

The Month In Review

June 2022

National Weather Service
Pendleton, Oregon

Photo: Flooding of Mill Creek, in Walla Walla County, WA.
Photo from Walla Walla County Emergency Management.

June 2022, Climate Conditions Summary

June 2022 was yet another wetter than normal month, however, average temperatures were near normal for all of the forecast area. The most significant weather events were flooding and thunderstorm events, which took place mostly over far northern to northeast OR and far southeast WA. Heavy rainfall amounts occurred from thunderstorms, and also from longer duration synoptic scale storms, which occurred during the first half of the month. The most significant weather events occurred on the 2nd through the 5th, and again on the 11th. There were severe thunderstorms during this time period which produced very heavy rainfall amounts in a very short period of time. There was significant thunderstorm damage in some locations. A small tornado was even observed by both National Weather Service personnel, as well as an airplane pilot, just south of the Pendleton, OR airport. During the second half of the month, conditions became dry under a more dominating upper high pressure ridges, with much warmer temperatures. The highest maximum temperatures were mostly in the 90s. The maximum temperature at the NWS Pendleton airport during the month was 98 degrees. Below are a few images of significant weather events that occurred during the month.



Flooding of Mill Creek, Walla Walla Co, WA, June 13th 2022. Photo from Walla Walla County Emergency Management.



An unusual late season snowfall at Tollgate, OR, June 13th 2022. Photo courtesy of the Tollgate Trailfinders.org.



Thunderstorm wind damage in Grass Valley, OR. Photo by: Daniel Earl.

More Images Representing June 2022 Weather/Climate Conditions



Impressive thunderstorm mammatus clouds.



Early morning noctilucent clouds, Pendleton, OR.



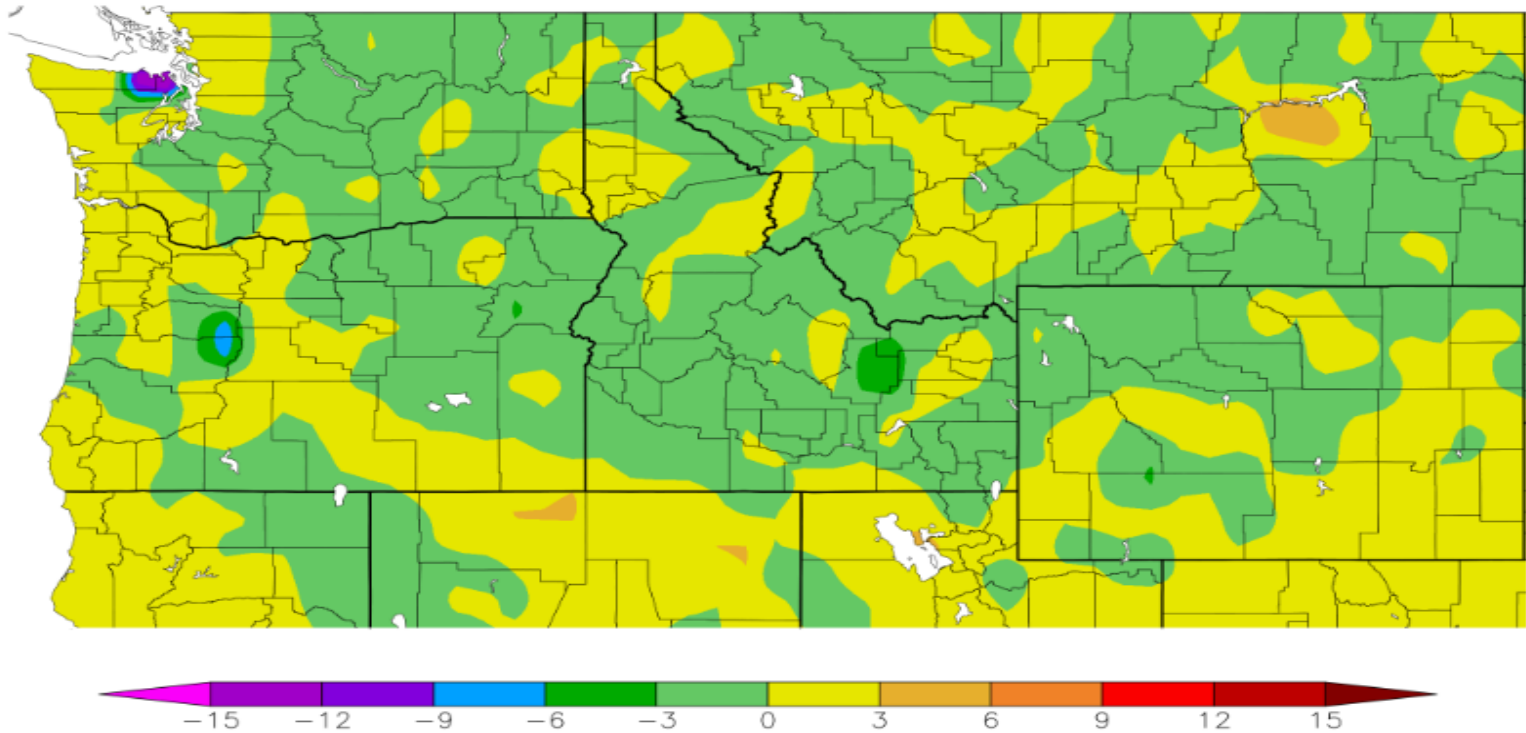
Funnel that became a tornado near Pendleton, OR.



Greenish thunderstorm cloud base implies hail.

