

Part 0. Recommendation Declaration

To be submitted to the DRIP support team prior to commencing work on Part I.

Recommendation Proposer

DRIP Member name, member type (state/non-state) and any partners (DRIP members or external) in development of proposed recommendation.

Alvar Escriva-Bou, non-state DRIP member (expert in water resource management). Other DRIP members who have previously expressed interest in this idea: Nancy Vogel, Katie Ruby, Katy Landau.

Potential contributing partners outside of DRIP Collaborative: CA Water Data Consortium (CWDC) and CA Data Collaborative (CaDC)

Recommendation Idea

Provide a brief (no more than 150 words) description of the idea for a recommendation.

There is a need to develop a practical drought early warning system to inform drought management actions—both proactive mitigation measures and effective emergency responses—to minimize drought impacts.

Our ability to link drought conditions and expected impacts is not sufficiently specific and actionable. Given the complexity of California’s water system, it is not straightforward to understand different sectors’ potential impacts and develop drought responses. We also lack useful summary statistics to characterize drought resilience at the highest level (the type of drought metrics that might appear in every DRIP report to show our collective effort in improving our resilience). To do this, we need an improved ability to monitor and integrate that data, working across all levels including local, state, federal and tribal.

This drought early warning system should be adopted as part of a larger narrative and communication plan. How these metrics should be visualized and communicated must be considered, likely as part of a potentially updated online dashboard.

Focus Area

☒ **Drought Relevant Data** ☐ Drought Narrative ☐ Drought Preparedness for Domestic Wells

Intended Benefit to the Drought Risk Management Cycle (Please check all that apply)

☒ **Mitigation, Preparation and Capacity**

☒ **Forecasting and Monitoring**

☒ **Response**

☒ **Recovery**

Part I: Recommendation Overview

Recommendation Title

Provide a concise title for your recommendation in fewer than ten words.

Indicators and metrics to improve drought decisions, actions and resilience

Description

In one or two paragraphs, please provide a brief overview of the recommendation and how it addresses the Focus Area problem statement. Supporting documentation to include an overview of existing trends, the reasons for urgent action, and people currently impacted.

There is a need to develop a practical drought early warning system to inform drought management actions—both proactive mitigation measures and effective emergency responses—to minimize drought impacts. This would take the form of an online web application or dashboard that would communicate in a simple manner, but accounting for the local nuances of California’s complex management, drought states and expected impacts for different California’s water-dependent sectors. This application would improve information for local and state actions, increasing drought resilience. This came out explicitly from past DRIP Collaborative conversations related to the “Drought Relevant Data” focus area, and arguably would be the first key action to address the overall data problem statement.

The identification of the most actionable (both at state and local level) drought metrics would serve as a focal point for data sharing/coordination, data collection and interoperability, and then more predictive capabilities such as incorporating climate change data and projections. It could help pilot an improved level of coordination, where state requested data is used directly and transparently for shared metrics that multiple stakeholders believe are critical for tracking resilience.

Today, given an uncoordinated approach to drought metrics and dashboards (such as US Drought Monitor, CA Water Watch, separate drought websites from DWR, State Water Board, etc.) it is believed there is inefficient action and results. We can not measure or quantify drought resilience today, in a way that is easily communicated and understood by all critical stakeholders. Aligned upon metrics and indicators could be the foundation for improved drought communication and narratives.

Impacts

What are the expected outcomes or benefits of this recommendation, and how will it specifically enhance drought resiliency in California?

The practical outcome of this recommendation would be the development of an online dashboard or web application that tracks drought status and impacts through a state-university partnership for state and local agencies to improve drought response and preparation and support better public communication. These would be tracked and quantified, providing key agencies with the ability to quantify relative improvement in resilience over time. The desired outcome of this would be a measurable improvement in our overall drought resilience, achieved via better management actions and improved decision-making.

What are the anticipated impacts or consequences of not adopting this recommendation?

