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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Which rainfall metric is more informative about the flood simulation performance? A comprehensive assessment on 1318 basins over Europe" *by* Stefania Camici et al.

Anonymous Referee #1

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General comments: The paper addresses the relevant scientific question of what are the most important metrics to assess the goodness of a SRPs product for hydrological applications. The question as well as the motivation of this work are stated clearly in the context of a comprehensive literature review. The methodology is appropriate to answer the question and the extensive analysis over 1318 basins across Europe defines the main novelty of this paper. Substantial conclusions about the most relevant indexes for assessing the quality of SRPs product for hydrological applications are reached, so overall this is good contribution for the scientific community. However, there are a number of issues that the authors need to address before the paper is accepted for publication.

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Specific comments:

1. Line 158-169: the E-OBS dataset is built on a station network with an average station density of 1 in 4000 km2 and the basin areas range from 200 to 136000 km2. Is the E-OBS dataset a reliable benchmark for the smaller basins? Maybe it is worth to discuss this in your discussion section.

2. Line 331: for the discharge assessment you used only one performance score, the KGE. Can you provide more information about why you selected this score?

3. Line 397: Can you explain better why KGE of rainfall is not relevant? From figure 4 the increasing trends of KGE-Q with rBIAS and KGE of rainfall look quite similar.

4. Line 411: How do assess that R and KGE ranges are large?

Technical corrections:

1. Line 124: State all the questions here. I can see that you have more questions later (e.g. lines 416,417,418)

2. Line 167: add spatial resolution of the product in the text

3. Line 215: it is a bit confusing when you say below TMPA area because I guess you mean the TMPA area. Change accordingly also in the other paragraphs and tables.

4. Line 262-263: swap the two lines because in the plots you present first rBIAS

5. Line 262: remove “x”

6. Line 263: I think the numerator shouldn’t be squared

7. Line 265: in the second bracket under the square root I think there is a mistake (see Gupta et al., 2009). The ratio in the bracket should be just between standard deviation of the SRP and of the E-OBS.

8. Line 300-Figure2: you are talking about “pattens” so I assume you are referring to Figure 2, but then the values at line 302 are the ones reported in Table 3, so for

the TMPA area. It is a bit complicated to follow, maybe you can just condense the most relevant information in figure 2 and put table 3 in supplementary material, since it doesn't provide much more information.

9. Line 328: I would put Figure 1.b which belong to result section in a separate figure from Fig.1.a which belong to the dataset section

10. Line 342: the 39% is not for CMOR but for TMPA

11. Line 379: higher absolute values of rBIAS

12. Line 389: maybe name the KGE as KGE-Q otherwise it can be confused with KGE of rainfall

13. Figure 2-3: you can add the name of each SRP product at the top of each column

14. Line 734: there are no figures d), e), f). Change CMORPH to CMOR to be consistent.

References:

Gupta, H. V., Kling, H., Yilmaz, K. K., and Martinez, G. F.: Decomposition of the mean squared error and NSE performance criteria: Implications for improving hydrological modelling, J. Hydrol., 377, 80–91, https://doi.org/10.1016/j.jhydrol.2009.08.003, 2009.

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