

## 2<sup>nd</sup> response to associated editor and reviewers

We thank the reviewers for another look at the manuscript and are grateful to see that the manuscript is almost ready for submission. Below is the response to reviewer 1. In addition, we have added the anonymous reviewers in the acknowledgements, a minor modification in one of the affiliations, as well as links to the model data and code in the data and code availability section. The DOI for the model data repository on Zenodo has been reserved and will become active when the DOI for this manuscript is created and added to the Zenodo dataset. During code cleaning, we also discovered the need for updating some numbers related to Figures 7, A3, and A4 about wind regimes and have therefore updated the corresponding text in Section 4.2.3 (minor edits between line 314 and 341 that do not change the qualitative findings of this work).

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### Reviewer 1

The authors have addressed all the major comments well. Substantial improvements have been made to the text and figures that have clarified the results.

While the unintentional change in topography outside the glaciated area in some simulations is unfortunate, it should not affect the major results. However, it would help the reader if the changes in DEM are shown (in an appendix) and if the (unintentional) effect of this on the results is foreshadowed in the methods section. To this end the following changes are suggested before publication:

- Around line 143 (in marked up manuscript) please add comment about effect on air temperature/precipitation of the elevation changes or at least point to the section where these are discussed.

We agree and have added a comment about this in lines 136-137 in the updated manuscript.

- Please include plots of elevation changes for both bed topography and 'Future' DEM (in an appendix) as these are insightful for not just the spurious temperature/precipitation patterns but also the magnitude of elevation changes in these scenarios.

We have added the two requested plots in the appendix (Figure A1) and refer to them in line 134.

An additional modification to address the major limitation highlighted in the original review is warranted in the conclusions –

- Line 419 (in marked up manuscript)- around this text "While this study focuses on the direct impact of vanishing ice on regional climate, our findings should be tested in coupled models accounting for changes in both glacier mass balance and the atmosphere over longer time periods." Please add a comment about the effects (e.g., land-surface air temperature feedbacks) of changing snow cover that would drive glacier recession here. In a coupled simulations, changes in snowfall will drive glacier recession, and the effect of the changing seasonal snowcover as well as glacier area and elevation on land-surface feedbacks and orographic processes should be explored in more detail.

These are good points to add to the conclusions. They are now included in lines 403-405.