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Performance evaluation of seasonal precipitation forecasting for June-September (JJAS) using NMME over West Africa

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Socioeconomic activities such as agriculture, water resources management, electricity production, disaster risk management, and health in West Africa (WA) are greatly related to rainfall. Therefore, there is an urgent need for reliable seasonal rainfall forecasts with sufficient lead time for responsible planning and decision-making. We present a regional evaluation of precipitation forecasts from 14 North American Multi-Model Ensemble (NMME) seasonal forecast models, using Global Precipitation Climatology Centre and African Rainfall Climatology Version 2 as a reference over the June-September (JJAS) season. We first assessed the quality of the forecasts in reproducing the climatology, then the quality of each individual model as well as the ensemble model in predicting the quality of forecasts in WA at a 0-5 month lead time. The results show that NMME capture the seasonal rainfall climatology of the JJAS season over the central and south eastern parts of WA around 11 mm/day. We found that, in most cases, precipitation skill was highest during the first lead time and declined rapidly thereafter. During the JJAS season, most NMME models showed Probabilities Of Detection (POD) greater than 50% for all the different normal seasons and less than 40% for the below and above normal seasons. The performances of the NMME ensemble mean was not consistently better than that of a single individual model, underlining the need for more advanced weight-based averaging schemes. The NMME forecasting system offers a promising skill set for forecasting seasonal precipitation over WA during the JJAS season at first lead time.

Abstract Category

Earth Physics

Author: Dr TCHINDA FEUDJIO, Armand (National Higher Polytechnic Institute (NAHPI), University of Bamenda)

Presenter: Dr TCHINDA FEUDJIO, Armand (National Higher Polytechnic Institute (NAHPI), University of Bamenda)

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