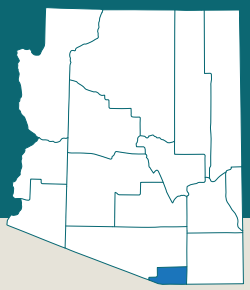


# ARIZONA WATER FACTSHEET
# Santa Cruz County

Get to know water in your county

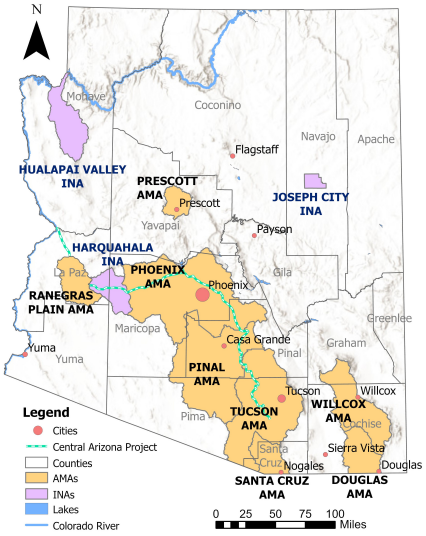
February 2024

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

## Water in Arizona

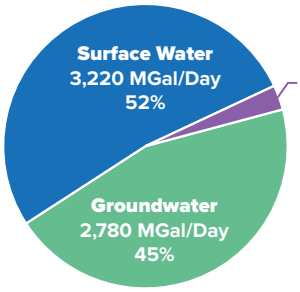
Arizona's future depends on sustainable water supplies, which in turn depend on vigilant and innovative management of those supplies. From low deserts to high mountains, counties and communities face different water challenges and take different approaches to addressing those challenges, while conforming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

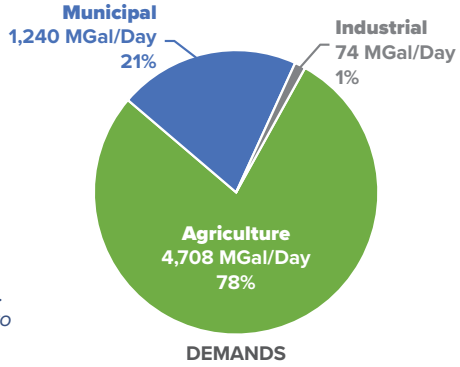
### Statewide Context




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

### Arizona Water Supply and Demand



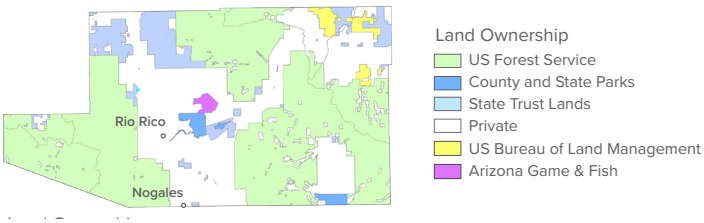




*Surface water includes streams, rivers, lakes, and reservoirs. Groundwater is water stored underground in subsurface aquifers. One million gallons (MGal) is equal to a little over three acre-feet and can serve 13 Tucson households for a year (Tucson Water 2018, USGS 2015).*

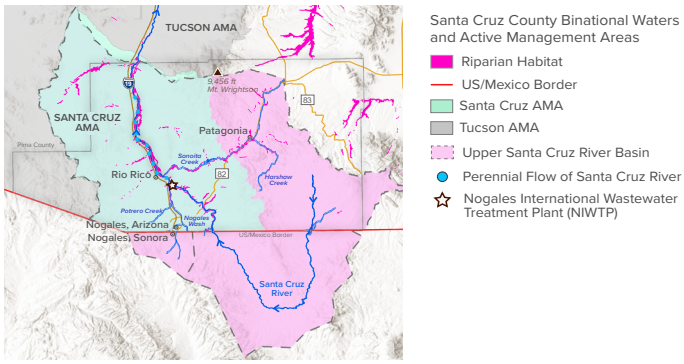
## Water in Santa Cruz County

Santa Cruz County is Arizona's smallest county at just 1,238 square miles and one of the most ecologically diverse. Located along Mexico's border in the Sky Island region of southern Arizona, this region harbors some of the last remaining native grasslands in the state. With an average of 18 inches of annual rainfall, the county's diverse landscape supports more than 7,000 species of plants and animals as well as the headwaters and some of the last perennial reaches of the Santa Cruz River.

