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The scoop on SCOOP

*A High Arctic fieldwork project funded by
POLARIN*



photo © Iain Rudkin

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Background

Glaciers are experiencing unprecedented, accelerating melting and retreat due to climate warming.

This has led to an increase in glacier discharge, which supplies freshwater and bioavailable dissolved organic matter (DOM) and nitrogen (N) to vulnerable fjord ecosystems. However, the sources of bioavailable DOM in glacial runoff, and how these will be impacted by the up-glacier migration of snow lines, remain unknown. In addition, potential inputs of bioavailable DOM and N leached from proglacial soils that develop when new terrain is exposed as a result of glacier retreat have not been quantified, limiting our understanding of controls on the supply of bioavailable DOM and N from glacierized catchments.

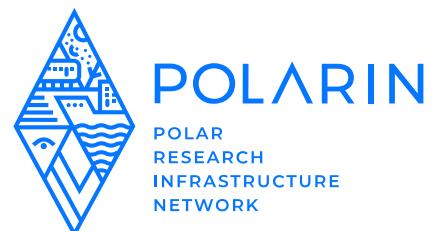
In October 2024, we designed a study to address these knowledge gaps. The title: **Sources and Cycling Of Organic matter along glacial-proglacial-fjord flow Paths, or SCOOP!**

Next step: acquire funding for fieldwork on two glaciers near Ny-Ålesund in Svalbard to test our hypotheses.

SCOOP got funded!

In March 2025, we got news that POLARIN decided to fund SCOOP under the Transnational Access Call 2024!

Now, it was time to start planning and preparing to best conduct our fieldwork and address our overall aim: **To constrain sources of bioavailable OM and N along glacial-proglacial-fjord flow paths and estimate changes in OM and N delivery to fjords as a result of glacier retreat.**

