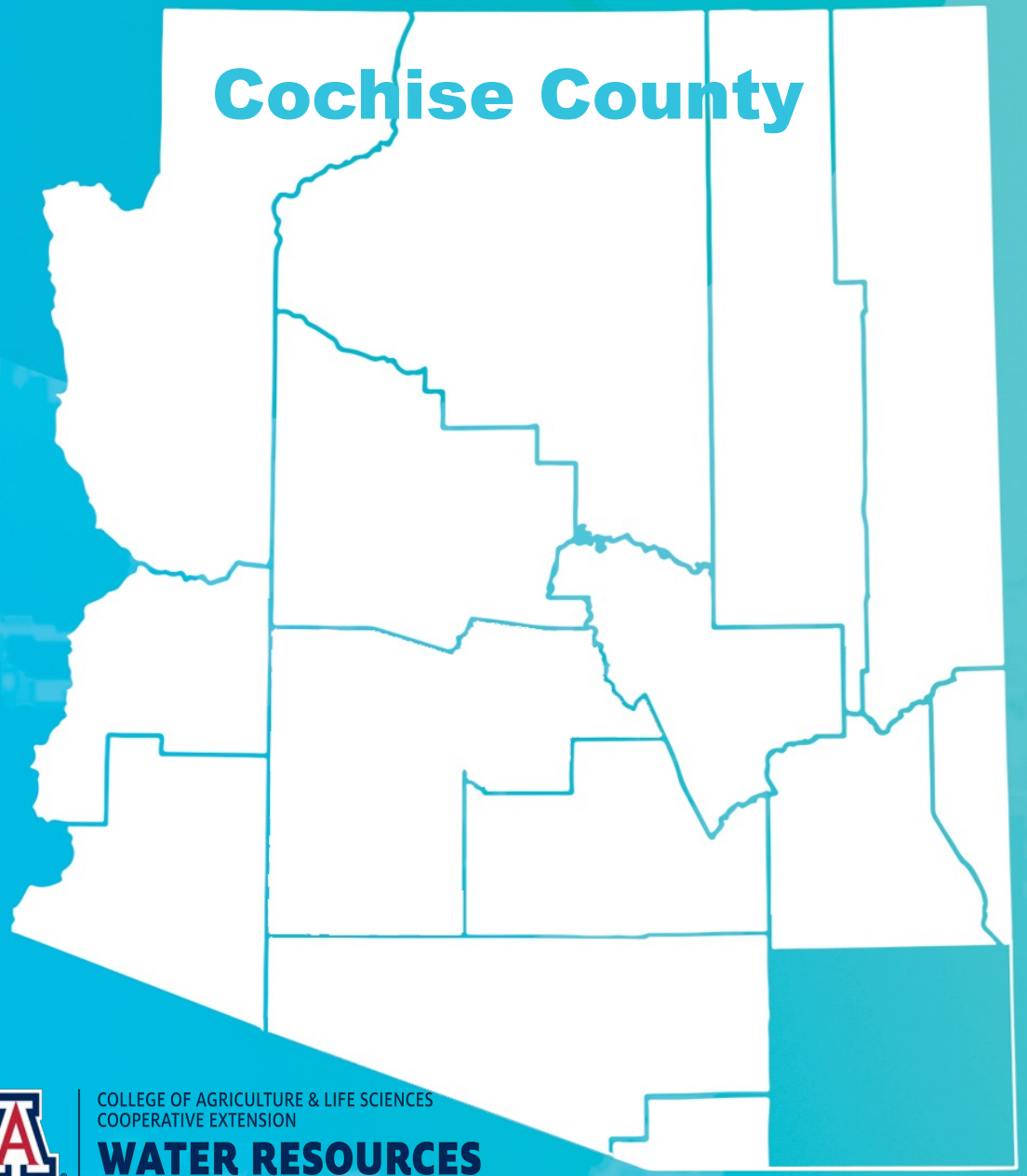


ARIZONA WATER FACTSHEET

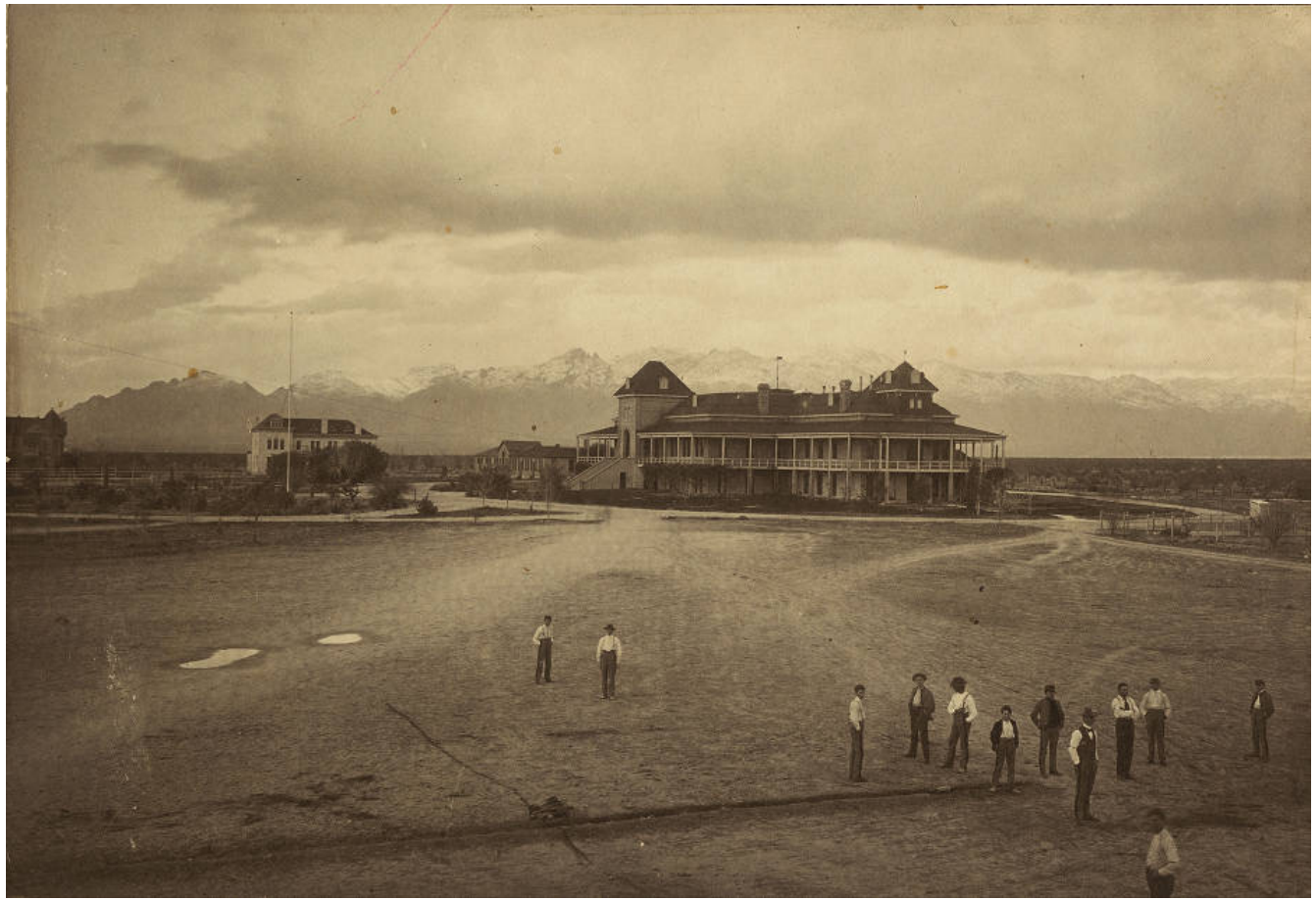
Mark Apel, MaryAnn Capehart, Taylor Simmons

