



Office of the Washington State Climatologist

May 2024 Report and Outlook

May 2, 2024

<http://www.climate.washington.edu/>

April Event Summary

Mean April temperatures were near-normal to below normal across Washington State. April precipitation was below normal for nearly the entire state. Temperatures were cooler relative to normal than they were in March, but precipitation was much lower relative to normal. Total March and April precipitation as a percent of normal is shown in Figure 1, with most of eastern WA receiving less than 70% of normal. The two-month precipitation deficits ranked below the 10th percentile in the historical record (1979-2015) for the eastern slopes of the Cascade Mountains, a portion of the southern Puget Sound region, and parts of the Lower Columbia Basin (Figure 1).

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Figure 2 shows the April daily temperatures and precipitation for Spokane International Airport, and the month began with above normal temperatures. Ellensburg (77°F) and Pasco (82°F - tie) set daily maximum temperature records. The

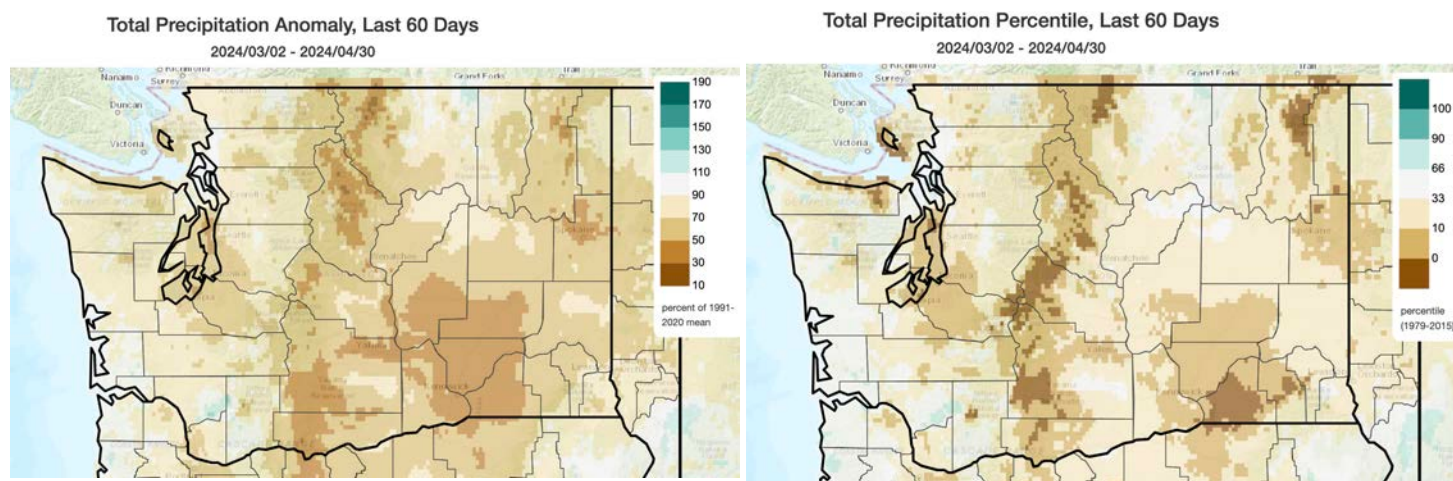


Figure 1: The precipitation percent of the 1991-2020 normal and precipitation percentiles for the last 60 days (March 2-April 30, 2024). The percentiles are calculated using 1979-2015 (Climate Toolbox).

heat was short-lived, however, with a much cooler and wetter period following. Two days during this time (4th and 5th) were the only really wet interval during the whole month at Spokane; note that lack of precipitation outside this period. The Pacific coast did receive some copious rains, with Quillayute recording a maximum daily rainfall record on the 8th with 2.38". Temperatures warmed through mid-month around the state, but then there was another cooler period around the 17th. Olympia (25°F - tie) and the Seattle WFO (34°F - tie) reached record low daily minimum temperatures on the 17th. Despite this cool period, the North Cascades Highway (SR 20) opened earlier than usual on April 19 due to the reduced snowfall during the past winter into spring.

The remainder of the month was relatively uneventful weather wise, aside from another wet period on the 25th and 26th. Olympia (0.88") and Hoquiam (1.11") recorded maximum rainfall records on the 25th as well as Bellingham (0.40") on the 26th. The unseasonably cool temperatures at the close of April brought some snow in the Cascade Mountain passes, a reminder that the snow threat isn't entirely gone yet.

