

The Month In Review

December 2022

National Weather Service
Pendleton, Oregon

Early winter heavy snow over the northern blue mountains

December 2022, Climate Conditions Summary

December 2022 was an active month with frequent weather systems that brought a variety of hazardous conditions. Heavy snow, strong winds, significant freezing rain, dense fog, and very cold temperatures with low wind chills were all seen this month. There was a colder than normal period at the beginning of December with low elevation snow. Many locations received 4 inches or more of snow. A drier period followed going into early-mid December with dense freezing fog, mainly over the Lower Columbia Basin and adjacent valleys owing to strong inversions. These conditions were superseded by additional short-lived colder and warmer than normal spells in mid-December. The mean upper trough pattern then shifted westward with a deep northerly flow aloft prior to the holidays, which brought an intrusion of modified arctic air. This resulted in cold temperatures with very low wind chills and mainly light to moderate snowfall. After that, warmer air and moisture moved up over trapped surface cold air, especially along and just east of the Cascades from north central OR northward along the southern WA Cascades, resulting in significant freezing rain. Some locations received a quarter of an inch of ice, or even more, during the holidays, while southern areas began to warm up. At the end of the month, conditions became warmer again in most of the forecast area. However, strong downslope wind events were seen along the Blue Mountain Foothills and in the Grande Ronde Valley. A wind gust of 87 mph was reported near Milton-Freewater, OR. Below are some images of climate conditions during the month.



First lower elevation snowstorm of the season.



Retreating fog bank over Pendleton, OR



Beams of light due to ice crystals in very cold air. Photo by John Moreau

More Images Representing December 2022 Weather/Climote Conditions



Fresh snow covered trees at Emigrant Springs State Park.



Early season snowfall over Pendleton, OR.



Sunset illuminating virga falling from distant clouds.



Rime ice coated trees from dense freezing fog in the Kittitas Valley.

Significant Weather Event Storm Reports for December 2022

Significant Weather Events					
Date	Location	State	Event Type	Magnitude	Source
December 1, 2022	9 SW SKI BLUEWOOD	OR	HEAVY SNOW	10	MESONET
December 1, 2022	SKI BLUEWOOD	WA	HEAVY SNOW	12	PUBLIC
December 1, 2022	5 NNW LA PINE	OR	SNOW	6	TRAINED SPOTTER
December 1, 2022	SE COVE	OR	HEAVY SNOW	7	TRAINED SPOTTER
December 1, 2022	WNW TOLLGATE	OR	HEAVY SNOW	24	TRAINED SPOTTER
December 4, 2022	MAUPIN	OR	SNOW	3	TRAINED SPOTTER
December 4, 2022	5 WSW PLYMOUTH	OR	HEAVY SNOW	4	TRAINED SPOTTER
December 4, 2022	LEXINGTON	OR	HEAVY SNOW	4.5	AMATEUR RADIO
December 4, 2022	1 NW HERMISTON	OR	HEAVY SNOW	4	TRAINED SPOTTER
December 4, 2022	ARLINGTON	OR	HEAVY SNOW	4	AMATEUR RADIO
December 4, 2022	4 S PENDLETON	OR	SNOW	2	TRAINED SPOTTER
December 4, 2022	1 ENE PILOT ROCK	OR	SNOW	2	TRAINED SPOTTER
December 4, 2022	1 SE KENNEWICK	WA	SNOW	2	TRAINED SPOTTER
December 4, 2022	ARLINGTON	OR	HEAVY SNOW	4	PUBLIC
December 4, 2022	IRRIGON	OR	HEAVY SNOW	4	PUBLIC
December 4, 2022	HERMISTON	OR	HEAVY SNOW	4	PUBLIC
December 4, 2022	2 W UMATILLA	OR	HEAVY SNOW	4.5	PUBLIC
December 5, 2022	KENNEWICK	WA	HEAVY SNOW	3.5	PUBLIC
December 5, 2022	GOLDENDALE	WA	SNOW	4.5	PUBLIC
December 5, 2022	WALLA WALLA	WA	HEAVY SNOW	4	PUBLIC
December 5, 2022	RICHLAND	WA	HEAVY SNOW	4	PUBLIC
December 5, 2022	DAYTON	WA	SNOW	3	PUBLIC
December 5, 2022	SUNNYSIDE	WA	SNOW	5	COUNTY OFFICIAL
December 5, 2022	ATHENA	OR	HEAVY SNOW	4	PUBLIC

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

continued on next slide →

Significant Weather Event Storm Reports for December 2022

Significant Weather Events					
Date	Location	State	Event Type	Magnitude	Source
December 5, 2022	HELIX	OR	HEAVY SNOW	4.5	PUBLIC
December 5, 2022	8 NNE HERMISTON	WA	HEAVY SNOW	4.8	CO-OP OBSERVER
December 5, 2022	1 SW UMATILLA	OR	HEAVY SNOW	5	COCORAHS
December 5, 2022	1 NNW HERMISTON	OR	HEAVY SNOW	5	CO-OP OBSERVER
December 5, 2022	MILTON-FREEWATER	OR	HEAVY SNOW	5	PUBLIC
December 5, 2022	1 NNW SUNNYSIDE	WA	HEAVY SNOW	5.5	CO-OP OBSERVER
December 5, 2022	1 NNE KENNEWICK	WA	SNOW	3.5	BROADCAST MEDIA
December 5, 2022	TERRACE HEIGHTS	WA	SNOW	1.8	TRAINED SPOTTER
December 5, 2022	2 W UMATILLA	OR	HEAVY SNOW	5.5	PUBLIC
December 5, 2022	4 W COLLEGE PLACE	WA	HEAVY SNOW	4	TRAINED SPOTTER
December 5, 2022	2 NNE GRANGER	WA	HEAVY SNOW	4	COCORAHS
December 5, 2022	1 N ELLENSBURG	WA	SNOW	3	TRAINED SPOTTER
December 5, 2022	1 ENE WALLA WALLA	WA	HEAVY SNOW	4.3	PUBLIC
December 8, 2022	1 W WHITE SALMON	WA	HEAVY SNOW	4	TRAINED SPOTTER
December 8, 2022	5 SE WHITE SALMON	OR	SNOW	1	TRAINED SPOTTER
December 8, 2022	2 SE W RICHLAND	WA	HEAVY SNOW	4.5	BROADCAST MEDIA
December 9, 2022	3 SSW WALLOWA	OR	SNOW	2.8	COCORAHS
December 9, 2022	1 SSW TROUT LAKE	WA	SNOW	6.5	COCORAHS
December 9, 2022	7 NE WHITE SALMON	WA	SNOW	3.5	COCORAHS
December 9, 2022	1 SW RICHLAND	WA	SNOW	3.3	COCORAHS
December 9, 2022	1 SSE TROUT LAKE	WA	SNOW	7	COCORAHS
December 9, 2022	6 NNW LYLE	WA	SNOW	3.8	COCORAHS
December 9, 2022	ELLENSBURG	WA	HEAVY SNOW	4	PUBLIC

continued on next slide →

Significant Weather Event Storm Reports for December 2022

Significant Weather Events					
Date	Location	State	Event Type	Magnitude	Source
December 9, 2022	22 N WHITE SALMON	WA	HEAVY SNOW	12.5	TRAINED SPOTTER
December 9, 2022	NACHES	WA	HEAVY SNOW	4	PUBLIC
December 9, 2022	14 W COLLEGE PLACE	WA	FREEZING RAIN	0	PUBLIC
December 9, 2022	MOXEE	WA	HEAVY SNOW	4	PUBLIC
December 9, 2022	15 SE PENDLETON	OR	NON-TSTM WND GST	52	PUBLIC
December 9, 2022	SELAH	WA	HEAVY SNOW	4	PUBLIC
December 9, 2022	YAKIMA	WA	SNOW	2.8	TRAINED SPOTTER
December 10, 2022	6 SSW MISSION	OR	NON-TSTM WND GST	59	MESONET
December 10, 2022	BEND	OR	HEAVY SNOW	6	PUBLIC
December 10, 2022	4 E MISSION	OR	NON-TSTM WND GST	72	MESONET
December 10, 2022	6 SE MISSION	OR	NON-TSTM WND GST	70	MESONET
December 10, 2022	TIETON	WA	HEAVY SNOW	5	PUBLIC
December 10, 2022	8 SSW THREE RIVERS	OR	SNOW	5	PUBLIC
December 10, 2022	1 SSW TROUT LAKE	WA	HEAVY SNOW	17.5	COCORAHS
December 10, 2022	5 NNW LA PINE	OR	HEAVY SNOW	5	TRAINED SPOTTER
December 10, 2022	2 NW YAKIMA	WA	HEAVY SNOW	5.8	TRAINED SPOTTER
December 10, 2022	2 ENE YAKIMA	WA	HEAVY SNOW	5	TRAINED SPOTTER
December 10, 2022	7 NE WHITE SALMON	WA	HEAVY SNOW	9	COCORAHS
December 10, 2022	13 NNE GOLDENDALE	WA	HEAVY SNOW	10	MESONET
December 10, 2022	9 S PILOT ROCK	OR	NON-TSTM WND GST	80	MESONET
December 10, 2022	6 NW THORP	WA	HEAVY SNOW	9	TRAINED SPOTTER
December 10, 2022	6 NW THORP	WA	HEAVY SNOW	9	TRAINED SPOTTER
December 10, 2022	11 NE GOLDENDALE	WA	HEAVY SNOW	7	TRAINED SPOTTER

