ODF Seasonal Climate Forecast
Nov. 2020 – Feb. 2021

Winter Weather Forecast Conference
Oregon Chapter of the AMS
October 24, 2020

Contact: ODF Meteorologist Pete Parsons
503-945-7448 or peter.gj.parsons@oregon.gov

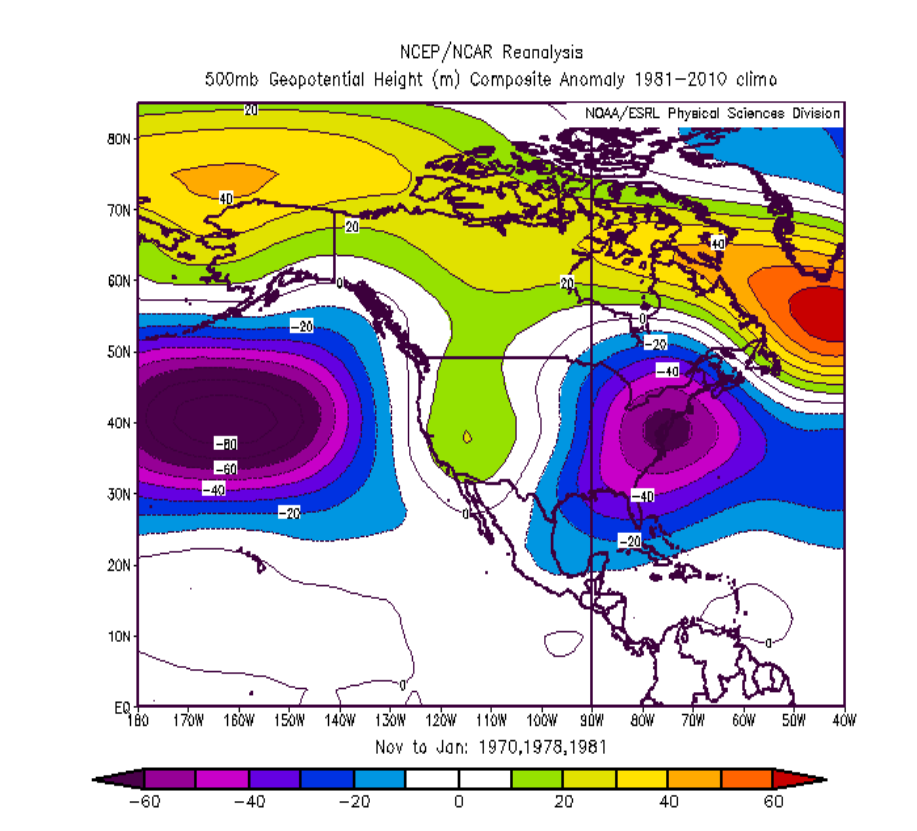
Oregon Department of Agriculture (ODA) - Oregon Department of Forestry (ODF)
Production support: Diana Walker; Jacob Cruser; Andy Zimmerman; Julie Waters

Start by Looking Back…

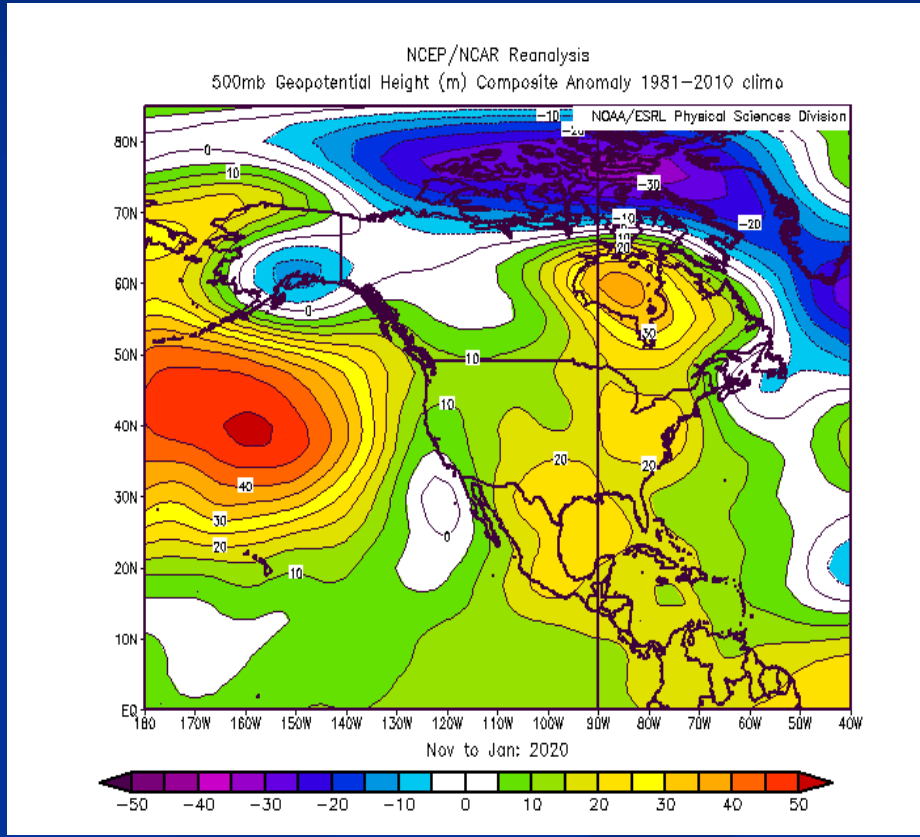
Nov. 2019 – Jan. 2020

(Forecast Issued October 17, 2019)/(Actual)

Forecast Upper-Air Anomalies

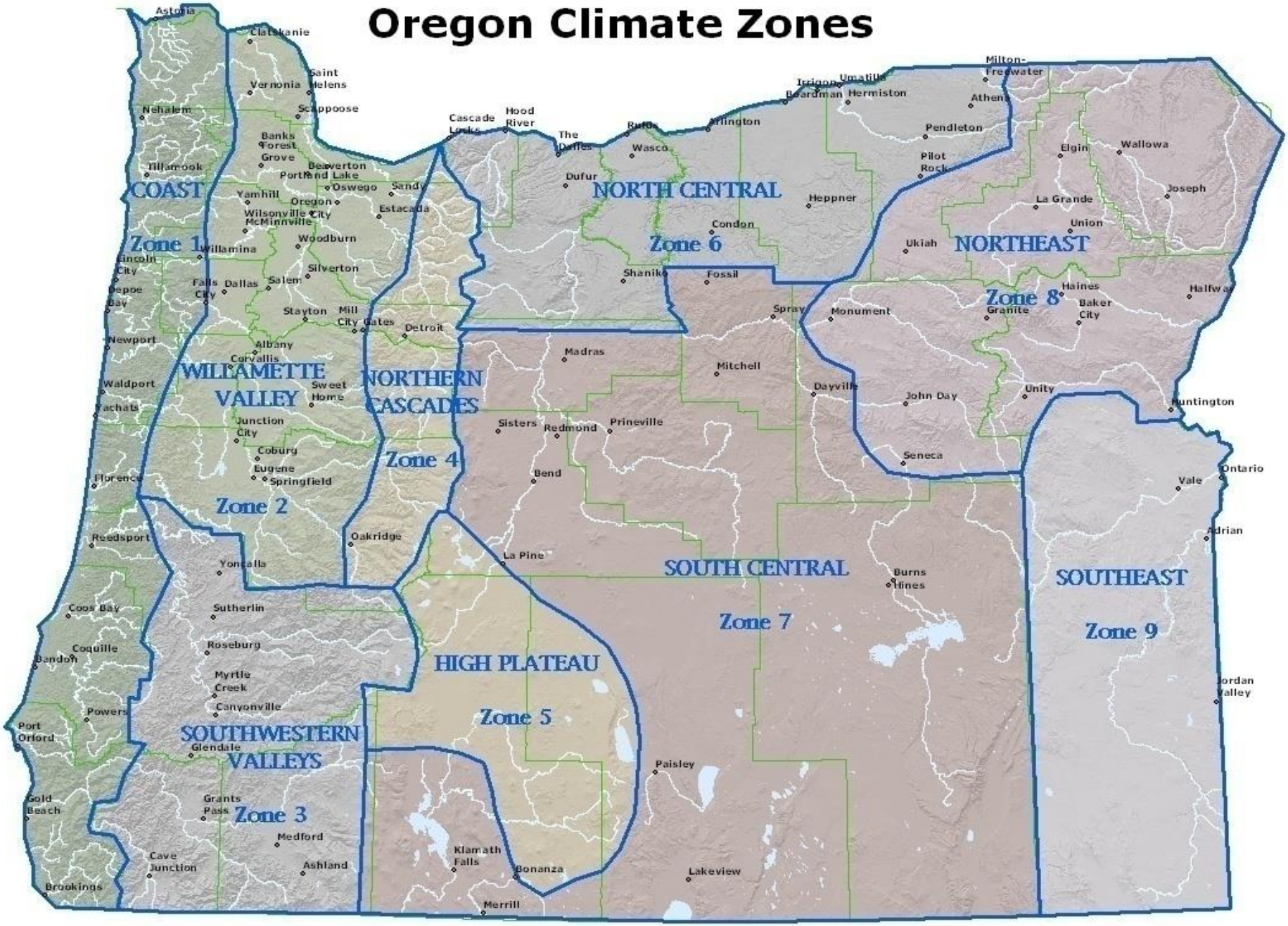


Actual Upper-Air Anomalies



- Positive upper-air anomalies were both predicted (left) and observed (right) for Oregon. However, anomalies were much more positive than expected over the Pacific Ocean and across the eastern U.S.

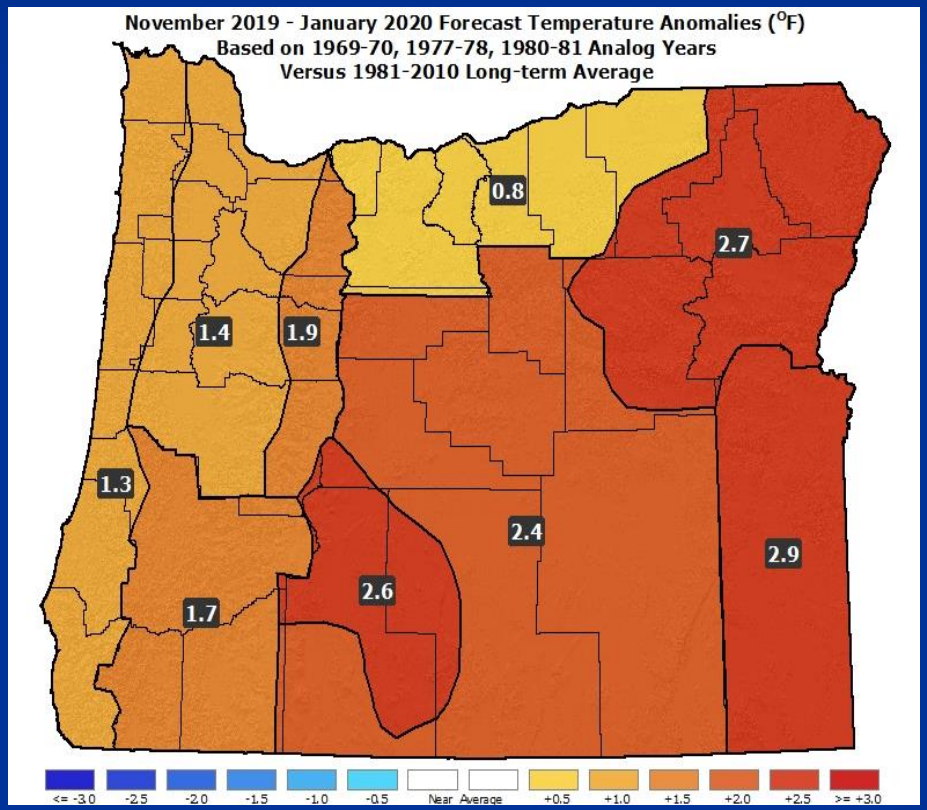
Oregon Climate Zones



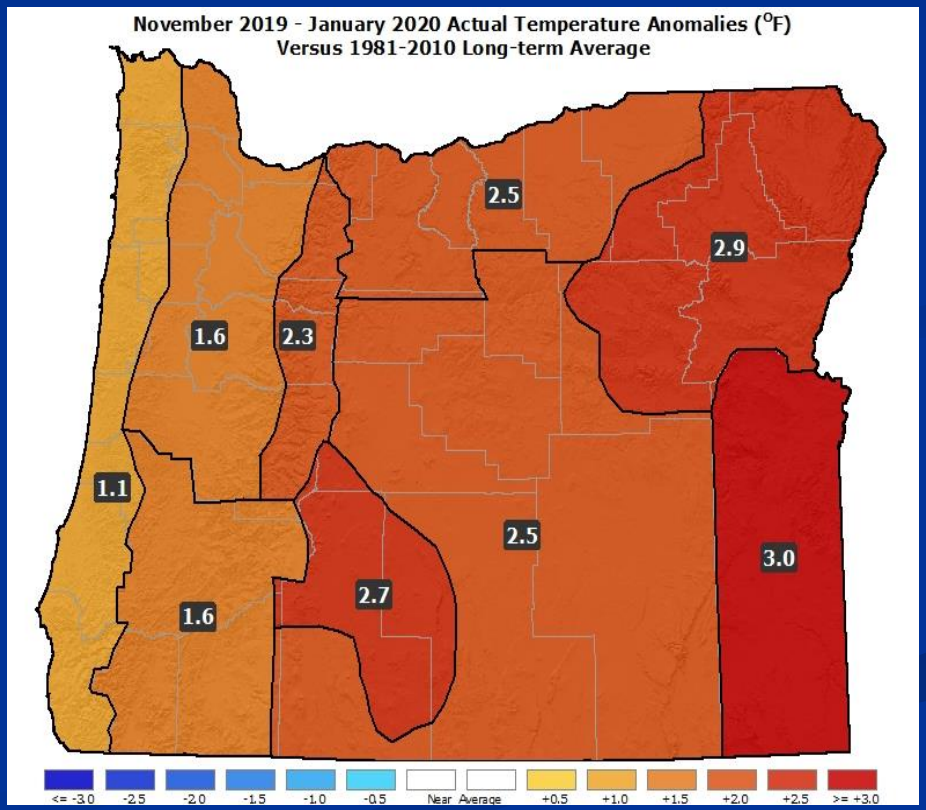
Nov. 2019 – Jan. 2020

(Forecast Issued October 17, 2019)/(Actual)

