

EL NIÑO/SOUTHERN OSCILLATION (ENSO) DIAGNOSTIC DISCUSSION

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

Synopsis: El Niño is expected to strengthen and last through the Northern Hemisphere Winter 2009-2010.

A weak El Niño was present during July 2009, as monthly sea surface temperatures (SST) departures ranged from +0.5°C to +1.5°C across the equatorial Pacific Ocean, with the largest anomalies in the eastern half of the basin (Fig. 1). Consistent with this warmth, all of the Niño-region SST indices were between +0.6°C to +1.0°C throughout the month (Fig. 2). Subsurface oceanic heat content (average temperatures in the upper 300m of the ocean, Fig. 3) anomalies continued to reflect a deep layer of anomalous warmth between the ocean surface and thermocline (Fig. 4). Also, convection was suppressed over Indonesia and enhanced across the western Pacific and near the International Date Line. In addition, developing El Niño's often feature westerly wind bursts over the western equatorial Pacific, such as the one which occurred at the end of July (Fig. 5). These oceanic and atmospheric anomalies reflect El Niño.

A majority of the model forecasts for the Niño-3.4 SST index (Fig. 6) suggest El Niño will continue to strengthen. While there is disagreement on the eventual strength of El Niño, nearly all of the dynamical models predict a moderate-to-strong El Niño during the Northern Hemisphere Winter 2009-10. A strengthening El Niño during the next few months is also suggested by the recent westerly wind event in the western equatorial Pacific, which can lead to additional anomalous warmth across the central and east-central equatorial Pacific during the next two months. Therefore, current conditions and model forecasts favor the continued development of a weak-to-moderate strength El Niño into the Northern Hemisphere Fall 2009, with the likelihood of at least a moderate strength El Niño (3-month Niño-3.4 SST index of +1.0°C or greater) during the Northern Hemisphere Winter 2009-10.

Expected El Niño impacts during August-October 2009 include enhanced precipitation over the central and west-central Pacific Ocean and 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 (see the Aug. 6th update of the [NOAA Atlantic Seasonal Hurricane Outlook](#)).

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 10 September 2009. To receive an e-mail notification when the monthly ENSO Diagnostic Discussions are released, please send an e-mail message to: ncep.list.ens-update@noaa.gov.

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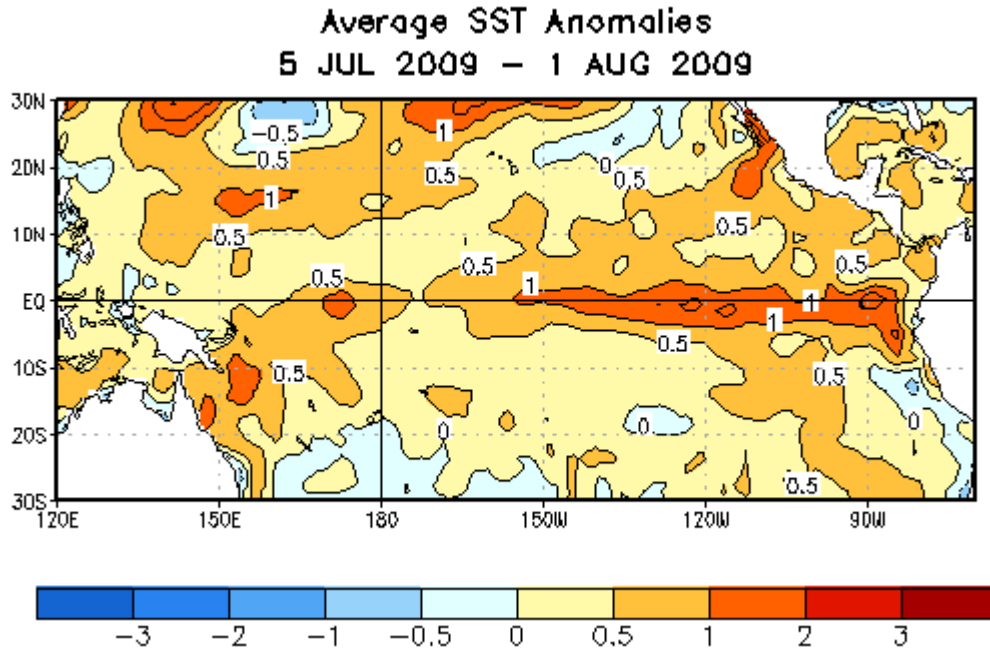


