

The Month In Review

March 2021

National Weather Service
Pendleton, Oregon

Photo: Heavy snow at Pendleton, Oregon

March 2021, Climate Summary

March 2021 was a typical transition month going from winter to spring. March is known for the increased wind events and sometimes increased synoptic scale storms. This past month, there was a significant wind event during the latter half of the month, which caused extensive damage to some locations. The wind also created blowing dust at times during the month. Overall, temperatures were near normal through the month and there were only a handful of days where temperatures were either much above or much below normal. Precipitation, on the other hand was well below normal for most locations in the forecast area. This is especially true for the Cascades and the northeast mountains. The greatest departure from normal was at Walla Walla, WA by 1.69 inches less than normal. The greatest amount of precipitation was interestingly also at Walla Walla, WA which received 0.61 of an inch of precipitation. There were a couple of convective episodes, but there were only a handful of lightning strikes. Below are some typical scenes of some of the weather events during the month in the forecast area.



Wind driven dust in Kennewick, WA



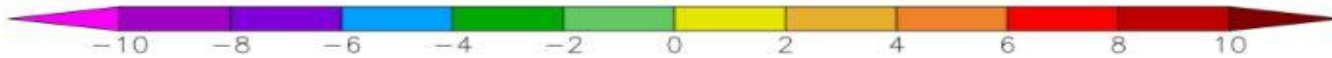
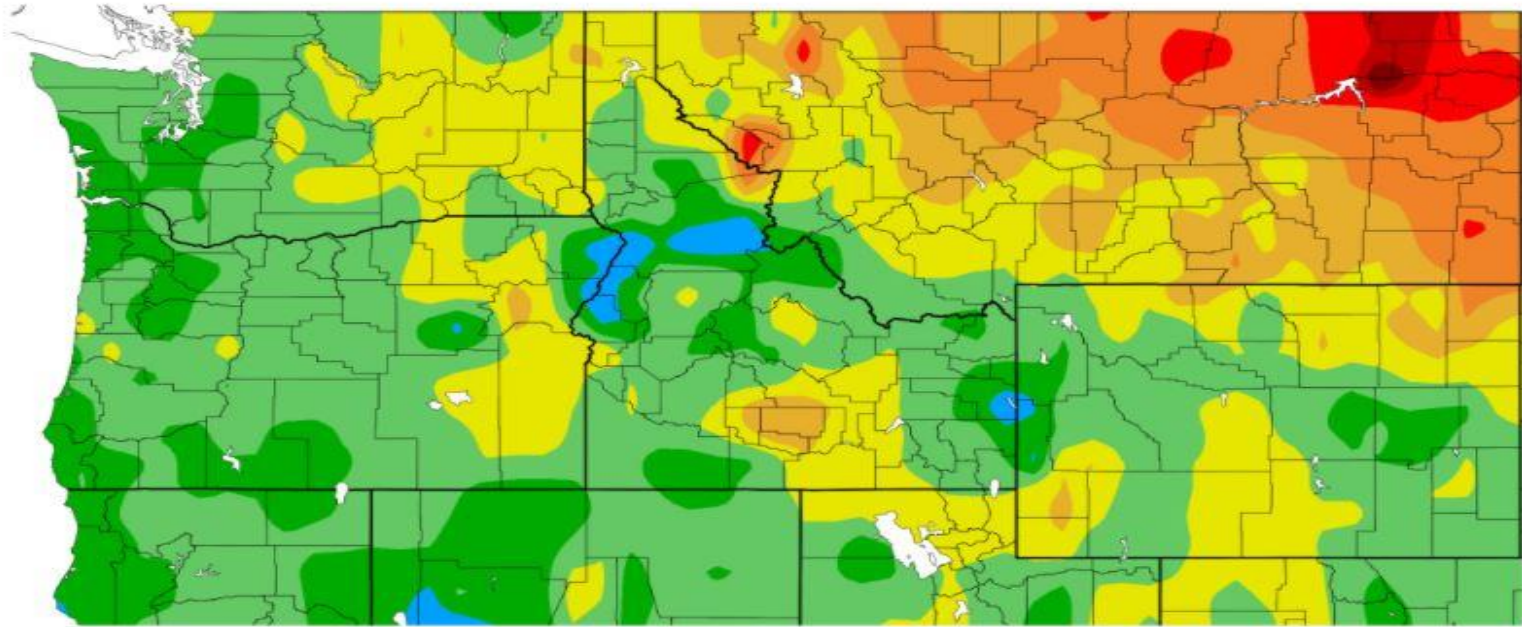
Early spring convection over Pendleton, OR.



Tree damage from strong winds in the Tri-Cities, WA.

