ENSO: Recent Evolution, Current Status and Predictions

Update prepared by:
Climate Prediction Center / NCEP
14 October 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 Advisory

La Niña conditions are present.*

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

Atmospheric anomalies over the tropical Pacific Ocean are consistent with La Niña.

La Niña conditions are present and favored to persist through December 2025 - February 2026, with a transition to ENSO-neutral likely in January-March 2026 (55% chance).*

*** 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.**

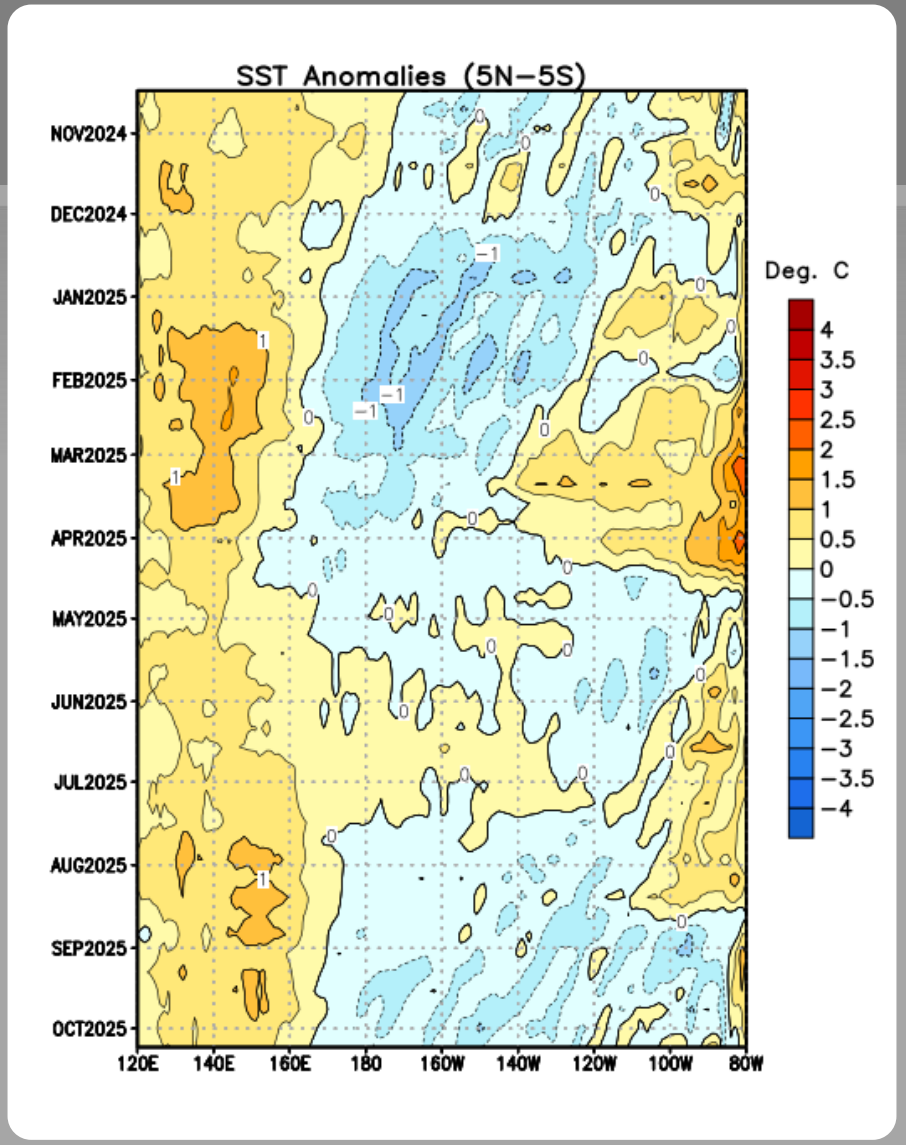
Recent Evolution of Equatorial Pacific SST Departures (°C)

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.

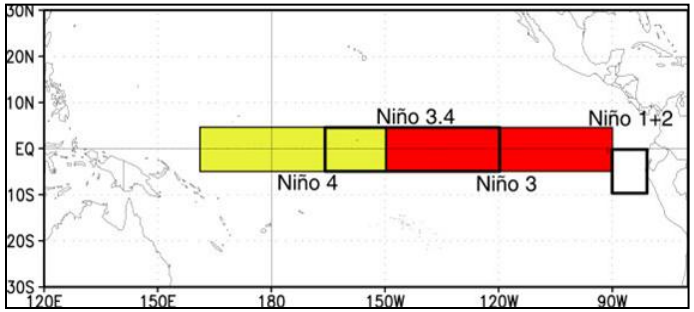
Since mid-August, equatorial SSTs have been near-to-below average in the central and eastern Pacific Ocean.

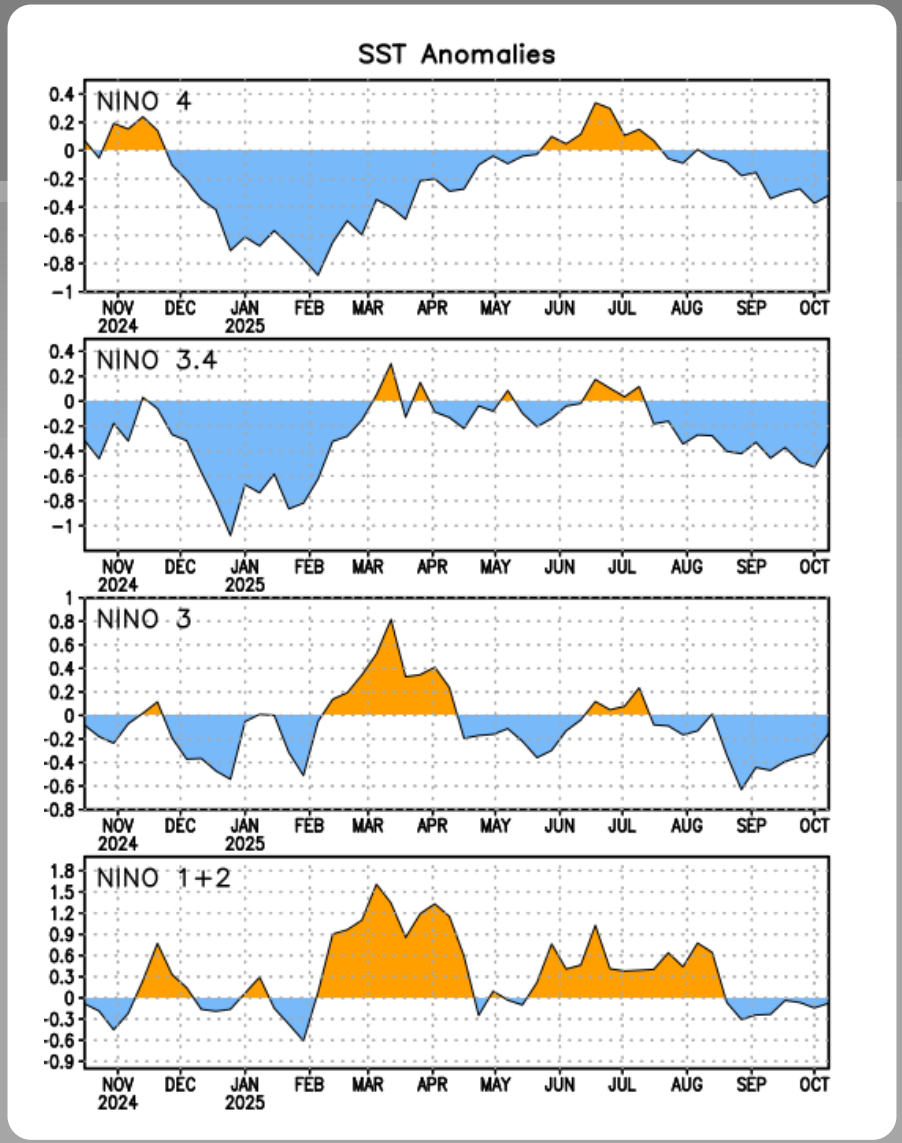


Niño Region SST Departures (ºC) Recent Evolution

The latest weekly SST departures are:

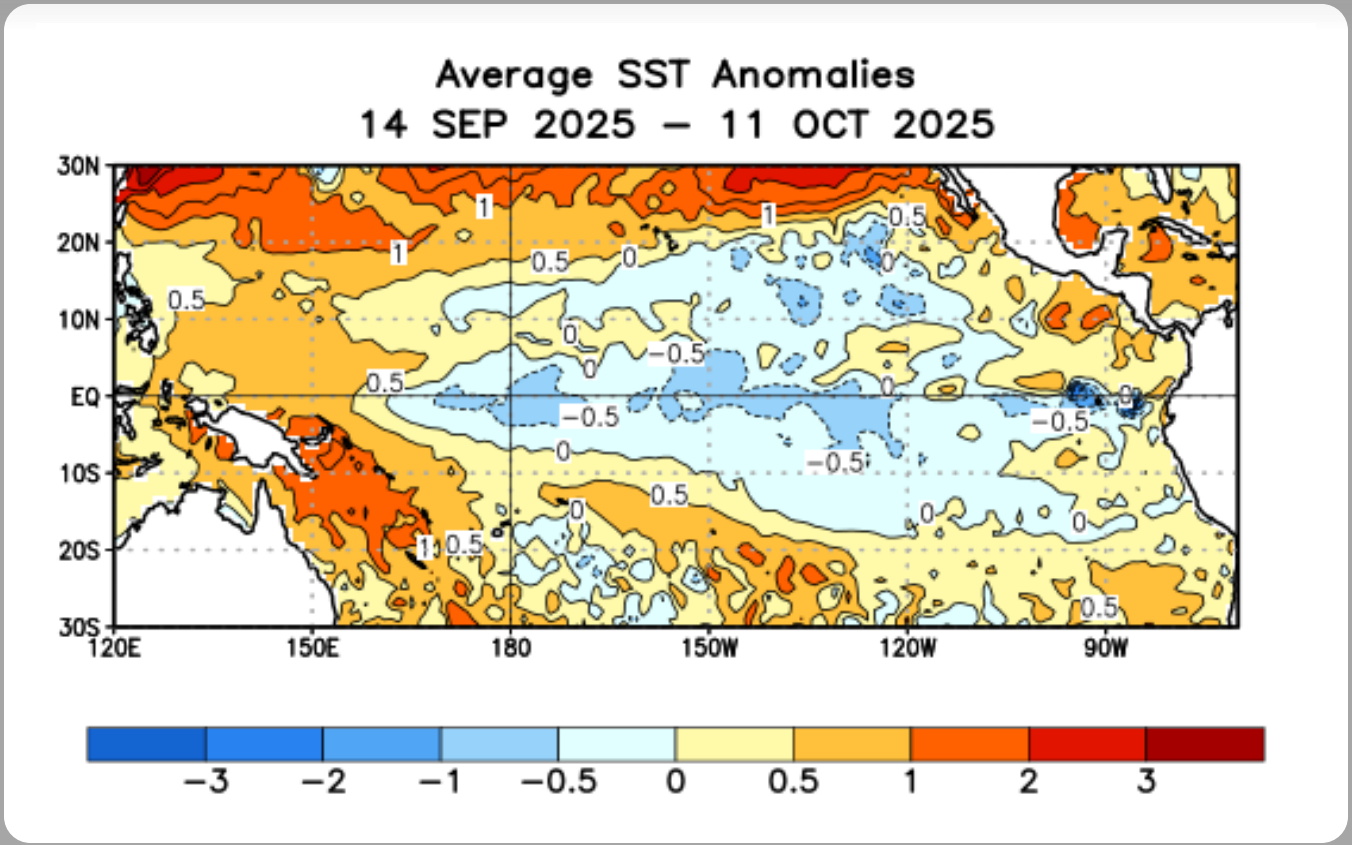
Niño 4	-0.3ºC
Niño 3.4	-0.3ºC
Niño 3	-0.1ºC
Niño 1+2	-0.1ºC





