**Review of "Toward an open-access of high-frequency lake modelling and statistics data for scientists and practitioners. The case of Swiss Lakes using Simstrat v2.1", by Gaudard et al.**

In this study, the authors present a new open-access web-based platform with visualization and easy-access to simulations with the lake model Simstrat v2.1 for 54 lakes in Switzerland. The practical use of the platform is illustrated with two case studies, one to assess the effects of past climate change on the thermal structure of a lake, and second how short extreme events temporally affect the lake thermal structure. The presented platform is state-of-the-art but this might be stressed in the paper even more. Furthermore, the manuscript could benefit from some structural and textual changes, of which I included a list with suggestions under 'textual comments'. In general, the study can only be considered for publication if the comments specified here below are sufficiently addressed.

## General Comments

1.   The main topic of the paper is to present the new online platform: I think this could be promoted even more throughout the paper:
     a.  The last paragraph of the introduction could be more elaborated. Also rewrite the sentence with 'with the intention of making our results openly accessible'. From what I understand, they are already open. More details could be provided on what is present on the platform. (In the introduction and/or in the results section, (P5 L13-15).
     b.  In the conclusion the main results of the two case studies as main advantages of the platform should be highlighted. I would also end the conclusion with a general statement about the platform.

2.   The manuscript could benefit from a slightly adjusted structure. Now, the results sections 3.1 and 3.2 describing the two case studies also include methodology and even literature review parts. Therefore I suggest to use a new structure as follows:

     2. Methods
     2.5. Case Studies
     2.5.1. Long-term evolution of the thermal structure of lakes: Lake Biel
     *Insert here paragraph 1 of page 6*
     2.5.2. Event based evolution of the lake thermal structure
     *Add here first paragraph of page 7*

## Specific comments

1.   In the abstract, it would be good to specify that the lakes on the platform are modeled with one lake model, Simstrat. Also the sentences could be rephrased more directly. Some examples are included in the textual comments.

2. P3 L19: 'an online platform': be more specific on which online platform: the new platform you present in this study? (see also general comment)

3. Figure 1: Please make the titles of the input and output boxes consistent. I suggest to only use 'input' and 'output' (so remove the 'data' in 'input data'). Please apply the same consistency in the figure legend and caption.

4. Figure 2: Please add color bar of lake temperatures and scale bar to figure. What is the green color on the figure representing? Please also add this in figure or figure caption.

5. The authors state that 'inflows are disabled if no discharge or temperature data is available' (P4, L1). Is this the case for many lakes? Please identify the relevant lakes in Appendix table A and add the number in the text. Please also include a statement on the sensitivity of this methodological choice.

6. P4 L2-5 and Appendix table A: please also indicate in the table for which lakes the Secchi depth measurements are available. Please also add a column with the lake tropic status, or provide the methodology of the classification in this paragraph.

7. For the story continuation it is better to switch the third and second paragraph of P4. Like this, it makes more sense to first describe the timeframes and then how data gaps are treated. Please also take care of the transition in the data-gap paragraph.

8. P4 L13-14: It is not clear to where the observations from the CTD profiles comes from. Please add the data source.

9. P4 L17: please add more details on how the parameters for calibration were selected, at least include a reference of the previous sensitivity analysis.

10. P4 L21: 'unless significant changes are made to either the model, forcing data or observational data'. In when is this the case? Please add more textual details on this.

11. P4 L26: Please add the source of lake volume, temperature and densities.

12. P5 L25-27: I would elaborate this paragraph, and discuss also the correlation coefficient showed in figure 3. Please also list the six lakes not shown in the figure caption.

13. P5 L27: Please add more info to the study of Bruce et al., 2018: is it a global lake modelling study? Do they incorporate lakes in Switzerland as well?

14.     P6 L26-31: On line 26 there is indicated that a 'similar analysis' is done for all modelled lakes, however, only an inter-comparison of winter and summer stratification is showed and discussed, while in the case study for Lake Brienz, the trends in stratifications are investigated. Please rewrite the text to be consistent with the figures showed. Please add also more information on the possible implications of the delay of melt water runoff. Also, in the caption figure 6, there is no information on winter stratification, but on ice cover. Please update the text so that it is consistent with the information on the figure.

15.     Figure 7: Please remove X and Y labels, and add 'in Schmidt stability' to 'Delay/ Recovery time' colorbar caption.

## Textual comments

These comments can just be implemented in the manuscript and do not have to be addressed in the response letter.

