



The Month In Review

December 2020

National Weather Service
Pendleton, Oregon

Photo: Deep snow cover in the Blue Mountains, OR

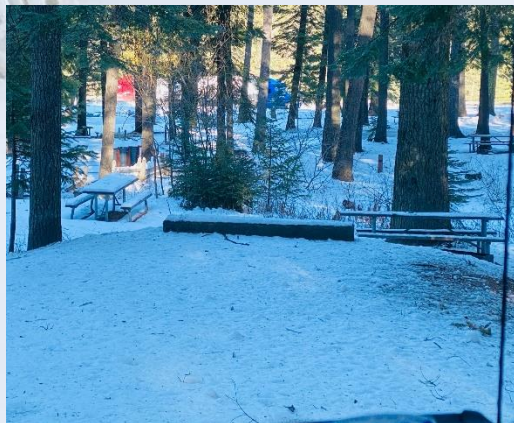
December 2020, Climate Summary

December can be characterized as a month of **greater than normal temperatures** and mostly below normal **precipitation**. There were several events during the month, which brought moderate to heavy amounts of snow, and a high wind event on the 21st. The snow events occurred mostly late in the month, near the Christmas holiday, and a mid month heavy snow event which occurred on the 12th. These heavy snow events affected mainly the higher elevations of the Cascades and the Blue Mountains.

There were only 3 record events reported, which were all record maximum temperatures. These occurred on the 19th and the 21st. The stations which reported these record highs were at The Dalles, OR with a tied record high of 56 degrees on the 19th, and Walla Walla, WA & Redmond, OR, with record highs of 65 and 60 degrees respectively. Below are some images of the typical conditions during the month.



A foggy sight on the freeway in the mountains of northeast Oregon.



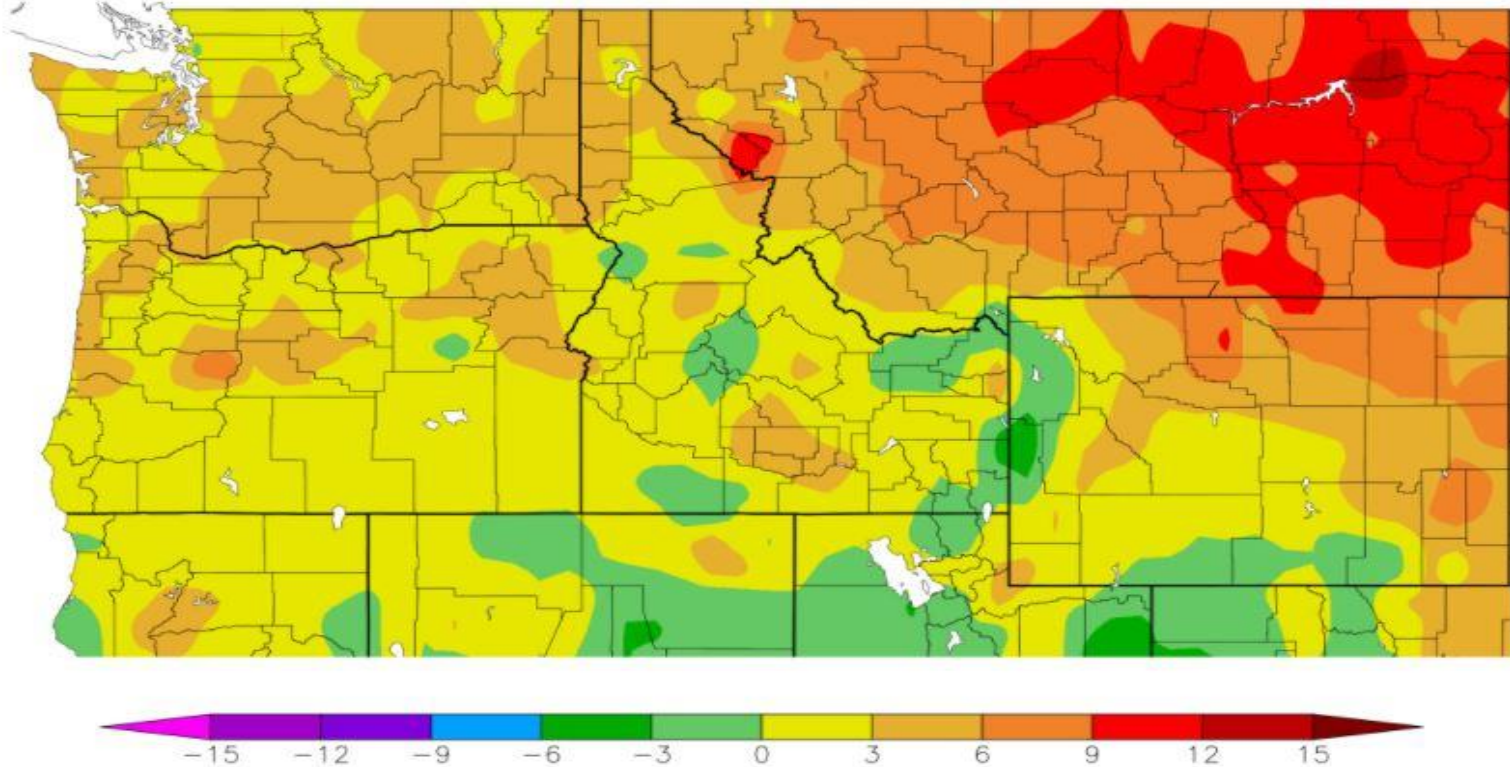
Snow covered camp site at Emigrant Springs State Park.



Camping on Christmas Day in the Blue Mountains.

