Welcome

The meeting will begin shortly, in the meantime please:

- Keep your phone muted during the meeting
- If you have a question/comment during the meeting type it in the chat box and it will be read and addressed
- If you experience any technical difficulties, please contact ADWR Help Desk at 602-771-8444 or tickets@azwater.gov

Phoenix AMA GUAC
January 26th, 2024

Meeting Agenda

1. *Call to Order – Welcome & Introductions – Chair*
2. *Meeting Logistics – Nicholas Mason, ADWR*
3. *Annual Drought Status Report – Laney Meeker, ADWR*

Laney will provide an update on drought status

4. *Supply and Demand Assessment Results – Collin Wogenstahl, ADWR*

Collin will present the 2023 Supply and Demand assessment results

5. *Water Management Assistance Program Updates*

a. Review withdrawal fee rates and money collected in past five years, WMAP projects, and remaining balance – Melissa Sikes, ADWR

The Council will hear the status of the WMAP fund and current projects.

6. *WMAP DCP Completed Project Presentations*

a. Gary Woodard – Water Resource Consulting's Water Efficiency Audits for HOA Common Areas and Other Irrigation Customers – Gary Woodard, Water Resource Consulting

b. Esser Design, L.L.C.'s Bringing the Groundwater System to Light through an Education Outreach Campaign/Video Series Targeting Youth and Adults – Pam Esser, Esser Design, L.L.C.

7. *AMA Director Report – Natalie Mast, ADWR*

Natalie will provide an update on ADWR activities, staffing, and the Governor's Water Policy Council

8. *Call to the Council – Council*
9. *Call to the Public – Chair*
10. *Adjournment – Chair*

Meeting Agenda

1. Call to Order – Welcome & Introductions – Chair
2. Meeting Logistics – Nicholas Mason, ADWR
3. Annual Drought Status Report – Laney Meeker, ADWR

Laney will provide an update on drought status

4. Supply and Demand Assessment Results – Collin Wogenstahl, ADWR

Collin will present the 2023 Supply and Demand assessment results

5. Water Management Assistance Program Updates

a. Review withdrawal fee rates and money collected in past five years, WMAP projects, and remaining balance – Melissa Sikes, ADWR

The Council will hear the status of the WMAP fund and current projects.

6. WMAP DCP Completed Project Presentations

a. Gary Woodard – Water Resource Consulting's Water Efficiency Audits for HOA Common Areas and Other Irrigation Customers – Gary Woodard, Water Resource Consulting

b. Esser Design, L.L.C.'s Bringing the Groundwater System to Light through an Education Outreach Campaign/Video Series Targeting Youth and Adults – Pam Esser, Esser Design, L.L.C.

7. AMA Director Report – Natalie Mast, ADWR

Natalie will provide an update on ADWR activities, staffing, and the Governor's Water Policy Council

8. Call to the Council – Council
9. Call to the Public – Chair
10. Adjournment – Chair

Meeting Logistics

- For guests joining online:
  - Please keep your phone muted during the meeting
  - Type your question/comment in the chat box and it will be read and addressed
- During the Call to Public attendees will have the option to speak to the Council
- This meeting is being recording and will be posted to ADWR's website
- With any technical difficulties please contact ADWR Help Desk at 602-771-8444 or tickets@azwater.gov

Meeting Agenda

1. Call to Order – Welcome & Introductions – Chair
2. Meeting Logistics – Nicholas Mason, ADWR
3. Annual Drought Status Report – Laney Meeker, ADWR

Laney will provide an update on drought status

4. Supply and Demand Assessment Results – Collin Wogenstahl, ADWR

Collin will present the 2023 Supply and Demand assessment results

5. Water Management Assistance Program Updates

a. Review withdrawal fee rates and money collected in past five years, WMAP projects, and remaining balance – Melissa Sikes, ADWR

The Council will hear the status of the WMAP fund and current projects.

6. WMAP DCP Completed Project Presentations

a. Gary Woodard – Water Resource Consulting's Water Efficiency Audits for HOA Common Areas and Other Irrigation Customers – Gary Woodard, Water Resource Consulting

b. Esser Design, L.L.C.'s Bringing the Groundwater System to Light through an Education Outreach Campaign/Video Series Targeting Youth and Adults – Pam Esser, Esser Design, L.L.C.

7. AMA Director Report – Natalie Mast, ADWR

Natalie will provide an update on ADWR activities, staffing, and the Governor's Water Policy Council

8. Call to the Council – Council
9. Call to the Public – Chair
10. Adjournment – Chair

ADWR Drought Program & Drought Status Update

Phoenix AMA GUAC
January 26, 2024

Laney Meeker
Statewide Planning Section Programs Supervisor

ADWR Drought Program

* 2003 Governor's Drought Taskforce
  * Set framework for current ADWR Drought program
* 2004 Drought Preparedness Operational Plan
  * Set framework for drought preparedness in the state and drought working committees

Drought Interagency Coordinating Group

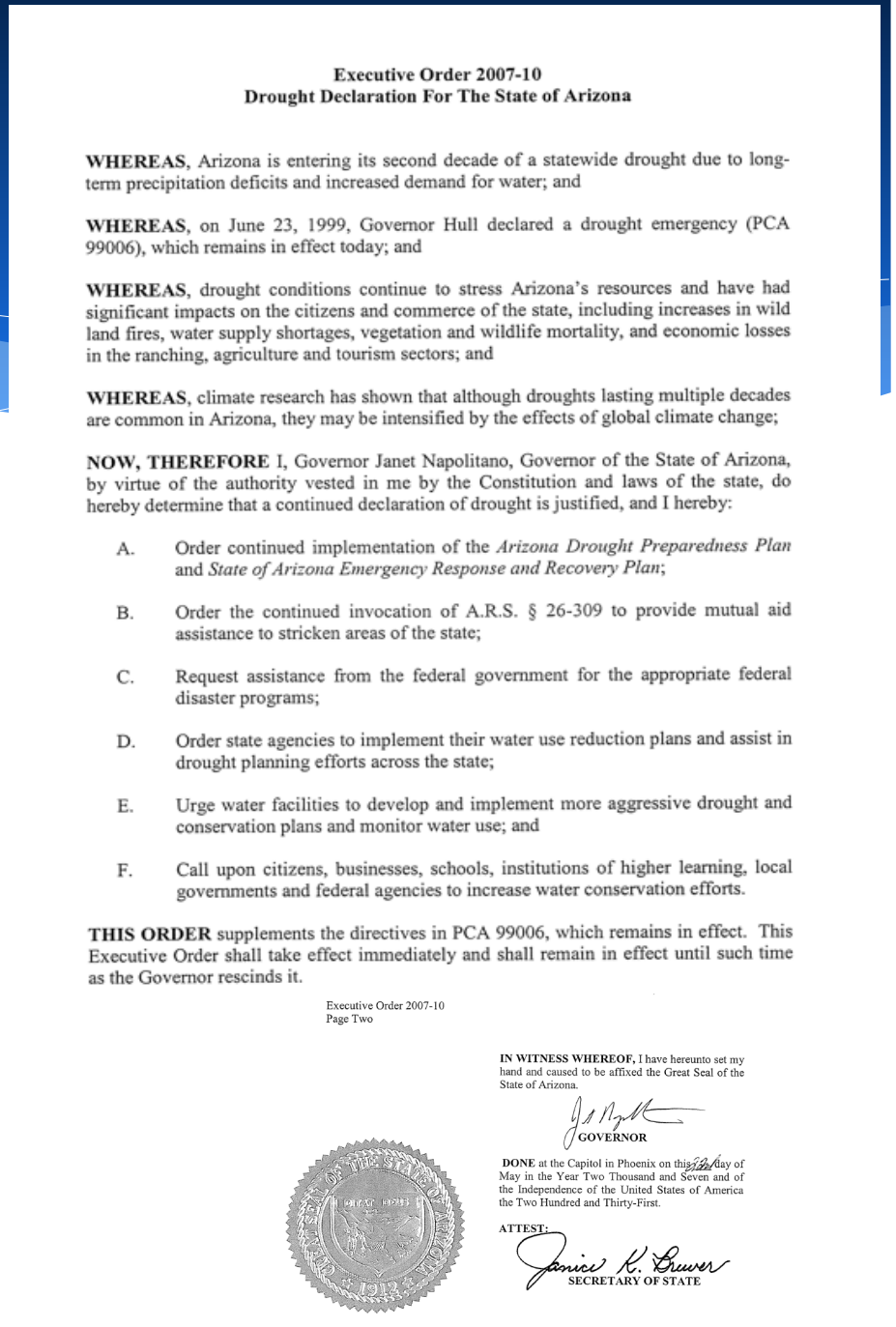
* The Interagency Coordinating Group (ICG) is an advisory body to the governor on Arizona drought issues. Comprised of state, federal and non-governmental organizations, this group meets twice a year to evaluate drought conditions and consider recommendations to the governor.

* Arizona has had a Drought Emergency Declaration (PCA 99006) in effect since June 1999 and a Drought Declaration (Executive Order 2007-10) has been in effect since May 2007.

* The Drought Interagency Coordinating Group unanimously recommended that both drought declarations be kept in place.

* The meeting agenda, summary, and presentations are posted on the ADWR ICG webpage.

* Next Meeting: May 2024, exact date TBD



Executive Order 2007-10
Drought Declaration For The State of Arizona

WHEREAS, Arizona is entering its second decade of a statewide drought due to long-term precipitation deficits and increased demand for water; and

WHEREAS, on June 23, 1999, Governor Hull declared a drought emergency (PCA 99006), which remains in effect today; and

WHEREAS, drought conditions continue to stress Arizona's resources and have had significant impacts on the citizens and commerce of the state, including increases in wild land fires, water supply shortages, vegetation and wildlife mortality, and economic losses in the ranching, agriculture and tourism sectors; and

WHEREAS, climate research has shown that although droughts lasting multiple decades are common in Arizona, they may be intensified by the effects of global climate change;

NOW, THEREFORE I, Governor Janet Napolitano, Governor of the State of Arizona, by virtue of the authority vested in me by the Constitution and laws of the state, do hereby determine that a continued declaration of drought is justified, and I hereby:

A. Order continued implementation of the *Arizona Drought Preparedness Plan* and *State of Arizona Emergency Response and Recovery Plan*;

B. Order the continued invocation of A.R.S. § 26-309 to provide mutual aid assistance to stricken areas of the state;

C. Request assistance from the federal government for the appropriate federal disaster programs;

D. Order state agencies to implement their water use reduction plans and assist in drought planning efforts across the state;

E. Urge water facilities to develop and implement more aggressive drought and conservation plans and monitor water use; and

F. Call upon citizens, businesses, schools, institutions of higher learning, local governments and federal agencies to increase water conservation efforts.

THIS ORDER supplements the directives in PCA 99006, which remains in effect. This Executive Order shall take effect immediately and shall remain in effect until such time as the Governor rescinds it.

Executive Order 2007-10
Page Two

IN WITNESS WHEREOF, I have hereunto set my hand and caused to be affixed the Great Seal of the State of Arizona.

GOVERNOR

DONE at the Capitol in Phoenix on this 16th day of May in the Year Two Thousand and Seven and of the Independence of the United States of America the Two Hundred and Thirty-First.

ATTEST:

SECRETARY OF STATE

Drought Monitoring Technical Committee

* December 2023 Short-term Drought Status Discussion
* October-December 2023 Long-term Drought Status Discussion – Erinanne Saffell – State Climatologist
* Objective Weather and Climate Data – Mark O'Malley – National Weather Service
* Agency Updates: SRP, ADWR Colorado River, ADWR Drought Index Wells…
* Drought Related Impacts to Key Species on Pima County Conservation Lands – Ian Murray, Pima County
* Next Meeting – April 2024, exact date TBD

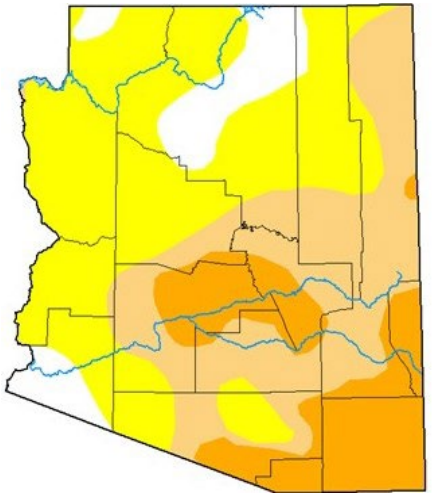
Local Drought Impact Groups (LDIGs)

County-level groups that:

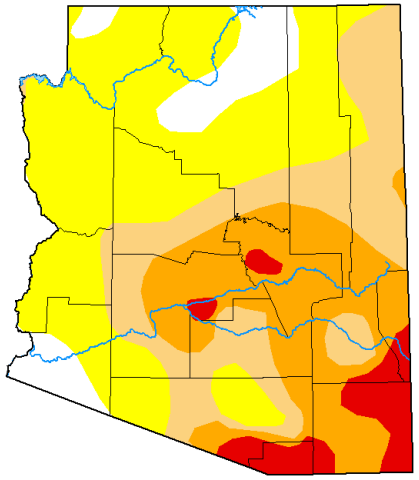
* Coordinate drought public awareness
* Provide impact assessment information to local and state leaders
* Implement and initiate local mitigation and response options
* Coordinated locally
    * Currently only Pima LDIG

Monthly Short-Term Drought Status Maps

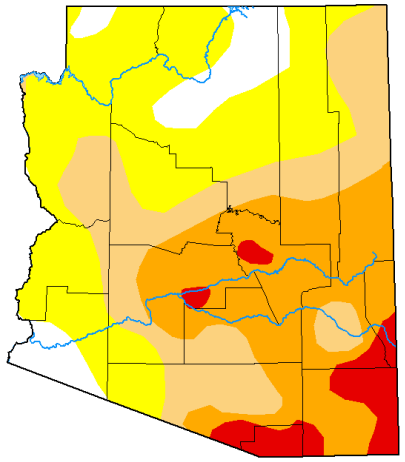
Past 5 Months



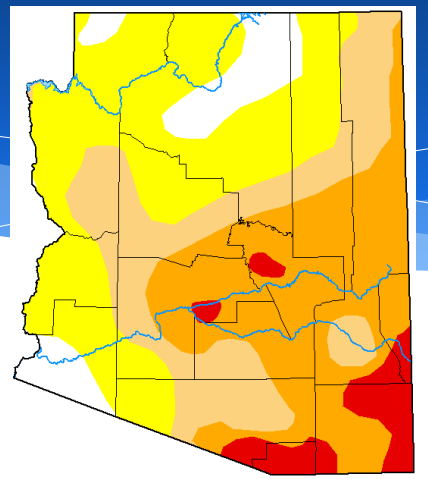
August 2023



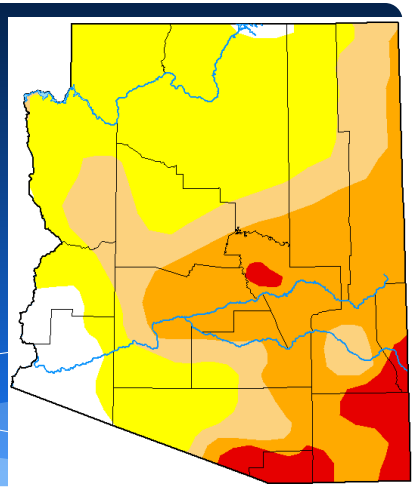
September 2023



October 2023



November 2023



December 2023

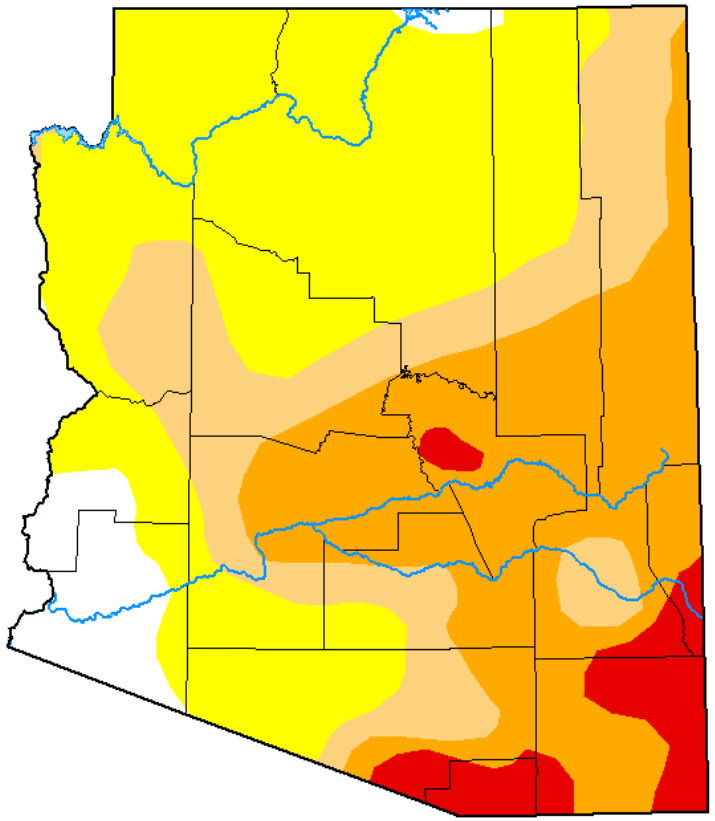
Drought Conditions

- None
- D0 - Abnormally Dry
- D1 - Moderate Drought
- D2 - Severe Drought
- D3 - Extreme Drought
- D4 - Exceptional Drought

