



Office of the Washington State Climatologist

June 4, 2010

May Highlights

Last month's newsletter featured the Climate Prediction Center's May-June-July seasonal forecast, which called for at least a 40% chance of above normal temperatures. Thus far, that seasonal outlook has not come into fruition, and the summer outlook (JJA) has since been updated (see Climate Outlook section). May, rather than staying consistent with the dry and warm conditions seen throughout most of the state this winter, continued with the cool and wet trend that started in April.

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May started out with a winter type storm that brought snow to the mountains (15" of new snow fell on Mt. Baker on May 2 & 3) and relatively low snow levels (about 1500 ft for the Cascades on May 4). A Puget Sound convergence zone (PSCZ) developed on May 3, and can clearly be seen on the 7 am May 4 CoCoRaHS map of 24-hr precipitation totals in King County (Figure 1). Strong sustained winds between 35-45 mph also affected eastern WA on the 3rd and blowing dust restricted visibility on major highways east of the Cascades. More information, including pictures of damage from the wind storm, can be found on the Spokane WFO site (http://www.wrh.noaa.gov/otx/photo_gallery/windstorm05032010.php). Cooler temperatures settled in across the state on May 5. It was especially cool in Seattle with a daily record low high temperature of 48°F recorded at Sea-Tac on May 5 - only 3°F warmer than the normal low temperature! Temperatures quickly rebounded back to normal, however, and remained that way for most of the state through the middle of the month.

Another strong system affected the state on May 19 causing lowlands wind gusts of 60 mph at Quillayute and Hoquiam, 49 mph at Whidbey Island and Bellingham, 36 mph at Seattle WFO and McChord Air Force Base, and 32 mph in Olympia and Renton, for example. Mountain wind gusts of 83 mph at Hurricane Ridge, 78 mph at Mt. Baker, and 55 mph at White Pass were also measured. In addition to heavy rainfall in eastern WA, there was an EF0 tornado that touched down 5 miles northeast of Moses Lake that was on the ground for approximately 1/2 to 1/3 of a mile. Strong systems continued to affect the state through the remainder of the month. A low pressure system south of WA on May 25 & 26 allowed for a unusual southeast to northwest circulation, causing heavy rainfall in eastern WA. Maximum daily rainfall records were broken with these events. For example, the maximum daily rainfall records were broken at Olympia with 0.64" (May 25), at Wenatchee with 0.47" (May 26), and at Spokane with 0.98" (May 27) of precipitation.

