

The Month In Review

April 2023

National Weather Service,
Pendleton, Oregon

Double rainbow over Pendleton, OR after a thunderstorm. Photo by: Christel Bennese

April 2023 Climate Conditions Summary

April 2023 was overall slightly cooler than normal, with near normal precipitation. There were frequent Pacific weather systems that continued to increase mountain snowpack at the very beginning of the month, with some snow accumulations even in the lower elevations. There was a slightly stronger mean upper trough pattern during the first half of the month, which resulted in stronger weather systems that moved across the forecast area than at the end of the month. During the latter part of the month, conditions became more benign with the introduction of warmer temperatures. There were two record lows recorded at the beginning of the month, but then two record highs by the end of the month. The near normal precipitation is owed to an overall average zonal to slightly southwest flow aloft, which brought frequent, but weak weather systems to the region. The upper flow pattern was more amplified at the start of the month, and finished with a flatter 500 mb pattern at the end. These two canceled each other out to result in a near normal month with regard to precipitation.

As the mountain snowpack (which was greater than normal) began to melt, the melting process was slow and gradual due to moderate temperatures and no heavy rainfall accompanying very warm temperatures at the same time. As a result rivers and streams only threatened to reach bankfull levels. There were not any significant wind events, except for some gusty winds with occasional thunderstorms, which were few and non-severe throughout the month.

Below and on the next slide are images of weather and climate conditions during the month.



Early April snow in the Horse Heaven Hills



Snow covered hills south of Kennewick, WA



Thunderstorm west of Pendleton, OR

More Images Representing April 2023 Weather/Climate Conditions



Still a heavy early April mountain snowpack, Meacham, OR



Photo courtesy of THE OUTLYING PERSPECTIVE

Thunderstorms over the Foothills of the Blue Mountains



Pea sized hail from a thunderstorm in Pendleton, OR



Post thunderstorm double rainbow over Pendleton, OR

Significant Weather Event Storm Reports for April 2023

Significant Weather Events						
Date	Location	State	Event Type	Magnitude	Source	
April 1, 2023	17 NW ROSLYN	WA	SNOW	4.5	COCORAHS	
April 1, 2023	2 WNW SISTERS	OR	SNOW	1	COCORAHS	
April 1, 2023	9 NW SENECA	OR	SNOW	4	COCORAHS	
April 1, 2023	6 SSW ANTELOPE	OR	SNOW	1	CO-OP OBSERVER	
April 1, 2023	8 WNW ROSLYN	WA	SNOW	3.5	COCORAHS	
April 1, 2023	18 N WHITE SALMON	WA	SNOW	1.5	COCORAHS	
April 1, 2023	25 NNE WALLOWA	OR	SNOW	6	COCORAHS	
April 1, 2023	6 SSE PRINEVILLE	OR	SNOW	0.8	COCORAHS	
April 1, 2023	1 E COVE	OR	SNOW	0.9	CO-OP OBSERVER	
April 1, 2023	15 SSE DAYTON	WA	HEAVY SNOW	11	MESONET	
April 1, 2023	13 NW ELGIN	OR	HEAVY SNOW	13	MESONET	
April 1, 2023	21 E MILTON-FREEWATER	OR	HEAVY SNOW	15	MESONET	
April 2, 2023	17 SSE DAYTON	WA	HEAVY SNOW	13	TRAINED SPOTTER	
April 3, 2023	2 NE WALLA WALLA	WA	SNOW	2	TRAINED SPOTTER	
April 3, 2023	2 NE WALLA WALLA	WA	SNOW	3	TRAINED SPOTTER	
April 3, 2023	WEST RICHLAND	WA	SNOW	0.5	BROADCAST MEDIA	
April 3, 2023	4 NNE MISSION	OR	SNOW	2	CO-OP OBSERVER	
April 3, 2023	9 W COLLEGE PLACE	WA	SNOW	2	PUBLIC	
April 3, 2023	4 SW COLLEGE PLACE	WA	SNOW	2	COCORAHS	
April 3, 2023	1 NE WALLA WALLA	WA	SNOW	4.8	TRAINED SPOTTER	
April 3, 2023	4 W COLLEGE PLACE	WA	SNOW	1.8	CO-OP OBSERVER	
April 3, 2023	2 NE WALLA WALLA EAST	WA	SNOW	2.7	CO-OP OBSERVER	
April 3, 2023	4 NNW ISLAND CITY	OR	SNOW	1.3	TRAINED SPOTTER	

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

discussion on next slide →

Significant Weather Event Storm Reports for April 2023

There were only 23 reports of significant weather in April, which all occurred on the first 3 days of the month, and all of the reports were of snow or heavy snow. These snow events occurred mostly in the northeast mountains and/or the Foothills of the Blue Mountains. However, some occurred also in the Cascades, especially the OR Cascades near central OR. There were other events during the month, such as thunderstorms, but none of them were significant enough to include in a Local Storm Report (LSR).

Record Weather Events for April 2023

Record Weather Reports					
Event	Date	Where	Previous Record	New Record	Records Began
Low Temperature	April 5, 2023	Yakima, WA	22 / 1975	21	1909
Low Temperature	April 5, 2023	Ellensburg, WA	24 / 2015	19	1934
Maximum Rainfall	April 10, 2023	Yakima, WA	0.17 / 2001	0.61	1909
High Temperature	April 29, 2023	Ellensburg, WA	81 / 2021	85	1934
High Temperature	April 29, 2023	Redmond, OR	89 / 1968	89 (tie)	1941

Like March, there were very few record weather events during the month of April. There were 2 each of record highs and record lows, and one record rainfall maximum. The record lows were on April 5th, and the record highs were at the end of the month on April 29th, of which one was a tie with the old record. The record maximum rainfall occurred on the 10th of the month. Due to the lack of records, or significant weather events, the month was seemingly benign for April, a transition month between winter and summer.

