Drought Resilience Interagency and Partners (DRIP) Collaborative

Report on 2023 Activities for the DRIP Collaborative

April 2024

California Department of Water Resources
Water Use Efficiency Branch

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DRIP Members 2023

The DRIP Collaborative membership consists of 26 individuals in total, comprised of 8 state agencies and 18 non-state agency representatives, all listed in Table 1.

Table 1. Members of the DRIP Collaborative, 2023.

Agency/Organization	Member
California Department of Fish and Wildlife	Joshua Grover
California Department of Food and Agriculture	Virginia Jameson
California Department of Water Resources	Karla Nemeth, Kris Tjernell
California Environmental Protection Agency	Anna Naimark, Katy Landau
California Natural Resources Agency	Nancy Vogel
California Office of Emergency Services	Christina Curry
Governor's Office of Planning and Research	Saharnaz Mirzazad
State Water Resources Control Board	Joaquin Esquivel
Agricultural Council of California	Emily Rooney
Jay Colombini Ranch, Inc.	Jason Colombini
California Association of Mutual Water Companies	David Michalko, Tim Worley
Community Water Center	Justine Massey
California Trout, Inc.	Redgie Collins
Environmental Defense Fund	Anna Schiller
California Water Institute at Fresno State	Laura Ramos
University of California Los Angeles	Alvar Escriva-Bou
Santa Cruz County	Sierra Ryan
California State Association of Counties	Catherine Freeman
Domestic Well Planning Group South American Subbasin	Suzanne Pecci
Plumas Lake Self Storage, Owner	Brent Hastey
California Urban Water Agencies	Katie Ruby
Los Angeles County Public Works	Russ Bryden
CivicWell	Grace Person
Self Help Enterprises	Tami McVay
Buena Vista Rancheria of Me-Wuk Indians	Emily Moloney
Yurok Tribe	Michael Gerace

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Abbreviations and Acronyms

CalEPA	California Environmental Protection Agency
CalOES	California Office of Emergency Services
CBO	Community-Based Organizations
CDFA	California Department of Food and Agriculture
CDFW	California Department of Fish and Wildlife
CNRA	California Natural Resources Agency
CUWA	California Urban Water Agencies
DACs	Disadvantaged Communities
DRIP	Drought Resilience Interagency and Partners
DWR	Department of Water Resources
ENSO	El Niño – Southern Oscillation
Flood-Mar	Flood-Managed Aquifer Recharge
OES	Office of Emergency Services
OPR	Office of Planning and Research
SB 552	Senate Bill 552
SWRCB	State Water Resources Control Board
Tribes	California Native American Tribes
VM	Virtual Meeting
WY	Water Year

Foreword

Our state is experiencing a surge of extreme weather events, spanning from record water shortage conditions and drought to historic precipitation and flooding. The natural oscillations of California's climate have been exacerbated by climate change, pushing us farther from the historical average in temperature and increasing precipitation intensities our water systems and infrastructure were designed for operation. The change must be studied, analyzed, and understood to support and maintain California's position as a leader in environmental policy and economic prosperity, both nationally and globally. Adaptation and building resiliency to these climatic changes will require innovative thinking, the development of new processes, and cultivating new and strengthening of existing relationships.

In September 2021, while the state was experiencing a record three-year drought, Senate Bill 552 (SB 552) was signed into law. SB 552 establishes new responsibilities and requirements for both state and local agencies to improve water resilience for small water suppliers and rural communities when facing future water shortages.

Within SB 552 (Water Code 10609.80(b)), the Department of Water Resources, in collaboration with the State Water Control Board and other relevant state agencies, is directed to establish a standing drought and water shortage task force. In turn, the Drought Resilience Interagency and Partners (DRIP) Collaborative was established. The DRIP Collaborative is tasked to facilitate proactive predrought planning and enhance coordination of post-drought emergency response by developing strategies to improve collaboration across government sectors with regional and local partners.

The DRIP Collaborative will increase our collective understanding of and response to water shortage conditions through recommended state actions that increase the resiliency of California's water supply for our communities, environment, and economy. Speaking for the Department of Water Resources and on behalf of the other member state agencies, we welcome and look forward to the continued work of the DRIP Collaborative in the coming years.

Executive Summary

Formation of the DRIP Collaborative

This report marks the first year of the Drought Resiliency Interagency and Partners (DRIP) Collaborative, established in response to SB 552, signed by Governor Newsom in 2021. The legislation mandated the Department of Water Resources (DWR) form a standing interagency task force, focusing on proactive planning and coordination for both pre-drought and post-drought scenarios. Comprising of 26 members from state agencies and various water user groups, the DRIP Collaborative is designed to address diverse perspectives and needs in state-level drought resilience strategies.

Task Force Structure and Mandate

The DRIP Collaborative, hosted by DWR in partnership with the State Water Resource Control Board (SWRCB) and other key state agencies, convenes three times annually. These in-person, publicly accessible meetings provide a platform for collaborative decision-making and integration of varied views and needs in drought and water shortage management. Recognizing the reoccurring nature of drought and its ongoing challenges in California, the DRIP Collaborative has no specified end date, underscoring its long-term commitment to statewide water issues.

2023 Activities and Focus Areas

During 2023, DRIP Collaborative members made significant strides in developing problem statements and potential actions for each identified focus area. The three key focus areas for immediate action, identified by members as crucial for enhancing California's drought resilience, included:

- Drought Definition and Narrative
- Drought-Relevant Data
- Drought Preparedness for Domestic Wells.

