



A HIGH-RESOLUTION CARBONATE RECORD FROM HOLOCENE IMAGES CORE MD99-2286, SKAGERRAK

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Marine sediments in the 32.4 m long piston core MD99-2286, provides a continuous and detailed palaeoceanographic and palaeoenvironmental record of the last 12 000 years in the Skagerrak. The investigated area is characterised by high sedimentation rates and intense water mass mixing, as a branch of the North Atlantic Current turns anti-clockwise, slows down and becomes mixed with other waters to form the Norwegian Coastal Current. Present-day SSTs in Skagerrak are strongly linked to the NAO-index.

Carbonate content in core MD99-2286 was measured using coulometry with 5-cm resolution. The carbonate record shows a steep rise from 9 to 15 % carbonate from 10 ka to 8 ka, and then a gradual decreasing trend down to about 12 % around 4 500 cal y BP. The timing of the peak at 8 ka coincides with the opening of the English Channel. The most likely processes controlling carbonate content in the Skagerrak sediments are redeposition of older carbonate particles (mainly controlled by the Jutland Current) and primary productivity competing with dilution by terrigenous material.

The carbonate record from MD99-2286 correlates with a palaeotemperature reconstruction based on oxygen isotopes from a speleothem in northern Norway. The correlation is positive in the interval 9 ka to about 5 ka, and negative from 5 ka to present. The timing of the shift in correlation matches the establishment of the modern circulation pattern, which is marked by a hydrographic shift at 5.5 ka,

interpreted from grain size and biostratigraphical data in a core from Skagen. This shift is manifested by an increase in the Jutland Current and stronger inflow of saline North Sea water to Skagerrak and Kattegat.

The CALYPSO-corer used for core MD99-2286 is believed to disturb the topmost sediments in cores. Therefore, a 2.5 m long gravity core, Sk000209-2, was retrieved from a nearby location in order to get full recovery of the surface sediments. Age control in core MD99-2286 is obtained from 20 AMS C-14 dates on shells and benthic foraminifera, and shows that core MD99-2298 spans about 12 ka. The age model for core Sk000209-2, based on 7 Pb-210 dates and 2 AMS C-14 dates, shows that core Sk000209-2 spans almost 900 calendar years and that the core top is of modern (zero) age. Correlation between the two cores using susceptibility, GRA-density and carbonate content indicate that the core top in MD99-2286 is of modern (zero) age and only slightly more disturbed than core Sk000209-2. The core correlation also shows that the sediment in the CALYPSO core MD99-2286 is expanded by a factor 1.6 relative to the gravity core Sk000209-2.