The Month In Review

December 2019

National Weather Service
Pendleton, Oregon

December, 2019 Climate Summary

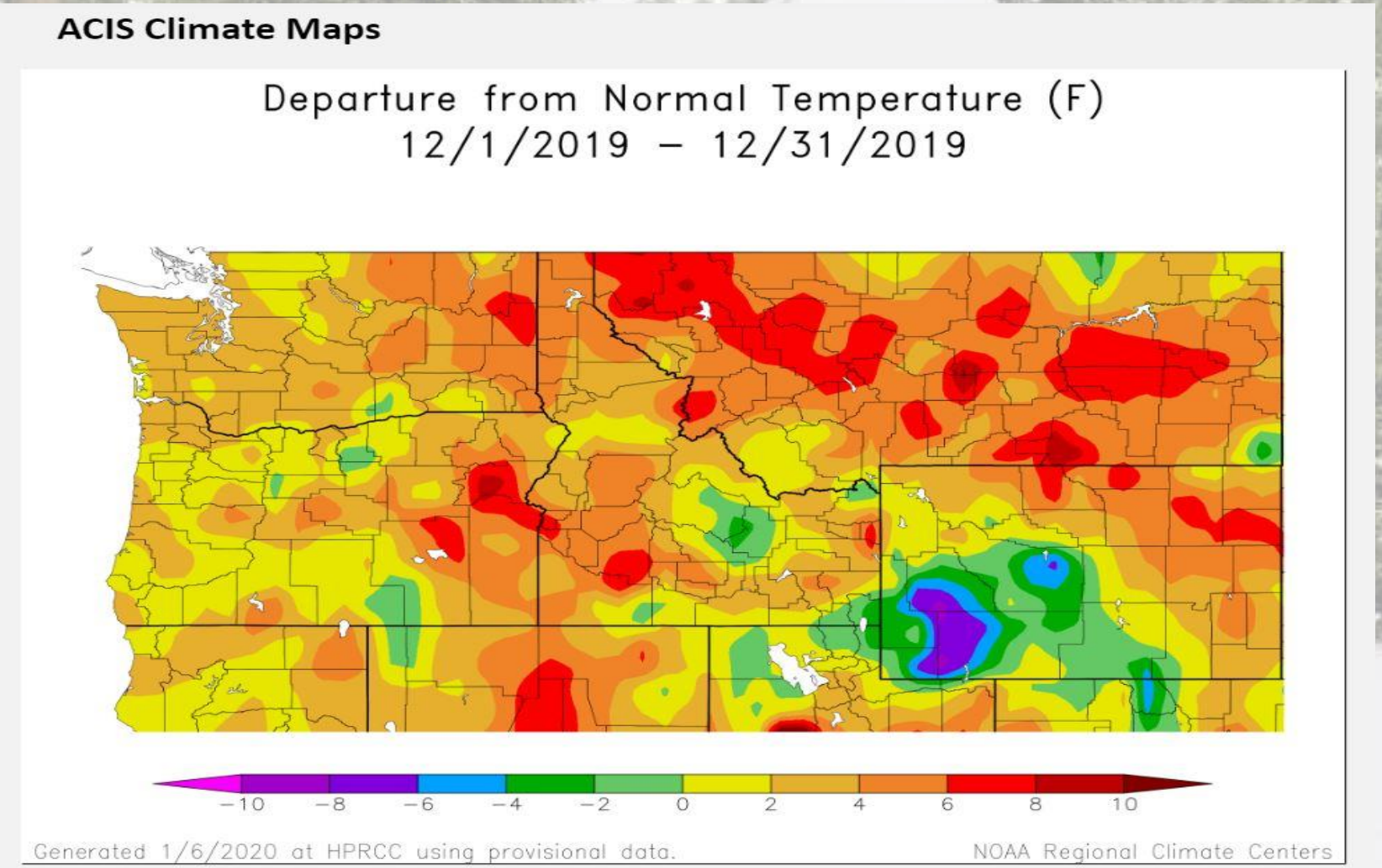
The month of December can be described as mostly tranquil and uneventful. There was little precipitation or significant storm systems. Also, the month was drier than normal in most locations and also warmer than normal. In fact, on the first day of winter, the high temperature at the Pendleton Airport was 64 degrees. There were only4 days in which the high temperature was at 32 or below. There were 24 days which had lows of 32 or below. The month can be described as somewhat breezy with the warm air. The background image on these slides show snow in the Blue Mountains during the middle to the end of the month. Usually, by December, the snow in the Blues would be much greater with walking in it to be difficult. There were several periods of high pressure where cold and moist air settled in the valleys and the Lower Columbia Basin creating inversions. This led to periods of fog/freezing fog, and in a couple cases dense fog/freezing fog which allowed rime ice to collect on trees and on other surfaces. Total precipitation for Pendleton was only 0.78 of an inch, which was 0.69 of an inch below normal. Below are images taken of the typical weather that occurred during the month.

Dense fog at night over the city of Pendleton.

Rime Ice in the trees due to freezing fog in Pendleton, OR.

