

The Month In Review

June 2021

National Weather Service
Pendleton, Oregon

Photo: A Very Hot and Hazy Day in Pendleton, OR

June 2021, Climate Summary

June 2021 was a very warm and dry month, especially during the latter half of the month. There were many all time station record high temperatures broken during a record breaking heat wave that covered the region during the latter part of the month. The Pendleton Airport broke its all time high temperature for any month of the year with a high of 117 degrees on the 29th. The old record was 113 degrees. The month was also very dry again, with every station included in this report having well below normal precipitation. There were also record high minimum temperatures reported during the latter part of the month. The hottest days of that heat wave was from the 25th through the 30th. There were three thunderstorm events, of which each produced mainly hail, and a few strong thunderstorm winds. The winds caused mainly damage to trees/tree limbs, but there were no reports of severe wind gusts (wind speeds \geq 58 mph). There was a flash flood on the 23rd in central Oregon near Bend. Below are some images of significant weather events during the month. Notice the hail that accumulated on the black camping chair. That hail fell as a quarter to half inch in size.



A bright, but very hot day in Pendleton, OR, when the temperature hit 117 degrees, which broke an all time record.



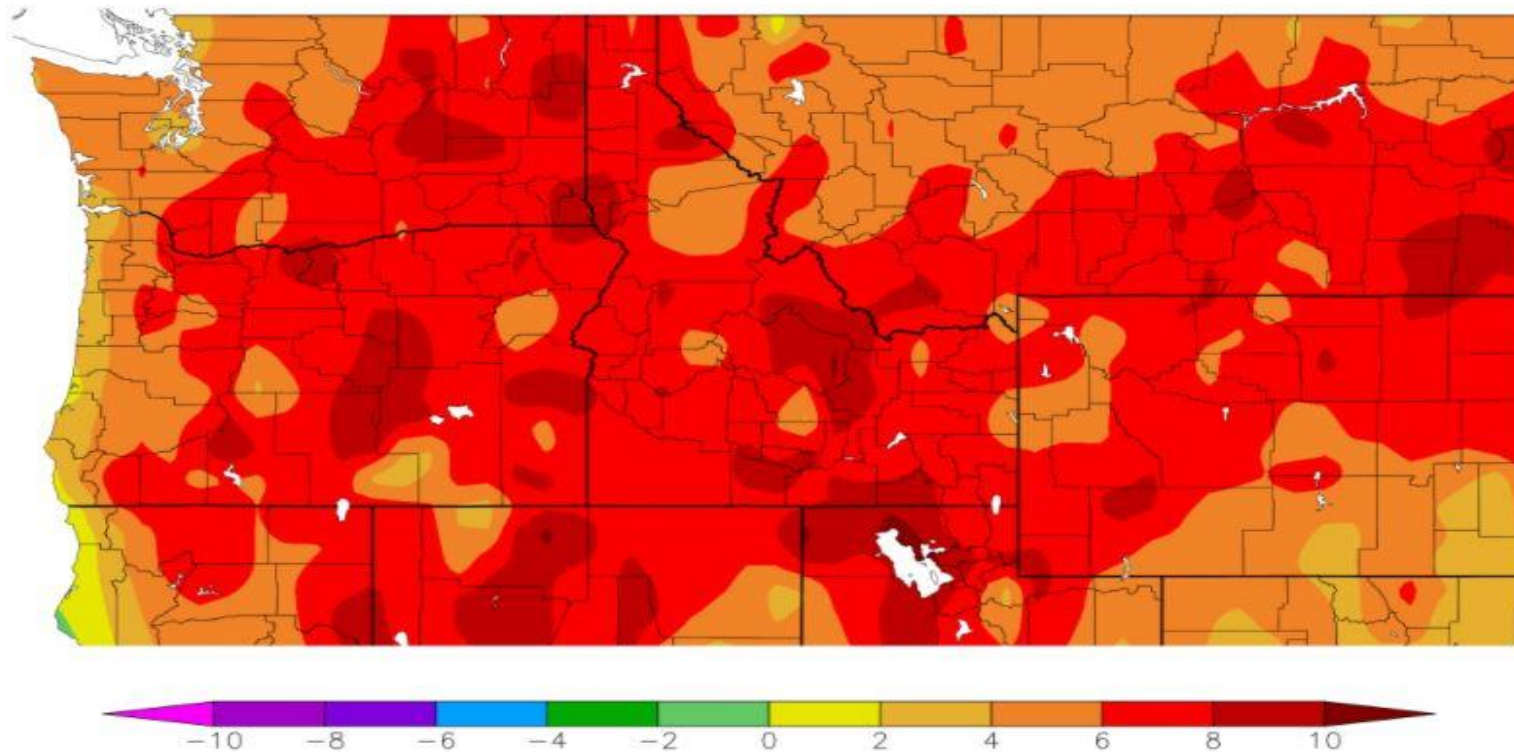
Thunderstorm damage to a tree in the city of La Grande, OR during the record-breaking heat wave.



One quarter to one half inch hail fell and accumulated on this camping chair near Meacham, OR during the middle of June.

