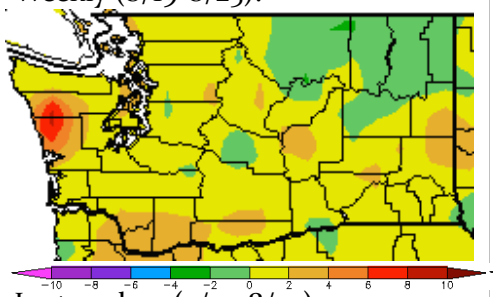
Washington State
Weekly Drought Monitoring Report

Thursday, August 27, 2015 Issue 19

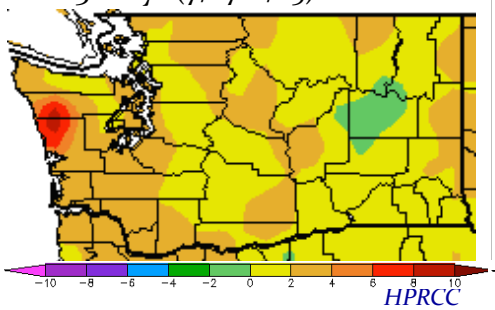
Statewide Overview

Mean Temperature Anomalies (°F)

Weekly (8/19-8/25):



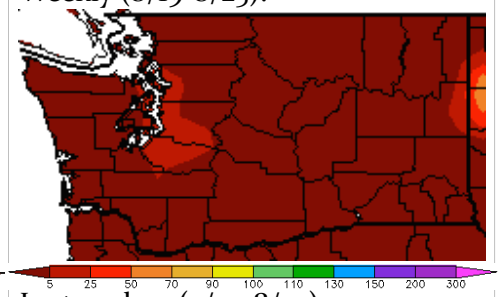
Last 30 days (7/27-8/25):



HPRCC

Precipitation Percent of Normal (%)

Weekly (8/19-8/25):



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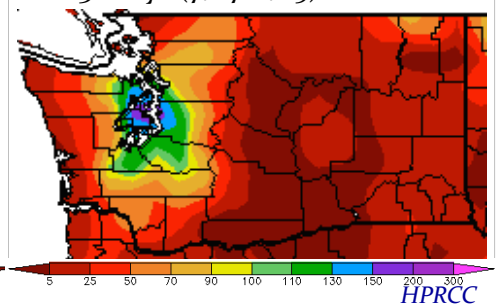
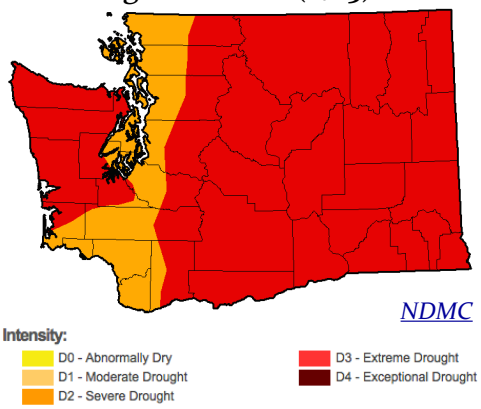


HPRCC

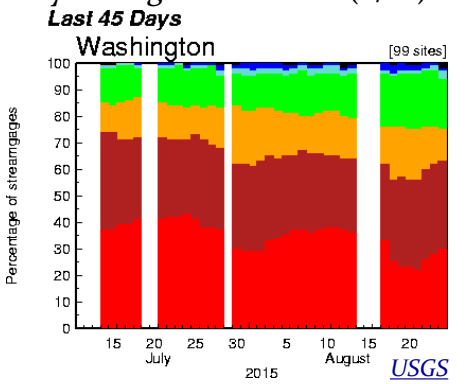
Drought Monitor, Streamflow, and Air Quality

US Drought Monitor (8/25):



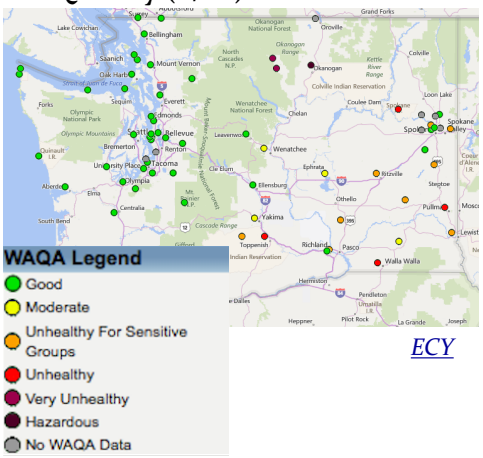
NDMC

7-day Average Streamflow (8/26):