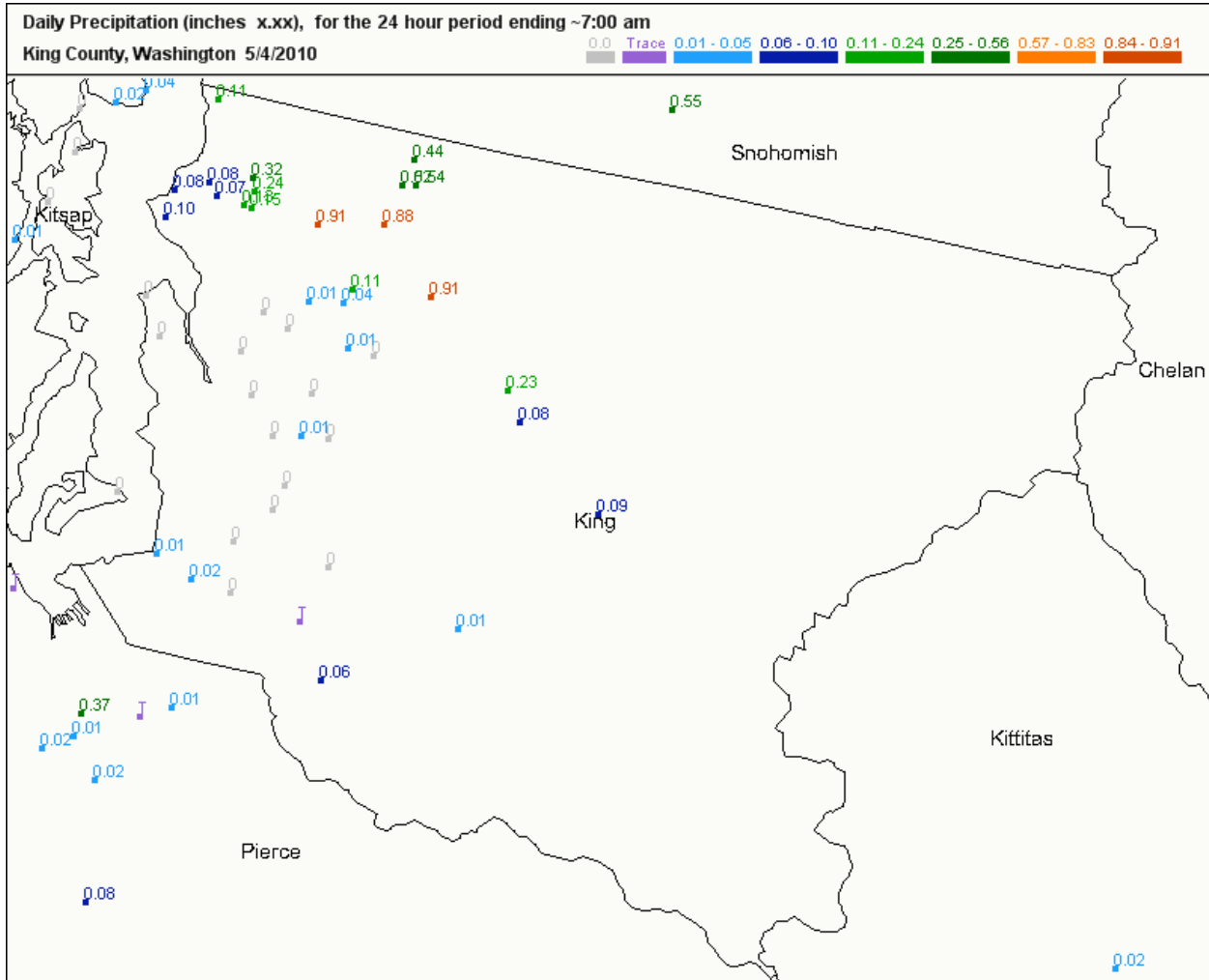


Figure 1: CoCoRaHS 24-hr precipitation totals at 7 am on May 4, 2010 showing the higher totals in northern King County from a Puget Sound Convergence Zone.

A Review of Winter 2009-2010

A report on the dry winter conditions, and how this El Niño compares to others, can now be found on our website: <http://climate.washington.edu/events/2010winter/>. Temperature and precipitation anomalies for this winter and past El Niño events, SST anomalies, and 850 mb mean winds are some of the highlights.

Spotlight on the Agricultural Weather Network (AWN)

The Agriculture Weather Network (AWN) is a collection of 134 weather stations owned and operated by Washington State University. Most of the stations are located in agricultural regions of eastern WA, but a significant expansion into other regions of the state took place about 2-3 years ago. The stations collect a wide range of variables including, but not limited to, temperature, precipitation, relative humidity, solar radiation, wind, and various soil properties. The option is available to view this data in an hourly, daily, or monthly format. The data for these stations is available online at the AWN site: <http://weather.wsu.edu/awn.php>. The OWSC site allows you to see the locations of these stations on our climate inventory maps and gives instructions on the exact links to click on to access the data:

<http://www.climate.washington.edu/maps/>. Figure 2 shows a screen shot of our hourly precipitation climate inventory map with the AWN station denoted by the yellow balloons.

