EL NIÑO/SOUTHERN OSCILLATION (ENSO) DIAGNOSTIC DISCUSSION

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CLIMATE PREDICTION CENTER/NCEP/NWS

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ENSO Alert System Status: La Niña Advisory

Synopsis: La Niña conditions are expected to gradually strengthen and continue through the Northern Hemisphere winter 2011-12.

During September 2011, La Niña conditions strengthened as indicated by increasingly negative sea surface temperature (SST) anomalies across the eastern half of the equatorial Pacific Ocean (Fig. 1). The weekly Nino indices continued their cooling trend and all are currently at or below –0.5°C (Fig. 2). Consistent with this cooling, oceanic heat content (average temperature anomalies in the upper 300m of the ocean, Fig. 3) remained below-average in response to a shallower thermocline across the eastern Pacific Ocean (Fig. 4). Also, convection continued to be suppressed near the Date Line, and became more enhanced near Papua New Guinea (Fig. 5). In addition, anomalous low-level easterly and upper-level westerly winds persisted over the central tropical Pacific. Collectively, these oceanic and atmospheric patterns reflect the continuation of La Niña conditions.

Currently, La Niña is not as strong as it was in September 2010. Roughly one- half of the models predict La Niña to strengthen during the Northern Hemisphere fall and winter (Fig. 6). Of these models, the majority predict a weak La Niña (3-month average in the Nino-3.4 region less than -0.9°C). In addition, a weaker second La Niña winter has occurred in three of the five multi-year La Niñas in the historical SST record since 1950. However, the NCEP Climate Forecast System (CFS.v1) predicts a moderate-strength La Niña this winter (between –1.0°C to –1.4°C) and CFS.v2 predicts a strong La Niña (less than –1.5°C), which rivals last year's peak strength. For CFS forecasts made at this time of year, the average error for December-February is roughly ±0.5°C, so there is uncertainty as to whether this amplitude will be achieved. Thus, at this time, a weak or moderate strength La Niña is most likely during the Northern Hemisphere winter.

Across the contiguous United States, temperature and precipitation impacts associated with La Niña are expected to remain relatively weak during the remainder of the Northern Hemisphere early fall, and to strengthen during the late fall and winter. It is important to note that the strength of U.S. impacts is not necessarily related to the strength of La Niña across the equatorial Pacific. During October-December 2011, there is an increased chance of above-average temperatures across the mid-section of the country. Also, above-average precipitation is favored across the Pacific Northwest, along with a higher probability for drier-than-average conditions across much of the southern tier of the country (see 3-month seasonal outlook released on 15 September 2011).

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 November 2011. 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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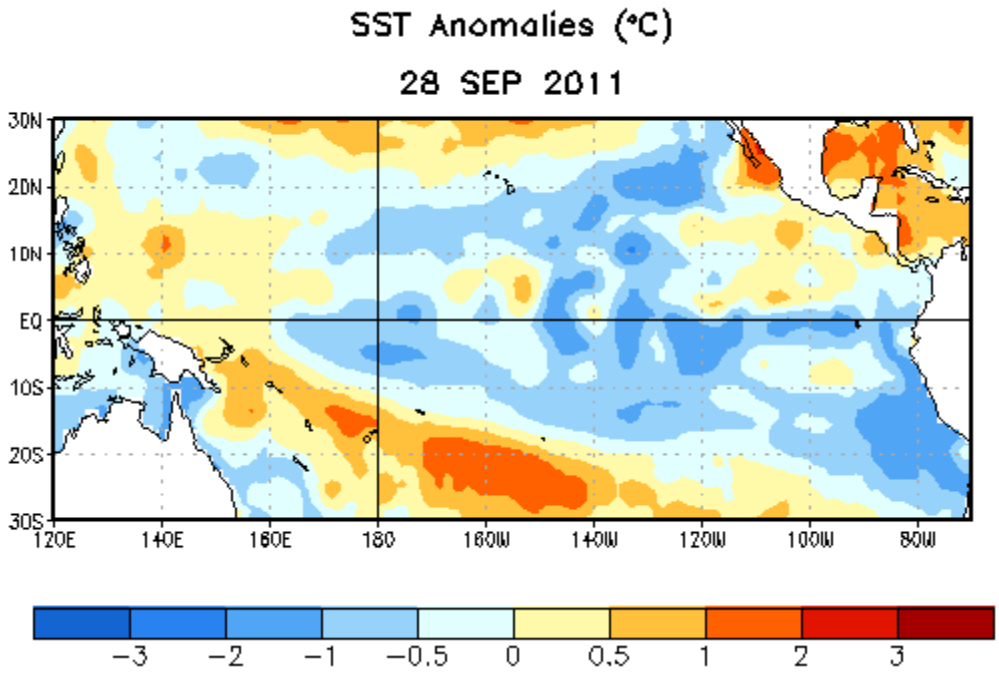

