



Seasonal Climate Forecast

January – March 2024

Issued: December 21, 2023

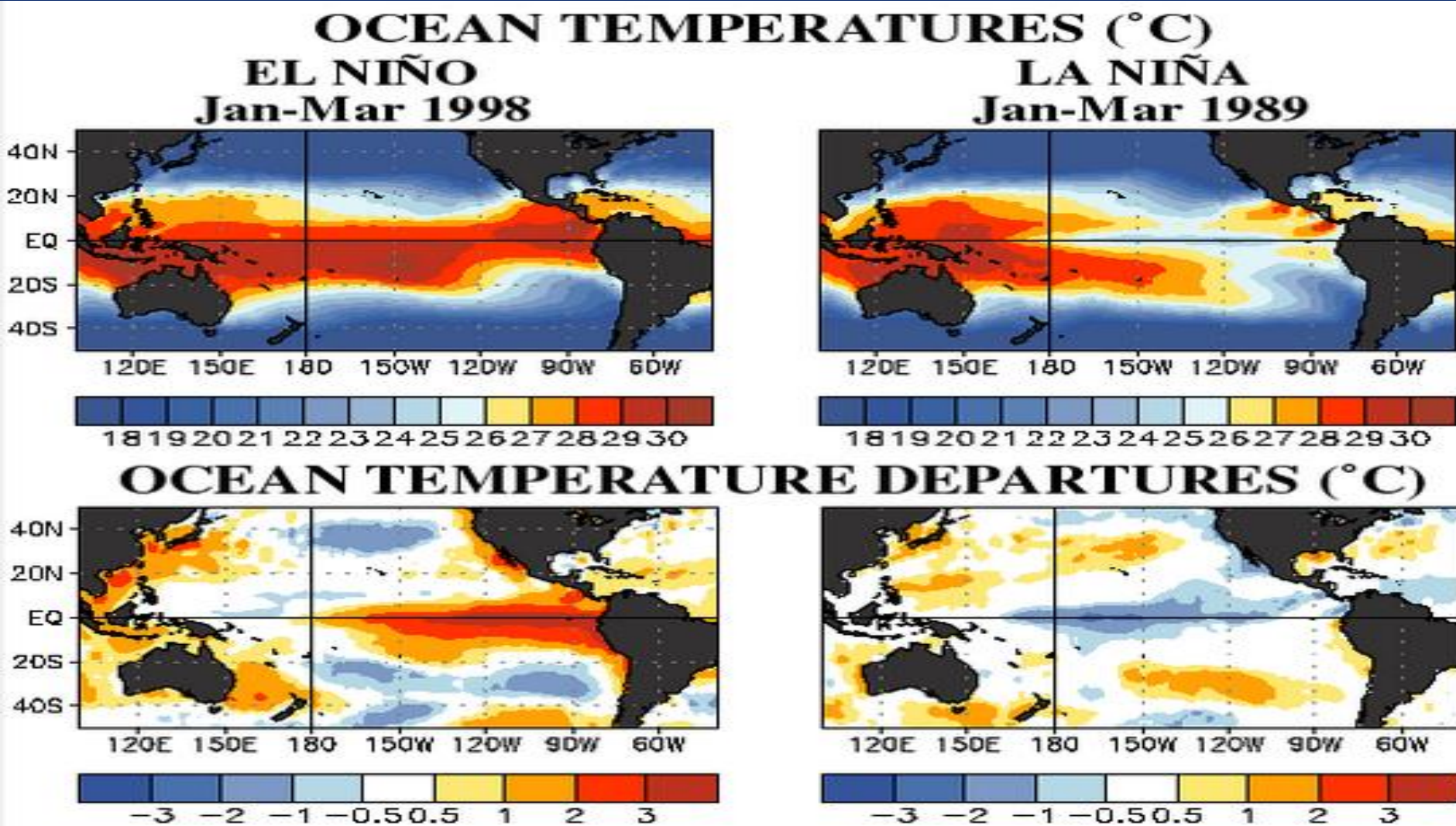
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ODA Team: Diana Walker; Andy Zimmerman; Jenn Ambrose; Taylor Harding
ODF Team: Julie Vondrachek; Kristin Cody

Photo: Bill Waterman

El Niño vs La Niña

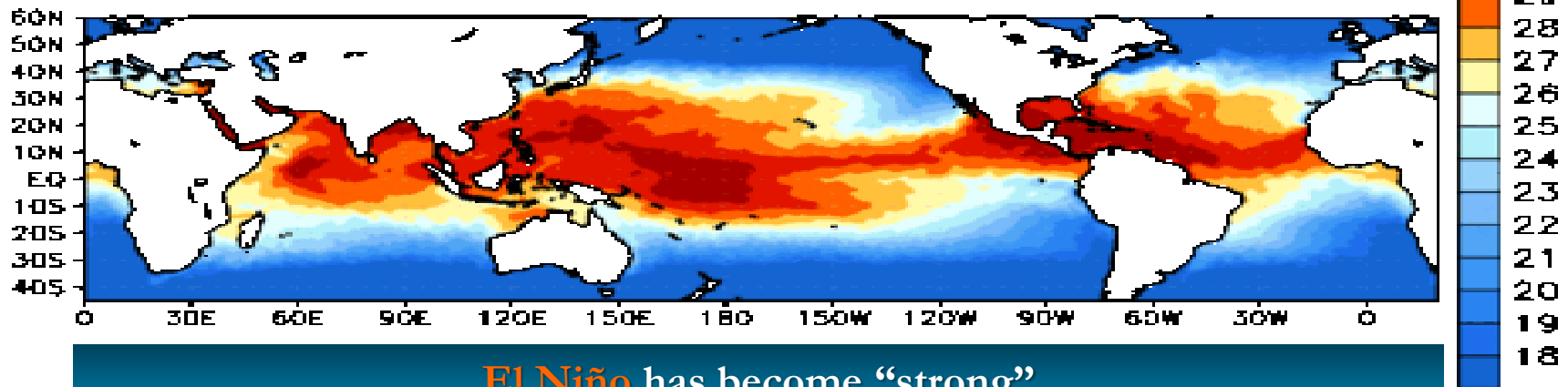
(SST Patterns in the Tropical Pacific Ocean)



Sea Surface Temperatures (SSTs)

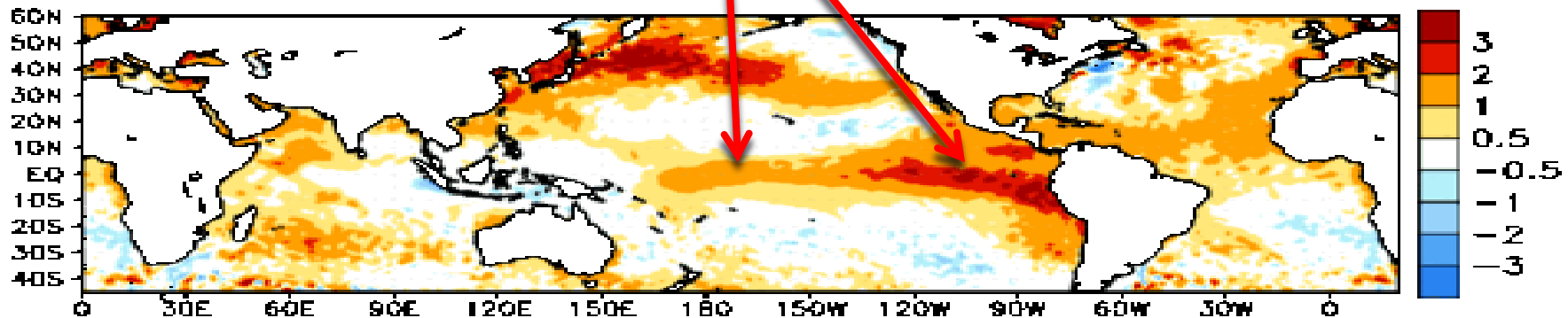
Animated (PowerPoint only) SSTs (top) / Anomalies (bottom)

Week centered on 27 SEP 2023
SST (°C)



El Niño has become “strong”

Anomalies (°C)



El Niño Southern Oscillation (ENSO)

Current Status and Forecast

- The November Southern Oscillation Index (SOI) was -0.8 , reflecting **El Niño** conditions across the tropical Pacific Ocean.
- The September – November Oceanic Niño Index (ONI $+1.8^{\circ}\text{C}$) rose into the **strong El Niño** range. This index lags real-time sea surface temperatures (SSTs), which also reflect **strong El Niño** conditions.
- NOAA's Climate Prediction Center (CPC) expects **El Niño** to persist through the winter then transition to **ENSO-neutral** next spring.

Important Note: This “Seasonal Climate Forecast” does not consider NOAA’s ENSO forecast. It uses only historical and current ENSO conditions to find “analog years” that most-closely match the evolution of the current ENSO state.

