

**SYNOPTIC VARIABILITY OF RAINFALL AND CLOUDINESS ALONG THE  
COASTS OF NORTHERN PERU AND ECUADOR DURING THE 1997-8 El  
NIÑO EVENT**

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**Abstract**

We describe meteorological conditions associated with large fluctuations in rainfall over the coastal regions of northern Peru and Ecuador during the 1997-8 El Niño event. Using data from a network of routine raingauges and special gauges established just prior to the onset of heavy rains, we show that large variations in the daily rainfall on quasi-weekly time scales occurred during the period January through April 1998. These rainfall fluctuations were approximately in phase along the coast from near the equator to ~7° S. We averaged the daily rainfall data to develop a subset of wet and dry days, and then used these dates as the basis for compositing. Special pilot balloon observations were composited with respect to the wet and dry days, showing that westerly and northerly wind anomalies are associated with wet spells. Composites of National Centers for Environmental Prediction (NCEP) reanalysis and outgoing longwave radiation (OLR) data support a modest association of anomalous westerly wind events with enhanced rainfall.

The relationship observed between westerly zonal wind anomalies and rainfall west of the Andes during 1998 suggested using the NCEP reanalysis to develop composites based on westerly wind events observed during other years. Zonal wind anomalies at 700 hPa were used as our primary criterion for stratifying “wet” and “dry” days, despite reservations about the association between rainfall and zonal wind. Compositing Geostationary Operational Environmental Satellite (GOES) and OLR data for 220 west wind anomaly events from the months of January to April for the years 1990-2005 showed that they are associated with enhanced cloudiness that propagates eastward at ~10 ms<sup>-1</sup>. The composites using NCEP reanalyses show the evolution of the windfield associated with the “wet” days and suggest a link between extratropical wave passages across North America and anomalous westerly wind events off the coast of Ecuador and northern Peru.