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Evaluation of Precipitation Products for an Operational Pan-African Flood Forecasting System

Vera Thiemig (1), Florian Pappenberger (2), Peter Burek (), Ad De Roo (), and Jutta Thielen ()

(1) JRC, Institute for Environment and Sustainability, Land Management and Natural Hazards Unit, Italy (vera.thiemig@jrc.ec.europa.eu), (2) European Centre for Medium-Range Weather Forecasts, Reading RG1 9AX, UK

An operational flood forecast system relies on two types of precipitation data: (1) real-time precipitation measurements to determine the present situation within the river basin and (2) precipitation forecasts to calculate the hydrological prediction. In order to be applicable in Africa and in an operational mode, the precipitation products have to fulfill certain basic requirements: a timely and near real-time provision, consistent in time and space for a minimum period and of a hydrological relevant resolution.

Eight precipitation products have been indentified that fulfill these requirements. Six out of these eight data sets are real-time precipitation products (CMORPH 0.25°, CMORPH $\sim$ 8 km, PERSIANN 0.25°, PERSIANN-CCS, TRMM-TMP and RFE 2.0), while the remaining two are forecast data sets (ECMWF-EPS and NOAA-forecasts). The potential of these data sets is evaluated for the three African river basins: Volta, Juba-Shabelle and Zambezi. Each of those basins is dominated by a different climatological regime and therefore permits to evaluate the applicability of these data sets for a Pan-African scale.

The evaluation procedure incorporates (1) a basic statistical analysis of the real-time precipitation products against ground observations, (2) a comparison of hydrographs derived based on a) the original precipitation data, b) bias corrected precipitation and c) bias corrected and calibrated, and finally (3) a evaluation of combinability of different real-time precipitation products with forecasts.

The statistical analysis shows that the accuracy of each real-time precipitation product varies largely for the different basins. In most cases, these tendencies are reflected by the hydrological model outcome, which advocates a correction of the precipitation data prior to any further hydrological consideration. Further, the results show that the observed hydrograph can be reproduced more accurately by using bias corrected precipitation over non-manipulated data, which is crucial for the determination of the initial stage within the basin. Further preliminary results and conclusions will be presented.