

Project information

Project title

Life at the edge

Year

2014-2016

Project leader

Jørgen Berge

Geographical localization of the research project in decimal degrees (max 5 per project, ex. 70,662°N and 23,707°E)

78.2° N, 15° E

Participants

Prof W.G. Ambrose Jr. (Bates, US & APN), Dr M.L. Carroll (APN), Dr O.J. Lønne and Dr T Gabrielsen (UNIS), Dr J. Nahrgang (UiT and UNIS), Prof B Bluhm (UiT and SFOS-UAF), H Andrade (APN), L Camus (APN, UiT), Dr M. Sejr (Denmark), Professor J.M. Weslawski and Dr M. Włodarska-Kowalczyk (Poland), Dr F. Cottier (UK).

Flagship

Fjord and Coast

Funding Source

UiT, NFR and flagship

Summary of Results

The Arctic is currently facing drastic changes with regard to climate, oceanography, sea ice extent and species distribution, leading towards a warmer in many areas summer ice free and therefore more accessible ocean. More favourable conditions in the North are likely to be used especially by temperate species with high proliferation potential and short generation times, to push the edge of their distribution further north. Additionally, accessibility of the Arctic will increase the level of human activities, with the main focus on exploitation of natural resources, development of new transport routes and tourist destinations. Previous periods of warming climate during the Holocene inherit drastic changes in the benthic assemblages and are found all over the Arctic. This short review focuses on the current and past distribution of the three commonly found species of the *Mytilus edulis* complex; *M. edulis*, *M. galloprovincialis* and *M. trossulus*, in Subarctic and Arctic waters of the northern hemisphere. By looking at the borders of their presence, the patterns in which they occur and comparing this to the physical- and environmental conditions at times, we try to help better understand the driving forces behind the species distribution and changes to it over time. Despite *Mytilus* exhibiting a clear northern edge of appearance, fossil findings reveal their ability to live and thrive further north as their current edge, making them a prime object to study environmental changes in the Arctic. We will furthermore focus our case study on Svalbard archipelago as a spatially restricted area, where specific insight is given to recent new findings of *Mytilus* spp. along the West coast of Spitsbergen.

Master and PhD-students involved in the project

PhD student Peter Leopold at UiT (2015-2017)

For the Management

The data provided through the analyses of samples and on-going experiments will contribute directly to on-going research and management of the effects of climate change on the Arctic ecosystem because the blue mussel on Svalbard represents a newly established species within the region with a potential for reproduction and further expansion around the Svalbard archipelago. Factors facilitating such expansion potential could include anthropogenic vectors for dispersal and settlement.

Published Results/Planned Publications

The first of three planned peer-review papers were published in 2016: Mathiesen, SS., Thyrring J., Hemmer-Hansen J., Berge J., Sukhotin A., Leopold P., Bekaert M., Sejr MK., Nielsen EE., (2016). Genetic diversity and connectivity within *Mytilus* spp. In the subarctic and Arctic. *Evolutionary Applications*. DOI: 10.1111/eva.12415

One more peer-review manuscript is currently under preparation (Leopold et al, in prep) and will be submitted early 2017, whereas the third manuscript will be finished by the end of 2017.

Communicated Results

So far, the project have contributed with the following dissemination:

2014: Blåskjell – snart på en meny nær deg? *Svalbardposten*, 2014(41), 22-23. This outreach article also appeared on the Framsenter website 20.10.2014.

2015: Two series of media stories, one in January and one in June 2015, the latter based upon a NTB news story published in June 2015:

Blåskjell og makrell på Svalbard sjokkerer forskere (Aftenposten Innsikt 19.01.2015)

<http://www.tu.no/klima/2015/06/28/fossiler-av-8000-ar-gamle-blaskjell-avslorer-hvordan-klimaet-har-vart-pa-svalbard>

<http://www.nrk.no/troms/blaskjell-forteller-klimahistorie-pa-svalbard-1.12431710>

Blåskjell forteller klimahistorie på Svalbard (Sunnmørsposten 28.06.2015)

Blåskjell forteller klimahistorie på Svalbard (Tønsbergs blad 14.06.2015)

Blåskjell forteller historie (Telemarksavisa 15.06.2015)

Forteller klimahistorie på Svalbard (Nationen 15.06.2015)

Blåskjell forteller klimahistorie (Klassekampen 15.06.2015)

Blåskjell som klimaguide (Helgelendingen 15.06.2015)

Blåskjell forteller klimahistorie (Haugesund Avis 15.06.2015)

Interdisciplinary Cooperation

Oceanography

Budget in accordance to results

On schedule

Could results from the project be subject for any commercial utilization

No

If Yes

No

Conclusions

The project is well on its way, and will produce very interesting and exciting results. The funding period from the Framsenter ends in 2016, but the research period for the PhD student ends in 2017 - final results from the project will therefore not be ready until the end of 2017. For 2016, there are outreach papers that will appear in December, but details is not available by the reporting deadline 2016.