California County Café

– Specializing in Drought Resilience

Welcome and Setting Intention

Julia Ekstrom – California Department of Water Resources

On the Menu

Welcome and Setting Intention

- → The C3 Process – Reminder
- → Statewide SB 552 Status

Theme for Today: **Domestic Wells and SSWS in Fractured Rock Areas**

- → Sharing and Discussion

Closing

The C3 Process

- **Desired outcome** – Network and exchange ideas and resources among counties.
  - Increase the understanding of SB 552 intent and requirements.
  - Learn about different implementation approaches, practices, and experience.
  - Compare identified resource needs and share funding opportunities.
  - Improve coordination with other agencies and interested parties.
- **Our format** – Information exchange among counties to share information and approach to SB 552 implementation. (Café gatherings and Office hours)
- **Intended audience** – County staff.

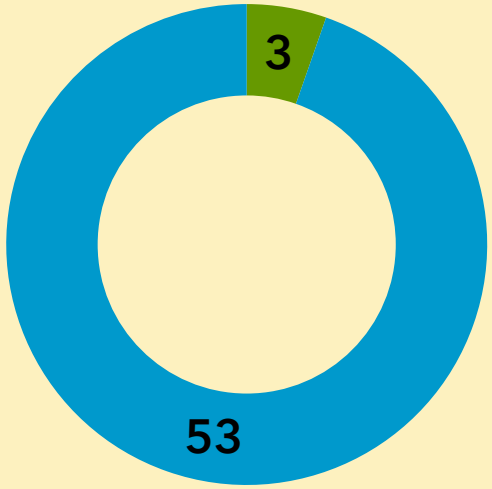
  Appreciate others listening in but focusing on staff who are responsible for developing the DRP and implementing.

Essentials of the C3 Gathering

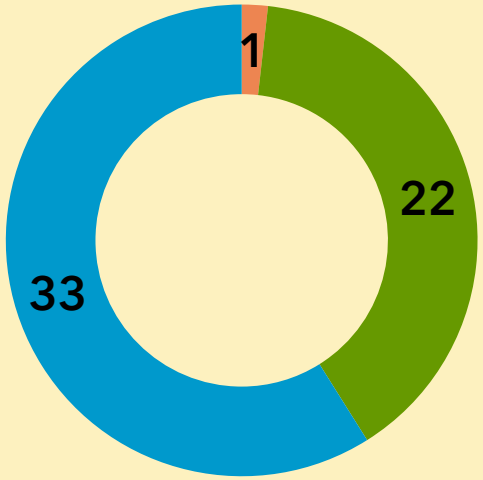
- ✓Join the conversation – share your experience and learn from other perspectives and experiences.
- ✓Make a connection – use the chat to connect with other participants.
- ✓County focused – While all are invited to join, this gathering will focus on supporting county staff.

Statewide SB 552 Status

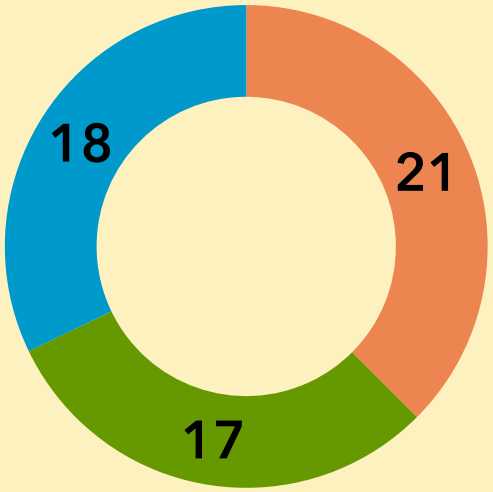
Task Force Formation



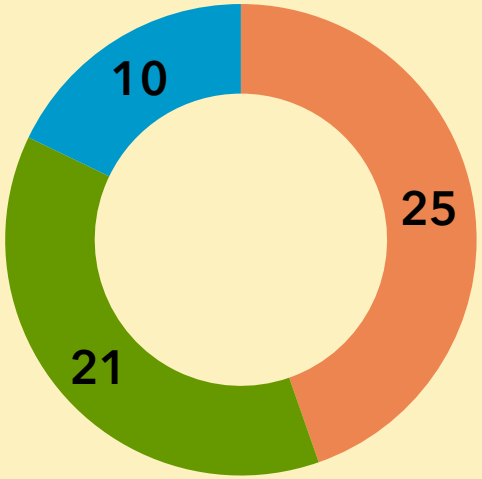
Risk Assessment



Response Actions and Mitigation Strategies



County Drought Resilience Plan Development



Not Started In Progress Completed

Four more completed plans! Colusa, Tehama, El Dorado, and Modoc

Source: 8/11/2025 data based on input from 56 counties enrolled in DWR's assistance program. Exclusions: The City and County of San Francisco are covered by other requirements, and one has not enrolled in DWR's assistance program.

Mitigations and Strategies

MANAGING INFRASTRUCTURE

- Well rehabilitation, deepening, and maintenance
- Well testing: On going testing to measure the depth-to-water during a drought or water emergency
- Testing devices loan program: loan out water level devices to impacted domestic well owners
- System Consolidation: coordination with interested domestic wells, to identify and implement a consolidation into a new SSWS, community water systems, or public water systems

EDUCATION AND OUTREACH

- Promote awareness about monitoring, maintenance, and drought resilience strategies
- Develop a Well Owner's Guide (keeping valuable records of the domestic wells and SSWS)
    - Example: *Well Owner's Guide: A Guide for Private Well Owners in Napa County*

MANAGING WATER DEMAND

- Conservation measures to reduce water use and improve water efficiency

AUGMENTING WATER SUPPLY TO IMPROVE RELIABILITY

- Storage Tank Installation connected to existing wells
- Rainwater harvesting (non-potable use) especially for irrigation or greywater purposes
- Managed Aquifer Recharge (MAR): Capture stormwater or seasonal surface water and direct it to infiltration basins or dry wells where feasible
- Watershed protection –maintain and restore vegetation cover to enhance infiltration and reduce runoff
- Reuse/recycle program for potable and non-potable water supplies

Fractured Rock Areas - Presentations

Michelle Dooley, DWR
Jarrad Fisher, San Mateo RCD
Martha Davis, Marin County

CALIFORNIA'S NON-BASIN AREA FRACTURED ROCK GROUNDWATER

California County Café Series: Well Management in Fractured Rock Areas

August 20, 2025

Michelle Dooley
CA Department of Water Resources
Division of Regional Assistance
Northern Region Office
Red Bluff, CA

What are Non-basin Areas?