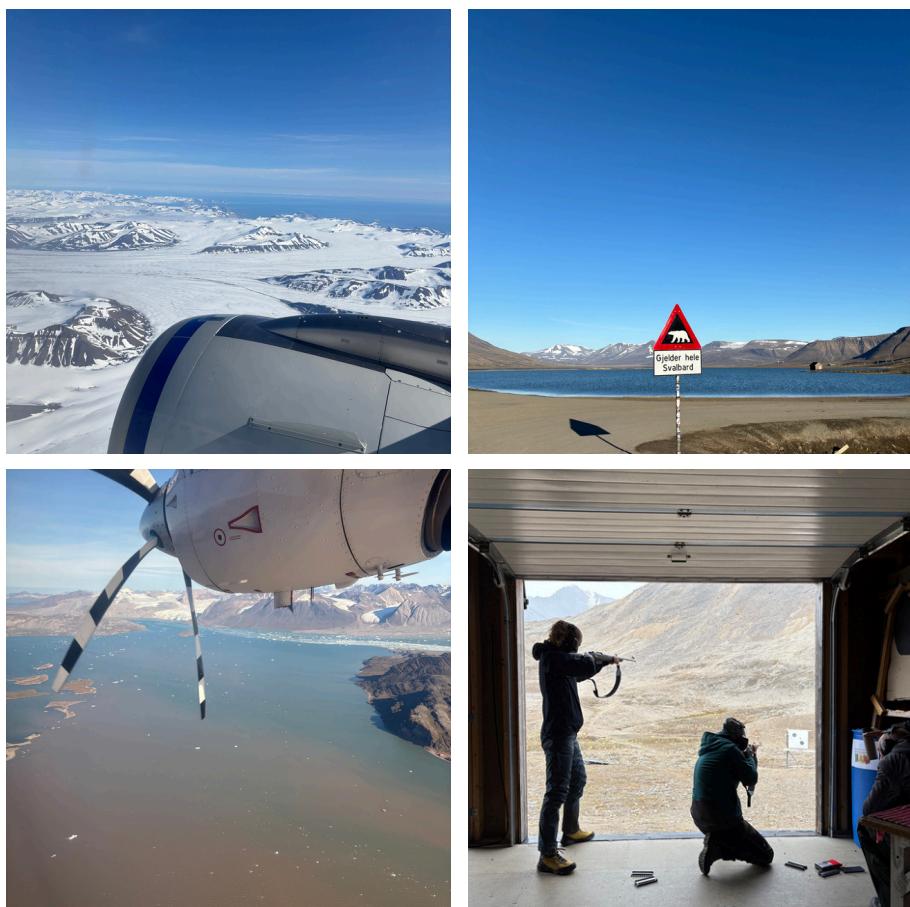


Preparations

The POLARIN transnational access grant covers access to the research station (in our case, the NERC Arctic Research Station) as well as travel and other costs associated with the fieldwork. We sorted medical paperwork, booked flights, prepared detailed sampling protocols, ordered chemicals, and washed a lot of lab equipment to get ready for our planned fieldwork in August 2025.

Fieldwork time !

On August 3, it was finally time to get going! First stop: Longyearbyen. The flight in was beautiful, and we had dinner in the sunshine before another breath-taking flight to Ny-Ålesund the next day. Ny-Ålesund is located next to Kongsfjorden, with an incredible view of the surrounding glaciers. In Ny-Ålesund, we were greeted by Iain Rudkin, the NERC Arctic Research Station manager, who helped us get settled in. The first two days included setting up the lab and, very important, polar bear safety training. We could bear-ly wait to get out sampling!



Amidst the breath-taking views, polar bear safety training is an essential component of research in Svalbard. Photos © Eva Doting, Eva Doting, Eva Doting, Anne Kellerman.

After two days in the lab, we were itching to go out again. Lucky for us, another decent weather day for sample collection on and in front of Midtre Lovénbreen!



A successful day in the field is often followed by a day or two in the laboratory!

Photos © Iain Rudkin, Iain Rudkin, Eva Doting, Eva Doting.

Once we collected the supraglacial, proglacial and fjord samples near Midtre Lovénbreen, it was time for more lab work. We processed and preserved samples, and set up more incubations. We conducted all our labwork in the terrestrial lab Veksthuset, operated by Kings Bay, and had arranged with the NERC station that we could use one of their vacuum pumps, which saved us some excess luggage costs. Once we finished our labwork, it was already time to start packing up and prepare for the journey home. **On to the next phase of the project: analysis!**

On our first sampling day, we got incredibly lucky with the weather again! Clear skies make everything easier. **We collected samples from Austre Brøggerbreen supraglacial streams, the proglacial river, and the fjord plume.** Both Iain Rudkin and Matthew Phillips (who was taking over station duties from Iain Rudkin later that week) joined us, which was a big help with both polar bear watch and getting some great fieldwork pictures (thanks Iain!).

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Sample collection was followed by two days of lab work to filter water samples, prepare soil leachates and set up incubations to test if fjord microbes could degrade the carbon present in the different samples.

Erosion of the subglacial bedrock brings incredibly red sediment from the land to the fjord. Photo © Eva Doting.



Next steps

Right now, we are in the process of preparing samples for analysis and acquiring data on the carbon and nitrogen content of the different samples collected along the supraglacial-proglacial-fjord transects of Austre Brøggerbreen and Midtre Lovénbreen.

We hope that our dataset will advance our understanding of how the input of bioavailable carbon and nitrogen to fjords may change as a result of deglaciation and subsequent soil development. Stay tuned!

Acknowledgements

We would like to thank the NERC Arctic Research Station, and in particular Iain Rudkin and Matthew Phillips, for supporting our fieldwork in Ny-Ålesund. We would like to thank POLARIN for funding the fieldwork, and the University of Pennsylvania (1), Florida State University (2) and the Norwegian Institute for Nature Research (3) for supporting Eva Doting (1,3) and Anne Kellerman (1,2) during this project.



Measuring salinity, pH, conductivity and temperature in Kongsfjorden. Photo © Iain Rudkin

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