1.     P1 L11: Please replace 'hypothesizes' with 'hypotheses'
2.     P1 L13: please change 'openly accessible' to 'open-access' or synonym.
3.     P1 L15: Please change 'regional areas' to 'regions' and remove 'worldwide'
4.     P2 L2: please remove 'most'.
5.     P2 L5: Please change 'consists in' to 'consists of'
6.     P2 L6: Please change 'scarcely' to 'barely'
7.     P2 L7: Please change 'country-scale' to 'country-level'
8.     P2 L19: Please replace '(e.g. temperature profiles)' to ', like temperature profiles,'
9.     P2 L24: Please replace 'toolbox'
10.     P2 L24: Please replace 'properties' by 'variables'
11.     P2 L29: Please change 'more generally the public' to 'the public in general'.
12.     P3 L9: Please change 'clearer' to 'more clear'
13.     P3 L9: Please replace 'openly available' with 'freely available or other synonym
14.     P3 L10 Please replace 'refactoring' by a synonym
15.     P3 L15: Please add 'i*n the model*' in 'the ice and snow module employed *in the model*, to enhance the sentence structure.
16.     P3 L18: Please add 'the' in '(iii) run *the* calibration' and on L19 'for *the* chosen model parameters'
17.     P3 L25: Please add 'the' in 'from *the* Federal Office of …'
18.     P3 L27: Please replace 'For hydrological forcing' by 'As hydrological forcing' or equivalent.
19.     P4 L7: Please replace 'depending on the data' by 'depending on the variable'
20.     P4 L6-11: Please revisit the whole paragraph and replace 'missing data' by 'data gaps' where appropriate. 'Missing data' can be interpreted as long series of data gaps.
21.     P4 L9: Please replace 'missing data are replaced' by 'data gaps are filled'
22.     P4 L11: 'The latter is calculated as described in Appendix C'. Here it is not clear that it points to the theoretical solar radiation. Please rephrase.
23.     P4 L18: Please replace 'maintain' with a synonym (e.g. 'keep').

24. P4 L29: Please change '.From this we calculate' to ', to calculate'
25. P5 L22: 'interfaced to' replace by synonym
26. P5 L23: Please rephrase sentence starting with 'Similarly, …'
27. P6 L4: Please replace 'were' with 'is'
28. P6 L18: Please change 'Contrarily' to 'In contrast to'
29. P6 L20: Please check figure numbers: two times 'Figure 4e and 4e'.
30. P6 L29: Add ', first reported by Livingstone et al. (2005), *which is* caused …'
31. Caption figure 2: 'Snaphop' to 'Snapshot'
32. Caption figure 6: Please add time period of data used in the figure and change last sentence to 'Lakes are ordered based on elevation form left (low elevation) to right (high elevation)' for clarity.
33. P7 L2: Please add 'a' in 'over *a* long period'.
34. At certain locations in the manuscript the language use is not entirely scientific and neutral. Here a list of this locations is provided, please change these to scientific wording or remove them:
    a. P1 L12 'by the modellers themselves'
    b. P2 L11: 'Although never perfect'
    c. P2 L15: 'Unfortunately'
    d. P2 L20: 'which remains a time-consuming process' and 'To be successful, such an endeavour'
    e. P2 L31: 'our extensive results'
    f. P5 L17: 'very well-suited'
    g. P7 L6: 'brutal', can be replaced by 'severe'
    h. P7 L12: 'by no means'
    i. P7 L22: 'obviously'
    j. P7 L29: 'comparatively overlooked'

16. P6 L7-31: In the whole section, the choice of words suggests that observations are analyzed, while model simulations are analyzed. Below some suggestions to improve this:
    a. L7: to the sentence 'we observe an increase in both yearly averaged surface and bottom temperatures' change to 'we observe an increase in both yearly averaged surface and bottom temperature *simulations*'
    b. L12: 'The vertical heterogeneous heating observed …' to 'the vertical heterogeneous heating modelled …'
    c. L14: 'We detect' to 'We simulate'
    d. Both L20 and L26: 'observed' to 'simulated'

17. P8 L15-18: Section *Code and Data Availability*: Please add here the used data sources as well, now the URLs are spread out over the document.
    a. Meteorological data from MeteoSwiss
    b. Hydrological forcing from the Federal Office for the Environment
    c. Data on CTD profiles (data source?)
    d. Geothermal data + URL (now in caption Table 2)
    e. Reference to PEST + URL (now on P4 L19)