



Office of the Washington State Climatologist

May 4, 2012

April Event Summary

April was wetter and slightly warmer than normal throughout most of WA. This was in contrast to the cooler than normal March 2012 conditions and for that matter, the near-record cold that was felt in April 2011 throughout the state. More information on the average April conditions of this year can be found in the climate summary section below.

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The daily maximum and minimum temperature plot for Seattle Tacoma Airport (Figure 1) illustrates the general weather pattern for the state during the month of April. The beginning of the month was marked by cool temperatures, especially east of the Cascades where record cold daily high temperatures were set at Boundary Dam (40°F) on the 4th and in Quincy (49°F) and Winchester (33°F) on the 5th. Light snow fell in far eastern WA during this cool period at the beginning on the month. Figure 1 also shows that there were two periods of warmer than normal temperatures. April 7-10 was warmer than normal, and record high daily temperatures were set at SeaTac (70°F), the Seattle Weather Forecasting Office (70°F), and Bellingham (68°F) on April 8th, for example. The second period of warmer than normal temperatures, April 21-24, was felt more on the east side of the Cascades. While some daily record high temperatures

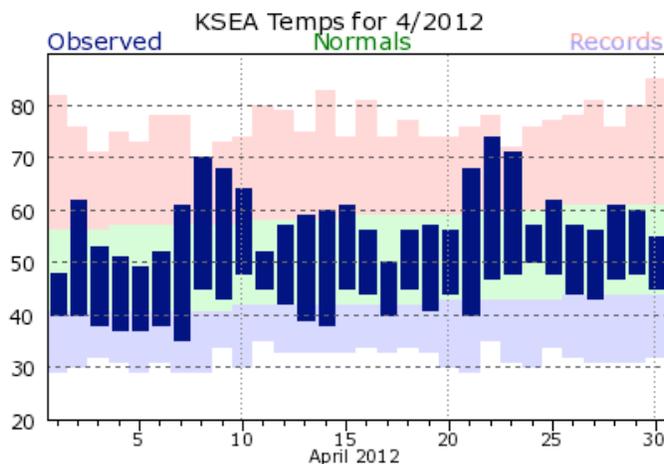


Figure 1: Daily high and low temperatures (blue bars) for SeaTac AP during April. The green shaded area represents the 1981-2010 normal temperature range.

were broken west of the Cascades, they were only by about 1°F over the previous record. East of the Cascades, daily records were broken by several degrees over the previous daily records: Wenatchee (82°F), Pullman (81°F), and Yakima (84°F) all recorded record daily high temperatures on April 22nd, for example.

The month was not entirely dry and warm, however; after all, the numbers did come in as

wetter than normal in most locations. Figure 2 shows the CoCoRaHS 24-hr precipitation totals as of approximately 7 am on April 20th. Precipitation fell statewide on the 19th, and was heavy at times, especially in southwestern WA. In eastern WA, a notable weather event occurred on April 23rd. Thunderstorms developed that afternoon, bringing frequent lightning and some heavy rainfall. Additionally, some daily rainfall records were broken east of the Cascades on April 26th as a strong cold front moved through the state. Pullman recorded 0.60" and Omak 0.59", both rainfall records for the day.

