

ARIZONA WATER FACTSHEET Yavapai County

Get to know water in your county

May 2023



COLLEGE OF AGRICULTURE & LIFE SCIENCES
COOPERATIVE EXTENSION

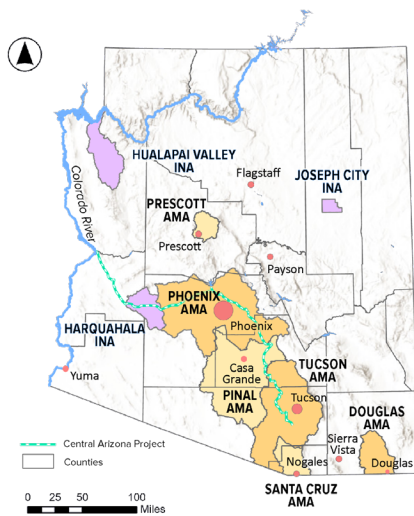
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Water in Arizona

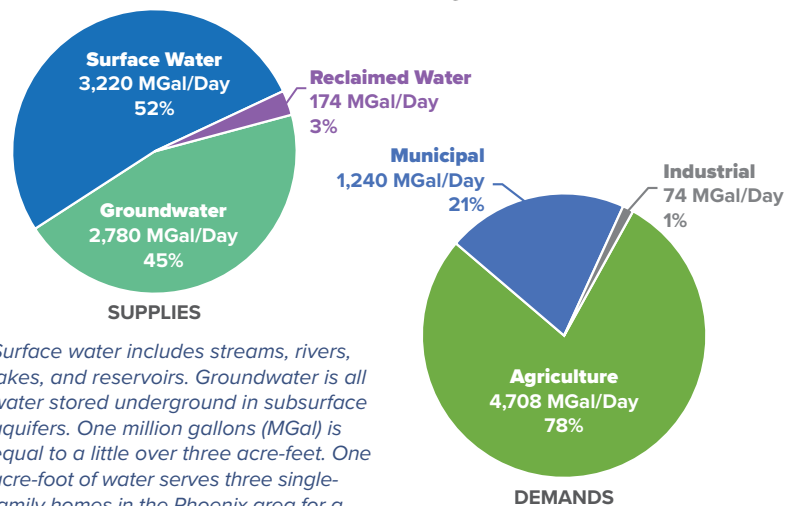
Arizona's future depends on sustainable water supplies, which in turn depend on vigilant and innovative management of those supplies. From low deserts to high mountains, counties and communities face different water challenges and take different approaches to addressing those challenges, while conforming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

Arizona Water Supply and Demand

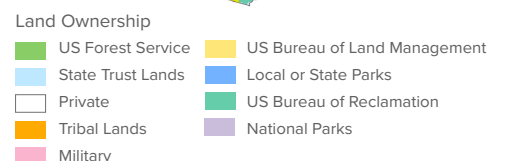
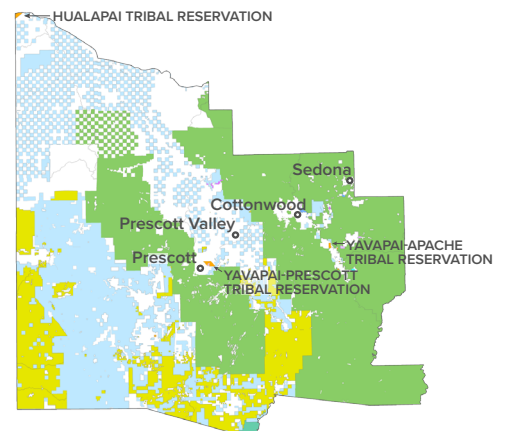


Surface water includes streams, rivers, lakes, and reservoirs. Groundwater is all water stored underground in subsurface aquifers. One million gallons (MGal) is equal to a little over three acre-feet. One acre-foot of water serves three single-family homes in the Phoenix area for a year (ADWR 2021, USGS 2015).

Water in Yavapai County

Bisected by the Mogollon Rim, Yavapai County transitions from the Sonoran Desert in the south to the conifer forests and shrublands of the Colorado Plateau to the north. The grasslands of the Chino Valley sustain agriculture and livestock grazing as well as the headwaters of the Verde River, a major perennial river in Arizona and the longest stretch of continuous riparian habitat in the state (over 150 miles). The county is also home to two other tributaries to the Gila River: the Agua Fria and Hassayampa Rivers. Each is over 100 miles long and supports diverse riparian habitats, agriculture, and population hubs of central Arizona.

