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Hydrology and Earth System Sciences
Discussions

Interactive comment on "A pan-African Flood Forecasting System" *by* V. Thiemig et al.

Anonymous Referee #3

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The manuscript presents an extension of the European Flood Awareness System to the African continent, using local GIS data sources, ERA interim, GPCP and ECMWF medium range forecasts. The framework is calibrated over 36 gauge stations. The performance of the system is evaluated with respect to the Kling Gupta Efficiency index while the predictability performance is evaluated with respect to the Continuous Rank Probability Skill Score. The paper is well written and organized. The system by itself is an achievement and leverages on previous papers by the same author and co-authors. It however presents this extension of the system without answering a particular scientific question, or it just remains unclear. The value of the system might be more emphasized by adding :

i) more technical details on the system with respect to other existing systems and research on large scale flood forecast system (GPCP dataset, calibration of forecasts,

downscaling approach, etc),

ii) put the reproductability performance (KGE) in context with respect to other existing systems over the region (African Drought Monitoring system, GLOFAS) for example,

iii) evaluate/emphasize changes in predictability of the flood across different horizons (short and medium range in particular) in order to clarify the performance of the system at the medium range scale in particular,

iv) evaluate with respect to nowcast (NASA flood monitoring) and other medium range forecast system (GLOFAS) in order to emphasize the value of a regional system over a global system.

Comments:

- No evaluation of the modeling performance (Kling Gupta Efficiency or NSE) with respect to other hydrologic set ups over Africa: Princeton's drought monitoring, NASA global nowcasting and GLOFAS systems for example.

- No evaluation with respect to global nowcasting POD and FAR numbers from the NASA system or GLOFAS for example. It would give some context on the value and performance of the system. Analysis in the day 1-3 range are relatively short term and could be compared to a nowcast system. Might be good to emphasize the capability of such system at short term and medium range in order to communicate the value of the system across multiple horizons and facilitate understanding of results by users who may be using multiple systems. And what is the added value of a continental flood forecast system like EFAS/AFFS with respect to GLOFAS?

- No reference to other existing global flood forecast system or research with African basin application like Wu et al., Schumann et al.

- The system is mentioned to include the effect of reservoirs but the reference to Haddeland et al. is a summary of multiple large scale reservoir models using monthly generic operating rules. Which model was used and how appropriate is it for flood

forecasting at a daily time scale? How sensitive were the results to the regulation from the reservoirs and reservoir modeling uncertainties – would you have gotten the same results without the reservoirs?

- The atmospheric forcing is at 71km spatial resolution but LISFLOOD runs at 0.1 degree grid cell. What is the downscaling approach? Also, the atmospheric forcing is mentioned to be adjusted with respect to GPCP precipitation. What motivated the choice of that specific dataset and which calibration approach was selected.

- The flow forecasting seems to go through some post processing, which one? Or is it normalization only for the analysis

- given that the motivation is focused on the medium range scale, the title might need to reflect that as well " A pan-African medium range ensemble flood forecast system" for example

Other comments:

P5566:"more than 10 clustered river pixels are affected." How does that affect basin of smaller size or with complex topology? How does it differ from other system and how sensitive is it to those criteria?

Figure 7: is it below or over the 10 day lead time?

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 11, 5559, 2014.