

EL NIÑO/SOUTHERN OSCILLATION (ENSO) DIAGNOSTIC DISCUSSION

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13 July 2023

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

Synopsis: There is a greater than 90% chance that El Niño will continue through the Northern Hemisphere winter.

In June, a weak El Niño was associated with above-average sea surface temperatures (SSTs) across the equatorial Pacific Ocean (Fig. 1). Nearly all of the weekly Niño indices were at or in excess of +1.0°C: Niño-3.4 was +1.0°C, Niño-3 was +1.5°C, and Niño1+2 was +3.3°C (Fig. 2). Area-averaged subsurface temperatures anomalies increased compared to May (Fig. 3), with positive anomalies below the surface of the equatorial Pacific Ocean (Fig. 4). In contrast, the tropical atmospheric anomalies were weaker compared to the oceanic anomalies. For the June monthly average, low-level winds were near average over most of the equatorial Pacific. Upper-level wind anomalies were easterly over the western Pacific and westerly over the eastern Pacific. Convection and rainfall were enhanced around the International Date Line and were weakly suppressed in the vicinity of Indonesia (Fig. 5). The equatorial Southern Oscillation Index (SOI) remained negative (0.5 standard deviations below average), while the traditional, station-based SOI was near zero. Collectively, the coupled ocean-atmosphere system reflected a weak El Niño.

The most recent IRI plume indicates El Niño will persist through the Northern Hemisphere winter 2023-24 (Fig. 6). Forecasters favor continued growth of El Niño through the fall, peaking this winter with moderate-to-strong intensity ([81% chance of November-January Niño-3.4 \$\geq\$ 1.0°C](#)). An event that becomes “historically strong” (seasonally averaged Niño-3.4 \geq 2.0°C), rivaling the winters of 1997-98 or 2015-16, has an approximately 1 in 5 chance. In summary, there is a greater than 90% chance that El Niño will continue through the Northern Hemisphere winter (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 10 August 2023. 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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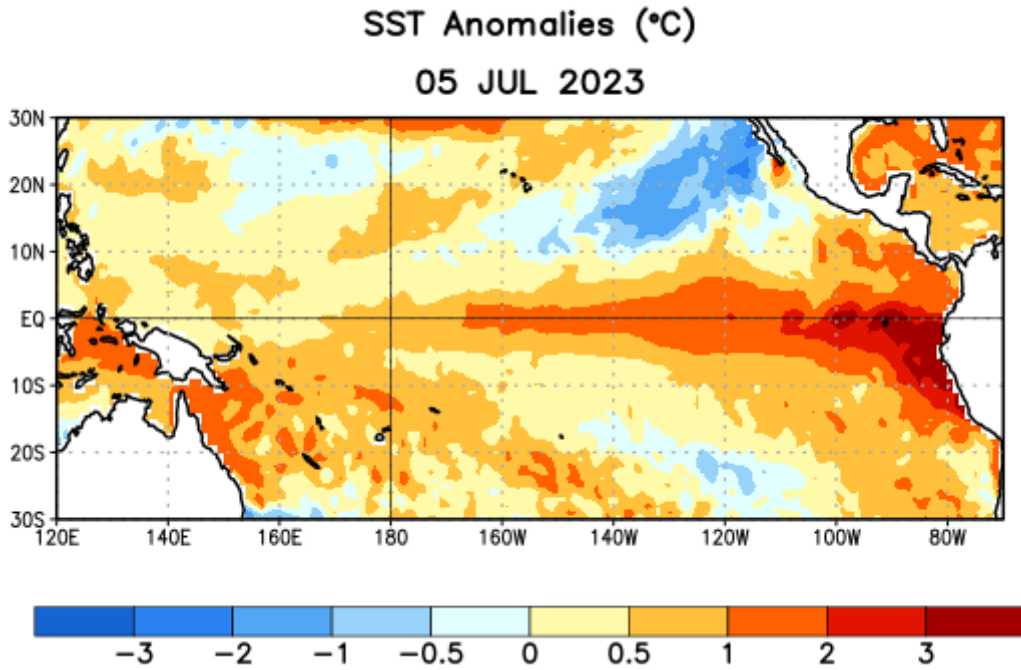


Figure 1. Average sea surface temperature (SST) anomalies (°C) for the week centered on 5 July 2023. Anomalies are computed with respect to the 1991-2020 base period weekly means.