The county's economic and environmental profile, which features ecotourism and wine trails, reflects the unique hydrology and binational nature of the Upper Santa Cruz River Basin. Major population centers within the county include Nogales and Rio Rico. Land ownership (54% federal, 8% state, 38% private) defines how water and lands are managed.




*Land ownership in Santa Cruz County (Arizona State Land Department 2020).*




*Santa Cruz County rivers, Upper Santa Cruz River Basin, riparian habitat, and AMAs. (USDA 2011, NHD 2022, FWS 2022).*

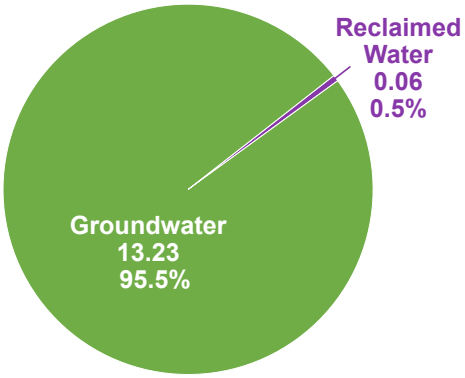
# Frequently Asked Questions

## Where Does Santa Cruz County's Water Come From?

### Groundwater

Groundwater use in Arizona is governed by a doctrine of reasonable use as defined by the Arizona Supreme Court. The **1980 Arizona Groundwater Management Act (GMA)** created **Active Management Areas (AMAs)**, which introduced regulation and conservation measures in areas with a history of heavy reliance on groundwater.

In Santa Cruz County, there are two AMAs: the **Santa Cruz AMA** (covering 46% of county's land area), addressing the unique challenges of the Upper Santa Cruz River Basin, and a small part of the **Tucson AMA** (9% of land area).




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

**Inside AMAs.** Management plans and goals for each AMA detail reporting and conservation obligations for water users. Additional regulations include:

- The ADWR-managed **Assured Water Supply (AWS)** program mandates demonstration of access to a continuous 100-year supply of good quality water before lands divided into six or more lots can be developed. Parcels with less than six lots are exempt from requirements, allowing the use of small-capacity private wells.
- Larger wells, pumping over 35 gallons per minute or irrigating more than 2 acres must report their water use.

**Outside AMAs.** The **Adequate Water Supply** program, administered by ADWR, applies to land subdivided into 5 or more lots. It requires a determination that water supplies of adequate quality will be 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.

### Surface Water

The Santa Cruz River is the major water source for many domestic, community, and agricultural wells in Santa Cruz County. Through time, increases in population, surface water diversions, and groundwater pumping in the region have dried up long stretches of the river. Since 1951, river flows have been bolstered by a steady flow of reclaimed water from the Nogales International Wastewater Treatment Plant (NIWTP), revitalizing a significant perennial section of the river in central Santa Cruz County.

**Under a binational agreement between the US and Mexico, the NIWTP processes about 15 MGD of dry weather flow, with roughly 80% originating in Mexico.**

### Reclaimed Water

This 16-mile perennial stretch of the Santa Cruz River relies on treated effluent sourced from Nogales, Sonora and Nogales, Arizona (Ambos Nogales) and Rio Rico, which supports river flows, riparian habitat, and contributes to aquifer recharge along the Santa Cruz River.

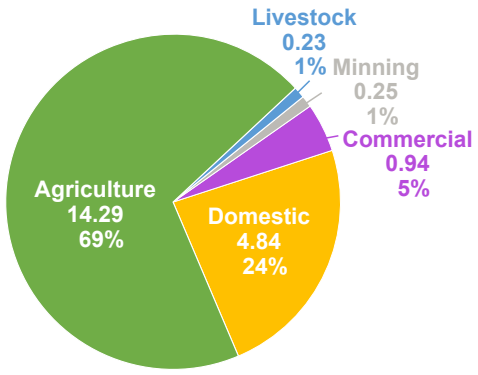
## How Is Water Used in Santa Cruz County?

