Water Resources Update

John Snickers, Division Manager
Terri Sue Rossi, Vice President - Water Resources
Ron Doba – NAMWUA CPWP
Nathan Miller – Matrix New World
Raluca Mihalcescu, Water Conservation Coordinator

October 23, 2024

Agenda

- **Welcome and Introductions**
- **AWC Statewide Overview**
- **Sedona System Updates**
- **AWC Water Resources Strategy**
- **Regional Water Resource Planning**
- **Local Water Resources Planning**
- **Integrated Demand Management Program: Ripple Effect**
- **Closing Remarks**

Statewide Overview of Arizona Water Company

- Established in 1955
- U.S. Owned and Family-operated
- 2nd Largest Investor-owned Utility in Arizona
- Serving 8 Counties
- 14 Incorporated Areas
- 24 Water Systems
- 105,000 Connections
- 300,000 People Served
- 261 Employees

Sedona System Updates

- East Sedona Tank
- Operations Status
- Sedona Operations Center (Relics)
- AWC and City of Sedona Coordinated Projects

Water Resources Strategy

Terri Sue Rossi, Vice-President
Water Resources

Suggested Approach

- **Joint Objective**
  - Create, manage and protect a sustainable water supply for all who live, visit and do business in Sedona: our constituents, businesses, visitors and our customers
- **Strategy**
  - Preserve our existing water resource assets including effluent and groundwater
  - Use all supplies as efficiently as possible
  - Protect local water supplies
  - Make smart decisions about growth

Original Work Plan – June of 2023

- **Track 1**: Develop understanding of the hydrology
- **Track 2**: Determine existing and committed demands
- **Track 3:** Determine future demands
- **Track 4:** Incorporate work from Tracks 1-3 into water budget and prepare water resource goals for demand management and water supply acquisition
- **Track 5:** Develop and integrated demand management plan

Sonoran Institute Growing Water Smart Workshop

SUSTAINABLE WATER ACTION PLAN (SWAP):

- **Goal 1**: Integrate critical water and wastewater data to support leadership decisions for creating a sustainable water supply
- **Goal 2**: Public education about SWAP initiative
- **Goal 3:** Provide Council with information to support SWAP
- **Goal 4:** Investigate Effluent Return Line
- **Goal 5:** Code Changes

Regional Water Resource Planning Efforts

Ron Doba, NAMWUA and CPWP

Northern Arizona Municipal Water Users Association

Members are water providers that started collaboration in 2002 and formed a 501 c 4 organization for water advocacy in 2008

AZ WATER COMPANY
CAMP VERDE
CHINO VALLEY
CLARKDALE
COTTONWOOD
FLAGSTAFF
SEDONA
PRESCOTT
PRESCOTT VALLEY

https://namwua.org

NAMWUA'S MISSION is to unite our expertise and resources in a collaborative effort to secure regional and local water resources for today and the future

- **Projects, such as water resource availability studies, are pursued jointly for efficient use of financial resources among participating members**
- **Regular review of proposed water legislation and lobbying**
- **Biennial training for system operators and water managers (WULF)**
- **Member representation on State (GWPC) and Kyl Center for Water Policy**

COCONINO PLATEAU

WATER ADVISORY COUNCIL & WATERSHED PARTNERSHIP

https://cpwac.org

FUNDING PARTNERS:

COCONINO COUNTY
CITY OF FLAGSTAFF
CITY OF SEDONA
CITY OF PAGE
TOWN OF TUSAYAN
TUSAYAN SANITARY DISTRICT
HAVASUPAI TRIBE
SIERRA CLUB
KACHINA VILLAGE IMPROVEMENT DISTRICT
FRIENDS OF THE VERDE RIVER

THE CPWAC AND CPWP IS MADE UP OF OVER THIRTY STAKEHOLDERS… FEDERAL AND STATE AGENCIES, COUNTY AND LOCAL GOVERNMENTS, UNIVERSITIES, NGOS AND CITIZENS THAT MEET MONTHLY

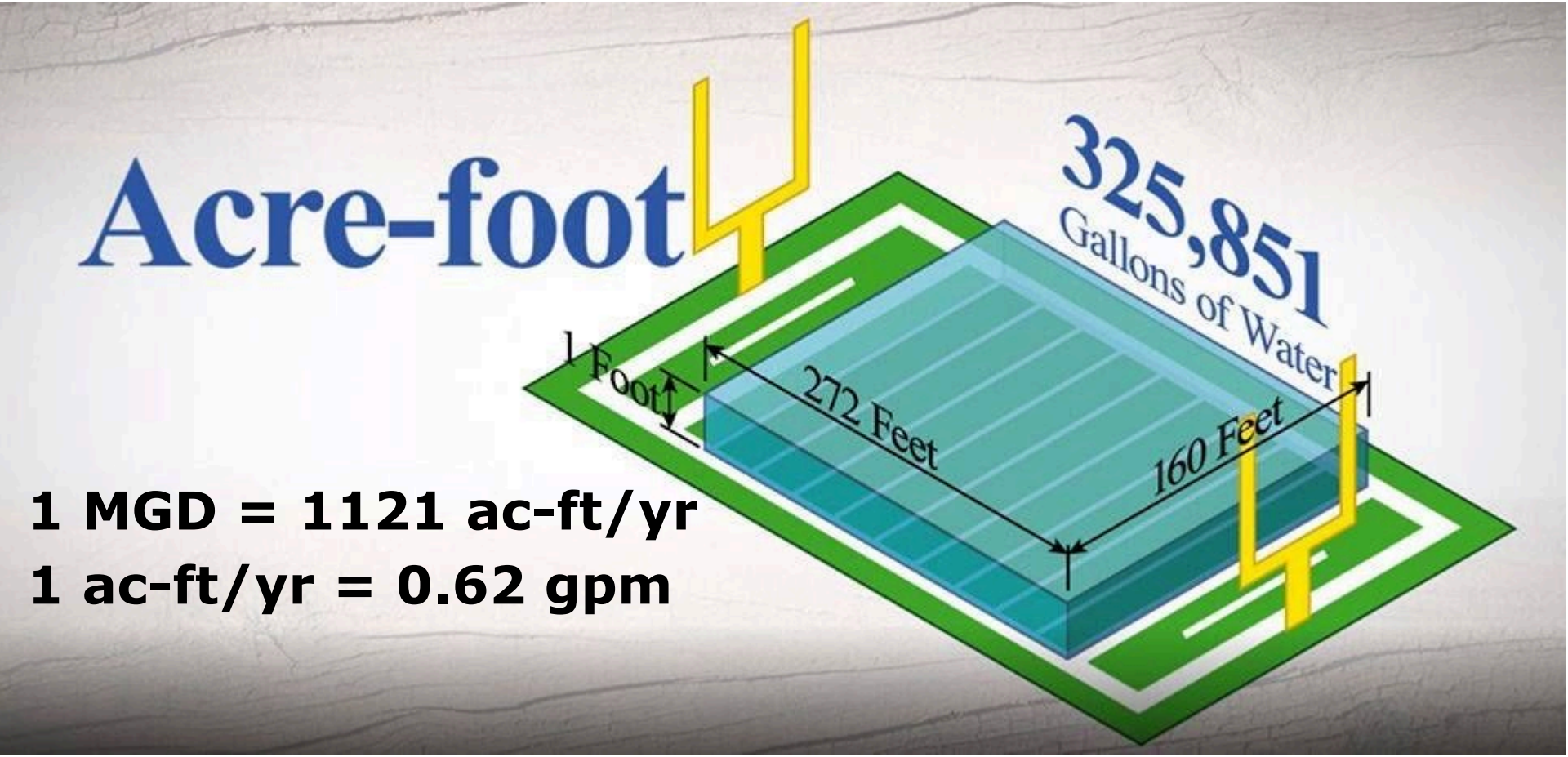
- **PUBLIC AWARENESS PROJECTS, SUCH AS THE 4TH GRADE WATER ETHICS CONTEST, PARCHED: THE ART OF WATER IN THE SOUTHWEST, AND PARTICIPATION IN WATER AND SCIENCE FESTIVALS AS WELL AS EARTH DAY ARE PRODUCED BY THE PUBLIC OUTREACH COMMITTEE (POC)**
- **REGULAR REVIEW OF PROPOSED WATER LEGISLATION AND LOBBYING (GAC)**
- **UTILIZATION OF GRANTS TO PERFORM GROUNDWATER MODELING, DETERMINATION OF STAKEHOLDERS WATER CONCERNS (WATER RELATED ECOSYSTEM SERVICES ASSESSMENT), AND PURSUIT OF RULES MODIFICATIONS FOR DETERMINATION OF WATER ADEQUACY (TAC)**