Hourly Precipitation Data

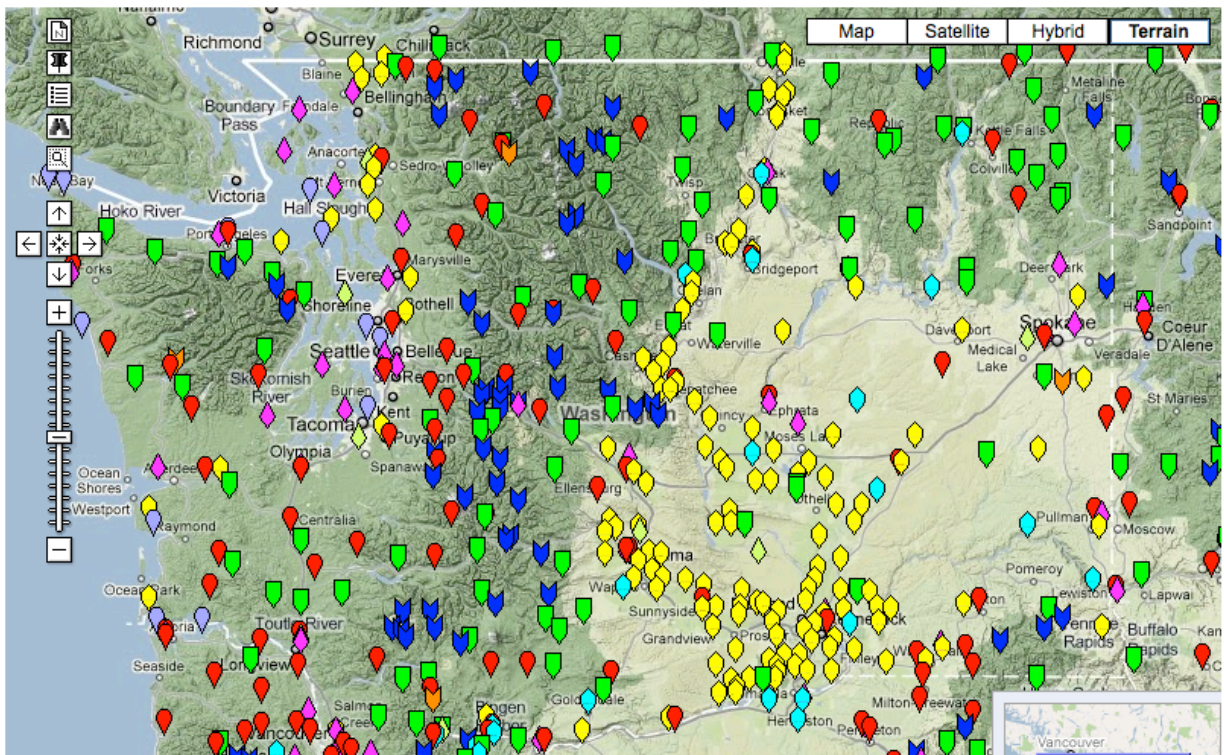
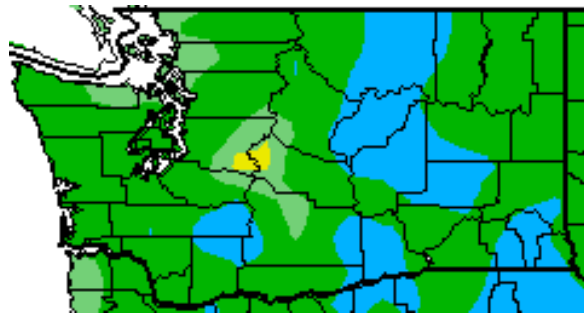


Figure 2: Hourly precipitation climate inventory map from the OWSC site: <http://www.climate.washington.edu/maps/>. The yellow balloons show the locations of the AWN sites.

