

2026 Super El Niño?

What might it mean for U.S. climate this winter?

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Climate Analysis Section, NSF-NCAR

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Climate Variability Lecture

CESM Tutorial, 9 July 2026

2026 Super El Niño?

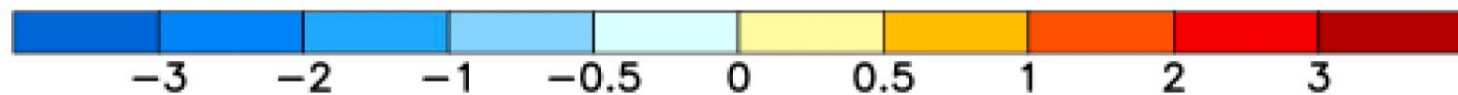
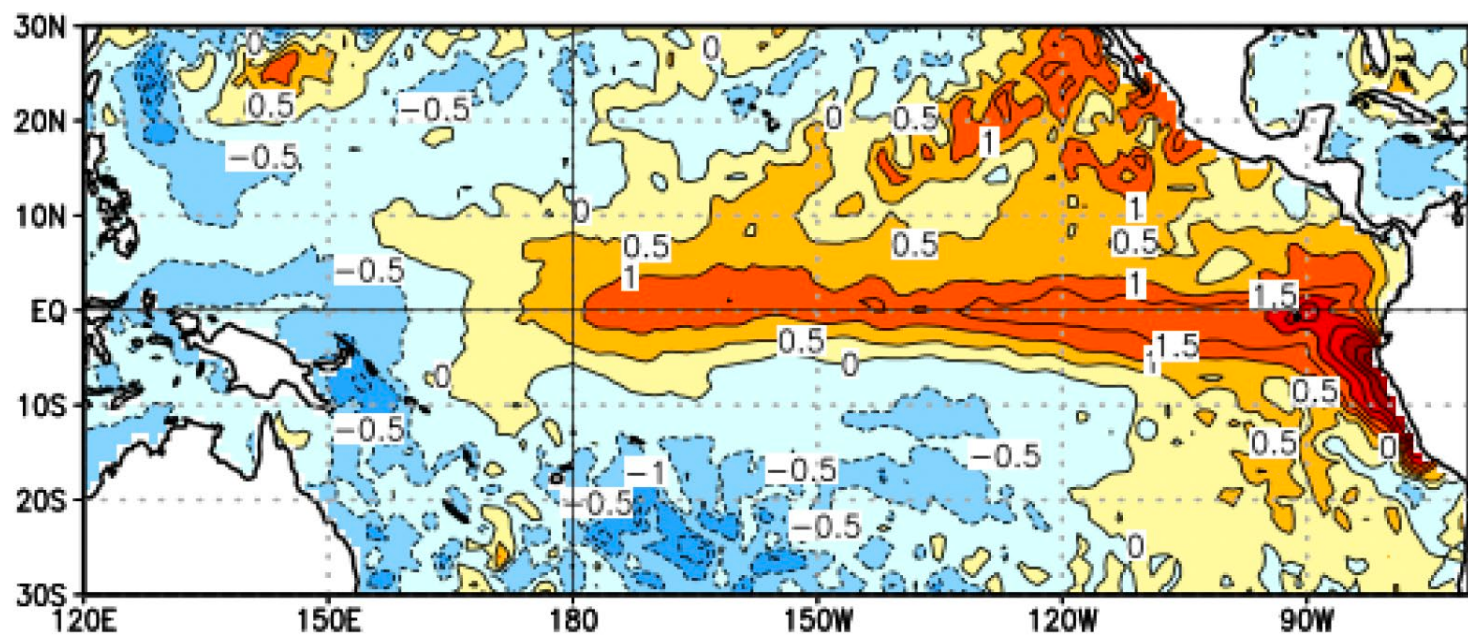
What might it mean for U.S. climate this winter?

Current Status

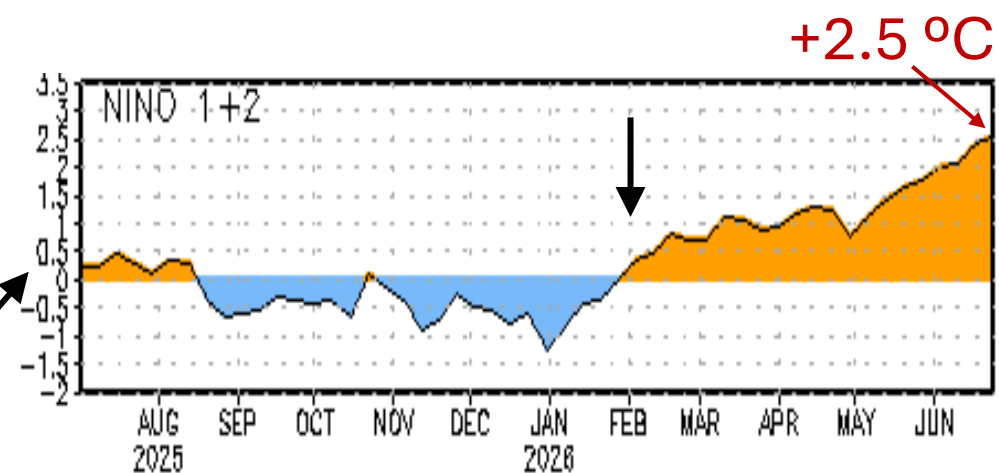
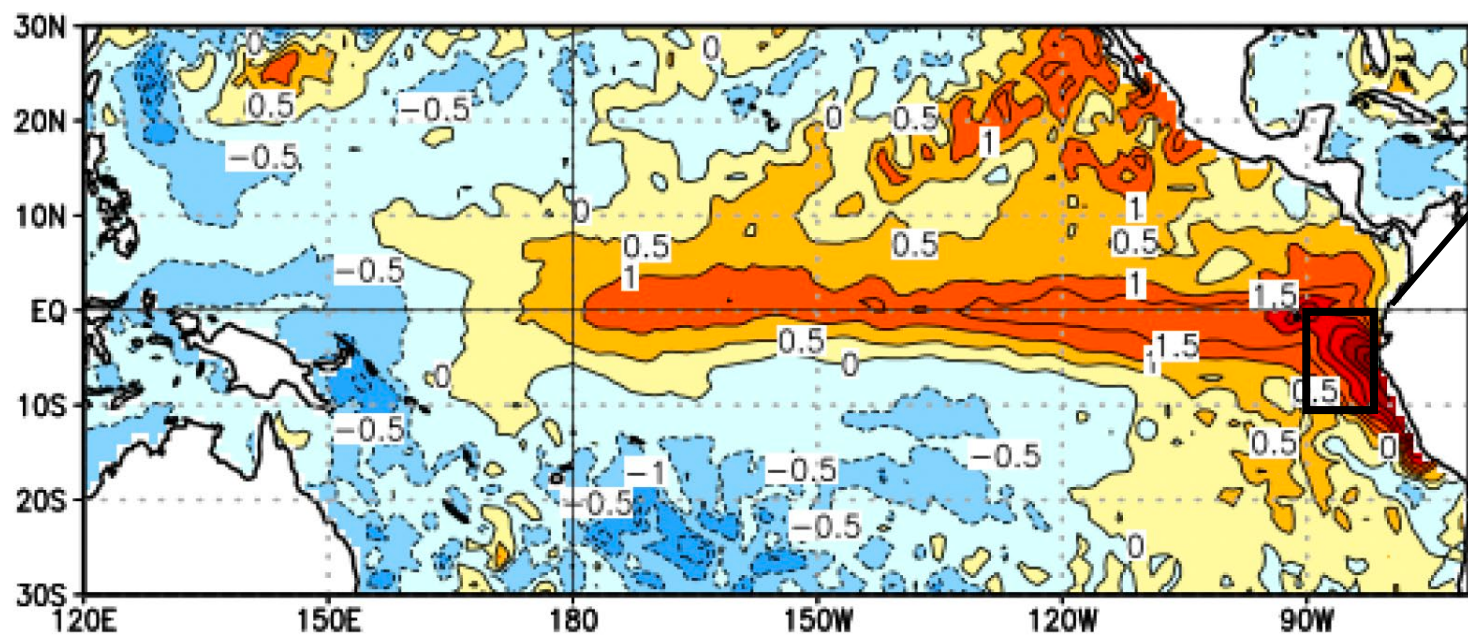


Update prepared by:
Climate Prediction Center / NCEP
29 June 2026

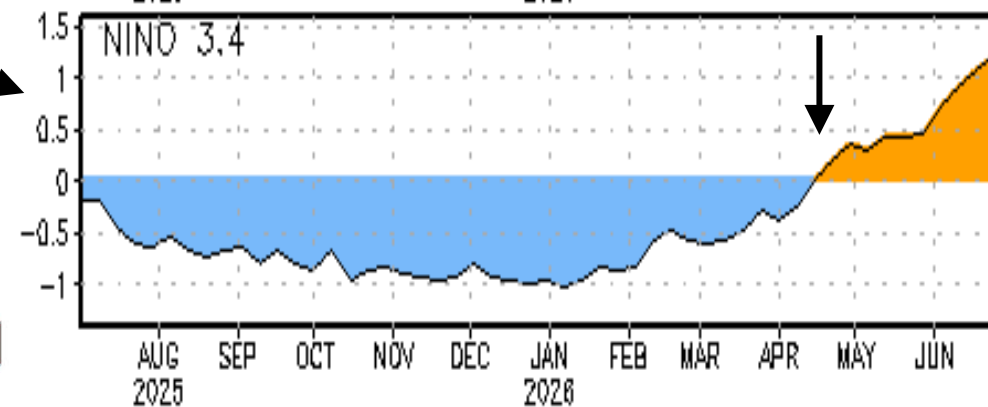
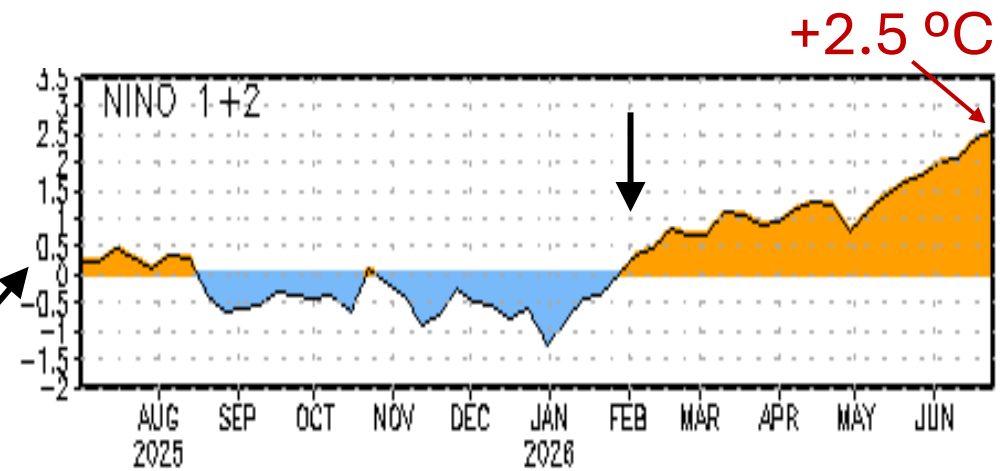
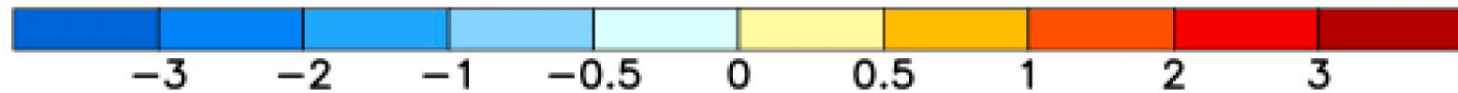
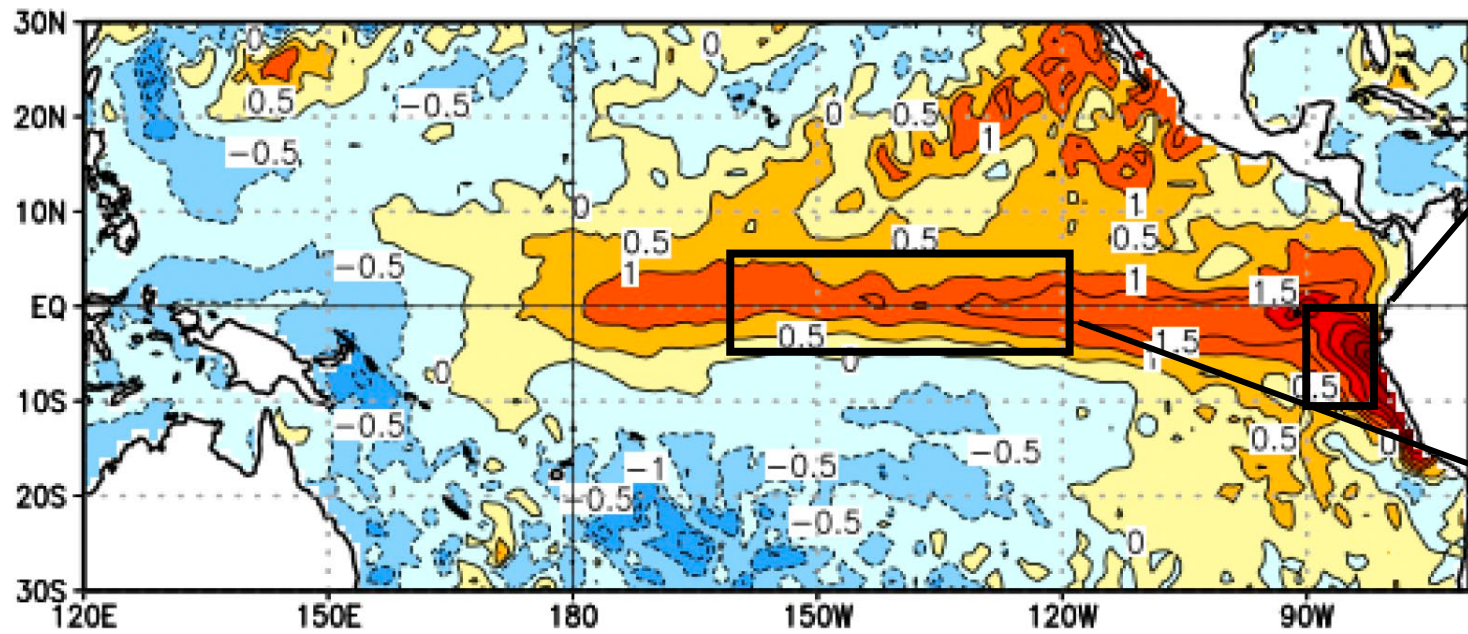
Average Relative SST Anomalies ($^{\circ}\text{C}$)
31 MAY 2026 – 27 JUN 2026



