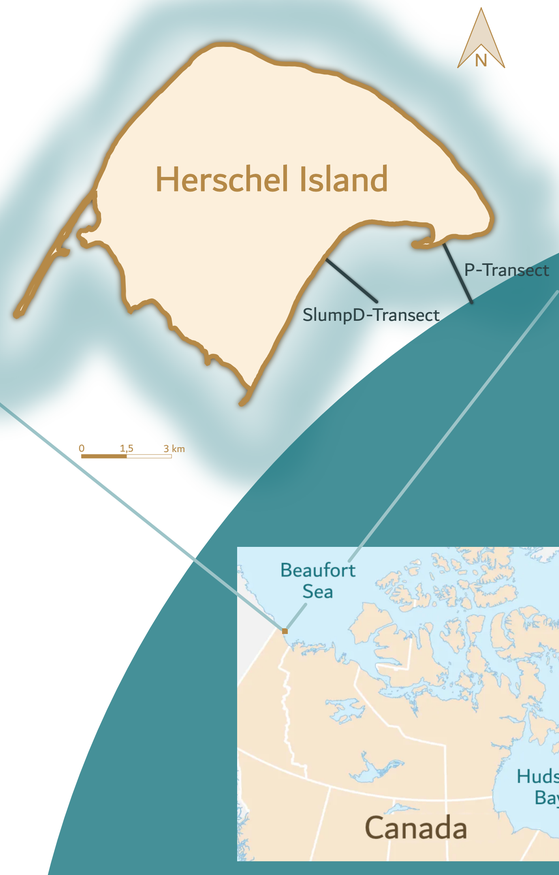

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Universität Potsdam

NUNATARYUK

The Way of Carbon:

Composition and Transport of Organic Carbon in the Nearshore Zone of Herschel Island, Qikiqtaruk

Pia Petzold [1] [2], Hugues Lantuit [1] [2], Michael Fritz [1]

[1] Section Permafrost Research at the Alfred-Wegener Institute, Helmholtz Centre for Polar- and Marine Research, Potsdam, Germany

[2] Institute for Geosciences at the University of Potsdam, Potsdam, Germany

WHERE? Herschel Island, Qikiqtaruk, is located off the Yukon coast, Canada (N69.60°; W139.00). Continuous ice-rich permafrost can be found all over the island as well as permafrost thaw related features like retrogressive thaw slumps (Lantuit and Pollard, 2006).

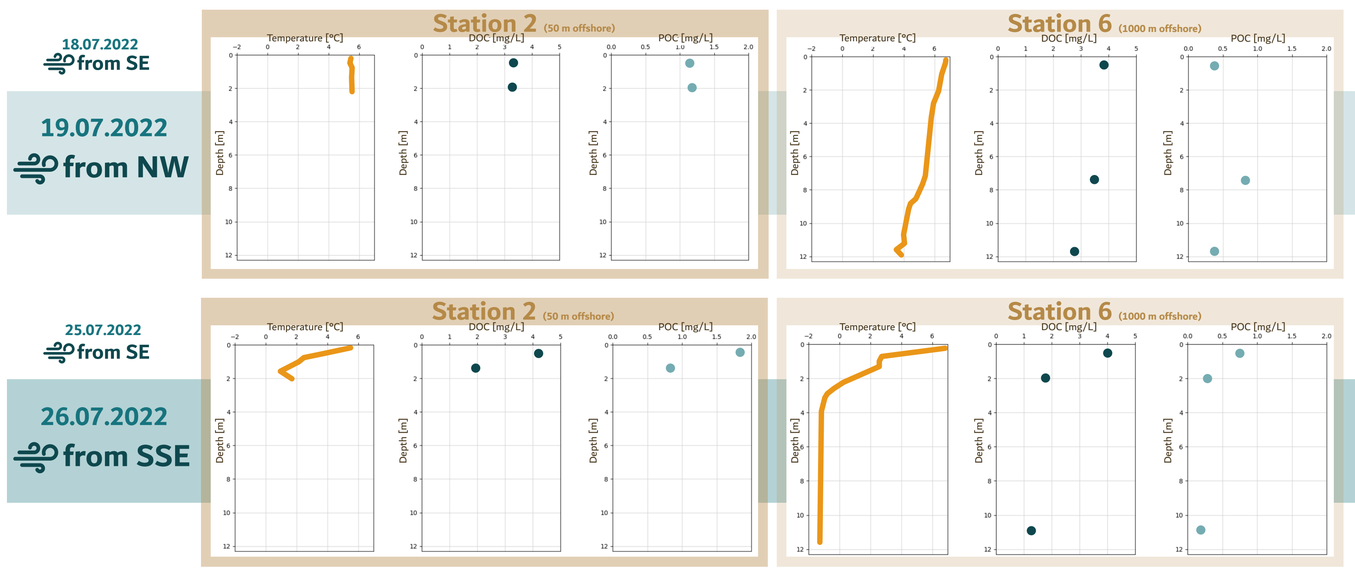
WHY? When permafrost is thawing the released carbon first enters into the nearshore zone (0 to 20 m of water depth) before being buried in marine sediments, transported fruther offshore or being degraded (Jong et al., 2020). This degradation potentially leads to a release of GHG into the atmosphere thus contributing to additional climate warming.

