

# Introducing LATTICE – a new project investigating land-terminating ice cliffs in North Greenland

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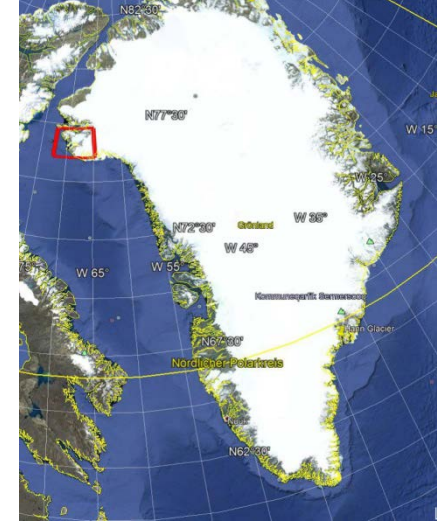
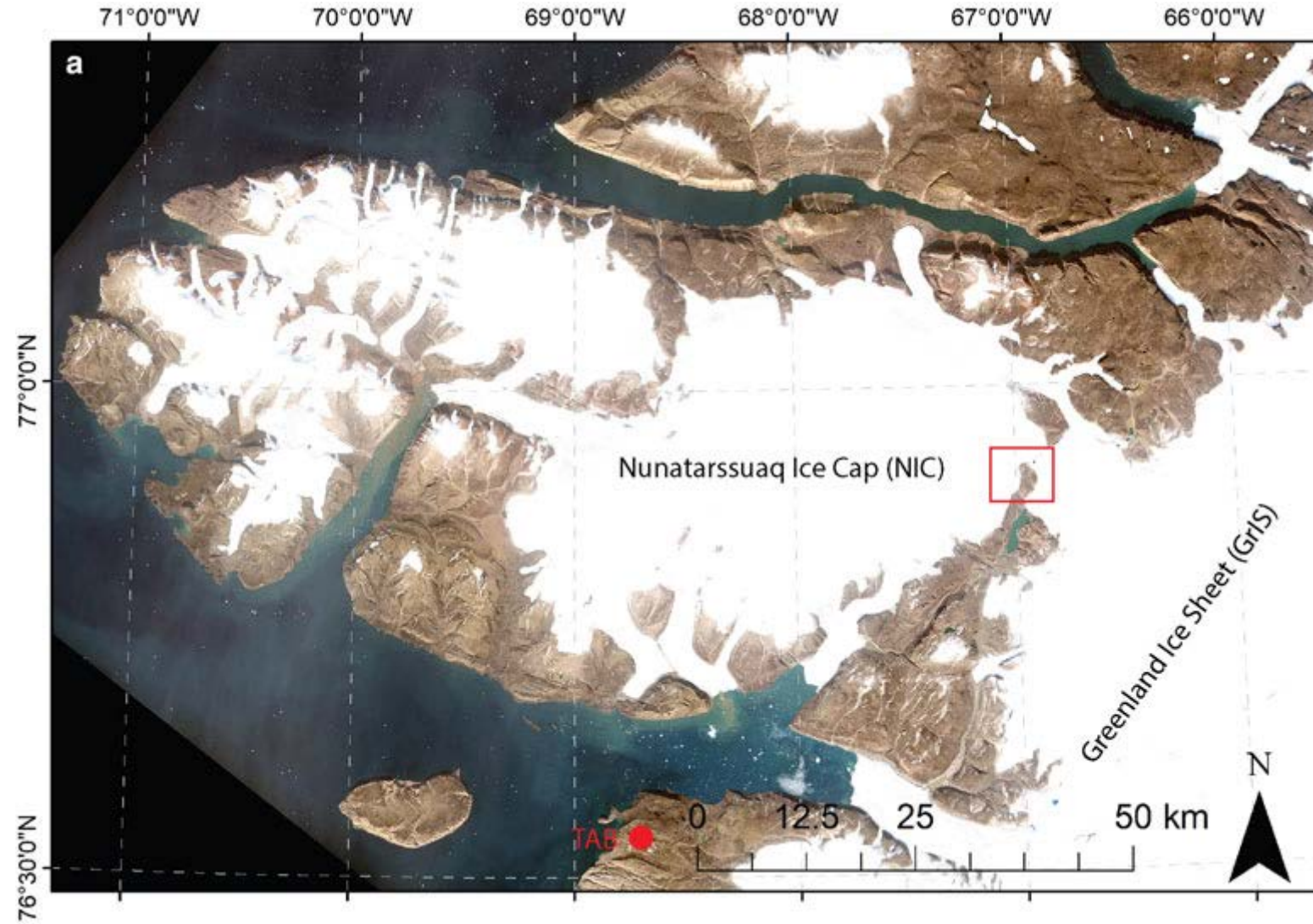
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# Background

- ❄ Kilimanjaro Ice Cliffs – Bibliography: Winkler 2011
- ❄ Nunatrassuaq ice cliff studies in the 1950s and 1960s - Richard P. Goldthwait
- ❄ Reconnaissance expedition 2017: Abermann et al. 2020 (J.Glac.)