June 2021, Departure from Normal of Average Temperatures

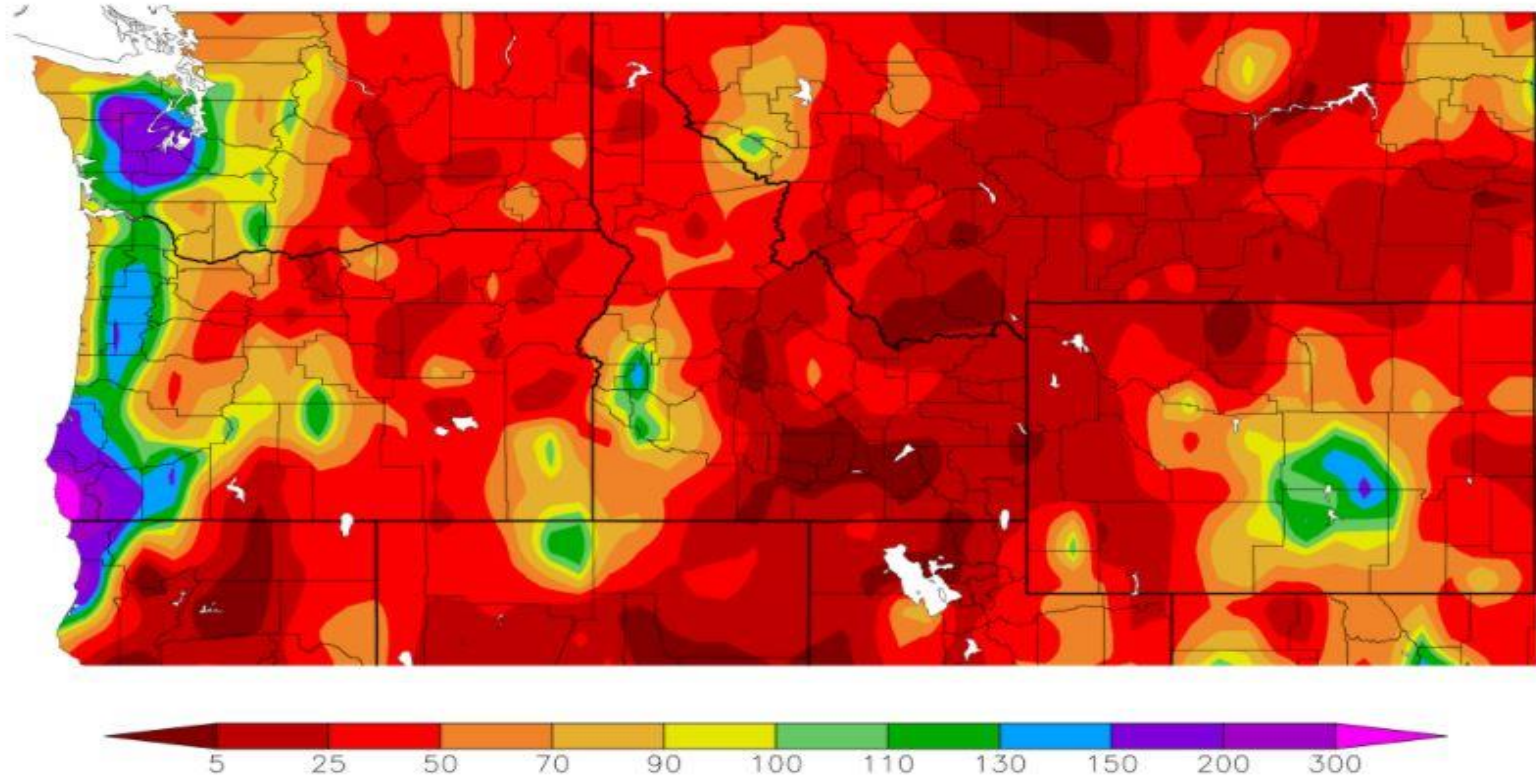
Departure from Normal Temperature (F)
6/1/2021 – 6/30/2021



All of the forecast area (central-northeast Oregon and south central-southeast Washington) had well above normal temperatures on average. The warmest areas were on the west end of the John Day Highlands, the eastern Columbia River Gorge and a small portion of Wallowa County.

June 2021, Percent of Normal of Precipitation

Percent of Normal Precipitation (%)
6/1/2021 – 6/30/2021



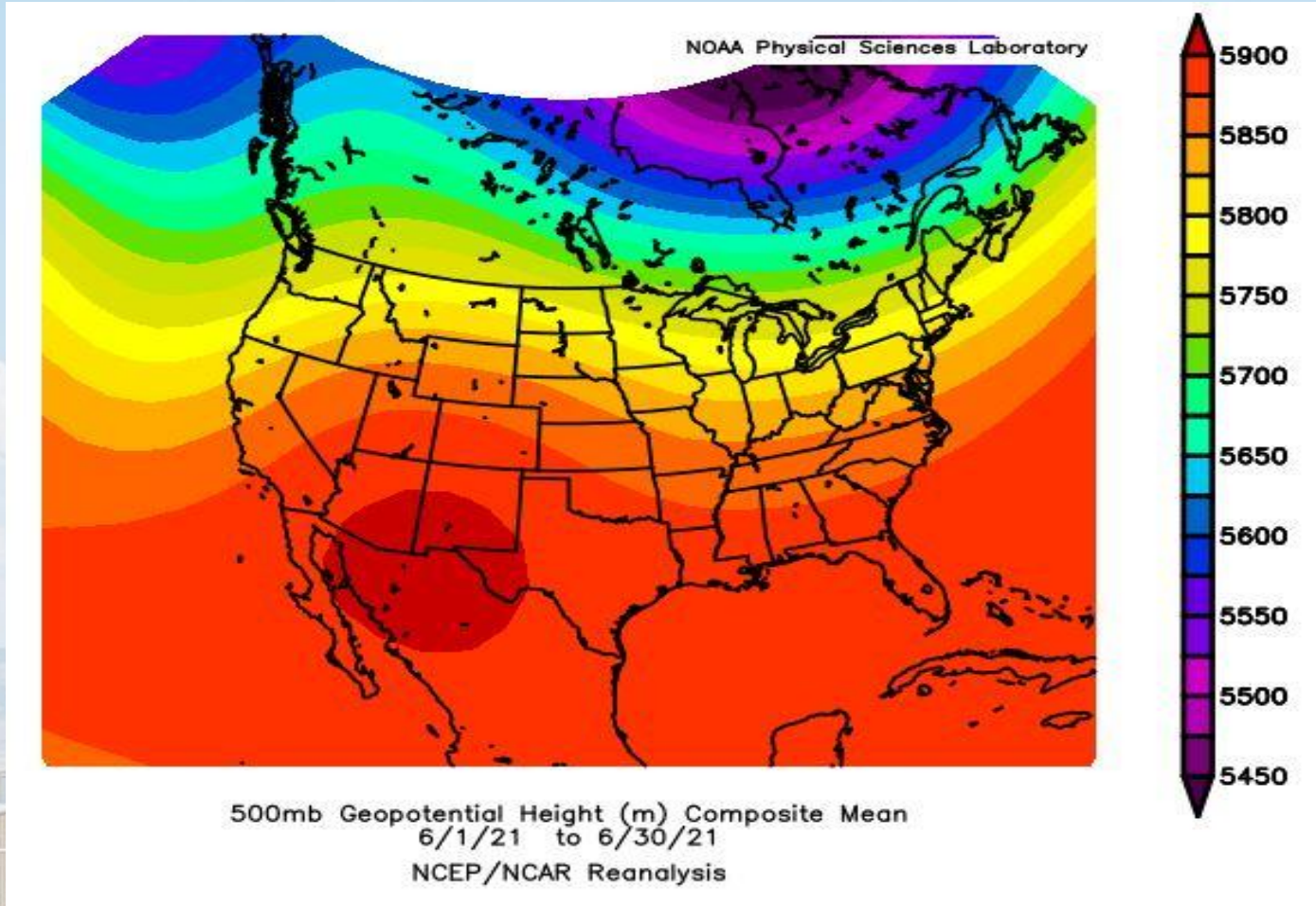
June was again significantly drier than normal with the percent of normal precipitation ranging from mostly 5 to 50 percent of normal. The only location that had a percent of normal precipitation greater than normal was over a very small portion of southeast Deschutes County, in central Oregon, likely due to heavy rain from thunderstorms.

