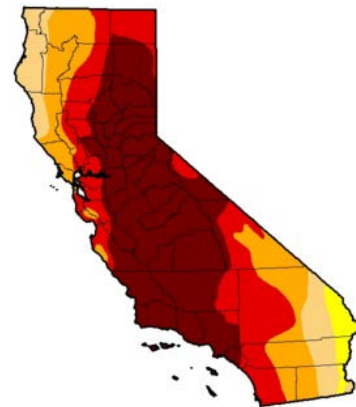


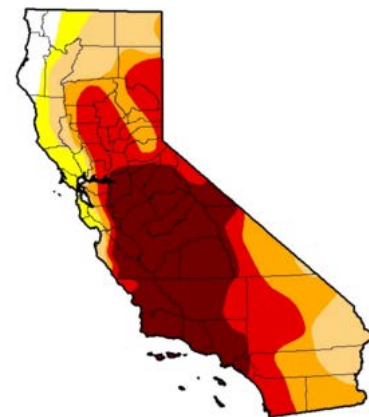
California Drought Status: Where are we now?

Written by: Caroline Minasian

Spring has sprung and many Californians are wondering if the recent storms should be leaving them with Gene Kelly’s notable “glorious feeling”—should we be happy again? Recently released news articles suggest that because California’s biggest reservoirs have recovered, stringent water conservation limits should be reworked. Water agencies continue to urge the State Water Resources Control Board (SWRCB) to reduce the mandated water conservation standards that were put into effect last year. Urban water suppliers were required to meet a 25% reduction as compared to 2013 water use. Their reduction targets ranged from 4% to 36% and on April 7, 2016 the SWRCB released updated [water supplier conservation standards](#) that take into account supplier’s submitted adjustments. 79% of the 410 urban water suppliers subjected to conservation received lowered targets. Though these limits are being reworked it is necessary to remember that many of the state’s reservoirs and groundwater basins remain depleted and as of April 5, 2016 over 50% of the state was still classified by the U.S. Drought Monitor at intensity D3 and D4: Extreme and Exceptional Drought.¹ Only 3.55% of the state is at “normal” conditions.



January 2016 drought status (top) vs. April 2016 (bottom). Dark red=exceptional drought conditions and red=extreme drought. Source: U.S. Drought Monitor



With northern reservoirs filled to historic levels and most of the state still in exceptional drought, where do we go with policy? In 2015, a lot of discussion revolved around “the new normal.” The Bay Area Council hosted a forum that focused on how extreme climactic events are becoming the norm and Governor Brown also noted the need to become more resilient as the weather continues to grow more unpredictable. So, do we continually adjust drought regulations based on a few storms and hope that they keep coming or do we keep what are meant to be “emergency” regulations in place as the “new normal”? To garner a deeper understanding of the level of recovery needed, it is important to first acknowledge the impacts of 2015 and what they mean in context of preparing for the extreme climactic events that, because of global warming, are becoming more frequent and standard.

¹ The U.S. Drought Monitor is produced by the National Drought Mitigation Center at the University of Nebraska, the United States Department of Agriculture and the National Oceanic and Atmospheric Administration.

A Look Back at 2015

2015 is a year that was legislatively driven by the continued drought. NASA and NOAA declared 2015 as Earth's hottest year on record which marks the fourth time in the 21st century a new annual temperature record high was set—previously set in 2005, 2010 and 2014. 2015 observed Asia and South America's warmest years and Europe and Africa's second warmest. It was also the second warmest year experienced by the United States.² Moderate to exceptional drought conditions were present over more than 98% of California by March 2015 and snowpack levels were at record lows. The nearly 900 participants of the World Economic Forum also ranked the water crisis as the top global risk for the very first time. Below are a few significant highlights from the year's activities that demonstrate the severity of California's dry condition.

State Water Project (SWP) Allocations: 2015's 20% SWP allocations were the second lowest since 1991. Agricultural customers got a 0% allocation and municipal customers received 30% of their requests.

