Water Year 2020

Summary Information

Water Year 2020 (October 1, 2019 through September 30, 2020) was dry in Northern California, with parts of Southern California receiving above-average precipitation thanks to late-season storms. The year got off to a promising start in late November, but January and February were largely dry. A wet spring partially compensated for the dry winter months but was insufficient to restore Northern California to average conditions. Water Year 2020 was also a dry year in the Colorado River Basin, an important source of supply for Southern California.

Water Year 2020 followed a wet Water Year 2019 that replenished storage in many of the state's larger reservoirs, helping lessen the impact of subsequent dry conditions. Water Year 2020 will probably be most remembered, however, for its late-summer heatwave and weather conditions that led to catastrophic wildfire conditions across the state, setting a new record for annual acreage burned.

Temperature and Precipitation

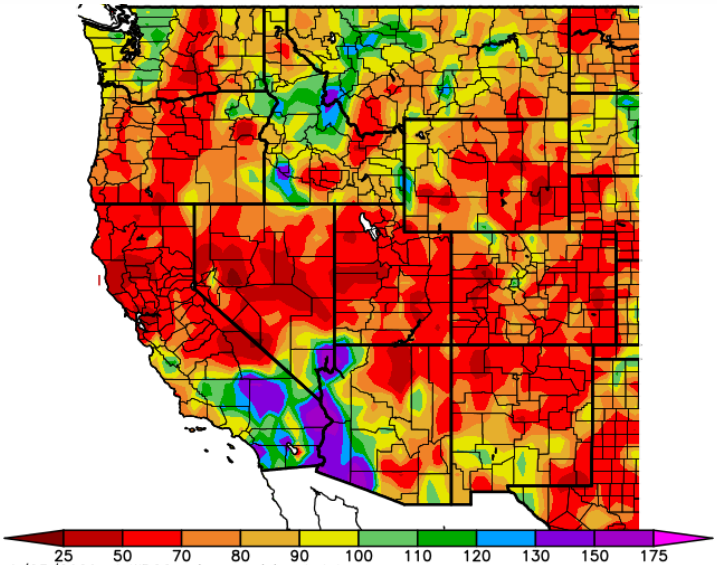
DWR's eight-station precipitation index, which tracks conditions in the Sacramento River Basin, ended the year at 62 percent of average. The five-station San Joaquin precipitation index and the six-station Tulare Basin index wrapped up the year at 62 and 65 percent of average, respectively. As illustrated in the map of gridded precipitation, the North Coast region was particularly dry. It was the third-driest year of record in the Russian River watershed and a drought emergency was declared for Oregon's portion of the interstate Klamath Basin. In contrast parts of Southern California were wetter than average, particularly in the Inland Empire and San Diego County. San Diego experienced one of its wettest Aprils on record.

Much warmer than average statewide temperatures occurred during the key winter snowpack accumulation months, continuing a long-term trend of warmer statewide temperatures that began in the 1980s. The April 1st statewide estimate of snowpack water equivalent, representing the time of typical maximum snowpack accumulation, was 53 percent of average based on electronic sensors or 50 percent of average based on manual snow course measurements. The year's late-season storms subsequently increased the peak snowpack to 66 percent of average, based on snow sensor measurements.

August and September wrapped up the water year with record heat and wildfires. August 2020 was the warmest August on record for California. Death Valley reached 130 degrees on August 16th. Other record August highs included Sacramento and Fresno (112), Santa Cruz (107), and Anaheim (105). Record daily highs in September included Lake Cachuma (120), Paso Robles and El Centro (117), Burbank (114), Red Bluff and San Luis Obispo (113), and Santa Rosa and Napa (110).

Percent of Average Precipitation (%)

