

EL NIÑO/SOUTHERN OSCILLATION (ENSO) DIAGNOSTIC DISCUSSION

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14 December 2023

ENSO Alert System Status: **El Niño Advisory**

Synopsis: El Niño is expected to continue through the Northern Hemisphere winter, with a transition to ENSO-neutral favored during April-June 2024 (60% chance).

Sea surface temperatures (SST) were above average across the equatorial Pacific Ocean (Fig. 1), increasing in the central and east-central Pacific during November. The growth in SST anomalies, however, abated in early December, with the latest weekly Niño index values at +1.4°C in Niño-4, +1.9°C in Niño-3.4, +2.0°C in Niño-3, and +1.3°C in Niño-1+2 (Fig. 2). Area-averaged positive subsurface temperature anomalies increased significantly during November (Fig. 3), reflecting the strengthening of above-average subsurface temperatures in the central and eastern Pacific associated with a downwelling oceanic Kelvin wave (Fig. 4). Low-level wind anomalies were westerly in the central and eastern Pacific, while upper-level wind anomalies were easterly across the Pacific. Convection/rainfall remained enhanced at the Date Line and was suppressed around Indonesia (Fig. 5). The equatorial Southern Oscillation Index (SOI) and the station-based SOI were negative. Collectively, the coupled ocean-atmosphere system reflected a strong El Niño.

The most recent IRI plume favors El Niño to continue through the Northern Hemisphere winter 2023-24 (Fig. 6). Based on the latest forecasts, there is now a [54% chance](#) of a “historically strong” El Niño during the November-January season ($\geq 2.0^\circ\text{C}$ in Niño-3.4). An event of this strength would potentially be in the top 5 of El Niño events since 1950. While stronger El Niño events increase the *likelihood* of El Niño-related climate anomalies, it does not imply expected impacts will emerge in all locations or be of strong intensity (see [CPC seasonal outlooks](#) for probabilities of temperature and precipitation). In summary, El Niño is expected to continue through the Northern Hemisphere winter, with a transition to ENSO-neutral favored during April-June 2024 (60% chance; Fig. 7).

This discussion is a consolidated effort of the National Oceanic and Atmospheric Administration (NOAA), NOAA’s National Weather Service, and their funded institutions. Oceanic and atmospheric conditions are updated weekly on the Climate Prediction Center website ([El Niño/La Niña Current Conditions and Expert Discussions](#)). Additional perspectives and analyses are also available in an [ENSO blog](#). A probabilistic strength forecast is [available here](#). The next ENSO Diagnostics Discussion is scheduled for 11 January 2024. To receive an e-mail notification when the monthly ENSO Diagnostic Discussions are released, please send an e-mail message to: ncep.list.enso-update@noaa.gov.

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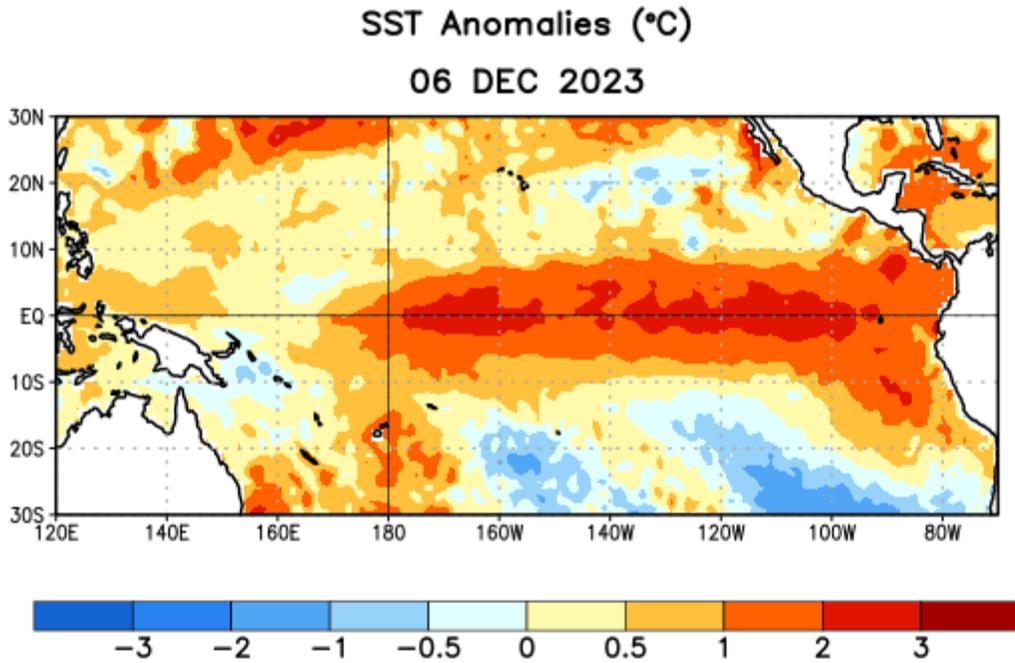


