation and Constituent Transport in Sarasota Bay	06/01/90 - 06/01/93
	FL499	Hydraulic and Salinity Characteristics of Matlacha Pass Estuary, Lee County	10/01/89 - 09/01/93
	FL509	Measurement of Point-and Nonpoint-Source Nutrient Loading to Estuaries With Emphasis on Tidally Dominated Rivers; a Case Study of Hillsborough Bay	08/01/90 - 09/01/92
	FL517	A Direct Methodology for Predicting Wetland Responses to Hydrologic Stresses	04/01/91 - 09/01/94
	FL523	Characteristics of the Secondary Porosity of Carbonate Injection Zones and Confining Units Underlying Peninsular Florida	10/01/91 - 09/01/93

## Appendix B--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Florida	FL525	Comparison and Evaluation of Techniques Used to Estimate Stormwater Runoff from Low-Gradient Streams in West-Central Florida	04/01/91 - 03/01/95
	FL526	Modeling the Hydrodynamics and Salinity of the Sebastian Creek Confluence	08/01/91 - 09/01/94
Georgia	GA075	Impact of Increased Water Use on the Quantity and Quality of the Ground Water Resources of Coastal Georgia	10/01/81 - 09/30/90
	GA083	Simulation of Fluid Flow in Fractured Limestone Formations Near Brunswick	10/01/83 - 06/20/89
	GA089	Effects of Ground-Water Pumping on Streamflow in the Lower Part of the Apalachicola, Chattahoochee, and Flint (ACF) River System, Alabama, Florida, and Georgia	10/01/86 - 09/30/90
	GA093	Relation of Flow and Transport Processes to Concealed Faults and Fracture Zones in a Multilayered Carbonate Aquifer System	10/01/87 - 09/01/92
	GA096	Hydrogeology of Cumberland Island and the Impact of Channel Deepening on the Freshwater Resources of the Island	08/01/88 - 09/01/93
	GA098	Hydrogeology of Caribbean Aquifers	10/01/88 - 09/30/90
	GA102	National Water Quality Assessment (NAWQA) Program: The Apalachicola-Chattahoochee-Flint (ACF) River Basin Study	10/01/90 - 09/01/96
Hawaii	HI166	Water Resources on the Island of Kahoolawe, Hawaii	04/01/88 - 06/10/91
	HI168	Ground-Water Availability Study, Kunsan, Kwang Ju, Taegu, Suwon, and Osan Air Bases, Republic of South Korea	04/01/89 - 06/10/91
	HI169	Appraisal of Ground-Water Supply Diego Garcia U.S. Naval Support Facility, British Indian Ocean Territory	10/01/89 - 09/01/99
	HI172	Water Resources of Kona, Hawaii	10/01/90 - 09/01/93
	HI178	Proxy Records for Tropical Pacific Paleohydrology and Paleoclimate from Banded Corals	10/01/90 - 09/01/91
	HI611	Ground-Water Development and Water Quality Assessment for Tutuila, American Samoa	10/01/88 - 09/01/92

## Appendix B--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Hawaii	HI714	Test Drilling Program in the Kagman Area, Saipan	06/01/88 - 09/30/89
	HI716	Geohydrology of Tinian, Commonwealth of the Northern Mariana Islands	05/01/90 - 09/01/94
	HI719	Appraisal of Ground-Water Availability and Contamination at U.S. Army Installations, Kwajalein Atoll, Republic of the Marshall Islands	04/01/90 - 09/01/92
	HI812	Water Resources Investigations of Islands in Truk State	10/01/82 - 09/30/90
	HI817	Ground-Water Resources of Majuro Atoll, Marshall Islands	03/01/84 - 09/30/87
	HI818	Comprehensive Ground-Water Resource Investigation of the Yap Islands	05/01/86 - 10/01/91
	HI819	Ground-Water Resource Evaluation in Pohnpei State, Mokil and Pinelap Atolls	06/01/86 - 09/30/88
	HI820	Ground-Water Hydrology of Marine Islands (Atolls), Yap State, Micronesia	10/01/86 - 09/30/88
	HI821	Ground-Water Resource Evaluations in Pohnpei State, Sapwuahfik Atoll	10/01/89 - 09/30/91
Idaho	ID157	Department of the Interior Irrigation Drainage Reconnaissance Study of American Falls Reservoir	10/01/87 - 07/19/90
	ID160	Development of a Hydraulic Model for the Snake River in the Vicinity of Deer Flats National Wildlife Refuge and Birds of Prey Areas to Determine Water-Surface Elevations for Minimal Allowable Streamflows at Swan Falls Dam	10/01/88 - 09/30/91
	ID171	Effects of Water Use on Recharge/Discharge Relations in the Mud Lake area, Southeastern Idaho	01/01/89 - 09/01/91
Illinois	IL081	Great Lakes Basin Ground-Water Contamination	01/01/87 - 05/29/91
	IL093	Use of Merged SLAR and TM Imagery to Classify and Map Land Cover and Land Use	01/01/91 - 03/01/93
Indiana	IN087	Shallow GW Flow and Stream-Aquifer Relations in the Great Marsh Wetlands, Indiana Dunes National Lakeshore	10/01/83 - 03/31/89
	IN107	Water Quality of the Calumet Aquifer in the Drainage Basin of the Grand Calumet River/Indiana Harbor Canal, Northwest Indiana	10/01/85 - 10/01/89

## Appendix B--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Indiana	IN133	Pollutant Discharges to Coastal Areas: Estimation of TotalMetal Loads	04/01/90 - 09/30/91
Kentucky	KY092	Investigation of Potential Environmental Contamination at the Kentucky Air National Guard Facility, Standiford Field, Louisville	09/01/90 - 09/01/92
Louisiana	LA071	Mississippi Empayment - West Gulf Coast Regional-Aquifer-System Analysis	04/01/82 - 01/28/91
	LA087	Hydraulics of the Lower Calcasieu River	04/01/84 - 08/06/87
	LA088	Determination of Flood Characteristics for Coastal Streams in Louisiana	10/01/84 - 09/30/90
	LA093	Analysis of the Occurrence, Movement, and Fate of Selected Hazardous Substances in the Lower Calcasieu River	04/01/85 - 09/01/92
	LA102	Investigation of an Emergency Water Supply for Jefferson Parish	10/01/88 - 09/30/91
	LA109	Assessment of Potential Trace Elements in Coastal Louisiana Streams using Sediment-Trace Element Models	01/01/91 - 03/01/93
Maine	ME031	Hydrology of Peat Bogs in Maine	04/01/80 - 09/30/91
Maryland	MD037	Analysis by Use of Digital Models of the Coastal Plain Aquifers Underlying Maryland and Delaware	10/01/79 - 05/29/90
	MD074	Hydrologic Characteristics of the Lower Patapsco Aquifer in Anne Arundel County	07/01/83 - 10/16/89
	MD080	Modeling Nonpoint Source Inputs to the Patuxent River Estuary	05/01/84 - 09/01/92
	MD081	Ground-Water Supply Potential in Somerset County	04/01/85 - 08/25/89
	MD085	Effects of Agricultural Best Management Practices on Shallow Ground Water in the Patuxent River Basin	07/01/85 - 09/01/92
	MD092	Brackish Water Intrusion at Indian Head	10/01/87 - 09/01/90
	MD094	Bay-Water Intrusion into Aquifers of Anne Arundel County	10/01/87 - 06/01/92
Massachusetts	MA068	Hydrology of a Flood-Plain Wetland and Its Influence on Streamwater Quality in Massachusetts	10/01/83 - 09/30/91
	MA083	Predicting Wetland Influences on Stream-Water Quality	10/01/87 - 09/30/90

## Appendix B--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Massachusetts	MA094	Aquifer Yields in the Cape Cod, Martha's Vineyard, and Nantucket Island Ground-Water basins	10/01/89 - 09/01/92
	MA098	Ground-Water Resources of the Buzzards Bay Planning Basin	04/01/91 - 05/01/93
Michigan	MI045	Ground-Water Movement near Upper Great Lakes Connecting Channels, Michigan	07/01/85 - 12/13/88
	MI056	Water Resources of Keweenaw Bay	05/01/91 - 09/01/92
Minnesota	MN104	Effects of Treated Wastewater Discharge on Hydrology and Water Quality of Wetlands in Minnesota and Wisconsin	04/01/85 - 06/20/90
	MN112	Ground-Water Flow in the St. Peter-Platteville-Drift Aquifer System Related to Contamination by Coal-Tar Derivatives, St. Louis Park	04/01/87 - 09/30/90
Mississippi	MS072	Mississippi Coastal Area Ground-Water Investigation and Digital Model	04/01/84 - 09/30/87
Montana	MT115	Irrigation Drainage Field-Screening Study, Sun River Unit	06/01/86 - 03/15/88
	MT116	Irrigation Drainage Field-Screening Study, Milk River Unit	06/01/86 - 03/15/88
	MT132	Phase Two Irrigation Drainage Investigation: Water Quality in the Sun River Area, West-Central Montana	05/01/90 - 09/01/93
Nevada	NV141	Water-Quality Reconnaissance of Irrigation Return Flows Affecting Wildlife Management Areas in the Newlands Irrigation Project Area, Churchill County	10/01/85 - 09/30/88
	NV143	Preliminary Plan of Study on Irrigation Drainage Quality in and Near the Stillwater Wildlife Management Area, Churchill County	05/01/86 - 07/12/89
	NV148	Irrigation Drainage, Stillwater	10/01/87 - 09/30/90
	NV159	Reconnaissance Investigation of Water Quality Bottom Sediment and Biota Associated with Irrigation Drainage In and Near the Humboldt Wildlife Management Area	01/01/90 - 09/01/91
New Jersey	NJ036	Land Subsidence Related to Ground-Water Withdrawals in the Coastal Plain of New Jersey	10/01/78 - 09/30/90
	NJ043	Simulation of Multilayer Coastal Plain Aquifer System of New Jersey	10/01/79 - 09/30/88

Appendix B--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
New Jersey	NJ061	Hydrologic Processes with Special Emphasis on GW Quality Near Atlantic City	07/01/83 - 09/30/91
	NJ064	Hydrologic Processes with Special Emphasis on GW Quality Near South River	07/01/83 - 09/30/91
	NJ088	Ground-Water Withdrawals and Use in South River Area	10/01/85 - 02/01/90
	NJ093	Optimal Withdrawals from a Coastal Aquifer Subject to Salt-water Encroachment: Numerical Analysis and Case Study	10/01/86 - 09/30/91
	NJ108	Water Resources and Saltwater Intrusion of the Holly Beach-Cohansey, Rio Grande, Atlantic City 800-foot Sand, and Piney Point Aquifers, Cape May County	10/01/88 - 09/01/91
	NJ110	Geophysical and Water-Quality Reconnaissance at the Ciba-Geigy Superfund Site, Toms River, Ocean County	10/01/88 - 09/30/91
	NJ112	Effects of Streamflow Diversions on the Water-Quality of Selected New Jersey Estuaries	10/01/88 - 09/30/91
	NJ114	Optimization of Ground-Water-Withdrawal Strategies for the Coastal Plain Aquifer System	10/01/89 - 09/01/92
	NJ118	Relations Between Ground-Water Hydrology and 1 Wetland Vegetative Ecology	0/01/90 - 09/01/93
	NJ121	Effects of Freshwater Withdrawals on Estuarine Water Quality of the Toms and Metedeconk Rivers	10/01/90 - 09/30/91
New Mexico	NM357	DOI Irrigation Drainage Program Field-Screening Study of Middle Rio Grande Project, Bosque del Apache National Wildlife Refuge	10/01/87 - 09/01/91
	NM362	Reconnaissance Investigations of Irrigation Drainage in the San Juan River Area, San Juan County, Northwestern New Mexico	01/01/90 - 01/31/92
New York	NY125	Hydrologic Models of the Ground-Water Flow System on Long Island	10/ 1/83 -
	NY147	Saltwater Encroachment in Nassau County, Long Island	4/01/84 - 09/30/89
	NY170	Fate and Transport of Landfill Leachate in a Phragmites Wetland	10/01/87 - 10/01/91

## Appendix B--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
New York	NY172	Advective Transport and Saltwater Influences on the North Fork of Long Island	10/01/87 - 09/30/91
	NY175	Resource - Management Evaluation and Study of Saltwater Movement within the Transition Zone of the Hudson River Estuary	05/01/88 - 09/01/92
	NY190	Effects of Stormwater Detention in Wetlands of the Lower Irondequoit Creek Basin near Rochester	10/01/89 - 09/01/94
	NY202	Geohydrology of Northern Nassau County, Long Island	10/01/90 - 09/01/95
North Carolina	NC071	North Carolina Coastal Plain Aquifer Study	10/01/79 - 09/30/90
	NC074	Effects of Stream Restoration on the Hydrology of the Grove Creek Watershed near Kenansville, and Open Marsh Water Management of Salt Marshes at Hobucken and West Onslow Beach	10/01/82 - 09/30/91
	NC084	An Appraisal of the Ground-Water Resources of Camp Lejeune Marine Corps Base	04/01/86 - 09/01/93
	NC091	Estuarine Water Quality and the Management of Artificial Drainage from Wetlands	10/01/87 - 09/01/92
	NC092	Determination of Flows and Flow Patterns in the Pamlico River and Neuse River Estuaries	10/01/87 - 09/01/92
	NC093	Hydrologic Characteristics and Water-Quality Trends of the Albemarle-Pamlico Estuarine System	10/01/87 - 09/30/91
	NC098	Analysis of Estuarine Water Quality Using Continuous-Monitoring Data	10/01/88 -
	NC105	Hydrodynamics of Estuarine-River Mixing Zone	10/01/90 - 09/01/92
	NC106	National Water Quality Assessment--Albemarle-Pamlico Drainage Study	10/01/90 -
	North Dakota	ND141	Trace-Element Distributions in Flow-Through Prairie Pothole Wetlands in North Dakota
Ohio	OH096	Lake Erie Tributary Loading - Ohio, Indiana, and Michigan	08/01/87 -
Oregon	OR138	Iron Geochemistry of the Dunes Aquifer near Coos Bay	10/01/85 - 06/01/91
	OR147	DOI Irrigation Drainage Field-Screening Study of Malheur National Wildlife Refuge	10/01/87 - 06/06/91