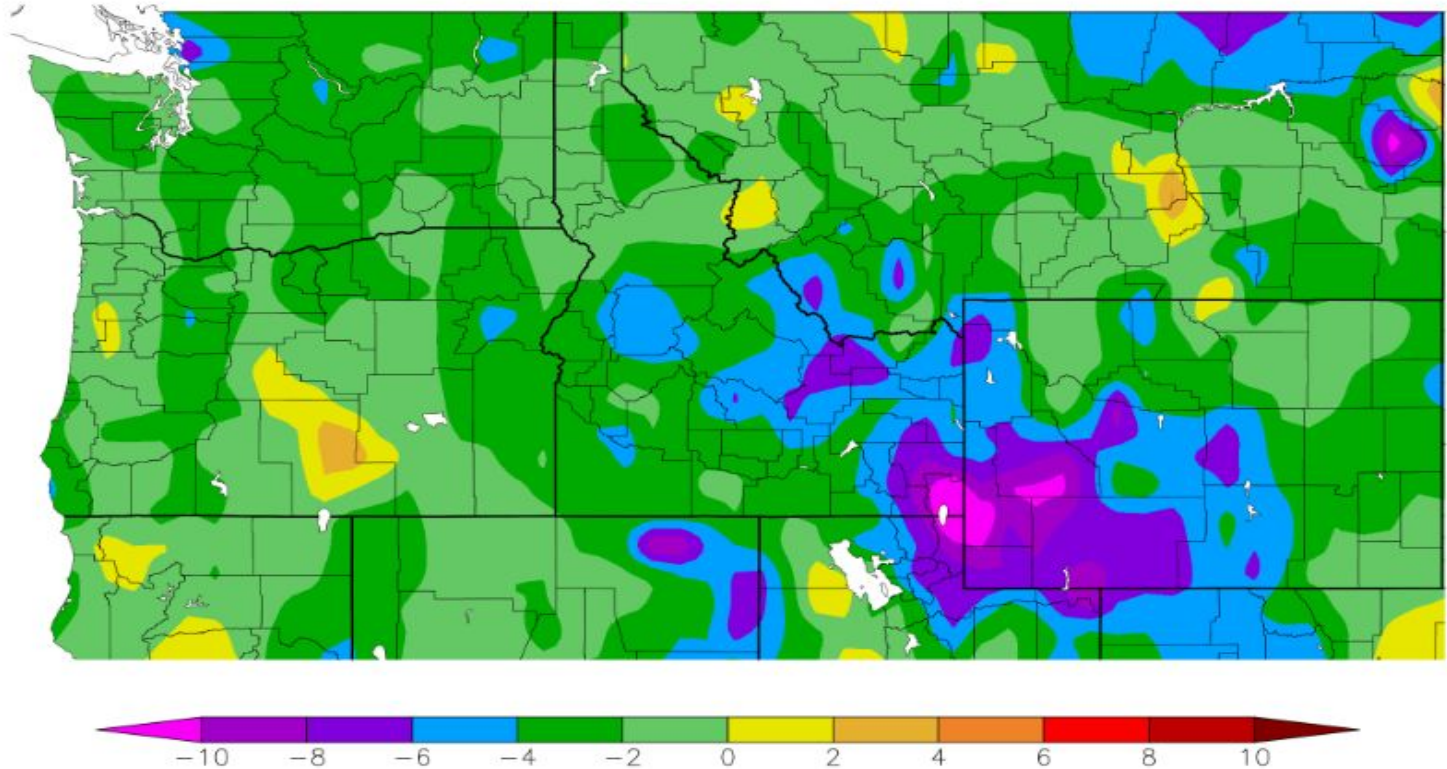
April 2023: Observed Monthly Maximum & Minimum Temperatures

Location	Highest Maximum	Lowest Minimum
Pendleton, OR	84	28
Redmond, OR	89	15
Pasco, WA	88	29
Yakima, WA	86	21
Walla Walla, WA	82	31
Bend, OR Co-Op	84	18
Ellensburg, WA	85	19
Hermiston, OR	88	26
John Day, OR	87	25
La Grande, OR	84	17
The Dalles, OR	90	27
Meacham, OR	78	5
MT Adams RS, WA	73	23

The list above shows the maximum and minimum highs and lows for each station respectively. The highest maximum was at The Dalles (Dallesport, WA) with a high with 90 degrees, and the lowest maximum was at the Mt. Adams Ranger Station, with 73 degrees. However, most of the highest maximum temperatures were in the 80s. Of the lowest minimums, Meacham, OR was again the coldest with a lowest minimum of only 5 degrees, while Walla Walla, WA had the warmest lowest minimum of 31 degrees. This shows that nights in April can still get very cold.

April 2023: Departure from Normal of Average Temperatures

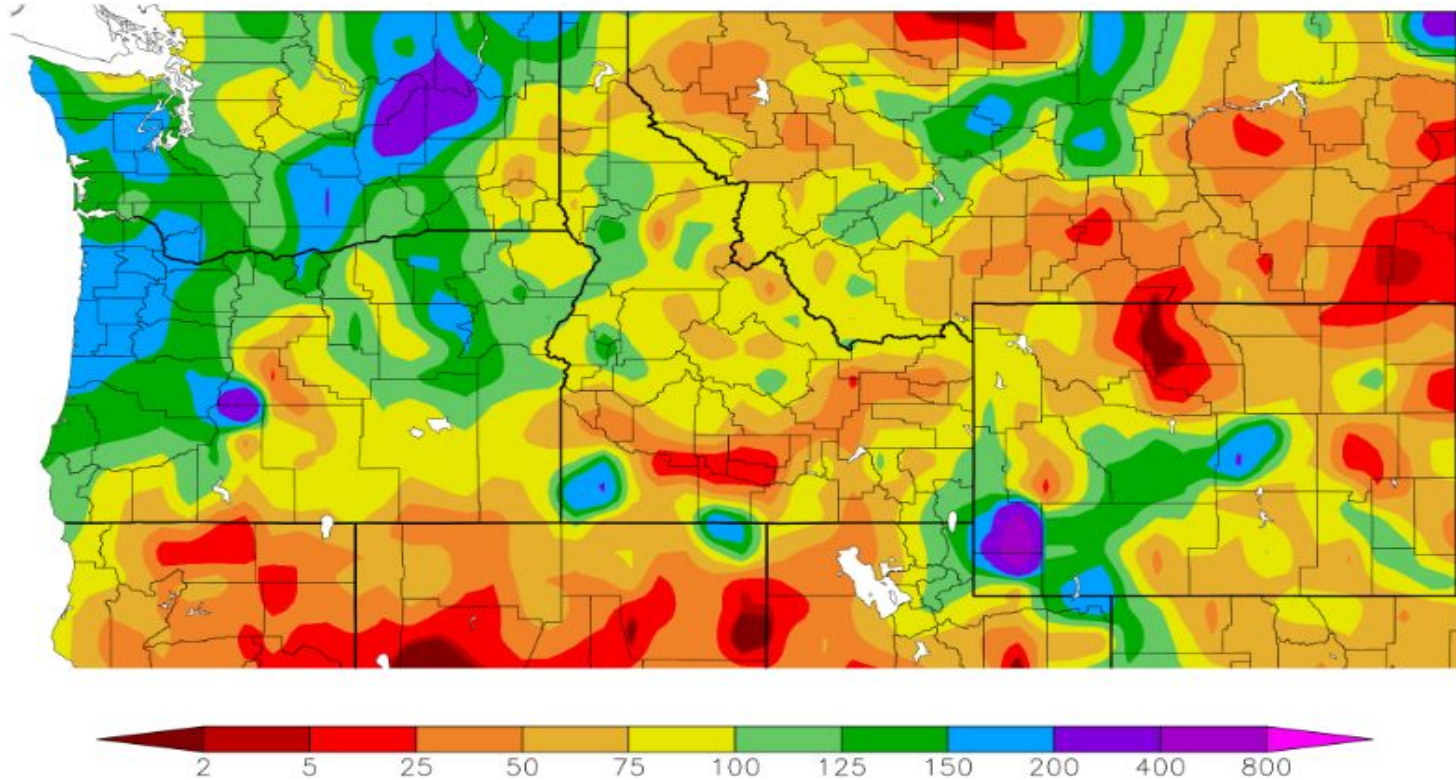
Departure from Normal Temperature (F)
4/1/2023 - 4/30/2023



