

MAP 2177A SHADED SEAFLOOR RELIEF BAY OF FUNDY, SHEET 4 OFFSHORE NOVA SCOTIA-NEW BRUNSWICK CANADA-UNITED STATES OF AMERICA. Includes authors (B.J. Todd, J. Shaw, and D.R. Parrott), scale (1:50 000), and various technical details like datum and projection.

DESCRIPTIVE NOTES

INTRODUCTION The Bay of Fundy, located on the east coast of Canada between the provinces of Nova Scotia and New Brunswick (Fig. 1), is a microtidal estuarine environment (Arnott et al., 1990) with the highest recorded tides in the world of 17 m (Orlitzky et al., 2005; Bishop, 2005). This map is one of a series of maps that show seafloor relief of the Bay of Fundy and topography of the surrounding areas in shaded relief view (coloured) at a scale of 1:50 000. The maps are based on multibeam sonar data processed from 1993 and 2009 to map 13 010 km<sup>2</sup> of the seafloor. Water depth contours generated from multibeam sonar data are shown in white on the colour-coded water depth map (Fig. 1). The bathymetric contours are derived from the multibeam sonar data using a 50 m interval. The contours are derived from the multibeam sonar data using a 50 m interval. The contours are derived from the multibeam sonar data using a 50 m interval.

MULTIBEAM BATHYMETRY DATA COLLECTION Multibeam water depth data were collected by the Canadian Hydrographic Service, the Geological Survey of Canada, and the University of New Brunswick. The survey systems used a 300 kHz echosounder with a 120 m swath. The survey systems used a 300 kHz echosounder with a 120 m swath. The survey systems used a 300 kHz echosounder with a 120 m swath.

BATHYMETRIC DATA DISPLAY The multibeam sonar bathymetry data are presented as a 5-m pixel horizontal resolution. The shaded relief image is presented with a vertical exaggeration of the bathymetry of 10 times and an artificial flattening of the relief by a vertical scale reduction of 10%. The resulting image is presented with a vertical exaggeration of the bathymetry of 10 times and an artificial flattening of the relief by a vertical scale reduction of 10%.

BAY OF FUNDY GEOMORPHOLOGY The Bay of Fundy is a south-west-trending funnel-shaped bay 155 km long that is 70 km wide at its entrance and tapers to 45 km wide at its northern end where it narrows into the Minas Channel (Fig. 1). The floor of the bay, although homogeneous in detail, presents a gently sloping profile along its axis from northeast to southwest. Grand Manan Island and its adjacent southeastern shoals occupy nearly half the entrance to the bay, and divide it into two channels. Between Bellefleur Island and Grand Manan Island are several isolated depressions that together form Grand Manan Basin. The maximum water depth within these depressions is 225 m and the depth to the sill between Grand Manan Basin and the adjoining deeper parts of the Gulf of Maine is 100 m.

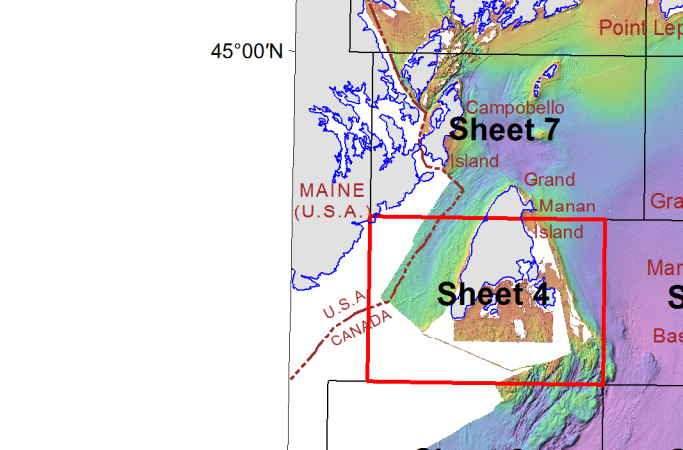
Geological history Geomorphological features revealed through mapping of the Bay of Fundy seafloor reflect the geological history of the region. The Bay of Fundy is situated within the Carboniferous-Triassic lowland (Geotectonic 1026; Crosby, 1982; Williams et al., 1972) and is underlain by Triassic and Early Jurassic sandstones, shales, and basalt (Wade et al., 1996). Exposed bedrock has been modified by glacial erosion and exhibits a rugged surface.

