The Month In Review

October 2021

National Weather Service
Pendleton, Oregon

Photo: Beautiful Autumn Colors in Pendleton, OR

October 2021, Climate Summary

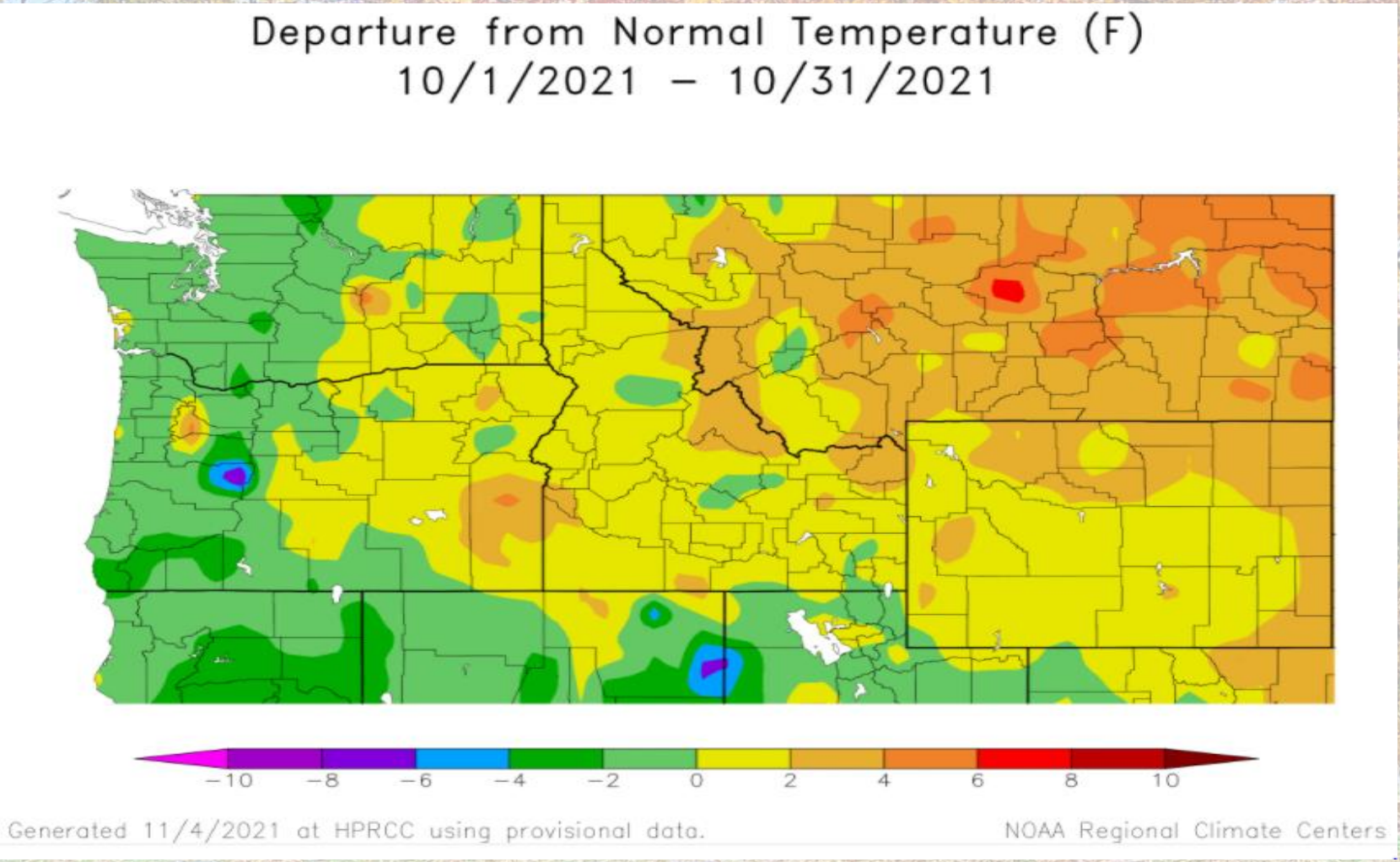
October turned out to be a substantial change from the previous 6 months of unusually dry, and at times, warm to hot conditions. Not only did October bring significant rainfall, it also brought cooler temperatures. There was a cold snap on the 12th of the month, where a record low temperature was recorded. Then later in the month, there was a high wind event in which wind speeds reached High Wind Warning criteria over much of the forecast area on the 24th. There were also a couple significant rainy periods, with one of them breaking record rainfall amounts on the 22nd through the 24th. There was another rain event on the 16th and 17th, where heavy rains fell especially over the Cascades. Despite the increase in precipitation and cooler temperatures, the month, overall, still had slightly warmer than normal temperatures, but also above normal precipitation. The autumn foliage colors were not the greatest due to such a hot and dry summer. Below are several images of the typical conditions during the month. There were a few pockets of colorful autumn foliage.

Cooler temperatures and some welcome rain over the forecast area.

Threatening storm clouds in the Lower Columbia Basin, near Pasco, WA.