Forecast Temperatures



Actual Temperatures

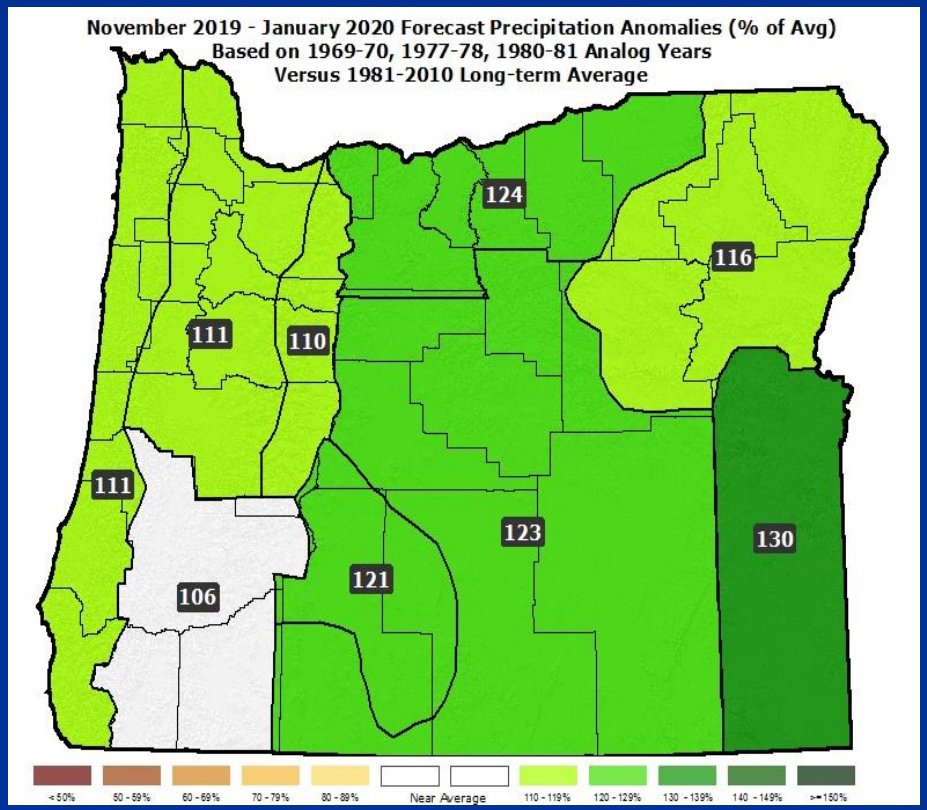


Data courtesy of the National Centers for Environmental Information (NCEI)

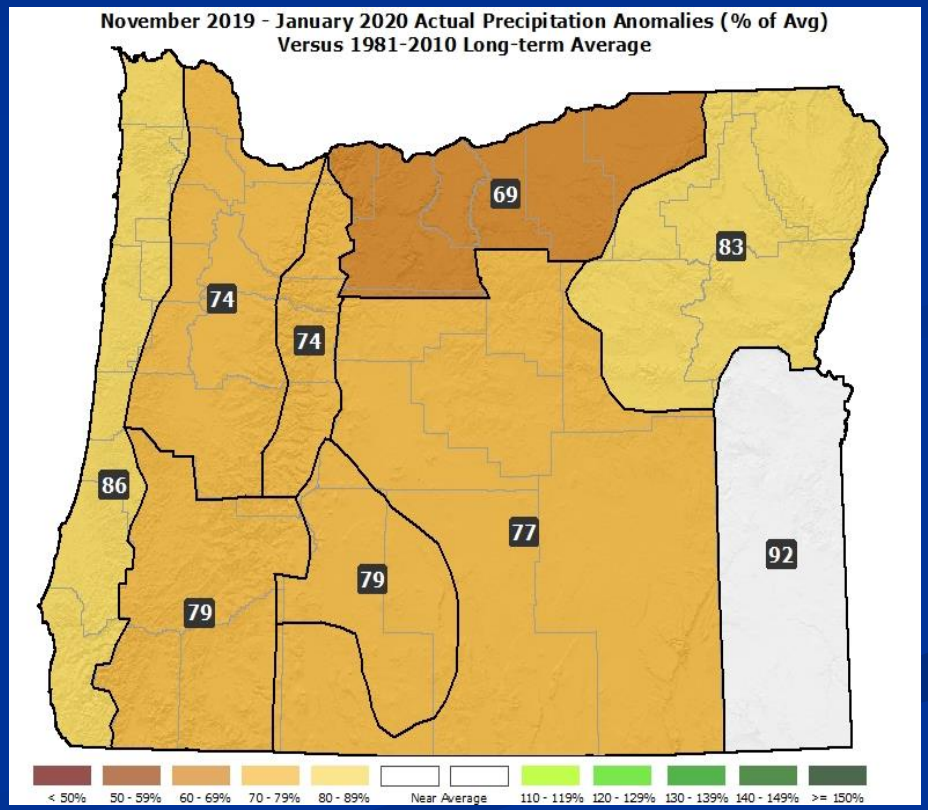
Nov. 2019 – Jan. 2020

(Forecast Issued October 17, 2019)/(Actual)

Forecast Precipitation



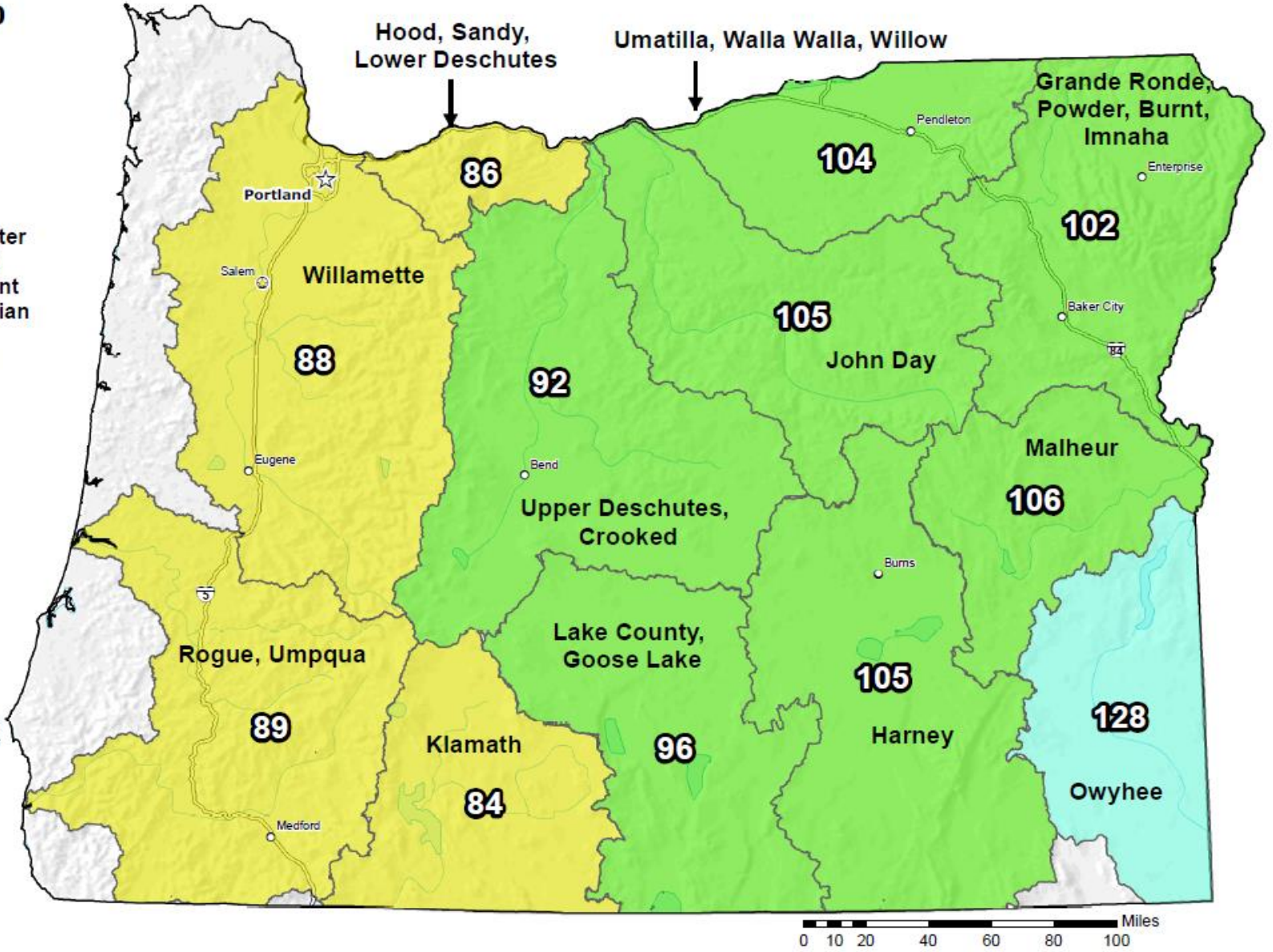
Actual Precipitation



Data courtesy of the National Centers for Environmental Information (NCEI)

Oregon SNOTEL Current Snow Water Equivalent (SWE) % of Normal

Feb 01, 2020



Current Snow Water Equivalent (SWE) Basin-wide Percent of 1981-2010 Median

- unavailable *
- <50%
- 50 - 69%
- 70 - 89%
- 90 - 109%
- 110 - 129%
- 130 - 149%
- >=150%

* *Data unavailable at time of posting or measurement is not representative at this time of year*

Provisional Data Subject to Revision

USDA NRCS

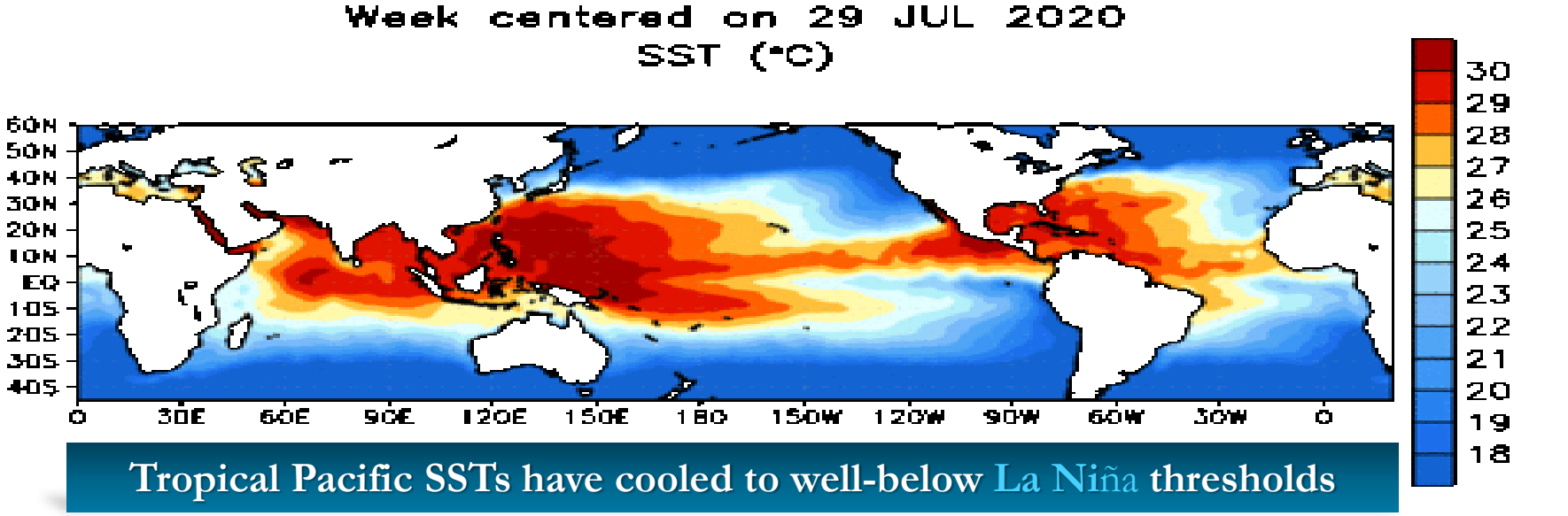
The snow water equivalent percent of normal represents the current snow water equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).

