

Authors' response to the Editor

J. Seguinot, on behalf of all authors.

June 14, 2021

Dear Andreas Lang,

We apologize for the delays during the peer review of our manuscript. We believe that we have addressed all points raised by the reviews and hereby submit our revised version to *Earth Surface Dynamics*.

Please find hereafter a short summary (and attached, a marked-up file) listing changes made to the manuscript since its first publication as a preprint. If possible, we ask you to please refer to our public responses for more detailed point-by-point lists of changes.

- **Sect. 2 (Methods):** We made explicit the input topography and temperature records used in the parent study (Seguinot et al., 2018), clarified simplifications made when computing erosion rates from basal velocities, and, accordingly, refer to the resulting quantities as “erosion potential” in the entire manuscript.
- **Sect. 4 (Discussion):** We added sentences and whole paragraphs to discuss the systematic eastwards bias of ice cover (and thus erosion potential), the magnitude of our computed erosion potential versus expectable glacial cycle erosion, the uncertainties on basal sliding, and model limitations in high mountains due to resolution and approximated physics.
- **Figures:** We added scale bars on all map figures, and hatched regions on Figs. 1, 2, 4 and 6 to indicate low confidence in our results for small glaciers. We added the field-based LGM outline on Fig. 1 (ex-Fig. 2), used different line styles to distinguish glacier advance and retreat on Fig. 2 (ex-Fig. 3), added glacier-advance (36 ka) and ice-free (0 ka) erosion maps of the Rhine Glacier on Fig. 3 (ex-Fig. 4), plotted glaciated hypsometry and cumulative erosion per elevation band on Fig. 4 (ex-Fig. 5), made style changes to improve readability of Figs. 6 and 7 (ex-Figs. 7 and 8), moved Fig. 8 (ex-Fig. 1) into the discussion and replaced one of the photos.
- **Supplementary figures:** This was not mentioned in our responses. Following the reviews, and if this does not result in additional page charges, we would like to amend a supplementary document containing copies of Figs. 1–5, and their equivalent as plotted with alternative erosion laws (more briefly presented in the manuscript Fig. 6). Comments from both reviewers highlight the difficulty of labelling any of the tested erosion laws more “realistic” (this wording was removed), and the supplementary figures may prove useful alongside future developments of empirical glacier erosion laws.

- **Text improvements** were made throughout the text and figure captions following suggestions from the reviewers.

We thank you again very much for your editorial work on our manuscript.