

Recent changes of the diatom assemblages in relation to human-induced pollution in Baltic Sea coastal inlets.

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The Baltic Sea, one of the world's largest semi-enclosed water bodies in northern Europe, is naturally vulnerable to hypoxia due to estuarine hydraulic characteristics (Zillén et al. 2008). Moreover, the ca 85 million people living in the drainage area are causing severe pressures on the ecosystem, resulting in environmental deterioration and one of the most polluted seas in the world (Leppäranta and Myrberg, 2009).

Diatoms are dominant primary producers in coastal ecosystems, and are sensitive to the environmental change. In this study, we present temporal changes of diatom assemblages in the core (c.l. 49 cm) from coastal fjord-like inlets Gropviken (site Gp2) on the Swedish southeast coast, and discuss the temporal variation of the ecosystem on the basis of primary producers.

Using the vertical variations of diatom assemblages of the past 130 years (²¹⁰Pb and ¹³⁷Cs age information), core Gp2 was classified into 4 diatom zones: DAZ1 (50-36cm; C.E. 1888-1952), relatively low and constant content of dominant species. DAZ2 (36-19cm; C.E. 1952-1989), intense dominance of *Skeletonema marinoi* intermittently and strong dominance of *Pauliella taeniata* in the lower horizons (39-33cm). DAZ3 (19-2cm; C.E. 1989-2014): strong dominance of *Cyclotella choctawhatchiana*, and DAZ4 (2-0cm; C.E. 2014-2017): Strong dominance of *Skeletonema marinoi*, similar assemblage to DAZ2.

Based on the ecological features of diatoms and their fluxes (valves/cm²/yr), the change in the primary producers in Gropviken (Gp2) during the 1950's, is considered to be caused by the acceleration of human-induced eutrophication. Recent records (CE 2014-2017), suggest a potential recovery from the initial change (CE 1952-1989).

[reference]

Zillén, L., Conley, D., Andrén, T., Andrén, E. & Björck, S. (2008) Past occurrences of hypoxia in the Baltic Sea and the role of climate variability, environmental change and human impact, Earth-Science Reviews 91, 77-92. Leppäranta, M., and Myrberg, K. (2009). Physical Oceanography of the Baltic Sea. Berlin: Springer/Praxis Pub.

Keywords: diatom assemblages, anthropogenic impact, eutrophication, coastal inlets, Baltic Sea, past 130 years