



Office of the Washington State Climatologist

October 5, 2009

Warm & Dry Summer

The mean temperature for June-July-August (JJA) averaged over all of Washington was relatively high (65.9°F) this year, ranking as the 8th warmest in 115 years (Figure 1) according to the National Climatic Data Center (NCDC). The warmest year in the record was in 1958 with an average temperature of 67.6°F. For precipitation, this JJA was dry compared to the 1901-2000 average, ranking as the 13th driest in 115 years (Figure 2). The driest meteorological summer for the state was in 2003 with an average precipitation of 0.88 inches.

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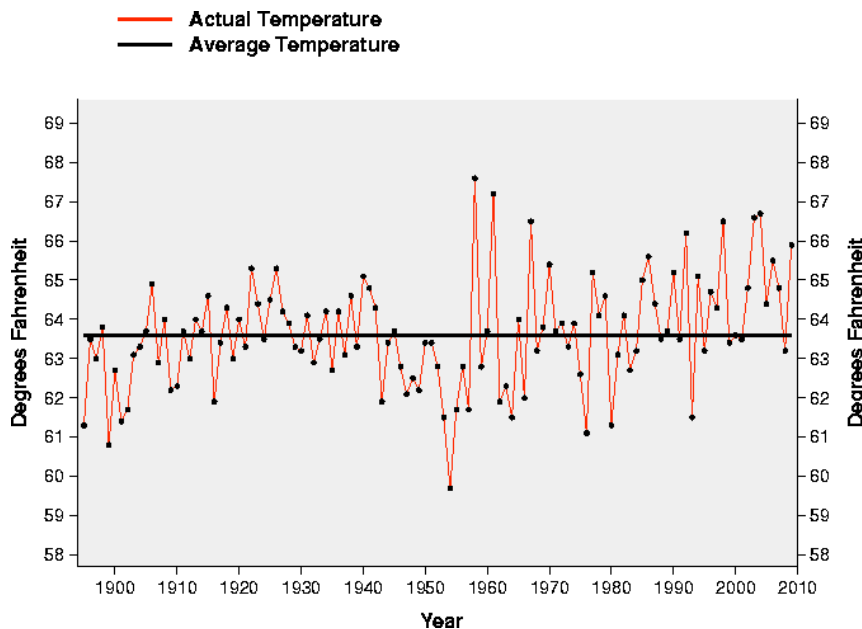


Figure 1: 115 years of mean JJA temperature (F) averaged over WA. The thick line is the 1901-2000 average (from NCDC).

September Summary

The warm and dry summer conditions generally extended into September, but there were finally some significant rain events in western WA. Labor Day weekend was wet and cool for a majority of the state. Daily precipitation records were broken on the west side: on the 5th, SeaTac recorded 0.24 inches of rain breaking the previous daily record of 0.04 in. On the 6th, SeaTac recorded 0.93

inches of rain, breaking the old record of 0.38 inches. Olympia recorded 1.54 inches on the 6th, also breaking their previous record of 0.76 inches. A tornado touched down in Pierce county on the 6th, spanning from south of Lake Tapps to north of Enumclaw. The tornado

