10.2. Special investigations

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Arctic and boreal benthic process and function (ArcProFun) and Deep Sea Vision

The Isfjord-Billefjord Ecosystem (western Svalbard, fig 10.1) was investigated 16-23 August.

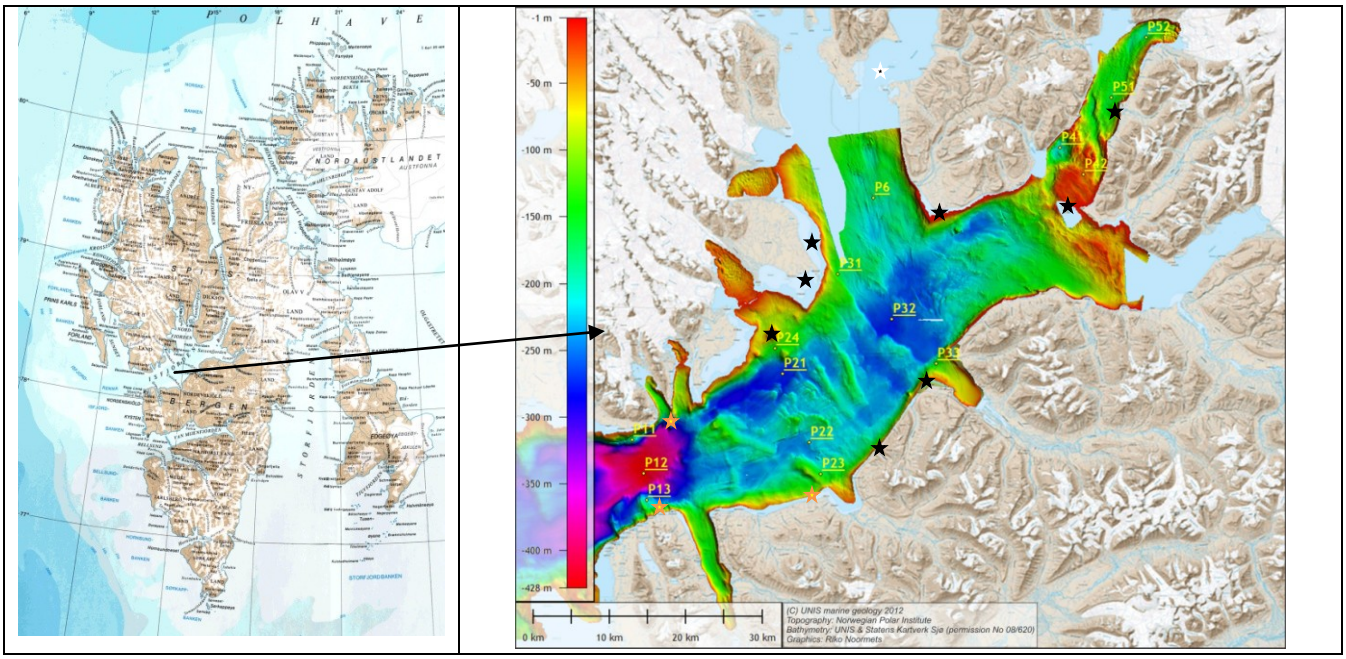

Figure 10.2.1. Svalbard and the western Is- and Billefjord system.

One of the main goals for the **Arctic and boreal benthic process and function (ArcProFun)** was to map the pelagic and benthic fauna (fish and invertebrates) composition of the fjords (deep and shallow; inner and outer part) and to characterize the functional roles of the most dominant fauna within identified communities. The question on who eats who will be central.

Another important goal was testing the DeepVision in-trawl camera system to collect a continuous, time- and depth-referenced, record of all organisms captured in the pelagic trawl.

1. The continuation of the ArcProFun (WP 1-6) will be by **workshops**, **data analyses**, **discussion groups** and finally **publishing** in 2013/2014 if financed by

WP1: Shallow water systems (lead by **Tove Gabrielsen,** UNIS)
WP2: Community structure in the Is-Billefjord: how to integrate abundance/biomass/trait data of fish, zooplankton and benthos (Lead by **Lis L Jørgensen** (IMR)/**Olga Ljubina** (MMBI))
WP3: Isotop analyses of sediment, water column, zooplankton, benthos and fish: what species isotops are important in relations to environmental factors (depth, inner-outer fjord) and biological factors (same species different locations, same species different life stadium, diverse feeding types) (Lead by **Therese Løkken** (UNIS)/**Paul Renaud** (APN/UNIS))

WP4: Fish populations and fish stomach analyses (Lead by **Elena Eriksen** (IMR)/**Tatiana Proklova** (PINRO))
WP5: System modeling (lead by **Ulf Lindstrøm/Greg Certain**, IMR)
WP6: The ability of dominant fauna to adapt to climate change (**Raymond Bannester** (IMR))
Preliminary results will be presented on the website later this year (before December).

2. The DeepVision in-trawl camera system collects five sets of stereo colour images per second, allowing species to be identified and lengths to be calculated.

The system was deployed on 20 hauls, both standard step-wise hauls for 0-group fish with 10 minutes of sampling each at surface, 20 m depth and 40 m depth and exploratory hauls with full sampling from the surface to seabed.