Executive Order B-29-15: On April 1, 2015 Governor Brown issued [EO B-29-15](#) which included directives to save water, increase enforcement against water waste, invest in new technologies, and streamline government response. The SWRCB, in response to their directive, adopted an emergency regulation in May 2015 that required a 25% statewide reduction in urban water use. Urban water suppliers were required to meet reduction targets ranging from 4% to 36%, as compared to 2013 water use, by February 2016. A second executive order ([B-36-15](#)) was issued in November 2015 that extended these restrictions till October 2016.

Prop 1 Water Bond: Passed in November 2014, this bond authorized \$7.545 billion for water projects. In 2015, the SWRCB and the Department of Water Resources (DWR) began administering their implementation programs—the SWRCB's Small Community Wastewater, Water Recycling, Drinking Water, Stormwater and Groundwater Sustainability and DWR's Groundwater Management Plans and Desalinization grants.

Greenhouse Gas Emission Reduction Target: On April 29, 2015 Governor Brown issued an executive order (EO B-30-15) to establish a California GHG reduction target 40% below 1990 levels by 2030. The European Union set the same target in October of 2014. In addition to the new targets, the executive order directs the state to incorporate climate change impacts into the state's Five-Year Infrastructure Plan, update the Safeguarding California Plan and factor climate change into state agencies' planning and investment decisions.

Tree Mortality State of Emergency: On October 2015 Governor Brown declared a [state of emergency](#) to address the tens of millions of trees across California that are dead or dying from the prolonged drought. In response a [Tree Mortality Task Force](#) was convened to coordinate emergency protective actions. Results from tree-mortality surveys show that over 29 million conifers and hardwood trees have died from bark beetles due to the drought.

Agricultural Impacts: UC Davis—in partnership with The California Department of Food and Agriculture and DWR—created an [economic analysis](#) that suggests that in 2015 the drought resulted in 540,000 acres fallowed, a loss of 10,100 direct seasonal jobs (21,000 total), and a total economic impact of \$2.7 billion dollars.

² NOAA National Centers for Environmental Information, State of the Climate: Global Analysis for Annual 2015, published online January 2016.

Looking Forward: 2016 and Beyond

2016 started off with a bang, bringing some much needed precipitation via El Nino storms to northern California. As of March 2016 Lake Shasta, Lake Oroville and Folsom Lake reservoirs were filled above historical averages and the State Water Project (SWP) increased allocations to 45%, which is a 35% increase since the beginning of 2016. Despite these recent boosts in northern California's reservoirs and the promising allocations, California's southern reservoirs are still significantly below historical averages; the San Luis reservoir is at 56% of historical average, New Melones at 42%, Castaic Lake at 48% and Lake Perris at 43%. Below are significant highlights that occurred in the first quarter of 2016.

State Water Project (SWP) Allocations

In January 2016 the SWP allocations increased to 15% and in February 2016 increased to 30%. By March 17th, SWP increased allocations to 45%.

Emergency Water Conservation

On February 2, 2016 the SWRCB extended the restrictions placed on urban water use through October 2016 and in March the SWRCB release updated conservation targets. The Board will hold a meeting [April 20, 2016](#) to receive public input on the current emergency regulations and final decisions will be determined at a meeting planned for May 2016.

On April 4, 2016 a [media release](#) noted that Californians saved 1.19 million acre-feet of water. This means that the state reached 96% of its goal—the 25% mandated conservation target set from June 2015 through February 2016.

Drought Contingency Plan

The SWRCB released the final [2016 Drought Contingency Plan](#). The plan outlines water project operations from February through November 2016 and assumes persistent dry conditions for 2016. The goals outlined include ensuring human health and safety needs, managing salt water intrusion within the San Joaquin Delta, providing protections for endangered species—including fish and wildlife resources—and seeking flexible water management practices.

Groundwater Sustainability Plan

DWR released draft [Groundwater Sustainability Plan Emergency Regulations](#) February 18, 2016. These regulations include the criteria DWR will use to evaluate plans and required plan elements. Final regulations will be adopted by June 2016.

