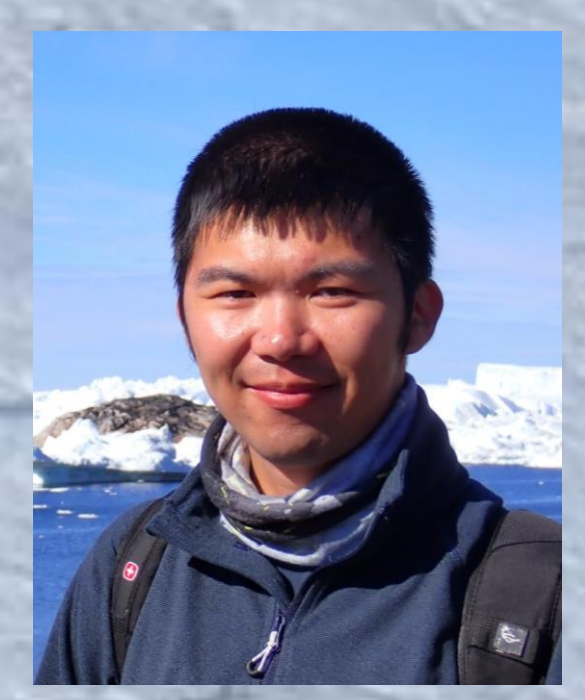


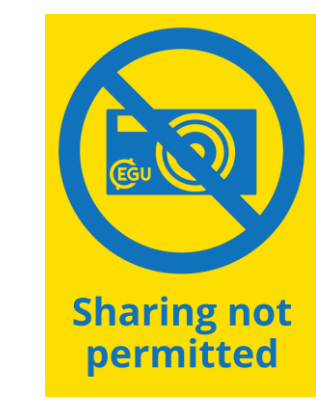
Topographic controls on the distribution of dark ice on the surface of the Greenland Ice Sheet



Abstract

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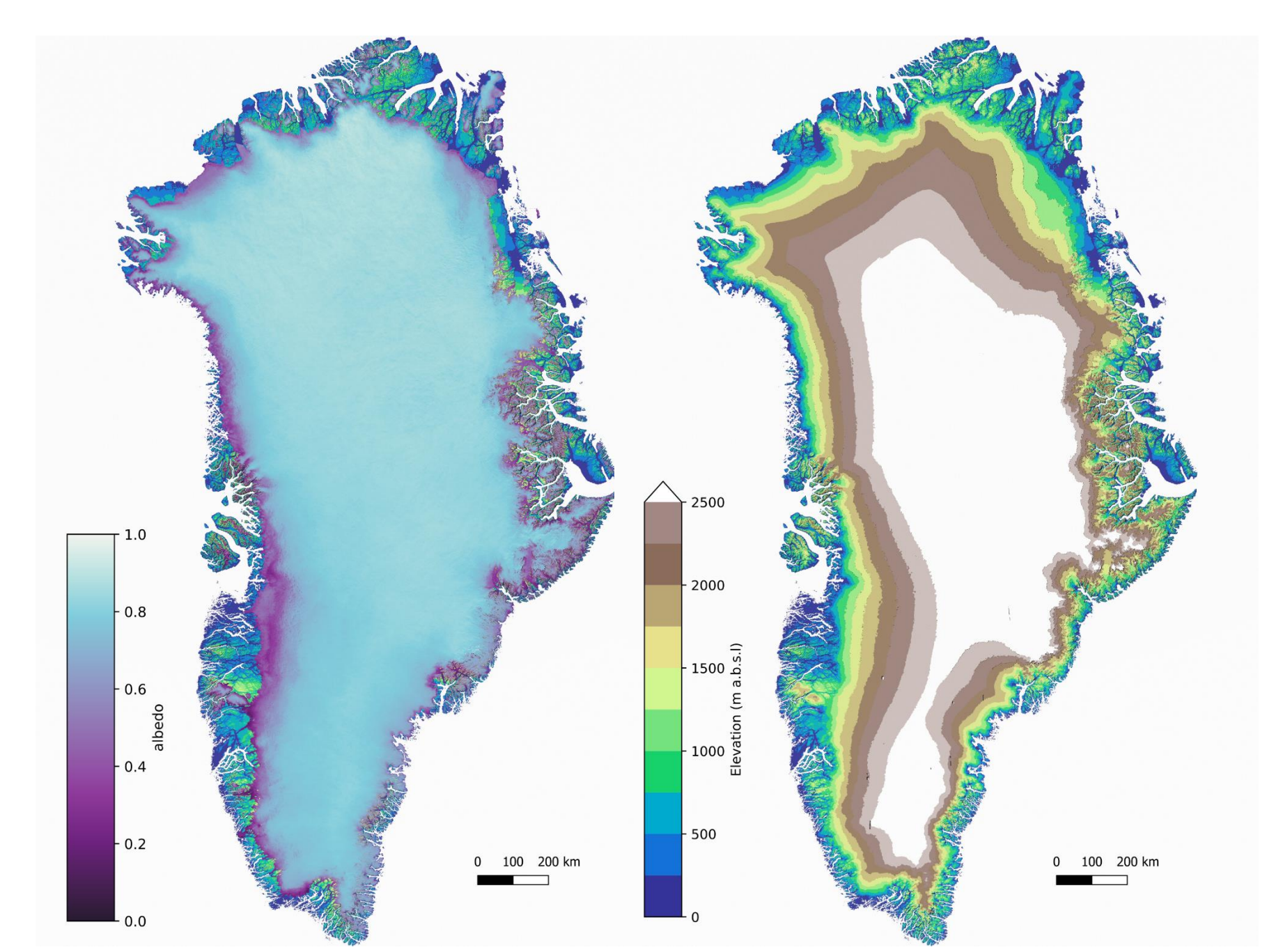
Contact*



