Weather and Climate Summary and Forecast

Winter 2015-16

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The first month of winter has come and gone with November bringing the western US its first widespread cooler than average month in a long time (Figure 1). Relatively cold conditions for this time of year settled in over the west due to a strong dome of cold air sweeping down into the center of the US. The western US temperature pattern was near normal to substantially cooler than normal for parts of California and most of Nevada (Figure 1). Even with the cold air event that influenced the majority of the US around Thanksgiving, the eastern US saw a substantially warmer than normal November (not shown).

The November precipitation pattern over the west reflects the broader storm tracks that occurred during the month. Western Washington northward into British Columbia saw higher than normal rainfall and central California east into the Sierra Nevadas received much higher than normal precipitation with welcomed early mountain snows. However, other locations in the western US where drier than normal during November (Figure 1). So far this El Niño is not behaving like other recent large events (see next section). For the rest of the US the dominant pattern for November was 150-300 percent of normal rainfall throughout the middle of the county and into the southeast (not shown).

Year to date conditions over the western US shows warmer than normal conditions pretty much everywhere (Figure 2). Average temperatures continue to run 1.0-4.0°F or more above the 1981-2010 climate normal. Across the rest of the US temperatures since the start of the year have been near average to warmer than average (not shown), while globally 2015 is on track to be the warmest year since good records have been keep (beating the record set last year). Annual precipitation amounts to date show the continued dry conditions with most of California, Oregon and Washington seeing 30 to 75% of normal since the first of the year (Figure 2). The rest of the US has seen a mixed pattern with higher than average precipitation in Texas up into the Great Plains and the Ohio River Valley while New England has been drier than average (not shown). The US Drought Monitor continues to show the severe to exceptional drought over most the west, although western Washington up into British Columbia has seen enough rains to lower the drought conditions (Figure 3).

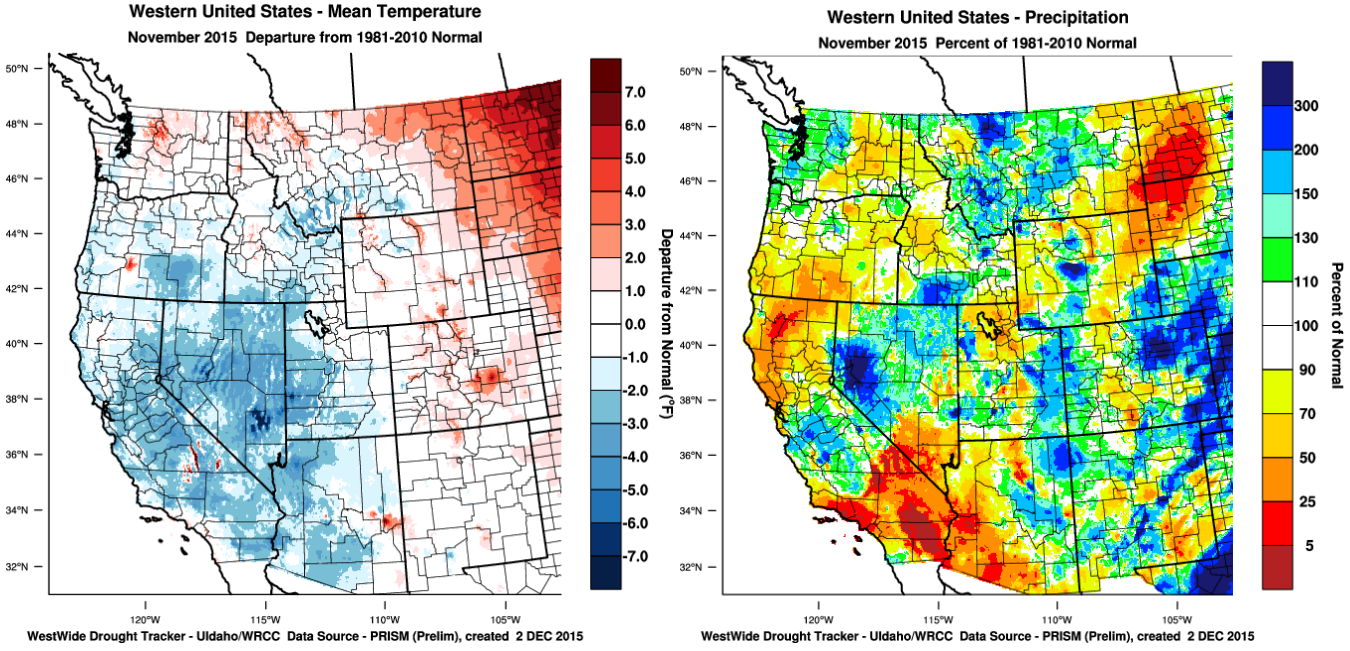

Figure 1 – Western US November 2015 temperature departure from normal (left) and percent of normal precipitation (right; images from WestWide Drought Tracker, Western Region Climate Center; University of Idaho).

