Variations of predication skill for ENSO related precipitation in North America

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The North American Regional Climate Change Assessment Program (NARCCAP) is using six nested regional climate models (RCMs) at 50 km node spacing to develop climate change projections for North America. In NAR-CCAP Phase I, ability of these RCMs to reproduce current climate is assessed using simulations for 1979 through 2004 that take initial and boundary condition data from the NCEP-DOE reanalysis. The large spatial domain used in NARCCAP, which stretches from the Canadian Arctic to subtropical Mexico, provides an opportunity for testing model skill in varying climatic regimes and topographic settings. Correlation of monthly observed and simulated time series of monthly precipitation as our metric shows that the models closely reproduce ENSO-related precipitation variations in coastal California, where the correlation between the simulated and observed monthly time series exceeds 0.94 for all models. The strong El Nino events of 1982-83 and 1997-98 are well reproduced for the Pacific coastal region of the U.S. in all models. ENSO signals are less well reproduced in other regions. Model performance tends to deteriorate from west to east across the domain, or roughly from the inflow boundary toward the outflow boundary. This deterioration with distance from the inflow boundary is ameliorated to some extent in models formulated such that large-scale information is included in the model solution, whether implemented by spectral nudging or by use of a perturbation form of the governing equations.