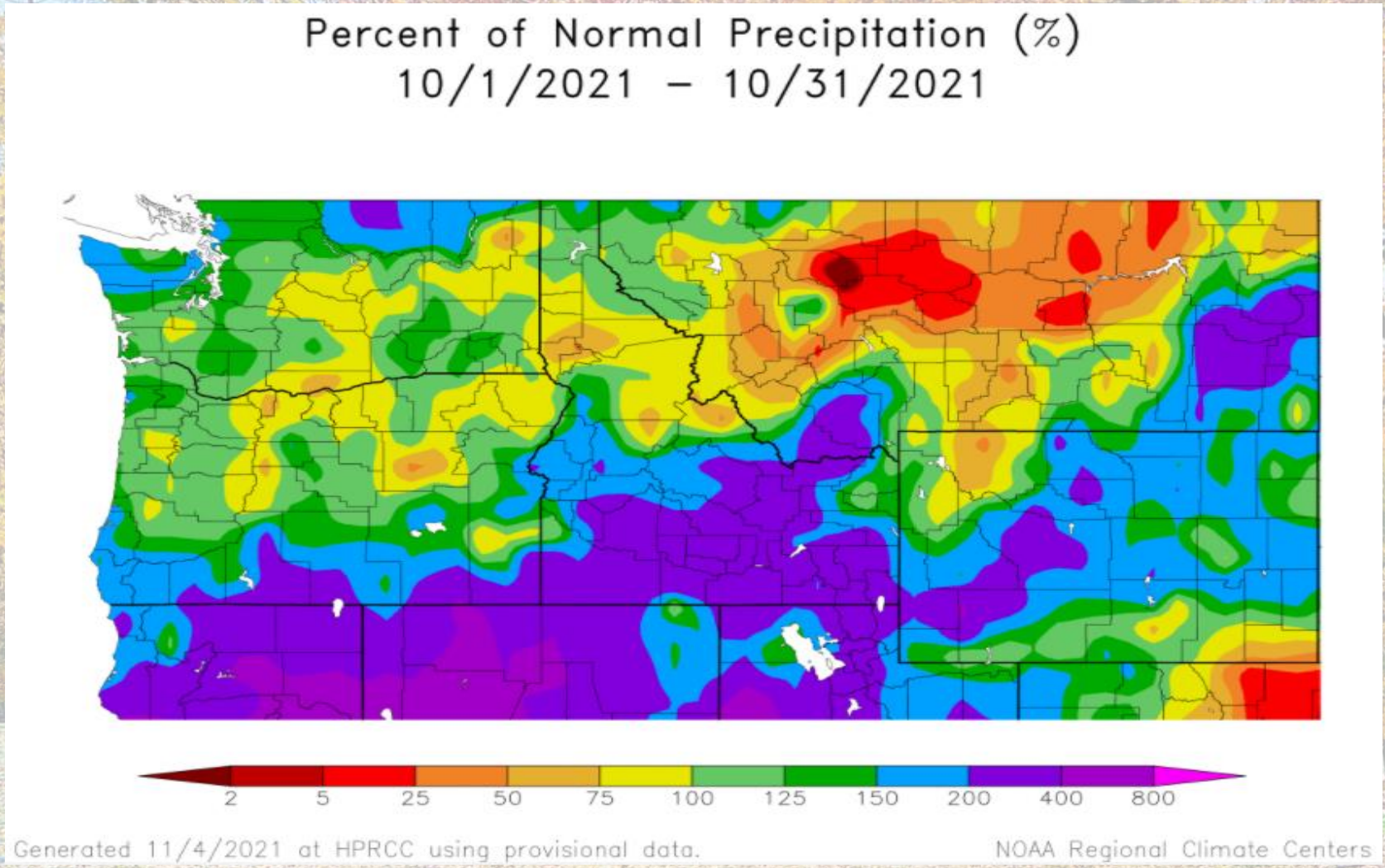
Beautiful autumn colors in the Columbia River Gorge near The Dalles, OR.

October 2021, Departure from Normal of Average Temperatures



The departure from normal of the average temperatures were close to normal, which mostly ranged from -2 to +2 degrees. The warmest areas were over the eastern two thirds of the forecast area, and the coolest areas were over the Cascades and some of the valleys just to the east of the Cascades.

October 2021, Percent of Normal of Precipitation



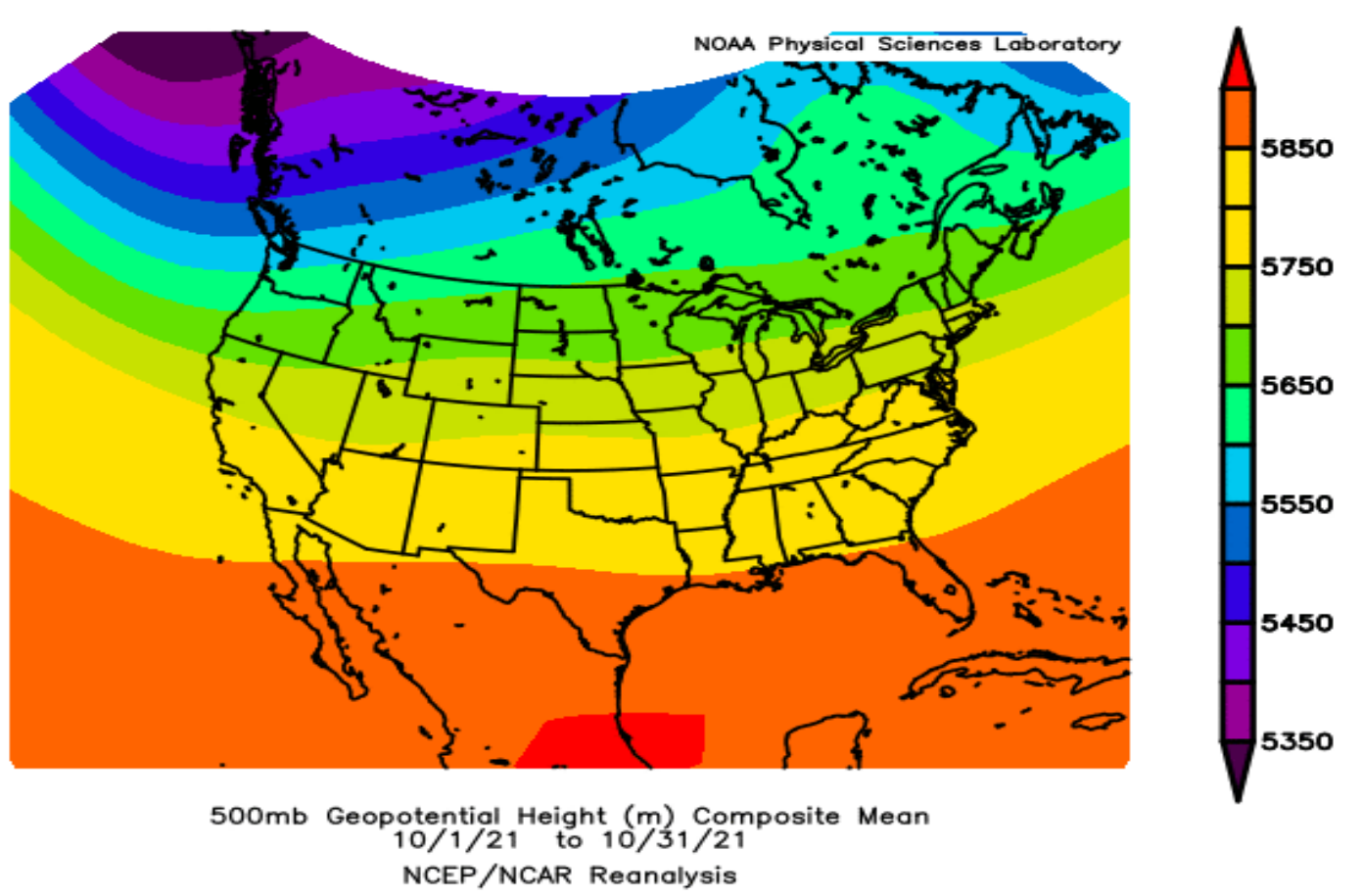
Like temperatures, the percent of normal precipitation for October was also near normal. The range of the percent of normal precipitation was mostly from 75 to 125 percent of normal. The distribution of precipitation was almost uniform across the forecast area. The wettest areas were over the Lower Columbia Basin and in central Oregon. Elsewhere, conditions were slightly drier than normal.

