

Holocene Evolution of the Norfolk Banks

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Abstract

The Norfolk Banks have long been regarded as typical examples of modern tidal sand ridges found on the world's continental shelves. Their asymmetric cross-sectional profile and internal structure indicate migration perpendicular to their long axes, and in an offshore direction. It is, however, difficult to demonstrate whether or not such migration occurs at the present time and at what rate. Recent observations of water movement, sandwave asymmetry and sand tracers support an offshore sand transport component (Collins, et al 1995). New data obtained as part of the UK's Land Ocean Interaction Study (LOIS) has allowed the internal geometry of some of the Norfolk Banks to be determined more clearly than ever before. The new data confirms the unidirectional nature of the dipping internal reflectors first noted by Houbolt (1968) which contrasts with the structure observed within sandbanks elsewhere in the North Sea (eg Davis and Balson, 1992; Berné et al, 1994). The new data has allowed the relationship between the sandbank and the underlying topography to be reconstructed and the volume of sediment within one of the banks, Well Bank, to be determined. This volume has been placed into the context of the long-term sediment budget for the area and a model for the Holocene evolution of the Norfolk Bank system is proposed. Comparison is made with bank systems elsewhere in the North Sea which differ in terms of their grain-size, sand transport patterns or evolutionary history.

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