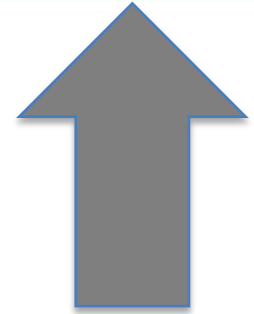


# **El Niño-Southern Oscillation (ENSO) Update + Seasonal Outlooks**

**NOAA Eastern Region Climate Services**

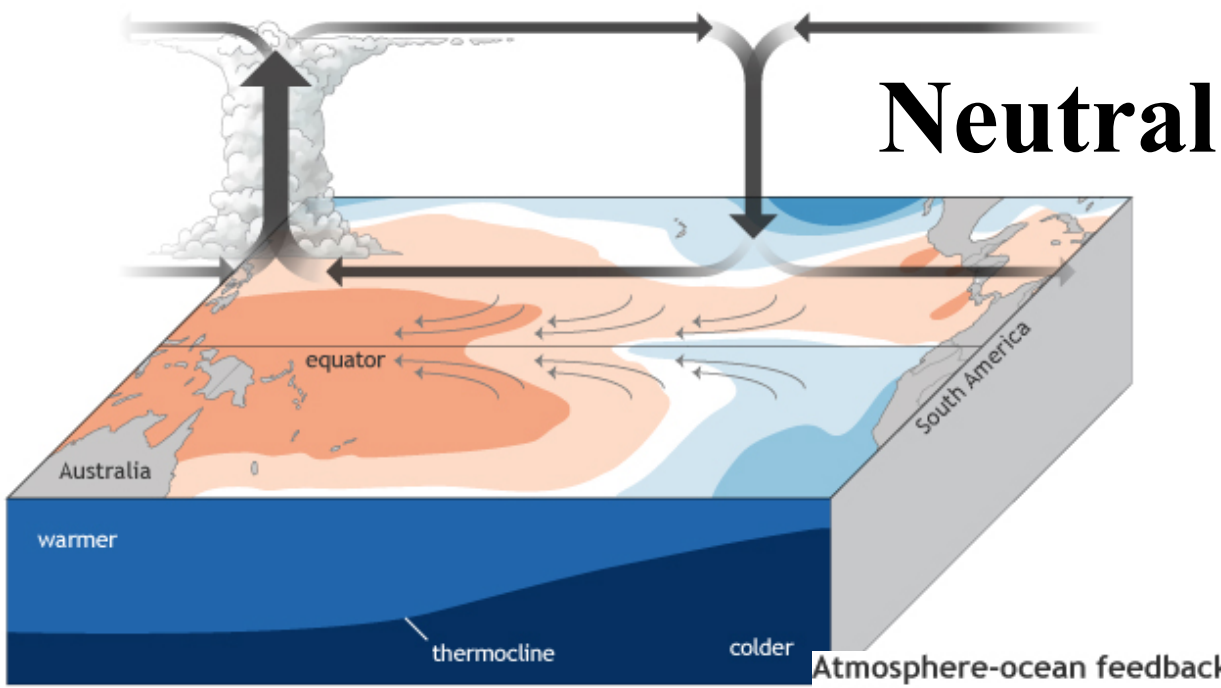
**Michelle L'Heureux  
Climate Prediction Center / NCEP/ NWS  
30 November 2021**



## La Niña Advisory

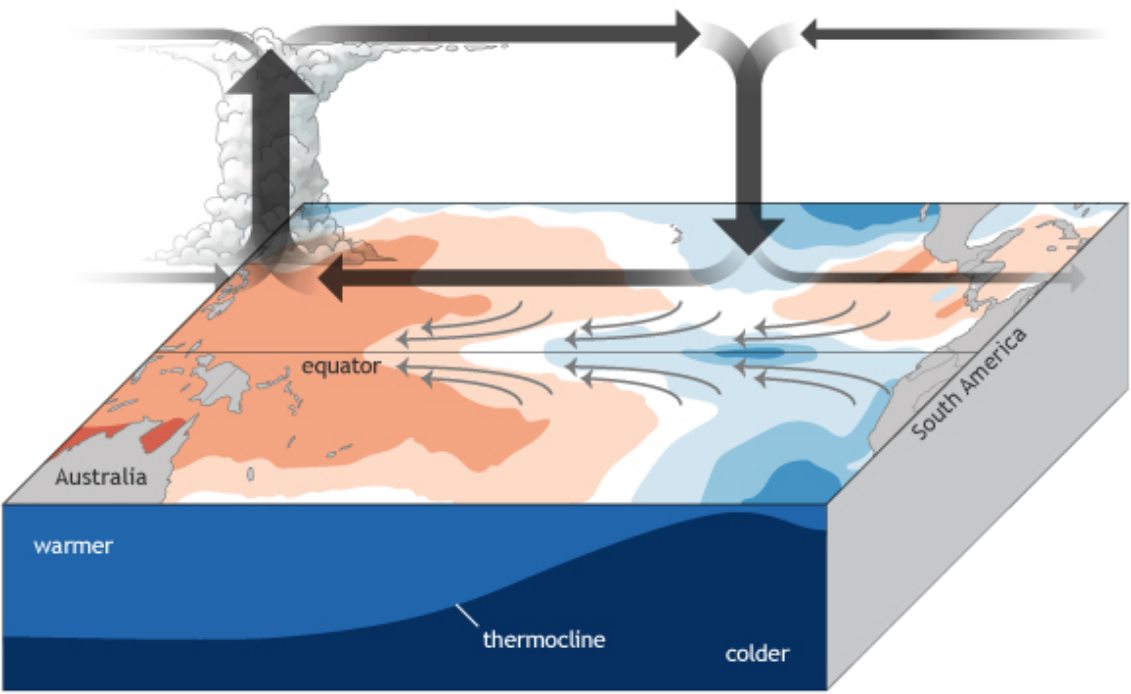
La Niña is likely to continue through the Northern Hemisphere winter 2021-22 (~90% chance) and into spring 2022 (~50% chance during March-May).