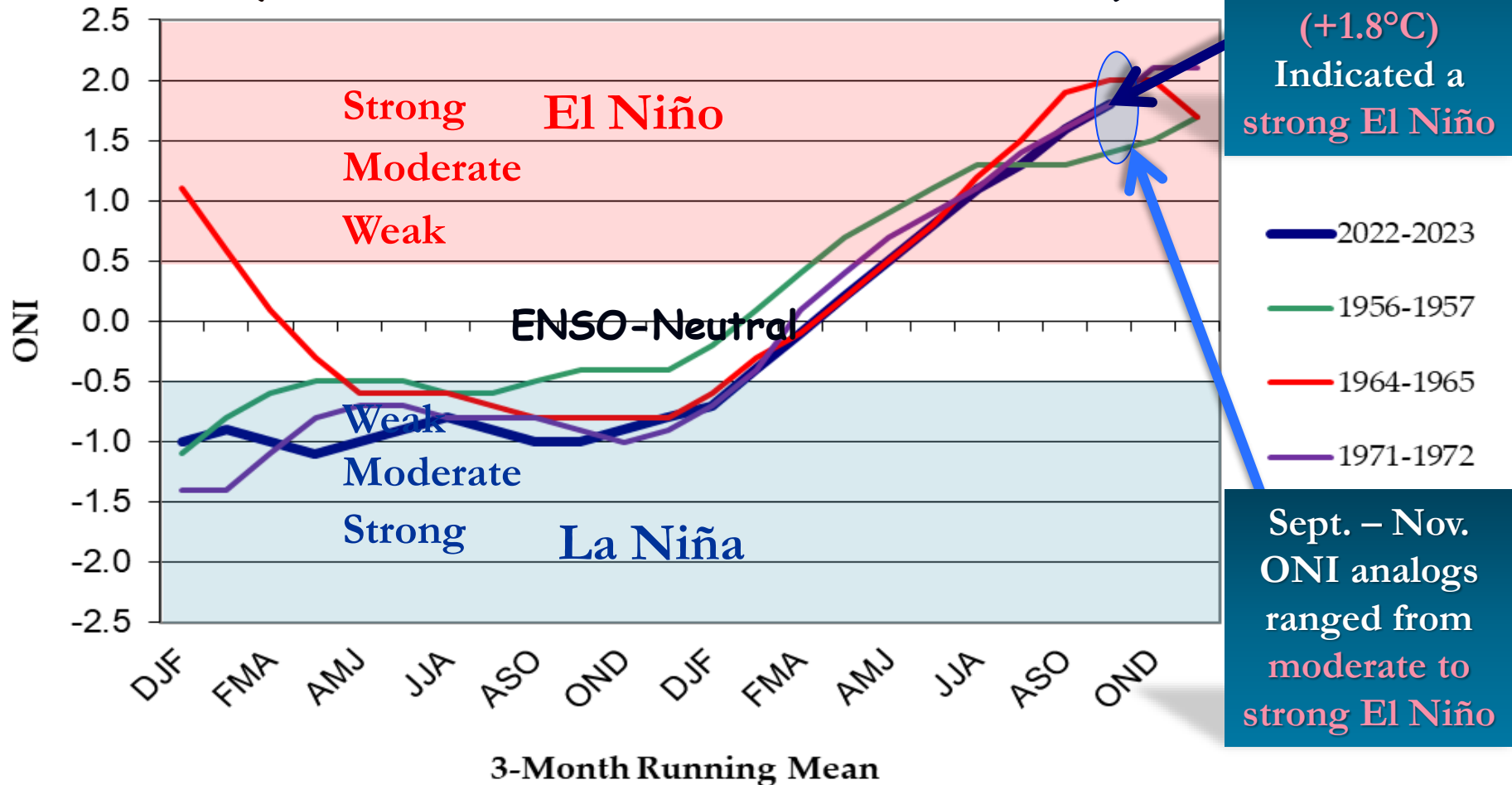
Southern Oscillation Index (SOI)

SOI values from the top "analog years" compared
with the current period (2022-2023)
(1957-1958; 1964-1965; 1971-1972)



Oceanic Niño Index (ONI)

ONI values from the top "analog years"
compared with the current period (2022-2023)
(1957-1958; 1964-1965; 1971-1972)

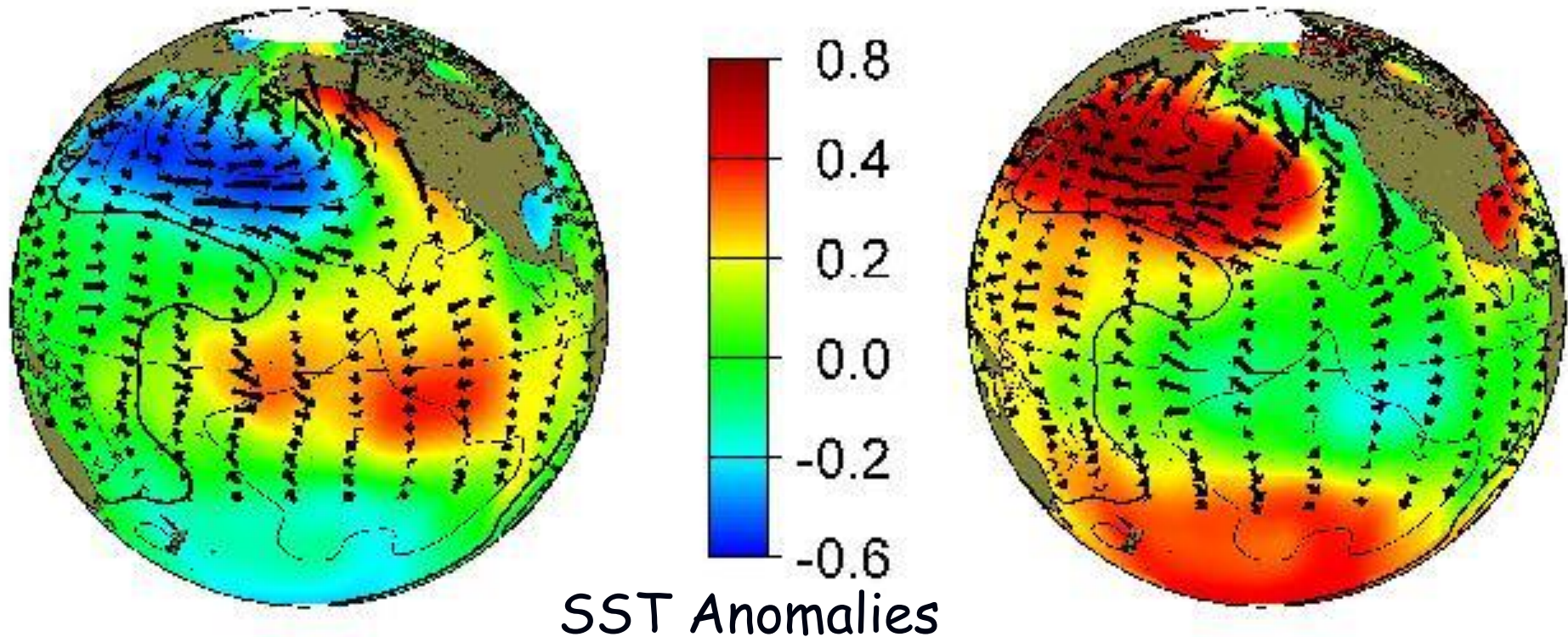


The Pacific Decadal Oscillation (PDO)

(Reflects SST “Phase” in the North Pacific Ocean)

Positive (Warm)
“Phase”

