The Month In Review

June 2023

National Weather Service,
Pendleton, Oregon

Thunderstorm Cloud To Ground Lightning in Central Oregon. Photo by: Aaron Seng

June 2023 Climate Conditions Summary

June 2023 was a fairly benign month weatherwise, but there were some abnormalities. These were mainly widespread above normal temperatures and widespread much below normal precipitation. There were only 6 significant weather events that were worthy of having a Local Storm Report (LSR) issued for them over the entire forecast area. Four of these were hail reports which size was just 0.7 inch in diameter for all 4 of them (i.e. non-severe hail, which is a hail size of 1 inch or greater in diameter). The other two significant weather events were a flash flood from a thunderstorm over a burn scar on the 7th in eastern Wallowa County, OR, and the other was a landspout in the higher terrain east of Milton-Freewater, OR on the 27th. A landspout is a type of tornado that forms during the growth stage of a thunderstorm cloud, in which a strong updraft stretches a near surface horizontal rotation into a tight vertical rotating column of air that can cause significant damage.

Total precipitation amounts during the month were mostly a tenth of an inch or less at most stations. However, there were a few reports of localized rainfall amounts that were greater than a half inch, mainly due to thunderstorm cores moving directly over the rain gauge. Temperatures were also mostly above normal, with many of the highest temperatures being 90 degrees or greater. The hottest was 100 degrees at Pasco, WA. However, there were also a few stations that had the lowest minimum temperatures in the upper 20s to lower 30s. However, these temperatures are not that unusual for the month of June, which can be either hot or cold. There were only 4 record weather events which were 2 record highs and 2 record low temperatures.

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

Moderate rain at Emigrant Springs Camp, OR

Wildfires increase as heat & dryness increase

Developing thunderstorm near Bend, OR

More Images Representing June 2023 Weather/Climate Conditions

Amazing sunset over Pendleton, OR

Smoke aloft from Canadian wildfires causing low visibility

Developing thunderstorms over central Oregon

Wildfire in the eastern Columbia River Gorge

Significant Weather Events - Local Storm Reports for June 2023

Significant Weather Events					
Date	**Location**	**State**	**Event Type**	**Magnitude**	**Source**
June 7, 2023	22 ENE Joseph	OR	Flash Flood	Wildfire Burn Scar	Public
June 26, 2023	Sisters	OR	Hail	0.7	Public
June 26, 2023	Prineville	OR	Hail	0.7	Public
June 26, 2023	Prineville	OR	Hail	0.7	Trained Spotter
June 26, 2023	1 SSE Prineville	OR	Hail	0.7	Trained Spotter
June 27, 2023	11 E Milton-Freewater	OR	Landspout	Not Available	Public

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

As mentioned in a previous slide, there were only 6 significant weather events, which were worthy of a Local Storm Report. Four of these were hail with a diameter just under three quarters of an inch, a Flash Flood over a burn scar, and a landspout east of Milton-Freewater, OR over the northwestern slopes of the northern Blue Mountains.

Record Weather Events for June 2023

Record Weather Reports					
Event	**Date**	**Where**	**Previous Record**	**New Record**	**Records Began**
High Temperature	June 12, 2023	Yakima, WA	94 / 1974	95	1909
High Temperature	June 12, 2023	Ellensburg, WA	93 / 2019	93 (tie)	1934
Low Temperature	June 19, 2023	Walla Walla, WA	44 / 1986	44 (tie)	1949
Low Temperature	June 19, 2023	Yakima, WA	36 / 1986	35	1909

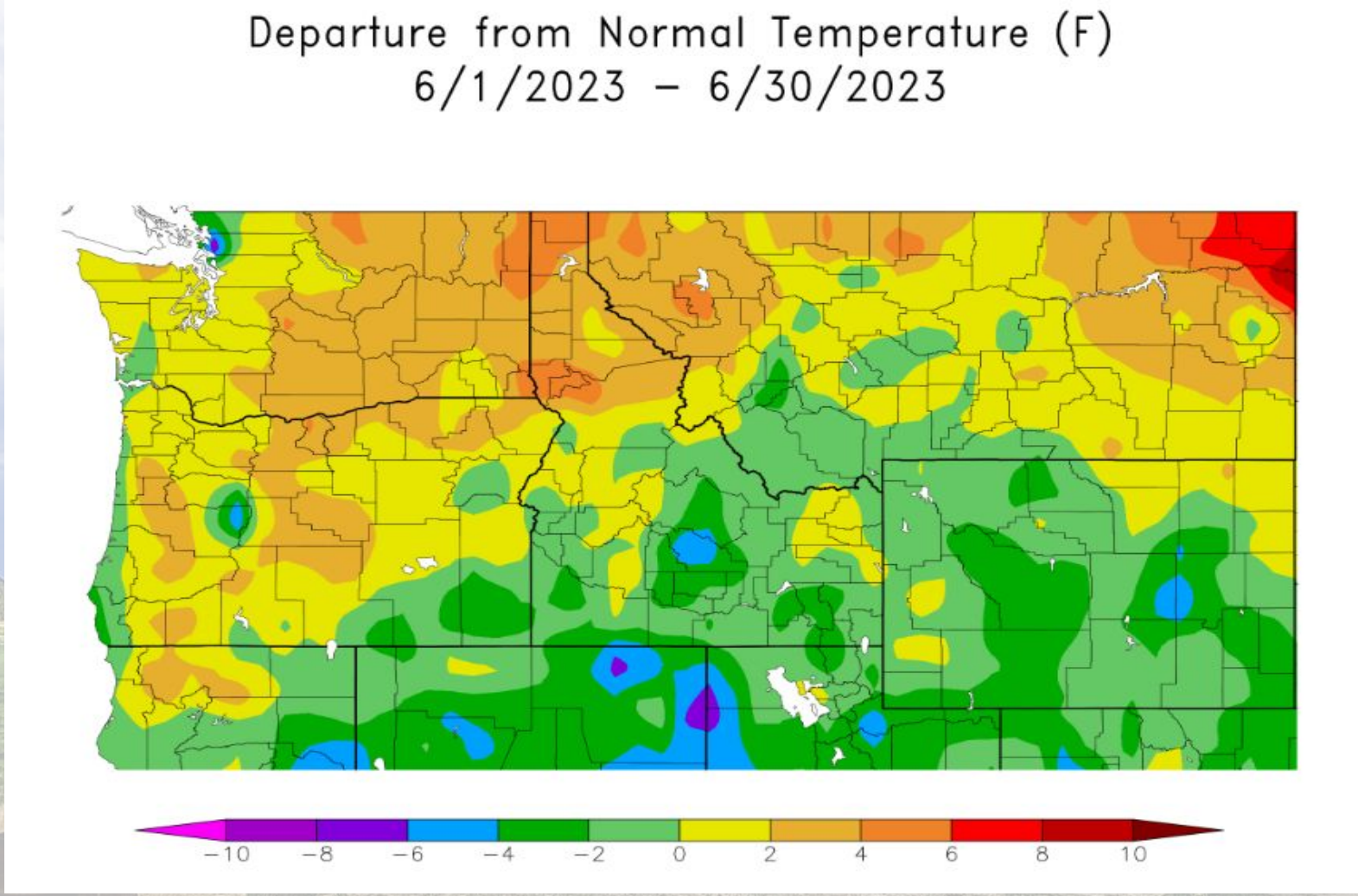
The number of record weather events were also very few (only 4 of them). Two were record high temperatures and two record low temperatures. Yakima, WA had both a record high and a record low temperature. The other two stations were at Ellensburg, WA, and Walla Walla, WA. There were no record events in central or northeast OR.