Atmosphere-ocean feedbacks during El Niño-Southern Oscillation  
Neutral



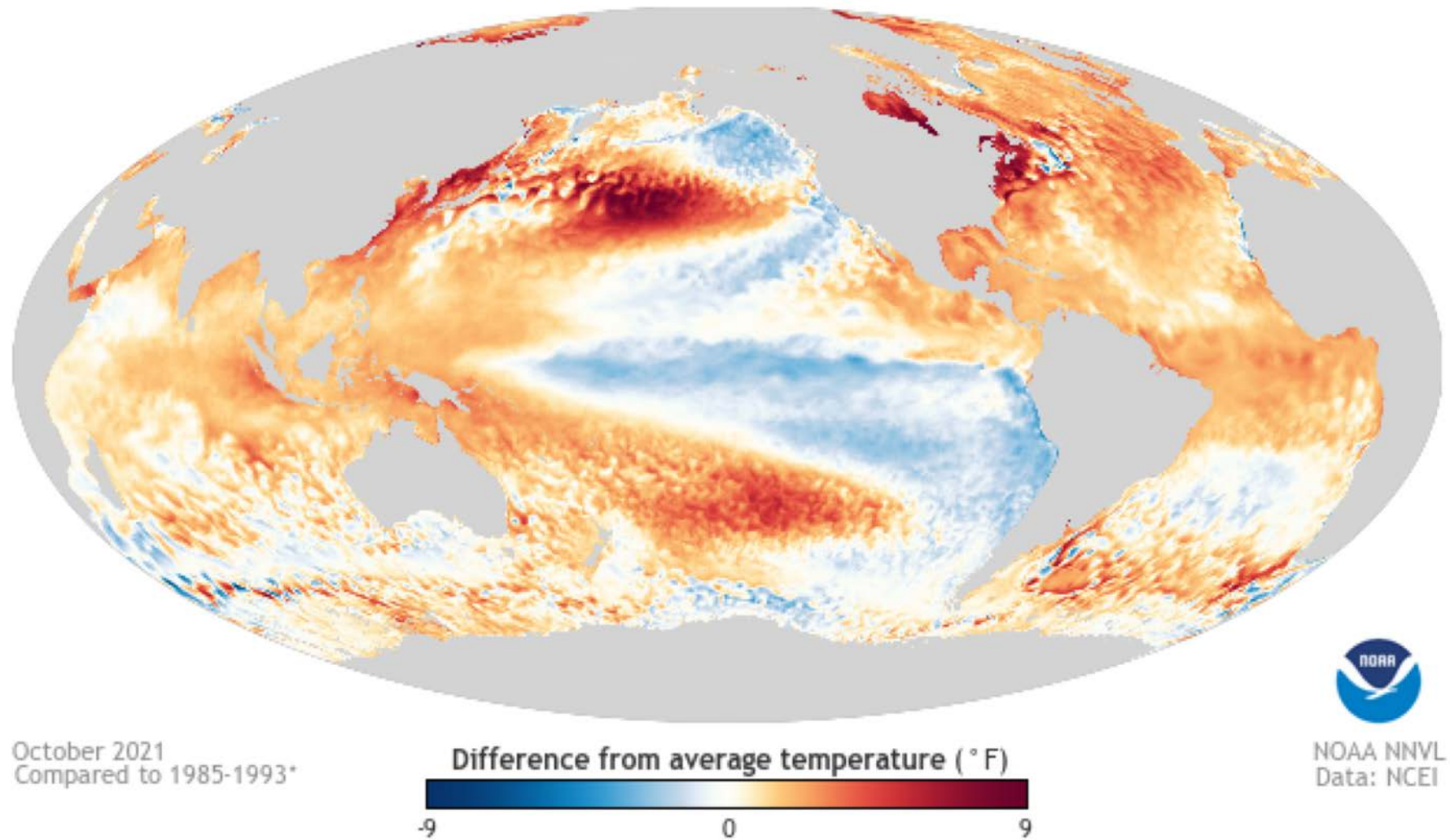
La Niña

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

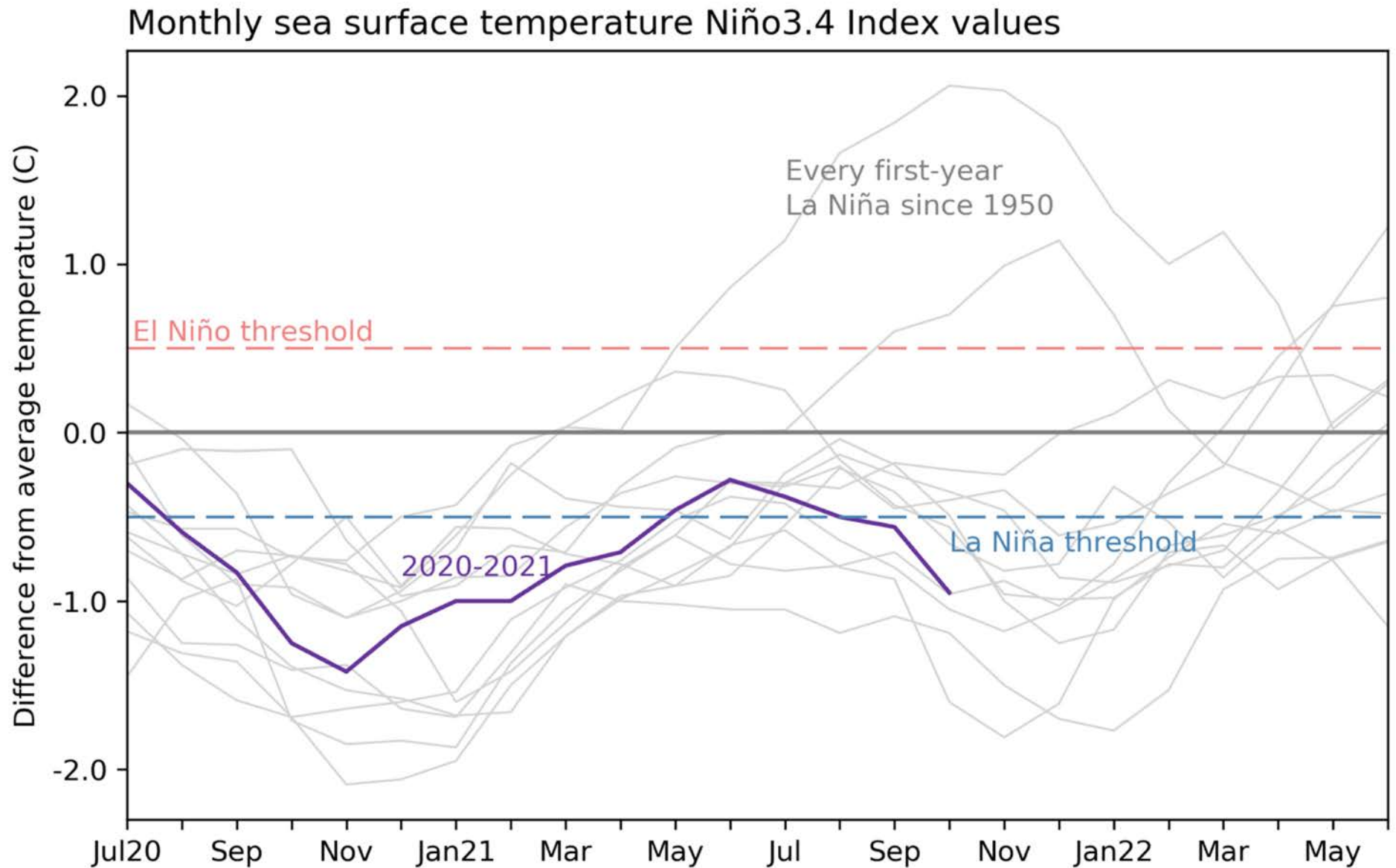


**Blue shading is Below-Average SST**

**Yellow-Red shading is Above-Average SST**

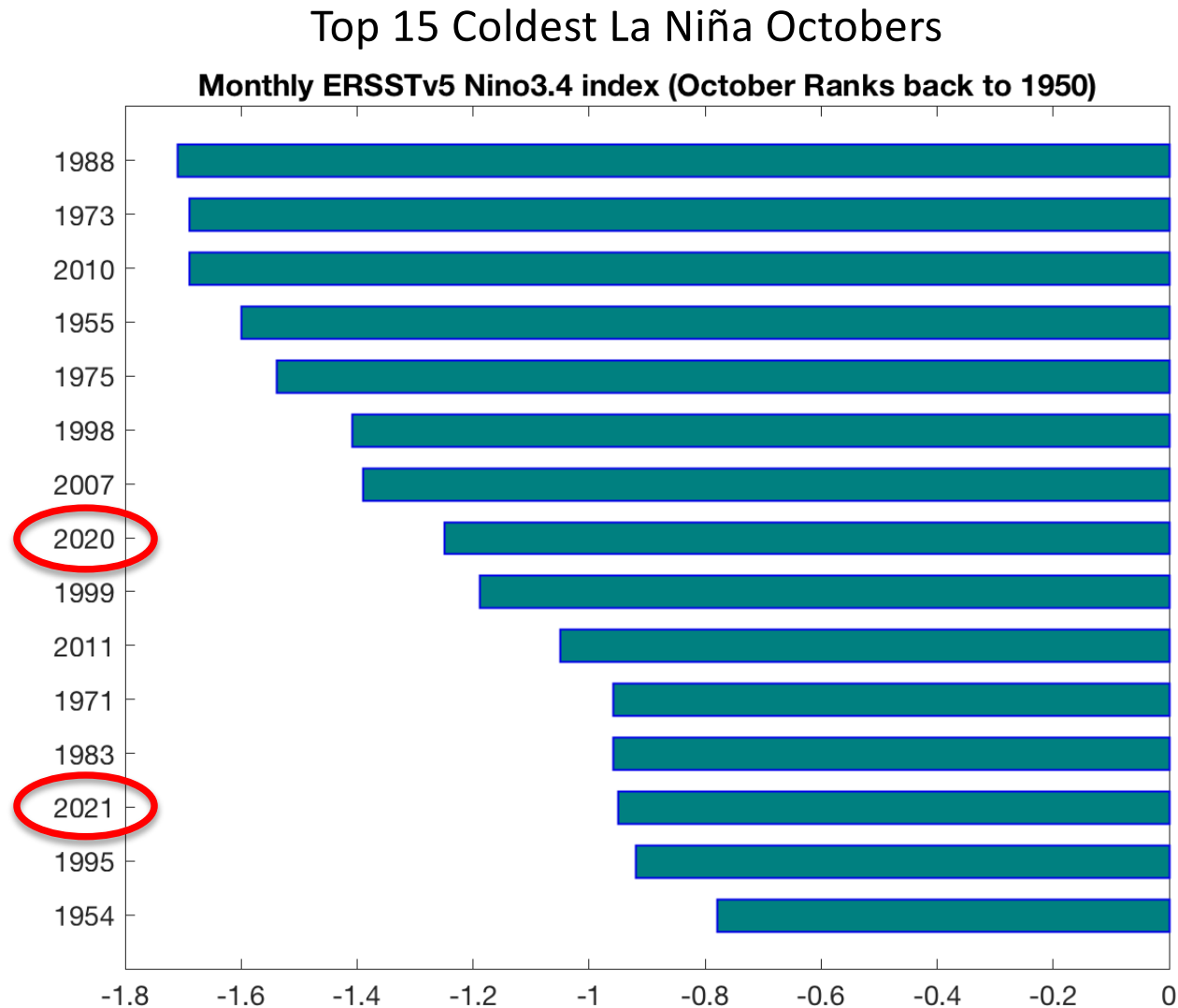
**Below-average SSTs across the equatorial Pacific Ocean, which indicate La Niña**

# This is the 2<sup>nd</sup> 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?



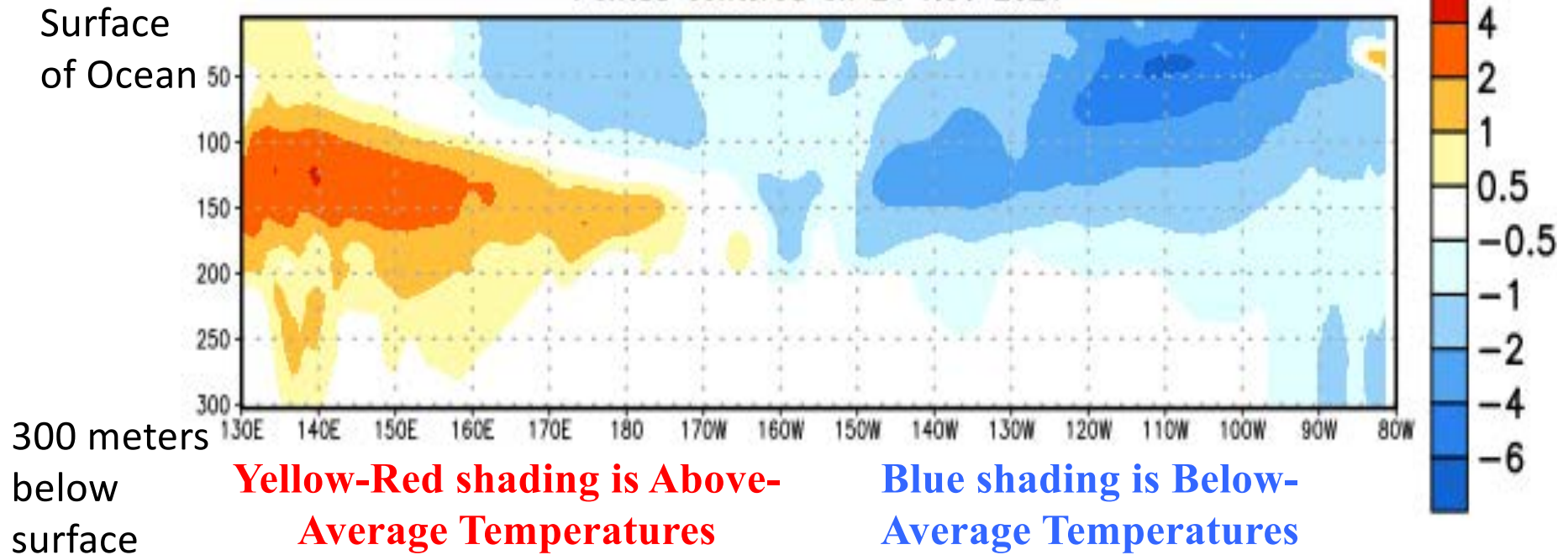
But La Niña is not just monthly SSTs.



