The Month In Review

January 2023

National Weather Service
Pendleton, Oregon

Beautiful sunset under low cloud ceiling

January 2023 Climate Conditions Summary

Early January was very active and featured a deep mean upper trough pattern off the coast with a southwest flow over the west coast. This setup resulted in frequent atmospheric river (AR) systems that impacted the west coast. While the greatest impacts were over California, these weather systems caused strong east-to-west pressure gradients across the northeast mountains of the forecast area. This pattern resulted in frequent high wind events from the Grande Ronde Valley to the Foothills of the Northern Blue Mountains. Conditions were also warmer than normal across the forecast area. Then by middle to late January, the upper trough off the coast weakened, and a mean upper ridge pattern set up along the west coast. This arrangement resulted in more tranquil weather across the forecast area. There was then a brief arctic intrusion during the latter part of the month, which resulted in a couple of days with much below normal temperatures. However, there were no record lows set in the forecast area. Warmer than normal conditions quickly returned at the end of the month. Most of the significant weather systems that occurred during the month were non-thunderstorm high wind events. However, there were a few snow/heavy snow events as well. Most of the high wind events occurred during the first half of the month, while most of the snow/heavy snow events occurred during the middle of January. There were only three record weather events - all record high temperature reports. Below, and on the next slide, are images representative of the weather and climate conditions that occurred during the month.

High wind damage to a pool and the yard.


Sledding in a snowstorm near Tollgate, OR.


Brilliant sunrise over Pendleton, OR

More Images Representing January 2023 Weather/Climate Conditions

Sudden, but short, burst of snow over Pendleton, OR

Warm tone colors during a sunset over Pendleton, OR

Dense fog with falling light snow over the Horse Heaven Hills, WA

Perfect conditions for skiing at Ski Bluewood Resort, WA

Significant Weather Event Storm Reports for January 2023

Significant Weather Events					
Date	**Location**	**State**	**Event Type**	**Magnitude**	**Source**
January 4, 2023	1 WNW GRASS VALLEY	OR	SNOW	2	TRAINED SPOTTER
January 4, 2023	6 SSE MISSION	OR	NON-TSTM WND GST	68	MESONET
January 5, 2023	5 SSE MISSION	OR	NON-TSTM WND GST	76	MESONET
January 5, 2023	6 SSE MISSION	OR	NON-TSTM WND GST	76	MESONET
January 5, 2023	4 ENE MISSION	OR	NON-TSTM WND GST	68	MESONET
January 5, 2023	4 SSW MISSION	OR	NON-TSTM WND GST	59	MESONET
January 5, 2023	9 S PILOT ROCK	OR	NON-TSTM WND GST	71	MESONET
January 5, 2023	11 ENE M-FREEWATER	OR	NON-TSTM WND GST	66	MESONET
January 5, 2023	7 SSE MISSION	OR	NON-TSTM WND GST	63	MESONET
January 6, 2023	4 ENE MISSION	OR	NON-TSTM WND GST	50	MESONET
January 7, 2023	9 S PILOT ROCK	OR	NON-TSTM WND GST	53	MESONET
January 7, 2023	7 SSE LA GRANDE	OR	NON-TSTM WND GST	49	MESONET
January 7, 2023	5 SSE MISSION	OR	NON-TSTM WND GST	47	MESONET
January 7, 2023	6 SSE MISSION	OR	NON-TSTM WND GST	58	MESONET
January 7, 2023	4 ENE MISSION	OR	NON-TSTM WND GST	51	MESONET
January 7, 2023	5 SSE MISSION	OR	NON-TSTM WND GST	53	MESONET
January 7, 2023	9 S PILOT ROCK	OR	NON-TSTM WND GST	73	MESONET
January 7, 2023	7 SSE MISSION	OR	NON-TSTM WND GST	60	MESONET
January 7, 2023	6 SSE MISSION	OR	NON-TSTM WND GST	65	MESONET
January 7, 2023	1 SSW LONG CREEK	OR	NON-TSTM WND GST	59	MESONET
January 8, 2023	6 SSE MISSION	OR	NON-TSTM WND GST	63	MESONET
January 8, 2023	6 SSE MISSION	OR	NON-TSTM WND GST	61	MESONET
January 9, 2023	4 ENE MISSION	OR	NON-TSTM WND GST	63	MESONET
January 9, 2023	6 SSE MISSION	OR	NON-TSTM WND GST	65	MESONET

Please note: Magnitude units are either inches, mph, degrees F, or miles.

continued on next slide →

Significant Weather Event Storm Reports for January 2023

Significant Weather Events					
Date	**Location**	**State**	**Event Type**	**Magnitude**	**Source**
January 9, 2023	6 SSE MISSION	OR	NON-TSTM WND GST	60	MESONET
January 9, 2023	4 ENE MISSION	OR	NON-TSTM WND GST	69	MESONET
January 9, 2023	9 S PILOT ROCK	OR	NON-TSTM WND GST	75	MESONET
January 9, 2023	6 SSE MISSION	OR	NON-TSTM WND GST	70	MESONET
January 9, 2023	5 SSE MISSION	OR	NON-TSTM WND GST	71	MESONET
January 12, 2023	4 ENE MISSION	OR	NON-TSTM WND GST	60	MESONET
January 12, 2023	7 SSE LA GRANDE	OR	NON-TSTM WND GST	52	MESONET
January 12, 2023	11 SW HEPPNER	OR	NON-TSTM WND GST	47	MESONET
January 12, 2023	9 S PILOT ROCK	OR	NON-TSTM WND GST	66	MESONET
January 12, 2023	6 SSE MISSION	OR	NON-TSTM WND GST	58	MESONET
January 12, 2023	6 SSE MISSION	OR	NON-TSTM WND GST	62	MESONET
January 12, 2023	5 SSE MISSION	OR	NON-TSTM WND GST	58	MESONET
January 12, 2023	4 ENE MISSION	OR	NON-TSTM WND GST	66	MESONET
January 12, 2023	6 SSE MISSION	OR	NON-TSTM WND GST	74	MESONET
January 12, 2023	5 SSE MISSION	OR	NON-TSTM WND GST	58	MESONET
January 12, 2023	6 SSE MISSION	OR	NON-TSTM WND GST	59	MESONET
January 12, 2023	4 ENE MISSION	OR	NON-TSTM WND GST	66	MESONET
January 13, 2023	4 ENE MISSION	OR	NON-TSTM WND GST	69	MESONET
January 13, 2023	6 SSE MISSION	OR	NON-TSTM WND GST	63	MESONET
January 13, 2023	5 SSE MISSION	OR	NON-TSTM WND GST	59	MESONET
January 13, 2023	6 SSE MISSION	OR	NON-TSTM WND GST	60	MESONET
January 13, 2023	6 SSE MISSION	OR	NON-TSTM WND GST	65	MESONET
January 19, 2023	8 ESE KOOSKOOSKIE	OR	HEAVY SNOW	6	MESONET
January 19, 2023	MEACHAM	OR	SNOW	6	PUBLIC

continued on next slide →

Significant Weather Event Storm Reports for January 2023

Significant Weather Events					
Date	**Location**	**State**	**Event Type**	**Magnitude**	**Source**
January 22, 2023	17 SSE DAYTON	WA	HEAVY SNOW	12	TRAINED SPOTTER
January 22, 2023	17 SSE DAYTON	WA	HEAVY SNOW	12	TRAINED SPOTTER
January 22, 2023	JOHN DAY	OR	HEAVY SNOW	6	CO-OP OBSERVER

The vast majority of the significant weather events in January were non-thunderstorm high wind gusts. The rest were either snow or heavy snow events. All of the non-thunderstorm wind events occurred during the beginning to the middle of the month. These were caused by strong low pressure systems that moved into the region from off the Pacific, which created strong west to east pressure gradients between Baker City, OR to Pendleton, OR. Except for a snow event on the 4th of the month, all of the snow or heavy snow events occurred during the middle to the end of the month.

