Biogeosciences Discussions

Biogeosciences Discuss., referee comment RC1
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Comment on bg-2022-156

Anna-Helena Purre (Referee)

Referee comment on "Duration of extraction determines CO_2 and CH_4 emissions from an actively extracted peatland in eastern Quebec, Canada" by Laura Clark et al., Biogeosciences Discuss., https://doi.org/10.5194/bg-2022-156-RC1, 2022

The manuscript „Years of extraction determines CO2 and CH4 emissions from an actively extracted peatland in eastern Québec, Canada" approaches the significant topic for the scientific community and also practicioners working with peatland management issues. The manuscript is well prepared and written, generally easy to understand. The methodology and presentation of results is on sound basis. I especially like that the manuscript has not been over-complicated statistically, and the figures are also nice and supporting the undestanding of the methodology and the results. So the manuscript is in my opinion well worth reaching the wider audience of readers after some more specific comments have been approached.

Specific comments

Introduction

-lines 47-50 please give an explanation what do you mean under the peat quality? Some economic value or quality for microorganisms or something else?

Section 1.2- for giving the audience the hunch of the significance of the topic, please also bring out the area of peat production sites (e.g. globally) or percent of peat production sites from global peatland area.

-lines 81-83- GHGs on active milled peatlands was also measured by Salm et al. (2012) (some of the sites in his study), please also consider his work in the introduction and also in the discussion.

Methods

- Section 2.1: I would prefer to have more background data about the sectors of the site, like peat layer thickness, and some general parameters such as pH, peat decomposition
- Section 2.1: Also I would like to have the information if the similar peat production works were done on all sectors in similar amount. Also, if similar amount of peat per hectare (or production field) was removed in all sections. In peat production, they tend to remove different amounts depending on the peat decomposition (e.g. white, brown or black peat)
- Section 2.2: how often the chamber measurements were made? Maybe you could also give the number of measurements per sector.
- Line 150-151: was peat temperature profile measured during each flux measurement campaign?

Results

- I would like to have the short analysis of all measured variables (peat temperatures at different depth, peat volumetric water content), e.g. average values with standard deviations or some table, per sections. The the rest of the results sectors can be easier to discuss;
- In different parts 3.1.2, 3.2.2, 3.4.1 sentences with long lists of nummerical results are given (marked in yellow in uploaded pdf), although the results are also presented in easier to understand figure. I would prefer the numerical results as a table (maybe in annexes), to make understanding these values easier.

Discussion

- Lines 360-364: discuss also the results of Salm et al. 2012
- Lines 378-379: it is said that there is almost no influence of surface temperatures on measured CO2 flux, but you also measured temperatures in deeper peat layers, what about those?

Please also control the citations and reference, there were some missing references and some redundant references in the list. I marked those I noticed as yellow in the uploaded document.

Technical comments are given in the uploaded pdf.

Reference

Salm, J. O., Maddison, M., Tammik, S., Soosaar, K., Truu, J., & Mander, Ü. (2012). Emissions of CO2, CH4 and N2O from undisturbed, drained and mined peatlands in Estonia. *Hydrobiologia*, *692*(1), 41-55.

Please also note the supplement to this comment:
https://bg.copernicus.org/preprints/bg-2022-156/bg-2022-156-RC1-supplement.pdf