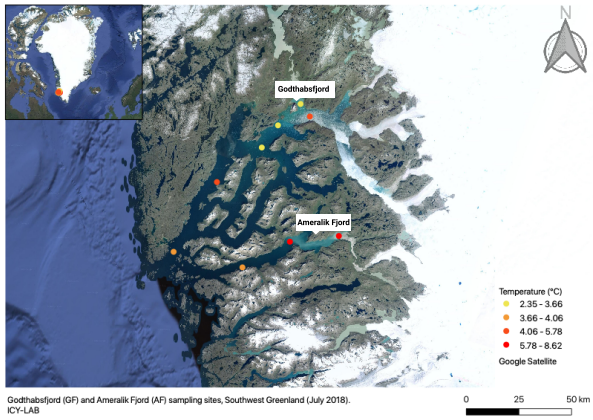
ICY-LAB

Micronutrient Export from Glacier to Fjord, Southwest Greenland: Potential Impacts on Open Ocean Primary Productivity (MScR)

Contact: rachael.ward@bristol.ac.uk

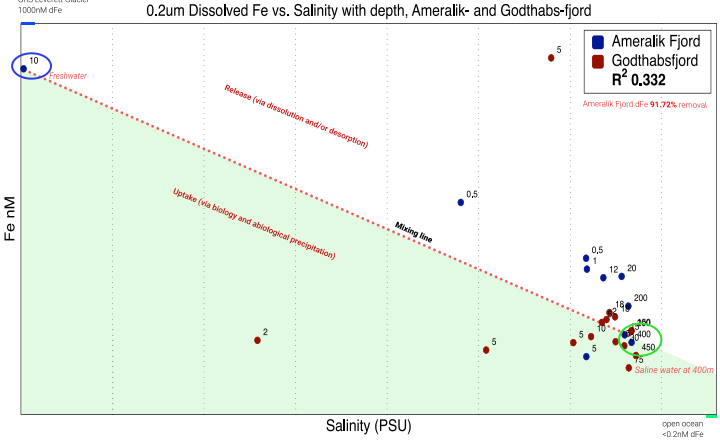
Ward, R., Hendry, K., Wadham, J., Sherrell, R., Hawkings, J., Annett, A.



Godthabsfjord (GF) and Ameralik Fjord (AF) sampling sites, Southwest Greenland (July 2018). ICY-LAB

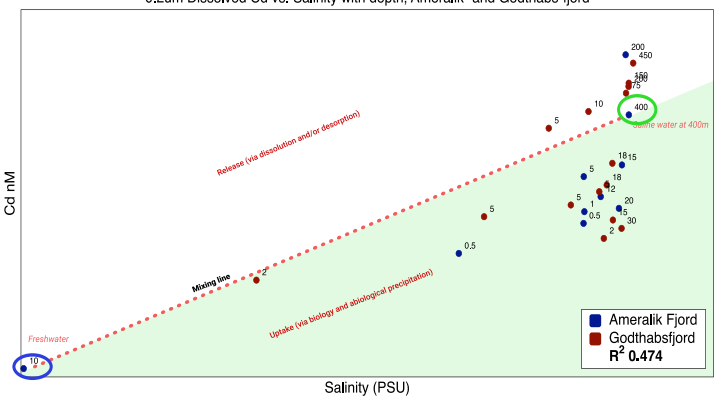
1. Hawkings et al. (2014) concentrations are filtered at 0.45 um

A

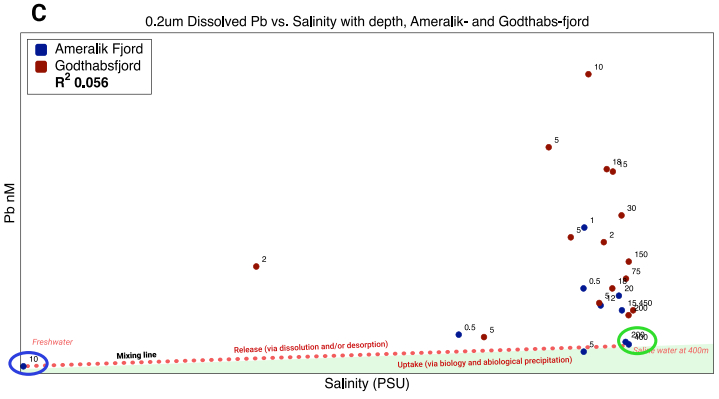


2. Annett, unpublished. Concentrations are filtered at 0.2 um

B

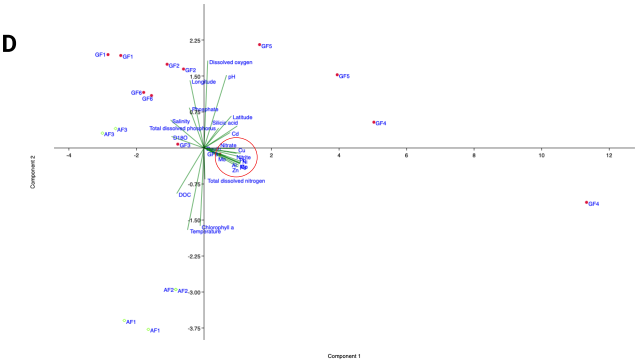


C



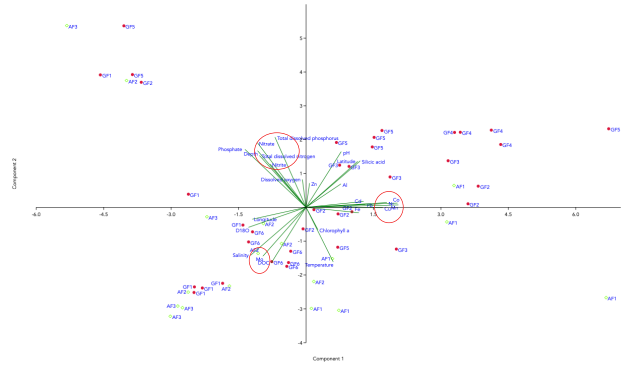
Trace metal micronutrients from glacial terminus through land- and marine-terminating fjords to open ocean is relatively understudied. These systems, their fate and their significance now needs to be investigated further. This project looks at Fe, Cu, Cd, Co, Mn, Mo, Pb, Ni, Zn, Al alongside key parameters i.e. salinity, turbidity, Chl a, DOC, P, N.

D



PCA particulate trace metals and key parameters, land- and marine-terminating glacial fjords; surface/depth. Two data points for each sample station (Total digest and Berger leach).

E



PCA dissolved trace metals and key parameters, land- and marine-terminating glacial fjords; surface/depth. See red circle for potential interesting clustering.

Dissolved water and particulate trace metal micronutrients will show the same behaviour with salinity across both fjords.

Labile (potentially bioavailable) Fe in both dissolved/particulate phases are heavily depleted in transit from glacial terminus to the distal fjord in both land- and marine-terminating fjords however, there's still a significant quantity reaching the North Atlantic.

Fig A-C show behaviour of three trace metals key to the study. Comparison of other dissolved and particulate trace metals/key parameters indicated are needed to answer hypotheses. Interpretation of particulates suggest similar trend to dissolved phase with regards to salinity across fjords. The contrasting fjord types will likely impact concentrations of key micronutrients. This comparison provides a useful insight into the potential future of retreating glaciers, whose rates of retreat may increase with enhanced global climate.

1. Hawkings et al. (2014) Ice sheets as a significant source of highly reactive nanoparticulate iron to the oceans. Nature Communications, 5(1), 3929. https://doi.org/10.1038/ncomms4929
2. Annett (unpublished data)