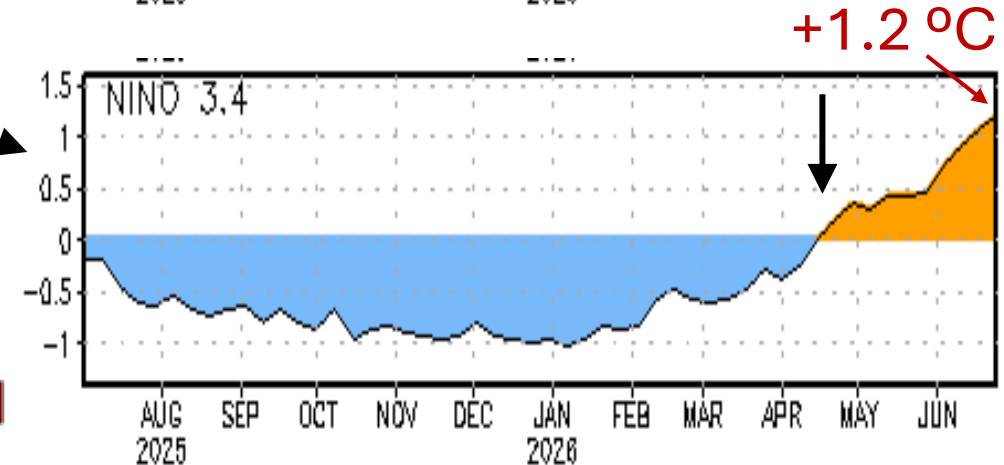
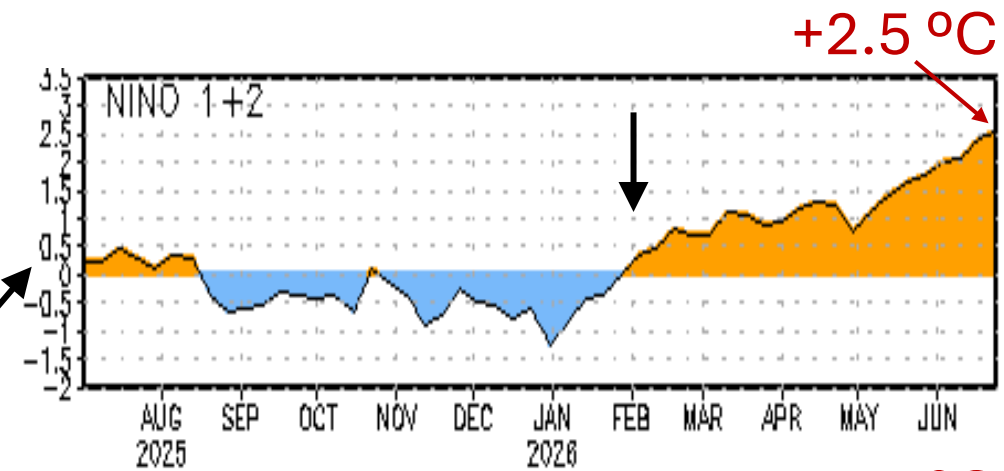
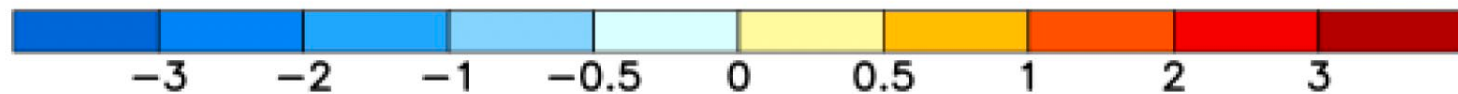
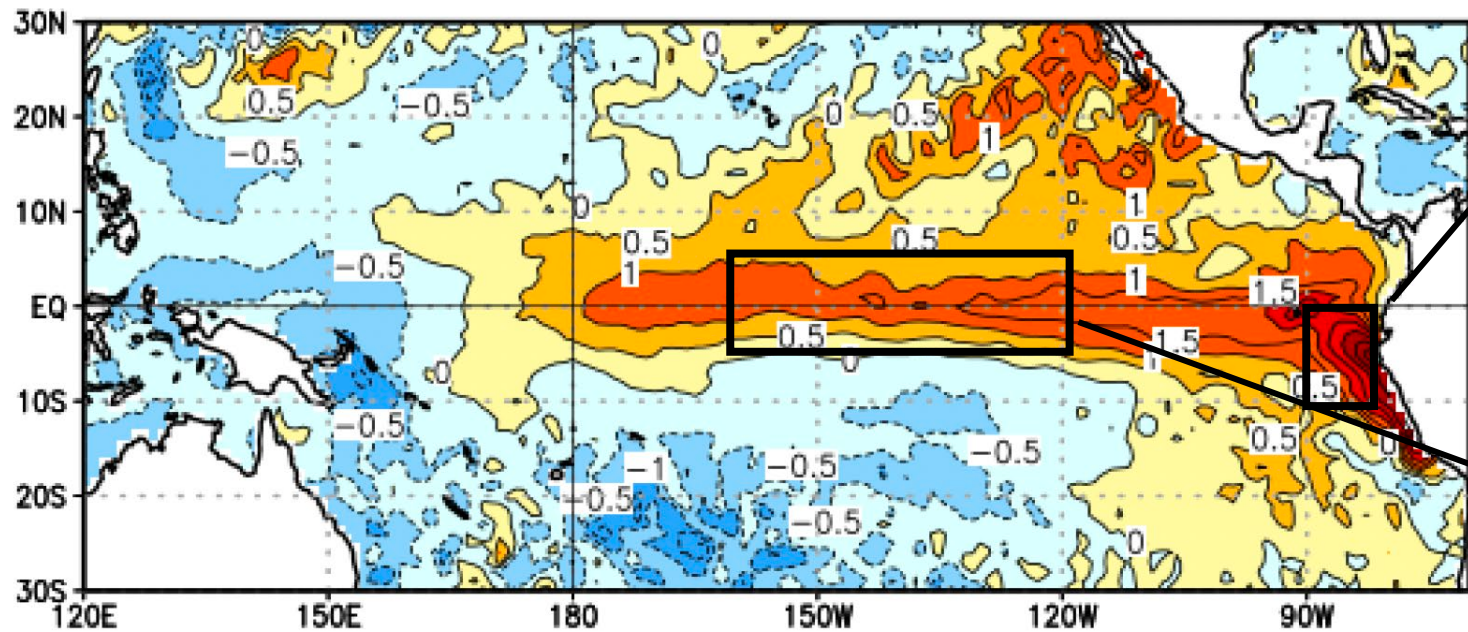
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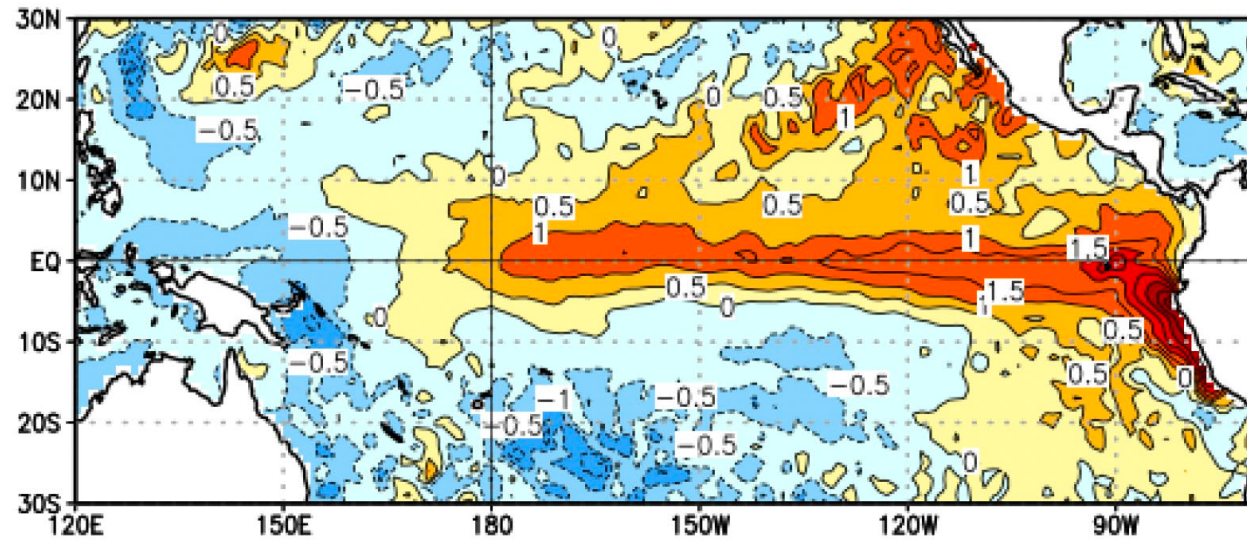


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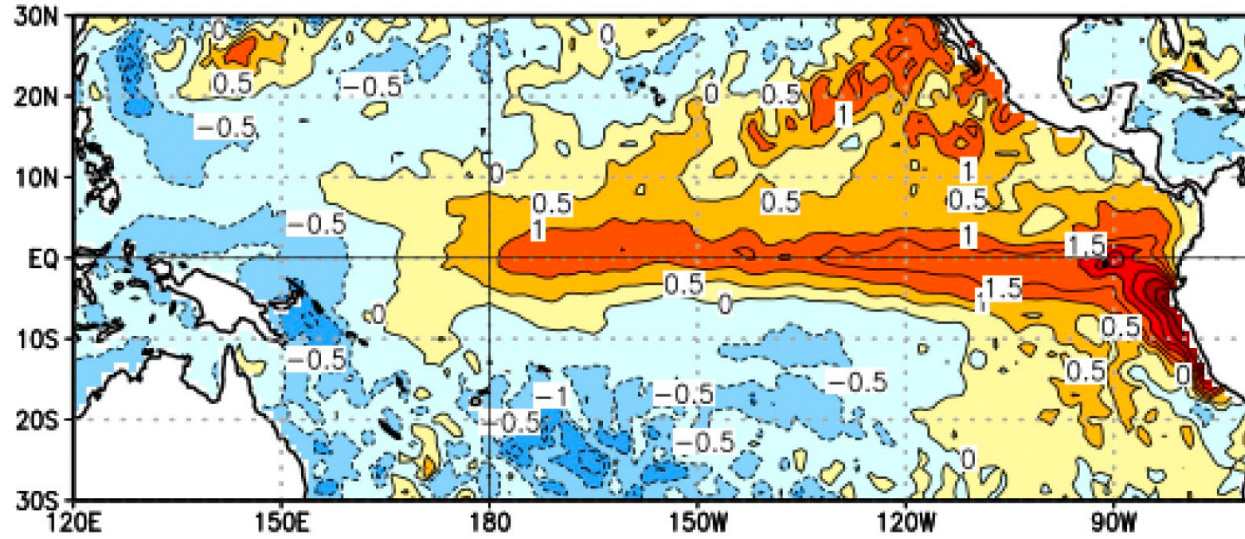


2 std dev

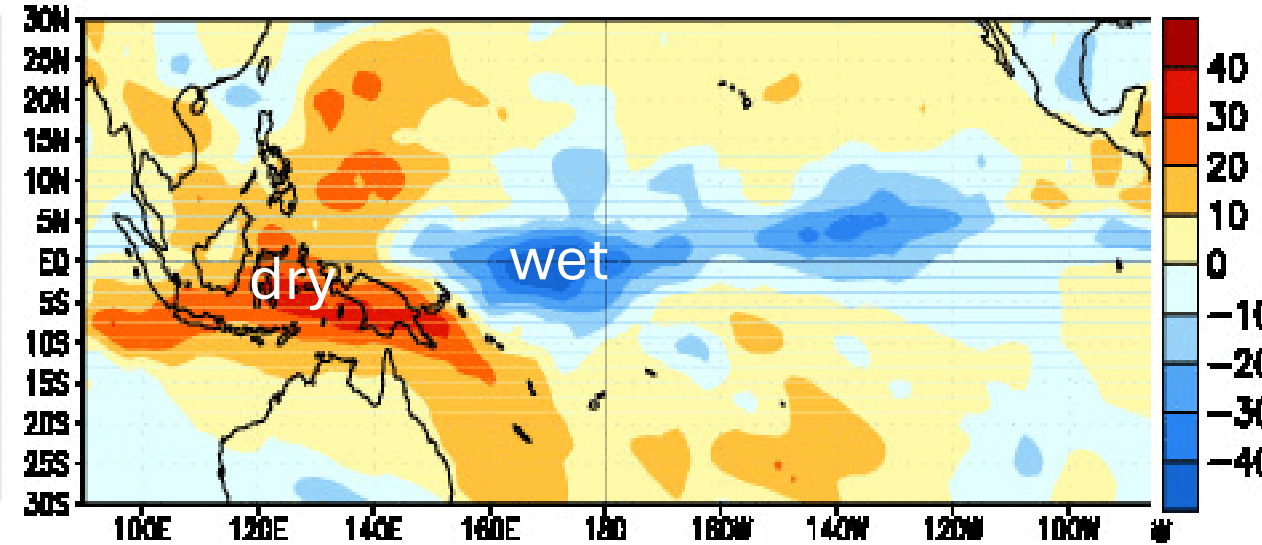
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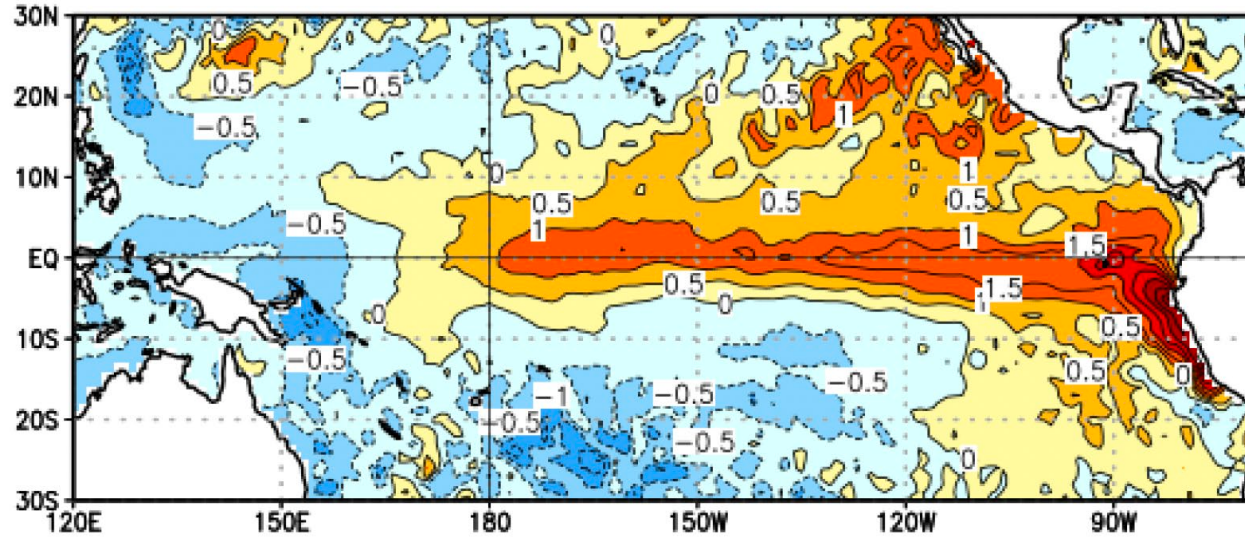
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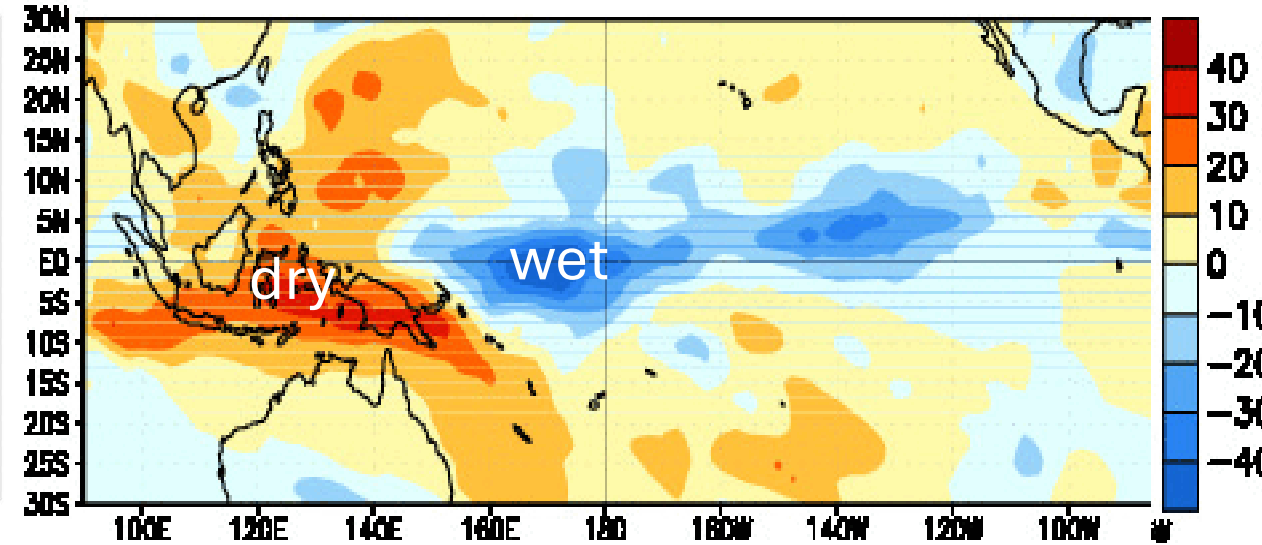
OLR Anomalies (Wm^{-2})



