THEMATIC MAP SERIES

Regional Geoscience Compilations

Thematic Map Series 94/2 (part A)

Regional compilations of geoscience data from the Paamiut-Buksefjorden area, southern West and South-West Greenland

GGU

GRØNLANDS GEOLOGISKE UNDERSØGELSE
Kalaallit Nunaanni Ujarassiortut Misissuisoqarfiat
GEOLOGICAL SURVEY OF GREENLAND

Regional compilations of geoscience data from the Paamiut-Buksefjorden area, southern West and South-West Greenland

edited by

Bridget Ady and Tapani Tukiainen

1995

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GRØNLANDS GEOLOGISKE UNDERSØGELSE
Ujarassiortut Kalaallit Nunaanni Misissuisoqarfiat
GEOLOGICAL SURVEY OF GREENLAND

The Geological Survey of Greenland (GGU) is a research institute affiliated to the Mineral Reources Administration for Greenland (RMA) within the Danish Ministry of Environment and Energy. As with all other activities involving mineral resources in Greenland, GGU's investigations are carried out within the framework of the policies decided jointly by the Greenland Home Rule Authority and the Danish State.

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Introduction

This publication is the third in a series of thematic map volumes comprising regional compilations of geoscience data. It acts as a geographic link between the first two publications in the series (Steenfelt *et al.,* 1990; Thorning *et al.,* 1994) by covering the area from 61° 30′ N, 40° 00′ W to 64° 00′ N, 52° 00′ W (Fig. 1). Although there has been minor mineral exploration activity in the region, the main objective of the thematic map series is to provide data to encourage further exploration activities.

The 63 maps (Table 1) and the introductory notes which make up the volume provide a synthesis of much of the recent, and for the most part unpublished, geoscience data from the region. Each map belongs to a specific theme. The introductory text gives some general background information for the area, details on data acquisition, analytical methods and form of presentation as well as some interpretive comments for each theme. Although this publication is not intended to present a comprehensive interpretation of all the data, the notes do provide some insight into such topics as ongoing geochronological studies and the recognition of Archaean terrane boundaries from geochemical signatures.

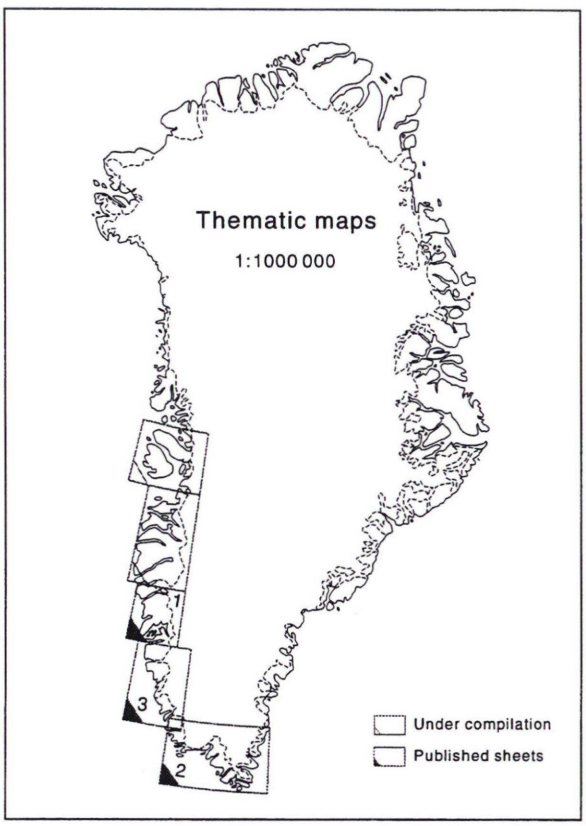

Figure 1. Location Map showing completed *Thematic Map Series* coverage.

The geological map (94/2-001) is a new 1:1 000 000 compilation for the region based on the 1:500 000 Geological Map of Greenland, Sheet 1 (northern part) and Sheet 2 (southern part) (Allaart, 1975, 1982). Distribution of granulite facies in the northern part of the map was revised and extended in the light of new information contributed to the 1:2 500 000 Geological Map of Greenland (Escher & Pulvertaft, 1995) and on the basis of oral communications (J. C. Escher). As a result of hitherto unpublished studies (for further details see next section), an extensive granulite facies area is defined south of Frederikshåb Isblink (V. R. McGregor & C. R. L. Friend, personal communication, 1994). The map legend was adapted to conform to the 1:2 500 000 Geological Map of Greenland with age constraints for several units based on recent isotope studies.