June 2022, Departure from Normal of Average Temperatures

Departure from Normal Temperature (F)
6/1/2022 – 6/30/2022



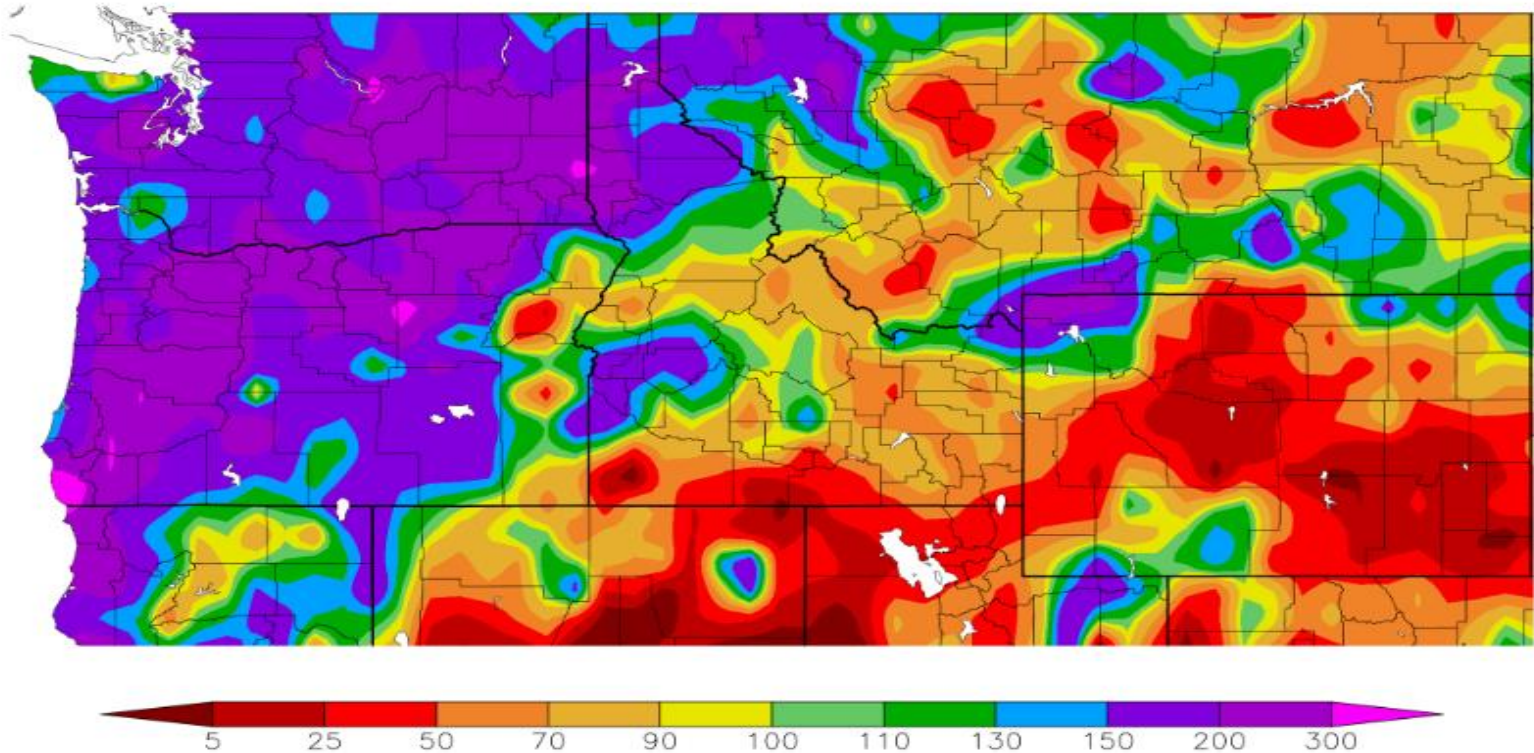
Generated 7/1/2022 at HPRCC using provisional data.

NOAA Regional Climate Centers

The departure from normal of the average temperatures were within +/- 3 degrees of normal over all of the forecast area. The coolest areas were over the northern and eastern most portions of the forecast area, except for some small localized locations in these areas. Central and north central OR were mostly warmer than normal, except for a small area over the central OR Cascades. However, the first half of the month was mostly cooler than normal, and the second half was mostly warmer than normal.

June 2022, Percent of Normal of Precipitation

Percent of Normal Precipitation (%)
6/1/2022 – 6/30/2022



Generated 7/1/2022 at HPRCC using provisional data.

NOAA Regional Climate Centers

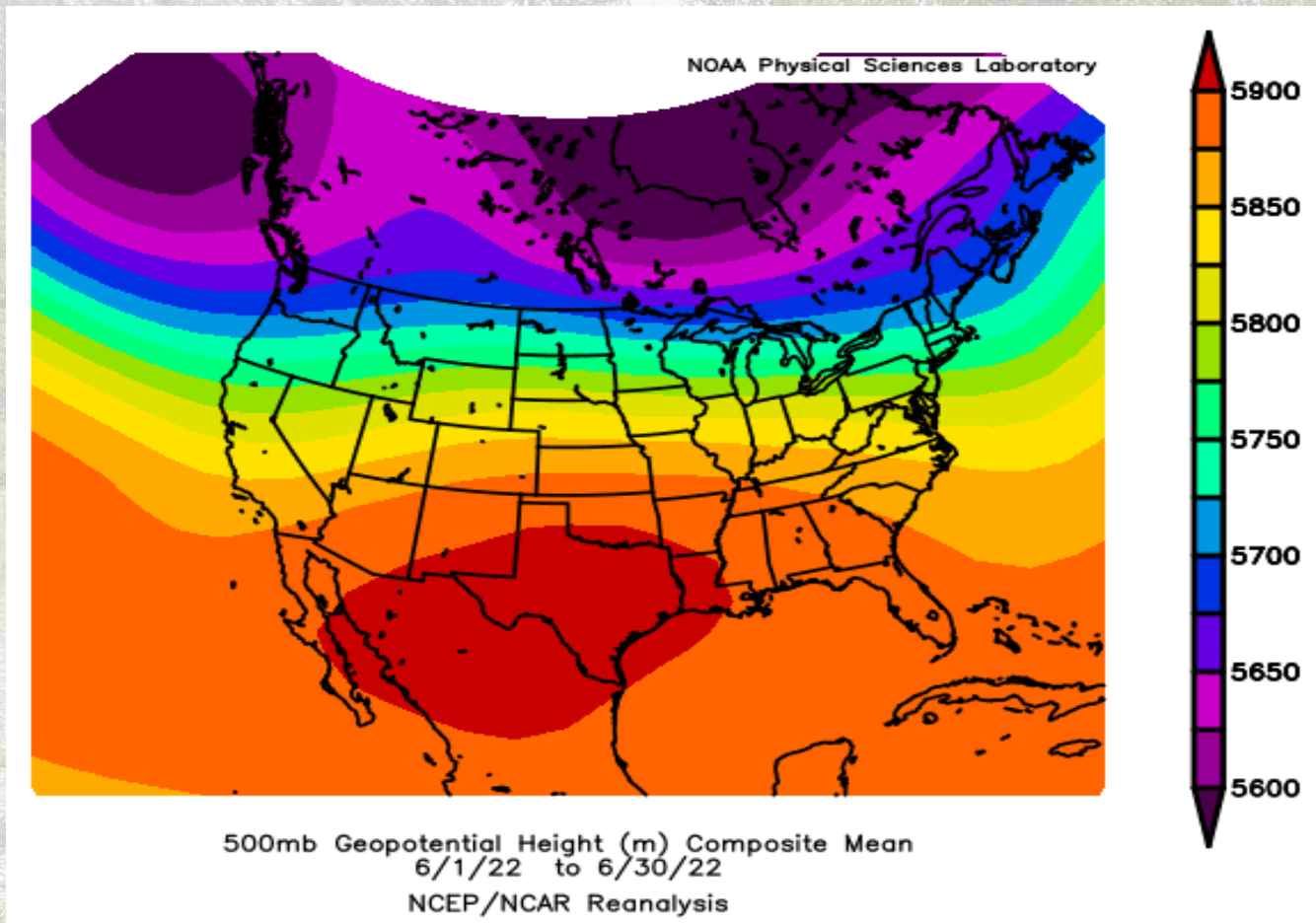
Nearly the entire forecast area, with the exception of far northeast OR, had much greater than normal precipitation, as shown above, in the percent of normal precipitation. Values ranged mostly from 130 to as high as 300 percent of normal in these areas. There was a area in northeast OR, over Wallowa County, with values ranging mostly from 70 to 90 percent of normal precipitation (i.e. below normal precipitation).