In the above image, most of the forecast area had below normal temperatures, with most departures being from -2 to -4 degrees of normal (green shading). The area of below normal temperatures were nearly evenly distributed across central to northeast OR and south central to southeast WA. The exception was over eastern Deschutes County, in central OR, where there was a small area with departures of up to +2 degrees of normal (the yellow shaded area).

April 2023: Percent of Normal of Precipitation

Percent of Normal Precipitation (%)
4/1/2023 - 4/30/2023



There were some areas with greater than 100 percent of normal precipitation, and other areas with less than 100 percent of normal precipitation. The driest area was in central OR, east of the Cascades, that was just east of an area where there was the greatest amount of precipitation above 100 percent of normal. However, most of the forecast area had an near even distribution of precipitation, with the areas east of the WA Cascades having the highest percent of normal.

April 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	61.4	-2.4	33.5	-0.9	47.5	-1.6	1.06	0.51
Kennewick	64.0	-2.3	41.7	-0.6	52.9	-1.4	0.73	-0.56
Walla Walla	59.3	-3.2	40.4	-1.6	49.9	-2.3	1.94	0.02
The Dalles	62.3	-2.1	39.8	-1.7	51.0	-1.9	0.92	0.13
Redmond	60.5	0.9	30.5	1.4	45.5	1.1	0.33	-0.40
Pendleton Airport	60.3	-1.8	38.6	-0.6	49.5	-1.2	1.71	0.50
La Grande	56.3	-2	32.4	-2.7	44.4	-2.3	2.63	1.05
John Day	60.4	0	37.3	4.4	48.9	2.2	0.98	-0.41

Most of the mean maximum, mean minimum and mean average temperature departures from normal were below normal (blue boxes), with only 5 data entries showing above normal temperatures (orange boxes). However, there was one station with an exact normal mean maximum temperature (John Day, OR). Also, there was a tie for the greatest departure from normal mean average temperatures between Walla Walla, WA and La Grande, OR, with each having a -2.3 degrees below normal departure. Thus, it can be said that April was mostly a cooler than normal month. The departures from normal precipitation was mostly above normal, with 5 stations above normal (green boxes) compared to 3 stations below normal (brown boxes). Thus it can be said that April had slightly greater than normal precipitation on average. ***The greatest departures are outlined in black boxes.***

April 2023: Observed Total Precipitation and Total Snowfall/Hail

Location	Total Precipitation (inches)	Total Snow/Hail (inches)
Pendleton, OR	1.71	0.6
Redmond, OR	0.33	M
Pasco, WA	0.82	M
Yakima, WA	1.06	M
Walla Walla, WA	1.94	M
Bend, OR Co-Op	0.09	T
Ellensburg, WA	0.91	M
Hermiston, OR	1.23	M
John Day, OR	0.98	M
La Grande, OR	2.63	M
The Dalles, OR	0.92	M
Meacham, OR	4.85	M
Mt. Adams RS, WA	2.14	3.5

The greatest precipitation amount in the list was at Meacham, OR, and the least amount of precipitation was at the Bend, OR Co-Op station (green and brown boxes respectively). While Meacham, OR (a Blue Mountain crest station) seemingly always has the greatest amount of precipitation each month, a more representative amount is at the Mt. Adams R.S. with 2.14 inches. Of the three available snowfall amounts reported, the Mt. Adams R.S. had the most with 3.5 inches, and the Bend, OR Co-Op station had the least with a trace.

April 2023 - Drought Monitor – Western USA

U.S. Drought Monitor Northwest RFC

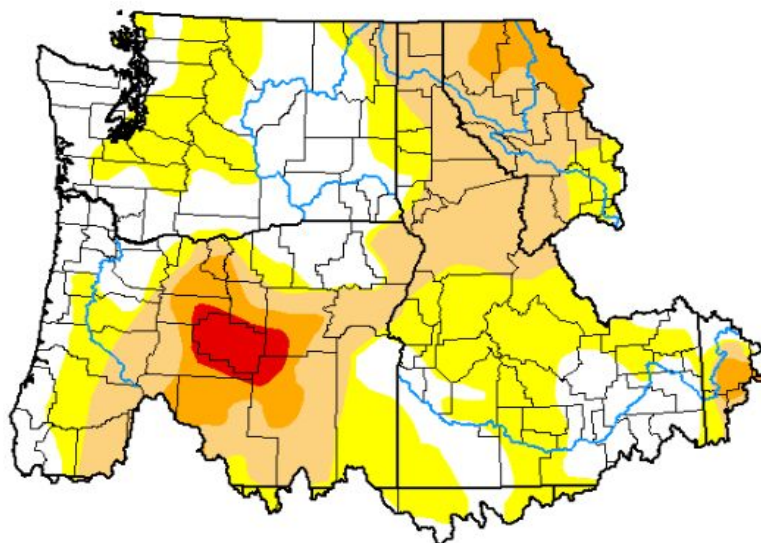
May 2, 2023

(Released Thursday, May. 4, 2023)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	33.68	66.32	34.09	8.95	2.04	0.00
Last Week 04-25-2023	33.68	66.32	32.55	6.94	2.04	0.00
3 Months Ago 01-31-2023	22.67	77.33	51.81	19.54	5.44	0.49
Start of Calendar Year 01-03-2023	14.75	85.25	48.70	23.61	8.20	0.49
Start of Water Year 09-27-2022	2.05	97.95	62.58	23.84	10.29	0.49
One Year Ago 05-03-2022	20.08	79.92	69.62	48.16	20.09	4.61



