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Ensemble Flood Forecasting in Africa: A Feasibility Study in the Juba-Shabelle River Basin

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Over the last years the African continent has increasingly experienced severe transnational floods that caused substantial socio-economic losses and put enormous pressure on countries across the continent. The planning, coordination and realization of flood prevention, protection and mitigation measures require time, which can be provided through an early flood prediction.

In this paper, the transferability of the European Flood Alert System (EFAS) to equatorial African basins is assessed. EFAS achieves early flood warnings for large to medium-size river basins with lead times of 10 days. This is based on probabilistic weather forecasts, the exceedance of alert thresholds and persistence indicators. These methodologies, having been tested for different events and time scales in mid-latitude basins in Europe, are being applied in this paper to the Juba-Shabella river basin, shared between Ethopia and Somalia. A variety of different meteorological data sources have been used, including ERA-40 and CHARM for the calculation of climatologies. The unique re-forecasts of the current operational ECMWF model provided hindcasts of historic flood events. The results show that for the selected flood events a detection rate of 85% was achieved, with a high accuracy in terms of timing and magnitude.