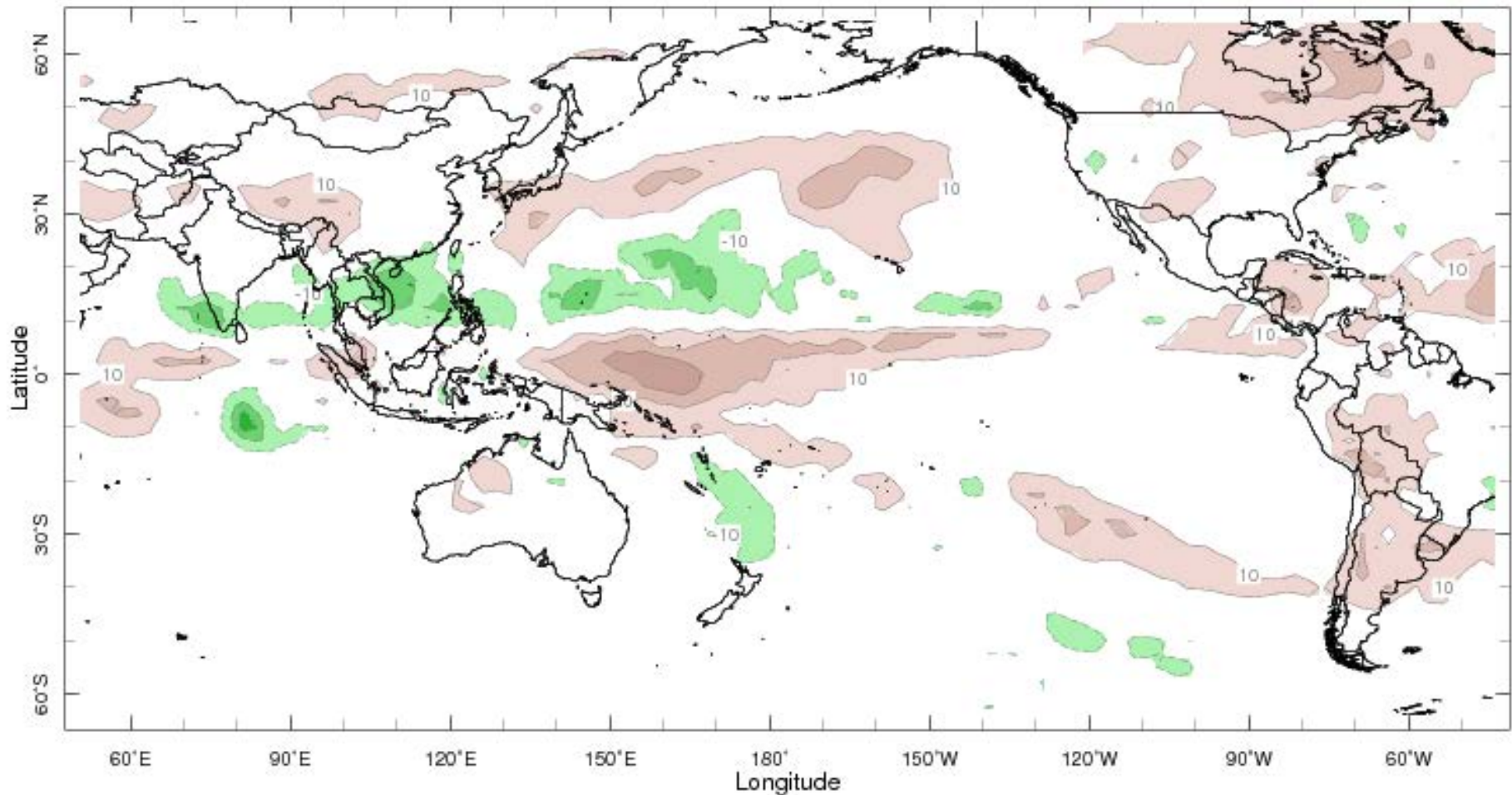
# Subsurface temperature anomalies on the Equator (Pacific Ocean)

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.

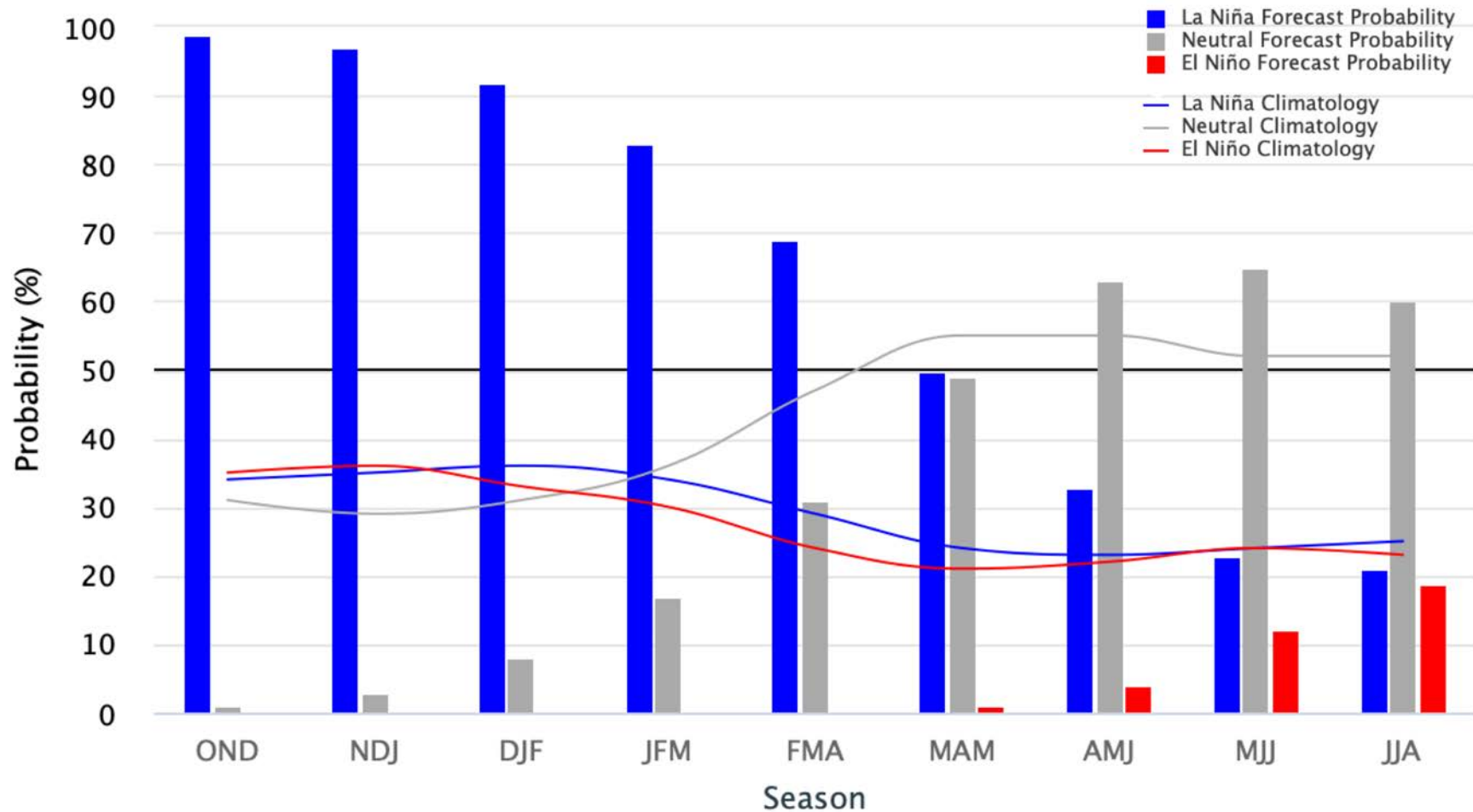


# Current ENSO Probabilities or Chances (in %) (updated 11 November 2021)

Early–November 2021 CPC/IRI Official Probabilistic ENSO Forecasts

ENSO state based on NINO3.4 SST Anomaly

Neutral ENSO:  $-0.5^{\circ}\text{C}$  to  $0.5^{\circ}\text{C}$



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

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

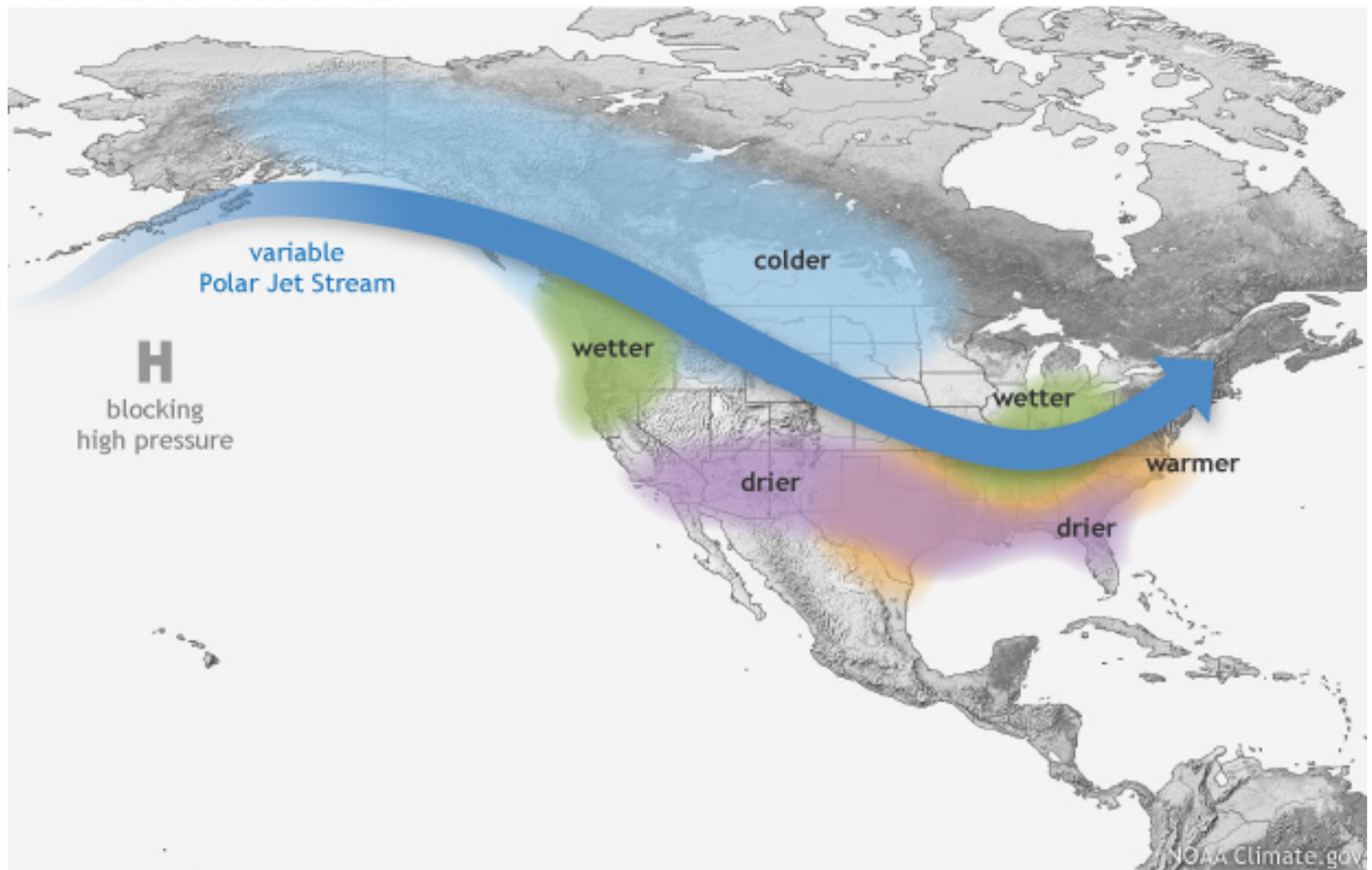
**The CPC seasonal outlook was  
updated on Thurs. Nov. 18<sup>th</sup>**