Figure 1. Average sea surface temperature (SST) anomalies (°C) for the week centered on 6 December 2023. Anomalies are computed with respect to the 1991-2020 base period weekly means.

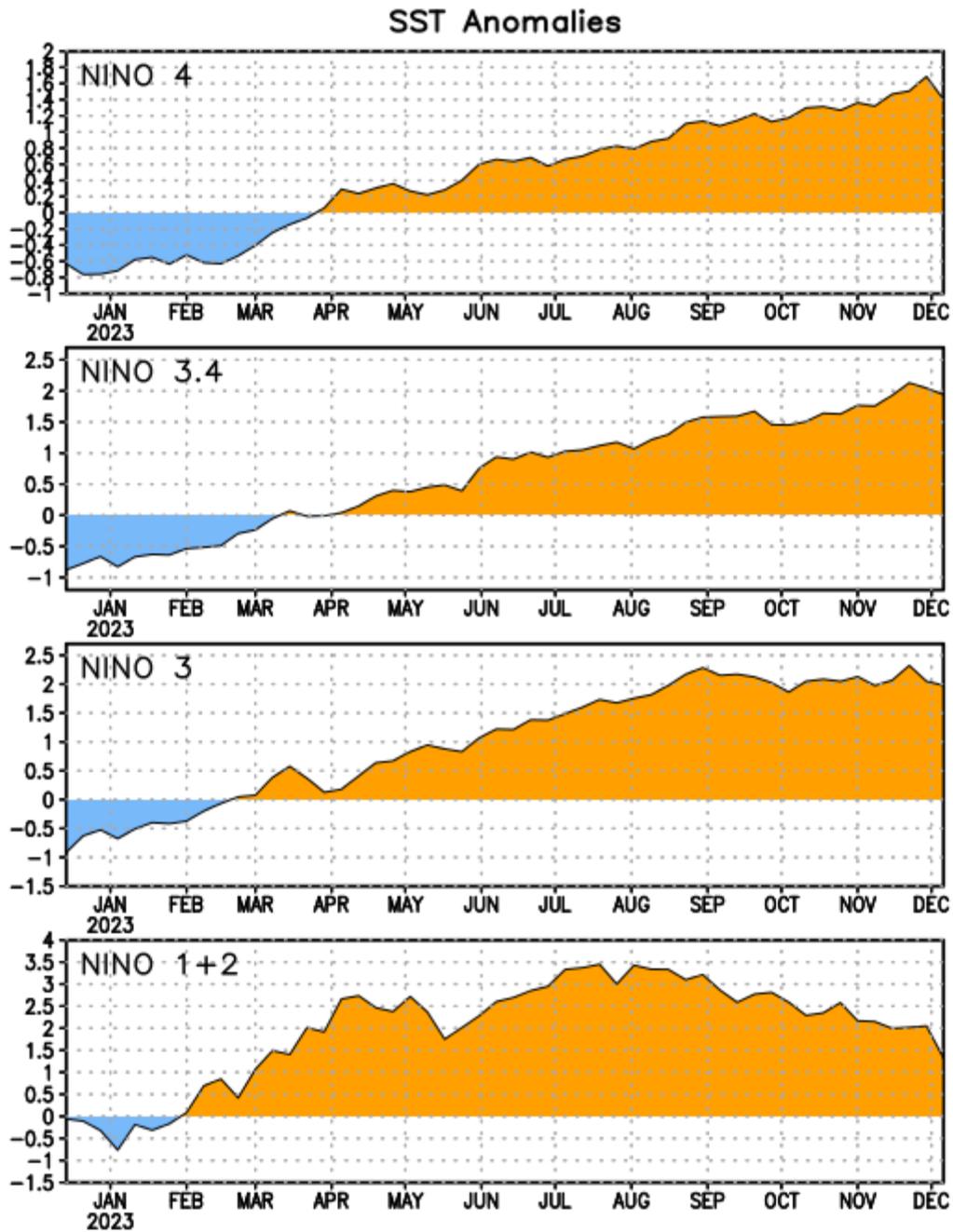


Figure 2. Time series of area-averaged sea surface temperature (SST) anomalies ($^{\circ}\text{C}$) in the Niño regions [Niño-1+2 (0° - 10°S , 90°W - 80°W), Niño-3 (5°N - 5°S , 150°W - 90°W), Niño-3.4 (5°N - 5°S , 170°W - 120°W), Niño-4 (5°N - 5°S , 150°W - 160°E)]. SST anomalies are departures from the 1991-2020 base period weekly means.

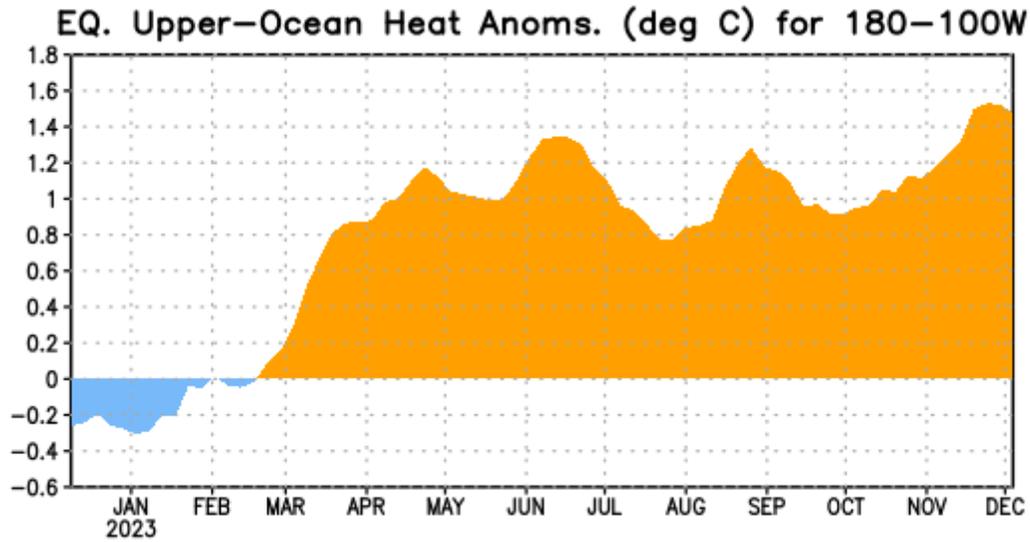


Figure 3. Area-averaged upper-ocean heat content anomaly ($^{\circ}\text{C}$) in the equatorial Pacific (5°N - 5°S , 180° - 100°W). The heat content anomaly is computed as the departure from the 1991-2020 base period pentad means.

