

Review of the Survey's activities in 1979

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On the 1st of May 1979 Home Rule was introduced in Greenland. Under the new status the Danish Government and the Greenlandic Home Rule Authorities have equal powers when it comes to policy and important concrete resolutions within the field of mineral resources, including water resources for hydroelectric power.

A Joint Danish-Greenlandic Committee on Mineral Resources (Fællesrådet) has been established on a parity basis to act in an advisory capacity in relation to the joint decision-making power vested in the Danish Government and the Home Rule Authorities.

The administrative functions relating to mineral resources are dealt with by a new Mineral Resources Administration (Råstofforvaltningen) under the Minister for Greenland. The Mineral Resources Administration also serves as the secretariat of the above Joint Committee.

The Geological Survey of Greenland, apart from carrying out all the practical and scientific aspects of geological investigations in Greenland on behalf of the State, also advises the Mineral Resources Administration concerning mineral licences and concessions, and supervises mining activity on behalf of the Mineral Resources Administration including environmental control in cooperation with the Greenland Fisheries Investigations (GF).

In recent years there has been an increased interest in the possible potential of hydroelectric power in Greenland. In 1979 GGU devoted a larger proportion of its budget to provide a sound foundation with which to evaluate the water resources available for hydroelectric power. The glacio-hydrological project which was started in 1977 on Nordbogletscher in Johan Dahl Land, South Greenland, was continued during the year. Mass balance studies were made using stakes established in the ablation area, and the local climatological elements were recorded both manually and by automatic means. In August 1979 a similar station was set up at Qamanârssûp sermia in the Godthåb region. At both stations it is planned to start discharge measurements in 1980. In Copenhagen plans were prepared for the next five years and work was continued on mass balance modelling. The work was given a boost in 1979 by the appointment of an additional scientific staff member to GGU's permanent personnel.

In North Greenland GGU completed the second summer of its three year programme in the area with geological mapping in the North Greenland fold belt and

