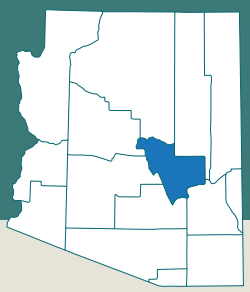


ARIZONA WATER FACTSHEET
GILA COUNTY

Get to know water in your county

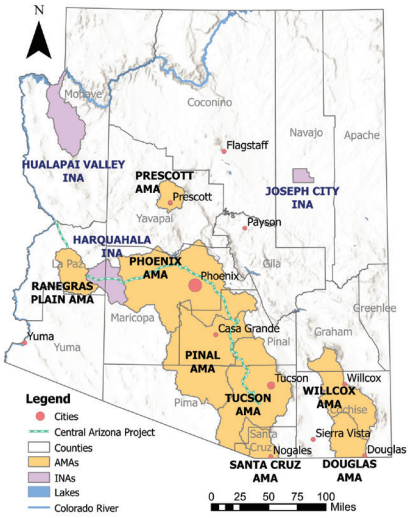
September 2023

THE UNIVERSITY OF ARIZONA
COOPERATIVE EXTENSION
WATER RESOURCES
RESEARCH CENTER
wrrc.arizona.edu/arizona-water-factsheets

Water in Arizona

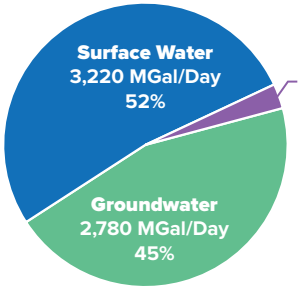
Arizona's future depends on sustainable water supplies, which in turn depend on vigilant and innovative management of those supplies. From low deserts to high mountains, counties and communities face different water challenges and take different approaches to addressing those challenges, while conforming with regional, state, and federal requirements. The Arizona Department of Environmental Quality (ADEQ) is responsible for water quality and tasked with enforcing federal environmental standards. The Arizona Department of Water Resources (ADWR) oversees the use of surface water and groundwater, which are legally distinct though physically interconnected. In general, ADWR regulates groundwater more strictly in Active Management Areas (AMAs) than in the rest of the state.

Statewide Context



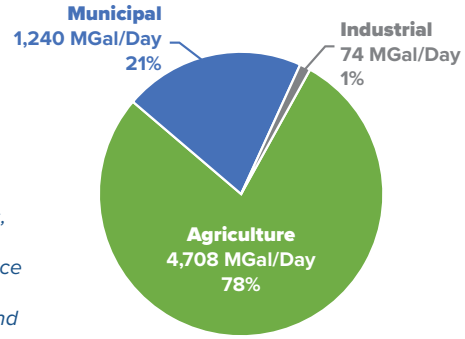
County, AMA, and INA boundaries (WRRC 2026).

Arizona Water Supply and Demand



SUPPLIES

Surface water includes streams, rivers, lakes, and reservoirs. Groundwater is water stored underground in subsurface aquifers. One million gallons (MGal) is equal to a little over three acre-feet and can serve 13 Tucson households for a year (Tucson Water 2018, USGS 2015).

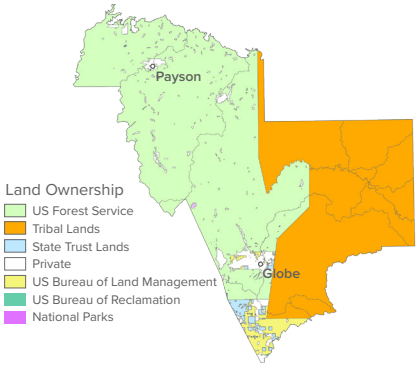


DEMANDS

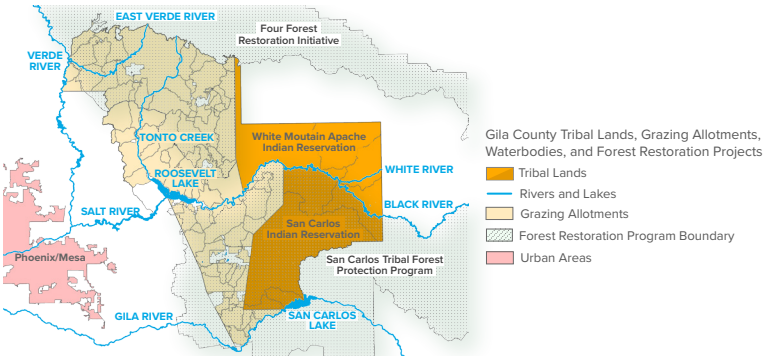
Water in Gila County

Gila County is defined by the diverse topography of the Mogollon Rim. High elevation ponderosa pine forests (above 8,000 feet) descend into low lying areas (between 2,000 and 2,500 feet) of the Sonoran Desert around Roosevelt and San Carlos Lakes. Average annual precipitation ranges from 7-25 inches, depending on elevation.