Prepared by:
USDA/NRCS National Water and Climate Center
Portland, Oregon
http://www.wcc.nrcs.usda.gov

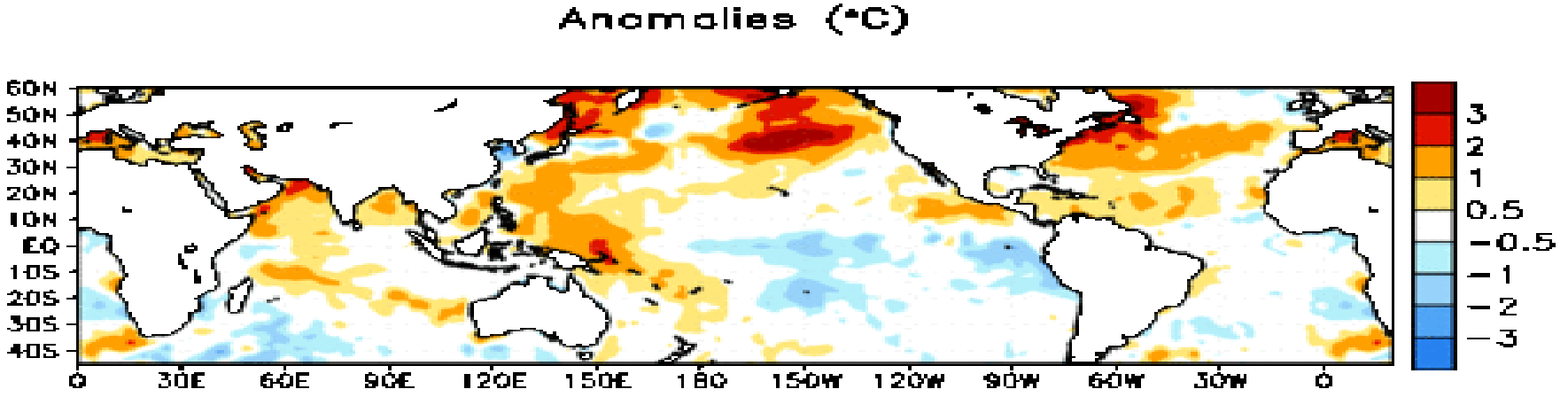

Predicting the Future…
Is it Wizardry?

…Follow the Pacific Ocean

Time Series of SSTs (top) / Anomalies (bottom)

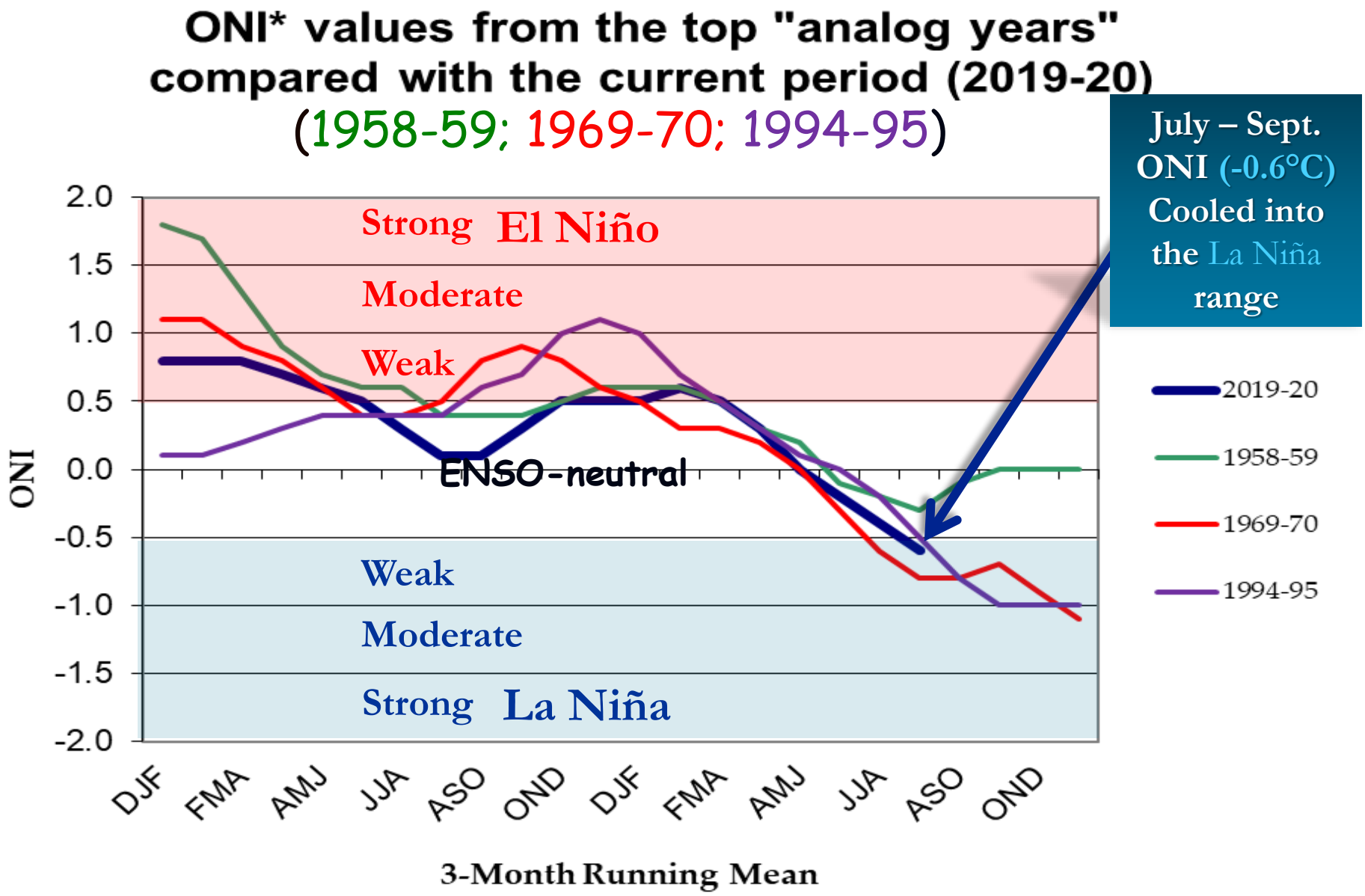


Tropical Pacific SSTs have cooled to well-below La Niña thresholds



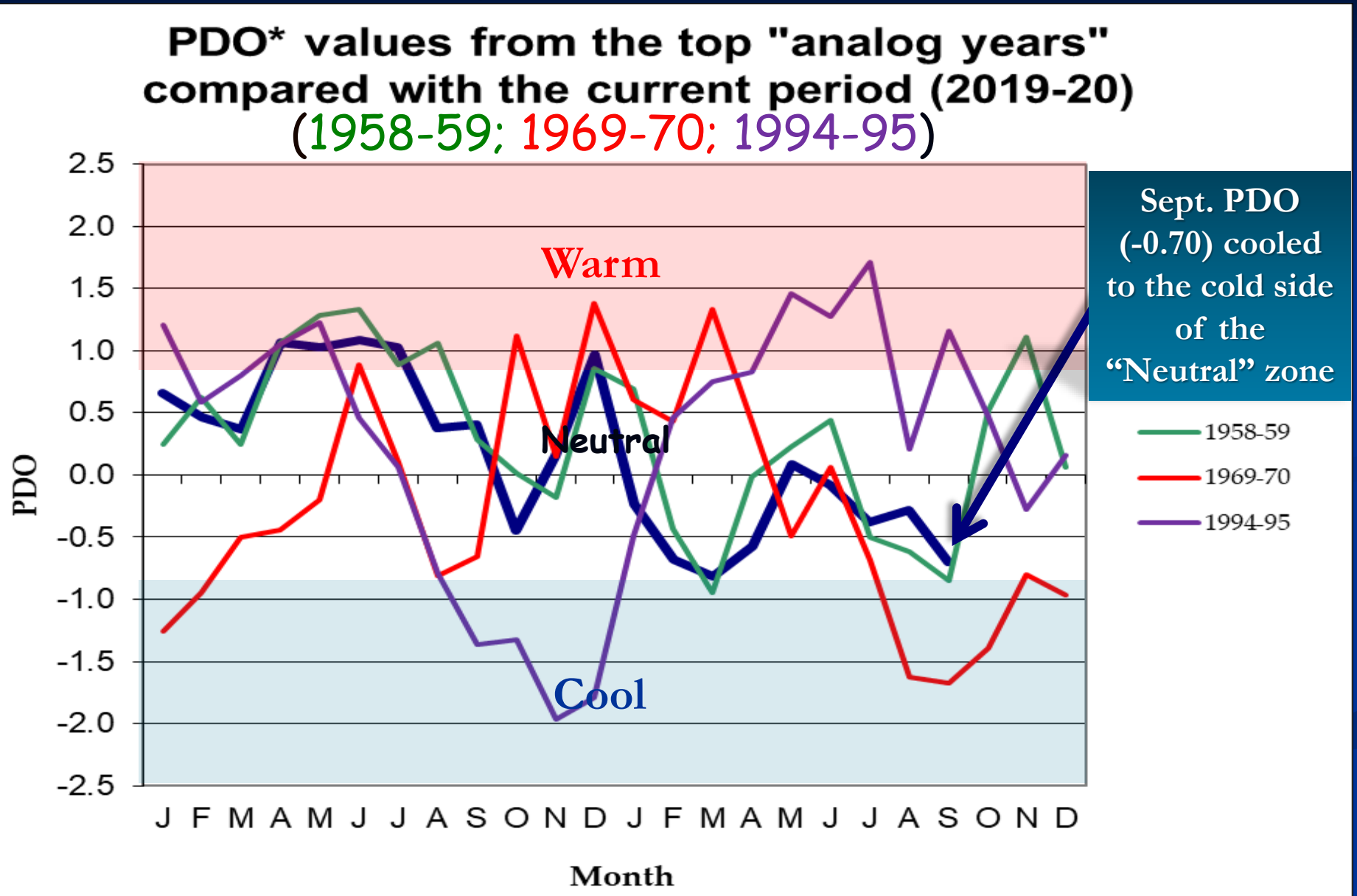
Courtesy: https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_update/gsstanim.shtml

Tropical Pacific Ocean



North Pacific Ocean

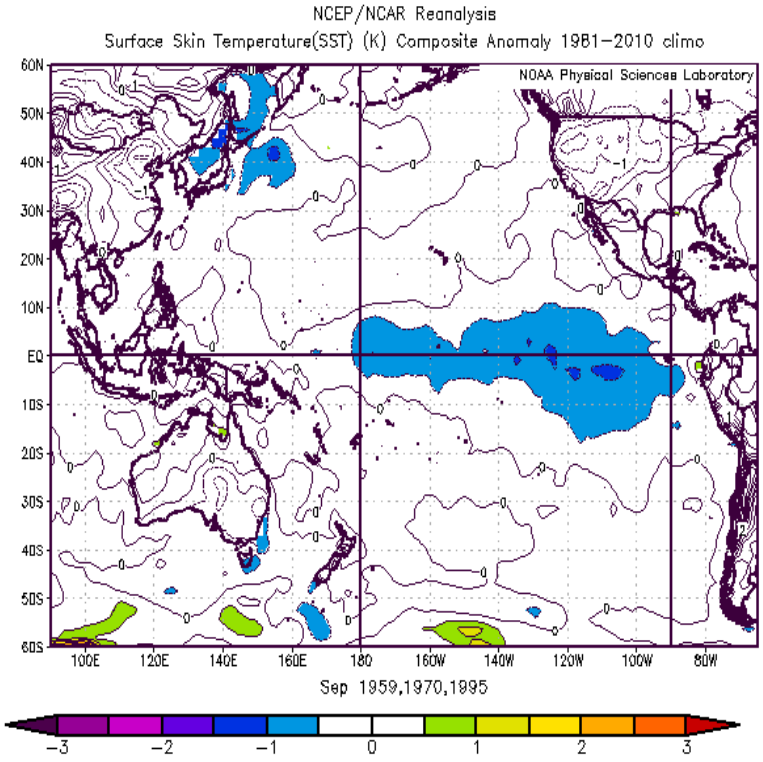
(Poleward of 20°N Latitude)



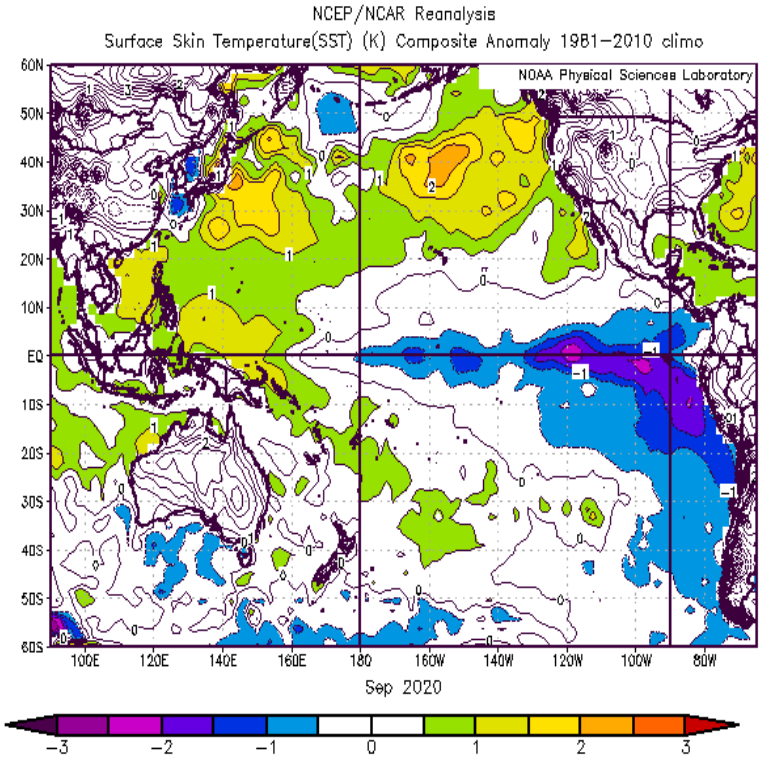
*To see PDO explanation, go to https://oda.direct/Weather and click on "Forecasting Methods."

