



**Western Region Technical Attachment  
No. 91-03  
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**EL NINO/SOUTHERN OSCILLATION (ENSO)  
DIAGNOSTIC ADVISORY 91/1**

Sea surface temperature (SST) anomalies increased in the central equatorial Pacific during December. Over the last two years, the central equatorial Pacific Ship Track 6 SST index has increased from less than -2 to greater than +1 (Fig. 1). This upward trend was rather steady except for a brief period during March-May 1990. Also, during the last two years, the longitudinal position of the highest SST has shifted steadily eastward. Enhanced convection began to appear along the equator near the date line in early 1990, but near normal or only weakly enhanced convection has been observed since April.

Low-level (850 mb) easterly winds have weakened in the central equatorial Pacific since early 1989, and during the last few months westerly anomalies have been observed. The Southern Oscillation Index (SOI) has shown a trend over the last two years which accompanies the variations in the OLR index (compare Fig. 2) and is consistent with the weakening of the 850 mb easterlies in the central equatorial Pacific.

The SST anomalies in the central equatorial Pacific are comparable to those observed during the early stages of previous warm (ENSO) episodes (compare the recent index values for Ship Tract 6 with those for 1972, 1977, 1982, and late 1986, Fig. 1). However, SST anomalies in the eastern half of the equatorial Pacific have remained near normal and most atmospheric indices have been fluctuating around zero.

Sea surface temperature anomalies have increased substantially in the central equatorial Pacific during the last year. During the same period, the equatorial easterlies have weakened and the Southern Oscillation Index has decreased. These features, in the past, have been reliable in indicating the development of warm episodes. Sea surface temperature anomalies along the equator near the date line reached more than +1.5°C in December. Anomalies of this magnitude have only been observed during past warm (ENSO) episodes. However, as yet, there has been a lack of persistent enhanced convection in the central equatorial Pacific. Instead, recent months have featured variable convective activity, which on average is only slightly greater than normal.

Statistical and model forecasts continue to indicate slightly warmer than normal conditions in the equatorial Pacific during 1991, although the various techniques differ as to the timing. Enhanced convection in the central equatorial Pacific is likely during the next few months given the magnitude of the positive SST anomalies in the region. Warm episode-like circulation and precipitation anomalies are also likely to develop in the tropical and subtropical belt in the central and western Pacific.

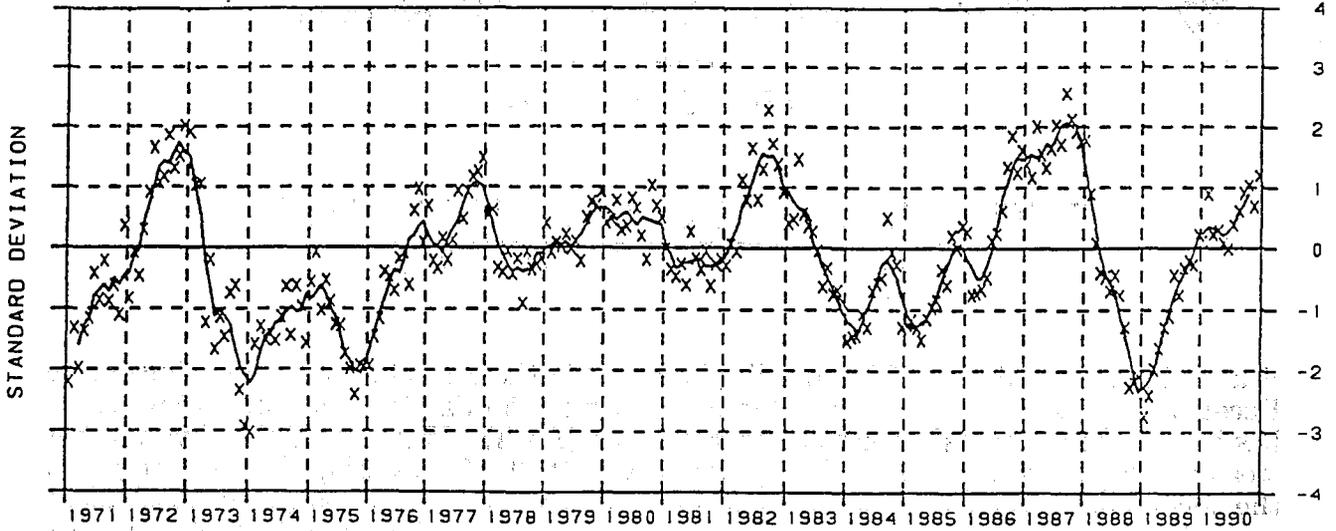


FIGURE 1 Time series plot of standardized sea surface temperature anomalies for the equatorial portion of the ship track that runs between Fiji and Hawaii (Ship Track 6), which crosses the equator near  $170^{\circ}\text{W}$ . Monthly anomalies were computed from the 1950-79 base period and standardized by the mean annual standard deviation (1951-1980).

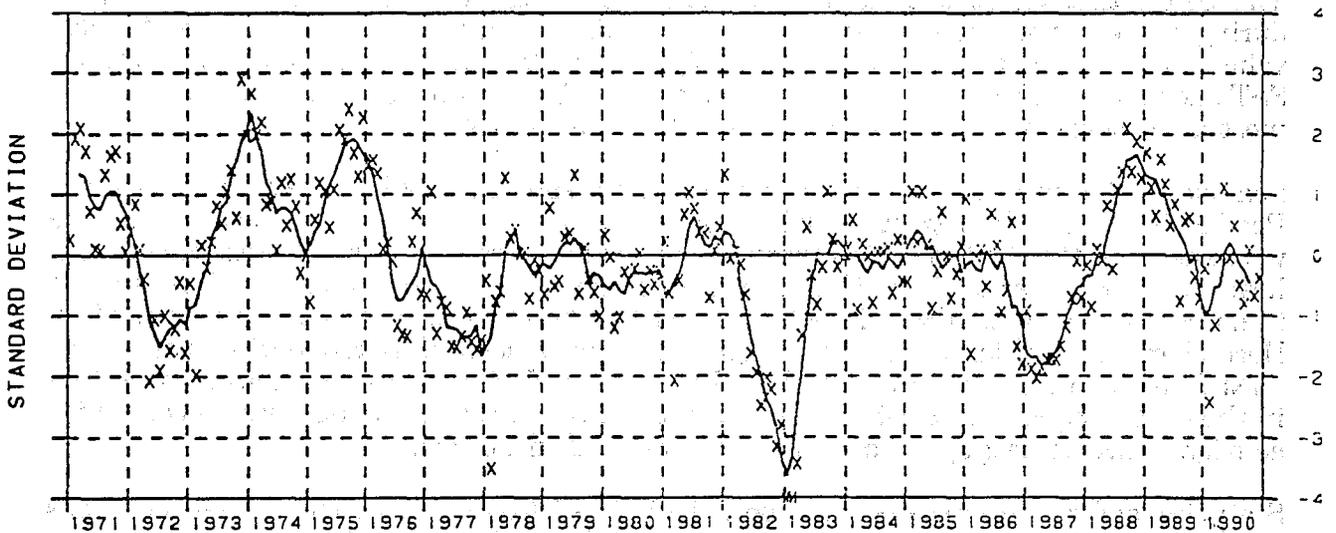


FIGURE 2 Five-month running mean of the difference between the standardized sea level pressure anomalies at Tahiti and Darwin (Tahiti-Darwin). Values are standardized by the mean annual standard deviation. Crosses are individual monthly means.