

Groundwater 101

**SUSTAINING FLOWS COUNCIL EDUCATION SESSIONS
DECEMBER 11, 2023**

Jennifer Diffley, Culp & Kelly, LLP

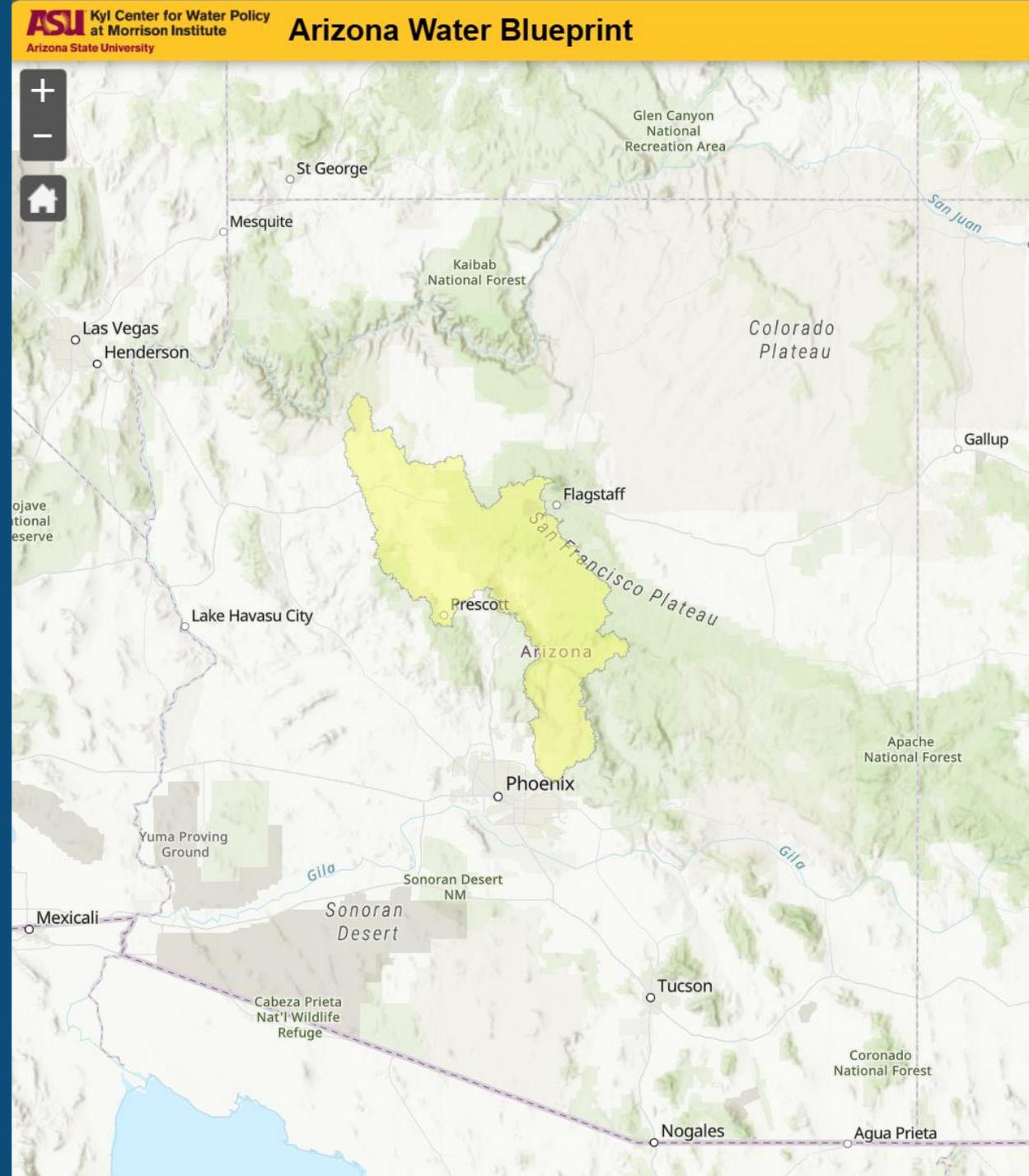
Overview

Basics of Hydrology

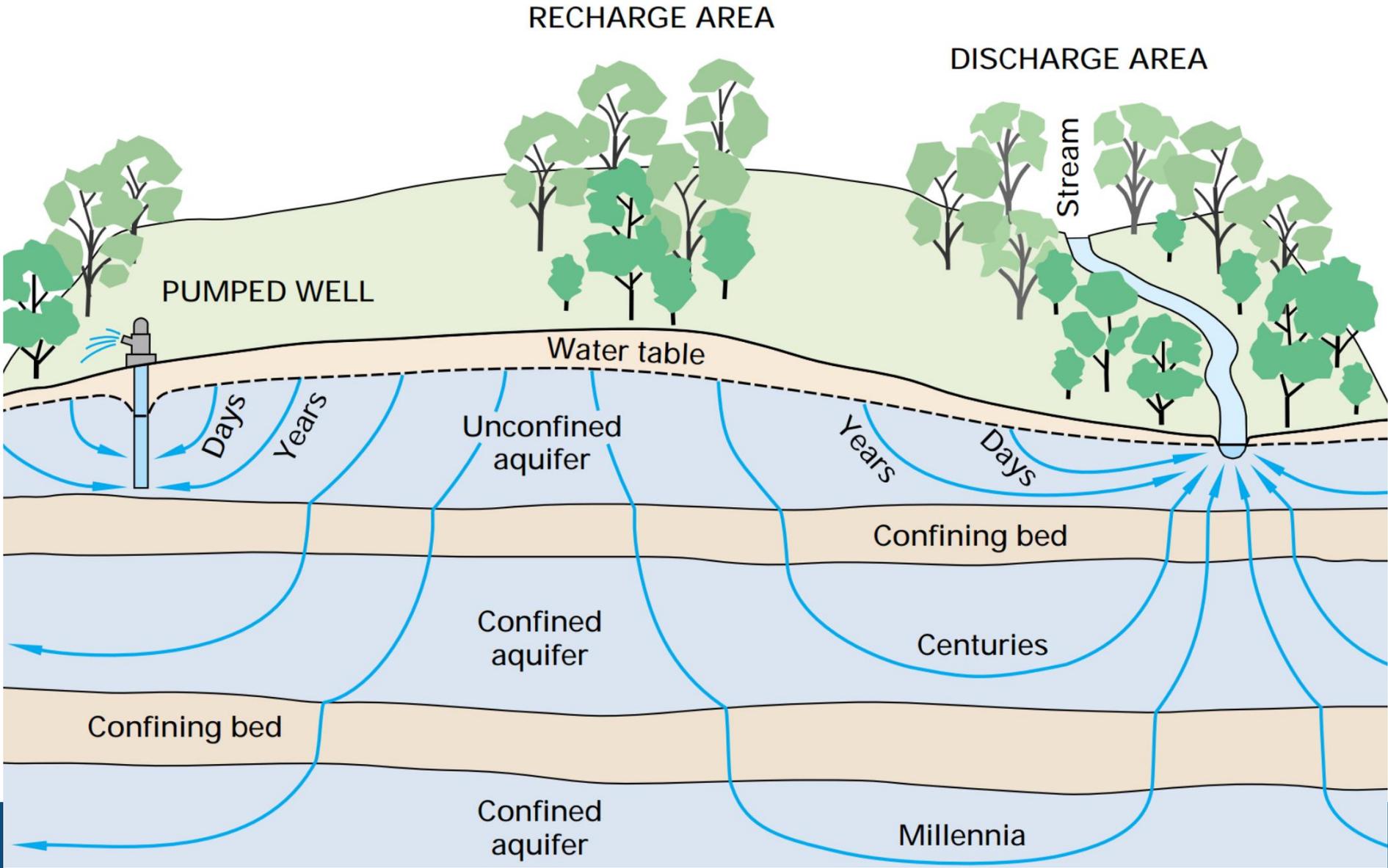
Arizona's Groundwater Laws

- Why Manage Groundwater?
- Arizona's Groundwater Management Act
 - Active Management Areas
 - Irrigation Non-Expansion Areas
 - Groundwater use outside AMAs and INAs
 - Long-Term Supplies for New Development: Assured & Adequate Water Supply Programs
- Additional Regulatory Considerations

Discussion & Questions



Basics of Hydrology



Source:
USGS

Potential recharge source areas in the upper and middle Verde River watersheds
(Source: USGS)