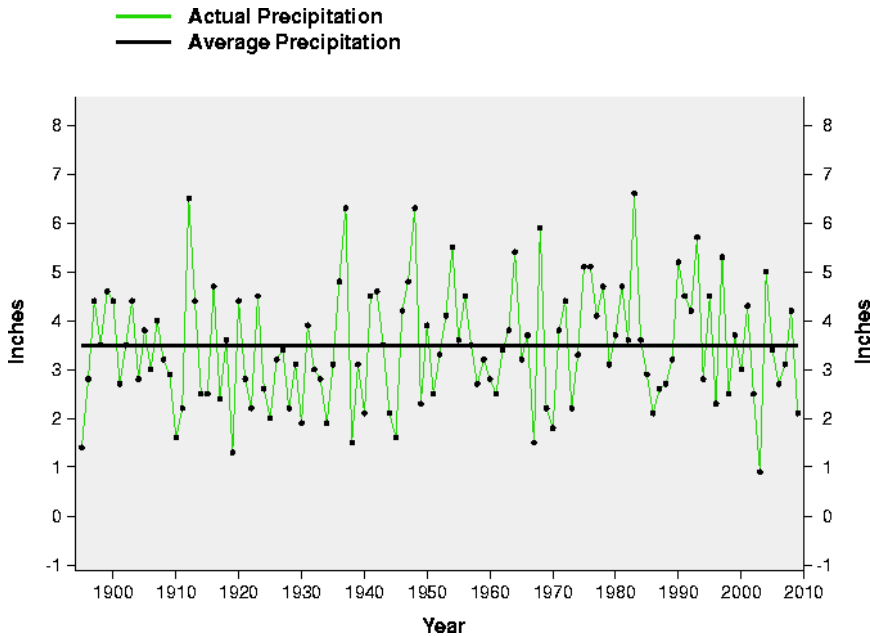


Figure 2: Same as Figure 1, except for JJA precipitation.

moved northeast for 9.6 miles at about 36 miles an hour, and was classified as an EF1 on the Enhanced Fujita scale. A high pressure moved into the state beginning on September 10th, enabling warmer than normal temperatures to persist for a few days. Some daily high temperatures were broken on the 11th (SeaTac Airport reach 87°F, breaking the daily record of 84°F; Quillayute also reached 87°F, breaking the 83°F record; Vancouver reached

96°F, breaking the record of 95°F) & 12th (Olympia reached 86°F breaking the record of 85°F; Stampede Pass reached 78°F breaking the record of 76°F). On September 13th, some daily high temperature records were broken in eastern WA (e.g. Omak reached 94°F, breaking the record of 91°F). Another front moved through on the 16th & 17th, however, bringing more rain to western and northeastern WA. Temperatures warmed up again, sparking many fire warnings throughout the state. On the 22nd & 23rd, smoke could be seen streaming over WA on the satellite image from two fires in Oregon. Some record high daily temperatures were broken on the 23rd (e.g. Omak reached 90°F, breaking the record of 89°F). Relatively warm temperatures persisted until a system moved through on the evening of the 28th ushering in much cooler autumn-like temperatures and precipitation. Snow even fell at the higher mountain elevations to kick off the start of the new water year on October 1st.



Community Collaborative Rain, Hail, and Snow Network News

As always, thank you CoCoRaHS volunteers for your participation.

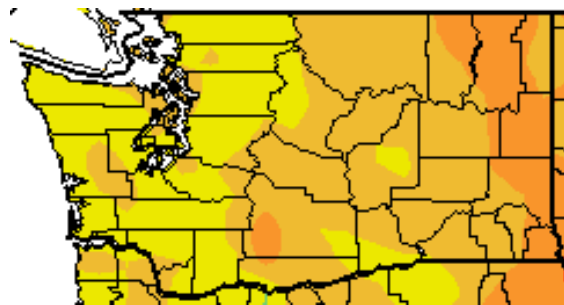
Washington finally has county coordinators! We have recently recruited three county coordinators (for Clark, San Juan, and Skagit counties) to help keep our network running smoothly. The county coordinators will help new observers with the placement of their rain gauges, encourage volunteers to keep reporting, and try to recruit more volunteers among other tasks. The county coordinator information is listed on the CoCoRaHS webpage. If you're interested in becoming the county coordinator for your county, please contact wash.cocorahs@gmail.com and/or your regional coordinator.

National headquarters launched a challenge this month to try and have a CoCoRaHS observer in every county across the country. Washington is close to that standard - we only have four counties that do not have any observers. Currently Asotin, Columbia, Franklin, and Wahkiakum do not have any CoCoRaHS volunteers. If you have friends or family residing in any of these locations, please encourage them to sign-up as observer! We have through the end of this year to complete the challenge. To sign up, please register at www.cocorahs.org. Since these counties are under-represented, the first to sign up in each county will qualify for a free rain gauge. Email wash.cocorahs@gmail.com to claim your gauge after you sign up.

Climate Summary

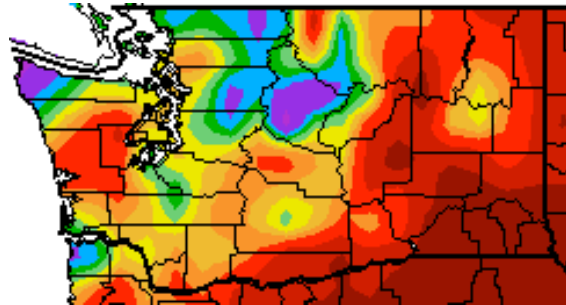
Temperatures were above normal for the entire state of Washington for the month of September. Most of western WA had temperatures that were warmer than normal by at least 1 or 2°F. Vancouver was an exception with the average September temperature 5.0°F warmer than normal (Table 1). East of the Cascade Mountains, however, was even warmer than locations in western WA, with temperatures anywhere between 2 and 6°F warmer than normal. Spokane was 4.7°F warmer than normal for the month (Table 1).

