

GGU's activities in 1993 – new discoveries and perspectives

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In general 1993 was a very encouraging year for GGU. The most exciting geological developments were the find of a major zinc deposit in North Greenland by the Canadian company Platinova A/S and the further investigations of the live oil showing discovered in 1992 on Nuussuaq in West Greenland. Both discoveries have contributed to increased interest in exploration for mineral resources by international oil and mining companies in Greenland.

On the home front, the regular reduction in GGU's yearly budget allocation was less than for many years, an improvement of some significance in limiting the loss of experienced staff members and enabling GGU to carry out its functions effectively.

Geological research in Greenland was considerably enhanced by a grant from the Danish National Research Foundation of 11 million US dollars, to be used to establish and run a new research institute, the Danish Lithosphere Centre. Administration of the new institute is linked to GGU, and the funding is to cover an initial period of five years. Studies will be focused on plate tectonic processes onshore and offshore East Greenland, and in West Greenland. Activities are planned in close cooperation with GGU, and the Geological Institute and Geological Museum of the University of Copenhagen. The institute will open in February 1994 in the same building complex also shared by GGU and the Geological Institute.

GGU has again participated in promotion activities aimed at increasing international awareness of the mineral resource potential of Greenland. This has taken the form of participation in international congresses, trade fairs and workshops, and publication and distribution of the Newsletters GHEXIS and MINEX. Efforts have been directed also at making various types of geological data more readily available to the interested public.

GGU carries out all geological tasks under the field of jurisdiction of the Mineral Resources Administration for Greenland. This includes evaluation of hydrocarbon and mineral potential, inspection visits and calculation of concession areas, and participation in discussions of new strategies and initiatives. In summer 1993 GGU carried out visits to the drilling activities by Falconbridge Greenland A/S on Disko, by Cyprus Greenland Corporation near Nanortalik, and by Platinova A/S at Citronen Fjord in North Greenland.

Political interest in GGU's work has been shown by the visit of the Joint Committee on Mineral Resources to a GGU field party in South Greenland, while the Energy Minister Jann Sjursen visited field activities in Greenland as well as GGU's offices in Copenhagen.

Geological, geochemical, geophysical and glaciological projects were carried out in 1993 in West, South, East and North-East Greenland, both traditional and specialised resource oriented surveys. A total of 62 scientific and technical personnel participated in GGU's expeditions in 1993. The permanent staff of 83 based in Copenhagen has been supplemented during the year by an additional 13 associated with externally financed projects.

Geological mapping

In 1993 the systematic geological mapping of Greenland at a scale of 1:500 000 was continued with initiation of a new project in eastern North Greenland which will continue until 1995. Geological reconnaissance was carried out between Jökelbugten (78°N) and northern Kronprins Christian Land (81°N), an area about two-thirds the size of Denmark. The 1993 reconnaissance studies included structural geological investigations of Caledonian thrust units, as well as stratigraphical and sedimentological studies of older platform sediments and the younger sediments of the Wandel Sea Basin.

In South Greenland 1:100 000 geological mapping was carried out within the SUPRASYD project with participation of British and Canadian scientists, aimed at completion of map sheet 60 V.3 N east of Qaqortoq/Julianehåb.

Mineral resource investigations

Project SUPRASYD, a mineral resource evaluation project in South Greenland, was continued in 1993 with activities centred on the region around Søndre Sermilik. Investigations were focused in particular on the gold potential along prominent shear zones and lineaments. Combined with comprehensive collecting and analysis of rock samples and stream sediment samples this has contributed to the localisation of areas and geological settings most conducive to gold mineralisation.

In West Greenland geochemical investigations were carried out in the regions around Paamiut/Frederikshåb, Nuuk/Godthåb, Maniitsoq/Sukkertoppen and Aasiaat/Egedesminde with funding provided by the Mineral Resource Administration. Collection of stream sediment and water samples was undertaken over an area of 16 000 km², at a density of one sampling site for each 20–30 km². With completion of the summer's programme, geochemical data are now available for the entire ice-free Precambrian coastal region of Greenland between Kap Farvel and Uummannaq. The data will be incorporated in an evaluation of the mineral resource potential of different areas.