Record Weather Events for January 2023

Record Weather Reports					
Event	**Date**	**Where**	**Previous Record**	**New Record**	**Records Began**
High Temperature	January 13, 2023	Walla Walla, WA	63 / 2021	63 (Tie)	1930
High Temperature	January 25, 2023	Dallesport, WA	59 / 2011	61	1929
High Temperature	January 26, 2023	Ellensburg, WA	49 / 2020	58	1934

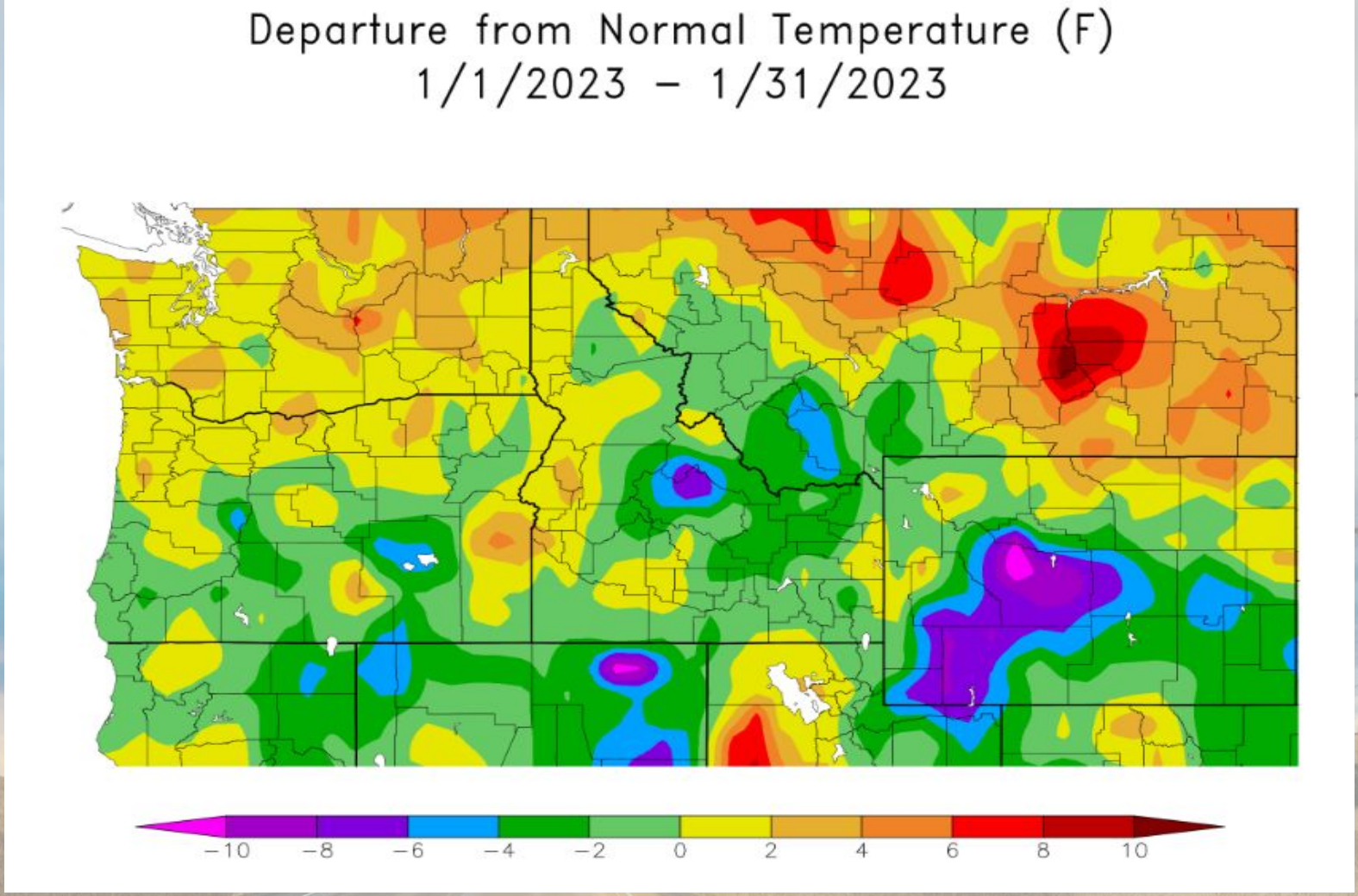
There were only 3 record weather reports during January, all of which were record high temperatures. Two of these were broken records at the end of the month, and one tie which occurred during the middle of the month, on the 13th, at Walla Walla, WA.

January 2023, Observed Monthly Maximum & Minimum Temperatures

Location	Highest Maximum	Lowest Minimum
Pendleton, OR	59	10
Redmond, OR	60	-7
Pasco, WA	59	8
Yakima, WA	58	8
Walla Walla, WA	63	13
Bend, OR Co-Op	57	-6
Ellensburg, WA	58	9
Hermiston, OR	58	5
John Day, OR	58	6
La Grande, OR	50	2
The Dalles, OR	61	12
Meacham, OR	47	-16
MT Adams RS, WA	51	2