October 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	63.5	-0.4	35.8	1.7	49.7	0.7	1.01	0.47
Kennewick	67.2	1.4	44.9	2.8	56.0	2.1	1.00	0.40
Walla Walla	63.9	0.4	43.5	0.4	53.7	0.4	1.89	0.21
The Dalles	65.5	-0.2	44.3	2.0	54.9	0.9	0.80	-0.19
Redmond	63.2	-0.3	35.6	4.3	49.4	2.0	0.84	0.19
Pendleton Airport	64.2	0.5	40.4	0.3	52.3	0.4	1.03	0.02
La Grande Airport	62.1	-0.2	37.5	2.3	49.8	1.1	1.02	-0.27
John Day	66.4	1.0	40.9	7.5	53.7	4.3	0.65	-0.34

The table above shows that there was an even split in the departure from normal mean maximum temperatures, with the variance from -0.4 (below normal) to +1.4 (above normal), which leans slightly toward warmer than normal. All of the departures from normal of the mean minimum and mean average temperatures were above 0.0, which is warmer than normal. There was close to an even split in precipitation amounts, with a variance that ranged from -0.34 (below normal) to 0.47 (above normal).

October 2021, Average 500 MB Pattern

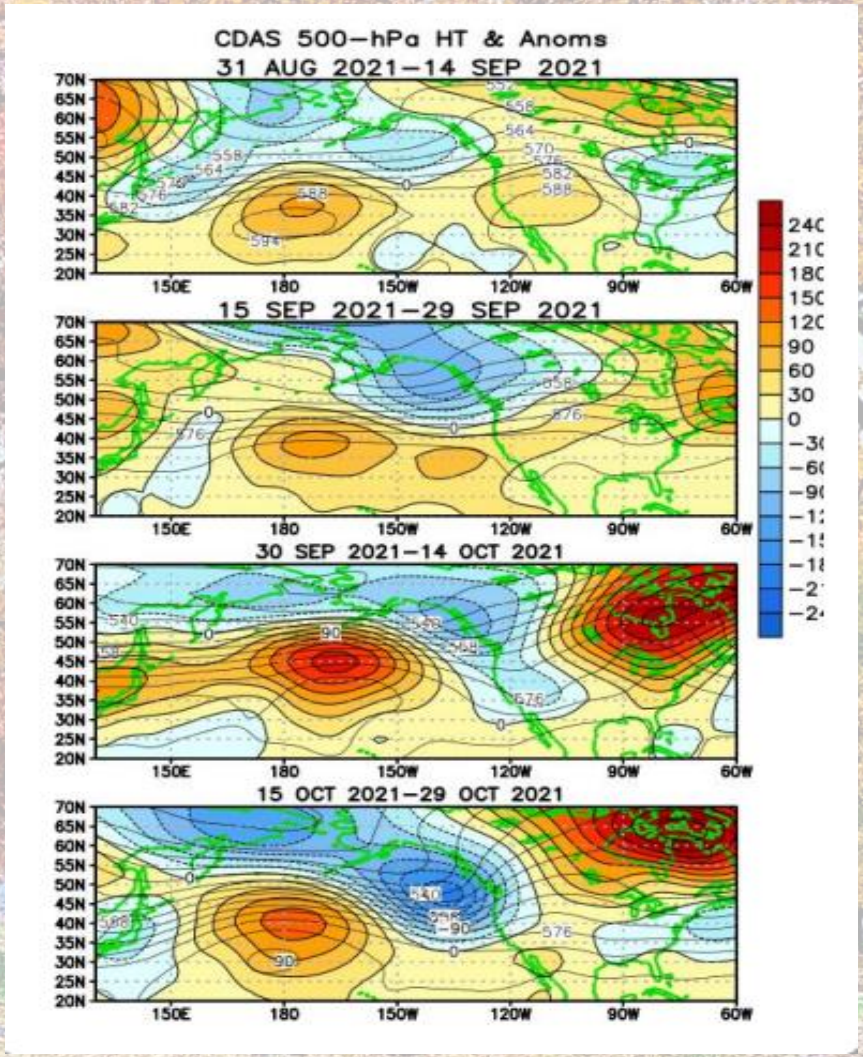


The average 500 MB pattern for October showed an overall upper trough over the Pacific Northwest, with the forecast area (northeast OR and southeast WA) on the east side of the upper trough axis, in a southwest flow. This pattern helped to keep the forecast area to having an overall slightly above normal temperature average and mostly above normal precipitation. As mentioned in previous slides, there was neither much variance in temperatures, nor precipitation. This pattern also supported more frequent weather systems across the region.

