

Interactive comment on “Performance evaluation of multiple satellite rainfall products for Dhidhessa River Basin (DRB), Ethiopia” by Gizachew Kabite Wedajo et al.

Anonymous Referee #1

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Brief summary:

This paper evaluates the satellite-based rainfall estimates (SREs) products for the Dhidhessa River Basin (DRB) using multiple statistical metrics and hydrological (streamflow) simulations. Overall, the results are of interest to both the research community and others (e.g., decision-makers), and this paper has made a good contribution to improve understanding of the latest SREs for Ethiopia and the DRB. The analysis follows adequate steps to evaluate SREs, but the novelty of the work is lacked. I also have some concerns about the methodologies. Therefore, I recommend publication after addressing the major/minor comments outlined below.

C1

Major comments:

(1) The novelty of the work

I understand that the purpose of this paper is to evaluate the latest SREs for climatological and hydrological applications in the DRB. However, I'm not sure that this study offers new knowledge compared to previous studies. Particularly, the discussion and conclusion mainly validate the findings with the literature. I recommend revising the discussion and conclusion sections to highlight the unique findings of this study, such as the seasonal performances of the SREs.

(2) Categorical metrics

It is not clear how the authors have defined a category. I assume that the non-zero or zero rainfall is adopted (Lines 258-263). If so, these metrics are not appropriate for the average monthly rainfall, because both observed and SREs are mostly non-zero. I recommend using multi-categorical metrics (e.g., tercile category; above-, near-, and below-normal) for evaluating categorical performances. As this multi-categorical analysis is used for many climatological/hydrological applications, this can make a contribution to this study.

(2) Hydrological simulation

The authors described two common methods for hydrological validation (Lines 291-295). For this type of analysis, I think the model setup is consistent with all SREs, which is the first method. Specifically, the groundwater parameters can have a strong effect on the amount of streamflow that can cause over or underestimation of streamflow. In this regard, the validation of streamflow should be sorely dependent on the rainfall products. Please consider this point in the revision.

Minor comments:

*I found that there are some typos, grammatical errors, and inconsistent tense throughout the manuscript, please pore over them.

C2

Line 118: Change “distributed” to “semi-distributed”.

Line 460: Change “stremflows” to “streamflow”.

Figure 1: The legends are too small to read them. Please remove the road lines (and town symbols if appropriate). I recommend showing the subbasin boundary only for the upstream of the streamflow gauge station.

Table 1: Please check the data periods. I suggest using actual data periods used in the study instead of the entire periods.

Table 2: The present form of the coefficient of determination (r^2) is the Pearson correlation (r). Lines 258-263: Again, please specify the category.

Figure 2: Can you use the same color limits for all products? I also recommend showing the standard deviation maps.

Lines 390-391: Please describe the details of these parameters.

Table 4: What does the fit value mean here (e.g., negative curve number)?

Lines 399-400: Does the observed rainfall have that uncertainty too?

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