Average annual precipitation ranges from 7-20 inches in the southern part of the county to 14-39 inches in higher elevation, forested areas. Approximately one-third of the county's population reside in rural areas. Major urban centers include Prescott, Prescott Valley, Sedona, and Cottonwood. The county includes the lands of the Yavapai-Prescott and Yavapai-Apache Tribal Reservations, as well as a small portion of the Hualapai Reservation in its northwest corner.



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

Frequently Asked Questions

Where Does Yavapai County's Water Come From?

The primary source of water in Yavapai County is groundwater (78%). The remaining water supplies consist of surface water (21%) and reclaimed water (1%).

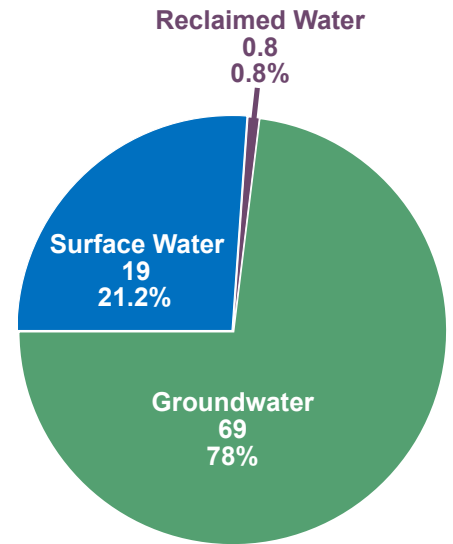
Groundwater

Most local groundwater is so-called "fossil water" that percolated into the ground many thousands of years ago and is considered nonrenewable because it is not replenished by nature. For 96% of Yavapai County, groundwater supplies are not regulated. Instead, groundwater is governed by a doctrine of beneficial use as defined by the Arizona Supreme Court.

To confront the overdraft of Arizona's groundwater resources, 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 mined groundwater.

Inside AMAs. There are two AMAs found within Yavapai County. The **Prescott AMA** covers about 6% of Yavapai County (485 square miles), and a small corner of the **Phoenix AMA** (58 square miles) extends into the county's southern border.

- The goal of both the Prescott AMA and Phoenix AMA is to achieve safe-yield by 2025. **Safe-yield** is a groundwater management goal which attempts to balance groundwater withdrawals with recharge – both natural and planned – in AMA aquifers.
- The **Assured Water Supply (AWS)** program in AMAs requires that land subdivided into six or more lots must demonstrate that a 100-year supply of good quality water will be continuously and legally available. Divisions of land into fewer parcels, known as lot splits, are not required to have an AWS and can source water from small-capacity private wells, which are exempt from reporting requirements and conservation regulations.
- Unlike exempt well owners, owners of large wells - capable of pumping more than 35 gallons per minute - must report how much water is pumped.



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

Water drawn from private exempt wells within the Prescott AMA represents the third largest groundwater demand behind withdrawals by the City of Prescott and Town of Prescott Valley.

Outside AMAs. The **Adequate Water Supply** program, requires ADWR to determine whether there is enough water of acceptable quality, legally and continuously available for 100 years before land may be subdivided into more than five lots. The results of this determination, whether an adequate water supply is available or not, must be disclosed to potential buyers of subdivided lots.

- As of 2022, service areas in Yavapai County designated as having an assured or adequate water supply include: City of Prescott, Wickenburg Ranch Water, LLC, Camp Verde Water System, Inc., City of Cottonwood, and the Town of Clarkdale.
- In 2008, Clarkdale elected to become a mandatory adequacy jurisdiction, the only one in Yavapai County. If ADWR determines that a developer's available water supply is not adequate, the town can deny approval of a new subdivision.