Local Water Resource Planning

Nathan Miller, Matrix New World

Unit of Measure

- **How much is one Acre-Foot of water?**
  325,851 gallons



1 MGD = 1121 ac-ft/yr

1 ac-ft/yr = 0.62 gpm

Sedona Area Hydrology

Map from USGS SIR 2013-5079

Map of Study Area

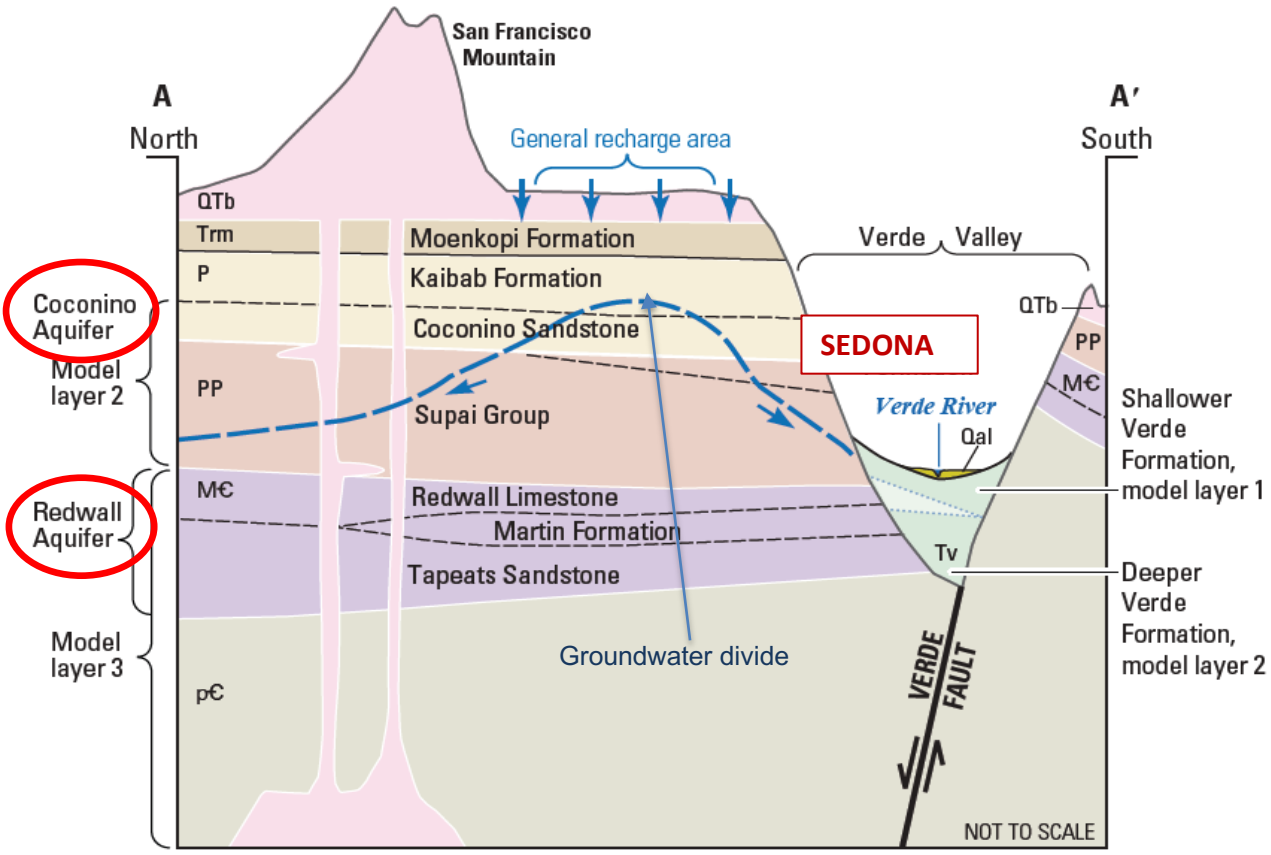
Geography

- Sedona is located at the base of the Mogollon Rim
- Southern extent of the Colorado Plateau (locally Coconino Plateau)
- Verde Valley sub-basin

Oak Creek

- Sterling Springs (headwaters)
- Page Springs

Sedona Area Hydrology



X-Section from USGS SIR 2013-5079
Thickness from USGS SIR 2005-5198

Geology:

- 1,000s feet thick sedimentary rock
- Layer cake stacking
- Mixture of sandstone, limestone & shale

Water Bearing Zones:

<u>Coconino Aquifer (C Aquifer)</u>
Thickness ~180 to 620'
(Supai Group)

<u>Redwall-Muav Aquifer (R Aquifer)</u>
Thickness ~600' to 760'

<u>Verde Formation</u>
Verde River
Thickness ~200' to >1,000'

Sedona Area Hydrology

Arizona Water Company - Water Supply Wells

Sedona Service Area:

- 9 active wells
- Total well depths range from 700 feet 1,120 feet below land surface
- Most AWC wells withdraw water from the Supai Formation (C Aquifer)
- Some AWC wells withdraw water from the Redwall-Muav Limestone (R Aquifer)

Arizona Water Company - Water Levels

Sedona 55#	Well #	Well Name	Elevation AMSL (ft)	Drilled Water Level Depth (ft)	Year	Recent Water Level Depth (ft)	Year	Total Decline (ft)	Decline Rate (ft/yr)	Period of Record (years)
616656	AWC 02	Sedona Oak Creek	4,250	281	1960	309	2023	-28	-0.4	63
616658	AWC 04	Sky Mountain	4,420	590	1955	611	2023	-21	-0.3	68
616659	AWC 05	Harmony Hills	4,371	565	1962	598	2023	-33	-0.5	61
616662	AWC 06	Rainbow	4,311	502	1949	526	2023	-24	-0.3	74
616661	AWC 07	Williams	4,374	455	1997*	496	2018	-41	-1.9	21
616663	AWC 08	Southwest Center	4,464	530	1975	571	2023	-41	-0.9	48
506794	AWC 09	Sedona	4,261	184	1984	205	2022	-21	-0.6	38
566709	AWC 10	Broken Arrow	4,246	297	1999	318	2019	-21	-1.1	20
204279	AWC 12	Harmony Hills	4,371	565	2005	605	2023	-40	-2.2	18
							average	-30	-0.9	46

* Williams Well: water level data started in 1997

Sedona Area Hydrology

Arizona Water Company - Pumping

Sedona Service Area:

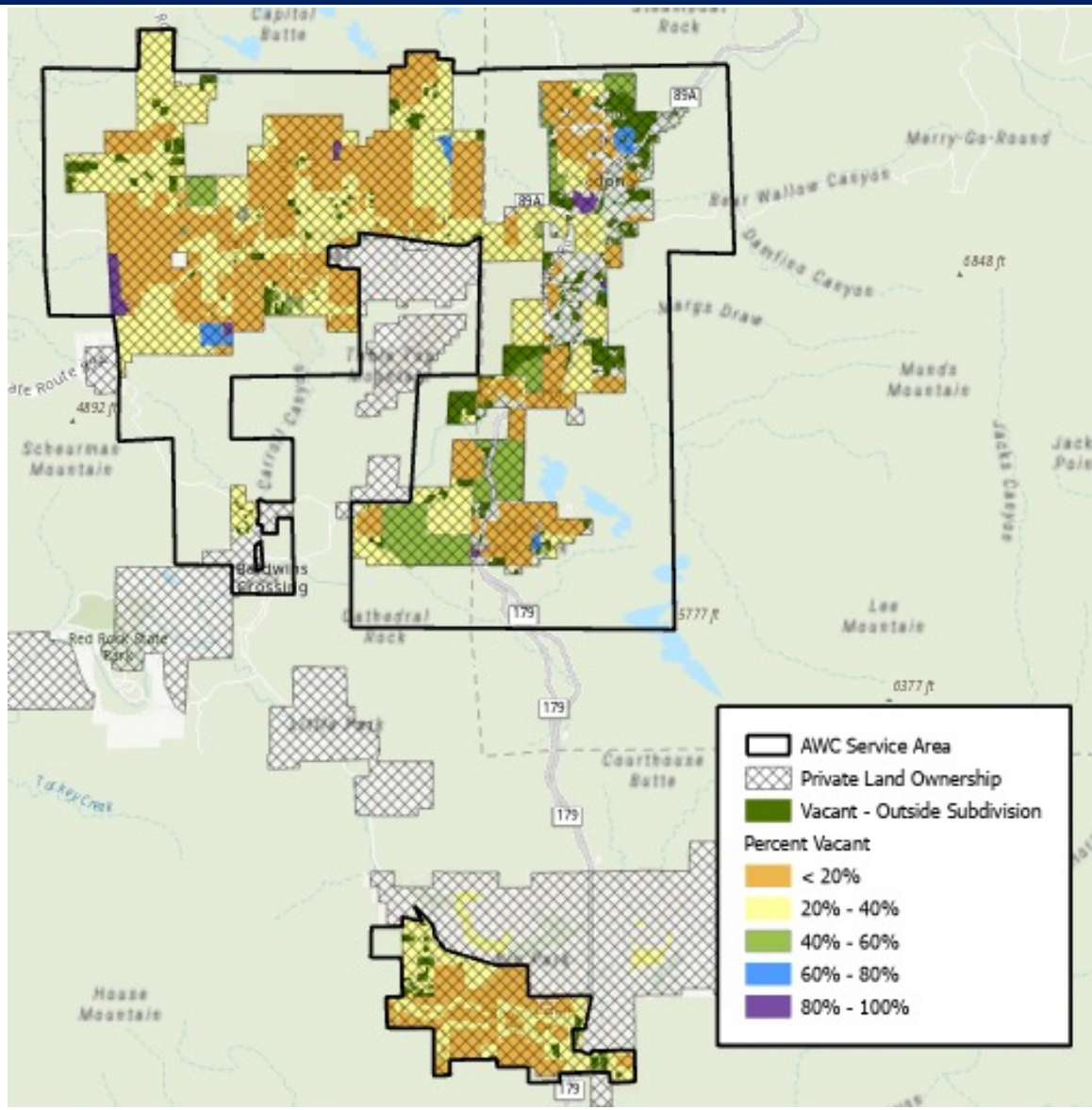
2023	3,021 AF	or	2.70 MGD
2022	3,095 AF	or	2.76 MGD
2021	3,268 AF	or	2.92 MGD
2020	3,178 AF	or	2.84 MGD
2019	2,960 AF	or	2.64 MGD
Avg.	**3,104 AF**	**or**	**2.77 MGD**

AF = acre-feet
MGD = million gallons per day

Demand Analysis

Approach

1. Analyzed county subdivision data
2. Summarized water usage data by subdivision
3. Water usage at full buildout
4. Future developments
5. Projected Demand – 2050
6. Options for reducing demand
   a) Conservation
   b) Effluent Use



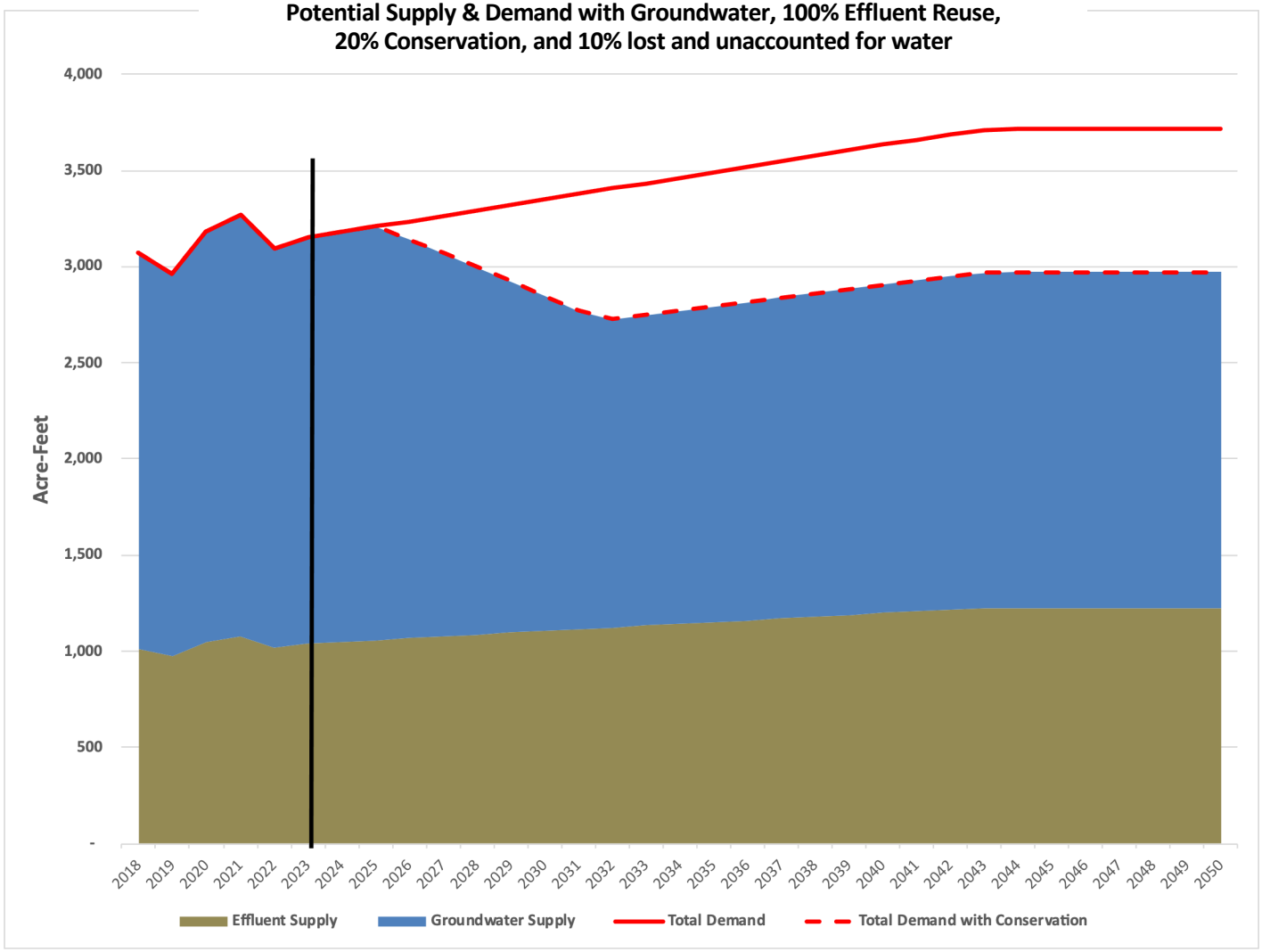
Buildout Demand Summary

Lot Sizes	Minimum AFA/Lot	Maximum AFA/Lot	Average AFA/Lot	Total Lots	Vacant	Water Use 2020 (AF)	Water Use 2021 (AF)	Water Use 2022 (AF)	Buildout Demand AFA
Small	0	0.95	0.24	3711	505	818	813	773	895
Medium	0	1.23	0.38	1702	393	508	508	496	645
Large	0	1.20	0.58	323	94	135	133	133	188
				5736	**992**	**1461**	**1455**	**1402**	**1727**
SINGLE FAMILY OUTSIDE SUBDIVISION									
Medium			0.48	703	33	320	323	309	321
Multi Family				602	7	188	204	196	197
Commercial				244	12	417	455	433	441
Temporary Lodging				60	0	447	497	485	485
Commercial Irrigation						176	189	167	167
TOTAL DEMAND						**3009** *	**3123** *	**2991** *	**3339** *

