Answer to Reviewer 1

We thank Reviewer 1 for his positive comments

This paper is well written and presents the data assimilation of in-situ observations of 3D lake models. The authors use EnKF based methods to assimilate the data so as to account for both model and data uncertainties. The results are presented well. I have the following minor comments to make 1) Although authors talk about Model errors, they do not describe literature relevant to model errors 2) Also, a paragraph about variational data assimilation should be mentioned Relevant citations: 1) Model Error in Data Assimilation 2) Accounting for Model Errors in Ensemble Data Assimilation 3) A Posteriori Error Estimates for the Solution of Variational Inverse Problems 4)A review of operational methods of variational and ensemble variational data assimilation

We have described assimilation methods in Appendix B but we propose to move parts of this section up to section 3, the Data assimilation section. We will also add more citations (also asked by Reviewer 2) regarding model errors:

Santha Akella and I.M. Navon:Different approaches to model error formulation in 4DVar: a study with high resolution advection schemes . , Tellus A . , Vol 61A, 112–128 (2009)

 Daescu D.N. and Navon I.M.:Sensitivity Analysis in Nonlinear Variational Data Assimilation: Theoretical Aspects and Applications. Chapter in book : Advanced Numerical Methods for Complex Environmental Models: Needs and Availability. Istvan Farago and Zahari Zlatev (Editors), Bentham Science Publishers, Published December 2013,ISBN: 978-1-60805-777-1 (2013)

Yet, a study of model errors was not the goal of the paper and we prefer not to deviate too much from our main message: describe and implement an integrated observation-model-DA forecasting system for physical processes in lakes. We believe that model error was adequately described in multiple figures and plots in the manuscript (Tables 2 and 3; Figures 2, 4, 5 , 6, 7, 8) with various statistics and diagrams. Those statistics and figures showed the error between observational data, model free runs and DA runs, and demonstrated the value and improvement of DA. We will add the above-mentioned references to the manuscript.

We have cited some references regarding data assimilations in freshwater system (Kourzeneva, 2014; Stroud et al., 2009, 2010; Yeates et al., 2008; Zhang et al., 2007). We propose to add the following more general reference together with the one already cited (Bannister 2017):

Carrassi, A., Bocquet, M., Bertino, L., & Evensen, G. (2018). Data assimilation in the geosciences: An overview of methods, issues, and perspectives. Wiley Interdisciplinary Reviews: Climate Change, 9(5), e535.