

The Month In Review

September 2021

National Weather Service
Pendleton, Oregon

Photo: Despite extreme drought conditions, the crest of the Blue Mountains were still green.

September 2021, Climate Summary

The month of September was significantly cooler and wetter than June, July or August. Weather system began to move across the region as the upper jet stream sagged southward over the forecast area, allowing more Pacific weather systems to cross over the Pacific Northwest, including the Pendleton Forecast Area. Rainfall amounts were significantly higher, with most stations reporting 0.40 inches or greater across the forecast area. In contrast, June-August reported much less, except for a few spots where intense rainfall was associated with thunderstorm cores moving over those areas. The month was quite benign weather wise, except for a few light rain events, and a non-thunderstorm wind gust event on the 18th of the month. The first half of the month saw warmer and drier conditions, but then the latter half became quite wetter and cooler. The rain events allowed national forests to re-open public use areas such as campgrounds and picnic areas. The highest temperatures reported were mostly at or above 90 degrees, except for Meacham, the Mt Adams Ranger station, and Ellensburg, WA, which both had maximum highs below 90 degrees. Below are some photos of the month.



Cooler temperatures and some needed precipitation enabled forest agencies to lift burn bans in some areas.



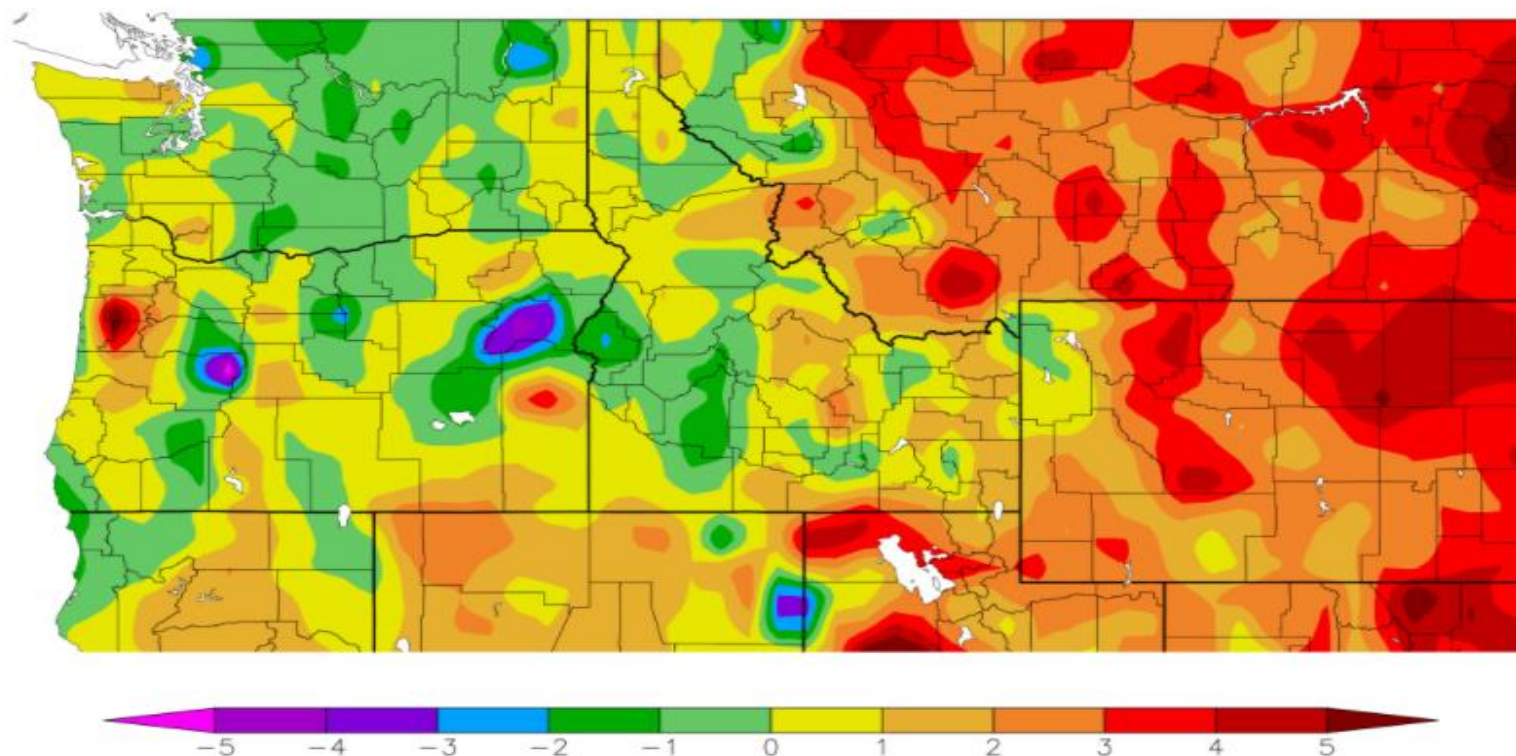
High thin cirrus at sunrise over northeast Oregon.