For each area, members crafted problem statements to articulate current challenges and proposed corresponding actions to address them. These activities create the foundation for the DRIP Collaborative to make collective, informed, impactful recommendations in the year 2024 and into the future.

Recommendations and Future Direction

Looking ahead, the DRIP Collaborative is poised to build on the foundation of its inaugural year, reflecting a continuous commitment to evolving and addressing the dynamic nature of drought challenges. In 2024, initiatives will center around continuing

the momentum of the three focus areas through knowledge development and member discussions to develop recommendations for drought resilience.

In establishing and supporting the DRIP Collaborative, DWR remains dedicated to ensuring that future recommendations and actions are well-researched, feasible, and aligned with the overarching goals of enhancing drought resilience and water shortage preparedness. This proactive approach underscores the DRIP Collaborative's ongoing dedication to collaborative, informed solutions for California's complex water management challenges.

1. Formation of the DRIP Collaborative

From 2020 to 2022, California experienced the driest consecutive three-year period on record. During these years, the State's average temperatures were 73.6°F (3rd highest), 73.1°F (4th highest), and 73.0°F (6th highest), respectively. The lower snowpack and earlier spring warming led to lower spring snowmelt runoff, ultimately decreasing the water supply from state surface water reservoirs. Consequently, there was increased reliance on groundwater, depleting groundwater aquifers and impacting over 1,200 domestic wells that went dry in 2022 – a 50% increase from 2021. Extreme drought conditions created an arid landscape, leading to some of the State's worst wildfire seasons on record.

Conditions changed dramatically in 2023 with precipitation records such as a 237% of historical average snowpack water content and a 128% historical average for the State's reservoirs. However, these improvements were limited to surface water supply. Groundwater aquifers still faced shortages, and physical impacts such as land subsidence continued. Water shortage conditions continue to impact the environment, Endangered Species Act (ESA) species, and well-dependent communities for which the State is still responding to drought and water shortage conditions.

Senate Bill 552 (SB 552), signed by Governor Newsom in 2021 during the 2020-2022 drought, requires additional measures for improving California's drought resilience and water shortage preparedness. It requires the Department of Water Resources (DWR) to establish a standing interagency drought and water shortage task force in partnership with the State Water Resource Control Board (SWRCB) and other key state agencies. The law prescribes that the task force be permanent and responsible for facilitating proactive state-level planning and coordination for both pre-drought and post-drought scenarios, developing strategies to enhance cross-sector collaboration and consider the perspectives and needs of all water user types (California Water Code Section 10609.80(b)(1)).

In 2023, DWR convened the Drought Resilience Interagency and Partners (DRIP) Collaborative, marking the inception of the State's first public and interagency drought and water shortage task force. The DRIP Collaborative comprises of 26 members, including eight from state agencies and two appointees from each representative water user group (listed in full in Appendix A). These groups represent a broad spectrum of water interests: local governments, community-based organizations (CBOs), Tribes, nonprofit technical assistance providers, the general public, representatives for agriculture and the environment, public water systems, small water suppliers, urban water agencies, and experts in land use planning, water resilience, and water infrastructure (California Water Code Section 10609.80(b)(2)). Figure 1 outlines the structure of the DRIP Collaborative.

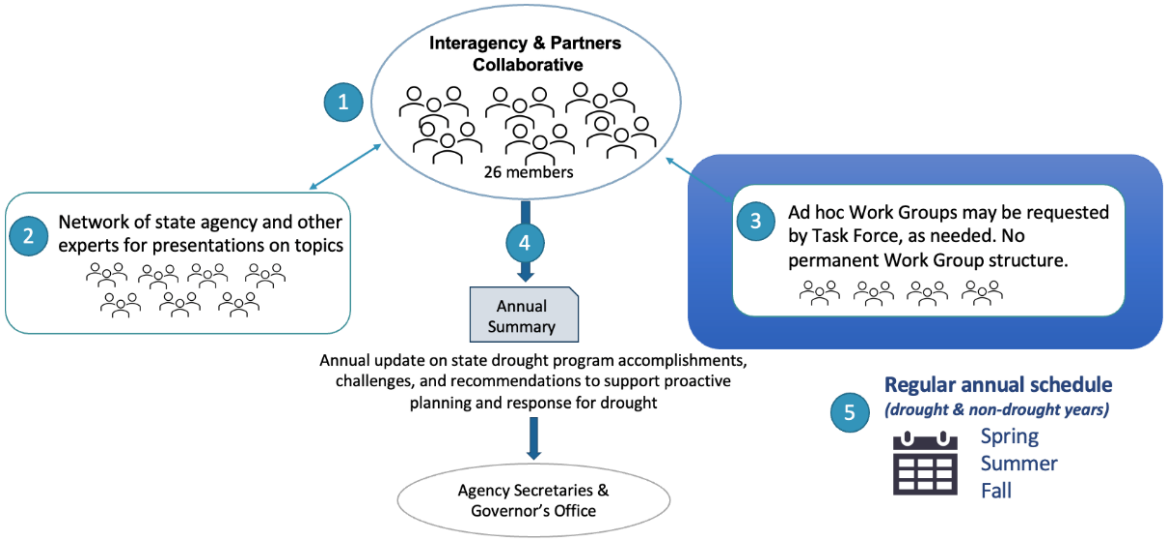

Figure 1. The structure of the DRIP Collaborative: (1) The membership includes eight state agencies and 18 water user group representatives, a total of 26 members; (2) Meetings and knowledge development include presentations from a network of state agencies and subject matter experts; (3) Ad hoc work groups are available by request to support research needs; (4) As needed, submit a report (this document) to agency secretaries and the Governor's Office; (5) The task force meets three times annually regardless of drought status.