If this recommendation is not adopted, we believe the consequence would be continued lack of focus, misunderstanding of drought severity and impacts, lack of coordination on essential actions, and likely continued serious impacts on vulnerable communities. In short, the status quo would continue even though DRIP members believe this is a critical enabler for better decision making.

Implementing Parties and Partners

Who would be the implementing agency or entity (potentially multiple)?

Implementation would undoubtedly require a mix of state and local agencies. During the evaluation and execution of this recommendation, a key question will need to be addressed: is there a lead agency and/or single home for this work? This is complicated given an existing mix of responsibilities being shared across many agencies and at different levels. Ideally, open data (housed in each authoritative agency) will be maintained, and these new metrics and indicators would have a highly transparent link back to source data and calculations. Whether these new metrics and indicators should simply be displayed on multiple dashboards (versus a single location) would need to be discussed.

Which existing entities (e.g., departments or other agencies, private or nonprofit groups, community-based organizations) will the implementing agency or entity need to partner with for successful implementation of this recommendation?

Existing entities or stakeholders that would need to be involved cross five different groups: 1) groups reporting needed data, 2) data collecting agencies, 3) organizations performing metrics calculations, 4) open data portals/dashboards communicating the metrics, and 5) end users who utilize the metrics and indicators (such as urban agencies, groundwater agencies, irrigation districts, environmental organizations, and small suppliers or domestic well owners). These groups would cross all relevant state agencies, counties, tribal, local water agencies, non-profit groups (including environmental conservation and justice organizations), community based organizations, academics, and key sectors like agriculture and industrial. Any increase in effort needed to collect additional data, would need to be justified and communicated along with the desired metrics.

Describe the coordination required by federal, state, local and tribal governments to successfully implement this recommendation.

To ensure successful implementation of this recommendation, it is believed the wide range of stakeholders need to be involved from the very beginning, most notably in defining the metrics and indicators. Each stakeholder representation should be given influence to inform and select the metrics, given careful consideration of the effort/cost required to gather the data and the resulting value of the metrics to decision making.

Alignment with Other Initiatives

How does the recommendation align with and/or leverage existing state efforts, concurrent public or private initiatives?

There are a number of ongoing initiatives already underway that would need to be considered in implementing this recommendation. These would serve as a starting point and foundation for creating

the drought metrics and indicators. Lessons learned from these efforts should be addressed. For example (not an exhaustive list):

- DWR work to assess vulnerability per SB 552 (Water Shortage Vulnerability Scoring and Tool)
- SWB SAFER Drinking Water Needs Assessment, Clearinghouse, other drought tools and methods
- UCLA work with NIDIS to define drought hazard and indicators at section and sub-regional level
- CA Water Data Consortium work on urban water reporting and data streamlining
- Community Water Center Drinking Water Tool
- US Drought Monitor and other federal, tribal efforts

Implementation Time Frame

Approximately how quickly could the proposed recommendation be implemented? Factor time needed to develop, design, permit, construct (if applicable). Select one timeframe:

☐ Short term (1-2 yrs.) ☒ **Medium term (2-4 yrs.)** ☐ Long term (4-5+ yrs.)

Key outstanding questions (for discussion on 2/23 VM meeting or later in 2024)

1. **Scope.** *Is it optimal to limit the scope to just recommending metrics? Or should it go further, for example to link metrics to specific decisions or thresholds (that trigger actions)?*
2. **Timing.** *When will we define the actual metrics/indicators? Worth doing a short-list in the next few months to make this more tangible? Or does it happen AFTER the rec is approved?*
3. **Quantity.** *How many metrics should we aim for? Less than 10 or more like 30-40? Should it include metrics that track actual (not just expected) impacts, so is not just “early warning”?*
4. **Home.** *Should we do a formal vote (likely in Oct 2024) without first determining the eventual home for the dashboard/metrics? Is it possible or preferred to intentionally avoid some of the authority issues or complicated politics that may exist with ownership of the metrics?*

Part II: Implementation Considerations

Necessary Steps & Measuring Success

What are the key steps to adopt and implement action?

