Macrobenthic diversity response to the Atlantification of the Arctic Ocean (Fram Strait, 79°N) – A functional trait approach

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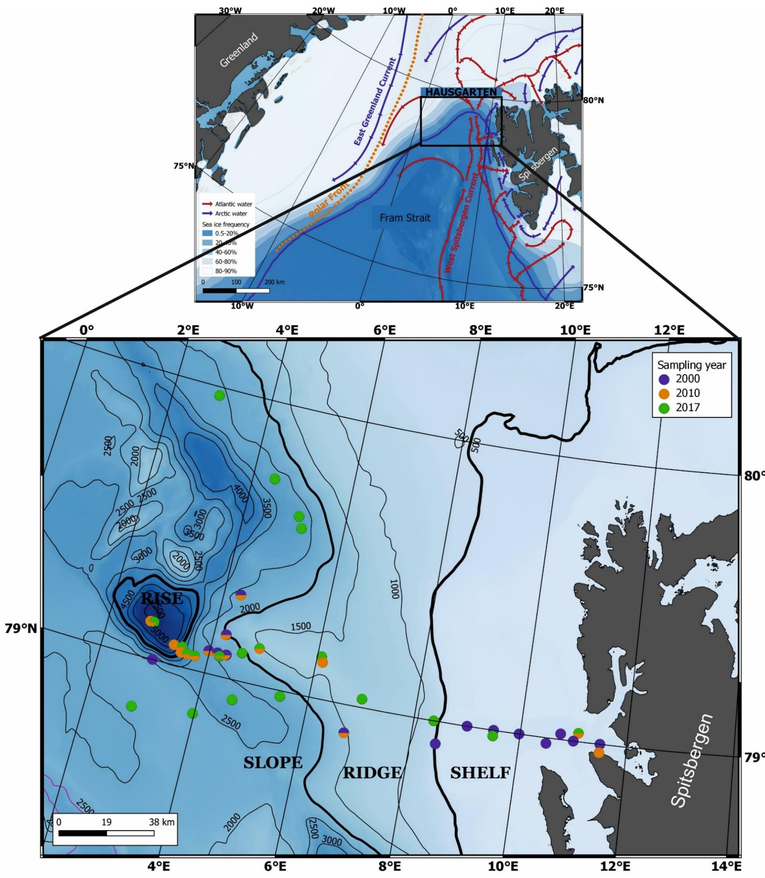
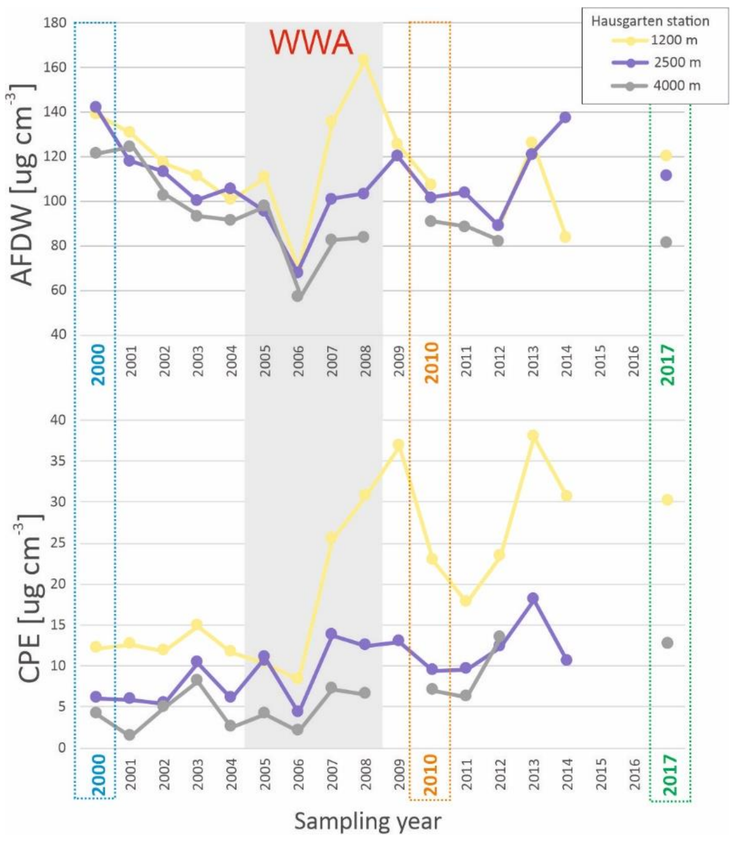
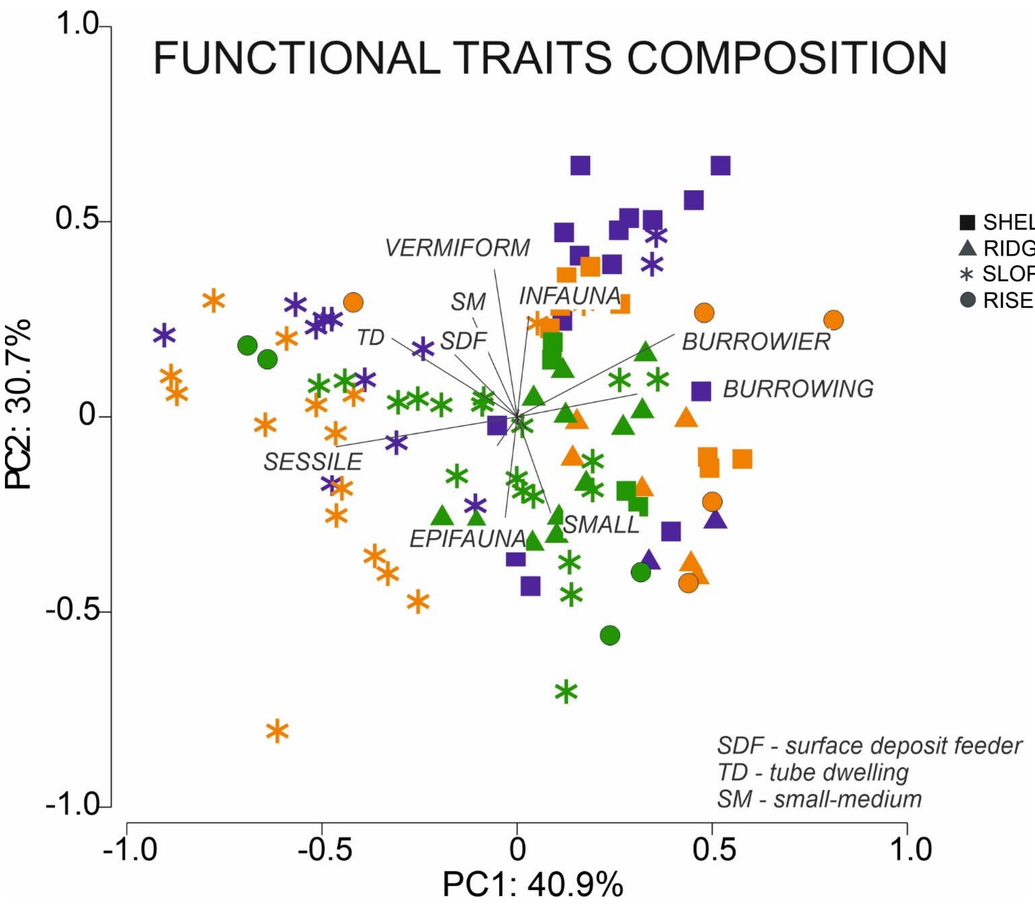
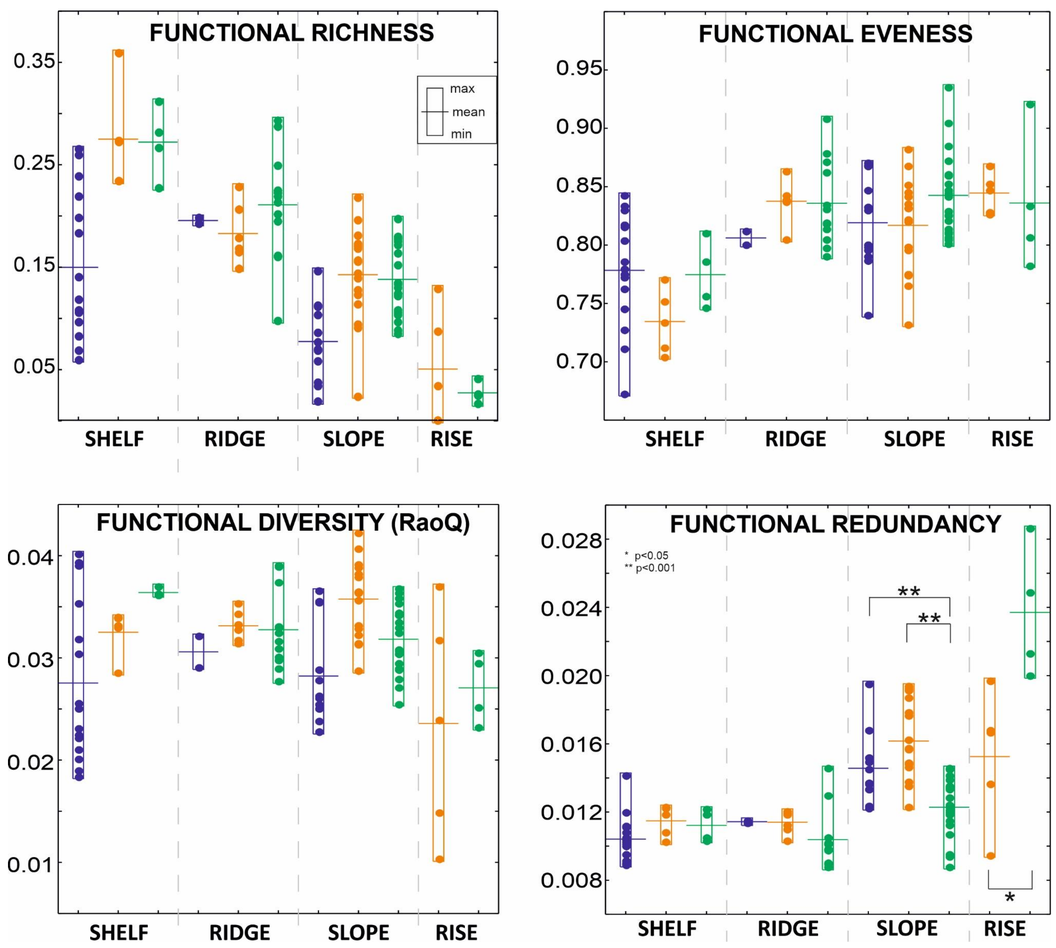