Monthly Short-Term Drought Status
December 2023

U.S. Drought Monitor

Arizona



January 2, 2024

(Released Thursday, Jan. 4, 2024)

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	5.62	94.38	53.37	33.54	5.75	0.00
Last Week *12-26-2023*	10.98	89.02	53.37	33.54	5.75	0.00
3 Months Ago *10-03-2023*	8.12	91.88	50.63	28.02	6.09	0.00
Start of Calendar Year *01-02-2024*	5.62	94.38	53.37	33.54	5.75	0.00
Start of Water Year *09-26-2023*	8.12	91.88	47.06	22.74	5.34	0.00
One Year Ago *01-03-2023*	12.40	87.60	38.94	7.85	0.00	0.00

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

Author:

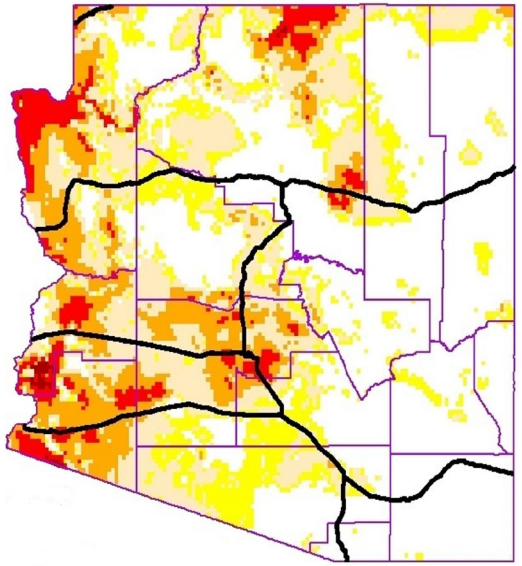
Lindsay Johnson
National Drought Mitigation Center

droughtmonitor.unl.edu

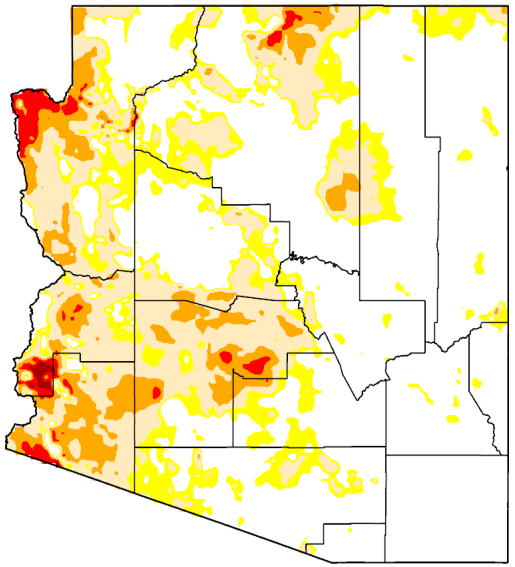
See most up to date ADWR Report here

Quarterly Long-Term Drought Status Maps

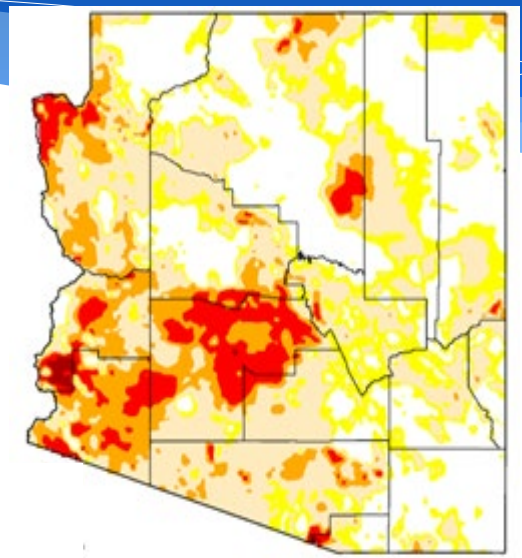
Jan-Mar 2023



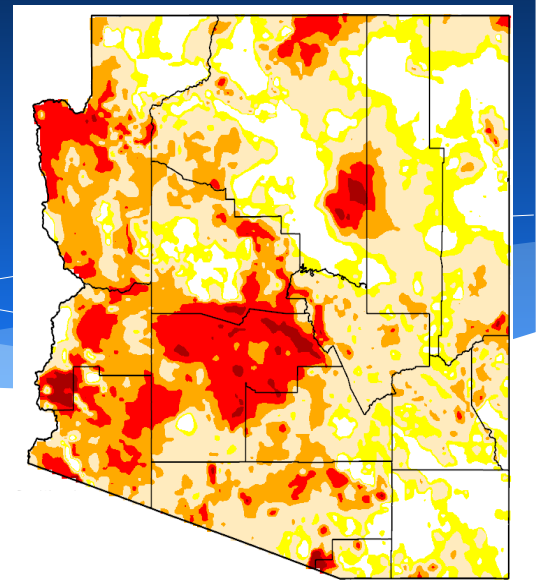
Apr-June 2023



July-Sept 2023



Oct-Dec 2023



Drought Conditions

- None
- D0 - Abnormally Dry
- D1 - Moderate Drought
- D2 - Severe Drought
- D3 - Extreme Drought
- D4 - Exceptional Drought

ARIZONA STATE CLIMATE OFFICE

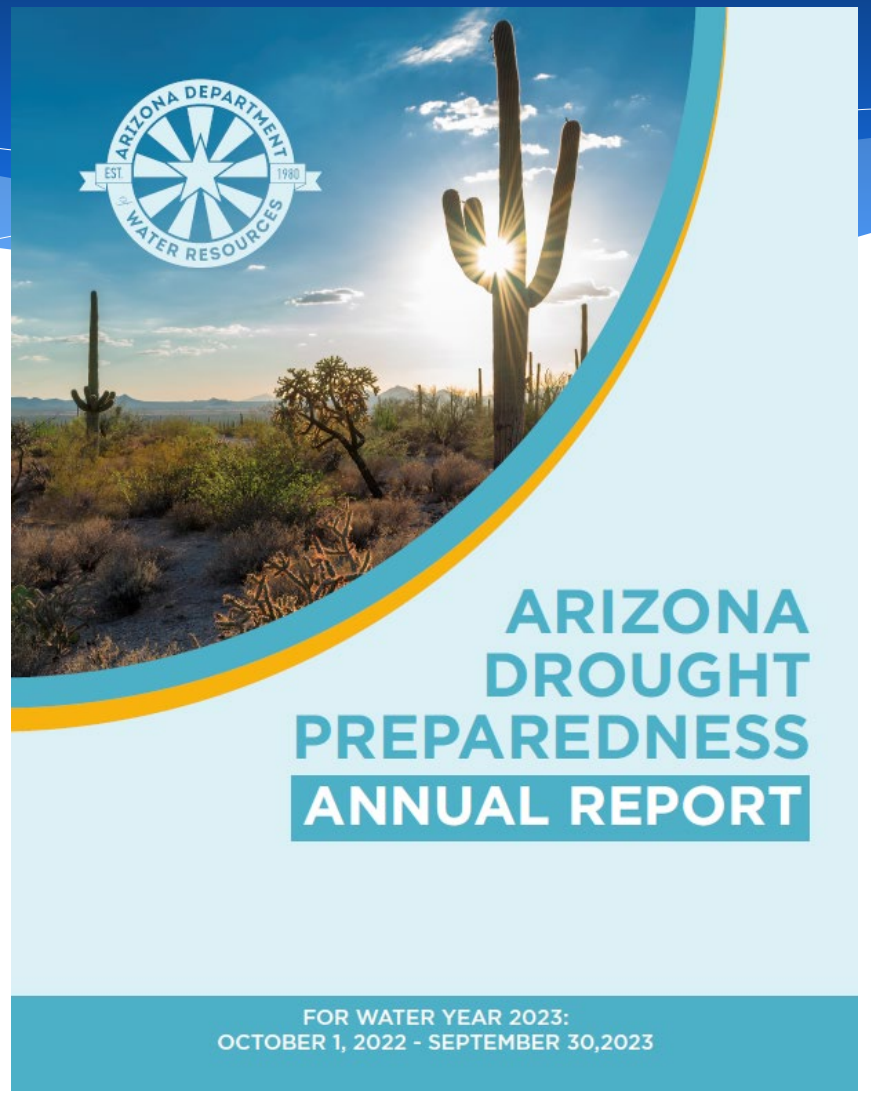
2023 Arizona Drought Preparedness Annual Report

* The *Arizona Drought Preparedness Plan* was adopted in 2004 and its continued implementation as ordered in 2007 (Executive Order 2007-10).

* ADWR prepares and annual report based on drought updates from the Drought Monitoring Technical Committee (MTC), Governor's Drought Interagency Coordinating Group (ICG), Local Drought Impact Groups (LDIGs), and others.

* The *2023 Arizona Drought Preparedness Annual Report* covers the drought conditions and preparedness activities for Water Year 2023, from October 1, 2022, through September 30, 2023.

[2023 Arizona Drought Preparedness Annual Report]



Collaborative Opportunities

* Drought Monitoring Technical Committee (MTC): Join drought observations & reporting discussions

* Create a Local Drought Impact Group (LDIG)

* Stay Informed: Email distribution lists & AZ Drought Preparedness Annual Report

ADWR Drought Program & Drought Status Update

Thank you!

arizonadrought@azwater.gov

https://new.azwater.gov/drought

Laney Meeker
Statewide Planning Section Programs Supervisor
lmeeker@azwater.gov

Meeting Agenda

1. Call to Order – Welcome & Introductions – Chair
2. Meeting Logistics – Nicholas Mason, ADWR
3. Annual Drought Status Report – Laney Meeker, ADWR

Laney will provide an update on drought status

4. Supply and Demand Assessment Results – Collin Wogenstahl, ADWR

Collin will present the 2023 Supply and Demand assessment results

5. Water Management Assistance Program Updates

a. Review withdrawal fee rates and money collected in past five years, WMAP projects, and remaining balance – Melissa Sikes, ADWR

The Council will hear the status of the WMAP fund and current projects.

6. WMAP DCP Completed Project Presentations

a. Gary Woodard – Water Resource Consulting's Water Efficiency Audits for HOA Common Areas and Other Irrigation Customers – Gary Woodard, Water Resource Consulting

b. Esser Design, L.L.C.'s Bringing the Groundwater System to Light through an Education Outreach Campaign/Video Series Targeting Youth and Adults – Pam Esser, Esser Design, L.L.C.

7. AMA Director Report – Natalie Mast, ADWR

Natalie will provide an update on ADWR activities, staffing, and the Governor's Water Policy Council

8. Call to the Council – Council
9. Call to the Public – Chair
10. Adjournment – Chair

Supply and Demand Assessment Results

Kevin Lane
Stakeholder Engagement Coordinator
Statewide Planning Section

January, 2024

Water Supply & Demand Statute

A.R.S. § 45-105(B)(14)

*"Not later than December 1, 2023 and on or before December 1 of each year thereafter, prepare and issue a water supply and demand assessment for at least six of the [**fifty-one**] groundwater basins established pursuant to section 45-403. The director shall ensure that a water supply and demand assessment is completed for all groundwater basins at least once every five years…"*

Water Supply & Demand Assessment - Managing Expectations

* Deadline: December 1, 2023 (and each December thereafter)

* Methods
  * Creating new structure/methods
  * Will improve on methods and add complexity over time

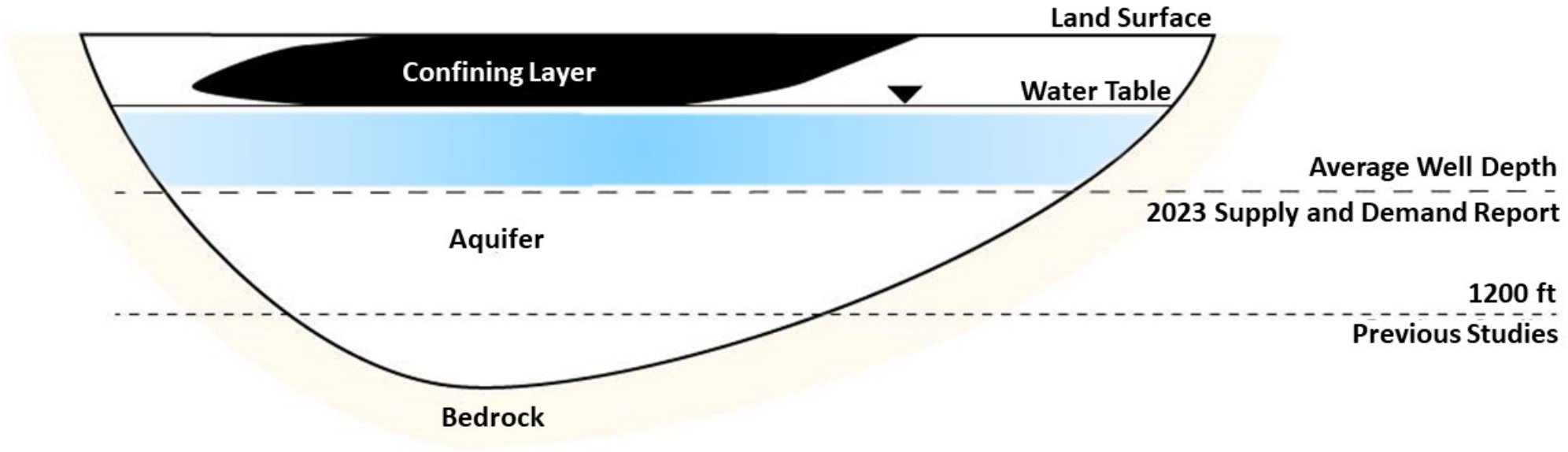
* Water budget is not a flow model
  * Not a spatial representation of water levels
  * Shows volumes as basin-scale totals

Water Supply & Demand Assessment provides data analysis intended for planning/informational purposes - not intended to be used as a regulatory tool.

Sectors

* **Agricultural**
* **Industrial**
  * Turf
  * Dairy
  * Feedlots
  * Grazing
  * Mining
  * Power
  * Sand and Gravel
  * Other
* **Municipal**
  * Residential Provider
  * Residential Non-Provider
  * Non-Residential
  * Lost & Unaccounted
* **Supply**
  * Groundwater
  * Surface Water
  * Colorado River
  * Effluent

2023 SDR Volumes of Water Available in Storage



Stakeholder Outreach

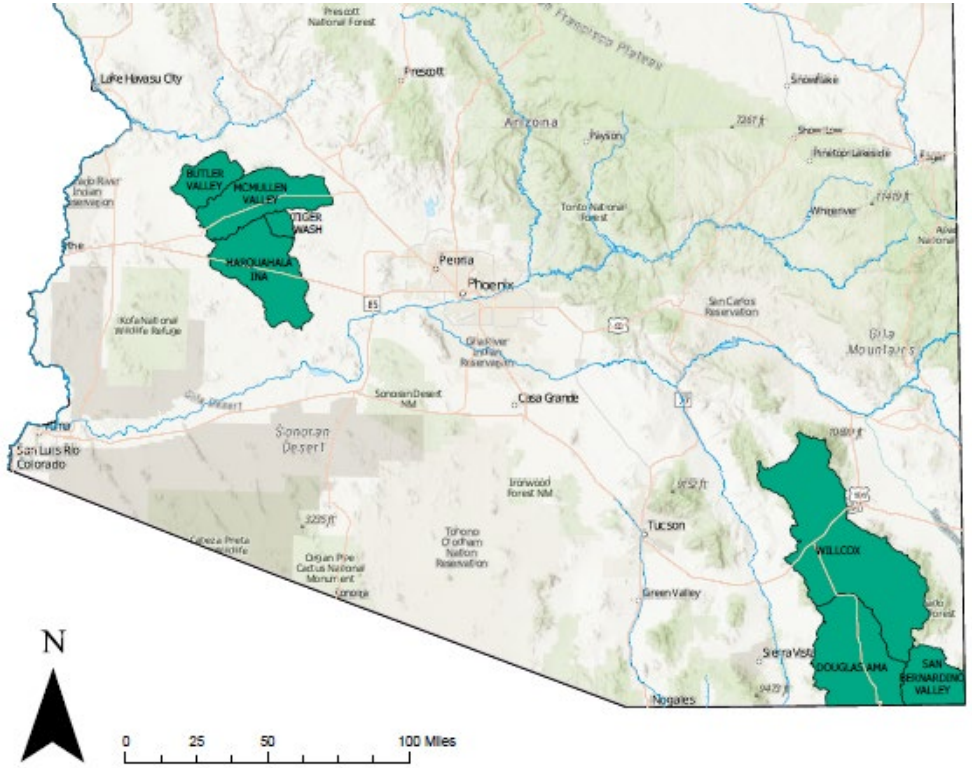
Initial outreach: Mail sent out to wide variety of stakeholders.

Stakeholder Meetings: Direct outreach to understand conditions in each basin.