Gila County has a significant rural population, with approximately 41% of residents found outside the major population centers of Payson or Globe. Many rural residents rely on private domestic wells for drinking water. Land and water management are defined by land ownership (38% Tribal, 57% federal, 1% state, 4% private). The White Mountain Apache and San Carlos Indian Reservations are found within the boundaries of Gila County and maintain autonomous systems of land and water management along with independent water rights.



Land ownership in Gila County (Arizona State Land Department 2020).

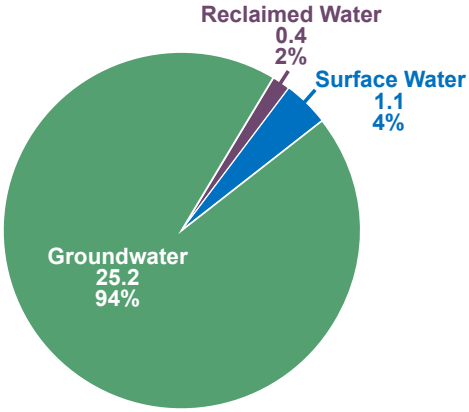


Gila County Tribal lands, grazing allotments, waterbodies, forest restoration projects, and surrounding urban areas (ASLD 2020, USDA 2022, USGS WBD 2022, US Census Bureau 2020).

Frequently Asked Questions

Where Does Gila County's Water Come From?

The primary source of water in Gila County is groundwater (94%). Surface water and reclaimed water provide the remainder (6%) of the county's water.



Sources (Million Gallons/Day) for Gila County's water (USGS 2015).

Groundwater

Groundwater is found under the earth's surface in aquifers, the pore spaces and fractures in rock and sediment.

- Most communities in Gila County are entirely dependent upon groundwater supplies for domestic and commercial uses.
- Groundwater use is regulated by ADWR within **Active Management Areas (AMAs)**. Gila County is not located within an AMA, but certain regulations of the **1980 Arizona Groundwater Management Act (GMA)** still apply.
- ADWR administers the **Adequate Water Supply Program.** Obtaining an Adequate Water Supply determination requires demonstration that water supply meets water quality standards and is physically, continuously, and legally available for 100 years. The determination of adequacy or inadequacy must be provided to buyers before subdivided lots can be sold to the public.

Surface Water

Surface water rights in Arizona are determined by the doctrine of prior appropriation, otherwise known as "first in time, first in right."

- Most surface water in Gila County comes from the Salt River, which flows east to west across the county, and has enabled robust farming along with rich and diverse riparian habitat in an arid region.
- Surface water from the Salt River and Tonto Creek watersheds are managed by the Salt River Project (SRP) via the Roosevelt Dam as a major water source for the Phoenix area.

In partnership with SRP, Payson began utilizing surface water from the C.C. Cragin Reservoir as a source of municipal water in 2019. The resulting reduction in local groundwater pumping, storage of unused supplies, and favorable runoff conditions has allowed for a rise in the local water table in excess of 60 feet in many areas.

Reclaimed Water

Reclaimed water, also known as recycled water or treated effluent, is an increasingly valuable water source generated by municipal wastewater treatment facilities in Gila County.

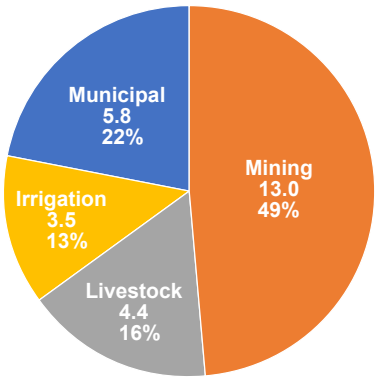
- Reclaimed water is used to irrigate parks and golf courses, and to recharge groundwater aquifers through rivers and infiltration basins, which can help boost water supplies for long-term sustainability.

How Is Water Used in Gila County?

Mining represents the largest water demand in Gila County (49%). Municipal use, including domestic and commercial (22%), irrigation (13%), and use for livestock (16%) account for the remaining demand.

Ranching, mining, and tourism are the top economic industries in Gila County. Audubon Arizona estimates $387 million is generated annually from water-related recreation in Gila County. Approximately 40% of the total county land area – majority federally owned – is allotted as range for livestock, while only 0.1% is irrigated cropland.