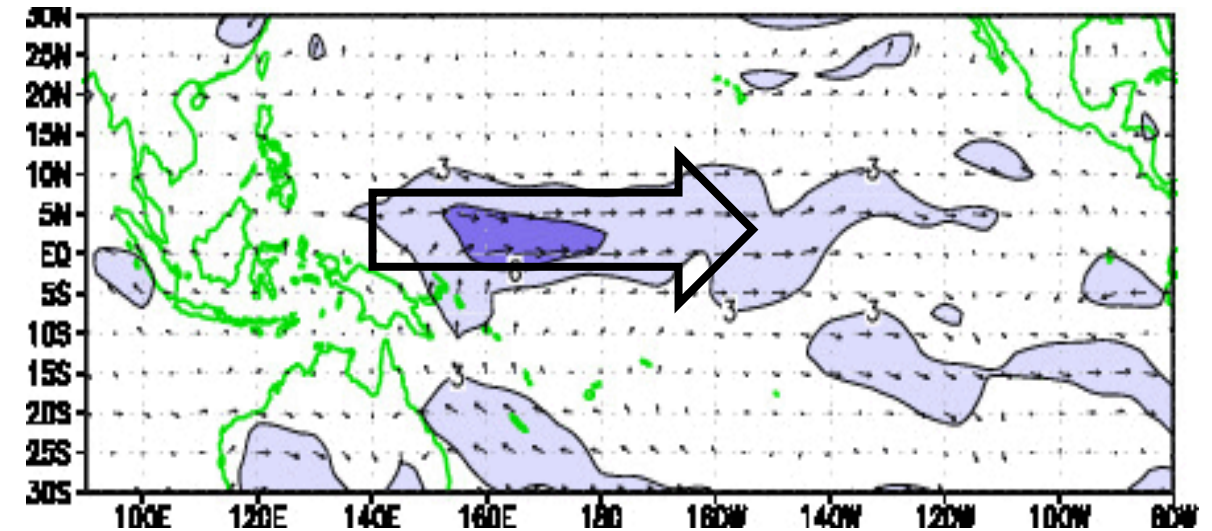
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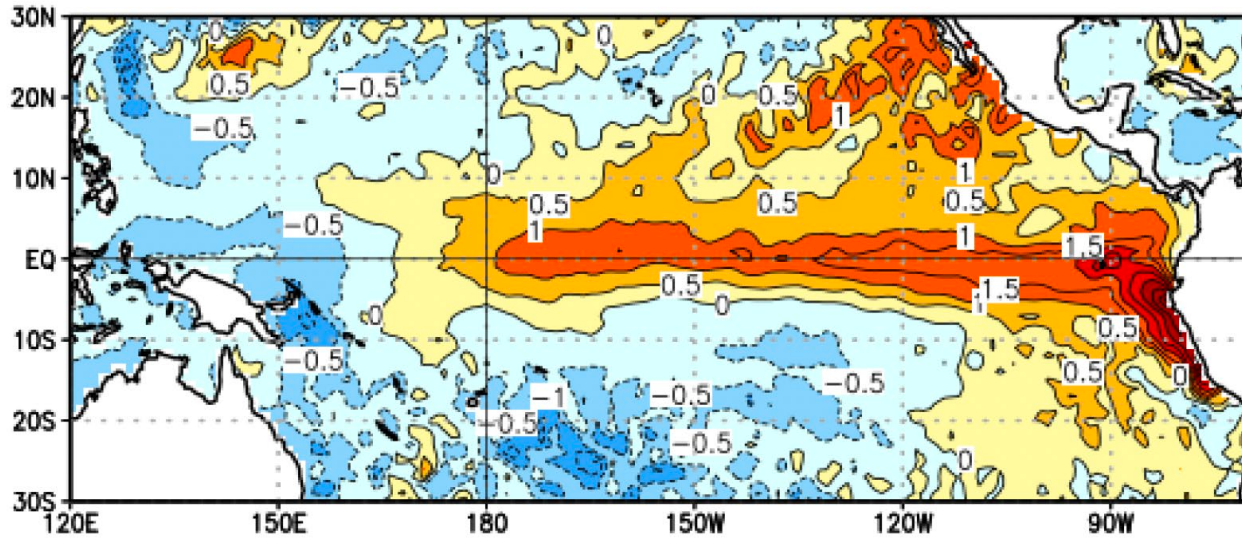
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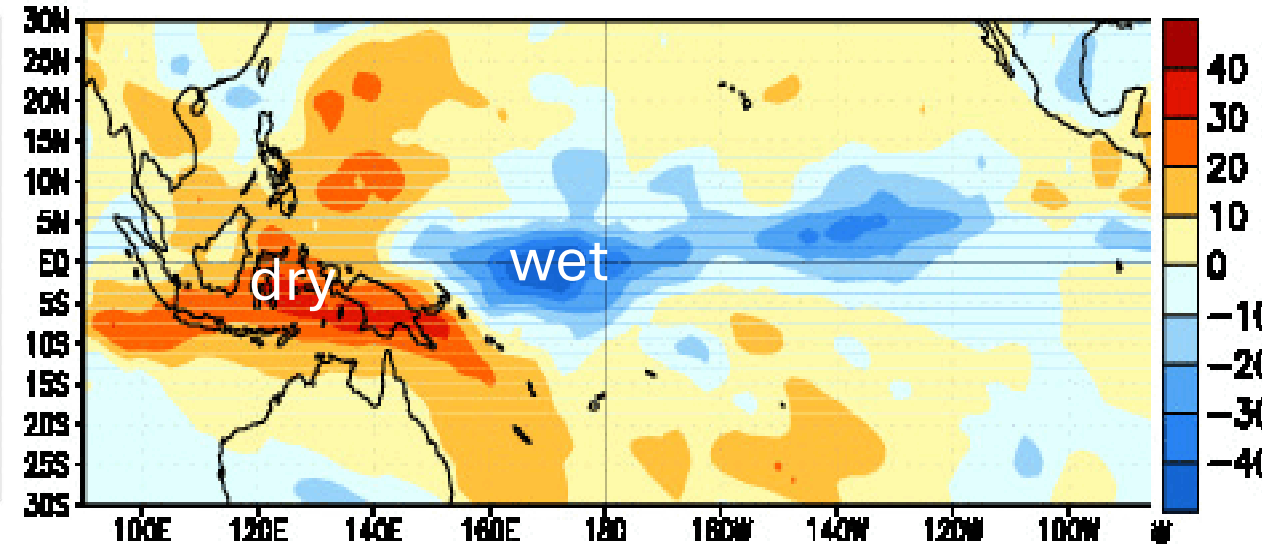
850hPa Wind Anomalies



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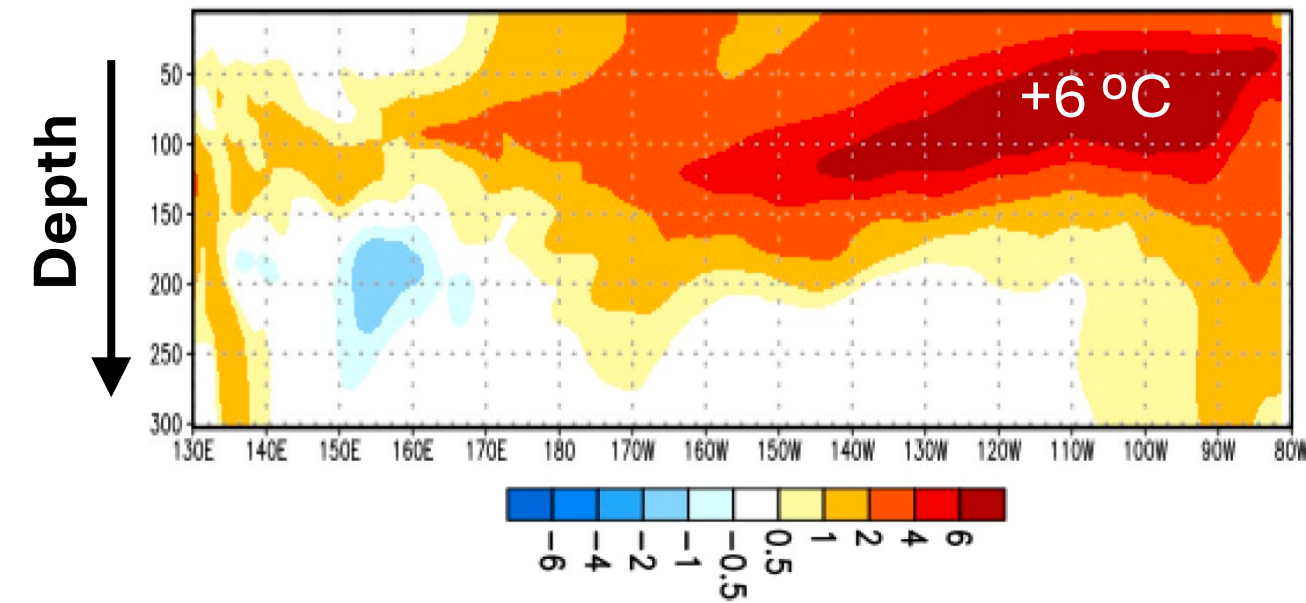


OLR Anomalies (Wm^{-2})

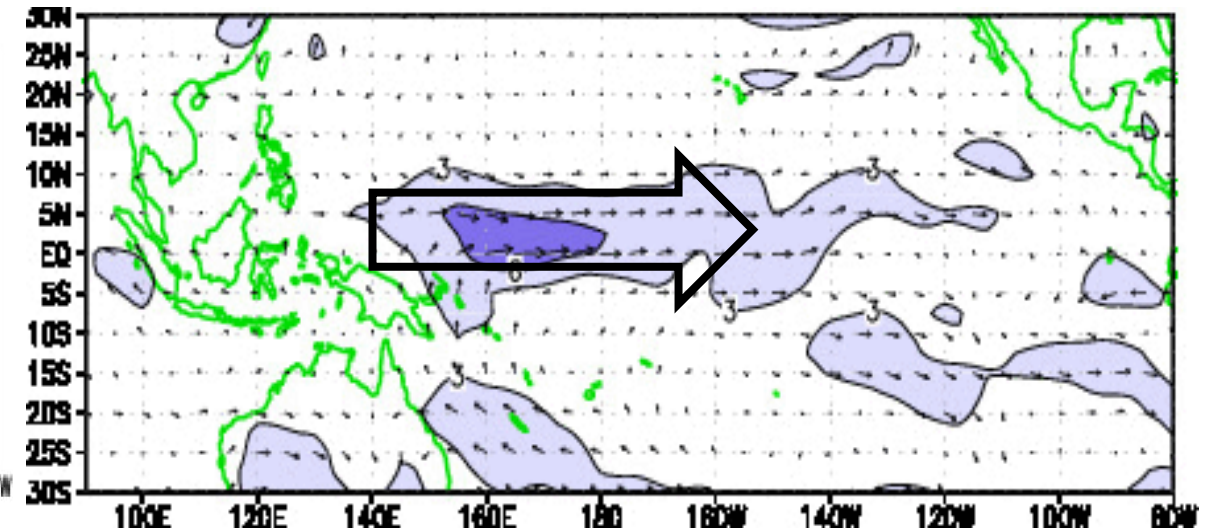


EQ. Subsurface Temperature Anomalies (deg C)

Pentad centered on 22 JUN 2026

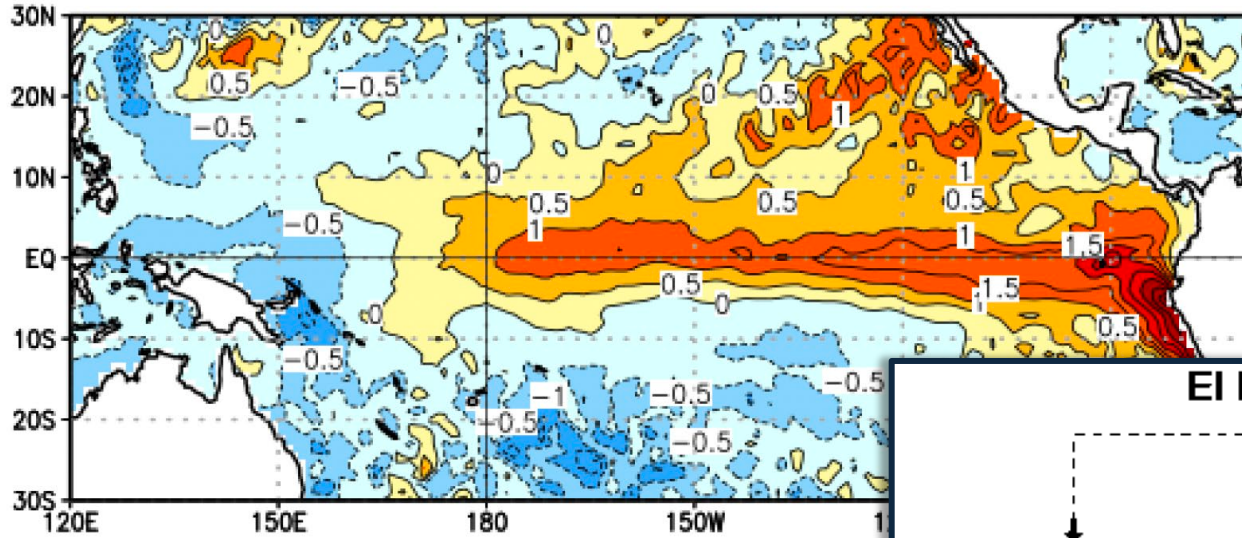


850hPa Wind Anomalies

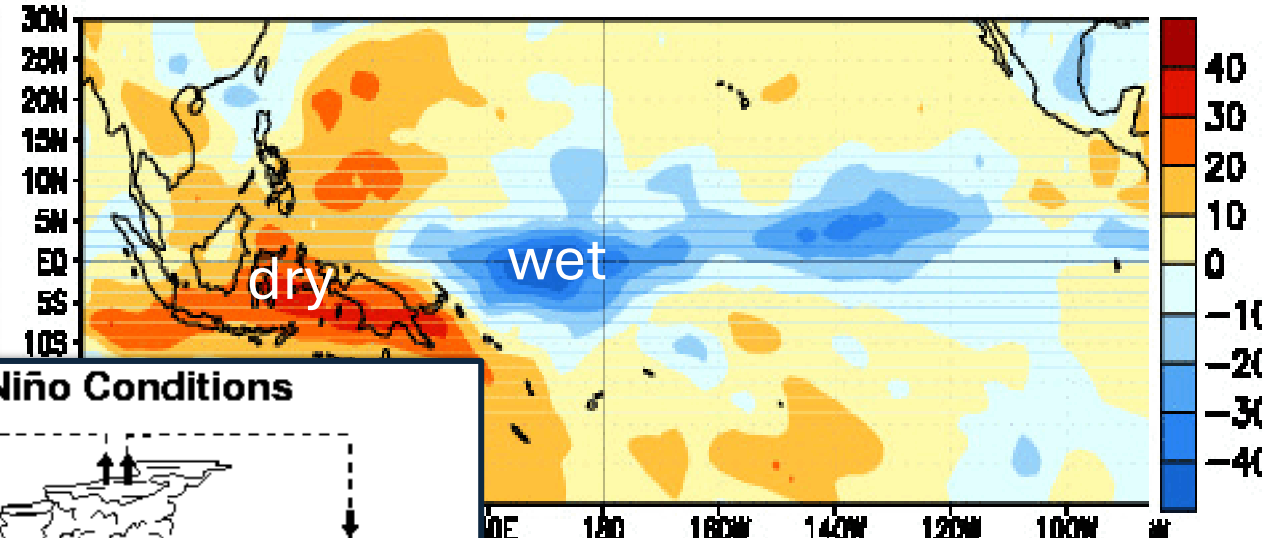


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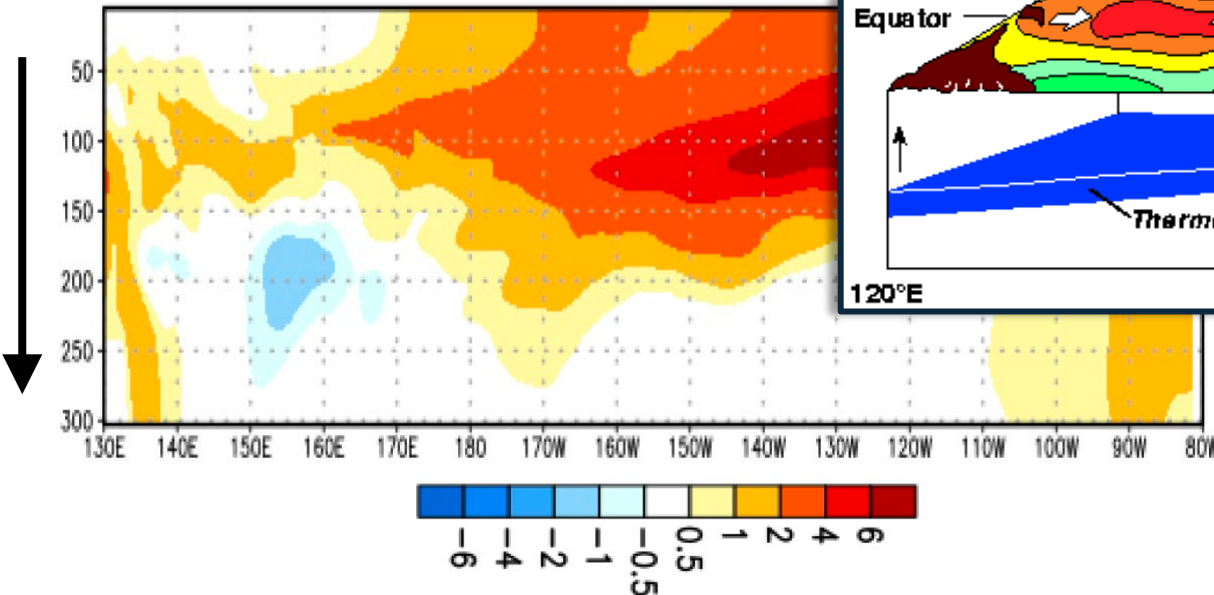
OLR Anomalies (Wm^{-2})