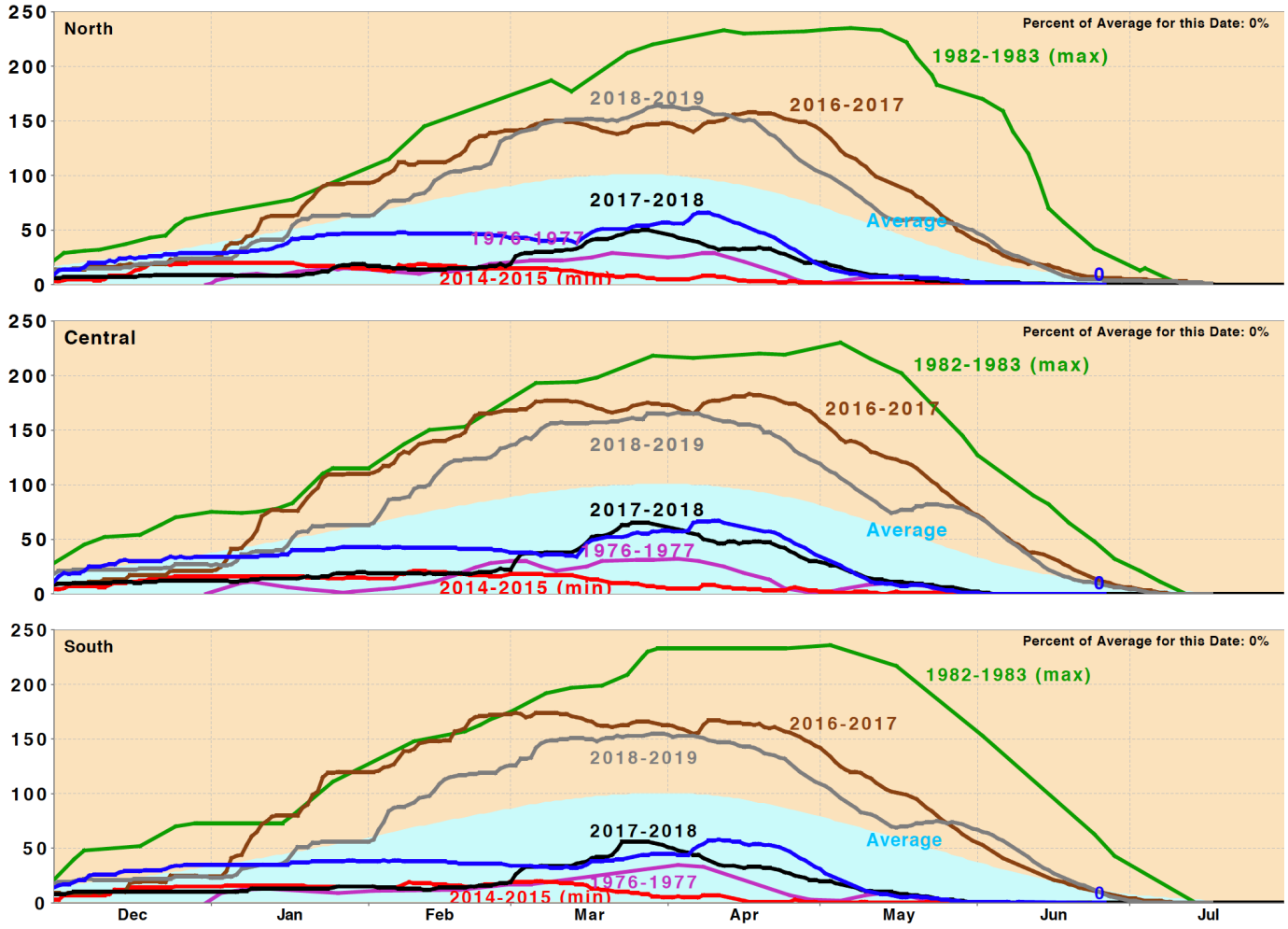
10/1/2019 - 9/22/2020



Generated 9/23/2020 at WRCC using provisional data.
NOAA Regional Climate Centers.

