



Office of the Washington State Climatologist

April 5, 2010

March Wrap Up

The beginning of the month started out relatively dry across the state, with temperatures slightly warmer than normal. A cold front moved through overnight on March 7, bringing rain to most locations and even some snow: SeaTac Airport recorded a trace of snow on March 8. Cooler temperatures settled across the state for a few days as well as some precipitation that brought snow to the mountains. SeaTac Airport and Olympia tied their record lows on March 9 (28°F; 23°F). By mid-month temperatures were warmer than normal, and the state was relatively dry. Some record high daily temperatures were set on March 24: 64°F in Bellingham, 68°F at SeaTac AP, and 70°F at Seattle WFO. Another system moved through on March 25, bringing precipitation mainly to western WA and the threat of thunderstorms east of the Cascades. Cooler and wetter conditions occurred in the whole state during the last few days of the month as a cold front and upper-level trough moved through (March 28 & 29). New snow in the mountains was measured in feet, wind gusts were anywhere between 35 (lowlands) and 92 (Olympic Mountains) mph, and some minor flooding occurred on the Olympic Peninsula.

In this Issue

March Wrap Up.....	1
Snowpack Report.....	2
CoCoRaHS March Madness Results.....	3
Climate Summary.....	3
Climate Outlook.....	6

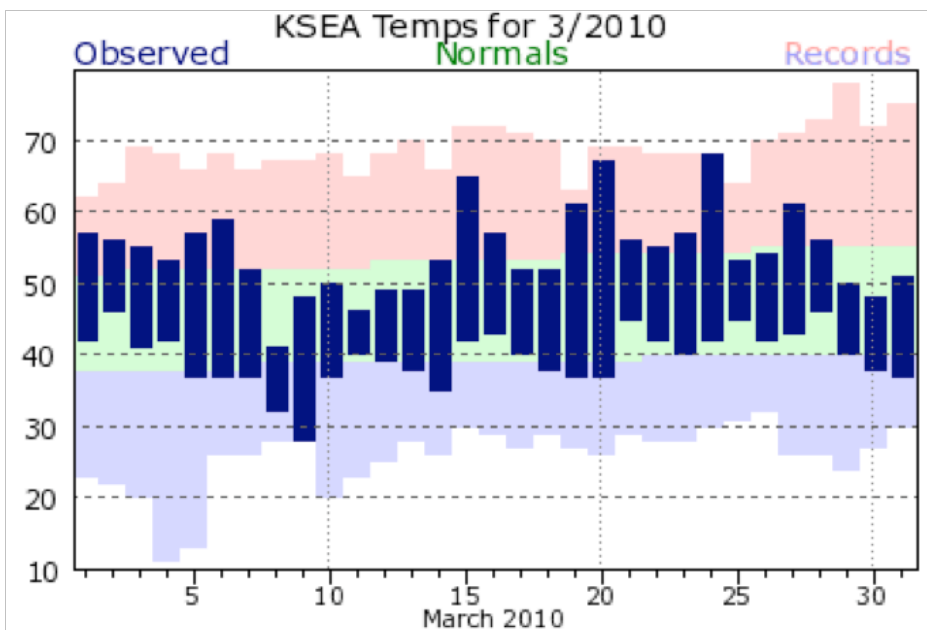


Figure 1 shows the daily maximum and minimum temperature for SeaTac Airport for March (from National Weather Service) and illustrates the general weather pattern for most of the state.

Figure 1: March 2010 maximum and minimum temperatures at SeaTac Airport along with the normal temperatures and records (from NWS).

Snowpack Report

The few storms in March (and early April - more on that next month) that brought snow to the higher elevations greatly improved the snowpack situation in WA. Unfortunately, many basins are still below normal which may pose some problems in the summer. Figure 2 shows the snow water equivalent percent of normal as of April 5, 2010. The Olympic and Lower Yakima basins are at normal snow water equivalent or above, with 125 and 98% of normal respectively. The North Puget Sound, Upper Columbia, Central Columbia, Lower Columbia, and Upper Yakima basins have between 72 and 88% of normal snow water equivalent. The Spokane, Lower Snake, Central Puget Sound, and South Puget Sound are of more concern, however, as those basins only have between 57 and 65% of normal snow water equivalent.

