NATIONAL INTEGRATED DROUGHT INFORMATION SYSTEM

CALIFORNIA-NEVADA DROUGHT OUTLOOK JULY 2017

CURRENT CONDITIONS

As California and Nevada have moved out of the region's primary precipitation season (October through March), little to no change has occurred in drought conditions in the region. As of July 25, 8.24% of California and none of Nevada remain in moderate to severe drought (D1-D2) according to the U.S. Drought Monitor. The 'Abnormally Dry' (D0) area in southern and southeastern Nevada has expanded, covering about 27% of the state. In June 2017, this area showed negative Palmer Drought Severity Index (PDSI) values, as did the dry or drought areas of the southern California coast and those near the California-Arizona border.

June and July experienced exceptionally warm temperatures. In June 2017, most of the region saw temperatures ranging from 2-6° F above normal (compared to 1981-2010), with similar differences in July. As discussed in the May 2017 CA-NV DEWS Drought & Climate Outlook Webinar, California and Nevada are experiencing an active wildfire season. Drying conditions are common for this time of year and precipitation generally becomes less important for water resource planning, with exception of southern Nevada and southern California which typically receive summer moisture from the North American Monsoon. The monsoon is a pronounced increase in rainfall over the southwestern U.S. and northwestern Mexico, usually occurring from July through September. This increase is due to intense summer solar heating combined with a subsequent seasonal wind shift resulting in a flow of moisture to the region from the south and southwest. For example, Las Vegas typically has a summer peak in annual precipitation in addition to wintertime precipitation. This year, much of the region has received below-average precipitation, however monsoonal moisture has increased in the last few weeks of July.

Melting of snowpack has continued throughout the summer. Water stores in the 28 western Sierras reservoirs have

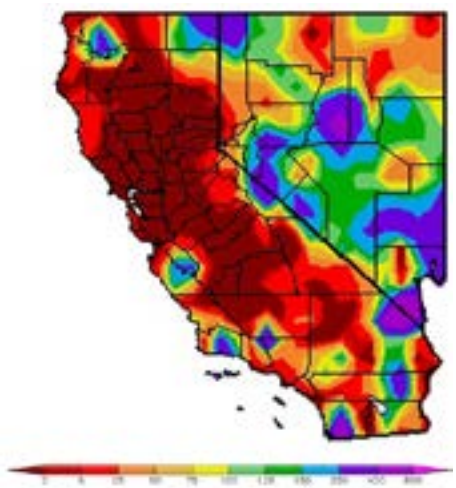
U.S. Drought Monitor for August 1, 2017

Drought intensity

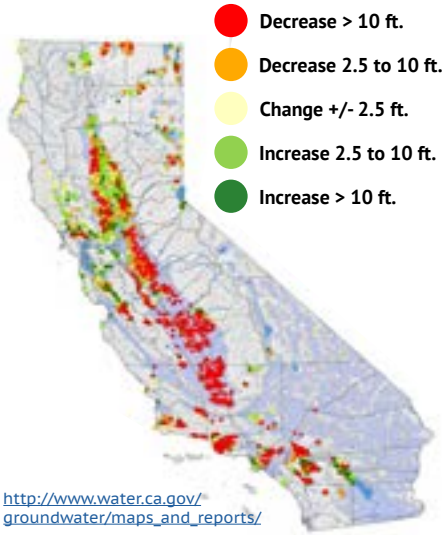
- D0: Abnormally dry
- D1: Moderate drought
- D2: Severe drought

Temperatures: Departure from Average (Deg F.) July 4- Aug. 3, 2017

Precipitation: Percent of Average July 4- Aug. 3, 2017



Groundwater Level Change Spring 2012 - Spring 2017



http://www.water.ca.gov/groundwater/maps_and_reports/

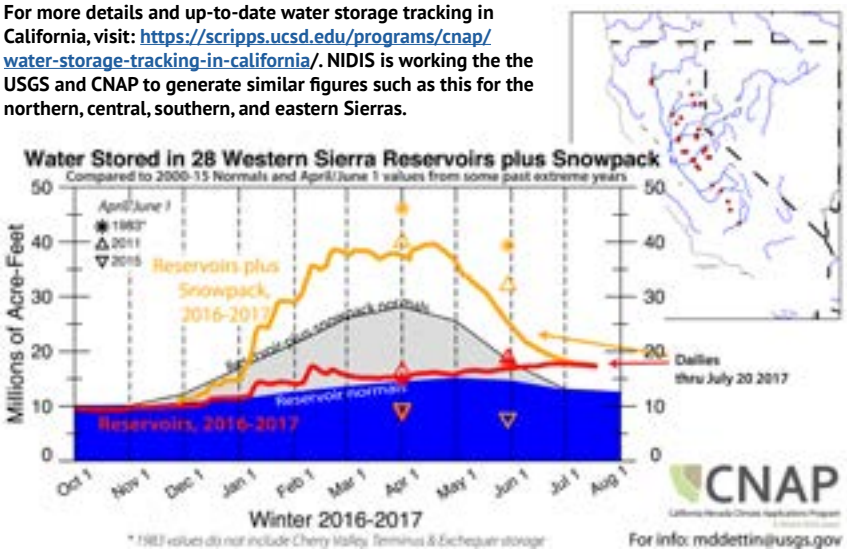
WHAT DOES ABOVE-NORMAL PRECIPITATION MEAN FOR GROUNDWATER RECHARGE?

