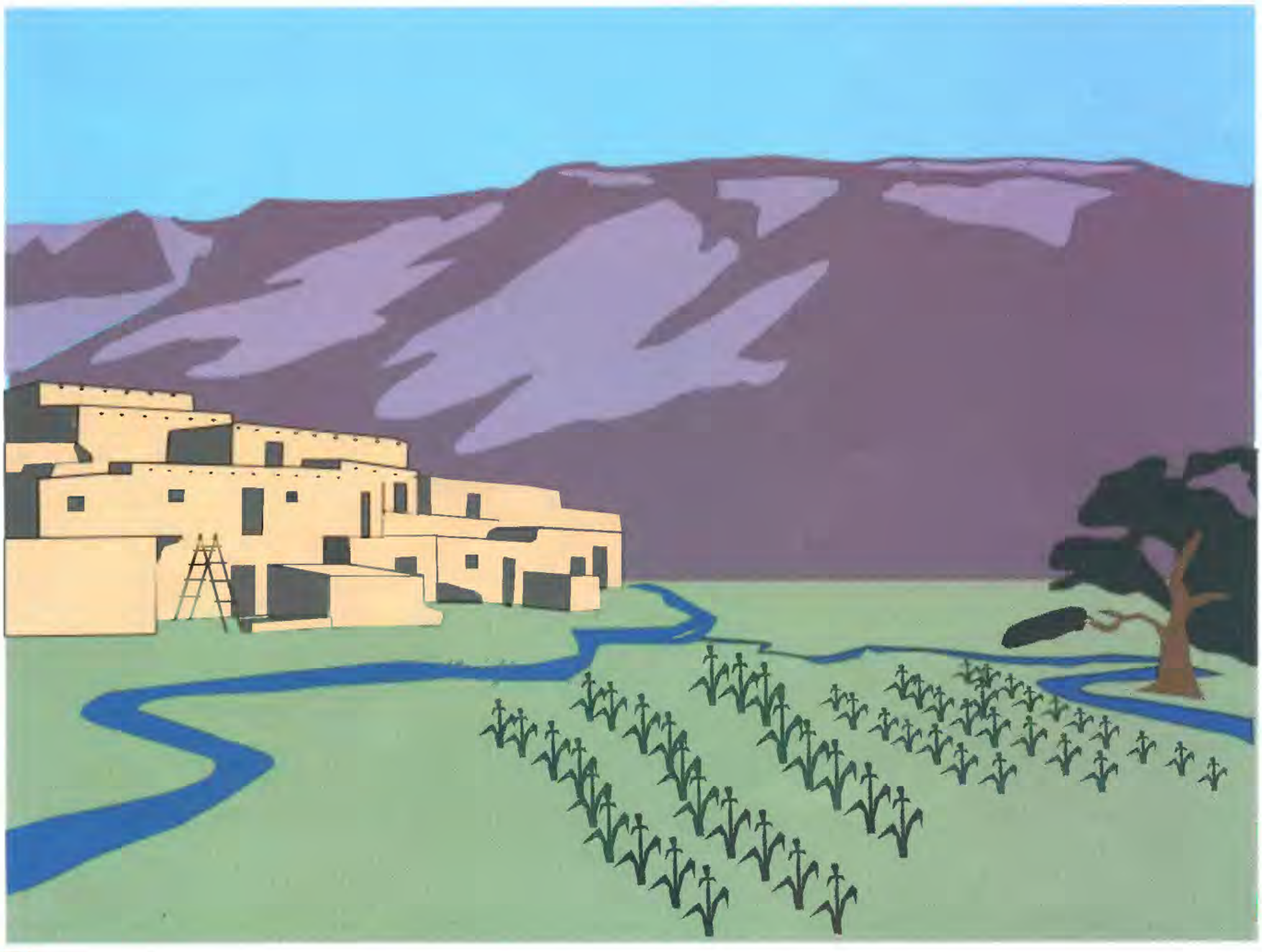
U.S.Geological Survey

Activities in New Mexico

1995



U.S. DEPARTMENT OF THE INTERIOR

BRUCE BABBITT, *Secretary*

U.S. GEOLOGICAL SURVEY

Gordon P. Eaton, *Director*

U.S. GEOLOGICAL SURVEY ACTIVITIES IN NEW MEXICO 1995

By Russell K. Livingston

U.S. GEOLOGICAL SURVEY
Open-File Report 95-314

Albuquerque, New Mexico
1995

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Streamflow-gaging station on the Rio Pueblo de Taos below Los Cordovas, New Mexico, October 4, 1974

"Historically the program emphasis of the U.S. Geological Survey has changed, from general geological and hydrological appraisals to more issue-oriented investigations, from traditional topographic mapping to digital coverages with highly specialized themes, and from predominately data-collection activities to a balance of data collection, interpretative studies, and research. Yet our mission is as pertinent to the resource issues of today as it was when our topographers first arrived at Fort Wingate, New Mexico, in the summer of 1880. The proud heritage and tradition that are so much a part of the U.S. Geological Survey have given each of us as employees a special feeling, not only about the agency we represent, but also the value of our contributions to present and future generations."

"This report provides an overview of recent activities of the USGS here in New Mexico, and includes activities carried out by the agency's Water Resources Division, Geologic Division, and National Mapping Division. Together with the numerous local, State, Tribal, and Federal clients that are our cooperators, we look forward to continued service to the State of New Mexico and the American public."

Russell K. Livingston

New Mexico District Chief

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Camp of U.S. Geological Survey hydrographers at Embudo, New Mexico, the "birthplace of systematic stream gaging" (c. 1888)

The technical, manuscript-preparation, editing, drafting, and computer expertise of many employees in the Water Resources, Geologic, and National Mapping Divisions greatly improved the content and quality of this publication. The author gratefully acknowledges their contributions.

INTRODUCTION 3

The U.S. Geological Survey was established by an act of Congress on March 3, 1879, as a Federal agency in the U.S. Department of the Interior. Its mission is to conduct the systematic and scientific classification of the public lands and to examine the geological structure, mineral resources, and products of the national domain. An integral part of that original mission includes publishing and disseminating the earth-science information needed to understand, to plan the use of, and to manage the Nation's energy, land, mineral, and water resources.

For over 100 years the U.S. Geological Survey (USGS) has provided the earth-science information on which many decisions regarding New Mexico's natural resources have been based. Some of the agency's activities touch a broad spectrum of the general public, such as preparation of topographic maps, while other services benefit a more limited customer base, such as assessment of county water resources or investigation of landslide hazards. Regardless of the activity or customer, the nonregulatory, independent, and scientific nature of the agency ensures products that are

- technically sound,
- unbiased,
- timely,
- based on a high degree of quality assurance, and
- cost effective.

For these reasons, the USGS has a well-deserved reputation for quality--a public-sector organization whose services are held in high regard.

The various programs of the USGS in New Mexico reflect a responsiveness to the State's needs for earth-science information. This is because much of the work of the USGS is part of a Federal-State Cooperative Program in which the diversity of interests among local, State, Tribal, and Federal agencies is accommodated through joint planning and funding. The USGS provides up to 50 percent of the required funding for this program and the remainder is provided by reimbursements from the cooperating agency. Other programs of the USGS are entirely federally funded, either directly through the USGS or other Federal agencies.

Anasazi petroglyphs in New Mexico. Photograph courtesy of William Stone.©

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WATER-DATA COLLECTION, STORAGE , AND RETRIEVAL

A historical record of water-resources information provides a foundation on which to build future investigations and a firm basis for decision making.

In virtually all parts of New Mexico, the quantity, quality, and distribution of water are critical to the State's economy, public health and welfare, and resource management. Among the typical issues are increased water-supply needs in response to population increases, effects of land and water use on water quality, public protection from floods and droughts, and management policy with regard to dwindling ground-water resources and overappropriated surface waters.

The USGS is the principal Federal agency cooperating with State and local agencies in the collection, storage, and retrieval of data on New Mexico's water resources. Through offices in Albuquerque, Las Cruces, and Carlsbad, the Water Resources Division of the USGS operates and maintains statewide networks of monitoring sites at which surface-water, ground-water, and water-quality data are collected, frequently recorded on a continuous basis. These data are all collected and processed by qualified Hydrologic Technicians using nationally standardized techniques. Among special-purpose instrumentation used are satellite telemetry, multi-parameter water-quality sensors, global positioning systems, and water-level sensing devices. All data are stored in computer files and published in annual data reports. Computer software is available to facilitate retrievals of historical data, including selection by date, location (county, latitude-longitude polygon, drainage basin, etc.), water-quality constituent, and aquifer.