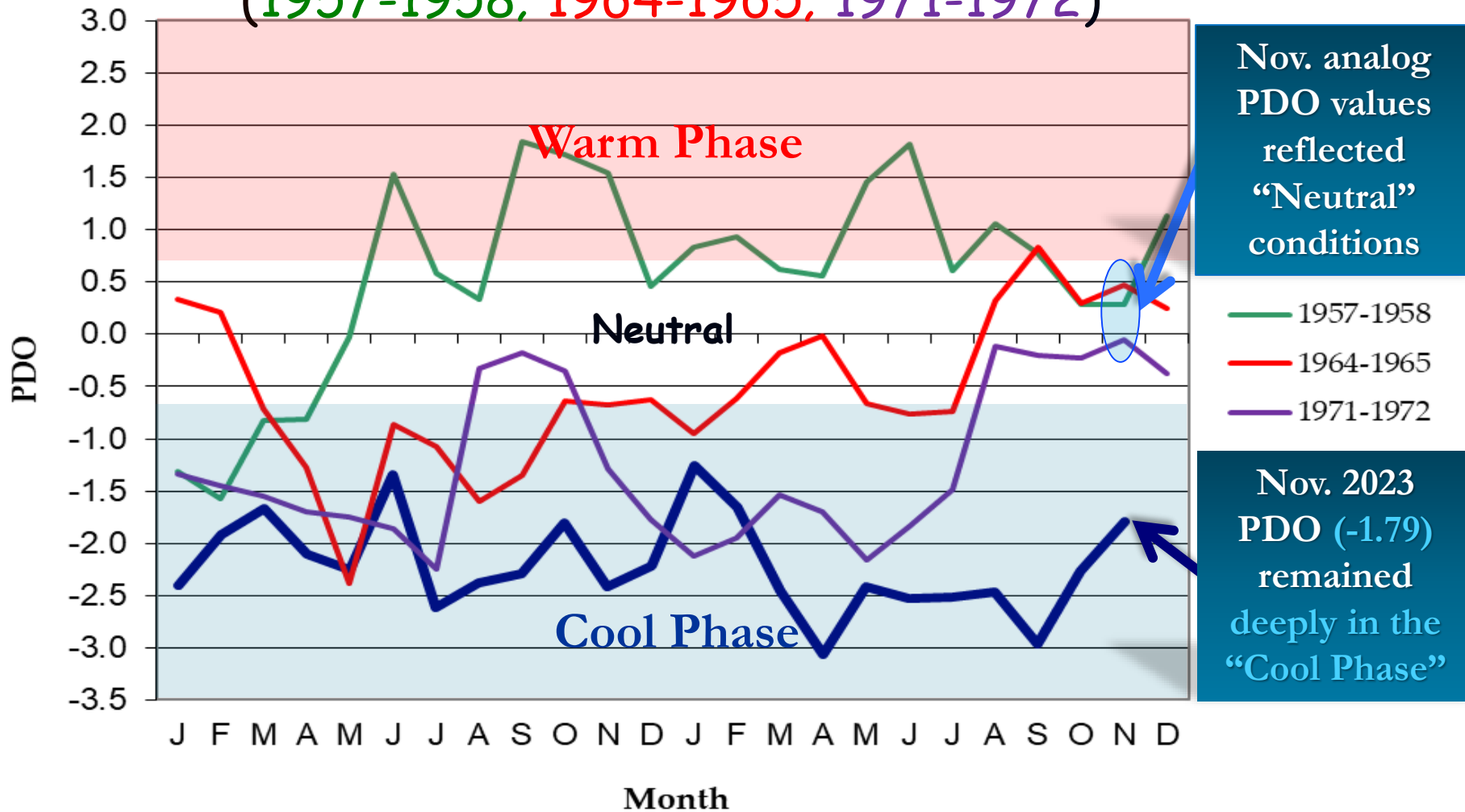
Negative (Cool)
“Phase”



North Pacific Ocean

(Poleward of 20°N Latitude)

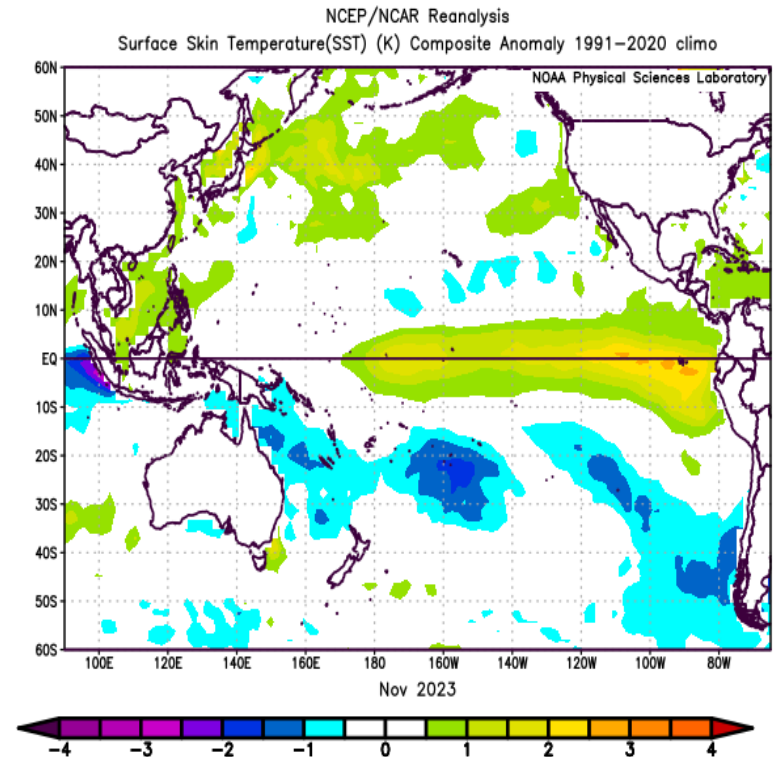
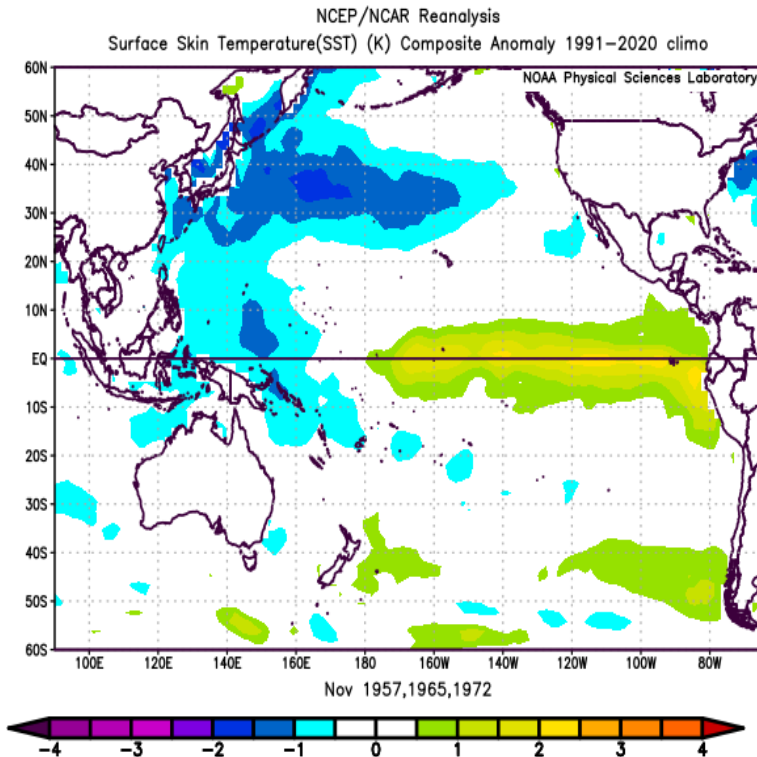
PDO values from the top "analog years" compared
with the current period (2022-2023)
(1957-1958; 1964-1965; 1971-1972)



SST Anomalies Comparison

November Analogs

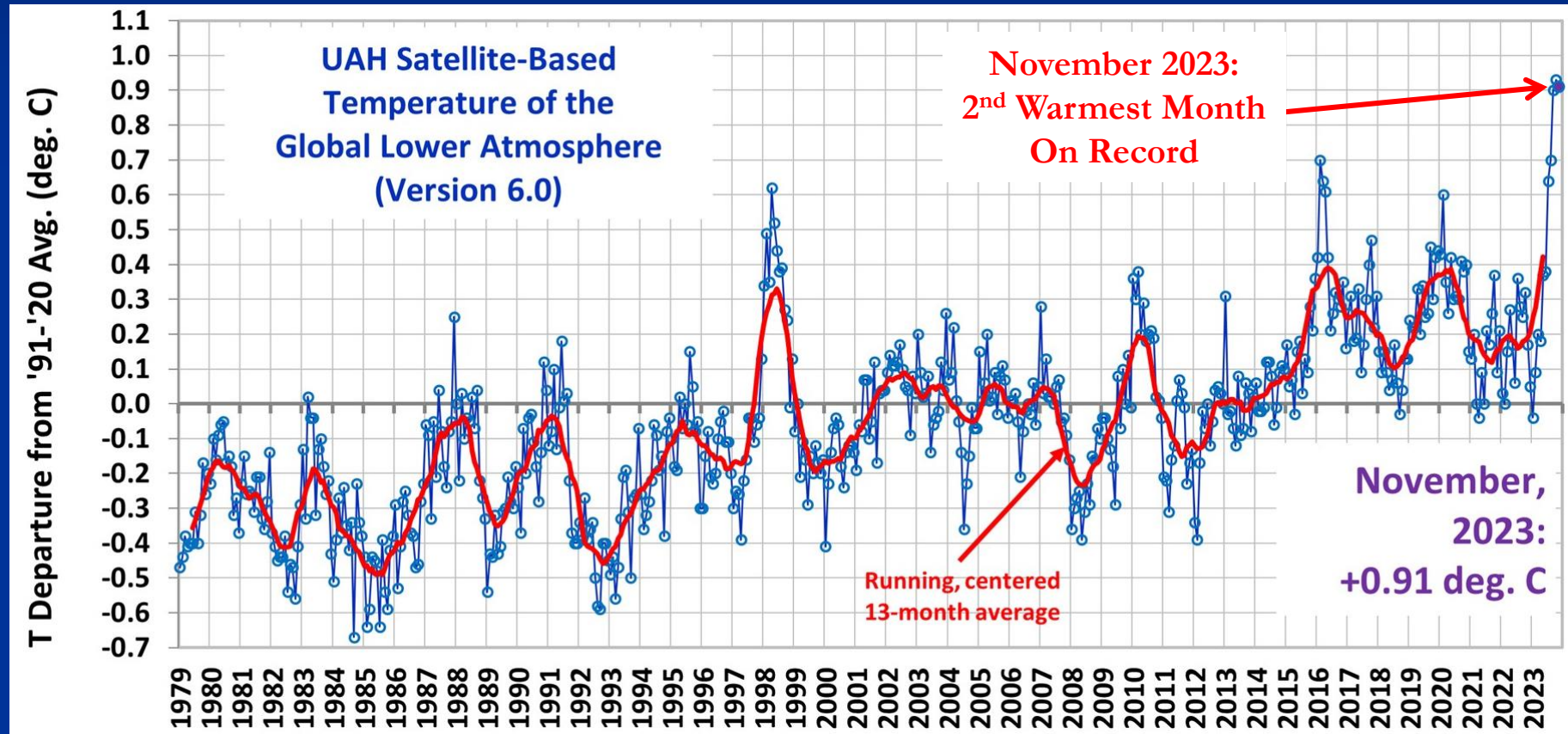
November 2023



- The November analog composite (left) has a similar SST anomaly pattern (“good match”), compared to that of November 2023 (right).
- Both charts show moderate-to-strong **El Niño (warm)** conditions in the tropical Pacific but have greater differences in the north Pacific.

