



Office of the Washington State Climatologist

September 3, 2010

August Event Summary

August average temperatures were near normal for a majority of the state, with some locations below normal. Precipitation was more consistent throughout the state, with most locations drier than normal. These dry August conditions and some strong frontal passages accompanied by thunderstorms caused some concern for fire ignitions. Overall, however, fire activity as measured by the total number of WA fires (789) and total acres burned (40,819) has been below the 1989-2009 average (from NWCC; <http://www.nwccweb.us>).

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A sizable fraction of the monthly rain in the Puget Sound fell on August 7, with totals between 0.20 and 0.70 inches recorded by CoCoRaHS observers. August 31 was another wet day, but this time for the entire state. The CoCoRaHS 24-hour precipitation totals ending at 7 am September 1 are shown in Figure 1. Note that parts of Snohomish and Lewis Counties received up to 2 inches of rain. Record maximum daily rainfall totals were also set at some of the traditional weather stations on the west side of the Cascades: Bellingham recorded 0.72", Hoquiam recorded 1.03", Quillayute recorded 2.18" and the Seattle WFO recorded 0.59".

The month was generally cool and cloudy west of the Cascades, but there were intermittent warm periods that set some record daily high temperatures. For example, cool and cloudy mornings persisted for a few days for the west side of the Cascades after the rain on August 7, but offshore flow building on the 13th brought temperatures to much above normal. The 14th saw record high temperatures with SeaTac Airport, Seattle WFO, Olympia, and Quillayute recording daily record high temperatures of 95, 91, 95, and 96°F, respectively. Similar temperatures were recorded on the 15th and 16th. Temperatures were warmer than normal on the east side at this time as well, but not record-breaking. Some coastal locations, such as Hoquiam, had marine air cool the maximum temperatures by the 15th. A marine push overnight into the 18th caused a substantial cool down for the remainder of the west side (by 10-20°F) while the east side remained at normal temperatures. Onshore flow continued, causing clouds for the west side with some afternoon sunbreaks for the inland locations. Temperatures warmed up but then another front moved in on the 26th with lightning that sparked several fires in eastern WA. The front and the following conditions caused the month to end on a cool and wet note that was a definite reminder that fall is approaching. Quillayute, Hoquiam and

Wenatchee recorded low minimum temperatures of 41, 45, 45°F on August 28, and there was the statewide precipitation on August 31 (Figure 1).