The dominant water demand within Santa Cruz County is agriculture (69%). Domestic (24%), commercial (5%), mining (1%), and livestock (1%) account for the remaining demand.

**Agriculture.** Agriculture, ranching, and tourism are top economic industries in Santa Cruz County. Ranching is predominant on public lands (54% of county), while crop production occurs on private lands.

**Tourism.** Santa Cruz County has a growing wine industry that plays an important role in tourism. The county is also a popular destination for outdoor recreation activities due its unique geophysical characteristics and large number of state and national parks and other protected areas.

**Mining.** Mining of aggregate, limestone, and copper uses water in the dewatering, extraction, treatment, and processing stages, as well as for dust control.



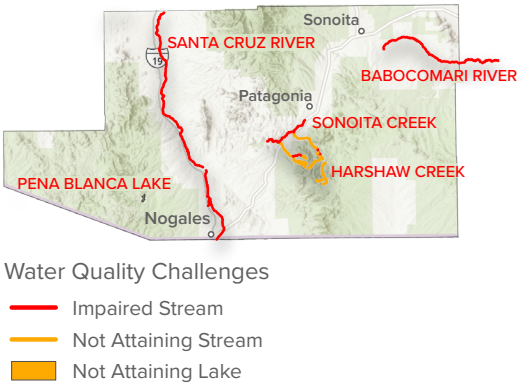

*Water use (Million Gallons/Day) in Santa Cruz County (USGS 2015).*

# What Water Challenges Does Santa Cruz County Face?

## Water Quality Challenges

**Surface Water Pollution.** Surface water is monitored by ADEQ. In Santa Cruz County, sections and tributaries of the Santa Cruz River, Sonoita Creek, Harshaw Creek, and the Babocomari River, along with Pena Blanca Lake, are classified as impaired. Heavy metals, organics, *E. coli*, and pH imbalances at levels that exceed regulatory standards have been found and are attributed to mining operations, agriculture, livestock, and contaminated transboundary fugitive wastewater and stormwater flows.

**Transboundary Water Quality Concerns.** During storm events in Ambos Nogales, heavy rains significantly increase stormwater and sewage flow, stressing the International Outfall Interceptor (IOI), the pipe that transports wastewater to the NIWTP. This often leads to sewer overflows, causing untreated or partially treated wastewater to flood residential areas and local waterbodies, such as the Nogales Wash. These overflows contain pollutants, including *E. coli* and heavy metals, adversely impacting environmental and water quality.




*Impaired waterbodies (ADEQ 2022).*

## Water Quantity Challenges

**Sustaining River Flows.** Climate change and ongoing drought conditions impact the amount of water available for riparian habitat, wildlife, and human use. Groundwater pumping can intensify the decline of surface flows in natural channels by lowering water tables, where groundwater contributes to stream flow.

**Transboundary Water Availability.** Since 1951, the US and Mexico have jointly managed effluent water flow from Nogales, Sonora, to NIWTP. A maximum limit of 9.9 MGD was set on wastewater deliveries from Mexico, but no minimum was set. However, effluent delivery has been prone to fluctuations, often surpassing the maximum limit (by 30%-126%) due to population increase and heavy rainfall events. To address overflow, the Mexican government commissioned the Los Alisos Wastewater Treatment Plant (Los Alisos) in 2012, which treats a portion of the wastewater generated in Nogales, Sonora. Since Los Alisos began operations, effluent delivery to NIWTP has dropped, with treated water now used in Sonora for agriculture and aquifer recharge through the Los Alisos River. With no binational agreement in place on an effluent delivery minimum from Mexico, there are now uncertainties about future effluent flows, the environmental effects, and future recharge in the Santa Cruz AMA.

# How Is Santa Cruz County Moving Toward Sustainable Water Management?

**Local Watershed Stewardship.** The Upper Santa Cruz Watershed is home to multiple organizations and public efforts dedicated to restoring and maintaining riparian habitat and sustaining flows on the Santa Cruz River, Sonoita Creek, Harshaw Creek, and other waters.