Deer forages on available green plants in the northern Blue Mountains.

September 2021, Departure from Normal of Average Temperatures

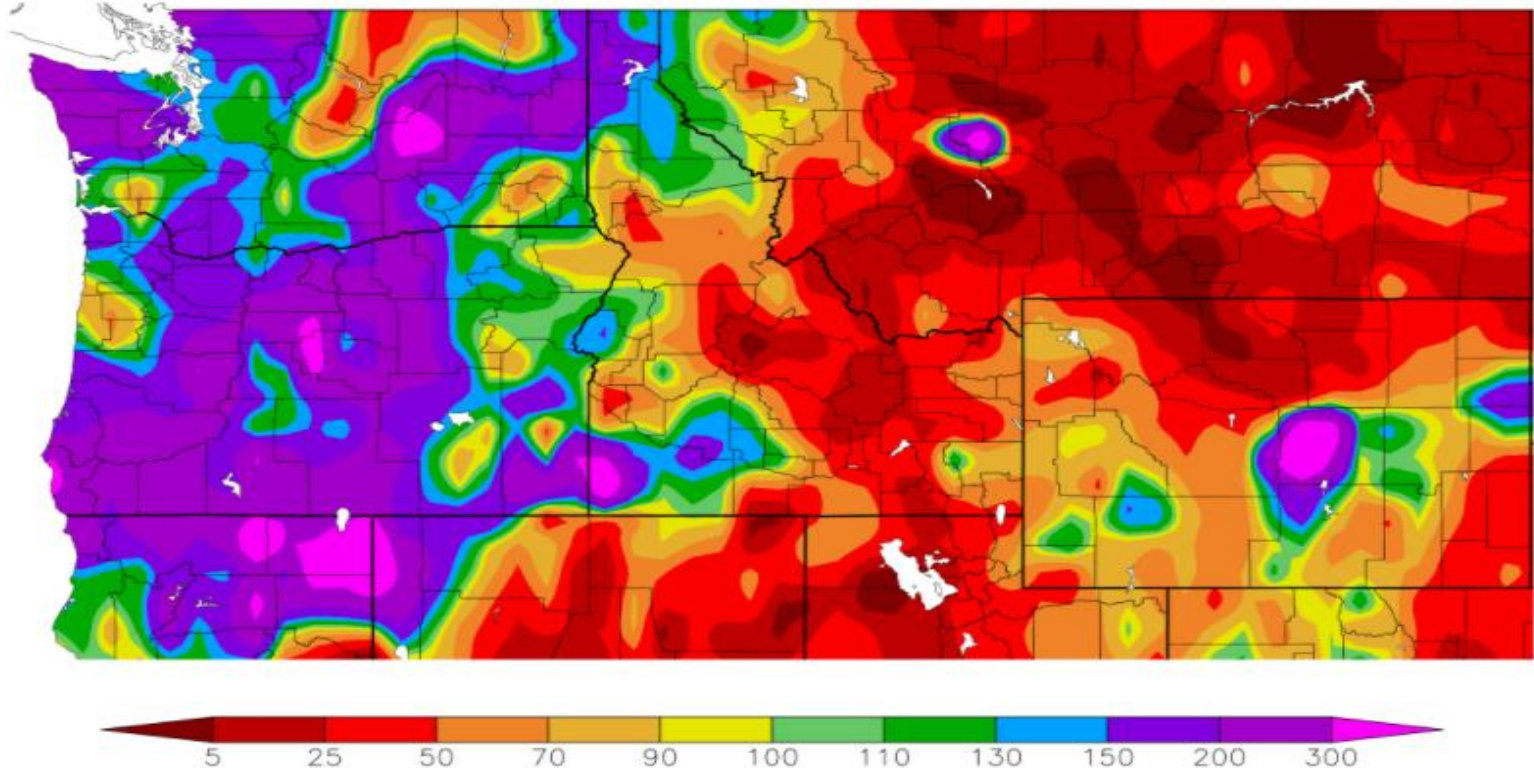
Departure from Normal Temperature (F)
9/1/2021 – 9/30/2021



Temperatures overall were close to normal for the month, with the warmest areas being along the Blue Mountains, the Blue Mountains Foothills, and in central OR. The coolest areas were over north central OR, a portion of east-southeast Grant County, and most of the WA zones of the County Warning Area (CWA).

