

El Niño-Southern Oscillation (ENSO) Update + Seasonal Outlooks

NOAA Eastern Region Climate Services

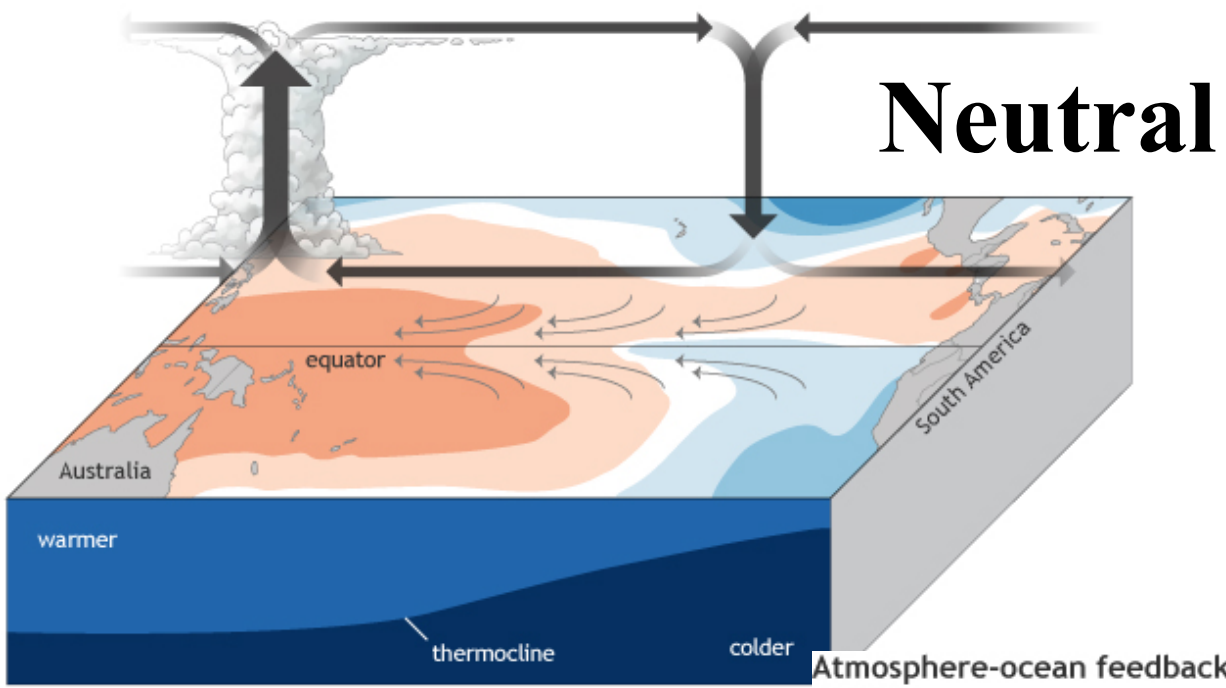
**Michelle L'Heureux
Climate Prediction Center / NCEP/ NWS
30 November 2021**



La Niña Advisory

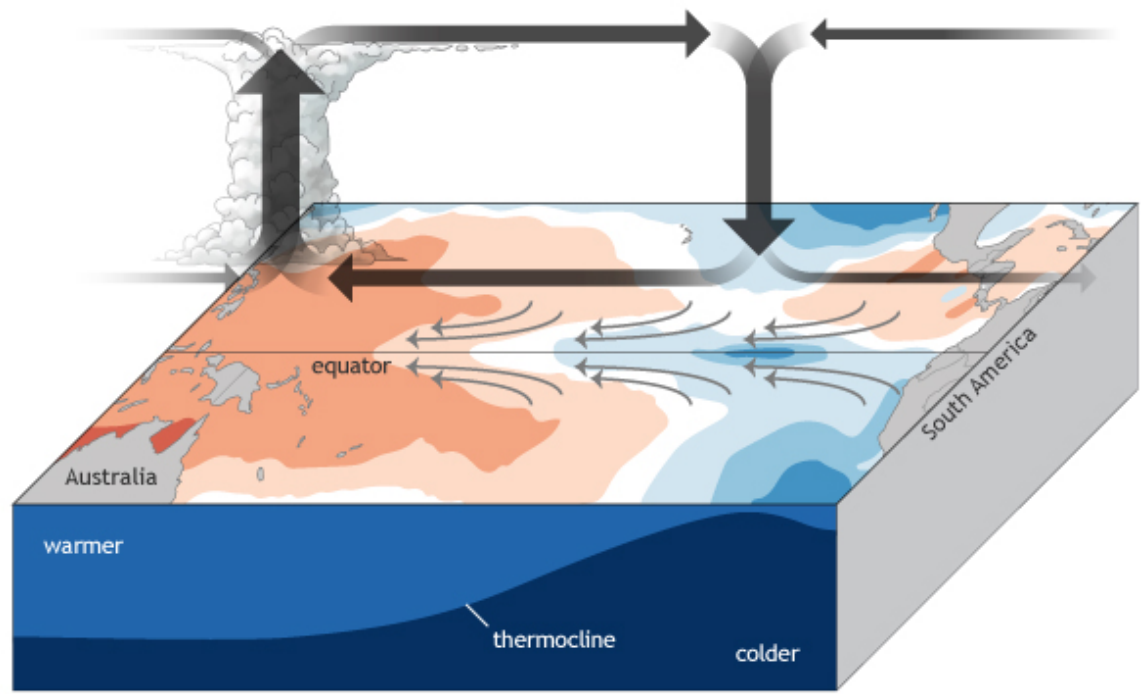
La Niña is likely to continue through the Northern Hemisphere winter 2021-22 (~90% chance) and into spring 2022 (~50% chance during March-May).

Atmosphere-ocean feedbacks during El Niño-Southern Oscillation
Neutral



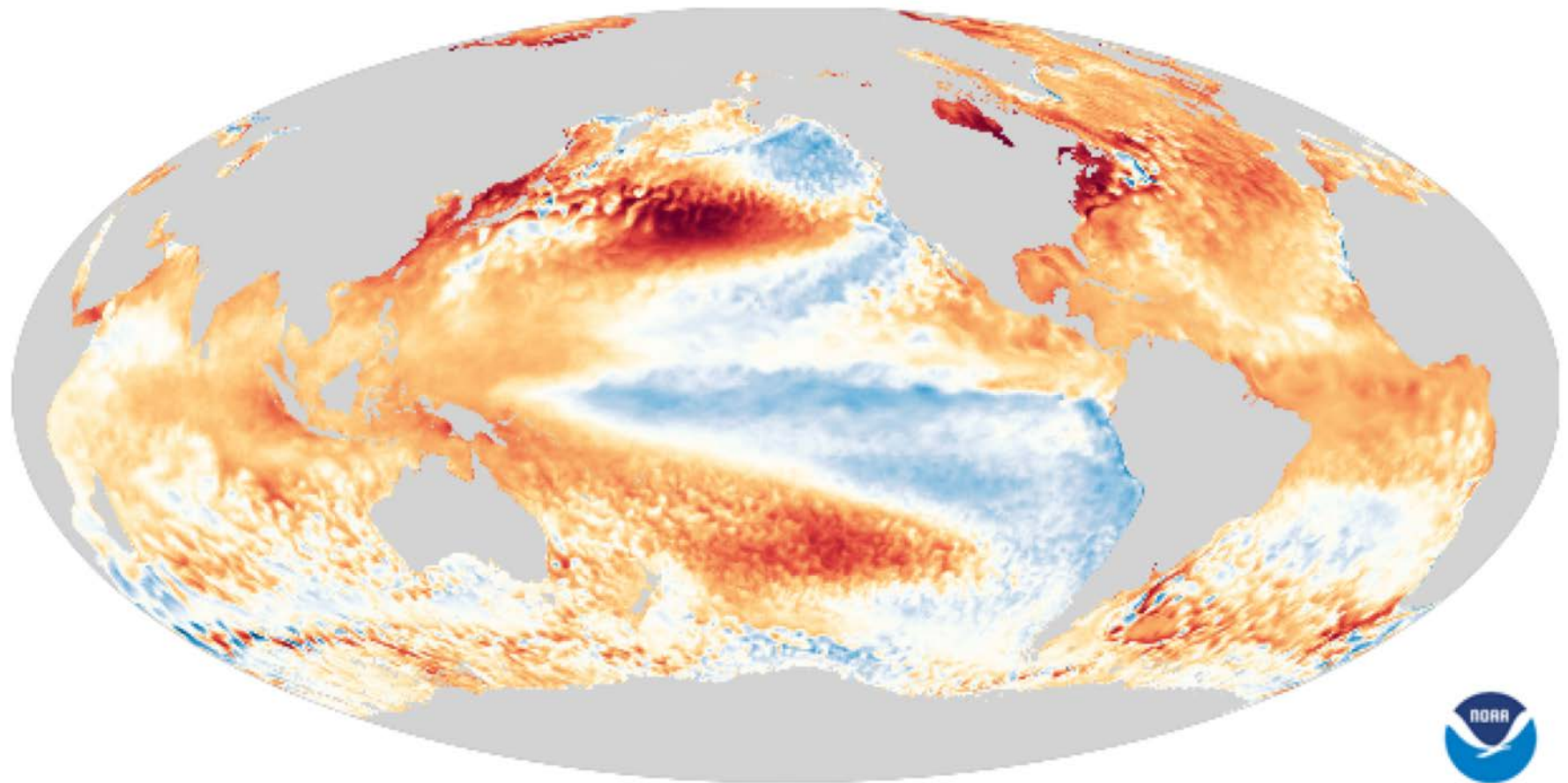
La Niña

Atmosphere-ocean feedbacks during El Niño-Southern Oscillation
La Niña



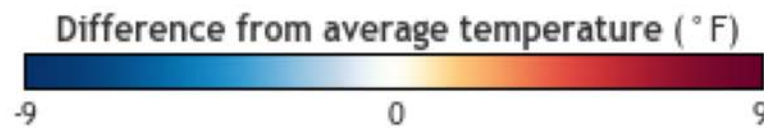
<https://www.climate.gov/news-features/blogs/enso/rise-el-niño-and-la-niña>

