sary tool for the data reduction is a detailed digital terrain model including bathymetric data from the fjords.

From gravimetry alone it will probably be impossible to distinguish between augite syenite and kakortokite, due to both the small density contrast and the unavoidable errors in the heights and topographic corrections for gravity stations in mountaneous areas. Thus to resolve the 'shallow' structure of Ilímaussaq, seismic control will be useful.

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Institut for Geofysik,
University of Copenhagen,
Haraldsgade 6,
2200 Copenhagen N.

Glaciological investigations in Johan Dahl Land, South Greenland, as a basis for hydroelectric power planning

Ole B. Olesen

In 1973 GGU proposed a project for "delineating water resources in connection with hydroelectric power-plant possibilities along the west coast of Greenland" to Statens Naturvidenskabelige Forskningsråd (SNF, Danish National Science Research Council). The project consisted mainly of mapping all natural drainage basins situated on the ice-free west coast using available maps and aerial photographs.

Using this map as a base, and applying available glacio-hydrological and climatological parameters, the project would have resulted in a map of potential water resources thereby constituting a rational basis for planning further investigations. The project included field investigations to collect some of the most needed glacio-hydrological and climatological data from key areas along the coast.

Unfortunately, this project had to be abandoned as no funds were allocated.

In 1975 Grønlands Tekniske Organisation, GTO, (Technical Organisation of Greenland) started measuring run-off from a number of basins along the coast of West Greenland and this continued in 1976. In 1977 GGU and GTO entered a formal agreement on further investigation of the hydroelectric potential of West Greenland by which, generally speaking, GTO would measure the 'output' from potentially promising basins and make all technical assessments while GGU would measure the 'input' and make overall regional syntheses of glacio-hydrological climatological and morphological parameters.

Johan Dahl Land basin

Due to the current investigations as to the volume and workability of the uranium deposit at Ilímaussaq, it was decided that GGU should begin its glacio-hydrological field work in the so-called Johan Dahl Land basin which is situated 50 km north-east of Ilímaussaq and 25 km north of Narssarssuaq airfield. Run-off measurements had already been initiated here in 1976 by GTO.

The main morphological units of the basin are: Valhaltinde mountain, Nordbogletscher and Nordbosø. Valhaltinde mountain dominates the eastern part of the basin giving it a west to south-west exposure. The peak Valhaltinde reaches an altitude of 1650 m, and is the highest point of the basin.

Nordbogletscher, a branch of the glacier Eqalorutsit kangigdlît sermiat, which is an outlet glacier from the Inland Ice, covers about 35 km^2 within the basin perimeter. Although the slope of the glacier is low, from about 950 m to approx. 700 m in a length of 6 km, it contains two ice-falls making the surface moderate to highly crevassed. At its lower end Nordbogletscher calves into Nordbosø.

Nordbosø is by far the largest lake in the basin covering an area of 10.5 km^2. The outlet from this lake forms the lowest point in the investigated basin at 660 m, and the GTO run-off measuring station is situated here.

The area of the glacier-free part of the basin is about 100 km^2 of which 15 km^2 are lakes ranging in size from 0.1–10.5 km^2; the basin has a median altitude of 885 m above sea level.

Meteorological observations

Difficulties in the funding of the project caused some delay in the field work and the base camp was not established until the 23rd July. Except for the period August 6th to August 11th this camp was continuously manned until September 18th when it was closed for the winter.

The base camp at 850 m altitude is situated in the northern part of the basin at the north-east side of the glacier, very near to one of the few easily reached access routes to the glacier.

At the base camp a meteorological observatory was established with the following instruments:

1 Thermohygrograph (7 day clockwork)
1 Barograph (7 day clockwork)
1 Maximum thermometer
1 Minimum thermometer
1 Evaporimeter (Piche)
1 Precipitation gauge (Hellmann, 200 cm^2)
1 Precipitation gauge (own design, 200 cm^2)
1 Cup anemometer
1 Cambell-Stoke sunshine recorder

Thermohygrograph, barograph and thermometers were placed in a Stevenson screen 2 m above ground while the evaporimeter was secured beneath the screen. The precipitation gauges were mounted on poles with their lips 1.5 m above ground while the cup anemometer was mounted 4 m above ground. The sunshine recorder was bolted to the flat upper surface of a large isolated boulder.

All instruments were read twice a day at 8 a.m. and 8 p.m. and at the same time notes were made of direction of wind and cloud cover.

Another Stevenson screen was placed on the middle of the glacier at 865 m, slightly higher than the base camp. The screen on the glacier contained a thermohygrograph (14 day clockwork) and a maximum and a minimum thermometer. A standard precipitation gauge (Hellmann, 200 cm^2) was placed nearby with its lip 1.5 m above the ice surface when the measurements started.

The instruments were read whenever the field party was nearby, at the same time making notes of wind direction and cloud cover.

In order to measure possible variation in liquid precipitation due to difference in heights and/or exposure, 16 precipitation gauges were installed on Valhaltinde mountain in two lines with a south-west and north-east exposure. Height differences between gauges were approximately 100 m with the highest at 1500 m altitude.

Glaciological observations

In order to make reference points for ablation/accumulation measurements and for the determination of rate of movement, 28 stakes were bored into the glacier ice forming one longitudinal and five transverse profiles. The stakes are 5 m aluminium tubes with a diameter of 32 mm and a wall thickness of 2 mm, which should give them sufficient strength to withstand the strong winds experienced in the area. The stakes were bored about 4 m into the ice with a petrol power-drill and marked with a strip of coloured cloth.

Due to the time of year and hence relatively high temperature of the glacier only few of the stakes froze fast in the ice during the field season. Therefore only a few reliable ablation measurements were made in spite of several visits to each stake.

At the end of the field season all stakes with less than 2 m protruding above the glacier surface were lengthened with an extra 2 m of aluminium tube to safeguard against complete burial by winter snow. In spite of this precaution it may prove necessary to further lengthen the stakes during the winter.

In order to measure positions and movements of stakes a 1.5 km baseline on the eastern side of the glacier was measured and marked with small bronze plaques. Unfortunately, all stakes could not be seen from this baseline and so a second was established towards the glacier front, both being tied together in a single coordinate system.