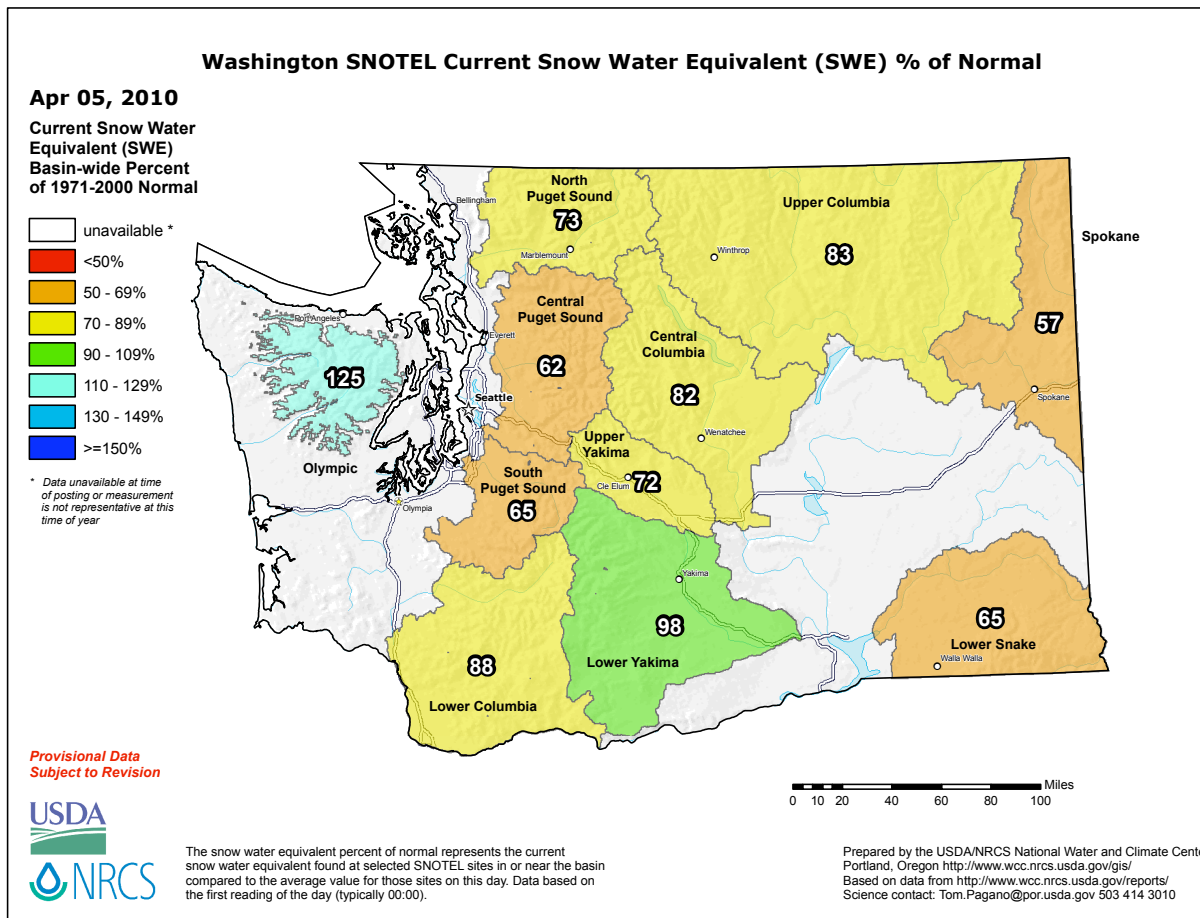


Figure 2: Snowpack (in terms of snow water equivalent) percent of normal for Washington as of April 5, 2010. Image is from the National Resources Conservation Service.



