

Washington State Weekly Drought Monitoring Report

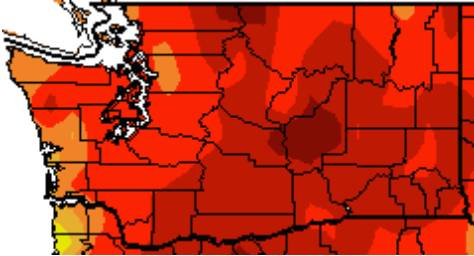
Thursday, July 9, 2015

Issue 12

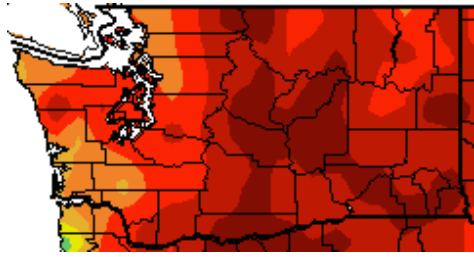
Statewide Overview

Mean Temperature Anomalies (°F)

Weekly (7/1-7/7):



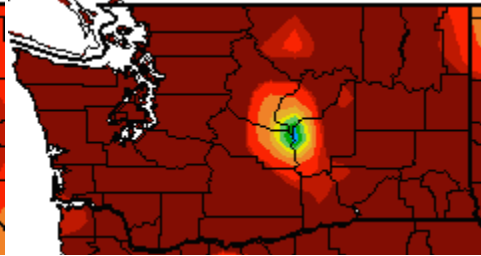
Last 30 days (6/8-7/7):



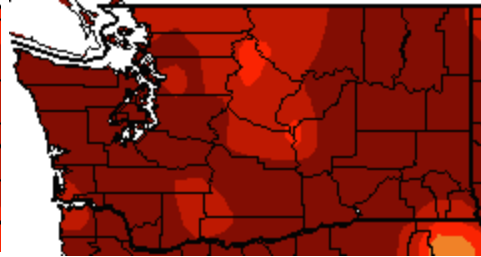
HPRCC

Precipitation Percent of Normal (%)

Weekly (7/1-7/7):



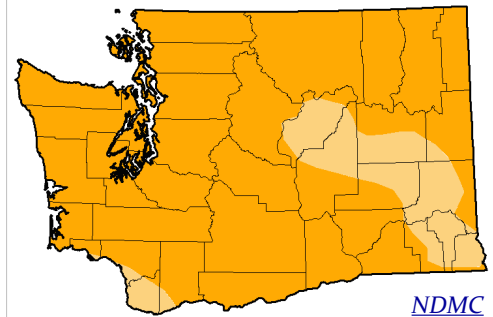
Last 30 days (6/8-7/7):



HPRCC

Drought Monitor, Streamflow, and 90-day Precipitation (in)

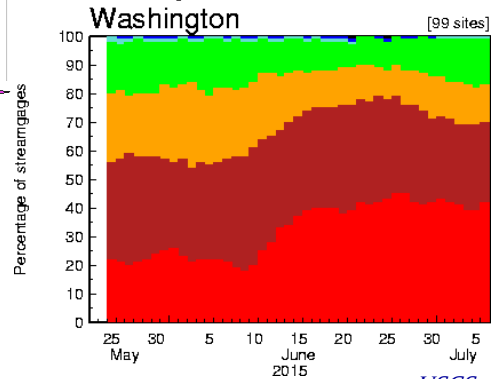
US Drought Monitor (7/7):



Intensity:
 D0 - Abnormally Dry
 D1 - Moderate Drought
 D2 - Severe Drought
 D3 - Extreme Drought
 D4 - Exceptional Drought

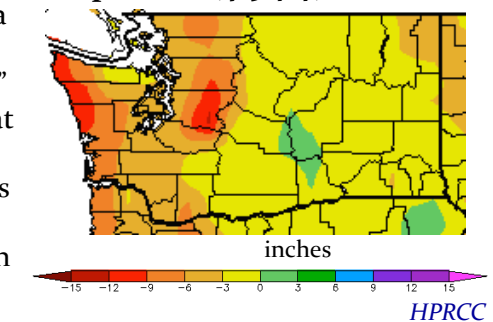
Streamflow Time Series (7/8):

