

The small cirque glacier Sylglaciären has been observed, surveyed and photographed relatively frequently since 1906 when prof. Fredrik Enquist made his detailed map, published two years later (Enquist 1910).

A re-drafted and slightly simplified version of his map is shown here. On the original map all surveyed points (black dots) had an elevation figure, given in m above sea level, and contour lines were drawn for each 20 m.

Due to the inaccurate height information which was available when Enquist constructed his map, no reliable comparisons of glacier surface variations since 1906 can be made. Comparisons between the old map and the new map constructions given here only indicate that the total glacier surface has decreased significantly.

Some old photographs, mainly taken by Jan Lundqvist in the 1940-ies and 1960-ies are shown on the reverse. A series of eight photographs from the period 1906-1943 is published in Mannerfelt (1945).

The vertical change (lowering) of the glacier surface, due to a general glacier retreat from 1958 to 1982, is demonstrated along three profiles — see the reverse, where also other relevant information is given.

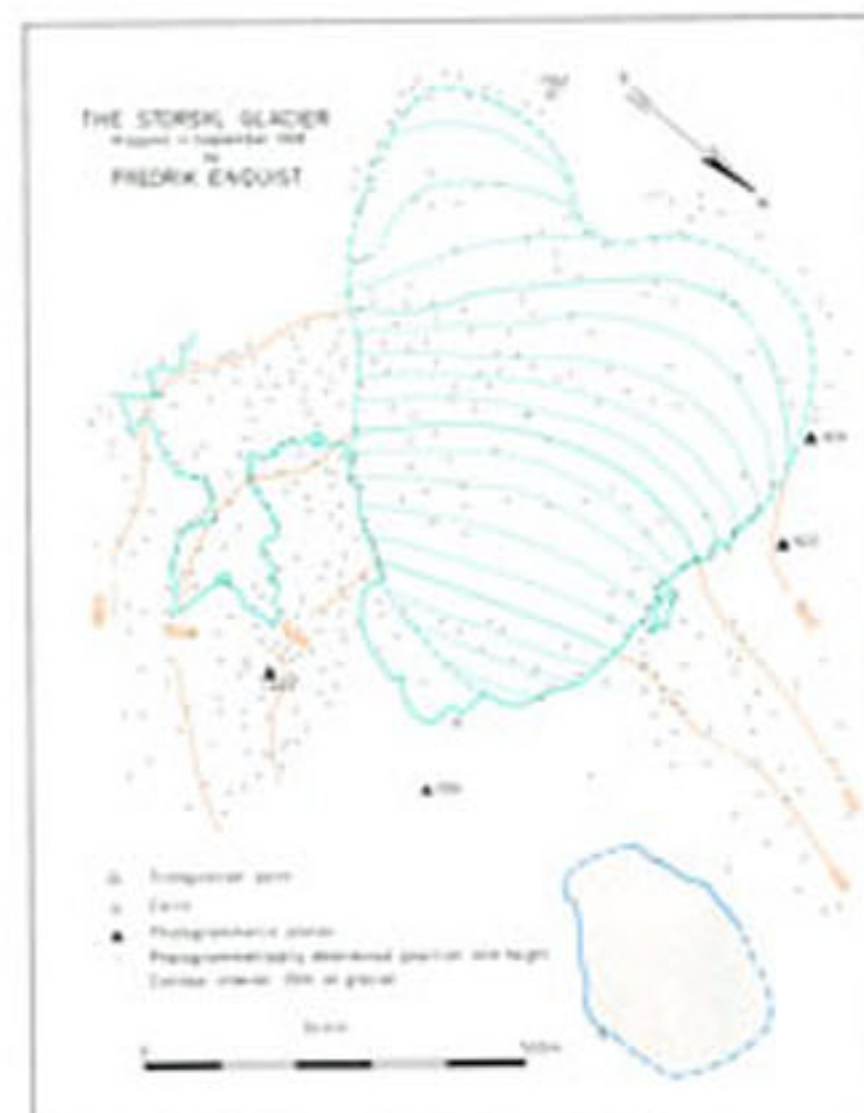


Fig. 1. For Linné & Co. 1910. Reprint. For Linné & Co.