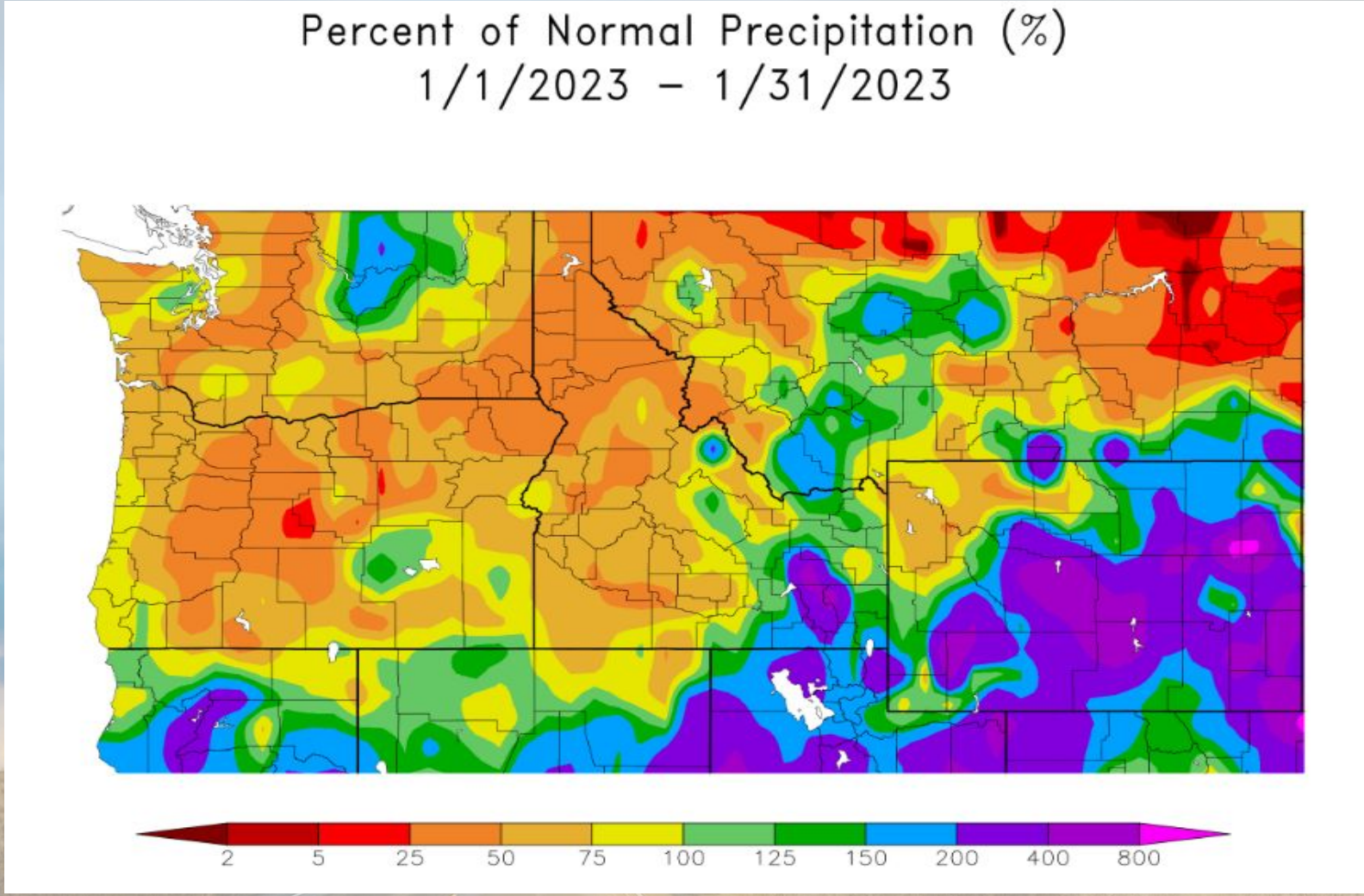
The table above shows that most of the highest temperatures that occurred in January were in the 50s to lower 60s. The warmest was at Walla Walla, WA with a high of 63 degrees, and the coolest highest temperature was at Meacham, OR with a high of 47 degrees. Most of the lowest temperatures recorded were in the single digits above zero. However, there were a few that were below zero. The least coldest was at Walla Walla with a lowest low temperature of 13 degrees. The coldest was at Meacham with a lowest low temperature of -16 degrees.

January 2023, Departure from Normal of Average Temperatures



Most of the forecast area had above normal average temperatures with departures that ranged from +1 to +6 degrees. The warmest areas were in the northern portion of OR and all of the forecast area in WA. The coolest areas were in central and northeast OR with departures that mostly ranged from -1 to -4 degrees. The coolest areas were found in extreme southwest Deschutes county and eastward to the northeast mountains.

January 2023, Percent of Normal of Precipitation



Most of the forecast area (northeast OR and southeast WA) had below normal precipitation during January. The percent of normal precipitation ranged from 5 to 25 percent of normal in central OR. Most of the rest of the forecast area had a percent of normal precipitation that ranged from 25 to sub-100 percent. There was a small area that had greater than 100 percent of normal in extreme northeast Kittitas County, WA that extended north into north central WA.

January 2023 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	41.0	2.4	25.1	1.8	33.1	2.1	0.87	-0.27
Kennewick	43.0	1.5	28.9	-0.6	36.0	0.5	0.61	-0.47
Walla Walla	44.5	3.6	29.8	-0.3	37.2	1.7	0.74	-1.79
The Dalles	47.5	5.3	34.7	3.7	41.1	4.5	1.33	-1.17
Redmond	45.7	3.3	24.0	0.9	34.9	2.2	0.24	-0.73
Pendleton Airport	46.9	5.1	31.1	2.3	39.0	3.7	0.61	-0.82
La Grande Airport	39.5	1.1	27.0	2.5	33.3	1.9	0.68	-0.95
John Day	44.9	2.4	29.1	5.7	37.0	4.1	0.31	-0.67

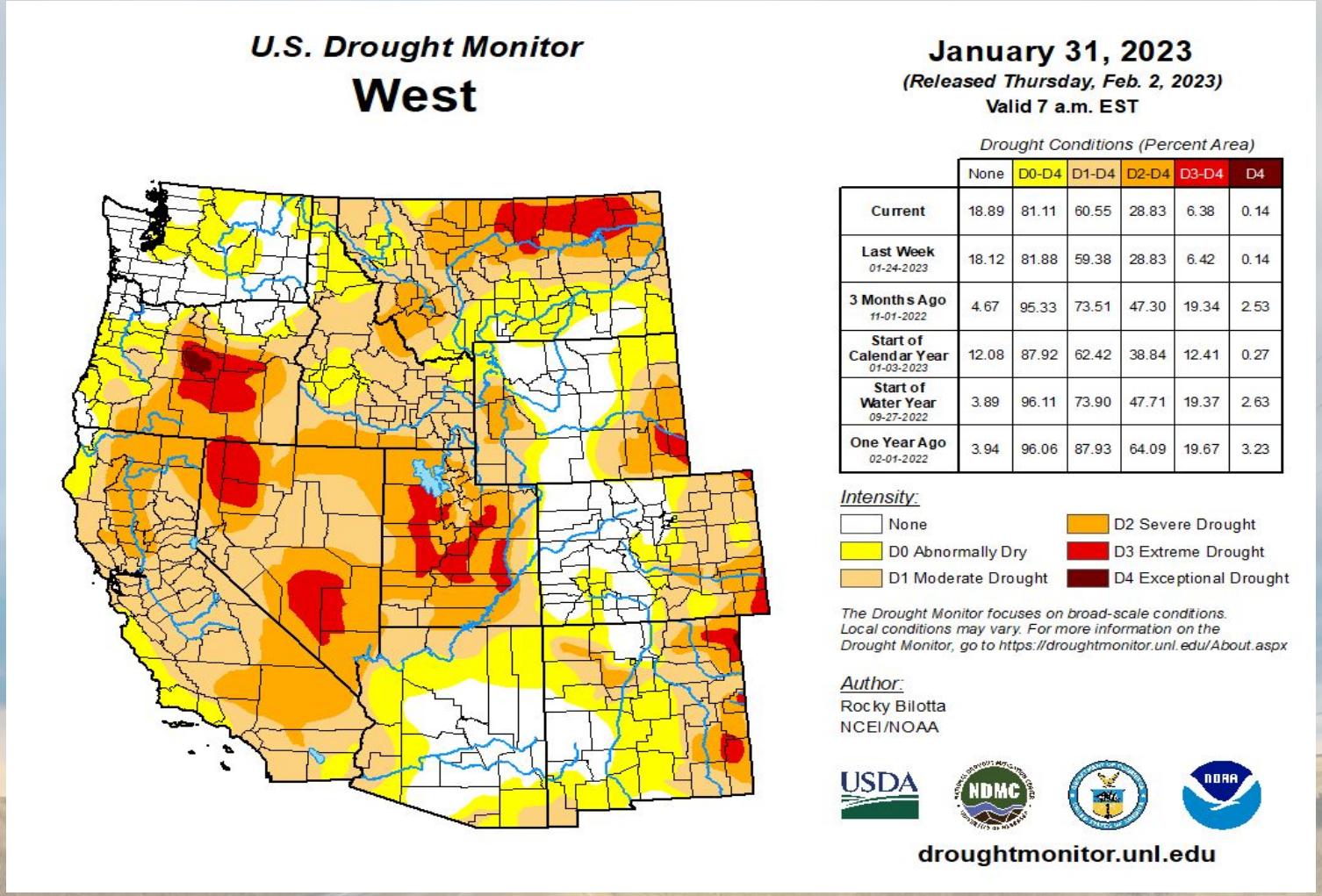
All of the average maximum temperatures were above normal with departures that ranged from 1.1 degrees to 5.3 degrees, of which the greatest was at The Dalles (Dallesport, WA). All but two of the average minimum temperatures were above normal, with the greatest at John Day, OR, with a departure of 5.7 degrees. The coolest ranged from -0.3 to -0.6 degrees which were at Walla Walla, WA and Kennewick, WA respectively. All of the mean average temperatures were above normal with departures that ranged from 0.5 degrees at Kennewick, WA to 4.5 degrees (greatest departure) at The Dalles (Dallesport, WA). All of the precipitation departures of normal were below normal, which ranged from -0.27 inch at Yakima, WA to the greatest (-1.79 inches) at Walla Walla, WA.

