

Interactive comment on “Calibration analysis for water storage variability of the global hydrological model WGHM” by S. Werth and A. Güntner

Anonymous Referee #1

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General comment:

This paper enhances understanding of the global water balance, its variations and uncertainties by the use of GRACE data to calibrate the WGHM global hydrology model. Sophisticated methods are applied for the calibration and evaluation procedures.

Specific comments:

Parts of the paper lack focus and/or understanding. This is especially true for Section 2.3.2. It is not that the description of the GRACE data is too brief, but I think for the general readership of HESS the filtering and error estimation procedures need to be explained in a clearer way. It is also not absolutely clear what GRACE data were used

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in the end, and at what spatial and temporal resolution they were derived and used for the model. A figure illustrating the procedure, perhaps in combination with or as an extension of Fig. 2, may significantly improve understandability.

p. 4824, l. 15-18: I do not understand this: How could these basins be used in the analysis if their observations do not cover the GRACE period? Doesn't the use of mean values (i.e. the neglect of inter-annual dynamics) seriously compromise the results?

Fig. 5: Against which observations were the data compared (especially the TWSV data) to derive the RMSE?

p. 4829, l. 7: What could be the reason for the decrease in accuracy for Mekong?

p. 4836: The baseline simulation was done using a specific climate dataset. I miss a brief discussion of the possible influence of the choice of this one (since there is considerable variation among different precipitation data sets in particular). That is, might the present results be strongly different if another climate dataset was used?

The conclusions are way too long, please be concise.

Table 1: What are the final parameter values for the individual basins? fig. 7 provides standardized values only.

Technical corrections:

p. 4815, l. 12-14: This is an incomplete list of global hydrological models with a strong focus on land surface models. Please state that this is a selection, or include others.

p. 4821, l. 13: What is the criterion to classify these rivers as "most important"?

p. 4826, l. 4: Order of figure numbers 2 and 3 is incorrect (3 is mentioned first in the text).

Table 1: I'd prefer that more intuitive abbreviations were used for the parameters rather than SL-1 etc.

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Table 2: Third line: "col. 6" not "col. 7". Table 4, second-last line: delete "compared".

Fig. 1: Are the Köppen classes really needed? Showing the basin numbers would be better.

Fig. 7: Don't use lines for these distinct cases.

Fig. 8: Much too small, numbers cannot be read. Remove the inset figure of c) (Lena).

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