Surface-Water Data-Collection Network

In New Mexico, the USGS's network of sites at which surface-water data are collected includes over 300 streamflow stations and 26 lake or reservoir stations (fig. 1). These data are used in such water-related fields as water supply, hydroelectric power, flood control, irrigation, bridge and culvert design, wildlife management, pollution abatement, regulation by interstate compacts, and water-resources development.

Ground-Water Data-Collection Network

The ground-water data network in New Mexico (fig. 1) consists of five data-collection networks: (1) about 1,200 wells measured periodically; (2) about 200 "key" wells measured annually in one of five designated areas of the State; (3) about 120 federally funded observation wells; (4) about 250 wells in the Eastern High Plains measured annually for inclusion in the Internal Revenue Service accounting system; and (5) daily values from continuous water-level recorders at selected wells.

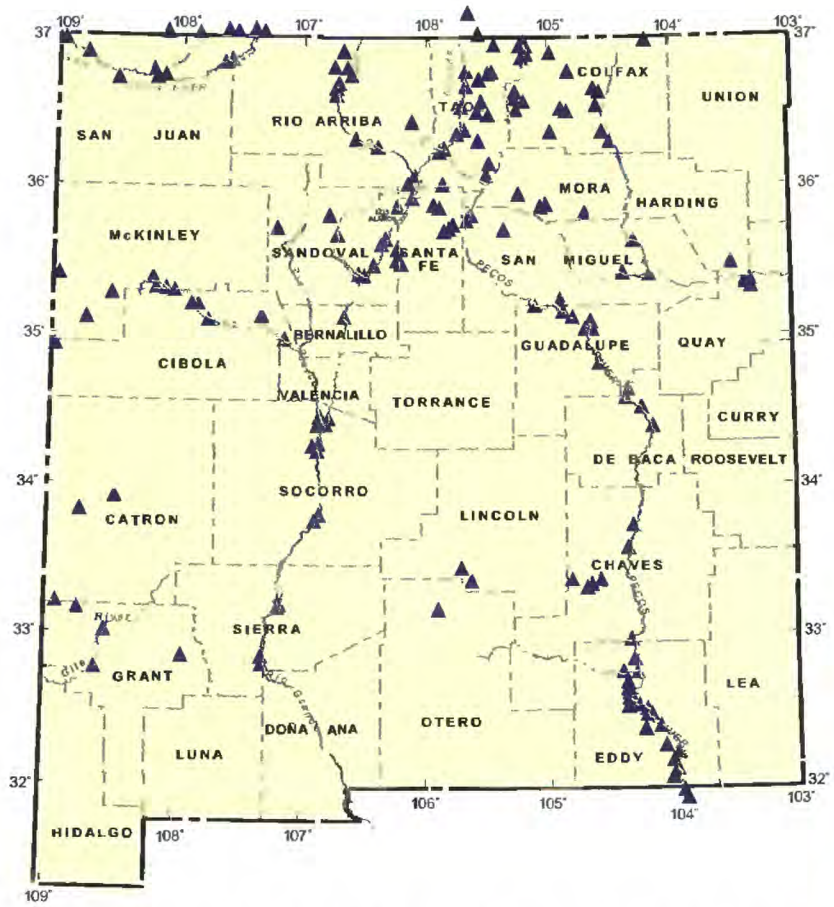
Water-Quality Data-Collection Network

Physical data and water samples for laboratory determination of chemical, sediment, and biological characteristics are collected in New Mexico at over 84 surface-water sites (fig. 1). In addition, water-temperature data, recorded at the time streamflow is measured, are available for most surface-water gaging stations (fig. 1).

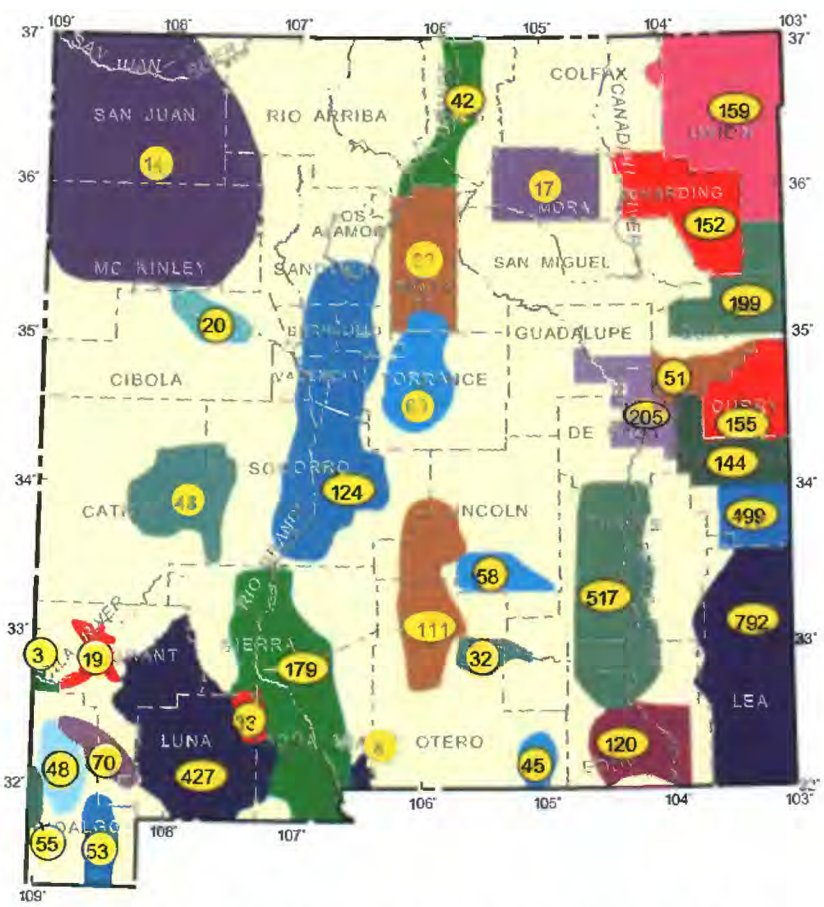
References

Cruz, R.R., and others, 1994, Water resources data, New Mexico, water year 1993: U.S. Geological Survey Water-Data Report NM-93-1, 590 p. (published annually).

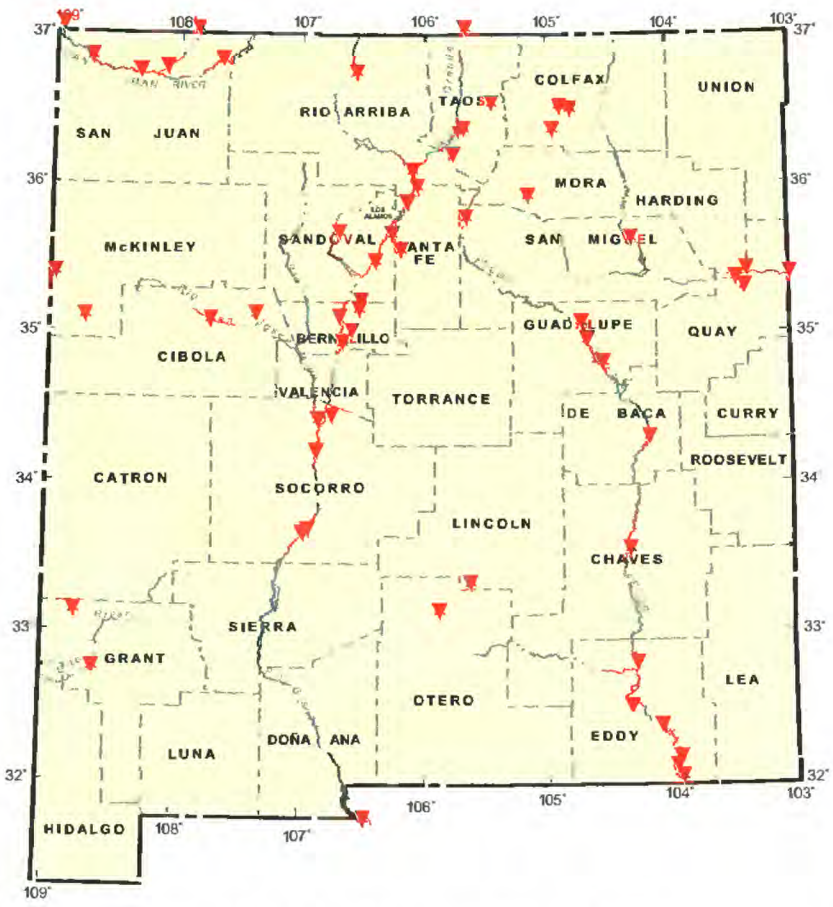
Dam, W.L., in press, Geochemistry of ground water in the Gallup, Dakota, and Morrison aquifers, San Juan Basin, New Mexico: U.S. Geological Survey Water-Resources Investigations Report 94-4253.