September 2021, Percent of Normal of Precipitation

Percent of Normal Precipitation (%)
9/1/2021 – 9/30/2021



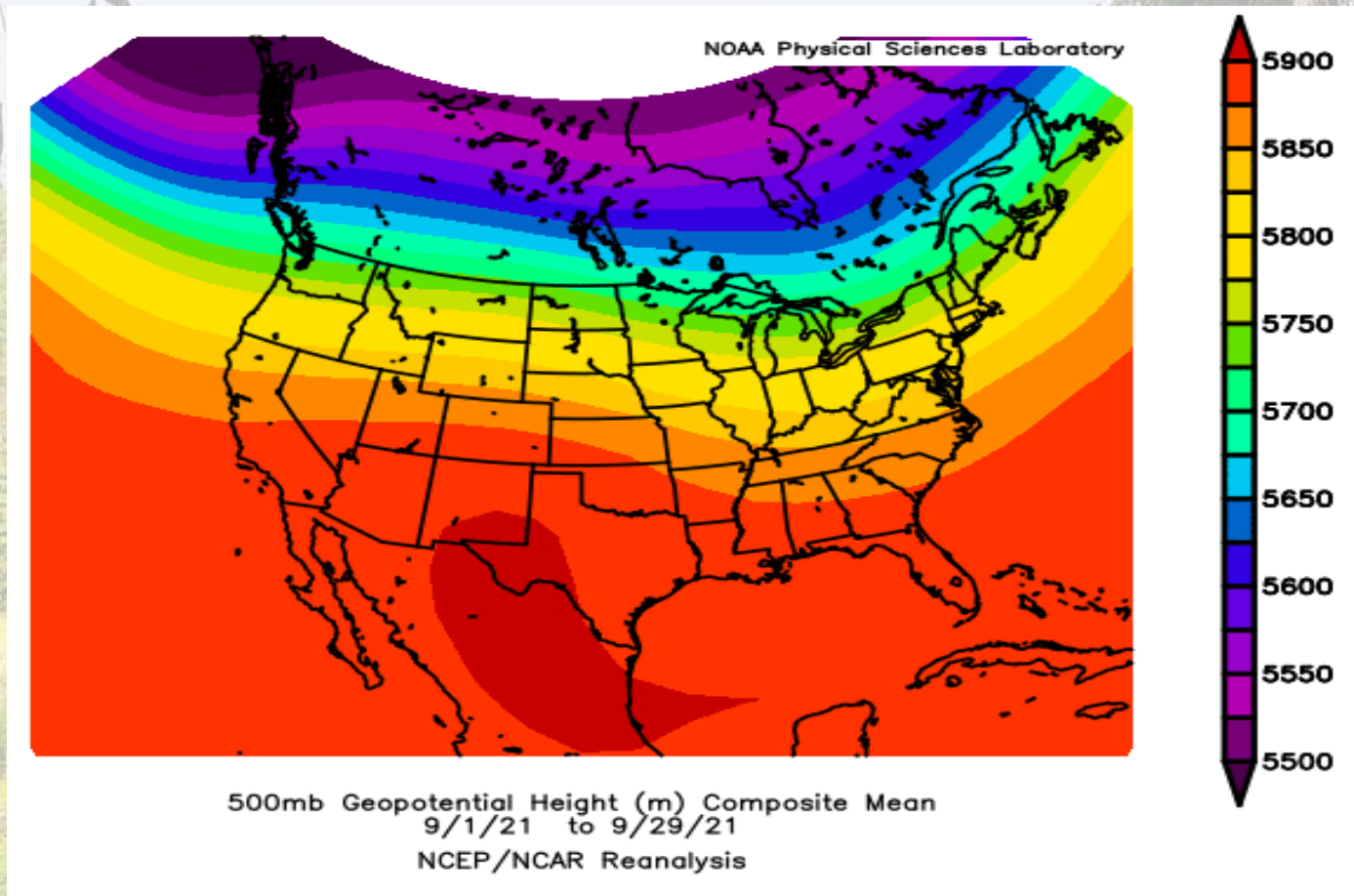
There is a stark contrast on the percent of normal precipitation over western areas of the CWA to previous months, due to a few Pacific storms that brought significant rains. The driest areas were over northeast Oregon and southeast Washington, due to most of the moisture being wrung out over the Cascades and adjacent valleys along the Cascade east slopes, of which the colors indicate.

September 2021, 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	78.0	0.0	45.3	1.8	61.7	0.9	0.43	0.07
Kennewick	80.4	0.5	54.0	1.7	67.2	1.1	0.41	0.11
Walla Walla	77.4	-0.5	53.4	0.8	65.4	0.2	0.76	0.01
The Dalles	81.7	1.6	53.6	2.0	67.6	1.8	0.60	0.13
Redmond	79.4	3.2	40.1	1.9	59.8	2.6	1.02	0.61
Pendleton Airport	78.5	1.1	48.8	-0.6	63.7	0.3	0.63	0.06
La Grande Airport	77.3	1.1	41.7	-2.0	59.5	-0.5	0.84	0.17
John Day	81.1	2.3	48.4	7.7	64.8	5.0	0.84	0.21

The table above shows that most of the means of the averages of temperatures were above normal, but only by a couple degrees. There was one station that had a below average mean of high temperatures, two stations of the mean average minimum temperatures, and one station of the mean average of the average temperatures. All of the precipitation amounts were wetter than normal for each of these stations. The wetter than normal precipitation was again caused by several rain events that occurred mostly during the second half of the month.