**Wastewater Treatment Upgrades.** Significant upgrades to the treatment processes at NIWTP in 2009 have resulted in substantial water quality improvements, the return of more diverse aquatic life to the river, and greater infiltration to groundwater aquifers.

**Nature-Based Restorative Economy.** Vital economic and quality of life benefits are derived from investments in nature-based tourism paired with conservation, restoration, and preservation activities in Santa Cruz County. In 2019, this economic strategy supported 779 jobs, $31.1 million in county GDP, and $76.6 million in sales.

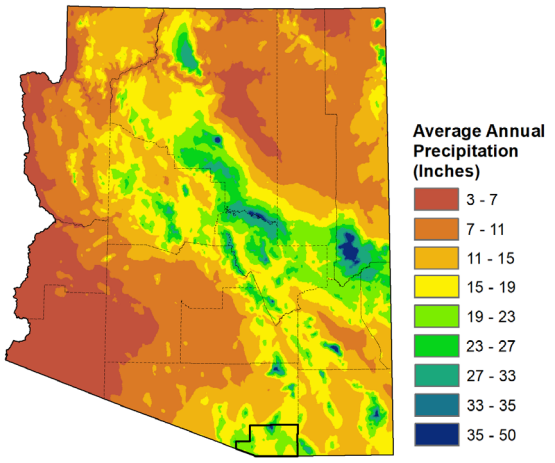
Pressure from local conservation organizations led to NIWTP upgrades and the subsequent return of the federally endangered Gila Topminnow to the Santa Cruz River. The fish was first seen in 2015, after a decade-long absence, and populations continue to grow.

**Stormwater Quality Improvements.** Binational partnerships are exploring nature-based solutions to address cross-border flows of contaminated wastewater and stormwater. Involving US and Mexican public institutions and state and federal agencies, these efforts aim to restore local ecosystems and promote healthier, sustainable border cities by developing a green infrastructure network of over 100 sites that include neighborhood parks, schools, and sports facilities in Ambos Nogales.

# What Does Santa Cruz 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 competing demands for county water resources. Drought and climate change pose significant risks to Santa Cruz County, including:

- Reduced forage available for local wildlife and cattle, dry stock ponds and creeks, an increased likelihood of fire, and increased flooding.
- The Sky Islands will become increasingly isolated due to montane habitat loss. This may affect their ability to serve as stepping stones and have negative implications for the region's biodiversity.




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

As water resources in the state become more strained, reclaimed water will become an increasingly valuable resource. Continued international cooperation between the US and Mexico along with a cultural movement toward environmental conservation are needed to sustain flows in the Santa Cruz River. As a haven for Arizona's rare and disappearing riparian environments, Santa Cruz County is well positioned to support a thriving ecotourism economy.

Large new mining projects identified in Santa Cruz County and Mexico have the potential to permanently change the landscape and hydrology of the region. Regular stream and well monitoring efforts are in place by local watershed organizations in Santa Cruz County to collect data on groundwater depths, stream flows, and water quality, which contributes to knowledge of the potential local impacts of these new regional mining operations.

# 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 (AMAs):** Information about groundwater regulation and the management of AMAs.
- **Arizona Groundwater Code:** 1980 Groundwater Management Act and resulting Groundwater Code.
- **Assured and Adequate Water Supply Programs:** Overview of the Assured and Adequate Water Supply programs.

### County Specific Water Resources

- **Arizona County Agricultural Economy Profiles:** Agriculture, water use, and regional economic data by county.
- **Nature-Based Restorative Economy in Santa Cruz County, Arizona:** Study of nature-based tourism, nature-based industries, and conservation, restoration, and preservation.
- **Patagonia Area Resource Alliance:** A community-driven nonprofit dedicated to the preservation of local mountains, wildlife, and watersheds in and around Patagonia, AZ.
- **Patagonia-Sonoita Creek Preserve:** Site of local stream and well monitoring managed by The Nature Conservancy.
- **Santa Cruz County Comprehensive Plan:** Provides official land use policy and outlines long-range goals for the county, including water resources.
- **The Sonoran Institute: A Living River:** A report detailing conditions along the perennial stretch of the Santa Cruz River in Santa Cruz County.

**TRIF Initiative**

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