Evaluation of the forecast skill of the North American Multi-Model Ensemble for monthly precipitation forecasts over Central America

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The North American Multi-Model Ensemble (NMME) precipitation forecast is one of the main tools used to support early warning systems for floods and droughts in Central America. This study aims to quantify the monthly precipitation forecast skill of the six NMME models (CFSv2, CanCM4i, GEM5_NEMO, GFDL_SPEAR, NASA_GEOSv2, and NCAR_CCSM4) and its multi-model ensemble mean initialized in May up to 6 lead months. We used the CMORPH Climate Data Record and CHIRPS satellite datasets to verify the models and the ensemble mean. Additionally, we analyzed the teleconnections effects of El Niño Southern Oscillation (ENSO) in the rainfall representation on the grand ensemble NMME forecast. We evaluated the accuracy of the ensemble mean using mean error, linear correlation, and root mean squared error maps, and we measured the skill of the hindcasts using the Brier Score and the Ranked Probability Score. Preliminary results showed a tendency of dry bias over in Guatemala, El Salvador, Honduras, and northern Nicaragua, while there is a wet bias in southern Nicaragua, Costa Rica, and Panama. Meanwhile, probabilistic evaluation suggests that El Salvador and Guatemala tend to show better skills than other countries in Central America. Evaluating the NMME forecast system provides an advancement in the understanding of sub-seasonal to seasonal forecast predictability, which might help to improve climate forecast applications in climate-related sectors across Central America.