January 2023 Observed Total Precipitation and Total Snowfall/Hail

Location	Total Precipitation (inches)	Total Snow/Hail (inches)
Pendleton, OR	0.61	0.7
Redmond, OR	0.24	M
Pasco, WA	0.44	M
Yakima, WA	0.87	M
Walla Walla, WA	0.74	M
Bend, OR Co-Op	0.12	1.5
Ellensburg, WA	0.83	M
Hermiston, OR	0.69	M
John Day, OR	0.31	M
La Grande, OR	0.68	M
The Dalles, OR	1.33	M
Meacham, OR	2.87	M
Mt. Adams RS, WA	2.62	2.0

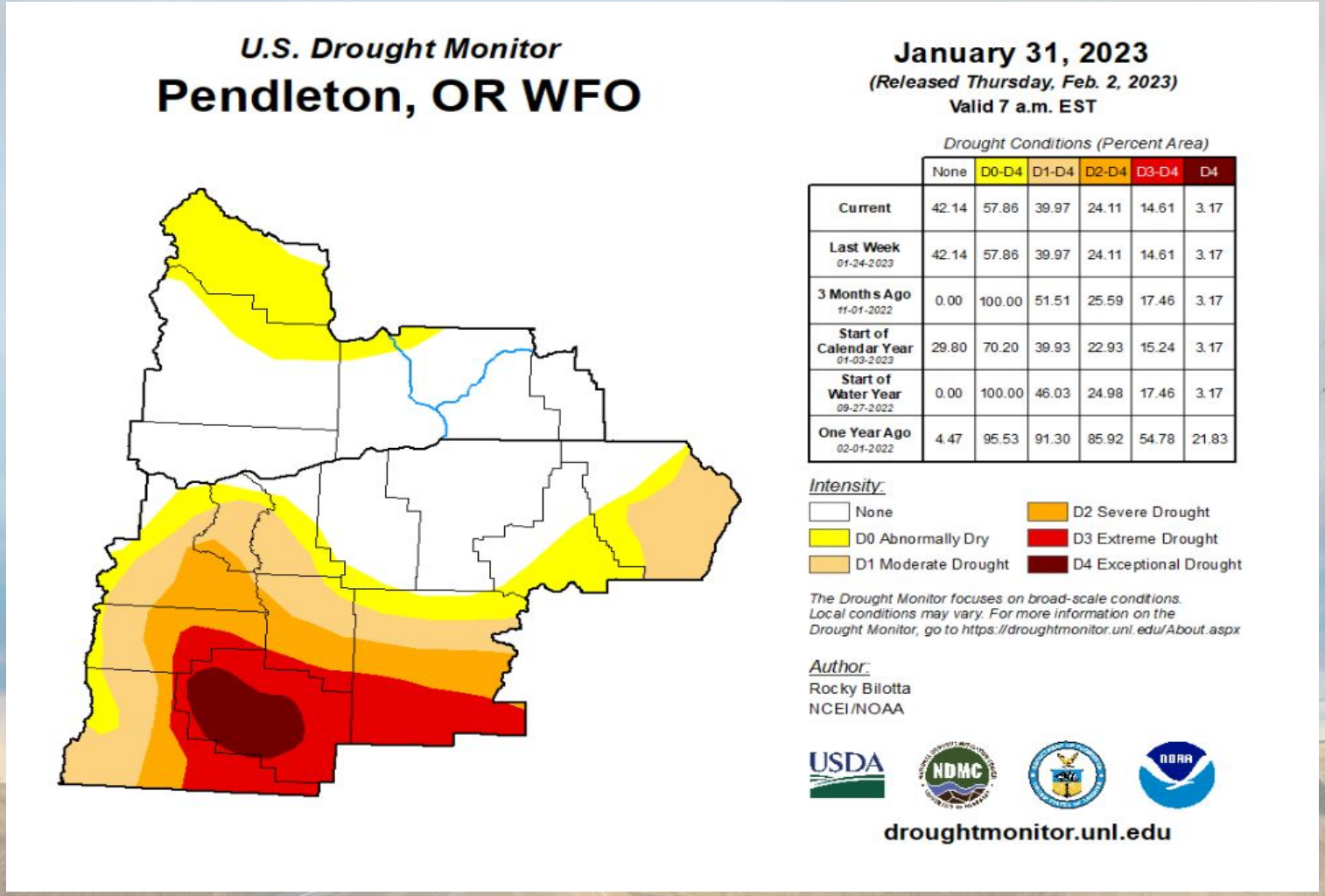
The greatest precipitation amount in the list above was at Meacham, OR, 2.87 inches, and the least was at the Bend, OR Co-Op station, only 0.12 inches. Most of the precipitation amounts were less than an inch, except for 3, which were greater than an inch and ranged from 1.33 inches at The Dalles (Dallesport, WA) to 2.87 inches at Meacham, OR. Of the three available snowfall reports, Pendleton, OR had the least amount of snow with only 0.7 inches, and the greatest was at the Mount Adams Ranger Station, with 2.0 inches.