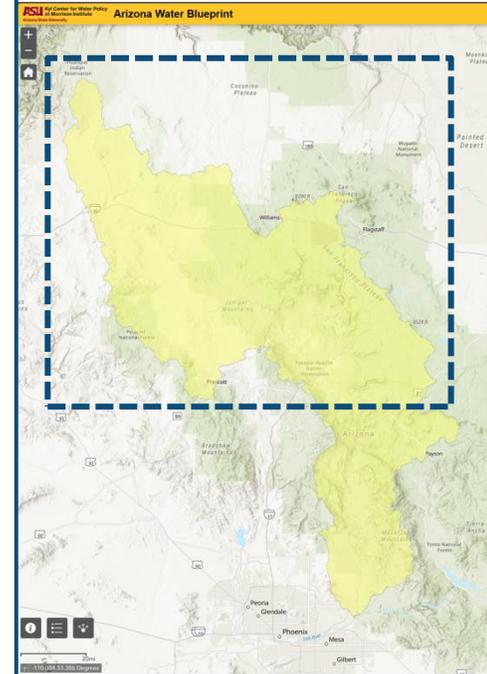


Base from U.S. Geological Survey digital data, 1:100,000, 1982 Universal Transverse Mercator projection, Zone 12

Geology modified from Reynolds, 1988

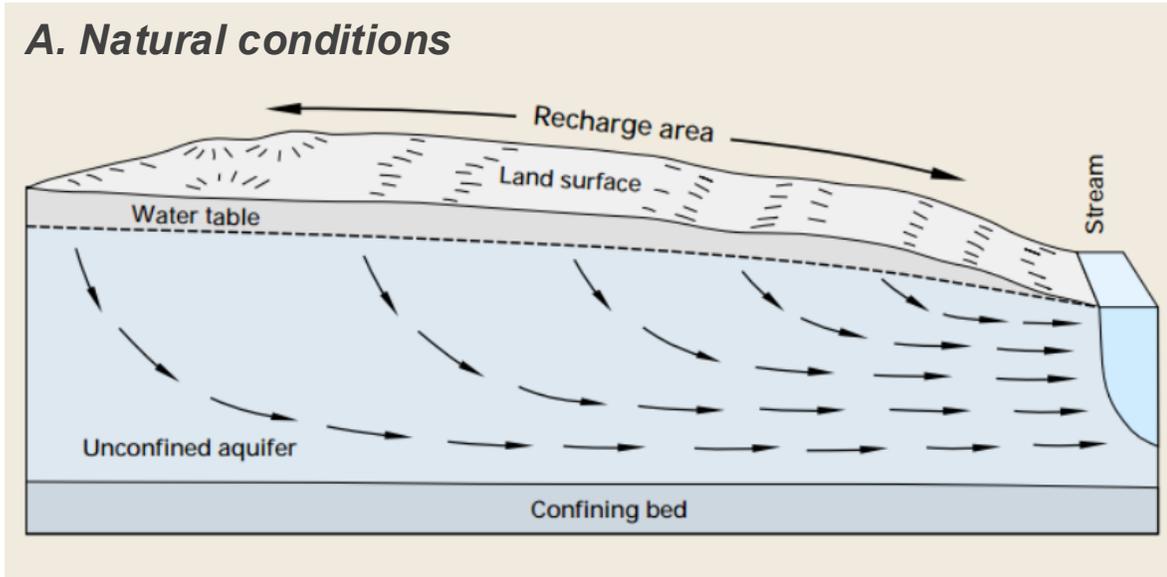
EXPLANATION

- | | | | |
|--|------------------|--|---|
| | ALLUVIUM | | RECHARGE-SOURCE AREA |
| | VERDE FORMATION | | POSSIBLE EXTENSION OF RECHARGE-SOURCE AREA BASED ON THE ADDITION OF ONE STANDARD DEVIATION TO THE AVERAGE ISOTOPE VALUE |
| | BASALTIC ROCK | | AREAS USED FOR GEOCHEMICAL MIXING MODEL AND RECHARGE ANALYSES |
| | PALEOZOIC UNITS | | |
| | PRECAMBRIAN ROCK | | |

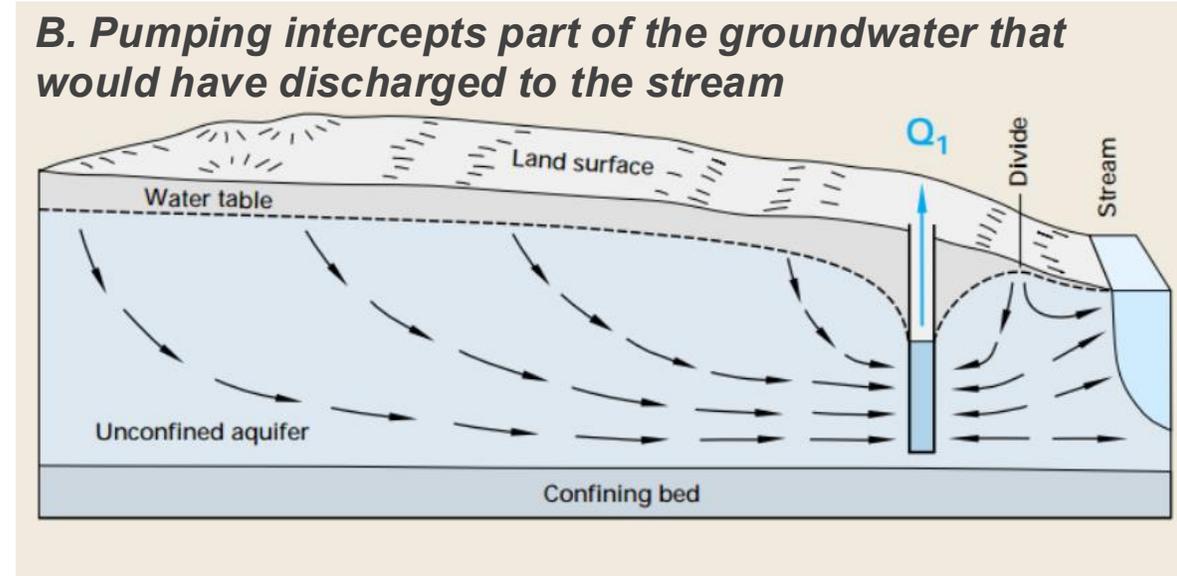


Effects of pumping from a simple unconfined aquifer (Source: USGS)

