

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

the first half of the month. Conditions were similar for other western Washington locations such as SeaTac and Olympia, but coastal locations such as Hoquiam and Quillayute started the month with more cooler-than-normal temperatures. In contrast, Spokane and Pullman experienced above-normal temperatures, but the duration of the period was much longer.

the red points. Other locations that saw large precipitation totals include the heavily populated areas in eastern Puget Sound, with the highest intensities in the Cascade foothills.

Temperatures stayed consistently near-normal for the rest of the month in western Washington, whereas eastern locations experienced near-normal to above-normal temperatures. The October 18th atmospheric river brought wet conditions to many western Washington locations (Figure 1), but much smaller accumulations in eastern Washington. Wet conditions returned near the end of the month for many locations in both western and eastern Washington.

Figure 3 shows the precipitation totals from volunteer CoCoRaHS observers on October 27th when the moderate atmospheric river took place. You can see that the heaviest precipitation once again fell in Bellingham region as indicated by

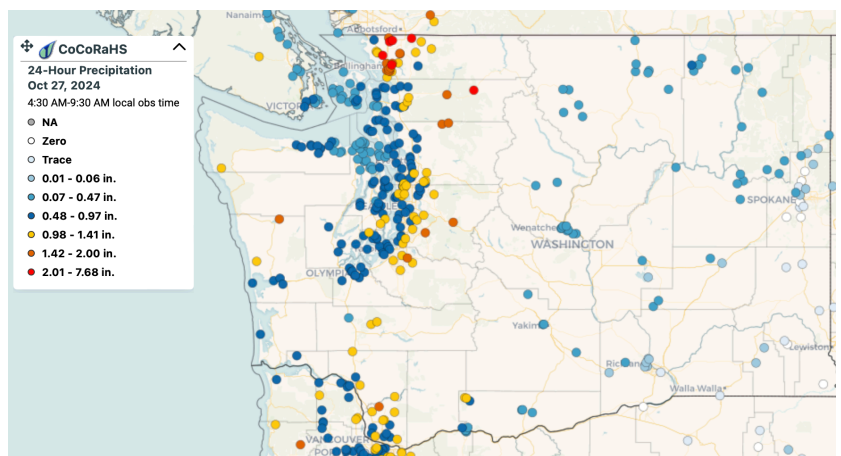


Figure 3: Accumulated precipitation in inches from October 27th, 2024 from CoCoRaHS volunteer observers.

Streamflow and Drought Summary

Average October streamflows (Figure 4) were near normal for much of western Washington, but below normal for most of southwest and eastern Washington. This closely aligns with where normal to above normal precipitation fell during October.

The latest update for the U.S. Drought Monitor (Figure 5) shows an almost complete absence of drought conditions in western Washington but almost no change for eastern Washington. Western Washington received normal to above-normal precipitation totals for the month, which led to improved conditions on the Olympic Peninsula and southwestern Washington, where conditions went from “abnormally dry” (D0) to drought-free. “Abnormally dry” (D0) conditions were introduced to parts of Yakima and Klickitat Counties where there was previously no drought. Some of the drought conditions in southeastern Washington improved from “severe drought” (D2) to “moderate drought” (D1).

The Washington state drought emergency was extended in mid-April for most of the state and is still in effect as we wait to see how our winter snowpack builds.