June 2021, Departures from Normal Averages/Sums for Select Cities

	Max T	Max T D	Min T	Min T D	Ave T	Ave T D	PCPN	PCPN D
Yakima	88.9	9.4	56.7	8.4	72.8	8.9	0.18	-0.44
Kennewick	89.9	8.3	63.1	7.0	76.5	7.7	0.24	-0.27
Walla Walla	88.2	9.4	60.5	6.3	74.4	7.9	0.61	-0.67
The Dalles	90.0	10.9	61.9	7.1	76.0	9.0	0.04	-0.52
Redmond	86.6	10.5	48.7	7.7	67.7	9.2	0.38	-0.26
Pendleton Airport	88.3	10.1	55.8	4.3	72.1	7.2	0.31	-0.67
La Grande Airport	86.7	12.0	51.3	2.6	69.0	7.3	0.14	-1.40
John Day	89.2	11.6	56.3	10.9	72.7	11.2	0.15	-1.28

The table above shows that all stations in the list had significantly above normal temperatures for all three of the averages (the mean max, mean min, and the mean avg). These numbers are not just typical of a couple to a few degrees, but some stations had an average maximum temperature as much as 11.6 degrees at John Day, and that's an average, which makes it even more significant. The same is true with the mean minimums and mean averages. Precipitation for the month were all significantly below average, especially at the La Grande Airport, and at John Day, where both had more than an inch of below normal precipitation for June 2021!

June 2021, Average 500 MB Pattern

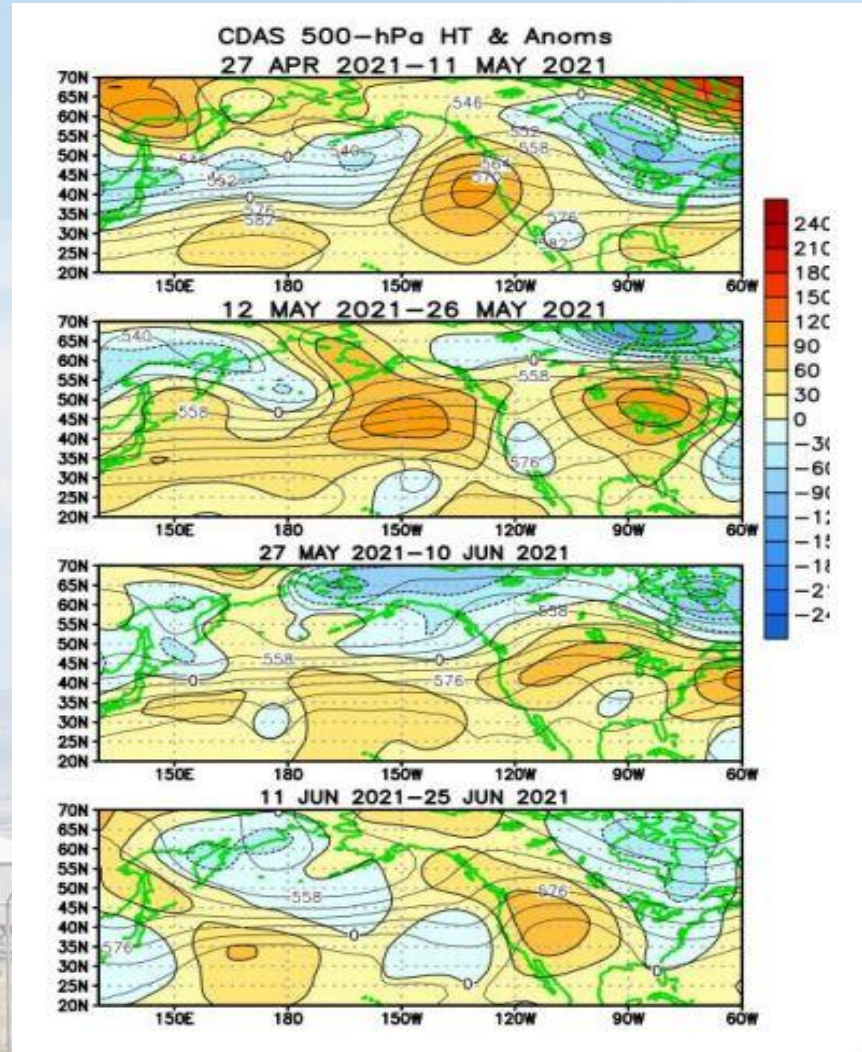


The average 500 MB pattern was an overall southwest flow over the Pacific Northwest. This is typically a very warm to hot pattern for eastern Oregon and Washington. It can also be a dry pattern during the early part of the summer season when monsoon moisture has not yet become established over the southwest USA, to be transported northward into the Pacific Northwest and the forecast area.