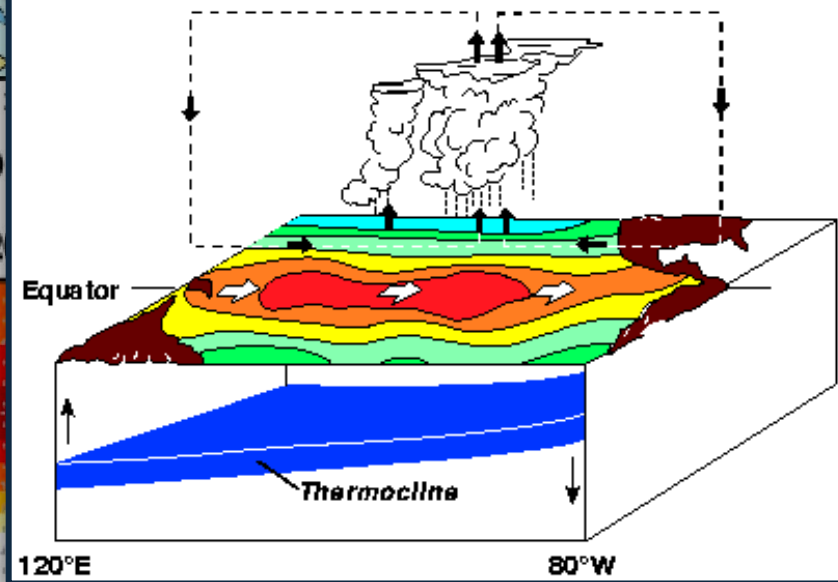
EQ. Subsurface Temperature Anom

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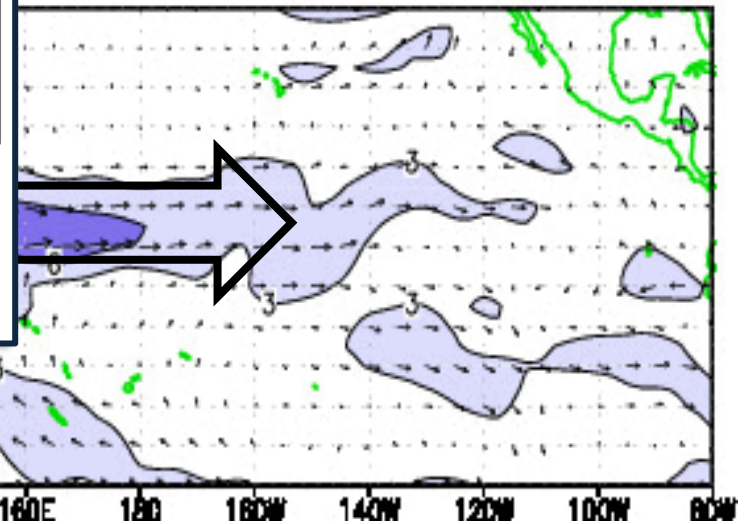
Depth



