

NWS Winter Seasonal Outlook

2022-2023

Weather Forecast Office

Portland, OR

Wednesday, October 26

Presenter: Treena Jensen, NWS Portland Warning Coordination Meteorologist





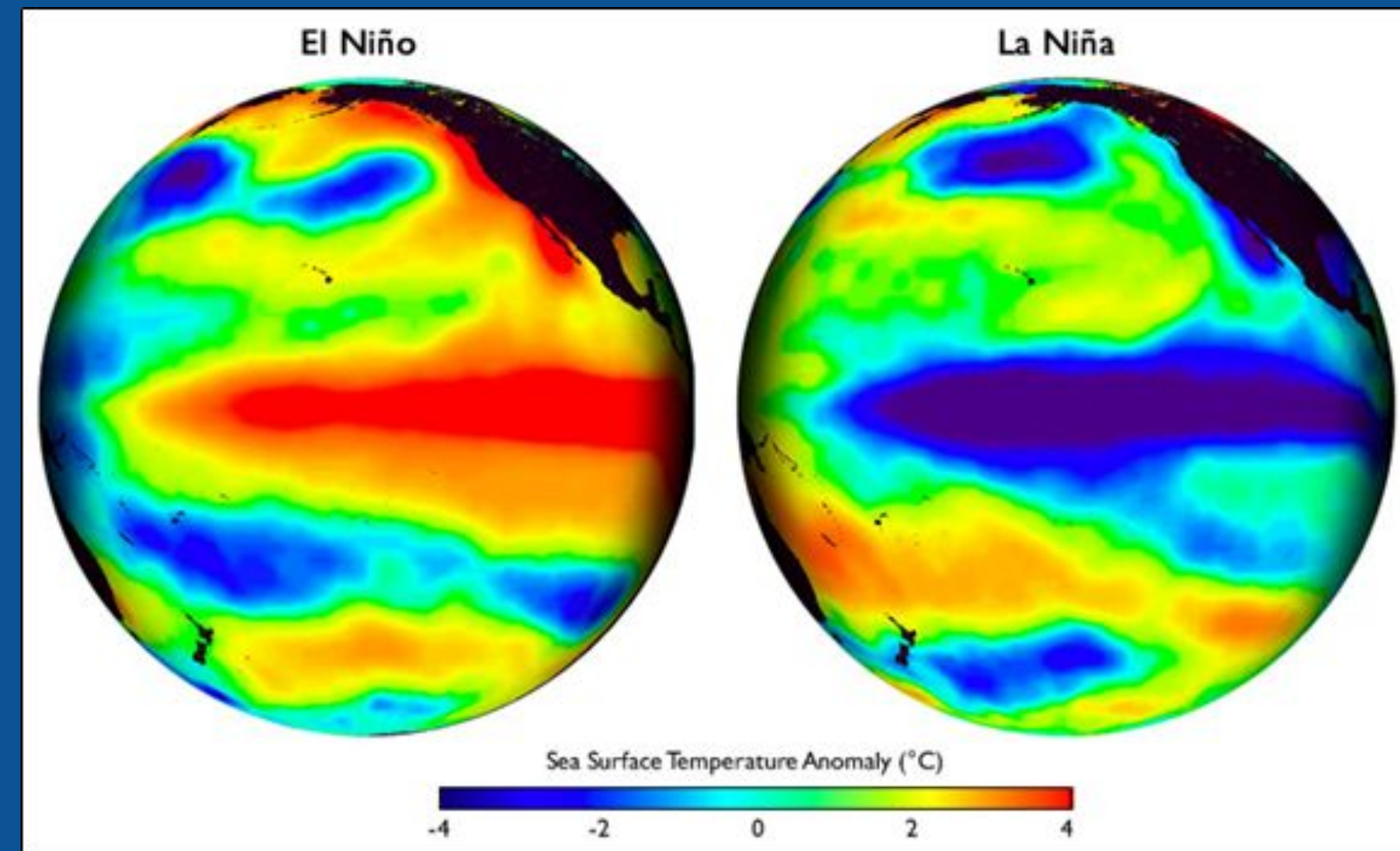
Key Points

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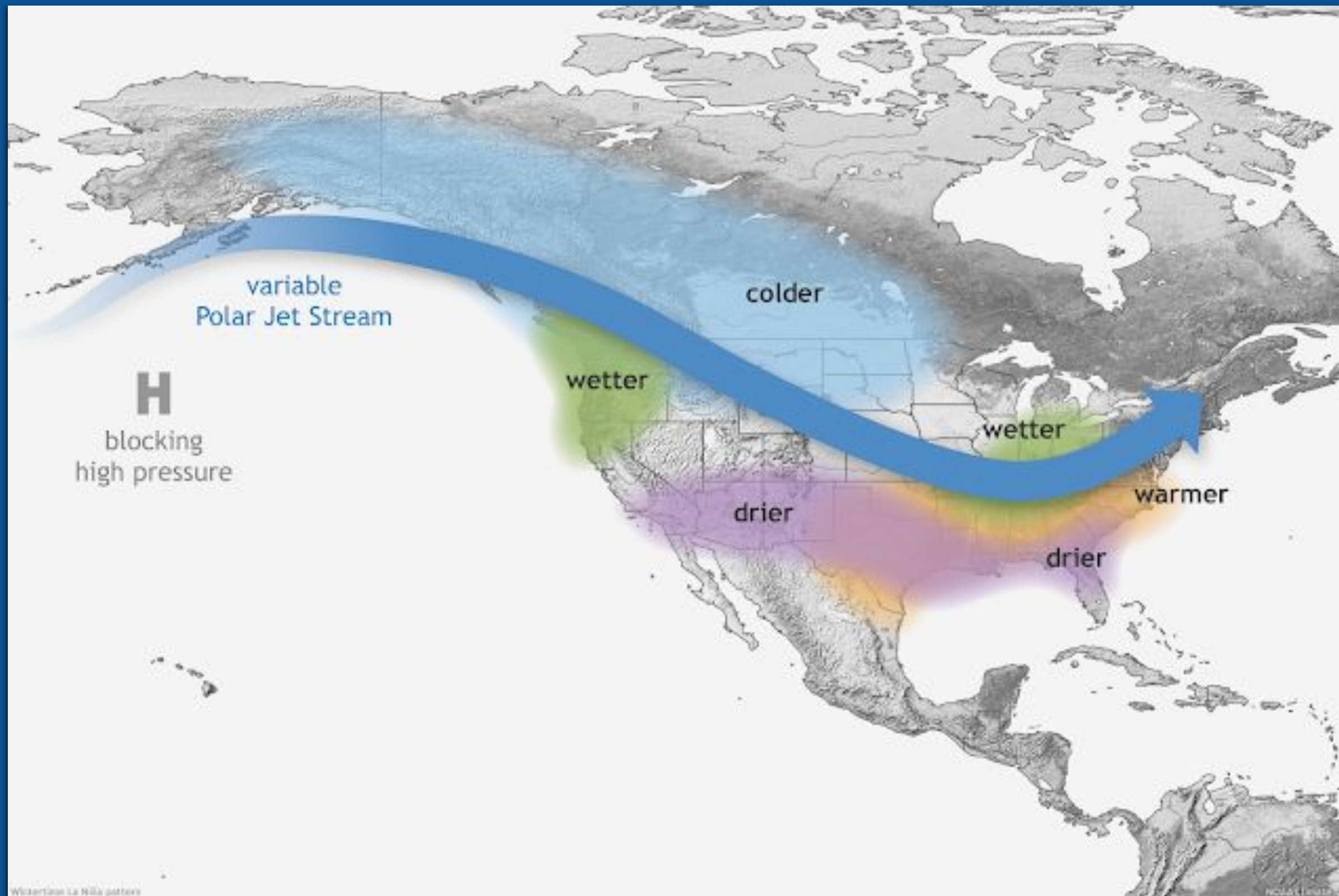
- Quick Review of ENSO (El Niño Southern Oscillation) & Current Status
- La Niña Weather Implications - historically
- Third consecutive winter of La Niña
- NWS Climate Prediction Center (CPC) outlooks
 - 1) 8-14 day (high chance for wetter than normal)
 - 2) 1 Month, November (WA wetter than normal, otherwise Equal Chance)
 - 3) 3 Month, Winter (slight favor for wetter and cooler than normal)
 - 4) 3 Month, Spring (slight favor for wetter and cooler than normal)
 - 5) 3 Month, Summer (Favors warmer than normal)

What is ENSO?

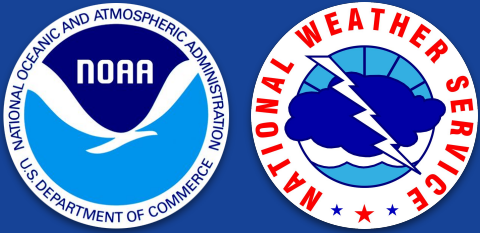
El Niño and the Southern Oscillation, commonly referred to as ENSO, is a periodic fluctuation in sea surface temperature (SST) and the overlying atmosphere across the equatorial Pacific Ocean



- ENSO has three possible stages:
 - ENSO-neutral (near-normal water temps across the equatorial Pacific)
 - **La Niña** (relatively **cool water** across the equatorial Pacific - **above right**)
 - **El Niño** (relatively **warm water** across the equatorial Pacific - **above left**)



- Equatorial sea surface temperatures (SSTs) are below average across most of the Pacific Ocean.
- There is a **75% chance La Niña will continue** this winter.
- A **54% chance of transitioning to ENSO-Neutral Spring (FMA) 2023**
- Favors **wetter and cooler** than normal conditions for the PNW this winter.



ENSO Status: **La Niña Advisory**

La Niña Categories:

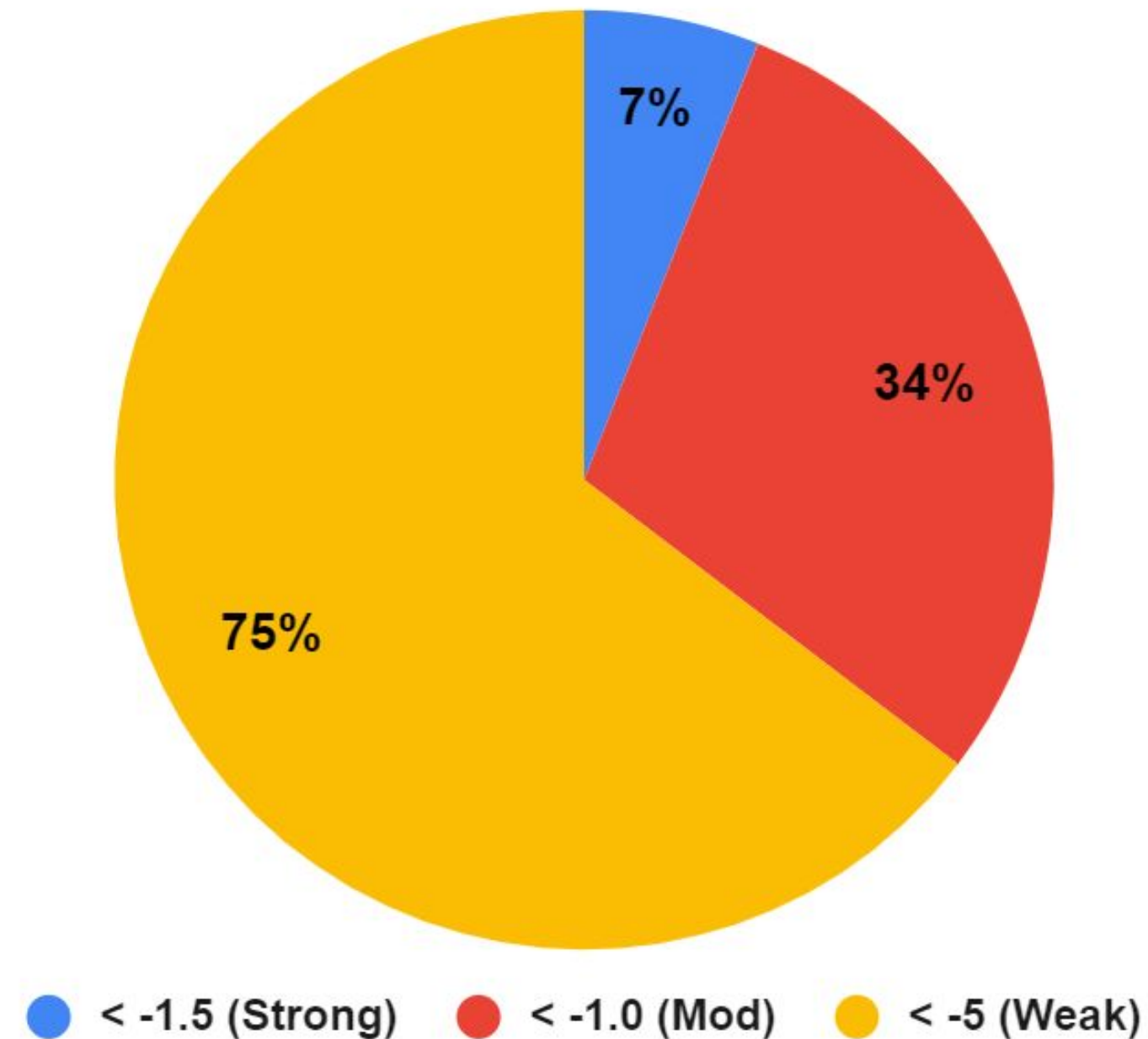
3 consecutive overlapping 3-mo periods with SST anomalies of the following categories:

- WEAK:** -0.5 to -0.9 °C
- MODERATE:** -1 to -1.4 °C
- STRONG:** -1.5 to -1.9 °C
- VERY STRONG:** ≥ -2 °C

Best chance are for a **WEAK** La Niña for 2022/23 Winter (DJF).

However, a moderate La Nina is possible, especially in December, as La Niña is expected to weaken in Jan and Feb

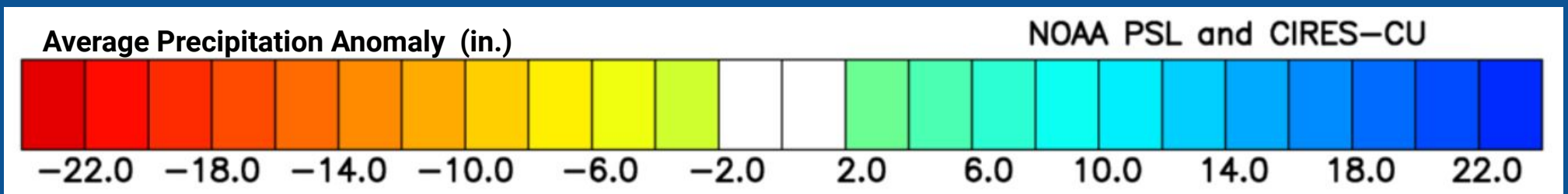
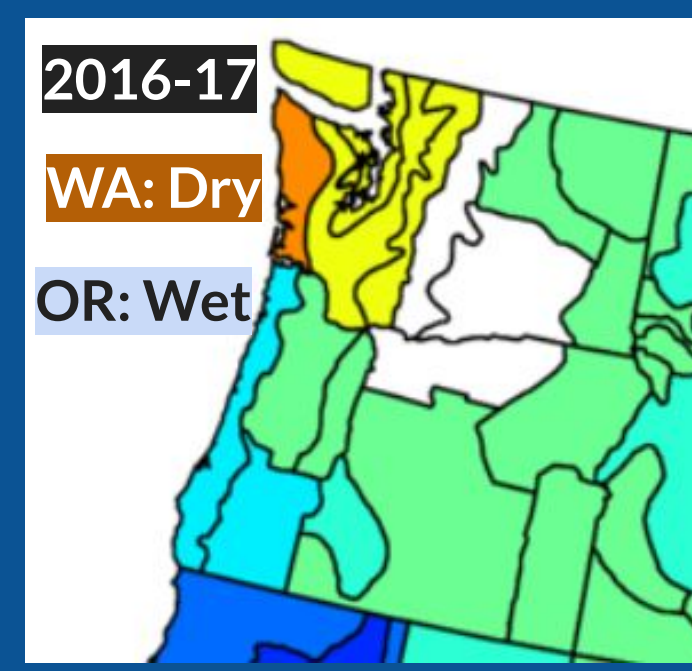
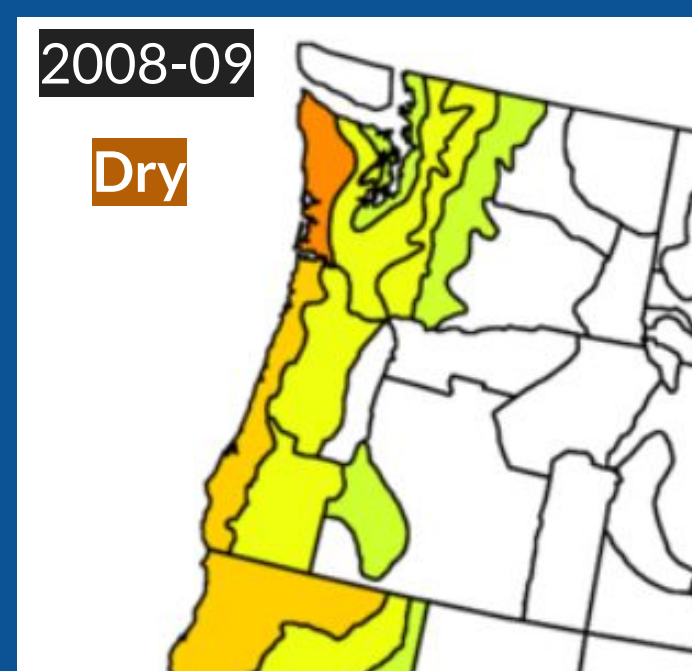
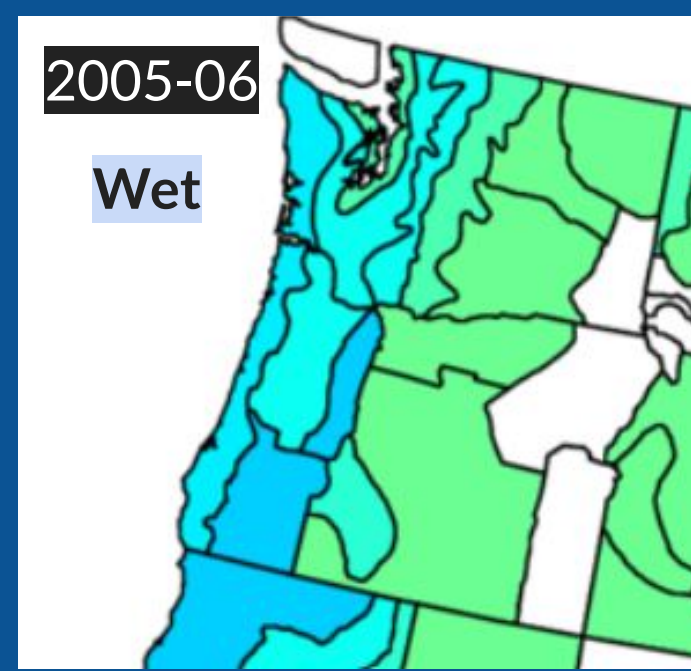
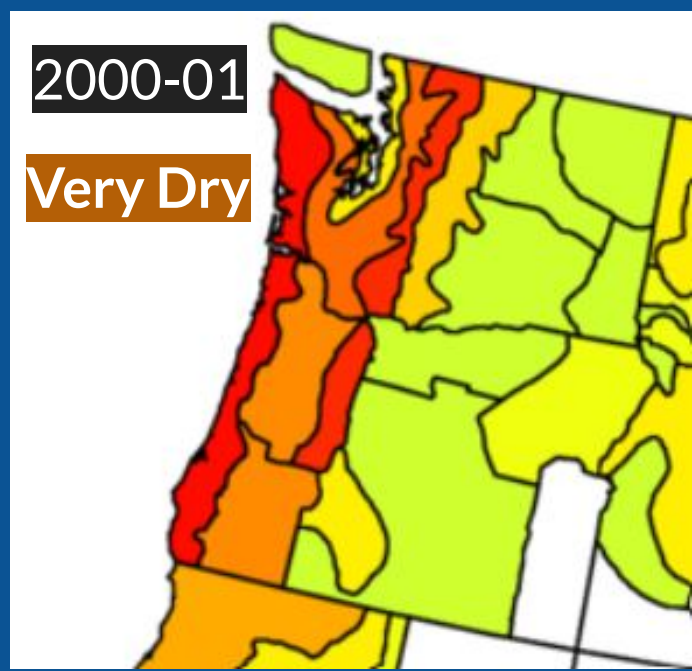
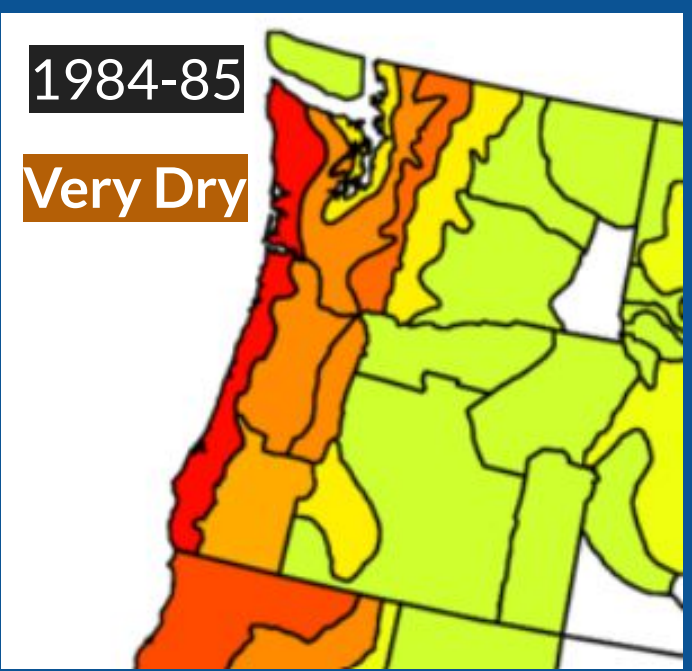
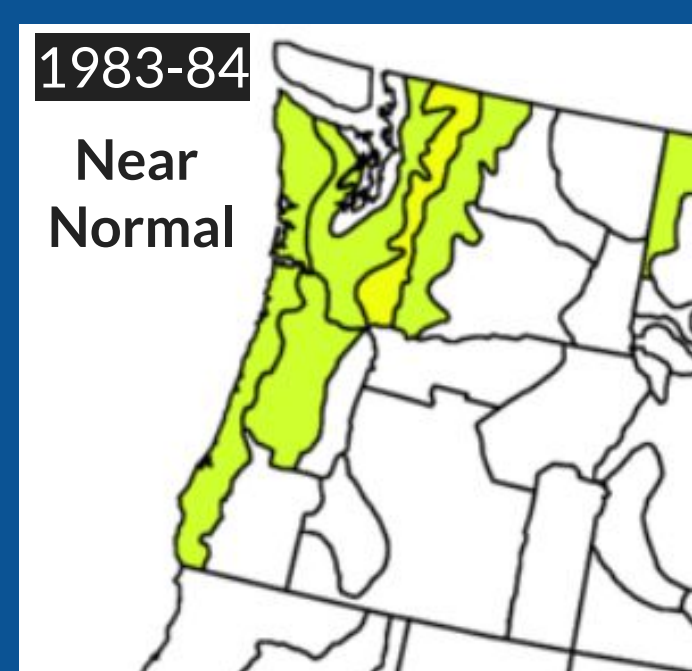
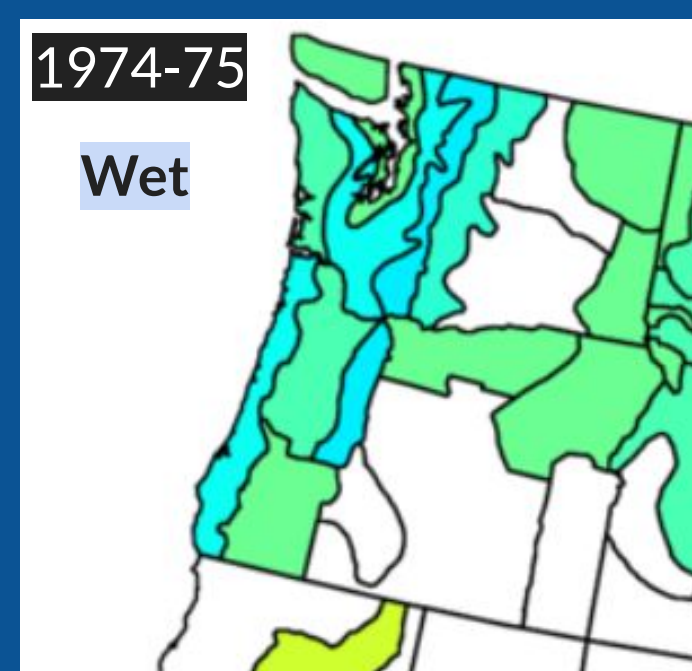
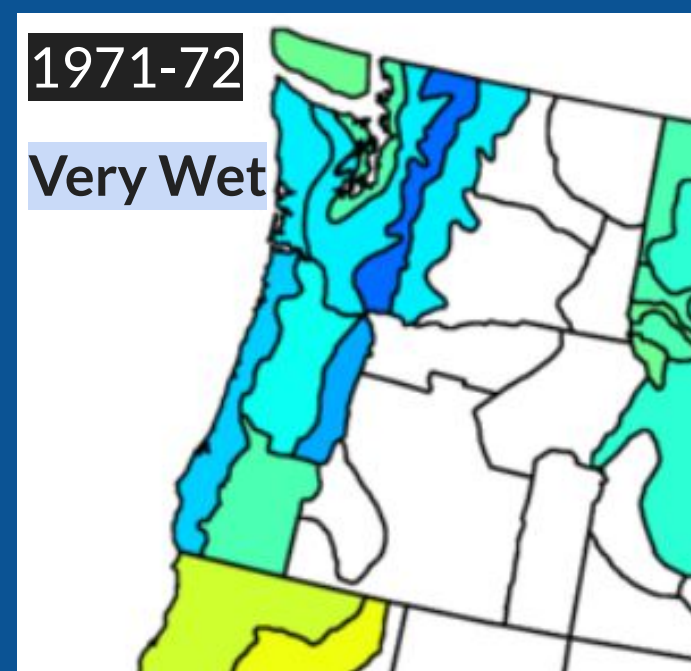
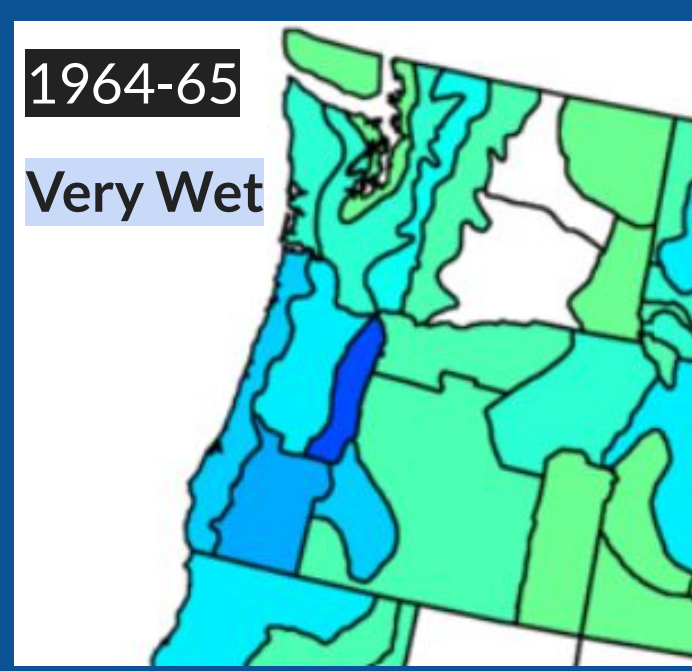
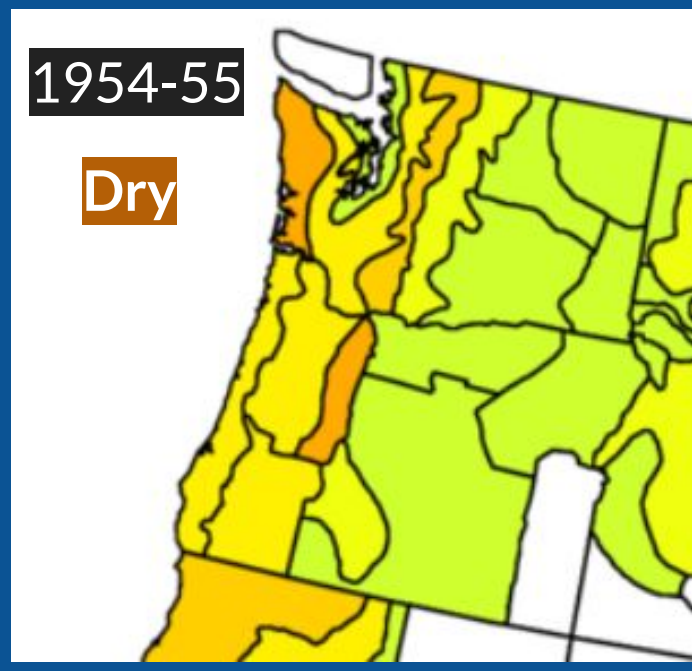
Probability of Exceeding La Nina Category for 2022/23 Winter (DJF)