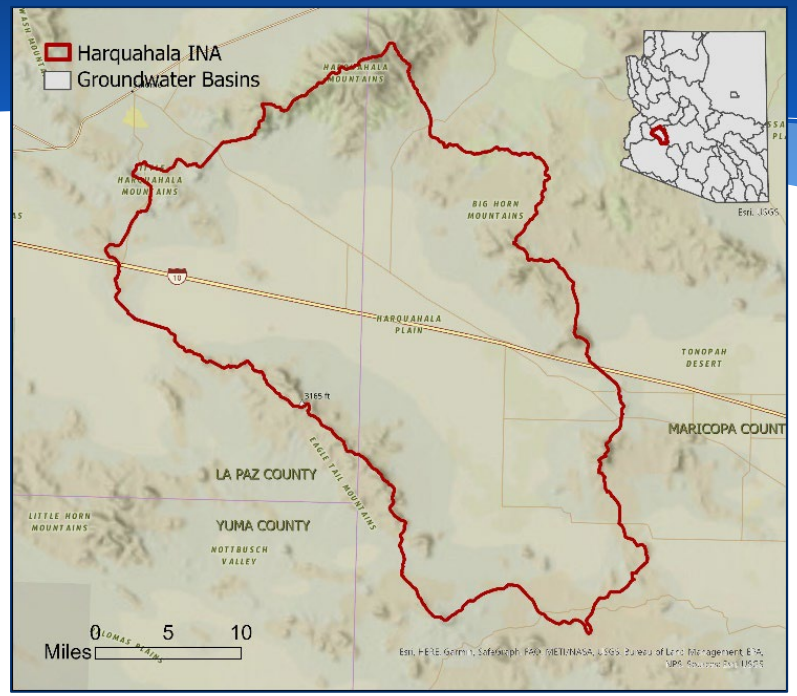
"boots on the ground" Field trips: Every basin we study we visit in person and meet stakeholders.

First Year (2023) Groundwater Basins Included in the Assessment

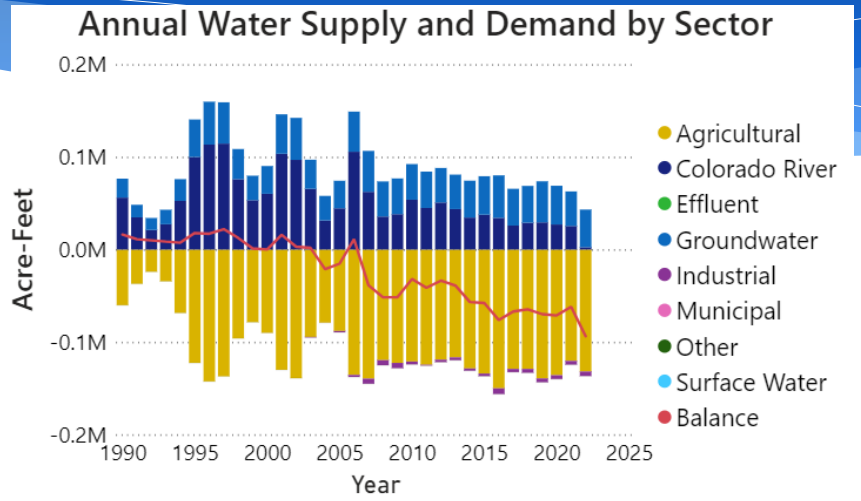
* West-Central Arizona Basins
  1. Harquahala INA
  2. McMullen Valley Basin
  3. Butler Valley Basin
  4. Tiger Wash Basin
* Southeastern Arizona Basins
  5. Douglas AMA
  6. Willcox Basin
  7. San Bernardino Valley Basin



Harquahala INA

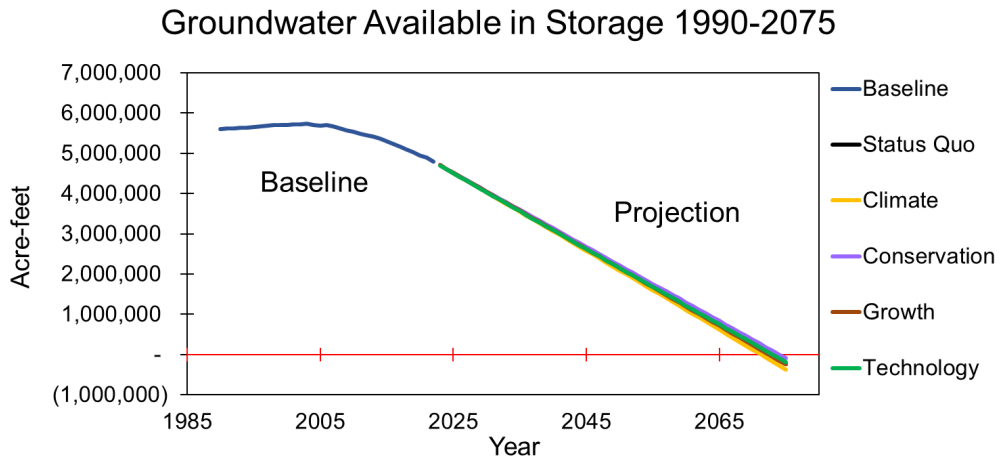


During the baseline period (1990-2022), for every 1 acre-foot of supply, 1.4 acre-feet were used.



Baseline groundwater in storage decreased by about 803,000 AF over 33 years (1990-2022).

Projected groundwater in storage decreases between about 4.8 to 5.1 million AF over 53 years (2023-2075).



Water Supply & Demand Assessment Deliverables

* Method: Basin-scale water budget and projections
* Data: Combination of reported data, existing estimates, newly developed estimates, and newly developed projection scenarios
  * Limited reported data – heavy reliance on estimates
    * 43/51 Basins are not required to report most water uses *(Exception: Community Water Systems)*
* Final Assessment Report and Online Data Tools

2024 Basin Selection

Agua Fria (AGF)

Big Sandy (BIS)

Cienega Creek (CCK)

Donnelly Wash (DON)

Gila Bend (GIL)

Lower San Pedro (LSP)

Prescott AMA (PRE)

Ranegras Plain (RAN)

Santa Cruz AMA (SCA)

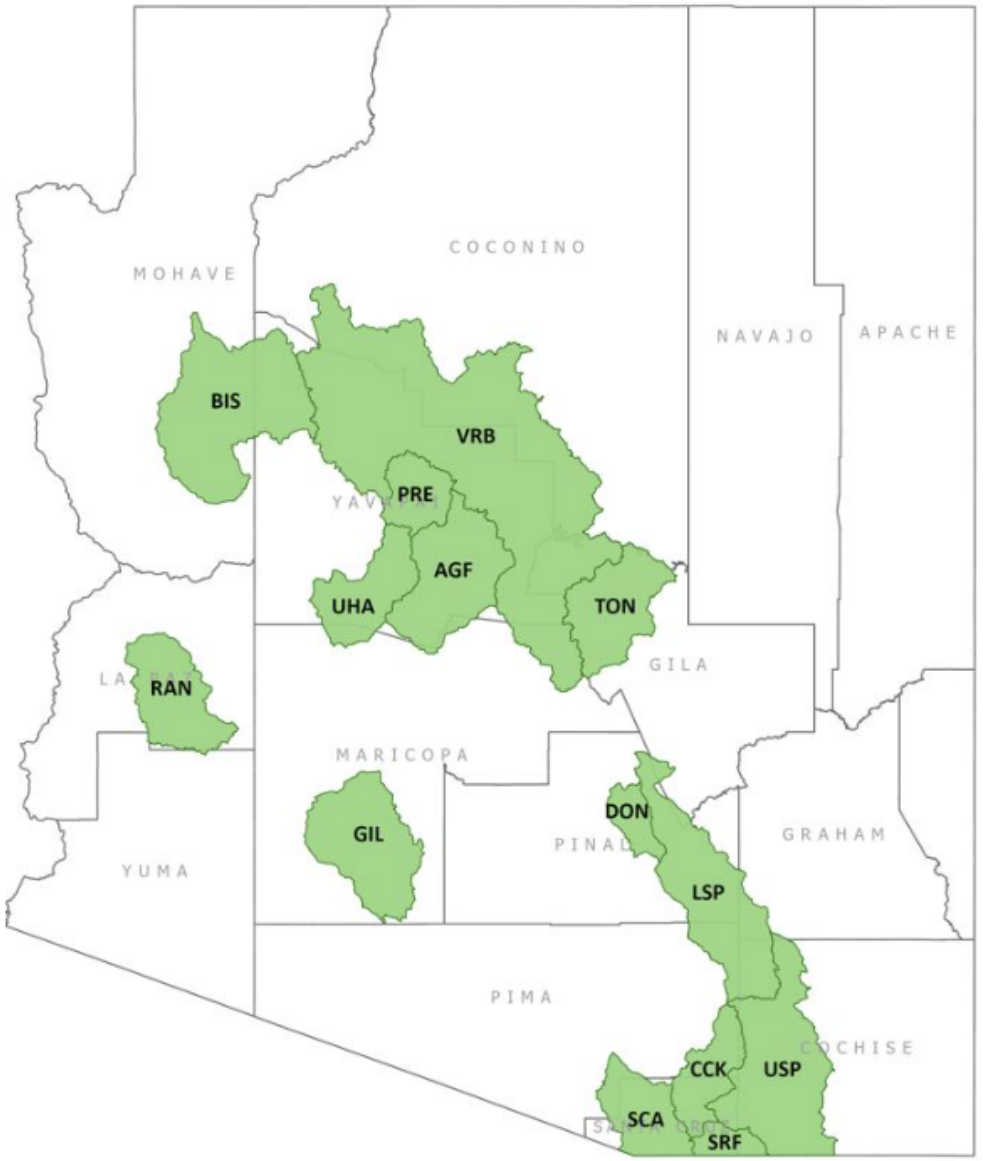
San Rafael (SRF)

Tonto Creek (TON)

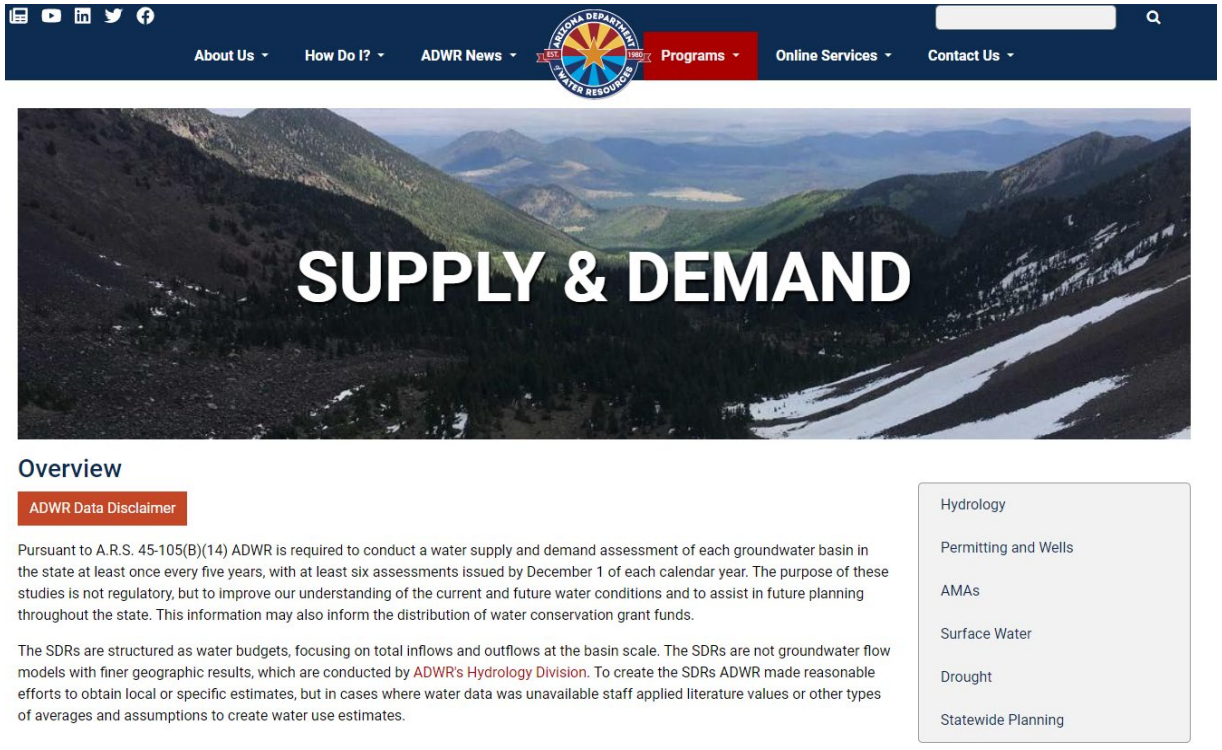
Upper Hassayampa (UHA)

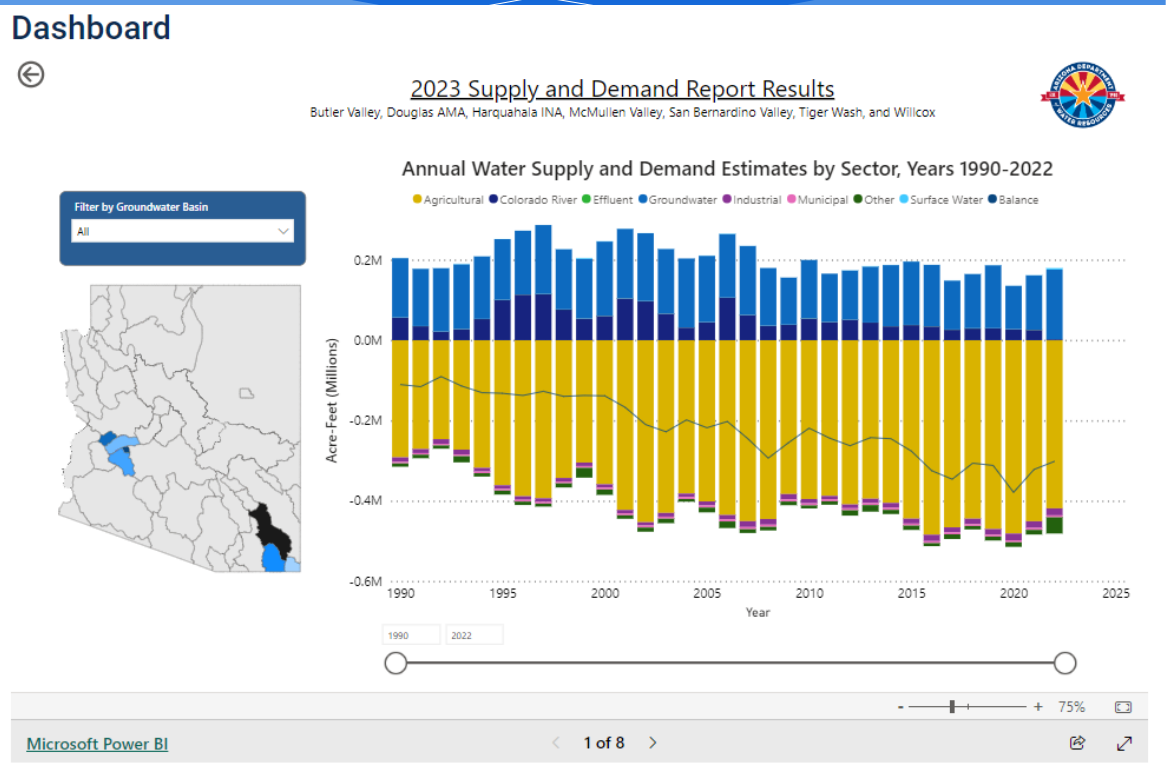
Upper San Pedro (USP)

Verde River (VRB)



Supply & Demand Website





https://www.azwater.gov/supply-demand

Questions?

Natalie Mast, AMA Director
602-771-4646
nlmast@azwater.gov

Collin Wogenstahl, S&D Program Supervisor
602-771-8540
cwogenstahl@azwater.gov

https://new.azwater.gov/

Meeting Agenda

1. Call to Order – Welcome & Introductions – Chair
2. Meeting Logistics – Nicholas Mason, ADWR
3. Annual Drought Status Report – Laney Meeker, ADWR

Laney will provide an update on drought status

4. Supply and Demand Assessment Results – Collin Wogenstahl, ADWR

Collin will present the 2023 Supply and Demand assessment results

5. Water Management Assistance Program Updates

a. Review withdrawal fee rates and money collected in past five years, WMAP projects, and remaining balance – Melissa Sikes, ADWR

The Council will hear the status of the WMAP fund and current projects.

6. WMAP DCP Completed Project Presentations

a. Gary Woodard – Water Resource Consulting's Water Efficiency Audits for HOA Common Areas and Other Irrigation Customers – Gary Woodard, Water Resource Consulting

b. Esser Design, L.L.C.'s Bringing the Groundwater System to Light through an Education Outreach Campaign/Video Series Targeting Youth and Adults – Pam Esser, Esser Design, L.L.C.

