Public justification (visible to the public if the article is accepted and published):
Dear authors, I have looked at the revised version, considering the earlier reviewer comments. I noted that a few reviewer comments still need to be addressed, and have some minor comments after rereading your resubmitted version. Line numbers refer to the version without track and trace.

Thank you for your close reading of our manuscript. I have addressed the comments below and the line numbers refer to the marked up version.

Unanswered reviewer comments:
Please still include the mathematical approach (i.e. formula?) for the Schmidt stability, meromictic stability, Brunt-Vaisala or buoyancy frequency (N) and the dimensionless lake Number in the methods section.

There was a statement in the methods that calculations were performed with an R package, but lines 106-108 to clarify this point: "The density, Brunt-Väisälä or buoyancy frequency (N^2, s^{-2}), and the Schmidt stability were calculated using the RLakeAnalyzer package v.1.11.4.1 with equations described in that packages documentation (Winslow et al., 2019)."

The dimensionless lake number calculation is described in lines 208-209, but this sentence has been further clarified to make that more explicit.

Associate editor comments:
After the discussion that describes i) mixing, ii) chemical and iii) biological characteristics, it would be good if there was a short paragraph where you can discuss how these parameters interact. I.e., how are chemical characteristics predicted by the physical mixing, and or biological characteristics predicted by the chemical characteristics? This can be done per lake, or across the lake systems. If there is no connection to be made, a few lines where you explain this can be placed in the discussion.

To better frame these characteristics in the results & discussion, I have written a preamble for that section that describes how these interact (lines 131-138). Additionally, I have added some clarifying statements to the conclusion section to better address this integration.

L 110, define SCML

Thanks for catching this. The definition was originally in the introduction but that line was moved to the discussion following the recommended revisions. The definition for this acronym has been moved to line 117.

L 119, please describe briefly what data was retrieved from the student reports.

Where student data is used it is cited and the full citation information is in the reference list. However, this statement is now in lines 128-129: "Morphometric data, temperature and conductance profiles, observations of water column mixing, and inferences from biological experiments in these reports are referenced in the current study."

L 238, "with the balance mostly from magnesium", the meaning of this expression is not clear to me, please rephrase.

This is the charge balance. "Charge" has been added before balance in line 255.

L 293, please add a few more words to explain why zooplankton grazing causes a subsurface chlorophyll maximum.

Line 310 has been updated to: "and avoidance of zooplankton grazing in the epilimnion".

L 295, 'that was persistently present'. Please check throughout the text that the revisions did not result in missing words.

Present was added to line 313. The entire manuscript was carefully read and edited for clarity.

Additional private note (visible to authors and reviewers only):
Dear author, as the requested corrections are minor, they will be reviewed by the associate editor after resubmission.

Best regards,
Cindy De Jonge