The Madden-Julian Oscillation (MJO) is a large-scale, tropical, convective disturbance that begins in the central Indian Ocean and propagates eastward into the Pacific past the dateline. Because the MJO has a period of 30–60 days, knowledge of its phase could extend conventional weather forecast beyond the usual one week.

In the past several years, IPRC scientists have developed a hybrid coupled GCM (intermediate ocean model + state-of-the-art atmospheric model), and used it to hindcast observations taken during the 4 months of the TOGA-COARE program in 1992–1993. The model was initialized with observations from January 1, 1993, and allowed to run freely for 2 months. A comparison of daily rainfall from the observations (left) and from a 100-ensemble-mean model output (right) reveals that the model was able to “forecast” the eastward movement and associated rainfall of the MJO beyond one month fairly accurately.