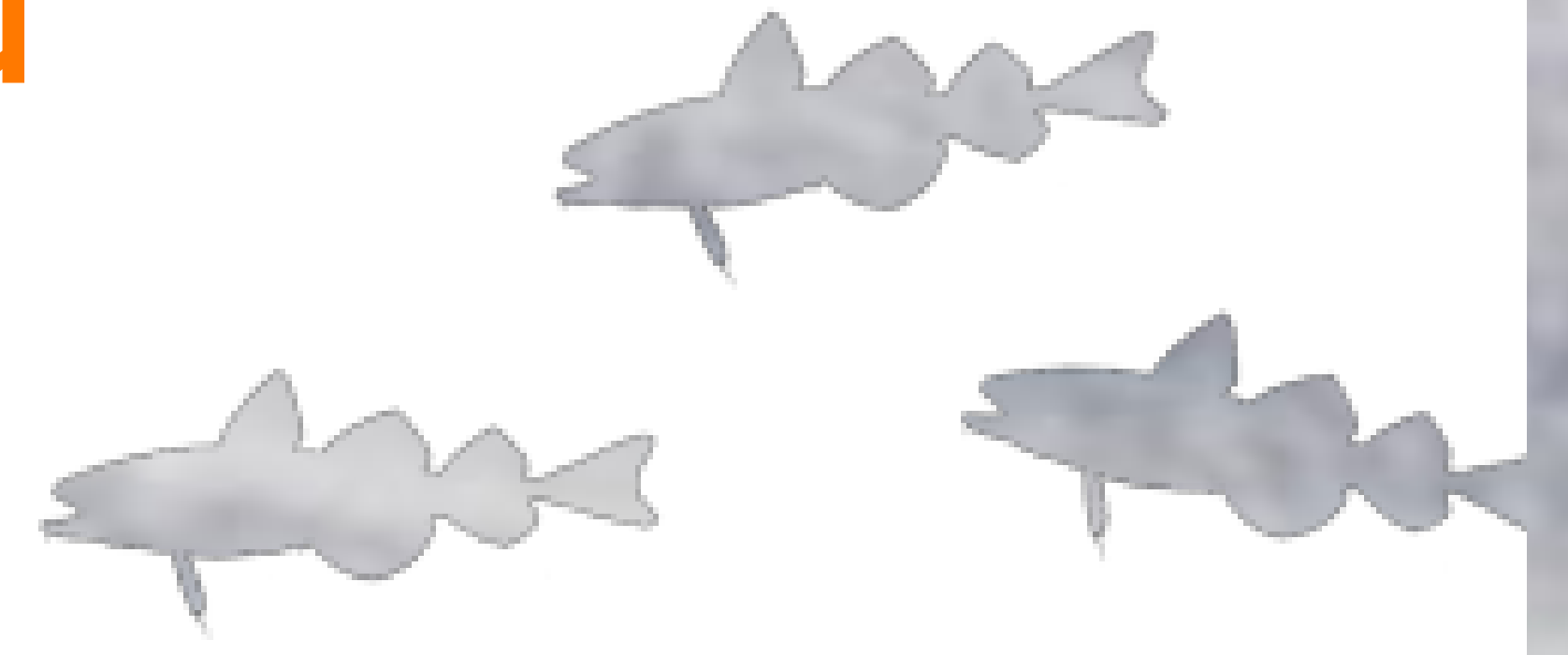




Variability in the diet of polar cod

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Introduction

Polar cod (*Boreogadus saida*) is an important food source for top predators and the most abundant fish underneath the Arctic pack ice. The diet of polar cod was investigated using fish caught directly underneath the sea ice, in order to look at the use of food sources that are provided by the sea-ice habitat. The diet was compared between polar cod from two different seasons.