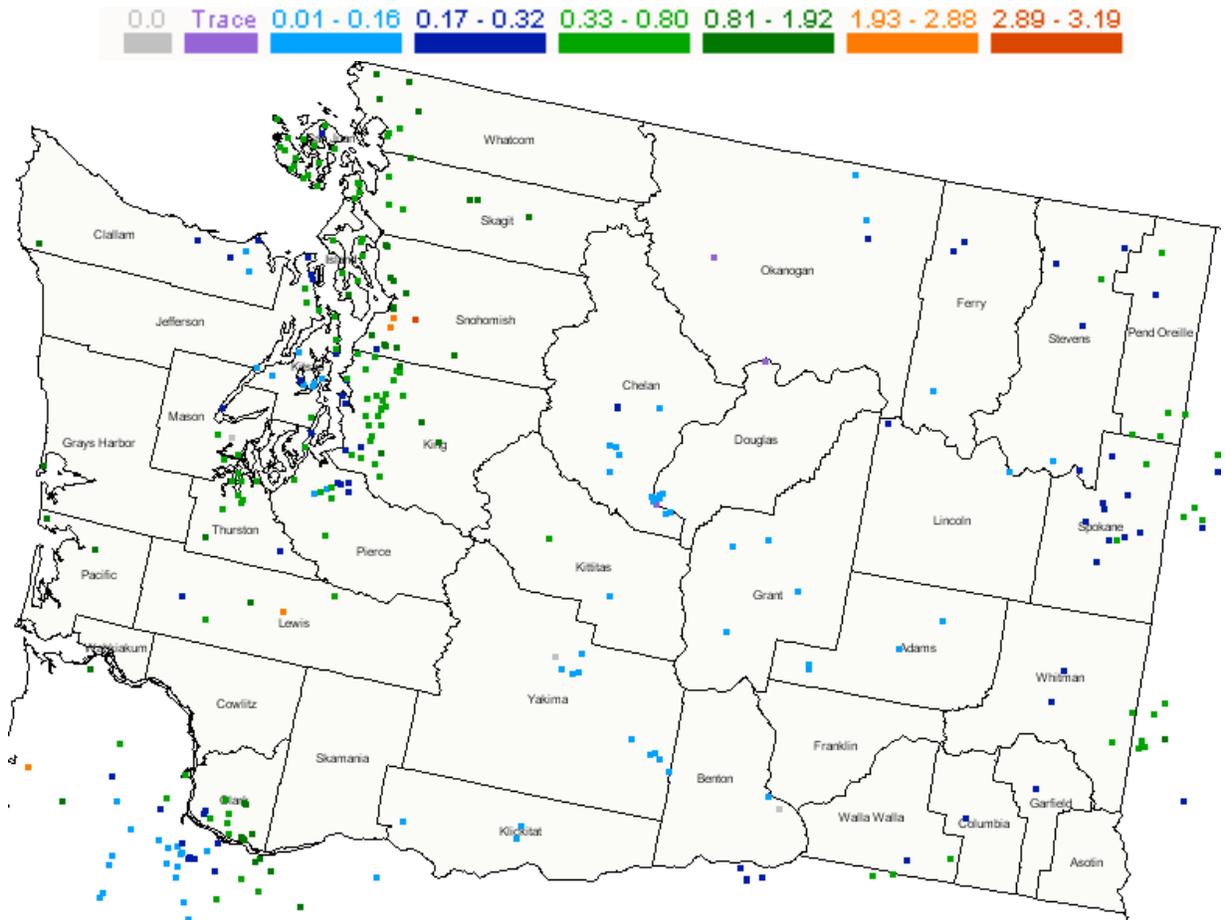


Figure 1: 24-hr precipitation totals measured by CoCoRaHS observers on September 1 at 7 am.

September: NOAA Weather Radio Awareness Month

September is weather radio awareness month! The WA State Emergency Management Division is highlighting the importance of having a weather radio in your disaster preparedness kit. A weather radio notifies you of potentially life-threatening hazards in your area, such as weather events, tsunamis, and volcanoes. The radios are battery operated and on different frequencies than AM/FM radio. You can read more about weather radios here:

http://www.emd.wa.gov/publications/pubed/noaa_weather_radio.shtml.

There will also be a statewide earthquake drill on September 15 at 10:15 am and a tsunami warning communication test for the coastal counties on the same day. More information can be found here: http://www.emd.wa.gov/preparedness/prep_infocus.shtml.

Spotlight: 2009 State of the Climate Report Released in the Bulletin of the American Meteorological Society

The State of the Climate Report is a yearly supplement to the Bulletin of the American Meteorological Society (BAMS) that summarizes the global and regional climate for each calendar year. The 2009 report was released in July, and can be found under "Articles" on the bottom of this page: <http://journals.ametsoc.org/toc/bams/91/7>. This note highlights some of the main points in the report.

Globally, the 2009 average temperature was 0.46°C above the 1961-1990 mean, according to the NOAA/NCDC data set. The 2000s now rank as the warmest decade on record (going back to the 1850s). The 2009 average precipitation was also above the 1961-1990 mean, according to three independent data sources.

For the US, 2009 was relatively cool when compared to the decade of the 2000s. The nationally averaged temperature was 11.7°C (53.1°F), the second coolest year since 2000 (2008 was slightly cooler). Still, 2009 was 0.1°C above the long-term average (1895-2009), and the average temperature for the 2000-2009 decade was 0.7°C above the 1901-2000 average. The 2009 US average precipitation was 64 mm (2.52") above 1895-2009 average (740 mm; 29.13"). The 2000-2009 decade as a whole was also relatively wet and averaged 18 mm (0.71") above the 1901-2000 average. Despite the wetter than average decade, some areas of the US experienced severe drought. The report tracks drought in the past 110 years, as defined by the Palmer Drought Severity Index, and ranked 2000-2009 as the decade with the third greatest drought, for the country as a whole, in the entire record.

Annual average temperature is useful in comparing one year to another, but it can mask important seasonal variations. The year of 2009 featured a swinging back and forth of temperature anomalies that was likely caused by natural variability. M. Hoerling and the NOAA Climate Scene Investigation (CSI) team discuss this idea in a small insert on pages S140-S141. They hypothesize that the transition between La Niña-like conditions (late 2008 through March 2009) and a moderate El Niño (developed in July 2009 and strengthened in October through the end of 2009) was partially responsible for large switches in temperature anomalies across the country. Using an ensemble of runs from global climate models (GCMs) that were forced by the global sea surface temperatures (SSTs), a large amount of the seasonal variability is replicated. For example, in WA, the cool January-February-March 2009 (JFM) anomalies were replicated by the model simulation though not to the same strength. The July-August-September (JAS) warm anomalies in WA were also represented in the models, meaning that the some of the seasonal variability may be related to the ocean.

