



Winter 2020-21 Outlook

Shawn Weagle ❄️ NWS Portland ❄️ October 24, 2020



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Portland, OR



Main Players

- ▶ El Niño / La Niña (“ENSO”)
 - ▶ 1 to 3 year cycle
- ▶ Pacific Decadal Oscillation (“PDO”)
 - ▶ 10 to 50 year cycle
- ▶ Long-term Climate Change / Trends
- ▶ Synoptic Weather Pattern
 - ▶ Daily to Weekly Scale



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Main Players

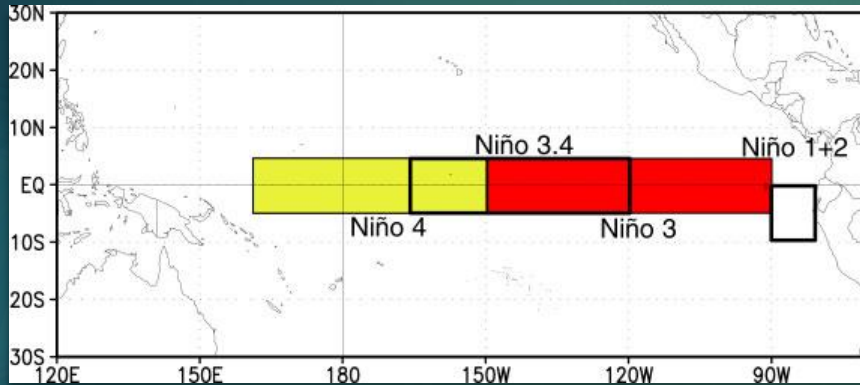
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What is La Niña?



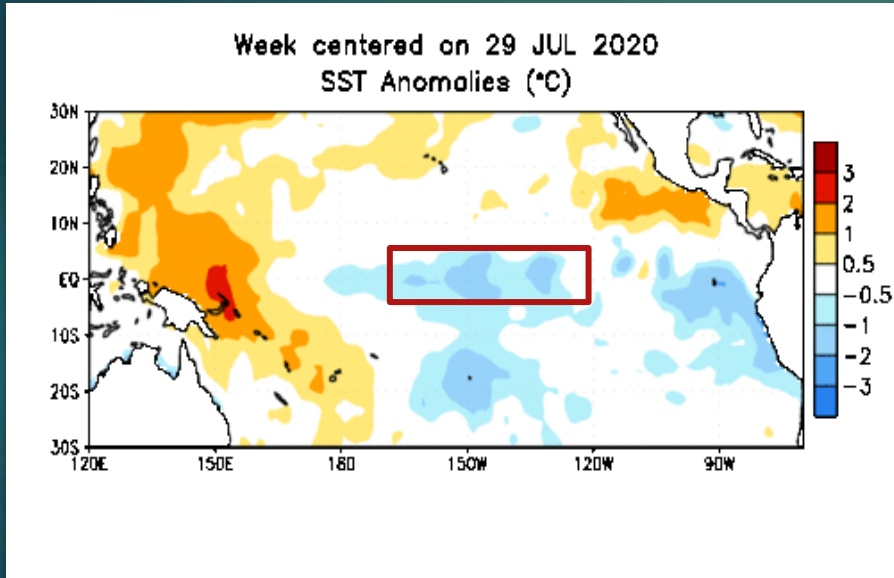
- ▶ Cooler than normal Sea Surface Temperatures (SST) in equatorial Pacific Ocean
 - ▶ “Niño 3.4” Region
- ▶ Anomaly can extend well below sea surface
- ▶ Affects atmospheric circulation
- ▶ Opposite of El Niño



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La Niña is Here



- ▶ Strength of La Niña:
(departure from normal SST
in Niño 3.4 region)
 - ▶ Weak: -0.5° to -1.0°C
 - ▶ Moderate: -1.0 to -1.5°C
 - ▶ Strong: -1.5°C or cooler