* Does not include lost and unaccounted for water

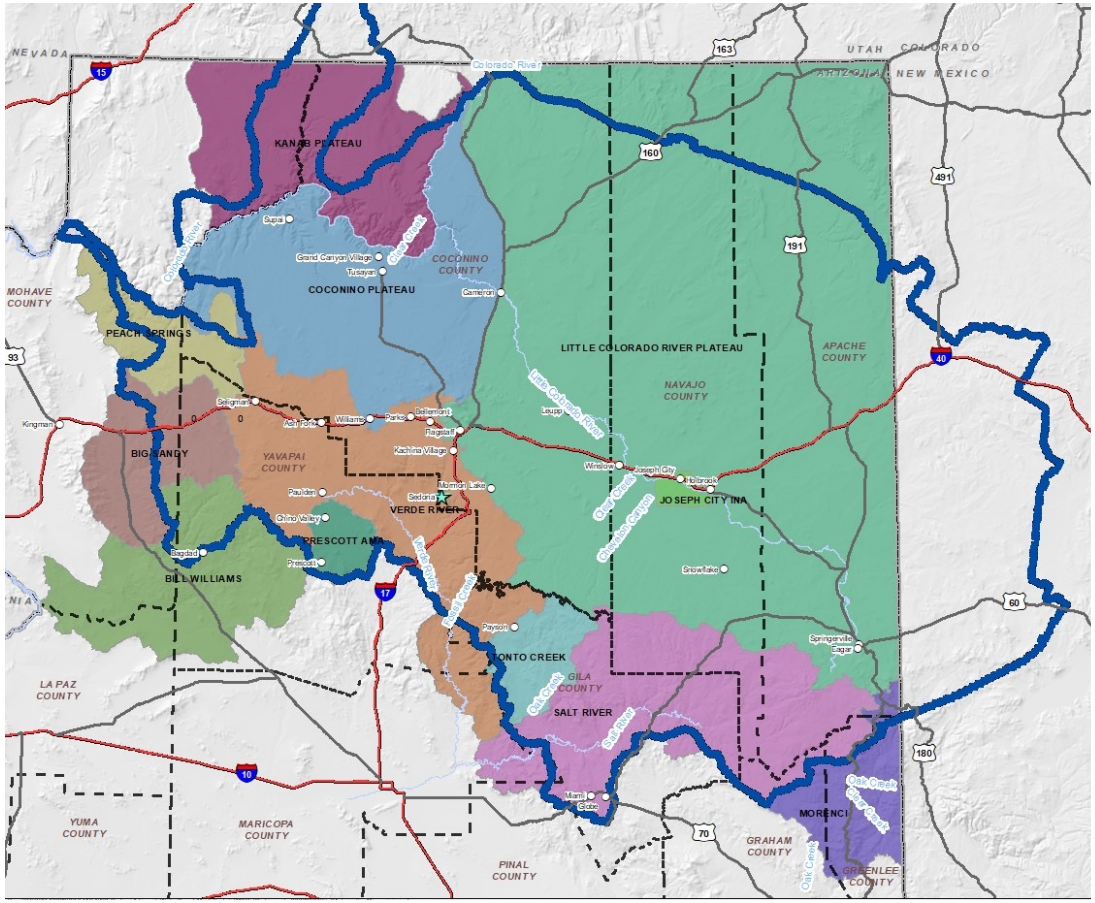
- Single Family Residential – Usage by lot size
- Multi-Family – Usage by number of units
- Commercial – Usage by size of lots
- Temporary Lodging – Usage by number of units
- Commercial Irrigation – Usage by total