Figure 1. Average sea surface temperature (SST) anomalies (°C) for the week centered on 28 September 2011. Anomalies are computed with respect to the 1971-2000 base period weekly means (Xue et al. 2003, *J. Climate*, **16**, 1601-1612).

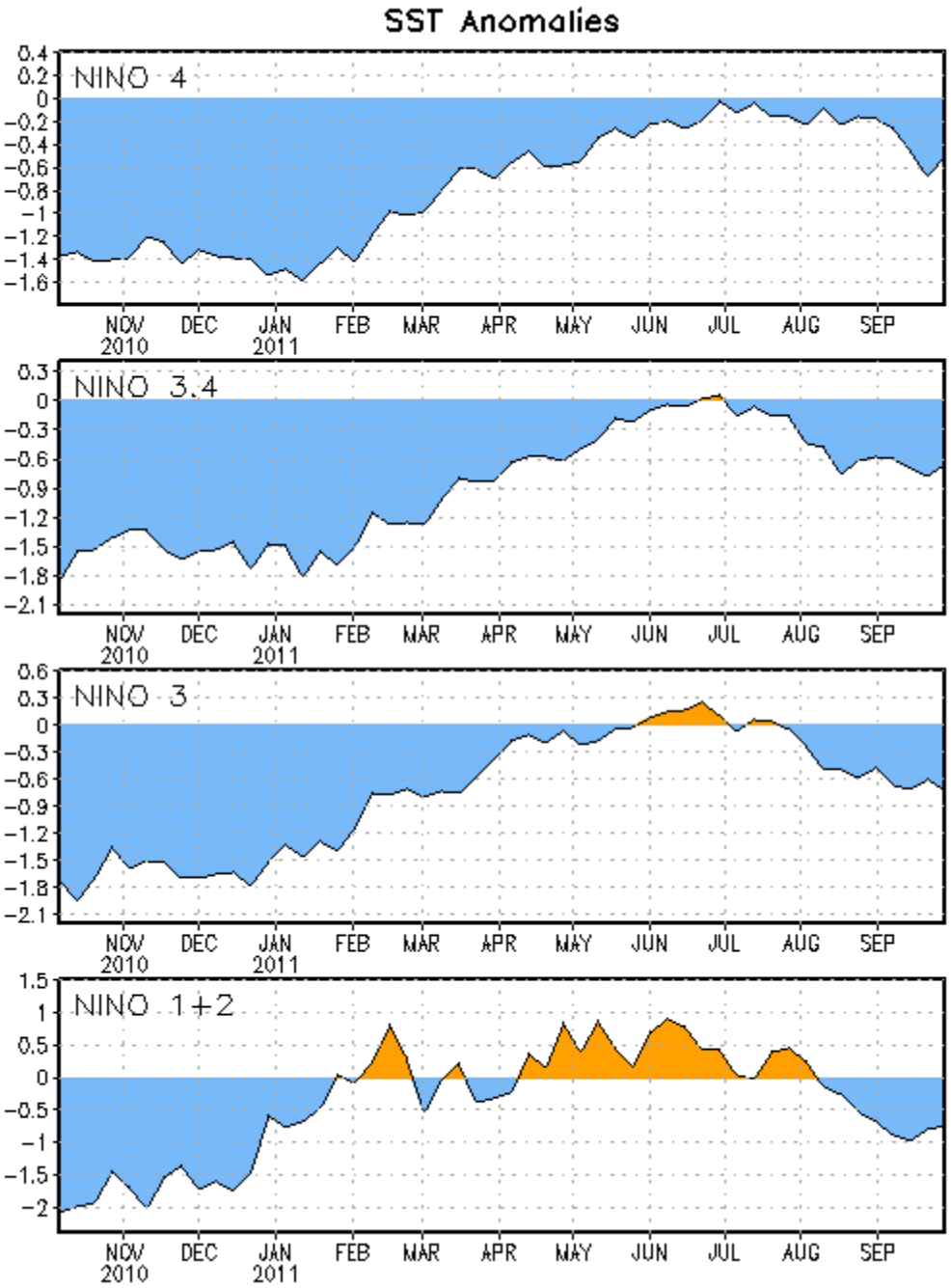

Figure 2. Time series of area-averaged sea surface temperature (SST) anomalies (°C) in the Niño regions [Niño-1+2 (0°-10°S, 90°W-80°W), Niño 3 (5°N-5°S, 