Any area outside of the state's 515 alluvial groundwater basins

About 60% of CA:
61,663,897 acres

Non-Basin Area Groundwater Occurrence

Hydrogeologic Provinces

- Northern Coast
- Klamath Mountains
- Cascades and Modoc Plateau
- Sierra Nevada
- Basin and Range
- Southern Coast Ranges
- Transverse and selected Peninsular Ranges
- San Diego Drainages
- Desert

United States Geological Survey 2003

Non-Basin Area Groundwater Use

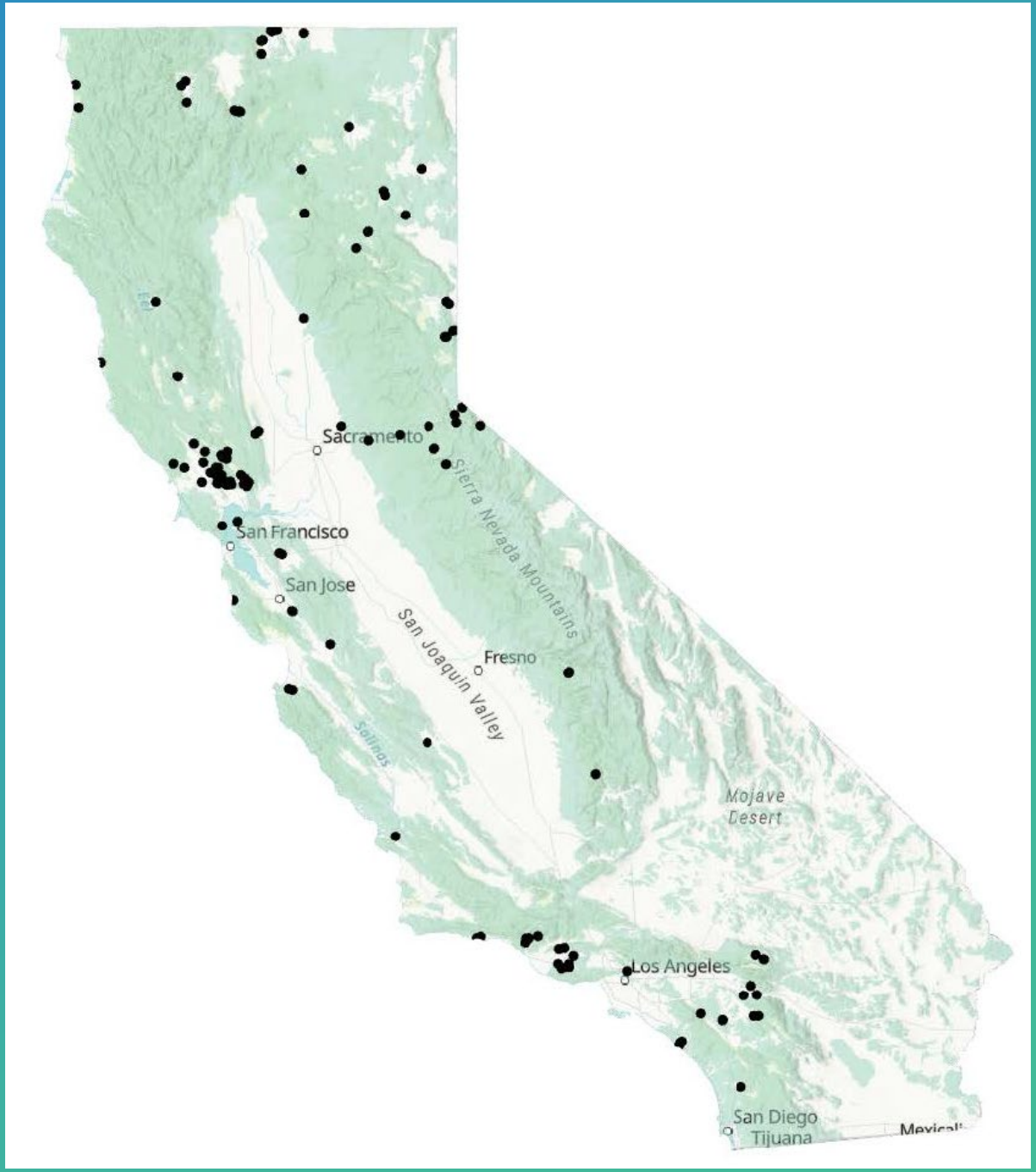
Non-basin Area Acreage		Groundwater Use
Urban and Domestic	1,271,300 statewide	709,000 af/yr
Agriculture	271,000 statewide	472,000 af/yr
		1,181,000 af/year

According to the 2020 U.S. Census, more than 7.2 million people reside in California's non-basin areas.

Statewide, over the last 20 years, the population living in non-basin areas has grown by over one million people.

Non-Basin Area Groundwater Monitoring

	Total	DWR	Other
Total number of measurements	252,491	32,989	219,502
Total number of wells	9,030	1,668	7,362
Number measured wells in B118 Basins	8,832	1,628	7,204
Number of measured wells in NBA	198	40	158