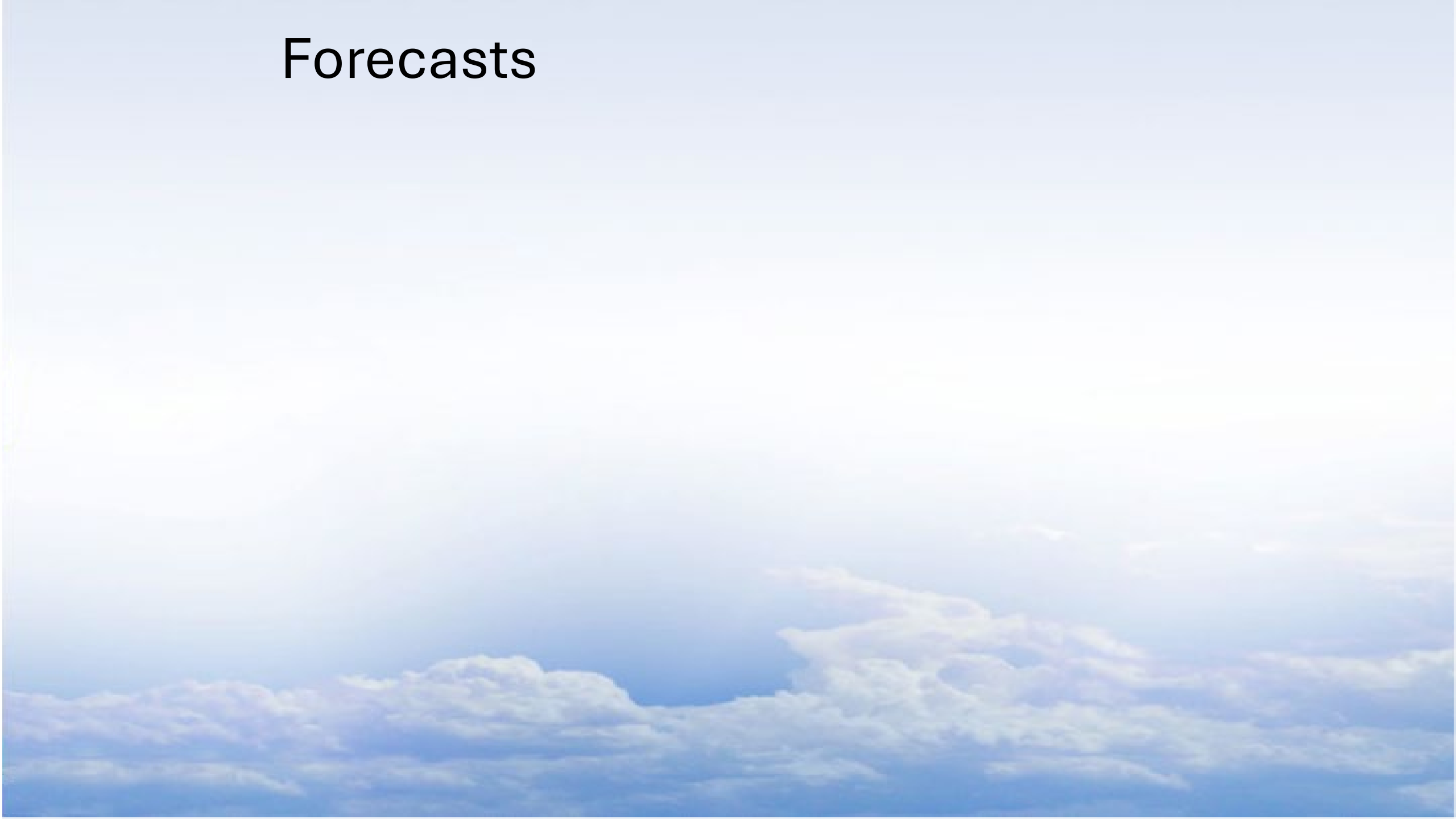
El Niño Conditions



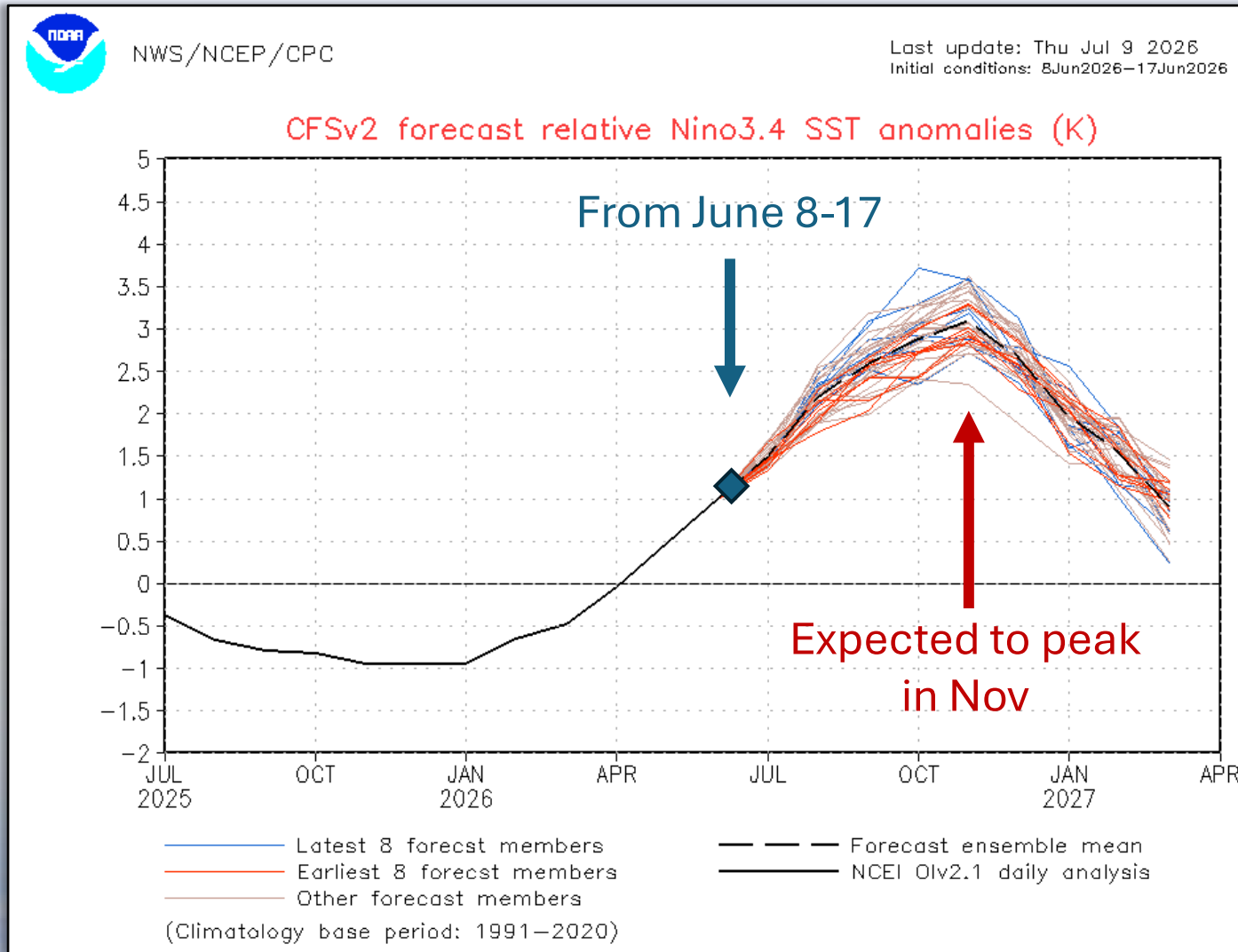
Sea Wind Anomalies



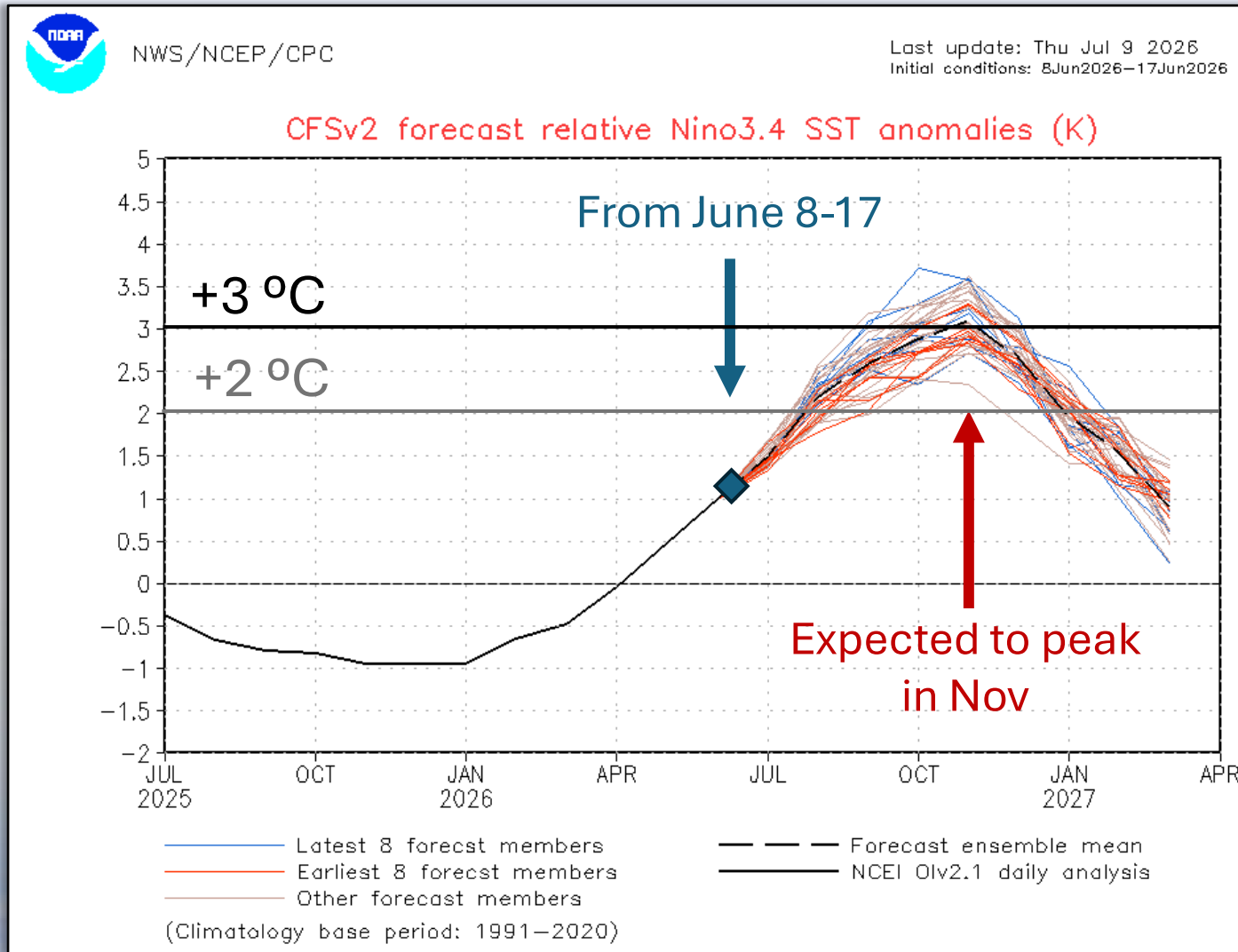
Forecasts



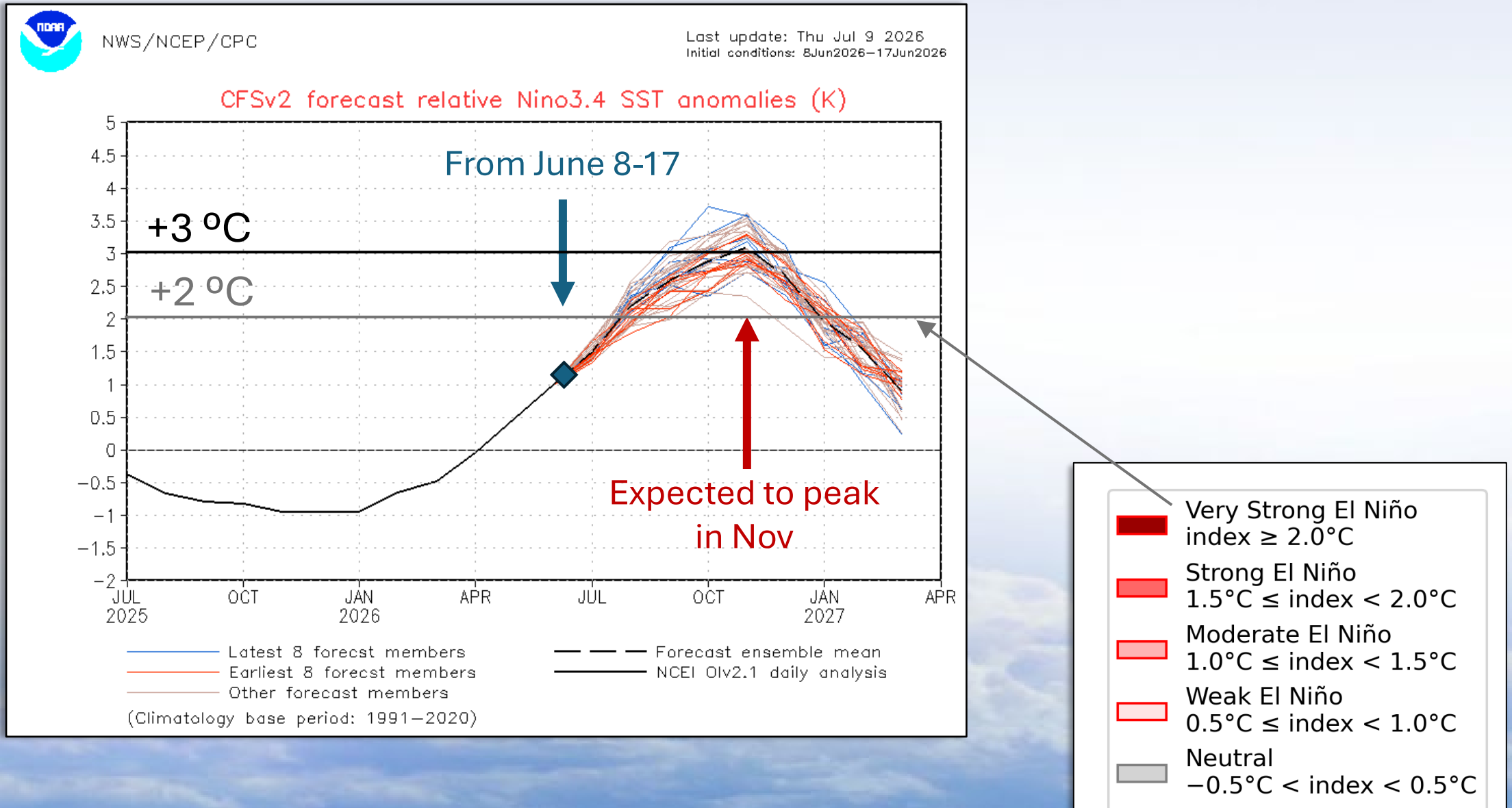
Forecasts



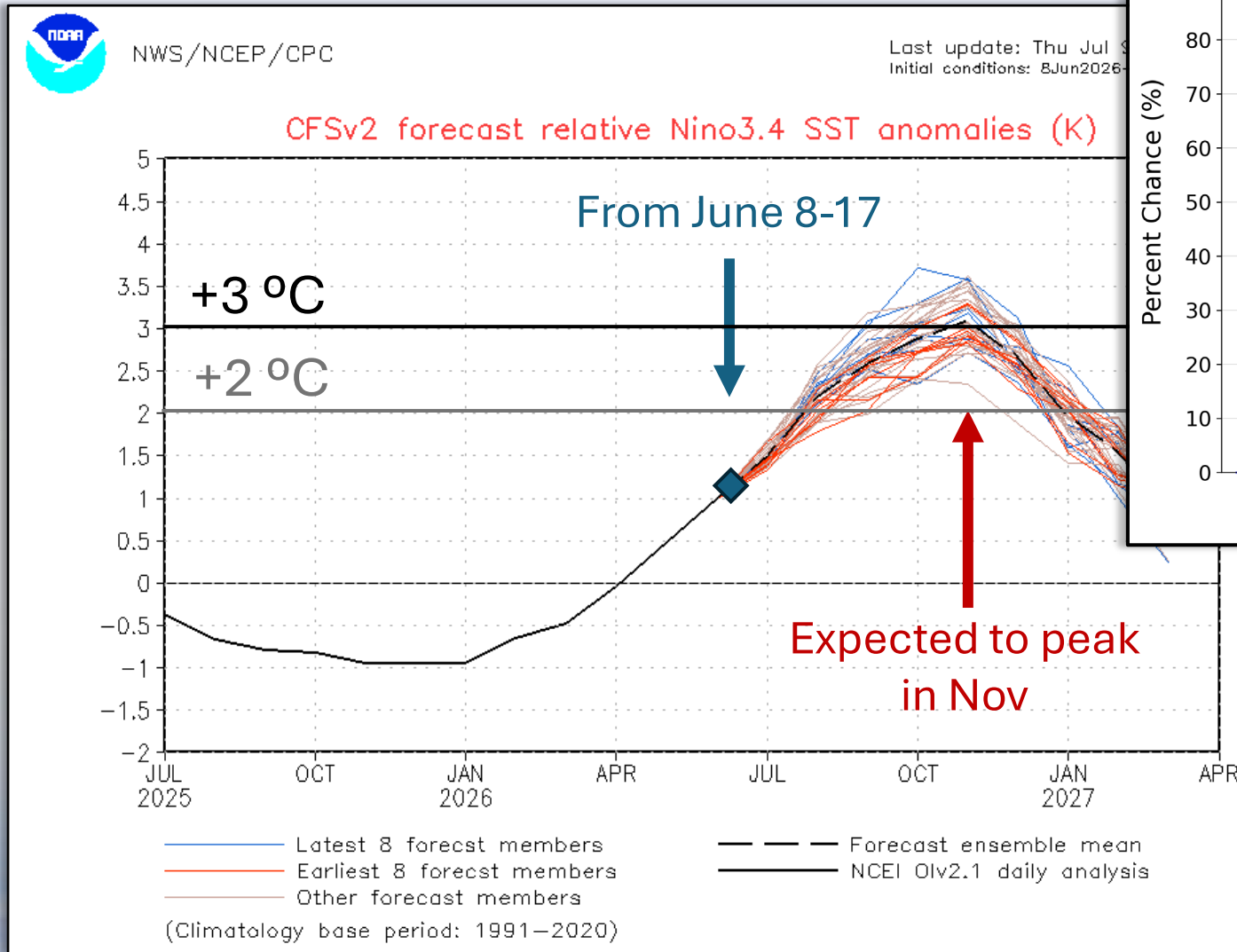
Forecasts



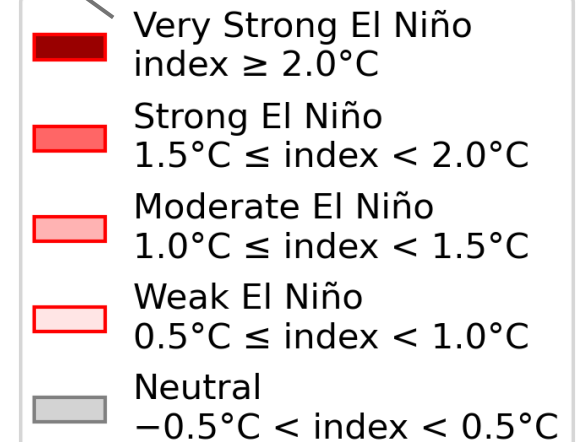
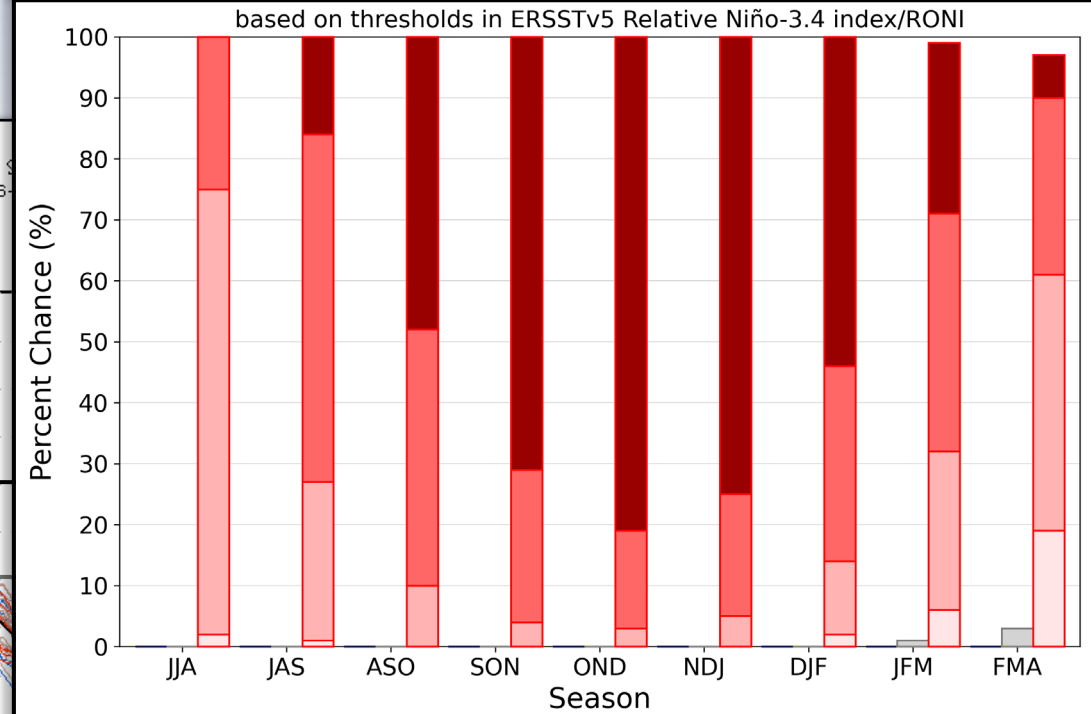
Forecasts