January 2023 - Drought Monitor – Western USA



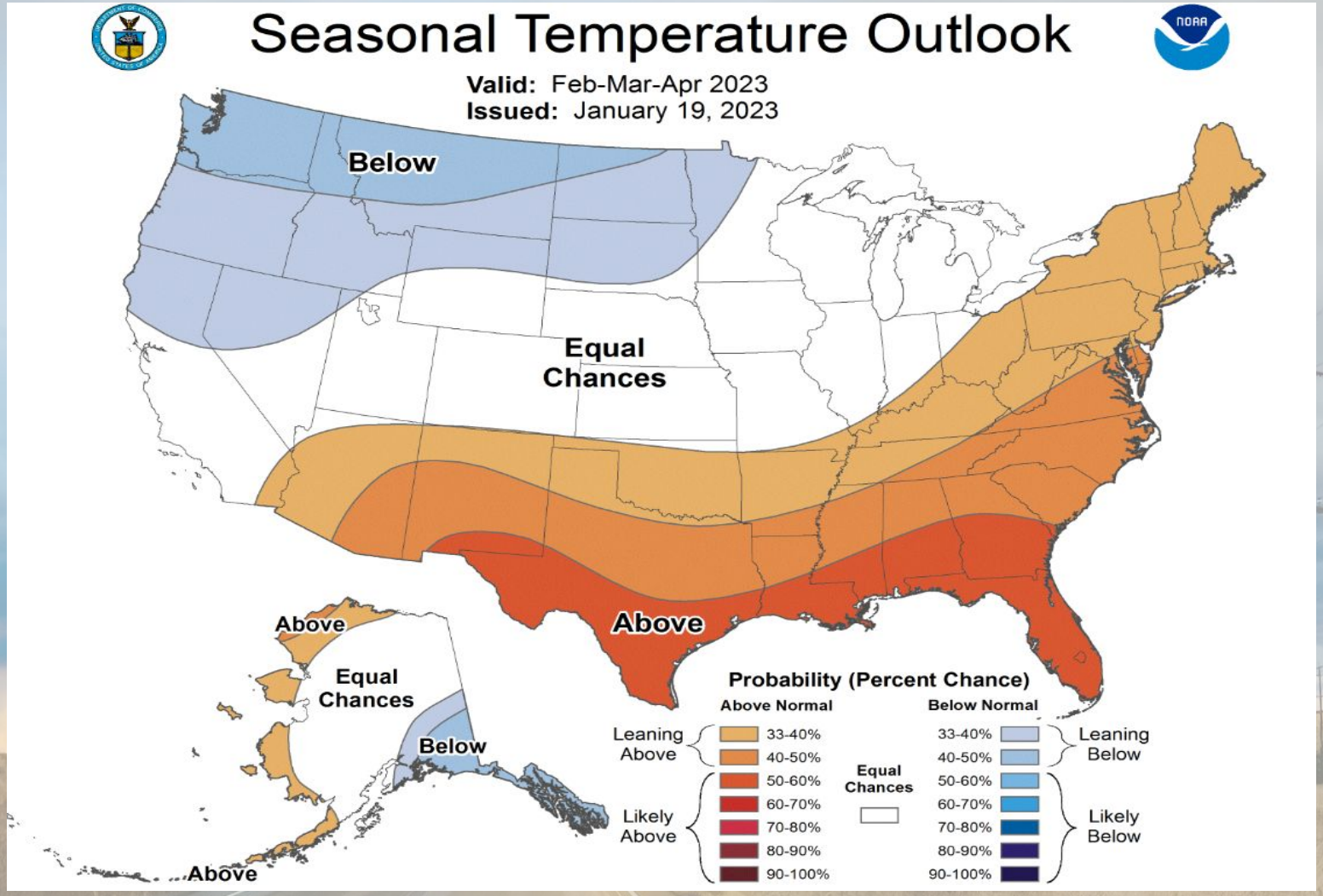
Drought conditions were in the “none” category over the Lower Columbia Basin to the Blue mountains and the southern WA Cascades (except for Kittitas County), which had drought conditions in the “D0” (Abnormally Dry) category. The greatest drought conditions continued to be in central OR, east of the Cascades, with drought conditions that ranged from the “D3” (Extreme Drought) category to as great as the “D4” (Exceptional Drought) category.

January 2023 - Drought Monitor – Pendleton Forecast Area



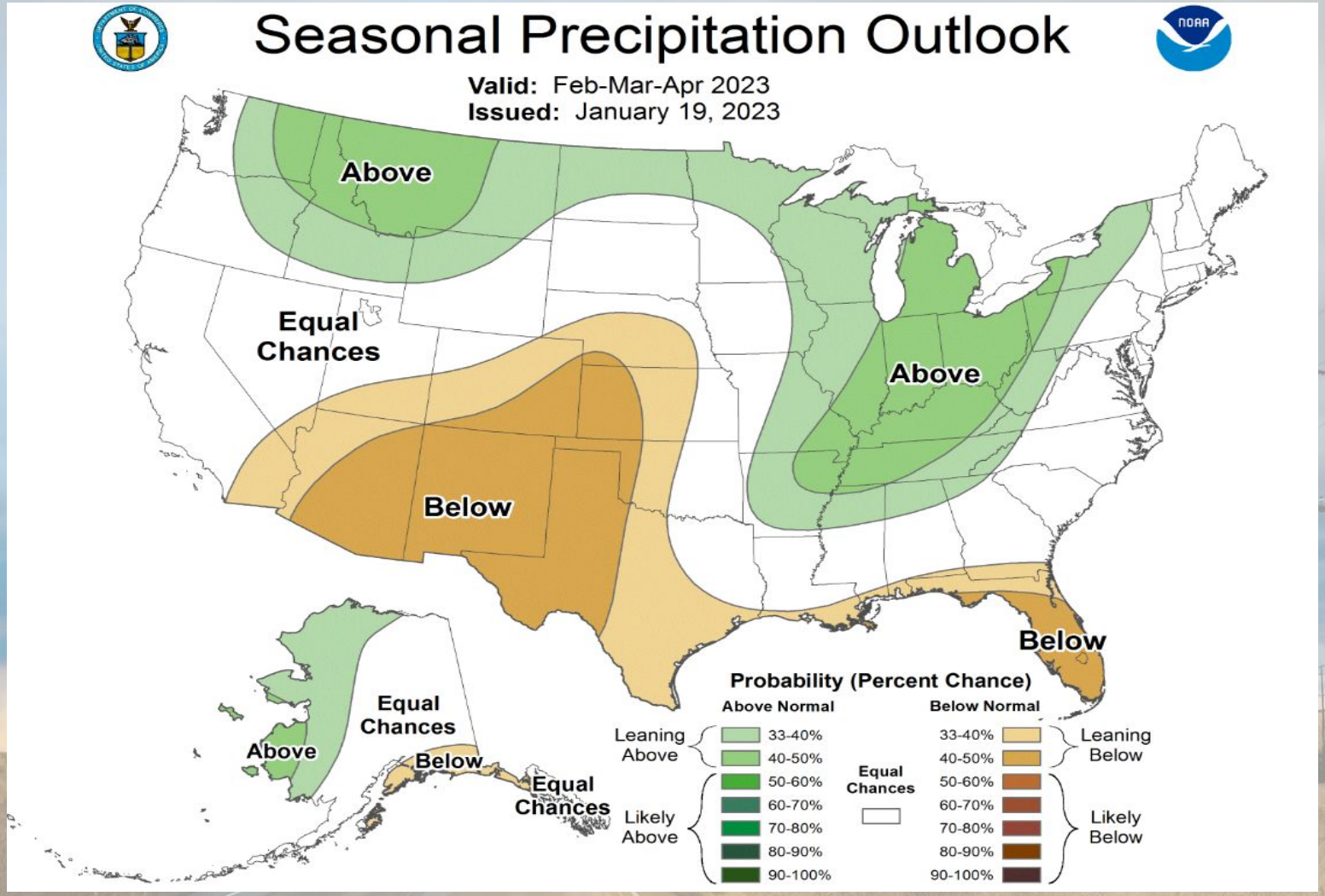
A close-up of the forecast area shows that drought conditions were the least (“none”) from the Lower Columbia Basin east to the Blue Mountains and most of the southern WA Cascades. Central OR, east of the Cascades, eastward across the southern Ochoco-John Day highlands had the worst drought conditions in the “D3” - “D4” (Extreme Drought to Exceptional Drought) category. Eastern Wallowa County had mostly a “D2” (Moderate Drought) category.