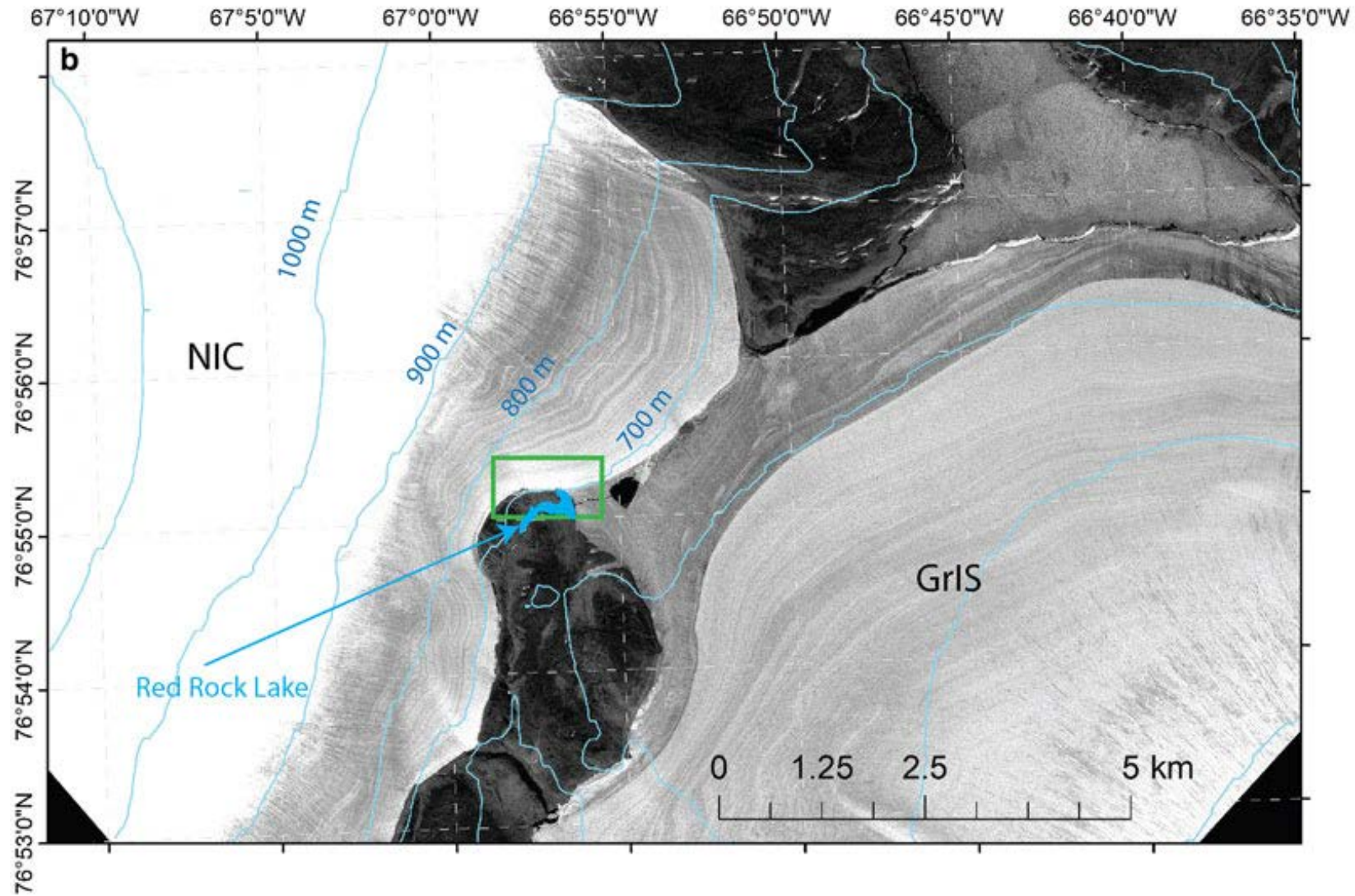
# Nunatarssuaq



Abermann et al. 2020



