Water worries mount in Middle Rio Grande Basin

If water use in the Middle Rio Grande Basin continues at its current pace, hydrological resources in the region will become steadily scarcer, concludes a newly completed five-year study by U.S. and Mexican researchers.

The $4.9 million study, funded by the U.S. Department of Agriculture, gauges the sustainability of surface water and groundwater use along the Rio Grande from New Mexico’s Elephant Butte Reservoir south to the junction of Mexico’s Rio Conchos and the Rio Grande. The area includes the Paso del Norte, a metropolex of 2.5 million people encompassing El Paso, Texas, and Ciudad Juárez, Mexico, as well as Doña Ana County, New Mexico and extensive farmland on both sides of the border.

“We can’t separate what is going on in the U.S. and Mexico,” says study coauthor Alfredo Granados, a professor at the Autonomous University of Ciudad Juárez. Granados terms the border region a “single ecological system.”

Over 120 Mexican and U.S. stakeholders were consulted for the study, which was led by the University of Texas at El Paso (UTEP) and involved modeling of different water-resource scenarios. The study forecasts that Elephant Butte, which provides irrigation water for Mexican as well as U.S. farms, will meet demand 20% of the time in the next 50 years under a likely “warmer, drier scenario,” and will never meet demand under a very dry scenario.

Allocations fall short

A 1906 agreement requires the release of 60,000 acre-feet of water annually from Elephant Butte—located roughly halfway between Albuquerque, New Mexico, and El Paso—to Mexico, which draws the water from the Rio Grande for farmers in the Juárez Valley. The requirement, however, can be overridden in the case of extraordinary drought or a “serious accident” affecting the U.S. irrigation system.

The U.S. section of the International Boundary and Water Commission (IBWC) reports Mexico’s allocation fell below 60,000 acre-feet every year during 2010-20, ranging from a high of 56,882 acre-feet in 2010 to a low of 3,781 acre-feet in 2013. Although this year’s Mexican allocation has yet to be determined, the amount will likely be similar to 2013, says IBWC spokesperson Lori Kuczanski.

Forecasts suggest U.S. irrigators will again take a hit, too. As the UTEP-led study underlines, declining snowpack likely related to climate change means less water for the Rio Grande and, thus, greater reliance on water from underground aquifers. Two binational aquifers, the Mesilla Bolson and Hueco Boson, will be “significantly depleted” under the study’s dry and very dry scenarios, which are based on forecasts by climate scientists. The authors raise the prospect of the Hueco Bolson being depleted of fresh water in the next half-century, with the Mesilla Bolson enduring longer before reaching depletion.

The Hueco Bolson, which extends from New Mexico and Texas into Mexico in the El Paso-Juárez area, is losing water at a rate of three feet per year, but could lose 28 feet annually in Mexico if pumping rates increase by 50%, researchers calculate. The Hueco and the Mesilla, which both underlie the Paso del Norte and straddle the border, are “fossil” aquifers with “little or no recharge,” the study stresses.

Discounting the possibility of a complete lack of water, UTEP Professor Josiah Heyman, co-principal investigator of the study, nevertheless warns good-quality water will cost more if consumption keeps rising. “We’re using easy and cheap water in the river and on top of the aquifer,” Heyman says, adding that as deeper, more saline groundwater is used, more intensive—and expensive—treatment is required.

Pecan orchards heavy users

Spotlighting particularly intensive areas of water demand, the study points to pecan orchards, which in the United States cover about 47,000 acres (19,000 hectares) in New Mexico’s Doña Ana County and the Lower El Paso Valley. Together with the booming pecan industry in neighboring Chihuahua, Mexico, the region has emerged as one of the most lucrative nut-producing areas of the world. If current irrigation practices continue, the study says, a prolonged drought of 8 to 10 years would result in insufficient water supplies for pecan farms unless “all other crops are removed from production in order to save pecan orchards.”

For Granados, the study underscores the need to balance rural and urban water demands, and to invest more in water conservation and modern infrastructure. Tricia Snyder, Rio Grande campaigner for the U.S. green group WildEarth Guardians, says water policy must also address environmental considerations—for instance, the need for periodic pulse flows to support downstream plant and animal life. Says Snyder: “The fact that New Mexico and far west Texas don’t see water in the river most of the year is a big problem.”

Experts argue it is past time for talks on a cross-border water-conservation strategy. “I hope we can trigger something,” says William Hargrove, the water study’s principal investigator and a recently retired UTEP administrator. “The longer we wait, the more expensive and traumatic it will be to do something.”

—Kent Paterson

Photos show water volumes of New Mexico’s Elephant Butte Reservoir in 2013 (left) and 1994 (right). Scientists say the current volume is similar to that of 2013 and will likely be the norm in future years. (Courtesy of CERM-UTEP)

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