

Interannual variations in the diet of young-of-the-year Arctic cod in the Mackenzie Shelf / Amundsen Gulf, Canadian Arctic, during fall

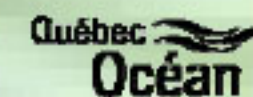


ArcticNet
 Арктический обмен опытом

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Introduction

The Arctic cod is a key species in the arctic marine food web, transferring low level biological production (carbon) to vertebrate predators (seals, whales, birds, bears and man).

As a step towards modeling the population dynamic of Arctic cod in the High Arctic (Theme 1), we determined and compared the diet of the late larval stages sampled during fall 2002, 2003 & 2004 in relation to the prey assemblage prevailing in 2002 in the eastern Beaufort Sea.

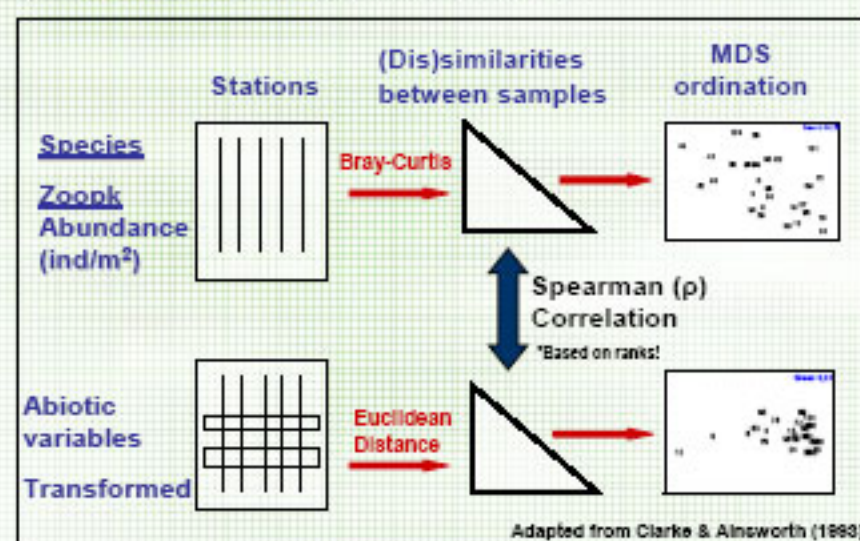


Fig. 1. YOY Arctic cod (*Boreogadus saida*)

Objectives

- Characterize different oceanographic regions in the study area of CASES 2002 based (1) on zooplankton abundance, and (2) on environmental factors;
- Evaluate interannual variations of 3 dominant species found in stomach content of juveniles (25-45mm) captured during fall 2002, 2003 & 2004;
- Compare relative abundance of the 3 dominant species found in stomach content of arctic cod from the Mackenzie Shelf and the Amundsen Polynia.

Bio-Env Procedure



Results

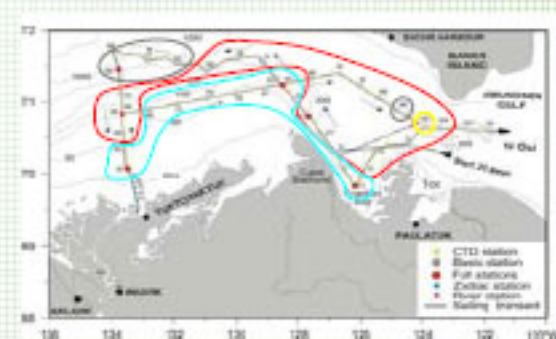
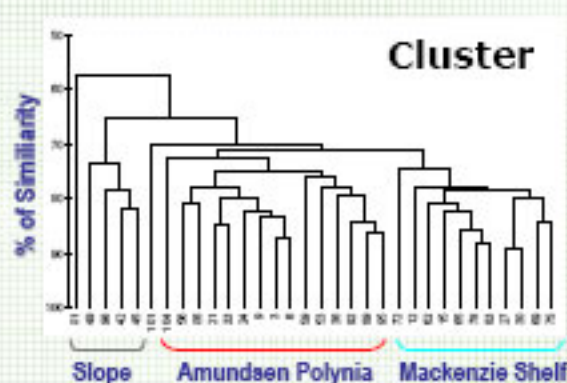


Fig. 2. Study area CASES 2002. Oceanographic regions characterized by cluster & MDS.

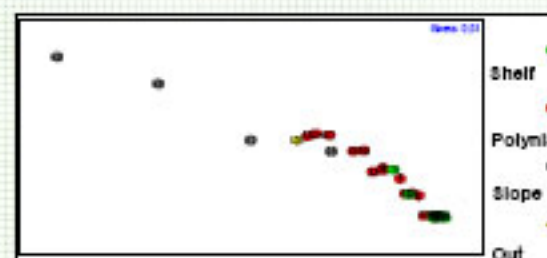


Fig. 3. Results of the Bio-Env analysis best combination (Longitude, Depth, Ice cover 15%).

