

## Project information

### Project title

Benthic biodiversity and ecosystem function in Svalbard and North Norway

### Year

2012/2013

### Project leader

Sabine Cochrane, ApN

### Participants

#### Co-leaders (alphabetical order)

- Sabine Cochrane, Akvaplan-niva (APN)
- Kari E. Ellingsen, Norwegian Institute for Nature Research (NINA)
- Lis Lindal Jørgensen, Institute for Marine Research (IMR)

#### Collaborators (unordered):

#### WP1

- Einar Nielsen (UiTø)
- Olga Plubina (MMBI, Russia)
- Einar Nilssen; Mona Fuhrmann, University of Tromsø (UiT)
- Eivind Oug, Norwegian Institute of Water Research (NIVA)
- Jan Sundet, (IMR)
- Maria Wlodarska-Kowalczyk; Jan M. Weslawski, Institute of Oceanology, Polish Academy of Sciences (IOPAS)

#### WPs 1 and 2

Paul Renaud (UNIS/APN)

Lindsay Wilson (APN)

#### WP2

- Tove Gabrielsen (UNIS)
- Jørgen Berge (UiTø/UNIS)
- Paul Renaud (UNIS/APN)
- Therese Løkken (UNIS/UiTø)
- Knut Sivertsen (FiHø)
- Raymond Bannester (IMR)
- Stein Fredriksen (UiO)

### Flagship

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

### Funding Source

Fram Centre, internal

### Summary of Results

This year's efforts have gone mostly to sample processing and additional fieldwork, as well as analyses of the data from last years' desk study.

#### Highlights

- 1) We have sorted 40 benthic samples from around Svalbard (Billefjorden, Raudfjorden and Rijpfjorden). Faunal identification will continue into 2013. Lead: Akvaplan-niva.
- 2) We have prepared for analysis a standardized dataset from north Norwegian fjords and offshore areas in the SW Barents Sea. Lead: NINA
- 3) We have conducted a multi-disciplinary sampling expedition to the Isfjorden complex, with a focus on benthos in an ecosystem

perspective. Lead: IMR/UNIS

#### Summary of progress

1. *Samples collected in 2011 (WP1)*. The 40 samples are sorted in our accredited biological laboratory, and identification is started. Because of the cut in the 2012 budget, we have to move some of this labour-intensive work into 2013. We applied for funding from Svalbard Miljøfond to support this work, but without success. Figure 1 shows the location of the samples.

