Food web interactions at the Belgian Continental Shelf

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Introduction

Based on results obtained in a previous OSTC-programme (Functional and structural biodiversity of North Sea ecosystems), the existence of two different food webs on the Belgian Continental Shelf (BCS) was hypothesized. A comparison of the response of nematode communities at an "open" sea station (Station 330) and a coastal 'accumulation" station (Station 115 bis) (Fig. 1) to the deposition of phytodetritus during a spring phytoplankton bloom revealed completely different reactions in terms of nematode densities, vertical distribution and diversity (Steyaert et al. subm, Vanaverbeke et al., in prep).

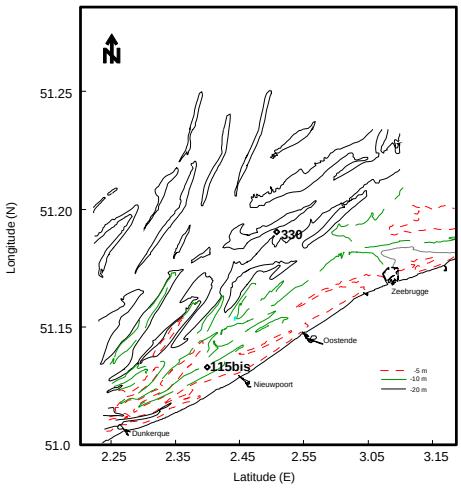

Figure 1 Map of the Belgian continental shelf with indication of the samplin stations

Within the framework of TROPHOS, we aim to unravel the differences in the benthic food webs at these two target locations. In a first step, all biota and structuring variables

at both stations are examined in order to quantify and understand the differences in primary and secondary production at both locations at the BCS.

General sampling scheme

Both stations are visited monthly with *RV* Belgica or Zeeleeuw and sampled according to the scheme presented in Fig. 2. The concentration and organic matter content of suspended particulate matter (SPM) will provide necessary insight into trophic status of the stations, whilst their stable isotope ratios (carbon and nitrogen) together with phytopigment concentrations will help track changes and blooms of primary producers. Similarly, the isotope ratios and pigment concentrations of surface sediment is analysed to follow organic matter transfer to the sediment (benthic-pelagic coupling). The amount of incoming organic matter channelled into benthic fauna will be traced through quantification of the biomass, standing stock and nitrogen and carbon isotope signatures of major benthic components (micro-, meio- and macro-fauna). Bulk remineralization of organic matter is followed by monthly sediment oxygen consumption (SOC) measurements

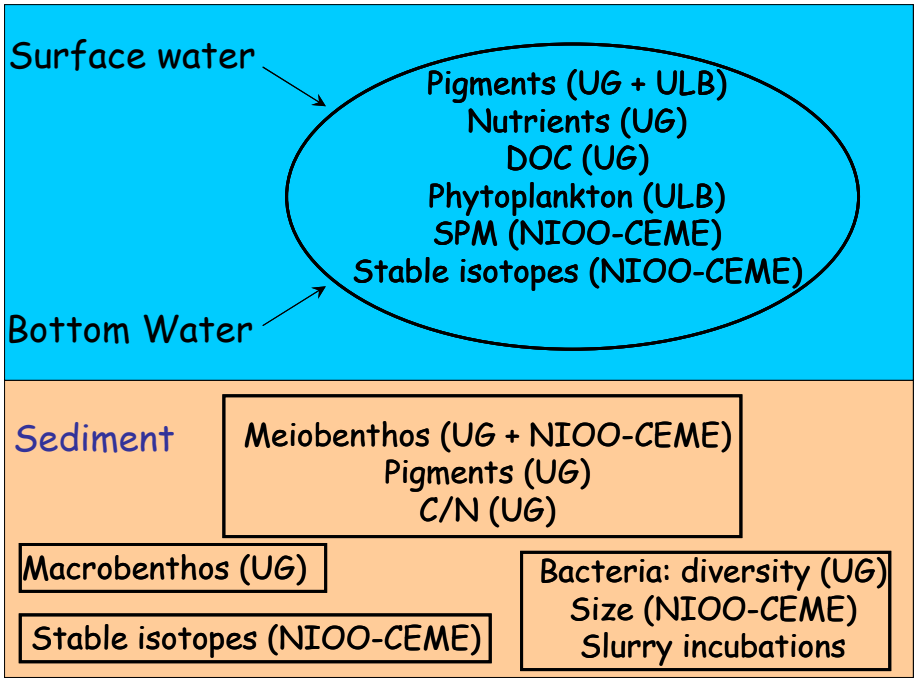

Figure 2 General sampling scheme

Preliminary results

The sampling campaigns, initiated in September 2002, have been very successful and analyses on the way. Here we present some preliminary data obtained in November 2002 during a cruise with the RV Zeeleeuw.

Sediment oxygen consumption (SOC) is a good indicator of total benthic activity and in accordance with the hypothesis, station 115 bis is characterized by higher metabolic activity. SOC at station 115 bis is more that twice that found at the "open" sea station (Fig. 3), reflecting a larger input of reactive organic matter to the former station.

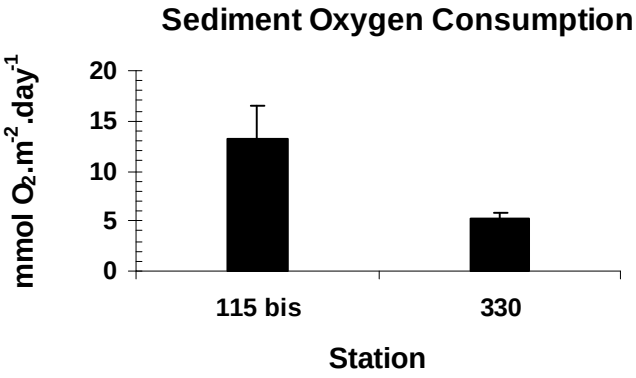

Figure 3: Sediment Oxygen Consumption at Station 115 bis and Station 330 (data from November 2002)

Similarly, surficial sediment bacterial biomass was also significantly higher at station 115 bis compared to station 330 (Fig. 4). Trends in SOC and bacterial biomass highlight the large differences in trophic status of the target locations.

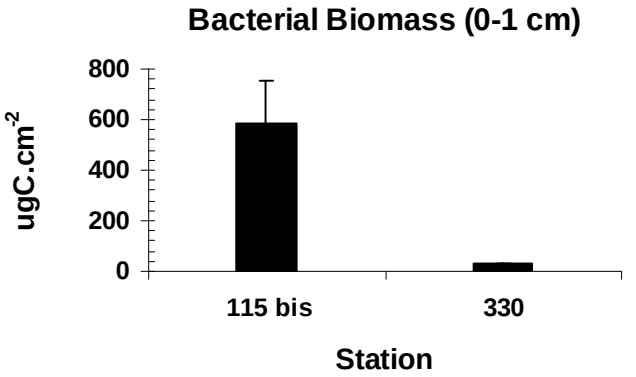

Figure 4. Bacterial biomass at Station 115bis and Station 330 (data from November 2002)

These measurements confirm the already observed differences between both locations during the spring phytoplankton bloom in 1999 (Steyaert et al. subm., Vanaverbeke et al. in prep). Using chl *a* concentrations in the sediment as a proxy for the labile organic matter pool in the sediment (Boon & Duineveld 1998), it became clear that the amount of mineralisable organic matter at Station 115bis was considerably higher. This results in a higher bacterial biomass as observed in the November measurements of 2002.