

Fanny Lehmann
PhD student

fanny.lehmann@ens-paris-saclay.fr

Palaiseau, 12. October 2021

Hydrology and Earth System Sciences, The Editor

RE: Water budget closure at the global scale

Dear Editor,

We are pleased to submit to *Hydrology and Earth System Sciences* a revised version of our manuscript titled "*How well are we able to close the water budget at the global scale?*".

We thank you and the reviewers for your comments and discussion that helped us improve the manuscript. Regarding the comments of the second reviewer, we clarified our choice of focusing on global runoff datasets in the data section 2.2.3 while mentioning at the end of the section 4.4 the results we obtained in 10 large basins while using GRDC runoff records. As explained in our detailed reply, the choice of Köppen-Geiger climate zones was based on the number of studies built on this classification and the lack of other variables providing a better explanation of the results.

Concerning the first reviewer's concerns about the processing of GRACE data, we discussed the misunderstanding of what they required us to modify. Several points raised related to a misunderstanding of the terminology used rather than a scientific issue. We have also detailed the known effects of time filtering in our detailed reply. We understand that the referees chose "major revision" for the paper. However, the changes required to the manuscript, based on the referees' comments, are not particularly extensive in terms of the scientific content. Following the advice from reviewer 2, we have removed several less important portions and removed any redundant information. As mentioned in correspondence with you by email, we could not identify issues raised by either referee that required substantial changes and all points are clarified and discussed in our detailed response to the comments.

If you feel that we missed something, please do not hesitate to get in touch.

We thank you in advance to consider our revised manuscript.

Sincerely,

On behalf of the co-authors

Fanny Lehmann