

The eastern Fram Strait during the last 2000 years: Warm water events as revealed by different microfossil groups

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The environmental system of the northern Nordic Seas is very sensitive to oceanographic and climatic changes at the contact of cold Arctic and warmer North Atlantic waters. These contrasts are reflected in the associations of marine microorganisms and archived in the bottom sediments. A multi-group microfossil study (diatoms, coccoliths, planktic foraminifers) of late Holocene sediments in core MSM5/5-712-1 from the eastern Fram Strait provides a better understanding of marine ecosystems and paleoenvironments during Arctic warming events of the last two millennia. Indicative diatom species and groups of species revealed a high variability of sea surface conditions. Based on the diatom distribution, three warming periods could be detected, corresponding to the time intervals of 0 to 440 CE (later part of the Roman Warm Period, RWP), 1200 to 1420 CE (final part of the Medieval Climate Anomaly, MCA), and 1730 CE to present (incl. the Recent Warming). Planktic foraminifers suggest a strong Medieval time warming but less subsurface heat advection in the RWP. The collected micropaleontological proxies in this study agree on the Recent Warming (industrial period) as the most pronounced warm event in the area during the last 2000 years.

Of particular interest is the finding of rare specimens of the diatom species *Neodenticula seminae* at the levels of 173 CE and 1989 CE in core MSM5/5-712-1. This species is endemic and dominant in diatom assemblages of the high-productive boreal pelagic North Pacific. However, it has recently been reported by various authors from plankton and sediment surface samples in and around the Nordic and Labrador seas and interpreted as evidence of Pacific Water import to the North Atlantic realm. Our findings in sediments from the late RWP in the eastern Fram Strait reveal that in the Holocene such events were not exclusively confined to the recent warming under the “Arctic Amplification”, but also occurred earlier.