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4-4 ENSO Simulations in the North American Multi-Model Ensemble: A First Look

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The El Nino/Southern Oscillation (ENSO) has a large influence on the seasonal precipitation (P) and temperature (T) patterns over the United States and across the globe. Many studies have shown that the improved skill of P and T prediction in climate models can be attributed to the known impacts of ENSO signals, especially during the Northern Hemisphere cold season. In this study, we compare the simulations of ENSO events in six models in the North American Multi-Model Ensemble (NMME), including the CFSv2, CM2.1, GEOS5, CCSM3, CanCM3, and CanCM4 models. NMME is an experimental multi-model seasonal forecasting system consisting of coupled climate models from U.S. modeling centers and Canadian Meteorological Centre, aimed at improving intraseasonal to interannual prediction capability as recommended by the National Research Council. The multi-model ensemble approach has proven effective at quantifying prediction uncertainty due to uncertainty in model formulation, and has proven to produce better forecast quality (on average) than any single model ensemble. We intend to take advantage of the large ensemble of NMME and examine how well NMME (or its individual model) simulates ENSO events, by comparing the model-based ENSO composites to the observed in the same period. The composite analysis is conducted using the 1982-2010 hindcasts for each of the six models with selected ENSO episodes based on the seasonal Ocean Nino Index (ONI) just prior to the date the forecasts were initiated. The composites apply to monthly mean conditions in November, December, January, February, and March, respectively, as well as to the five-month averages resembling the winter conditions. The NMME composites are the equally weighted mean of the six models' composites. We provide a first look at the results in this presentation.