continued on next slide →

Significant Weather Event Storm Reports for December 2022

Significant Weather Events					
Date	Location	State	Event Type	Magnitude	Source
December 11, 2022	17 SSE DAYTON	WA	SNOW	4	PUBLIC
December 11, 2022	6 SSE PRINEVILLE	OR	SNOW	4	COCORAHS
December 11, 2022	7 W REDMOND	OR	SNOW	4.5	COCORAHS
December 11, 2022	MADRAS	OR	HEAVY SNOW	6	PUBLIC
December 11, 2022	TERREBONNE	OR	HEAVY SNOW	6	PUBLIC
December 11, 2022	1 WSW REDMOND	OR	HEAVY SNOW	7.3	TRAINED SPOTTER
December 11, 2022	REDMOND	OR	HEAVY SNOW	8	PUBLIC
December 11, 2022	REDMOND	OR	HEAVY SNOW	7	PUBLIC
December 11, 2022	8 ESE REDMOND	OR	HEAVY SNOW	10.5	PUBLIC
December 12, 2022	JOSEPH	OR	HEAVY SNOW	6.3	COCORAHS
December 12, 2022	5 NE JOSEPH	OR	HEAVY SNOW	8	TRAINED SPOTTER
December 12, 2022	5 E JOSEPH	OR	HEAVY SNOW	7	TRAINED SPOTTER
December 12, 2022	1 WNW ENTERPRISE	OR	HEAVY SNOW	6	PUBLIC
December 20, 2022	29 WNW TIETON	WA	HEAVY SNOW	12	MESONET
December 20, 2022	SNOQUALMIE PASS	WA	HEAVY SNOW	15	DEPT OF HIGHWAYS
December 22, 2022	10 NW ELLENSBURG	WA	EXTR WIND CHILL	-21	MESONET
December 22, 2022	3 NNE ELLENSBURG	WA	EXTR WIND CHILL	-24	ASOS
December 22, 2022	3 SE ELLENSBURG	WA	EXTR WIND CHILL	-20	MESONET
December 22, 2022	12 NW W RICHLAND	WA	EXTR WIND CHILL	-21	MESONET
December 22, 2022	2 W FRUITVALE	WA	EXTR WIND CHILL	-20	MESONET
December 22, 2022	13 NNE BURBANK	WA	EXTR WIND CHILL	-21	MESONET
December 22, 2022	1 ESE MESA	WA	EXTR WIND CHILL	-22	MESONET
December 22, 2022	5 N CONNELL	WA	EXTR WIND CHILL	-20	MESONET

Significant Weather Event Storm Reports for December 2022

Significant Weather Events					
Date	Location	State	Event Type	Magnitude	Source
December 22, 2022	8 SW HIGHLAND	WA	EXTR WIND CHILL	-24	MESONET
December 22, 2022	12 N PROSSER	WA	EXTR WIND CHILL	-23	MESONET
December 22, 2022	3 SW W RICHLAND	WA	EXTR WIND CHILL	-21	MESONET
December 22, 2022	9 S BENTON CITY	WA	EXTR WIND CHILL	-23	MESONET
December 22, 2022	15 ESE MORO	OR	EXTR WIND CHILL	-21	MESONET
December 22, 2022	19 N WEST RICHLAND	WA	EXTR WIND CHILL	-21	MESONET
December 22, 2022	4 S BENTON CITY	WA	EXTR WIND CHILL	-25	MESONET
December 22, 2022	10 ESE KITTITAS	WA	EXTR WIND CHILL	-23	MESONET
December 23, 2022	ARLINGTON	OR	SNOW	2	DEPT OF HIGHWAYS
December 23, 2022	GOLDENDALE	WA	FREEZING RAIN	0.2	TRAINED SPOTTER
December 23, 2022	4 NW SELAH	WA	SNOW	1.7	COCORAHS
December 23, 2022	17 NW ROSLYN	WA	SNOW	5.5	COCORAHS
December 23, 2022	8 WNW ROSLYN	WA	SNOW	4	COCORAHS
December 23, 2022	2 NNE RICHLAND	WA	SNOW	1.8	COCORAHS
December 23, 2022	1 WSW BEND	OR	SNOW	1.3	COCORAHS
December 23, 2022	1 WSW TERREBONNE	OR	SNOW	1.1	COCORAHS
December 23, 2022	10 NNE PASCO	WA	SNOW	1.5	CO-OP OBSERVER
December 23, 2022	1 WNW WHITE SALMON	WA	SNOW	1.5	COCORAHS
December 23, 2022	2 E KENNEWICK	WA	SNOW	2	PUBLIC
December 23, 2022	7 SSE LA GRANDE	OR	NON-TSTM WND GST	67	MESONET
December 23, 2022	TIETON	WA	SNOW	2.5	PUBLIC
December 23, 2022	7 W PASCO	WA	SNOW	2.5	TRAINED SPOTTER
December 23, 2022	1 W WHITE SALMON	WA	HEAVY SNOW	4	TRAINED SPOTTER

Continued on next side →

Significant Weather Event Storm Reports for December 2022

Significant Weather Events					
Date	Location	State	Event Type	Magnitude	Source
December 24, 2022	11 WNW ROSLYN	WA	FREEZING RAIN	0.21	ASOS
December 24, 2022	30 W TIETON	WA	FREEZING RAIN	0.25	PUBLIC
December 24, 2022	4 ESE ROSLYN	WA	HEAVY SNOW	12	TRAINED SPOTTER
December 24, 2022	5 WNW CHENOWETH	OR	FREEZING RAIN	0.25	TRAINED SPOTTER
December 24, 2022	25 SW SOUTH CLE ELUM	WA	FREEZING RAIN	0.25	TRAINED SPOTTER
December 24, 2022	1 WNW GRASS VALLEY	OR	FREEZING RAIN	0.25	TRAINED SPOTTER
December 25, 2022	5 SSW CHENOWETH	OR	FREEZING RAIN	0.25	TRAINED SPOTTER
December 25, 2022	16 ESE BINGEN	WA	FREEZING RAIN	0.14	ASOS
December 27, 2022	SUNNYSIDE	WA	FREEZING RAIN	0.25	CO-OP OBSERVER
December 27, 2022	GRANGER	WA	FREEZING RAIN	0.25	PUBLIC
December 27, 2022	1 W SOUTH BROADWAY	WA	FREEZING RAIN	0.12	ASOS
December 27, 2022	9 S PILOT ROCK	OR	NON-TSTM WND GST	61	MESONET
December 27, 2022	1 NW HEPPNER	OR	NON-TSTM WND GST	60	MESONET
December 27, 2022	SHANIKO	OR	NON-TSTM WND GST	64	MESONET
December 27, 2022	19 N WEST RICHLAND	WA	NON-TSTM WND GST	59	MESONET
December 27, 2022	15 ESE MORO	OR	NON-TSTM WND GST	67	MESONET
December 27, 2022	4 SSW FOSSIL	OR	NON-TSTM WND GST	64	MESONET
December 27, 2022	10 NNW BENTON CITY	WA	NON-TSTM WND GST	67	MESONET
December 27, 2022	11 ENE M-FREEWATER	OR	NON-TSTM WND GST	63	MESONET
December 27, 2022	3 N JOSEPH	OR	NON-TSTM WND GST	59	MESONET
December 27, 2022	5 W SHANIKO	OR	NON-TSTM WND GST	60	MESONET
December 27, 2022	11 E SHANIKO	OR	NON-TSTM WND GST	60	MESONET
December 27, 2022	4 SSW FOSSIL	OR	NON-TSTM WND GST	74	MESONET