7. AMA Director Report – Natalie Mast, ADWR

Natalie will provide an update on ADWR activities, staffing, and the Governor's Water Policy Council

8. Call to the Council – Council
9. Call to the Public – Chair
10. Adjournment – Chair

PHOENIX ACTIVE MANAGEMENT AREA
Groundwater Withdrawal Information

Year		2019	2020	2021	2022	2023	2024	2025
WMAP	Fee	$0.25	$0.25	$0.25	$0.25	$0.25	$0.30	Max. $2.00
	Collected	$190,473	$192,269	$189,094	$204,201	N/A	N/A	
Admin & Enforcement	Fee	$0.50	$0.50	$0.50	$0.50	$0.50	$0.50	Min. $0.50 Max. $1.00
	Collected	$380,986	$385,250	$380,914	$408,401	N/A	N/A	
Water Bank	Fee	$2.50	$2.50	$2.50	$2.50	$2.50	$2.50	$2.50
	Collected	$1,904,932	$1,925,479	$1,904,572	$2,042,004	N/A	N/A	
Total	Fee	$3.25	$3.25	$3.25	$3.25	$3.25	$3.30	TBD
	Collected*	$2,691,035	$2,730,644	$2,731,949	$2,867,164	N/A	N/A	

*In addition to WMAP, Admin & Enforcement and Water Bank, amount includes late fees, recovery wells fee, and Water Quality Fund fee

Water Management Assistance Program Fund

Current Balance: $650,452

Encumbered/committed: $572,896

Remaining Balance: $77,556

Meeting Agenda

1. Call to Order – Welcome & Introductions – Chair

2. Meeting Logistics – Nicholas Mason, ADWR

3. Annual Drought Status Report – Laney Meeker, ADWR

Laney will provide an update on drought status

4. Supply and Demand Assessment Results – Collin Wogenstahl, ADWR

Collin will present the 2023 Supply and Demand assessment results

5. Water Management Assistance Program Updates

a. Review withdrawal fee rates and money collected in past five years, WMAP projects, and remaining balance – Melissa Sikes, ADWR

The Council will hear the status of the WMAP fund and current projects.

6. WMAP DCP Completed Project Presentations

a. Gary Woodard – Water Resource Consulting's Water Efficiency Audits for HOA Common Areas and Other Irrigation Customers – Gary Woodard, Water Resource Consulting

b. Esser Design, L.L.C.'s Bringing the Groundwater System to Light through an Education Outreach Campaign/Video Series Targeting Youth and Adults – Pam Esser, Esser Design, L.L.C.

7. AMA Director Report – Natalie Mast, ADWR

Natalie will provide an update on ADWR activities, staffing, and the Governor's Water Policy Council

8. Call to the Council – Council

9. Call to the Public – Chair

10. Adjournment – Chair

Selected Findings from Water Efficiency Audits of HOA Common Areas & Irrigation Meters

Gary Woodard, JD MPP

Gary Woodard
Water Resources Consulting

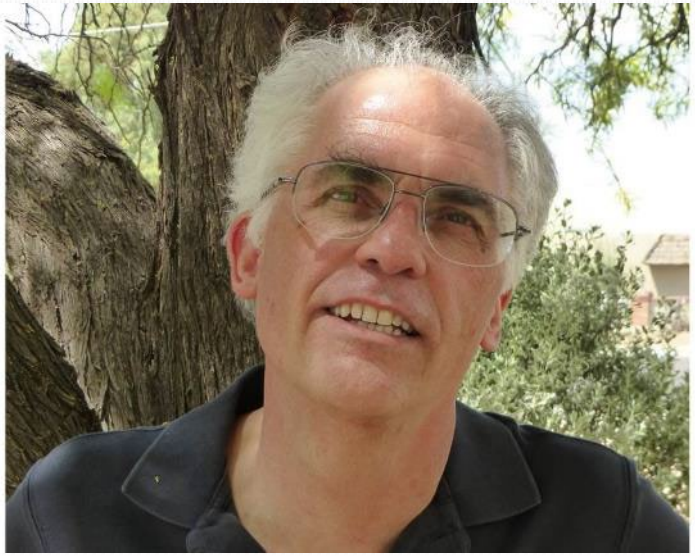
Roger Van Gelder, PE

Groundwater Conservation Grants
Final Report to Phoenix AMA GUAC

The water audit team

Gary C. Woodard, JD, MPP

Water Resources Consulting



Gary has 42 years experience in municipal water demand research, including 31 years at the University of Arizona, and 11 years as a consultant. This includes 8 years of CII water audit work for Scottsdale and Tucson.

Roger van Gelder, PE

Commercial Water Auditing

Over the past 25 years, Roger van Gelder has conducted water efficiency audits at hundreds of CII facilities, including for Scottsdale Water, Tucson Water, Seattle Public Utilities, and the California Public Utilities Commission.

Three major goals for all water audits:

- Help the customer save water and money
- Make them look good, and feel good about the process
- Quickly identify leaks and other cost-effective opportunities to significantly reduce water demand

Find the low-hanging fruit

Reviewing data with water customer

Underground leak near valve box

Patterns in CII water audit findings

After conducting scores of CII audits, patterns emerged:

- Leaks in buried irrigation lines are:
  - common (1 in 4 audits)
  - large (5.5 AFY average)
  - costly ($10K/year)
- When identified, leaks are quickly repaired
- Recommended equipment upgrades typically have a 5-month payback period
- Identified potential water savings average 12% of total water use

Repair of underground leak in irrigation line

Additional reasons to audit irrigation meters

Broken irrigation heads are common, producing intermittent “leaks”.

Failure to seasonally adjust water schedules is also endemic. Tucson Water estimates that 30-50% of irrigation systems in its service area have significant leaks and/or irrigation scheduling problems.

These irrigation scheduling issues take several forms:

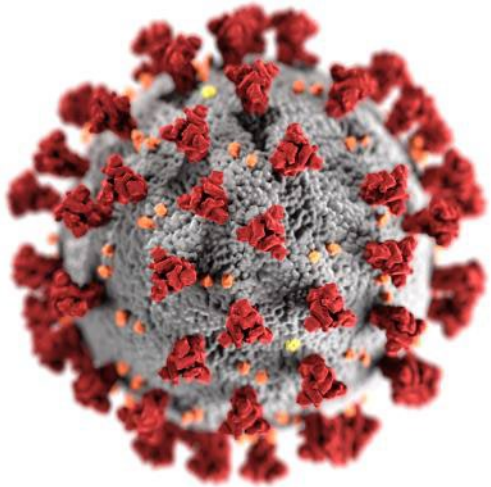
- chronic over-irrigation – too often or too long
- failure to adjust irrigation for precipitation, and
- failure to seasonally adjust the schedule

Project delays and extension due to pandemic and unexpected level of interest in audits

Silver lining – Many HOAs were already under economic stress. Water and sewer bills were becoming an issue, which intensified during the recession.

In addition, growing drumbeat about megadrought, shortages on the Colorado River, declining Lake Mead levels created an atmosphere highly conducive to water conservation in general.

Audits promised to save HOAs both money and water.



Budget request & supplemental funding sources

Request was for $162,960 to complete 60+ audits.

Award was for $120,000, with suggestion that I request the difference from the CAGRD.

CAGRD provided $10,000 to support pre-audit steps

Several water providers agreed to cost sharing to fund additional audits:

Goodyear	$15,000
Arizona Water Co.	$10,000
Chandler	$10,000
Queen Creek	$ 3,000
Avondale	$ 3,000
Global Water	$ 1,700
	$42,700

HOA/Irrigation Audits differ from CII audits

Pre-Analysis

- Several years of billing data and remote sensing were used to pre-screen potential sites for those most likely to have leaks and other irrigation issues

High-frequency Meter Logging

- ERT or logger data was gathered before the initial site visit for sites with suspicious usage levels and/or patterns of use

Concise Reports

- Short, heavily illustrated reports focused on the audit findings and recommendations

Step 1 – Preliminary Analysis

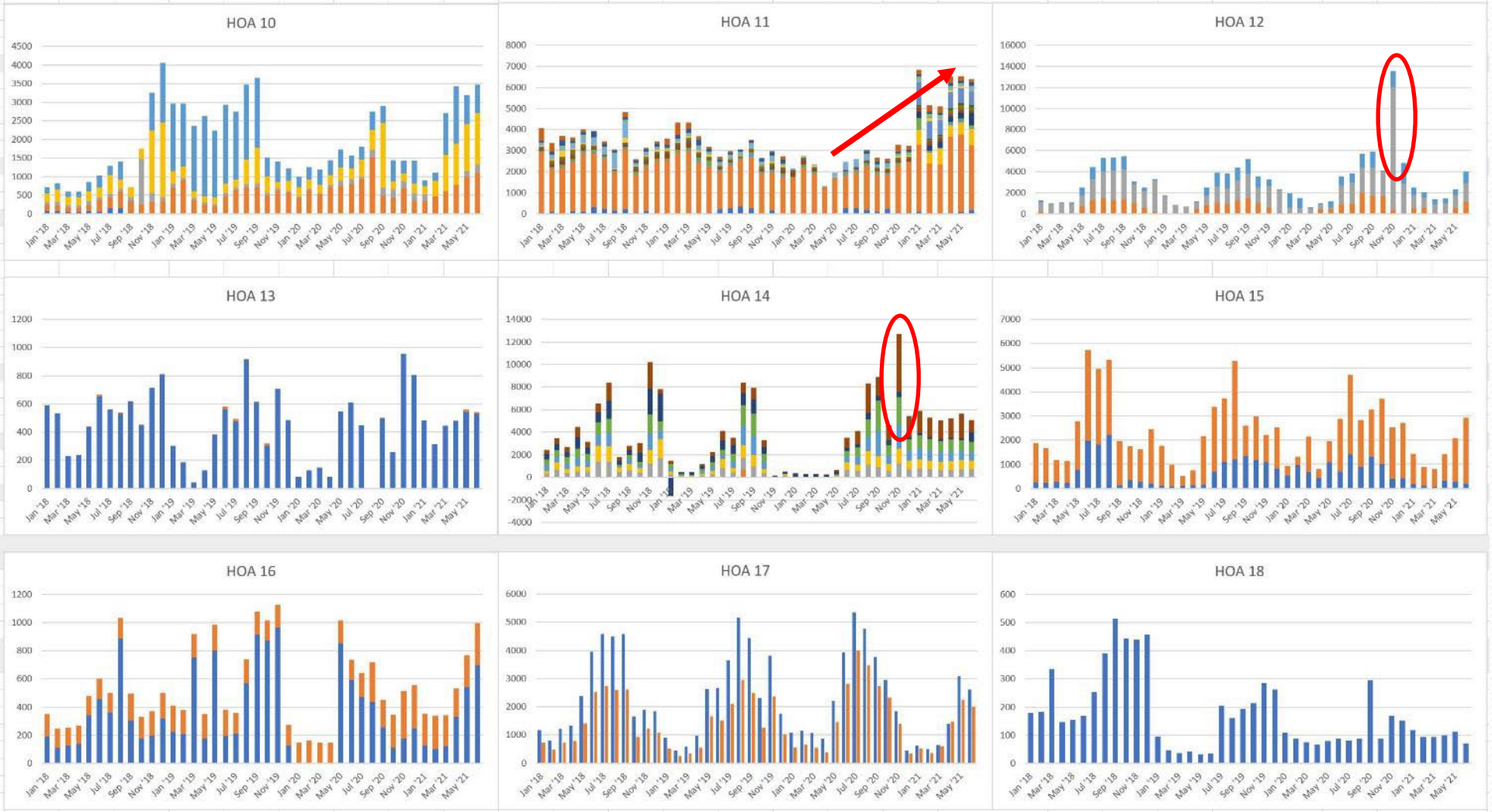
Develop a database of irrigation meter customers for participating municipal providers that includes:

- five years of monthly billing data
- where available, hourly water use from AMR-equipped maters (generally 40 days of hourly readings)
- Remote sensing images from Google Maps or Google Earth

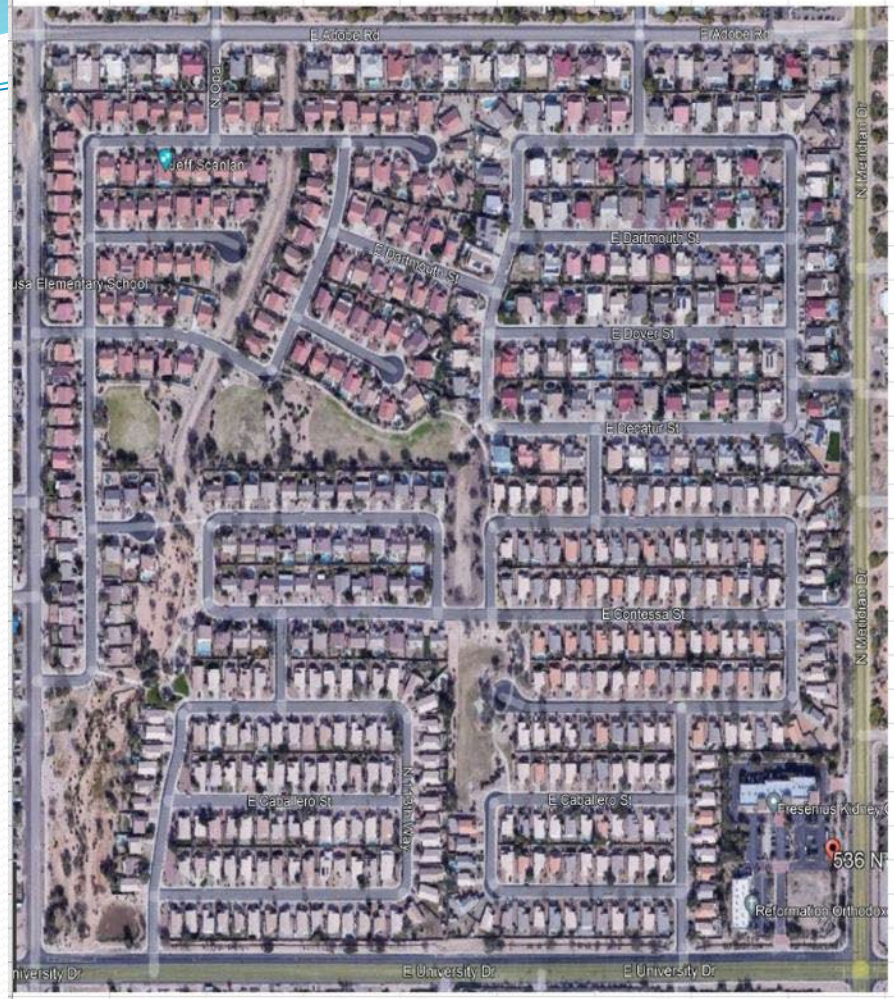
Usage data were examined for:

- Increases in usage over time
- Spikes in usage
- Continuous flows over 24-hour periods
- Lack of expected seasonality
- Rough estimates of irrigation efficiencies

Preliminary analysis begins with billing records

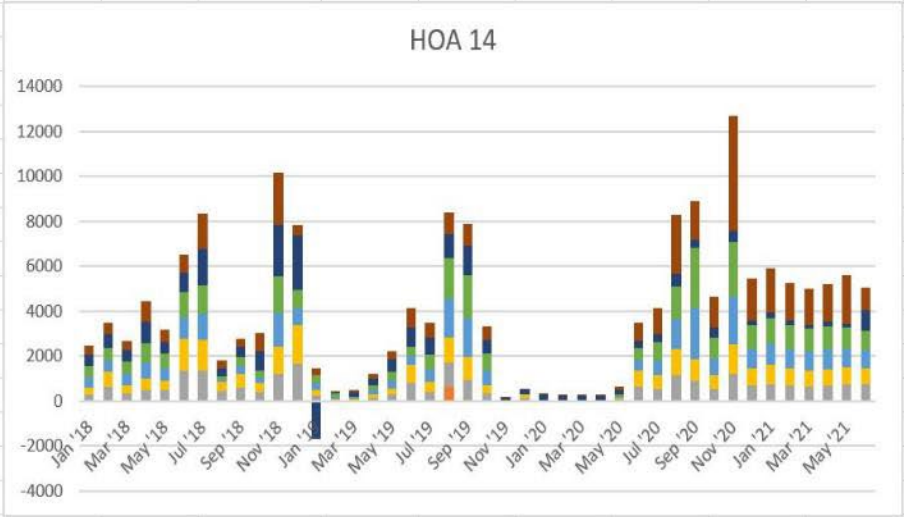


HOA 14



Entire HOA in summer, showing dormant common area turf

Closeup of turfed areas in winter, showing heavy irrigation



Conclusions:

There are 6 meters, and the usage through all of them increased dramatically during last winter. This pattern is not consistent with a single leak. It could be consistent with a decision to start overseeding with Rye, which appears to be confirmed through Google Earth data. Need to talk with HOA as to whether something has changed last November or December.

Conclusion re auditing pending estimation of Rye-only irrigation requirements.

5 turfed areas, very high quality turf in winter, poor to dormant in summer

Location	sq ft	acres
NW	29,905	0.69
NW	34,248	0.79
NE	54,697	1.26
E	40,348	0.93
SW	16,717	0.38
W	12,674	0.29
TOTAL	188,589	4.33

Audit decision is based on several factors

These include:

- Date of 1st service
- Relative age of irrigation system
- Number of meters
- Total annual water use
- Months of billing record
- Seasonality (none, weak, moderate, strong)
- Trend over time
- Usage over last 12 mos. as % of previous 12 mos.
- Miscellaneous information and other factors

Step 2 – Recruitment and site visits

Based on this analysis, customers with suspected leaks and scheduling problems were identified and offered free audits, with a priority given to HOAs.