WRRC Seminar Series

March 16, 2023

COLLEGE OF AGRICULTURE & LIFE SCIENCES
COOPERATIVE EXTENSION
WATER RESOURCES
RESEARCH CENTER

Development of the Arizona County Factsheets



Old Main, University of Arizona, 1902
Courtesy of UArizona Special Collections.

The WRRC is a unit of the University of Arizona Cooperative Extension System

Bridging the research and educational outreach of the university with the needs of our communities.

Untangling Water Information, County by County

Data Sources → 100s of water topics → Scale? Units? → Stakeholder Input!

ADEQ Arizona Department of Environmental Quality

USGS science for a changing world

PRISM GROUP

Water use in Cochise County (USGS 2015).

County and AMA boundaries (WRRC 2021).

COUNTY OF COCHISE 1881 ARIZONA

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

ARIZONA DEPARTMENT OF WATER RESOURCES EST. 1980

Sources for Cochise County's water (USGS 2015).

Water Wise

Agriculture, recharge, and subsidence in Cochise County (ADWR, USDA 2022).

County and AMA boundaries (WRRC 2021).

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

Impaired streams and Superfund sites in Cochise County (ADEQ 2022).

Cooperative Extension Cochise County

USDA

COLLEGE OF AGRICULTURE & LIFE SCIENCES
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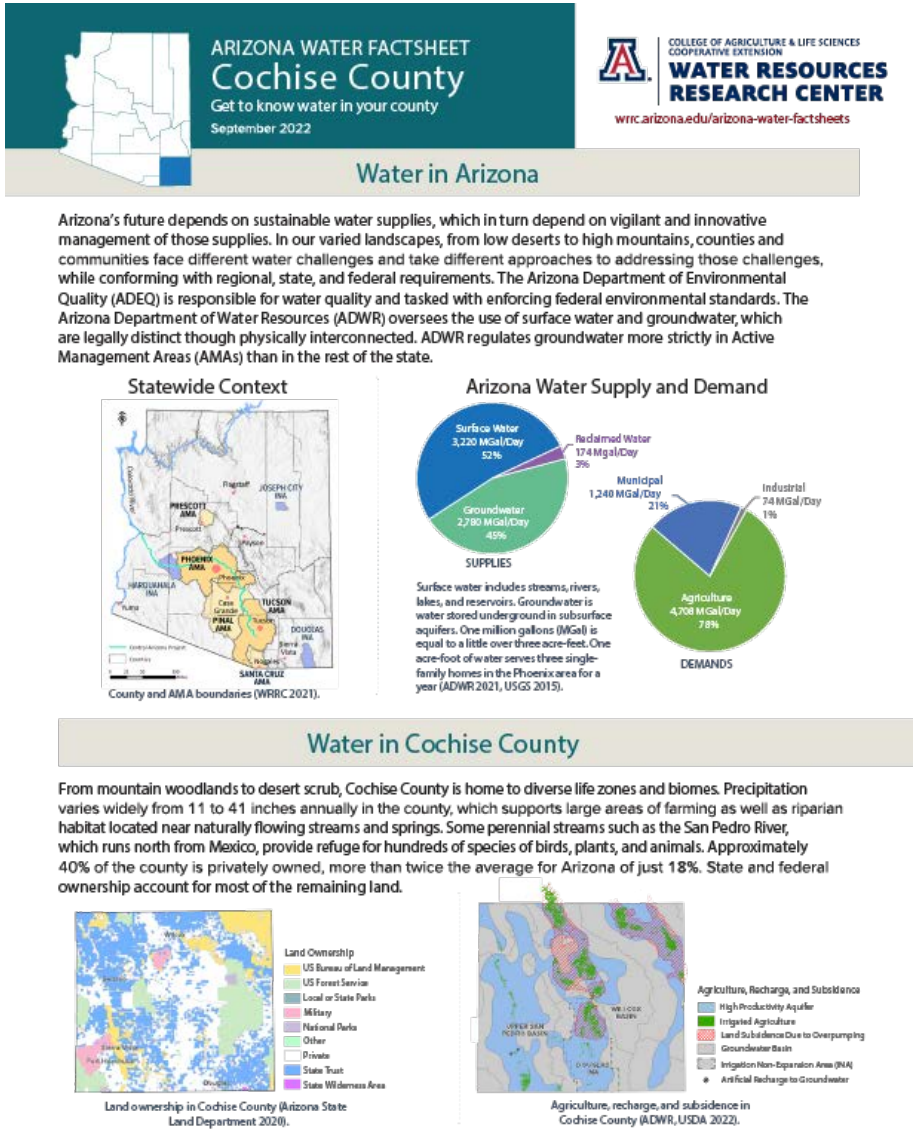
Covering Water Topics from A to Z

- Statewide Context
- Water Sources
- Water Use
- Water Quantity
- Water Quality
- Sustainable Management
- Future of Cochise Water



ARIZONA WATER FACTSHEET
Cochise County
Get to know water in your county
September 2022

COLLEGE OF AGRICULTURE & LIFE SCIENCES 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. In our varied landscapes, 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. ADWR regulates groundwater more strictly in Active Management Areas (AMAs) than in the rest of the state.