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>

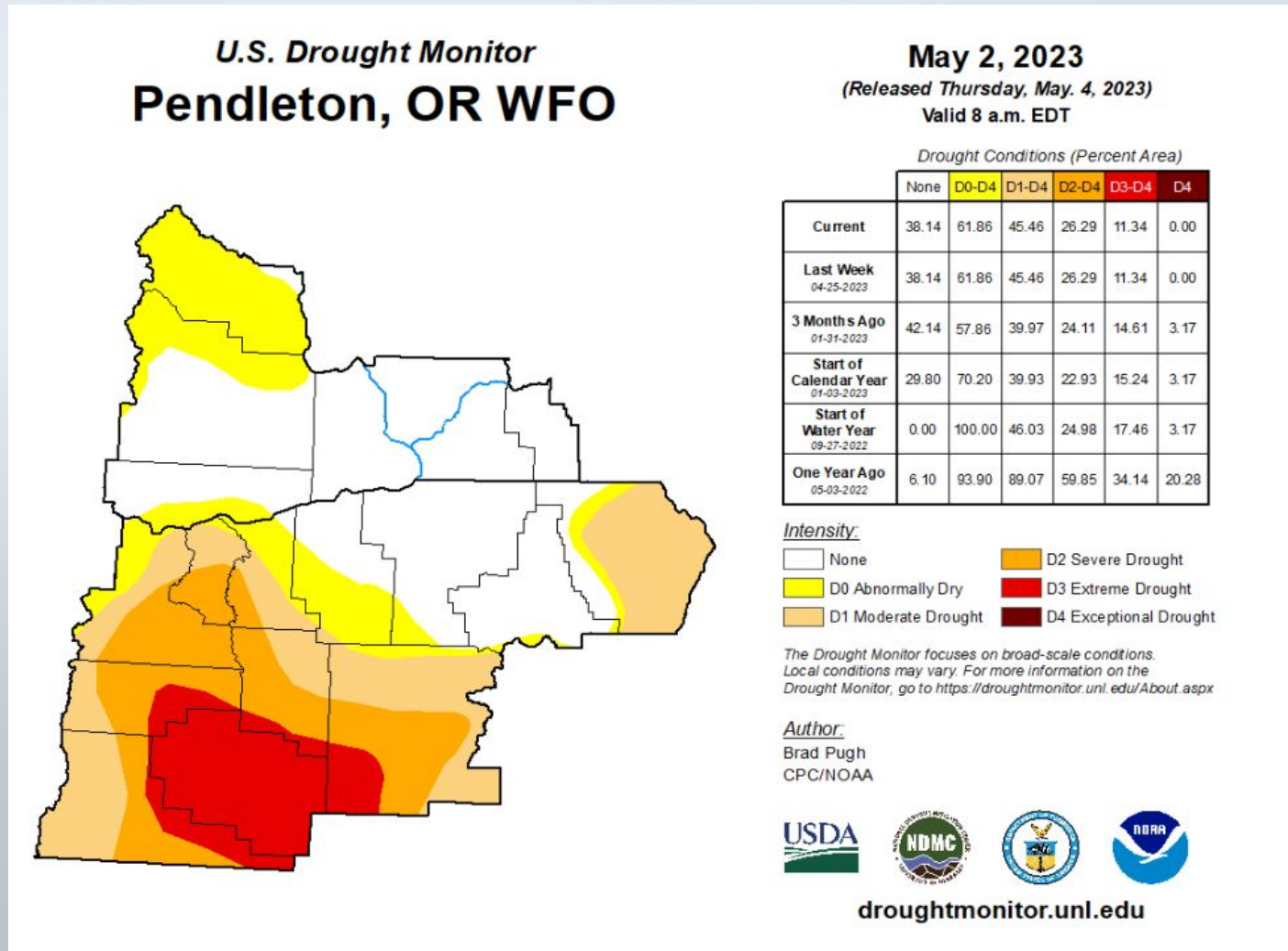
Author:
Brad Pugh
CPC/NOAA



droughtmonitor.unl.edu

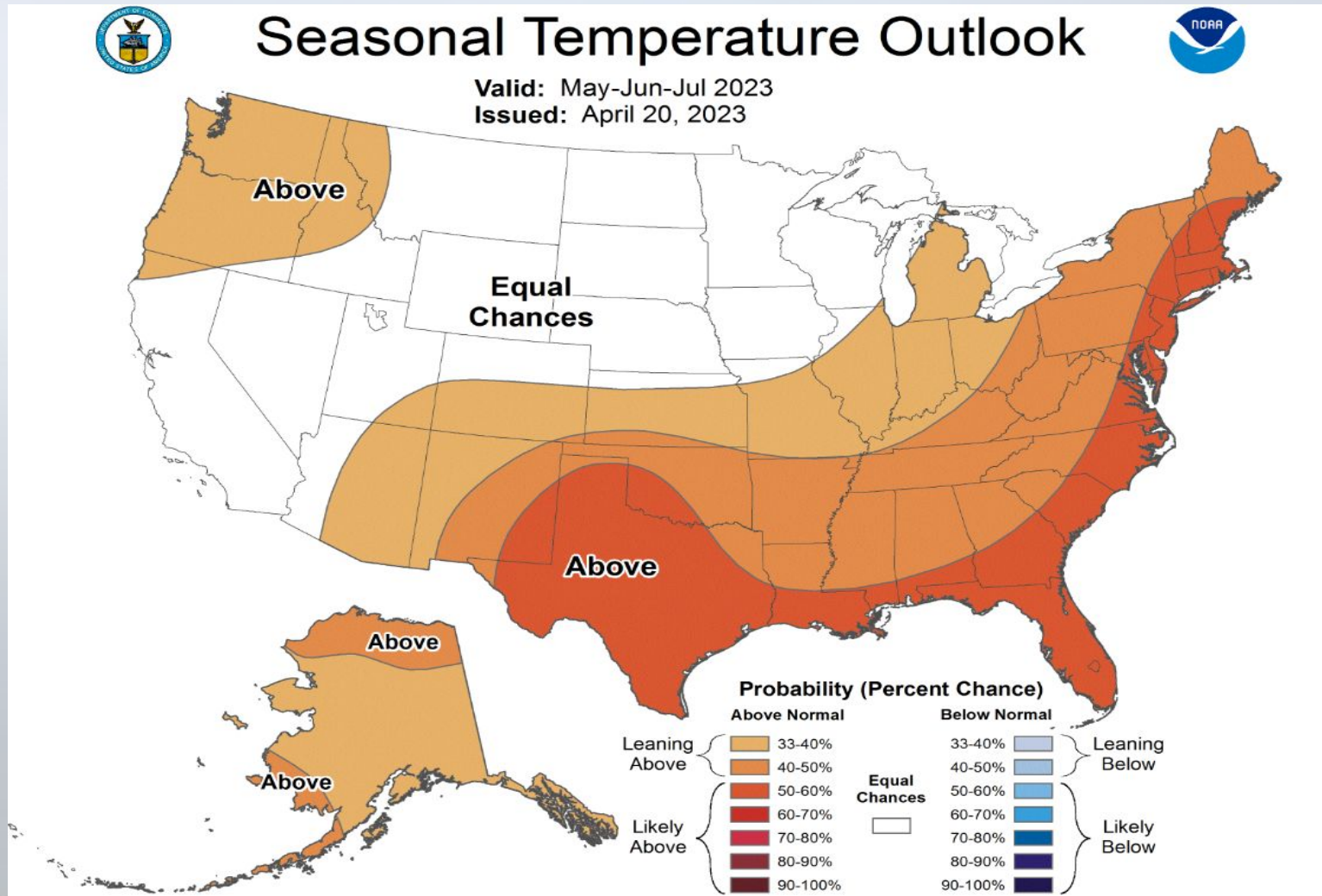
Drought conditions were similar to last month. The worst drought conditions was a D3 (Extreme) drought over mainly Crook County in central OR. This was surrounded by bands of D1 and D2 (Moderate to Severe) drought covering all of central OR. Most of the rest of the eastern OR and WA had None to a D0 (Abnormally Dry) drought. The lack of change from the previous month indicates that April had near normal precipitation, that resulted in little change.

