

# EL NIÑO/SOUTHERN OSCILLATION (ENSO) DIAGNOSTIC DISCUSSION

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

**Synopsis:** El Niño conditions will continue to develop and are expected to last through the Northern Hemisphere Winter 2009-2010.

During June 2009, conditions across the equatorial Pacific Ocean transitioned from ENSO-neutral to El Niño conditions. Sea surface temperature (SST) anomalies continued to increase, with the latest weekly departures exceeding +1.0°C along a narrow band in the eastern equatorial Pacific (Fig. 1). All of the weekly SST indices increased steadily during June and now range from +0.6°C to +0.9°C (Fig. 2). Subsurface oceanic heat content anomalies (average temperatures in the upper 300m of the ocean, Fig. 3) also increased as the thermocline continued to deepen (Fig. 4). Consistent with the oceanic evolution, the low-level equatorial trade winds were weaker-than-average across much of the Pacific basin, and convection became increasingly suppressed over Indonesia. This coupling of the ocean and atmosphere indicates the development of El Niño conditions.

Model forecasts of SST anomalies for the Niño-3.4 region (Fig. 5) reflect a growing consensus for the continued development of El Niño (+0.5°C or greater in the Niño-3.4 region). However, the spread of the models indicates disagreement over the eventual strength of El Niño (+0.5°C to +2.0°C). Current conditions and recent trends favor the continued development of a weak-to-moderate strength El Niño into the Northern Hemisphere Fall 2009, with further strengthening possible thereafter.

Expected El Niño impacts during July-September 2009 include enhanced precipitation over the central and west-central Pacific Ocean, along with the continuation of drier than average conditions over Indonesia. Temperature and precipitation impacts over the United States are typically weak during the Northern Hemisphere Summer and early Fall, and generally strengthen during the late Fall and Winter. El Niño can help to suppress Atlantic hurricane activity by increasing the vertical wind shear over the Caribbean Sea and tropical Atlantic Ocean. The [NOAA Atlantic Seasonal Hurricane Outlook](#) issued in May (will be updated on Aug. 6<sup>th</sup>) indicates the highest probabilities for a near-average season.

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 web site ([El Niño/La Niña Current Conditions and Expert Discussions](#)). Forecasts for the evolution of El Niño/La Niña are updated monthly in the [Forecast Forum](#) section of CPC's Climate Diagnostics Bulletin. The next ENSO Diagnostics Discussion is scheduled for 6 August 2009. 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](mailto:ncep.list.enso-update@noaa.gov).

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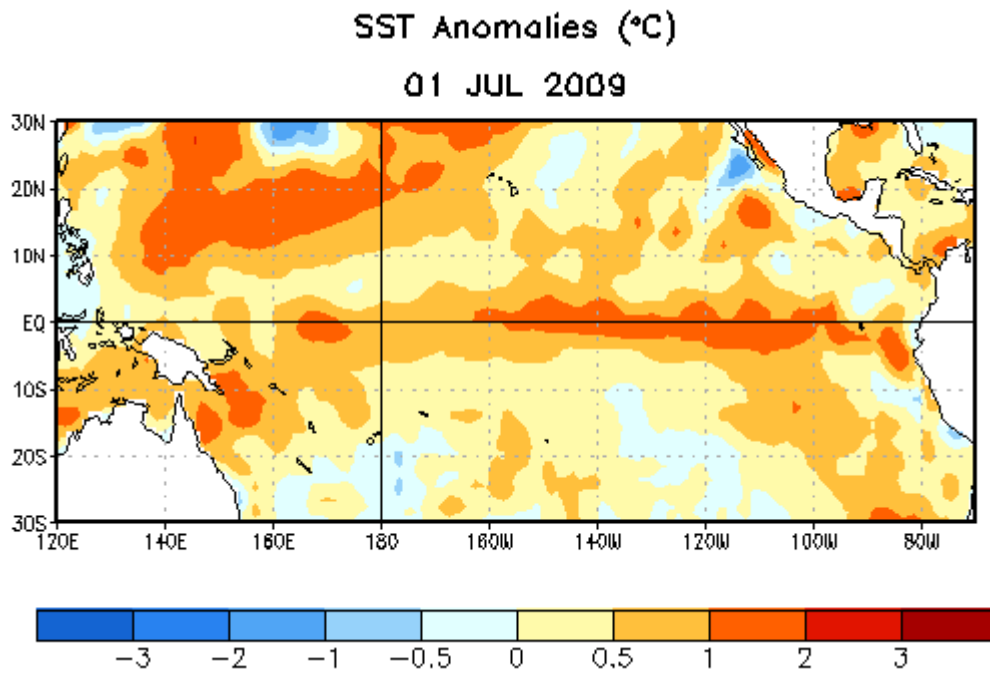


Figure 1. Average weekly sea surface temperature (SST) anomalies (°C) centered on 1 July 2009. Anomalies are computed with respect to the 1971-2000 base period weekly means (Xue et al. 2003, *J. Climate*, **16**, 1601-1612).

