

Hydrol. Earth Syst. Sci. Discuss., referee comment RC2
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Comment on hess-2021-250

Limon Reza Ahmad (Referee)

Referee comment on "Performance of the Global Forecast System's medium-range precipitation forecasts in the Niger river basin using multiple satellite-based products" by Haowen Yue et al., Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2021-250-RC2>, 2021

Title: Performance of the Global Forecast System's Medium-Range Precipitation Forecasts in the Niger River Basin.

Author: Haowen Yue et al.

This manuscript evaluated the accuracy of medium-range precipitation forecasts from GEFS over the Niger river basin. The authors used the IMERG Final products as the reference to evaluate the performance of GEFS forecasts.

The article presents an interesting topic and is quite well written. However, some modifications should be made before it is published. Please refer to the following sections for some corrections and suggestions to improve the manuscript.

Main Comments:

- In the abstract, the authors mentioned that application of post-processing techniques involving near-real time satellite rainfall products could improve the accuracy of the GFS forecasts. However, no supporting analysis was presented in this manuscript for this statement. What is the basis of this statement? If it is based on some reference study, please provide details of those studies. If not, then please include appropriate analysis results in support.
- In section 3.5, the authors attempted to correct for biases in the IMERG Early precipitation products with climatological input and concluded that climatological bias correction is not effective for IMERG Early products. However, there was no significant

relevance of this section to this manuscript. What was the purpose of presenting these analyses in this manuscript?

- The authors stated in conclusion that the GFS forecasts are almost unbiased at low to medium rain rates. However, it is unclear which GEFS forecast product they are referring to by this statement. It is my assumption that they are referring to the 15-day accumulated precipitation here which should be clearly stated to avoid confusion.
- The authors claimed in conclusion that the use of IMERG Early to calibrate GFS would improve GFS forecast quality, however, there was no evidence presented to support this statement. Did the authors performed any analysis that has not been included in this manuscript and reached to this conclusion? If so, they should include the results from that analysis to support their claim.
- Since the area studied involves multiple dams used for water supply, irrigation, hydropower, etc., I would have loved to see some event specific results to demonstrate GFS products' ability to forecast significantly dry and wet event which is very significant for reservoir management.

Minor Comments:

- Axes should be labelled appropriately to convey that these are 15-day accumulated precipitation amounts instead of "daily".
- Page 2, Line 13: "with annual rainfall of rainfall" should be rewritten as "with annual rainfall of".
- Page 3, Line 29: Please check the reference "Saha et al. 2011". Should this be "Saha et al. 2014"?
- Page 4, Lines 76-78: Please check this sentence and rewrite.
- Page 5, Line 106: "Hybrid eddy-diffusivity mass-flux (EDMF)".
- Page 6, Line 128: "The Climate Hazard's group Infrared Precipitation (CHIRP) and with Stations (CHIRPS)" should be rewritten as "The Climate Hazards Group InfraRed Precipitation with Station data (CHIRPS)".
- Page 7, Line 164: In terms of the size of the watershed, smallest among the study dams is the Bakolori Dam. However, the author said it is the Markala Dam on this line. The unit of the watershed area should also be changed to "km²" from "m²".
- Page 10, Line 209: "CV is the coefficient of variation" instead of "CV is the coefficient if variation"
- Page 23, Lines 393-394: Please rewrite this sentence.
- Page 26, Line 432: "some consistent features emerged" instead of "some consistent featured emerged".