Hatton et al. 2019

Glacial DSi is isotopically distinct - could this help understand fjord processes?

Terrestrial

Fjords

Open Ocean

Leverett Glacier, Kiattuut Sermiat

Godhabsfjord, Ameralik Fjord

DY081 SW Greenland

Project ICY-LAB

Impact of Glacial Meltwater within Fjords and Beyond: Using Si as a Case Study

Hatton, J., Ng, H. C., Hendry, K., Beaton, A., Meire, L.

High Diatom activity on shelf

Despite low surface DSi concentrations

A

Down Fjord

Salinity

Low DSi concentrations exit the fjords - despite high Si in glacial inputs

B

Low δ^{30}Si of fjord water cannot be explained by water mass mixing alone

Seawater value

Down Fjord

Salinity

Mixed fractionation model cannot reproduce observed seawater δ^{30}Si

Source of isotopically light Si: Benthic upwelling? Dissolution of glacial sediments?

C

δ^{30}Si_{seawater} = δ^{30}Si_{initial} - ε ln(f)

ε = Diatom Utilisation Fractionation Factor

f = fraction of Si remaining in water

To fully understand the impact of glacial meltwaters to downstream ecosystems we need to consider dissolved and particulate export - the importance of sediments in these environments need to be investigated further

Hendry et al. 2019

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