September 2021, Average 500 MB Pattern

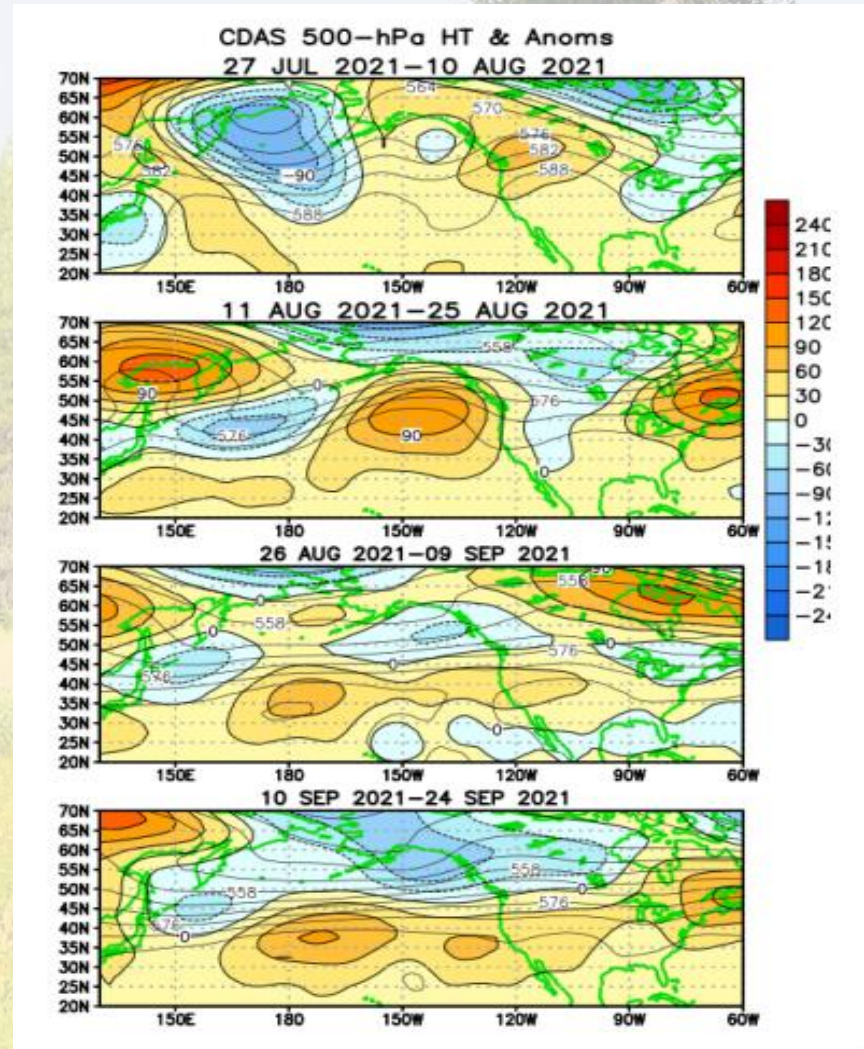


The average 500 MB pattern for September was mostly a zonal to a slight southwest flow over the Pacific Northwest. The tight 500 Mb gradient over the Pacific Northwest shows that the upper jet stream has sagged southward, allowing more frequent Pacific weather system to move across the CWA. Notice the widespread cold air across all of central Canada.

Two Month, Bi-weekly 500 MB Plots for August and September 2021

These are more detailed semi-monthly average 500 mb pattern plots, which was from the following period: 27th July 2021 through 24th Sep 2021.

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.



The top image shows an upper ridge over the western USA, while the second image shows that the ridge has shifted westward. Then the bottom two images show that there was a zonal flow over the Pacific Northwest. This corresponds well to the warm August due to the upper ridge, but then cooling with more Pacific Weather Systems took place in September in the westerly flow.

Significant Weather Events for September 2021

Significant Weather Events				
Event	Date	Report	Where	Source
Non TS Wind Gust	September 18, 2021	E 52.00 mph @ 3:27 AM	Pendleton, OR	ASOS
Non TS Wind Gust	September 18, 2021	E 52.00 mph @ 4:27 AM	Pendleton, OR	ASOS

There were only two significant weather events in September, which both happened at the same location (Pendleton, OR), on the same day, but at different times.

Record Weather Event Reports for September 2021

Record Weather Reports					
Event	Date	Where	Previous Record	New Record	Records Began
Rainfall	September 11, 2021	Redmond, OR	0.42 / 1997	0.62 inches	1941

There was only one record event reported in September, which was a high rainfall amount on the 11th of the month in Redmond, OR.

September 2021, Observed Monthly Max & Min Temperatures

Location	Highest Maximum	Lowest Minimum
Pendleton, OR	90	38
Redmond, OR	93	27
Pasco, WA	96	39
Yakima, WA	92	37
Walla Walla, WA	89	45
Bend, OR	90	33
Ellensburg, WA	89	38
Hermiston, OR	95	37
John Day, OR	95	37
La Grande, OR	90	32
The Dalles, OR	94	45
Meacham, OR	87	27
MT Adams RS, WA	87	32

Every station listed here, except for two high elevation stations of Meacham, OR and the Mt. Adams Ranger station, and then also Ellensburg, WA, had a highest maximum temperature of 90 or above. The other three had a highest maximums in the 80s. These are typical and close to normal for September. The lows were cool and mostly in the 30s and 40s, except for Meacham, OR and Redmond, OR which had a lowest reading in the 20s.

