

# Review of the Survey's activities in 1984

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The Geological Survey of Greenland (GGU) continued the investigation of the geology of Greenland during the year with both field studies in Greenland and laboratory studies in Copenhagen. Field work was carried out between June and September by two main field groups in the northern and southernmost parts of Greenland separated by more than 2000 km. Smaller groups worked in several areas along the west coast and a short reconnaissance was accomplished along the south-east coast. GGU's work encompassed geochemical and geophysical studies, mineral exploration, petroleum geology, environmental investigations, and glaciology. Seventy-nine scientists and technicians participated in the summer's field work. In addition to the GGU parties several groups from other institutions worked in close collaboration with GGU. The areas of activity in 1984 are indicated on fig. 1.

## *North Greenland*

The North Greenland expedition was the Survey's main activity, both in numbers of participants (37) and expenditure. The work in this remote part of central and western North Greenland between 81° and 83°30'N represents the first systematic geological investigation of an area which became famous at the beginning of the century through the activities of the Second Thule expedition under the leadership of Knud Rasmussen. In addition to the 1:500 000 geological mapping and regional studies a systematic geochemical sampling programme was carried out to delineate areas of interest for possible mineral resources. Petroleum source rock investigations were extended from the Peary Land area; this programme was funded by the Danish Ministry of Energy as part of an energy research programme to evaluate the petroleum potential of the sedimentary Lower Palaeozoic basin of North Greenland.

## *West Greenland*

In West Greenland GGU continued the collection of glaciological and hydrological data for eventual hydropower development. The investigations, partly funded by the EEC European Development Fund, were concentrated in four areas near Godthåb, Sukkertoppen, Søndre Strømfjord and Jakobshavn.

A carbonatite complex near Sukkertoppen with its associated phosphate occurrence was the subject of detailed geological and geophysical investigations. This project is supported by the EEC Research and Development Programme in the Raw Materials Sector.