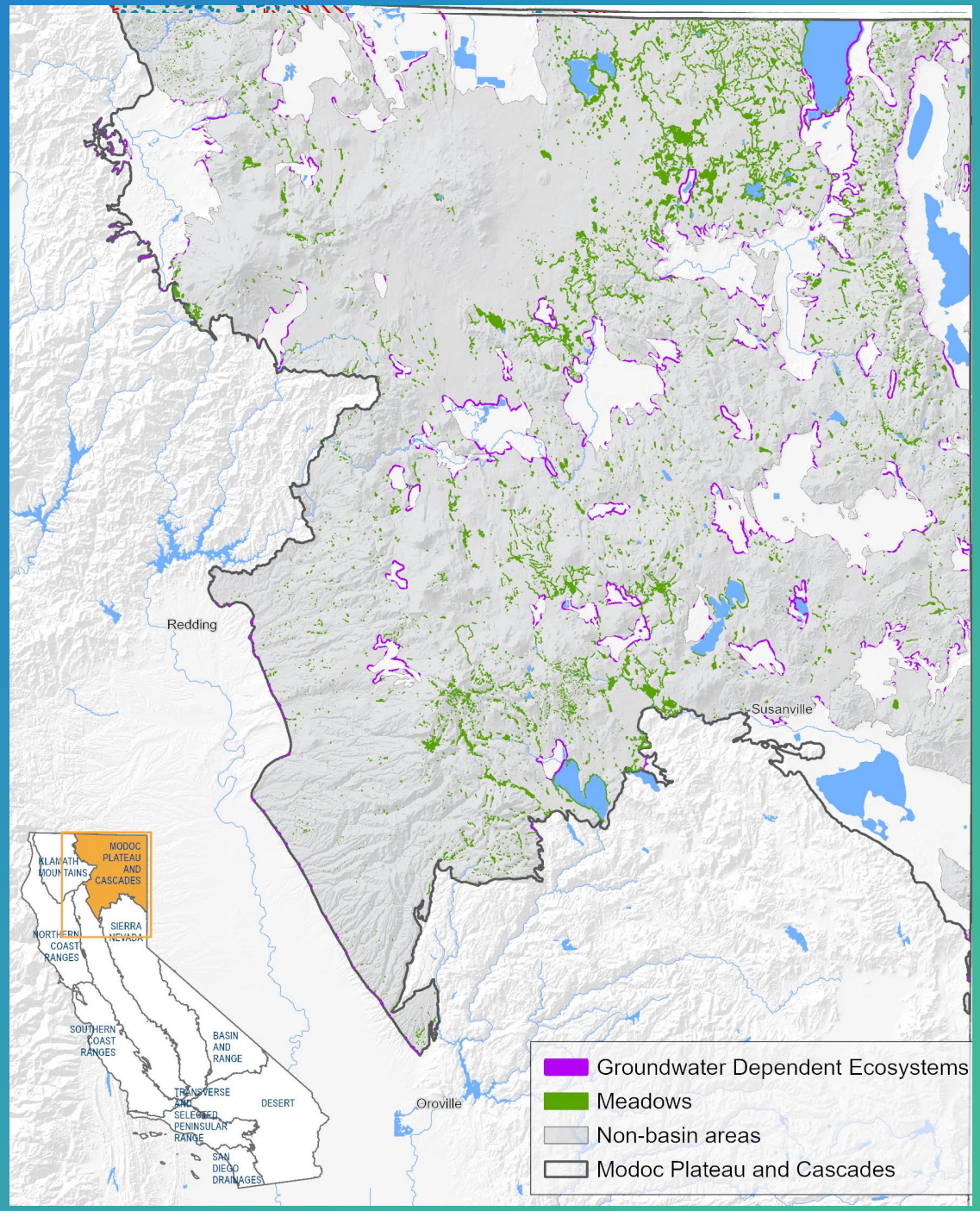


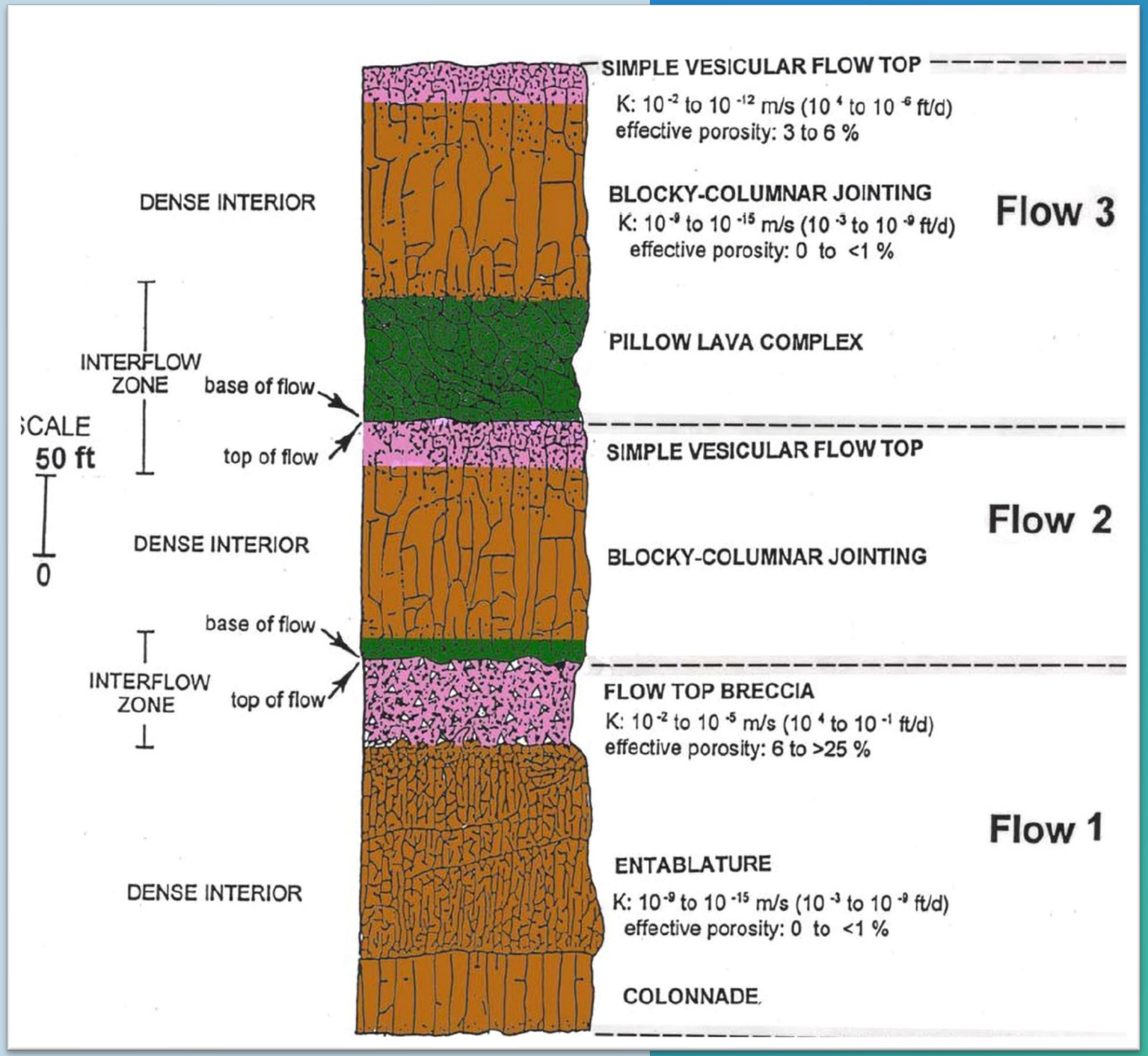
CASCADES AND MODOC PLATEAU HYDROGEOLOGIC PROVINCE

Natural hydrogeologic infrastructure:

Recent/Quaternary Faulting and Springs

Meadows and Groundwater Dependent Ecosystems

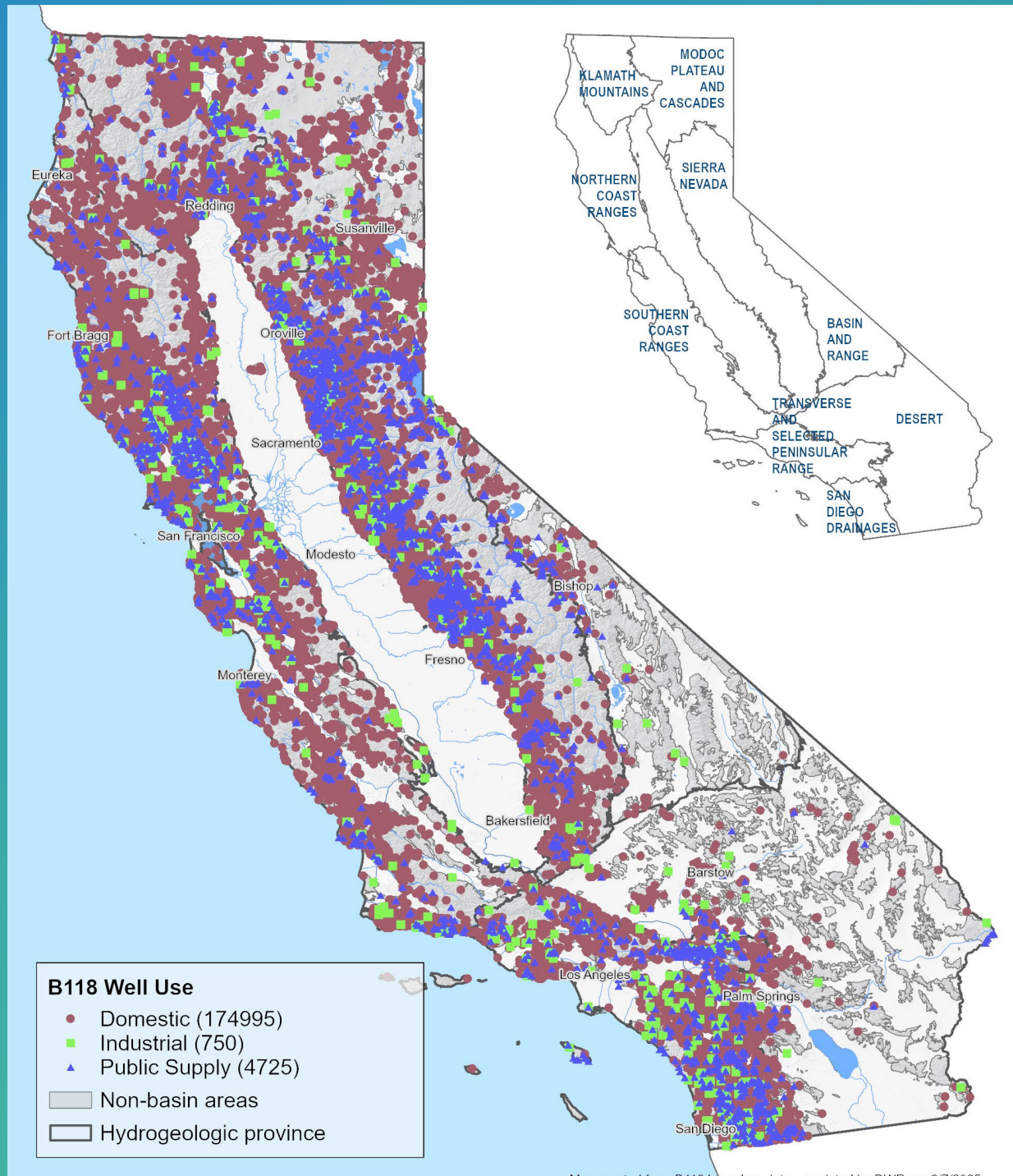




From Tolan et al., 2009

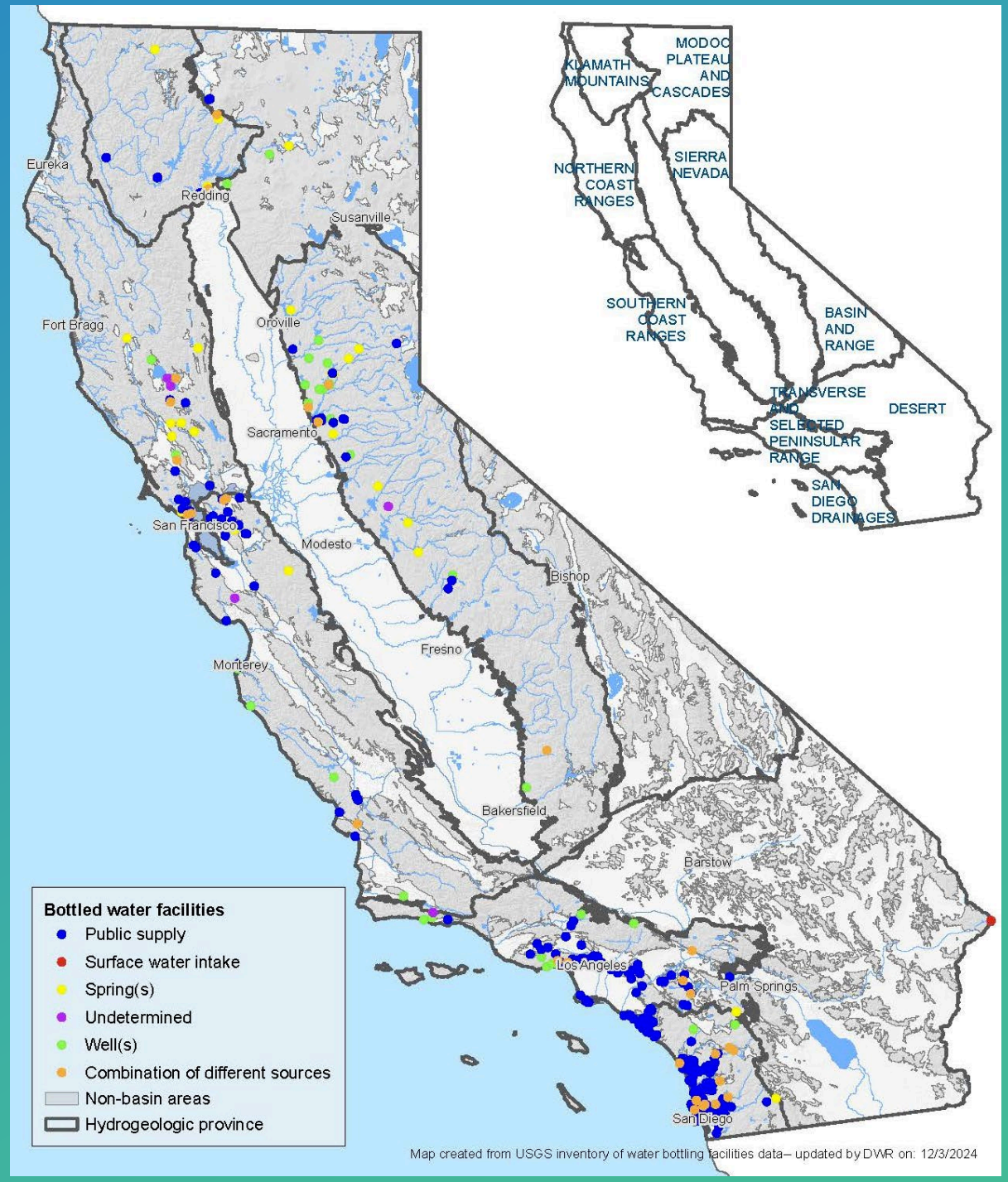
Non-basin Area Wells

- Domestic
- Industrial
- Public Supply



Non-basin Area Water Bottling Facilities

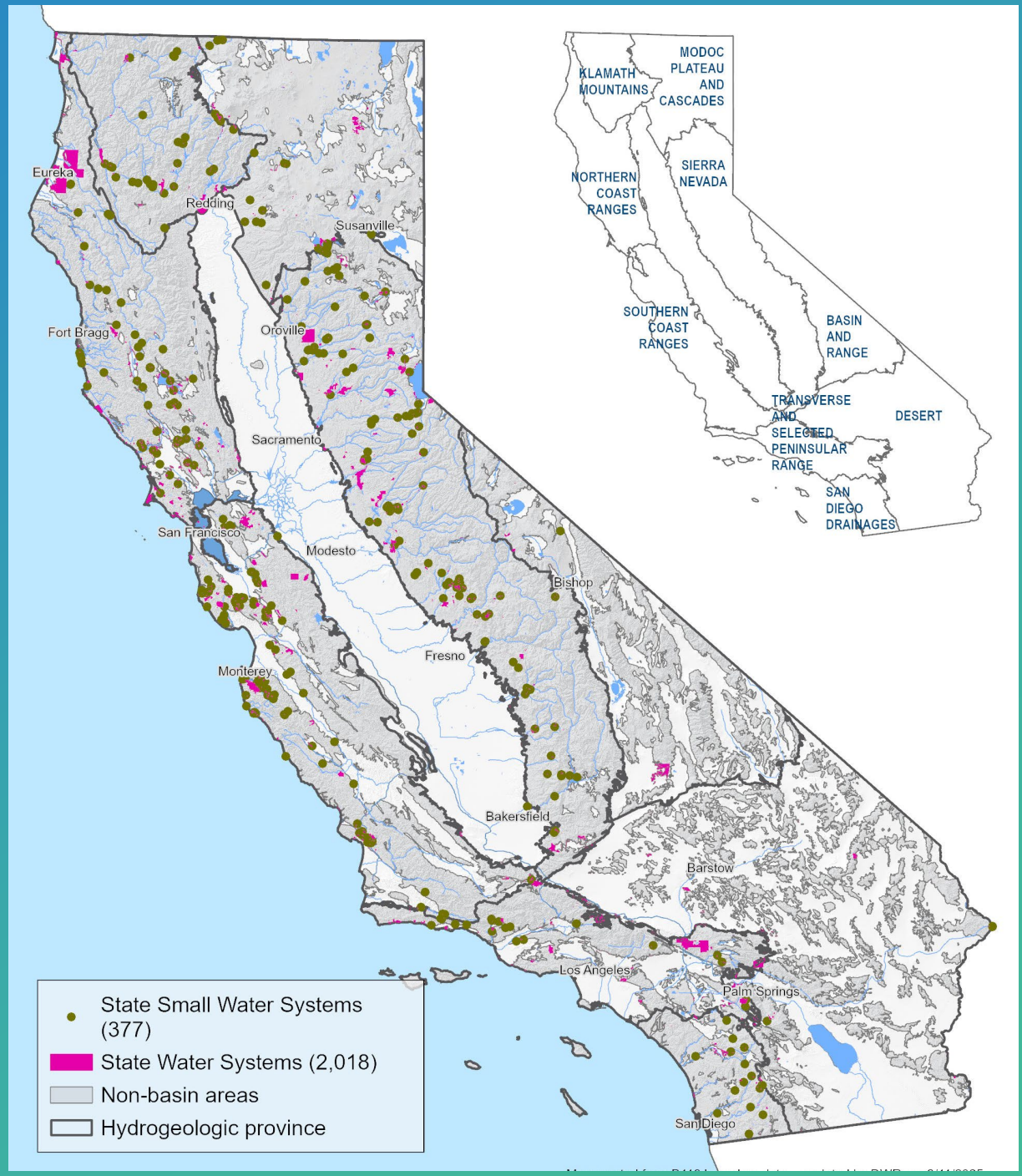
HGP	Groundwater	Springs
Sierra Nevada	33	9
Transverse and Selected Peninsular Ranges	7	1
San Diego Drainages	6	1
Southern Coast Ranges	4	2
Northern Coast Ranges	3	7
Cascades and Modoc Plateau	2	2
Klamath Mountains	0	4
Desert	0	0
Total Known	**55**	**26**



