

Thank you for the helpful suggestions on this manuscript. Please find the comments (blue) and our reply (black) below.

Authors using the word "glacial" very often do not specify that they mean age but not the origin of the deposits they studied. It might confuse the readers who are not familiar with the paleoenvironmental conditions of the area of investigation. I suggest to use marine isotopic stages or regional stratigraphic units.

Where necessary, we changed "glacial" to refer only to age and not origin to avoid ambiguity, e.g. line 23 and line 274.

Lines 64 and 65. I would recommend to authors include in the review of the assessments of the carbon pools in different stratigraphic horizons research published by Shmelev et al (Shmelev, D., Veremeeva, A., Kraev, G., Kholodov, A., Spencer, R. G., Walker, W. S., & Rivkina, E. (2017). Estimation and Sensitivity of Carbon Storage in Permafrost of North-Eastern Yakutia. *Permafrost and Periglacial Processes*, 28(2), 379-390.).

We included this information as suggested in lines 69–72.

Line 95. It is not so important for this study, but permafrost temperature in this region varies with the topographic forms and consist of -9 within the thermokarst depressions and -10.5 at the yedoma hills (Kholodov, A., Gilichinsky, D., Ostroumov, V., Sorokovikov, V., Abramov, A., Davydov, S., & Romanovsky, V. (2012, June). Regional and local variability of modern natural changes in permafrost temperature in the Yakutian coastal lowlands, Northeastern Siberia. In *Proceedings of the Tenth International Conference on Permafrost, Salekhard, Yamal-Nenets Autonomous District, Russia* (pp. 25-29).)

Thank you for this reference. However, we agree that the temperature differences between topographic forms are not of utmost importance for the current study.

For the Results section, I also recommend authors to insert the graphs of dynamics of the greenhouse gases production during the experiment to give readers a better idea about dynamics of the process of organic matter decay.

Thank you for this important comment. We will deposit all the data of the current manuscript on PANGAEA (<https://doi.pangaea.de/10.1594/PANGAEA.892950>) so we decided not to insert the graphs of dynamics of the greenhouse gas production during the incubation of the samples in the manuscript. Since we incubated 117 individual samples, this cannot be done in a reasonable way.