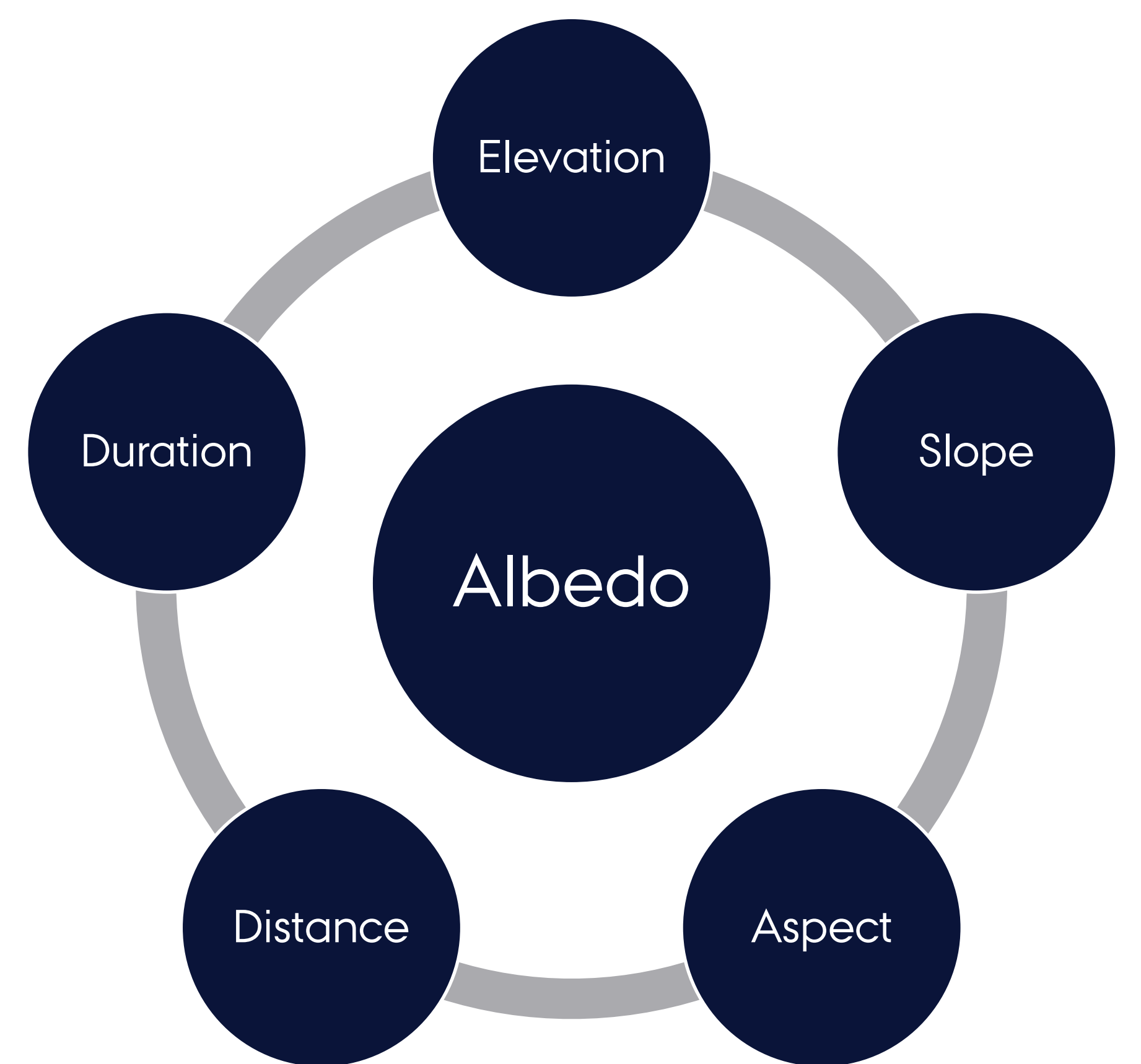
Project

GitHub fsn1995
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<https://www.glacier-hub.com/>