Last 45 Days



Explanation - Percentile classes						
Low	<10	10-24	25-75	76-90	>90	High
	Much below normal	Below normal	Normal	Above normal	Much above normal	

Departure from Normal (1981-2010) Precipitation (4/9-7/7):

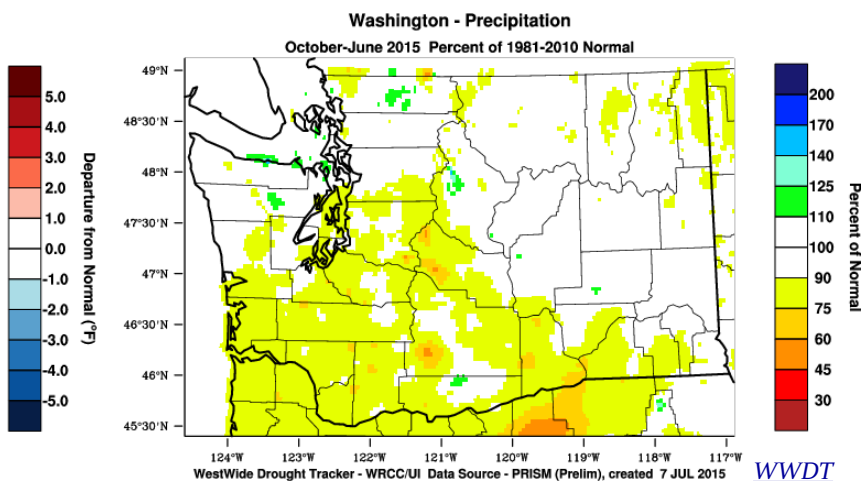
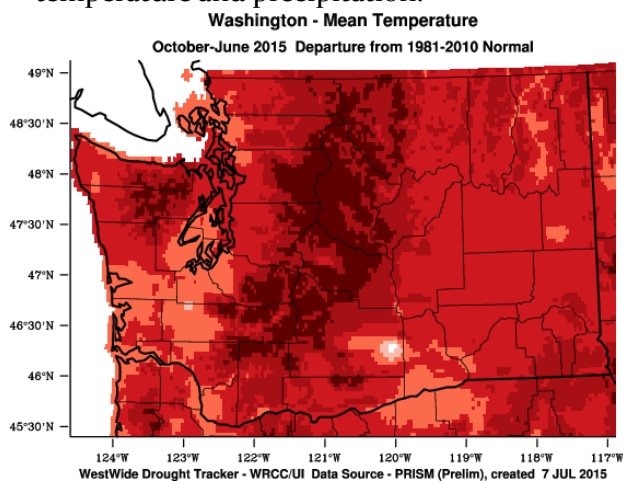


A snapshot of recent conditions for WA State is shown on this page using statewide temperature, precipitation, and streamflow over varying time frames. Temperatures have been extremely warm over the last 7 days, with average temperatures 9-15°F above normal throughout most of the state. Daily temperature records were broken in western WA, and SeaTac Airport recorded 5 consecutive days with temperatures at 90°F or above, which ties August 1981 for the longest stretch on record. The 30-day temperature anomalies are also very warm, with eastern WA experiencing temperatures between 8 and 12°F above normal. To give some perspective to these temperatures: June was the warmest on record averaged over the state. As for precipitation, there was no precipitation over the last 7 days, aside from 0.14" in Wenatchee on the evening of the 7th from a thunderstorm, resulting in the bull's eye on the map. Precipitation over the last 30 days has been minimal, with the state receiving less than 5% of normal. While we don't typically see a lot of precipitation at this time of year, the precipitation deficits since April (last 90 days) are showing substantial precipitation deficits between 3 and 12" in western WA. In eastern WA, those deficits are approaching 3", showing that our snowpack drought is morphing into a precipitation drought. This has been reflected in the US Drought Monitor, with more degradation shown this week as the area of severe drought has expanded through most of the state. Dry soils, low streamflows, recent precipitation deficits, and high evaporation rates have all been taken into account for the depiction. About 70% of WA's streams have much below normal streamflow at this time.