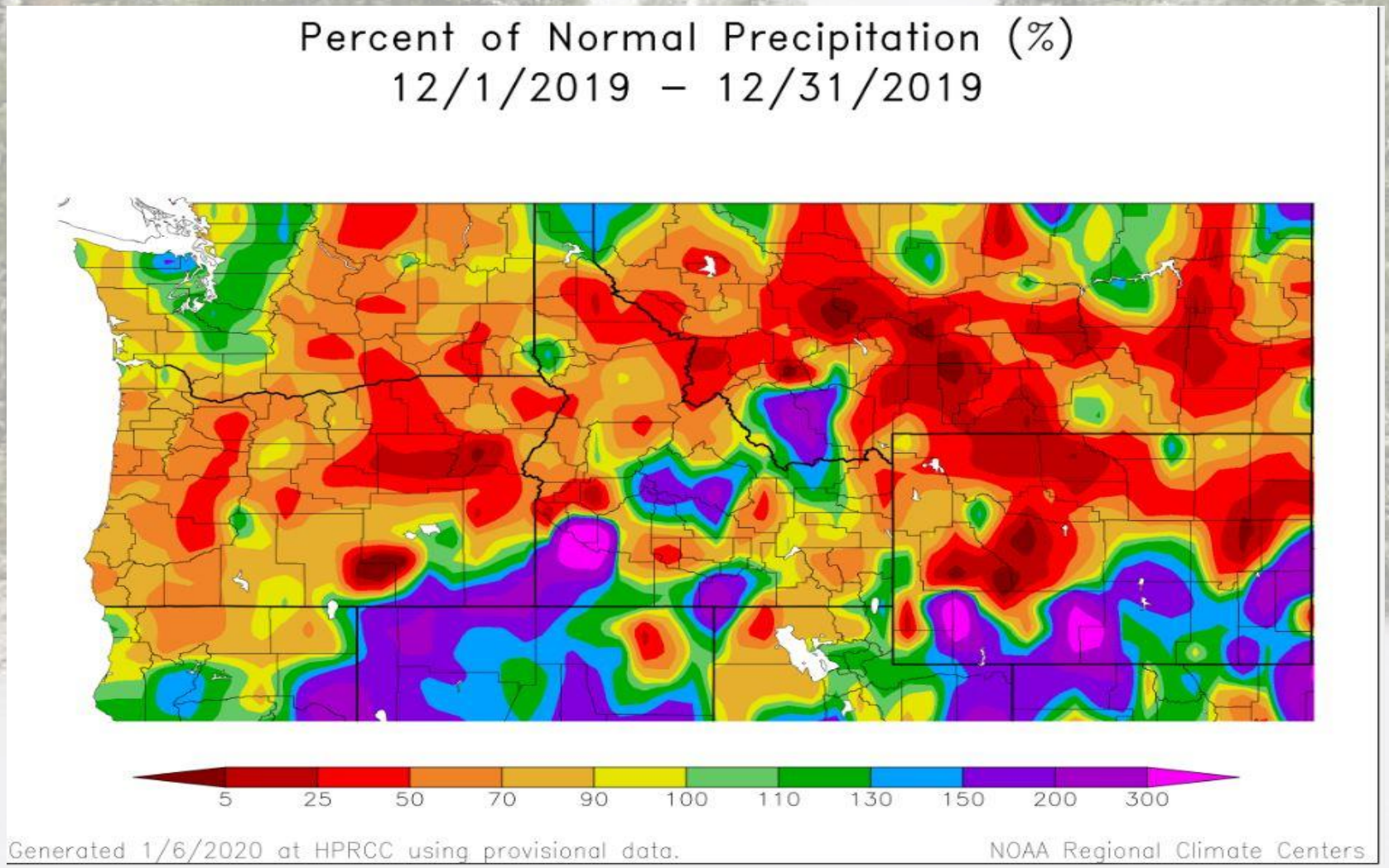
Fog bank moving in from the northwest into the city of Pendleton.

December 2019, Departure from Normal of Average Temperatures



The image above shows that most of the forecast area, except for small portions of north central Oregon and a small area in the Lower Columbia Basin that were slightly below for the month. The temperature departure from normal ranged from 0 to +6 degrees above Normal for the month.

December 2019, Percent of Normal Precipitation



The above image shows that all of the forecast area and most of the Pacific Northwest had below normal precipitation for the month (mostly 20% - 70% of normal). This was due to the fact that during the month, high pressure aloft suppressed wet storms from moving Through the region.

