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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 hydroelectric potential of West Greenland, glaciological investigations were started at the Qamanârssûp sermia in 1979. The glacier is situated at the innermost part of Godthåbsfjord (Kangersuneq) and is an outlet glacier from the Inland Ice proper, running west down to about 60 m above sea level. From the snout up to the 1500 m contour line the area has been measured to be 146 km². Above this height the boundaries of the drainage area have not yet been adequately defined, so no area measurement has been attempted.

Ablation measurements

In 1979 and 1980 the work has concentrated on establishing a network of ablation stakes on the glacier. Due to the size and the rough surface of the glacier (including two impassable icefalls) this has been a difficult task, and only this summer has the stake network been extended to 1400 m above sea level.

As the glacier was bare of snow up to about 1000 m, both during a visit in early March and at the start of the summer field season in early June, only ablation measurements have been carried out.

The net balance on the lower 1000 m of the glacier has been calculated to be -215×10^6 m³ of water equivalent for the period 8 September 1979 to 21 September 1980 (fig. 21 and Table 6). The corresponding elevation of the firn line was just above 1300 m above sea level.

The recession on the net balance curve in fig. 21, between 100–300 m is most probably due to shadow effects and frequent low fog coming in from the fjord.

Other investigations

In concert with the ablation measurements, meteorological observations were carried out both at the base camp and at the same elevation on the glacier. Temperature, humidity, evaporation, precipitation, wind run and direction, sunshine duration and cloud cover were

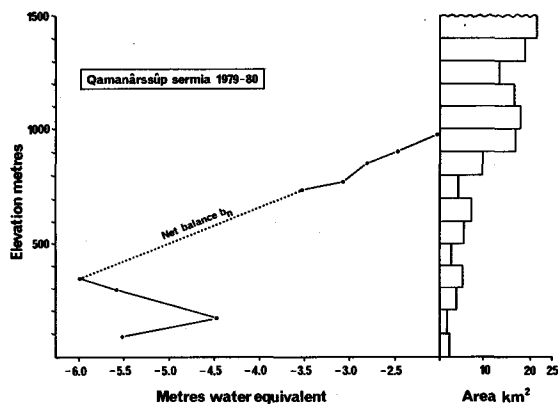


Fig. 21. Net balance curve and area distribution of Qamanârssûp sermia, 1979-1980

observed at the base camp, while only temperature, humidity and precipitation were measured at the glacier station.

Short term (almost daily) ablation measurements show that temperature is the principal controlling factor, while wind, rainfall and duration of sunshine, in decreasing order, only have minor influences.

The ablation stakes were surveyed from stations on bedrock in order to determine their position and the movement of the glacier. Also a photogrammetric survey of the snout and lower part of the glacier was carried out by Laboratoriet for Fysisk Geografi, Aarhus University.

Table 6. Net balance in relation to elevation and area distribution, Qamanârssûp sermia, 1979-1980

Height m. a.s.l.	Area km ²	Net balance	
		B_n 10 ⁶ m ³	b_n m
1500-1400	21.65	-	-
1400-1300	18.93	-	-
1300-1200	13.30	-	-
1200-1100	16.49	-	-
1100-1000	17.79	-	-
1000- 900	16.70	-36.24	-2.17
900- 800	9.40	-25.00	-2.66
800- 700	4.22	-14.39	-3.41
700- 600	7.17	(-29.0)	(-4.0)
600- 500	5.51	(-25.9)	(-4.7)
500- 400	2.67	(-14.2)	(-5.3)
400- 300	5.16	-30.70	-5.95
300- 200	3.84	-20.20	-5.26
200- 100	1.59	- 6.73	-4.23
100- 60	1.89	-10.43	-5.52
	146.31	-212.79	-1.45