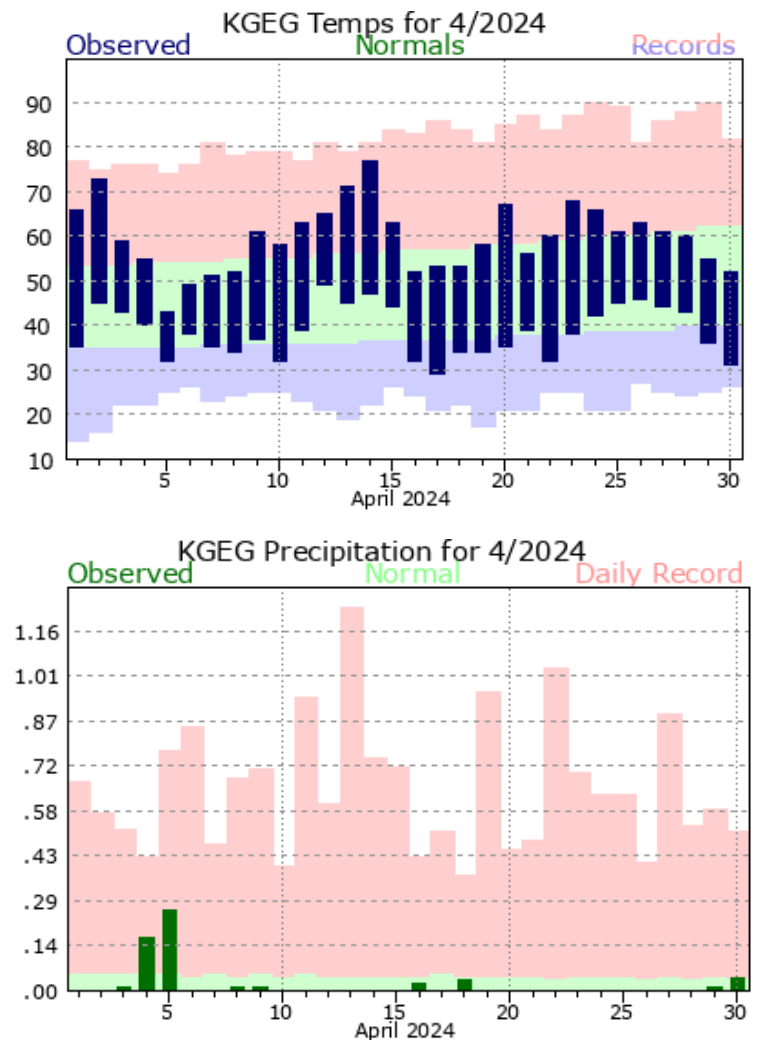


Figure 2: April 2024 daily temperatures (left) and precipitation (right) for Spokane International Airport compared to the 1991-2020 normal (green envelope) and previous records (blue and red envelopes; NWS).

Snowpack and Drought Summary

As shown above, precipitation was below normal for both March and April, resulting in limited late-season additions to the snowpack. Figure 3 shows the basin average snow water equivalent (SWE) percent of median from the Natural Resources Conservation Service on April 1 and May 1. Snowpack continues to be between 53 and 69% of median for the majority of the state. Snowmelt was underway for most of the SNOTEL sites shown on the basin average SWE maps throughout April. Some late season mountain snow at the very end of the month suspended that melt temporarily but ultimately did not add significant SWE. For example, the Meadows Pass (3,230'. Figure 4) snowpack trace shows a few inches of SWE added, which is a station that responded a bit more favorably to this event than others.

Snowmelt is evident on the average April streamflow map (Figure 5), as reflected by sites with normal to above normal streamflow, mainly in eastern WA. Lower than usual streamflows have emerged for a majority of the western WA streamflow sites, particularly those that are in rain dominant watersheds, because of the lower than normal April precipitation.

Because of the low snowpack and the anticipation of a warmer and drier than usual late spring into

