

**Nearshore and Harbour Sedimentation in the Southeastern Beaufort Sea,
Tuktoyaktuk, Canada**

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Tuktoyaktuk Harbour is a flooded river valley that contains two deep basins exceeding 20 m water depth. This provides a valuable natural harbour which has been used for the transportation of goods dating back to 1935, and for shore-base requirements of the oil and gas industry since the early 1970s. The entrance to Tuktoyaktuk Harbour is protected by Tuktoyaktuk Island. The only useable entrance to the harbour is at the eastern end of the island where water depths rarely exceed 5 m, thereby limiting access to shallow-draft vessels. The approaches to the harbour were deepened and widened in the 1980s and subsequently experienced some infilling. Nearshore sedimentation in the harbour approaches is influenced by the Mackenzie River discharge plume and nearby coastal erosion of Tuktoyaktuk Island. The outer shoreline of the island is retreating at 2 m/yr, almost twice as fast as the average coastal erosion rate in the region. This delivers a considerable volume of sediment to the nearshore system on an annual basis. Expansion of the harbour approaches to widen and deepen the channel could be a viable solution to allow for larger vessels to enter the harbour. Data from high resolution multibeam bathymetry, shallow seismic stratigraphy, and regional sediment samples acquired by the Geological Survey of Canada will contribute to a better understanding of nearshore stratigraphy, dynamics, and sediment sources. This type of information is critical to the planning of any removal or redistribution of sediment in nearshore and harbour systems.