Winter (DJF) Precipitation History: **Weak La Niñas**

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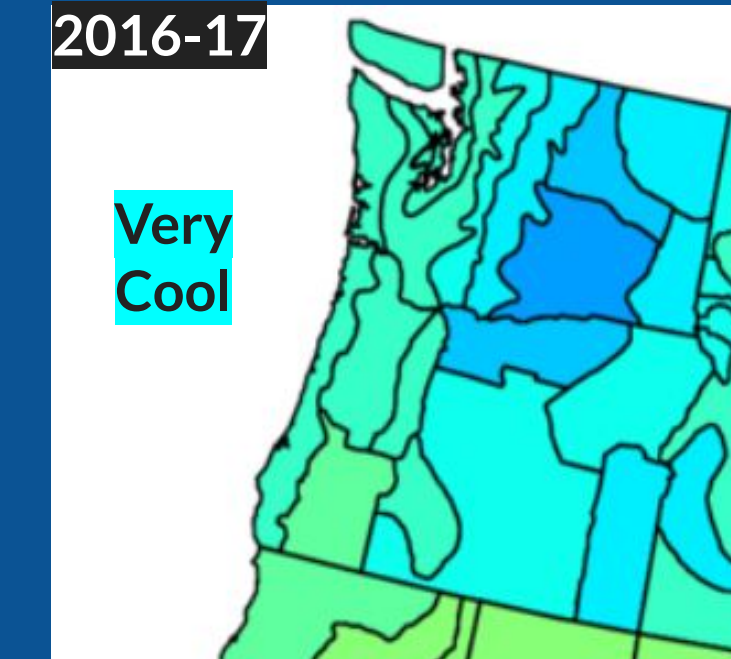
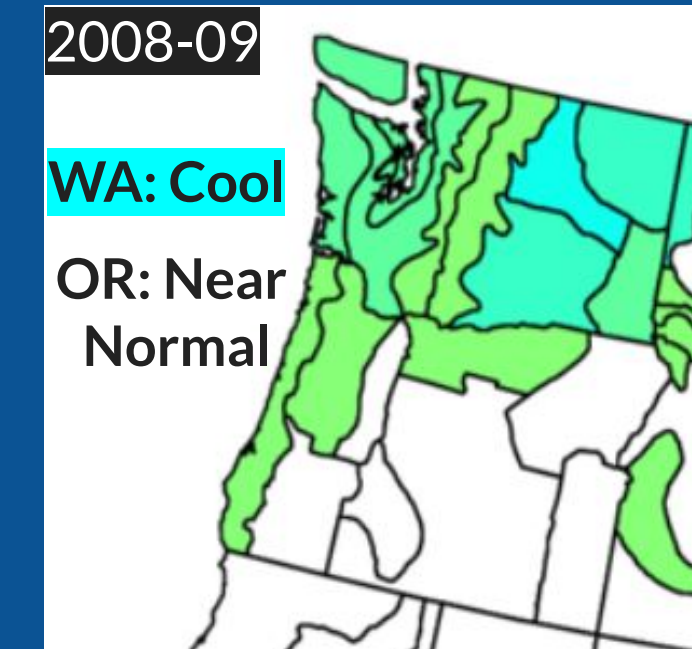
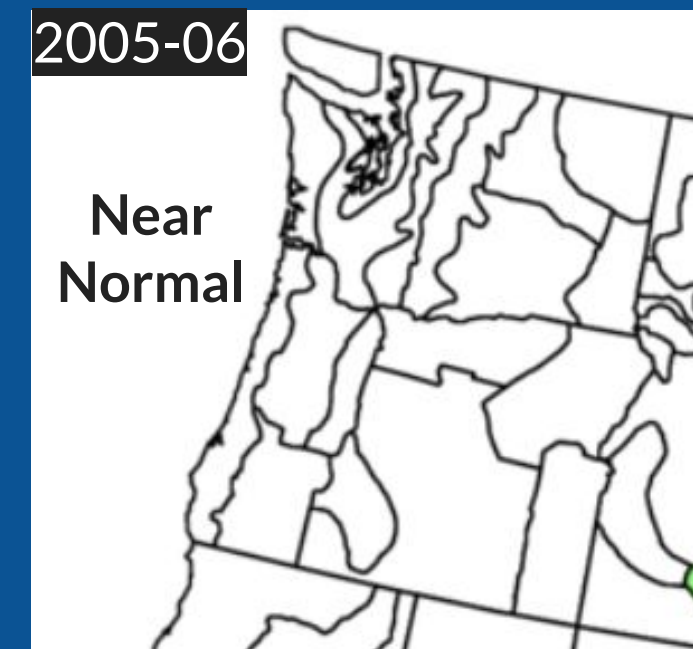
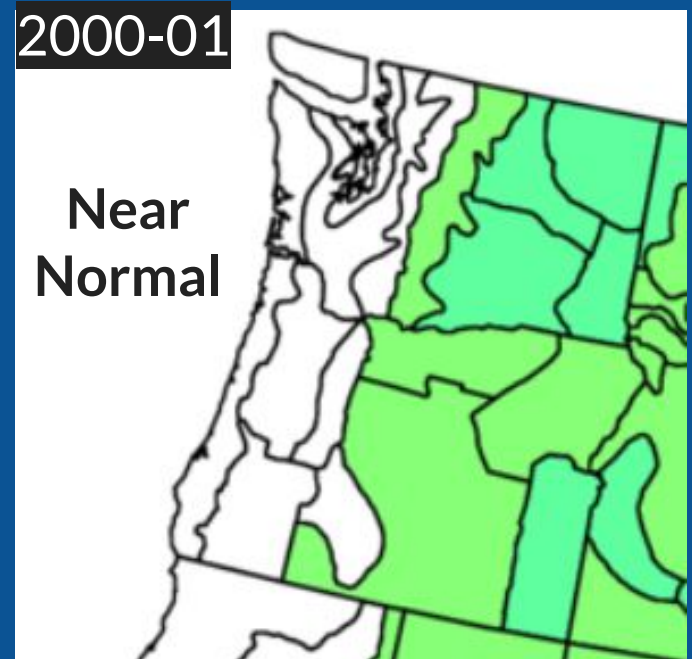
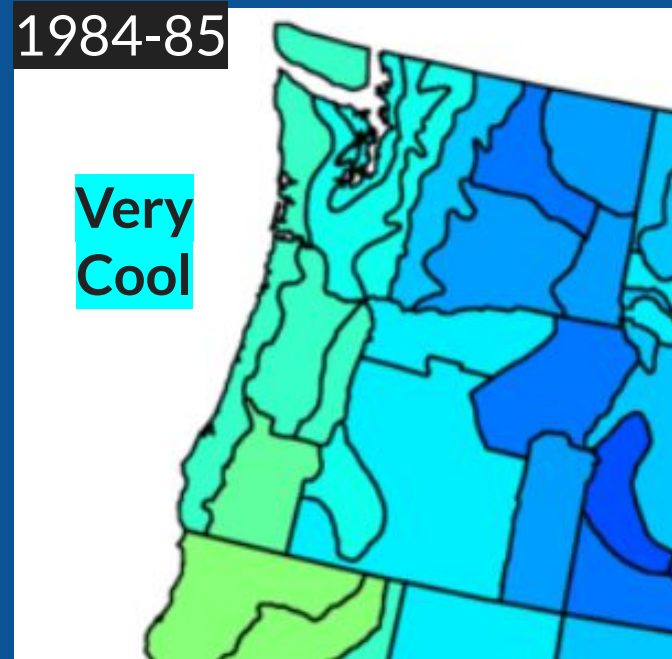
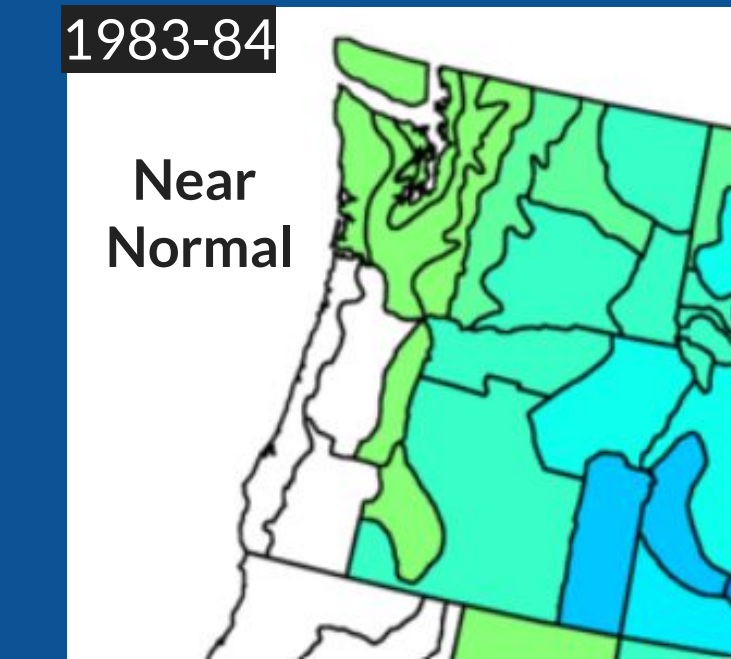
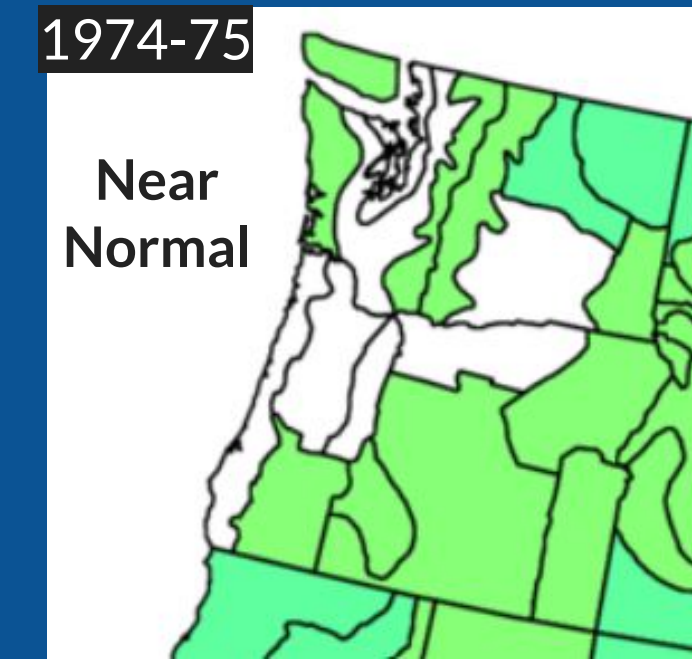
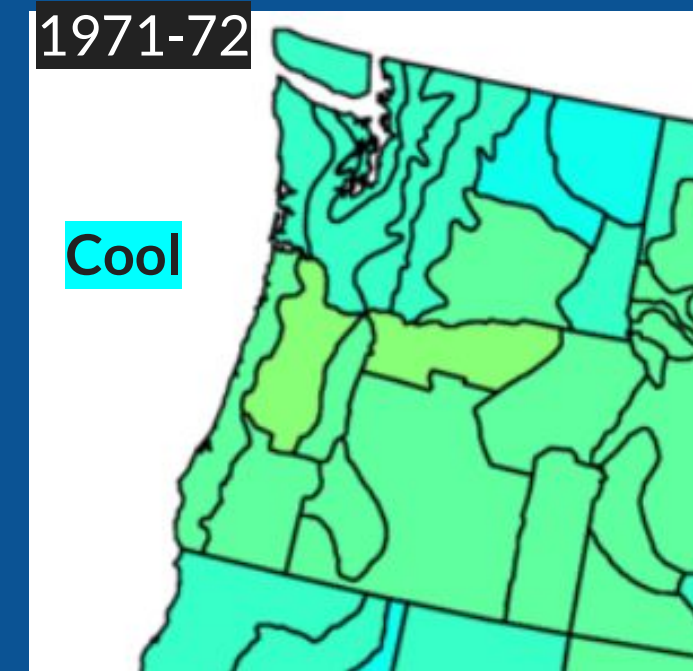
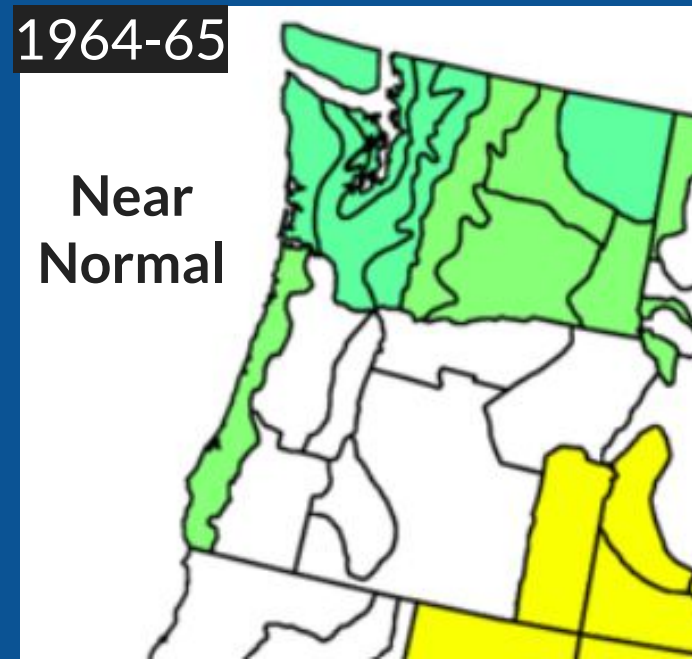
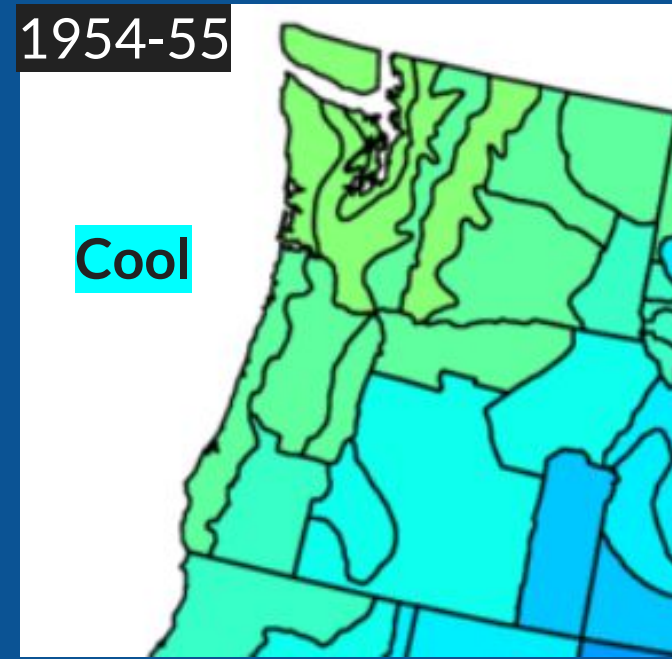


Weak La Nina: 5 consecutive overlapping 3-month periods with SST anomalies between -0.5 to -0.9 °C.



