

AMUNDSENISEN, SVALBARD 1:25,000

(Aerial photogrammetric map)

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The Amundsenisen Icefield is located in the central part of south Spitsbergen on Wedel Jarlsberg Land. This is a wide accumulation area for the largest glaciers in this region, namely the Torellbreen, the Paierlbreen and the Recherchebreen. Its area is approximately 40 km². A high mountain range separates the area from the glaciers which flow north-eastwards. The area is influenced by oceanic air masses from the south-western direction. The surface of Amundsenisen is slightly undulating and lies at an altitude of 650–750 m a.s.l.

Elevation changes of the central part of Amundsenisen were measured using a map derived from the terrestrial photogrammetric survey carried out in the summer of 1934 and a similar photogrammetric survey at the same points in April 1990. The results indicate a decrease in the glacier's thickness of about 10–12 m. Accumulation on the Amundsenisen area is one of the highest in Spitsbergen. Mean winter mass balance in the period 1990–1995 was +1.43 m w.e. Compared with the mean net balance of +0.56 m w.e., the lowering of the accumulation area surface by 0.2 m per year indicates that a predominant amount of the ice mass discharge was drained into the outlet glaciers.

The Paierlbreen, the Torellbreen and the Recherchebreen have been described as surge type glaciers. Distinct changes of the Paierlbreen surface topography were observed in April 1994. New fields of wide crevasses, shear zones along the contact zone of the glacier and the valley slopes and high undulations of the glacier surface occurred. These features point to the development of the active phase of a new surge.

The map of the Amundsenisen was published on the 60th anniversary of Polish geodetic works on Spitsbergen. It covers part of the aerial photographs which belong to the Norwegian Polar Research Institute and were taken on 29 July 1990 (No. 3408–3411; flight altitude 7600 m; camera focal length 152.83 mm). The slides are at the scale 1:50,000. The photogrammetric control and cartographic elaboration is the same as used for a "twin" map of Hans glacier. The map contains: topographic elements, posts of the terrestrial photogrammetric survey of 1934 (9, 10, 16, 17, 20, 21) and 1990 (901–906), glacier mass balance stakes placed in 1991 (GPS reading). The contour interval is 40 m. The elaboration of relief of the glacier and the snowfields was difficult due to an unsatisfactory optical density of the slide copies. Small gaps along the western border of the map are the result of the different sizes of the stereomodel blocks. Names of the geographical locations are taken from the topographic map of Svalbard 1:100,000. ("Torellbreen" and "Van Keulenfjorden" sheets). Erratum: the name of the summit at 881 m a.s.l. (coordinates 85721000/518200) should read "Belvedertoppen", not "Belvederotoppen". The map was published in two colours using raster techniques in 1994).