**(next one is Thurs. Dec. 16<sup>th</sup>)**

**[http://www.cpc.ncep.noaa.gov/products/predictions/long\\_range/](http://www.cpc.ncep.noaa.gov/products/predictions/long_range/)**

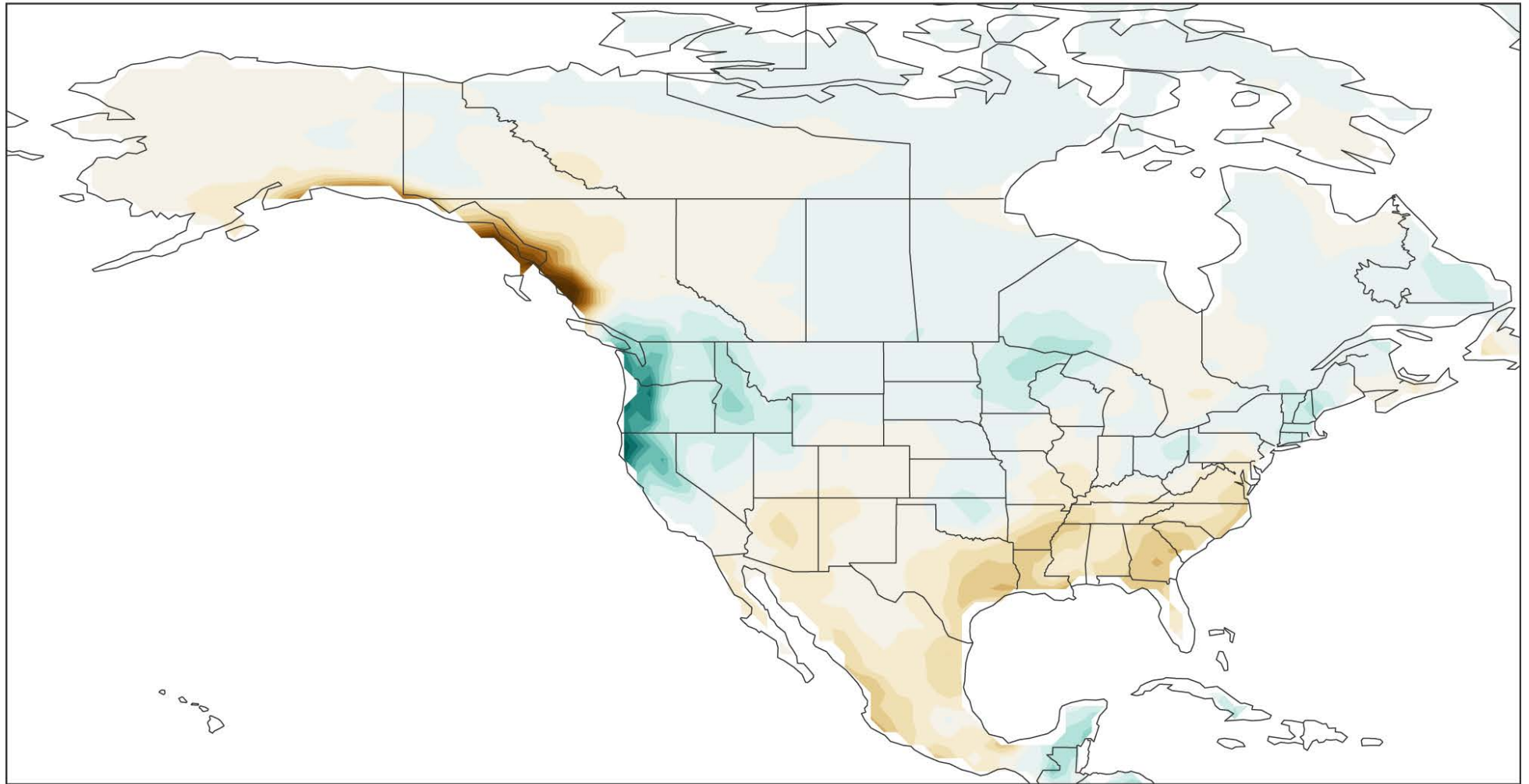
# Schematic Version of La Niña Impacts

## WINTER LA NIÑA PATTERN

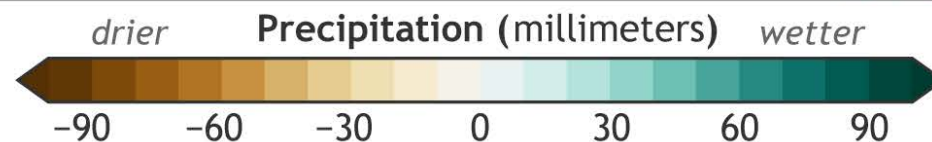


# Average October-December La Niña Precipitation Anomaly

Difference from average precipitation, October–December La Niña years



Oct-Dec, all 23 La Niña  
years since 1948



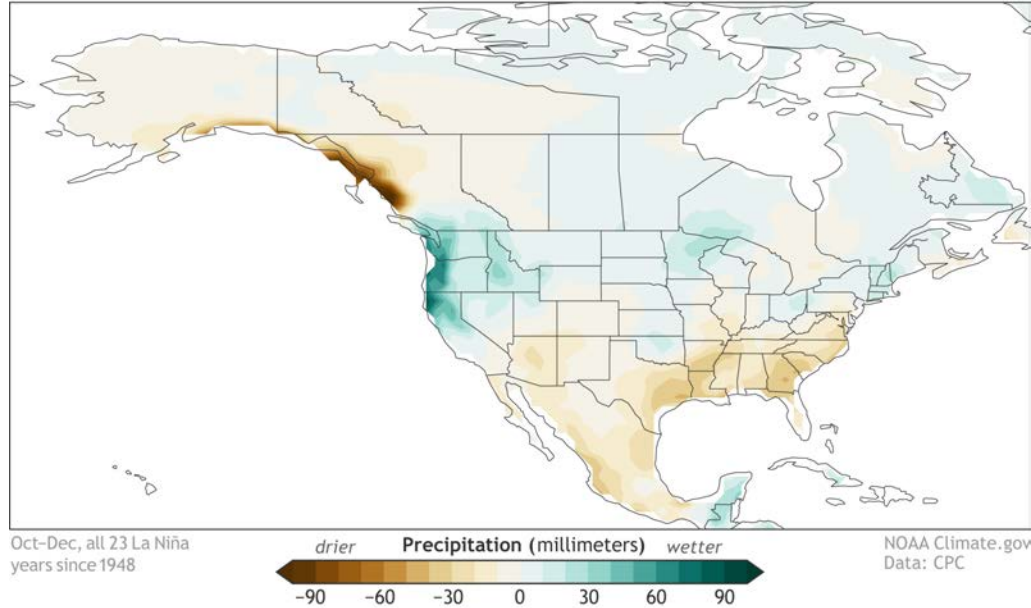
NOAA Climate.gov  
Data: CPC

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

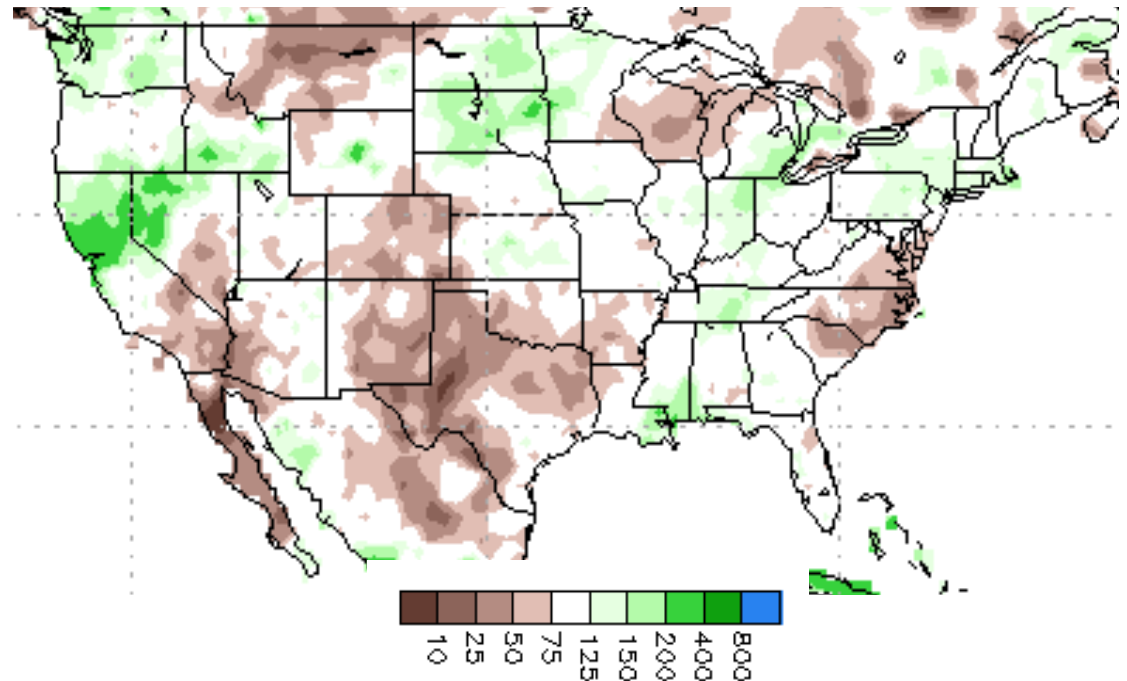


# So far, U.S. Precipitation Anomalies are pretty La Niña-ish

Difference from average precipitation, October–December La Niña years