# Red Rock



Abermann et al. 2020

# Greenland Mass Balance

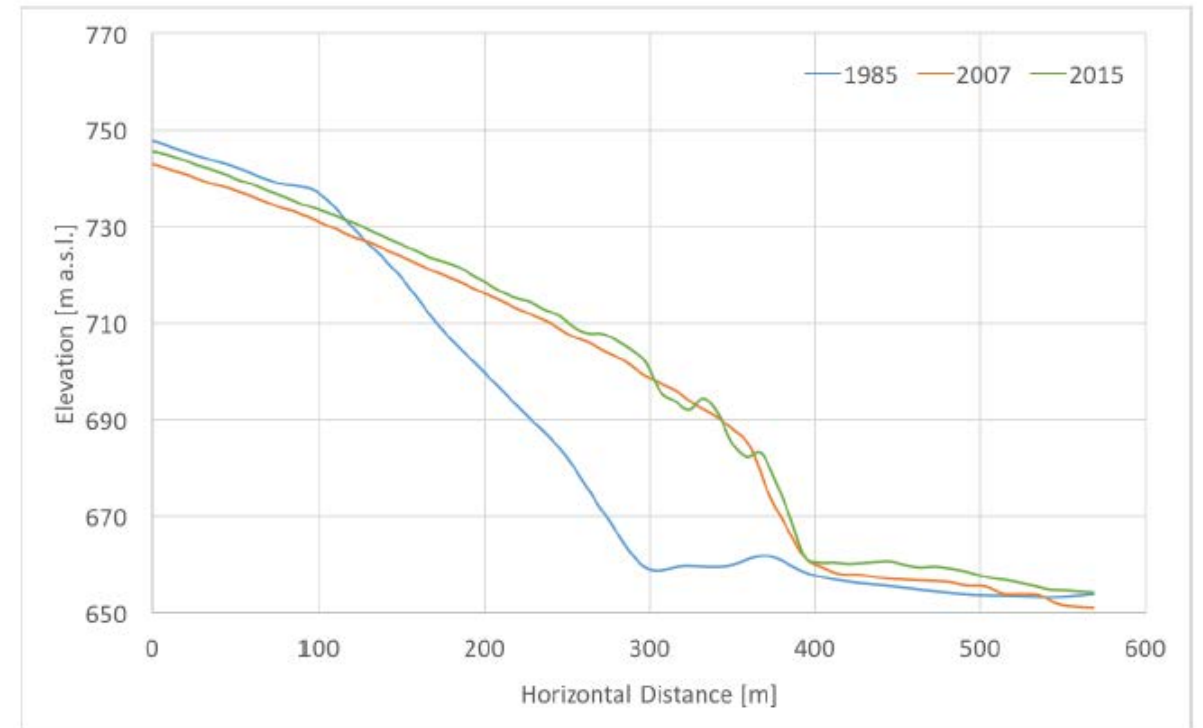