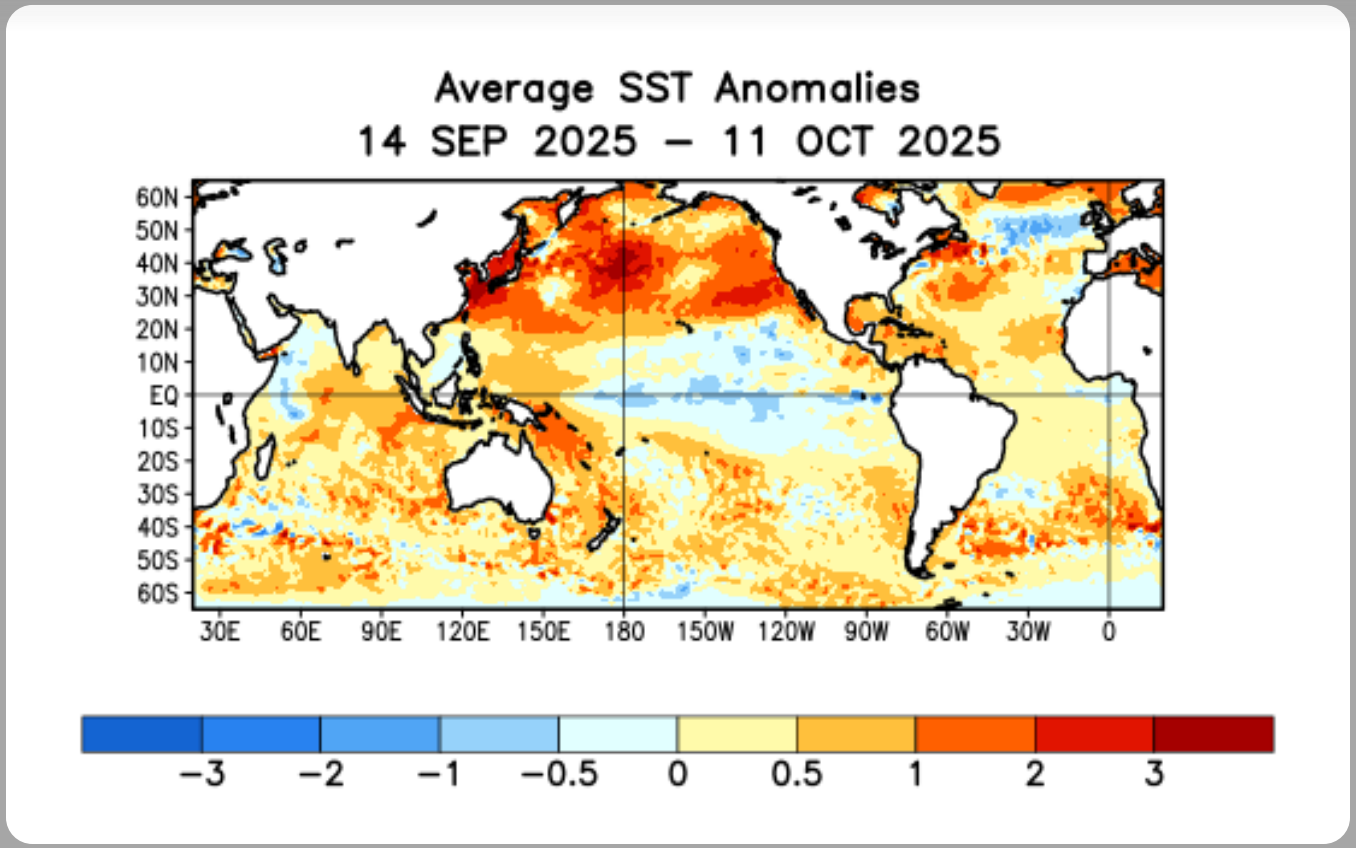
SST Departures (°C) in the Tropical Pacific During the Last Four Weeks

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



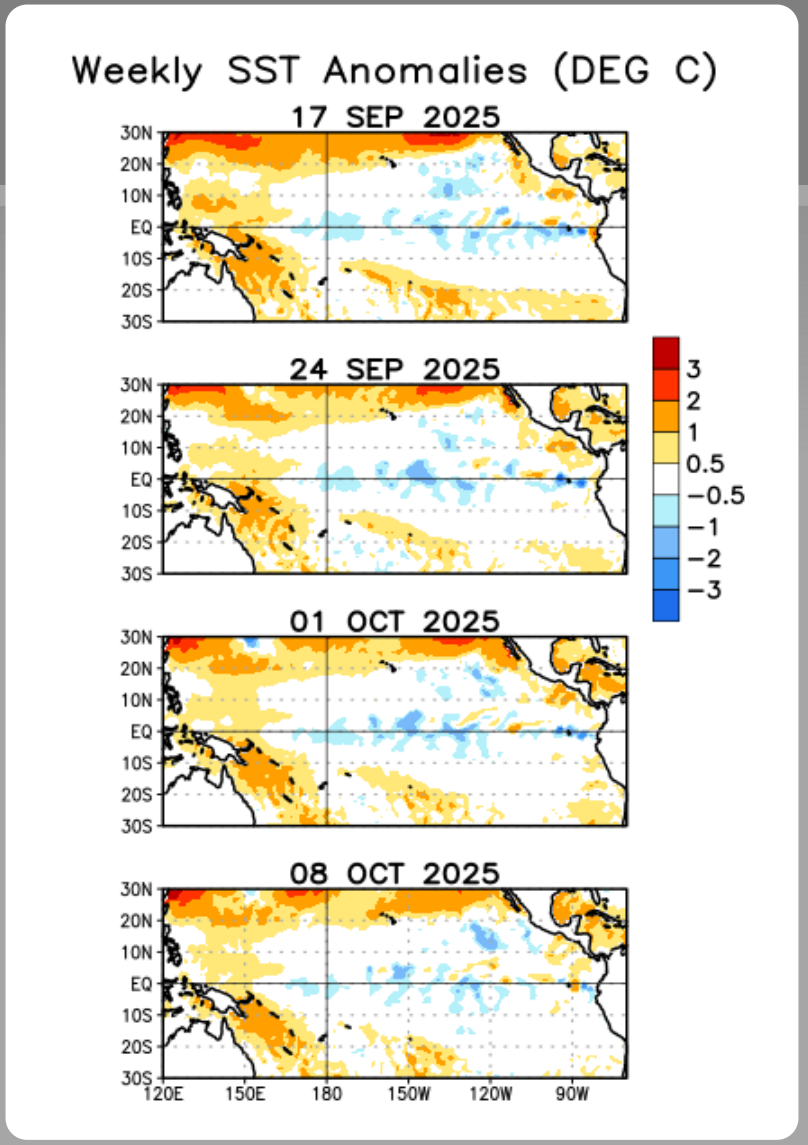
Global SST Departures (°C) During the Last Four Weeks

During the last four weeks, equatorial SSTs were below average in the central to eastern Pacific Ocean and a small region of the western Indian Ocean. SSTs were above average in the western Pacific, and in the central and eastern Indian Oceans.



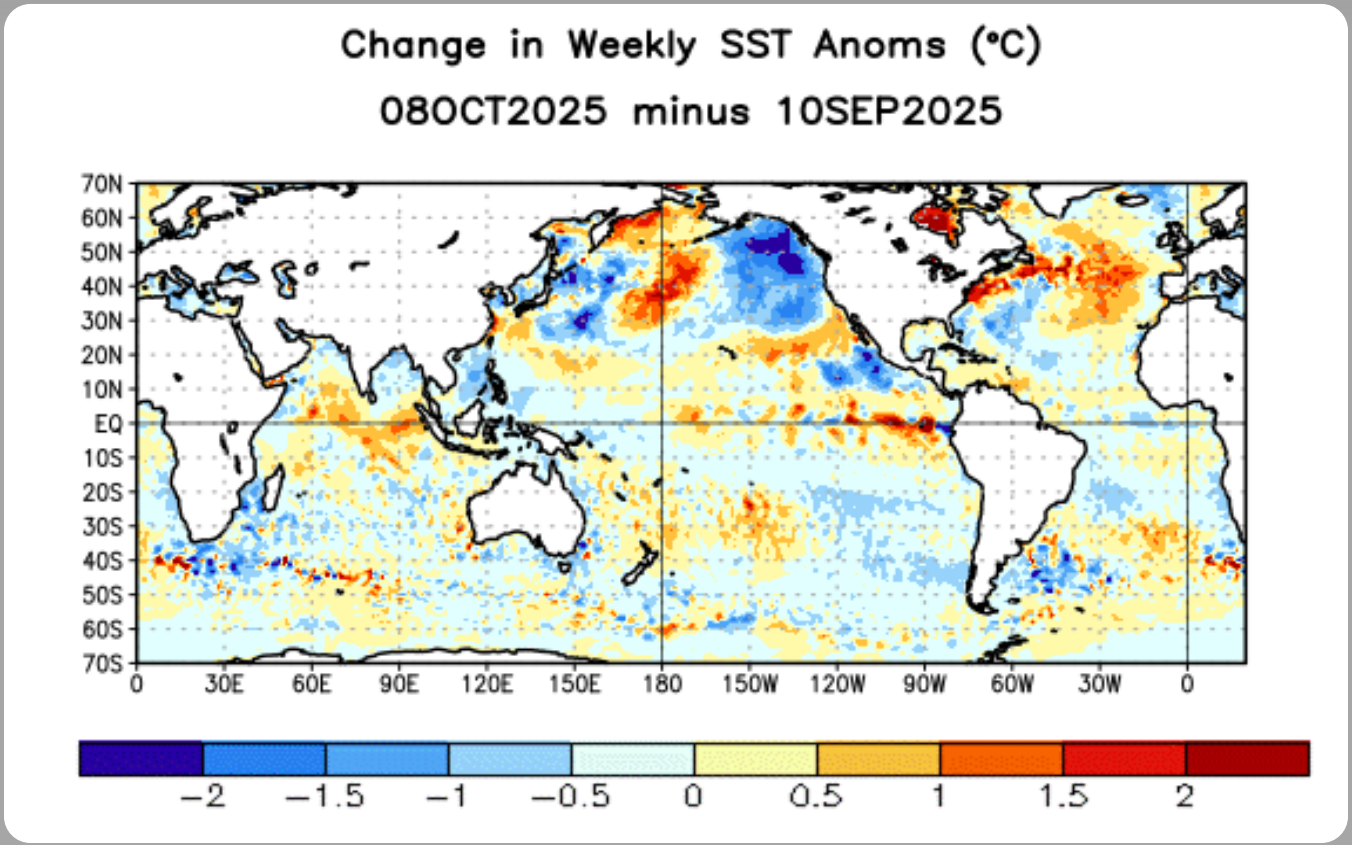
Weekly SST Departures during the Last Four Weeks

During the last 4 weeks, mostly below average equatorial SSTs were present across the central and eastern Pacific Ocean, while above average SSTs were evident in the far western Pacific.