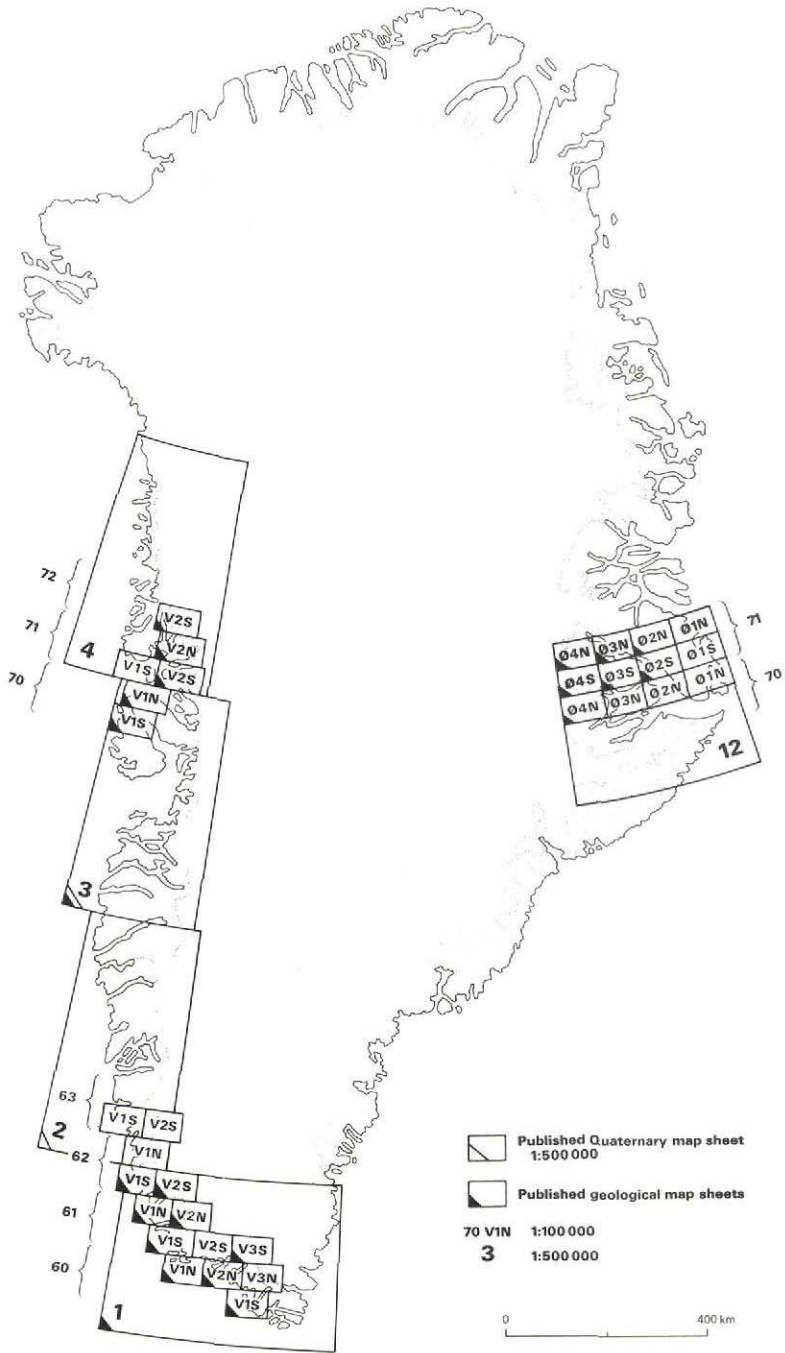


Fig. 2. Map sheets published and in preparation by the Survey (see inside rear cover).

continuation of the mapping in the platform areas to the south. The mapping forms part of GGU's 1:500 000 mapping project to cover Greenland with geological maps at that scale. The programme also supported investigations on the Quaternary geology, palaeomagnetic studies and geochemical sampling. The geodesists of the Geodetic Institute, who form part of the joint programme, also completed the measurement of the ground control points in the western part of the region (Wulff Land, Nyeboe Land) in preparation for orthophotographic maps of the region. The summer's programme ran according to plan and expects to complete the first stage in 1980; the second stage is planned to start in 1983.

The 1:500 000 mapping projects continued north of Upernavik and in South-East Greenland. To the north of Upernavik detailed work was undertaken in selected areas suitable for the production of 1:100 000 map sheets. In South-East Greenland a party made use of a fixed-wing aircraft and a helicopter for reconnaissance and transport to cover some of the inland areas. The most notable find was a layered gabbro intrusion inland from Søndre Aputitêq. Another party worked with rubber boats in Sermilik which provided an almost complete cross-section of the Nagssugtoqidian mobile belt.

Various groups from the University of Copenhagen continued their mapping projects under the auspices of the Survey. The group responsible for the mapping of the sheet Agpat (70 V.2 Nord) continued their work during the season with five parties. On Disko another group of two parties completed the field mapping of the sheet 69 V.1 Nord and continued their examination of the native iron bearing basaltic rocks and their surroundings. They made use of a topographic map which had been prepared on GGU's stereo plotter and on which many geological boundaries were drawn in the stereo plotter. A party that is making a detailed geological map at 1:10 000 of the part of the Ilímaussaq intrusion that lies south of the fjord Tunugdliarfik continued their work during the summer. In East Greenland a party continued a sedimentological study of the Permian deposits in the area to the south of Mesters Vig.

In the Godthåbsfjord area two parties from GGU continued work for the 1:100 000 map sheet 64 V.1 Syd.

The exploration for radioactive minerals continued in three areas in West Greenland. In the Sarfartôq carbonatite complex the extent of uraniferous pyrochlore zones was established by detailed scintillometry, in the Qaqarssuk carbonatite complex soil sampling and radiometric and geological field work were carried out, and in the Godthåbsfjord area the numerous pegmatites were examined for radioactive mineralisation. A special study of the regional distribution of ultramafic, carbonatitic and kimberlitic dykes was carried out in the gneisses surrounding the Sarfartôq complex.

