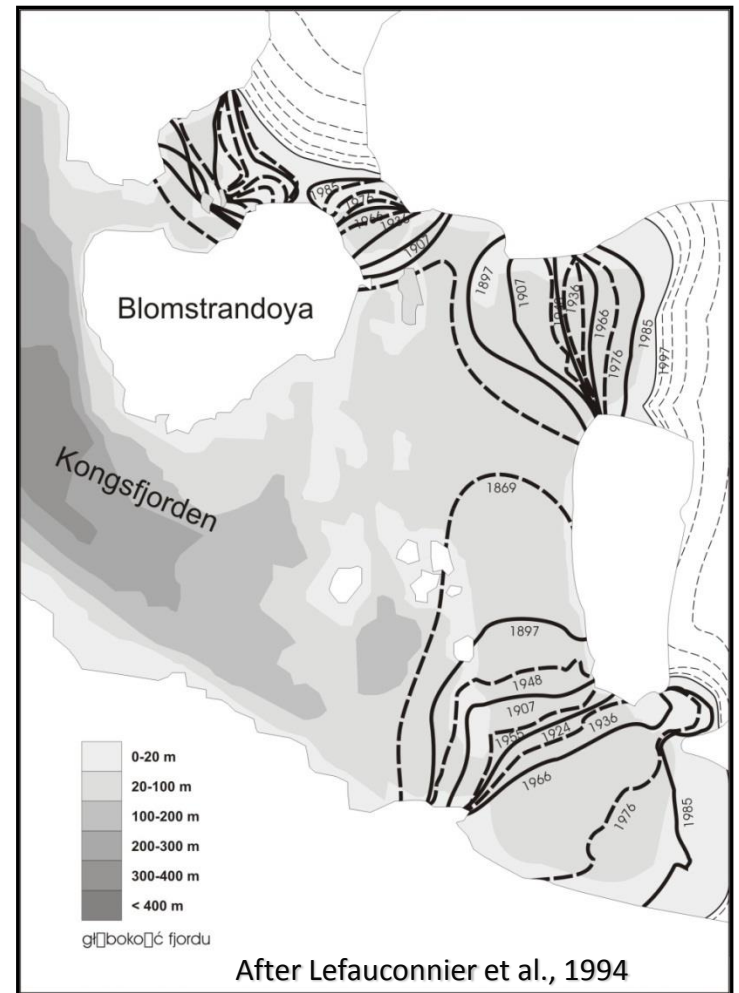
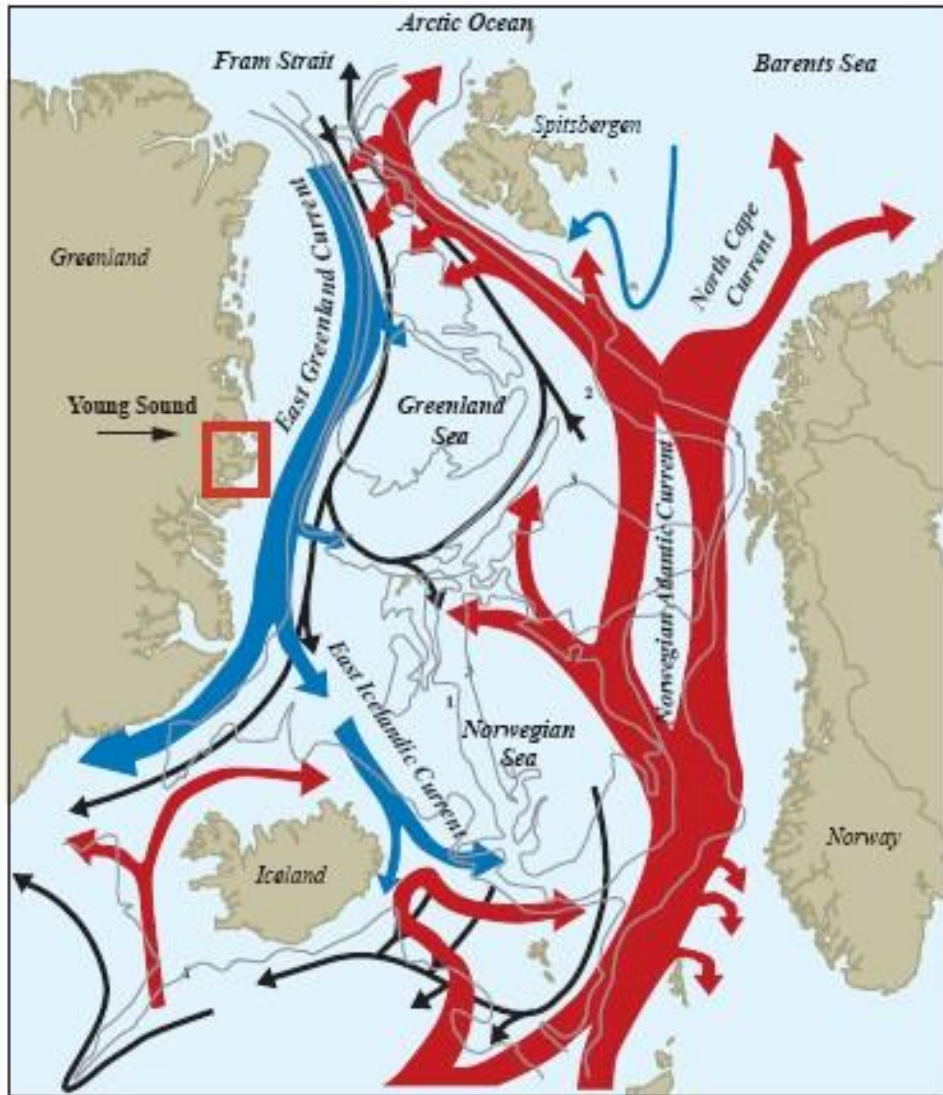
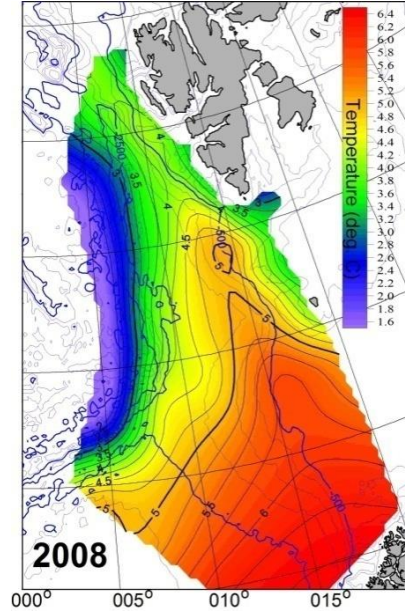
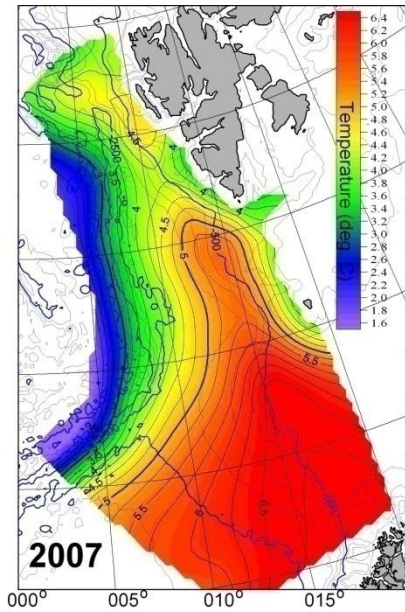
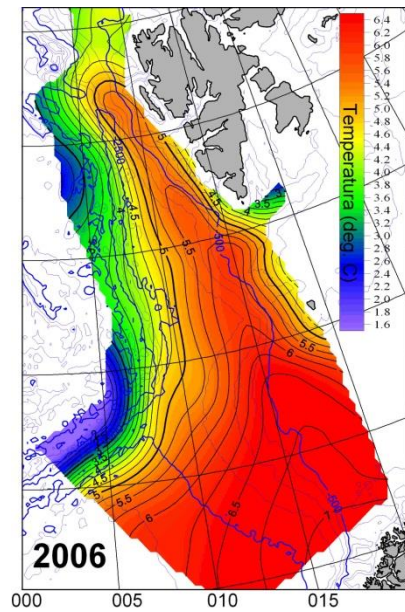