2023 Inaugural Report

This inaugural report documents the establishment of the DRIP Collaborative and highlights how its members have shaped the task force's role and focus areas during its first year. While this first report does not offer recommendations, future reports may provide more extensive suggestions, including proposals for funding and legislative changes to improve proactive drought planning and implementation. These recommendations, informed by DRIP Collaborative member (henceforth member) expertise and input from non-members, and the report are intended for decision-makers within the State. Accordingly, the report will be submitted to the Governor's Office; the Secretaries of the California Natural Resources Agency (CNRA), the California Department of Food and Agriculture (CDFA), and the California Environmental Protection Agency (CalEPA); and the Directors of the Offices of Planning and Research (OPR) and California Office of Emergency Services (CalOES).

2. 2023 Focus Areas and Development

2023 was the foundational year for the DRIP Collaborative, centered on building a robust partnership among its members. Meeting in April, July, and October, the DRIP Collaborative dedicated its inaugural year to collectively defining its focus areas for 2024 and beyond, embodying the collaborative aspect of the group's formation. These focus areas, identified by members as critical for enhancing California's drought resilience, encompass ideas, opportunities, and aspirations. They are integral to the

DRIP Collaborative's roadmap, guiding the development and implementation of future actions and shaping recommendations the DRIP Collaborative will make each year.

Developing and sharing knowledge is the cornerstone of effective discussions on drought resilience and collaborative efforts. In-person meetings feature presentations on hydrologic conditions (outlined in Appendix B) and insights from member and non-member experts. These sessions aimed to cultivate an inclusive perspective of drought and water shortage conditions and establish a shared understanding of California's drought challenges and initiatives. The sessions also helped identify high-impact focus areas for the DRIP Collaborative's work in enhancing drought resilience. Detailed themes and outcomes of these meetings are available in Appendix C, with meeting summaries accessible on the DRIP Collaborative website.

Focus Area Development and Problem Statements

The collective defining of key focus areas began with an initial list of over 130 potential focus areas identified in the first two DRIP meetings, further refined in virtual meetings, and consolidated into a reference list. Through breakout sessions during Meeting 2 and subsequent optional virtual meetings, members pinpointed three key focus areas for the highest impact in 2024: Drought Definition and Narrative, Drought-Relevant Data, and Drought Preparedness for Domestic Wells. The selection and development of these areas were steered by member interest and input, as described in Appendix D.

Problem Statements

After identifying the three key focus areas, members engaged in a series of virtual meetings to explore potential subtopics. These informative only meetings, enriched by input from subject matter experts, aimed to create specific, actionable problem statements for each focus area. Essential to the DRIP Collaborative's strategic planning, problem statements define the specific issue or challenge to be addressed, guide research, and inform solution development. They also ensure a common understanding of each focus area, facilitating communication, collaboration, and effective resource allocation. Working problem statements were presented during in-person Meeting 3 and members provided written and discussion-based feedback. This member feedback was incorporated into expanded draft problem statements, described below, which will be presented at the DRIP Collaborative's first 2024 meeting scheduled for April.

Drought Definition and Narrative Problem Statement

Although drought is a natural feature of its climate, California lacks a cohesive, strategic drought resilience plan. The lack of a unified understanding of water shortage impacts across sectors hinders the State's ability to respond to and prepare for drought effectively. A multitude of drought definitions and the way drought impacts vary by

sector and geography leads to fragmented responses and impedes the development of true drought resilience. A comprehensive, shared understanding of drought and water shortage conditions—including physical indicators and environmental, economic, and social impacts at the regional and local level—is essential for enabling cohesive, strategic management of water shortages.

This shared understanding relies on a clear definition of the legal and institutional aspects and knowledge of the narratives and interpretations of these definitions across sectors. The DRIP Collaborative's goal is not to redefine drought but to articulate the State's vulnerabilities and opportunities for resilience in the face of water shortages, thereby clarifying the rationale for specific state responses and fostering a common purpose among various sectors. Reframing drought as a water shortage issue based on conditions can shift the narrative to prompt the most effective action, focusing on strategic needs for drought resilience. This collective understanding is crucial in improving coordination and decision-making, leading to effective actions that bolster drought resilience. With aligned perspectives, California can adopt a more unified and informed approach to managing its water resources during prolonged dry periods.

Drought-Relevant Data 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, effective, 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.

These challenges are interconnected and form four key subtopics, each building upon the other, to address issues related to drought-relevant data:

- **Drought indicators and metrics:** There is a need to define indicators for risk and outcome metrics to prioritize drought management actions and to identify which actions are most critical, assess their effectiveness, and understand impacts at a regional and sector-specific level.
- **Coordination and data sharing:** It is essential to improve coordination and data sharing and provide the opportunity to align with existing metrics tracked by various agencies and organizations (local, state, federal, and Tribes) and address disjointed efforts and data silos.
- **Data gaps and data quality:** Prioritizing specific data gaps and quality issues will allow us to efficiently enhance the reliability and completeness of data for informed decision making at an integrated watershed level.
- **Incorporating data analytics and forecasting techniques:** Adding predictive elements to drought indicators is required to enable a more purposeful shift from

reactive to proactive drought management, allowing more pre-emptive actions to mitigate the impacts of drought in a changing climate.

