



High resolution sparker evidence of sediment transport patterns and Late Quaternary structures between the islands of Sylt and Rømø, SE. Northsea

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The off-shore northern part of the barrier island Sylt in the southeastern North Sea has been investigated using high-resolution sparker seismics. Bedforms identified in the seismic data reveal the postglacial sedimentary regime and actual sediment dynamics. The area can be divided into three parts. The North Sea sector of the area is characterized by northward sediment bypass as a result of strong long-shore (tidal) currents heading towards the Lister Deep, the tidal inlet between Sylt and the Danish island of Rømø. The Lister Deep is characterized by a major dune field with up to 8 m high dunes with a wavelength of 270 m indicative of easterly sediment transport (flood dominated). Further to the northwest in the outer delta a dune field suggesting westerly sediment transport is found. The northern part of the Lister Deep is formed by a marked erosion channel with a depth of 30-40 msec. The two dune fields are separated by minor structures. East of Sylt the area is characterized by presence of dunes of smaller dimensions than those observed in the Lister Deep. In the eastern and western part of the channel system present here, the dunes indicate sediment transport towards south (flood dominated), whereas in the central part of the area northward transport is indicated. Based on the bedform pattern a general current regime can be described. Northward sediment transport along the westcoast of Sylt following the coastline leads into the Lister Deep, where under the influence of the coastal configuration and Coriolis effect a major dune field has been formed along the north coast of Sylt. The outgoing (ebb) current comes from the Wadden Sea area towards the east and enters the northern part of the Lister Deep, where the erosion channel is found. Here the current is responsible for the formation of the west migrating dunefield in the Lister Deep and towards the outer delta the current turns north and large amounts of sediments are likely deposited. Thus the model shows that sediments are deposited offshore along the northcoast of Sylt and offshore along the southwest coast of Rømø and thus both Islands are characterized by sediment deposition which leads to narrowing and presumably deepening of the tidal inlet. (Sub) horizontal deeper reflectors have also been recorded and some of them are probably representative for strata of Eemian age.