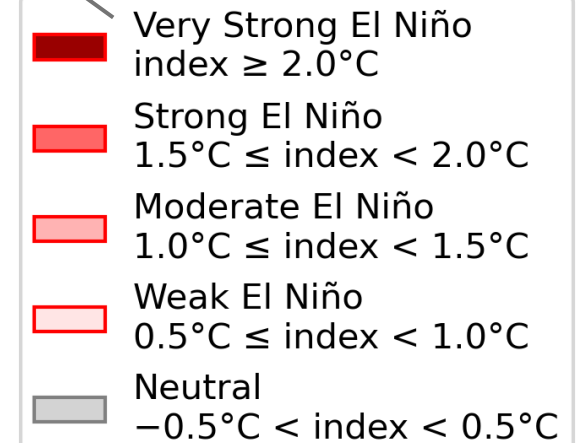
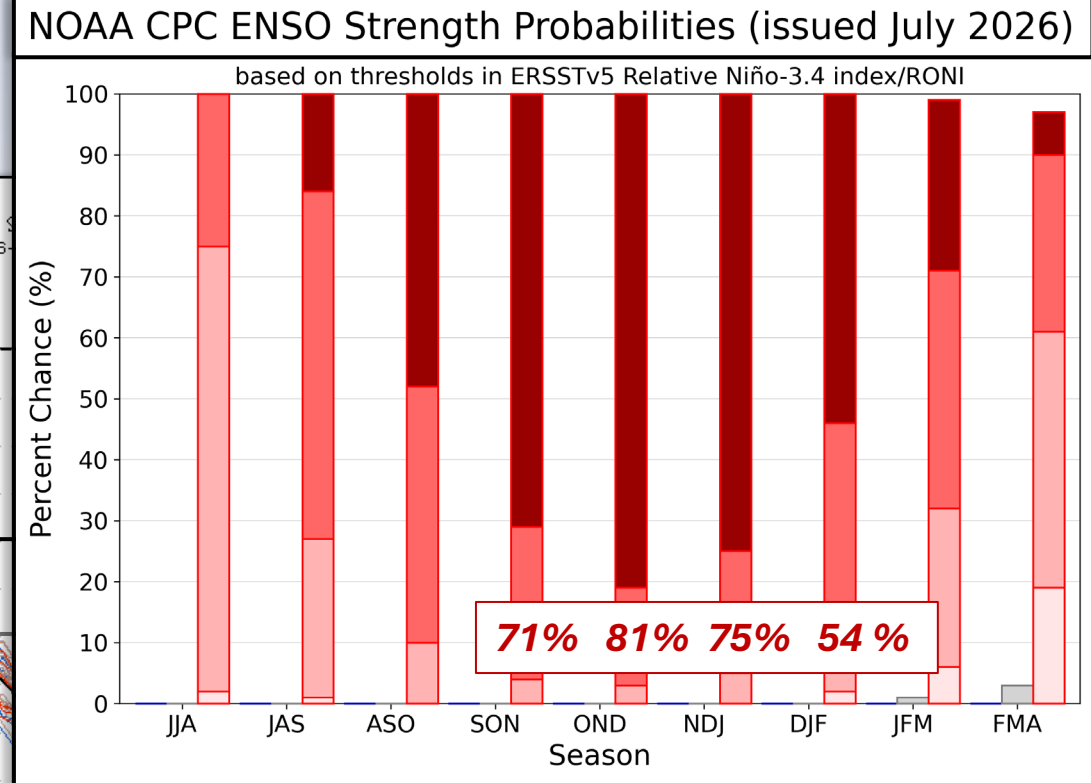
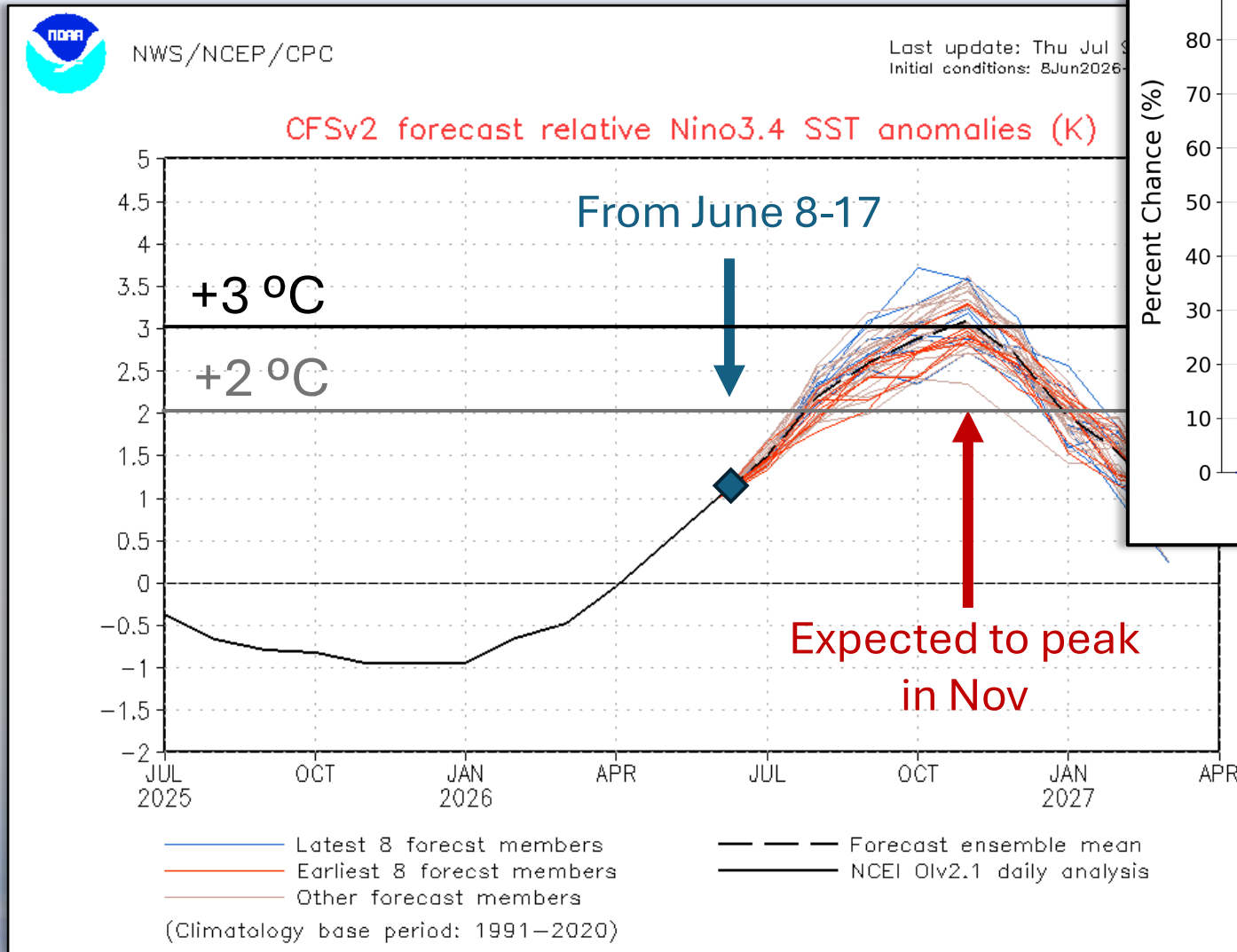
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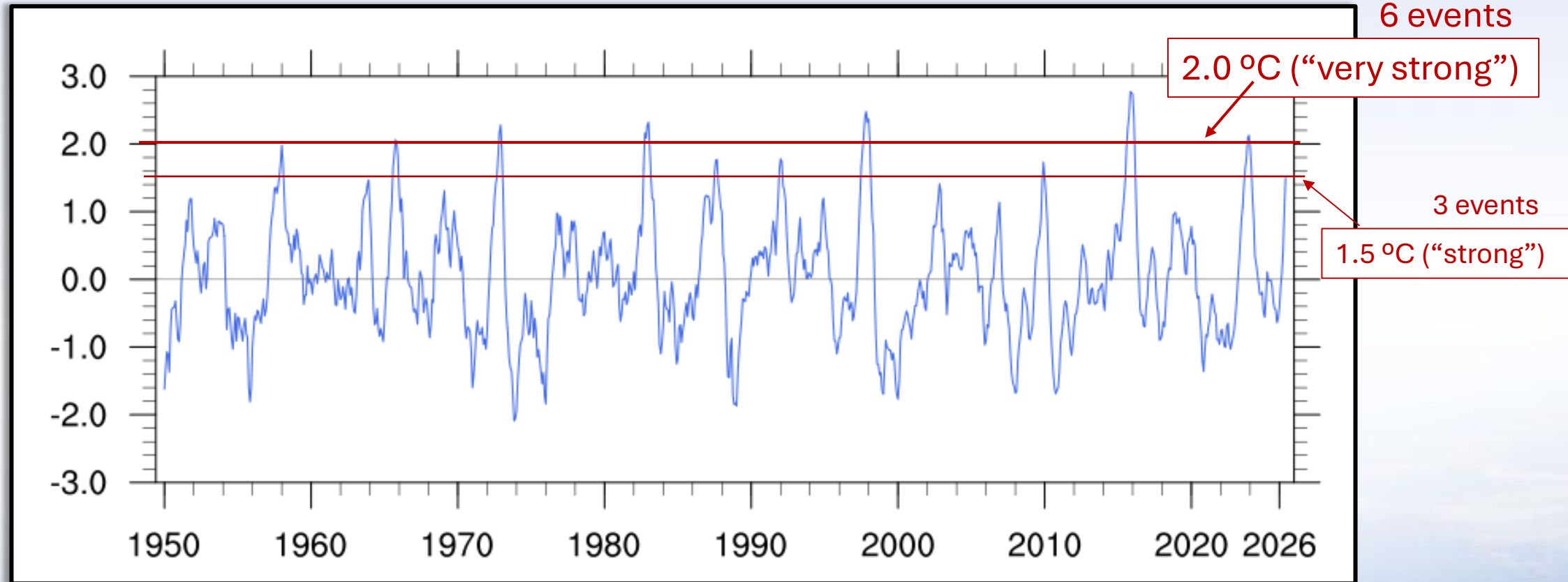
NOAA CPC ENSO Strength Probabilities (issued July 2026)



Forecasts



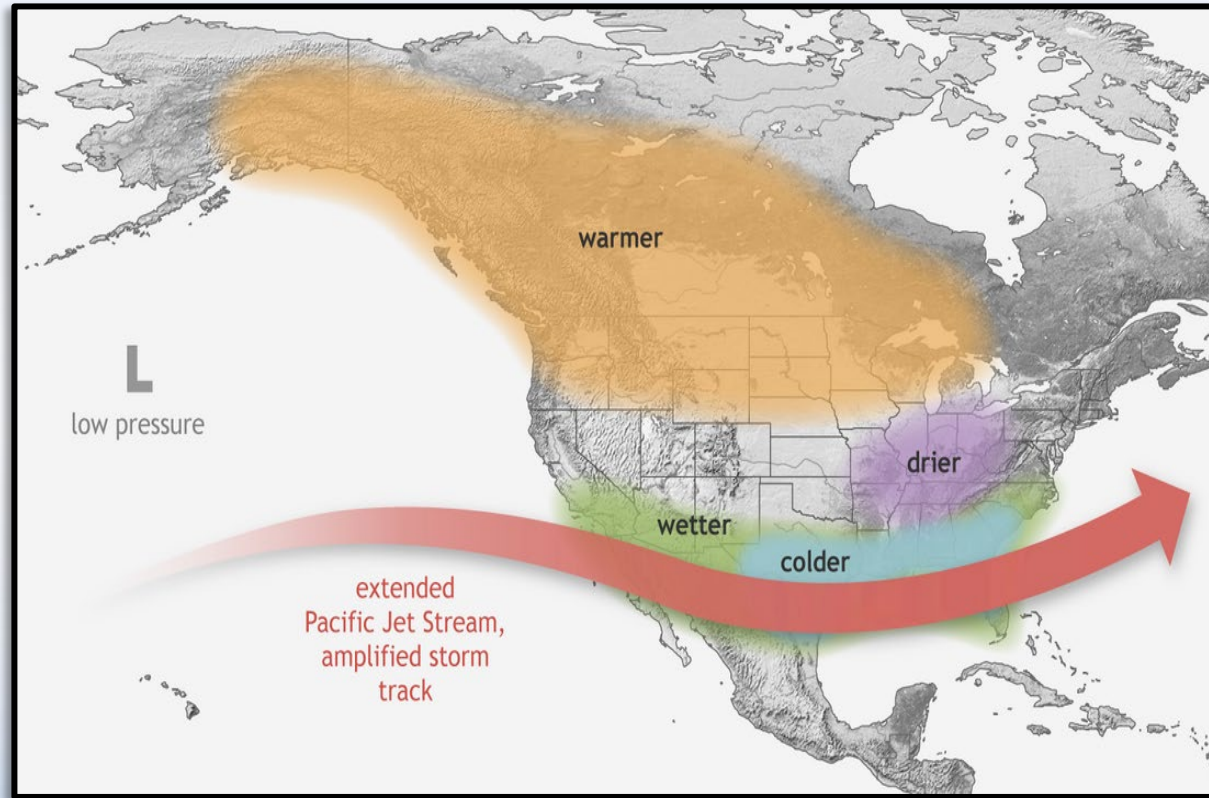
Nino3.4 SST Anomalies through June 2026



Climate Impacts



Climate Impacts



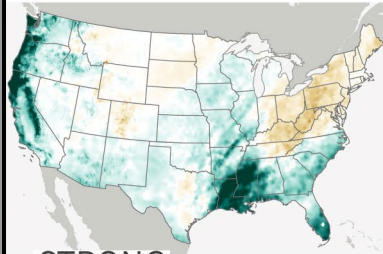
Canonical
El Niño
Impacts

Precipitation during all El Niño winters since 1950, sorted by strength

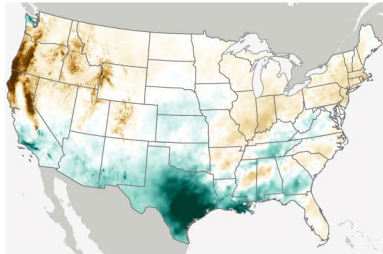
December–February compared to 1991–2020 average

Nino34 SSTA

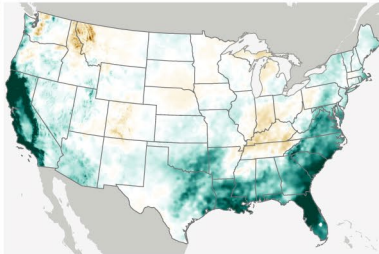
2.5°C
1982–83



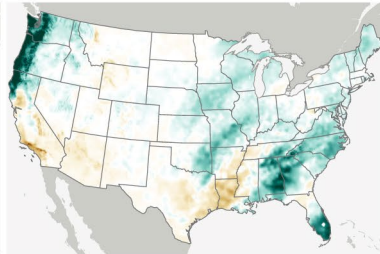
2.3°C
1991–92



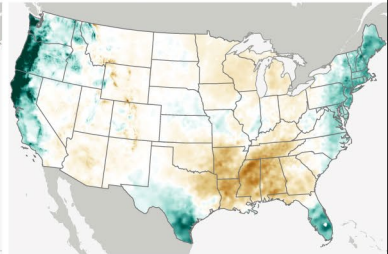
2.2°C
1997–98



2.2°C
2015–16



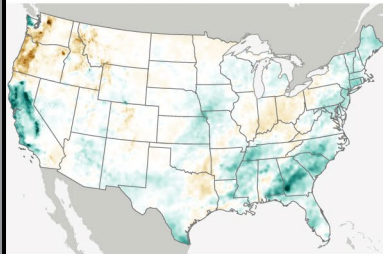
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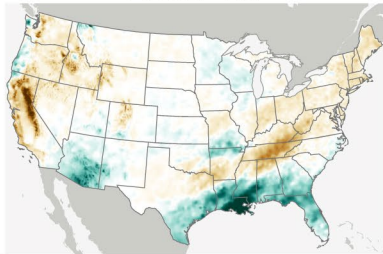
STRONG

Nino34 SSTA

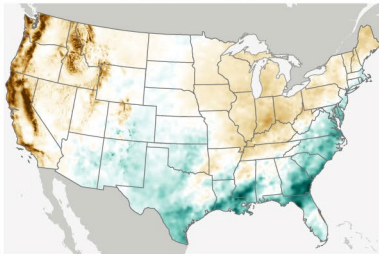
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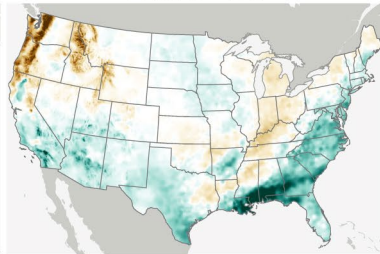
1.7°C
1965–66



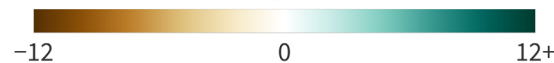
1.6°C
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Difference from average precipitation (inches)

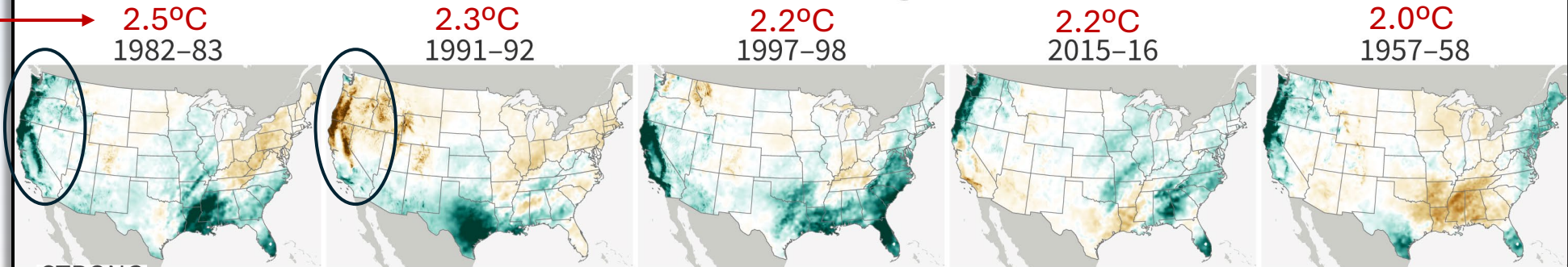


[/www.climate.us/news-features/blogs/enso/](http://www.climate.us/news-features/blogs/enso/)

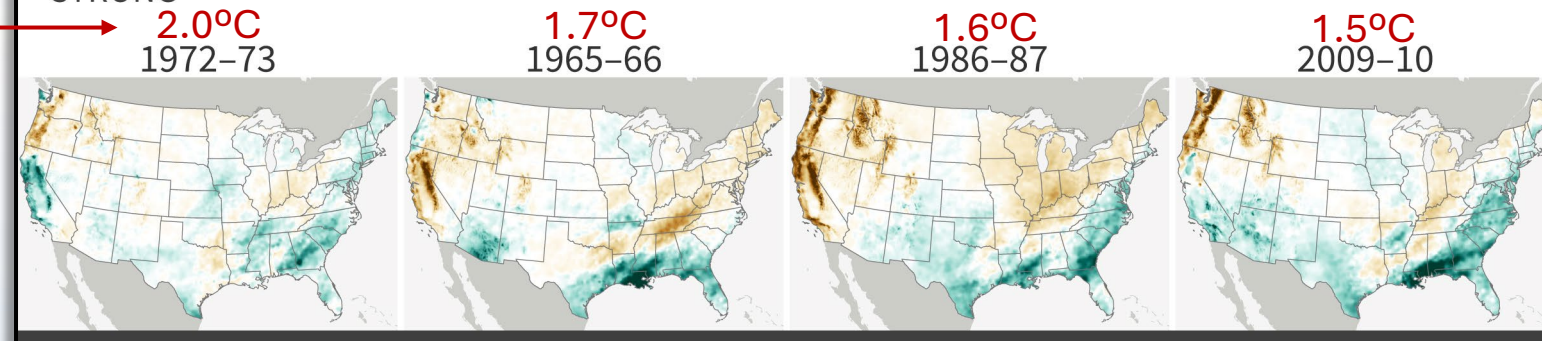
Precipitation during all El Niño winters since 1950, sorted by strength

