

Weather and Climate Summary and Forecast Winter 2015-16

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January 14, 2016

Finally a winter; relief from the drought but too much, too quickly for some. But first to the month that was, December 2015. Temperature patterns were flipped in December with the PNW and northern Rockies seeing slightly warmer than normal conditions, while most of California and into the SW was slightly cooler than normal (Figure 1). The cooler conditions across California and the SW was due to increased cloud cover during the month. While not shown in Figure 1, the eastern US experienced one of its warmest Decembers on record ... quite a difference from the previous December with feet of snow on the ground.

The December precipitation pattern over the west was nearly opposite of what would be expected in a normal El Niño year. From Northern California into the PNW and Canada, the region saw 200% or more above normal precipitation, while the much of Southern California and into the SW saw much below normal precipitation (Figure 1). The rest of the US was mixed with a dry December into much of the Great Basin and scattered across the Rockies, while the much of the Midwest and Southeast were substantially wetter than normal (not shown). Again, so far this El Niño is not behaving like other recent large events (see next section).

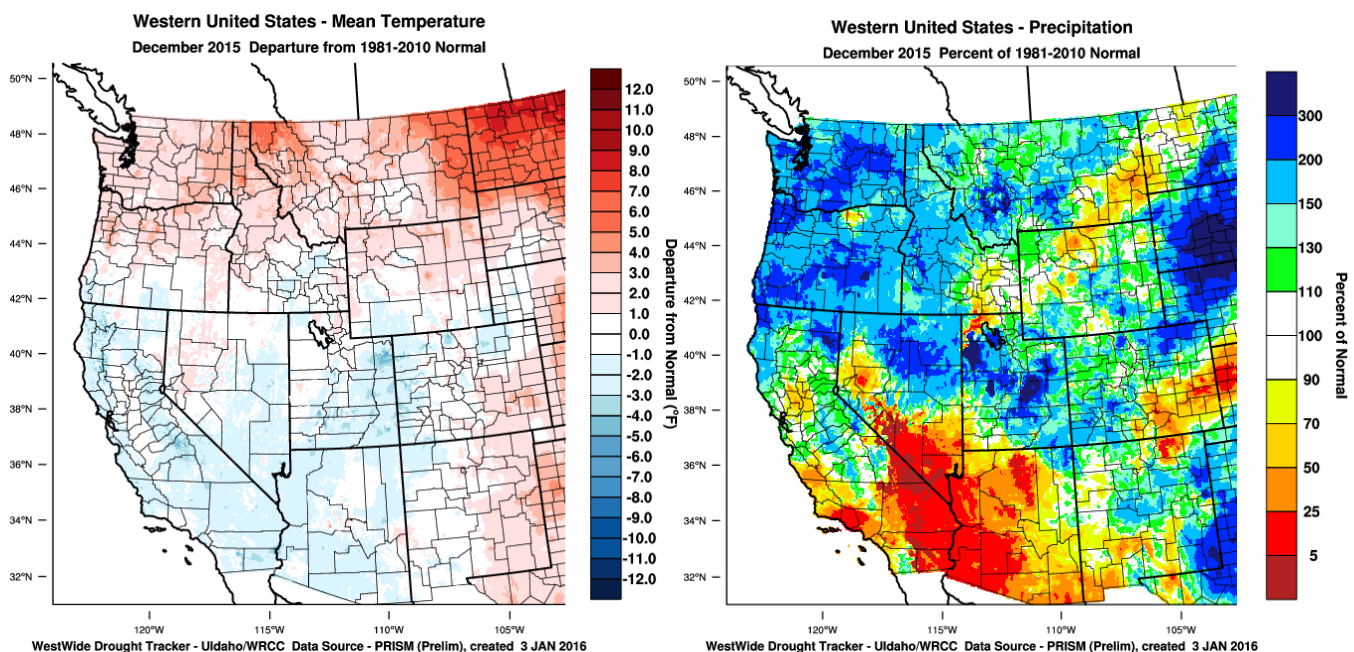


Figure 1 – Western US December 2015 temperature departure from normal (left) and percent of normal precipitation (right; images from WestWide Drought Tracker, Western Region Climate Center; University of Idaho).

