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## Evaluation of ensemble precipitation forecasts from NWP models in Indian River basins and agro-climatic zones

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This study evaluates the deterministic and ensemble quantitative precipitation forecasts (QPFs) obtained from four Numerical Weather Prediction (NWP) models over the Indian region during the monsoon period (June to September) for the years 2011 to 2020. We considered 18 river basins and 14 Agro climatic zones to compare the skill of the forecasts with the observation data. From The Observing System Research and Predictability Experiment Interactive Grand Global Ensemble (TIGGE) archives, we obtained QPFs from Environment and Climate Change Canada (ECCC), European Centre for Medium-Range Weather Forecasts (ECMWF), Korea Meteorological Agency (KMA), and National Centres for Environmental Prediction (NCEP) with 1 to 5 day lead time at a spatial resolution of  $0.5^{\circ}$ . The Integrated Multi-satellite Retrievals for Global Precipitation Measurement (IMERG) data for the same time period is used as observation data. Deterministic (RMSE, NSE, and CC) and dichotomous (POD and FAR) assessment have been performed to evaluate the skill of the QPF(s). Our result shows that overall the performance of ECMWF ensembles mean is better than the other NWP model, as the NSE and CC value is more close to 1. The river basins in the southern part of the country (Godavari, Krishna and Cauveri River Basins) have the higher error (RMSE more than 100 and NSE close to 0) compared to Brahmaputra, Ganga, and Barak River basins. The errors are less in those agro-climatic zones which has high elevation where the rainfall is less. The detailed result of the ongoing research will be presented at the conference.