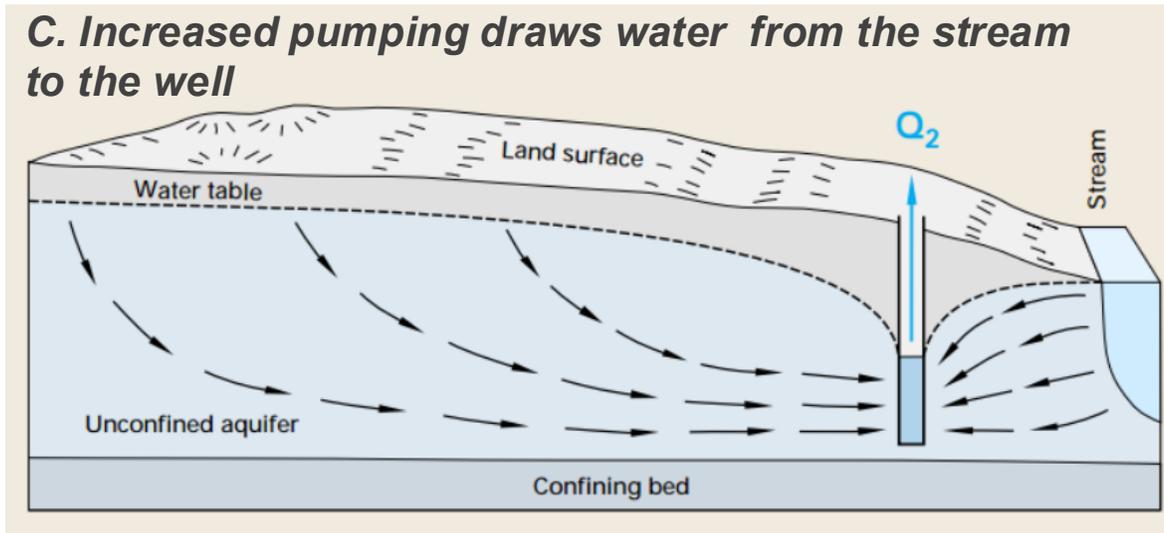
A. Natural conditions



B. Pumping intercepts part of the groundwater that would have discharged to the stream



C. Increased pumping draws water from the stream to the well

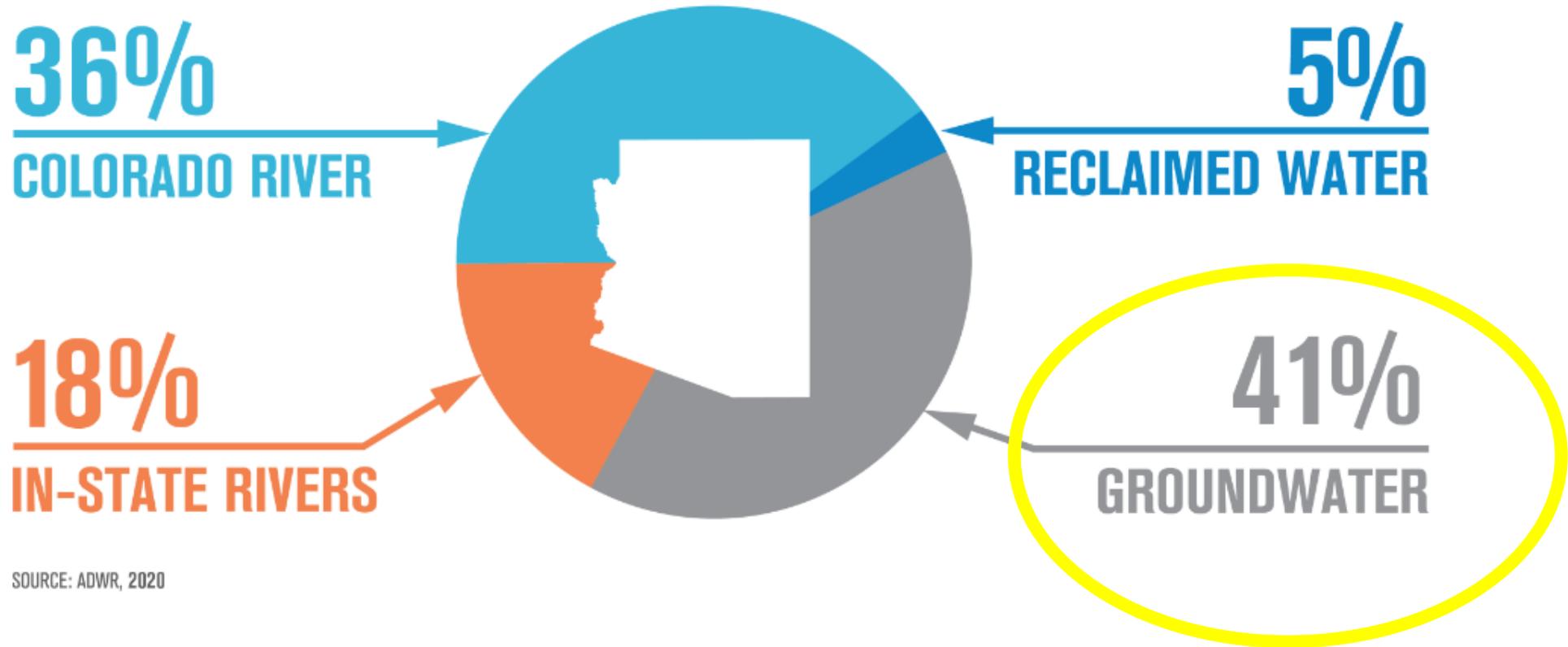


Arizona's Groundwater Laws



(Photos Source: ADWR)

ARIZONA'S WATER SUPPLY



SOURCE: ADWR, 2020



Wells drying up around Willcox, where an effort to change rules failed

In southeastern Arizona, farms are drilling wells up to 2,500 feet deep. Water levels are dropping and some homeowners are struggling with the costs.

MARK HENLE, THE REPUBLIC



Earth fissures and subsidence threatens people and livestock, damages homes, roads, dams, and canals, and reduces property values.