Preliminary summary maps of 2015 show that the year was warmer than normal over the western US (Figure 2). Average temperatures ended up 1.0-4.0°F or more above the 1981-2010 climate normal, especially in the PNW where up to 6°F above normal was seen in some areas. This pattern continues across the entire US, but with temperature differences from the plains to the Midwest, Southeast and eastern US not as much as we saw in the west, running 1.0-2.0°F (not shown). Again, globally 2015 is on track to be the warmest year since good records have been kept (beating the record set last year). Precipitation amounts in 2015 were mixed across the west with drier than normal conditions throughout most of California, into portions of Oregon and inland regions in the Great Basin and Northern Rockies (Figure 2). The rest of the US was generally wetter than average, especially from Texas into the Great Plains and the Ohio River Valley and in portions of the Southern Eastern US (not shown). The US Drought

Monitor in early January reflects the 2015 rainfall pattern with continued dry conditions much of the west, and a return to normal conditions in the PNW and much of the rest of the US (Figure 3).

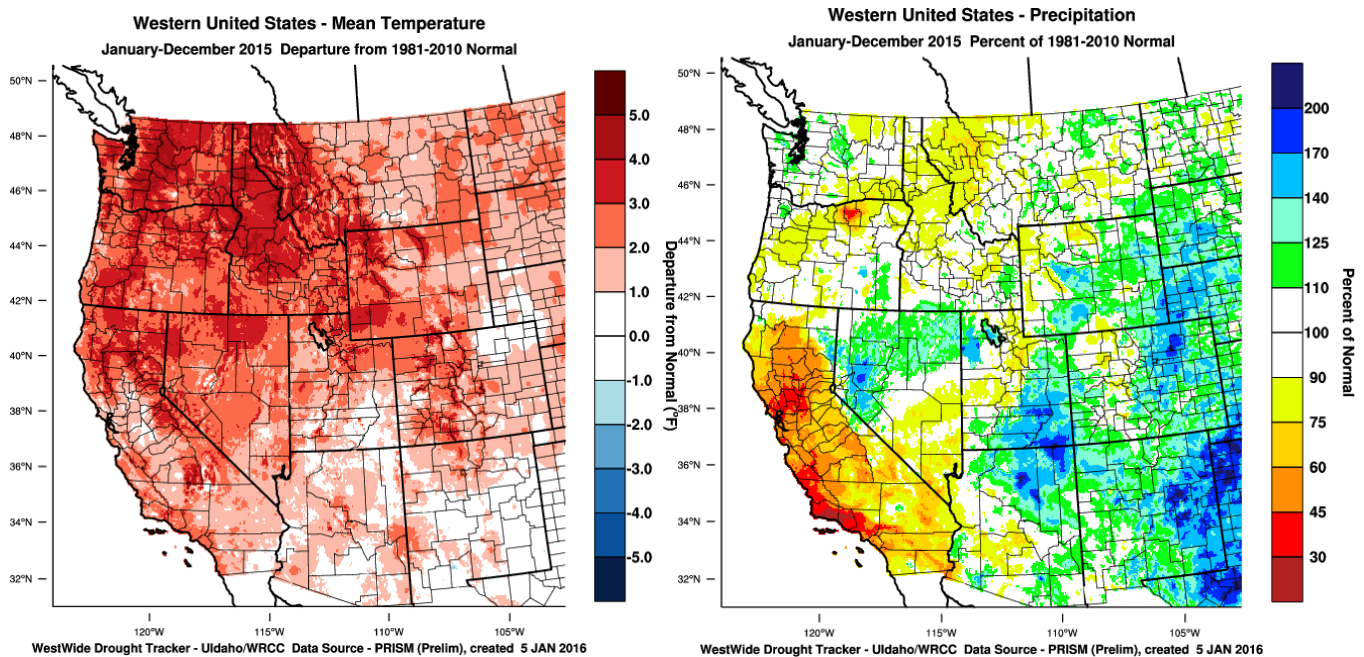


Figure 2 – Western US January through December 2015 temperature departure from normal (left) and percent of normal precipitation (right; images from WestWide Drought Tracker, Western Region Climate Center; University of Idaho).