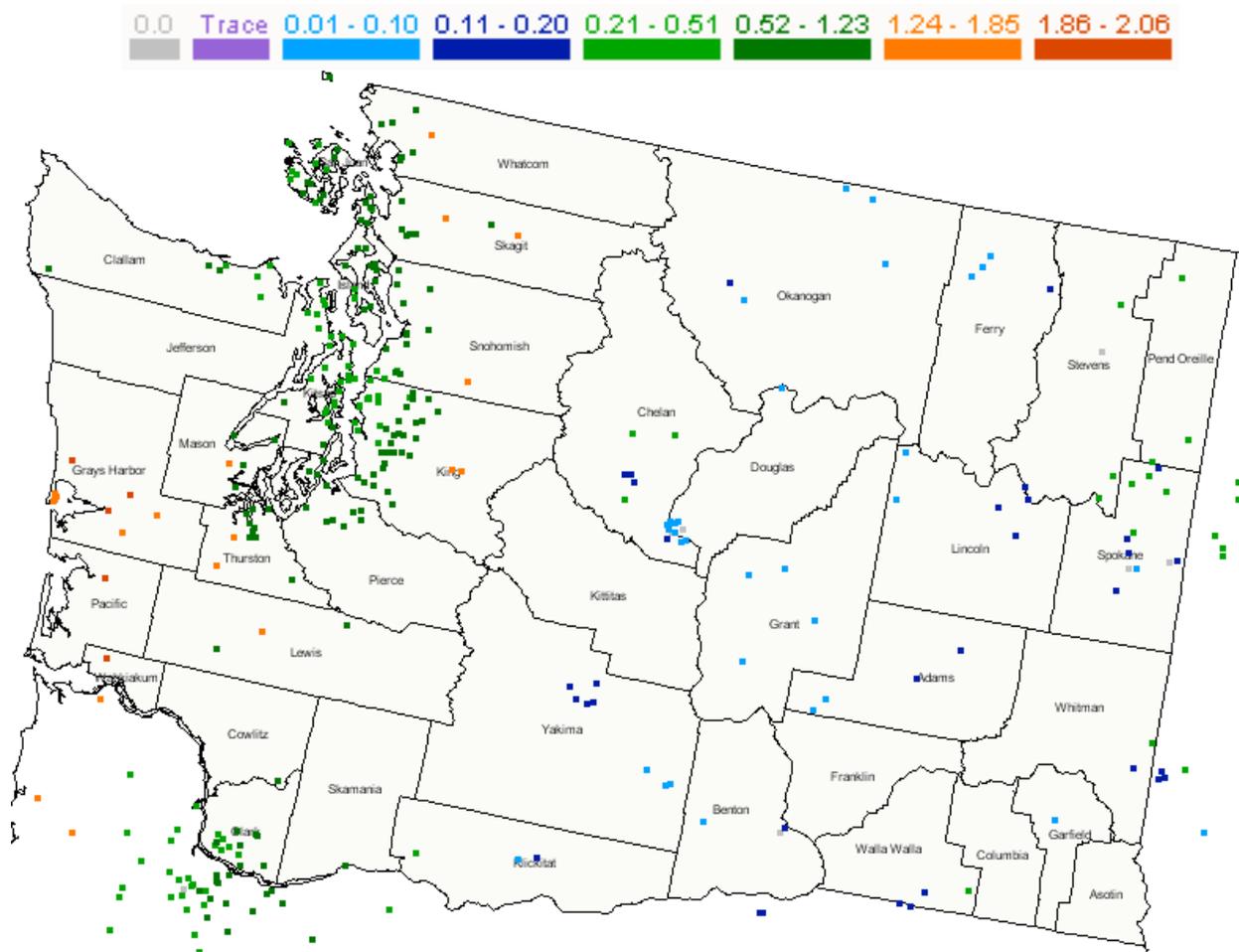


Figure 2: The 24-hr precipitation totals on the morning of April 20, 2012 from CoCoRaHS observers.

Snowpack

WA currently has a healthy snowpack for this time of year. The May 3 snow water equivalent (SWE) percent of normal from the National Resources Conservation Service (NRCS) is shown in Figure 3. The Olympic and Central Puget Sound basins still have much above normal snowpack with 167 and 169% of normal, respectively. The North Puget Sound, South Puget Sound, Lower Columbia, Lower Yakima, Upper Yakima, Central Columbia, and Upper Columbia all have above normal SWE (113 to 143% of average). In far eastern WA, the Lower Snake and Spokane basins are near-normal, with 96 and 107% of normal, respectively.

The water supply forecast from the Northwest River Forecast Center (Figure 4) is above normal from now through September.