USGS

Air Quality (8/26):



ECY

Recent temperature, precipitation, and streamflow conditions are shown here for WA State. Precipitation over the last 7 days has essentially been zero throughout WA state, which is a drastic change from the map presented in last week's report. The heavy rain on the 14th is still dominating the 30 day percent of normal precipitation map in the Puget Sound region, while the rest of the state has seen below normal precipitation for that time period. Temperatures over the last week have been largely within 2°F of normal with a tendency toward above normal. Temperatures anomalies were greater over the last 30 days, with the Peninsula and the southern Puget Sound between 2 and 4°F above normal. The percentage of streams with 7-day average streamflow much below normal (~60%) has increased over the last week.

The lack of precipitation is bad news for the fires burning throughout eastern WA, with the conditions over the last week being favorable for fires to spread. Fire behavior was particularly extreme on the 21st due to strong winds in eastern WA. Omak Airport, for example, recorded sustained winds of 40 mph and gusts in the upper 50s. The smoke from the fires has also been a problem. The figure on the bottom right shows the air quality as of the 26th, showing unhealthy to hazardous air quality throughout eastern WA. Some of the smoke even made it to the western WA on the 22nd through the 24th. The US Drought Monitor depiction of drought has worsened to "extreme drought" throughout all of eastern WA, largely because of record low streamflows, large precipitation deficits, and drought indices that support "D3".

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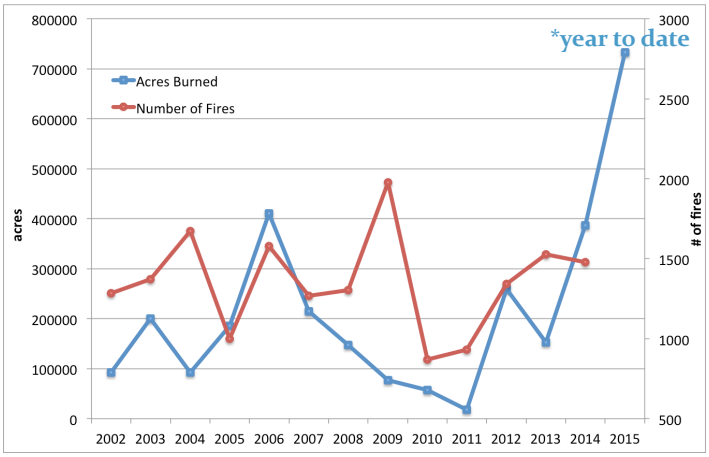
Statewide Drought Declared

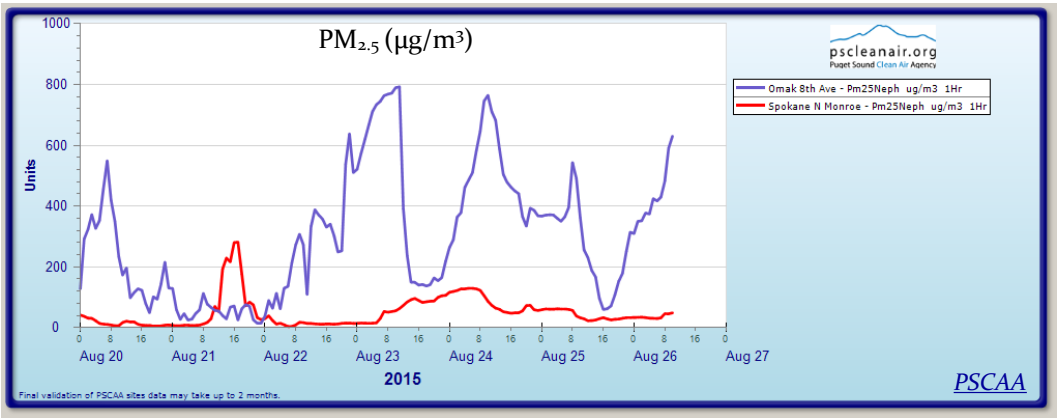
On May 15, Governor Inslee declared a statewide drought; more information can be found at WA State Department of Ecology. This section will focus on a few areas of the state in a little more detail.