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

These are more detailed semi-monthly average 500 mb pattern plots, which was from the following period: 31st Aug 2021 through 29th October (mainly September and October).

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 map image shows a zonal flow pattern, which transitioned to an upper trough off the coast and a southwest flow over the Pacific Northwest during the latter half of September. Then during the first two weeks in October, the upper trough axis was directly over the forecast area, and then it retrograded westward, off the coast with a southwest flow pattern during the latter half of October.

Significant Weather Events for October 2021

Significant Weather Events				
Event	Date	Report	Where	Source
Non-TSTM Wind Damg	October 24, 2021	2 inch tree limb down	1 WNW Cayuse, OR	Co-Op Observer
Non-TSTM Wind Gust	October 24, 2021	M 58 mph	7 NE Cove, OR	Mesonet
Non-TSTM Wind Gust	October 24, 2021	E 57 mph	10 E Pendleton, OR	Public
Non-TSTM Wind Gust	October 24, 2021	E 51 mph	4 SSW Mission, OR	Co-Op Observer
Non-TSTM Wind Gust	October 24, 2021	M 65 mph	4 SSW Mission, OR	Co-Op Observer
Non-TSTM Wind Gust	October 24, 2021	M 50 mph	8 NNW Clarno, OR	Mesonet
Non-TSTM Wind Gust	October 24, 2021	M 52 mph	5 ESE Pendleton, OR	Mesonet
Non-TSTM Wind Damg	October 24, 2021	power pole fires	Weston, OR	Fire Dept/Rescue
Non-TSTM Wind Gust	October 24, 2021	M 73 mph	4 W Adams, OR	Co-Op Observer
Non-TSTM Wind Gust	October 24, 2021	M 53 mph	17 S Imnaha, OR	Mesonet
Non-TSTM Wind Gust	October 24, 2021	M 50 mph	2 S Grass Valley, OR	Co-Op Observer
Non-TSTM Wind Gust	October 24, 2021	M 51 mph	1 SW John Day, OR	ASOS
Non-TSTM Wind Gust	October 24, 2021	M 55 mph	3 N Helix, OR	Co-Op Observer
Non-TSTM Wind Gust	October 24, 2021	M 59 mph	3 NE Walla Walla, WA	ASOS
Non-TSTM Wind Gust	October 24, 2021	M 50 mph	12 SW Post, OR	Mesonet
Non-TSTM Wind Gust	October 24, 2021	M 59 mph	4 ESE Walla Walla, WA	Co-Op Observer
Non-TSTM Wind Gust	October 24, 2021	M 67 mph	1 NW Heppner, OR	Co-Op Observer
Non-TSTM Wind Gust	October 24, 2021	M 50 mph	NW Spout Springs, OR	Mesonet
Non-TSTM Wind Gust	October 24, 2021	M 50 mph	10 SSE La Grande, OR	Mesonet
Non-TSTM Wind Damg	October 24, 2021	trees down	Union, OR	Public
Non-TSTM Wind Damg	October 24, 2021	trees down	Heppner, OR	Public
High Sustained Winds	October 24, 2021	M 40 mph	3 NNE Waitsburg, WA	Mesonet
Non-TSTM Wind Damg	October 24, 2021	trees & power lines down	Kamela	Utility Company
Non-TSTM Wind Gust	October 24, 2021	M 58 mph	2 N Joseph, OR	Mesonet
Non-TSTM Wind Damg	October 24, 2021	trees down, power outage	Walla Walla, WA	Newspaper
Non-TSTM Wind Gust	October 24, 2021	M 75 mph	7 SSW Cayuse, OR	Dept of Highways

Record Weather Event Reports for October 2021

Record Weather Reports					
Event	Date	Where	Previous Record	New Record	Records Began
Low Temp	October 12, 2021	Redmond, OR	17 deg / 2002	17 deg (tie)	1941
Max Rainfall	October 22, 2021	Pendleton, OR	0.55 inch / 1923	0.56 inch	1934
Max Rainfall	October 22, 2021	Hermiston, OR	0.24 inch / 1951	0.46 inch	1906
Max Rainfall	October 22, 2021	Pasco, WA	0.33 inch / 1923	0.34 inch	1942
Max Rainfall	10/24,2021	Yakima, WA	0.43 inch / 1979	0.48 inch	1909

October 2021, Observed Monthly Max & Min Temperatures

Location	Highest Maximum	Lowest Minimum
Pendleton, OR	78	26
Redmond, OR	82	17
Pasco, WA	79	28
Yakima, WA	76	25
Walla Walla, WA	77	32
Bend, OR	78	21
Ellensburg, WA	72	24
Hermiston, OR	78	27
John Day, OR	83	23
La Grande, OR	81	23
The Dalles, OR	80	33
Meacham, OR	75	16
MT Adams RS, WA	72	23