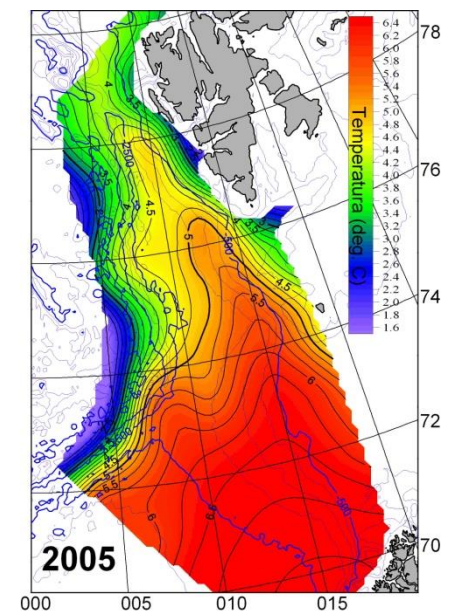
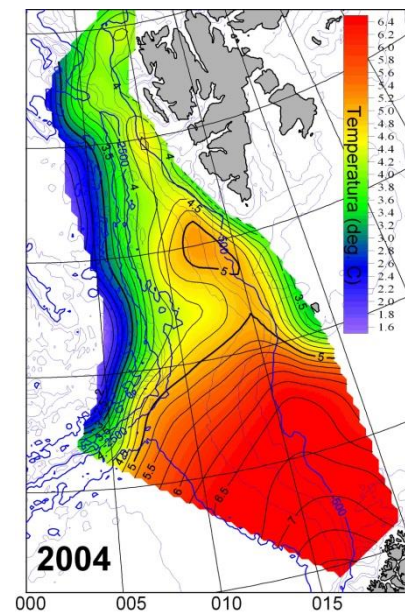
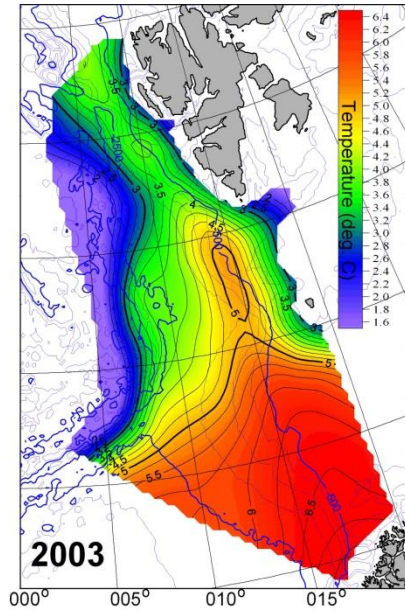
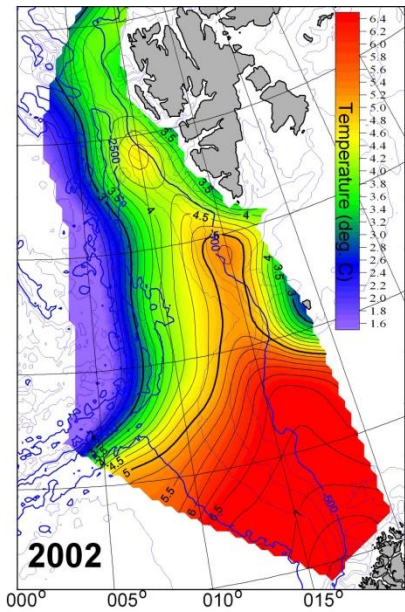