CoCoRaHS March Madness Results

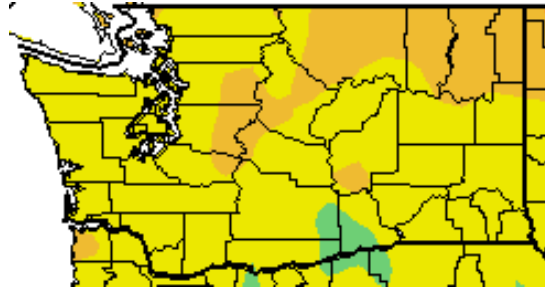
The March Madness results are in. This year, the population of each state was used to come up with population-weighted scoring system so that the less populated states had the ability to compete against the more populated states that have a bigger population pool to recruit volunteers from. And the winner is... North Dakota, with 21 new volunteers! Mississippi recruited an impressive 80 new volunteers and came in 2nd place. The top five was completed by Wyoming, Utah, and Kansas, with 10, 31, and 25 new volunteers, respectively.

Washington came in 26th place and recruited 12 new volunteers. It's a respectable finish and thanks go to anyone that spread the word. In total, 642 new volunteer observers were signed up across the country during March. You can still help recruit volunteers even though the competition is over. We even have some free rain gauges still available for observers that sign up and are in under-represented areas of the state. Sign up at www.cocorahs.org and then email wash.cocorahs@gmail.com to see if you qualify for a free gauge. Even if you don't, one can be purchased for less than \$30, so sign up today!

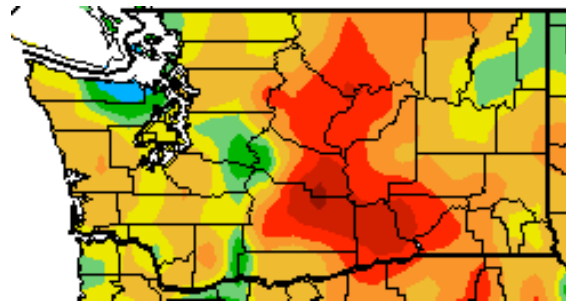
Climate Summary

Unlike January and February, when WA average temperatures were much above normal, the average March temperatures were much closer to normal throughout the whole state. The top map below from the High Plains Regional Climate Center (HPRCC) shows that much of the state had temperatures that were close to normal or up to 2°F above normal (Table 1). Some sites in south central WA were below normal by a maximum of 2°F; Pasco was 0.3°F below normal (Table 1). Northeastern WA through the north central region (ex. Omak, Table 1) was the only area with temperatures that were more than 2°F above or below normal, with average temperatures between 2 and 4°F above normal. Vancouver, in southwestern WA, was also above normal by 5.5°F (Table 1).

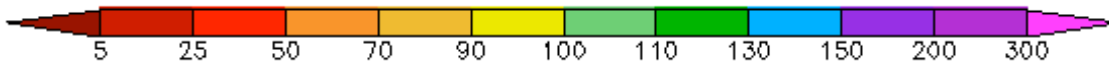
March precipitation was less consistent than temperature, though most of the state had below normal precipitation, as shown by the bottom map below from the HPRCC. Yakima County through central WA and up through Okanogan County were especially dry, only receiving between 20 and 50% of normal precipitation. Western WA was not as dry, with their dry spots receiving between 50 and 90% of normal. Some locations even had above normal precipitation for the month, like eastern Clallam County and most of King County. SeaTac Airport recording exactly the normal March precipitation (Table 1). Snow was not abundant this month, and SeaTac Airport and Spokane recorded a trace.



Temperature (°F)



Precipitation (%)



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

Since the beginning of the water year (starting October 1, 2009) through April 1, 2010, the temperatures have been slightly above normal. Most of the state has had temperatures that are less than 2°F above normal, but the northeastern portion of the state's average water year temperature so far are between 2 and 4°F above normal. Parts of the southeastern portion of the state have had temperatures slightly below normal for the current water year (not shown).

Water year precipitation (Figure 3) has been normal to slightly above normal on the Olympic Peninsula and throughout the Puget Sound. Precipitation has also been normal in Yakima and Okanogan Counties, but the rest of the state has between 70 and 90% of normal water year precipitation thus far. The Ephrata area has been especially dry this water year (between 5 and 25% of normal precipitation), but there are currently some problems with Ephrata precipitation gauge, according to Spokane WFO, so that may be contributing to the low reading.