April 2023 - Drought Monitor – Pendleton Forecast Area



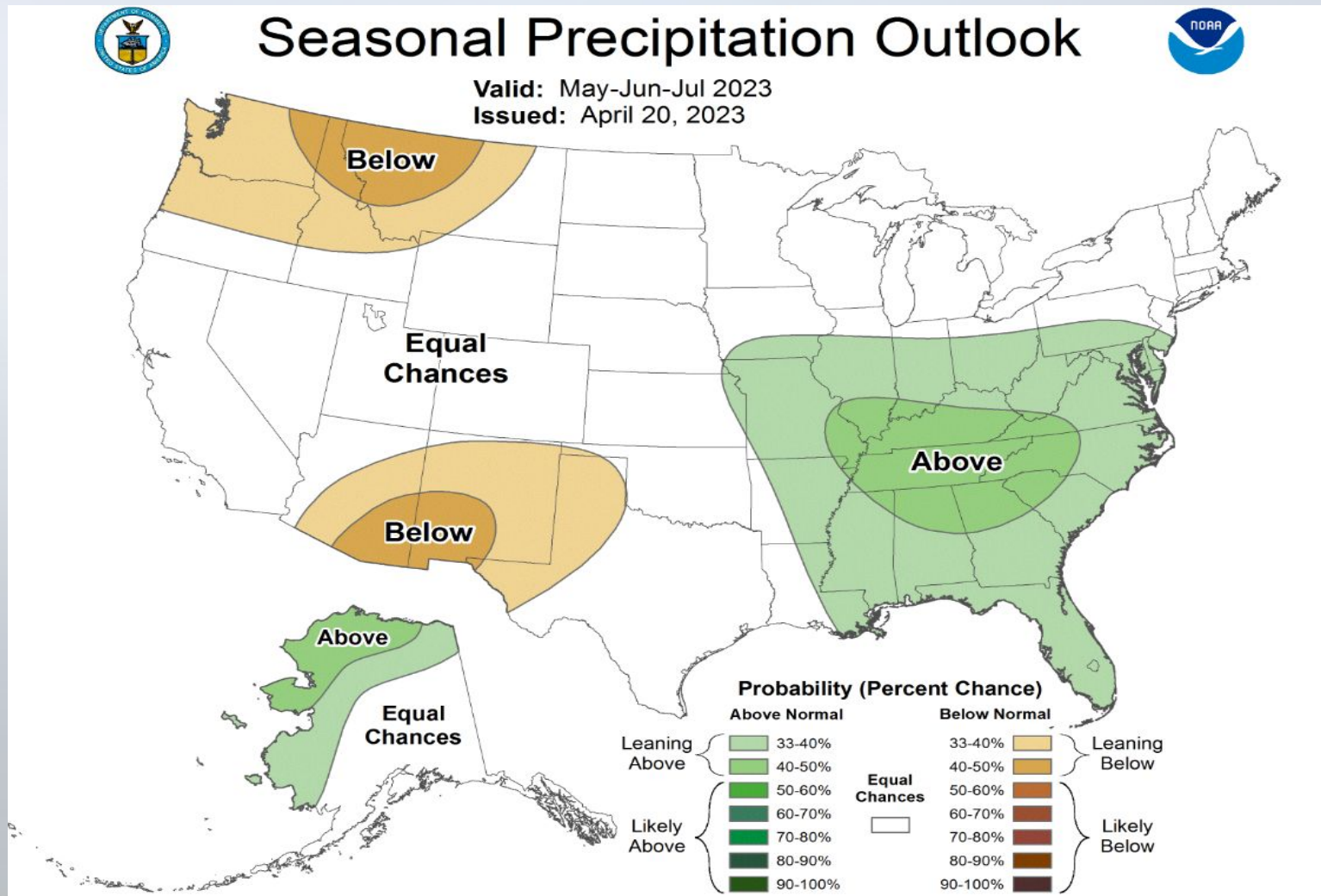
A close up of the forecast area shows that drought conditions were the worst in Crook County, in central OR, with a drought category of D3 (Extreme) drought. This was surrounded by bands of D1 to D2 (Moderate to Severe) drought. The rest of the forecast area, had either None to a D0 (Abnormally Dry) drought, except for the eastern two thirds of Wallowa County, which had a D1 (Moderate) drought .