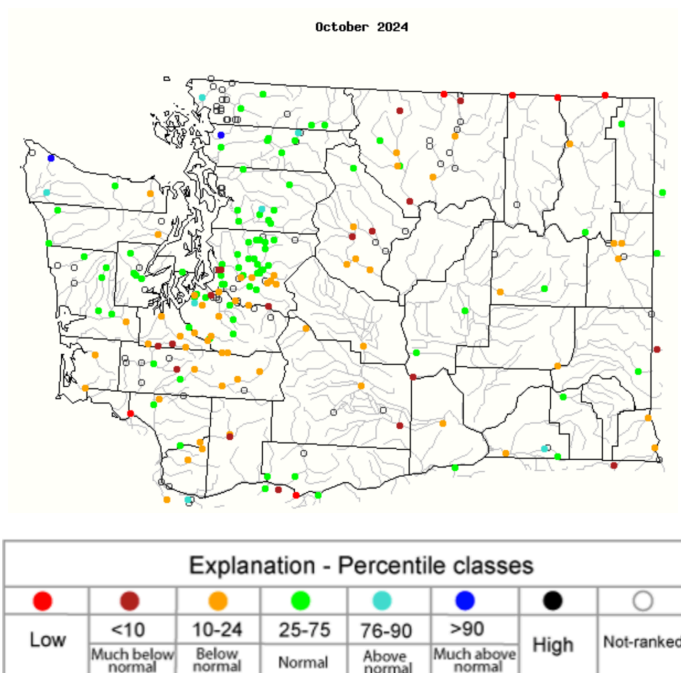


Figure 4: The average October streamflow percentiles (USGS).

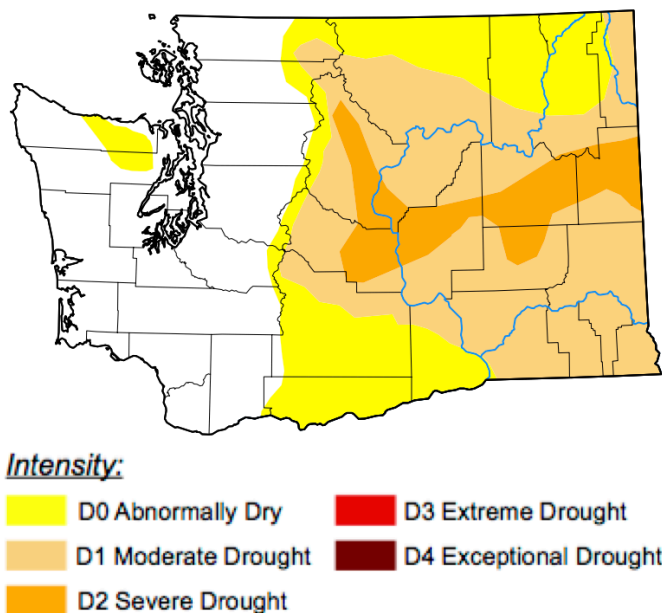


Figure 5: The November 5th, 2024 edition of the US Drought Monitor.

2024 Water Year Impacts Survey

Happy 2025 Water Year! Now that water year 2024 is complete, we want to hear from you! How was the Pacific Northwest (Washington, Oregon, and Idaho) impacted?

We encourage you to fill out the **Water Year Impacts Survey**. The goal of this survey is to gather information about impacts and response actions that were implemented during the 2024 water year (October 1, 2023 - September 30, 2024) due to either abnormally dry or abnormally wet conditions.

The anonymous survey should take about 15 minutes to complete and your responses are **vital** for informing the **PNW Water Year Impacts Assessment**. Respondents are able to enter impacts for different sectors (e.g., agriculture, forests, recreations, drinking water, etc.). The survey will remain open until **Wednesday, November 27, 2024**.

Call for Heat-Monitoring Campaigns!

NOAA's Center for Collaborative Heat Monitoring announced the call for **community heat monitoring applications!** Applications from the Pacific Northwest communities are welcome and NOAA is offering \$10,000 and technical support to run the community heat monitoring campaign.

There's an "expression of interest" form due by **November 15**, and it should take less than 5 minutes to complete. The full application is due by January 17, 2025.

Water Year in Review

Climate Matters Series

Author: Guillaume Mauger

We recently held our annual **Water Year 2024 Recap & 2025 Outlook Meeting**. As a refresher, we often look at our climate through the lens of the “water year”, which goes from October 1st through September 30th, as opposed to the usual calendar year. We do this so that we don’t split our wet season in two.

Focused on Oregon and Washington, our goal in these meetings is to summarize the conditions of the past water year, hear about its impacts (on ecosystems, agriculture, and water supply), and look at what the forecasts say for the coming year. We’ll be releasing an assessment that summarizes all of this in the spring (you can see past assessments [here](#)).