continued on next slide →

Significant Weather Event Storm Reports for December 2022

Significant Weather Events					
Date	Location	State	Event Type	Magnitude	Source
December 27, 2022	1 NW HEPNER	OR	NON-TSTM WND GST	62	MESONET
December 27, 2022	17 NW GOLDENDALE	WA	NON-TSTM WND GST	59	MESONET
December 27, 2022	WALLA WALLA	WA	NON-TSTM WND GST	69	ASOS
December 27, 2022	HERMISTON	OR	NON-TSTM WND GST	58	ASOS
December 27, 2022	3 WSW RUFUS	OR	NON-TSTM WND GST	60	MESONET
December 27, 2022	14 SE BURBANK	WA	NON-TSTM WND GST	58	MESONET
December 27, 2022	4 NW W RICHLAND	WA	NON-TSTM WND GST	60	MESONET
December 27, 2022	4 W ADAMS	OR	NON-TSTM WND GST	68	MESONET
December 27, 2022	1 NNW LEXINGTON	OR	NON-TSTM WND GST	68	MESONET
December 27, 2022	8 WSW GRASS VALLEY	OR	NON-TSTM WND GST	63	MESONET
December 27, 2022	1 WNW ARLINGTON	OR	NON-TSTM WND GST	59	MESONET
December 27, 2022	1 NNE PASCO	WA	NON-TSTM WND GST	58	ASOS
December 27, 2022	22 NE GOLDENDALE	WA	NON-TSTM WND GST	67	MESONET
December 27, 2022	8 WSW ECHO	OR	NON-TSTM WND GST	59	MESONET
December 27, 2022	9 NNE RICHLAND	WA	NON-TSTM WND GST	58	MESONET
December 27, 2022	5 WSW RUFUS	OR	NON-TSTM WND GST	62	MESONET
December 27, 2022	5 N RICHLAND	WA	NON-TSTM WND GST	59	MESONET
December 27, 2022	10 NNW BENTON CITY	WA	NON-TSTM WND GST	79	MESONET
December 27, 2022	15 ESE MORO	OR	NON-TSTM WND GST	71	MESONET
December 27, 2022	27 S MABTON	WA	NON-TSTM WND GST	60	MESONET
December 27, 2022	4 ESE WALLA WALLA	WA	NON-TSTM WND GST	60	MESONET
December 27, 2022	6 E WALLA WALLA	WA	NON-TSTM WND GST	60	MESONET
December 27, 2022	5 N RICHLAND	WA	NON-TSTM WND GST	58	MESONET

continued on next slide →

Significant Weather Event Storm Reports for December 2022

Significant Weather Events					
Date	Location	State	Event Type	Magnitude	Source
December 27, 2022	8 NW WEST RICHLAND	WA	NON-TSTM WND GST	60	MESONET
December 27, 2022	6 E WALLA WALLA	WA	NON-TSTM WND GST	60	MESONET
December 27, 2022	2 WSW MISSION	OR	NON-TSTM WND GST	60	MESONET
December 27, 2022	8 SE MISSION	OR	NON-TSTM WND GST	65	MESONET
December 27, 2022	2 NNW PENDLETON	OR	NON-TSTM WND GST	58	ASOS
December 27, 2022	14 NNW W RICHLAND	WA	NON-TSTM WND GST	59	MESONET
December 27, 2022	6 SSE MISSION	OR	NON-TSTM WND GST	58	MESONET
December 27, 2022	13 W COLLEGE PLACE	WA	NON-TSTM WND GST	60	MESONET
December 27, 2022	10 NNW PENDLETON	OR	NON-TSTM WND GST	62	MESONET
December 27, 2022	WALLA WALLA	WA	NON-TSTM WND GST	76	ASOS
December 27, 2022	1 SW KAHLOTUS	WA	NON-TSTM WND GST	62	MESONET
December 27, 2022	5 SSW IRRIGON	OR	NON-TSTM WND GST	59	MESONET
December 27, 2022	11 ENE M-FREEWATER	OR	NON-TSTM WND GST	87	MESONET
December 30, 2022	5 WNW UNION	OR	NON-TSTM WND GST	61	MESONET
December 30, 2022	1 SSW LONG CREEK	OR	NON-TSTM WND GST	55	MESONET
December 30, 2022	6 SSE MISSION	OR	NON-TSTM WND GST	53	MESONET
December 30, 2022	6 SSE MISSION	OR	NON-TSTM WND GST	70	MESONET
December 30, 2022	5 SSE MISSION	OR	NON-TSTM WND GST	63	MESONET
December 30, 2022	7 SE MISSION	OR	NON-TSTM WND GST	54	MESONET
December 30, 2022	7 SSE MISSION	OR	NON-TSTM WND GST	50	MESONET
December 30, 2022	4 SSW MISSION	OR	NON-TSTM WND GST	50	MESONET
December 30, 2022	1 S UNION	OR	NON-TSTM WND GST	48	MESONET
December 30, 2022	4 ESE WALLA WALLA	WA	NON-TSTM WND GST	46	MESONET

continued on next slide →

Significant Weather Event Storm Reports for December 2022

Significant Weather Events					
Date	Location	State	Event Type	Magnitude	Source
December 30, 2022	4 ENE MISSION	OR	NON-TSTM WND GST	63	MESONET
December 30, 2022	7 SSE LA GRANDE	OR	NON-TSTM WND GST	51	MESONET
December 30, 2022	2.3 NW FINLEY	WA	DENSE FOG	0.25	TRAINED SPOTTER
December 30, 2022	5 NNW LA PINE	OR	SNOW	2.5	TRAINED SPOTTER
December 30, 2022	ELLENSBURG	WA	SNOW	4	TRAINED SPOTTER
December 30, 2022	2 NE YAKIMA	WA	SNOW	2.6	TRAINED SPOTTER
December 30, 2022	1 N ELLENSBURG	WA	SNOW	4	TRAINED SPOTTER

There were a great number of significant weather reports during December, including strong non-thunderstorm wind gusts, snow/heavy snow, significant freezing rain, and very cold air with very low wind chills. There were also periods of dense freezing fog, over strong valley inversions, while during fair weather in the higher elevations. Most of the significant events were either heavy snow, freezing rain or strong winds.

Record Weather Events for December 2022

Record Weather Reports					
Event	Date	Where	Previous Record	New Record	Records Began
Low Temperature	December 2, 2022	Ellensburg, WA	10 / 2014	6	1934
Low Temperature	December 4, 2022	Ellensburg, WA	11 / 2013	6	1934
Maximum Rainfall	December 11, 2022	Redmond, OR	0.66 / 1948	1.09	1941
Low Temperature	December 21, 2022	Ellensburg, WA	0 / 1998	-8	1934
Low Temperature	December 22, 2022	Ellensburg, WA	-2 / 1998	-9	1934

Only 5 record weather events occurred, four of which were record low temperatures and one was a record maximum rainfall, which was at Redmond, OR.