Sea surface temperatures (SST) anomalies during October



NOAA NNVL
Data: NCEI

October 2021
Compared to 1985-1993*

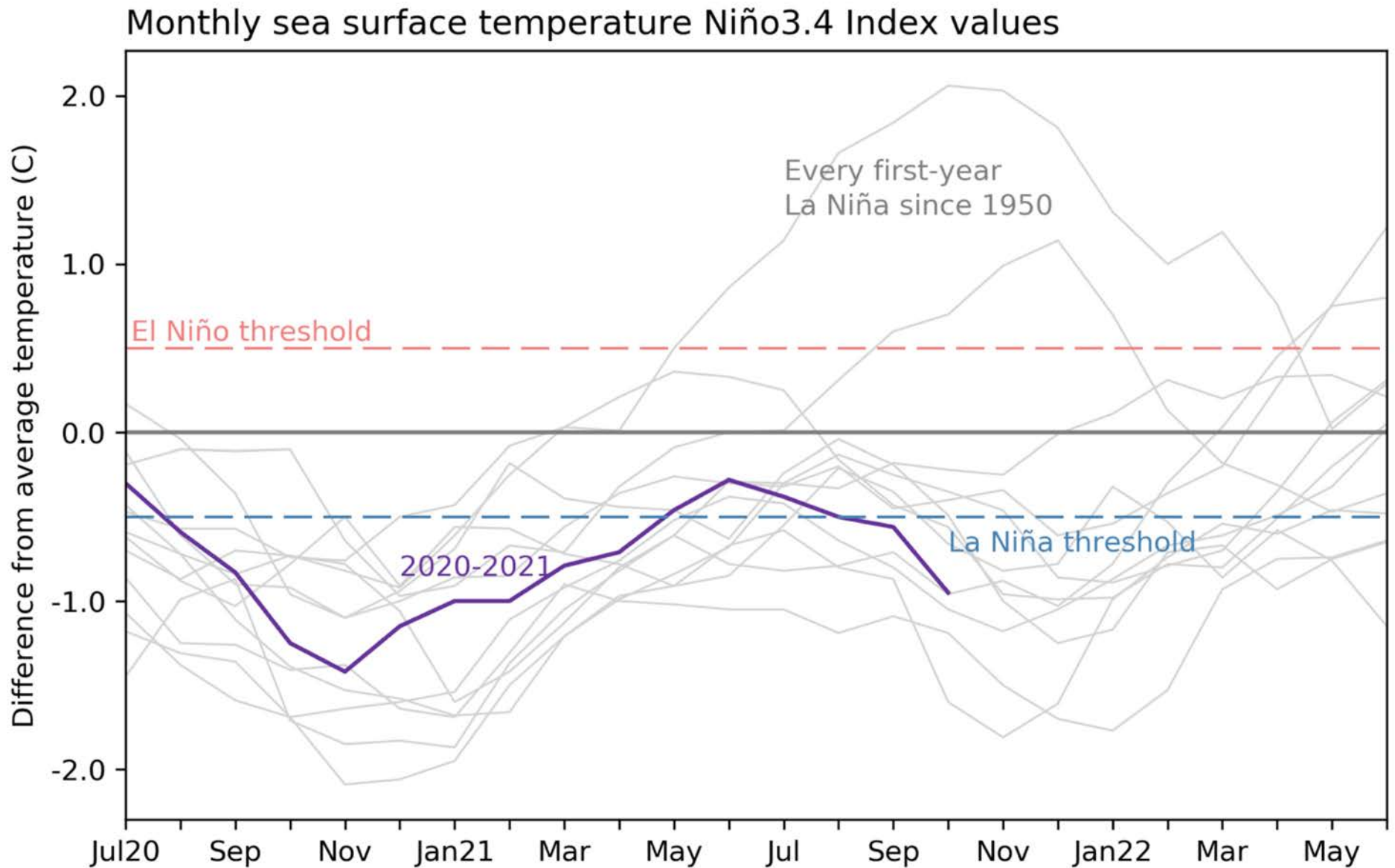


Blue shading is Below-Average SST

Yellow-Red shading is Above-Average SST

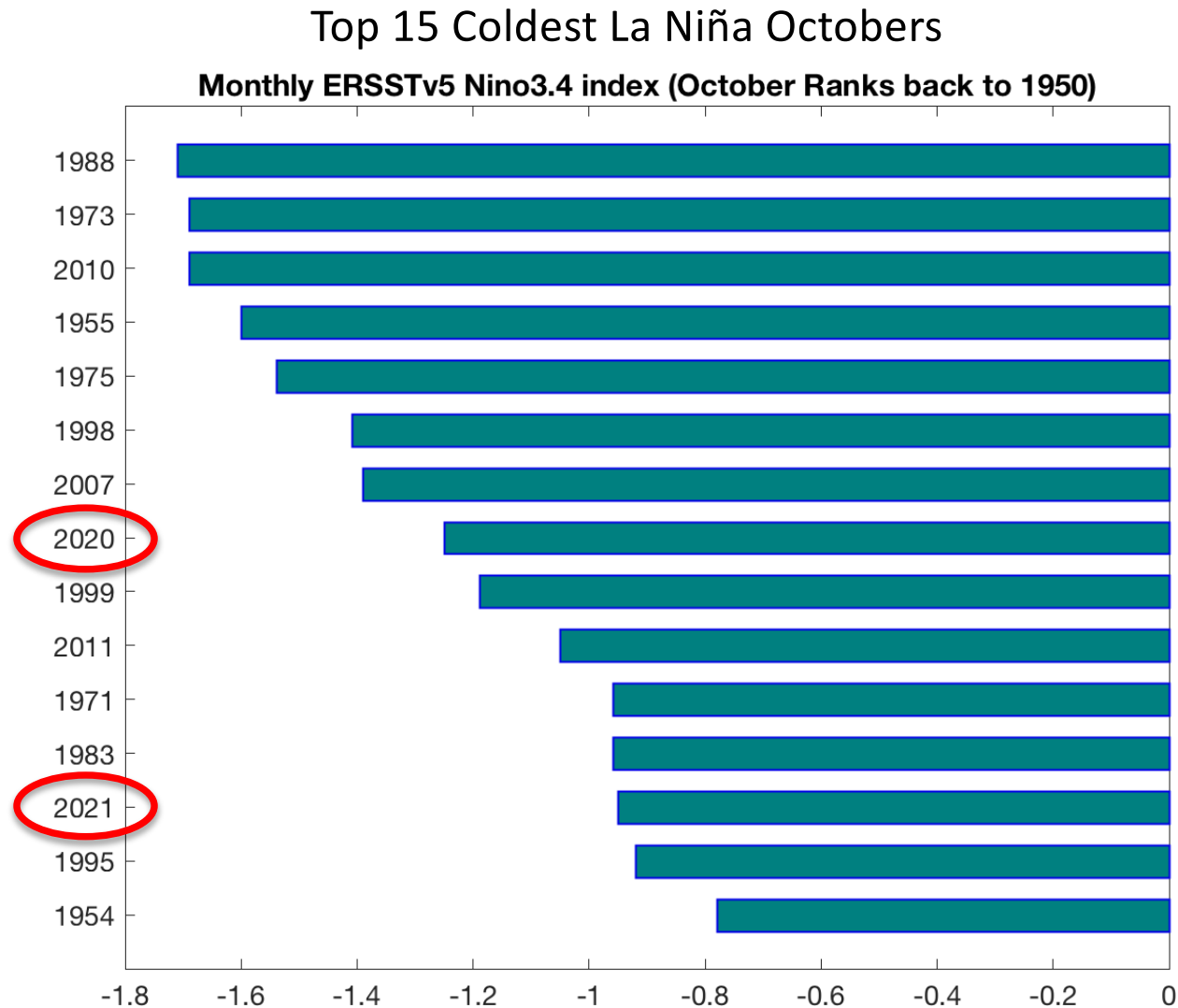
Below-average SSTs across the equatorial Pacific Ocean, which indicate La Niña

This is the 2nd Dip of Back-to-Back La Niña



From ENSO blog: <https://www.climate.gov/news-features/blogs/enso/november-2021-la-niña-update-movie-night>

Looking back to 1950, How Strong is it so far?

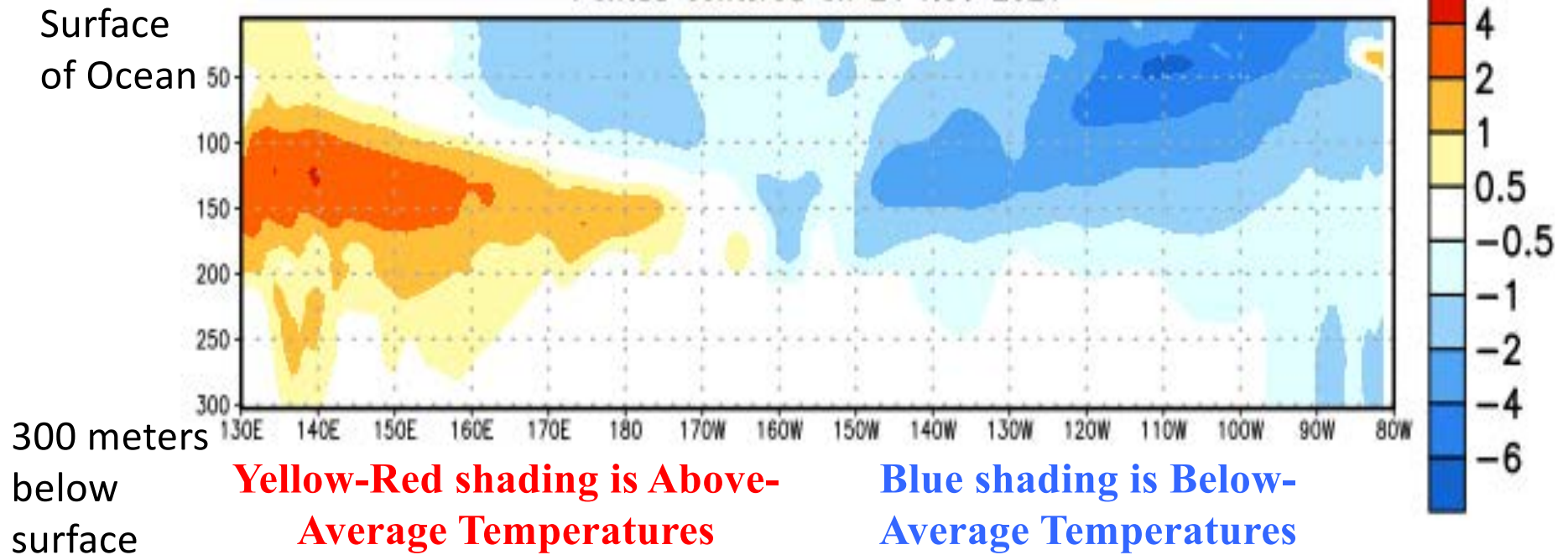


But La Niña is not just monthly SSTs.