Multiyear changes in Kongsfjorden benthos

Monika Kędra & Jan Marcin Węśławski



Distribution of temperature at 100 dbar in summers 2002-2011



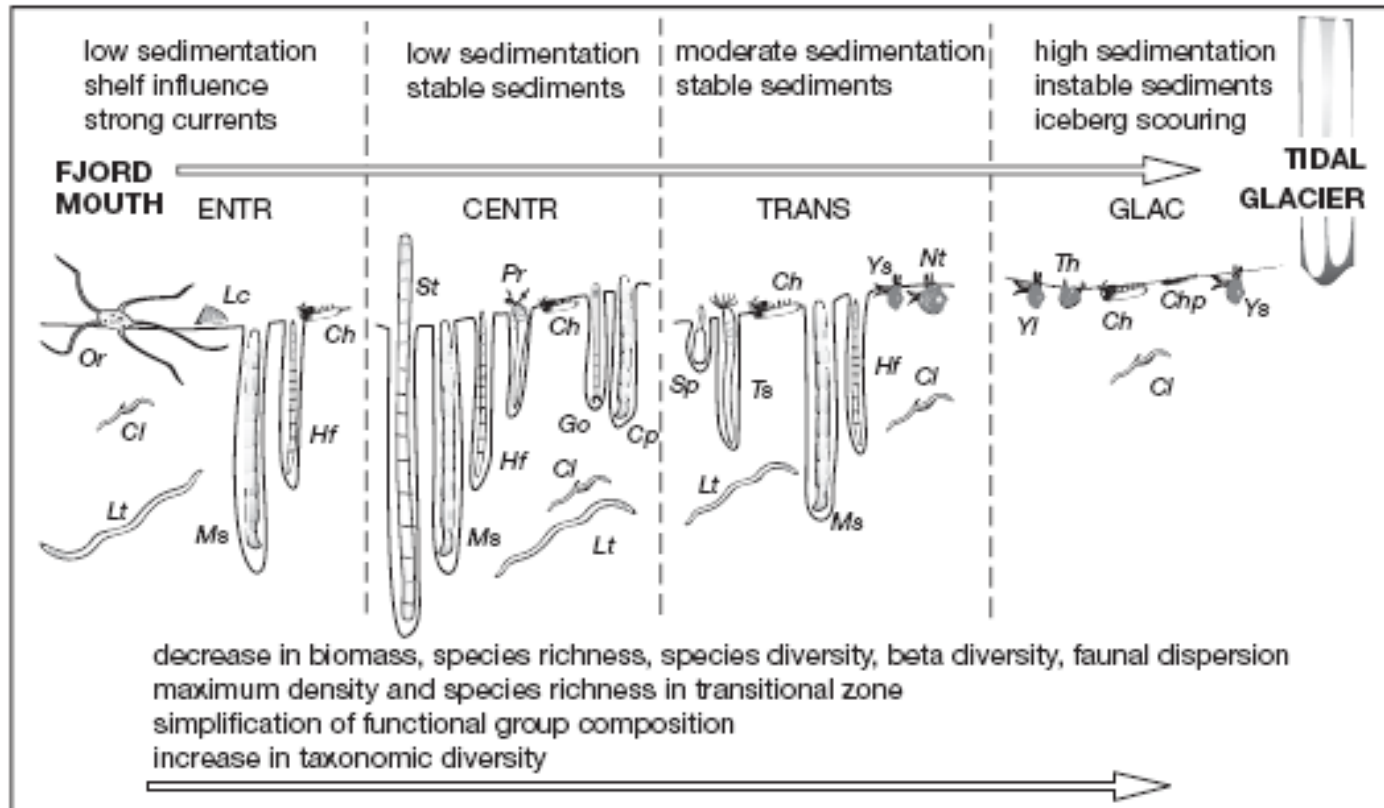


Kongsfjorden as a climate indicator

- The biodiversity and faunal populations in this fjord are strongly structured by the different physical factors that influence the fjord from both ends
(Svendsen et al., 2002)
- Because Kongsfjorden receives variable inputs of both Arctic and Atlantic influence it functions as a climate indicator on a local scale
(Hop et al., 2002)



Benthic communities distribution patterns: 1997-98



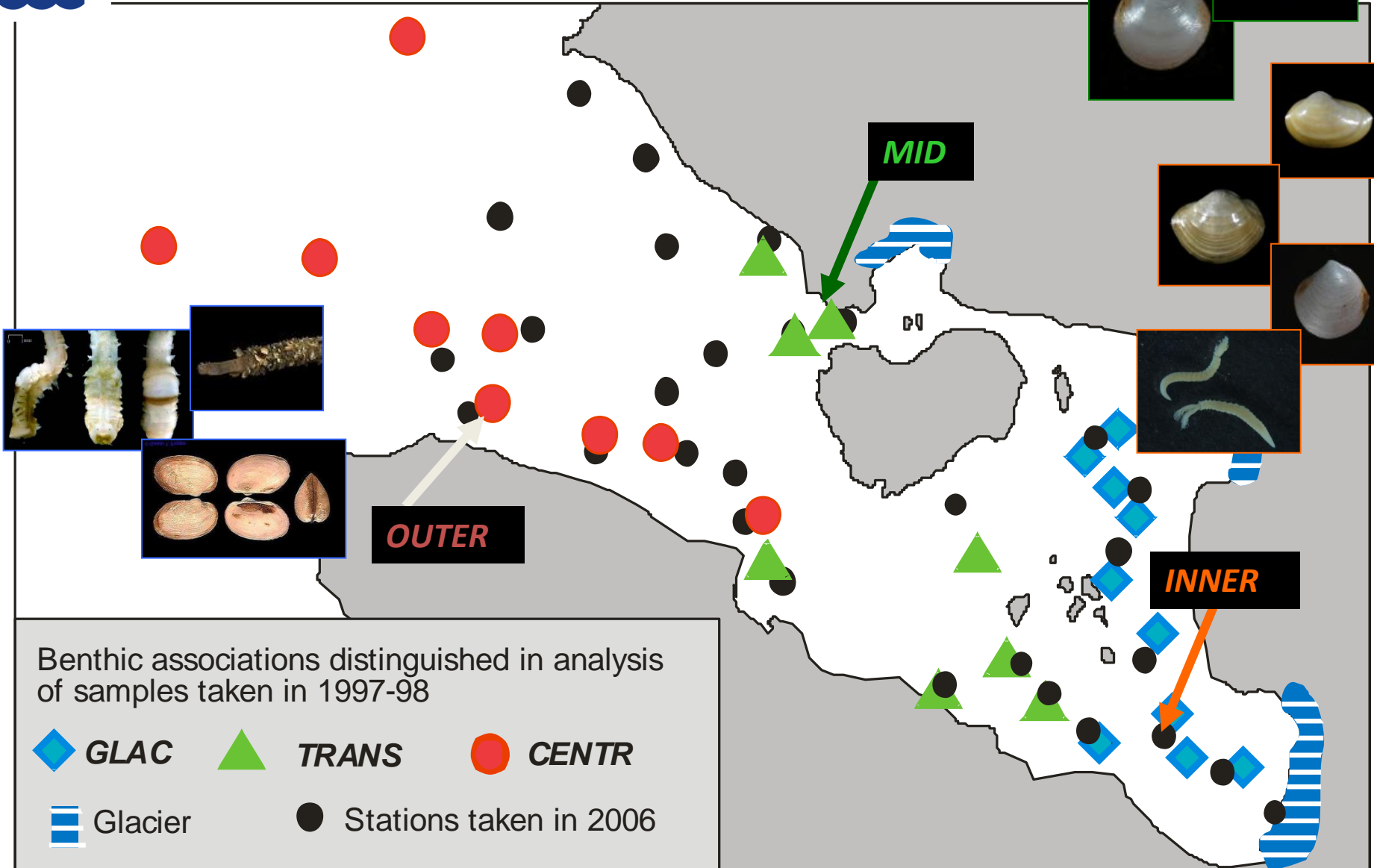
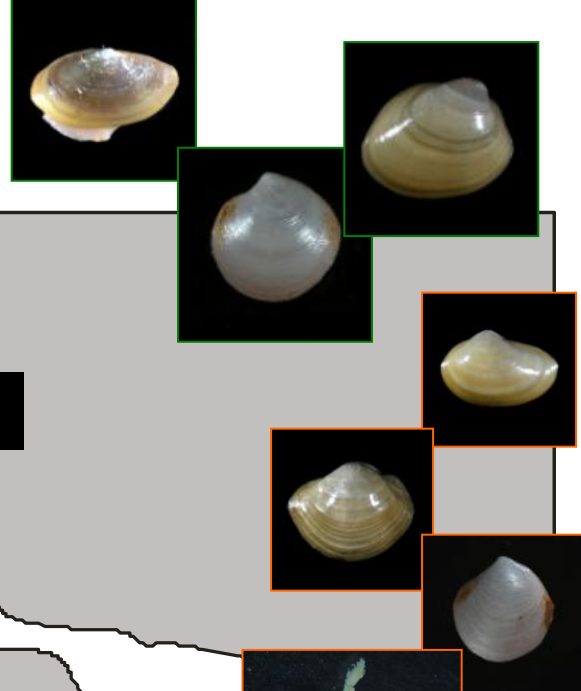
- Intermediate Disturbance Hypothesis (Huston 1979)
- Pearson & Rosenberg's (1978) organic enrichment gradient model