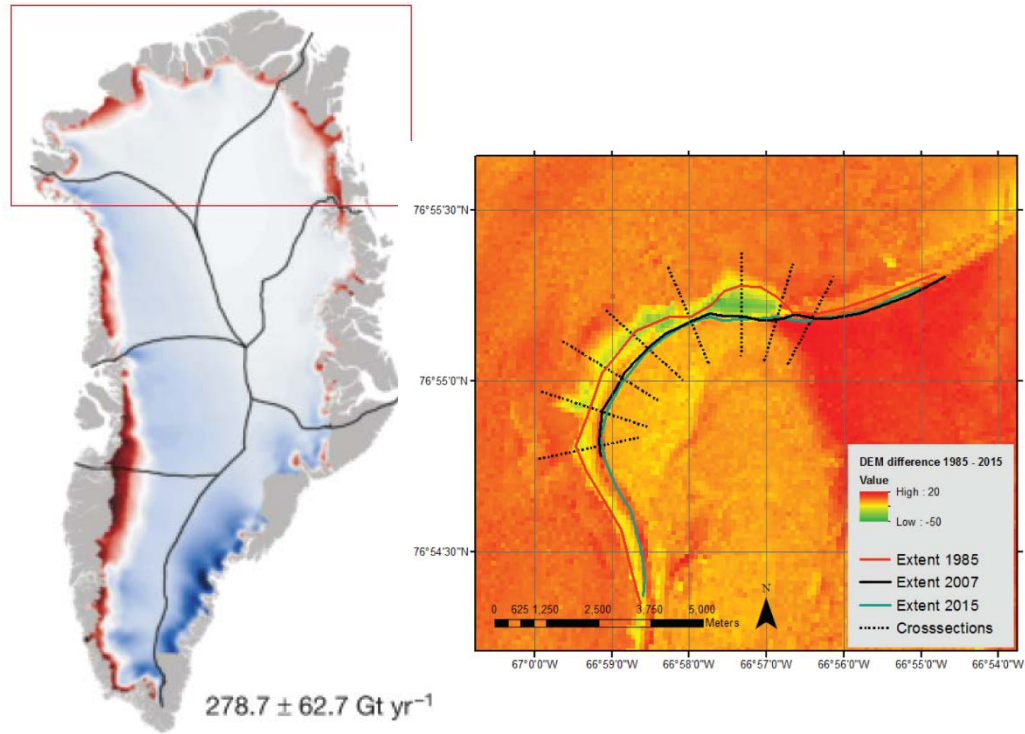
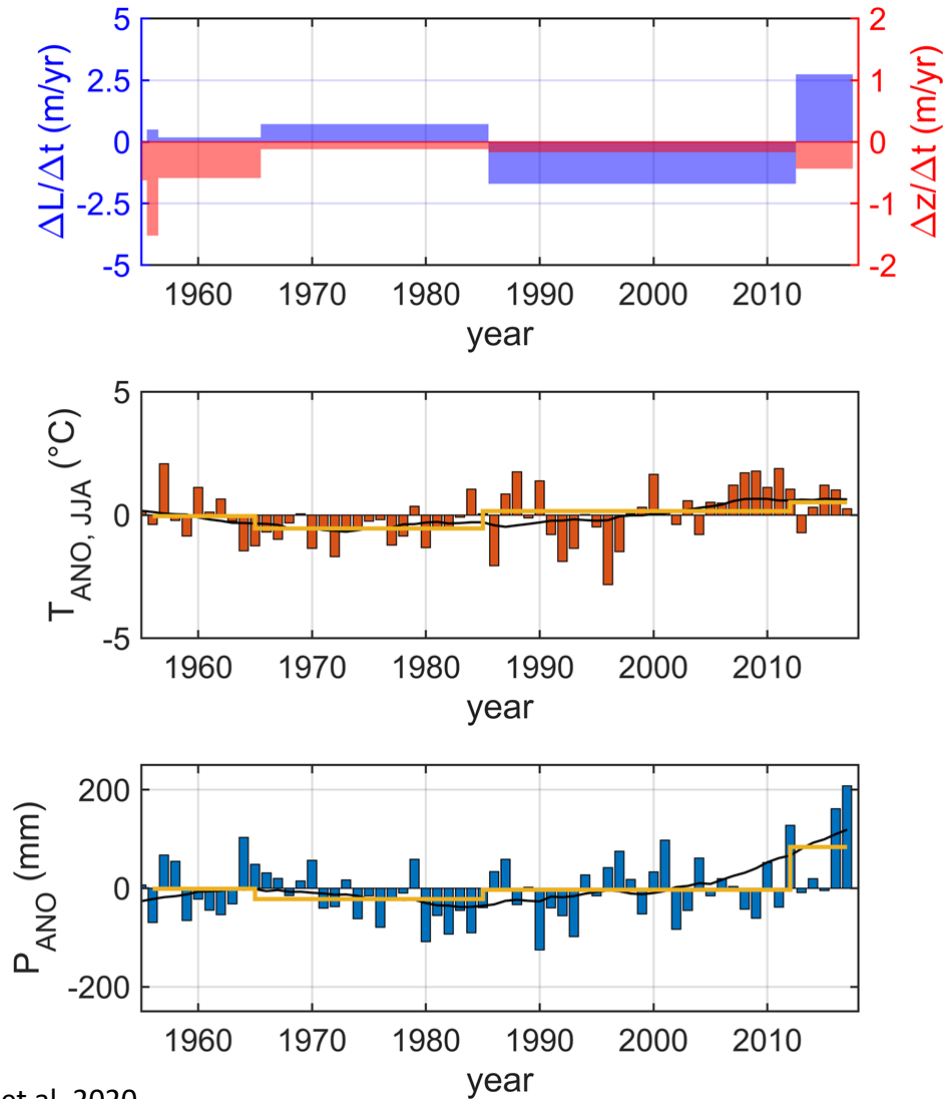


