Dear Prof. Yi He,

Thank you for handling our paper, and we have addressed your comments accordingly. Additionally, we have updated the "Author Contributions" section as per your recommendation.

Thank you for responding to the review from Referee #2. I have some additional comments as follows. I look forward to receiving your responses.

CC and KGE in the abstract need full names

Authors´ response:

- Thank you! We have added the full names of CC and KGE.

L58: missing 'OF', Whilst precipitation is one OF the most important components.
Authors´ response:

- Thank you. This is now modified.

L127: A comprehensive and physically based gridded global hydrological model (WBMsed; Cohen et al., (2013)) is used to simulate river discharge globally. Upon reading the paper by Cohen et al., (2013), I understand the WBMsed model is 'a spatially and temporally explicit (pixel-scale and daily) implementation of the BQART river-mouth sediment load model (Syvitski and Milliman, 2007)'. Please explain the reason for selecting this model in a global assessment of streamflow.

Authors´ response:

- As explained in section 2.2, WBM is one of the first global hydrological models, with comprehensive parameters and datasets including reservoirs, dams, and crop water evapotranspiration often not included in most global hydrological models. WBMsed, a combination of the latest WBM version (WBMplus) and the sediment model (BQART), enables the simulation of sediment fluxes within the WBM framework. In this paper, we indeed only analyse the hydrological predictions from the framework but opted to use the 'sed' version of the framework for consistency with our following analysis of sediment flux. The hydrological predictions by WBMsed and WBMplus are equivalent. This clarification has been added to the introduction (lines 127-128) and section 2.2 (lines 210-215) to enhance clarity.

L230: It is important to note that this study assesses the precipitation datasets without calibration of the WBMsed model for each precipitation dataset, which could theoretically improve their performance in replicating observed river discharge. The WBMsed model is a physically based model. Please explain what parameters would need to be calibrated if you were to calibrate the model.

Authors´ response:

- The parameters for calibrating the WBMsed model include soil characteristics (e.g., depth, soil moisture, field capacity, rooting depth), baseflow release time, quick flow coefficient, snowfall and snowmelt threshold, percolation fraction, maximum canopy interception storage, evapotranspiration response to soil moisture drying, speed of

wave propagation, and multiple hydraulic geometry features of the river channel such as depth, width, and velocity.

- Soil characteristics are among the most sensitive parameters often used for calibration, along with flow characteristics. For more information about the hydrological model parameters see Wisser et al., 2010.

Spatial resolution: Because the precipitation products were interpolated to the same spatial resolution of 0.1°, I wonder how this affects the model outputs. Does this favour the rainfall products that are already at 0.1° resolution. Please comment on how the spatial resolution and interpolation potentially affect the model performance and your conclusion.

Authors´ response:

- This is a very good question and may indeed have some influence, particularly when comparing to observed precipitation rather than streamflow, which represents catchments greater than 100 km^2 in area. If resolution were to have a significant impact, the PERCCDR and TERRA datasets, which have the highest resolution, would have performed very well. When high-resolution datasets are aggregated to a coarser resolution, they often perform well, but this is not the case for PERCCDR and TERRA. Hence, accuracy relies more on the methods and datasets used to develop the datasets rather than spatial resolution.

Reference:

- Wisser, D., Fekete, B. M., Vörösmarty, C. J., and Schumann, A. H.: Reconstructing 20th century global hydrography: a contribution to the Global Terrestrial Network- Hydrology (GTN-H), Hydrology and Earth System Sciences, 14, 1–24, https://doi.org/10.5194/hess-14-1-2010, 2010.