

ENSO: Recent Evolution, Current Status and Predictions



Update prepared by:
Climate Prediction Center / NCEP
2 September 2025

Outline

Summary

Recent Evolution and Current Conditions

Oceanic Niño Index (ONI)

Pacific SST Outlook

U.S. Seasonal Precipitation and Temperature Outlooks

Summary

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ENSO Alert System Status: **La Niña Watch**

ENSO-neutral is present.*

Equatorial sea surface temperatures (SSTs) are near-to-below average across most of the Pacific Ocean.

ENSO-neutral is most likely through the late Northern Hemisphere summer 2025 (56% chance in August-October). Thereafter, a brief period of La Niña conditions is favored in the fall and early winter 2025-26 before reverting to ENSO-neutral.*

* Note: These statements are updated once a month (2nd Thursday of each month) in association with the ENSO Diagnostics Discussion, which can be found by clicking [here](#).

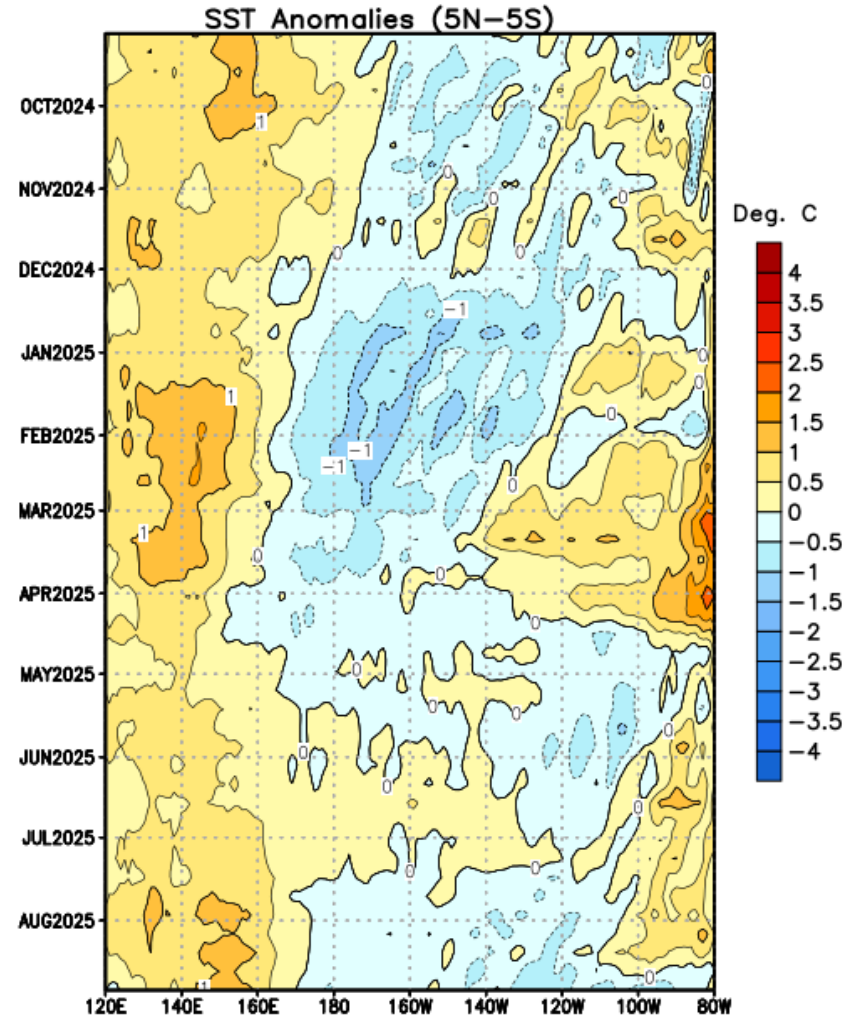
Recent Evolution of Equatorial Pacific SST Departures (°C)

From early December 2024 through February 2025, below-average SSTs persisted in the east-central and central Pacific.

During February-March 2025 and late May-August, above-average SSTs were observed in the eastern Pacific.

Since the end of March, SSTs returned to near average across most of the equatorial Pacific Ocean.

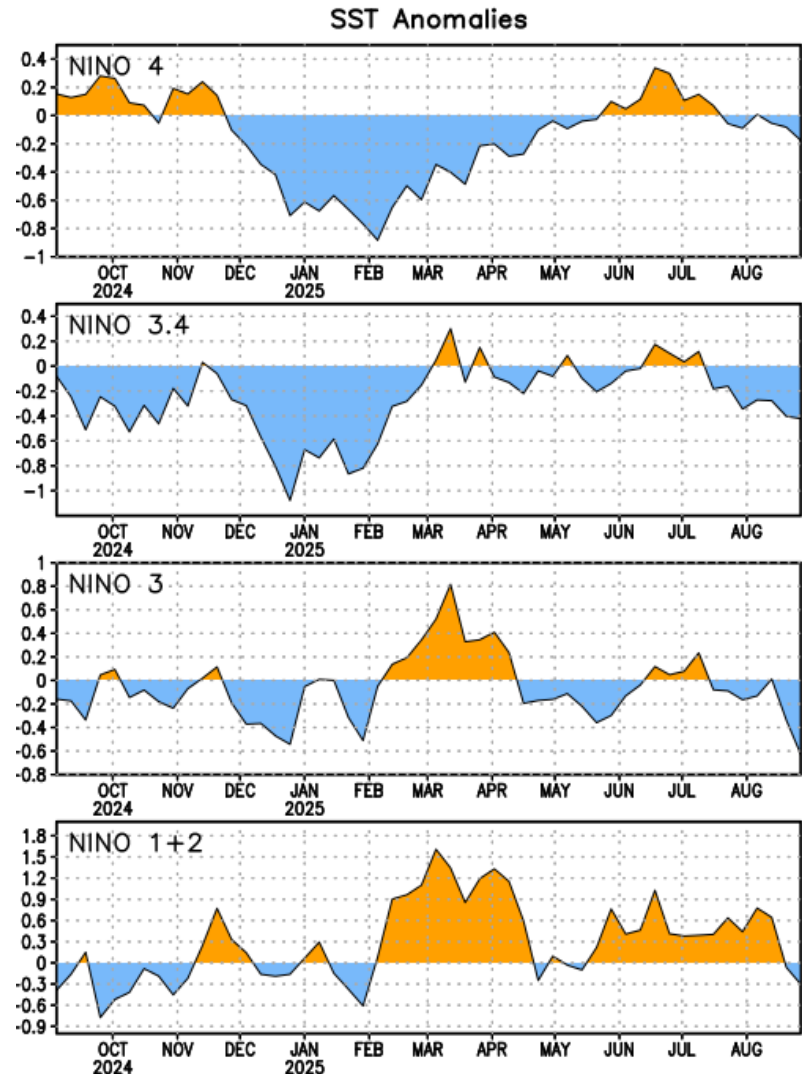
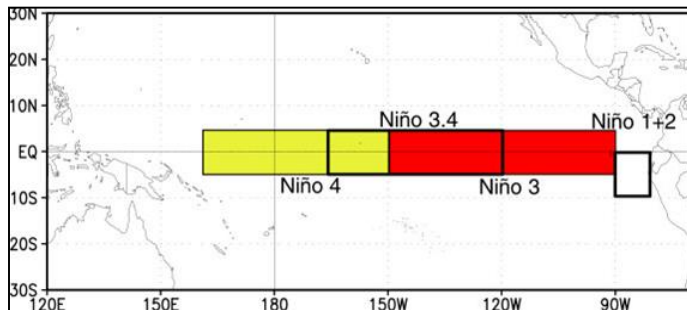
Recently, equatorial SST anomalies became near-to-below average in the east-central and eastern Pacific Ocean.



Niño Region SST Departures (°C) Recent Evolution

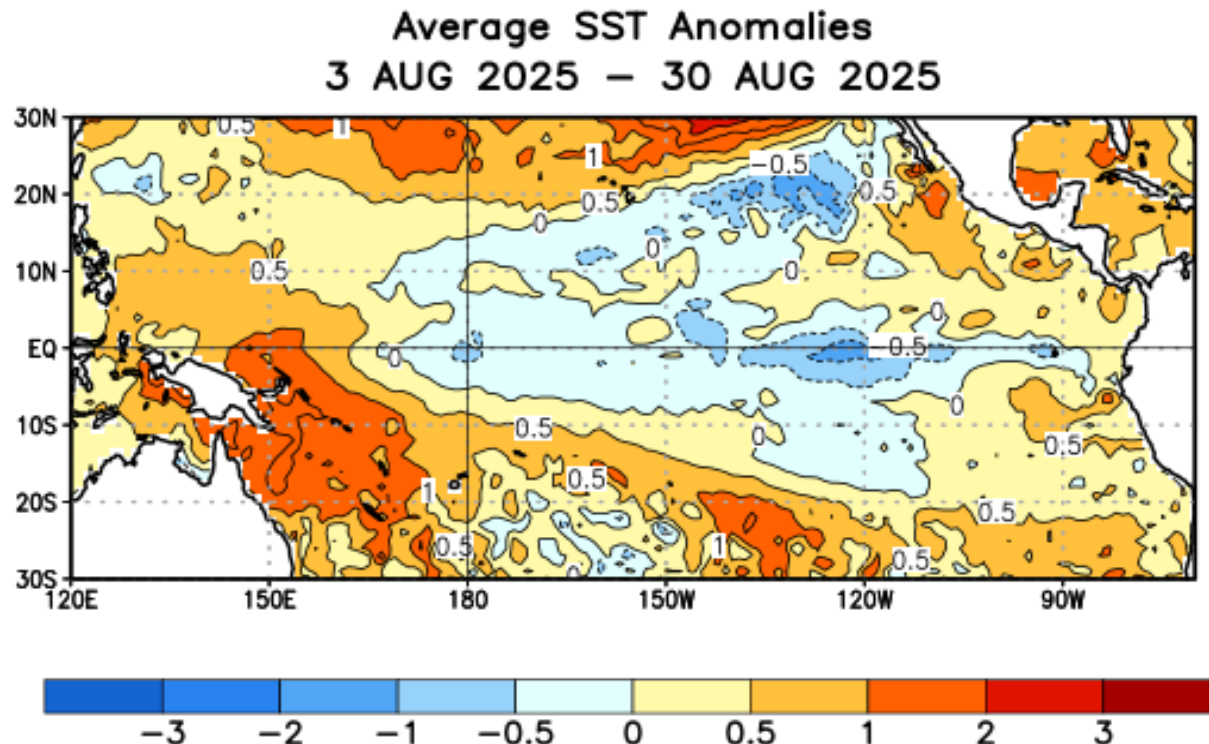
The latest weekly SST departures are:

Niño 4	-0.2°C
Niño 3.4	-0.4°C
Niño 3	-0.6°C
Niño 1+2	-0.3°C



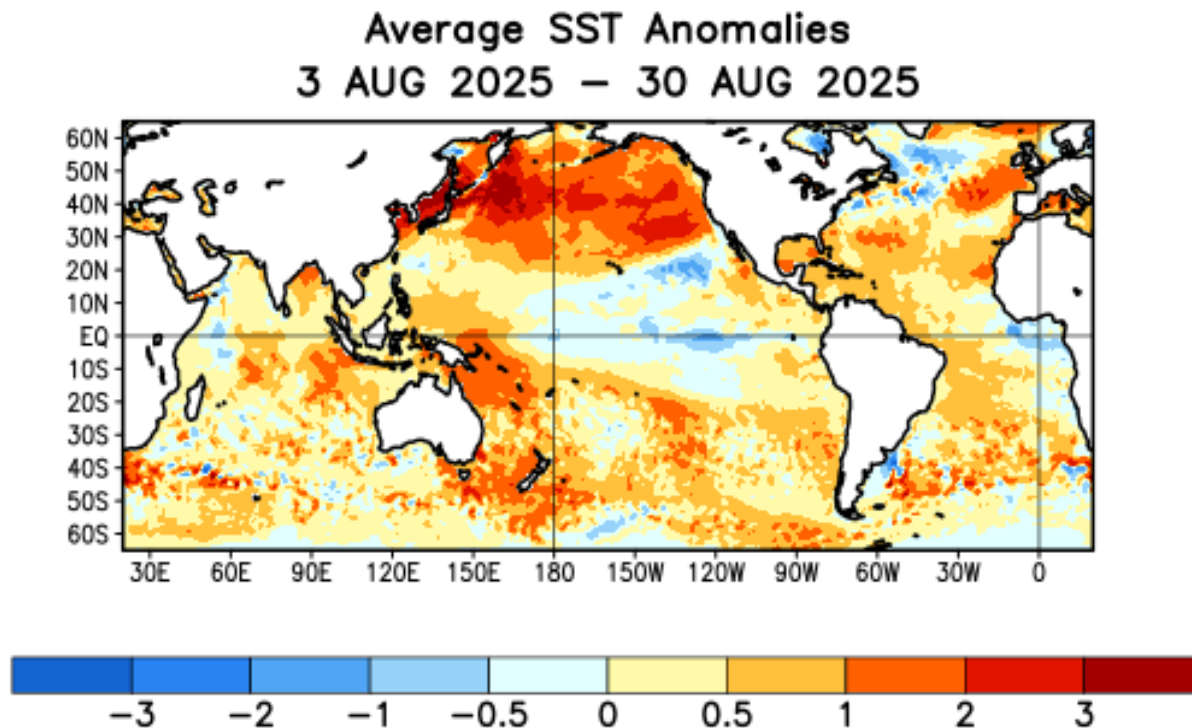
SST Departures (°C) in the Tropical Pacific During the Last Four Weeks

In the last four weeks, equatorial SSTs were above average in the western Pacific Ocean, and were near-to-below average across most of the central and eastern Pacific.



Global SST Departures (°C) During the Last Four Weeks

During the last four weeks, equatorial SSTs were near-to-below average in the eastern Atlantic, east-central Pacific, and western Indian Oceans. SSTs were above average in the western Pacific, western Atlantic, and central and eastern Indian Oceans.

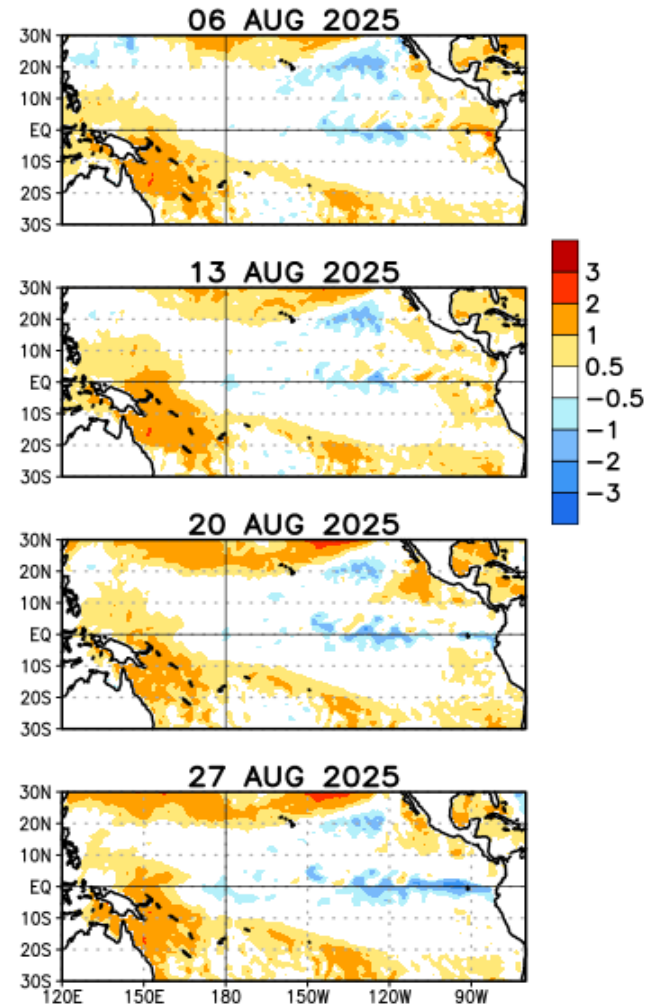


Weekly SST Departures during the Last Four Weeks

During the last 4 weeks, near-to-below average equatorial SSTs continued across most of the Pacific, except for the above-average SSTs that persisted in the western Pacific.

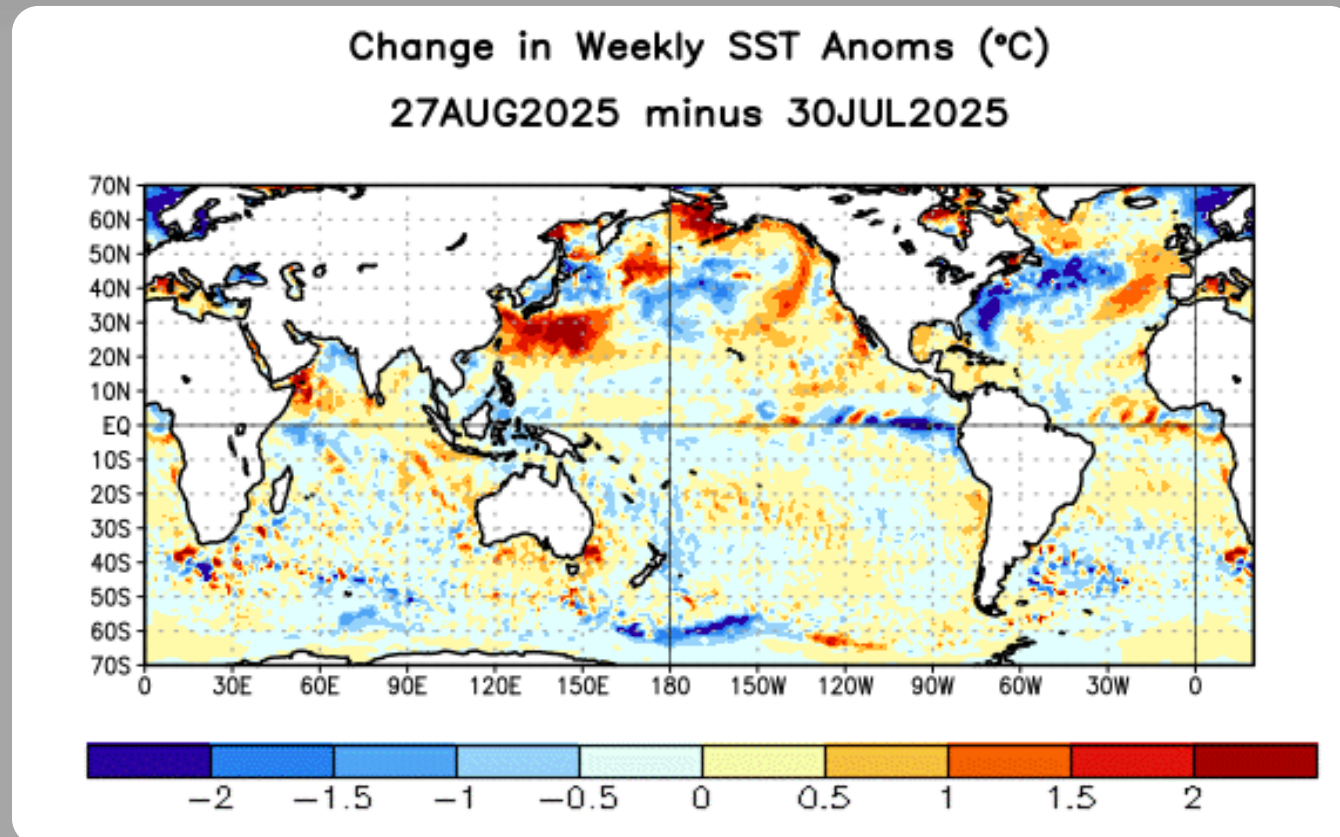
Above-average SSTs weakened in the eastern Pacific Ocean.

Weekly SST Anomalies (DEG C)



Change in Weekly SST Departures over the Last Four Weeks

During the last four weeks, mostly negative SST anomaly changes were evident from the central to eastern equatorial Pacific Ocean.