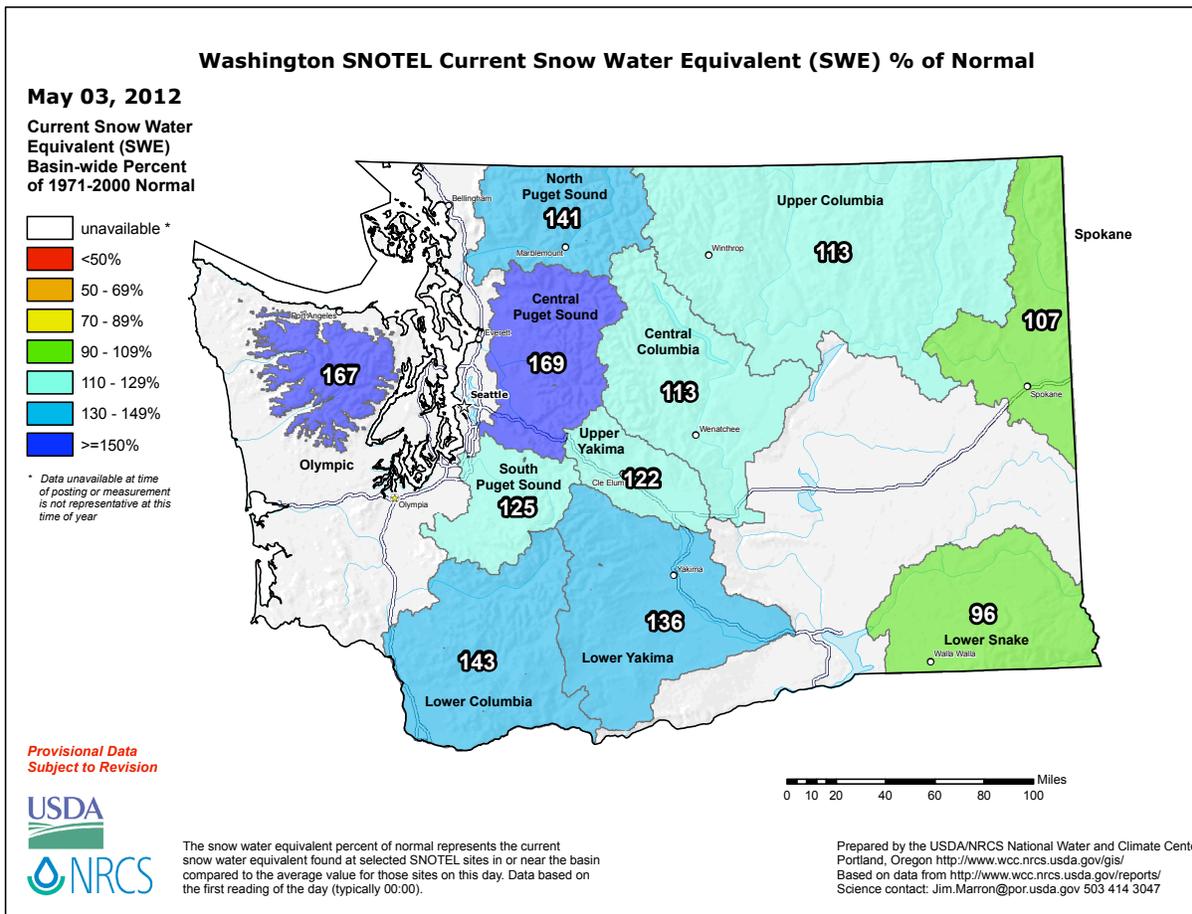


Figure 3: Snowpack (in terms of snow water equivalent) percent of normal for Washington as of May 3, 2012. Image is from the National Resources Conservation Service.

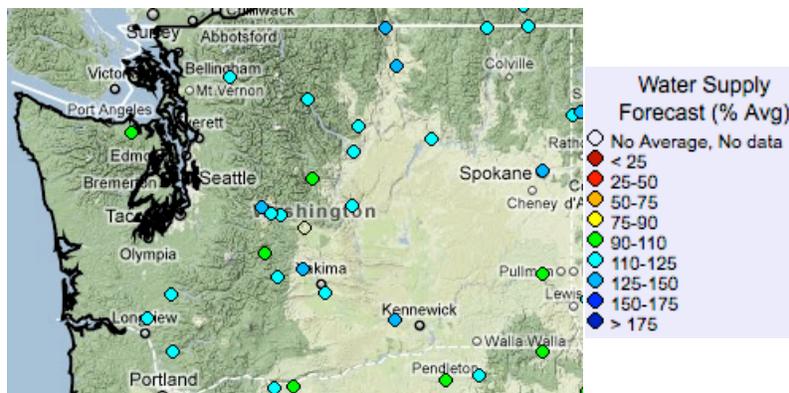


Figure 4: The water supply forecast from May through September from the Northwest River Forecast Center (<http://www.nwrfc.noaa.gov/ws/>).

WA Pollen Counts versus Rainfall

A message from the State Climatologist

The spring pollen season appears to have started rather late this year, at least in western Washington. From a personal perspective, I usually start exhibiting symptoms in about the middle of March, apparently due to an allergy to birch and alder pollen, but this year it happened noticeably later. Through comparing notes with friends and coworkers, I expect many others had similar experiences. Recall that March was abnormally wet across most of the state. Could the abundant rainfall have served to decrease or postpone the occurrence of high pollen concentrations?

