



WESTERN REGION TECHNICAL ATTACHMENT
NO. 87-31
August 25, 1987

WHAT IS ENSO DOING NOW?

Western Region Technical Attachment (WRTA) 87-20 highlighted the status assessment of the latest El Nino/Southern Oscillation (ENSO) event during the summer months. This event, which first showed signs of its existence early in 1986 and weakened during the summer of 1986, was probably a strong contributing factor to the observed height anomalies (i.e., the positive 500 mb anomaly over western North America) during the latest winter and early spring seasons. WRTA 87-20 discussed a number of indicators which would point to either maintenance or demise of the ENSO event during the summer months. This TA is an update on these indicators.

Meehl (1987) showed that the Indian monsoon is modulated to some extent by the phase of the ENSO cycle. Lighter than normal monsoonal precipitation so far this year indicates that the warm event is probably still going. Figure 1, from the Weekly Climate Bulletin (issued by the Climate Analysis Center, NMC), shows in areas 6 and 7 that southeastern Asia has, on the whole, been experiencing lighter than normal precipitation.

Figure 1 also shows maintenance of the large area of above normal sea surface temperatures across the equatorial eastern Pacific (area 2). Other indicators such as enhanced convection in the central Pacific (as indicated by strong negative outgoing longwave radiation anomalies), related circulation anomalies, and a negative Southern Oscillation Index indicate a continuation of this ENSO event (NOAA, 1987). Likewise, tropical cyclone activity in the eastern Pacific, which has shown a positive correlation with ENSO events in the past, has been slightly above normal through mid-August, with 10 named tropical storms compared to the normal of 8.5 (Gunther and Cross, 1986). While this may not be a statistically significant departure, it is at least in the expected direction.

The strongest effects of ENSO events on the East Pacific and North America circulation tend to occur in the northern hemisphere winter half-season (November through April). Therefore, should the current event continue into November (which seems very possible at this time, given that no major indicators suggest that the event is weakening), large scale anomalies similar to those which normally occur during ENSO events will likely be seen once again, such as those shown by Horel and Wallace (1981).

It is important to remember, however, that circulation anomalies over the western U.S. have varied considerably among past ENSO events. Details on temperature and precipitation anomalies over the West from past ENSO events shed little light on what to expect this upcoming winter, should the current ENSO event persist. Likewise, projecting this winter's weather from last winter's weather because they are both within the same ENSO event is not a good practice, since the base state of global forcings has likely changed. Based on past ENSO events, the most probable anomaly would be for above normal temperatures across the northern tier of western states.

Perhaps the most important feature of an ENSO event is that the circulation pattern that sets up early in the winter half-season will probably dominate as long as the ENSO forcings are maintained. It is this persistence that causes the seasonal extremes of weather anomalies that are often observed with the ENSO events.

References:

Gunther, E.B. and R.L. Cross, 1986: Eastern North Pacific Tropical Cyclones of 1985. Mon. Wea. Rev., 114, 1931-1949.

Horel, J.D. and J.M. Wallace, 1981: Planetary-scale Atmospheric Phenomena Associated with the Southern Oscillation. Mon. Wea. Rev., 109, 813-829.

Meehl, G.A., 1987: The Annual Cycle and Interannual Variability in the Tropical Pacific and Indian Oceans. Mon. Wea. Rev., 115, 27-50.