The degree of groundwater recharge is determined by several factors including soil type, bedrock, surface water hydrology, and surface use. California Department of Water Resources has observed increases of greater than 2.5 feet in water levels in about 32% of 4,399 California wells over the last year. However, about 47% of 3,657 California wells with available data are still 2.5 feet or more below their water level of five years ago, with 29 percent at least ten feet lower. These wells are concentrated in the San Joaquin River and Tulare Lake hydrologic basins and the Southern Central California Coast. Runoff will fade into summer and fall, and the degree that long-term drought deficits have been alleviated varies greatly.

Interested in more Groundwater Data and Information? Check out the California Department of Water Resources (http://www.water.ca.gov/groundwater/gwinfo/index.cfm) and the U.S. Geological Survey (https://water.usgs.gov/ogw/).

- Summary maps and reports
- Interactive well locator maps
- Create figures of recent and historic well data
- Download one well or all available data

For more details and up-to-date water storage tracking in California, visit: https://scripps.ucsd.edu/programs/cnap/water-storage-tracking-in-california/. NIDIS is working the the USGS and CNAP to generate similar figures such as this for the northern, central, southern, and eastern Sierras.



increased (see figure above), and 10 of 12 California Department of Water Resources-managed reservoirs are above historical averages. Lake Tahoe has also rapidly filled since fall of 2016, when levels were well below the natural rim. However, this year neither reservoir levels nor reservoir-snowpack combined reached 2011 or 1983 levels.

CLIMATE OUTLOOK

ENSO-neutral conditions have persisted through early summer into July with equatorial sea surface temperatures (SSTs) remaining near- to above-average across the central and east-central Pacific Ocean. NOAA's ENSO alert system is currently not active, and ENSO-neutral is favored (50 to ~55% chance) to continue into the Northern Hemisphere winter 2017-2018. Although not favored, the official probabilistic ENSO forecast as of July 21 shows El Niño conditions have an elevated chance of occurring (~35-45%) relative to the long term average (~25-35%). However, more than half of the IRI/CPC models favor ENSO-neutral through the remainder of 2017. Overall the current ocean and atmosphere system remains consistent with ENSO-neutral and forecasters will continue to watch conditions closely.

The Climate Prediction Center (CPC) seasonal outlooks for California and Nevada as of July 20 show equal chances of above, below, or average precipitation in August-September-October (ASO) and November-December-January (NDJ). There is a 33-60% chance of above-normal temperatures through the end of summer into fall and winter, with the greatest chances centered on northeast Nevada in ASO. Through October, drought is expected to persist in the southern central California coast as well as near the southern California-Arizona border.

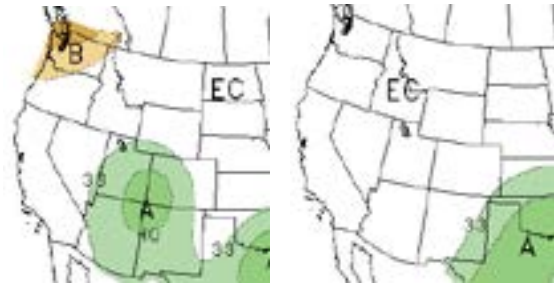
CAL-ADAPT

California's 4th California Climate Change Assessment, an inter-agency effort to implement a substantial portion of the state's Climate Change Research Plan, is underway and includes scenario development, including drought scenarios. The California-Nevada Applications Program (CNAP), a NOAA RISA program, at Scripps Institution of Oceanography is participating in the assessment providing drought scenarios and downscaled global climate model projections. This includes LOCA, or Localized Constructed Analogs, a statistical technique that uses past history to add improved fine-scale detail to global climate models. More information and tools can be found at Cal-Adapt and see the A Scenario of 20 year Drought in Northern California presentation by Dr. Daniel Cayan (CNAP/SIO) from this webinar.

OUTLOOK: PRECIPITATION

EC means equal chances of above, below, and normal

AUG-SEPT-OCT **NOV-DEC-JAN**

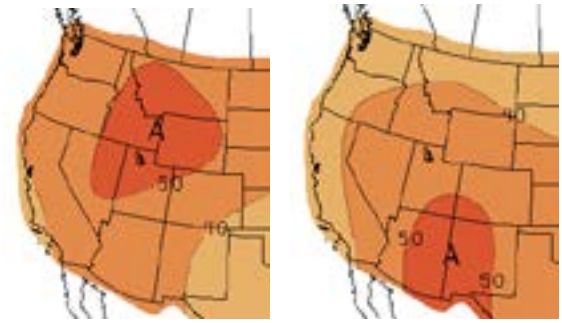


Probability of above-normal precip
33%-40% 40%-50% 50%-60%

Probability of below-normal precip
33%-40% 40%-50% 50%-60%

OUTLOOK: TEMPERATURE

AUG-SEP-OCT **NOV-DEC-JAN**



Probability of above-normal temps
33%-40% 40%-50% 50%-60%

http://www.cpc.ncep.noaa.gov/

NEW INTERACTIVE OUTLOOKS

The National Weather Service Climate Prediction Center has recently launched new interactive maps for the U.S. seasonal outlooks. Visit http://www.cpc.ncep.noaa.gov and click the word "interactive" next to any of the outlooks (6-10 day, 8-14 day, One Month, or Three Month).

ABOUT THIS OUTLOOK

On July 24, 2017 NIDIS and its partners held a California-Nevada DEWS Drought & Climate Outlook Webinar as part of a series of regular drought and climate outlook webinars designed to provide stakeholders and other interested parties in the region with timely information on current drought status and impacts, as well as a preview of current and developing climatic events like La Niña.
A video of and presentations from this webinar can be accessed here: https://www.drought.gov/drought/calendar/events/california-nevada-drought-climate-outlook-webinar-july-24

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