



El Niño-Southern Oscillation (ENSO) + Upcoming 2022-23 Outlook

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* ENSO blog affiliates

NOAA Eastern Region Climate Webinar Series
29 November 2022



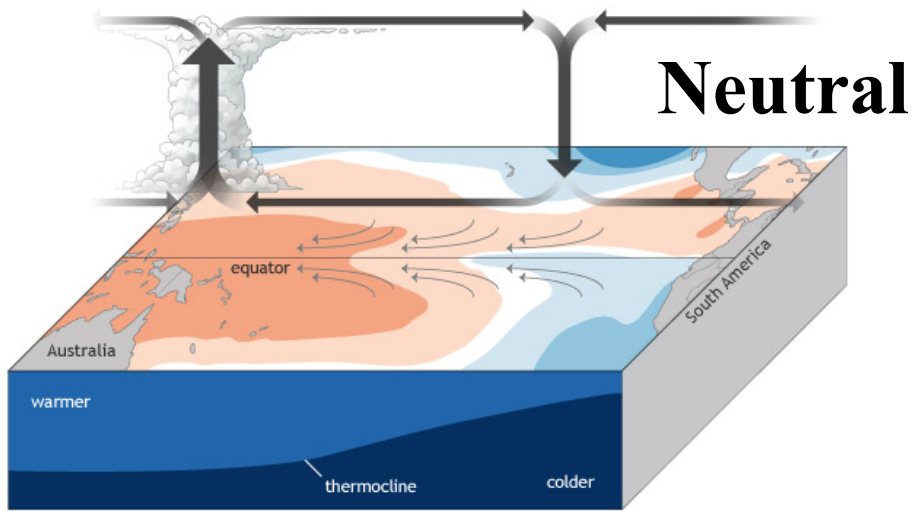
La Niña Advisory

10 November 2022 Update:

There is a 76% chance of La Niña during the Northern Hemisphere winter (December-February) 2022-23, with a transition to ENSO-neutral favored in February-April 2023 (57% chance).

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

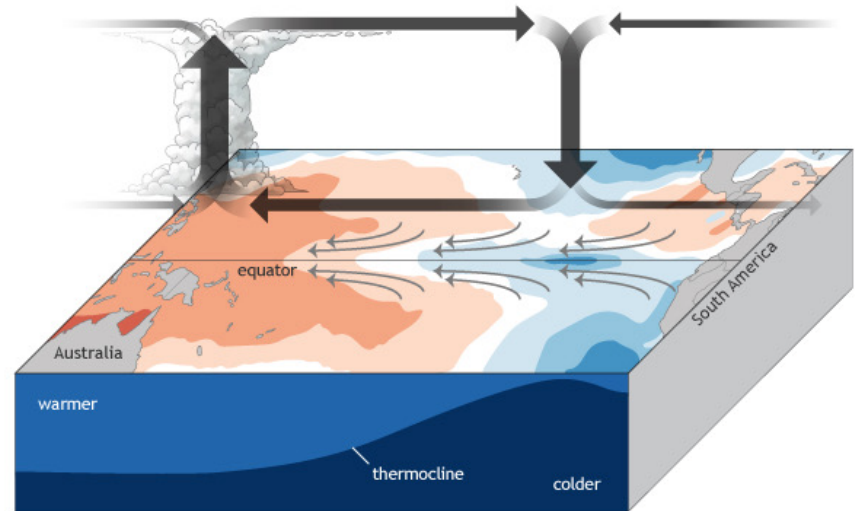
Atmosphere-ocean feedbacks during El Niño-Southern Oscillation
Neutral



NOAA Climate.gov

La Niña

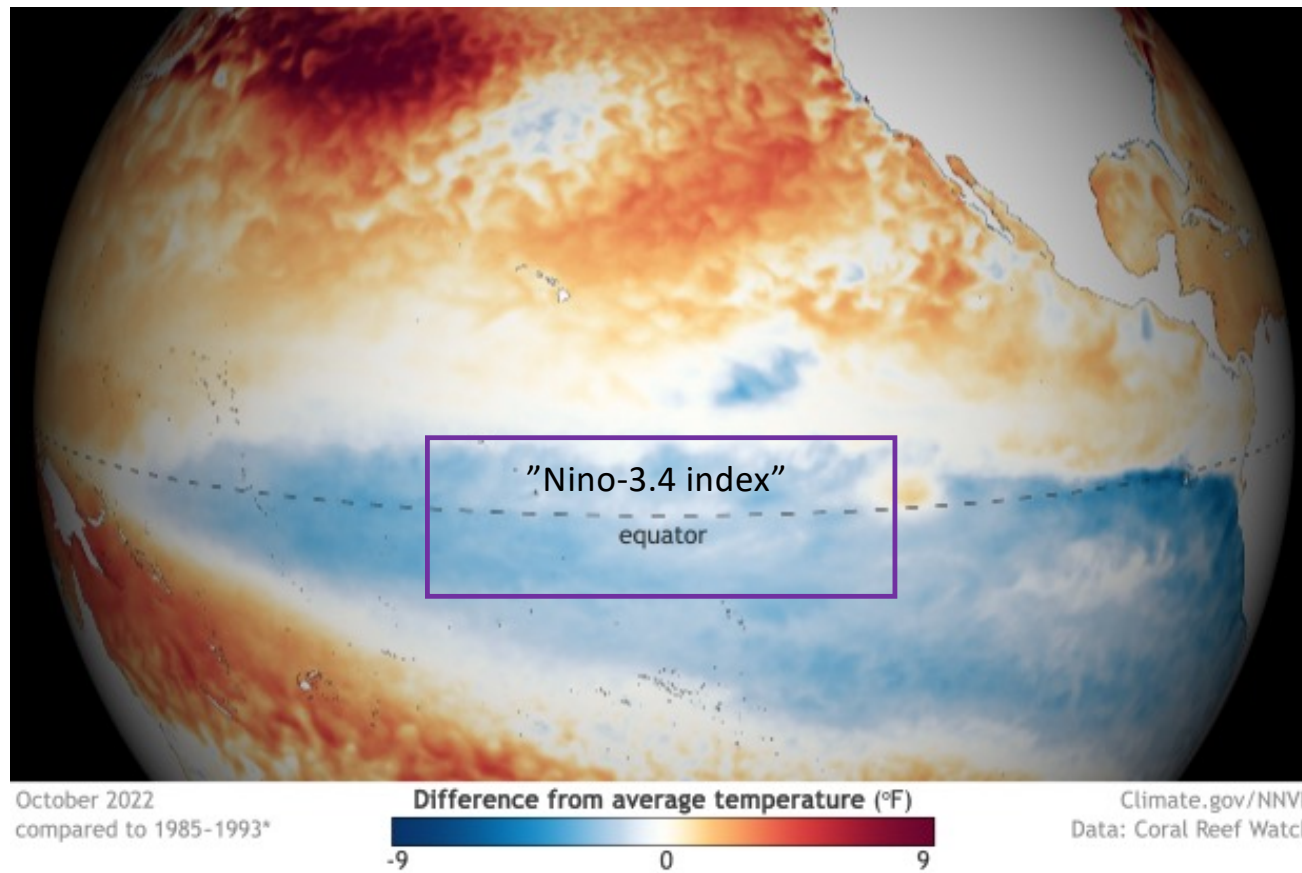
Atmosphere-ocean feedbacks during El Niño-Southern Oscillation
La Niña