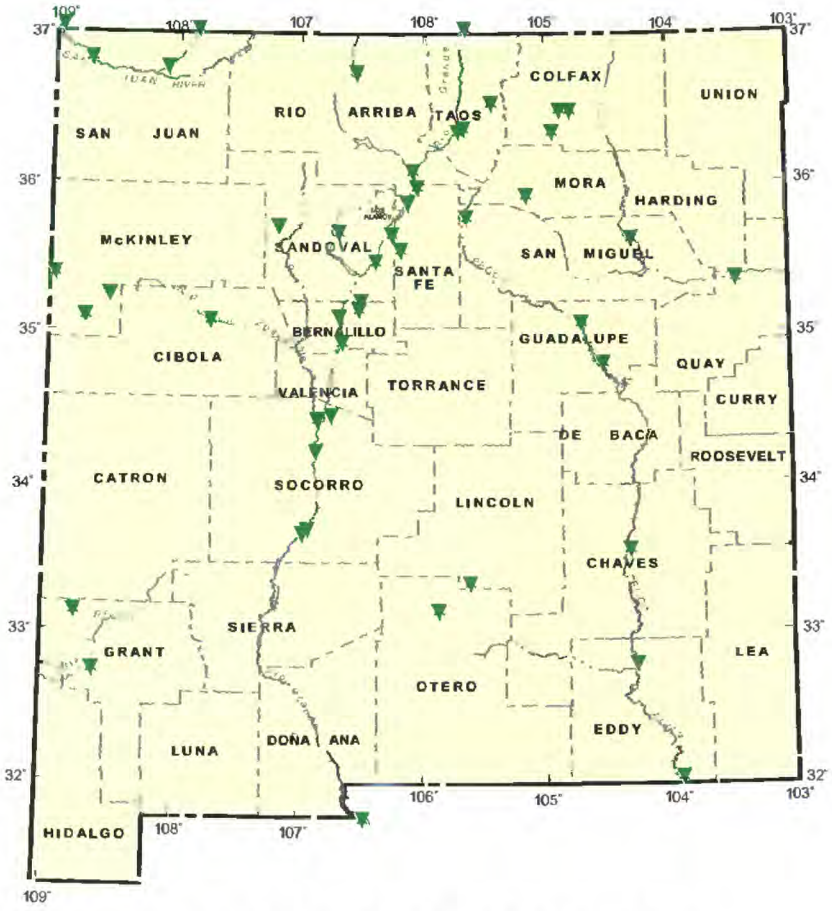
SURFACE-WATER GAGING STATIONS



GROUND-WATER MONITORING AREAS
(Number indicates number of wells measured periodically)



SURFACE-WATER CHEMICAL-QUALITY STATIONS



SURFACE-WATER SUSPENDED-SEDIMENT STATIONS

Figure 1.--Water-data program of the USGS in New Mexico (modified from Cruz and others, 1994).

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HYDROLOGIC AND GEOLOGIC HAZARDS

Earth-science information concerning naturally occurring hazards improves planning and protects lives.

Due to its climatic and geologic characteristics, New Mexico has a variety of hydrologic and geologic hazards, such as floods, droughts, subsidence, landslides, and earthquakes. Data collection and investigations conducted by the Geologic and Water Resources Divisions address these issues as well as many others. The Albuquerque Seismological Laboratory, part of the Geologic Division, collects information on worldwide earthquake activity. The Water Resources Division conducts flood magnitude/frequency assessments, surveys high-water marks for the indirect determination of flood discharge, and studies land subsidence due to ground-water development.

Investigation and Analysis of Flood Discharge for Unregulated Streams in New Mexico

This statewide study, a cooperative effort with the New Mexico State Highway and Transportation Department, began in 1966 and is planned for completion in 1995. The objective is to obtain and analyze hydrologic data that can be used in the design of highway drainage structures. The study will determine relations between basin characteristics and the magnitude, volume, and frequency of floods for ungaged sites. Analysis of data is in progress to update previous interpretations as described by Waltemeyer (1986) (fig. 2).

Landslide Hazards

Conducted in cooperation with the New Mexico Bureau of Mines and Mineral Resources, the New Mexico State Highway and Transportation Department, and the Italian National Research Council, this statewide study will result in maps showing the historical distribution of landslides. These maps will be used to identify areas where buildings are likely to be damaged by landslides and to document the extent of landslides in the State.

Land Subsidence in the Albuquerque Area

Withdrawal of ground water from the Albuquerque Basin has caused limited land subsidence in the area (Kernodle and others, 1995). To monitor changes in land-surface elevation, a geodetic network has been established and resurveyed periodically. An extensometer and several piezometers have been installed and operated to monitor pore-pressure changes and associated aquifer-system compaction. The data collection is being conducted by the USGS in cooperation with the City of Albuquerque.

References

Kernodle, J.M., McAda, D.P., and Thorn, C.R., 1995, Simulation of ground-water flow in the Albuquerque Basin, central New Mexico, 1901-1994, with projections to 2020: U.S. Geological Survey Water-Resources Investigations Report 94-4251, 114 p.

Waltemeyer, S.D., 1986, Techniques for estimating flood-flow frequency for unregulated streams in New Mexico: U.S. Geological Survey Water-Resources Investigations Report 86-4104, 56 p.

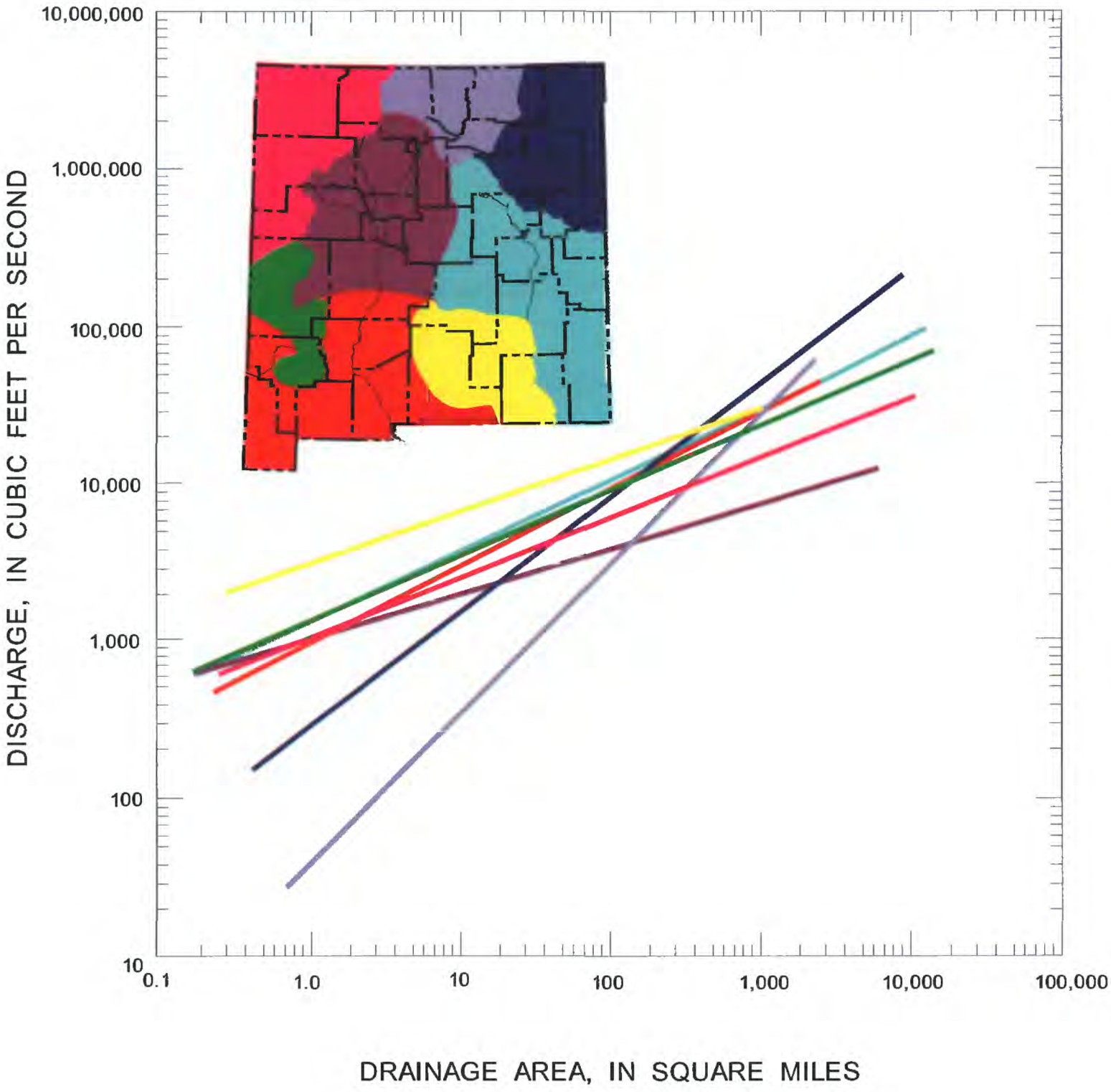

Figure 2.--Relations between 100-year peak discharge and drainage area for seven physiographic regions in New Mexico (Waltemeyer, 1986).