Statewide Context

County and AMA boundaries (WRRC 2021).

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. One acre-foot of water serves three single-family homes in the Phoenix area for a year (ADWR 2021, USGS 2015).

Water in Cochise County

From mountain woodlands to desert scrub, Cochise County is home to diverse life zones and biomes. Precipitation varies widely from 11 to 41 inches annually in the county, which supports large areas of farming as well as riparian habitat located near naturally flowing streams and springs. Some perennial streams such as the San Pedro River, which runs north from Mexico, provide refuge for hundreds of species of birds, plants, and animals. Approximately 40% of the county is privately owned, more than twice the average for Arizona of just 18%. State and federal ownership account for most of the remaining land.

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

Agriculture, recharge, and subsidence in Cochise County (ADWR, USDA 2022).

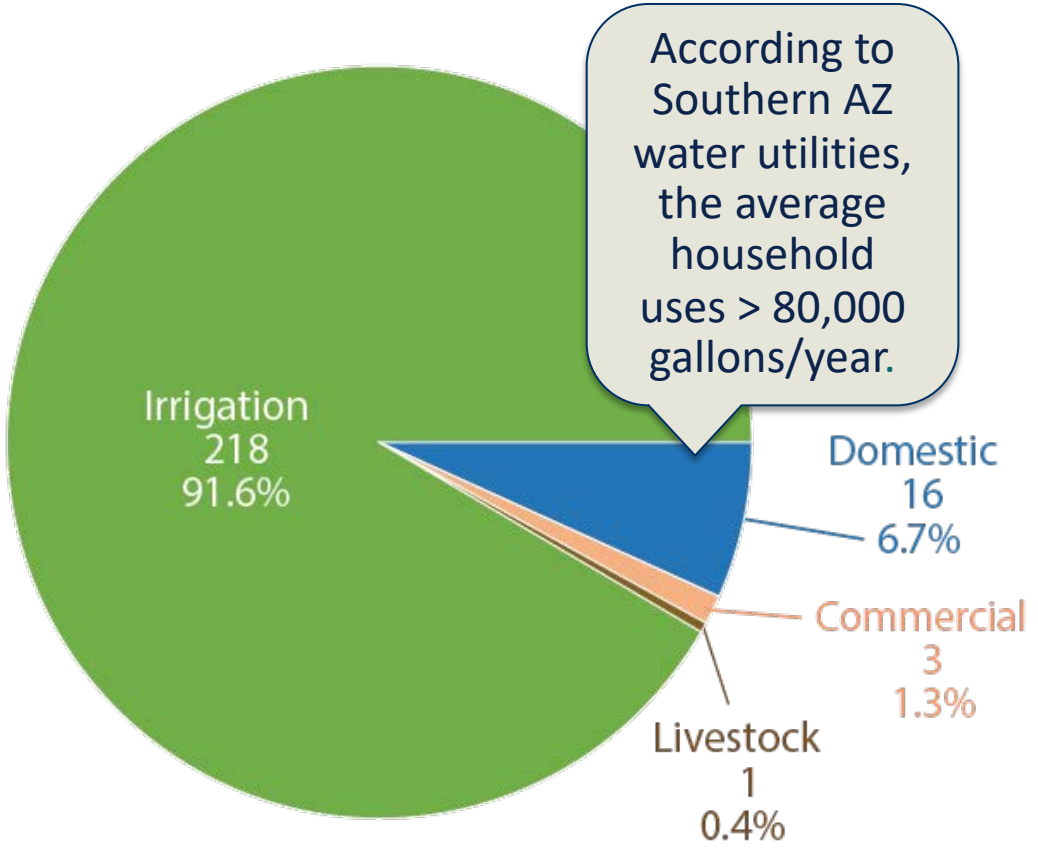
Water Use and Patterns

Competing Water Demands

- Domestic
- Businesses
- Agriculture
- Industry
- Natural Features

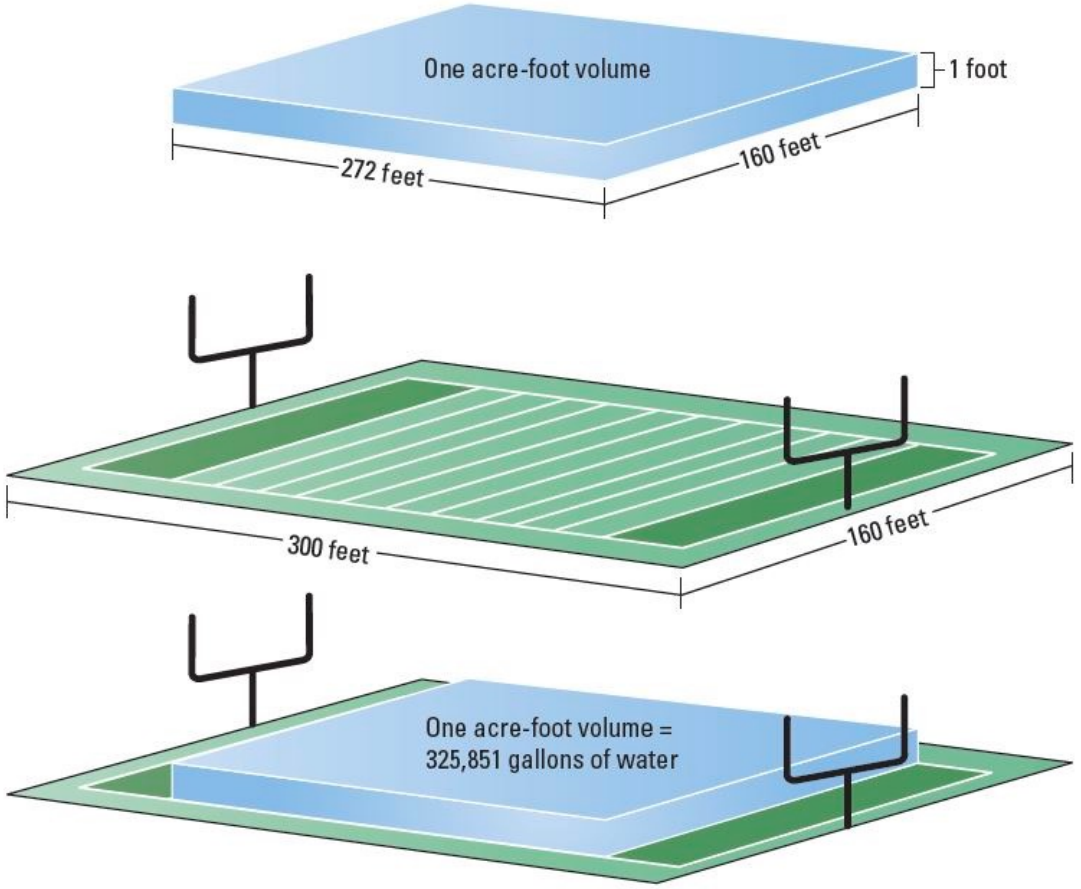
Water Use Patterns: 1991-2014

- Willcox Basin- increase from 133k AF to 180k AF/year
- Douglas Basin- increase from 37k AF to 50k AF/year (despite INA)