March 2021, Departure from Normal of Average Temperatures

Departure from Normal Temperature (F)
3/1/2021 – 3/31/2021



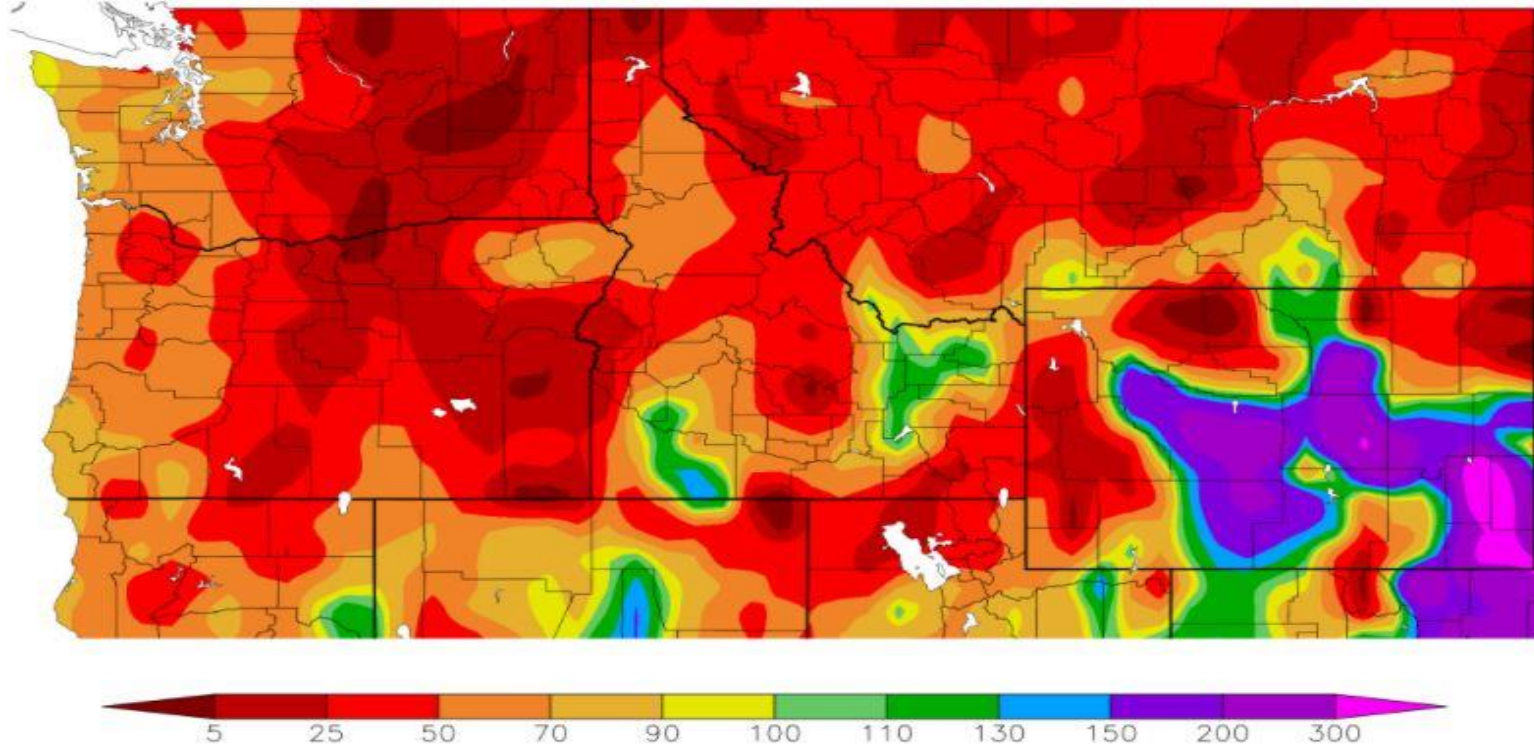
Generated 4/1/2021 at HPRCC using provisional data.

NOAA Regional Climate Centers

The entire forecast area has seen near normal average temperatures, with the western portions of the forecast area being slightly below normal, and most of the eastern portions of the forecast area being near to slightly warmer than normal. The departures were not more than 2 degrees above or below normal.

March 2021, Percent of Normal of Precipitation

Percent of Normal Precipitation (%)
3/1/2021 – 3/31/2021



Generated 4/1/2021 at HPRCC using provisional data.

NOAA Regional Climate Centers

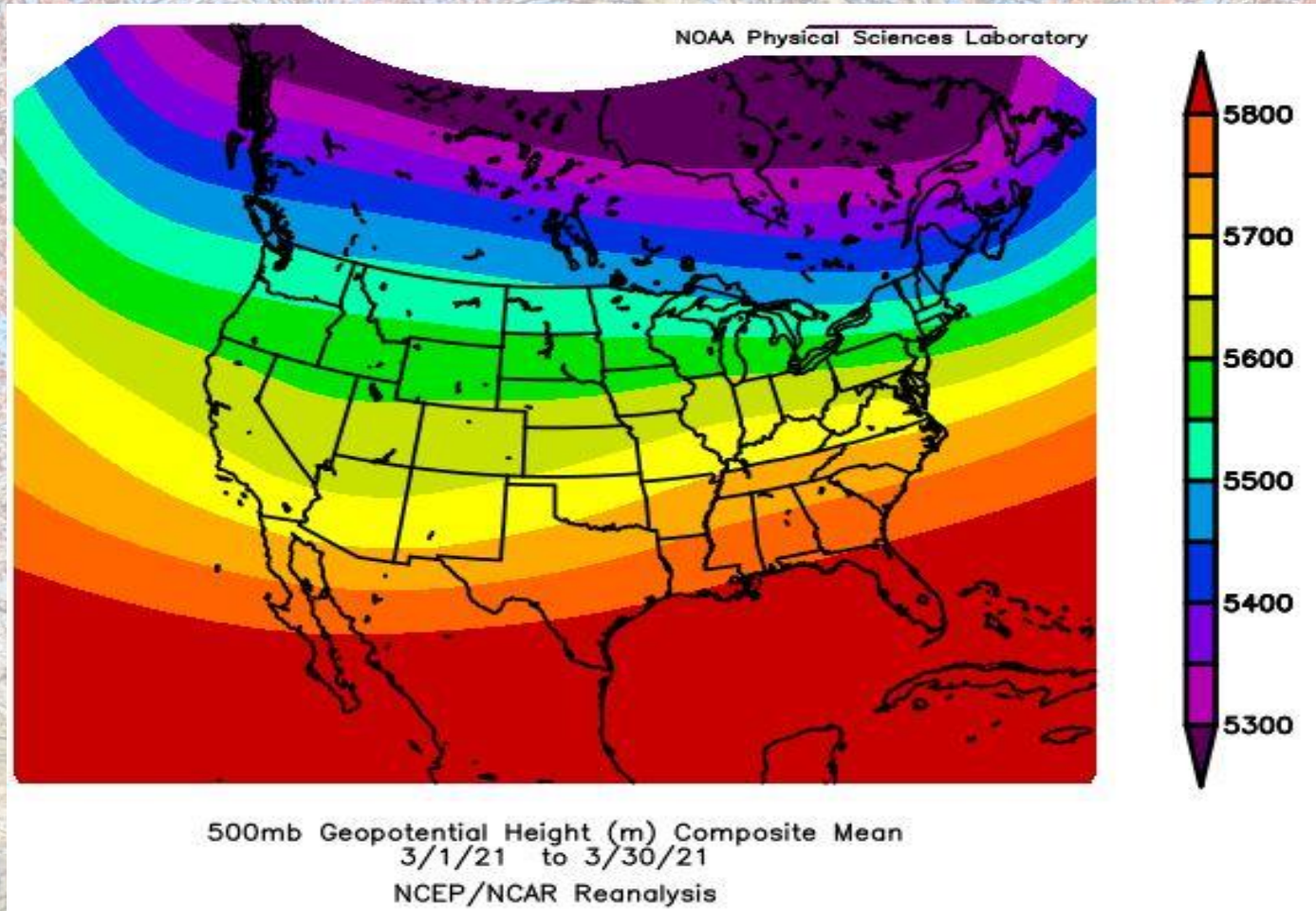
The widespread painting of deep reds, and small areas of orange shows how significantly March 2021 was drier than normal. The range of departure from the percent of normal was around 5 percent to 50 percent of normal, which covered most of the forecast area. There were small areas of 50 to 70 percent of normal.