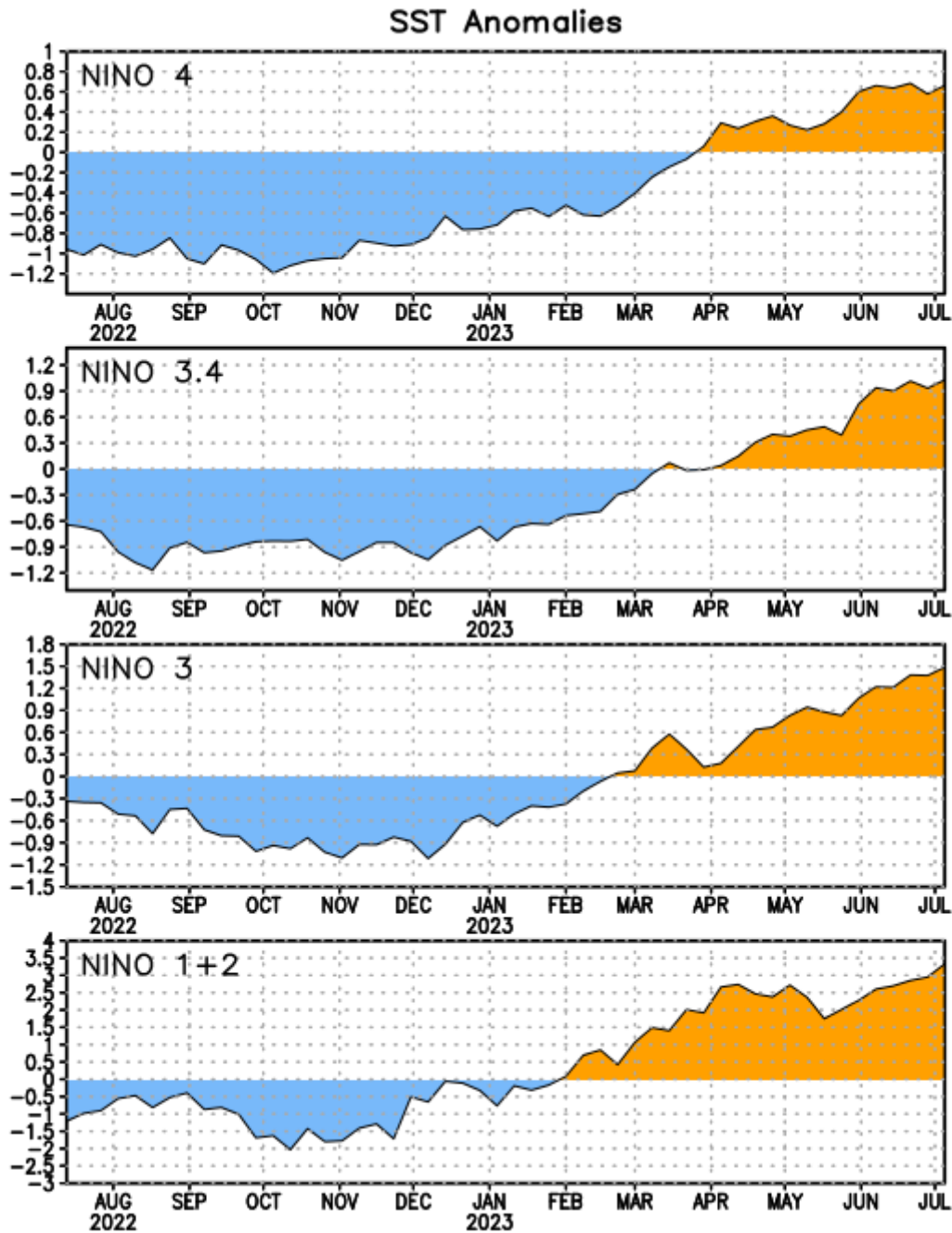


Figure 2. Time series of area-averaged sea surface temperature (SST) anomalies ($^{\circ}\text{C}$) in the Niño regions [Niño-1+2 (0° - 10°S , 90°W - 80°W), Niño-3 (5°N - 5°S , 150°W - 90°W), Niño-3.4 (5°N - 5°S , 170°W - 120°W), Niño-4 (5°N - 5°S , 150°W - 160°E)]. SST anomalies are departures from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

