What would you do if your water faucets ran dry?

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If a picture is worth a thousand words, then comparing satellite images of New Mexico's Elephant Butte Reservoir from June 2, 1994, and July 8, 2013, captures the story of New Mexico's water challenges. Published on NASA's Earth Observatory website, the 1994 photo shows Elephant Butte Reservoir's water volume at 89 percent of the reservoir's total water-holding capacity, while the 2013 image shows the reservoir's water volume at a shockingly low three percent.

Elephant Butte Reservoir is meant to provide water for about 90,000 acres of farmland and nearly half the population of El Paso, Texas. If you are not a farmer or don't live in El Paso, you may think that Elephant Butte Reservoir is not your concern. But New Mexico is a desert state and drought is a recurring issue for all areas of the Land of Enchantment.

As a landlocked state, all of our water comes from precipitation. While we receive additional river water flowing down from Colorado, 97 percent of the total water supply evaporates or is used by plants. The remaining three percent is what we live on as New Mexicans. It will take a lot of water conservation on the consumer end and a lot of long-term planning and progress in the water expert arena to not only meet present-day water needs but allow for population growth and economic development.

“If you want to avoid running out of water 10 or 20 years from now,” said Jeri Sullivan Graham, a Los Alamos National Laboratory scientist who recently was appointed to join Governor Susana Martinez’s Drought Task Force, “you need to engage in serious planning and implementation today. Short-term thinking will not get us anywhere, because we’ve been lowering our aquifer levels and can only drill down so far to get drinking-quality water.”

Last year the New Mexico village of Magdalena—about two hours southwest of Albuquerque—gained more experience with a receding aquifer than its thousand residents ever could have imagined. When Magdalena’s water table unexpectedly dropped 15 to 20 feet—falling below the minimum intake level of the village’s only operating well—the village was left without potable water and had to depend on a daily parade of trucks to deliver water on an emergency basis.

Developing new sources of water

As decreasing aquifers come face to face with growing populations and increasing commercial water use, municipalities and industries are forced to explore nontraditional water sources, such as brackish water (water that has more salinity than fresh water) or produced water (water that’s left over from oil and gas production). At the state level, Jeri Sullivan Graham will support the Governor’s Drought Task Force by leading the Energy, Minerals and Natural Resources Department’s Brackish Water Work Group and also will assist with produced water issues.

Sullivan Graham has just the right qualifications for the job. She not only is a hydrogeologist and geochemist in Los Alamos’ Chemical Diagnostics and Engineering group but also led the multi-institution team that invented the OrganiClear™ technology for treating produced water on a large scale. Sullivan Graham splits her time between Los Alamos and the State of New Mexico as part of a collaborative agreement.

“Brackish water can be found in estuaries, where fresh water mixes with seawater, and in aquifers,” Sullivan Graham explained. “In aquifers, the brackish water, which is more salty than fresh water but less salty than seawater, has to be harvested from below the fresh-water depth, but it could be an important drought buffer.”

In addition to leading the state’s brackish water project, Sullivan Graham is encouraged by the presence of the Bureau of Reclamation’s Brackish Groundwater National Desalination Research Facility in Alamogordo. Since opening in 2007 the facility has successfully brought together researchers and stakeholders from federal, state and local agencies; universities; research organizations; and the private sector. “We know that drought is recurring in New Mexico,” Sullivan Graham said, “can be severe and needs to be addressed with a broad systematic focus, bringing together many entities.”

For additional information on the State of New Mexico’s drought efforts, or to view New Mexico’s monthly drought status reports, visit the Drought Task Force website. For an overview of the Bureau of Reclamation’s brackish water project, go to the Brackish Groundwater National Desalination Research Facility page and watch their Water for Our Future video on YouTube.

Water also was at the center of a two-day town hall meeting earlier this spring, which brought together over 300 stakeholders from 31 New Mexico counties. A final town hall report is available from New Mexico First's Town Hall on Water Planning, Development and Use website.

To learn about water conservation at home, visit the New Mexico Office of the State Engineer's Water Use and Conservation for Home Owners site, for example, or the Save Water Santa Fe page. To see how small of an impact even a heavy monsoon rain makes on a dry stream, you might try YouTube's brief Rio Grande, Not So 'Big River' video.