



Climate forcing of salt-marsh archives of the German North Sea coast

Dorothea Bunzel (1), Katharina Müller-Navarra (1), Yvonne Milker (1), Helge Arz (2), and Gerhard Schmiedl (1)
(1) University of Hamburg, Institute of Geology, Earth Sciences, Hamburg, Germany, (2) Leibniz Institute for Baltic Sea Research (IOW), Rostock, Germany

Salt marshes are of substantial importance for the adaptation of coastal regions to present-day and future climate changes. High-resolution salt-marsh sediments from the southern North Sea provide an exceptional archive to understand the response of coastal systems to short-term climate variability. To address the complex regional to super-regional interplay between tides, storm surges, wind strengths and human-induced coastal management during the last century, we focus on the $\ln(\text{Zr}/\text{Rb})$ ratio as proxy for grain-size distribution, and foraminiferal assemblages as proxy for elevation and flooding frequency. Since the modern dikes were built, variations in the grain-size distribution, together with the amount of reworked tidal-flat foraminifera, reflect the accumulation of storm tide deposits. Our records indicate vertical sediment accretion, attributed to both the human-caused ditching and natural climate processes. Periodic fluctuations at interannual to multi-decadal time scales suggest a close link of the sediment accretion with North Atlantic Oscillation (NAO) and Atlantic Multidecadal Oscillation (AMO) related wind strength variations. We further observe an enhanced vertical growth of the salt marshes after foundation of the Wadden Sea National Park in 1985 AD, caused by the return of natural vegetation. Ultimately, our results suggest that the natural salt marshes provide a high potential in keeping pace with ongoing sea-level rise.