

To cope with California's drought, policymakers must go beyond water conservation and rationing

*Two thirds of the state of California is experiencing extreme to exceptional drought conditions after four dry years. **B. Lynn Ingram** writes that to cope with the drought, those in the Golden State need to plan for the long-term to increase resilience to extended water scarcity. She argues that policymakers must now think more collaboratively about reducing the 'water footprint' of Californians and the products they produce.*



California has been struggling with unprecedented drought for four years, with a snowpack that dropped to only 5 percent this winter, record warm temperatures, and almost double the number of wildfires. A recent [survey](#) has revealed that the drought is the top issue of concern for Californians. Although two-thirds of the state is in extreme to exceptional drought after four critically dry years, the state has actually experienced lower than average runoff in all but two years since 2002. In the face of this prolonged dry period, is California doing enough?

From the perspective the past few thousand years, California has an exceptionally variable climate that is often in a state of drought. In fact, 20th century droughts have been relatively short, lasting no more than six years, when compared with this longer term history. In the past, prolonged droughts lasting over a decade were common, occurring once or twice per century. And periods of lower than average precipitation lasting a century or longer struck every one to two millennia. The most recent of these "megadroughts" occurred during the Medieval Warm Period, 900 to 1350 A.D., when the precipitation dropped to only 60 percent of average, and wildfires were 30 percent more frequent. These droughts brought down flourishing civilizations in California and the Southwest, with archaeological evidence of malnutrition, infant mortality, violence, and warfare.

A megadrought has a ten percent chance of naturally recurring in California, but with human-caused warming and climate change, that chance will rise to 80 percent by the middle of this century, according to a [recent study](#). In a warmer world, many regions, including the West, will get drier, with less rain and snow. Increased evaporation rates will dry out soils, vegetation, and surface waters, and lead to more frequent wildfires. Given this probability, we need to begin long-term planning to increase our resilience to extended water scarcity. These preparations need to go way beyond water conservation and rationing.



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Water managers have begun examining the measures taken by the Australians during their recent 12-year drought. This drought was the worst in the country's history, with record low river flows, agricultural collapse, and catastrophic fires and dust storms. The Australian government mandated multiple strategies to adapt to water scarcity, and citizens complied with making sacrifices for the common good. Some of their measures included the recycling and reusing of treated wastewater (or grey water) with the treatment of this water to a level safe enough for drinking. Most homes capture rainwater that falls on roofs and transfer it to storage tanks to be used for toilets, laundry, and gardens. Water from baths, showers, and washing machines is reused in the garden. All homes have switched to water efficient appliances, and residents now use no more than 55 gallons per person per day. Australia has also improved its tracking of water through the hydrologic cycle, from its source where it falls as precipitation to its extraction by humans. All river and groundwater levels are monitored, recorded, and regulated. Last year California enacted legislation to begin monitoring groundwater, but it will take until 2025 to phase in.

We also might consider the "embedded," or virtual, water in foods and products (dubbed our "water footprint"). The water footprint is analogous to the more familiar carbon footprint in providing an accounting of the total amount of water used in producing a crop or product. Keeping track of our water footprint will ultimately help individuals, companies, and even countries practice more intelligent water usage. For instance, the water footprint of 8 ounces of beef (which includes water used to grow feed grain, water used to produce the antibiotics, and the amount of water a cow drinks over its three year lifespan), is about 920 gallons. Compare this with the water footprint of eight ounces of almonds, which is approximately 225 gallons. And California's water footprint expands far beyond its geographic boundaries, since one-half of the nation's food is grown here, with a large fraction being exported beyond the United States. Further, some are now questioning whether it makes sense for a drought-prone state to be growing water-intensive crops like cattle feed (alfalfa), rice, cotton, and nuts, for export. Clearly now is the time for policy makers and residents to move toward a new, overarching policy of collaboration, to act together for the collective good and the survival of the region.

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