In this study, we aimed to investigate the extent to which organic carbon pathways are affected by prevailing weather conditions.

What we saw

clear differences in turbidity in coastal water masses

What we measured



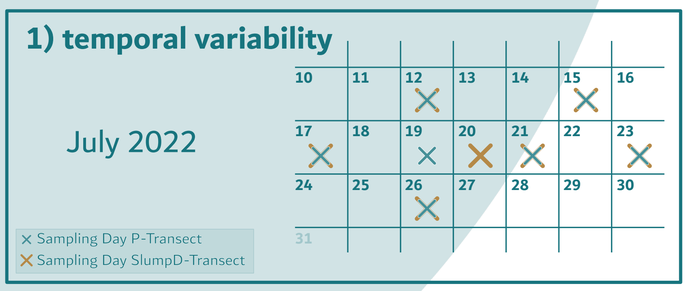
Synoptic meterology drives the pathways of organic carbon in the nearshore zone.

Water stratification and organic matter contents differ greatly along the nearshore-offshore gradient.

WHAT IS NEW?

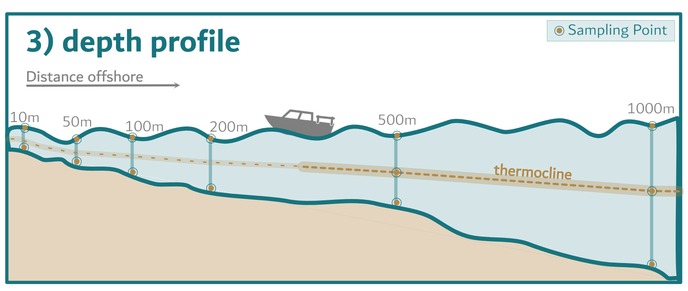
3 types of variability captured by the sampling:

1) temporal variability



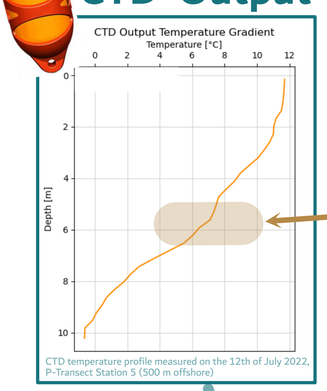
2) slump vs. non-slump affected coast

3) depth profile



HOW? The sampling was repeatedly carried out along two transects over a period of two weeks during the open water season in summer 2022. In addition to **surface water** samples, **water close to the bottom** and **in the thermocline** was analyzed using CastAway TM - CTD-measurements (parameters: condutivity, temperature, depth, pressure, salinity). The water samples were then processed according to the workflow shown below.

CTD-Output



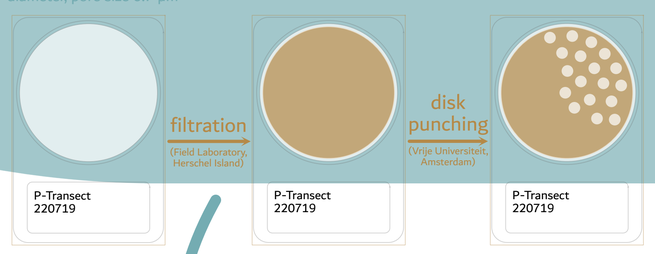
CTD temperature profile measured on the 12th of July 2022, P-Transect Station 5 (500 m offshore)

turbidity measurement

schematic turbidity in water samples [NTU]

What a filter can tell you:

glass microfiber filter, 47 mm diameter, pore size 0.7 µm



filtrate → Dissolved Organic Carbon (DOC)

pia.petzold@awi.de

Write me an e-mail!

Acknowledgements:

A very big thank you goes to my supervisors, Hugues Lantuit and Michael Fritz, and all participants of the Yukon Coast 2022 expedition. For the filter processing the working group of Prof. Jorien Vonk at the Vrije Universiteit, Amsterdam, welcomed me warmly in their lab facilities and assisted with their knowledge on the filter preparation for POC measurements - thank you for the instructive and beautiful time on site!

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