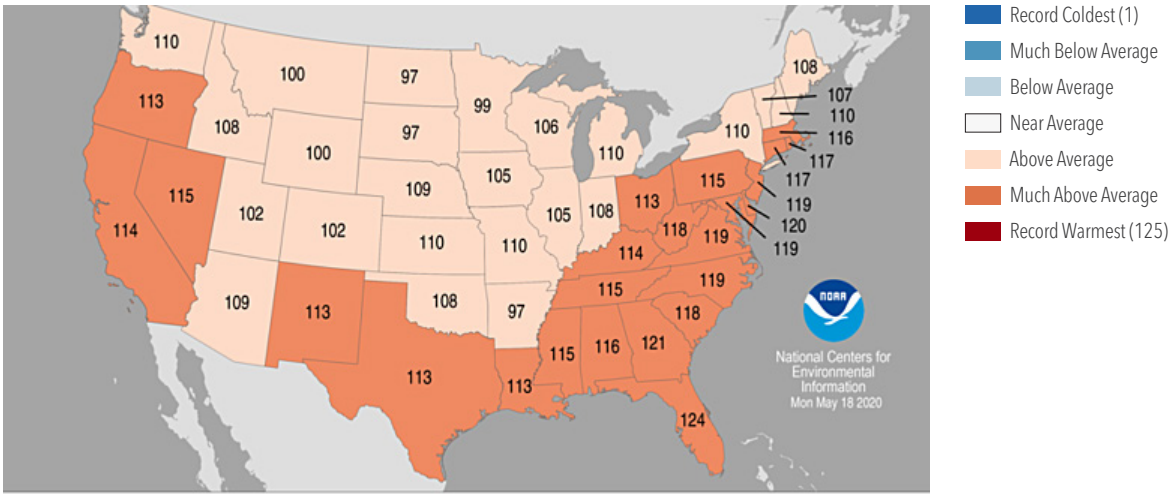
California Snow Water Content

Percent of April 1 Average for: 26-June-2020



Statewide Average Temperature Ranks

November 2019 - April 2020 | Period: 1895 - 2020



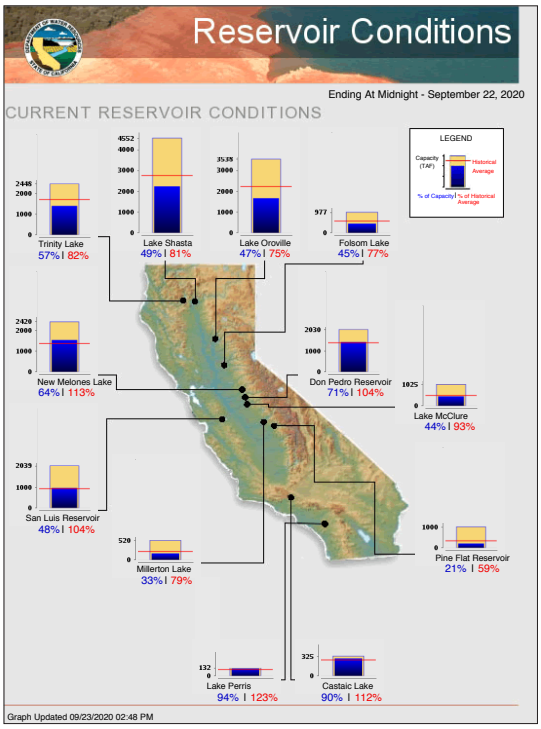
Reservoir and Groundwater Storage

California began Water Year 2020 with generally good storage in the state's major reservoirs thanks to a wet Water Year 2019, which ended with storage in the 154 larger reservoirs that DWR tracks at 125 percent of average. Water Year 2020 is ending with statewide reservoir storage at 95 percent of average.

Storage in Colorado River system reservoirs continues to fluctuate around the half of total capacity level, reflecting the persistence of long-term dry conditions in the basin since 2000.

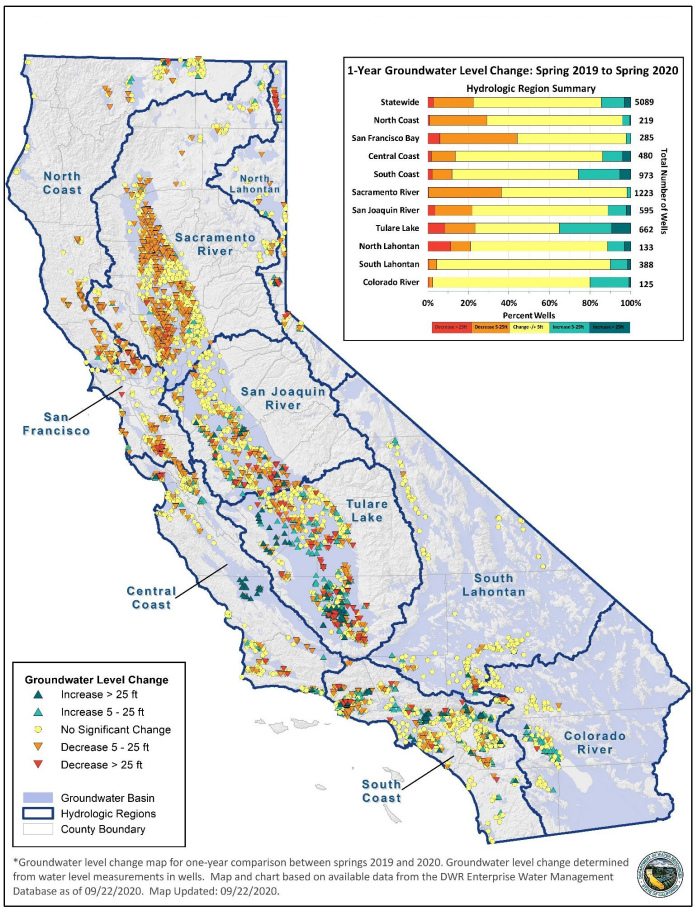
The two maps show groundwater level changes in the state's high- and medium-priority groundwater basins over 1-year and 3-year time periods. In both cases the comparison water year (2019 or 2017) was wet. Changes in groundwater level conditions can occur at slower time scales than changes in surface water hydrology because of the time needed to recharge aquifers.