Demand Projection to 2050

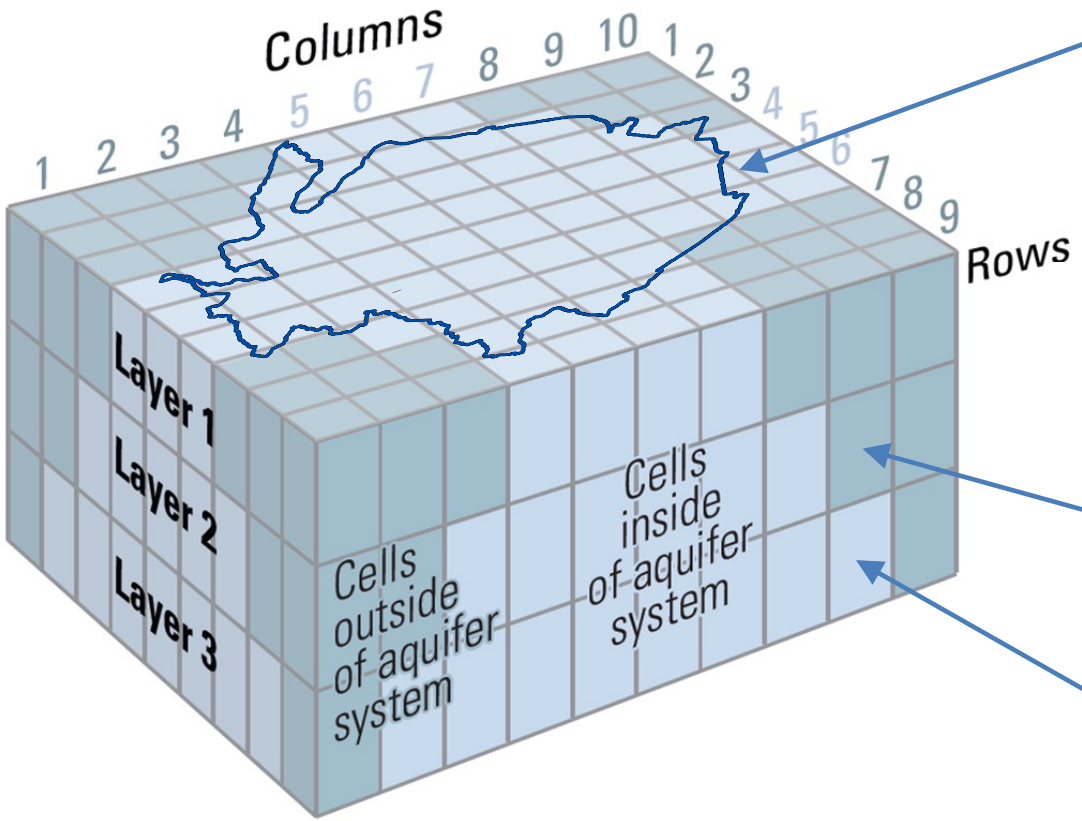


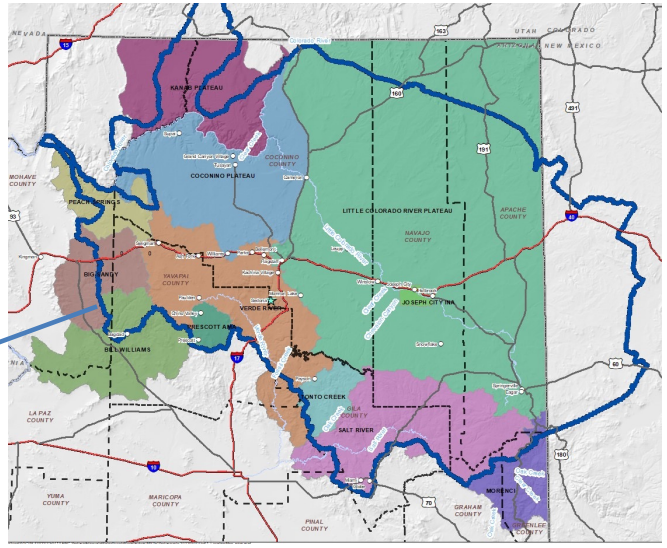
Groundwater Model Background

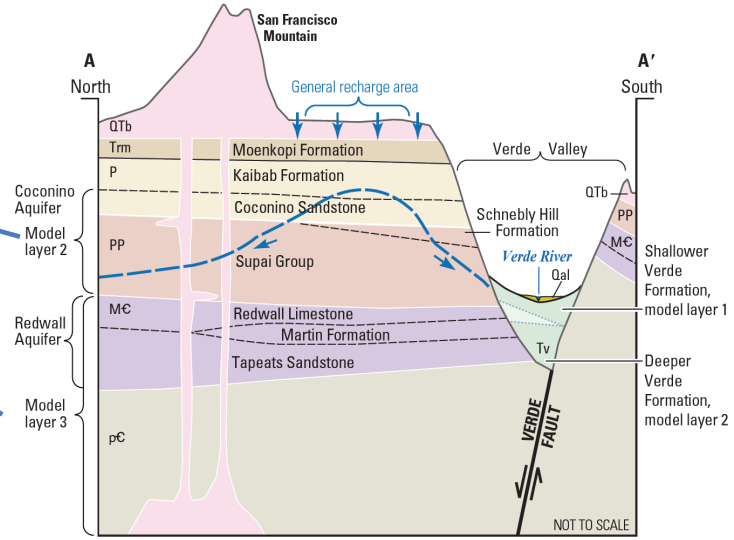
- Northern Arizona Regional Groundwater Flow Model (**NARGFM**) developed by the USGS in 2010
- Red Gap Ranch Leupp Groundwater Flow Model (**RGRLGFM**) developed by Southwest Groundwater Consultants in 2015
- Coconino and Redwall-Muav Aquifer Modeling Project (**CARAMP**) developed by Matrix in 2019 and 2024



