

Conserving and Protecting Water

Population growth, increasing demand, contamination issues, and droughts have placed the nation's water supply under tremendous stress. Conserving fresh water and protecting water quality are essential. Researchers and Extension educators at land-grant universities across the United States are helping farmers and communities conserve water and implement tools and strategies that improve water quality.

Here are some examples:

- Scientists in **Illinois** analyzed the evolution of water use by the agriculture industry by taking a closer look at water withdrawals for eight different crops and six kinds of livestock over the course of a decade. A better understanding of agricultural water use over time will help the United States prepare to meet future demands.
- **Georgia** Extension educators are helping cotton and peanut growers use advanced irrigation scheduling tools to determine exactly how much water crops need and when to apply it. So far, 42 peanut farmers are using these tools and saving an estimated 93 cubic feet of water per second.
- Six million people depend on the Rio Grande Basin water supply for urban use, agriculture, hydro power and ecosystem services. **New Mexico** researchers developed a method that predicts major shifts in the hydro logic system and identifies locations of disconnection between surface and groundwater. Researchers also created a model to analyze and predict the economic costs of new policies that would protect the aquifers given various scenarios. These tools help policymakers, water managers and residents make informed decisions about sustainable water use, such as irrigation for important crops like the world-famous Hatch green chile, which is critical for the New Mexico economy.
- Increased use of nontraditional water sources is becoming increasingly necessary as traditional sources face stress from climate change and increased demand. To help alleviate concerns about the quality and safety of nontraditional water, a **New Mexico** research team created two virtual labs to help farmers and others see how recycled water is tested and monitored. These easily accessible, high-quality

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digital educational tools have been used nearly 5,000 times since December 2019 and have supported a shift within both agricultural and nonagricultural communities toward the use of nontraditional irrigation sources. Other researchers are taking a closer look at the chemical composition of wastewater produced by the oil and gas industry to determine whether it can be used to irrigate crops.

- Stormwater runoff is a major source of pollution to Lake Champlain and a driver of harmful algae blooms. **Vermont** Extension developed hands-on curriculum that was used to teach over 300 middle and high school students about stormwater issues and management in 2019 and 2020. Students learned to identify stormwater sources and how to implement green infrastructure like rain gardens and green roofs to reduce stormwater runoff from their school campuses.
- In 2019, **Texas** Extension water conservation programs reached more than 1.9 million people, increasing their awareness and adoption of efficient water use in their homes, yards and farms. These programs have resulted in an estimated annual savings of 3.1 billion gallons – enough water to supply 28,100 households for a year. These water savings are worth about \$11.2 million. As a result of water quality programs, 9,300 residents learned about the causes of water quality issues in their watersheds and ways to manage these issues. Participants have taken a range of actions, including repairing failing septic systems, installing stormwater management structures, setting up pet waste stations, and implementing better water, fertilizer and waste management practices on farms. Improved water quality has reduced water treatment costs in some areas and has helped protect clean water for drinking, recreation, fish and wildlife and other uses. As a result, multiple Texas watersheds have been removed from the Environmental Protection Agency’s list of impaired water bodies.
- Homeowners and landscape professionals who engaged in **Florida** Extension educational events, workshops, and one-on-one educational programs have adopted better irrigation practices and technologies, such as converting turfgrass areas to landscape beds and minimizing irrigation rates. During 2019, estimated water savings totaled over 467 million gallons—enough to supply water to 5,308 households for a whole year. Responsible water use will help meet the growing demands on Florida’s water supply and lower water bills for residents and water delivery costs for utilities.
- Septic systems are one of the major potential sources of well water contamination. **Florida** Extension increased government officials’ and residents’ understanding of private well management, septic system maintenance and the importance of protecting Florida’s water. Programs reached over 400 people in 2019. Fifty-nine participants had their septic tanks pumped in 2019, preventing an estimated 1,003 pounds of nitrogen from leaching into groundwater, and many other participants plan to do so.
- **Arkansas** researchers are working with state and federal partners to reestablish native aquatic plants in DeGray Lake and promote healthy populations of recreationally important fish species, which once thrived in the lake. Scientists used floating vegetation cages attached to buoys to disperse native aquatic plants throughout the lake and deployed submersible drones and boat-mounted sonar to assess plant reestablishment. The increase in submerged aquatic plants will increase the number of microbes, baitfish, crawfish, and snails in the lake. In turn, this will increase populations of predators like black bass, which are highly sought after by local fishers.