December 2020, Departure from Normal Average Temperatures

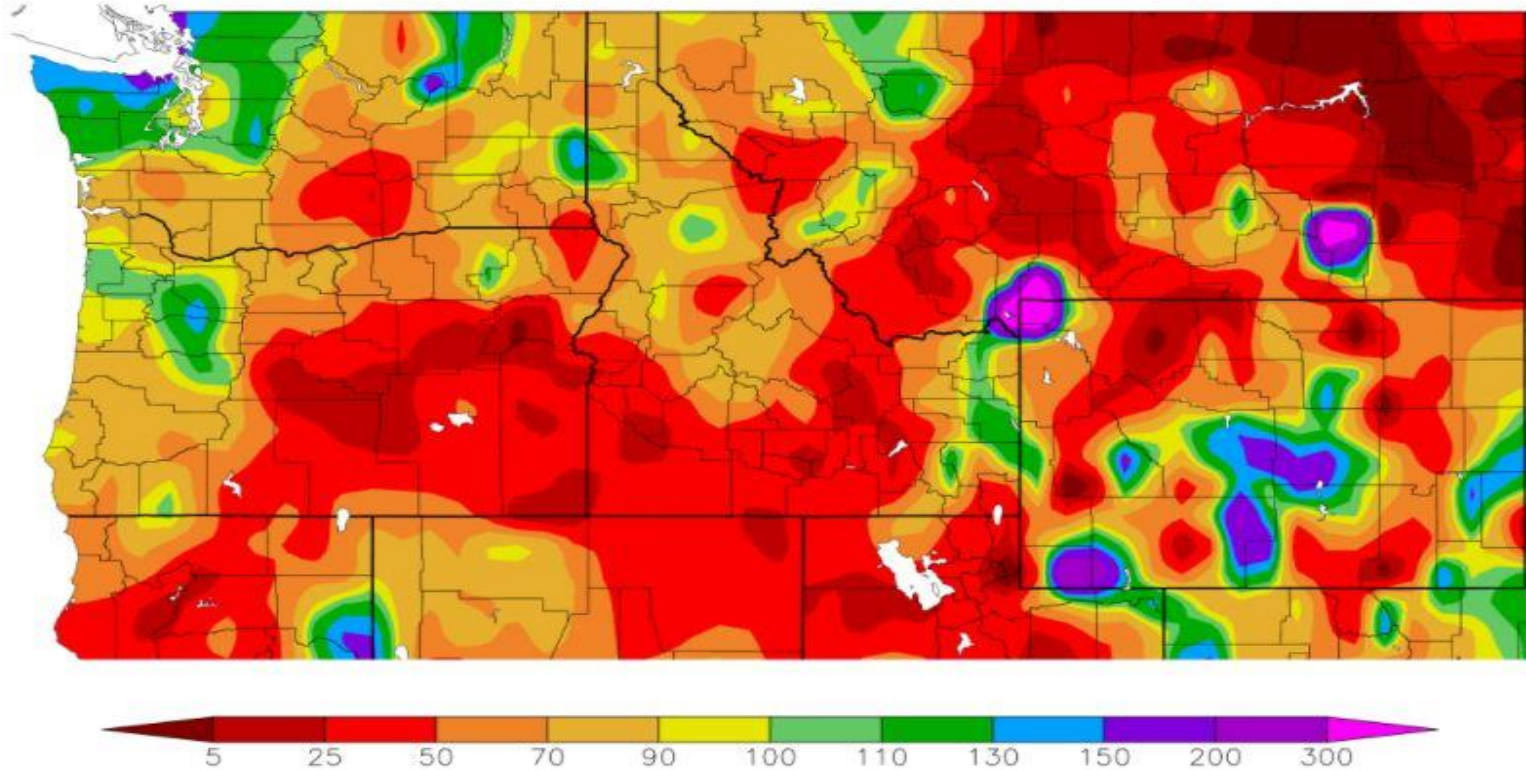
Departure from Normal Temperature (F)
12/1/2020 – 12/31/2020



Nearly all of Oregon and Washington had above normal temperatures, with departures from normal ranging from +3 to +6 degrees F. The exception is a very small portion of southern Grant County, Oregon, which had a departure from normal of 0 to -3 degrees F.