June 2022 Departures from Normal Means/Sums for Select Cities

	Max T	Max T D	Min T	Min T D	Ave T	Ave T D	PCPN	PCPN D
Yakima	79.0	-0.5	50.5	2.2	64.8	0.9	0.71	0.09
Kennewick	80.7	-0.9	57.0	0.9	68.9	0.1	0.88	0.37
Walla Walla	76.3	-2.5	53.8	-0.4	65.1	-1.4	3.41	2.13
The Dalles	80.9	1.8	56.9	2.1	68.9	1.9	1.15	-0.52
Redmond	77.0	0.9	46.0	5.0	61.5	3.0	1.88	1.24
Pendleton Airport	78.0	-0.2	53.2	1.7	65.6	0.7	2.16	1.18
La Grande Airport	73.4	-1.3	46.3	-2.4	59.9	-1.8	2.40	0.86
John Day	77.8	0.2	51.0	5.6	64.4	2.9	2.69	1.26

The table above shows that there more stations that had below normal mean high temperatures than above normal. However mostly above normal mean low and mean average temperatures occurred. The black boxes represent the absolute value extremes. The greatest departure for the mean high was at Walla Walla, WA, and at John Day, OR, for the mean low temperatures. The greatest departure of the mean average temperatures was at Redmond, OR. All, but one station, in the list had above normal precipitation. The exception was at Dallesport, WA (commonly known as The Dalles, OR). The greatest departure from normal precipitation was at Walla Walla, WA, with 2.13 inches, which is significant for June.

June 2022, Average 500 MB Pattern

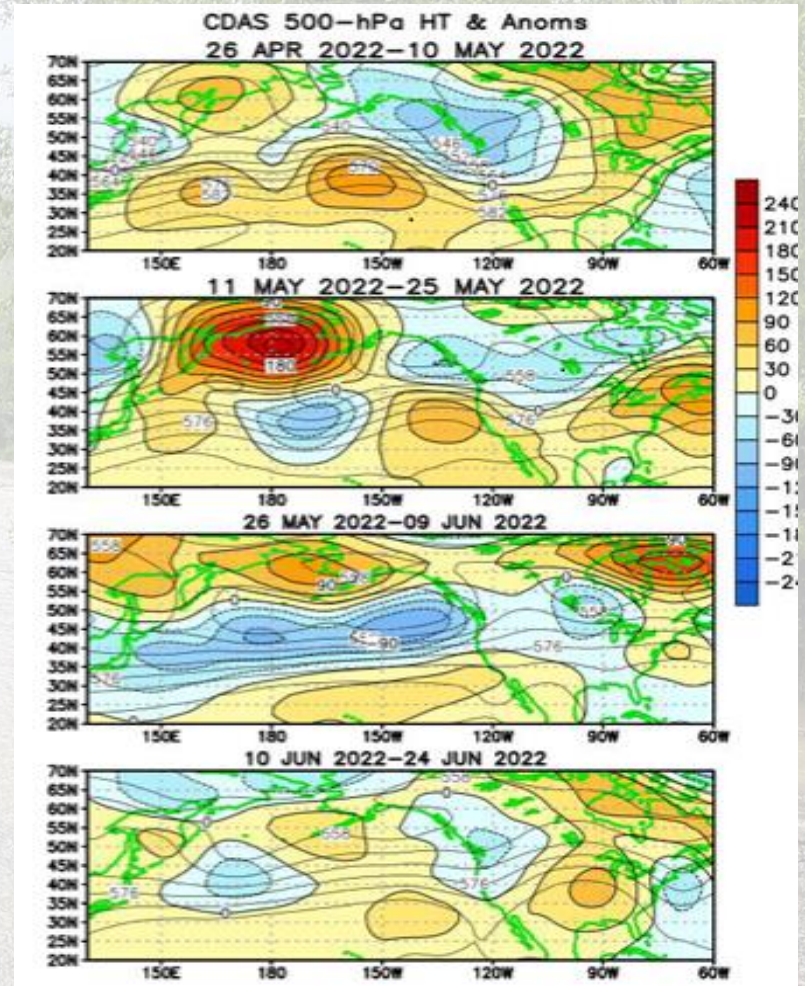


The average 500 MB flow pattern for June was a broad upper trough along the coast and a southwest flow pattern over the interior Pacific Northwest. This led to more frequent weather systems for the month. During the first half of the month, conditions were cooler and much wetter than normal. The depth and frequency of the Pacific Weather Systems during the first half of the month dominated over the upper high pressure ridges during the latter half of the month, which resulted in the average upper trough/southwest flow pattern.