Infrastructure, topography and climate

The map area lies within what is known as Greenland's 'Open Water Area' which is generally ice-free all year round. It comprises the northern half of Paamiut commune with a total population of *c.* 2,600 and the southern half of Nuuk kommune with a total population of *c.* 13,000 (the majority of whom live just north of the map area in the capital of Nuuk). Although only about 5% of Greenland's population lives within the actual map boundaries, the area is part of Greenland's most highly populated belt i.e. the coastal strip that extends from the tip of South Greenland to northern central West Greenland.

The largest settlement is the town of Paamiut (pop. *c.* 2,200) which is home to the College for Maritime and Fishery training as well as Greeenland's largest sports centre. Fishing and related activities are the main occupations for the area and there are fish processing factories in both Paamiut and Qeqertarsuatsiaat (pop. *c.* 309). A hydro-electric plant at the head of Buksefjorden supplies Nuuk's energy needs. In addition to the communities mentioned many smaller settlements have existed in the area at one time or another, but all of these have been abandoned over the last few decades.

The area lies on the major coastal shipping route from Narsarsuaq in the south to Upernavik at *c.* 73° 00′ N. Most air passenger traffic into the area is through the airports of Narsarsuaq and Nuuk from where there are regular connections to Denmark, Iceland and Canada. For local transport Paamiut is connected to Nuuk and other coastal cities by boat or scheduled helicopter flights. Inland areas can only be reached by chartered helicopter or on foot. Freight is transported by air or by transatlantic shipping from Denmark. As the area is ice-free all year round ordinary ships can sail into Paamiut, Nuuk (to the north) and Ivittuut (to the south) all year round.

Geographically the region falls into Greenland's damp coastal zone characterised by low arctic plants, crowberry, willow scrub and herb slopes. The climate is arctic with a mean temperature below +10°C for the warmest month.

Mineral exploration activity

The extensive Archaean gneisses which dominate the geology impart an almost monotonous gently rolling topography to the entire area. This gentle topography coupled with reasonable access to infrastructure and open water ports make this area one of the country's more attractive regions for potential exploration activities. The area has had a long history of geological investigations, many of which were carried out by GGU. Athough there has been some mineral exploration activity in the region, particularly in the supracrustal belt of the extreme south-east corner (for a more detailed discussion of this area see Thorning *et al.*, 1994) there have been no active mines to date. Associated with the anorthosites and related rocks in the northern half of the area is the Fiskenaesset chromite showing with 100×10^6 t grading 14% Cr_2O_3. Rubies have also been the focus of exploration activity in the anorthosite complex. There has been some interest in those areas of the Archaean block where kimberlites, lamproites and related rocks are known.

The database behind the thematic maps

The maps in this volume are produced entirely from digital data using the Arc/INFO geographic information system (GIS). Production of the *Thematic Map Series* is continuing in tandem with studies to develop an integrated geoscience information system using a GIS and linked relational database management system (RDBMS) and other third party software.

The vector geological map (94/2-001) was created as a series of Arc/INFO coverages of which lithology and major faults are the only ones reproduced here. Existing digital topographic data was also converted to Arc/INFO format. Geoscientific data from GGU databases were exported to create Arc/INFO point coverages (for geochemical dot maps and mineral occurrence maps) and grids (geophysical data). The Arc/INFO coverages and grids are available in a variety of data exchange formats for export to desktop publishing, cartographic, CAD and other GIS software.

Geological summary

Most geological mapping in the area was carried out during the 1960s and 1970s and, apart from the 1:500 000 scale maps mentioned above, geological maps at 1:100 000 have been published for the whole area (Fig. 2). Map sheet descriptions are available for the two 1:500 000 maps (Kalsbeek *et al.*, 1990, Sheet 1; Kalsbeek & Garde, 1989, Sheet 2) and for a few of the 1:100 000 sheets (Higgins, 1990, 61 V.1 Nord and 61 V.2 Nord; Chadwick & Coe, 1983, 63 V.1 Nord). These publications, together with a regional description of the Archaean craton of Greenland by Bridgwater *et al.* (1976), describe the geology of the area in more detail than the present summary and yield access to most of the available literature.

Most of the area covered by the maps in this collection belongs to the Archaean craton of Greenland. A small area in the south-eastern corner of the map is occupied by early Proterozoic supracrustal rocks, the 'Grænseland succession', which unconformably overlies the craton and is related to the Ketilidian orogen of South Greenland (see GGU's *Thematic Map Series* 94/1; Thorning *et al.*, 1994). Most rocks of the craton were formed during the late Archaean, between *c.* 3000 and 2600 Ma. In the north-westernmost corner of the map an older sequence of rocks occurs, the early Archaean (3600-3800 Ma) Amitsoq gneisses and associated rocks (McGregor, 1973; McGregor *et al.*, 1986; for a detailed description of this part of the area see Chadwick & Coe, 1983).