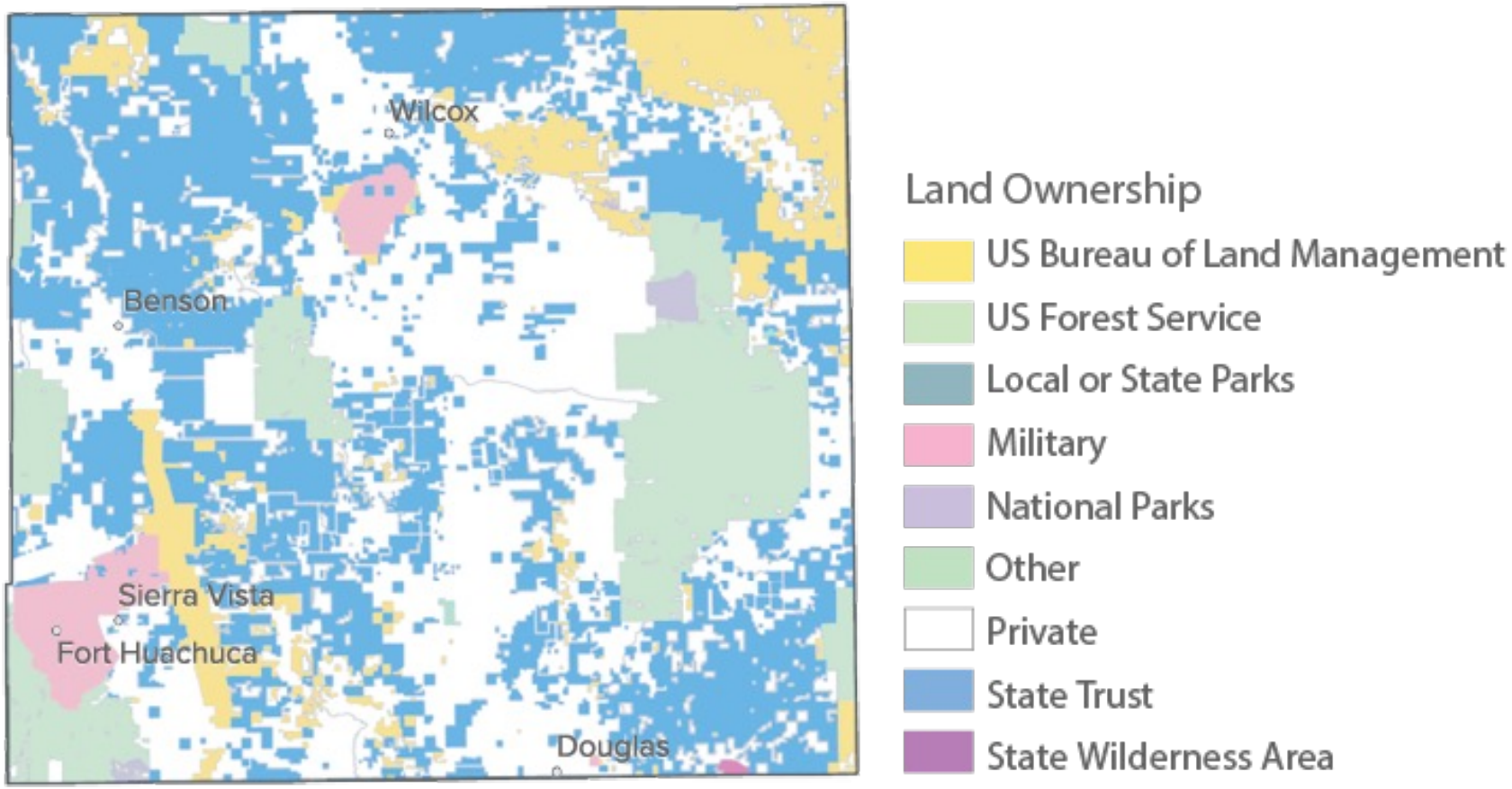
Water use (Million Gallons/Day) in Cochise County (USGS 2015).

Acre-Foot Context



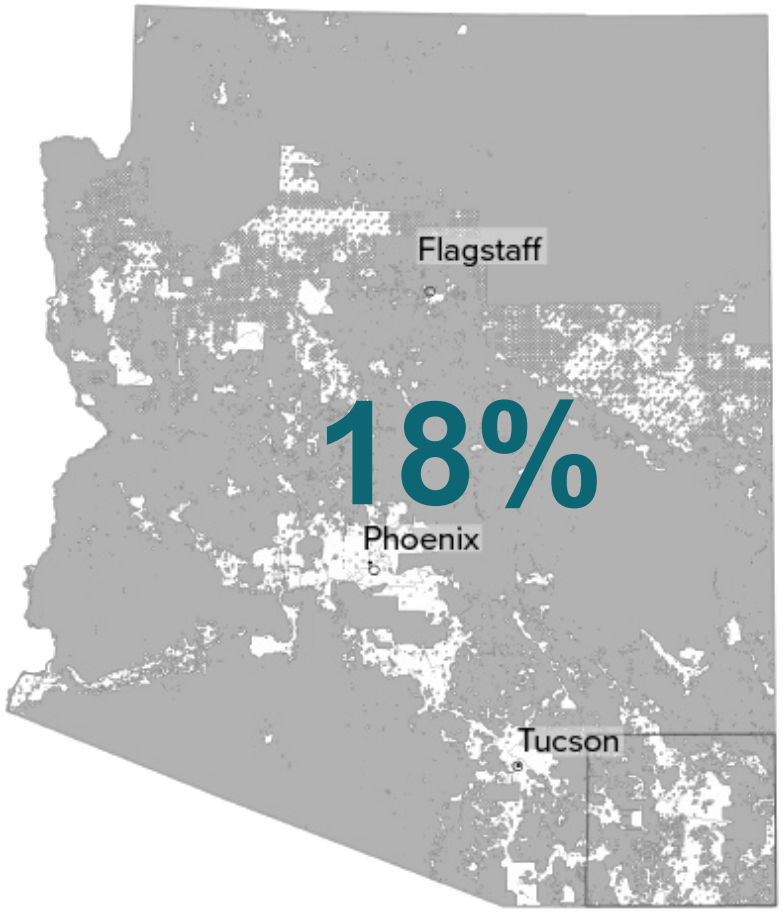
One acre foot is equal to about one football field covered in a foot of water (USGS 2020).