September 2021, Observed Total Precipitation and Total Snowfall/Hail

Location	Total Precipitation (inches)	Total Snow/Hail (inches)
Pendleton, OR	0.63	0.0
Redmond, OR	1.02	M
Pasco, WA	0.41	M
Yakima, WA	0.43	M
Walla Walla, WA	0.76	0.0
Bend, OR	0.25	M
Ellensburg, WA	0.35	M
Hermiston, OR	0.74	M
John Day, OR	0.84	M
La Grande, OR	0.84	M
The Dalles, OR	0.60	M
Meacham, OR	2.13	M
MT Adams RS, WA	2.42	0.0

Precipitation amounts were significantly higher than the previous 6 months. The highest amounts were in the Cascades, central OR, and over the Blue Mountains. There were no reports of snow or hail at any stations during the month. Most of the snow/hail reports were missing.

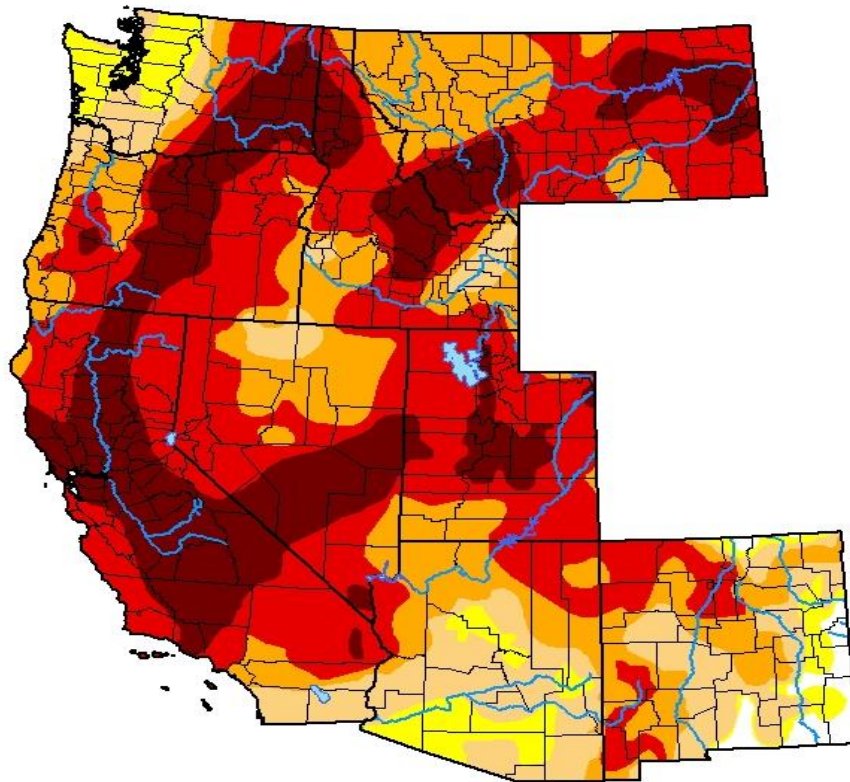
September 2021 - Drought Monitor

U.S. Drought Monitor West

September 28, 2021

(Released Thursday, Sep. 30, 2021)

Valid 8 a.m. EDT



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	1.32	98.68	93.35	81.07	58.72	21.77
Last Week <i>09-21-2021</i>	1.34	98.66	94.09	80.82	58.64	21.62
3 Months Ago <i>06-29-2021</i>	1.82	98.18	93.16	81.88	59.56	26.54
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>09-29-2020</i>	9.96	90.04	73.14	51.29	32.19	2.50

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:

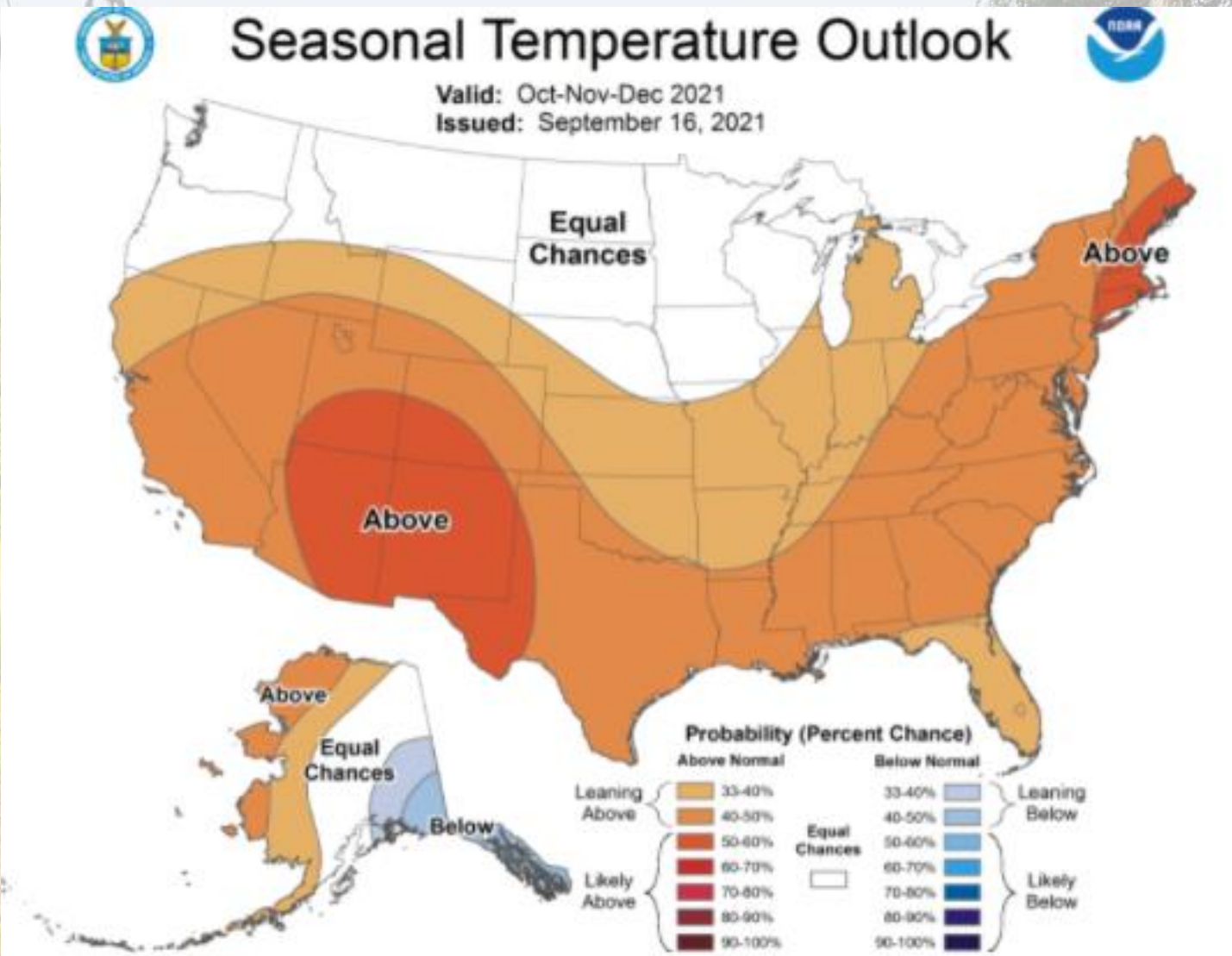
Brian Fuchs
National Drought Mitigation Center