In the meantime, we thought it would be helpful to provide a short summary of Washington’s conditions from the last water year here in our newsletter. Overall the water year was warmer than normal (+1.4°F), but only slightly low on precipitation and well within the normal range. Looking by season is where we saw the impacts. In the next few paragraphs I’ll hit on the main events.

Snowpack was historically low coming out of last winter (Figure 6). A big reason for this was December, which had average temperatures +5.2°F above the 1991-2020 normal, resulting in very little snow accumulation. We also experienced a dip in snowpack when a big atmospheric river hit the west coast in late January through early February. Because they bring air from lower latitudes, atmospheric rivers tend to be warm and often

bring rain and melt to higher elevations. As a result of these conditions, the Department of Ecology declared a drought for nearly the entire state of Washington in April.

A secondary reason for the early drought declaration was the seasonal forecasts, which suggested we’d have a relatively warm and dry spring and summer. The spring temperature forecast turned out to be wrong. Importantly, spring temperatures were well below normal for the North Cascades. These mountains hold the bulk of the state’s winter snowpack, so the cooler temperatures helped prolong our snowpack and bring us a bit closer to normal conditions coming out of the spring. Unfortunately, this didn’t help the whole state: temperatures were near normal elsewhere, and precipitation was below normal on the eastern slopes of the Cascades, especially around Yakima County.

By July most of the state’s snowpack is gone, with all but the highest elevations melted out. This means rainfall is key to ensuring there is enough water through the summer season. Unfortunately, this July was anything but that. Statewide, precipitation was only 38% of normal and temperature was +4.0°F above normal (Figure 7). Again, conditions were most severe on the eastern slopes of the Cascades, especially around Yakima County. Not only did this worsen drought conditions, July was when many of our summer’s wildfires flared up. Thankfully, August was wet (more than 150% of normal), and we ended up with a fairly normal fire year. Still, damages and disruptions due to fire were significant, including

the Rimrock Retreat fire near Yakima, which prompted evacuations and damaged the Tieton Main Canal, ultimately burning over 45,000 acres.

The Yakima area and surroundings were hardest hit by drought this year. In addition to the damage to the Tieton canal, proratable water users in the nearby Roza and Kittitas irrigation districts received only about half of its usual water allocation. There were major concerns for salmon too, especially given that this was a record year for sockeye returns. On the lower Yakima River, the hot and dry conditions led to record high water temperatures – high enough to be **deadly for salmon in some instances**, and potentially keep them from spawning in others.

So where are we today, now that we’re heading into winter? As of today, the drought declaration has not yet been lifted. That’s because our fall was unusually dry, with a relatively late start to the rainy season. With the rains we’ve been having this week it might feel odd to say we’re still in drought. But the late start to rains delayed our usual winter build up to normal conditions. Looking forward, we’re hopeful for this winter. It’s looking like a weak La Niña (which tend to be cool and sometimes wet), but those odds are still better than last year’s strong El Niño.

Average Washington Snowpack

(Water Year 2024)

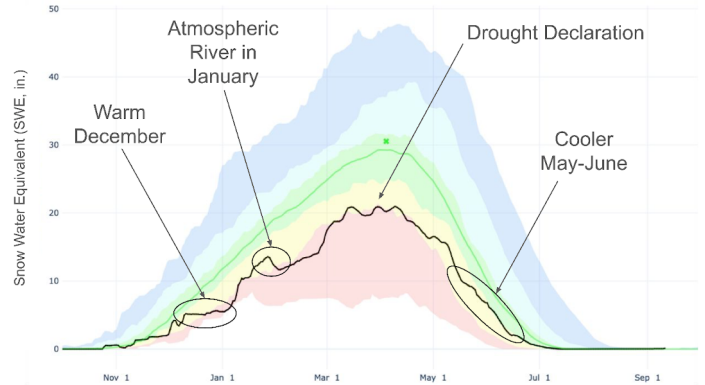


Figure 6: Average Washington Snowpack (black line) for water year 2024. The green line shows the typical conditions (median for 1991-2020), and the shading show the range we’ve seen in the past. The top of the red shading (which tracks closely with 2024 snowpack) is the 10th percentile, meaning that 9 out of 10 years historically have been above that level. *Source:* <https://nwcc-apps.sc.egov.usda.gov/basin-plots/#WA>