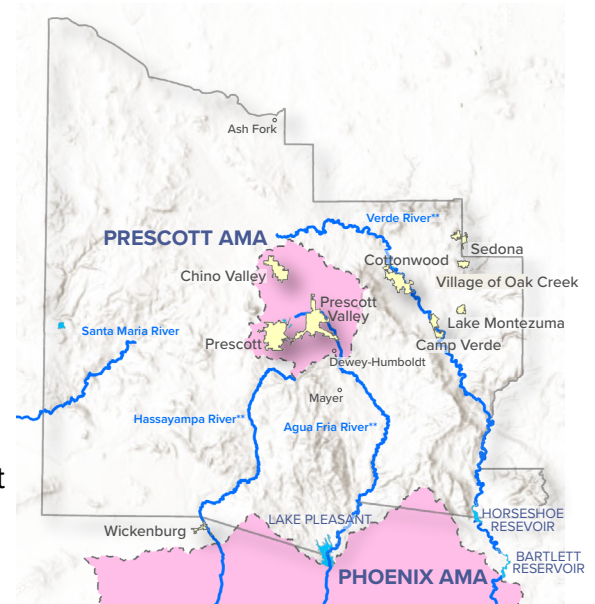
Surface Water

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

- Water rights within the Gila River Watershed, which includes the major rivers within Yavapai County, will be impacted by ongoing litigation on the right to divert water from rivers and streams and pump water from wells located near these rivers. The lawsuit is known as the Gila River General Stream Adjudication, and will determine the nature, extent, and priority of water rights within the watershed. The case involves more than 40,000 parties and almost 85,000 competing water rights claims.

Three tributaries of the Gila River, the Verde, Agua Fria, and Hassayampa Rivers originate within Yavapai County.

- The Verde River passes through the communities of Clarkdale, Cottonwood, and Camp Verde before reaching the Horseshoe Reservoir. The Verde River supplies approximately 40% of the surface water that Salt River Project (SRP) delivers annually to Phoenix-area residents for irrigation as well as cities and towns for municipal uses.
- The Agua Fria River has a rich record of human history and is considered a prominent prehistoric site of the American Southwest. The river also provides 83,000 acre-feet of water to Lake Pleasant, which is transported via the Central Arizona Project (CAP) canal to supplement water supplies in Phoenix during the summer.



Yavapai County AMAs, Waterbodies, and Urban Areas

— Rivers
** Adjudicated Waters
— Lakes and Reservoirs
Urban Areas
Active Management Areas (AMAs)

AMAs, Waterbodies, and Urban Areas in Yavapai County
(ADWR 2022, NHD 2022, US Census 2010).

Reclaimed Water

Uses of reclaimed water within Yavapai County include irrigation for residential landscapes, parks, and golf courses in addition to groundwater recharge through infiltration ponds or rivers.

Using reclaimed water can help reduce the county's reliance on surface water sources like the Verde River.

WATER ESSENTIALS

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

Aquifer: Subsurface porous rock or sediment saturated with groundwater.

Surface water: Water flowing in natural channels (streams, canyons, ravines), as well as lakes, ponds, and springs.

Subflow: Underground water considered to be part of the surface stream, this legal definition refers to water found in the sand, gravel, and loose rock of a river's floodplain.

Base flow: Water that seeps into a river or stream from groundwater (not from precipitation). Groundwater allows some rivers to flow year-round by providing a base flow of water in between snowmelt runoff and rain events.

Reclaimed Water: Also known as recycled water, this highly treated wastewater is collected as sewage and treated to quality standards suitable for the intended use (e.g., irrigation for landscaping, discharge to rivers, etc.) before distribution.

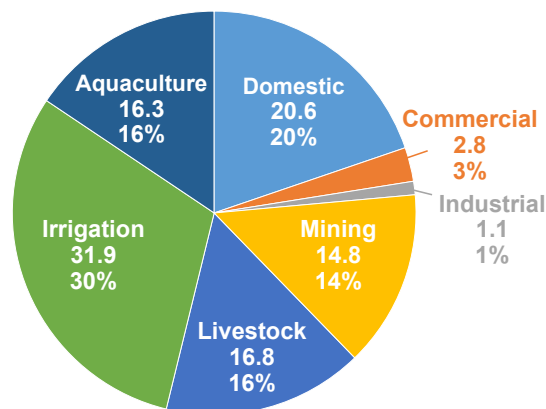
How Is Water Used in Yavapai County?

The dominant water use within Yavapai County is irrigation (30%), followed by domestic use (20%), aquaculture and livestock (16%), and mining (14%). Commercial and industrial uses make up the remaining 4%.

Tourism. A major economic industry in Yavapai County, tourism is dependent on water as a major driver.

