

We thank the reviewer and appreciate the thorough and insightful comments which have helped improve the quality of the manuscript. Please find our responses to the reviewers' suggestions below. Our author responses are denoted "AR" with blue text.

Reviewer #1

This manuscript makes a valuable contribution to understanding methane emissions in inland waters. The authors describe a coordinated, multi-lake methane flux dataset collected across a significant latitudinal gradient in Sweden, which helps address an existing gap in consistent, long-term, and comparable lake methane observations. The work is timely, given the growing emphasis on aquatic methane emissions and their climate feedbacks, even though the study does not yield particularly novel conclusions. The manuscript is clear and concise, and it effectively sets out the scientific rationale, methodological novelty, and key findings. I have some minor comments that I hope will help improve this manuscript.

Here are my suggestions:

1. Line 38-39, incorrect use of parentheses.

AR: Thanks, now fixed.

2. Line 109-110, temperature and water color are not presented in Table 1.

AR: Thanks for noting. Table 1 is now updated with additional information following comments from other reviewers. We have revised the text, so it matches the new Table content.

3. Table 1, why does Lake ERS exhibit a dimictic mixing pattern despite having a maximum depth of only 5 m?

AR: The lake ERS has brown water and is surrounded by forest. It develops a metalimnion from approximately 2 m down to 4 m and have a tiny hypolimnion between 4 and 5 m. Hence, it resembles STO most in water chemistry and surroundings. The polymictic lake ALM with similar bathymetry has clear water and is highly wind exposed (alpine and low tundra vegetation in surroundings).

4. Figure 1, the label "stations not in the lake GHG program" does not need to be marked on the map. Furthermore, it is recommended to abandon the Köppen-Geiger scheme and instead label the corresponding climate types directly to improve readability and reduce comprehension barriers.

AR: Figure 1 has been updated by removing non-chamber program stations. We also changed the legend and now write out the climate zones instead of the Köppen-Geiger scheme.

5. Line 166, in Bastviken et al. 2004, "For each chamber the calculated k_{600} was divided by the minimum k_{600} for the same lake and sampling period, which we attributed solely to diffusive flux." "Hence a ratio of 2 was chosen as a threshold where we inferred significant methane flux into the chamber had occurred by ebullition." k_{600} , but not the k , please check the data.

AR: Correct and thanks for detecting this mistake. It is now clarified that the calculation is made with k_{600} .