

United States-Mexico Transboundary Aquifer Assessment Program

Description

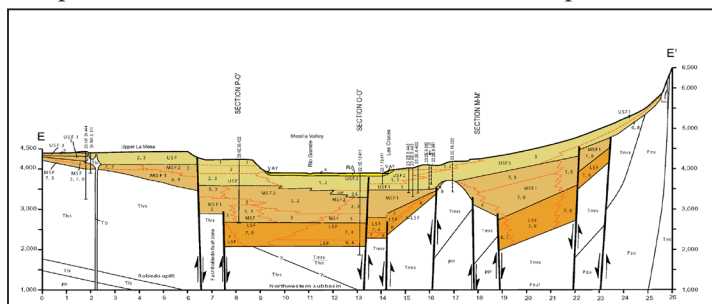
The U.S. Congress authorized this program under Public Law 109-448 to conduct binational scientific research to assess systematically priority transboundary aquifers. Concurrence by Mexico on both the desire to engage binationally and on the aquifers to be studied was necessary for the binational effort to take hold. The results of this program are providing essential new information and a scientific foundation for state and local officials to address pressing water resource challenges in the U.S.-Mexico border region. Investigations are being conducted in partnership with the U.S. Geological Survey (USGS) and Water Resources Research Institutes in Arizona, New Mexico, and Texas and in collaboration with appropriate state agencies, stakeholders, Mexican counterparts, and the International Boundary and Water Commission.



Border cities, such as El Paso, TX and Cd. Juarez, CH, and communities rely on transboundary aquifers

Relevance and Background

Transboundary aquifers are an essential and in many cases the only source of water for border communities. Declining water levels, deteriorating quality, and increasing use of groundwater resources by municipal and other water users on both sides of the international border have raised serious concerns about long-term availability of this supply. Water quantity and quality are determining and limiting factors that ultimately control future economic development, population growth, and human health along the border. However, knowledge about the extent, depletion rates, quality, and solute movement in transboundary aquifers is inadequate and in some areas completely absent. Binational and multi-state collaboration is needed to develop new, reliable, and comprehensive information on these critical aquifers.

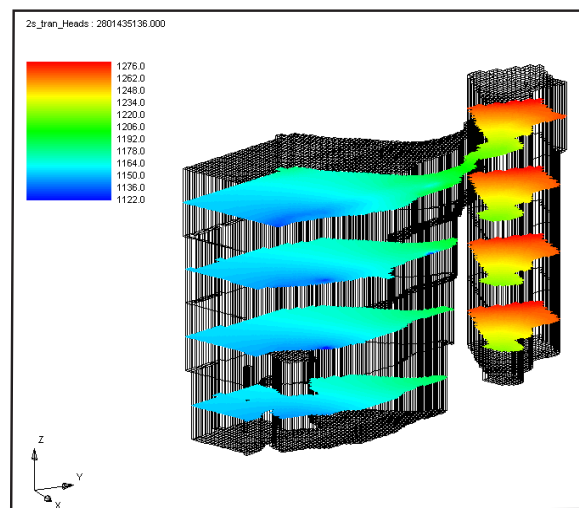


Hydrogeologic cross section of a transboundary aquifer

Objectives

Objectives of the U.S.-Mexico Transboundary Aquifer Assessment Program include the following:

- Develop high quality, comprehensive binational groundwater quantity and water quality information and shared databases
- Assess the extent, availability, movement, and interaction of transboundary aquifers
- Develop and improve groundwater flow information for binational aquifers to facilitate water resource assessment and planning
- Analyze trends in groundwater quality, including salinity, nutrients, toxins, and pathogens
- Apply the new data, models, and information to evaluate strategies to protect water quality and enhance supplies