8 ENVIRONMENTAL ASSESSMENT

The USGS's corporate knowledge of the State's geohydrology, comprehensive data bases of hydrologic and geologic information, specialized skills and experience, and extensive resources make it well suited for environmental assessments.

Human impact on the environment, particularly its water resources, continues to be a major concern to the Nation. To provide the specialized data-collection skills required by environmental assessments, USGS personnel are experienced in National Environmental Protection Act compliance. Additional resources available to the USGS include equipment for soil, water, and air sampling with associated analytical services, surface and borehole geophysics, drilling capabilities (auger, air/mud rotary, and pushrod), and experience in preparation of all required planning documents (Workplan, Sampling and Analysis Plan, Quality Assurance Project Plan, and Health and Safety Plan). These resources also enhance the USGS's general studies of local and regional ground-water-quality problems and environmental impacts of land use.

Installation Restoration Program at Kirtland Air Force Base

For more than 6 years the New Mexico District has been participating in the U.S. Air Force's (USAF) Installation Restoration Program (IRP), Remedial Investigation/Feasibility Study (RI/FS), and RCRA Facility Investigation (RFI) to delineate and describe sites of possible ground-water, surface-water, and soil contamination on USAF bases. Since 1988, the USGS has conducted studies of 24 sites (Kirtland Air Force Base in Albuquerque) to determine the extent and types of contamination indicated in previous investigations (fig. 3). Activities have included installation of 35 monitoring wells, soil sampling at 23 sites, soil-gas surveys at 5 sites, and completion of numerous compliance reports.

Ground-Water Contamination, Land Use, and Aquifer Vulnerability in Eastern Bernalillo County

The residents of eastern Bernalillo County are concerned about the quality of ground water, their sole water supply, and its vulnerability to contamination due to land use. Among the concerns are concentrations of nitrate exceeding recommended standards for drinking water, possibly due to septic tank contamination. Using data from a well-sampling program, the USGS will describe the water quality of the area. The results are intended to assist planning future land use in this rapidly developing area of the county.

Erosion on the Zuni Reservation

As a result of intense arroyo development, gullying, and erosion in the period 1890-1920, the Zuni Land Conservation Act of 1990 was created. Through a cooperative agreement with the Pueblo of Zuni, the USGS is helping the tribe to develop and implement a resource-development plan, which includes evaluating erosion conditions in selected areas, developing a plan to monitor erosion-control practices, and training Zunis in various aspects of hydrology, geomorphology, and erosion control.

Reference

Wilcox, Ralph, 1995, Analytical results from an environmental investigation of six sites on Kirtland Air Force Base, New Mexico, 1993-94: U.S. Geological Survey Open-File Report 94-547, 55 p.

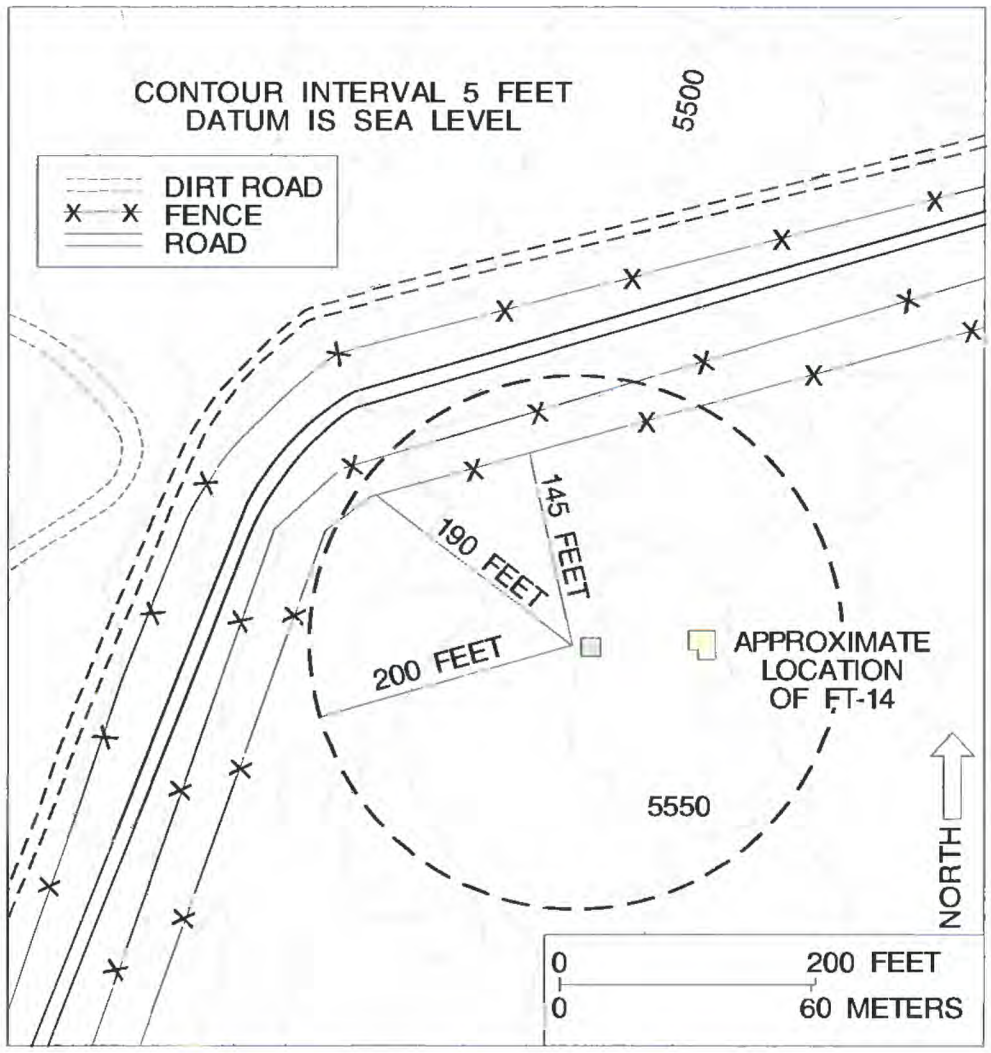

Figure 3.--Location of a site at Kirtland Air Force Base investigated by USGS (Wilcox, 1995).

10 WATER AVAILABILITY

It is especially important in an arid State such as New Mexico that good hydrologic information is available on which to base water-management decisions.

The availability of ground water and surface water within New Mexico is of the utmost importance. These resources are critical for municipal, industrial, and agricultural water supply, assurance of water quality, esthetic and special ethnic interests, and maintenance of an ecological/hydrological balance in the environment. Many of the activities of the USGS are directed at the numerous hydrologic and geologic issues associated with water availability. Examples include quantification of aquifer properties and response to hydrologic stress, artificial and natural recharge, and water quality.

Deep Percolation from Irrigated Areas in the Roswell Basin

Water management in the Roswell Basin and other declared basins in New Mexico has been a critical issue for many years. The amount of deep percolation (recharge) from applied irrigation water is one of the hydrologic issues for which better information is needed so that water managers can better understand these complex ground-water systems and estimate aquifer depletion. In cooperation with the New Mexico State Engineer Office, USGS scientists are conducting recharge investigations at two sites in the basin.

Ground-Water Depletion in the Albuquerque Basin

The future water supply for the city of Albuquerque is the dominant water issue in New Mexico. Studies by the USGS, in cooperation with the City of Albuquerque, and other agencies have concluded that the aquifer on which Albuquerque relies for its entire water supply is less extensive than previously thought (Thorn and others, 1993). This new information, along with projections of future water-level declines from a USGS ground-water-flow model of the basin (Kernodle and others, 1995) (fig. 4), has been the basis for extensive changes in water management, including development by the City of a Water Conservation Program.

Water Resources of Taos County

Ground water is the primary source for domestic use in Taos County, but few data exist about the extent and quality of ground-water supplies. About 95 percent of the water use in the county is surface water, mostly for irrigated agriculture, and most surface-water resources are overappropriated according to the New Mexico State Engineer Office. With the likelihood of increasing demands for water, there are concerns about water availability in the future and about water-quality degradation that has occurred in localized areas. In response to these concerns, the USGS conducted a study (Garrabrant, 1993) of the water resources of Taos County in cooperation with the New Mexico State Engineer Office, New Mexico Environment Department, and New Mexico Bureau of Mines and Mineral Resources.

