

The Cryosphere Discuss., referee comment RC1  
<https://doi.org/10.5194/tc-2022-134-RC1>, 2022  
© Author(s) 2022. This work is distributed under  
the Creative Commons Attribution 4.0 License.

## **Comment on tc-2022-134**

Anonymous Referee #1

---

Referee comment on "Permafrost saline water and Early to mid-Holocene permafrost aggradation in Svalbard" by Dotan Rotem et al., The Cryosphere Discuss.,  
<https://doi.org/10.5194/tc-2022-134-RC1>, 2022

---

Dear authors,

I have reviewed your paper entitled "Permafrost saline water and Early to Mid-Holocene permafrost aggradation in Svalbard". It provides a novel approach to the understanding of permafrost evolution in one of the best studied areas in the polar regions with regards to past environments and permafrost dynamics. Even if I am not expert on the modelling part, I found it well-written and easy to follow. Figures and tables are of good quality.

The introduction constitutes a very complete assessment of the research background on the studied topics and objectives of the work. The study area does not provide present-day climate data, which would help to frame to understand (past) simulated conditions. The methodological part is very well described, and the different steps of the research approach clearly exposed. Discussion is concise and summarizes the main findings, comparing it with other areas where Holocene permafrost dynamics has been also examined. Conclusions capture also the main findings of the paper. It would be interesting to add what are the implications of these results for recently exposed (Late Holocene) areas, and how these data can be used to assess on the future evolution of permafrost in Svalbard (aggradation. vs degradation).

### **Specific comments**

Page 3, l. 50 – include also snow cover dynamics.

Page 3, l. 52 –warm-based glaciers

Page 3, l. 54 –better to refer to Last Glacial Cycle than to the LGM

Page 4, l. 86 – last glacial cycle

Page 4, l. 88 – are all ages calibrated (cal BP)?

Page 4, l. 102 – to better understand and frame the study cases presented later in the paper, present-day MAATs should be given here. Similarly, as also described in the Discussion, precipitation values should be included here.

## **Figures**

Consider adding a picture of the study site (and maybe also of the cores) to help the reader better understand the environmental/sedimentological setting.