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## Evaluation of Precipitation Forecast from Global Forecast System Over Transboundary Rivers in Africa

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This study evaluates the short-to-medium range precipitation forecasts from Global Forecast System for 14 major transboundary river basins in Africa against GPM IMERG “Early”, IMERG “Final”, and CHIRPSv2 products. Daily precipitation forecasts with lead times of 1-day, 5-day, 10-day, and 15-day and accumulated precipitation forecasts with periods of 1-day, 5-day, 10-day, and 15-day are investigated. The 14 selected basins are (1) Senegal; (2) Volta; (3) Niger; (4) Chad; (5) Nile; (6) Awash; (7) Congo; (8) Omo Gibe; (9) Tana; (10) Pangani; (11) Zambezi; (12) Okavango; (13) Limpopo and (14) Orange. For each basin, several sub-basins are defined by the major dams in the basin. Our preliminary results in the Nile river basin show that in terms of temporal variability, there was a good agreement between the forecasted and observed accumulated precipitation on a 15-day basis. When compared to IMERG “Final”, the correlation coefficients of accumulated GFS forecasts scored as high as 0.75. Thus, GFS products provide relatively reliable accumulated precipitation forecasts. However, the precipitation forecasts were mostly biased: they tend to overpredict rainfall for the eastern part of the Nile river, underestimate rainfall for the northern part of the Nile river and produce almost unbiased estimates for the southern part of the river. Additionally, GFS forecasts have a general tendency to underpredict the area of precipitation across the Nile basin. Although the performance of GFS varies at different locations, the GFS precipitation forecasts can be a good reference to dam operators in Africa.