Change in Weekly SST Departures over the Last Four Weeks

During the last four weeks, mostly positive SST anomaly changes were observed in the east-central and eastern equatorial Pacific Ocean.



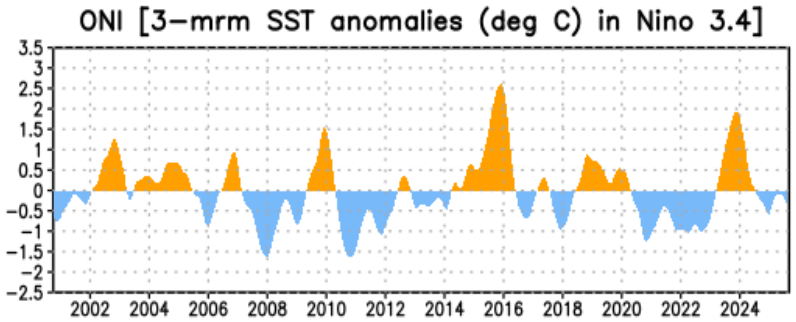
Upper-Ocean Conditions in the Equatorial Pacific

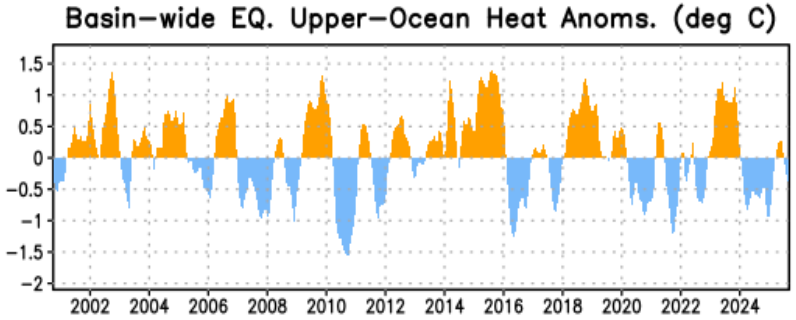
The basin-wide equatorial upper ocean (0-300 m) heat content is greatest prior to and during the early stages of a Pacific warm (El Niño) episode (compare top 2 panels), and least prior to and during the early stages of a cold (La Niña) episode.

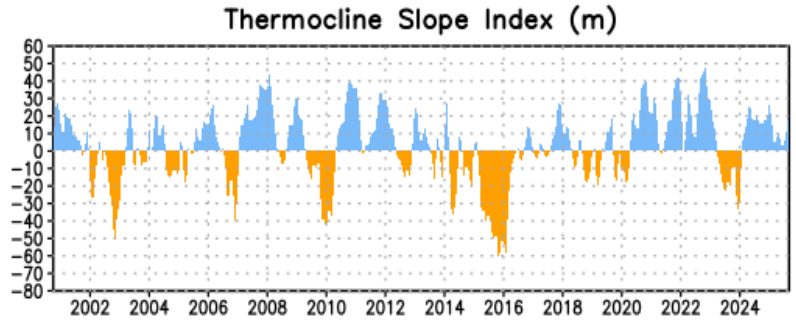
The slope of the oceanic thermocline is least (greatest) during warm (cold) episodes.

Recent values of the upper-ocean heat anomalies (slightly below-average) and thermocline slope index (slightly above-average) reflect La Niña conditions.

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).

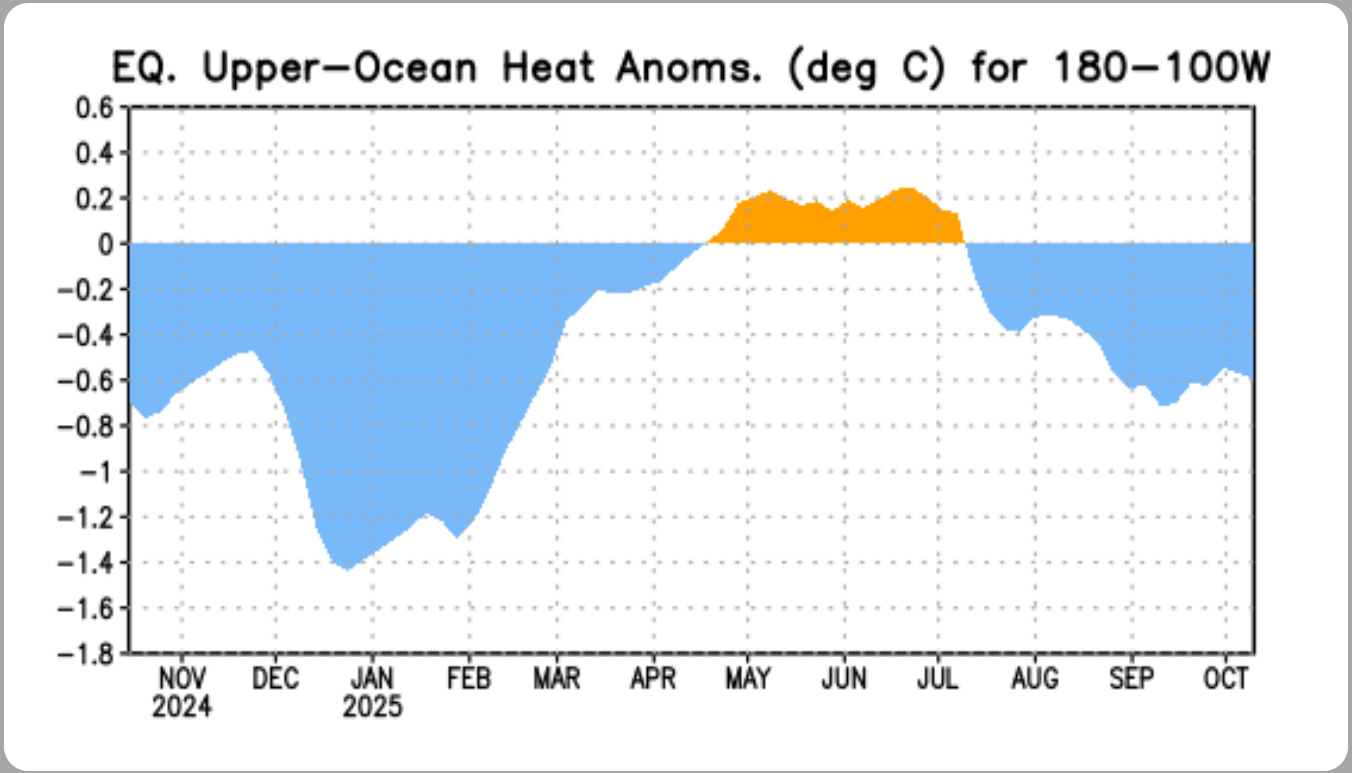






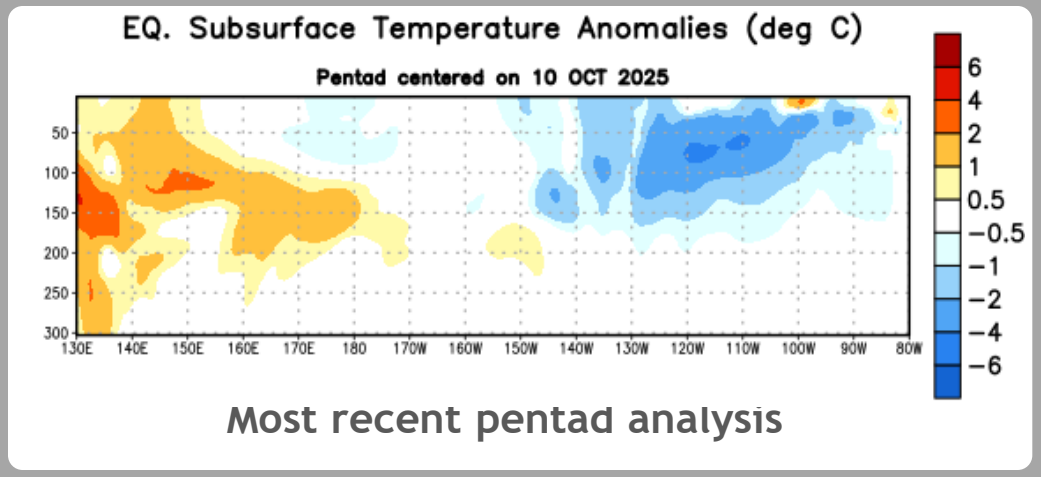
Central and Eastern Pacific Upper-Ocean (0-300 m) Weekly Average Temperature Anomalies

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 and mid-August, negative anomalies strengthened.