Reservoir Conditions



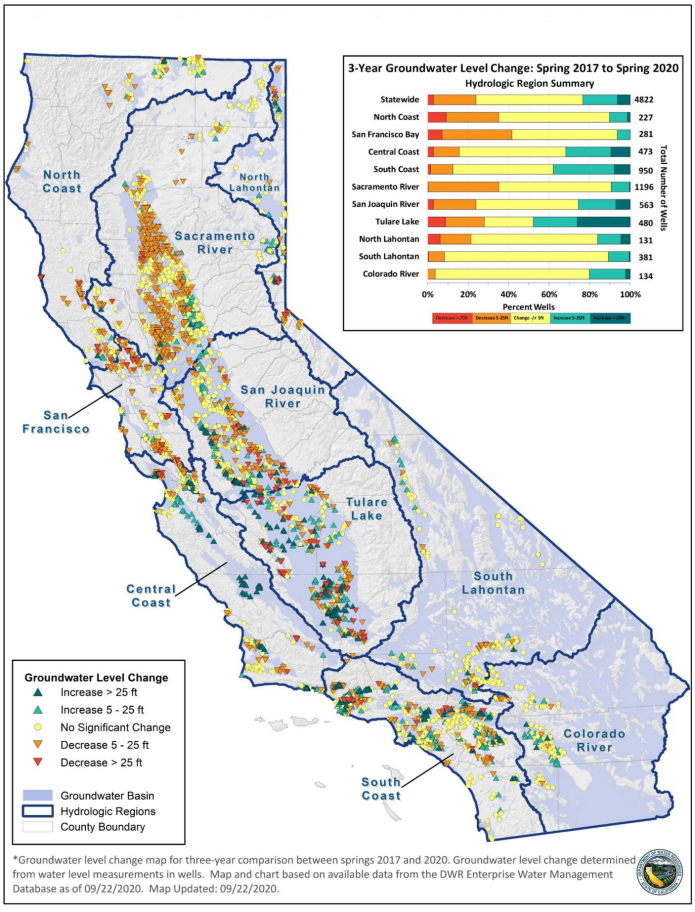
https://cdec.water.ca.gov/resapp/RescondMain

Groundwater Level Change - Spring 2019 to Spring 2020



*Groundwater level change map for one-year comparison between springs 2019 and 2020. Groundwater level change determined from water level measurements in wells. Map and chart based on available data from the DWR Enterprise Water Management Database as of 09/22/2020. Map Updated: 09/22/2020.

Groundwater Level Change - Spring 2017 to Spring 2020

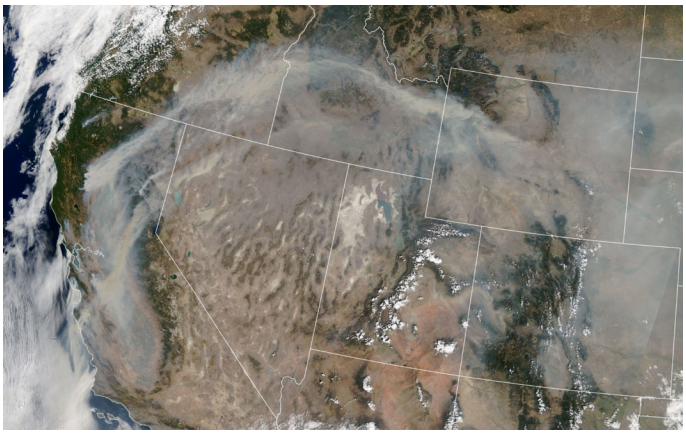


*Groundwater level change map for three-year comparison between springs 2017 and 2020. Groundwater level change determined from water level measurements in wells. Map and chart based on available data from the DWR Enterprise Water Management Database as of 09/22/2020. Map Updated: 09/22/2020.

Water Year Outcomes

For the dry parts of the state, impacts of a single dry year would not be severe enough to be termed a drought for most water users. However, after an initial dry year water agencies should prepare for the possibility of continued dry conditions in the following year.