Investigations carried out in the Godthåbsfjord area during the last decade have shown that the area is built up of different geological 'terranes' with distinct geological histories, and separated by mylonite zones (Friend *et al.*, 1988; McGregor *et al.*, 1991). Early Archaean gneisses are restricted to the 'Akulleq terrane', whereas most rocks in the northern part of the present map belong to the 'Tasiusarsuaq terrane' and have ages between 2920 and 2800 Ma (e.g. Kalsbeek & Pidgeon, 1980; McGregor *et al.*, 1991). Recent investigations by V. R. McGregor and C.R.L. Friend (personal communication, 1994) suggest that a subdivision into terranes is applicable to the whole area covered by the present maps.

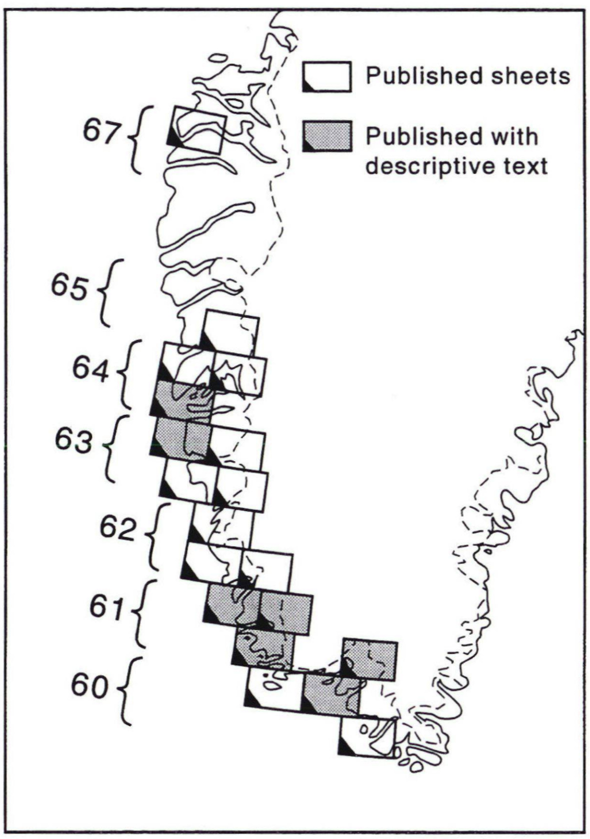

Figure 2. Published 1:100 000 map sheet coverage.

The Archaean craton of southern Greenland contains numerous gabbroic and doleritic dykes (see Kalsbeek *et al.*, 1990). Most of these are of early Proterozoic age (*c.* 2150 Ma, Kalsbeek & Taylor, 1985) and become deformed and metamorphosed on approaching the Ketilidian belt of South Greenland. Others are related to the middle Proterozoic Gardar igneous province (see Kalsbeek *et al.*, 1990). Younger dykes of Phanerozoic age occur sporadically; they are probably related to rifting preceding opening of the Labrador Sea. None of these dykes are shown on the present map.

Main rock units in the Archaean craton

The Archaean craton is dominated by variable orthogneisses with large rafts of amphibolite and anorthositic rocks. A study of a grid collection of 300 rock samples, covering an area of 4000 km^2 south of Fiskenæsset, showed that 85% of that area is underlain by gneisses, 10% by amphibolite and 5% by anorthositic rocks (Kalsbeek, 1976). Similar proportions are typical for most of the area, although anorthositic rocks are less common outside the Fiskenæsset region.

In the southern part of the map area a unit of low grade basic metavolcanic rocks with subordinate metasediments occurs - the 'Tartoq Group'. Late sheets of younger metagranitoid rocks, the 'Ilivertalik augen granite', occupy major areas north of Fiskenæsset. Another area of granitic rocks, the 'Neria granite' (Steenfelt, 1994), occurs in the south-eastern part of the map area.

Anorthositic rocks can locally be seen to intrude into amphibolites (Escher & Myers, 1975), and both amphibolites and anorthositic rocks commonly occur as inclusions within gneisses and contain intrusive sheets of gneiss. It is therefore believed that in individual areas gneisses are the youngest and amphibolites the oldest rocks present. However, because similar-looking gneisses in different terranes may be of widely different ages, this does not imply that all amphibolites and anorthosites are older than all gneisses. Few precise dates are as yet available for the present area, and chronological generalisations are therefore not justified.

Amphibolites and associated rocks

Ten to twenty per cent of the craton is made up of amphibolites and associated metasedimentary gneisses and ultramafic layers and pods. They occur as major concordant layers or as inclusions within the gneisses. They are usually folded and form some of the principal marker horizons revealing the structure of the gneiss complex. Local occurrence of pillow structures suggests that at least parts of the amphibolites were derived from submarine lavas. The map area also comprises major occurrences of greenschist, for example in a major belt south-east of Ravn Storø and within the Tartoq Group (see below). The belt south-east of Ravn Storø can be followed into more strongly deformed and more high-grade amphibolites, and it is believed that there is no essential difference in origin between greenschists and amphibolites.

