California

DRIP Collaborative

Drought Resilience Interagency & Partners (DRIP) Collaborative Meeting

Friday July 17, 2026
California Natural Resources Agency
715 P Street, Sacramento, CA
Room 02-221 A/B/C (Second Floor)

Meeting Information

1. This meeting is being live streamed and recorded.
2. Members of the public are welcome to listen. Public comments will be taken throughout the meeting.
3. Please practice electronics courtesy and turn off or mute your cell phones.
4. All viewpoints are welcome; we look forward to engaging, innovative, thoughtful, and respectful discussions!

Paul Gosselin, CA Department of Water Resources – Deputy Director of Sustainable Water Management

WELCOMING REMARKS

Meeting Objectives

Objective #1: Advance collective understanding of drought and water shortage resilience efforts.

Objective #2: Review progress and solicit additional feedback on the two priority initiatives Roles and Responsibilities (R&R) and Drought Indicators and Metrics (DI&M)

Objective #3: Increase awareness of Proposition 4 funding opportunities and their potential relevance to drought resilience efforts.

Meeting Agenda

1. Welcoming Remarks and Setting Intentions
2. Orientation to the Work of the DRIP Collaborative
3. Hydrology Report - California Water Conditions Update and Expectations
4. Accomplishments Related to the 2024 /25 DRIP Collaborative Recommendations
5. Roles & Responsibilities for Domestic Wells and State Small Water Systems
6. LUNCH [12:30pm – 1:30pm]
7. Drought Indicators & Metrics
8. BREAK [3:15pm – 3:30pm]
9. Prop 4 Climate Bond Funding Opportunities- Presentation
10. Public Comment
11. Closing Remarks

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DRIP Collaborative (Quorum is 14)

1. **Alexandra Biering**, California Farm Bureau
2. **Carolina Hernandez**, Los Angeles County Public Works
3. **Charles Delgado,** California State Association of Counties
4. **Emily Rooney**, Agricultural Council of California
5. **Ivy McElroy (for Anna Schiller)**, Environmental Defense Fund
6. **Joaquin Esquivel,** State Water Resources Control Board
7. **Joshua Cahill**, Yurok Tribe
8. **Katy Landau (for Anna Naimark),** California Environmental Protection Agency
9. **Laura Ramos**, California Water Institute at Fresno State
10. **Maria Gallegos Herrera,** Rural Community Assistance Corporation (RCAC)
11. **Mariko Falke,** California Department of Water Resources - Tribal Affairs Office
12. **Nate Ortiz (for Christina Curry),** California Office of Emergency Services
13. **Paul Gosselin,** California Department of Water Resources
14. **Samantha Arthur**, California Natural Resources Agency
15. **Sierra Ryan**, Santa Cruz County
16. **Sophie Morin (for Chelsea Haines)**, Association of California Water Agencies
17. **Suzanne Pecci,** Domestic Well Advisory Group, South American Subbasin
18. **Tami McVay,** Self Help Enterprises
19. **Tim Worley,** California Association of Mutual Water Companies
20. **Virginia Jameson,** California Department of Food and Agriculture

Additional Members:

21. **Abby Edwards,** Governor's Office of Land Use and Climate Innovation
22. **Alvar Escriva-Bou,** University of California, Davis
23. **Brent Hastey,** Plumas Lake Self Storage, Owner
24. **Emiko Burchill,** California Department of Fish and Wildlife
25. **Jennifer Clary**, Clean Water Action
26. **Redgie Collins,** California Trout Inc.

Welcome to New Members and Alternates

Introducing

Ivy McElroy, Environmental Defense Fund (EDF) (Senior Analyst, Climate Resilient Water Systems)

Jennifer Clary, Clean Water Action (California State Director)

Sophie Morin, ACWA (Policy Advocate)

DRIP Collaborative Purpose: Facilitate proactive state planning and coordination, both for predrought planning andmitigation, emergency response, and post-drought management, and to develop strategiesto enhance collaboration between various fields, for all types of water users. (Water Code §10609.80., subd. (b))

Glen Low, The Earth Genome

ORIENTATION TO THE WORK OF THE DRIP COLLABORATIVE

Year 4: Impact on Urgent Items

Year 1
Foundation Building
Shared process, initial ideation (needs, solutions), engagement

2023

Year 2
Building Muscle
Content work, focused on early wins and demonstrating success

2024

Year 3
Scaling Impacts
High impact, more difficult work. System change (as needed)

2025

Year 4
Moving to Action
Work to address issues with near term impacts

2026



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2026 DRIP Collaborative Engagement Timeline



Any questions on the process for this year?

In-Person Meeting

Virtual Meeting

California DRIP Collaborative

Recap of April 17, 2026 meeting

Meeting Summary

Drought Resilience Interagency & Partners (DRIP) Collaborative
Spring 2026 Meeting
California Natural Resources Agency, Room 02-221A/B/C
715 P Street, Sacramento
April 17, 2026, 10:00 am - 5:00 pm

The meeting was live streamed and recorded. The recording can be viewed at: https://youtu.be/ypqvRFZ3nVQ

Meeting materials (including the presentation) are available online at: https://water.ca.gov/drip.

A list of Drought Resilience Interagency & Partnership (DRIP) Collaborative members (members) is included in Appendix A. The DRIP development team includes:

- Anthony Navasero, CA Department of Water Resources (DWR), Drought Coordinator
- Julie Ekstrom, DWR, Environmental Program Manager in the Water Justice Office
- Zoe Kanavas, DWR
- Kira Haynes, DWR
- Jaden Torres, DWR
- Glen Low, Earth Genome
- Orit Kalman

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DRIP Collab 4.17.2026 Mtg Summary

Roles & Responsibilities for Domestic Wells & State Smalls

Orit Kalman, Facilitator [1:00:10 – 2:12:40, slides 41-59]

The session opene
(Community Soluti
Alcantra, a well ow
experience with on
purchasing his pro
With support from
contamination from
standards.

Dario shared that
improvements, wat
bottled water. He e
the difficulty of nav
connecting his well
community suppor
He highlighted the
support and empha
have limited acces

Drought Indicators and Metrics

Glen Low, Earth Genome [2:12:40 – 3:09:19, slides 63-82]

Glen introduced the Drought Indicators and Metrics effort by revisiting the intent of the recommendation and the approach moving forward. The work focuses on building on existing efforts by documenting what already exists and identifying where additional value can be added. This includes avoiding redundancy with existing inventories (e.g., NOAA/NIDIS inventory) and recognizing the long history of data collection and drought-related analysis in California. The emphasis is on improving the usability of drought indicators, not simply expanding the number of indicators available. A central theme is the need for a user-centered approach, where indicators are tailored to specific audiences and designed to inform decision-making. This includes moving beyond hazard-based indicators to consider the actions they trigger and the impacts they are intended to prevent. The recommendation's focus on a drought early warning system reflects this shift, emphasizing the connection between data, decision-making, and outcomes.

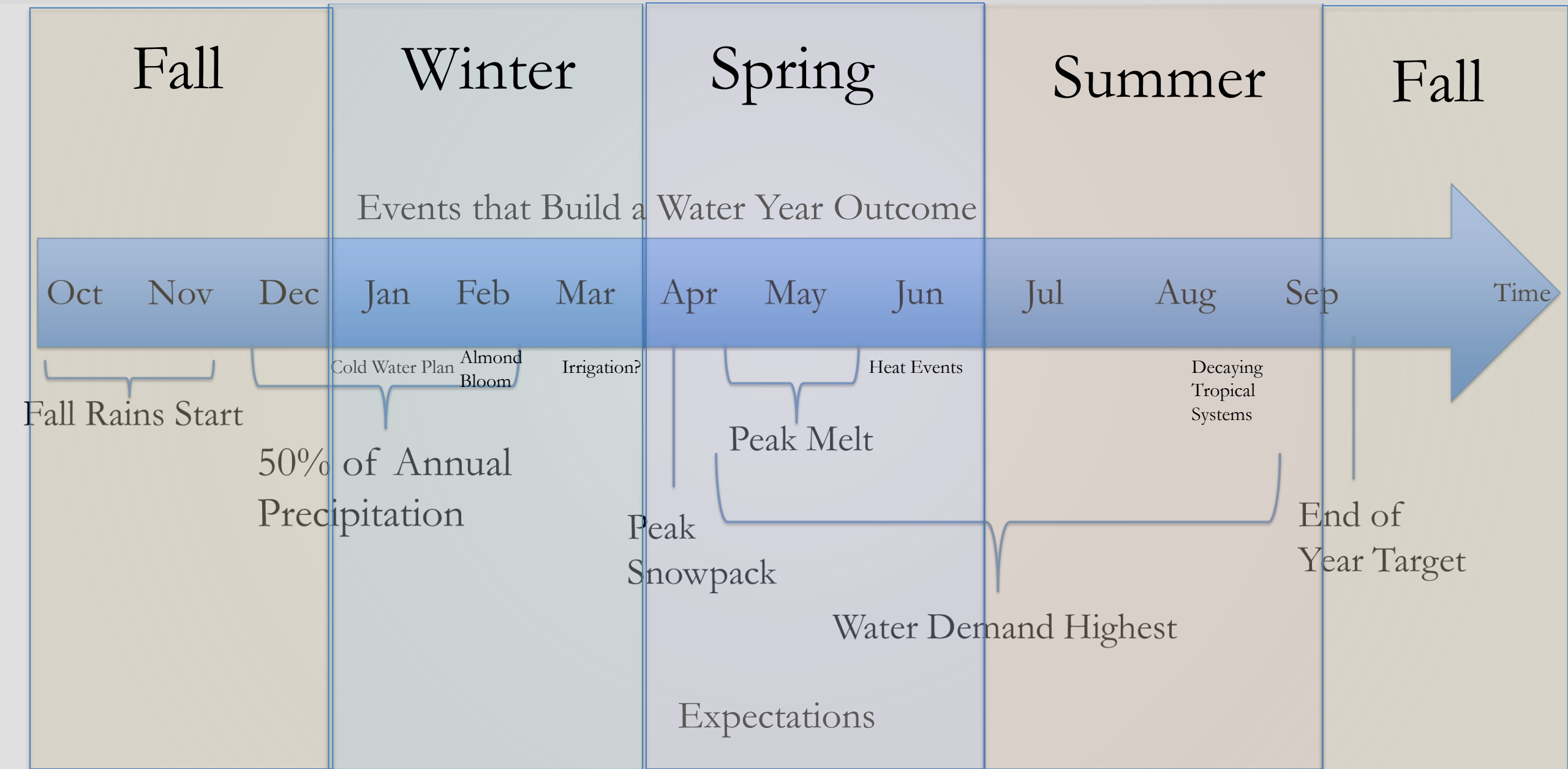
Prof. Alvar Escriva-Bou (UC Davis) gave an update on his work to develop improved drought indicators for California. This work focuses on addressing limitations in existing indicators by better reflecting the state's complex water system, including multiple water sources and sector-specific conditions (sectors include urban communities, small communities, agriculture, and environment). Efforts include development of indicators across water sources (e.g., precipitation, surface water, groundwater, and imports) and linking hydrologic conditions (e.g. reservoir levels) to expected outcomes, such as water deliveries, groundwater availability, and risk of dry wells.

Mike Anderson, State Climatologist for California, Department of Water Resources

CALIFORNIA WATER CONDITIONS UPDATE AND EXPECTATIONS

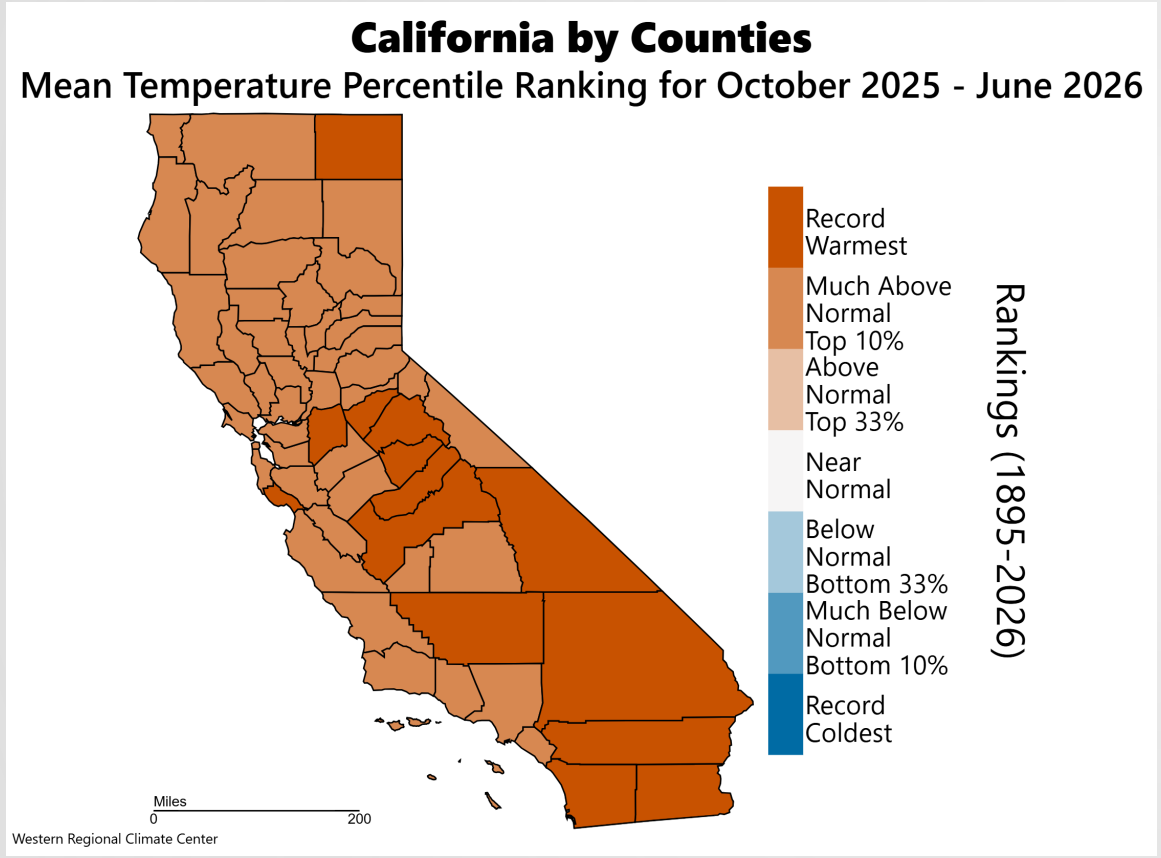
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Water Year Timeline

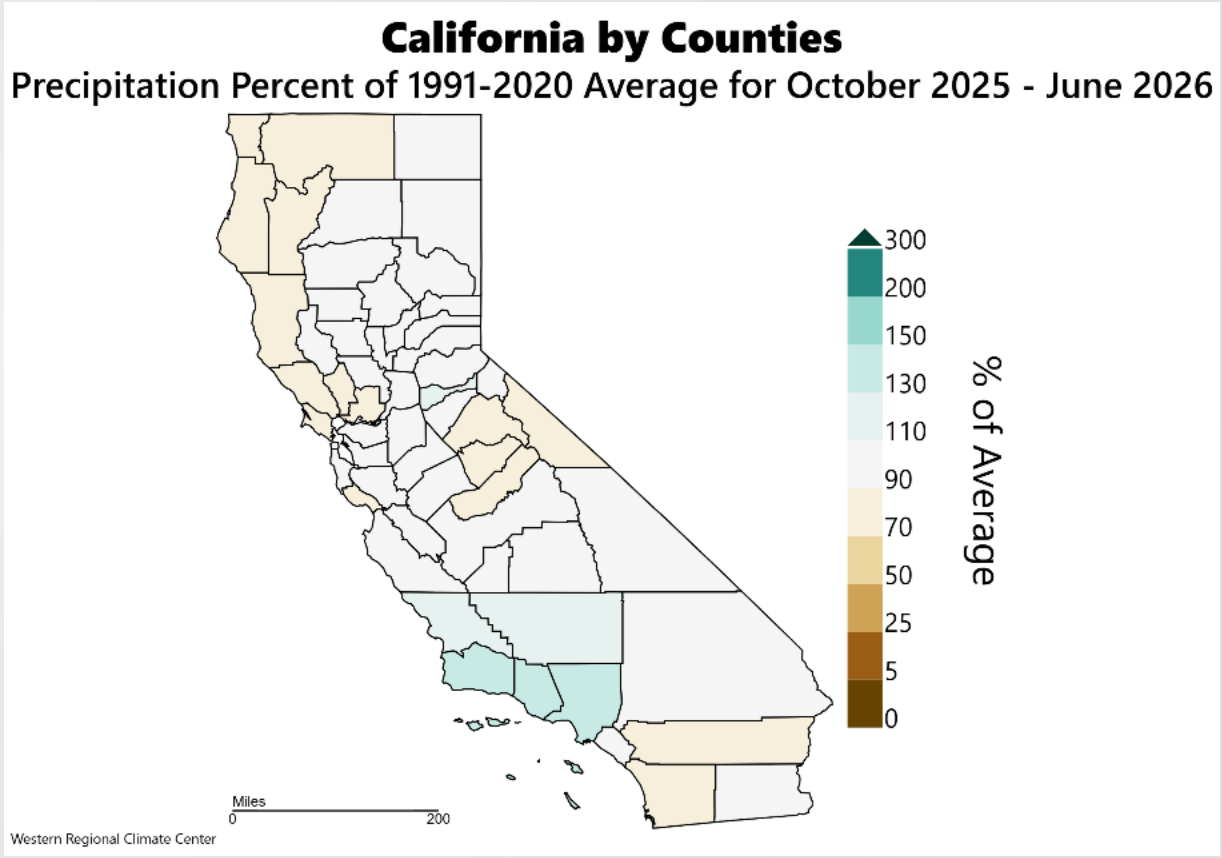


Water Year 2026 So Far

Statewide Anomaly +4.2 degrees F (warmest*)



Water Year to Date 96% of average

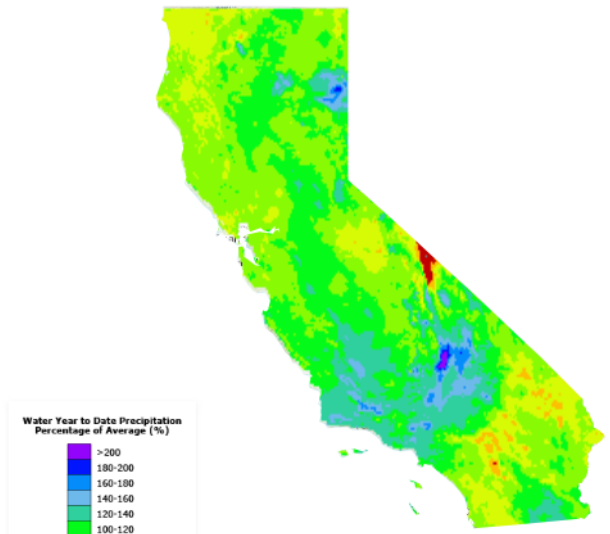


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*Tied with water year 2015

California Water Watch

PRECIPITATION | SNOWPACK | RESERVOIRS | GROUNDWATER | TEMPERATURE | STREAMFLOW | SOIL MOISTURE | VEGETATION



Precipitation as of 07/04/2026*

California's annual precipitation can vary greatly from year to year and region to region. The map of California shows how this water year's precipitation compares to what has been observed historically. The chart below provides a summary of California's current statewide precipitation statistics.

Precipitation Statistics (period of record: 1981-current)

Statewide as of 07/04/2026

Water Year to Date: **22.11"**

% of Average: **97%**

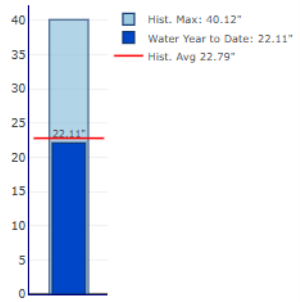
Precipitation % of average for full water year through September 30th: **93%**

Historical Record to Date:

Max: **40.12"**

Mean: **22.79"**

Min: **11.2"**



Precipitation for water year to date is 97% of historical average

California's new Water Year began Oct. 1, 2025 and ends Sept. 30, 2026. Graphics on this site use data for WY 2025-26. To view WY 2024-25 data, visit the yearly summary page.

**Updated daily at 1 pm from the prior day, as data is made available.*

Get More Data >

Major reservoir levels

Reservoirs get us through the dry months



106%

of average levels

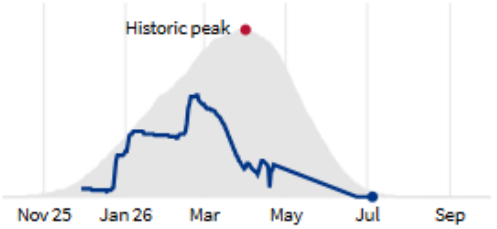
Updated daily

More about reservoirs

Statewide snowpack levels

Snow melt feeds our reservoirs & rivers

0% of average peak snowpack



Updated daily

More about snowpack levels

Monitoring Wells Below Normal Level

28%

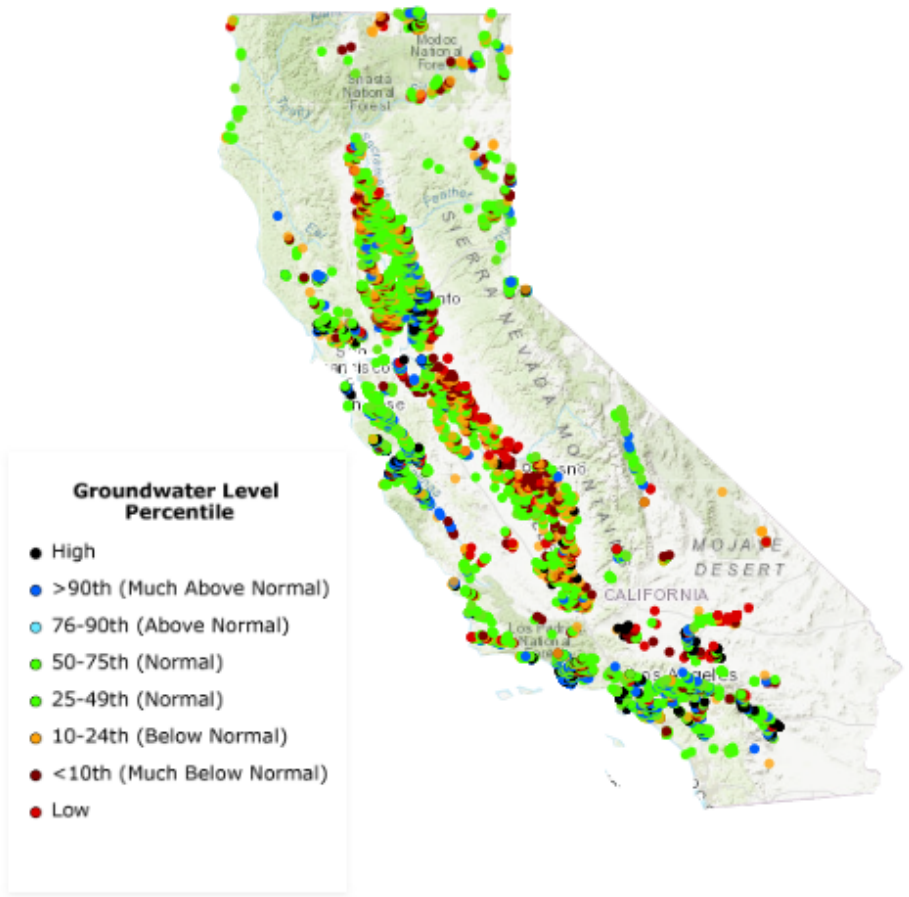
Dry Wells Reported - Year to Date

33

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Groundwater Conditions

PRECIPITATION | SNOWPACK | RESERVOIRS | **GROUNDWATER** | TEMPERATURE | STREAMFLOW | SOIL MOISTURE | VEGETATION



Groundwater as of 07/05/2026

The map of California shows groundwater level conditions across the state by comparing the most recent groundwater level measurement at individual monitoring wells to historical measurements during the same month. For a well to appear on this map, the most recent measurement must have occurred within the last 18 months, and measurements from at least 10 years must exist for that month.

Currently, most monitoring wells are only measured twice a year, in the spring and fall. Few wells have monthly data, however the State and local groundwater monitoring agencies are working to improve and expand groundwater level data collection.

We are collectively learning more than ever before about our groundwater basins from data being collected and reported by local groundwater agencies. These data are the foundation to support future decision-making related to land use and water resource planning.

The State and locals will continue monitoring and tracking groundwater conditions and collecting new data allowing locals to better manage water resources including implementing groundwater recharge during average and wet years to ensure groundwater will be available as a buffer for future dry and drought times when it is needed most.

