

ARIZONA WATER FACTSHEET

Pinal County

Get to know water in your county

August 2024



THE UNIVERSITY OF ARIZONA
COOPERATIVE EXTENSION

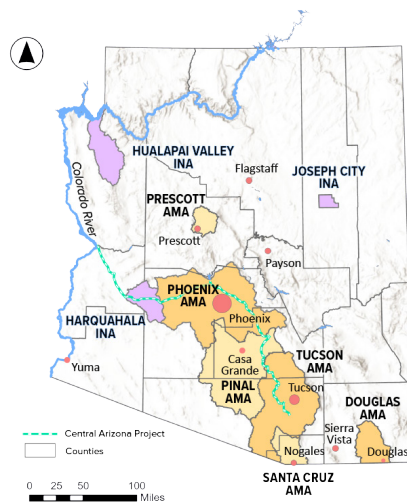
WATER RESOURCES RESEARCH CENTER

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Water in Arizona

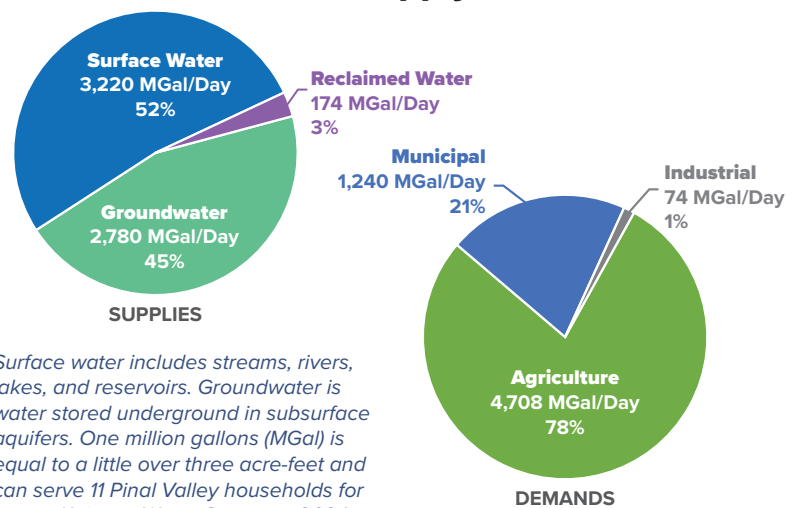
Arizona's future depends on sustainable water supplies, which in turn depend on vigilant and innovative management of those supplies. From low deserts to high mountains, counties and communities face different water challenges and take different approaches to addressing those challenges, while conforming 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 2023).

Arizona Water Supply and Demand

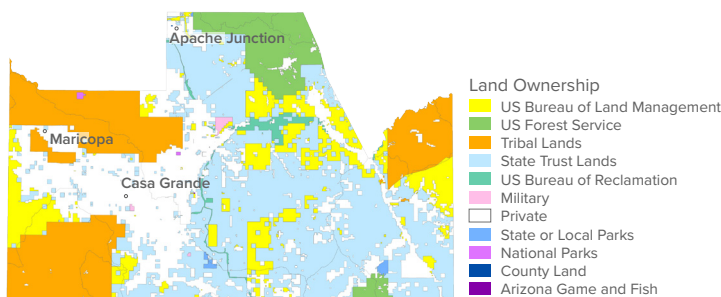


Surface water includes streams, rivers, lakes, and reservoirs. Groundwater is water stored underground in subsurface aquifers. One million gallons (MGal) is equal to a little over three acre-feet and can serve 11 Pinal Valley households for a year (Arizona Water Company 2024, USGS 2015).

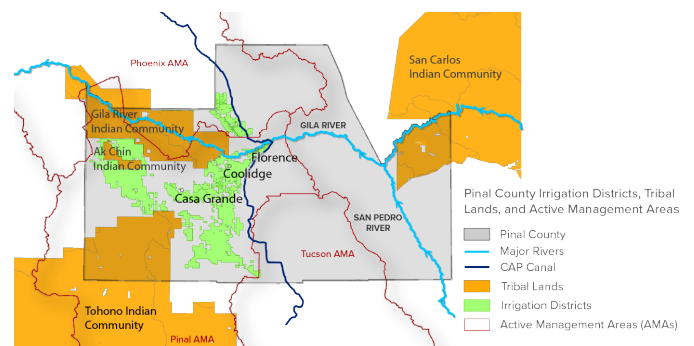
Water in Pinal County

Pinal County, Arizona's third most populous county, spans two diverse landscapes: in the east, the grasslands and woodlands of the Madrean Archipelago, and in the west, the Sonoran Desert, with areas of agricultural and urban development punctuated by mountain peaks. Average annual precipitation ranges from 7-25 inches depending on location and elevation, and supports perennial flows in reaches of the Lower San Pedro and Gila Rivers.