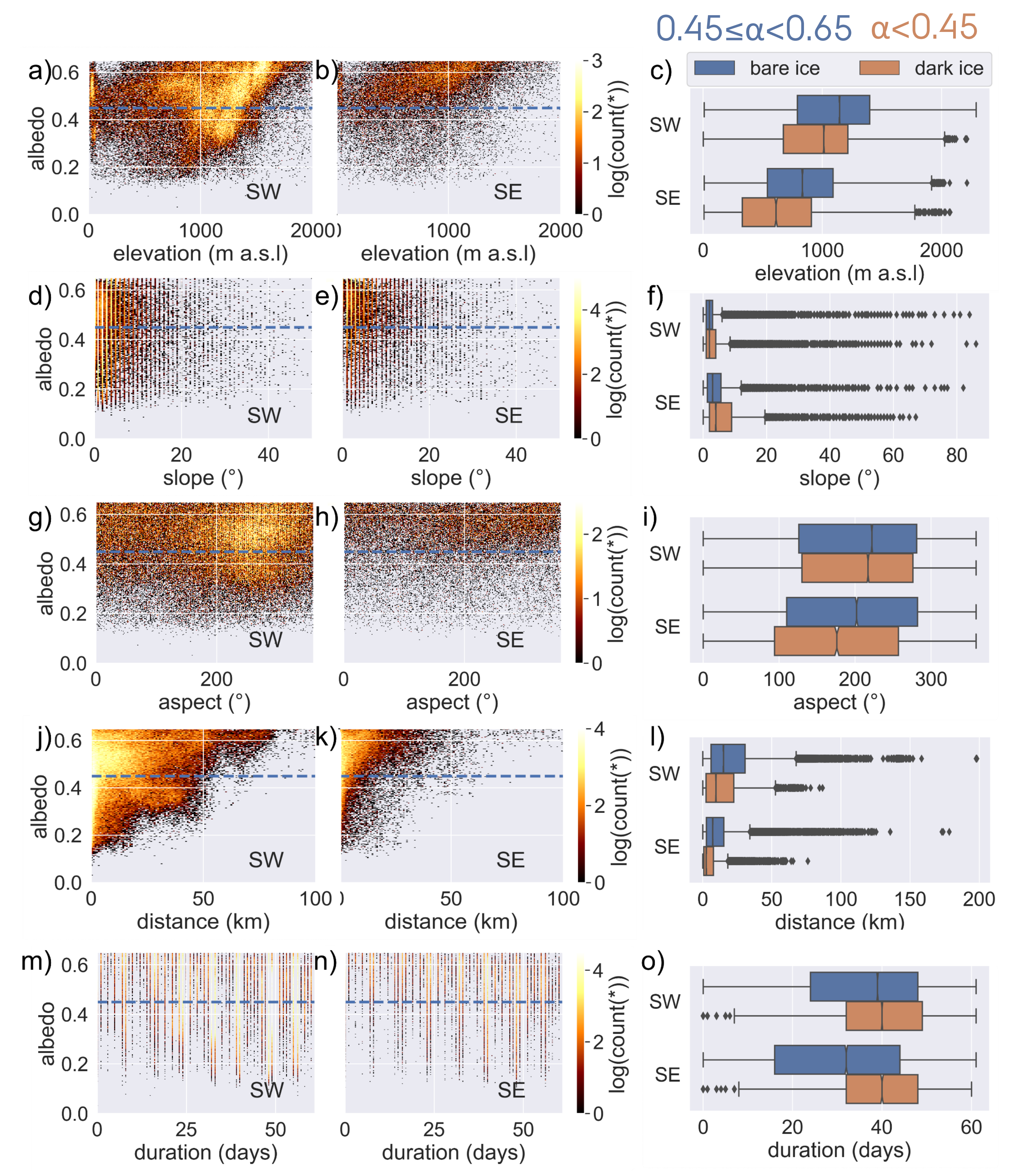
Can the extent of dark ice in the southeast and the southwest of the GrIS be explained by geo-topographic and phenological factors?