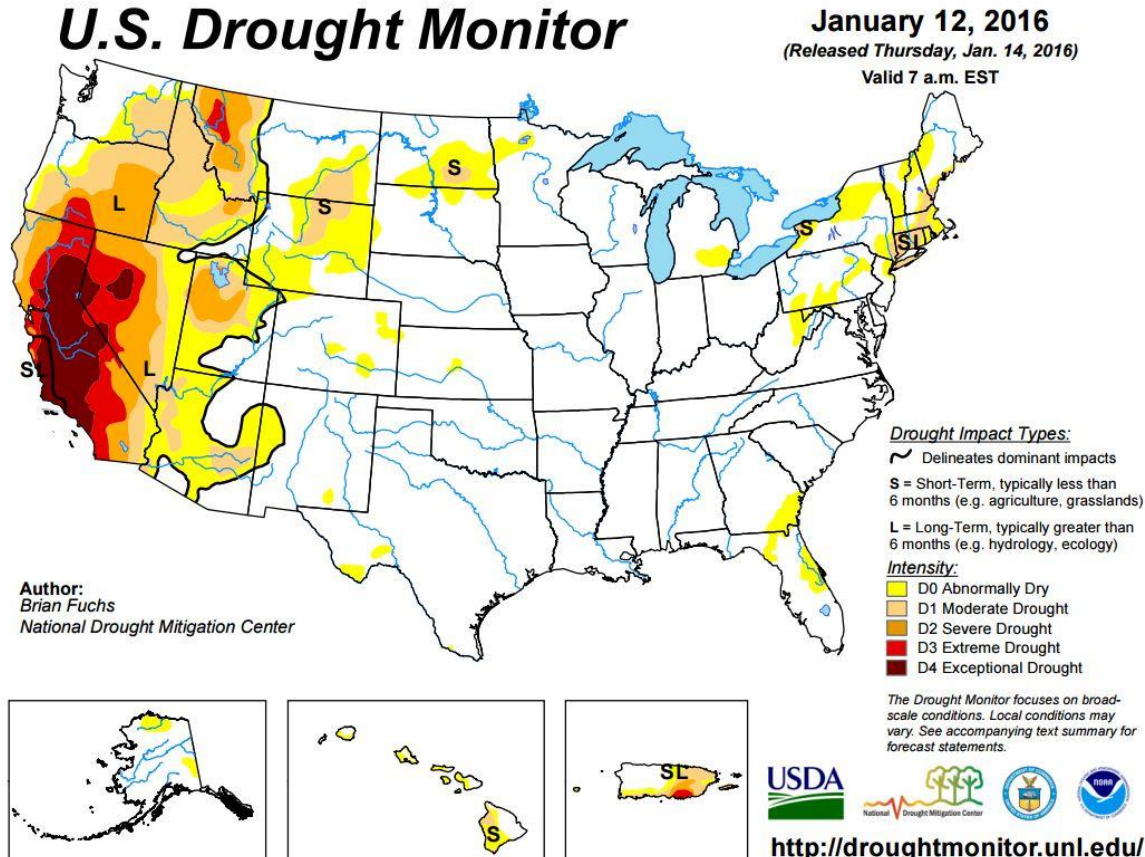


Figure 3 – Current US Drought Monitor.

El Niño Watch – As of January 14, 2016 the Climate Prediction Center still has the status as an “El Niño Advisory”. However, the CPC and other agencies throughout the Pacific are indicating that the current strong El Niño will weaken with a transition to ENSO-neutral during the late spring or early summer. Forecasters from many governments in the Pacific are in agreement with the general model consensus, though the exact timing of the transition is difficult to predict. However, El Niño effects throughout the region are expected to continue as there is a lag time from when the ocean temperatures shift to when the atmosphere responds. Therefore, the CPC seasonal outlooks (see below) indicate an increased likelihood of above-median precipitation across the southern tier of the US, and below-median precipitation over the northern tier of the US. Above-average temperatures are favored in the west and northern US with below-average in the southern Plains and along the Gulf Coast.

As mentioned last month the current El Niño has not brought similar impacts over the western US compared to other large El Niños. In the PNW we have seen much greater precipitation than would be expected, while it has been colder than normal. While in Northern California, precipitation in the winter is trailing the amounts during the start of the previous largest appearances of El Niños (1997 and 1982). However, reservoirs in California are getting some much needed inflow, whether it will be enough to lower lingering drought concerns is the issue. Also, snow packs over the western US are in much better shape than they were at this time last year. But we still have a long way to go to get to the average for the water year.

North Pacific Watch – the “blob” of warmer than normal sea surface temperatures in the North Pacific continues, but has continued to weaken slightly (Figure 4). However, current index values of the Pacific Decadal Oscillation have been running strong positive, indicating that the warm phase is in place. The current long range forecasts continue (see below) to be driven by the combined effects of a warm North Pacific and El Niño conditions in the tropics, but will start to transition as we get further toward spring. As detailed in previous months, from historical analogs (years with similar conditions), the western US would be expected to experience:

Spring (Feb-Apr) – El Niño transitioning to neutral and a warm North Pacific would typically have springs that transition quickly to warmer and drier from the northern most counties in California into the PNW and up into Canada and Alaska in most years. Near normal spring temperatures from the North Coast southward along with very likely higher rainfall amounts. However, during these types of years in the past there is a much greater risk of extreme, heavy rainfall in the late spring across California and the southwest. The ultimate precipitation pattern and amounts will depend on how this El Niño transitions over the next few months.