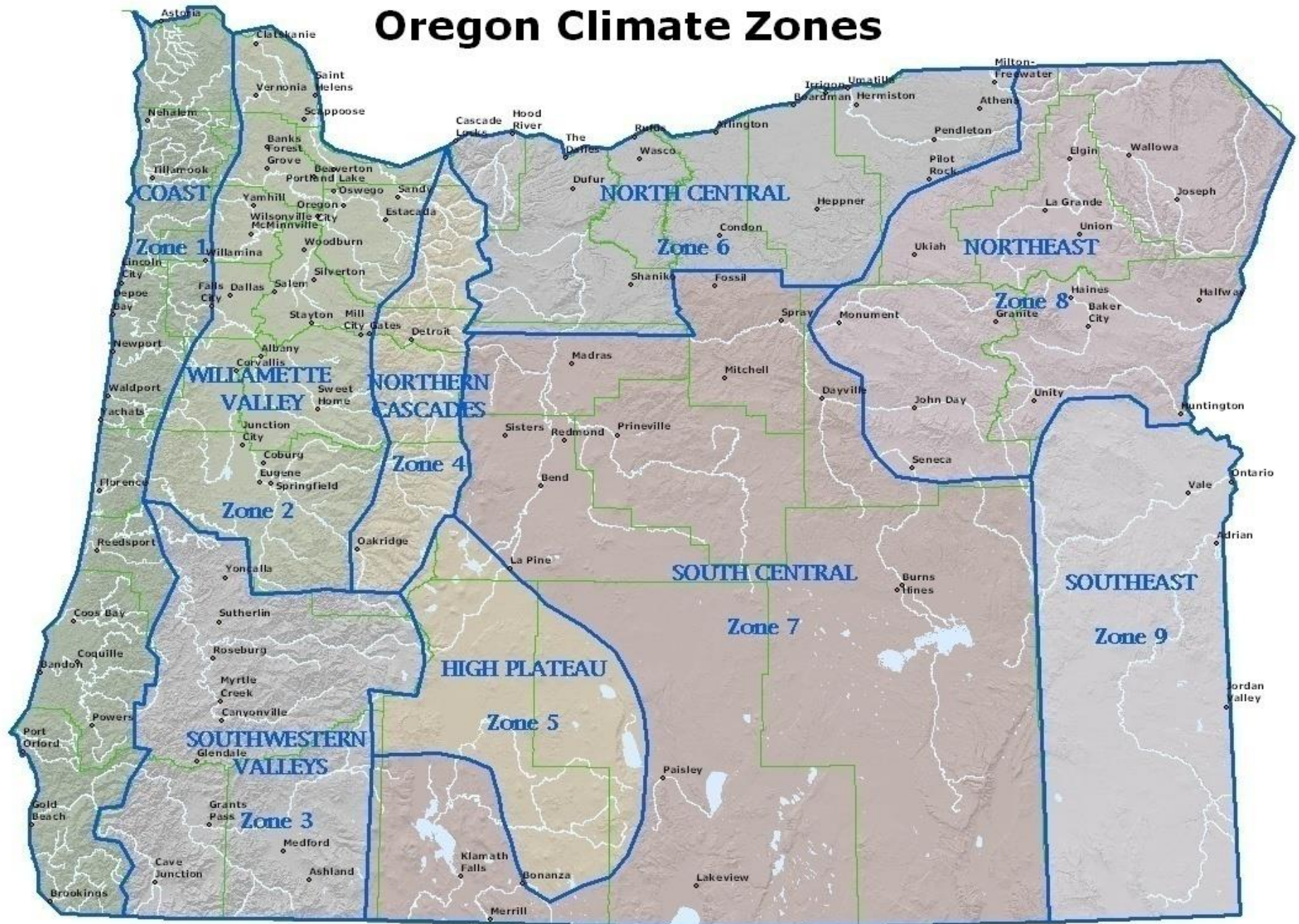
Global Temperature Changes

Increase Error in Analog Forecasts!



Courtesy: <http://www.drroyspencer.com/latest-global-temperatures/>

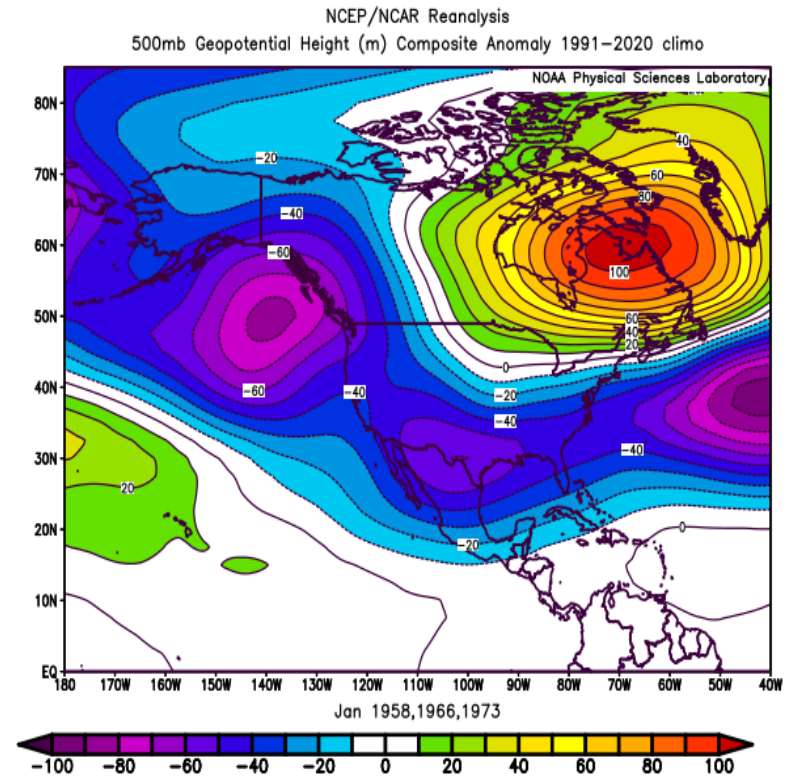
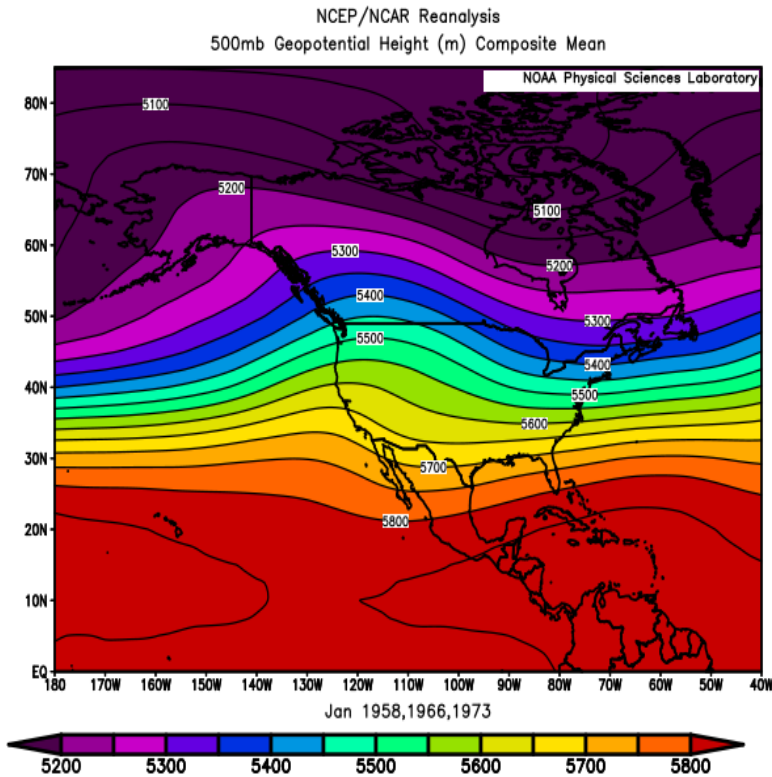
Oregon Climate Zones