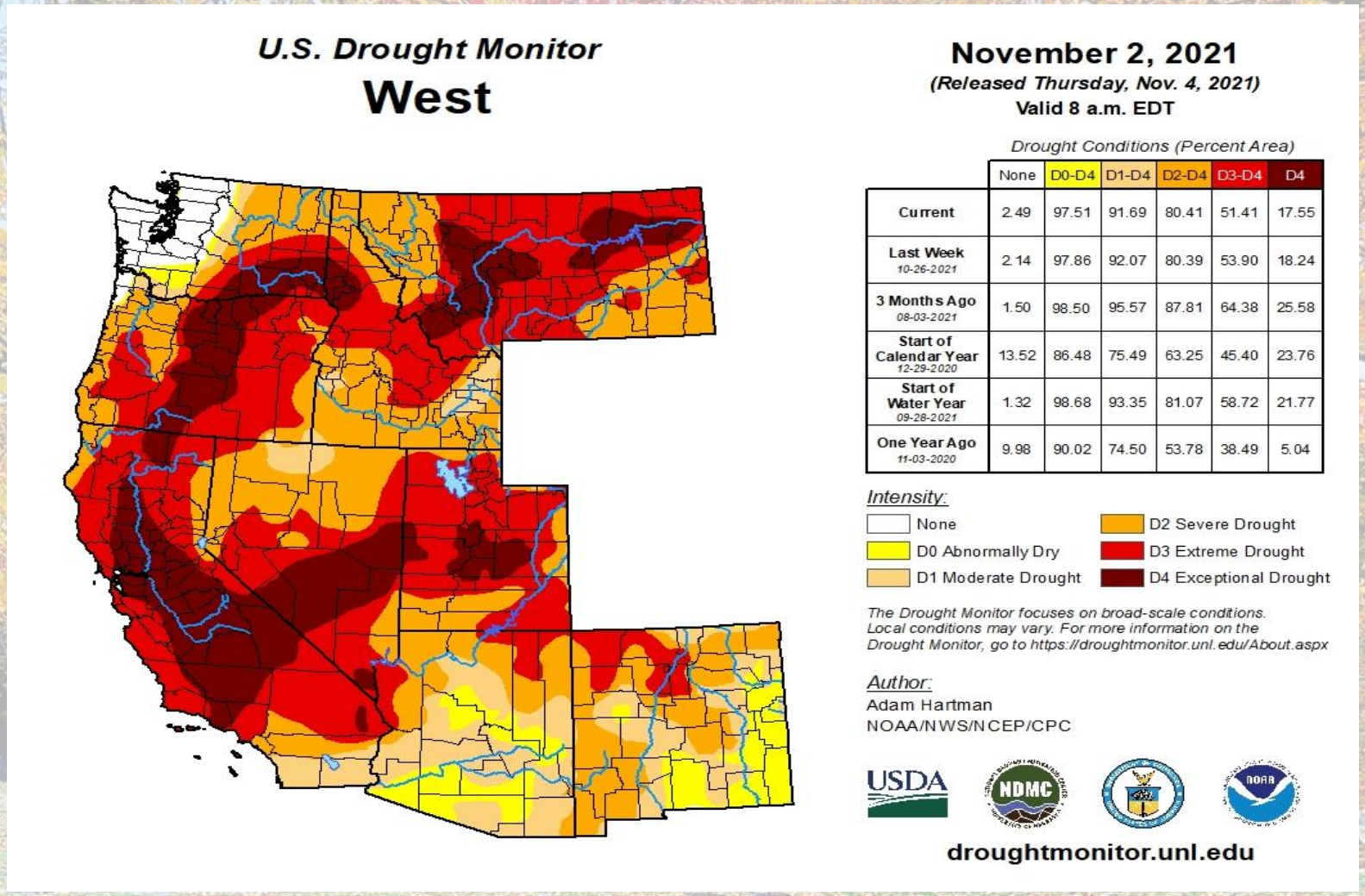
The highest maximum temperatures ranged from 72 degrees at the Mt Adams Ranger Station to 83 degrees at John Day, OR. The lowest minimum temperatures ranged from 16 at Meacham, OR to 33 degrees at The Dalles, OR. These temperatures are not that much out of the ordinary, as there can be either very warm maximum or very very cold minimum temperatures during the climatic transition month of October from summer to winter.

October 2021, Observed Total Precipitation and Total Snowfall/Hail

Location	Total Precipitation (inches)	Total Snow/Hail (inches)
Pendleton, OR	1.03	0.0
Redmond, OR	0.84	M
Pasco, WA	0.88	M
Yakima, WA	1.01	M
Walla Walla, WA	1.89	M
Bend, OR	0.14	0.0
Ellensburg, WA	0.59	M
Hermiston, OR	1.25	M
John Day, OR	0.65	M
La Grande, OR	1.02	M
The Dalles, OR	0.80	M
Meacham, OR	2.10	M
MT Adams RS, WA	4.65	0.0