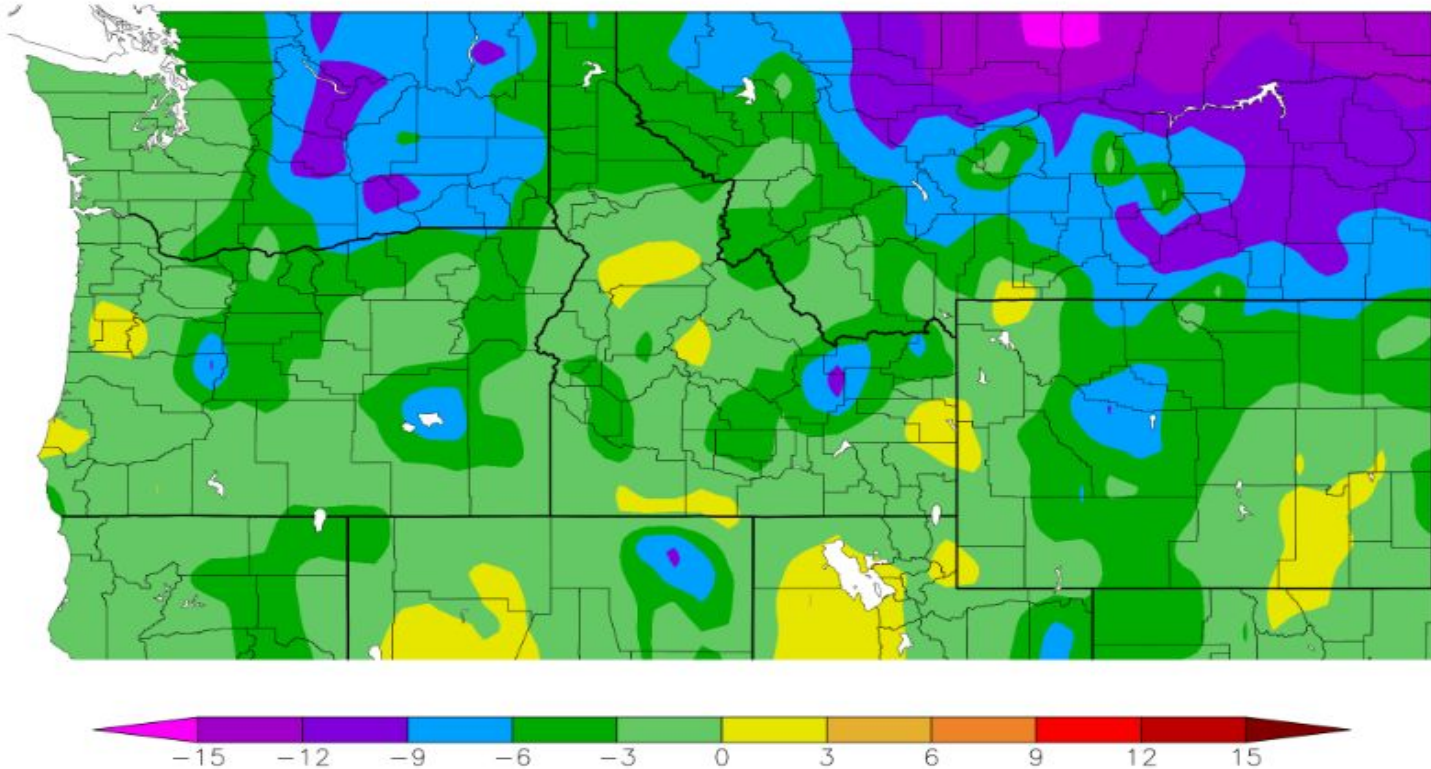
December 2022, Observed Monthly Maximum & Minimum Temperatures

Location	Highest Maximum	Lowest Minimum
Pendleton, OR	59	2
Redmond, OR	55	-3
Pasco, WA	55	0
Yakima, WA	47	2
Walla Walla, WA	57	-1
Bend, OR	57	6
Ellensburg, WA	45	-9
Hermiston, OR	61	2
John Day, OR	57	11
La Grande, OR	52	-1
The Dalles, OR	55	14
Meacham, OR	46	-5
MT Adams RS, WA	41	3

The table above shows that most of the highest maximum temperatures were in the 50s, but there were also a few in the 40s, and one above 60 degrees. The greatest maximum was 61 degrees at Hermiston, OR, and the lowest was 41 degrees at the Mt. Adams Ranger station, WA. The lowest minimum temperature was -9 degrees at Ellensburg, WA, and the highest was 14 degrees at The Dalles (Dallesport, WA). Most were in the single digits above and below zero, with two at or above 10 degrees, and none at or below -10 degrees.

December 2022, Departure from Normal of Average Temperatures

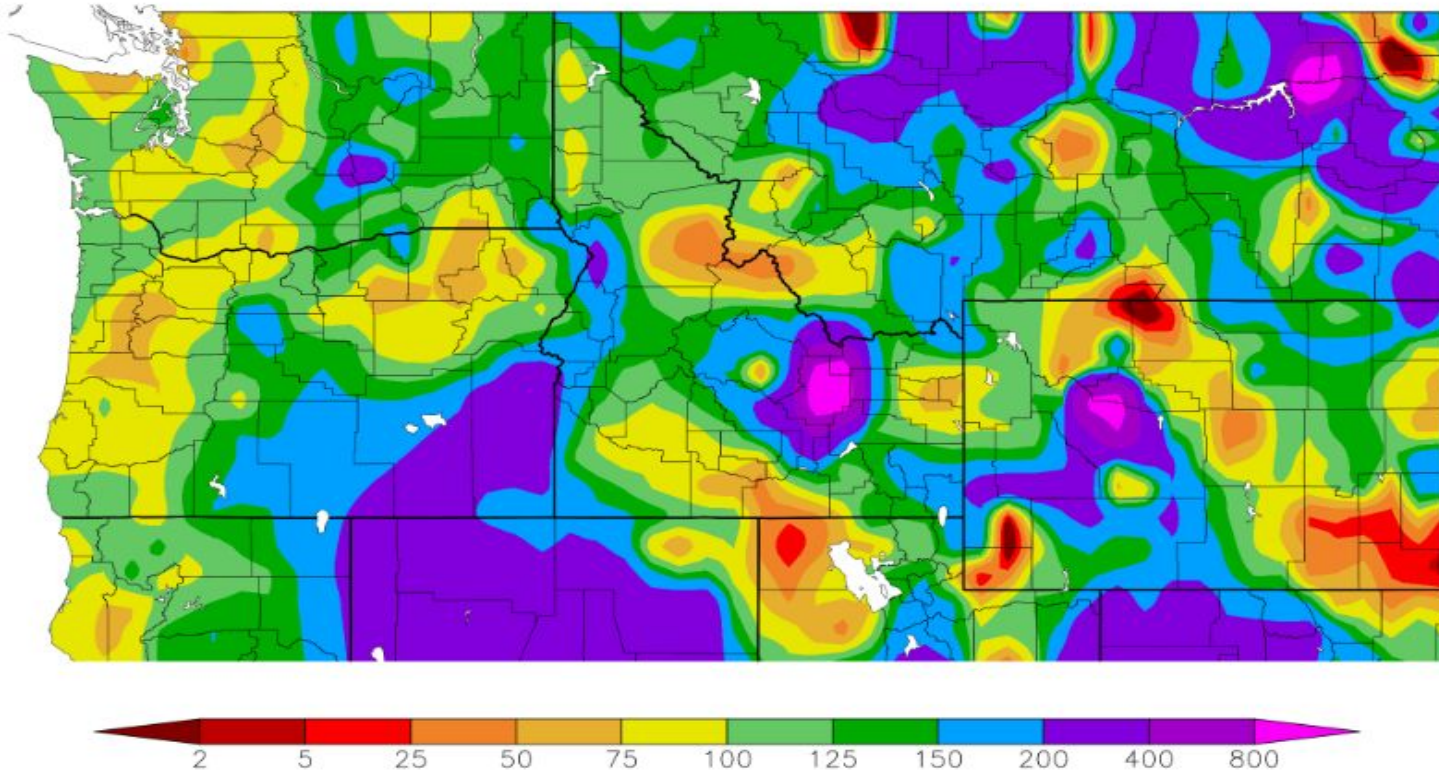
Departure from Normal Temperature (F)
12/1/2022 – 12/31/2022



Nearly all of the forecast area had a departure from normal of the average temperatures that were below normal. The coldest areas were on the Washington side with most of that area having departures from -6 to -12 degrees. On the Oregon side, most areas had departures from 0 to -6 degrees. However, there was one report, at John Day, OR, which had a departure of +2.8 degrees for the mean average temperature as shown in a table, in a slide below.

December 2022, Percent of Normal of Precipitation

Percent of Normal Precipitation (%)
12/1/2022 – 12/31/2022



Most of the east central to the northeast mountains, and the Blue Mountain Foothills had below normal precipitation, with percent of normals ranging from 50 to 99 percent of normal. Most of the remainder of northeast OR and southeast WA had above normal precipitation with percent of normals ranging from 101 to 150 percent of normal. There were small areas that were above 150 percent of normal, but no areas below 50 percent of normal.

