Reply on CC1
Yu Cai et al.


Thank you for the comments.


Therefore, our dataset has a longer time period than Du's product and contains more lakes than Su's product. In comparison with Wang's product, which used only one central pixel from multi-source passive microwave data at different grid spacings for each lake, and used visual interpretation to obtain lake ice phenology, our dataset considered all the pixels 6.25 km away from the lake shore, and the lake ice phenology were extracted by an automatic algorithm based on the calibrated enhanced resolution passive microwave (CETB) dataset. In this case, we think that Wang's product provides precious records for small lakes, but the larger the lake, the worse the representation of the single pixel. In the contrast, our dataset is more suitable for the analysis of spatiotemporal changes in large lakes.

References:


The followings are point-to-point response to the comments.

- SMMR, SSM/I-SSMIS data from CETB dataset provide continuous brightness temperature records with consistent grid resolution, the obtained lake ice phenology results are more comparable and suitable for time series analysis. Moreover, a lake ice phenology product based on AMSR-E/2 data has already been published (Du et al., 2017). Therefore, if users prefer to use the lake ice phenology from AMSR2 data, they can replace the results after 2012 with the results from Du's product. Furthermore, we compared the lake ice phenology from the two products in the manuscript (see Section 3.3.2), providing users with a reference for consistency and bias in using the two datasets.
- The brightness temperature of SSM/I and SSMIS data from the CETB dataset were calibrated, while the SMMR data were not cross-calibrated with the SSM/I-SSMIS data. However, we used unique threshold for each pixel from each satellite during the extraction of lake ice phenology (see Line 173). Therefore, whether or not the brightness temperature data were calibrated would not affect the extraction of lake ice phenology.
- We did not compare the lake ice phenomenology results with optical data because there are currently no lake ice phenomenology datasets in the northern hemisphere based on optical data that directly provide calendar date results. Instead, in addition to the AMSR-E/2 product, we also compared the lake ice phenomenology results with GLRIPD records and GLERL ice cover records. We believe that in-situ observations and ice charts can better represent the actual situation of lake ice status, and the comparisons with these records are more meaningful. Example of day-to-day comparison of ice coverage were also presented in the section of comparisons with GLERL ice cover records.
- We provide freeze-up start date, freeze-up end date, break-up start date, break-up end date, complete freezing duration, and ice cover duration in the dataset. For seven intermittently ice-covered lakes, annual maximum ice cover are also provided. We have made detailed description in the Data Availability section (see Lines 413-416), you can also open the link to look over the dataset (https://doi.org/10.1594/PANGAEA.937904).