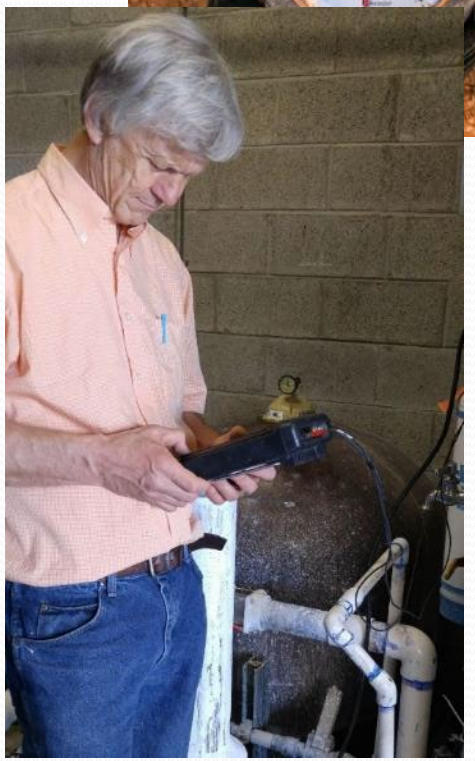
Sites agreeing to audits were typically visited twice during which:

- high-frequency loggers were attached to the irrigation meters
- data were downloaded and analyzed
- site was visually inspected for signs of leaks and broken heads
- conductivity readings were taken of all decorative water features and their source water, and
- ultrasonic meters possibly deployed to pinpoint leak locations

HOA common areas with a swimming pool received additional inspections, beginning With conductivity readings.

Instruments installed

- Meter loggers were installed on city meters with continuous flows but for which hourly ERT data was not available, or resolution was too low.
- Ultrasonic flow meters were deployed on critical lines where there was no meter.
- Conductivity meters were used to determine pool leaks, fountain issues, source water of puddles.



Step 3 – Analysis, report writing, follow-up

Audit findings are summarized in a succinct 6-page report.

Follow-up contact verify that necessary repairs and irrigation adjustments have been made.

Project effectiveness is measured by metrics that include:

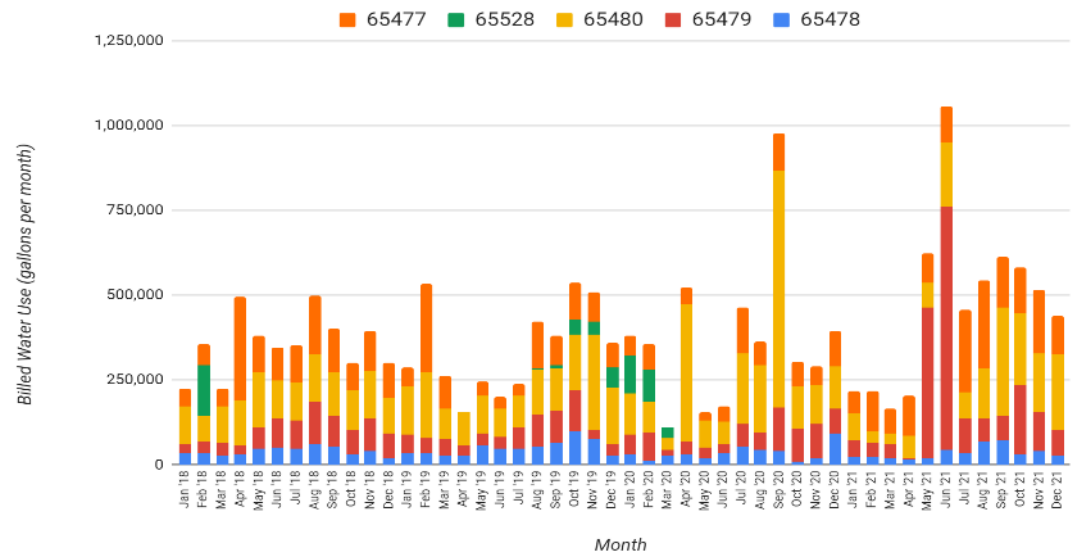
- Estimates of water savings based on quantified leaks and broken heads
- Estimates of water savings based on adjusted irrigation schedules
- Statistical estimates of water savings based on pre- and post-audit billing data

Non-quantifiable measures of effectiveness include opportunities to build or strengthen working relationships between HOAs and their municipal water providers.

Concise Reports

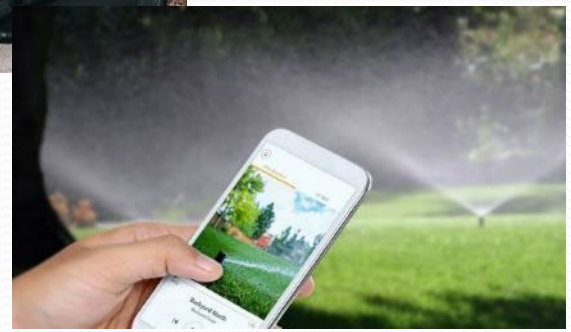
Customers receive a brief report that includes:

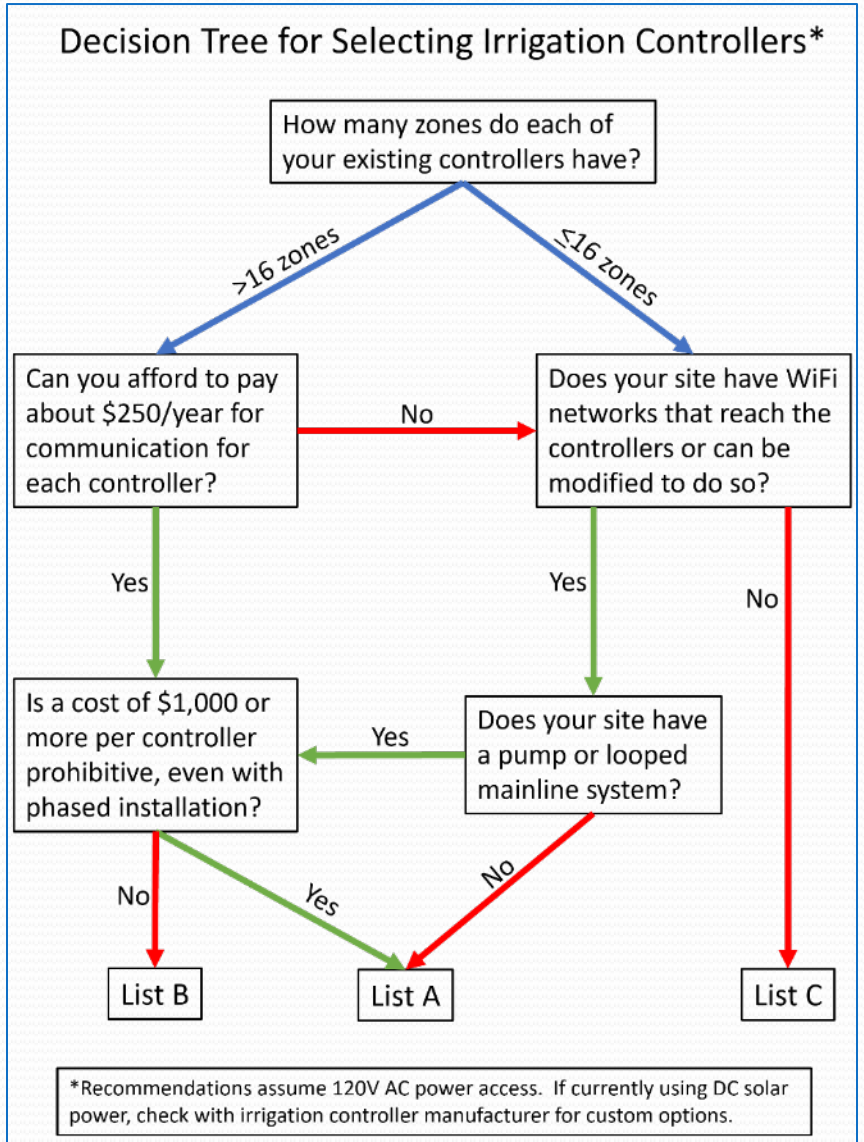
- Historical water use and costs analysis
- Detailed descriptions of water uses and efficiency issues by category
- Descriptions, charts, and photos of problems uncovered
- Proposed measures with estimated savings potential



Follow-up Support included:

- HOA irrigation management BMPs
- Post-audit survey and summary
- Smart controller purchase guide with decision tree
- Workshop on selecting and programming smart meters





Participating providers and service areas

- Arizona Water Company
  - Apache Junction, Gold Canyon, Superior, White Tanks
- Avondale
- CAGRD
- Chandler
- Global Water
- Goodyear
- Queen Creek
  - (no name), H2O Inc., Diversified Water
- Scottsdale

Summary of Audit Activity

Number	Activity
500+	Pre-analyses (billing & remote sensing data)
120+	Sites identified for potential audits
82	Unique sites visited
120+	Site visits made
80	Final reports
51	Reports on HOAs (64% of total)
187	Total recommendations made
2.5	Recommendations per report
67	Leaks detected
84%	Percent of sites with at least one leak detected

Non-HOA Common Area Sites

Sites were highly diverse, and included:

- Schools
- Parks & aquatic centers
- Strip mall landscaping
- Church, cemetery, rest stop

Sites also varied greatly in size and complexity, from 1 meter to over 20 meters, including sites with 57 and 74 meters.

The pre-analysis skewed selected sites towards those with more meters.

Summary of Audit Findings

379,447	Annual water use (Kgals)
1,164.5	Annual water use (AFY)
70,087	Potential savings (Kgals)
215.1	Potential savings (AFY)
20 %	Percent water savings
$2,341,599	Annual water bills
$ 375,892	Potential savings
$ 10,000	Average potential savings
17%	Percent monetary savings

HOA/Irrigation audits vs CII audits

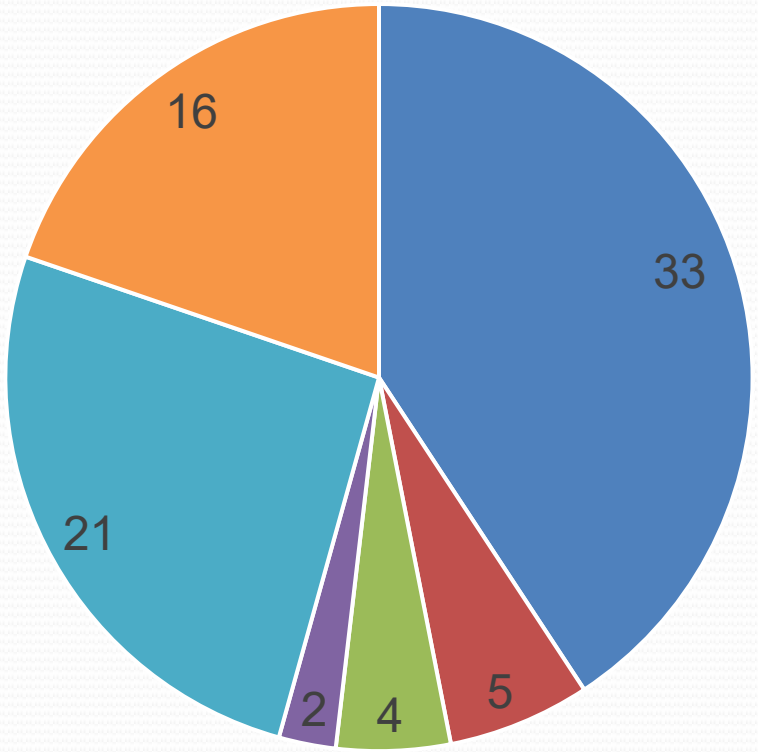
Our proposal to ADWR posited that focusing on HOAs and performing pre-analysis of potential audit sites would ***increase the frequency and relative size*** of uncovered leaks and other water use inefficiencies compared to CII audits. Here is what we found:

Audit Metric	CII Audits	HOA/Irrig. Audits
Water savings	12%	20% (67% greater)
Monetary savings	10%	17% (70% greater)
Irrigation meter leak(s)	25%	47% (88% greater)

These statistics support our pre-audit assumptions. The pre-analysis led to our focusing on sites with "red flags" in historic use patterns, thereby increasing the frequency of leaks.

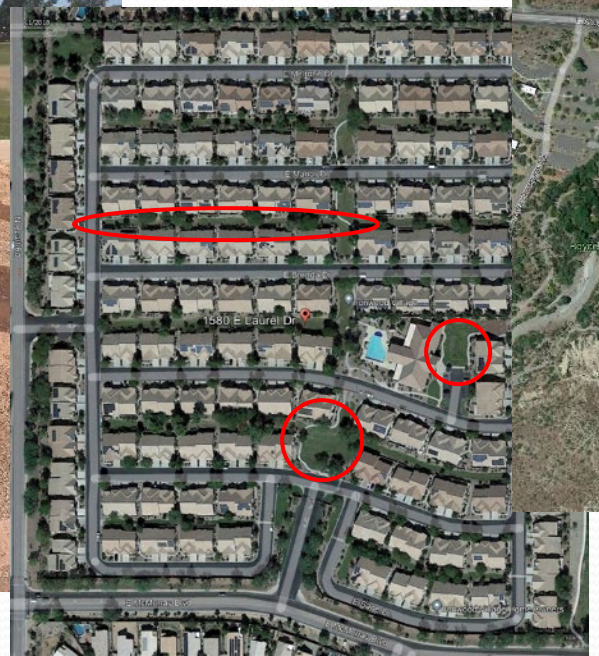
These audit results are consistent with the belief that HOA common areas are more likely to have leaks and other inefficiencies than CII customers, but they do not prove this.

Recommendations by Type

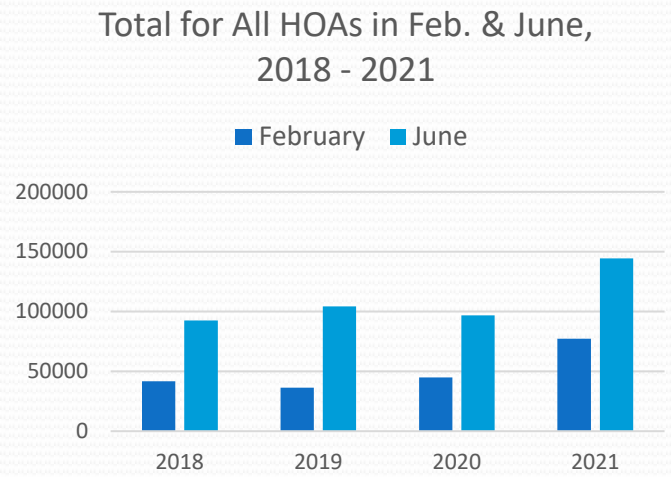


Examples of “other” recommendations

- Remove irrigation from areas with no landscaping
- Estimate potential water/money savings for removing some turf
- Install more meters and control valves
- Replace failed meter
- Provide guidance on redoing an entire irrigation system

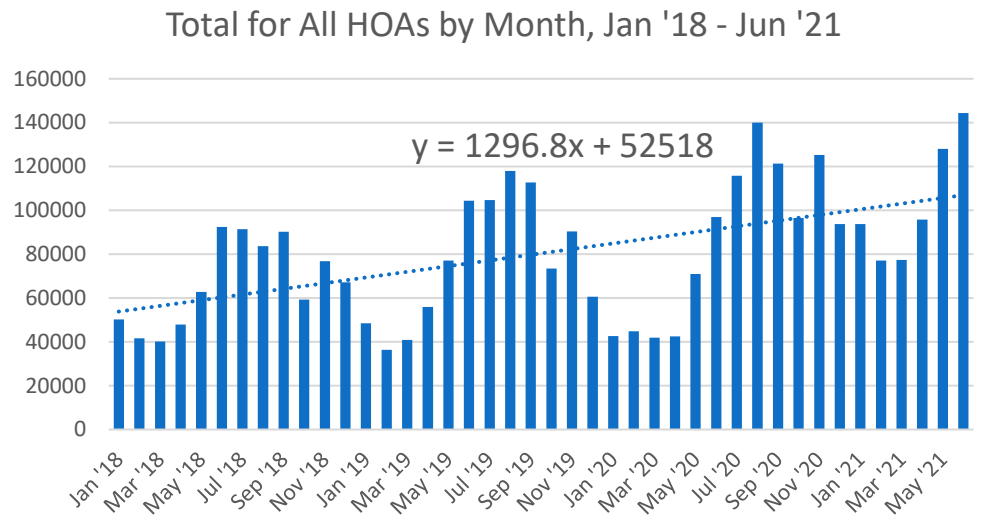


Broad observation – irrigation water use is increasing



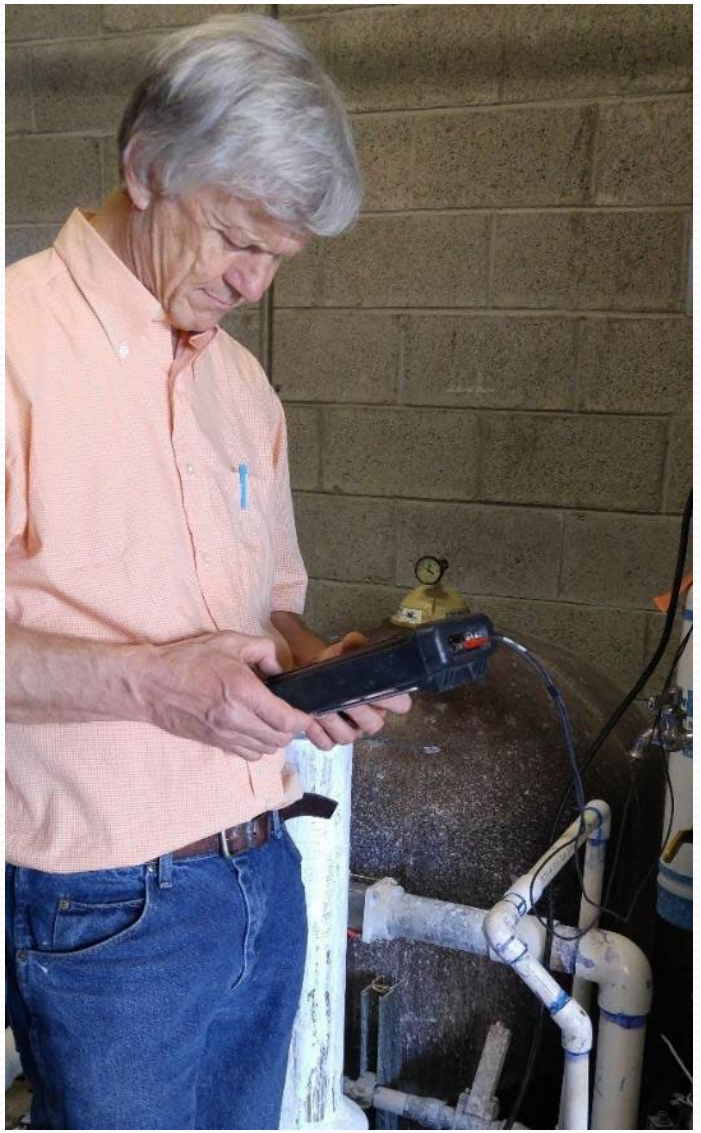
Water use across a sample of 57 HOA common areas increased in 2021 during both months of low and high demand.