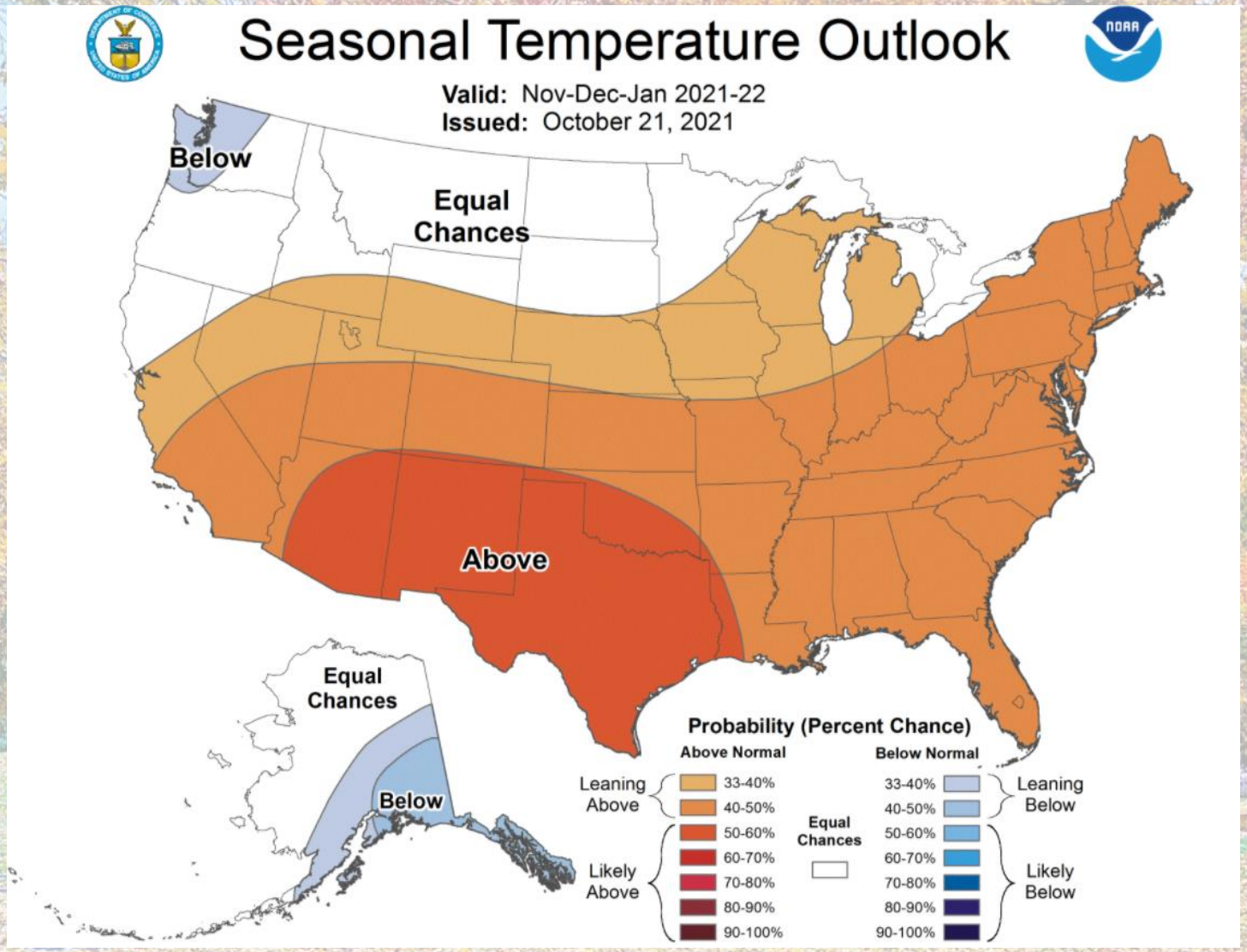
Precipitation amounts were mostly significant, with 7 of the stations receiving over an inch of rain for the month, with the highest amount of 4.65 inches at the Mt. Adams Ranger Station, and the lowest precipitation amount of 0.14 of an inch at Bend, OR. This indicates that most of the weather systems moved mostly across the northern half of the forecast area. There were not any reports of snow or hail during the month.

October 2021 - Drought Monitor



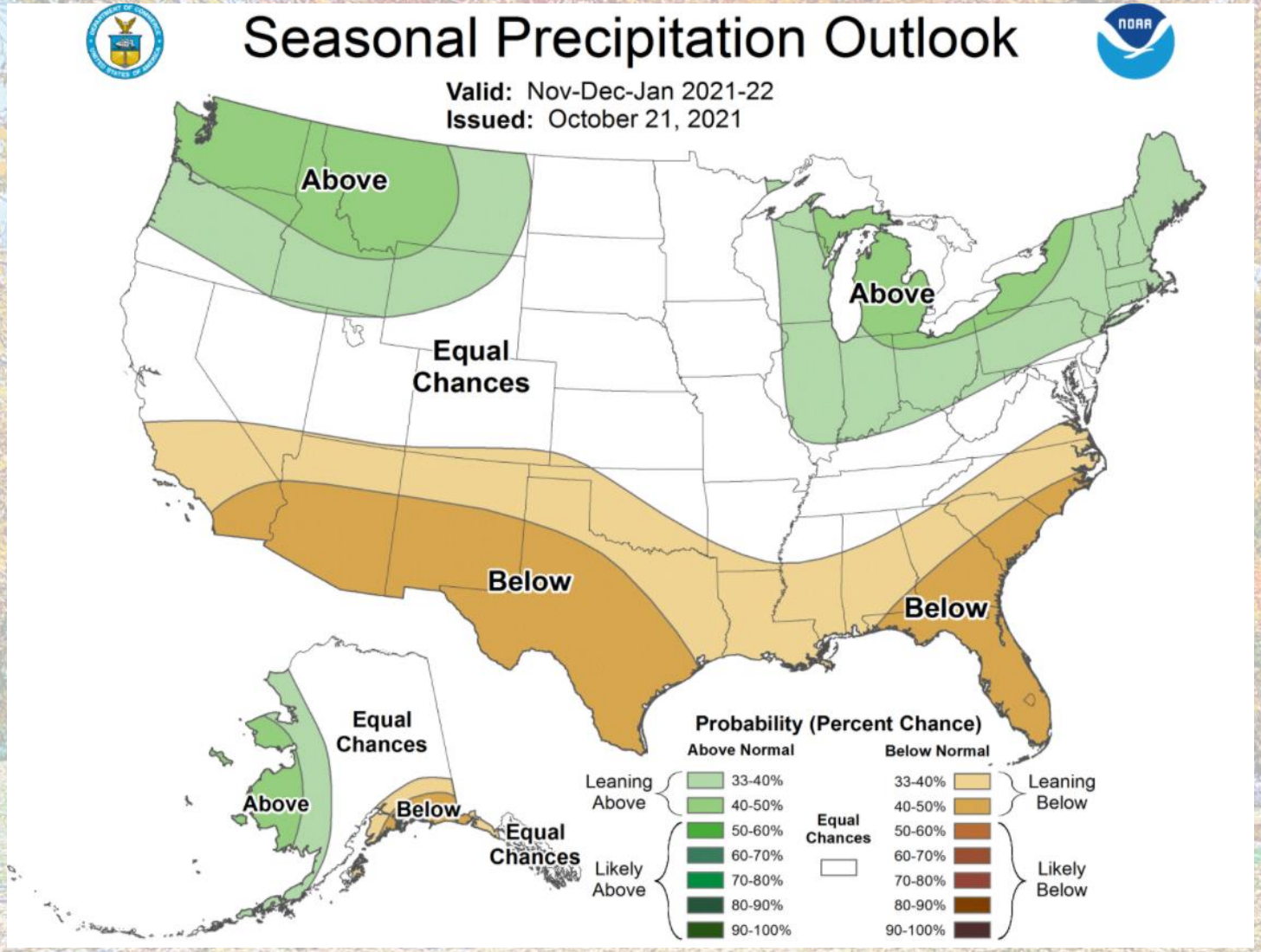
As of November 2nd , an Exceptional Drought still existed over the east slopes of the Cascades and the Lower Columbia Basin. Elsewhere, drought conditions were mostly in the Extreme Drought category, with small areas of drought conditions ranging in the None to Severe category. Even with the mostly above normal rainfall during October, there was still not enough precipitation to ease the drought conditions more significantly.