Two Month, Average Bi-weekly 500 MB Plots for May & June 2022

These are more detailed bi-weekly average 500 mb pattern plots, which was sampled from the following period: 26th of April through the 24th of June 2022.

The land boundaries are shown in green. Yellow and orange colors represent areas of high pressure or ridges at 500 mb and the cooler shades of blue color show areas of low pressure or troughs at 500 mb.



During the period from very late April through almost mid May, there was a strong upper trough pattern. This led to much wetter than normal conditions. Then from mid May to late May the upper trough moved eastward, with an overall upper ridge/northwest flow pattern over the region. Then from late May through almost mid June an upper trough pattern returned to the coast, with a southwest flow over the interior Pacific Northwest, leading to very wet conditions. This overall pattern persisted, but weakened, during the middle to latter part of June due to more frequent, but weaker high pressure ridges than upper troughs.

Significant/Record Weather Events for June 2022

Significant Weather Events				
Event	Date	Report	Where	Source
Heavy Rain	June 2, 2022	M 0.45 inch	2 NE Bend, OR	Public
Flash Flood	June 2, 2022	Mud and rock slide	6 E Dayton, WA	Trained Spotter
Heavy Rain	June 2, 2022	M 2.50 inches	6 E Dayton, WA	Trained Spotter
Heavy Rain	June 2, 2022	M 0.96 inch	2 SSW Grass Valley, OR	Trained Spotter
Heavy Rain	June 3, 2022	M 0.62 inch	Meacham, OR	ASOS
Heavy Rain	June 3, 2022	M 0.85 inch	8 SE Pilot Rock, OR	Trained Spotter
Heavy Rain	June 3, 2022	M 0.47 inch	4 N Bingham Springs, OR	Trained Spotter
Heavy Rain	June 3, 2022	M 0.80 inch	6 E Dayton, WA	Trained Spotter
Heavy Rain	June 4, 2022	M 0.49 inch	5 NNE La Grande, OR	Trained Spotter
Heavy Rain	June 4, 2022	M 1.50 inches	6 E Dayton, WA	Trained Spotter
Heavy Rain	June 5, 2022	M 1.40 inches	6 NNW Heppner, OR	Trained Spotter
Heavy Rain	June 11, 2022	M 1.35 inches	8 SE Pilot Rock, OR	Trained Spotter
Heavy Rain	June 11, 2022	M 0.90 inch	5 NNE La Grande, OR	Trained Spotter
Tornado	June 11, 2022	Tornado & debris seen by pilot	6 SW Pendleton, OR Airport	Airplane pilot

All, but two, significant weather events were heavy rain events, that were caused by either strong low pressure systems and/or thunderstorms. The strongest events occurred on the 2nd through the 5th, and again on the 11th of the month. There was also a flash flood event, which occurred on the 2nd, and a weak tornado which occurred on the 11th. The tornado was observed by NWS personnel, as well as an airplane pilot, just south of the Pendleton, OR airport. Most of these events were reported by trained weather spotters.

Record Weather Reports					
Event	Date	Where	Previous Record	New Record	Records Began
Maximum Rainfall	June 15, 2022	Dallesport Airport, WA	0.23 / 2005	0.40 inch	1929
Low Temperature	June 15, 2022	Walla Walla, WA	45 / 2012	42 degrees	1930

There were only two record weather events during June. They were both on the 15th of the month. One was a high temperature record and the other was a low temperature record. Two nights before the record low temperature occurred (on the 13th), there were several inches of snow that fell above the 5000 ft MSL level, at Tollgate, OR, which is rare for June.

June 2022, Observed Monthly Max & Min Temperatures

Location	Highest Maximum	Lowest Minimum
Pendleton, OR	98	44
Redmond, OR	103	36
Pasco, WA	105	47
Yakima, WA	98	40
Walla Walla, WA	96	42
Bend, OR	95	31
Ellensburg, WA	97	42
Hermiston, OR	101	44
John Day, OR	103	42
La Grande, OR	98	34
The Dalles, OR	104	46
Meacham, OR	92	30
MT Adams RS, WA	90	35

The highest maximum temperatures ranged from 90 degrees at the Mt Adams Ranger Station, WA to 105 degrees at Pasco, WA. The lowest minimum temperatures ranged from 31 degrees at Bend, OR to 47 degrees at Pasco, WA. For the month of June, these are typical highest and lowest maximum and minimum temperatures. The highest and lowest temperatures in the lists are box colored red and blue respectively.

