Aquifer Mapping in New Mexico
A Status Report
for Interim Committee on
Water & Natural Resources
WHAT IS AQUIFER MAPPING? – A scientific process wherein a combination of geologic, geophysical, hydrologic, and chemical field and laboratory analyses are applied to characterize the quantity, quality, and distribution of ground water in aquifers.
Partners and Users

Academic Institutions: NMT, UNM, NMSU, Highlands

State Agencies: NMOSE/NMISC, NMEMNRRD, NMED


Counties, Municipalities, Irrigation Districts, Water Utilities: Sandoval, Taos, Otero, Lincoln, Bernalillo, Albuquerque, Santa Fe, Town of Taos, PVACD

Tribes: Taos, Picuris, Santo Domingo, Tesuque, Sandia, Isleta, Santa Ana, etc.

Soil & Water Conservation Districts: Otero, Taos, Ciudad
Active and Completed Projects

Albuquerque Basin – NMOSE, USGS, NMBGMR

Placitas – Legislative funding to Sandoval County, NMBGMR

Roswell Artesian Basin – PVACD, NMBGMR

Santa Fe Area – NMOSE, NMBGMR, Santa Fe County

Sacramento Mountains – Legislative funding to NMDA/NMSU, Otero SWCD

Taos County – NMOSE/NMISC, NMBGMR, Taos County, Healy Foundation

Each area is unique in its hydrogeologic setting and the driving water policy issues.
The Santa Fe Area

THE ISSUES: NMOSE administrative needs and the City/County water utilities’ search for sustainable, potable water sources.

THE GOAL: Update hydrogeologic information on the basin aquifer and support development of tools for water rights administration and long-term sustainable development of aquifers.
The Santa Fe Area

THE PRODUCTS:

• Geologic framework – maps, cross sections and 3-D model of aquifers

• Developed long-term regional water-level monitoring networks for NMOSE and City

• Analyzed water quality and the chemical character of aquifers

• Parameters for City/County ground-water model: aquifer layers, aquifer properties, and updated water levels for model calibration

THE FUNDING:

• NMBGMR AQUIFERMAP Program

• NMBGMR STATEMAP Program – $300K Federal funding since 2000

• NMOSE Hydrology Bureau – $175K

• Santa Fe County – $10K
Santa Fe Area Reports

Influence of Basement Structure on Shallow Aquifer Geochemistry in the Santa Fe Embayment of the Española Basin, Northern Rio Grande Rift
Peggy S. Johnson and Daniel J. Koning, NMBGMR; V.J.S. Grauch and A. Manning, USGS

Geophysical Interpretations of the Southern Española Basin, New Mexico, That Contribute to Understanding Its Hydrogeologic Framework
V.J.S. Grauch, J.D. Phillips, V. Bankey, USGS; D.J. Koning and P.S. Johnson, NMBGMR

Geochemical Characterization of Ground Water In the Southern Española Basin, Santa Fe County, New Mexico
Peggy S. Johnson, Daniel J. Koning, Stacy W. Timmons, and Brigitte Felix, NMBGMR

Peggy S. Johnson, Daniel J. Koning, and Adam S. Read
THE ISSUES: What are the effects of tree thinning and climate variability on the local hydrologic balance; the hydrogeology of the mountain block and its connection with adjacent aquifers (Pecos Slope and Salt Basin).

THE GOAL: Support scientifically sound decisions regarding vegetation and watershed management, and ground water development in mountain and adjacent aquifers.
THE PRODUCTS:
- Geologic framework – maps, cross sections and 3-D model of aquifers
- Developed long-term regional water-level monitoring network
- Analyzed water quality and the chemical character of aquifers
- Conceptual model of ground-water flow, recharge to adjacent aquifers
- Watershed study – effects of tree thinning on local water balance

THE FUNDING:
- NM Legislature (NMDA/NMSU and Otero SWCD) – $2.362M
- NMBGMR STATEMAP Program – $297K Federal funding since 2004
- NMISC – $150K to watershed study
Sacramento Mountains Reports

2009, Sacramento Mountains hydrogeology study, Update of Open-File Report 512


Taos County

THE ISSUES:

- NMISC administration of Rio Grande compact
- Taos County land use planning and rural development relying on shallow aquifers
- Taos SWCD programs to protect watersheds and recharge areas.

THE GOAL: Support scientifically sound policy decisions regarding regional ground water development, Rio Grande compact administration, and protection of recharge areas and watersheds.
Taos County

**THE PRODUCTS:**
- Geologic framework – maps, cross sections and 3-D model of aquifers
- Regional and local water-level maps
- Age dating of Rio Grande springs and regional ground water
- Conceptual model of ground-water flow, stream/aquifer interconnection, and recharge/discharge

**THE FUNDING:**
- NMBGMR AQUIFERMAP Program
- NMBGMR STATEMAP Program – $260K
  Federal funding since 1995
- NMISC – $55K
- Taos County – $75K
- Healy Foundation – $75K
- US BOR - $61K
Taos County Reports


Benefits and Products of AQUIFERMAP Program

- Baseline geologic and hydrologic information
- Long-term water-level monitoring networks
- Databases of existing hydrogeologic information
- Interpretive reports and maps publicly available
- Scientifically defensible decision making
Possible Future Projects

• Continue local- to regional-scale hydrogeologic assessments to meet State, County, Municipal, and Rural water needs
  – Alamosa Creek and Plains of San Agustin (NMISC, NMED, NMEMNRD)
  – Miranda Canyon, southern Taos County (Taos County)
  – White Sands National Monument, Tularosa Basin (National Park Service)

• Deep aquifer characterization – NMBGMR’s Subsurface Data Center (NMISC)

• Uranium and mining legacy issues – impacts to ground water (NMED)

• Carbon sequestration
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NMBGMR and AQUIFERMAP Web Links

- www.geoinfo.nmt.edu
- www.geoinfo.nmt.edu/resources/water