USA Three Month Temperature Outlook



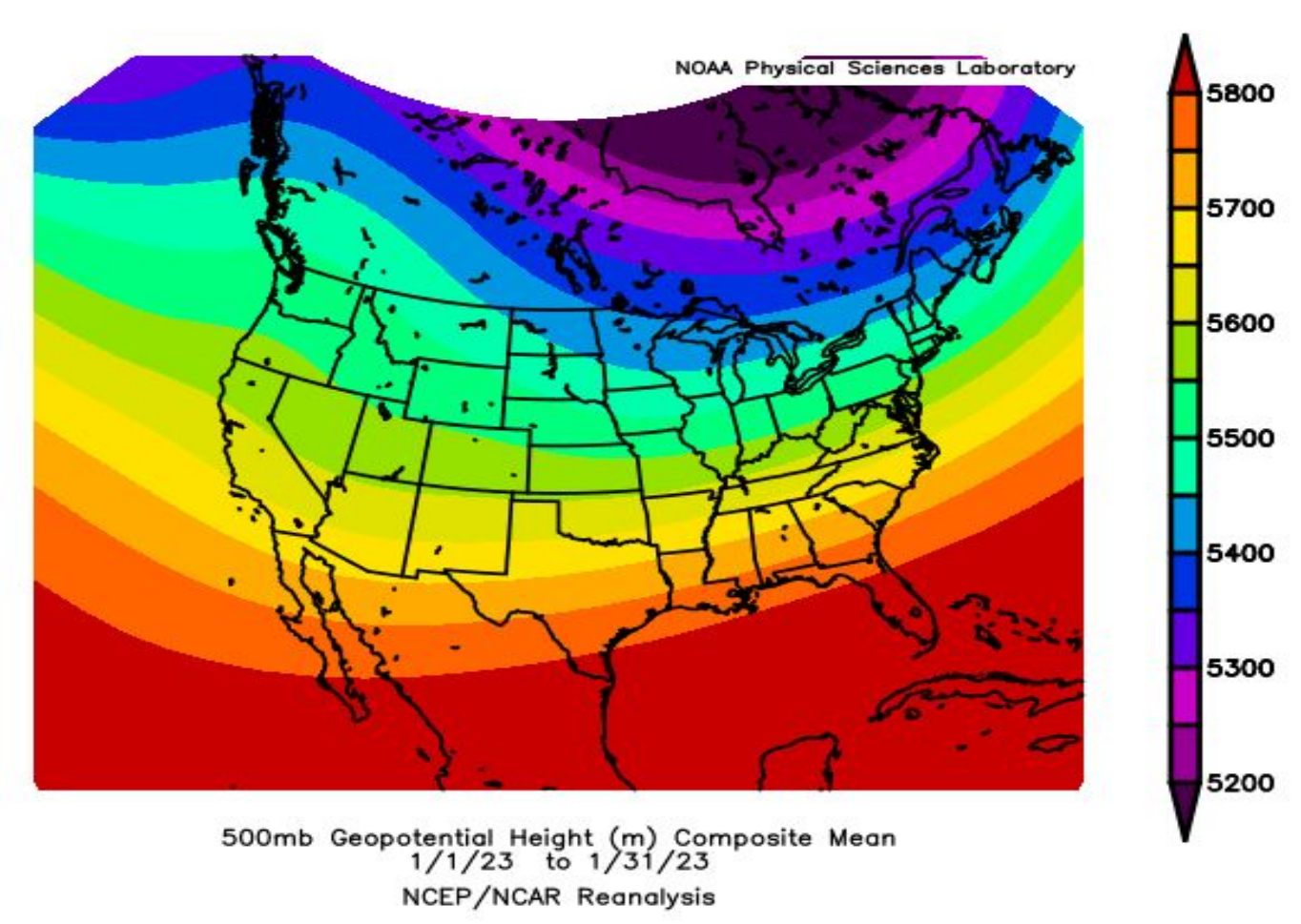
The three month outlook for the period February through April for the Pacific Northwest shows that temperature probabilities are leaning below normal. This is consistent with the ongoing La Nina event. The coldest areas are more favored to be over the WA portion of the forecast area. Most of the OR portion of the forecast area had a lesser chance of below normal temperatures.

USA Three Month Precipitation Outlook



The three month outlook for the period February - April for the Pacific Northwest shows that precipitation probabilities are mostly leaning to have above normal precipitation. This, like the temperature outlook, is also consistent with the ongoing La Nina event. The exception is in central OR, which has equal chances of above or below normal precipitation.

January 2023, Average 500 MB Pattern

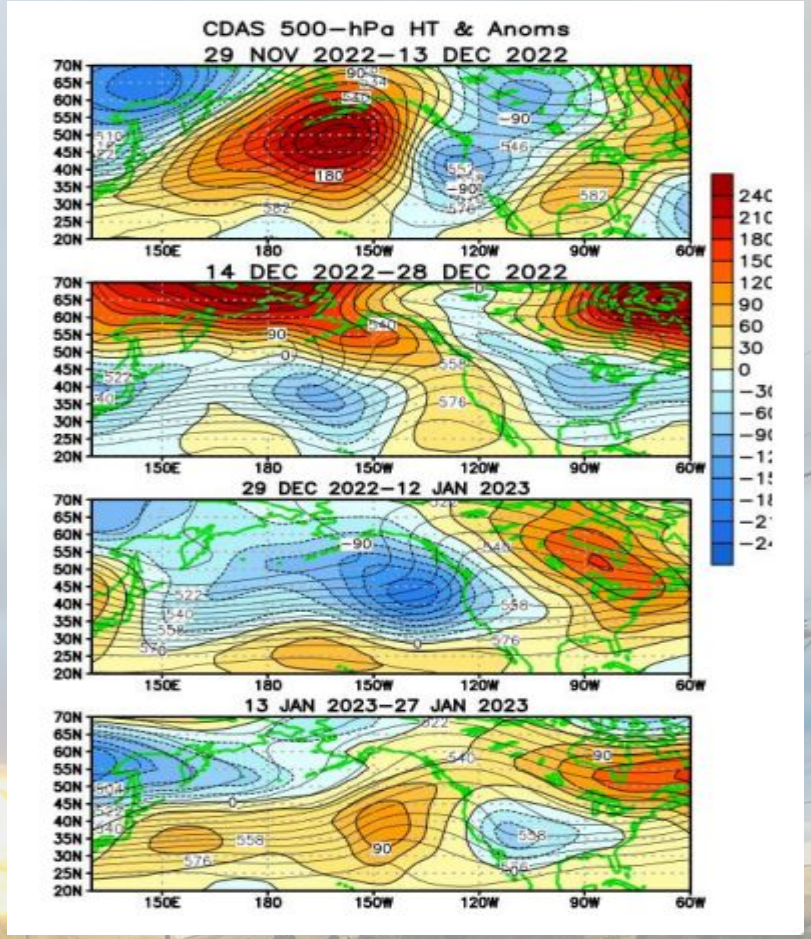


The average 500 mb pattern over the Pacific Northwest in January was a weak upper ridge pattern. This is likely the reason why the forecast area had mostly average warmer and drier than normal conditions. However, despite this average upper ridge pattern, there were frequent Pacific storms which caused high wind events (mostly in the Blue Mountain Foothills eastward to the Grande Ronde Valley). There were also a few snow/heavy snow events that were mostly in the mountains, while the lower elevations received very little snow.

Two Month, Average Bi-weekly 500 MB Plots for Dec 2022 - January 2023

These are more detailed bi-weekly average 500 mb pattern plots, which was sampled from the following period: Very late November through the end of January.

The area of focus is the Pacific Northwest (OR & WA). The land boundaries are shown by the green lines. Yellow and orange colors represent areas of high pressure or ridges at 500 mb. The blue colors show areas of low pressure systems or troughs at 500 mb.