January 2024 Forecast

Mean Upper-Air Pattern

Upper-Air Anomalies

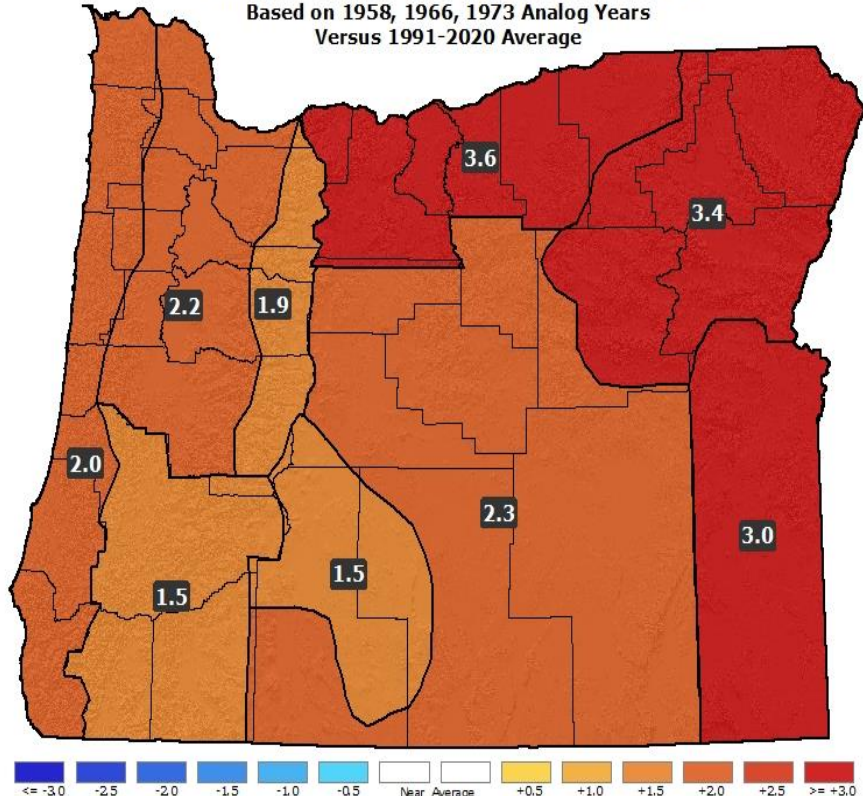


- Upper-air patterns of analogs all had mean ridging with a “split-flow” pattern along the Pacific Northwest Coast.
- This is a classic mid-winter “signature” of **El Niño** that tends to prevent cold air from pushing south into Oregon.

January 2024 Forecast

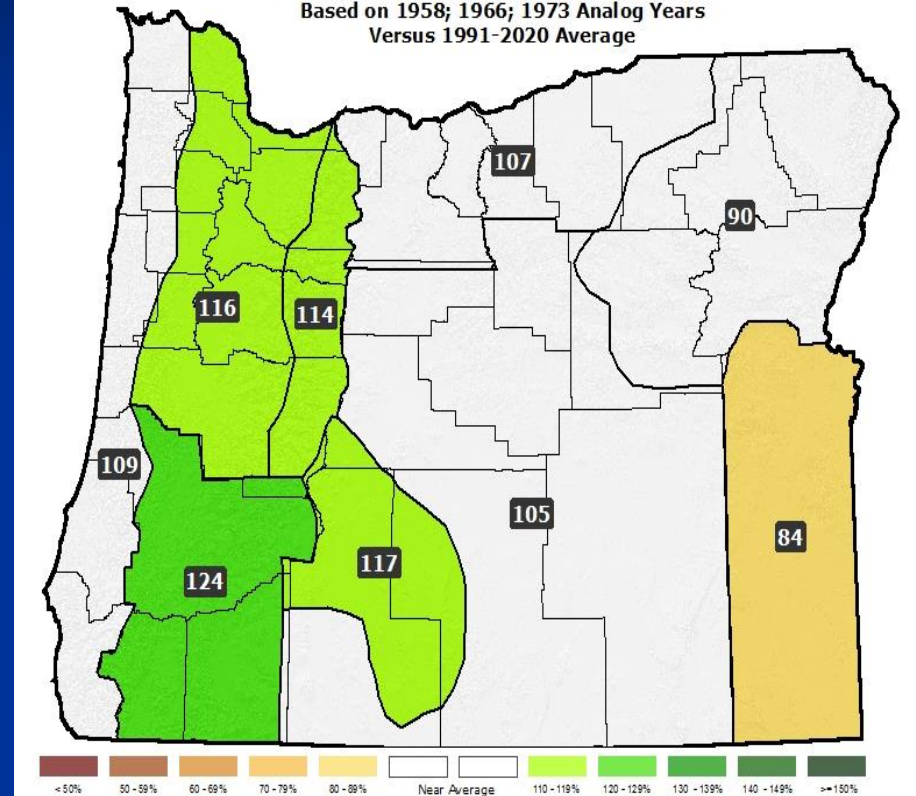
Temperatures

January 2024 Forecast Temperature Anomalies (°F)
Based on 1958, 1966, 1973 Analog Years
Versus 1991-2020 Average



Precipitation

January 2024 Forecast Precipitation Anomalies (% of Avg)
Based on 1958; 1966; 1973 Analog Years
Versus 1991-2020 Average

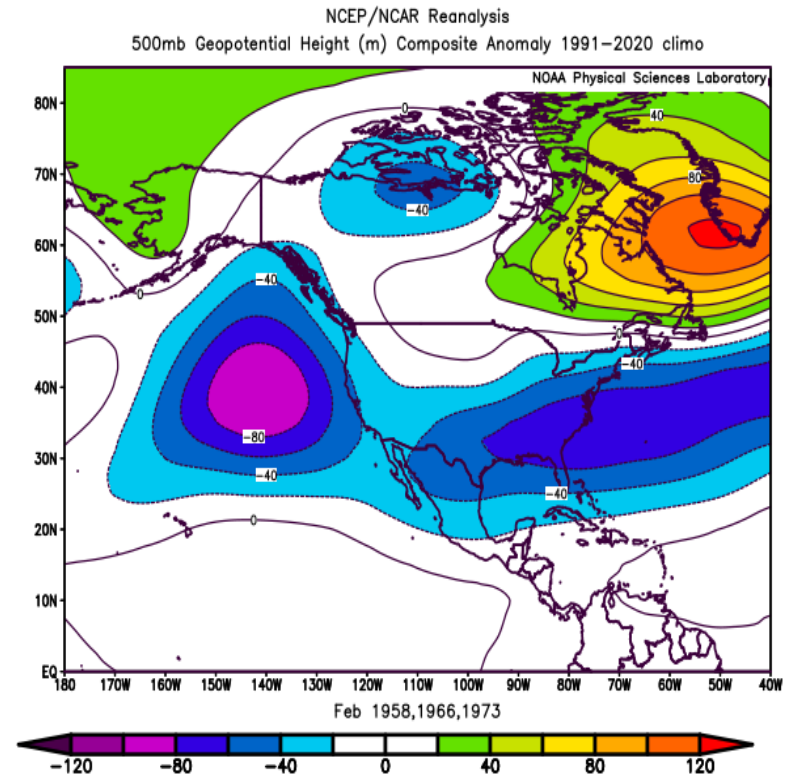
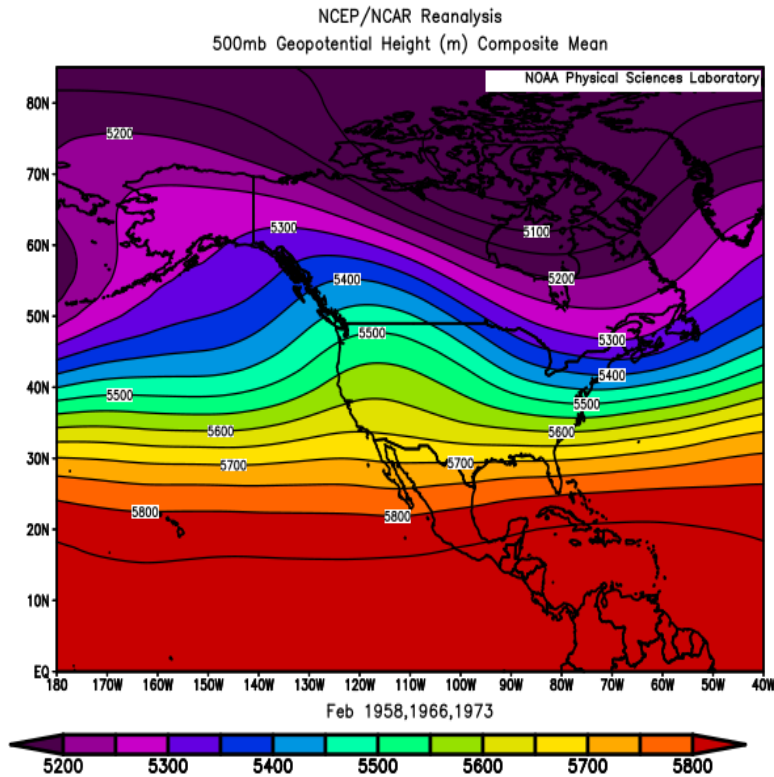


- Analogs varied from slightly cool (1973) to very mild (1958). Arctic intrusions were noticeably absent; above-average temperatures likely.
- Analogs varied on either side of average precipitation. Southern zones have the best chances for above-average rain and mountain snow.