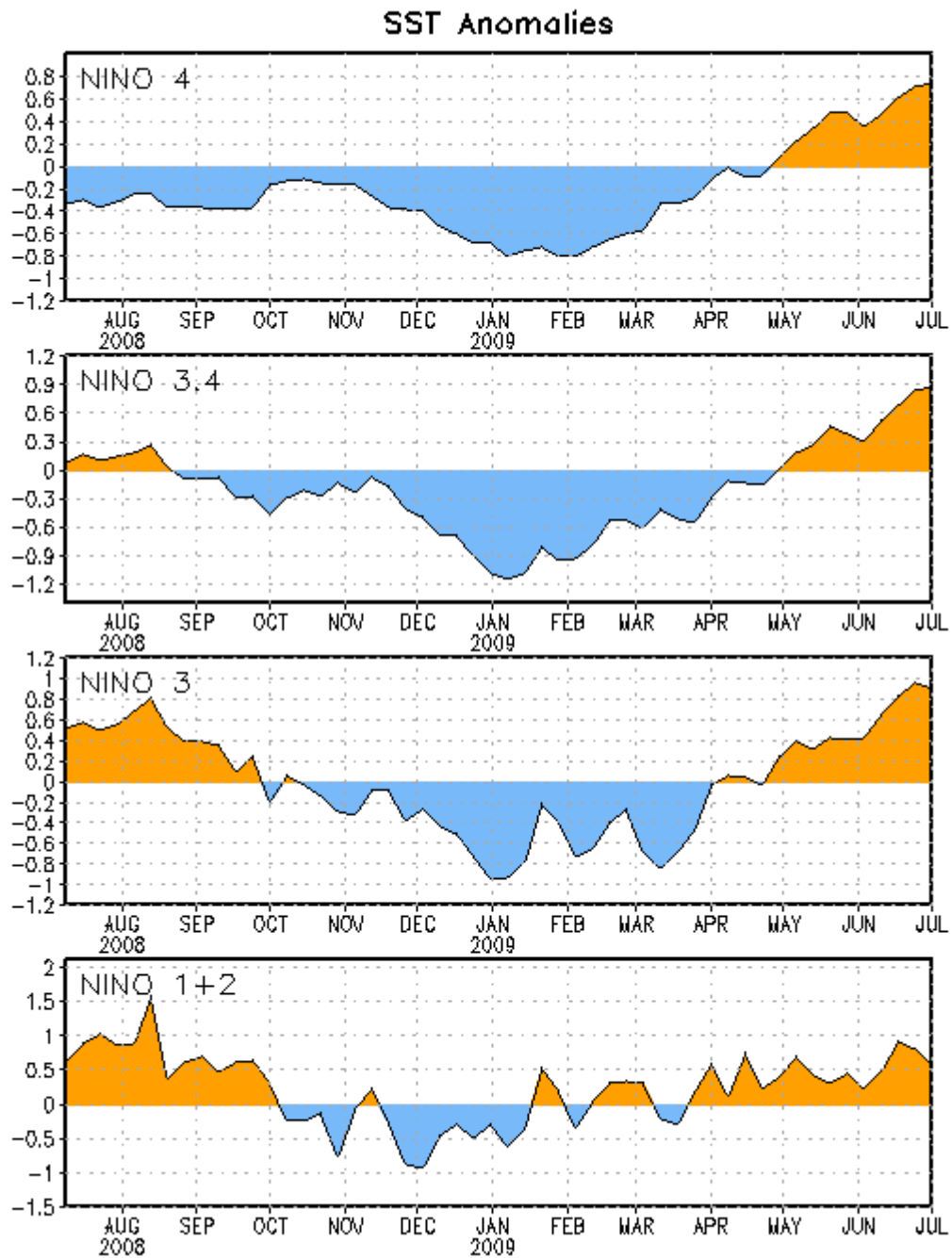


Figure 2. Time series of area-averaged sea surface temperature (SST) anomalies ( $^{\circ}\text{C}$ ) in the Niño regions [Niño-1+2 ( $0^{\circ}$ - $10^{\circ}\text{S}$ ,  $90^{\circ}\text{W}$ - $80^{\circ}\text{W}$ ), Niño 3 ( $5^{\circ}\text{N}$ - $5^{\circ}\text{S}$ ,  $150^{\circ}\text{W}$ - $90^{\circ}\text{W}$ ), Niño-3.4 ( $5^{\circ}\text{N}$ - $5^{\circ}\text{S}$ ,  $170^{\circ}\text{W}$ - $120^{\circ}\text{W}$ ), Niño-4 ( $150^{\circ}\text{W}$ - $160^{\circ}\text{E}$  and  $5^{\circ}\text{N}$ - $5^{\circ}\text{S}$ )]. SST anomalies are departures from the 1971-2000 base period weekly means (Xue et al. 2003, *J. Climate*, **16**, 1601-1612).