June 2022 Observed Total Precipitation and Total Snowfall/Hail

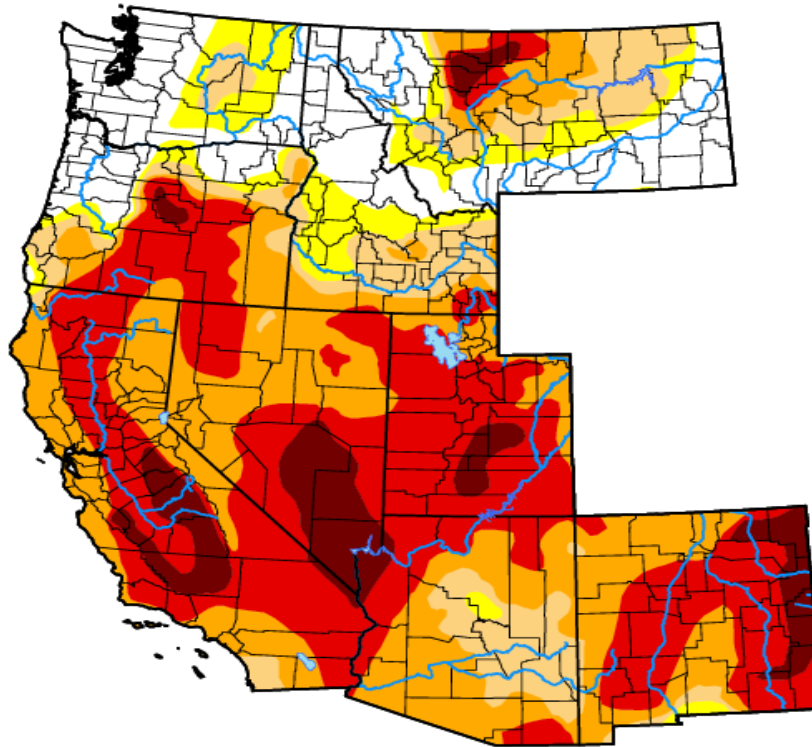
Location	Total Precipitation (inches)	Total Snow/Hail (inches)
Pendleton, OR	2.16	0.0
Redmond, OR	1.88	M
Pasco, WA	1.11	M
Yakima, WA	0.71	M
Walla Walla, WA	3.41	M
Bend, OR	1.68	0.0
Ellensburg, WA	1.39	M
Hermiston, OR	1.65	M
John Day, OR	2.69	M
La Grande, OR	2.40	M
The Dalles, OR	1.15	M
Meacham, OR	5.39	M
MT Adams RS, WA	2.73	0.0

Precipitation amounts ranged from a minimum of 0.71 inch at Yakima, WA (brown color) to a maximum of 5.39 inches at Meacham, OR (green color). However, most precipitation amounts ranged from one to three inches. These values are much greater than typical for June. The only available snow reports were all 0.0 inches. Note that Tollgate, OR is not a regular reporting station, which had several inches of snow on the 13th, which is rare.

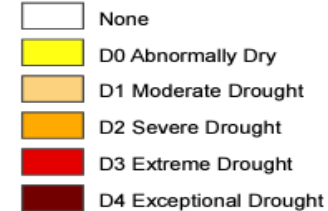
June 2022 - Drought Monitor - West

U.S. Drought Monitor West

June 28, 2022
(Released Thursday, Jun. 30, 2022)
Valid 8 a.m. EDT



Intensity:



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

Author:

Curtis Riganti
National Drought Mitigation Center



droughtmonitor.unl.edu

There continued to be an “Exceptional” (D4) drought over central OR, east of the Cascades, and an “Extreme” (D3) drought over the John Day Highlands. Heavy rains have caused drought conditions to become “None” over most of the Lower Columbia Basin, the Blue Mountain Foothills, and the eastern Columbia Gorge. Elsewhere, drought conditions ranged from “Abnormally Dry” (D0) to “Severe” (D2), except for the southern WA Cascades, where drought conditions were mostly “Abnormally Dry” (D0).

USA Three Month Temperature Outlook

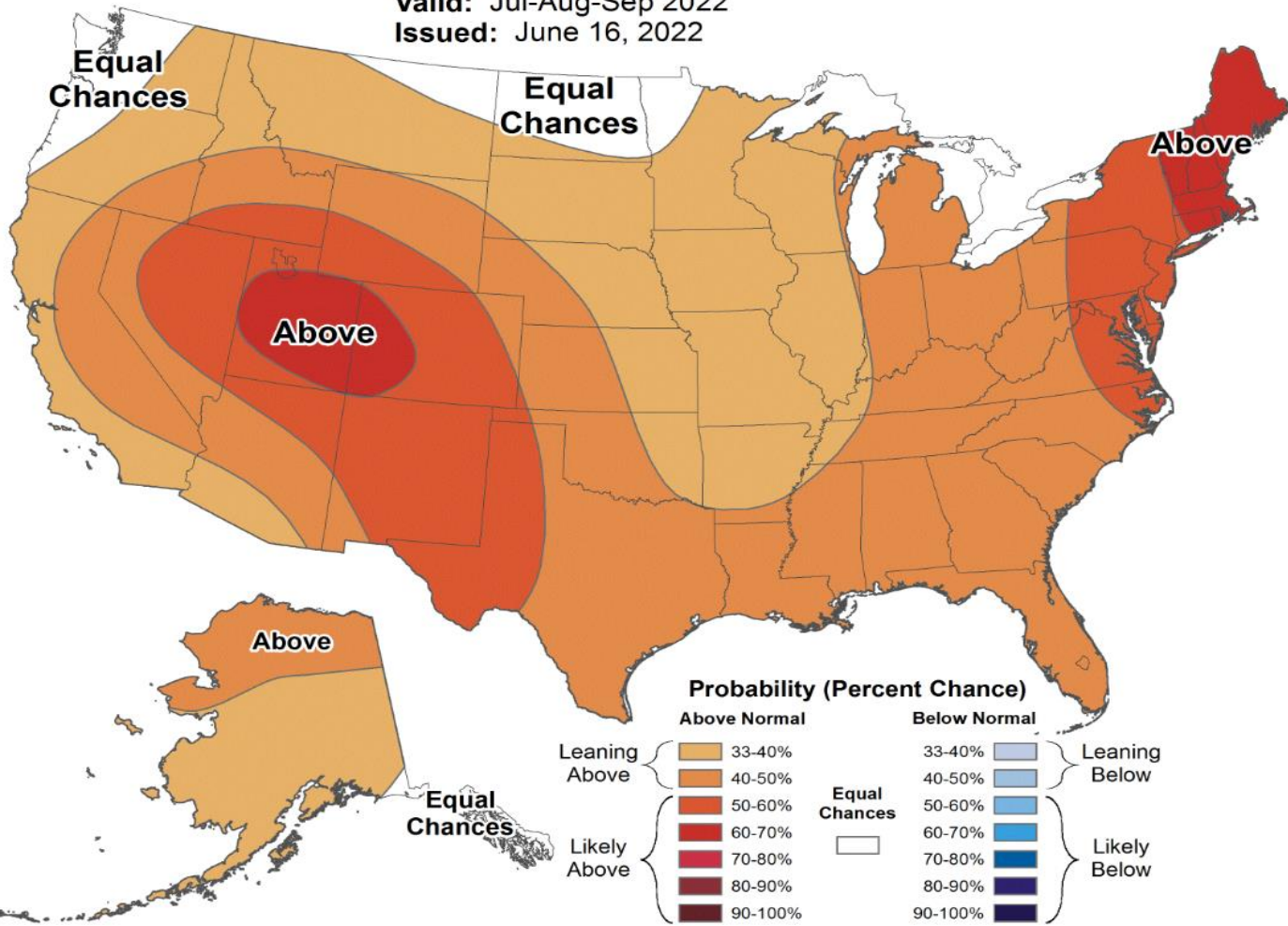


Seasonal Temperature Outlook



Valid: Jul-Aug-Sep 2022

Issued: June 16, 2022



The temperature outlook for the next 3 months (July - September) is for equal chances to slightly above normal temperatures for the Pacific Northwest. While this may depart some from typical La-Nina conditions over the Pacific Northwest, this forecast is not unusual for a typical eastern OR/WA summer.

