

Interactive comment on “Summer fluxes of methane and carbon dioxide from a pond and floating mat in a continental Canadian peatland” by M. Burger et al.

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Reviewer 1:

It is unclear to me whether the authors were comparing the gradient CO₂ fluxes in both July and September or whether they are comparing to the chamber measurements.

– Here we compared the results of the gradient method with the chamber measurements at two different times, a) in September when the results were similar, and b) in July when fluxes obtained with the gradient method were overestimated. We suggest clarifying the wording of this statement in the revised version of the manuscript.

The authors might add another sentence or two in the methods section to justify why

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they used the gradient technique and why fluxes and why they differ from chamber measurements.

– We used the gradient method coupled to infrared sensor measurements to obtain daily amplitudes of CO₂ concentrations and fluxes, which is difficult to do with chamber measurements. We agree with the reviewer and suggest adding this motivation to the methods section.

I believe that Figure 9 might be eliminated and that the information within it can be added in tables 1 and 2.

– As the reviewer rightly states, Tables 1 and 2 detail relationships between environmental drivers and CO₂ and CH₄ flux. The relationships consistently consist of correlations, however, which differs from the comparison of means with the Kruskal Wallis test. To reduce the number of figures, as requested, we thus suggest adding the four numbers and standard deviations of the fluxes to the text, and moving the figure itself, which essentially visualizes the distribution of flux values, to the Supplementary information.

Figure 2 might be added to the Supplementary Material since it is not thoroughly discussed within the results and discussion.

– In the results we wrote a section on the weather data, which is in our opinion helpful for evaluation of the flux data, in particular with regard to the presentation of environmental controls in Table 1 and Table 2. We also refer to the weather conditions and Fig. 2 in the Discussion. While we agree that the paper is not about the weather conditions at the site, we thus believe that the figure should not be removed to the Supplementary Material.

In Figure 6 it is unclear, which four locations are depicted within each panel, and this information is not in the Methods section of the main text. It is also unclear where the sediment/water interface is located in Figure 6 and how deep the water is in each

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location. This information would be valuable for interpreting the discussion surrounding Figure at the end of page 12. Also I assume that these data [are] from the peepers and not the Vaisala probes, but it would be good to indicate this within the figure caption.

– We completely agree with these suggestions and suggest adding this information to the revised version of the paper.

Minor points Table S1: Reference error in the caption.

– We will correct this error.

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