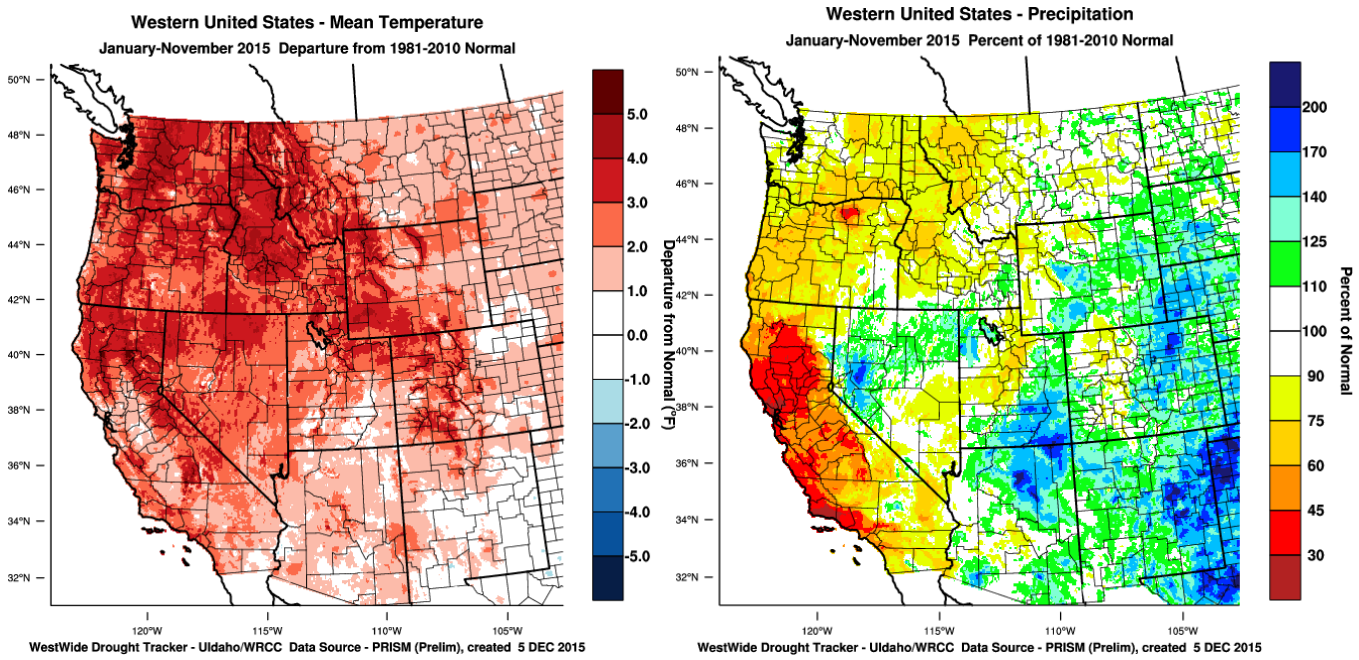

Figure 2 – Western US January through November 2015 temperature departure from normal (left) and percent of normal precipitation (right; images from WestWide Drought Tracker, Western Region Climate Center; University of Idaho).

