

Characterisation of the organic matter in surface sediments from the East Greenland continental margin

Kierdorf, Christoph; Hefter, Jens; Stein, Ruediger

Alfred Wegener Institute for Polar and Marine Research, Columbusstrasse, 27568 Bremerhaven, Germany

corresponding author: ckierdorf@awi-bremerhaven.de

The main objective of this study was a detailed characterisation of the organic matter in marine surface sediment samples from the East Greenland continental margin. Important sources for the organic material in surface sediments are sediments transported by sea-ice or oceanic currents, planktic and benthic organisms, and organisms living in sea-ice and meltwater ponds on the sea-ice. Among the marine sediments also samples from the source areas (sediments on ice floes and sediments from coastal areas of East Greenland) were investigated. Thus, organic-geochemical bulk parameters (TOC- and carbonate-content; C/N-ratios), Rock Eval parameters (hydrogen and oxygen index), stable carbon isotopes of both total organic carbon and specific biomarkers as well as specific biomarkers (n-alkanes, n-alkanols and fatty acids) have been used to determine the amount and composition of the organic matter.

Organic-geochemical bulk parameters in marine surface sediments show clear gradients between the coastal areas and the deep-sea. TOC and carbonate values increase with increasing water depth whereas TOC/N ratios decrease. Fatty acids represent the major compounds of analysed biomarker lipids. The Marginal Ice Zone (MIZ) is characterised by changes in the composition and concentration of biomarkers. Concentrations of marine-derived biomarkers (specific fatty acids) decrease with increasing water depth, whereas concentrations of land-derived lipids (longchain n-alkanes, longchain fatty acids) increase. We suggest that sea-ice is the most important source of land-derived organic matter in surface sediments of the East Greenland continental margin. Greenland as a source area is only of minor importance.