Get More Data >

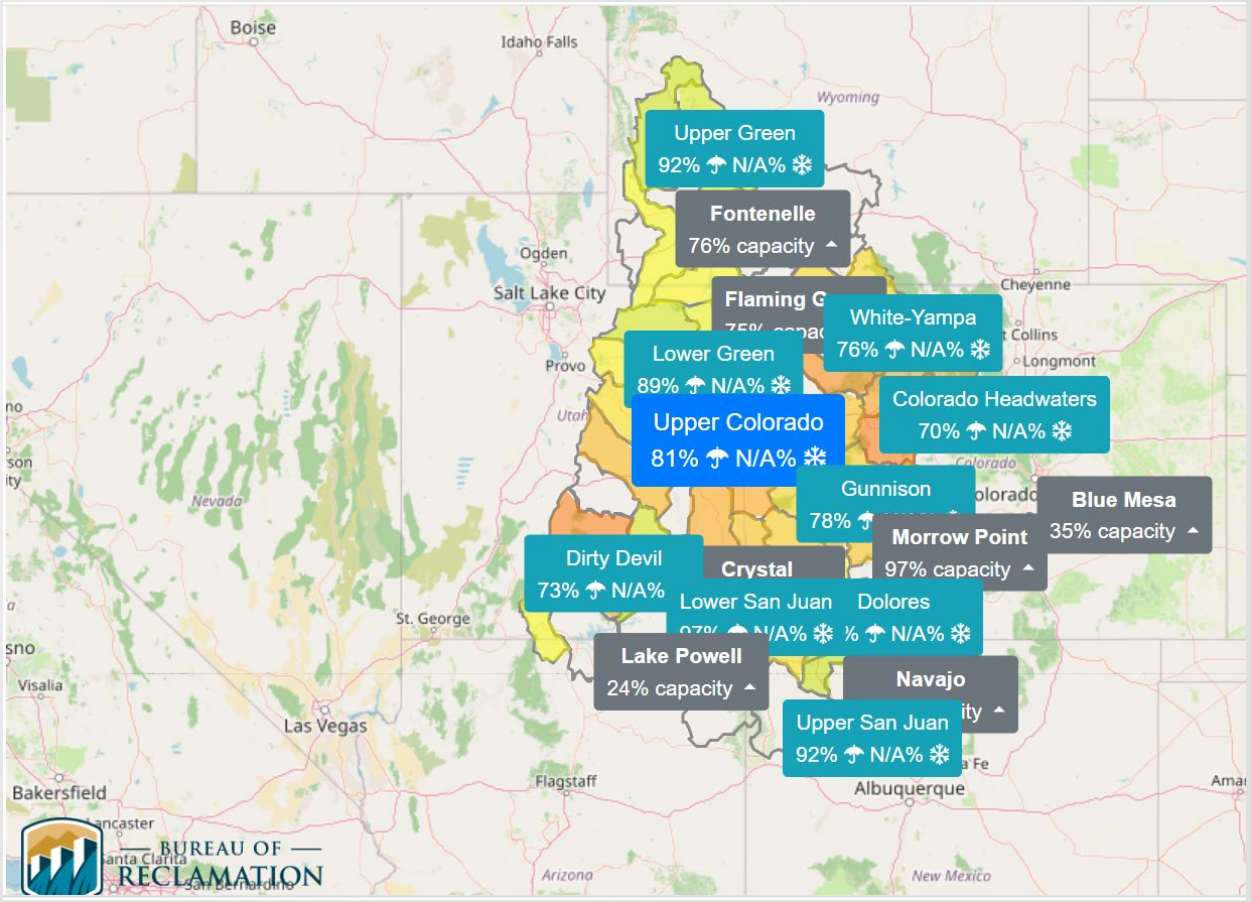
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CVP/SWP Allocations 2026

- CVP:
  - 100% North of Delta
  - 100% In Delta M&I
  - 20% In Delta Irrigation
  - 20% South of Delta Irrigation
  - 70% South of Delta M&I
- SWP
  - 45% of Contract Requests

Colorado River Conditions

- Water year 2026 resulted in the lowest snowpack on record necessitating changes in Upper Basin storage to maintain power generation at Lake Powell for this year.



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[Basin Status Maps | Water Operations | UC Region | Bureau of Reclamation]

Building the Water Year

- Fall (October/November)
  - Precipitation Onset
  - Temperature Anomaly
  - Soil Moisture State with Snowpack Initiation
- Winter (December/January/February)
  - Wet/Dry
  - Notable Anomalies
- Spring (March/April/May)
  - Late-Season Bailout or Early Shutoff?
  - Peak Snowpack Timing and Magnitude
- Summer (June/July/August/September)
  - Drying Pace and Scale
  - Heat Events
  - Tropical Activity
- Multi-Year Prediction – What about

Climate Change: How different will the next decade be?

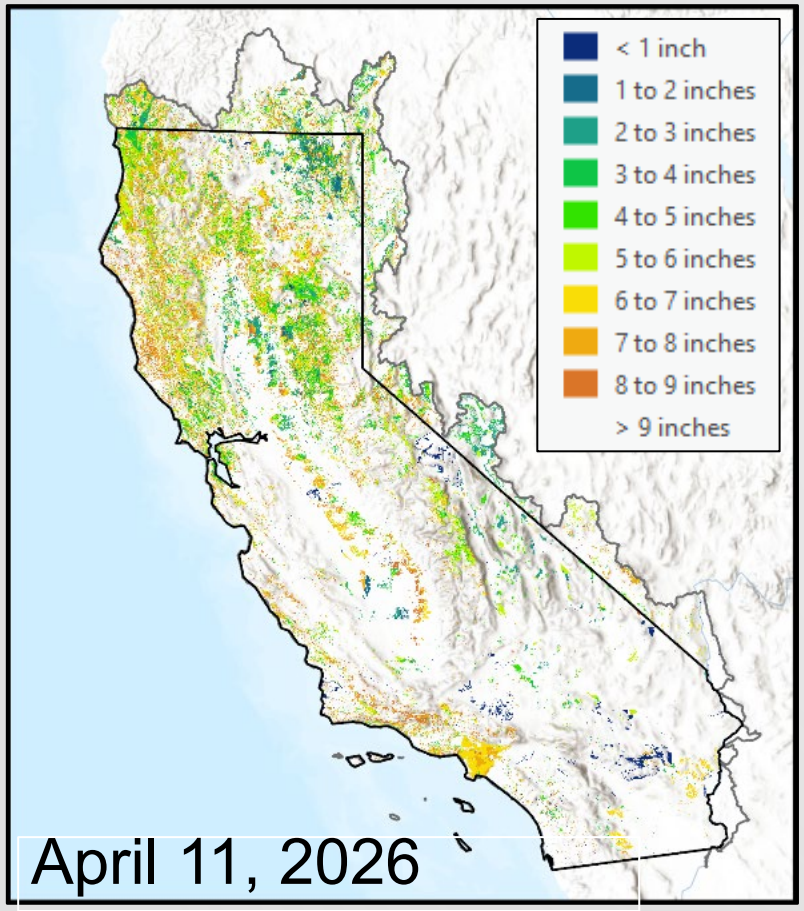
©2026 Earth Knowledge

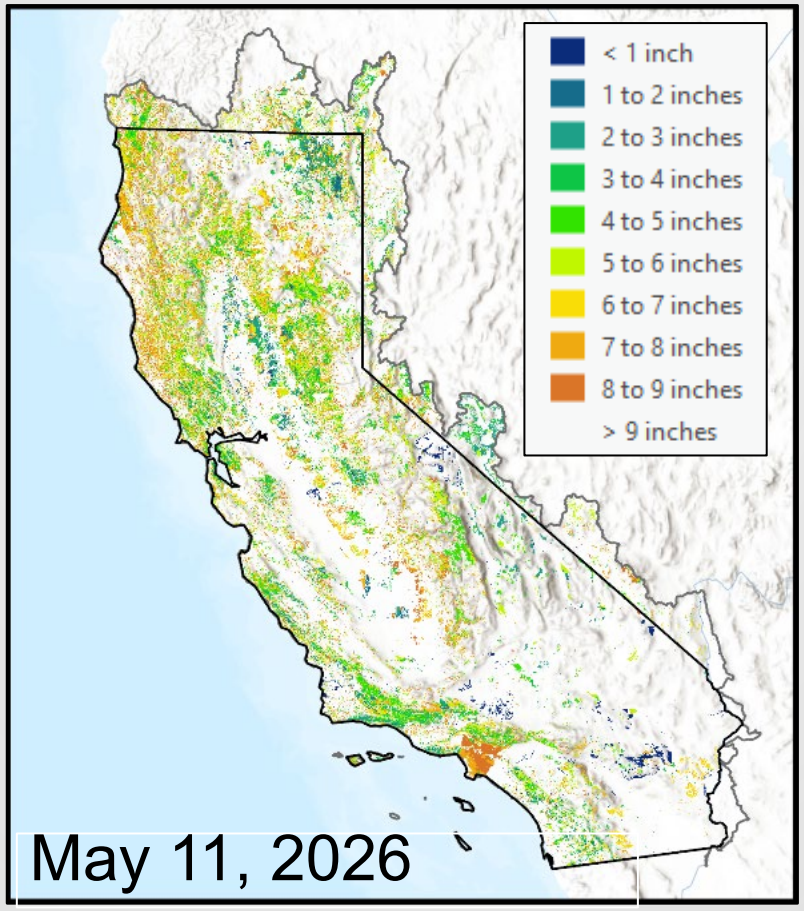
Antecedent conditions prior to rainfall

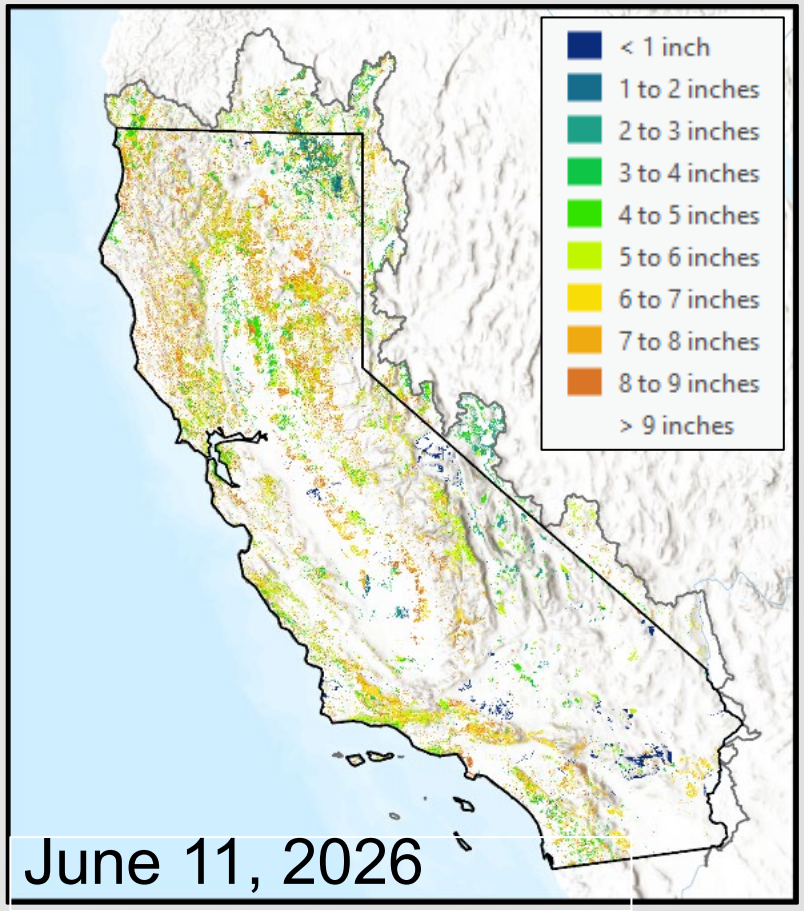
Inches of rain needed to fill soils and produce runoff

EarthKnowledge
INTEGRATED PLANETARY INTELLIGENCE™

Observations: Antecedent conditions determine how much precipitation or snowmelt is needed to fill soils and produce runoff. This forecast period starts with >5-9" needed in all locations, slightly drier than last month.

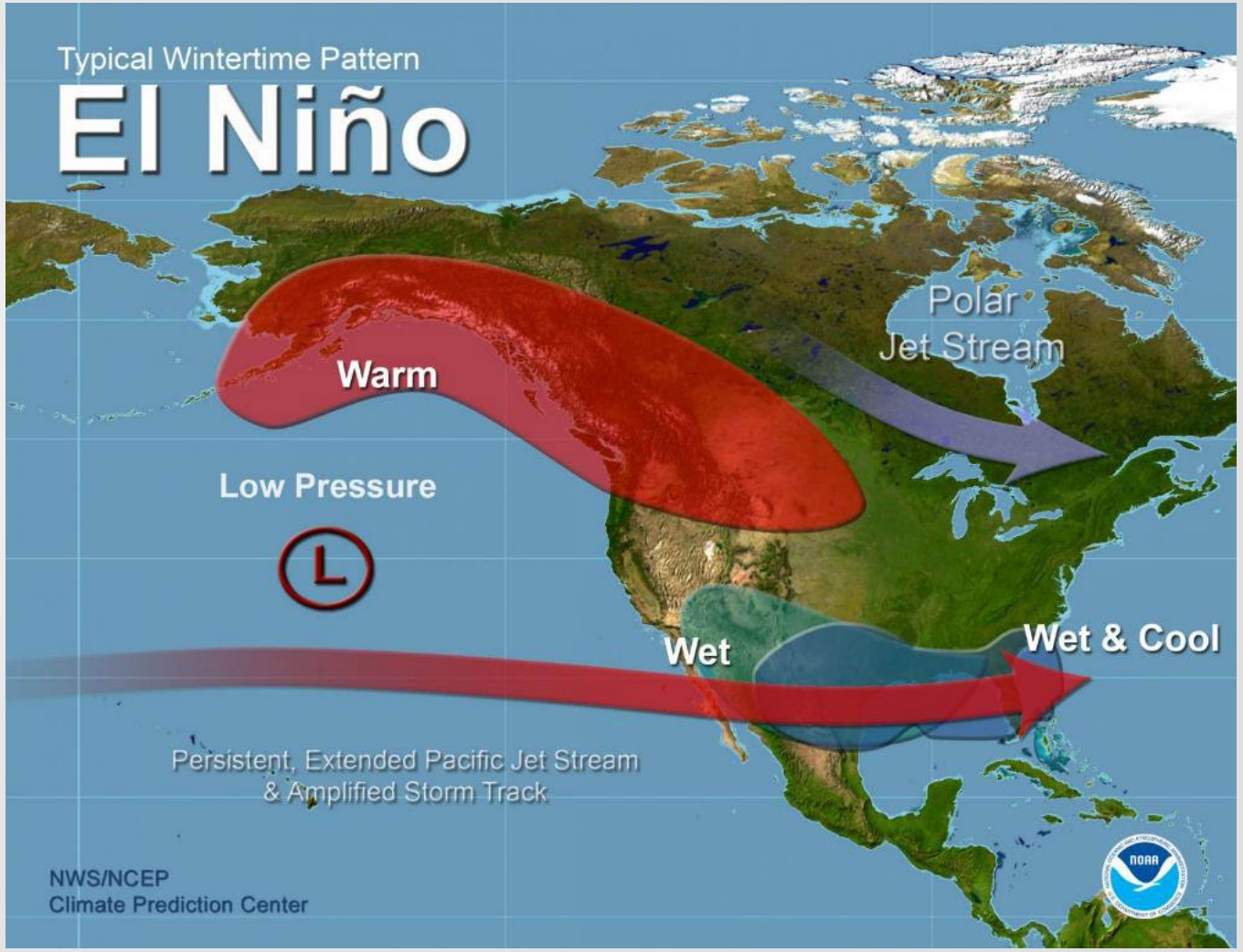






ENSO Impacts Wintertime Storm Tracks

- Jet stream flat and fast
- Displacement to the south determines CA impacts
- More quick storms and coastal damage likely
- Higher sea levels
- Marine animal stress



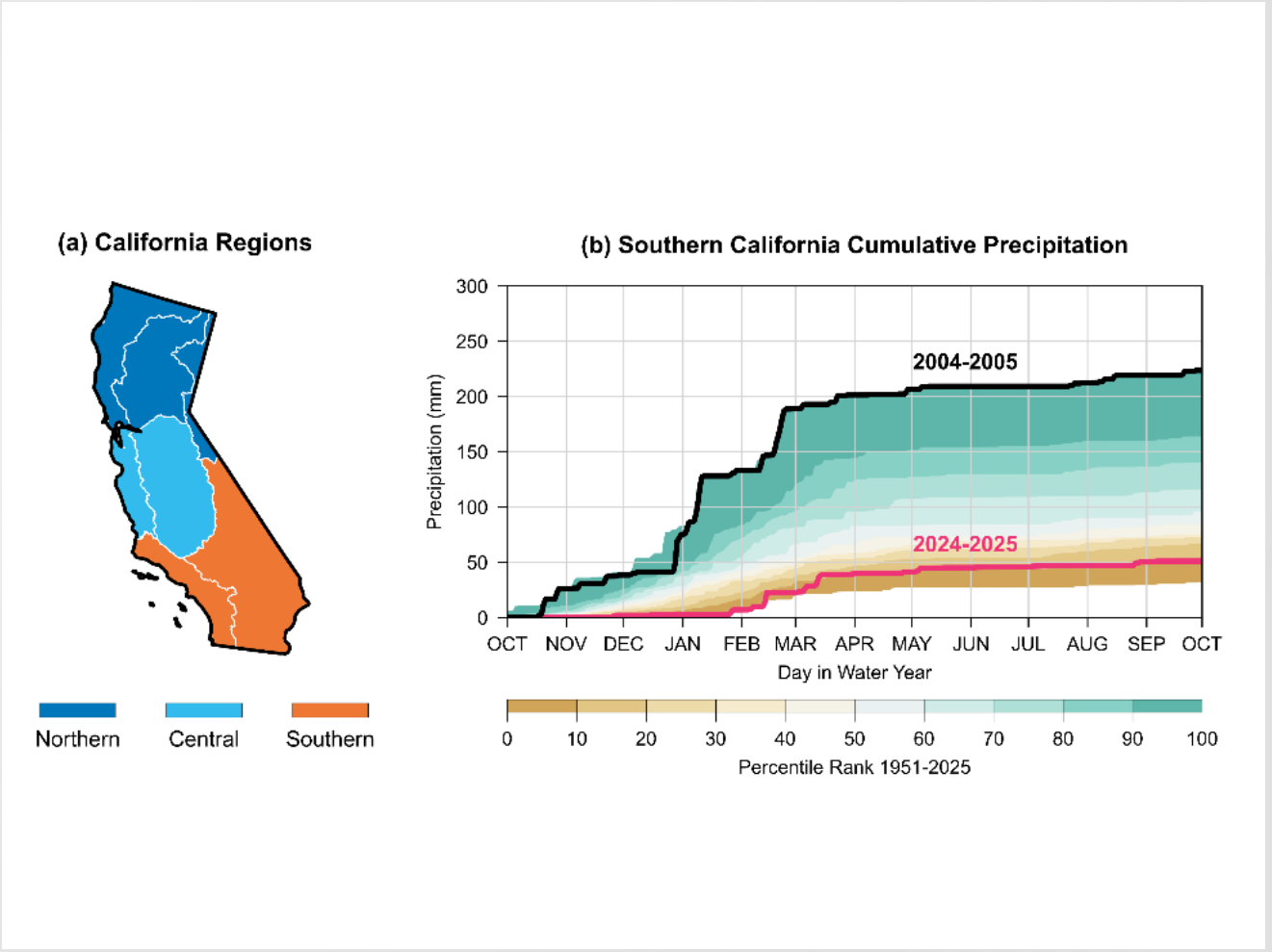
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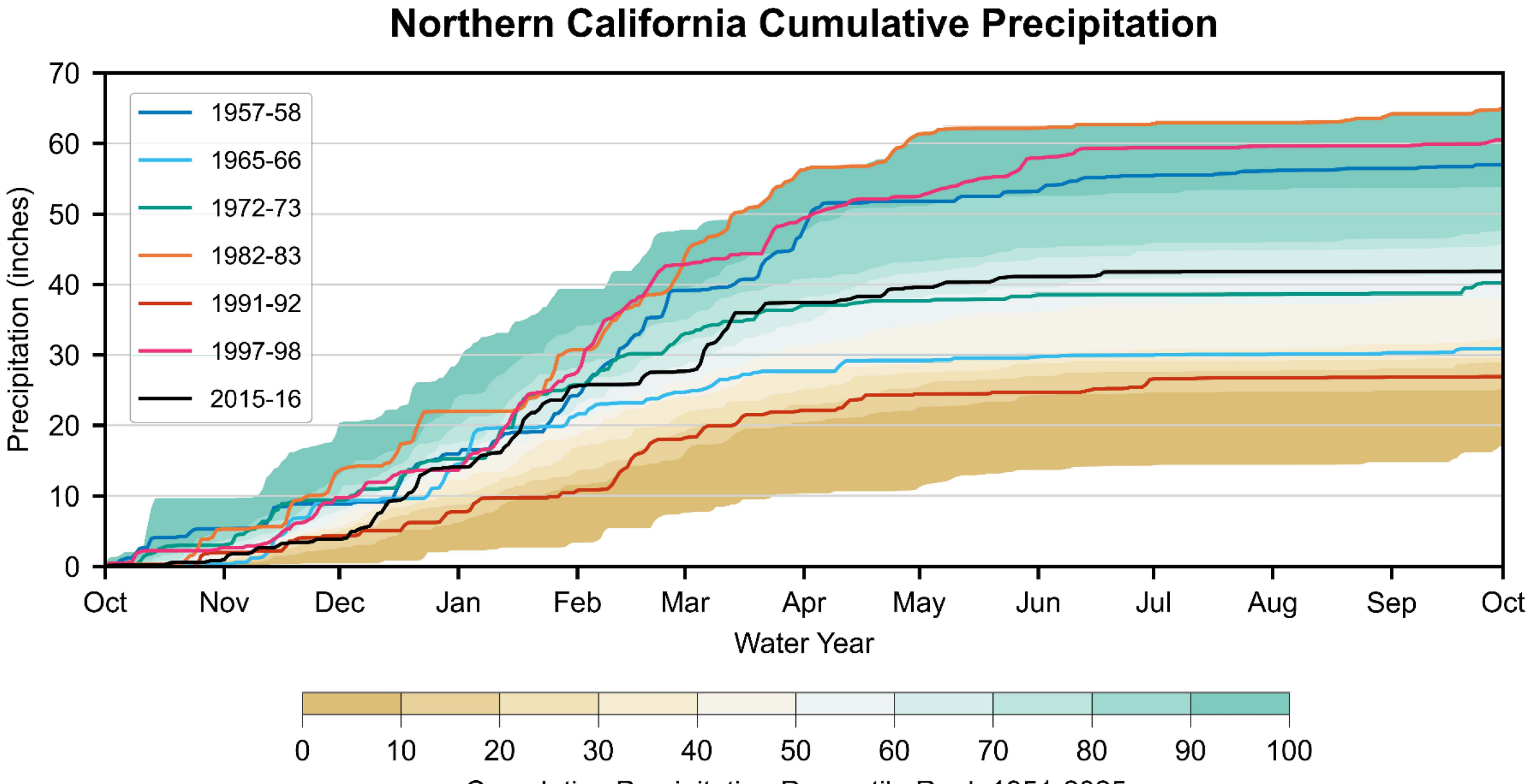
Years with Strong El Niño

Water Yr	PkRONI	Season	Statewide Precipitation	Apr 1 SWE
1958	2.02	DJF	**149%**	**171%**
1966	2.04	OND	84%	83%
1973	2.27	NDJ	113%	148%
1983	2.52	NDJ	**184%**	**227%**
1992	2.32	DJF	84%	60%
1998	2.38	SON	**167%**	**158%**
2016	2.37	NDJ	102%	85%

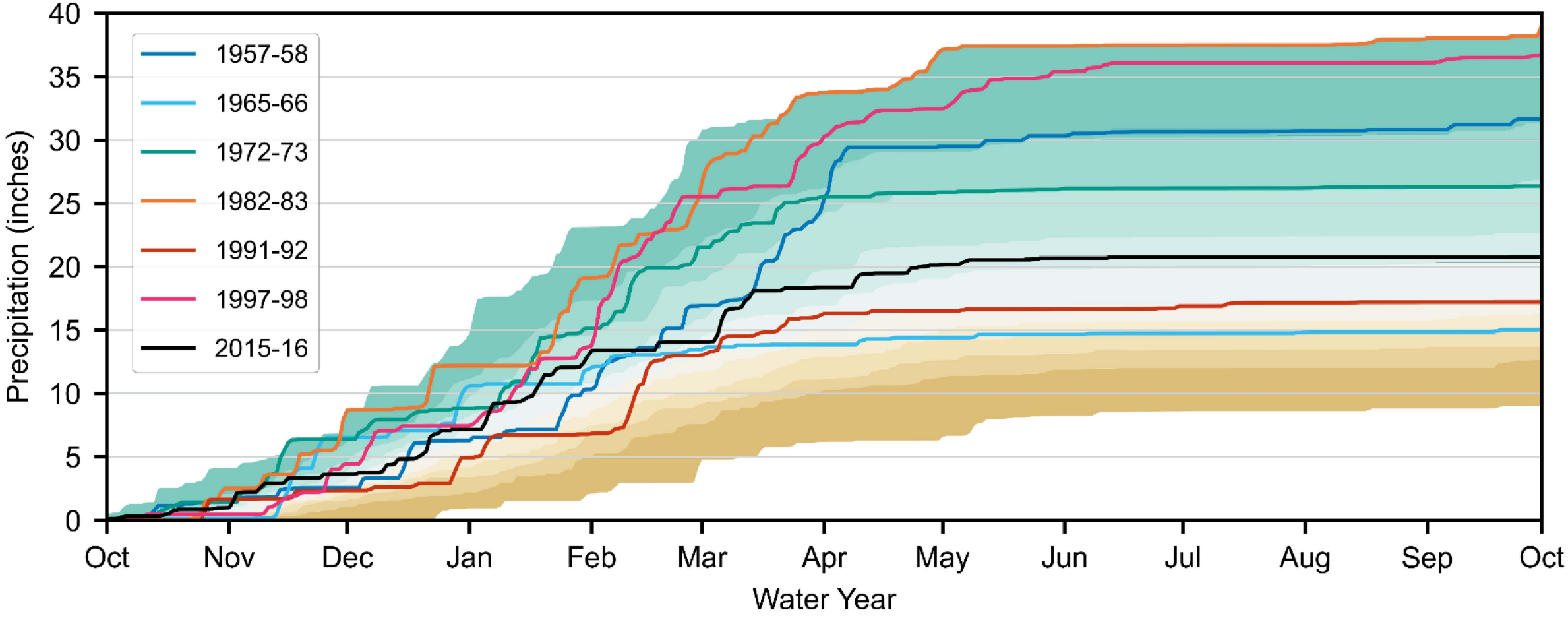
Variability in Precipitation Outcomes

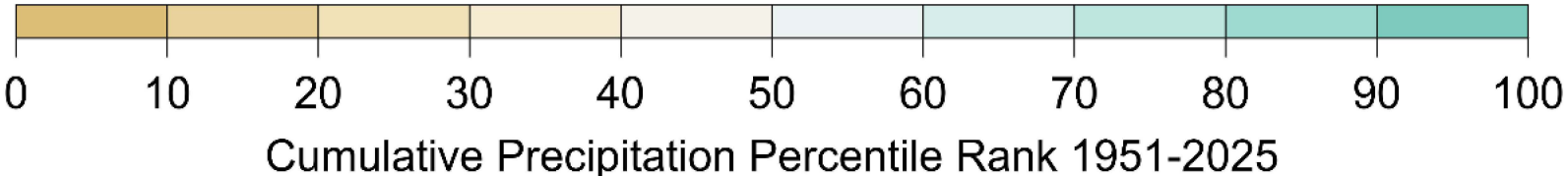
- Courtesy of Andy Hoell, NOAA PSL
- Annual precipitation traces to show year to year and within year variability.