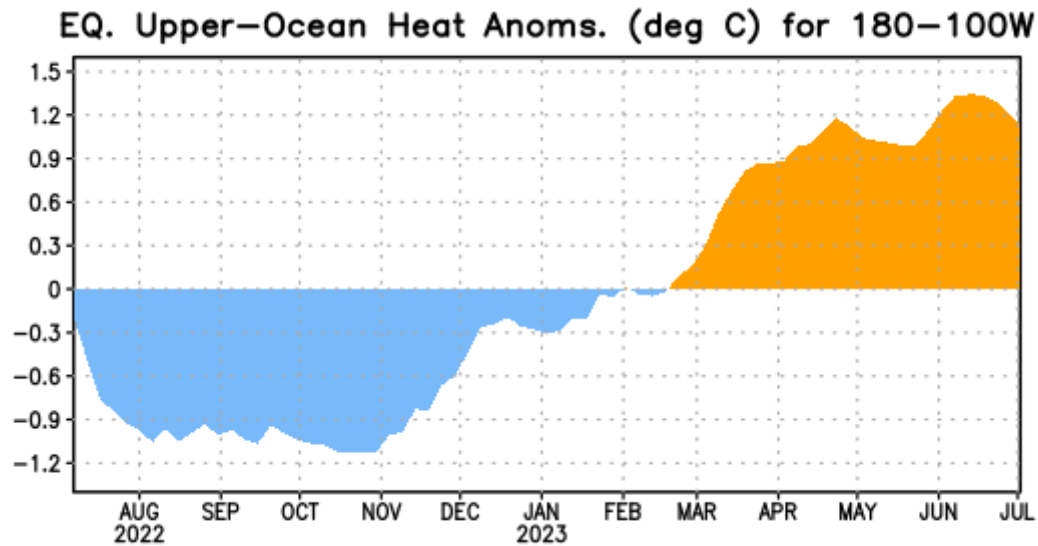


Figure 3. Area-averaged upper-ocean heat content anomaly ($^{\circ}\text{C}$) in the equatorial Pacific (5°N - 5°S , 180° - 100°W). The heat content anomaly is computed as the departure from the 1991-2020 base period pentad means.

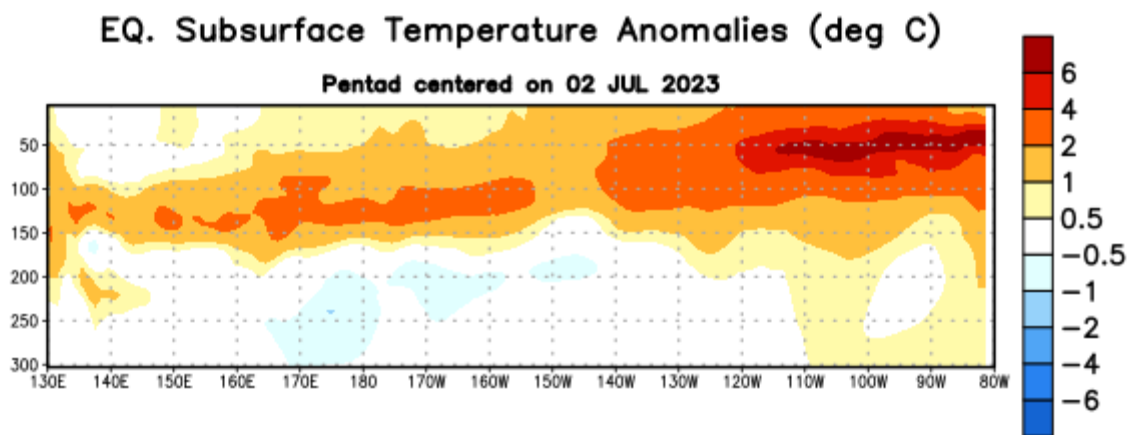


Figure 4. Depth-longitude section of equatorial Pacific upper-ocean (0-300m) temperature anomalies ($^{\circ}\text{C}$) centered on the pentad of 2 July 2023. Anomalies are departures from the 1991-2020 base period pentad means.