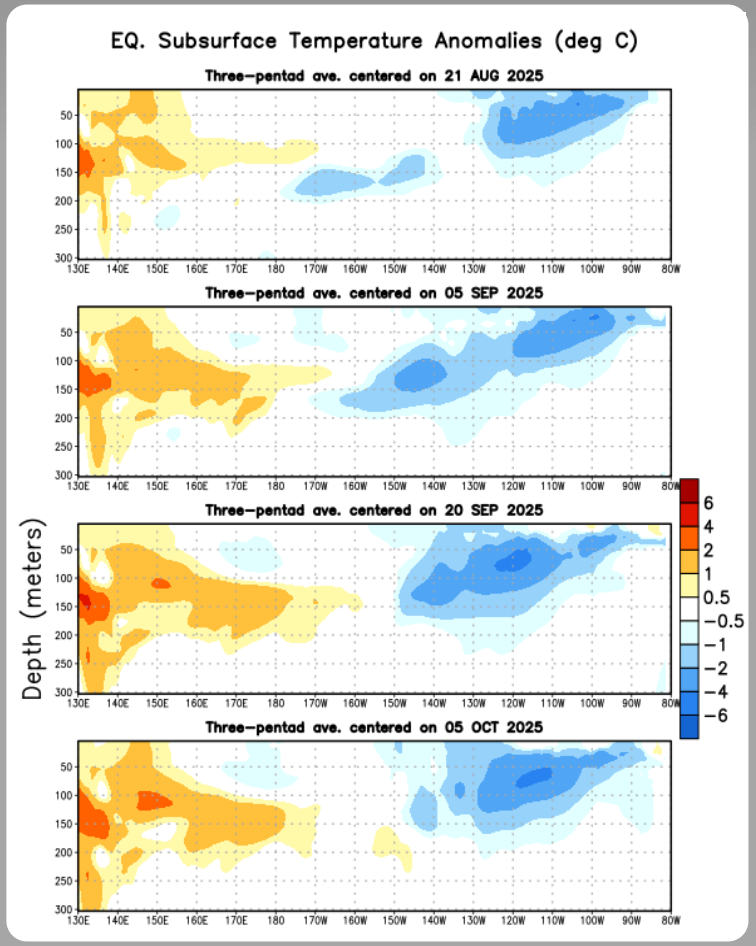


Sub-Surface Temperature Departures in the Equatorial Pacific

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



Above-average subsurface temperatures persisted in the western half of the Pacific.

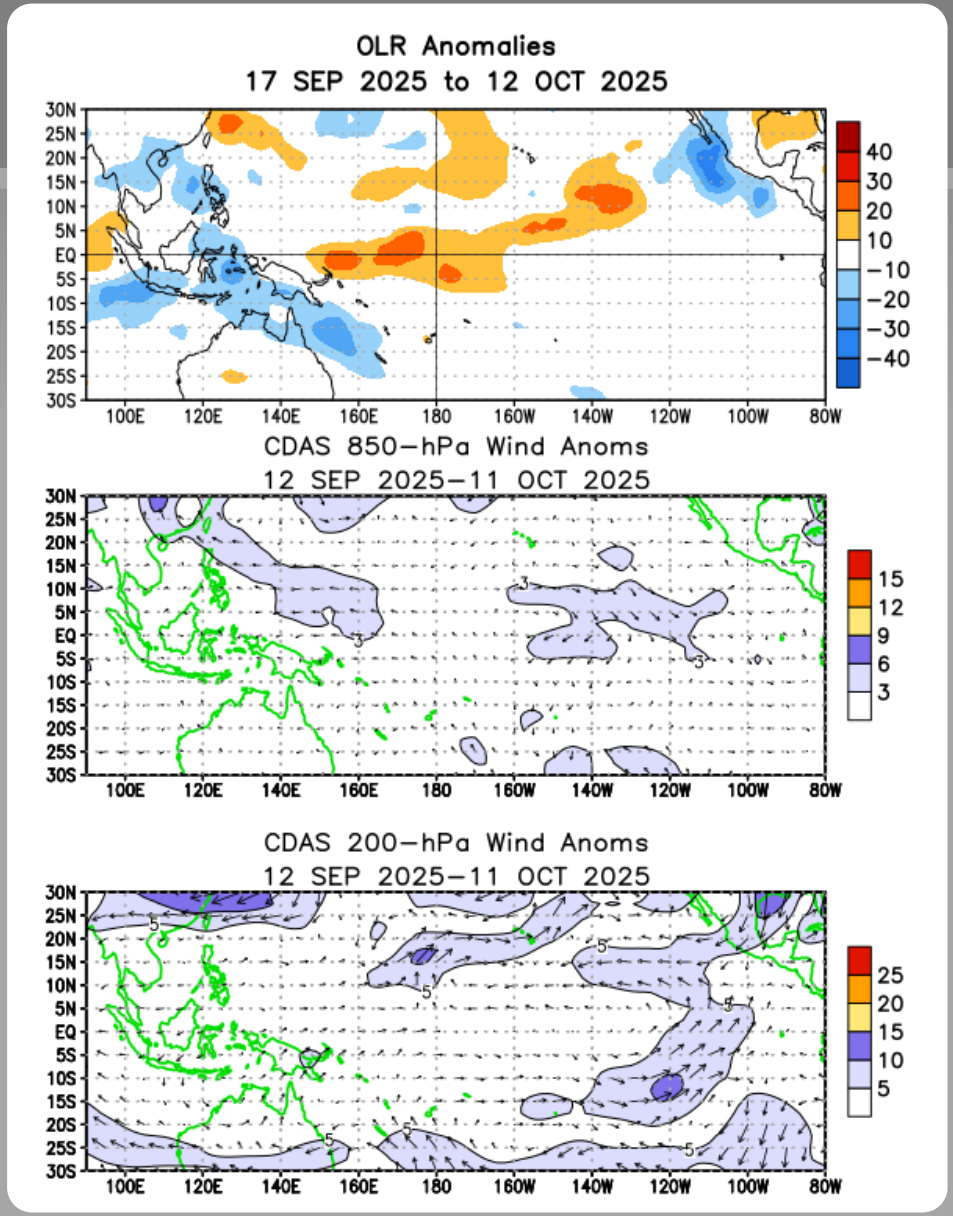


Tropical OLR and Wind Anomalies During the Last 30 Days

Below-average OLR (enhanced convection and precipitation) was evident over Indonesia, while above-average OLR (suppressed convection and precipitation) was observed near the Date Line.

Low-level (850-hPa) wind anomalies were easterly over the western and east-central equatorial Pacific Ocean.

Upper-level (200-hPa) wind anomalies were westerly over the 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.

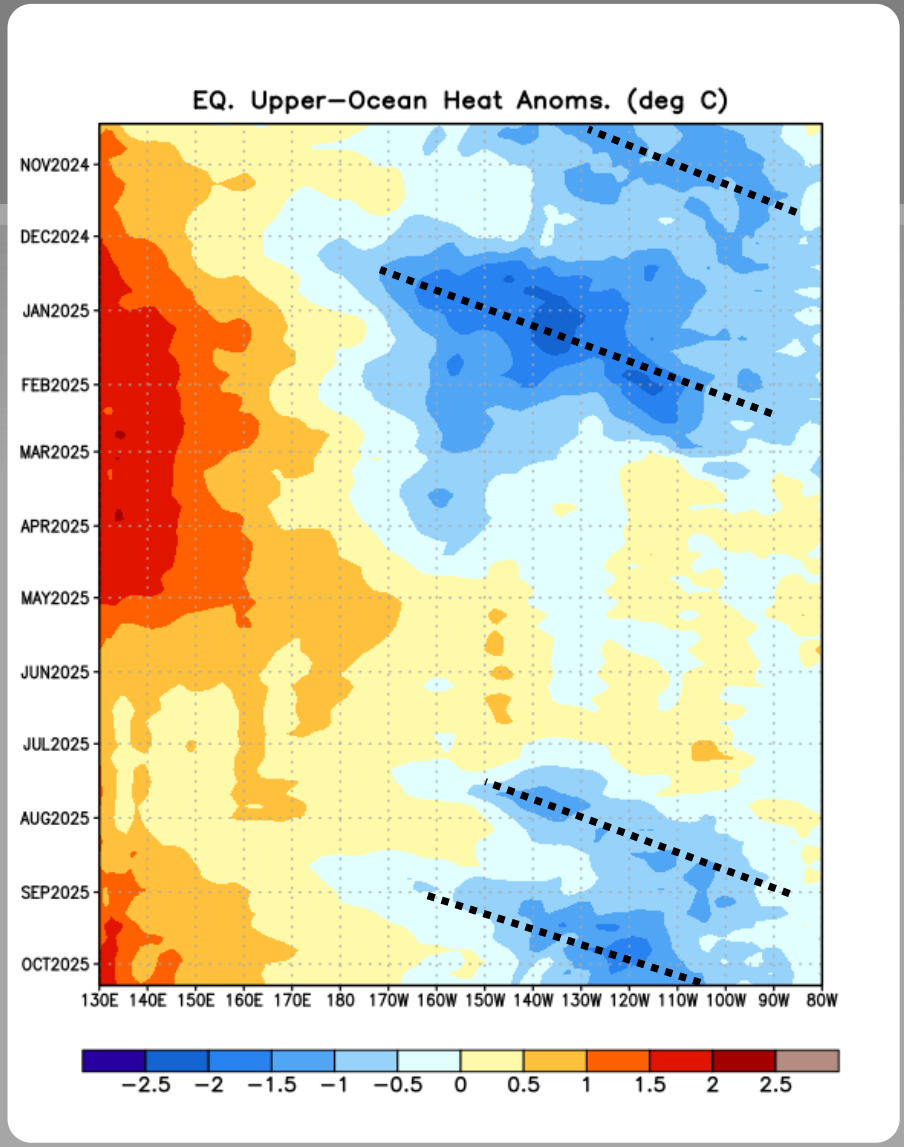
Weekly Heat Content Evolution in the Equatorial Pacific

Significant equatorial oceanic Kelvin wave activity (dashed and dotted lines) has been present at times 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, July, and August 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 and eastern Pacific.

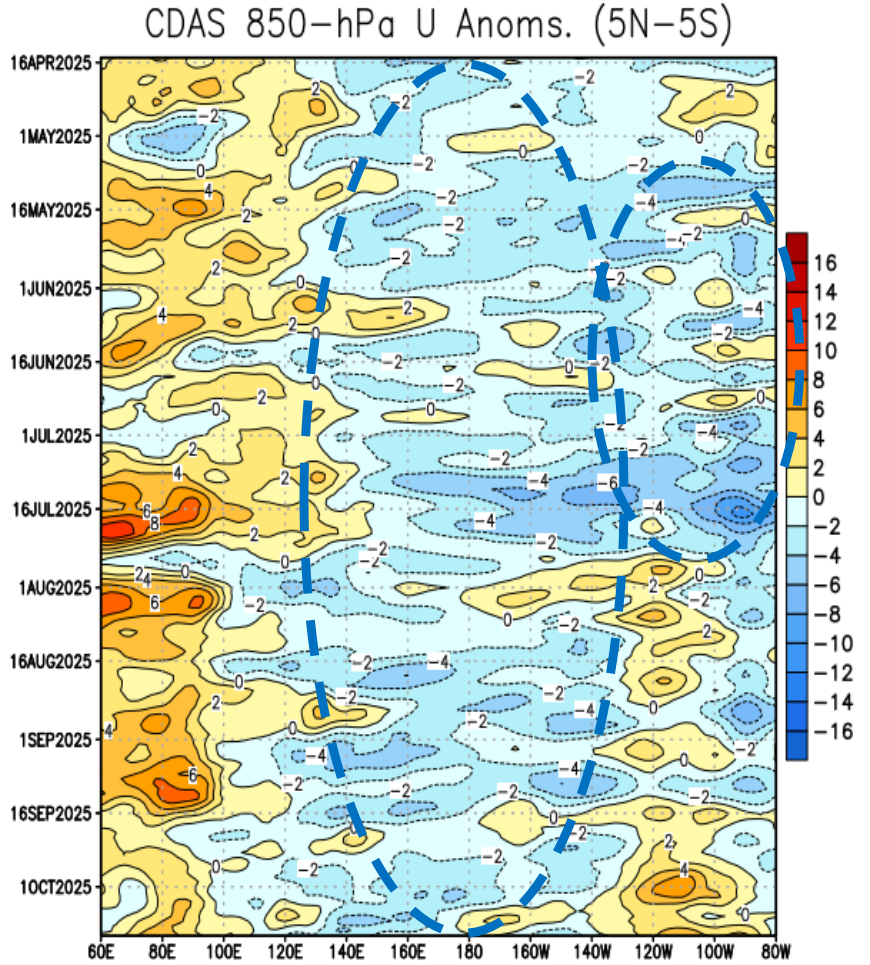
Equatorial oceanic Kelvin waves have alternating warm and cold phases. The warm phase is indicated by dashed lines. Down-welling and warming occur in the leading portion of a Kelvin wave, and up-welling and cooling occur in the trailing portion.



