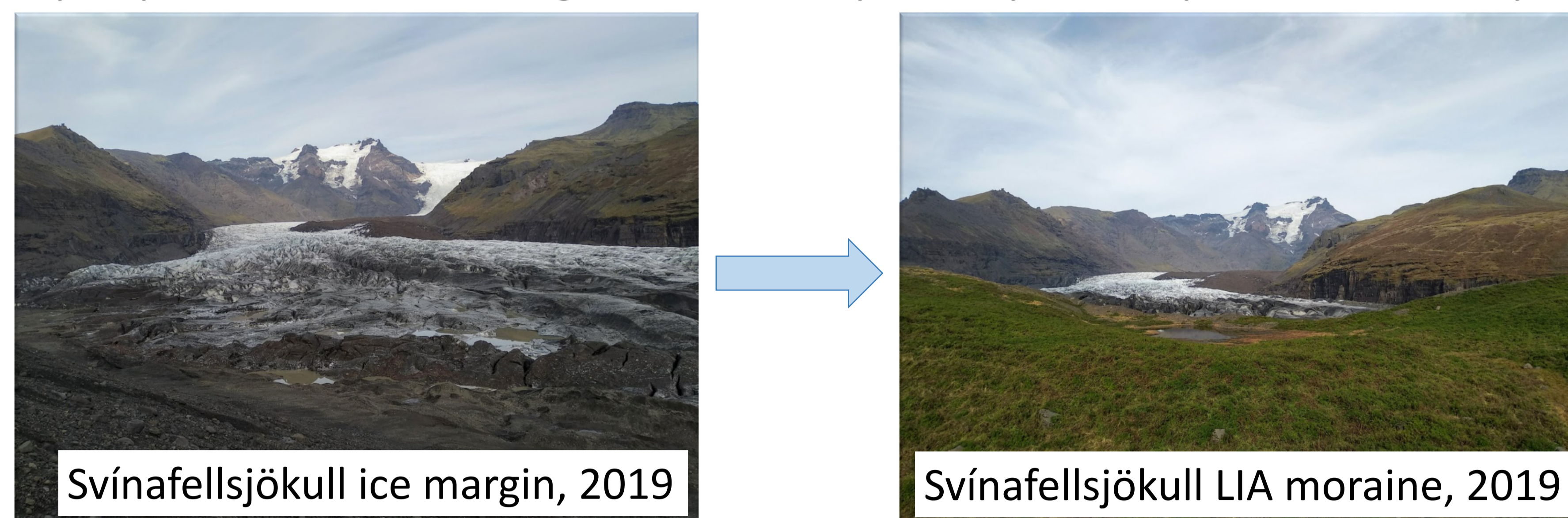


Quantifying and Characterising Organic Carbon in Newly-developed Soils Following Glacier Retreat in Northern Latitudes

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Background

- Glacial organic carbon (GOC) held within glacier ice, subglacial sediments, and proglacial sediments and soils.
- 21st century warming will result in global glacier retreat with the potential to expose and release GOC.
- Newly-exposed nutrient rich glacial landscapes may develop soils and ecosystems.



Research Question

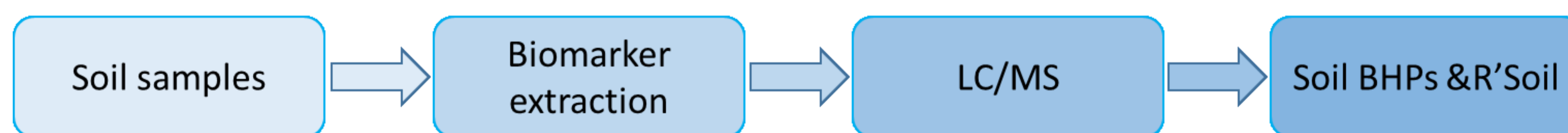
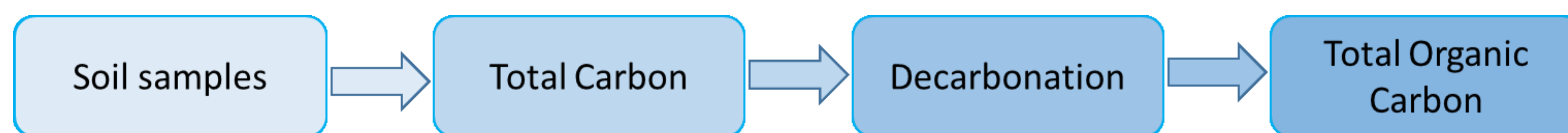
- Interested in understanding the main source of OC in soils exposed after glacier retreat and soil development along downstream transects from the glacier front.