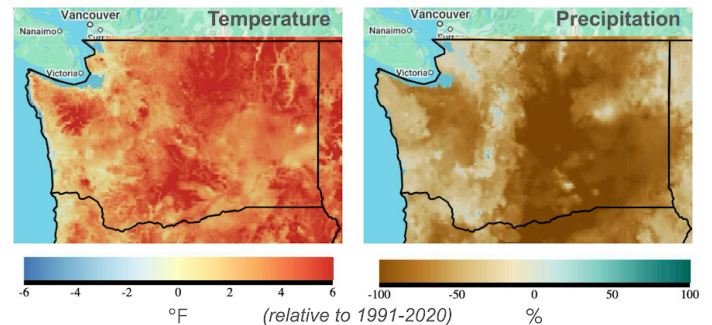


Figure 7: Temperature and Precipitation for July 2024, showing warm and dry conditions everywhere, with especially low precipitation on the eastern slopes of the Cascades. Maps show the departure from normal conditions, based on the average for 1991-2020, in °F for temperature, percent (%) for precipitation.

Climate Summary

Average temperatures were generally near-normal for October, though above-normal temperatures were present for most of lowland Puget Sound region, outer coast, east slope of the Cascades, and north central Washington. For example, in western Washington above-normal temperatures ranged between 1.4-1.9°F above normal (Table 1). Eastern Washington also had locations with above normal temperatures, though it wasn't consistent throughout the entire region. For example, Spokane, Omak, and Pullman had October temperatures 3.0°F, 1.7°F, and 1.8°F above normal, respectively.

October precipitation was near-normal to above normal across western Washington. Quillayute, Hoquiam and Bellingham experienced above-normal total precipitation (Table 1). Eastern Washington, in contrast, was dry. Although Pullman and Spokane were near-normal, other places were extremely dry, including Wenatchee and Ephrata with 24% and 33% of normal October precipitation, respectively.

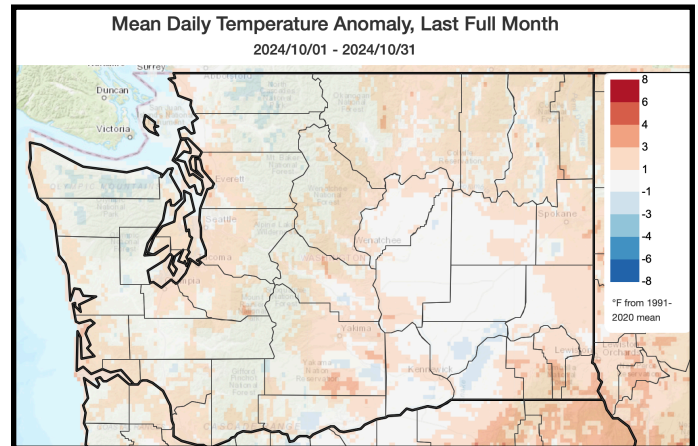


Figure 8: October temperature (°F) departure from normal relative to the 1991-2020 normal (Climate Toolbox).

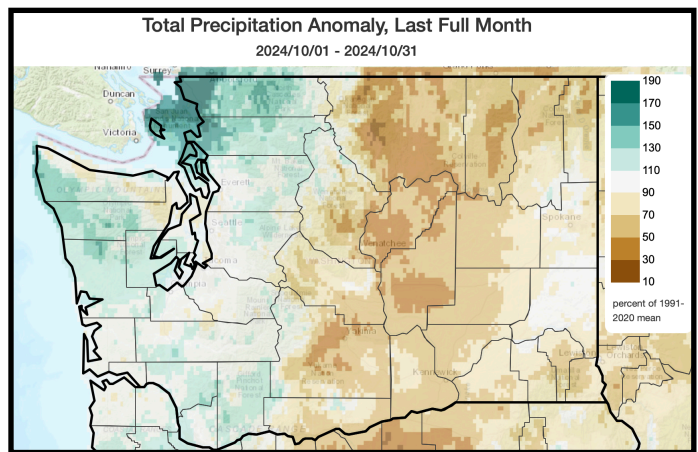


Figure 9: October precipitation departure from normal relative to the 1991-2020 normal (Climate Toolbox).