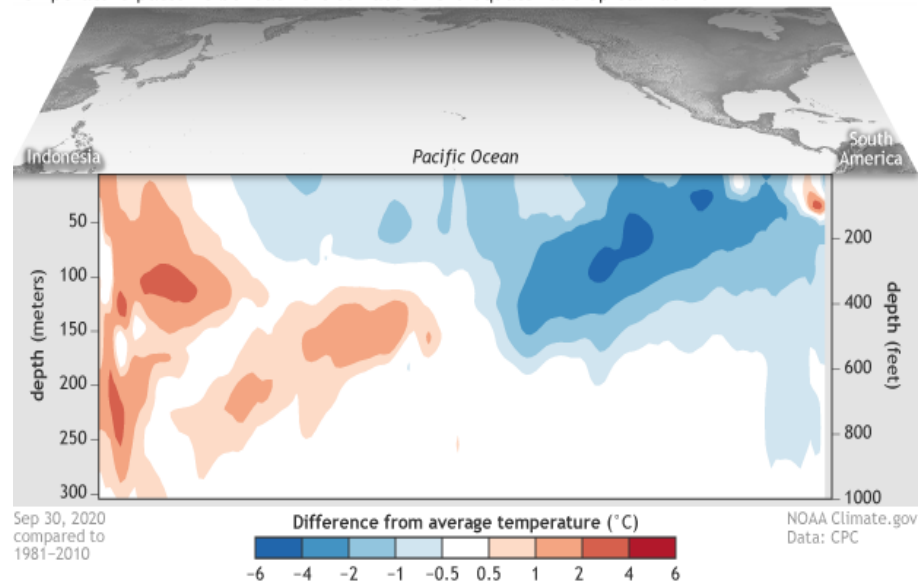
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... and, La Niña is Deepening

- ▶ Cold SST Anomalies down to 500 ft below sea surface
- ▶ Cold SST anomalies as strong as -5°C
- ▶ La Niña is underway and strengthening

Temperature patterns beneath the surface of the equatorial tropical Pacific

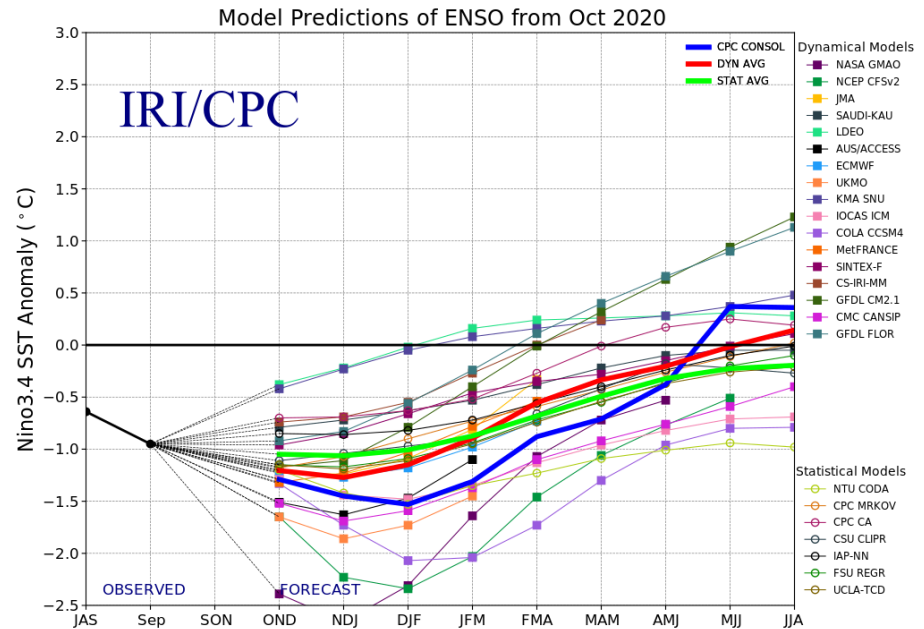


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La Niña Forecast

- ▶ Observed SST anomaly averaging -1°C in Niño 3.4 region
- ▶ Most models suggest La Niña will strengthen this winter
- ▶ Likely return to neutral ENSO by summer 2021