Winter (DJF) Temperature History: **Weak La Niñas**

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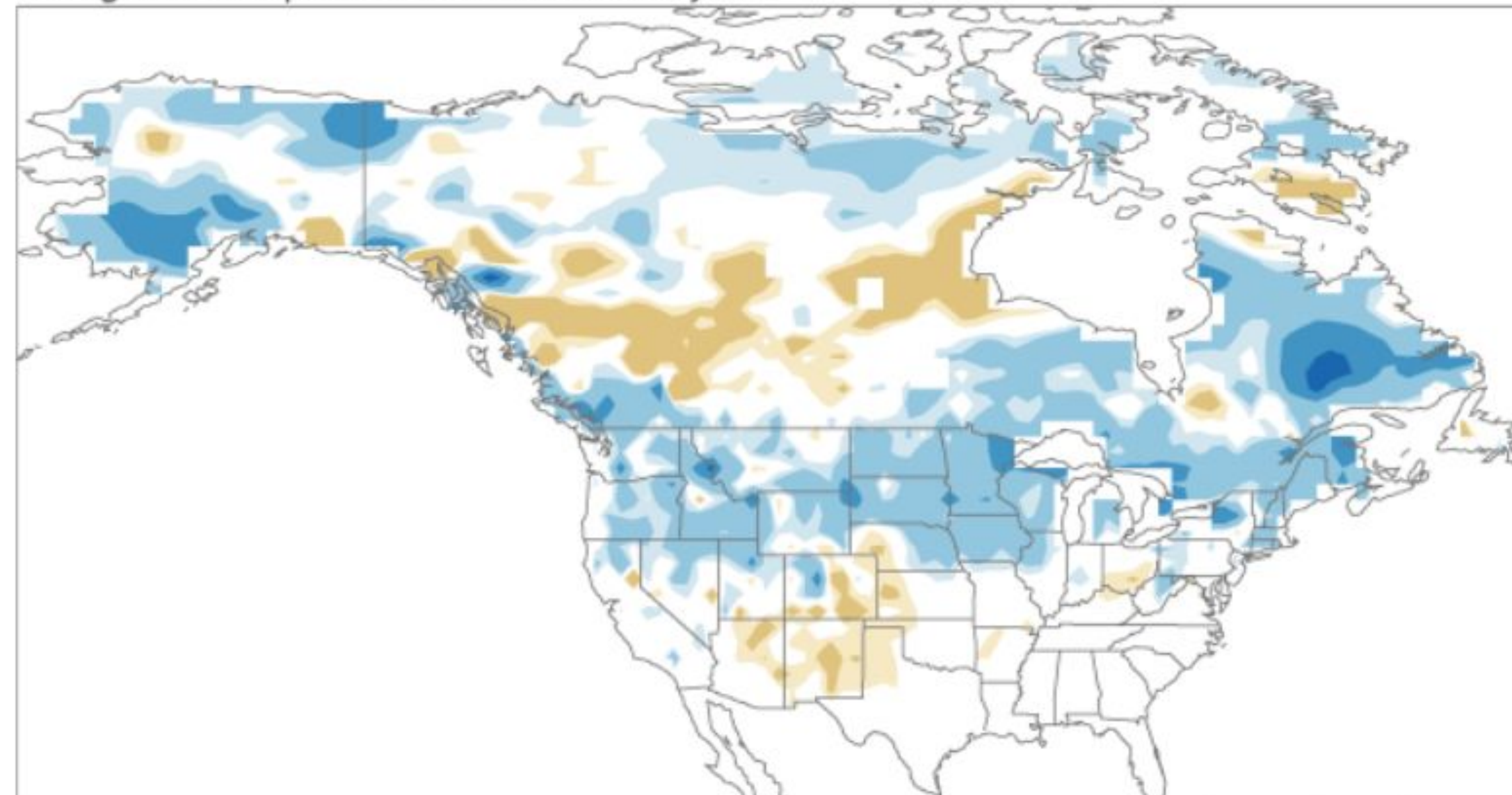
Weak La Nina: 5 consecutive overlapping 3-month periods with SST anomalies between -0.5 to -0.9 °C.

Average Snowfall for weak La Nina Years (Oct - Apr)

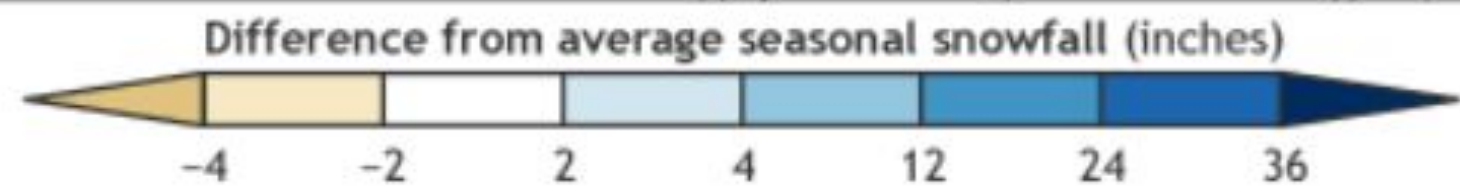
1950 - 2009 (missing two weak La Nina events).

Shows 4 to 12 inches more snow than average for the OR and WA Cascades

Average snowfall patterns for weak La Niña years



October-April
1950-51 to 2008-09



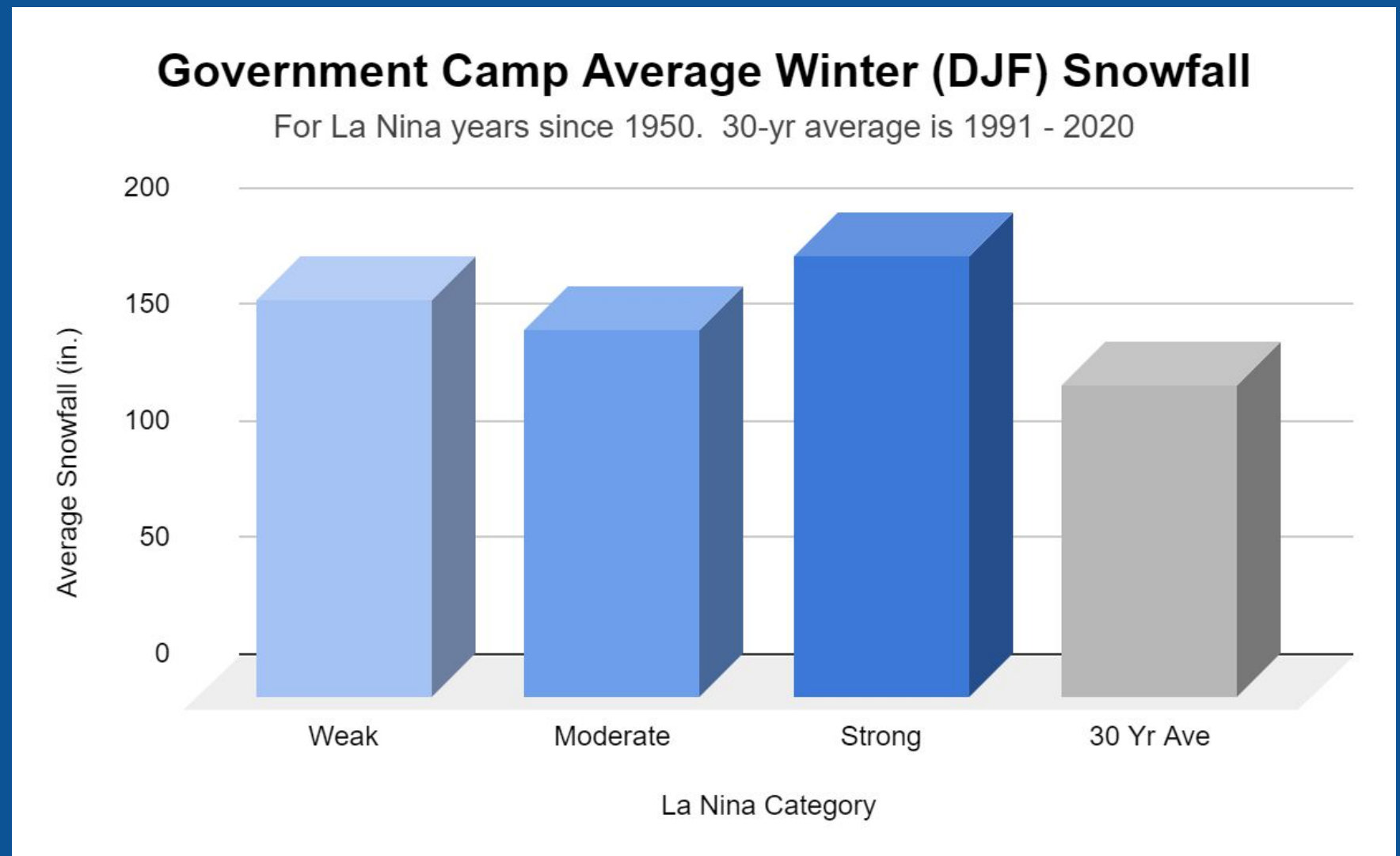
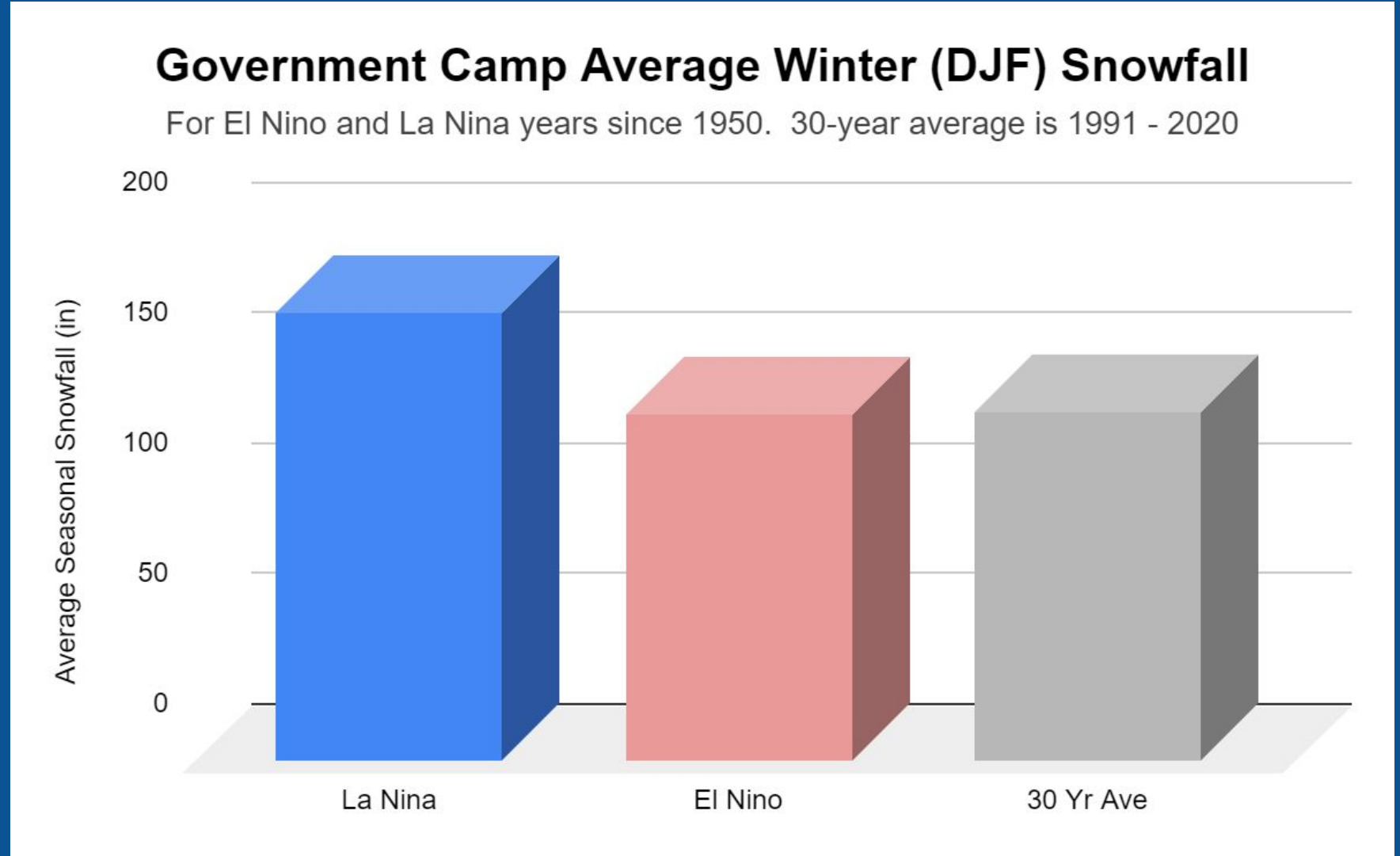
NOAA Climate.gov
Data: Rutgers GSL

Snowfall departure from average for weaker La Niña winters (1950-2009). Blue shading shows where snowfall is greater than average and brown shows where snowfall is less than average. Climate.gov figure based on analysis at CPC using Rutgers gridded snow data.



Winter (DJF) Cascade Snow History: **Government Camp**

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Government Camp Average DJF Snowfall:

La Nina:	172 inches
El Nino:	133 inches
1991-2020:	134 inches

Departure from normal:

Weak:	37 inches
Moderate:	23 inches
Strong:	56 inches



Water Year Runoff vs. ENSO: Skagit River at Mt. Vernon, WA

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Nov-Jan

Oceanic Niño Index

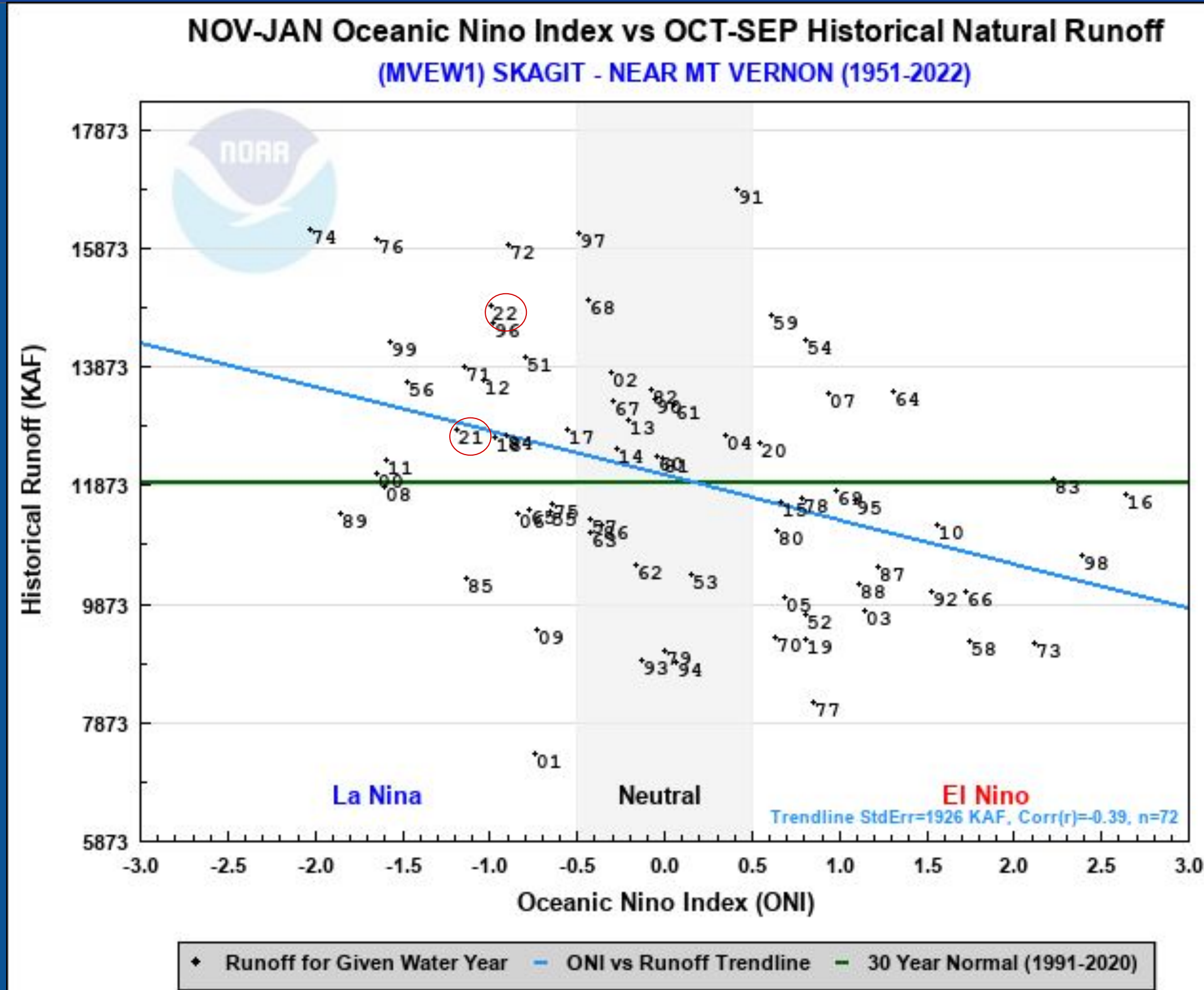
VS.

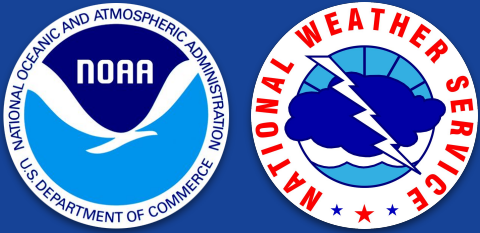
Historic

Water Year Runoff Volume

in Thousands of Acre-feet

www.nwrfc.noaa.gov





Water Year Runoff vs. ENSO: Willamette R at Salem, OR

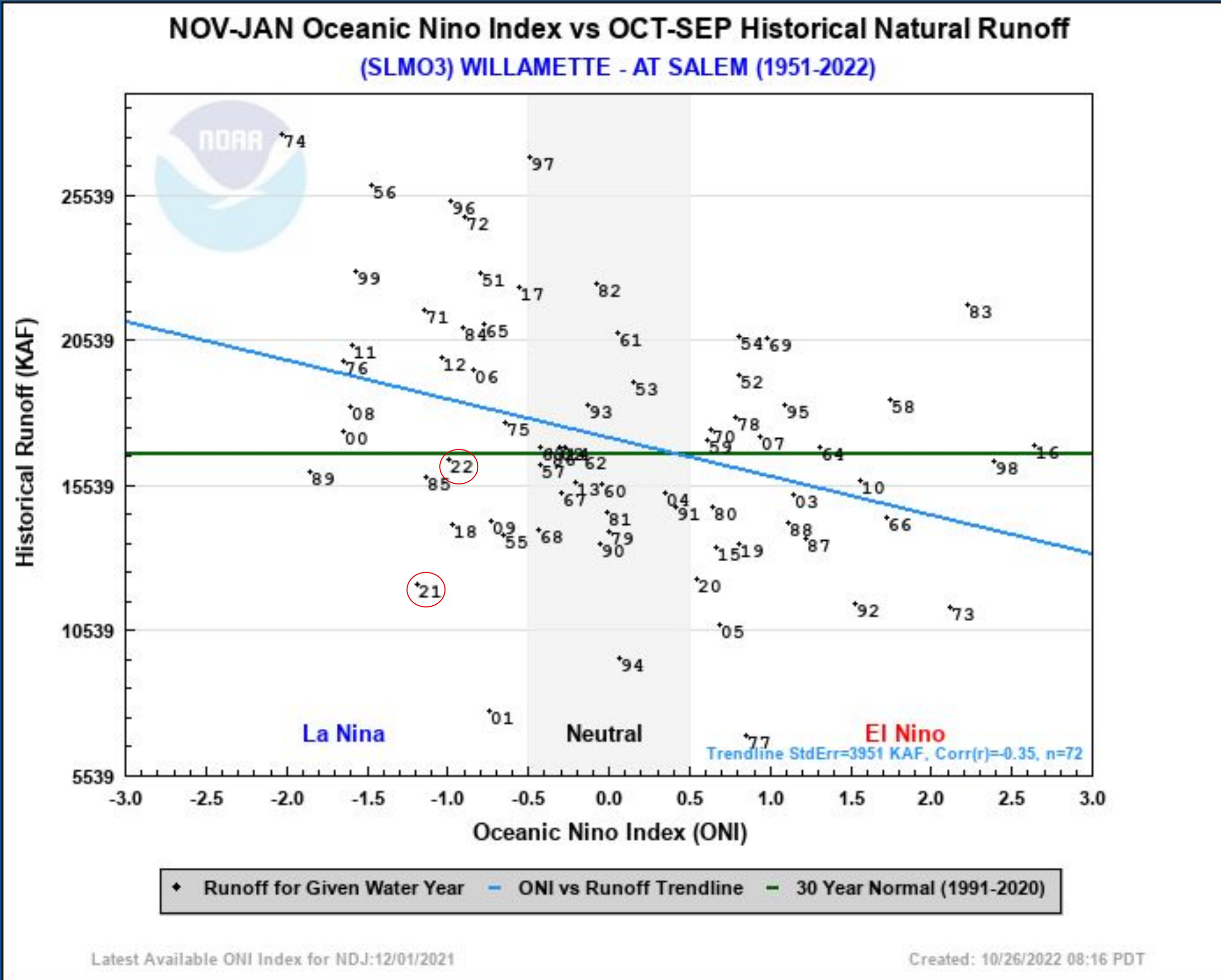
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VS.

