

## ***Interactive comment on “Wildfire switches the typical understanding of boreal peatland methane emissions” by Scott J. Davidson et al.***

**Anonymous Referee #1**

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Authors of the manuscript have studied the topic of utmost importance in the field of environmental research and the topic of their research is within the scope of current journal. In the World with warming climate and accompanying increased fire activity in boreal forest and peatland areas, more attention should be paid to the topic. Methane emissions of boreal fen are so far poorly studied and current manuscript has significant results to fill this gap. The text of the manuscript is fluent and easy to follow. The scientific quality of the research is excellent: experiment planning, data collection and data analysis support that received results have scientific value. I find that the manuscript can be considered for publication after minor revision. My specific comments on the manuscript are following:

Specific comments.

C1

Abstract: Page 1, line 15: Could you be more specific: were the emissions in the MB and SB significantly lower when compared to UB.

Introduction Page 2, line 2: A bracket is missing. Page 2, lines 5-13: Could you add also some information about the fire induced deposition of charcoal and ashes, and their effect to the soil pH and physical characteristics. Page 2, line 22: You mention the hydrophobicity of the peat as the reason for low surface moisture content. What about deposited ashes?

Methods Page 3, line 12-14: Please provide Latin names of plants and mosses with proper affiliations. This comment goes for all Latin names mentioned in the text. Page 3, line 15-19: Can you assure that the initial conditions of peatland margin and interior part were comparable by means of vegetation cover and water table conditions? Page 3, line 29-31: What about the vegetation succession? How much did the vegetation cover change between 2017 and 2018? Could this be the reason for changed CH<sub>4</sub> fluxes? Page 4, line 5-7: Why did you start with the gas collections 7 minutes after chamber was placed? Page 5, line 7: You have used the soil temperatures measured at 30 cm depth, although measurements were done from 2-30 cm depth. Is there any scientific explanation for that?

Results: Page 6, line 4-6: Please move this sentence to the Material part. This is partly explaining my question about the conditions in peatlands interior and margin areas.

Discussion: Page 7, line 2: “lend itself to” sound like informal language to me, but as I am not a native speaker, I might be also mistaken. Page 7, line 19: I would also add the time factor to the sentence. I think “whether” the CH<sub>4</sub> emissions will return to similar levels is rather sure. It is much more interesting how long it takes...

Figure 2: Graphics of current figure do not able to understand the microform type for most of burn severity classes.

Please also note the supplement to this comment:

C2

<https://www.biogeosciences-discuss.net/bg-2019-139/bg-2019-139-RC1-supplement.pdf>

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Interactive comment on Biogeosciences Discuss., <https://doi.org/10.5194/bg-2019-139>, 2019.