June 2023: Observed Monthly Maximum & Minimum Temperatures

Location	Highest Maximum	Lowest Minimum
Pendleton, OR	96	42
Redmond, OR	96	31
Pasco, WA	100	44
Yakima, WA	96	35
Walla Walla, WA	94	44
Bend, OR Co-Op	88	29
Ellensburg, WA	94	43
Hermiston, OR	99	42
John Day, OR	93	39
La Grande, OR	94	32
The Dalles, OR	97	46
Meacham, OR	86	28
MT Adams RS, WA	88	34

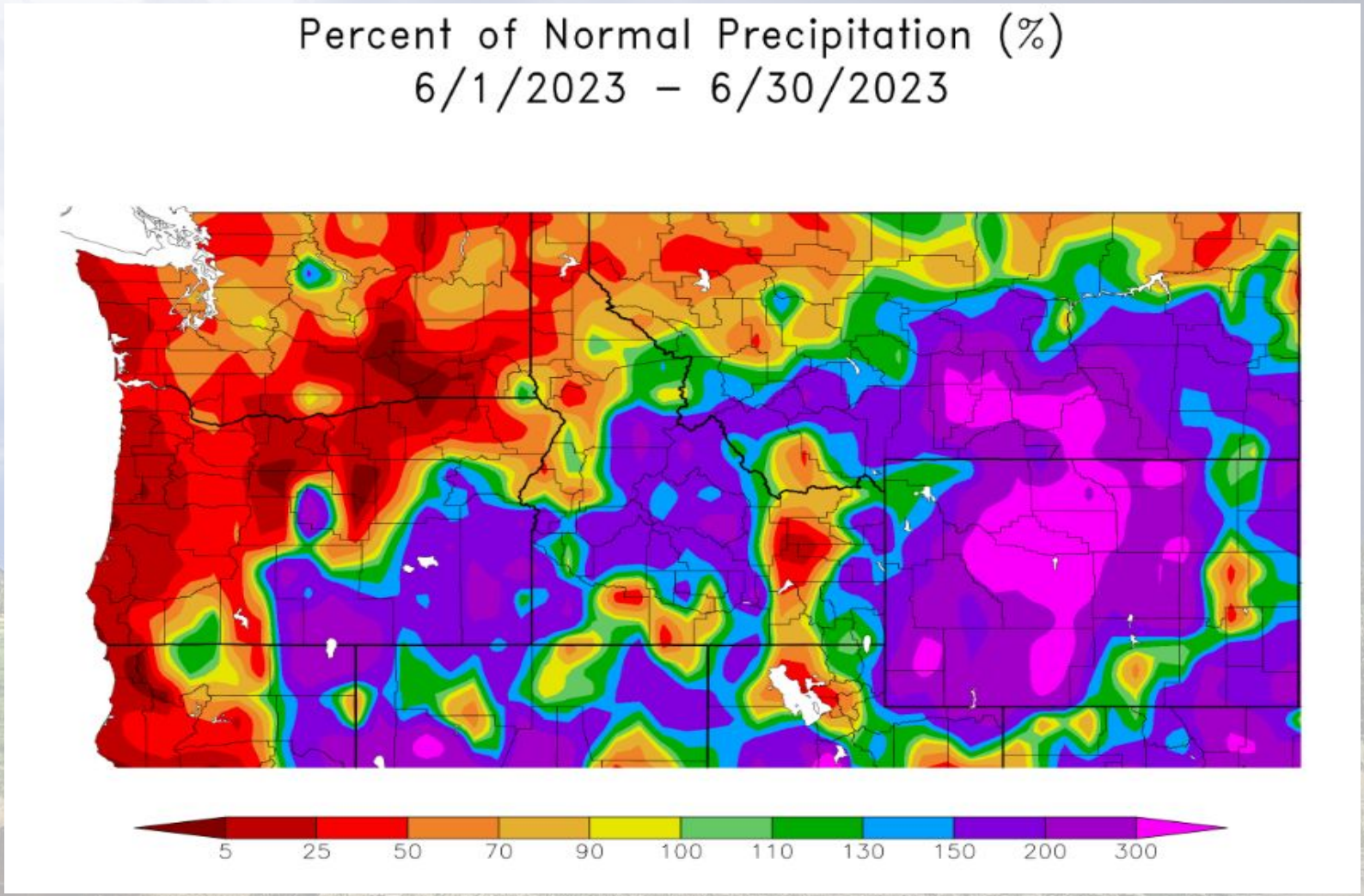
The greatest highest maximum temperature was 100 degrees at Pasco, WA, and the least highest maximum temperature was at Meacham, OR (86 degrees). Most of the highest maximum temperatures were above 90 degrees. The warmest lowest minimum temperature was at The Dalles, OR (at the Dallesport, WA airport) with 46 degrees, and the coldest lowest minimum temperature was at Meacham, OR (28 degrees). Note that it can still get below freezing in June, but mainly at higher elevation stations.