Historic
Water Year
Runoff Volume
in Thousands
of Acre-feet

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Water Year Runoff vs. ENSO: Yakima R at Kiona, WA

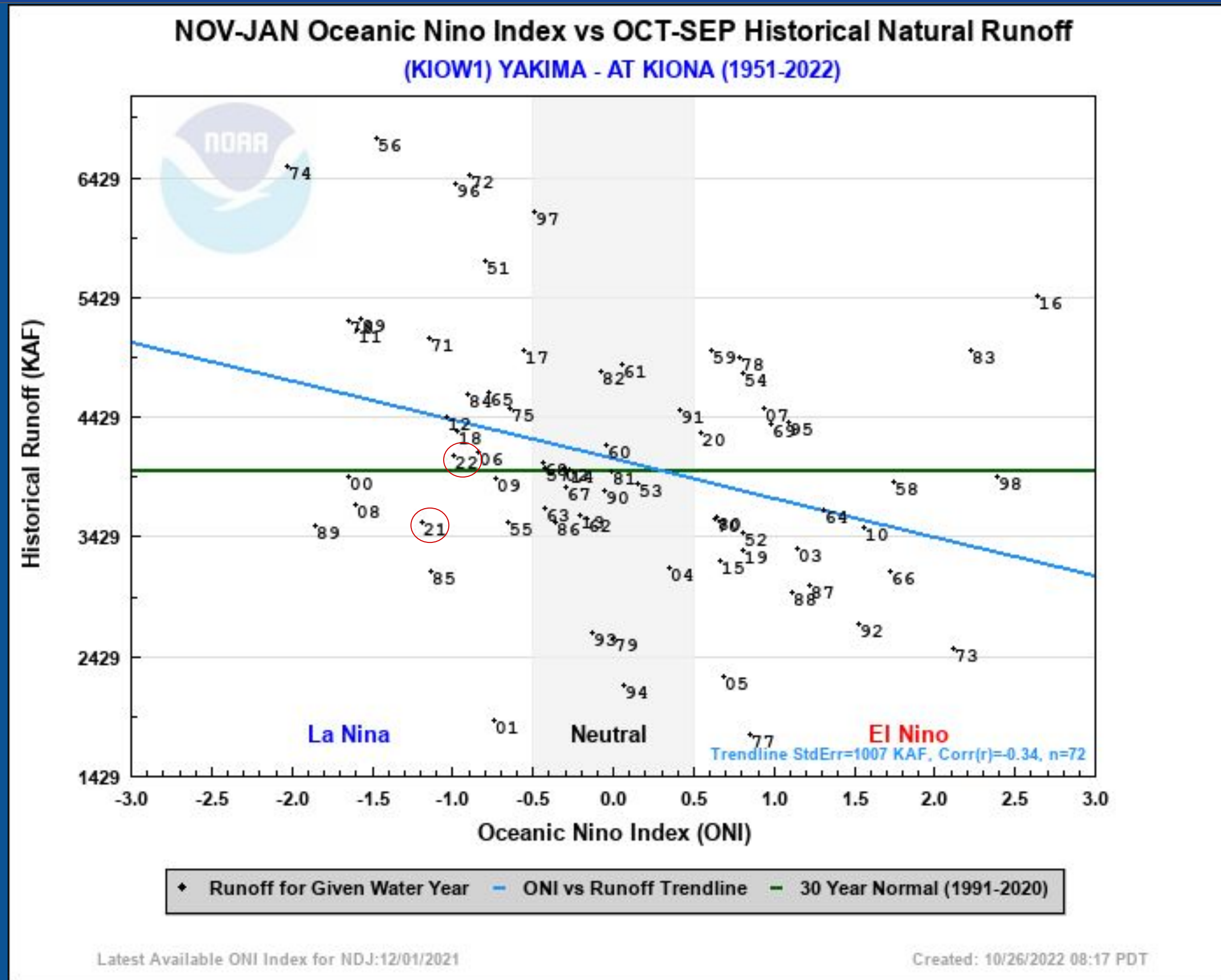
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Water Year Runoff vs. ENSO: Crooked R near Prineville, OR

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Nov-Jan

Oceanic Niño Index

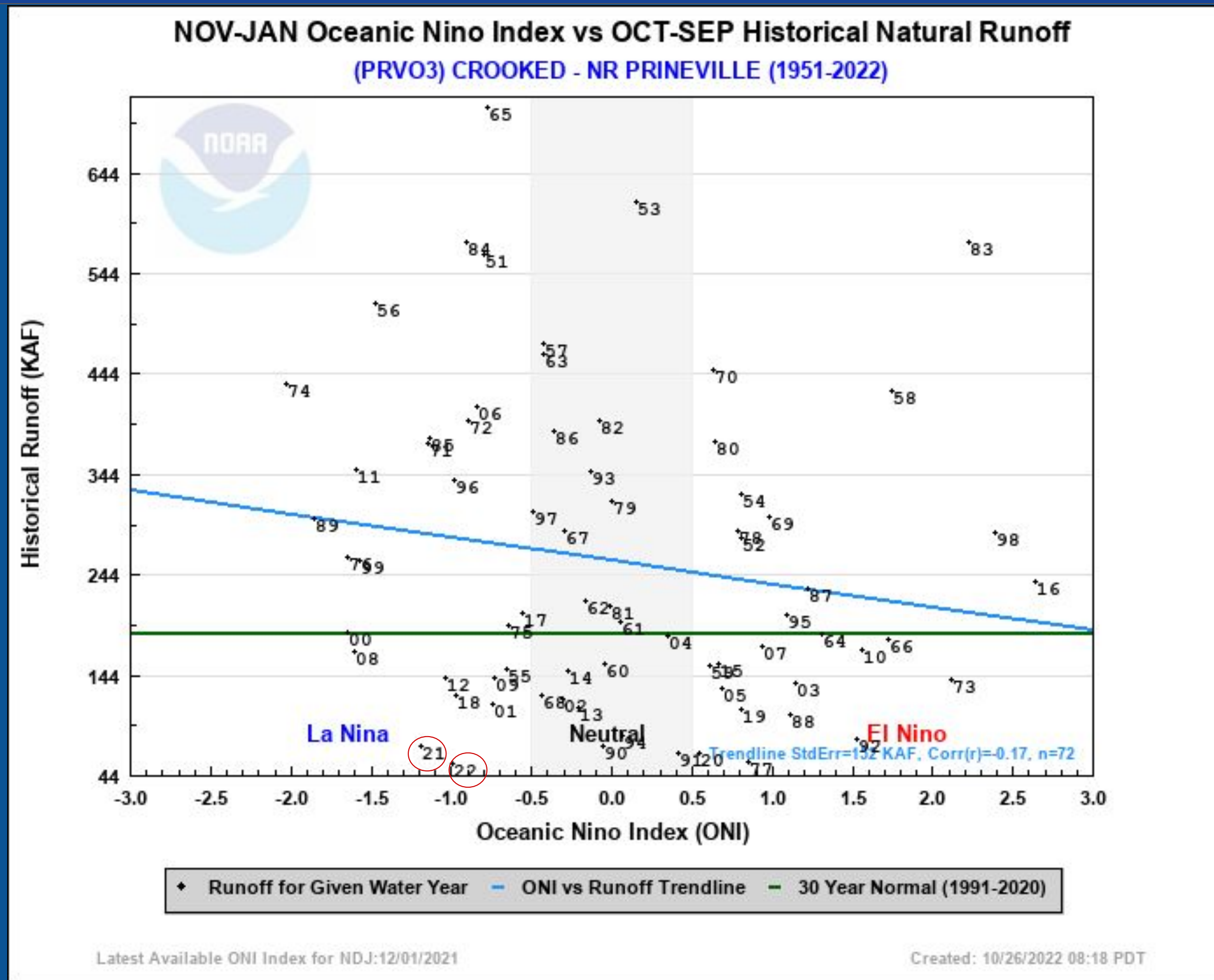
VS.

Historic

Water Year Runoff Volume

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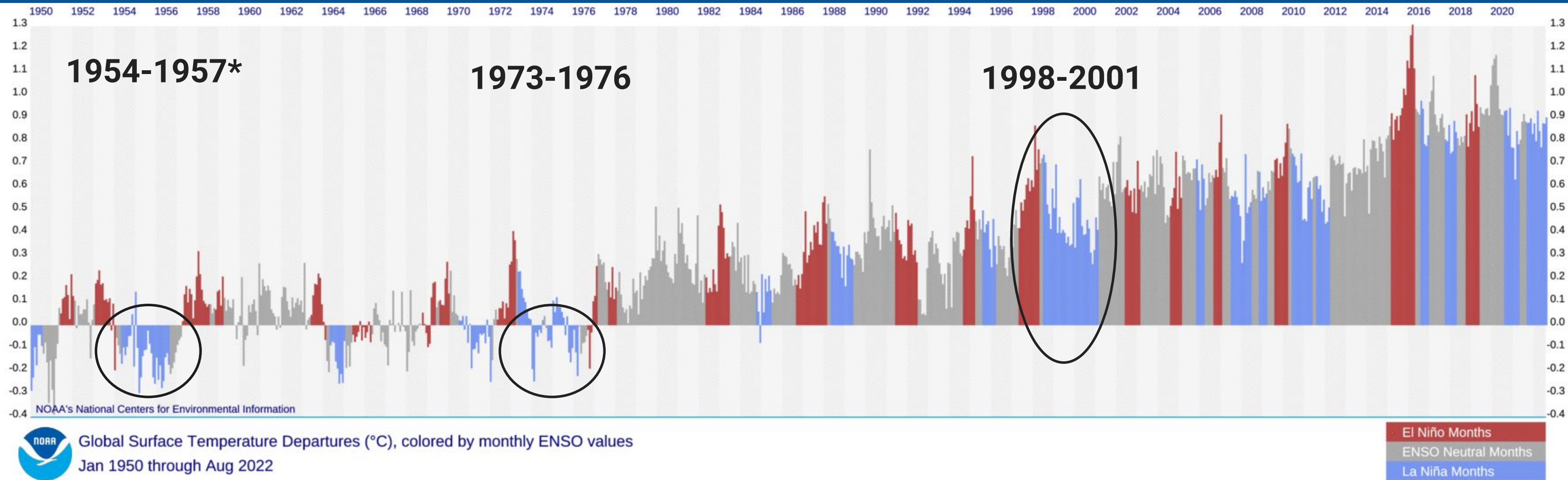




ENSO Status: 'Triple Dip' La Niña Advisory

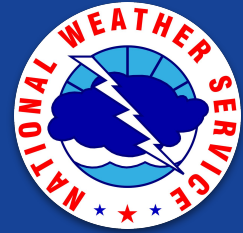
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Monthly Global Temperature Departures (°C) since 1950.
Blue shaded = La Nina Years, Red = El Nino Years.



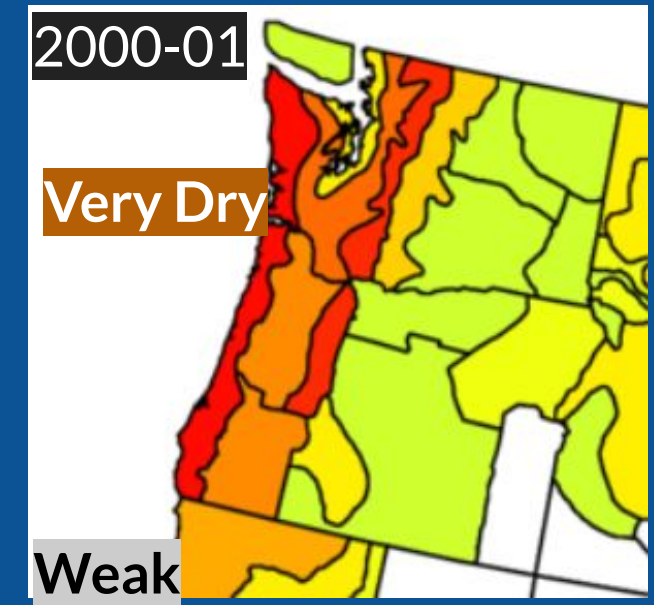
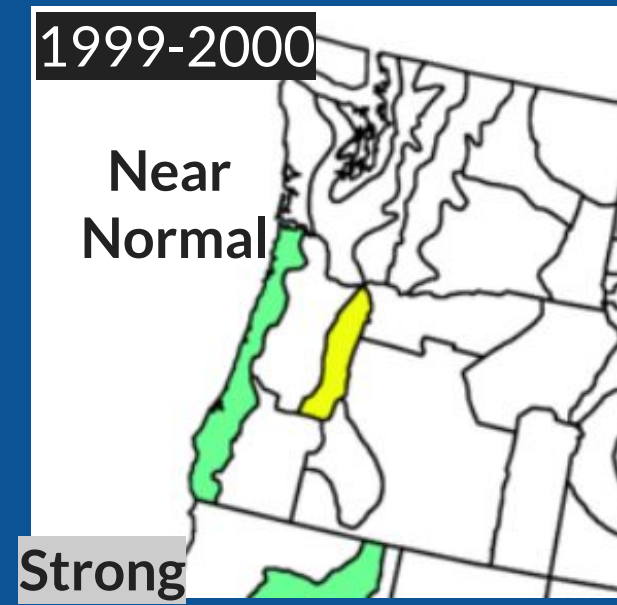
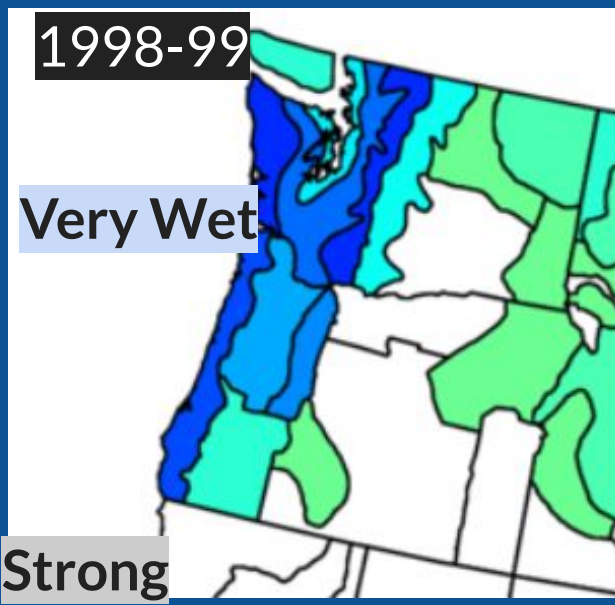
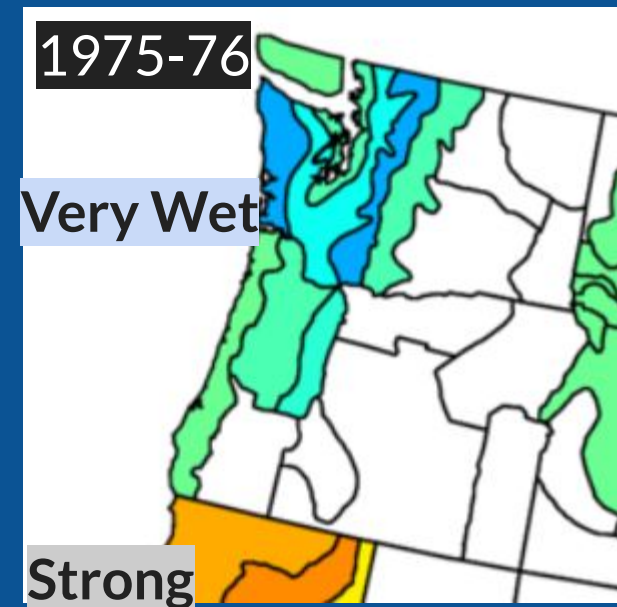
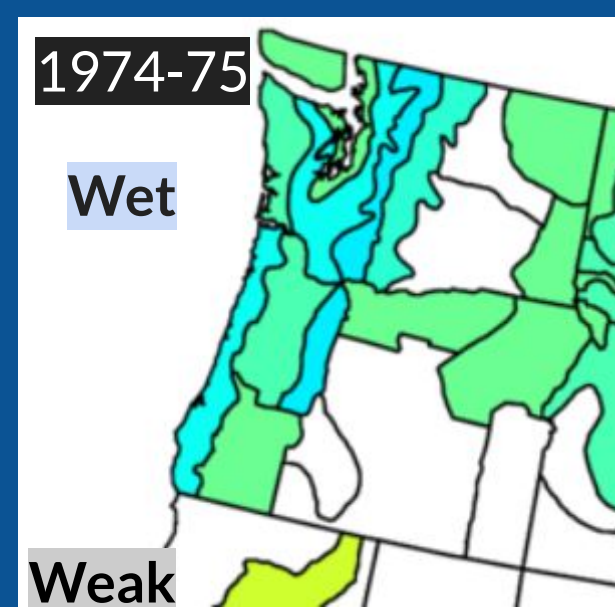
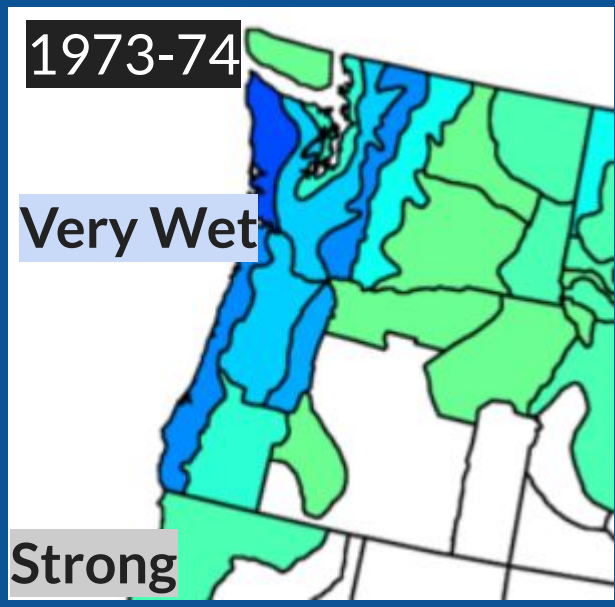
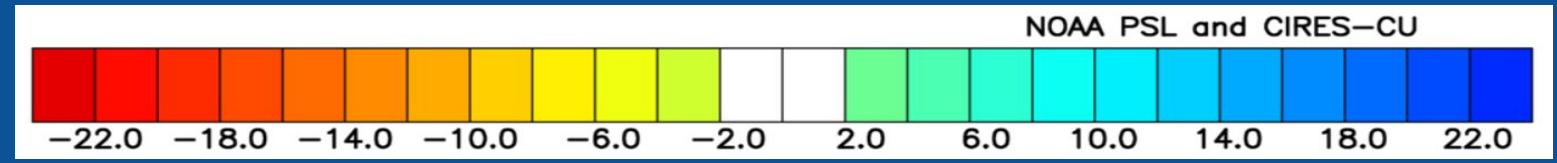
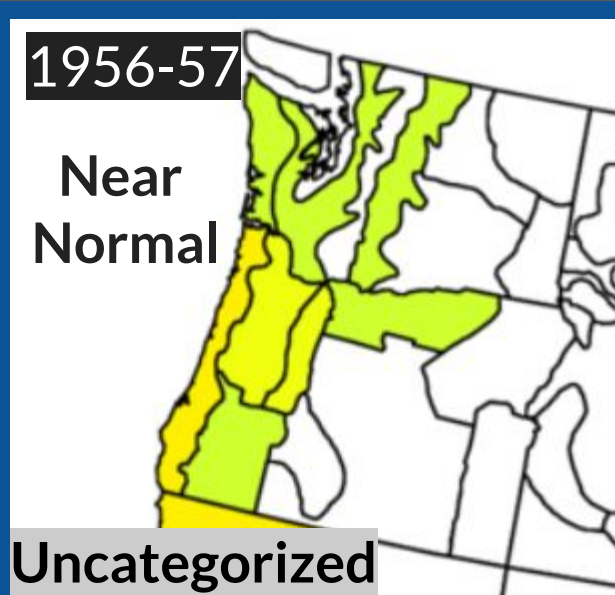
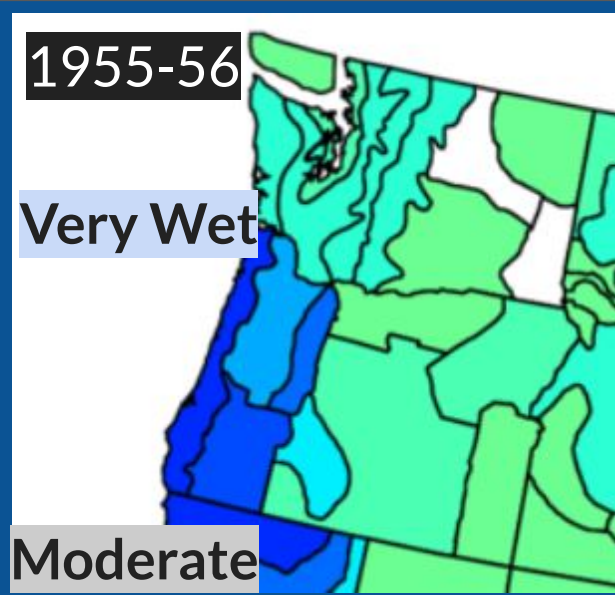
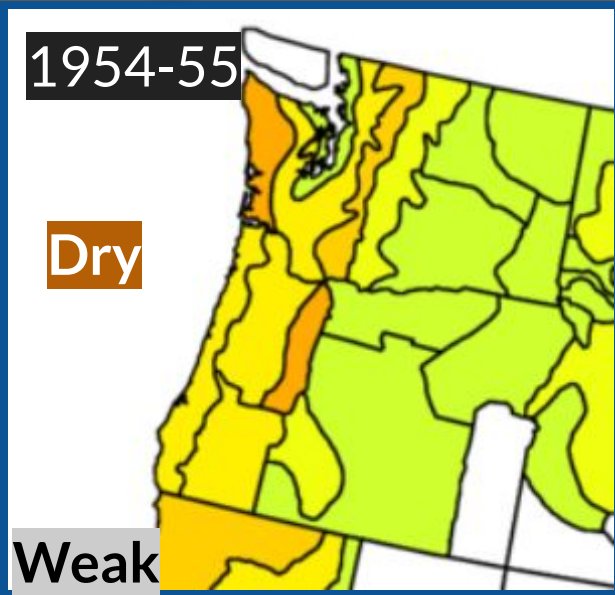
Three* occurrences since 1950 - very small sample size