- Audubon Arizona estimates that \$1 billion is generated annually from recreation on or along rivers, lakes, and streams in Yavapai County.

Mining. Active mining within the county includes copper, stone, cement, gravel, and aggregate operations. Water is used in the extraction, treatment, and processing stages of these operations as well as for dust control.



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

Page Springs Hatchery is Arizona Game and Fish Department's largest operation. Producing approximately 750,000 fish a year, it accounts for close to 57% of the stock trout in Arizona's waterways and contributes \$185.3 million to the state's economy.

Irrigation. Agriculture and ranching have a long history in Yavapai County in addition to a substantial economic impact.

- Ranching is active on about 15% of the county's total land area and irrigated agriculture is mainly found in valleys adjacent to the Verde River.
- Yavapai's growing prominence in Arizona's wine industry presents an alternative to the types of farming typically associated with the state and plays an important role in tourism in the county.

Aquaculture. Yavapai County uses more water for aquaculture than any other county in the state.

- Most of the water is used to support large public and private hatcheries on Oak Creek. Water used in state-run hatcheries is not considered consumptive use, because it uses a flow-through system.

What Water Challenges Does Yavapai County Face?

Water Quantity Challenges

Climate Change. Climate and ongoing drought conditions have an impact on the amount of water available for riparian habitat, wildlife, and human use. Groundwater pumping can lower water tables and intensify the decline of surface flows in natural channels, disrupting flow among surface water bodies. The long-term conservation of water and land is dependent on the connection between surface water and groundwater.

Groundwater Overdraft. The Prescott AMA has been in overdraft for all but five years since 1985. As of 2019, the Prescott AMA has been in a state of long-term overdraft, with almost three quarters of the AMA's total demand supplied by groundwater overdraft. Due to a variety of legal agreements, prior appropriations, and pending adjudications, surface water within the AMA is not consistently available and there is therefore, a heavy reliance on groundwater. Importation of water from the nearby Big Chino Sub Basin has been considered, but there are a variety of legal and infrastructure impediments to the project.

Exempt Wells. The Prescott AMA is estimated to have over 13,000 exempt wells, pumping more than 2,700 acre-feet per year. Exempt wells contribute to groundwater overdraft, placing the long-term viability of aquifers at greater risk and impeding the AMA's ability to reach its management goal of safe-yield by 2025.

Gila River Adjudication. As these judicial proceedings continue into a fifth decade, there is uncertainty about the amount of water that will be available to individuals, businesses, and communities. Under these circumstances, it can be difficult to plan for future water needs or ensure long term water sustainability, which may impact economic growth.

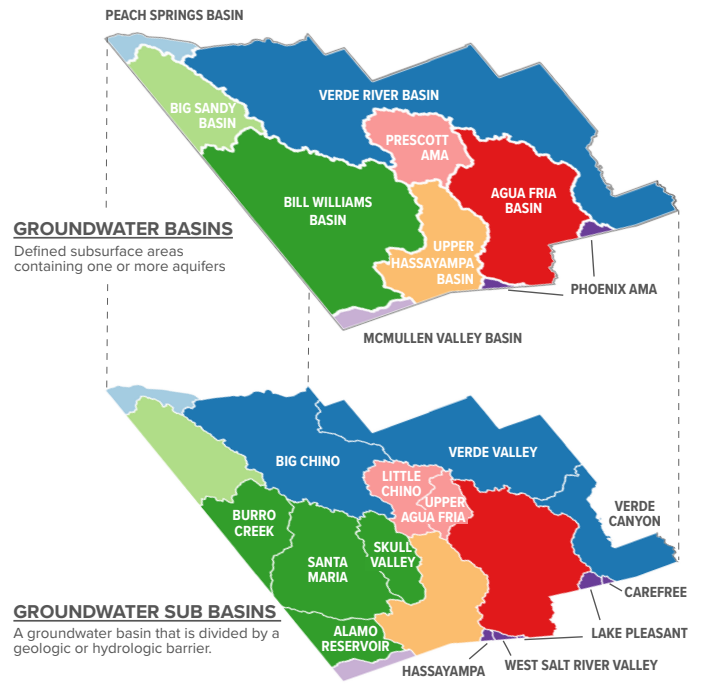
Water Quality Challenges

Superfund Sites. Superfund sites are federally designated areas contaminated by toxic substances. The Iron King-Mine Humboldt Smelter is the only Superfund site in Yavapai County. The current groundwater contaminants of concern at this site include arsenic, lead, and other heavy metals. Site cleanup is governed by the U.S. EPA and is funded by federal and local entities.