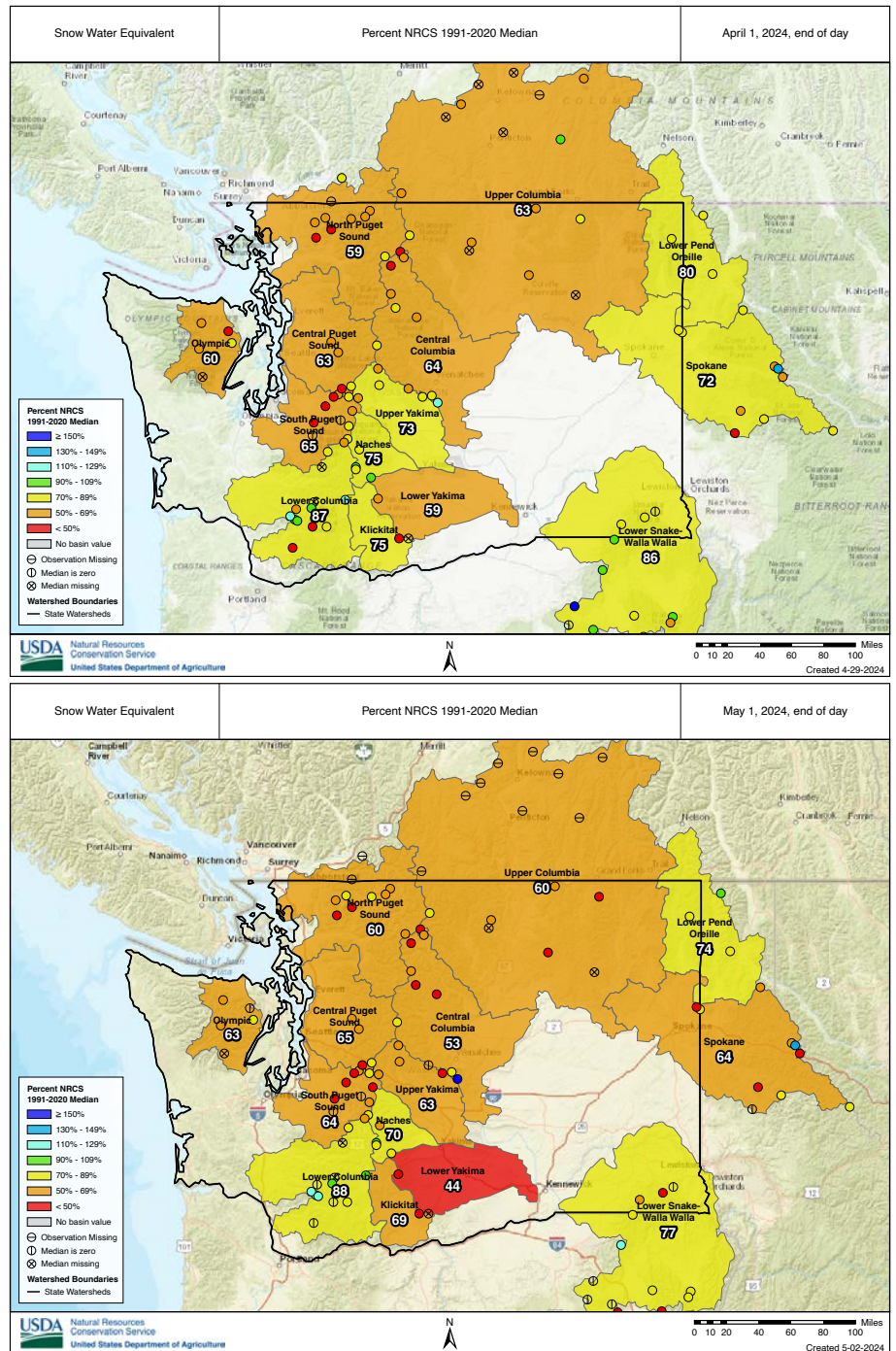


Figure 3: Snowpack (in terms of snow water equivalent) as of April 1, 2024 and May 1, 2024 (NRCS).

summer (see the “Climate Outlook” on page 10), the WA Department of Ecology extended the drought emergency for nearly the entire state on

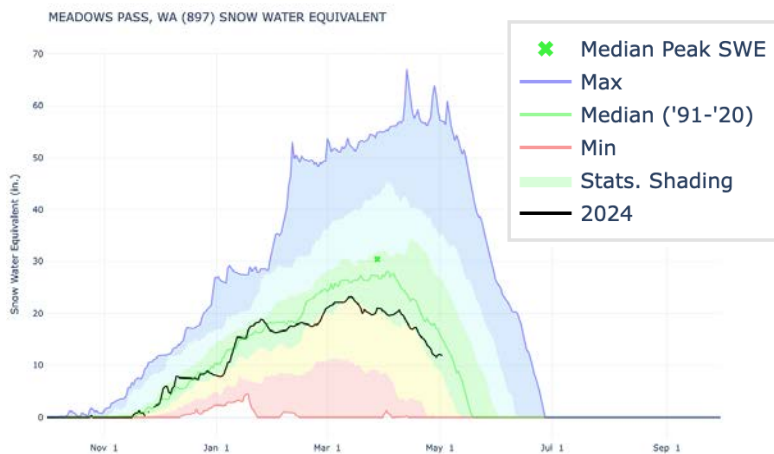


Figure 4: The 2024 water year snow water equivalent (inches; black line) for Meadows Pass compared to historical percentiles (shading). NRCS

