

Morphology and depositional facies, Inner Scotian Shelf near Halifax Harbour: Implications for Late-Glacial sea-level

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Distinct zones of erosional and depositional landforms occur on the inner Scotian Shelf. These "zones" or "acoustic landforms" can be defined by unique acoustic surface morphology and internal seismic sequences related to water depth. In the approaches to Halifax Harbour two major zones can be recognized: (1) outcrop zone and (2) truncation zone. The outcrop zone can be characterized as a broad area of acoustic basement with high relief that is largely devoid of surficial sediments. It extends from 70 to 120 m water depth. The truncation zone, extending from 70 m to the present shoreline, is defined by muted topography and a planar, erosional surface truncating bedrock and surficial cover. Sediment-infilled valleys within the truncation zone are often characterized by seismic facies with a ponded style of deposition planed by the sea surface or by erosional unconformities near the surface. Near Halifax, two depositional sub-zones within the truncation zone are noteworthy, Unit "C" and the "Sambro Delta". Unit C is an incoherent seismic facies that forms a flat blanket over the acoustic basement. Chaotic reflections are sometimes resolved within Unit C. These are truncated by the sea surface at depths between 50 and 70 m. The surface of Unit C is relatively flat. Side scan sonograms show a hard, cobbly and bouldery surface. Grab

samples revealed a stony, sandy diamicton with rounded pebbles. Unit C is interpreted as a diamicton and bedded deposit of glacial origin that has been reworked in the shore-face zone during transgression that followed post-glacial sea-level fall. The progradational feature termed the Sambro delta is interpreted as a delta primarily because of oblique terminations of clinof orm reflections and its location at the head of a southwest-trending valley. A core was obtained from the delta front at 73 m water depth. The top 70 cm of the core reveals a grey, medium to coarse sand capped by a lag surface of well-rounded cobbles. Abundant mussel (*Mytilus edulis*) valve fragments were found at 70 cm. One of these fragments was radiocarbon dated and produced an age of $11,650 \pm 110$ B.P.

A series of parallel ribbed moraines occur in water depths greater than 70 m south of Sambro and Sheet Harbour, Nova Scotia. They are part of the Morainal Zone. Near Sambro these moraines are superimposed on drumlins. The surface of these drumlins appears truncated at 70 m water depth. From the morphology and depositional facies of the inner shelf near Halifax we conclude that sea-level was 70 m lower than present at the end of the last glaciation.