USA Three Month Precipitation Outlook

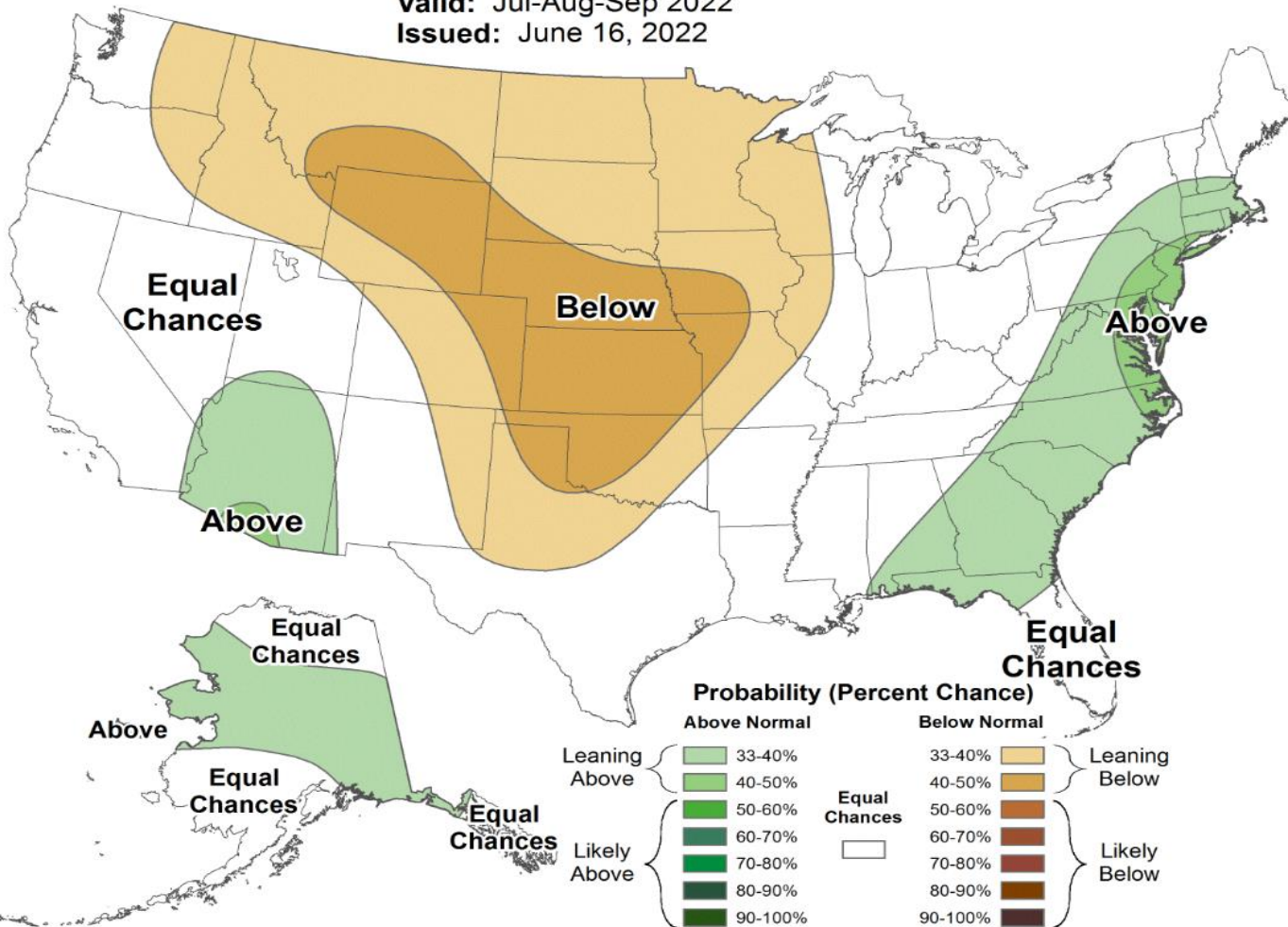


Seasonal Precipitation Outlook



Valid: Jul-Aug-Sep 2022

Issued: June 16, 2022

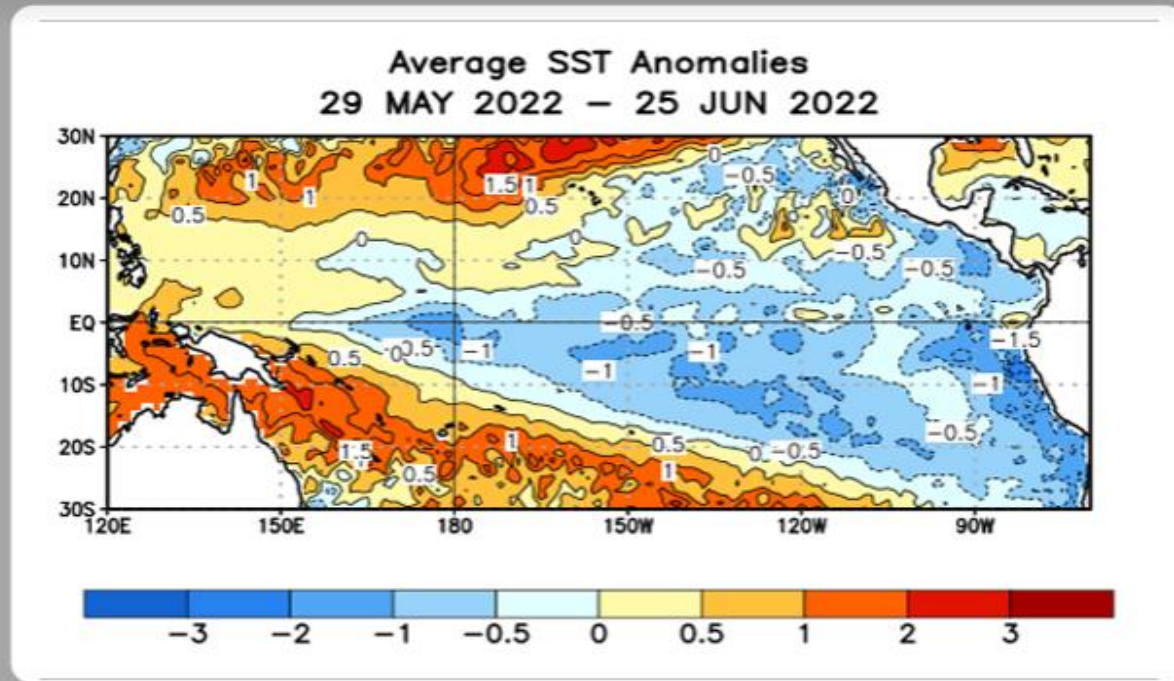


The precipitation outlook for the next 3 months (July - September) is for equal chances to slightly below normal precipitation over the Pacific Northwest. While this is not consistent with La Nina conditions, it is not unusual to have dry conditions during a typical eastern OR/WA summer.

Sea Surface Temperature (SST) Anomalies for June 2022

SST Departures (°C) in the Tropical Pacific During the Last Four Weeks