USA Three Month Temperature Outlook



The temperature outlook for the next 3 months (November – January) is for a greater chance of near to below normal temperatures over the Pacific Northwest. This is consistent with an expected La Nina event this coming winter.

USA Three Month Precipitation Outlook

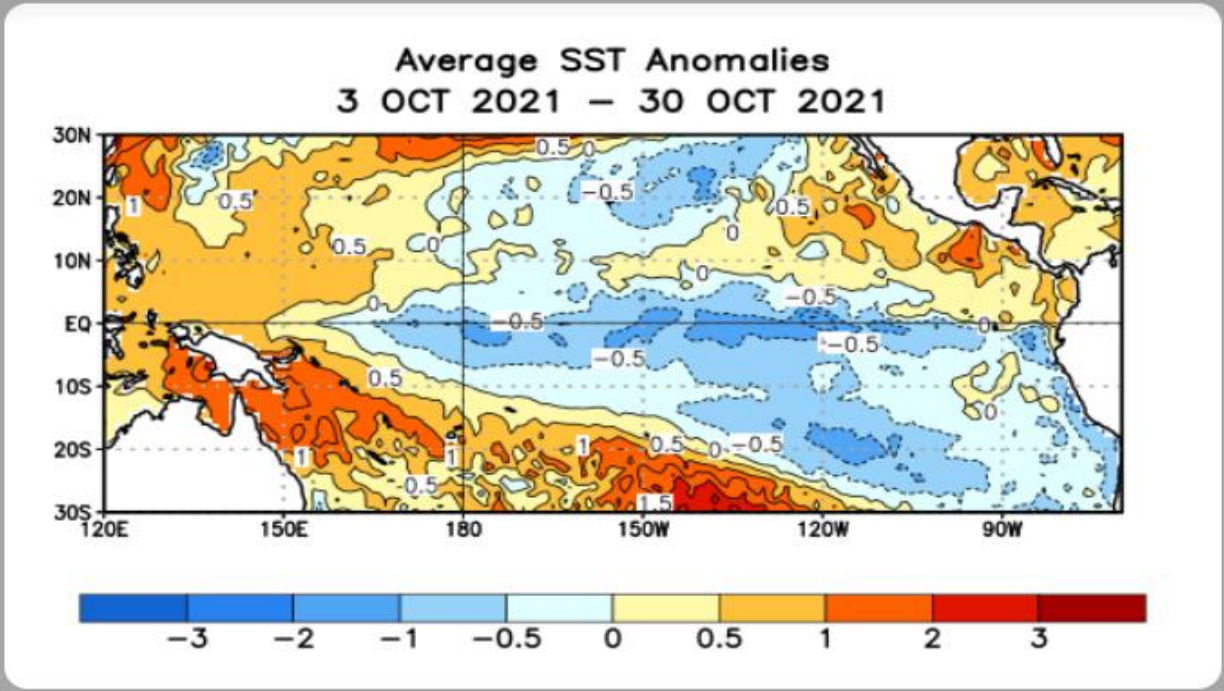


The forecast area is expected to have a greater chance of above normal precipitation during the next three months (November - January). This is also consistent with an expected La Nina event this winter.

Sea Surface Temperature (SST) Anomalies for October 2021

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

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



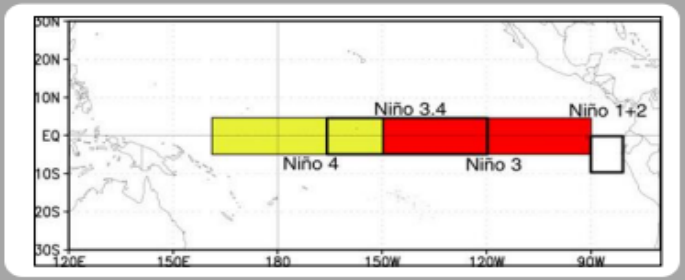
Equatorial SSTs were mostly below average from the 3rd of October to the 30th of October, with the anomalies being as much as -0.5 to -1.0 degrees. There were some warmer than normal anomalies along the Central American coast, north of the equator, however, ENSO conditions are mostly dependent on SST's anomalies AT the equatorial areas of the Pacific.

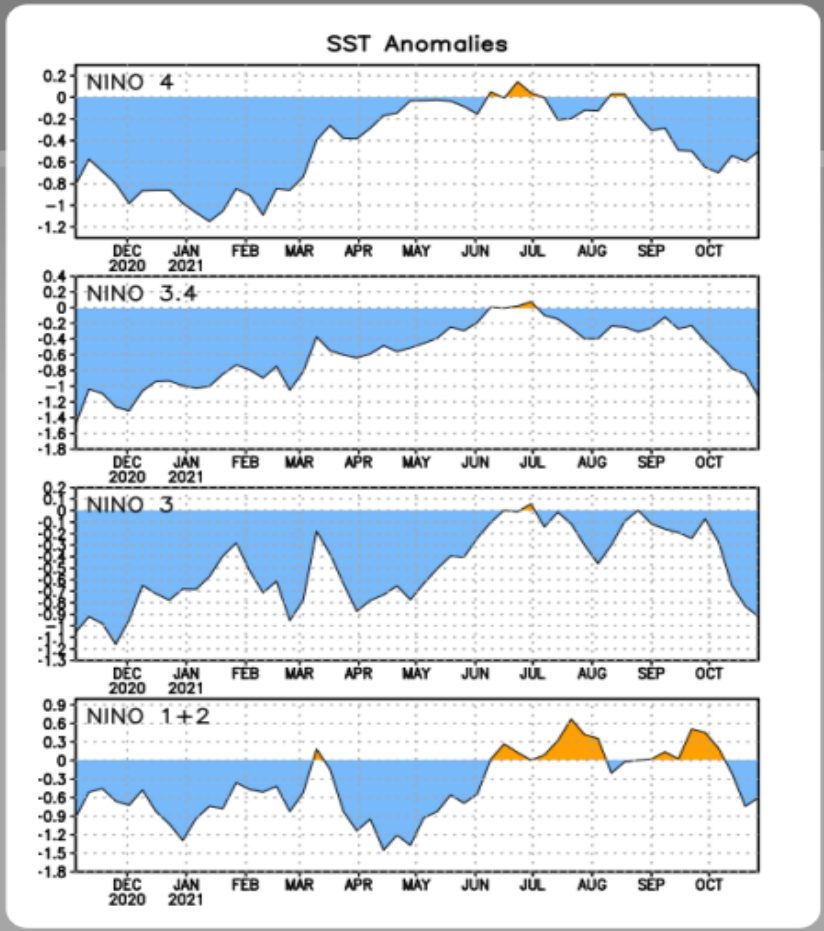
ENSO NINO Regions SST Anomalies for Each Nino Region