September precipitation was much more variable throughout the state. Eastern WA was very dry, with parts (e.g. the Blue Mountains) receiving less than 25% of normal for the month. Pullman only received 13% of its normal September precipitation (Table 1). The Olympic Peninsula was also generally dry, only receiving between 50 and 70% of normal. Precipitation was closer to normal throughout the Puget Sound (90-100%), and Seattle received more than normal precipitation for the first time since May. Parts of the northern Cascades and the northwestern portion of the Olympic Peninsula even received between 120 and 150% of normal, but Omak only received 78% of normal.



Temperature (°F)





Precipitation (%)



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

	Temperature (°F)			Precipitation (inches)		
	Avg	Normal	Departure from Normal	Total	Normal	% of Normal
Olympia	59.6	58.3	1.3	2.48	2.03	122
Seattle	62.6	61.5	1.1	2.35	1.71	137
Sea-Tac	62.4	61.1	1.3	1.75	1.63	107
Vancouver	65.8	60.8	5.0	1.44	1.78	81
Spokane	63.9	59.2	4.7	0.49	0.76	64
Omak	64.6	61.5	3.1	0.42	0.54	78
Pullman	61.4	58.7	2.7	0.11	0.88	13
Ephrata	66.7	64.7	2.0	0.14	0.37	38
Pasco	65.4	65.2	0.2	0.15	0.35	43
Yakima	62.2	59.9	2.3	0.43	0.39	110

Table 1 - September Climate Summaries from locations in western Washington and eastern Washington (highlighted in orange) from NWS (climate normal baseline is 1971-2000).

Dry Conditions Continue

Despite a few locations throughout Washington with precipitation greater than the monthly normal, dry conditions continued for the majority of the state. The September 29th edition of the Drought Monitor has the entire state at least classified as “Abnormally Dry” (Figure 3). Since last month, there has been some improvement on the Olympic Peninsula due to some relief via rain, but the rest of the state has not recovered. Streamflows, however, have improved since last month as shown by the 28-day average streamflow map from USGS (Figure 4). Many of the gauges in western WA are reporting “Normal” streamflow for the month, which is an improvement from the “Below Normal” and “Much Below Normal” that was published in last month’s newsletter. Some degradation can be seen in eastern and central Washington due to the dry conditions in September.

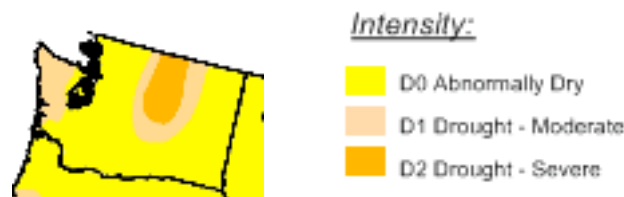


Figure 3: The September 29th edition of the US Drought Monitor.

Governor Gregoire requested on September 28 that the U.S. Secretary of Agriculture declare 6 counties as farm disaster areas due to the low winter snowpack and the dry conditions experienced this summer. This declaration would give farmers and ranchers more options for low-interest loans to cover damages from the drought. The 6 counties are Chelan, Douglas, Ferry, Grant, Lincoln, and Okanogan, which are all located in north central WA where the driest conditions have been seen. The statement can be read here:

