Western Region Technical Attachment
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EL NINO IN TROPICAL PACIFIC MAY AFFECT CLIMATIC CONDITIONS WORLDWIDE

CLIMATE ANALYSIS CENTER/NMC

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

The current "ENSO" (El Nino-Southern Oscillation) event, characterized by above normal sea surface temperatures, strong westerly wind flow at the surface, and strong easterly upper-air (200 mb) circulation in the equatorial Pacific Ocean basin, is likely to be associated with climatic anomalies in several regions, as have previous ENSO events. Hence, there is considerable interest in identifying the onset of ENSO conditions and in monitoring its progress.

Past studies by Climate Analysis Center scientists C. Ropelewski and M. Halpert have already identified those regions where significant climatic responses to an El Nino are most likely (see publication list below). The results were obtained by statistical analysis of anomalous climatic conditions that occurred at the time of previous El Nino events. The maps show the regions, the nature of the anomaly, and the most likely months of occurrence. Not every indicated anomaly occurs with every ENSO event. The very strong event of 1982-83 triggered a response in nearly all of the indicated regions. The weaker event currently underway has likely played a role in the occurrence of some recent climatic anomalies.

Scientists believe that an El Nino brings about large-scale climatic aberrations by adding extra heat from the warmer-than-normal ocean waters to the overlying atmosphere, thereby changing atmospheric circulation patterns to some extent. Since no two ENSO events are identical in every detail, it is not possible to predict the resulting disturbance of climatic conditions exactly. Research continues on the causes of ENSO events (and the high index [cold] phase of the Southern Oscillation [Ropelewski and Halpert, 1989]) and the way they affect climatic conditions worldwide.

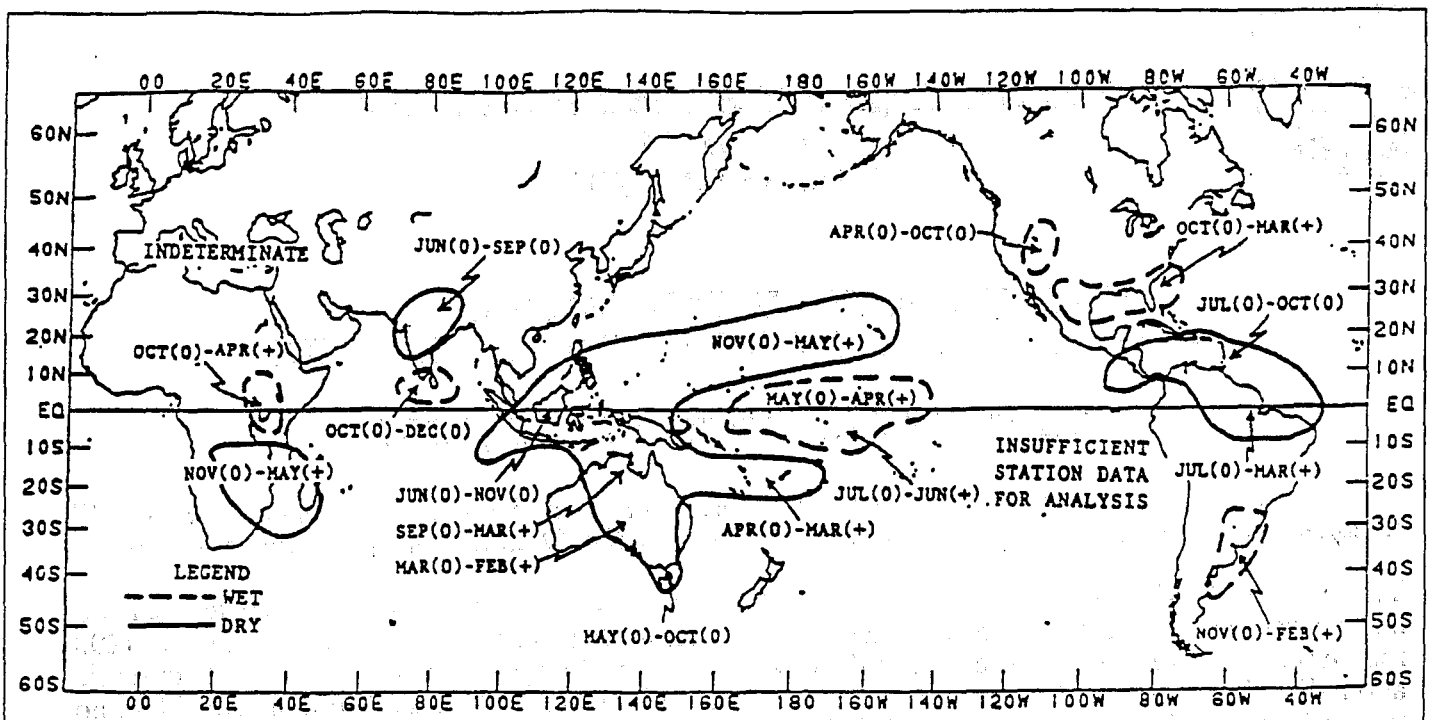
References

Ropelewski, C.F. and M.S. Halpert, 1986: Norther American Precipitation and Temperature Patterns Associated with the El Nino/Southern Oscillation (ENSO). *Monthly Weather Review,* 114, 2352-2362.

Ropelewski, C.F. and M.S. Halpert, 1987: Global and Regional Scale Precipitation Patterns Associated with the El Nino/Southern Oscillation. *Monthly Weather Review,* 115, 1606-1626.

Ropelewski, C.F. and M.S. Halpert, 1989: Precipitation Patterns Associated with the High Index Phase of the Southern Oscillation, *Journal of Climate,* 2, 268-284.

Halpert, M.S. and C.F. Ropelewski, 1991: Surface Temperature Patterns Associated with the Southern Oscillation. *Journal of Climate,* in press.



Regions that are likely to experience anomalous precipitation (top) and temperature (bottom) conditions during an ENSO (El Niño/Southern Oscillation) event. An "O" in parentheses after the month indicates the month of the same year as the ENSO event began; a "+" indicates the following year. For the event currently in progress, "O" is 1991 and "+" is 1992. For example, below normal temperatures between October 1991 – March 1992 are depicted as likely in the Gulf Coast region.