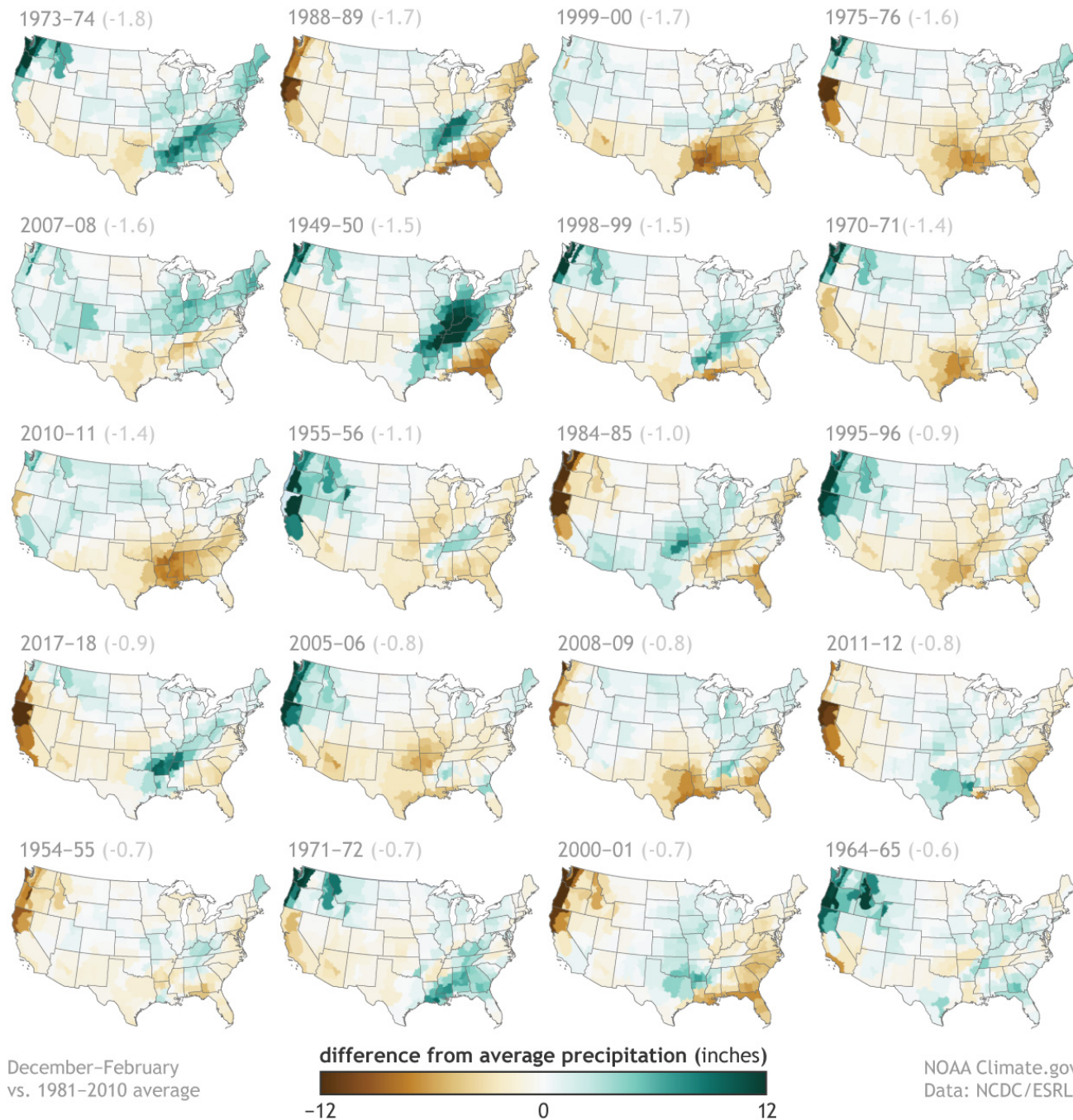
Last 90 days Percent of Average Precipitation  
(through 27 November 2021)



# Precipitation anomalies associated with La Niña winters

Winter precipitation during the 20 strongest La Niña events since 1950

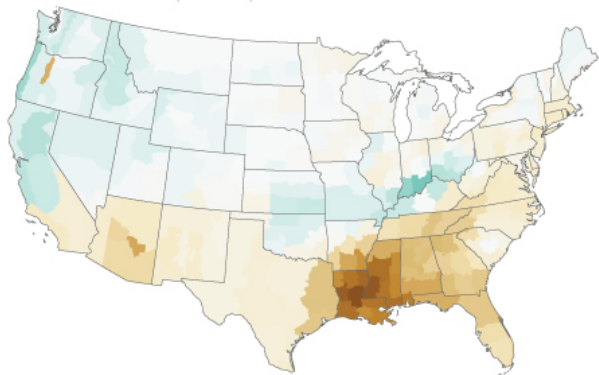
Dec-Feb (ONI value)



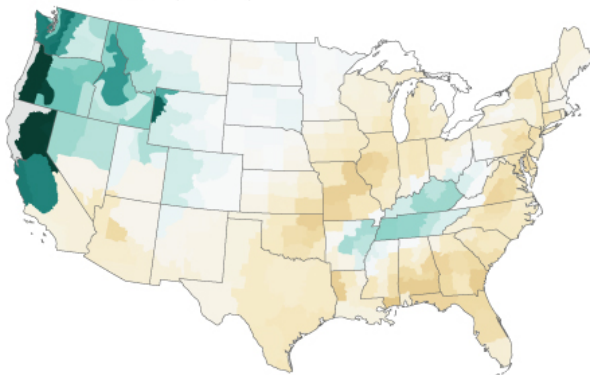
# Precipitation anomalies associated with 2<sup>nd</sup> Dip La Niña winters

Dec-Feb (ONI value)

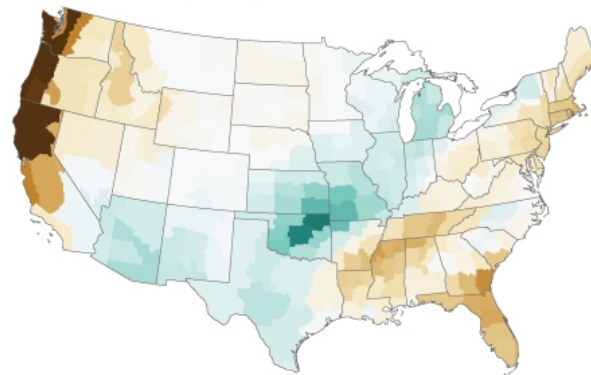
1999-00 (-1.7)



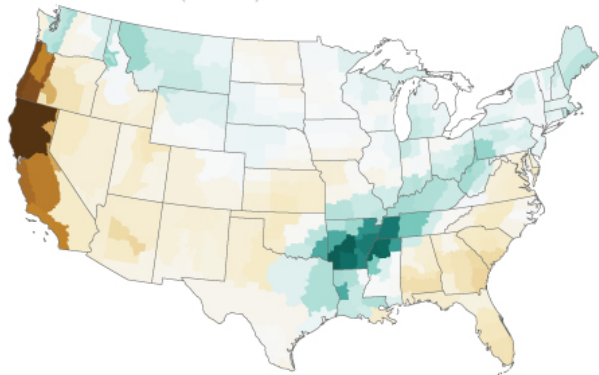
1955-56 (-1.1)



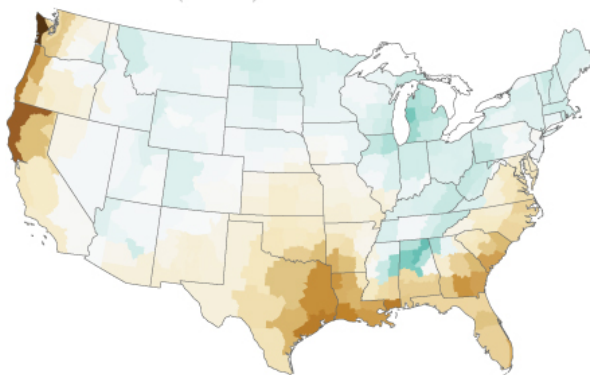
1984-85 (-1.0)



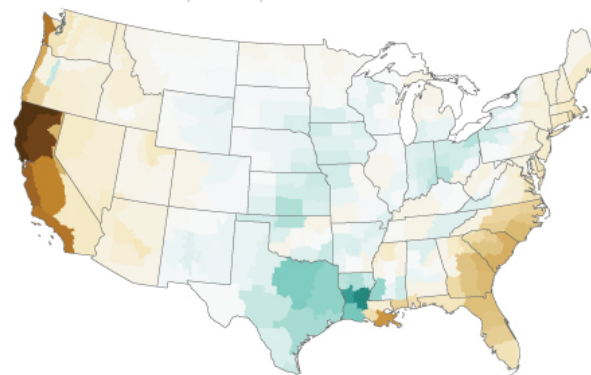
2017-18 (-0.9)