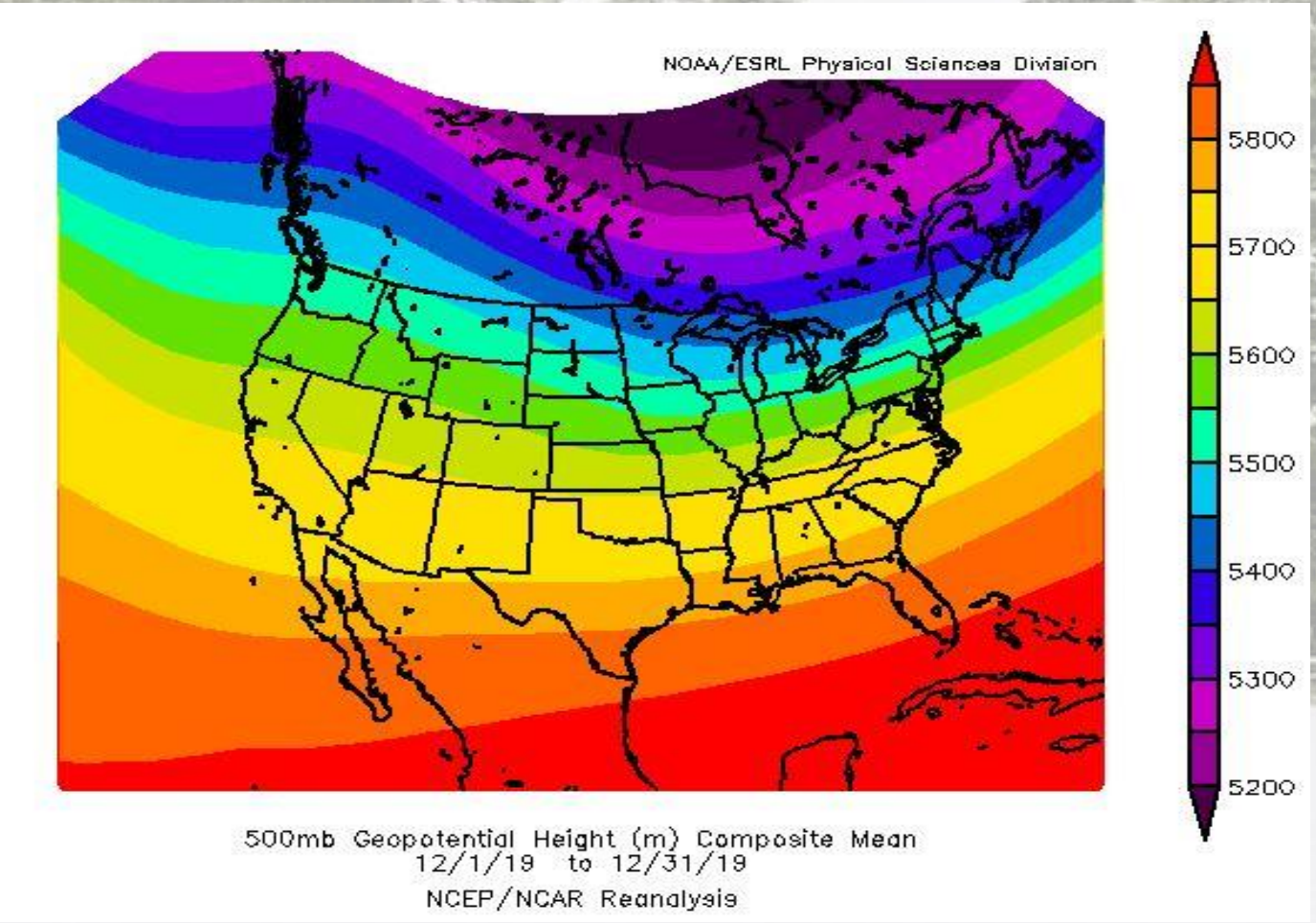
December 2019, Departures from Normal of Averages for Select Cites

	Max T	Max T D	Min T	Min T D	Ave T	Ave T D	PCPN	PCPN D	Snow	Snow D
Yakima	38.5	2.7	28.0	6.7	33.2	4.7	0.66	-0.87	0.0	-9.4
Kennewick	41.1	1.2	31.6	2.8	36.3	2.0	0.75	-0.38	0.0	-0.4
Walla Walla	40.3	1.8	30.3	1.9	35.3	1.9	1.05	-1.42	0.0	-4.4
The Dalles	41.1	0.8	32.7	2.5	36.9	1.7	1.54	-1.19	0.0	-5.0
Redmond	44.5	4.0	26.2	5.5	35.3	4.7	0.84	-0.32	0.0	-5.1
Pendleton Airport	43.3	3.8	29.1	2.1	36.2	3.0	0.78	-0.69	0.0	-6.0
La Grande	41.9	4.3	26.7	3.0	34.3	3.6	0.62	-1.04	1.2	-1.9

NOTE: T & M = 0.0

The data above shows that every single average temperature data departure from normal value was above normal (blue color). Every single precipitation and snow departure from normal value were all below normal (orange color). As for snow, the only station that even received greater than zero, a trace, or that was not missing was La Grande, with 1.2 inches of snow for the month of December. Please note that all snow reported as a trace, zero, or that was missing is treated as a value of 0.0 inches in the calculation of departure.

December 2019 Average 500 MB Weather Pattern



The average 500 mb pattern over the Pacific Northwest was slight ridging, but more important it was mostly zonal westerly. This did not allow many, if any, amplified ridges or troughs, but just a zonal flow off the Pacific, of marine air, which is typically warmer than a continental air mass in December. As a result the month was warmer than normal, but drier than normal too, due to the slight average ridging instead of an average trough pattern.

