Weather and Climate Summary and Forecast Fall 2015

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As harvest winds down, or in many cases comes to a close, the month of September provided a very nice end to the season. Temperatures cooled to near normal, especially at night, but rain mostly stayed away providing a long and unpressured harvest period which is likely to continue into the first couple of weeks of October (see forecast periods). Overall September temperatures in the US were largely warmer than normal except near normal in the southeast and cooler than normal in the PNW. The pattern in temperatures over the western US (Figure 1) resulted from a strengthening trough over the Gulf of Alaska (which is normal for this time of year) that brought down temperatures in the north but was not strong enough and eventually lost out to the ridge to the south. For the western US conditions were cool north (Figure 1); near normal to 1.0-2.0°F below normal from coastal Northern California into Oregon and Washington; while 1-4°F warmer than average south into California and the Great Basin and Rockies (Figure 1). Precipitation nationally was mixed with the majority of the country drier than normal and isolated areas wetter than normal. The greatest deviation from normal was seen in Southern California where events bringing tropical moisture northward resulted in more rain in September than average conditions along the North Coast, in the Olympics and Southern California, while the rest of the west was drier than normal.

Changes in day length and the cooler air out of the Gulf of Alaska brought nighttime temperatures down in the PNW, while higher than average nighttime temperatures continued in September for the rest of the western US. The overall pattern of warm nighttime temperatures is a result of warm Pacific SSTs (Figure 2) and is likely to continue into the 90 day forecast period (see below). Growing degree-days continue at slightly above to record numbers throughout the west. Even with the September cool down, Washington has seen the largest increases in degree-day accumulations with totals as of October 1st 30-35% over the 1981-2010 averages, while in California wine regions are running 15-25% above normal. For Oregon April through September accumulations are running close to the record numbers seen in 2014 (see the Appendix figure for four locations in Oregon) and 20-25% above the 1981-2010 climate normals.



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

El Niño Watch – <u>NO CHANGE</u> from last month as all monitoring agencies worldwide continue to show and forecast strengthening El Niño conditions (warm tropical waters off South America, Figure 2). Tropical sea surface temperatures and warming with depth show a reservoir of heat energy to sustain the current El Niño. Current long lead forecasts are giving it a 90% chance of lasting through winter and 80% chance of lasting into spring 2016. However, confidence on impacts on weather in the west is not as high and runs differently depending on the reporter and news outlet (oh the sensationalism!). While it appears that the El Niño will likely bring welcomed moisture this fall/winter to Southern California, the desert SW, and the Great Basin (see forecast periods below), how far it reaches northward and how much it brings are the unknowns. As the event unfolds over the fall, conditions will become more forecastable for the rest of the winter. For general conditions commonly seen during these type of events see the Forecast Periods below for more information.

North Pacific Watch – <u>NO CHANGE</u> ... the "blob" of warmer than normal sea surface temperatures in the North Pacific continues (Figure 2). 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 last month, from historical analogs (years with similar conditions), the western US would be expected to experience:

Summer (June-Sept) – warmer from the North Coast of California into Oregon and Washington, cooler from the Bay Area south and into the southwest. The cooler conditions south would be expected from increased cloud cover, precipitation, and higher humidity levels from southwest flow from the El Niño region. Thunderstorm activity during the summer from the central valley of California north into Oregon also increases during these conditions. Similar conditions in the last 30 years occurred during the 1992, 1998, 2003, 2004, and 2005 growing seasons.

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. (summer and winter analogs did not change from last month)



Figure 2 – Global sea surface temperatures (°C) for the period ending October 1, 2015 (image from NOAA/NESDIS).

Forecast Periods:

6-10 Day: The ridge over the western US appears to mostly hold over the next couple of weeks. The result is there is only a slight chance of rain in the forecast mid-week and next weekend. Chance of rain increases north into the Olympics, but amounts will be light pretty much everywhere. The result over the short term is for warmer than normal conditions over the entire western US. Precipitation forecast over the 6-10 day period is normal to wetter than normal from northern Oregon into Washington, while all points south and southeast will likely continue to see drier than normal conditions. Cool nighttime temperatures likely to continue, but nothing approaching frost conditions in the 6-10 day forecast.

8-14 Day: Same thing ... not much change from the end of the 6-10 day forecast period. Temperatures are forecast to trend warmer than normal over the entire western US. Precipitation forecast two weeks out points to a continued drier than normal California and interior western US states. The PNW has a higher likelihood of near normal to slightly higher than normal precipitation. Cool nighttime temperatures likely to continue, but nothing approaching frost conditions in the 8-14 day forecast.

30 Day: The outlook for October favors above normal temperatures in much of Alaska and all of the PNW, California, the intermountain west, and the northern and central Rockies. The 30 day forecast for precipitation has no clear signal with an equal chance for slightly above, normal or slightly below for Washington, Idaho, Oregon and into central California. Probable continue enhancement of El Niño conditions has forecasters pointing to a higher likelihood of a wetter than average October for extreme southern California, the desert SW, and into Texas.

90 Day: The October-November-December (OND) forecast is 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. The Alaska and the PNW are forecast to be the warmest regions, but the entire western states is likely to see a mild start to winter. For precipitation, the OND outlook tilts the odds to below median precipitation in the PNW, equal chances south into northern to central California and above normal for the southern portion of California into the desert SW and Texas. 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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Appendix Figure – Cumulative growing degree-days (base 50°F, no upper cut-off) for McMinnville, Roseburg, Milton-Freewater, and Medford, Oregon. Comparisons between the current year (2015) and a recent cool year (2010), a recent warm year (2014) and the 1981-2010 climate normals are shown (NCDC preliminary daily data).