March 2021, Departures from Normal Averages/Sums for Select Cites

	Max T	Max T D	Min T	Min T D	Ave T	Ave T D	PCPN	PCPN D
Yakima	58.3	2.1	29.5	-0.6	43.9	0.7	0.08	-0.54
Kennewick	60.4	2.0	35.4	-1.0	47.9	0.5	0.12	-0.61
Walla Walla	56.5	1.3	35.0	-2.4	45.7	-0.6	0.61	-1.69
The Dalles	58.0	1.0	34.5	-2.1	46.3	-0.5	0.18	-0.98
Redmond	55.9	2.1	23.8	-2.2	39.9	0.0	0.12	-0.54
Pendleton Airport	57.7	2.5	33.1	-1.9	45.4	0.3	0.32	-1.00
La Grande	50.8	-0.4	27.5	-2.9	39.1	-1.7	0.02	-1.44
John Day	56.5	2.2	31.5	2.4	44.0	2.3	0.29	-0.98

The table above shows that most of the maximum temperature departures were above normal high temperatures and mostly below normal lows. Therefore, the departures of the average temperatures were divided almost in half. In other words, March 2021 had near normal temperatures. On the other hand, precipitation amounts were all significantly below normal, with the driest being at Walla Walla, WA at -1.69 inches, and the least dry being at Yakima, WA and Redmond, OR of which both had a departure of -0.54 of an inch.