<http://www.governor.wa.gov/news/news-view.asp?pressRelease=1336&newsType=1>

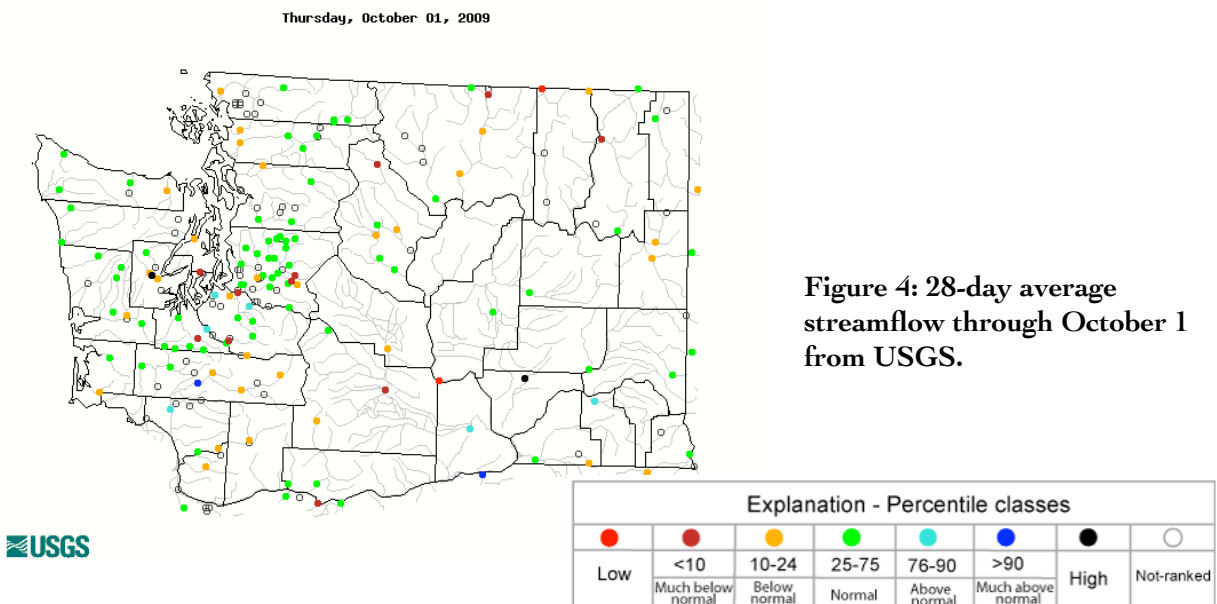


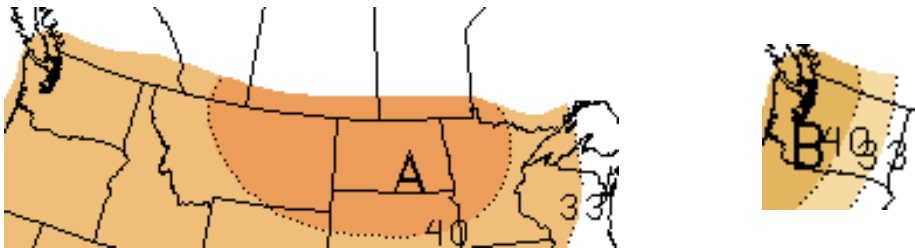
Figure 4: 28-day average streamflow through October 1 from USGS.

Outlook

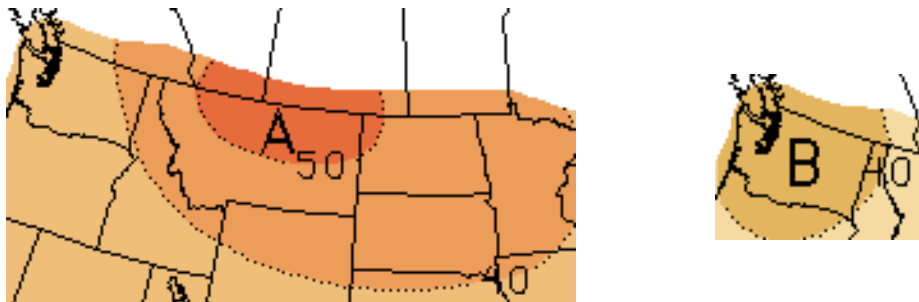
Weak El Niño conditions are present in the tropical Pacific Ocean. According to forecasts from the Climate Prediction Center, El Niño is expected to strengthen through the fall and persist into the winter (<http://www.cpc.noaa.gov/products/precip/CWlink/MJO/enso.shtml>), producing a moderate warm event. This situation provides some skill in predicting the upcoming winter season in the Pacific Northwest and much of North America. On average, winters during El Niño years are warmer and drier than typical conditions for WA state. This is not always the case, however, as some El Niño winters have been near normal, or cooler and wetter than average. Consequently, the seasonal prediction should be interpreted as a tilting of the odds towards a warm, dry winter.