USA Three Month Temperature Outlook



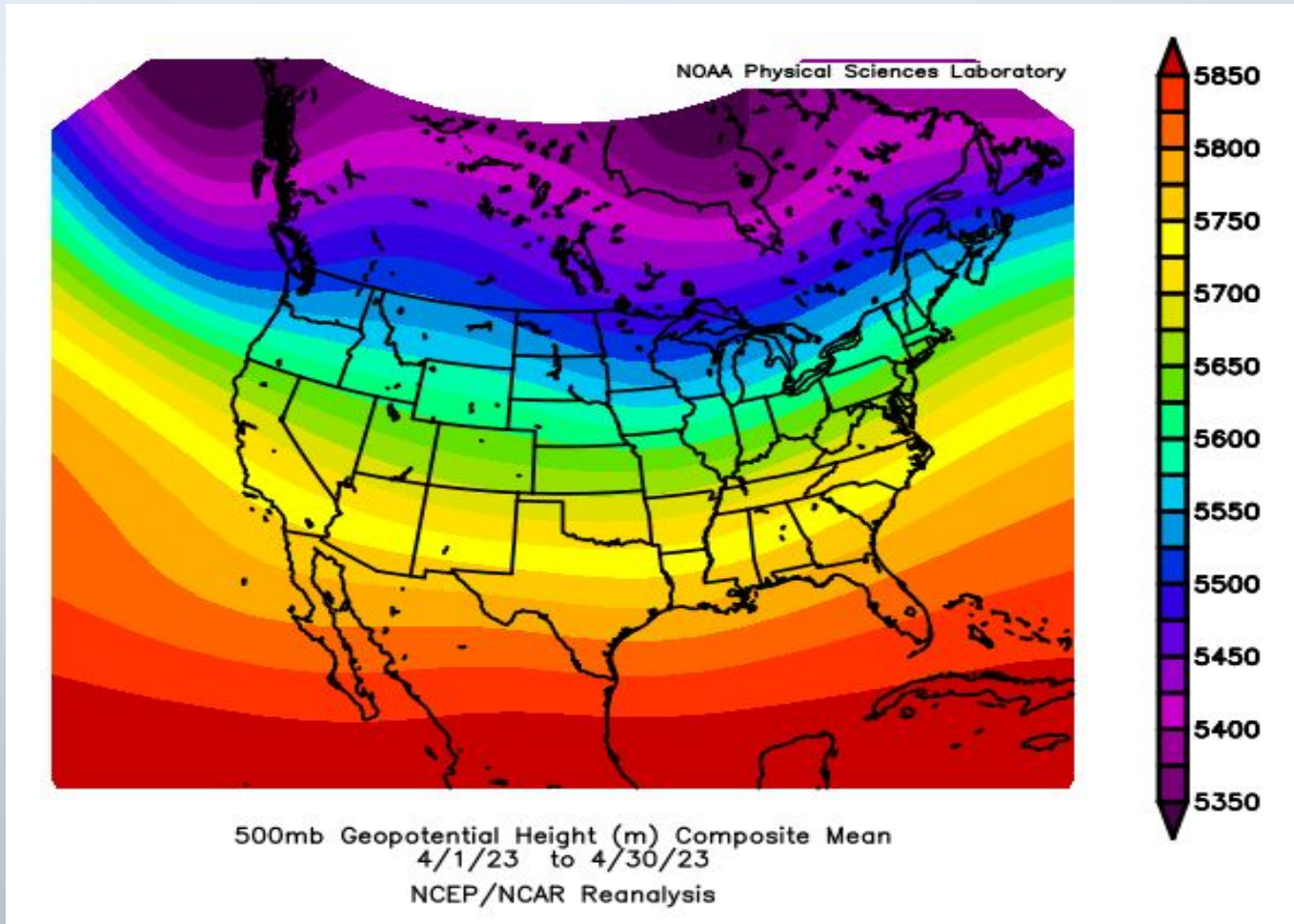
The three month outlook for the period May through July over the Pacific Northwest shows that temperature probabilities are leaning to mostly above normal. However, there is a small area in extreme southeast OR which has equal chances of above or below normal temperatures during the next 3 months.

USA Three Month Precipitation Outlook



The three month outlook for the period May through July over the Pacific Northwest shows that most of the forecast area is leaning toward having below normal precipitation. The exception is in the southern third of OR, which has equal chances of above or below normal precipitation.

