

Identification of sources of predictability and climatic variability for precipitation over Mexico.Ramón Fuentes Franco[†];[†] CICESE, MexicoLeading author: rafuente@cicese.mx

This paper examines the seasonal predictability of precipitation (P) over Mexico, through the identification of large-scale climate patterns obtained from a correlation analysis and a study of the wettest and driest years. The analysis shows spatial patterns of high correlation of P with sea surface temperature (SST) and geopotential height at 500mb (Z500). During winter a negative phase of the NPO reduces precipitation, and a moderate ENSO warm event produces the largest increase of P in this season. For summer, neutral conditions or weak La Niña increases P and in turn El Niño favors the opposite. The most significant regions of the patterns found in SST and Z500 are used as predictors of P. The predictive skill of SST, Z500, and a combination of these two are compared. The predictability of P for summer is greater than for winter, though winter correlation patterns of SST and Z500 with P are more significant. The forecasting optimal period is investigated. The predictive skill of the SST for summer P is high in the central and southern regions, with notable deficiencies over the northeastern and northwestern regions of Mexico. However both predictors do not work well in reproducing the intensity of rainfall anomalies during the wettest and driest years. In general the SST is a more robust predictor than the Z500, due to the greater variability of the latter and the persistence of the former.