When viewed monthly, use increased fairly steadily across the 4-year period.



Questions?

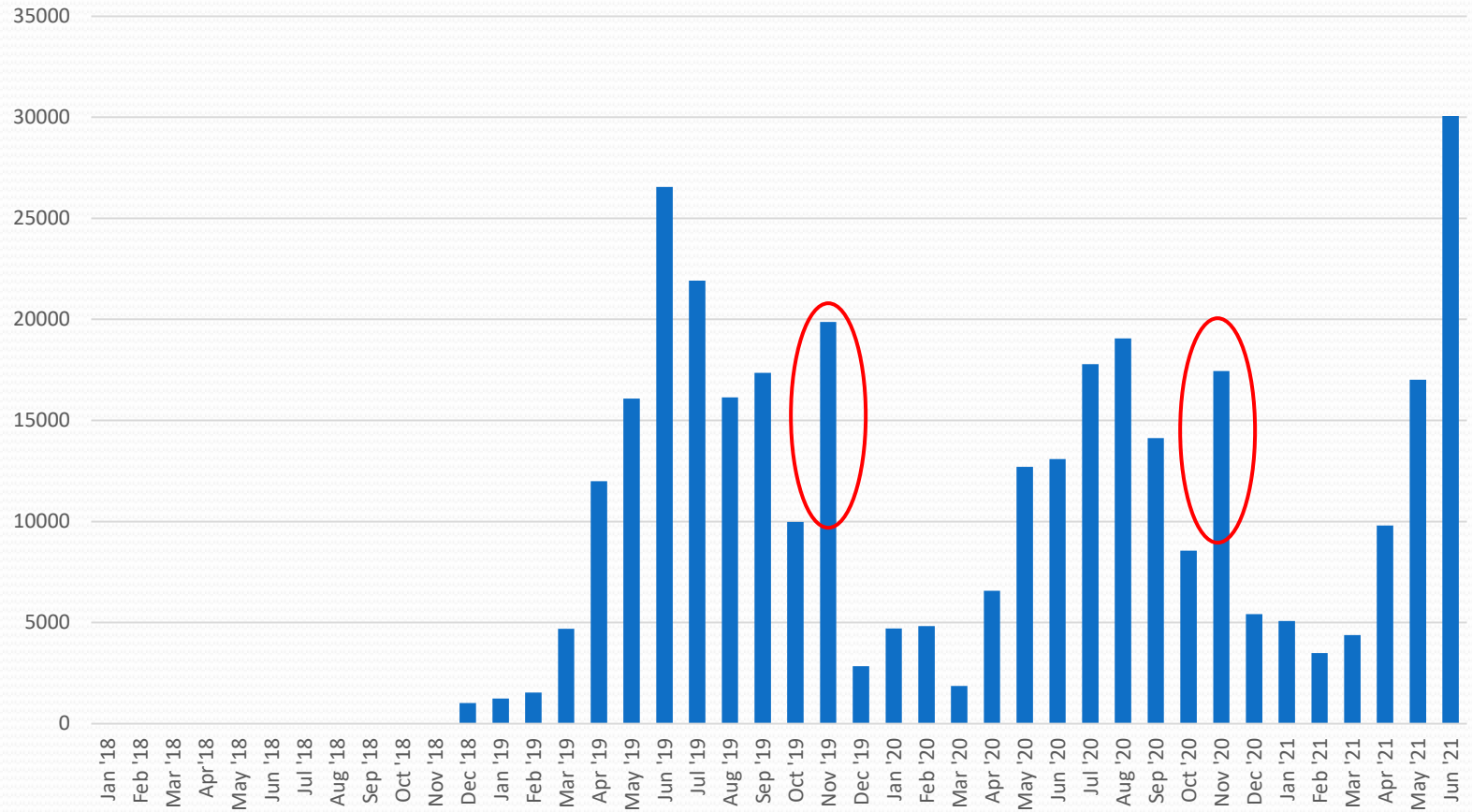
- *Identify customers with irrigation meters and low irrigation efficiencies*
- *Focus on HOA common areas*
- *Identify leaks, especially those with continuous flow*
- *Investigate other sources of leaks*
- *Make recommendations regarding repairs and upgrades to irrigation systems*
- *Follow up to verify actions taken and to quantify water savings*



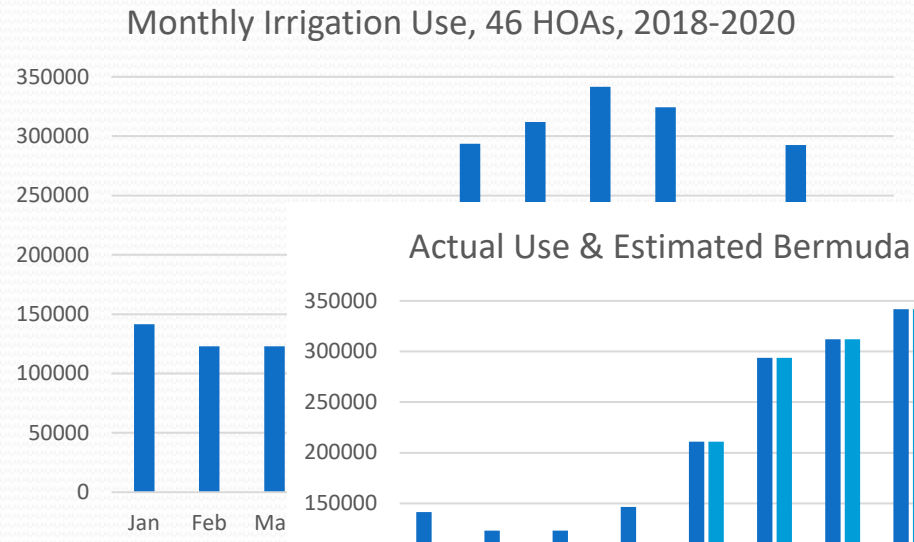
Deploying an ultrasonic flow meter at a pool to log unmetered flows

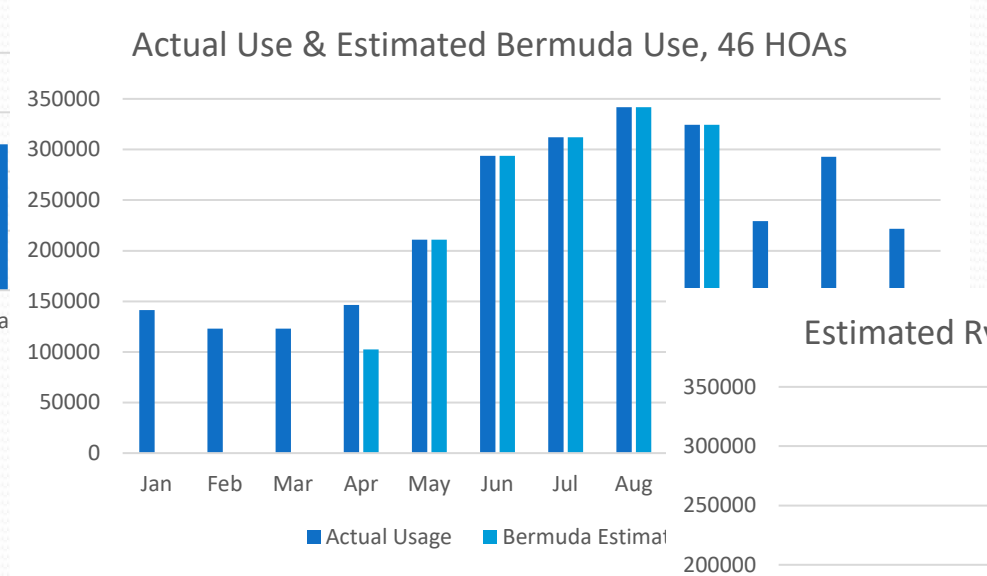
A frequent observation – over-irrigation of Rye grass

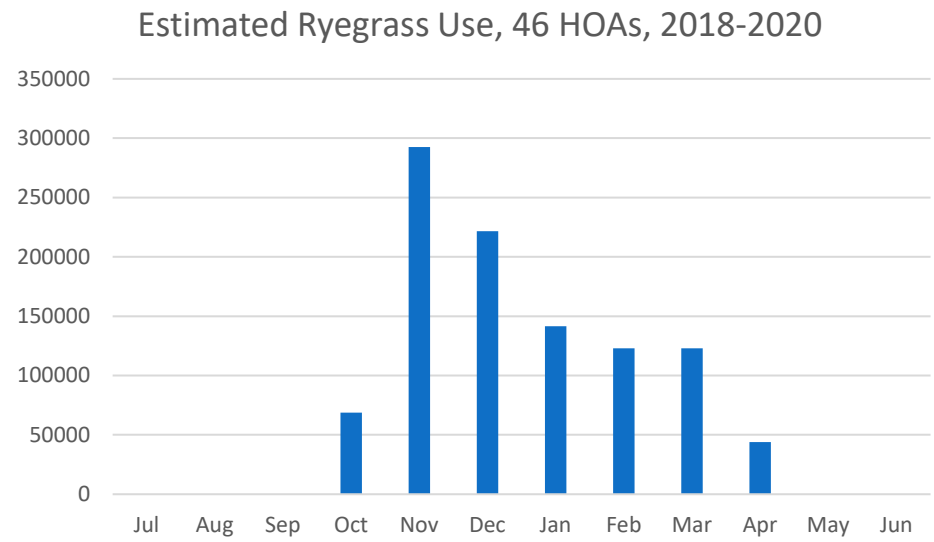
A not unusual finding is that HOAs with winter Rye grass use as much or even more water in November as in the middle of summer.



Rye grass is often heavily over-irrigated in November







Example issues, traces from audits

A surprising number of irrigation problems are obvious.

Flooded
control box

Seeping
irrigation head

Missing emitter

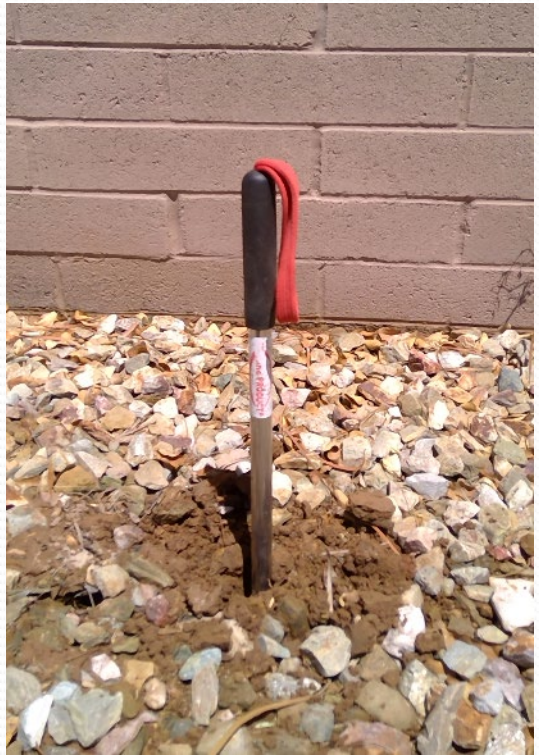
Leak at
control valve

Others require a bit of detective work

Missing irrigation head by sidewalk resulted in flood irrigation (note pattern of green grass)

Jammed controller cover could not be opened, despite there being no lock. This may partially explain why the controller appears not to have been adjusted in over a year.

A simple metal rod with handle is useful for probing for underground leaks.



Meter traces are most useful diagnostics

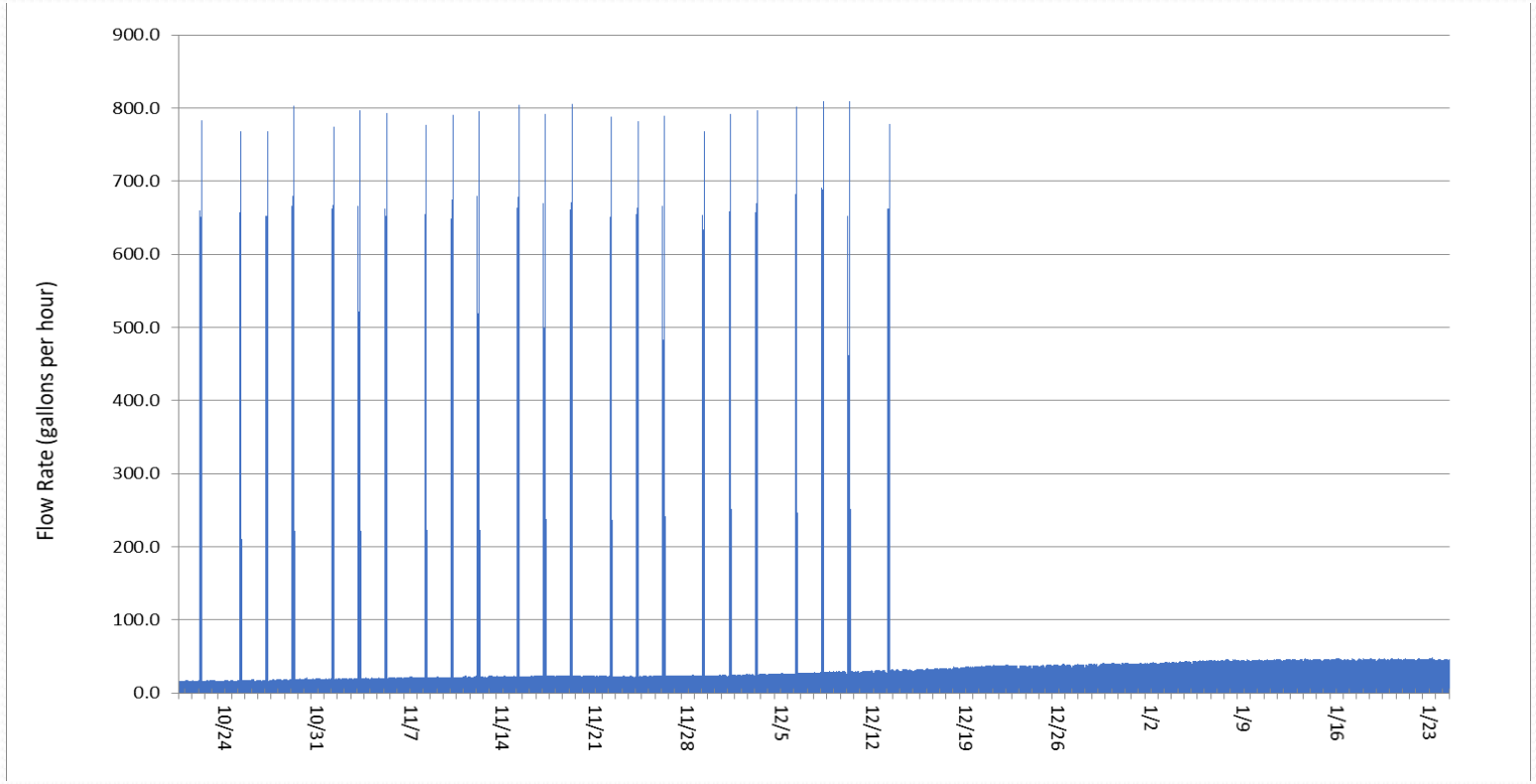
High-frequency water flow traces can be obtained from three sources:

- ERT data from newer meters, 1-hour resolution, 3+ months
- Meter logging from MagneFlow loggers, 5-second resolution, 24 hours to weeks or months
- Ultrasonic meters, 10-second resolution, 24 hours to a week

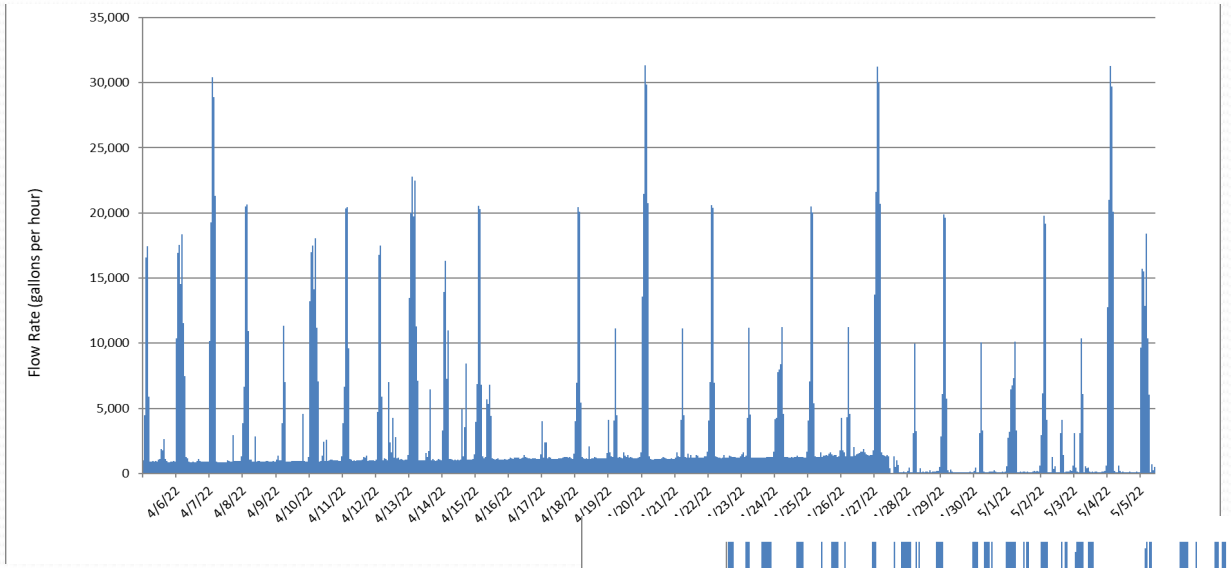
When combined with historic monthly data and on-site observations, these traces often reveal detailed information about water use issues.