Non-basin Area Water Systems

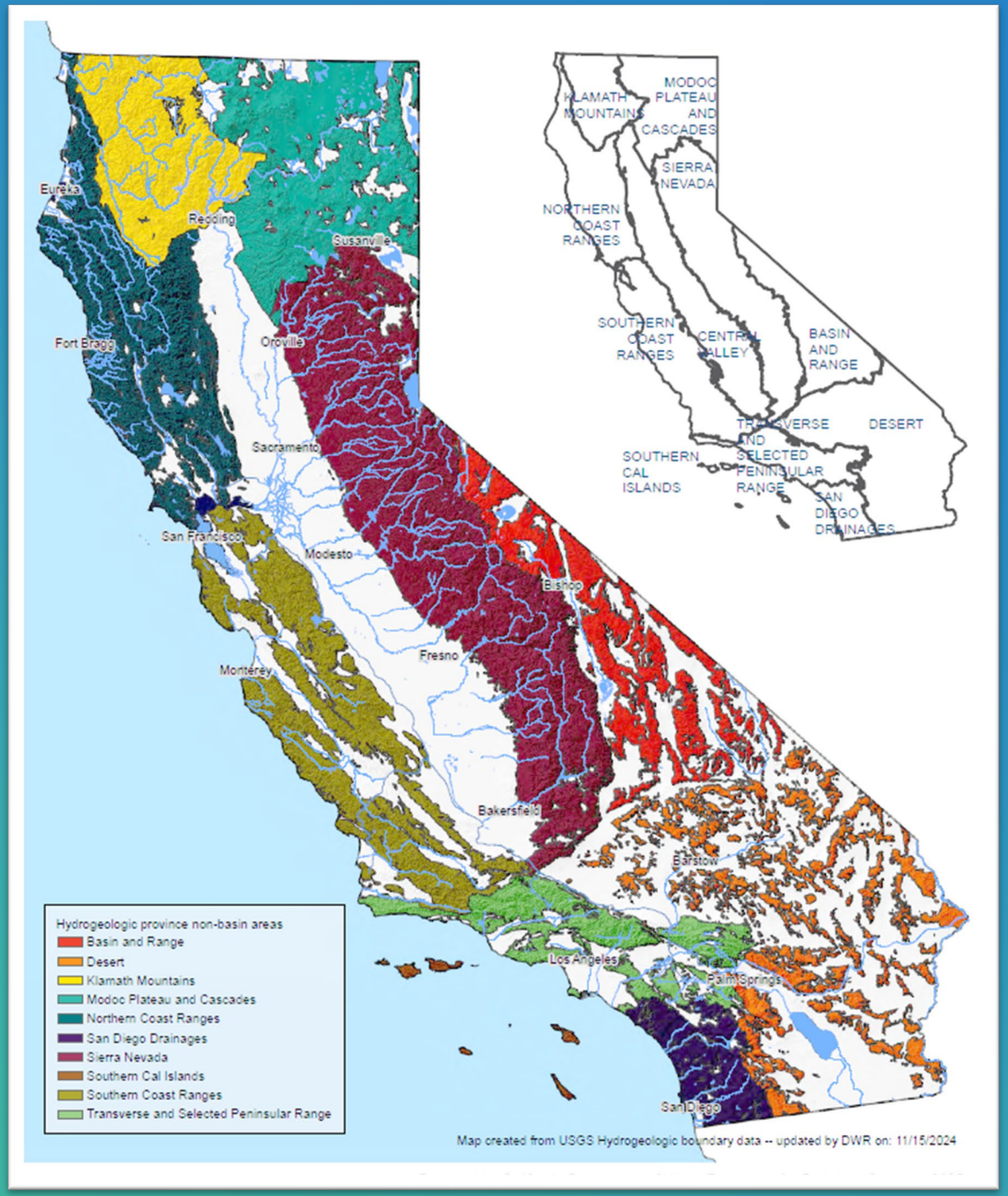
State Water Systems

State Small Water Systems



Non-basin Area Public Supply Wells

HGP	Number of public-supply wells NBAs
Sierra Nevada	1,529
Northern Coast Ranges	571
Transverse and Selected Peninsular Ranges	510
Southern Coast Ranges	439
San Diego Drainages	224
Cascades and Modoc Plateau	176
Klamath Mountains	126
Desert	64
Basin and Range	63
Total	**3,702**