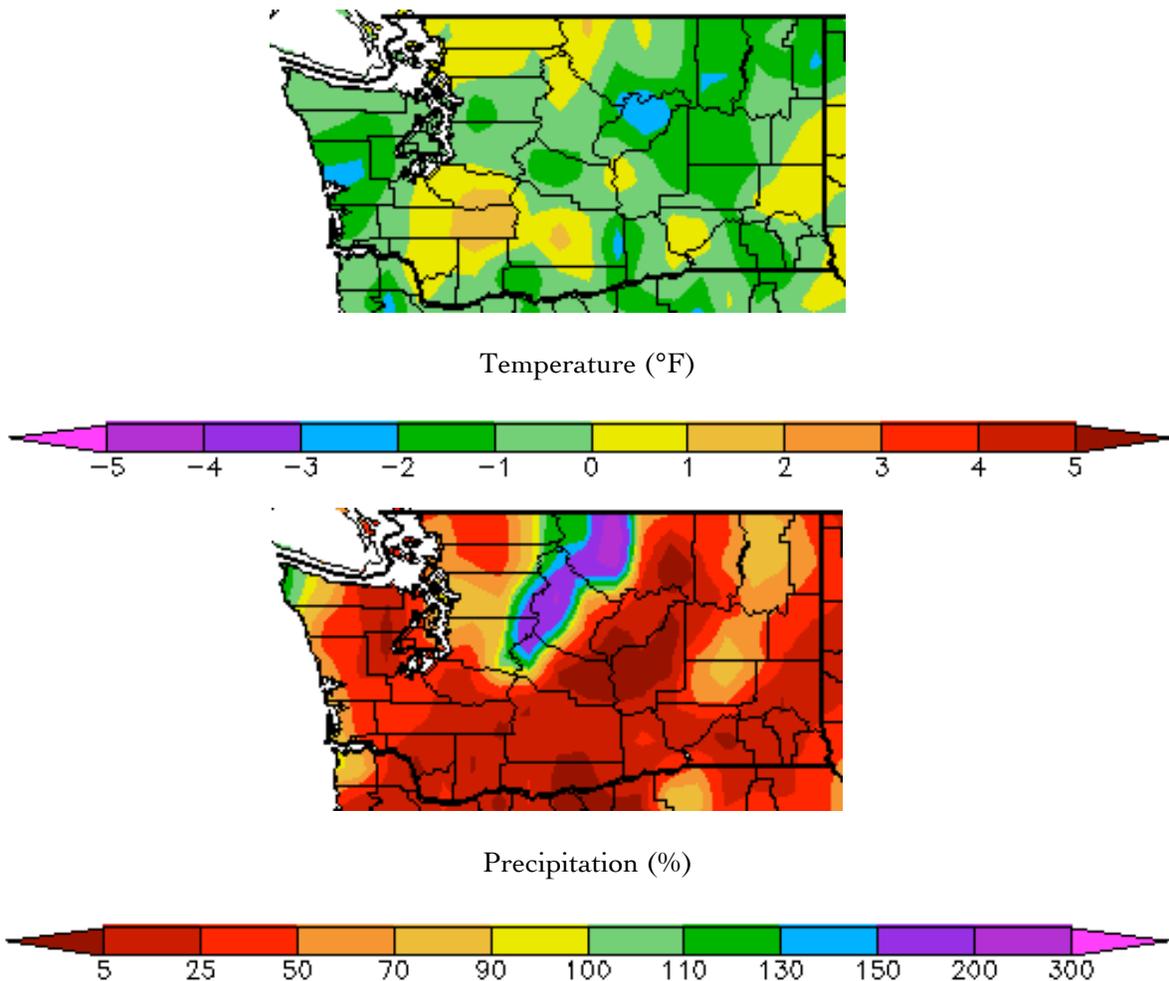
Reference:

Arndt, D.S., M. O. Baringer, and M. R. Johnson, Eds., 2010: State of the Climate in 2009. *Bull. Amer. Meteor. Soc.*, **91** (7), S1-S224.

