

In California, the next drought is always looming on the horizon. While we don't get advance warning of when a drought will occur, how long it will last, or how severe it will be, we do have advance knowledge that drought planning and preparation are important. First, we know water management during droughts can have profound and lasting consequences for state and local water supply and, ultimately, for people and ecosystems. Second, we know past droughts have challenged those who manage and use water, revealing vulnerabilities in how we cope with drought. Finally, the more frequent and intense droughts we expect in the future are likely to amplify water conflicts and challenges. As a result, effective water rights administration and oversight will become increasingly vital in coming years.

In my [last post](#), I highlighted some of the key takeaways from research my colleagues and I did to understand how the State Water Resources Control Board (Board) carried out its water rights responsibilities during past droughts. Our analysis suggests that, because the Board often needed to improvise its drought response strategies in the midst of drought crises, these responses were sometimes less effective—and less well received—than they could have been. This post provides an overview of [our recommendations](#) for actions the Board can take before, during, and after droughts to make water rights administration and oversight more timely, fair, and effective (see *Figure 1*).

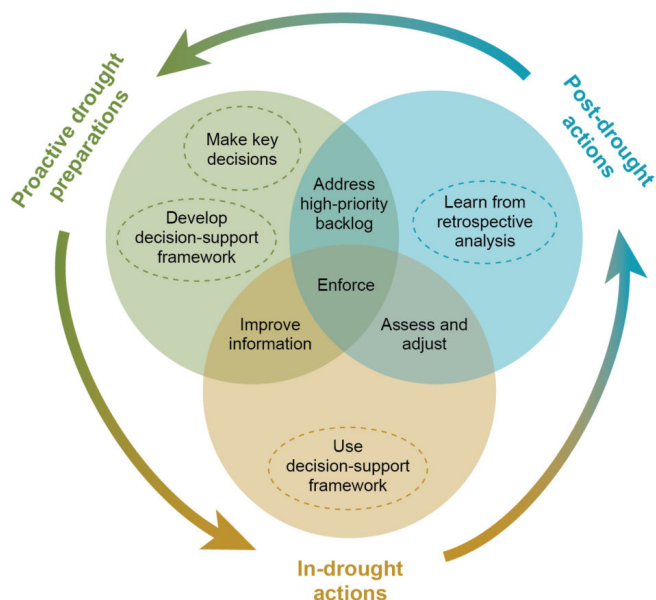


Figure 1. Actions the Board can take before, during, and after droughts to improve its future drought response

California's water supplies should be allocated among different human and environmental uses transparently, efficiently, and predictably, in accordance with the priorities that flow from state and federal law. Some in-drought innovation and improvisation will always be necessary, even desirable. However, the Board can, and should, do its best to prepare for future droughts by proactively identifying clear priorities and goals, developing strategies to protect and achieve them, and improving the information and tools that guide decision making during drought emergencies.

With some help from the governor and state legislature, the Board has already begun taking steps to improve its drought response capabilities. For example, it [tried out an array of new strategies during the recent drought](#) and has been able to [increase the quality and quantity of information](#) it will receive about water diversions during future droughts and dry periods. But it needs to do more.

Here are five actions the Board can take to build on past gains and its institutional knowledge from past drought experiences:

1. Develop a contingency-based framework to support more timely and effective drought decision making.

Our core recommendation is for the Board to proactively think through what actions would be appropriate under different drought and dry-year scenarios. In essence, it can create a toolbox of well-thought-out drought response strategies, organized within a framework that helps guide consideration of whether, when, and how to implement each one. *I'll explain this recommendation in more detail in my next post.*

In addition, we recommend the following complementary efforts, which feed into the contingency-based framework and help improve it over time:

2. Make key policy decisions in advance of droughts.

A decision-support framework will be most useful if it is designed with clear goals and priorities in mind, and with an understanding of how specific courses of action would serve—or thwart—those goals and priorities under different conditions. But in some cases, the state has not yet established clear objectives, or it has established multiple important, and potentially conflicting, objectives that need to be reconciled with one another—for example, water right priorities, legal protections for species and ecosystems, and human health and safety protections. Whenever possible, these key policy judgments should be made in advance of droughts, when there is time for meaningful stakeholder engagement and for considering the implications of different options. *I'll discuss this recommendation more fully in a future post.*

3. Improve the information that informs drought decisions.

Information provides critical context for [water decision making](#). For the Board, this includes data regarding water supply, water diversion and use, water rights, and ecological considerations. To ensure that water users exercise their rights appropriately in times of shortage, the Board needs to understand how much water is available for diversion from a particular waterway under a particular water right. As I mentioned in my [last post](#), the mere fact that water is present at a water user's point of diversion isn't enough. Instead, determining legal water availability involves comparing water supply and demand in the context of water rights and other legal priorities. The Board has faced ongoing challenges obtaining adequate information about all four. Fortunately, some types of data have seen significant improvements in recent years. In particular, the Board has [acquired](#) or [developed](#) new tools for getting more timely, accurate, and complete information about surface water diversions. By contrast, in most areas, information about watershed supply and diverters' net water use (for example, from [networks of stream gages](#)) remains too [imprecise and inaccurate](#) to support real-time water management.

4. Maximize learning from droughts.

Droughts are important learning opportunities. Regardless of how well the Board tries to prepare, each drought will stress test its preparations, inevitably revealing areas that need improvement. The Board can establish mechanisms for evaluating what worked well and what did not, and for using these lessons to inform adjustments and guide further drought preparations. For example, if it adopts a contingency-based framework to support drought decision making, the Board will want to assess the framework's general utility as a decision-support tool, as well as the effectiveness of particular drought-response actions taken under it. Evaluation mechanisms should seek out and take into account feedback from stakeholders, who can provide both insights about how they experienced the Board's drought response actions and creative ideas for improvements.

5. Prioritize water rights enforcement between droughts.

Although droughts bring attention to and increase incentives to address water right compliance problems, enforcement between droughts is also critical. First, it builds the Board's experience and expertise. It also helps water users understand their rights and responsibilities, clarifies the repercussions of violations, and promotes trust in the Board's methods and motives. Addressing illegal diversions protects people who follow the law from injury, and contributes to ecosystem recovery during [critical rebuilding periods following droughts](#). Finally, following through with drought-related enforcement actions after drought conditions end gives courts the chance to weigh in on unresolved legal issues, such as the Board's authority to take certain drought response actions. It's a positive sign that

the Board is currently considering developing an explicit [water rights enforcement policy](#), which would further many of these goals.

In future posts, I'll discuss some of these recommendations in more detail. I'll also explain why acting on them would improve not just the Board's future drought responses, but also water rights administration and oversight—and the drought and climate resilience of California water management—more broadly.

This post is part of a series that draws on a [pair of recent reports](#) published as part of [California's Fourth Climate Change Assessment](#). In the first report, my colleagues and I analyze how the State Water Resources Control Board—a key water decision maker whose actions affect how scarce water resources are allocated among different human and environmental uses during droughts—has carried out its water rights responsibilities during past droughts. In the second report, we offer recommendations for improving the agency's future drought response capabilities. You can find both reports [here](#).