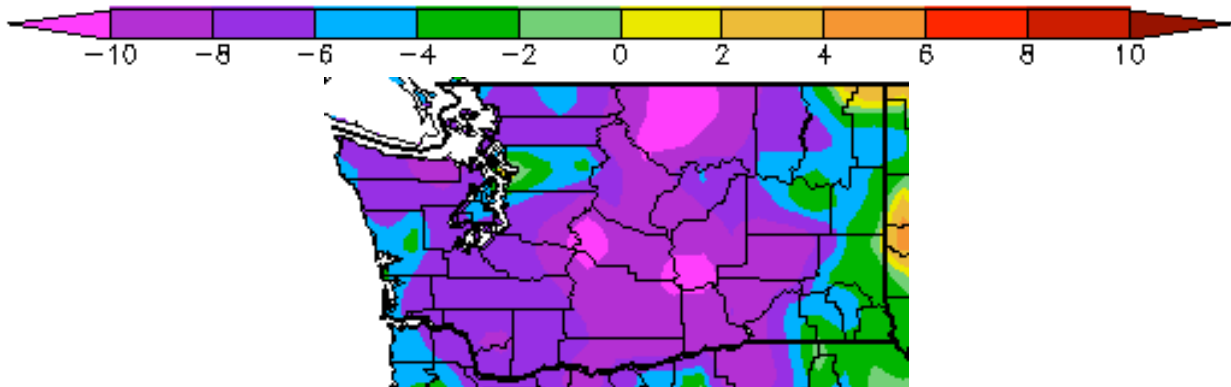
Climate Summary

Average temperatures were below normal for the month of May for the entire state, as illustrated by the High Plains Regional Climate Center (HPRCC) map below. Most of the state was between 2 and 4°F below normal, but some parts of central WA were even cooler. Omak and Pasco, for example, were both 4.8°F below normal for May, Wenatchee was 4.3°F below normal, and Ephrata was 5.0°F below normal (Table 1).

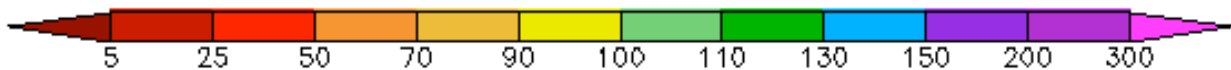
Unlike this past winter, May total precipitation was much above normal for the entire state. The HPRCC map below shows that most of the state received at least 150% of normal precipitation. A low pressure system south of WA at the end of May caused southeasterly flow over the state, ensuring that eastern WA got its fair share of precipitation. Omak, Wenatchee, Ephrata, and Yakima all had greater than 200% of the May normal (Table 1).



Temperature (°F)



Precipitation (%)



*(May temperature (°F) departure from normal (top) and May 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	51.0	53.3	-2.3	4.15	2.27	183
Seattle	53.6	55.9	-2.3	3.66	2.10	174
Sea-Tac	53.2	55.8	-2.6	2.83	1.78	159
Quillayute	48.8	51.2	-2.4	8.12	5.51	147
Vancouver	54.4	55.8	-1.4	3.94	2.64	149
Eastern WA						
Spokane	51.3	54.4	-3.1	2.15	1.60	134
Wenatchee	55.1	59.4	-4.3	1.50	0.61	246
Omak	52.8	57.6	-4.8	3.05	1.08	282
Ephrata	55.4	60.4	-5.0	1.45	0.64	227
Pasco	56.8	61.6	-4.8	1.14	0.67	170
Yakima	54.1	56.2	-2.1	1.46	0.51	286

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

Summer Streamflow

The cool and wet May conditions have been beneficial for the summer water supply outlook. The June-September streamflow forecast issued on May 27 from the Northwest River Forecast Center was improved since last month's prediction (Figure 3). Many streams in central WA have improved to 75-90% of normal streamflow for June-September (last month's forecast was 50-75% of normal). Additionally, the Lewis-Merwin Dam (on the border of WA and OR) June-September streamflow forecast has improved to 94% of normal. The wet spring thus far has not only alleviated drought concerns in many areas of the state, but it may also be a good sign for delaying the start of fire season throughout WA.