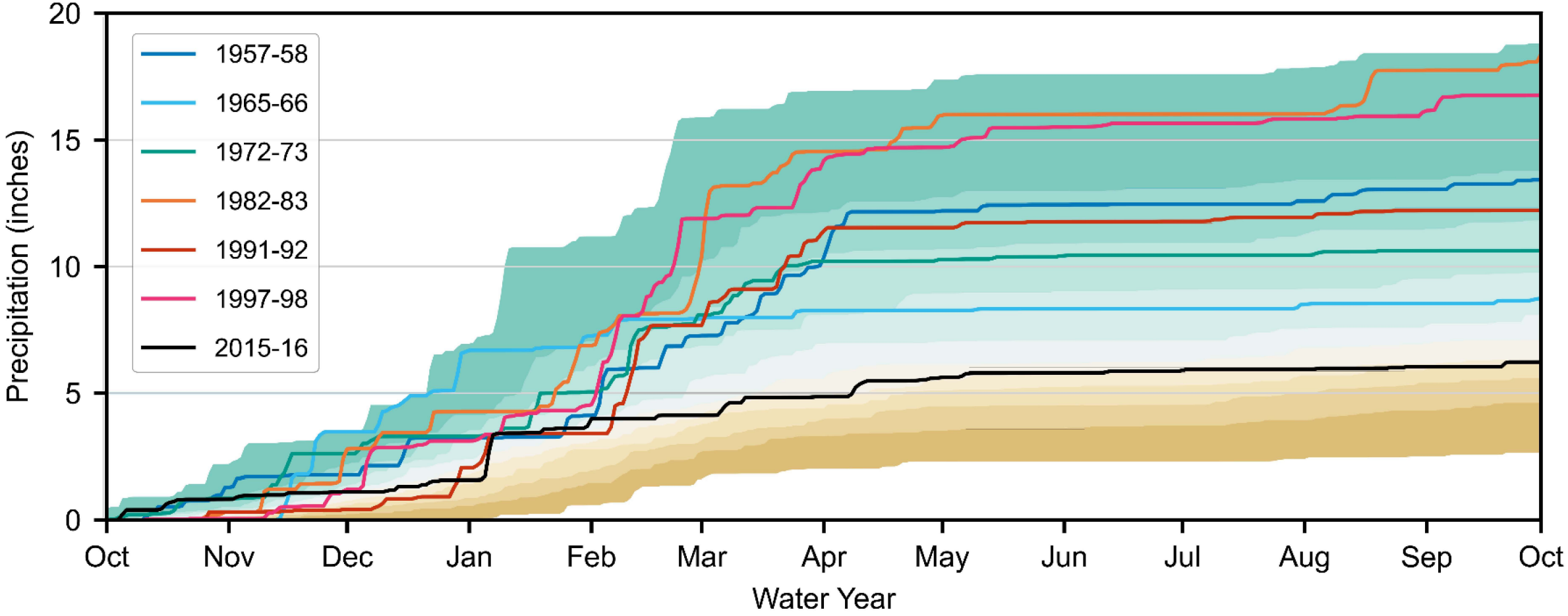

Northern California Cumulative Precipitation
Precipitation (inches)
70
60
50
40
30
20
10
0
1957-58
1965-66
1972-73
1982-83
1991-92
1997-98
2015-16
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Water Year
0
10
20
30
40
50
60
70
80
90
100

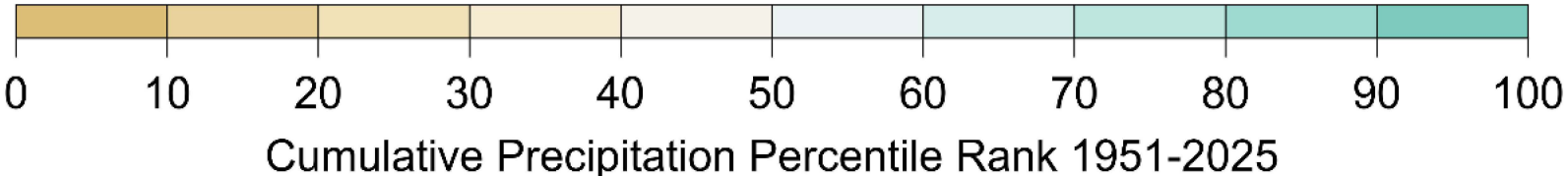
Central California Cumulative Precipitation





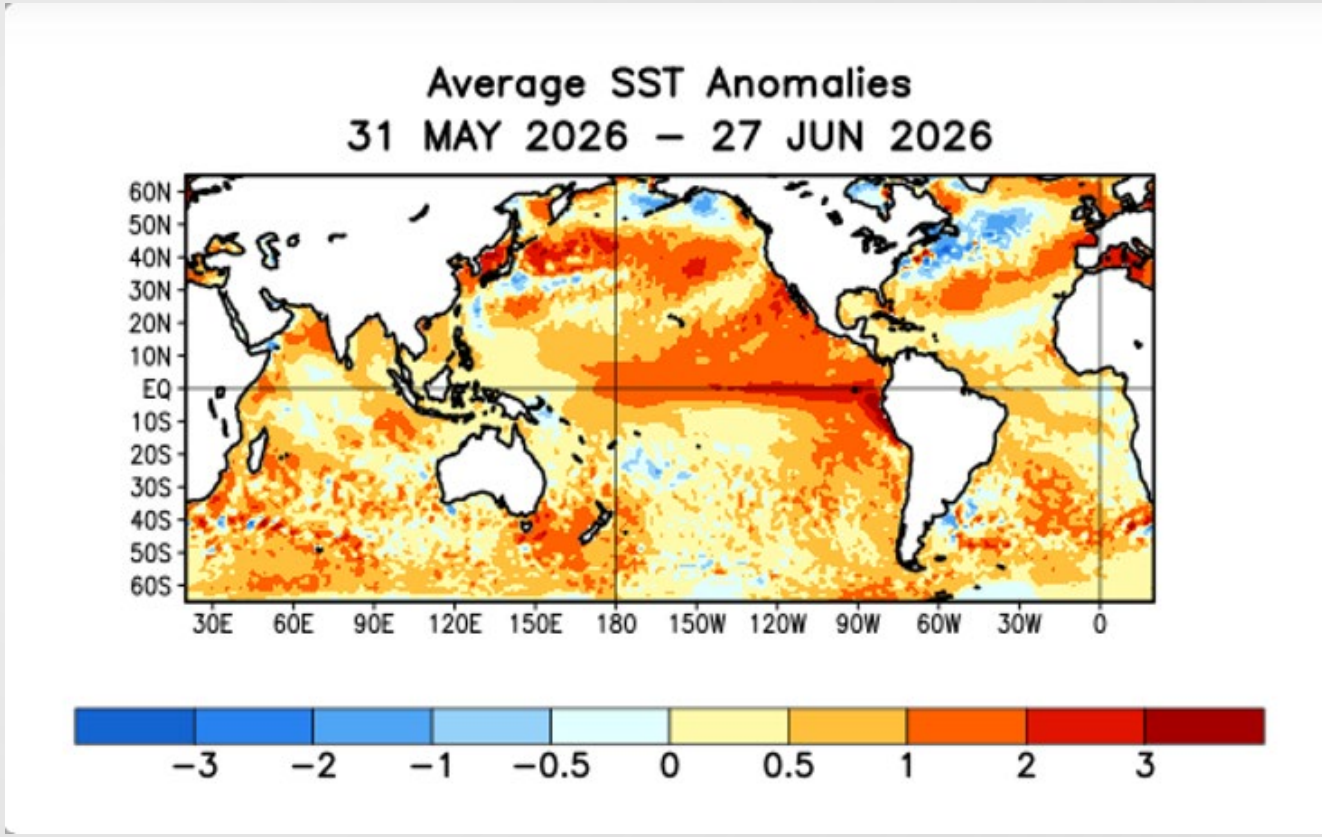
Southern California Cumulative Precipitation





ENSO and Marine Heat Anomalies

- What is different now versus 1980s?
- What studies are worth revisiting?
- What additional knowledge is available to incorporate into new expectations?



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Public Comment
Hydrology Report

1. In-person participants
2. Virtual participants:
    a) Raise your hand with the “Raise Hand” feature in Zoom and you will be asked to unmute and speak.
    b) Send a Zoom chat to the webinar manager if you need technical assistance.
    c) If you are dialing in by phone, dial *9 to raise your hand and dial *6 when it you are called on to speak.

Julie Ekstrom, CA Department of Water Resources – Water Justice Office

ACCOMPLISHMENTS RELATED TO THE DRIP COLLABORATIVE 2024/25 RECOMMENDATIONS AND DISCUSSIONS

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Tracking the 2024 DRIP Collaborative Recommendations

Focus Area	Recommendation	Progress	
DROUGHT RELEVANT DATA	1. **Drought Indicators and Metrics**		UCD project **expanded**, NIDIS SoCal pilot **expanded**; DRIP Collaborative workshop series **in progress**
	2. **Rapid Inventory of Drought-Related Tools and Resources**		ICARP Climate Services is documenting drought related tools and data; VCP guidance.
DROUGHT PREPAREDNESS FOR DOMESTIC WELLS	3. **Empowering County Drought Resilience Planning for DW* and SSWS****		County direct assistance and grants complete: monthly webinars **pivoted** to county needs/interests; county templates and other materials in development
	4. **Voluntary Community-Based Well Monitoring Program**		DWR-supported pilot program **implemented** through regional offices. **Equipment deployment in early stages.**
	5. **Roles & Responsibilities**		DRIP Collaborative workshop series **in progress**.
DEFINITION & NARRATIVE	6. **Drought Definitions and Case Studies**		LCI including case studies of community drought experiences, as part of State's Fifth Climate Change Assessment. Soliciting input.

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DW*: Domestic Wells
SSWS**: state small water system, serving 5-14 connections



New progress identified



Early progress identified



No progress to report to date

Tracking the 2025 DRIP Collaborative Recommendations

Focus Area	Recommendation	Progress
ECOSYSTEMS	1. Instream Flows: Best Practices for Landowner Cooperative Solutions	 No reported update.
LAND USE PLANNING-WATER NEXUS	2. Housing Needs in Reflection of Capacity of Water Supply and Wastewater Infrastructure	 UCLA Luskin Center for Innovation – Masters project complete
	3. Alignment Assessment and Guidance of Housing and Water Planning	 No reported update; early discussions LCI-DWR.
COMPLEMENTARY EFFORT	A. Integrate Water into Land Use Planning	 LCI developing optional water element in its General Plan Guidance Update.
	B. Guidance to Integrate/Align Drought Planning	 No reported progress.



New progress identified



Early progress identified



No progress to report to date

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Recommendation Highlight:
Voluntary Community-Based Well Monitoring Program

Progress: Pilot program launched and expanded through DWR's regional offices. Initial equipment has been purchased, and region offices are **in the early phases of equipment deployment**.
Led by: Water Justice Office (Zoe Kanavas) and Sustainable GW Management Office (Bryce Russell)

Pilot!

What is the Community Groundwater Monitoring Program?

- 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**



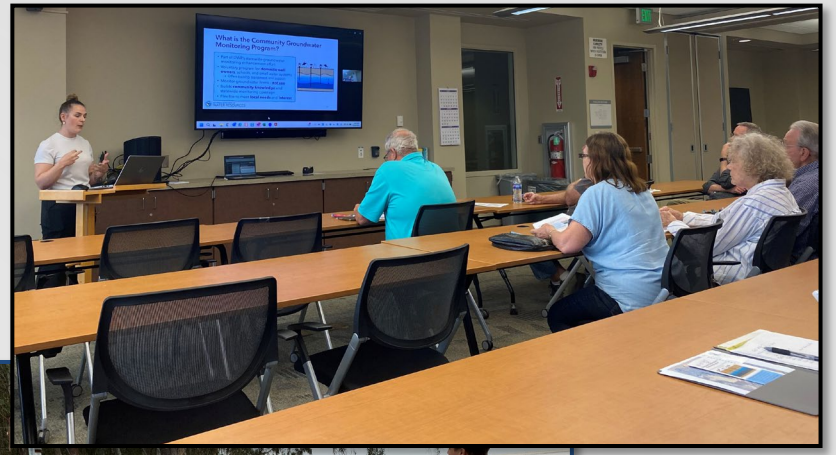




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Recommendation Highlight:
Voluntary Community-Based Well Monitoring Program

Progress: Pilot program launched and expanded through DWR's regional offices. Initial equipment has been purchased, and region offices are **in the early phases of equipment deployment**.





Pilot!

What is the Community Groundwater Monitoring Program?

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- Monitor groundwater *levels* – **not use**
- Builds **community knowledge** and statewide monitoring coverage
- Flexible to meet **local needs** and **interest**

Status to date:

- **47 domestic well** owners (most in Sonoma and Sac)
- **30 NTNC schools** (across the state)
- **42 small systems** (most in Central Valley)

Partnering with:

- DWR Regional Offices
- Sonoma LEVEL UP! Voluntary Well Monitoring Program
- Self-Help Enterprises

Self-Help ENTERPRISES



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DRIP Collaborative Discussion

What additional activities and initiatives are being implemented to

- Advance the 2024/25 recommendations
- Planning for drought and water shortage response

Public Comment

Tracking the 2024 and 2025 DRIP Collaborative Recommendations

1. In-person participants
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- Review of the roles and responsibilities recommendation
- Summary of learnings from discussions to date
- R&R workshop participants reflections
- Discussion on the structure and approach to outlining roles and responsibilities at the local level

ROLES AND RESPONSIBILITIES FOR DOMESTIC WELLS AND STATE SMALL WATER SYSTEMS

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Roles and Responsibilities

Problem Statement: When domestic wells (DW) and state small water systems (SSWS) fail to provide safe drinking water, due to impaired water supply or quality, it impacts **Californians' Human Right to Water.** California currently lacks a comprehensive approach to address the urgent drinking water needs of households served by **failing DW and SSWS** and lacks a comprehensive policy for reducing the growth of dry DW and SSWS in the future.

2024 DRIP Collaborative Recommendation: Analyze and clarify the roles and responsibilities of State, local, and other entities in managing and coordinating **risk management efforts** to address **water supply losses and water quality issues** affecting private wells and SSWS.

Updated Vision Statement: A future where it is clear who has what role and responsibility related to domestic wells and state small water systems in California to support reliable access to safe and sufficient drinking and sanitation water.

Approach:

STEP I – Current State

- **Current Roles:** Assess existing responsibilities in managing domestic wells and SSWS across the drought-risk management cycle.
- **Identified Gaps**: Highlight inefficiencies in authority, funding, and coordination.

STEP II – Future Opportunities

- **Gap Prioritization**: Focus on addressing the most critical gaps affecting drought resilience.
- **Proposed Solutions**: Provide recommendations for funding mechanisms and long-term planning to mitigate risks.

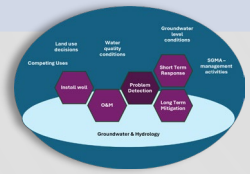
STEP I – Current State (DRIP Collaborative work in 2026)

Activities completed:

- Development of a framework, initial inventory (state overview), primers R&R
- Acknowledging local variabilities – Began exploring RESPONSE programs at the LOCAL LEVEL

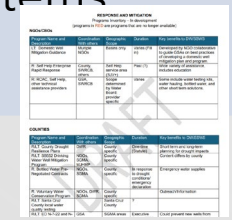
Framework – Scope

View and organize roles and responsibilities through a systems framework that accounts for all potential stressors and their interconnections.



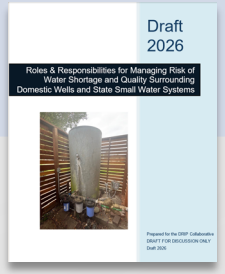
Workshop 1 Inventory

Compile an inventory of known (current and past) programs that support domestic wells and state small water systems



DRIP Collaborative April Meeting Primer

Outline the roles and responsibilities of property owners, local, state, and federal agencies, NGOsand CBOs.



Workshop 2

Local Review Example

Review of local plans and programs to clarify what exists at the local level and the local variability.



Recap of Workshop 2
Understanding Local Plans and Programs

Short Term Response

Goal: Understand what programs exist at the local level to inform discussions of gaps (extent of) and possible needs

Process:

1. Identify study area – **geographic scope:** highest concentration of dry wells
2. Identify **relevant planning and resources** to identify domestic well mitigation plans, strategies, etc. within the study area
3. Compile local and regional **programs, activities, strategies** in place (or planned) to support domestic wells and state smalls (related to drought/shortage, water quality)
4. Assess **key elements** to identify availability/gaps

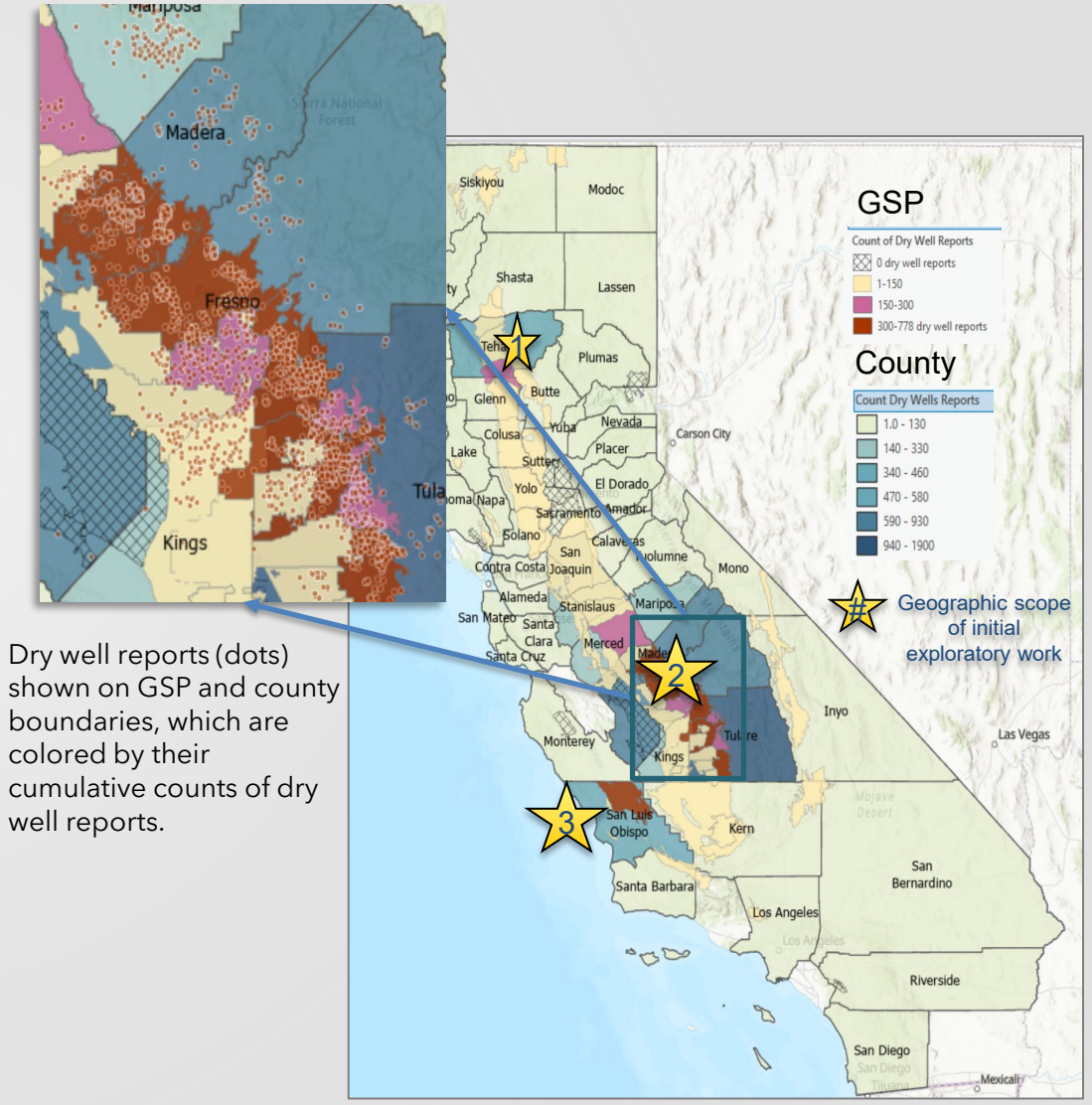
Recap of Workshop 2
Understanding Local Plans and Programs

Short Term Response

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1. Identify study area – **geographic scope:** highest concentration of dry wells



Dry well reports (dots) shown on GSP and county boundaries, which are colored by their cumulative counts of dry well reports.

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Recap of Workshop 2
Understanding Local Plans and Programs

Short Term Response

Goal: Understand what programs exist at the local level to inform discussions of gaps (extent of) and possible needs

Process:

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Planning documents reviewed include:

- County SB552 Drought Resilience Plans
- Local SGMA Domestic Well Mitigation Plans
  - Groundwater Sustainability Agency Project / Management Actions
  - Groundwater Sustainability Plan
- Water Quality Well Testing Program Map/Inventory
- County Water Quality Capacity assessment (SAFER/OEHHA)

Summary of the Types of Response Programs & Activities that May be Identified through the Materials

What type of information can we compile from each source?