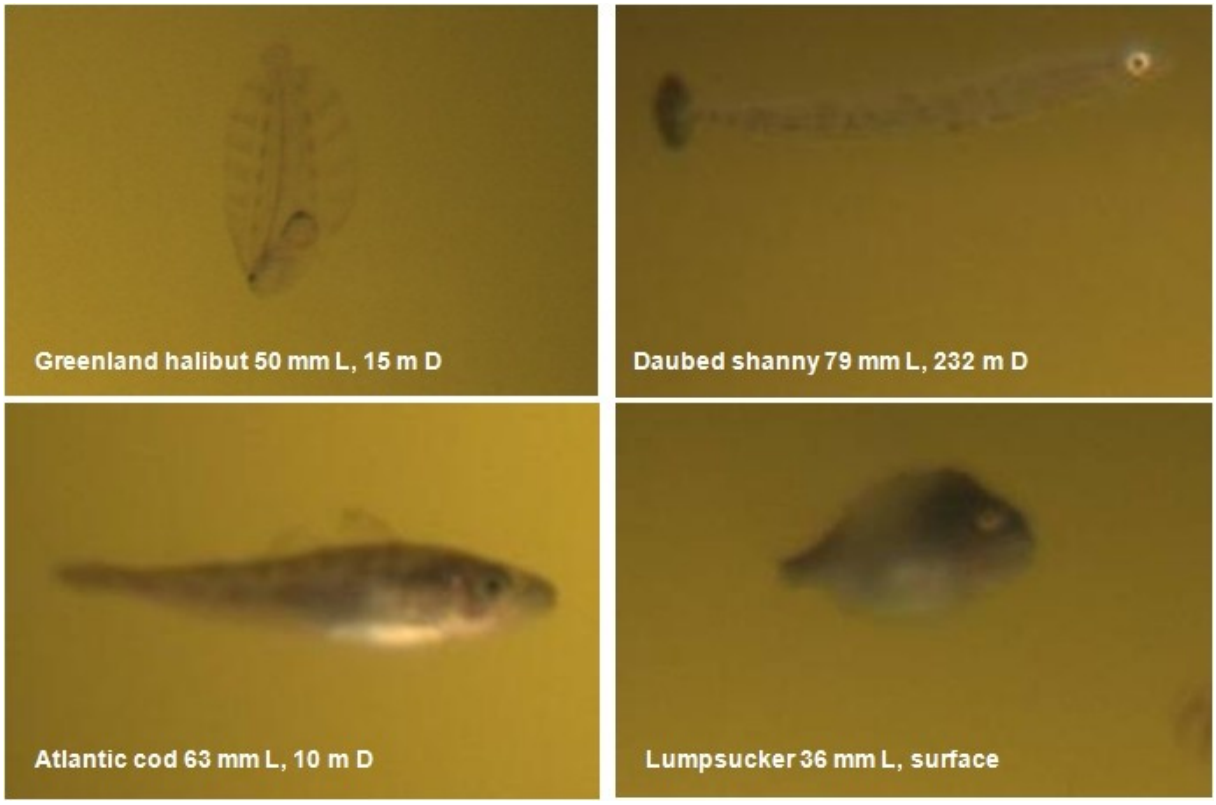

Figure 10.2.2. Examples of 0-group fishes imaged with DeepVision in-trawl camera system

In addition to fish, the DeepVision system documented depth distribution and densities of crustacea and cnidaria. Distributions of krill, in particular, were highly patchy with magnitude-scale variation in density over < 1 minute

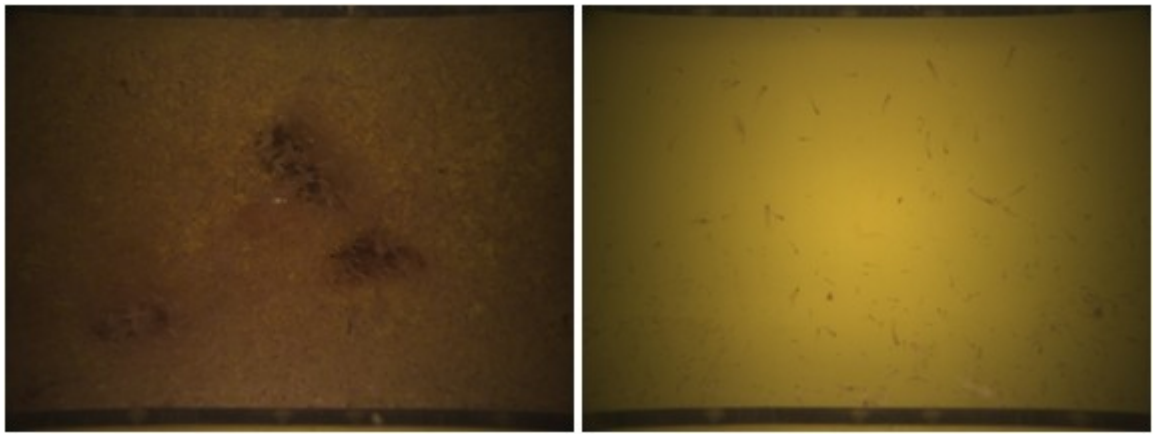

Figure 10.2.3. Magnitude scale variation in krill densities were measured using images from the DeepVision system. These images were taken 41 seconds apart at the surface in Billefjord (station P41).

Further analyses are underway, and will focus on patchiness in distribution of 0-group fishes during shooting and hauling phases of standard step-wise hauls.