



Providing Assistance & Solutions

In many areas of the United States, the frequency, intensity, and duration of drought events is increasing. This pattern is expected to continue and shift outside of historical trends, making forecasting our water supply and quality more difficult. EPA is conducting research and working with stakeholders to better understand the impact of drought on water quality and availability, and to provide solutions to help communities become more resilient.

Water Efficiency & Aging Infrastructure.

EPA supports innovative plumbing products that help conserve water and energy through its WaterSense program. By purchasing products with a WaterSense label, consumers can save money, while conserving water and energy. EPA also works with the U.S. Department of Housing and Urban Development to incorporate water efficiency into its programs. Advances in low-flow plumbing and fixtures for water quantity conservation present new challenges for maintaining water quality in systems designed for higher flows. EPA is funding research to support water conservation and healthy drinking water in distribution and premise plumbing systems (plumbing in homes and other buildings) under lower-flow conditions.

Aging infrastructure, such as leaky pipes and water mains, is estimated to result in the loss of 2.1 trillion gallons of treated drinking water in the U.S. each year. Replacing our Nation's failing water infrastructure is expected to cost approximately \$500 billion. EPA is helping by providing water loss training workshops to public and tribal water utilities and collaborating with states and tribes to leverage Drinking Water State Revolving Funds—EPA's largest funding source for drinking water infrastructure—for water loss control auditing.

Aquifer Recharge. Prolonged drought can deplete groundwater aquifers that many communities rely on for drinking water and irrigation. Through the National Drought Resilience Partnership (NDRP), EPA will work with municipalities and utilities to promote stormwater and rainwater capture to augment water supplies and replenish aquifers. EPA scientists and partners are conducting field studies to explore the influences of innovative green infrastructure practices, such as dry wells and infiltration basins, on water movement into aquifers. They are also evaluating the quality of recharged water.

Water Reuse. Water conservation practices promoting water reuse—also known as fit-for-purpose water—for potable (drinking) and nonpotable (not for drinking) water are becoming increasingly important. Such practices are especially critical in parts of the western U.S. where climate change, extreme drought, increased evaporation, and population growth are decreasing water availability. To help states achieve water supply resiliency, EPA is promoting water reuse and the expansion of nontraditional water supplies (for example, impaired, alternative, or reclaimed water) previously not considered for reuse, while continuing to protect human and environmental health. In addition, EPA is also working with other federal agencies to address sustainability at the federal level, including water resource management and drought response.

To advance innovative water reuse, EPA is assessing approaches for controlling waterborne contaminants associated with built infrastructure; evaluating treatment, monitoring, and risks to human health; advancing water systems that encompass the entire water cycle; developing approaches to evaluate transformative water systems (systems that meet public health and environmental goals while optimizing treatment and maximizing resource recovery and system resiliency); and evaluating rainwater harvesting systems for nonpotable water supplies. EPA has awarded grants to five institutions to better understand potential human and ecological health effects associated with water reuse and conservation practices. Their research will evaluate how reclaimed water applications, such as direct and indirect potable reuse, aquifer recharge, and irrigation, might affect public and ecological health.

Desalination. Brackish and salt water can augment water supplies in areas impacted by drought. EPA scientists are growing salt-tolerant algae that remove salts from these waters, which could reduce the energy footprint and

costs of desalination. The algae could then be harvested and used as raw material for biofuel production. EPA scientists are also identifying, designing, and demonstrating cost-effective options that will enable the recovery of water from compromised sources, with an added goal of managing the brine concentrates produced by desalination systems.

EPA has given Small Business Innovation Research awards to companies developing and testing new cost-effective desalination technologies for water utilities. Technologies being developed include a microdevice to desalinate water off grid, allowing its use where it is needed most, and a system that will enable small water utilities to include lower quality source water (such as salt water) at their intakes, further reducing the demand on groundwater and surface water.

Response, Recovery, & Restoration. EPA participates in many partnerships across the Nation and provides research grants, tools, support, and training to help communities become more drought resilient. Through the National Drought Resilience Partnership (NDRP), EPA is collaborating on the development of tools and guides that water and wastewater utilities can use to prepare for, respond to, and recover from drought. Using the *Climate Resilience Evaluation and Awareness Tool*, EPA's Climate Ready Utilities Program is working nationwide to help utilities conduct climate change risk assessments to identify utility-level strategies that will build readiness and resilience. In addition, EPA and the Indian Health Service are convening federal and state partners to coordinate information on infrastructure needs and funding, technical assistance, emergency drought relief, and conservation opportunities for tribes.

To advance drought-related research even further, EPA has awarded grants to four institutions to investigate how drought and wildfire—and projects for managing wildfire—might impact the quality of surface water and its treatment at drinking water facilities. Awarded research also includes reducing risks associated with preparedness for pre-drought planning and emergency response.

Watershed Sustainability. EPA supports community efforts to identify, and find solutions for, issues related to drought resiliency and watershed sustainability. EPA's Centers of Excellence for Watershed Management program works with academia across the Southeast to provide products and services for communities to address watershed problems related to water scarcity and drought and issues of climate resilience and water utility infrastructure sustainability. EPA also supports projects in

vineyards and orchards that are implementing management practices to reduce irrigation demand, retain soil moisture, and minimize soil loss. Other actions include working with partners to decrease the impacts of low flows and climate change on wetland projects, and to provide information on changes in water flow due to drought, floods, and other stresses that impact flow regimes and affect aquatic life.

In addition, EPA researchers are providing tools and conducting studies to better understand how drought affects watersheds, including evaluating drought-related stream salinization effects on the local extinction of aquatic organisms, quantifying the extent and impact of drought conditions affecting watershed resilience and integrity, and assessing influences of drought and water management on lake level decline and habitat quality.

Available Resources

- ❖ U.S. Drought Portal drought.gov
- ❖ Drought in America – White House whitehouse.gov/campaign/drought-in-america
- ❖ WaterSense Program epa.gov/watersense/
- ❖ Research Grants epa.gov/research-grants
- ❖ Climate Ready Water Utilities epa.gov/crwu
- ❖ Drought Response and Recovery: A Basic Resilience Guide for Water Utilities epa.gov/waterutilityresponse/drought-response-and-recovery-water-utilities
- ❖ Public Awareness Kit for Utilities epa.gov/communitywaterresilience/water-utility-public-awareness-kit
- ❖ Climate Resilience Evaluation and Awareness Tool epa.gov/crwu/assess-water-utility-climate-risks-climate-resilience-evaluation-and-awareness-tool
- ❖ National Water Program Climate Adaptation Tools epa.gov/climate-change-water-sector/national-water-program-climate-change-adaptation-tools-summary
- ❖ Watershed Management Optimization Support Tool epa.gov/si/si_public_record_report.cfm?dirEntryId=311013
- ❖ All Hazards Boot Camp epa.gov/waterresiliencetraining/waterwastewater-utility-all-hazards-bootcamp-training#all-hazards
- ❖ Environmental Finance Center epa.gov/envirofinance/efcn
- ❖ Federal Funding for Utilities in Natural Disasters epa.gov/fedfunds
- ❖ State Revolving Fund – Green Project Reserve epa.gov/cwsrf/green-project-reserve-guidance-clean-water-state-revolving-fund-cwsrf
- ❖ Sustainability and the Clean Water State Revolving Fund – A Best Practices Guide epa.gov/sites/production/files/2015-04/documents/sustainability_best_practices_guide.pdf