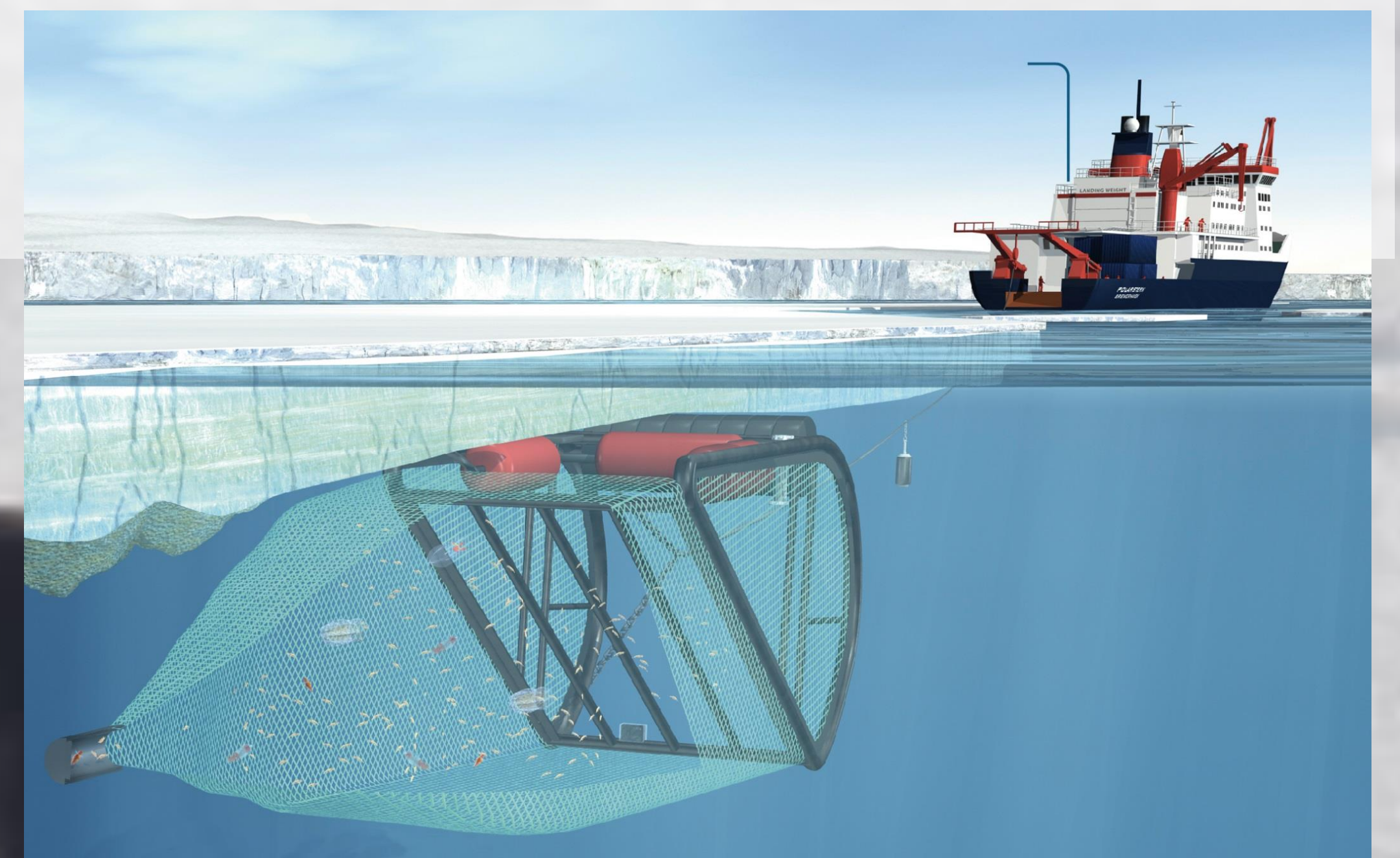


Polar cod (*Boreogadus saida*)