Significant change in environmental conditions in HAUSGARTEN area (Greenland Sea, Fram Strait) occurred in 2004-2008 (**W**arm **W**ater **A**nomaly, Beszczynska-Möller et al., 2012). The material for our study was collected before (in 2000) and after the **WWA** (in 2010 and 2017) at station depths ranging from 203 m to 5561 m. We explored the influence of environmental changes on the structure (species composition and diversity) and functioning (functional trait composition and diversity) of macrofauna communities.







The composition of functional traits differed significantly among groups of stations and sampling years (PERMANOVA, $p < 0.05$).

Most of the variation in the composition of functional traits among stations and years was explained by ‚adult movement', ‚living habit' and ‚body form'.

The DistLM procedure showed that the FDA explained 12.1 % of the variation in trait composition.

The functional richness was significantly **lower before the WWA** than after the warm period and it decreased significantly along the bathymetric gradient (PERMANOVA, $p<0.05$).

Significantly lower functional eveness was observed at SHELF stations, and increased towards greater depths (PERMANOVA, $p<0.05$).

RaoQ did not vary among group of stations but it was significantly **lower before the WWA** (PERMANOVA, $p<0.05$).

Functional redundancy remained **at similar levels before and after the WWA.** Functional redundancy was significantly higher at SHELF and RIDGE than at greater depths (PERMANOVA, $p<0.05$).

Macrofauna communities at the shallowest stations showed high functional redundancy, i.e., trait composition remained unchanged after the WWA.

At water depths below 1500 m, where functional redundancy was significantly lower, functional trait composition changed significantly after the WWA.

Our results suggest that macrofauna communities on the shelves are more resistant to environmental changes compared to deep-sea assemblages in the eastern Fram Strait.

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