

proxy for water discharge), a program of sonar seabed mapping, sediment coring, water-column measurements, and stream measurements was initiated in 2008 for the McCornick River (a presently glaciated catchment of 80 km² area), Nachvak Brook (presently unglaciated, 170 km² area), and associated marine basins in Nachvak Fjord and Saglek Fjord, respectively. In the summer of 2008, approximately 180 km of sidescan and sub-bottom survey lines were collected from deep, muddy marine basins closest to the two river mouths, to augment data collected during previous ArcticNet cruises. Boxcores were collected to sample specific acoustic facies identified in sonar, and cores were subsampled for analysis of sedimentary structures (X-radiography), radioisotope geochemistry (Th²³⁴, Be⁷, Pb²¹⁰, and Cs¹³⁷, to evaluate sediment depositional processes), and granulometry.

Preliminary analysis of sonar results suggest that the thickness of postglacial sediments in the marine basin for the McCornick River (16 km² area, 150–170 m deep) is 5–10 m, and 10–20 m in the basin off Nachvak Brook (20 km², 250 m deep), implying that sediment volumes are proportional to catchment area. In both basins, sediments have been deposited in wedges that thicken towards the river mouth. X-radiographs of sediment cores show very faint stratification in mostly bioturbated clay-rich sediments. The presence of stratification in bioturbated sediment, however faint, is suggestive of rapid episodic sediment delivery (such as by gravity-driven mechanisms), rather than from water-column plumes. This possibility is being evaluated in more detail at present through radiometric and granulometric analyses of cores. Rapid transfer via gravity-driven flows from river mouth to a deep, proximal marine basin would enhance the preservation potential of such episodic deposits, improving the utility of such sediment records as proxies for fluvial discharge in the recent past.

Marine record of sediment flux from glaciated and unglaciated catchments, Torngat Mountains, Canada (poster presentation)

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Records of environmental processes and conditions (over decadal to millennial timescales) are very sparse for the Torngat Mountains National Park Reserve (Canada's newest National Park, in Northern Labrador/Nunatsiavut, Canada), although recent evidence indicates that the Labrador Peninsula is undergoing rapid environmental changes. In order to evaluate marine sedimentary records of river discharge (of sediment, a