Recent temperature, precipitation, and streamflow conditions are shown here for WA State. The last 7-day (8/26-9/1) and 30-day precipitation maps are a refreshing change, as western WA received between 200 and 800% of normal precipitation (1-5”) over the last week. A series of frontal systems impacted the state beginning on the 27th, bringing rain and strong winds. The storm on the 29th caused widespread power outages in western WA from broken limbs and downed trees. Wind gusts were between 40 and 65 mph in western WA, and mostly in the 30s and 40s in eastern WA. Rain even fell in eastern WA on the 30th, and the weekly precipitation percent of normal map shows some areas of above normal precipitation in northeastern WA. On the 30-day time scale, precipitation is still much below normal there. Regardless, the recent rain and cooler temperatures helped fire fighting efforts and improved air quality in eastern WA. Looking at a longer time scale - June 1 through August 31 - the state still has precipitation deficits between 1 and 6”. The eastern Olympic Peninsula, and Kitsap and eastern Whatcom counties are the exceptions, where summer precipitation has been closer to or above normal.

The recent rain has caused big changes for streamflow: the 7-day average streamflow is now normal to above normal for much of western WA. Currently, less than 30% of the stream gauges in the state are “much below normal” or less. “Extreme drought” was removed from the US Drought Monitor on the Olympic Peninsula and parts of the western slopes of the Cascades in response to the recent precipitation and increased streamflows.

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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.

Western WA Precipitation

Widespread precipitation fell throughout western WA over the last week, as mentioned above, with the heaviest precipitation occurring on the 29th and 30th. The rainfall totals are impressive, with the last few days of August feeling more like October or November for western WA. The total precipitation amount over the last 7 days (8/26-9/1) can be found in the parenthetical for these locations: Bellingham (1.69”), SeaTac Airport (1.93”), Olympia (2.16”), Hoquiam (2.25”), and Quillayute (4.24”). As mentioned above, area streams responded to the precipitation. The plot on the right-hand side (top) shows the streamflow for the Skagit River near Mt. Vernon over the last month, showing flows peak to above normal for the time of year. The pair of plots from the Department of Ecology (bottom right) tells the story well. The picture on the left is of Squire Creek (east of Oso in Snohomish county) on August 28 - essentially a cobblestone path. The plot on the right shows the streamflow jump up to over 1000 cubic feet per second (cfs) during the heavy rain. The flow has since dropped, but is above 400 cfs at the time of this writing. Despite these strong responses to the recent rain, it’s unlikely that salmon were able to get upstream during the short window of above normal streamflow. Continued precipitation and cooler temperatures this week should help maintain flows over their late August minimums.

Puget Sound

Earlier in the summer, we reported that the Army Corp. of Engineers was limiting the number of times that the Chittenden Locks (connecting Puget Sound to Lake Union and Lake Washington in Seattle) were opened in order to conserve water in the lakes. The Lake Union/Lake Washington basin is now below 20’, which is the first time the lake levels have been that low in 28 years. The lowest level (18.35’) was recorded in 1958, but the USACE is projecting the lake to drop below 19’, which is particularly concerning for house boat owners on the lake. This story was covered in the news late last week - before the heavy rain set in - but the plot on the right is current as of September 2. The lake levels have increased to above 20’ from the recent rain, but just barely, and the current USACE news release advises preparing for a level of 18.5’. In a similar vein, the Seattle-Tacoma- Everett area residents are still being encouraged to voluntarily conserve water. While reservoirs did receive rain over the last week, it was not enough to make up for current deficit.

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The 8-14 day forecast from NOAA/CPC for 10–16 September indicates above normal temperatures and below normal precipitation for WA. This forecast is based on a broad region of higher than normal geopotential heights at the 500 hPa level centered near the northwest end of Vancouver Island. There is a lower than normal confidence in this pattern, and the resulting weather, due to a large amount of spread between individual model simulations. At any rate, we should be thankful for the recent rains, which have at least temporarily improved conditions, especially in the west part of the state.

Extended forecasts are available for not just the weather, but also for many streams in the Pacific Northwest. The Northwest River Forecast Center (NWRFC) of NOAA provides 10 day and 120 day forecasts. The 10 day forecasts are produced across the Pacific Northwest; the 120 day forecasts are produced for streams in the Columbia River Basin. Current examples of both types of these forecasts for the Methow River at Pateros are provided below. The 10 day forecasts are based on the results from hydrological model simulations using observed flows and weather forecasts, considering temperature as well as precipitation. The 120 day forecasts use current hydrological information (streamflows and reservoir capacities), 10 day weather forecasts and then climatological temperature and precipitation out to 120 days as input for hydrological model simulations. Regarding the forecasts themselves, the 10 day forecast for the Methow River shows a marked increase in streamflow associated with the recent rains after a period in late August of flow near historical minimums for the date. Alas, the recent bump in streamflow appears likely to be short-lived, with predicted discharges expected to approach record lows again by the middle of September. This downward trend is also shown in the 120 day extended forecast, which shows a discharge below the 90% level (meaning the flow is greater on a particular date 90% of the time) from mid-September into early November 2015. There is a temporary uptick during November and then lower forecast flows later in the year, essentially because the precipitation usually falls as snow rather than rain, resulting in declining runoff. An important point illustrated by these extended forecasts is that it is liable to require a substantial period for the flows in many streams to begin sustaining typical values, even if the precipitation returns to near normal.

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