Chemically the amphibolites have similarities with low-K ocean floor basalts (Rivalenti, 1976; Weaver *et al.*, 1982), and they are believed to represent fragments of Archaean oceanic crust. More felsic amphibolitic rocks have been locally recognised in the Fiskenæsset area, for example in the belt south-east of Ravn Storø and in a major belt of amphibolites south of Grædefjord. These rocks have andesitic to dacitic compositions and commonly display a fragmentary fabric resembling that of pyroclastic rocks. No detailed descriptions of these rocks are available, and their relationship to the more common mafic amphibolites is not clear.

Locally amphibolites are associated with minor amounts of biotite schists. Major units of metasedimentary gneisses, the 'Isorssua supracrustal sequence' occur in the south-eastern part of the map area. They consist mainly of brown, biotite-rich schistose rocks dominated by quartz and feldspar (mainly plagioclase) with additional garnet, sillimanite and cordierite (Masson, 1970).

Tartoq Group

The Tartoq Group (Higgins & Bondesen, 1966; Higgins, 1968; Berthelsen & Henriksen, 1975; Evans & King, 1993) is a several kilometre thick greenstone belt which forms major outcrops on both sides of Sermiligaarsuk in the south-eastern part of the area. It consists of strongly deformed basic metavolcanic rocks and siliceous schists at relatively low metamorphic grade: greenschist to low amphibolite facies. Siliceous schists may in part represent acid metavolcanic rocks (Higgins, 1990). Horizons of iron-formation have been found at several localities (Appel, 1984). Several minor occurrences of gold as well as sulphide showings with both stratiform and vein-type mineralisation have been documented (Appel, 1984; Appel & Secher, 1984; Erfurt, 1990; Evans & King, 1993).

The age of the Tartoq Group is not known, but a minimum age is provided by a 2944 ± 7 Ma SHRIMP U-Pb zircon date on tonalite sheets which cut greenschists of the group (Nutman & Kalsbeek, 1994). Contacts between the Tartoq Group and the surrounding gneisses are commonly strongly sheared, and relationships between these rock units are not well understood.

Anorthosites and associated rocks

Metamorphosed calcic anorthosites and associated leucogabbroic and gabbroic rocks form one of the most distinctive rock associations in the Archaean craton of Greenland. They occur as concordant rafts and trains of inclusions in the gneisses, and provide some of the best marker horizons for tracing out structures on a regional scale. They are most spectacularly developed in the Fiskenæsset region where they form *c.* 5% of the total outcrop. Primary igneous structures and textures (e.g. occurrence of cumulus plagioclase of the order of 5-10 cm) have here been extensively preserved. A detailed description with a review of the earlier literature has been given by Myers (1985).

In the Fiskenæsset region anorthositic rocks appear to form a single stratiform intrusion, called the Fiskenæsset complex by Windley (1969). Because of strong deformation and extensive disruption by younger granitoid intrusions it is impossible to estimate the original thickness of the complex; it may have been of the order of one kilometre. The main rock types in the Fiskenæsset complex are metamorphosed anorthosite (< 10% mafic minerals), leucogabbro (10-35% mafics) and gabbro (35-65% mafics) together with minor amounts of ultramafic rocks and chromitite. By mapping out these rock types it has been possible to establish the original igneous stratigraphy of the complex (Windley, 1971; Windley *et al.*, 1973; Myers, 1985; Fig. 3). The lower parts of the complex are dominated by ultramafic and