NOAA Climate.gov

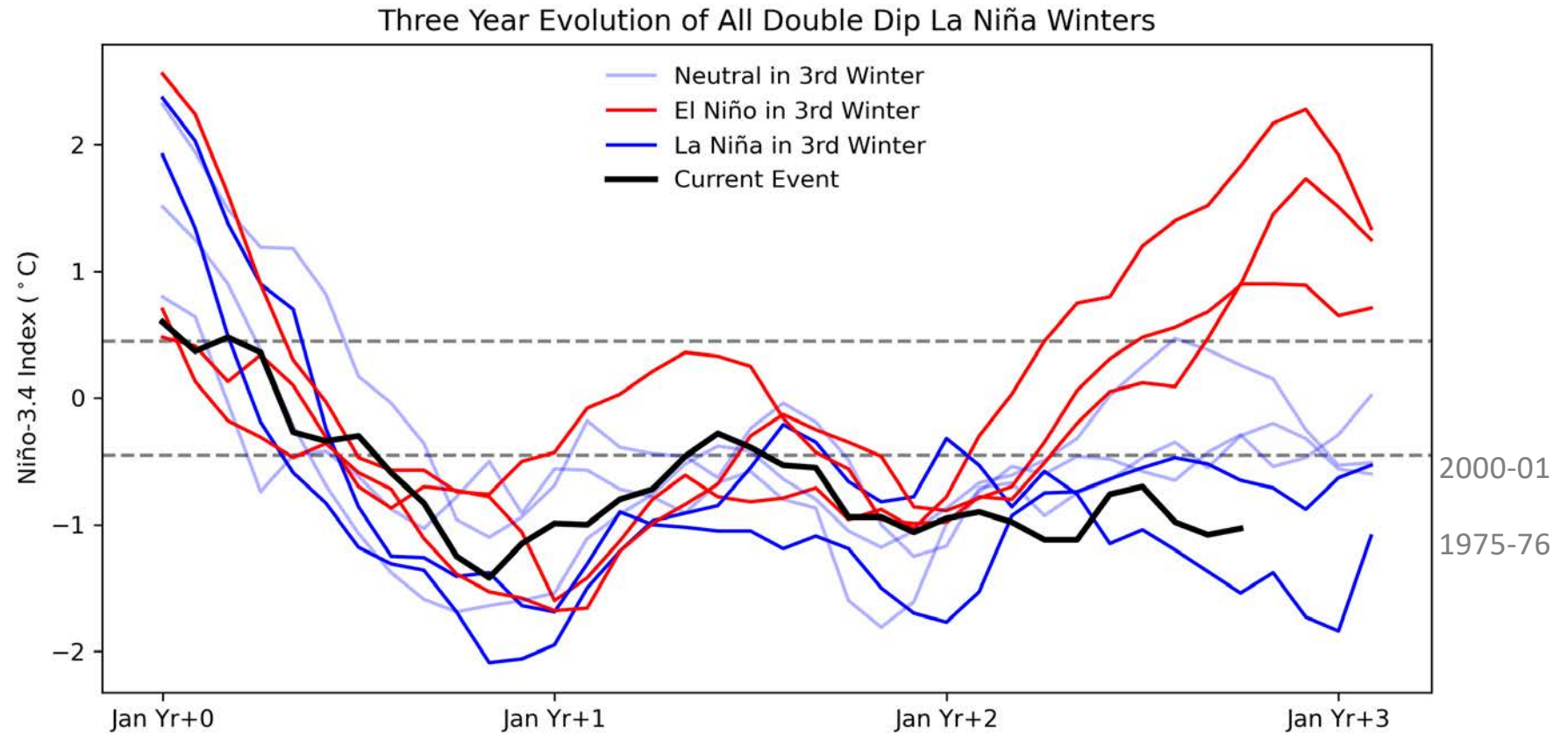
<https://www.climate.gov/news-features/blogs/enso/rise-el-niño-and-la-niña>

October 2022 Sea Surface Temperature (SST) Departures



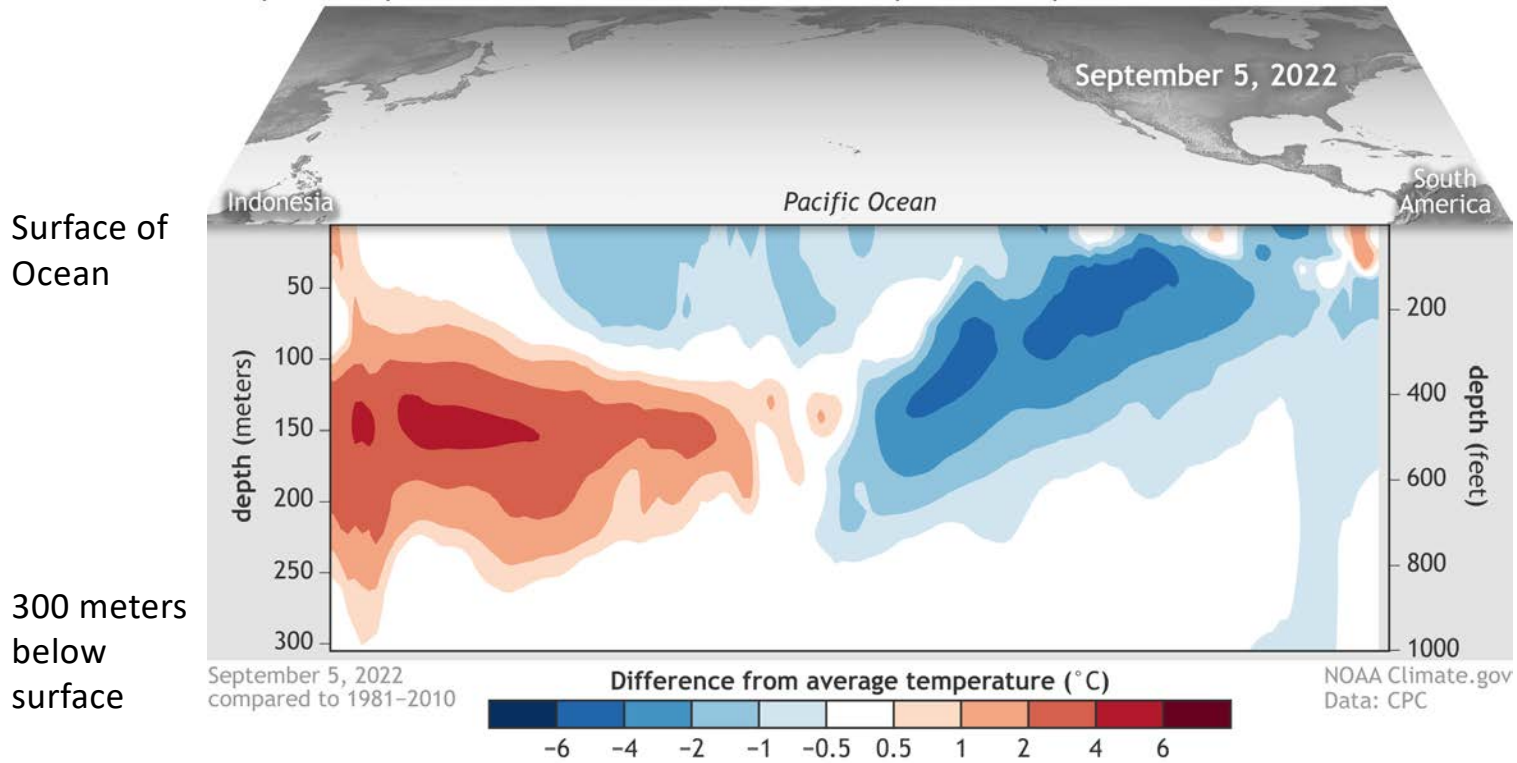
<https://www.climate.gov/maps-data/data-snapshots/data-source/sst-enso-region-monthly-difference-average>