June 2023: Departure from Normal of Average Temperatures



The forecast area had above normal temperatures (departures from normal greater than zero), along with nearly all of WA and most of OR as seen by the abundant warmer colors in the image above. The warmest areas were from central OR north along the Cascades into WA, and east to the Idaho border. There was just a sliver of cooler than normal temperatures along the crest of the central OR Cascades in western Deschutes County.

June 2023: Percent of Normal of Precipitation



June's percentage of normal precipitation, as shown in the image above, showed well below normal precipitation across most of the forecast area. The driest areas were over north central OR, portions of central OR, the Lower Columbia Basin, and the northern Blue Mountains & Foothills. Percentages of normals ranged mostly from 5 percent to 90 percent of normal in these areas. There was a small pocket of above normal precipitation shown in central OR.

June 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	84.1	4.6	52.4	4.1	68.3	4.4	0.07	-0.55
Kennewick	85.1	3.5	59.2	3.1	72.2	3.4	T	-0.51
Walla Walla	81.7	2.9	56.2	2	68.9	2.4	0.04	-1.24
The Dalles	83.4	4.3	55.8	1	69.6	2.6	0.04	-0.52
Redmond	81.2	5.1	44.0	3	62.6	4.1	0.01	-0.63
Pendleton Airport	83.4	5.2	52.3	0.8	67.9	3	0.07	-0.91
La Grande Airport	77.5	2.8	47.4	-1.3	62.5	0.8	1.38	-0.16
John Day	81.8	4.2	50.7	5.3	66.2	4.7	0.12	-1.31

Every monthly average high, low, and average temperatures was warmer than normal, except for the monthly average low temperature at the La Grande, OR Airport. This was consistent with the image before that showed the departures of normal temperatures over the forecast area. The greatest departures from normal were at the Pendleton, OR Airport, and at John Day, OR that were all close to 5 degrees above normal. Every departure from normal precipitation were below normal. All were greater than a half inch below normal, except at the La Grande, OR Airport with -0.16 of an inch below normal. The greatest departure was -1.31 inches at John Day, OR, followed by -1.24 inches at Walla Walla, WA.

The greatest departures are outlined in black boxes.

June 2023: Observed Total Precipitation and Total Snowfall/Hail

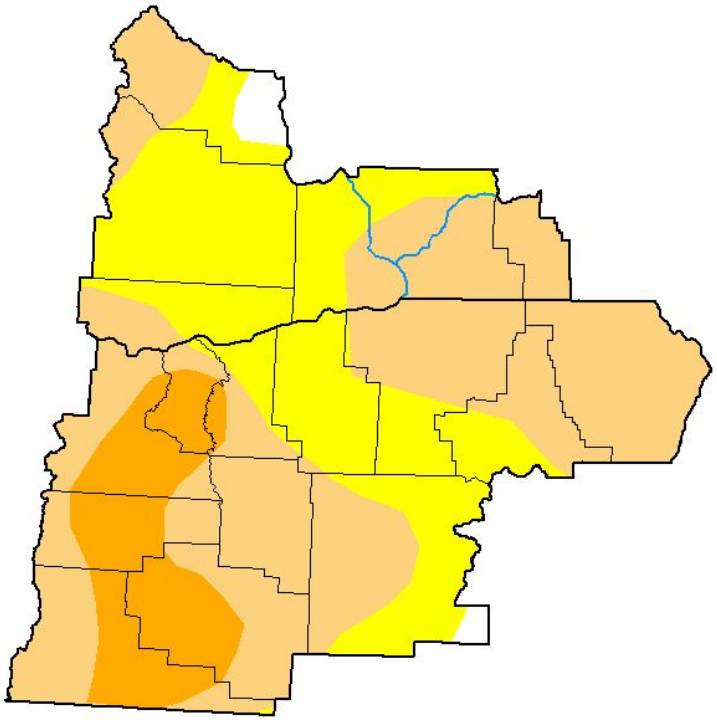
Location	Total Precipitation (inches)	Total Snow/Hail (inches)
Pendleton, OR	0.07	0.0
Redmond, OR	0.01	M
Pasco, WA	T	M
Yakima, WA	0.07	M
Walla Walla, WA	0.04	M
Bend, OR Co-Op	0.05	0.0
Ellensburg, WA	0.10	M
Hermiston, OR	0.03	M
John Day, OR	0.12	M
La Grande, OR	1.38	M
The Dalles, OR	0.04	M
Meacham, OR	0.78	M
Mt. Adams RS, WA	0.13	0.0

The greatest total precipitation amount was 1.38 inches at La Grande, which resulted in a departure from normal of only -0.16” (see previous slide), and the least was a trace at Pasco, WA. However, most precipitation amounts were a tenth of an inch or less. There were no reports of snow or hail at any of these listed stations. However, hail was observed at some locations, but were not reported at any of these regular reporting stations shown in the list above (see the Significant Weather Events slide above).

June 2023 - Drought Monitor – Pendleton Forecast Area

U.S. Drought Monitor

Pendleton, OR WFO



July 4, 2023

(Released Thursday, Jul. 6, 2023)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	1.59	98.41	64.55	13.32	0.00	0.00
Last Week *06-27-2023*	14.84	85.16	59.34	15.49	0.00	0.00
3 Months Ago *04-04-2023*	29.49	70.51	45.64	27.56	12.26	0.00
Start of Calendar Year *01-03-2023*	29.80	70.20	39.93	22.93	15.24	3.17
Start of Water Year *09-27-2022*	0.00	100.00	46.03	24.98	17.46	3.17
One Year Ago *07-05-2022*	36.51	63.49	40.02	27.78	22.24	4.01