Geomorphology of this map A series of detailed maps at a scale of 1:25 000 (Fig. 2-5) highlights geomorphological features around Grand Manan Island, New Brunswick. For each of these maps, the colour-coded values are systematically optimized and differ from the 1:50 000 map sheet colour values.

Offshore Brunsford Cove in Grand Manan Channel is a set of four transverse sediment bottoms (Fig. 3). The nonlinear trends of the bottoms form an echelon pattern with overall west strike. The accumulation of sediment to the north of the bottoms creates a ridge that is parallel to the flow from south to north.

Grand Manan Channel is a suite of discontinuous, south-west-trending curvilinear ridges with high (up to 20 m) relief (Fig. 2). The ridges are roughly parallel to the flow from south to north. The ridges are roughly parallel to the flow from south to north.

The east of White Head Island in water depths of 130-140 m, the seafloor has been scoured into a pattern of curvilinear furrows by the keels of icebergs calved from the front of the ice sheet that advanced northward into the Bay of Fundy during the last deglaciation (Fig. 5). The scours have a more muted appearance than those mapped in deeper water in the bay, likely as a result of sediment infilling.



ACKNOWLEDGMENTS

B. MacGowan, M. Lamplugh, and J. Griffin of the Canadian Hydrographic Service (CHS) organized the multibeam sonar bathymetry survey of the Bay of Fundy and assisted with data processing. The Canadian Hydrographic Service provided the data to the Geological Survey of Canada (GSC) for further processing and interpretation. E.E. Hughes (GSC) and J. Griffin (CHS) provided the bathymetric data. The Canadian Hydrographic Service provided the data to the Geological Survey of Canada (GSC) for further processing and interpretation.

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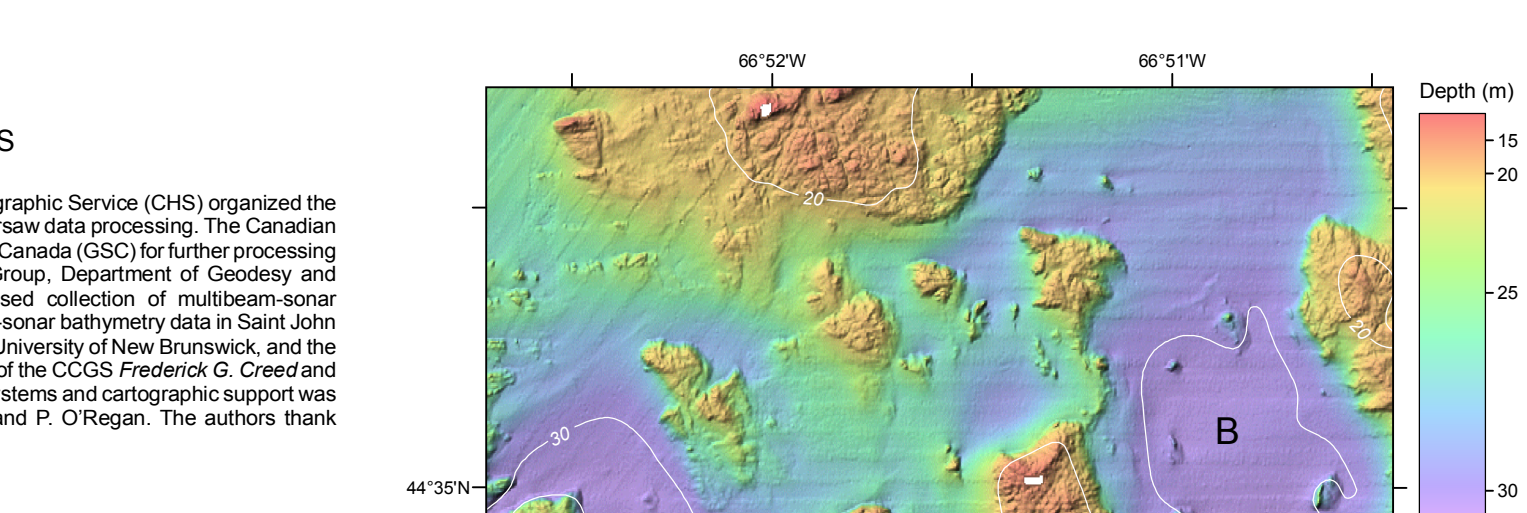


