

***Interactive comment on “Reconstructing 20th century global hydrography: a contribution to the Global Terrestrial Network- Hydrology (GTN-H)” by D. Wisser et al.***

**D. Wisser**

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Dear Dr. Wagener,

We very much appreciate your suggestions as well as those of the two reviewers regarding our manuscript entitled Reconstructing 20th century global hydrography: A contribution to the Global Terrestrial Network- Hydrology (GTN-H).

In addition to the specific and general comments of the reviewers (see separate documents), we have addressed the main criticism of the reviewers, which deals with the lack of a formalized sensitivity and uncertainty analysis. We addressed this as de-  
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scribed immediately below.

To understand the robustness of the model, we performed specific test aimed at quantifying the uncertainty in model predictions arising from parameter variations using a Generalised Likelihood Uncertainty Estimation (GLUE) approach. As this method relies on a large number of simulations and therefore cannot be done at the global scale given current CPU limitations (a single run takes about 20 minutes for one year), we estimated the uncertainty for two river basins with different hydroclimatic conditions.

To understand the impact of variations in the precipitation input data, we returned to the global scale and performed additional model simulations using three global precipitation data sets that are based on observations (both gauge-based on satellite-based) and provided the range of predictions of discharge-to-the-oceans based on those data sets. Furthermore, we executed a sensitivity analysis on the estimates of river water aging by assuming a simple reservoir operation model where release is assumed to be equal to the long-term inflow to the reservoir.

We hope that you find our manuscript with these changes acceptable for publication in HESS.

Best wishes,

Dominik Wisser

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