Drought Preparedness for Domestic Wells Problem Statement

As California faces a hotter, drier future marked by intensified water shortages, the resilience of domestic wells and state small water systems is of paramount importance. These systems, heavily reliant on groundwater, face declines in water levels due to both human activity and climate trends, leading to significant reductions in water quality and availability.

The SB 552 framework mandates proactive planning and specific actions to safeguard these critical water sources throughout the state. The stakes are high: More than 1.3 million Californians depend on domestic wells for their water needs. Thousands of wells are at risk during prolonged dry periods, threatening the water supply for potentially hundreds of thousands of people with profound social, economic, and health consequences–especially for Disadvantaged Communities (DACs) that are often the first to face water shortages. Fragile water supply systems can lead to a cascade of public health crises and economic instability, exacerbating inequities.

Three critical subtopics capture the challenges faced in enhancing drought preparedness for domestic wells and state small water systems:

- **Responsibility and Accountability:** The preparedness and resilience of domestic wells and small systems depend on clearly defined responsibilities and authority across jurisdictions that includes local groundwater sustainability agencies, private property owners, county governments, and the State.
- **Funding and Financing:** The current mechanisms for funding and technical assistance are insufficient, with long lead times for emergency funding and disparities in the capacity of counties to address the needs of domestic wells. Equity issues infuse drought vulnerability, with differences between high-income and low-income residents and between tenants and landowners.
- **Coordination and Information Flow:** There is an urgent need for enhanced coordination and information sharing among federal, state, local, Tribal, non-state, and community organization players. This coordination and flow are crucial for enhancing education around resilience of existing wells and for preventing the drilling of new, unsustainable wells.

The inaugural year of the DRIP Collaborative built a strong foundation to support future recommendations and collective actions. Through a series of focused meetings and collaborative discussions, members successfully identified and refined key focus areas and corresponding problem statements that will guide efforts in enhancing California's drought resilience, reflecting a deep and shared understanding of challenges and

opportunities in the face of water shortages. As the DRIP Collaborative moves into 2024, these focus areas and problem statements will serve as a blueprint for member-driven, targeted actions and initiatives.

3. 2024 Focus Areas

Focus Area Actions

As 2023 concludes, the DRIP Collaborative transitions from foundational strategic planning to action. For 2024, members identified the desire to develop actionable recommendations for each of the three focus areas, reflecting a collective commitment to progressing in a thoughtful and strategic manner. To achieve this, knowledge development and discussions in 2024 will seek to address specific aspects of each problem statement, including:

- Clarifying drought definitions and narratives, outlining their impacts, and linking them to different resilience resources and actions.
- Identifying gaps in the roles and responsibilities of the State, counties, domestic well owners, and others (housing professionals, groundwater sustainability agencies) and the funding availability and needs related to drought preparedness for domestic wells.
- Identifying and prioritizing drought metrics and indicators for evaluating drought vulnerability and risk to communities, the environment, and the economy.

Future Focus Areas

In addition to the actions previously outlined, members identified several broadly scoped and diverse focus areas to refine. These areas, which encompass aspects like climate change adaptation, nature-based solutions, ecosystem impact reduction, and various facets of water and land use management, require further input from members to develop clear problem statements. Given the varying development timelines of these areas, they are tentatively set for exploration in 2024, with an understanding that each may progress at different rates.

Activities

Acknowledging the importance of developing and sharing knowledge of all focus areas and building a shared understanding of California's drought and water shortage initiatives and challenges, 2024 will feature a series of informational sessions. These sessions, led by subject matter experts on key drought topics, will inform the focus areas developed in 2023 and potentially guide future focus areas.

These actions and future focus areas are vital to developing informed and impactful progress toward drought resilience. As a standing task force, the DRIP Collaborative will

meet in April, July, and October of 2024 with optional virtual meetings interspersed. DWR, who is responsible for convening the task force, will host the meetings and provide support staff. This commitment ensures that future discussions build on the established foundation and will lead to well-researched, feasible recommendations that align with the primary objectives of enhancing drought resilience and water shortage preparedness.

4. Recommendations

Looking ahead, the DRIP Collaborative is poised to act and expand its efforts for proactive planning and coordination for drought resilience. Future reports may propose recommendations on improved coordination and communication, proposed legislation, budgetary actions, or other recommended initiatives for State decision-makers. Due to the foundational nature of the meetings held in 2023, the DRIP Collaborative intentionally has not developed recommendations to date. Instead, the emphasis of 2023 was on building a shared understanding and laying a strong foundation for future action rather than rushing immediate recommendations.

Going forward, the DRIP Collaborative will adopt a structured approach to recommendations, responding to members' desire to make firm, actionable suggestions to applicable state agencies and decision-makers. A recommendation process will be presented for adoption at the first meeting of DRIP members in 2024.

Appendix A: DRIP Membership 2023

The DRIP Collaborative membership consists of 26 individuals, comprised of eight state agencies and 18 non-state agency representatives. Following a letter of invitation from DWR Director, Karla Nemeth, the relevant state agencies appointed a delegate to serve as the agency representative. Members may designate an alternate to attend meetings on their behalf. The selected members and their alternates are listed in Table A1.