April 2023 Average 500 MB Pattern

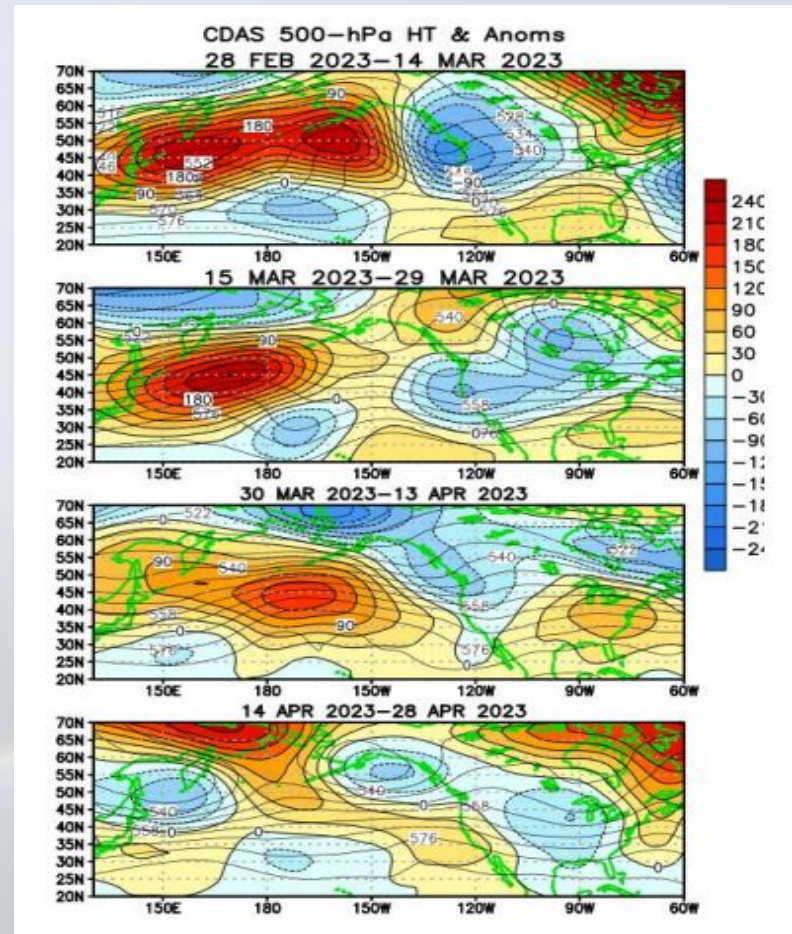


The average 500 mb pattern over the Pacific Northwest featured an upper zonal to a west - slightly southwest flow pattern over OR and WA. This pattern resulted in frequent, but mostly weak weather disturbances that moved across the forecast area. The increased cloudiness, and with slightly greater than normal precipitation, overall, due to these weather disturbances off of the Pacific is the likely cause of the overall cooler than normal temperatures.

Two Month, average Bi-weekly 500 MB Plots for March - April 2023

These are more detailed bi-weekly average 500 mb pattern plots that was sampled from the very end of February through the very end of April.

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.

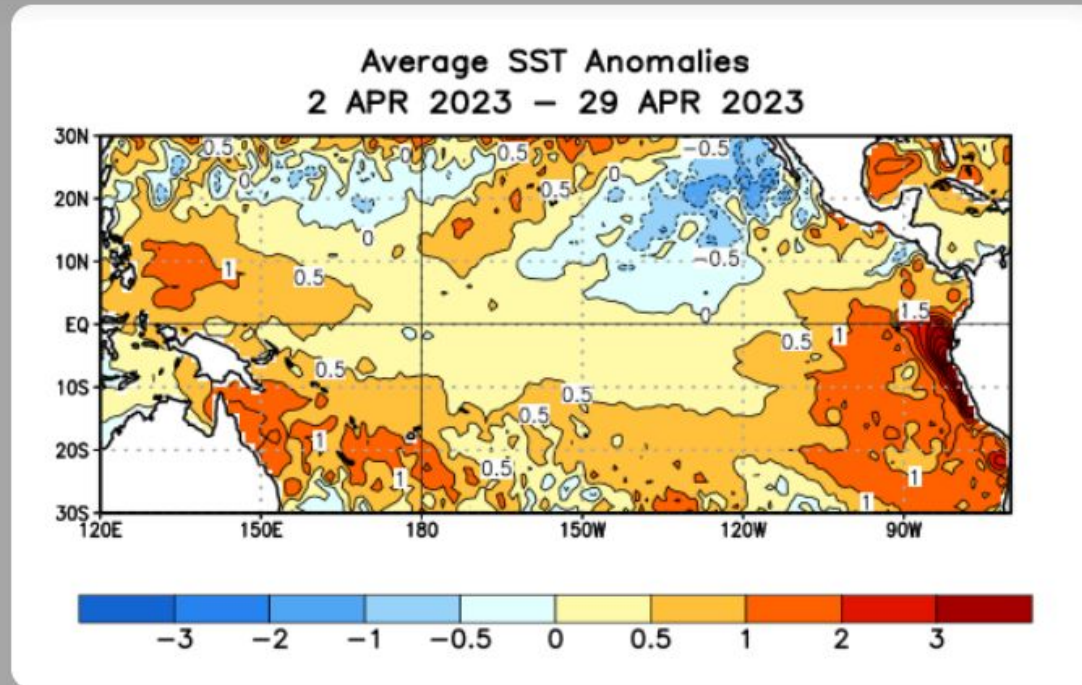


From February 28th through March 14th, there was a pronounced upper trough over the west coast. Then during the latter half of March, the trough weakened, and the offshore ridge retrograded westward. This pattern did not change much during the first half of April, through the upper trough along the coast did seem to deepen slightly. Then it weakened to almost a zonal flow during the latter half of April. This weakening during the latter half of April likely explains the relatively more benign conditions during the latter half of the month. During the first half of April, there were stronger weather systems, which produced more significant weather reports as shown above in the list of storm reports.

Sea Surface Temperature (SST) Anomalies for April 2023

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

In the last four weeks, equatorial SSTs were above average in the eastern and western Pacific Ocean and were near average in the central and east-central Pacific Ocean.



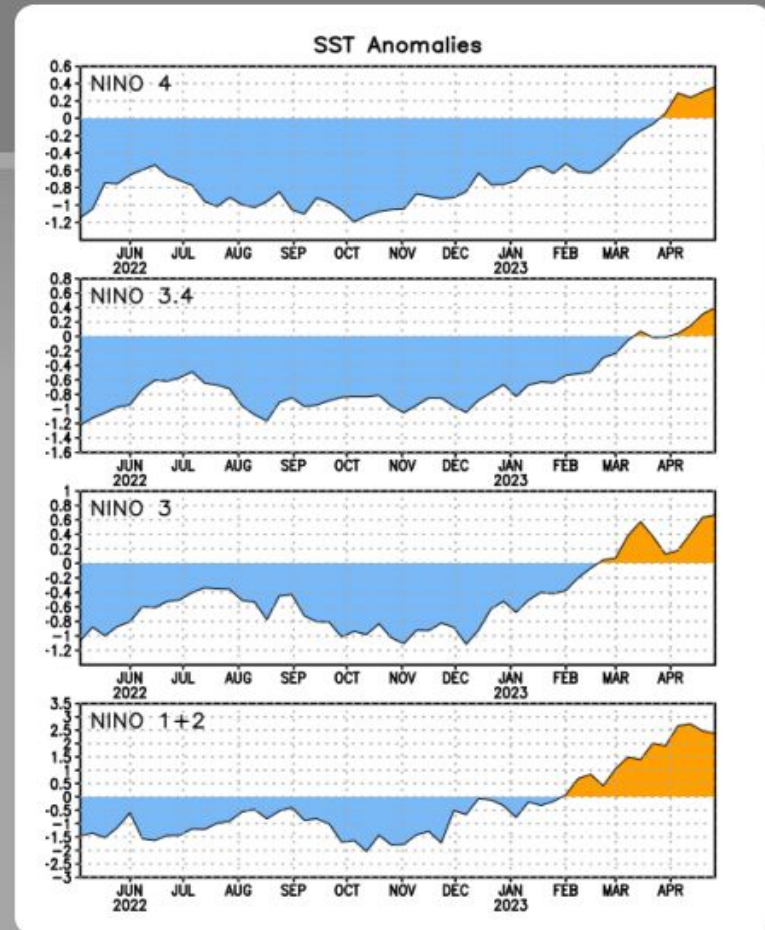
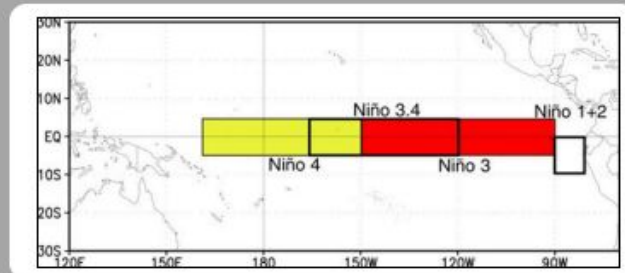
During the last 4 weeks equatorial Sea Surface Temperatures (SSTs) became warmer than normal in the eastern and western Pacific Ocean, but were near average in the central and east-central Pacific Ocean. This warming trend continues to show the transition from La-Niña this past winter to ENSO-neutral this spring, and then the likelihood of an El-Niño this summer.