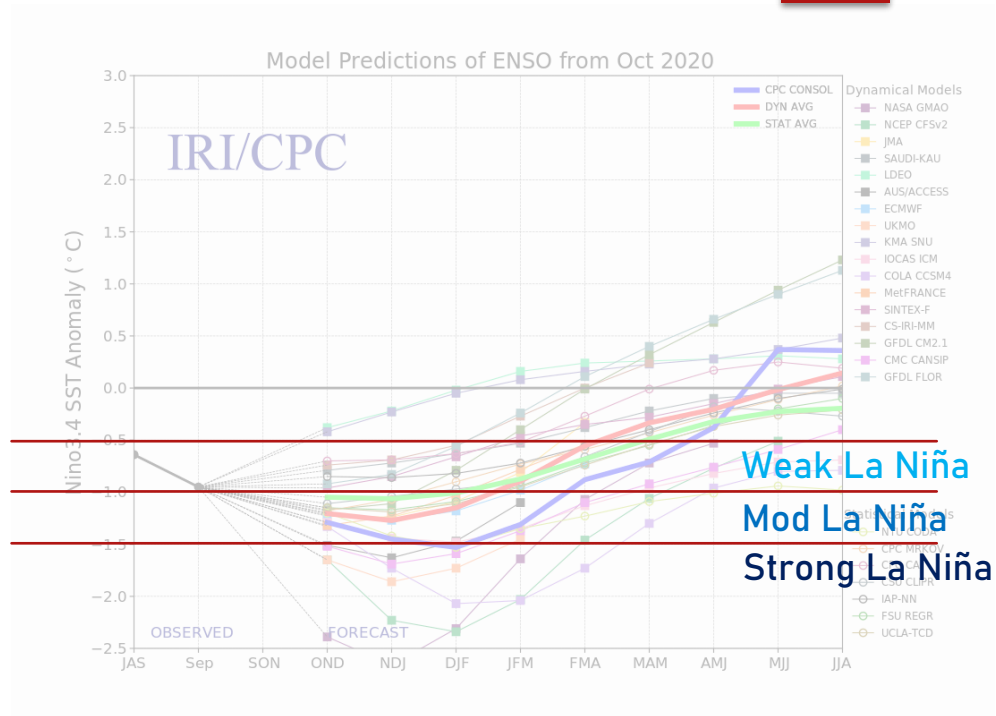


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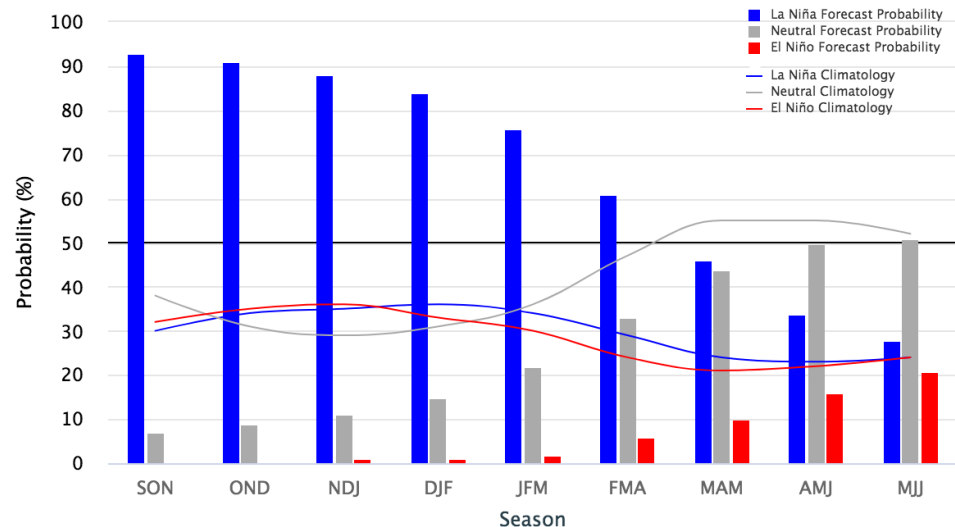


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Early-October 2020 CPC/IRI Official Probabilistic ENSO Forecasts

