

The line numbers refer to the last version of the revised manuscript.

General comments

The authors have made substantial clarifications, greatly improving the manuscript.

I still do not understand the contradiction between Fig.S2 and the text l.287. As expected, the simulated permafrost region (continuous permafrost) in Fig.S2 is smaller than the observations from Brown et al. (2002) (continuous+discontinuous). However, the text states that the simulated initial permafrost region covers $2.5 \cdot 10^7 \text{ km}^2$, which is larger than the observed permafrost region ($2.1 \cdot 10^7 \text{ km}^2$). This contradiction could be explained if the observed permafrost region was the actual area underlain by permafrost (i.e. the sum of the grid cell areas multiplied by the permafrost fraction). However, this does not seem to be the case, as the area underlain by permafrost is estimated to be between 1.4 and $1.6 \cdot 10^7 \text{ km}^2$ (Obu, 2021). If I understand correctly, the observed permafrost region of $2.1 \cdot 10^7 \text{ km}^2$ represents the entire area within the black boundaries of Fig.S2. As the simulated initial permafrost region is smaller than the observations (Fig.S2), I would expect it to be smaller than $2.1 \cdot 10^7 \text{ km}^2$.

However, this is a minor issue and does not impact the main results of the paper. Therefore, I consider that the manuscript can be published as is.

Technical comments

l.155 : Typo “Chiedung” → “Schiedung”

l.307 : Typo “afterwords” → “afterwards”

References

Obu, J. (2021). How much of the Earth's surface is underlain by permafrost? Journal of Geophysical Research: Earth Surface, 126, e2021JF006123. <https://doi.org/10.1029/2021JF006123>