

Project information

Project title

Lower trophic levels and carbon-fluxes in Arctic fjord systems

Year

2011/2012

Project leader

Tove Gabrielsen, UNIS

Participants

- Tove M. Gabrielsen, UNIS
- Marit Reigstad, UiT
- Camilla Svensen, UiT

Flagship

Fjord and coast, Theme: Structure, function and change in Arctic and boreal fjord ecosystems

Funding Source

Fram Centre, internal

Summary of Results

The main aim of this project was to investigate the importance of pico-and nanoflagellates in our arctic model fjord ecosystem Billefjorden. Sea water samples were taken at different depths from the pelagial (5m, 15m, 35m, 75m, 150m), and sympagic organisms were collected from the bottom of the sea ice (bottom 3 cm). In addition, the potential importance of these small flagellated to the bottom communities were investigated by collecting samples using a 24h sediment trap with sampling syringes at four depths (20m, 40m, 60m, 90m). The samples will be analysed in terms of fractionated Chl a biomass (from cells larger vs smaller than 3 µm), POC, DNA diversity, and community composition. The results from these analyses will enable us to elaborate on the importance of pico-and nanoflagellates in the pelagial vs sympagic part of the ecosystem, as well as their importance in the vertical flux. Sampling was performed in April and May of 2011 according to plan. The samples are currently being analysed, and the results are thus not clear yet.

Published Results/Planned Publications

The publications from this project will rely on the results from the ongoing analyses, but the results will be discussed in several papers relating to the theme:

"Importance of small flagellates in the high arctic model fjord Billefjorden"

Communicated Results

The cooperation and initiated work was presented by PhD student Ingrid Wiedmann at the Nordic PhD course "From Bloom to Gloom" as poster. This course included international scientists and Nordic PhD students with a specific interest from vertical flux and regulation mechanisms. The course was part of the Nordic Research Network "Biopump". The science ideas and perspectives within this project was also communicated by Marit Reigstad and Camilla Svensen through lectures and teaching lab courses during this course.

Interdisciplinary Cooperation

The fieldwork of the project was run in parallel with two UNIS courses (AB204, AB330) and one interdisciplinary project (FastIce, led by Ole Jørgen Lønne, UNIS). Thus, the funded project benefitted from collaboration within research fields such as

- physical oceanography
- ice physics
- sea ice ecology

Budget in accordance to results

The Fram centre funding mainly contributed towards initiating a collaboration between Reigstad and Gabrielsen combining the utility of molecular tools to improve our understanding of sedimentation processes (e.g. identify the possible contribution of small flagellates to vertical flux). This cooperation would not have been initiated and realized without the funding from the Fram Centre.

Could results from the project be subject for any commercial utilization

No

Conclusions

The project has improved our understanding of the turnover rate of microbial organisms also in the arctic, and has resulted in a new research collaboration between Reigstad and Gabrielsen along with other colleagues to investigate arctic microbial turnover and sedimentation processes at a temporal much more often scale. A PhD student has started on a project that will benefit from this initiated cooperation.

The results from the project will be important for the ongoing collaboration with SINTEF on improving the SINMOD model on vertical carbon export through an increased understanding of the role of microbial organisms in vertical flux. At present no algorithms exists on this. This work adds a complementary but important contribution to a project funded by Tromsø forskningsstiftelse (CONFLUX).

In a longer time aspect the resulting knowledge will have implications for our understanding of carbon flux, ecosystem dynamics and biogeochemical cycling.