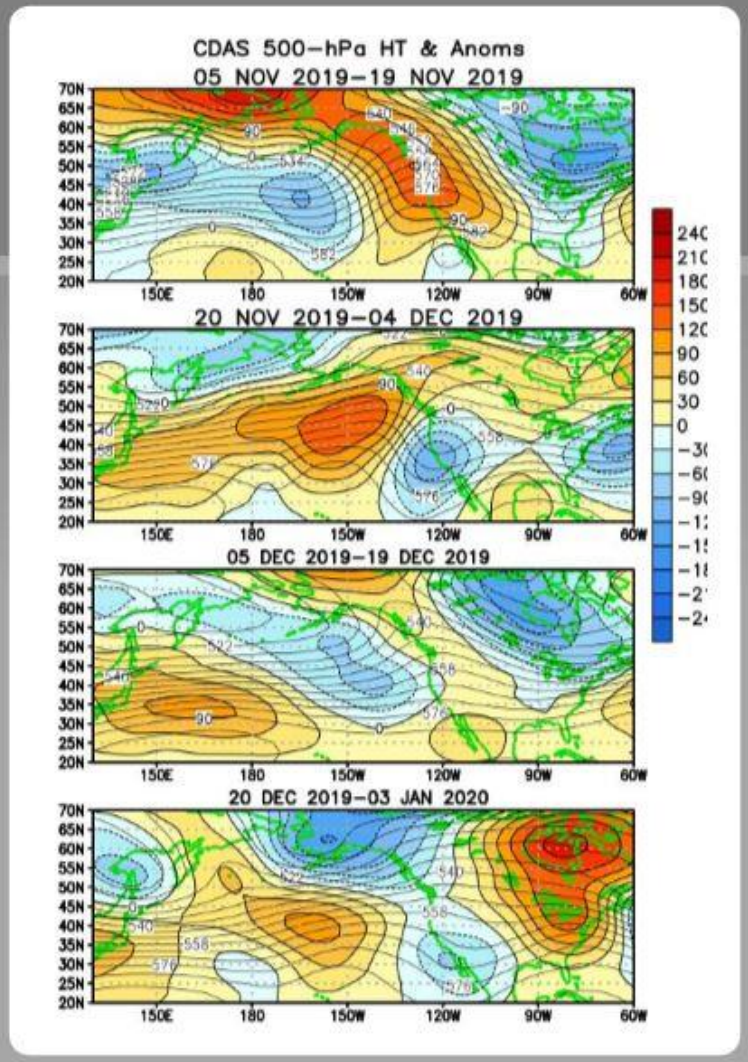
More Detailed 500 MB Plots for December, 2019

Atmospheric anomalies over the North Pacific and North America During the Last 60 Days

During early-to-mid November, an amplified ridge-trough pattern covered the U.S., along with above-average temperatures in the far western U.S. and below-average temperatures in the central or eastern U.S.

During early-to-mid December, above-average temperatures were evident across most of the U.S.

During late December into early January, below-average heights and temperatures were present over Alaska and the southwestern U.S., with above-average heights and temperatures across the central and eastern U.S.



In the image to the upper right, the western USA and the Pacific Northwest were dominated mostly by upper ridging, which was carried over from November.

Significant Weather Events/Records for December, 2019

Significant Weather Events

Event	Date	Report	Where	Misc
Blizzard	Dec 1	G53, blowing snow	2 NW Union, OR	Dept of Highways
Blizzard	Dec 1	1/4 mi vis in blowing snow	1S Union, OR	Trained Spotter
Mod Snow	Dec 11	E 3.0 "	7 NNW Easton, WA	Trained Spotter
Non TSTM wind gust	Dec 17	M 59 mph	La Grande Airport, OR	AWOS
Non TSTM wind gust	Dec 17	M 64 mph	La Grande Airport, OR	AWOS
Mixed Wintry Precip	Dec 19	M 0.25 inch sleet	W Trout Lake, WA	Trained Spotter
Heavy Snow	Dec 20	M 8.0 inches snow	2 SSE Snowqualmie Pass, WA	CoCoRahs
Heavy Snow	Dec 20	M 9.0 inches snow	2 SE Snoqualmie Pass, WA	Co-op observer
Mod Snow	Dec 19	M 3.4 inches snow	2 SE Snoqualmie Pass, WA	Co-op observer
Mod Snow	Dec 19	M 3.4 inches snow	2 SE Snoqualmie Pass, WA	CoCoRahs

Record Weather Reports

Event	Date	Where	Previous Record	New Record	Records Began
Low Temp	Dec 3	La Grande City	10 / 1992	8	1887
High Temp	Dec 20	Pendleton Airport	61 / 2018	63	1906
High Temp	Dec 21	Pendleton Airport	63 / 1933	66	1906
High Temp	Dec 21	Hermiston Airport	61 / 2018	63	1934
High Temp	Dec 22	Walla Walla Airport	63 / 1972	63 (tied)	1930
High Temp	Dec 22	Pelton Dam	62 / 1994	62 (tied)	1958
High Temp	Dec 22	Whitman Mission	60 / 2018	61	1962

The tables above show that most of the events were either record high temperatures or mostly wind. There were only 2 reports of heavy snow during the month, and they were at high elevation locations. The rest were either mixed precipitation or wind related snow events (i.e. blizzards).

December, 2019 Observed Monthly Max & Min Temperatures

Location	Highest Maximum Temperature	Lowest Minimum Temperature
Pendleton, OR	64	18
Redmond, OR	59	7
Pasco, WA	65	20
Yakima, WA	58	15
Walla Walla, WA	63	20
Bend, OR	52	7
Ellensburg, WA	45	15
Hermiston, OR	66	19
John Day, OR	60	20
La Grande, OR	51	8
The Dalles, OR	54	25
MT Adams RS, WA	49	18