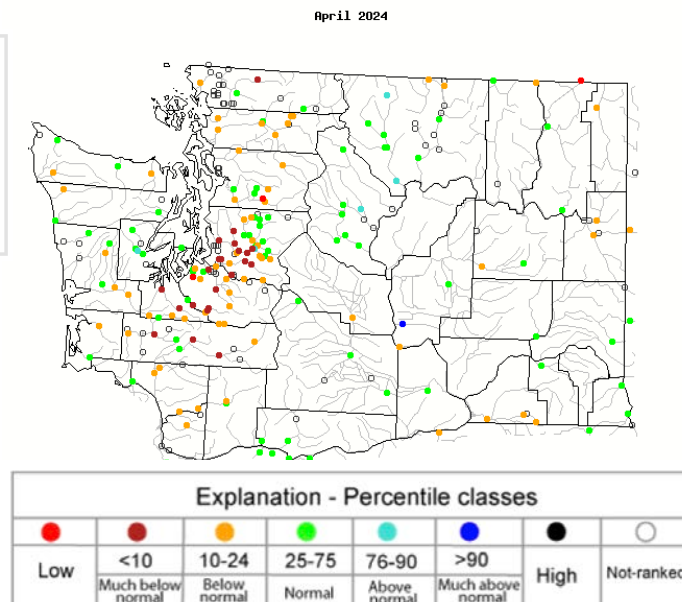


Figure 5: The average April streamflow percentiles (USGS).

April 16 (Figure 6). The smaller areas near Everett, Seattle, and Tacoma were excluded because the water utilities in those areas are not expected to have water supply limitations. The WA State definition of drought includes a hardship criterion where there needs to be expected impacts on people, farms, or fish in order for a declaration to be made. A declaration allows qualifying public agencies to apply for emergency response grants to help mitigate drought impacts. For example, the Bureau of Reclamation's April forecast was for the junior water rights users in Yakima basin to expect only 63% of their April-September water allotments because of the drought conditions. That particular forecast is expected to be updated May 3.

our newsletter (Figure 7). The Drought Monitor depiction represents the areas with low snowpack, below normal water year precipitation, and below normal streamflows. It is important to recognize that the U.S. Drought Monitor is a weekly product recognizing *current* drought conditions, while the state was able to take *anticipated* conditions into


Washington Drought Declaration



Figure 6: A map of the extended WA State drought emergency declared on April 16 (Ecology).

There has been expansion of “abnormally dry” and “moderate drought” on the U.S. Drought Monitor since the last edition of

account when making the drought declaration. In other words, the expectation of a warmer and drier than normal spring and summer is not taken into account in the Drought Monitor.



Report Your Drought Impacts

Are you experiencing a drought impact? Your on-the-ground observations are critical in helping us understand the broad picture of drought in the state. The National Drought Mitigation Center and partners have developed Condition Monitoring Observer Reports on Drought ([CMOR-drought](#)), a short survey that allows the public to enter their observations regarding crops, water supply, fire, etc. We would greatly appreciate your input, and these reports help experts assess drought impacts for the U.S. Drought Monitor depiction.

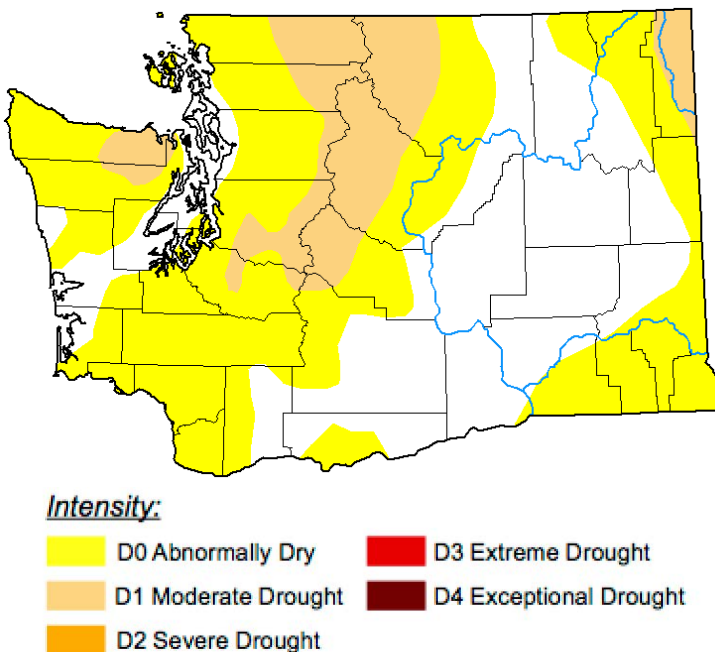


Figure 7: The May 2, 2024 edition of the U.S. Drought Monitor.