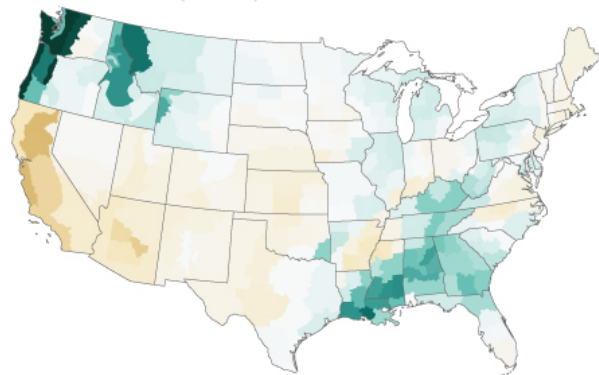
2008-09 (-0.8)



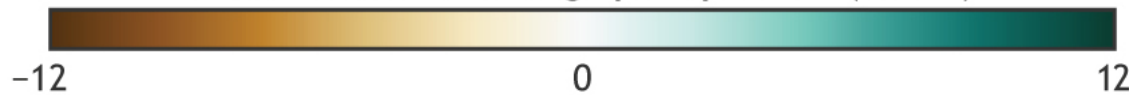
2011-12 (-0.8)



1971-72 (-0.7)



difference from average precipitation (inches)



December-February  
vs. 1981-2010 average

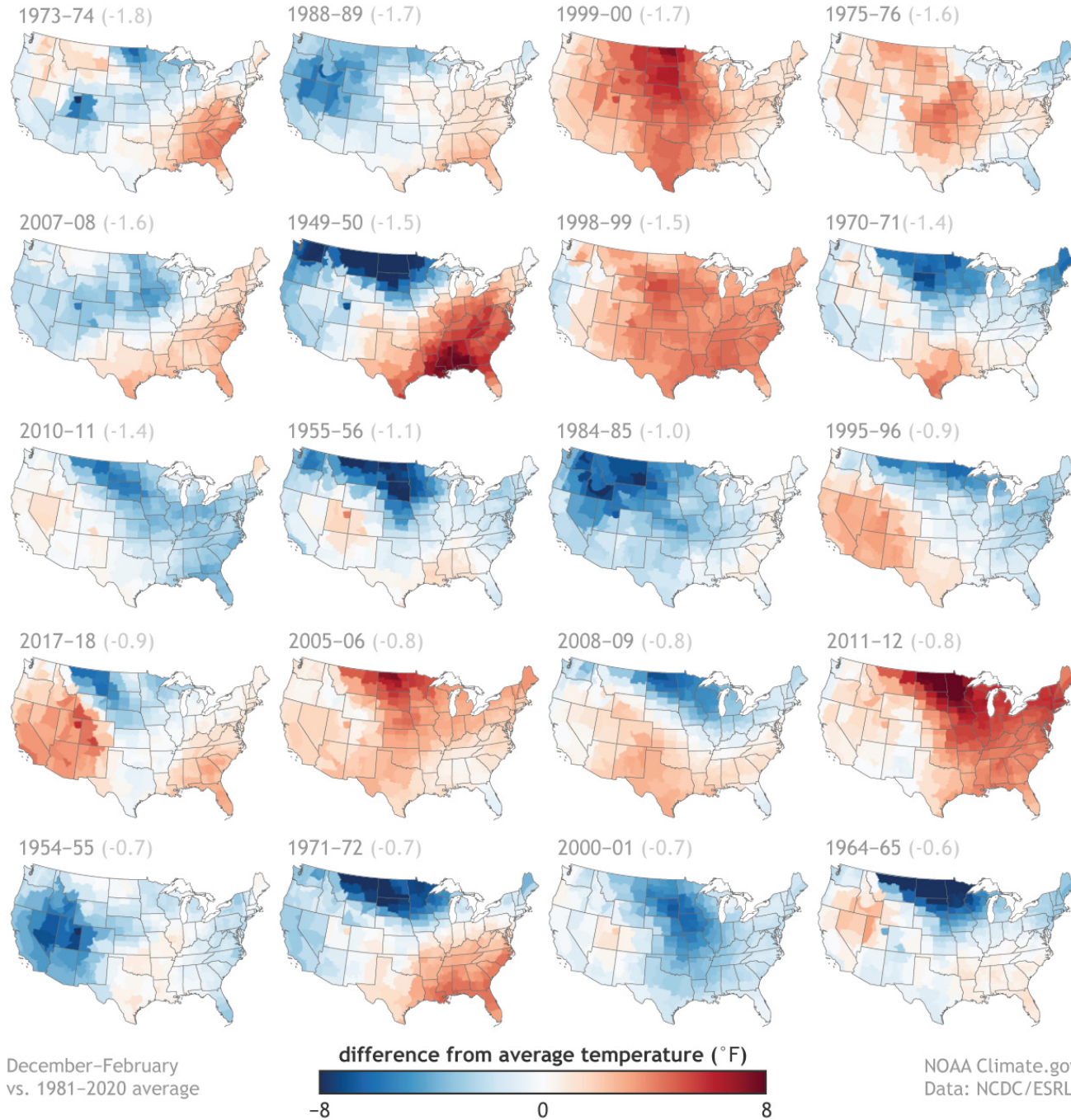
NOAA Climate.gov  
Data: NCDC/ESRL



# Temperature anomalies associated with La Niña winters

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

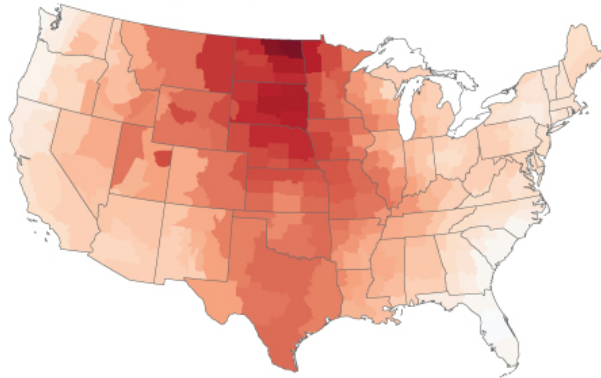
Dec-Feb (ONI value)



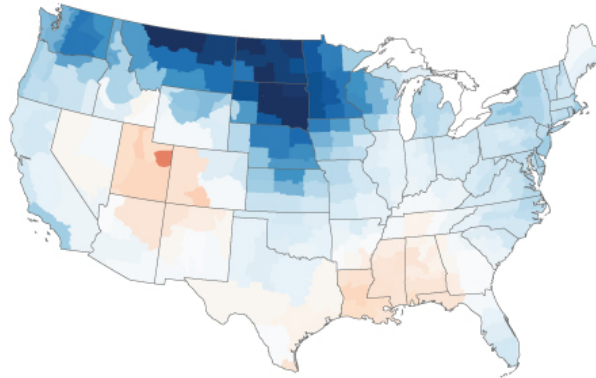
# Temperature anomalies associated with 2<sup>nd</sup> Dip La Niña winters

Dec-Feb (ONI value)

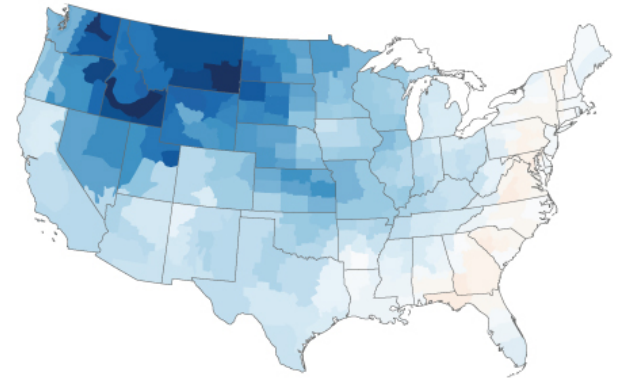
1999-00 (-1.7)



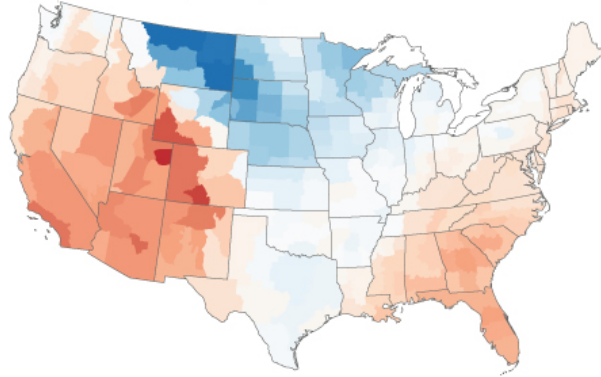
1955-56 (-1.1)



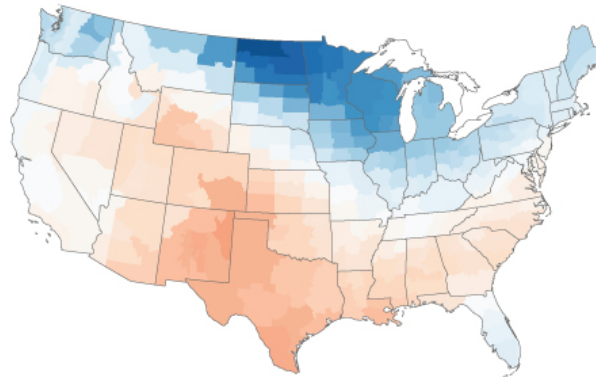
1984-85 (-1.0)



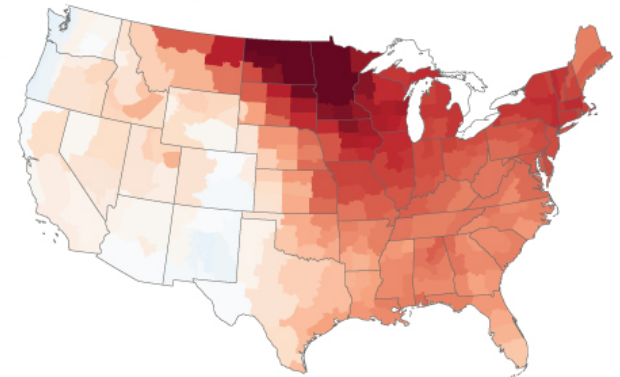
2017-18 (-0.9)



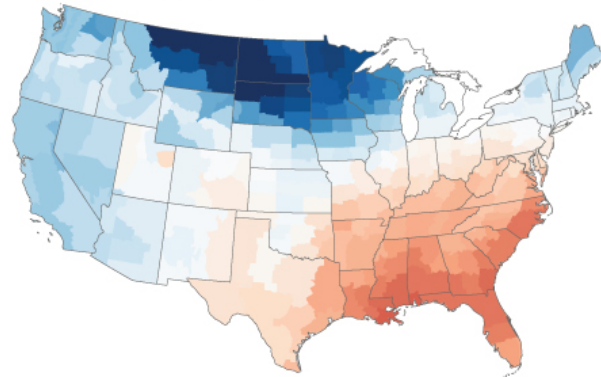
2008-09 (-0.8)