Triple Dip, Triple Decker, Three-Peat (aka third winter of La Niña)



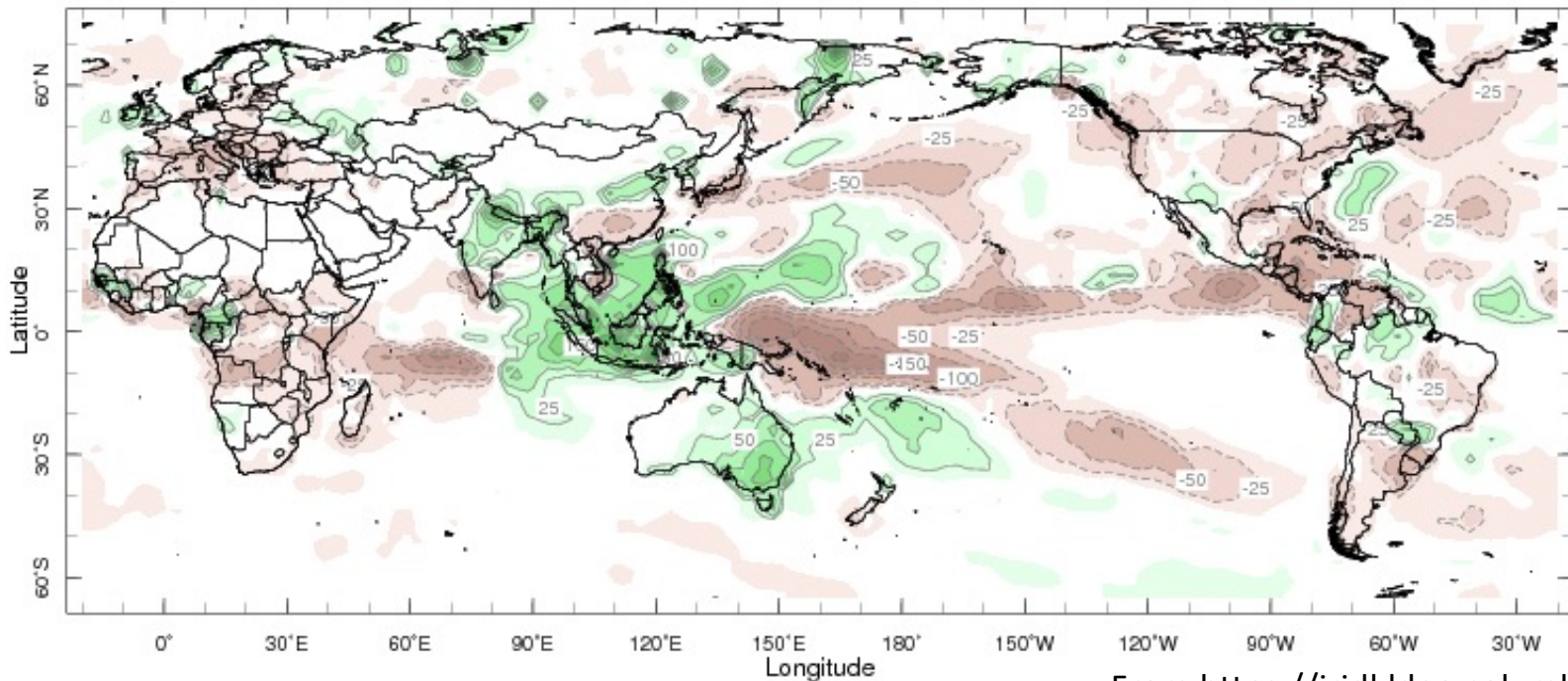
Subsurface Temperature Departures during September and October 2022

Temperature patterns beneath the surface of the equatorial tropical Pacific



<https://www.climate.gov/news-features/blogs/november-2022-la-niña-update-let's-get-some-exercise>