* SST anomalies > -0.5 °C in Oct 1956



Winter (DJF) Precipitation History: Triple Dip La Niñas

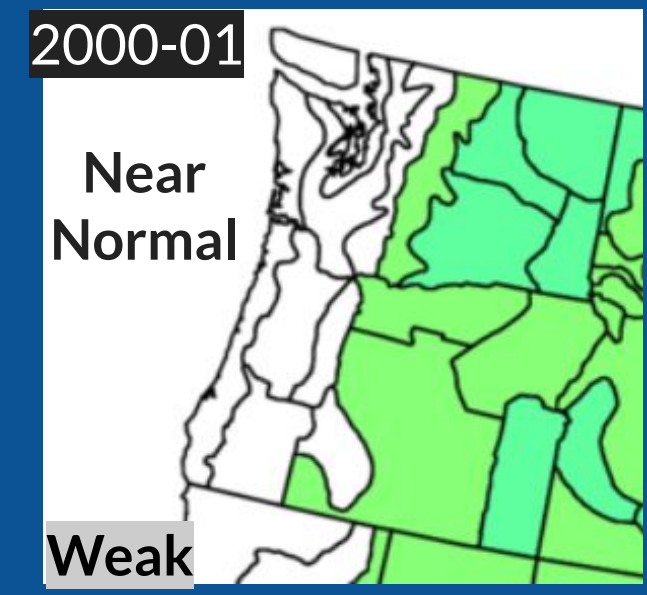
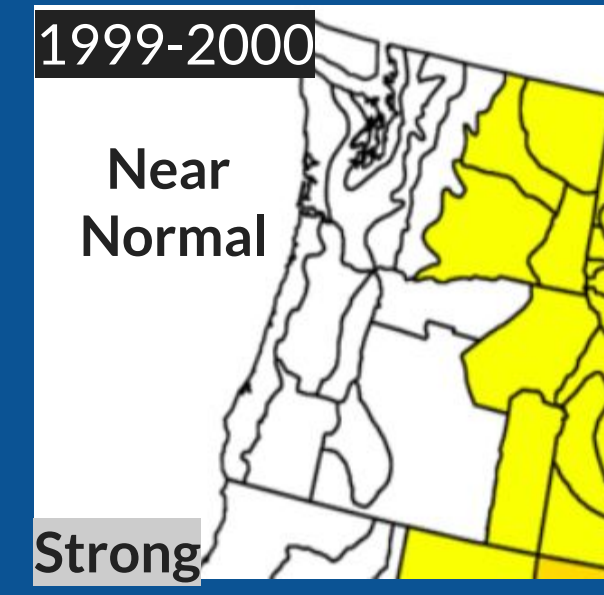
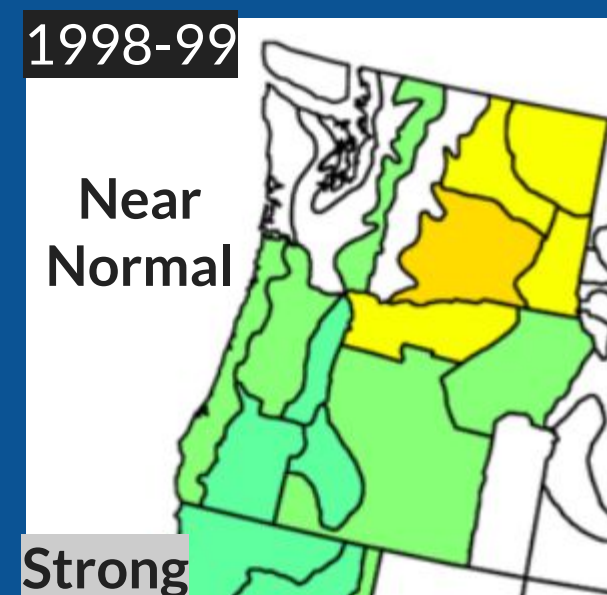
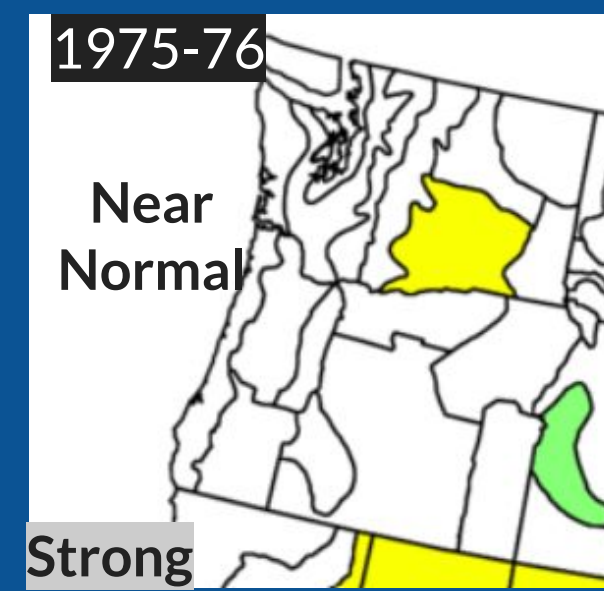
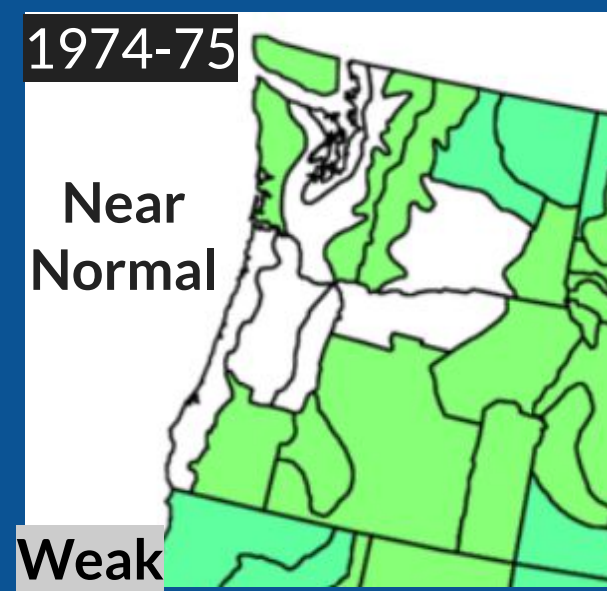
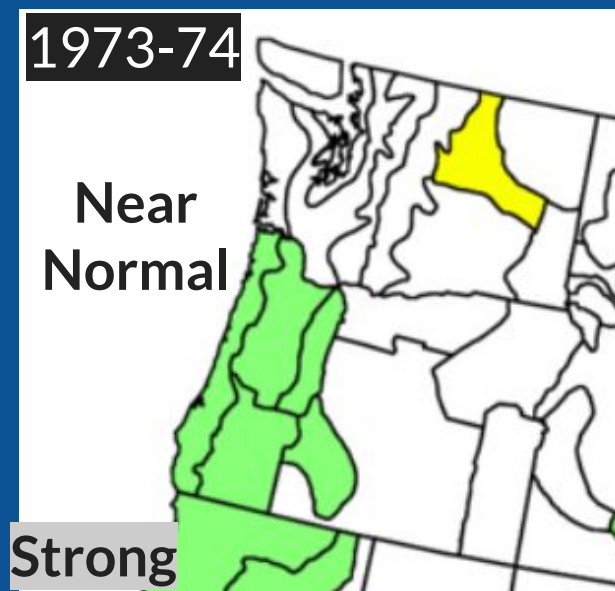
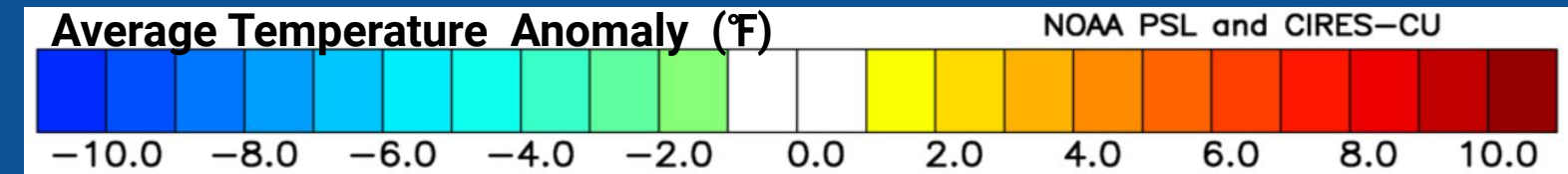
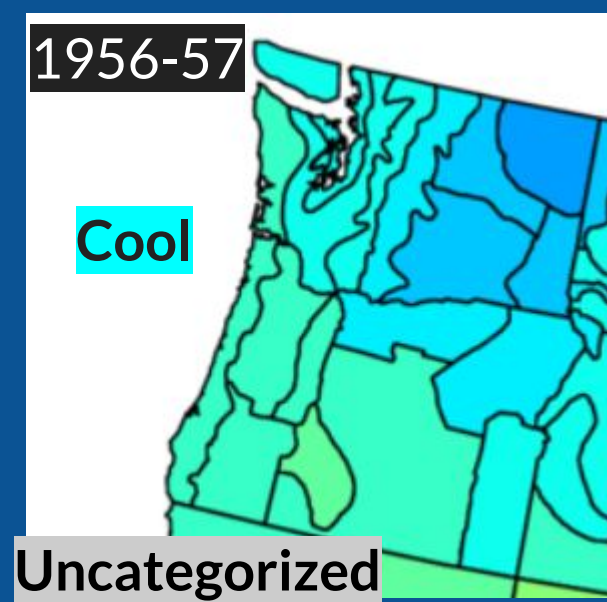
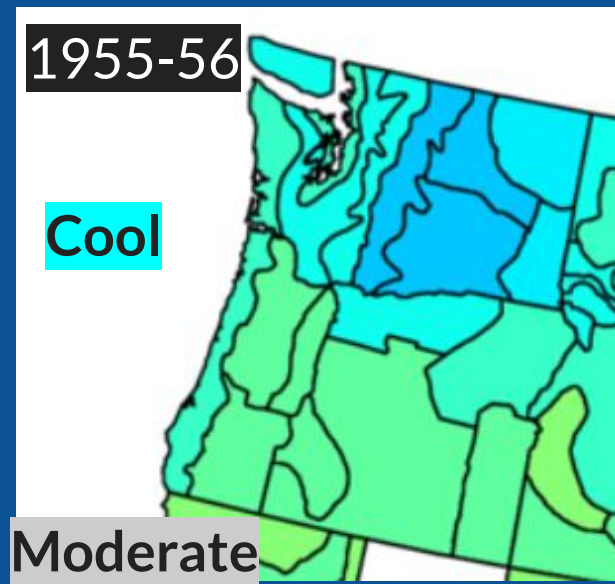
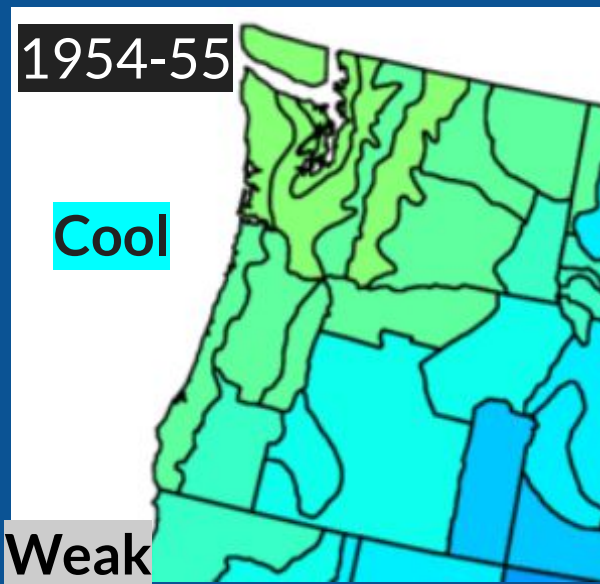
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Winter (DJF) Temperature History: Triple Dip La Niñas

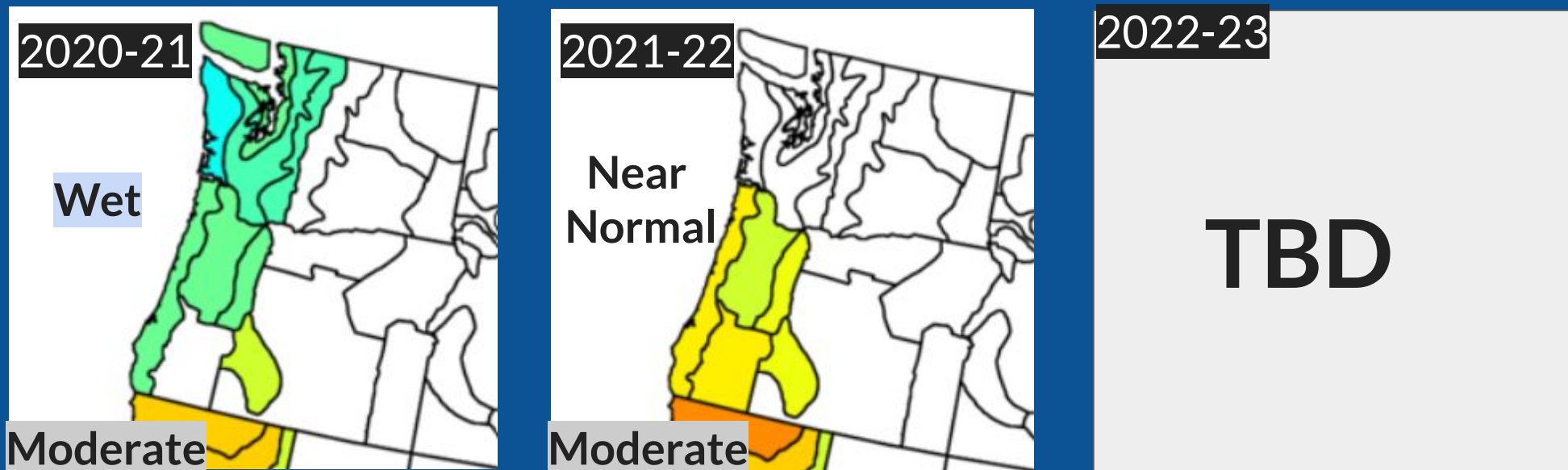
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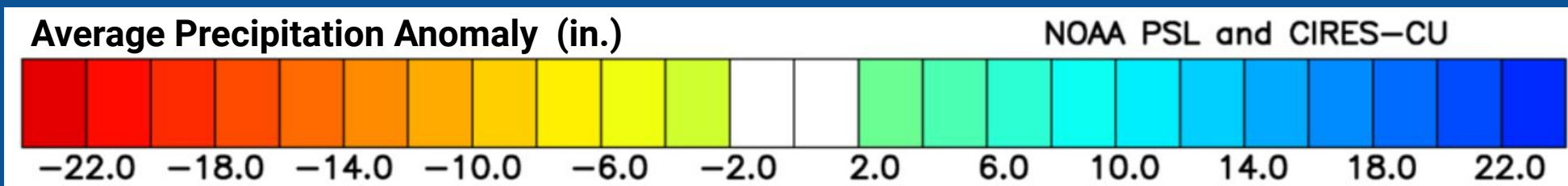


Triple Dip La Niña: **in Progress**

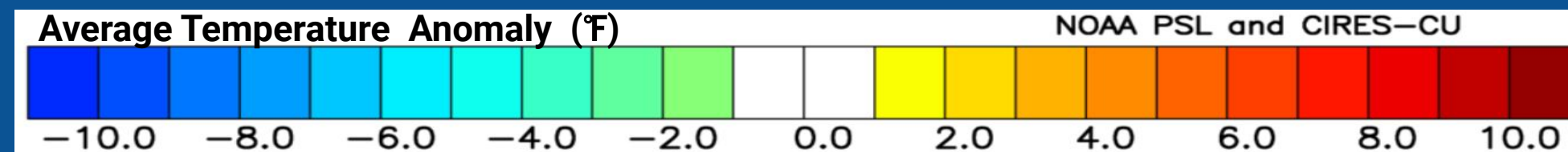
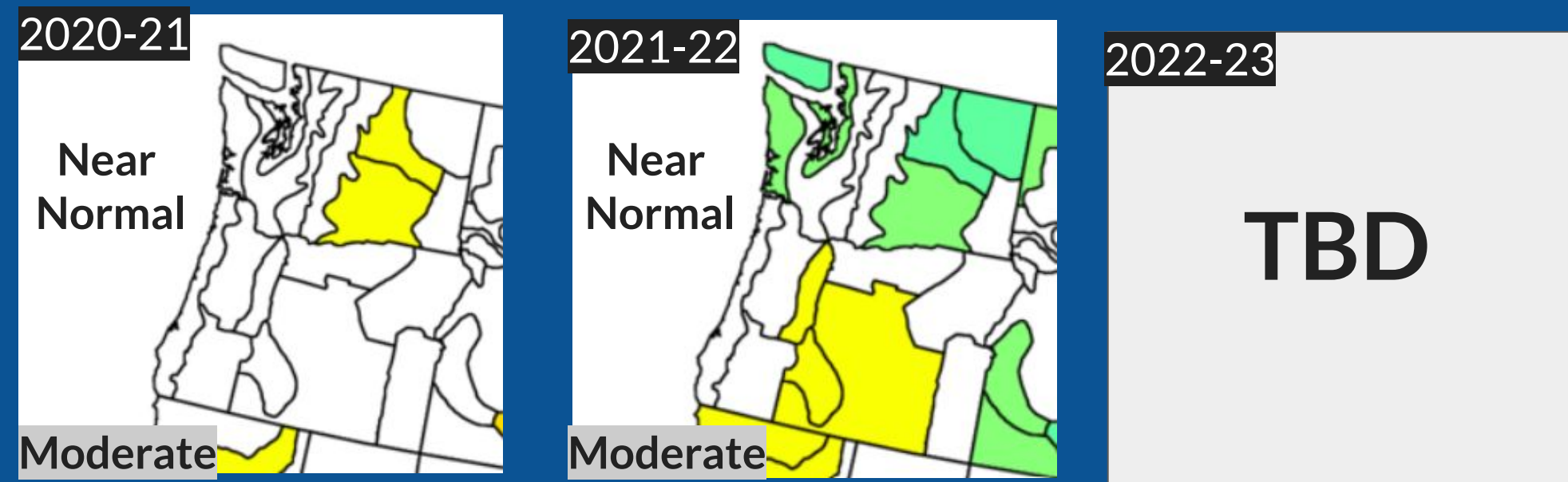
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← **Winter (DJF) Precipitation**