Figure 1. Average sea surface temperature (SST) anomalies ($^{\circ}\text{C}$) for the four-week period 5 July 2009 - 1 August 2009. Anomalies are computed with respect to the 1971-2000 base period weekly means (Xue et al. 2003, *J. Climate*, **16**, 1601-1612).

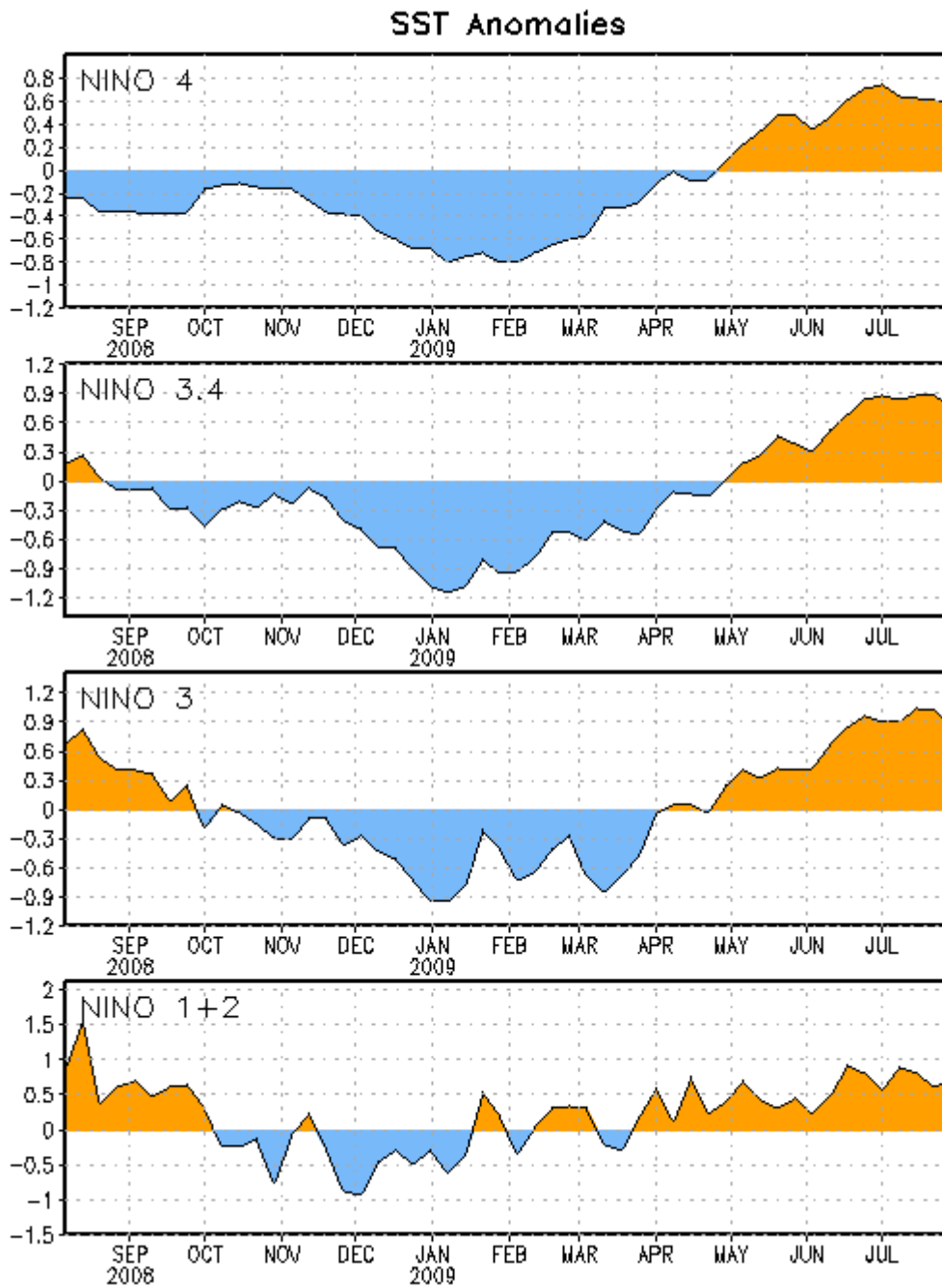


Figure 2. Time series of area-averaged sea surface temperature (SST) anomalies ($^{\circ}\text{C}$) in the Niño regions [Niño-1+2 (0° - 10°S , 90°W - 80°W), Niño 