February 2024 Forecast

Mean Upper-Air Pattern

Upper-Air Anomalies

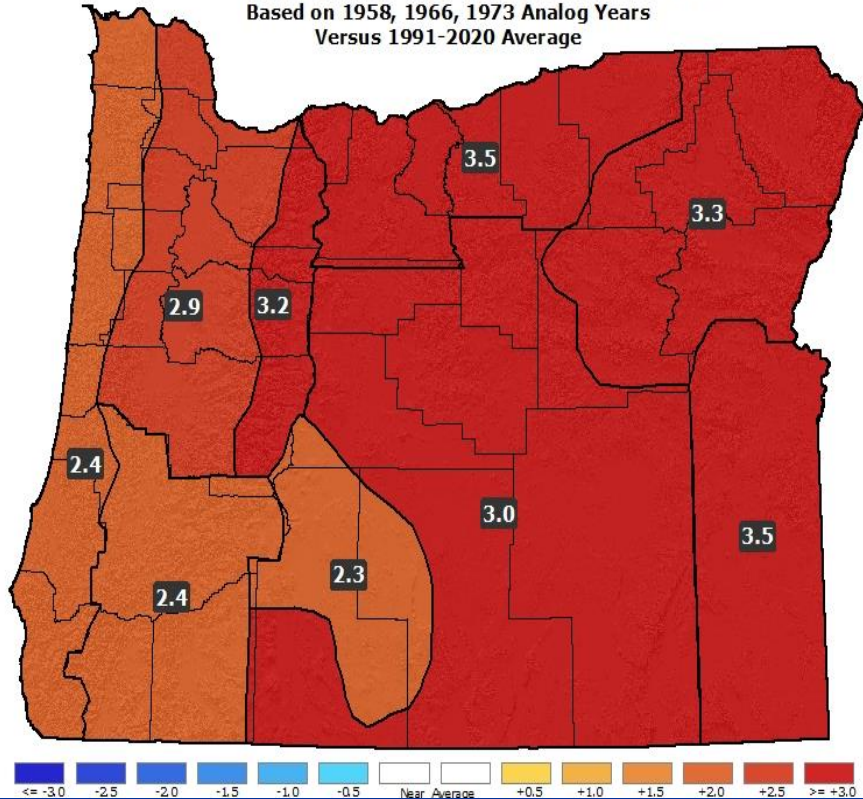


- A “split-flow” pattern should continue over the Pacific Northwest (indicative of a mature **El Niño**) with mean ridging over the Rockies.
- This pattern tends to bring relatively mild conditions and weakens storms as they move inland across Washington and Oregon.

February 2024 Forecast

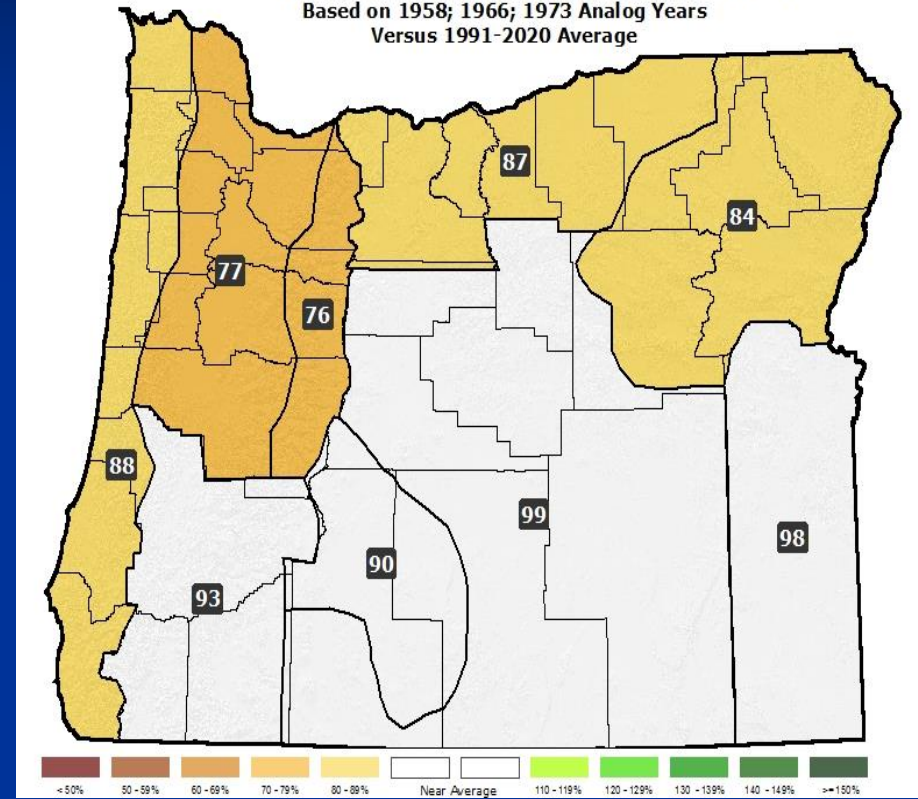
Temperatures

February 2024 Forecast Temperature Anomalies (°F)
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Versus 1991-2020 Average



Precipitation

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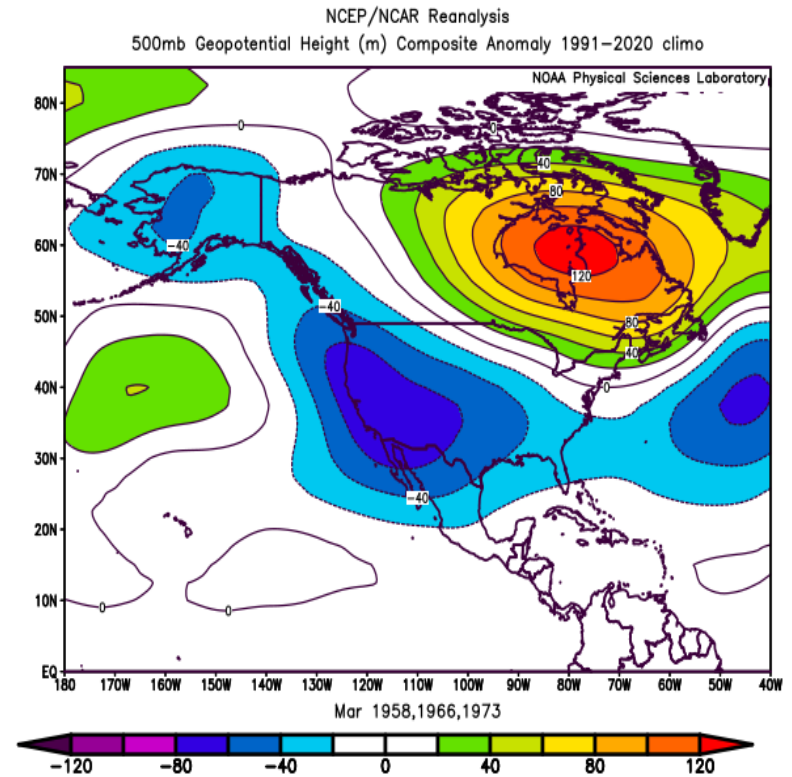
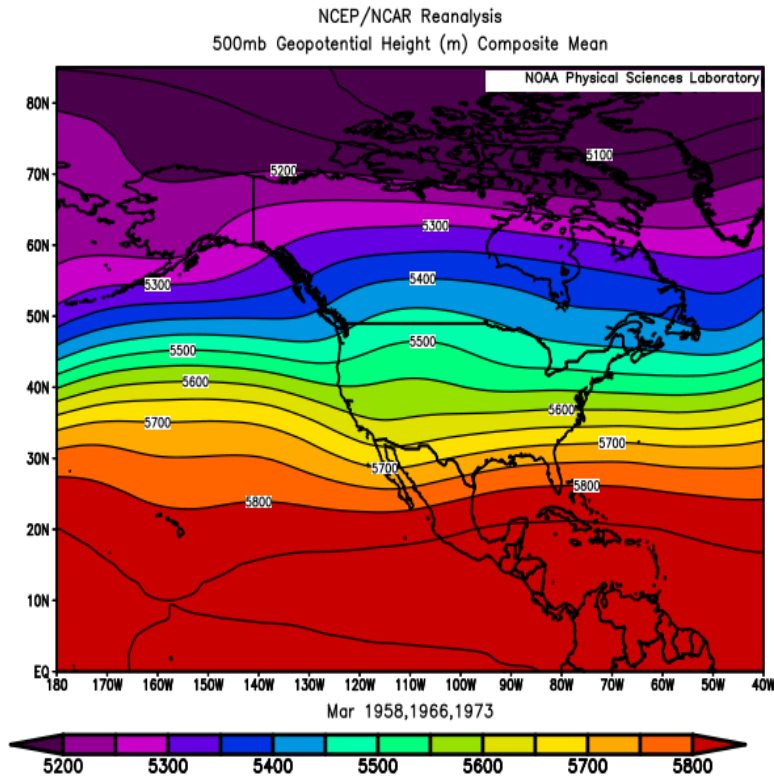


- Analogs ranged from slightly cool (1966) to extremely mild (1958). Expect above-average temperatures with any cool periods lacking both magnitude & duration...typical during **El Niño**.
- Rainfall/mountain-snow deficits are most likely in the northern zones.