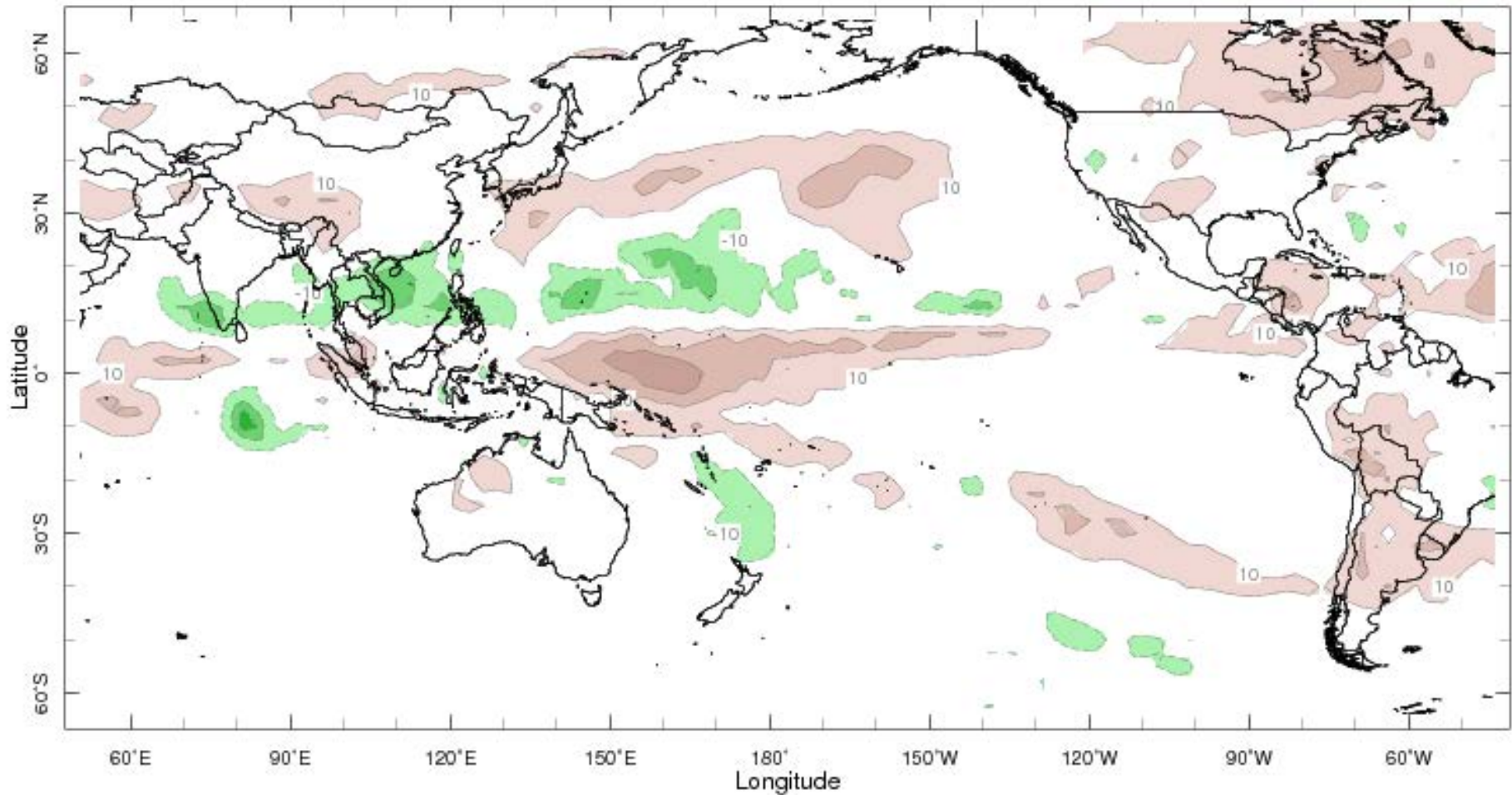
Subsurface temperature anomalies on the Equator (Pacific Ocean)

EQ. Subsurface Temperature Anomalies (deg C)

Pentad centered on 24 NOV 2021



Cloudiness/Rainfall (Outgoing Longwave Radiation) anomalies during October



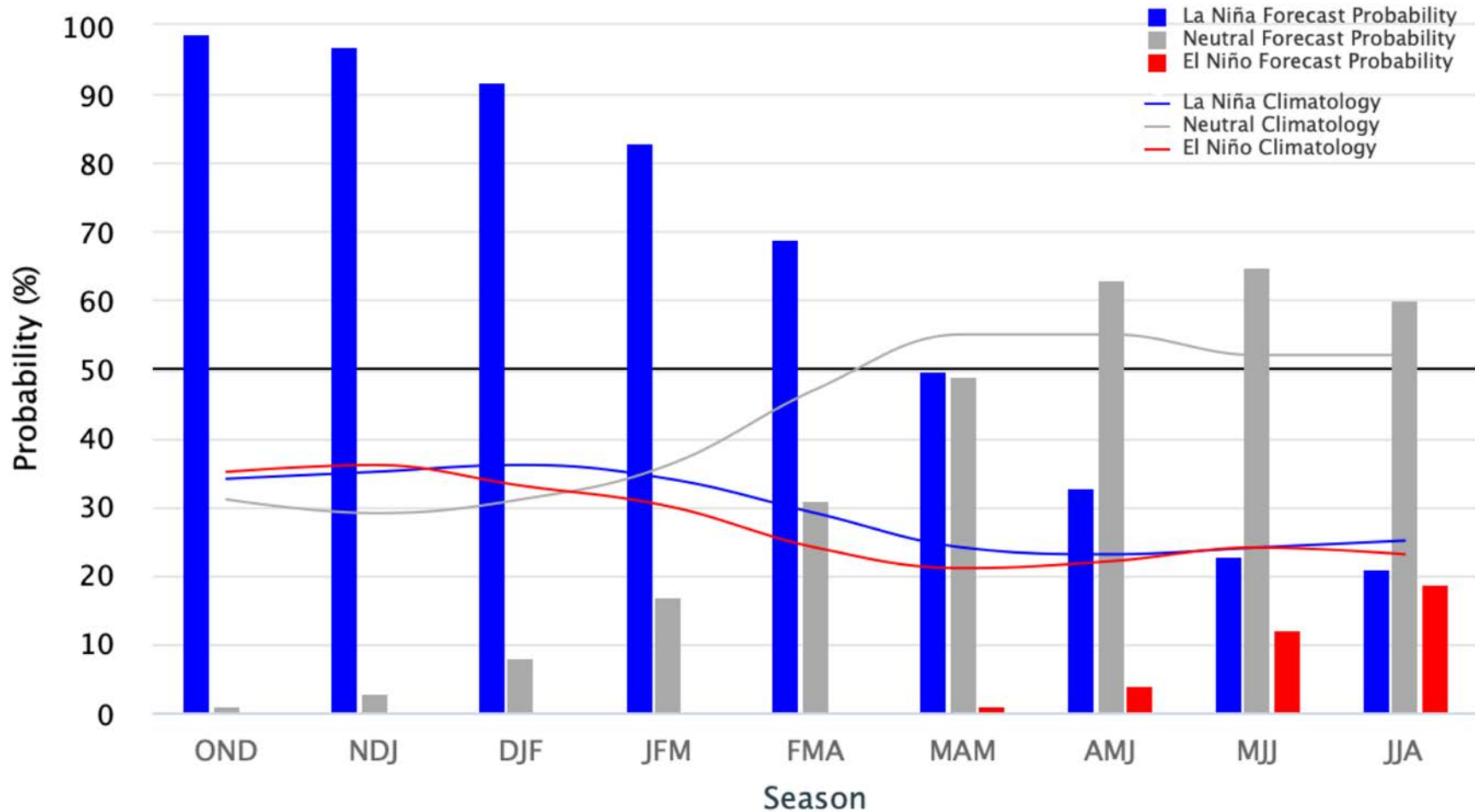
Oct 2021

The typical La Niña pattern is drier than average conditions near the Date Line (on equator) and wetter than average conditions over Indonesia.

Current ENSO Probabilities or Chances (in %) (updated 11 November 2021)

Early–November 2021 CPC/IRI Official Probabilistic ENSO Forecasts

ENSO state based on NINO3.4 SST Anomaly
Neutral ENSO: $-0.5\text{ }^{\circ}\text{C}$ to $0.5\text{ }^{\circ}\text{C}$



La Niña favored for the winter and into the spring.

ENSO-neutral is slightly more likely starting in April-June 2021

Probabilities for ENSO Strength

ENSO Strengths

This table shows the forecast probability (%) of Niño-3.4 index exceeding a certain threshold (in degrees Celsius).

For negative thresholds, the table shows the probability (%) of a Niño-3.4 index value that is less than (more negative) that value.

For positive thresholds, the table shows the probability (%) of a Niño-3.4 index value that is greater than (more positive) that value.

This tool supports the official ENSO Diagnostic discussion updated on the 2nd Thursday of each month.

| Target | < -1.5°C | < -1.0°C | < -0.5°C | > 0.5°C | > 1.0°C | > 1.5°C |
|--------|----------|----------|----------|---------|---------|---------|
| OND | 2 | 58 | 99 | ~0 | ~0 | ~0 |
| NDJ | 14 | 66 | 97 | ~0 | ~0 | ~0 |
| DJF | 14 | 56 | 92 | ~0 | ~0 | ~0 |
| JFM | 8 | 41 | 83 | ~0 | ~0 | ~0 |
| FMA | 3 | 24 | 69 | ~0 | ~0 | ~0 |
| MAM | 1 | 10 | 50 | 1 | ~0 | ~0 |
| AMJ | ~0 | 5 | 33 | 4 | ~0 | ~0 |
| MJJ | ~0 | 4 | 23 | 12 | 1 | ~0 |
| JJA | ~0 | 4 | 21 | 19 | 4 | ~0 |
| | < -1.5°C | < -1.0°C | < -0.5°C | > 0.5°C | > 1.0°C | > 1.5°C |

How we made this:

<https://www.climate.gov/news-features/blogs/enso/enso-forecast-mash-ups-what's-best-way-combine-human-expertise-models>

WS-features/blogs/enso/enso-forecast-mash-ups-what's-best-way-combine-human-expertise-models

For the November-January season, there is a 66% chance of Niño-3.4 index less than -1.0°C, but only a 14% chance of the index being less than -1.5°C.

So, favoring a moderate strength event.