Mining has a long history within the county, dating back to 1878, owing to prolific deposits of copper, granite, sand, gravel, and aggregates. Water is used in the extraction, treatment, and processing stages of mining operations as well as for dust control at mining sites.



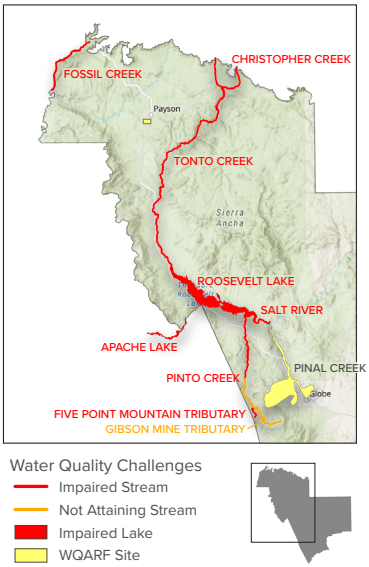
Water use (Million Gallons/Day) in Gila County (USGS 2015).

What Water Challenges Does Gila County Face?

Water Quantity Challenges

Geology. Due to the unique geology of northern Gila County, vast groundwater aquifers are generally not found in the county. Instead, shallow groundwater aquifers, existing along streams and washes, and those found in fractures and joints of otherwise impermeable rock, rely on seasonal recharge from rain and snow melt. Because of this, periods of sustained drought can cause declines in groundwater levels and reduced water availability.

Forest Management. The large percentage of federally managed forest lands in Gila County presents an opportunity to increase water yield during storm events with proper forest management. A properly thinned forest allows more rain to reach the forest floor for infiltration and reduces the risk of wildfires that can cause conditions in which soil becomes hydrophobic, repelling water and reducing infiltration.



Impaired waterbodies and WQARF site (ADEQ 2022).

Water Quality Challenges

Groundwater Contamination. Two Water Quality Assurance Revolving Fund (WQARF) registry sites are found in Gila County. Contamination at the Pinal Creek site is connected to past mining activity. The Payson PCE site is linked to dry cleaning operations. These sites are actively managed and overseen by ADEQ.

Surface Water Pollution. Roosevelt Lake, Apache Lake, Pinto Creek, Fossil Creek, Tonto Creek, along with portions of Christopher Creek and the Salt River have been designated as impaired by ADEQ. Contaminants are derived from failing septic systems, recreation, mining activity, atmospheric deposition, wildlife, livestock, and fish hatcheries.

Emerging Contaminants. Per- and polyfluoroalkyl substances (PFAS) are contaminants found throughout Arizona waterways. They include ingredients found in pharmaceuticals, household items, fire retardant fabrics, and personal care products. The US Environmental Protection Agency (EPA) has set limits on some PFAS and water providers are responsible for monitoring and finding ways to limit or eliminate exposure.

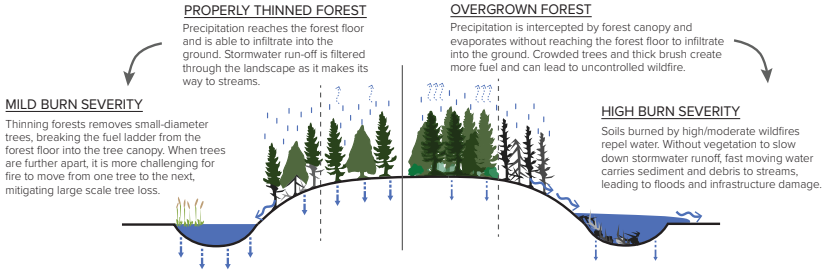


Diagram of forest management effects to water quality/quantity (WRRC 2023).

Wildfires. Wildfires alter a forest's natural storage and infiltration processes, impacting water quality. Melting snowpack and rain flow much faster through burned forests, increasing erosion and carrying debris and sediment to waterways. Degraded landscapes and stream channels can lead to decreased infiltration of water to aquifers.

How Is Gila County Moving Toward Sustainable Water Management?

As water resources in the state become more strained, people continue to study ways to stretch or increase supplies.

Reclaimed Water Use: Green Valley Park is a multi-functional public green space and cooperative water reclamation project between the Green Valley Water and the Town of Payson. The 48-acre park uses reclaimed water to maintain a 10.5-acre lake, which provides storage and distribution of reclaimed water for reuse customers, park irrigation, and natural aquifer recharge through percolation (about 325 acre feet per year).

Watershed Stewardship. Groundwater reliance, wildfire preparedness, and sustainable recreation have been the focus areas of local stakeholders as they examine water resources challenges and identify community projects to restore and enhance the watershed. In the Pinal Creek Watershed, the Cobre Valley Watershed Partnership's action plan aims to drive the planning and implementation of watershed restoration projects.