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

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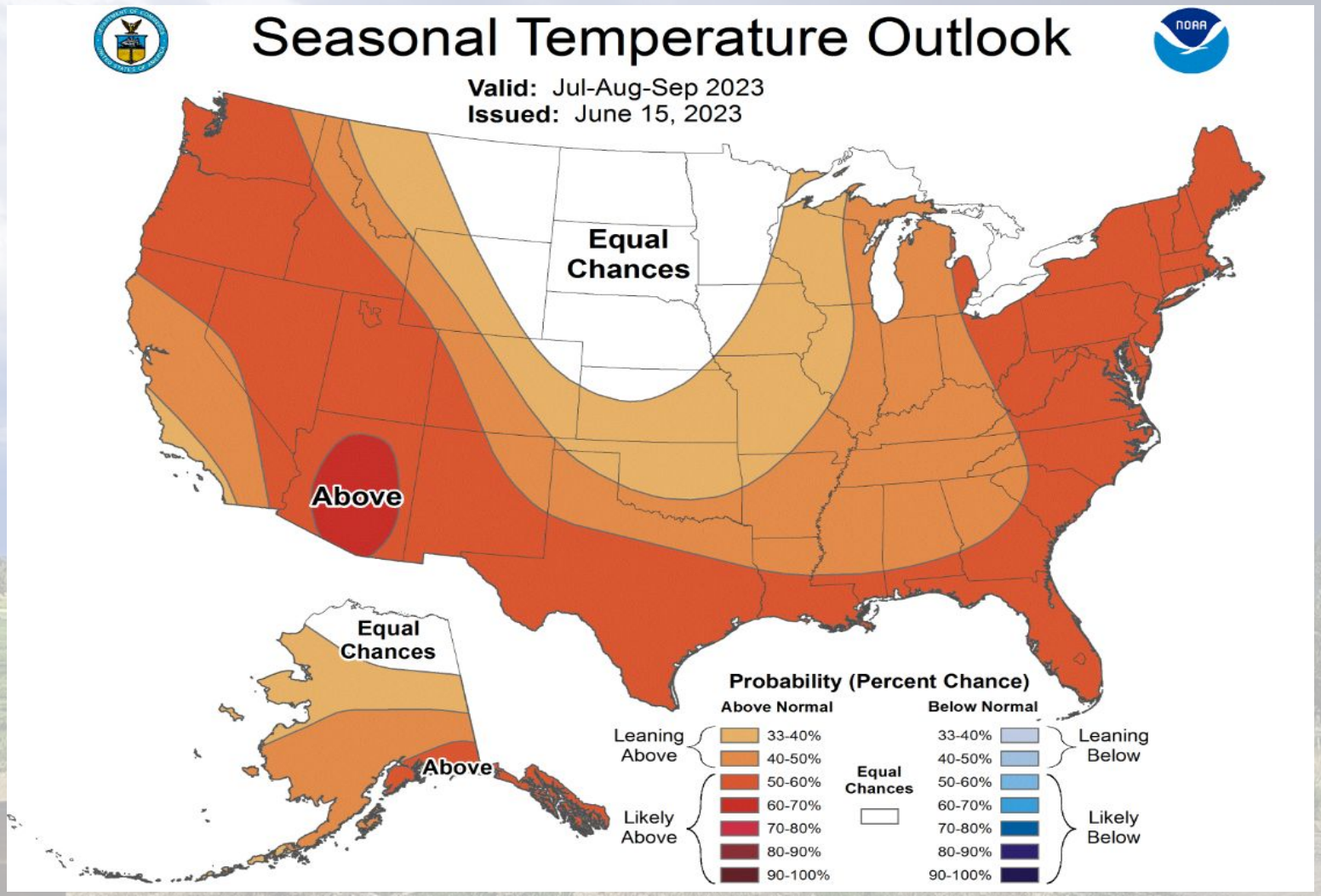
National Drought Mitigation Center

droughtmonitor.unl.edu

For additional drought and water supply information, please check out the NWS Pendleton ***Drought Summary / Water Supply Outlook*** *that was released on* ***July 10, 2023.***

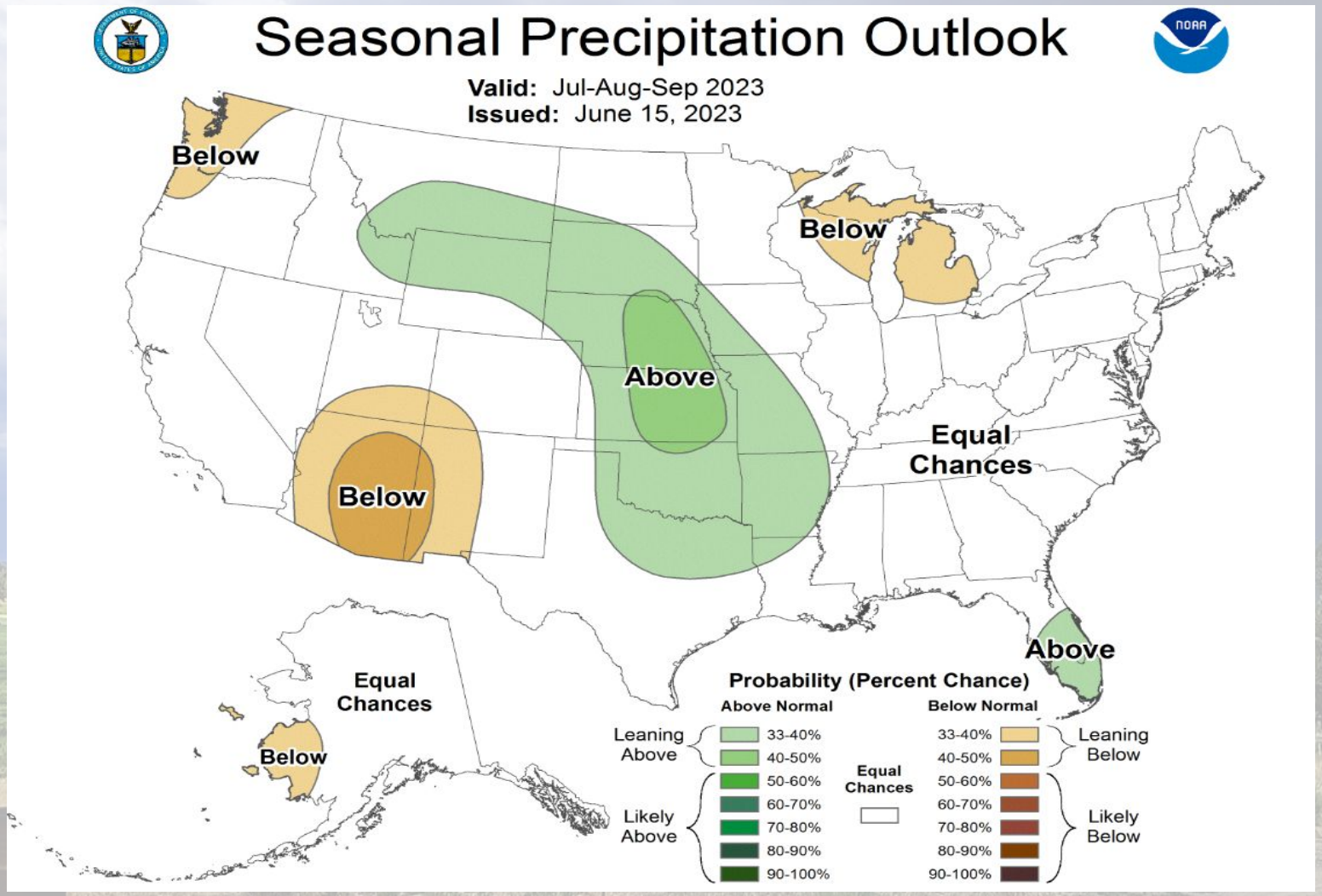
While parts of central OR and the central OR mountains saw small improvements in drought conditions with the greatest drought condition still D2 (“Severe Drought), areas of south central WA to the Lower Basin and northeast mountains saw conditions deteriorate (D1, “Moderate Drought”). This is consistent with June’s percent of normal precipitation, previously shown, where precipitation was much below normal.