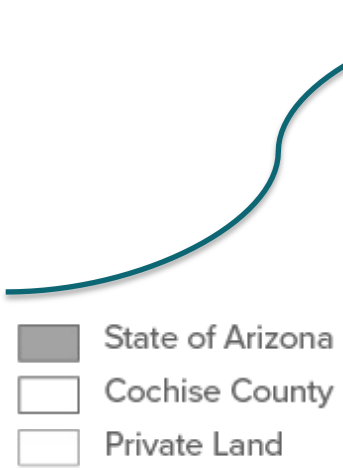
Land Ownership and Management



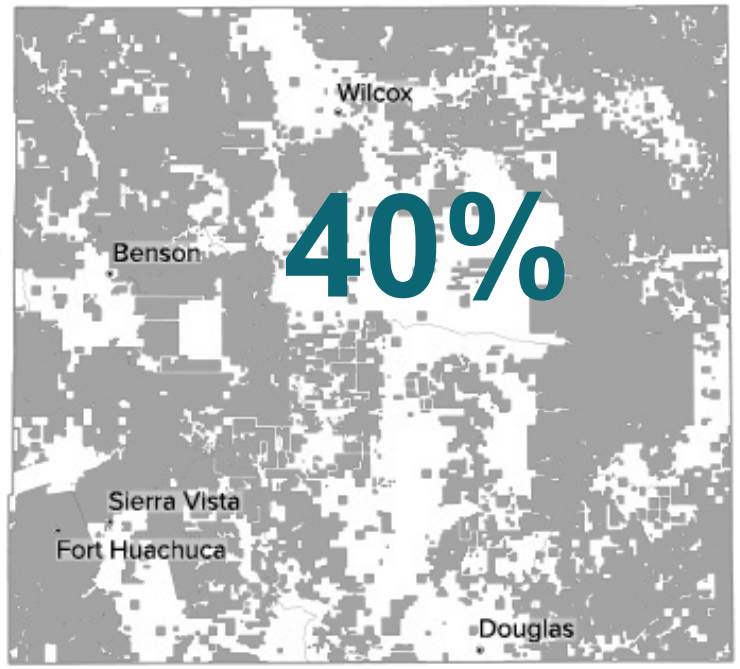
Land ownership in Cochise County (Arizona State Land Department 2020).

Land Ownership Influences Water Use





Private land in Arizona (Arizona State Land Department 2020).



Private land in Cochise County (Arizona State Land Department 2020).