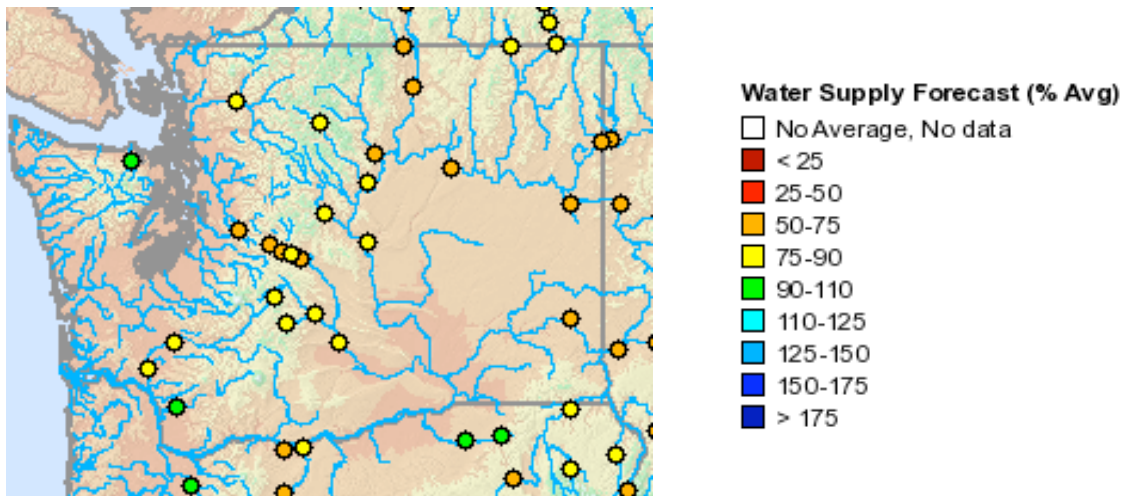


Figure 3: June through September water supply forecast for WA as of May 27, 2010 from the National Weather Service Northwest River Forecast Center (http://www.nwrfc.noaa.gov/water_supply/ws_fcst.cgi).

Climate Outlook

The El Niño conditions have weakened in the last month, and are shifting into ENSO-neutral conditions. According to the CPC (<http://www.cpc.noaa.gov/products/precip/CWlink/MJO/enso.shtml>), sea-surface temperature (SST) anomalies are currently negative in the eastern tropical Pacific and have been at least 0.5°C below normal for the last 4 weeks. The western tropical Pacific SST anomalies have been 0.5°C above normal for the last 4-week period. The transition to neutral conditions is expected to continue, and the neutral conditions may last through winter 2010-11. The model forecasts for ENSO are typically not very reliable at this time of year, but the majority are indicating neutral ENSO conditions for next winter. The number of models indicating a La Niña, however, are increasing, and more information will become available in the coming months (http://iri.columbia.edu/climate/ENSO/currentinfo/SST_table.html).

In the meantime, the CPC seasonal outlooks are shown below and are mainly based on recent trends, the dynamical forecasts from the NCEP Climate Forecast System (CFS), and the continued shift to neutral ENSO conditions. The predictive accuracy of the forecast is low for this time of year, and is perhaps why the odds are even for both of the seasonal temperature predictions. Remember that when the odds are even, or there is lack of guidance, there is still a 33% chance each for above average, normal, or below average conditions.

The summer (June-July-August; JJA) outlook has equal chances of above, equal to, or below normal temperatures for the entire state. The precipitation outlook calls for a 40% chance of below normal precipitation for the entire state. The late summer (July-August-September; JAS) outlook calls for an equal chance of below, equal to, or above normal temperatures (a 33% chance for each). The chances for below normal precipitation for JAS exceed 40% for most of the state, with a somewhat lower probability of dry conditions in the northwestern portion (including the Olympic Peninsula).



(June-July-August outlook for temperature (left) and precipitation (right) from the CPC).



(July-August-September outlook for temperature (left) and precipitation (right) from the CPC).