BRIEF COMMENTS ON THE MAP

The compilation of this glacier map, covering one of the valleys glaciers in the central part of Jotunheimen — an area of the highest mountains in South Central Norway — was based upon aerial photographs taken for this purpose on 29 September 1980 by Fælledanger Flyveidrett A/S (cruise No. 65055). This special air photography was made at the end of an unusually long summer after a winter of little snow accumulation. Consequently, most of the glacier was uncovered from last winter's snow, but during the days just before the photography some new snow fell on the upper part of the glacier. This made it difficult to construct contour lines there.

The photography and the compilation of this map was made entirely to produce a glacier map, thus it was possible to emphasize geomorphologic features such as crevasses, surface drainage patterns, moulines, etc.

The scale (1:10,000) and the contour interval (10 m on the glacier, 10 and 50 m elsewhere) were selected according to recommendations made at an International Symposium on Glacier Mapping held in Ottawa, Canada, in 1968. The Universal Transversal Mercator grid (UTM net, Zone 32) is drawn on the map for each kilometer. Geomorphologic coordinates are marked with reference to the Greenwich meridian. The local Norwegian coordinate system is also indicated by tick marks.

A number of triangulation points were used in the construction of this map. Some of them have been established by the Norwegian Geophysical Survey (NGU). All these control points were used for the orientation of the stereo models in the Wild A7 photogrammetric system.

Due to the fact that this glacier has been mapped several times before, both by terrestrial photography (1941), plane-table mapping (1965), and aerial photography (1965), it has been possible to determine the variations in glacier thickness or, more correctly, the surface elevation along a longitudinal profile. The work was done by Liestal already in 1962 (Hoel & Waernskoeld, 1962, p. 130) when he published profiles based upon measurements performed in both 1929, 1931, 1940, and 1949. By additional information obtained from the present map and the maps from 1962 and 1968 he has continued this work, and the result is shown in the diagram below.

A comparison between the photogrammetric map from 1941 and the present map demonstrates a drastic change in the glacier surface. The glacier has now a more bell-shaped aspect, whereas it was a tongue-like body in 1941.

It is assumed that the plotting accuracy on this map is better than 0.5 m for single points in the horizontal direction and in the order of 5.0 m in the vertical direction on the lower part of the glacier, whereas — due to the limited photographic area — it may be a vertical error up to 5.0 m on the uppermost part of the glacier. However, the existence of many crevasses and short distances to bedrock makes it probable that the contours on the upper part of the map area show the height with an accuracy which is better than 1.0 m.

The location of the present map as well as the location of previously produced glacier maps are shown in the upper right corner.

The reproduction of this map was a result of a team-work between Norsk Polarinstitutt and the Glaciology Section within the Norwegian Water Resources and Electricity Board (NVE).

REFERENCES


Hellsåugubreen, Norway
Mass balance 1962-1980

Hellsåugubreen has been selected as a representative for the Jotunheimen glaciers on an East-West profile, as used from the continental Glacier Mass Balance Project to the extreme maritime Jotunheimen. These glaciers are included in a long-term mass balance observation program. The general trend of negative glacier mass balance since 1980 was broken in the beginning of the 1980s, when strong negative years were exchanged by less negative or even positive balance years, particularly in the westernmost glaciers in the profile. Hellsåugubreen has experienced a total net loss of about 1 m water equivalent during the period 1962-1980.

The upper picture was taken on 26 August 1980 by A. Kiler. The next picture was taken on 12 September 1962 by H. Sikken. The air photograph was taken by Norsk Polarinstitutt, in August 1955 by B. Lunes. Only four vertical air photographs are available from 1980, taken by Fælledanger Flyveidrett A/S, Oslo, on 26 September.