USA Three Month Temperature Outlook



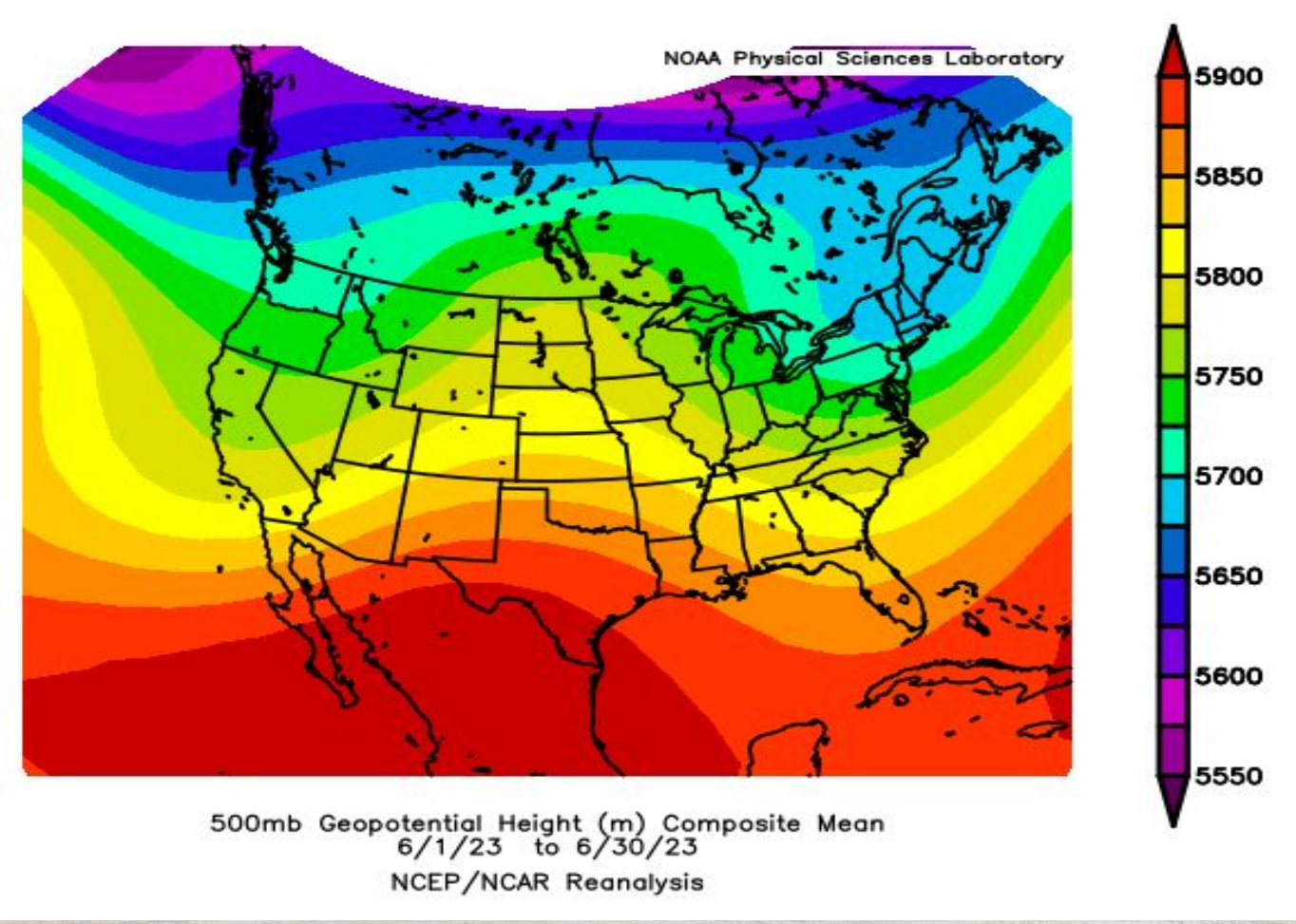
The three month outlook for the period July through September over the Pacific Northwest shows temperature probabilities leaning towards above normal (50-60%). This is not much of a change since April, except that the probabilities are slightly higher, and with a solid coverage area in this probability range.