December 2022 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	29.6	-6.2	16.6	-4.7	23.1	-5.4	2.17	0.64
Kennewick	31.5	-8.4	21.4	-7.4	26.5	-7.8	1.63	0.50
Walla Walla	34.4	-4.1	22.7	-5.7	28.6	-4.8	1.63	-0.84
The Dalles	40.8	0.5	28.2	-2	34.5	-0.7	2.08	-0.65
Redmond	39.8	-0.7	18.2	-2.5	29	-1.6	1.91	0.75
Pendleton Airport	37.4	-2.1	24.5	-2.5	31	-2.2	1.32	-0.15
La Grande Airport	35.3	-2.3	24.6	0.9	29.9	-0.8	1.48	-0.18
John Day	42.5	0.8	27.2	4.8	34.8	2.8	1.02	-0.22

All, but two, of the mean maximum and mean minimum temperature departures from normal were negative (below normal). The greatest mean maximum departure was -8.4 degrees at Kennewick, WA and the greatest mean minimum departure was -7.4 degrees, also at Kennewick, WA. All, but one, of the mean average temperature departures were negative (below normal). The greatest of these was also at Kennewick, WA. Kennewick, WA was the coldest station in the list above, while John Day, OR was the warmest. All, but two, of the precipitation departures from normal were negative (drier than normal). The greatest of these was -0.84 inch, which was at Walla Walla, WA. The two wettest stations in the list above were Yakima, WA and Kennewick, WA, which had 0.64 and 0.50 inch above normal respectively.

December 2022 Observed Total Precipitation and Total Snowfall/Hail

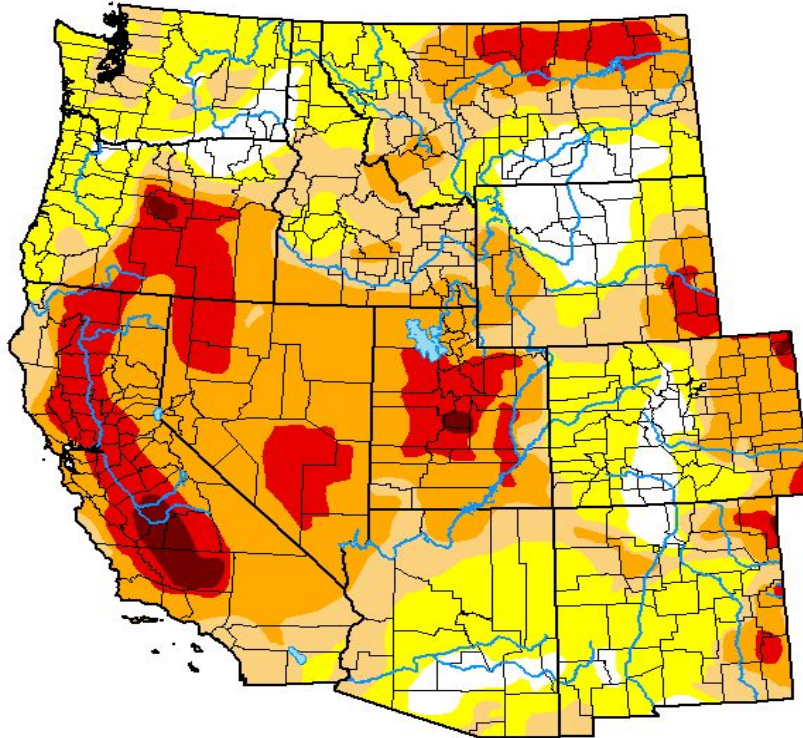
Location	Total Precipitation (inches)	Total Snow/Hail (inches)
Pendleton, OR	1.32	6.4
Redmond, OR	1.91	M
Pasco, WA	0.46	M
Yakima, WA	2.17	M
Walla Walla, WA	1.63	M
Bend, OR	M	1.0
Ellensburg, WA	1.73	M
Hermiston, OR	1.38	M
John Day, OR	1.02	M
La Grande, OR	1.48	M
The Dalles, OR	2.08	M
Meacham, OR	3.42	M
Mt. Adams RS, WA	4.12	28.0

The greatest precipitation amount in the list above was 4.12 inches at the Mt. Adams Ranger Station, WA, which also had the greatest snowfall amount of 28.0 inches. The least amount of precipitation was at Pasco, WA with only 0.46 inch. However, most stations had between one and just over 2 inches of precipitation. The second most amount of snow (of the only 3 stations which snowfall reports were available) was at Pendleton, OR with 6.4 inches, and the least was 1.0 inche at Bend, OR.

December 2022 - Drought Monitor – Western USA

U.S. Drought Monitor West

December 27, 2022
(Released Thursday, Dec. 29, 2022)
Valid 7 a.m. EST



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	8.44	91.56	64.25	43.80	14.08	1.27
Last Week 12-20-2022	8.66	91.34	64.64	43.80	14.08	1.27
3 Months Ago 09-27-2022	3.89	96.11	73.90	47.71	19.37	2.63
Start of Calendar Year 01-04-2022	3.68	96.32	89.29	64.90	23.85	3.94
Start of Water Year 09-27-2022	3.89	96.11	73.90	47.71	19.37	2.63
One Year Ago 12-28-2021	3.43	96.57	90.94	71.00	31.05	4.82

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:

Richard Heim
NCEI/NOAA

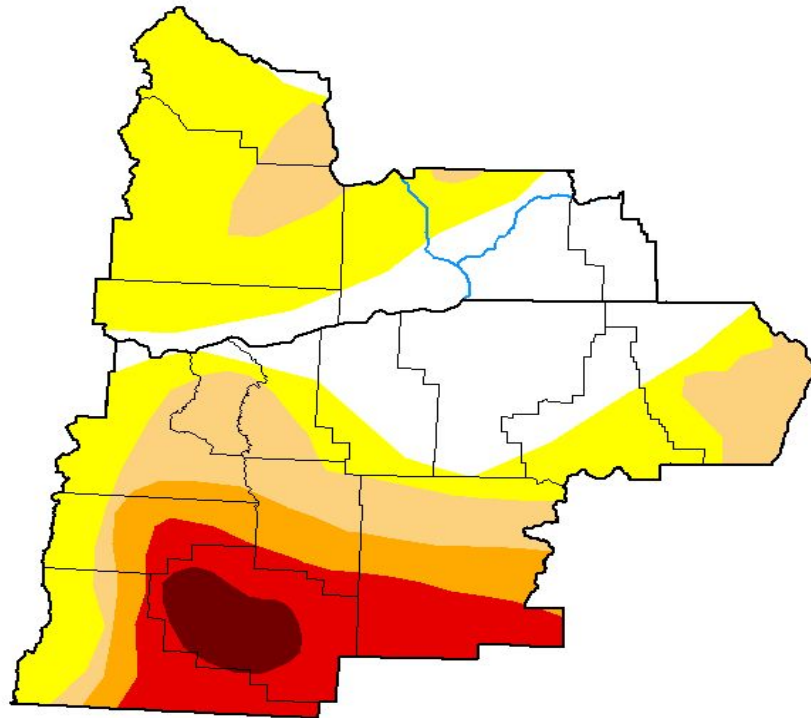


droughtmonitor.unl.edu

Drought conditions did not change much over December from November with the Lower Columbia Basin to the Blue Mountains having no drought (“none” category). Most of the rest of the forecast area had between D0 to D1 (“Abnormally Dry” - “Moderate”) drought conditions. The lower elevations of central OR, and the southern half of the Ochoco-John Day Highlands had D3 to D4 (“Extreme” - “Exceptional”) drought conditions.

December 2022 - Drought Monitor – Pendleton Forecast Area

U.S. Drought Monitor Pendleton, OR WFO



December 27, 2022

(Released Thursday, Dec. 29, 2022)

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	26.08	73.92	39.93	22.93	15.24	3.17
Last Week 12-20-2022	26.08	73.92	39.93	22.93	15.24	3.17
3 Months Ago 09-27-2022	0.00	100.00	46.03	24.98	17.46	3.17
Start of Calendar Year 01-04-2022	3.10	96.90	95.52	87.37	61.34	21.83
Start of Water Year 09-27-2022	0.00	100.00	46.03	24.98	17.46	3.17
One Year Ago 12-28-2021	2.13	97.87	96.75	91.41	72.41	22.83

Intensity:

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

Richard Heim
NCEI/NOAA



droughtmonitor.unl.edu

Here is a close-up of the forecast area, showing the drought conditions. As previously mentioned, drought conditions were the least (“none”) from the Lower Columbia Basin to the Blue Mountains. Most of the rest of the forecast area had D0 to D1 (“Abnormally Dry” - “Moderate”) drought conditions. The lower elevations of central OR to the southern half of the Ochoco-John Day Highlands had D3 to D4 (“Extreme” - “Exceptional”) drought conditions.