Questions

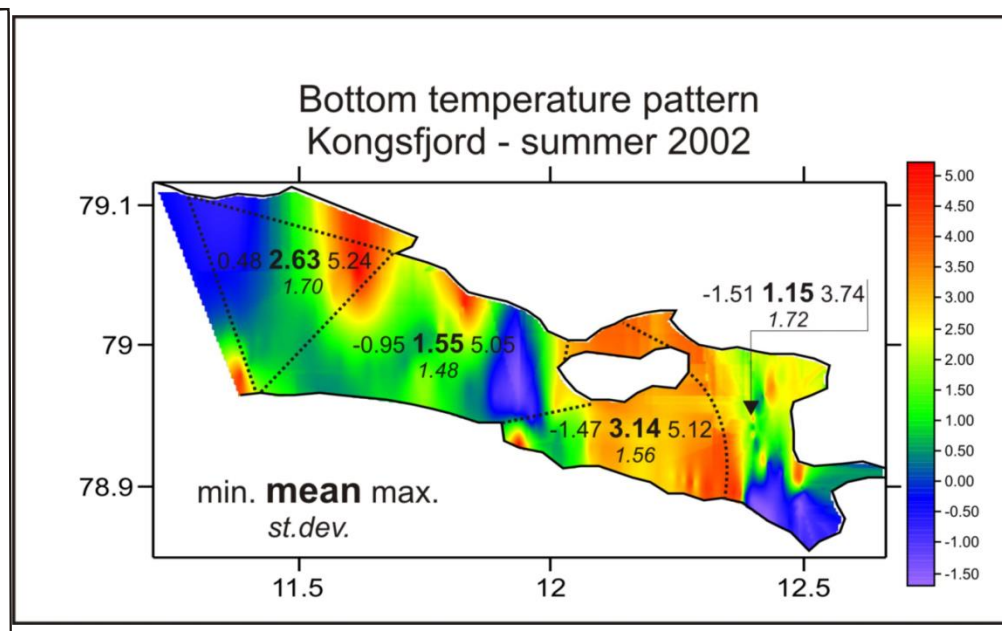
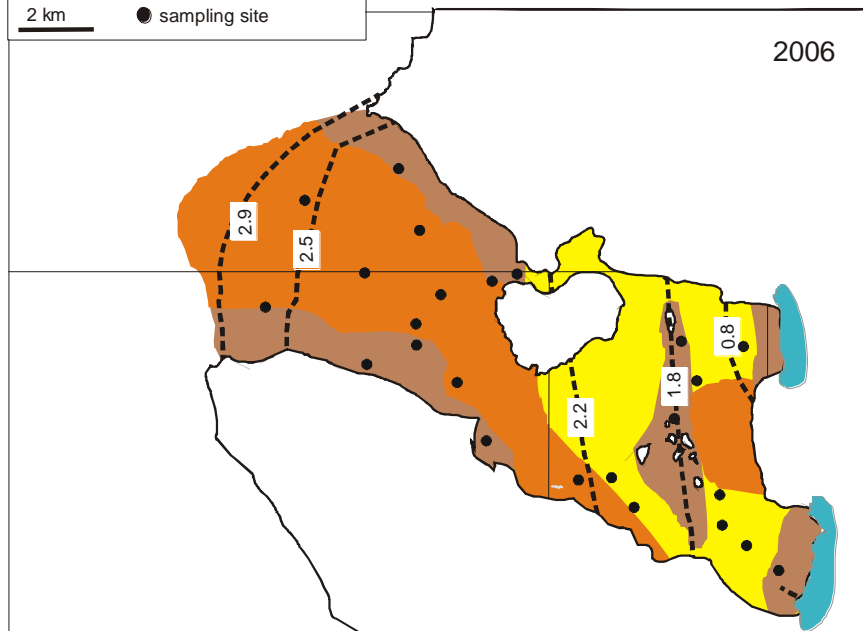
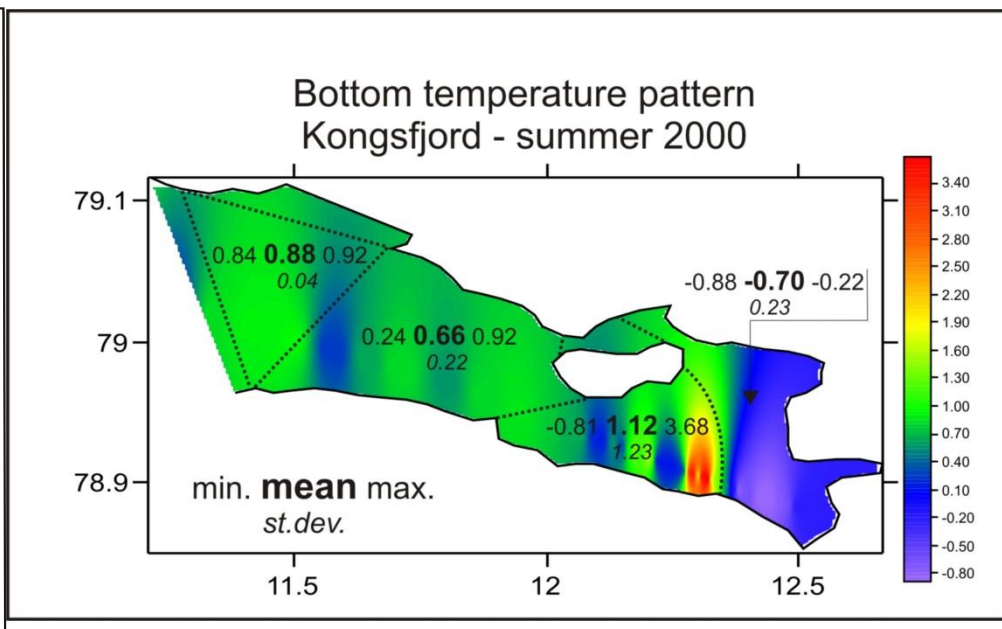
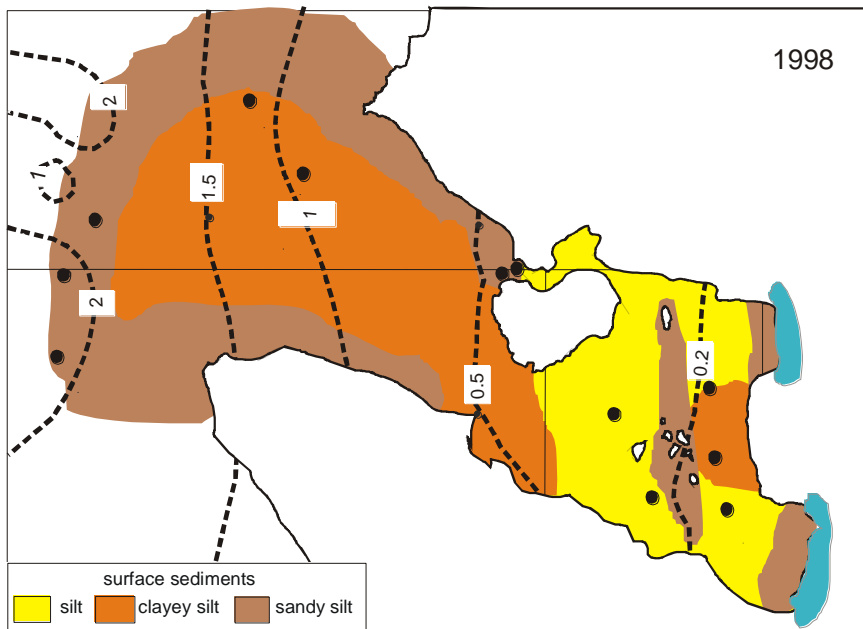
- Did the density, taxonomic composition and biodiversity of Arctic soft bottom fauna change during 12 year long period (from 1997 to 2008)?
- Which of the large-scale environmental factors are responsible for the biodiversity change?
- How the predicted climatic change will influence the benthic biodiversity?