References

Garrabrant, L.A., 1993, Water resources of Taos County, New Mexico: U.S. Geological Survey Water-Resources Investigations Report 93-4107, 86 p.

Kernodle, J.M., McAda, D.P., and Thorn, C.R., 1995, Simulation of ground-water flow in the Albuquerque Basin, central New Mexico, 1901-1994, with projections to 2020: U.S. Geological Survey Water-Resources Investigations Report 94-4251, 114 p.

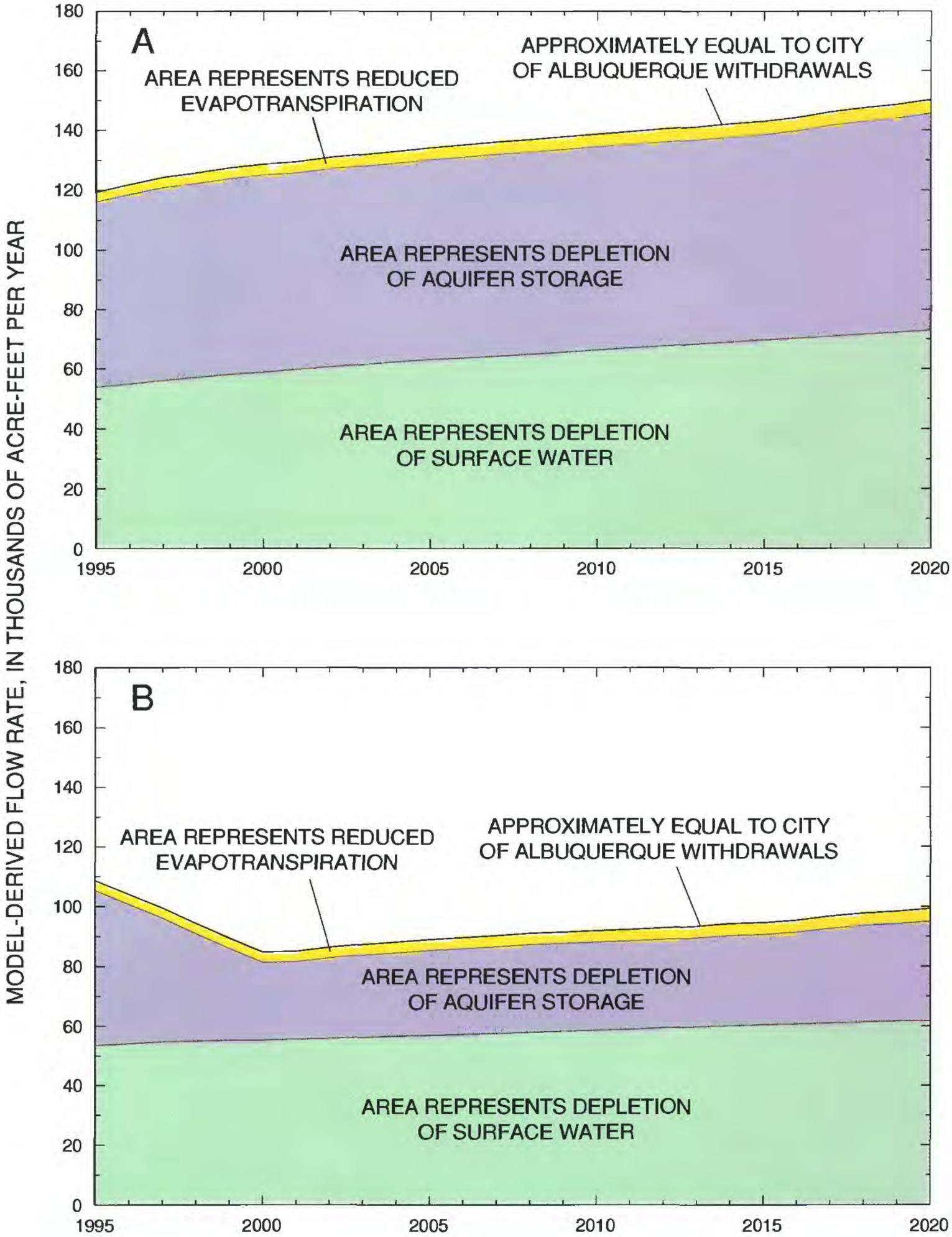

Figure 4.--Sources of CIty of Albuquerque withdrawals assuming medium growth for 1995 2020: A. No water conservation; B. 30-percent conservation (modified from Kernodle and others, 1995).

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WATER QUALITY AND STREAM ECOLOGY

Concerns that changing water quality may impair the capability of the State's water resources to meet future uses, including preservation of stream ecology, are ever present.

Degradation of the quality of the Nation's water resources is frequently caused by human impact on the environment. In New Mexico, this potential is of particular concern due to the generally limited quantity of these resources, and the areal and temporal variation in these resources, particularly surface water. Information on the status, trends, and causes of water-quality conditions in the State is vital to decision makers who set policy, promulgate regulations, establish priorities, or manage water resources (fig. 5). Examples include determining the relative effects on water quality of various types of point and nonpoint sources, identifying aquifers requiring different types and degrees of water-quality protection, allocating budgetary resources among various water-quality problems, identifying the extent and causes of water-quality degradation, and determining whether desired goals for water-quality improvement are being met. The USGS's strong technical capabilities, including complete analytical services and use of standardized sampling techniques, have led to numerous studies in New Mexico that provide information that addresses these issues.

Reconnaissance Investigation of Water Quality, Bottom Sediment, and Biota Associated with Irrigation Drainage in the San Juan River Area

During the last several years, there has been increasing concern about the quality of irrigation drainage and its potentially harmful effects on human health, fish, and wildlife. This USGS investigation of several irrigation projects in the San Juan River area (Blanchard and others, 1993) was conducted to determine if drainage from the projects has caused or has the potential to cause significant harmful effects on human health, fish, or wildlife, or to reduce the suitability of river water for beneficial uses.

National Water Quality Assessment Program (NAWQA)

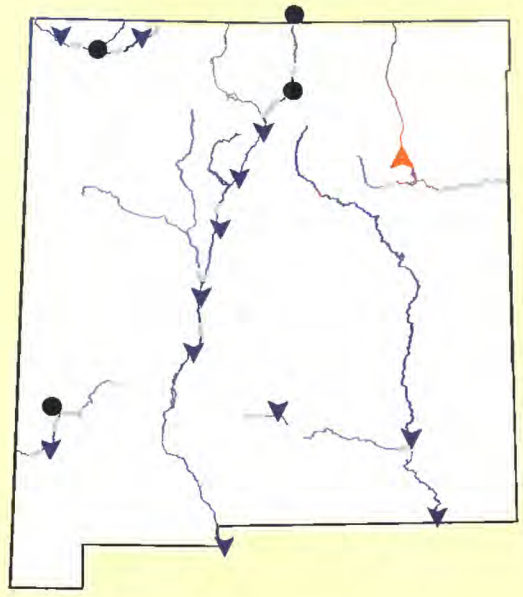
Two NAWQA study units are located partly in New Mexico--the Rio Grande Valley and the Southern High Plains. The long-term goals of these NAWQA studies are to describe status of and trends in the units' surface- and ground-water resources, and to identify the natural and human factors that affect their quality. The program is conducted by the USGS; however, communication and coordination with local water-management officials and other water-resources agencies are key components of the program. Water information produced by these studies will be useful to policy makers and water managers at the local, State, Tribal, and Federal levels.

Trace Metals in the Rio Grande

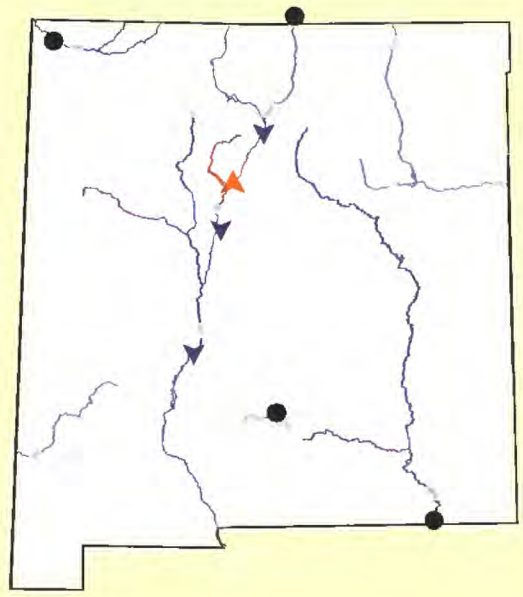
The USGS, in cooperation with the U.S. Environmental Protection Agency, City of Albuquerque, New Mexico Environment Department, and Pueblo of Isleta, began a 2-year study in 1994 to collect additional trace metal data for the reach of the Rio Grande from San Felipe Pueblo to Los Lunas. The study is designed to establish baseline concentrations of selected trace metals and determine instantaneous loading of these metals, to address concerns regarding the consumption of arsenic contained in fish in the study reach, and to resolve concerns regarding the quality of previous data by using ultra-clean field and laboratory techniques.