What to Expect for US Temperature and Precipitation

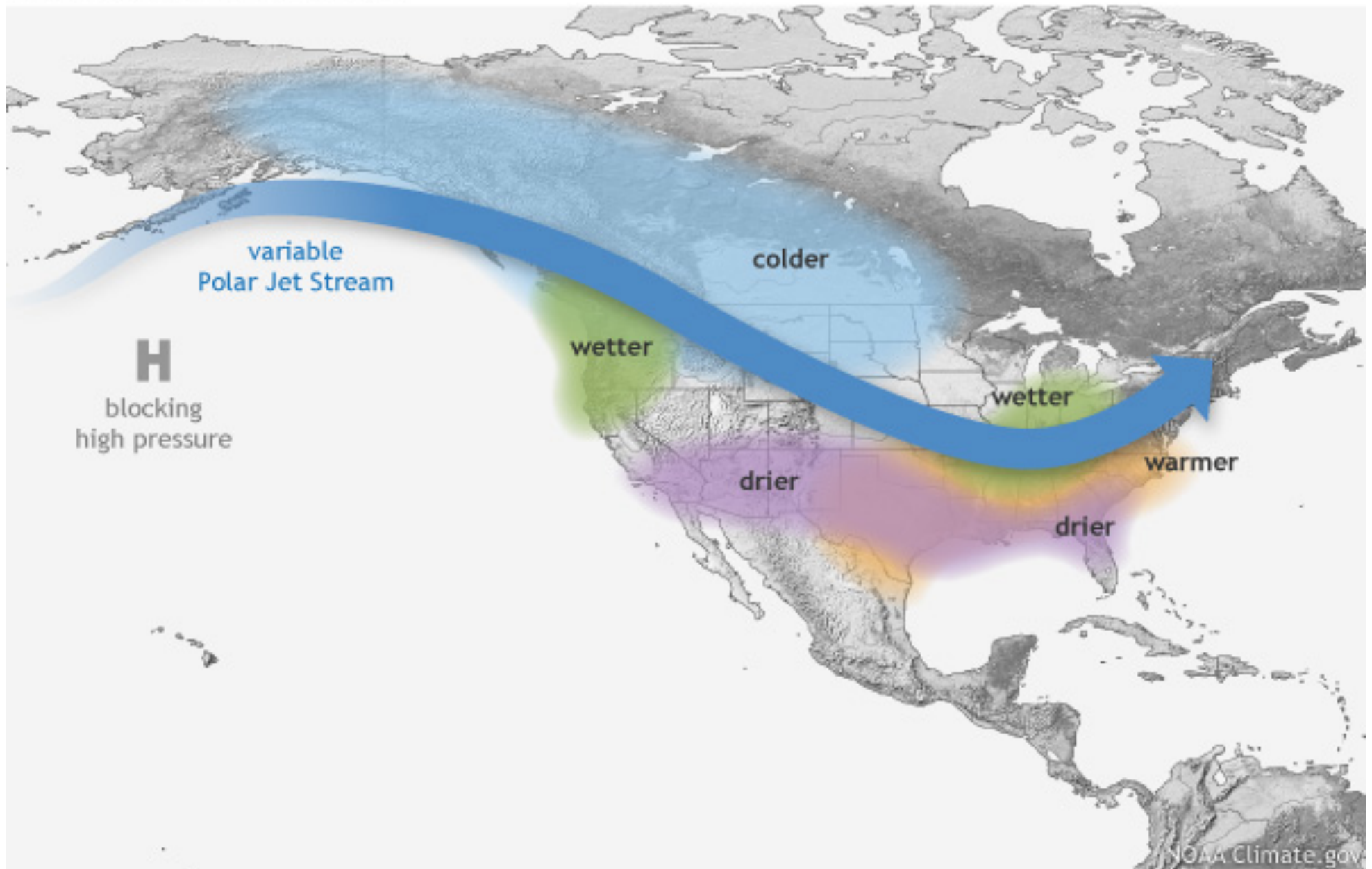
**The CPC seasonal outlook was
updated on Thurs. Nov. 18th**

(next one is Thurs. Dec. 16th)

http://www.cpc.ncep.noaa.gov/products/predictions/long_range/

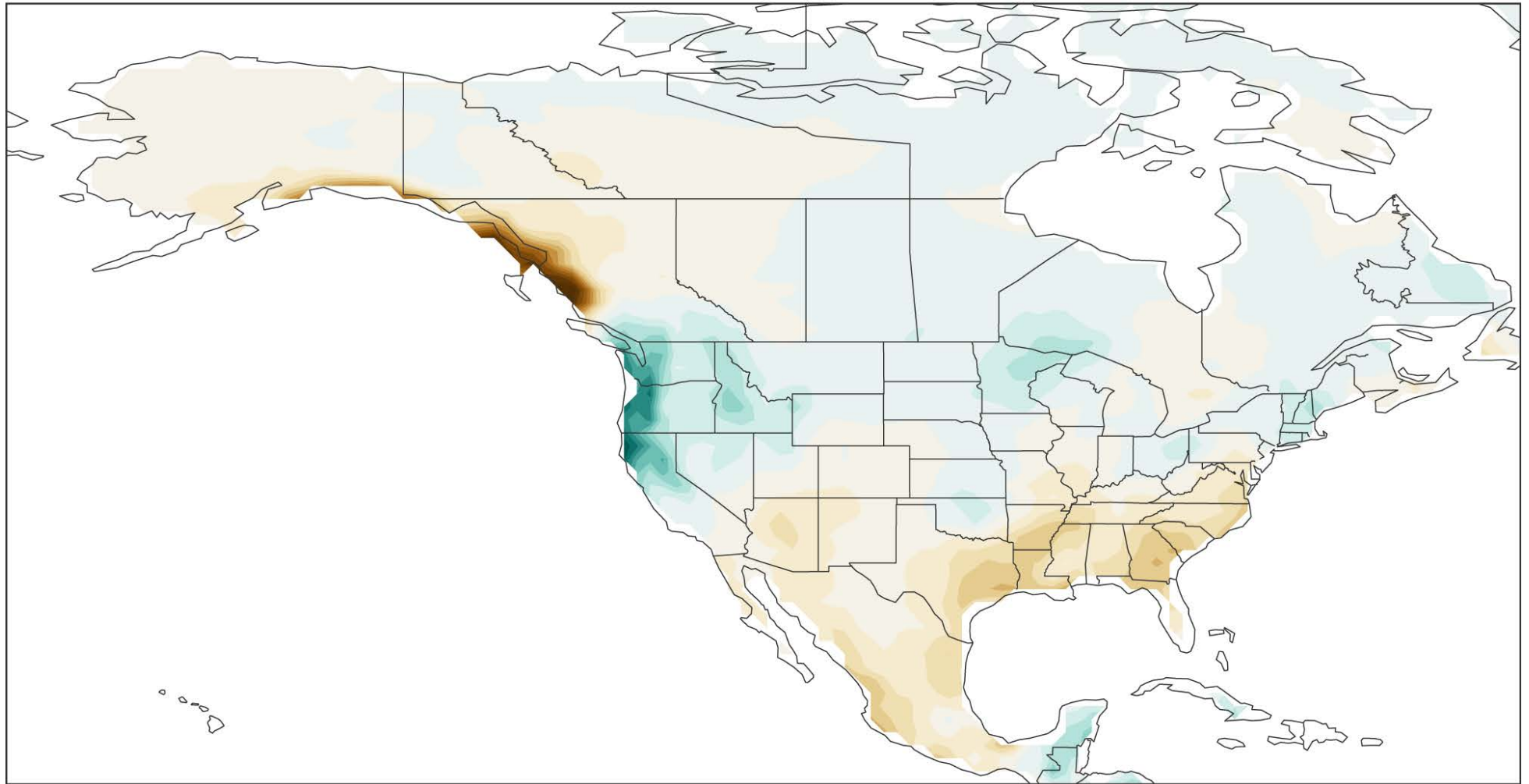
Schematic Version of La Niña Impacts

WINTER LA NIÑA PATTERN

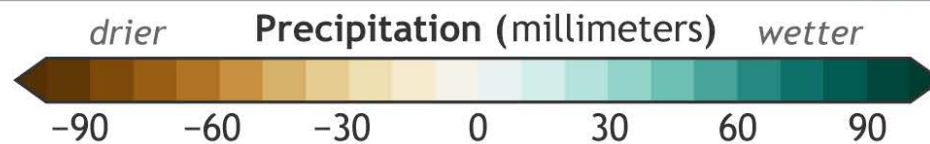


Average October-December La Niña Precipitation Anomaly

Difference from average precipitation, October-December La Niña years



Oct-Dec, all 23 La Niña years since 1948

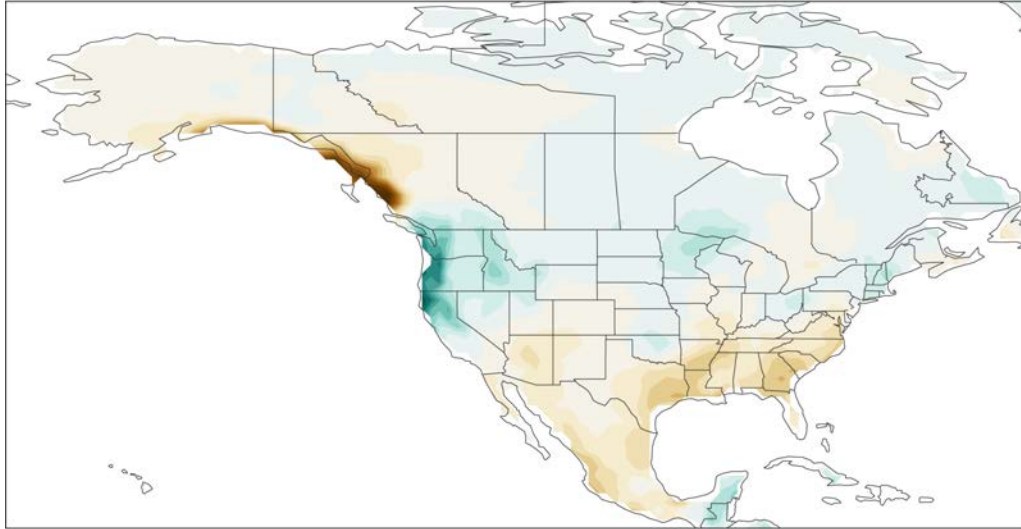


NOAA Climate.gov
Data: CPC

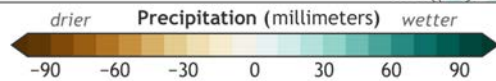
From ENSO blog: <https://www.climate.gov/news-features/blogs/enso/november-2021-la-niña-update-movie-night>