Material and methods



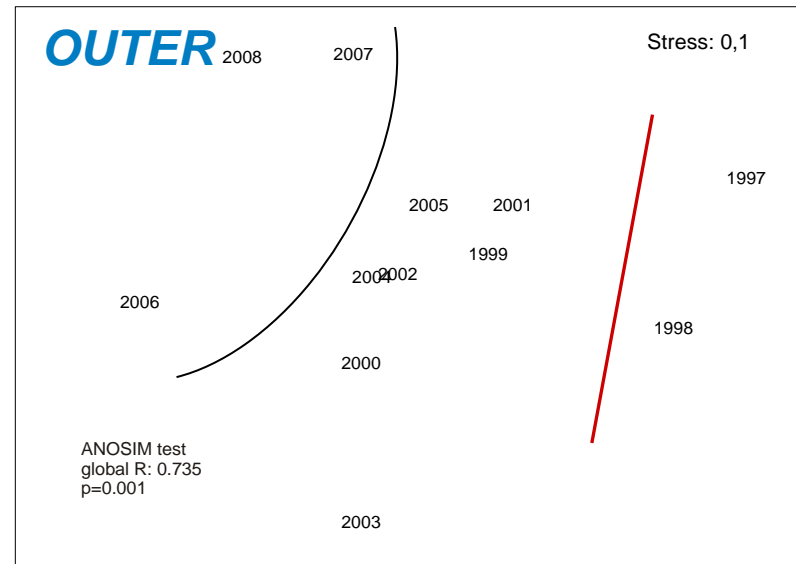
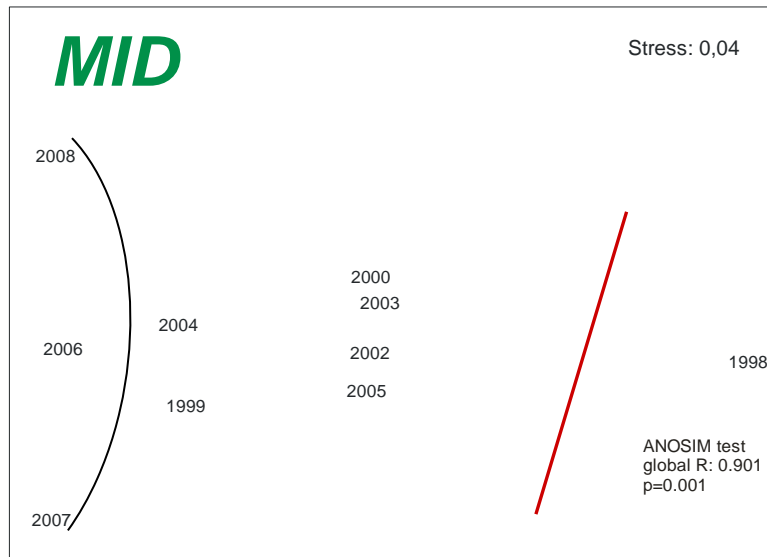
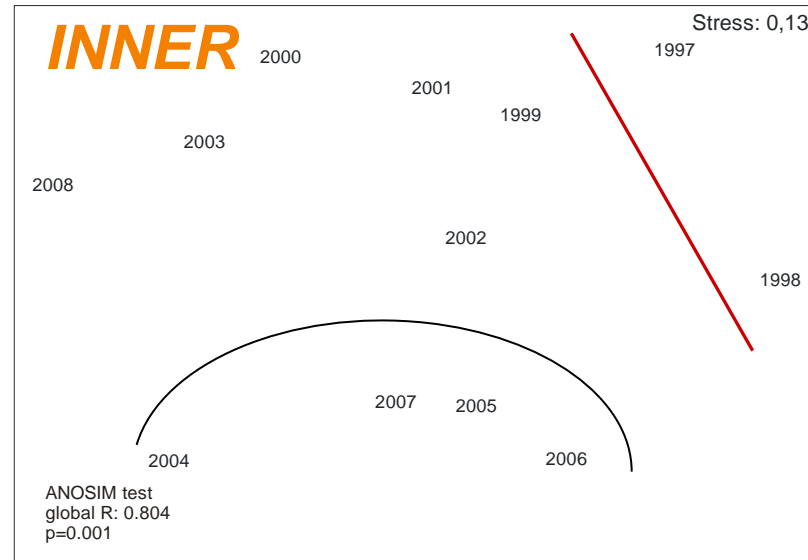
Material and methods