USA Three Month Precipitation Outlook



The three month outlook for the period July - September over the Pacific Northwest shows equal chances of above, near, or below normal precipitation (about 33% either way). Only the northwest portions of the forecast area (central WA) are expected to lean to slightly below normal precipitation (33-40%).

June 2023 Average 500 MB Pattern

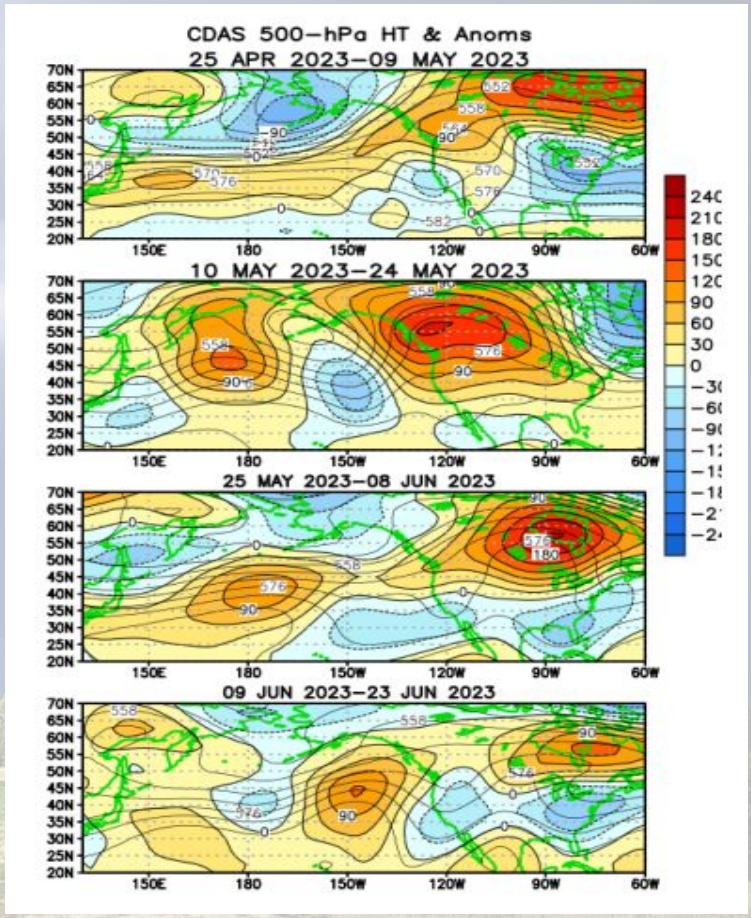


The average 500 flow pattern shows a broad mean upper trough with a westerly flow over the Pacific Northwest. This pattern is mostly a dry pattern mainly due to a lack of moisture and instability east of the Cascades in both OR and WA. However, there were a few weak weather systems, which were embedded in this flow, that brought mostly light precipitation, except for localized areas of heavier precipitation from thunderstorms. However, this is an overall dry weather pattern for the forecast area during the late spring and early summer season.

Two Month, average Bi-weekly 500 MB Plots for May - June 2023

These are more detailed bi-weekly average 500 mb pattern plots that were sampled from the very end of March through the end of May

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

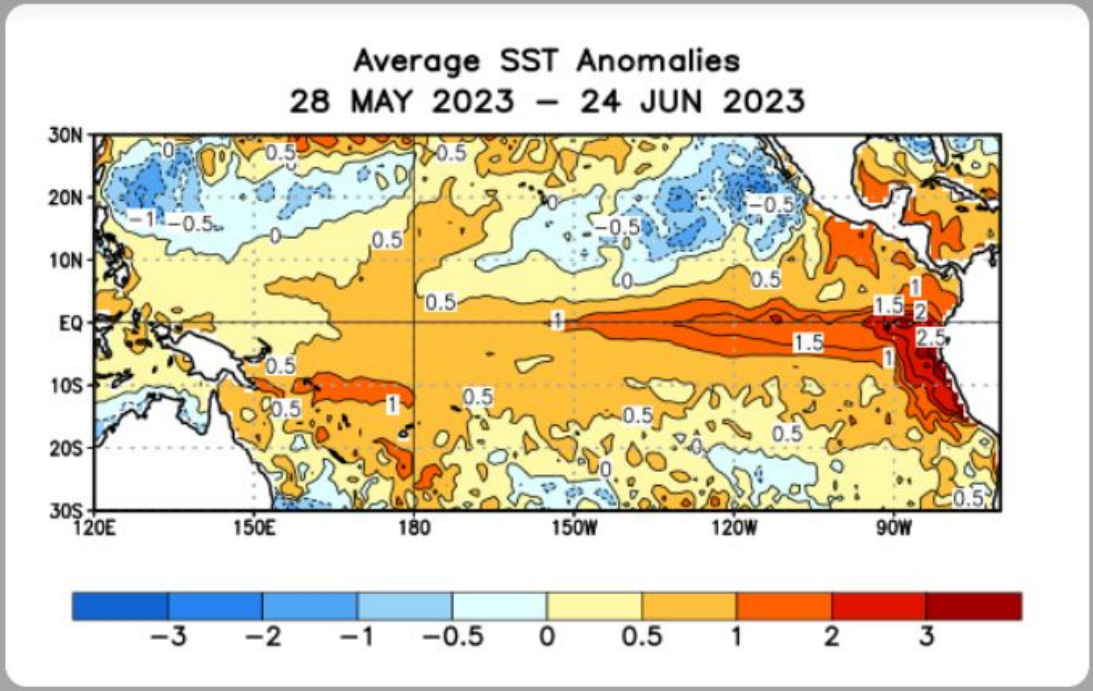


From the 25th of April to the 9th of May a broad upper trough to an almost zonal westerly flow existed over the Pacific Northwest. Then from May 10th - May 24th a strong upper ridge developed over mainly western Canada, with more of a southwest to west flow over the Pacific Northwest. Then the pattern became mainly a dry westerly zonal flow from May 25th to June 8th. After that, a stronger upper trough pattern developed over the region from June 9th to the 23rd. The overall result of this increased number of bi-weekly pattern changes resulted in mostly benign, average weather with mostly drier and warmer than normal conditions.