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.



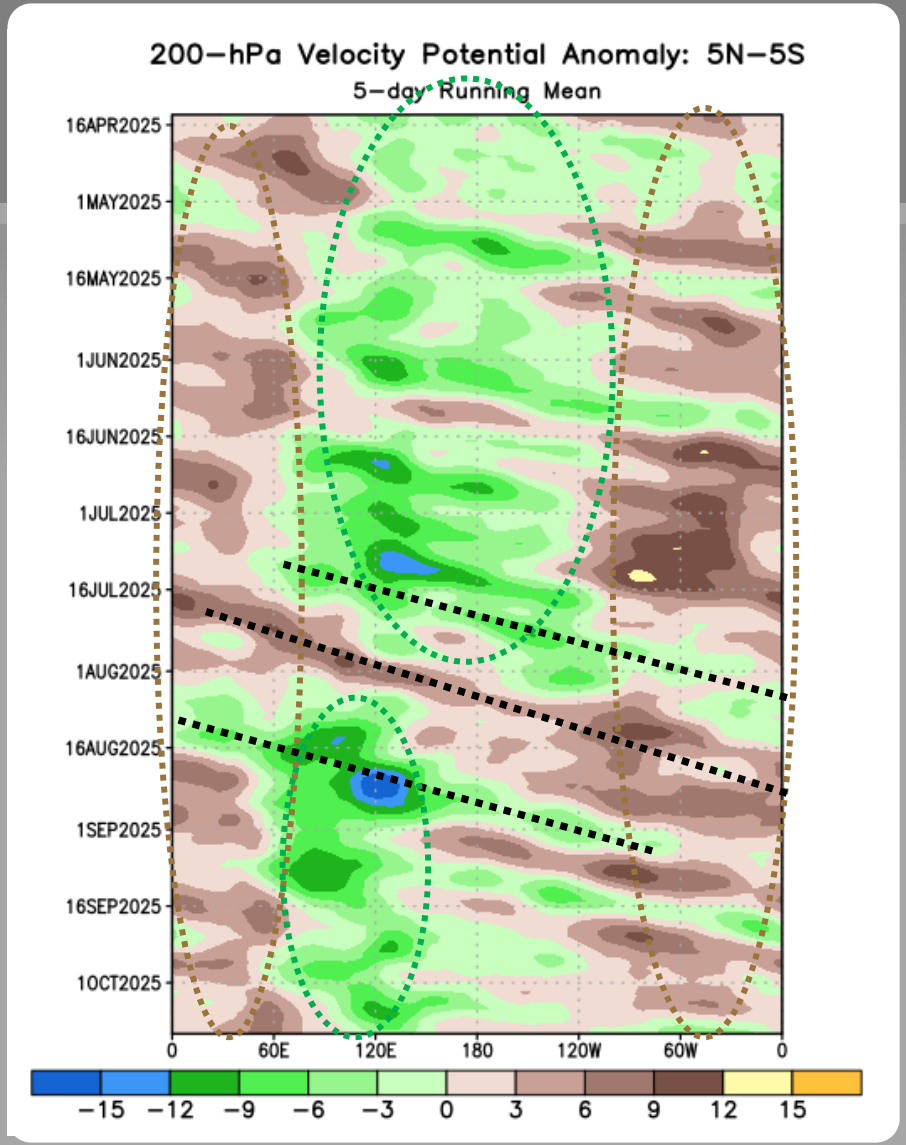
Westerly Wind Anomalies (orange/red shading)
Easterly Wind Anomalies (blue shading)

Upper-level (200-hPa) Velocity Potential Anomalies

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

Through the end of July, anomalous divergence was mostly observed over the western and central Pacific. Beginning in August, anomalous divergence was observed mostly over Indonesia.

Since the beginning of the period, anomalous convergence mostly persisted outside of the tropical Pacific Ocean.

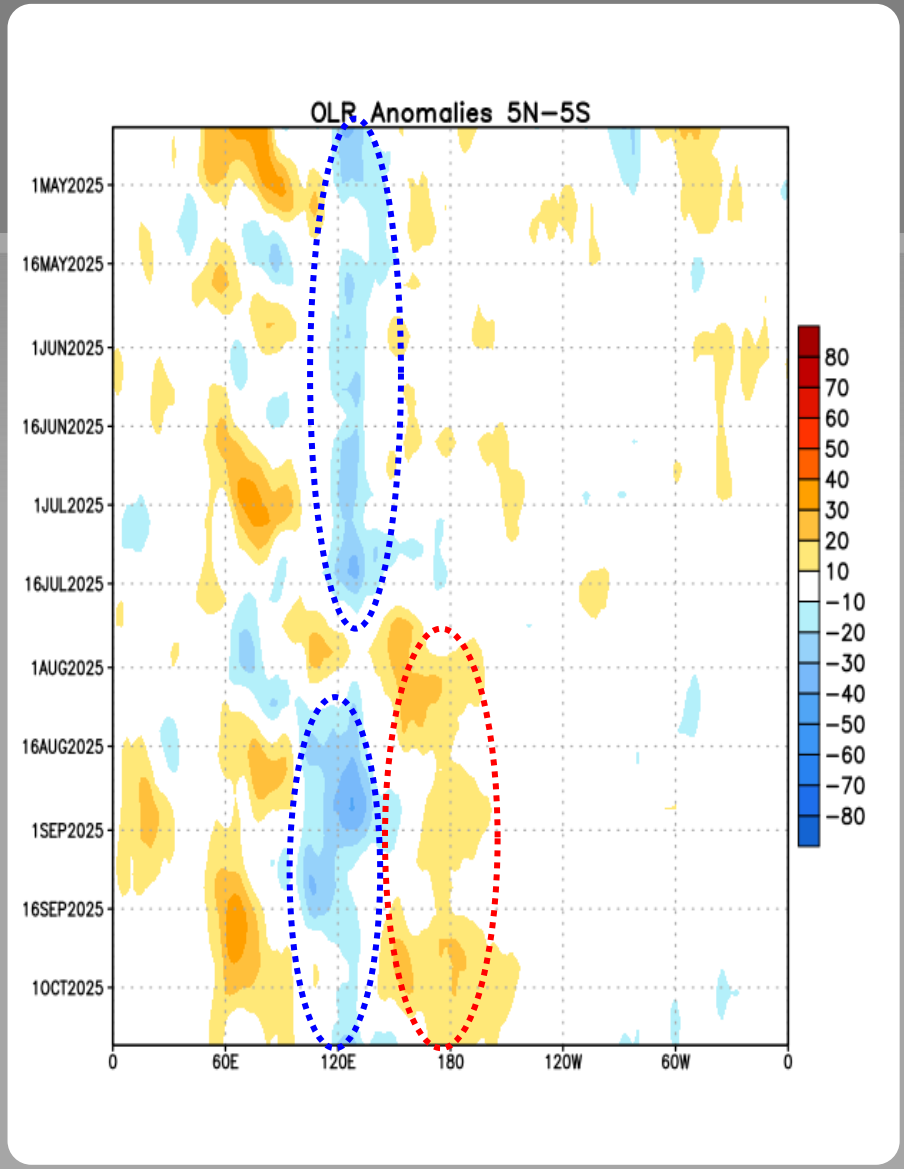


Unfavorable for precipitation (brown shading)
Favorable for precipitation (green shading)
Note: Eastward propagation is not necessarily indicative of the Madden-Julian Oscillation (MJO).

Outgoing Longwave Radiation (OLR) Anomalies

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

Positive OLR anomalies (suppressed convection/rainfall) 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°C.

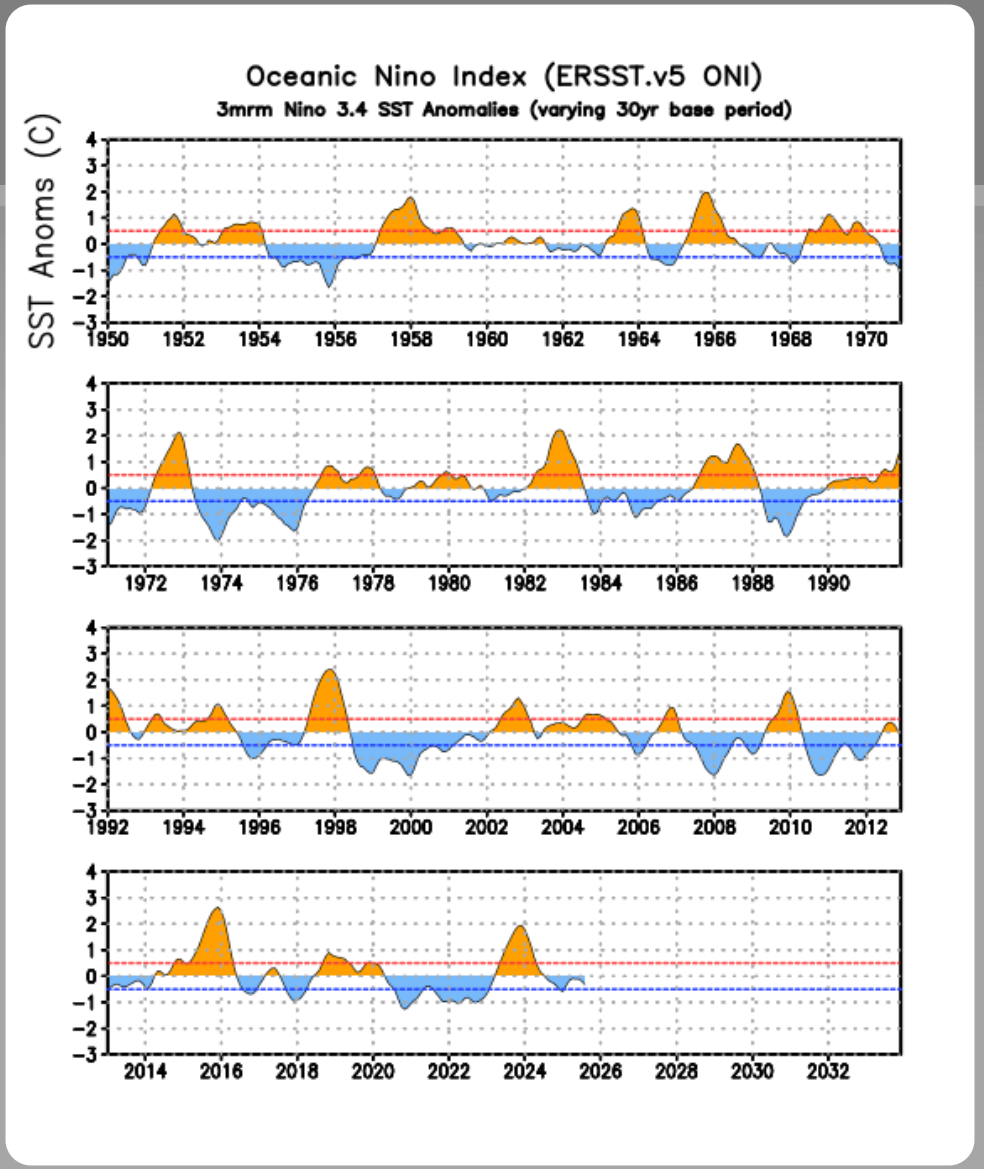
La Niña: characterized by a negative ONI less than or equal to -0.5°C.

