

## Reviewer 1

We would like to thank the Reviewer for his general very positive opinion about our manuscript as well as very constructive comments and suggestions. In the following we response to all of the comments (in bold italics).

Minor remarks:

***Line 30: (e.g., one or two years, or even less).***

Corrected.

***Line 70: how can the catchment have elevation lower than the lake itself (reported being 117 amsl)?***

Thank you for correcting our obvious mistake. The catchment has minimum elevation of 117 amsl which is the same as the lake level.

***Line 128: I suggest merging section 3.3 and 3.4 with a different name. The name for section 3.3 is a little misleading, as it could also apply to 3.4, 3.5 and 3.6.***

We changed the structure of sections 3 and 4 according to the suggestions of both reviewers. Now, section 3. Methods is divided into 3.1 Strategy for long-term monitoring, 3.2 Water column measurements and sampling (this section incorporates 3.2, 3.3 and 3.4 from the previous version), 3.3 Sediment trap sampling and analysis, and 3.4 Ice cover data. Section 4 Results is now divided into 4.1 Water column data time series and 4.2 Modern sedimentation.

In this way we simplified the structure and made sections 3 and 4 more comparable. Methods section 3.2 corresponds to results section 4.1 while section 3.3 corresponds to section 4.2. We do hope that the structure of new version is more logical and in line with the expectations of the reviewers.

***Line 161 and following (Ice cover data): it is strange to give a single date to this parameter. Ice melting and freezing are processes occurring over several days. Maybe should you write something about the duration and/or accuracy (e.g., +/- n days) of this recorded parameter.***

Thank you for this comment. Indeed, the process of ice cover formation and breakup take some time. It is very difficult to precisely indicate the beginning of the process without continuous (daily) monitoring of the lake surface. Also the end of the process is not easy to determine because remnants of ice cover can survive longer in specific locations, e.g. in the littoral zone overgrown with reeds. Since we rely mainly on observations of local citizens, the dates we present in the manuscript should be interpreted as follows: (i) the date of ice breakup is the first day with central part of the lake completely free of ice (but discontinuous ice cover still possible in the littoral zone), (ii) the date of ice cover formation is the first day with the whole central part of the lake covered with ice. We also used Landsat and Sentinel satellite imagery datasets to confirm the presence or absence of ice cover but due to cloud cover it was often not useful. We added an explanation to the metadata file as suggested by Reviewer 2 as well.

***Figure 4: specific conductivity colour scheme is not very efficient to show something.***

We modified the color scheme to be more expressive.

**Figure 5: why plotting only the values for surface water when values for bottom waters are also available?**

We decided to present in the figure surface water data because they illustrate strong seasonality and the process of calcite precipitation which is described in the text. The data for bottom waters are available in the data file and can be used for any specific reason. However, in the context presented in the manuscript we think it is not necessary to plot them.

**Metadata file (zab\_metadata.pdf). Hydrochemistry-tributaries: I suggest repeating what I1, I2 and I3 refer to (or a link to Figure 1).**

We modified the metadata file. This reads now as:

- in\_out (stream id): I\* – inflow, O\* – outflow; character:
  - I1: major inflow from Lake Purwin (54.13590731° N; 21.98398011° E)
  - I2: episodic inflow from the direct catchment (54.13160649° N; 21.98812808° E),
  - I3: major inflow from Żabinka village (54.12980987° N; 21.98246778° E),
  - O1: major outflow to Lake Gołdopiwo (54.13060358° N; 21.97381504° E).

**Metadata file (zab\_metadata.pdf). Hydrochemistry: ions, I suggest spelling the elements out (na = sodium; k = potassium ....)**

We modified the metadata file. This part now reads:

- ions: mg L<sup>-1</sup>; numeric:
  - na: sodium (Na<sup>+</sup>),
  - k: potassium (K<sup>+</sup>),
  - mg: magnesium (Mg<sup>2+</sup>),
  - ca: calcium (Ca<sup>2+</sup>),
  - cl: chloride (Cl<sup>-</sup>),
  - so4: sulfate (SO<sub>4</sub><sup>2-</sup>).

**Metadata file (zab\_metadata.pdf). Sediment trap: explain why some data are missing with flags similar to the other datasets.**

We introduced the ND flag (no data). Lack of elemental data in two samples is related to the CNS analyzer failure (obviously wrong results, we were not able to repeat the measurements because of not enough sediment material left) while in one sample we measured TC/TN/TS but TOC/TIC could not be done due to lack of sediment material. Each of these cases is now marked with the ND flag.

**Metadata file (zab\_metadata.pdf). Remind the depth of the trap in the metadata file.**

Added info to the metadata:

The active area of the trap was exposed at 2 m above the sediment surface and deployed at 2012.05.05.

**Metadata file (zab\_metadata.pdf). Full resolution temperature data: the explanation of periods versus series is not clear. Would it be possible to explain this in a different way?**

We have rewritten this metadata information as follows:

“Series: one data series means that data logger operated continuously without any interruptions from the beginning of logging to the data offload.

Period: one period encompasses one or more series. Continued period means, that the end of one series is followed immediately by the beginning of the next series. Change from series to series means that only short logger offload time is introduced into the data. Continued

period allows uninterrupted data homogenization procedure. Change in the period variable means that the next series did not follow preceding one immediately and requires reset of the homogenization procedure.”

***Finally, I tried to get the daily meteorological data from the meteorological stations from the Institute of Meteorology and Water Management – National Research Institute open database (<https://danepubliczne.imgw.pl/>), but the web site is in Polish only, and I have not been able to go further than the home page. Would it be possible to provide a more specific link to the two datasets of interest for this paper?***

Source of meteorological data is independent of our research and we cannot provide the files. However, in the section “Data availability” we provided wider explanation with a reference to a paper which explains how to retrieve data for specific meteorological station from the IMWM-NIR database. This part now reads:

„Long-term, daily meteorological data from the meteorological stations in Kętrzyn (approx. 40 km west of the lake; ID 12185) or in Mikołajki (approx. 50 km southwest of the lake; ID 12280) are publicly available from the Institute of Meteorology and Water Management – National Research Institute (<https://danepubliczne.imgw.pl/>). However, because of complicated manual data access procedure we suggest using the provided Application Programming Interface (API), for example using R “climate” package (Czernecki et al., 2020) and provided station IDs.”

Czernecki, B.; Głogowski, A.; Nowosad, J. Climate: An R Package to Access Free In-Situ Meteorological and Hydrological Datasets for Environmental Assessment. Sustainability 2020, 12, 394. <https://doi.org/10.3390/su12010394>.