SST Anomalies Comparison

Sept. Analog Composite



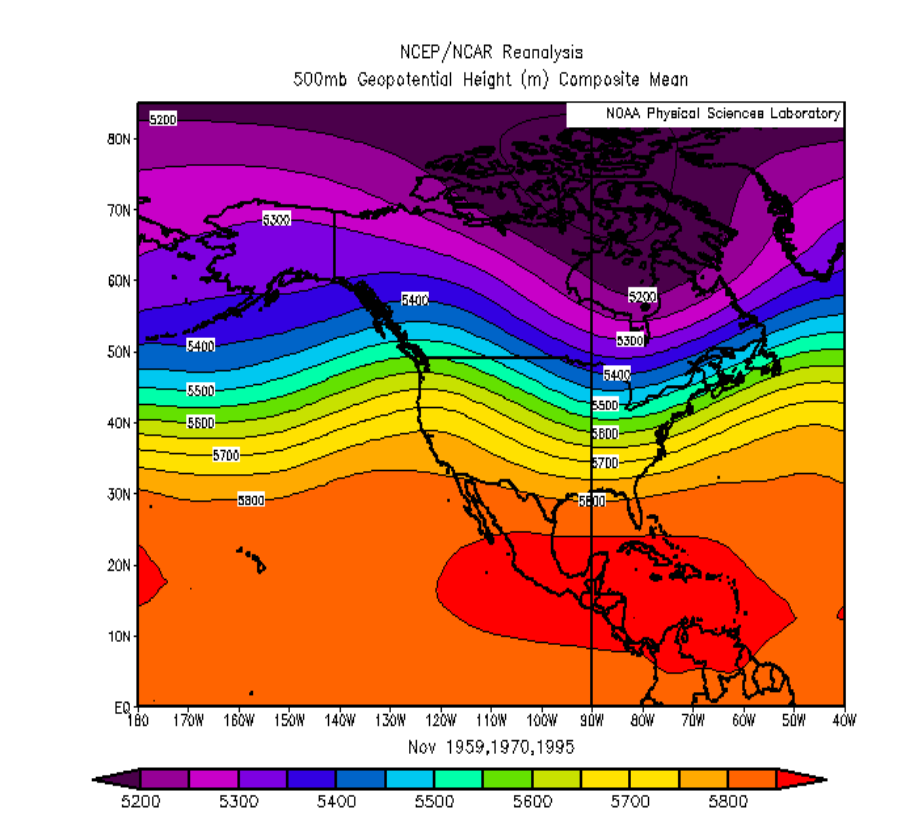
September 2020



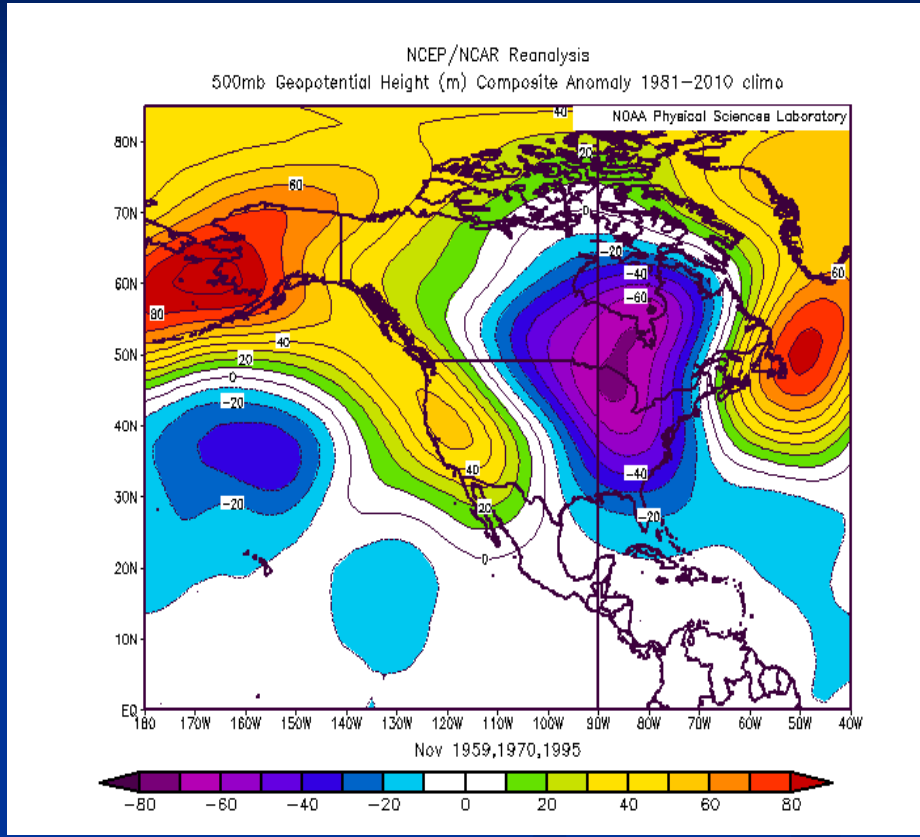
- The SST anomalies from the September analog composite (left) and from September 2020 (right) have similar (cool) patterns. They both show La Niña conditions across the tropical Pacific.

November 2020 Forecast

Mean Upper-Air Pattern



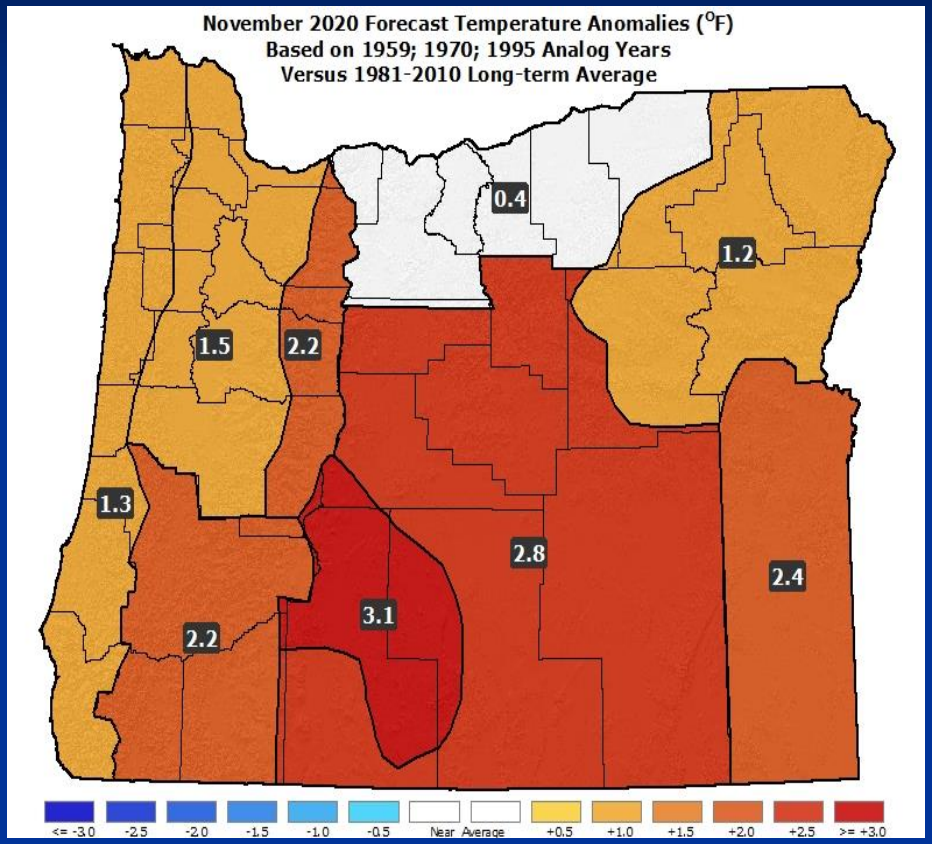
Upper-Air Anomalies



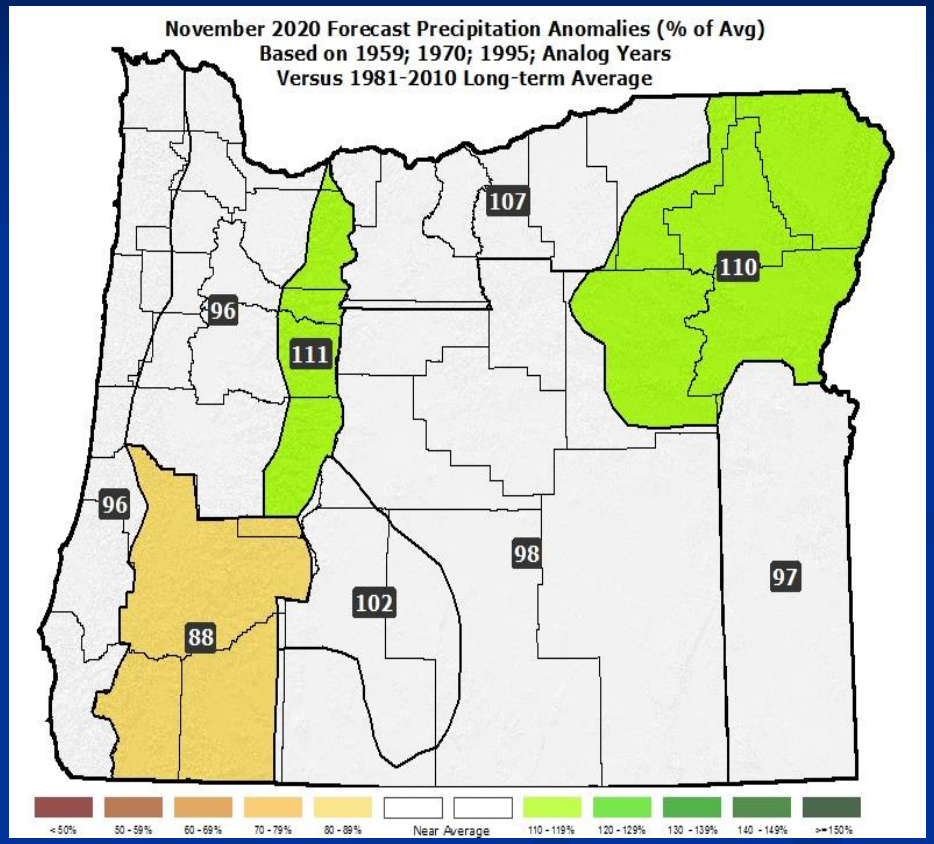
- Analogs show more upper-level ridging than usual over the west coast of the U.S., which favors warmer-than-average conditions.
- However, moderately-high variation among the analog solutions lowers forecast confidence, especially with regards to precipitation.