droughtmonitor.unl.edu

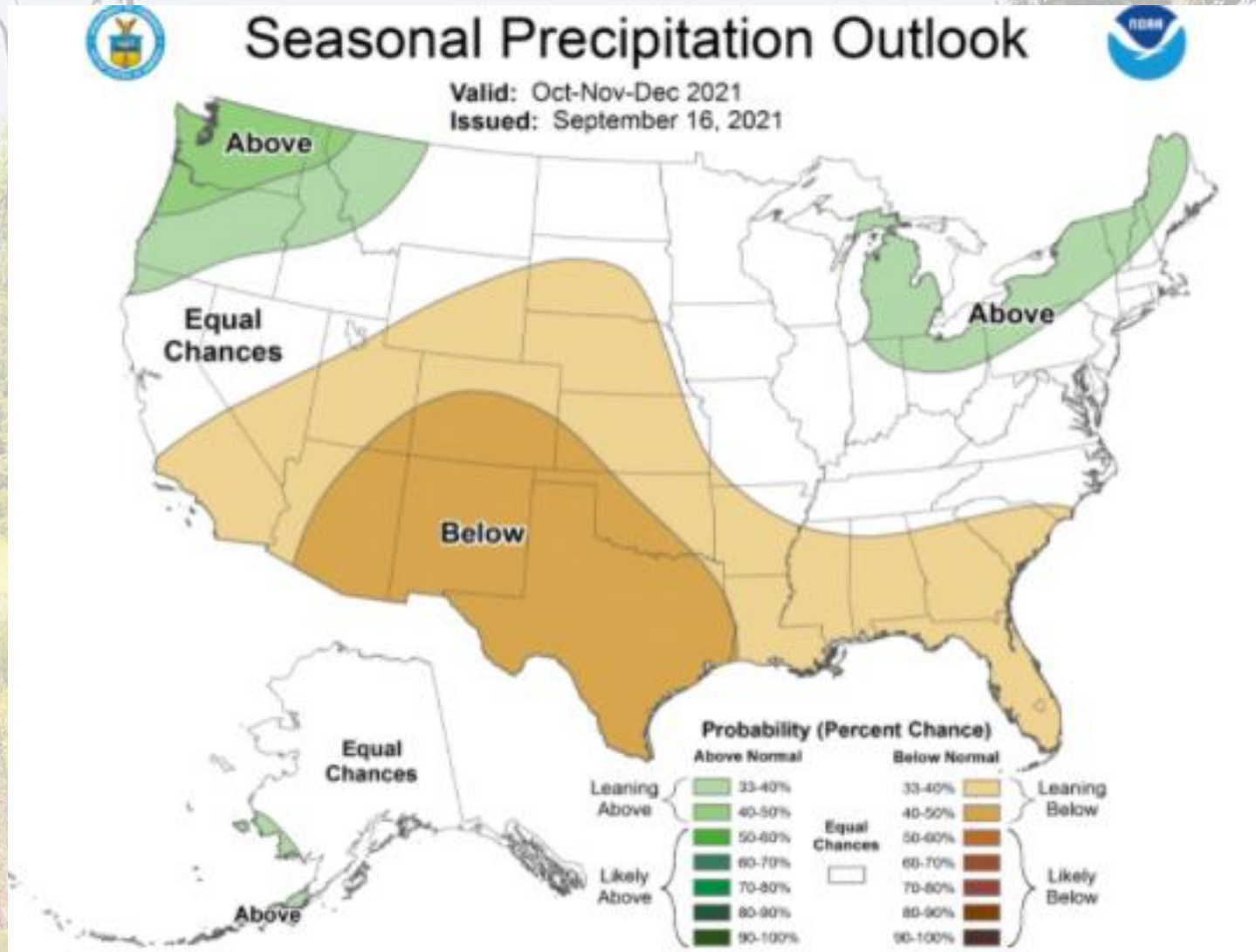
Despite the heavy rains in the Cascades and areas adjacent to the east of the Cascades, there is still an Exceptional Drought in those areas. This just goes to show that the drought has been so long and severe that it will take many more weather systems to bring drought conditions back down to low drought conditions such as classifications of “None” or “D0”.

USA Three Month Temperature Outlook



The temperature outlook for the next 3 months (October- December) is for an equal chance of normal temperatures, except in southeast OR, which just clips the southeast corner of the CWA.

USA Three Month Precipitation Outlook

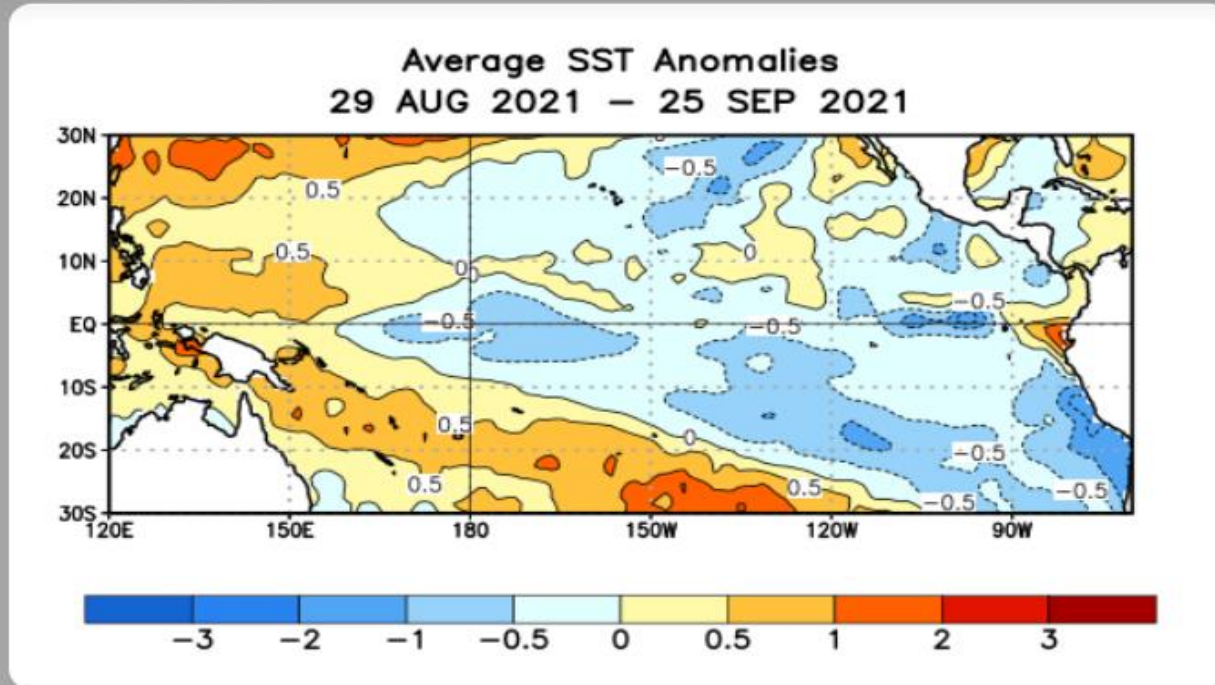


A greater chance of above normal precipitation (especially in northwest areas) are expected during the next three months (October - December).