March 2021 Average 500 MB Pattern

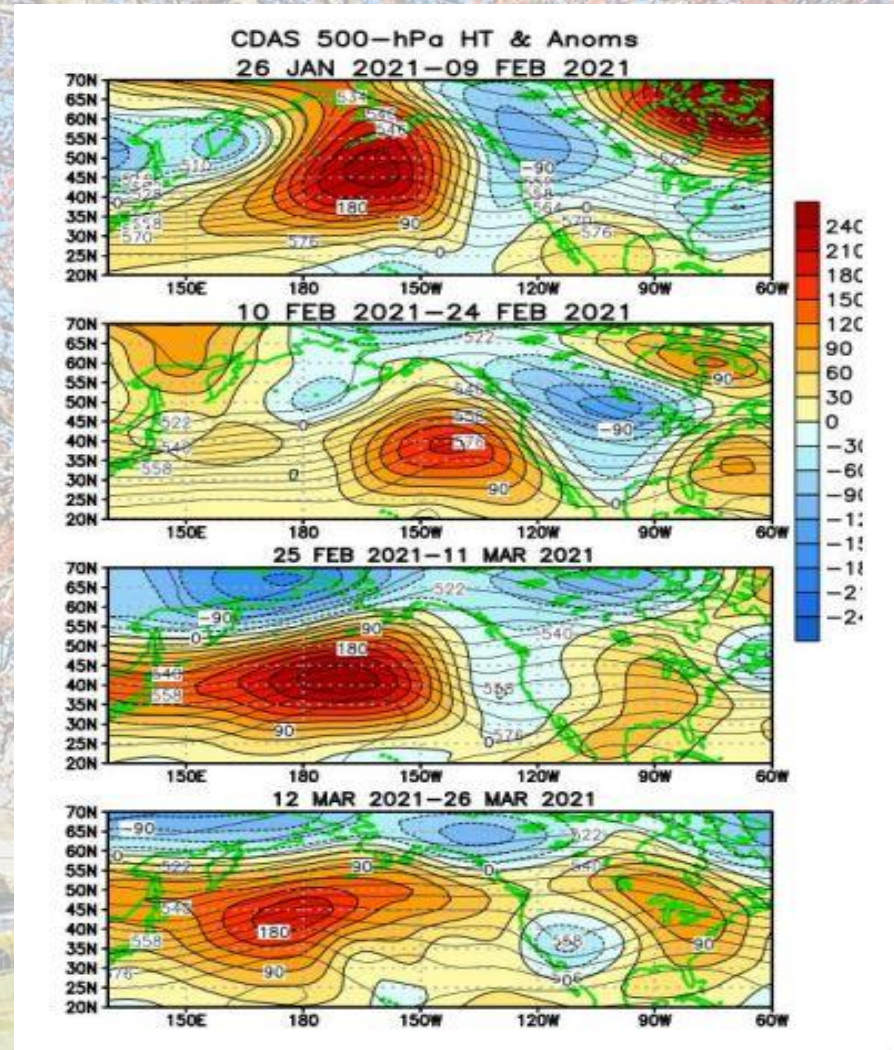


The average 500 MB pattern was an overall westerly flow with just a slight amount of a southwest to northeast trajectory. This resulted in a month which had near normal temperatures. It also is a pattern which is not favorable for strong precipitation producing storms. Orographic terrain features are such that this flow being perpendicular to the Cascade mountain range resulted in downslope drying on the east side of the Cascades, which is where the forecast area is.

Two Month, Bi-weekly 500 MB Plots for February and March 2021

These are more detailed semi-monthly average 500 mb pattern plots, which were from the following periods: 26th Jan 2021 through 26th of March 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.



During the latter part of January through early February, the pattern was mostly a trough pattern, then from early February to the end of February there was mostly a northwest flow pattern. Then from late February through the end of March the flow was mostly westerly.

Significant Weather Events for March 2021

Significant Weather Events

Event	Date	Report	Where	Source
Heavy Snow	March 22, 2021	M 6.0 inches	4 W Meacham, OR	NWS Employee
Heavy Snow	March 22, 2021	E 9.0 inches	Tollgate, OR	Dept of Highways
TSTM Wind Gust	March 25, 2021	Land Spout	W. Pasco, WA	Media
Non TSTM Wind Gust	March 28, 2021	M 58 mph	4 NW Richland, WA	Meso Net
Non TSTM Wind Gust	March 28, 2021	M 59 mph	22 NE Sunnyside, WA	Meso Net
Non TSTM Wind Gust	March 28, 2021	M 59 mph	20 NW W. Richland, WA	Meso Net
Non TSTM Wind Gust	March 28, 2021	M 68 mph	19 NW W. Richland, WA	Meso Net
Non TSTM Wind Gust	March 28, 2021	M 65 mph	8 SSE Goldendale, WA	Meso Net
Non TSTM Wind Gust	March 28, 2021	M 66 mph	5 WSW Rufus, OR	Meso Net
Non TSTM Wind Gust	March 28, 2021	M 59 mph	2 SSW Grass Valley, OR	Meso Net
Non TSTM Wind DMG	March 28, 2021	Tree Down	3 W Yakima, WA	Trained Spotter
Non TSTM Wind Gust	March 28, 2021	M 59 mph	2 S Grass Valley, OR	Meso Net
Non TSTM Wind Gust	March 28, 2021	M 68 mph	5 W Shaniko, OR	Meso Net
Non TSTM Wind Gust	March 28, 2021	M 60 mph	4 W Adams, OR	Meso Net
Non TSTM Wind Gust	March 28, 2021	M 62 mph	5 ENE Rufus, OR	Meso Net
Non TSTM Wind Gust	March 28, 2021	E 65 mph	12 SSW Pine Grove, OR	Meso Net
Non TSTM Wind Gust	March 28, 2021	M 64 mph	WSW Kent, OR	Meso Net
Non TSTM Wind Gust	March 28, 2021	M 60 mph	5 ESE Pendleton, OR	Meso Net
Non TSTM Wind Gust	March 28, 2021	M 60 mph	2 SE Paterson, OR	Meso Net
Non TSTM Wind Gust	March 28, 2021	M 63 mph	2 NW Wasco, OR	Meso Net
Non TSTM Wind Gust	March 28, 2021	M 73 mph	3 NW Pendleton (at Airport)	ASOS
Non TSTM Wind DMG	March 28, 2021	7 " tree limb down, Power Out	S. Pilot Rock, OR	Trained Spotter
Non TSTM Wind Gust	March 28, 2021	U 60 mph	Bickleton, WA	Public
Non TSTM Wind Gust	March 28, 2021	E 65 mph	Condon, OR	Public
Non TSTM Wind Gust	March 28, 2021	M 59 mph	4 W Arlington, OR	Meso Net
Non TSTM Wind Gust	March 28, 2021	M 70 mph	Benton City, WA	Meso Net
Non TSTM Wind Gust	March 28, 2021	M 65 mph	1 SW Kahlotus, WA	Meso Net
Non TSTM Wind Gust	March 28, 2021	M 58 mph	Lyle, WA	Meso Net
Non TSTM Wind Gust	March 28, 2021	M 58 mph	The Dalles, OR	ASOS
Non TSTM Wind Gust	March 28, 2021	M 63 mph	Pasco, WA	ASOS
Non TSTM Wind Gust	March 28, 2021	M 59 mph	5 SSE Matthew, WA	Meso Net
Non TSTM Wind DMG	March 28, 2021	Roof blown off barn	Mission, OR	Public
Non TSTM Wind Gust	March 28, 2021	M 57 mph	Walla Walla, WA	ASOS
Non TSTM Wind Gust	March 28, 2021	M 56 mph	Yakima, WA	ASOS
Non TSTM Wind Gust	March 28, 2021	M 68 mph	Hermiston, OR	ASOS
Non TSTM Wind Gust	March 28, 2021	E 60 mph	Bickleton, WA	Public
Non TSTM Wind DMG	March 28, 2021	Many Power Lines Down	Pendleton, OR	Media
Non TSTM Wind DMG	March 28, 2021	Fire caused by power lines down	Pendleton, OR	Media

Significant Weather Events for March 2021 (cont.)