November 2020 Forecast

Temperatures



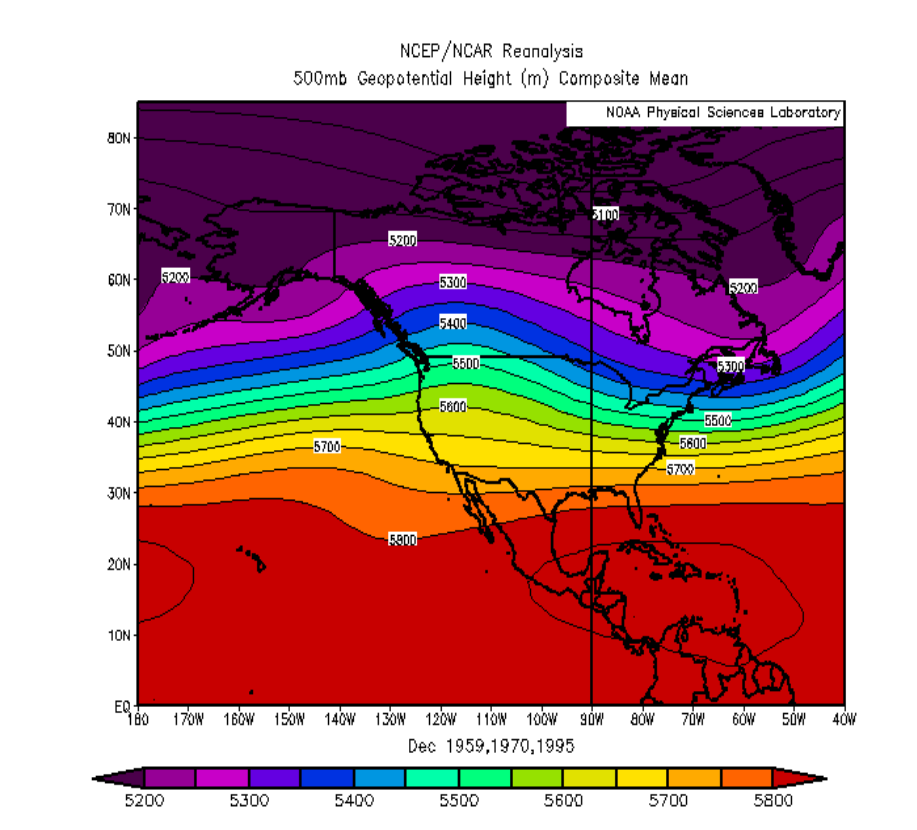
Precipitation



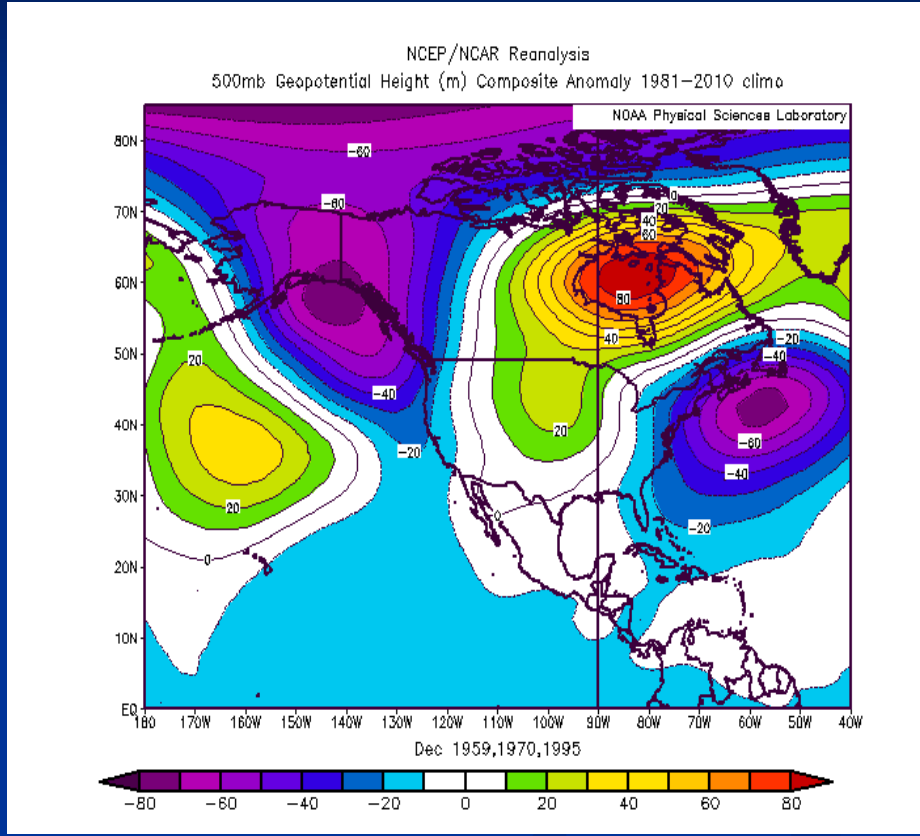
- Above-average temperatures likely, but brief cold snaps are possible.
- Individual analog solutions showed considerable variation in rain & mountain snowfall, with their blend yielding near-average precipitation.

December 2020 Forecast

Mean Upper-Air Pattern



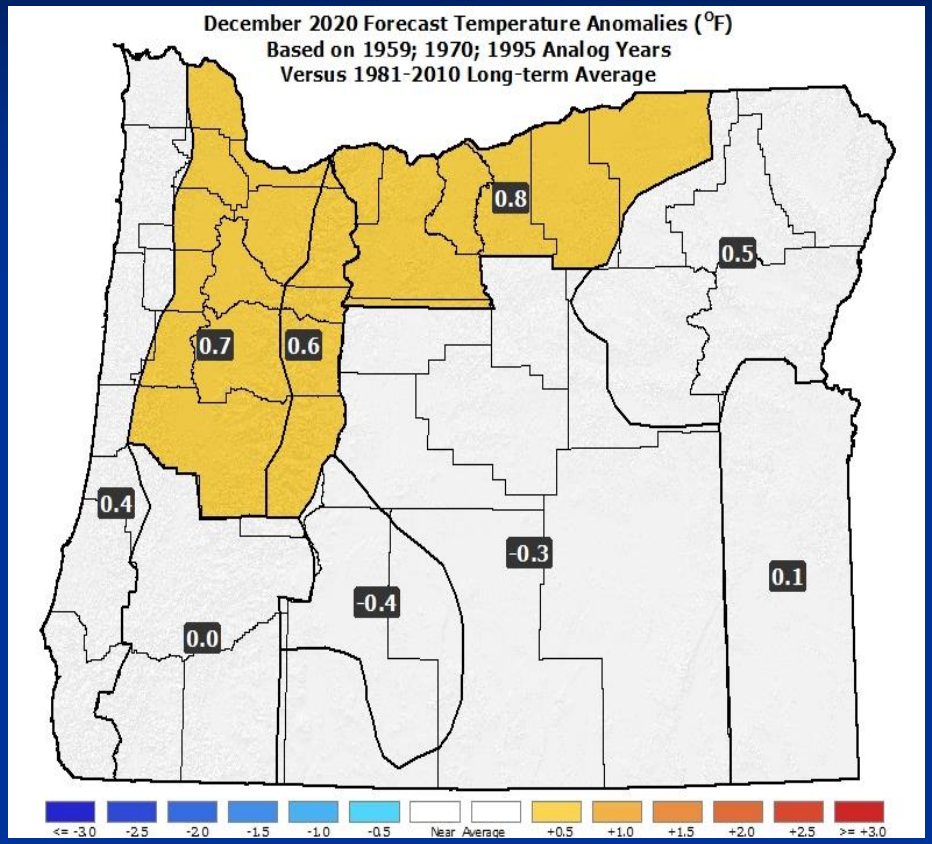
Upper-Air Anomalies



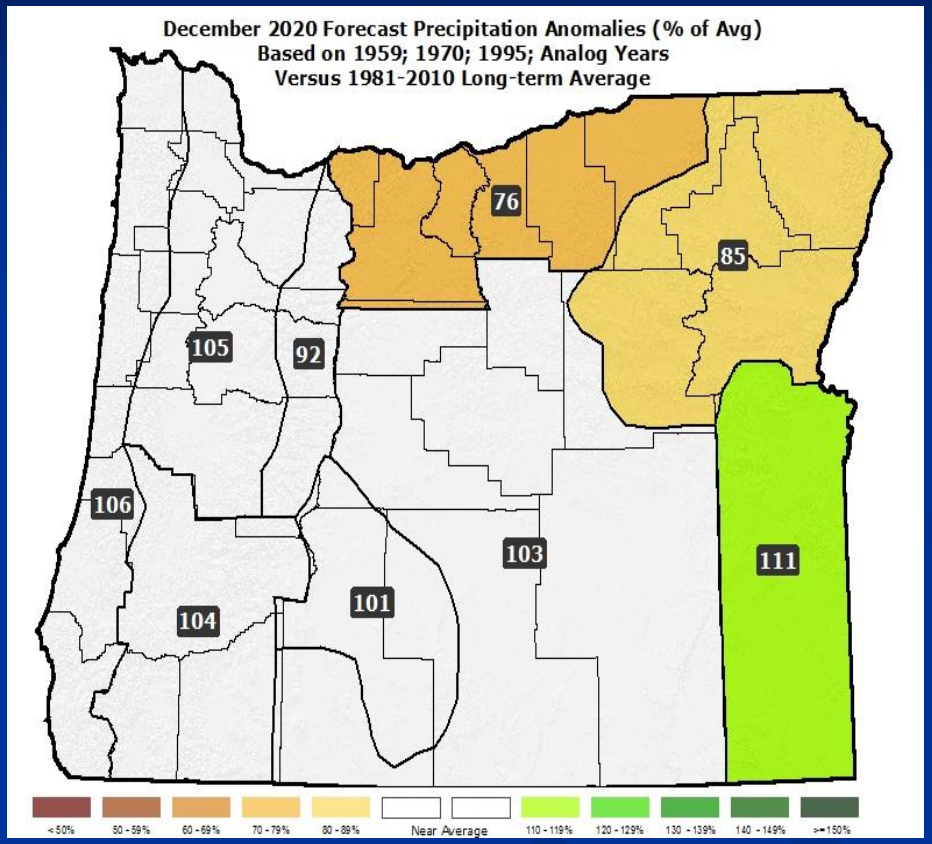
- A weakening of the anomalous ridging along the west coast is indicated, but there is considerable variation among the analogs.
- In general, the above pattern favors increased storminess across Oregon, especially for western zones, but not severe cold outbreaks.

December 2020 Forecast

Temperatures



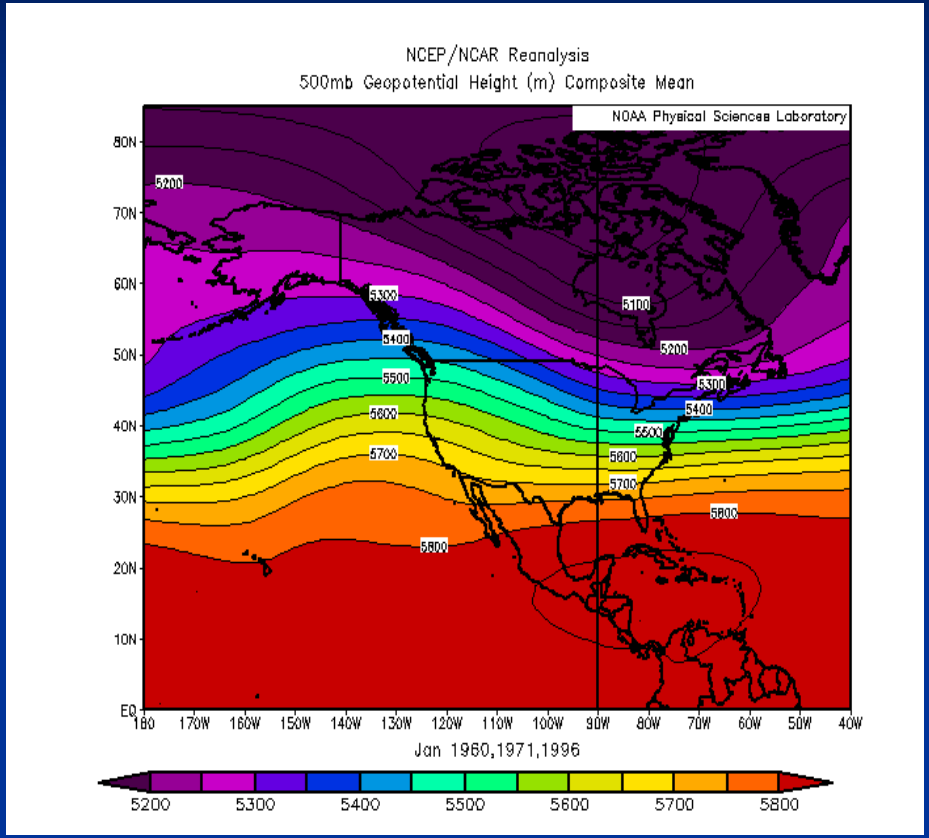
Precipitation



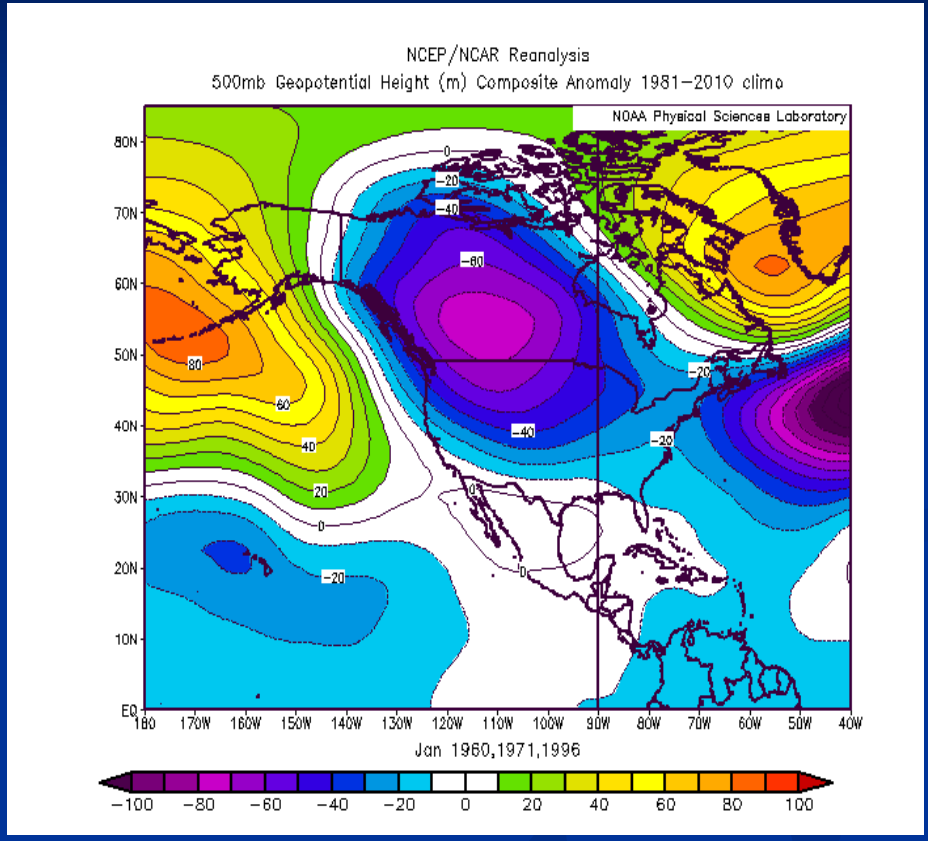
- Analogs have high variability, which lowers forecast confidence. A blend of the analogs yields near-average temperatures.
- Precipitation will likely be near or above-average. Elevated chances for high-wind events, especially across the western zones.