Sea Surface Temperature (SST) Anomalies for June 2023

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

In the last four weeks, equatorial SSTs were above average across most of the Pacific Ocean, with near average SSTs present only in the western Pacific Ocean.



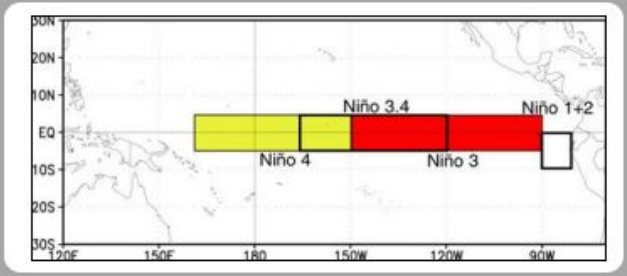
equatorial Sea Surface Temperatures (SSTs) were above average over most of the Pacific Ocean the last four weeks. There were some cooler than normal areas off the coast of Mexico southwestward. These persistent mostly above normal SSTs continues to show the transition into an El-Niño event, which is expected to continue through the summer and fall into the winter of 2023 - 2024.

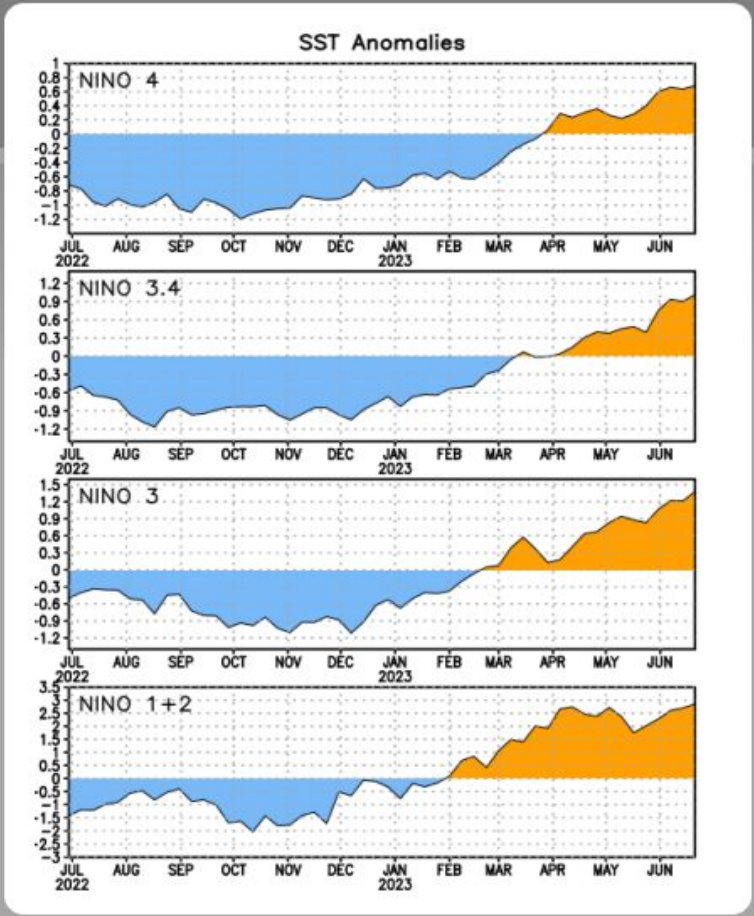
ENSO Niño Regions SST Anomalies for Each Niño Region in June 2023

Niño Region SST Departures (°C) Recent Evolution

The latest weekly SST departures are:

Niño 4	0.7°C
Niño 3.4	1.0°C
Niño 3	1.4°C
Niño 1+2	2.9°C





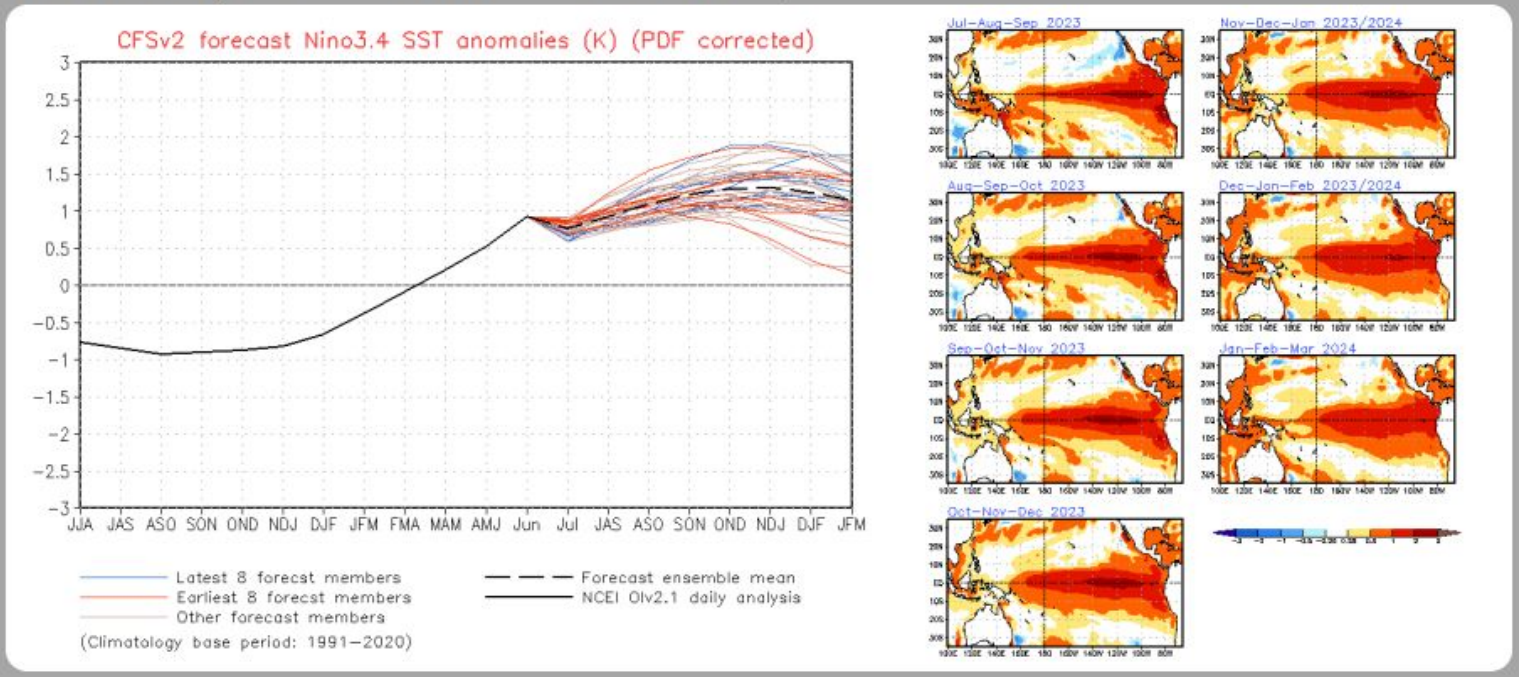
All Niño Regions continued to show warming in June, with the amount of warming continuing to increase since March - April (shown by the area of orange color). Again, this is consistent with the transition into an El-Niño event, which is expected to continue through the summer and fall into the winter of 2023 - 2024. These warming SSTs have been taking place during the past 3 to 5 months, with the greatest in Niño Region 1 + 2, and Niño Region 3.