Classic growth in continuous leak over time

Hourly logging trace shows irrigation was suspended in late December, but a main line leak grew from 16.5 gph to 45.5 gph.

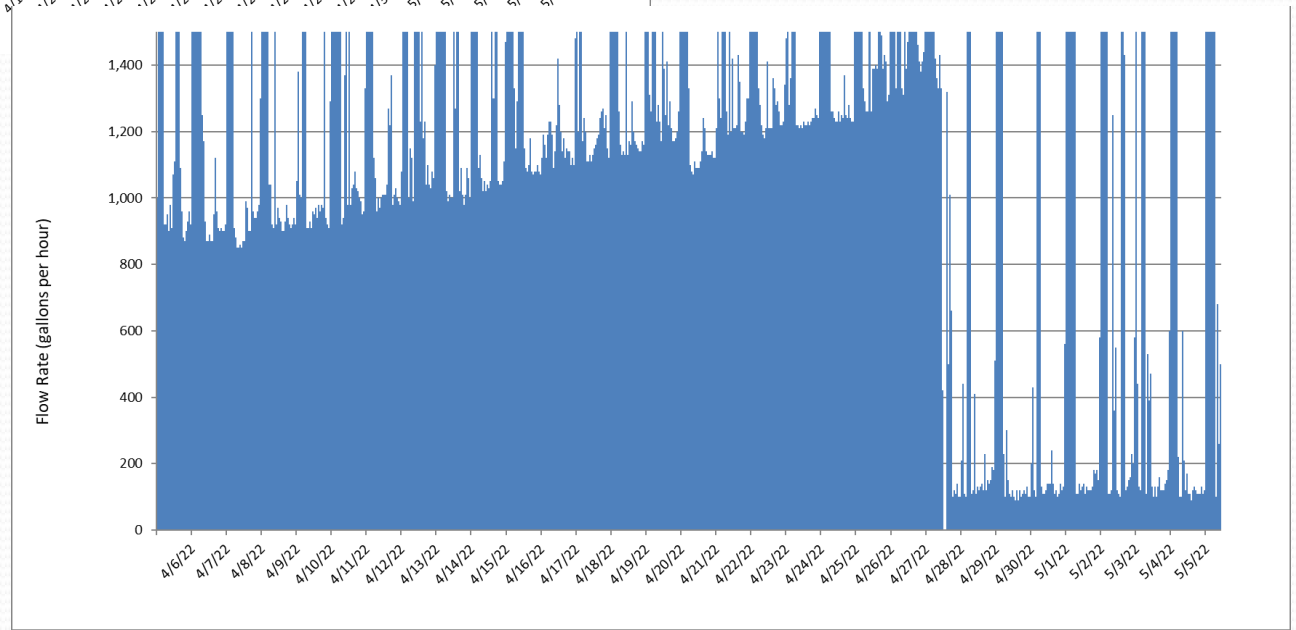


Example – Obvious and not-so-obvious leak at a park



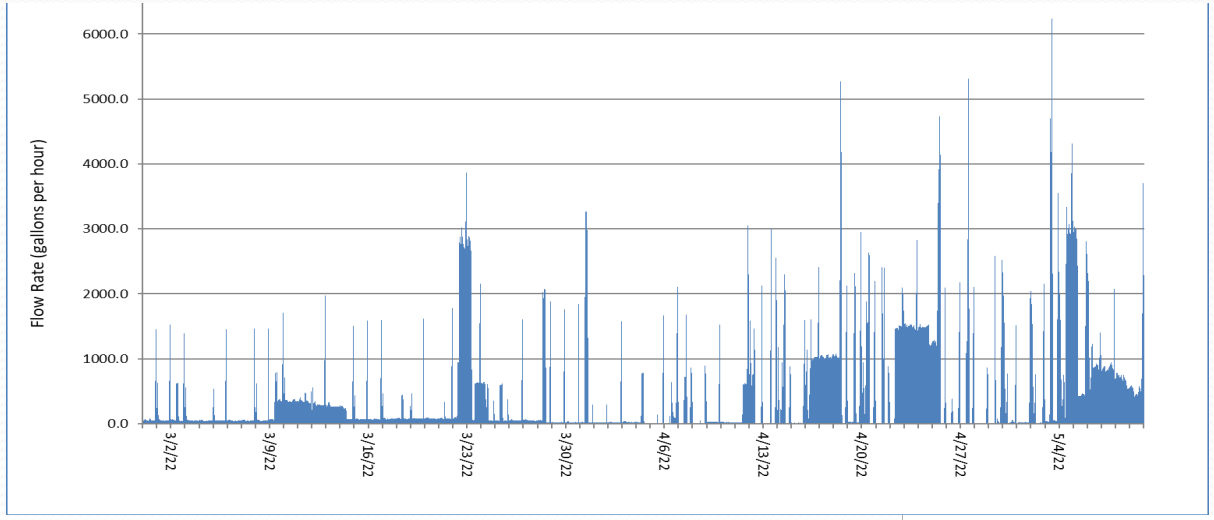
Trace appears to show that a growing leak has been repaired…

…but clipping the Y-axis at 1,500 gph reveals there was a second leak.



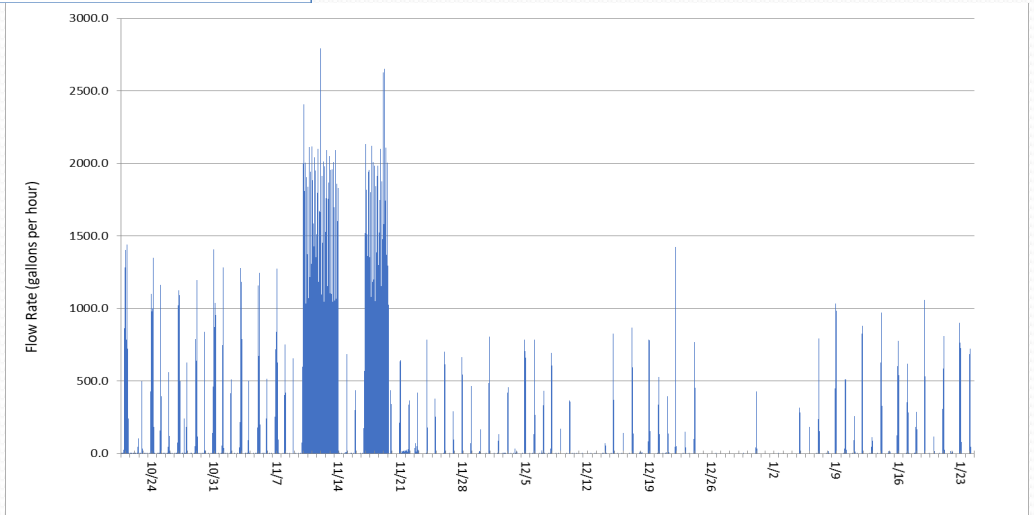
Recommendations may be based on pre-audit leaks

Sometimes there are no current leaks but maintenance or other recommendations are made based on a history of leaks.

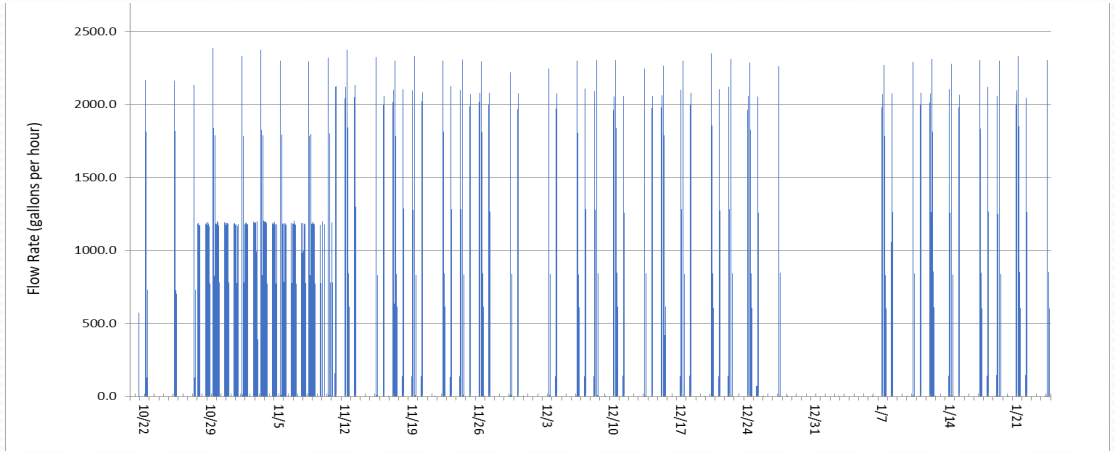


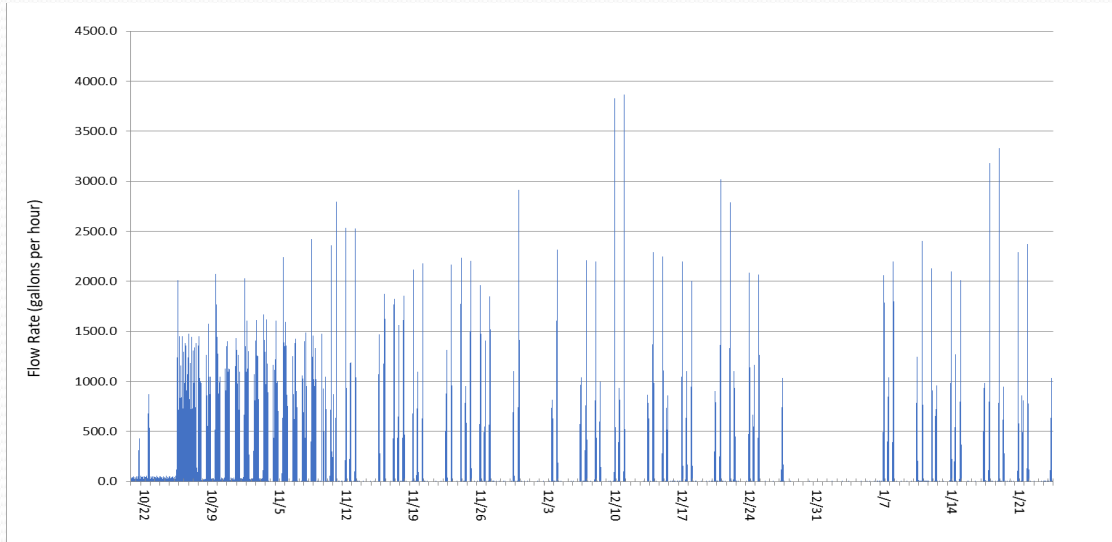
Evidence of several significant leaks in the recent past.

Another example of pre-audit leaks from hourly meter logs, lasting 4 and 3 days and averaging 25 gpm.



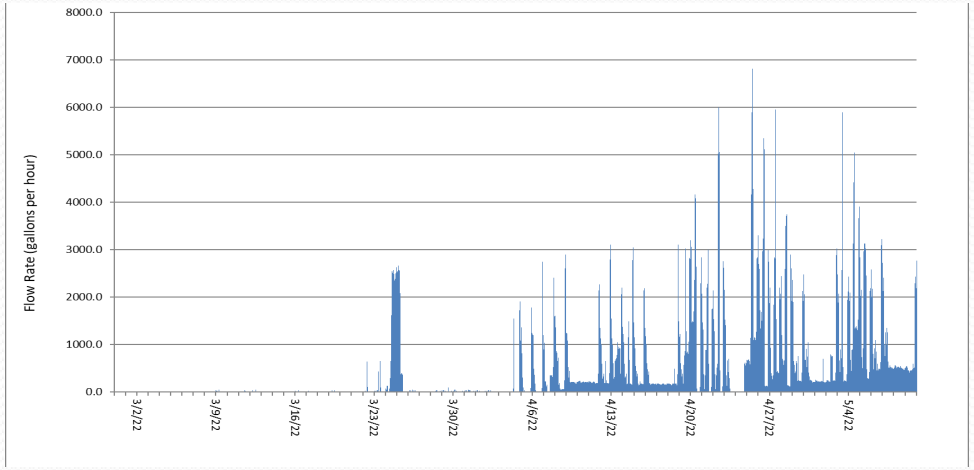
Evidence of over-irrigation of winter Rye in fall

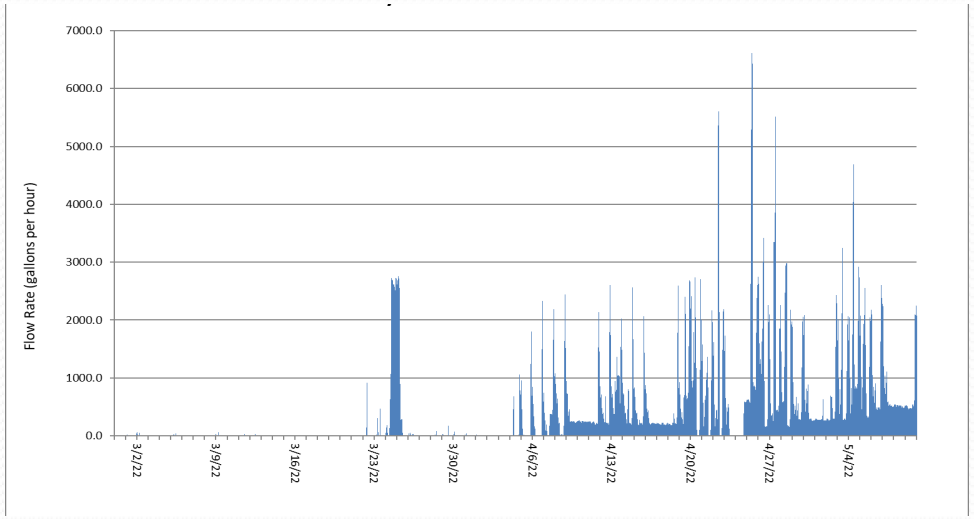




These traces reveal very heavy irrigation in late October and early November linked to over-seeding with winter Rye.

