
Ice keel features in Amundsen Gulf, Canadian Arctic Archipelago: marine evidence for a glacial ice stream

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Studies of multibeam imagery and 3.5 kHz sub-bottom profiles obtained by ArcticNet and the Ocean Mapping Group, University of New Brunswick reveal the presence of ice keel ridge and groove lineations on the seafloor in Coronation Gulf, Dolphin and Union Strait and Amundsen Gulf, which lie in the southwestern part of the Northwest Passage. Drumlins occur locally in western Coronation Gulf and parts of Amundsen Gulf. Trends of the lineations and drumlins and published information delineating glacial ice flow directions and landforms on the adjacent islands and mainland provide a record of late glacial events in this region of the Canadian Arctic. Lineations displayed by the multibeam imagery resemble modern and paleo lineations found by researchers in Antarctica, Svalbard, Greenland, and other Canadian Arctic regions. They have been interpreted to have been emplaced by fast flowing glacial ice streams. These interpretations are supported by results from studies of bedforms formed and being formed beneath active present day Antarctic ice streams. Those bedforms include both lineations and drumlins. On the basis of the seafloor evidence and published terrestrial data within the study area, a glacial ice stream is interpreted to have occupied Amundsen Gulf, Coronation Gulf, Dolphin and Union Strait and parts of the adjacent islands and mainland during the Late Wisconsinan glaciation. Part of the ice stream was diverted through Prince Albert Sound and rejoined the main ice stream in Amundsen Gulf. The coalescent ice stream extended northwestward into the Beaufort Sea.