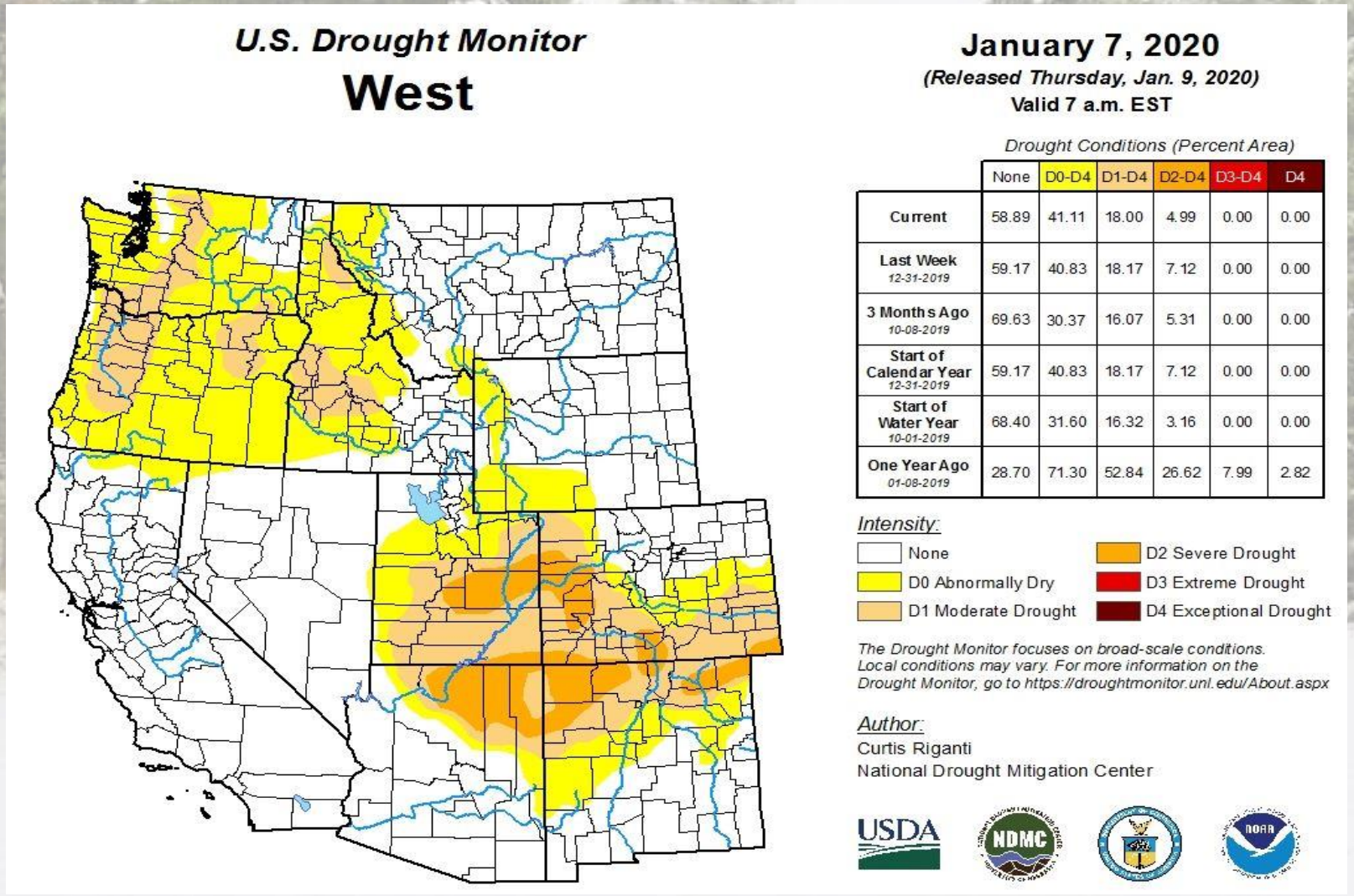
There were five stations which had a monthly maximum of 60 degrees or greater. There no stations which had a monthly maximum of 32 or less. There were 3 stations that had a monthly minimum in the single digits, 5 in the teens and the rest in the 20s. It is suffice to say that the month was a warmer than normal one.

December 2019, Monthly Precipitation and Snowfall Totals

Location	Total Monthly Precip (inches)	Total Snowfall (inches)
Pendleton. OR	0.78	Trace
Redmond, OR	0.84	Trace
Pasco, WA	0.47	Trace
Yakima, WA	0.66	0.0
Walla Walla, WA	1.05	Trace
Bend, OR	0.85	Missing
Ellensburg, WA	1.13	Missing
Hermiston, OR	0.13	Trace
John Day, OR	0.29	Missing
La Grande, OR	0.62	1.2
The Dalles, OR	1.54	Missing
Mt Adams RS, WA	4.36	5.0