## SYLGLACIÄREN

The glacier Syllglaciären is the largest one of the four very small glaciers in the Syljama massif, and it is the second southernmost glacier in Sweden. It is situated in an east-facing cirque just at the international border between Norway and Sweden. It is believed to have been re-formed entirely after the Holocene climatic optimum. Nowadays it occupies almost only the cirque, but earlier also a large area below the cirque has been ice-covered. The latest known maximum extension was reached in the beginning of this century, although the glacier may have been somewhat larger during the Little Ice Age probably during the 18th-19th century. Since the 1910's the ice has receded, at least until the mid 60's. Probably, as a consequence of high precipitation in the 1960's, an increased accumulation has taken place and there are signs of a recent advance of the margin. Whether this development will continue or not cannot yet be determined.

Jan Lundqvist

## COMMENTS ON THE MAPS

The Syljama mountains have been covered several times by modern Swedish aerial photography. Due to the fact that the small cirque glacier Syllglaciären is located very near the border between Norway and Sweden, it has been included also in several Norwegian air photo missions. So, for construction of glacier maps from different years, a relatively large photographic material was available. However, not all verticals were suitable for glacier mapping — in many cases almost covered most of the glacier and this made a reliable map construction almost impossible. Therefore, a selection was made among all available verticals. Four Swedish and one Norwegian set of photographs were finally used for the map construction. Various technical information on the photography used in the compilation is given for each of the five glacier maps, see the front cover.

A technical problem arose from the fact that very few control points were available in this uninhabited mountain area. Only three high precision points could be included in the stereo models: Sysskåshuudet (Fruentimmerslumpen), Storslyten, and the International border cairn No. 155A.

To create the models in the stereoplottter it was, therefore, necessary to include also various information taken from the new and modern topographical maps 18C Syljama NV and 1721 B Essandstjen. The compilation was made in a Wild B8 stereoplottter.

The first International Symposium on Glacier Mapping, held in Ottawa 1965, recommended the use of 10-m contour intervals and the scale of 1:10 000 for glacier maps. This has been adhered to for the present maps, as well as the recommended use of the Universal Transverse Mercator (UTM) coordinates. These are drawn for each km on the maps, but both Geographical coordinates and the local Swedish grid (Rikets nät) are shown in the frame by tick marks.

Gunnar Östrem

## REFERENCES

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Syllglaciären, photographed by G.E. Du Rietz in July, 1913. Because of a scanty snow cover it can be seen clearly that the glacier covers not only the cirque below the peak Syttoppen but also the steep slope below it.



This photo was taken on 21 July 1942 by J. Lundqvist. The glacier is still almost as large as shown on Engquist's map from 1906. In the lower right part of the picture it can be seen how the glacier extends between the upper bare rocks across the steep slope in the lowermost part. The picture is taken from the mountain Storslyten visible to the left on the photograph taken in 1966 below.



An oblique air photo taken by J. Lundqvist on 26 August 1966. The glacier has approximately the same size as during the last few years, but it seems that the glacier has grown slightly in its upper part. The ice is clearly coming on the left hand (southern) side. A local advance has occurred between exposed bedrock on the right hand side of the front.