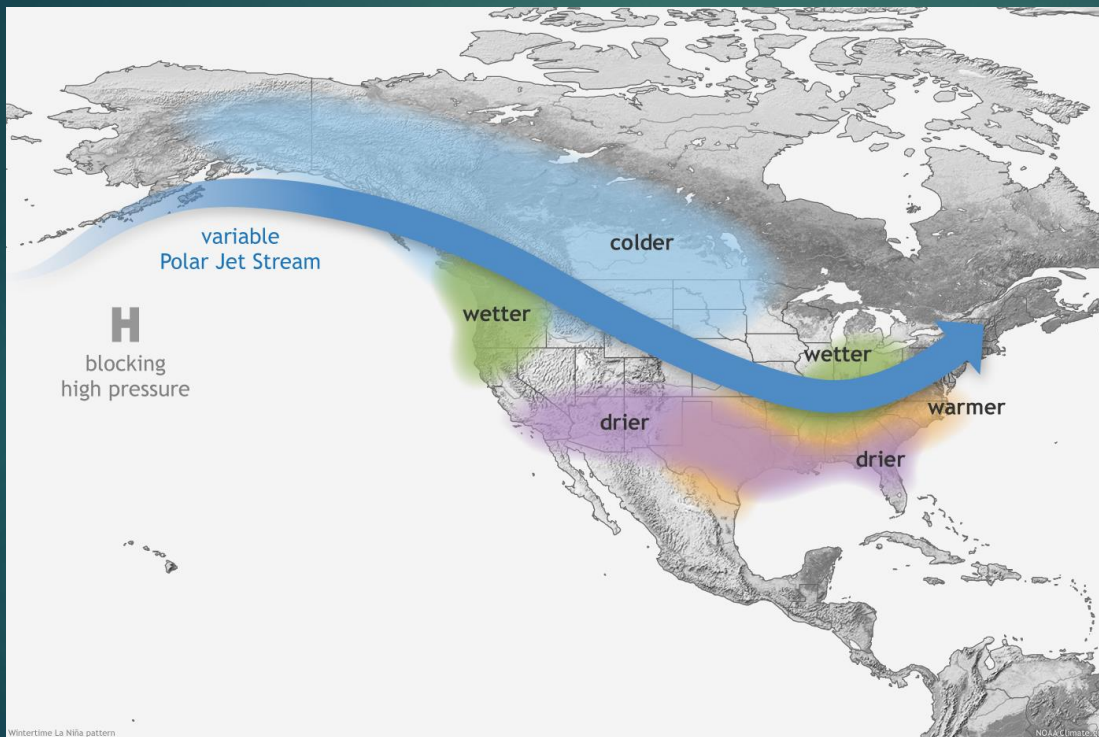
ENSO state based on NINO3.4 SST Anomaly
Neutral ENSO: -0.5°C to 0.5°C



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“Typical” La Niña Pattern



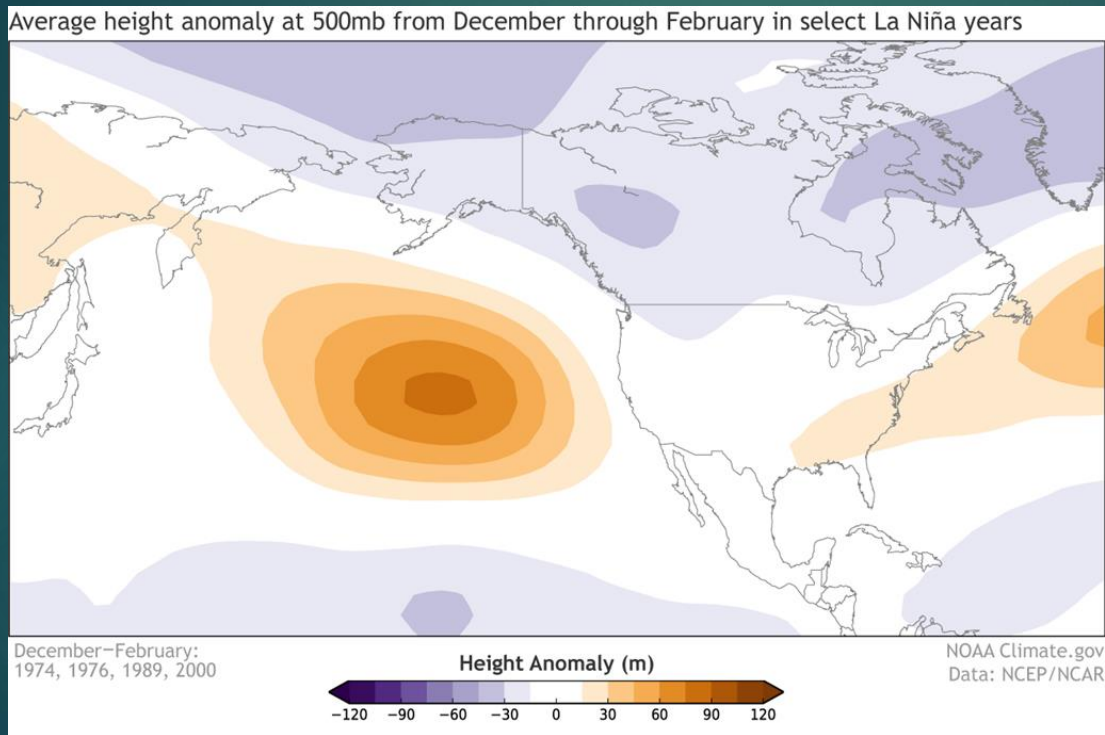
- ▶ Persistent ridge of high pressure just east of International Dateline
- ▶ Northwesterly jet stream aimed toward PNW
- ▶ Potentially fewer Atmospheric River events
- ▶ Cool, showery systems for PNW build snow in the Cascades
- ▶ As usual, variations occur