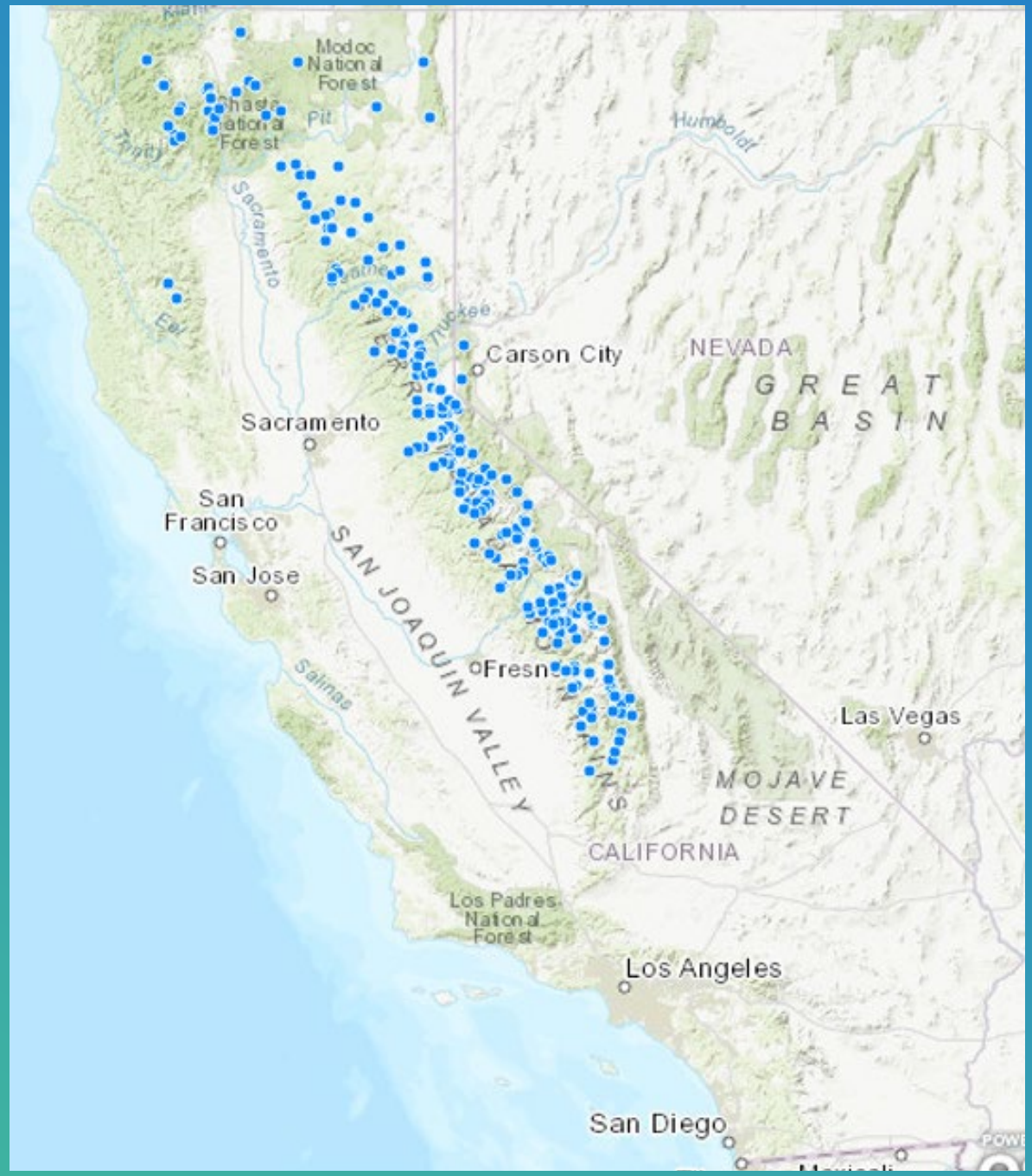


Climate change and snowpack in Non-basin Areas

Statewide average annual maximum temperature is projected to increase by **4.7 to 5.8 degrees F** (https://cal-adapt.org/ 2025)

State Water Project predicted to decrease its delivery capacity **by 23% within the next 20 years** because of changing runoff patterns (DWR, 2024. "New Report Estimates Potential Water Losses Due to Climate Crisis, Actions to Boost Supplies").

Narrower snowmelt patterns will result in reduced groundwater recharge, as there will be **less total time for snowmelt to infiltrate** non-basin fractured rock areas (Chao and Tasoff, 2021).

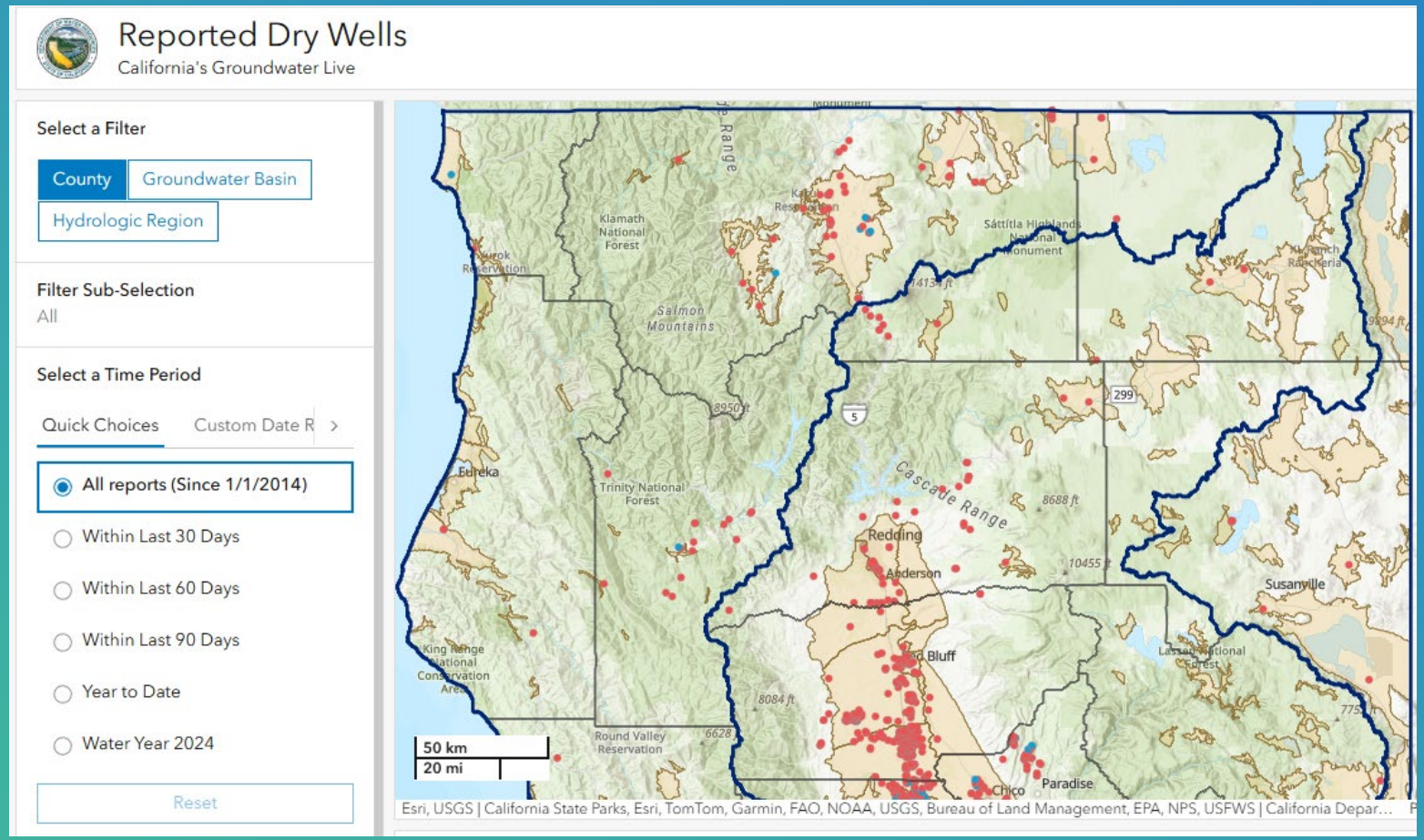


Dry wells in Non-Basin Areas

In non-basin areas, **90%** of wells are domestic wells.

Among the small water suppliers and self-supplied communities at a high risk of drought and water shortage vulnerability, **68%** are in non-basin areas.