January 2021 Forecast

Mean Upper-Air Pattern



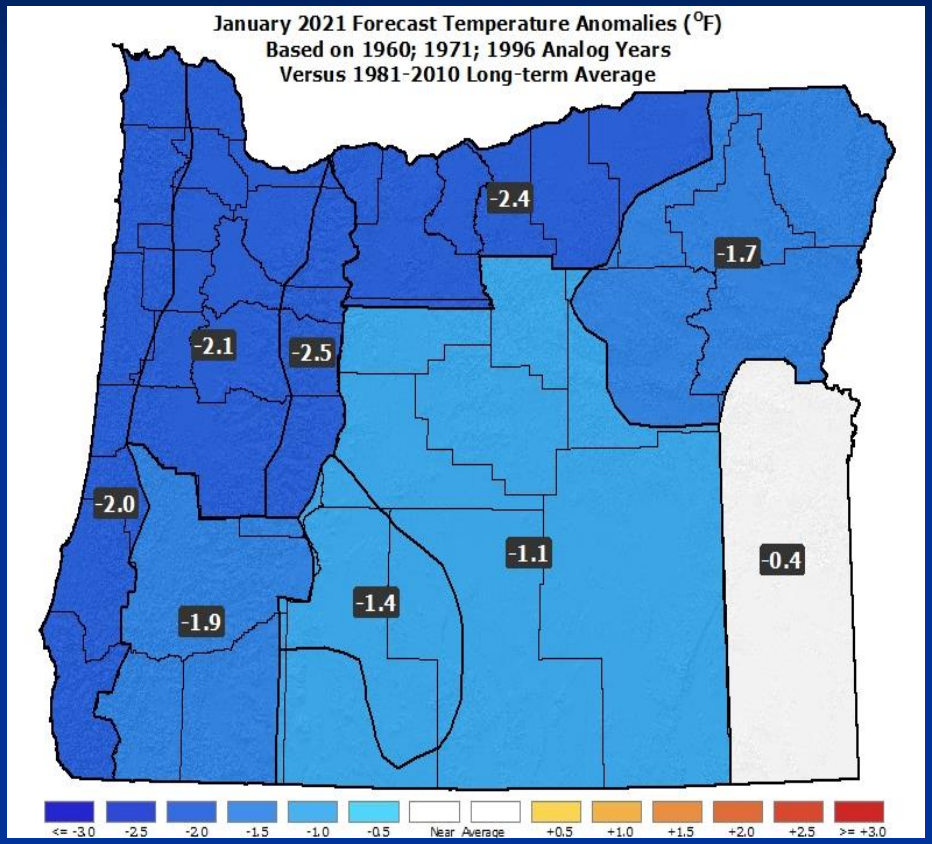
Upper-Air Anomalies



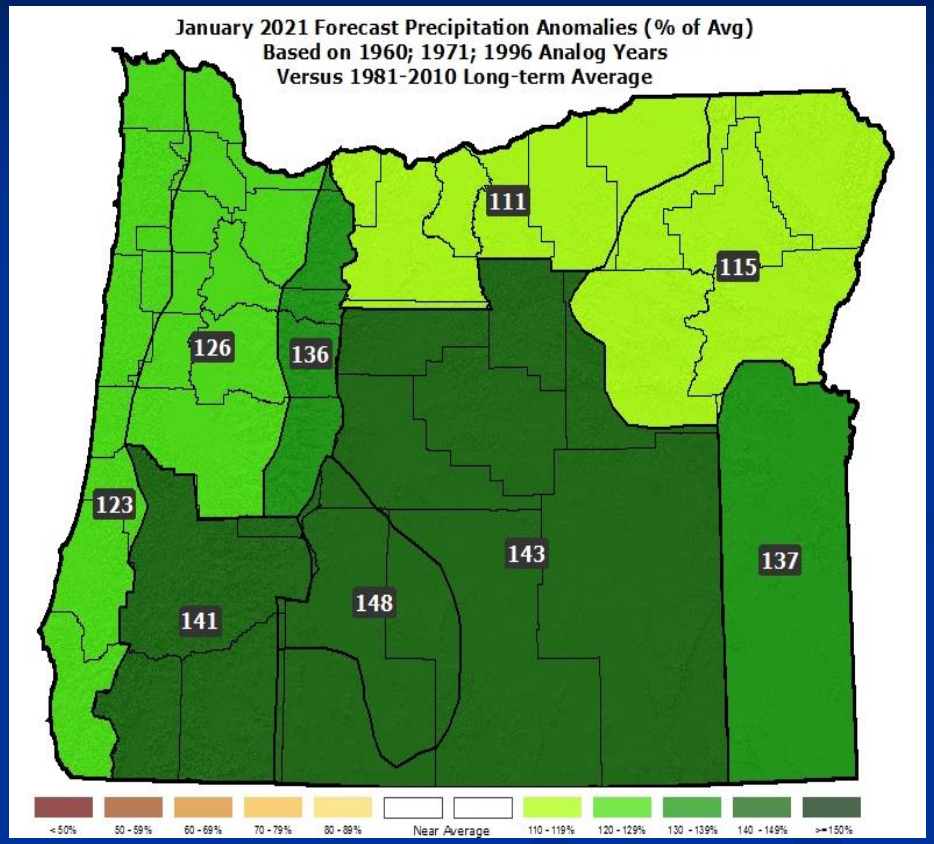
- All of the analog years had negative temperature anomalies over western Canada and more jet stream energy than usual over Oregon.
- These anomalies should lead to above-average snowfall in the mountains and open the door for significant cold-air outbreaks.

January 2021 Forecast

Temperatures



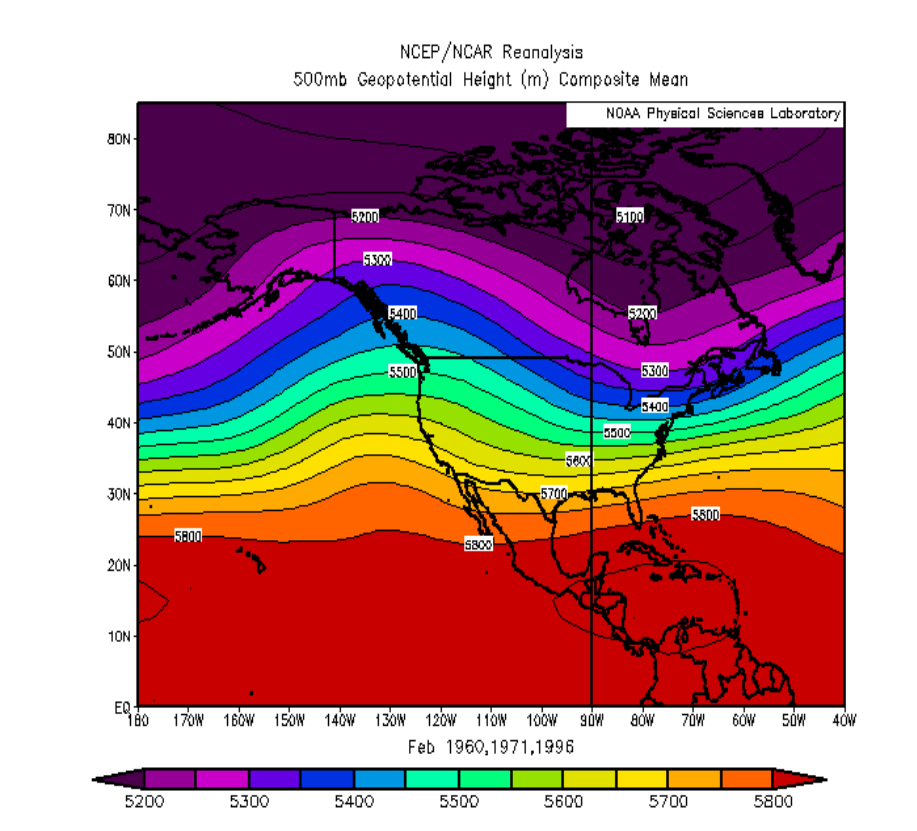
Precipitation



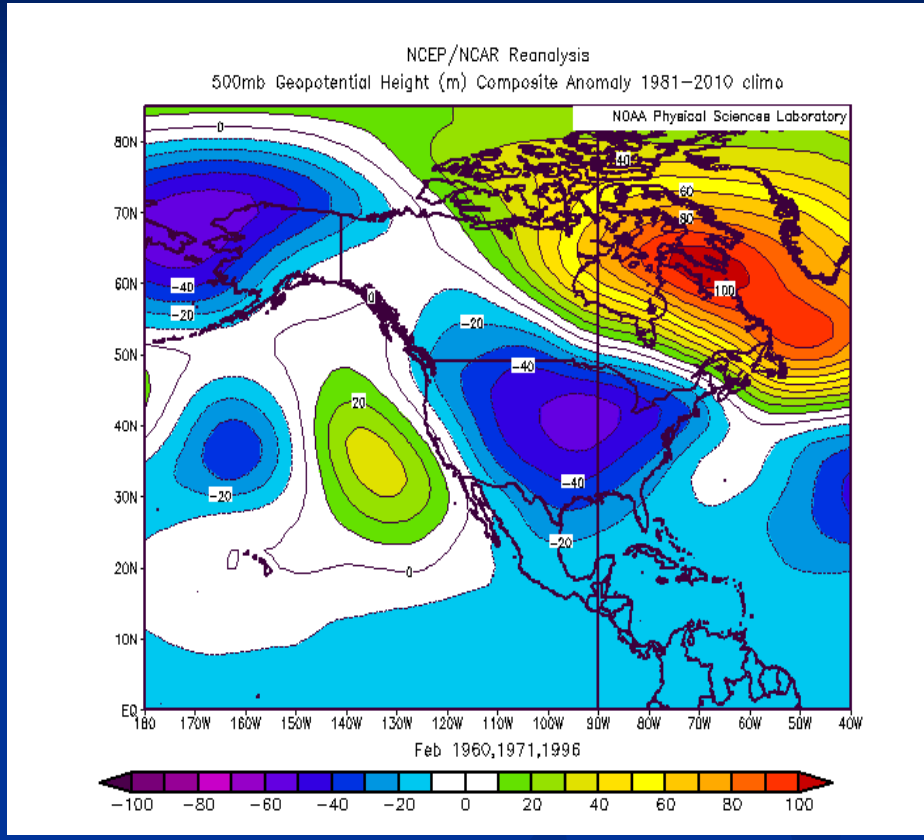
- Above-average precipitation and near or above-average mountain snow. Increased chances for windstorms, especially along the coast.
- Temperature forecast is less certain, with possible transitions between stormy and cold periods. Western valley snow event(s) likely.