Significant Weather Events (continued)				
Event	Date	Report	Where	Source
Non TSTM Wind Gust	March 28, 2021	M 60 mph	3 W Umatilla, OR	Meso Net
Non TSTM Wind DMG	March 28, 2021	Sign damaged at museum	Fossil, OR	Public
Non TSTM Wind Gust	March 28, 2021	M 58 mph	3 NE Walla Walla, WA	ASOS
Non TSTM Wind Gust	March 28, 2021	M 59 mph	4 W Arlington, OR	Meso Net
Non TSTM Wind DMG	March 28, 2021	Trees down at 36th Avenue	2 W Yakima, WA	Media
Non TSTM Wind Gust	March 28, 2021	M 70 mph	4 E Rufus, OR	Dept of Highways

By far, wind was the most significant kind of weather event for the month. The only other weather event of significance was a heavy snow event for the northern Blue Mountains.

Record Weather Event Reports for March 2021

Record Weather Reports					
Event	Date	Where	Previous Record	New Record	Records Began
High Temp	March 5, 2021	Pasco, WA	67 / 2014	74	1942
High Temp	March 5, 2021	Hermiston, OR	70 / 1987	76	1906
High Temp	March 6, 2021	Long Creek, OR	66 / 2020	66 (tied)	1908
High Temp	March 6, 2021	Pelton Dam, OR	71 / 1979	71 (tied)	1958
High Temp	March 5, 2021	Kennewick, WA	72 / 1905	75	1884
High Temp	March 18, 2021	Walla Walla, WA	69 / 1960	72	1930
Low Temp	March 23, 2021	Redmon, OR	16 / 1973	15	1941

There were only 7 records that were either tied or broken during the month. Six of the records were for high temperatures from the 5th to the 6th, of the month, and then again on the 18th. A record low temperature was reported on the 23rd of the month at Redmond, OR.

March 2021, Observed Monthly Max & Min Temperatures

Location	Highest Maximum Temperature	Lowest Minimum Temperature
Pendleton, OR	73	24
Redmond, OR	73	15
Pasco, WA	75	21
Yakima, WA	66	22
Walla Walla, WA	72	28
Bend, OR	68	19
Ellensburg, WA	67	21
Hermiston, OR	76	20
John Day, OR	73	24
La Grande, OR	70	19
The Dalles, OR	68	28
MT Adams RS, WA	57	23

Most stations in the list had monthly maximum temperatures in the 60s and 70s, except for the Mt. Adams Ranger Station, which had a monthly maximum of only 57 degrees. Lowest minimum temperatures ranged from 15 degrees at Redmond OR to 28 degrees at Walla Walla, WA and The Dalles, OR. These temperatures are not too extreme given the weather pattern during the month, though some of these are records.

March 2021, Observed Monthly Precipitation and Snowfall/Hail Totals

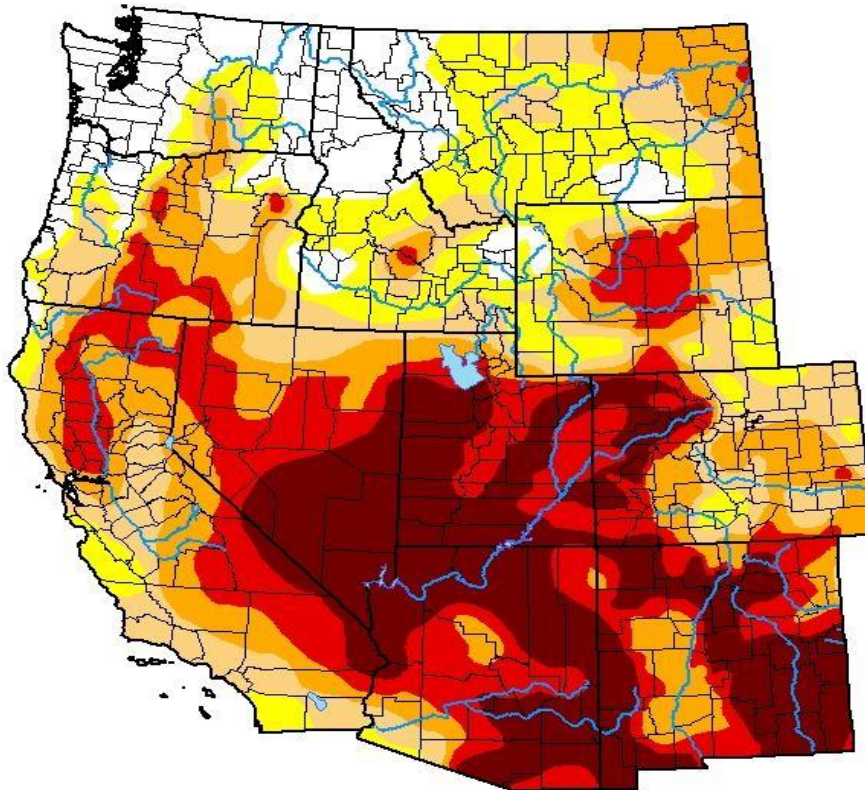
Location	Total Monthly Precipitation (inches)	Total Snowfall/Hail (inches)
Pendleton, OR	0.32	Trace
Redmond, OR	0.12	M
Pasco, WA	0.12	M
Yakima, WA	0.08	M
Walla Walla, WA	0.61	M
Bend, OR	0.03	0.0
Ellensburg, WA	0.14	M
Hermiston, OR	0.12	M
John Day, OR (RAWS)	0.29	M
La Grande, OR	0.02	M
The Dalles, OR	0.18	M
Mt Adams RS, WA	0.01	0.0

Monthly precipitation totals for the same list of cities in the previous slide shows very low values of precipitation. The greatest was at Walla Walla, WA with a total of 0.61 of an inch, and the least amount at the Mount Adams Ranger Station with only 0.01 of an inch for the month. This was followed by La Grande, OR with only 0.02 of an inch for the month. Only zero to a trace of snow was reported at any of these stations.