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 +/- 0.5°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 (July - September 2025) is -0.3°C.



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.

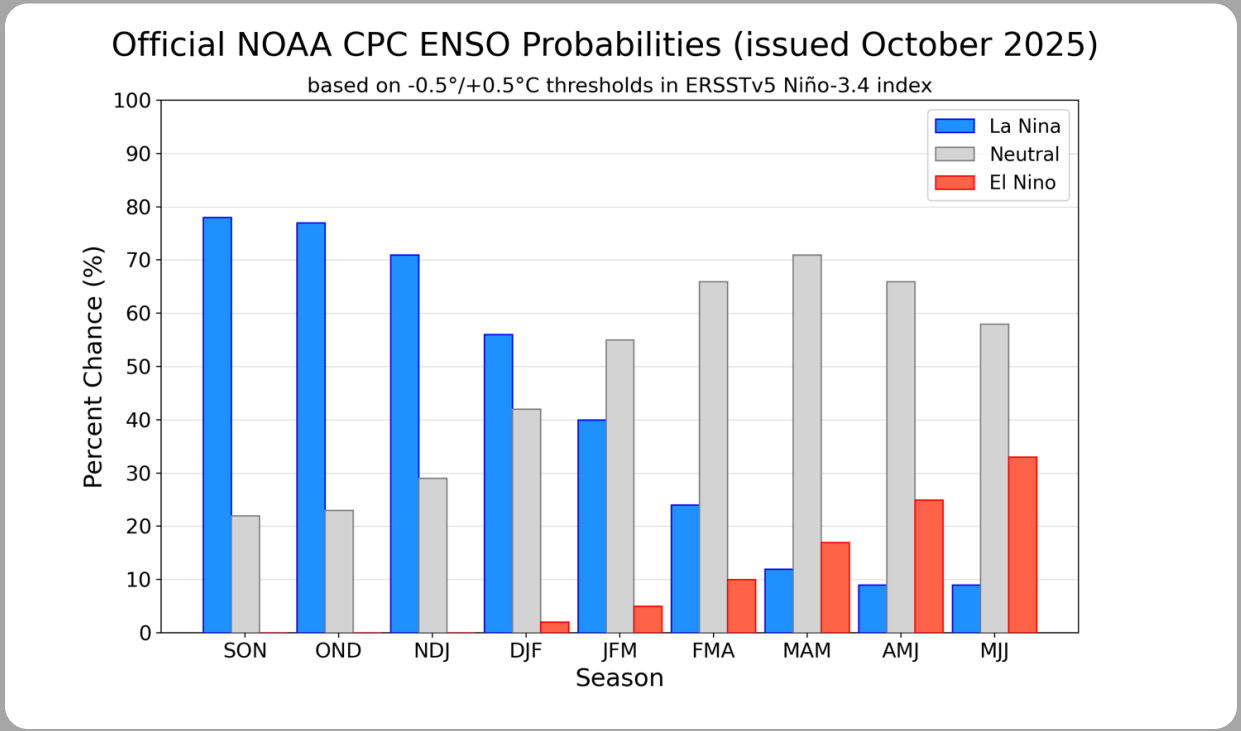
The ONI is one measure of the El Niño-Southern Oscillation, and other indices can confirm whether features consistent with a coupled ocean-atmosphere phenomenon accompanied these periods. The complete table going back to DJF 1950 can be found here.

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	-0.2	-0.3				

CPC Probabilistic ENSO Outlook

Updated: 9 October 2025

La Niña is favored to persist through December 2025 - February 2026, with a transition to ENSO-neutral likely in January-March 2026 (55% chance).



IRI Pacific Niño 3.4 SST Model Outlook

Most models favor La Niña to emerge in the coming season, persisting through Northern Hemisphere winter (December-February) before transitioning back to ENSO-neutral in early 2026.

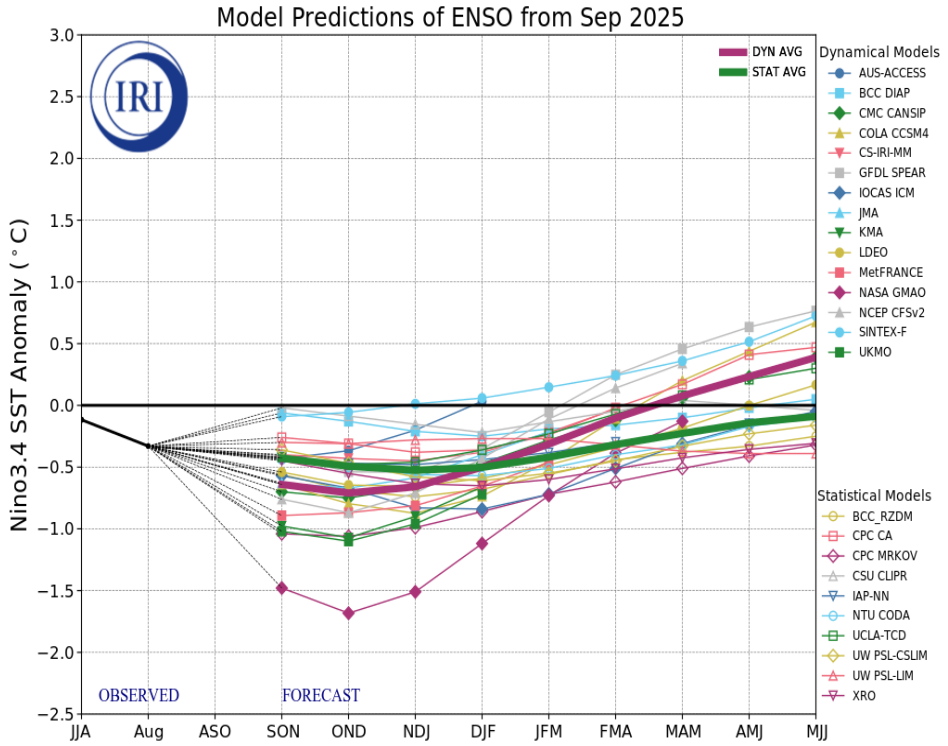
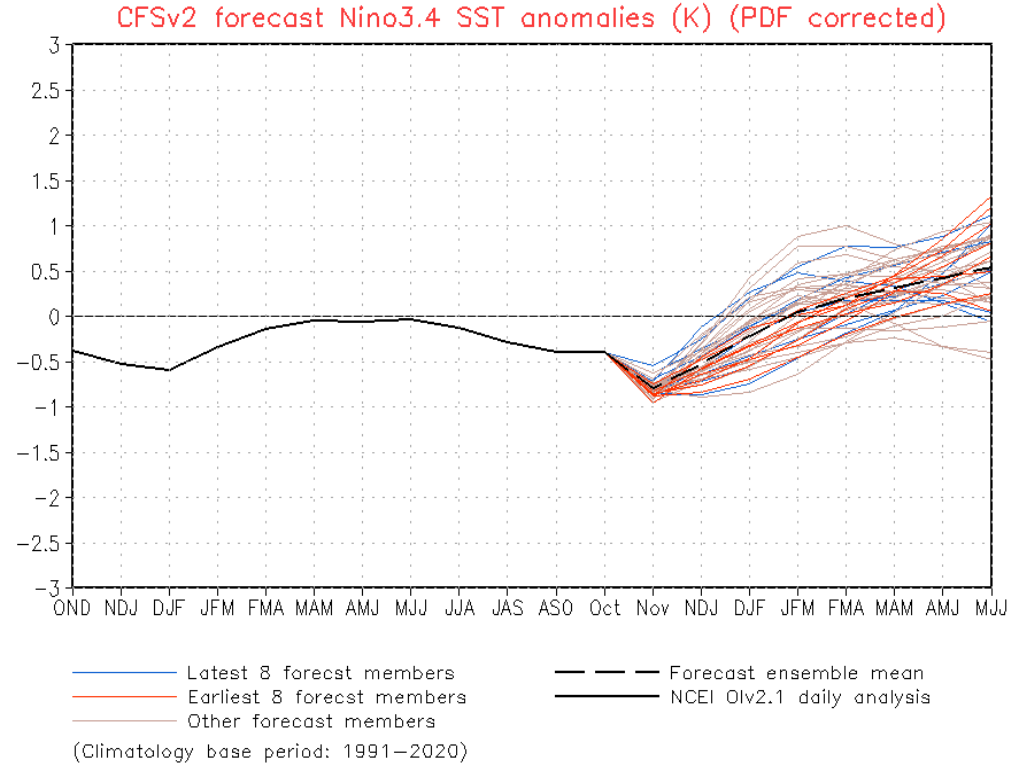


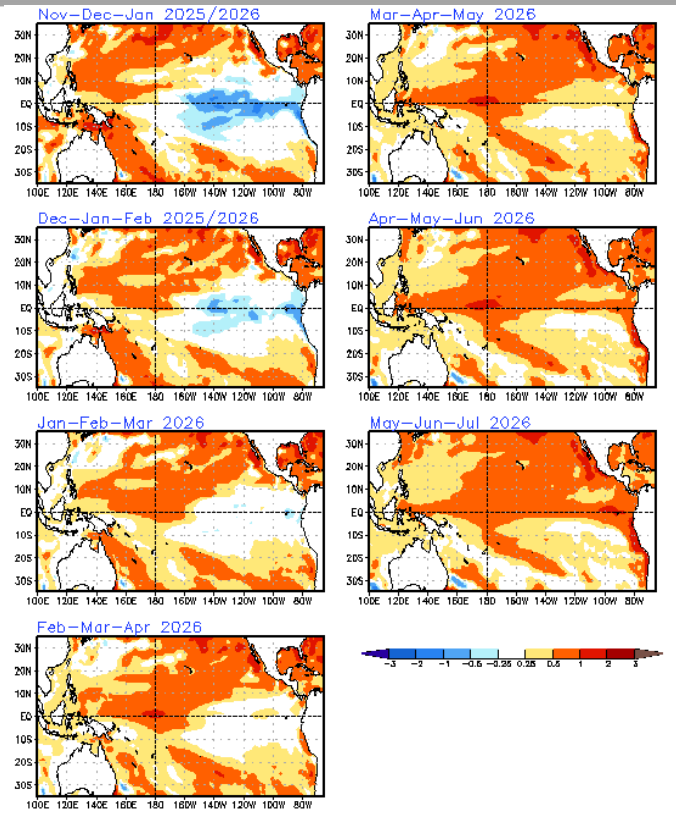
Figure provided by the International Research Institute (IRI) for Climate and Society (updated 19 September 2025).