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

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

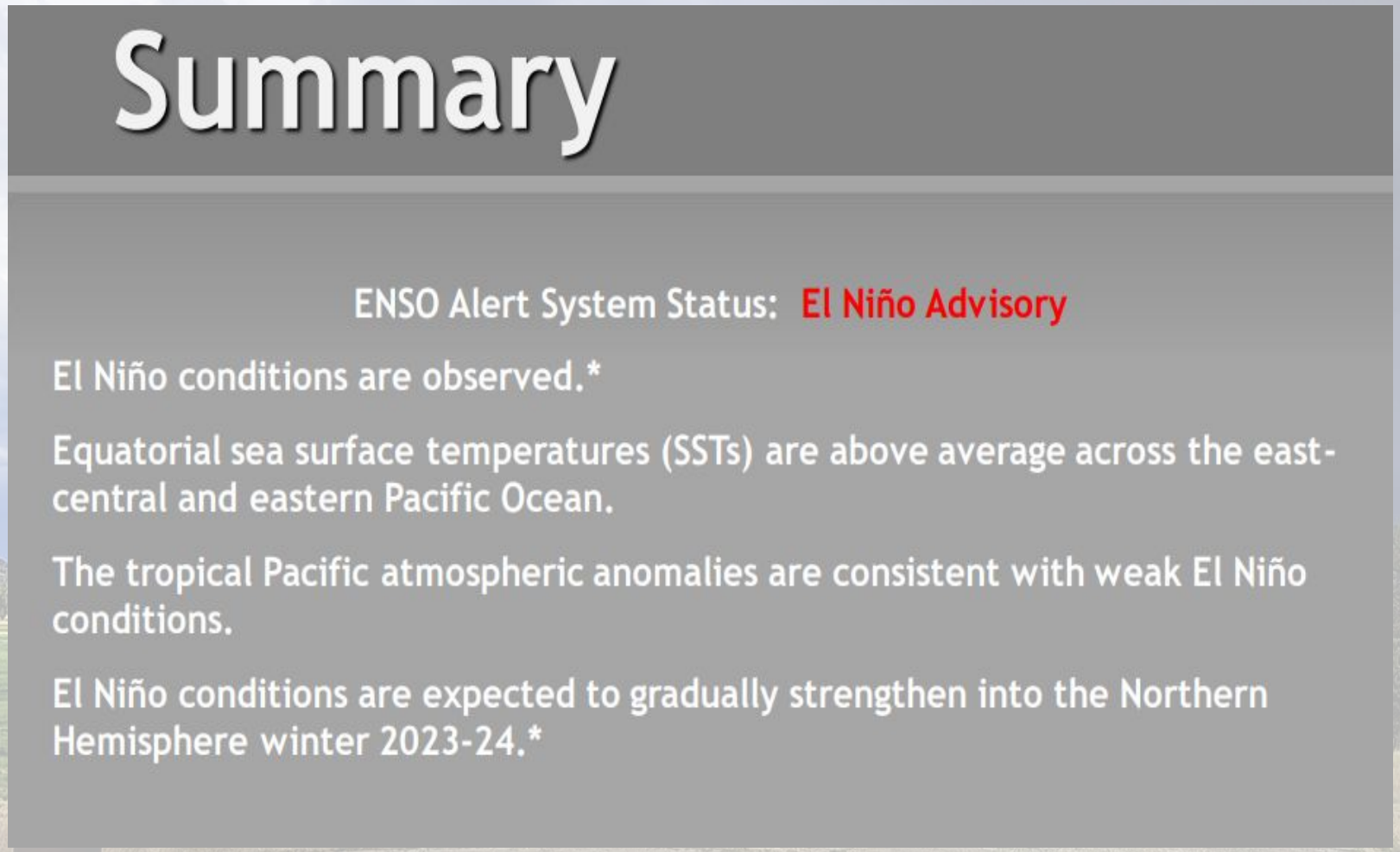
Issued: 26 June 2023

The CFS.v2 ensemble mean (black dashed line) indicates El Niño will continue through the Northern Hemisphere winter 2023-24. A moderate-strength El Niño is favored (ONI between 1.0°C and 1.5°C).



The SST CFS.v2 forecast ensemble mean (the black dashed line) shows that El-Niño will continue through the Northern Hemisphere winter of 2023-2024. This is favored to be a moderate strength El-Niño. All of the thumbnail images to the right show a consistent series of above normal SSTs through the summer and fall, into the winter of 2023-2024.

Current ENSO (El Niño Southern Oscillation) Alert System Status



The current ENSO Alert System Status is now **"El Niño Advisory"**. El-Niño conditions are currently observed, with equatorial SSTs above average across the east-central and eastern Pacific Ocean. The tropical Pacific atmospheric anomalies are consistent with weak El-Niño conditions. However, El-Niño conditions are expected to gradually strengthen into the Northern Hemisphere winter of 2023-2024.


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