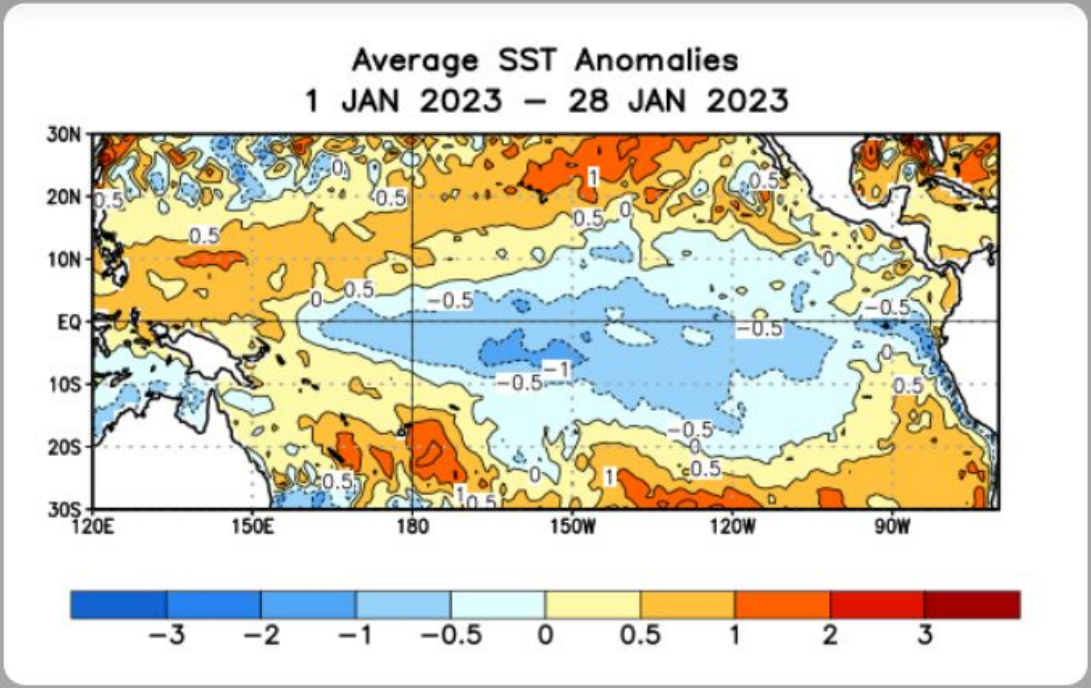


From late November to mid-December, a strong upper ridge was over the northeast Pacific, resulting in an average upper trough downstream over the Pacific Northwest. Then the upper ridge weakened and shifted east, with the upper ridge axis over the west coast. A deep upper trough then formed off the coast during early January, resulting in numerous atmospheric river (AR) events that impacted the west coast (mostly in CA). However, the resultant southwest flow caused warmer conditions over the Pacific Northwest. An upper ridge returned over the west coast later in January and brought more tranquil and warmer than normal conditions.

Sea Surface Temperature (SST) Anomalies for January 2023

SST Departures (ºC) 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.



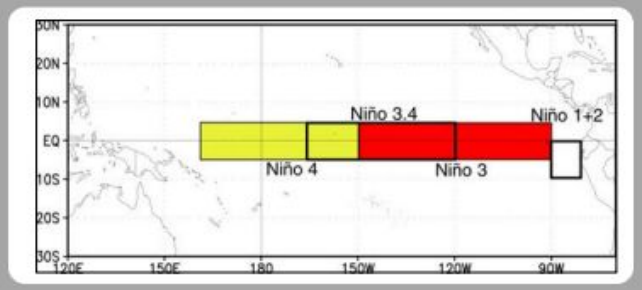
During January, Sea Surface Temperatures (SSTs) were below average across most of the tropical Pacific Ocean. There continued to be some warmer areas off the coasts of Southern and Central America. This is consistent with the ongoing La Nina event. However, the SSTs over the equatorial Pacific are expected to warm, causing a transition to ENSO-neutral.

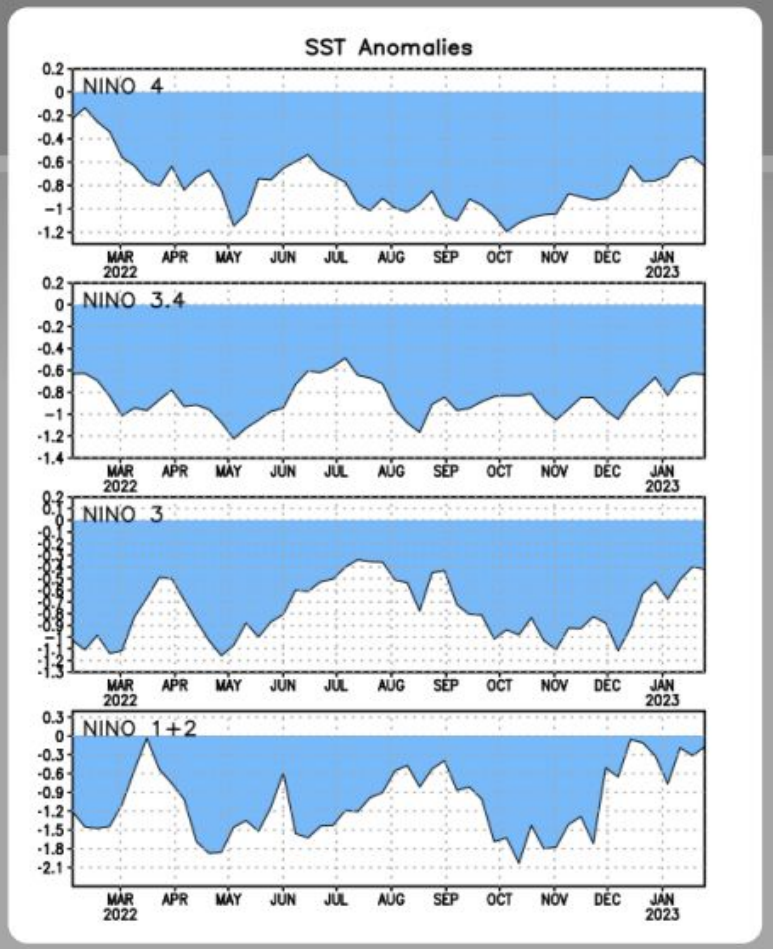
ENSO NINO Regions SST Anomalies for Each Nino Region in January 2023