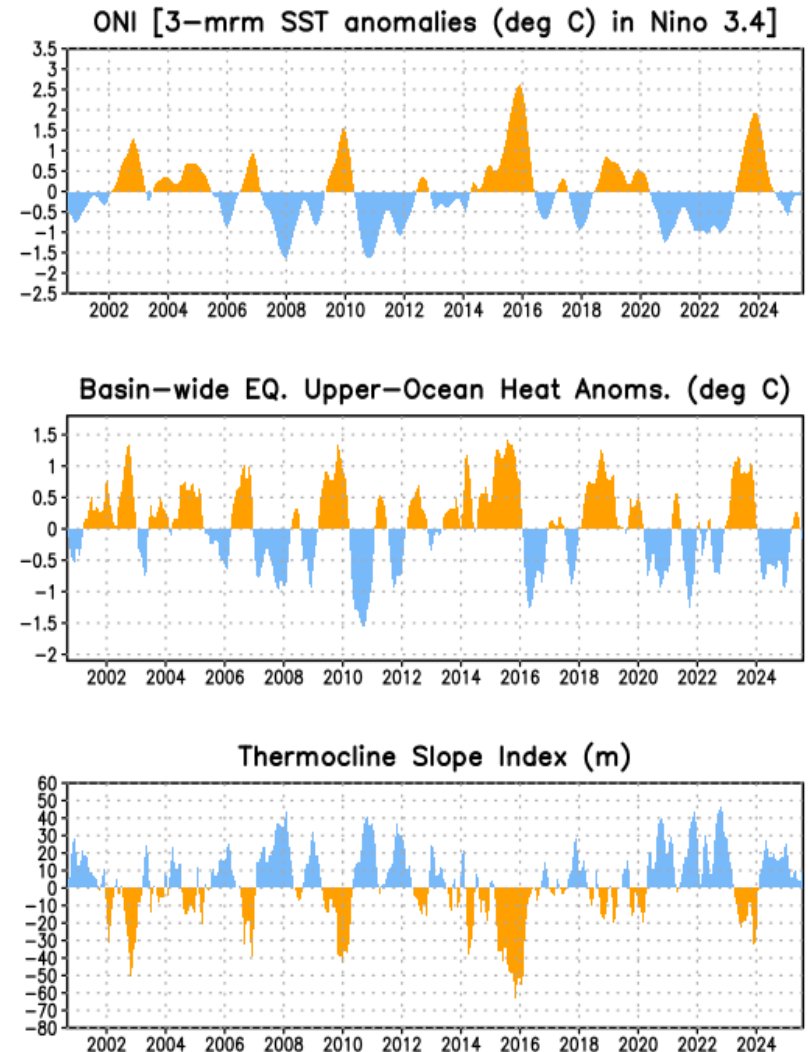
Upper-Ocean Conditions in the Equatorial Pacific

The basin-wide equatorial upper ocean (0-300 m) heat content is greatest prior to and during the early stages of a Pacific warm (El Niño) episode (compare top 2 panels), and least prior to and during the early stages of a cold (La Niña) episode.

The slope of the oceanic thermocline is least (greatest) during warm (cold) episodes.

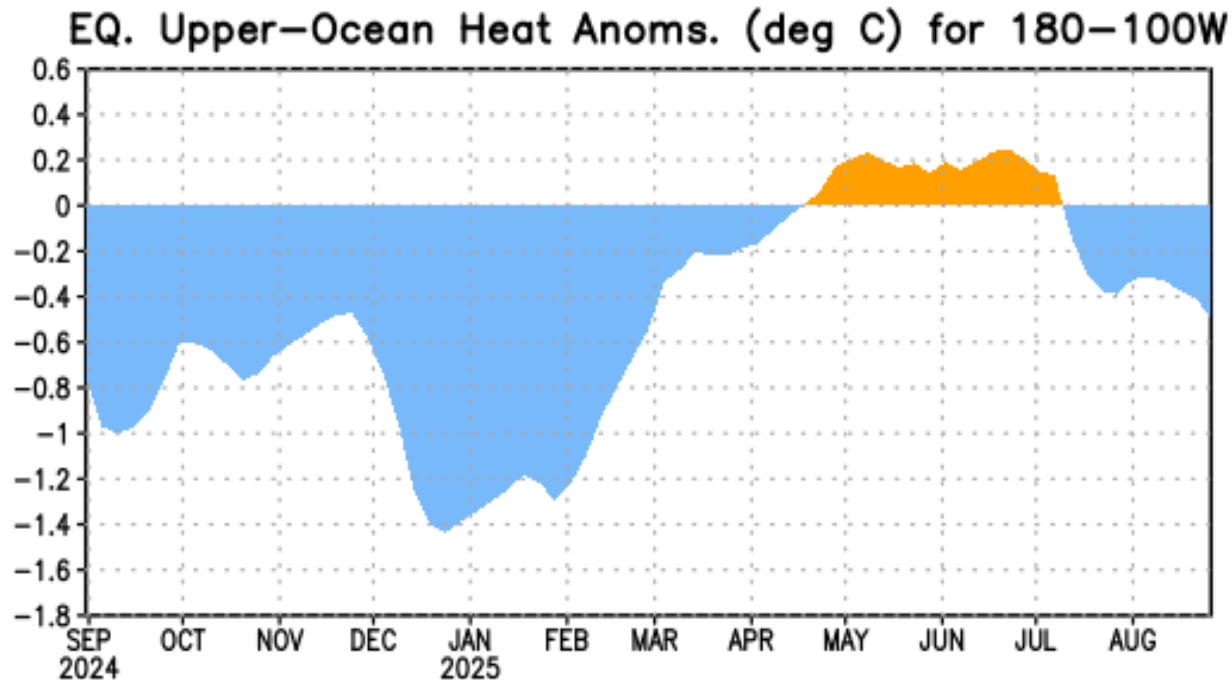
Recent values of the upper-ocean heat anomalies (near-average) and thermocline slope index (near-to-above average) reflect ENSO-neutral.

The monthly thermocline slope index represents the difference in anomalous depth of the 20°C isotherm between the western Pacific (160°E-150°W) and the eastern Pacific (90°-140°W).



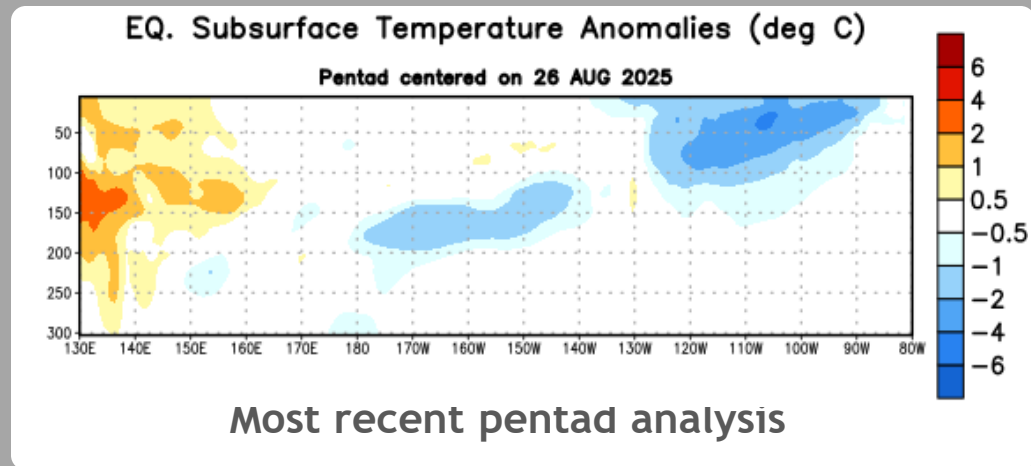
Central and Eastern Pacific Upper-Ocean (0-300 m) Weekly Average Temperature Anomalies

Negative subsurface temperature anomalies dominated from the start of the period through the beginning of April 2025. The negative anomalies reached a minimum in December 2024. In February and March 2025, the negative anomalies significantly weakened. Weak positive anomalies were present from mid-April through early July. In mid-July, negative anomalies strengthened and have persisted.

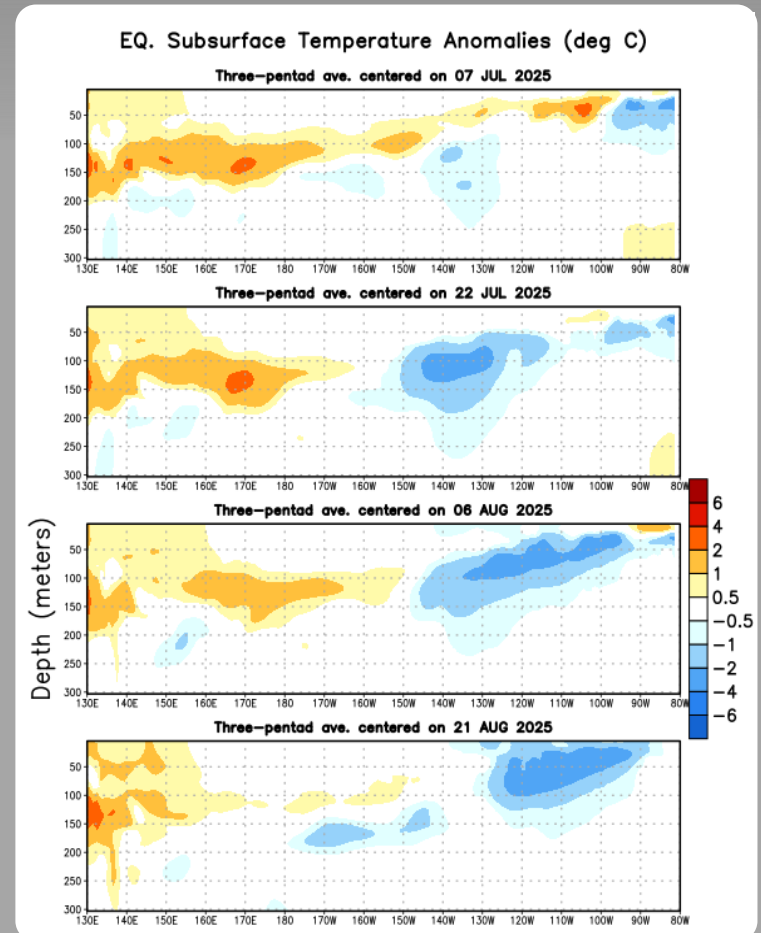


Sub-Surface Temperature Departures in the Equatorial Pacific

Over the last couple of months, below-average temperatures strengthened across the central and eastern Pacific.



Above-average subsurface temperatures persisted in the western Pacific.