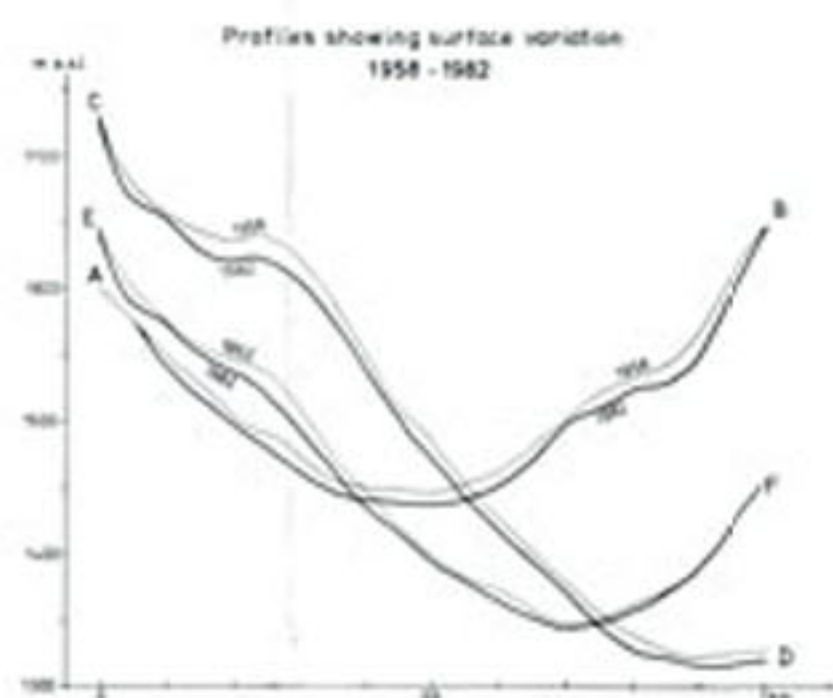
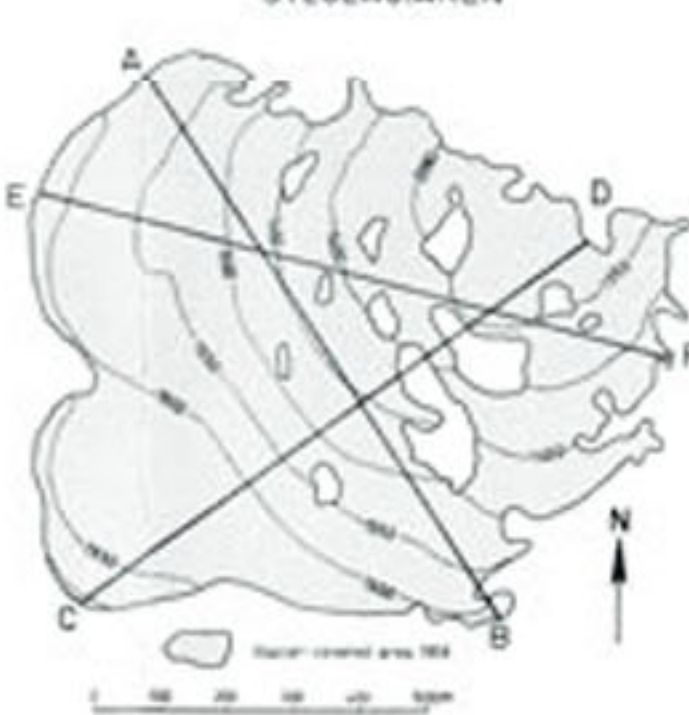
Syllglaciären, photographed by J. Lundqvist on 24 August 1966. The convex glacier surface is clearly seen to the left. In the right hand part, in front of the highest peak, masses of ice has slid down between exposed bedrock. A local, small advance took place in the autumn of 1966, possibly due to the steep substratum in this area.



This photograph, taken by J. Lundqvist on 24 August 1966, shows a detail of the ice masses which caused a small, local advance in autumn 1966.



## SYLGLACIÄREN



Three profiles were placed on the oldest (1958) and the most recent (1962) glacier map to visualize the lowering of the glacier surface. The maximal total vertical displacement amounts to more than 15-m for the 24 year period. In most areas the glacier surface is about 5-10-m lower in 1962 than in 1958.

A rough calculation based upon the vertical displacement in 54 points along the profiles indicate that the glacier lost about 4 - 12 m<sup>3</sup> water in the period 1958-62. This corresponds to a total specific mass loss of 8.3 m of water equivalent during 24 years.