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Time-slice maps of postglacial palaeoceanography in the Skagerrak

R. Gyllencreutz (1,2), J. Backman (2), M. Jakobsson (2), C. Kissel (3), E. Arnold (2)

(1) Department of Earth Science, University of Bergen, Norway, (2) Department of Geology and Geochemistry, Stockholm University, Sweden, (3) Laboratoire des Sciences du Climat et de l'Environnement, CEA/CNRS, Gif-sur-Yvette, France (richard.gyllencreutz@geo.uib.no / Fax: +47-55583660 / Phone: +47-55583537)

We present here four event-stratigraphic maps representing compilations of a literature review, that portray the crucial periods of change in the latest glacial to early-Holocene paleogeographic and paleoceanographic evolution of the Skagerrak region. The maps correspond to time-slices on a calibrated age scale at 14.0 kyr, 11.2 kyr, 10.2 kyr and 8.1 kyr.

The course of paleoenvironmental events is set in a high-resolution chronological framework using multi-proxy records from the AMS ^{14}C-dated IMAGES core MD99-2286 and a grid of chirp sonar profiles. The maps visualize the complex, rapid palaeogeographic and palaeoceanographic changes during the glacial-interglacial transition, which is characterized by major changes in circulation, sediment sources, and depositional processes.

A strong regional seismic reflector developed around 13.5 kyr as a result of a drastic decrease in sedimentation rates. The change to Holocene sedimentary conditions in NE Skagerrak occurred gradually, where glacial marine sediments were substituted by increasing proportions of normal marine sediments. Iceberg calving and IRD deposition ended at about 10.7 kyr, indicating the time when the ice margin recessed onshore. Glacial marine sediments dominated deposition in the Skagerrak until 10.3 kyr. Outflow of glacial meltwater from the Baltic across south-central Sweden at about 11.3 kyr caused clay-rich distal glacial marine sediments from the Vänern basin to be deposited in the Skagerrak. Differential isostatic uplift caused the major outflow route for these sediments to migrate southwards along the Swedish west coast, from the

Otteid-Stenselva Strait in the north to the Uddevalla Strait and finally to the Göta Älv river in the south. At about 10.3 kyr, sedimentation in the Skagerrak began to gradually change from distal glacial marine to normal marine sedimentation governed by the North Jutland Current. The modern circulation pattern was established at 8.5 kyr, through a marked hydrographic shift to higher energy conditions in the Skagerrak. This shift was the combined result of increased Atlantic water inflow, opening of the English Channel and the Danish Straits, and transgression of the southern North Sea. This series of events enabled formation of the South Jutland Current, which is an important feature of the modern circulation in the Skagerrak. Since 8.5 kyr until the present, sediments in NE Skagerrak have been derived predominantly from the Atlantic Ocean and the North Sea, with varying contributions from the South Jutland Current, the Baltic Current, and the currents along the coasts of southern Norway and western Sweden.