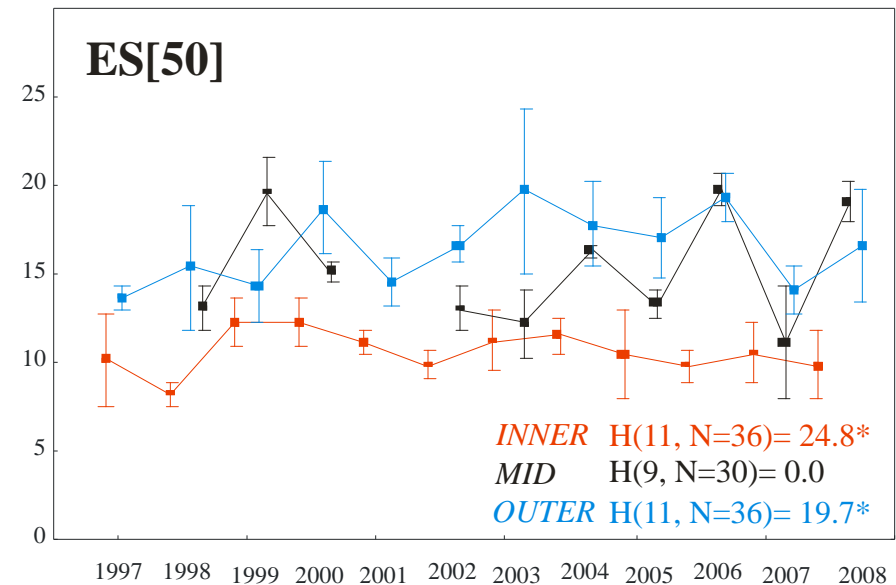
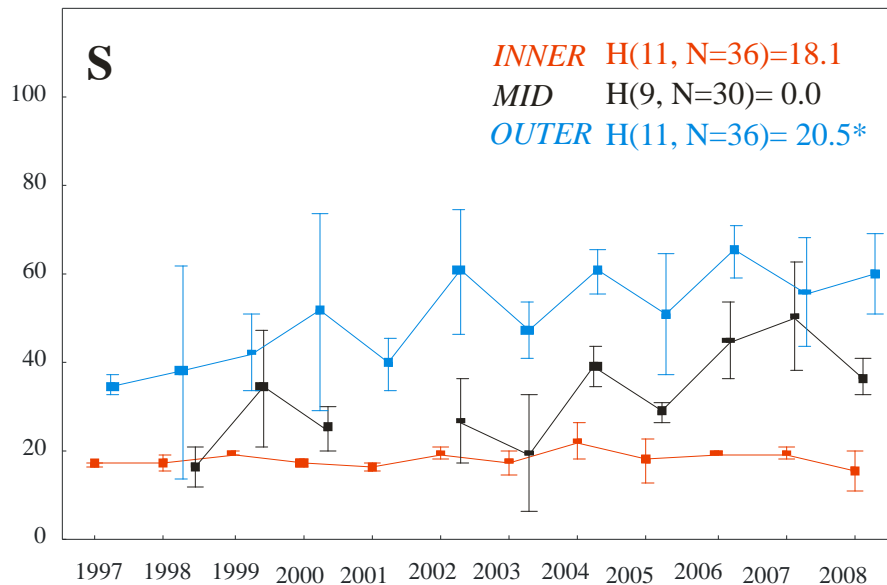
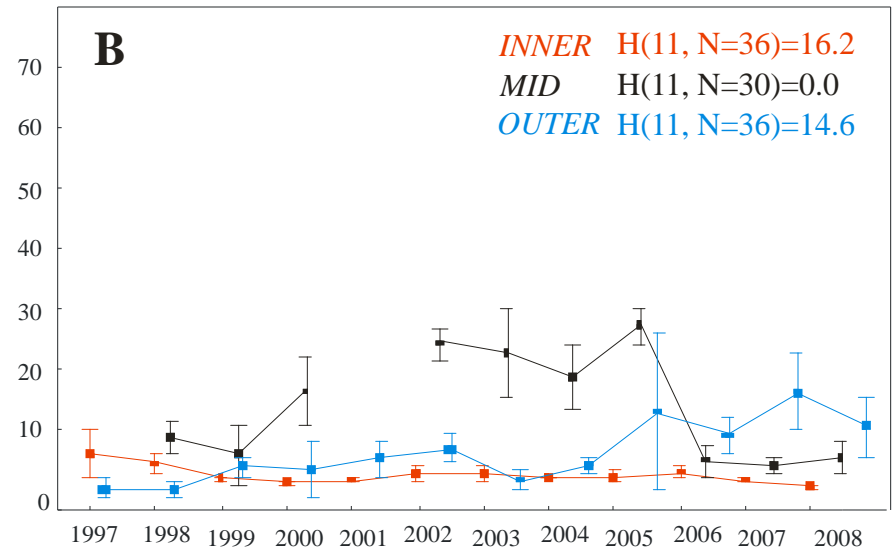
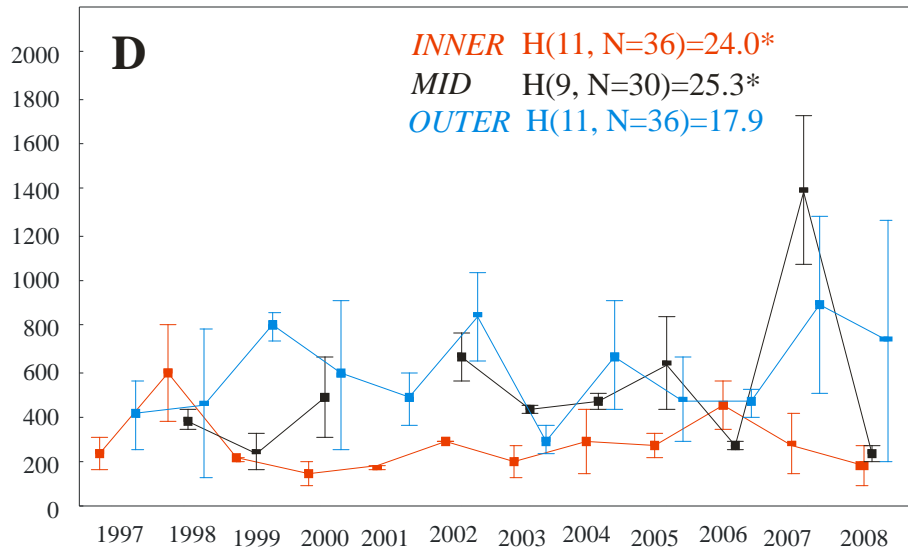