So far, U.S. Precipitation Anomalies are pretty La Niña-ish

Difference from average precipitation, October–December La Niña years

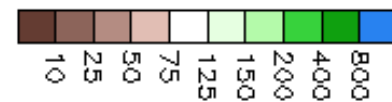
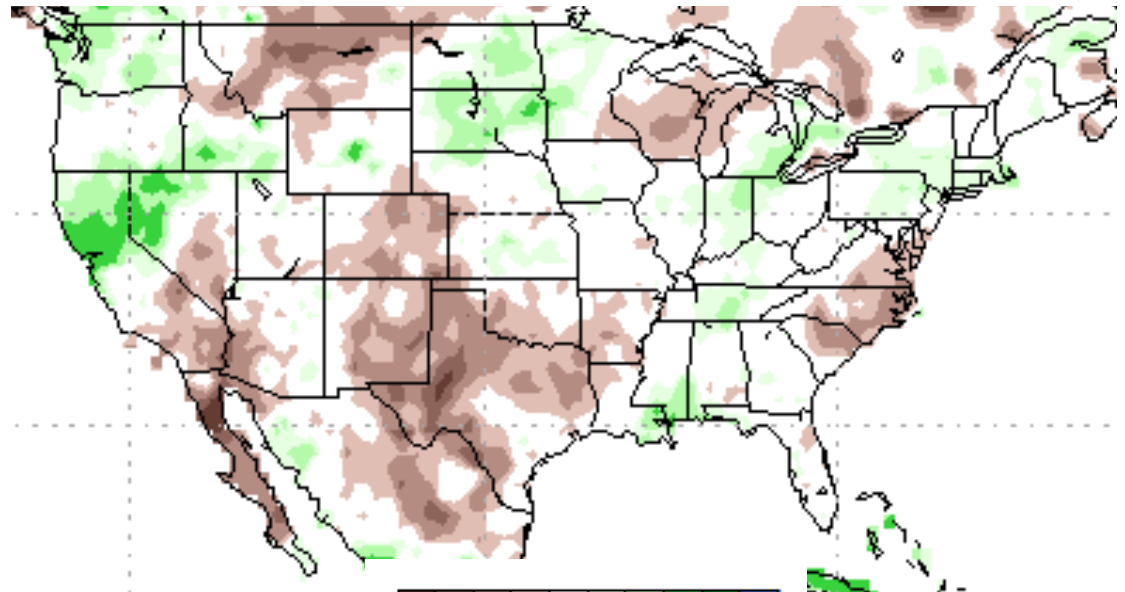


Oct–Dec, all 23 La Niña years since 1948



NOAA Climate.gov
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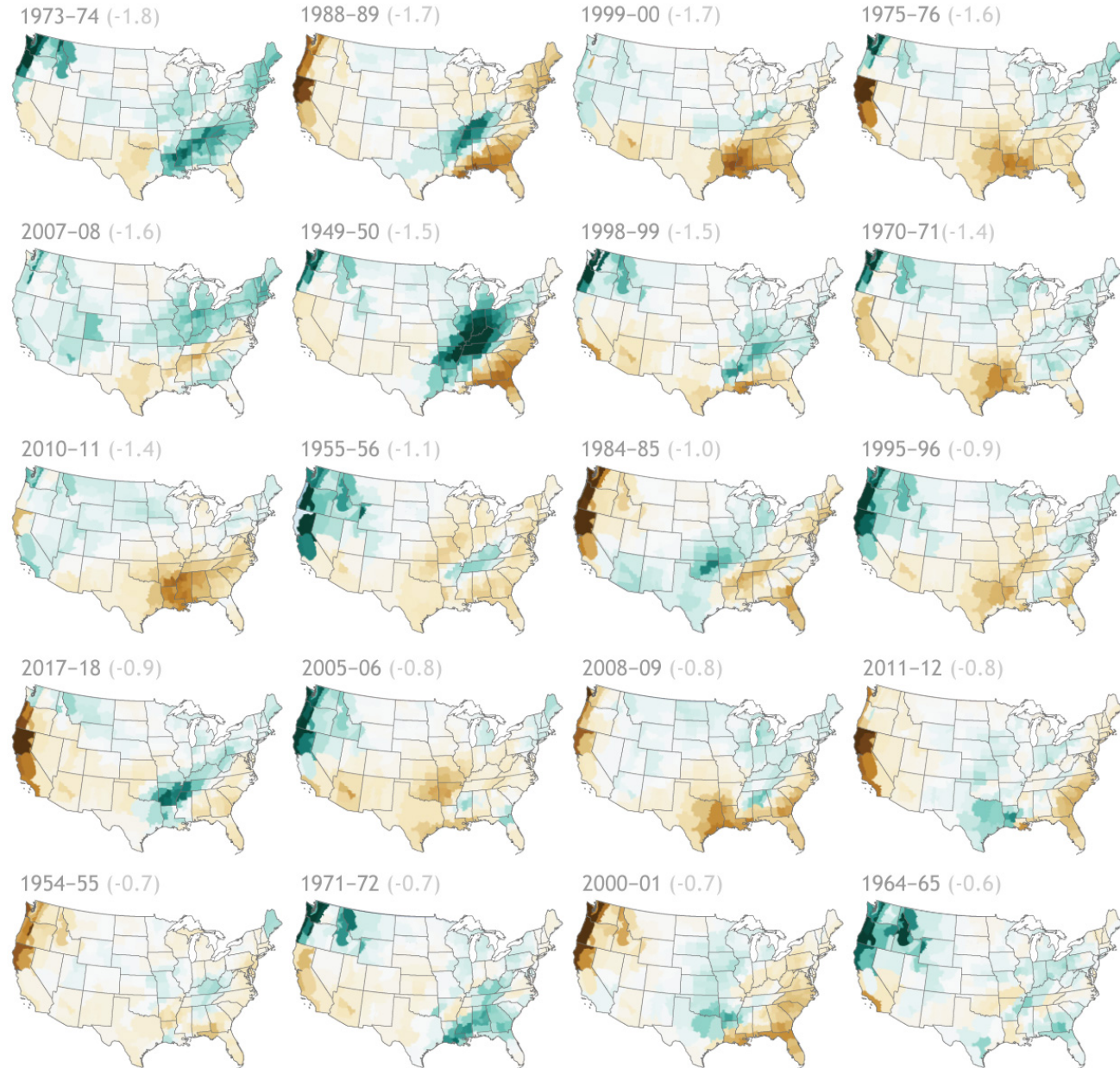
Last 90 days Percent of Average Precipitation (through 27 November 2021)



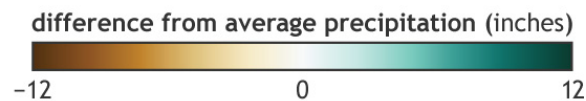
Precipitation anomalies associated with La Niña winters

Winter precipitation during the 20 strongest La Niña events since 1950

Dec-Feb (ONI value)



December-February
vs. 1981-2010 average

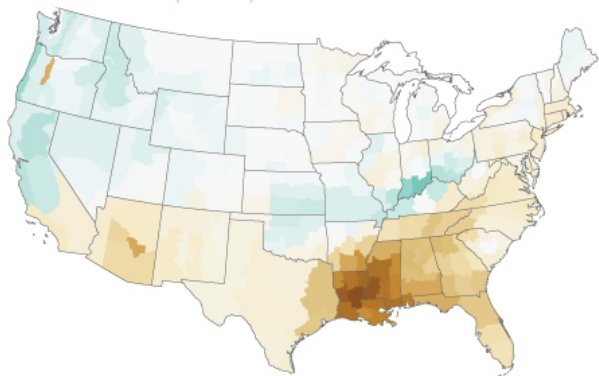


NOAA Climate.gov
Data: NCDC/ESRL

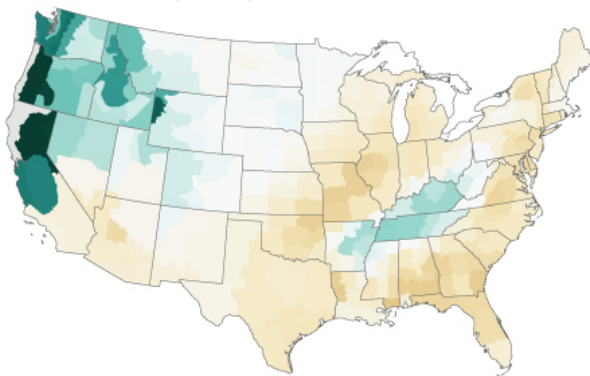
Precipitation anomalies associated with 2nd Dip La Niña winters

Dec-Feb (ONI value)

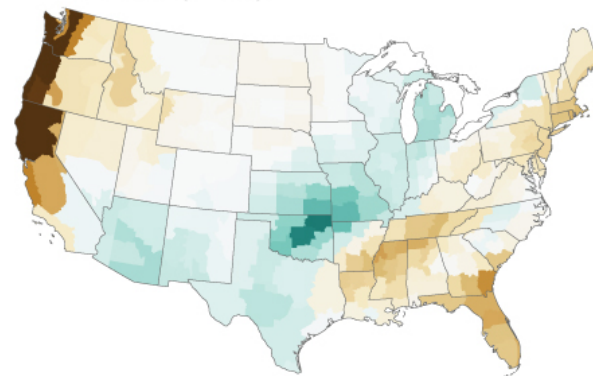
1999-00 (-1.7)



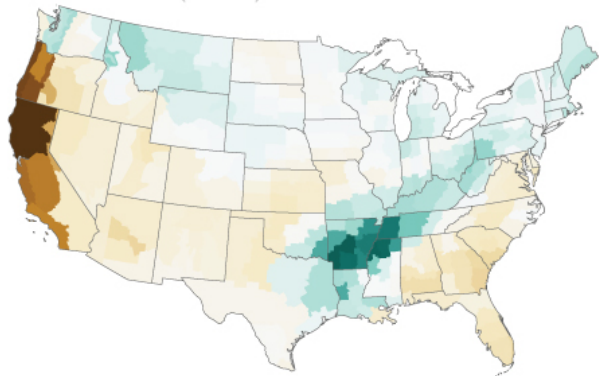
1955-56 (-1.1)



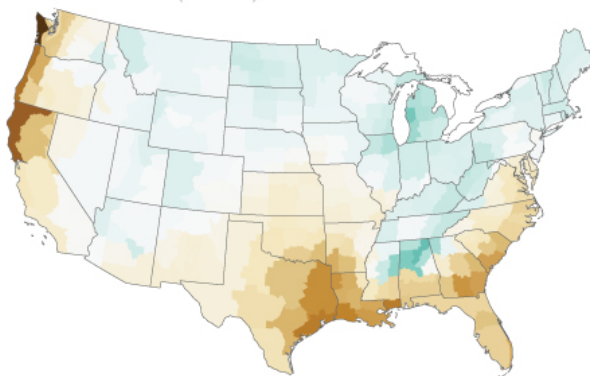
1984-85 (-1.0)