December 2020, Percent of Normal Precipitation

Percent of Normal Precipitation (%)
12/1/2020 – 12/31/2020



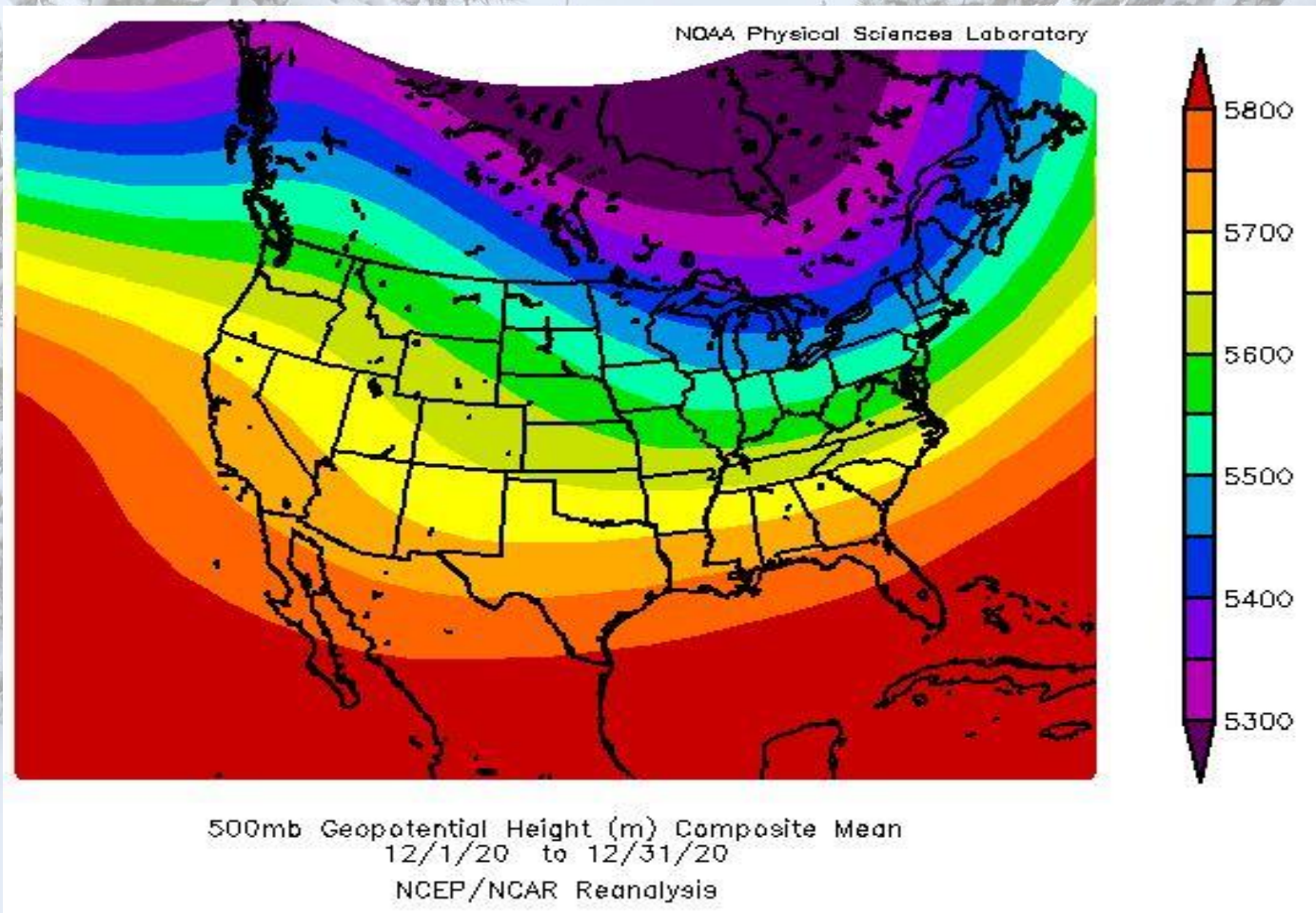
Just about all of the forecast area (northeast Oregon and southeast WA) had a percent of normal precipitation that was below normal, except for a small portion of the Northern Blue Mountains of Oregon. Departures ranged from 25 to 90 percent of normal.

December 2020, Departures from Normal Avg/Sums for Select Cites

	Max T	Max T D	Min T	Min T D	Ave T	Ave T D	PCPN	PCPN D	Snow	Snow D
Yakima	40.4	4.6	25.7	4.4	33.1	4.6	0.58	-0.95	M	M
Kennewick	43.1	3.2	31.5	2.7	37.3	3.0	1.17	0.04	M	M
Walla Walla	41.2	2.7	30.3	1.9	35.8	2.4	1.82	-0.65	M	M
The Dalles	43.6	3.3	32.5	2.3	38.1	2.9	1.66	-1.07	M	M
Redmond	46.8	6.3	25.5	4.8	36.2	5.6	0.37	-0.79	M	M
Pendleton Airport	43.1	3.6	29.5	2.5	36.3	3.1	1.01	-0.46	1.2	-4.8
La Grande	42.2	4.6	25.3	1.6	33.8	3.1	2.08	0.42	0.0	-3.1

All of the mean maximum, minimum, and mean average temperatures were above normal for the month. Precipitation totals were all below normal, except for Kennewick, WA and La Grande, OR, which were above normal by an amount of +0.04 and +0.42 inches respectively. Snowfall amounts were all missing, except for the Pendleton, OR Airport and La Grande, OR, of which both had below normal snowfall by an amount of -4.8 and -3.1 inches respectively.

