

# Washington State Weekly Drought Monitoring Report

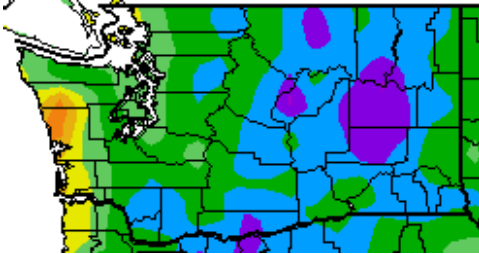
Thursday, July 30, 2015

Issue 15

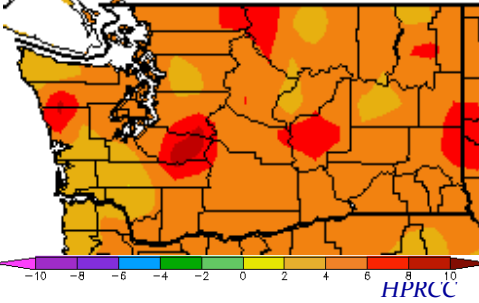
## Statewide Overview

### Mean Temperature Anomalies (°F)

Weekly (7/22-7/28):

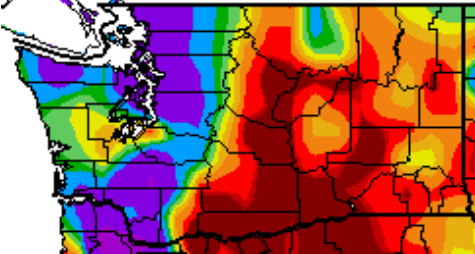


Last 30 days (6/29-7/28):

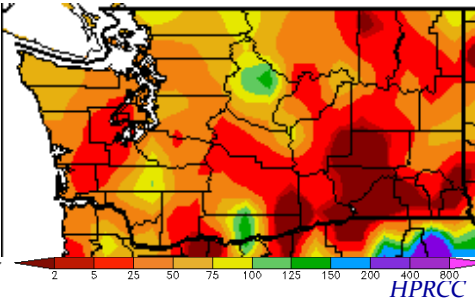


### Precipitation Percent of Normal (%)

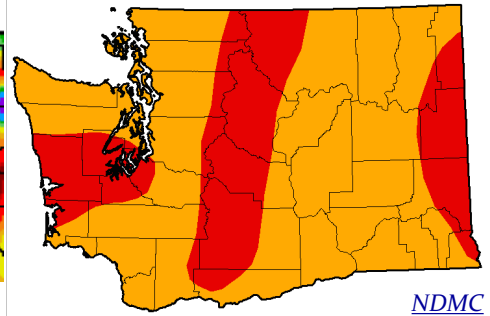
Weekly (7/22-7/28):



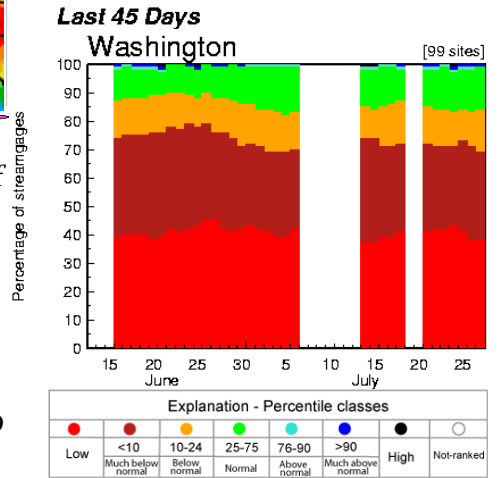
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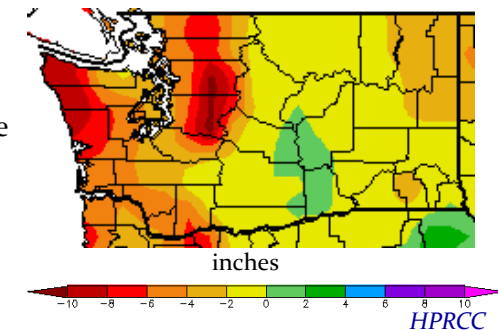
### Drought Monitor, Streamflow and 90-Day Precipitation (in.)