Reference

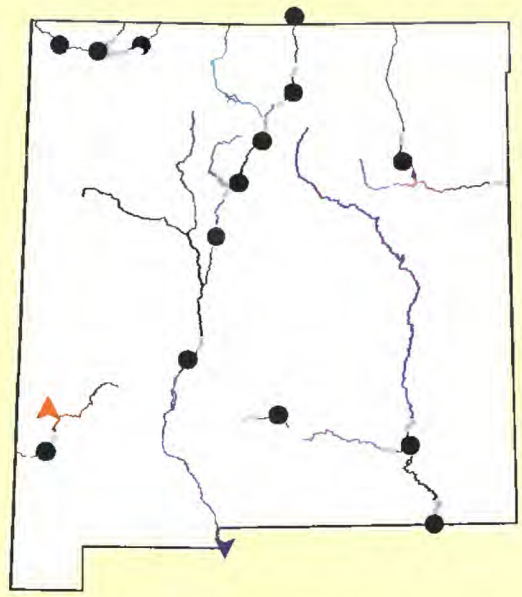
Blanchard, P.J., Roy, R.R., and O'Brien, T.F., 1993, Reconnaissance investigation of water quality, bottom sediment, and biota associated with irrigation drainage in the San Juan River area, San Juan County, northwestern New Mexico, 1990-91: U.S. Geological Survey Water-Resources Investigations Report 93-4065, 141 p.



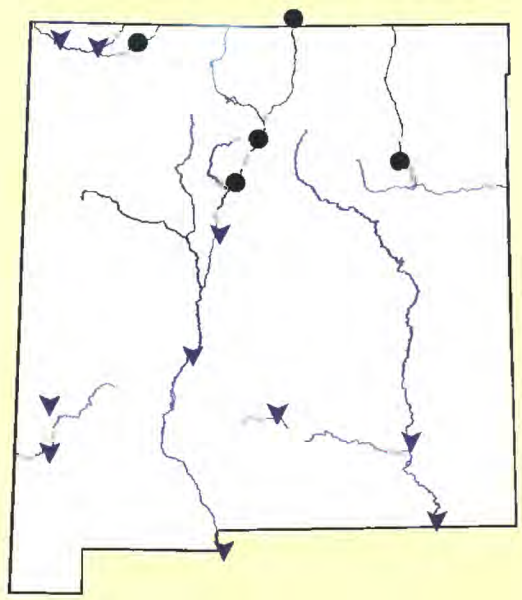
Specific conductance, 1975-89



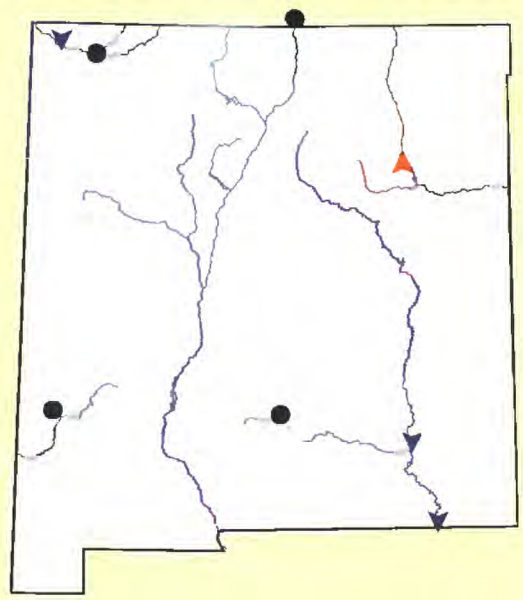
Fecal coliform bacteria, 1975-89



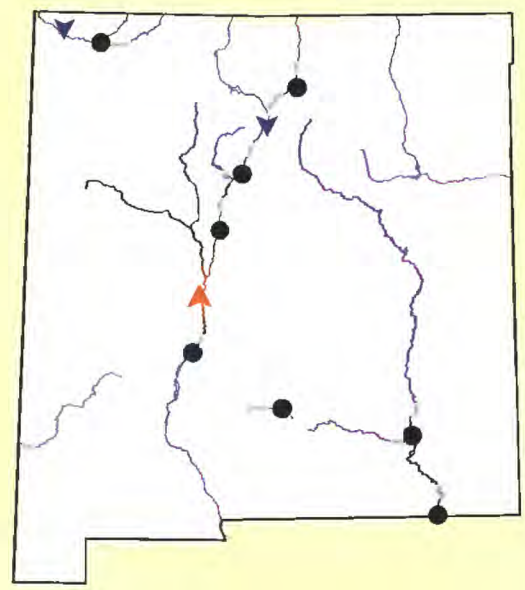
Alkalinity, 1975-89



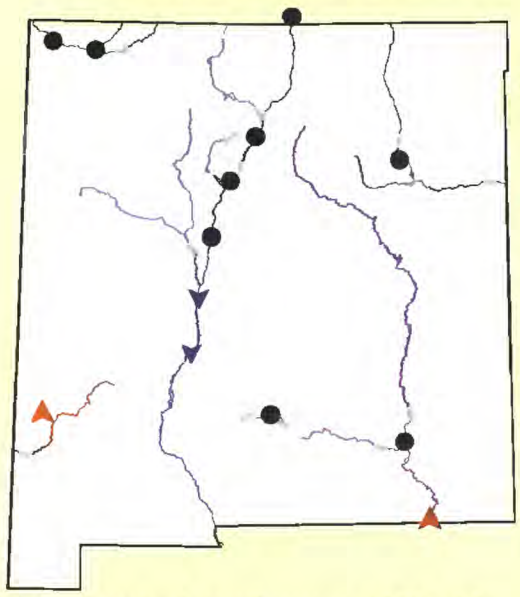
Dissolved sulfate, 1975-89



Dissolved solids, 1975-89



Dissolved nitrite plus nitrate, 1975-89



Suspended sediment, 1975-89

EXPLANATION

Trend in water-quality property or constituent

▲Upward

●None

▼Downward

0 50 100 MILES

0 50 100 KILOMETERS

Figure 5.--Trends in water quality of selected streams in New Mexico (data from U.S. Geological Survey files).

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ASSESSMENTS OF ENERGY AND MINERAL RESOURCES

The location and extent of energy and mineral resources and effects of their development on the environment are vital to New Mexico's future

The Nation's ability to make informed decisions about energy- and mineral-resource needs and Federal land use depends on maintaining current, unbiased information on the occurrence, quality, quantity, and availability of nonrenewable resources. Through the collection of high-quality data and maintenance of standardized data systems, the USGS responds quickly to requests for objective scientific information that Federal and State land-management agencies rely upon for decision making. Assessment work conducted in New Mexico by the USGS is part of a nationally coordinated project that applies a standard methodology of evaluation to quantify the energy and mineral potential of Federal lands and, in some cases, non-Federal lands. These and other studies, frequently conducted in cooperation with the New Mexico Bureau of Mines and Mineral Resources, benefit Federal, Tribal, and State agencies, private industry, and the general public. These clients use USGS information and data to help land management, set public health and safety standards, formulate economic policy, protect the environment, and maintain a viable energy and minerals industry.

Gas Resources in the San Juan Basin

In the San Juan Basin, a major gas-producing region, new technologies and strategies are needed to discover additional resources and extract an estimated technically recoverable 8 trillion cubic feet of gas (Gautier and others, 1995). The USGS, in cooperation with the New Mexico Bureau of Mines and Mineral Resources, various Indian Tribes and universities, and other Federal agencies, has initiated a program to provide a comprehensive understanding of gas distribution in the basin.

Environmental Impacts of Mining in the Mimbres Resource Area

The four-county Mimbres Resource Area in southwestern New Mexico has the largest mineral production in the State. Large-scale mining operations, characteristic of this area, produce waste rock, mill tailings, furnace slag, and flue dust. In conjunction with a minerals-resource assessment of the Mimbres area, USGS scientists are assessing the contributions to the soil matrix of elements resulting from ore extraction and smelting. As shown in figure 6, among the current finds is a significant increase in copper in soil, even at depths exceeding 10 centimeters (3.94 inches), since 1973 (E.L. Mosier, written commun., 1995).