Multi-Dimensional Scaling

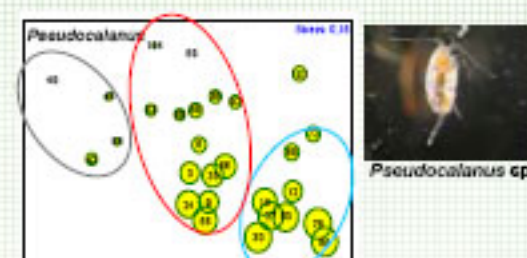
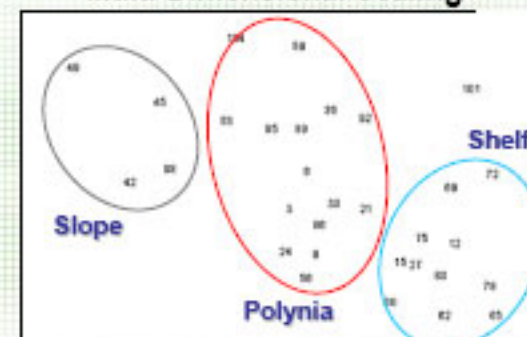


Fig. 4. Abundance of small copepods species *Pseudocalanus* sp. and *Oithona similis* (Ind/m²) in the mesozooplankton during fall 2002.

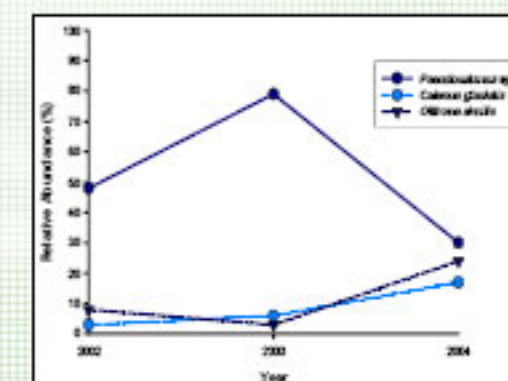
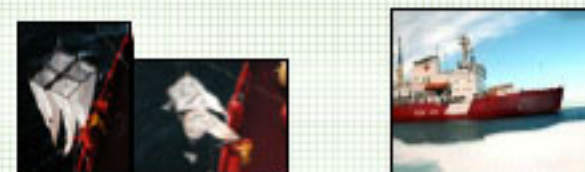


Fig. 5. *Boreogadus saida*. Relative abundance of 3 dominant species in stomach contents of Arctic cod (25-45mm) captured during fall 2002, 2003 and 2004.

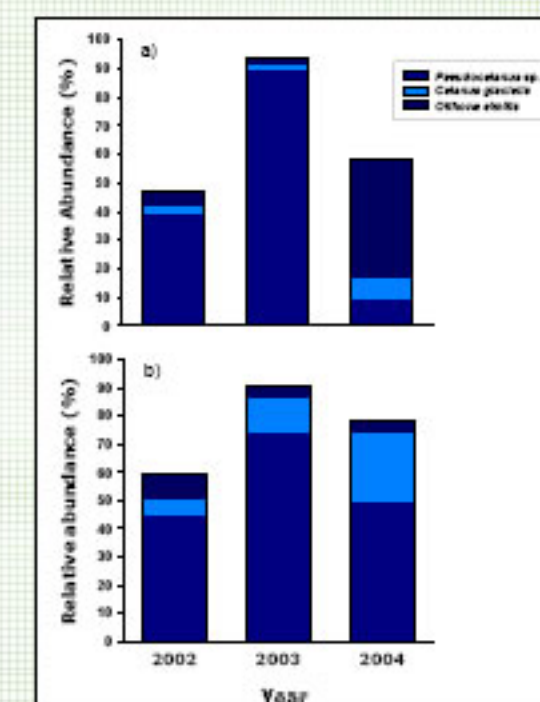


Fig. 6. *Boreogadus saida*. Relative abundance of 3 copepod species in the diet of YOY Arctic cod caught in (a) Mackenzie Shelf and (b) Amundsen Polynia.

Conclusion

- Multivariate analysis of the prey field and environmental variables were correlated and demonstrated the differentiation of three oceanographic regions within the study area in 2002 (Fig. 2 & 3). The copepod *Pseudocalanus* spp. was clearly indicator of the shallower waters of the Mackenzie Shelf whereas cyclopoids were more present in the Polynia region (Fig. 4).
- Copepodites of the medium-size calanoid copepod *Pseudocalanus* spp. largely dominated the diet of Arctic cod late larval stages in 2002 and 2003. The preys were more diverse in 2004, with cyclopoids and the copepod *Calanus glacialis* dominating the diet (Fig. 5). The differences observed in 2004 may reflect the sampling in 2 oceanographic regions (Fig. 6).
- The next step is to explore the links between interannual differences in the prey field of YOY Arctic cod and ocean climate (circulation, temperature, sea-ice regime), with the objective of developing models of the impacts of the on-going reduction of sea-ice on the trophic web of the High Canadian Arctic.

Acknowledgements