March 2021 - Drought Monitor

U.S. Drought Monitor West

March 23, 2021
(Released Thursday, Mar. 25, 2021)
Valid 8 a.m. EDT



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	11.44	88.56	74.50	58.66	39.49	20.61
Last Week 03-16-2021	10.69	89.31	74.92	58.63	39.74	20.32
3 Months Ago 12-22-2020	11.57	88.43	78.33	65.18	46.63	22.16
Start of Calendar Year 12-29-2020	11.57	88.43	78.63	65.18	46.49	22.16
Start of Water Year 09-29-2020	8.51	91.49	76.07	54.55	33.11	2.31
One Year Ago 03-24-2020	51.19	48.81	24.66	3.60	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:

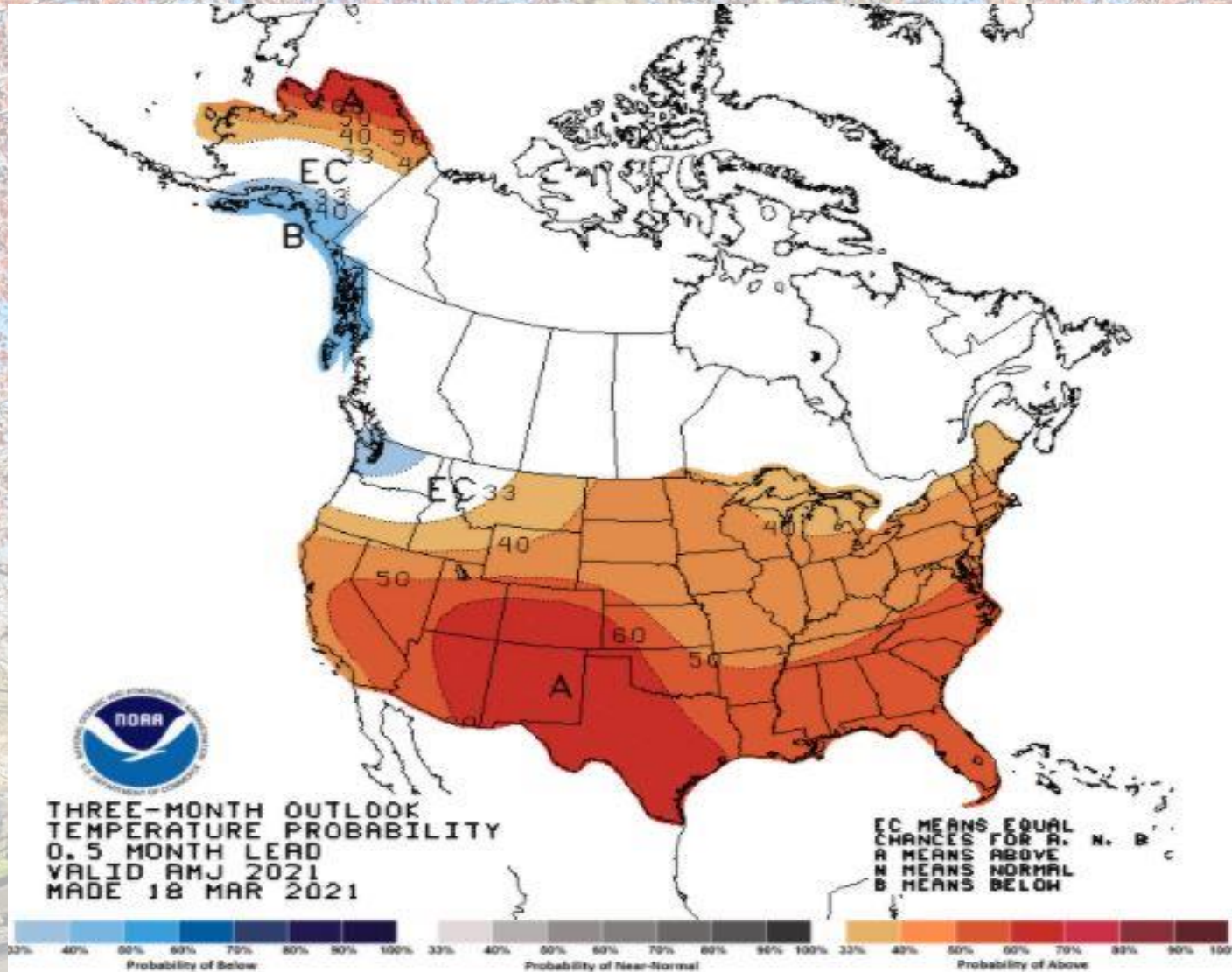
Brad Pugh