Metallic Mineral Potential of Mexican Spotted Owl Habitat in New Mexico's National Forests

At the request of the U.S. Forest Service, the USGS is determining the extent of areas of suitable habitat for Mexican Spotted Owls that coincide with National forest lands having mineral potential for undiscovered gold, silver, copper, or molybdenum. The assessment will be used to develop strategies for the protection of the owls' habitat in the event of future exploitation of these mineral resources.

Reference

Gautier, D.L., Dolton, G.L., Takahashi, K.I., and Varnes, K.L., 1995, National assessment of United States oil and gas resources - Results, methodology, and supporting data: U.S. Geological Survey Digital Data Series 30 [CD-ROM].

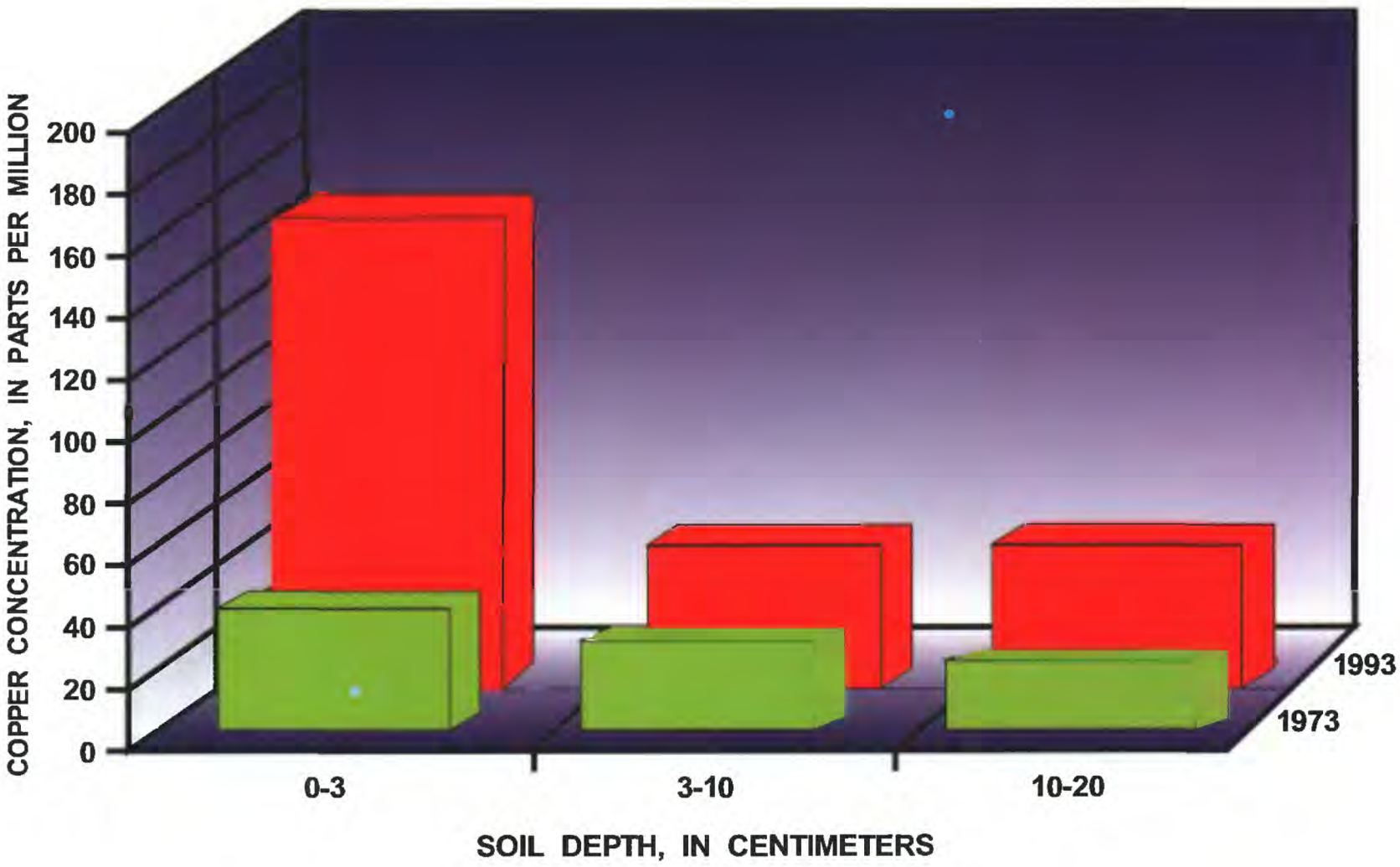


Figure 6.--Concentration of copper in soil from selected depths below land surface, 1973 and 1993, in the Playas Valley, New Mexico (E.L. Mosier, written commun., 1995)

16

CARTOGRAPHIC/ THEMATIC PRODUCTS AND GEOGRAPHICAL INFORMATION SYSTEMS

Recent advances in the use of satellite and high-altitude imagery, along with Geographical Information Systems, have complemented highly useful topographic maps.

Accurate, up-to-date map data serve as the fundamental framework to which all other land and resource data are spatially referenced to provide the basic information and analytical capability for resource decision making. For large areas of New Mexico, USGS cartographic and thematic products represent the only spatial framework available for resource management and disaster mitigation (fig. 7). These products include maps documenting the Earth's natural and constructed features and conditions, base maps and special purpose thematic maps, digital map data, and remotely sensed data. The USGS is also the principal Federal agency responsible for coordinating Geographical Information Systems (GIS) coverages, developing data standards, developing a clearinghouse, and planning a data framework for geospatial (GIS) information.

National Mapping Program

Among the most popular and versatile products of the USGS are its 1:24,000-scale topographic maps, of which 2,035 entirely cover the State of New Mexico. These maps are available to the general public to be used for a variety of technical applications as well as for outdoor uses such as hiking and camping. Other topographic products, generally designed for more specialized purposes, include false-color composites produced from multispectral scanners such as on Landsat satellites, digital orthophoto quads produced from aerial photographs, and land-use and land-cover maps showing 9 general categories and 37 subcategories. In addition thematic maps are available on such special subjects as population, soils, Federal lands, and major forest types.

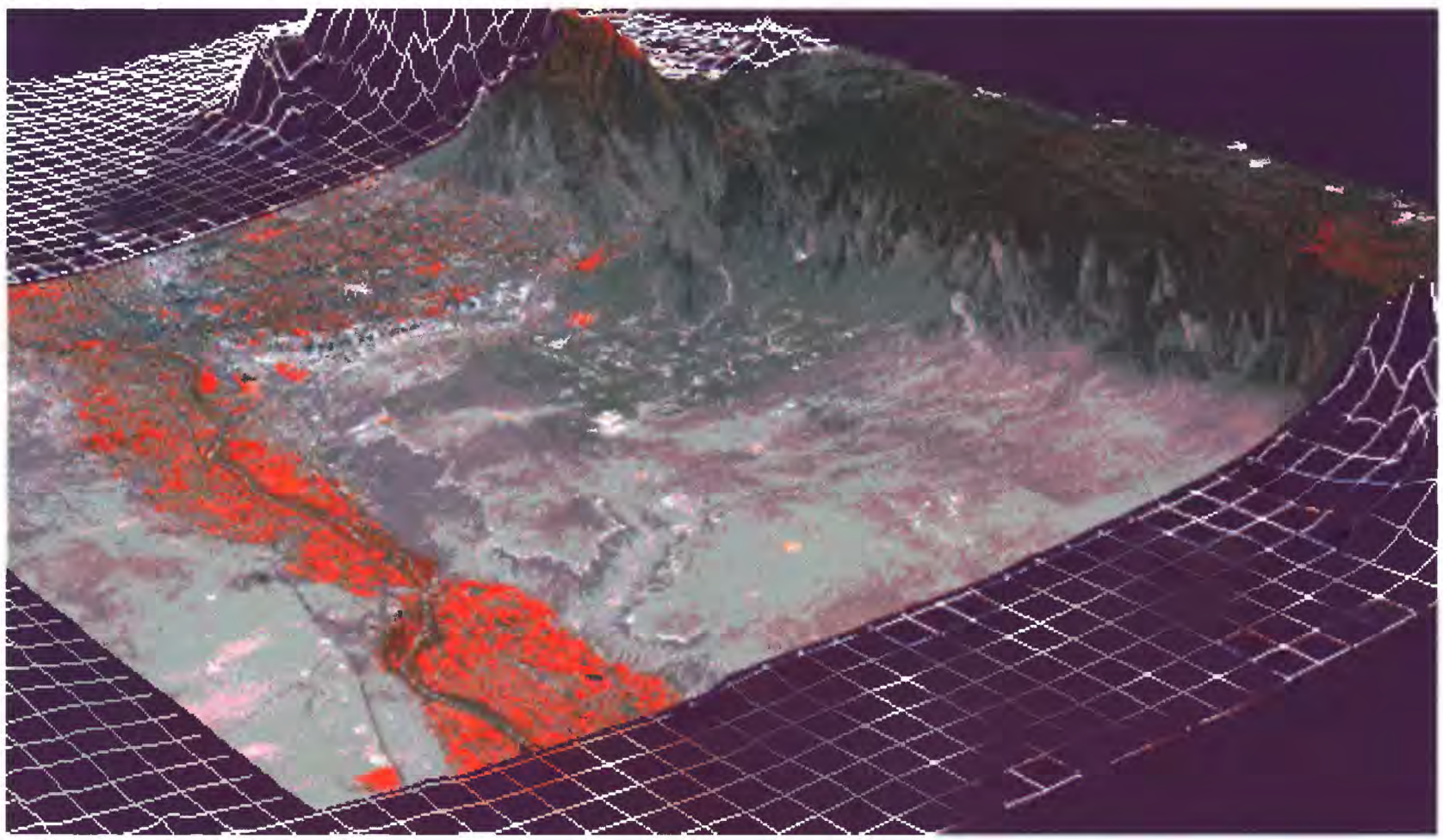
Upper Rio Puerco Watershed Digital Elevation Data

