Probabilistic predictions of the Indian monsoon rainfall in below-normal category using NMME global model products

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Abstract: Seasonal predictions of rainfall during the Indian monsoon from the North American Multi-Model Ensemble (NMME) have been used to compute the prediction skill. Observed and model-predicted rainfall have been put in three categories (namely below-normal, above-normal, and near-normal) based on the value of interannual standard deviation. In this study, focus is on the rainfall in below-normal rainfall category over central India. Forecast products were evaluated against the observed rainfall data for the period from 1982 to 2009. Simple model averaging and singular value decomposition (SVD) methods have been used to prepare the multi-model ensemble (MME) predictions. The root mean square error over central India is very less in the MME predictions compared to the member models. The weighted MME scheme using SVD method only marginally improves the skill over the simple MME scheme. The deterministic forecast skill is low (the correlation coefficient is non-significant) over central India even when the SVD scheme is employed. Both parametric and non-parametric methods have been applied to prepare probabilistic forecasts using multi-model ensemble for seasonal prediction. The probabilistic forecasts are reliable and usable as the hit rate is more than the false alarm rate for below-normal rainfall category.