



EGUsphere, referee comment RC2  
<https://doi.org/10.5194/egusphere-2022-1006-RC2>, 2022  
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## **Comment on egusphere-2022-1006**

Anonymous Referee #2

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Referee comment on "Peatlands and their carbon dynamics in northern high latitudes from 1990 to 2300: a process-based biogeochemistry model analysis" by Bailu Zhao and Qianlai Zhuang, EGU sphere, <https://doi.org/10.5194/egusphere-2022-1006-RC2>, 2022

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### Overall Comment:

This manuscript presents important PTEM model projections concerning northern peatlands for a range of future climate change scenarios from 1990-2300. I think this study presents significant findings and conclusions that warrant publication subject to minor revisions as detailed below.

### General Comments:

I feel that a potential reader will benefit from inclusion of a study area (region) map to give context to the scale and geographical context of the region of interest. I particularly enjoyed seeing the maps in the Supplementary Information file and a map depicting this area will greatly benefit this manuscript.

I find that the text relating to your workflow methodology is confusing, this will be greatly improved if the authors include a simplified figure of the steps taken in the analysis. In the current format, the workflow methodology is difficult to follow and potentially replicate and test in future studies.

Some parts of the manuscript lack clarity and careful attention needs to be given to this. The use of multiple abbreviations makes the manuscript difficult to read in places where multiple abbreviations are used concurrently.

Please provide context to the reader when referring to "run-on".

### Specific Comments:

Line 7: This sentence lacks clarity, have they been a C sink during the entire Holocene?

Line 14: Adjust the text to "C sources are attributed to 1) peatland water table depth..."

Line 19: It will be beneficial to the reader to indicate specifically how much earlier this shift will take place.

Line 22: Please provide an in-text reference for the primary reference of this definition of peatland ecosystems.

Line 29: Please provide details on the phenology of peatlands in this region.

Line 29: The authors use the word "severe", rather quantify (increase in °C) being currently measured or projected between the Arctic region and surroundings. This needs more detail.

Lines 28-35: It is unclear whether these changes have been observed already (and have been quantified) or they are projected climate warming influences. As the previous comment suggests, please be more specific here. This detail will add to your argument.

Line 88: What about the peatland dynamics? This sentence must be rephrased as it is misleading.

Figure 1: Within the figure boxes please include the reference (citation) of the different datasets used. This will also aid in describing your workflow.

Line 414: Adjust the text from "no" to not

Line 436: Adjust the text from "depending" to depends.