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	-0.4°C
Niño 1+2	-0.2°C





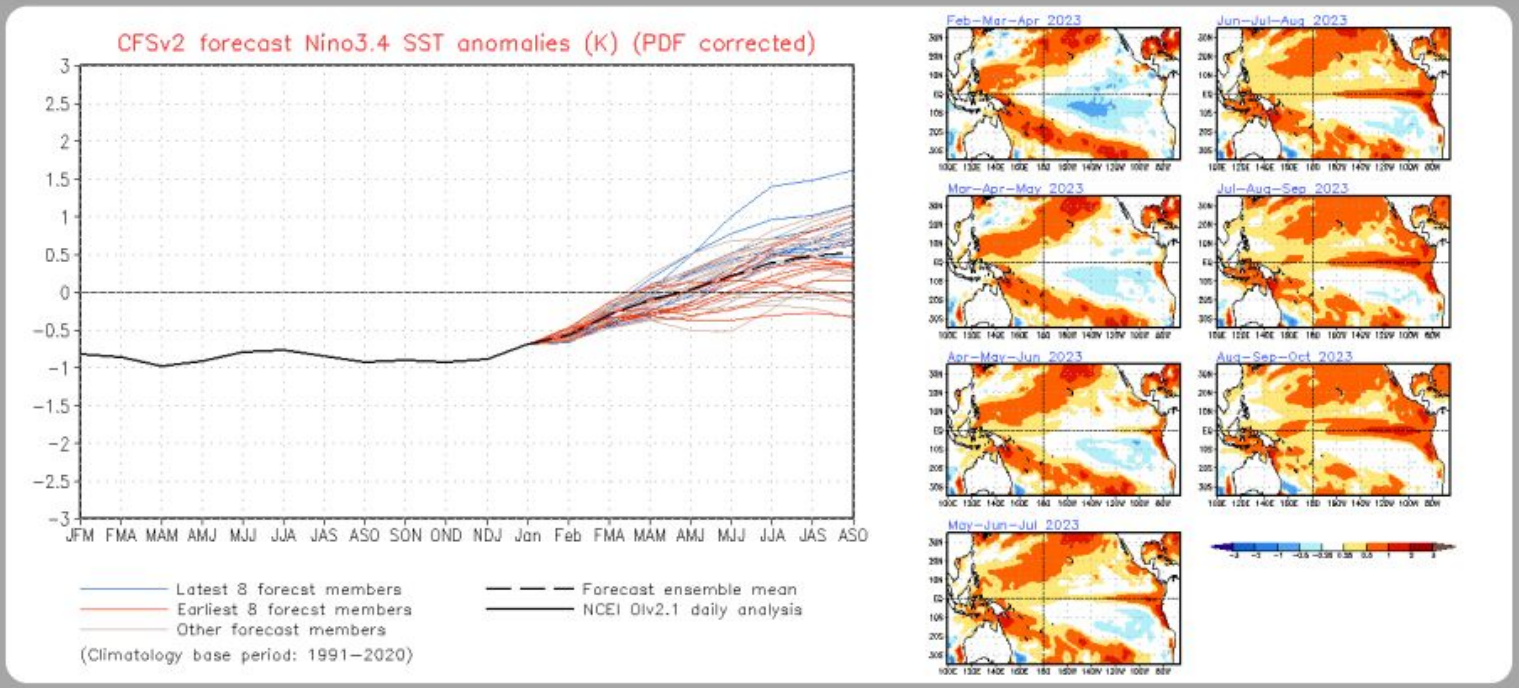
All Nino Regions still had below normal SSTs during the past year with no periods of above normal SSTs in any of the Nino Regions. All Nino Regions showed overall average warming during the past few months. Nino Regions 1+2 and 3 had the greatest warming, while Nino Regions 3.4 and 4 had less warming. However, the overall trends in SSTs indicate that the current La Nina event is beginning to transition to ENSO neutral, which is expected this spring.

Sea Surface Temperature (SST) NCEP CFS.v2 Ensemble Mean Outlook

SST Outlook: NCEP CFS.v2 Forecast (PDF corrected)

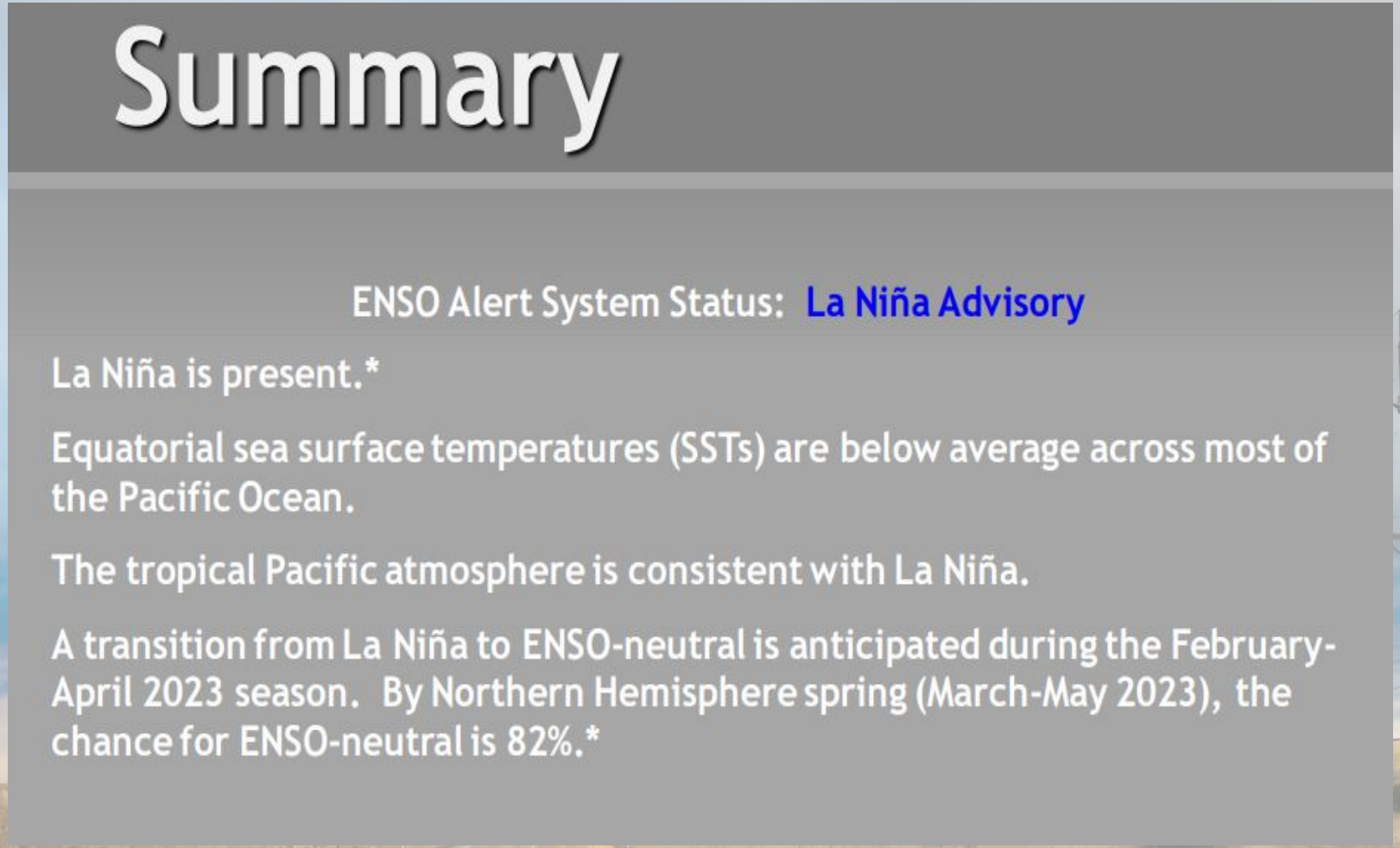
Issued: 30 January 2023

The CFS.v2 ensemble mean (black dashed line) indicates La Niña is expected to transition to ENSO-neutral by February-April 2023.



The SST CFS.v2 forecast ensemble mean shows that La Nina conditions are expected to continue weakening and transition to ENSO-neutral during February - April 2023. The smaller SST images to the right also show the gradual warming of SSTs during each of the 3-month periods, which they represent, from the rest of this winter and spring into the summer of 2023.

Current ENSO (El Nino Southern Oscillation) Alert System Status



The current ENSO Alert System Status is still **"La-Nina Advisory"**. Equatorial sea surface temperatures are still below average across most of the Pacific Ocean, and the tropical Pacific atmosphere is still consistent with La Nina. The La Nina is expected to transition to ENSO-neutral during February - April 2023. There is an 82 percent chance that by the Northern Hemisphere spring (March - May 2023) conditions will become ENSO-neutral.


NOAA
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE
NATIONAL WEATHER SERVICE
Thank You!