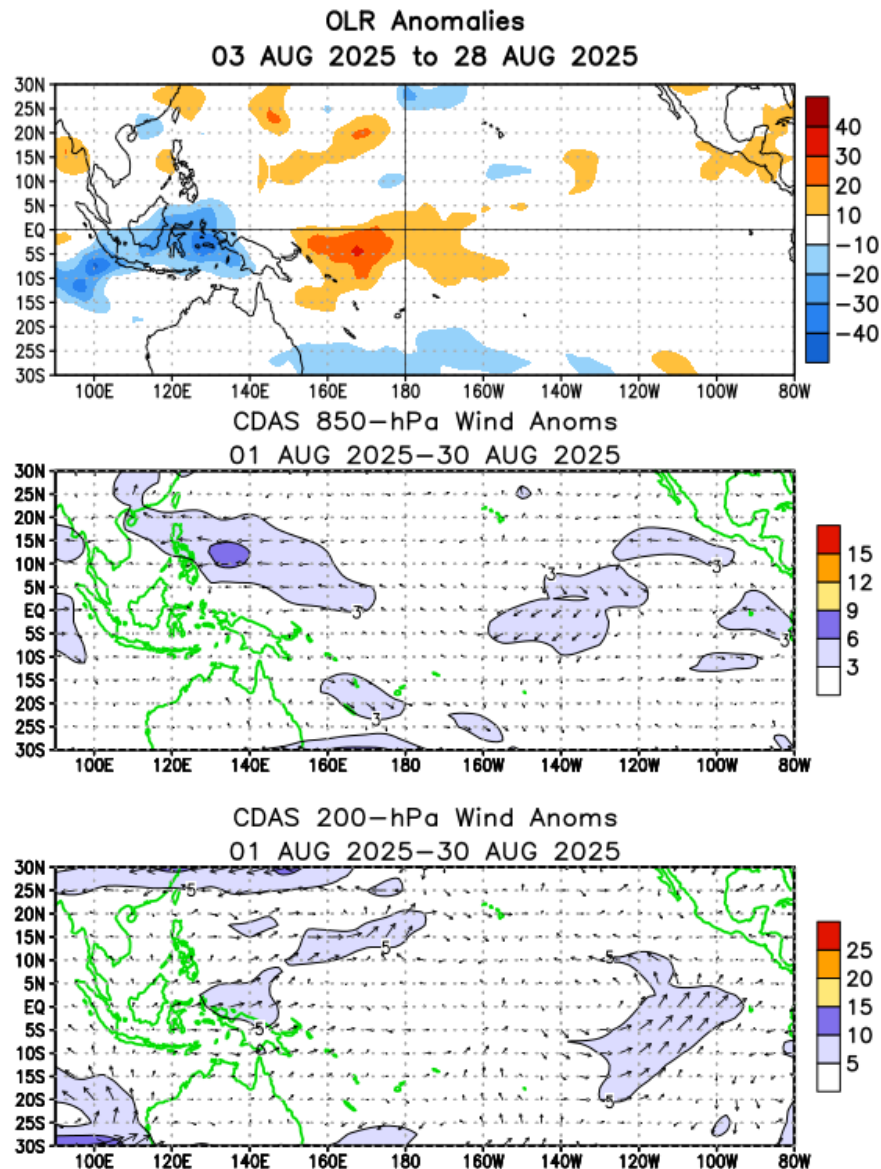


Tropical OLR and Wind Anomalies During the Last 30 Days

Below-average OLR (enhanced convection and precipitation) was evident over Indonesia, while above-average OLR (suppressed convection and precipitation) was observed in the western and central equatorial Pacific Ocean.

Low-level (850-hPa) wind anomalies were easterly over most of the equatorial Pacific Ocean.

Upper-level (200-hPa) wind anomalies were westerly over the far western and eastern equatorial Pacific.



Intraseasonal Variability

Intraseasonal variability in the atmosphere (wind and pressure), which is often related to the Madden-Julian Oscillation (MJO), can significantly impact surface and subsurface conditions across the Pacific Ocean.

Related to this activity:

Significant weakening of the low-level easterly winds usually initiates an eastward-propagating oceanic Kelvin wave.

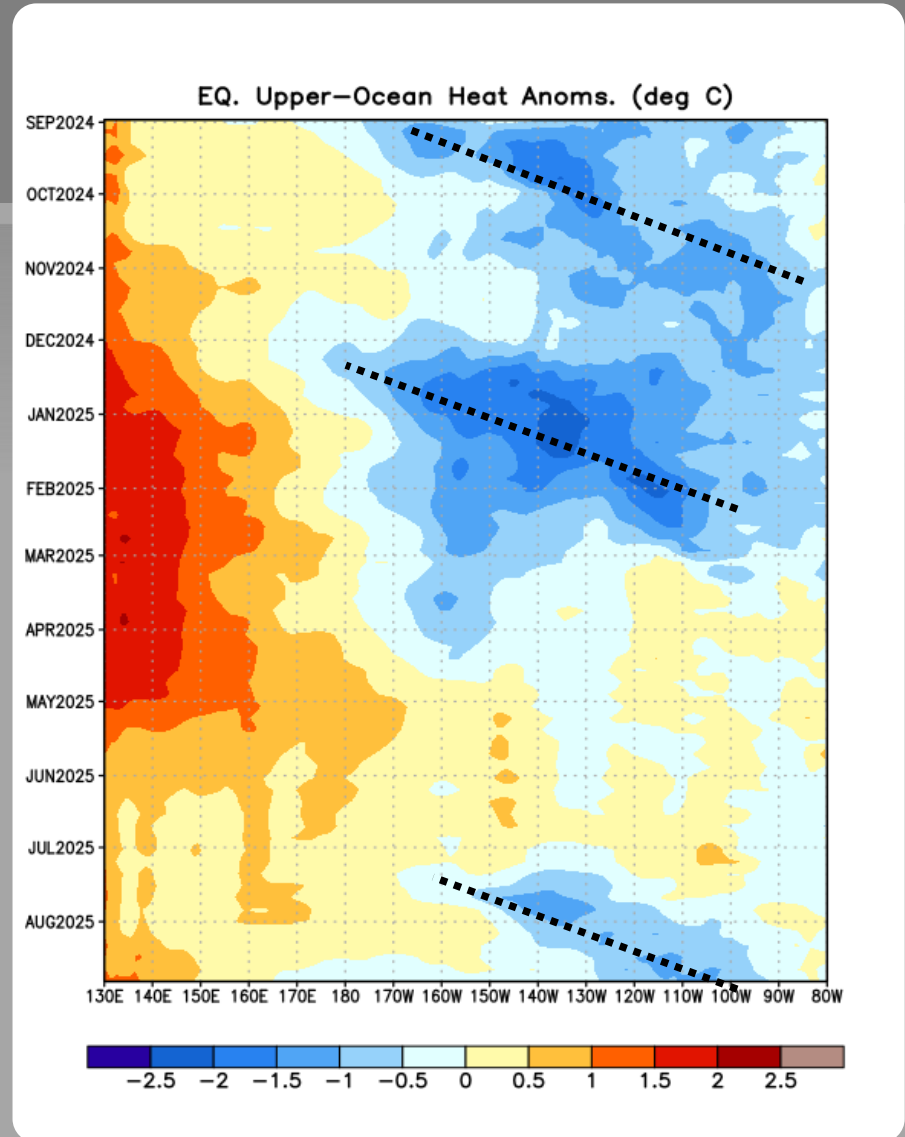
Weekly Heat Content Evolution in the Equatorial Pacific

Significant equatorial oceanic Kelvin wave activity (dashed and dotted lines) has been present throughout the period shown.

Through February 2025, below-average subsurface temperatures dominated the east-central and eastern Pacific. Upwelling Kelvin waves were initiated during September 2024, December 2024, and July 2025.

From April to early July 2025, near-average temperatures dominated the central and eastern Pacific. Below-average temperatures returned in July 2025 and have persisted in the east-central Pacific.

Equatorial oceanic Kelvin waves have alternating warm and cold phases. The warm phase is indicated by dashed lines. Down-welling and warming occur in the leading portion of a Kelvin wave, and up-welling and cooling occur in the trailing portion.



Low-level (850-hPa) Zonal (east-west) Wind Anomalies (m s^{-1})

At times, the Madden Julian-Oscillation (MJO) has contributed to the eastward propagation of low-level wind anomalies.

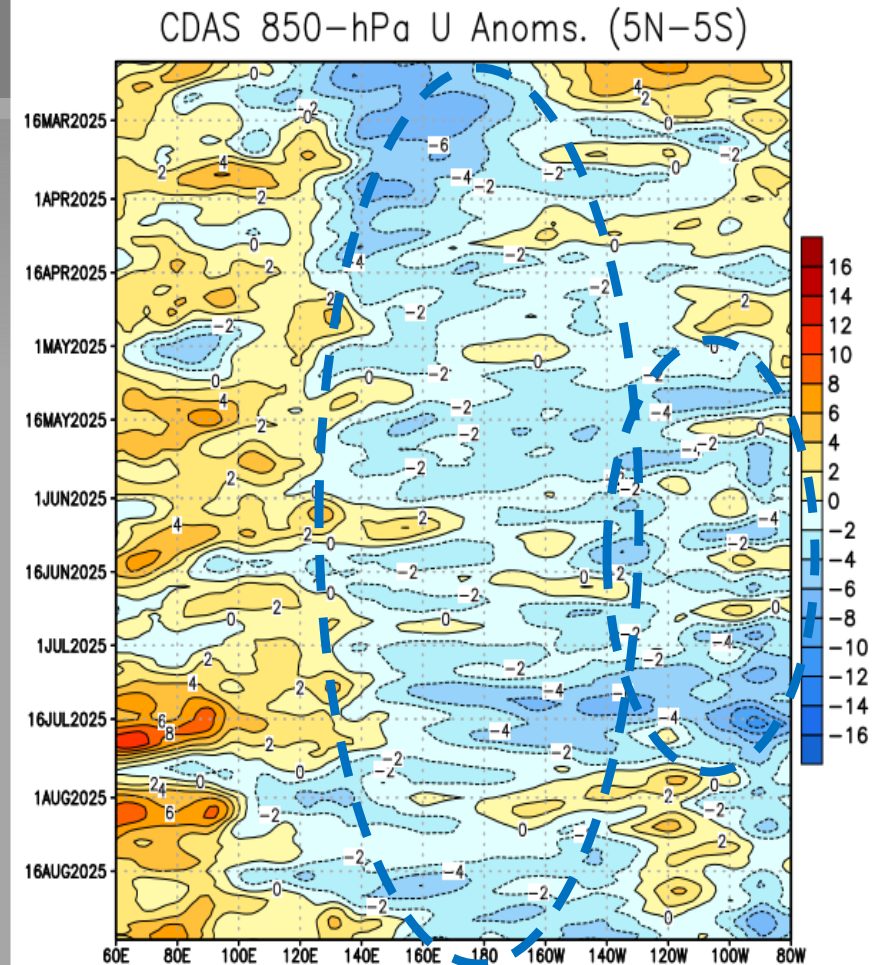
Since the beginning of the period, easterly wind anomalies mostly dominated the central Pacific Ocean.

Since early May 2025, easterly wind anomalies have mostly persisted over the eastern Pacific Ocean.

Recently, easterly wind anomalies strengthened over the east-central and eastern Pacific Ocean.

Westerly Wind Anomalies (orange/red shading)

Easterly Wind Anomalies (blue shading)



Upper-level (200-hPa) Velocity Potential Anomalies

At times, regions of anomalous divergence (green shading) and convergence (brown shading) shifted eastward.