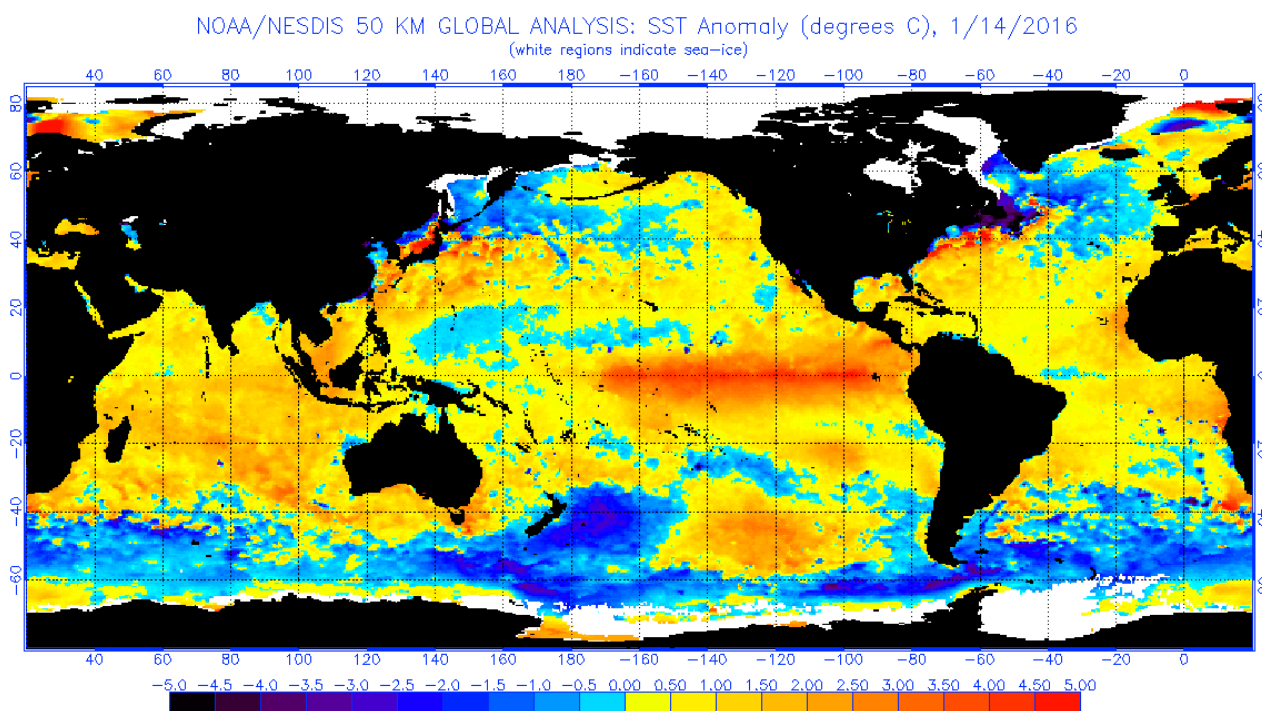


Figure 4 – Global sea surface temperatures (°C) for the period ending January 14, 2016 (image from NOAA/NESDIS).

Forecast Periods:

6-10 Day: Forecast is tending warm and wet over most of the western US while the eastern half of the country will likely see cooler and drier conditions. This is due to slight shift to a trough over the North Pacific, ridge over the western US, and a trough into the Midwest and eastern US. The trough in the North Pacific will spin off a series of storms into the western US keeping the precipitation levels near normal to greater than normal for the west coast for this time of year.

8-14 Day: Does not deviate much from the 6-10 day forecast with the overall pattern dominated by a greater chance of warm/wet in the west and cool/dry in the east. Circulation over the North Pacific is likely to continue favoring frequent storms tracking into the western US.

30 Day: Forecast through the rest of January is holding to a more classic El Niño pattern with a likelihood of warm and relatively dry conditions from the PNW east across the northern tier of states and wet/warm in Southern California then wet/cold across the southern states.

90 Day: Even with some slight departures over the first half of the winter from the expected El Niño patterns, the January-February-March (JFM) forecast continues to be dominated by more classic El Niño patterns in expected temperatures and precipitation. The JFM forecast exhibits a greater chance of broader warmer than average conditions in the western US and across the northern states. For precipitation, the JFM outlook tilts the odds to near normal to below median precipitation in the PNW and across the northern Rockies and into the Great Lakes. The forecast pattern also continues to show the expansion of above normal precipitation for the central to southern portion of California into the desert SW, Texas and the southeast. If El Niño conditions continue this will likely hold, however there can be large variance in where rain events occur and how much moisture they deliver.

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