Contacts: Karin Bumbaco (kbumbaco@uw.edu)
 Nick Bond (nab3met@uw.edu)
 Jeff Marti (jema461@ecy.wa.gov)

Statewide Drought Declared

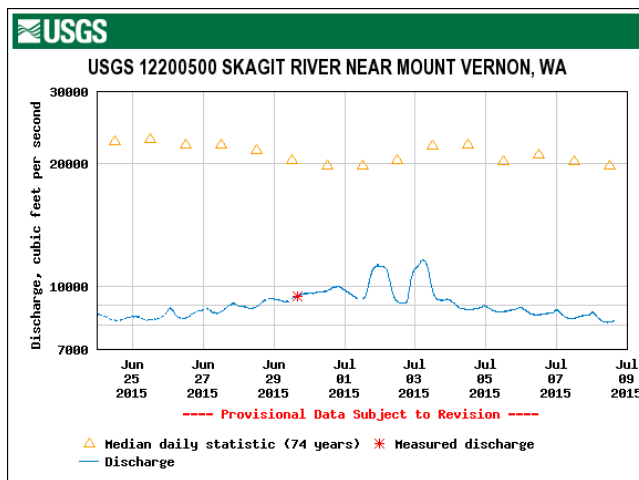
On May 15, Governor Inslee declared a statewide drought; more information can be found at WA State [Department of Ecology](#). This section will focus on a few areas of the state in a little more detail, but will first review the water year temperature and precipitation.



Another month is in the books, and an update on the temperature and precipitation anomalies for the water year (beginning October 1, 2014) is provided here. The plots above are from the WestWide Drought Tracker, and use gridded data to compare the recent water year to the 30-year average (1981-2010). Temperatures over the last 9 months have been between 3 and 6°F above normal for most of the state. The calendar year thus far (January-June) is on track to become the warmest year on record for WA State, though that of course depends on the remaining 6 months of the year. October through June precipitation is below normal (75-90% of normal) through southern WA into the southern and central Puget Sound. Due to the normal winter precipitation, the remainder of the state is still showing near-normal (90-110% of normal) precipitation, even with the recent dry period.

Skagit County

Like the rest of the state, Skagit county has been warm and dry over the last week and last 30 days. Temperatures at the end of June reached the upper 80s, about 14°F above normal. An interesting [story](#) has been unfolding out of Anacortes recently: the city is “loaning” water to area agriculture, with approval from the Department of Ecology. The agriculture irrigation districts have lesser claims to water, and are now (through Sept.) able to buy up to 5 million gallons/day from the city and 1.6 million gallons/day from the Skagit Public Utility District. In a typical year, the farmers - mostly growing spinach, beet, and cabbage seed - are able to pump water from the Skagit River. Due to the current drought, the Skagit River is running low, and the seed farmers water rights are lower on the priority list. The plot on the right shows the streamflow over the last 2 weeks from the Skagit River near Mt. Vernon, where flows are about 40% of normal and in the 4th percentile.



USGS

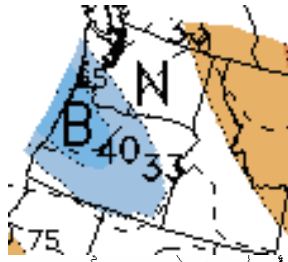
Spokane Area

Similar warm and dry conditions have been plaguing the Spokane area, with temperatures in the upper 90s and into the 100s measured at the end of June at the Spokane Airport; temperatures have remained well into the 90s for the first week of July, running about 10-15°F above normal. The Spokane National Weather Service office has been measuring pan evaporation since 1980, and the April through June levels of evaporation have been the highest on [record](#). Admittedly, the 35-yr record isn't long by most climatology standards, but it does represent the impact of the much warmer than normal temperatures during the spring.

Contacts: Karin Bumbaco (kbumbaco@uw.edu)
 Nick Bond (nab3met@uw.edu)
 Jeff Marti (jema461@ecy.wa.gov)

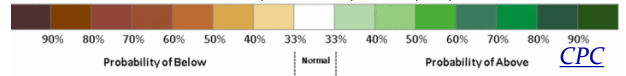
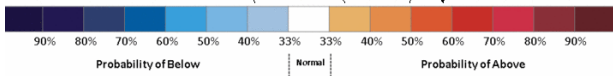
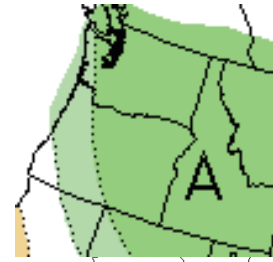
Extended Outlook