Figure 2. Bedrock outcrop (A) and sediment-filled basin (B) offshore Columbia Head, Grand Manan Island.

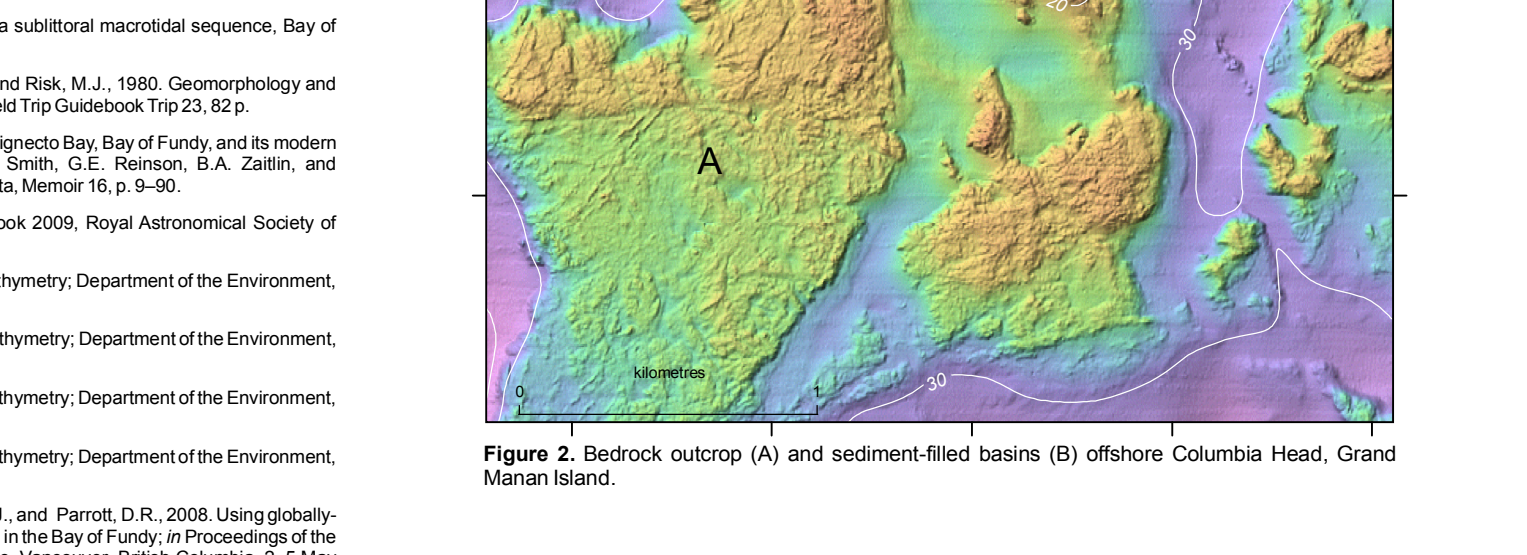


Figure 3. Flow transverse sediment bottoms offshore Bradford Cove, Grand Manan Channel.