USA Three Month Temperature Outlook

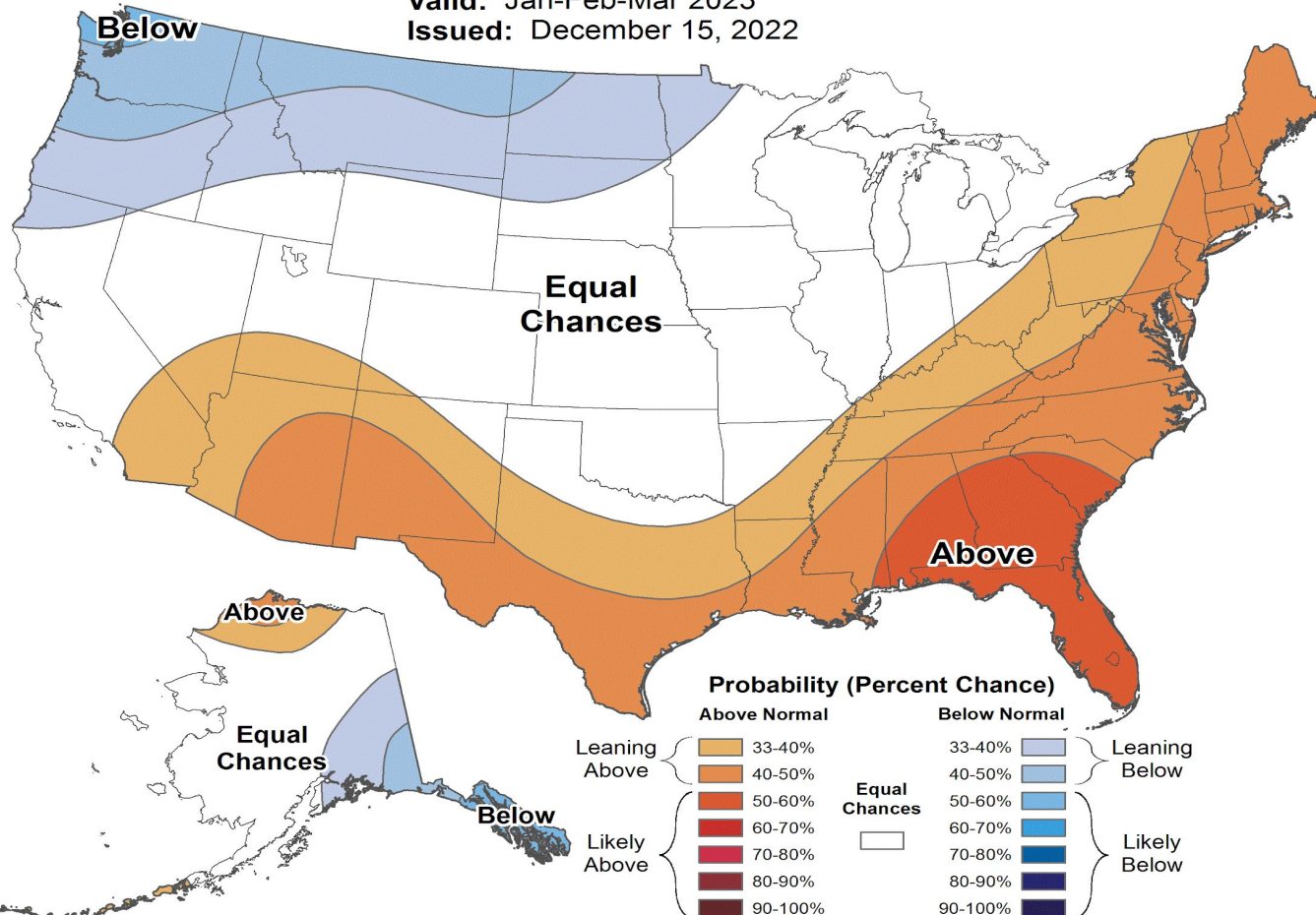


Seasonal Temperature Outlook



Valid: Jan-Feb-Mar 2023

Issued: December 15, 2022



The three month outlook for the period January through March for the Pacific Northwest shows that temperature probabilities are tilted slightly to be colder than normal. This is consistent with the ongoing La Nina event. The coldest areas are more favored to be over the north central and northwest OR portions of the forecast area, and all of the WA portions of the forecast area.

