

Application of the Ems-Wrf Model in Dekadal Rainfall Prediction over the Gha Region

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ABSTRACT

The IGAD Climate Prediction and Applications Centre exists to monitor and predict the patterns of rainfall over the greater Horn of Africa region, and provide early-warning products and information, particularly concerning recurrent drought episodes and localized flooding. Forecasting on dekadal (ten-day) timescales is critical because it is the bridge that links short term scales, called the NWP range, and seasonal scales. This study seeks to assess the validity of downscaled GCM rainfall outputs by the Environmental Modelling System's Weather Research and Forecasting (EMS-WRF) model in 2011. The results reveal that the EMS-WRF model, by and large, performs well over the region, but the excellence of the forecast products varies temporally and spatially. Nonetheless, the model exaggerates rainfall amounts over certain areas, particularly that forced by mesoscale systems. Moreover, the model generally underestimates the rainfall amounts arising from unexpected storms, and displaces the areas of the highest rainfall intensity in several respects. The EMS-WRF model is useful for predicting the distribution of dekadal rainfall over the GHA, but may perform better through improving the ocean-atmosphere interactions and feedback processes and employing multi-model ensemble forecasting techniques. The model should be used cautiously in tandem with other forecasting techniques.

Key words: EMS-WRF model, rainfall, prediction, forecasting, dekad, dekadal, ICPAC