Program	SB552	GSP Domestic Well Mitigation Plan	Water Quality Well Testing Program	SAFER OEHHA County WQ Assessment
Emergency water supply Bottled water, water hauling and bulk water supply, tanks, fill stations, +	Yes	Yes	Yes	No
Well and system response - infrastructure	Yes	Yes	Yes, POU/POE treatment, small scale connection; treatment options, water filtration; water system connection	funding
Early warning of problem	Yes	not in program, but in GSP	Yes, Water testing; well assessment	Yes, WQ testing requirements;
Voluntary water conservation program	Yes	yes	no	no
Website maintained as part of public outreach	Yes	yes	yes	County website quality scored

Recap of Workshop 2
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Site: San Joaquin Valley
A domestic well neighborhood



Risks to note: History of dry wells; gw decline acceleration during drought

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NE Madera County (Basin Area)

Short Term Response

Activities/ Programs	SB552 – County Drought Resilience Plan	GSP Domestic Well Mitigation Plan	SWB - Water quality technical assistance	OEHHA's analysis - County Capacity (SAFER Scored 2.5-low)
Outreach/ Communication	Materials and distribution: Dry well reporting, voluntary demand reductions			Information about quality, resources, and services provided on County website
Monitoring	Proactive surveillance of drought risks		Well water quality testing	Water quality testing for DW (Bacterial/other) Run/funded by county Admin services provided by non-county provider
Coordination	Coordination with partner organizations			
Funding	Pursue funding opportunities upon drought emergency			Information on funding available through non-county sources
Emergency Water Supplies	If State grants are awarded, CBO would provide bottled and tank water		Bottled water Water fill stations	
Mitigation - Infrastructure		Well replacement Connection to system	POU treatment	
Eligibility criteria		Dollar cap - $35,000 Well age limit – 30 yrs No income threshold Tenants are not covered Impact cutoff date of 1/1/26		

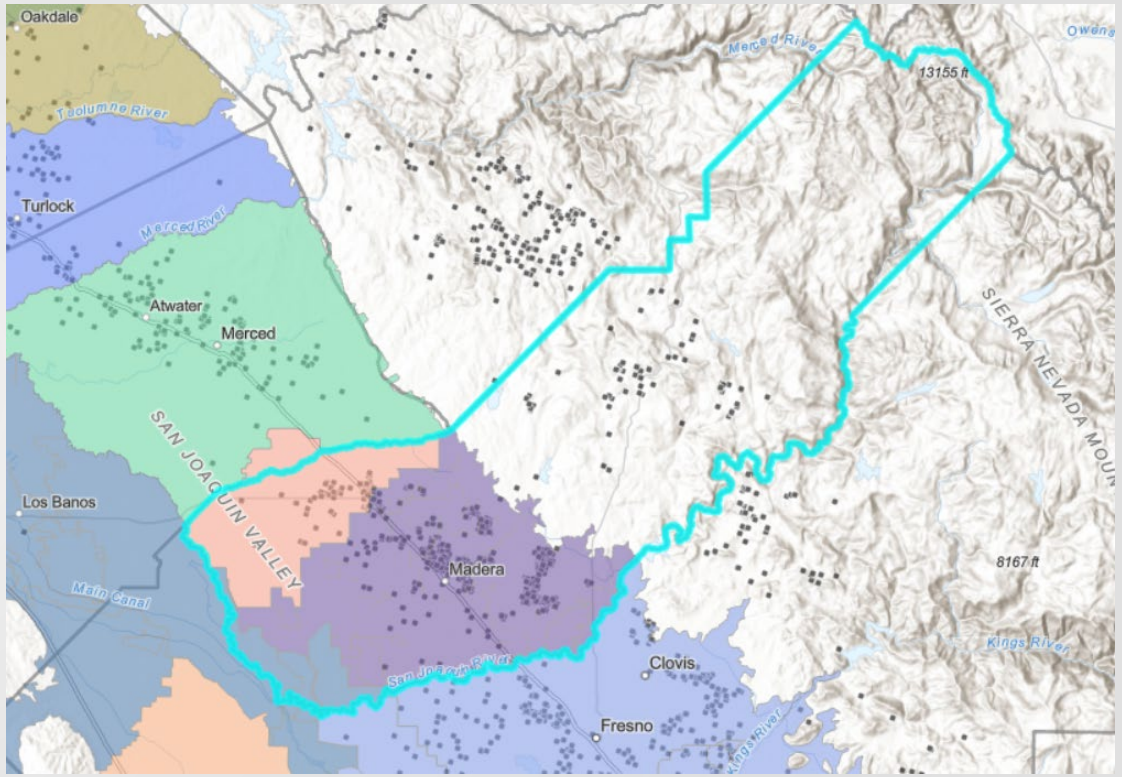
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4. Assess **key elements** to identify availability/gaps



Counties: Tehama, Kern, Fresno, Kings, Stanislaus, San Joaquin, Madera, San Luis Obispo, Tulare, Merced

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Coverage Summary – Shortage (County SB552 Plans)

Activity/county	Tehama	Kern	Fresno	Kings	Stanislaus	San Joaquin	Madera	San Luis Obispo	Tulare	Merced
Packaged or bottled water										
Water hauling (bulk water delivery										
Dedicated water filling stations										
Expedited well permitting										
Emergency proclamation										
Domestic Well Mitigation Program										
Emergency Intertie activation										

Color Key*

- Available / No Additional Resources Needed
- In-Progress / Partially Operational
- Proposed / Contingent on Funding or Action
- Deferred to GSA Program
- Not Feasible / Not Established / Active Gap
- Unknown / No Information

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*Text version of cells in table is available upon request

Coverage Summary – Shortage (County SB552 Plans)

Activity/county	Tehama	Kern	Fresno	Kings	Stanislaus	San Joaquin	Madera	San Luis Obispo	Tulare	Merced
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Emergency Intertie activation										

Color Key*

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- In-Progress / Partially Operational
- Proposed / Contingent on Funding or Action
- Deferred to GSA Program
- Not Feasible / Not Established / Active Gap
- Unknown / No Information

Broader SB 552 Plans Components Review

- Packaged or Bottled Water
- Water Hauling (Bulk Water Delivery)
- Dedicated Water Filling Stations
- Expedited Well Permitting
- Emergency Intertie Activation
- Emergency Proclamation / Declaration
- Domestic Well Mitigation Program
- Emergency Water Vendor / Hauler Procurement
- Mutual Aid Agreements
- Temporary Water Storage Tanks
- Water Conservation / Demand Reduction
- NGO / CBO Water Distribution Partnership
- Point-of-Use Water Treatment
- System Consolidation (Physical or Managerial)
- GSA Domestic Well Mitigation Program

Coverage Summary – County Capacity for Water Quality

Scored Indicators / County	Tehama	Kern	Fresno	Kings	Stanislaus	San Joaquin	Madera	San Luis Obispo	Tulare	Merced
Testing Requirements	1	0	1	1	0	0	0	0	0.5	0
Testing Type	1	0	0	1	0	0	0	0	0	0
Test Result Impacts Permit	1	0	1	1	1	0.25	1	0	0.5	1
County Monitoring Program	1	1	0	0.5	1	0	0	0.5	0	0
Administrative Services	0	1	0	1	1	0.5	1	0	0.5	1
Website Quality	1	0	0	0.5	0	0	0	0	0	0
Funding	1	1	0	1	1	0.5	1	0.5	1	1
Total W. Quality Capacity	7	5	3	11	4	2	3	1.5	10	3

Obtained from: Drinking Water Needs Assessment available on the SAFER website for additional information on the indicators and scoring:
https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/needs.html

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Coverage Summary: GSA Domestic Well Mitigation Plans

Dimension	Madera	ETGSA	Kaweah	Central Kings	Paso Robles	Corning (Tehama)	Merced
Program status	Active (Dec 2025)	Active (2022/2024)	Active (2024)	Active (Oct 2024)	In development	Pending (~Jan 2026)	Pending (~Apr 2026)
Hauled/ bottled water	No	Yes (14 days)	Yes (within 24-72 hrs)	Yes	N/A	Yes (indirect)	Yes (flexible)
Pump lowering covered	No	Yes	Yes	Yes	N/A	No	Yes (modifications)
Dollar cap	$35,000	No cap	No cap	Age-depreciated	N/A	$40,000 (proposed)	$30,000
Income threshold	No	No	No	Yes (≤80% median)	N/A	No	No
Well age limit	30 years	25 years	None stated	50 years	N/A	No limit (depreciated)	Pre-existing use
Impact cutoff date	1/1/2026 (primary)	1/1/2015	1/1/2015	Pre-program	N/A	GSP period	1/28/2020
Tenants covered	No	No	Yes (interim water)	No	N/A	Case-by-case	No
NGO partner	SHE (eligibility only)	SHE (pilot contract)	SHE (primary partner)	None	N/A	NVCF	Flexible/TBD
Primary funder	Not specified	Penalty revenue	Extraction fees	GSA budgets	N/A	TBD	Inter-GSA share

Eligibility criteria

STEP I – Current State (DRIP Collaborative work in 2026)

Challenges identified/validated in analysis process

- **Resource and capacity limitations** make developing and maintaining this detailed inventory challenging
- Challenges locating and **accessing plans and supporting documents**
- There are **planning and monitoring gaps in fractured rock areas** where mitigation planning may not exist (beyond CDRPs, maybe Nitrate management zones)
- **Complex relationships** among counties, GSAs, mitigation plans, and water quality planning efforts
- Planning **information is often fragmented, inconsistent**, and difficult to connect across efforts

STEP I – Current State (DRIP Collaborative work in 2026)

However, participants shared -

General Support: The inventory and mapping effort provides an important foundation and should be completed before identifying gaps and developing solutions.

Value of the Inventory: The inventory can support more actionable guidance while recognizing significant regional differences and varying local needs.

Implementation Considerations: Existing programs and resources should be interpreted with caution, as implementation often depends on available funding, staffing, and local capacity.

Identifying Gaps: Assessing gaps should consider not only assigned responsibilities but also program effectiveness, implementation, and local conditions.

Point in Time: Recognize that this analysis represents what we know about existing conditions and serves as a baseline to identify creative solutions where additional support may be needed.

DRIP Collaborative Members Feedback:

Sierra Ryan, Santa Cruz County

Laura Ramos, California Water Institute at Fresno

Next Activities for Step I

STEP I · 2026 › STEP II · 2027

Current State · 2026

JUL–AUG

Statewide Analysis

Expand the county-level analysis to all counties to learn about the variability and coverage of existing planning efforts.

AUG - OCT

Workshop 3/DRIP Meeting

Review analysis results with DRIP Collaborative members and local interests

OCT - DEC

White Paper

Collaborate with DRIP Collaborative members to document regional conditions across the state. Share a draft at the Oct Drip Collaborative meeting for additional input

Questions the white paper will address

1. Who are the responsible parties for programs and initiatives that support DW and SSWS?
2. What current programs and initiatives are relevant to supporting DW and SSWS?
3. What can we learn from existing programs – what works, and what is missing?
4. What expertise, funding, and institutional support are available?

Volunteers Needed: DRIP Collaborative members are invited to review and provide feedback on the draft White Paper.

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Next Activities for Step II

STEP I · 2026 › STEP II · 2027

Future Opportunities · 2027

Gap Prioritization

Focus on addressing the most critical gaps affecting drought resilience.

Proposed Solutions

Identify potential funding mechanisms and long-term planning approaches to mitigate risks.

JAN-APR

Regional Workshops

Convene counties and GSAs to review planning coverage and identify local needs and gaps to fill.

APR & JUL

DRIP Meetings

Bring key takeaways to the DRIP Collaborative and discuss statewide long-term planning opportunities grounded in local needs.

OCT

White Paper

Document takeaways from Regional Workshops and identified opportunities as part of the white paper.

Topics to address:

- Underlying causes of gaps
- Prioritizing gaps & opportunities
- Opportunities for progress
- Barriers & challenges

California DRIP Collaborative

Small Group Discussion

Purpose: Gather feedback on the usefulness, structure, scalability, and potential applications of the proposed roles and responsibilities analysis.

Breakout Topic 1 (20 min): How can we ensure the statewide analysis is reflective of local conditions?

1. Are we fully capturing the activities across the state at the local level?
2. While this analysis is focused on RESPONSE actions, how can it help identify gaps and opportunities across the broader state small water systems and domestic well lifecycle (installation, maintenance, response, and long-term mitigation) and the risk management cycle?

Breakout Topic 2 (10 min): Analysis Review

1. What review process would build confidence in the analysis results?
2. What local perspectives or expertise are essential?

Report Out (15 min): Share insights from breakouts

- Each breakout group has ~5 minutes to report out key points
- We will collect notes to inform further development and future discussions

Breakout Assignments

How can we ensure the statewide analysis is reflective of local conditions?

Group 1. (Zoe and Glen)	Group 2. (Julie)	Group 3. (Orit and Anthony)
• Emily Rooney • Ivy McElroy • Karen Mogus • Nate Ortiz • Sophie Morin • Suzanne Pecci • Tim Worley • Virginia Jameson	• Alex Biering • Andrew Altevogt • Joaquin Esquivel • Katy Landau • Maria Gallegos Herrera • Mariko Falke • Samantha Arthur	• Carolina Hernandez • Charles Delgado • Joshua Cahill • Laura Ramos • Paul Gosselin • Sierra Ryan • Tami McVay

Roles and Responsibilities - Discussion

Local R&R Analysis: How can we ensure the statewide analysis is reflective of local conditions?

- Which regional differences matter most?
- Who should validate county-level findings?

AUG
24

Next R&R Workshop: Monday, August 24, 2026, 1 pm to 3 pm.

Public Comment
Roles and Responsibilities

1. In-person participants
2. Virtual participants:
    a) Raise your hand with the “Raise Hand” feature in Zoom and you will be asked to unmute and speak.
    b) Send a Zoom chat to the webinar manager if you need technical assistance.
    c) If you are dialing in by phone, dial *9 to raise your hand and dial *6 when it you are called on to speak.

LUNCH BREAK!

PLEASE RETURN AT:
1:25pm
(so we can start promptly at 1:30pm)

DRIP Collaborative (Quorum is 14)

1. **Alexandra Biering**, California Farm Bureau
2. **Carolina Hernandez**, Los Angeles County Public Works
3. **Charles Delgado,** California State Association of Counties
4. **Emily Rooney**, Agricultural Council of California
5. **Ivy McElroy (for Anna Schiller)**, Environmental Defense Fund
6. **Joaquin Esquivel,** State Water Resources Control Board
7. **Joshua Cahill**, Yurok Tribe
8. **Katy Landau (for Anna Naimark),** California Environmental Protection Agency
9. **Laura Ramos**, California Water Institute at Fresno State
10. **Maria Gallegos Herrera,** Rural Community Assistance Corporation (RCAC)
11. **Mariko Falke,** California Department of Water Resources - Tribal Affairs Office
12. **Nate Ortiz (for Christina Curry),** California Office of Emergency Services
13. **Paul Gosselin,** California Department of Water Resources
14. **Samantha Arthur**, California Natural Resources Agency
15. **Sierra Ryan**, Santa Cruz County
16. **Sophie Morin (for Chelsea Haines)**, Association of California Water Agencies
17. **Suzanne Pecci,** Domestic Well Advisory Group, South American Subbasin
18. **Tami McVay,** Self Help Enterprises
19. **Tim Worley,** California Association of Mutual Water Companies
20. **Virginia Jameson,** California Department of Food and Agriculture

Additional Members:

21. **Abby Edwards,** Governor's Office of Land Use and Climate Innovation
22. **Alvar Escriva-Bou,** University of California, Davis
23. **Brent Hastey,** Plumas Lake Self Storage, Owner
24. **Emiko Burchill,** California Department of Fish and Wildlife
25. **Jennifer Clary**, Clean Water Action
26. **Redgie Collins,** California Trout Inc.

- Recent progress, including recap of DI&M Workshop #2
- Insights from recent National Academies drought paper
- Update from NOAA/NIDIS on CA pilot
- Analysis of media user from 2012-2016 drought
- Breakout discussion – 45 minutes

DROUGHT INDICATORS & METRICS

California
DRIP Collaborative

Drought Indicator & Metrics

Problem Statement: As California faces a hotter, drier future, **the absence of clearly defined, actionable drought metrics and indicators** poses a significant challenge to prioritize **drought actions** effectively and understand their **full impacts**. To ensure adaptive and localized strategies through all phases of the water lifecycle, it is crucial to bridge data gaps, ensure data accessibility and interoperability, and support modeling for climate-ready decision making across the state.

2024 DRIP Collaborative Recommendation: Develop a practical drought early warning system to improve information to inform local and state drought management actions and increase overall drought resilience.

This analysis should include:

- **Implementation Considerations**: Need to develop a partnership between state agencies and other interested parties, possibly via steering workgroup and advisory committee. Conduct research activities and set-up hosting/maintenance.
- **Equity Considerations**: Address limited resources and data to small communities, domestic well owners, tribal nations, and those most vulnerable to droughts.
- **Alignment with Other Initiatives**: Ensure complementarity and value add with other existing efforts, including SB 552 (Water Shortage Vulnerability Tool), SAFER, NIDIS, US Drought Monitor and CWDC (Consortium) efforts.

DRIP White Paper Development Process 2026

PREPLANNING	• Identify individuals, organizations, and information resources to support topic development. • Develop a draft vision and white paper outline to guide workshops discussions.
I. VISION FOR THE FUTURE	• Define the desired end state and the key questions to be addressed in the white paper. Framing the Vision - Key Questions to Explore - White Paper Scope and Outline
II. UNDERSTANDING WHERE WE'RE AT	Establish a shared understanding of the current situation, experience, and capacity. Current Conditions - Experience and Capacity
III. GAP ANALYSIS	Identify discrepancies between the current situation and the desired future vision. Comparing Vision and Reality - Underlying Causes of Identified Gaps - Prioritizing Gaps
IV. LOOKING AHEAD	Identify practical pathways to move from current conditions toward the desired vision. Opportunities for Progress - Barriers and Challenges - Proposed Next Steps
V. PUTTING IT ALL TOGETHER	Draft the white paper to document discussions, findings, and suggested next steps.

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DI&M WHITE PAPER: KEY QUESTIONS TO ANSWER

1. **Vision**. What is the appropriate DI&M vision for California?

2. **Current Conditions (and Audience)**. What is the current landscape of drought tools and portals? Who are the various intended end users and what are their needs?

3. **Inventory**. What are the existing indicators? Can we create a master inventory list of indicators, identify key gaps, and plan out the path forward to ensure sufficient (spatial / temporal) coverage?

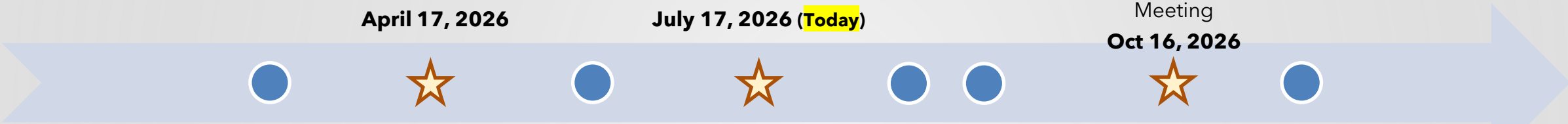
4. **Datasets**. What datasets are needed to achieve those indicators? Which ones exist already? What additional data needs to be gathered?

5. **Roadmap**. What defines success in 1 year (immediate)? 3 years (short-term)? Next 5 years (medium-term)?

6. **Funding/Resources**. What type of investment is needed to achieve the roadmap? What types of resources and expertise is needed?

7. **Organizations and Hosting**. What organizations needs to be involved? Who should lead the effort? Who will play what role in hosting and being authoritative sources for indicators? Will there always be many tools/efforts?

DI&M Development Timeline



April 1, 2026
Virtual meeting
Workshop #1
Vision, Framework, Current Efforts

DI&M Approach and Guidance
April 17, 2026

June 5, 2026
Virtual meeting
Workshop #2
User Needs, Gaps/Opportunities

Discuss findings and Gaps/ Opportunities for DI&M
July 17, 2026 (Today)

Sep 3, 2026
Virtual meeting
Prepare draft White Paper on key findings. SME meetings

DRIP Collaborative Meeting
Oct 16, 2026

Nov/Dec 2026
Finalize White Paper on key findings

DRIP Collaborative meeting – Fri, July 17th

- Report on key learnings from the workshop
- Gather input on user needs possible gaps/ opportunities

Next DI&M workshop – scheduled for Thu, Sept 3 from 1-3pm

In-Person Meeting

Virtual Meeting

California DRIP Collaborative

Framing the Vision for Drought Indicator & Metrics

Proposed vision statement:

All California **audiences** have access to the **current, historical, and upcoming risks and impacts** of drought. This includes knowledge at a **sector-specific level** via a Drought Early Warning System (**DEWS**), that can help inform what **actions** are required to most effectively achieve drought resilience.

Needs to start with **audiences**, to ensure we're **"user centric"**



Agriculture/Farmers



Water Agencies



Cities



Tribal/Vulnerable Communities

State Agencies



Academics/Researchers



Counties



NGOs/Environment



Media

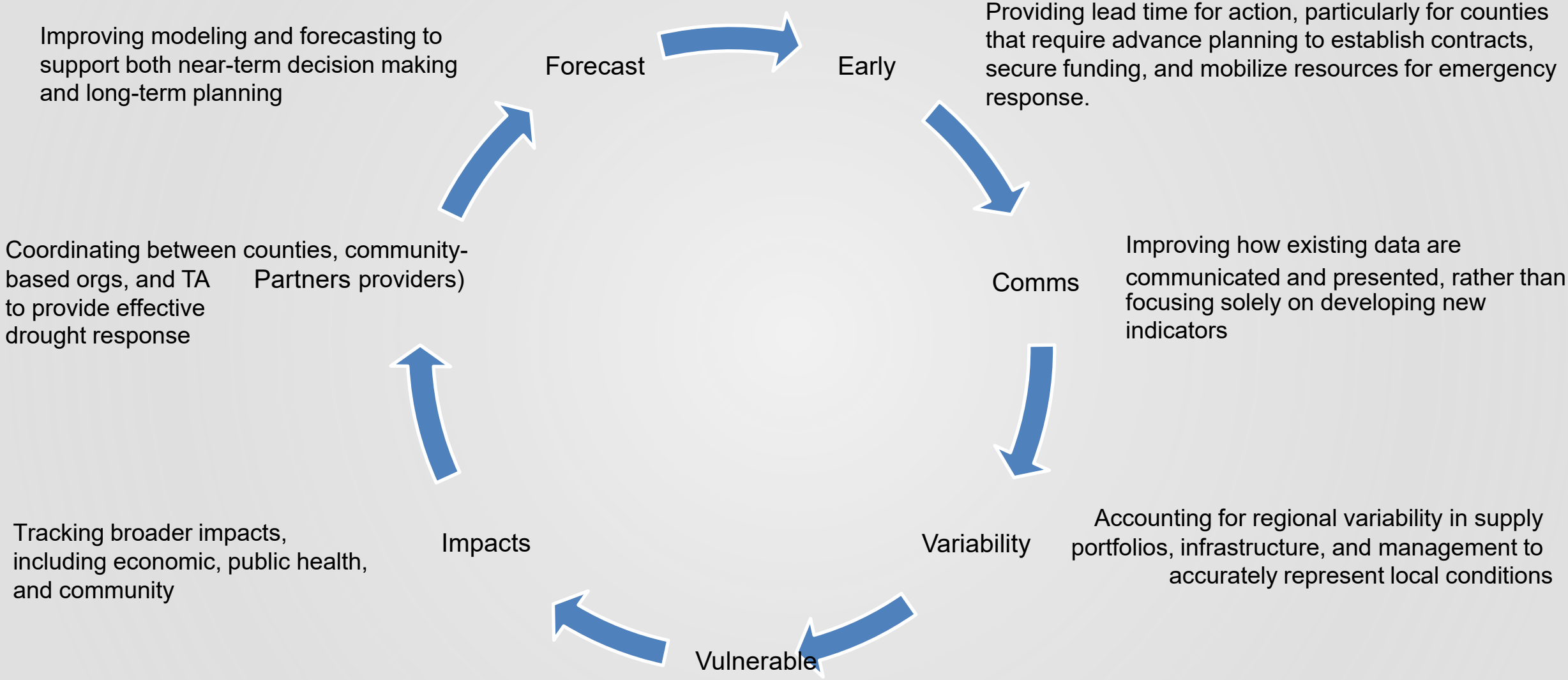
...plus others including Federal Agencies, Finance/Insurance, Recreation/Tourism, and Public Health

Drought Indicator & Metrics – Workshop #1 and #2

Participation: Eight presenters shared their latest DI&M related work, including recent innovations

Project	Presenter	Description	Audience
UC Davis Drought Early Warning	Alvar	Project to establish a CA centric, higher resolution drought early warning system and dashboard	State/regional/local Researchers
NOAA NIDIS SoCal Pilot	Amanda/Andy	Pilot to modernize DEW by improving sector specific response and move to proactive	Local health officials, farmers, water utilities
CWDC Drought Data	Robyn G	Project making drought data more accessible, especially those from urban water agencies	Water data stakeholders, including water agencies
UC ANR / CIWR	Erik P	Research to assess drought response and impacts, including financial effect on water utility finances	State/regional/local Researchers
CA Water Watch & DWR Water Shortage Vulnerability Explorer	Julie	Tools to communicate key info, assess risk of small water systems, DWs, and state smalls	Small Water Systems, DWs, State Small WS, Counties
SWB Outage Forecast Predictor	Eric Z	Program to forecast community water system outages using drought indices	Div of Drinking Water, CalOES, Water System staff
LCI Drought and VCP	Ben M	Effort to use drought indices in climate work and Vulnerable Communities Platform	VCP: NGOs, locals, and policy makers
UCI CHRS Drought Monitoring and Prediction System	Amir A	Global SPI forecasting (out 12 months) using AI, with vulnerability and coping capacity (VCC)	State/researchers/locals and policy makers

DI&M: APRIL 17 KEY COMMENTS



Improving modeling and forecasting to support both near-term decision making and long-term planning

Providing lead time for action, particularly for counties that require advance planning to establish contracts, secure funding, and mobilize resources for emergency response.

Improving how existing data are communicated and presented, rather than focusing solely on developing new indicators

Accounting for regional variability in supply portfolios, infrastructure, and management to accurately represent local conditions

Prioritizing at-risk communities and systems to anticipate where impacts may occur first and support proactive response and resource allocation

Tracking broader impacts, including economic, public health, and community

Coordinating between counties, community-based orgs, and TA providers) to provide effective drought response

California DRIP Collaborative

2000 – 2025 CA Drought Indicators (7 Science Papers)

Summary of select science papers describing California drought indicators

Rethinking the Line in the Sand: How Science Redefined California's Drought Tracking

Before 2015, drought monitoring suffered from a major operational disconnect. While scientists created complex indicators, a striking survey revealed that 16 out of 18 Western states with official drought plans often did not use their own metrics. Water managers described them as "arbitrary guesses," "borrowed from other states," or "never tested."