In the last four weeks, equatorial SSTs were below average across most of the Pacific Ocean.



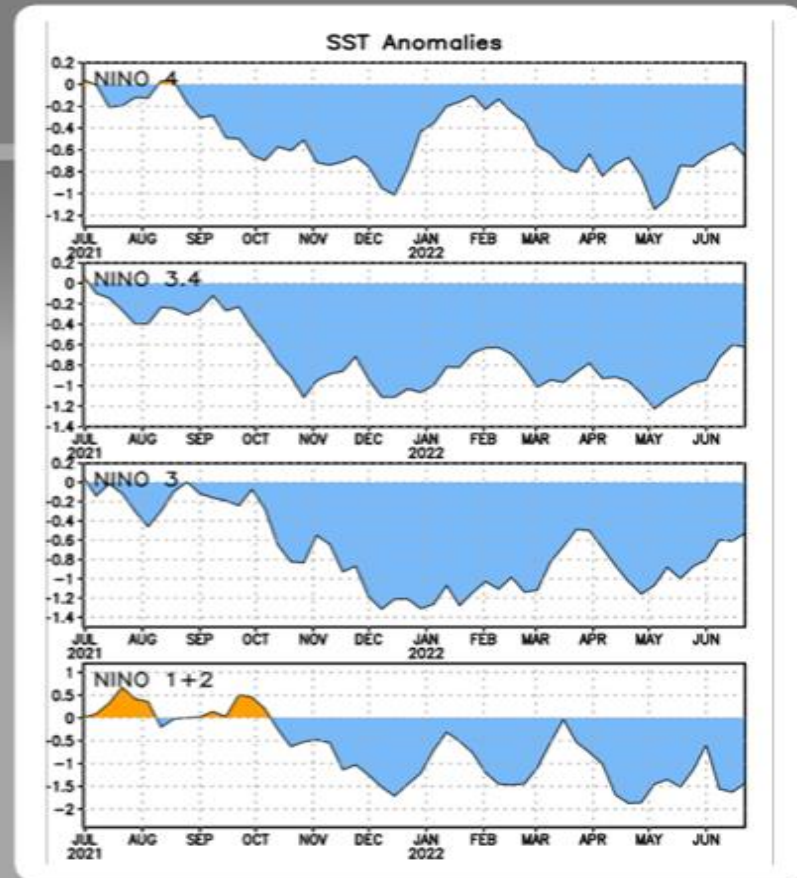
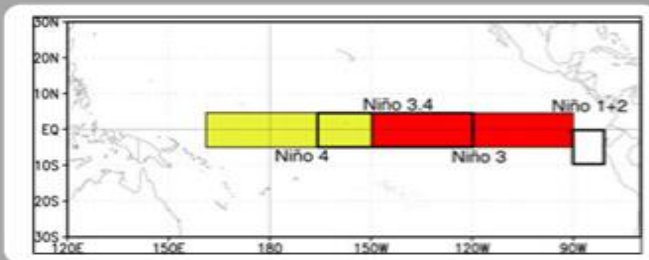
Sea Surface Temperatures (SSTs) remained below average over the central and eastern equatorial Pacific during the month of June, by as much as -0.5 to -2 degrees C. The cooler than normal SSTs have expanded slightly more into the western Pacific since May 2022 as well. This is consistent with the ongoing La-Nina event. The small areas of above normal SSTs off the coasts of Mexico, Central and northern South America have greatly decreased since last month, and became almost non-existent along the immediate coast lines.