Table A1. State Agency Members of the DRIP Collaborative, 2023

Agency	Member	Alternate(s)
California Department of Fish and Wildlife	Joshua Grover	
California Department of Food and Agriculture	Virginia Jameson	Tawny Mata, Margaret Phipps
California Department of Water Resources	Karla Nemeth	Kris Tjernell
California Environmental Protection Agency	Anna Naimark	Katy Landau
California Natural Resources Agency	Nancy Vogel	
California Office of Emergency Services	Christina Curry	Lori Nezhura, Nate Ortiz
Governor's Office of Planning and Research	Saharnaz Mirzazad	Elea Becker Lowe Ben McMahan, , Sam Assefa
State Water Resources Control Board	Joaquin Esquivel	Andrew Altevogt, Eileen Sobeck

For non-agency representatives, DWR opened a public call, with press releases in English and Spanish, for interested parties to submit a letter of interest, open for five weeks between January 19, 2023 and February 17, 2023. DWR received 78 eligible letters of interest to fill 18 non-state agency member positions on the Collaborative. From the interest letters received, DWR selected two members per representative group (Table A2). The selection of members was informed by the need to represent the diverse geography of California and its broad spectrum of water interests: local governments, community-based organizations (CBOs), Tribes, nonprofit technical assistance providers, the general public, representatives for agriculture and the environment, public water systems, small water suppliers or urban water agencies, and experts in land use planning, water resilience, and water infrastructure as defined by California Water Code Section 10609.80(b)(2).

Membership terms last two years for non-state agency members, and state agency members are annually reappointed by that agency's director.

Table A2. Non-State Agency Members of the DRIP Collaborative and their Representative Group, Organization and Region within California.

Rep	Organization	Region	Member	Alternate(s)
Ag	Agricultural Council of California	Statewide	Emily Rooney	
Ag	Jay Colombini Ranch, Inc.	SJV, Sierras	Jason Colombini	
CBO	California Association of Mutual Water Companies	Southern	David Michalko, Tim Worley	
CBO	Community Water Center	SJV, Central Coast	Justine Massey	
Envi	California Trout, Inc.	Statewide	Redgie Collins	
Envi	Environmental Defense Fund	Statewide	Anna Schiller	Robyn Grimm
Expert	California Water Institute at Fresno State	SJV	Laura Ramos	
Expert	University of California Los Angeles	Statewide	Alvar Escriva-Bou	
Local Gov	Santa Cruz County	Central Coast	Sierra Ryan	
Local Gov	California State Association of Counties	Statewide	Catherine Freeman	Brian Cote
Public	Domestic Well Planning Group South American Subbasin	Central Valley	Suzanne Pecci	
Public	Plumas Lake Self Storage, Owner	Northern	Brent Hastey	
PWS	California Urban Water Agencies	Statewide	Katie Ruby	Wendy Broley, Amy Martin
PWS	Los Angeles County Public Works	Southern	Russ Bryden	
TA	CivicWell	Statewide	Grace Person	
TA	Self Help Enterprises	SJV	Tami McVay	Emily McCague
Tribal	Buena Vista Rancheria of Me-Wuk Indians	North Central	Emily Moloney	
Tribal	Yurok Tribe	Northern	Michael Gerace	

Abbreviations: Rep = Representative water user group, Ag = Agriculture, CBO = community-based organizations, TA = nonprofit technical assistance providers, Public = general public, Envi = environment, PWS = public water systems, small water suppliers or urban water agencies, State = state agency, Expert = expert in land use planning, water resilience, or water infrastructure, SJV = San Joaquin Valley

Appendix B: Hydrology Update

Present and Future Drought Considerations

DRIP Collaborative meetings include a status briefing on the current hydrology and other conditions by Jeanine Jones, the DWR Interstate Resources Manager. These status reports included a discussion about how our ability to forecast swings in weather is limited, especially for upcoming seasons, which is critical for water management. The DWR Report, Water Year 2023: Weather Whiplash, From Drought to Deluge, provides an overview of Water Year (WY) 2023 (October 1, 2022 to September 30, 2023) and covers much of what was presented in the DRIP Collaborative meetings. Highlights are summarized below, and the report is accessible online.

California's WY 2023 was characterized by extreme weather conditions, aptly described as "weather whiplash." During this year, California experienced simultaneous drought and flood emergency proclamations, a rare occurrence reflecting the State's changing weather and climate patterns as well as the diverse variety of impacts across the State. Coming out of the driest three-year period in the historical record, WY 2023 was one of the wettest with the highest snowpack on record.

Key Highlights

Precipitation and Snowpack: WY 2023 concluded with 141% of statewide historical average precipitation and a remarkable 237% of the April 1 historical average (Fig. B1). While precise comparisons are not possible given advances in snowpack measurement technology, the snowpack was among the largest on record, comparable to those in 1952, 1969, and 1983.

