California needs to begin a serious and comprehensive plan to adapt to what may be a very long drought

California is currently in the midst of one of the worst droughts in the state's history. Despite the crisis, the Golden State's taps continue to run, with water use now far exceeding supply. **B. Lynn Ingram** *writes that the current drought is just one of many very dry periods California has experienced regularly over the last 5,000 years or so. Taking the hardship of indigenous populations in previous droughts as a warning, she writes that the state's rapid population growth is placing huge pressure on local water reserves. A comprehensive plan which takes advantage of new technologies such as wastewater recycling and ocean desalinization is now needed to adapt to the growing scarcity of water.*

Although signs of deepening drought abound in California, with drying forests and riverbeds, raging wildfires, shrinking reservoirs and dwindling snowpack, water still runs plentifully and cheaply through the taps. Most of our lawns are still green, swimming pools are full, and fruits and vegetables are still plentiful and affordable on grocery store shelves. The state is in the worst drought in history, and yet there seems to be no sense of anxiety or urgency. A look back at the bigger picture of climate and drought in this region provides a much-needed wake-up call, and an incentive to begin more comprehensive and sustained action now to conserve our most precious resource.

The current drought in California is not only the worst in modern history, but is among the worst in half a millennium. We know this by studying the growth rings of long-lived trees like the Giant Sequoias in the Sierra Nevada, and the Bristlecone pines in the White Mountains of eastern California. In fact, the state has weathered six very dry years since 2007, this year being by far the lowest. Is this just the beginning of a prolonged drought? While we can't really answer that is any degree of certainty, we can use the natural archives that hold clues to California's climate history – tree rings, lake and ocean sediments, and other earth materials, to unravel the full range of climate conditions this region can expect, including the frequency and length of droughts. And what we find is that California has experienced long periods of drought fairly regularly in the past.

Strings of drier than average years repeat every few decades, for instance, and are related to changes in ocean temperature in the North Pacific. More concerning, the geologic record reveals that at times in the past, particularly during periods of climatic warmth, droughts lasted much longer than a decade in the West. A particularly dry stretch occurred between 900 and 1400 AD, during the so-called Medieval Climate Anomaly, when two 100-year long droughts descended on the West. These droughts caused large lakes to shrink or dry out completely, more frequent wildfires, and extreme hardship for native populations as natural water sources shrank and other resources declined. Their numbers had grown larger during the wetter times before the drought, leaving them more vulnerable to the megadrought that followed. Another prolonged drought that persisted for centuries 5000 years ago during another period of global warmth, when native populations were forced to migrate from the parched interior deserts of the Great Basin to the California coast.

There are cautionary parallels between our modern society, and past societies that were forced into mass migration and in some cases collapsed under prolonged periods of drought in the past. Like these past societies, our modern society experienced rapid population growth throughout the relatively wet 20th century. Today, California has 38 million people, a number that may double by 2050, made possible by developing all available sources of water, including underground aquifers that took thousands of years to accumulate. We are not only using all available surface waters, we are drawing down our "water in the bank." The drilling of these aquifers is currently unmonitored and unregulated, providing free water Central Valley farmers, increasingly only to those who are willing and able to drill deeper and deeper wells. Over the past year, the companies that install these wells and pumps are working round the clock, often deepening wells by 1000 to 2000 feet.

Drought affected Sandy Wool Lake in Santa Clara, California, 31 August 2014 Credit: Don DeBold (Flickr, CC-BY-2.0)

Modern Californians have some advantages over the past societies, but we have yet to put them to good use. These advantages include knowledge of climate variability, and the long-term history of drought for the region. We also have more advanced technology at our disposal, including water efficient appliances, the ability to treat and recycle wastewater, and ocean water desalination. Scores of water conservation measures, including a recent analysis by the Pacific Institute that outlines water management strategies that could potentially conserve 14 million acre-feet of water per year, seem virtually ignored. Given that we are currently using 6 million acre-feet of water per year more than the supply, these strategies would be well worth employing as soon as possible.

Society as a whole needs to be educated about water's vital importance, its scarcity, and what can be done to live more sustainably. We need to value water as a precious and scarce resource, not only for human use but also for the natural ecosystems that have suffered in recent decades as water has been diverted toward human uses. California needs to begin a serious and comprehensive plan as we adapt to water scarcity. The $7.5 billion water bond that California lawmakers have recently approved for the November election ballot would provide funding for water use efficiency, safe drinking water, and increased water storage. However, the bond does not include groundwater reform – the critically-needed monitoring and regulation of California's groundwater – our most important buffer against drought.

As a society, an important first step is an increased awareness about both the direct and the indirect water usage in our daily lives – our water footprint. This awareness would help govern our decisions about water use and conservation going forward. We would also benefit from reflecting on the native cultures that came before us – their understanding about the delicate balance between consumption and conservation, and their eventual collapse under prolonged drought.

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Note: This article gives the views of the author, and not the position of USApp– American Politics and Policy, nor of the London School of Economics.

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