

## **The Influence of El Niño Phenomena on the Climate of Venezuela**

Edilberto Guevara<sup>1</sup>

Civil and Environmental Engineering, Carabobo University, Bárbula, Valencia, Venezuela

**Abstract.** Annual rainfall distribution in tropical America depends on the ITC zone, affected by factors such as Andes Mountain, tropical Pacific and Atlantic Oceans and local convergence areas. Studies have showed correlation between the ENSO Phases and hydrologic anomalies in the region. In Venezuela ENSO effects are reflected as climatic anomalies with magnitudes varying within the areas. This paper deals with the study of the effects of El Niño phenomena on the climatic variables in Venezuela. Variables affected directly by El Niño are rainfall, temperature and flows. Indirectly consequences are associated with an increase of diseases such as Malaria, Dengue and Cholera. ENSO phenomena create anomalies in Hadley cells over Venezuela originating negative anomalies for rainfall during El Niño years and positive rainfall anomalies during La Niña events. Results of correlations between these anomalies and SSTA-3/4 have shown negative rainfall anomalies between 8 and 20 % and positive anomalies of 14 to 30 %, depending on the region. About 85 % of ENSO years coincide with rainfall deficits bigger than 35 %. Temperature values are less sensitive to the occurrence of El Niño, being anomalies only about 0.5 °C to 1 °C, but enough high to increase in 100 % the transmission of Dengue. Malaria mortality and mobility increases in 37 % the year after an El Niño event. The relationship between ENSO 3/4 Indices and flow anomalies of Caroní River shows that the joint occurrence of atmospheric and oceanic events exercise the biggest influence on the occurrence of flow anomalies in this basin. During the cold El Niño period in the Pacific (La Niña) flows in Caroní basin diminish affecting the storage and level of operation of Guri reservoir and the production of hydro electrical energy. In fact, 12 from the 15 El Niño events that happened during the analyzed period of flows (1950-2004) coincide with years which mean annual flow is far smaller than the historical mean.

**Keywords:** Climatic anomalies; ENSO in Venezuela; effect of El Niño in Venezuela; influence of ENSO on the Climate of Venezuela; effects of tele-connections.

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<sup>1</sup> Profesor of Civil and Environmental Engineering.

Carabobo University  
Bárbula, Valencia 2001.  
Venezuela

Tel: 58-241-8254892, Fax: 58-241-8239413, E. Mail: [eguevara@uc.edu.ve](mailto:eguevara@uc.edu.ve)