3 (5°N - 5°S , 150°W - 90°W), Niño-3.4 (5°N - 5°S , 170°W - 120°W), Niño-4 (150°W - 160°E and 5°N - 5°S)]. SST anomalies are departures from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

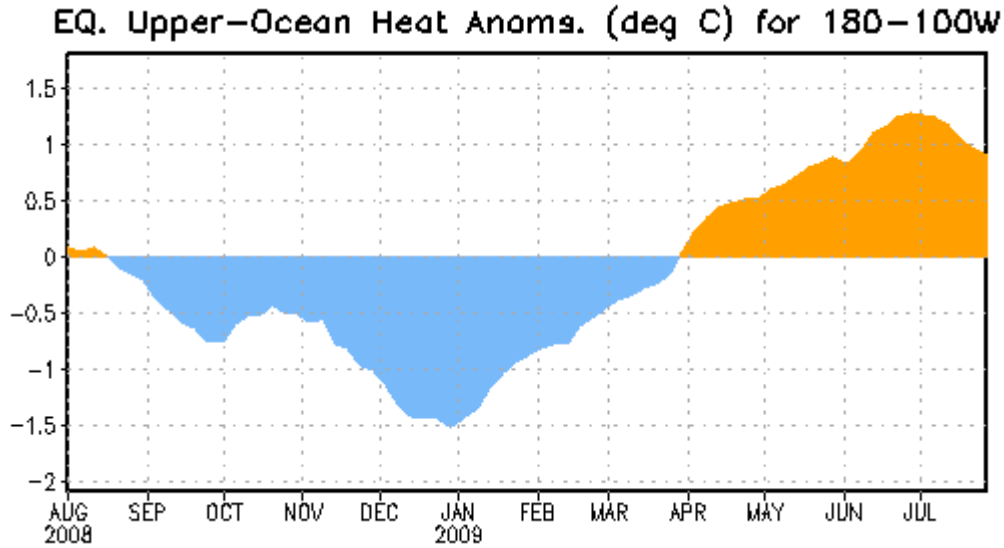


Figure 3. Area-averaged upper-ocean heat content anomalies ($^{\circ}\text{C}$) in the equatorial Pacific (5°N - 5°S , 180° - 100°W). Heat content anomalies are computed as departures from the 1982-2004 base period pentad means.