The seasonal climate forecast by the NOAA Climate Prediction Center for October-November-December (OND) calls for a 33-40% chance of above normal temperatures for the entire state. There is at least a 40% chance of below normal precipitation for the Olympic Peninsula through the Cascades. Just east of the Cascades there is at least a 33-40% chance of below normal precipitation for OND. The very eastern part of the state (including Spokane) has an equal chance of below, equal, or above normal precipitation for late Fall.

The outlook for November-December-January (NDJ) reflects a strengthening of the El Niño pattern over the western United States with the chances of above normal temperatures exceeding 33% over the entire site and exceeding 40% over the northeastern portion of the state. Chances of below normal NDJ precipitation exceed 40% for the entire state.



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



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

As a reminder, the seasonal forecasts put out by the CPC have three categories, separating the chances of below, equal to, or above normal temperatures or precipitation into equal probabilities of 33%. When there is at least a 33% chance of above normal temperature, for example, it should be looked at as a slight tilting of the odds in favor of higher than normal temperatures. Figure 5 illustrates this idea. The pie chart shows the February-March-April outlook for Seattle in which there is a 43% chance of higher than normal temperature (in this newsletter, we would word this as at least a 40% chance of higher than normal temperatures). The near normal probability stays close to 33%, but the probability of below normal temperatures decreases to 25% with the forecast of higher temperatures.

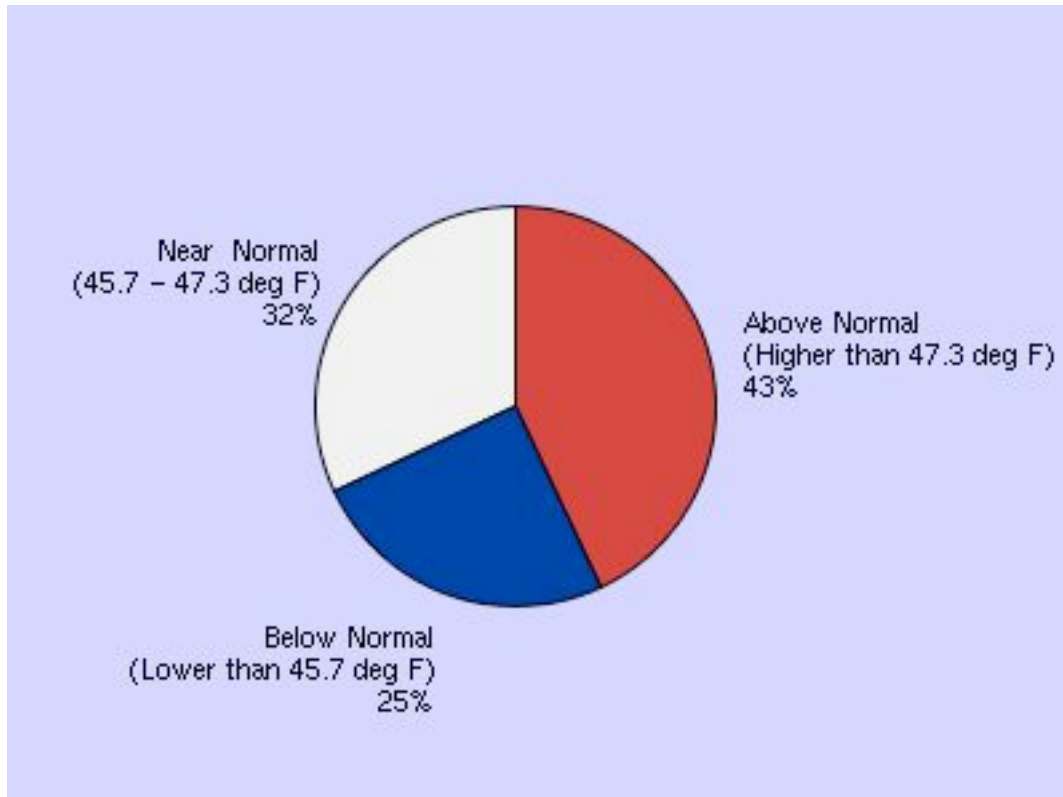


Figure 5: February-March-April 2010 temperature forecast for Seattle. There is a higher chance for temperatures to be higher than normal during this time period. Note that the normal temperature probability stay near 33%, but the below normal temperature probability drops (from NWS Seattle Office).