Figure 1: Surface Mass Balance of the GrIS 2003 - 2010 (Kjeldsen et al., 2015) with the in-

# Ice cliff thinning and advancing



=> FWF Proposal

Abermann et al. 2020

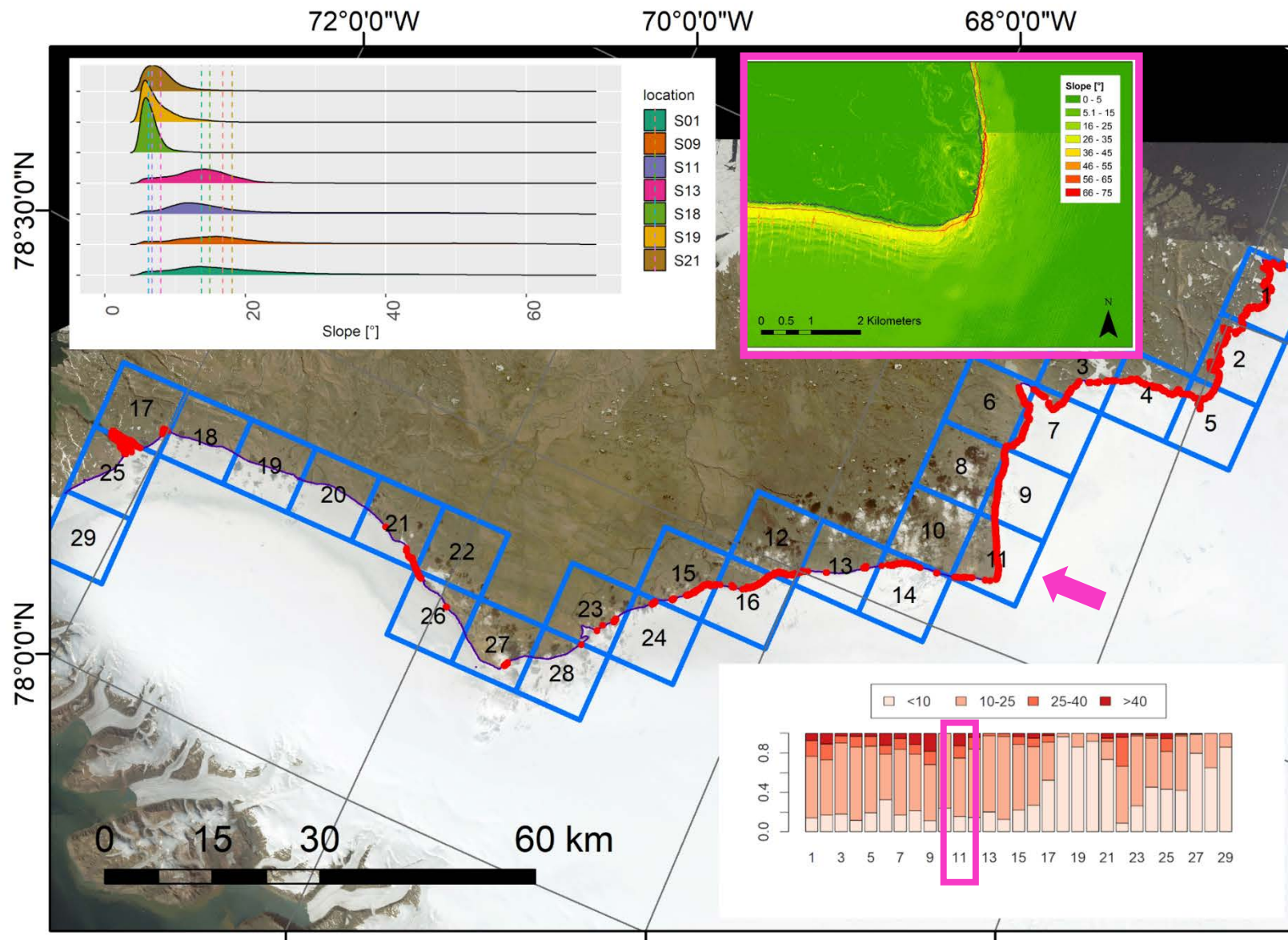


# LATTICE – Land-terminating ice cliffs in North Greenland: processes, drivers and their relation to regional climate: Oct 2023 – Jan 2027

- \* Identify the drivers of change in ice cliff position and morphology and quantify the sensitivity of the ice cliff to these main drivers.
- \* Decipher a climate signal from observed ice cliff changes.
- \* Determine if and how local scale processes relate to large-scale synoptic patterns and modes of climate variability.



# Ice cliff position and morphology

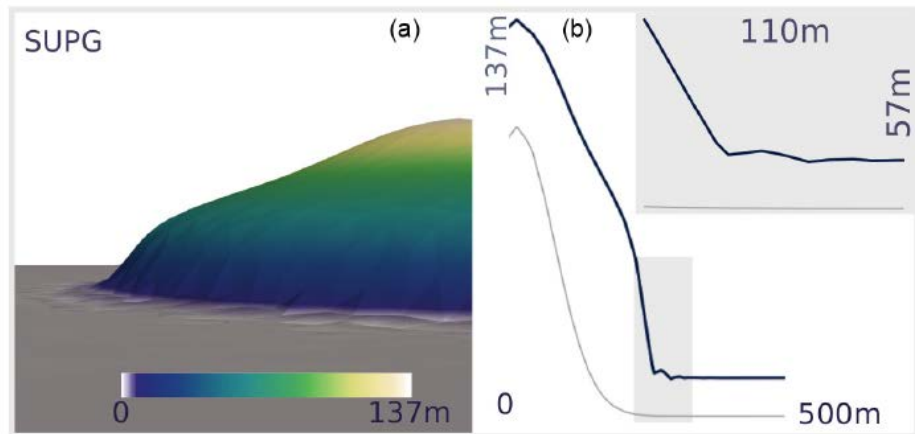


Steiner et al. in prep.