Winter (DJF) Temperature →





CPC 8 -14 Day: 2 Week Outlook

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8-14 Day Outlook Favors



Precipitation

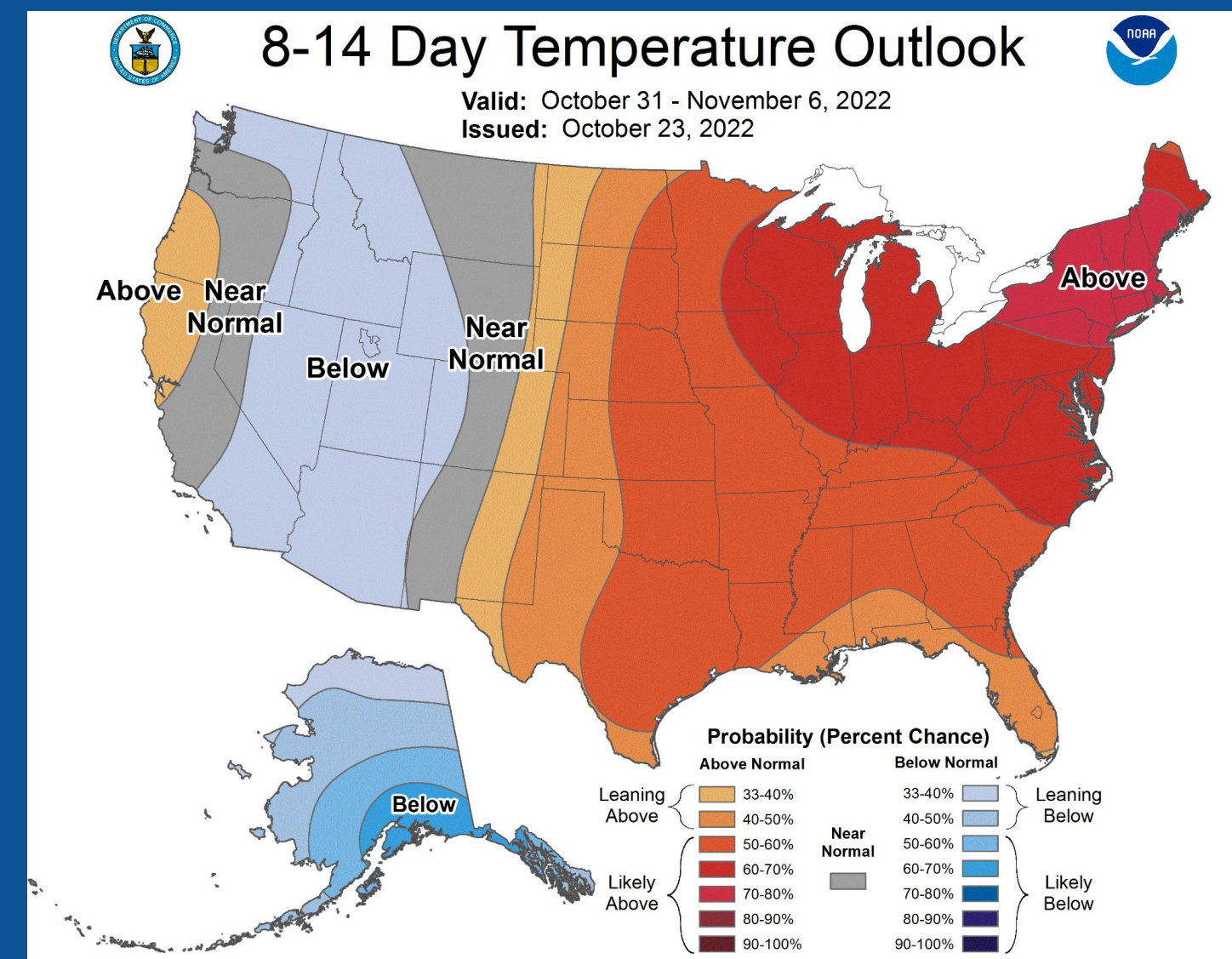
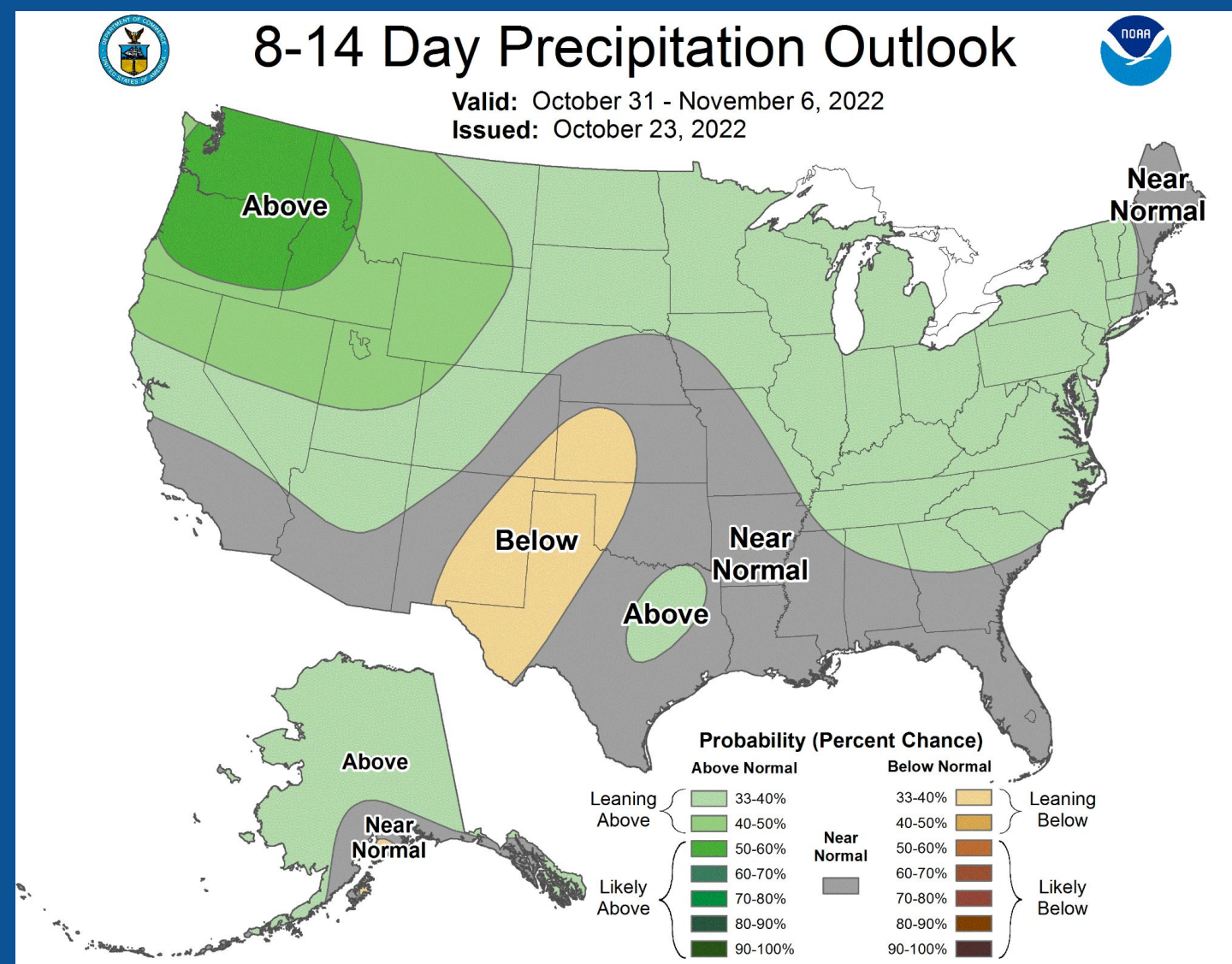
Greater chances for above normal



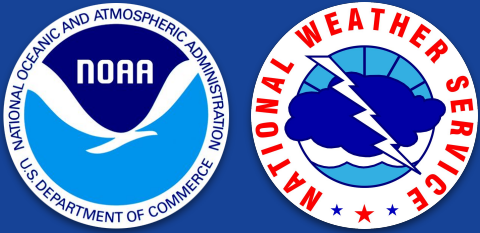
Temperatures

North: Greater Chance for Near Normal

South: Greater Chance for Above Normal



'Normal' is a 30 year average from 1991 through 2020



CPC 8 -14 Day: Risk of Hazardous Weather

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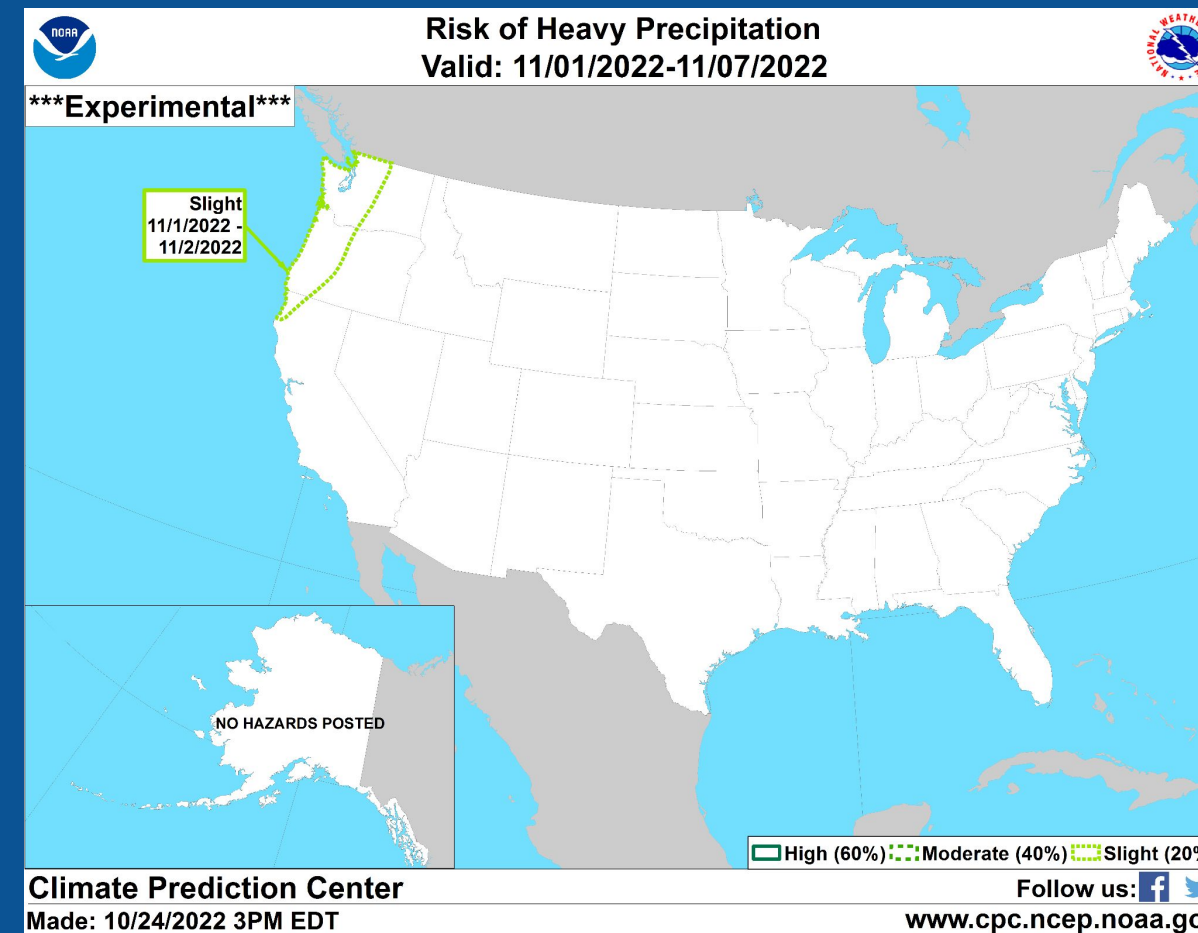
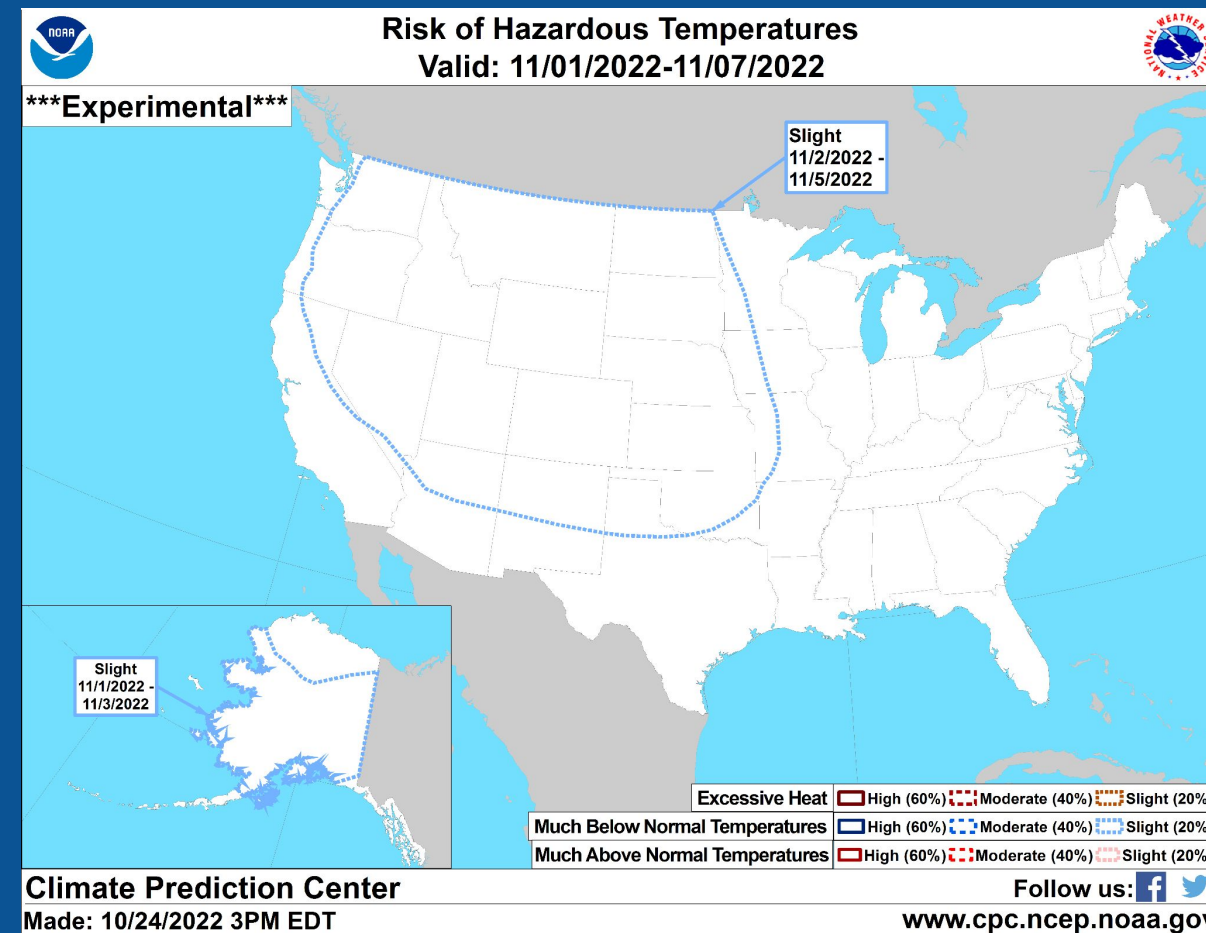
8-14 Day

Risk of Hazardous



Temperatures

**Slight Risk for Much Below Temperatures
Nov 2 - 5, 2022**



8-14 Day

Risk of Hazardous



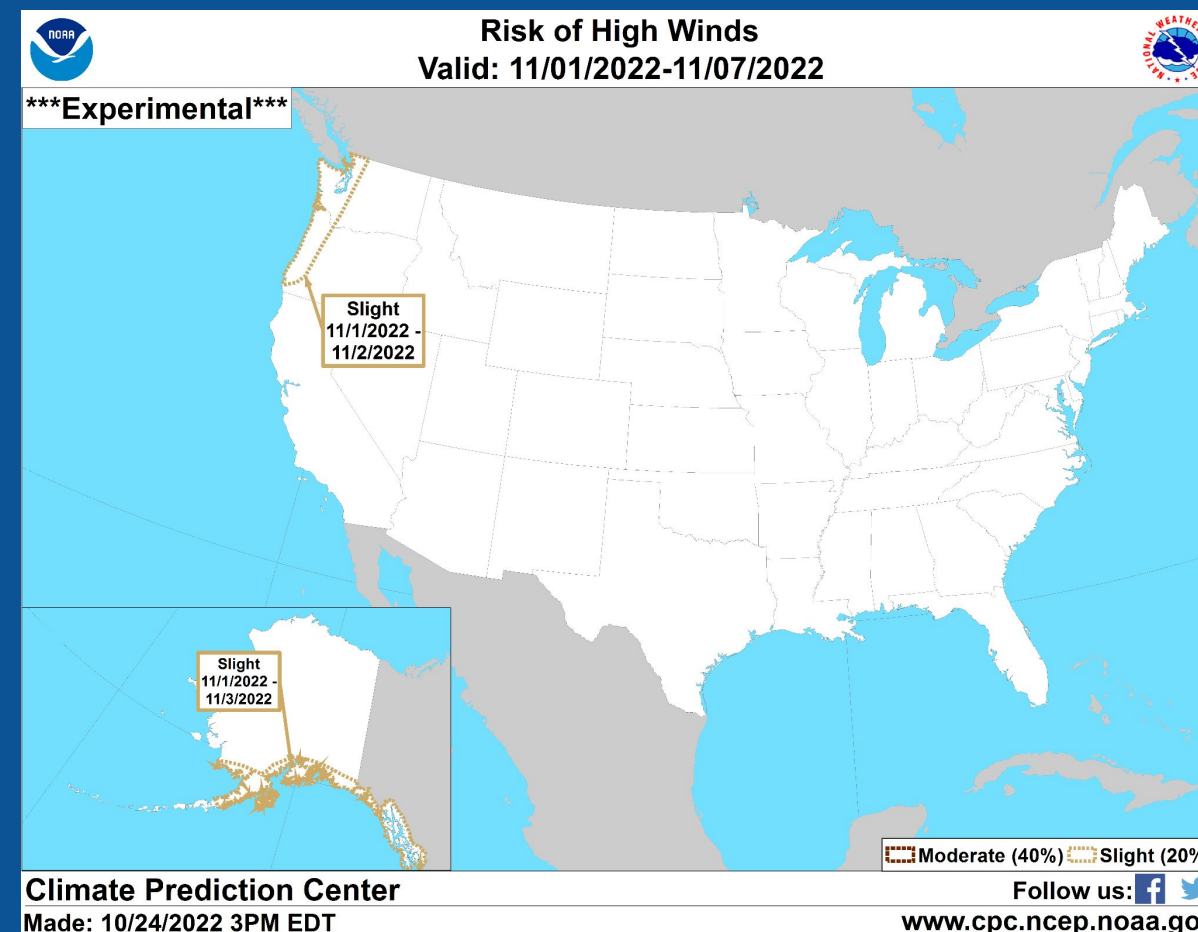
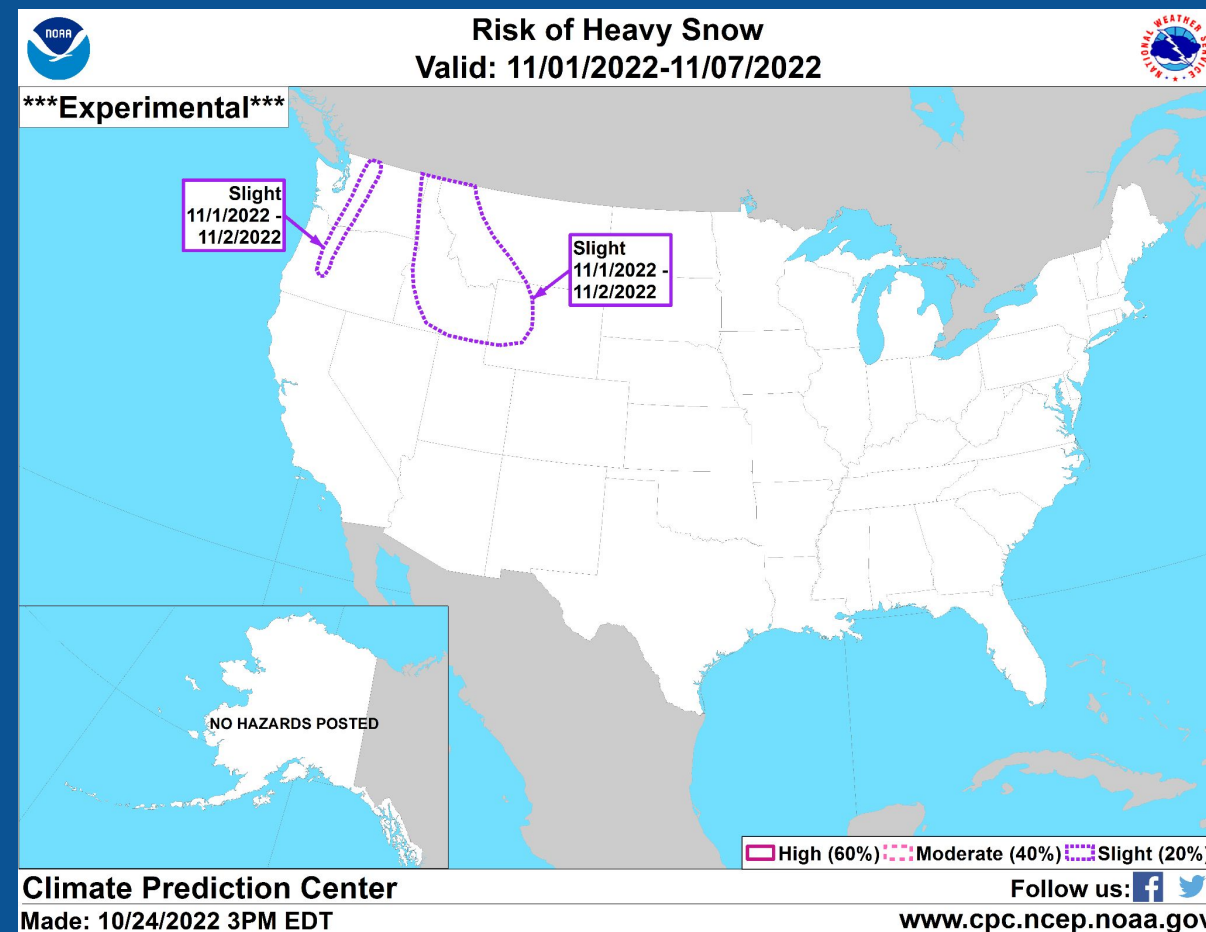
Heavy Precipitation