WA Wildfires

As mentioned in the opening, the weather conditions in WA State were favorable for fire growth over the last week. The Okanogan Complex fire - at least 4 individual fires that joined into 1 - is now the largest fire in state history (~258,000 acres), surpassing the Carlton Complex fire that broke the record just last year (2014). Additionally, the combined acreage of current fires has already set a record for the total acreage of wildfires in a year. As of 8/26, the acreage of the current WA fires is 732,608 (NIFC). The plot of the right shows the total acres burned from wildfires since 2002 (blue trace), showing that this year far surpasses the active years of 2006 (~410,000 acres) and 2014 (~387,000 acres). The plot also shows the number of fires each year (red trace) through 2014. The fires have been taxing the infrastructure in place to fight them; firefighters from Australia and New Zealand have been arriving to assist with the Okanogan Complex fire and the National Weather Service has a record 40 incident-meteorologists (imets - on-site meteorologists trained to forecast for the firefighters) deployed throughout the western US. Air quality in eastern WA has also been a huge problem. The plot below shows the particulate matter smaller than 2.5 microns (i.e., a measure of smoke) at Omak (purple line) over the last week (Puget Sound Clean Air Agency), with remarkably hazardous air quality (above 250 μg/m³) for most of the period. Spokane (red line) was not quite as bad, but had "very unhealthy" air quality on the 21st and and "unhealthy" on the 23rd and 24th. On the 24th, the USDA Crop Report indicated losses to orchards, livestock, and pastures from fires in Douglas and Chelan counties.



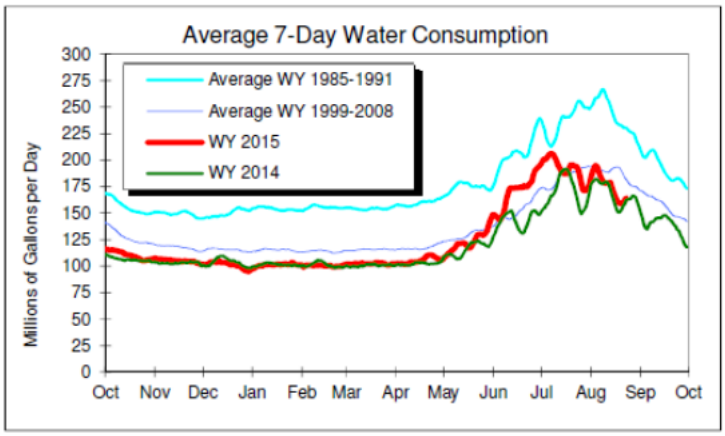
OWSC; data from NICC



PSCAA

Puget Sound

Thus far, the effort by water users to voluntarily reduce their water usage in the Seattle, Everett, Tacoma areas by 10% has been successful, with reports that the regional goal has been met. The cooler, more seasonal temperatures of late have likely helped, and it's important to continue efforts to conserve. The plot on the right shows average 7-day water consumption from just the Seattle Public Utilities water system, with the August readings (red line) below the 1999-2008 average (dark blue line). Tacoma and Pierce county and city officials are leading by example and reducing water use throughout areas that are maintained by the Public Works Department, such as parks and fire stations, for example.



SPU

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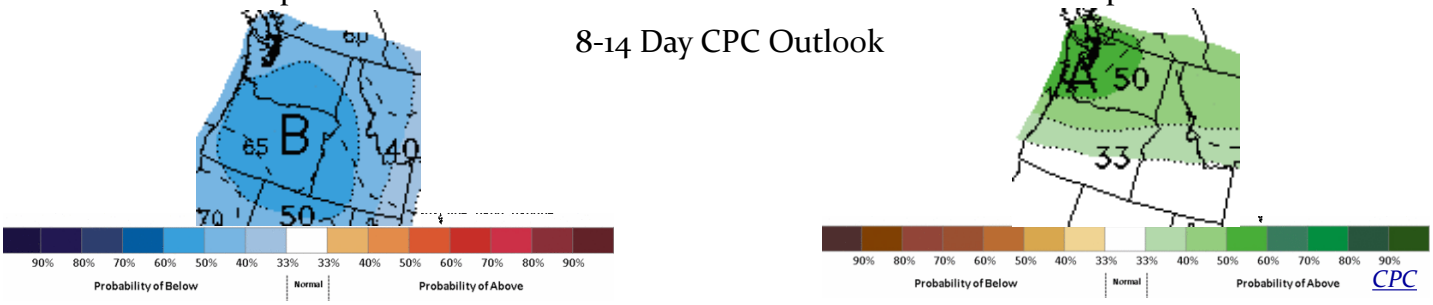
Extended Outlook