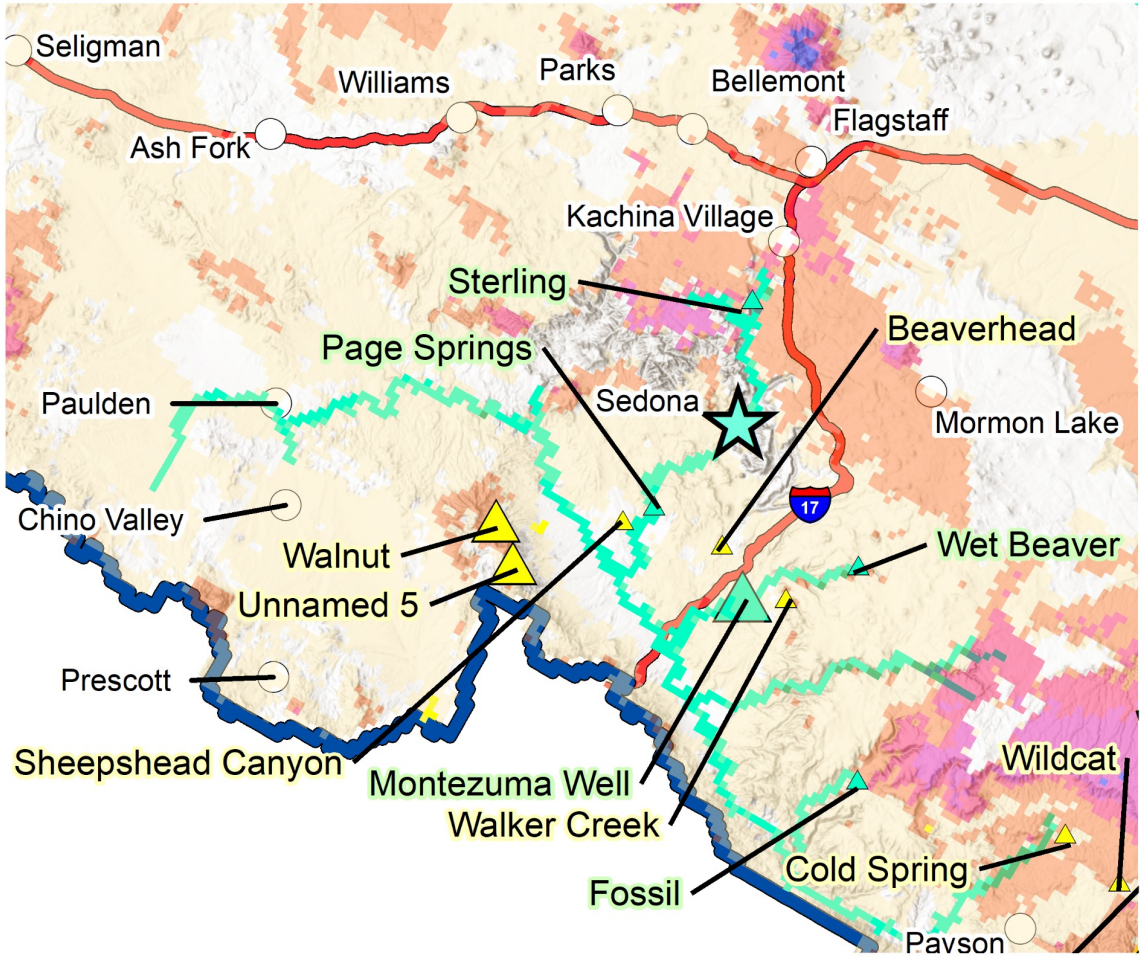
Groundwater Model Construction

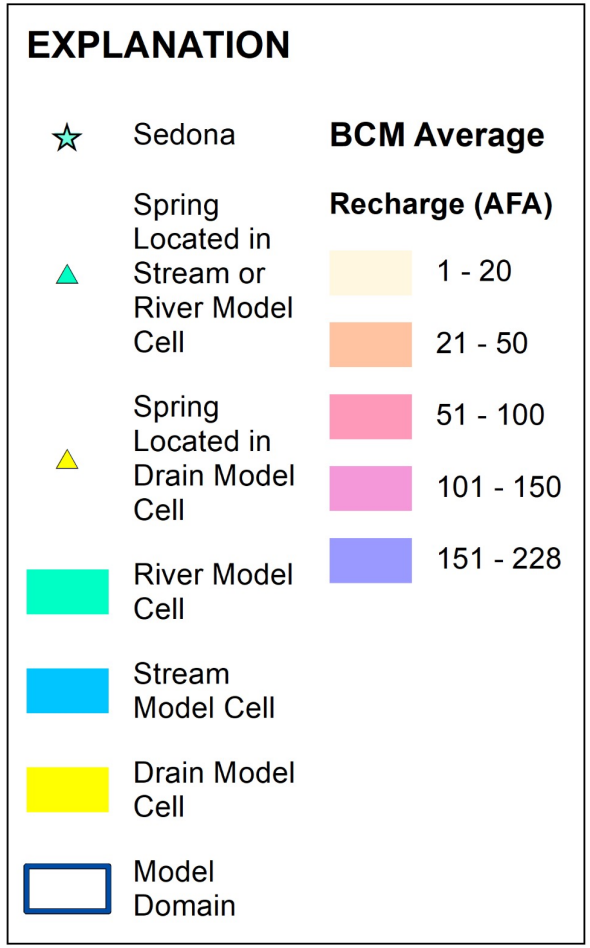




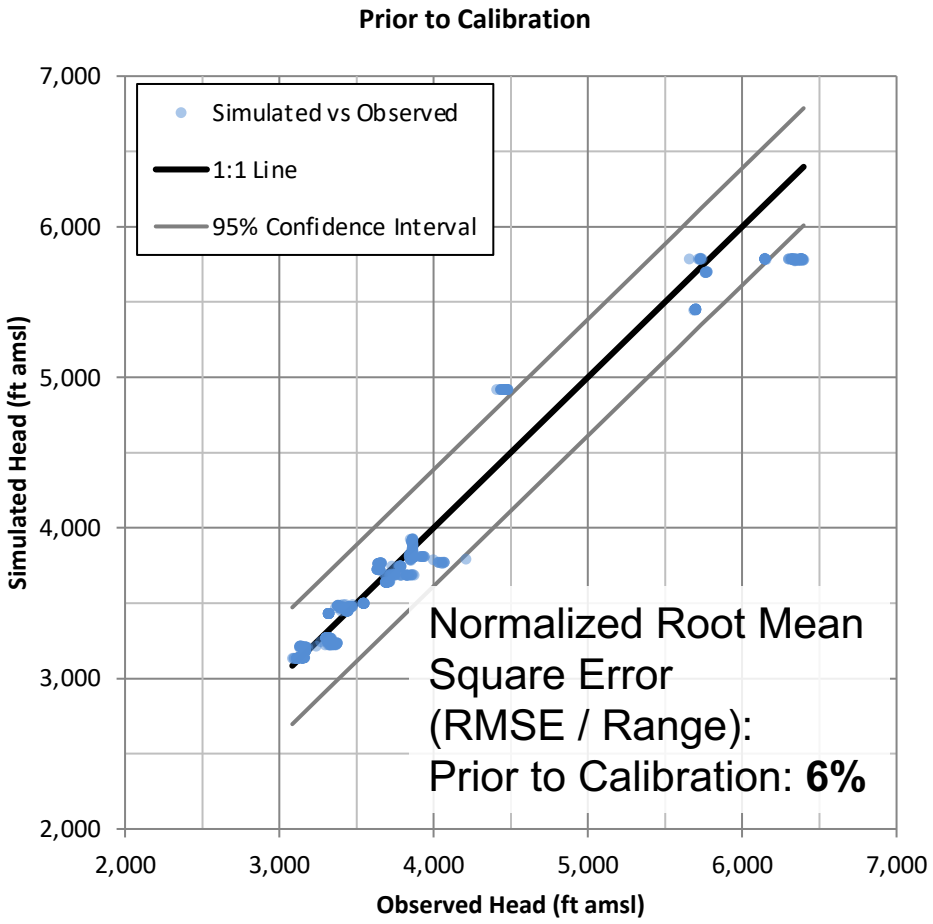


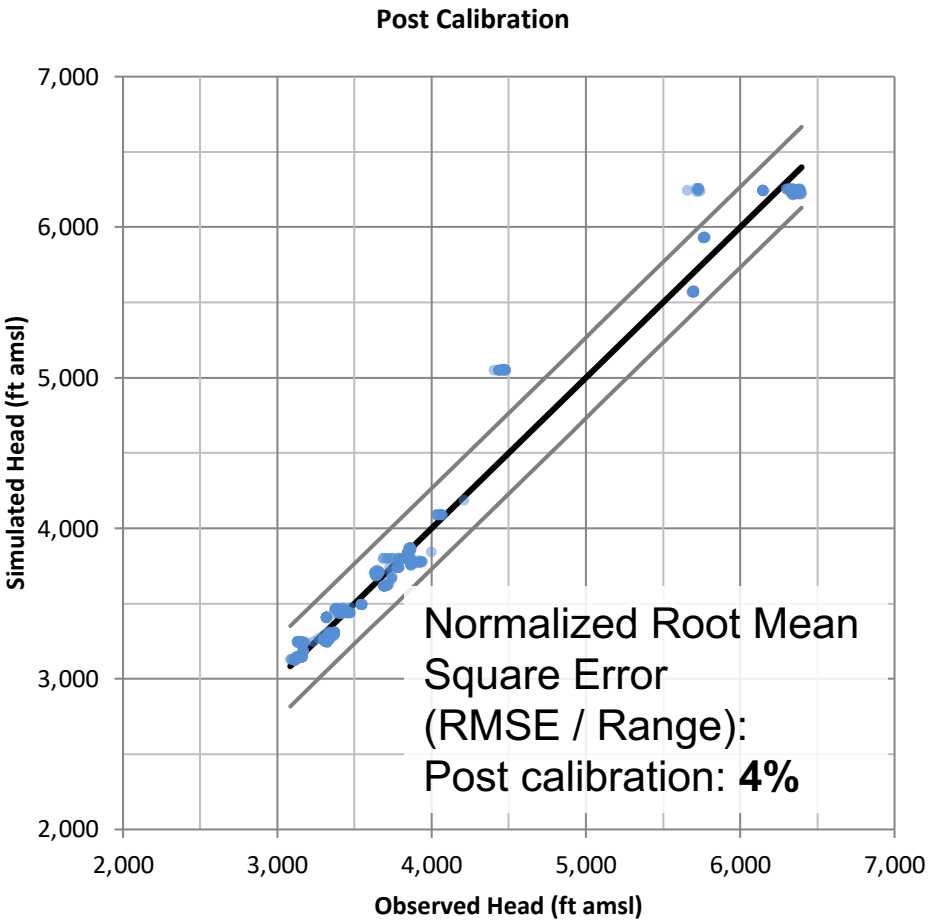
Groundwater Model Construction – Water Budget