Cloudiness/Rainfall Anomalies in October 2022



Oct 2022

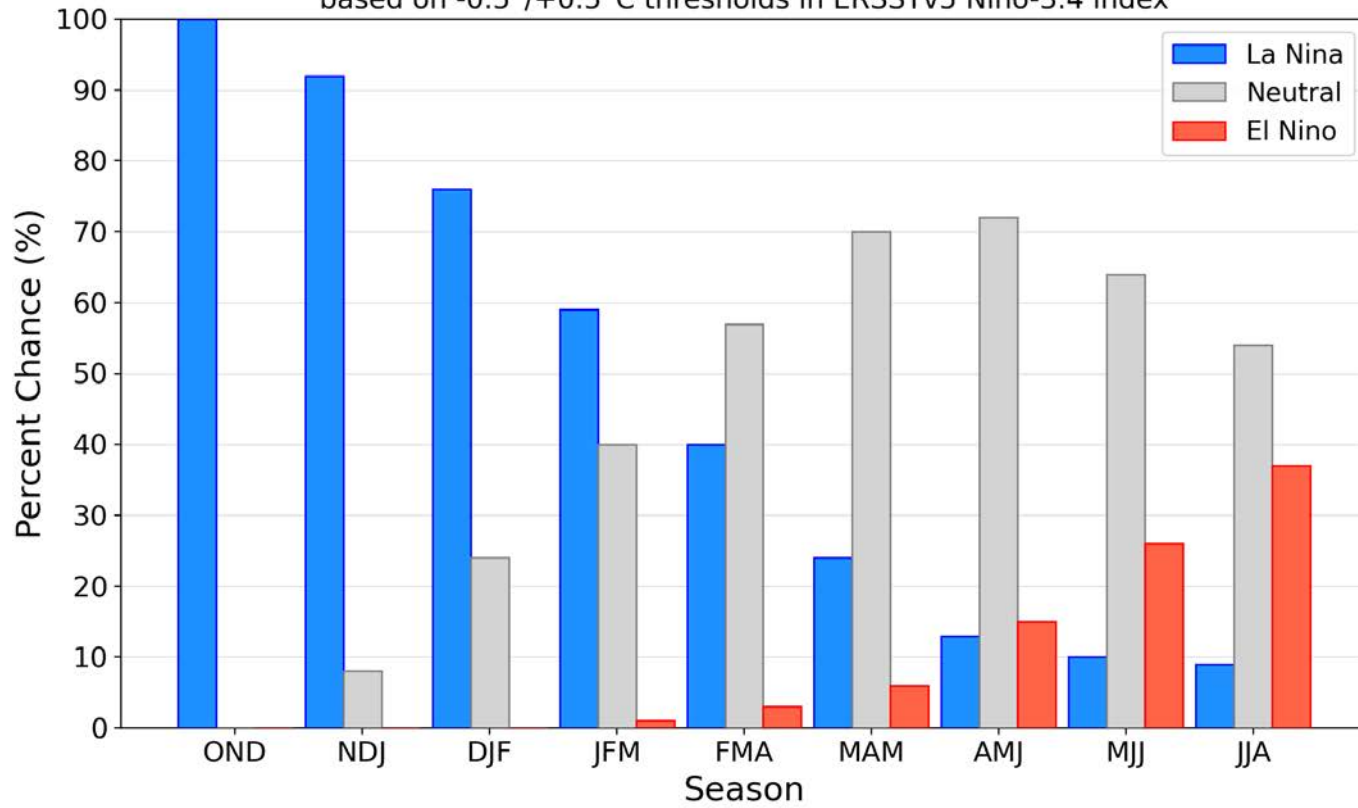
From <https://iridl.ldeo.columbia.edu/>

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

ENSO Outlook (updated 10 November)

Official NOAA CPC ENSO Probabilities (issued Nov. 2022)

based on $-0.5^{\circ}/+0.5^{\circ}\text{C}$ thresholds in ERSSTv5 Niño-3.4 index



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

Niño3.4 Index Strength Outlook (updated 10 November)

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	61	~100	~0	~0	~0
NDJ	5	45	92	~0	~0	~0
DJF	4	30	76	~0	~0	~0
JFM	2	17	59	1	~0	~0
FMA	~0	7	40	3	~0	~0
MAM	~0	2	24	6	~0	~0
AMJ	~0	1	13	15	1	~0
MJJ	~0	1	10	26	4	~0
JJA	~0	1	9	37	11	1
	< -1.5°C	< -1.0°C	< -0.5°C	> 0.5°C	> 1.0°C	> 1.5°C

For the upcoming seasons, there is a 45% to 61% chance of Niño-3.4 index less than -1.0°C, but 2-5% chance of the index being less than -1.5°C.

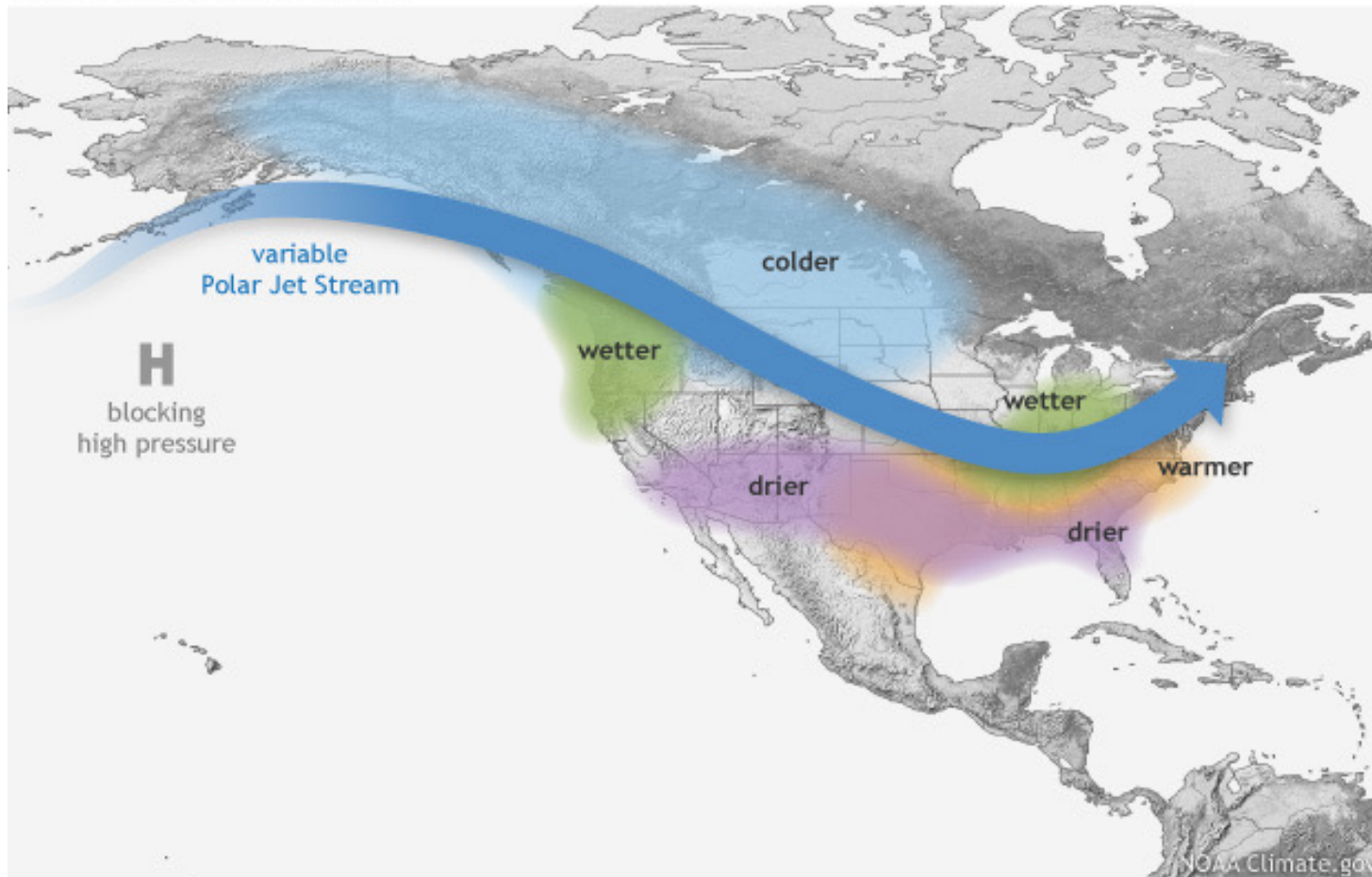
So, favoring a moderate strength event. Niño3.4 SST is probably around its minimum right now.