**Slight Risk for Heavy Precipitation
Nov 1 - 2, 2022**



Heavy Snow

**Slight Risk for Heavy Snow in Cascades
Nov 1 - 2, 2022**



High Winds

**Slight Risk for High Winds
Nov 1 - 2, 2022**

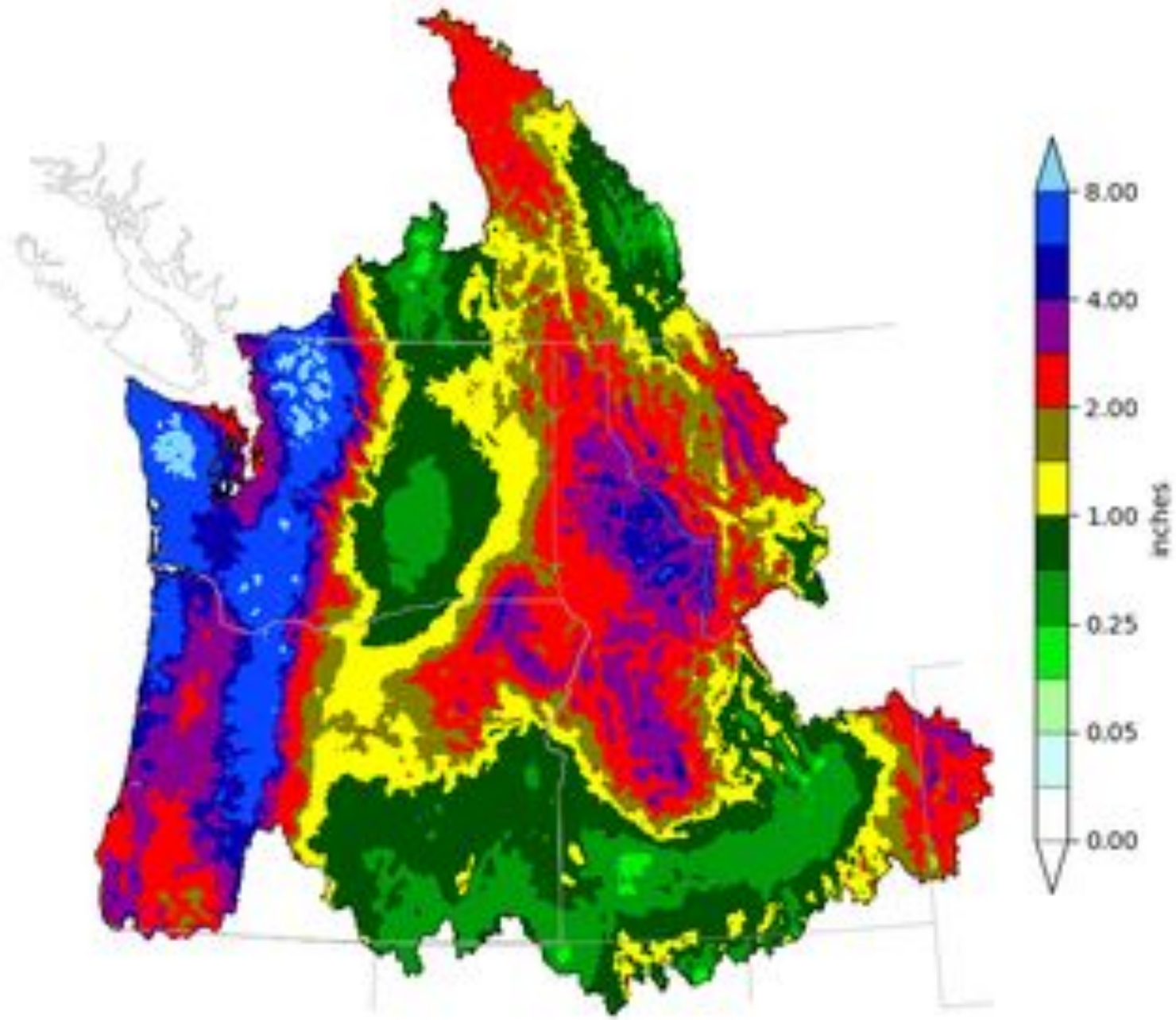


RFC 10-Day Precipitation Forecast

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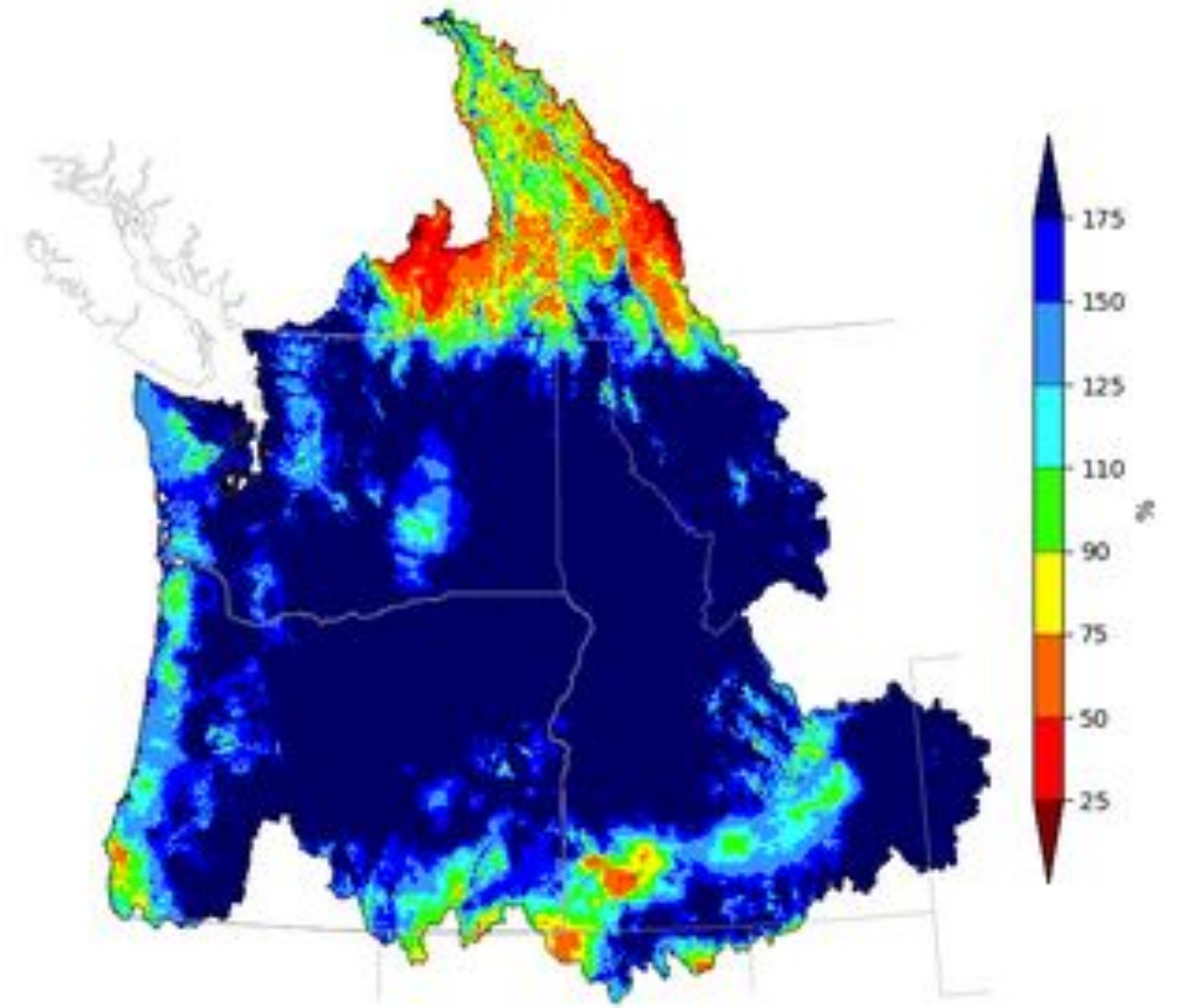
Northwest River Forecast Center
10 Day QPF, Ending 12Z, 11/04/22



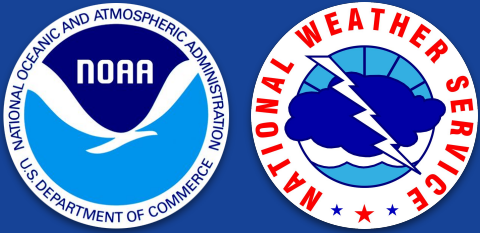
Creation Time: Tue Oct 25 15:07:30 UTC 2022



Northwest River Forecast Center
10 Day QPF (Percent of Climatology), Ending 12Z, 11/04/22



Creation Time: Tue Oct 25 15:08:34 UTC 2022



CPC November 2022: 1 Month Outlook

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Nov 2022

Outlook Favors



Precipitation

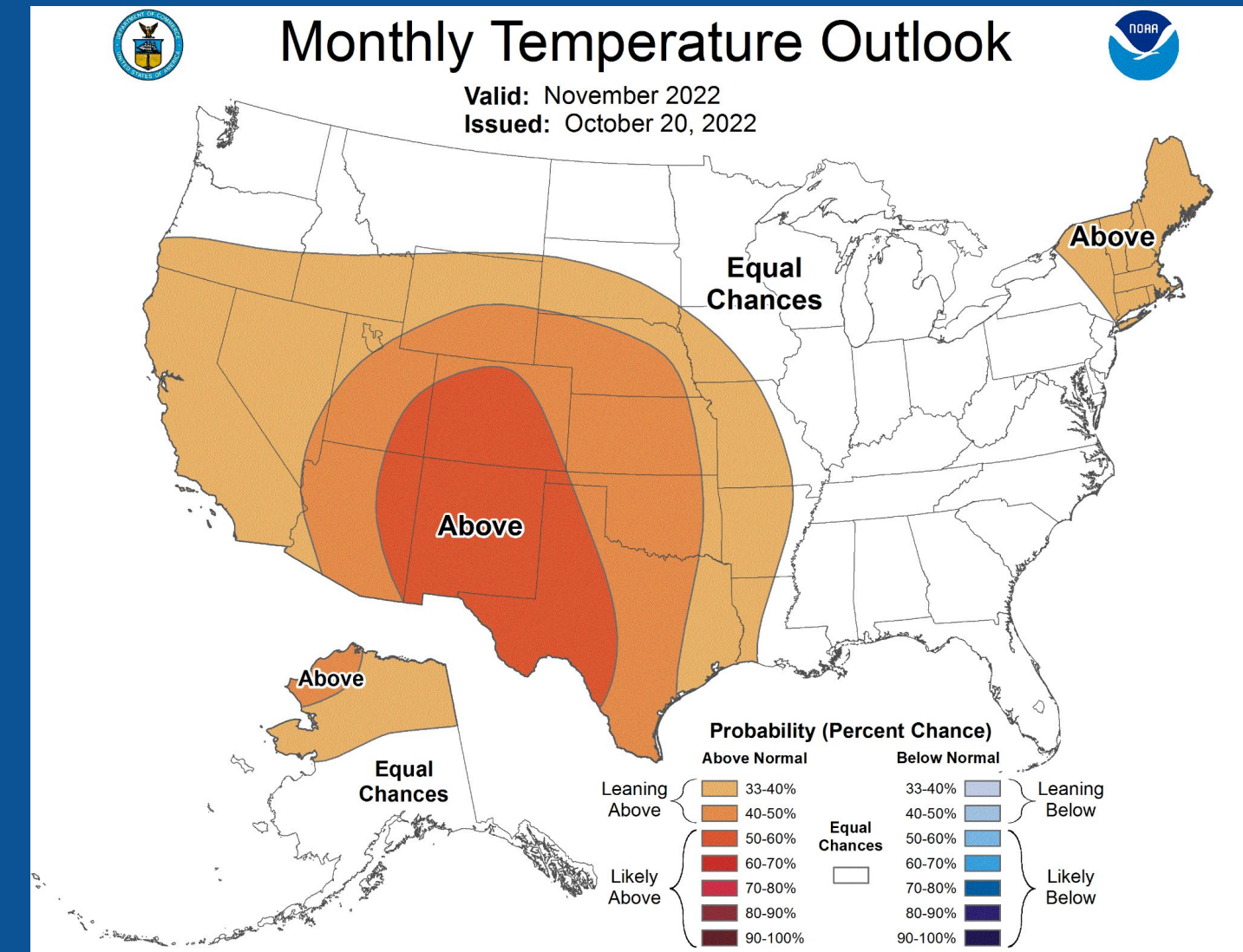
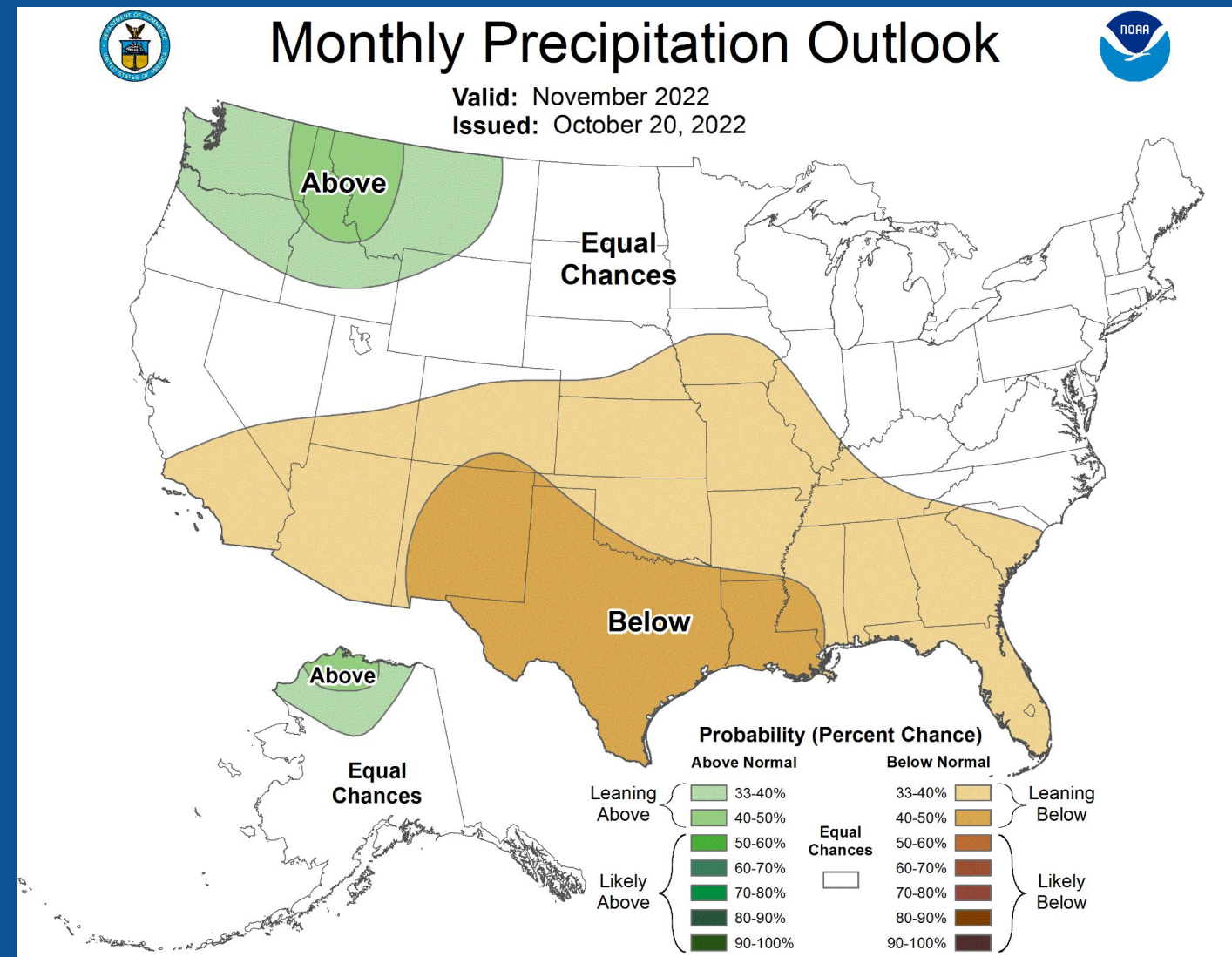
North: Greater Chance for Above Normal

South: Equal Chances for Above, Near, or Below Normal



Temperatures

Equal Chances for Above, Near, or Below Normal





CPC Dec 2022 - Feb 2023: 3 Month Outlook

Weather Forecast Office
Portland, OR
Wednesday, October 26

Dec-Feb Outlook Favors



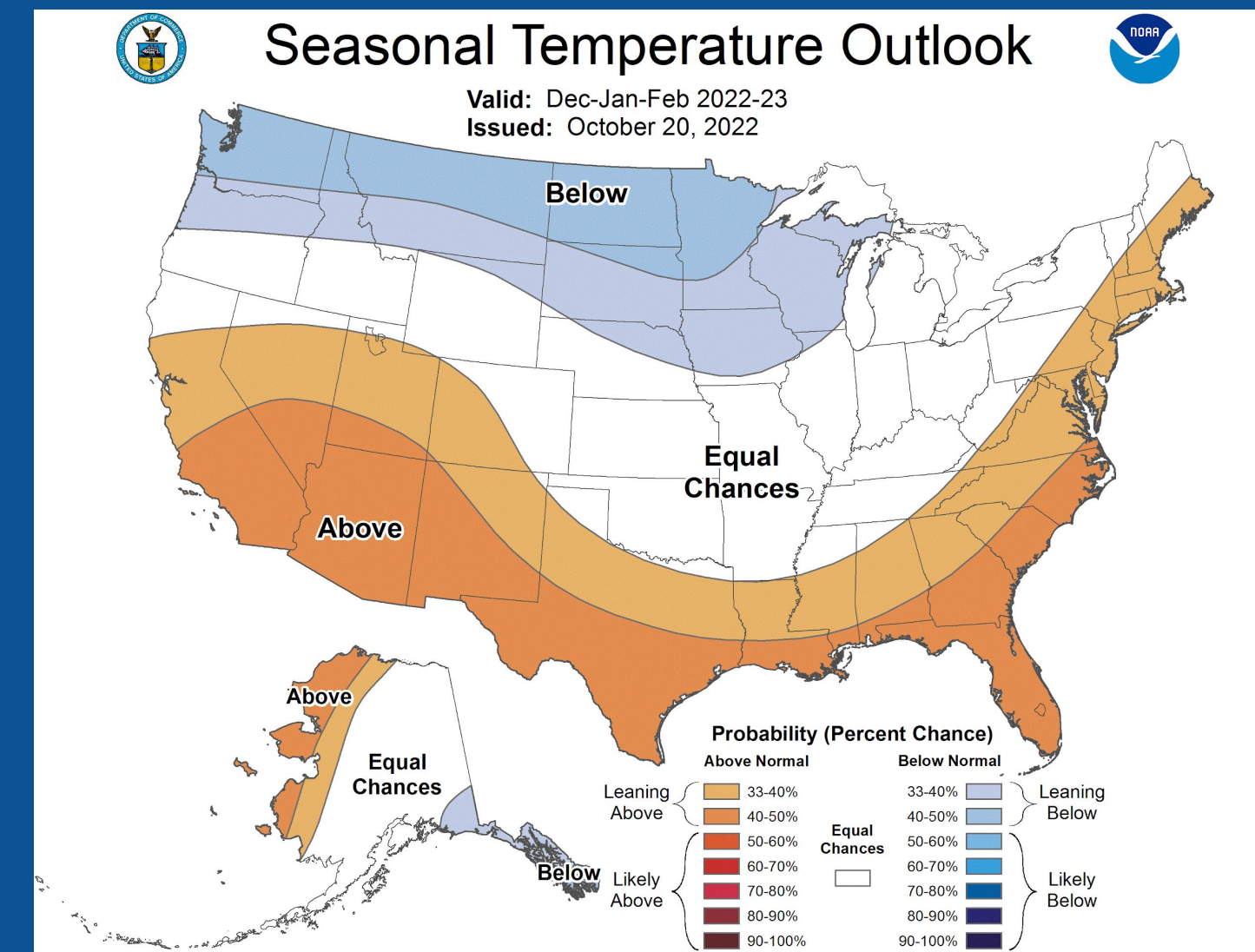
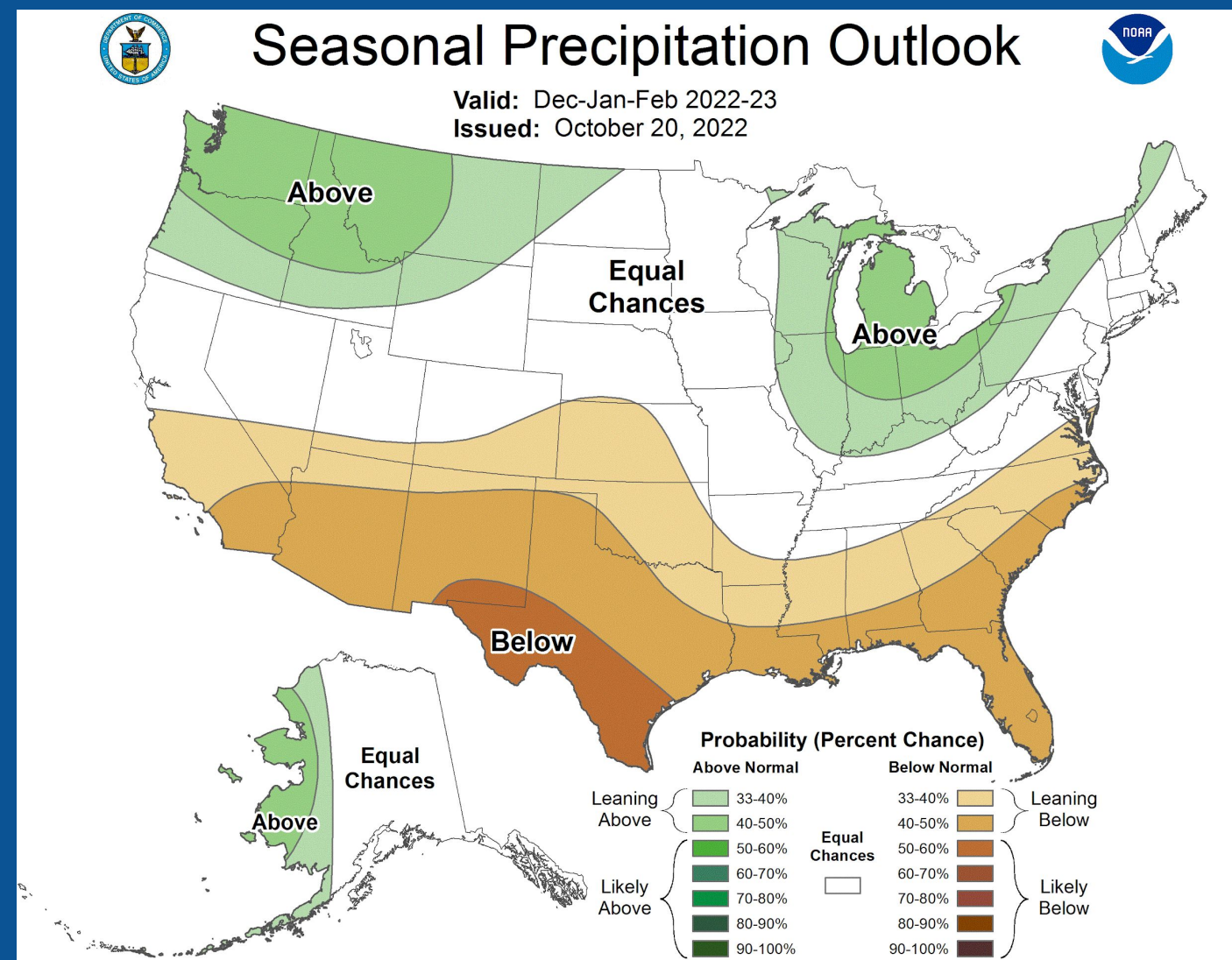
Precipitation