December 2020, Average 500 MB Weather Pattern

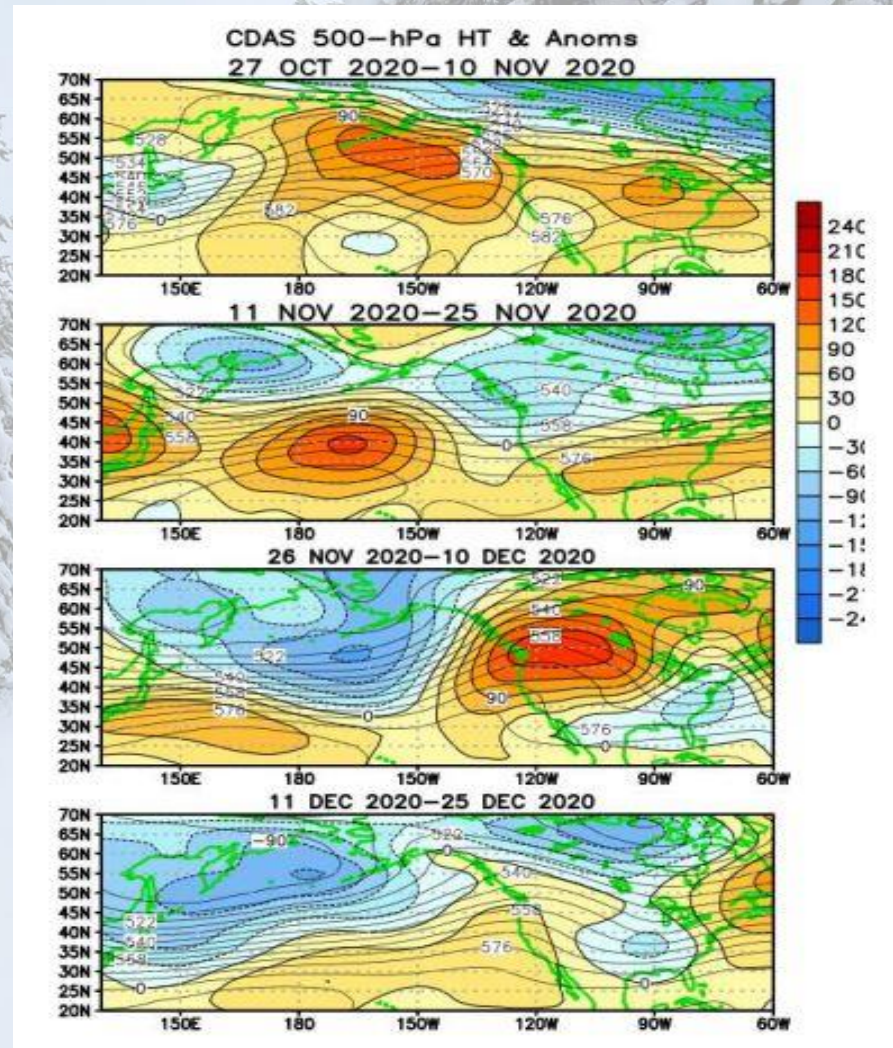


The average 500 MB pattern was an overall ridging pattern over the Pacific Northwest. This pattern is consistent with the above normal temperatures and below normal precipitation that was shown in previous slides.

More Detailed 500 MB Plots for November – December 2020

These are more detailed semi-monthly average 500 mb pattern plots, which were from the following periods: Oct 27th to December 25th.

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



A westerly zonal flow dominated the first two periods, from late October through late November. Then an upper ridge pattern developed over the western USA during the last two periods, from late November through late December. The upper ridge patterns in the latter two images are consistent with the above normal temperatures and below normal precipitation during December.

Significant Weather Events for December, 2020

Significant Weather Events				
Event	Date	Report	Where	Source
Heavy Snow	December 12, 2020	M 5.0 inches	3 S Heppner, OR	Public
Heavy Snow	December 12, 2020	E 5.0 inches	3 N Fossil, OR	Public
Heavy Snow	December 12, 2020	M 5.0 inches	4 SSW Heppner, OR	Trained Spotter
None TSTM Wind Gust	December 21, 2020	M 59 mph	3 NNE Walla Walla, WA	ASOS
None TSTM Wind Gust	December 21, 2020	M 65 mph	Pendleton, OR Airport	ASOS
Snow	December 25, 2020	M 2.0 inches	4 SW Kennewick, WA	Trained Spotter
Snow	December 25, 2020	M 3.5 inches	The Dalles, OR	Public
Snow	December 25, 2020	M 4.0 inches	5 SSW Chenoweth, OR	Trained Spotter
Snow	December 25, 2020	M 1.0 inches	1 NNW Hermiston, OR	Public
Snow	December 25, 2020	M 2.0 inches	Richland, WA	Public
Heavy Snow	December 26, 2020	M 10.0 inches	1 N Trout Lake, WA	Trained Spotter
Snow	December 26, 2020	M 7.1 inches	7 NE White Salmon, WA	CoCoRAHS
Snow	December 26, 2020	M 6.0 inches	1 WNW White Salmon, WA	CoCoRAHS
Snow	December 26, 2020	M 5.0 inches	4 ESE Mosier, OR	CoCoRAHS
Snow	December 26, 2020	M 4.5 inches	25 NNE Wallowa, OR	CoCoRAHS
Snow	December 26, 2020	M 4.5 inches	17 NW Roslyn, WA	CoCoRAHS
Snow	December 26, 2020	M 3.0 inches	7 SSW Richland, WA	CoCoRAHS
Snow	December 26, 2020	M 2.8 inches	Kennewick, WA	CoCoRAHS
Snow	December 26, 2020	M 2.5 inches	Prosser, WA	CoCoRAHS
Snow	December 26, 2020	M 2.4 inches	10 N Elgin, OR	CoCoRAHS
Snow	December 26, 2020	M 2.4 inches	1 WSW Umatilla, OR	CoCoRAHS
Snow	December 26, 2020	M 2.3 inches	1 WNW Yakima, WA	CoCoRAHS
Snow	December 26, 2020	M 2.3 inches	2 WSW Fruitville, WA	CoCoRAHS
Snow	December 26, 2020	M 2.2 inches	3 SSW Richland, WA	CoCoRAHS
Snow	December 26, 2020	M 2.1 inches	4 NW Selah, WA	CoCoRAHS
Snow	December 26, 2020	M 2.0 inches	2 SW Goldendale, WA	Co-Op
Snow	December 26, 2020	M 2.0 inches	4 WSW Pasco, WA	CoCoRAHS
Snow	December 26, 2020	M 2.0 inches	1 WSW Fruitville, WA	CoCoRAHS
Snow	December 26, 2020	M 2.0 inches	3 SE Lostine, OR	CoCoRAHS
Snow	December 26, 2020	M 2.0 inches	1 SW Richland, WA	CoCoRAHS
Snow	December 26, 2020	M 1.8 inches	2 NNE Granger, WA	CoCoRAHS
Snow	December 26, 2020	M 1.8 inches	3 SSW Wallowa, OR	CoCoRAHS
Snow	December 26, 2020	M 1.7 inches	1 NE Sunnyside, WA	CoCoRAHS
Snow	December 26, 2020	M 1.5 inches	8 WNW Roslyn, WA	CoCoRAHS
Snow	December 26, 2020	M 1.3 inches	9 NW Seneca, OR	CoCoRAHS
Snow	December 26, 2020	M 1.0 inches	2 NW Hermiston, OR	CoCoRAHS
Snow	December 26, 2020	M 1.0 inches	4 SSE Pendleton, OR	CoCoRAHS
Snow	December 26, 2020	M 1.0 inches	4 WNW Joseph, OR	CoCoRAHS
Snow	December 26, 2020	M 2.5 inches	4 W Roslyn, WA	Co-Op

Significant weather events are continued on the next slide

Significant Weather Events for December, 2020 (continued)

