

Forecasting the Onset of El Niño Based on GPCP Precipitation:
Validation and Future Work

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While an active Madden Julian Oscillation (MJO) is often viewed as a precursor to El Niño events, significant correlations between MJO indices and the strength of El Niño are rare. This result is likely influenced by the region and variable used to construct the MJO index. Also, the MJO-El Niño link may be important only when the air/sea system in the Pacific is conducive to El Niño development. Finally, other intraseasonal variations (eg. westerly wind bursts) may be better correlated with El Niño. In this study intraseasonal variations on top of a particular background pattern of GPCP precipitation anomalies in the eastern Indian Ocean are shown to be related to El Niño events since 1979. In 2001 this relationship led to the development of an experimental forecast system for the onset of El Niño. In late January 2002, the necessary conditions were met to forecast a 2002 El Niño, consistent with the Climate Prediction Center (CPC) advisories found in the Climate Diagnostics Bulletin. However, based on past events, we predicted the onset to begin in July at the earliest, instead of Spring (the actual onset month was June according to CPC). As the 2002 El Niño developed, we tracked air-sea coupled intraseasonal variations as they traveled from the Indian Ocean to the western Pacific, using high resolution satellite observations of precipitation, wind, and sea surface temperatures. Much has yet to be learned about the initiation and forcing mechanisms associated with these precipitating systems. Future prospects of extending the analysis to the western Pacific and before the satellite era will be discussed.