Two Month, Bi-weekly 500 MB Plots for May and June 2021

These are more detailed semi-monthly average 500 mb pattern plots, which was from the following period: 27th April 2021 through 25th of June 2021.

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



Late April and early May was dominated by an upper ridge pattern, which transitioned into an upper trough pattern during the latter part of May. Then an upper trough pattern developed over the Pacific Northwest in late May and early June, which then transitioned into a mostly upper ridge pattern by the end of June. The upper ridge during the end of June resulted in the record heat wave.

Significant Weather Events for June 2021

Significant Weather Events				
Event	Date	Report	Where	Source
Hail	June 13, 2021	M 0.5 inch	11 N Cowiche, WA	Trained Spotter
TSTM Wind Gust	June 14, 2021	E 50 mph	Richland, WA	Public
Hail	June 15, 2021	E 0.25 inch	9 SE Dayton, WA	Trained Spotter
Hail	June 15, 2021	E 0.88 inch	1 NNW La Grande, OR	Trained Spotter
Hail	June 15, 2021	E 0.75 inch	Kooskooskie, WA	Public
Hail	June 15, 2021	E 0.25 inch	15 ESE Heppner, OR	Trained Spotter
Hail	June 15, 2021	E 0.50 inch	10 NE Service Creek, OR	Trained Spotter
Hail	June 15, 2021	E 1.75 inch	2 SE Kooskooskie, WA	Unknown
TSTM Wind Damage	June 15, 2021	Trees/power Lines down	College Place, WA	County Official
TSTM Wind Damage	June 15, 2021	Small plane flipped over	College Place, WA	Law Enforcement
Hail	June 21, 2021	M 0.25 inch	5 S Bend, OR	Public
Hail	June 23, 2021	E 0.25 inch	3 ESE Lostine, OR	Trained Spotter
Hail	June 23, 2021	E 0.50 inch	Bend, OR	Trained Spotter
Hail	June 23, 2021	E 0.75 inch	Bend, OR	Trained Spotter
Hail	June 23, 2021	E 0.25 inch	2 NE Bend, OR	Trained Spotter
Hail	June 23, 2021	E 1.00 inch	Bend, OR	Public
Hail	June 23, 2021	E 0.75 inch	Bend, OR	Public
Hail	June 23, 2021	E 1.25 inch	3 NW Bend, OR	Trained Spotter
Hail	June 23, 2021	M 1.00 inch	4 N Bend, OR	Public
Hail	June 23, 2021	M 1.00 inch	1 NE Bend, OR	Public
Hail	June 23, 2021	M 1.00 inch	3 ENE Bend, OR	Public
Flash Flood	June 23, 2021	Water on hwy 97/hwy 20	2 NNW Bend, OR	Public
Hail	June 23, 2021	E 1.00 inch	3 NNE Bend, OR	Trained Spotter
Hail	June 30, 2021	M 0.50 inch	1 W Lostine, OR	Trained Spotter
TSTM Wind Damage	June 30, 2021	Large tree limbs down	La Grande, OR	Public

There were three distinct significant weather events during the month of June. The first was from the 13th – 15th, which produced mostly hail. The second was from the 21st – 23rd, which again produced mostly hail. Then at the end of the month, on the 30th, a strong thunderstorm caused more hail and also tree damage in northeast Oregon, especially near La Grande.

Record Weather Event Reports for June 2021 (all High Temperatures)

