



The Baltic Sea – from environmental monitoring data to paleoenvironmental reconstructions in a marine/brackish system

Helge W. Arz (1), Olaf Dellwig (1), Katharina Häusler (1), Jérôme Kaiser (1), Thomas Leipe (1), Matthias Moros (1), and Falk Pollehne (2)

(1) Leibniz Institute for Baltic Sea Research Warnemünde (IOW), Marine Geology department, Rostock-Warnemünde, Germany, (2) Leibniz Institute for Baltic Sea Research Warnemünde (IOW), Biological Oceanography department, Rostock-Warnemünde, Germany

Instrumental observations in the Baltic Sea are reaching back into the 19th century, but a comprehensive ecosystem monitoring by means of coastal stations, research vessels, moorings, permanent stations, and satellites was developed stepwise after WWII and significantly intensified after founding of the HELCOM (Helsinki Commission) in 1975 for protecting the Baltic marine environment against anthropogenic influences. Such influences are well recorded in surface sediments of the different Baltic Sea sub-basins, where i.a. heavy metal and organic pollutants accumulated in the course of the last century with characteristic rates. However, despite of the vast amount of instrumental data, calibration of paleoenvironmental proxies is often complicated due to weakly constraint chronologies of these young sediments. In many cases sedimentation is not continuous and sediments are subject to erosion, re-suspension, lateral transport, and focusing due to intense wind driven waves and current activity. Therefore, a direct link of sedimentary proxies with instrumental water column observations is not always straightforward and generally not well established. Recently developed event stratigraphic and radionuclide based chronologies in some restricted Baltic Sea areas like the central Baltic deeps form now a solid base for the in depth proxy development and validation with instrumental time series. Promising results come from e.g. the solid-phase Mn and trace element signatures and organic biomarkers in recent/sub-recent sediments from the central Baltic Sea enhancing the potential of reconstructing the Littorina-Stage environmental development.