Niño Region SST Departures (°C) Recent Evolution

The latest weekly SST departures are:

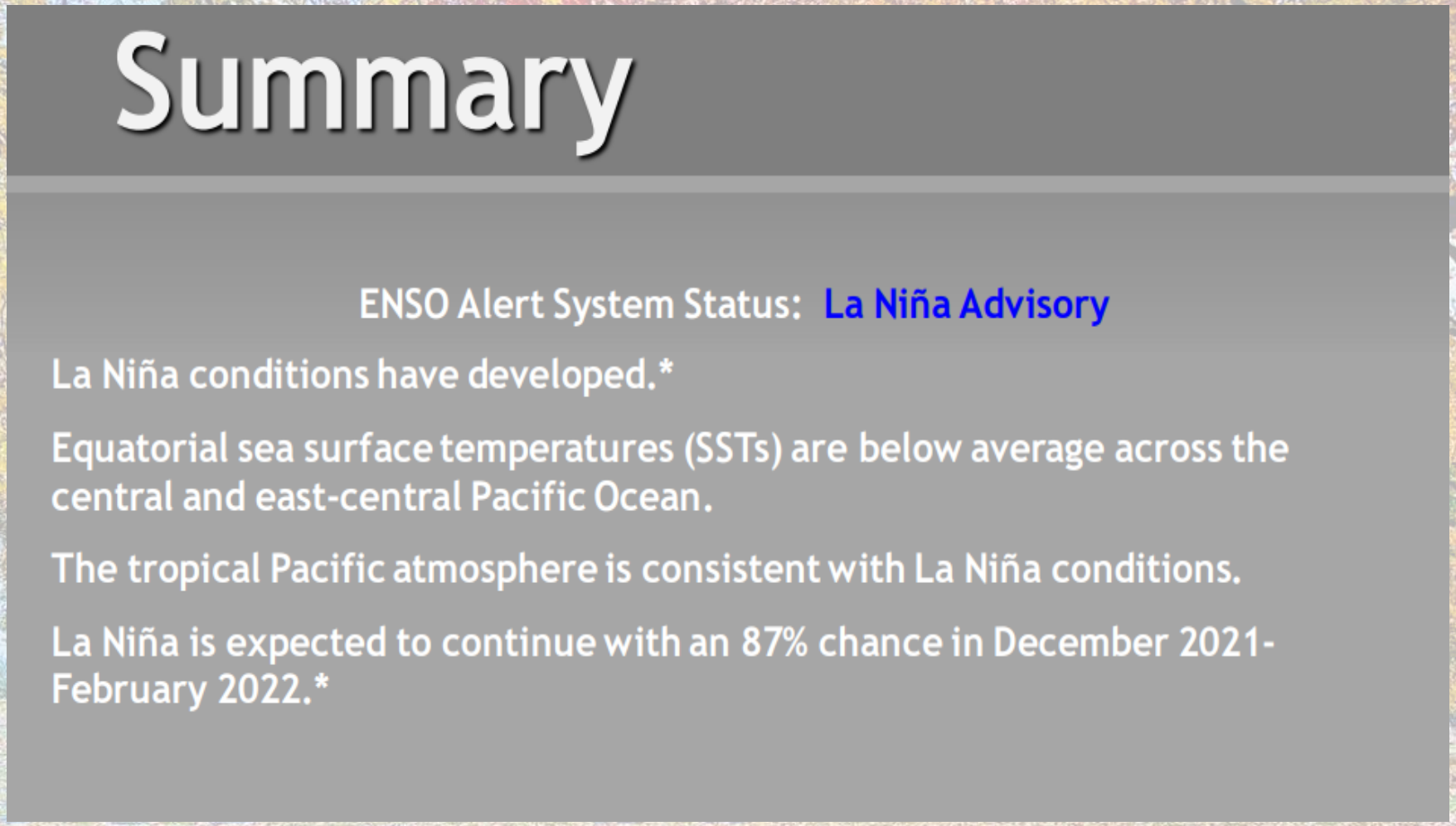
Niño 4	-0.5°C
Niño 3.4	-1.1°C
Niño 3	-0.9°C
Niño 1+2	-0.6°C





All Nino Region departures from normal SST's continued to cool during the month of October. The greatest cooling was in Nino Regions 3, 3.4, and 4. Nino region 1 + 2 showed the least amount of cooling, and had the most above normal SST's from June through September. This cooling is also consistent with an expected La Nina event this winter.

Current ENSO (El Nino Southern Oscillation) Alert System Status



The current ENSO Alert System Status is now **"La Nina Advisory"**. La Nina conditions have developed, and are expected to continue with an 87% chance from December – February. The tropical Pacific atmosphere is consistent with La Nina conditions.

Thank You!