Groundwater Model Calibration





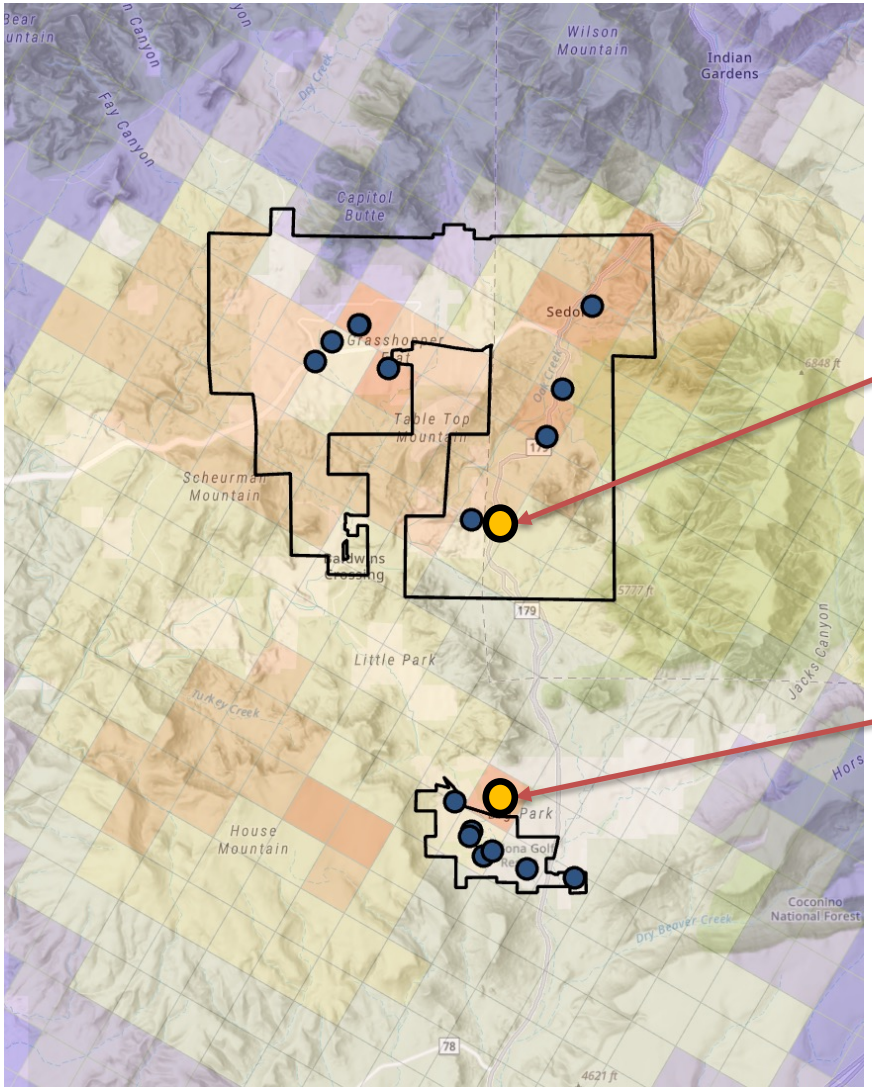
Groundwater Model Scenarios Run to Date

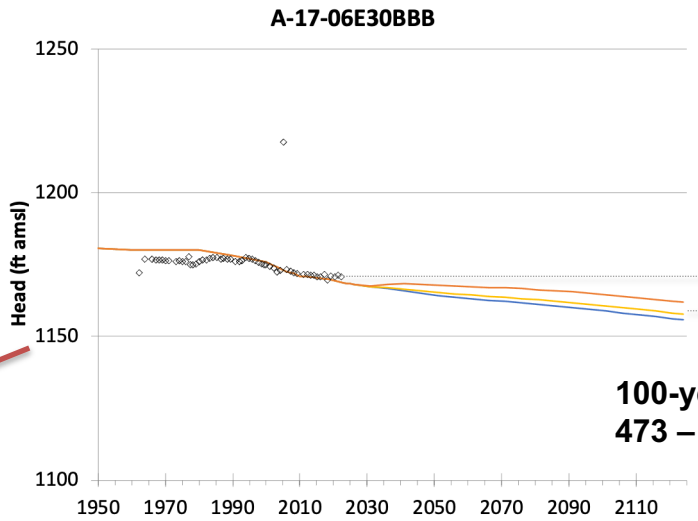
Scenario #	Effluent Reuse	Conservation	Climate Change	Sedona GW Pumping (ac-ft/yr)
1	None	None	None	3,900
2	None	20%	None	3,100
3	33%	20%	None	1,800

Modeling Outputs for First Scenarios

1. 100-year Groundwater level drawdown
2. Remaining aquifer thickness after 100-years
3. Depth to static groundwater level after 100-years

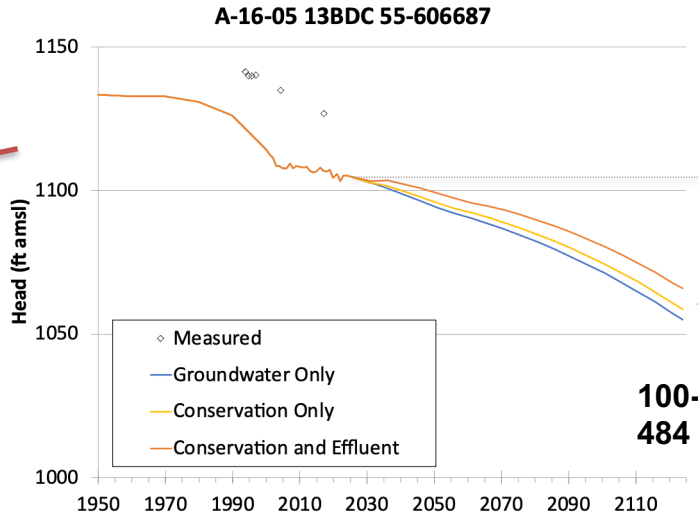
Groundwater Model Results





Drawdown: 10 - 15 feet

100-year DTW: 473 – 478 feet bls



Drawdown: 40 - 50 feet

100-year DTW: 484 – 495 feet bls

Joint Demand Management Program

Regulations for Conservation

Arizona Department of Water Resources (ADWR)

- Sedona not within an Active Management Area (AMA)
  - *"There are no mandatory conservation requirements to systems outside AMAs"*
- Submit a Community Water Systems (CWS) report
  - Next submission 2024-25

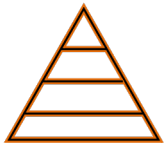
Arizona Corporation Commission (ACC)

- Conservation tariffs proposed by AWC in 2013 and set by the ACC
- Records of conservation actions can be requested
  - Must be reported ASAP
- Tariffs that apply to Sedona covered on next slide

Regulatory and Planning Elements

- City Code requiring native and low-water use plants
- Current Sedona Community Plan
  - Environment and Sustainability Actions
    - "Investigate strategies for either incentivizing or regulating water conservation measures."
    - "Identify appropriate standards for water conservation that can be applied during the development review process."
    - "Encourage water use audits to help identify water leaks and high use fixtures."
    - "Create landscaping guidelines for developers and residents that address preserving natural areas, native plants, and xeriscape practices."
    - "Develop a resource guide and development standards for low impact development/green infrastructure methods of managing stormwater."
    - "Explore and implement incentives, rebates and other ways that support energy and water conservation improvements."

Basic Program Elements



Conservation Oriented Rate Structures

Leak detection and repair program

Meter repair and replacement program

Customer high water use inquiry resolution, notification

Public Engagement Programs

Stormwater Education and Cleanup Events

- Partner with Oak Creek Watershed Council
- Municipal Separate Storm Sewer Systems (MS4) Education
- Watershed Outreach and Creek Cleanups

Macroinvertebrate Education (left) and Creek Cleanups (middle & right)

Public Engagement Program

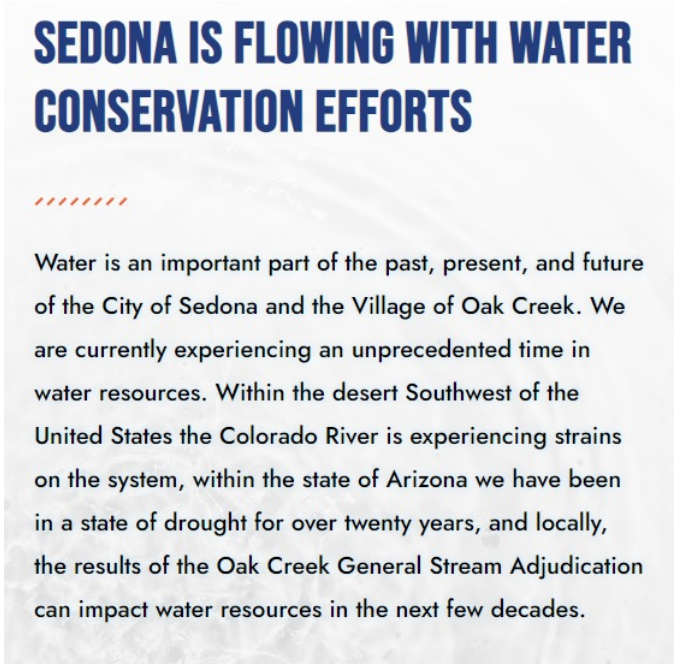
Facebook

- Audience: Residential and commercial water users
- Unique monthly themes and messages
- Managed by Blossom Digital Marketing

Public Engagement Program

Landing Page

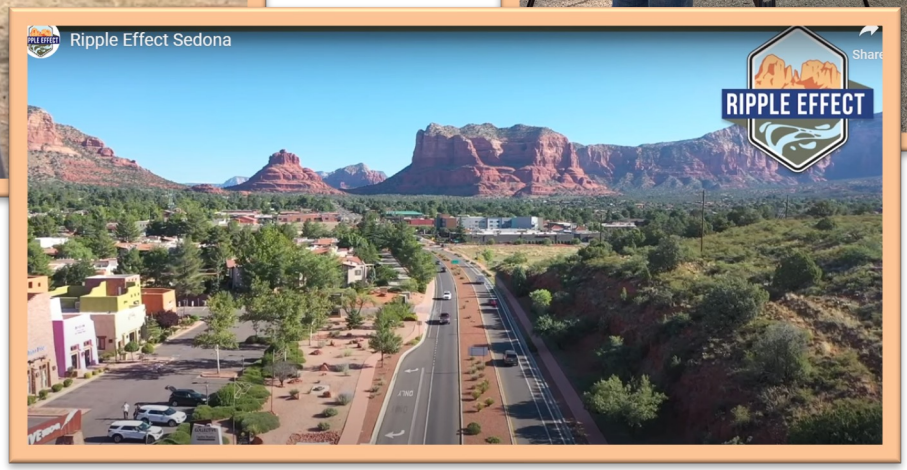
- Independent website
- Explains the joint program goals, purpose, and resources



