Predictability of the MJO impact on hurricanes and flooding disasters in Mexico and Central America

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The predictability of the MJO in combination with its well-known influence on hurricane activity in the eastern Pacific and Gulf of Mexico raises the potential for forecasting hurricane-related extreme events over North and Central America. We assess this predictability by: 1) examining the influence of hurricanes and tropical storms on extreme rain events in those areas, using daily station data; 2) determining the MJO influence on the hurricane-related extremes; 3) assessing the related predictability using a real-time MJO forecast; and 4) quantifying the societal impacts for Mexico and Central America in terms of the occurrence of recorded flood and windstorm disasters.

The GHCN daily station data is used for precipitation, the HURDAT database is used for hurricane and tropical storm locations, the CRED database is used for disaster records, and the Maharaj and Wheeler real-time forecast is used for the MJO. The period of analysis is 1974-2004. The influence of hurricanes and tropical storms on North American extreme precipitation events is extensive, even away from the most-affected coastal regions. The hurricane influence on extreme events is clearly modulated by the MJO in several areas of Mexico and Central America. In the most-affected areas, there appears to be predictability out to at least 10 days, even using an operational forecast of the MJO. Analysis of the disaster records shows a dominant influence of the MJO, with flood and windstorm disasters nearly *twice* as likely during the positive phase of the MJO as compared to the negative phase. Predictability of the disasters also appears to extend to at least 10 days.