

Extreme precipitation variability in the core of the North American Monsoon

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We investigate the variability of extreme daily precipitation (P95 > 95th percentile) events in the core of the North American monsoon region during Jun-Jul-Aug-Sep of 1950-2003 and the role of land-sea thermal contrast in the onset of extreme precipitation. The results for 39 rainfall stations in the core monsoon region of northwest Mexico show a positive and significant trend ($p < 0.05$) in the intensity of P95 during the study period, especially events related to tropical cyclones and hurricanes (TC) and in mountain sites. TC-derived P95 (non TC-derived P95) events are associated to a large (small) Western Hemisphere warm pool area, La Niña (neutral) conditions, and strong (weak) land-sea thermal contrast in Northwest Mexico and the Southwest United States that favor a strong low-level cyclonic circulation in the mouth of the Gulf of California and heavy precipitation in the core monsoon region, while precipitation is suppressed in the Great Plains of the United States.