Fourth Pacific Northwest Water Year Impacts Assessment Released

Climate Matters Series

The [fourth Pacific Northwest \(PNW\) Water Year Impacts Assessment](#), released in March, is a collaborative effort between water managers and scientists at the Office of the Washington State Climatologist, the Climate Impacts Group, Oregon Climate Service, Idaho Department of Water Resources, and the NOAA National Integrated Drought Information System (NIDIS). As reviewed in this newsletter before, the assessment is a culmination of several activities during the water year which include water year meetings and an end-of-the-water-year impacts survey. For the first time, an abbreviated version of the assessment is available in Spanish (Figure 8). The assessment summarizes the variations in

temperature, precipitation and snowpack across Washington, Oregon, and Idaho during the 2023 water year (October 1, 2022-September 30, 2023) and reports on different sector-specific impacts that those caused. Here, we highlight just a few of the main findings.

Averaged over the water year, and for the PNW, temperatures were near the 1991-2020 normal and total precipitation was only slightly below normal. But examining the regional averages masks both the spatial variability and the seasonal variability throughout the water year. In general, the northwestern portions of the PNW, including Washington, were drier than normal, which

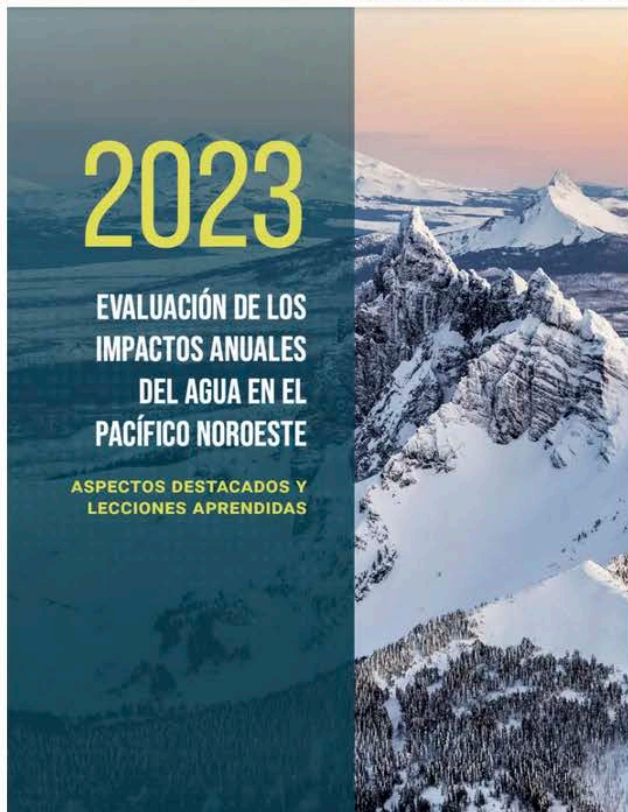
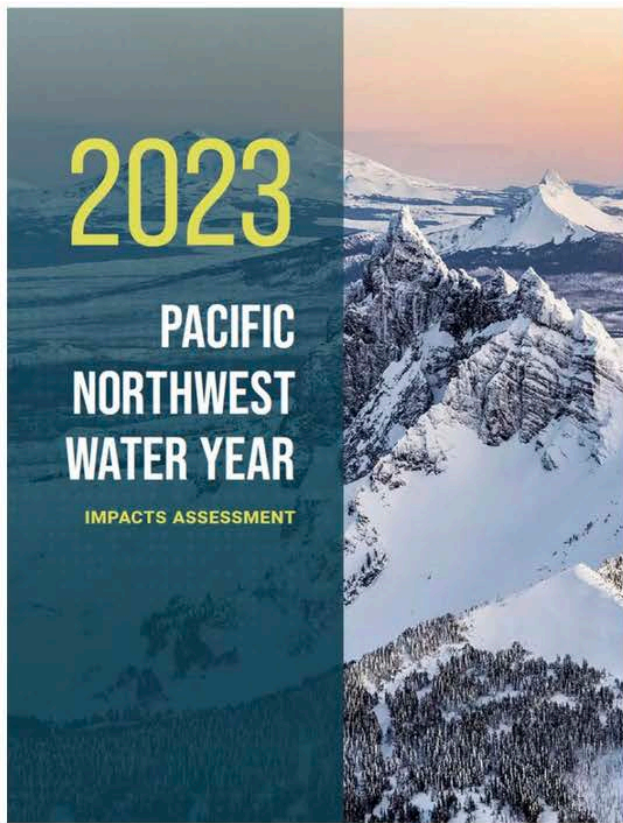