Record Weather Reports

Event	Date	Where	Previous Record	New Record	Records Began
High Temperature	June 1, 2021	Redmond, OR	95 / 1986	97	1941
High Temperature	June 2, 2021	Yakima, WA	95 / 2007	100	1909
High Temperature	June 2, 2021	Walla Walla, WA	98 / 1970	99	1930
High Temperature	June 2, 2021	Redmond, OR	96 / 1970	99	1941
High Temperature	June 2, 2021	Hermiston, OR	102 / 1937	102 (Tied)	1906
High Temperature	June 2, 2021	Pendleton, OR	96 / 1913	100	1934
High Temperature	June 22, 2021	Redmond, OR	95 / 1970	100	1941
High Temperature	June 26, 2021	Pendleton, OR	104 / 2015	104 (Tied)	1934
High Temperature	June 26, 2021	Yakima, WA	104 / 2015	104 (Tied)	1909
High Temperature	June 26, 2021	Redmond, OR	101 / 2015	101 (Tied)	1941
High Temperature	June 26, 2021	Hermiston, OR	106 / 1925	108	1906
High Temperature	June 26, 2021	Hanford, WA	106 / 2015	108	1945
High Temperature	June 26, 2021	The Dalles, OR	108 / 2015	110	1929
High Temperature	June 27, 2021	Pendleton, OR	109 / 2015	112	1934
High Temperature	June 27, 2021	Hermiston, OR	111 / 2015	114 (All time record broken)	1906
High Temperature	June 27, 2021	Redmond, OR	100 / 2015	108 (All time record tied)	1941
High Temperature	June 27, 2021	The Dalles, OR	107 / 2015	115 (All time record broken)	1929
High Temperature	June 27, 2021	Meacham, OR	98 / 2015	99 (Tied)	1929
High Temperature	June 27, 2021	Yakima, WA	108 / 2015	109 (All time June record broken)	1909
High Temperature	June 27, 2021	Walla Walla, WA	109 / 2015	110	1930
High Temperature	June 27, 2021	Hanford, WA	110 / 2015	114 (All time record broken)	1945
High Temperature	June 28, 2021	Pendleton, OR	109 / 2015	113 (All time June record broken)	1934
High Temperature	June 28, 2021	Hermiston, OR	107 / 2015	114 (All time record tied)	1906
High Temperature	June 28, 2021	Redmond, OR	97 / 2008	110 (All time record broken)	1941
High Temperature	June 28, 2021	Yakima, WA	108 / 2015	109 (All time June record tied)	1909
High Temperature	June 28, 2021	Walla Walla, WA	113 / 2015	113 (All time June record tied)	1930
High Temperature	June 28, 2021	Hanford, WA	111 / 2015	115 (All time record broken)	1945
High Temperature	June 28, 2021	Dallesport Airport, WA	103 / 2008	118 (All time WA state record tied)	1929
High Temperature	June 29, 2021	Pendleton, OR	102 / 1904	117 (All time record broken)	1934
High Temperature	June 29, 2021	Redmond, OR	100 / 2008	112 (All time record broken again)	1941
High Temperature	June 29, 2021	Hermiston, OR	105 / 1948	118 (All time record broken)	1906
High Temperature	June 29, 2021	Yakima, WA	103 / 1948	113 (All time June record broken)	1909
High Temperature	June 29, 2021	Walla Walla, WA	105 / 2008	116 (All time June record broken)	1930
High Temperature	June 30, 2021	Yakima, WA	102 / 2008	108	1909
High Temperature	June 30, 2021	Walla Walla, WA	104 / 1987	108	1930
High Temperature	June 30, 2021	Redmond, OR	97 / 2008	103	1941
High Temperature	June 30, 2021	Hermiston, OR	105 / 1924	109	1906

June 2021, Observed Monthly Max & Min Temperatures

Location	Highest Maximum	Lowest Minimum
Pendleton, OR	117	39
Redmond, OR	112	31
Pasco, WA	115	46
Yakima, WA	113	40
Walla Walla, WA	116	46
Bend, OR	107	31
Ellensburg, WA	114	36
Hermiston, OR	118	44
John Day, OR	111	41
La Grande, OR	107	31
The Dalles, OR	118	49
Meacham, OR	103	29
MT Adams RS, WA	109	32

Every single station in the list had a maximum temperature greater than 100 degrees, and only 4 out of the 13 stations listed were below 110 degrees. These maximum temperatures were nearly all record highs, which smashed many old records, and some are all time record high temperatures for any month. The lowest minimum temperatures are more typical, as June can still have cold nights, especially at higher elevations, like Meacham, OR.

June 2021, Observed Monthly Precipitation and Snowfall/Hail Totals

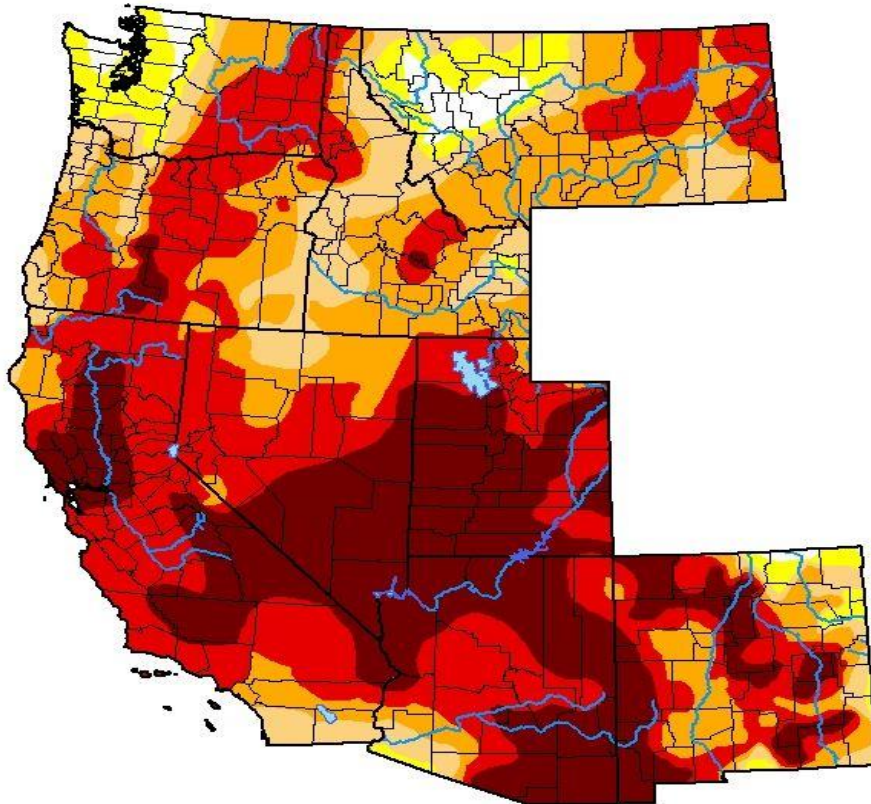
Location	Total Precipitation (inches)	Total Snow/Hail (inches)
Pendleton, OR	0.30	0.0
Redmond, OR	0.38	M
Pasco, WA	0.19	M
Yakima, WA	0.18	M
Walla Walla, WA	0.58	M
Bend, OR	0.39	0.0
Ellensburg, WA	0.52	M
Hermiston, OR	0.23	M
John Day, OR	0.15	M
La Grande, OR	0.14	M
The Dalles, OR	0.04	M
Meacham, OR	0.84	M (hail fell, but was not reported)
MT Adams RS, WA	1.15	0.0

For the fourth month in a row, precipitation amounts were significantly low, and were below normal. The lowest precipitation amount was at The Dalles, OR with only 0.04 of an inch for the month. Most had less than a half inch, except for the MT Adams R.S. and at Meacham, OR where there was considerably more precipitation from thunderstorms. There was no snow, or hail that was reported at these stations, though hail did occur, as listed in slide 8.