150°W-90°W), Niño-3.4 (5°N-5°S, 170°W-120°W), Niño-4 (150ºW-160ºE and 5ºN-5ºS)]. SST anomalies are departures from the 1971-2000 base period weekly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

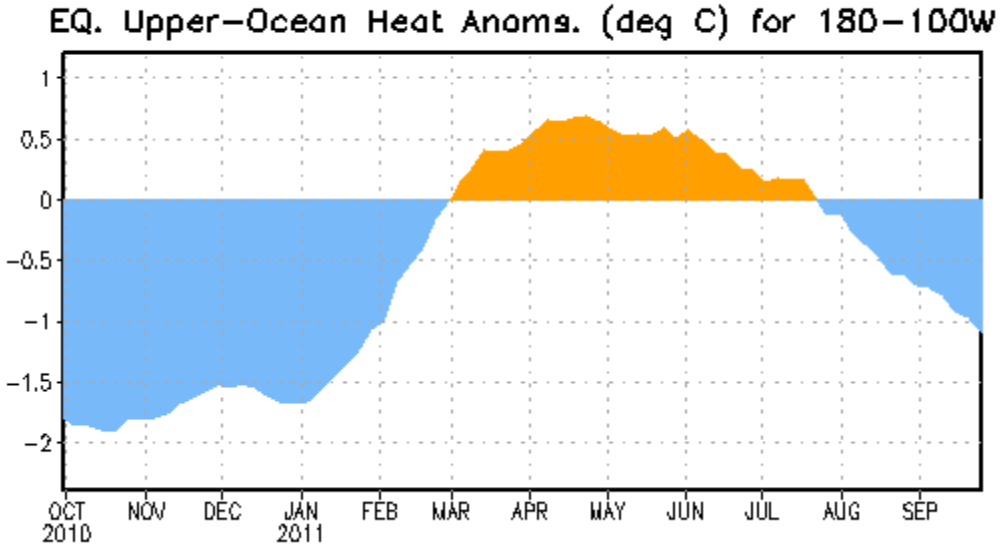

Figure 3. Area-averaged upper-ocean heat content anomaly (°C) in the equatorial Pacific (5°N-5°S, 180º-100ºW). The heat content anomaly is computed as the departure from the 1982-2004 base period pentad means.