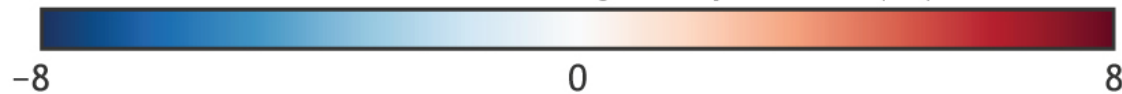
2011-12 (-0.8)



1971-72 (-0.7)



difference from average temperature (°F)



December-February  
vs. 1981-2010 average

NOAA Climate.gov  
Data: NCDC/ESRL

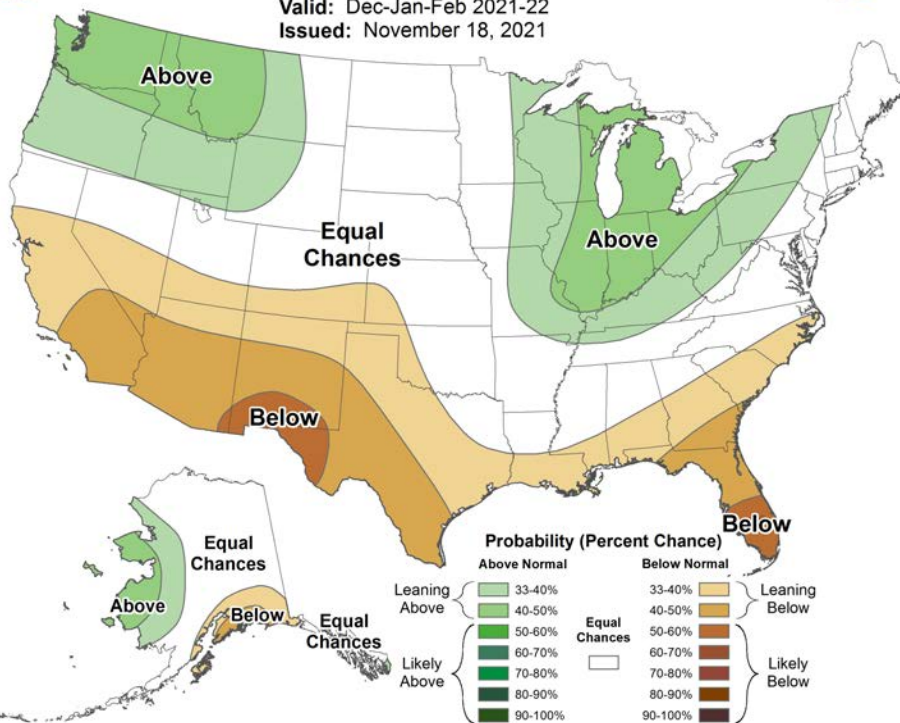


# December-January-February (DJF) Outlook 2021-22

## Precipitation Chances

### Seasonal Precipitation Outlook

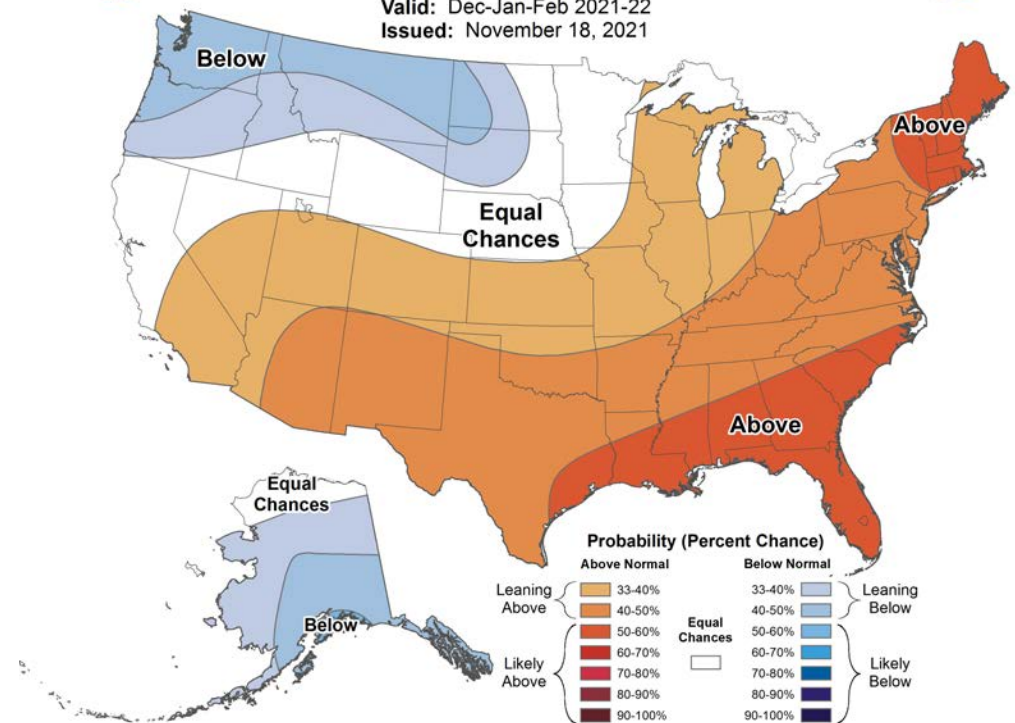
Valid: Dec-Jan-Feb 2021-22  
Issued: November 18, 2021



## Temperature Chances

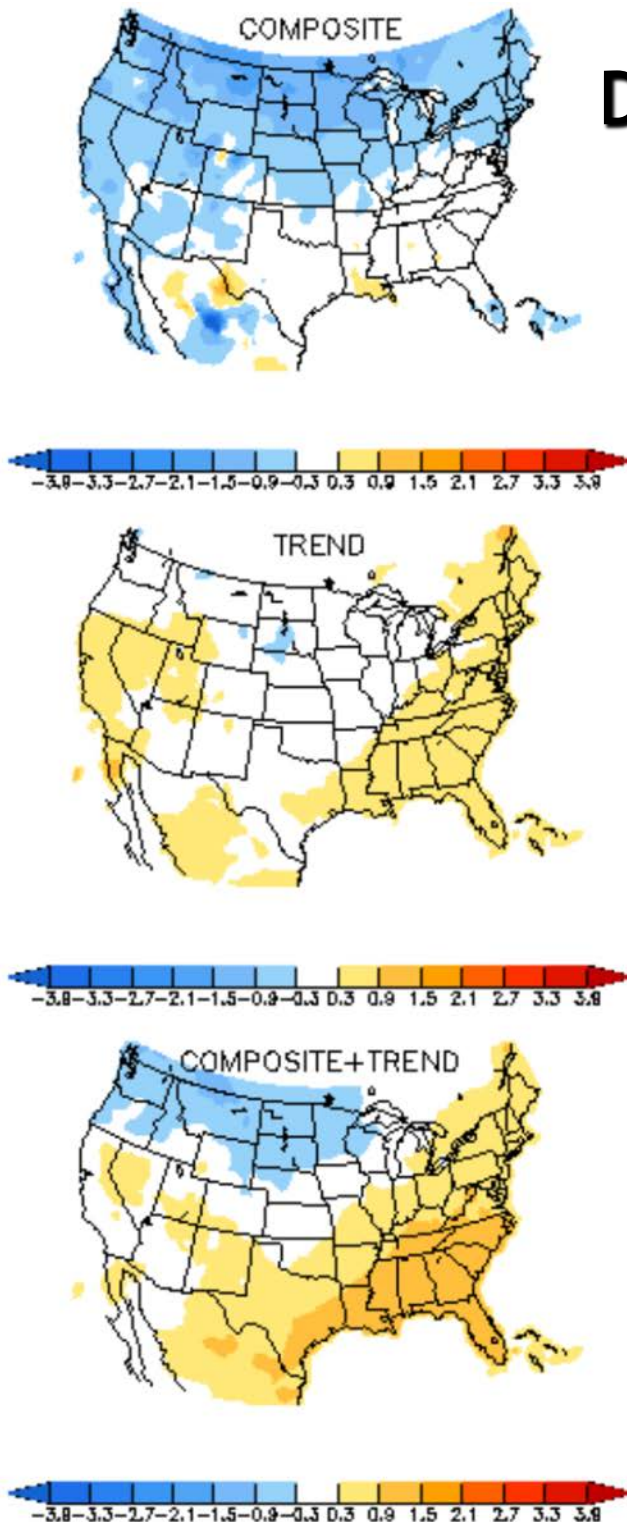
### Seasonal Temperature Outlook

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



[http://www.cpc.ncep.noaa.gov/products/predictions/long\\_range/](http://www.cpc.ncep.noaa.gov/products/predictions/long_range/)