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

Issued: 13 October 2025

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

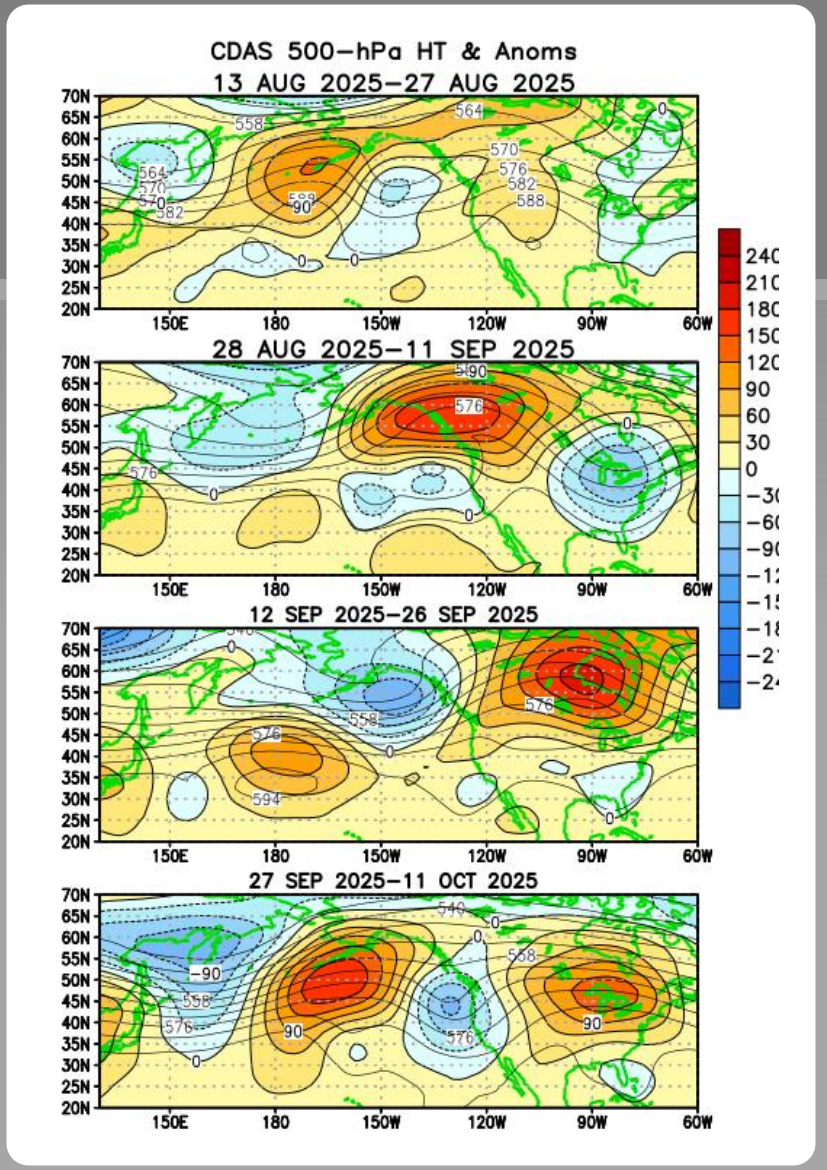




Atmospheric anomalies over the North Pacific and North America During the Last 60 Days

From mid-August to mid-September, below-average heights and temperatures were evident over the eastern U.S. Starting in mid-September, above-average heights and temperatures dominated the eastern U.S.

From early September to mid- October, below-average heights and temperatures prevailed over the eastern North Pacific Ocean and parts of the western U.S.



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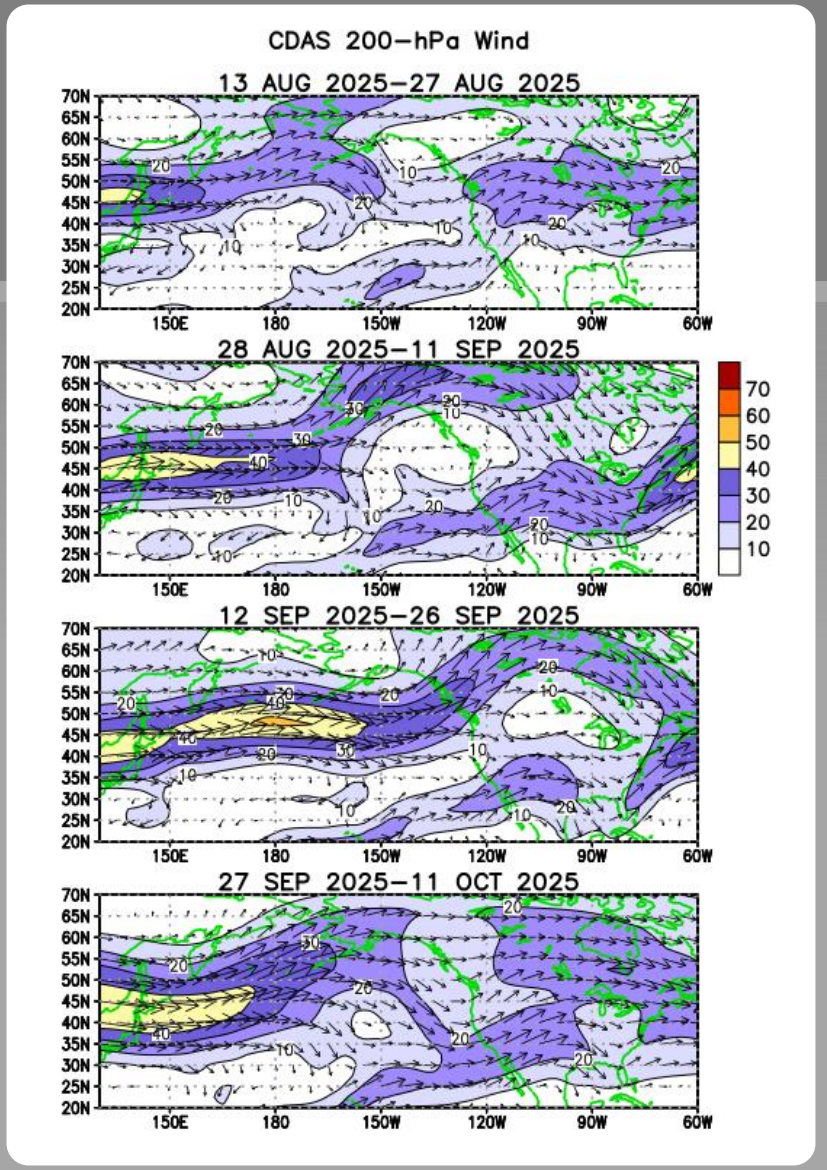

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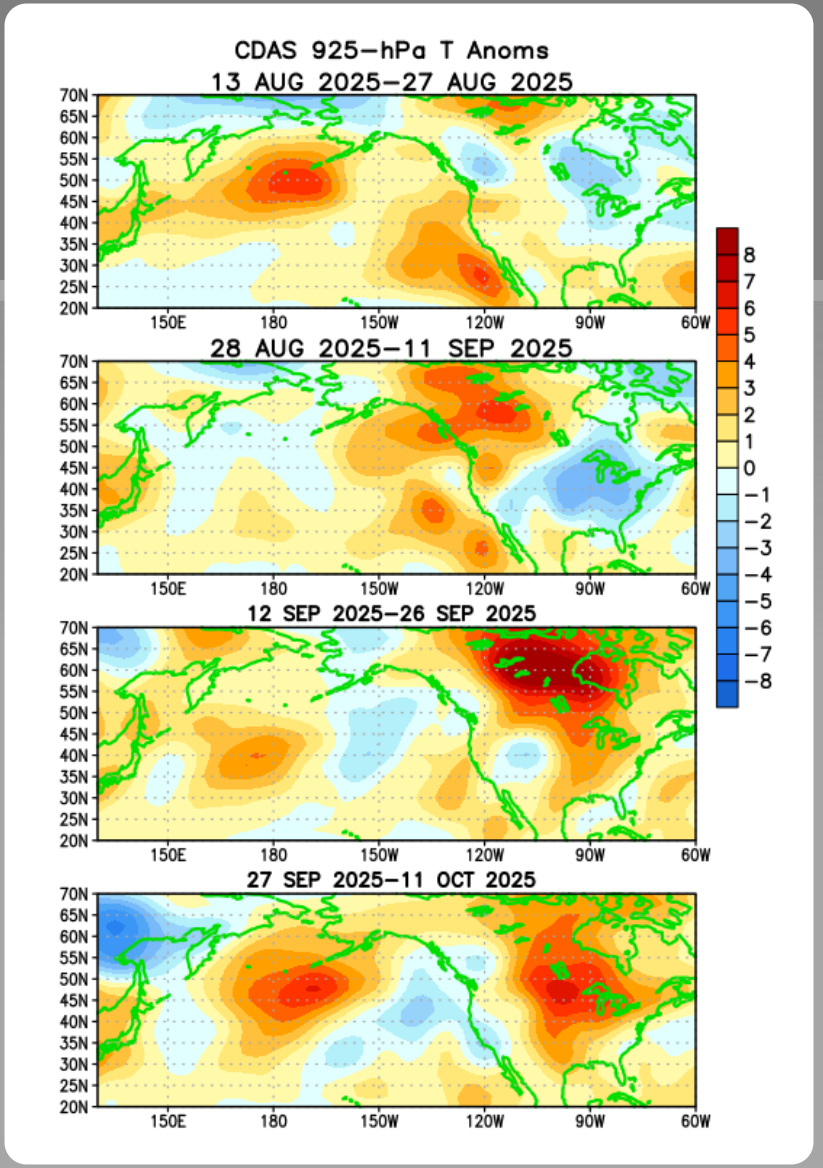
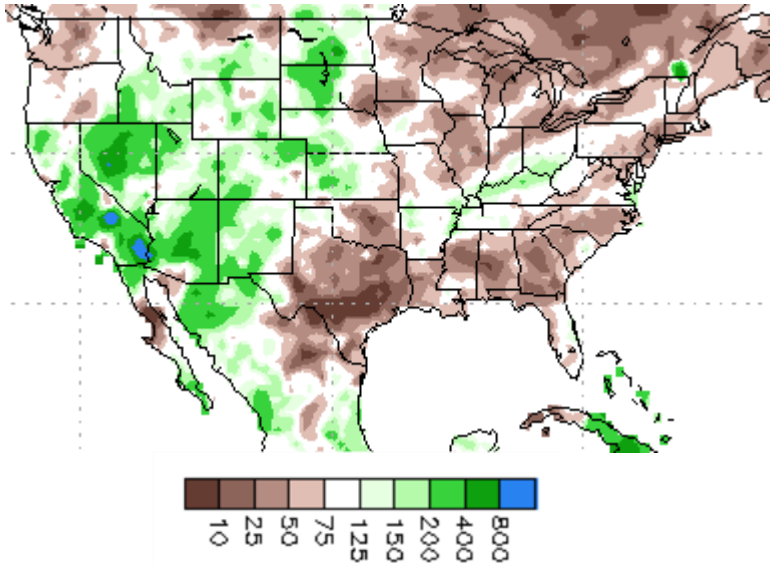