Figure 8: Cover images of the English (top) and Spanish (bottom) versions of the PNW 2023 Water Year Impacts Assessment.

aligned with the areas of worsening drought. But the biggest determinant of that worsening drought was the rapid melt of a normal snowpack caused by much above normal temperatures in May 2023. May was the warmest ever in Washington state over the 129-year record.

Various impacts were reported throughout the PNW in response to 2023 water year conditions. For example, drinking water, agriculture, forestry, fisheries, and hydropower were all affected by abnormally dry conditions. The assessment features a call-out box in Seattle City Light hydropower impacts. In addition, there were various voluntary, and even some mandatory, water restrictions. The assessment provides more details by sector; a sample summary of the impacts for drinking water is shown in Figure 9.

Overall lessons learned from the water year are also provided in the report. The 2023 water year was an example how temperature can be the primary driver of water supply variations. The seasonal temperature anomalies had a greater effect than precipitation on water supply during two key portions of the water year: the below normal temperatures from February through April and much above normal temperatures in May. The colder than usual Feb-Apr ensured that precipitation fell as snow in the high elevations, building a decent snowpack in Washington despite drier than normal conditions. And, as mentioned above, the warmer than usual May caused snowpack to melt rapidly thus altering the water supply situation. In short, it's not all about precipitation.

We hope we included enough of a teaser of what's in the assessment to encourage you to take a closer look. We also invite you to participate in