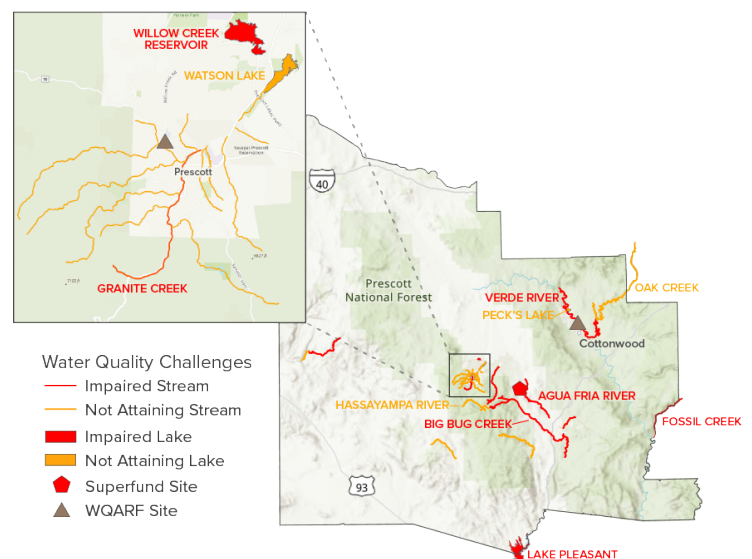
Groundwater Contamination. There are two Water Quality Assurance Revolving Fund (WQARF) registry sites undergoing groundwater remediation in Cottonwood and Prescott. The groundwater contaminants of concern at both sites include volatile industrial solvents (PCE and TCE). The sites were associated with dry cleaning facilities using chlorinated solvents and degreasers. Site cleanup is governed by ADEQ.

Surface Water Pollution. Over 25 streams along with four lakes and reservoirs have been listed as impaired in Yavapai County. Surface water impairment is monitored by ADEQ and identifies bodies of water that do not attain water quality standards for their designated uses. Contaminants within these waterbodies include heavy metals, and E. coli. ADEQ has found that the contamination derives from stormwater runoff, failing septic systems, faulty wastewater treatment facilities, wildlife, and inactive mines.

Emerging Contaminants. Per- and polyfluoroalkyls substances (PFAS) are compounds commonly found in consumer, commercial, and industrial products due to their distinctive properties, such as resistance to extreme temperatures, nonstick characteristics, and durability. PFAS exposure has been linked to cancers in humans and animals, and studies have shown that they are ubiquitous in our water, air, fish, and soil across the nation and globe. The U.S. EPA has set legally enforceable limits on some PFAS and water utility customers must now be informed if they are detected. Water systems are responsible for monitoring and finding ways to limit or eliminate exposure.



Groundwater basins and sub basins in Yavapai County (ADWR 2022).



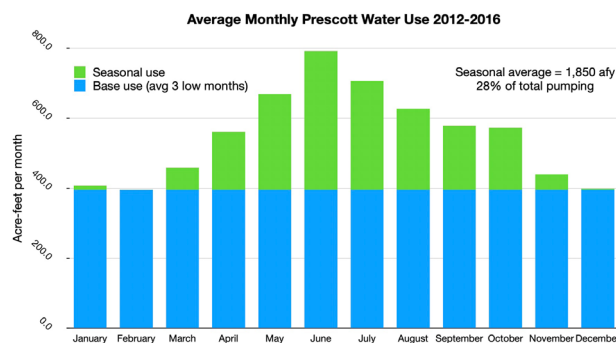
*Impaired and not attaining lakes, and streams
WQARF and Superfund sites (ADEQ 2020).*

How Is Yavapai 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. Many communities within Yavapai County, including Chino Valley, Cottonwood, Prescott, Prescott Valley, and Sedona, are using reclaimed water to supplement groundwater supplies through direct recharge to groundwater aquifers through river beds and/or infiltration basins. These efforts can help boost future municipal water supplies by replenishing groundwater supplies and lessening the reliance on surface water.

