

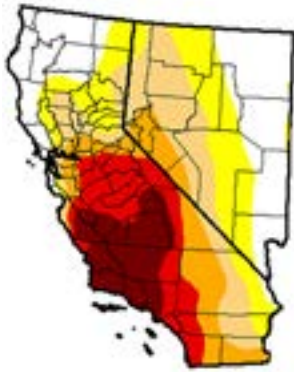


# NATIONAL INTEGRATED DROUGHT INFORMATION SYSTEM

## CALIFORNIA-NEVADA DROUGHT OUTLOOK

### JANUARY 2017

U.S. DROUGHT MONITOR FOR JAN. 3, 2017



**Drought intensity**

Yellow: D0: Abnormally dry  
Orange: D1: Moderate drought

U.S. DROUGHT MONITOR FOR JAN. 24, 2017



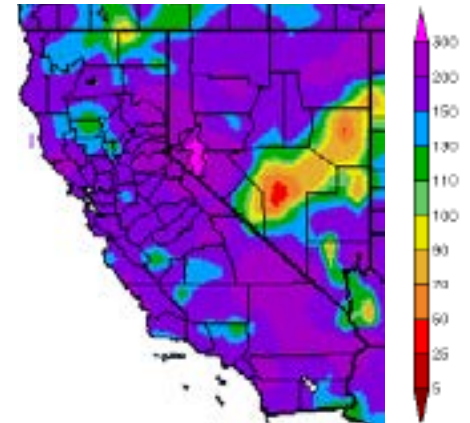
Orange: D2: Severe drought  
Red: D3: Extreme drought  
Dark red: D4: Exceptional drought

U.S. DROUGHT MONITOR CLASS CHANGE: JAN. 3 - JAN. 24, 2017



Grey: No change  
Light green: 1 Class improvement  
Medium green: 2 Class improvement  
Dark green: 3 Class improvement  
Blue-green: 4 Class improvement

% NORMAL PRECIPITATION WATER YEAR THROUGH JAN. 29, 2017 (OCT. 1, 2016 - JAN. 29, 2017)



<http://droughtmonitor.unl.edu/>

### CURRENT CONDITIONS

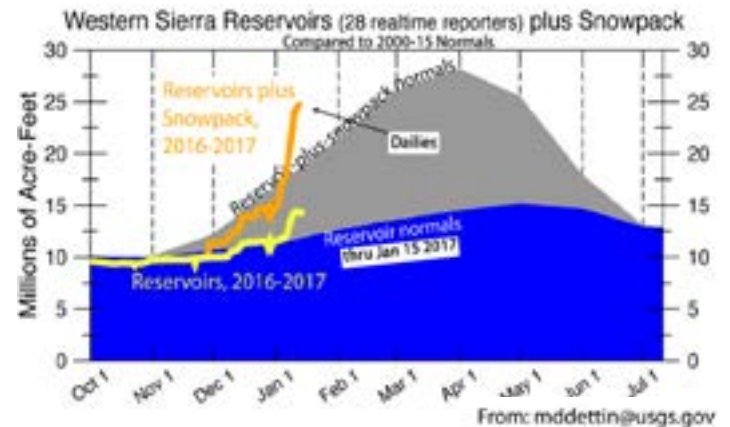
Drought conditions have improved greatly in California and Nevada, with removal of drought in parts of Nevada and Northern California and slower, albeit notable, drought reduction in Southern California. Much of this improvement has been since January 1, 2017, with widespread one to three class improvements in the past 4 weeks. As of January 24, only 51.4% of California and 5.93% of Nevada remain in moderate to exceptional drought according to the U.S. Drought Monitor (USDM) (compared to 97.17% and 73.26% at this time last year, respectively).

These improvements are due to near and above normal precipitation region-wide. Since the beginning of the 2017 water year (WY 2017) precipitation totals across both states are above normal, with much of the region receiving over 200% of normal January precipitation. These marked improvements are in large part the result of several large (and frequent) precipitation events called atmospheric rivers, in January. Atmospheric rivers (ARs) are narrow corridors of high water vapor transport in the lowest 2 km of the atmosphere. ARs can produce abundant and often intense rainfall and are especially important in California because they can boost rainfall totals (especially important for the replenishment of rain-fed reservoirs, surface water supplies and groundwater aquifers) but can also result in natural hazards such as flooding, intense runoff and landslides.

Snow drought, an increasingly common occurrence in the West in recent years, is a result of above average temperatures causing precipitation that would normally be expected to fall as snow to occur instead as rain. The most basic definition of snow drought is above normal precipitation accumulation and below normal snow water equivalent (SWE) occurring at the same time. This can

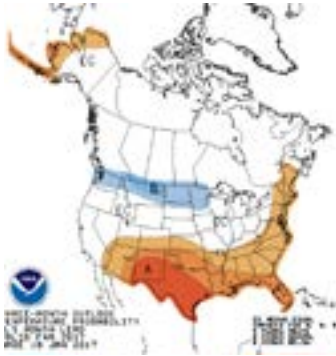
result in diminished snow accumulation and increased, or early runoff. In late 2016, the Sierra Nevada snowpack in California was 66% of normal, despite above normal precipitation from several ARs, due to above normal temperatures during storms resulting in temporary snow drought conditions. However, continuous storms through mid-January 2017 brought heavy snowfall and lower snow levels and resulted in greatly improved regional snowpack. As of January 19, SWE observations are above normal for this time of year. Nevada SNOTEL sites show 125% to greater than 200% above normal for this time of year, while California Department of Water Resources (CA DWR) north, central, and south automated snow sensors in the Sierra Nevada are at 145%, 175%, and 203% of normal, respectively.