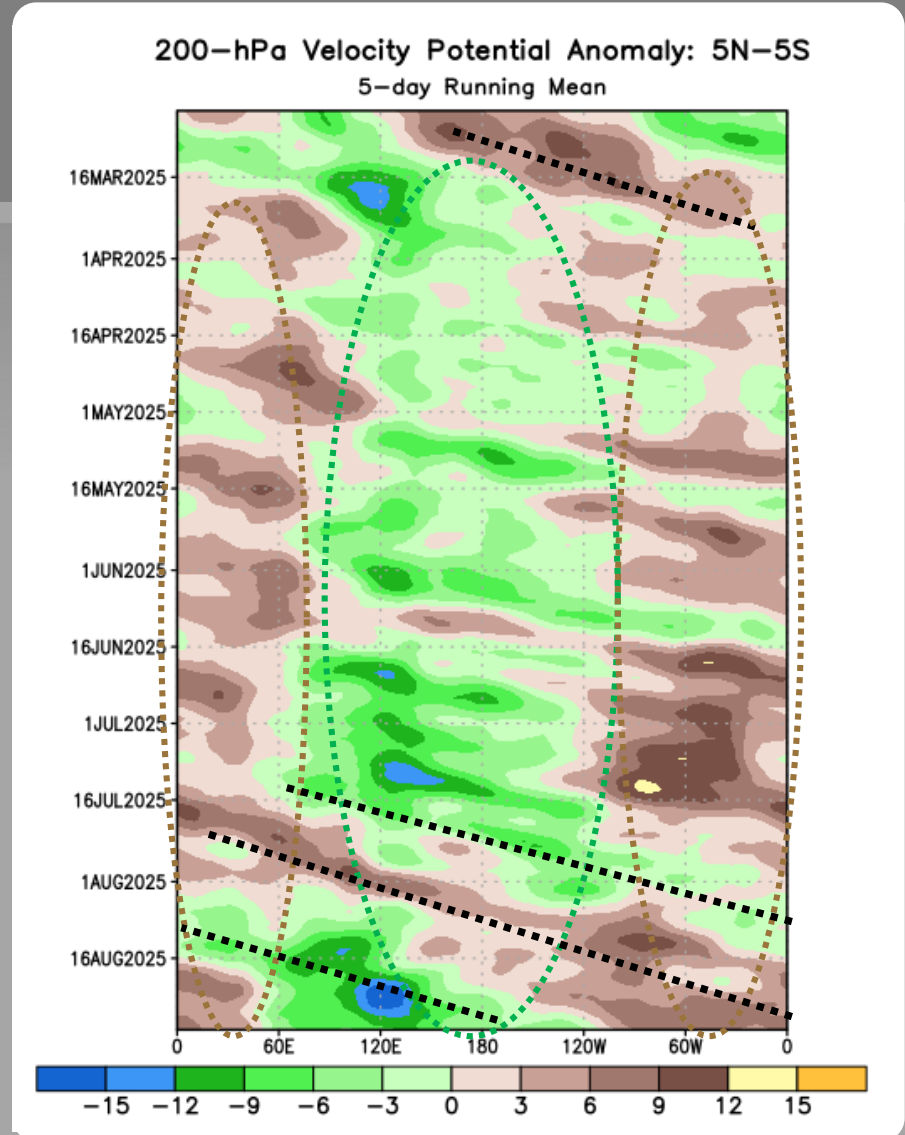
Since the beginning of the period, anomalous divergence has mostly observed over Indonesia and/or the western Pacific.

Since mid-March 2025, anomalous convergence mostly persisted outside of the tropical Pacific Ocean.

Unfavorable for precipitation (brown shading)

Favorable for precipitation (green shading)

Note: Eastward propagation is not necessarily indicative of the Madden-Julian Oscillation (MJO).



Outgoing Longwave Radiation (OLR) Anomalies

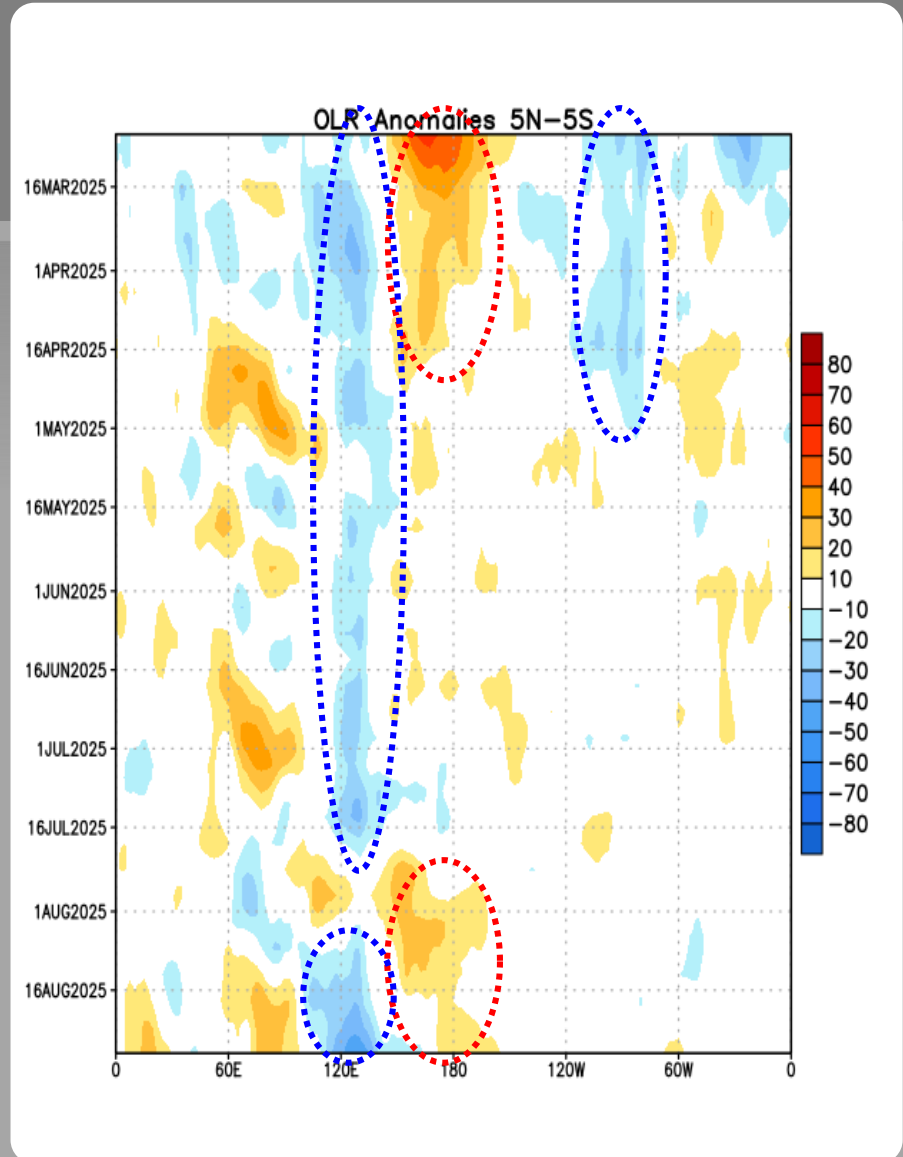
Positive OLR anomalies (suppressed convection/rainfall) were observed near the Date Line through mid-April 2025.

Through early May 2025, negative OLR anomalies persisted over the eastern Pacific Ocean.

Negative OLR anomalies (enhanced convection/rainfall) persisted over Indonesia through mid-July 2025 and emerged again in early August 2025.

Positive OLR anomalies emerged near the Date Line in late July 2025.

Drier-than-average Conditions (orange/red shading)
Wetter-than-average Conditions (blue shading)



Oceanic Niño Index (ONI)

The ONI is based on SST departures from average in the Niño 3.4 region, and is a principal measure for monitoring, assessing, and predicting ENSO.

Defined as the three-month running-mean SST departures in the Niño 3.4 region. Departures are based on a set of improved homogeneous historical SST analyses (Extended Reconstructed SST - ERSST.v5). The SST reconstruction methodology is described in Huang et al., 2017, J. Climate, vol. 30, 8179-8205.)

It is one index that helps to place current events into a historical perspective.

Note: a different SST dataset is used for weekly SST monitoring (slides #4-9) and is using OISSTv2.1 (Huang et al., 2021).

NOAA Operational Definitions for El Niño and La Niña

El Niño: characterized by a positive ONI greater than or equal to $+0.5^{\circ}\text{C}$.

La Niña: characterized by a negative ONI less than or equal to -0.5°C .

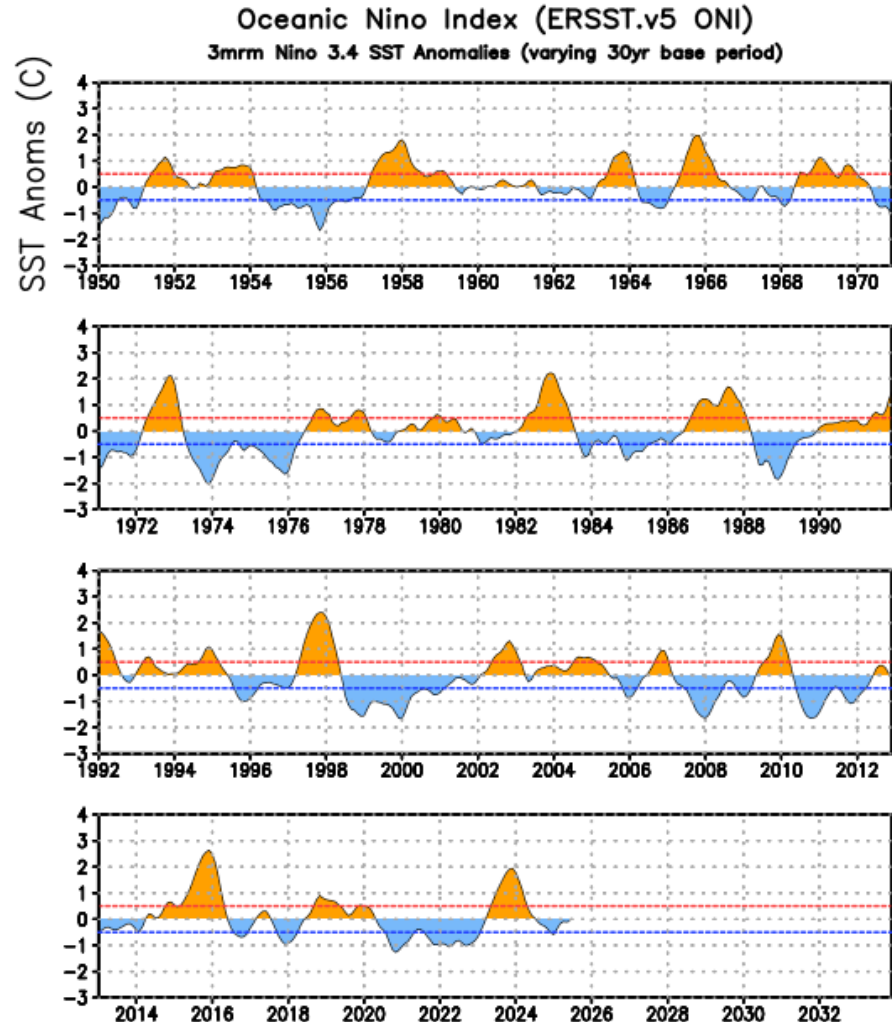
By historical standards, to be classified as a full-fledged El Niño or La Niña episode, these thresholds must be exceeded for a period of at least 5 consecutive overlapping 3-month seasons.