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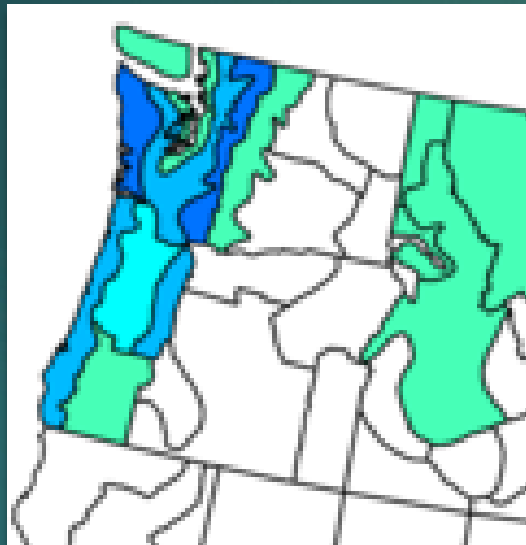
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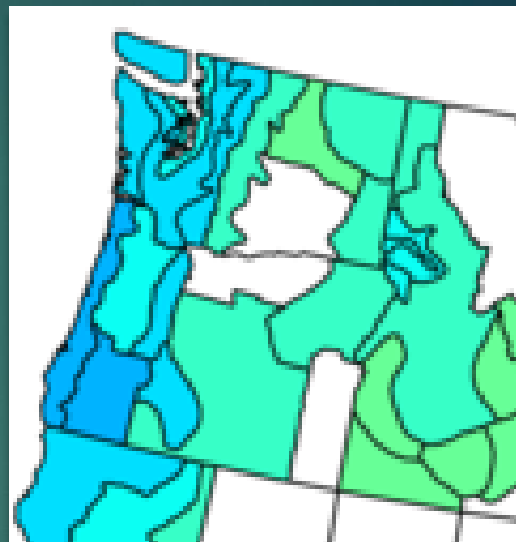
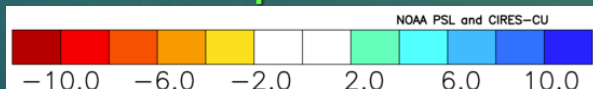
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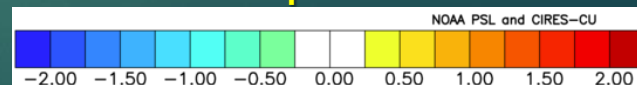
Anomalies: Strong La Niña Years



