

USING MULTIBEAM SURVEY SYSTEMS TO MAP THE SEABED AND SUBMERGED COASTAL FEATURES IN THE CANADIAN ARCTIC

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Climate change in the Arctic may already be affecting rates of coastal change, with important implications for northern residents and coastal ecosystems. As extent and duration of open water in summer increase and as sea level rises on northern coasts, rates of erosion are expected to increase and wave reworking of the shallow seabed will be more widespread and intense. Rates of relative sea-level change vary across the Arctic from areas of uplift and land emergence to areas of subsidence and coastal submergence. To improve our ability to project future change, it is necessary to determine what past experience has shown. This project aims to improve understanding of changes in relative sea level and associated vertical crustal motion by focusing in areas of rising relative sea level, where the depth and extent of submerged coastal features is poorly known. The project also supports related work on shallow benthic ecology, coastal erosion, regional impacts assessment, and community adaptation.

A full understanding of coastal processes requires knowledge of both subaerial and submerged components of the coastal system. This study concentrates on the latter, the submerged part of the coast and relict coastal features on the seabed. Multibeam sounding and other supporting marine remote sensing tools can provide detailed shaded-relief images of the seafloor, giving a view of the seabed as if the water were not there. Multibeam sounding also provides data on the acoustic backscatter from the seabed, enabling the interpretation of sediment characteristics. Different sediment textures, such as gravel, sand, or mud, have different reflection properties and can be recognized in the multibeam data.

As part of ArcticNet project 1.6, a multibeam system has been installed and operating on the *Amundsen* over the past two summer seasons. In 2005, under project 1.2, we planned to carry out shallow-water surveys using the UNB survey launch *Heron*, which was to be carried on and deployed from *Amundsen* at sites in Baffin Bay, Amundsen Gulf, and the Beaufort Sea. Unfortunately, a shipboard accident shortly before the start of the summer 2005 northern cruise resulted in the loss of the *Heron* and cancellation of plans for shallow multibeam surveys this year. This poster presents examples of multibeam seabed imagery from deeper water in the vicinity of coastal survey sites and other seabed imagery collected in coastal waters of the Beaufort Sea over the past two years. We demonstrate the relevance of this imagery to the interpretation of environmental change, coastal evolution and sediment supply, seabed hazards and habitat characteristics.