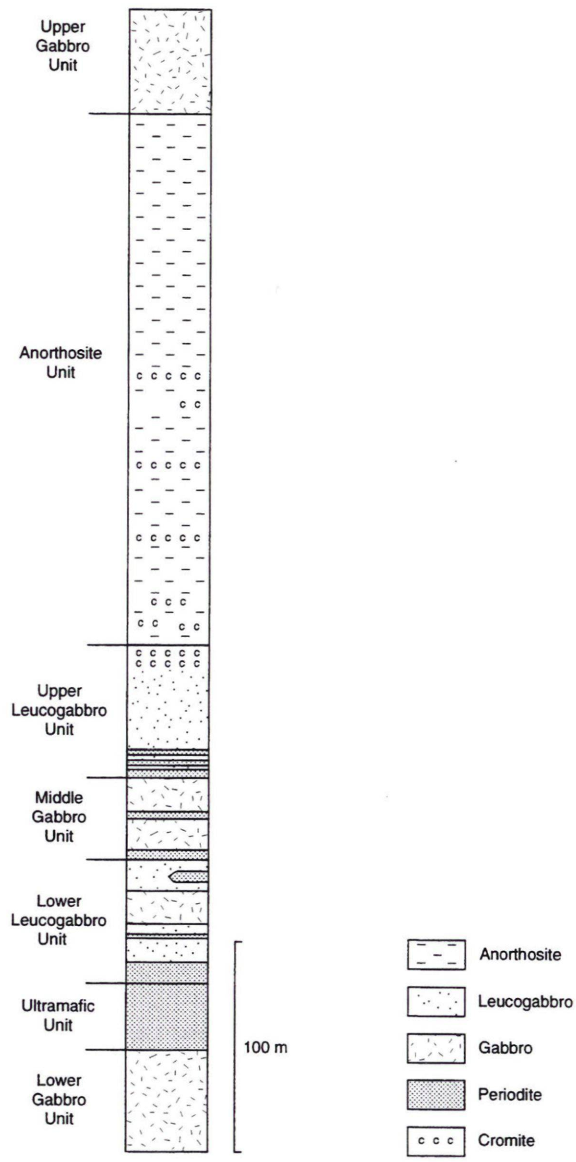

Figure 3. Simplified stratigraphic section of the Fiskenæsset complex, modified after Myers (1985).

(leuco-)gabbroic rocks; the upper parts by anorthosite. Chromite layers (Ghisler, 1976) are mainly present in the upper, anorthositic units of the complex. In parts of the Fiskenæsset region the complex occurs in a strongly compressed syncline, the stratigraphy being symmetrically repeated about the centre of what may appear to be a single layer on the map.

The Fiskenæsset complex may have formed from a moderately aluminous tholeiitic magma (Weaver *et al.*, 1981). Olivine, orthopyroxene, clinopyroxene and abundant plagioclase were the main cumulus phases, whereas hornblende was formed partly as intercumulus mineral and (mainly) by later metamorphic reactions.

The most recent age determination for the Fiskenæsset complex yielded a date of 2860 ± 50 Ma (2σ, Sm-Nd whole rock and mineral isochron, Ashwal *et al.*, 1989; for older data see that paper). This is younger than the age of tonalitic rocks in the southern part of the region (*c.* 2940 Ma; Nutman & Kalsbeek, 1994), and illustrates that not all amphibolites and anorthosites are older than all gneisses.

Orthogneisses

Contrary to earlier interpretations (e.g. Kalsbeek, 1970) it is now generally accepted that nearly all Archaean gneisses are of igneous origin. Compositions are mainly tonalitic to granodioritic, K-feldspar being rather rare. About 70% of the gneisses from the Fiskenæsset grid collection had < 10% K-feldspar and may be classified as tonalite or trondhjemite. The rest has granodioritic to granitic compositions (Kalsbeek, 1976). These rocks were intruded as sub-concordant sheets and larger complexes that penetrated and disrupted ('exploded') pre-existing amphibolites and anorthositic rocks. The gneisses occupy much larger volumes than the framework of older rocks which they intruded, a relationship that is typical for most of the Archaean terrain of Greenland.

Most gneiss outcrops show a multiphase structure. Earlier, more basic phases (including dioritic rocks) are intruded by younger tonalites and granodiorites. Darker phases are cut by paler phases, and commonly the earlier phases are more deformed than later phases. Often, however, the gneisses are strongly sheared and give little evidence of their original nature. Formation of banded gneisses from their better preserved igneous precursors has been described in detail by Myers (1978).

Experimental and trace-element evidence suggests that tonalitic melts may be generated by anatexis of Archaean (low-K) tholeiitic basalts or amphibolites (Barker & Arth, 1976; Winther & Newton, 1991). This suggests that Archaean gneisses of the type that dominate the present area were derived from calc-alkaline igneous rocks formed by subduction of Archaean tholeiitic ocean crust during plate-tectonic processes.

Ilivertalik augen granite

The Ilivertalik granite (*c.* 2800 Ma; Pidgeon & Kalsbeek, 1978) consists of a suite of biotite, hornblende and hypersthene bearing granites, characterised by 1-4 cm K-feldspar augen. In the area between the head of Graedefjord and the Sermeq glacier east of Sermilik it forms large outcrops which probably all belong to one thick sheet thrown into large isoclinal E–W trending folds with vertical to steeply dipping axial planes (Myers, 1976). On the geochemical maps outcrops of Ilivertalik granite are characterised by high K_2O and Rb. Associated with the Ilivertalik granite there are dioritic and tonalitic sheets, up to 100 m thick, with locally preserved igneous textures and igneous layering.

The Ilivertalik granite and associated diorite/tonalite sheets cut sharply across the older gneiss complex with amphibolite and anorthosite inclusions. It post-dates several phases of folding and metamorphism in the gneisses, but is more or less contemporaneous with a phase of granulite facies metamorphism dated at *c.* 2800 Ma (Pidgeon & Kalsbeek, 1978).

