Disturbance effects from the 79N Glacier (Northeast Greenland) on local benthos ecosystem functions: correlating data from then and now

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Glacier mass loss is seen as the main player for global sea level rise, but little is known about how increasing glacier disturbance, coming along with the accelerated retreat, will influence local marine ecosystems and their functions in a changing climate.

We investigated the effects of recent glacier retreat from the 79N Glacier, Northeast Greenland, on local benthic communities and their functions. Samples were collected in September/October 2017 during PS109 onboard *RV* Polarstern at 13 stations either with a benthic Lander or a Multicorer. Oxygen consumption was measured ex situ over time. For benthic community characterization (bacterial abundances and soft bottom macrofauna), subsamples were taken for every station. In parallel, sediment granulometry and porosity, pigment and TOC concentrations and porewater chemistry (DIC, nutrients, sulfate, chloride) were assessed to characterize the habitat.

Bacterial abundances in 0-1 cm sediment depth varied between $3.306*10^8$ and $2.607*10^9$ cells ml^{-1} and did not follow a specific geographical pattern; highest abundances were observed at the Norske Trough and the Djimphna Sund. Abundances in 4-5 cm depth ranged from $1.163*10^8$ to $2.711*10^9$ cells ml^{-1}. Total oxygen uptake varied between -1.199 and 1.670 mmol m^{-2} d^{-1} with lowest values near the glacier and highest values at the inner Norske Trough.

The results, together with the obtained macrofauna community data, will be compared to data published in the early nineties that were taken in the same region (Piepenburg et al. 1997; Rowe et al. 1997; Ambrose and Renaud 1995), which would be a first attempt to evaluate changes in the benthos attributed to the effect of glacial melt water and allow an evaluation of how ecosystems and their services will alter in the future.

References

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Keywords: arctic; climate change; glacier disturbance; benthic functions; infauna