End of June 2021 - Drought Monitor

U.S. Drought Monitor West

June 29, 2021
(Released Thursday, Jul. 1, 2021)
Valid 8 a.m. EDT



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	1.82	98.18	93.16	81.88	59.56	26.54
Last Week <i>06-22-2021</i>	2.11	97.89	90.92	78.14	55.83	26.71
3 Months Ago <i>03-30-2021</i>	11.95	88.05	73.82	59.44	42.24	23.23
Start of Calendar Year <i>12-29-2020</i>	13.52	86.48	75.49	63.25	45.40	23.76
Start of Water Year <i>09-29-2020</i>	9.96	90.04	73.14	51.29	32.19	2.50
One Year Ago <i>06-30-2020</i>	38.10	61.90	42.12	21.57	2.42	0.00

Intensity:

None	D2 Severe Drought
D0 Abnormally Dry	D3 Extreme Drought
D1 Moderate Drought	D4 Exceptional Drought

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:

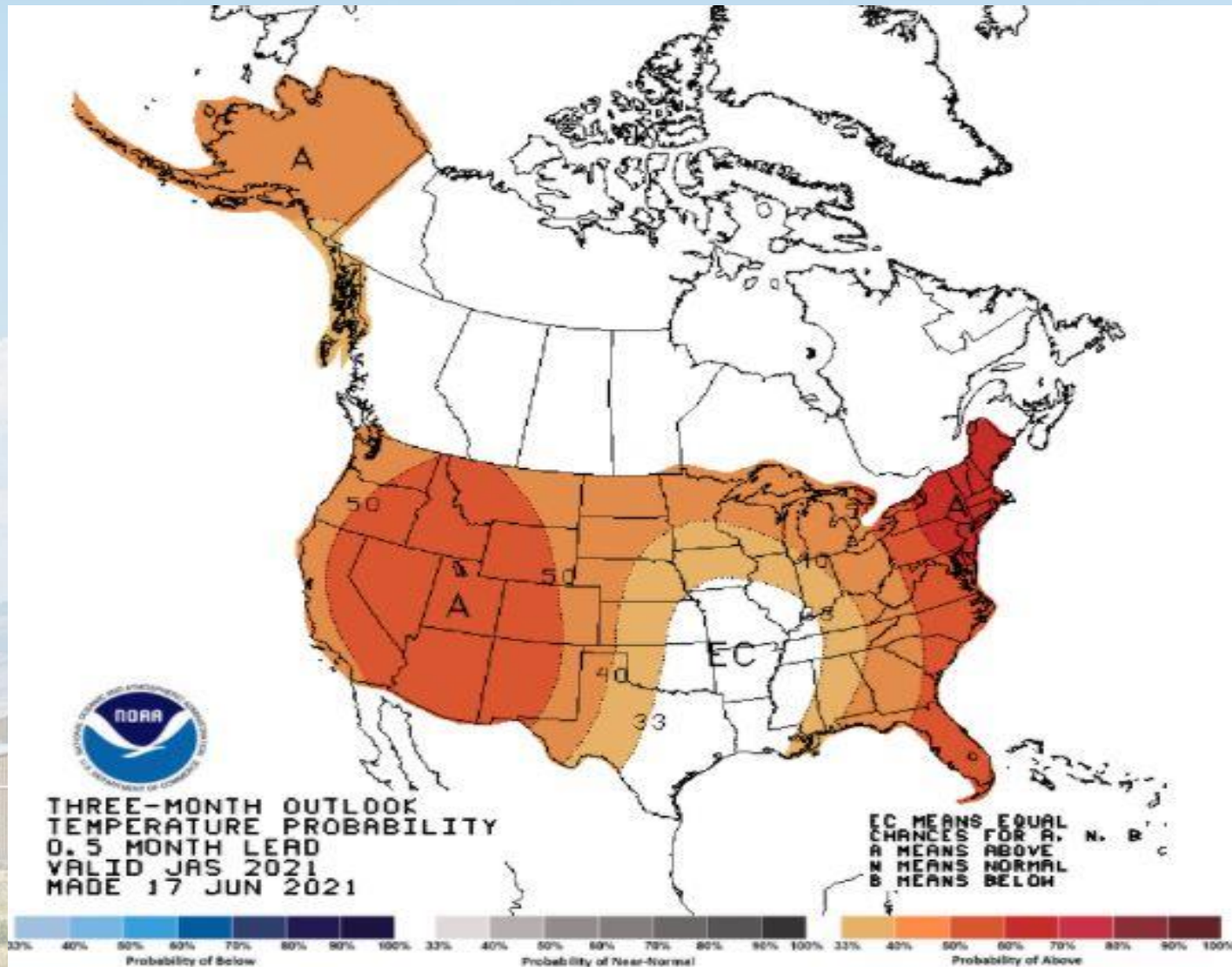
Deborah Bathke
National Drought Mitigation Center



