

## Reply on CC2

Youjiang Shen et al.

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Author comment on "High-resolution water level and storage variation datasets for 338 reservoirs in China during 2010–2021" by Youjiang Shen et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2021-470-AC3>, 2022

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Dear Xingguo Mo,

Thank you for your time and efforts in reviewing our manuscript. This was a prompt response to your comments and detailed responses are expected to be here in the coming days.

Firstly, we are very happy to hear your positive feedback on our complete and consistent datasets and your recognition of impressive workload of our work, which are an important contribution to the large-scale studies and could provide strong support for many aspects.

Secondly, we agree with some of the issues you raised, and all of them have been addressed well in our revised datasets as we modified our datasets in the past four months of manuscript review. Data version-2 and the revised paper will be uploaded once we receive all comments from reviewers.

Here is a brief summary of the issues you raised, which have been already addressed from our side.

Issue 1 - systematic biases of satellite altimetry-derived water level.

Please note we provide two modes of satellite water level, standard rate (single satellite) and high rate (multiple satellites). For High rate, we need to remove systematic biases among satellites. The biases are removed using two approaches, (1) directly removing the mean differences for those with enough overlapping periods. (2) for those without overlapping periods, remotely sensed surface area time series are used to act as an anchor of biased time series, allowing for estimation of the relevant biases. Here, a 2-D cost function in surface-area–water-level coordinates is minimized within a Gauss–Helmert adjustment scheme.

Issue 2 - quantitative metrics for different letter grades assigned to reservoirs without in situ observations.

This issue is solved and replied in previous reviewer comment.

Issue 3 - The validation for SWA is not convincing enough.

We have already added a cross-validation against other similar existing water area datasets such as RealSAT and a SR paper in our revised datasets. Please note that validation against our remotely-sensed area has been done using 139 reservoirs with in situ water level, and our altimetry-derived water level in our manuscript.

Issue 4 - makes any sense to calculate the RWSC of the reservoirs with poor  $R^2$  values.

Partly agree, we will divide our RWSC data into two parts for users to further selections, i.e., with higher  $R^2$  values and with  $R^2$  values.

Issue 5 - the reservoir might freeze in winter when you derive the WSE with algorithm for water surface from altimeters?

No, we just use the official and commonly used algorithms to derive the water level. This issue has minor influences on our derived water level considering the locations and climates of our provided reservoirs, and we will add some explanations and discussions in our paper.

All other minor comments and detailed responses to above moderate issues will appear here in the coming days.

Kind regards.