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

Let's shift to Potential Impacts

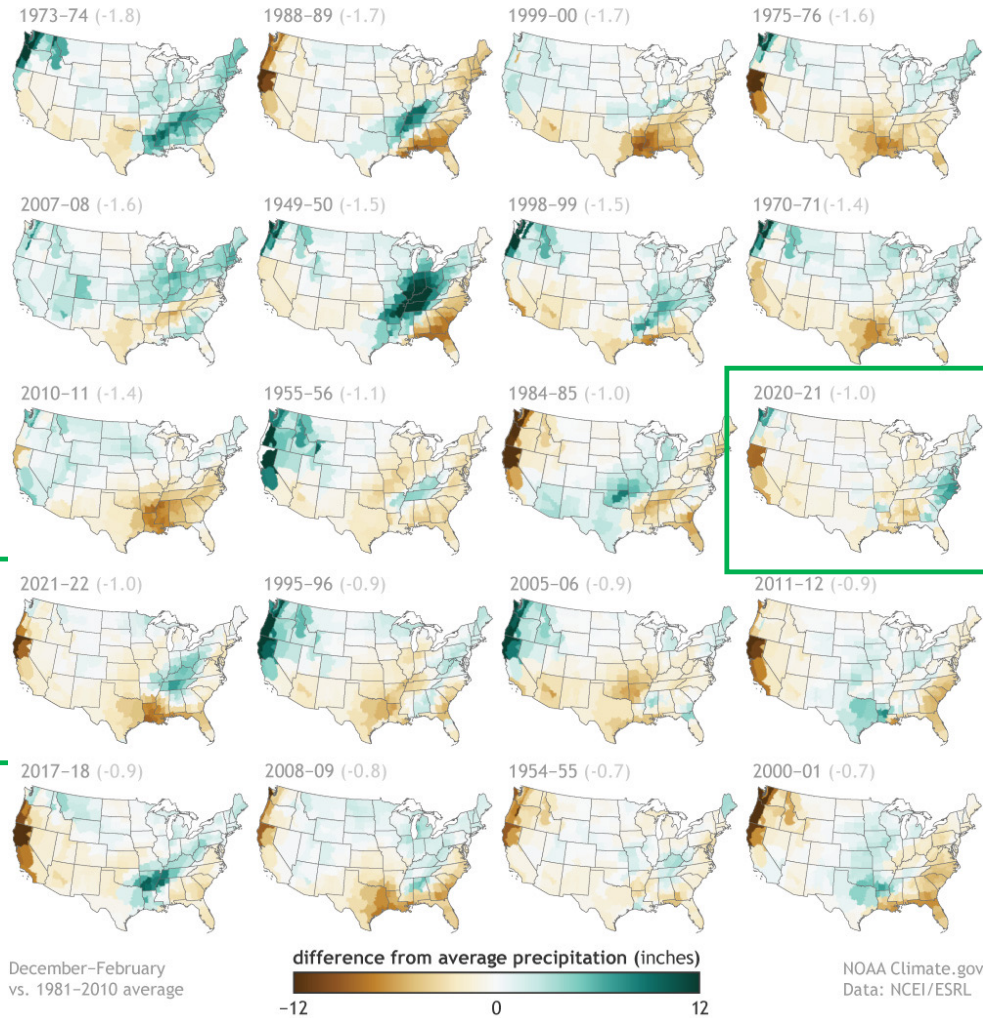
Schematic Version of La Niña Impacts

WINTER LA NIÑA PATTERN



Precipitation anomalies associated with La Niña winters

Winter precipitation during the 20 strongest La Niña events since 1950
Dec-Feb (ONI value)



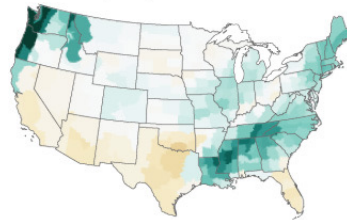
Previous Triple Dip La Niñas (Precipitation)

Winter precipitation during La Niña three-peats

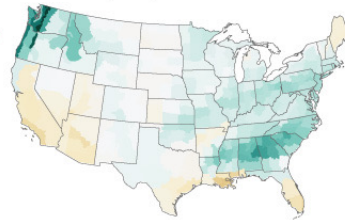
Dec-Feb (ONI value)

Three-peat #1

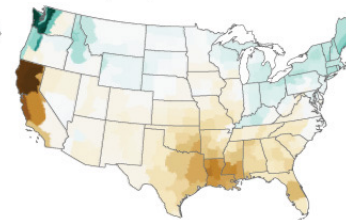
1973-74 (-1.8)



1974-75 (-0.5)

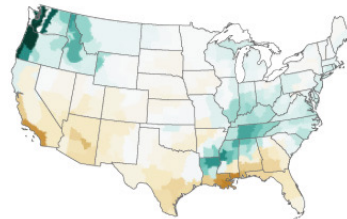


1975-76 (-1.6)

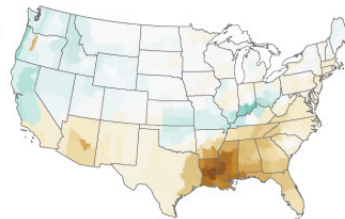


Three-peat #2

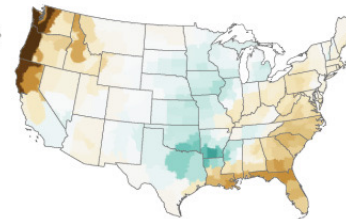
1998-99 (-1.5)



1999-00 (-1.7)

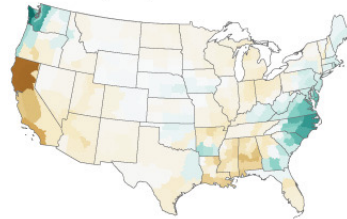


2000-01 (-0.7)

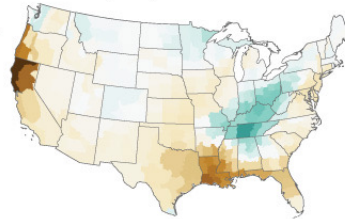


Three-peat #3

2020-21 (-1.0)