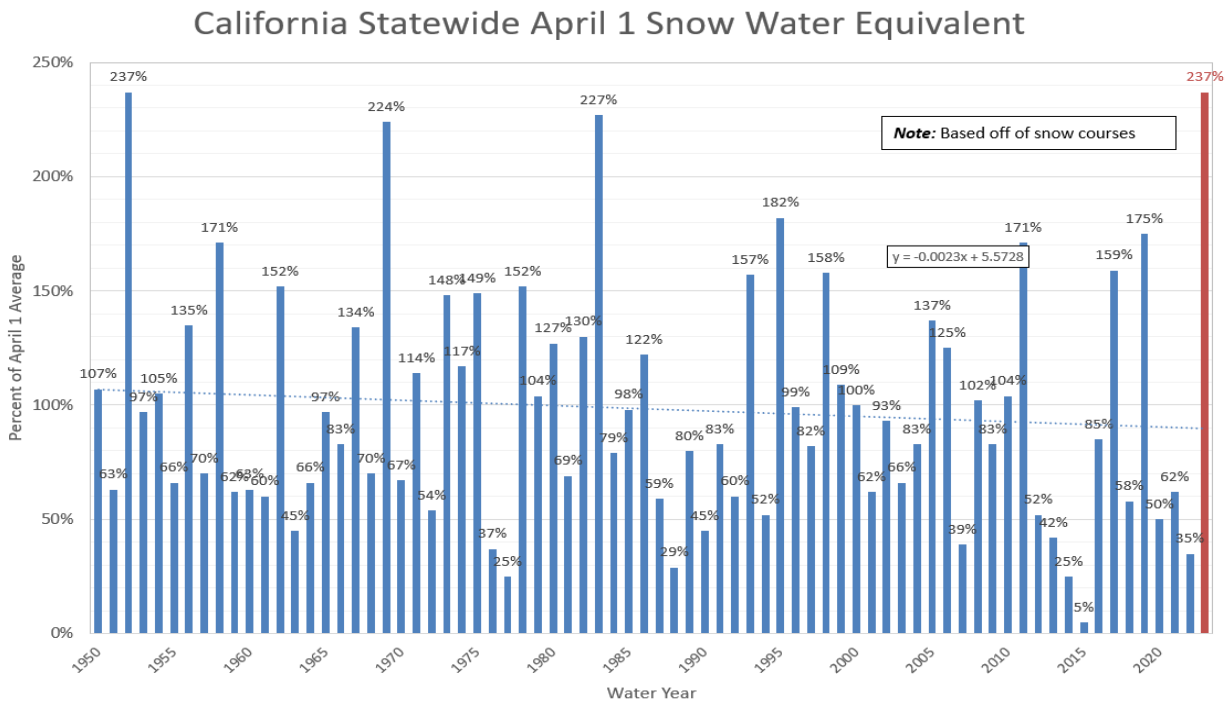

Figure B1. Historic snow water equivalents from 1950 to 2023 as a percentage of the April 1 California statewide average shows WY 2023 as a record year with 237% of the average. For California's snow course measurements, only 1952, 1969 and 1983 recorded statewide results above 200% of the April 1 average. While the above measurements were above average across the state in WY 2023, snowpack varied considerably by region. The Southern Sierra snowpack was at 300% of its April 1 average and the Central Sierra at 237% of its April 1 average. However, the critical Northern Sierra, where the state's largest surface water reservoirs are located, was at 192% of its April 1 average.

Reservoir and Groundwater Storage*:* Average statewide reservoir storage was extremely low at the beginning of WY 2023 and well above average at the end of WY 2023, providing good carry-over storage into WY 2024. Groundwater storage levels may require longer time periods to recharge from wet weather but comparing spring 2023 to 2022 showed no significant change in water levels; the trend is declining groundwater levels and many basins are below normal. However, the summer months saw great groundwater recharge efforts. Many wells in unconfined aquifers/shallow wells showed positive levels; however, wells in aquifers with significant aquitards have not recovered and still show low levels.

Water Supply Conditions: The result of the extremely wet year was 100% allocation for municipal and agricultural uses from the State and Central Valley Water Projects for the first time since 2006. However, conditions in Lake Mead resulted in significant cutbacks from Colorado River deliveries as part of an ongoing federal effort. Small water systems and private wells did not experience significant issues in WY 2023, though small localized systems faced intermittent shortages. However, these shortages

are often due to factors like well casing failures or localized contamination and not directly linked to hydrologic conditions.

Temperature Trends: The strong atmospheric rivers in the winter led to a high snowpack. The year was also colder than average, allowing for slower snowmelt and, therefore, avoiding what would have been greater catastrophic flooding under warmer conditions.

Outlook: This year's carry-over storage will improve water supply reliability even if WY 2024 is dry with surface water supplies, potentially leading to less need for water users to access groundwater. While calendar year 2023 fluctuated to the El Niño - Southern Oscillation (ENSO), studies show little correlation between national ENSO forecasts and water supply outcomes in California.

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Appendix C: DRIP Meeting Themes and Discussions

The following section provides a high-level summary of three in-person meetings conducted in 2023. These meetings were pivotal in shaping strategies and initiatives and were thoroughly documented for reference. Recordings of each meeting are available online under Public Meetings on the DRIP Collaborative website, along with meeting agendas, detailed notes, and presentation slides, ensuring full access to the wealth of information and insights shared during these gatherings.

Establishing the Foundation: Meeting 1, April 6

The inaugural meeting of the DRIP Collaborative included an introduction exercise, where members presented their names, affiliations, and their top two visions for the group's collaboration and accomplishments. This session laid the groundwork for a Collaborative Visioning Exercise. Members contributed their ideas on chart papers around the room, each headlined with main themes derived from the introductions. This exercise fostered a dynamic environment where members could 'upvote' their preferred ideas using stickers, prioritizing the DRIP Collaboration's goals. A discussion ensued, providing a recap of the ideas and engaging members in a deeper dialogue to refine the DRIP Collaborative themes and priorities.

Member Presentations

In Meeting 1, five members, each representing critical sectors in drought management, were asked to present their insights and expertise. The representatives included Tami McVay from Self-Help Enterprises, Redgie Collins from California Trout, Emily Rooney of the Agricultural Council of California, Katie Ruby from California Urban Water Agencies (CUWA), and Emily Moloney of the Buena Vista Rancheria of Me-Wuk Indians. They each responded to a predetermined set of questions, offering perspectives from technical assistance providers, the environment, public water systems, and agricultural and Tribal viewpoints, respectively. This session set the stage for a greater understanding of the diverse challenges and potential solutions in drought management, laying a foundational framework for the subsequent meetings.