Significant Weather Events (continued)				
Event	Date	Report	Where	Source
Heavy Snow	December 26, 2020	M 12.0 inches	W Trout Lake, WA	Trained Spotter
Snow	December 26, 2020	E 4.0 inches	4 W Meacham, OR	NWS Employee
Heavy Snow	December 30, 2020	M 8.9 inches	2 SSE Snoqualmie Pass, WA	Co-Op
Heavy Snow	December 30, 3030	M 11.0 inches	6 NW Easton, WA	CoCoRAHS
Heavy Snow	December 31, 2020	M 12.0 inches	1 WSW Ski Blluewood, WA	Trained Spotter
Heavy Snow	December 31, 2020	M 14.0 inches	2 SSE Snoqualmie Pass, WA	Co-Op
Heavy Snow	December 31, 2020	M 14.0 inches	6 NW Easton, WA	CoCoRAHS
Heavy Snow	December 31, 2020	M 10.0 inches	Cle Elum, WA	Co-Op
Heavy Snow	December 31, 2020	M 11.0 inches	9 SW Ski Bluewood, WA	Meso-Net
Heavy Snow	December 31, 2020	E 14.0 inches	WNW Tollgate, OR	Trained Spotter

Most of the significant weather events for December were either snow or heavy snow events. There was also a high wind event, which produced high non-thunderstorm wind gusts on December 21st, of 59 and 65 mph at Walla Walla, WA and Pendleton, OR respectively.

Record Weather Reports for December, 2020

Record Weather Reports					
Event	Date	Where	Previous Record	New Record	Records Began
High Temp	December 21, 2020	Walla Walla, WA	63 / 2019	65	1930
High Temp	December 21, 2020	Redmond, OR	59 / 2019	60	1941
High Temp	December 29, 2020	The Dalles, OR	56 / 1953	56 Tied	1929

All of the record weather reports were record high temperatures on December 21st, and the 29th. The highest record was at Walla Walla, WA on December 21st, and the lowest record high was at The Dalles, OR on December 29th, which was a tie with the previous record high in 1953.

December 2020, Observed Monthly Max & Min Temperatures

Location	Highest Maximum Temperature	Lowest Minimum Temperature
Pendleton, OR	65	18
Redmond, OR	62	9
Pasco, WA	62	19
Yakima, WA	58	15
Walla Walla, WA	65	21
Bend, OR	63	15
Ellensburg, WA	52	16
Hermiston, OR	58	18
John Day, OR	58	10
La Grande, OR	55	17
The Dalles, OR	56	23
MT Adams RS, WA	49	17

Most of the stations in the list had a maximum monthly high temperature in the 50s to 60s, except for The Mt Adams Ranger Station, which had a highest maximum temperatures of 49 degrees. Most stations in the list has a monthly minimum temperature between 10 and 25 degrees, except for Redmond, OR with a lowest minimum of 9. These values are typical for December, and were near normal.

December 2020, Monthly Precipitation and Snowfall/Hail Totals

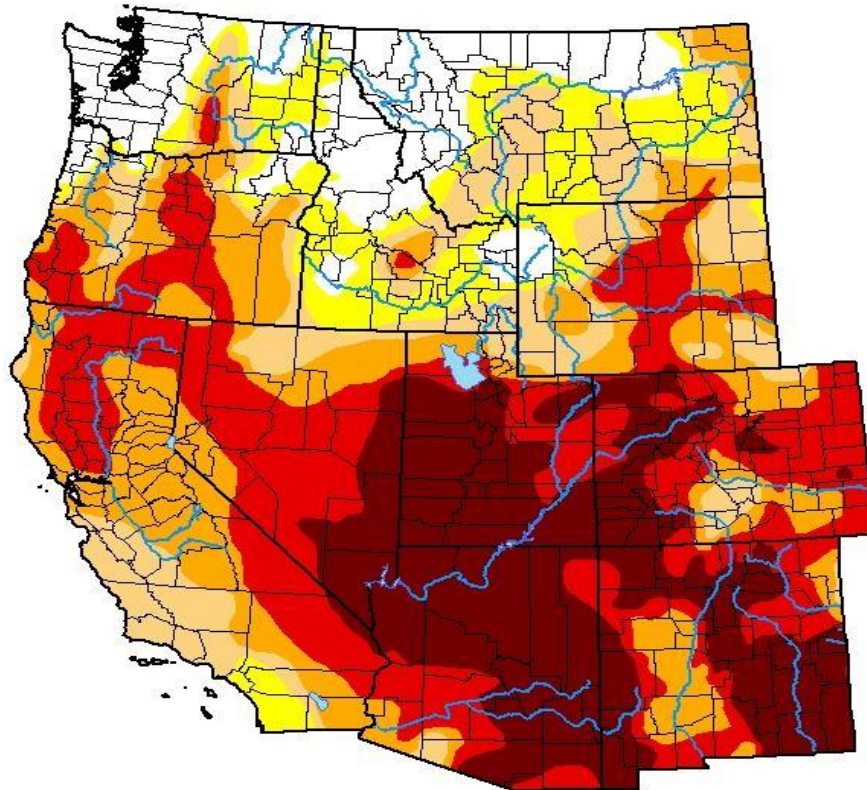
Location	Total Monthly Precip (inches)	Total Snowfall/Hail (inches)
Pendleton, OR	1.01	1.2
Redmond, OR	0.36	M
Pasco, WA	0.63	M
Yakima, WA	0.58	M
Walla Walla, WA	1.82	M
Bend, OR	0.74	M
Ellensburg, WA	0.88	M
Hermiston, OR	0.63	M
John Day, OR (RAWS)	0.21	M
La Grande, OR	2.08	0.0
The Dalles, OR	1.66	M
Mt Adams RS, WA	7.19	5.5

Precipitation amounts for the month were mostly below normal. However, a few early winter storms brought significant amounts of precipitation to mainly the Northern Blue Mountains and the Cascade east slopes. The greatest amount of precipitation was a whopping 7.19 inches at the Mt. Adams Ranger Station. The second highest was at La Grande, OR with 2.08 inches. The least amount of precipitation for the month was in Central OR, and the John Day Highlands, with Redmond, OR only reporting 0.36 inches, and La Grande, OR only reporting 0.21 inches. Snowfall was light at the only 3 stations which reported snowfall amounts, and they were below normal.