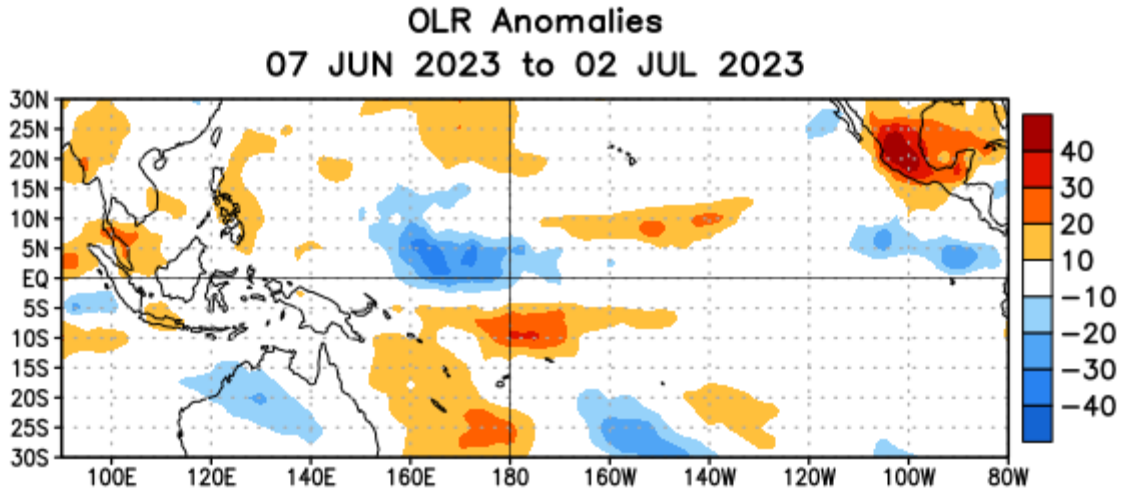


Figure 5. Average outgoing longwave radiation (OLR) anomalies (W/m^2) for the period 7 June – 2 July 2023. OLR anomalies are computed as departures from the 1991–2020 base period pentad means.

