

Interactive comment on “Suitability of 17 rainfall and temperature gridded datasets for largescale hydrological modelling in West Africa” by Moctar Dembélé et al.

Anonymous Referee #1

Received and published: 16 May 2020

This is an interesting paper that is reasonably well written. Although the assessment includes a large number of datasets, the study area is relatively small, and the model is not recalibrated for each variable, which has led to some questionable conclusions.

You state that "rainfall datasets have contrasting performances across the four climatic zones present in the VRB, suggesting that, in general, basin-wide hydrological model performance might be misleading and invalid for a smaller spatial domain." What makes you think that your results, which also represent a relatively small spatial domain, are not "misleading and invalid" as well? It is stated that "the results can be considered valid for West Africa and regions with similar hydroclimatic and physical features" which

C1

is highly speculative and likely not true given the variation in precipitation dataset performance and gauge network density. To improve the generalizability of the results, the assessment should be expanded to other regions across Africa or the globe. Alternatively, the abstract and discussion should clearly state that the conclusions and the performance ranking of the datasets are not representative of other regions.

The soil moisture, terrestrial water storage, and actual evaporation assessments were carried out without recalibrating the model and therefore the results for these variables are subject to substantial uncertainty. This is supported by the fact that MSWEP, which was used to force GLEAM, does not exhibit good actual evaporation scores. The model should be recalibrated for each variable.

The word "gauge" is not used in the abstract and the datasets are only classified as either satellite or reanalysis. However, the amount of gauge data incorporated in the datasets may well be the overriding factor in determining the performance, given the good performance of TAMSAT and CHIRPS in terms of streamflow.

Figures 7 and 10 are impossible to interpret, way too much information. Should be condensed.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2020-68>, 2020.

C2