The USGS, in cooperation with the Bureau of Land Management, has produced high-quality, high-resolution digital elevation data for the upper Rio Puerco watershed. These data are being used by USGS scientists, in collaboration with researchers from other Federal agencies, to study the dynamics of the channel of the Rio Puerco, which has one of the highest sediment yields in the Nation. Results of the research will enable land managers to better understand and control soil erosion in the watershed.

Earth-Science Applications of Geographical Information Systems (GIS)

The use of GIS has been found to enhance and broaden the usability of earth-science data. The USGS has used GIS in a variety of applications, including ground-water modeling and analysis of water-quality data. Over 1,500 coverages are maintained and shared with the Resource Geographical Information System for New Mexico, including the following:

Potential Evaporation
Annual Precipitation
Hydrography
Drainage Basins
Wetlands
Surficial Geology
Soils
Digital Elevation Models
Shaded Relief Maps
State and County Delineations
Land Ownership
Land Use/Land Cover
Political Boundaries
Population and Demographics
Roads
Landfills
Dams
Canals and Drains
Septic Systems
Wells and Springs
Landsat Imagery



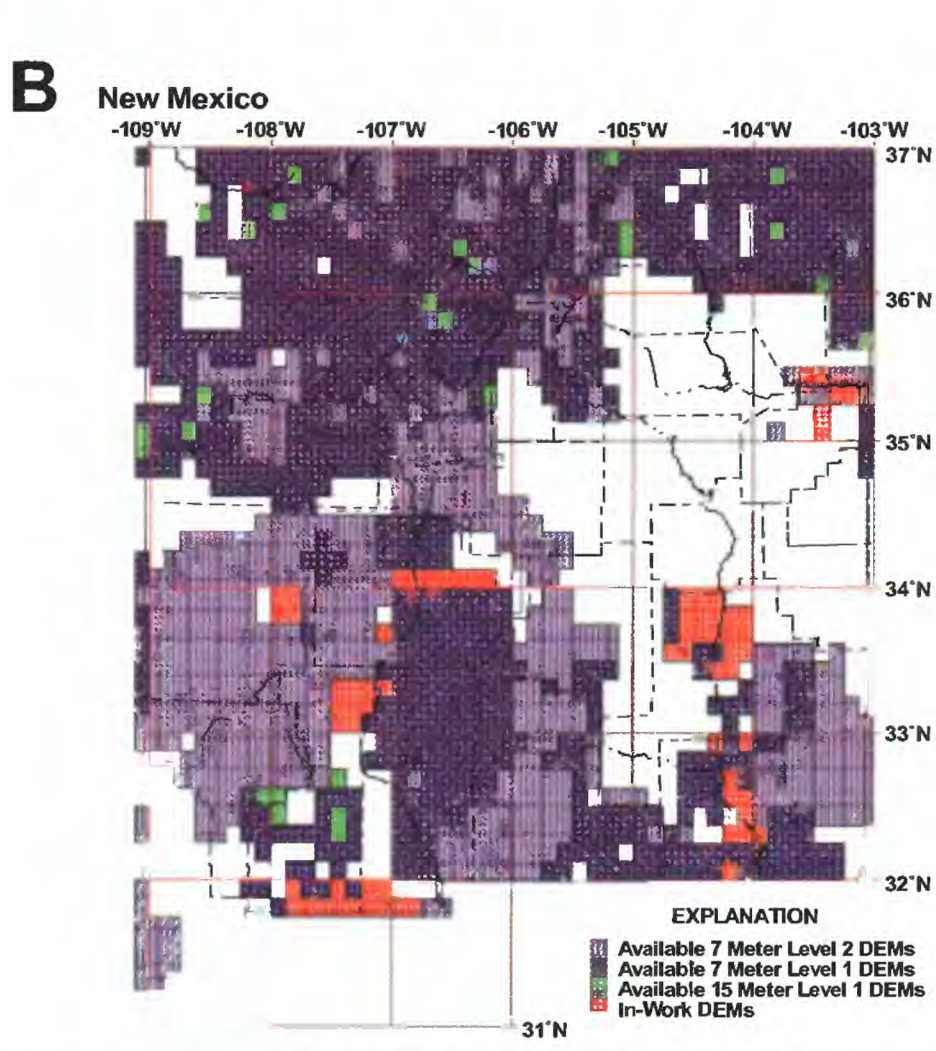


Figure 7.--Selected cartographic/thematic products: A. Landsat image draped on 1:24,000-scale Digital Elevation Model data at Albuquerque, New Mexico. B. Status of 1:24,000-scale Digital Elevation Model mapping in New Mexico.

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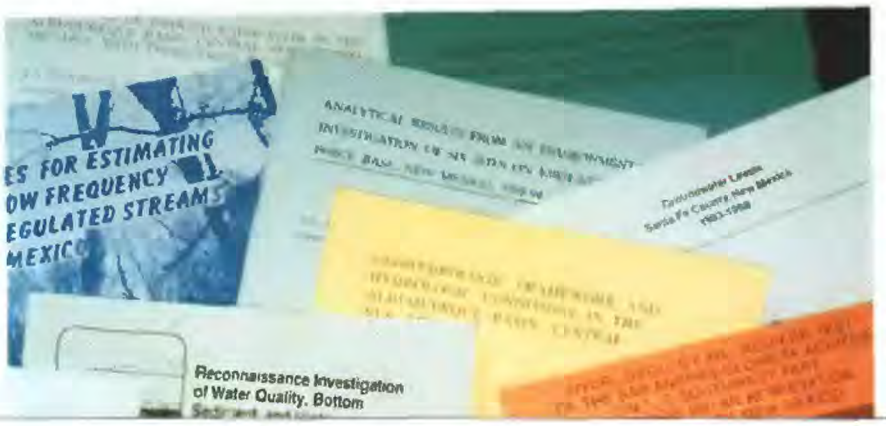

THE CLIENTS WE HAVE SERVED

*"We at the U.S. Geological Survey are, I believe, justifiably proud of our contributions to the well-being of the American public. * * * Americans face many crucial issues that require reliable, objective earth-science information and knowledge of the sort provided by the USGS."*

Dr. Gordon P. Eaton
Director, U.S. Geological Survey
February 23, 1995

Public

Federal

Federal Emergency Management Agency
International Boundary and Water Commission
U.S. Air Force
- Brooks Air Force Base
- Cannon Air Force Base
- Holloman Air Force Base
- Kirtland Air Force Base

U.S. Department of Agriculture
- Forest Service

U.S. Department of the Army
- Corps of Engineers
- Fort Bliss
- White Sands Missile Range

U.S. Department of Energy
- Los Alamos National Laboratory
- Sandia National Laboratories

U.S. Department of the Interior
- Bureau of Indian Affairs
- Bureau of Land Management
- Bureau of Reclamation
- National Park Service
- U.S. Fish and Wildlife Service

U.S. Department of Justice
U.S. Environmental Protection Agency

Tribal

Jemez River Indian Water Authority
Navajo Nation
Pueblo of Acoma
Pueblo of Isleta
Pueblo of Laguna
Pueblo of Zuni

State

FOR FURTHER INFORMATION

New Mexico USGS office locations shown with topography and rivers

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TDD 303-236-8654

Additional earth-science information can be found by accessing the USGS "Home Page" on the World Wide Web at "http://www.usgs.gov"

Streamflow Information Hotline (updated semiweekly) 505-262-5388

For more information on all USGS reports and products (including maps, images, and computerized data) call 1-800-USA-MAPS