



Lateglacial and Holocene sediment sources and transport patterns in the Skagerrak interpreted from high-resolution magnetic properties and grain size data

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Lateglacial and Holocene changes in current circulation, sedimentation and sediment source areas in north-eastern Skagerrak were studied using high-resolution mineral magnetic and grain size data from the 32-m-long, AMS ¹⁴C-dated IMAGES core MD99-2286. Previous magnetic studies of numerous short cores in the northern Skagerrak have shown that most of the sediments derive from the North Sea and Atlantic water inflow, whereas the sediments along the coasts of Norway and Sweden receive additional contributions from the Baltic Sea and the Scandinavian countries. Core MD99-2286 was retrieved from a location at the border between these two general sediment provinces, where presently waters from the Atlantic, the Baltic Sea and the Jutland Current mix to form the Norwegian Coastal Current. The mineral magnetic properties and grain size data from core MD99-2286 show significant changes in hydrography and sediment source areas from lateglacial times through the Holocene in north-eastern Skagerrak.

Between 12 and 11.3 cal. kyr, a calving ice front occupied the Oslo Fjord, and sedimentation was strongly influenced by meltwater carrying re-deposited glacial sediments from southern Norway and western Sweden. Between 11.3 and 10.3 cal. kyr, sedimentation was dominated by re-deposited glacial sediments transported by meltwater outflow across south-central Sweden. After the Otteid-Stenselva outlet was closed at 10.3 cal. kyr, glacial marine sedimentation changed to normal marine sedimentation. A hydrographic shift at 8.5 cal. kyr marks the onset of modern circulation

in the Skagerrak–Kattegat, and occurred as a result of increased Atlantic inflow, transgression of former land areas, and opening of the English Channel and the Danish Straits. After 8.5 cal. kyr, sedimentation was governed by input from the Atlantic Ocean and the North Sea, with varying contributions from the South Jutland Current, Baltic Current, and currents along the coasts of western Sweden and southern Norway. From 0.9 cal. kyr until present, the sedimentation has been totally dominated by southern North Sea and Atlantic Ocean sources.