December–February compared to 1991–2020 average

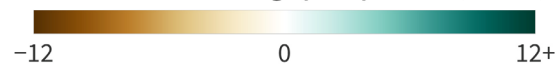
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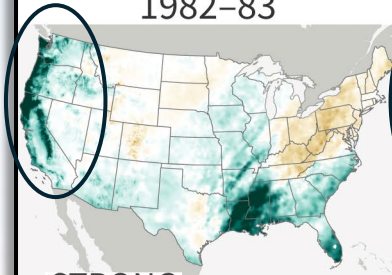
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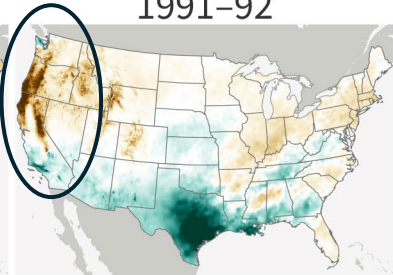
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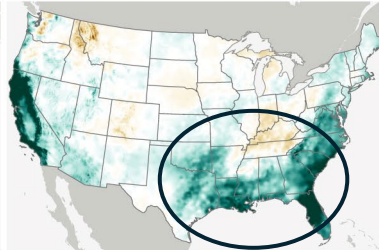
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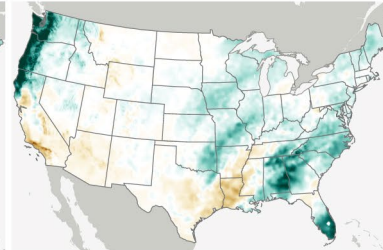
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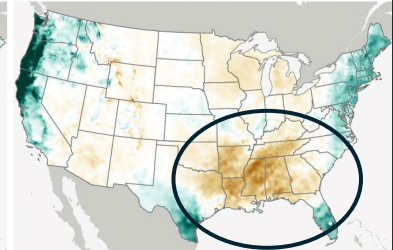
2.2°C
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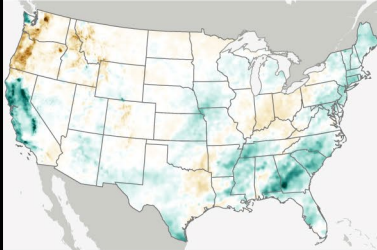
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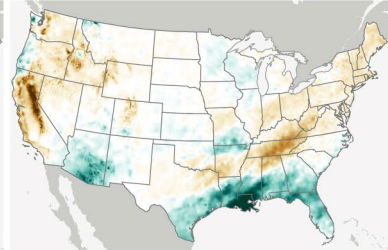
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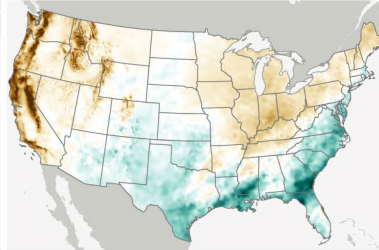
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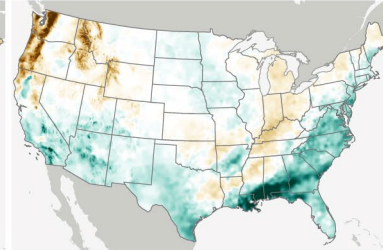
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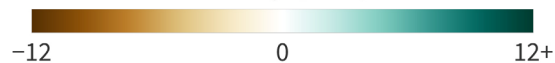
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Difference from average precipitation (inches)



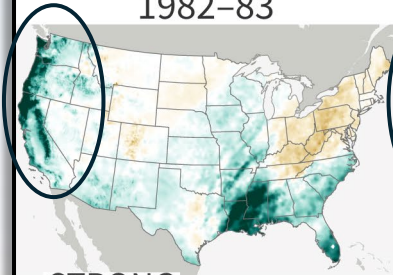
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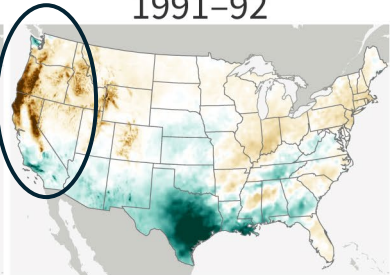
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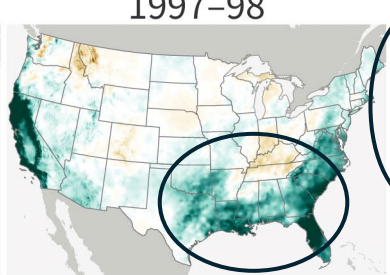
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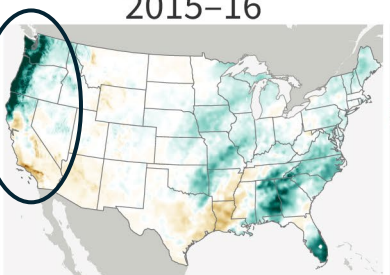
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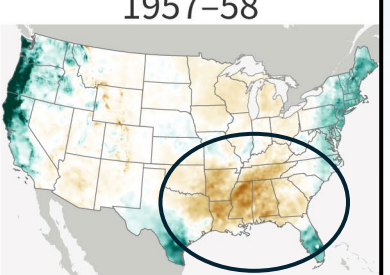
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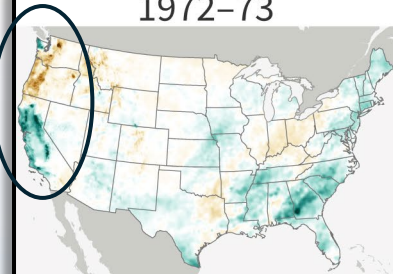
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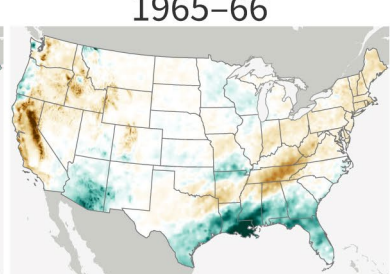
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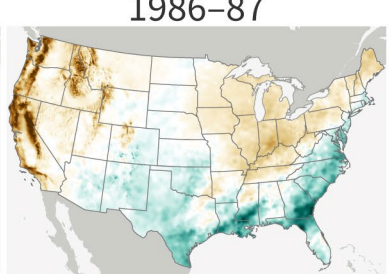
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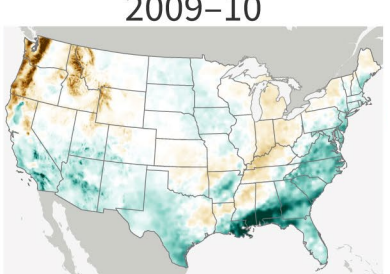
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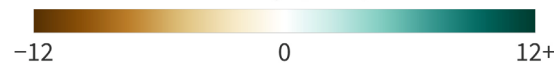
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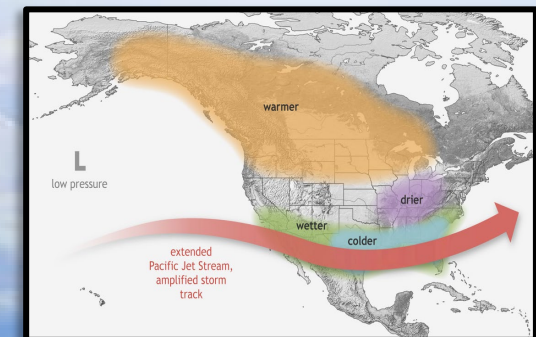


Difference from average precipitation (inches)



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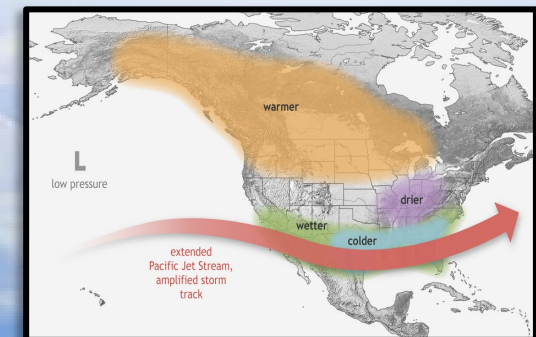
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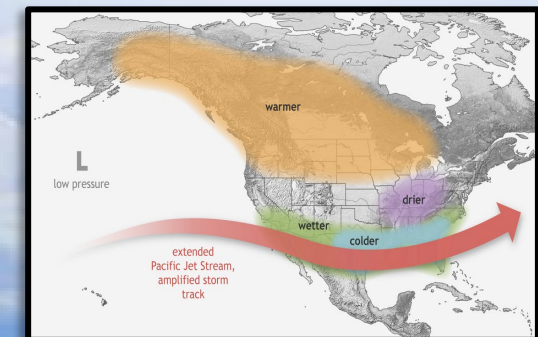
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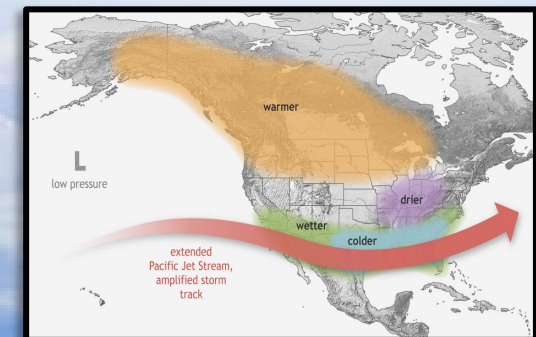
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Because...

- 1) Atmospheric teleconnections driven by El Niño will always be superimposed upon circulation anomalies arising from independent sources (e.g., intrinsic atmospheric variability);
- 2) Canonical impacts have uncertainties (due to the limited sampling of El Niño events);
- 3) Background climate change is altering the teleconnections.

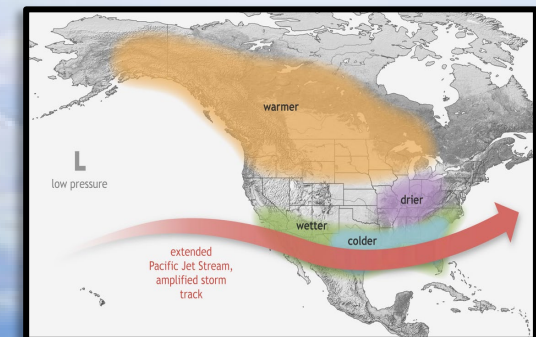


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- 1) Atmospheric teleconnections driven by El Niño will always be superimposed upon circulation anomalies arising from independent sources (e.g., intrinsic atmospheric variability);
- 2) Canonical impacts have uncertainties (due to the limited sampling of El Niño events);
- 3) Background climate change is altering the teleconnections.

Deser et al. 2017, 2018 and 2026 (*J. Climate*).



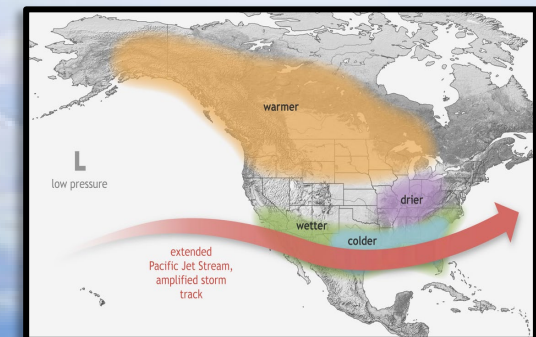
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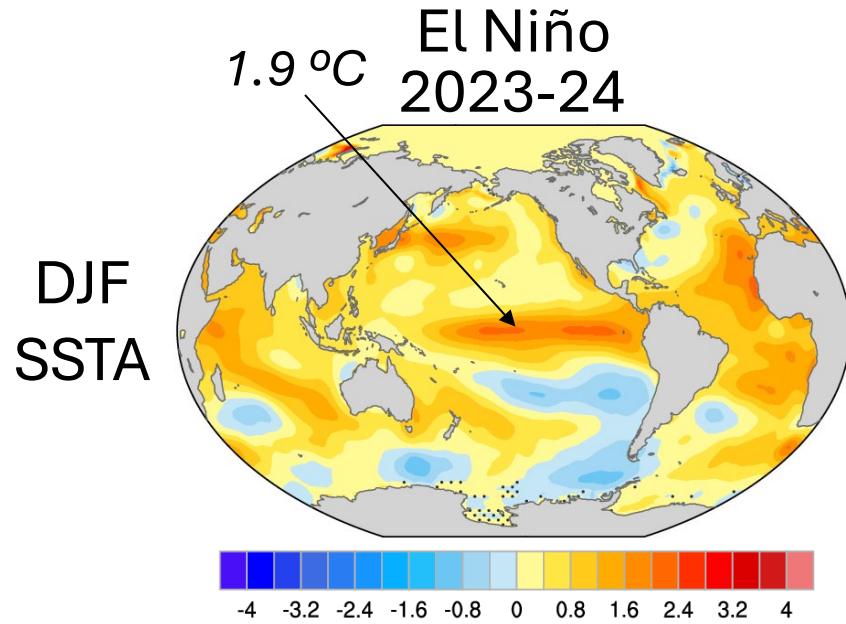
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The Role of Background Climate Change

Deser et al. 2026



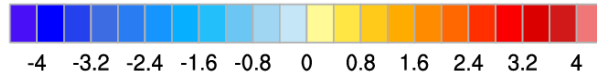
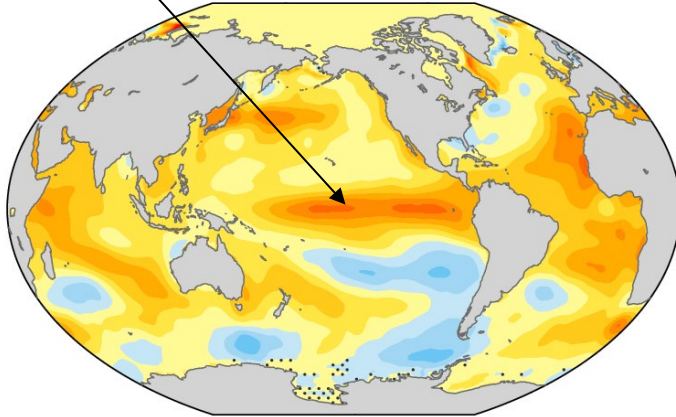
The Role of Background Climate Change

Deser et al. 2026

El Niño
2023-24

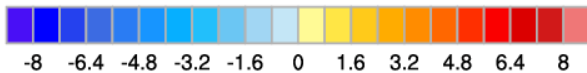
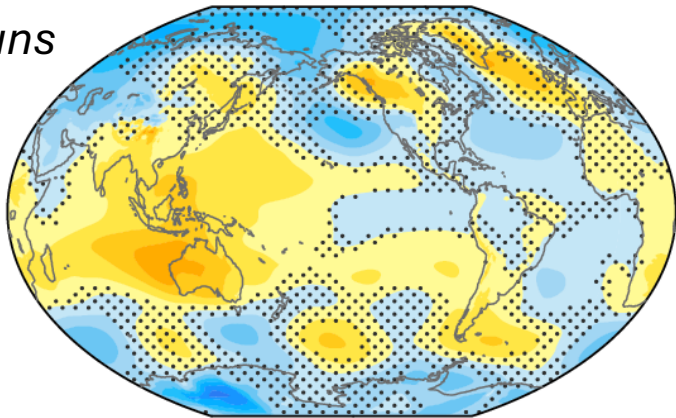
1.9 °C