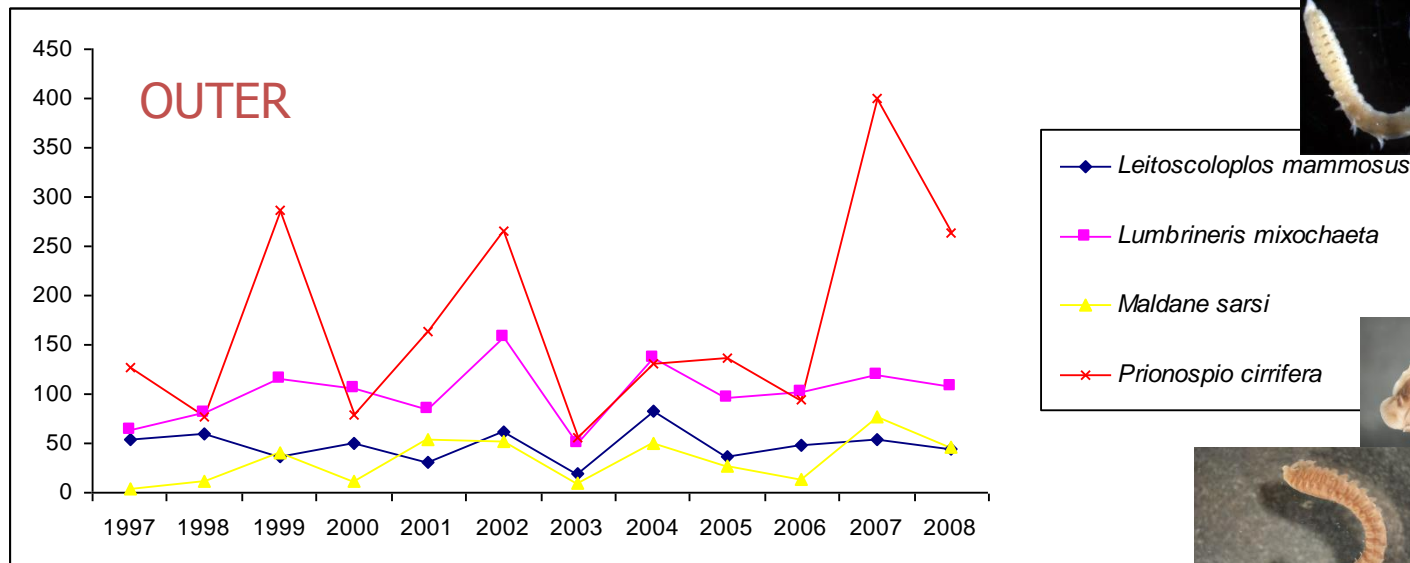
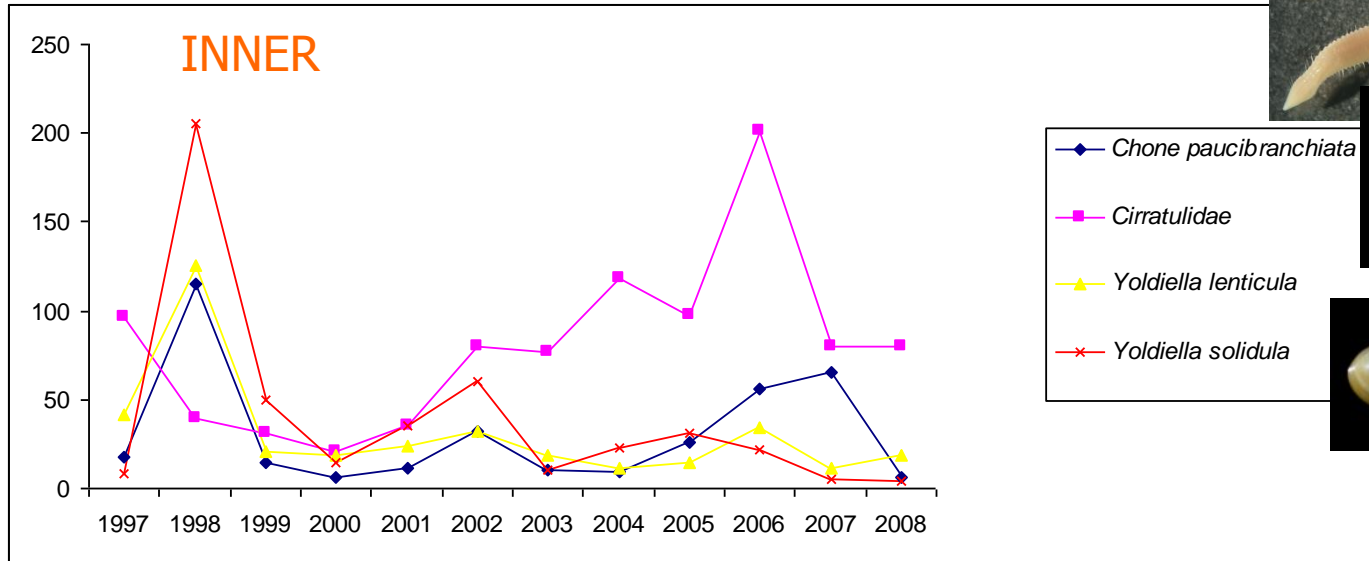
Benthic monitoring: 1997- 2008