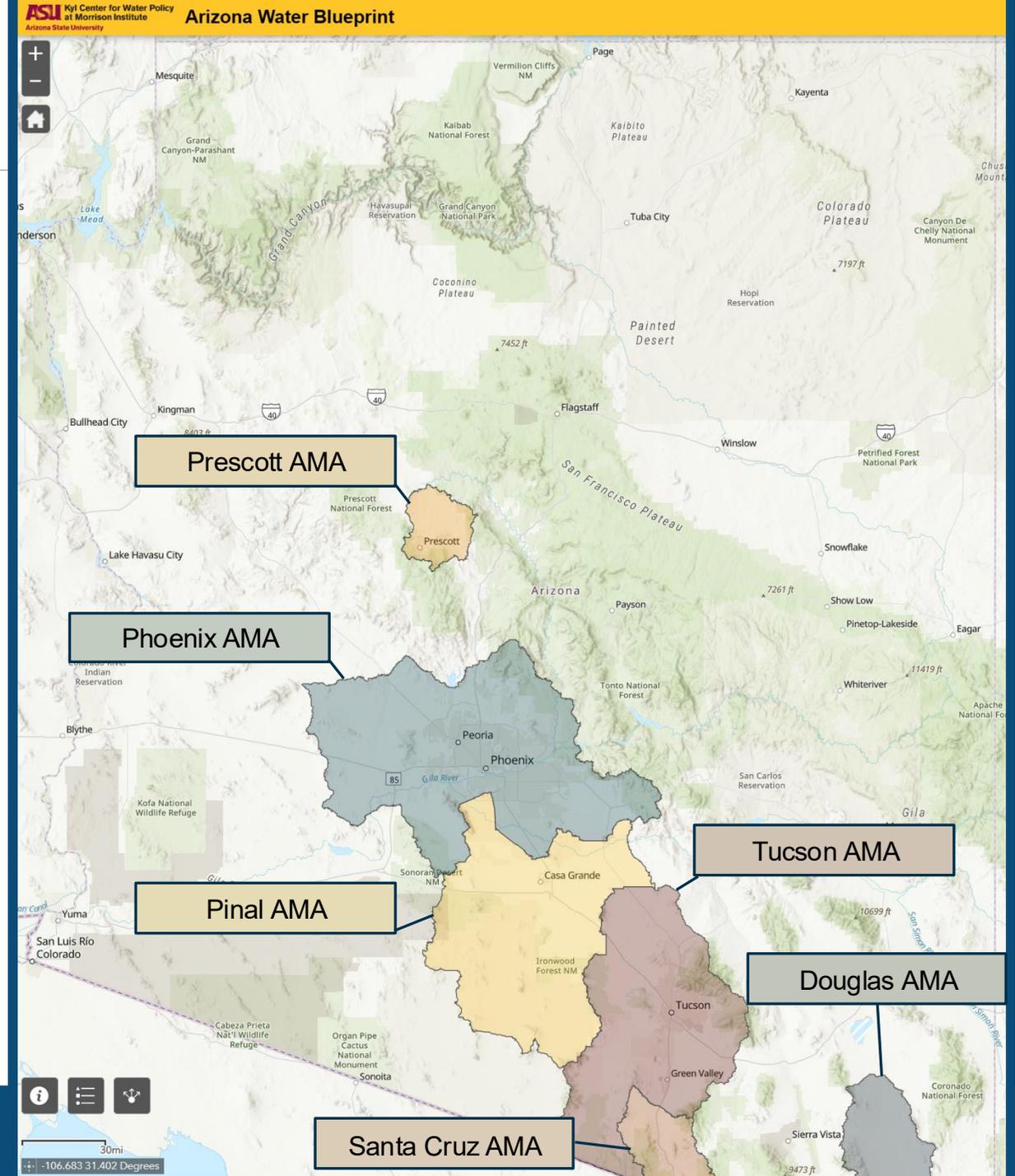
(Photo Source: Arizona Geological Survey)

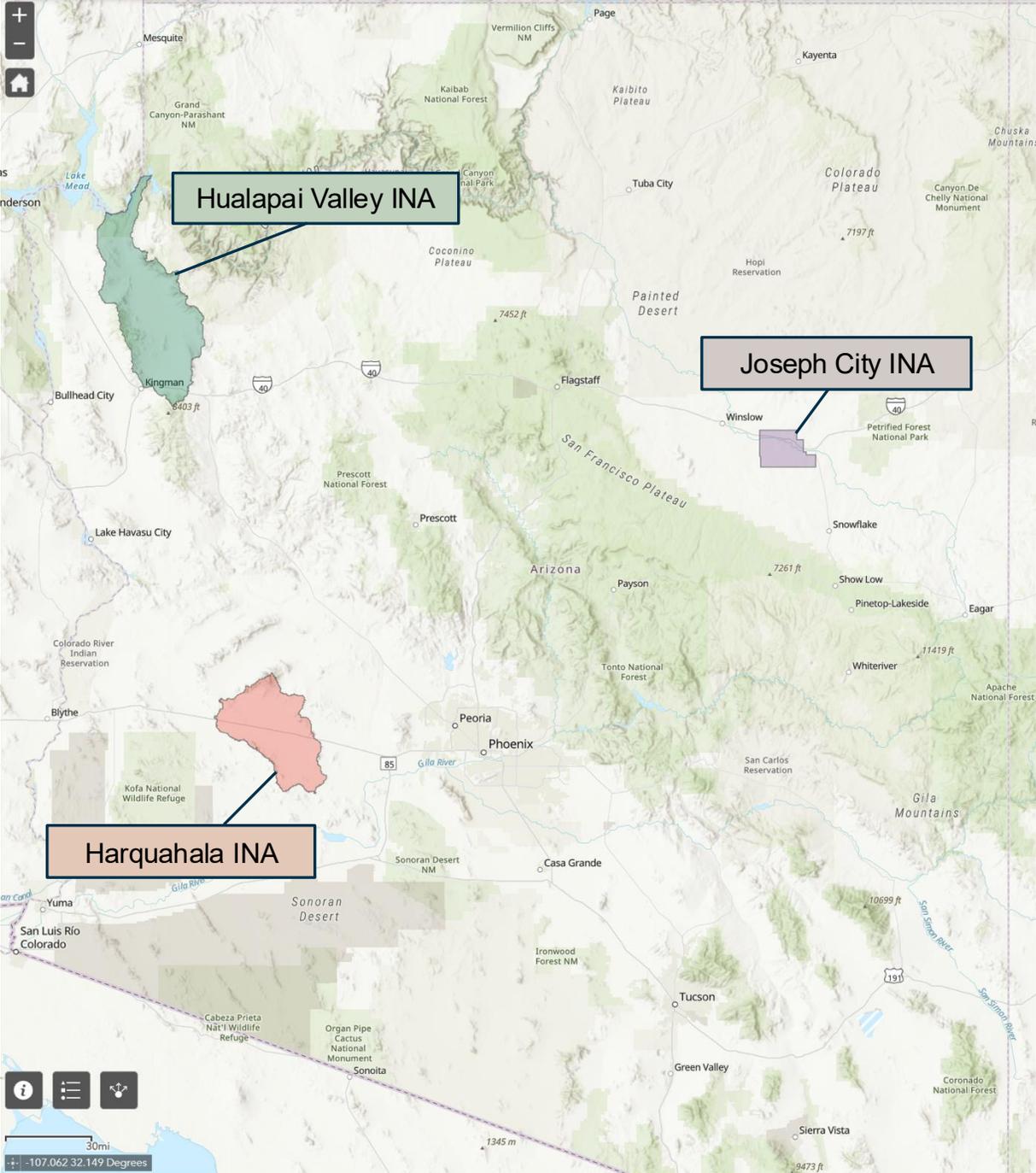
(Photo Source: AMWUA)