DJF
SSTA



CAM6 SLP response

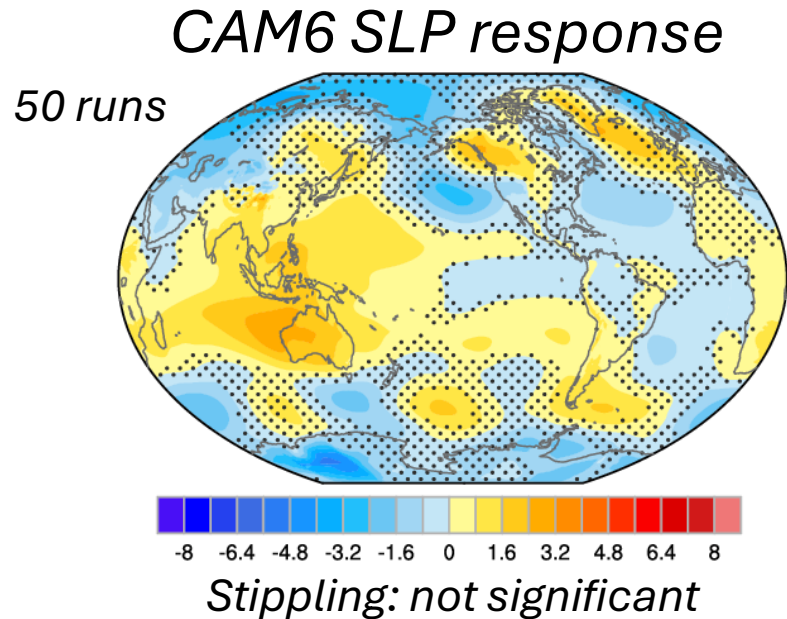
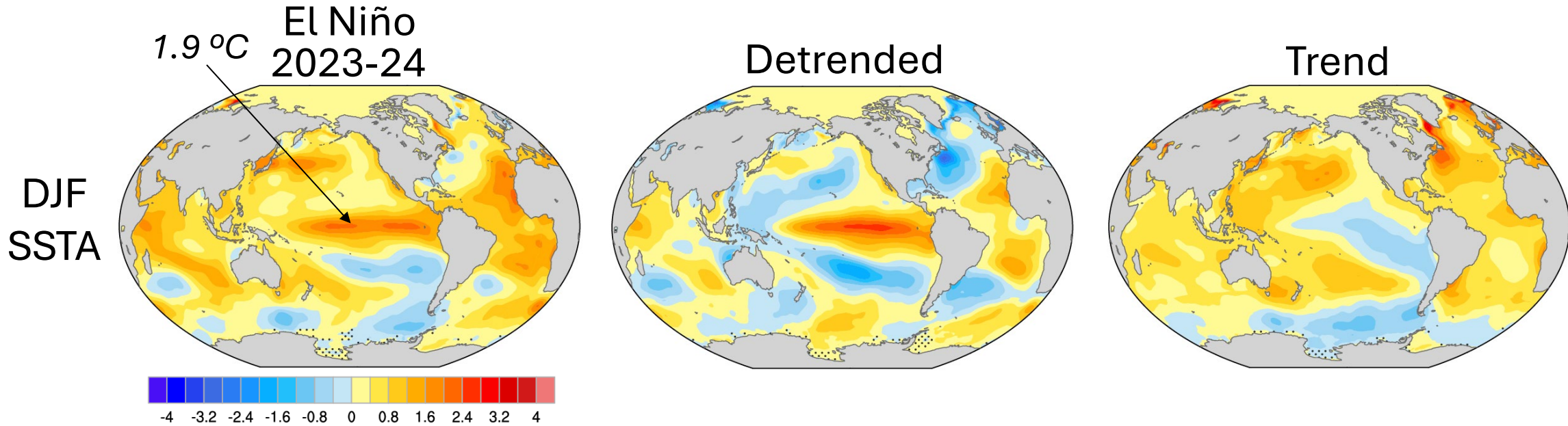
50 runs



Stippling: not significant

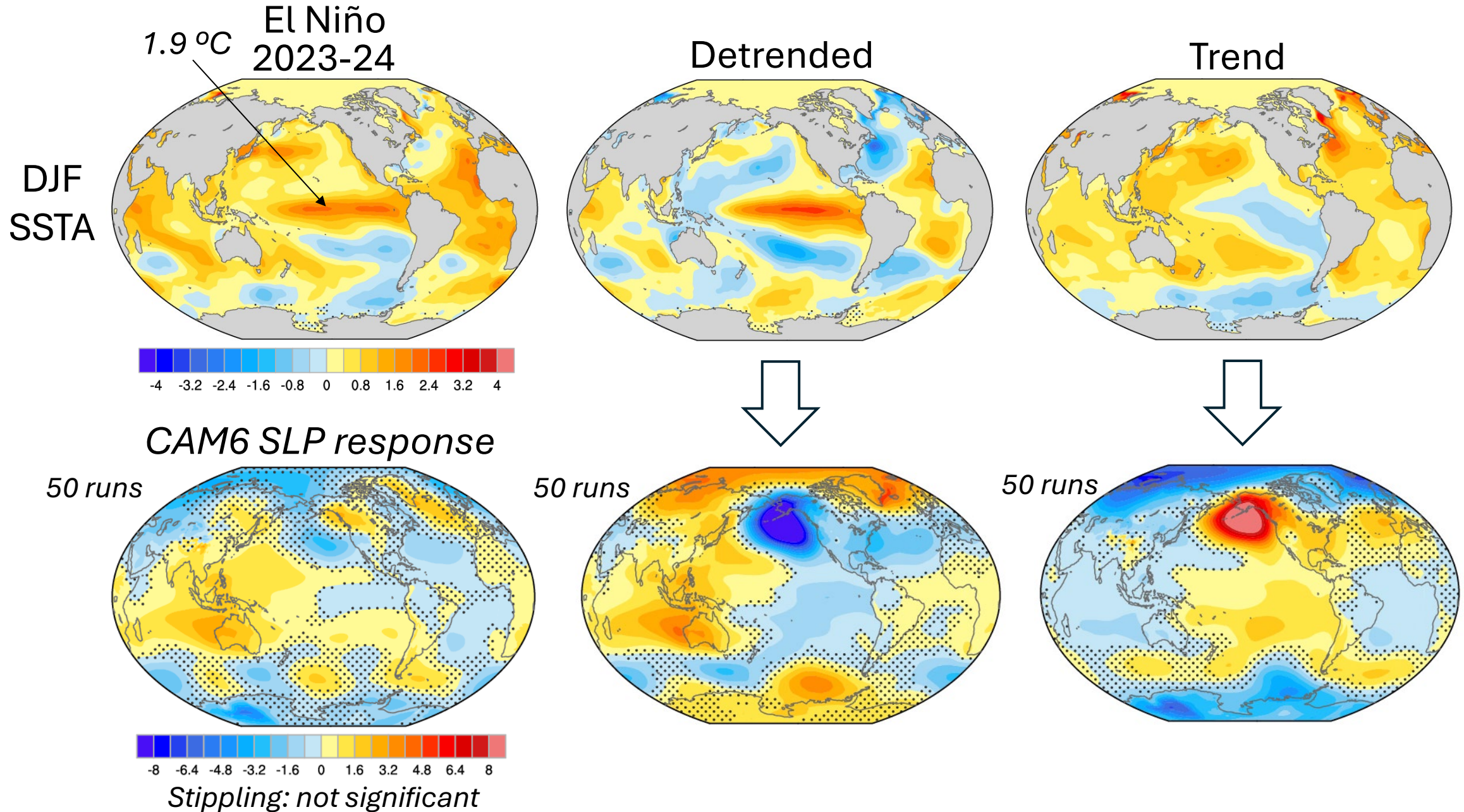
The Role of Background Climate Change

Deser et al. 2026



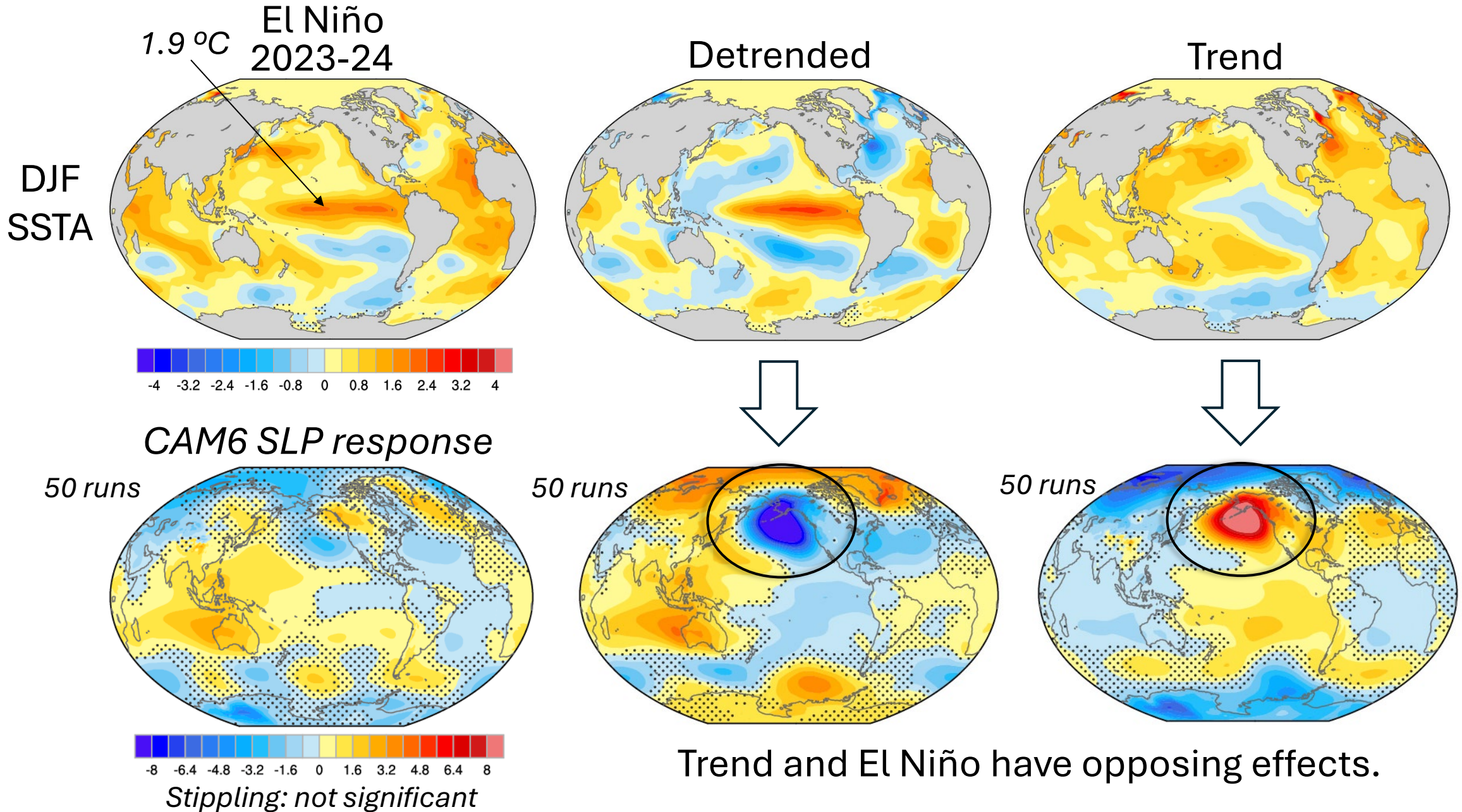
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Deser et al. 2026



The Role of Background Climate Change

Deser et al. 2026

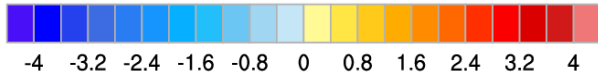
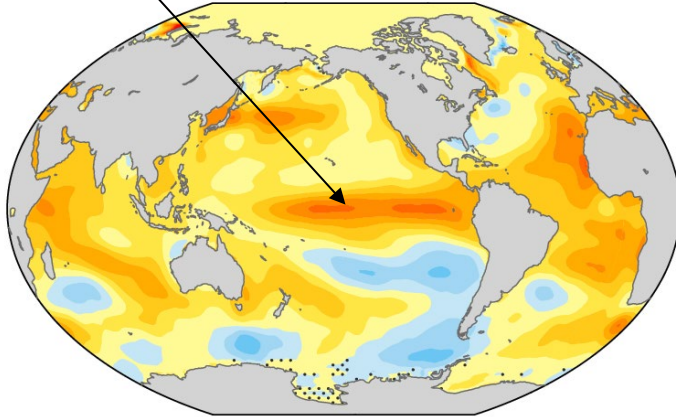


The Role of Background Climate Change

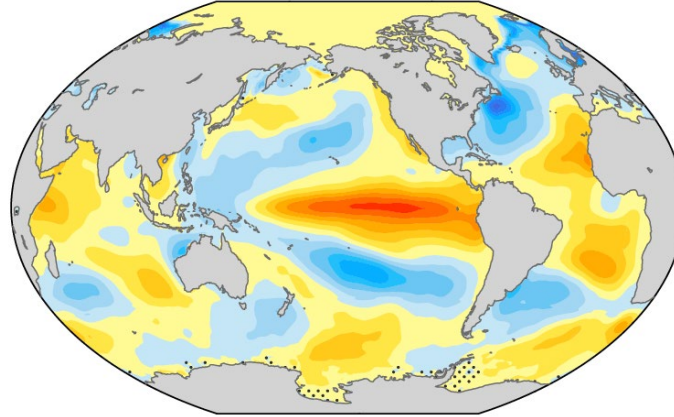
Deser et al. 2026

El Niño
2023-24
1.9 °C

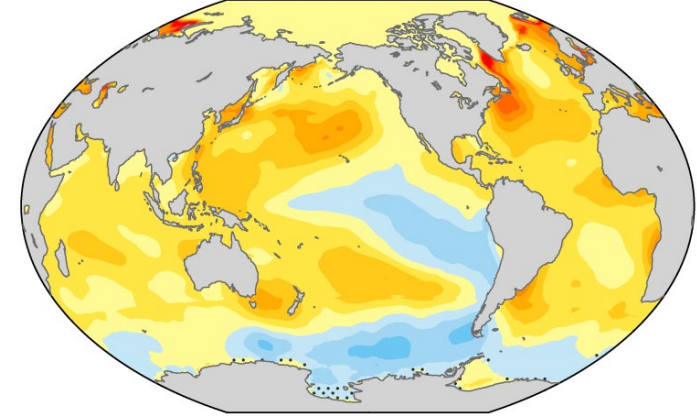
DJF
SSTA



Detrended

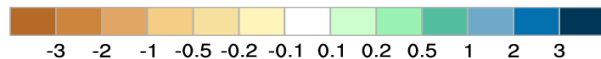
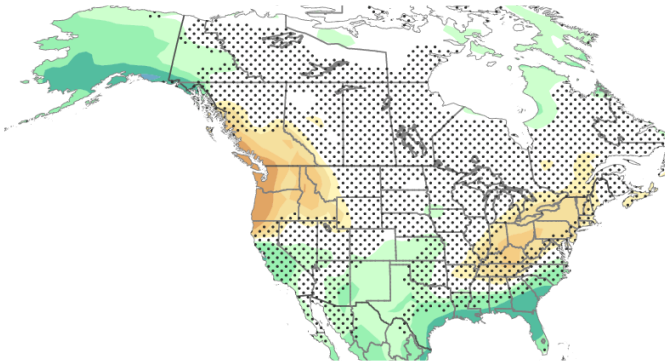


Trend

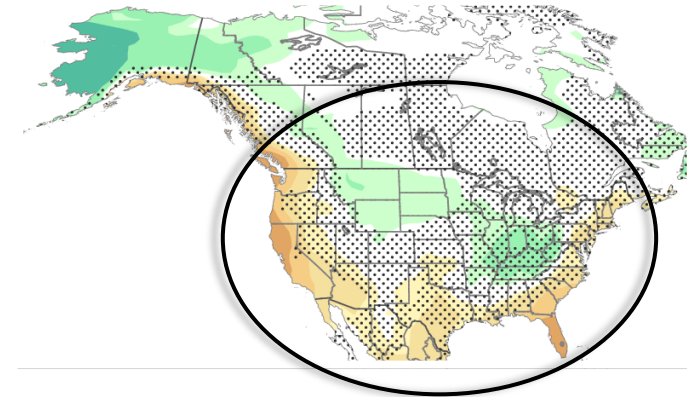
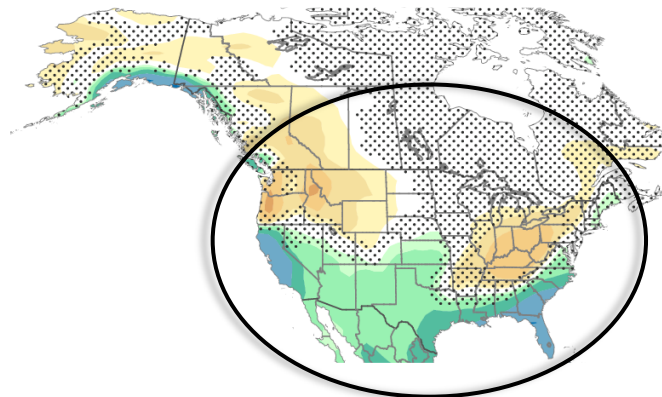


CAM6 Precipitation response

50 runs



Stippling: not significant



Trend and El Niño have opposing effects.

2026 Super El Niño?

What might it mean for U.S. Climate this winter?

Clara Deser
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cdeser@ucar.edu

Climate Variability Lecture
CESM Tutorial, 9 July 2026