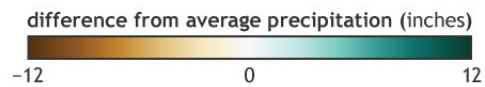
2021-22 (-1.0)



2022-23



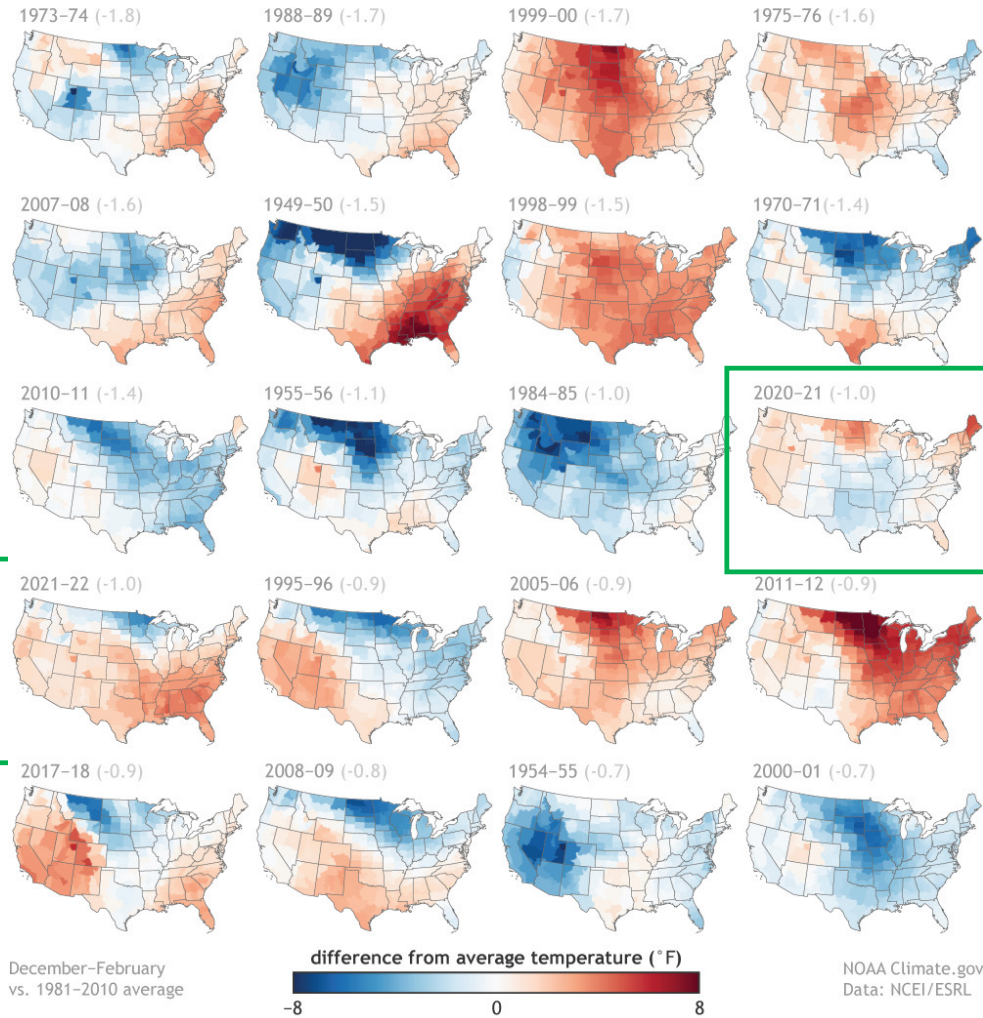
December-February
vs. 1981-2010 average



NOAA Climate.gov
Data: NCEI/ESRL

Temperature anomalies associated with La Niña winters

Winter temperature patterns during the 20 strongest La Niña events since 1950
Dec-Feb (ONI value)



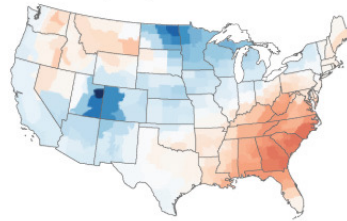
Previous Triple Dip La Niñas (Temperature)

Winter temperatures during La Niña three-peats

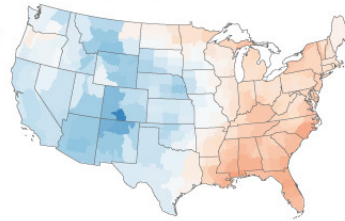
Dec-Feb (ONI value)

Three-peat #1

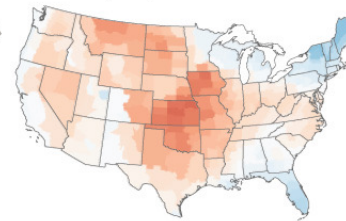
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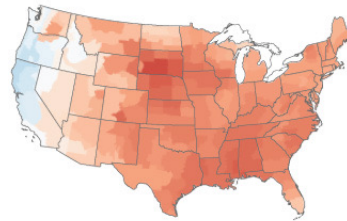


1975-76 (-1.6)

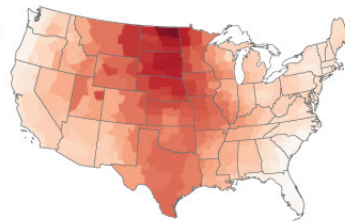


Three-peat #2

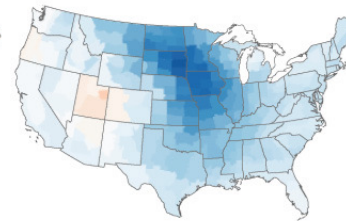
1998-99 (-1.5)



1999-00 (-1.7)

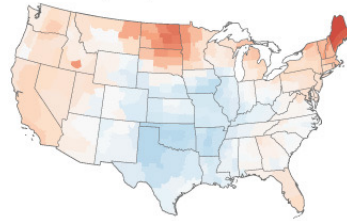


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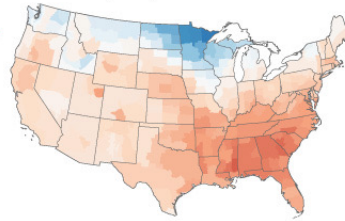


Three-peat #3

2020-21 (-1.0)



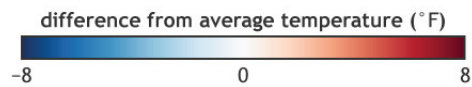
2021-22 (-1.0)