Dry Well Reporting System



Water Shortage Vulnerability Explorer Tool (2024)
https://experience.arcgis.com/experience/ae1b4e3e41004f07b4901a7a3fa50637/

Dry Well Reporting System
https://mydrywatersupply.water.ca.gov/report/;jsessionid=8882F028B29B72E6749E00AA89E40DAD

THANK YOU

SOURCES

Meadows / Wetlands / GDEs

Wetlands Mapper
US Fish and Wildlife Service

Sierra Nevada Multi-source Meadow Polygons Compilation v.2 | Sierra Nevada Meadows
UC Davis

i02 NCCAG Wetlands - Dataset - California Natural Resources Agency Open Data
DWR et al.

Faults and Springs

Fault Activity Map of California and Geologic Map of California
CA DOC CA Geological Survey

Springs and Springs-Dependent Species Online Database Home
Springs Online

CONSIDERATIONS

Fractured rock non-basin area groundwater flow paths may be much deeper in upper watersheds and travel underground much farther than previously thought – ranging from 30 to 150 miles, depending on the region.

Deep groundwater flow can contribute more than half of stream baseflow, and lateral groundwater flow between watersheds and alluvial basins is significant. (Yang et al., 2025)

SAN MATEO RESOURCE CONSERVATION DISTRICT

Drought Planning In Fractured Rock Areas

Jarrad Fisher Director of Water Resource Programs
San Mateo County Café series
8/20/2025


Wildlife
We improve the chances of survival for species of plants and animals at risk of extinction by restoring their habitats.
Water
We help ensure clean and reliable water for the farms, fish, and people who share this precious resource.
Climate
We work to reduce emissions and remove greenhouse gases from the atmosphere as well as help people prepare for extreme weather.
Agriculture
We serve farmers and ranchers to help ensure viable, environmentally friendly local agriculture.
Forest Health and Fire Resiliency
We work with communities to reduce the risk of catastrophic fire, improve forest health, and heal the land after fires occur.


NORTHERN DIRECTIONAL DRILLING


Help


KOHLER
KOHLER
KOHLERPower.com


PUMP STATION

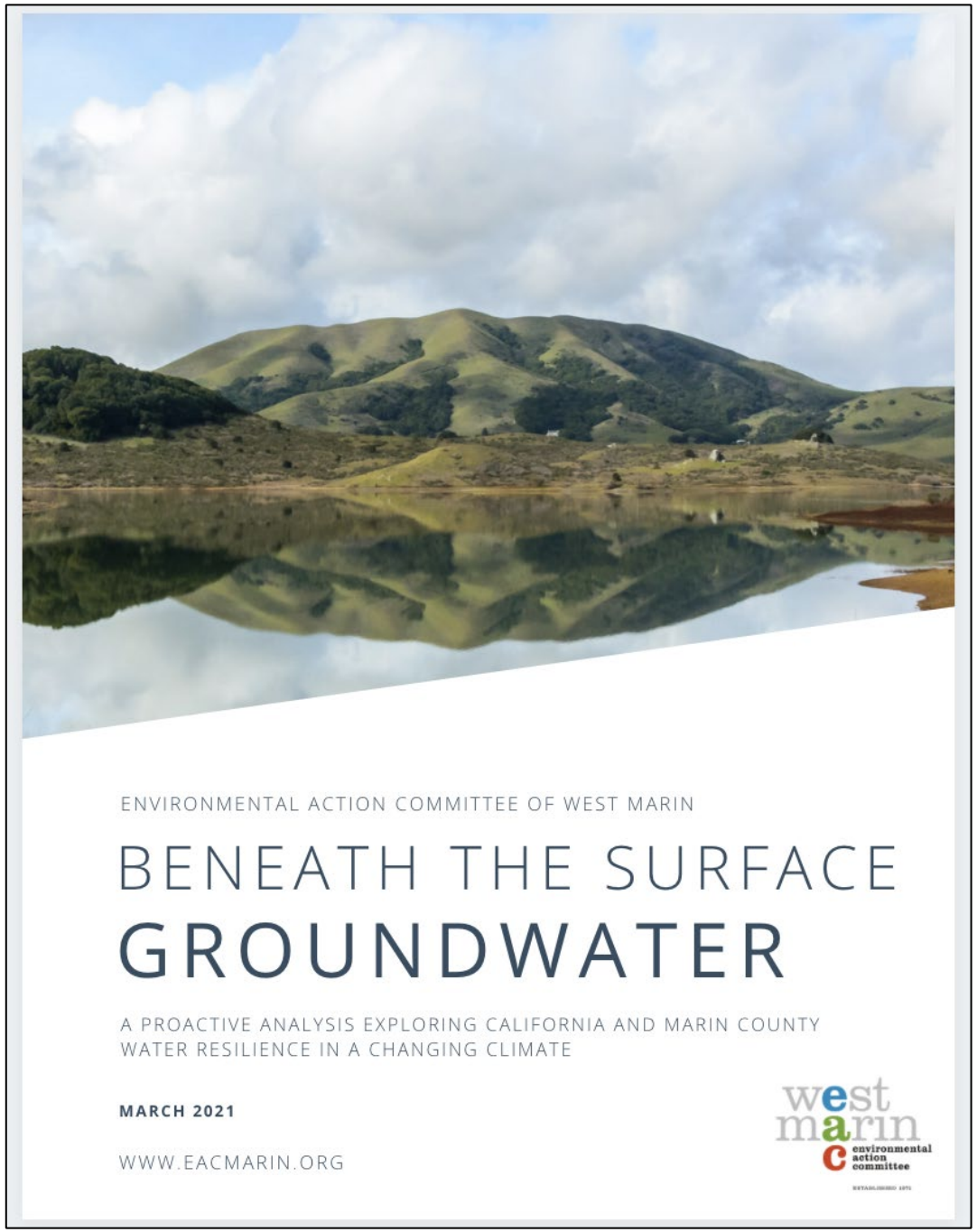
Questions?

SAN MATEO RESOURCE CONSERVATION DISTRICT

Jarrad Fisher Director of Water Resource Programs
Jarrad@sanmateoRCD.org

Well Management in Fractured Rock Areas
California Cafe Series
August 20, 2025

Martha Davis
Nicasio Land Owner Association Board Member



"There's the people who know they don't have enough water, and there's the people who don't know it yet."

Dave Smith, Assistant Director at U.S. Environmental Protection Agency Region 9, speaking before the San Francisco Bay Regional Water Quality Control Board, September 2020

Fractured Rock Area Need: Basic Education and Tools for Proactive Well and On-site Water Management

2021 Drought Response
NLOA Community Newsletters*

Memo #1: Drought Resilience in Nicasio

Water Memo #2: How Does my Well Work?