- Develop a partnership between state agencies and university researchers to implement this recommendation
- Establish a task force (including agencies and researchers) to guide the initial development
 - Define specific goals of the early warning system to track, communicate and minimize drought impacts
 - Identify other strategies that are aligned to create synergies and avoid overlapping actions
- Launch an advisory committee of relevant stakeholders that would identify specific needs and provide feedback on the research activities
- Conduct research activities to create a sector-specific drought early warning system for California

- Develop an application (dashboard or webpage) that is simple to understand but account for the complex nuances of drought representation in California, and serves to inform local and state decision and policy making
 - Must provide appropriate links and attribution to other related sites
- Set up a hosting and maintenance plan (including review options) to keep the tool working and improve it over time

To help monitor progress and success, what thresholds and reporting can be identified to reflect successful implementation?

- Set-up a stage-gate, agile design process to determine appropriate project milestones.
- Milestones, which should be tracked for progress, could include:
 - Establishment of the task force that is tasked to monitor the progress
 - Establishment of advisory committee
 - Definition of specific goals for the online tool/application; alignment on essential scope
 - Conducting research activities, including identifying the initial and refined drought metrics
 - Note: This should include symbology, visualization, etc. that was previously part of Rec 7 Communication Plan
 - Development of the online application (webpage or dashboard). Includes original mock-up, beta version and final version
- Ongoing usage of application
 - Usage of tool, impressions/views
 - Downloads of related datasets
 - Media mentions
 - Use by different users, especially local communities and vulnerable communities
- In the long-term, improvement of drought communication (for instance, media usage) and drought response (improved decisions and policies)

Potential Challenges

What issues or challenges might arise during implementation (e.g. authority or need for additional authority, funding or revenue streams, public awareness and perception, technical, interagency coordination)? List these hurdles and offer a brief description of how to address/mitigate them.

- Lack of clarity of the specific goals (conflicting views of the objectives): the initial task force will be crucial to define the objectives, and the advisory committee should help increasing the usability of this tool
- Data availability: identify data gaps and determine how critical gaps can be filled
- Funding: identify funding sources for the development and maintenance
- Maintenance: create a maintenance plan accounting for its costs of ongoing use and hosting

Are there foreseeable potential negative consequences or unintended impacts associated with implementing this recommendation?

- NA

Funding

What are the potential (estimated) costs to implement the recommendation? Is there both an implementation cost and ongoing costs? Briefly describe any assumptions behind the estimate.

- ~\$1.5 million: 3 years, 2 full time researchers, 1 lead PI working 1 month per year, a team of webpage developers, and some funds for travel and workshops.
- In-kind contributions expected (e.g. technical support/products from state agencies)

What potential existing and/or future funding sources or mechanisms are available (e.g., grants, general fund, bond funds, rate payers, philanthropic foundations, etc.)? Does the recommendation require funding from the state and potentially matching funds?

- NIDIS has committed to fund \$300,000 in fiscal year 2024-25, and it's likely to fund other \$300,000 for fiscal year 2025-26.
- Other sources of funding could be USDA, CDFA, DWR or USBR.

Equity and Outreach

How does this recommendation align with established agency equity policies and how might the recommendation address any specific equity or justice concerns, as defined by the DWR Racial Equity Vision, during its implementation?

- Usually there is less data about water supplies and other drought metrics for small communities, domestic well owners, and tribal nations, who are often the most vulnerable to droughts. They also have less physical and financial capacity to adapt to water scarcity. That could be a concern for equity.
- Others?

What sort of outreach is necessary for the successful implementation of the recommendation? Describe the target audience and the methods of outreach needed (e.g., communication, technical or financial assistance, partnering assistance).

- Target audience: local and state decision-makers on drought actions, and the general public.
- Workshops and meetings will be needed to gather feedback and disseminate the results.
- Maintenance of the established partnership, as well as access the data and refinement of methods, will be key for long-term success.