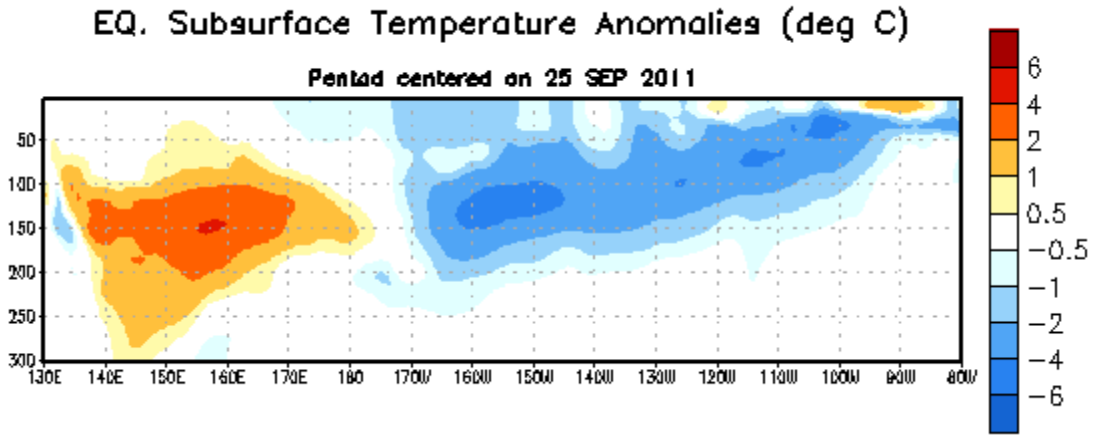

Figure 4. Depth-longitude section of equatorial Pacific upper-ocean (0-300m) temperature anomalies (°C) centered on the week of 25 September 2011. The anomalies are averaged between 5°N-5°S. Anomalies are departures from the 1982-2004 base period pentad means.

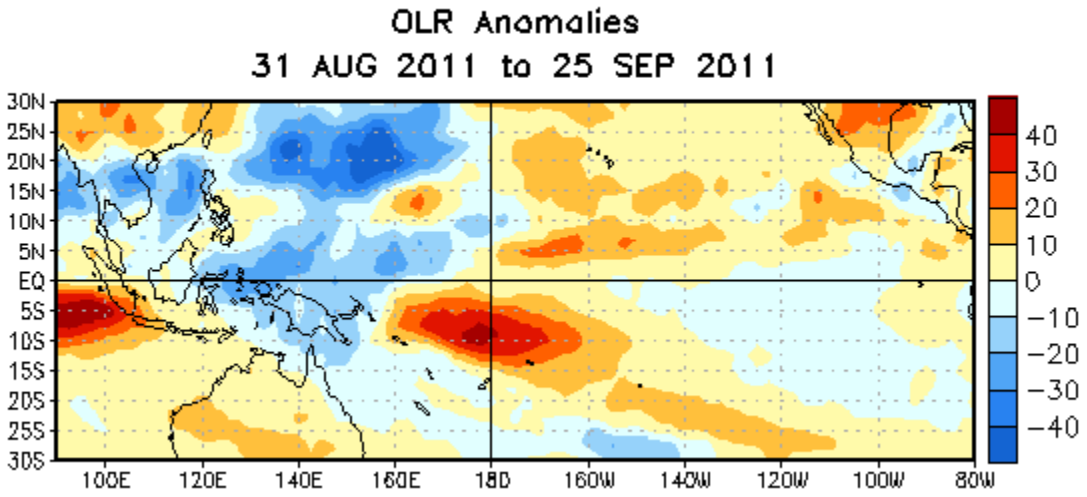

Figure 5. Average outgoing longwave radiation (OLR) anomalies (W/m^2) for the four-week period 31 August – 25 September 2011. OLR anomalies are computed as departures from the 1979-1995 base period pentad means.

