Western Region Technical Attachment
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EL NINO/SOUTHERN OSCILLATION (ENSO) DIAGNOSTIC ADVISORY 91/6

CLIMATE ANALYSIS CENTER/NMC

[Editor's Note: The following Technical Attachment is a Diagnostic Advisory on the El Nino/Southern Oscillation (ENSO) situation, issued by the Climatic Analysis Center of NMC.]

Oceanic and atmospheric anomaly patterns and tropical Pacific indices are consistent in indicating a developing warm episode. In September, sea surface temperature (SST) anomalies were greater than +1C in the equatorial Pacific near the date line, and along 5N and 5S throughout most of the eastern Pacific. This pattern of anomalies is quite similar to that observed during the early stages of the 1986-1987 warm episode.

During the last two years, the warmest SSTs have gradually shifted eastward to near the date line and SST anomalies have increased in the central and eastern equatorial Pacific. During the same period, low-level equatorial easterlies averaged weaker than normal and tropical convective activity was slightly stronger than normal just west of the date line.

In September, the Southern Oscillation Index (SOI) decreased to -1.8, the lowest value observed during the last 12 months, as negative sea level pressure anomalies dominated the tropical eastern Pacific and positive anomalies prevailed over northern Australia and Indonesia. The SOI has been negative for most of the last 12 months, and the five-month running mean value centered on July 1991 was -1.

Between August and September 1991, the equatorial low-level easterlies weakened substantially throughout the Pacific. This should result in the generation of eastward propagating oceanic Kelvin waves, which can be expected to reach the South American coast within two months. These waves are generally associated with a deepening of the oceanic thermocline and positive SST anomalies. We note, however, that additional periods of westerly anomalies (weakened easterlies) will be required in order to sustain these features should they develop.

An important feature of warm episodes is the development of enhanced convection along the equator in the vicinity of the date line. It is primarily the establishment of this feature that results in the anomalous global-scale circulation and precipitation patterns normally associated with warm (ENSO) episodes. As yet, only weakly enhanced convection has been observed in that region. If the convective activity in the central equatorial Pacific increases and becomes persistent during the next two months, we can probably expect the development of a full-fledged warm (ENSO) episode during the upcoming northern winter.