

# Geographic Information System for Water Resources Research Planning

Bobby J. Creel, New Mexico Water Resources Research Institute

*Project descriptors: management and planning, GIS, water quality, digital mapping*

## PROBLEM AND RESEARCH OBJECTIVES

The New Mexico Water Resources Research Institute has become the focal point for geographic information system (GIS) data and information concerning water resources in New Mexico. It combines database management with digital mapping into spatial-tabular data models. These models are powerful tools for representing and manipulating earth-science information.

The project's primary objective is to increase availability and accessibility of water resource information to support water resource planning and management in the state. This entails providing spatial data library accessibility and includes spatial data development, evaluation of needs, establishment of priorities, and development of spatial data that is otherwise unavailable. These efforts are coordinated with cooperating agencies and organizations to ensure no duplication of effort and to establish guidelines for coverages and priorities. The investigators maintain, update, and make data available to cooperators through formal and informal arrangements to facilitate water resource planning activities.



## METHODOLOGY

Several cooperative data sharing agreements have been entered into with state, federal, and local agencies and organizations. The NMWRRI maintains a GIS laboratory consisting of computer workstations, data storage devices, input/output devices (color plotter, digitizer, etc.), software for mapping and analysis (ARC/Info), database development and visualization, and network systems. The lab is connected via fiber to the NMSU computer network and thereby to the Internet. The NMWRRI also maintains an Internet web server site through which both spatial and tabular water resource data can be provided.

## PRINCIPAL FINDINGS

Various research activities are supported by the system. For example, the lab is utilized by the NM Interstate Stream Commission to provide GIS mapping products for use in their plans and in public outreach. Support has been given to the New Mexico/Texas Water Commission and various public entities of southern New Mexico for their planning activities including GIS mapping support to the Lower Rio Grande Water Users Organization.

This sophisticated mapping and geo-spatial database management system, originally designed to support WRRI-funded research activities, is now being used for external research grants like the *Creation of a Digital Hydrogeologic Framework Model of the Mesilla Basin and Southern Jornada del Muerto Basin*; creation of maps for planning purposes funded by the New Mexico ISC; and state pesticide management planning for the New Mexico Department of Agriculture. A research grant resulted in the creation of a regional GIS to support water planning in the Paso del Norte borderland area of the southwestern U.S.

New data are continually being added to the database and assistance is given to produce specific GIS products upon request.