



**Western Region Technical Attachment
No. 90-35
September 25, 1990**

**EL NIÑO/SOUTHERN OSCILLATION (ENSO)
DIAGNOSTIC ADVISORY 90/7**

Positive sea surface temperature anomalies of greater than 1°C were found near the date line in August. During the last year in the Pacific sector, the warmest equatorial water (greater than 29.5°C) has expanded and slowly shifted eastward from near 150°E to near 170°E.

During August 1990, the low-level zonal winds were near normal throughout the equatorial Pacific, but enhanced convection was observed in the vicinity of the date line. This enhanced convective activity appears to be associated with a rather strong intraseasonal (30-60 day) oscillation which developed in the Indian Ocean sector during July. The Southern Oscillation Index (SOI) dropped to -0.5 in August as the sea surface temperature anomaly rose at Darwin and fell at Tahiti.

The development over the last several months of sea surface temperature anomalies greater than 1°C in the vicinity of the date line and the shift of the warmest equatorial water to just west of the date line suggest an evolution towards a warm episode. The Niño 4 sea surface temperature index has steadily increased during the last year with a mean sea surface temperature for that region in excess of 29°C during each of the last two months. The 28°C oceanic isotherm (the approximate threshold for deep convection in the tropics) has shifted eastward nearly 20 degrees of longitude during the last year and during August reached just east of 160°W. The only other times during the last ten years that the 28°C isotherm has been at or east of 160°W in August were during the 1982-83 and 1986-87 warm episodes.

The next three months is a particularly critical time period as convection seasonally weakens over Southeast Asia and shifts southward towards the equator. Abnormally warm sea surface temperatures in the central equatorial Pacific at this time of year favors the development of enhanced atmospheric convection in the vicinity of the date line accompanied by low-level westerly wind anomalies in the western equatorial Pacific. A change to weaker easterlies (westerly anomalies) in the western Pacific initiates oceanic Kelvin waves which propagate eastward affecting the depth of the oceanic thermocline and sea surface temperatures in the eastern equatorial Pacific in succeeding months.

During the next three months, atmospheric monitoring will focus on the evolution of the low-level wind field and atmospheric convection in the central and western equatorial Pacific, while oceanic monitoring will continue to focus on the evolution of the warm pool just to the west of the date line. The next Advisory will be issued in early October.