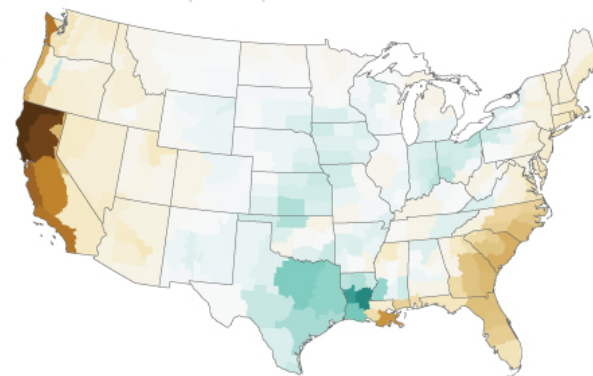
2017-18 (-0.9)



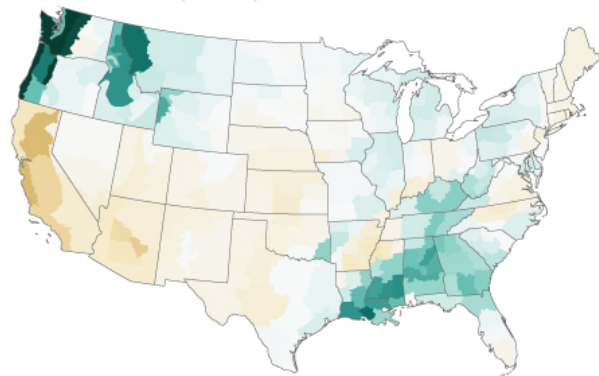
2008-09 (-0.8)



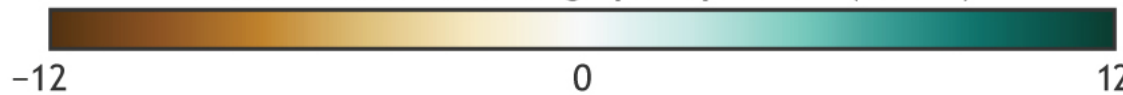
2011-12 (-0.8)



1971-72 (-0.7)



difference from average precipitation (inches)



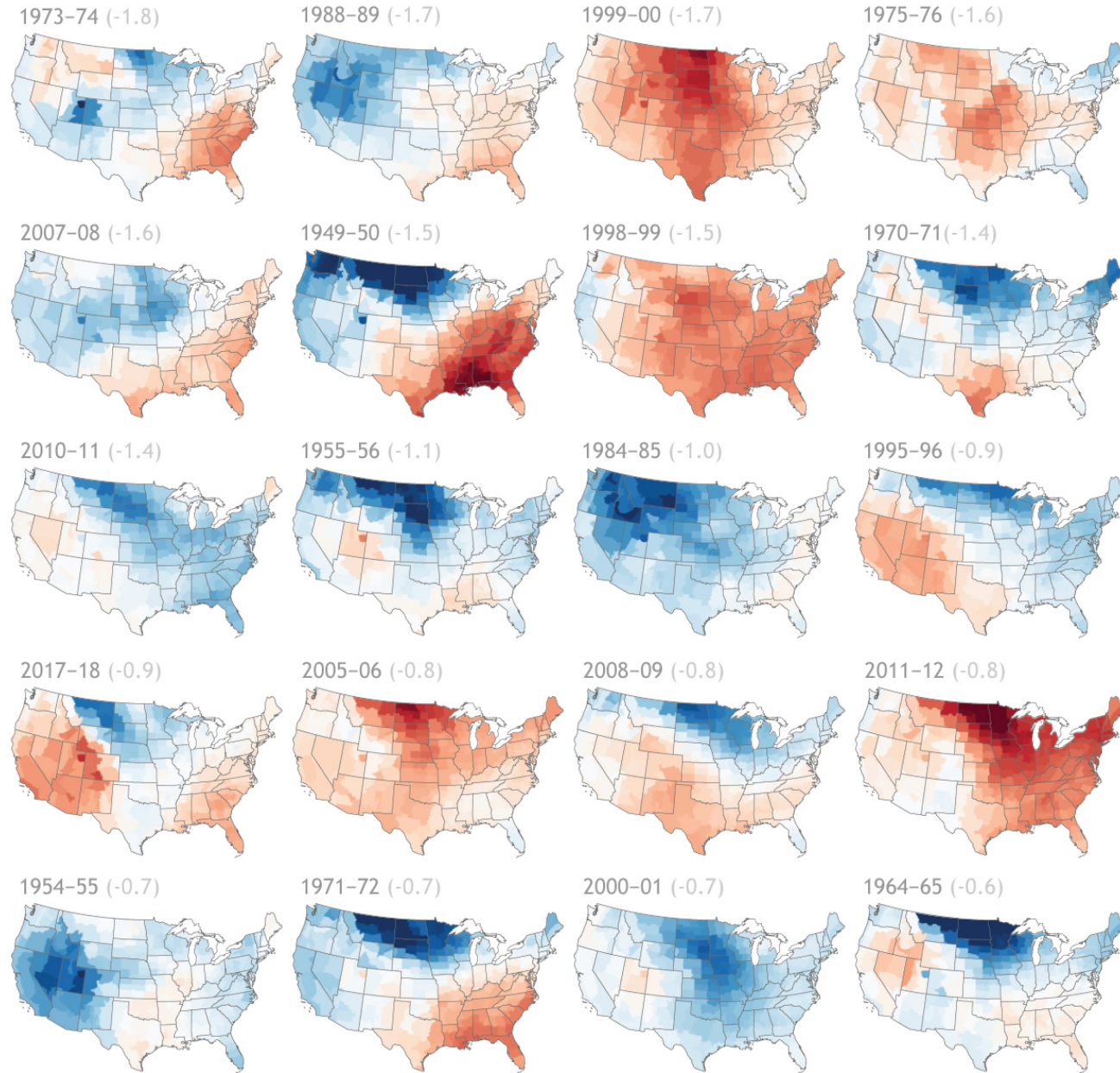
December-February
vs. 1981-2010 average

NOAA Climate.gov
Data: NCDC/ESRL

Temperature anomalies associated with La Niña winters

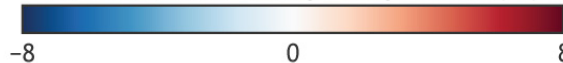
Winter temperature patterns during the 20 strongest La Niña events since 1950

Dec-Feb (ONI value)



December-February
vs. 1981-2020 average

difference from average temperature (°F)

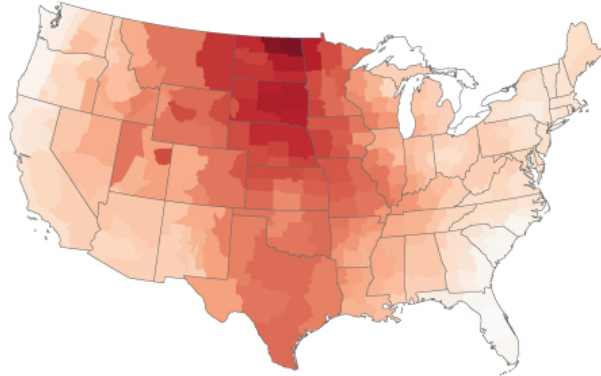


NOAA Climate.gov
Data: NCDC/ESRL

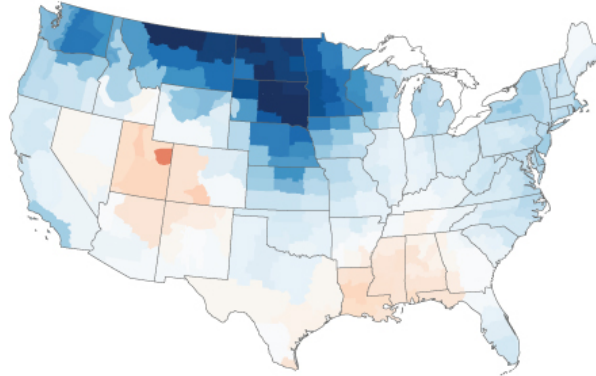
Temperature anomalies associated with 2nd Dip La Niña winters

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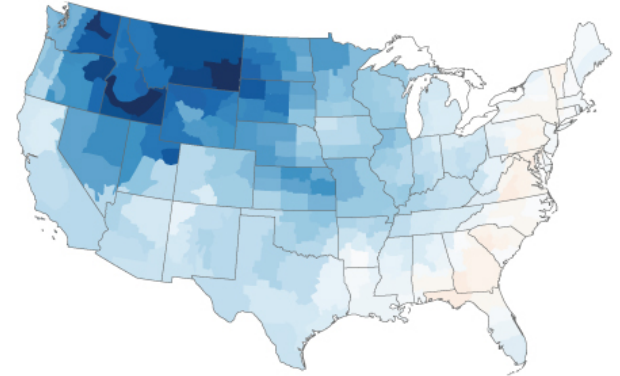
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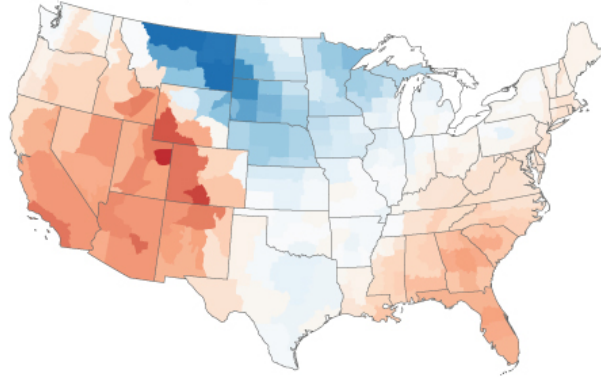
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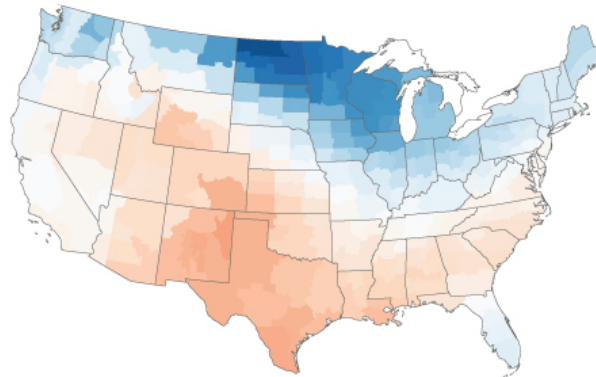
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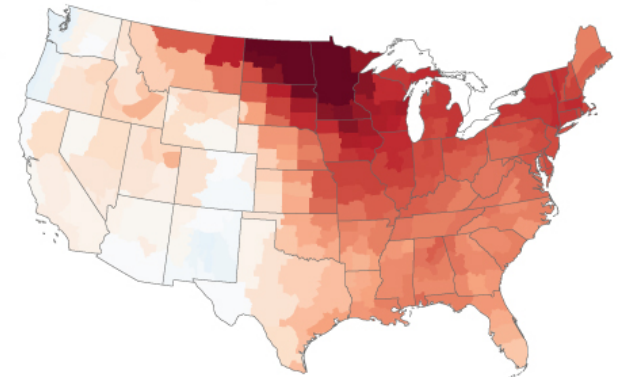
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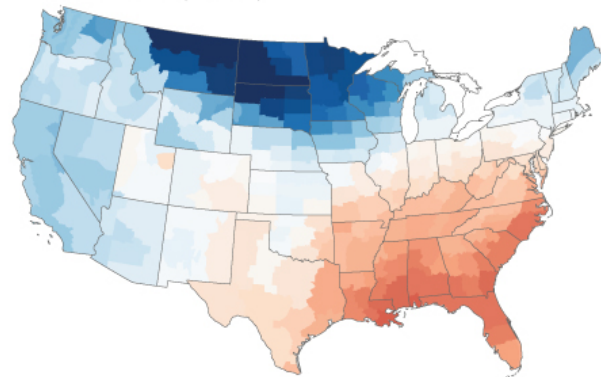
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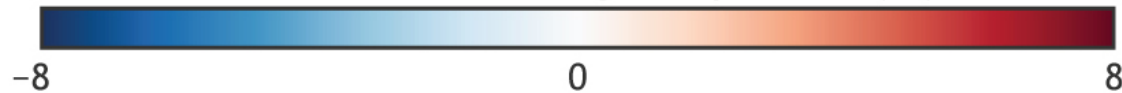
2011-12 (-0.8)