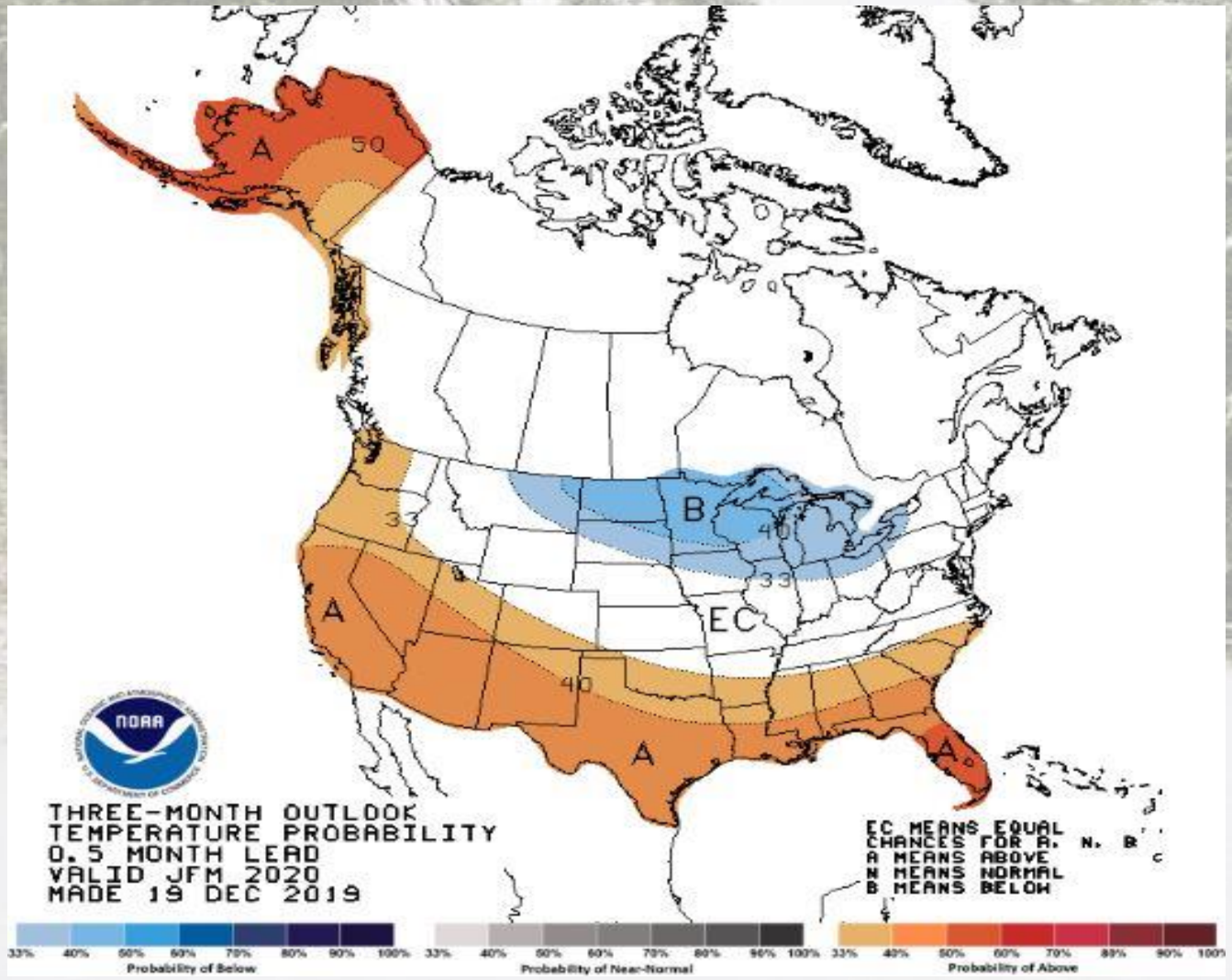
Most stations reported greater or equal to a half inch of melted precipitation, however only 2 stations reported greater than a trace of snowfall out of the 8 stations which did not have missing data. It is suffice to say that this month was closer to normal than November for precipitation, but that it was obviously also warmer than normal as evident by the lack of snowfall.

December, 2019 - Drought Monitor



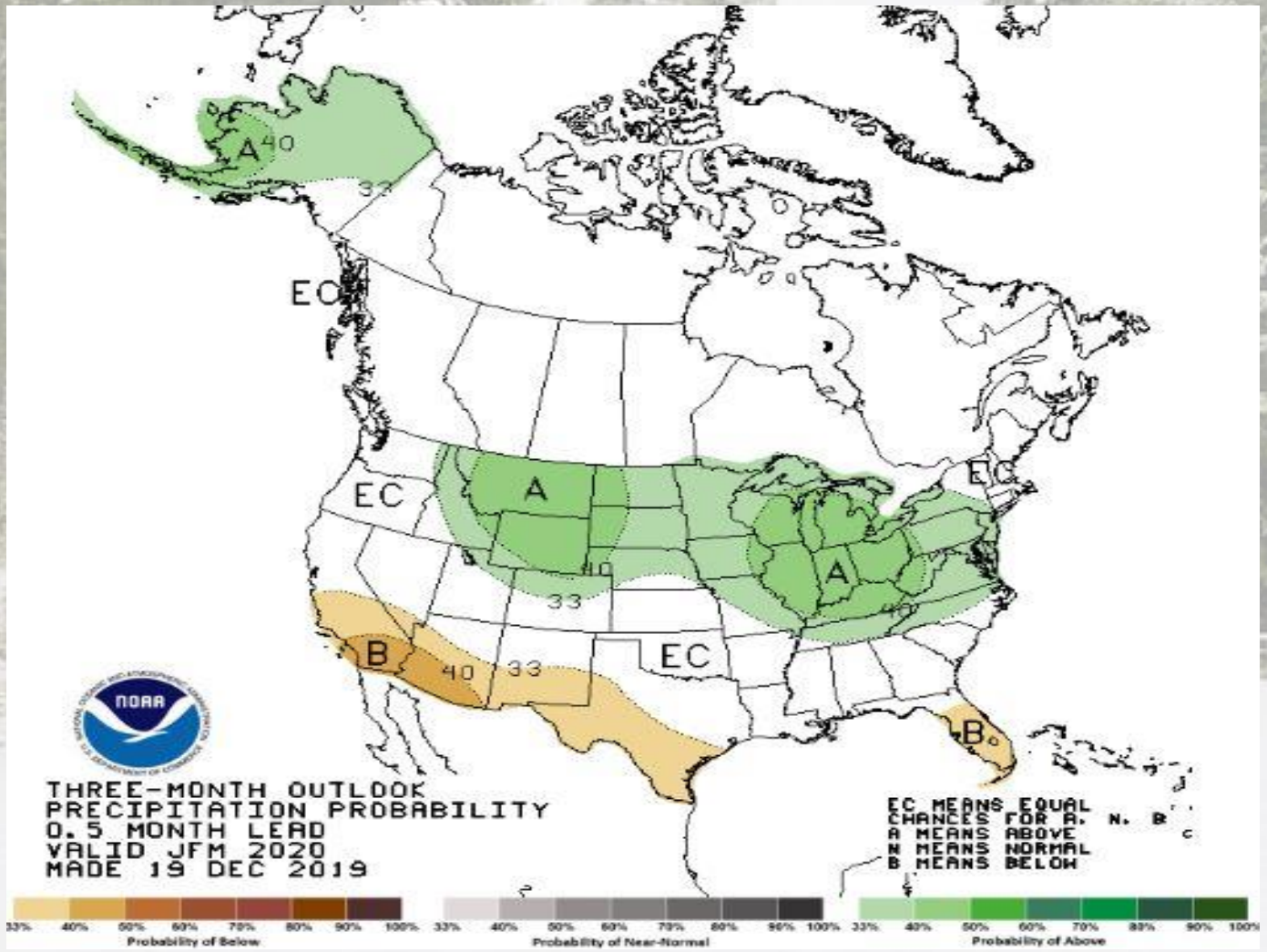
As of early January, after a month (December), with warmer and drier than normal conditions, the drought index across the Pacific Northwest, and all of the forecast area, was in the classification of D0 to D1, which means it is now Abnormally dry to Moderate Drought.

