Project information

Keywords
fjord oceanography ecosystem

Project title
Impact of massive Winter Herring Abundances on the KaLdfjorden Environment (WHALE)

Year
2017

Project leader
Angelika Renner (IMR)

Geographical localization of the research project in decimal degrees (max 5 per project, ex. 70,662°N and 23,707°E)
Kaldfjorden, Troms, approx. 69.8°N, 18.7°E

Participants

Jon Albretsen, Lars Asplin, Melissa Chierici, Elizabeth Jones, Jofrid Skarðhamar (IMR), Martin Biuw, Ole Anders Nøst, Paul Renaud, Qin Zhou (Akvaplan-niva), Marit Reigstad, Ingrid Wiedmann (UiT The Arctic University of Norway), Zoe Walker (University Centre of the Westfjords, Icelan/UiT), Evgeny Yakushev (Norwegian Institute for Water Research)

Flagship
Fjord and Coast

Funding Source

Fjord and coast flagship

Summary of Results

The main sampling period has just started, results are therefore very preliminary.

In this first project year, work started in the different tasks:

Task1: opportunistic surveys were carried out from bigger research vessels in March and October (UiT teaching cruises, RV Helmer Hanssen) making use of the vessels CTD, ADCP, and echosounder (for collaboration with weShare). The next survey using a research vessel will take place in the period 28.11-08.12. as part of IMR's "Fjord i Nord" cruise onboard RV Johan Hjort. Monthly small boat surveys started in early September and will continue throughout 2017 and until summer 2018. Two current profilers (ADCPs) were deployed on the EFFECTS/JellyFrarm moorings in September. Gathering historic data has started and is ongoing, including data going back to the 1930s. Model data analyses are ongoing. First analyses of the hydrographic data confirm large seasonal variability in the fjord with some pronounced differences in the outer and inner parts of the fjord. The inner part is generally fresher and lacks the saline bottom layer found in the outer fjord. The model revealed interesting circulation patterns, which need to be confirmed through further analyses.

Task 2: A first NorFjords160 run has been completed covering the winter 2015/2016. A run covering 2017 will be done in early 2018. The FVCOM model grid for Troms has been developed. FVCOM model runs will begin in 2017 and continue in 2018.

Task 3: Water samples collected as part of an internal IMR project in autumn/winter 2016 have been analysed for DIC and nutrients. In 2017, water samples were collected during each survey on the mid-stations of each transect, at 5 depths. Dissolved oxygen profiles were taken with the CTD during the surveys. The sampling will continue during the upcoming surveys in December and until summer 2018. Lab analyses of the 2017 samples are ongoing. Libby Jones (IMR) has joined the project and will analyse the results.

Task 4: A MSc student, Zoe Walker, joined the project to conduct her thesis on the work in this part of the project. A successful test deployment of the 24h sediment traps took place in September. The first full deployment followed in October and was repeated in early November. The sediment traps are placed in four different depths near the EFFECTS/JellyFram mooring south of Fiskeøya. Lab analyses of POC, Chl a, and particulate matter for flux derivation have started and are ongoing. The next sediment trap deployment will take place in early December, and monthly deployments will continue throughout the winter 2017/2018.

Master and PhD-students involved in the project

Zoe Walker (UWestfjords/UiT); working title for the thesis: Suspended biomass and its vertical export in Kaldfjord during polar night

For the Management

An understanding of the impact of herring invasions on the fjord system is crucial for managing human activities in the fjord, including fisheries, aquaculture, and tourism. However, to be able to assess the impact, a basic knowledge of the system has to be achieved first. The data collected and modelling done so far in WHALE give promising results to create and contribute to such a baseline of the fjord system.

Published Results/Planned Publications

Dillon et al.: Predicting harp seal body condition with a supervised artificial neural network and multiple animal-borne sensor data, submitted to PLOS One, use CTD data provided through this project. The data are published at NMDC:

Renner, A. (2017): CTD profile from station T3.1 in Kaldfjorden, Troms, Norway, taken on 10 Oct 2016. doi:10.21335/NMDC-267689998

Walker Z: Suspended biomass and its vertical export in Kaldfjord during polar night (working title). MSc Thesis, to be submitted summer 2018

Wiedmann/Walker/Renner et al: Winter suspended biomass and vertical export in Kaldfjord.

Renner/Skardhamar/Jones/Chierici: Kaldfjorden hydrography and carbonate chemisty

Communicated Results

The project was presented during workshops at IMR, UiT, and within the Fram Centre.

The project and Zoe's MSc thesis were presented on the JellyFarm and on AR's personal blog. Pictures of fieldwork activities and project aims were shared on social media (Twitter & Instagram). AR included the project during teaching activities and the teaching cruise in the UiT course BIO-2516 Ocean Climate.

Interdisciplinary Cooperation

The project is inherently interdisciplinary by integrating physical, chemical, and biological research. Collaboration with weShare and EFFECTS will include the social sciences. Zoe's MSc thesis will include a management component, in cooperation with the weShare project.

Budget in accordance to results

yes

Could results from the project be subject for any commercial utilization

No

Conclusions

First conclusions will be available in 2018, after the end of the field period.