Public Engagement Program

Launch Video

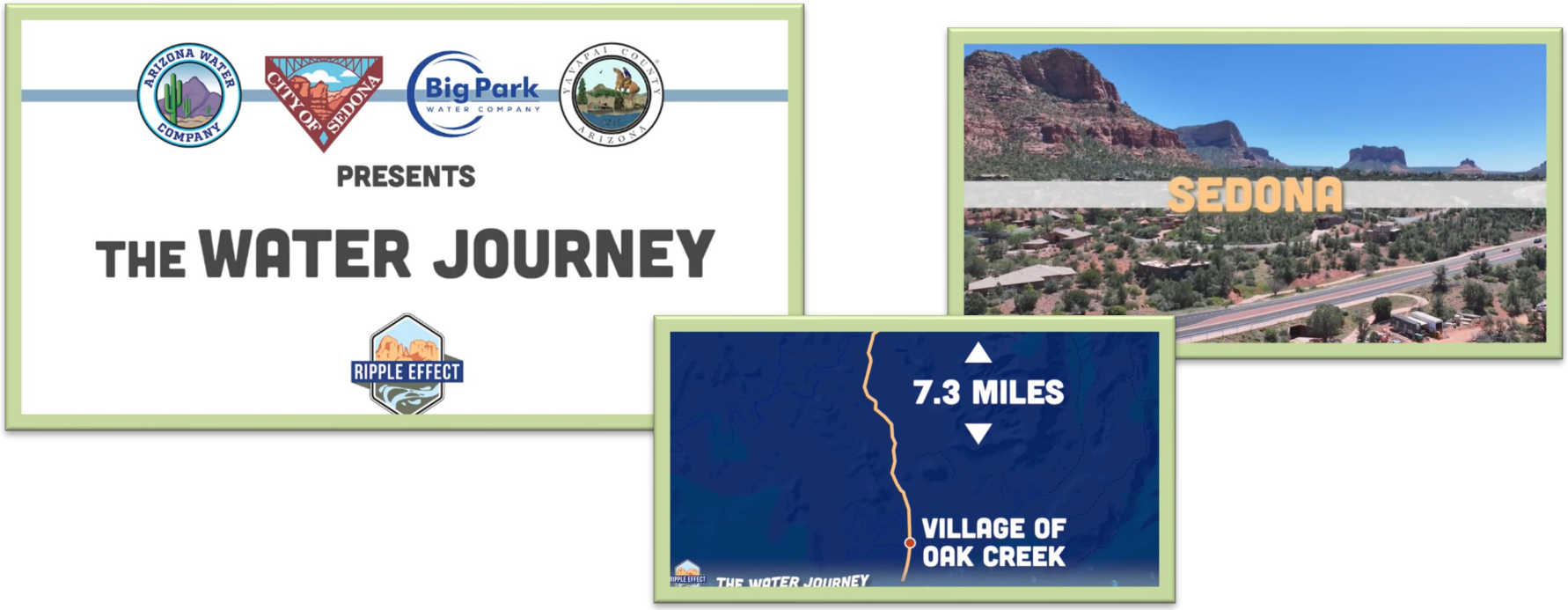
- Explains the program
- Engages the public
- Did video shoot on 8/28



Public Engagement Program

Water Journey Video

- Explains how water gets to the city
- Emphasizes the effort to deliver clean, safe drinking water to drive conservation messaging
- Will watch at the end if there is time



Public Engagement Program

Monthly Educational Videos with Kegn

- Address concerns posed by the community
- Drive content and actions
- Upcoming videos: Restaurant water video with the Mayor

Commercial Program

- Indoor and outdoor water use audits and customized conservation recommendations
  - Utilizing contractor: Water Resources Consulting
- HOAs, Resorts, Schools, and City facilities



4th Grade Education

- Partnership with Arizona Project WET
- Teach 4th graders about:
  - Groundwater
  - Watersheds
  - Water Cycle
  - Water Conservation Technology
- Schools participating:
  - West Sedona Elem
  - Sedona Charter
  - Running River
  - Beaver Creek
- Sponsors:
  - City of Sedona
  - Arizona Water Company
  - Wyndham Sedona

Other Elements

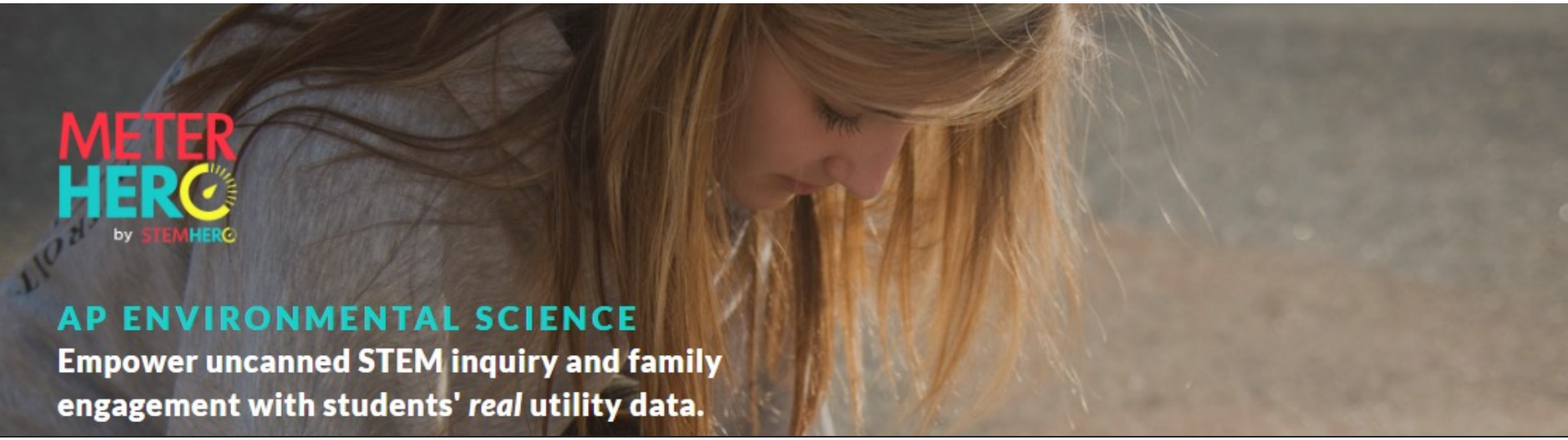
World Water Day

- 2024: Friday, March 22nd
  - First ever event at Red Rock Crossing State Park
  - Groups involved
- 2025: Saturday, March 22nd
  - Annual event

Other Elements

Meter Hero

- Educating high school students on:
  - Average water use
  - How to read a meter
  - Their personal household consumption
  - Experimenting with the conservation impact of certain behavior changes
  - New for 2024-2025 school year



Closing Remarks

NAMWUA and CPWAC/CPWP Action Plan for 2025

- Complete/continue efforts to improve water adequacy determination rule for users of the Coconino and Redwall-Muav Aquifers
- Provide a groundwater resiliency workshop in conjunction with ASU and Coconino County (Spring 2025)
- Continue representation on Governor's Water Policy Council and Kyl Center for Water Policy
- Secure grant funding to increase participation for 4th grade water ethics contest and public awareness (AZ humanities)
- Build on regular educational programs for stakeholders (monthly speakers, field trips, member information sharing)
- Monitor proposed legislation for stakeholder positions, including rural water management areas

Sedona-AWC Action Plan for 2025

- **Finalize Groundwater Modeling**
  - Run additional scenarios including climate change-based scenarios
  - Present scenarios to City
  - Prepare final technical memorandum
- **Further Water Supply and Demand Analysis**
  - Develop future land use plans
  - Refine water supply and demand
  - Determine conservation and augmentation goals and strategies
  - Develop Sedona water hub
- **Ongoing Implementation of Ripple Effect**
- **Focus on Future City actions**
  - Wastewater Master Plan Update
  - Develop/revise water use codes
  - Make future land use decisions

Suggested Approach

- **Joint Objective**
  - Create, manage and protect a sustainable water supply for all who live, visit and do business in Sedona: our constituents, businesses, visitors and our customers
- **Strategy**
  - Preserve our existing water resource assets including effluent and groundwater
  - Use all supplies as efficiently as possible
  - Protect local water supplies
  - Make smart decisions about growth

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October 23, 2024

Water Journey Video

- Link to video