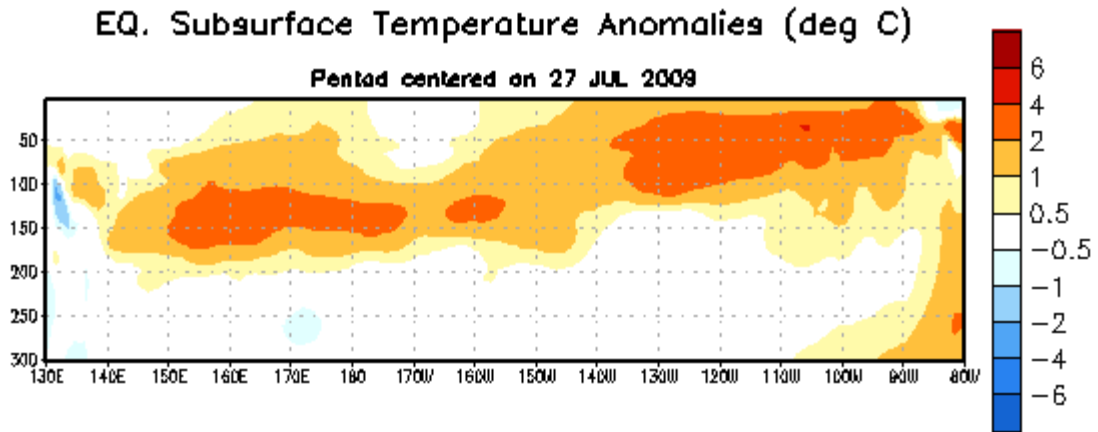


Figure 4. Depth-longitude section of equatorial Pacific upper-ocean (0-300m) temperature anomalies ($^{\circ}\text{C}$) centered on the week of 27 July 2009. The anomalies are averaged between 5°N - 5°S . Anomalies are departures from the 1982-2004 base period pentad means.

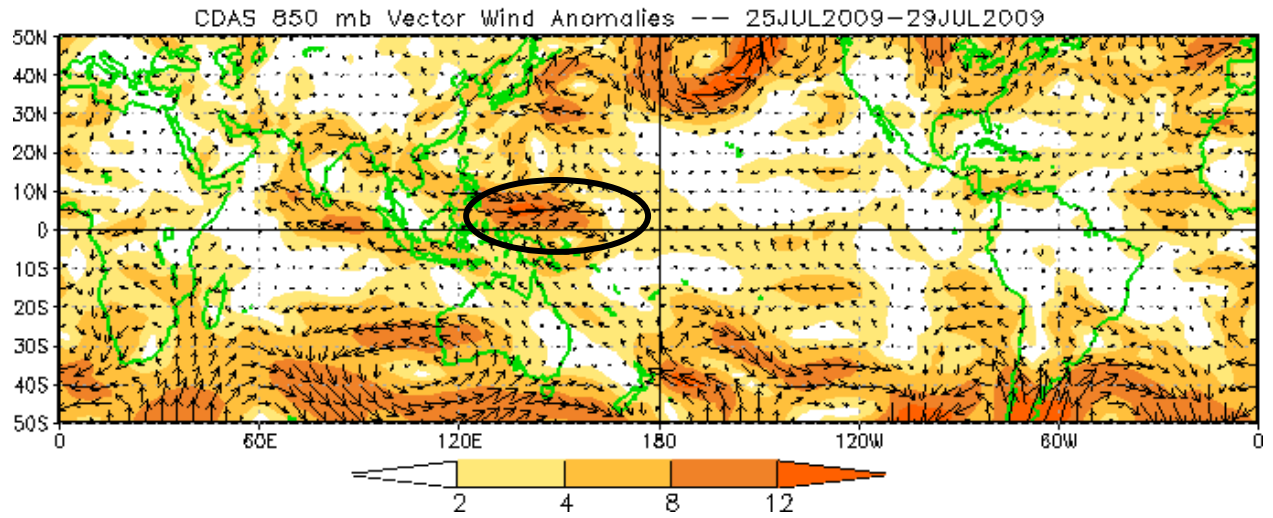


Figure 5. Average low-level (850-hPa) vector wind anomalies (meters per second) for the five day period 25 July 2009 - 29 July 2009. Anomalies are computed with respect to the 1979-1995 base period daily means (Kalnay et al, 1996)

