

Interactive comment on “Rapid waxing and waning of Beringian ice sheet reconcile glacial climate records from around North Pacific” by Zhongshi Zhang et al.

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Dear Darrell,

Thanks for reading and commenting on our paper.

We agree with you that our simulated ice extent in Alaska still includes mismatches with regional direct evidence, due to the modelling uncertainties and the coarse resolution of the climate model. However, our simulations reveal the following two points, which agree reasonably with your map. 1) Alaska is not fully covered by ice during past glacial-interglacial cycles. 2) The ice or glacier system on Alaska can be divided into

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two parts, one in the north, the other in the south. The south part is connected to Cordilleran ice sheet, also shown in your map. Our simulations suggest that the north part belongs to the BerIS. Alaska is the key region to investigate whether the BerIS and the Cordilleran ice sheet was once connected or not.

On the other hand, when we consider the map from Glushkova (2011) and your map in Alaska (Kaufman et al, 2011) together, it remain acceptable to say that our simulated BerIS agrees nicely, at least reasonably, with these maps. The majority of the BerIS is located on the NE Siberian side, not in Alaska. The ice sheet on the NE Siberian continents plays a crucial role in reorganizing the atmosphere circulations.

Very detailed reconstructions for the regional ice sheet extent in Alaska relies on the coupled high-resolution climate and ice sheet models, and often needs down-scaling simulations. When the possibility of the BerIS can be reconsidered, we believe there will be more efforts to constrain the ice extent in Alaska with high-resolution models.

If you have more comments, please let us know.

Zhongshi on behalf of all coauthors

1. Glushkova, O. Y. Late Pleistocene glaciations in north-east Asia//Developments in Quaternary Sciences. Elsevier 15, 865-875, 2011.

2. Kaufman, D.S., Young, N.E., Briner, J.P., Manley, W.F.: “Alaska Palaeo-Glacier Atlas (Version 2)” in Quaternary Glaciations Extent and Chronology, Part IV: A Closer Look, Developments in Quaternary Science, J. Ehlers, P.L. Gibbard, P.D. Hughes, Eds, (Elsevier, 2011), pp.427-445.

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