## Appendix B--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Oregon	OR149	Streambed Scour Predictions for the Waldport Bridge Pier Locations at the Alsea River Estuary Crossing, Waldport	01/01/88 - 11/01/91
	OR157	Role of Disturbed Marshland and Reservoir Regulation in Causing Excessive Nutrient Enrichment in Upper Klamath Lake	02/01/89 - 06/05/91
	PN360	Department of Interior Irrigation Drainage Reconnaissance Study of the Owyhee-Vale Irrigation Projects, Oregon and Idaho	10/01/89 - 09/01/92
Puerto Rico	PR090	Water Resources of the North-Coast Limestone Aquifers	01/01/84 - 09/01/92
	PR094	Caribbean Island Aquifers Regional Aquifer System Analysis	10/01/84 - 09/01/92
	PR097	Inter-Aquifer Water Movement Within the Limestone Aquifers of the North Coast	06/01/87 - 09/01/92
	PR100	Ground-Water Development in the U.S. Virgin Islands	01/01/89 - 09/01/92
	PR103	Water Resources of the Rio Majada and Rio Lapa Alluvial Valleys	10/01/88 -
	PR105	Ground-Water Development Strategy for the U.S. Virgin Islands	10/01/88 - 09/30/90
	PR113	Storm-Wave Swash Caused by the Passage of Hurricane Hugo Over the U.S. Virgin Islands and Eastern Puerto Rico, September 17-18, 1989	10/01/89 - 06/30/91
	PR115	Environmental Assessment in the Vicinity of the Mayaguez Ocean Outfall	11/01/90 - 09/01/91
	PR119	Locating the Saline-Freshwater Interface Zone in the Valle de Yabucoa Alluvial Aquifer	10/01/90 - 09/01/92
Rhode Island	RI024	Determination of the Fresh Surface-Water Inflow to Narragansett Bay	07/01/86 - 09/30/89
	RI026	Ground-Water Appraisal of Block Island	10/01/87 - 09/30/91
	RI028	Development Alternatives in the Usquepaug-Queen Ground-Water Reservoir	10/01/88 - 09/01/93
South Carolina	SC048	Southeast Coastal Plain Regional Aquifer System Study	10/01/79 - 06/30/87
	SC056	Saltwater Encroachment in the Limestone Aquifer in the Hilton Head Island Area	01/01/84 - 09/30/91

## Appendix B--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
South Carolina	SC063	Impact of Water Withdrawal from the Intracoastal Waterway and Bull Creek in the Grand Strand Area	10/01/84 - 09/30/87
	SC071	Simulation of Transport of Striped Bass Eggs in Congaree, Wateree, and Santee Rivers	03/01/87 - 08/29/91
	SC083	Hurricane Hugo Tidal Floods of September 21-22, 1989, Along the South Carolina Coast	10/01/89 - 09/01/91
	SC084	Computation of Discharge in the Cooper River, Back River, and Foster River Area from Pinopolis Dam to Yellow House Creek	04/01/90 - 03/01/92
	SC087	Investigation of Nonpoint-Source Pollutants in the Myrtle Beach Area	12/01/90 - 09/30/91
	SC088	Assessment of Foster Creek at Naval Weapons Station, Charleston	03/01/91 - 09/01/92
	SC090	Sensitivity of the Water Supply Potential of the Intracoastal Waterway/Lower Pee Dee River to Climate Change and Sea Level Rise	01/01/91 - 09/01/91
South Dakota	SD086	Department of Interior (DOI) Irrigation Drainage Program Field-Screening Study of the Angostura, Unit	02/01/88 - 09/12/90
	SD087	DOI Irrigation Drainage Program Field-Screening Study of the Belle Fourche Project	02/01/88 - 11/20/90
Tennessee	TN078	Documentation and Analysis of Sediment Deposition in Wetlands through Botanical and Sedimentological Techniques	10/01/87 - 09/30/91
Texas	TX100	Irrigation Drainage Quality of the Lower Rio Grande Valley	03/01/86 - 09/30/88
	TX126	Status of the Gulf of Mexico: Freshwater inflows-- Case Studies on Trends in Historical Flows	08/01/90 - 09/01/91
Utah	UT179	Irrigation Drainage Problems at Stewart Lake Waterfowl Management Area	06/01/86 - 09/19/88
	UT191	Detailed Study of Irrigation Drainage in the Middle Green River Basin, Utah	10/01/87 - 09/01/91
	UT213	Ashley Creek and Green River Selenium Remediation	10/01/90 - 09/01/93
Virginia	VA057	Analysis of Aquifer System in the Coastal Plain of Virginia	10/01/79 - 09/30/87
	VA076	Analysis of Ground-Water Flow in the Coastal Plain of Southeastern Virginia	07/01/84 - 09/30/87

Appendix B--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Virginia	VA083	Ground Water of the Eastern Shore Peninsula	10/01/86 - 09/30/90
	VA088	Shallow Ground-Water Resources of Eastern York County	01/01/89 - 06/01/92
	VA093	Biogeochemical Processes Controlling Nitrate Concentrations in Ground-Water Discharge	10/01/90 - 09/01/94
Washington	WA303	Rainfall-Runoff Models for Small Basins in Metropolitan Areas of Western Washington	10/01/84 - 09/30/89
	PN359	Upstream Boundaries for the State of Washington Shoreline Management Act of 1971	07/01/90 - 06/01/92
	PN372	Occurrence and Quality of Ground Water on Guemes Island, Skagit County	04/01/91 - 03/01/93
West Virginia	WV073	Assimilative Capacity of a High Altitude Wetland, Canaan Valley	10/01/90 - 09/01/93
	WV074	Microenvironmental Determinants of Denitrification in Wetlands	10/01/90 - 09/01/93
Wisconsin	WI090	Reconnaissance of Nonpoint Source Pollution	10/01/77 - 09/01/93
	WI143	Ground-Water Levels on Crex Meadows Wildlife Area, Burnett County	11/01/84 - 08/14/89
	WI161	PCB and Other Contaminant Loads to Green Bay, Lake Michigan	10/01/87 - 12/01/92
	WI167	Mobility and Diffusivity of Polychlorinated Biphenyls (PCBs) in Bottom Sediments and Interstitial Water of the Lower Fox River, Northeastern Wisconsin	05/01/89 - 09/30/91
	WI170	Hydrogeological Assessment and Guidelines Development for Wetland Restoration and Creation Projects	11/01/89 - 09/01/96
	WI175	Hydrologic and Biogeochemical Budgets in Temperate Lakes and Their Watersheds, Northern Wisconsin	12/01/90 - 09/01/93
Wyoming	WY096	Water-Quality Field Screening of Irrigation Drainage from the Kendrick Project near Casper	01/01/86 - 11/18/87
	WY104	Trace Elements in Water, Soil, and Rocks of the Kendrick Irrigation Project, Natrona County	08/01/87 - 01/15/90
	WY106	Field Screening Study of Water Quality, Bottom Sediments and Biota of the Riverton Irrigation Project, Fremont County	10/01/87 - 11/10/90

## Appendix B--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Wyoming	WY111	Detailed Study and Assessment of Irrigation Drainage in the Kendrick Reclamation Project Area	10/01/87 - 09/30/91
<b>Part 2. <u>Investigations conducted by regional centers.</u></b>			
Central Region	CR266	Transport and Deposition of Sediments and Sediment-Borne Contaminants in Tidal Rivers and Estuaries	10/01/80 - 09/01/82
	CR293	The Role of Chemical Fluxes in the Biogeochemistry of Inland Surface Waters, Including Lakes, Reservoirs, and Wetlands	10/01/84 -
Northeastern Region	NR019	Numerical Simulation Of Hydrodynamic Processes in Rivers	07/01/68 -
	NR065	Sedimentary Geochemical Processes Affecting the Exchange of Nutrients and Transition Metals Between Sediment and Water in Riverine, Estuarine, and Lacustrine Environments	07/01/75 -
	NR090	Remote Sensing and Ecological Research in Wetlands	06/01/72 -
	NR105	Northern Atlantic Coastal Plain Aquifer System Analysis (RASA)	10/01/79 - 09/01/87
	NR137	Great Lakes Basin Ground-Water Contamination Study through GIS	01/01/87 - 10/01/87
	NR143	Research Vessel Leopold Operations in Potomac River, Chesapeake Bay, and Adjacent Coastal Waters	05/01/88 - 01/01/99
	NR145	Vegetation and Hydrogeomorphic Relations	10/01/89 -
Western Region	WR043	Dispersion Processes in Estuaries and Rivers	07/01/67 - 09/30/88
	WR046	Geochemistry of Riverine and Estuarine Waters	09/01/67 -
	WR060	Circulation Patterns and Sediment Transport in San Francisco Bay and Adjacent Ocean	07/01/70 - 09/30/88
	WR140	Hydrodynamics and Mathematical Modeling of Circulation and Transport Phenomena in Tidal Estuaries	07/01/75 -
	WR164	Plankton Dynamics in Tidal Estuaries	10/01/78 -
	WR192	Environmental Influences on Estuarine Benthic Community Dynamics	10/01/86 - 09/01/99

## Appendix C--Selected U.S. Geological Survey Investigations And Research Related To Water-Resources Contamination

[NOTE: Asterisk (\*) following project number indicates investigation related to the effects of agricultural chemicals or practices on water resources.]

### Part 1. Investigations conducted by field offices

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Alabama	AL076	Determination of Storm-Water Runoff Quality in Birmingham	03/01/90 - 09/01/92
	AL077	Streamflow, Water Quality, and Time of Travel, Big Creek Lake, and Water Quality at Mobile River at Bucks	03/01/90 - 09/01/93
	AL078	An Assessment of Hydrological Problems Associated With Aquaculture in West-Central Alabama	06/01/90 - 09/15/91
	AL079	Determination of Storm-Water Runoff Quality in Montgomery	10/01/90 - 09/01/93
Alaska	AK150	Hydrology and Geochemical Processes at a Sub-Arctic Landfill, Fairbanks	10/01/82 - 03/22/90
	AK154	Unsaturated Flow near Leach Fields in a Subarctic Environment	10/01/83 - 09/30/88
	AK163	Ground-Water Contamination in Glacial Materials: Methods of Investigation	10/01/85 - 09/30/89
	AK168	Ground-Water Conditions at Landfills in the Matanuska-Susitna Borough	02/01/86 - 09/30/88
	AK172	Assessment of Ground-Water Contamination at the U.S. Coast Guard Support Center, Kodiak Island	02/01/87 - 09/30/90
	AK173	Installation Restoration Program--Clear Air Force Station	10/01/87 - 09/30/91
Arizona	AZ082	Movement of Contaminants in Ground Water, Lower Wash and Pinal C. Basins	04/01/84 - 09/01/93
	AZ097*	Irrigation Drainage Quality Activities for the Lower Colorado and Gila River Valley Projects	09/01/85 - 09/30/88
	AZ101	Contaminants in Runoff, Greater Tucson Area	10/01/86 - 09/01/93
	AZ106	Evaluation of the Hydrologic Impacts Associated with In-Situ Copper-Leaching Experiment near Casa Grande	06/01/87 - 09/30/88
	AZ110	Occurrence and Movement of Radionuclides and Other Trace Elements in the Puerco and Lower Little Colorado River Basins, Arizona and New Mexico	10/01/86 - 09/01/92

## Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Arizona	AZ116	Trend Analysis of Water-Quality Data at Stream Gages in the Salt and Gila River Basins	07/01/89 - 09/30/90
	AZ125	Solute Balance and Geochemical Interactions, Roosevelt Lake	10/01/90 - 09/01/92
	AZ126	Signature and Mapping of Nitrates in Ground Water	10/01/90 - 09/01/93
	AZ127	Flood-Model Assessment and Water-Quality Characterization of Urban-Runoff, Maricopa County	04/01/91 - 09/01/93
	AZ129	Geochemical Investigation in and near Abandoned Uranium Mines, Cameron and Monument Valley Mining Districts	08/01/91 - 09/01/92
Arkansas	AR057	Installation Restoration Program - Stage 1 Little Rock Air Force Base, Little Rock	11/01/86 - 09/30/90
	AR064	Hydrologic Surveillance of Lakes Maumelle and Winona in Central Arkansas	05/01/89 - 09/01/93
	AR065	Processes and Controls Affecting Anisotropic Flow and Contaminant Transport Potential of Caronate-Rock Aquifers	10/01/89 - 09/01/93
	AR066	Vulnerability to Potential Surface Contamination of Public Water-Supply wells in Arkansas	10/01/89 - 09/30/90
	AR067*	National Water-Quality Assessment Program: Ozark Plateaus Study Unit	10/01/90 - 09/01/99
	AR068	Determination of Storm-Water Runoff Quality in Little Rock	03/01/91 - 09/01/93
California	CA400	Transport of Contaminants from Underground Wastewater Disposal Systems, Upper Mojave River Basin	10/01/87 - 09/30/90
	CA421*	San Luis Drain Receiving Water Monitoring Studies	01/01/83 - 05/01/90
	CA422	Application of Urban Rainfall-Runoff and Runoff-Quality Models to Three Catchments in Fresno	10/01/85 - 09/30/88
	CA428	Central Valley RASA II	01/01/85 - 09/30/90
	CA441*	An Assessment of Quality and Contaminant Transport in the Soils and Ground Water of the San Luis Project Service Area	10/01/83 - 05/01/90
	CA453*	Irrigation Drainage Field-Screening Study of Sacramento Refuge Complex	10/01/87 - 09/30/89

Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
California	CA455	Hydrologic Evaluation of a Gasoline Leak at the Seal Beach Naval Weapons Station	10/01/84 - 02/09/90
	CA456*	Western San Joaquin Valley Hydrologic Studies	10/01/84 - 09/30/90
	CA458	Effects of Urban Storm Runoff in Receiving Soils and Ground Water in Fresno	10/01/85 - 09/30/87
	CA460*	Irrigation Drainage Field-Screening Study of Klamath Basin Refuge Complex	10/01/87 - 12/26/90
	CA462	Irrigation Drainage Field-Reconnaissance Study, Salton Sea Area	05/01/86 - 07/20/89
	CA463*	Irrigation Drainage Field Reconnaissance Study, Tulare Lake	05/01/86 - 09/30/88
	CA464*	Ground-Water Quality in the Bunker Hill Basin, San Bernardino Valley	10/01/85 - 10/25/88
	CA465	Effects of Urban Runoff on Quality of the San Joaquin River near Three Urban Storm-Water Outfalls in Fresno	10/01/86 - 09/30/89
	CA466*	Evaluation of Ground-Water Contamination from Agricultural Irrigation, Lompoc	10/01/86 - 09/01/93
	CA470*	Detailed Study and Assessment of Irrigation Drainage in the Salton Sea Area, Imperial Valley	10/01/87 - 09/01/94
	CA475	Effects of Nonpoint-Source Urban Runoff from Alameda County on South San Francisco Bay	10/01/88 - 09/01/92
	CA480*	Nitrates in the Hemet Ground Water Subbasin	01/01/90 - 09/01/93
	CA481*	Process Governing the Distribution and Mobility of Dissolved Solids and Selected Trace Elements in Shallow Ground Water, Tulare Lake Basin	10/01/89 - 09/01/93
	CA484*	Sources and Fate of Agricultural Pesticides in the San Francisco Bay Estuary	03/01/90 - 10/01/95
	CA485	San Joaquin-Tulare Basins National Water Quality Assessment Program	12/01/90 - 01/01/01
	CA489*	Irrigation Drainage Detailed Study of Klamath Basin, California and Oregon	10/01/91 - 09/01/93
	CA491	National Water Quality Assessment Program-- National Synthesis	10/01/90 - 01/01/01

## Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Colorado	CO097	Effects of Sludge Land Disposal on Ground-Water Quality	05/01/77 - 09/30/90
	CO180*	Evaluation of Nonpoint-Source Contamination of the Fountain Creek Alluvial Aquifer	04/01/84 - 09/30/90
	CO197*	Ground-Water Quality Effects of Soil Application of Sewage Sludge on Farmland near Denver	10/01/84 - 09/30/91
	CO217	Mechanisms of Stream Recovery from Metal Contamination	02/01/86 - 09/01/93
	CO218	Effects of Current and Projected Wastewater Effluents on Fountain and Monument Creeks	04/01/86 - 09/30/91
	CO221	Hydrology and Geochemistry of Reclaimed Coal Spoils in Northwestern Colorado	08/01/86 - 09/30/90
	CO222	Hydrology and Geochemistry of Reclaimed Coal Spoils in Northwestern Colorado	08/01/86 - 09/30/90
	CO226	U.S. Air Force Academy Installation Restoration Program Study	10/01/87 - 09/01/93
	CO231*	DOI Irrigation Drainage Field Screening of Gunnison River and Sweitzer Lake	11/01/87 - 09/01/93
	CO236*	Irrigation Drainage Reconnaissance of the Pine River Area, Southern Ute Reservation, Southwestern Colorado	10/01/88 - 09/30/90
	CO241	Comparison of Water-Quality Simulation Results for the SouthPlatte River from Littleton to Denver	06/01/89 - 02/05/91
	CO245	The Effects of Leachate from Sewage-Sludge-Disposal Areas on Ground-Water Quality	10/01/89 - 09/01/94
	CO248	Upper Arkansas River Metal Loads	06/01/90 - 09/01/93
	CO252	Surface-Water and Ground-Water Monitoring and Evaluation Rocky Mountain Arsenal.	08/01/90 -
	CO260*	The Effects of Agricultural Application of Sewage Sludge on the Unsaturated Zone and Saturated Zone of Farmland near Denver	10/01/90 - 09/01/94
Connecticut	CT052	Transport and Concentrations of PCB and Suspended Sediment in the Housatonic River in Western Connecticut	07/01/84 - 01/31/91
	CT054	The Effects of Atmospheric Deposition on Surface-Water Quality in the Salmon River Basin	10/01/85 - 09/30/90

## Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Connecticut	CT055*	Effect of Pesticides on Ground-Water Quality in Connecticut	10/01/86 - 03/25/91
	CT056	Occurrence and Distribution of Selected Radionuclides in Connecticut Ground Water	10/01/87 - 09/30/91
	CT057	Workplan for Proposed Research Study of Gasoline Contamination in Fractured Bedrock.	09/01/88 - 09/30/89
District of Columbia	DC012	Bolling Air Force Base/Andrews Air Force Base - Installation Restoration Program - Ground-water Contamination	09/01/87 - 09/30/91
Delaware	DE022*	The Occurrence of Pesticides in the Shallow Ground Water of Two Agricultural Areas in Delaware	01/01/88 - 09/30/90
	DE025*	Geochemistry of Ground Water in the Coastal Plain Aquifers of Southern New Castle County	01/01/91 - 09/01/93
Florida	FL154	Subsurface Waste Storage, Statewide	10/01/70 - 09/01/93
	FL362	Evaluation of Stormwater Detention Basins in the Tampa Bay Area, West-Central Florida	10/01/80 - 09/01/92
	FL406	Transport of Organic Contaminants in Ground Water, Pensacola	10/01/82 - 09/30/89
	FL422*	Impacts of Selected Developmental Activities on the Quality of Water in the Floridan Aquifer System, Central Florida	04/01/84 - 09/30/90
	FL425	Reconnaissance of Water Quality at a Department of Energy Site, Pinellas County	05/01/84 - 09/30/87
	FL430	Geologic Controls on Ground-Water Movement and Contamination in Polk County	10/01/84 - 09/30/88
	FL432*	Effects on Ground-Water Quality from the Application of Domestic Wastewater-Treatment Sludge to Soils Overlying the Biscayne Aquifer, Dade County	10/01/84 - 10/04/91
	FL439	Numerical Simulation of the Migration of Landfill Leachate in a Highly Permeable Surficial Aquifer, Palm Beach County	06/01/85 - 09/30/88
	FL442	Effects of Septic Tanks and Domestic Wells on Water Quality and Levels, Northeast Palm Beach County	10/01/85 - 11/27/91
	FL446	Water-Resource Evaluation of the Freshwater Lens on Key West	10/01/85 - 07/12/90

## Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Florida	FL449	Simulation of a Saltwater Plume from a Flowing Well in a Surficial Aquifer, Dade County	10/01/85 - 09/30/89
	FL451*	Nutrient Loads in the Apopka-Beauclair Canal, Upper Oklawaha Basin, Central Florida	05/01/86 - 09/30/91
	FL452	Delineation of Protection Zones Around Public Supply Wells in Florida	10/01/86 - 09/30/89
	FL454	Procedure for Assessing Contamination Probability in the Sole-Source Surficial Aquifer System, Southeast Florida, Using a Geographical Information System	10/01/86 - 09/30/89
	FL458	Monitoring the Transition Zone Between Saltwater and Freshwater in the Major GW Producing Zones in the Coastal Area of Southwest Florida	10/01/86 - 09/30/91
	FL459*	Sources of Nitrogen in Ground Water from Areas Subject to the Application of Wastewater by Spray Irrigation and Commercial Fertilizers near Tallahassee	10/01/86 - 01/11/90
	FL464	Saltwater Intrusion in Springs along the Coastal Margin of Citrus and Hernando Counties	10/01/86 - 09/30/90
	FL465*	Potential for Contamination of the Floridan Aquifer System, West-Central Florida	10/01/86 - 08/19/91
	FL466	Floridan Aquifer System Water Quality in an Area of Drainage-Well Inflow	10/01/86 - 10/31/90
	FL471	Ground-Water Quality in the Vicinity of Stormwater Ponds, Pineallas County	10/01/86 - 09/30/89
	FL472	Assessment of a Disposal Site	10/01/86 - 12/10/91
	FL473	Hydrologic Impacts of Phosphate Mining on Small Basins, Central Florida	04/01/87 - 03/01/92
	FL475*	Use of an Existing Data Base to Investigate Factors Related to the Occurrence of Ethylene Dibromide (EDB) in Ground Water	03/01/87 - 09/30/90
	FL478	Occurrence and Significance of Saline Water in the Floridan Aquifer, Northeast Florida	10/01/87 - 09/30/91
	FL480	Characterization of Water Quality for the Major Aquifer Systems in Florida	10/01/87 - 12/31/91
	FL489	Water Quality in the Winter Park Chain of Lakes	10/01/88 - 09/01/93

## Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Florida	FL491	Assessment of Saltwater Intrusion in Coastal Broward County	10/01/88 - 09/01/93
	FL493	Hydrogeology and the Effects of Degradation of the Airport Landfill Materials on Geochemistry of Ground Water Southwest of Tallahassee	10/01/88 - 09/30/91
	FL502*	Leaching of Selected Chemical Constituents from Soil Amended with Crab Scrap Compost	01/01/90 - 12/20/91
	FL503*	North Florida Dairies and their Effects on Ground-Water	02/01/90 - 09/01/92
	FL509	Measurement of Point- and Nonpoint-Source Nutrient Loading to Estuaries With Emphasis on Tidally Dominated Rivers; a Case Study of Hillsborough Bay	08/01/90 - 09/01/92
	FL510*	Source and Extent of Nitrate-Nitrogen Contamination of Ground-Water Near the Staff Housing Area, MacDill Air Force Base	08/01/90 - 04/01/92
	FL511*	An Evaluation of the Effects of Nonpoint Source Pollution from Swine and Poultry Operations on Ground- and Surface Water Quality in North Florida	10/01/90 - 03/01/93
	FL512	Effects of the Hillsboro Canal Pumpage on Water Quality of the Secondary Canals in Boca Raton	10/01/89 - 09/01/92
	FL516	Unsaturated Flow and Transport Under Rapid Infiltration Basins	10/01/90 - 10/01/93
	FL518*	Influence of Municipal Reclaimed Water on the Leaching of Pesticides from Golf Courses in Florida	01/01/91 - 12/01/93
	FL524	Extent of Diesel Fuel Components in Ground Water Beneath an Ordinance Disposal Area, Avon Park Air Force Base	10/01/90 - 09/01/92
Georgia	GA075*	Impact of Increased Water Use on the Quantity and Quality of the Ground Water Resources of Coastal Georgia	10/01/81 - 09/30/90
	GA079*	Migration of Pesticides Through the Unsaturated and Saturated Zones at a Selected Site in Southeast Lee County	10/01/82 - 09/30/88
	GA087*	Movement and Fate of Agricultural Chemicals in the Subsurface, Southwest Georgia	10/01/84 - 09/01/92
	GA095	Hydrology of the Valdosta, Georgia Area and Impact of Withlacoochee River Recharge on the Quality and Quantity of the Upper Floridan Aquifer	06/01/88 - 09/01/92

## Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Georgia	GA097	Evaluation of the Migration and Fate of Contaminants at an Abandoned Gas Manufacturing Plant at Albany	12/01/88 - 09/01/92
	GA101	Use of Chlorofluorocarbons to Assess the Contamination Potential of a Limestone Aquifer in a Karst Terrane	10/01/90 - 04/01/92
	GA102*	National Water Quality Assessment (NAWQA) Program The Apalachicola-Chattahoochee-Flint (ACF) River Basin Study	10/01/90 - 09/01/96
	GA104	Ground-Water Flow and Quality in the Vicinity of Savannah River at the Savannah River Site, Georgia and South Carolina	08/01/91 - 09/01/96
Hawaii	HI167	Geohydrologic Assistance for U.S. Navy Assessment and Control of Installation (NACIP) program, Hawaii and Guam	10/01/88 - 10/01/90
	HI179	Evaluation of Organic Constituents in Ground-Water Aquifers	10/01/84 - 09/30/87
	HI194	Phase II Investigation, Installation Restoration Program, Hickam AFB POL, Island of Oahu, Hawaii	10/01/85 - 10/01/91
	HI528	Long Term Response at Ordot Landfill Superfund Site, Guam	04/01/91 - 09/01/92
	HI719	Appraisal of Ground-Water Availability and Contamination at U.S. Army installations, Kwajalein Atoll, Republic of the Marshall Islands	04/01/90 - 09/01/92
Idaho	ID137*	Hydrologic Assessment of the Snake River Plain Regional Aquifer, Southern Idaho	06/01/79 - 09/30/91
	ID142	Ground-Water Contamination in the Michaud Flats, Fort Hall Indian Reservation	10/01/80 - 09/30/89
	ID151	Physical, Chemical, and Biological Evaluation of the Boise River between Veterans Memorial Park Bridge and Star, Idaho	07/01/87 - 09/30/89
	ID154	Ground-Water Contamination in the Westside Area, Bingham County	01/01/84 - 09/30/87
	ID156	Hypolimnetic Concentrations of Dissolved Oxygen, Trace Elements, and Nutrients in Lake Coeur d'Alene	05/01/87 - 02/03/89
	ID157*	Department of the Interior Irrigation Drainage Reconnaissance Study of American Falls Reservoir	10/01/87 - 07/19/90
	ID165	Hydrology of Subsurface Waste Disposal, Idaho National Engineering Laboratory	10/01/59 -

Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Idaho	ID174	Eutrophication and Trace-Element Contamination of Coeur d' Alene Lake	10/01/90 - 09/01/94
	ID175*	National Water Quality Assessment Plan (NAWQA) - Upper Snake River Basin Study Unit	11/01/90 - 09/01/96
Illinois	IL044	Hydrology of Unsaturated Flow through Porous Media at the Low-Level Radioactive Waste Disposal Site near Sheffield	10/01/80 - 01/10/91
	IL063	Transport of Radioactive Gases and Exchange of 14(C) in the Unsaturated Zone at a Low-Level Radioactive Waste Site, Sheffield	10/01/83 - 09/30/89
	IL070	Cedar Creek Water-Quality Assessment; Impact of Storm Runoff and Combined-Sewer Overflows from Galesburg	01/01/85 - 09/30/89
	IL081	Great Lakes Basin Ground-Water Contamination	01/01/87 - 05/29/91
Indiana	IN098	Hydrologic Effects of Two Landfills in Marion County	12/01/84 - 07/07/89
	IN103	Monitoring White River for Effects on Dissolved Oxygen from Wet-Weather Combined Sewer Overflows and for General Quality	10/01/85 - 11/21/89
	IN105	Ground-Water Flow and Quality beneath Sewage-Sludge Lagoons and a Comparison with the Ground-Water Quality beneath a Marion County	10/01/85 - 09/20/88
	IN114	Preliminary Evaluation of the Impact of Combined Sewer Overflows and Urban Runoff Discharging to Fall Creek on the White River, Indianapolis	10/01/86 - 09/30/88
	IN117	Investigation Superior Area Elkhart	11/01/86 - 01/20/88
	IN133	Pollutant Discharges to Coastal Areas: Estimation of Total Metal Loads	04/01/90 - 09/30/91
	IN134*	Analysis Of Agricultural Chemicals in Indiana Ground Water	03/01/90 - 09/01/92
Iowa	IA048*	Stream-Sediment Chemistry of the Cedar River	05/01/84 - 09/30/88
	IA050	Des Moines Air National Guard Base, Installation Restoration Program, Phase II Stages I and II	07/01/84 - 09/01/90
	IA055*	An Accounting of Pesticides in Soil and Ground Water at Selected Sites in the Iowa River Basin	10/01/85 - 09/01/88
	IA057*	Evaluation of Factors Influencing the Occurrence of Agricultural Chemicals in Shallow Ground Water in the Central Midwest	10/01/87 - 09/01/93

## Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Iowa	IA058*	Hydrologic Analysis of Water Quality and the Flow System in the Big Spring Basin, Clayton County	10/01/87 - 09/01/92
	IA061*	The Movement of Nonpoint Source Agricultural Chemicals by the Interaction of Ground Water and Surface Water in an Alluvial Aquifer	05/01/88 -
	IA066*	Effects of Grain-Storage Facilities on Ground-Water Quality in Iowa	01/01/90 - 09/01/90
	IA067*	Water Flow Processes and Related Agricultural Chemical Loadings In the Walnut Creek Watershed near Ames	10/01/90 - 09/01/93
	IA068*	Agricultural Chemicals in a Water-Supply Reservoir in South-Central Iowa	10/01/90 - 09/01/92
	IA069*	The Occurrence and Flux of Inert Pesticide Ingredients in Shallow Ground Water	03/01/91 - 09/01/93
	IA070*	Determination of Storm-Water Runoff Quality in Davenport	04/01/91 - 03/01/94
Kansas	KS111	Central Midwest Regional Aquifer-System Analysis	10/01/79 - 09/30/91
	KS135*	Water Quality in the High Plains Aquifer, Western Kansas, Related to Petroleum Production, Irrigated and Non-Irrigated Cropping Land Use	01/01/84 - 09/30/90
	KS138	Geohydrologic Evaluation of Hazardous Waste Site in Selected Areas of Kansas	10/01/84 -
	KS143	Evaluation of the Effects of Dry-Pond Detention Storage on the Quality of Runoff from Urban Areas	07/01/85 - 09/30/90
	KS150*	Transport, Occurrence, and Effects of Agricultural Pesticides in the Tuttle Creek Lake/Stream System	10/01/85 - 09/30/88
	KS151*	Movement and Persistence of Agricultural Pesticides in the Saturated and Unsaturated Zones in Kansas	10/01/85 - 09/30/91
	KS154	Processes Controlling Movement of Leachate from Oil Refinery Wastes in an Alluvial Aquifer System	10/01/86 - 09/30/87
	KS155	Example Demonstration of Procedures for Delineating Wellhead Protection Areas Around a Midwest Public Ground-Water Supply Site	10/01/87 - 09/30/90
	KS156*	Organic Geochemistry of Natural and Polluted Water-Nonpoint-Source Contamination	09/02/82 -

## Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Kansas	KS157*	Chemical and Micobial Degradation Rates of Atrazine in Ground-Water Systems	10/01/87 - 09/30/91
	KS159*	Soil and Cropping Management Effects on Atrazine Movement in Soil Water	04/01/88 - 09/30/91
	KS166*	Development and Operation of a Facility for Measurement of Transport of Agricultural Chemicals Through and Beyond the Rooting Zone of Soil.	07/01/89 - 09/30/89
	KS170*	Effects of Grain-storage facilities on Ground-water Quality in Kansas	10/01/89 - 10/31/90
	KS171*	Central Nebraska River Basin Water-Quality Assessment	10/01/90 -
	KS173*	Distinguishing Atrazine Occurrence in Ground Water: Point-Source Versus Nonpoint-Source	10/01/90 - 09/01/91
Kentucky	KY069	Assessment of Ground- and Surface-Water Conditions in Oil and Gas Producing Areas within the Kentucky River Basin	10/01/84 - 09/30/89
	KY075	Evaluation of Post-Mining, Hydrologic Impacts Associated with above Drainage, Underground Coal Mining Sites in Selected Area of Eastern Kentucky	11/01/87 - 09/30/89
	KY076	Water Availability in Northwest Hardin County	10/01/87 - 08/06/90
	KY078	Anthropogenic Contamination of the Lost River Karst Ground Water Basin, Warren County	8/01/88 - 09/30/90
	KY079	Investigation of Leaking Underground Storage Tank Sites in Kentucky	07/01/89 - 09/01/94
	KY080	Assessment of the Impacts of Class V Injection Wells on Ground-Water Quality in Elizabethtown	10/01/89 - 09/01/91
	KY081	Hydrogeologic and Water-Quality Assessment of the Ohio River Alluvial Aquifer, Jefferson County	01/01/90 - 09/01/92
	KY082	Ground-Water Monitoring at the Laurel County Landfill	10/01/90 - 09/01/92
	KY083	Technical Assistance during the Remedial Investigation and Feasibility Study Process for the Howe Valley Landfill Site,Hardin County	02/01/90 - 10/01/91
	KY084	Investigation of Urban Hydrology in Jefferson County	10/01/89 - 09/01/93
	KY085	Technical Assistance With the Remedial Investigation/ Feasibility study at the Caldwell Lace Leather site, Auburn	03/01/90 - 09/01/92

## Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Kentucky	KY089*	Fate and Transport of Agrichemicals Within a Small, Karstified Multi-Crop Watershed Utilizing Soil and Water Management Practices	06/01/90 - 09/01/92
	KY091*	Assessment of the Effectiveness of Best Management Practices for Highway Runoff near Georgetown	07/01/90 - 09/01/92
	KY092	Investigation of Potential Environmental Contamination at the Kentucky Air National Guard Facility, Standiford Field, Louisville	09/01/90 - 09/01/92
	KY093	Technical Assistance During the Remedial Investigation/Feasibility Study for the Green River Disposal Superfund Site, Daviess County	10/01/90 - 09/01/92
	KY094	Hydrogeology and Simulation of Ground-Water Flow in the Alluvial Aquifer, Calvert City	04/01/91 - 09/01/93
Louisiana	LA090	Presence and Extent of Minor Elements, Including Barium, Lead, and other Toxic Substances, in Ground Water of Louisiana	10/01/84 - 07/01/88
	LA091	Geohydrologic Characteristics of the Sparta Aquifer, North-Central Louisiana	10/01/84 - 09/30/90
	LA093	Analysis of the Occurrence, Movement, and Fate of Selected Hazardous Substances in the Lower Calcasieu River	04/01/85 - 09/01/92
	LA102*	Investigation of an Emergency Water Supply for Jefferson Parish	10/01/88 - 09/30/91
	LA103	Ground-Water Monitoring and Contamination at Fort Polk	10/01/88 -
	LA106	Movement and Fate of Fecal Indicator Bacteria Through a Shallow Ground-Water System That Recharges Surface Waters	01/01/90 - 09/01/92
Maine	ME044	Hydrogeological Technical Assistance to USEPA Waste Management Division, Region 1, Boston, Massachusetts	04/01/88 - 03/31/89
	ME045	Loadings of Phosphorus and Selected Trace Metals from Rural Highways	09/01/91 - 12/01/92
Maryland	MD077	Investigation of Ground Water in the Vicinity of O-Field, Edgewood Area, Aberdeen Proving Ground	04/01/84 - 08/10/89
	MD080*	Modeling Nonpoint-Source Inputs to the Patuxent River Estuary	05/01/84 - 09/01/92
	MD082	Effect of Storm-Water Infiltration Practices on Ground-Water Quality at Selected Management Sites in Maryland	10/01/85 - 09/30/90

Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Maryland	MD084	Investigation of Ground-Water Contamination in the Canal Creek Area, Aberdeen Proving Ground	08/01/85 - 12/01/91
	MD085*	Effects of Agricultural Best Management Practices on Shallow Ground Water in the Patuxent River Basin	07/01/85 - 09/01/92
	MD089	Investigation of Ground-Water Contamination in the Carroll Island and Graces Quarters Area, Aberdeen Proving Ground	10/01/86 - 03/01/92
	MD091	Ground-Water Contamination in J-Field, Aberdeen Proving Ground	07/01/87 - 12/01/92
	MD092	Brackish Water Intrusion at Indian Head	10/01/87 - 09/01/90
	MD095	Geohydrologic investigations at U.S. EPA Region III Superfund Sites	10/01/88 -
	MD100	Investigation of Sediment, Surface-Water, and Ground-Water Contamination at New O-Field, Aberdeen Proving Ground	09/01/90 - 09/01/94
	MD103*	Evaluating Ground-Water Vulnerability Factors and Developing Monitoring Strategies for Nonpoint Sources of Contaminants in the Delmarva Peninsula	04/01/91 - 12/01/92
Massachusetts	MA048	Effectiveness of Highway-Drainage Systems in Preventing Salt Contamination of Ground Water, Route 25 from Wareham to the Cape Cod Canal	01/01/79 - 12/01/94
	MA062	Processes Controlling Transport of Solutes in a Sewage Plume in Ground Water at Otis Air Base, Cape Cod	04/01/83 - 09/01/95
	MA073	Hydrogeological Technical Assistance to UPEPA Waste Management Division, Region I, Boston	06/01/85 - 11/15/89
	MA080	Ground-Water Quality in Massachusetts	10/01/86 - 09/30/91
	MA090	Effects of a Septage Treatment Plant on Ground-Water Quality, Orleans	10/01/88 - 09/01/94
	Michigan	MI032	Ground-Water Study of Wurtsmith Air Force Base
MI038		Ground-Water Contamination at the United States Coast Guard Air Station, Traverse City	07/01/82 - 09/30/88
MI040*		Water Resources of Grand Traverse County	05/01/84 - 09/07/90
MI043		Ground-Water Contamination at K.I. Sawyer Air Force Base	12/01/84 - 09/01/91

## Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Michigan	MI045	Ground-Water Movement near Upper Great Lakes Connecting Channels	07/01/85 - 12/13/88
	MI046*	Ground-Water Protection in Kalamazoo County	03/01/86 - 06/11/90
	MI049	Ground Water at the Verona Well Field, Battle Creek	01/01/89 - 02/01/91
	MI053	Geohydrologic Investigations at U.S. Environmental Protection Agency, Region V, Superfund Sites in Michigan	03/01/90 - 09/01/93
	MI054	Regional Analysis of Fractured Bedrock to Evaluate Water Supply Potential in Southern Lower Peninsula	03/01/91 - 10/01/91
	MI056	Water Resources of Keweenaw Bay	05/01/91 - 09/01/92
Minnesota	MN094	Modeling of Contaminant Migration from a Chemical-Waste-Disposal Site in the Twin Cities Metropolitan Area	07/01/83 - 10/24/88
	MN095	Crude-Oil Contamination of Ground Water Near Bemidji	03/01/83 - 09/01/94
	MN104	Effects of Treated Wastewater Discharge on Hydrology and Water Quality of Wetlands in Minnesota and Wisconsin	04/01/85 - 06/20/90
	MN106*	Hydrogeology and Water Quality of the Bemidji and Bagley Surficial-Outwash Aquifers, North-Central Minnesota	10/01/85 - 05/31/91
	MN110*	Impact of Agricultural Chemicals and Tillage Practices on Quality of Ground Water in Sand-Plain Aquifers in Minnesota	10/01/86 - 09/30/89
	MN111*	Ground-Water Hydrology of the Rochester Area, Southeastern Minnesota	10/01/86 - 06/05/91
	MN112	Ground-Water Flow in the St. Peter-Platteville-Drift Aquifer System Related to Contamination by Coal-Tar Derivatives, St. Louis Park	04/01/87 - 09/30/90
	MN113	Availability of Ground Water and the Effects of Withdrawals in the Vicinity of the Minneapolis Water-Works Treatment Plant	10/01/86 - 10/16/90
	MN114*	Effects of Ground Water Withdrawals on the Temperature and Quality of the Straight River	01/01/88 - 09/30/90
	MN116*	Ground-Water Flow in the Karst Area of Southeastern Minnesota	10/01/87 - 09/30/90
	MN120*	Sources and Transport of Sediment, Nutrients, and Oxygen-Demanding Substances in the Minnesota River	07/01/89 - 09/01/94

Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Minnesota	MN121*	Atmospheric Transport and Deposition of Herbicides	03/01/90 - 06/01/91
	MN122*	Hydrogeologic Sensitivity of the Prairie du Chien-Jordan Aquifer	10/01/89 - 09/01/92
	MN129	Hydrogeology of the Grand Portage Indian Reservation, Northeastern Minnesota	04/01/91 - 09/01/93
Mississippi	MS084	Susceptibility of Major Aquifers to Surface and Shallow-Source Contamination	10/01/90 - 09/01/95
	MS085	Determination of Methods for Characterization of Underground Injection Sites in Mississippi	10/01/90 - 09/01/93
Missouri	MO059	Potential Effects of Hazardous Wastes on the Hydrologic System in the Weldon Spring Area, St. Charles County	10/01/83 - 08/04/87
	MO060	Water Quality in the Missouri River Alluvial Aquifer near Kansas City and Independence	10/01/84 - 10/01/86
	MO062	Effects of Reclamation on the Hydrology and Water Chemistry at an Abandoned Surface Coal Mine near Montrose	10/01/84 - 09/30/91
	MO064	Geology, Hydrology, and Pedology at Six Dioxin-Contaminated Sites in Missouri	12/01/84 - 01/29/87
	MO065	Water-Quality Characterization of Spring River Basin, Southwestern Missouri	07/01/85 - 10/31/90
	MO068*	Effects of Special Area Land Treatment on Sediment and Nutrient Transport in the Higginsville Reservoir Watershed	10/01/85 - 09/30/87
	MO069*	The Occurrence of Pesticides in Ground Water, Streams and Streambed Sediments in the Southeast Lowlands of Missouri	07/01/86 - 09/30/88
	MO071	Extent and Magnitude of Contamination of the Water Resources in the Vicinity of the Weldon Spring Radioactive Waste-Disposal Sites, St. Charles County	06/01/87 - 09/01/95
	MO072	Effects of Lead and Zinc Mining on the Quality of Surface Waters and Recent Alluvium in the Old Lead Belt of Southern Missouri	07/01/87 - 09/30/90
	MO073	Mine Drainage and Subsidence from Abandoned Underground Coal Mines at Huntsville	07/01/87 - 01/06/92
MO078	Uptake and Release of Contaminants by overburden Soil Minerals in the Vicinity of the Raffinate Pits, Weldon Spring Chemical Plant, St. Charles County	03/01/89 - 09/01/93	

## Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Missouri	MO079	Comprehensive Assessment of the Potential Hydrologic and Biological Impact of Lead and Zinc Mining in the Mark Twain National Forest of Southern Missouri	06/01/89 - 12/01/92
	MO082	Urban Stormwater Data Collection and Modeling for the City of Rolla	07/01/90 - 06/01/93
	MO083*	Contamination Potential of Grain-Storage Facilities on Ground-Water Quality in Missouri.	06/01/90 - 09/30/90
	MO085*	Use of Nitrogen and Oxygen Isotopes to Measure Nitrogen-Cycle Processes in Claypan Soils and Glacial-Drift Aquifers	01/01/91 - 09/01/93
	MO086	Water-quality characteristics of Lake Jacomo, Prairie Lee Lake, and Harrisonville Lake in Jackson and Cass Counties	05/01/91 - 12/01/93
Montana	MT107*	Ground Water in Shallow Aquifers along the Upper Clark Fork, Southwestern Montana	10/01/85 - 09/30/88
	MT111	Potential Effects of Coal Mining on Dissolved Solids in Hanging Woman Creek Basin, Southeastern Montana	10/01/85 - 05/01/89
	MT114	Hydrogeochemical Maps of Selected Oil Fields	04/01/86 - 09/30/87
	MT118	Development of a GIS Data Base and Investigation - of Mine Spoils Geochemistry for Parts of the Powder River Coal Region, Southeastern Montana	07/01/87 - 09/30/90
	MT119*	Occurrence and Mobility of Persistent Pesticides in Agricultural Environments in the Northern Great Plains	01/01/88 - 08/08/90
	MT120	Investigation of Mine-Spoils Geochemistry and Development of a GIS Data Base for Parts of the Powder River Coal Region, Southeastern Montana	10/01/87 - 11/02/90
	MT127	Geohydrologic Evaluation of the Helena Valley	10/01/89 - 09/30/91
	MT132*	Phase Two Irrigation Drainage Investigation: Water Quality in the Sun River Area, West-Central Montana	05/01/90 - 09/01/93
	MT133	Technical Assistance to EPA on the Silver Bow Creek National Priorities List (NPL) Site	10/01/89 - 09/01/92
	MT134	Technical Assistance to Environmental Protection Agency (EPA) on the Butte Portion of the Silver Bow Creek NPL Site	10/01/89 - 09/01/92
	MT135	Sediment and Water-Quality Sampling on the Clark Fork and its Tributaries	10/01/89 - 09/01/92

## Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Montana	MT136	Technical Assistance to the Environmental Protection Agency	10/01/89 - 09/01/93
	MT137	Technical Assistance to Environmental Protection Agency (EPA) on Burlington Northern National Priorities List (NPL) Site, Somers	10/01/89 - 09/01/94
	MT138	Extent, Magnitude and Movement of Contamination in Unconsolidated Quaternary Aquifers in and near the East Poplar Oil Field, Northeastern Montana	01/01/91 - 09/01/94
Nebraska	NE048*	A Study of Nonpoint-Source Derived Nitrate-Nitrogen and Organic Constituents in Water From Selected Areas of the High Plains Aquifer in Nebraska	12/01/83 - 09/30/90
	NE056*	Effects of Conservation Tillage Practices on Ground-Water Quality of Unconfined Aquifers in Nebraska	03/01/88 - 09/01/89
	NE059*	Contamination Potential of Grain-Storage Facilities on Ground Water in Nebraska	07/01/90 - 10/15/90
	NE060	Data Appraisal of the Ground-Water Contamination Site at Hastings	10/01/89 - 11/30/90
	NE061*	Central Nebraska River Basin Water-Quality Assessment	10/01/90 -
	NE062*	Hydrogeology of the Nebraska MSEA site	10/01/90 - 09/01/93
	NE064*	Ground-Water and Sediment Quality Monitoring for the Superior Special Protection Area, Superior	10/01/90 - 09/01/93
Nevada	NV072	Geohydrology and Radioactive Solute Migration, Beatty Disposal Site, Nye County	10/01/76 -
	NV130	Weapons Testing Hydrology Program at the Nevada Test Site	10/01/76 -
	NV141*	Water-Quality Reconnaissance of Irrigation Return Flows Affecting Wildlife Management Areas on the Newlands Irrigation Project Area, Churchill County	10/01/85 - 09/30/88
	NV142	National Water Quality Assessment Study of Ground-Water Quality in the Carson River Basin	04/01/86 - 01/01/01
	NV143*	Preliminary Plan of Study on Irrigation Drainage Quality in and Near the Stillwater Wildlife Management Area, Churchill County	05/01/86 - 07/12/89
	NV148*	Irrigation Drainage, Stillwater	10/01/87 - 09/30/90

## Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Nevada	NV159*	Reconnaissance Investigation of Water Quality Bottom Sediment and Biota Associated with Irrigation Drainage In and Near the Humboldt Wildlife Management Area	01/01/90 - 09/01/91
	NV167	Nevada Basin and Range National Water Quality Assessment	12/01/90 - 01/01/01
New Hampshire	NH030	Northeast Glacial Valley Regional Aquifer System Analysis (RASA)	05/01/83 - 09/30/87
	NH038	Ground-Water Flow Analysis to Estimate Contributing Areas to Pumping Wells in the Milford-Souhegan Aquifer, Milford	05/01/88 - 09/30/89
	NH042	Evaluation of Hydraulic Interaction between Crystalline Bedrock and Overburden, Mirror Lake	10/01/89 - 09/01/94
	NH043	Ground-Water Flow in the Vicinity of the Savage Well, Souhegan River Valley Aquifer, Milford	08/01/90 - 09/01/93
New Jersey	NJ059	The Geohydrology at Picatinny Arsenal in Morris County	08/01/82 - 09/30/91
	NJ061	Hydrologic Processes with Special Emphasis on GW Quality Near Atlantic City	07/01/83 - 09/30/91
	NJ062	Hydrologic Processes with Special Emphasis on GW Quality Near Camden	07/01/83 - 09/30/91
	NJ064	Hydrologic Processes with Special Emphasis on GW Quality Near South River	07/01/83 - 09/30/91
	NJ069	Evaluation of Field Sampling Techniques and Analytical Methods for Organic Compounds in Ground Water	07/01/83 - 03/15/91
	NJ075	Ground-Water Quality and its Relationship to Geohydrology and Land Use in the Outcrop Area of the Potomac-Raritan-Magothy Aquifer System, Mercer and Middlesex Counties	01/01/84 - 09/30/91
	NJ083	Investigation of Naturally Occurring Radioactive Substances in Ground Water of the Triassic Formations in New Jersey	10/01/84 - 07/09/90
	NJ086	Geohydrology in the Vicinity of a Fusion Test Reactor, Plainsboro Township, Middlesex County	04/01/85 - 09/30/89
	NJ087	Geochemical Effects on the Corrosivity of Ground Water in the Kirkwood-Cohansey Aquifer in the New Jersey Coastal Plain	10/01/85 - 09/30/91

## Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
New Jersey	NJ089	An Assessment of Ground-Water Resources in the Vicinity of Ground-Water Contamination Sites in Greenwich Township, Gloucester County	10/01/85 - 09/30/91
	NJ090	Ground-Water Contamination by Light Chlorinated Hydrocarbons at Picatinny Arsenal, Morris County, New Jersey	10/01/85 - 09/01/95
	NJ091	Geohydrologic Investigations at United States Environmental Protection Agency Superfund Sites	02/01/86 - 09/30/90
	NJ095	Valley-Fill Hydrologic Systems	10/01/86 - 09/30/90
	NJ097	Surfactant Sorption to Soil and its Effect on the Distribution of Anthropogenic Organic Compounds	10/01/87 - 08/30/90
	NJ098	Removing Volatile Ground-Water Contaminants by Inducing Air-Phase Transport	10/01/87 - 09/30/91
	NJ099	Mobility, Transport and Fate of Naturally Occurring Radionuclides in Ground Water, Newark Basin	10/01/87 - 09/30/90
	NJ104	Natural Radioactivity in Ground Water of the Kirkwood-Cohansey Aquifer System, Southern Coastal Plain	10/01/88 - 05/22/90
	NJ106	Modeling and Experimental Investigation of Hydrocarbon Transport and Biodegradation in the Unsaturated Zone	10/01/88 - 09/30/91
	NJ108	Water Resources and Saltwater Intrusion of the Holly Beach-Cohansey, Rio Grande, Atlantic City 800-foot Sand, and Piney Point Aquifers, Cape May County	10/01/88 - 09/01/91
	NJ109	Compositional Modeling of Organic Transport and Biodegradation in the Unsaturated Zone and Ground Water	10/01/88 - 09/01/91
	NJ110	Geophysical and Water-Quality Reconnaissance at the Ciba-Geigy Superfund Site, Toms River, Ocean County	10/01/88 - 09/30/91
	NJ113	Mobility, Transport, and Fate of Naturally Occurring Radionuclides in Ground Water in the Kirkwood-Cohansey Aquifer System, Southern Coastal Plain	10/01/89 - 09/01/92
	NJ115*	Relation of Agricultural Pesticide Usage to Presence of These Pesticides in Surface Waters used for Water Supply in New Jersey	10/01/89 - 08/01/92
	NJ117	Northeast Nonpoint-Source Ground-Water Contamination Investigation	10/01/90 - 09/01/95

## Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
New Jersey	NJ119*	Vulnerability of Ground Water to Nitrate and Pesticide Contamination	10/01/90 - 09/01/91
	NJ122	Volatile Organic Contaminant Transport and Plume Delineation in Fractured Bedrock of the Passiac Formation, Rutgers University Busch Campus, New Brunswick	03/01/91 - 09/01/92
New Mexico	NM252	Hydrology of the Albuquerque South Valley Area	01/01/84 - 02/01/87
	NM257*	Ground-Water Flow Characteristics and Chemical Quality in the Animas, La Plata, and San Juan River Valleys	07/01/85 - 07/01/87
	NM260*	Effects of Forest Management Practices on Water Quality of a High Mountain Stream in the Southern Rocky Mountains of New Mexico	04/01/87 - 09/01/92
	NM264	Assessment of the Impacts of Atmospheric Precipitation on Water Quality in Chuska Mountains Lakes	07/01/87 - 09/01/92
	NM277	Puerco River-Little Colorado River Contaminants Study	07/01/88 - 07/01/93
	NM279	Ground-Water Contamination, Land Use, and Aquifer Vulnerability in Eastern Bernalillo County	08/01/89 - 06/01/92
	NM324	Hydrologic Investigations Related to a Radioactive Wastes Repository in Salt, Southeastern New Mexico	05/01/75 - 09/01/87
	NM351	Hydrologic Characteristics of the Lee Acres Landfill Area, San Juan County	12/01/86 - 09/30/88
	NM352*	Effects of Forest Management Practices on Sedimentation of a High Mountain Stream in the Southern Rocky Mountains of New Mexico	04/01/87 - 09/01/92
	NM360	Investigation of Possible Ground-Water Contamination at Kirtland Air Force Base	02/01/88 - 01/01/89
	NM361	Characterization of the Hydrology of the Hazardous Waste Disposal Facility White Sands Missile Range, Otero County	07/01/88 - 09/30/89
New York	NY046	Occurrence and Transport of Polychlorinated Biphenyl (PCB) Residues Within the Upper Hudson River Basin	02/01/77 -
	NY125	Hydrologic Models of the Ground-Water Flow System on Long Island	10/01/83 -

## Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
New York	NY145	Effect of Waste-Disposal on Ground Water in the Upper Glacial Aquifer of Long Island	10/01/83 - 05/11/88
	NY147	Saltwater Encroachment in Nassau County, Long Island	04/01/84 - 09/30/89
	NY148	Ground-Water Quality Appraisal of Long Island	04/01/84 - 09/30/89
	NY153	Selected Topics in Ground-Water Geochemistry on Long Island	01/01/85 - 09/30/91
	NY156	Analysis of Solute Transport in the Upper Glacial and Magothy Aquifers on Long Island	10/01/84 - 09/30/89
	NY157	The Effect of Stormwater Recharge Basins on the Quantity and Distribution of Recharge in Nassau County	10/01/84 - 09/30/91
	NY159	Ground-Water Flow and Contaminant Transport in Two Hydraulically Connected Aquifers	10/01/85 - 12/31/88
	NY164	Hydrogeology of the Niagara Falls Area	06/01/86 - 09/30/91
	NY165	Sorptive and Transport Characteristics of PCB Congeners in the Upper Hudson River	07/01/86 - 09/30/91
	NY169*	Subsurface Transport of Pesticides and Nitrates in Fields under Conventional and Conservation Tillage Practices	01/01/87 - 02/28/90
	NY170	Fate and Transport of Landfill Leachate in a Phragmites Wetland	10/01/87 - 10/01/91
	NY176	Estimating Recharge Areas and Zones of Contribution to Public Water Supply Wells and Springs in the Tug Hill Glacial Aquifer in Northern New York	05/01/88 - 09/05/90
	NY177	Analysis of Aquifer Vulnerability to Contamination in Special Ground-Water Protection Areas, Nassau and Suffolk Counties, Long Island	08/01/88 - 09/30/89
	NY180	Northeast Atlantic Coastal Plain Ground-Water Quality Regionalization Study	10/01/88 - 09/01/89
	NY183	Evaluation of the Vertical Migration of Contaminants by Advective Transport beneath a Waste-Disposal Site, Town of Brookhaven, Long Island	10/01/88 - 09/30/90
	NY184	Estimation Of Contributing Areas To Public Water-s Supply Well And Flow Paths From Contaminant Sources In The Glacial-Drift Aquifer At Cortland	05/01/89 - 09/01/92

## Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
New York	NY186*	Probabilistic Assessment of Atrazine Contamination In Ground Water	10/01/89 - 09/01/93
	NY190	Effects of Stormwater Detention in Wetlands of the Lower Irondequoit Creek Basin near Rochester	10/01/89 - 09/01/94
	NY194	Simulated Low-Level Radioactive Waste Disposal in - Fine Grained Sediments, West Valley	06/01/90 - 12/01/90
	NY198	Migration of Chlorinated Organic Compounds in Ground Water in the New Cassel Area, Nassau County	10/01/89 - 09/01/92
	NY204	Biogeochemical Process Controlling Nitrogen Cycling and Associated Hydrogen and Aluminum Leaching in an Undeveloped Headwater Basin	07/01/91 - 09/01/97
North Carolina	NC076	Effects of Land Use on the Biological Environment of Streams in Piedmont North Carolina	01/01/84 - 01/01/89
	NC077	The Effects of Land Use on Ground-Water Quality in a Combined Regolith-Fractured-Rock Aquifer System	05/01/84 - 02/01/89
	NC081*	Effects of Land-Management Practices on Sediment and Chemical Transport in Guilford County	10/01/84 - 09/30/91
	NC083	Ground-Water Supply and Potential for Contamination, CherryPoint Marine Corps Air Station	04/01/86 - 09/01/93
	NC084	An Appraisal of the Ground-Water Resources of Camp Lejeune Marine Corps Base	04/01/86 - 09/01/93
	NC089	Water Quality of Urban Areas in Charlotte and Mecklenburg County	04/01/87 - 09/30/88
	NC093	Hydrologic Characteristics and Water-Quality Trends of the Albermarle-Pamlico Estuarine System	10/01/87 - 09/30/91
	NC094	Development of Ecological Surveys for the National Water-Quality Assessment (NAWQA) Program	10/01/87 - 09/01/92
	NC100	Occurrence, Characteristics, and Estimates of Leachate Discharge at Solid-Waste Disposal Sites in Mecklenburg County	05/01/89 - 09/30/90
	NC103*	Hydrology of the Sand Hills Aquifer and Identification of Sources of Water Pumped from Municipal Wells in the Aberdeen Area	01/01/90 - 04/01/92
	NC107	Phase II RCRA Facility Investigation Study at Fort Bragg	10/01/90 - 12/01/98
North Dakota	ND115	Evaluation of Effects of Ongoing and Future Mining and Reclamation Activities in Western North Dakota	10/01/82 - 09/30/89

Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
North Dakota	ND125	Hydrogeochemical Controls on the Mobility of Radiogenic Constituents in Uraniferous Lignite and Ash in North Dakota	10/01/83 - 9/30/89
	ND138*	Evaluation of the Potential for Toxic-Element Consequences Due to the Garrison Diversion Unit, North Dakota and South Dakota	03/01/86 - 05/30/90
	ND140	In Situ Monitoring of Organic Contaminants in Ground Water Using a Portable Field Laser Fluorescence Spectrometer	07/01/86 - 09/30/89
	ND141	Trace-Element Distributions in Flow-Through Prairie Pothole Wetlands in North Dakota	03/01/87 - 04/15/90
	ND142	Trace-Element Contributions to the Environment from Mesozoic Rocks of North Dakota	07/01/87 - 09/30/89
	ND150	Water-quality Assessment of the Red River of the North near Fargo	08/01/89 - 09/30/91
	ND152	Toxic Substances Hydrology, Ground Water Reports	01/01/89 - 09/01/91
	ND154	Hydrology of the Flying J, Inc., Refinery near Williston	05/01/90 - 10/01/91
	ND157*	Effects of Evapotranspiration on Pesticide Distributions and Transport in the Unsaturated Zones of Northern Cornbelt Sand Plains	03/01/91 - 09/01/92
	Ohio	OH042*	Water Quality of Selected Streams in Ohio
OH048		Hydrogeologic Conditions and Aquifer System Response to Increased Ground-Water Development, Geauga County	10/01/79 - 02/19/90
OH083		Surface-Water Quality of Coal-Mine Lands in Raccoon Creek Basin	10/01/84 - 02/29/88
OH084		Quality of Surface Water and Ground Water in Active Coal Mining Areas	04/01/85 - 09/01/92
OH085		Ground-Water Hydrology and Quality Assessment of Lucas, Sandusky, and Wood Counties, Northwestern Ohio	10/01/85 - 02/15/91
OH086		Ground-Water Movement and Quality in Northeast Union County	07/01/85 - 04/17/87
OH092		Effects of Highway Deicing Chemicals on Shallow, Unconsolidated Aquifers in Ohio	09/01/87 - 01/01/98
OH093		Hydrogeology and Ground-Water Quality of Wright-Patterson Air Force Base, Southwestern Ohio	06/01/87 - 09/01/92

## Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Ohio	OH094	Hydrogeology and Water Quality of the Major Aquifers in an Area of Deep-Well Brine Disposal Systems, Shalersville and Adjacent Townships, Portage County	04/01/87 - 10/09/90
	OH096*	Lake Erie Tributary Loading - Ohio, Indiana, and Michigan	08/01/87 -
	OH097	Bacteriological Quality of the Scioto and Olentangy Rivers in the Columbus Area	10/01/87 - 09/30/90
	OH103	Ground-Water Flow and Geochemistry Beneath - Surface Mined Watersheds Reclaimed with Flue-Gas-Desulfurization By-Products as Spoil and Soil Amendments, Southeastern Ohio	01/01/90 - 04/01/94
	OH104	CERCLA Remedial Response Support for Sites in EPA Region	03/01/90 -
	OH105*	The Fate and Transport of Atrazine in a Buried River Valley Aquifer Influenced by High, Medium, and Low-Chemical Input Farming Practices	03/01/90 - 09/01/94
	OH107	Bacteriologic and Hydrologic Processes Controlling Fecal-Indicator Bacteria in the Cuyahoga River	04/01/91 - 09/01/94
Oklahoma	OK075	Limnology of Selected Coal-Mine Ponds in the Coal-Mining Region of Eastern Oklahoma	10/01/84 - 09/30/89
	OK080	Hydrogeologic Characteristics of Selected Shaley Formations in Oklahoma, with Particular Emphasis on their Suitability for Containment of Hazardous Wastes	10/01/85 - 09/01/88
	OK082	Hydrogeology and Water Quality of the Garber-Wellington and Associated Aquifers, Central Oklahoma	04/01/86 - 09/01/96
	OK086	Altus AFB IRP Study: Confirmation/Quantification Phase	10/01/87 - 09/01/92
	OK091	Source and Movement of Naturally Occurring Toxic Substances in the Central Oklahoma Aquifer	07/01/88 - 01/30/91
	OK092	Evaluation of the Impact of Oil Refinery Products and Wastes on the Ground- and Surface-Water Resources near Cyril in Southeastern Caddo County	07/01/89 - 09/30/91
	OK097	Hydrologic Study Of Tribal Reserve Lands Of The Sac & Fox Nation Of Oklahoma Lincoln County, Oklahoma	02/01/90 - 09/01/93
Oregon	OR122	Quality of Willamette Harbor Bottom Material and Elutriates	08/01/84 - 05/01/89

## Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Oregon	OR138	Iron Geochemistry of the Dunes Aquifer Near Coos Bay	10/01/85 - 06/01/91
	OR147*	DOI Irrigation Drainage Field-Screening Study of Malheur National Wildlife Refuge	10/01/87 - 06/06/91
	OR148	High-Volume Liquid-Liquid Extraction of Trace Organic Contaminants from Water	12/01/87 - 06/15/90
	OR153*	Johnson Creek Water-Quality Assessment	05/01/88 - 09/30/90
	OR157*	Role of Disturbed Marshland and Reservoir Regulation in Causing Excessive Nutrient Enrichment in Upper Klamath Lake	02/01/89 - 06/05/91
	PN356*	Water Quality Assessment, Tualatin River Basin	01/01/90 - 09/01/94
	PN360*	Department of Interior Irrigation Drainage Reconnaissance Study of the Owyhee-Vale Irrigation Projects, Oregon and Idaho	10/01/89 - 09/01/92
	PN364	Nutrient-Metabolism Relations in a Periphyton-Dominated Stream Community	10/01/90 - 09/01/93
	PN366	Water-Quality Assessment Program--The Willamette Basin	08/01/91 - 09/01/96
	PN369	Amazon Creek Water Quality Assessment	10/01/90 - 09/01/93
Pennsylvania	PA118*	Effects of Agricultural Best Management Practices on Nonpoint Sources in the Conestoga River Basin above Lancaster	01/01/81 - 09/01/92
	PA142	Application of Limestone Quarry Waste in the Abatement of Acidic Drainage from a Coal Strip-Mine Site	01/01/83 - 05/21/90
	PA146	GW Resources of Cambrian and Ordovician Carbonate Rocks in the Valley and Ridge Province in Pennsylvania	07/01/83 - 01/25/90
	PA157	Ground-Water Quality Assessment of Warren County	07/01/84 - 09/30/91
	PA158*	Evaluation of Agricultural Best Management Practices and Other Innovative Methods of Controlling Nutrient Discharges in the Lower Susquehanna River Basin	0/01/84 - 09/01/92
	PA159*	Assessment of Nutrient Sources in the Susquehanna River Basin	10/01/84 - 09/30/90
	PA160	Water-Quality Effects of the Application of Sewage Sludge on Surface Coal Mines	01/01/85 - 09/01/92

## Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Pennsylvania	PA161	Hydrology of Indian Creek Basin, Fayette and Westmoreland Counties	03/01/85 - 09/30/88
	PA163	Effects of Strip Mining on the Hydrology of a Small Watershed in Fayette County	07/01/85 - 09/30/88
	PA164*	Ground-Water Flow Systems and Water Quality of the Gettysburg Area, Pennsylvania	09/01/85 - 09/30/89
	PA165	Ground-Water Flow in the Carbonate Rock of the Valley Creek Basin Chester County	10/01/85 - 09/30/89
	PA166	Hydrology and Water Resources of Indiana County	05/01/86 - 09/30/91
	PA168	Geohydrology and Water Quality of Unconsolidated Deposits of Erie County	10/01/85 - 09/30/90
	PA183	Geophysical study of USEPA Superfund sites in Pennsylvania, Delaware, Maryland, West Virginia, Virginia, and Washington, D.C. (EPA Region III)	10/01/88 - 09/01/92
	PA185	Use of Multiple Stable Isotopes to Distinguish Sources of Nitrogen Contamination in the Susquehanna River Basin	10/01/88 - 09/30/90
	PA187	Hydrology of West Valley Creek basin, Central Chester County	10/01/89 - 09/01/93
	PA189*	Effectiveness of Agricultural Best Management Practices in Reducing Nutrient Loads to the Conestoga Headwaters, Lancaster County	10/01/89 - 09/01/92
	PA193*	Concentrations and Loads of Pesticides and Nutrients in Spring Discharge and Relation to Land Use in Two Spring Basins Within Cumberland County	04/01/90 - 09/30/91
	PA195	Technical Support for Superfund Site Investigation, Publicker National Priority List (NPL) Site, Philadelphia	10/01/90 - 09/01/92
	PA196	Role of Abandoned Multi-Aquifer Wells in Regional Ground-Water Contamination, Bucks and Montgomery Counties	10/01/90 - 09/01/92
	PA197	Geophysical study of EPA Superfund sites in Pennsylvania	10/01/90 - 09/01/92
	PA198	Preliminary Characterization of Ground-Water Quality of the Mauch Chunk Formations in Central-Northeastern Pennsylvania including the C & D Recycling Superfund Site and Vicinity	10/01/90 - 09/01/92

Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Pennsylvania	PA199	Development of Geographic Information Systems (GIS) Coverages for Pequea and Mill Creek Watersheds, Lancaster County	10/01/90 - 09/01/92
	PA206*	The Effectiveness of Agricultural Best Management Practices in Improving Ground-water Quality in a 55-Acre Field Site Near Ephrata, Lancaster County	10/01/90 - 09/01/94
	PA208*	Transport of Pesticides in the Unsaturated Zone Overlying a Carbonate Rock Aquifer	10/01/90 - 09/01/92
	PA209	Water-Quality Effects of Special Handling of Pyritic, Acid-Forming Materials at a Reclaimed Surface Coal Mine	04/01/91 - 09/01/93
	PA210	Contribution of Septic Systems and Parking Lot Runoff to Ground-Water-Nutrient Concentrations, Milford-Matamoras Area, Pike County	06/01/91 - 09/01/92
	PA211*	Atmospheric Deposition of Nutrients and Triazine Herbicides in the Conodoguinet Creek Basin	05/01/91 - 09/01/92
	PA212*	Hydrologic Investigation of the Lake Wallenpaupack Watershed	08/01/91 - 09/01/94
Puerto Rico	PR094	Caribbean Island Aquifers Regional Aquifer System Analysis	10/01/84 - 09/01/92
	PR096	Geohydrology of Potential Hazardous Waste Sites in Puerto Rico	10/01/86 - 08/19/91
	PR101	Ground-Water System-Management Study, Upper Rio Grande de Loiza Basin	10/01/88 - 09/01/92
	PR105	Ground-Water Development Strategy for the U.S. Virgin Islands	10/01/88 - 09/30/90
	PR107	Manganese and Iron Chemistry in the Valle de Yabucoa Alluvial Aquifer, Southeastern Puerto Rico	10/01/88 - 09/30/90
	PR108	Removal of Bottom Sediments from Lago Loiza by Explosive Mobilization and Stormwater Flushing	10/01/88 - 09/30/91
	PR110	An Evaluation of Ground-Water Reclamation in the Superfund Site of Vega Alta, Puerto Rico	10/01/89 - 09/01/92
	PR115	Environmental Assessment in the Vicinity of the Mayaguez Ocean Outfall	11/01/90 - 09/01/91
Rhode Island	RI020	Assessment of Water Quality in Major Rhode Island Streams	10/01/83 - 09/15/90
	RI024	Determination of the Fresh Surface-Water Inflow to Narragansett Bay	07/01/86 - 09/30/89

## Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Rhode Island	RI025	Assessment of Water Quality in Major Rhode Island Streams	10/01/87 - 09/30/90
	RI029	Estimating Maximum Water-Table Elevations at Proposed Sites for Individual Sewage Disposal Systems	01/01/90 - 09/30/91
South Carolina	SC056	Saltwater Encroachment in the Limestone Aquifer in the Hilton Head Island Area	01/01/84 - 09/30/91
	SC059	Investigation of Ground-Water Protection at the Defense Waste Processing Facility, Savannah River Plant	07/01/84 - 11/30/86
	SC073	Geohydrologic Investigation in the Vicinity of the Hazardous-Waste Landfill near Pinewood	06/01/87 - 09/30/90
	SC076	Work Plan for Toxic Waste Research at Cone Mills Bleachery, Greenville	08/01/88 - 09/30/89
	SC078	Remediation of JP-4 Contamination using Hydraulic Containment and In Situ Biodegradation at the Defense Fuel Supply Center, Charleston	10/01/88 - 09/01/93
	SC085	Hydrologic Aspects of Waste Disposal in the Piedmont Terrain of Pickens County	11/01/90 - 09/01/92
	SC086	Ground-Water Flow and Quality in the Vicinity of the Savannah River at the Savannah River Site, Georgia and South Carolina	05/01/91 - 09/01/96
	SC087	Investigation of Nonpoint-Source Pollutants in the Myrtle Beach Area	12/01/90 - 09/30/91
	SC088	Assessment of Foster Creek at Naval Weapons Station, Charleston	03/01/91 - 09/01/92
SC089	Use of Nitrate for Bioremediation of a Jet Fuel Spill in a Shallow Aquifer at Hanahan	08/01/91 - 07/01/93	
South Dakota	SD079	Sediment Chemistry as Related to Transport of Arsenic and Trace Metals in Whitewood Creek and the Belle Fourche and Cheyenne Rivers, West-Central South Dakota	04/01/85 - 01/01/91
	SD086*	Department of Interior (DOI) Irrigation Drainage Program Field-Screening Study of the Angostura, Unit	02/01/88 - 09/12/90
	SD087*	DOI Irrigation Drainage Program Field-Screening Study of the Belle Fourche Project	02/01/88 - 11/20/90
	SD096	Water-Quality Assessment of the Pine Ridge Indian Reservation in Shannon, Jackson, and Bennett Counties	04/01/89 - 09/01/94

## Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
South Dakota	SD099	Black Hills Hydrology Study	10/01/89 - 09/01/95
Tennessee	TN030	Burial Ground Studies at Oak Ridge National Laboratory	07/01/75 - 09/30/89
	TN059	Pollution Susceptibility Evaluation with Radar Data, Eastern and Western Tennessee	03/01/83 - 09/30/87
	TN061	Hydrogeology--Y-12 Plant and Environs, Oak Ridge	04/01/84 - 02/01/90
	TN069	Geohydrology and Pesticide Transport at North Hollywood Dump, Memphis	10/01/85 - 02/13/91
	TN070	Background Water-Quality Data for Selected Trace Constituents and Organic Compounds in the Shallow Water-Table Aquifer in the Memphis Area	10/01/85 - 09/22/88
	TN073	Characterization of Quality of Shallow Ground Water in and near the Flood Plain of East Fork Poplar Creek at Oak Ridge	08/01/86 - 12/08/88
	TN075	Toxic Plume Delineation by Bacterial Bioassay and Unsaturated-Zone Gas Analysis at a Hazardous Waste Site Near Nashville	10/01/86 - 09/14/89
	TN076	Assessment of Hydrogeology and Water Quality near Wayne County Waste-Disposal Site near Waynesboro	10/01/87 - 07/25/88
	TN077*	Geochemical and Geomicrobial Processes Affecting the Fate of Organochlorine Pesticides in Ground Water	10/01/87 - 03/01/91
	TN080	Preliminary Assessment of the Potential for Contamination of the Memphis Sand Aquifer in the Memphis Area	10/01/87 - 06/01/90
	TN081	Stratigraphy and Hydrogeology of the DuPont Test Well, Humphreys County	01/01/88 - 09/30/88
	TN087	Hydrogeology and Geochemistry of Deeply Buried Rocks of Low Permeability	02/01/89 - 09/01/92
	TN090	Hydrologic and Geochemical Controls on the Occurrence of Radionuclides in Ground Water from Maury and Lewis Counties, Middle Tennessee	02/01/89 - 03/15/90
	TN091	Mussels and Yellow Colony Former Syndrome	07/01/89 - 09/30/91
	TN092	Investigation of Ground-Water Quality at the Shelby County Landfill, Memphis	04/01/89 - 09/30/90
	TN094*	Effects of Agriculture on Water Quality in the Beaver Creek Basin of West Tennessee	08/01/89 - 09/01/94

## Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Tennessee	TN096	Storm-Water Runoff Quality in Urban Areas of Tennessee	10/01/89 - 09/01/93
	TN097	Hydrogeology of Arnold Air Force Base	10/01/89 - 09/01/92
	TN098	Effects of Contaminants From an Abandoned Wood-Preserving Facility on Ground Water and Surface Water, Jackson	01/01/90 - 04/01/92
	TN104	Hydrogeology of the Naval Air Station, Memphis at Millington	10/01/90 - 04/01/92
	TN105	Digital Data Acquisition and Development of Coverages of Wells and Springs Used for Public Supply in Tennessee	10/01/90 - 06/01/92
Texas	TX028	Urban Hydrology Study, Houston	07/01/64 - 09/01/90
	TX060	Urban Hydrology Study, Austin	09/01/74 - 07/02/90
	TX083	Potential Impact of Trinity River Diversions on the Water Quality of Lake Houston, Texas - Phase I, Prediversions	10/01/83 - 09/01/93
	TX084	Sources and Inflow of Nutrients into Lake Lewisville	10/01/83 - 06/09/89
	TX093*	Attenuation of Selected Pollutants in the Unsaturated Zone of the Edwards Aquifer, Austin	03/01/85 - 09/30/88
	TX099	Determination of Recharge Characteristics of the Georgetown Formation in the Georgetown Area	03/01/86 - 09/30/88
	TX101	Geohydrology of the Water Resources and the Potential for Contamination of Oak Spring, Big Bend National Park	06/01/86 - 09/30/89
	TX102	Ground-Water Contamination at Two Sites, Kelly Air Force Base	10/01/86 - 09/30/91
	TX113	A Study of the Saline Zone of the Edwards Aquifer, San Antonio Region	02/01/89 - 09/01/91
	TX115	A Reconnaissance of Trace Volatile Organic Compounds in the Edwards Aquifer, North Central Bexar County	02/01/89 - 03/01/90
	TX123	Renovation of Tertiary-Treated Municipal Wastewater by Migration through the Hueco Bolson Aquifer, El Paso	07/01/90 - 09/01/92
	TX125	An Assessment of the Potential Effects of High-Salinity Waters on the Highland Lakes	07/01/90 - 09/30/91

## Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Texas	TX126	Status of the Gulf of Mexico: Freshwater inflows-- Case Studies on Trends in Historical Flows	08/01/90 - 09/01/91
	TX132	Nonpoint Source Contamination and Eutrophication of the Sandy Creek Embayment of Lake Travis	01/01/91 - 09/01/93
	TX135*	Evaluation of the Effects of Rangeland Management Practices on Water Quality and Quantity in the Seco Creek Basin near San Antonio	04/01/91 - 09/01/94
	TX136*	Trends in Bacteria and Nutrient Concentrations in Tributaries of the North Bosque River, Erath and Hamilton Counties	05/01/91 - 09/01/95
	TX137*	Trends in Bacteria and Nutrient Concentrations in Tributaries to Lake Fork Reservoir, Hopkins, Rains, and Wood Counties	03/01/91 - 09/01/95
	TX138*	Agricultural Chemical Contamination of a Shallow Aquifer System in North-Central Texas	07/01/91 - 09/01/94
	TX139	Determination of Quality of Urban Storm-Water Runoff in the Dallas-Fort Worth Metroplex	05/01/91 - 09/01/93
Utah	UT171	Depth to Base of Moderately Saline Ground Water, San Juan County	02/01/85 - 09/30/90
	UT173	Hydrologic Evaluation of the Castle Valley Ridge and Alkali Creek Coal-Lease Areas	03/01/85 - 01/31/87
	UT179*	Irrigation Drainage Problems at Stewart Lake Waterfowl Management Area	06/01/86 - 09/19/88
	UT182	A Plan for Determining the Effects of Injecting Brine into Tertiary Sedimentary Formations of the Uinta Basin	10/01/86 - 09/30/91
	UT184	Quality of Surface and Ground Water at the Silver Creek Tailings Site, Park City	04/01/87 - 09/30/88
	UT185	Ground Water Hydrology of the Prospector Square Area, Summit County	04/01/87 - 09/30/88
	UT186*	Review of Ground-Water Contamination, Southwestern Salt Lake Valley	08/01/87 - 09/30/90
	UT187	Installation Restoration Program Remedial Investigation Feasibility Study, Landfills 1 and 2, Hill AFB	10/01/87 -
	UT191*	Detailed Study of Irrigation Drainage in the Middle Green River Basin	10/01/87 -

## Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Utah	UT198	Investigation of Salinity in the Navajo Sandstone Aquifer in the Aneth area, San Juan County	10/01/88 - 09/01/95
	UT208	Mechanisms of Stream Recovery from Metal Contamination Upper Ark SW Toxics	02 /01/86 - 09/01/93
	UT212	Utah Test and Training Range, Geophysical Survey	10/01/90 - 09/30/91
	UT213	Ashley Creek and Green River Selenium Remediation	10/01/90 - 09/01/93
	UT216*	The Movement of Pesticides in Ground Water in the Lower Spanish Fork Area of Southern Utah Valley, Utah County	07/01/91 - 09/01/94
Virginia	VA057	Analysis of Aquifer System in the Coastal Plain of Virginia	10/01/79 - 09/30/87
	VA077	Hydrology of the Defense General Supply Center and Surrounding Area with Emphasis on Contaminated Ground Water	04/01/84 - 09/30/90
	VA082	Analysis of Federal, State, and Local Earth Science and Natural Resource Data By Use of a Geographical Information System (GIS) to Improve Environmental Management Capabilities in the Elizabeth River, a Tributary to the Chesapeake Bay	05/01/86 - 09/30/89
	VA084	Volatiles Organic Contamination in the Triassic Fractured Rock Aquifer of Prince William County	02/01/87 - 03/07/90
	VA088	Shallow Ground-Water Resources of Eastern York County	01/01/89 - 06/01/92
	VA090	Sources and Sinks of Nutrients and Trace Contaminants in the Chickahominy River	07/01/89 - 10/01/92
	VA093*	Biogeochemical Processes Controlling Nitrate Concentrations in Ground-Water Discharge	10/01/90 - 09/01/94
Vermont	VT022	Determination of Surface Water Inflow to Lake Champlain	07/01/89 - 09/01/91
	VT023	Hydrologic Methods for Investigations at Solid-Waste Landfills in Glaciated Terrains: An Application at Two Landfills in Bristol	04/01/90 - 09/01/92
Washington	WA240	Evaluation of the Areal, Vertical, and Temporal Distribution of Nitrate and Other Related Nitrogen Species in the Unconsolidated Deposits Near Burbank, Western Walla Walla County	04/01/80 - 09/30/88
	WA282	Basalt Waste Isolation Coordination	10/01/82 - 09/30/89

Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Washington	WA296	An Investigation of Hydrologic Conditions at the Midnite Mine and Vicinity, Stevens County	09/01/83 - 09/30/89
	WA297	Hazardous Waste Assessment in the State of Washington	10/01/83 -
	WA314	Yakima, Washington, Gasoline and Diesel Spill Study	10/01/85 - 09/30/87
	WA320	Ground-Water Contamination Assessment at Gas Works Park, Seattle	06/01/86 - 12/07/88
	WA321	National Water-Quality Assessment Program, Surface Water Phase--Pilot Study in the Pacific Northwest District	10/01/85 - 09/01/92
	WA322*	Pesticides in the Ground Water of Agricultural Areas	02/01/87 - 10/01/89
	WA331	Ground-Water Quality of Clark County	03/01/88 - 09/30/90
	WA335	Quality of Ground Water in the Toppenish Basin, Yakima Indian Reservation	02/01/89 - 09/01/92
	WA338	Investigations of Hazardous Waste at Hanford CERCLA Sites	02/01/89 - 09/01/93
	WA340	Hydrologic Investigations at the Hanford Nuclear Reservation	03/01/89 - 09/01/94
	PN355	Ground-water Resources of Selected Areas on the Spokane and Kalispel Indian Reservations, Northeastern Washington	05/01/90 - 09/30/91
	PN357	Surface-Water Quality Study in the Clover Creek Basin, Pierce County	04/01/90 - 09/01/93
	PN365	National Water Quality Assessment, Central Columbia Plateau	06/01/91 - 09/01/97
	PN373*	Department of Interior (DOI) Irrigation Drainage Reconnaissance Study of the Columbia Basin Irrigation Project	03/01/91 - 09/01/93
	PN377	Petroleum in Soil and Ground Water at Longmire, WA, Mount Rainier National Park	08/01/90 - 10/01/91
West Virginia	WV061	Water Resources of the Elk River basin	10/01/84 - 09/11/89
	WV065	Application of an Unsteady-Flow Solute-Transport Model to the lower New River in West Virginia	07/01/87 - 09/30/90
	WV066	Ground-Water Flow in Karst Areas of Jefferson County	10/01/87 - 06/25/90
	WV070	Traveltimes of Dissolved Conservative Contaminants in the Kanawha River	03/01/89 - 09/01/91

## Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
West Virginia	WV073	Assimilative Capacity of a High Altitude Wetland, Canaan Valley	10/01/90 - 09/01/93
Wisconsin	WI090	Reconnaissance of Nonpoint Source Pollution	10/01/77 - 09/01/93
	WI142*	Ground-Water Resources and Geology of Wood County	10/01/84 - 09/14/88
	WI144	East River Water-Quality Assessment Study	01/01/85 - 09/10/89
	WI145	Occurrence, Transport, and Simulation of PCB's in the Lower Fox River	10/01/85 - 09/01/92
	WI150	Assessment of Contaminant Effects on Aquatic Biota in Selected Reaches of the Illinois River System: An Application of Bioassay Methodology	06/01/86 - 01/24/89
	WI151	Upper Illinois River Basin Water-Quality Assessment	04/01/86 - 09/30/91
	WI156	Prestudy for Green Bay Mass Balance Study	06/01/87 - 09/26/88
	WI160	Balsam Lake Water and Phosphorus Budgets	11/01/87 - 08/19/91
	WI161	PCB and Other Contaminant Loads to Green Bay, Lake Michigan	10/01/87 - 12/01/92
	WI162	Roles of Groundwater Transport and Lake Sediment Sorption Processes in Mercury Cycling in Northern Wisconsin Lakes	07/01/88 - 02/10/89
	WI163	Roles of Groundwater Transport and Lake Sediment sorption Processes in Mercury Cycling in Northern Wisconsin Lakes	12/01/88 - 09/30/91
	WI164	CERCLA Remedial Response Support for Sites in EPA Region V	11/01/88 -
	WI166*	Evaluating Best Management Practices in Wisconsin	07/01/89 - 09/01/94
	WI167	Mobility and Diffusivity of Polychlorinated Biphenyls (PCBs) in Bottom Sediments and Interstitial Water of the Lower Fox River, Northeastern Wisconsin	05/01/89 - 09/30/91
	WI168*	Evaluating Best Management Practices in the Black Earth Creek Basin	05/01/89 - 09/01/96
	WI169	Evaluating the Toxicity of Urban Runoff	07/01/89 - 09/30/91
	WI176	Sources of Pollutants in Urban Runoff	03/01/91 - 09/30/91
	WI179	Transport of Trace Organics from the Sheboygan River into Lake Michigan	08/01/91 - 09/01/93

## Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Wyoming	WY060*	Ground-Water Hydrology of the Southern Power River Uranium District	10/01/80 - 09/27/90
	WY090	Reaeration Coefficients and Traveltime for Major Rivers in Wyoming	03/01/85 - 02/24/89
	WY094	The Occurrence, Mobility, and Geochemical Controls Effecting Selenium Concentrations in Ground Waters and Associated Rocks Disturbed by Mining, Powder River Basin	02/01/86 - 02/03/89
	WY095	Site characterization for the Installation Restoration Program at F.E. Warren Air Force Base	12/01/85 - 12/01/95
	WY098	Assessment of Selenium, Arsenic, Uranium, and Radionuclide Loads in Surface Waters Entering the Proposed Sandstone Reservoir, Carbon County	06/01/86 - 12/27/90
	WY104*	Trace Elements in Water, Soil, and Rocks of the Kendrick Irrigation Project, Natrona County	08/01/87 - 01/15/90
	WY111*	Detailed Study and Assessment of Irrigation Drainage in the Kendrick Reclamation Project Area	10/01/87 - 09/30/91
	WY117	Ground-Water Recharge and Discharge in Backfilled Spoil Material at Surface Coal Mines, Powder River Basin	06/01/88 - 04/17/89
	WY118	Effects of In Situ Oil-Shale Retorting on Water Quality near Rock Springs	07/01/88 - 12/19/90
	WY122	Hydrologic Characteristics in a Fractured-Rock Aquifer, Rock Springs	03/01/90 - 10/01/91
	WY130	The Role of Natural Organic Solutes on the Mobility of Selenium	10/01/90 - 09/01/94

## 2. Investigations conducted by regional centers.

Central Region	CR266	Transport and Deposition of Sediments and Sediment-Borne Contaminants in Tidal Rivers and Estuaries	10/ 1/80 - 09/ 1/82
	CR278	Origin, Fate, and Transport of Organic Compounds in Surface and Ground Waters and their Effect on Water Quality.	04/ 1/88 - 10/ 1/90
	CR309	Sediment-Transported Pollutants in the Mississippi River	02/ 1/87 - 09/ 1/91
	CR313	Sediment-Water Chemistry in Large River Systems: Biogeochemical, Geomorphic, and Human Controls	10/ 1/87 - 09/ 1/99

## Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Central Region	CR318	Reaction-transport modeling in ground-water systems	08/01/89 -
Nevada Nuclear	NN310**	Management and Integration of Nevada Nuclear Waste Storage Investigations (NNWSI) Hydrologic Program	10/01/85 -
	NN332	Saturated Zone Hydrology	10/01/85 -
	NN333	Hydrology of Unsaturated Zone, Yucca Mountain and Vicinity, Nevada	10/ 1/85
	NN335	Paleohydrology	10/01/86 -
	NN521	R and I Licensing, Regulatory Interactions	10/01/85 - 09/30/86
	NN522	R and I Licensing, Site Characterization Plan	10/01/85 -
	NN612	ES, Management and Integration - Safety and Quality Assurance	10/ 1/85 -
	NN691	ES, Testing-Exploratory Shaft Test Plan	10/01/85 -
Northeast Region	NR034	Spatial Distribution Of Chemical Constituents in Ground Water	01/01/57 -
	NR092	Hydrogeochemical Controls on the Migration of Radionuclides from Uranium Mill Tailings	03/01/78 -
	NR120	Digital Modeling of Transport in the Saturated Zone	10/01/81 -
	NR122	Dispersion of Toxic and Radioactive Wastes in Ground Water Systems	07/01/81 -
	NR129	Comparative Study of Organic Degradation in Selected Hydrogeologic Environments	10/ 1/82 - 09/01/87
	NR132	Relationship Between Chemical Quality of Natural Waters and Human Health and Disease	01/01/79 -
	NR135	Distribution and Speciation of Metals in Sedimentary Environments	10/01/85 -
	NR137	Great Lakes Basin Ground-Water Contamination Study through GIS	01/01/87 - 10/01/87
	NR139	The Mathematical Simulation of the Transport and Reaction of Chemical Species in Ground Water	07/01/72 -
	NR142	Organic Contaminants in Water	05/01/88 - 01/09/91

**\*\*NOTE:** A number of additional investigations associated with Nevada nuclear waste storage and Yucca Mountain are not listed here.

## Appendix C--continued

	<u>Project No.</u>	<u>Project Title</u>	<u>Period of Study</u>
Western Region	WR068	Fate of Organic Chemicals in Subsurface Environments	07/01/70 -
	WR071	Influence of Geologic and Hydrologic Factors Upon Migration of Radionuclides from Solid-Waste Burial Ground, National Reactor Testing Station, Idaho	11/01/70 - 09/30/88
	WR125	Availability of Trace Elements in Sediments to Aquatic Organisms	08/01/74 -
	WR128	Chemical Modeling and Thermodynamic Data Evaluation of Major and Trace Elements in Acid Mine Waters and Ground Waters	07/01/74 -
	WR137	Effects of Toxic Substances on Aquatic Communities	06/01/75 -
	WR191	Interaction of Bacteria with Environmental Contaminants and Solid Surfaces in the Aquatic Environment	10/01/85 -
	WR199	The Fate and Transport of Immiscible Contaminants in the Subsurface	10/01/88 -