Water Conservation. Efforts are in place throughout Yavapai County to expand reclaimed water use to replace potable water for irrigation. Water used outdoors can double municipal demand during the peak summer season (June) and represents 28% of total water demand in cities like Prescott. To increase the resilience of water supplies, communities throughout the county employ strategies such as schedules that limit irrigation to specified times and offering rebates or incentives for low water use appliances and retrofitting landscapes for low water use. New residential and commercial developments also must use low water landscapes use or xeriscaping in some communities.



*Average monthly water use in Prescott, AZ from 2012-2016
(City of Prescott 2016).*

Landscape Restoration for Aquifer Recharge. Large-scale restoration efforts are planned in northern Yavapai County throughout the Big Chino sub basin and Prescott AMA to improve recharge near the headwaters of the Verde River. The Upper Verde River Watershed Protection Coalition is an intergovernmental partnership composed of representatives from the City of Prescott, Towns of Prescott Valley and Chino Valley, Yavapai County and the Yavapai-Prescott Indian Tribe. The Coalition's Watershed Restoration and Management Project Plan includes detailed information on projects that aim to enhance recharge while mitigating the risk of wildfires, improving water quality, and restoring riparian and wildlife habitat.

Cooperative Watershed Stewardship. The Verde River Watershed is home to multiple organizations forging collaborative community partnerships to restore riparian habitat and sustain river flows. Planning and policy tools like the Verde Watershed Report Card, provide information on the health of the watershed based on a range of environmental and community vitality indicators like water conservation measures, habitat quality, housing affordability, unemployment, recreation, and others.

Water Use Offset. Innovative partnerships between businesses, local decision makers, residents, and conservation organizations seek to balance water use throughout the Verde River Watershed. The Verde River Exchange is a voluntary water offset program that allows groundwater users to lower their water footprint by purchasing credits made available when other users voluntarily reduce their water use. SRP operates a similar program, offering historic water rights from two properties purchased along the Verde River to existing water users to balance water use in the Verde Valley.

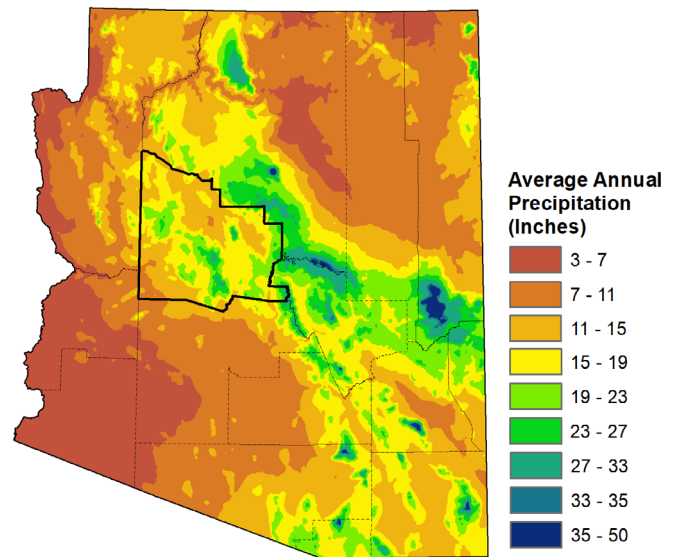
Water conservation awareness and improvements in water delivery have increased local water efficiency in Cottonwood and Clarkdale. Addressing system leaks and replacing old piping has led to an over 30% decrease in water losses for both communities.

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

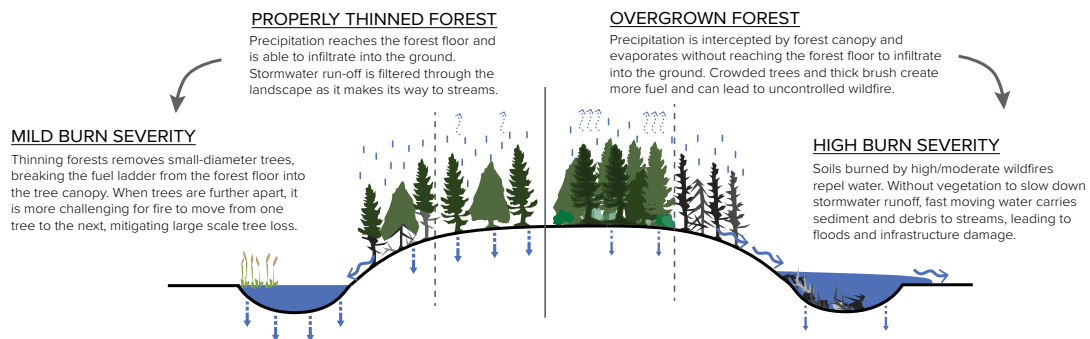
The state of Arizona has been experiencing drought conditions for over 20 years. A hotter and drier future means increased pressure on competing demands for county water resources. Drought and climate change pose significant risks to Yavapai County, including:

- Unpredictable weather patterns and more severe storms and flooding.
- Little forage available for local wildlife, stressed vegetation, increased fire risk, and nearly dry stock ponds and creeks.
- Declining water tables and long-term effects on groundwater supply and water flow between surface bodies of water such as streams, lakes, and rivers.

Forest Management. Healthy forests are integral to maintaining healthy watersheds. Each component of a forest, from the tree canopy to the soil, serves a function in the storage and filtration of the water that passes through it. Historically, small fires were a natural part of the ecosystem in Arizona's forests, removing excess vegetation and improving soil conditions. Modern forest management policies have suppressed fire to the degree that large portions of the state's forests are now at risk for catastrophic fires, putting the state's physical beauty, economic vitality, and water supplies at risk.



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



Forest management impacts within a watershed (WRRRC 2023).

Growing Population. In Yavapai County, the projected population growth rate is double the national average. Integrated land and water management can help communities mitigate and plan for increasing temperatures and changing precipitation patterns by directing growth patterns and water use in a coordinated and sustainable way. Continued monitoring of local water supplies is essential to support the ongoing growth within the county and central Arizona.

Watershed Planning. Coordinated and careful management of local watersheds is important for continued year-round flow of the Verde River and its tributaries. These waters are crucial for supporting the county's population, agricultural economy, and rural/suburban lifestyle while supporting rich riparian ecosystems.

Over the past decade, federal agencies, NGOs, and farmers have collaborated in the Verde Valley to protect flows in the Verde River, West Clear Creek, and Oak Creek. Programs are in place that support farmers in adopting practices that reduce the amount of water diverted from rivers while also improving crop quality.

Additional Resources

The WRRC has compiled and periodically updates a list of additional resources related to water in Arizona. These resources range from statewide information from ADWR to information available from local watershed groups and non-profits. Visit the **WRRC website** to see the complete list. The resources used for this factsheet are provided 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 by planning area, 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.
- **Assured and Adequate Water Supply Programs:** Overview of AWS programs as part of the 1980 Groundwater Management Act.
- **Arizona Groundwater Code:** Information on regulations and allocations of Colorado River Water from ADWR.
- **AZ Commerce Authority Population Estimates:** Projections of state and county populations.
- **Cooperative Extension Save Water:** 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:** Groundwater and aquifer basics and in-depth publications 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

- **Active Management Areas (AMAs):** Groundwater regulation in Arizona and the management of AMAs.
- **Audubon Arizona:** Quantified 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.
- **Central Arizona Project (CAP):** Background information on the Central Arizona Project.
- **Friends of the Verde River - Watershed Report Card:** Interactive report that assess the health of water, habitat, and communities within the Verde watershed.
- **SRP Watershed Management:** SRP's efforts to protect watersheds from degradation, including wildfires.
- **Subflow Delineation Report for Verde River:** Information about the adjudication process involving the Verde River and its tributaries from ADWR.
- **The Nature Conservancy (TNC):** Information on TNC's cooperative conservation efforts in the Verde Valley.

County Specific Water Resources

- **Arizona County Agricultural Economy Profiles:** County profiles highlighting agricultural production, water use, and regional economic data from UA Cooperative Extension.
- **Upper Verde River Watershed Protection Coalition:** An intergovernmental partnership managing large-scale watershed restoration and management efforts in the Upper Verde Watershed.
- **Yavapai County Comprehensive Plan:** Includes the vision, goals and policy ideals identified for future development within the county.

TRIF Initiative

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GREATER DEPTH, BROADER PERSPECTIVE FOR A CLEAR WATER FUTURE

We tackle key water policy and management issues, empower informed decision-making, and enrich understanding through engagement, education, and applied research.