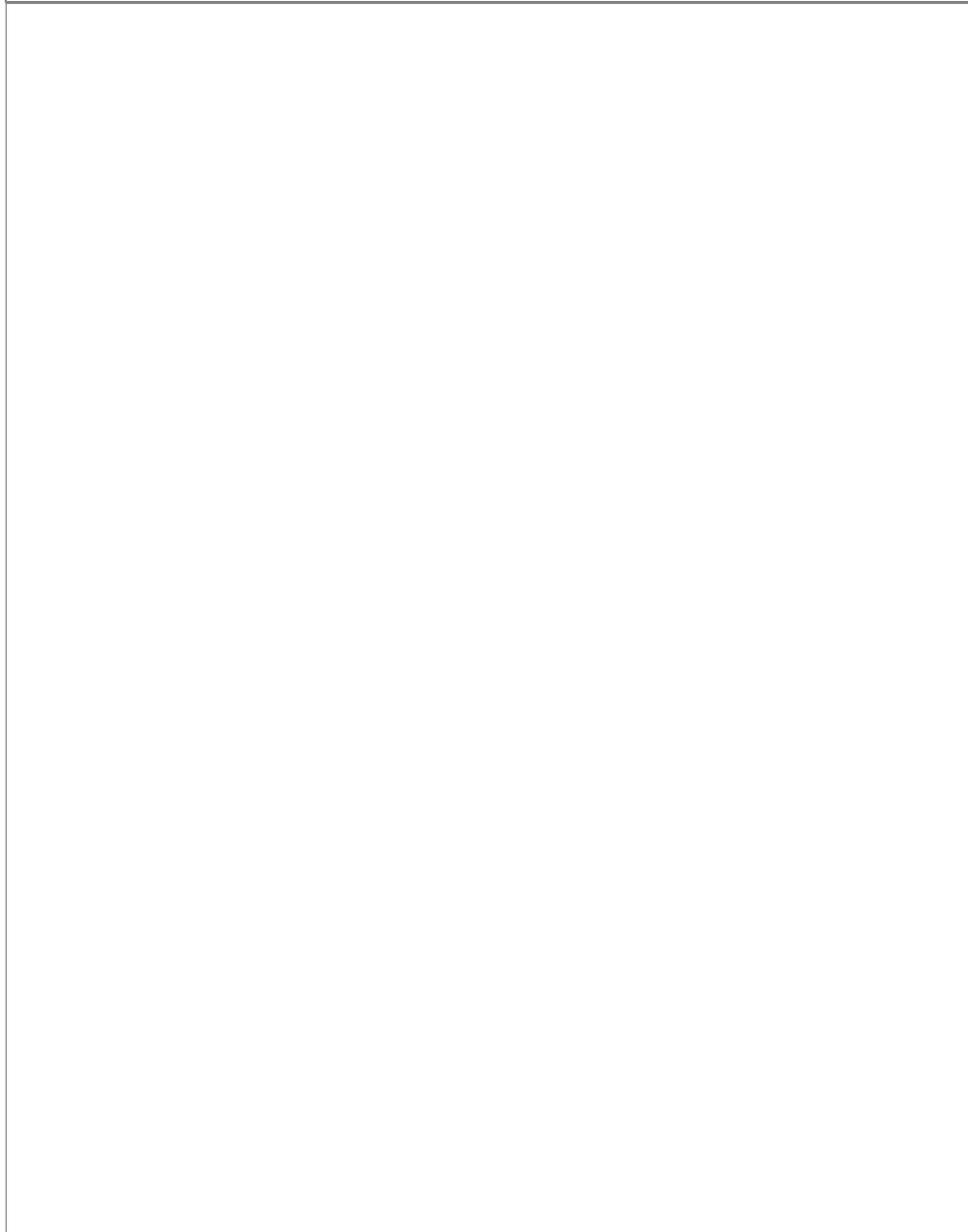


Fig. 1. Study area (circles). B = Billefjorden, Ra = Raudfjorden, Ri = Rippfjorden

2. *Analyses of data (WP1)*. One of the challenges in analysing benthic datasets which have been compiled from a variety of sources is the issue standardizing species names and levels of identification used (species, genus etc.). The analytical budget for 2012 has been used for this work, and some comparative analyses between north Norwegian fjords and offshore areas.

3. *Interdisciplinary sampling expedition to Isfjorden complex (WP2)*.

This WP has also been reported separately (see submitted report by Lis Lindal Jørgensen for details). In essence, this expedition represents an important advance in drawing together various aspects of benthic studies, which often have a tendency to be carried out in isolation. In this cruise, benthic macrofauna was sampled in the same regions where larger epifauna were collected by trawl, and

food web studies were carried out at as many levels of the faunal communities as possible (from plankton to small infauna to large epifauna and motile predators. Benthic macrofaunal foraminiferans (agglutinated type) also were sampled, and this makes a novel advance because these largely are ignored from benthic surveys, such that we still do not fully understand their role in benthic systems.

WP1 and WP2 have merged expertise throughout this cruise, to maximal benefit to the project as a whole. Figure 2 shows the general sampling areas.



Figure 2. Sampling areas visited in the Isfjorden complex during research expedition led by IMR/UNIS, autumn 2012.

Published Results/Planned Publications

None yet; first publication to come in

2013.

#### Communicated Results

The interdisciplinary cruise was publicized through Aftenposten, 02.10.2012 (enclosed as separate files). Further communications will be done in 2013 when we have results from all the analysed data.

#### Interdisciplinary Cooperation

The positives therefore are that a sampling strategy was developed where one set of analyses can build on the other, i.e. samples were collected at the same locations, using a wide range of collection gears, and purposes. Until recently, most attempts to join datasets have had to take a patchwork approach. We will continue to build upon this joint approach.

Disciplines involved (main areas; see Jørgensen report for details):

- Traditional benthic macrofaunal sampling
- Trawl samples for large epifaunal invertebrates
- Food-web analyses using stable isotopes of a wide range of organisms
- Benthic macrofaunal foraminifera

Together, we can compile information on structure of the food webs and energy flow pathways, as well as gaining an overview of predator prey selection. Accompanying this is a solid knowledge of the fauna in and associated with the bottom substrates, along a variety of environmental, and in some cases also temporal, gradients.

#### Budget in accordance to results

We have been able to collect and process valuable samples which we otherwise would not have had the possibility to do.

- **Did the Fram Centre funding act as a sufficient boost for completing the project through other sources of funding?**

Unfortunately not this year (unsuccessful application for additional funding to Svalbard Miljøvernfond, February 2012).

#### Could results from the project be subject for any commercial utilization

No

If Yes

The results are not commercial, as such. However, the project can and will make a contribution which will be valuable for management plans around Svalbard, and particularly the Isfjorden complex. We assess baseline conditions across a wider area, and identify changes which have occurred over time, both in sparsely populated/trafficked areas and around Pyramiden, where a previously active human settlement has been decommissioned more than 10 years ago.

We will deliver a short popular-scientific communication to the Governor of Svalbard to this effect.

#### Conclusions

a) Indicate future research and/or perspectives which the project results have led to

The project participants will continue to strive towards bringing the various aspects of benthic research into a cohesive, ecosystem-orientated assessment concept.

b) List and describe new methods or techniques that have been developed during the project or that the project has revealed a need for

Not new methods as such, but combining traditional faunal analysis methods with trophic web analyses using stable isotopes is an innovative advance on previous, more strictly traditional approaches.