February 2021 Forecast

Mean Upper-Air Pattern



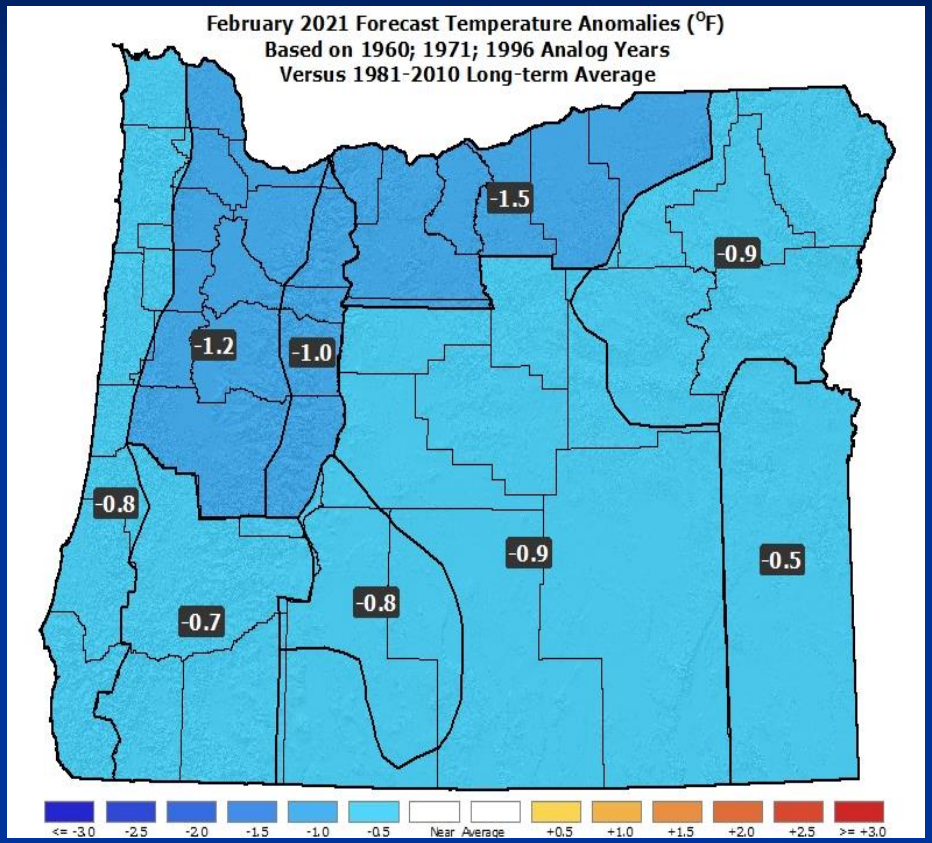
Upper-Air Anomalies



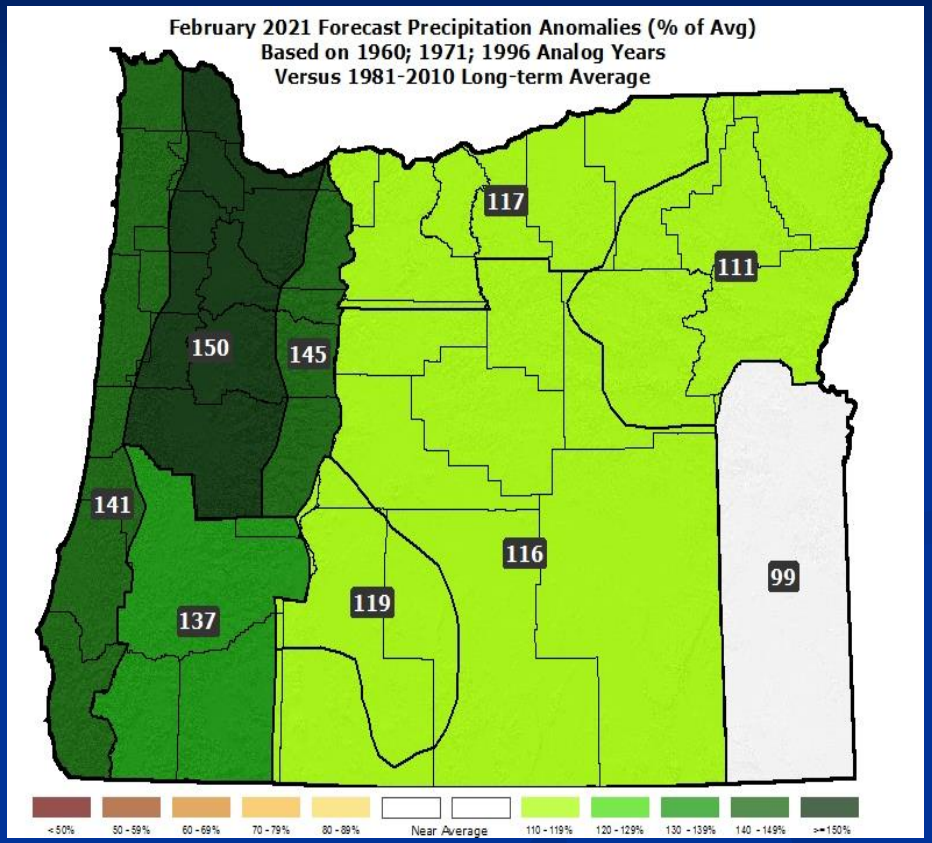
- Analogs still have considerable variation but favor negative temperature anomalies over the Pacific Northwest.
- An enhanced jet stream and below-average snow levels should lead to near or above-average mountain snowpacks.

February 2021 Forecast

Temperatures



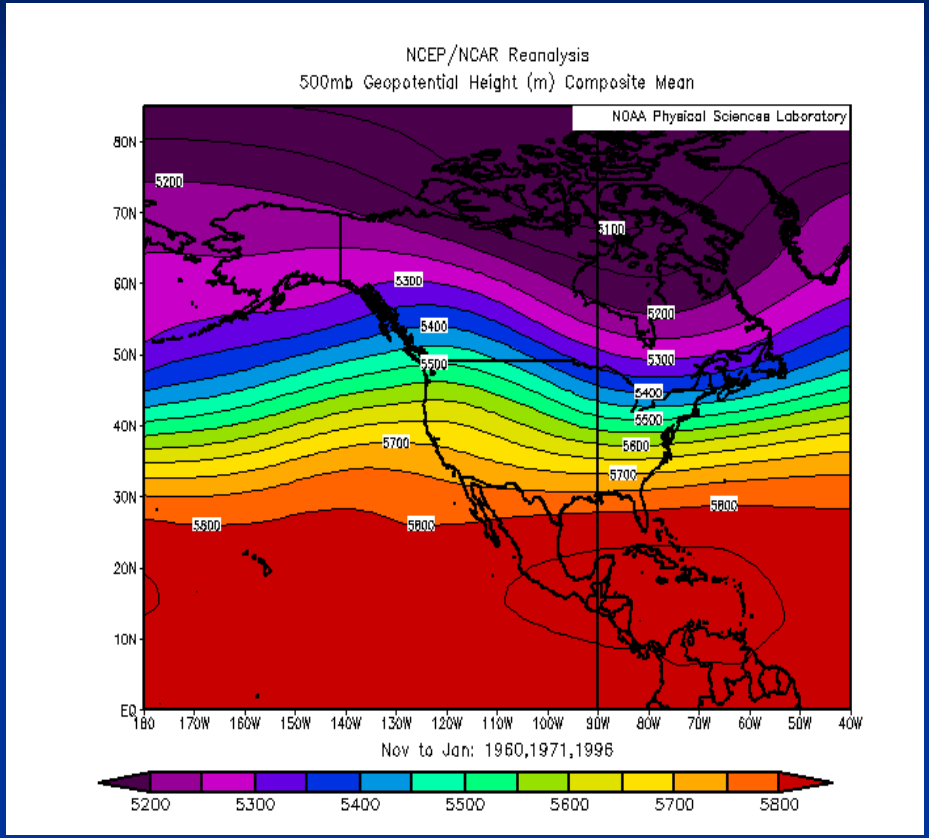
Precipitation



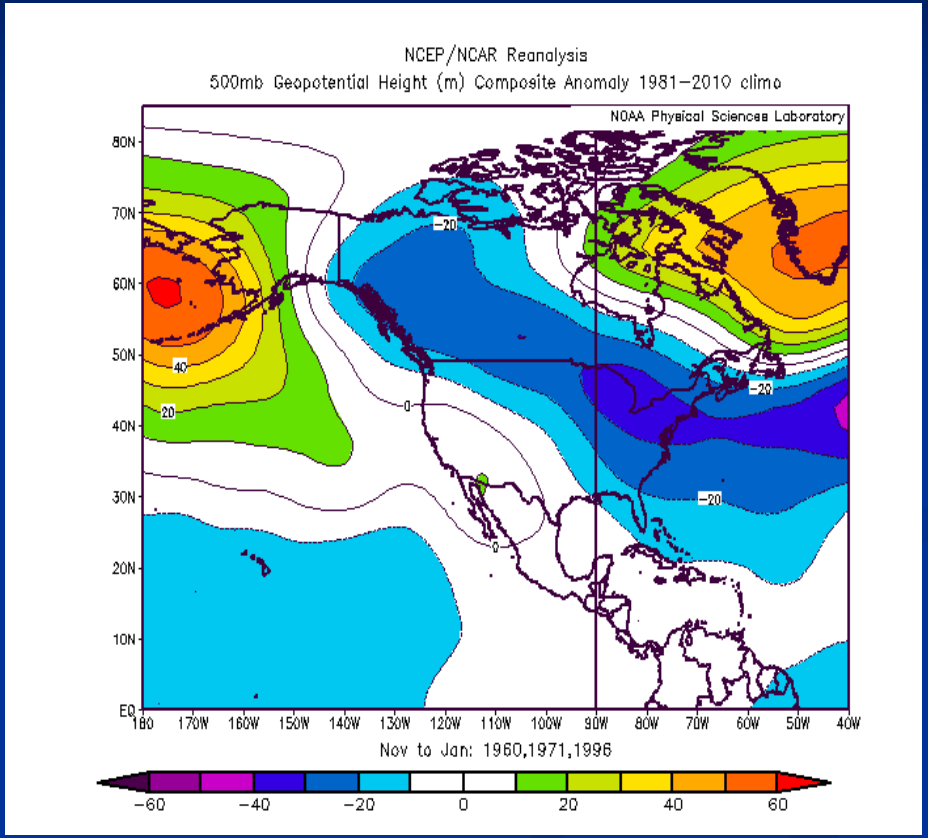
- Above-average storminess likely. Heightened chance of heavy rain events and flooding for western zones.
- Rapid transitions from cold/dry to mild/wet periods possible. Overall, temperatures should be near or slightly-below average.

Nov. 2020 – Jan. 2021 Forecast

Mean Upper-Air Pattern



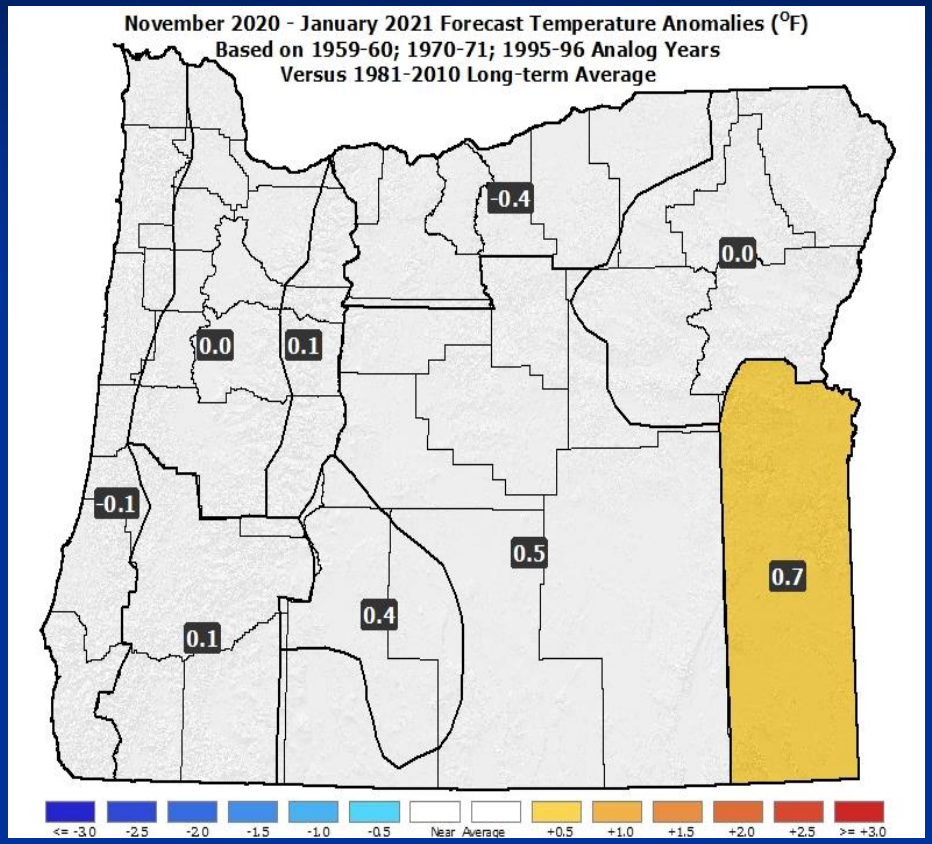
Upper-Air Anomalies



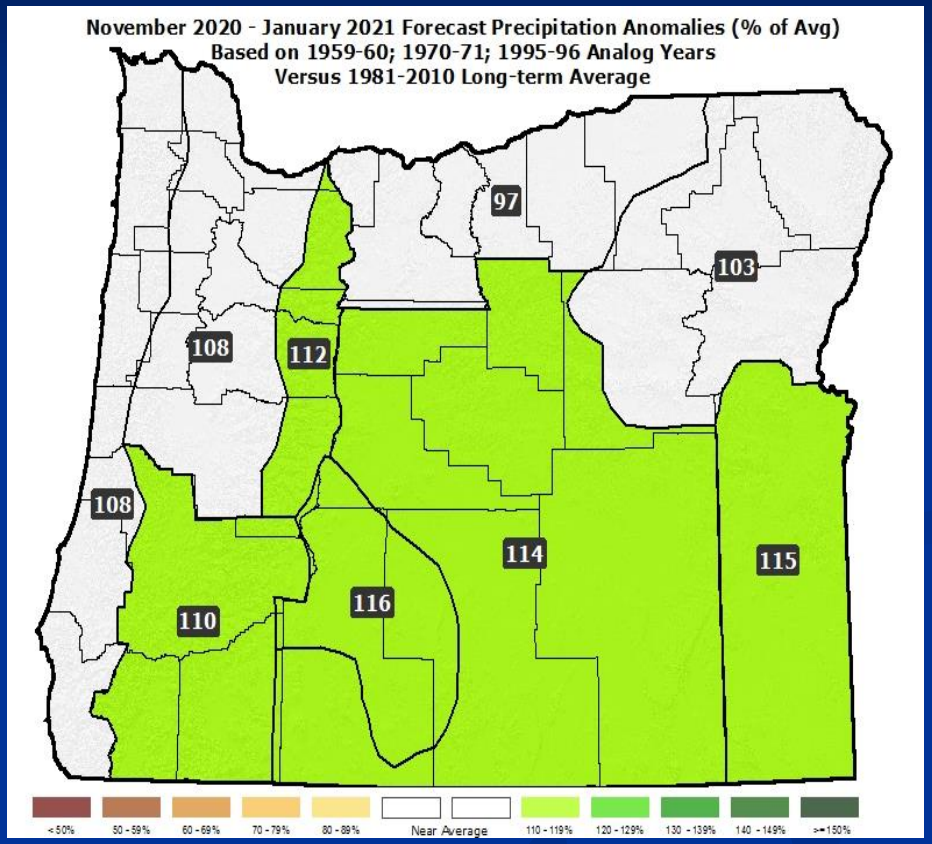
- Enhanced polar jet stream with anomalous ridging over Oregon in November and anomalous troughing in late-December & January.
- Analogs favor increasingly-volatile weather, as we progress through the 3-month period, ranging from rainy & windy to Arctic cold and snow.