The combination of record heat, dry conditions in the Sierra Nevada and Coast Ranges, unusually active summer storm activity producing dry lightning and high winds in much of the state, and ample dry fuel from the massive tree mortality associated with the 2012-2016 drought contributed to a devastating outbreak of wildfires beginning in mid-August. More than 3.8 million acres have burned since the beginning of calendar year 2020, already surpassing the previous record for annual acreage burned of just under two million acres set in 2018. Wildfires present an increasing risk to water and power infrastructure, with the 2020 fires threatening hydroelectric power infrastructure at large projects (DWR's Lake Oroville and Southern California Edison's Big Creek System) and as well as facilities of small rural water systems.



Smoke from California wildfires can be seen in this August 2020 National Aeronautics and Space Administration (NASA) satellite image.

Prospects for Water Year 2021

The present state of the science cannot provide a reliable prediction for Water Year 2021. Although the ability to make operational weather forecasts of precipitation has greatly improved over the past several decades, National Weather Service precipitation outlooks beyond the two-week weather timeframe have minimal ability to forecast the outcome of the state's wet season. Attempts have been made to use the El Niño-Southern Oscillation (ENSO) as a predictor of California precipitation, but the historical record shows that precipitation in most of the state has little relationship to ENSO conditions, except for a tendency to link La Niña conditions with dryness in Southern California in some, but not all, years. La Niña conditions are present now in the equatorial Pacific Ocean and are forecasted to persist this winter. The accompanying figure shows relationship between ENSO conditions and observed precipitation for the state's climate divisions.

The high annual variability in California's precipitation means that every year could hold the possibility of either record wet or record dry conditions. In the absence of the ability to reliably predict seasonal precipitation, Californians must be prepared for the possibility of extreme wet or dry conditions in any water year.

ENSO and California Precipitation

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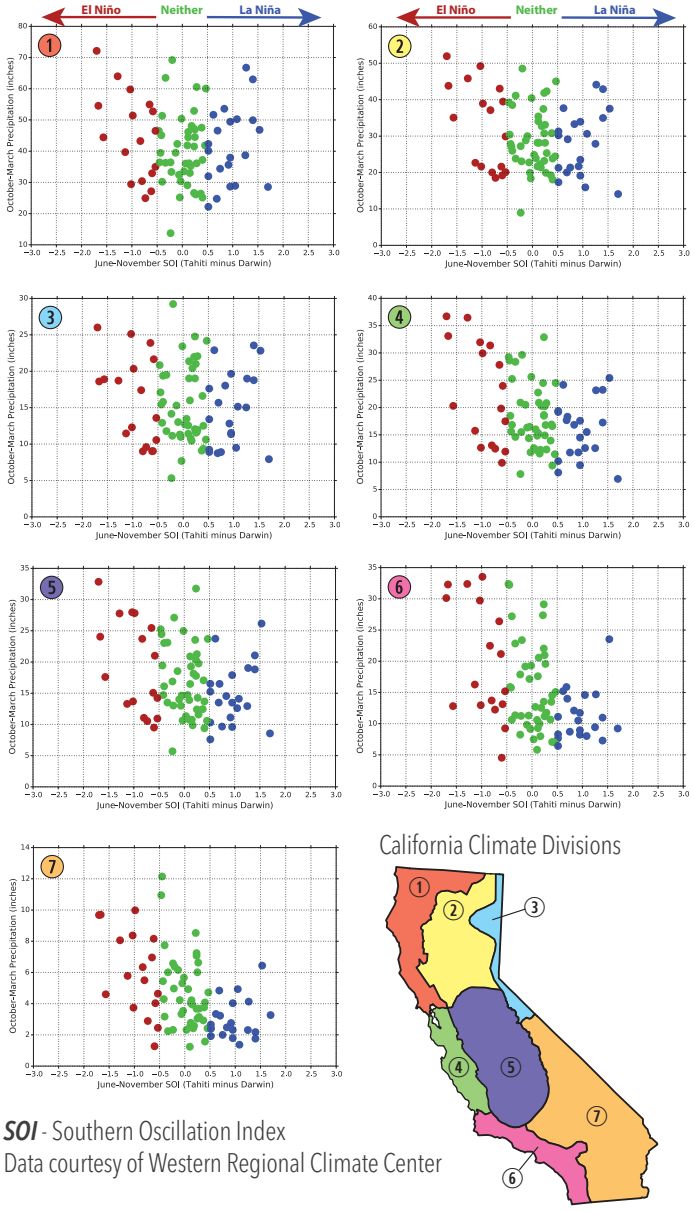

SOI - Southern Oscillation Index
Data courtesy of Western Regional Climate Center