

Geosci. Model Dev. Discuss., referee comment RC1 https://doi.org/10.5194/gmd-2021-75-RC1, 2021 © Author(s) 2021. This work is distributed under the Creative Commons Attribution 4.0 License.

Comment on gmd-2021-75

Shuqi Lin (Referee)

Referee comment on "Development of a coupled simulation framework representing the lake and river continuum of mass and energy (TCHOIR v1.0)" by Daisuke Tokuda et al., Geosci. Model Dev. Discuss., https://doi.org/10.5194/gmd-2021-75-RC1, 2021

General comments:

This study involves tremendous data processing when coupling the river and lake dataset together before conducting the simulations. Could you provide a map or a chart to state the number of river and lakes in different groups you defined and how many systems among them have been processed specifically? I think it will be helpful for the readers to understand the whole dataset and reproduce the framework.

Specific comments:

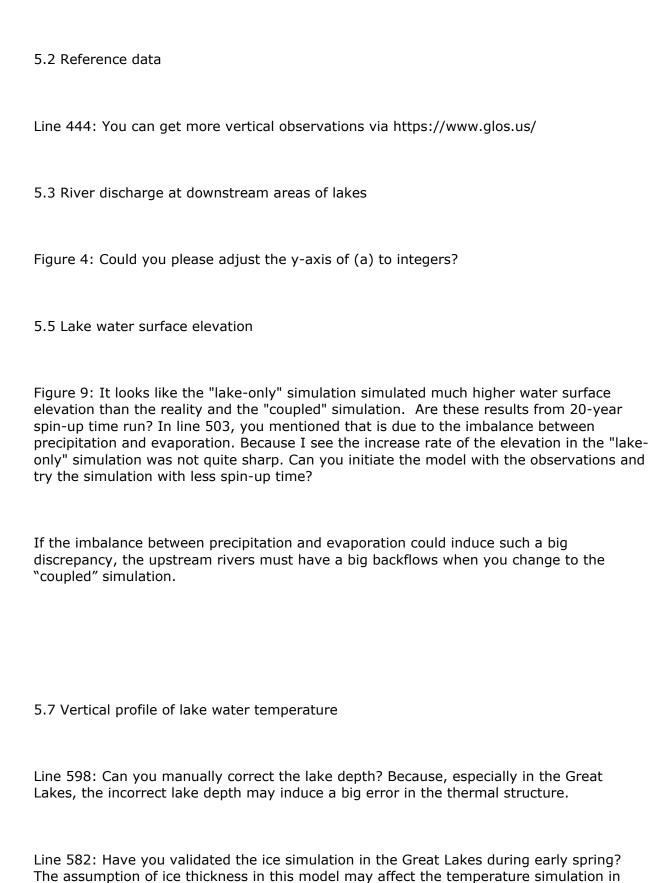
2.1 Harmonization of geographical information

Did you basically implement the lake data from HydroLAKES and river data from MERIT Hydro?

I see a lot of preprocessing of lake and river geographical information in the second paragraph. Could you please provide a table or a chart to conclude the results of the preprocessing, like how many lakes are classified into the two groups, respectively, and how many inconsistencies are detected in two datasets and which dataset contained the largest upstream area you chosen in the end, etc.

Line 89: Could you provide the links of these dataset here?

3.2 Lake model
Line 166: Any reference of this 1D lake model?
Line 265: Should have a punctuation after the back bracket.
Line 298: How is the shortwave radiation weighted by the area of ice? Could you provide the equation here?
3.3 Implementation of coupling interface
Line 323: For how many river-lake systems in your study you have made the corrections? Are they the minor part of the whole dataset?
Why don't you leave off these particular systems to avoid the inaccuracy brought by the corrections?
4 Validation of harmonized geographical information
Table 1: Could you indicate these eight reservoirs in Fig 3 by different colors?
5.1 Simulation configuration
Line 384 - 385: Could you mention this information at the beginning of the paper (maybe in section 2?)
Line 407: Where are these initial values from?



the Great Lakes.

7 sensitivity to meteorological forcing dataset
Is this section necessary in the main body of this manuscript if the different meteo forcing did not generate obvious discrepancy?
9 Conclusion
Line 672: Please list some metrics here to show how much the "coupled" simulation is better than "river-only" and "lake-only" simulations.
Technical corrections:
Figure 9: the unit of lake surface elevation should be (m) in the caption.