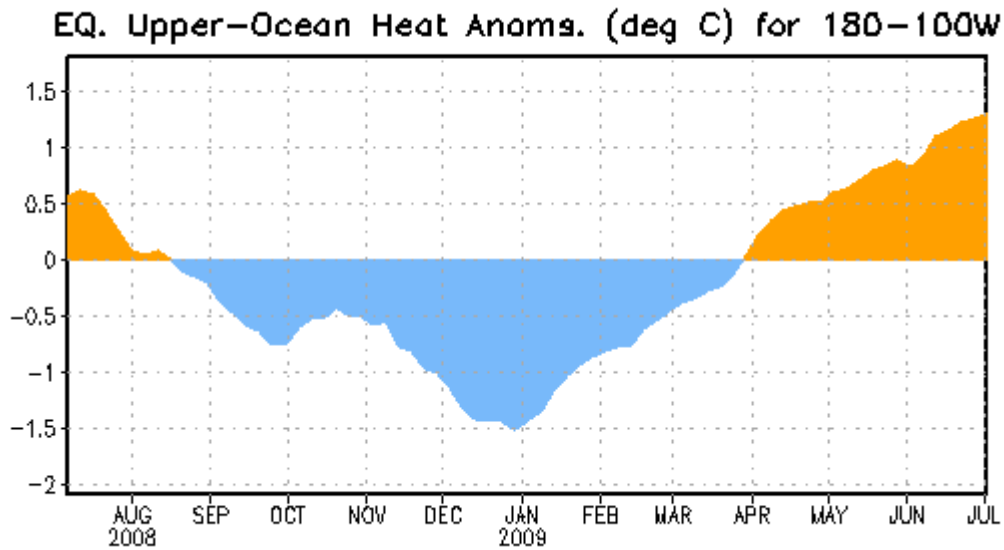


Figure 3. Area-averaged upper-ocean heat content anomalies ( $^{\circ}\text{C}$ ) in the equatorial Pacific ( $5^{\circ}\text{N}$ - $5^{\circ}\text{S}$ ,  $180^{\circ}$ - $100^{\circ}\text{W}$ ). Heat content anomalies are computed as departures from the 1982-2004 base period pentad means.

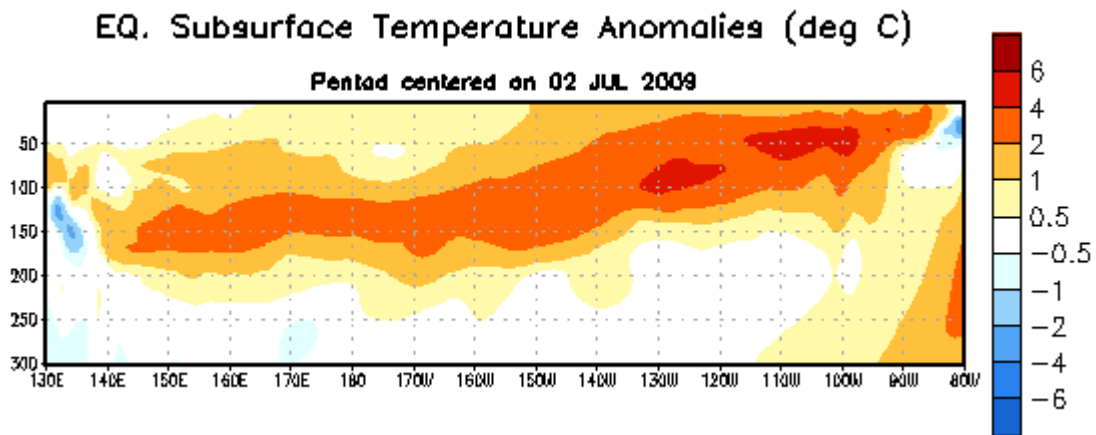


Figure 4. Depth-longitude section of equatorial Pacific upper-ocean (0-300m) temperature anomalies ( $^{\circ}\text{C}$ ) centered on the week of 2 July 2009. The anomalies are averaged between  $5^{\circ}\text{N}$ - $5^{\circ}\text{S}$ . Anomalies are departures from the 1982-2004 base period pentad means.