Forest Health. Ongoing collaboration supports two initiatives focused on landscape-scale restoration of fire-adapted ecosystems in Gila County and the Tonto National Forest. The Four Forest Restoration Initiative (4FRI) and the San Carlos Tribal Forest Protection Program will conduct forest thinning on over 5.4 million acres to reduce fuels and the risk of severe wildfires, protect communities and watershed health, and enhance wildlife habitat.

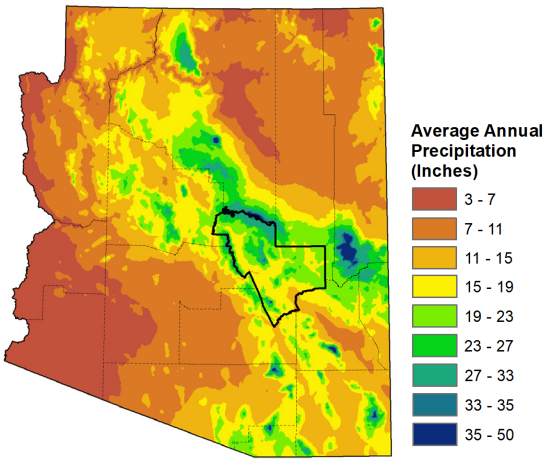
What Does Gila County's Future Water Situation Look Like?

The state of Arizona has been experiencing persistent drought conditions for over 20 years. In October 2020, exceptional drought was experienced for the first time in Cobre Valley since 1980. A hotter and drier future means increased pressure on competing demands for county water resources. Drought and climate change pose significant risks to Gila County, including:

- Reduced forage available for local wildlife and cattle, dry stock ponds and creeks, an increase likelihood of fire, and increased flooding.
- According to the Arizona Department of Forestry and Fire Management, 90% of the Cobre Valley is considered at high or extreme fire risk.

As water resources in the state become more strained, education will be critical to promote an understanding of water sources and limitations, as well as encourage an ethic of water conservation and watershed stewardship.

Residential water conservation, rainwater harvesting, the capture and recharge of stormwater flows, expanding the utilization of reclaimed water, and reducing water delivery loss are important strategies in sustainable water management for Gila County.



*Mean Precipitation 1981-2010 (**PRISM Climate Group 2016**).*

Additional Resources

The WRRC compiles and periodically updates a list of additional resources related to water in Arizona. These resources range from statewide information to information available from local watershed groups and non-profits. Visit the **WRRC website** to see a complete list. The resources used for this factsheet are listed below.

WRRC Water Map

A reliable and concise visual representation of Arizona's water resources. This map includes information on land ownership, water use by groundwater basin, annual precipitation, subsidence and groundwater storage, annual water use by region, supply and demand, Colorado River apportionment, and more. **Map Info**

Statewide Water Resources

- **ADEQ Emerging Contaminants Report**: An assessment of the emerging contaminants in Arizona's water supplies.
- **ADEQ Impaired Water Information**: Maps and information about the impaired surface waters in the state.
- **ADEQ WQARF Registry**: A list of WQARF sites across the state with descriptions of the individual sites.
- **ADWR Community Water System Map:** A map of water providers and their service areas.
- **Cooperative Extension Water Wise**: Information on water saving techniques for Arizona relating to irrigation, gray water, and rainwater harvesting.
- **Desert Water Harvesting Initiative**: Resources for local water harvesting and Green Infrastructure.
- **PRISM database**: Data on historic and current climate patterns, used for the precipitation map of Arizona.
- **USGS Ground Water Atlas of the United States**: Information about aquifers throughout the US.
- **Tribal Water Rights**: Information on Tribal water usage in the Colorado River basin and the barriers to that usage.

Regional Management and Planning

- **Audubon Arizona:** Impact of recreation on Arizona's rivers, lakes, and streams on statewide and local economies.
- **Arizona Department of Health Services (ADHS):** Information on water quality testing for private well owners.
- **Arizona Well Owner's Guide:** Comprehensive resource on private wells, their components and maintenance, along with geology, water quality, and regulation information.
- **SRP Watershed Management**: Information on SRP's efforts to protect watersheds from degradation, including wildfires.
- **Water for Arizona**: A multi-stakeholder coalition focused on securing sustainable water supplies for the state.

County Specific Water Resources

- **Arizona County Agricultural Economy Profiles:** Agriculture, water use, and regional economic data by county.
- **Cobre Valley Watershed Partnership Watershed Action Plan:** Provides watershed information along with a framework for planning restoration projects within the Pinal Creek Watershed.

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TRIF Initiative

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