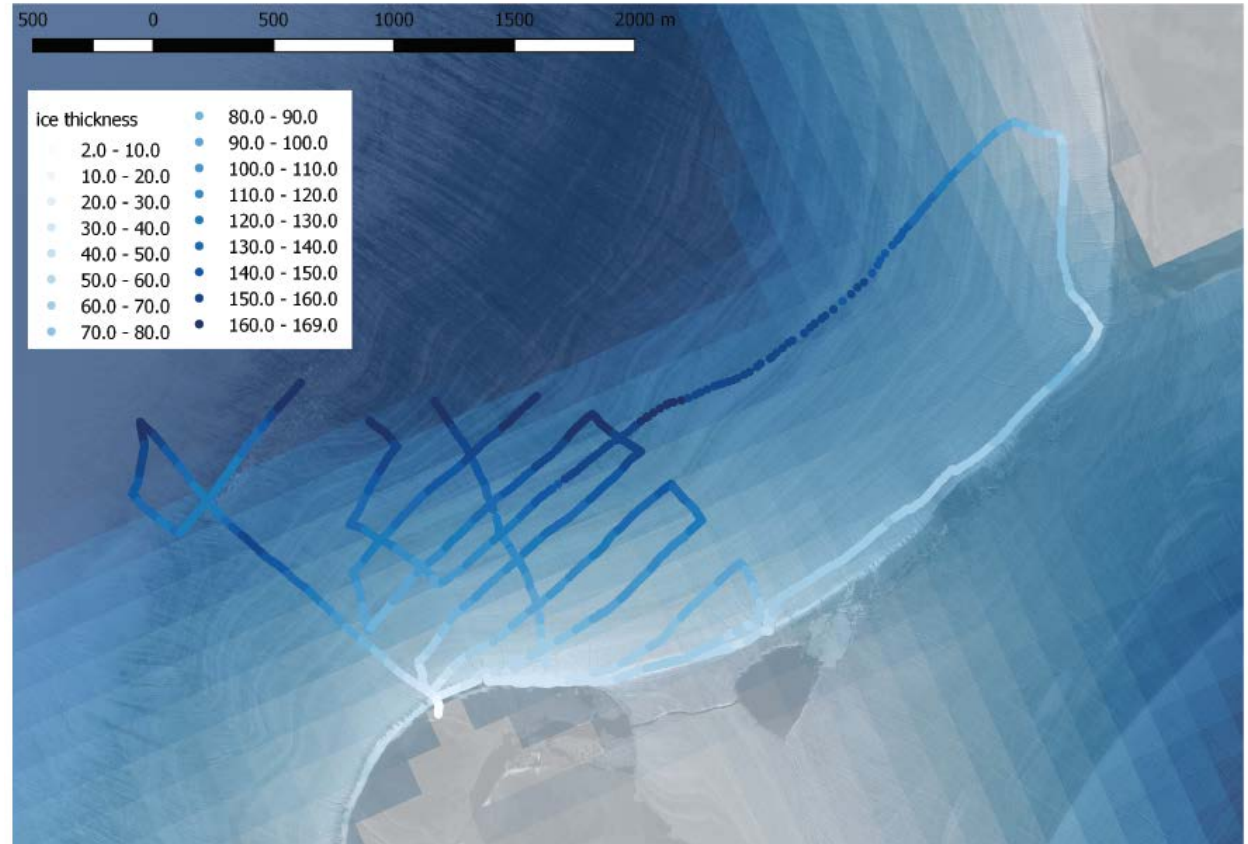


# Role of glacier dynamics?

❄️ FEM stokes model "evolve\_glacier"



Wirbel and Jarosch 2020



Abermann et al. 2020

## Two different glacier regimes – climate signal?

- \* Two glacier regimes: vertical cliff and horizontal surface
- \* Different responses to climate controls