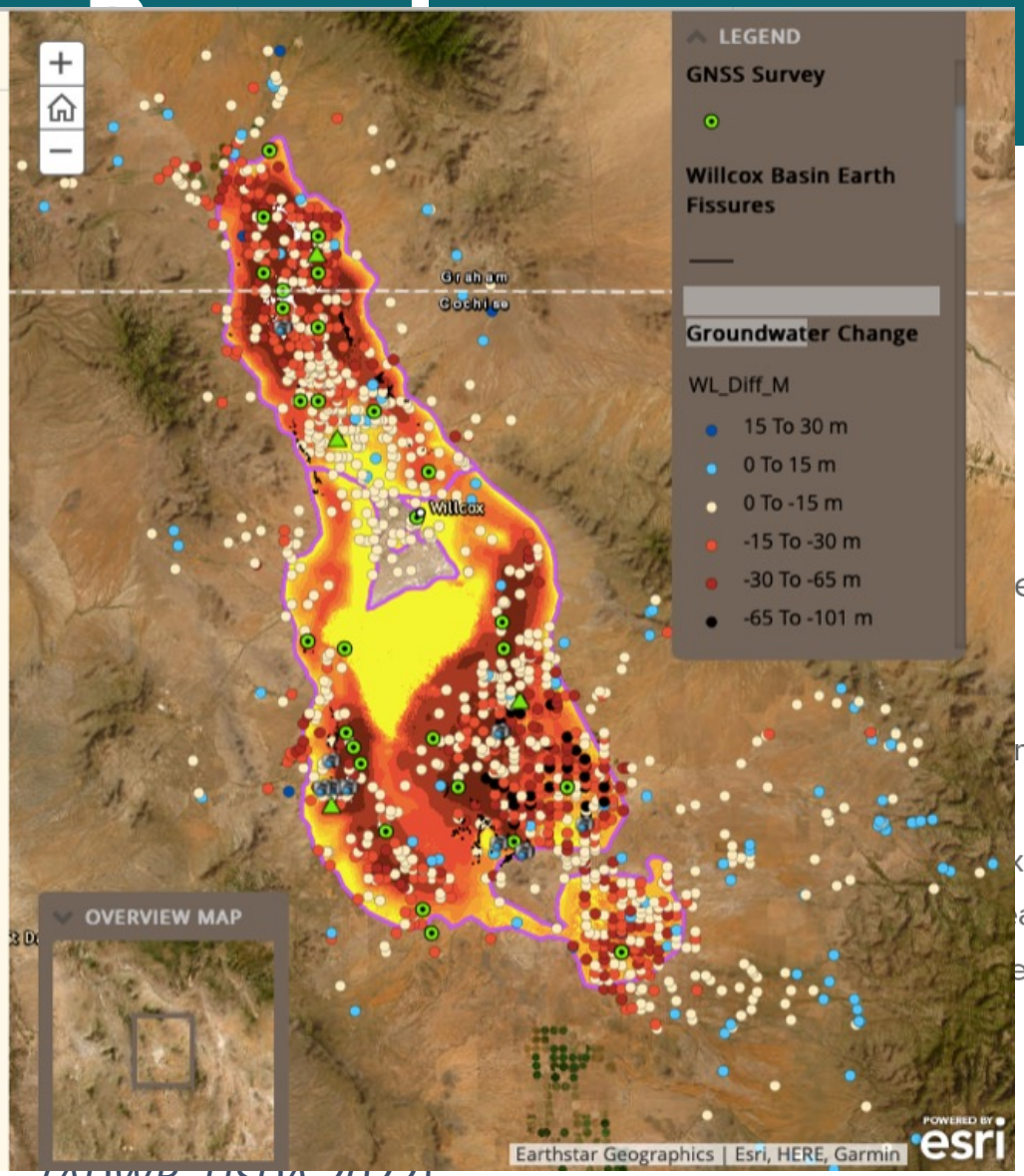
AZ Dept of Water Resources

reenshot

Land Subsidence in the Willcox Basin

The Willcox Groundwater Basin has the highest land subsidence rate in Arizona. Due to groundwater pumping far exceeding the natural mountain front recharge, groundwater levels will likely continue to decline, resulting in continued land subsidence. There are no external sources of surface water currently available or planned for the Willcox basin that could supplement groundwater use and slow the declining groundwater levels. It is estimated that current groundwater production exceeds recharge by a factor of three to eight in the Willcox Basin.
More information on land subsidence please visit: ADWR Hydrology

What is land subsidence



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mping

xpansion Area (INA)

a (AMA)

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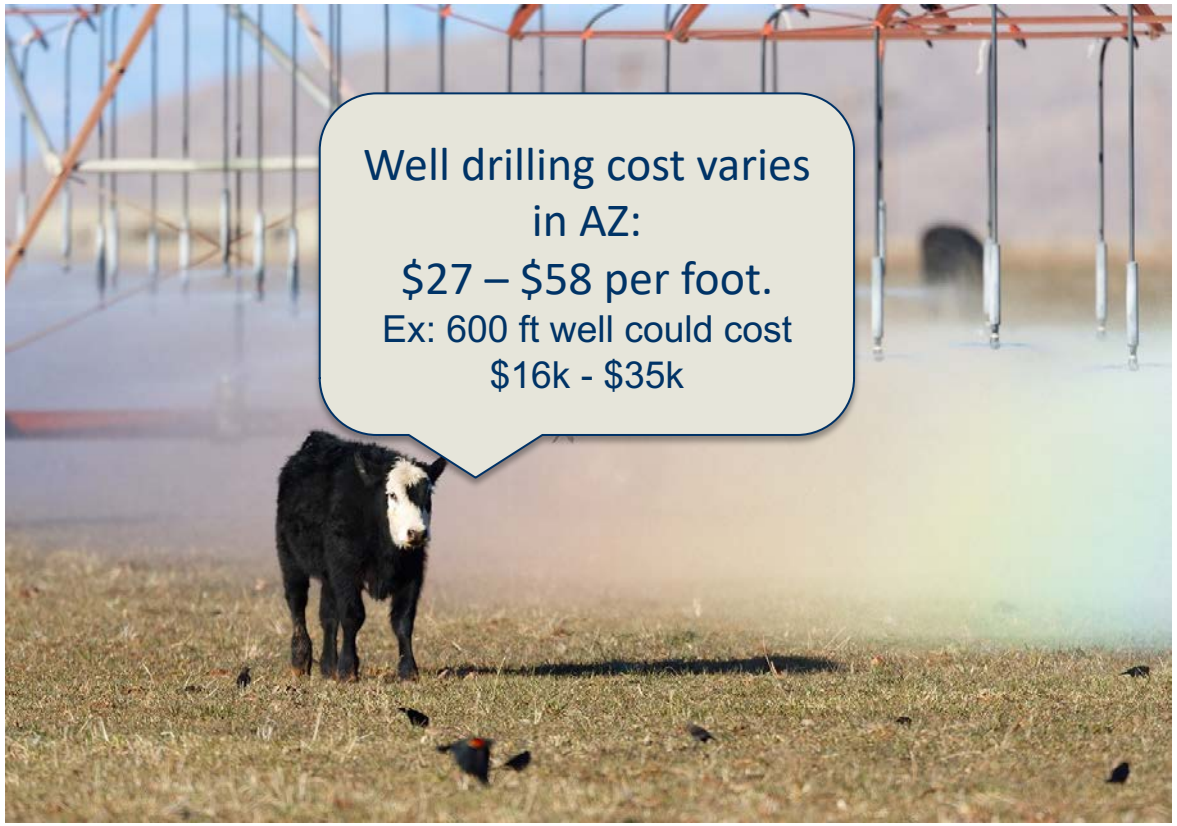
Sources f

(USGS 2015).

(ADWR, USDA 2022).

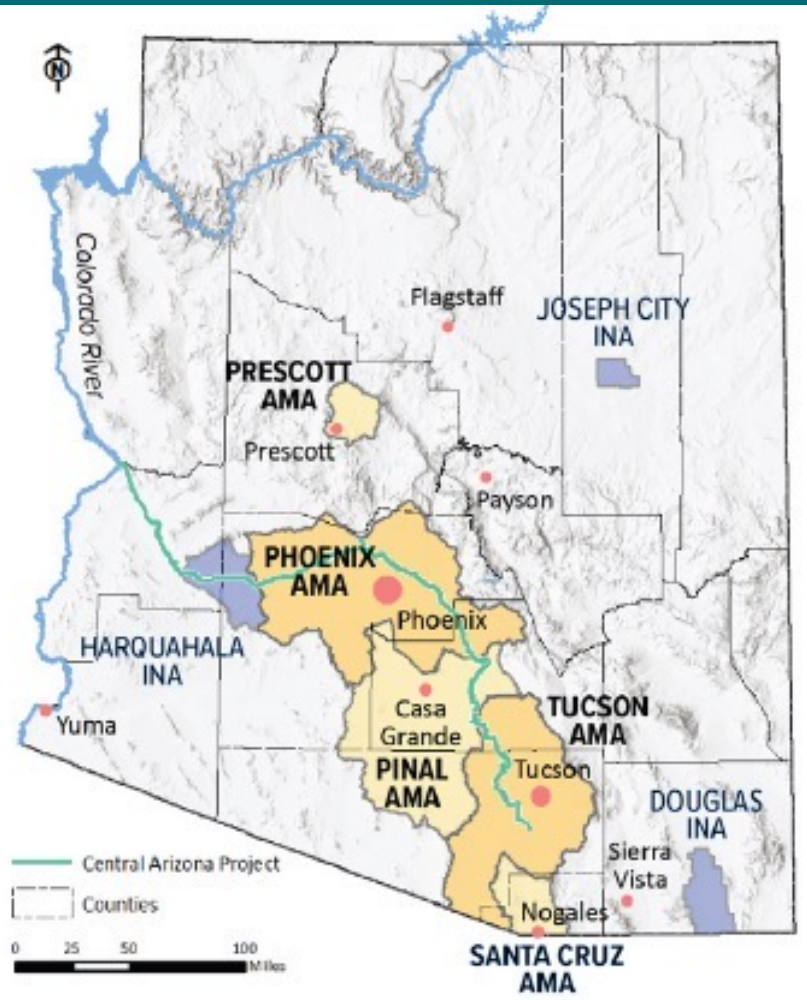
Groundwater Quantity Challenges

- Groundwater Overdraft
  - Land Subsidence
  - Deepening of Wells
    - Irrigation may become too expensive for some farmers



