

In the [first post](#) in this series, I talked about why it's important for the state of California to spend time preparing for future droughts even in wet years like this one. This post examines some of the lessons from past droughts that can inform these preparations.

Past droughts have stress-tested California's water management institutions, and some of the vulnerabilities they revealed still linger today. Given that climate change is expected to increase the frequency and intensity of future droughts, recognizing and addressing institutional vulnerabilities is critical. With this goal in mind, my colleagues and I studied how the [State Water Resources Control Board](#) (Board) carried out its water rights responsibilities during past droughts. [This work](#) was recently published as part of [California's Fourth Climate Change Assessment](#). We focused on the Board because its actions—or inaction—during times of drought can have significant repercussions for nearly every person, entity, and ecosystem around the state, whether they realize it or not.

The Board plays a multifaceted role in California water management, one that touches on water rights, water quality, and drinking water. It is responsible for administration and oversight of [critical aspects](#) of California's water rights system. While there are questions about how far the Board's water rights authorities extend, some things are clear. For example, since late 1914, anyone who wanted to begin diverting water from a stream or lake to use on non-adjacent property, or to store for later use, has needed the Board's permission to legally do so. But the Board also has some degree of authority and responsibility for [ensuring that all types of water rights are exercised appropriately](#) in the broader context of water rights law, water quality law, and other state and federal environmental laws. Additionally, the Board [regulates activities that might affect water quality](#) in surface water bodies and groundwater. One of the key ways it implements water quality requirements (including requirements related to flow) is through water rights administration and oversight. For example, the Board can include appropriate [terms and conditions](#) in individual water right permits, licenses, and other approvals, or it can adopt broadly applicable [regulations regarding water diversion and use](#).

Although they are always important, water rights administration and oversight are especially vital during droughts. In times of shortage, water right priority rules are supposed to determine who may divert water in a particular watershed, and how much they may take. In theory, these rules should help to prevent or resolve conflicts and allow water users to make informed decisions about the future (such as whether to pursue additional water supplies or plant permanent crops) based on the likelihood that water will be available under their priority of right. However, following these rules and other legal requirements is not always straightforward in practice. It's not simply a matter of asking "*Is there water in the stream at my point of diversion?*" Instead, answering the question of

whether water is legally available to a particular diverter at a particular time may require a complex analysis of water supply, water demand, water right priority, and other legal requirements. For example, there could be water users with more senior rights downstream of the location, the flow in the stream might include releases of previously stored water that the diverter has no right to take, some of the streamflow may be needed to meet instream requirements, or all of the above may be true. Effective administration and oversight can help water users understand when water is, or is not, available to them and ensure that water is diverted and used in accordance with state and federal law. Without it, law-abiding water users and water-dependent ecosystems can suffer.

Here are four key takeaways suggested by our historical analysis of water rights administration and oversight during the last four major statewide droughts:

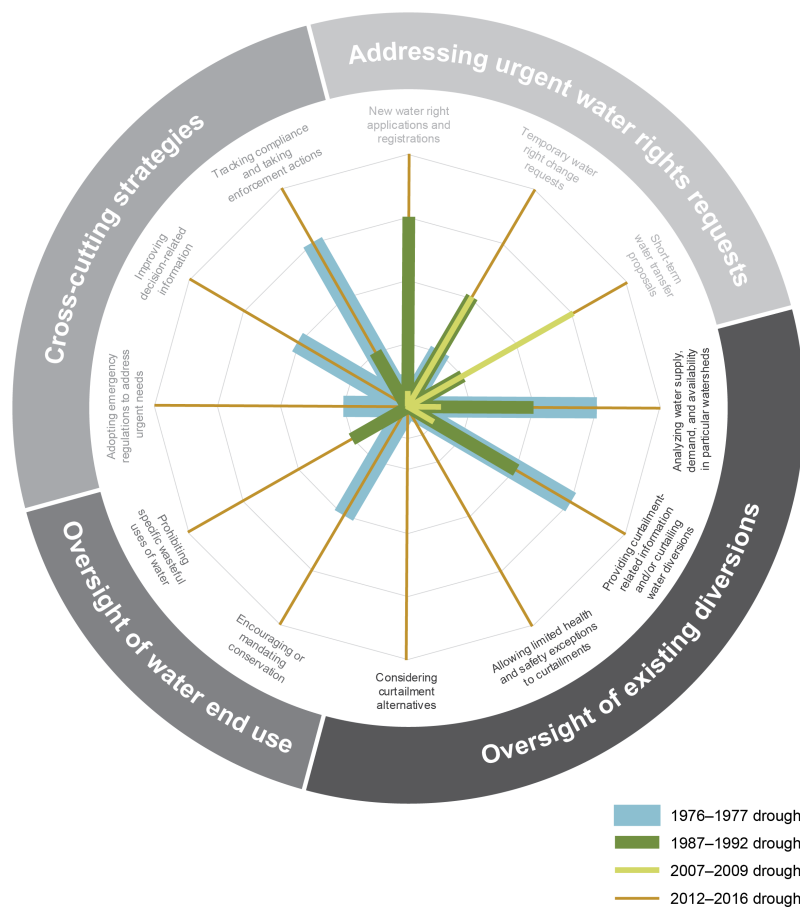


Figure 1. The relative extent to which the State Water Resources Control Board used different drought response strategies during each of the last four major statewide droughts (*The center of the chart*

represents no apparent usage, while the outermost ring represents the highest level of apparent usage observed in our historical data. Estimates are subjective and take into account both the depth and breadth of activity. See sections 4 and 5.1 to 5.3 of report [CCCA4-CNRA-2018-009](#) for more details.)

#1. The Board responded differently to each drought, sometimes taking on a very active role, and sometimes taking a more hands-off approach. It used different types and combinations of drought response strategies in different droughts (see *Figure 1*). These strategies fall into four broad categories: (1) addressing urgent water rights requests, (2) providing oversight of existing water diversions, (3) providing oversight of water use, and (4) cross-cutting strategies. Our research suggests the Board was more active in most of these areas during the 1976–1977 drought than it was during the next two droughts (from 1987–1992 and from 2007–2009). The Board was most active in all categories during the recent 2012–2016 drought.

#2. A lack of sufficient pre-drought planning and preparation was an important factor in the Board’s variable drought responses. Instead of proactively identifying what actions might be appropriate for different drought contingencies and developing the processes, procedures, and information it would need to select and effectively implement them, the Board often needed to rapidly improvise its drought response strategies in the midst of drought crises.

#3. Overreliance on in-drought improvisation hindered effective drought response. The Board made some significant and creative advances in drought management during and after past droughts. But it also spent valuable time in the midst of each drought trying to marshal its resources and make basic decisions about what to prioritize, what strategies to use to protect those priorities, and when and how to engage with stakeholders. Direction from political leadership, especially the governor but also the legislature, heavily influenced these decisions. Water users did not know what to expect from the Board in advance, making it difficult for them to make their own drought preparations, such as securing access to alternative water sources or deciding what crops to plant or fallow. The Board’s ad hoc responses sometimes made particular water users, [species and ecosystems](#), watersheds, and the state at large more vulnerable to drought impacts; intensified ongoing water management challenges; and led to [pushback against various actions](#), including [litigation](#).

#4. More proactive planning and preparation would improve the Board’s future drought responses. To prepare for the more frequent and intense droughts we expect in

the future, and set the stage for more timely and effective decision making under pressure, the Board can shift from largely reactive drought responses to more proactive efforts based around drought contingency planning.

The next several posts in this series will delve into our recommendations for how the Board could most fruitfully target its drought planning and preparation efforts.

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](#).