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difference from average temperature (°F)



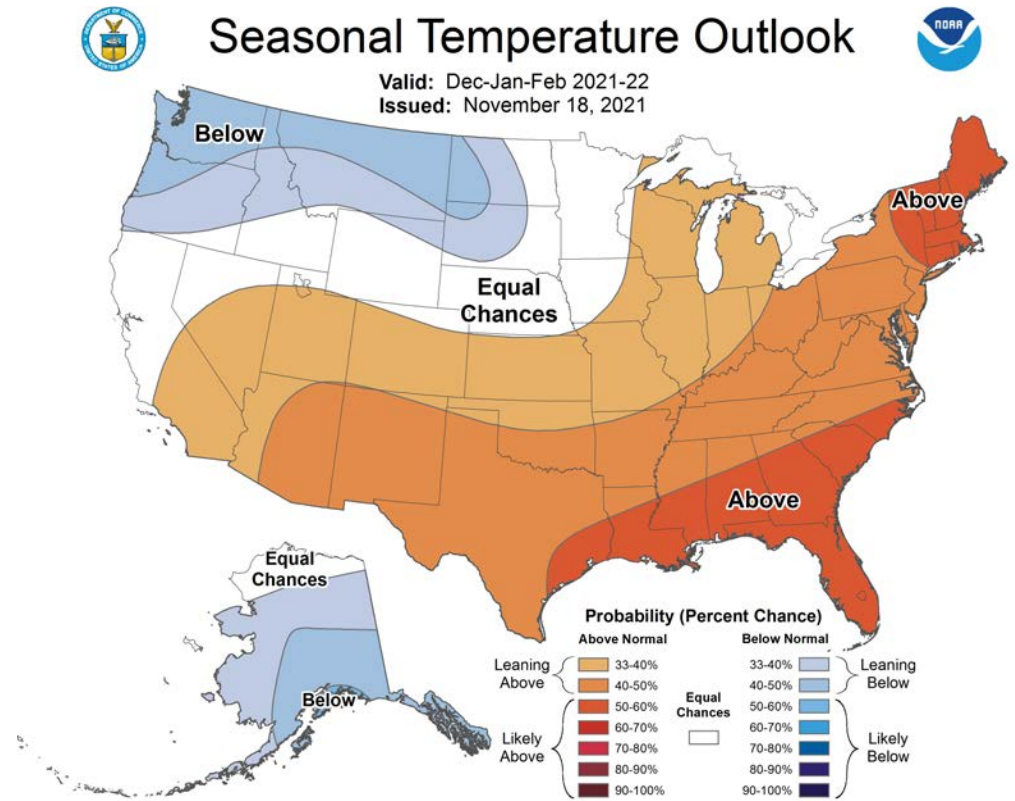
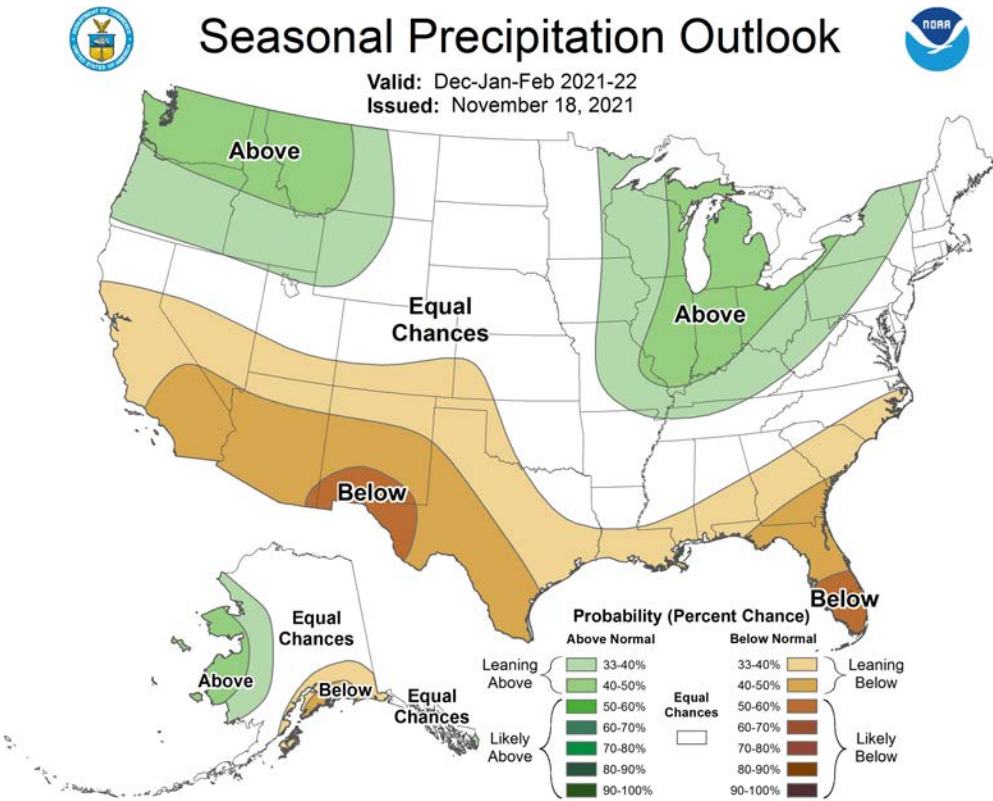
December-February
vs. 1981-2010 average

NOAA Climate.gov
Data: NCDC/ESRL

December-January-February (DJF) Outlook 2021-22

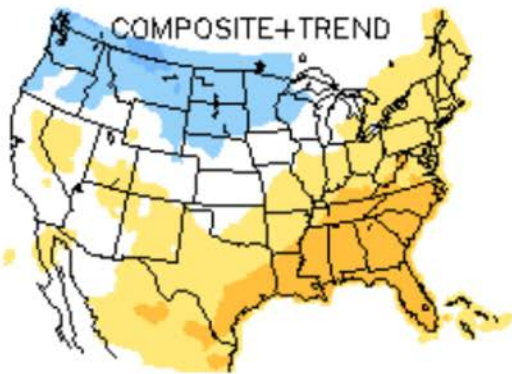
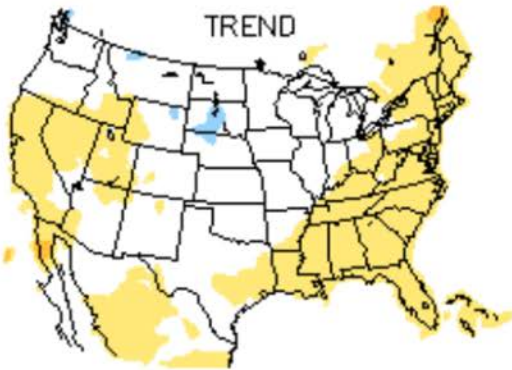
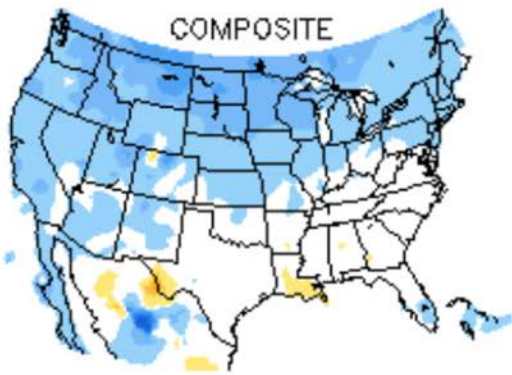
Precipitation Chances