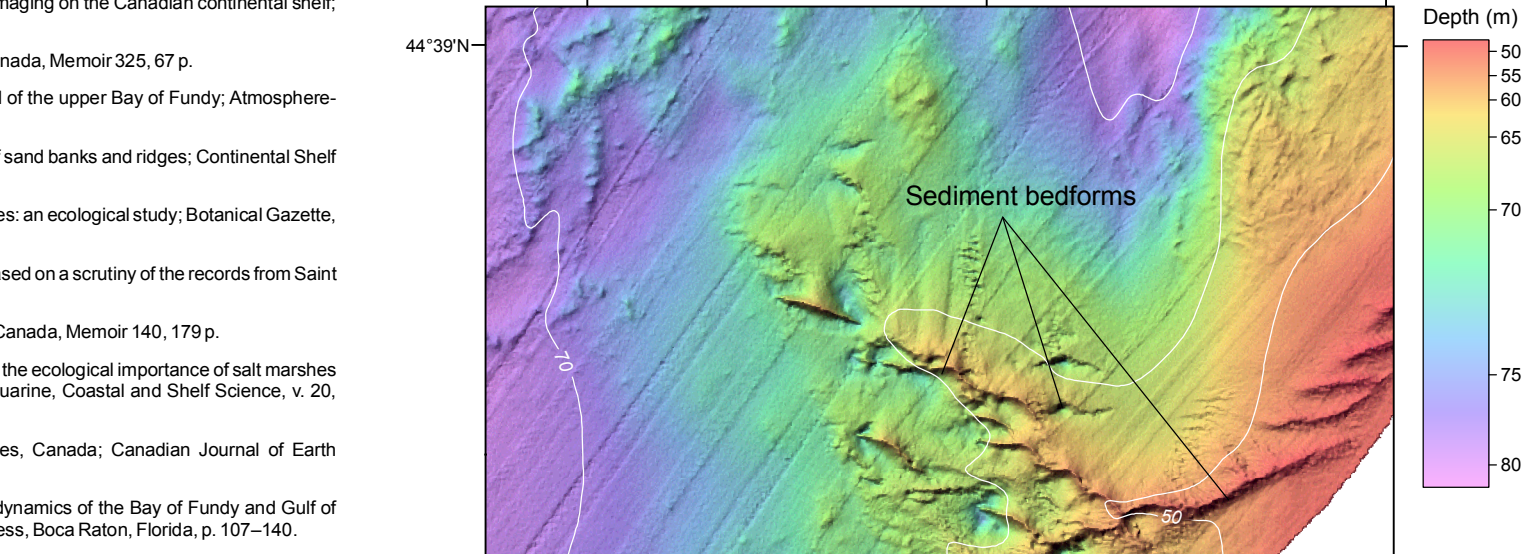


Figure 4. Regional moraine and De Geer moraines, Grand Manan Channel.