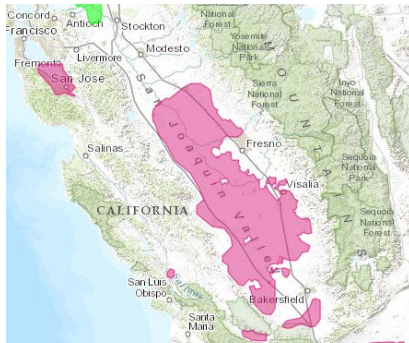
California Water Action Plan 2016 Update

Originally released by the Brown administration in 2014 as a five-year roadmap, the [2016 update](#) reflects on progress and goals that seek to take an integrated approach to make the state's water system stronger and more resilient. As the introduction states: "Nothing focuses Californians' attention on our water resources like the extremes of flood and drought."

Governor's Proposed Budget

On January 7th, 2016 Governor Brown released the proposed [2016-2017 budget](#) that allocates \$323.1M for emergency drought response. This includes \$68.4M for protecting water supplies, \$95M for water conservation and \$159.7M for emergency response. The final budget will be released in May 2016.

Road Forward to Drought Recovery



Map of Land Subsidence in the Central Valley. The red is subsidence caused by groundwater pumping.

Source: USGS

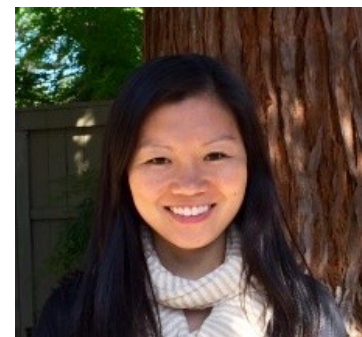
In considering policy changes and the importance of creating a path forward that promotes a resilient future, it is necessary to go below the surface and take into account groundwater pumping and land subsidence. NASA released an analysis in December 2014—based on space and airborne measurements—that stated 11 trillion gallons of water are needed to recover from California’s drought. Using GRACE data and other satellite observations, it was also shown that groundwater levels across the Southwest United States are in the lowest 2-10% since 1949.³ This is one effect of the state’s multi-year drought, which spurred the “overdrafting” of groundwater basins that has led to seawater intrusion and land subsidence.

The San Joaquin Valley’s land subsidence has been monitored since the 1960s and it was noted in 1975 by Joseph Poland and others that 1 foot of subsidence affected more than 5,200 square miles of irrigable land. Sinking of the earth’s surface becomes a problem because it has the potential to damage buildings and infrastructure, increase flood risk in low-lying areas, and cause lasting damage to groundwater aquifers.

In 2015, DWR had a report prepared by NASA’s Jet Propulsion Laboratory entitled [Subsidence in the Central Valley, California](#). Their research shows that in certain locations the San Joaquin Valley is sinking nearly 2 inches per month, which is significantly faster than historic levels. It was also noted by DWR that long-term subsidence has already destroyed thousands of public and private groundwater well casings in the San Joaquin Valley. Though not all from subsidence, from 2014 to March 2016 the County of Tulare has had reports of 1,469 well failures which demonstrates the continued hardship for many in regards to lasting drought impacts.

So, though the state’s northern reservoirs are filling to capacity, Californians still have a long road forward. If we are to avoid a relapse before recovery is even possible, it is crucial to turn conservation into a habitual routine through both individual and policy efforts. As the planet continues to warm we will be faced with longer droughts and larger floods and being able to adapt quickly will become necessary. Instead of treating these climactic disasters as emergencies we need to treat them as “normal” occurrences. If the state is capable of conserving 96% of the emergency conservation target that was set in place last year, then let’s continue to conserve so that the state has greater water security and reliability for the future. Let’s not aim to create a temporary “patch” each time a drought hits, but to continually plan and implement so that the patch sticks.

This is the first of a number of articles that will be written about California’s water situation as a part of Synergy’s Billion Gallon Challenge. Be sure to check back frequently to stay up-to-date on all things water as we gear up for the summer. If you have a topic you’d like discussed feel free to email caroline@synergy.org.



Author Caroline Minasian

³ Steve Cole and Alan Buis, “NASA Analysis: 11 Trillion Gallons to Replenish California Drought Losses,” December 16, 2014.