



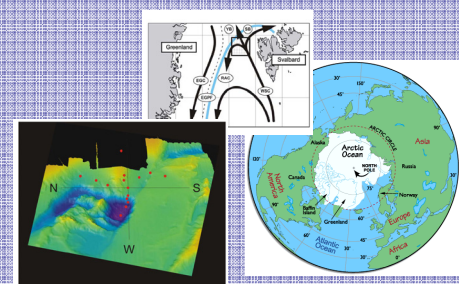
The temporal and spatial variability within meiobenthos communities at the Arctic Marginal Ice Zone

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The Marginal Ice Zone

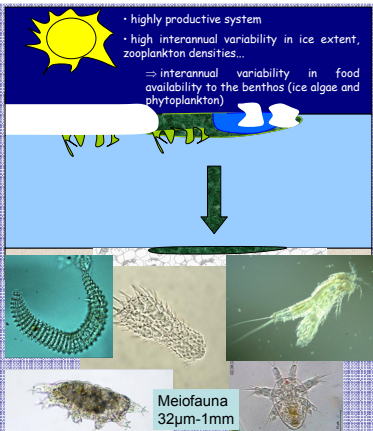
Sampling technique



The study area → The Hausgarten area =

→ Long term station at Arctic summer ice margin (annual sampling)

→ Bathymetric transect from 1200 to 5500 m



RV Polarstern (AWI)



Multicorer

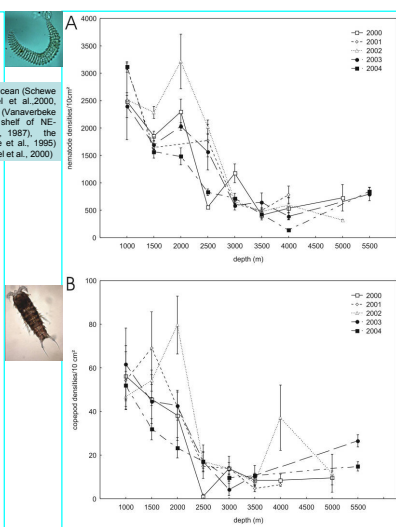
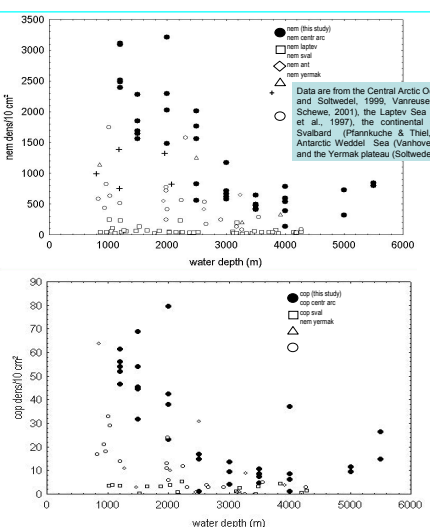
summer 2000-2004

- ✓ samples taken during summer months when food supply to the benthos was expected to be highest
- ✓ 3 replicates of stations between 1200-5500m along 'Hausgarten' bathymetric transect.
- ✓ Subsamples of MUC taken with a syringe of 2 cm diameter (3.14 cm²)
- ✓ Upper 5 cm divided in 1- cm slices

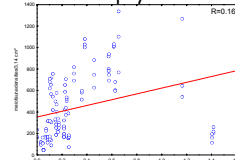
Objectives at higher taxon level:

Gain a better understanding of the relation between benthos and environmental variables related to (changing) ice conditions.

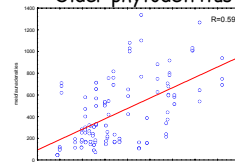
- ✓ Are deep-sea meiobenthos densities along the productive Marginal Ice Zone higher than in other polar regions?
- ✓ Are influences of time-related changes in environmental variables on meiobenthos densities comparable to influences of depth-related changes in environmental variables?



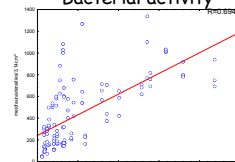
Fresh phytodetritus



Older phytodetritus



Bacterial activity



Conclusions:

- ✓ Densities are higher at the HAUSGARTEN than at other Arctic areas due to higher food availability
- ✓ Meiobenthos densities decrease with increasing water depth BUT there are two distinct communities which reflect the topography of the area rather than a gradual decrease.
- ✓ Meiobenthos densities are correlated with foodavailability, however not with fresh material (Chl a); best correlations were found with FDA → possible importance of bacteria as a food source for nematodes

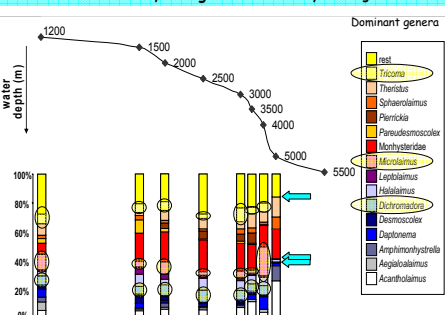
Objectives at the level of nematodes species community structure :

- ✓ Explain differences in nematode communities over the bathymetric gradient
- ✓ it was tested to what extent annual differences in food input were reflected in the nematode genus and species composition
- ✓ at which water depth are annual differences in nematode community structure most pronounced ?

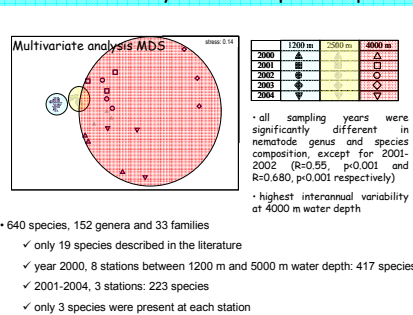
Objectives at the level of species diversity

- ✓ Do nematode genus and species diversity patterns accommodate with the unimodal trends as observed for other taxa ?
- ✓ Does nematode diversity change over time?

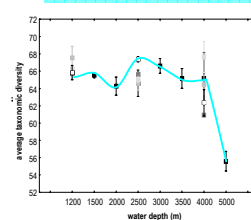
Nematode community changes over the bathymetric gradient



Interannual variability in nematode species composition

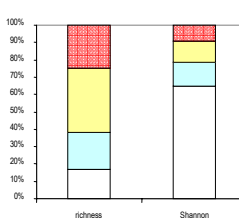


Nematode species diversity



Conclusions:

- ✓ A strong unimodal trend in diversity over the bathymetric gradient with a diversity peak at 2000 m water depth was not found. It seems more likely that there is an increase in diversity from shallow water depths towards the deep sea with a plateau in diversity from the mid slope till the lower slope and with a decreasing trend towards the slope base as was found for sample size independent indices.
- ✓ Diversity does change over the time series and differences over the time series contributed more to the regional diversity compared to changes over the bathymetric gradient. It is likely that a combination of real interannual variability and patchiness caused the high contribution of variability in time to the diversity.



richness
Shannon
diversity within 1 sample
contribution of additional water depths to the diversity
contribution of additional sampling years to the diversity
contribution of replicates to the diversity

- ✓ Typical deep-sea genera such as *Monhystridae*, *Acantholaimus*, *Halalaimus* ... are also the dominant genera at ice margin
- ✓ Nematode communities change over the bathymetric gradient
- ✓ Species turnover increases with increasing water depth with a faunal break at 5000 m water depth
- ✓ Some interannual variability is apparent
- ✓ Interannual variability increases with increasing water depth
- ✓ There are some parallel changes at 1200 m and 4000 m water depth which are possibly related to differences in food availability