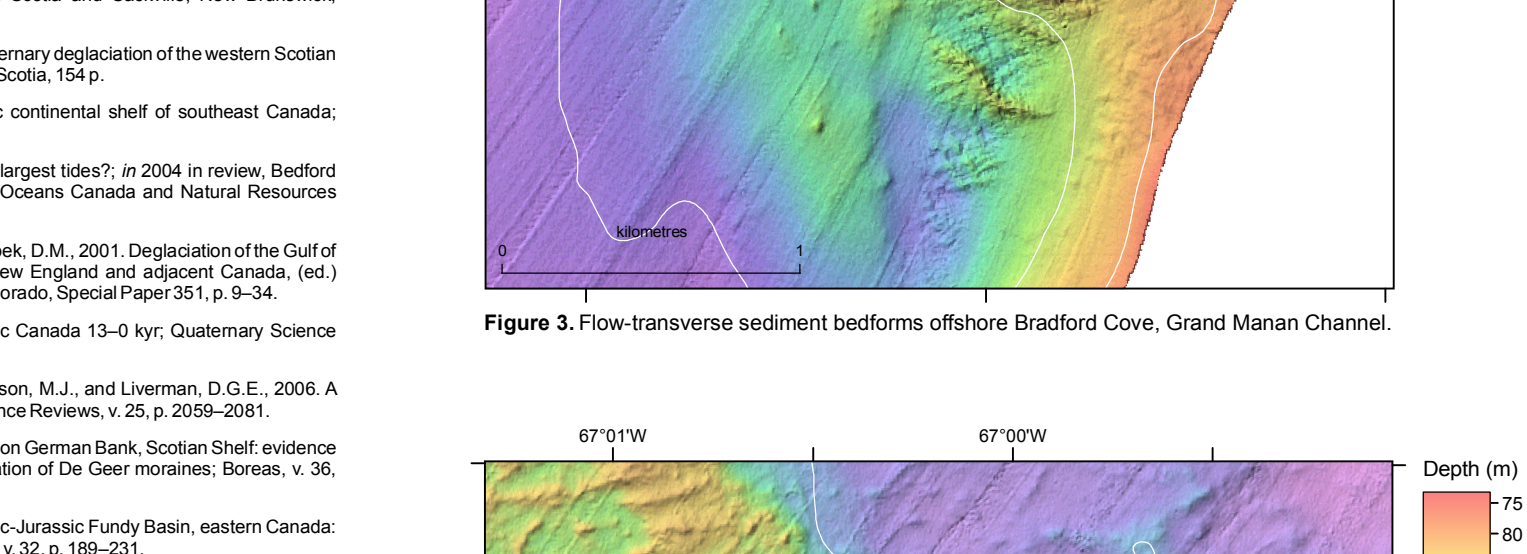


Figure 5. Iceberg scours and pits offshore White Head Island.