December 2020 - Drought Monitor

U.S. Drought Monitor West

December 29, 2020
(Released Thursday, Dec. 31, 2020)
Valid 7 a.m. EST



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	11.57	88.43	78.63	65.18	46.49	22.16
Last Week 12-22-2020	11.57	88.43	78.33	65.18	46.63	22.16
3 Months Ago 09-29-2020	8.51	91.49	76.07	54.55	33.11	2.31
Start of Calendar Year 12-31-2019	59.17	40.83	18.17	7.12	0.00	0.00
Start of Water Year 09-29-2020	8.51	91.49	76.07	54.55	33.11	2.31
One Year Ago 12-31-2019	59.17	40.83	18.17	7.12	0.00	0.00

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme 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:

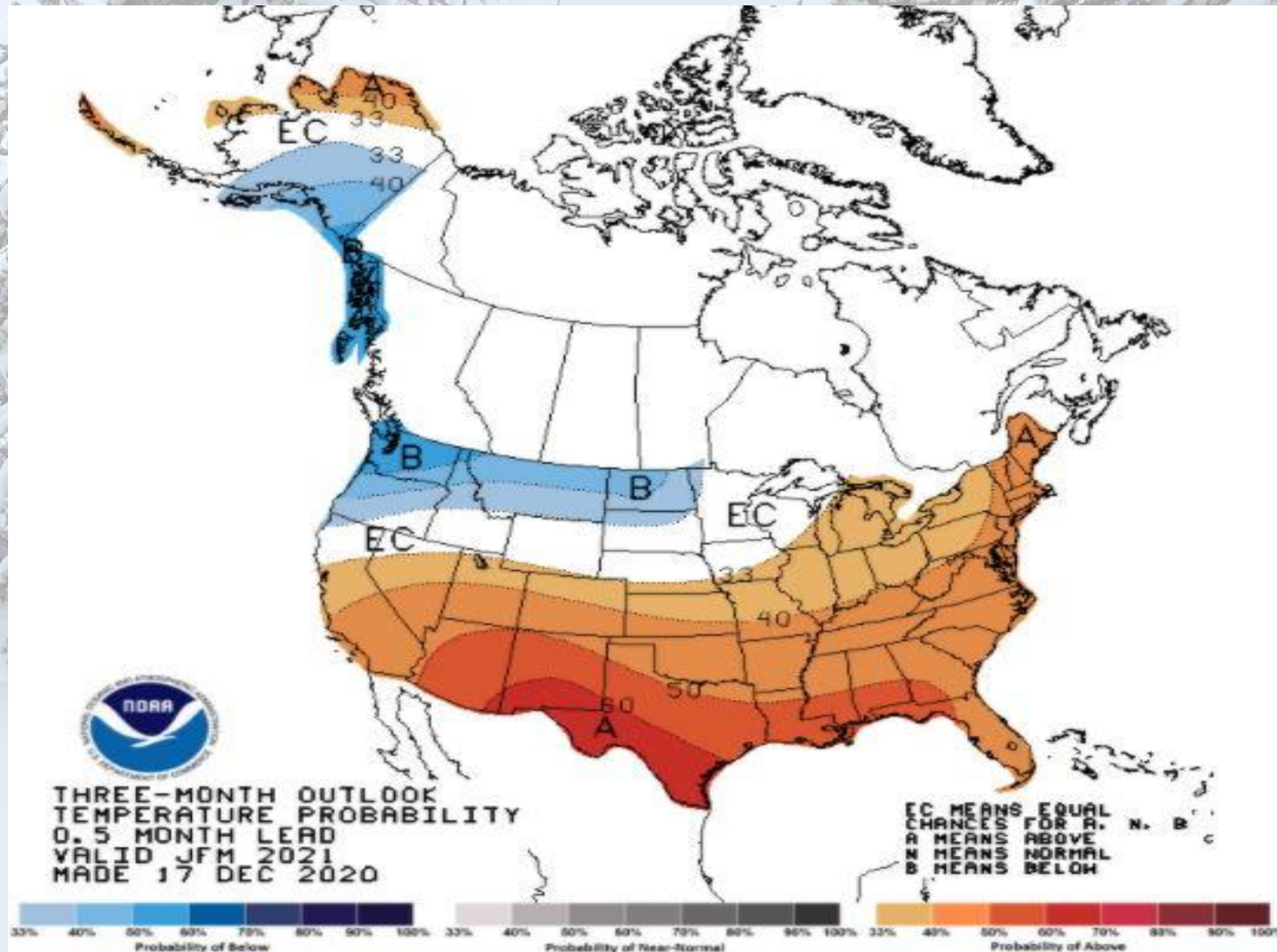
Adam Hartman
NOAA/NWS/NCEP/CPC



droughtmonitor.unl.edu

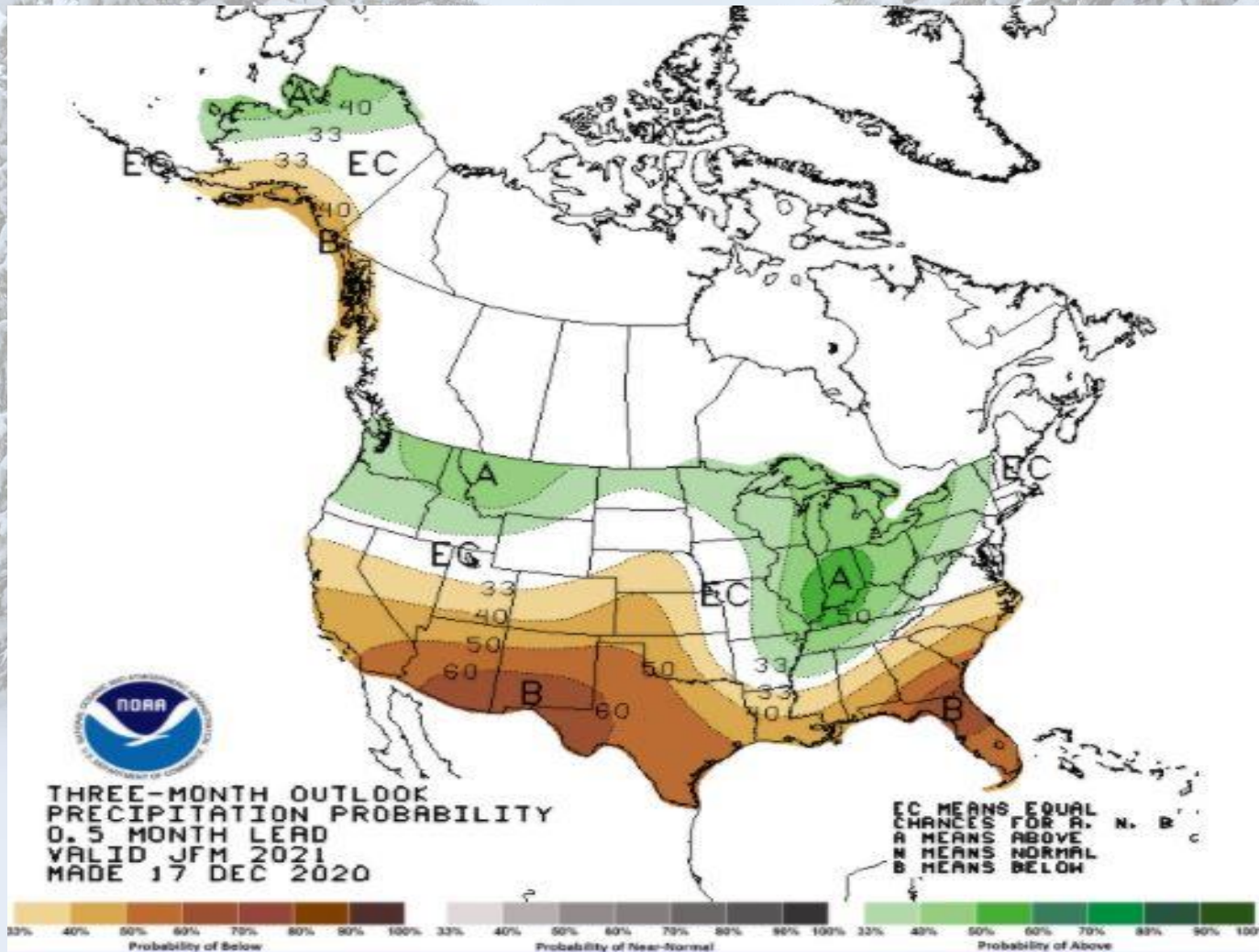
