The Aquifer Mapping Program addresses the critical need for information on New Mexico’s groundwater resources. “Aquifer mapping” is a scientific method that applies hydrogeologic techniques to assess the quantity, quality, and distribution of groundwater in aquifers.

No other program in the state integrates the variety of scientific information (geologic, hydrologic, geophysical, and geochemical) with the objectivity and knowledge that the Aquifer Mapping Program possesses.

New Mexico Tech’s Bureau of Geology and Mineral Resources is the only non-regulatory state agency engaged in this specialized, multidisciplinary science and research.
Aquifer Mapping Program
Current Projects 2015

Southern Taos Valley

Client and Study Area: Taos County groundwater systems in the southern Taos Valley between the Picuris Mountains and the Rio Grande.

Issues: Water sustainability during rapid development; sources of recharge; age of groundwater; interconnection between aquifers, the Rio Grande, and tributaries.

Products: A hydrogeologic conceptual model of groundwater and surface water systems will provide decision-making tools for Taos County planning and zoning, and help the County, historic communities, acequias, and neighborhoods, to better plan new development that sustains and conserves water resources.

Funding: Taos County, Healy Foundation, Aquifer Mapping Program and Bureau of Geology.

San Agustin Plains and Alamosa Creek Watershed

Client and Study Area: Support for New Mexico interests (NMOSE/ISC, NM EMNRD, NM Dept of Game and Fish) in the Plains of San Agustin and Alamosa Creek watershed, eastern Catron and western Socorro counties.

Issues: Groundwater availability and sustainability in the Plains of San Agustin; groundwater quality and source of water to springs at the Monticello Box, Alamosa Creek watershed.

Products: Hydrogeologic information for state agencies and the public about the groundwater systems in the central Plains of San Agustin and Alamosa Creek watershed, and their interconnection with the Rio Grande Valley; public outreach and education.

Funding: Aquifer Mapping Program, Bureau of Geology, National Cooperative Geologic Mapping Program (STATEMAP), Healy Foundation, and the NMOSE.
Statewide water assessments

**Client and Study Area:** WRRI in collaboration with NM Tech, USGS, NMOSE, and NMSU to address recharge and groundwater issues statewide in New Mexico.

**Issues:** Working with WRRI to develop datasets to aid in analysis of statewide water assessments. These datasets will help address water scarcity challenges and improve water planning needs for New Mexico.

**Products:** A publicly available database, technical reports and ArcGIS maps that are focused on 1) potential recharge areas within NM and 2) regional groundwater level and storage changes.

**Funding:** New Mexico State Legislature through WRRI with support from the Aquifer Mapping Program, Bureau of Geology, and New Mexico Tech.

Hydrogeology of the Questa Area

**Client and Study Area:** Support for New Mexico and local interests (NMED, NM OSE/ISC, Village of Questa, Taos County, NM EMNRD MMD, NM Dept of Game and Fish) in the area of Questa, New Mexico, from the base of the Sangre de Cristo Mountains to the Rio Grande.

**Issues:** A gap in regional scientific information for deep and shallow, sediment-volcanic aquifers and surface waters in the Questa area; diverse local issues, including sustainable sources of drinking water, sources of water to springs and streams that feed fisheries and discharge to the Rio Grande, the character of natural, background water quality, and possible impacts from mine-related waters.

**Products:** Regional hydrogeologic conceptual model describing ground water and surface water interactions; important understanding of local effects of faults and geology on water quality; a decision-making tool for local interests to use toward water development needs.

**Funding:** Healy Foundation, the Aquifer Mapping Program, Bureau of Geology, National Cooperative Geologic Mapping Program (STATEMAP).

Clovis-Portales Regional Hydrogeology

**Client and Study Area:** New Mexico Environment Department (NMED) and Eastern Plains Council of Governments (EPCOG); Curry County and northern Roosevelt County.

**Issues:** As part of a regional Source Water Protection Plan being developed by EPCOG for NMED, we are assessing the regional hydrogeology of this region. Future water availability and water quality are major concerns in the region.

**Products:** A technical report that will serve as an appendix in the regional Source Water Protection Plan. This will be a compilation of existing geologic and hydrologic information, in addition to several new water level measurements and water chemistry samples. This will help decision making in the region about water use and management issues.