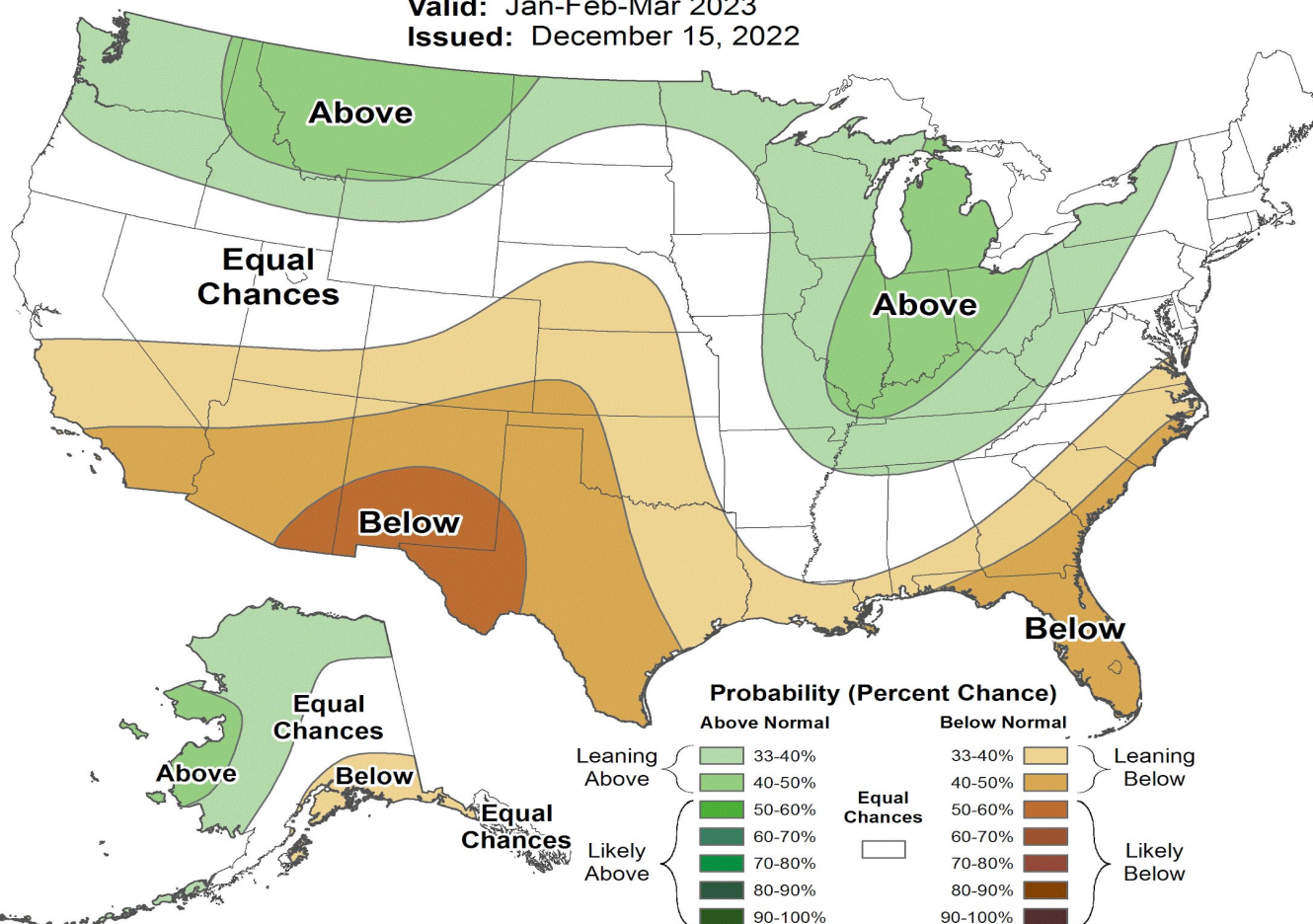
USA Three Month Precipitation Outlook



Seasonal Precipitation Outlook

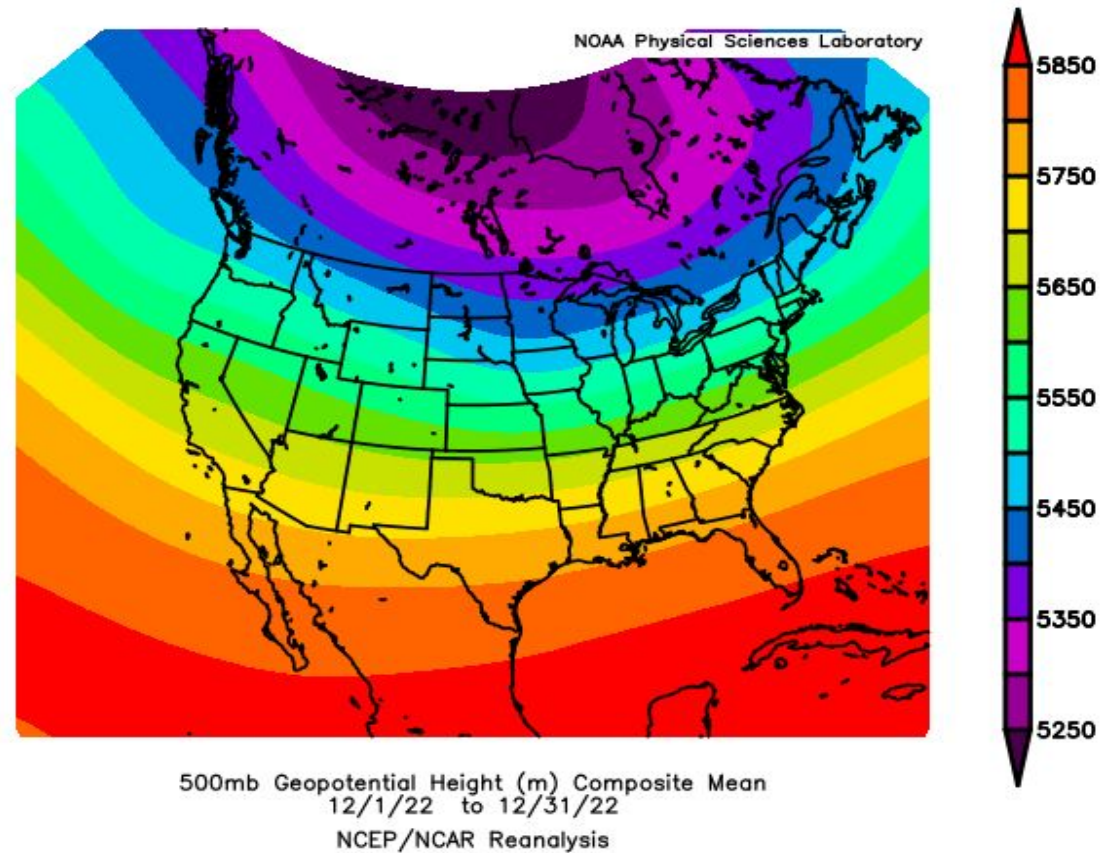


Valid: Jan-Feb-Mar 2023
Issued: December 15, 2022



The three month outlook for the period January - March for the Pacific Northwest shows that precipitation probabilities are mostly tilted slightly to be above normal. This, like the temperature outlook, is also consistent with the ongoing La Nina event. All, but the extreme southwest portions of the forecast area are favored to be above normal.

December 2022, Average 500 MB Pattern

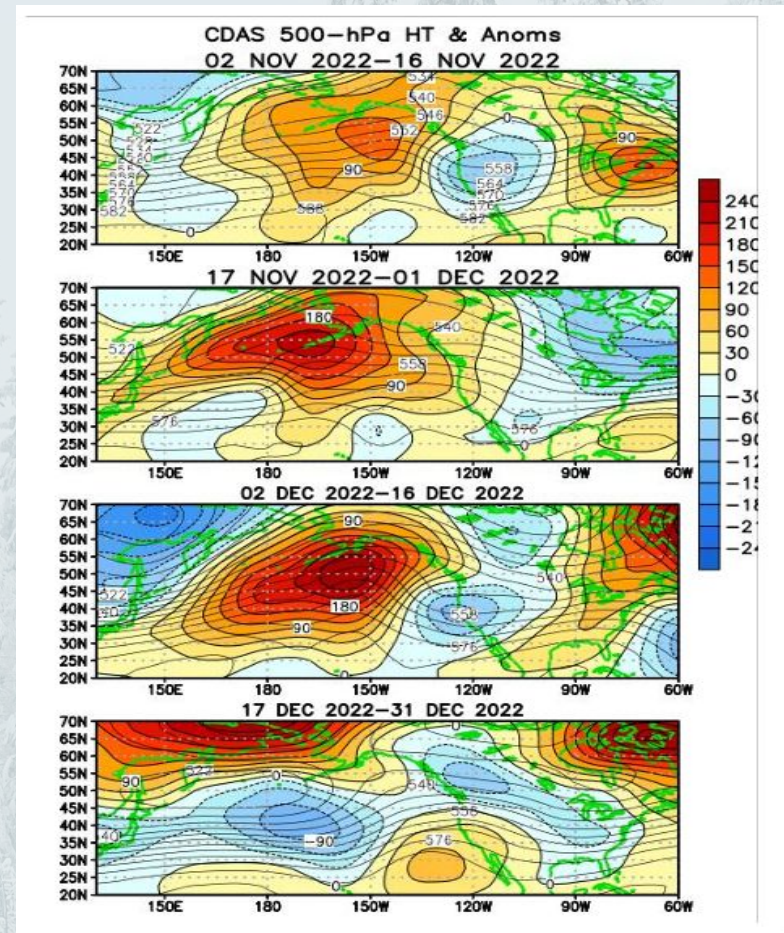


Despite the active weather during the month, the average 500 mb pattern was a west to northwest flow over the Pacific Northwest. However, this progressive near zonal flow pattern allowed more frequent Pacific weather systems to move across the forecast area. This promoted mostly wetter and cooler than normal conditions. Cooler because of more cloud cover and an intrusion of modified arctic air during the latter part of the month in tandem with colder than normal periods in early and mid December.

Two Month, Average Bi-weekly 500 MB Plots for November & December 2022

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

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.

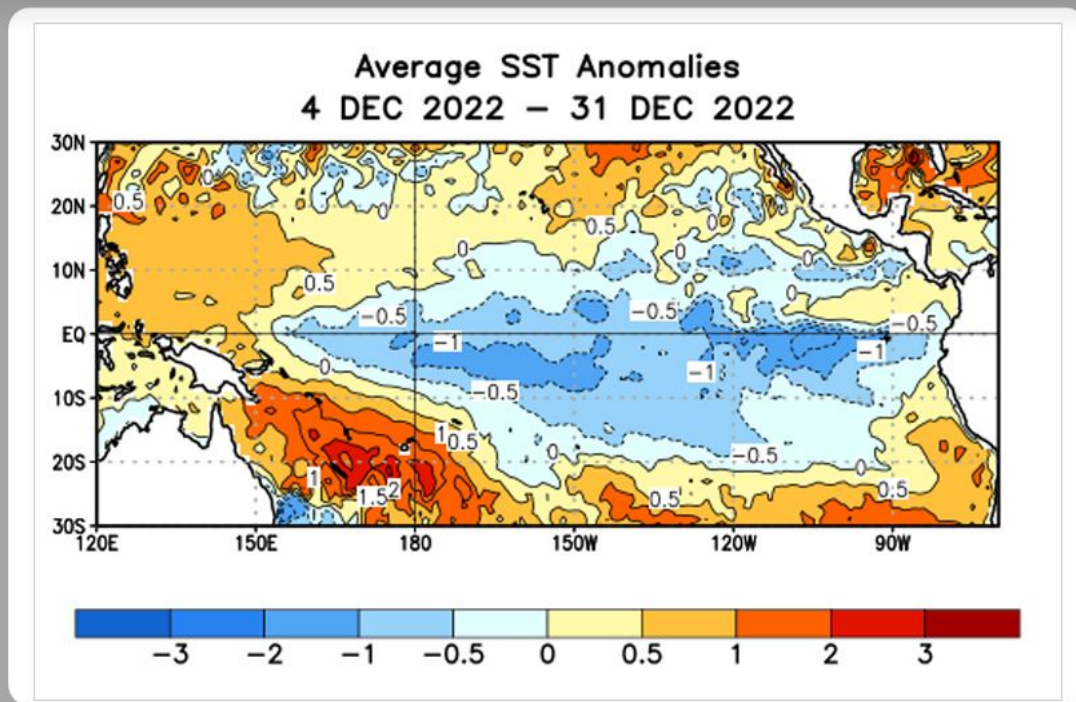


The period from early November to mid November shows an average upper 500 mb trough over the Pacific Northwest and then an upper ridge pattern from mid November to the first of December. Then from early December to mid December there was an average upper trough again. The upper trough pattern then weakened during the latter half of December over extreme northern portions of the Pacific Northwest, with an upper ridge over most of the west coast. The upper troughs were stronger than the upper ridges, during these fluctuations, resulting in mostly cooler than normal conditions over the forecast area.