CPC considers El Niño or La Niña conditions to occur when the monthly Niño3.4 OISST departures meet or exceed $\pm 0.5^{\circ}\text{C}$ along with consistent atmospheric features. These anomalies must also be forecasted to persist for 3 consecutive months.

ONI (°C): Evolution since 1950

The most recent ONI value (May - July 2025) is -0.1°C .

El Niño ↑
Neutral
La Niña ↓



Historical El Niño and La Niña Episodes Based on the ONI computed using ERSST.v5

Recent Pacific warm (red) and cold (blue) periods based on a threshold of ± 0.5 °C for the Oceanic Nino Index (ONI) [3 month running mean of ERSST.v5 SST anomalies in the Nino 3.4 region (5N-5S, 120-170W)]. For historical purposes, periods of below and above normal SSTs are colored in blue and red when the threshold is met for a minimum of 5 consecutive over-lapping seasons.

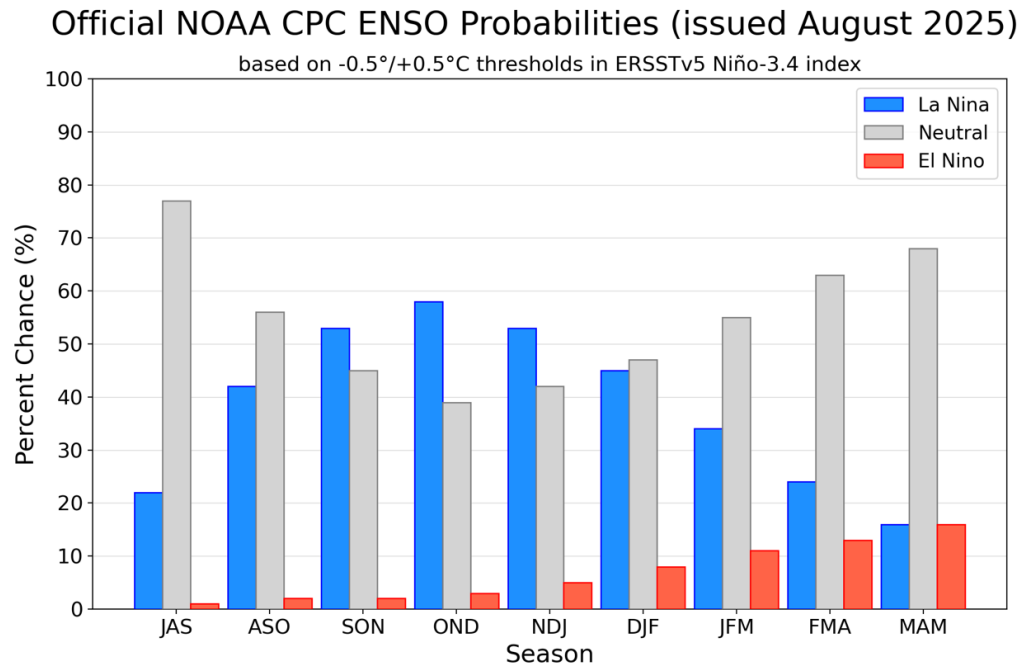
The ONI is one measure of the El Niño-Southern Oscillation, and other indices can confirm whether features consistent with a coupled ocean-atmosphere phenomenon accompanied these periods. The complete table going back to DJF 1950 can be found [here](#).

Year	DJF	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO	SON	OND	NDJ
2013	-0.4	-0.4	-0.3	-0.3	-0.4	-0.4	-0.4	-0.3	-0.3	-0.2	-0.2	-0.3
2014	-0.4	-0.5	-0.3	0.0	0.2	0.2	0.0	0.1	0.2	0.5	0.6	0.7
2015	0.5	0.5	0.5	0.7	0.9	1.2	1.5	1.9	2.2	2.4	2.6	2.6
2016	2.5	2.1	1.6	0.9	0.4	-0.1	-0.4	-0.5	-0.6	-0.7	-0.7	-0.6
2017	-0.3	-0.2	0.1	0.2	0.3	0.3	0.1	-0.1	-0.4	-0.7	-0.8	-1.0
2018	-0.9	-0.9	-0.7	-0.5	-0.2	0.0	0.1	0.2	0.5	0.8	0.9	0.8
2019	0.7	0.7	0.7	0.7	0.5	0.5	0.3	0.1	0.2	0.3	0.5	0.5
2020	0.5	0.5	0.4	0.2	-0.1	-0.3	-0.4	-0.6	-0.9	-1.2	-1.3	-1.2
2021	-1.0	-0.9	-0.8	-0.7	-0.5	-0.4	-0.4	-0.5	-0.7	-0.8	-1.0	-1.0
2022	-1.0	-0.9	-1.0	-1.1	-1.0	-0.9	-0.8	-0.9	-1.0	-1.0	-0.9	-0.8
2023	-0.7	-0.4	-0.1	0.2	0.5	0.8	1.1	1.3	1.6	1.8	1.9	2.0
2024	1.8	1.5	1.1	0.7	0.4	0.2	0.0	-0.1	-0.2	-0.3	-0.4	-0.5
2025	-0.6	-0.4	-0.2	-0.1	-0.1	-0.1						

CPC Probabilistic ENSO Outlook

Updated: 14 August 2025

ENSO-neutral is most likely through the late Northern Hemisphere summer 2025 (56% chance in August-October). Thereafter, a brief period of La Niña conditions is favored in the fall and early winter 2025-26 before reverting to ENSO-neutral.



IRI Pacific Niño 3.4 SST Model Outlook

Most models favor ENSO-neutral to prevail through the Northern Hemisphere fall and winter 2025-26.

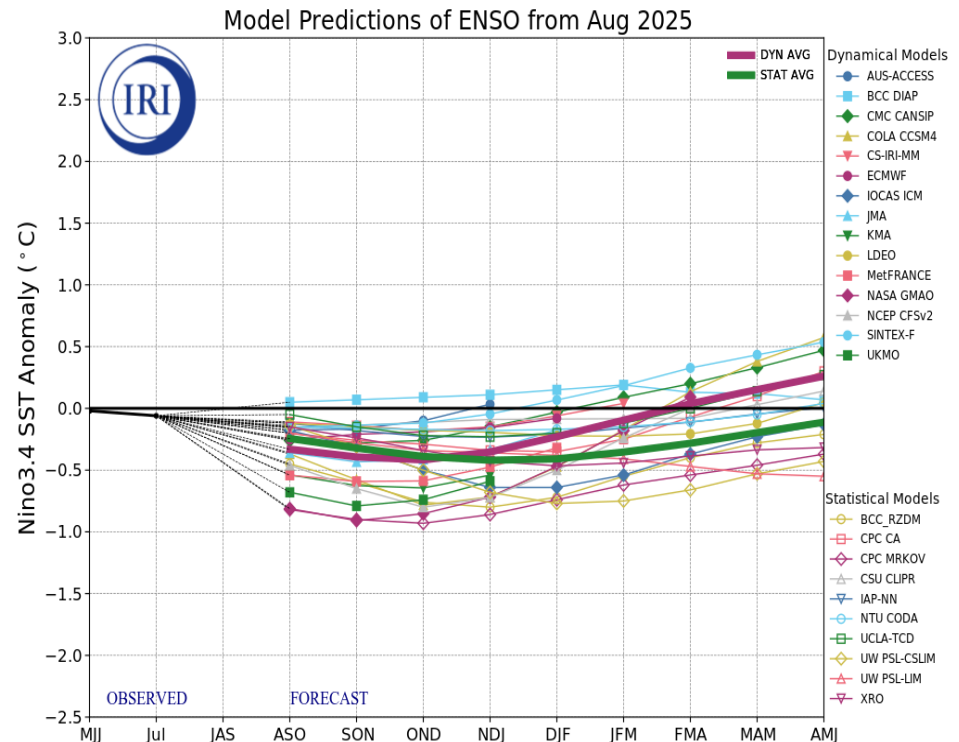


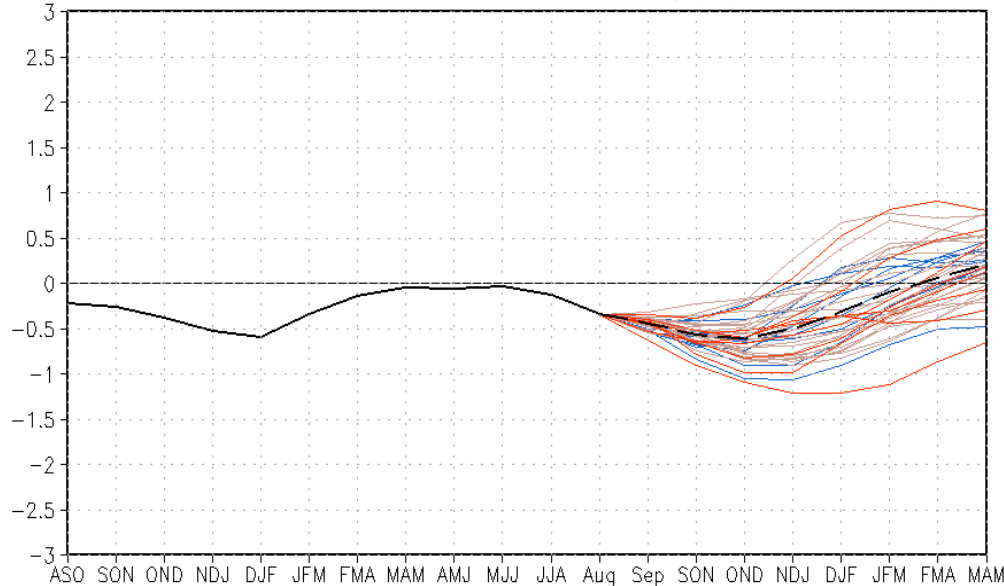
Figure provided by the International Research Institute (IRI) for Climate and Society (updated 19 August 2025).