DRINKING WATER IMPACTS SURVEY

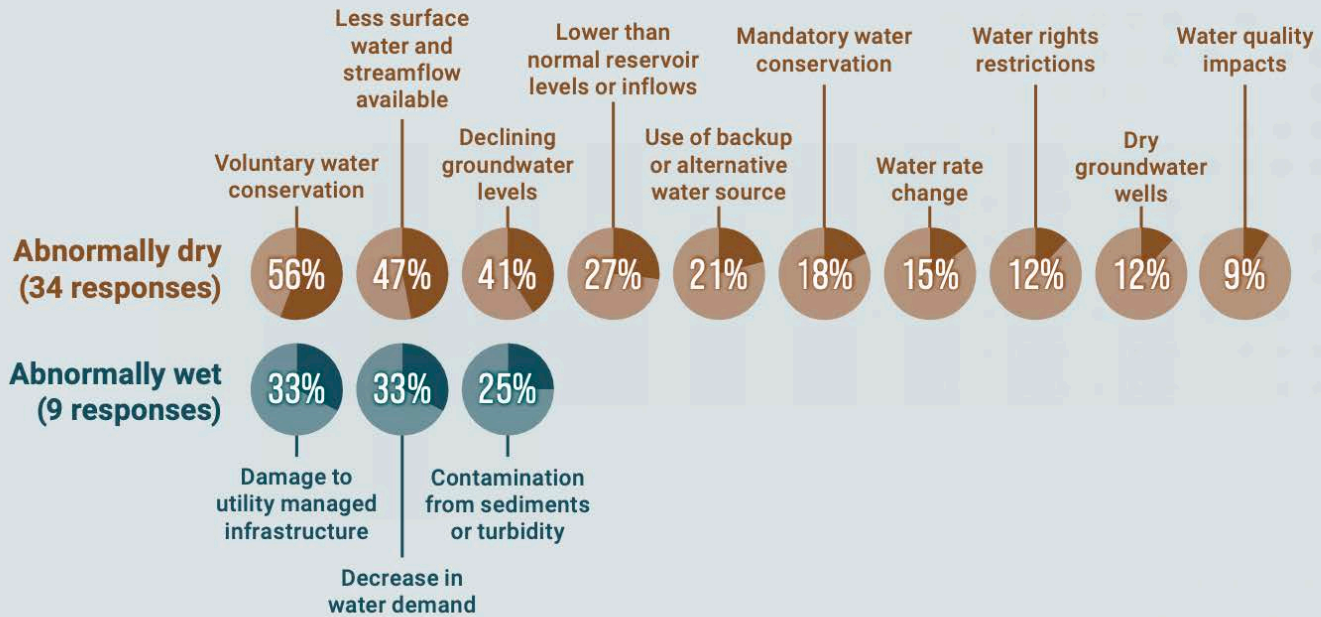


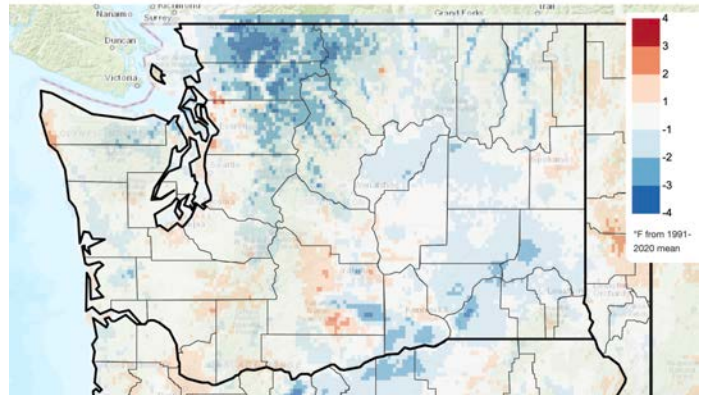
Figure 9: The PNW survey responses from the drinking water sector to a series of questions about abnormally dry or abnormally wet conditions during the 2023 water year (2023 assessment).

this process of documenting impacts as we are planning to write a fifth assessment for the 2024 water year. In the fall, we will provide more opportunities for water managers, agricultural producers and others to provide their insights into how drought and seasonal climate conditions impacted them. The annual water year survey is typically distributed in early October, and the water year meeting is held in November.

Climate Summary

April average temperature anomalies were below normal to near normal across Washington State. The northern Cascades April average temperatures were between 2 and 4°F below normal according to the gridded map from the Climate Toolbox on the right-hand side. Bellingham had the largest monthly cold temperature anomaly in Table 1 of 2.1°F below normal, consistent with the northwestern portion of WA being particularly chilly. Pullman was another cool spot relative to normal, with temperatures 1.4°F below normal. Much of the rest of the state had near-normal temperatures, such as Hanford, the Seattle Weather Forecasting Office, Omak, Olympia and Pasco (Table 1).

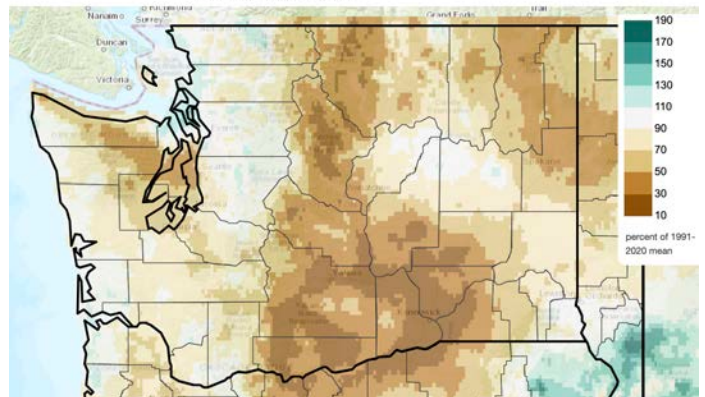
Mean Daily Temperature Anomaly, Last Full Month
2024/04/01 - 2024/04/30



April temperature (°F) departure from normal relative to the 1991-2020 normal (Climate Toolbox).

April precipitation was below normal for a majority of the state, particularly the eastern slopes of the Cascades Mountains, the Lower Columbia Basin, northeastern Washington, and the eastern slopes of the Olympic Mountains. Those locations had less than 50% of normal precipitation, and some only between 10 and 30% of normal. For example, Wenatchee, Hanford, and Pasco only received 28, 28, and 17% of normal precipitation, respectively. In contrast, some locations on the coast (Hoquiam and Quillayute) had near-normal precipitation and a few isolated areas in the central and northern Puget Sound region had slightly above normal precipitation (between 110 and 130% of normal).

Total Precipitation Anomaly, Last Full Month
2024/04/01 - 2024/04/30



April total precipitation percent of the 1991-2020 normal (Climate Toolbox).

Since so few stations report snowfall and the season is coming to a close, we omitted the snow columns from Table 1. Spokane AP received an inch of snow, which is about normal (0.7"). Hanford did not receive any April snow, which is near its climatological values of a trace amount.