March 2024 Forecast

Mean Upper-Air Pattern

Upper-Air Anomalies

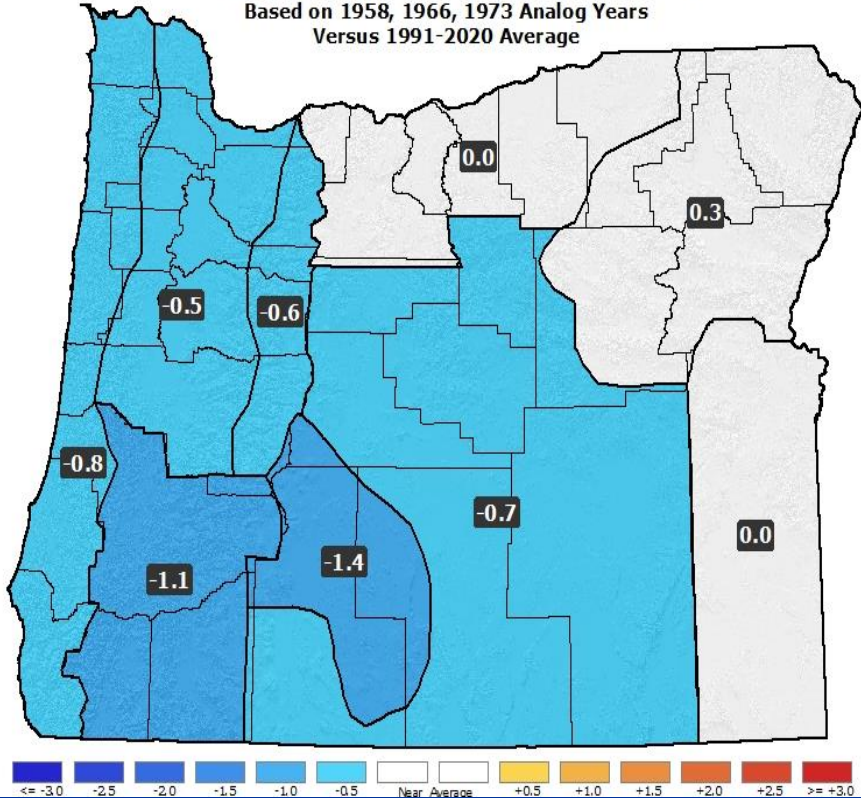


- A “split-flow” jet stream pattern should continue across the Pacific Northwest with enhanced storm activity directed towards California.
- Although storms will tend weaken as they approach the Oregon Coast, their frequency should be high enough to bring precipitation most days.

March 2024 Forecast

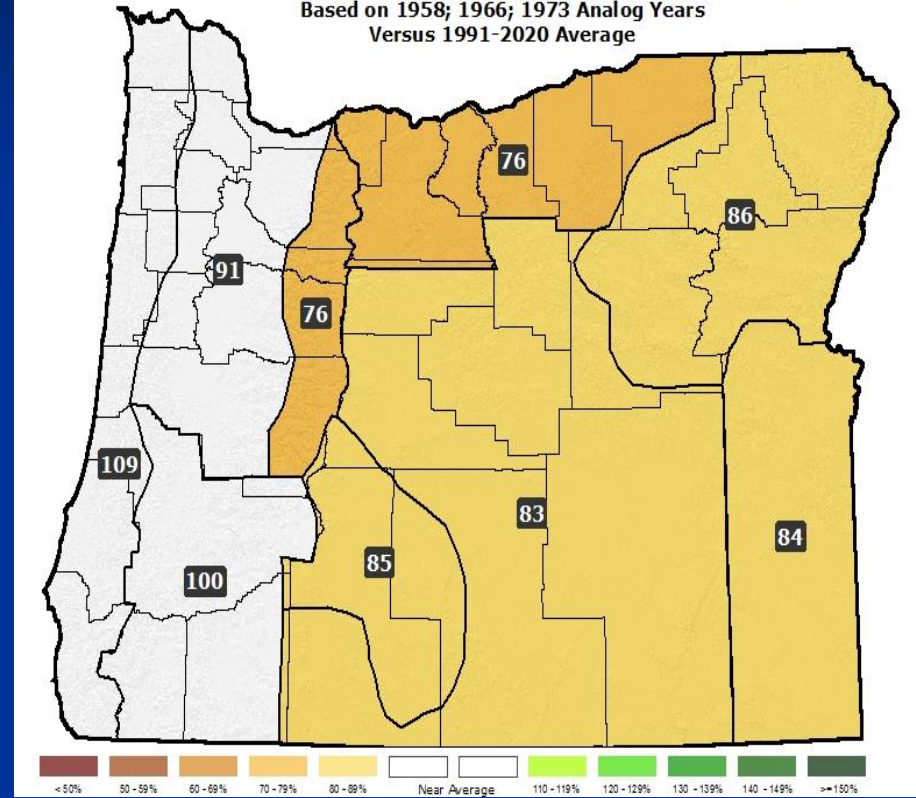
Temperatures

March 2024 Forecast Temperature Anomalies (°F)
Based on 1958, 1966, 1973 Analog Years
Versus 1991-2020 Average



Precipitation

March 2024 Forecast Precipitation Anomalies (% of Avg)
Based on 1958; 1966; 1973 Analog Years
Versus 1991-2020 Average

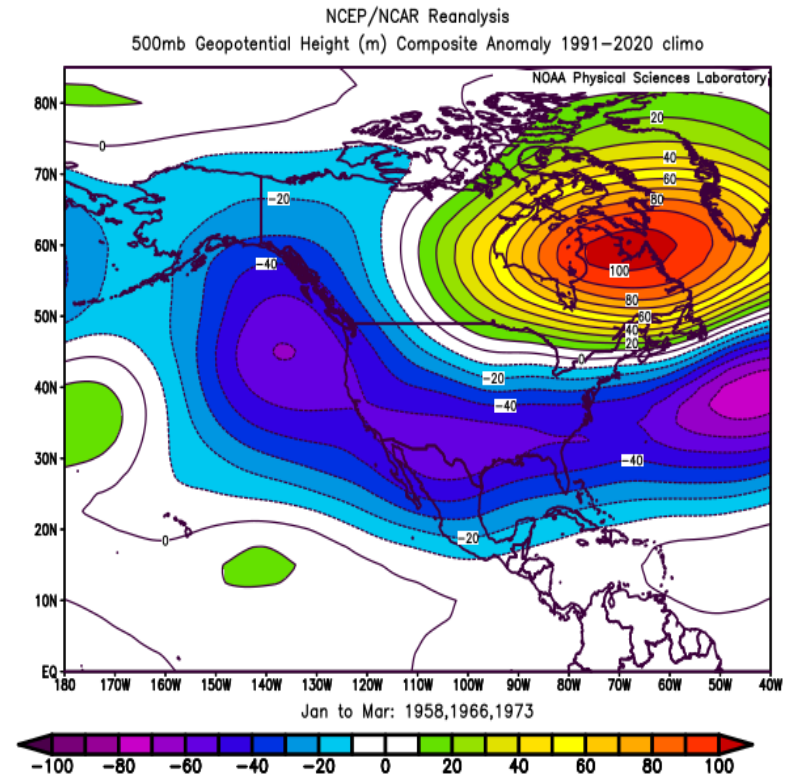
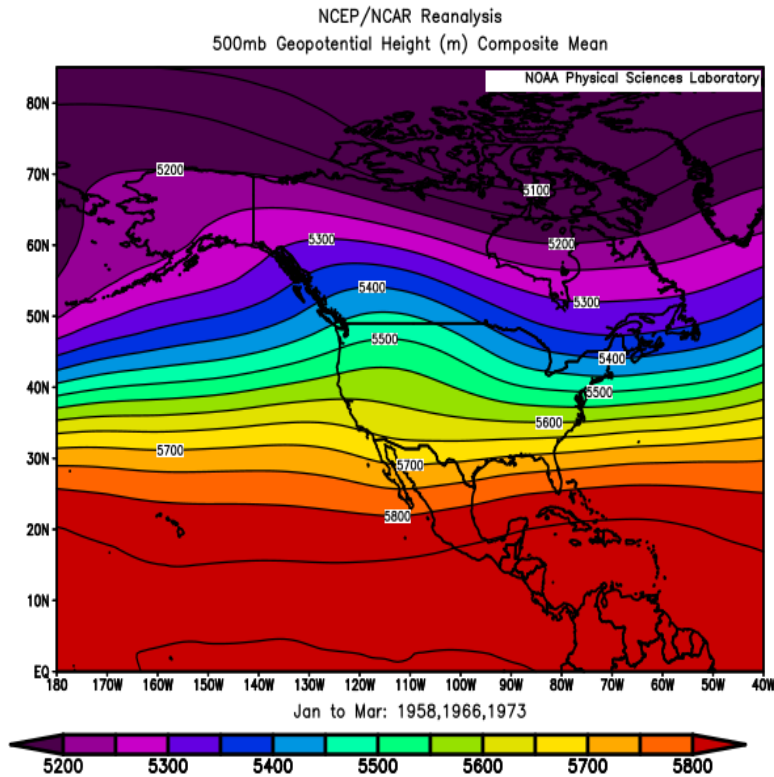


- All 3 analog years had near or below-average temperatures.
- Expect precipitation most days, but the “split-flow” jet stream pattern will tend to weaken storms as they come ashore...leading to mostly below average rain and mountain snow, especially north and east.