Groundwater Management Code



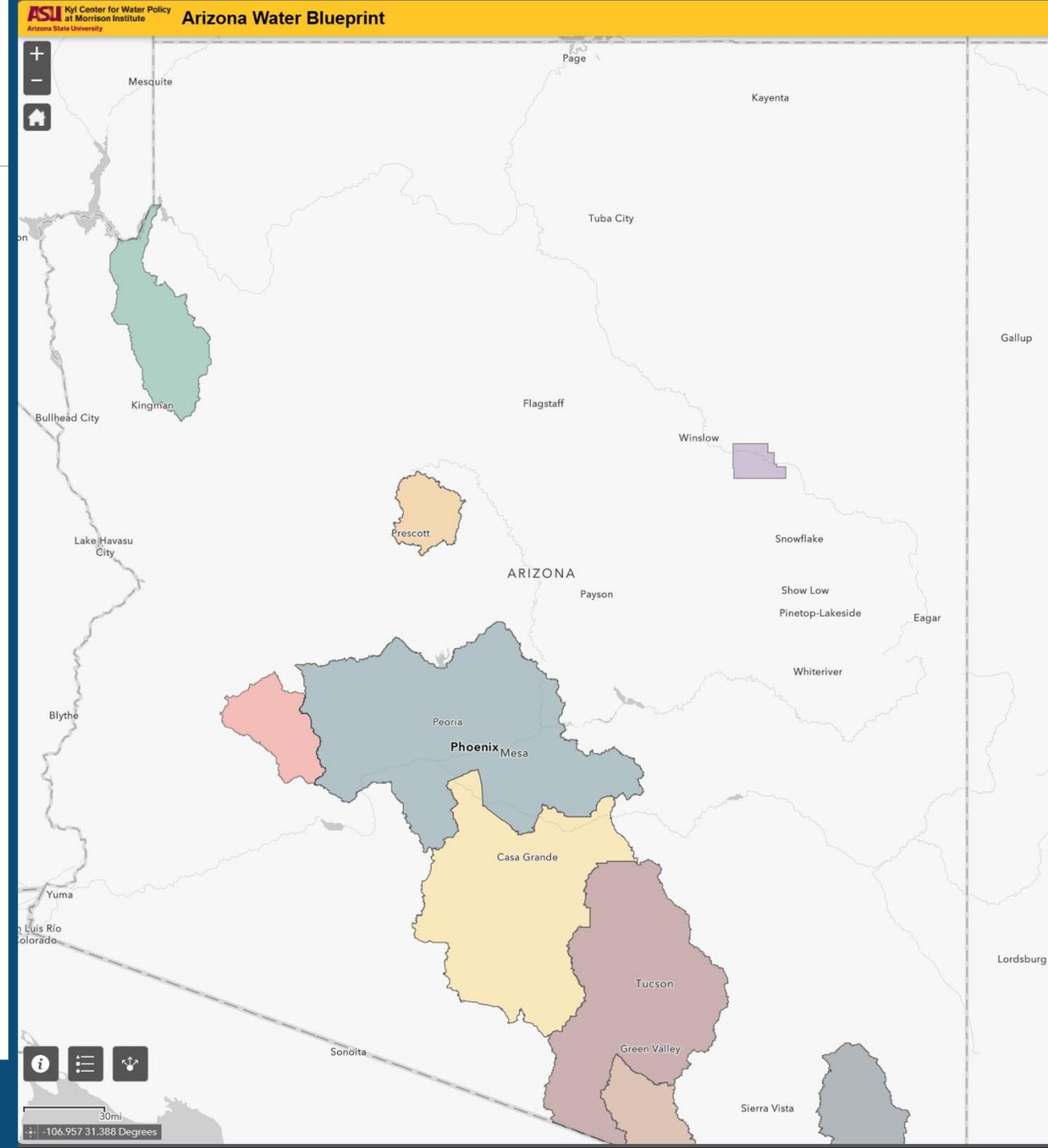
Active Management Areas





Irrigation Non-Expansion Areas

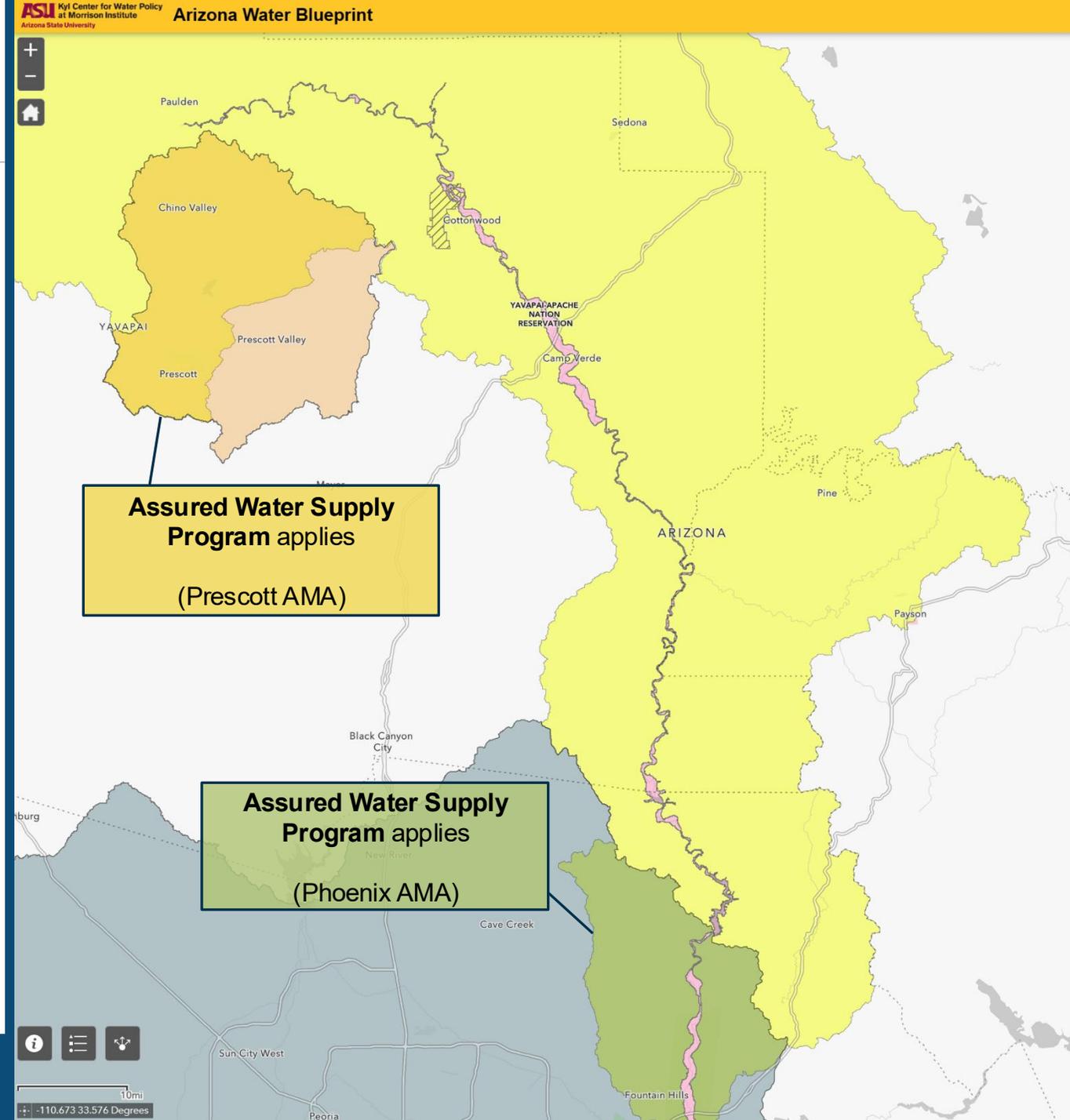
Groundwater Use Outside AMAs and INAs



Long-Term Supplies for New Development

Assured Water Supply Program

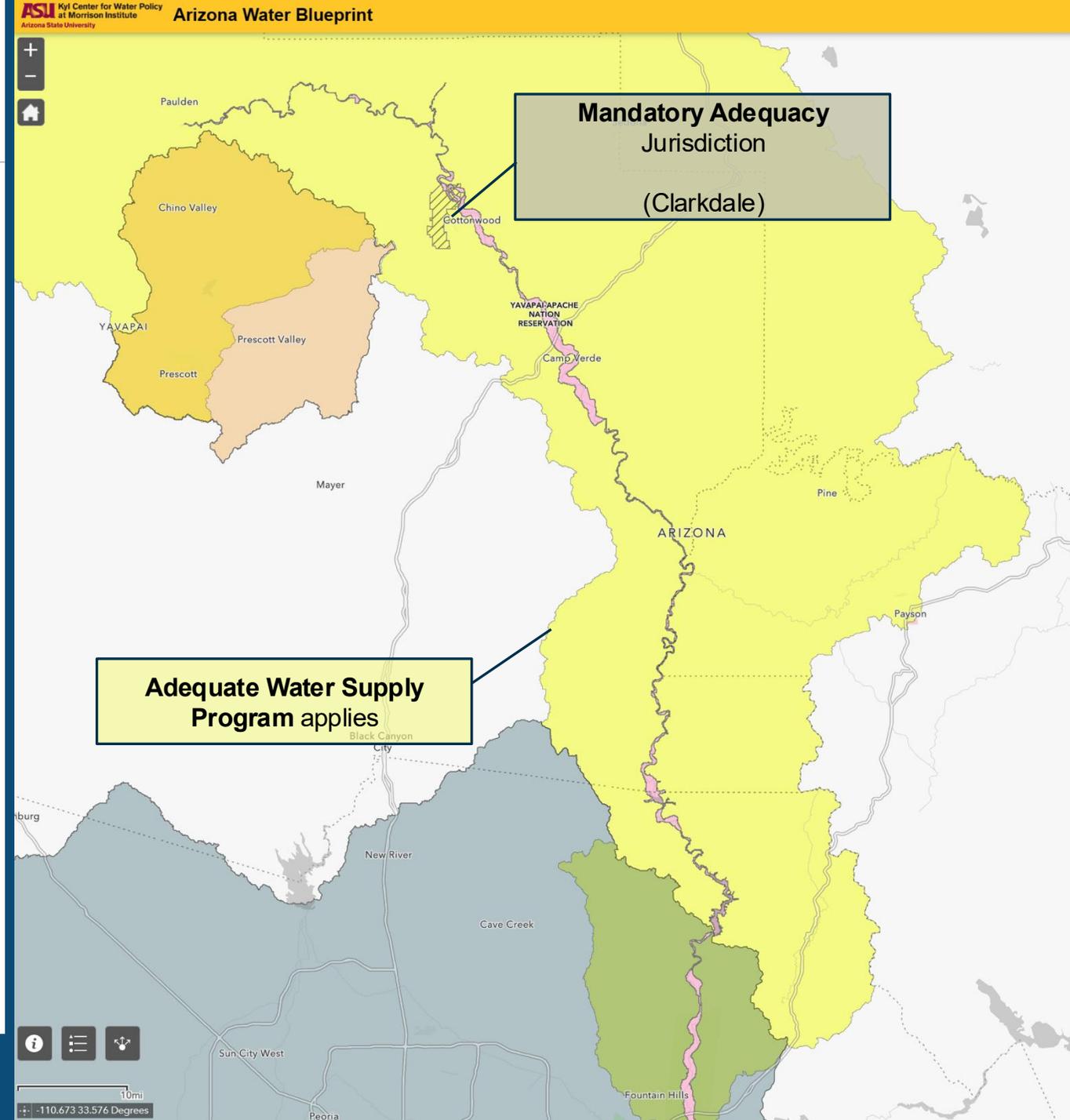
- Operates only within AMAs
- Requires demonstration of all of the following for a new subdivision before recording plats or selling parcels:
 - Physical availability
 - Continuous Availability
 - Legal Availability
 - Water Quality
 - Financial Capability
 - Consistency with AMA Management Plan
 - Consistency with AMA Management Goal