Nov. 2020 – Jan. 2021 Forecast

Temperatures



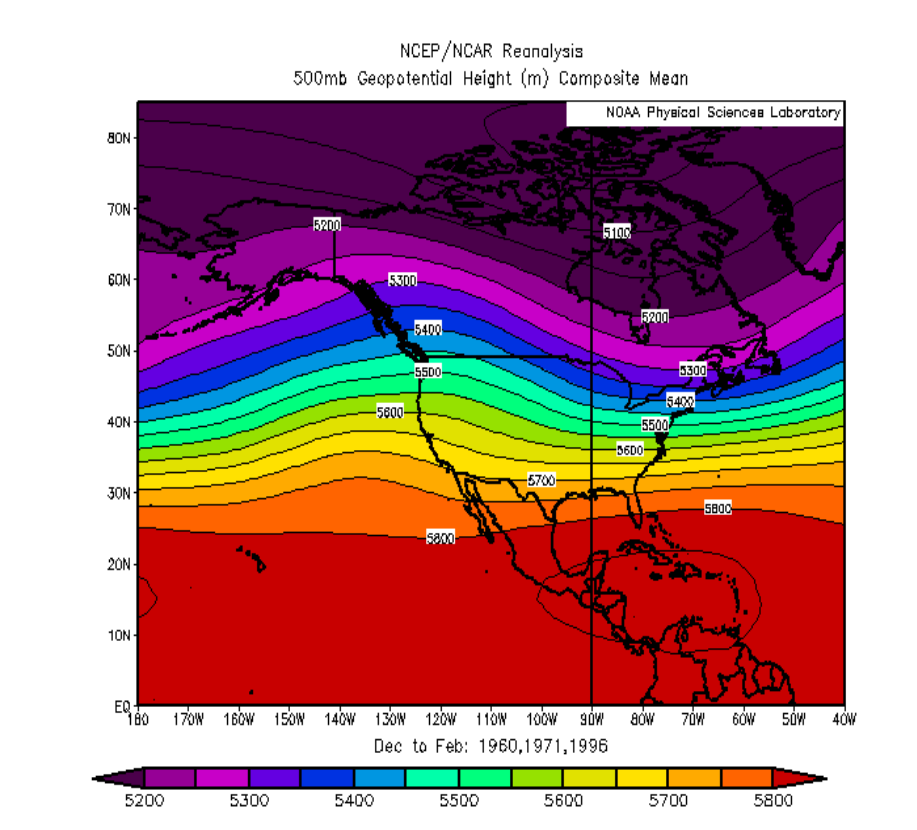
Precipitation



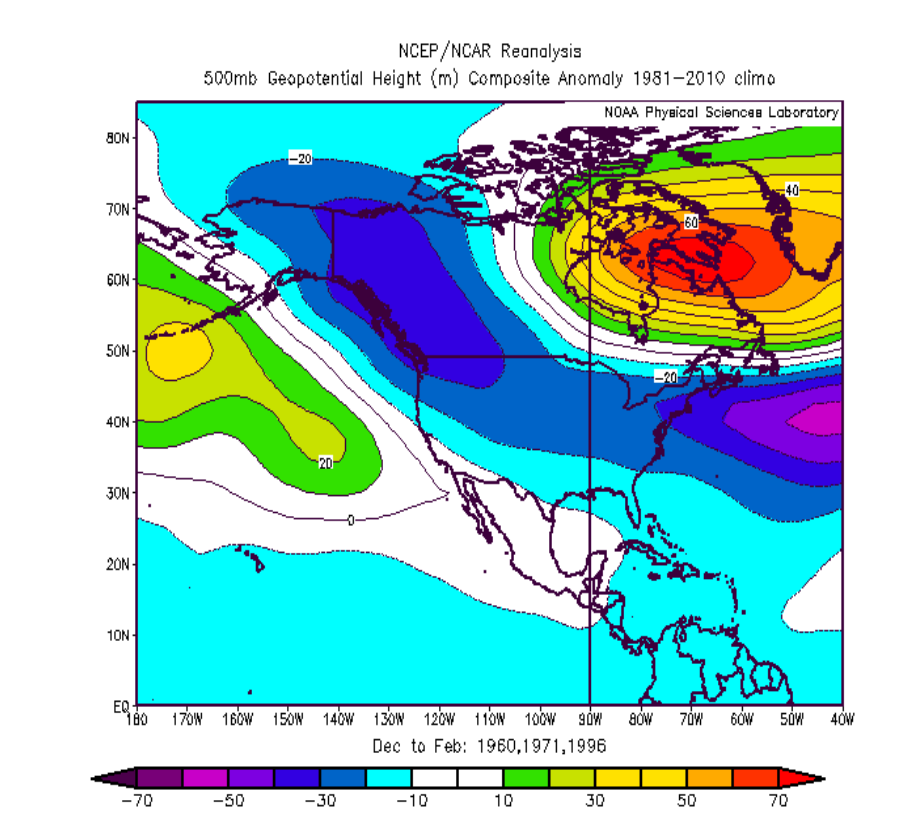
- Relatively-mild conditions early; progressively colder/stormier late.
- Elevated chances for heavy rain, strong winds, above-average mountain snow, and cold-air outbreaks with valley snow, especially in January.

Dec. 2020 – Feb. 2021 Forecast

Mean Upper-Air Pattern



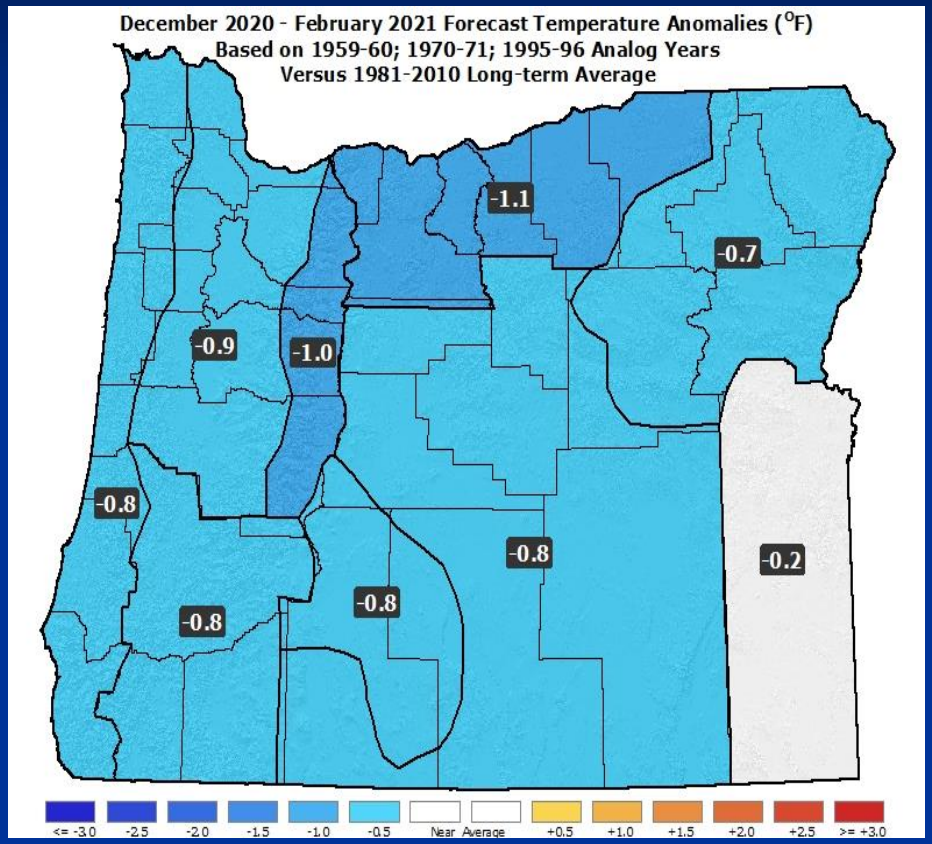
Upper-Air Anomalies



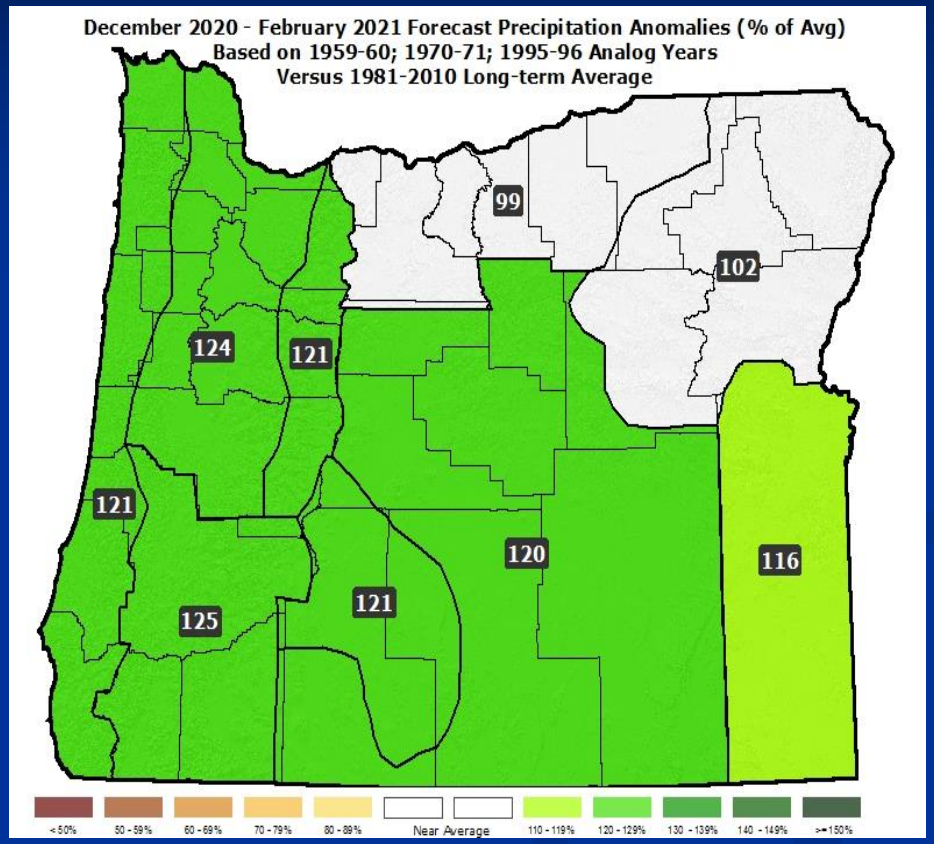
- Upper-level ridging will be more westward than usual, which will open the door for cold air masses to drop southward, from the Arctic, into the eastern Gulf of Alaska, western Canada, and the Pacific NW.
- A wide variety of weather scenarios are possible…

Dec. 2020 – Feb. 2021 Forecast

Temperatures



Precipitation



- Should be colder, relative to average, than the previous 3-month period.
- Elevated chances for heavy rain, strong winds, above-average mountain snow, cold-air outbreaks, and valley snow events, especially in January.

Could it be the…?

Winter 2020-21 Highlights

- Perhaps it won't be the 'Coldest Winter Since '78!," but…
- Unlike the past two years, this winter should have stormy period with some "extreme" weather events.
- Expect relatively-mild temperatures in late fall, with a transition to colder weather, relative to average, by January.
- Analogs favor at least one cold-air outbreak, with some snowfall in the Willamette Valley, especially in January.
- Mountain snowfall should be near or above normal.
- Heightened chances for windstorms and flooding across western Oregon, especially along the coast.

Oregon Department of Agriculture

http://www.oregon.gov/ODA/programs/NaturalResources/Pages/Weather.aspx

Seasonal Climate Forecast

The Seasonal Climate Forecast offers a three-month look at Oregon weather and is provided courtesy of Oregon Department of Forestry meteorologist Pete Parsons.

Seasonal Climate Forecast (PDF), issued October 15, 2020
Seasonal Climate Forecast (PowerPoint), issued October 15, 2020
See a video by Pete Parsons discussing his Seasonal Climate Forecast, issued October 15, 2020

Verification of Climate Forecast (PDF), issued October 15, 2020
Verification of Climate Forecast (PowerPoint), issued October 15, 2020
See a video by Pete Parsons discussing his forecast verification, issued October 15, 2020

Forecasting Methods (PDF), revised December 18, 2019
Forecasting Methods (PowerPoint), revised December 18, 2019

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Forecast Updated Monthly

(Around the 20th)

"Thank you"
Oregon Chapter of the AMS!

Pete Parsons, ODF Meteorologist
at 503-945-7448 or peter.gj.parsons@oregon.gov