# Dec-Feb La Niña Composite + Trend

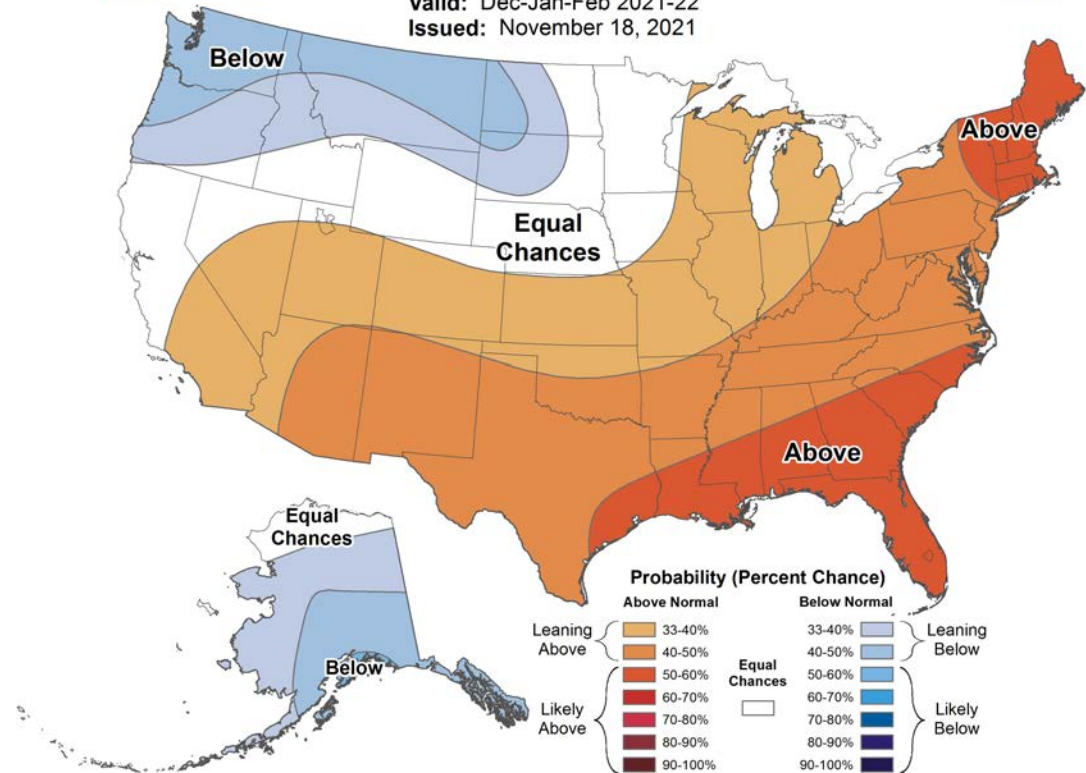


## Seasonal Temperature Outlook



Valid: Dec-Jan-Feb 2021-22

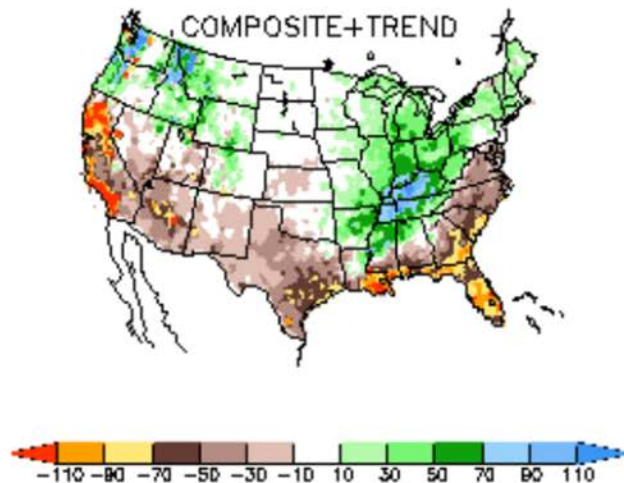
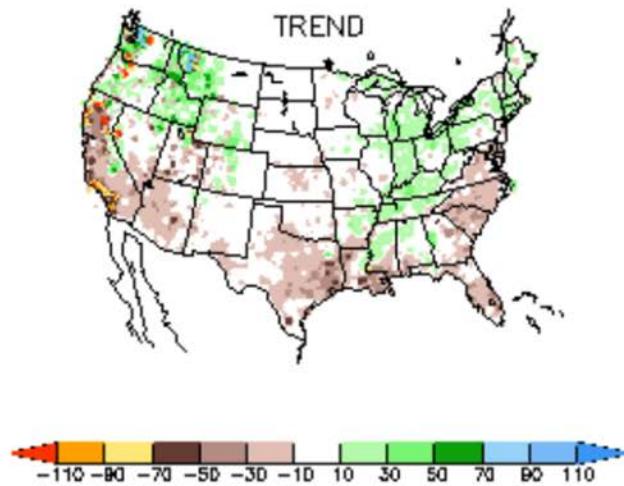
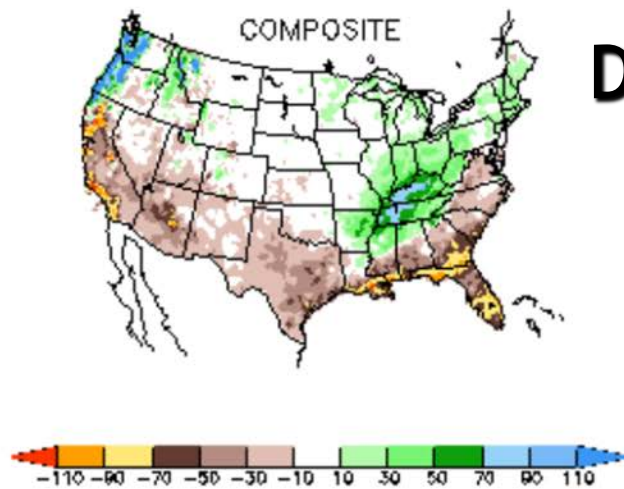
Issued: November 18, 2021



<https://www.cpc.ncep.noaa.gov/products/precip/CWlink/ENSO/composites/>



# Dec-Feb La Niña Composite + Trend

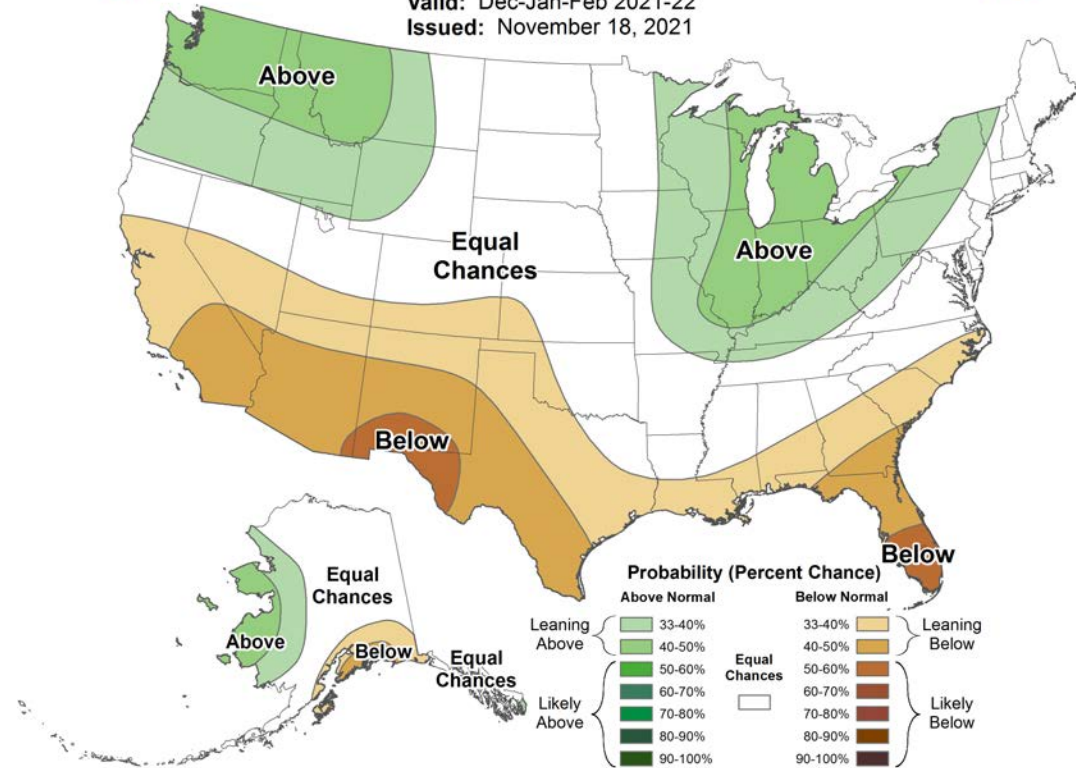


## Seasonal Precipitation Outlook



Valid: Dec-Jan-Feb 2021-22

Issued: November 18, 2021



<https://www.cpc.ncep.noaa.gov/products/precip/CWlink/ENSO/composites/>

# ENSO Blog on Climate.gov

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

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

[https://www.climate.gov/  
news-  
features/blogs/enso/inde  
x-page-enso-blog-posts](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.

### LATEST BLOGS

**Variable Walks In Our  
Climate Forest**

**October 2021 ENSO update:  
La Niña is here!**

**ENSO as a climate conductor  
for global crop yields**

**ENSO and Climate Change:  
What does the new IPCC**

## ENSO Blog

Sort by blog

ENSO

Items per page

10

Sort by Date

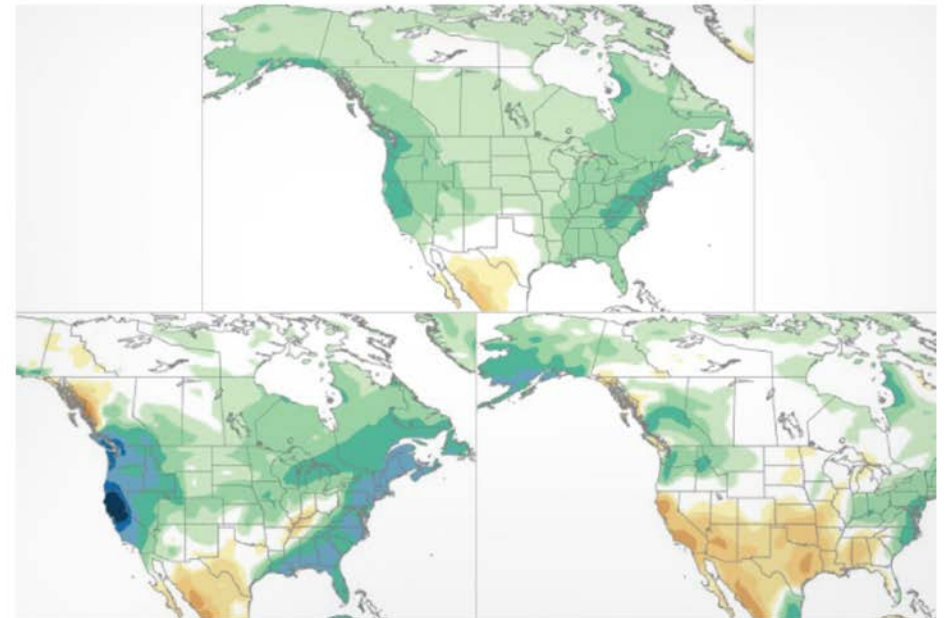
Descending

Apply

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

*[updated on 2<sup>nd</sup> Thursday of each month]*