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Discussions

**HESSD**

Interactive
comment

*Interactive comment on* "MSWEP: 3-hourly 0.25 global gridded precipitation (1979–2015) by merging gauge, satellite, and reanalysis data" *by* H. E. Beck et al.

**Anonymous Referee #1**

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In the manuscript titled "MSWEP: 3-hourly 0.25 global gridded precipitation (1979–2015) by merging gauge, satellite, and reanalysis data" authors have merged several satellite and reanalysis only precipitation products. This merged product is later validated using precipitation data sets that are not used in the merging process and using HBV hydrological model outputs. Results of both validation efforts show the merged product is on average superior to input products. The idea of merging different products to obtain a better one sounds trivial, yet in this case it results in a product that may have large application areas. The topic is relevant to HESS Journal, and both the methodology and the validation efforts sound good. I recommend the study to be published after correction of some points.

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[Discussion paper]

1.a) I found the methodology section related with HBV model rather short, it would be idea if it is expanded. I guess NSE is calculated between observed and simulated Q values, but I couldn't find this info written explicitly. I am not very familiar with the HBV model, so the parameter calibration part seems not clear to me (e.g., how did authors implemented the calibration, using a particular software? Running the model with different combinations of parameters sampled randomly from their defined range in Table 3?)

1.b) Did HBV calibration and validation efforts use the same runoff (Q) data? If they are the same, then it is very likely that the calibration might fit Q observations too closely (which is a particular advantage on MSWEP compared to other products).

2) Do Reanalysis data have 5m wind dataset instead of converting 80m height to 5m using some wind-profile relation?

3) E = P – Q. If E is only evaporation (line 6, page 7), then what happens to transpiration component?

4) Why normalize absolute bias? The unit of the bias is very important as well.. It would be complementary with RMSE (i.e., the random components can be calculated if non-normalized bias and RMSE are known).

5) Figure 6a, Long-term average weights would have been more meaningful rather than arbitrarily chosen single day.

6) It is not really clear to me why reanalysis HBV performance is much worse than MSWEP given there is only minor difference between them in terms of accuracy of P (Figure 7)?

7) NSE increases with increasing distance for Reanalysis? How come farther away gauges give more reliable precipitation information compared to closer gauges? I might be missing something simple.

Minor

- Page 3, line 8, "These datasets have . . .".

- Table 1, CMORPH does not use gauge data, why it is included in "Gauge, satellite" row? There is another row specifically dedicated to "satellite" (products 19 and 20).

- Consider using the word "using" instead of "in turn"/"in turn with". It is very confusing.

- Figs. 8-11 captions should include very brief info about the parameter used in NSE calculation (i.e., Q).

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