CPC/NOAA



droughtmonitor.unl.edu

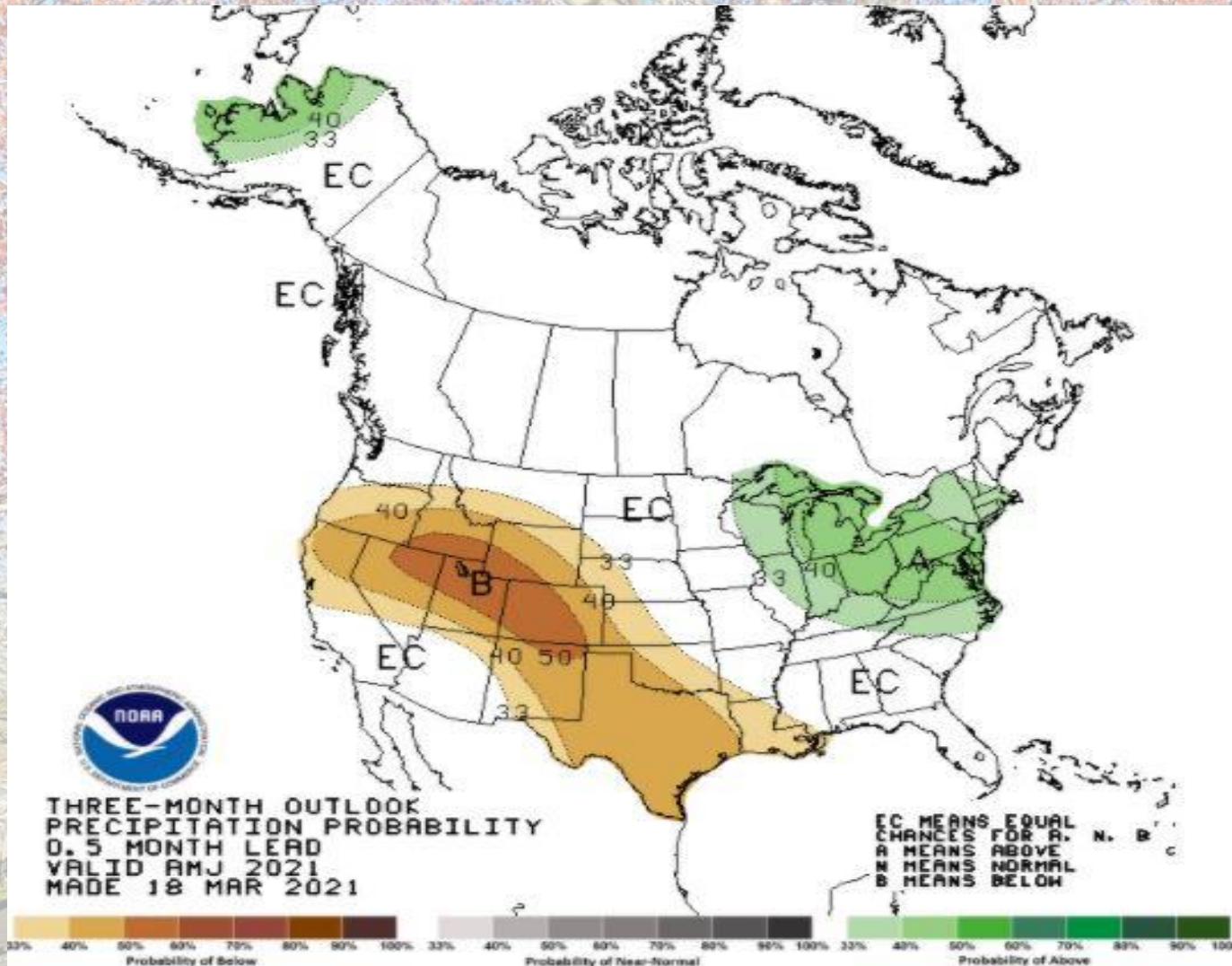
As of March 23rd, much of northeast OR and southeast WA had drought conditions greater than “D0” (none, or no drought). The areas which were the driest were in the central OR Cascades and a small area in the eastern mountains. The northeast mountains including the Northern Blue Mountains and the Wallowa Mountains, were at “D0”, or “none”, meaning no drought conditions.

USA Three Month Temperature Outlook



The temperature outlook for the next 3 months (April - June) are mainly equal chances for above or below normal temperatures.