Temperature

8-14 Day CPC Outlook

Precipitation



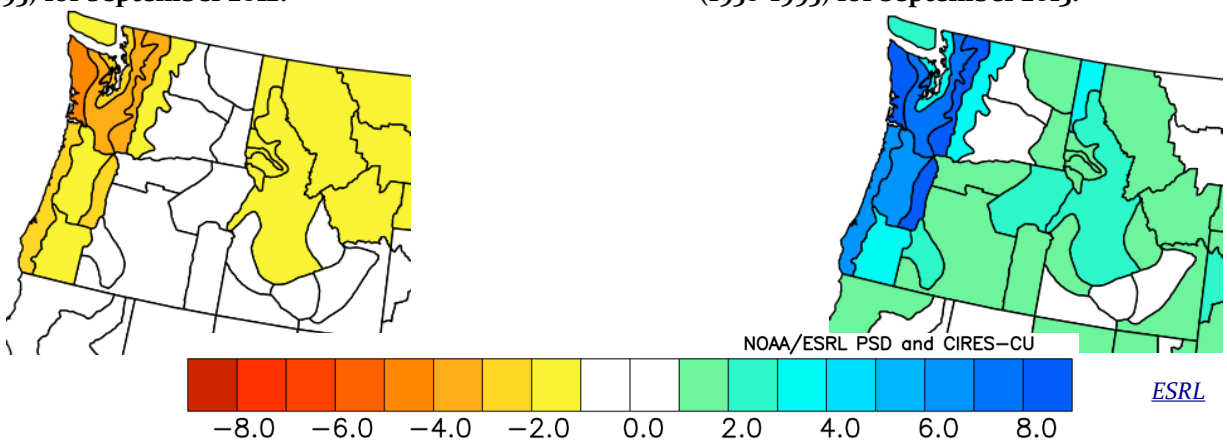
The 8-14 day forecast from NOAA/CPC for 3–9 September indicates below normal temperatures and above normal precipitation. The early part of this period is likely to be cool and wet due to the lingering effects of an upper-level trough that moves into the Pacific Northwest from the Gulf of Alaska during the last couple of days of August. Most current computer model forecasts indicate that this trough will weaken and move east during the Labor Day weekend, resulting in more near-normal temperatures and precipitation across WA. In other words, while a significant amount of rain may occur at the start of September, it does not appear that it will represent the onset of a prolonged period of wet weather.

The years of 2012 and 2013 demonstrate how dry and wet, respectively, it can be in WA state during the month of September. From an area-average statewide perspective, only 0.16" of precipitation occurred in September 2012 (the second driest in the record back to 1895) while 5.60" occurred in September 2013, which constitutes a record for the month. The discrepancy between the two years was even greater in some of the wetter climate divisions on the west side of the Cascade Mountain crest, as shown in the pair of figures below. In absolute amounts, September 2012 brought less than a half inch of precipitation to the West Olympic Coast and Cascade Mountains West climate divisions, compared with greater than 12" of precipitation in both regions a year later. This difference can be attributed to the regional atmospheric circulation during the two years. The former year featured an anomalous ridge aloft from the Pacific Northwest through western Canada, effectively diverting North Pacific storms into southern Alaska. A much different pattern characterized the latter year, during which an anomalous upper-level trough was located just off the coast of WA and OR. This set-up was accompanied by 3 periods of heavy rainfall on the west side of the state, with the storm of 28-29 September 2013 being especially noteworthy.

What looks to be in store for September 2015? The latest set of climate model simulations indicates an atmospheric circulation pattern that would tend to suppress precipitation for WA state, but only to a modest extent. This is consistent with the simulated precipitation anomalies from the International Multi-Model Ensemble, which includes negative values only over the northwest tip of Washington and the latest prediction from NOAA's Climate Prediction Center, which indicates equal chances of below-normal, near-normal, and above-normal precipitation for WA in September 2015.

Precipitation departures (inches) from normal (1950-1995) for September 2012:

Precipitation departures (inches) from normal (1950-1995) for September 2013:



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