Sea Surface Temperature (SST) Anomalies for December 2022

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.



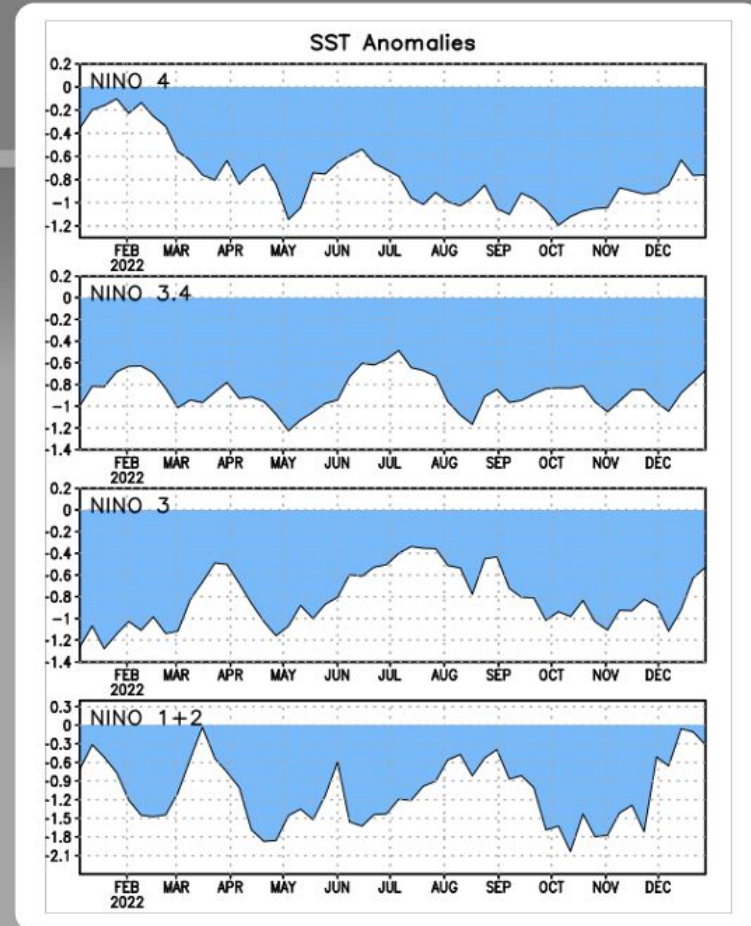
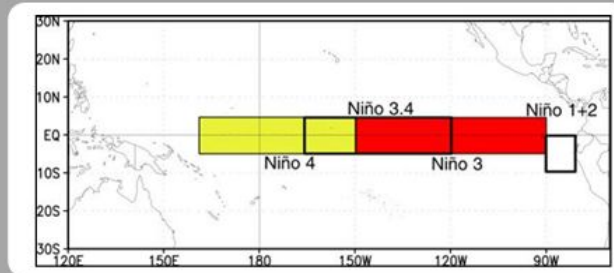
From early December to the end of December, Sea Surface Temperatures (SSTs) were below average across most of the tropical Pacific Ocean. There continued to be some warmer areas off the coasts of Southern and Central America. This is consistent with the ongoing La Nina event, which is expected to persist during most of this winter.

ENSO NINO Regions SST Anomalies for Each Nino Region in December 2022

Niño Region SST Departures (°C) Recent Evolution

The latest weekly SST departures are:

Niño 4	-0.8°C
Niño 3.4	-0.7°C
Niño 3	-0.5°C
Niño 1+2	-0.3°C



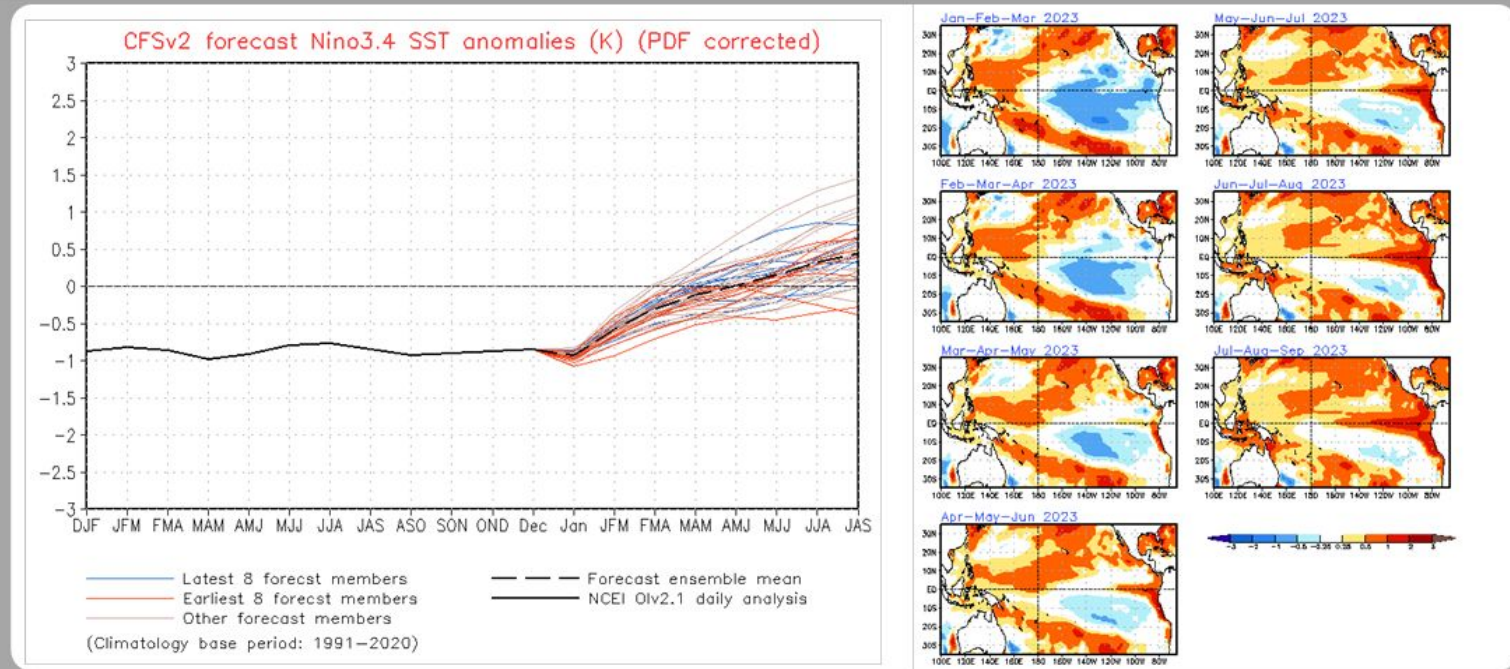
All Niño Regions showed a solid area of below normal SSTs during the past year with no periods of above normal SSTs in any of the Niño Regions. All Niño Regions showed overall average warming of SSTs during December. However, Niño Region 3 and 3.4 showed more significant warming than Niño Regions 1+2 and 4, which had more fluctuations. This is also consistent with the ongoing La Niña event, though the La Niña conditions are weakening.

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

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

Issued: 3 January 2023

The CFS.v2 ensemble mean (black dashed line) indicates La Niña is expected to transition to ENSO-neutral around January-March 2023.



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

Current ENSO (El Nino 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 across most of the Pacific Ocean.

The tropical Pacific atmosphere is consistent with La Niña.

La Niña is expected to continue into the winter, with equal chances of La Niña and ENSO-neutral during January-March 2023. In February-April 2023, there is a 71% chance of ENSO-neutral.*

The current ENSO Alert System Status is still **“La-Nina Advisory”**. Equatorial sea surface temperatures are below average across most of the Pacific Ocean, and the tropical Pacific atmosphere is consistent with La Nina. The La Nina is expected to continue this winter, however, there are equal chances of ENSO-neutral conditions developing from January - March 2023. By February - April, there is a 71% chance of ENSO neutral conditions.



Thank You!