

The role of the tropical cyclones in the Mexico climate

Christian Dominguez[†]; Victor Magaña

[†] Atmospheric Sciences Center from UNAM, Mexico

Leading author: dosach87@gmail.com

Tropical cyclones (TC) play an important role in the summer rainfall in Mexico. TCs tracks over the North Atlantic and Eastern Pacific ocean may be determined from the HURDAT and EPA databases for the 1970-2009 period. By means of a cluster analysis, TCs trajectories that affect Mexico are determined. Their positive and negative effects on precipitation are examined using differences in precipitation between consecutive days of TC activity and no-TC activity. Composites, of precipitation anomalies, convective inhibition index, winds, outgoing longwave radiation (OLR), moisture convergence, vertical velocity and sea surface temperature (SST) show that the moistening or drying effect of a TC over Mexico depends on both, distance of the system to Mexico and its intensity. Results show changes in precipitation from one period to another are related to subsidence and moisture divergence induced by the TC. Therefore, the TC contribution to seasonal precipitation in Mexico varies from one cluster to another. There are regions in Mexico where seasonal precipitation varies in $\pm 25\%$ depending on the preferred tracks in a particular year. The relevance of the present analyses for seasonal climate forecasts or climate change scenarios at the regional level is discussed.