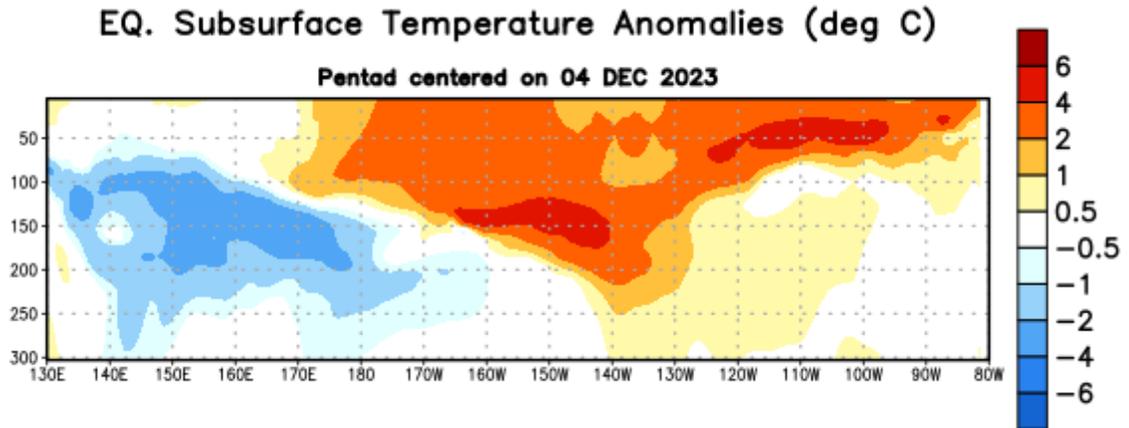


Figure 4. Depth-longitude section of equatorial Pacific upper-ocean (0-300m) temperature anomalies ($^{\circ}\text{C}$) centered on the pentad of 4 December 2023. Anomalies are departures from the 1991-2020 base period pentad means.

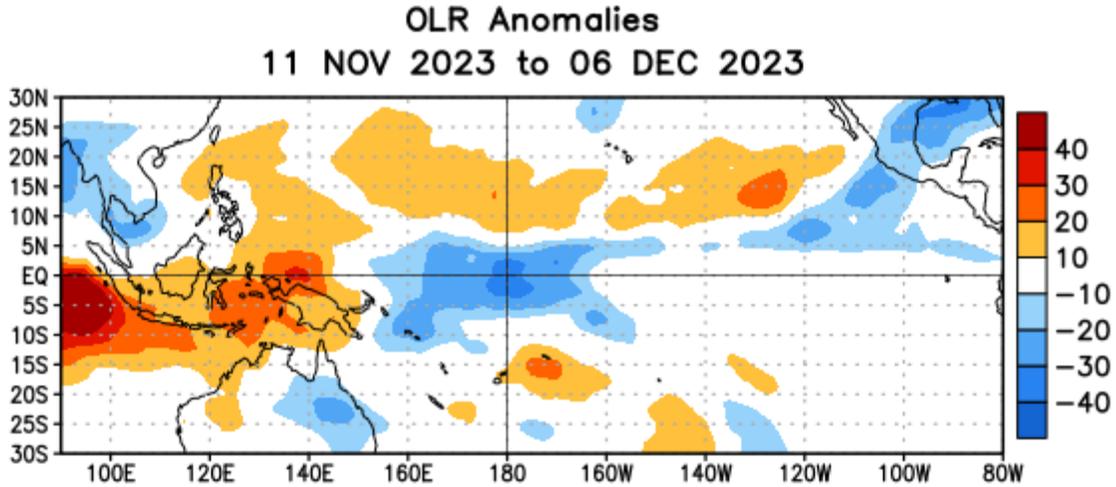


Figure 5. Average outgoing longwave radiation (OLR) anomalies (W/m^2) for the period 11 November – 6 December 2023. OLR anomalies are computed as departures from the 1991-2020 base period pentad means.

