

CATHEDRAL MASSIF GLACIER, CANADA, 1:5,000

(Terrestrial/aerial photogrammetric map)

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The map covers the Cathedral Massif Glacier with its proglacial area and the surrounding terrain - altogether an area of about 5.2 square kilometers. The small cirque glacier is located in the Cathedral Massif (59°20.3'N/134°06.3'W) on the continental slope of the northern Boundary Range, the northernmost range of the Coast Mountains in British Columbia (Jones 1975). The region is separated from the adjacent northern periphery of the Juneau Icefield by glacially eroded valleys.

A reconnaissance for the purpose of a glacier survey was done in 1972 by G. Konecny within the long-term Juneau Icefield Research Programme. In 1975, geodetic field surveys as well as terrestrial photogrammetry were carried out by K. Jacobsen, and in the following year a two-colour map at a scale of 1:5,000 was produced (Konecny and coworkers 1976: Glacier at Cathedral Peak, 1:5,000, Technical University of Hannover, FRG).

Within the framework of mass balance studies on the glacier in 1976/77 - 1977/78, preparation of a map covering the entire glacier and its forefield began. L. Mauelshagen, F. Boochs and H. Slupetzky installed the base lines and carried out the field survey and the terrestrial photogrammetry in July 1977. Photographs were taken using a Wild P 32 camera from 15 selected base lines which were connected by bundle triangulation. Computation and bundle triangulation were done by F. Boochs and L. Mauelshagen, W. Schröter helped with the photogrammetric plotting and evaluation, H. Slupetzky carried out the compilation, geomorphological interpretation and the drafting of the map, and W. Gruber took charge of the cartography. Two vertical aerial photos taken on August 13, 1975, and made available by the Department of Energy, Mines and Resources, Ottawa, Canada, were also used. The glacier forefield and the surrounding areas were mapped first. Due to the lack of a connection with the official Canadian geodetic net, the local net established by K. Jacobson in 1975 was used. Elevations are based on barometric altimetry of a survey point at camp 29. The resulting elevation of Cathedral peak (2337.0m a.s.l.) is somewhat higher than the value (6950ft = 2316.7m

a.s.l.) indicated on the Topographic Map of Canada, 1:25,000, Sheet Skagway. The indicated direction to the north represents magnetic North; true North is 30 12' west (in 1977).

The main objective of the mapping was to document the present-day glacier with its specific topographical and climatological setting and to give geomorphological details of the glacier forefield in order to provide a basis for reconstructions of neoglacial and modern glacier fluctuations. The area covered by the glacier during neoglacial stages of maximum extent is therefore depicted separately in grey. In addition, snow patches were represented as exactly as possible because of their close relation with mesoscale surface topography, vegetational patterns, permafrost and rock glaciers. The key to the colour coding used is as follows:

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|-----------------------|--|
| (1) black: | framework, lettering, spot elevation, moraine, scree, debris cover, trim-line; location map |
| grey: | tint for bedrock, scree, subnival belt (unspecified) |
| light grey: | tint for glacier forefield and rock glaciers |
| (2) brown: | contours on terrain and seasonal snow patches, vegetation edge, tree symbols |
| (3) green: | tint for vegetation |
| (4) "glacier"-blue: | tint for glacierized area, contours on glacier |
| light "glacier"-blue: | snow patches |
| (5) blue: | hydrographic features: proglacial lake, glacier stream; crevasses, avalanche cones, ice margin, edge of snow patches |

The surface area of the glacier was 1.701 square kilometers in 1977 and has further reduced since then. During the stage of maximum neoglacial extent, the glacier area must have been close to 2.8 square kilometers. Details of the glacier surface and the transient snow line could not be shown because the glacier was still largely snow-covered at the time of the field survey. The morainic ridges were mapped in summer 1987 by H. Slupetzky.

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