David Quanrud: Chasing a rainbow 2010 Sulphur Springs Valley AZ (2021 WRRC Photo Submission).

Douglas Basin: Groundwater Regulation Before Dec. 2022



County and AMA boundaries (WRRC 2021).

Douglas INA

- Limited irrigatable land
- Nonexempt annual well reporting
- “Intent to Drill” notice

Reasonable Use Doctrine

- Beneficial use
- Ex: drinking water, gardening, watering livestock

Mandatory Adequacy Jurisdiction

- In 2007, Cochise County elected
- Requires developers to prove water adequacy as determined by the ADWR

Strained Water Budget Despite Regulation

Overview of Factors

- Megadrought
- Expansion of corporations
- Competing water demands
- Groundwater overdraft
- Recorded anecdotes of drying wells
- Land subsidence
- Loss of ecosystems
- Strained economies

Groundwater Management Act- Statute § 45-415

- Allows designation of an active management area on petition by ten percent of the registered voters residing within boundaries of the proposed AMA. The Board of Supervisors or Cochise County called for an election to designate Willcox and Douglas Basins into AMAs.

First Citizen-Initiated AMA

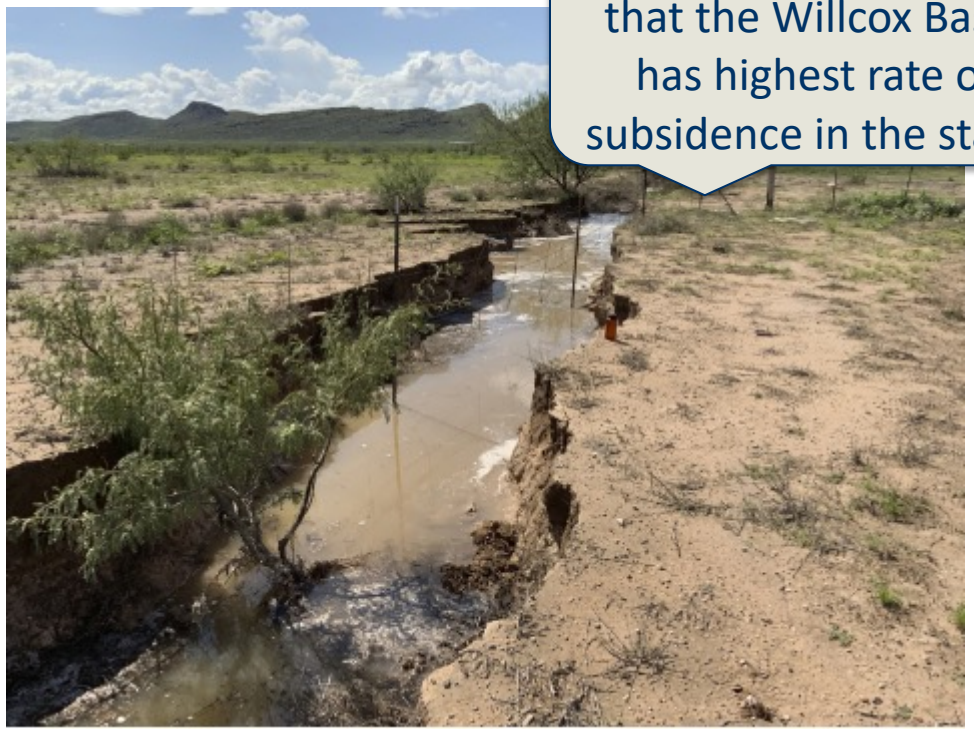


Image: Joseph Cook

Opposition and Defense

- Rural Water Assurance
- Arizona Water Defenders

Turn Out

- 6,400 registered voters in Willcox
- 13,460 registered voters in Douglas

Outcome

- Douglas INA → Douglas AMA

Douglas INA vs AMA

INA and AMA Similarities:

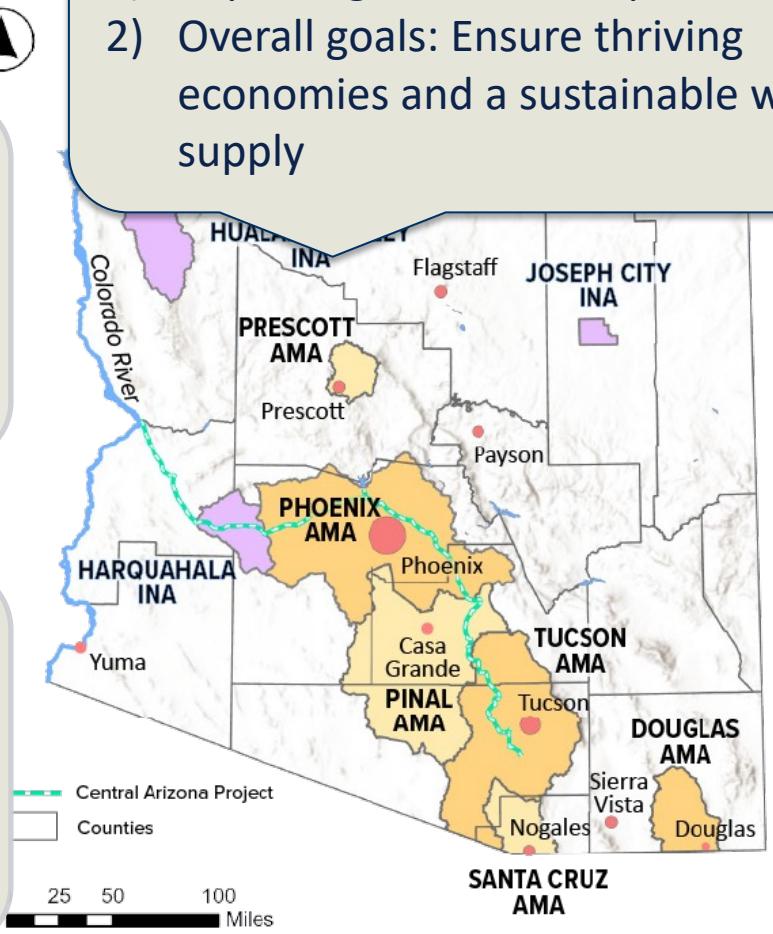
1) Reporting for nonexempt wells
2) Overall goals: Ensure thriving economies and a sustainable water supply

