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INTRODUCTION

Breiðafjörður has high biomass and diversity but information on planktonic communities in the area is sparse [1]. Consequently, knowledge about phytoplankton and zooplankton interaction, and energy transfer through the food web is limited. In this study phytoplankton biomass and community composition is documented in relation to the physical- and chemical environment in the fjord.

OBJECTIVE

The objectives are to determine phytoplankton biomass and community composition in Breiðafjörður and to estimate the spatial and temporal variation in phytoplankton abundance in association with environmental factors.

RESULTS

The results indicate spatial- and temporal variability in the physical characteristics of the fjord, which were reflected in the chemical and biological components. Water column stratification was more prominent in the outer part of the fjord compared to the inner part of the fjord which showed limited stratification (Figure 2). Influences of tidal flow on water properties were apparent at times when warm water propagation deep in the water column was observed at station BFR5 (Figure 2). Phytoplankton bloomed in the northern part of the fjord in early spring, but flourished at the south shore in late spring and early summer (Figure 3). Phytoplankton species composition was characterized by diverse diatoms and by *Phaeocystis pouchetii* in early spring and flagellates in late summer (Figure 4).

METHOD

Samples were collected at 10 stations on two transects (BFS and BFR) across the fjord (Figure 1). The physical parameters were measured continuously through the water column. Water was collected at discrete depth intervals from the surface to the bottom for chemical and biological analysis.

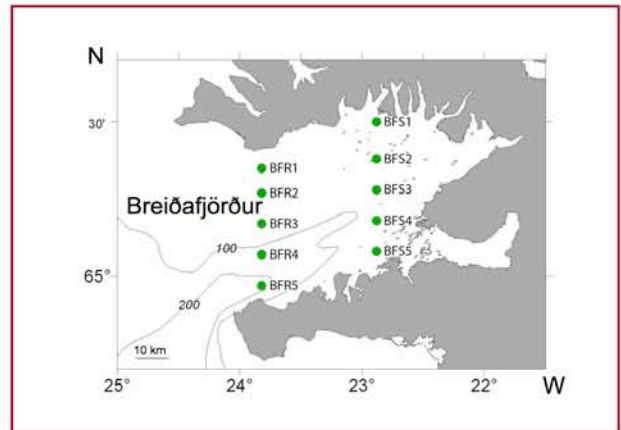


Figure 1. Station locations in Breiðafjörður. Distance between stations is 10 to 11 km.

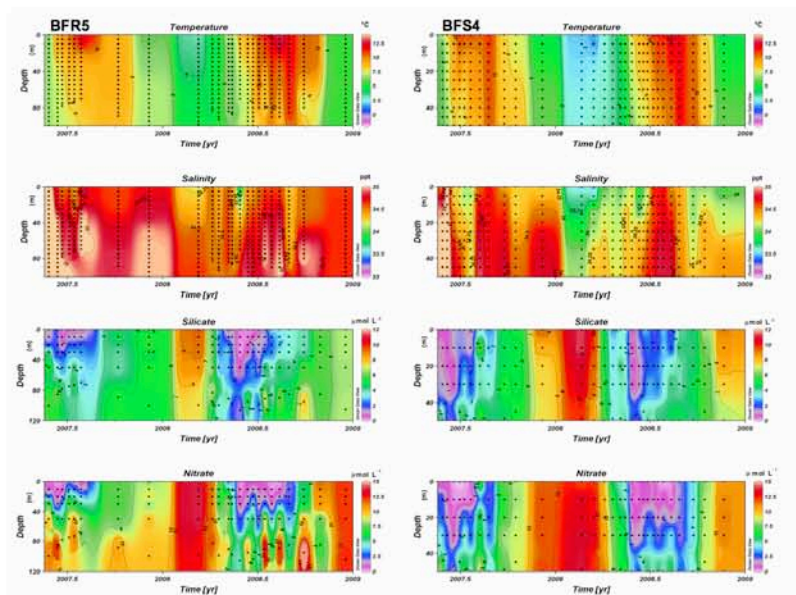


Figure 2. Physical properties (temperature, salinity) and nutrient concentrations (silicate and nitrate) at stations BFR5 and BFS4, from May 2007 to end of December 2008. The scale of Y-axis is according to the depth of the water column at the sample sites, 120 m at station BFR5 and 50 m at station BFS4. Black dots represent sampling dates and depth at which samples were collected within the water column.

DISCUSSION

The preliminary results of this ongoing study indicate spatial- and temporal variability in the physical properties of the fjord, which are reflected in the chemical and biological characteristics. The water column in the outer part of the fjord gets stratified during summer, whereas the shallower part of the fjord remains well mixed throughout the year. Furthermore, phytoplankton biomass shows a north-south density gradient, with seasonal alterations of the location of the maxima. The project is considered as initiation of a time series study of phytoplankton dynamics in Breiðafjörður which aims at furthering the understanding of the linkage between primary production and energy transfer through the food web in the fjord.

REFERENCES

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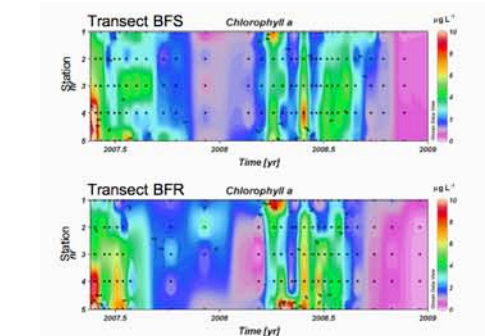


Figure 3. Phytoplankton biomass (Chlorophyll a) at 10 m depth at the East (BFS) and West (BFR) transects in Breiðafjörður. Duration of study is from May 2007 to December 2008. Stations numbered 1 to 5 from North to South.

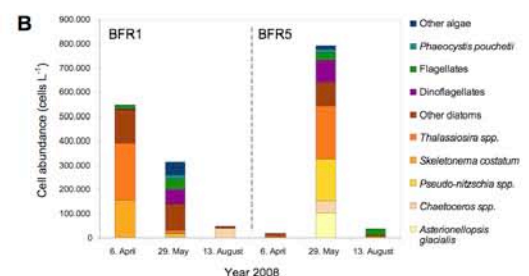
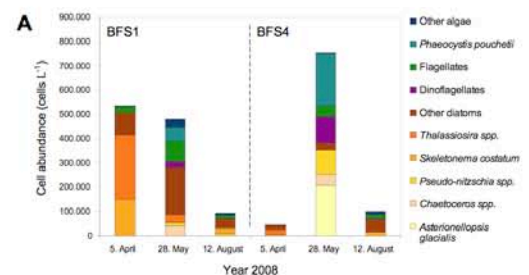


Figure 4. Phytoplankton abundance (cells L⁻¹) at two stations on the Eastern (A) and Western (B) transect in summer of 2008. Phytoplankton bloomed in April in the North (BFS1/BFR1) and in late May in the South (BFS4/BFR5) compared to August of low cell abundance.