January – March 2024 Forecast

Mean Upper-Air Pattern

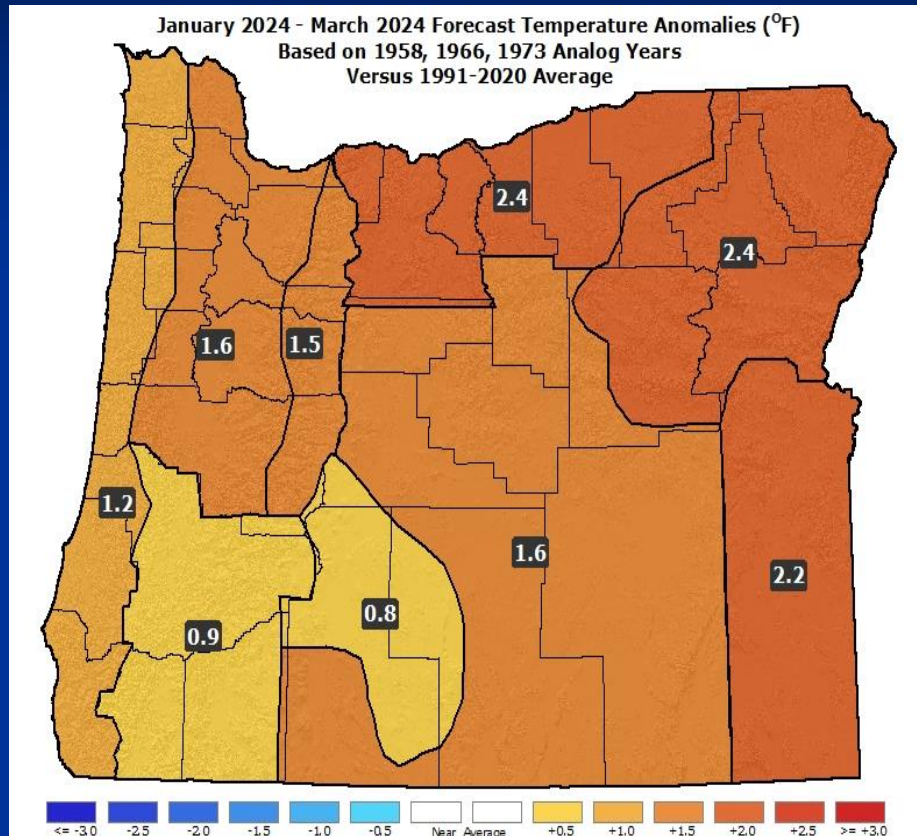
Upper-Air Anomalies



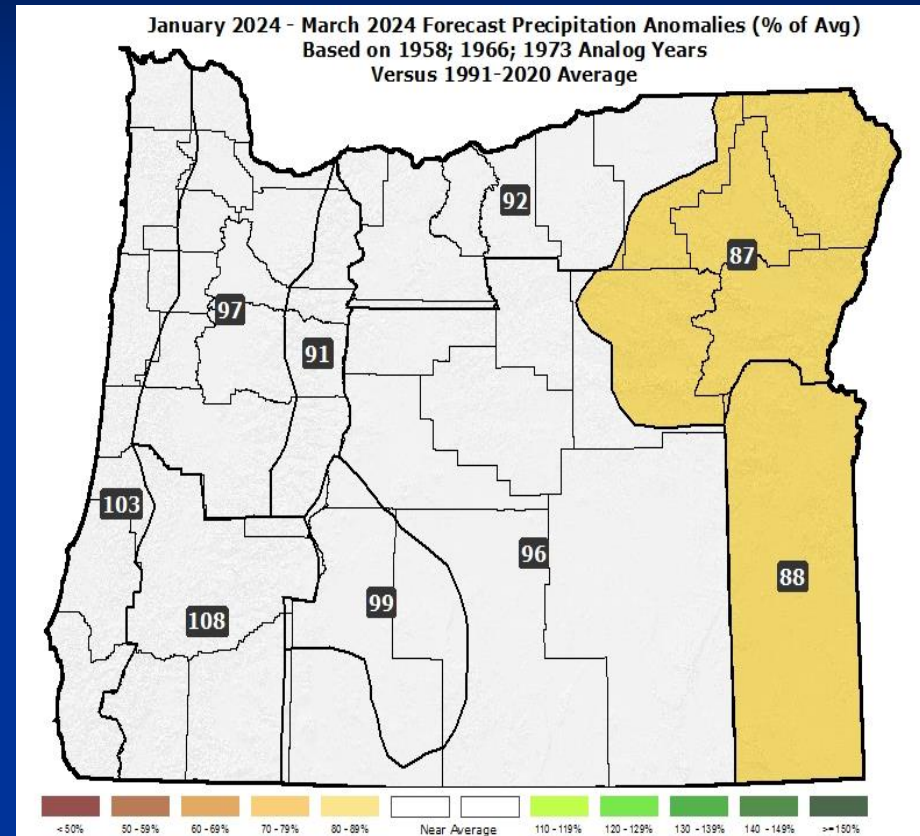
- “Split-flow” jet stream pattern into the Pacific Northwest Coast with a mean ridge centered over the Rockies (classic **El Niño** signature).
- Expect a relatively mild winter with minimal or absent cold periods. Precipitation most days but with overall deficits, especially north.

January – March 2024 Forecast

Temperatures



Precipitation



- Above-average temperatures, especially in January and February.
- An abundance of days with precipitation but expect overall rain and mountain snow totals to be near-to-below normal. SW Oregon has the best chances for above normal precipitation.

Forecast Highlights

- Increased chances for above-average temperatures & near-to-below-average precipitation during the January-March period.
- This forecast is based on the (1958; 1966; 1973) analog years (1952 was replaced by 1958 on this month's update). These years all experienced moderate or strong El Niño conditions.
- The expected “split-flow” jet stream pattern will tend to weaken and shear apart storms approaching the Oregon Coast. Snow levels should generally be above average with significant cold spells unlikely.
- **Bottom line:** Expect a relatively mild winter...below-average rain & mountain snow north with near-average rain and mountain snow south.

Disclaimer: This forecast is not associated with NOAA's CPC (see “Forecasting Methods...” at: <https://oda.direct/Weather>) nor the official CPC “Three-Month Outlooks,” which are available at: https://www.cpc.ncep.noaa.gov/products/predictions/long_range/seasonal.php?lead=1

Forecast Resources

- ODA Seasonal Climate Forecast Home:

<https://www.oregon.gov/ODA/programs/NaturalResources/Pages/Weather.aspx>

- CPC Official US Three-Month Forecasts (Graphics):

https://www.cpc.ncep.noaa.gov/products/predictions/long_range/seasonal.php?lead=01

- CPC US 30-Day & 90-Day Forecasts (Discussions):

https://www.cpc.ncep.noaa.gov/products/predictions/long_range/fxus07.html

- CPC Weekly & Monthly ENSO Discussions:

https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory

- Australian Government Climate Model Summary:

<http://www.bom.gov.au/climate/model-summary/#region=NINO34&tabs=Overview>

- Australian Government ENSO Wrap-Up:

<http://www.bom.gov.au/climate/enso>

- IRI ENSO Quick Look:

<https://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/>

Water Supply / Fire-Potential Outlook

- CPC U.S. Seasonal Drought Outlook:

https://www.cpc.ncep.noaa.gov/products/expert_assessment/season_drought.png

- NRCS Snow Water Equivalent Oregon Map:

https://www.wcc.nrcs.usda.gov/ftpref/data/water/wcs/gis/maps/or_swepctnormal_update.pdf

- NRCS/USDA Snow Water Equivalent Products:

<https://www.nrcs.usda.gov/wps/portal/wcc/home/snowClimateMonitoring/snowpack/>

- NDMC U.S. Drought Monitor:

<https://droughtmonitor.unl.edu/>

- NIDIS North American Drought Portal:

<https://www.drought.gov/nadm/content/percent-average-precipitation>

- WRCC WestWideDroughtTracker:

<https://www.wrcc.dri.edu/wwdt/>

- NWCC Northwest Interagency Coordination Center (video)

<https://gacc.nifc.gov/nwcc/predict/outlook.aspx>



Updated Monthly

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