Precipitation



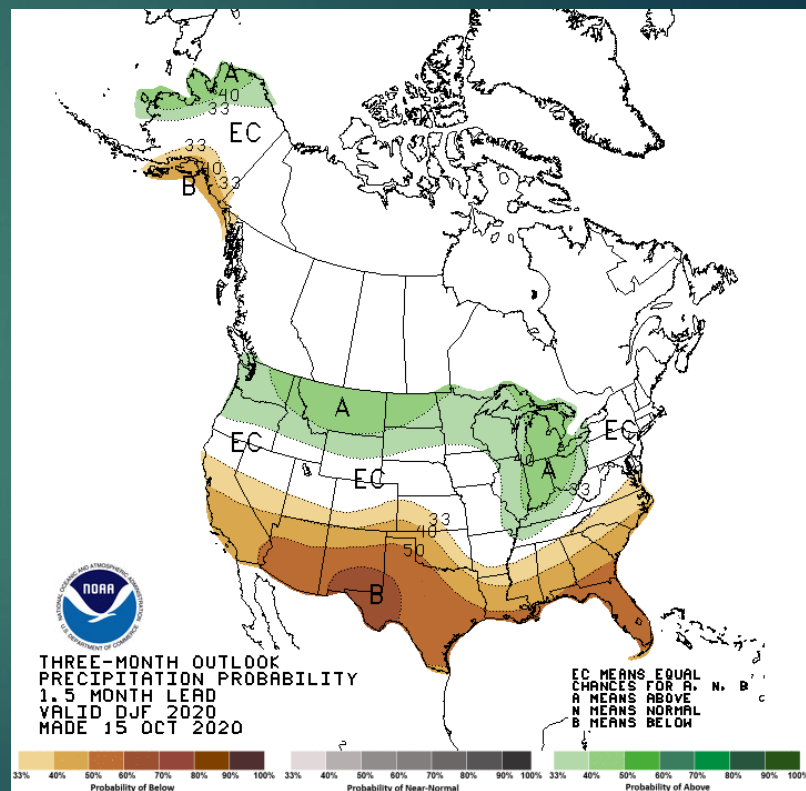
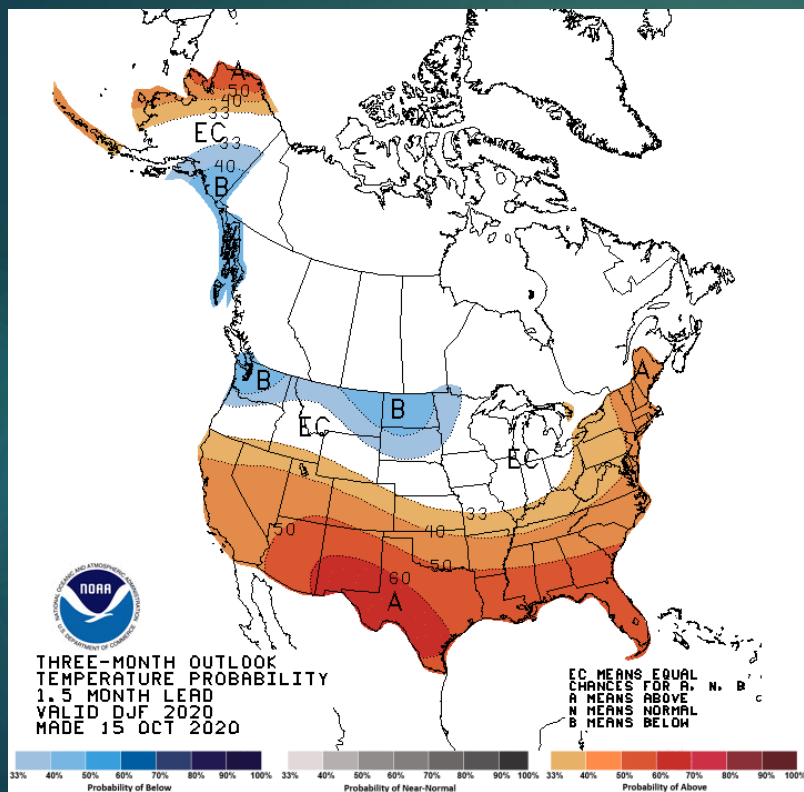
Temperature