droughtmonitor.unl.edu

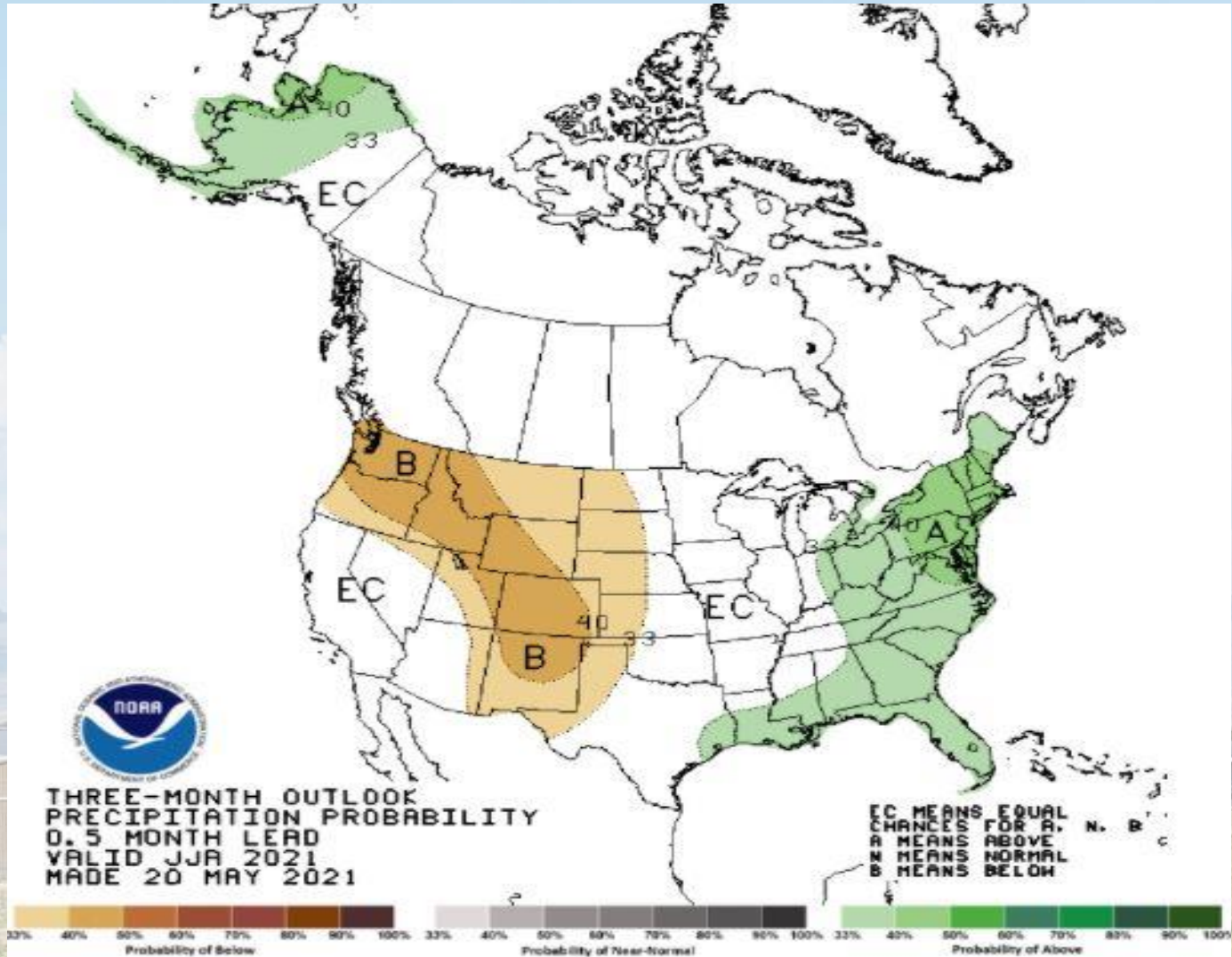
As of June 29th, all of the forecast area was still in a category of drought with no neutral or “none” drought intensity areas. The Cascades, John Day Highlands and the Columbia Basin had the greatest drought index values of mostly “D3” - “D4” (Extreme Drought). The rest of the forecast area had a drought indexes from “D0” – “D3”, or “Abnormally Dry” to “Severe Drought”.

USA Three Month Temperature Outlook



The temperature outlook for the next 3 months (July - September) is for a greater chance of above normal temperatures over the Pacific Northwest.