2022-23

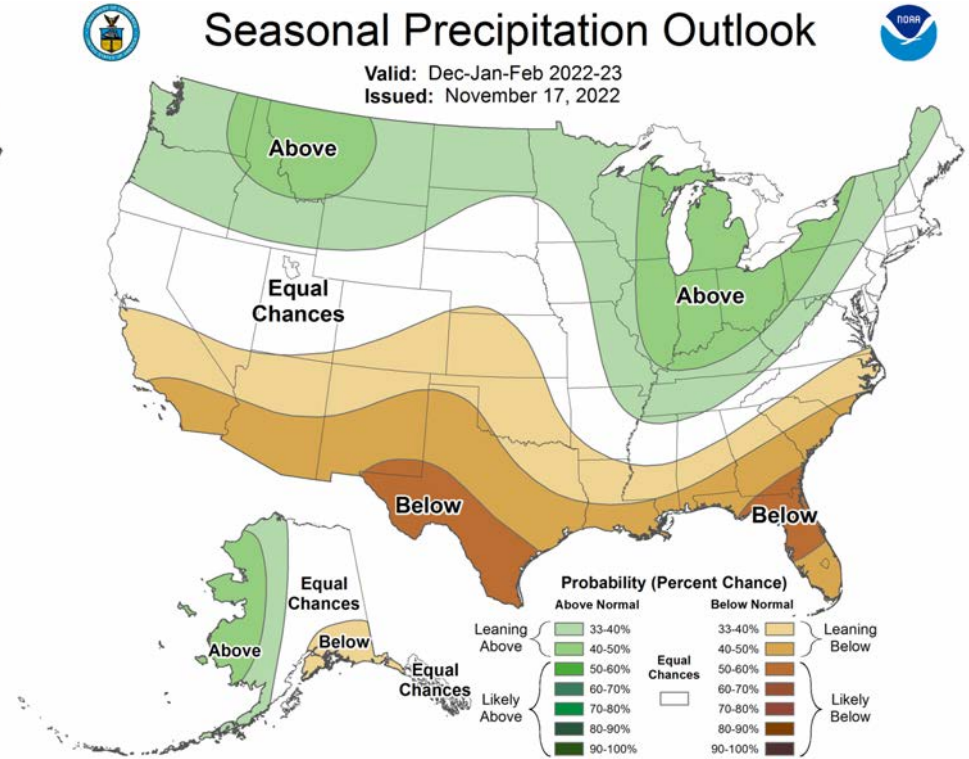
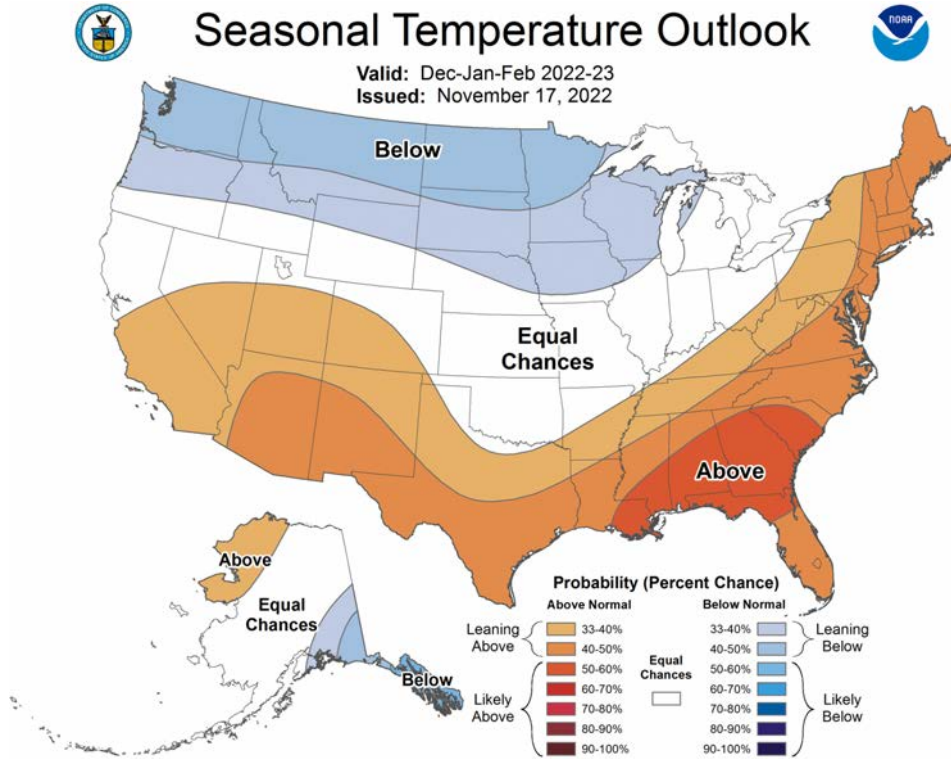


December-February
vs. 1981-2010 average



NOAA Climate.gov
Data: NCEI/ESRL

December 2022-February 2023 Seasonal Outlook

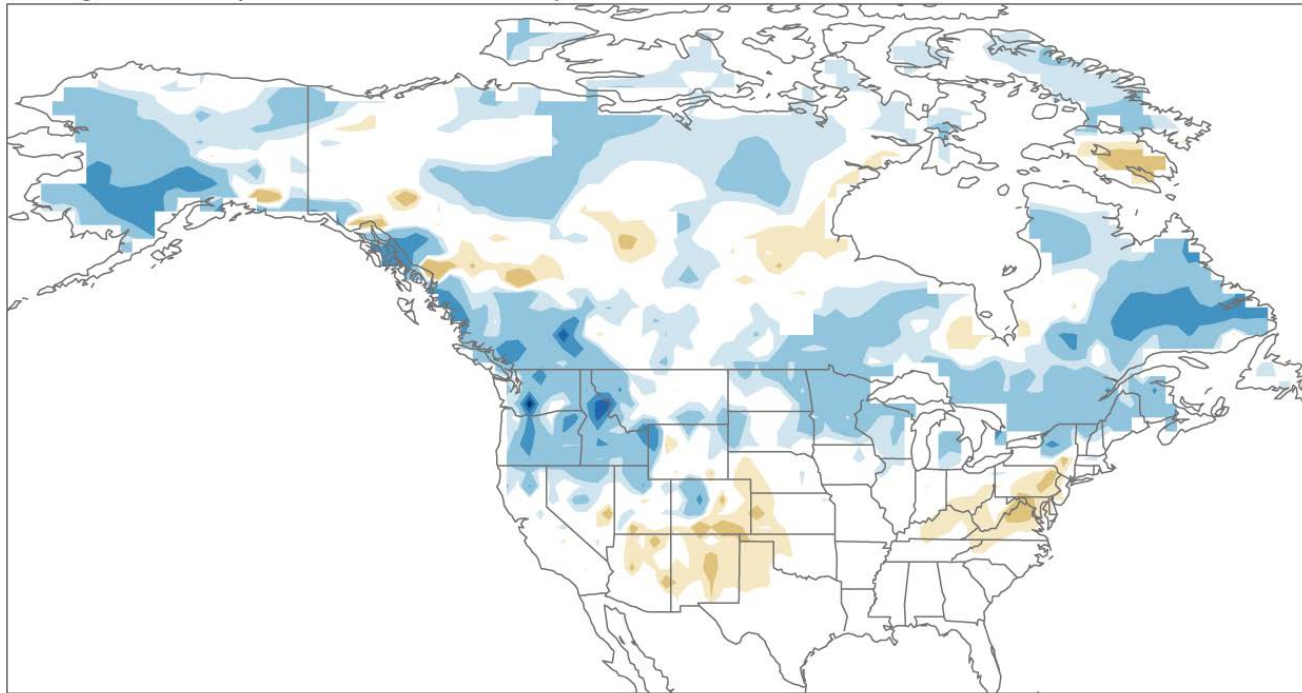


Broadly similar pattern for the Eastern US through February-April (FMA)