Development of numerical models for aquifer assessment

Program Activity & Accomplishments To Date

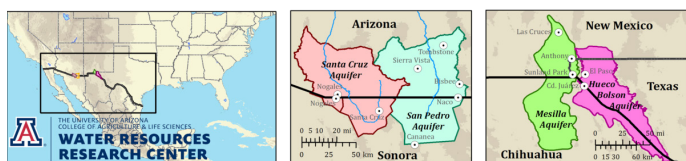
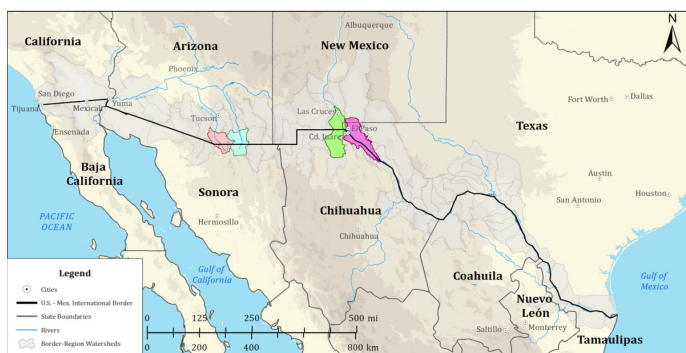
- Binational research plans have been and are being developed in collaboration with state and local stakeholders to ensure the program meets user needs.
- A major accomplishment was the development and signing of a U.S.-Mexico binational agreement to allow the sharing of transboundary aquifer data, models, and information and to coordinate and collaborate on binational scientific investigations.
- The Mexican National Water Commission (CONAGUA), the Geological Survey of Mexico (SGM), and the University of Sonora are conducting parallel collaborative research through the Transboundary Aquifer Assessment Program to develop and provide compatible, previously unavailable aquifer information.
- Existing U.S. hydrologic and geologic data, well records, associated databases, and geographic information systems have been compiled and are being integrated and analyzed.

- Completion and publication of the Binational Study of the Transboundary San Pedro Aquifer, which is the first-ever binational aquifer study prepared and released simultaneously in English and Spanish by the International Boundary and Water Commission.
- A binational website has been developed to provide access to data, scientific reports, and information and is to be a repository for this program's research and products.



Researchers collecting water samples (left) and measuring water levels (right)

- Aquifer water samples are being collected for chemical analysis and to assess trends in groundwater quality and groundwater vulnerability.
- Hydrogeologic models for the evaluation of groundwater flow and assessment of water availability are being developed and validated.
- A new hydrologic model was developed from the existing MODFLOW-2005 groundwater-flow model for the Mesilla Valley Aquifer, and it includes a Farm Process module that simulates recharge and irrigation well production.



Priority Transboundary Aquifers



Program Partners and Collaborators

Texas Water Development Board, El Paso Water Utilities, Texas AgriLife Research, New Mexico State University, University of Arizona, USGS Texas Water Science Center, USGS New Mexico Water Science Center, USGS Arizona Water Science Center, Mexican National Water Commission, University of Sonora, International Boundary and Water Commission (United States and Mexican Sections), CONAGUA, Geological Survey of Mexico, and many others (see stakeholders below).



Binational technical visit to Santa Cruz infiltration gallery

Stakeholders and Supporters

Organizations supporting this initiative include Far West Texas State Water Planning Group, El Paso County Water Improvement District #1, El Paso Water Utilities, New Mexico-Texas Water Commission, Paso del Norte Water Task Force, Texas Water Development Board, Border Trade Alliance, CHIWAHA, Elephant Butte Irrigation District, NM Office of the State Engineer, City of Las Cruces, City of Deming, Management Association of Professional Photogrammetric Surveyors, Southwest Consortium for Environmental Research and Policy, Arizona Department of Water Resources, Upper San Pedro Partnership, Friends of the Santa Cruz River, ISARM Programme, Arizona-Mexico Commission, Northwest Basin Commission of the Mexican National Water Commission, Sonoran State Water Commission, City of Nogales, and Sonora Water Utility.



Scientific information exchange at binational meetings

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