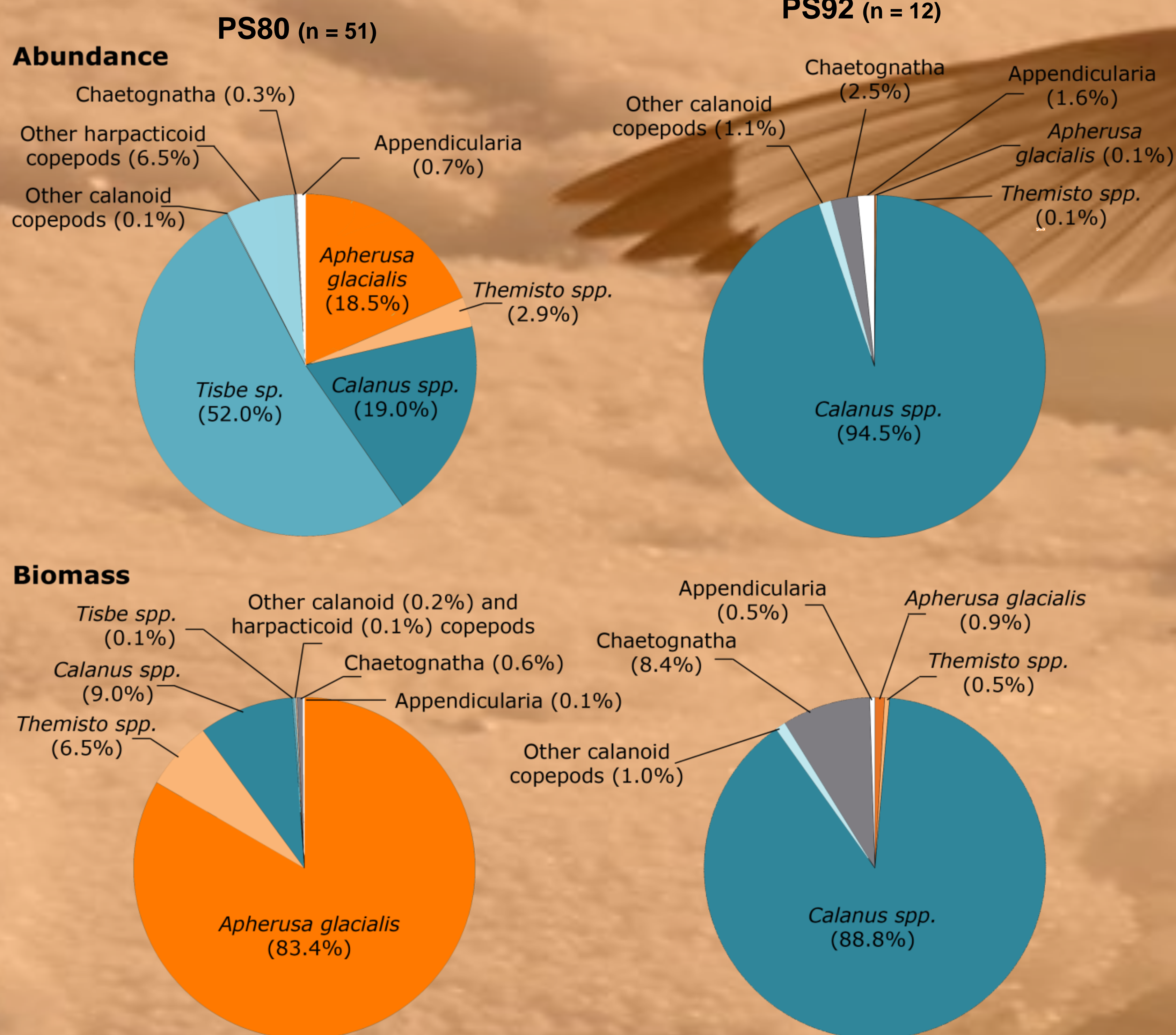
Methods

First- and second-year polar cod were caught underneath the sea ice in the Eurasian basin of the Arctic Ocean from August to October 2012 (PS80), and the Svalbard shelf and Yermak plateau in June 2015 (PS92). The fish were caught at a depth of 0 to 2m using a Surface and Under Ice Trawl (SUIT). Diet was investigated by analysis of the stomach content using microscopy.

