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8.3 BTH 142 Gyllencreutz, Richard

HOLOCENE SEDIMENTATION FROM HIGH-RESOLUTION CHIRP SONAR DATA AND IMAGES CORE MD99-2286 IN NORTHEASTERN SKAGERRAK

Gyllencreutz, Richard, Department of Geology and Geochemistry, Stockholm Univ, Stockholm SE-10691 Sweden, richard.gyllencreutz@geo.su.se.

The Skagerrak is the deepest part of the otherwise relatively shallow North Sea. The North Atlantic Current mainly governs the circulation and subsequent sedimentation in Skagerrak, with important contributions from the Jutland Current and Baltic Sea outflow. In northeastern Skagerrak, mixed currents form an anti-clockwise gyre and the average current speed is greatly reduced allowing fine-grained sediment to fall out at high rates. This makes the Skagerrak the major sink for fine-grained matter in the North Sea and a key area for our understanding of the late Quaternary oceanographic and climatic history of the North Sea region with adjacent land areas. In previous seismic studies of the Skagerrak and the Norwegian Trench, the uppermost seismic unit is regarded to be of Holocene age, and has been reported as acoustically transparent, with no or few internal reflectors. A high-resolution chirp sonar survey in north eastern Skagerrak was made in 1998, and in this area the CALYPSO core MD99-2286 was retrieved within the International Marine Past Global Changes Study (IMAGES) program during leg 3 with R/V Marion Dufresne in 1999. Marine sediments in the 32.4 m long piston core MD99-2286, provides a continuous and detailed paleoceanographic and paleoenvironmental record of the last 12,000 years in the Skagerrak. A detailed view of the Holocene stratigraphy in northeastern Skagerrak is presented by reconstructing a 3D stratigraphic model from high-resolution chirp sonar data, multibeam bathymetry data from the Geological Survey of Norway, and sediment physical properties of core MD99-2286. On the chirp sonar profiles, four stratigraphic units are distinguished. The lowermost unit, unit D, is characterised by strong reflectors draping the subjacent bedrock, and is interpreted as glacial marine sediments. The top three units, units A, B and C, comprise a thick seismically laminated blanketing sequence, and are interpreted as postglacial marine mud. Tentative correlation to core MD99-2286 based on p-wave velocity data and radiocarbon dating suggest that the Pleistocene/Holocene boundary (11,500 calendar years BP) is located in the lower part of unit C, above the glacial marine sediments of unit D.