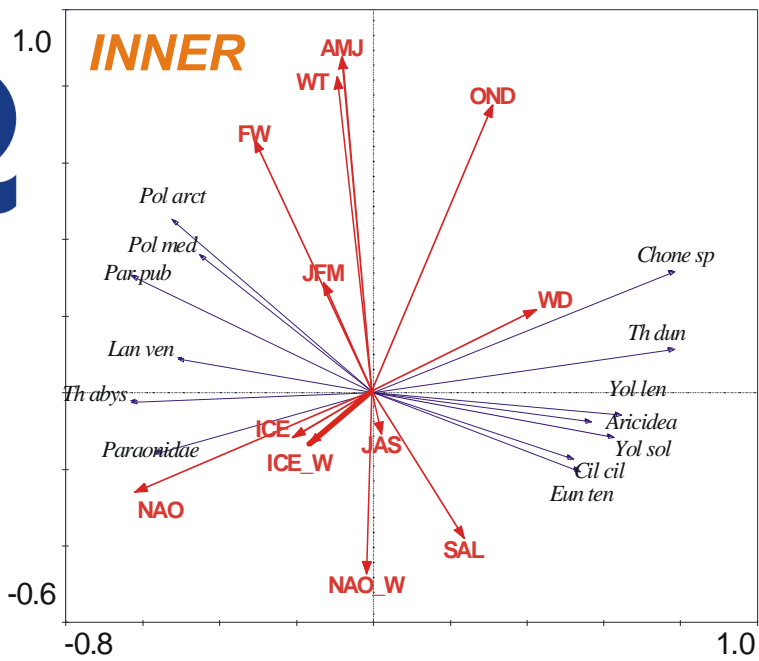


Benthic monitoring Kongsfjorden: 1997-2008



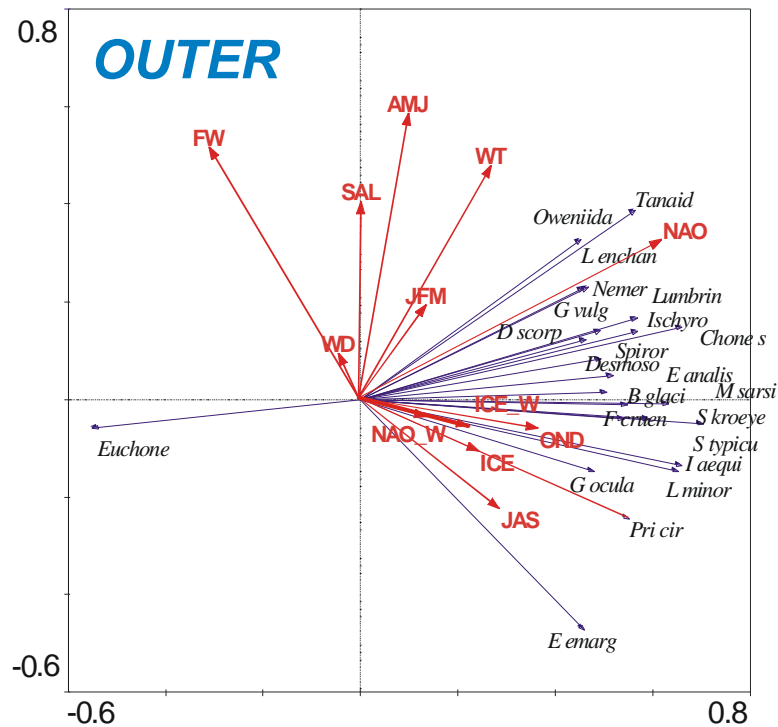
Benthic monitoring Kongsfjorden: 1997-2008





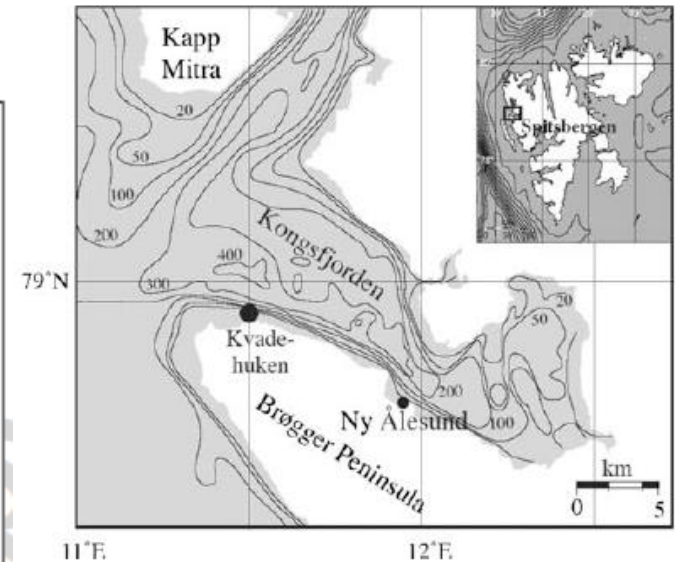
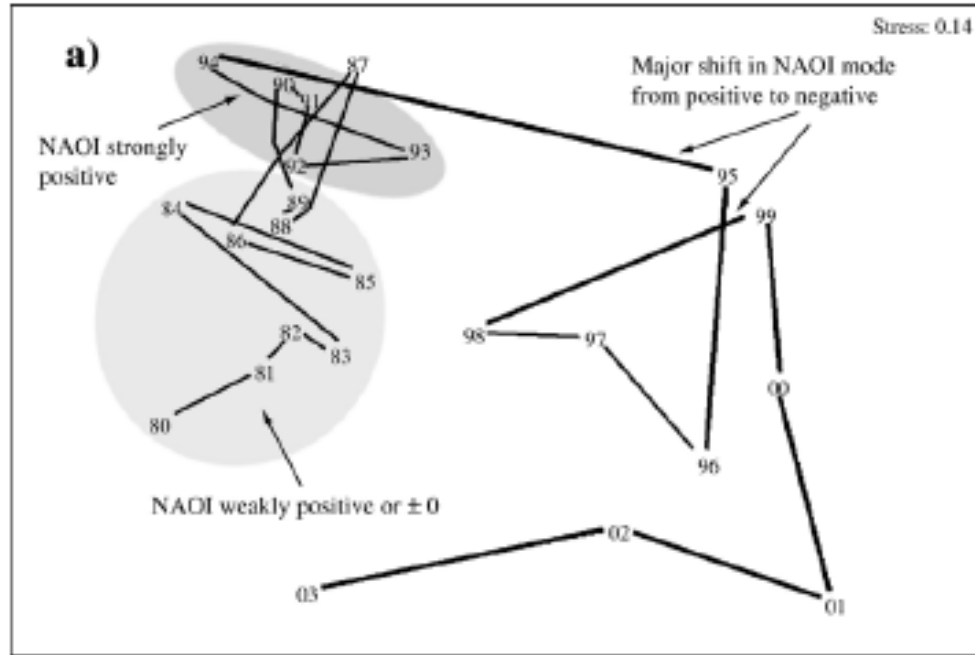
RDA – redundancy analysis:

INNER:	P	F
Oct-Nov-Dec air temp	0.002	3.51
NAO	0.002	3.68
water temperature	0.004	2.04
fresh water	0.002	3.40
annual ice cover	0.004	2.58
salinity	0.002	3.15



Pearson's Correlation Coefficient

	S	N	ES(50)	B
SAL	0.36	-	-	-
WT	0.54	-	0.39	0.39
FW	-	-0.38	0.39	-



- 1980 - 2003
- Appearance of brown algae and decline of actinarians
- Local environmental factors linked to NAOI comprised 45% of the variability of the benthic community in Kongsfjorden
- West Spitsbergen Current (water temp.) affects the benthic community structure through episodic inflows of transformed Atlantic water into the fjord
- Time lags between environmental forcings factors to benthic biological response



Benthic monitoring: conclusions

There were significant changes in density, species richness and diversity at all Kongsfjorden monitoring stations.

However, glacial bay fauna seems to remain stable.

The most important environmental factor responsible for benthic variability in Kongsfjorden is water temperature (West Spitsbergen Current).

Predicted climate change will influence Kongsfjorden soft bottom fauna, including its diversity.

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