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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Historical modelling of changes in Lake Erken thermal conditions" *by* Simone Moras et al.

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We would like to thank Annie Visser (Referee 3) for the valuable comments and criticisms on the manuscript. The detailed comments provided will be certainly useful to improve the overall quality of this work. Before answering to the specific comments, however, we would like to better clarify our vision of the manuscript. We do not agree with the referee on the fact that our work represents only a case study application. On the contrary, we described an effective methodology that is able to reconstruct historical lake water temperature that can be applied and extended to many other lakes, not only Lake Erken specifically. Therefore, we believe that this study advances scientific progress. We also think, however, that the specific comments provided by the referee are extremely helpful to better elucidate the general purpose of this work. Additionally,

in this work we used local meteorological data to reconstruct historical lake water temperature. A potential step forward could be driving the model with historical gridded climate data (0.5° x 0.5° lat-long grid), often used in climate models, and compare the modelled lake water temperature with the ones obtained in our work. This work could be seen, therefore, as a starting point towards this direction. We speculate that the use of gridded data might be less accurate to reconstruct past lake water temperature than using local meteorological data. We think that this would be an important scientific outcome to better understand the changes that have already occurred in lake thermal structure. Please, see supplement file for our responses to the specific comments.

On behalf of all the authors, Simone Moras

Please also note the supplement to this comment:
https://www.hydrol-earth-syst-sci-discuss.net/hess-2019-199/hess-2019-199-AC3-supplement.pdf

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