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Establishment of a new survey station at Tasersiaq

Ole B. Olesen

As part of the GGU programme for the regional mapping of the hydroelectric potential of West Greenland a new glaciological field station was established during August and September this year. The new station is situated at 66°6.5'N, 50°7.3'W near the long (73 km) and narrow (1.5–2 km) lake Tasersiaq just east of Sukkertoppen Ice Cap (fig. 30).

With an estimated hydroelectric potential of more than 1000 GWh/year (GTO, September 1980) the Tasersiaq basin ranks as one of the largest potential sources of energy from the westcoast basins.

The Tasersiaq basin

The Tasersiaq basin, excluding its Inland Ice sector, covers an area of 1900 km^2, of which 465 km^2 are ice covered and 225 km^2 are lakes, with the lake system Tasersiaq and Tasersiap qalia together occupying 144 km^2. Adjoining this area to the east is a 2030 km^2 sector of the Inland Ice contributing to the runoff of the basin thus giving a total drainage area of 3930 km^2.

Tasersiaq, at a height of 680 m above sea level, divides the basin into two morphologically different areas. The northern area is a relatively flat plateau at about 1000–1200 m above sea level with only a few peaks at 1400–1500 m. This area contains numerous smaller lakes and about 80 very small and scattered glaciers and perennial snow patches ranging from less than 0.1 km^2 to 1.3 km^2 and totalling 14.3 km^2.

The southern part of the basin is dominated by three local ice caps, Sukkertoppen Ice Cap to the west, 'Qârajugtoq ice cap' in the middle and the smaller 'Amitsulôq ice cap' to the east. The total area of the three ice caps within the boundaries of the basin is 422 km^2. The heights range from the level of Tasersiaq up to about 1800 m above sea level. The highest level of the transient snow line in the innermost part of the basin was about 1100 m at the end of the ablation season at the beginning of September this year.

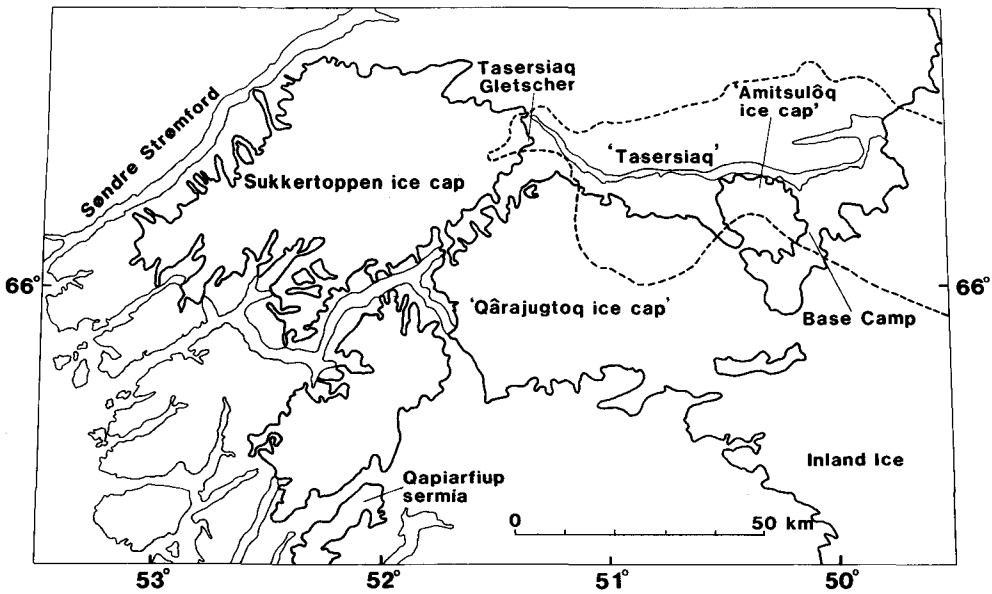

Fig. 30 Sketch map showing place names and localities mentioned in the text.

The field station

The base camp was set up on the south side of a small glacier running almost due east from the 'Amitsulôq ice cap' which covers an area of 165 km^2. As this glacier has only a few crevasses and an even contact with its southern bank, it affords easy access to the higher parts of the ice cap itself.

The base camp is situated at 950 m above sea level and consists of an insulated, prefabricated wooden hut with 18 m^2 floor space. It provides living, sleeping and cooking facilities for a crew of three, but will sleep five if need be. A storage and working shed of 6 m^2 has been added to the hut which also serves as a windbreak for the access door. The hut is heated by a kerosene stove and should be able to support the crew even during winter time.

The field programme

At the base camp meteorological instruments have been set up so that temperature, humidity, evaporation, precipitation, total radiation, duration of sunshine, wind speed and wind direction can be measured on a regular basis. On the glacier itself a Stevenson screen with a thermohygrograph and maximum and minimum thermometers will be installed next year. The same type of screen and instruments plus a precipitation gauge and an anemometer for measuring wind direction will be set up at the snout of Tasersiaq gletscher at the extreme western end of the basin.

Stakes for measuring accumulation, ablation and movement of 'Amitsulôq ice cap' have been drilled into the ice this summer. Next field season it is the intention to extend the stake net and supplement the ablation measurements with runoff measurements at the front of the 'base camp glacier'. It is also the intention to drill stakes in Tasersiaq gletscher. Together with measurements already started at Qapiarfiup sermia at 65°36.3'N, 52°9.3'W this will give a profile ranging from the more humid coastal environment to the relatively arid climate near the Inland Ice margin.

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Glaciological investigations at Qamanârssûp sermia, West Greenland

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As part of the GGU programme for the regional mapping of the hydropower potential of West Greenland, glaciological and climatological investigations were continued on the Qamanârssûp sermia (inventory number 1CH21002) in 1981. The station was first established in late summer 1979 (Olesen, 1981) so that records for two whole summers are now available.

Fieldwork

The field programme included measurement of transient balance in a network of twenty stakes extending from about 80 to 1300 m above sea level. The more remote stakes could only be visited a few times during the season, while daily readings were made at three stakes, the '751' stakes, on the glacier near to the base camp. Because of the delayed arrival of the field party in early June and possibly because May was exceptionally warm considerable ablation had already occurred on the lower parts of the glacier before the start of measurements. Consequently, it was not possible to determine separate winter and summer balances. However, on a short visit in early March it was observed that there was no winter snow on the glacier below about 1000 m so the observed annual balances probably reflect the annual ablation patterns quite closely.

In addition to the mass balance readings, the stake positions were surveyed in mid June and late August by intersection from fixed points on the bedrock. Analyses of the results will allow estimates to be made of 'winter' and 'summer' velocities.