Sea Surface Temperature (SST) Anomalies for August 2021

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

In the last four weeks, equatorial SSTs were near-to-below average across most of the equatorial Pacific Ocean, and were above average in the western and far eastern Pacific Ocean.



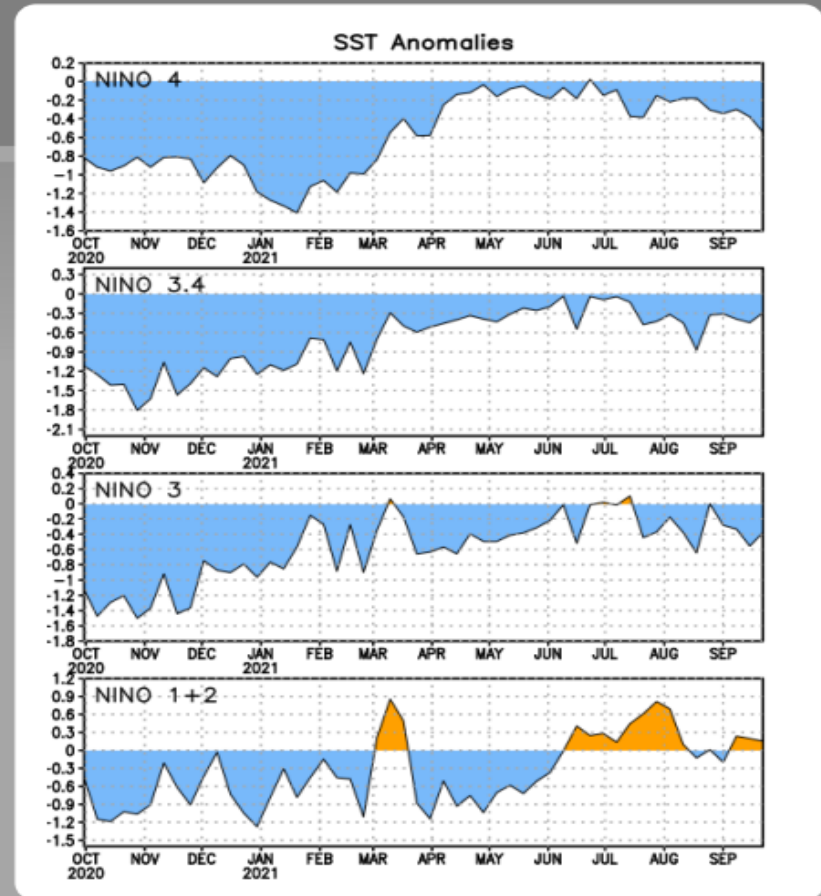
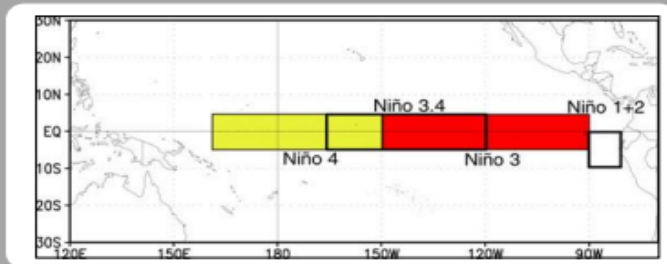
SSTs were near to below average across most of the equatorial Pacific, except above average along portions of the coasts of central and south America. However, overall, the tropical Pacific was cooler than last month, which indicates the coming of another La Nina event this by the winter of 2021-2022.

ENSO NINO Regions SST Anomalies for Each Nino Region

Niño Region SST Departures (°C) Recent Evolution

The latest weekly SST departures are:

Niño 4	-0.5°C
Niño 3.4	-0.3°C
Niño 3	-0.4°C
Niño 1+2	0.2°C



All Niño Regions, continued to show increasingly cooler SST anomalies. Niño Region 1 + 2, which is in the eastern most tropical Pacific, still had some above normal anomalies, but as mentioned, SST's there are cooling too. These increasingly cooler SST anomalies is another indication that another La Nina event is coming by the winter of 2021-2022.

Current ENSO (El Nino Southern Oscillation) Alert System Status

Summary

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

ENSO-neutral conditions are present.*

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

A transition from ENSO-neutral to La Niña is favored in the next couple of months, with a 70-80% chance of La Niña during the Northern Hemisphere winter 2021-22.*

The current ENSO Alert System Status is again: **“La Nina Watch”**. ENSO conditions are currently still ENSO-neutral, and are favored to transition from ENSO-neutral to La Nina conditions. There is about a 70-80 percent chance of La Nina conditions developing in the Northern Hemisphere by the winter of 2021-2022.



Thank You!