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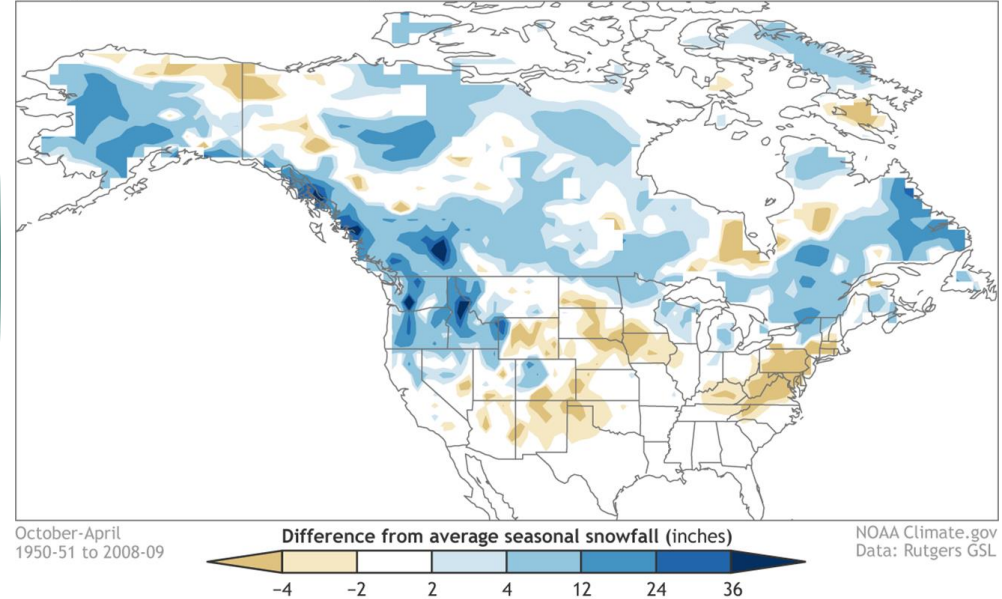
Climate Prediction Center Outlook



What does this mean for snow?

- Strong La Niñas tend to be GREAT snow years...

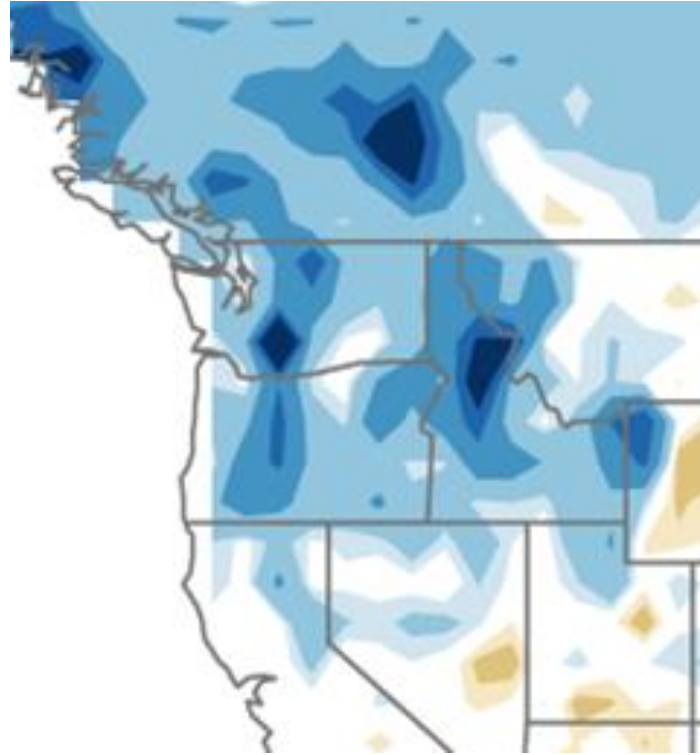
Average snowfall patterns for strong La Niña years



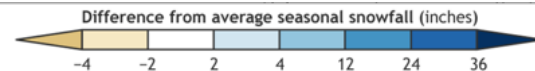
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**FOR THE
CASCADES!
(and Blue Mountains)**



October-April
1950-51 to 2008-09



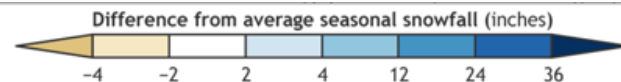
NOAA Climate.gov
Data: Rutgers GSL

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- ▶ Strong La Niñas tend to be GREAT snow years...
FOR THE CASCADES (and Blues)
- ▶ Slightly more snow ON AVERAGE than “normal” for Willamette Valley
- ▶ Correlation between Portland snow and Strong La Niña is not robust



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1950-51 to 2008-09



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Data: Rutgers GSL

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Takeaways

- ▶ La Niña is likely to persist through winter.
- ▶ Odds favor **above normal precipitation**.
- ▶ Odds favor **below normal temperatures**.
- ▶ Decent chance for a good ski season in the Cascades.
 - ▶ **Lower snow levels in general**
- ▶ Fewer warm, atmospheric river events to rip away snowpack.
 - ▶ Also good news for areas burned by Labor Day Firestorm.
- ▶ FOR THE LOWLANDS: **TIMING WILL BE EVERYTHING!**



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Questions?

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