

Meeting Summary

Drought Resilience Interagency & Partners (DRIP) Collaborative Drought Indicators and Metrics (DI&M)

Workshop #3

On Thursday, September 3rd, 2026, the CA Department of Water Resources (DWR) hosted the third in a series of workshops to address [the 2024 DRIP Collaborative recommendation](#) on clarifying drought indicators & metrics (DI&M) for statewide decision making. During the workshop, the participants reviewed progress to date, discussed DI&M gaps and opportunities, and reviewed critical impact metrics to potentially feature in the DI&M White Paper.

Deputy Director Paul Gosselin, DWR – Sustainable Water Management Division, welcomed participants and commented on the variability of rainfall and dryness across California, along with the importance of efforts in getting information to key audiences to assist with response adaptation and planning, especially in extreme climates such as drought. He emphasized the importance of protecting people, businesses, and the environment.

DI&M Process and Progress to Date

Glen Low, DRIP Collaborative co-facilitator, briefly summarized progress so far made. This included introducing Prof. Alvar Escriva-Bou's original 2024 recommendation plus key insights from [DI&M Workshop 1](#) and [DI&M Workshop 2](#). He emphasized the key points from the July 17 DRIP Collaborative in-person meeting, which included the importance of being user-centric, relevant sections from a National Academies drought paper, and insights from an analysis of media newspaper coverage of the 2012-2016 drought and how that may inform gaps and opportunities going forward.

He emphasized the importance of the ongoing coordination required, most notably between the UC Davis drought dashboard work (led by Escriva-Bou, funded by NOAA NIDIS), the ongoing CA Water Data Consortium work to clarify audiences' needs for DI&M, and the scaling of the NIDIS Drought Early Warning System (DEWS) SoCal pilot to the rest of California.

Gaps and Opportunities Group Discussion

Glen introduced a list of gaps and opportunities emphasized in previous DRIP Collective workshops/discussions along with their rationale/source. See the visuals on the next page that summarize the Top 10.

During a group discussion, the workshop participants commented on the need to shift from reactive to proactive and the data required to address these gaps. Multiple participants brought up the issue of sustained funding to ensure continuity of data collection.

Other issues raised included asking who will collect the desired data, the lack of public engagement, and data sharing between authorities. It was agreed that greater coordination and clear communication was needed to achieve any of these identified opportunities.

	Key Finding	Rationale
Improved Indicators & Metrics	1. User centric decision support. Create user specific views - Aligned to decisions, to ensure info actionable - Co-developed via a design process with user feedback 2. Actionable risks. CA specific: sub-region, sub-sector, supply mix 3. Thresholds/actions. Improve understanding for each user 4. Impact metrics. Capture drought impact info, to create true cost accounting across sectors (ag/food, public health, etc.) 5. Predictive/forecasts. Enable more timely proactive response, instead of dealing with impacts after they happen 6. Vulnerable. Ensure improved coverage of select groups, such as rural communities, Tribal and ecosystems to minimize impacts on those with limited adaptive capacity	- Workshop #1 comments, NIDIS approach, CWDC analysis - UC Davis work, USDM limitations - Workshop #2 comments, July 17 - Workshops #2 comments, National Academies Drought paper - Workshops #1 and #2 comments, DRIP Collaborative meetings - DRIP Collaborative meetings
Implementation	7. Data mechanisms. Ensure there is cost-efficient mechanisms to regularly collect needed data to ensure operational response and long-term planning 8. Funding. Ensure sufficient resources for reliable and trusted data collection and analysis by state/local agencies and researchers - Make the business case for this funding via reduced drought impacts (on vulnerable) and improved predictive capabilities 9. Communication. Develop audience messaging (from trusted/ existing messengers) that is simple/easy to understand, leveraging the latest media formats and ensuring timely communication 10. Dashboard. Update existing drought web portals (CA Water Watch, DWR and SWRCB websites, etc.) to include new and improved indicators (possible use of user-based navigation)	- Workshops #2 comments, National Academies Drought paper - DRIP Collaborative meetings, National Academies Drought paper - DRIP Collaborative meetings, plus DRIP 2024 recommendation - DRIP Collaborative meetings, UC Davis DEWS work

Initial Insights from User Needs Analysis (Counties)

Alyssa Senturk, California Water Data Consortium, shared initial insights from interviews across different California counties. She summarized different indicators that these counties used, which included local monitoring wells, dry-well reports, precipitation indicators, storage tank presence, amongst others.

Alyssa then moved onto specific topics that many counties spoke about in their interviews. The five highlighted were as follows: Information on real-time impacts is more valuable than forecasted metrics, synthesizing existing indicators is more important than sourcing new ones, indicators are only as useful as actions they're tied to, vulnerability thresholds in indicators can vary from county to county, and that countywide or basin wide metrics can obscure some sharp differences. She ended her talk focusing on the importance of bridging the gap between indicators and action (who is interpreting data, what action needs to take place, what resources and funds are available, etc.).

Workshop participants commented that each county is different and a willingness to share is critical. They also emphasized how DI&M is very reinforcing of the Roles & Responsibilities work done by the DRIP Collaborative.

Work Session – Critical Impact Metrics

Glen then reviewed the topic of impact metrics, building on one of the identified Top 10 Gaps and Opportunities. This included a prioritized list of ~20 impact metrics, broken down into six categories. Participants were then invited to join a breakout session and discuss the list of metrics, including a more extended list of ~40 impact metrics.

Participants were asked to discuss if there are metrics to be added, deleted, or modified and if impact metrics deserved a deep dive for the final DI&M White Paper. Key items raised:

- Relatedness. Participants noted many metrics were related
- Cause/effect. Some impacts are directly from drought, others have other factors. For example: fallowed land. How do we measure how much of the fallow land is directly due to drought instead of other conservation and climate change efforts?
- Inevitability of Impacts. Some impacts will happen regardless of drought due to longstanding challenges like long-term land subsidence.
- Economic Impact Across Sectors. There are financial implications across every impact. Should we try and capture that systematically?
- Communication. Need to tailor communication to end user. How best to display?
- Comments on specific impact metrics:
 - Hauled and Bottled Water. Not listed as one of the top ten critical factors but begs questions on how to capture individual impacts at the local level?
 - Conversion of Land. Could a metric be created for land that isn't fallowed, but instead turned into a different kind of water use (industrialization, home, etc.)?
 - Valley Fever. Need information to correlate between drought and increases in local cases.
 - Aquatic Species Health. What would a metric look like for this?

Overall, it was a vibrant discussion and there was strong support for impact metrics.

Upcoming Activities

Glen shared an outline for the DI&M White Paper, welcoming feedback on topics to highlight. He emphasized that a draft of the white paper would be created in preparation for the Oct 16 DRIP Collaborative meeting.

Looking forward to 2027, he emphasized the criticality of further coordination between the California Water Data Consortium's upcoming audience needs assessment, Prof. Alvar Escriva-Bou's dashboard, and NOAA NIDIS pilot work. The audiences for each of these projects is mutually reinforcing and could be key input for a DRIP Collaborative DI&M White Paper for 2027.