SST Outlook: NCEP CFS.v2 Forecast (PDF corrected)

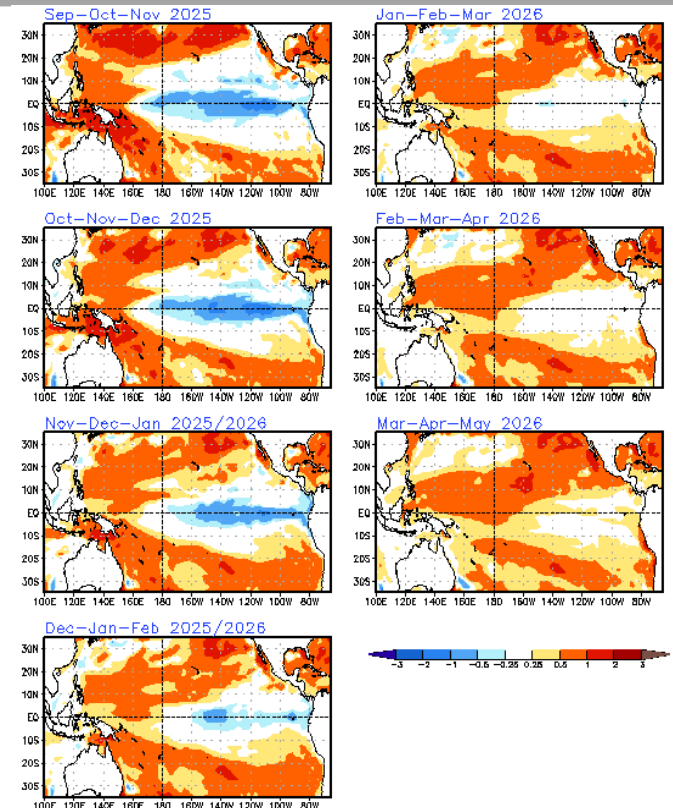
Issued: 1 September 2025

The CFS.v2 ensemble mean (black dashed line) favors La Niña during the Northern Hemisphere fall and early winter 2025-26.

CFSv2 forecast Nino3.4 SST anomalies (K) (PDF corrected)



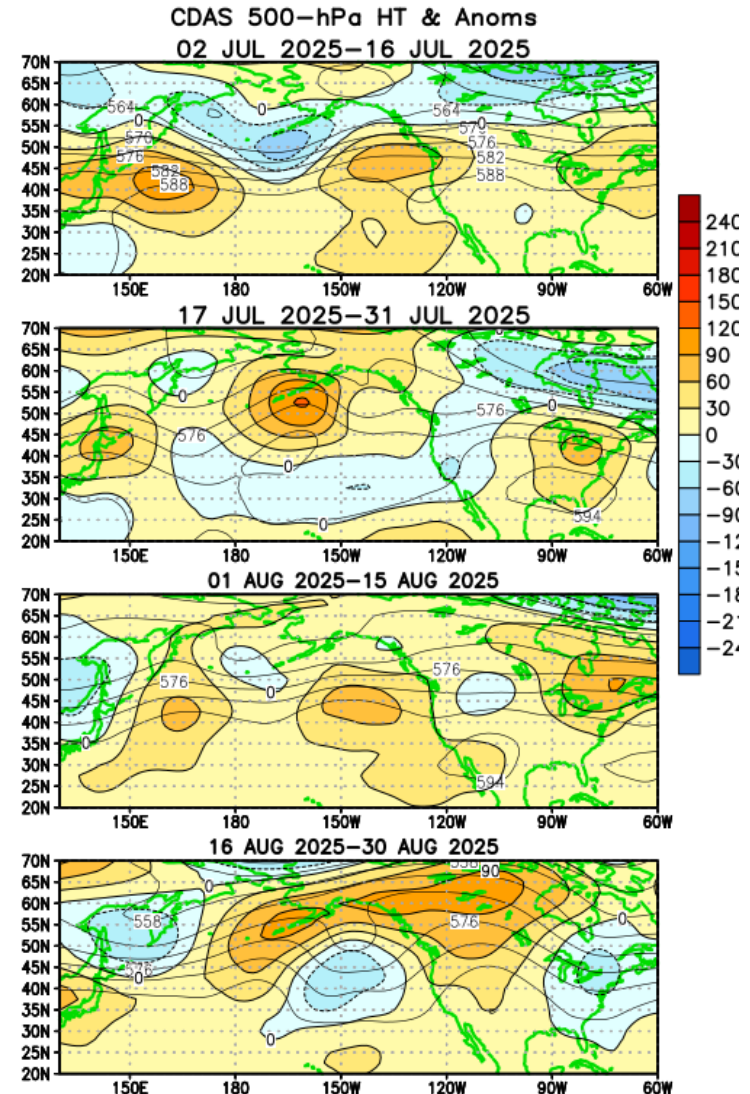
— Latest 8 forecast members
— Earliest 8 forecast members
— Other forecast members
— Forecast ensemble mean
— NCEP Olv2.1 daily analysis
(Climatology base period: 1991–2020)



Atmospheric anomalies over the North Pacific and North America During the Last 60 Days

From early July to mid-August, above-average heights and temperatures were evident over the eastern U.S.

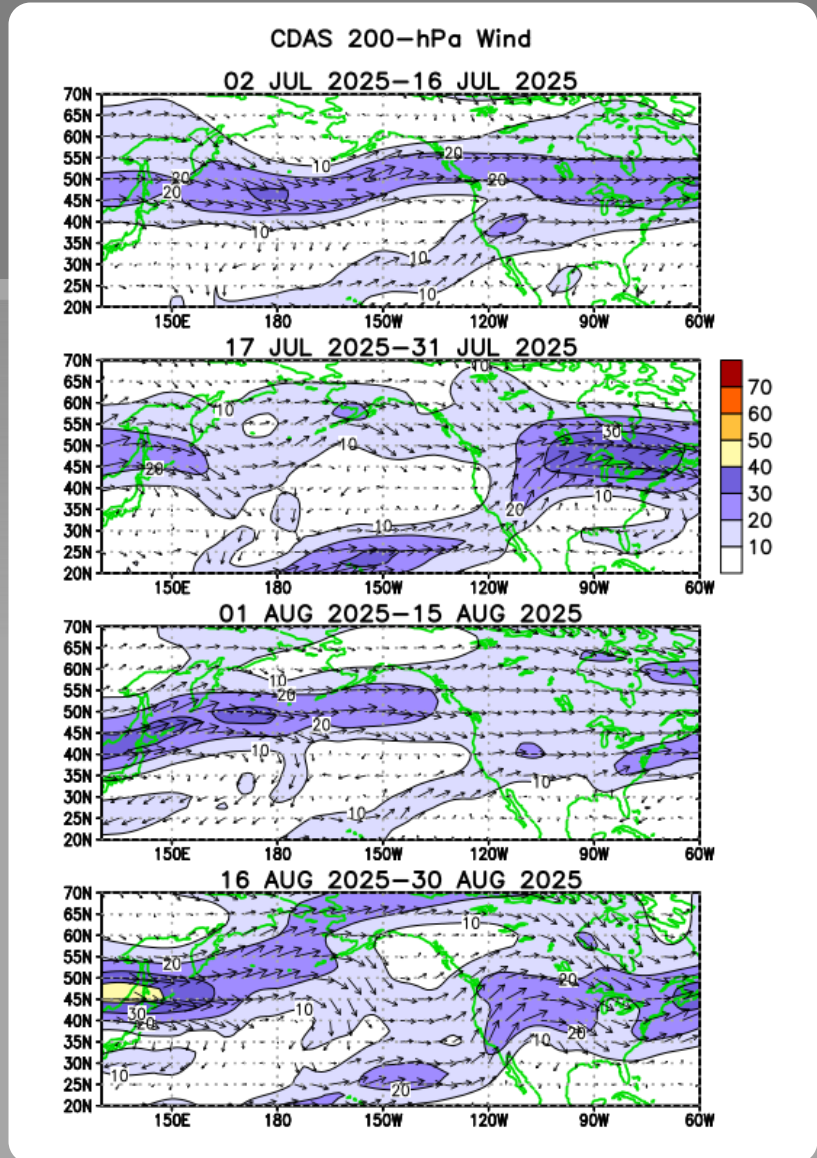
Since mid-August, below-average heights and temperatures have emerged over the eastern U.S., while above-average heights and temperatures strengthened over the western U.S.



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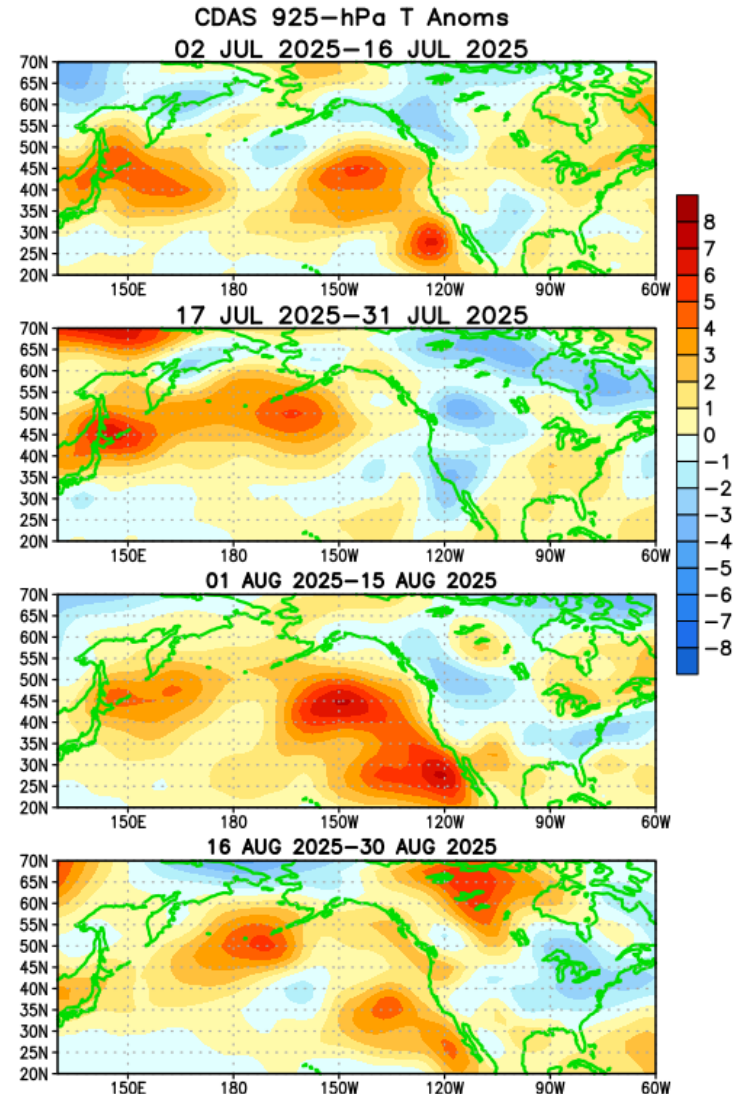
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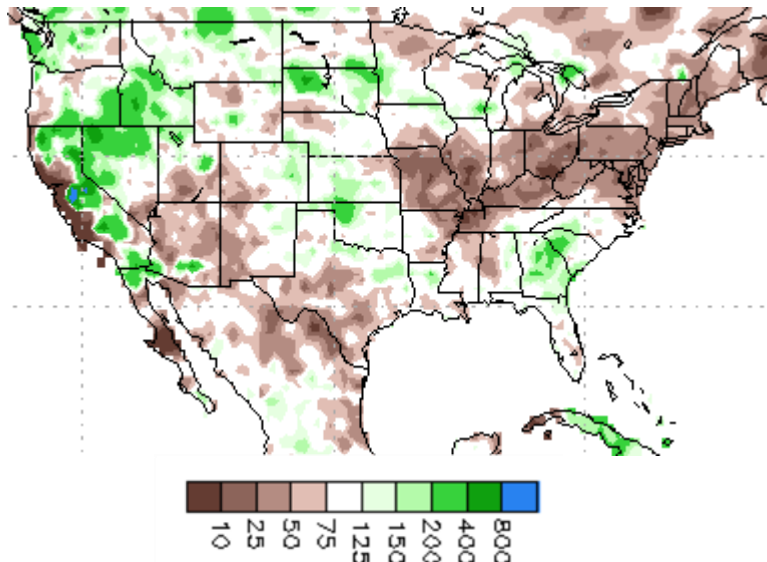
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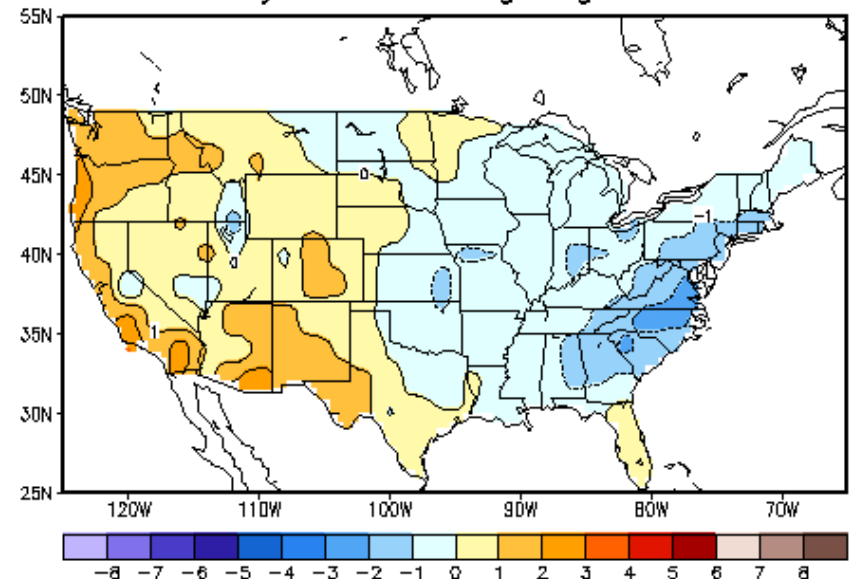
U.S. Temperature and Precipitation Departures During the Last 30 Days