Long-Term Supplies for New Development

Adequate Water Supply Program

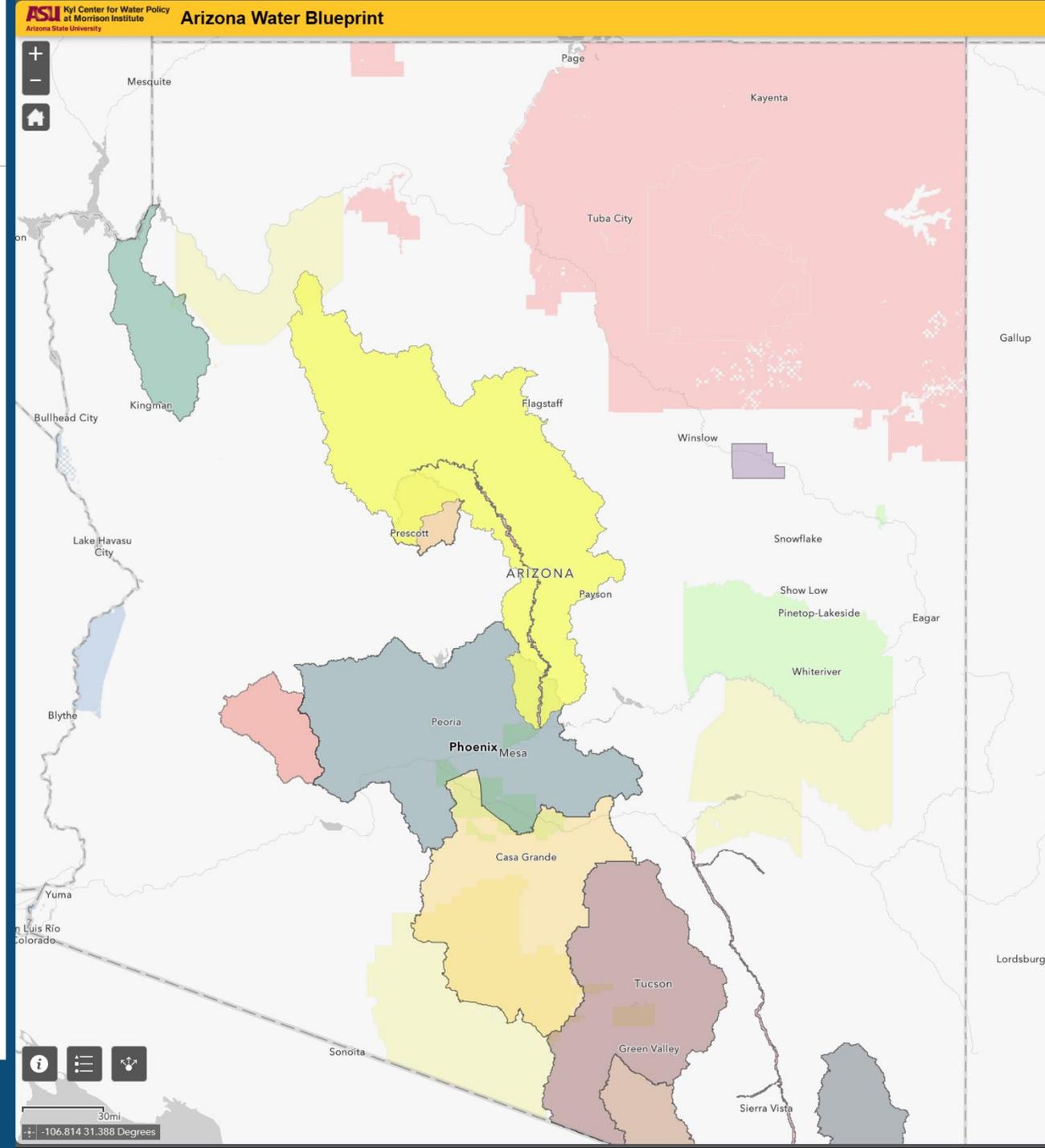
- Operates only outside AMAs
- Requires a public disclosure of water adequacy (or inadequacy) for a new subdivision before selling parcels, which involves an evaluation of:
 - Physical availability
 - Continuous Availability
 - Legal Availability
 - Water Quality
 - Financial Capability
- Jurisdictions may opt in as a **Mandatory Adequacy** jurisdiction, which requires a determination of adequate supply prior to plat approval and issuance of the public report allowing lots to be sold.



Additional Considerations

related to pumping underground water:

- *AMAs & INAs*
- *Federal Indian Reservations with a Tribal Water Settlement (federal reserved water rights, may include surface water and/or groundwater)*
- *Subflow Zone (surface water)*



Rural Groundwater Policy Discussions



On January 9, 2023, Governor Katie Hobbs issued an **Executive Order** to establish the Governor's Water Policy Council (the "Council"), which is tasked with modernizing the Arizona Groundwater Management Act, the state's playbook for protecting its groundwater. The group will update groundwater management tools and protect groundwater, which serves as 41 percent of the state's water supply.

Practical Points & Additional Resources

- ADWR, **A Practical Guide to Drilling a Domestic Water Well in Arizona**, [https://infoshare.azwater.gov/docushare/dsweb/Get/Document-11792/Practical Guide Rev 09-23-2019 for Web\(2\).pdf](https://infoshare.azwater.gov/docushare/dsweb/Get/Document-11792/Practical%20Guide%20Rev%2009-23-2019%20for%20Web(2).pdf)
- ADWR, **Assured and Adequate Water Supply**, <https://www.azwater.gov/aaws-overview>
- **Governor's Water Policy Council**, <https://www.azwater.gov/gwpc>
- WeSERV Association of Realtors, **Water in Arizona – Is My Property in an AMA or INA?** <https://www.wemargad.org/water-in-arizona-is-my-property-in-an-ama-or-ina/> (*Informational flyer designed for REALTORS®, appraisers, lenders, insurance agents, and their clients*)

Jennifer Diffley, Partner

Culp & Kelly, LLP

jdiffler@culpkelly.law

(602) 888-7011

Surface Water 101

Luke R. Erickson, Esq.

Hiser Joy

5080 N 40th St, Suite 245

Phoenix, AZ 85258

(480) 505-3900



HISER JOY



What is Surface Water?

- “The water of all sources, flowing in streams, canyons, ravines or other natural channels, or in definite underground channels... **perennial** or **intermittent**... lakes, ponds and springs on the surface...” A.R.S. 45-141(A)
- Includes flood, waste or surplus water
- **Not:** ephemeral flow – flow in direct response to precipitation











Irrigation Districts and Ditch Companies

- Ditch companies are private associations that manage a "ditch" that delivers irrigation water
- Landowners in the service area are members and pay dues
- Must have a surface water right AND a share of ditch water
- 42 ditch companies in the Verde Watershed
- Irrigation districts are special taxing districts - corporations
- Board made up of at least 3 landowners, levy assessments, deliver water to property within the district