While most of the county's population relies on utilities to deliver drinking water, 22% live in rural areas and depend on domestic wells. Water management is influenced by land ownership (35% state, 26% private, 20% Tribal, and 19% federal). Tribal lands of the Gila River Indian Community, Tohono O'odham Nation, San Carlos Apache Tribe, and Ak-Chin Indian Community are found within county borders and maintain autonomous systems of land and water management.



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



Pinal County Tribal lands, major rivers, AMAs, and CAP canal. (ASLD 2020, NHD 2022, ADWR 2022).

Frequently Asked Questions

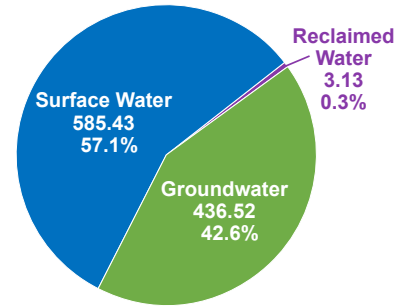
Where Does Pinal County's Water Come From?

Groundwater

Groundwater occurs in underground aquifers— subsurface porous rock or sediment saturated with water—found at varying depths.

Active Management Areas (AMAs). ADWR regulates groundwater use within AMAs. Pinal County includes portions of the Phoenix, Tucson, and Pinal AMAs.

- The primary management goal in the **Phoenix** and **Tucson AMAs** is to achieve safe-yield by 2025. Safe-yield is an attempt to balance groundwater withdrawals with recharge in AMA aquifers.
- The goal in the **Pinal AMA** is to sustain the agricultural economy while conserving groundwater for future non-irrigation uses.



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

Historic data does not reflect current water supply trends

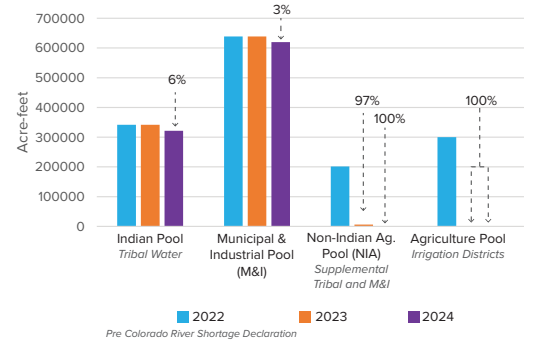
Surface Water

Surface water has been the main source of water in Pinal County since the 1990s. It supports robust farming and diverse riparian ecosystems in the desert. The majority of the county's surface water is Colorado River water delivered via the Central Arizona Project (CAP) canal. The remaining surface water comes from the Gila, Santa Cruz, and San Pedro Rivers. In Arizona, surface water allocations are determined by the doctrine of prior appropriation, otherwise known as "first in time, first in right."

Colorado River entitlements are managed by the US Bureau of Reclamation (Reclamation) and ADWR, which oversee diversions by CAP for delivery to the 3-county CAP service area, which includes Pinal County.

- Until CAP allocations were reduced due to Colorado River shortages, agriculture accounted for 90% of CAP water demand within the Pinal AMA. Agriculture bears the brunt of CAP reductions.
- Water resource managers are working to manage portfolios to mitigate uncertainties in water supplies resulting from ongoing drought, growing populations, increased groundwater pumping, and Colorado River shortages.

Reductions to CAP Deliveries by Priority Pool



CAP delivery reductions due to Colorado River shortage declarations (CAP 2024).

How Is Water Used in Pinal County?

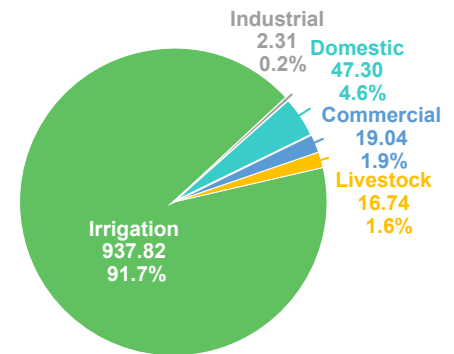
The dominant water demand within Pinal County is agriculture (92%). Domestic (4%), commercial (2%), livestock (1.6%), and industrial uses (0.4%) account for the remaining demand.