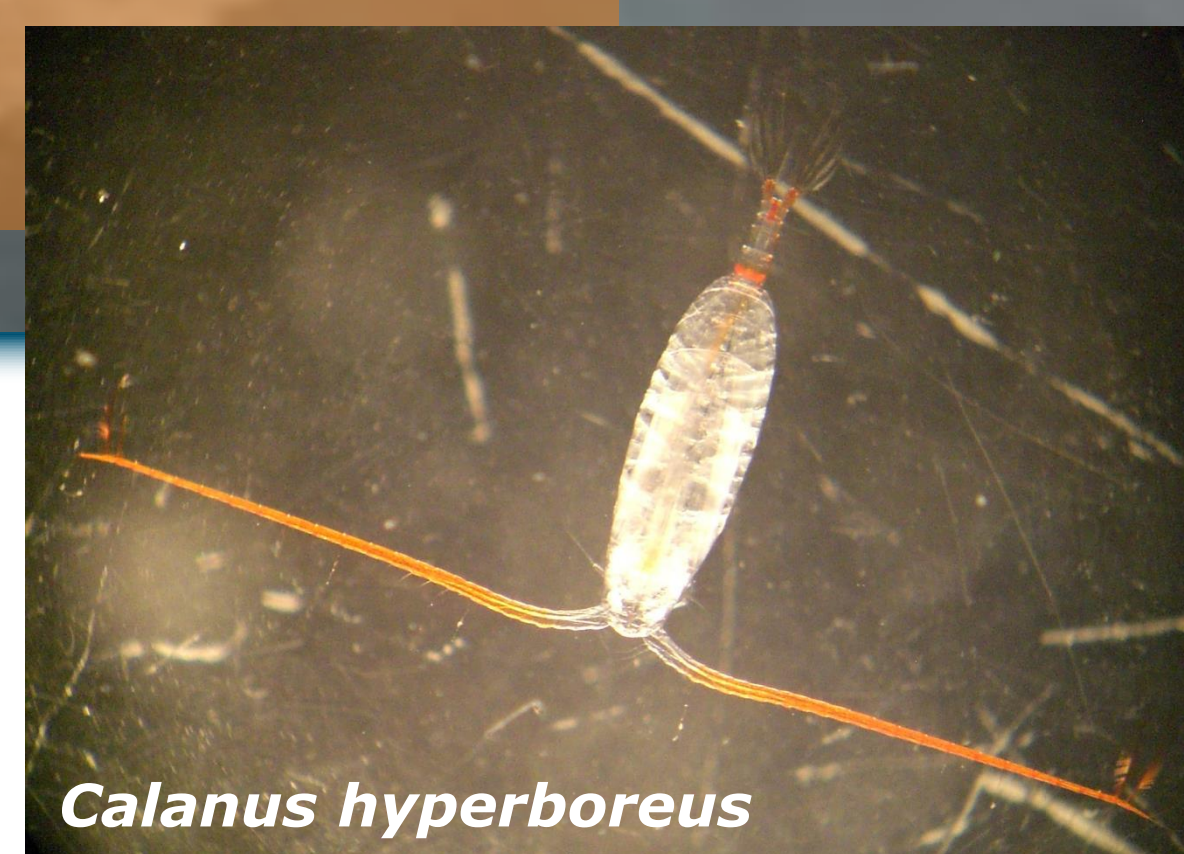
The Surface and Under Ice Trawl (SUIT) sampling underneath the sea ice.



Stomach contents



➤ Polar cod were much more abundant in the ice-water interface layer during PS80 compared to PS92.



Calanus hyperboreus

Discussion

Differences in diet are likely caused by food availability rather than seasons, based on quantitative comparison with the under-ice zooplankton community composition during PS80, and comparison with other studies. The sea-ice associated amphipod *Apherusa glacialis* and the copepod *Tisbe spp.* were important food sources in the central Arctic Ocean, while *Calanus spp.* was consumed in less deep waters. Further investigation of zooplankton underneath sea ice has to verify if this is due to differences in the distribution of these species.

Environment	PS 80	PS92
Water column depth sampling area (m)	3424 - 4354	189 - 2249
Under-ice surface water temperature (°C)	-1.82 - -1.06	-1.83 - -1.26
Under-ice surface chlorophyll <i>a</i> (mg m ⁻³)	0.15 - 0.44	0.27 - 10.6
Sea ice thickness (m)	0 - 1.40	1.14 - 3.67
Fish		
Size range polar cod (mm)	52 - 137	63 - 157
Average stomach content weight (g)	0.09	0.45
Average condition index*	78.6	73.1

* Condition index = 100 * (eviscerated wet weight fish (g)/wet weight fish (g))

Associated literature

David C, Lange BA, Krumpen T, Schaafsma FL, Van Franeker JA, Flores H (2015). **Under-ice distribution of polar cod *Boreogadus saida* in the central Arctic Ocean and their association with sea-ice habitat properties.** Polar Biology 39(6), 981–994.

Kohlbach D, Graeve M, Schaafsma FL, Lebreton B, Lange BA, David C, Vortkamp M, Flores H (in review). **Strong linkage of polar cod (*Boreogadus saida*) to sea ice algae-produced carbon: evidence from stomach content, fatty acid and stable isotope analyses.**

Photos: H. Flores (polar cod), G. Castellani (background)
SUIT graphic: GEO Grafik/Illuteam43