As of December 29th, there continued to be an “Extreme Drought” (D3) east of the OR Cascades and in north to south central Oregon. Also, “Extreme Drought” (D3) conditions existed over south central WA. Elsewhere, in northeast Oregon and extreme southeast Washington, “None” drought conditions existed. Elsewhere, D0 (“Abnormally dry”) to D2 (“Severe Drought”) conditions existed.

USA Three Month Temperature Outlook



The temperature outlook for the next 3 months (January – March, 2021) are near to below normal over northern and western Oregon and all of Washington, especially northwest WA.

USA Three Month Precipitation Outlook

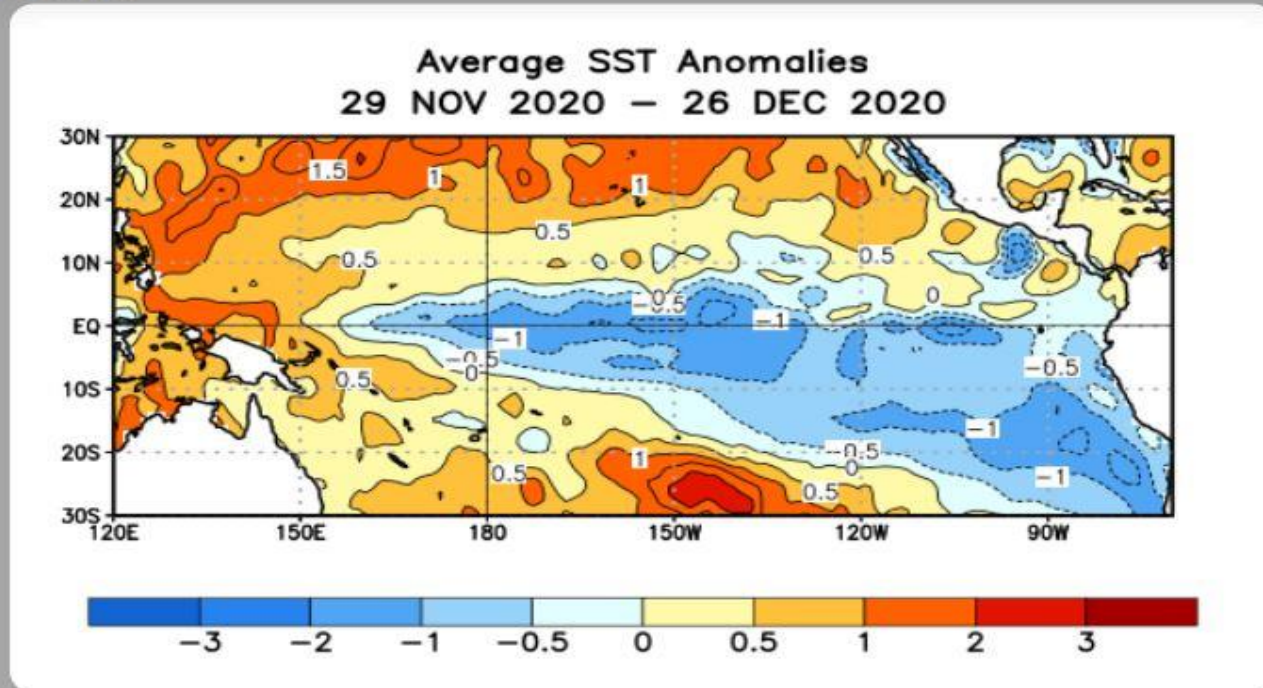


The precipitation outlook for the next 3 months (January – March, 2021) shows the Pacific Northwest having mostly a 33 – 50 percent greater chance of being above normal, with only extreme southern OR having equal chances of above or below normal precipitation.