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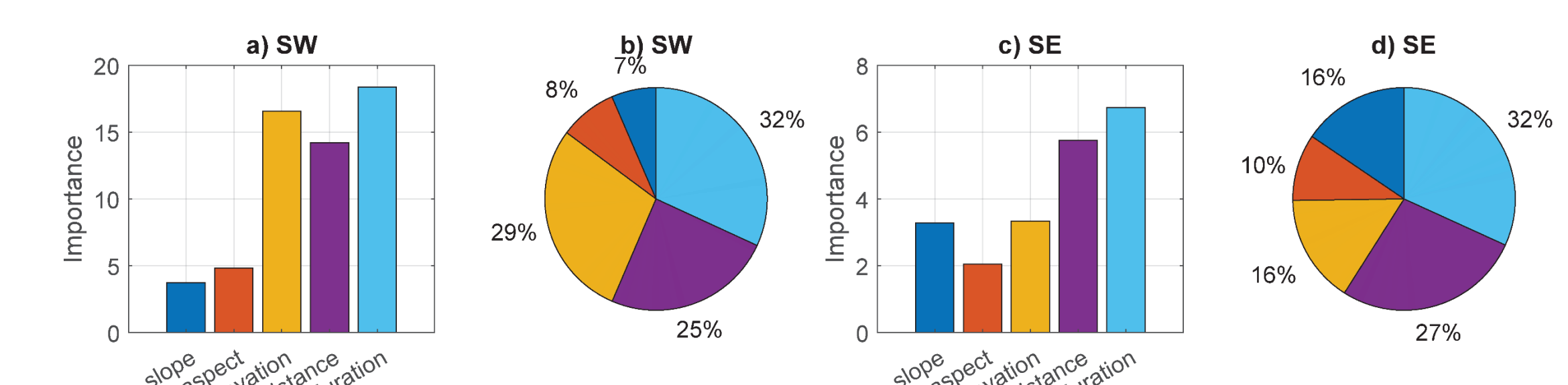


Results: regional comparison and statistical analysis



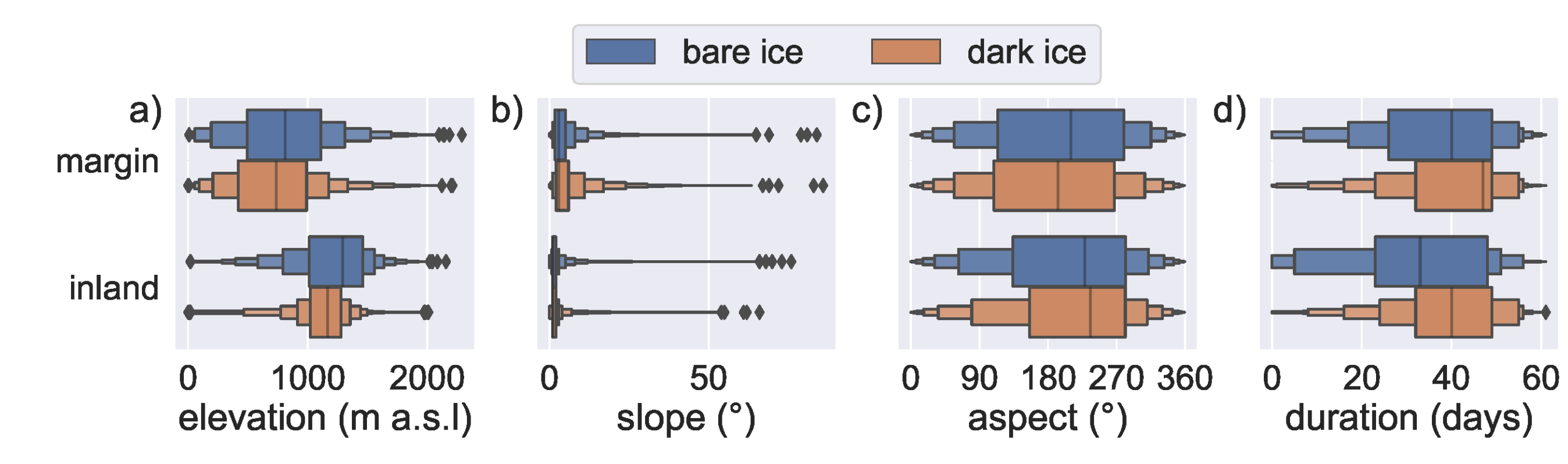
Heatmap shows the association between albedo and analyzed factors. Boxplot shows the distribution of bare ice and dark ice in the southwest and southeast GrIS.

Results: predictor Importance



Relative importance of all factors estimated from a random forest classification model.

Results: subregional analysis in SW GrIS



Take home message:

- Phenological factor is primary control, geo-topographic factors are secondary
- Slope and aspect influence darkening via snow-free duration and algal growth
- Longer (median=40 days) snow-free duration is prerequisite for ice to become dark

Reference and Acknowledgement

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2. DEMs provided by the Polar Geospatial Center under NSF-OPP awards 1043681, 1559691, and 1542736.
3. Feng, S., Cook, J. M., Anesio, A. M., Benning, L. G. and Tranter, M. (2023) "Long time series (1984–2020) of albedo variations on the Greenland ice sheet from harmonized Landsat and Sentinel 2 imagery," *Journal of Glaciology*. Cambridge University Press, pp. 1–16. doi: 10.1017/jog.2023.11.