Temperature Chances



http://www.cpc.ncep.noaa.gov/products/predictions/long_range/

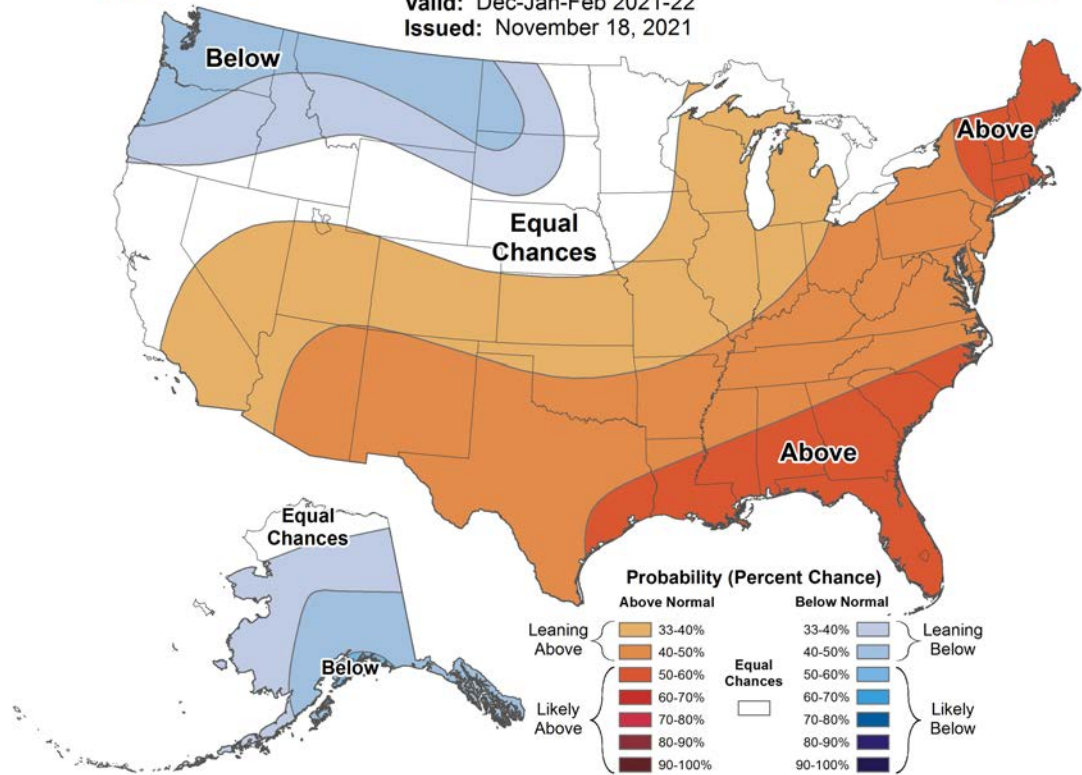
Dec-Feb La Niña Composite + Trend



Seasonal Temperature Outlook

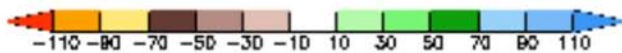
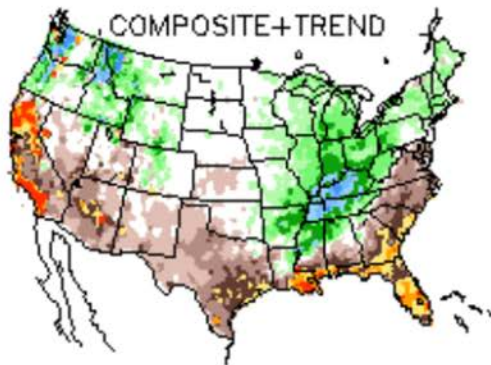
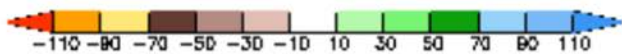
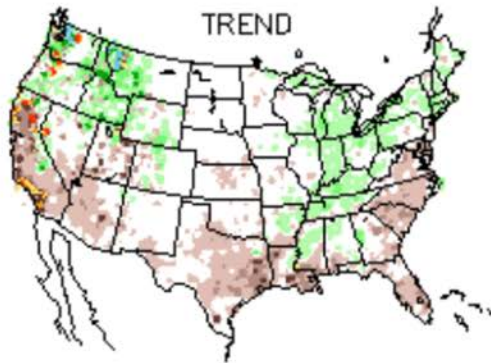
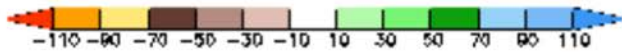
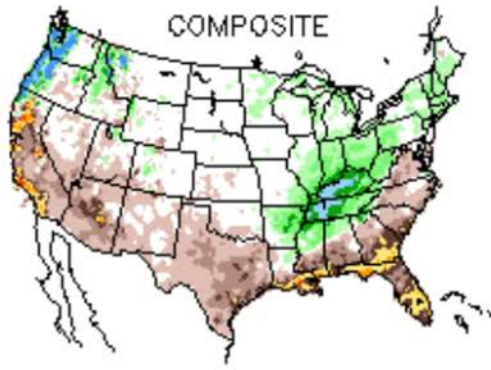


Valid: Dec-Jan-Feb 2021-22
 Issued: November 18, 2021



[https://www.cpc.ncep.noaa.gov/products/precip/CWlink/ENS O/composites/](https://www.cpc.ncep.noaa.gov/products/precip/CWlink/ENS/O/composites/)

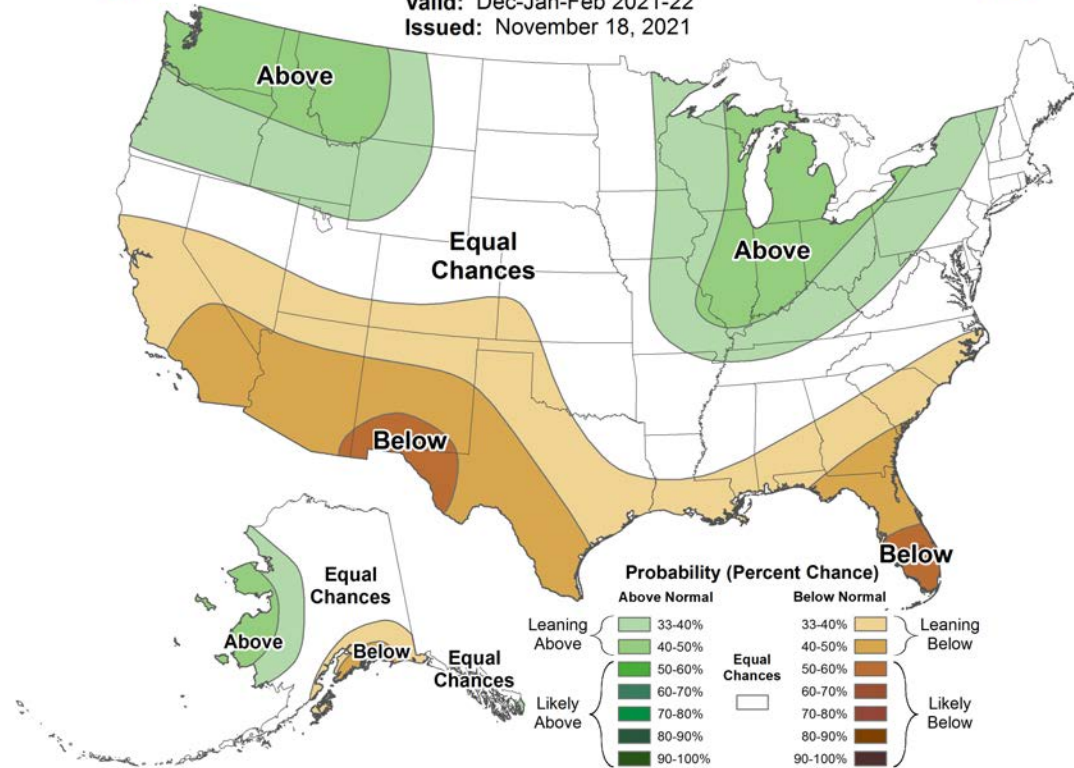
Dec-Feb La Niña Composite + Trend



Seasonal Precipitation Outlook



Valid: Dec-Jan-Feb 2021-22
 Issued: November 18, 2021



[https://www.cpc.ncep.noaa.gov/products/precip/CWlink/ENS O/composites/](https://www.cpc.ncep.noaa.gov/products/precip/CWlink/ENS/O/composites/)

ENSO Blog on Climate.gov

Updated twice a month. One post is associated with the ENSO Diagnostics Discussion release (2nd Thursday).

Index page that archives past blog articles (goes back to May 2014):

<https://www.climate.gov/news-features/blogs/enso/index-page-enso-blog-posts>

<https://www.climate.gov/news-features/departments/enso-blog>

Or just Google “ENSO Blog”

ENSO BLOG

A blog about monitoring and forecasting El Niño, La Niña, and their impacts.

DISCLAIMER

The ENSO blog is written, edited, and moderated by Michelle L'Heureux (NOAA Climate Prediction Center), Emily Becker (University of Miami/CIMAS), Nat Johnson (NOAA Geophysical Fluid Dynamics Laboratory), and Tom DiLiberto and Rebecca Lindsey (contractors to NOAA Climate Program Office), with periodic guest contributors.

Ideas and explanations found in these posts should be attributed to the ENSO blog team, and not to NOAA (the agency) itself. These are blog posts, not official agency communications; if you quote from these posts or from the comments section, you should attribute the quoted material to the blogger or commenter, not to NOAA, CPC, or Climate.gov.

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10

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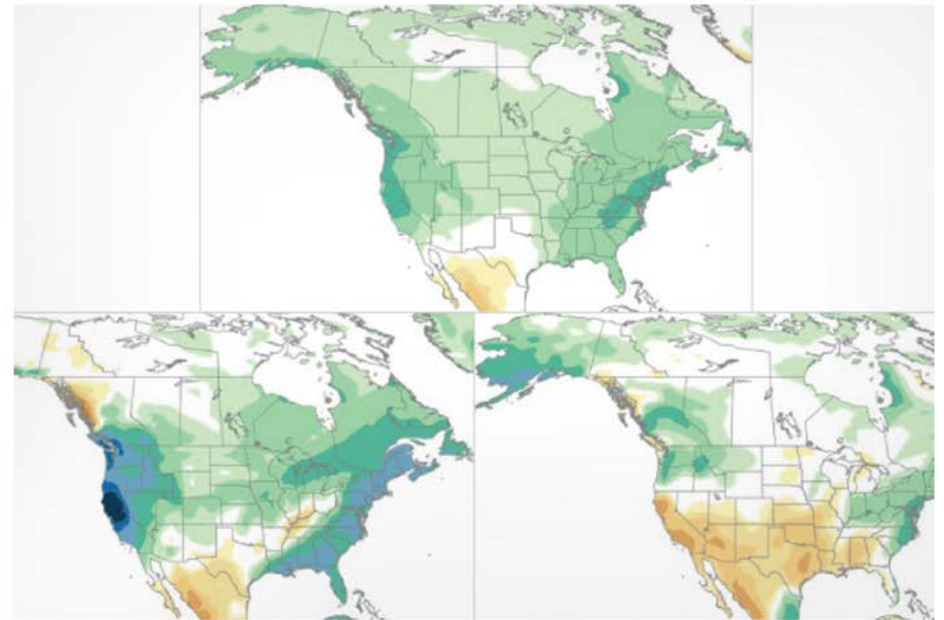
Descending

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ENSO BLOG | OCTOBER 28, 2021 | COMMENTS: 2

Variable Walks In Our Climate Forest

BY MICHELLE L'HEUREUX



When the climate doesn't behave like we expect, whether it's for an individual season or for several decades, we often hear scientists blaming internal variability. Scientists use this term a lot (even on Twitter) and I've noticed that I usually obtain a few blank faces

Summary

- Currently, there is a La Niña Advisory
- La Niña is likely to continue through the Northern Hemisphere winter 2021-22 (~90% chance) and into spring 2022 (~50% chance during March-May).
- Winter (Dec-Feb) seasonal outlook is informed by various climate models. La Niña and the Trend are prominent drivers in these predictions.

ENSO Diagnostics Discussion

http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/ensodisc.html

[updated on 2nd Thursday of each month]