Weather and Climate Summary and Forecast

Summer 2015

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After a record breaking June, July brought some changes that were welcomed and some that were not. The main differences in July were the result of cut-off or thermal low pressure areas, with warm and moist southerly flow that increased cloud cover, brought thunderstorms, and rain to many areas. Unfortunately these thunderstorms also brought lightning that has sparked numerous fires and now has much of the west under a blanket of smoke (see forecast discussion). Temperatures over the western US were largely above normal from Northern California into the PNW (Figure 1), while cooler than normal over much of Southern California and into the Great Basin. While Seattle and Portland experienced a July 5°F or more above normal, San Francisco was only 2°F above, Los Angles right at normal and Las Vegas and Phoenix 1-2°F or more below normal. The pattern of temperatures (warmer vs cooler) is a direct result of cloud cover and moisture from the subtropics. The pattern can also be seen in the July precipitation where large areas of California, Nevada and portions of the Great Basin saw 200-300% or more of normal. However, the dramatic pattern seen in the blues needs to be taken lightly as 300% of next to no rainfall normally is still very little rainfall in total. Preliminary data from the thunderstorms in July show that lightning strikes are running higher than average this year.

Continuing the trend from previous months, nighttime temperatures were higher in July over much of the western US. This is largely the result of the warmer than normal sea surface temperatures in the North Pacific (Figure 2), but also from the increased flow from the subtropics that has come from the cut-off lows and monsoon flow. Growing degree-days continue at slightly above to record numbers throughout the west. Degree-days are currently at or above normal in California and substantially higher than normal in Oregon and Washington with April-July accumulations running 5-20% above the record numbers seen in 2014 (see the Appendix figure for four locations in Oregon) and 35-40% above the 1981-2010 climate normals. As reported in the media, record early harvests have already started in many regions and others are reporting that they saw a rapid progression through lag phase and into véraison, which now has many 2-6 weeks from harvest if conditions remain the same.

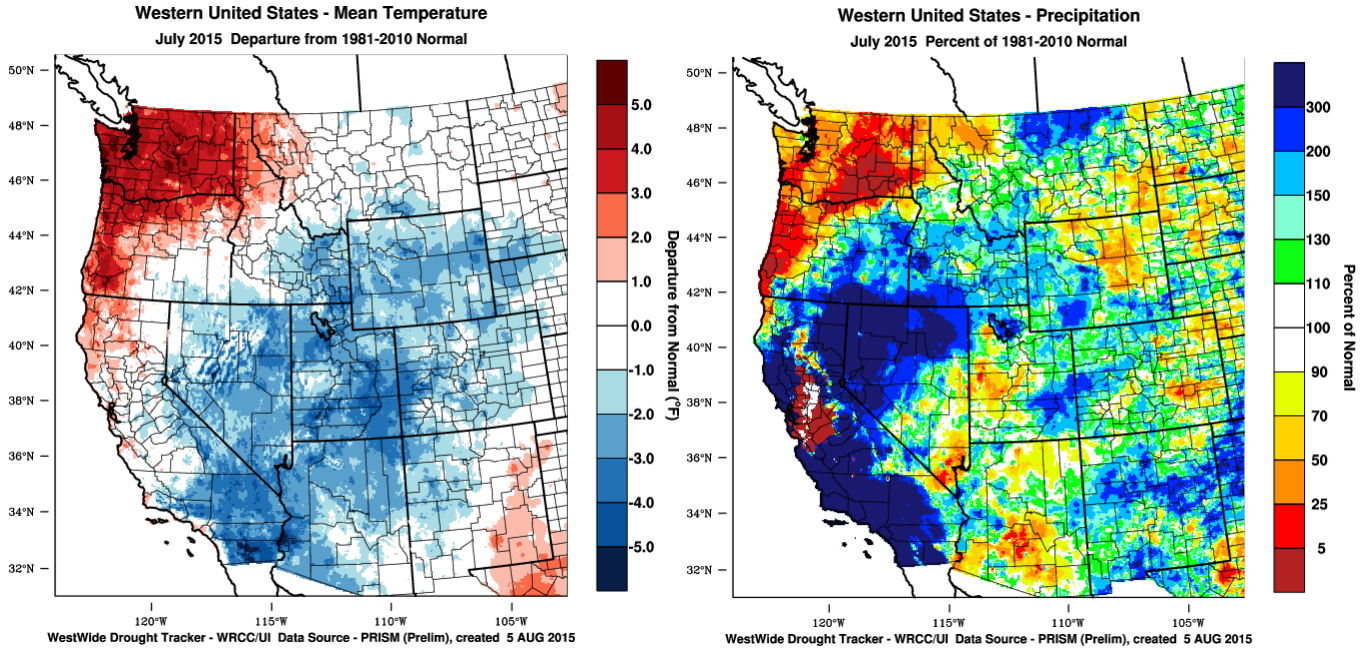

Figure 1 – Western US July 2015 temperature departure from normal (left) and percent of normal precipitation (right; images from WestWide Drought Tracker, Western Region Climate Center; University of Idaho).