Neria granite

The Neria granite (Steenfelt, 1994; Steenfelt *et al.*, 1994) is a complex of granitic and granodioritic rocks with numerous inclusions of metasediments and older gneisses, some very large and undisturbed. The age of the granite is not known. The Isorssua supracrustal rocks to the east and north-east of the granite are invaded by numerous granitic and pegmatitic bodies and veins (Preston, 1969; Masson, 1970). The outcrop area of the Neria granite stands out on the geochemical maps by enhanced concentrations of K_2O and Rb.

Early Proterozoic supracrustal rocks

On Midternæs, the south-eastern corner of the map area and further south, the Archaean gneisses are unconformably overlain by well preserved early Proterozoic sediments and basic volcanic rocks (Higgins, 1970). On Midternæs this sequence is more than 5 km thick. The lower *c.* 800 m consists of shelf deposits: shale, siltstone, local iron-formation (Appel, 1974), quartzite, conglomerate and dolomite beds. The overlying volcanic part consists of well preserved tholeiitic pillow lavas, locally with abundant pyroclastic material and with numerous basic sills, which make up 25-40% of the section. Towards the south these rocks become strongly deformed and metamorphosed in the early Proterozoic Ketilidian orogenic belt, but in the present area they are undeformed and almost unmetamorphosed. This area of early Proterozoic rocks is not covered by the present geochemical maps.

(Feiko Kalsbeek)

Economic geology

Archaean economic geology

Mid-Archaean supracrustal rocks of the Nuuk-Fiskenæsset region

The supracrustal rocks in the northern part of the map sheet comprise mafic intrusive and extrusive amphibolites, ultramafic intrusive rocks and possible acid volcanic rocks. Marble beds have been occasionally encountered as well as quartz-sillimanite schists and calc-silicate rocks. These amphibolite to granulite facies rocks are highly deformed and host a variety of mineralisations including copper-zinc sulphides, scheelite, molybdenite and gold.

The amphibolites are believed to represent fragments of Archaean oceanic crust. This is supported by the presence of mineralised zones up to several metres wide associated with anthophyllite-gedrite assemblages within the amphibolites. These are interpreted as zones of sea-floor hydrothermal alteration of mafic and ultramafic volcanic rocks. The mineralised zones which can be traced for hundreds of metres along strike and have a high content of pyrrhotite, pyrite, chalcopyrite and locally gahnite ± molybdenite ± magnetite (Appel, 1990).

Scheelite is found as stringers and as small grains disseminated as stratabound mineralisations in amphibolites often associated with tourmalinites. The scheelite is thought to be of submarine exhalative origin and cogenetic with sulphides in the sea-floor hydrothermal alteration zones (Appel, 1994).

Molybdenite is found scattered throughout the region in supracrustal rocks, in gneisses and even in anorthosites. Near Narsaq at the northern edge of the map abundant molybdenite is found in a sequence of supracrustal calc-silicates in amphibolites.

Gold anomalies have been found in supracrustal amphibolites spatially associated with the Fiskenæsset anorthosite complex. The highest concentrations obtained were 1.37 ppm Au over 2 metres in a channel sample (Appel, 1993). A grab sample from a shear zone cutting supracrustal rocks conatined 5.2 ppm Au.

Tartoq group supracrustal rocks

The Archaean Tartoq supracrustal rocks outcrop in the southern part of the map on either side of the Sermiligaarsuk fjord. The supracrustals, with a minimum age of 2944 ± 7 Ma (Nutman & Kalsbeek, 1994) comprise low grade metamorphosed pillow structured greenschists, siliceous schists some of which are considered to be of acid volcanic origin and others of detrital origin. Calcareous schists and ultramafic lenses are also frequently encountered. In the greenschists bands of iron-formation are found. Oxide facies iron-formations with an exposed width of 50 m, consisting of centimetre wide metachert bands alternating with centimetre-wide magnetite-rich bands and sometimes thin sulphide layers with pyrite and minor amounts of chalcopyrite (Appel, 1984). Sulphide facies iron-formations occur as more than 50 metre wide units traceable for several hundred metres along strike. They consist of pyritic layers alternating with metachert layers. The latter are often fuchsite stained. The Iterdlak area and the Tartoq area immediately south of the map have been prospected and drilled by several companies (Evans & King, 1993). The best result obtained is 19.4 ppm Au over 2.5 m in a chip sample (Erfurt, 1990).