Average Sea Surface Temperature (SST) Anomalies for December 2020

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

During the last four weeks, equatorial SSTs were below average from west of the Date Line to the eastern Pacific Ocean, and were above average in the far western Pacific Ocean.



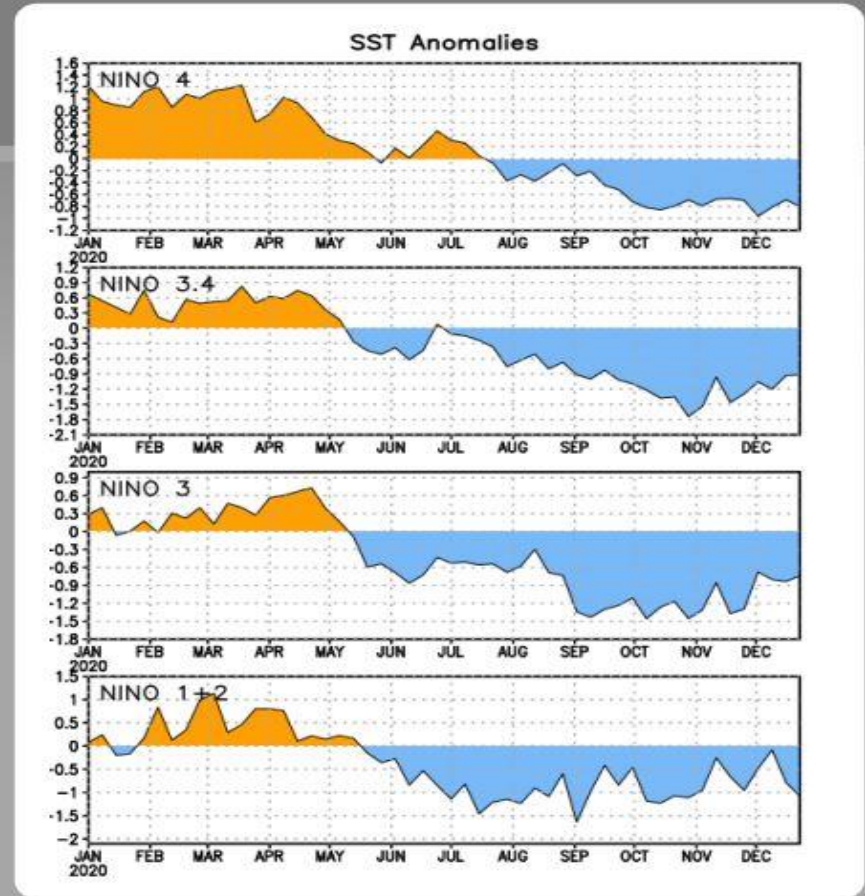
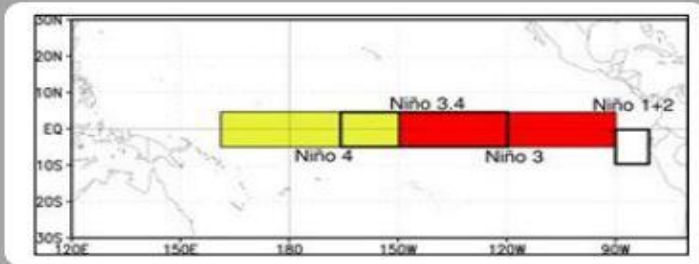
Sea Surface Temperatures (SST's) were again below average in December over the central and eastern tropical Pacific by -0.5 degrees to -2 degrees C. The last 4 - 5 months of below normal SST's are consistent with a La Nina event which is expected to continue this winter through March, 2021. La Nina conditions are expected to decrease in April through June.

El Niño/ La Niña Regions, Showing SST Anomalies for Each Niño Region

Niño Region SST Departures (°C) Recent Evolution

The latest weekly SST departures are:

Niño 4	-0.8°C
Niño 3.4	-0.9°C
Niño 3	-0.7°C
Niño 1+2	-1.1°C



All Niño Regions continued to show below normal SST's again during the past 5 to 7 months. These continued cooler than normal SST's in the eastern tropical Pacific, is consistent with an ongoing La Niña event which will continue through this winter into the spring of 2021. A La Niña Advisory has been in effect for the past several months, and will continue through the rest of this winter until early March of 2021.

Current ENSO (El Niño Southern Oscillation) Alert System Status

Summary

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

La Niña conditions are present.*

Equatorial sea surface temperatures (SSTs) are below average from the west-central to eastern Pacific Ocean.

The tropical atmospheric circulation is consistent with La Niña.

La Niña is likely to continue through the Northern Hemisphere winter 2020-21 (~95% chance during January-March), with a potential transition during the spring 2021 (~50% chance of Neutral during April-June).*

The current ENSO status is still: “**La Nina Advisory**”, which is in effect from now through the rest of this winter, until March, 2021. Then there is a potential for a transition to neutral ENSO conditions in the spring of 2021. The chances for a La Nina event is still about a 95 percent chance through March, 2021, and then about a 50 percent chance of returning to neutral ENSO conditions from April through June, 2021.



Thank You!