El Niño Watch – meteorological agencies around the Pacific continue to show and forecast strengthening El Niño conditions (warm tropical waters off South America, Figure 2). While forecasts put the event as 99% likely to persist through the end of the year, confidence on its strength and impacts on weather in the west is not as high. The main reasons are that we have not had such warm tropic SSTs at the same time as very warm North Pacific SSTs (aka the blob). 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, how far it reaches northward and how much it brings are the unknowns. As the event unfolds over the summer/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 – 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)

Summer rains from cut-off lows and monsoon flow, which is likely ramped up some by the onset of the El Niño, has reduced some of the extreme drought in the southwest. However, the US Drought Monitor is showing a similar amount of the western US in severe to exceptional drought with long term persistence likely.

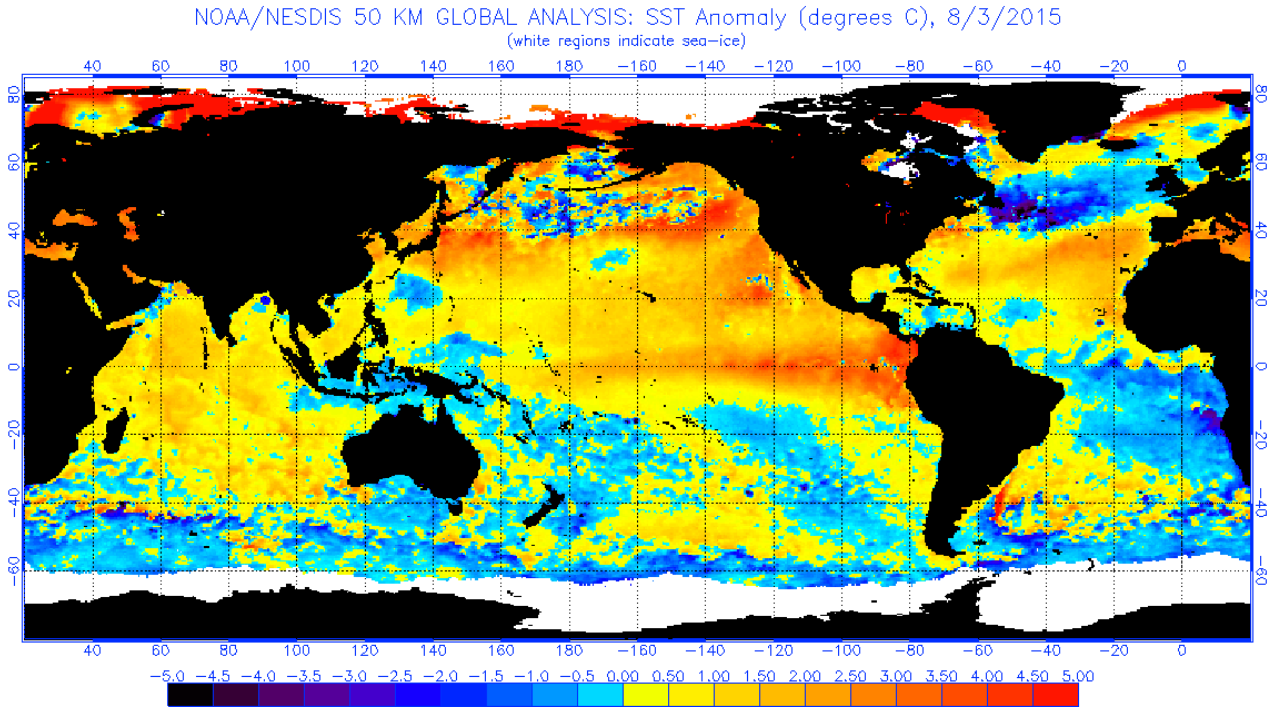

Figure 2 – Global sea surface temperatures (°C) for the period ending August 3, 2015 (image from NOAA/NESDIS).

Forecast Periods:

6-10 Day: For many this period will be dominated by smoke. Fires in many regions from Idaho, Washington, Oregon, and California are still active or being contained, but the atmosphere is not providing enough air flow to flush out all of the smoke. Some thunderstorm activity from the south and southeast has ushered in moderately extensive cloud cover, higher humidity levels and some rain, but not enough in most places to lay down the fires or clear out the air. Temperatures during this period are forecast to be slightly warmer than normal from southern to northern California, normal throughout the PNW, and cooler than normal into the Great Basin and up into Idaho. Precipitation during this period will likely come from isolated thunderstorm activity, but western Washington and northern Oregon is forecast to be slightly wetter than normal (remember that normal is very little in August). Higher moisture levels (humidity) are likely to continue and will keep nighttime temperatures warmer than normal.

8-14 Day: Big difference into this forecast period is that the air will likely finally mix enough to clear out much of the smoke, except in local zone near the fires. Temperatures are forecast to trend warmer, especially along the coast and into the central valley and southern portions of California. Precipitation out into the two week forecast will likely remain isolated to thunderstorms and is forecast to be normal over most of the west (remember that normal is very little in August) and drier than normal into the Great Basin. Slightly higher humidity levels should continue across the west.