A similar programme of stream sediment and water sampling was carried out in eastern North Greenland, in order to define areas with high mineral resource potential. North Greenland has attracted the attention of the international mining industry following the discovery of a major zinc deposit at Citronen Fjord by Platinova A/S.

Studies have been initiated in connection with an evaluation of prospecting methods for diamonds in two areas of South Greenland, around Sarfartoq and Maniitsoq/Sukkertoppen. Investigations are directed towards the question of whether pathfinder minerals from kimberlites, the host rocks of diamonds, can be detected in river sand after transport, erosion and deposition.

Petroleum geology

During the 1992 field programme in the Uummannaq region carried out in cooperation with the Geological Museum, oil was discovered in vesicles in basalts at Marraat, in southern Nuussuaq. Following the discovery, new field work was carried out in 1993, and core drilling and logging was undertaken with the financial support of the Mineral Resources Administration. Live oil was present in vesicles in the basalts within the upper 90 m of the 450 m core, with traces of oil present at greater depths.

Interpretation of c. 6000 km of the seismic data obtained since 1990 from the West Greenland shelf has been continued, and improved by the purchase of Landmark work stations. Furthermore, interpretation of the 4070 km of seismic data acquired in Melville Bay by Nunaoil A/S as part of the KANUMAS project is in progress.

In cooperation with the University of Copenhagen and with financial support of the Ministry of Energy's Energy Research Programme, investigations were carried out in Jameson Land on oil formation and reservoir possibilities. In addition to surface sampling, a total of 932 m of drill core was collected from 11 holes.

In eastern North Greenland, the reconnaissance studies in the Wandel Sea Basin succession included stratigraphical and petroleum geology investigations.

Glaciology

Glaciological studies in 1993 were focused primarily on international climate research projects. One study was carried out in eastern North Greenland, where ablation and climatic observations were made at the margin of the Inland Ice in Kronprins Christian Land. This work, financed by the EC and Nordisk Ministerråd (Nordic Council of Ministers), was carried out in cooperation with scientists from Germany and Switzerland. Studies were also carried out around Hans Tausen Iskappe in Peary Land and on the glacier Storstrømmen near Danmarkshavn. Both of these are cooperative ventures with the Alfred Wegener Institute, Germany, and the University of Copenhagen.

Glacio-hydrological studies in the Buksefjord basin south of Nuuk, West Greenland, were carried in cooperation with Grønlands Energiforsyning (Greenland Energy Authority) in connection with a possible expansion of the hydroelectric scheme.

For the first time a member of GGU staff took part in an Antarctic expedition during the 1992-93 field season. The background for the work was linked to GGU's extensive experience in climatic studies in Greenland, and a series of similar studies were undertaken in cooperation with Norsk Polarinstitut. The research is followed up in the 1993/94 season. Participation in both seasons was made possible by the support of the Danish Natural Science Research Council and Norsk Polarinstitut.

Other research activities

Offshore South-East Greenland, a seismic survey was carried out by a group comprising GGU, the University of Aarhus and the Geological Survey of Denmark, financially supported by the Danish Natural Science Research Council, and linked to Leg 152 of the international Ocean Drilling Program (ODP). ODP drilling was carried out in the North Atlantic off South-East Greenland in October and November 1993 with two GGU scientists participating, one as co-chief scientist. The main objective was to study processes related to the formation of volcanic rifted margins; six drill holes were completed.

Publications

In 1993 GGU published a special coloured plate at a scale of 1:20 000 showing a continuous coast profile of the south side of Nuussuaq. Five numbers in GGU's Bulletin series, one number in the Report series, eight numbers of the Open File Series and one map sheet description were also issued. As a consequence of GGU research activities 55 articles were published in international scientific journals.