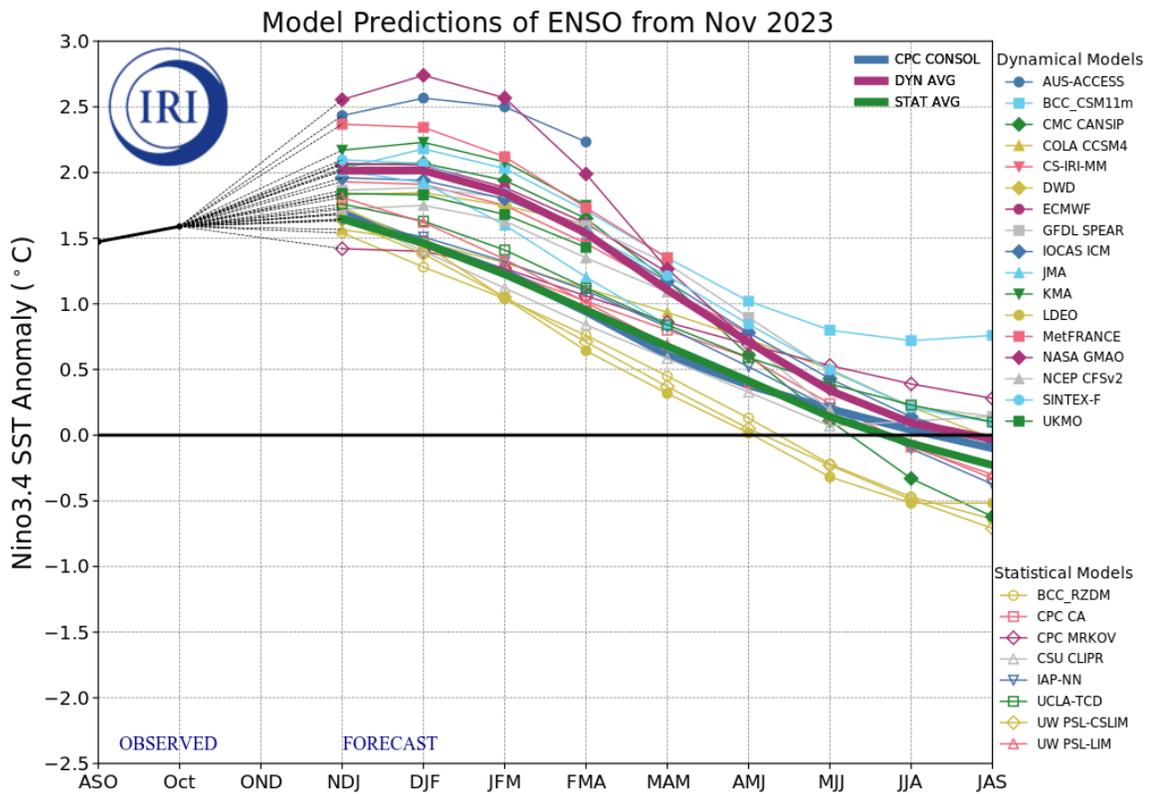


Figure 6. Forecasts of sea surface temperature (SST) anomalies for the Niño 3.4 region ($5^{\circ}N-5^{\circ}S, 120^{\circ}W-170^{\circ}W$). Figure updated 20 November 2023 by the International Research Institute (IRI) for Climate and Society.

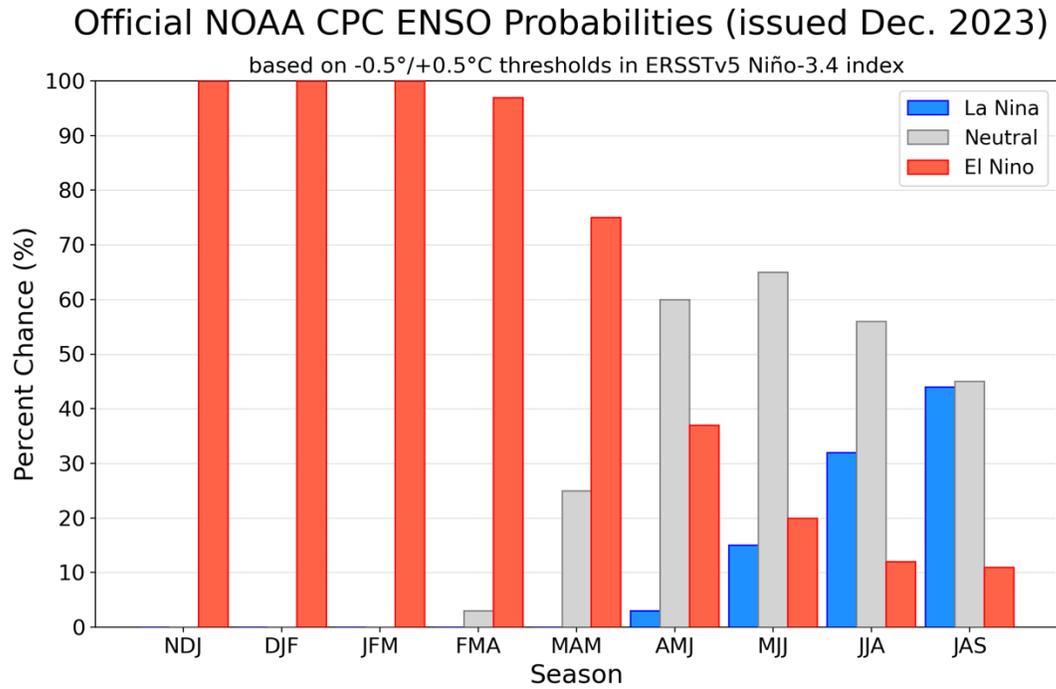


Figure 7. Official ENSO probabilities for the Niño 3.4 sea surface temperature index (5°N - 5°S , 120°W - 170°W). Figure updated 14 December 2023.