### 7-day Average Streamflow (7/28):



### Precipitation Departure from Normal (4/30-7/28):



The recent weather for WA state is summarized above in the form of maps of temperature and precipitation anomalies for the last 7 days, and for the last 30 days. The weather during 22-28 July was much different than what has been typical during the last few months. It was cooler than normal for almost the entire state, with some locations in eastern WA enjoying mean temperatures that were more than 6 °F below normal. This served as a respite from the extreme heat that prevailed in WA state from late June into July, as reflected in the 30-day temperature anomaly map for the period of 29 June through 28 July, which shows that most of the state was on the order of 6 °F above normal. The last 7 days also featured welcome precipitation, largely in the western portion of WA state. The precipitation totals ranged from under 0.1" to greater than 1", with the central and northern Cascade Mountains, and the northwestern tip of WA, receiving the greatest amounts. It remained mostly dry in eastern WA. The precipitation as a percentage of normal for the 30-day period of 29 June through 28 July shows that virtually the entire state has been dry, with the exception of a couple of small pockets on the east slope of the Cascade Mountains. The US Drought Monitor (figure at upper right) indicates a deterioration in conditions with some portions of WA state now in the D<sub>3</sub> category (Extreme Drought). The large majority of streamflow gauging sites indicate flows in the lowest 10 percentile (middle right) in spite of the recent rain, consistent with the precipitation deficits that have accumulated over the last 90 days (lower right).

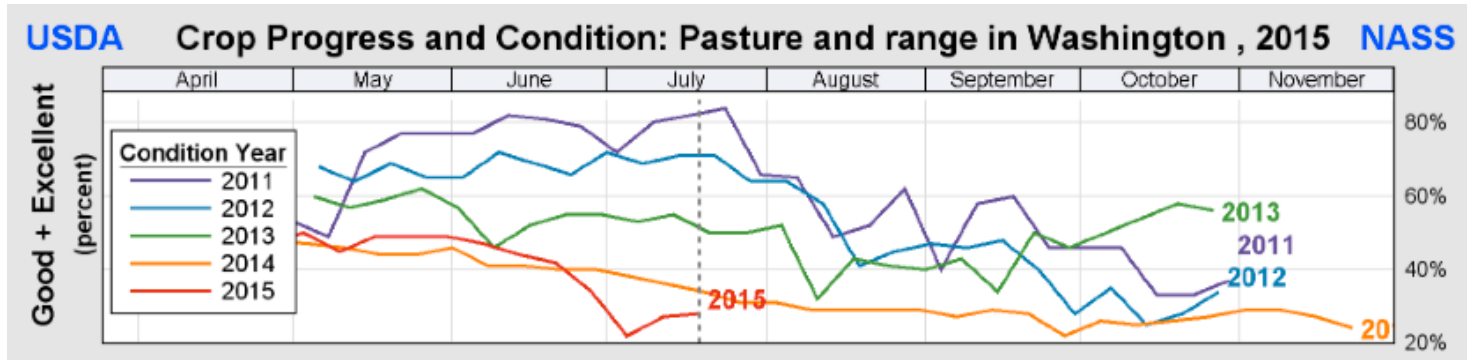
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# Statewide Drought Declared

On May 15, Governor Inslee declared a statewide drought; more information can be found at WA State [Department of Ecology](#). This section highlights issues that have developed in various regions of the state.

