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Comment on hess-2021-630

Anonymous Referee #2

Referee comment on "Long-term water clarity patterns of lakes across China using Landsat series imagery from 1985 to 2020" by Xidong Chen et al., Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2021-630-RC2>, 2022

This paper developed a 30 m long-term Lake Water Secchi Depth (SD) dataset (LAWSD30) of China (1985–2020) using the robust water-color-parameter-based SD model. The LAWSD30 dataset can be used to study the temporal and spatial changes of Lake SD. Therefore, it is of great significance to the study of long-term trend of Lake SD and lake ecological environment management.

Specific comments

- The RMSE was used for evaluating the accuracy of the model. However, in my opinion, this index is not very appropriate. For example, when the real value is equal to 2 or 20, although the RMSE value is 0.2, the accuracy of the model is very different. Thus, this index does not show how close the real value is to the estimated value I suggest using MAPE or similar indicators to evaluate the accuracy of the model.
- Line 125-126. "The summer months were chosen because the water clarity is relatively stable in this season and suitable for monitoring with remote sensing imagery". I understand that calculating SD in the same season can enhance the comparability of data, but I don't think the clarity is relatively stable in the summer, because heavy rainfall and algal bloom often occur in summer, resulting in the change of suspended solids and therefore affecting the SD.
- Line 163-164. The collected SD measurements were within seven days of satellite overpasses. I suggest the meteorological conditions should be considered since both heavy rain and strong wind could affect the SD.
- Figure 4. When SD is less than 2, the covariance relationship between in-situ SD and LAWSD30 is very weak because many data are vertical lines. The accuracy should be analyzed in this situation.
- Line 332. Why Selinco Lake and Hongze Lake were chosen to illustrate the LAWSD30?

- Figure 10. The figures present the different SD trends of lakes with area $\leq 1 \text{ km}^2$ and $> 1 \text{ km}^2$, in different region of China. The five regions have different socio-economic, geological and climatic conditions, should the driver factors of SD changes be further explained?