

Minor revisions, Author response to RC #1.

1. Regarding section 2.3.4, section 3.2.5 and also Fig. 8, I made a remark concerning the use of imbalances during the last review. This was not addressed. I said the following:

"Concerning the imbalances, the terminology of 'imbalances' is proper, as opposed to using 'residuals'. The implicit assumption here is that the residuals, i.e. model uncertainty, are considered constant for every case study. Clark et al. (2008) show that model uncertainty differs between climates. Especially, more arid climate have higher residuals. Thus, the analysis based on the relative imbalance can only be semi-reasonably compared within 1 ecoregion. I do think imbalances is an interesting concept to use."

Clark, M. P., Slater, A. G., Rupp, D. E., Woods, R. A., Vrugt, J. A., Gupta, H. V., ... & Hay, L. E. (2008). Framework for Understanding Structural Errors (FUSE): A modular framework to diagnose differences between hydrological models. *Water Resources Research*, 44(12).

In the current version of the paper, this point is still valid, because this assumption is not mentioned in section 2.3.4. However, the authors still compare the different ecoregions in section 3.2.5. The results showed in the subplots of Fig. 8 are compared in section 3.2.5.

Response: I'm not understanding this comment, specifically the line "The implicit assumption here is that residuals, i.e. model uncertainty, are considered constant for every case study". I don't think this is a correct interpretation. We are not assuming that model uncertainty is constant between climates, in fact we are comparing *how* spatially varying uncertainty affects interpretations and conclusions drawn from a simple water balance analysis.

1. In my opinion, the abstract is still too long. I noticed you have shortened it already, well done. At the moment the results are listed in detail. Perhaps, it is possible to summarise this more. It would be great if you can write the abstract in one paragraph.

Response: We agree. The abstract has been trimmed by about 40%, now fitting into a single paragraph.

2. The introduction is 4.5 pages. This is quite long. When I first read the introduction, my attention waned from line 70 onwards and I skipped ahead till the end of the introduction. For me, the introduction became interesting again from line 168. The section that I skipped contained a lot of background information regarding what is already done in literature. I understand that for a CSA study, it is important to also show what the current state of affairs is in literature. So, I agree that this should be placed in the article. I just wonder if this should be placed in the introduction. I would recommend to add another section after the introduction that details this information: "Current state of affairs in literature" or some other title. Since this new section would still be about 3 pages long, I would also recommend to divide this new section into several subsections to increase readability.

Response: Rather than insert an entirely new section, we have significantly reduced the overly detailed comparison/validation literature review in the introduction to a more readable and succinct form.

3. For Fig. 7, thank you for the explanation. I understand now why there is no plot for runoff (no satellite data available). I would still recommend moving SWE to the bottom and removing the empty plot. I think leaving this in would only raise questions. If there is an empty blank space in the bottom right, it will not disrupt the overall look of the figure as much.

Response: The figure has been corrected.

4. Concerning Fig. 8, I agree with the reasons (the graphs are already information dense) the authors have given for leaving out 2 ecoregions. What I still do not understand though is the threshold for excluding these two, since the difference between the "Southern semi-arid highlands" ecoregion, which is excluded, and the "Temperate sierras" ecoregion, which is included, is only 0.29% of the whole CONUS land surface. Can this be clarified further?

Response: We have added in the two excluded regions to Figure 8, as well as corrected typos in the plot and x-axis titles where "Residual" was used instead of "Imbalance". Table 4 was updated to include summary statistics for the two additional regions.

5. Finally, in Fig. 2 panel b) Coefficient of variation has an 'a' in front of it in the graph. This should be changed to a 'b'.

Response: This has been corrected.

Extraneous figures in the Supplement were removed as well.