Climate Summary

Average August temperatures were near normal for a majority of the state according to the map below from the High Plains Regional Climate Center (HPRCC). The Puget Sound stations of SeaTac and Olympia experienced essentially normal average August temperatures (Table 1). Spokane, Omak, and Yakima (Table 1) were also within 1°F of normal for the month. There were, however, a few stations with average August temperatures that were 1.5°F or more cooler than normal (i.e. Ephrata, Pasco, and Pullman; Table 1), as also shown on the map below.

August was extremely dry for a majority of the state, as shown in the map and table below. Some stations in central WA (i.e. Ephrata and Wenatchee; Table 1) received less than 5% of their normal precipitation. A few stations in the northern Cascades received above normal precipitation (map) and the Seattle WFO was close to normal (96% of normal; Table 1), but they were exceptions to the generally dry month.



*(August temperature (°F) departure from normal (top) and August precipitation % of normal (bottom).
Source: High Plains Regional Climate Center (<http://www.hprcc.unl.edu>).*

	Mean Temperature (°F)			Precipitation (inches)		
	Average	Normal	Departure from Normal	Total	Normal	% of Normal
Western WA						
Olympia	63.2	63.3	-0.1	0.51	1.10	46
Seattle	65.3	66.2	-0.9	0.93	0.97	96
Sea-Tac	65.4	65.6	-0.2	0.64	1.02	63
Eastern WA						
Spokane	68.5	68.6	-0.1	0.21	0.68	31
Wenatchee	71.8	72.9	-1.1	0.01	0.35	3
Omak	70.0	70.5	-0.5	0.16	0.65	25
Ephrata	72.5	74.0	-1.5	0.01	0.25	4
Pullman	64.4	66.8	-2.4	0.31	0.89	35
Pasco	72.8	74.4	-1.6	0.28	0.36	78
Yakima	69.0	68.3	0.7	0.05	0.36	14

Table 1 - August Climate Summaries from around Washington from NWS (climate normal baseline is 1971-2000 except for Seattle WFO that has a baseline of 1986-2000).

Website Updates

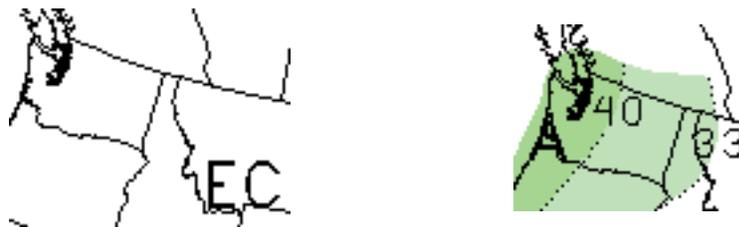
- The precipitation ranking utility (<http://climate.washington.edu/precipranking/>) was updated with the most recent monthly precipitation totals. The tool plots and ranks precipitation for 8 WA sites (Bellingham, Hoquiam, Lakeside, Quillayute, Seattle, Spokane, Vancouver, and Yakima) by calendar year, water year, and season.
- Some additional links to outside climate information have also been provided on our “Links” page: <http://climate.washington.edu/links.html>.

Climate Outlook

La Niña conditions are present across the equatorial Pacific according to the Climate Prediction Center (<http://www.cpc.noaa.gov/products/precip/CWlink/MJO/enso.shtml>). During the last 4-weeks, sea surface temperatures (SSTs) were 1.0-2.0°C below average in the tropical Pacific, with the strongest anomalies in the western equatorial Pacific (near the date line). Models are in agreement that the La Niña conditions will persist through the boreal winter and some indicate that it will strengthen though there is still some disagreement on the intensity (http://iri.columbia.edu/climate/ENSO/currentinfo/SST_table.html).

A cold ENSO is typically associated with cooler than normal and wetter than normal January-February-March conditions, but we are already seeing a reflection of the La Niña in the fall Climate Prediction Center (CPC) outlook. The September-October-November (SON) outlook calls for equal chances of below, equal to, or above normal temperatures for the whole state. Precipitation, on the other hand, is expected to be above normal for SON, with at least a 33% chance in eastern WA and 40% chance in western WA.

The October-November-December (OND) CPC outlook has an equal chance of below, equal to, or above normal temperatures. The OND precipitation outlook exceeds a 40% chance of above normal precipitation for the entire state.



(September-October-November outlook for temperature (left) and precipitation (right) from the CPC).



(October-November-December outlook for temperature (left) and precipitation (right) from the CPC).