

The Cryosphere Discuss., referee comment RC3 https://doi.org/10.5194/tc-2021-208-RC3, 2021 © Author(s) 2021. This work is distributed under the Creative Commons Attribution 4.0 License.



Comment on tc-2021-208

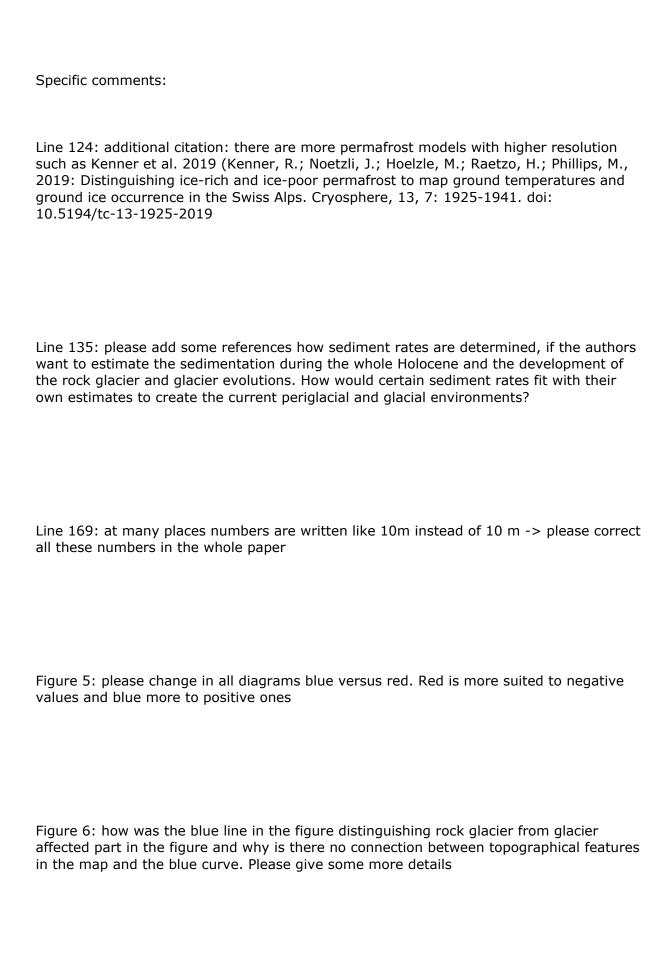
Anonymous Referee #3

Referee comment on "Glacier–permafrost relations in a high-mountain environment: 5 decades of kinematic monitoring at the Gruben site, Swiss Alps" by Isabelle Gärtner-Roer et al., The Cryosphere Discuss., https://doi.org/10.5194/tc-2021-208-RC3, 2021

This paper investigates about five decades of kinematic monitoring at the Gruben rock glacier and glacier site in the Valais, Swiss Alps. The study tries to better understand the evolution between a more permafrost influenced structure and the polythermal glacier part, which form several complex geomorphological forms with different vertical and horizontal changes. This study is an excellent example what efforts of long-term observations can provide to better understand geomorphological landforms and their process-based behaviors. The study is very well prepared and written and the history of the study is carefully compiled.

General comments:

- Figure 1 and 2 could be joined into one single figure and the color scale of the permafrost distribution model of Böckli et al. 2012 could be strongly reduced to a very light transparency level. If the authors do not want to change this, then the figure 2 should be deleted and the dashed white lines should be integrated in figure 1.
- It is understandable that the authors have not included the old measurements of Kääb et al. 1997. However, this study is somehow missing this important information and the study would strongly profit, if the old information of Kääb et al. 1997 could be included in Figure 5 to particularly show the whole investigated period. I do not think that this is a duplication of information, but readers would probably like to have access to full five decades and not only the new data since 1994 to 2016.



Line 331: giving a retreat of the no debris covered glacier part is somewhat problematic as this part is not really the glacier tongue as it is still connected to the debris covered part of the glacier and showing a retreat of this part is not very convincing. In addition, giving the full retreat of 370 m is ok, but showing the annual mean values of 17 m does not make sense, as one knows that glacier retreat can be highly variable and if the individual annual values are not measured, the annual values should not be provided.