30 Day: The outlook for August is showing warmer than normal conditions over the western US with the greatest deviation to warmer conditions in the PNW. The precipitation forecast during August reflects confidence in strengthening monsoon flow in the desert SW with most of the regions running from Arizona into Colorado and the central Plains expected above normal. California, Oregon and Washington are forecast to have an equal chance of slightly above to slightly below precipitation in August and will likely be influenced by the pattern of the monsoon flow, cloud cover, and rainfall amounts from thunderstorm activity.

90 Day: Not much change from the 30 day outlook to NOAA's seasonal outlook for Aug-Sep-Oct. Broad warmer than normal conditions are forecast throughout the west with the greatest chance in the PNW. The monsoonal pattern forecast for August is expected to continue, influencing the forecast for higher than normal precipitation in the desert SW and into the Rockies and central Plains. Again, confidence in this pattern is moderate and could shift west enough to bring late summer rains further west, but this calls for week to week forecast periods and will be monitored as harvest nears.

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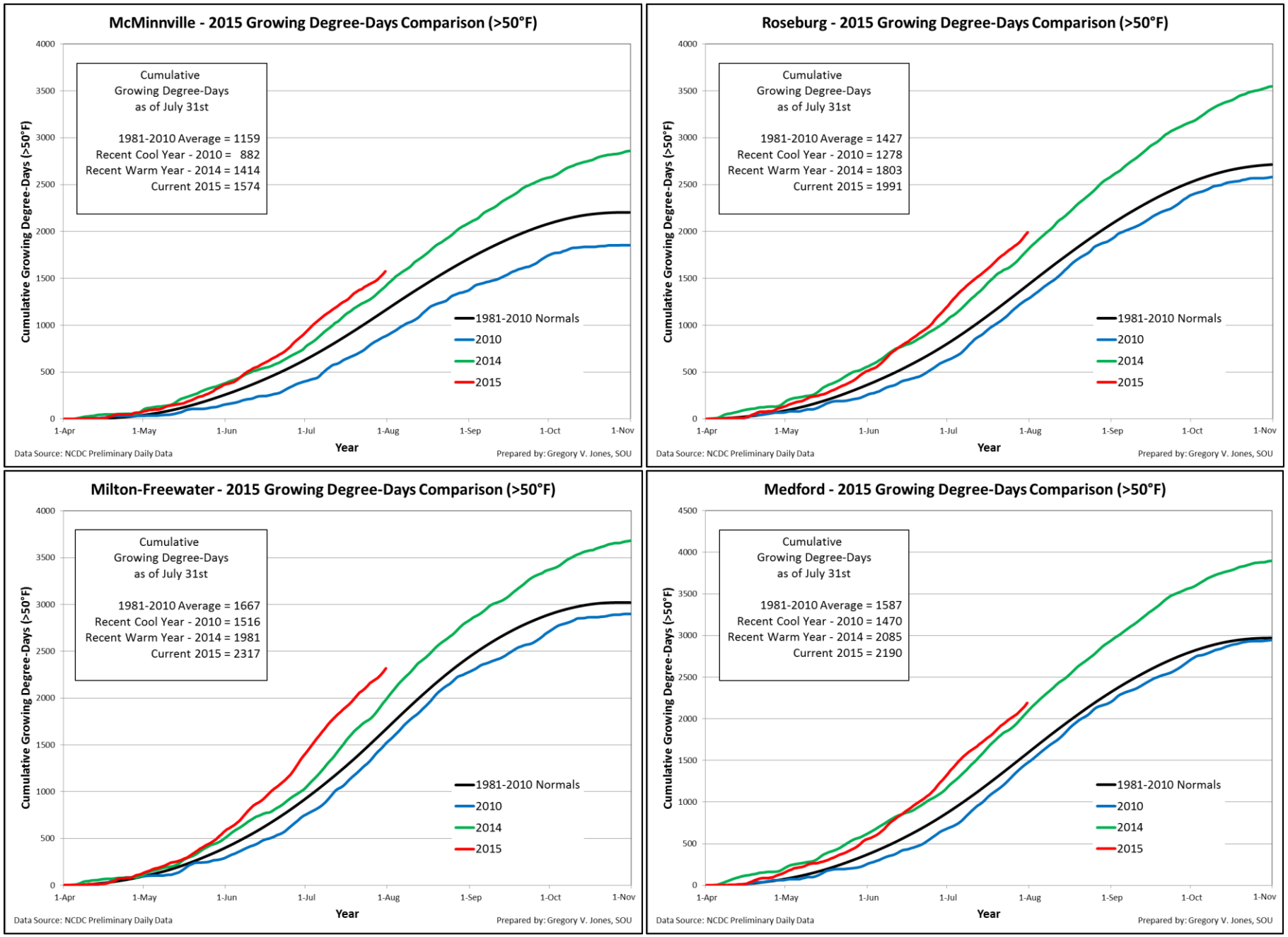

Appendix Figure – Cumulative growing degree-days (base 50°F, no upper cut-off) for McMinnville, Roseburg, Milton-Freewater, and Medford, Oregon. Comparisons between the current year (2015) and a recent cool year (2010), a recent warm year (2014) and the 1981-2010 climate normals are shown (NCDC preliminary daily data).