

THOMPSON GLACIER, CANADA 1:5000

(Aerial Photogrammetric Map)

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Thompson Glacier is an advancing outlet of the Fritz-Mueller Ice Cap (former McGill Ice Cap) in Axel Heiberg Island, Canadian Arctic Archipelago. The mean width of the main stream measures about 3 km. The front of the glacier is rimmed in the center and on the east side over a distance of about 2 km by the push moraine and on the west side by an ice-cliff 30 to 50 m high. The valley filling consists, at least on the surface, of permanently frozen fluvioglacial sediments. The snout of the Thompson Glacier is bulldozing the frozen detritus to a push moraine. On the map the push moraine appears as a half-moon shaped bulge, subdivided into ridges running roughly transversely to the glacier.

The definition of a push moraine is given by Chamberlin (1890): "A glacier pushes matter forward mechanically, ridging it at its edge, forming what may be termed push moraine". A push moraine system consists of three parts: the glacier, the underlying material and the push moraine, the latter being the result of an interaction of the two former elements. The glacier is superimposing a variable stress field on the underlying material. The stresses exceed the strength properties of the material involved. Thus we can understand the push moraine as a failure zone. This phenomenon is certainly not restricted to the observable part; it is bound to extend underneath the glacier (adapted from Kaelin, 1971).

The Thompson Glacier push moraine was surveyed every summer from 1959 onwards. In cooperation with the Canadian National Research Council's Photogrammetric Research Section a detailed topographical map at the scale 1:5000 was prepared in 1960, and an orthophoto map with contour lines overlaid at the same scale for the 1967 situation. This was the basis laid for the quantitative analysis of the mechanics of the push moraine process by Kaelin (1971) under the supervision of the late Prof. F. Mueller, then at the Institute of Geography, Swiss Federal Institute of Technology (ETH), Zuerich. The present orthophoto map is based on aerial photographs by the Royal Canadian Air Force of August 1977 and was produced by the Institute of Cartography, ETH, Zuerich.