We thank Referee #2 for the valuable comments. Our answers are given below each comment.

Specific Comments

1. The Abstract is provides clear information of a general nature, but it could be developed to provide specific, quantitative information on the extent of improvements in accuracy of model temperatures and mixed layer depths

We agree and will add the main quantitative results, i.e. up to 40% reduction in RMSE for the near-bottom temperature and a significantly better reproduction of the vertical extent of the seasonal deep convective mixing.

2. p.5, l.15: gamma depends on bottom friction and basin geometry – please add some detail on this

We will replace gamma by its equation, based on Goudsmit et al. (2002):

$$\gamma = A_{lake} V_{lake}^{-3/2} \rho_{water}^{-1/2} C_D$$

where A_{lake} and V_{lake} are the lake surface area and volume, respectively, ρ_{water} the density of water and C_D the bottom drag coefficient.

3. p.9, l.24: The PEST software is used to calibrate the model; beyond the reference to Doherty (2005), please define the acronym and briefly explain how PEST works

We will define the acronym of PEST ("Model-Independent Parameter Estimation and Uncertainty Analysis") and add the following sentence: "PEST searches for the optimal value of chosen parameters which ensure the best match between model results and available observations […]".

4. p.9, l.26: Two of the three parameters used in model tuning are only mentioned here; please provide details (equations?) to explain the "fit parameter for absorption of solar radiation" and the "fit parameter for the fluxes of sensible and latent heat"

We will give more details about these two parameters as follows, based on Goudsmit et al. (2002):

- *p_1 (fit parameter for absorption of longwave radiation) linearly scales the amount of heat that is absorbed in the lake water from the incoming longwave radiation from the atmosphere;*
- *p_2 (fit parameter for the fluxes of sensible and latent heat) linearly scales the exchange of sensible and latent heat between the lake surface and the atmosphere.*

We will explain the significance of these two parameters as follows: "p_1 and p_2 account for the fact that, in specific cases, there is always a difference between the heat flux formulas and the effective fluxes."

5. pp. 15-16: Sect.4 provides brief conclusions; there is no explicit discussion, although brief reference to applications (p.16, lines 1-2); a more developed Discussion section would be more appropriate

We agree, however we purposely kept the manuscript as concise as possible. We will develop the following items in more detail:

- *We will further comment Figure 7, as follows: "Fig. 7 shows that the original version of the model largely overestimated deep convective mixing, as full lake mixing was being predicted almost every year. Using wind filtering, deep seasonal mixing is more finely*

reproduced, which also helps towards modelling of lake-scale circulation of water, oxygen and nutrients."

- *We will also discuss our calibrated values for the α parameter for the deep lakes, which tend to be higher than the ones found by previous studies. For example, regarding Lake Geneva, one reason is that the meteorological station chosen for the study underestimates the wind intensity over the lake, thereby leading to larger α values.*

1. p.3, l.20: rather then "aquatic systems", why not say "lakes"?

We will replace the expression by "lakes and reservoirs".

2. p.7, l.8: "in order to smooth the cut-off effect"

3. p.7, l.14: "both oppose excitation of BSIWs"

4. p.11, l.5: "and rather briefly"

5. p.11, lines 5-6: the sentence "A comparison of the filtering for all four lakes is shown in Fig. 3" should be moved to the start of Sect. 3.1

6. p.11, l.13: Equation (12) is hardly an equation – why is it necessary to use two different symbols for the same factor?

7. p.12, l.1: How is "average wind direction" defined?

8. p.15, l.2: "which then remains denser"

9. p.15, l.19: "In winter, however, filtering strongly …"

We thank Referee #2 for these technical corrections and will change the manuscript accordingly. In particular, we will remove Equation (12) and instead explain how average wind direction can be calculated.