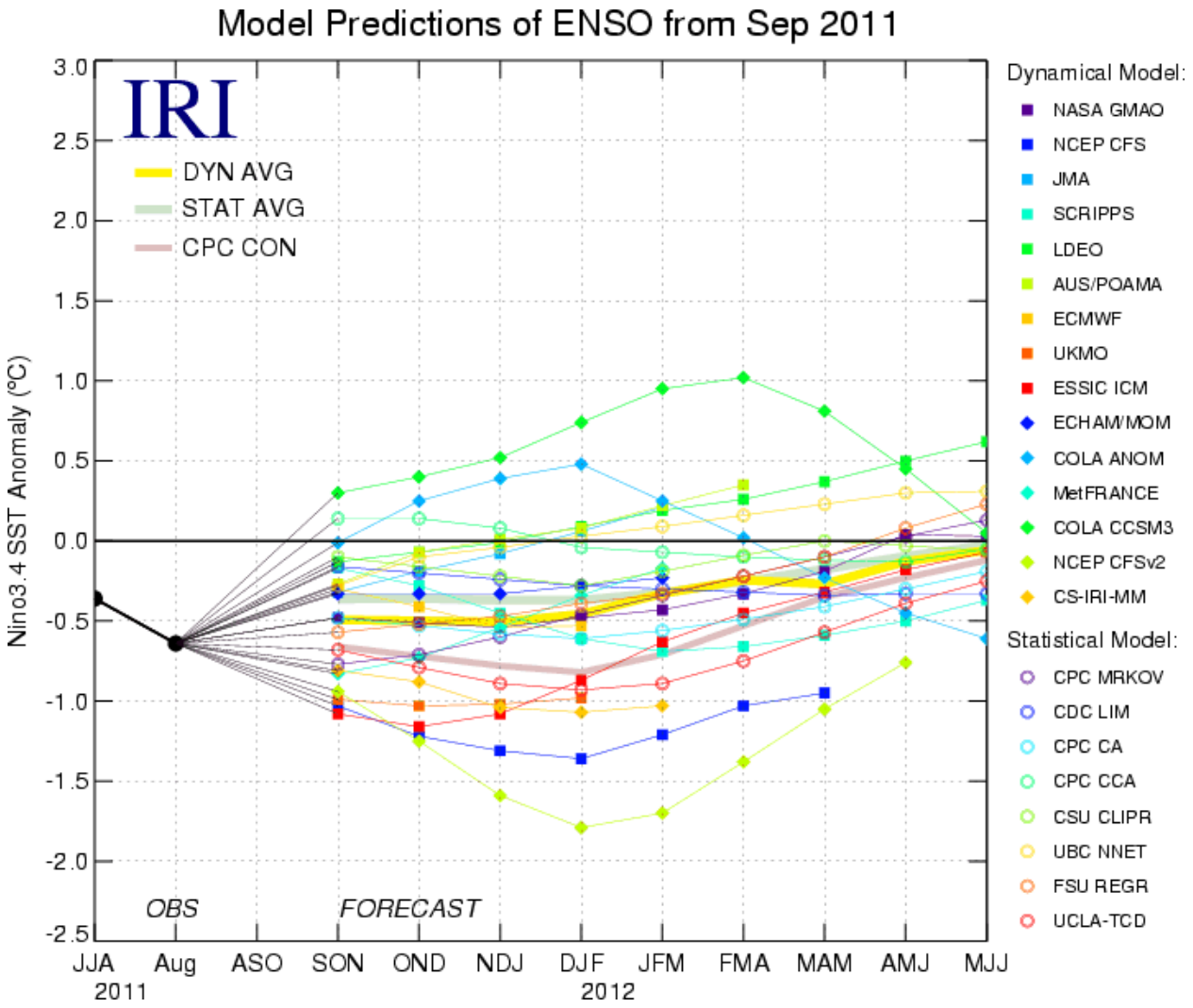

Figure 6. Forecasts of sea surface temperature (SST) anomalies for the Niño 3.4 region (5°N-5°S, 120°W-170°W). Figure courtesy of the International Research Institute (IRI) for Climate and Society. Figure updated 13 September 2011.