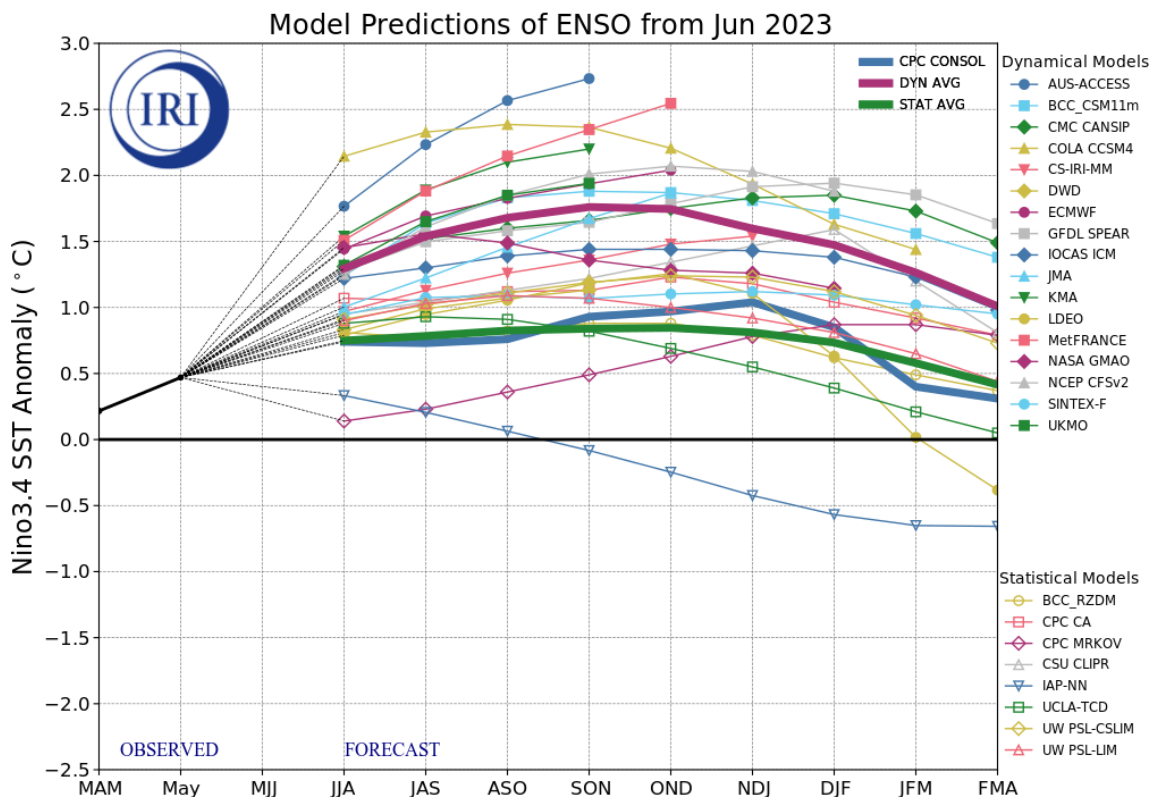


Figure 6. Forecasts of sea surface temperature (SST) anomalies for the Niño 3.4 region ($5^{\circ}N$ - $5^{\circ}S$, $120^{\circ}W$ - $170^{\circ}W$). Figure updated 16 June 2023 by the International Research Institute (IRI) for Climate and Society.

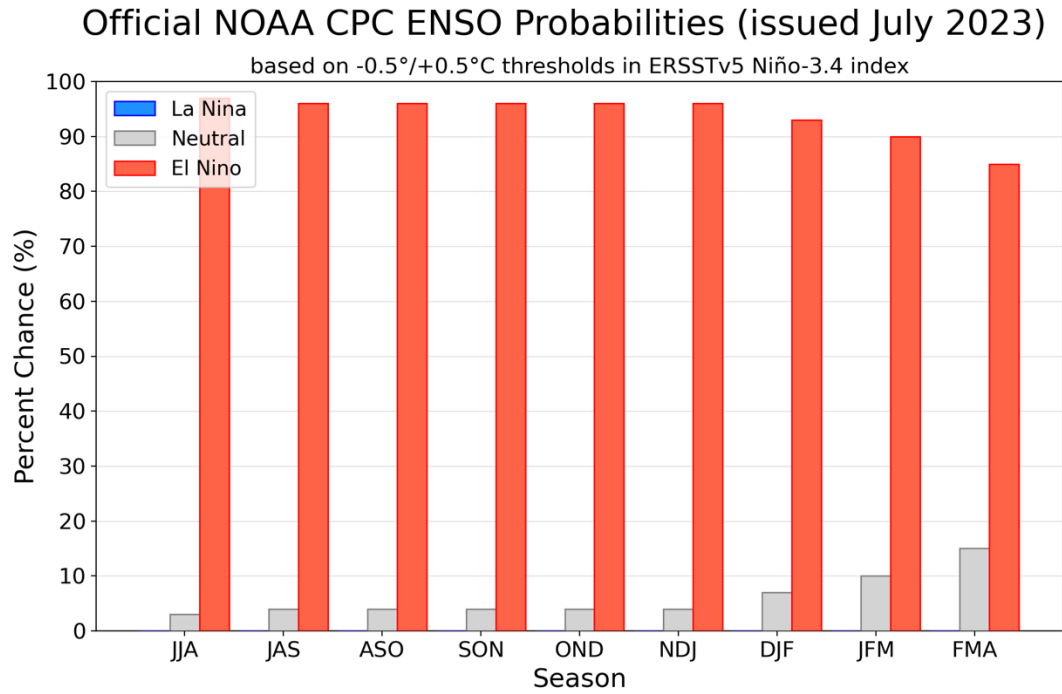


Figure 7. Official ENSO probabilities for the Niño 3.4 sea surface temperature index (5°N - 5°S , 120°W - 170°W). Figure updated 13 July 2023.