The relationship between pollen counts and the weather, specifically precipitation, is examined here for the period of early March through late April 2012. The source of the pollen data is www.pollen.com; overall counts are available for various locations and the values posted for Seattle are considered here. The posted data does not include information on the relative contributions of the different species making up the total pollen count, and the counts are in unknown units. In general, the website lacks documentation of how the data is collected and processed. That constitutes a red flag in terms of using the data for any serious science, but we will forge ahead anyway. Time series of these counts at 2-day intervals, and of 2-day rainfall totals at SeaTac airport (SEA), are plotted in Fig. 5 for the period of 9 March through 30 April 2012. These time series reveal that at least in terms of the day-to-day fluctuations, that there is a marked negative correspondence between pollen counts and recent (previous 2 days) rainfall. Consistently higher pollen counts began occurring towards the end of March into the first half of April when it rained much less (with the exception of a few days at the

very end of March). A similar pair of time series was examined for Spokane (not shown). The pollen counts in Spokane exhibited smaller short-term fluctuations than in Seattle. Nevertheless, the wet period of 4-6 April for Spokane was also accompanied by a dip in pollen counts. The pollen time series suggest that indeed the allergy season was probably postponed this year, but that can only really be established through a comparison with past years. Such a compari-

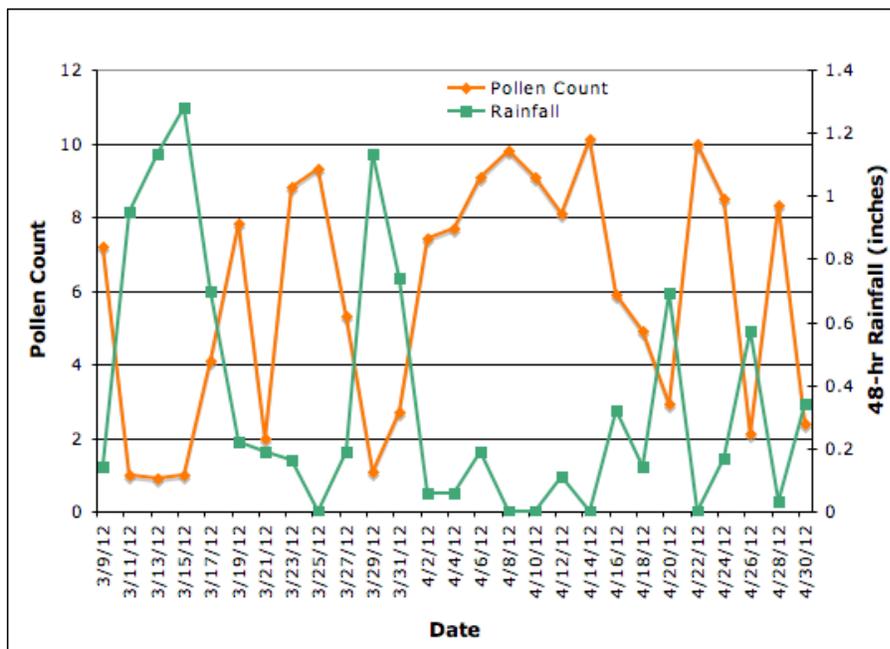


Figure 5: The two-day pollen metric in Seattle (orange) and the 2-day total Seattle rainfall (green) from March 9 through April 30, 2012.

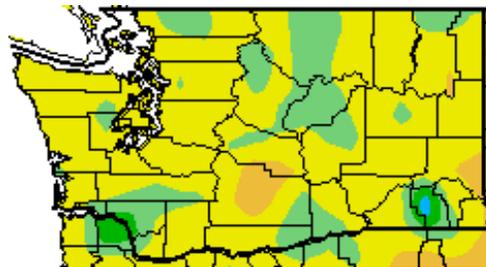
son is also necessary to indicate the effects of temperature; presumably the anomalous cold during March 2012 in Washington state served to delay flower development for various species and ultimately the development of high pollen concentrations. An attempt was made to find historical pollen data, without success. Perhaps some readers of this newsletter happen to know of sources of that kind of data, and if so, OWSC would appreciate finding out about them.

The conventional wisdom is that pollen counts are lower when it is wet because the rain “cleans” the air, i.e., scavenges minute particles including grains of pollen. In many situations, however, this may be a secondary rather than primary mechanism controlling pollen concentrations. The weather may dictate pollen concentrations more through its impacts on pollen release and dispersal. The release of pollen tends to be enhanced during periods of low humidity and high temperature, and dispersal increases with wind speeds. Yet another reason to celebrate the rainy weather we often get around here, especially during the last couple of springs.

