Trends and Abrupt Changes in 104-years of Ice Cover and Water Temperature in a Dimictic Lake in Response to Air Temperature, Wind Speed, and Water Clarity Drivers

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Discussion by Renjie Xia

General Comments

This article is well written, and the topic is interested. Authors did an extensive literature review, and provided a large number of references to validate their work. The conclusions presented in this article are useful.

Specific Comments

(1) Both DYRESM (Dynamics Reservoir Simulation Model) and DYRESM-WQ (Dynamic Reservoir Simulation Model – Water Quality) developed by the Center for Water Research at the University of Western Australia have been extensively calibrated and verified through field work. These models are reliable to use.

Authors added an ice and snow model to the DYRESM-WQ, and developed a new model called as DYRESM-WQ-I. Authors wrote that this resulting model was validated and employed (validated using a long-term (1911-2014) observational dataset, then employed to simulate long-term (1911-2014) ice cover and water temperature in the lake). One question has arisen what is the meaning of "validated" or "employed"? In general, "calibrated" and "verified" are common used in scientific articles. Authors should explain why using "validated" and "employed"? In addition, seems this new model was validated and employed just once by using the same observational dataset. Therefore, another question has arisen that the results obtained from this new model (validated and employed just once) is reliable?

(2) One suggestion: dividing the long-term observational dataset to two groups, then using one for the "validated" purpose, and using another for the "employed" purpose.

(3) Readers might be interested in the long-term 104-year continuous dataset and want to know how many variables observed are included in this dataset. Summarizing a table to show all the observational variables in the dataset will be grateful to these readers.