U.S. Temperature and Precipitation Departures During the Last 30 Days

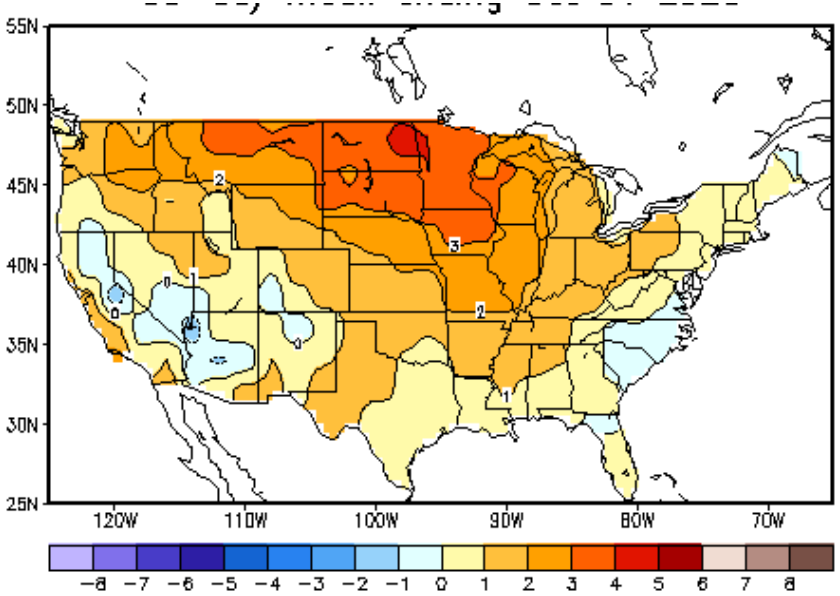
End Date: 12 October 2025

Percent of Average Precipitation



End Date: 4 October 2025

Temperature Departures (degree C)

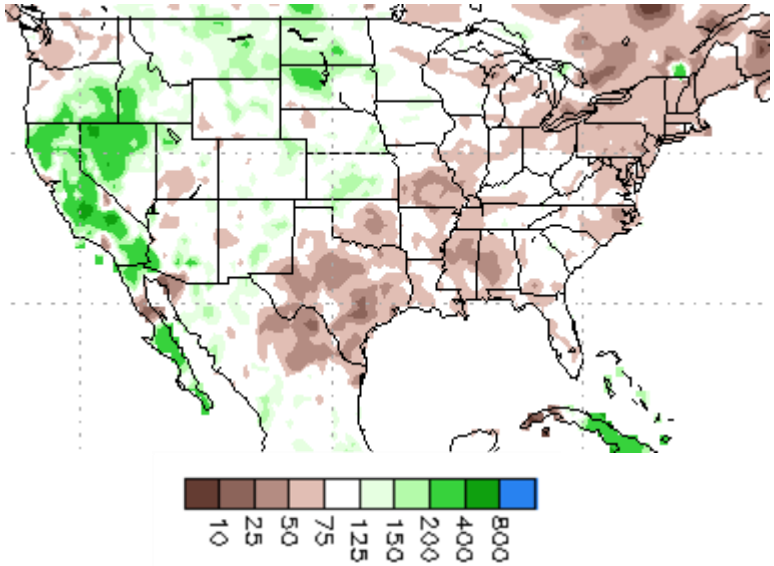


U.S. Temperature and Precipitation Departures During the Last 90 Days

End Date: 12 October 2025

End Date: 4 October 2025

Percent of Average Precipitation



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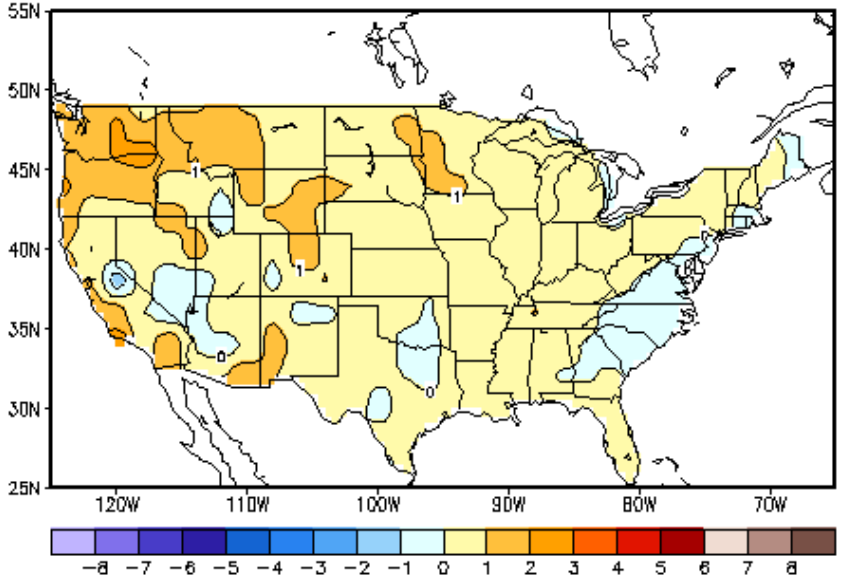
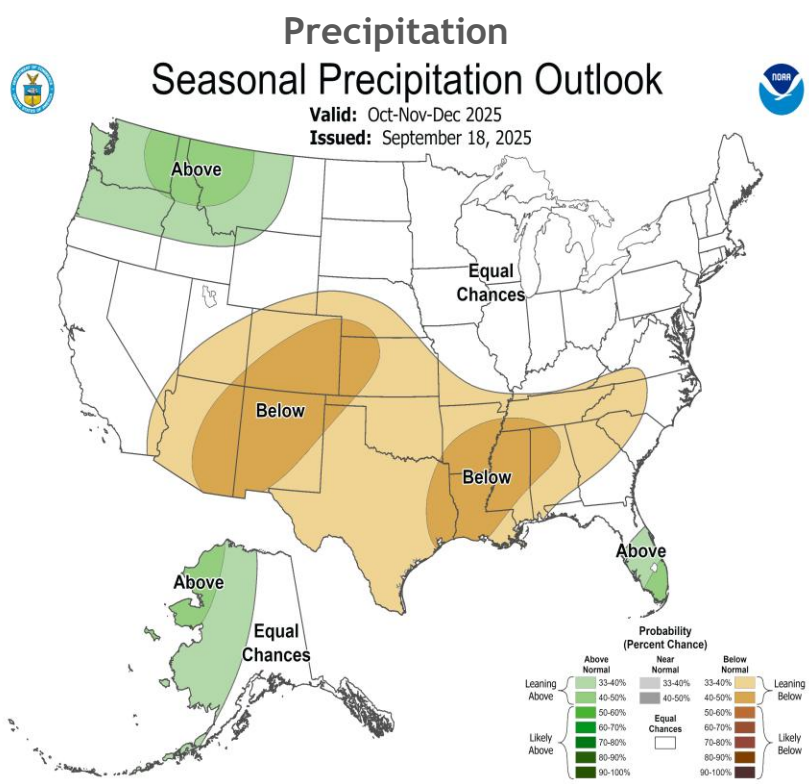


U. S. Seasonal Outlooks

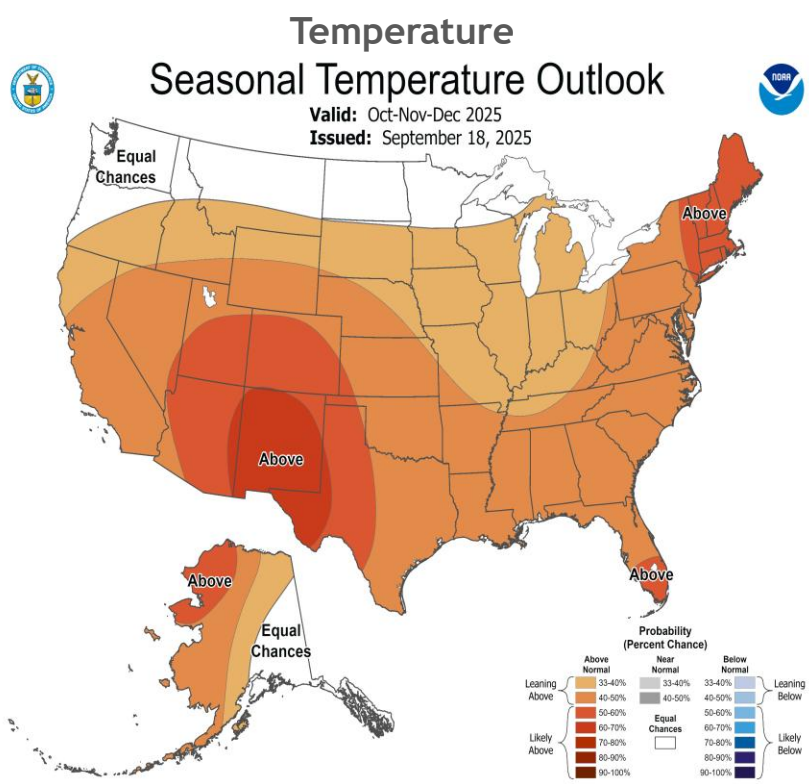
October-December 2025

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

Precipitation



Temperature



Summary

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Atmospheric anomalies over the tropical Pacific Ocean are consistent with La Niña.

La Niña conditions are present and favored to persist through December 2025 - February 2026, with a transition to ENSO-neutral likely in January-March 2026 (55% chance).*

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