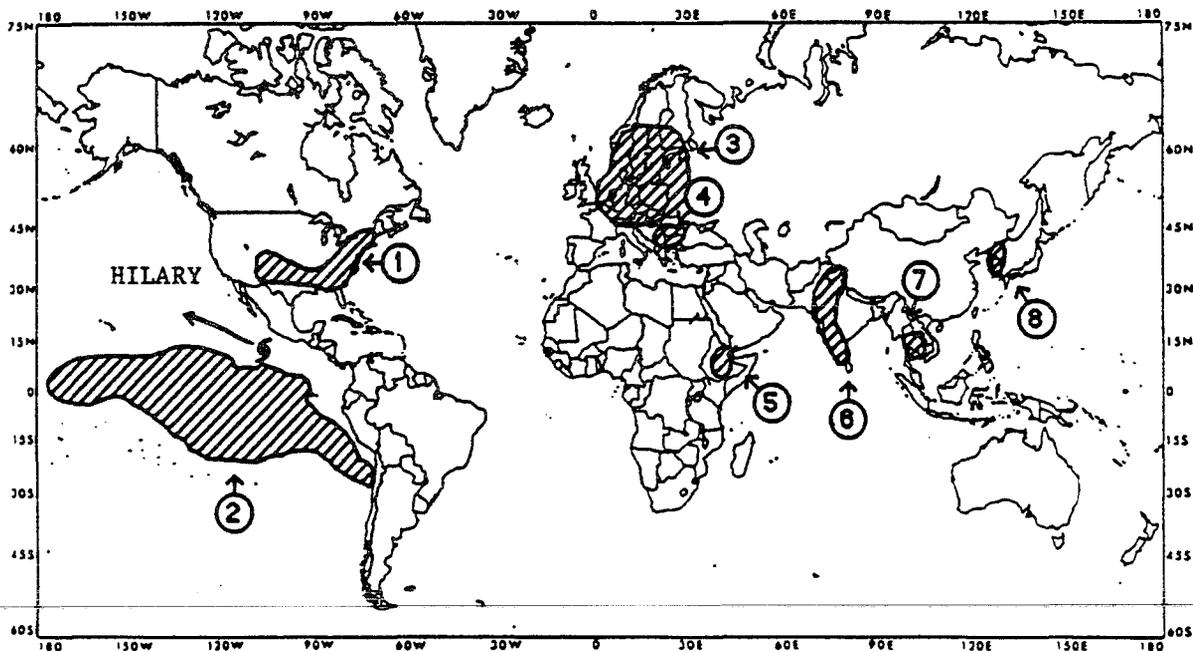
NOAA, 1987: Climate Diagnostics Bulletin. NWS, Climate Analysis Center/NMC, July.

Western Region Technical Attachment 87-20: Assessing the Status of ENSO During the Summer.

GLOBAL HIGHLIGHTS

MAJOR CLIMATIC EVENTS AND ANOMALIES AS OF AUGUST 8, 1987
(Approximate duration of anomalous conditions in brackets.)

- 1. SOUTHERN AND EASTERN USA: SCATTERED RAINS EASE DRYNESS IN MANY AREAS, BUT DRY POCKETS REMAIN.**
Scattered rainfall, heavy in some cases, eased dry conditions that developed in many parts of the region during July, but not all areas benefited from the rains. Dry areas persist in scattered locations from the southern Rockies eastward to the Carolinas and northward to Ohio, Pennsylvania, and New England. [4-6 weeks]
- 2. CENTRAL AND EASTERN TROPICAL PACIFIC: EL NINO CONDITIONS PERSIST.**
Ocean surface temperatures continue to average between 1 C (1.8 F) and about 2 C (3.6 F) above normal in the region shown on the map below. [11 months]
- 3. CENTRAL EUROPE: UNUSUALLY COOL TEMPERATURES PREVAIL.**
Temperatures last week averaged from 3 C (5.4 F) to as much as 6.5 C (11.7 F) below normal, as unusually cool weather for mid-summer prevailed for the second week over a wide region centered on the Germanies. Heavy precipitation accompanied the low temperatures in many locations. [2 weeks]
- 4. SOUTHEASTERN EUROPE: DRYNESS LINGERS DESPITE INCREASED RAINFALL.**
Increased rainfall especially in Romania and Hungary helped to alleviate dryness in the region, but parts of Romania, Bulgaria, and Yugoslavia remain unusually dry. [5-9 weeks]
- 5. ETHIOPIA: RAINFALL IS WELL BELOW NORMAL IN RECENT WEEKS.**
The last several weeks have been much drier than normal throughout most of Ethiopia, following unusually heavy rains during May and early June. [4-6 weeks]
- 6. WESTERN INDIA: CONTINUED DRY IN NORTH, INCREASED RAINFALL IN SOUTH.**
Northwestern India and adjacent Pakistan remain abnormally dry during what is supposed to be the peak of the rainy season. Rainfall increased markedly over southern India, alleviating recent dryness in the region. [5-10 weeks]
- 7. SOUTHEAST ASIA: ABNORMAL DRYNESS PERSISTS DESPITE SOME INCREASE IN RAINFALL.**
Unusually dry conditions for the season continue in much of Thailand and parts of some adjacent countries in southeastern Asia. [6-9 weeks]
- 8. KOREA: HEAVY RAINS CONTINUE**
Much of Korea experienced a fourth week of unusually heavy rainfall, as amounts of up to 177 mm (6.98 in) fell last week. The heavy rains likely caused more flooding to occur. [4 weeks]



Approximate locations of the major anomalies and events described above are shown on this map. See the other world maps in this Bulletin for current two-week temperature anomalies, four-week precipitation anomalies, and (occasionally) longer-term anomalies.

FIGURE 1