Confusion about which meters correspond to particular water uses is common



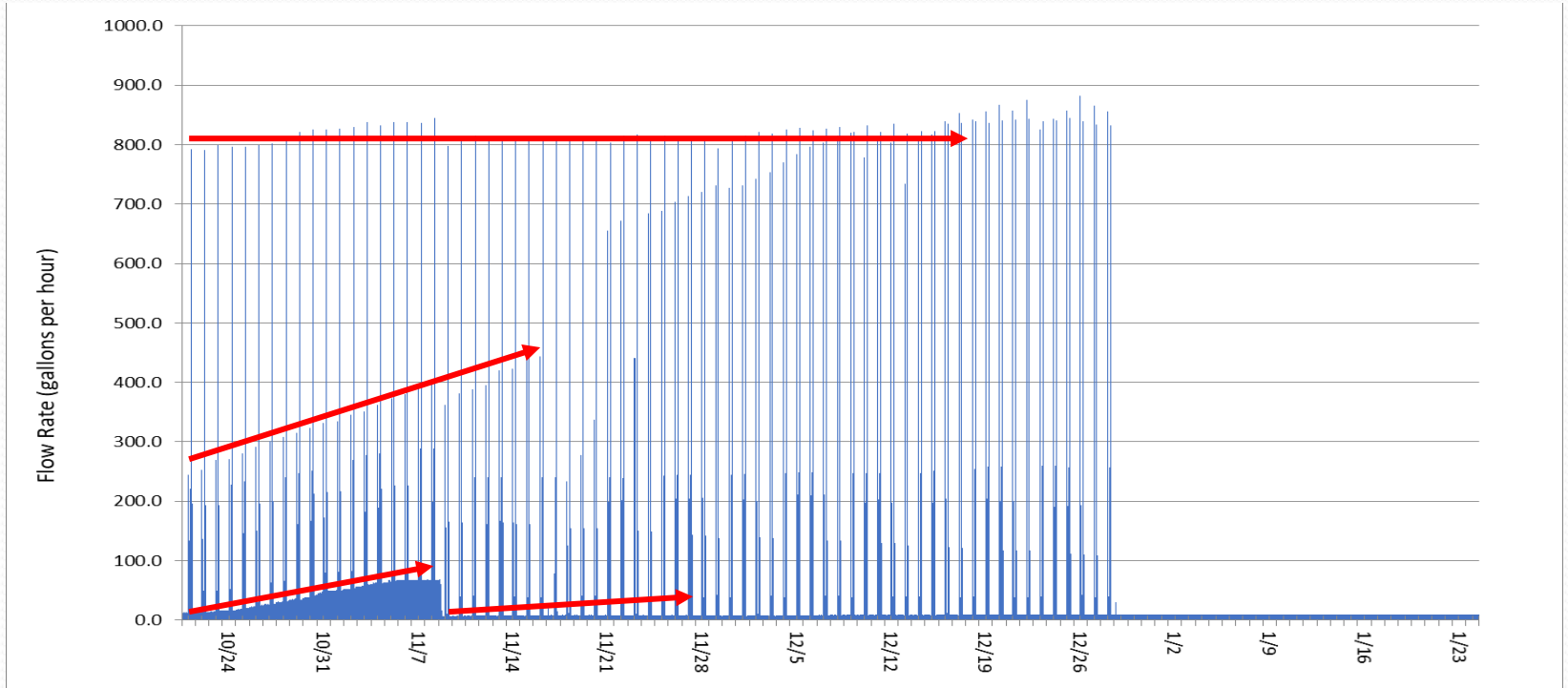


The customer explained which irrigation meter corresponded to different landscaped areas.

But these two irrigation meters are clearly feeding the same irrigation loop.

One trace reveals four distinct problems

1. One large and growing leak was repaired;
2. Another continuous leak was not repaired, and is growing;
3. Leak in irrigation line is rapidly growing
4. Lack of seasonality suggests there is no weather-based controller



Spinoff Audits

Some municipal water providers requested and fully funded additional audits outside the Maricopa AMA:

- Arizona Water Co.: Audits for Casa Grande & Coolidge service areas, plus a 3-year contract for audits across all service areas
- Tucson Water: Audits of 9 HOA common areas; more coming
- Chandler: Will begin audits of city facilities in Fall ’23; submitted WIFA proposal to fund more audits; also will begin CII audits in Fall ‘23
- Scottsdale: Second 5-year contract for audits
- Avondale: Submitted WIFA proposal to fund more audits

The value of HOA and other irrigation audits appears to be widely accepted, and the demand is high.

Meeting Agenda

1. Call to Order – Welcome & Introductions – Chair
2. Meeting Logistics – Nicholas Mason, ADWR
3. Annual Drought Status Report – Laney Meeker, ADWR

Laney will provide an update on drought status

4. Supply and Demand Assessment Results – Collin Wogenstahl, ADWR

Collin will present the 2023 Supply and Demand assessment results

5. Water Management Assistance Program Updates

a. Review withdrawal fee rates and money collected in past five years, WMAP projects, and remaining balance – Melissa Sikes, ADWR

The Council will hear the status of the WMAP fund and current projects.

6. WMAP DCP Completed Project Presentations

a. Gary Woodard – Water Resource Consulting's Water Efficiency Audits for HOA Common Areas and Other Irrigation Customers – Gary Woodard, Water Resource Consulting

b. Esser Design, L.L.C.'s Bringing the Groundwater System to Light through an Education Outreach Campaign/Video Series Targeting Youth and Adults – Pam Esser, Esser Design, L.L.C.

7. AMA Director Report – Natalie Mast, ADWR

Natalie will provide an update on ADWR activities, staffing, and the Governor's Water Policy Council

8. Call to the Council – Council
9. Call to the Public – Chair
10. Adjournment – Chair

Arizona Project Wet Groundwater Video Series and Educational Outreach Media Campaign

Funding through its Drought Contingency Plan Groundwater Conservation Grant
February 2021 – June 30, 2022

esserdesign

ARIZONA DEPARTMENT OF WATER RESOURCES EST. 1980

COOPERATIVE EXTENSION
Arizona Project WET

TASK 1: Updated Arizona ProjectWet Website Design

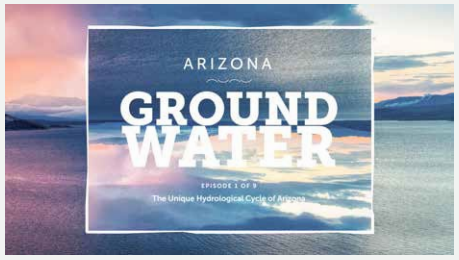
TASK 2: Series of 9 Educational Videos focused on the Groundwater System in Arizona

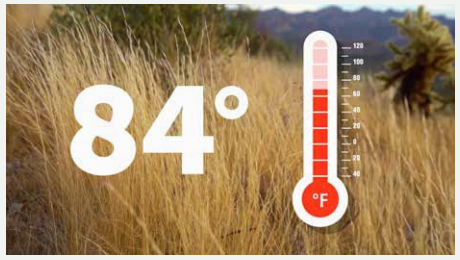
TASK 3: Marketing & Outreach Plan

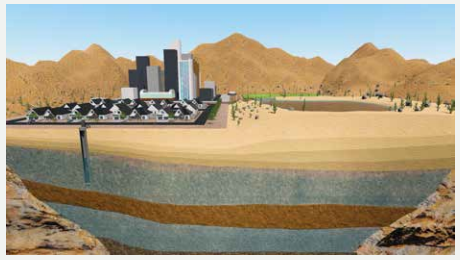
TASK 4: Campaign Implementation and Final Report

Educational Videos Target Audience

- **Youth and adults in the Phoenix AMA**
- **Primary and secondary educators statewide**
- **Policymakers and government leadership**
- **Those interested in water conservation, the groundwater system in general, and more specifically in Arizona**

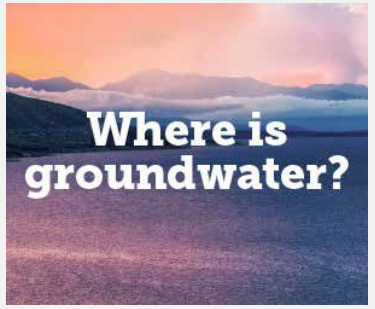






Paid Digital Campaign Overview [4/25/22 – 6/19/22]

- **Geotargeting Counties based upon population:**
  Maricopa 70%, Pima 20% and Pinal 10%
- **Segments: Demo A30+, homeowners, interest in conservation, socially aware, civic interest/value**
- **Digital Display, Digital Native and Paid Social (Facebook)**
- **Budget: $27,281**



Videos Social Media Engagement Report [4/25/22 – 6/19/22]

Website

Sessions	Total Users	New Users	Avg. Visit (min)	Pages/Visit
25,161	21,382	20,834	2:23	1

Facebook

Page Reach	Page Visits	Page New Likes	Impressions
389,578	865	214	1,368,700

Instagram

Reach	Profile Visits	New Followers	Impressions
15.024	216	73	17,873

YouTube

Views	Watch Time (Hrs)	New Subscribers
14.100	592.1	96

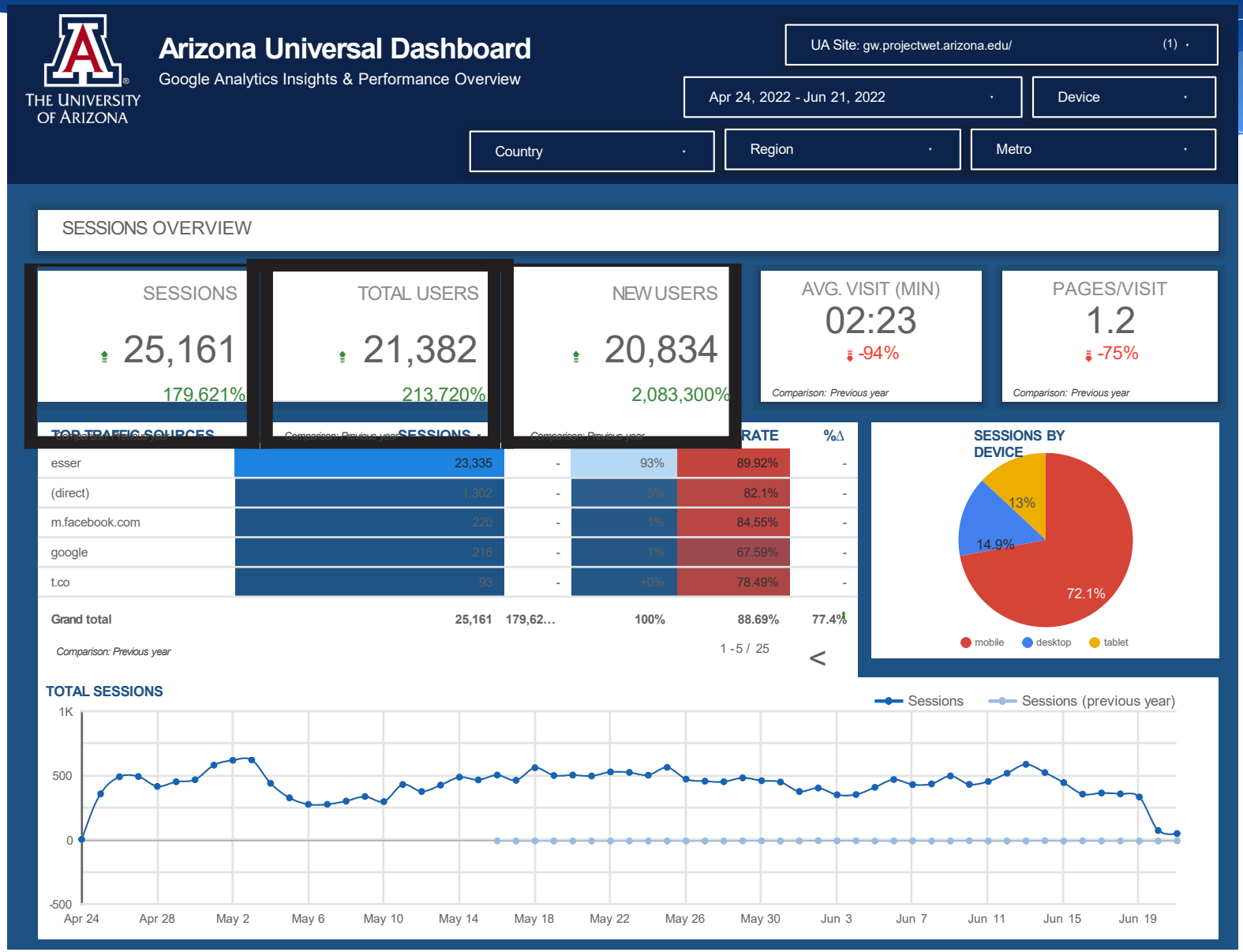
Twitter

Impressions	Engagments	Engagement Rate	Link Clicks
10,244	461	5.43%	82

Shares

# Original Posts	# Reshares	Reactions	Comments	Shares & Retweets
43	11	193	3	42

Groundwater Website Dashboard



Summary Outreach Media Campaign

The response and interest level about this topic and particularly the Video Series itself has far surpassed traditional expectations.

Social Media Ads delivered a 1.55% link click-thru rate and 4.46% total click rate including all activity/engagement with the ads. Both measurements are well above any average or benchmark metric.

1,027 people viewed at least half of the 3-min+ videos and 762 viewed in full (95%) on Facebook.

In total, the paid social campaign delivered 1,401,213 impressions on Facebook and drove 57,194 TOTAL clicks/engagements and 20,274 link clicks to the landing page/website.

Next Steps

* Our teams recommend additional funding support to extend the life and impact of these important educational and outreach tools

* Additional funds to be used for:

  - Spanish language versions
  - Updating the graphics to reflect current data
  - Additional Outreach Media Campaign planning and execution

Meeting Agenda

1. Call to Order – Welcome & Introductions – Chair

2. Meeting Logistics – Nicholas Mason, ADWR

3. Annual Drought Status Report – Laney Meeker, ADWR

Laney will provide an update on drought status

4. Supply and Demand Assessment Results – Collin Wogenstahl, ADWR

Collin will present the 2023 Supply and Demand assessment results

5. Water Management Assistance Program Updates

a. Review withdrawal fee rates and money collected in past five years, WMAP projects, and remaining balance – Melissa Sikes, ADWR

The Council will hear the status of the WMAP fund and current projects.

6. WMAP DCP Completed Project Presentations

a. Gary Woodard – Water Resource Consulting's Water Efficiency Audits for HOA Common Areas and Other Irrigation Customers – Gary Woodard, Water Resource Consulting

b. Esser Design, L.L.C.'s Bringing the Groundwater System to Light through an Education Outreach Campaign/Video Series Targeting Youth and Adults – Pam Esser, Esser Design, L.L.C.

7. AMA Director Report – Natalie Mast, ADWR

Natalie will provide an update on ADWR activities, staffing, and the Governor's Water Policy Council

8. Call to the Council – Council

9. Call to the Public – Chair

10. Adjournment – Chair

Meeting Agenda

1. Call to Order – Welcome & Introductions – Chair
2. Meeting Logistics – Nicholas Mason, ADWR
3. Annual Drought Status Report – Laney Meeker, ADWR

Laney will provide an update on drought status

4. Supply and Demand Assessment Results – Collin Wogenstahl, ADWR

Collin will present the 2023 Supply and Demand assessment results

5. Water Management Assistance Program Updates

a. Review withdrawal fee rates and money collected in past five years, WMAP projects, and remaining balance – Melissa Sikes, ADWR

The Council will hear the status of the WMAP fund and current projects.

6. WMAP DCP Completed Project Presentations

a. Gary Woodard – Water Resource Consulting's Water Efficiency Audits for HOA Common Areas and Other Irrigation Customers – Gary Woodard, Water Resource Consulting

b. Esser Design, L.L.C.'s Bringing the Groundwater System to Light through an Education Outreach Campaign/Video Series Targeting Youth and Adults – Pam Esser, Esser Design, L.L.C.

7. AMA Director Report – Natalie Mast, ADWR

Natalie will provide an update on ADWR activities, staffing, and the Governor's Water Policy Council

8. Call to the Council – Council
9. Call to the Public – Chair
10. Adjournment – Chair

Meeting Agenda

1. Call to Order – Welcome & Introductions – Chair
2. Meeting Logistics – Nicholas Mason, ADWR
3. Annual Drought Status Report – Laney Meeker, ADWR

Laney will provide an update on drought status

4. Supply and Demand Assessment Results – Collin Wogenstahl, ADWR

Collin will present the 2023 Supply and Demand assessment results

5. Water Management Assistance Program Updates

a. Review withdrawal fee rates and money collected in past five years, WMAP projects, and remaining balance – Melissa Sikes, ADWR

The Council will hear the status of the WMAP fund and current projects.

6. WMAP DCP Completed Project Presentations

a. Gary Woodard – Water Resource Consulting's Water Efficiency Audits for HOA Common Areas and Other Irrigation Customers – Gary Woodard, Water Resource Consulting

b. Esser Design, L.L.C.'s Bringing the Groundwater System to Light through an Education Outreach Campaign/Video Series Targeting Youth and Adults – Pam Esser, Esser Design, L.L.C.

7. AMA Director Report – Natalie Mast, ADWR

Natalie will provide an update on ADWR activities, staffing, and the Governor's Water Policy Council

8. Call to the Council – Council
9. Call to the Public – Chair
10. Adjournment – Chair

Meeting Agenda

1. Call to Order – Welcome & Introductions – Chair

2. Meeting Logistics – Nicholas Mason, ADWR

3. Annual Drought Status Report – Laney Meeker, ADWR

Laney will provide an update on drought status

4. Supply and Demand Assessment Results – Collin Wogenstahl, ADWR

Collin will present the 2023 Supply and Demand assessment results

5. Water Management Assistance Program Updates

a. Review withdrawal fee rates and money collected in past five years, WMAP projects, and remaining balance – Melissa Sikes, ADWR

The Council will hear the status of the WMAP fund and current projects.

6. WMAP DCP Completed Project Presentations

a. Gary Woodard – Water Resource Consulting's Water Efficiency Audits for HOA Common Areas and Other Irrigation Customers – Gary Woodard, Water Resource Consulting

b. Esser Design, L.L.C.'s Bringing the Groundwater System to Light through an Education Outreach Campaign/Video Series Targeting Youth and Adults – Pam Esser, Esser Design, L.L.C.

7. AMA Director Report – Natalie Mast, ADWR

Natalie will provide an update on ADWR activities, staffing, and the Governor's Water Policy Council

8. Call to the Council – Council

9. Call to the Public – Chair

10. Adjournment – Chair