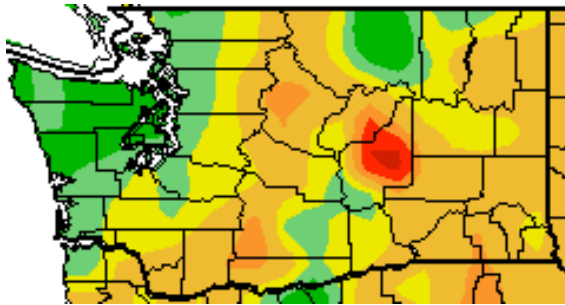
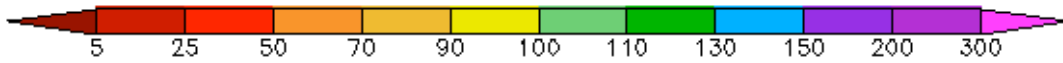


Figure 3: Precipitation percent of normal from October 1, 2009 through April 1, 2010 (from HPRCC).



	Mean Temperature (°F)			Precipitation (inches)			Snow (inches)		
	Avg	Norm	Departure from Normal	Total	Norm	% of Normal	Total	Norm	% of Normal
Western Washington									
Olympia	44.5	43.6	0.9	5.07	5.29	96	0	1.0	0
Seattle	47.7	45.9	1.8	3.16	3.84	82	0	M	-
Sea-Tac	47.0	46.2	0.8	3.76	3.75	100	T	0.6	0
Quillayute	45.1	43.9	1.2	9.79	10.99	89	0	1.6	0
Vancouver	47.5	42.0	5.5	3.77	4.86	78	0	M	-
Eastern Washington									
Spokane	41.2	39.5	1.7	1.20	1.53	78	T	3.1	0
Wenatchee	44.5	43.6	0.9	0.20	0.68	29	M	1.3	-
Omak	42.8	40.6	2.2	0.52	1.00	52	M	0.5	-
Pasco	46.7	47.0	-0.3	0.25	0.77	32	0	0	-
Yakima	43.8	42.5	1.3	0.14	0.70	20	0	1.2	0

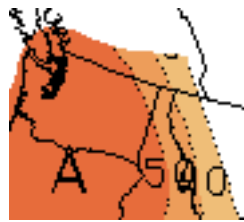
Table 1 - March Climate Summaries from around Washington from NWS (climate normal baseline is 1971-2000 except for Seattle WFO that has a baseline of 1986-2000). T denotes a trace of precipitation and M denotes missing data.

Climate Outlook

The El Niño conditions have weakened since December 2009, but are still persisting, and are expected to last through spring. The most recent 4-week equatorial sea-surface temperature (SST) anomalies are more than 1°C, similar to the previous 4-week period, according to the CPC (<http://www.cpc.noaa.gov/products/precip/CWlink/MJO/enso.shtml>). While this situation provides some skill in predicting winter conditions in the Pacific Northwest and much of North America, the skill for predicting spring and summer decreases substantially. On average, winters during El Niño years are warmer and drier than typical conditions for WA state, and that has generally been the case this year. Consequently, the spring seasonal prediction is mainly based on the recent trends, but also takes into account dynamical forecasts from the NCEP Climate Forecast System (CFS), and the expected decline of El Niño. 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 spring (April-May-June; AMJ) outlook has the chances of above normal temperatures exceeding 50% for the entire state, except for a tiny northeastern sliver. The northeastern portion has at least a 40% chance of above normal temperatures. The precipitation outlook calls for an equal chance of below, equal to, or above normal precipitation (a 33% chance for each) for AMJ.

The outlook for May-June-July (MJJ) calls for at least a 40% chance of above normal temperatures for the entire state. The precipitation outlook has equal chances of below, equal to, or above normal precipitation for MJJ.



(April-May-June outlook for temperature (left) and precipitation (right) from the CPC).



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