Station	Mean Temperature (°F)			Precipitation (inches)		
	Average	Normal	Departure from Normal	Total	Normal	Percent of Normal
Western Washington						
Olympia	48.6	48.2	0.4	2.46	3.67	67
Seattle WFO	50.9	50.8	0.1	2.42	2.98	81
SeaTac AP	50.3*	51.3	-1.0	0.89*	3.18	-
Quillayute	50.0	46.9	3.1	8.59	8.11	106
Hoquiam	48.5	48.7	-0.2	5.52	5.35	103
Bellingham AP	47.5	49.6	-2.1	2.26	2.77	82
Vancouver AP	52.9	51.7	1.2	2.01	2.93	69
Eastern Washington						
Spokane AP	49.1	47.0	2.1	0.56	1.25	45
Wenatchee	51.3**	51.1	0.2	0.16**	0.57	28
Omak	49.9	49.8	0.1	0.43	0.83	52
Pullman AP	45.4	46.8	-1.4	1.31	1.79	73
Ephrata	50.5	50.8	-0.3	0.33	0.58	57
Pasco AP	53.4	52.7	0.7	0.11	0.66	17
Hanford	53.6	53.6	0.0	0.16	0.57	28

Table 1: April 2024 climate summaries for locations around Washington with a climate normal baseline of 1991-2020. *Two days (Apr 24-25) of precipitation and one day (Apr 25) of temperature missing. April 25 was a wet day regionally so we excluded the April percent of normal precipitation for SeaTac. **One day missing (Apr 30). Since April 30 was dry around Wenatchee, we left the monthly precipitation percent of normal.

Climate Outlook

According to the Climate Prediction Center (CPC), El Niño remains in the equatorial Pacific Ocean but it is weakening. There are now below normal sea-surface temperature anomalies in the far eastern equatorial Pacific, and the atmospheric component of El Niño has also been slackening. According to [ENSO models](#), a transition to ENSO-neutral is expected during the period of April-June. The odds of neutral conditions during this time frame is 85%, while the odds of continued El Niño are 15%. It is likely that La Niña develops during the upcoming summer. By October-December, the chances of La Niña are 86%, and the CPC has issued a “La Niña Watch”. The transition to La Niña is not expected to play a large role in our summer weather in Washington.

The CPC May outlook issued on April 30 (Figure 10) has changed compared to previous outlooks for May. It was previously expected to have higher odds of above normal temperatures and below normal precipitation, but there is now little indication of how the month will play out. Both the May temperature and precipitation outlooks have equal chances of below, near-normal, or above normal conditions statewide.

The May-June-July (MJJ) temperature outlook (Figure 11) has higher odds of above normal temperatures statewide. The odds are highest (between 50 and 60%) in eastern Washington. MJJ precipitation is more likely to be below normal statewide with the highest odds of below normal precipitation across northeastern Washington.



Figure 10: May outlook for temperature (left) and precipitation (right).

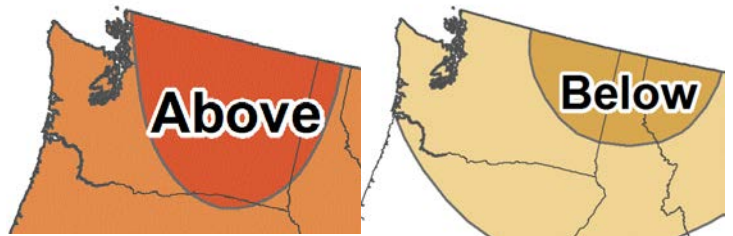
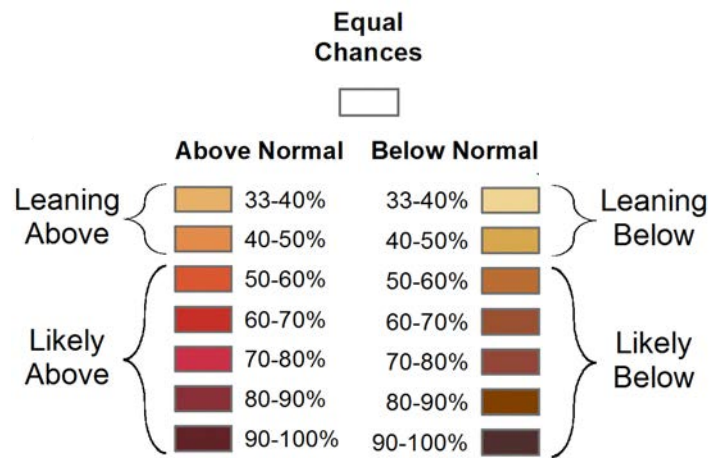


Figure 11: May-June-July outlook for temperature (left) and precipitation (right) (Climate Prediction Center).