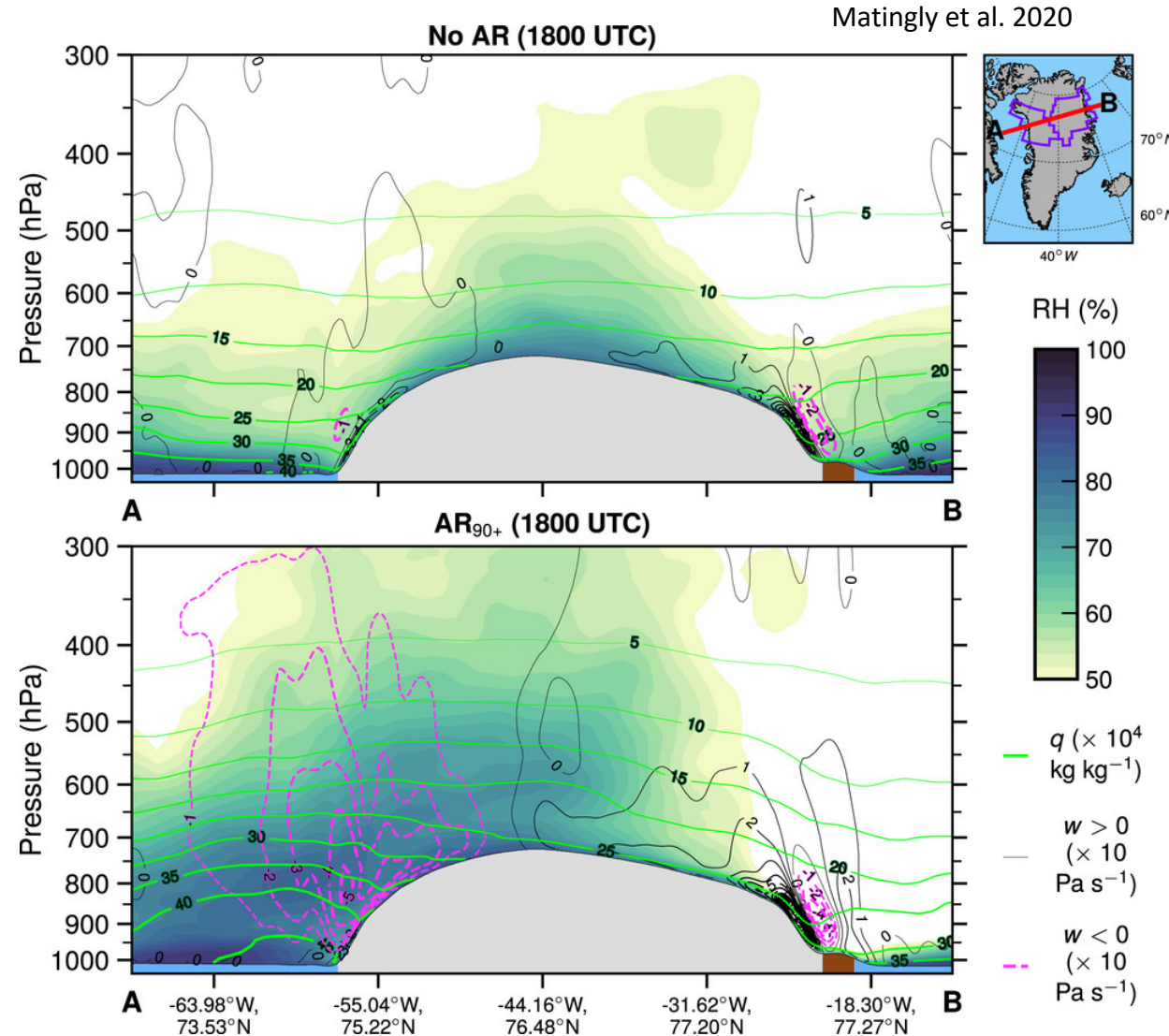
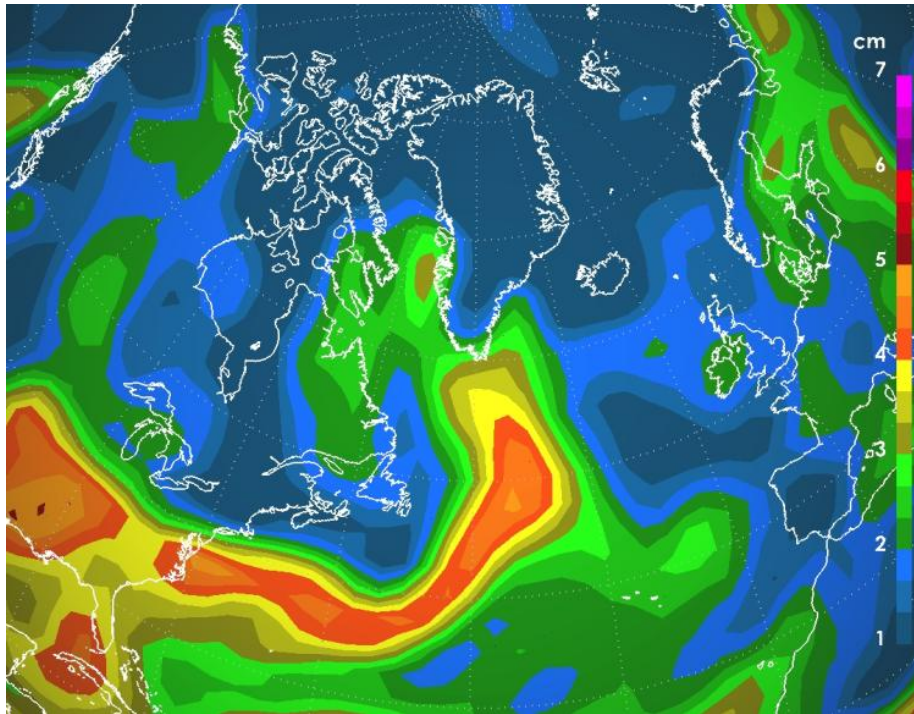
	Vertical cliff	Horizontal glacier
Clear sky, dry, cold	High ablation	Low ablation
Overcast, humid, warm	Low ablation	High ablation

# Upscaling – from local to regional?

Are changes of the ice cliffs predictors for a

❄️ Warmer Arctic?