**Funding:** New Mexico Environment Department, Bureau of Geology, Aquifer Mapping Program.
Sacramento Mountains Watershed Study

Client and Study Area: Otero Soil & Water Conservation District; two watersheds in the southern Sacramento Mountains.

Issues: The hydrologic effects of tree thinning and climate variability in high-elevation (>8,000) feet densely forested watersheds.

Products: Impartial hydrologic information for state and federal agencies and the public to support scientifically sound decisions regarding vegetation and watershed management; public outreach and education.

Funding: New Mexico State Legislature through NMSU Dept of Agriculture and the Otero SWCD, NM ISC, US Forest Service, and NM FWRI Highlands; additional funds and resources for tree thinning provided by NRCS and NM State Forestry.

White Sands National Monument

Client and Study Area: National Park Service; White Sands National Monument (WSNM)

Issues: Understanding the hydrogeology of WSNM, the connection between the deep, regional aquifer and shallow dune aquifers; potential impacts of groundwater pumping to the WSNM.

Products: Hydrologic information needed to understand, manage, and preserve the sand-dune environment and its water resources.

Funding: National Park Service, with assistance from the Bureau of Geology, the USGS, and the National Cave and Karst Research Institute at New Mexico Tech.

El Camino Real Paleohydrogeology

Client and Study Area: The New Mexico Spaceport Authority; 611 square-miles of the Jornada del Muerto surrounding Spaceport America and El Camino Real.

Issues: The hydrogeologic framework and groundwater flow conditions; areas of extinct and historic water sources such as paleo-springs and paleo-wetlands; adverse effects to the historic Camino Real de Tierra Adentro (a National Historic Trail designated by Congress).

Products: Research contributions to the Mitigation Plan for El Camino Real de Tierra Adentro, at Spaceport America; hydrologic information used toward long-term management and predictive modeling of resource locations.

Funding: New Mexico Spaceport Authority, for Spaceport America.
GOOD RESOURCE MANAGEMENT REQUIRES
GOOD SCIENCE AND COLLABORATION

- Geohydrologic mapping of aquifer materials
- Water-level measurements and groundwater flow conditions
- Geochemical characterization
- Hydrologic and well database
- Geophysical surveys
- Deep drill holes and 3-D geologic models
- Aquifer hydraulic properties
- Hydrologic modeling

Plains of San Agustin, water level measurements

WHO BENEFITS?

- NEW MEXICO STATE AGENCIES—Office of State Engineer/Interstate Stream Commission, Environment Department, Energy, Minerals & Natural Resources, State Lands Office
- STATE AND LOCAL WATER AND LAND MANAGERS—Counties, municipalities, Pueblos, irrigation districts, water utilities, Soil and Water Conservation Districts
- INDIVIDUALS AND REGIONAL STAKEHOLDERS—Home owners, rural water users, developers, realtors

Aeromagnetic map - Southern Taos Valley study

La Cienega, groundwater hydrographs
COMPLETED STUDIES

- **Albuquerque Basin**—geologic map and subsurface geologic model
- **Española Basin**—hydrogeologic models and water quality study, Santa Fe
- **Estancia Basin**—water budget
- **La Cienega and La Cieneguilla, Santa Fe County**—spring and wetlands hydrogeology
- **Lower Pecos Valley**—geologic map and subsurface geologic model
- **Magdalena**—small scale hydrogeology assessment
- **Placitas area**—geologic map and aquifer delineation
- **Pueblo of Picuris**—water resource assessment
- **Roswell Artesian Basin**—water-level monitoring
- **San Juan Basin**—assessment of shallow and deep groundwater resources
- **Southern Sacramento Mountains**—mountain-block hydrogeology and recharge study
- **Taos County**—hydrogeology of Arroyo Seco, Arroyo Hondo, Taos Plateau and the springs of the Rio Grande Gorge
- **Truth or Consequences**—geothermal resource assessment
- **Tularosa Basin**—mountain-front geologic map, water table, depth to water, recharge
- **Union County**—mapping deep bedrock aquifers underlying the Ogallala

WATER-RELATED PUBLICATIONS

- Groundwater Reports, Hydrologic Reports, and Hydrologic Sheets are available from the NM Bureau of Geology and Mineral Resources.