## Statewide Agricultural Sector

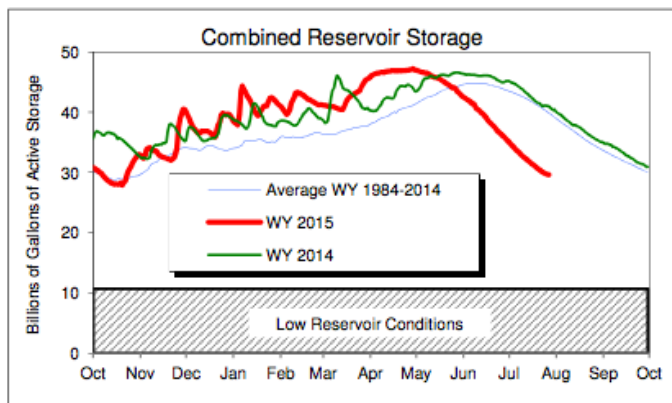


USDA

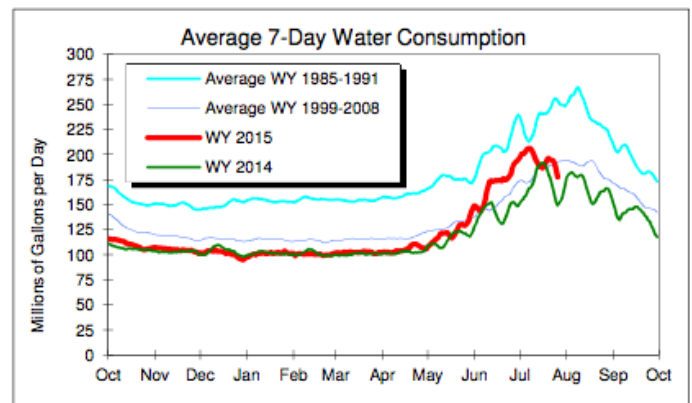
The pastures and rangelands of WA state are in considerably worse shape than they have been in recent years. The figure above shows that less than 30% of these regions are rated in good or excellent condition. The narrative from the Washington [Weekly Crop Progress and Condition Report](#) includes multiple descriptions of pastures being “short and extremely dry”. Additional concerns are emerging about the hops crop in the Yakima Valley, which accounts for a large proportion of the nation’s total production. Many of these growers have had significant restrictions in their water supply and crop losses of unknown magnitude are anticipated, with the potential for [hops shortages for breweries](#) as soon as next year.

## Puget Sound Municipalities

The increased demand for water in the urban areas of Puget Sound have resulted in the cities of Tacoma, Seattle, and Everett implementing the first stage in their water shortage contingency plans. They are requesting that their customers voluntarily manage their water usage and reduce waste. These are precautionary measures and it is still expected that water supplies will be adequate through the remainder of the dry season. More information is provided [here](#).



The combined reservoir storage of Chester Morse Lake, Masonry Pool, Lake Youngs and South Fork Tolt Reservoir is below the long term average for this time of the year.



Water use over the past week averaged about 178 million gallons per day (mgd), which is less than the 193 mgd used during the same period over the years 1999-2008.

SPU

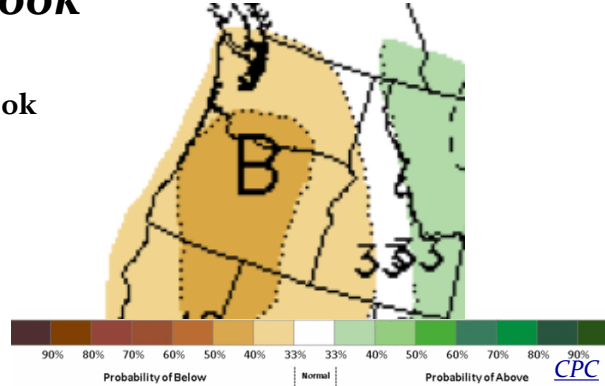
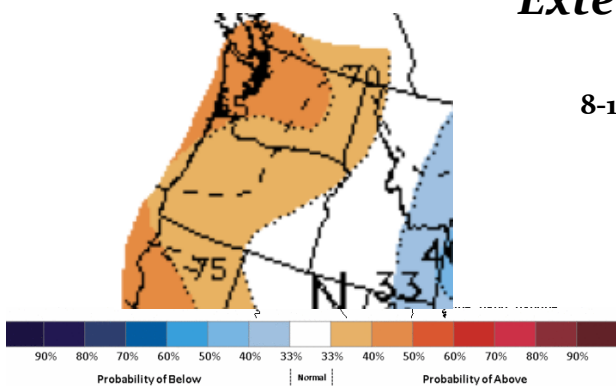
The status of the [Seattle Public Utilities Water System](#) is illustrated in the two plots above. Note the especially high rate of consumption during the heat wave of late June and early July of 2015 (right panel); these rates were still less than the average during the period of 1985-1991 despite the increase in the population served.