USA Three Month Precipitation Outlook

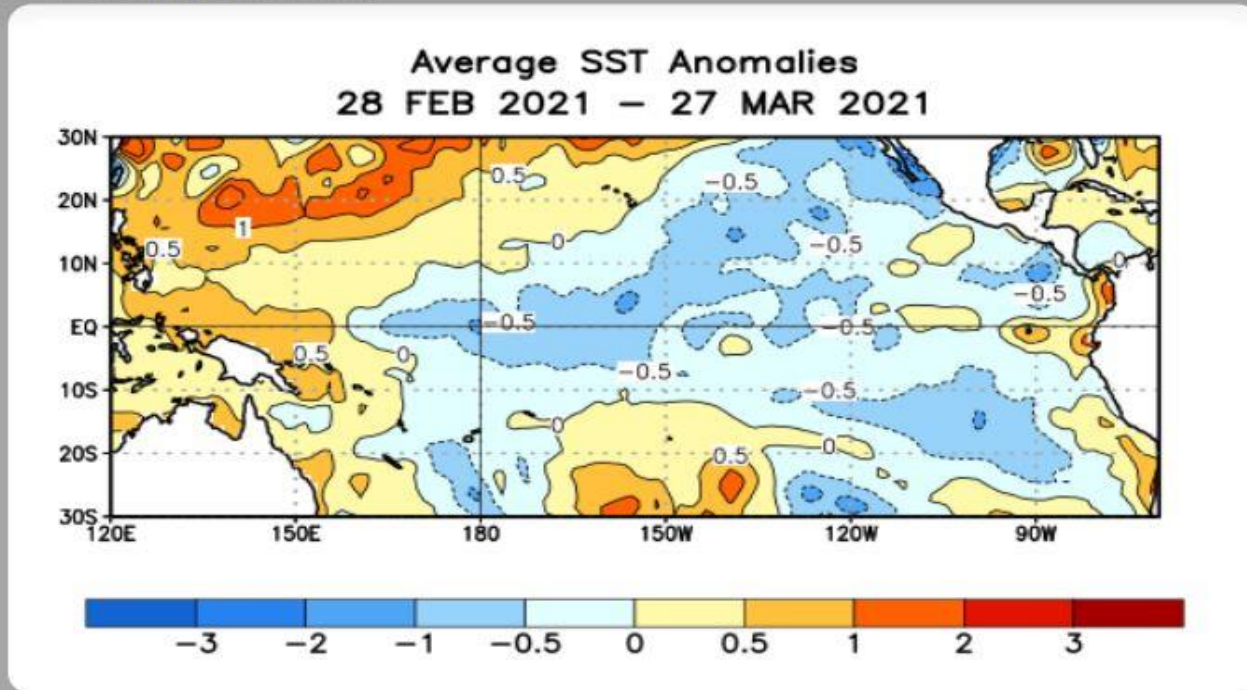


The Oregon side of the forecast area is expected to have below normal precipitation during the month, while the Washington side of the forecast area is expected to have equal chances for above or below normal precipitation.

Average Sea Surface Temperature (SST) Anomalies for March 2021

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

In the last four weeks, equatorial SSTs were mostly below average from the west-central Pacific to $\sim 110^{\circ}\text{W}$. Equatorial SSTs were near-to-above average closer to the coast of South America.



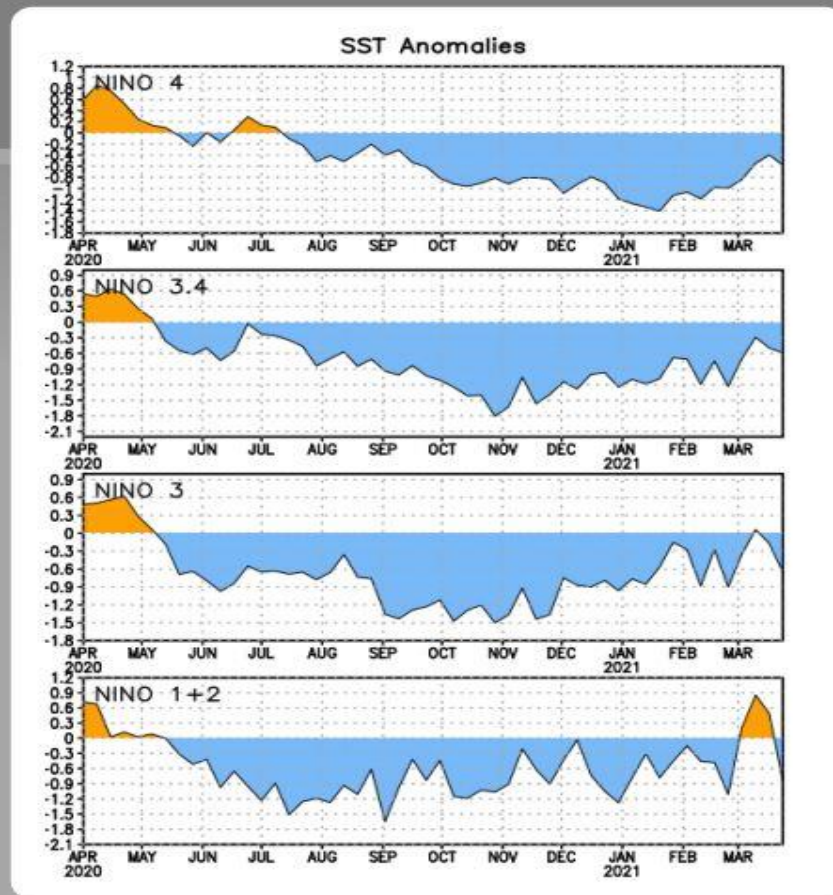
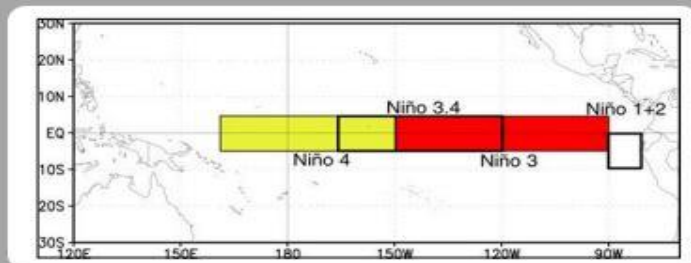
SSTs were still below average again from late February through late March for most of the Eastern tropical Pacific, especially near the central American coast. The coverage of below Normal SST's is less than the previous few months, which may suggest that the ongoing La Nina event is showing signs of transitioning to ENSO neutral.

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	-0.6°C
Niño 3.4	-0.6°C
Niño 3	-0.7°C
Niño 1+2	-0.9°C



All Niño Regions are showing below normal SST's again during this past month, except for Niño Region 1 + 2 (the eastern tropical Pacific), which now has above normal temperatures overall compared to last month, which was below normal. This is another sign that the La Nina event is beginning to transition into ENSO neutral.

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 from the west-central to eastern Pacific Ocean.

The tropical atmospheric circulation is consistent with La Niña.

There is a ~60% chance of a transition from La Niña to ENSO-Neutral during the Northern Hemisphere spring 2021 (April-June).*

The current ENSO status is still: “**La Nina Advisory**”, which is still in effect. There is still a 60 percent chance that conditions will transition from La Nina to ENSO-Neutral during this spring from April to June. This is consistent with the previous two slides that are showing some warming taking place in the eastern tropical Pacific.



Thank You!