USA Three Month Precipitation Outlook

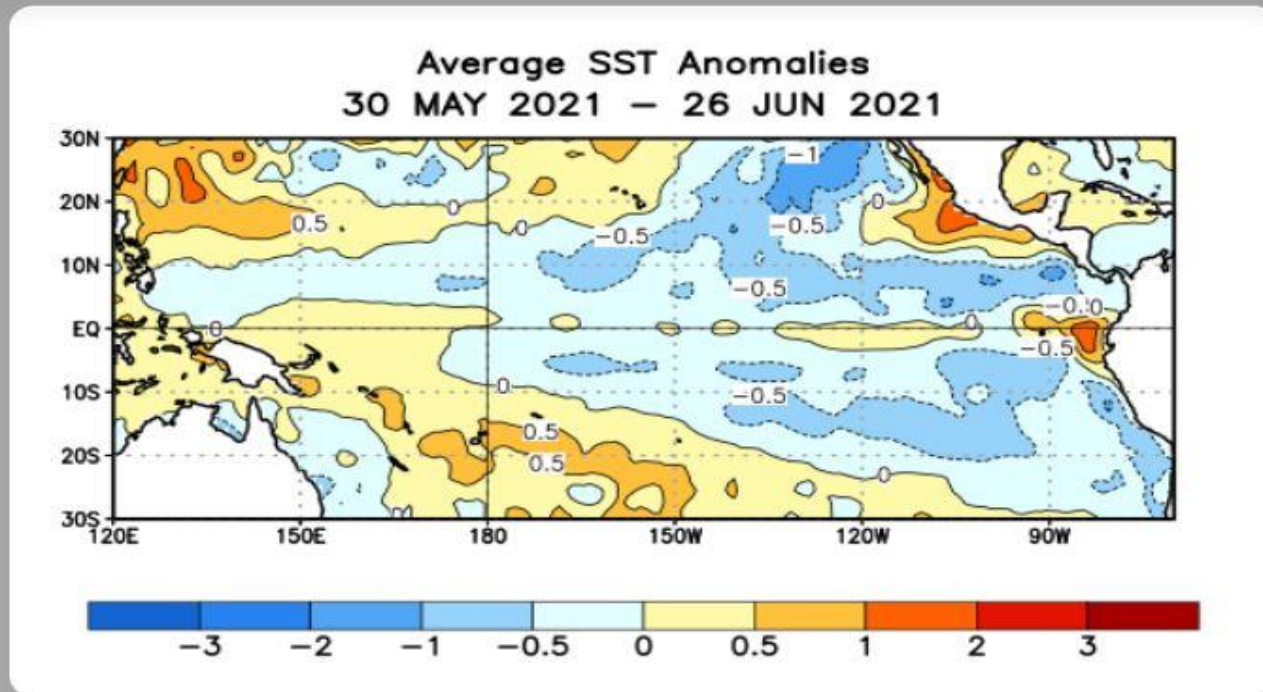


The forecast area is expected to have a greater chance of below normal precipitation for the next three months (July – September) over the Pacific Northwest.

Sea Surface Temperature (SST) Anomalies for June 2021

SST Departures ($^{\circ}\text{C}$) in the Tropical Pacific During the Last Four Weeks

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



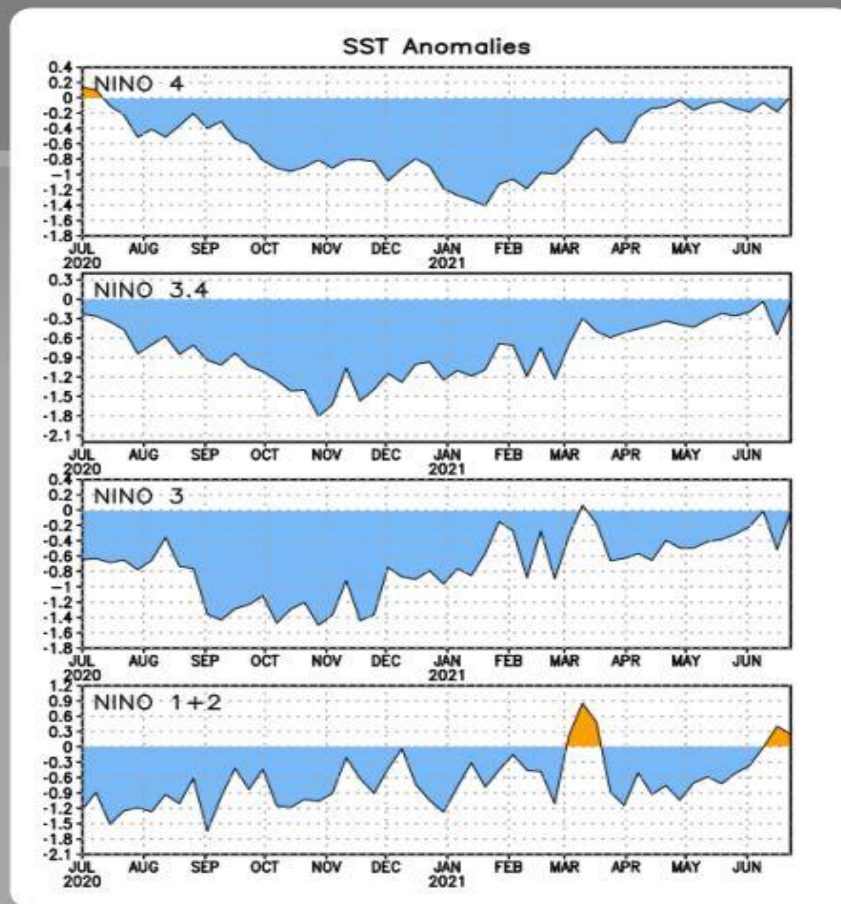
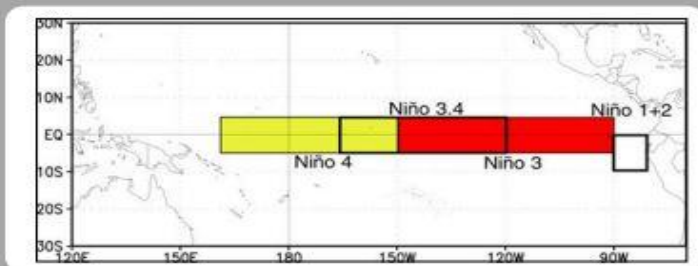
SSTs were mostly near to below average from May 30th - June 26th over most of the eastern tropical Pacific. However, there were areas of warmer than average SST anomalies along, or near the central and south American coasts. These averaged out to overall near neutral anomalies of Sea Surface Temperatures, which marked the end of the recent La Nina Event.

El Nino/La Nina Regions, Showing SST Anomalies for Each Nino Region

Niño Region SST Departures (°C) Recent Evolution

The latest weekly SST departures are:

Niño 4	0.0°C
Niño 3.4	0.0°C
Niño 3	0.0°C
Niño 1+2	0.2°C



All Niño Regions, except for Niño Region “1 + 2” were still showing below normal SST’s during this past month. Niño Region “1 + 2” showed warmer than normal SST’s in June. This continued trend of warming SST’s resulted in near neutral ENSO conditions, which is another indicator of the end of the recent La Nina event from this past winter and spring.

Current ENSO (El Nino Southern Oscillation) Alert System Status

Summary

ENSO Alert System Status: Not Active

ENSO-neutral conditions are present.*

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

ENSO-neutral is favored through the Northern Hemisphere summer (78% chance for the June-August season) and fall (50% chance for the September-November season).*

The current ENSO status is now: “**Not Active**”, since the ENSO conditions are now ENSO-neutral. ENSO-neutral conditions are favored through the northern hemisphere summer (about a 78% chance), and then decreasing to 50% during the autumn period of September – November.



Thank You!