Study sites

- Örafajökull icecap, Iceland (2018 & 2019)
- Tarfala valley, Sweden (2018)
- Zackenberg valley, Greenland (2019)

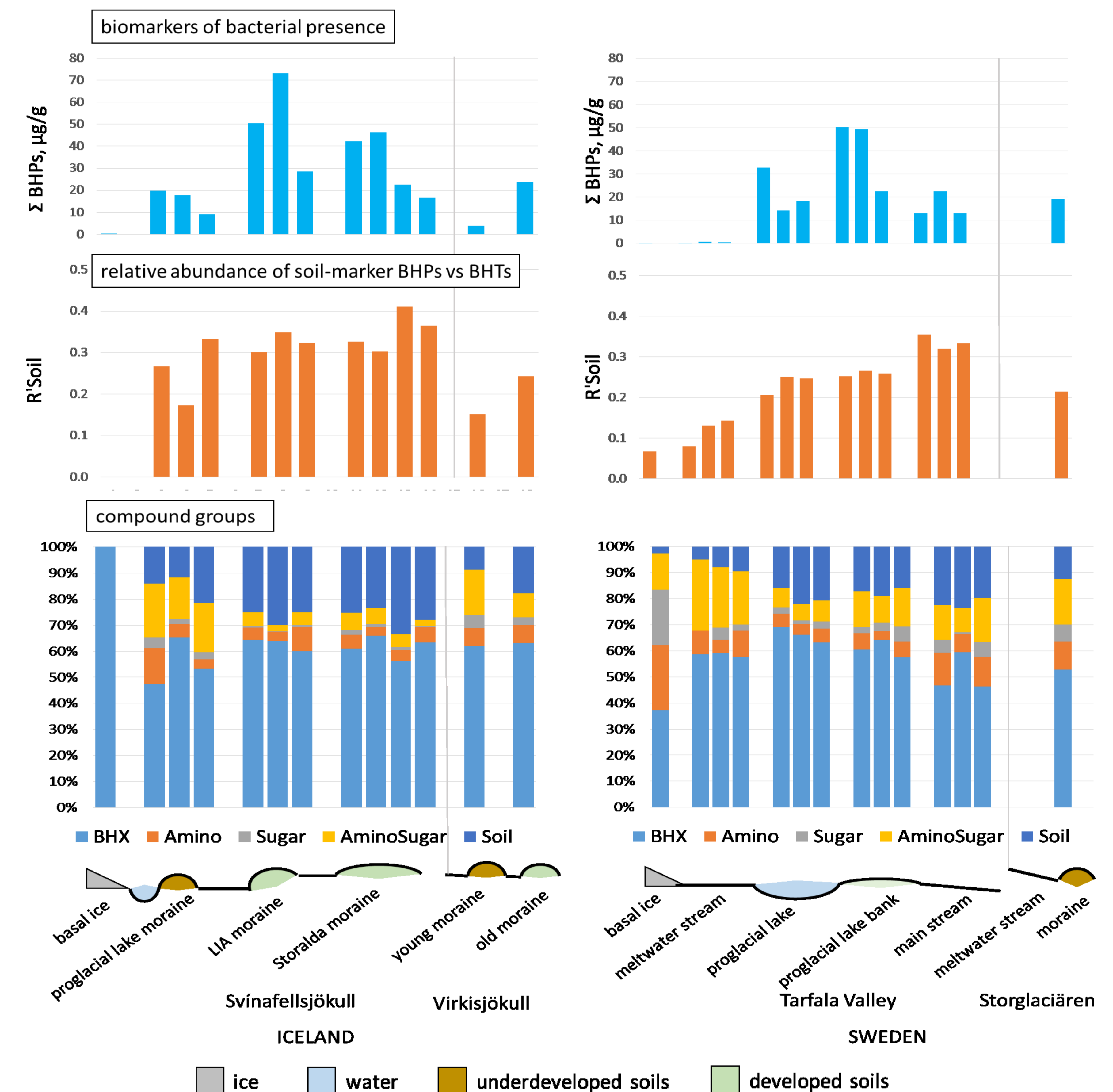


Methods



- Bacterioplanepolyols (BHPs) are a group of membrane lipids, with different BHPs produced by different bacteria, and therefore used as biomarkers of bacterial presence.
- Bacterioplanetetrol (BHT) is a commonly produced BHP, not directly indicative of any specific bacterial community, but can be a useful general guide to the overall abundance of bacteria.
- R'soil index is based on the relative abundances of soil-marker BHPs vs BHTs.

Results



Findings

- Direct glacial output of organic carbon is low
- Organic Carbon develops in soils
- Higher bacterial presence in moraine and bank soils
- Soils develop over time after being exposed

Conclusions

- Build-up of new terrestrial OC stores
- Erosion of OC by glacial meltwater
- Future retreat might increase terrestrial OC productivity and carbon export