Building a Strategic Framework: Meeting 2, July 20

The second meeting focused on developing a robust framework for the task force’s impact, structured over a three-year timeline (Fig. C1).

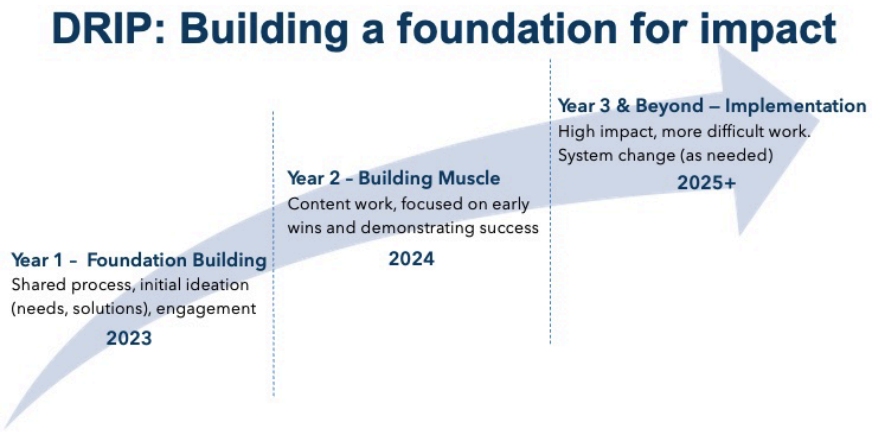

Figure C1. A framework for building a foundation for impact from year 1 was presented during Meeting 2, highlighting the importance of building a shared process and ensuring member engagement from the start.

A significant portion of the meeting was devoted to discussing the drought risk management cycle (Fig. C2). This cycle encompasses a standard disaster crisis cycle, segmented into four key quadrants: Mitigation, preparation, and capacity building; Forecasting and monitoring; [Emergency] response; and Recovery [from disaster]. Each category encompasses a broad range of activities, such as enhancing storage capacity and refining scientific understanding during the mitigation phase.

Activities, types of expertise needed, and funding differ widely across each quadrant. Grouping efforts within these elements highlight where the gaps exist in managing dry periods. Despite drought having a slower onset and longer duration than other episodic natural hazards like floods, hurricanes, heat events, wildfires, and earthquakes, orienting drought into a disaster risk management framework can help understand who is responsible for what, how resources are allocated, and identify gaps and future needs to reduce harmful impacts.

Member & Guest Presentations

Representatives from member state agencies provided an in-depth look into their respective activities as part of the drought risk management framework. One of the notable complexities in managing drought is the difficulty in distinctly categorizing actions within this cycle, as mitigation, response, and recovery efforts often occur concurrently. Presenters from DWR, SWRCB, California Department of Fish and Wildlife (CDFW), CDFA, CalOES, OPR, and CNRA utilized a standard template slide, based on Fig. C2, to illustrate their activities within each quadrant, offering the start of a comprehensive view of the State's multifaceted approach to drought risk management.

Figure C2. A framework for the drought risk management cycle used for discussion of state agency activities at Meeting 2, July 20, 2023. The framework is adapted from Ekstrom et al. (2020) and informed by Baird (1975); Carter (2008); Coetzee and Niekerk (2012); and Van Dongeren et al. (2018).

Meeting 2 also featured a presentation from Laura Jensen of the California Water Commission, who presented an overview of the Commission's ongoing directive from the Water Resilience Portfolio to develop strategies to protect communities and fish and wildlife in the event of drought lasting at least six years. Jensen shared preliminary strategies, offering insights as potential focal points for DRIP to consider in future endeavors. This presentation highlighted the extensive efforts undertaken by the Commission and opened avenues for DRIP to align its efforts with these well-researched strategies.

The outcomes of this meeting included reaffirming the DRIP Collaborative's role as outlined in the legislation, developing an integrated view of existing State and local efforts for drought resilience, and reaffirming the intention to build a multi-year roadmap based on members' interests.

Informational Knowledge Development Series

Notably, during Meeting 2, there was a call for sessions dedicated to furthering member knowledge development on key drought topics. This request and key topics for a “101 series” were refined in subsequent virtual gatherings and Meeting 3. Based on members’ interests, a suitable virtual format for engaging on these topics will be developed in 2024.

The following potential topics were discussed for potential future informational discussions:

- In-stream flows
- Flood-MAR

- Domestic well data
- Groundwater banking
- Recycled water
- California Water Watch
- Water law
- Water systems
- Nature based solutions
- Climate change and water impacts

Defining Focus Areas and Sequencing: Meeting 3, October 25

The third meeting concentrated on articulating problem statements for prioritized focus areas and sequencing the remaining ones. The discussion was structured around defining specific focus areas, followed by formulating problem statements to guide future actions.

Member and Guest Presentations

During Meeting 3, information sharing and knowledge development focused on addressing the requests for information made by members in Meeting 2.