Temperature



8-14 Day CPC Outlook

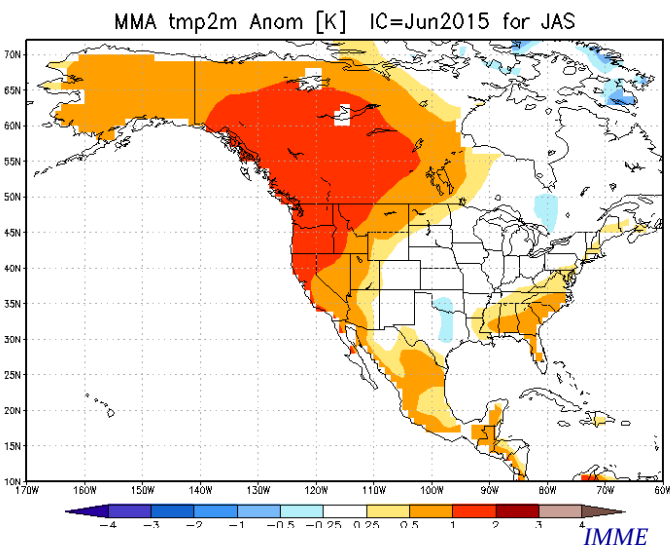
Precipitation



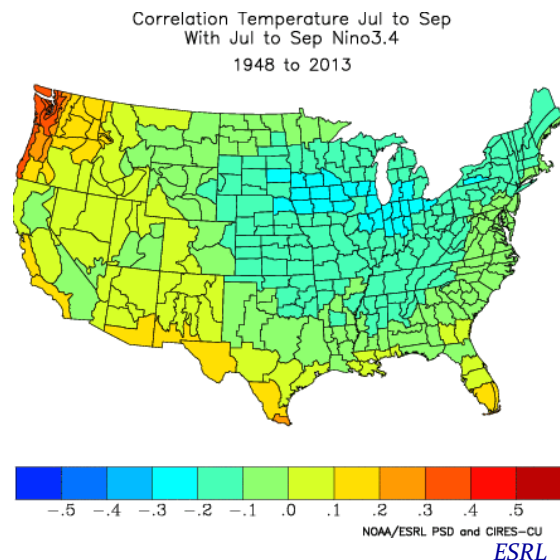
The 8-14 day forecast from NOAA/CPC for 16-22 July indicates near normal temperatures, and elevated odds of above normal precipitation for WA state. Because WA is generally so dry during this time of year, it does not take much rain to constitute an above normal amount. Moreover, the discussion accompanying the 8-14 day forecast includes a statement of below-average confidence in the precipitation forecast. Assuming some rain occurs in WA after the exceedingly dry period of the last 30 days, will it be in the more in the form of beneficial widespread light rains or thunderstorms? The latter are of special concern this summer from a wildfire perspective. Only time will tell, of course, but inspection of current individual model simulations suggests that the regional circulation during the upcoming 8-14 day period will generally not be favorable for active outbreaks of thunderstorms. Nevertheless, there is still the threat of scattered thunderstorms at times in the Cascade Mountains.

The heat wave that has baked WA from the latter part of June into the first part of July 2015 is coming to an end. Since most of summer lies ahead of us, it seems worthwhile to review recent temperature forecasts. The mean temperature anomaly forecast for July through September (JAS) from the International Multi-Model Ensemble (IMME) is shown on the bottom left. There is very strong model consensus that WA will be warmer than normal, with a model mean value of a positive anomaly between 1 and 2°C statewide. This warmth can be attributed in part to the moderate-strong El Niño that is present, as illustrated in a map of the correlation between the NINO3.4 index and US temperatures during July-September (bottom right). The models incorporated in the IMME account for the effects of El Niño, and the warmer than normal ocean temperatures off the coast of the Pacific Northwest, at least in principle. Other aspects of the atmosphere-ocean-land system provide additional predictability, but these seasonal predictions always include significant uncertainty.

IMME JAS Temperature Forecast:



JAS Temperature Correlation to an El Niño index:



Contacts: Karin Bumbaco (kbumbaco@uw.edu)
 Nick Bond (nab3met@uw.edu)
 Jeff Marti (jema461@ecy.wa.gov)