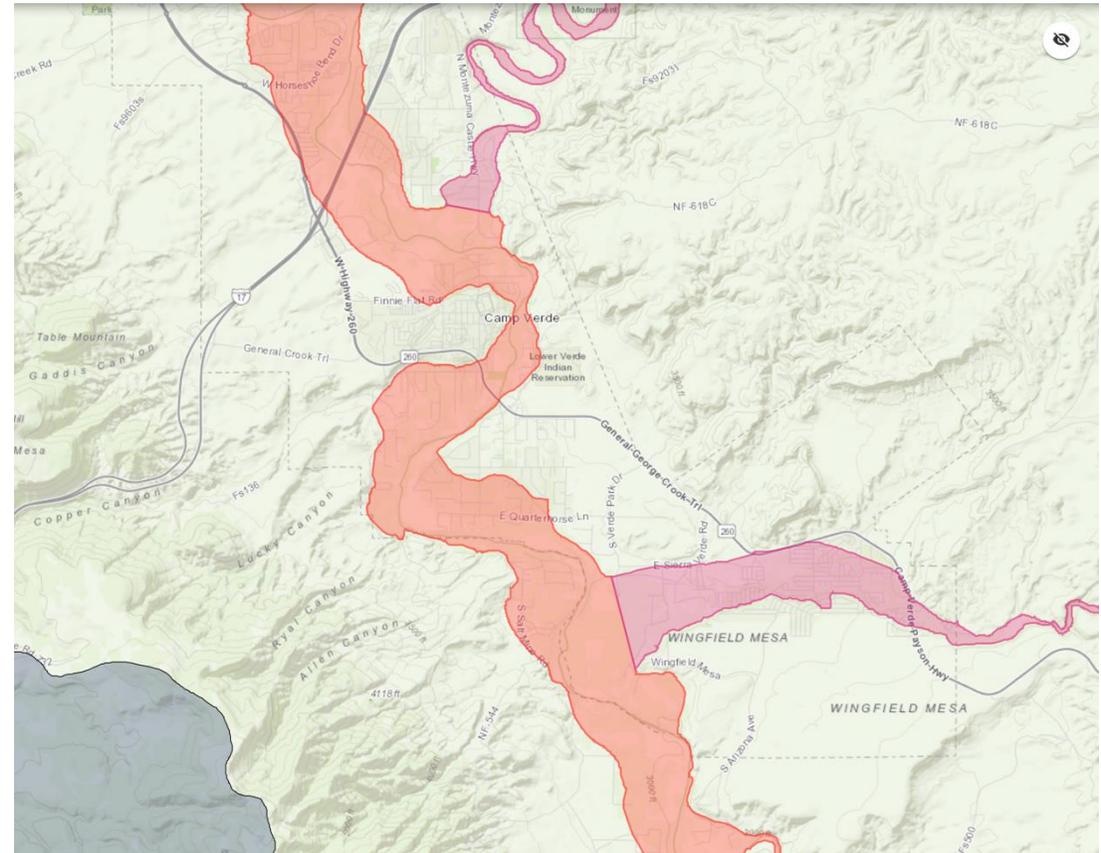


Subflow

- Legal concept
- “underground channels” in the statute defining surface water
- Those waters which slowly find their way through sand and gravel that is part of the bed of the stream or lands immediately under or adjacent to the stream – *Southwest Cotton* 1931
- *Gila II* affirmed *Southwest Cotton* “does drawing off the subsurface water tend to diminish appreciably and directly the flow of the surface stream?”

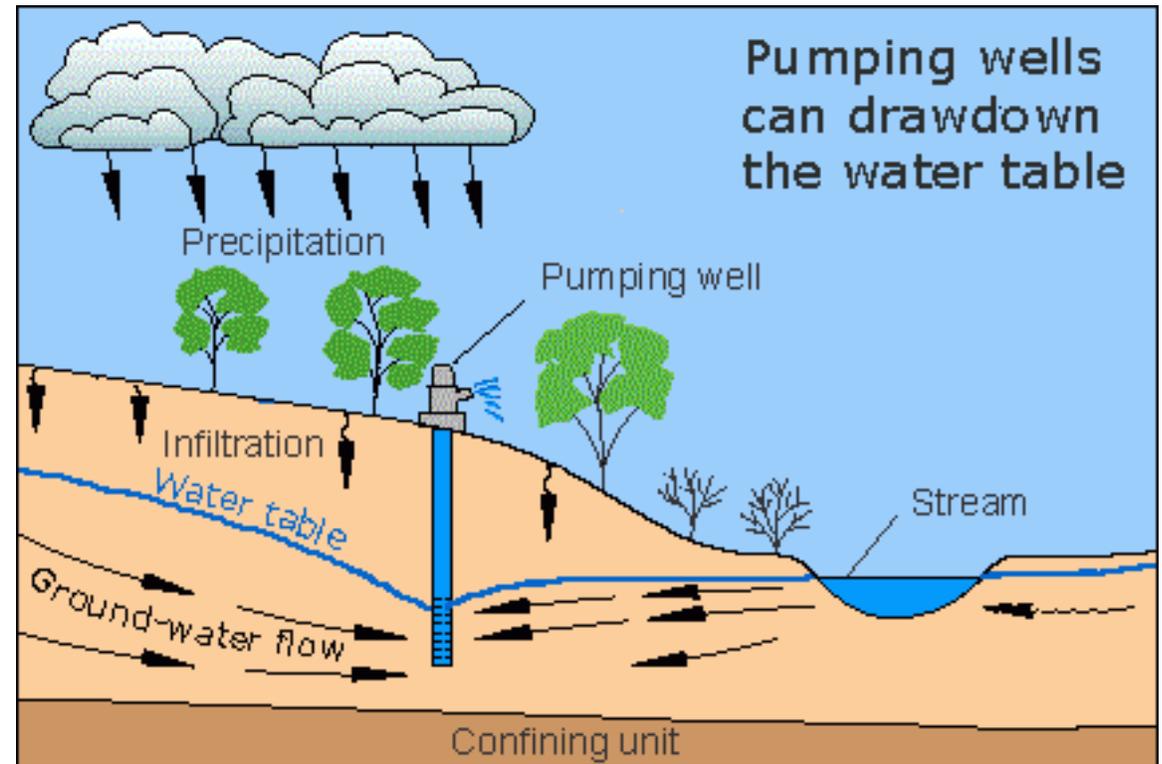
Subflow

- Known as the “saturated floodplain Holocene alluvium” today – *Gila IV*
- Defining subflow in an area is an “endeavor” and “not an all or nothing proposition” – *Gila IV*
- Nuance
- ADWR has delineated subflow zone it one watershed and preliminarily in another
- <https://www.azwater.gov/adjudications>



Why is the Subflow Zone Important?

- Wells can withdraw subflow
- Need a water right if you are withdrawing subflow
- ADWR developing a subflow depletion test to determine which wells withdraw subflow
- Can even apply to wells not physically located near the river



Must Have a Right to Use Surface Water

- “Any person, including the United States, the state or a municipality, intending to acquire the right to the beneficial use of water, shall make an application to the director of water resources for a permit to make an appropriation of the water.” - A.R.S. 45-152(A)
- First in time, first in right – **Doctrine of Prior Appropriation**
- Prior to June 12, 1919, a landowner could appropriate water by putting it to beneficial use and posting a notice at point of diversion
- 1919 Arizona Legislature enacted the Water Code requiring a permit
- Those using and claiming water under state law prior to March 17, 1995, must file a Statement of Claim – A.R.S. 45-182

Rights to Surface Water Continued

- After 1919 and new use – Application to Appropriate to ADWR
- ADWR issues a Permit to Appropriate – build diversion and delivery works
- Once put to beneficial use, ADWR issues a Certificate of Water Right
- Use it or lose it: 5 consecutive years of nonuse can result in forfeiture
- Still must file a Statement of Claimant with ADWR to participate in the Arizona General Stream Adjudication

What is the Adjudication?

- Active court proceeding in Maricopa County Superior Court to determine surface water rights in all Arizona watersheds (except Colorado River)
- ADWR files a report on all water claims in a watershed
- Each claim becomes a contested case if the claim gets objections
- A Special Master presides over contested cases
- Ultimately results in legally enforceable water rights for landowners who can support their claims
- Catalogue of “abstracts” will list each water right in Arizona

Abstract of Water Right San Pedro Watershed

1. Proposed Water Right No.:	113-09-CB-008-DM001
2. Owner of Water Right:	State of Arizona – Arizona State Land Department
3. Landowner	State of Arizona – Arizona State Land Department
4. Statement of Claimant No.(s):	39-7161
5. Statement of Claimant Name(s):	Arizona State Land Department
6. Lessee or Permittee:	Bingham Sacaton Ranch
7. Basis of Right:	36-27331
8. Beneficial Use:	Domestic
9. Priority Date:	December 31, 1900
10. Quantity:	One (1) acre-foot annually
11. Place of Use:	NWNWNW sec. 16 T10S R18E of the Gila and Salt River Base and Meridian, Pinal County, Arizona
12. Point of Diversion:	NWNWNW sec. 16 T10S R18E of the Gila and Salt River Base and Meridian, Pinal County, Arizona
13. Source of Water:	Subflow of the San Pedro River