Fiskenæsset anorthosite complex

The stratiform anorthosite complex consists of gabbroic, ultramafic and leucogabbroic units with an average thickness of 400 m and a strike length of more than 200 km (Myers, 1985). In several stratigraphic levels within the complex layers of chromite occur (Fig. 3 and Map 94/2-403). These layers can be more than 50 metres wide, but are mostly less than one metre wide and traceable along strike for hundreds of metres (Ghisler, 1976). The chromite layers contain up to 57 % chromite together with hornblende and plagioclase. Chromite concentrates have 33 % Cr_2O_3, 34 % FeO and 21 % Al_2O_3 with a Cr/Fe ratio of 0.85:1 (Appel, 1992). The presence of a chromite banded bronzitite with minor pentlandite in the anorthosite complex lead to detailed prospecting for a Merensky type platinum deposit. Results with up to 0.6 ppm Pt and 3 ppm Pd were encountered. Recent channel sampling of this bronzitite yielded 74 ppb Pt, 115 ppb Pd and 59 ppb Au (Appel, 1993).

Rubies

Ruby or red corundum has frequently been encountered in the Fiskenæsset area in a host rock composed of grass green pargasite, pale blue sapphirine, bright red spinel, greenish to brownish kornerupine and phlogopite. The aluminium-rich host rock is situated mostly in those amphibolites of possible supracrustal origin which border anorthosites. Its unusual mineral assemblage was formed during high-grade metamorphism.

Quite heavy prospecting has focused on the quest for a gem quality ruby, however most rubies found to date have numerous internal cracks and fractures. The ruby-bearing rock could possibly find a use in the production of attractive artifacts and carvings, but so far stones suitable for facetting have not been found.

Pegmatites

In the Archaean gneisses east and north-east of the Paamiut granite sheets a large number of pegmatites occur. Some of the pegmatites are spodumene-bearing, and exploration in 1971 by Renzy Mines yielded grab samples with grades up to 1.23 % Li (Geisler, 1972).

Economic geology of Proterozoic supracrustal rocks

Ketilidian supracrustal rocks

These supracrustal rocks are virtually unmetamorphosed and discordantly overlie the Archaean gneisses and the Archaean Tartoq supracrustal rocks. The Proterozoic Ketilidian supracrustal rocks comprise a sequence of detrital and chemical sediments with an overlying volcanic unit with tholeiitic lavas, pyroclastics and minor bands of iron-formation (Appel, 1974). The basal conglomerate has a matrix of magnetite and pyrite. Structurally controlled lead-zinc-silver mineralisation in dolomites in the Midternæs area can be traced for 300 m along strike. Float samples have yielded grades up to 1210 ppm Ag, 18 % Pb, 0.16 % Zn and 0.79 % Cu. Further up in the Ketilidian sequence massive to semi-massive sulphides, mainly pyrrhotite with minor chalcopyrite has been found in interflow sedimentary horizons in basaltic pillow lavas (Erfurt, 1990).

Kimberlites and ultramafic lamprophyres

Only a few kimberlites have been found in the Paamiut - Buksefjorden region. At Nigerlikasik (Map 94/2-501) a 0.5 m wide steeply dipping dyke can be followed for *c.* 500 m into Archaean gneisses. The kimberlite contains rounded nodules of garnet and spinel peridotites and the dyke contains megacrysts/phenocrysts of olivine in a groundmass composed of carbonate, serpentine, phlogopite and Fe-Ti oxides, with accessory clinopyroxene, perowskite and apatite (Larsen, 1991). At Midternæs flat lying kimberlite sheets have been found with a composition resembling the Nigerlikasik dyke. The Midternæs kimberlites and several similar kimberlite sheets just south of the map area are intruded into Archaean rocks which have been modified by Ketilidian deformation.

Dyke swarms of ultramafic lamprophyres have been recorded in the area immediately south of Paamiut, as well as in three locations further north; (1) south of Narsaq; (2) at Kangerluarsorseq/Grædefjord and (3) south-east of Fiskenaesset. These range in age from 141 to 196 Ma (Larsen, 1991).

Mineral occurrences

The mineral occurrence maps (94/2-401–404) are based on data which have been extracted from the GREENMIN database at GGU (Lind *et al.*, 1994). This database contains data obtained by mining companies as well as data obtained as a result of activities carried out by GGU and other research groups.

The non-confidential company reports are available for inspection at GGU or can be purchased on microfiche. A bibliographic index of released industry reports (Nielsen, 1992) can be obtained from GGU on request.

The selection of mineral occurrences is printed on the following basis. The sample locations have been chosen only when the commodity was the first or second most important commodity at that sample site. Where more than one occurrence is reported from a location with similar characteristics then one database listing is plotted with an underscore to indicate more than one listing is recorded at that site. Where the characteristics differ at the same site all occurrences are plotted.