## Model Forecasts of ENSO from *Jun 2009*

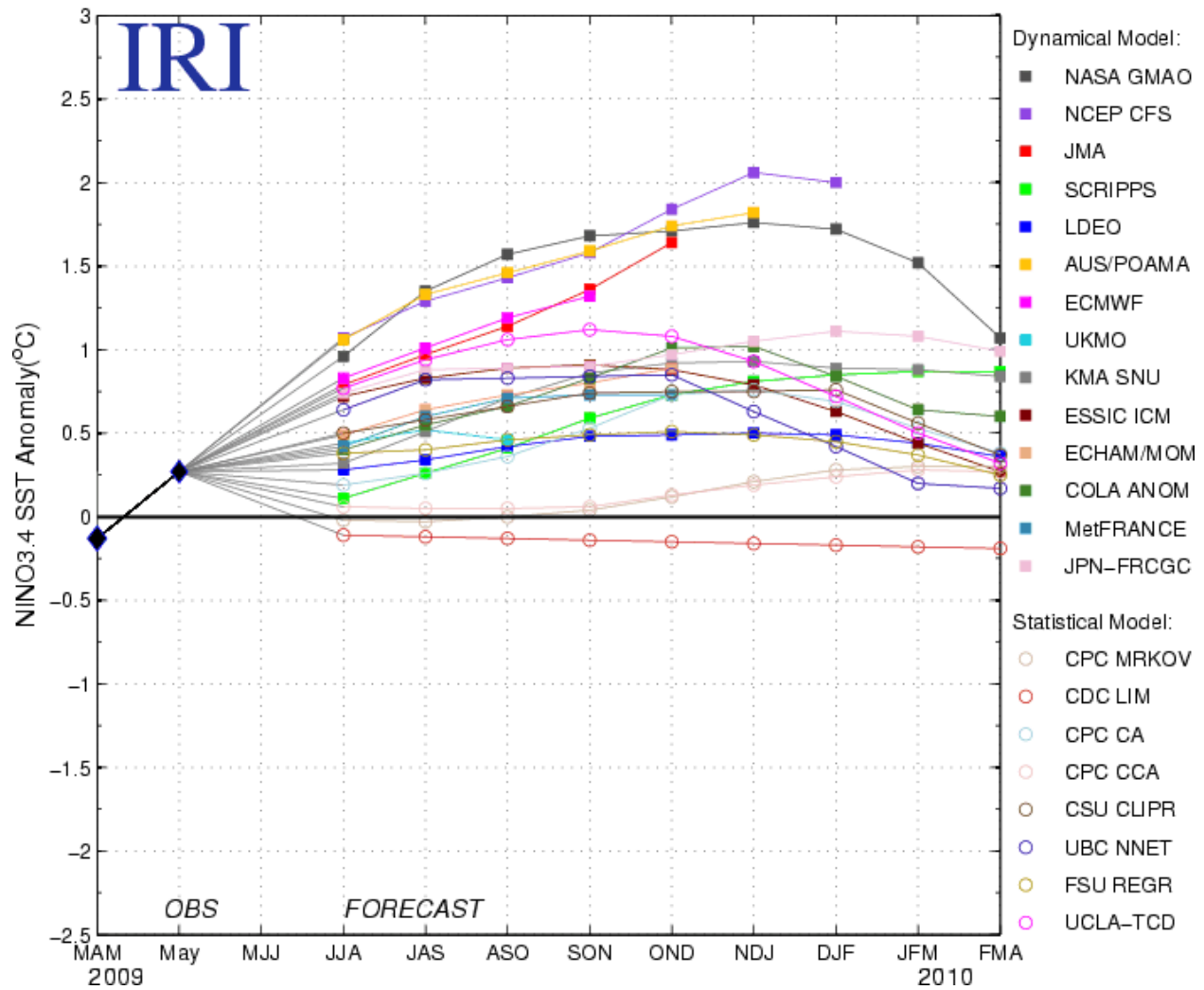


Figure 5. Forecasts of sea surface temperature (SST) anomalies for the Niño 3.4 region (5°N-5°S, 120°W-170°W). Figure courtesy of the International Research Institute (IRI) for Climate and Society. Figure updated 15 June 2009.