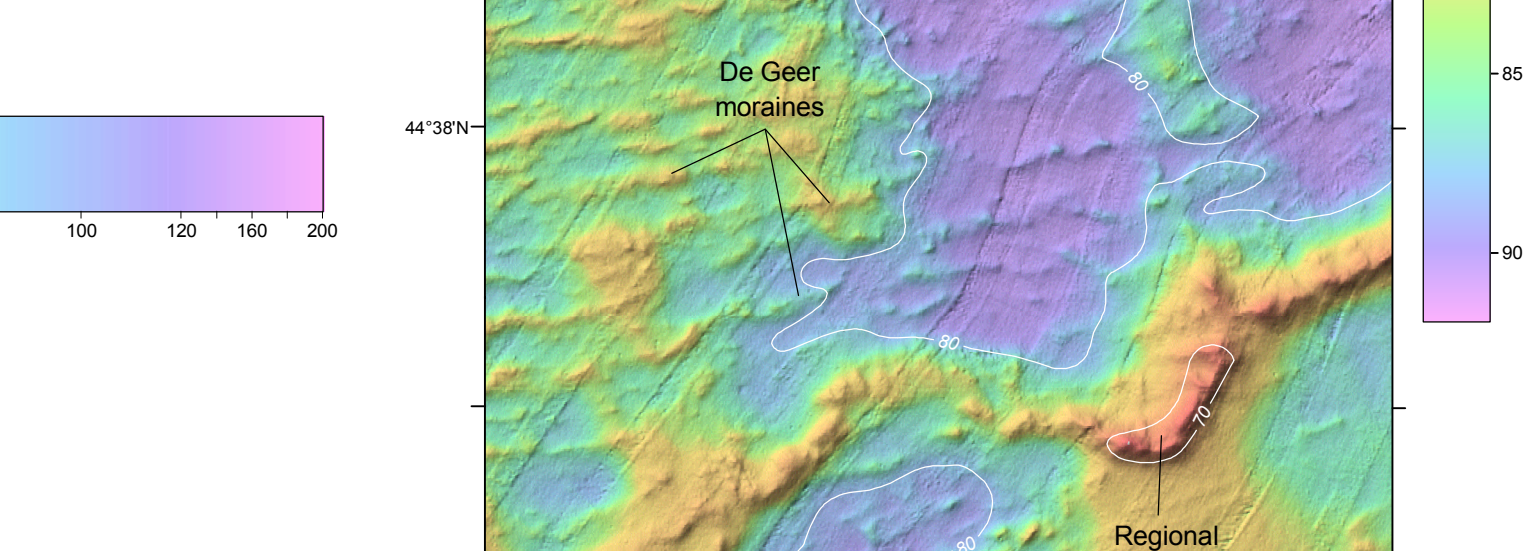
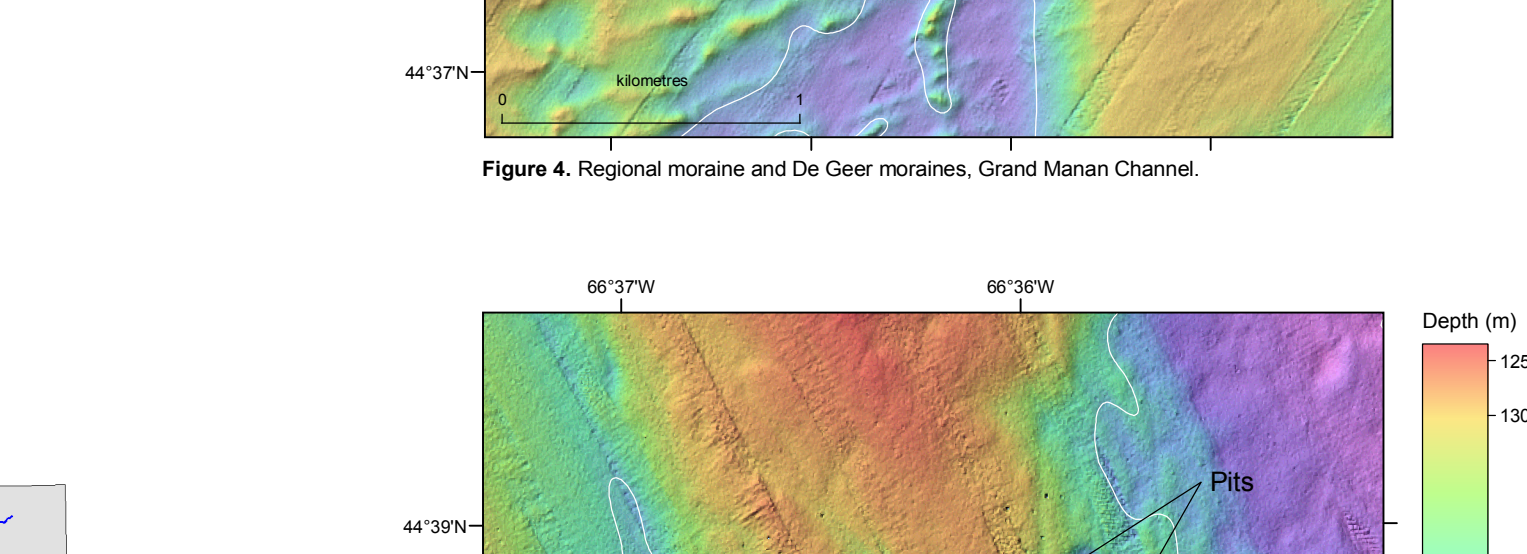


Figure 6. Location map showing seventeen 1:50 000 map sheets covering the Bay of Fundy. Sheet 4 (outlined in red) is in southwestern Bay of Fundy.



Recommended citation: Todd, B.J., Shaw, J., and Parrott, D.R., 2011. Shaded seafloor relief, Bay of Fundy, Sheet 4, offshore Nova Scotia-New Brunswick, Canada. Geological Survey of Canada, Map 2177A, scale 1:50 000. doi:10.4095/286681