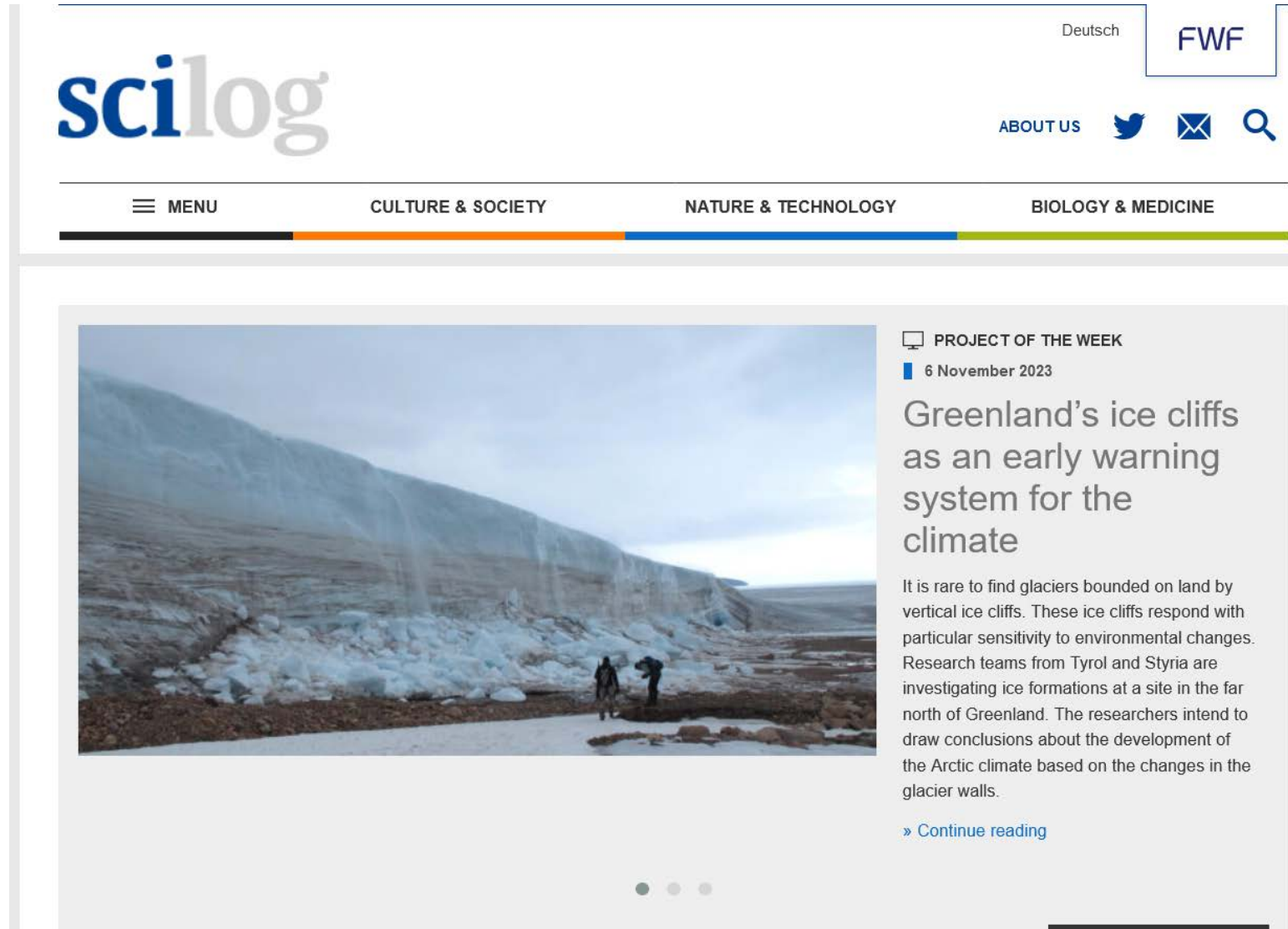
❄️ Wetter Arctic?





# Outlook

- ❄ Field campaign August 2024
- ❄ FWF project of the week



The screenshot shows the scilog website interface. At the top right, there is a language selector set to 'Deutsch' and the FWF logo. Below this are navigation icons for 'ABOUT US', Twitter, email, and search. A horizontal menu bar contains 'MENU', 'CULTURE & SOCIETY', 'NATURE & TECHNOLOGY', and 'BIOLOGY & MEDICINE'. The main content area features a large photograph of a massive ice cliff in Greenland. To the right of the image, the text reads: 'PROJECT OF THE WEEK', '6 November 2023', and the title 'Greenland's ice cliffs as an early warning system for the climate'. A short paragraph follows, describing the research. At the bottom right of the article, there is a link '» Continue reading'. At the bottom of the image area, there are three small circular indicators.

Deutsch FWF

ABOUT US

scilog

MENU CULTURE & SOCIETY NATURE & TECHNOLOGY BIOLOGY & MEDICINE

PROJECT OF THE WEEK

6 November 2023

### Greenland's ice cliffs as an early warning system for the climate

It is rare to find glaciers bounded on land by vertical ice cliffs. These ice cliffs respond with particular sensitivity to environmental changes. Research teams from Tyrol and Styria are investigating ice formations at a site in the far north of Greenland. The researchers intend to draw conclusions about the development of the Arctic climate based on the changes in the glacier walls.

[» Continue reading](#)