One party, operating from a boat, made an extensive sample collection for geochemical and geochronological work from Ivigtut to Egedesminde.

At the lead-zinc mine at Mârmorilik GGU continued its supervisory functions

governing geological aspects of the mining. Government control over spillage into the surrounding environment was continued with sampling in the fjords and analyses in the laboratory, and *Recipientundersøgelse, Agfardlikavså, Qaumarujuk, 1977-78* was issued in May 1979 in association with the Greenland Fisheries Investigations and Copenhagen University's Institute for Petrology.

The GGU computer facilities in Copenhagen have been expanded over the years in order to cover the requirements from both long-term GGU work as well as the various 'projects' administered by GGU. GGU's chemical laboratory, together with other specialised laboratories, carry out routine processing.

In recent years GGU administered 'projects' funded from external sources, principally the European Economic Communities and the Danish Ministry for Trade in connection with their Energy Resources Programmes, and the Danish Natural Science Research Council (SNF). In the summer of 1979 seven of these programmes were active in Greenland.

On Nûgssuaq the 'Coal Project' investigated the extent, thickness and quality of the Cretaceous-Tertiary coal seams in the area. There is a change in the area from sandy facies in the south to more shaly facies in the north accompanied by increasing thickness and greater abundance of coal seams. Work was concentrated on the south coast of Nûgssuaq and the northern part of Sarqaqdalen where there are the best exposures.

Off East Greenland the M/V *Dana* carried out a sparker seismic and side scanning sonar survey. Ice conditions were favourable and 100 000 line kilometres were covered during two months covering the shelf from Kap Farvel to as far north as Kong Oscars Fjord and penetrating into Scoresby Sund. Combined with previous surveys it is now possible to extend the areas of sedimentary basins and to delineate the part of the sea floor underlain by basement.

In South Greenland 'Syduran' made an extensive geophysical and geochemical survey for uranium. A new light-weight gamma-spectrometer built for the project at Risø National Laboratory was mounted in a helicopter. The helicopter was also used for sampling of stream sediments and stream water. The survey extended from Sermiligârssuk (61°30'N) south to Kap Farvel. More detailed treatment was given to areas where previous work and the geological setting indicated a potential for uranium mineralisation. The first results have demonstrated that there is relatively low radioactivity in the northern part of the area while the supracrustal rocks of the Tasermit area have three times the radioactive background of equivalent rocks in the northern part. Most of the season's geological field work was spent in the Gardar alkaline complexes and their surroundings of which the Grønnedal-Íka and Igaliko complexes, together with the Ilímaussaqa intrusion, gave the most encouraging results.

The assessment of the uranium potential of Kvanefjeld, by Narssaq, was continued during the year in cooperation with Risø National Laboratory with the ex-

traction of an additional 800 tons of ore from the old trial mine. The ore is to be used in the new carbonate leaching process which is under development at Risø.

The 'Eastmar' project that started in 1978 with the collection, compilation and study of aeromagnetic data already collected by other organisations over east and north-east offshore Greenland, continued during 1979 by flying areas not previously adequately covered. Approximately 63 000 line kilometres of high sensitivity aeromagnetic data were flown over the shelf in a six month period. The major parts of the western land boundary of the offshore sedimentary basins were continuously covered by a dense grid and oceanic basin was encountered on all the seaward extended lines.

Project 'Westmar' that terminated during the year issued some of its preliminary results on the sea bottom features in the form of a report – GGU Rapport 87.

East Greenland is being used as a research area for the study of remote sensing techniques using airborne instruments so that maximum information can be extracted from similar data obtained by satellites. A project in connection with the French Groupement pour le Développement de la Télédétection Aérospatiale (GDTA) flew about 13 000 square kilometres over varied geological terrain with good exposure. The flying programme was carried out with eight days of flying with the accumulation of data in multispectral scanning systems. The data are of high quality and the quantity will require several years of detailed study and assessment.

During the year five short-term contract scientific personnel were attached to GGU while the contract of three others came to an end. One new staff scientist was appointed to GGU's permanent staff.