Agriculture. Agriculture plays an important role in Pinal County's economy and history. Approximately one-third of county land is in farms, located mainly in the valleys along the Gila and Santa Cruz Rivers and near the CAP canal. Production in the county accounts for about one-fourth of Arizona's total agricultural sales.

Irrigation Districts. Irrigation districts serve an important role in Pinal County. The 16 irrigation districts, covering 10% of the land (509 square miles), manage water distribution and infrastructure, ensuring fair access by members and adapting to annual water supply changes due to local drought and Colorado River shortages.

Industrial Water Use. Since 1985, industrial water use in the Pinal AMA has quadrupled from 4,500 to 19,000 acre-feet annually, declining from a peak of 28,000 acre-feet in 2008, driven by the growth of dairies, cattle operations, manufacturing, and copper mining. Following dairy growth, crop production has also shifted towards more water-intensive feed crops like alfalfa and corn.

Municipal Water Use. Municipal water use within the Pinal AMA relies primarily on groundwater pumping which increased by more than 170% from 1985-2019 (from 13,000 AF to 35,200 AF), but has stabilized at approximately 33,000 acre-feet per year since 2007.



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

What Water Challenges Does Pinal County Face?

Water Quality Challenges

Surface Water Pollution. Surface water is monitored by ADEQ, which classifies numerous Pinal County rivers and creeks as impaired. Low dissolved oxygen, *E. coli*, pesticides, metals, inorganics, and nutrients at levels that exceed regulatory standards have been found in these waters. ADEQ has determined that some of these exceedances come from runoff from agricultural, mining, livestock operations, failing septic systems, and wildlife.

Groundwater Contamination. ADEQ's Ambient Groundwater Monitoring Program found exceedances of arsenic and nitrates in areas of Pinal County from which residents of Casa Grande and Maricopa pump water. While water utilities ensure that delivered potable water meets drinking water quality standards, the safety of private well water is the responsibility of the well owner. ADEQ encourages private well owners to test for these contaminants to ensure that their well water is safe to drink.

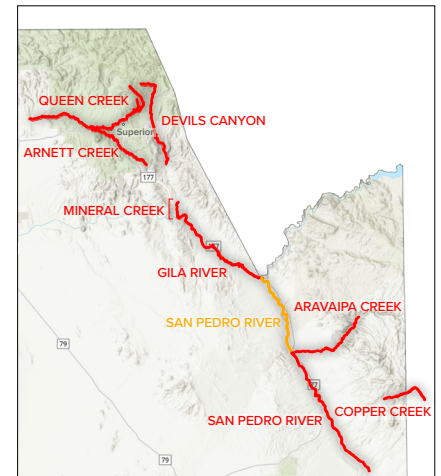
Water Quantity Challenges

Unmet Demand: ADWR released the Pinal AMA Groundwater Model in 2019, which indicated a potential unmet groundwater demand of 8.1 million acre-feet over 100 years. Without alternative sources, unmet groundwater demand can lead to overdraft (pumping more water from an aquifer than is recharged) that can cause damaging land subsidence, a sinking ground level, and earth fissuring.

Colorado River Shortages. The 2019 **Drought Contingency Plan (DCP)** aims to mitigate Colorado River shortages. Due to low water levels in Lake Mead, CAP deliveries to agricultural users in Maricopa, Pima, and Pinal Counties have been reduced. Pinal County faces further reductions with Colorado River shortage declarations by Reclamation. The Tier 1 shortage in 2024 may lead to reductions in irrigated acreage and/or increases in groundwater pumping, though the extent is yet unknown. In May 2024, Reclamation adopted a proposal to conserve an additional three million acre-feet of Colorado River water by 2026.

Drought. Climate change and drought affect water availability for ecosystems, wildlife, and human use, reducing surface water and groundwater recharge, especially in shallow aquifers. These impacts underscore the need to preserve surface flows and near-surface groundwater through managed pumping and diversions.

Legal Proceedings. Pinal County water supplies are also affected by the ongoing Gila River General Stream Adjudication. Other existing state and federal laws, court decrees, and water settlements also have significant impacts on agricultural, industrial, and municipal water use within the county (e.g. Arizona Water Settlements Act of 2004 and the 1935 Globe Equity Decree).



Water Quality Challenges
— Impaired Stream
— Not Attaining Stream

Impaired waterbodies (ADEQ 2022).

How Is Pinal County Moving Toward Sustainable Water Management?