USA Three Month Temperature Outlook



The temperature outlook for the next three months (January, February & March) shows about a 0% to 33 % percent greater chance of having above normal temperatures for the three month period on average for the Pacific Northwest.

USA Three Month Precipitation Outlook

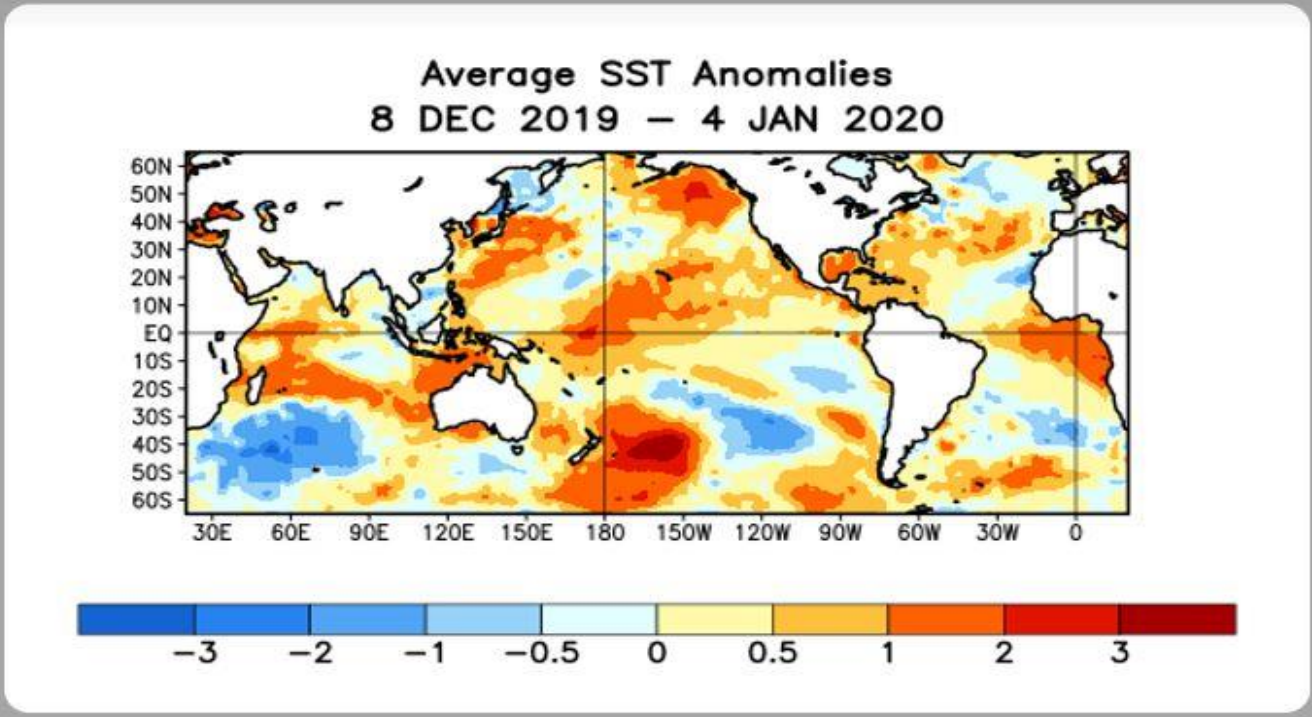


The percent of precipitation of normal for the next three months (January, February & March) shows the entire Pacific Northwest having equal chances of having above or below percent of normal precipitation for the Pacific Northwest.

