

## Evaluation of the MJO and Tropical Cyclones in Global Models

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Tropical cyclones and the MJO were evaluated in the NCEP Global Ensemble Forecasting System (GEFS) Reforecast version 2 (1985–2012). The MJO signals were found to weaken rapidly when the forecast lead time exceeds one week, and large errors were found in the regional distribution of tropical cyclones. Further analysis suggested that these biases are linked to the deficiencies of the cumulus parameterization of the GEFS model. A bulk diagnostic metric was proposed to evaluate the simulated precipitation processes. Multiple models from the S2S database were evaluated using the metric, and the link of the model biases in the MJO and tropical cyclones to the cumulus parameterization was explored.