ENSO NINO Regions SST Anomalies for Each Nino Region in June 2022

Niño Region SST Departures (°C) Recent Evolution

The latest weekly SST departures are:

Niño 4	-0.7°C
Niño 3.4	-0.6°C
Niño 3	-0.5°C
Niño 1+2	-1.4°C



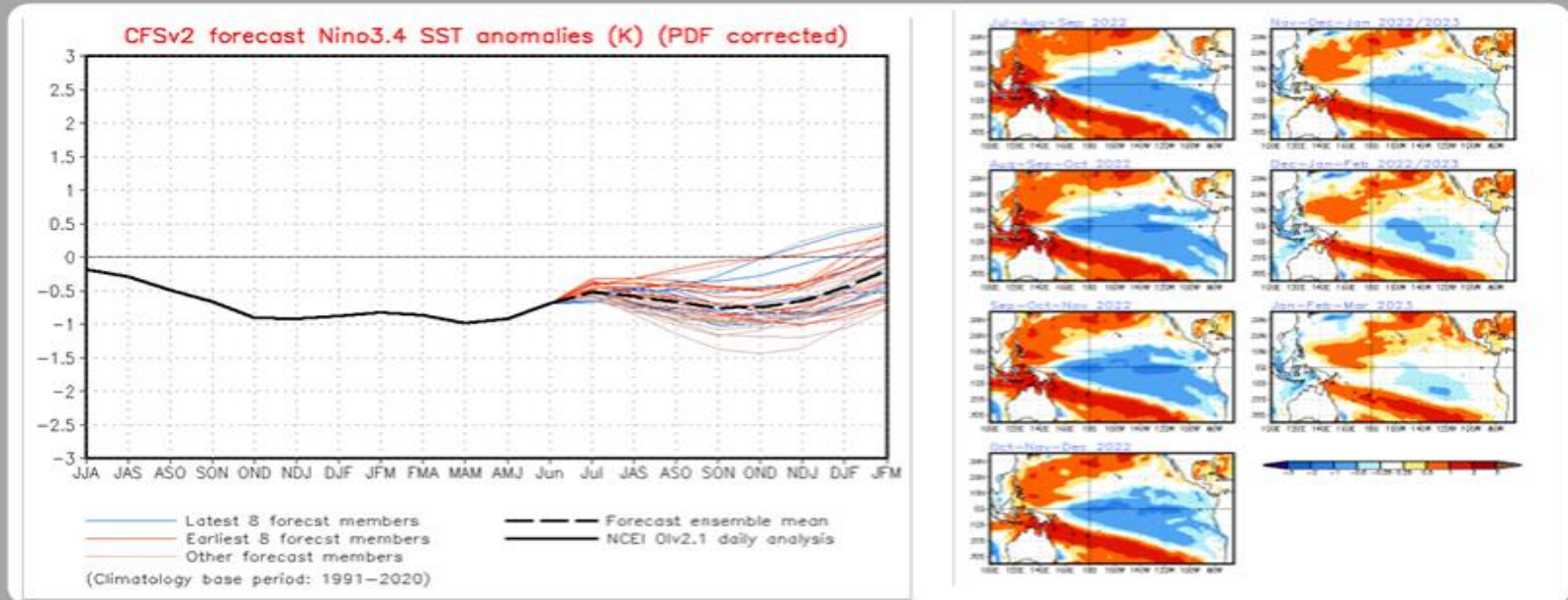
All Niño Regions continued to have SST anomalies less than zero degrees C. However, there was some cooling that took place in Niño Regions 3.4 and 4 during June. Niño Regions 1+2 and 3 had some slight warming of SSTs during the month. The greatest cooling was in Niño Region 4, and the amount of warming in Niño Regions 1+2, and 3 were about the same. The fact that all Niño Regions continued to have SST anomalies less than zero is consistent with the ongoing La Niña event, especially in Niño Regions 3.4 and 4 where the cooling place rather than warming.

Sea Surface Temperature (SST) NCEP CFS.v2 Ensemble Mean Outlook

SST Outlook: NCEP CFS.v2 Forecast (PDF corrected)

Issued: 27 June 2022

The CFS.v2 ensemble mean (black dashed line) indicates borderline La Niña /ENSO-neutral conditions during the Northern Hemisphere summer, with La Niña strengthening during the fall and early winter.



The SST CFS.v2 ensemble mean outlook shows that SSTs are forecast to remain below the zero (neutral) line through the winter of 2022-2023. However, the increasing SSTs shown by the dashed black line (the ensemble SST forecast) still indicates a weakening of La Nina during the Northern Hemisphere summer. Then La Nina conditions are forecast to strengthen again during the Northern Hemisphere fall into early winter. After that, La Nina conditions are forecast to weaken again, to near ENSO-neutral, by late winter 2022-2023, with many ensemble members increasing to above zero. The overall trend of warming SSTs are shown in the images to the right, which shows equatorial Pacific SSTs gradually become warmer for each 3 month period.

Current ENSO (El Niño Southern Oscillation) Alert System Status

Summary

ENSO Alert System Status: **La Niña Advisory**

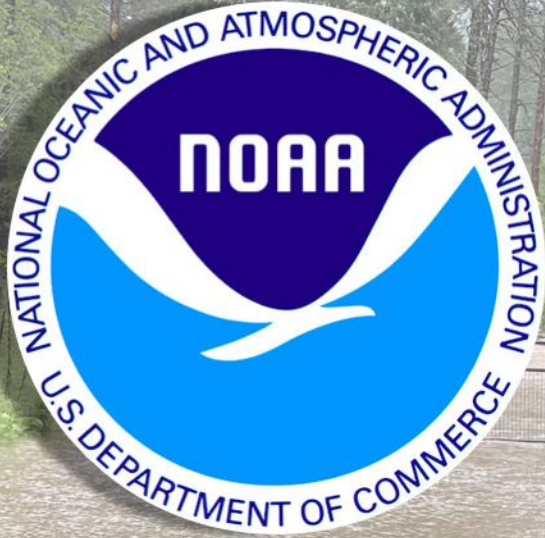
La Niña is present.*

Equatorial sea surface temperatures (SSTs) are below average across most of the Pacific Ocean.

The tropical Pacific atmosphere is consistent with La Niña.

Though La Niña is favored to continue through the end of the year, the odds for La Niña decrease into the Northern Hemisphere late summer (52% chance in July-September 2022) before slightly increasing through the Northern Hemisphere fall and early winter 2022 (58-59% chance).*

The current ENSO Alert System Status is still “**La-Nina Advisory**”. Equatorial SSTs are below average across most of the Pacific Ocean, and the tropical Pacific atmosphere is consistent with La-Nina. La-Nina conditions are still favored to continue through the end of the year, with the odds for La Nina decreasing into the late Northern Hemisphere summer being a 52 percent chance from July – September. Then La Nina increases slightly again through the Northern Hemisphere fall and early winter 2022 (with a 58-59 percent chance) before decreasing again.



Thank You!