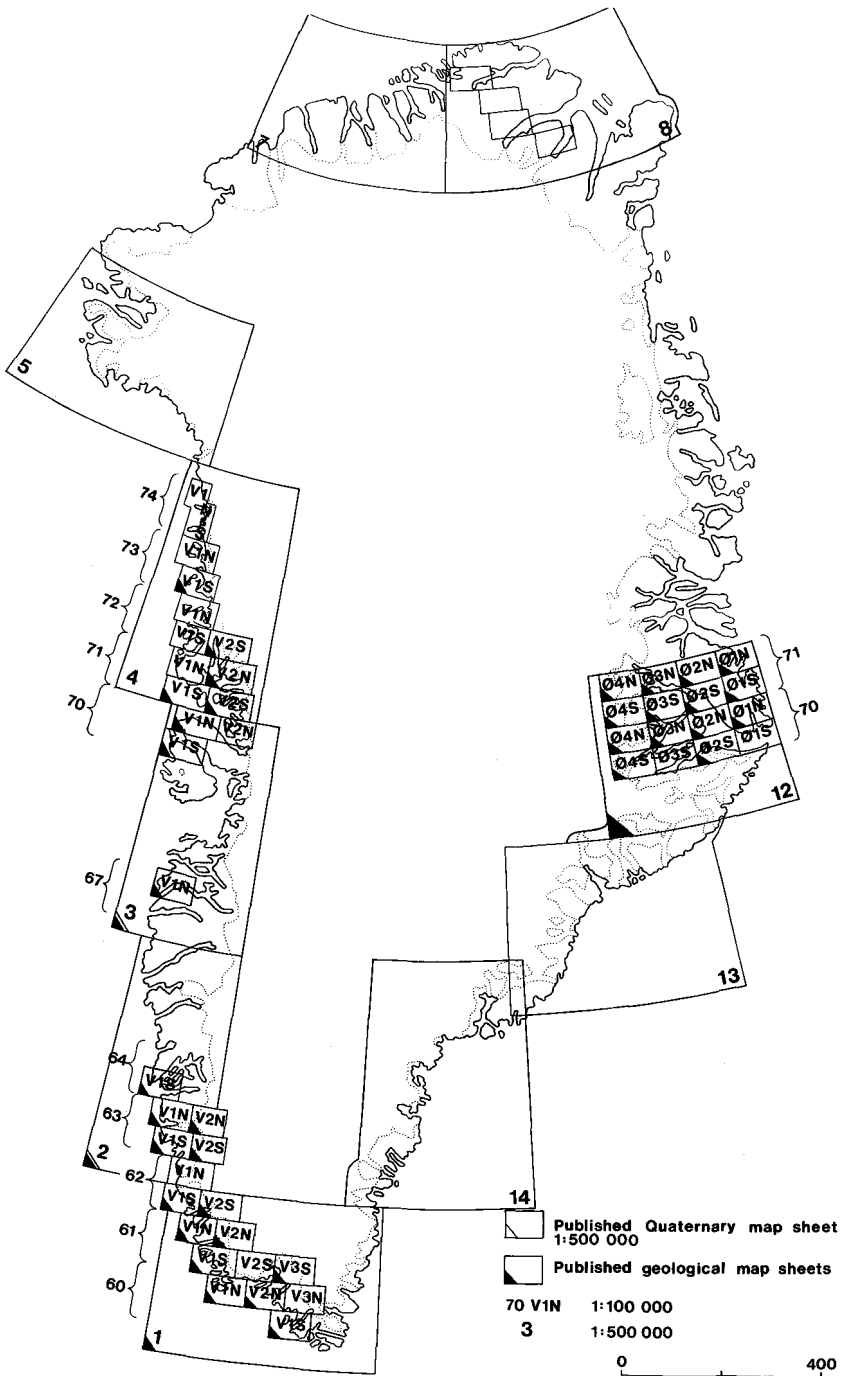


Fig. 2. Map sheets published and in preparation by the Survey (see inside rear cover).

The extent of the known scheelite occurrences in the Godthåb area was expanded during a short visit and now includes also parts of the Isua supracrustal belt. GGU assisted the municipality of Godthåb in collecting high quality material from a gedrite-anthophyllite occurrence for a planned production of semi-precious stones and jewellery.

### *South Greenland*

The investigations in South Greenland were mainly devoted to the exploration of mineral resources. The intrusive syenitic rocks around Motzfeldt Sø in the Igaliko complex were mapped and sampled for geochemical studies in collaboration with a group from the University of Durham, England. The associated pyrochlore mineralisation was investigated with financial support from the EEC in collaboration with the Technical University of Munich.

The uranium exploration in South Greenland, financed by the Danish Ministry of Energy, was continued. A pre-Gardar uranium mineralisation at Iglorssuit (60°23'N, 46°06'W), first found in 1982 was studied, and a detailed radiometric survey of the locality was carried out by Risø National Laboratory. An area southwest of Qagssiarssuk was prospected in detail, and new additional small uranium mineral occurrences were discovered. In the same area geophysical methods were applied in the search for structurally bound sulphide and uranium mineralisation. Magnetic methods were used to determine glacier thicknesses in the area of the Johan Dahl Land hydropower project. Aeromagnetic measurements over the Inland Ice were continued with reconnaissance lines flown across South Greenland in co-operation with the Geological Survey of Canada and the National Aeronautical Establishment of Canada.

### *East Greenland*

The project NAD (North Atlantic D) continued the interpretation of offshore geophysical data from East Greenland with support from the Danish Ministry of Energy. The project finished at the end of 1984, and the final report summarises the structure and regional petroleum potential of the East Greenland shelf.

A systematic regional geological investigation and 1:500 000 mapping programme is planned for South-East Greenland in the summers of 1986 and 1987, covering the area from Angmagssalik to Tingmiarmiut. A reconnaissance by fixed-winged aircraft and helicopter was made in order to establish the necessary logistic knowledge for detailed planning.

### *General*

Environmental studies on the heavy metal content of sea water and bottom sediments were carried out in co-operation with the Greenland Fisheries and Environ-

mental Research Institute. Samples were collected in Arsuk Fjord near the temporarily re-opened cryolite mine at Ivigtut, at Tartôq south of Sermiligârssuk close to sulphide mineralisation in greenstones, and around the lead-zinc mine at Mârmorilik. In North Greenland samples for heavy metal investigations were collected at Qânâq, and a possibly polluted area was studied at Dundas.

GGU continued to assist the Mineral Resources Administration in their final negotiations with ARCO-Nordisk Mineselskab concerning a petroleum concession in Jameson Land. Assistance was also provided in connection with inspection of the mineral exploration and exploitation activities of Greenex A/S at Târtoq and Mârmorilik respectively, as well as in the geological evaluation of private company reports and applications for concessions.

The Survey was granted funds from the Ministry of Greenland to buy an automatic X-ray fluorescence spectrometer for simultaneous analysis of a number of major as well as trace elements. This new facility with high capacity enables GGU to increase the number of whole-rock analyses for scientific investigations, and also makes it possible to assay in-house the numerous geochemical samples collected in connection with the exploration of mineral resources.

During the year five new map sheets at a scale of 1:100 000 and one at 1:500 000 were published. Six Survey Reports and three Bulletins were published.