End Date: 31 August 2025

Percent of Average Precipitation



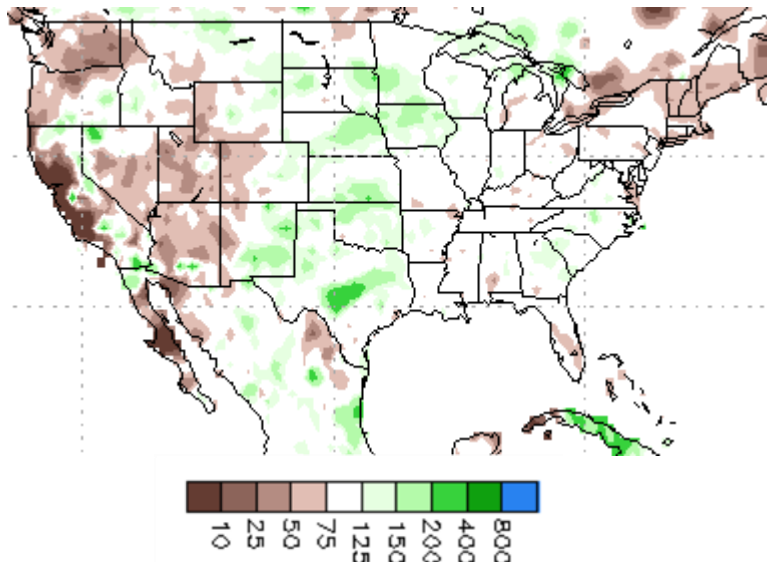
Temperature Departures (degree C)



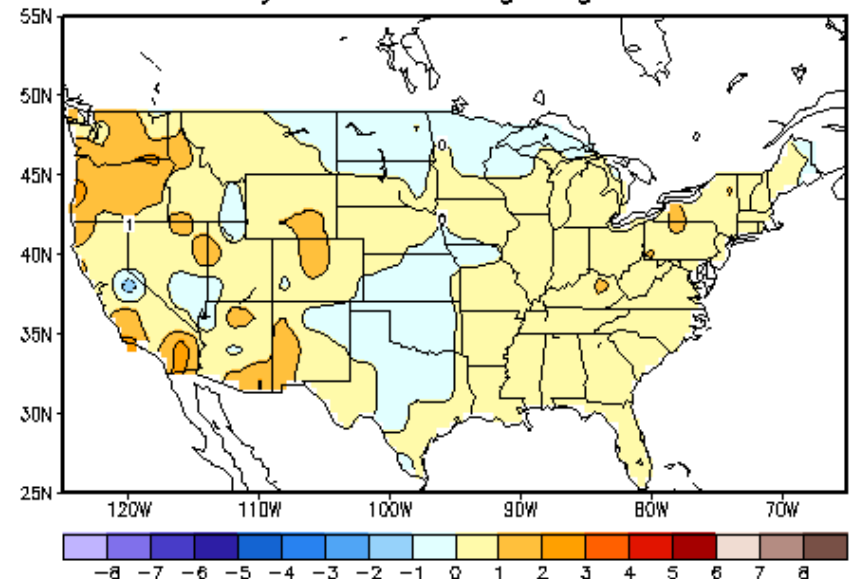
U.S. Temperature and Precipitation Departures During the Last 90 Days

End Date: 31 August 2025

Percent of Average Precipitation



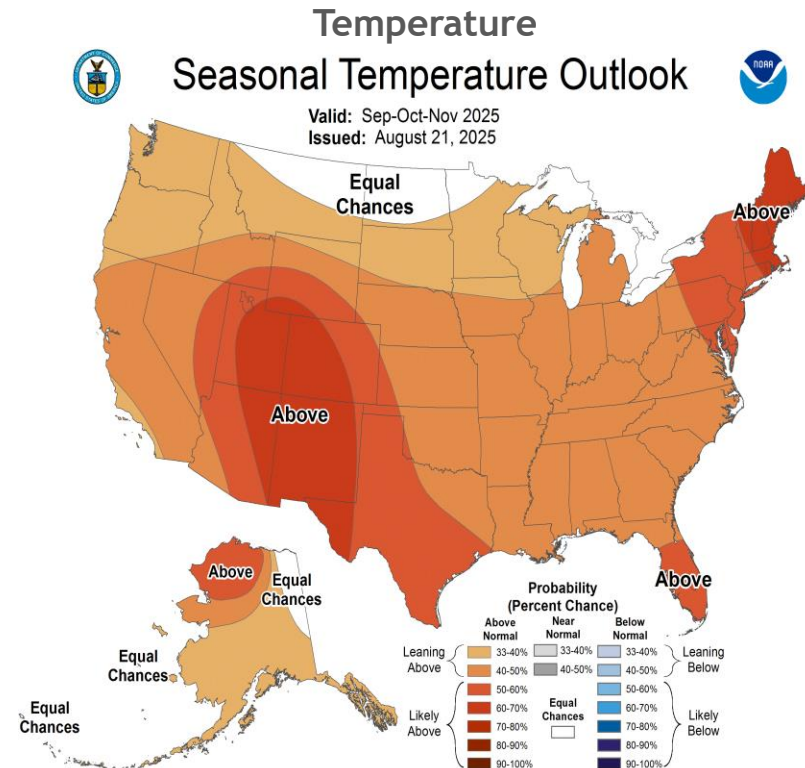
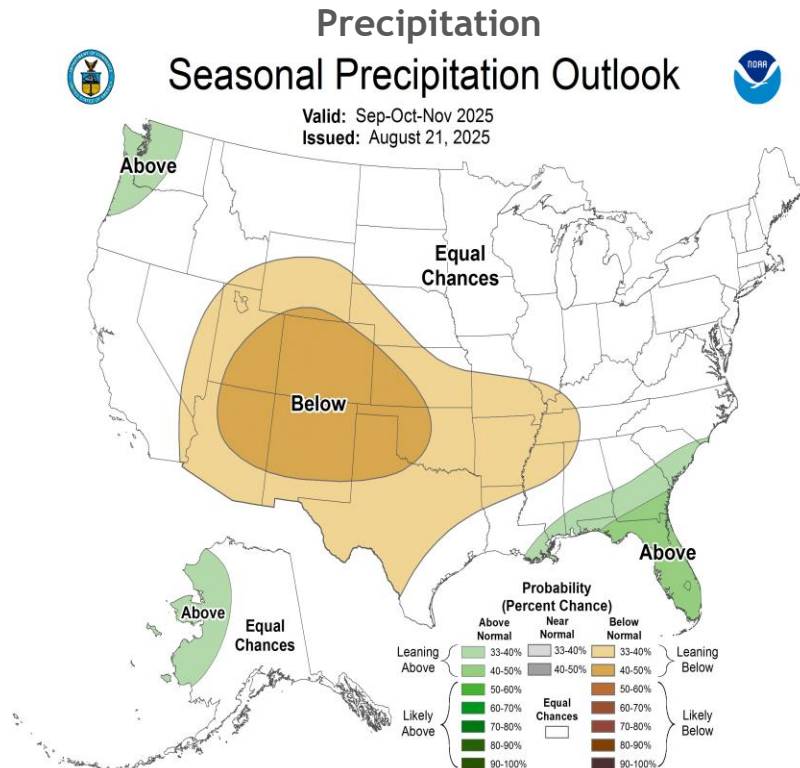
Temperature Departures (degree C)



U. S. Seasonal Outlooks

September-November 2025

The seasonal outlooks combine the effects of long-term trends, soil moisture, and, when appropriate, ENSO.



Summary

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ENSO-neutral is present.*

Equatorial sea surface temperatures (SSTs) are near-to-below average across most of the Pacific Ocean.

ENSO-neutral is most likely through the late Northern Hemisphere summer 2025 (56% chance in August-October). Thereafter, a brief period of La Niña conditions is favored in the fall and early winter 2025-26 before reverting to ENSO-neutral.*

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