However, as California's climate shifts and its massive water delivery infrastructure faces unprecedented strain, atmospheric scientists and hydrologists have fundamentally rewritten the rules of water tracking.

Recounting the period 2000 to 2015, four scientific papers (*McEvoy et al., 2012; Diffenbaugh et al., 2015; Steinemann et al., 2015; He et al., 2017*) describe a significant evolution. Together, they document how California moved away from crude, one-size-fits-all rainfall tallies and toward a highly sophisticated, multi-layered tracking system built specifically for the state's unique plumbing network.

Pre-read (sent out for Workshop #2)

Developing and Evaluating Drought Indicators for Decision-Making

ANNE STEINEMANN* AND SAM F. IACOBELLIS

Scripps Institution of Oceanography, University of California, San Diego, La Jolla, California

DANIEL R. CAYAN

Scripps Institution of Oceanography, University of California, San Diego, and U.S. Geological Survey, La Jolla, California

(Manuscript received 12 December 2014, in final form 28 March 2015)

Indicators and indicator systems can present a number of limitations for decision-making. For instance, indicators are often based on metrics that are subjective, statistically inconsistent across different temporal and spatial scales, noncomparable with other indicators, and disconnected from relative risk or historic conditions.

In addition, indicators in plans are typically selected in an ad hoc and arbitrary way, without understanding or testing their performance. Decision-makers often lament the lack of guidance for developing and evaluating indicators. For example, a recent survey of 19 drought managers from western states found that 16 of the 18 states with drought plans did not use their indicators, citing them as "not at all useful," "ignored," "a guess," "borrowed from another state," and "never tested" (Steinemann 2014).

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KEY DROUGHT QUESTIONS (INDICATOR RELATED)

1. Are we in a drought? How severe? What type? What sector? Where? When?	→ **Hazard**	**Risk**
2. Am I (or my assets) at risk?	→ **Exposure**	
3. Level of susceptibility, given the broader situation (physical, institutional, economic)?	→ **Vulnerability**	
4. At what point will action be taken? By whom?	→ **Thresholds**	
5. What are the possible actions/response?	→ **Actions**	
6. How effective/efficient was the response?	→ **Effectivenes**	
7. What was (or will be) the impact (hydrologic, economic, societal, environmental)?	**s** → **Impacts**	
8. What is the resulting drought resilience?	→ **Resilience**	

DI&M: SAMPLE INDICATORS (FOUR CATEGORIES)

1 Risk

Hazard Indicators
- US Drought Monitor, including DSCI
- Palmer Drought Severity Index (PDSI)
- Standardized Precipitation Index (SPI)
- Normalized Difference Vegetation Index (NDVI)
- Standardized Soil Moisture Index (SSI)

+many, many others…

2 Thresholds

SWP allocations
- Snow water equivalent (SWE) and reservoir levels
- Availability modeling that inform SW curtailments

County, NGO, Individuals
- GW levels and dry well reporting

Delta
- Saltwater intrusion

Water Agencies
- Water shortage contingency stages
- GSP minimum thresholds

3 Actions

State Agency
- # of Executive Orders and drought proclamations
- $B in emergency drought response
- $/well to restore access

Surface water
- # of curtailments
- % water deliveries (SWP, CWP, etc.)

Water systems
- % water conservation
- # of PWS consolidation orders

4 Impacts

Community
- # of dewatered wells
- # of people without sustainable access
- # of DACs affected

Agriculture
- % decrease in yields
- # of acres repurposed
- # of jobs lost
- $ of lost ag revenue

Environment
- % decrease in fish species
- % change in subsidence
- Impact on forests, fires

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For an extended list of 200+ indicators (among the four categories), please see the Workshop #2 slides

Communication ideally uses a cohesive narrative

Integrated Example: Urban Water Supplier (sample audience)

Risk

1. **Drought levels.** US Drought Monitor D-Levels indicate severe drought in an area
2. **Hazard**. Low storage levels in critical reservoirs
3. **Exposure**. # of people (millions) of urban and suburban residents across Southern California
4. **Vulnerability**. Absolute AF water needs by segments (urban, ag, industrial) and heavy % reliance on imported water via State Water Project

Thresholds

1. **DWR State Water Project**. DWR sets the % allocation of water
2. **Urban suppliers**. Low allocations mean the urban water agencies have to activate a more severe stage in their Water Shortage Contingency Plan

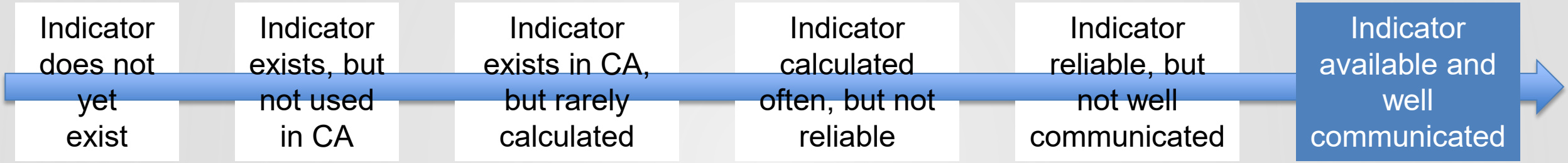
Actions

1. **Conservation**. % of urban water agencies passing emergency actions, such as local ordinances limiting outdoor watering and higher tier pricing on water bills. Recommending conservation

Impacts

1. **Behavior**. % reduction in average per capita daily water use (GPCD)
2. **Economic (suppliers)**. Lower $ water revenue, given conservation measures. $ increase in costs to acquire alternative sources of water. Worsening financial stability of local water agencies
3. **Societal**. Rise in $ costs for monthly water bills. Number of dewatered wells (given increased use of groundwater).

Gaps in DI&M: Gaps (indicators) exist along a spectrum

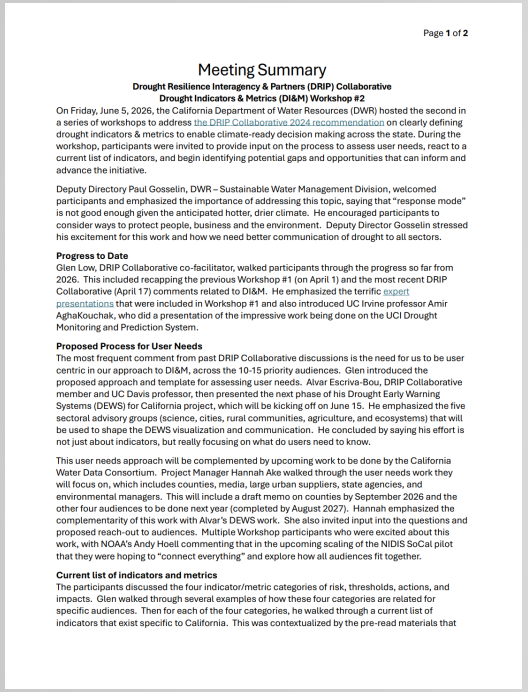


"A" Gap (unknown)	"B" Gap (not used)	"C" Gap (frequency, maybe costs)	"D" Gap (reliability, maybe data)	"E" Gap (communication, use)	No Gap

Hypothesis: Within California DI&M,
most gaps likely frequency, reliability or comms/use

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Workshop #2 Summary



Page **1** of **2**

Meeting Summary

Drought Resilience Interagency & Partners (DRIP) Collaborative
Drought Indicators & Metrics (DI&M) Workshop #2

On Friday, June 5, 2026, the California Department of Water Resources (DWR) hosted the second in a series of workshops to address the DRIP Collaborative 2024 recommendation on clearly defining drought indicators & metrics to enable climate-ready decision making across the state. During the workshop, participants were invited to provide input on the process to assess user needs, react to a current list of indicators, and begin identifying potential gaps and opportunities that can inform and advance the initiative.

Deputy Directory Paul Gosselin, DWR – Sustainable Water Management Division, welcomed participants and emphasized the importance of addressing this topic, saying that "response mode" is not good enough given the anticipated hotter, drier climate. He encouraged participants to consider ways to protect people, business and the environment. Deputy Director Gosselin stressed his excitement for this work and how we need better communication of drought to all sectors.

Progress to Date
Glen Low, DRIP Collaborative co-facilitator, walked participants through the progress so far from 2026. This included recapping the previous Workshop #1 (on April 1) and the most recent DRIP Collaborative (April 17) comments related to DI&M. He emphasized the terrific expert presentations that were included in Workshop #1 and also introduced UC Irvine professor Amir AghaKouchak, who did a presentation of the impressive work being done on the UCI Drought Monitoring and Prediction System.

Proposed Process for User Needs
The most frequent comment from past DRIP Collaborative discussions is the need for us to be user centric in our approach to DI&M, across the 10-15 priority audiences. Glen introduced the proposed approach and template for assessing user needs. Alvar Escriva-Bou, DRIP Collaborative member and UC Davis professor, then presented the next phase of his Drought Early Warning Systems (DEWS) for California project, which will be kicking off on June 15. He emphasized the five sectoral advisory groups (science, cities, rural communities, agriculture, and ecosystems) that will be used to shape the DEWS visualization and communication. He concluded by saying his effort is not just about indicators, but really focusing on what do users need to know.

This user needs approach will be complemented by upcoming work to be done by the California Water Data Consortium. Project Manager Hannah Ake walked through the user needs work they will focus on, which includes counties, media, large urban suppliers, state agencies, and environmental managers. This will include a draft memo on counties by September 2026 and the other four audiences to be done next year (completed by August 2027). Hannah emphasized the complementarity of this work with Alvar's DEWS work. She also invited input into the questions and proposed reach-out to audiences. Multiple Workshop participants who were excited about this work, with NOAA's Andy Hoell commenting that in the upcoming scaling of the NIDIS SoCal pilot that they were hoping to "connect everything" and explore how all audiences fit together.

Current list of indicators and metrics
The participants discussed the four indicator/metric categories of risk, thresholds, actions, and impacts. Glen walked through several examples of how these four categories are related for specific audiences. Then for each of the four categories, he walked through a current list of indicators that exist specific to California. This was contextualized by the pre-read materials that

There were vibrant discussions in both sessions, with many ideas being offered by participants. Along the four categories, here were the key ideas discussed:

Risk (hazard, exposure, vulnerability)

- Groundwater monitoring. Today there is a huge latency issue with lack of groundwater measurement and data
- Predictive. Providing proactive information for rural communities was mentioned, especially as it relates to need for predictive groundwater information
- Vulnerability. Could the DRIP Collaborative help synthesize the weightings used to assess vulnerability?

Threshold

- Triggers. We need more understanding of triggers and what that means for users. People mentioned the simplicity of Purple Air and understanding PM2.5 air quality thresholds

Actions

- Capacity. It was remarked that action was a challenge today given lack of local capacity. For example, we need to better train county public health departments

Impacts

- Financial and economic. Including impacts on household affordability and ability to pay
- Public health. Linking human impacts to thresholds and hazard indicators. Can we get at statistical relationships relating drought to health outcomes (akin to wildfire smoke, air quality impact on human health)
- Water quality. Link drought impacts to water quality
- Secondary impacts. In general, it was remarked that we need to link drought to later impacts (such as water quality, public health) and other cascading hazards, such as heat
- Other groups. Impacts should include mental, spiritual, migrant populations, Tribal, etc.

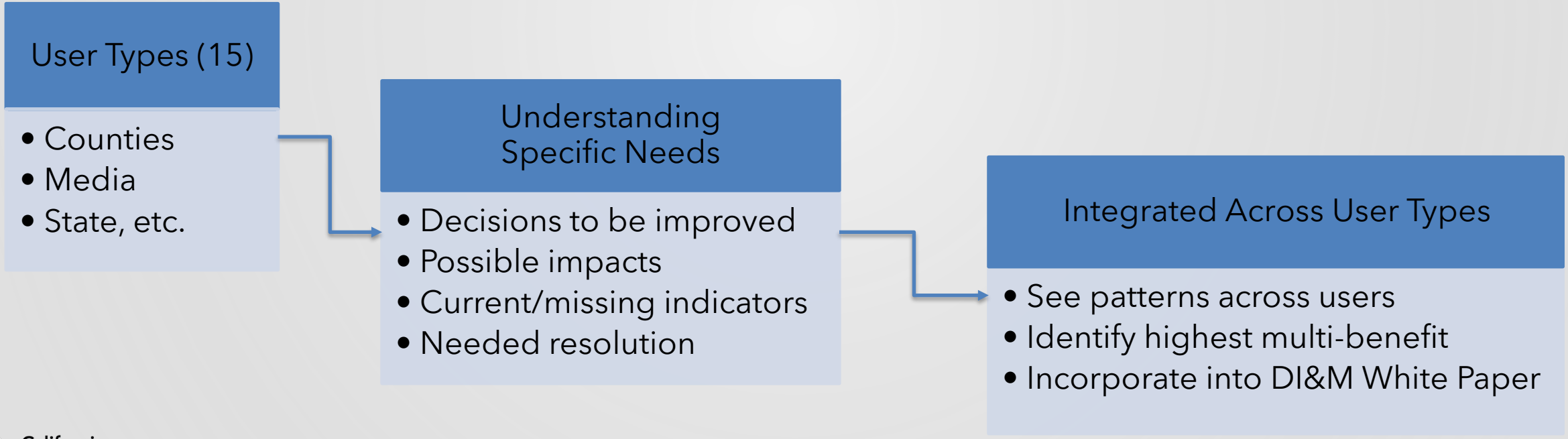
Overall, on the topic of communication, numerous participants said we need to tap into trusted and existing messengers in communicating. It was mentioned that if most people rely on the media as their main source, we've probably failed as a water community.

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Approach for DI&M User Needs Assessment
Identify Gaps and Opportunities for Improvements

Develop an approach to:

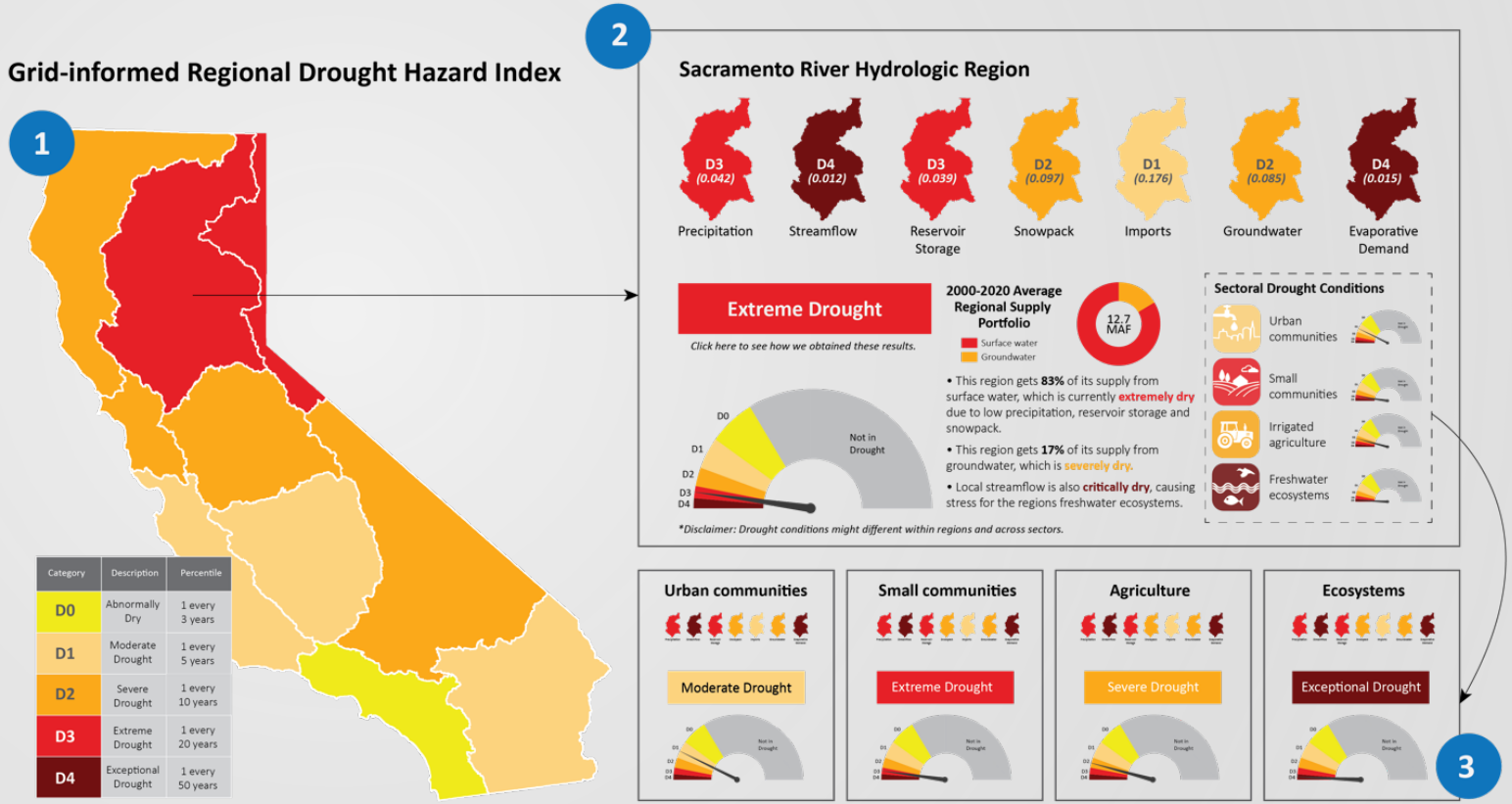
- Gather actionable user specific input on potential indicators and metrics that would lead to directly improved decisions and reduction of drought related impacts
- Identify unique and also overlapping needs, across multiple user types, to inform gaps/opportunity
- Inclusion into the DI&M White Paper for 2026 (and continuing into 2027)



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Alvar/UC Davis project: Goal is to develop a Drought Early Warning Dashboard for California

- A public web-based dashboard updated monthly
- Estimation of statewide drought indicators and impacts for:
  - Cities
  - Small communities
  - Agriculture
  - Ecosystem



Web mock-up developed to help understand the goal of our project

We are developing the dashboard with a new project funded by NIDIS

Drought Hazard Indicators

Develop comprehensive statewide hazard indicators to track resource and moisture levels.

Drought Impact Estimation

Analyze and estimate environmental, agricultural, and economic drought impacts.

Web-Based Dashboard

Construct an interactive, robust visual interface for public and executive-level analytics.

Audience/User Co-Production

Incorporate continuous end-user feedback and requirements directly into the design process.

National Scalability Assessment

Evaluate systemic models and data standard rules for scaling platforms beyond California.

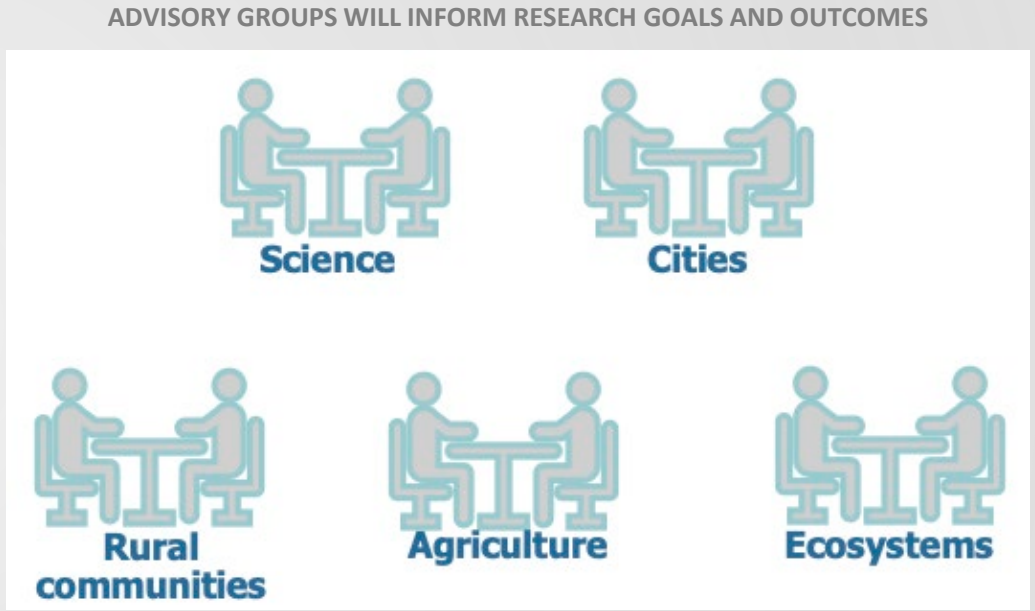
KICKOFF DATE
June 15, 2026

FUNDING PARTNER
NOAA - NIDIS

UCDAVIS
CIVIL AND ENVIRONMENTAL ENGINEERING

The project will be informed by relevant audiences

- We will convene five sectoral advisory groups to ground-truth assumptions and research questions and co-produce products
- Users will shape the product by:
  - Identifying key decisions users need to make
  - Designing sector-specific views and visualizations
  - Testing mock-ups with agencies and stakeholders
  - Refining usability, indicators, and impact communication



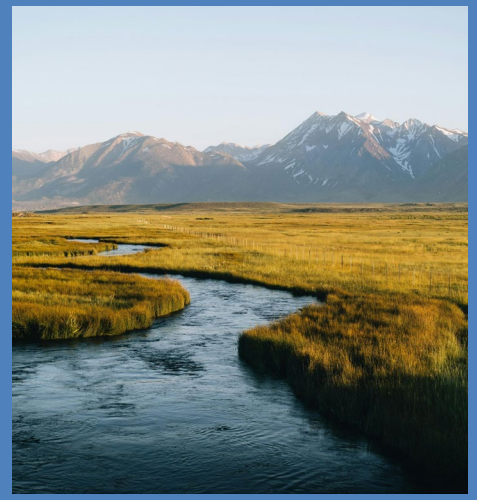
CA Water Data Consortium: DI&M User Needs analysis



Counties

Assess drought indicator information needs of CA counties as they relate to **County Drought Resilience Plans for domestic well users and state small water systems.**

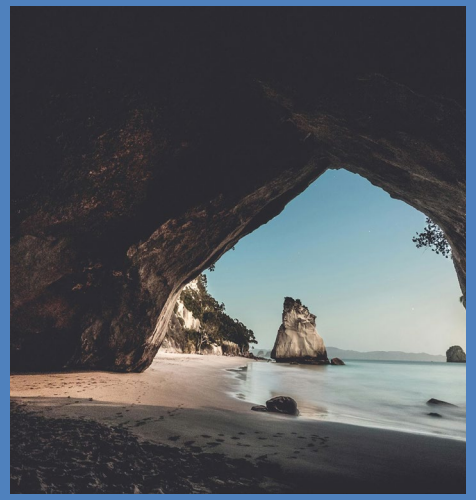
Draft memo by **Sep. 2026**



Media

Asses drought related information needs of the media organizations to identify **which data and communications formats would best support accurate and timely reporting** on drought.

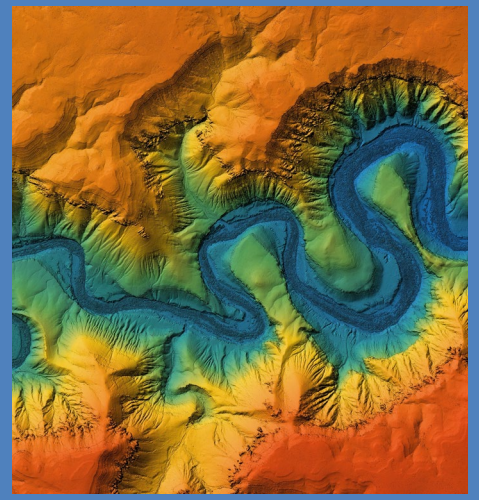
Summaries by **Mar. 2027**



Large Urban Suppliers

Document **existing drought metrics and forecasting processes** of large urban water suppliers to evaluate if there is an approach to using **regional metrics and frameworks more broadly at the state level.**

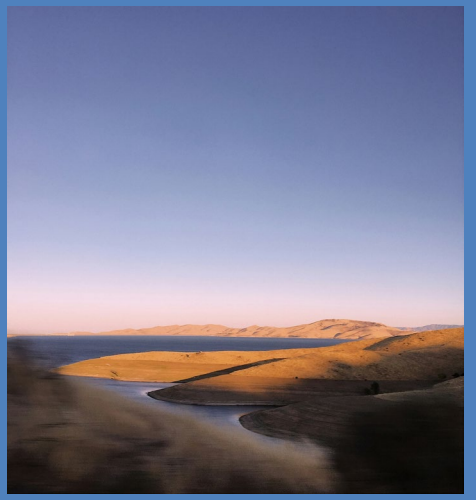
Summaries by **Mar. 2027**



State

Identify information needs and decision making processes of CA state agencies as they relate to **emergency proclamations and drought response**.