ENSO Niño Regions SST Anomalies for Each Niño Region in April 2023

Niño Region SST Departures (°C) Recent Evolution

The latest weekly SST departures are:

Niño 4	0.4°C
Niño 3.4	0.4°C
Niño 3	0.7°C
Niño 1+2	2.4°C



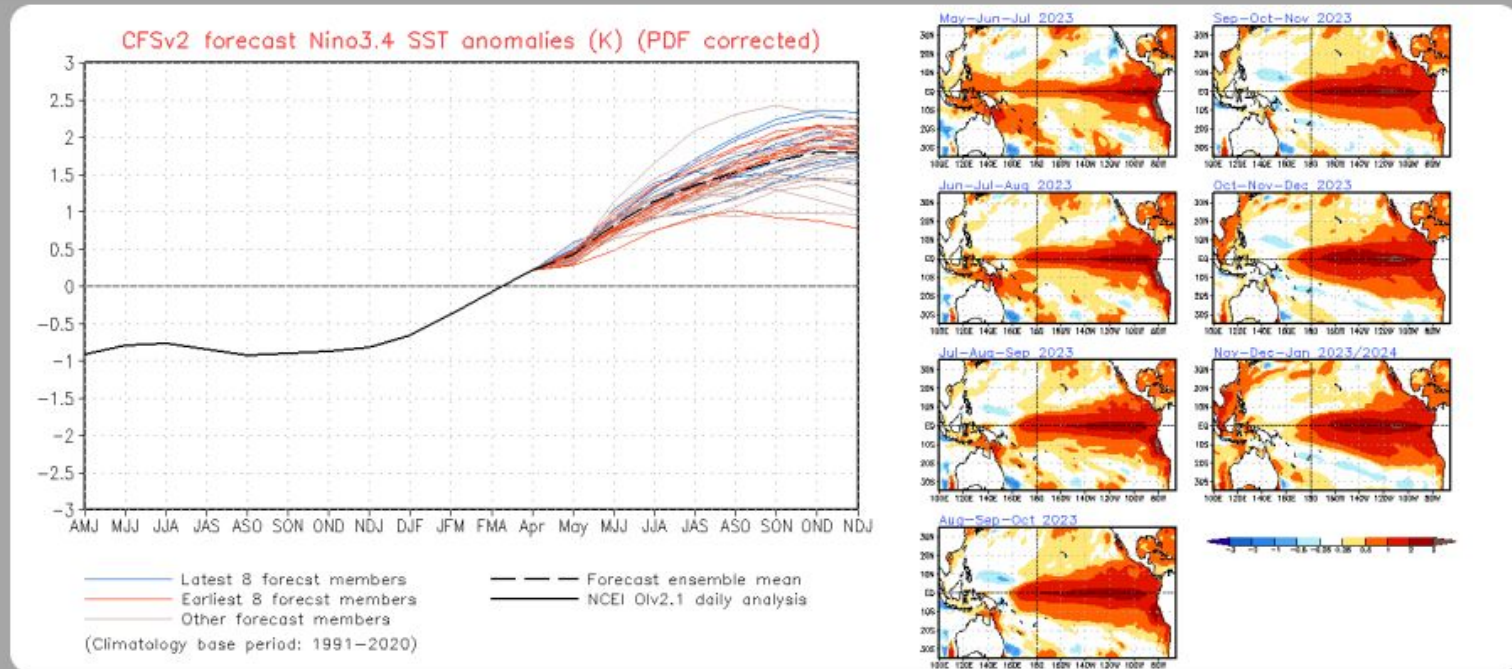
All Niño Regions continued to show warming during April, with SSTs in all Niño Regions now above normal (depicted by the orange shading). This trend is forecast to continue as ENSO conditions continue to transition from La-Niña to ENSO-neutral to El-Niño during this spring and the coming summer. The greatest warming was in Niño Region 1 + 2 and 3, with the least warming in Niño Regions 3.4 and 4.

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

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

Issued: 30 April 2023

The CFS.v2 ensemble mean (black dashed line) favors a transition from ENSO-neutral to El Niño in the next few months.



The SST CFS.v2 forecast ensemble mean continues to show a favorable transition from ENSO-neutral to El-Niño during the next few months. All of the SST ensemble members are now above normal, and are forecast to continue warming through early autumn, and then level off. The thumb nail images to the right also show this progressive warming through the summer.

Current ENSO (El Niño Southern Oscillation) Alert System Status

Summary

ENSO Alert System Status: **El Niño Watch**

ENSO-neutral conditions are observed.*

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

ENSO-neutral conditions are expected to continue through the Northern Hemisphere spring, followed by a 62% chance of El Niño developing during May-July 2023.*

The current ENSO Alert System Status has changed to **“El Niño Watch”**. ENSO-neutral conditions are currently observed, with equatorial SSTs now near-to-above average across most of the Pacific Ocean. ENSO-neutral conditions are expected to continue through the Northern Hemisphere spring, followed by a 62 percent chance of El-Niño developing during the late spring into summer.



Thank You!