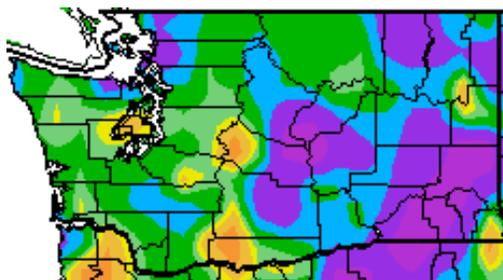
Climate Summary

Mean April temperatures were within 2°F of normal throughout Washington, as shown in the temperature departure from normal (1971-2000) map from the High Plains Regional Climate Center (HPRCC) below. Most of the state was on the warmer side of normal, and all of the populated locations listed in Table 1 were warmer than normal as well. The exception is Omak, whose average April temperature is equal to the 30-year normal. Otherwise, Yakima was a warm spot, with a mean April temperature 2.6°F above normal.

Total April precipitation was normal to above normal for most of the state. The HPRCC map for precipitation (in terms of percent of normal) below indicates that precipitation on the east side of the Cascades was much above normal, between 150 and 300% of normal, and those numbers are reflected in Table 1 as well. An area stretching from the central Olympic Peninsula into Kitsap County had slightly below normal April precipitation, ranging between 70 and 100% of normal precipitation. While the snowfall information was omitted from Table 1 since it became irrelevant for many of the stations, Spokane AP did receive 1.1" of snow during April, 0.1" above normal.



Temperature (°F)



Precipitation (%)



*April temperature (°F) departure from normal (top) and April 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 Washington						
Olympia	48.9	48.3	0.6	4.35	3.54	123
Seattle WFO	51.7	50.5	1.2	2.31	2.77	83
Sea-Tac	50.8	50.3	0.5	2.68	2.71	99
Quillayute	47.7	46.7	1.0	10.29	7.85	131
Bellingham AP	49.5	48.4	1.1	3.57	2.69	133
Vancouver	53.3	52.1	1.2	2.49	3.01	83
Eastern Washington						
Spokane AP	48.3	47.0	1.3	1.39	1.28	109
Wenatchee	52.2	51.6	0.6	1.14	0.46	248
Omak	50.0	50.0	0	1.16	1.05	110
Pullman AP	47.7	46.1	1.6	2.61	1.56	167
Ephrata	51.4	50.4	1	0.70	0.48	146
Pasco AP	54.0	52.9	1.1	0.90	0.65	138
Yakima AP	51.7	49.1	2.6	0.81	0.55	147

Table 1 - April climate summaries for locations around Washington with a climate normal baseline of 1981-2010. Note that the Vancouver Pearson Airport and Seattle WFO 1981-2010 normals involved using surrounding stations in NCDC's new normal release, as records for these station began in 1998 and 1986, respectively.

Climate Outlook

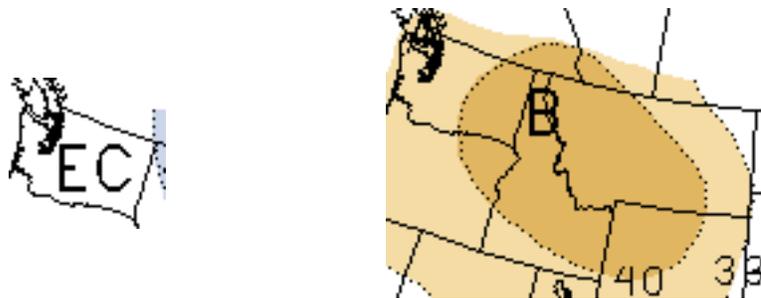
The “Final La Niña Advisory” was issued by the Climate Prediction Center (CPC) early this month, as La Niña conditions continue to weaken. The advisory can be found here: http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/ensodisc.html. To summarize, sea-surface temperature (SST) anomalies in the Niño 3 and Niño 1+2 regions of the ocean (eastern Pacific) remain positive while the SST anomalies in the western Pacific (Niño 4 and Niño 3.4) continue to become less negative. ENSO forecast models are indicating near-neutral conditions through spring and summer 2012.

The May CPC three-class temperature outlook has higher chances of below normal temperatures for the western two-thirds of the state, with chances exceeding 40% for the Olympic Peninsula. However, May precipitation is a toss up; there are equal chances (a 33% chance of each outcome) for precipitation to be below, equal to, or above normal.

The CPC 3-month seasonal outlook for May-June-July (MJJ) has equal chances of below, equal to, or above normal temperatures for the state. MJJ precipitation, on the other hand, is expected to be below normal for the state, with higher chances of below normal precipitation east of the Cascades.



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



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