

## ***Interactive comment on* “Numerical study on the response of the largest lake in China to climate change” by Dongsheng Su et al.**

### **Anonymous Referee #2**

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The Qinghai lake is the largest in land lake in China. It has large volume of biotic resources and tourism resources. Its thermodynamic changes under global warming remains unclear. Su et al. use a one-dimensional lake model to investigate thermodynamic changes of the Qinghai lake in the last three decades. The results show that the Qinghai lake has been warming up in the last three decades and the warming was the strongest in winter. Before getting published, however, this manuscript should be revised in several aspects. Please consider the points listed below and marked out in the manuscript. I strongly recommend language editing by some native English speaker, there are many errors in the grammar and improper expressions. 1. The authors emphasize the ice cover plays the first role in long-term change of thermodynamics, however, they do not validate the performance of Flake on the ice dynamics.

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The ice-on and ice-off dates can be obtained from MODIS data. The authors can use the MODIS-derived ice-on and -off dates to validate the performance of the Flake on ice phenology. Here is the data link: <http://www.csdata.org/p/214/> 2. The author should deemphasize the purpose to validate the performance of Flake on the Tibetan Plateau. Because both Lazhu et al. (2016) and Kirillin et al. (2017) has demonstrated its performance on the Tibetan Plateau. in Lazhu's study, the Namco lake is also a brackish and large lake. they even use observational temperature at different depths to validate its performance. in this respect, their study should be a better case to evaluate the performance of the Flake Model. 3. Even the Qinghai lake is a brackish lake, but its salinity is not low ( $\sim 12.5$  g/L). I agree with the authors that the salinity would not change the mixing type (dimictic), but salinity produces effects on the dates of spring and autumn overturning, which will change the energy flux. do the authors have any other observation data related the mixing of lake water column? If they have, they should show it or have some description on it.

I have some other comments and suggestions, please find the attached PDF file for details.

Please also note the supplement to this comment:

<https://www.hydrol-earth-syst-sci-discuss.net/hess-2018-583/hess-2018-583-RC2-supplement.pdf>

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