Climate change affecting Rio Grande water supply
Albuquerque Journal 12/12/13

http://www.abqjournal.com/318542/news/rising-temps-affecting-our-water-supply.html

Scientists forecast shrinking river flows, more evaporation

Rising Rio Grande Basin temperatures, already increasing faster than at any time in more than 10,000 years, are projected to sap the basin of one-third of its surface water supply by the end of the century, according to a new report by federal scientists.

"It is sobering," said Assistant Secretary of the Interior Anne Castle, who was in Albuquerque on Wednesday morning for the release of the Upper Rio Grande Impact Assessment, done by a team of scientists from the U.S. Bureau of Reclamation, the Army Corps of Engineers and Sandia National Laboratories.

The study projected average temperature increases of 4 to 6 degrees Fahrenheit by the end of the 21st century, with decreasing snowpack, increased evaporation and shrinking river flows converging on federal, state and local water management institutions. "That has ripple effects throughout the system," Castle told a group of area water managers and community members Wednesday.

The study looked at flows on the Rio Grande from its headwaters in southern Colorado to Elephant Butte and Caballo reservoirs in southern New Mexico.

While the study is primarily focused on future conditions, water managers already have seen changes over the course of the drought that has lingered since the late 1990s, such as warmer temperatures leaving little low-elevation winter snow. "We're already starting to see a shift," said Mike Hamman, manager of the Bureau of Reclamation's Albuquerque office, which operates a number of dams on the Rio Grande.

The assessment is the latest and most detailed in a series of analyses that have all come to the same conclusion: that rising greenhouse gases, which are driving up temperatures and changing the region's climate in other ways, are likely to cause substantial reductions in the region's already skimpy water supplies.

But while overall average water supplies will decline, the region is projected to experience an increasing range of wet and dry periods, with more severe droughts accompanied on occasion by more severe floods. "We're not going to be in what feels like a stable climate system," said Dagmar Llewellyn, a hydrologist with the Bureau of Reclamation and one of the leaders of the study team.

That poses a dilemma for water managers, who face conflicting needs to store more water behind their dams to save it for use during dry times, while juggling the conflicting demand to leave more empty space behind dams to be ready to catch flood flows, said Ariane Pinson, a climate scientist with the Corps of Engineers and another of the study's authors.

Groundwater, a common refuge when river supplies decline, also will become less reliable in the future, the study found. Groundwater recharge from farms, irrigation drainage and the river would decrease, while municipal demand for groundwater is projected to increase as cities pump more to make up for declining surface water supplies.

With less water in the river, New Mexico water managers will have to take steps such as reducing agriculture or cutting back water-sucking riverside vegetation to ensure the state meets its legal obligation to deliver water to users in southern New Mexico and Texas, as required by the interstate agreement that divides the river's water, the study found.

One bright spot in the study was its finding that deliveries of water from the San Juan-Chama project, which imports supplies from the Colorado River Basin for use in Santa Fe and Albuquerque, are only likely to drop 10 to 15 percent on average, according to Jesse Roach of Sandia National Laboratories, another of the study's author.

A key purpose of the study is to provide a foundation for area water managers' future planning efforts, Castle explained. The city and county of Santa Fe are already working with the agencies on a follow-up study. The Albuquerque Bernalillo County Water Utility Authority also is in discussions with the Bureau of Reclamation about taking the study's findings and applying them to Albuquerque's water planning, said Art De La Cruz, a Bernalillo County Commissioner and chairman of the water utility's board of directors.

Full report here: http://www.usbr.gov/watersmart/wcra/reports/urgia.html