SB 552 County Task Force Status Update

Julie Ekstrom from DWR provided an update on SB 552 County Task Forces, noting that DWR has published a guidebook for county task forces and the development of county drought resilience plans. As of October 25, 2023, 27 (47%) of California counties had convened drought task forces. Two counties (Santa Cruz and Tulare Counties) had adopted county drought resilience plans. A total of 19 counties had applied for technical assistance to develop plans, and three had applied for non-competitive planning grants as part of the DWR County Drought Resilience Planning Assistance Program.

California Domestic Well Data Overview

Ben Brezing, also from DWR, provided an update on California domestic well data, describing a “patchwork” system of monitoring systems and inventories maintained at various levels (county, DWR, SWRCB) that provides an incomplete account of domestic well usage and water supply conditions in many areas. He noted that domestic wells are highly vulnerable to drought, and a consistently maintained, publicly accessible inventory would help the state and local governments understand vulnerabilities and plan solutions. The discussion following his presentation highlighted the difficulty of

monitoring domestic well conditions due to the lack of legislative directives or funding for maintaining a statewide well inventory.

The outcomes of this meeting were three-fold. The group workshopped the working problem statements for the three prioritized DRIP Collaborative focus areas, building on past discussions and providing input for the final version of each statement. For each focus area, members also identified potential actions for 2024, focusing on roles, responsibilities, timelines, and resources. Additionally, an interactive exercise helped to define potential sequencing for the remaining focus areas. Lastly, the meeting concluded with an alignment on developing the 2023 DRIP Collaborative Inaugural Report, marking a significant step towards documenting and sharing the collaborative's progress and insights.

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Appendix D: Developing Focus Areas

Focus areas are defined as ideas, opportunities, and aspirations identified by DRIP members as crucial for enhancing California's drought resilience. Focus areas are integral to developing DRIP's roadmap as they guide the development and implementation of future actions and shape DRIP's recommendations each year. A roadmap is defined as an action plan that outlines DRIP's collective efforts to achieve its stated purpose. It includes specific timeframes and milestones and clarifies DRIP's role in directly enhancing drought resilience outcomes.

The focus areas were formed from insights shared during Meetings 1 and 2 and refined through optional, small-group virtual meetings in August and during Meeting 3.

Reference List

The initial list of focus areas, derived from visioning exercises and introductions during the first meeting, marked the beginning of a comprehensive compilation of focus areas. A systematic inquiry process was then initiated to compile a comprehensive list of over 130 suggested focus areas, culminating in the creation of the Reference List. The process included analyzing content from the first and second meetings, reviewing California's drought resiliency reports, including the California Water Resilience Portfolio, Governor's Executive Order N-10-19, Report to the Legislature on the 2012-2016 Drought as Required by Chapter 340 of 2016, and preliminary drought strategies listed by California Water Commission, and incorporating feedback from a DRIP member survey. The goal was to identify common themes and ideas from these diverse sources and categorize them into broader themes. This approach was instrumental in facilitating discussions during Meeting 2 and ensuring that the focus areas were aligned with DRIP's objectives and member interests.

Meeting 2 Breakout Sessions

During the second meeting, breakout sessions were organized around five broad themes to discuss focus areas and better understand member interests and collaborative opportunities. These sessions focused on identifying the level of DRIP engagement for various focus areas, categorized as Inform, Complement, or Lead (Fig. D1).

Figure D1. Three Levels of Engagement for the DRIP Collaborative: Inform – Informing about existing efforts; Complement – Complementing with coordination and collaboration; Lead – Leading by assuming a leadership role in focus areas.

The sessions were structured to encourage members to reflect on their potential roles and suggest further actions, problem statements, and the necessary structure and support for action in 2024. Members were also tasked with identifying how topics are currently addressed in the State to avoid duplication and build on existing efforts. The insights from these sessions were then digitized and analyzed to refine the focus areas for further discussion.

Virtual Meetings

To maintain momentum and align interests after in-person Meetings 1 and 2, and in response to member interest in ongoing engagement, a series of virtual meetings (VMs) were scheduled prior to Meeting 3. These meetings aimed to further gauge DRIP members' interest in the focus areas, ensure alignment to establish the initial focus areas, assess engagement levels, and identify opportunities for inclusion in the DRIP roadmap.

Outcomes from First Virtual Meetings (VM1)

The primary objective of VM1 was to continue to reach a consensus on a select list of focus areas for further refinement. The meeting identified key areas for subsequent discussions, drawing from the presented information and member discussions. The focus areas noted for deeper exploration included Drought Definition and Narrative, Drought-Relevant Data, and Drought Preparedness for Domestic Wells. Beyond aligning on these three areas, VM1 underscored the necessity for a shared language and the development of baseline knowledge among DRIP members, including Tribal ecological knowledge.

Outcomes from the Second Virtual Meetings (VM2)

VM2 aimed to accomplish a specific objective for each previously identified focus area. One VM was held for each of the three focus areas. The primary goal was to develop a

detailed problem statement for each area with corresponding goals and objectives. The feedback and discussions from VM2 were consolidated and presented at Meeting 3.

Meeting 3 Workshops

During Meeting 3, participants engaged as a group in three workshops on the prioritized focus area problem statements. This effort was built upon previous discussions and aimed at identifying actions that the DRIP Collaborative could undertake in 2024 to address these problem statements directly. The focus was defining roles and responsibilities, establishing a timeline, and identifying potential resources.

To facilitate this process, members were provided with a recap of VM2 and framing documents for each problem statement, available on the DRIP Collaborative website. Additionally, worksheets were distributed for personal notes or to share insights with the DRIP team at a later stage. This approach ensured that all members were adequately prepared and could contribute effectively to the discussions and refinement processes.

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