Water Memo #3: Rainwater Capture

Water Memo #4: Graywater

Water Memo #5: Public Assistance

Water Memo #6: Measuring your Well's Performance

Water Memo #7: When your Well Runs Dry

Water Memo #8: Water Storage Tanks

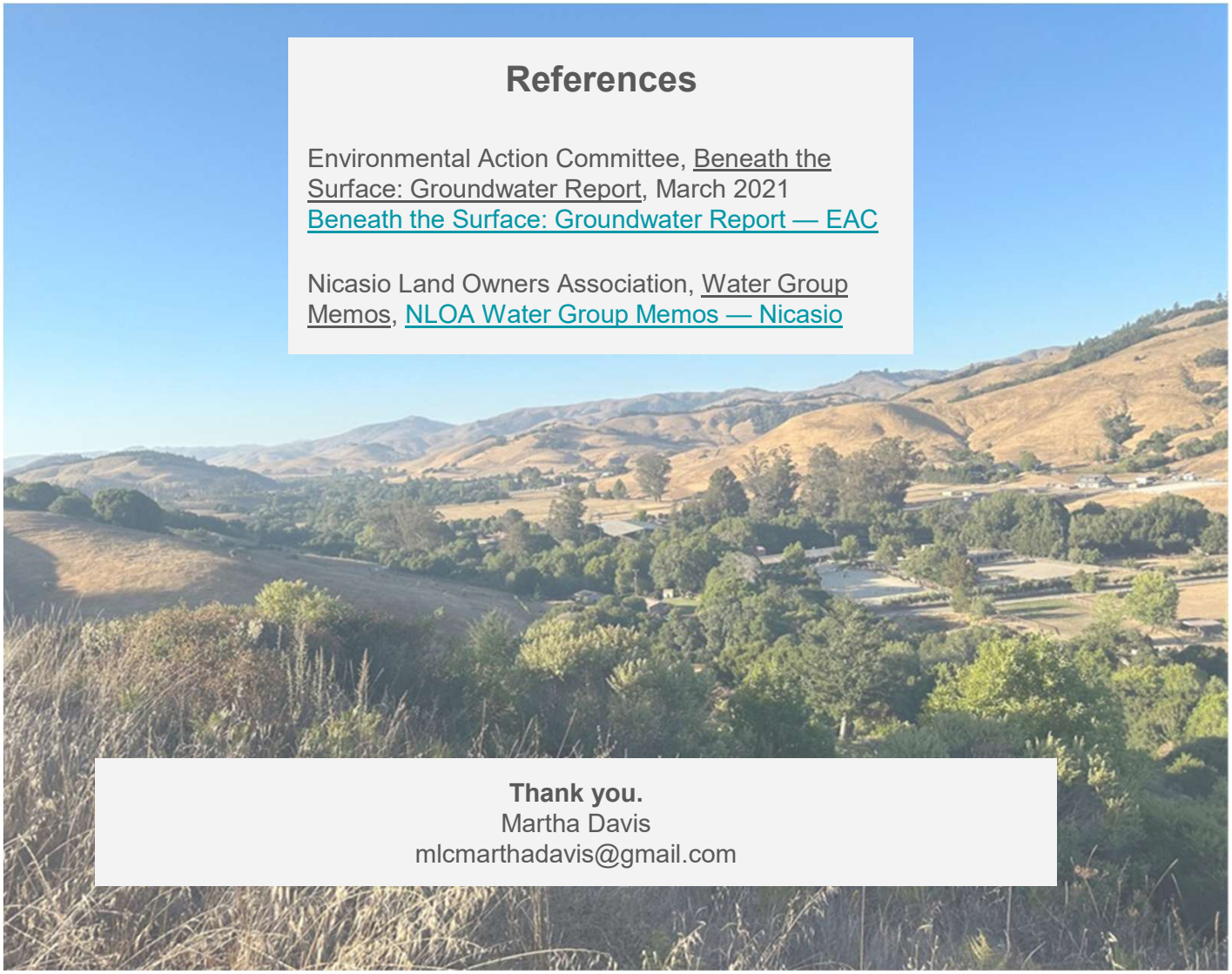
Water Memo #9: Well & Storage Tank Maintenance

Water Memo #10: Water Conservation

**See NLOA Water Group Memos — Nicasio*

Managing Community Vulnerability for Drought Resilience

- Multiple Benefits: Proactive well and on-site water management improves fire safety and emergency responses and enhances biodiversity, soil health, and stream flows
- Technical Assistance: Make it easy for property owners to find help. Potential programs include well management guidance, water budget education, support for monitoring programs, and coordinating circuit rider programs, especially for management of small water systems
- Improved County Policies and Ordinances to Address Vulnerability: Require“Point of purchase” disclosures on well performance, provide new well owner “tips for success”, offer incentives for expanding on-site storage, improved water metering and voluntary reporting on well performance.



References

Environmental Action Committee, Beneath the Surface: Groundwater Report, March 2021
Beneath the Surface: Groundwater Report — EAC

Nicasio Land Owners Association, Water Group Memos, NLOA Water Group Memos — Nicasio

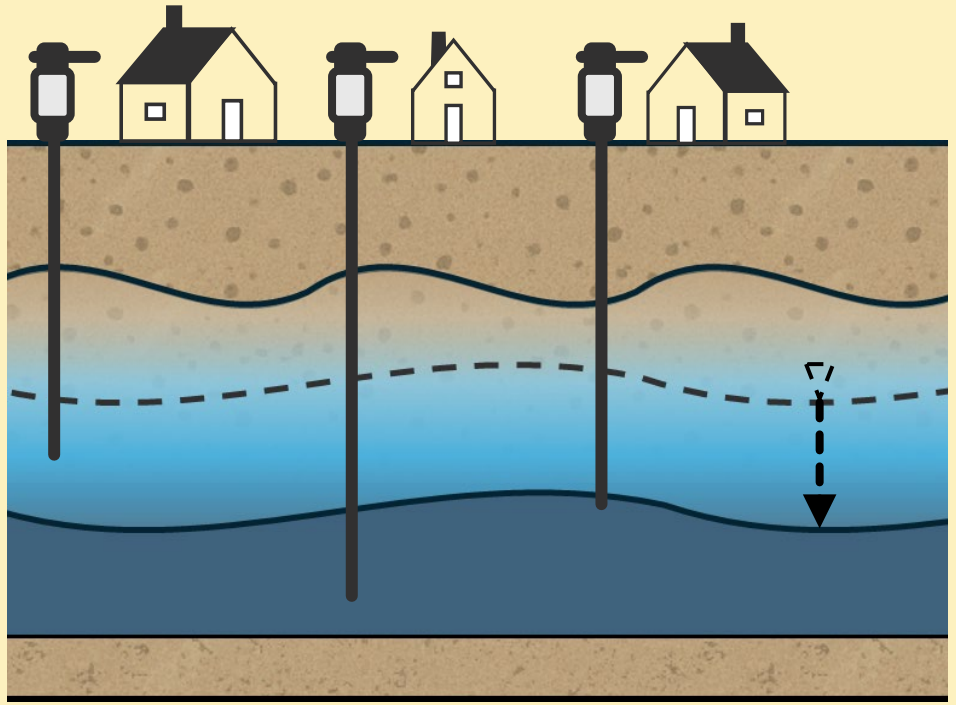
Thank you.

Martha Davis
mlcmarthadavis@gmail.com

Community Groundwater Monitoring Program

Partnering with communities to build groundwater knowledge and resilience

- Voluntary DWR program supporting **domestic well owners**, schools, and small water systems
  → Offers training, equipment, and support
- Monitor groundwater *levels* – **not use**
- Builds **community knowledge** and statewide monitoring coverage
- Flexible to meet **local needs** and **interest**



We will discuss this program and **Napa County's Groundwater Self-Monitoring Program** in the October gathering.

Upcoming County Discussion Opportunities

September 24th, 9-10am: Office Hours

→ Follow-up questions from August Gathering

October 29th, 9-10am : CA County Café Gathering

→ Community & County Groundwater Monitoring

Follow-up questions?
Feedback to share?
Please fill out this survey!

https://forms.office.com/g/huVDFvNnJY

Closing – Thank you!

Next steps – we will follow up with an email to counties for future gatherings, ppt, invitation to share in upcoming gathering.