Temperature

Extended Outlook

Precipitation

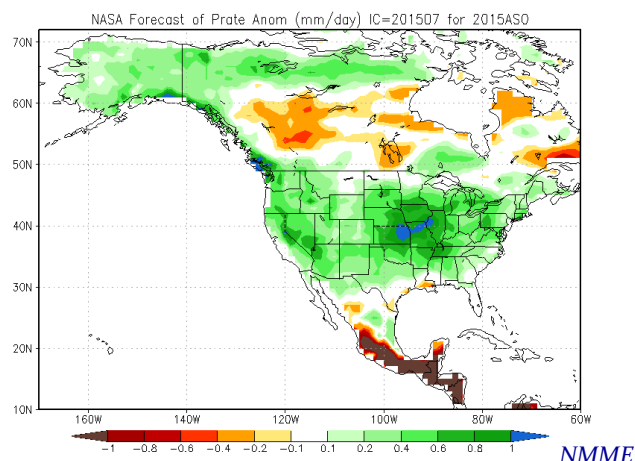
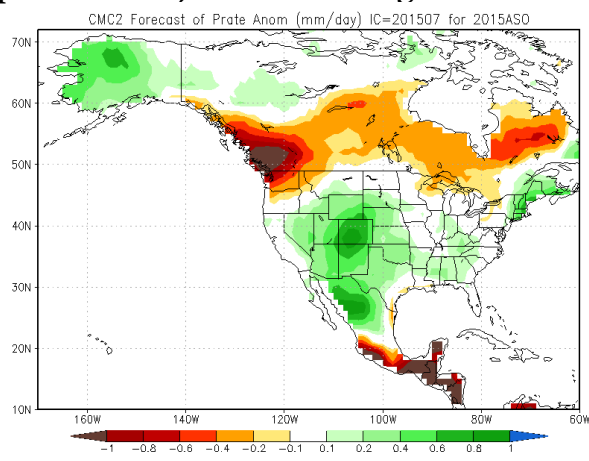
8-14 Day CPC Outlook  
6-12 August



The 8-14 day forecast from NOAA/CPC for 6-12 August indicates elevated odds of above normal temperatures, and a lesser indication of below normal precipitation for WA state (shown above). The predicted weather is liable to provide little help for dwindling streamflows and water supplies in most places. But of course this is an expectation rather than a guarantee, which raises the following question: how accurate are these kinds of forecasts for WA?

Thirteen 8-14 day forecasts that have been reviewed in this weekly report are considered here, and while this constitutes a small sample size, the results of this validation are likely still meaningful. The forecasts from CPC are in terms of probabilities with respect to a three-tier system, that is the mean temperatures or total precipitation for the period being in the below-normal, near-normal, or above-normal category. Each category occurs one-third of the time in the long-term (multi-year) sense. We have compared the forecasts with the observed values of the temperature and precipitation (examples are shown in the first page of these reports) from a statewide perspective, with account for the spatial structure within the state in some cases. Of the 13 temperature forecasts, 9 were of the correct category, 3 were off by one category, and 1 was off by two categories. The overall skill of the precipitation forecasts has been lower. Seven of these forecasts were of the correct category, and there have been 4 forecasts with one category errors and 2 forecasts with two category errors. This result is not a surprise, since in most settings there is greater predictability in temperature than precipitation, especially on extended time scales. In summary, at least for the period considered here, the 8-14 day forecasts for WA from NOAA/CPC appear to have had value.

Precipitation Projections for August-October 2015



Current climate model simulations are yielding a range of precipitation outlooks for WA state during the period of August through October 2015. For example, the CMC2 model (left panel) predictions indicate drier than normal for WA state while the NASA model (right panel) indicates wetter than normal. There is a weak consensus among the 7 models used in the National Multi-Model Ensemble (NMME) that August through October in WA state will be on the dry side, but not necessarily to a substantial extent. There is much stronger agreement among the models that temperatures will generally be above normal, and remain that way through the winter of 2015-16.