Summaries by **May 2027**



Environmental Managers

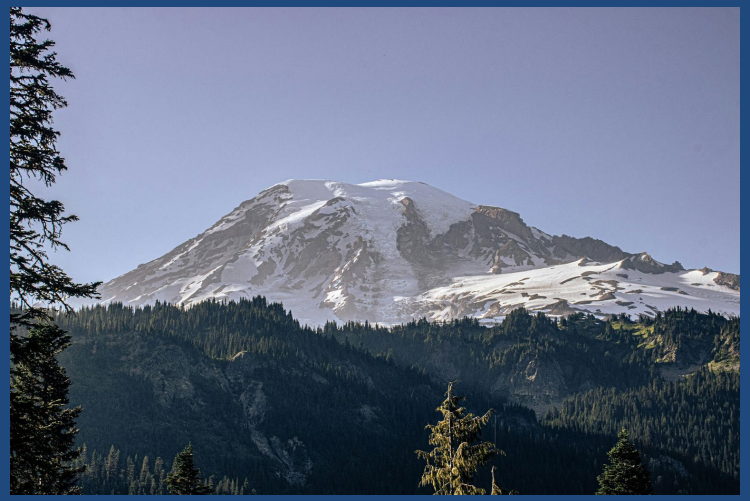
Evaluate information needs of decision makers managing for environmental outcomes and ecosystem health to identify **which data and communication formats best support management of flows during dry periods.**

Summaries by **May 2027**

California Water Data Consortium

Draft memo on all user groups by **July 2027,** Synthesizing webinar and final memo by **Aug. 2027**

Approach, Deliverables, and Feedback







Approach

- Interviews
- Small group discussions
- Workshops

Deliverables

- Interview/discussion summaries
- Synthesizing webinar
- Memos on each user group

Feedback

- DRAFT county user group memo by **9/30/26**
- DRAFT memo on all user groups by **7/22/27**
- FINAL memo and synthesizing webinar by **8/31/27**

California Water Data Consortium

DROUGHT INDICATORS & METRICS
NATIONAL ACADEMIES DROUGHT PAPER

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National Academies drought paper (1of3)



June 30, 2026

The United States **needs an expanded capability for drought assessment** to support efforts that ensure resilience and thriving in the face of the changing (**nonstationary**) nature of drought and drought impacts.

Conclusion 7-3: Assessment of drought impacts requires information on drought conditions as well as the **status and adaptive capacity of affected systems** to inform operational drought response and long-term planning, but **mechanisms for collecting and using such data do not exist consistently** across the United States.

Recommendation 7-1: NIDIS should work with decision-makers, scientists, and the broader drought community to **develop a set of best practices by which drought impacts data can be consistently and effectively used** for all aspects of drought assessment, especially for state drought plans and other policy and action plans.

https://www.nationalacademies.org/projects/DELS-WSTB-24-02/publication/29217

National Academies drought paper (2of3)



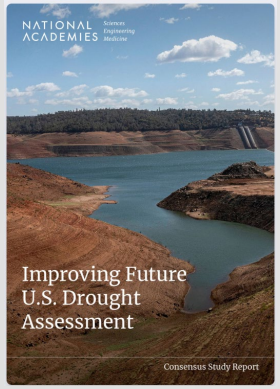
Strong and reliable **relationships between drought indicators and impacts are necessary** to effectively predict, forewarn, and assess drought impacts in a systemic and scientifically robust way.

Drought Indicators, Indices, and Impacts

Drought Type	Indicators	Indices	Impacts
Meteorological	Precipitation, ET	SPI, EDDI	N/A
Agricultural	Soil Moisture, Crop Greenness, ET	SMVI, VegDri, NDVI	Crop Yields, Irrigation Water Use
Ecological	Greenness, ET, Sap Flow, Wetted Riffle	NDVI, EVI	Flora/Fauna mortality, reproduction, growth
Hydrological	Streamflow, Water Table, Groundwater, Reservoir Level	Flow percentiles, Action Trigger Levels	Water Use Restrictions, Release Changes, Auxiliary Water Sources
Socioeconomic	Market Volatility, Geopolitical Stability, Food-Water-Energy Prices	Socioeconomic Drought Index, Time-Weighted Water Deficit and Backward Index	Higher Food-Energy-Water Prices, Poor Health Outcomes, Geopolitical Conflict

FIGURE 7-1 Examples of drought indicators, indices, and impacts for different drought types.

National Academies drought paper (3of3)



Conclusion 7-6: Current drought impact **reporting systems do not capture consistent or comprehensive drought impact information** across time, geography, or drought types, which limits the usefulness of impact data to drought assessment and decision making.

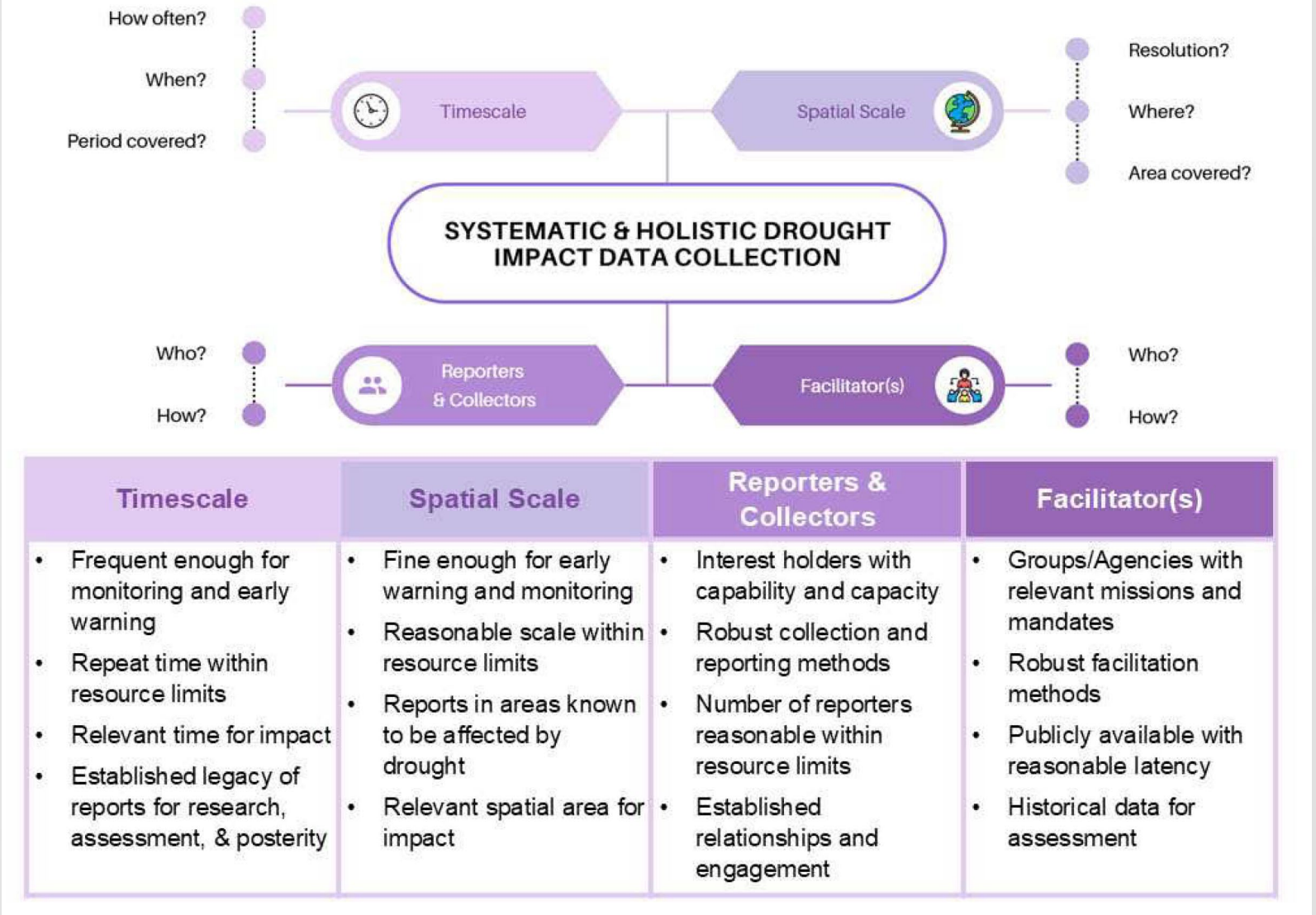


Figure 7-2 Attributes of a system that can properly incorporate impact data into drought assessment.

DROUGHT INDICATORS & METRICS

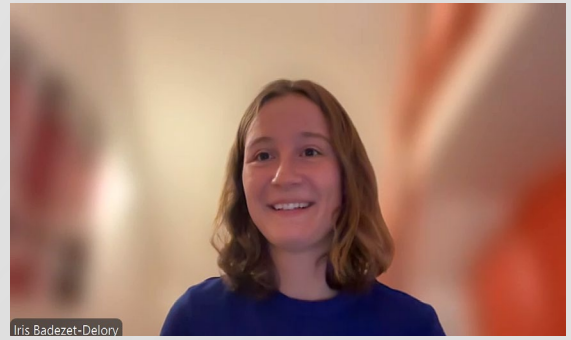
NOAA/NIDIS UPDATE ON CA PILOT

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DROUGHT INDICATORS & METRICS

MEDIA ANALYSIS OF 2012-2016 DROUGHT

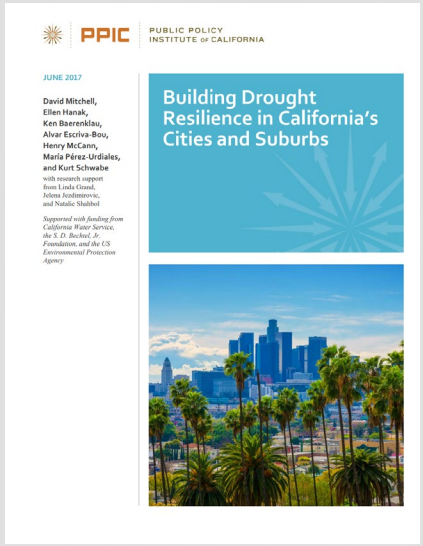
ANALYSIS BY IRIS BADEZET-DELORY (INTERN FROM THE UNIVERSITY OF CHICAGO)

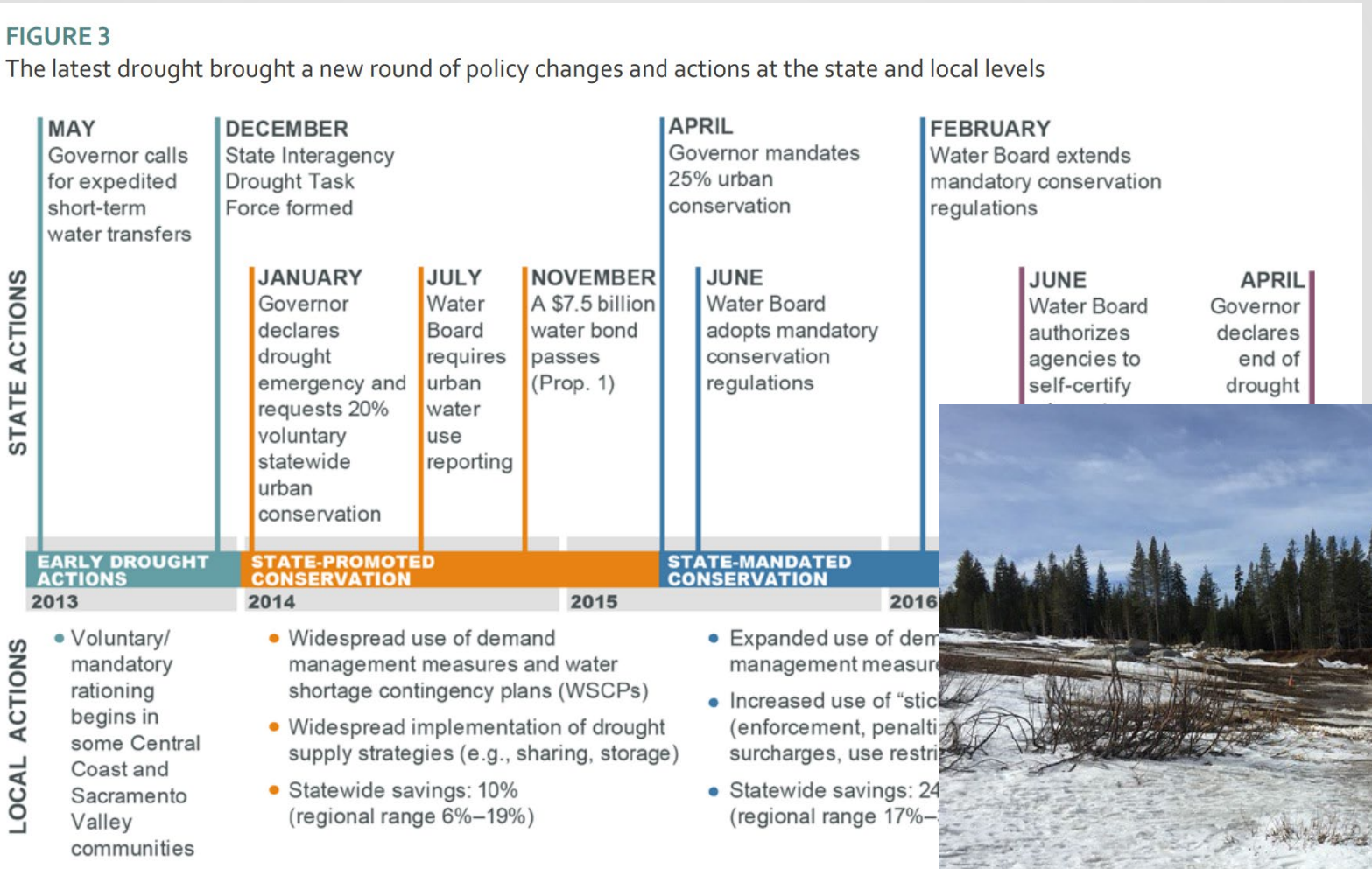


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2012-2016 Drought: Context

Opening Question: What do you remember about the 2012-2016 drought?

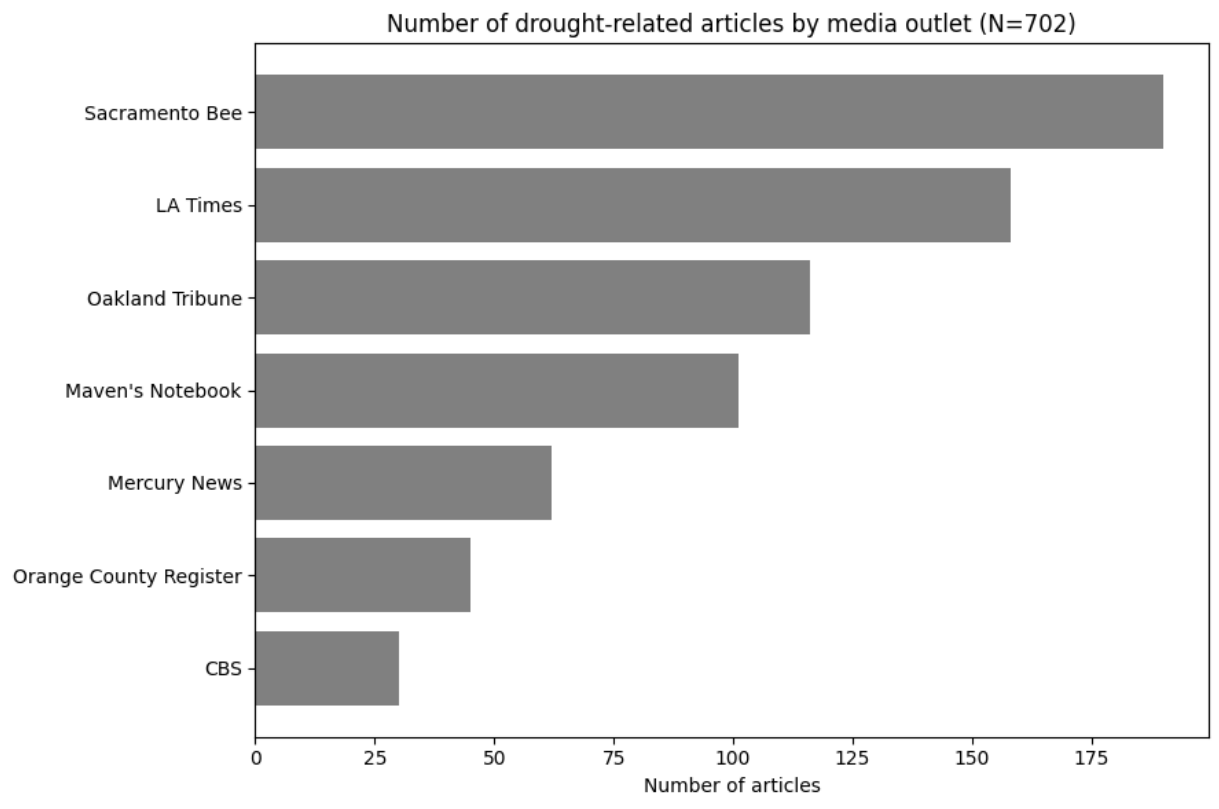


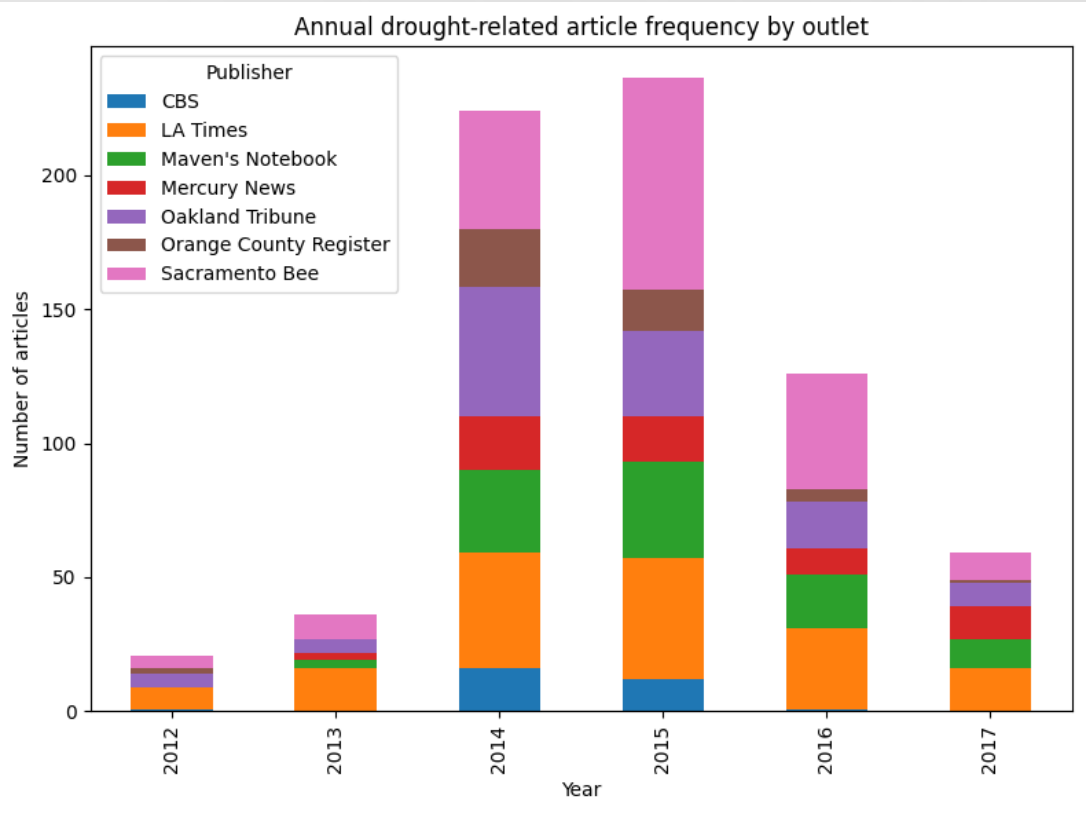




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Drought Coverage by Media Outlet





Method: Lit search conducted, 700+ articles found via python algorithm and natural language processing, supplemented with human interpretation.

Scope: Media was limited to major newspapers and select TV. Articles were concentrated among larger, broader-reach outlets, with the Sacramento Bee and LA Times leading total article volume. Social media and radio was not included.

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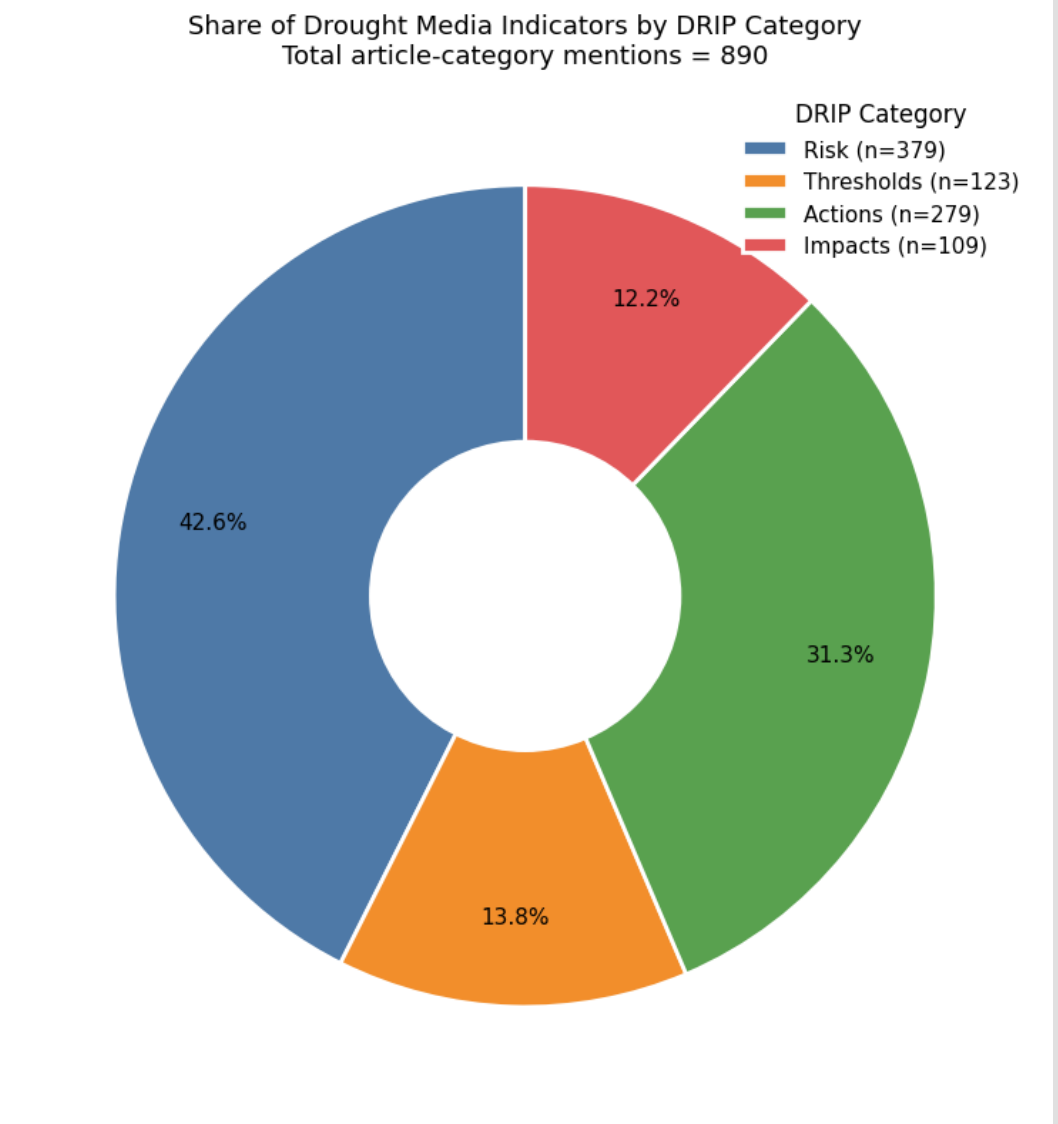
Distribution across four indicator categories

Across the media analysis, Risk indicators dominate, followed by Actions, while Thresholds and Impacts receive much less attention.

