

**The Seismic Stratigraphy of Sable Island Bank; Scotia Shelf:  
Application to the Understanding of Shelf Processes**

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The seismic stratigraphy of Sable Island Bank provides a model for continental shelf sandbody accumulation. The Holocene Sable Island sandbody is located 227 km offshore from Halifax, Nova Scotia. It covers an area of approximately 6500 km on the outer Scotian shelf and contains a sand volume of 98 km. This region at 44 N experiences both high energy North

Atlantic storms and high velocity tidal currents. Relative sea level has risen from depths of a least 50 m at 11 ka and continues to rise by 33 mm/yr.

The Holocene shelf sandbody was derived from the transgressive reworking of Pleistocene proglacial sediments that were deposited during the most recent Late Wisconsinan low sea level

stand. The subaerial Sable Island sandbody is lens shaped, 50 km long, 2 km wide and up to 51 m thick. The island extends subaqueously into asymmetric spits, each over 30 km long and 45 m thick. South and west of Sable Island lies a system of shoreface-connected and shoreface-detached ridges which results from storm reworking.

Sediment transport in the early phase of transgression resulted from shoreface retreat and shoreface ridge reworking within Sable Island Bank. Transport was directed NE to accumulate in the Sable Island region, forming a coarsening-up sandbody. Modern reworking results from both tidal and storm processes. Shoreface ridges migrate SE and continue to work Pleistocene sediments south and west of Sable Island. Further

reworking of the Holocene sandbody is also taking place now by the migration of shoreface ridges. Sediments are transported NE towards East Bar, NW towards Northern Spur and north over West Bar. Tidal and storm currents rework sediments arriving on both East and West Bar producing bidirectional sediment transport to the north and to the south.

The major Sable Island sand accumulation has developed during the Holocene in an isolated outer shelf setting. It illustrates the importance of sea level and transgressive reworking to sandbody accumulation. The variety of morphologic and stratigraphic features present in the sandbody indicate the complexity of sand transport processes in the continental shelf setting.