Sea Surface Temperature (SST) analysis for December, 2019

Global SST Departures (°C) During the Last Four Weeks

During the last four weeks, equatorial SSTs were near-to-above average across the Pacific, the Atlantic Ocean, and the western Indian Ocean. SSTs were below average in the eastern Indian Ocean.



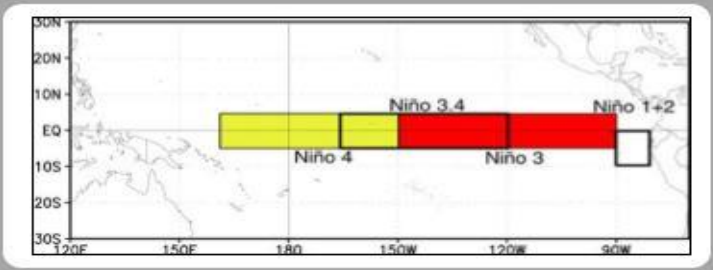
This indicates that the tropical Pacific had an increase of above normal sea surface temperatures (SSTs) for about all of the tropical Pacific. If this continues for longer (an increase for more than the past two months so far), it may indicate that El-Nino conditions may increase again. However, this graphic alone does not indicate El-Nino conditions.

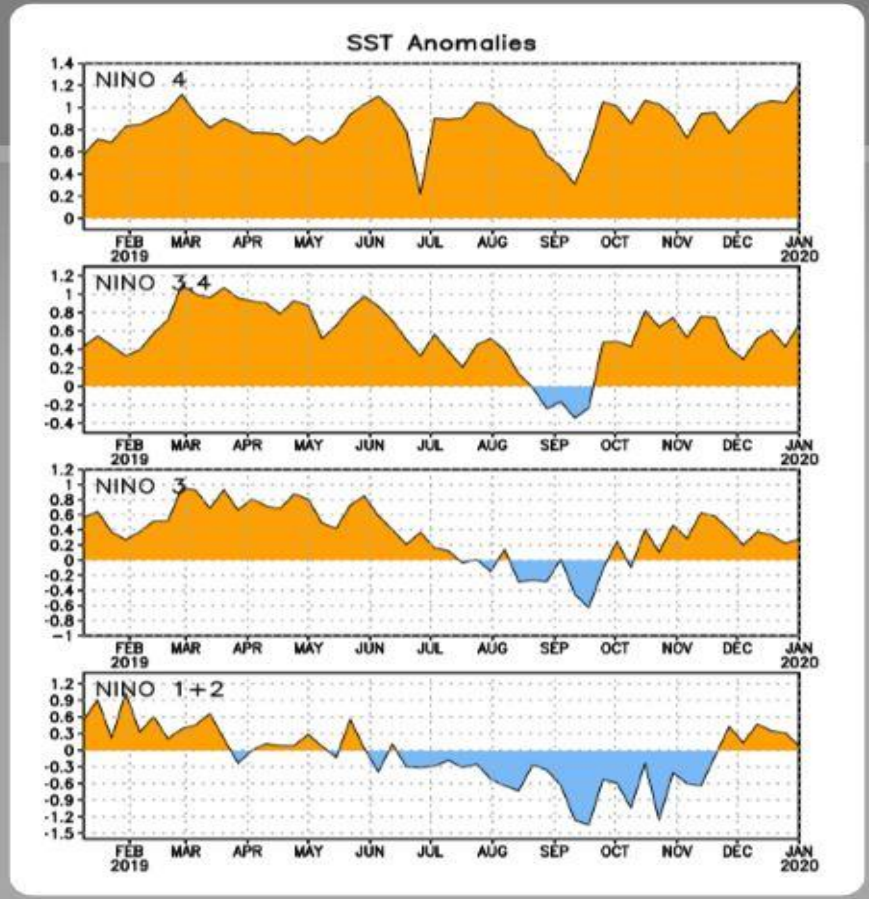
El Nino/ La Nina Regions, Showing SST Anomalies for Each Nino Region

Niño Region SST Departures (°C) Recent Evolution

The latest weekly SST departures are:

Niño 4	1.2°C
Niño 3.4	0.7°C
Niño 3	0.3°C
Niño 1+2	0.1°C





The above images shows that Nino regions 3.4 and 4 had mostly all positive (warmer than normal) SST's, while Nino 1 + 2, and 3 have had greater periods of below normal SST's from summer to now, especially Nino region 1 + 2, which is closest to the tropical Pacific off the central American coast. This cooler than normal period would indicate a continued decline in El-Nino conditions compared to the other Nino regions.

Current ENSO (El Nino Southern Oscillation) Alert System Status

ENSO Alert System Status: Not Active

ENSO-neutral conditions are present.*

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

The pattern of anomalous convection is generally consistent with ENSO-neutral.

ENSO-neutral is favored during the Northern Hemisphere winter 2019-20 (70% chance), continuing through spring 2020 (~65% chance).*

In consistency with the previous graphic of the Nino Regions, the ENSO Alert System Status is “Not Active”, meaning that we are no longer in an El-Nino status, but rather now are in “Neutral” ENSO status. These neutral conditions are forecast to continue through the rest of this winter through spring of 2020 (a 70% chance).

Thank You!