→ Drought is framed mostly as a combination of evolving conditions and policy/management responses

Most used indicators by category

Risk	Thresholds	Actions	Impacts
Snowpack / SWE	Snowpack thresholds	Water-use cuts	Agricultural impact
Precipitation totals	Groundwater levels	Drought relief funding	Fish / Wildlife impact
Reservoir storage	SWP/CVP allocations / deliveries	Water overuse fines	Economic impact
US Drought Monitor	Recommended flow thresholds	Emergency regulations / water bonds	Tree mortality / forest health



Risk Metrics (count of indicators in the 890 article mentions)

Drought Severity & Monitoring

1. US Drought Monitor 20+
2. Drought Severity and Coverage Index (DSCI) 0
3. Palmer Drought Severity Index (PDSI) 0
4. Standardized Precipitation Index (SPI) 0
5. Standardized Soil Moisture Index (SSI) 5-10

Snowpack

1. Snow water equivalent (SWE) 20+
2. Snowpack percent of average 20+
3. Snow survey measurements 10-20
4. Mountain runoff forecast 1-4

Weather conditions

1. Precipitation totals and deficits 20+
2. Precip forecasts and seasonal outlooks 20+
3. Temperature anomalies and heat 5-10
4. Atmospheric river activity 5-10

Groundwater

1. Groundwater and aquifer levels/decline 20+
2. Dry well reports; well vulnerability 1-4
3. Water quality risk 1-4
4. Rural communities and water systems 1-4

Surface Water

1. Reservoir storage levels 20+
2. Streamflow/runoff 20+
3. Water supply forecasts 1-4

Thresholds Metrics

Ecosystems

1. Stream gage and functional flow 1-4
2. CDFW / SWB recommended flow thresholds 10-20
3. Salmon/coho / Chinook flow thresholds 5-10
4. Ecological flow thresholds 0

Groundwater (SGMA)

1. GSP minimum thresholds; SGMA undesirable results 0
2. Groundwater levels 20+
3. Dry-well reporting thresholds 1-4
4. Subsidence triggers via InSAR 5-10

Water Infrastructure

1. Hydroelectric power plant dead-pool elevation 0
2. Reservoir levels conveyance-capacity thresholds linked to subsidence 20+
3. Infrastructure vulnerability thresholds for canals, aqueducts, and water-delivery systems 0

Bay-Delta Water Quality

1. Decision 1641 limits 0
2. X2 outflow target 0
3. Delta salinity standards 1-4
4. HAB advisory tiers 0

Urban Water UWMP

1. Water Shortage Contingency Plan 0
2. Urban supplier allocation thresholds 1-4
3. “Making Conservation a CA Way of Life” 0
4. Urban water-use objectives/budgets 0

Surface Water

1. Snow water equivalent/snowpack thresholds 20+
2. SWP allocations and CVP allocations 10-20
3. % water deliveries for SWP/CVP/CWP 5-10
4. Water Year Classifications 0

Actions Metrics

Groundwater

1. Pumping caps, extraction fees 0
2. Drilling moratoriums (GSA) 0
3. Basin probationary status (SWB) 0
4. Emergency response 0
5. GW recharge projects 0

Infrastructure Operations

1. Drought salinity barriers 1-4
2. Reservoir and pumping ops 10-20
3. Fast-track water market transfers 1-4
4. Temporary urgency change petitions 0

Governance

1. Executive orders and Drought proclamations 20+
2. Emergency drought regulations, water bonds 20+
3. Agency response plans 10-20
4. Drought project and relief funding 20+

Ecosystem

1. Cannabis cultivation forbearance 0
2. Hatchery relocations (CDFW) 0
3. Environmental flow protections 1-4
4. Suspend env review for GW recharge 0
5. Water hyacinth management 0
6. Expand fire protection 1-4
7. Fish/wildlife enforcement 1-4

Water Rights Enforcement

1. Curtailment orders (SWB) 10-20
2. Data and telemetry req’ts 0
3. Junior rights cutbacks 1-4
4. Allocation changes and SWP/CVP delivery cuts 20+

Urban Municipal

1. Water Shortage Contingency Plans stages (Utilities) 1-4
2. Outdoor irrigation bans 1-4
3. Water-use cuts 20+
4. Drought surcharges and water overuse fines 20+
5. Turf/lawn rebates 5-10
6. Conservation incentives 5-10

Impact Metrics

Agriculture

1. Net Idled/Fallowed Cropland Acreage 5-10
2. Agricultural-Sector Job Losses 5-10
3. AG Revenue or Yield Losses 5-10
4. Water Transfer Costs 1-4
5. Groundwater Pumping Energy Surcharges 0
6. Orchard Removal (Bulldozed Acreage) 0
7. Increased Forage Costs 0

Community

1. Domestic Well Failures 1-4
2. Number of People/DACs Without Supply 0
3. Residents using Hauled/Bottled Water 10-20
4. Utility Revenue Decrease 0
5. Subsidence Conveyance Capacity Declines 1-4
6. Subsidence Repair Costs 0
7. Water Quality Increased Costs 1-4

Environment

1. Species Mortality Rates 10-20
2. Harmful Algal Blooms 0
3. Urban canopy loss 0
4. Impact on forests 10-20
5. Fire fighting costs 0

Public Health

1. Dust/particulate matter 5-10
2. Illness incidence 1-4
3. Water Quality Impacts 1-4
4. Water Affordability 5-10

Energy

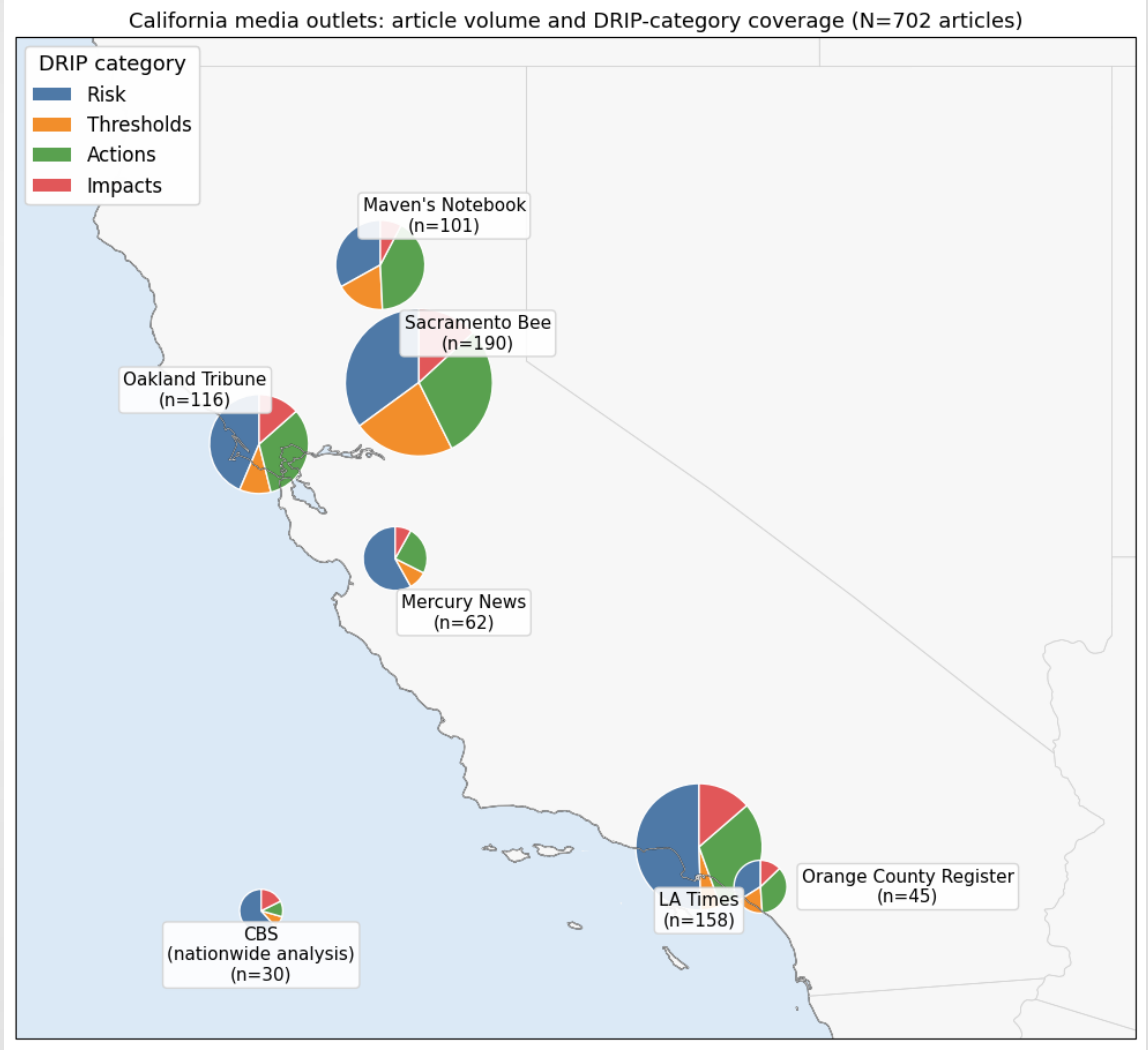
1. Hydropower Loss 5-10
2. Grid Replacement Costs 1-4
3. Carbon Impacts 0

Coverage differences by geography

Outlet-level coverage varies substantially in volume

Risk and Actions dominate the four categories across most media outlets

- ➔ Media outlets converge around a relatively narrow set of drought narratives (e.g. water use cuts, drought condition reports through snowpack / precipitations).
- ➔ Threshold references appear more prominent among outlets closer to political and water-management centers.
- ➔ Action coverage is mixed across regions
  - ➔ Southern California outlets appear more focused on urban conservation actions, such as water-use cuts, outdoor irrigation restrictions, surcharges, fines, and turf rebates.
  - ➔ Population density may shape how drought actions are communicated.

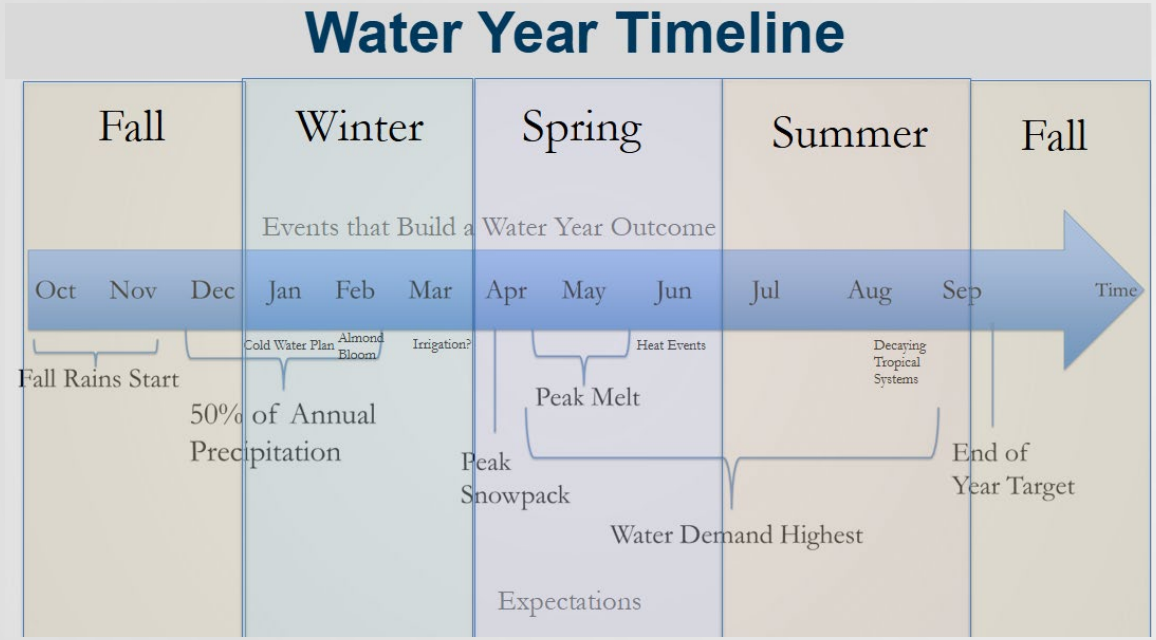


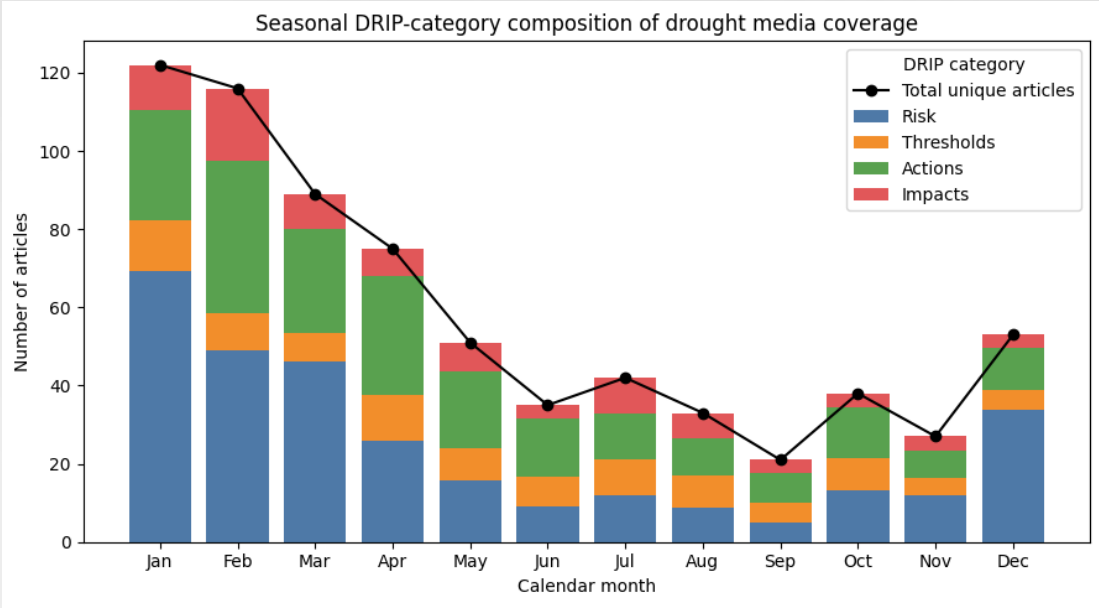
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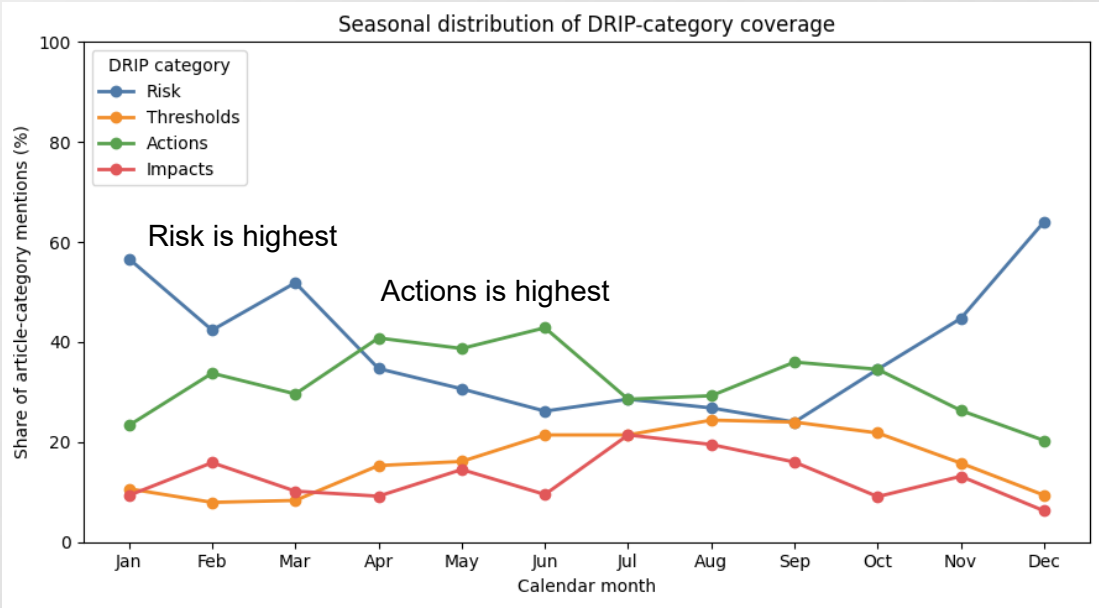
Coverage by season (by calendar month)

Drought coverage is highest from December to April.

➔ Media follows the hydrologic calendar when precipitation, snowpack, and réservoirs levels are most newsworthy.



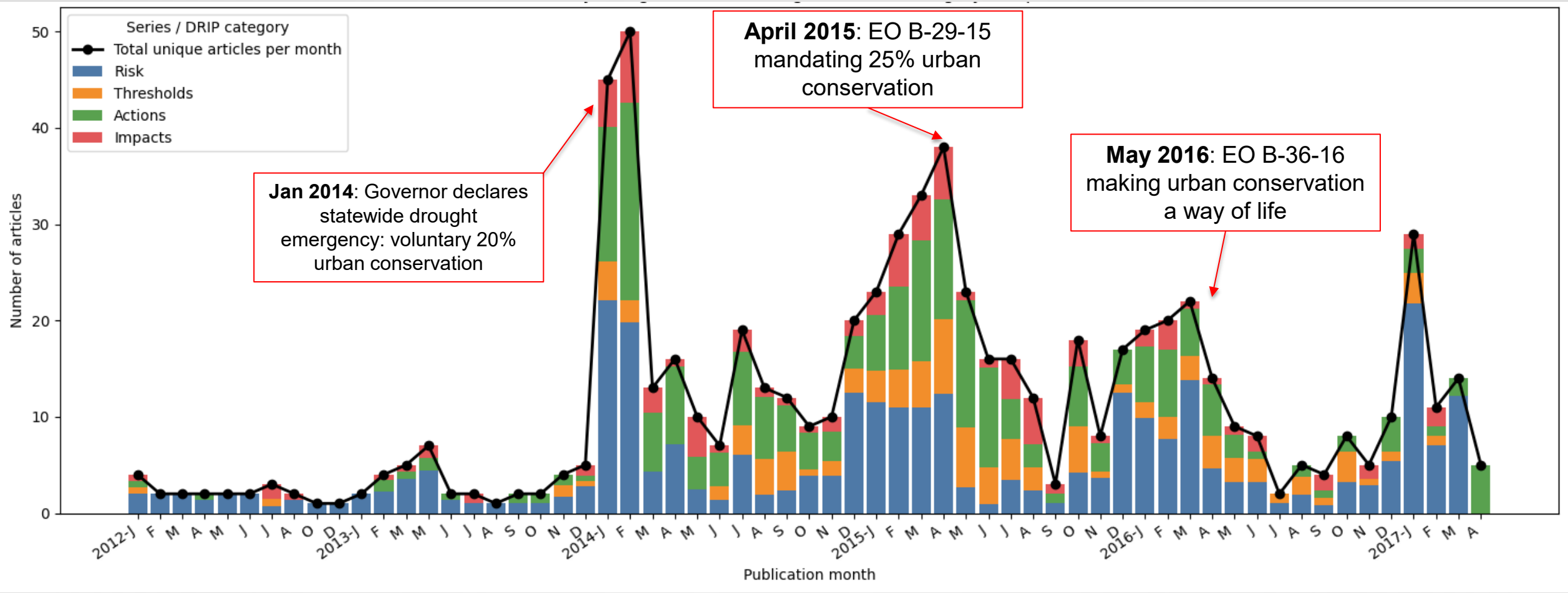




➔ Risk dominates in winter while Actions, Thresholds, and some Impacts become relatively more visible later in the year.

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Monthly Coverage and DRIP-Category Share

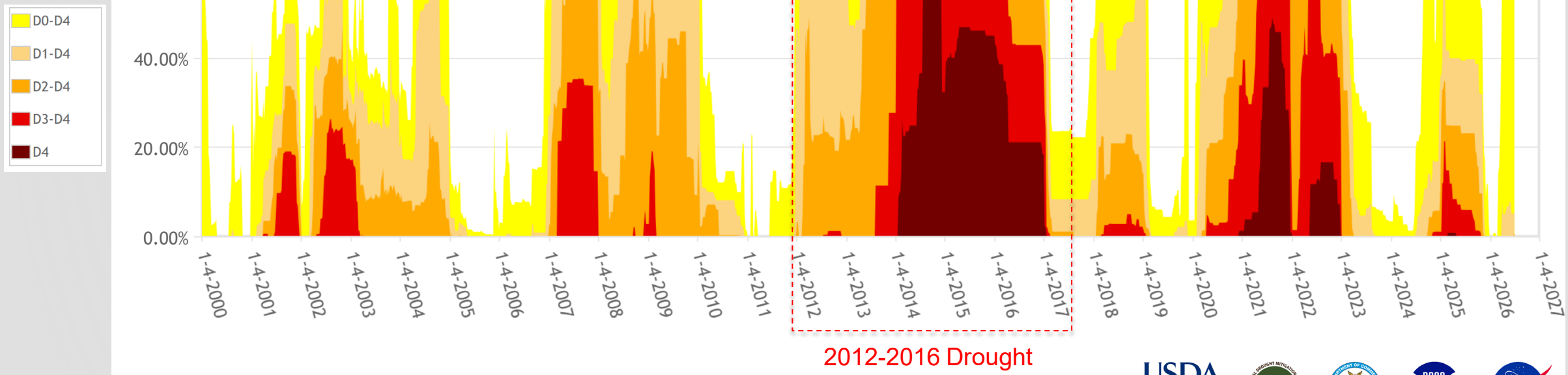


Even during high attention periods, the major monthly coverage spikes are driven by a combination of Risk and Action indicators, while Thresholds and Impact indicators remain secondary.

→ The media primarily communicate about the drought through “what is happening?” and “what is being done?”

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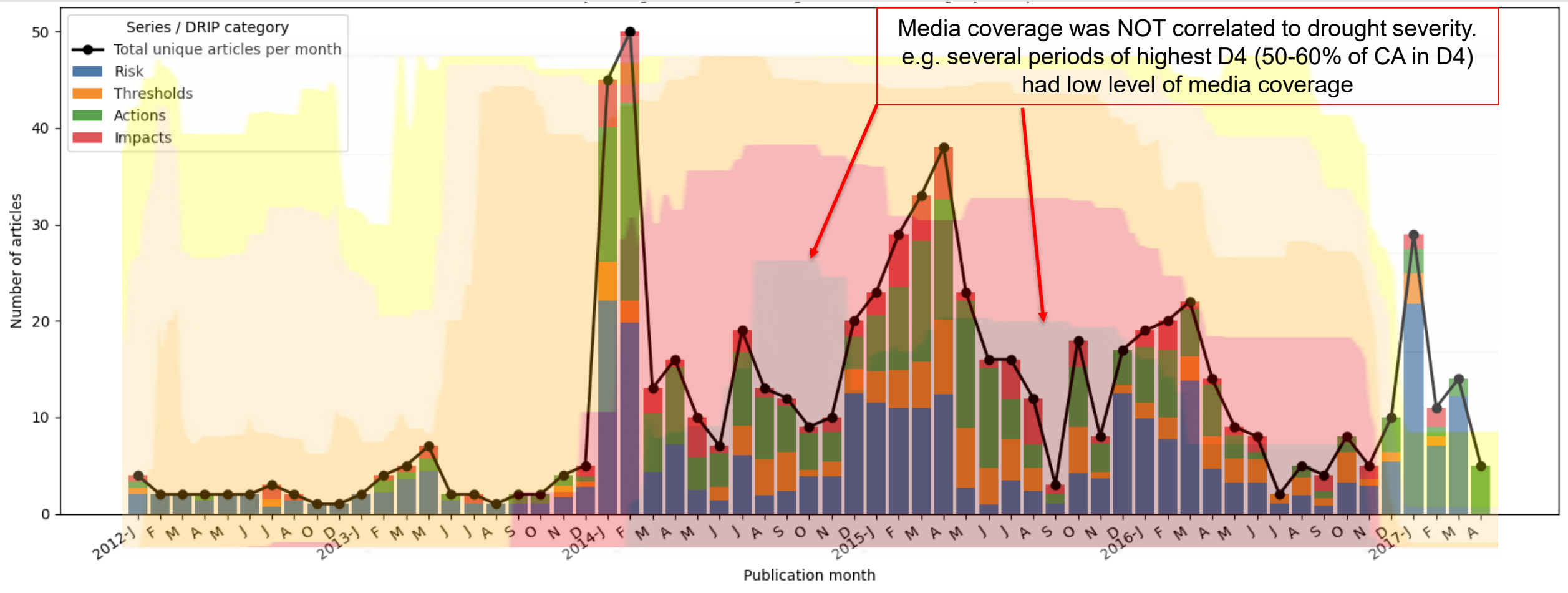
Reminder: 2012-2016 Drought Severity



From the U.S. Drought Monitor website, https://droughtmonitor.unl.edu/DmData/TimeSeries.aspx, 7-10-2026

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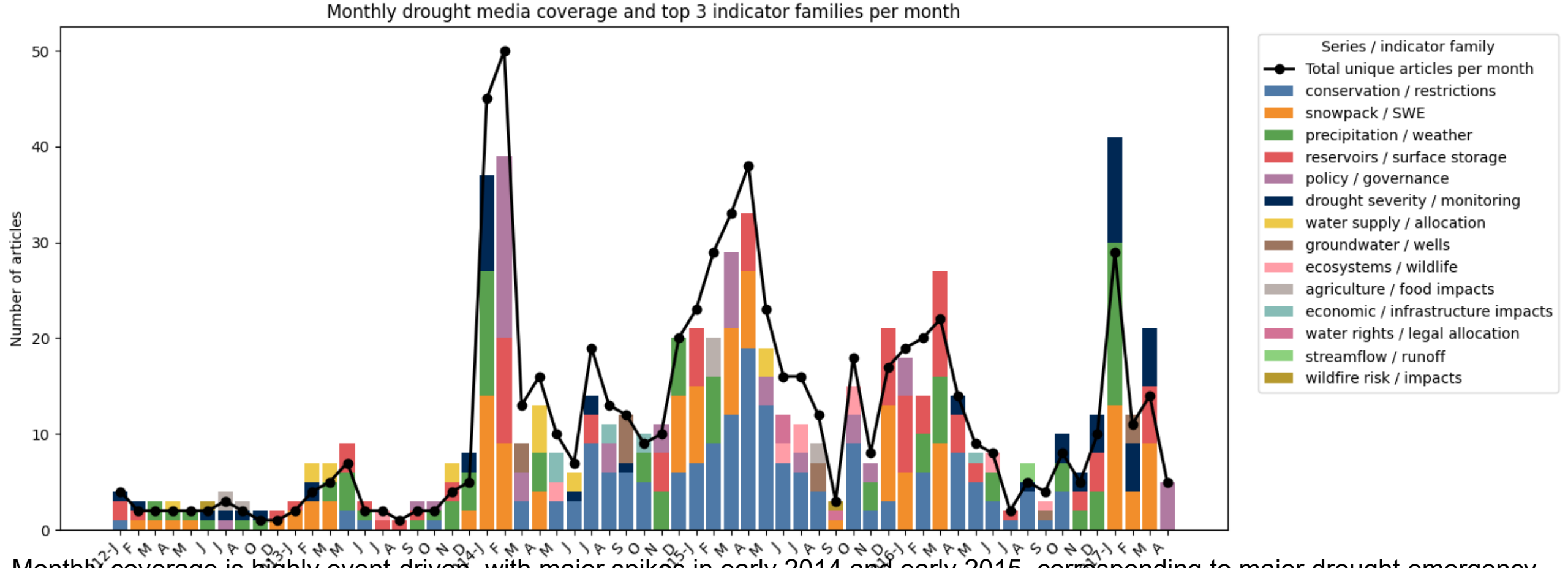
Media Coverage and USDM Severity



Beyond fixing "what" indicators are used, **is there an opportunity to improve the "when" (timing) of indicators**?