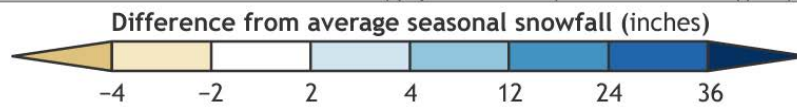
Other seasons here: <https://www.cpc.ncep.noaa.gov/products/predictions/90day/>

October-April Average Snowfall during La Niña

Average snowfall patterns for all La Niña years



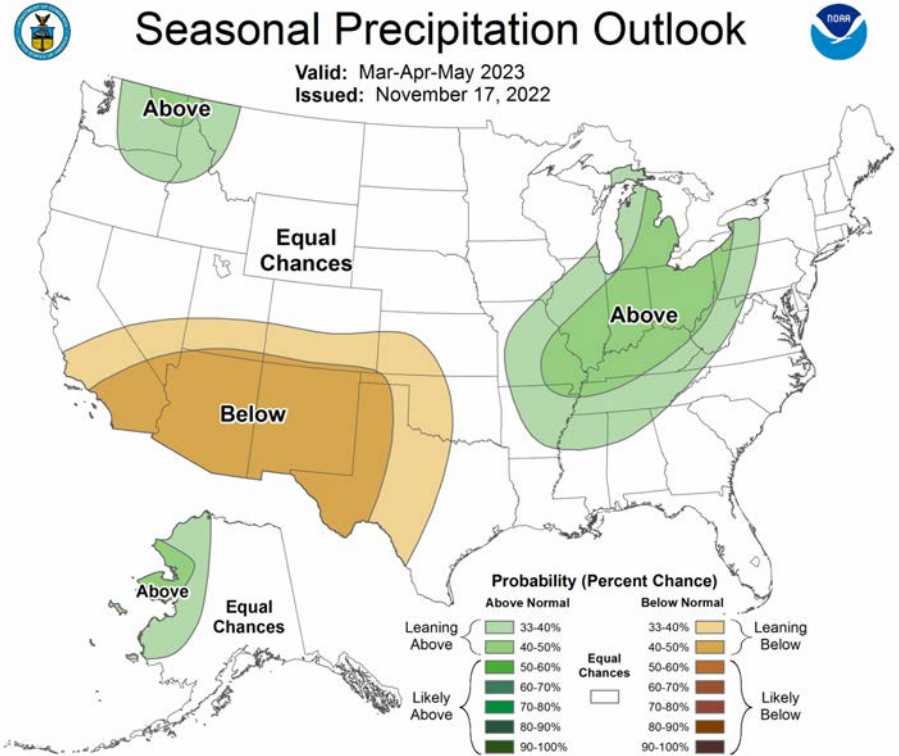
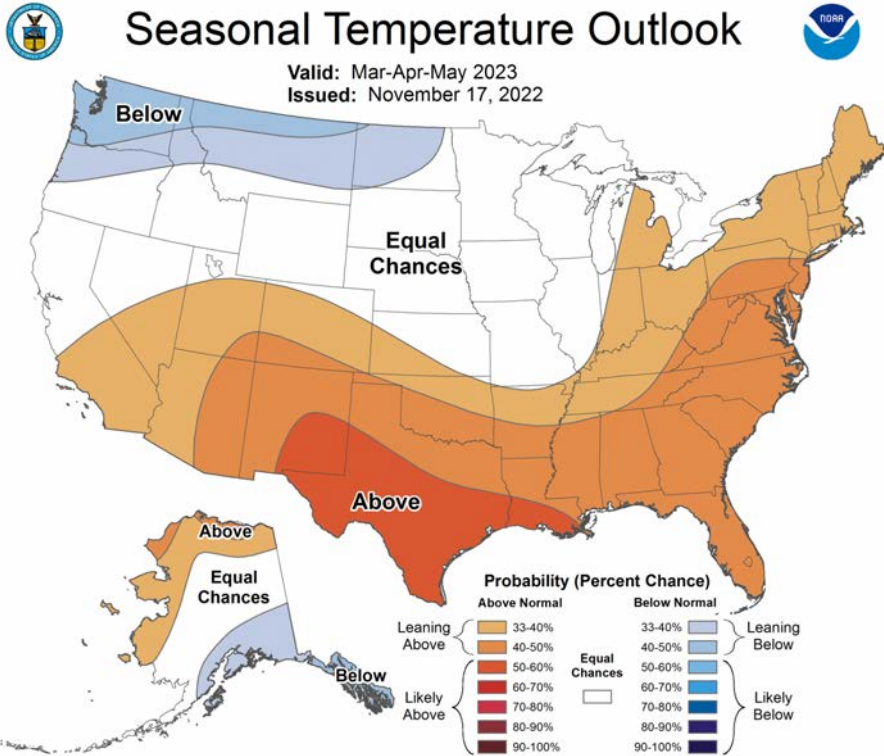
October-April
1950-51 to 2008-09



NOAA Climate.gov
Data: Rutgers GSL

<https://www.climate.gov/news-features/blogs/enso/what-about-snow-during-la-niña-winters>

March-May 2023 Seasonal Outlook



Other seasons here: <https://www.cpc.ncep.noaa.gov/products/predictions/90day/>

Key Takeaways

- **We are currently in La Niña.**
- **There is a 76% chance of La Niña during the Northern Hemisphere winter (December-February) 2022-23, with a transition to ENSO-neutral favored in February-April 2023 (57% chance).**
- **La Niña (+ Trends) favors an increased chance of a warmer winter/spring across the eastern US.**
- **Wetter conditions are more likely inland, closer to the Great Lakes and Ohio Valley with “Equal Chances” (climatology) near and along the NE coast. Snowfall chances also follow this general pattern.**

[ENSO Diagnostics Discussion \(updated on the 2nd Thursday of each month\)](#)

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

[ENSO Blog \(updated twice a month\)](#) <https://www.climate.gov/news-features/blogs/enso>