INA

- Prohibits groundwater expansion for new irrigation operations prior to 1980
- "Unlimited" withdraw if land is grandfathered

AMA

- ADWR closely monitors large-scale users
- Best Management Practices
- Conservation plans for agriculture, municipalities, and industries
- Assured Water Supply for developers
- AMA Management Goals
- Well spacing requirements



County and AMA boundaries (WRRC 2023).

Future of Douglas AMA

Eric Jewett- Cattle Cup
(2022 WRRC Photo Submission).

What we know

- AMA designation replaces INA.
- Irrigation can continue if lands were legally irrigated five years preceding election.
- Groundwater withdraw permits:
  - Individuals and entities with irrigation authority need to apply for a grandfathered right 15 months after the election.
  - Cities, towns, private water companies, and irrigation districts are required to obtain service area right to withdraw for delivery.

Future of Douglas AMA

Eric Jewett- Cattle Cup
(2022 WRRC Photo Submission).

What we know

- Nonexempt wells must measure groundwater withdraws with measuring device and method approved by ADWR.
- Under current statutes, there is no groundwater withdraw fee.
- There may be a water quality assurance fee for non-irrigation uses.
- Grandfathered rights application fees have been announced.
- ADWR director will appoint area director for the AMA, and the governor will appoint members for the groundwater users advisory council (GUAC) to inform management goals.
- Director of ADWR will propose AMA management goal no later than two years after designation.
- Public hearing on the proposed goal and management plan.
- The last AMA was the Santa Cruz (1994).

Douglas AMA Timeline

Douglas AMA designation December 1st, 2022

- AMA replaces INA.
- Threshold date for groundwater rights (5 years prior).
- Nonexempt wells must measure groundwater withdraws with measuring device and method approved by ADWR.

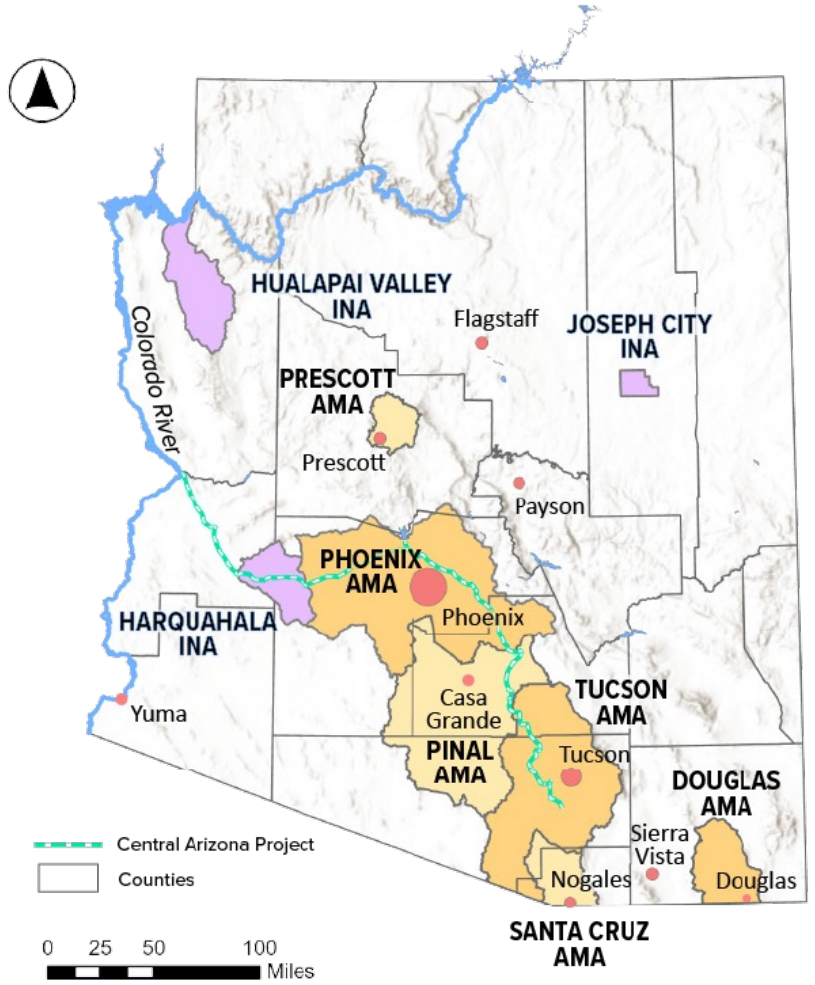
Groundwater Withdraw Permits (15 months)

- Individuals and entities with irrigation authority need to apply for a grandfathered right 15 months after the election.
- Cities, towns, private water companies, and irrigation districts are required to obtain service area right to withdraw for delivery.

AMA Management Goal (two years)

- ADWR director will appoint area director for the AMA.
- The governor will appoint five members for the groundwater users advisory council (GUAC) to inform management goals.
- Director of ADWR will propose AMA management goal no later than two years after designation.
- Public hearing on the proposed goal and management plan.

Stakeholder Involvement



County and AMA boundaries (WRRC 2023).

Get Involved!

- Five GUAC members are appointed for six-year terms to represent groundwater users in their respective AMA. They provide advice and recommendations to the AMA Director on groundwater management programs and policies within the AMA.
- The management plan goes up for public comment.
- Stakeholders can attend public hearings and initiate judicial review if needed.
- If groundwater withdraw fees do get approved, the fees are limited to a maximum of two dollars per acre-foot per year, and funding helps water users achieve efficient use, helping the AMA meet its water management goal.
- There is another source!!!

Questions?

James Bowman- Whitewater Draw (2021 WRRC Photo Submission).

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