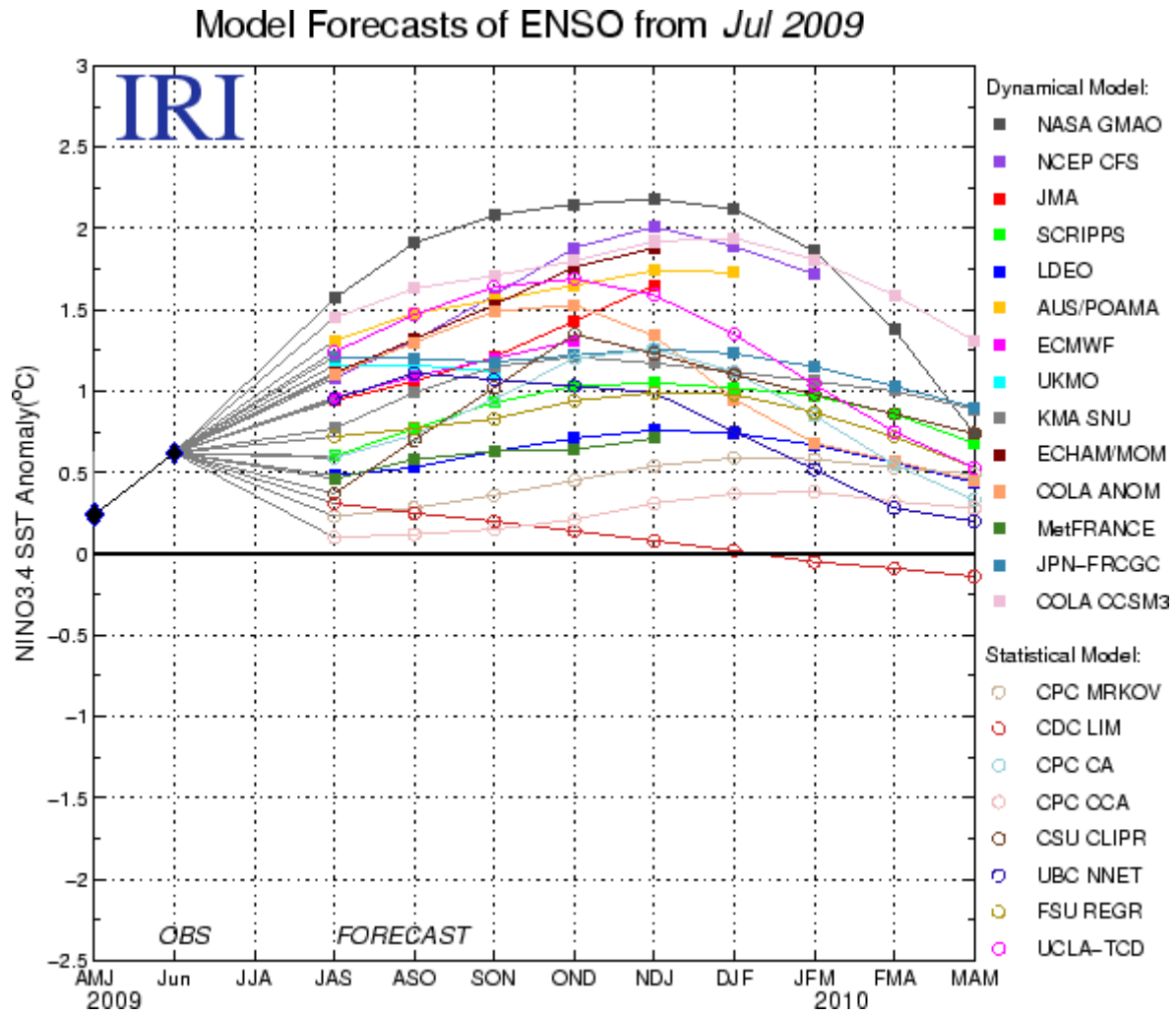


Figure 6. Forecasts of sea surface temperature (SST) anomalies for the Niño 3.4 region (5°N-5°S, 120°W-170°W). Figure courtesy of the International Research Institute (IRI) for Climate and Society. Figure updated 16 July 2009.