Currently California's snowpack is 108% of the April 1st normal and many reservoirs in Northern California are near or above historical normals with some nearing flood control release

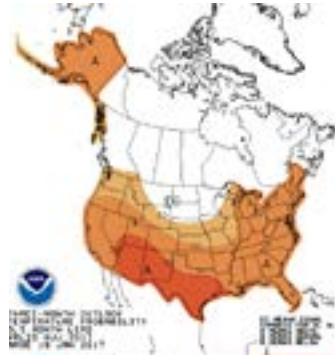


From: mddettin@usgs.gov

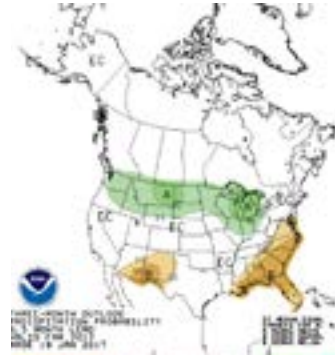
**OUTLOOK: TEMPERATURE  
FEB-MAR-APR**



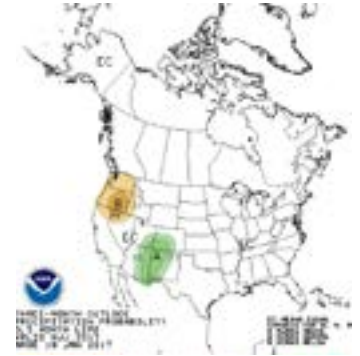
**MAY-JUN-JULY**



**OUTLOOK: PRECIPITATION  
FEB-MAR-APR**



**MAY-JUN-JULY**



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

levels. Reservoir levels are very important for California’s water supply, but many regions (including the Central Valley) are groundwater dependent and even with January’s above normal precipitation groundwater conditions have not yet stabilized or are unknown. Although drought conditions are much improved, cautious optimizing is advised. Warm and dry conditions between now and April 1st 2017 could result in early melting and sublimated snowpack potentially setting the stage for continued drought conditions throughout the rest of the year.

**FLOODING IN TIMES OF DROUGHT**

Recent intense storm events can help alleviate drought impacts, but can also cause flooding. As a result, a region may be dealing with drought and flooding events simultaneously. While it is true that many parts of California have seen extreme amounts of precipitation in recent months, resulting in vastly improved drought conditions, Southern California has not experienced the same level of improvements. Through mid-January, much of Southern California was still classified as Extreme to Exceptional Drought (D3-D4) while under flood watches and warnings, including San Luis Obispo, Santa Barbara, Ventura, Los Angeles, Orange and San Diego counties.

While rain and snowpack totals are key inputs in the USDM decision making process, the USDM also takes into account a variety of factors including, but not limited to reservoir storage, surface and groundwater conditions, and range and forestland health. If Southern California continues to receive precipitation throughout the coming months, the USDM

will be updated to reflect these improved water supply, soil moisture and other conditions important for measuring the severity of drought.

Even though recent precipitation in Southern California is beginning to help ameliorate drought conditions in the region locally, there are still tremendous deficits remaining, especially in local reservoirs and groundwater supplies. One of the best examples of this remaining deficit is Lake Cachuma, a rain-fed reservoir that supplies approximately 40% of Santa Barbara’s drinking water, and is currently only at 13% of normal (according to the CA-NV River Forecast Center Summary).

**CLIMATE OUTLOOK**

Over this past fall into early winter, equatorial sea surface temperatures (SST) cooled and reached weak La Niña conditions in the tropical Pacific Ocean and currently La Niña conditions are present. This means that equatorial (Niño 3.4 region) SSTs during the last 4 weeks were below average in the central and east-central Pacific Ocean. As of January 19, NOAA’s Climate Prediction Center (CPC) has issued a La Niña Advisory. Most multi-model averages favor continuing weak La Niña conditions through the Northern Hemisphere with a transition to ENSO neutral conditions by February 2017. Early forecasts favor ENSO-neutral through mid-2017 with a chance of El Niño (~35%) or La Niña (~15%) developing by August-September-October 2017.

The CPC Seasonal Outlooks as of January 19th show equal chances of above, below, and average temperatures and precipitation in February-March-April in California and Nevada. This pattern is

forecasted to continue through much of spring with a slight favoring in the odds of above normal temperatures in southern California and southern Nevada and drying of northern California and northwestern Nevada. Through the end of April, drought is expected to persist in the far southern portion of California with areas of southern and central California and southwestern Nevada forecasted to remain in drought but improving and drought removal likely. High uncertainty remains. For shorter term forecasts, please see the 8-14 day outlooks provided by your local NWS office or CPC.

**ABOUT THIS OUTLOOK**

On January 23, 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/ca-nv-drought-climate-outlook-webinar-jan-23>

**CONTRIBUTORS**

- Daniel McEvoy, WRCC/DRI
- Cindy Matthews, NWS WFO Sacramento
- Tim Bardsley, NWS WFO Reno
- Andrea Bair, NWS Western Regional Headquarters
- Ben Hatchett, DRI
- Amanda Sheffield, SIO/UCSD
- Alicia Marrs, NOAA/NIDIS