Station	Mean Temperature (°F)			Precipitation (inches)		
	Average	Normal	Departure from Normal	Total	Normal	Percent of Normal
Western Washington						
Olympia	51.9	50.3	1.6	4.04	5.07	79
Seattle WFO	54.8	53.6	1.2	4.03	3.65	110
SeaTac AP	54.0	53.8	0.2	3.04	3.91	78
Quillayute	52.5	50.6	1.9	15.93	10.68	149
Hoquiam	53.2	52.5	0.7	7.60	6.91	110
Bellingham AP	51.1	51.1	0	4.38	3.85	114
Vancouver AP	55.8	54.2	1.6	3.14	3.41	92
Eastern Washington						
Spokane AP	50.9	47.9	3.0	0.90	1.37	65
Wenatchee	52.3	50.7	1.6	0.15	0.62	24
Omak	50.8	49.1	1.7	0.33	0.92	36
Pullman AP	50.2	48.4	1.8	1.46	1.59	92
Ephrata	51.4	50.9	0.5	0.22	0.66	33
Pasco AP	53.6	52.1	1.5	0.38	0.66	58
Hanford	54.6	53.4	1.2	0.46	0.62	74

Table 1: October 2024 climate summaries for locations around Washington with a climate normal baseline of 1991-2020.

Climate Outlook

According to the Climate Prediction Center (CPC), conditions in the equatorial Pacific Ocean remain ENSO-neutral (ENSO = El Niño Southern Oscillation), and a “La Niña Watch” is still in effect. Eastern and east-central Pacific Ocean sea surface temperatures (SSTs) still ranged between near and below average, whereas the SSTs in the western Pacific Ocean were above average. ENSO neutral conditions are expected to continue for the next few months, but La Niña is favored to make its appearance during November-January (75% chance) and persist through January-March 2025. For the November-January period, models predict a 25% chance of neutral conditions and no chance (0%) of El Niño.

The CPC November temperature outlook (Figure 10) gives equal chances of above-normal, near-normal, and below-normal conditions statewide. The precipitation outlook for the coming month shows a slightly higher chance of above-normal precipitation, putting the odds at 33-40% in western and southern Washington, and 40-50% in northeastern Washington.

The three-month fall (November-December-January; NDJ) temperature outlook (Figure 11) shows equal chances of above-normal, near-normal, or below-normal temperatures over the whole state. The NDJ precipitation outlook indicates elevated chances of above-normal precipitation statewide, with chances ranging from 33-50% on the three-tiered scale.

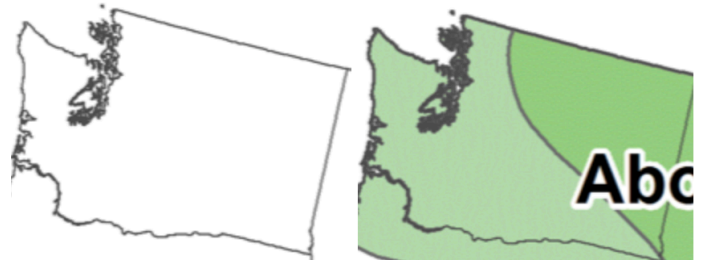


Figure 10: November outlook for temperature (left) and precipitation (right).

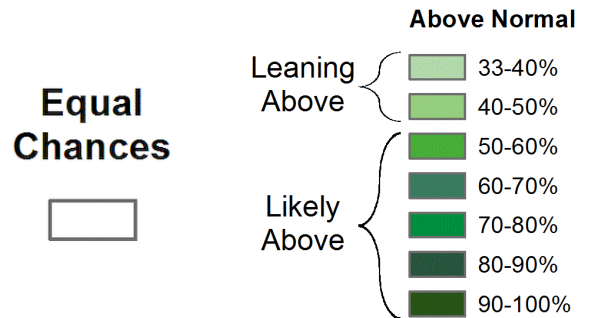


Figure 11: November-December-January outlook for temperature (left) and precipitation (right). (Climate Prediction Center)