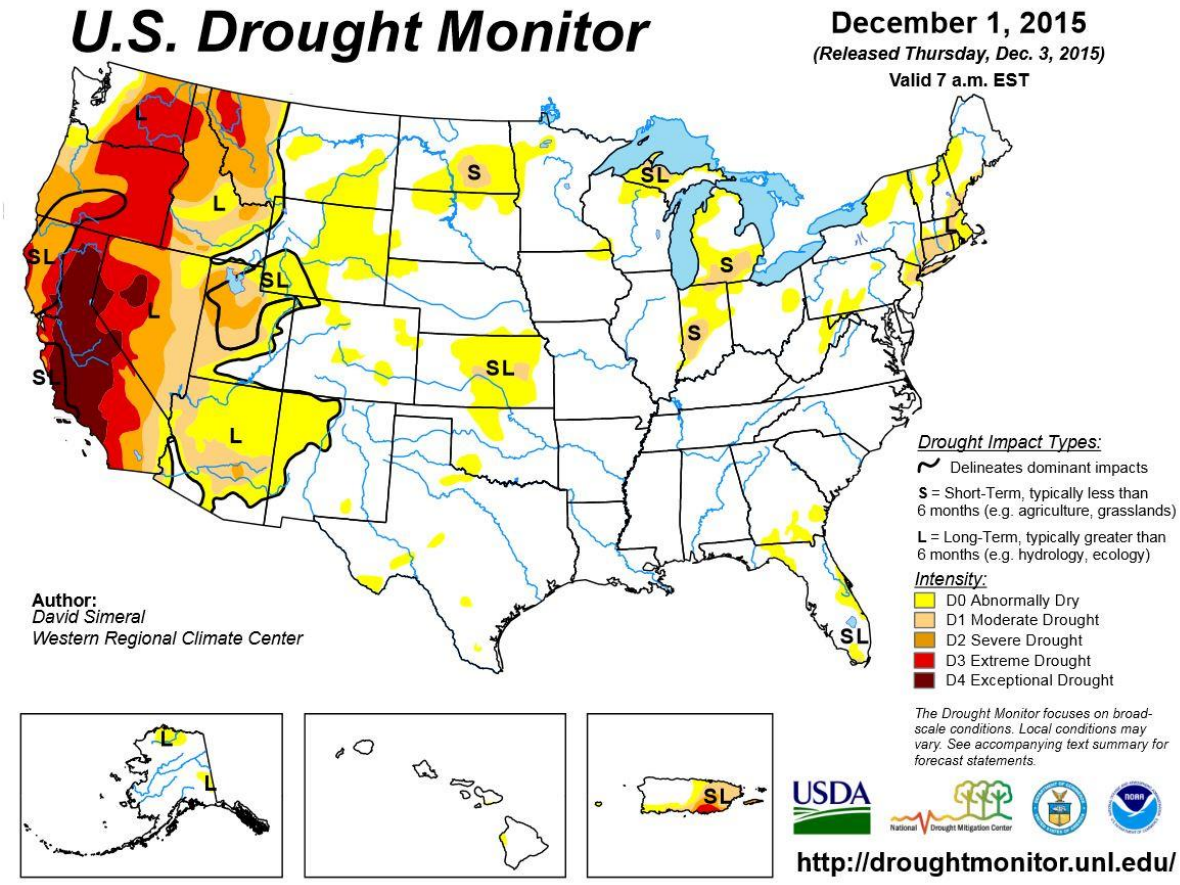

Figure 3 – Current US Drought Monitor.

El Niño Watch – As of December 10, 2015 the Climate Prediction Center still has the status as an "El Niño Advisory". As such the CPC states that El Niño is expected to remain strong through the Northern Hemisphere winter 2015-16, with a transition to ENSO-neutral anticipated during late spring or early summer 2016. The CPC Seasonal outlooks (see below) indicate an increased likelihood of above-median precipitation across the southern tier of the United States, and below-median precipitation over the northern tier of the United States. Above-average temperatures are favored in the West and northern half of the US with below-average in the southern Plains and along the Gulf Coast.

For the first part of winter, this El Niño is not behaving like other events. In the PNW we have seen much greater precipitation, in heavy events, while it has been colder than normal. While in Northern California, precipitation in the second half of this year is trailing the amounts during the start of the previous largest appearances of El Niños (1997 and 1982). The shortfalls are especially acute in the North Coast; for example Napa has totaled only 2.33 inches of rain from July 1 through December 5, according to the National Weather Service. That compares to the city's 10.52 inches of rain during the same period in 1997, and 13.07 inches in 1982.

However, we still have time as El Niño events have tended to deliver the bulk of their precipitation during December through March. It is just that the atmospheric circulation pattern right now is favoring heavy events bringing flooding potential to the PNW or pushing moisture into Texas and the southeast. This overall pattern in the pre-dominant flow of the atmosphere will have to shift to bring some much needed rains and snows into California.

North Pacific Watch – the "blob" of warmer than normal sea surface temperatures in the North Pacific continues (Figure 4). Current index values of the Pacific Decadal Oscillation have been running strong positive, indicating that the warm phase is in place. The main result of the warmer waters is that humidity levels are up across the west, along with nighttime temperatures. 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. As detailed in previous months, from historical analogs (years with similar conditions), the western US **would be expected** to experience:

Winter (Oct-Feb) – typically much warmer and drier from the northern most counties in California into the PNW and up into Canada and Alaska in most years. Near normal winter 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 winter across California and the southwest. The ultimate precipitation pattern and amounts will depend on the strength of this El Niño. (winter analogs did not change from previous months)