Drought-Tolerant Crops. Guayule, a drought-tolerant shrub grown in Pinal County for cattle feed and commercial products, requires half the water of crops like cotton and alfalfa and resists most pests, reducing the need for insecticides and tilling while supporting soil carbon storage.

Reclaimed Water Use: Reclaimed water recharge projects using infiltration basins are active in Maricopa, Eloy, Florence, Coolidge, Casa Grande and Arizona City. New reclaimed water use projects are being developed between Pinal county communities and Arizona Water Company and Global Water Resources. These projects can be used to offset groundwater pumping.

Water Conservation: Expanding the use of reclaimed water for residential irrigation is an important step in water conservation. Utilities and municipalities in Pinal County have implemented reclaimed water systems for non-potable uses, along with high-tech water meters, desert-adapted landscaping, and conservation ordinances to save water.

The Lower San Pedro River, the last major natural river ecosystem in southern Arizona, supports diverse and endangered wildlife. The Lower San Pedro Collaborative works to conserve the watershed's resources, protect water quality and habitats, and promote ecological health, recreation, and community welfare.

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

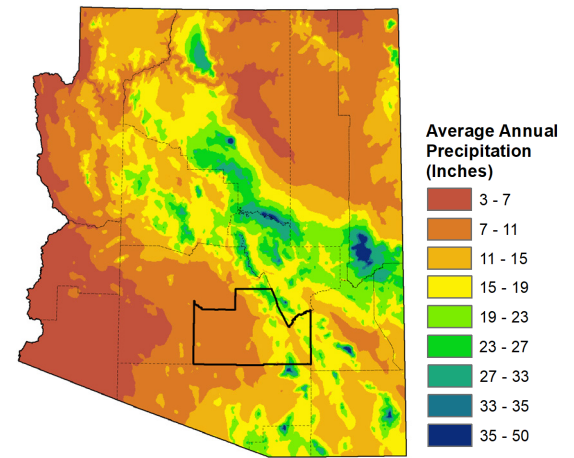
The state of Arizona has been experiencing drought conditions for over 20 years. A hotter and drier future means increased pressure on county water resources. Drought and climate change pose significant risks to Pinal County:

- Reduced forage for local wildlife and cattle, dry stock ponds and creeks, and increased likelihood of fire.
- Unpredictable weather patterns, more severe storms and flooding, as well as increasing temperatures that create challenges for communities and agriculture.

The number of housing units in Pinal County more than doubled between 2000-2018 (most built before 2008), and the population is projected to double by 2050. A significant portion of planned development is still unconstructed. This potential urban growth raises questions about how development will occur relative to water supplies.

With the decrease in CAP surface water deliveries to Pinal County farmers due to Colorado River shortages and the planned sunseting of Non-Indian Agricultural Pool, the consequences of increased groundwater dependence, overdraft, and subsidence are critical concerns. Collaborative efforts among local, county, and federal stakeholders are underway to identify and secure sustainable water resources for the future.

Continued local and regional cooperation among the region's key water users is necessary to encourage information sharing, create partnerships to address vulnerabilities to water shortages, and work toward comprehensive and sustainable water management.



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:** Information about impaired surface waters in the state.
- **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.
- **Tribal Water Rights:** Information on Tribal water usage in the Colorado River basin and the barriers to that usage.
- **USGS Ground Water Atlas of the United States:** Information about aquifers throughout the US.

Regional Management and Planning

- **Active Management Areas:** Information about groundwater regulation in Arizona and the management of AMAs.
- **CAP Colorado River Reductions:** Information on Reclamation reductions and impacts to CAP deliveries.
- **Drought Contingency Plan (DCP):** An overview of the DCP and its implications for Arizona water users.

County Specific Water Resources

- **ADWR: 2019 Pinal Groundwater Model:** Analysis of the Pinal County area's groundwater conditions.
- **Arizona County Agricultural Economy Profiles:** Agriculture, water use, and regional economic data by county.
- **A Visual Guide to Water in the Pinal Active Management Area:** Water policy and management in the Pinal AMA.
- **Eloy and Maricopa-Stanfield Basin Study:** Groundwater budget and future supply and demand scenarios report.
- **Greene Wash Watershed Plan-Environmental Assessment:** Ongoing planning and research regarding flood mitigation.
- **Lower San Pedro Collaborative:** Watershed-wide, inclusive stewardship effort focused in the Lower San Pedro watershed.
- **Pinal AMA 5th Management Plan:** Conservation programs to guide the Pinal AMA to its management goal by ADWR.