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Monthly Coverage and Top 3 Indicators



Monthly coverage is highly event-driven, with major spikes in early 2014 and early 2015, corresponding to major drought emergency declarations and policy decisions. The dominant indicators shift across peak periods rather than following a single stable pattern.

→ Media often cite familiar indicators, but their use is not consistent across time. Specific indicators used often shift in response to the most pressing issue of the moment.

Media: Perceived DI&M gaps

- *Thresholds gap* – few references to trigger points that determine specific actions and decisions.
- *Impact gap* – community, infrastructure, health, and economic impact metrics are underused.
- *Narrative gap* – indicators are often reported separately or come in pairs (e.g., Actions/Risks) but aren't interwoven in the coverage narrative.
- *Breadth gap* – coverage relies on a relatively narrow set of familiar indicators (US Drought Monitor, snowpack, precipitation, water use cuts, policy decisions).
- *Timing gap* – drought coverage is heavily event-driven, and volume varies seasonally.
- *Action gap* – drought coverage and narrative lack individual action suggestions despite evidence that heavy media coverage can affect water use behavior.

Science paper that linked media coverage to water use

SCIENCE ADVANCES | RESEARCH ARTICLE

ENVIRONMENTAL STUDIES

Changes in water consumption linked to heavy news media coverage of extreme climatic events

Kimberly J. Quesnel[1,2] and Newsha K. Ajami[2,3]*

Public awareness of water- and drought-related issues is an important yet relatively unexplored component of water use behavior. To examine this relationship, we first quantified news media coverage of drought in California from 2005 to 2015, a period with two distinct droughts; the later drought received unprecedentedly high media coverage, whereas the earlier drought did not, as the United States was experiencing an economic downturn coinciding with a historic presidential election. Comparing this coverage to Google search frequency confirmed that public attention followed news media trends. We then modeled single-family residential water consumption in 20 service areas in the San Francisco Bay Area during the same period using geospatially explicit data and including news media coverage as a covariate. Model outputs revealed the factors affecting water use for populations of varying demographics. Importantly, the models estimated that an increase of 100 drought-related articles in a bimonthly period was associated with an 11 to 18% reduction in water use. Then, we evaluated high-resolution water consumption data from smart meters, known as advanced metering infrastructure, in one of the previously modeled service areas to evaluate breakpoints in water use trends. Results demonstrated that whereas nonresidential commercial irrigation customers responded to changes in climate, single-family residential customers decreased water use at the fastest rate following heavy drought-related news media coverage. These results highlight the need for water resource planners and decision makers to further consider the importance of effective, internally and externally driven, public awareness and education in water demand behavior and management.

Also, PPIC paper in June 2017 said 78% of suppliers said media coverage was moderately to very important in helping them reduce customer water use following the mandate

Template: DI&M User Needs Assessment - Media

User Type: Media	Example Users: TV Outlets (CBS, ABC, PBS), Newspapers (LA Times, Sacramento Bee, La Opinion, Fresno Bee), Online publications (Maven's Notebook), Social Media News Outlets, Radios (KQED, LAist)
Decisions: Decide when drought is newsworthy, which DI&M to feature, how to explain drought severity, what geographic scale to emphasize, and whether to frame the story around conditions, policy response, impacts, or public action.	**Currently Used DI&M:** US Drought Monitor, precipitation, snowpack/SWE, reservoirs, water supply/allocation, conservation restrictions, water-use cuts, policy decisions.
	Missing DI&M: Threshold and Impact indicators; sector, sub-region, and community-specific metrics; and accessible connectors between current DI&M and drought news narratives. Needed connectors should clarify who is affected, where, at what trigger point, and what action follows across urban, agricultural, industrial, ecosystem, utility, and community contexts.
Impacts: Directly affects public response and awareness. Audiences may be more or less likely to reduce water use based on narratives. Increase understanding of emergency decisions, when drought requires action and who is most affected.	**Resolution:** Spatial need: varies by outlet and news type Temporal resolution: seasonal needs but should generally include seasonal/water-year context, monthly updates, and daily/weekly trackers during drought events, especially given the frequency of publications about the drought. Future forecasting: Possibly to raise awareness and preparedness Use of AI: bridge between all four buckets and linking DI&M indicators into clear and newsworthy stories
	Four Categories: Risks and Actions are the most widely covered buckets while Thresholds and Impacts should be where newest efforts should focus on (in addition to bridging categories to fill in the actionability and connector gaps).

Thoughts: 2020-2022 drought coverage

Can findings from this 2012–2017 analysis still inform drought communication today?
→ Yes: the narrative framing has evolved, but the indicator toolkit is broadly similar.

Preliminary scan of recent drought dashboards and 2020-2022 Sacramento Bee coverage
→ Many media outlets still rely on familiar indicators identified in the historical analysis, including the U.S. Drought Monitor, precipitation, snowpack/SWE, reservoir levels, water allocations, water-use restrictions, and conservation targets.

Main differences/changes
→ Articles are often shorter and more adapted to digital/social-media reading styles.
→ Drought is more frequently put in connection with climate change, and longer-term water stress.
→ Recent droughts coverage also emphasizes temperature, not just precipitation (hotter and drier).
→ Clearer linkage of drought to fire (given CA 2020 fire season of 4.3M burned acres).

Similarities that support the applicability of the findings
→ Media coverage still relies heavily on a narrow set of familiar Risk and Action indicators.
→ Threshold and Impact indicators remain less visible.
→ Indicators are still most often reported individually rather than connected into a clear narrative.

Media user needs – Proposed next steps

1) **Validate findings**
   Directly interview journalists / editors from major and local news outlets to understand how they choose certain drought indicators, what makes a story newsworthy and what drives their selection of indicators to include in stories.

2) **Test with media the ideas behond greater specificity (sub-sector, sub-region, supply mix)**
   Indicators should distinguish urban, agricultural, industrial, ecosystem, utility, and rural community.

3) **Develop a journalist-facing DI&M guide**
   This guide should link indicators to sources and connect indicators across risk thresholds, consequences, and actions while also addressing other identified gaps. Suggest new indicators

4) **Revise dashboard and drought trackers**
   Identify how tools like California Water Watch, CalMatters' Drought Tracker, or the SF Chronicle's drought tracker could better compile indicators into media-ready drought narratives.

Drought Indicator & Metrics – Discussion

Breakout Topic 1 (15min): Next steps on media / input on user needs

- What do you think should be the next steps on the media analysis?
- Do you have further input on the user needs work that will be done by CA Water Data Consortium? (five users: counties, media, large urban suppliers, State, and environmental managers)

Breakout Topic 2 (15 min): Gaps and opportunities

- Based on all the findings to date, what do you think are the specific gaps and opportunities that should be further assessed and described in the DI&M white paper?

Group Discussion (15 min): Share insights from breakouts

- Each breakout group has ~5 minutes to report out key points

Breakout Groups

Topic 1: Suggested next steps for media, other input on user needs (via Consortium)?

Topic 2: Ideas on gaps and opportunities that should be in the DI&M white paper?

Group 1 – Glen

- Ivy McElroy
- Alex Biering
- Laura Ramos
- Virginia Jameson
- Samantha Arthur
- Katy Landau
- Joaquin Esquivel
- Charles Delgado

Group 2 - Julie/Zoe

- Sierra Ryan
- Tim Worley
- Jennifer Clary
- Tami McVay
- Maria Gallegos Herrera
- Karen Mogus
- Emily Rooney

Group 3 – Orit/Anthony

- Suzanne Pecci
- Carolina Hernandez
- Sophie Morin
- Mariko Falke
- Paul Gosselin
- Nate Ortiz
- Andrew Altevogt
- Joshua Cahill

Drought Indicator & Metrics - Discussion

Share insights from both breakout topics

Topic 1: Suggested next steps for media, other input on user needs (via Consortium)?

Topic 2: Ideas on gaps and opportunities that should be in the DI&M white paper?

Next DI&M Workshop: Scheduled for Thursday, Sept 3, 2026 from 1-3pm PT

Drought Indicator & Metrics – Next Steps

Develop initial draft of the DI&M white paper. Review and discuss at Workshop #3

Based on the previously mentioned paper outline, will incorporate prior analysis including:

- Input from DRIP Collaborative April 17 and July 17 discussions
- Workshop #1 and #2 presentations from subject matter experts
- Evolution of drought indicators, since 1900 and also last 25 years in CA
- Timeline of how data and systems have evolved in CA since 1980
- Extended list of indicators and metrics, compiled and discussed
- In process user needs analysis, including counties and media
- Coordination with NOAA NIDIS, UC Davis, and CA Water Data Consortium
- Other literature review and science papers
- Gap/opportunity analysis discussed today and with SMEs (to be fleshed out further)

DI&M Workshop #3: Scheduled for Thursday, Sept 3, 2026 from 1-3pm PT

California DRIP Collaborative

Volunteers Needed: DRIP Collaborative members are invited to review and provide feedback on the draft White Paper.

Public Comment
Drought Indicators and Metrics

1. In-person participants:
    a) Submit a comment card before or during the break.
2. Virtual participants:
    a) Raise your hand with the “Raise Hand” feature in Zoom and you will be asked to unmute and speak.
    b) Send a Zoom chat to the webinar manager if you need technical assistance.
    c) If you are dialing in by phone, dial *9 to raise your hand and dial *6 when it you are called on to speak.

SHORT BREAK

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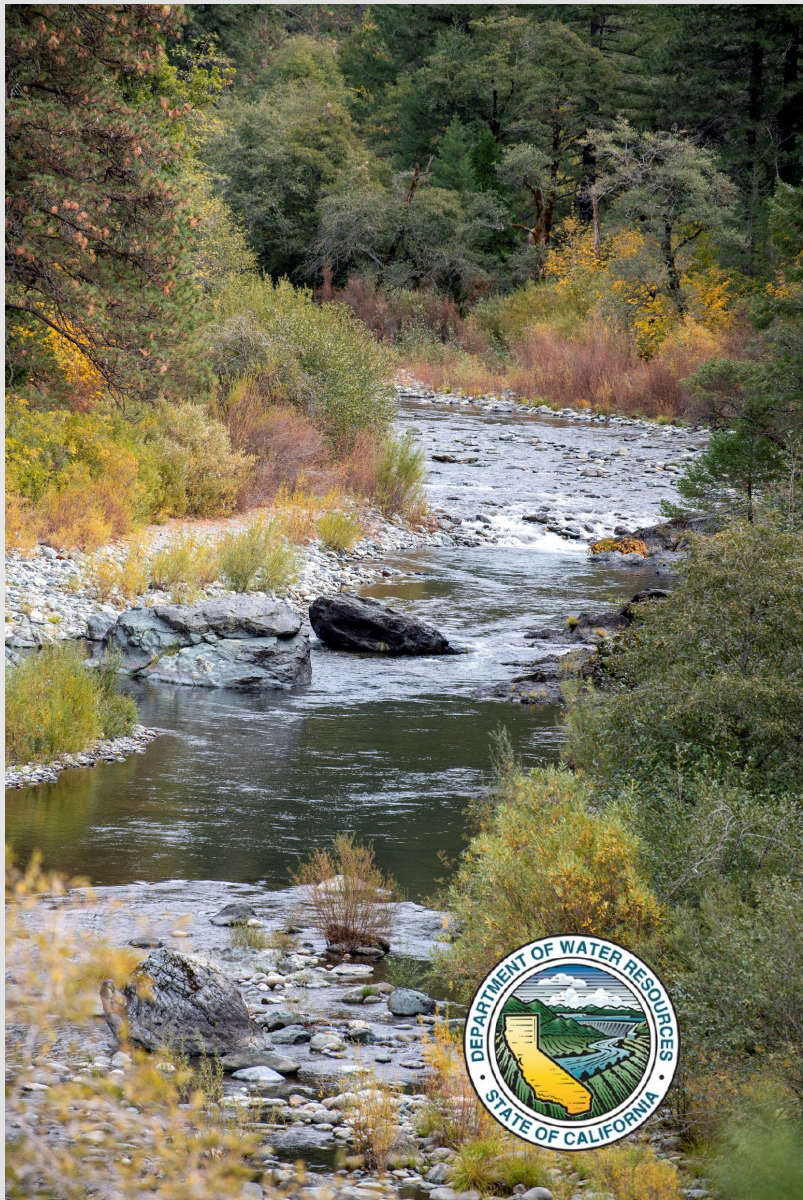
Jule Rizzardo, Principal Engineer, Financial Assistance Branch Manager, Department of Water Resources
Lisa Hong, Section Manager, Division of Financial Assistance, State Water Resources Control Board
Scott Weeks, Senior Environmental Scientist Supervisor, California Department of Food and Agriculture

PROPOSITION 4 FUNDING WATER RELATED PROJECTS

Proposition 4 at a Glance

- Authorizes $10 Billion in State general obligation bonds to reduce climate risks and impacts
  - Protects drinking water
  - Reduces wildfire and flood risks
  - Restores natural places
  - Supports healthy working lands
  - Expands access to parks and outdoor spaces

  Approx $2 Billion administered by Department of Water Resources



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Proposition 4 Eligibility

- Public agencies
- Local agencies
- Nonprofit organizations
- Special districts
- Joint powers authorities
- Tribes
- Public utilities
- Mutual water companies

At least 40 % of total funds for vulnerable populations or disadvantaged communities. At least 10 % of the total funds to severely disadvantaged communities.

Full Text: November 5, 2024, General Election Voter Information Guide - Proposition 4 Text of Proposed Laws

California DRIP Collaborative

Proposition 4
Alignment with DRIP Collaborative

Expanded disadvantaged community definition: less than 80% MHI **OR** less than 80% of the area average

40% of funds support severely disadvantaged communities

Vulnerable population: a subgroup within a region or community that faces higher climate risk and has fewer resources to cope, adapt, or recover.

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DEPARTMENT OF WATER RESOURCES
STATE OF CALIFORNIA

Proposition 4 Watershed Resilience Alignment with DRIP Collaborative

- $152 million for integrated planning and multi-benefit solutions that increase climate resilience
- Building on IRWM
- Regional watershed networks for coordinated resilience, habitat, and water security



California DRIP Collaborative

DEPARTMENT OF WATER RESOURCES · STATE OF CALIFORNIA

Proposition 4 Sustainable Groundwater Alignment with DRIP Collaborative



$320 Million for ecosystem and nature-based solutions like groundwater recharge to improve regional resilience



California
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DEPARTMENT OF WATER RESOURCES
STATE OF CALIFORNIA

Small Groundwater Sustainability Agencies

- Proposition 4 provides $3.5 million for Small Groundwater Sustainability Agencies
- GSAs that pump less than 10,000 acre-feet per year
- Help smaller agencies pool resources and coordinate regional interests
- Small GSA funding will be administered first – releasing guidelines for comment in August 2026

Proposition 4 Watershed Resilience and Sustainable Groundwater Rollout

Pre-Guideline Public Scoping Workshop Held on April 30th and **Recording Available Online**.

Draft Guidelines under development – Summer 2026

Draft Guidelines out for public comment & workshops - Fall 2026

Final Guidelines to be released - Winter 2026

Application period to open – Spring 2027

California DRIP Collaborative

DWR Financial Assistance Contact Resources

- Sustainable Groundwater Management Grant Program Webpage: https://water.ca.gov/work-with-us/grants-and-loans/sustainable-groundwater
- Watershed Resilience Program Webpage: https://water.ca.gov/Work-With-Us/Grants-And-Loans/watershed-resilience-program
- E-mail for all programs: financialassistance@water.ca.gov
- Subscribe and Stay Connected

SCAN ME

California DRIP Collaborative

DEPARTMENT OF WATER RESOURCES · STATE OF CALIFORNIA ·

Water Board Funding Opportunities



1. Water Resiliency

- Prop 4 water recycling grant
- Prop 4 stormwater grant

2. Vulnerable Communities and Equity

- Wastewater funding
- Drinking water funding
- Technical assistance
- Bottled water

3. Advice for Funding

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Water Board Funding Opportunities

Water Recycling

Prop 4 allocated $386 million → $130 million remaining



<u>Construction grant</u>

- $15 million maximum per project.
- Large-scale projects: $15 million per phase. 2 phases max per project or per program.
- Continuous application.

Small amount available for feasibility studies.

Water Board Funding Opportunities

Stormwater

- Prop 4 allocated $101 million for projects.
- Custom solicitation. Workshop on funding guideline July 21.
- Project must be in a Storm Water Resource Plan (SWRP)
- Storm Water Funding Requirements
  - Multiple Benefit
  - Urban storm water project
  - Addresses flooding



Water Board Funding Opportunities

Wastewater



Small Disadvantaged Communities
(Planning)

- Continuous application cycle
- Apply for planning funds to develop CEQA, engineering design, etc.
- Current priorities: addressing violations, septic-to-sewer
- Grant availability varies annually



Small Disadvantaged Communities
(Construction)

- Continuous application cycle
- Current priorities: addressing violations, septic-to-sewer
- Grant availability varies annually



All Other Communities

- Low Interest Loan (~2%)
- $50 million loan = ~$11 million savings
- Annual application cycle Complete application by 12/31
- Projects are ranked - $50M max per project; $600M total capacity

Water Board Funding Opportunities

Drinking Water

Failing & At-Risk Systems (Planning)

- Continuous application cycle
- Apply for planning funds to develop CEQA, engineering design, etc.
- Small, expanded small, medium DACs or small moderate-income communities
- Certain public health priority projects may be expedited

Failing & At-Risk Systems (Construction)

- Continuous application cycle
- Small, expanded small, medium DACs or small moderate-income communities
- Certain public health priority projects may be expedited

Emerging Contaminants

- Continuous application cycle
- PFAS, 1,2,3 TCP, manganese, 1,4 dioxane, etc.
- No grant max for small or disadvantaged systems
- $25 million max grant for others

All Other Projects

- Low Interest Loan (~2%)
- $50 million loan = ~$11 million savings
- Annual application cycle
  Complete application by 12/31
- Projects are ranked - $50M max per project; $300M total capacity

Water Board Funding Opportunities

Technical Assistance

Support communities on drinking water and wastewater projects.

Services provided include:

- Capital improvement planning
- Engineering and environmental studies
- Financial, legal, and TMF evaluations
- Leak detection and compliance audits
- Training for boards and operators

Eligibility:

- Communities with fewer than 10,000 residents
- Median Household Income (MHI) below 80% of the state average
- Assistance priority will align with drinking water and wastewater grant priorities



Water Board Funding Opportunities

Bottled Water

Eligibility:
Public water system serving less than 1,000 people, failing for exceedance of an acute primary maximum contaminant level may be eligible

Examples of Interim Solutions:
- Bottled or hauled water
- Point of Use/Point of Entry systems
- Temporary connections or purchasing water
- Emergency repairs

Expected to move towards long-term solution.

RCAC provides a bottled water for schools program.



Water Board Prop 4 Funding Opportunities

Advice for Funding

1. If applying for construction, be shovel ready – CEQA, engineering design, finances

2. Submit initial application as soon as possible to be assigned a dedicated project manager

3. Review applicable funding guidelines/policies to understand funding requirements

4. Ensure fund expiration date is doable for your project

5. Funding is cyclical - find ways to move planning work forward in prep for future opportunities



The total CDFA Allocation is $195 million. This includes administrative funding.



2025–26 Budget Invests in Climate-Smart Agriculture and Resilient Food Systems

Water Efficiency & Soil Health

- **40 million** for the **State Water Efficiency and Enhancement Program (SWEEP)** to improve irrigation systems on farms and ranches, conserving water and reducing emissions associated with pumping.
- **65 million** for the **Healthy Soils Program** to support soil health practices that sequester carbon and lower greenhouse gas emissions on farms and ranches.



OARS Block Grants

Why It Matters

- **New funding process** for Healthy Soils & SWEEP
- **Producers no longer applying directly to CDFA**
- **Must apply through a local Block Grant Recipient (BGR)**
- **Each BGR must provide one on one technical assistance to support local growers**
- **Each sets their own application process, timeline, and service area**
- **Eligibility depends on having a BGR in your area**
- **CDFA has a Tribal Set Aside**
- **Received Concept Proposals, currently in Full Proposal stage**

California DRIP Collaborative

cdfa The Office of Agricultural Resilience & SUSTAINABILITY

State Water Efficiency and Enhancement Program

SWEEP helps farmers reduce greenhouse gas emissions and conserve water through the adoption of advanced, climate-smart irrigation technologies.

Eligible practices include:

- Irrigation water management, including soil moisture monitoring, flow metering and in field Evapotranspiration (ET) station
- Efficient irrigation systems up grades, such as drip irrigation.
- Retrofitting existing systems to support lower pressure components
- Pump repair or replacement
- Fuel efficiency changes to the pumping system, including renewable energy installation



Healthy Soils Incentives



Healthy Soils Program has been supporting farmers and ranchers to help them incorporate new sustainable agricultural practices into their systems. All of these practices build organic carbon belowground, and some aboveground, while reducing land-based greenhouse gas (GHG) emissions

27 Practices are available, including:

- **Organic Soil Amendments:** Compost, Mulch, Whole Orchard Recycling
- **Annual Plantings:** Cover Crops, Crop Rotations
- **Permanent Plantings:** Hedgerows, Windbreaks, Range Plantings
- **Decreased Tillage:** No-Till, Reduced Tillage

Benefits for healthy soils include:

- Crop Nutrition
- Soil Structure
- Water Infiltration and Storage
- Reduced Soil Erosion
- Biodiversity
- Carbon Sequestration

Stay in the Loop with OARS

Follow us on social media:

- **Instagram:** cdfa_oars
- **Twitter:** *@cdfa_oars*
- **LinkedIn:** *California Department of Food and Agriculture*
- **Facebook:** CDFA Office of Agricultural Resilience and Sustainability

- **General Email:** *cdfa.oars@cdfa.ca.gov*
- **Website:** *www.cdfa.ca.gov/oars*
- **Sign up for our newsletter:**

cdfa
The Office of Agricultural Resilience & SUSTAINABILITY

Public Comment
Prop 4 Climate Bond – Funding Opportunities

1. In-person participants:
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2. Virtual participants:
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Process Reflections



Given our focus on two priority initiatives this year, how well are our discussions advancing the purpose and goals of the DRIP Collaborative? Any suggestions for improvements?

Looking ahead to our October meeting, our final DRIP Collaborative meeting of 2026, what topics, issues, or emerging opportunities would you like us to discuss or learn more about?

SB 552 Drought Resilience Symposium

Join state and local leaders to celebrate five years of progress implementing SB 552 and advancing drought resilience across California.

Celebrate SB 552 accomplishments.

Explore opportunities for integration of drought planning with broader planning efforts and ideas for the next phase of implementation

Connect with practitioners shaping the future of drought resilience.

The symposium will feature panel discussions, presentations, an interactive informational showcase, and opportunities to connect with partners from across the state.



Register here:

California
DRIP Collaborative

Next Engagement Opportunities

AUG 24

Next R&R Workshop: Scheduled for Monday, August 24, 2026, 1 pm to 3 pm.

SEPT 03

Next DI&M Workshop: Scheduled for Thursday, September 3, 2026, 1pm to 3pm.

OCT 16

Next DRIP Collaborative Meeting: Friday, October 16, 2026, 10 am to 5 pm.

Paul Gosselin, CA Department of Water Resources – Deputy Director of Sustainable Water Management

CLOSING REMARKS

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Adjourn

Thank you!