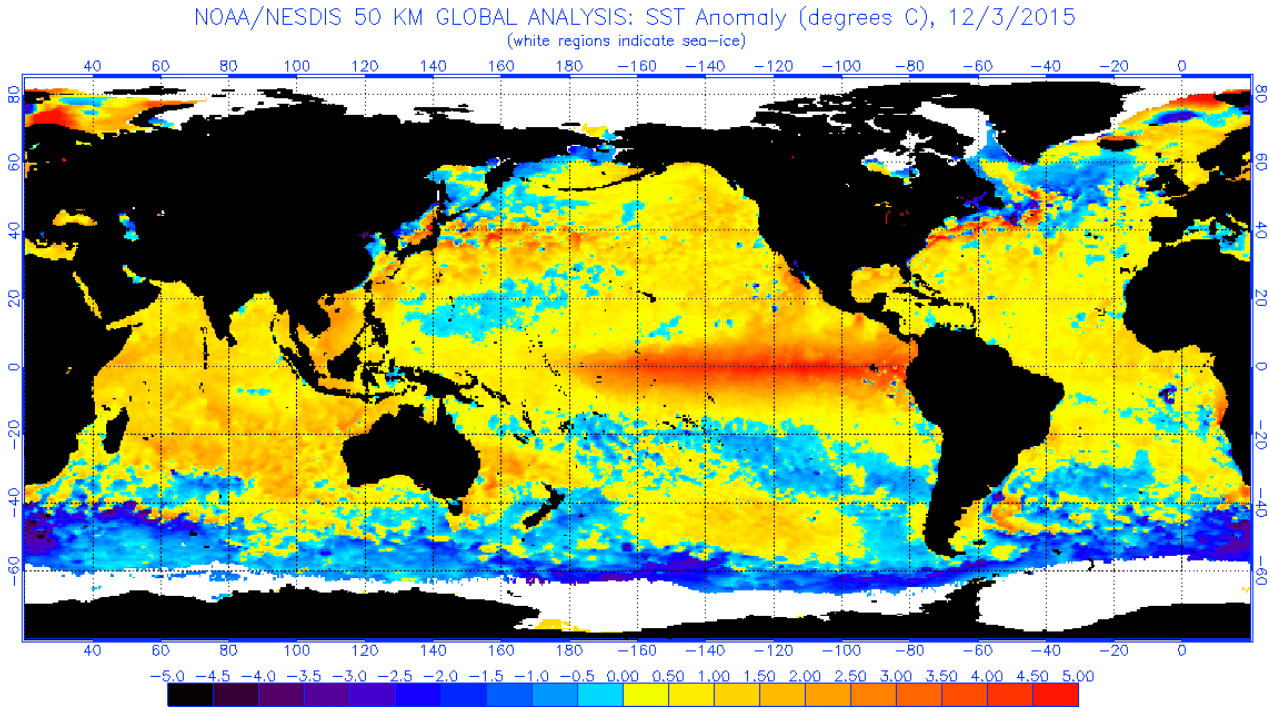

Figure 4 – Global sea surface temperatures (°C) for the period ending December 3, 2015 (image from NOAA/NESDIS).

Forecast Periods:

6-10 Day: Forecast is tending cold and wet over the entire western US while the eastern half of the country will likely see warm and wet conditions. A series of storms dropping down out of the Gulf of Alaska and into the western US will likely bring rain (heavy at times) and mountain snows every 24-36 hours.

8-14 Day: An extension of the 6-10 day forecast with the overall pattern dominated by cold/wet in the west and warm/wet in the east. Circulation over the North Pacific favors frequent storms tracking into the western US.

30 Day: Even with a strong likelihood of cold/wet conditions in the short term, the longer term forecast is still tilting the odds to a warmer than normal west coast. The desert SW and intermountain west will likely stay cooler than average while the eastern US is forecasted to be much warmer than average. Precipitation amounts are forecasted to be wet in the PNW, dry into the northern Rockies Mountains, near normal into California and wet into Texas and the southeastern US.

90 Day: The December-January-February (DJF) forecast continues to be dominated by El Niño developments. Forecasts are pretty much following the typical El Niño influences with greater chances of broader warmer than average conditions in the western US. Alaska and the PNW are forecast to be the warmest regions, but the entire western states are forecasted to see a mild mid-winter. For precipitation, the NDJ outlook tilts the odds to near normal to below median precipitation in the PNW and the northern Rockies. The forecast pattern also continues to show the expansion of above normal precipitation for the southern portion of California into the desert SW, Texas and the southeast. This is a classic pattern driven by historic conditions during El Niño. However, El Niño conditions can have a large variance in where and when the onset of rains occur, so only time will tell.

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