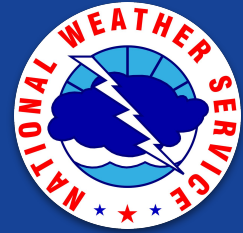
Greater Chances for Above Normal



Temperatures

Greater Chances for Below Normal





CPC Oct 2022 - Jan 2023: Seasonal Drought Outlook

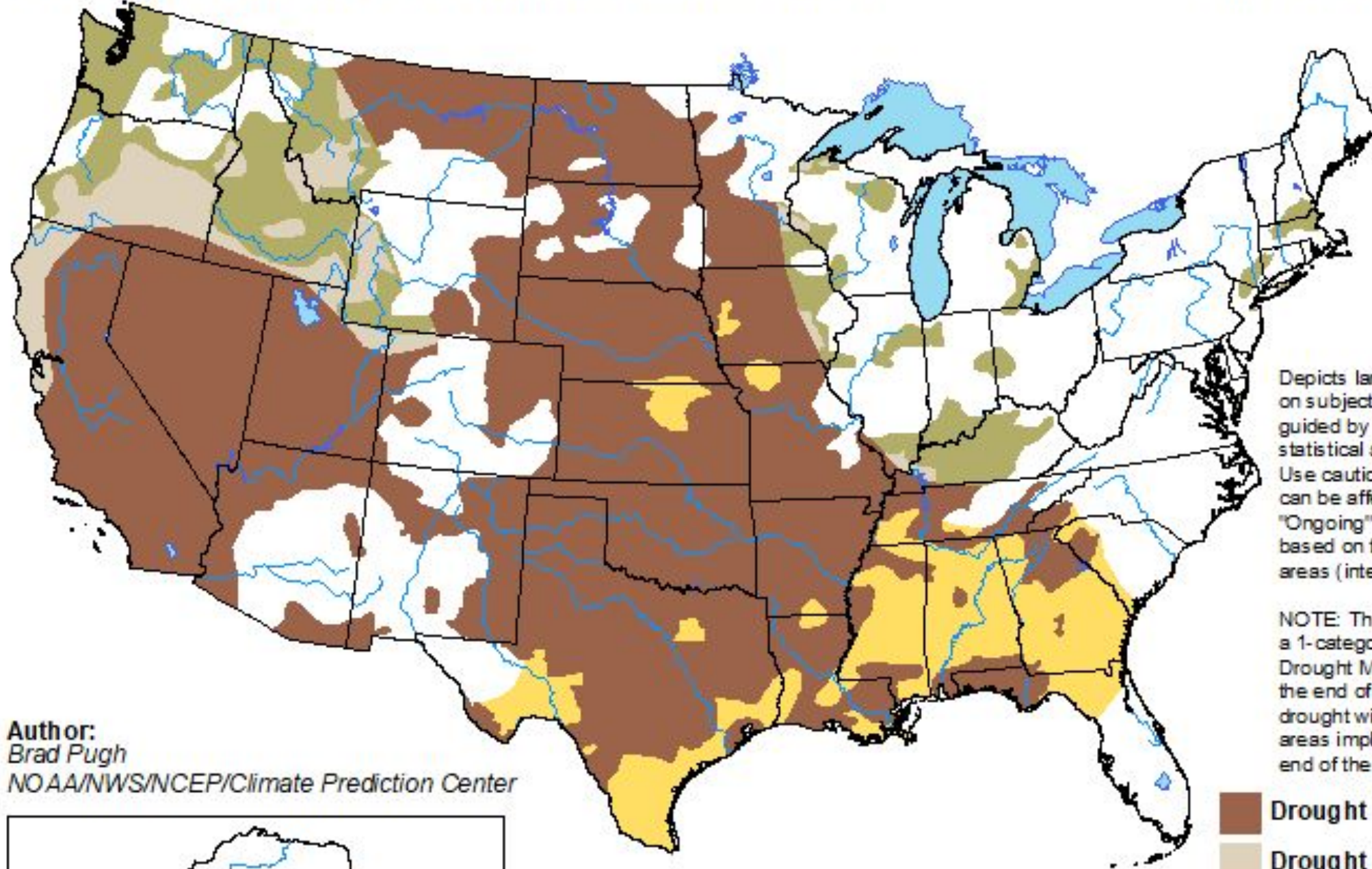
Weather Forecast Office
Portland, OR
Wednesday, October 26

Oct-Jan Outlook Favors

**Drought conditions
improving or even
ending across much of
Oregon & Washington**

U.S. Seasonal Drought Outlook Drought Tendency During the Valid Period

Valid for October 20, 2022 - January 31, 2023
Released October 20, 2022

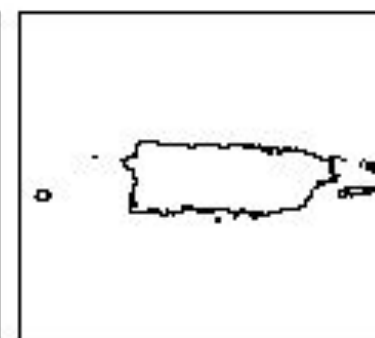
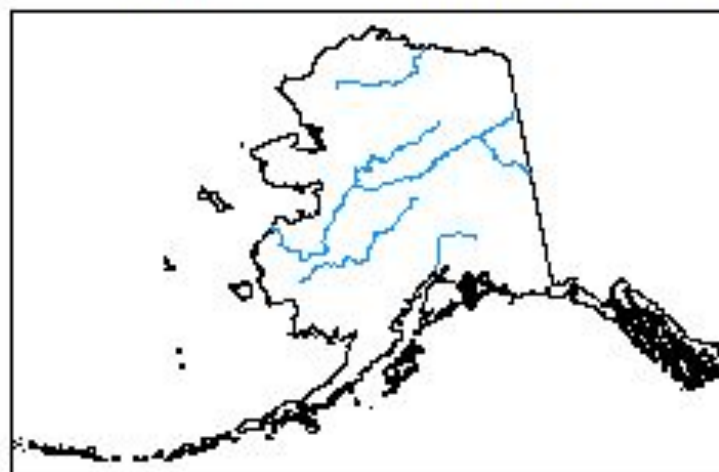


Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4).

NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).

- Drought persists
- Drought remains but improves
- Drought removal likely
- Drought development likely

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<http://go.usa.gov/3eZ73>



NATIONAL WEATHER SERVICE
NATIONAL OCEANIC & ATMOSPHERIC ADMINISTRATION



CPC Mar - May 2023: 3 Month Outlook

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Mar-May (Spring 2023) Outlook Favors



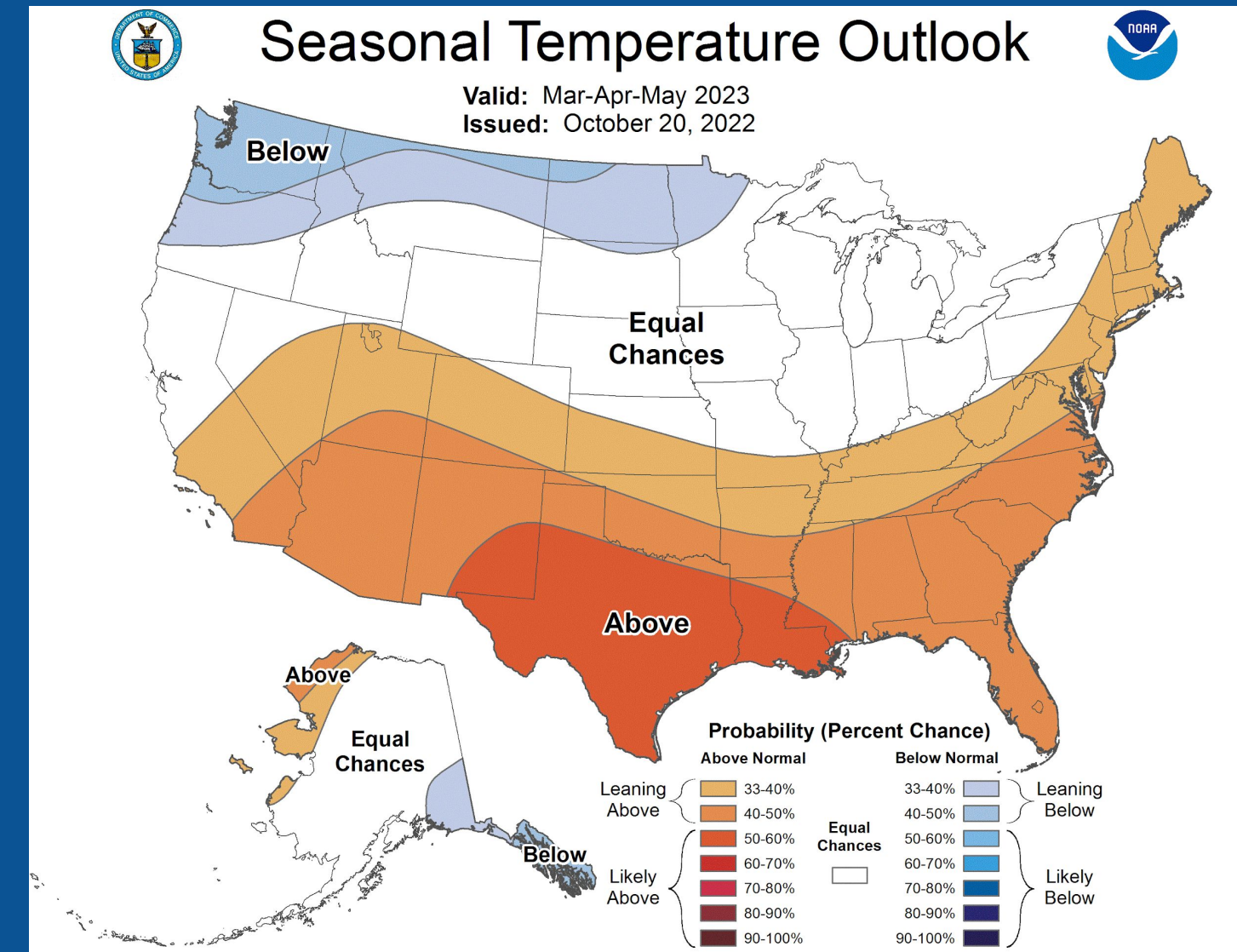
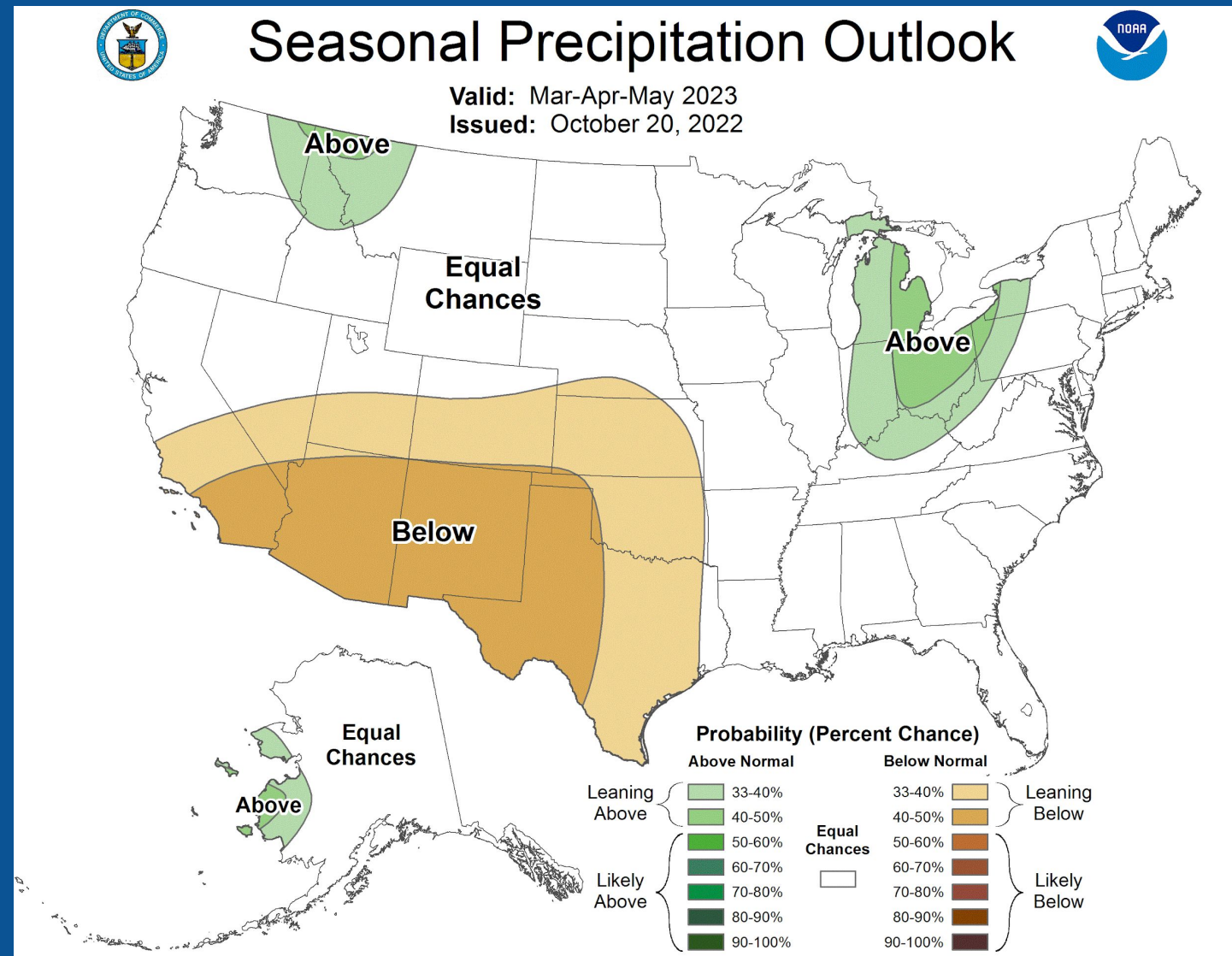
Precipitation

Equal Chances for
above, near, or below
normal



Temperatures

Greater Chances for
Below Normal





CPC Jun - Aug 2023: 3 Month Outlook

Weather Forecast Office
Portland, OR
Wednesday, October 26

Jun-Aug (Summer) Outlook Favors



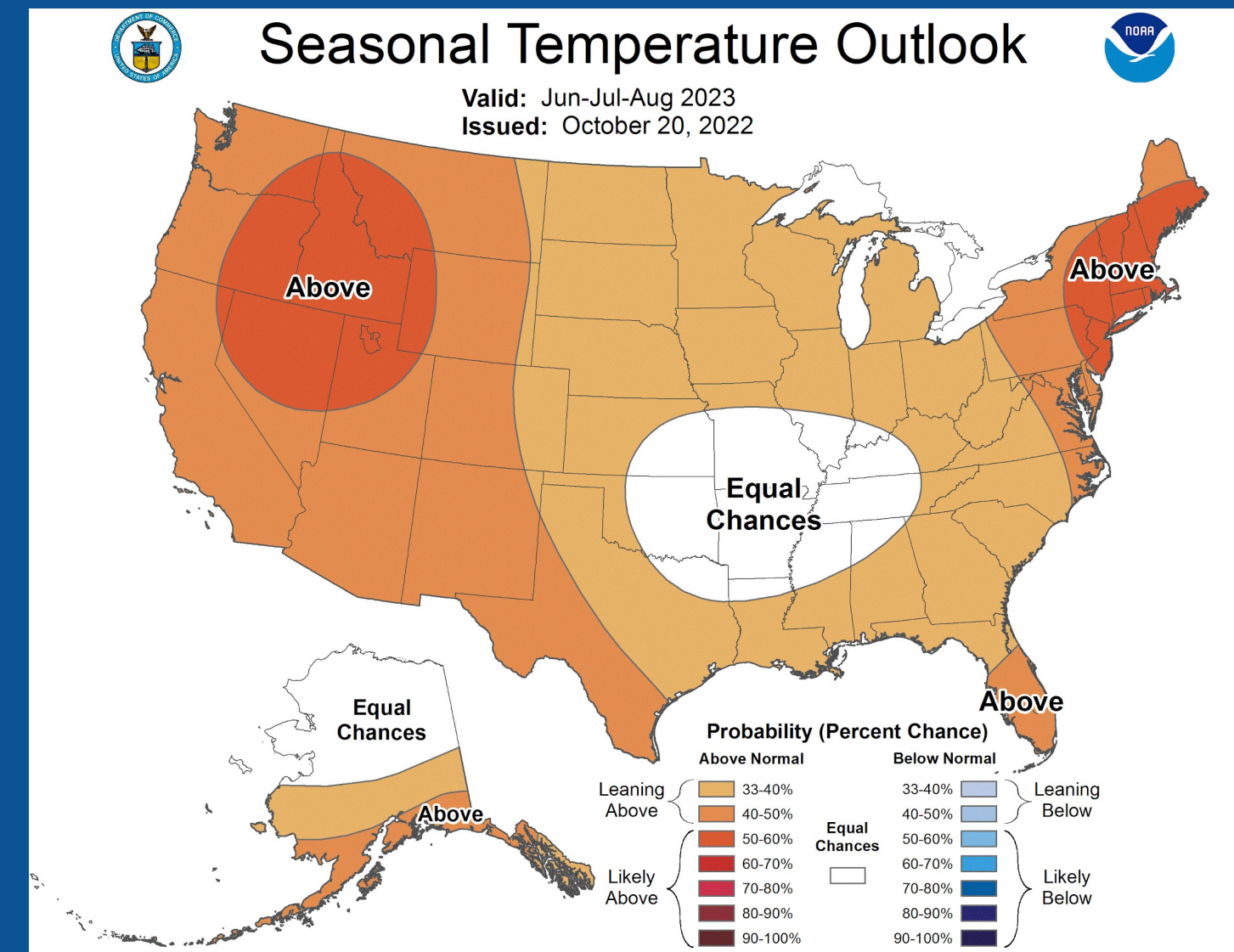
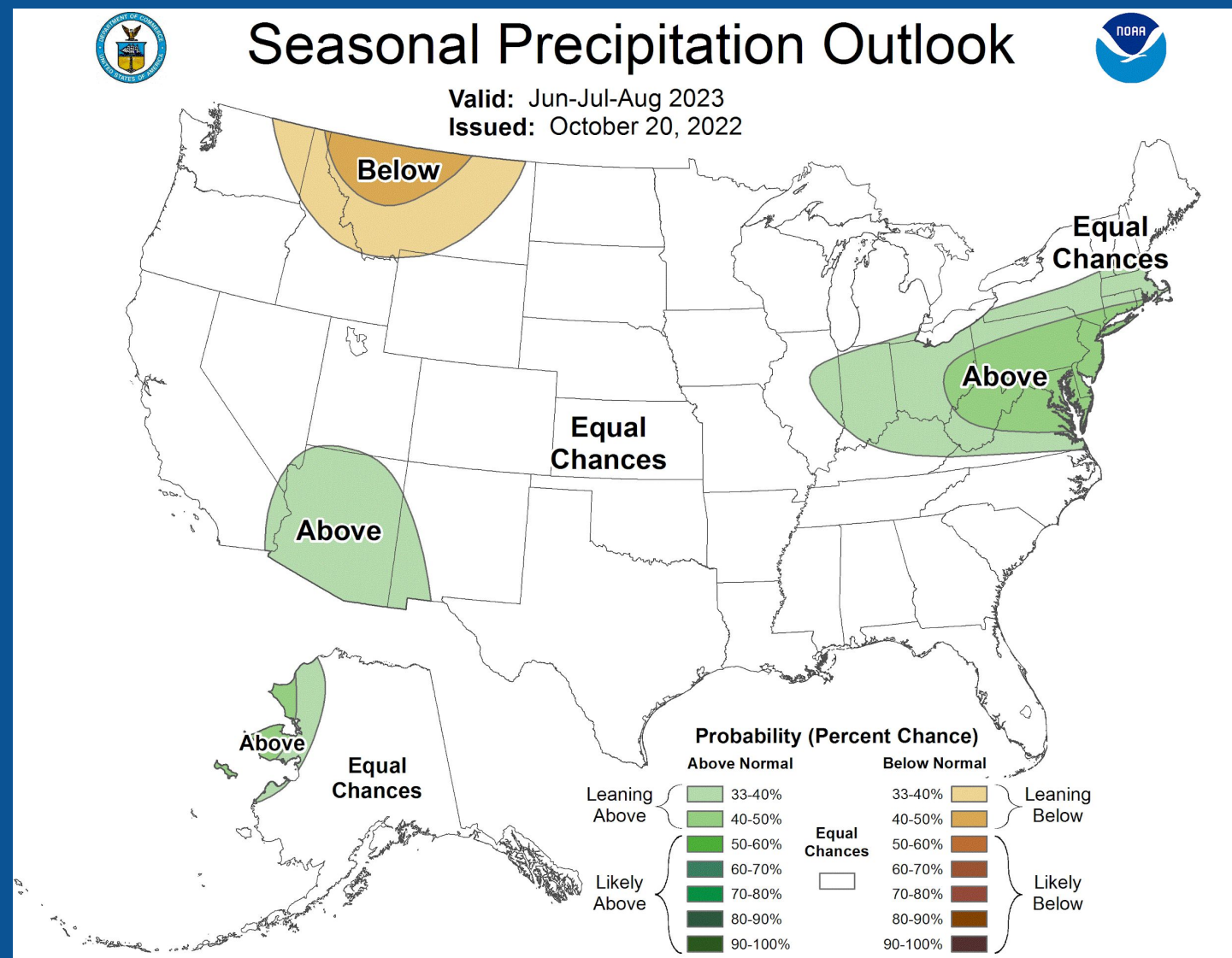
Precipitation

Equal Chances for
Above, Near, or
Below Normal



Temperatures

Greater Chances for
Above Normal

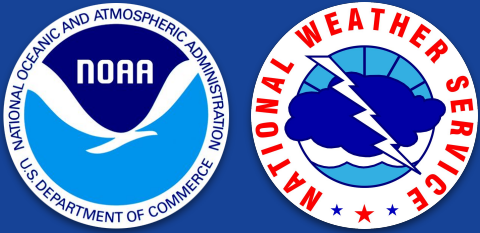




Climate Prediction Expectation

Weather Forecast Office
Portland, OR
Wednesday, October 26

Climate predictions can have skill in predicting seasonal totals and averages. However, most impacts are associated with short-duration storm systems.




Summary

Weather Forecast Office
Portland, OR
Wednesday, October 26

- Quick Review of ENSO (El Niño Southern Oscillation) & Current Status
- La Niña Weather Implications - historically
- Third consecutive winter of La Niña
- NWS Climate Prediction Center (CPC) outlooks
 - 1) 8-14 day (high chance for wetter than normal)
 - 2) 1 Month, November (WA wetter than normal, otherwise Equal Chance)
 - 3) 3 Month, Winter (slight favor for wetter and cooler than normal)
 - 4) 3 Month, Spring (slight favor for wetter and cooler than normal)
 - 5) 3 Month, Summer (Favors warmer than normal)

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