(Peter W. Uitterdijk Appel)

Magnetometry

The total magnetic intensity anomaly map (94/2-101) has been produced using data from three surveys, each of which has been compiled independently. No attempt has been made to homogenise the data or remove boundary effects between the surveys. The three data sources are listed here with a few comments on data compilation:

(1) The offshore area of the map is covered by a grid compiled by the Atlantic Geoscience Centre, Canada (AGC), from a variety of mostly shipborne data. The grid was prepared by AGC (Verhoef *et al.,* 1994). With the exception of a projection transformation and a subsequent regridding, these data have not been subjected to any additional processing.

(2) Most of the onshore ice-free area is comprised of an aeromagnetic survey flown in 1967-68 by Finprospecting Ky for Kryolitselskabet Øresund. This was a regional survey covering most onshore areas from Kap Farvel (70° N) to Nuussuaq (59° 45′ N); the gaps in the data coverage were caused by difficulties with the original data acquisition. Flight line spacing was two kilometres with an average 300 metre terrain clearance. The original digital line data has been lost, however GGU has retained copies of the 1:500 000 scale anomaly maps originally prepared by Finprospecting Ky. It was possible, therefore, to digitise the magnetic anomaly contours and, after subtraction of a suitable International Geomagnetic Reference Field (IGRF), produce a grid. Severe levelling problems were inherent in the original maps and these problems have been transferred to the grid. In order to remove diurnal effects and other errors the gridded data were filtered in the frequency domain using a combination of a Butterworth filter and a directional cosine filter. This process was further complicated by the fact that the original survey was flown in blocks with different line azimuths, making it necessary to treat these blocks one at a time. Vestiges of diurnal effects remain in the data despite attempts to filter them out. This is particulary noticeable in the south, where some linear anomalies trending N to NNE must be attributed to this cause. These could not be removed without attenuating other meaningful anomalies.

(3) The data over the Inland Ice are from the GICAS project (Thorning *et al.*, 1986, 1988). The line spacing was approximately 10 kilometres with an average 300 metre terrain clearance over the surface of both the Inland Ice and the ice-free areas. These data have been subjected to corrections for diurnal variation and light filtering in the frequency domain.

Gridding was performed at 500 m intervals, based on minimum total curvature. Frequency filtering was accomplished with Geosoft Magmap programs. Geosoft GXF Grid files were exported to Arc/INFO where they were reclassified and vectorised for final display. The associated shaded relief map (94/2-102) was produced with a light source to the north.

The dominant trend of the magnetic anomalies is clearly WSW–ENE, although, as mentioned above, this is contaminated by artificial anomalies along lines in the south. Despite the obvious discontinueties along the boundaries of the surveys, many structures can be followed under the Inland Ice by their magnetic expression. The continuation to offshore areas is not very clear, probably because of the pronounced differences in wavelength of the anomalies. Several of the anomalies can be correlated with known intrusions (compare with the geological map 94/2-001), but the most impressive feature is perhaps the WSW–ENE striking belt of anomalies in the Fiskenæsset area originating no doubt from the intrusions related to the anorthosites in this area. The gabbro-anorthosite province can probably be extended under the Ice Cap in an ENE direction for some 80 kilometres and with less certainty for some 40–60 kilometres offshore to the WSW, emphasising the truly regional extent and character of these features. The generally higher magnetisation of the area, and also of the area just north of Sermeq, may in part be due to the presence of granulite facies rocks (Thorning, 1984).

(Leif Thorning)

Gravimetry

The two gravity anomaly maps (94/2 - 111 & 112) are based on measurements carried out by Kort- og Matrikelstyrelsen (KMS) and GGU, mostly in 1993. The purpose of KMS's gravity observation programme is the determination of the geoid and only requires regional measurements. Whenever possible GGU augments the data (as was the case here) by measuring the gravity at geochemical sample sites. As a result, the density of observations are higher around Paamiut and in the northern part of the map, where geochemical sampling was carried out in 1993, and more scattered in the central part of the map where only the KMS programme was undertaken. The GGU programme is an effort to obtain data at a level of detail more relevent to local geological features.

The observations have been processed by KMS in order to calculate simple Bouguer anomalies. Terrain corrections have not been carried out. The anomalies are relative to IGSN71. An average density of 2.67 g/cm^3 for rocks has been used for the calculation of the Bouguer correction. The grid cell size and method of gridding is the same as for the magnetic anomaly map.

Map 94/2-111 shows a gravity field totally dominated by a gradient in a direction perpendicular to the coast. This basically reflects the regional transition from ice-covered interior to the offshore areas. This trend effectively masks any smaller anomalies due to local geological features. The residual gravity map (94/2-112) has been produced by subtracting a second order surface calculated from all grid points of map 94/2-111. It displays a broad, general correlation with the geology (Map 94/2-001).

(Leif Thorning)

Gamma-ray spectometry

The radiometric maps (94/2-121–124) are based on the data from an airborne gamma-ray spectometric survey covering West Greenland from 63°N to 69°N (Secher, 1976, 1977). The raw data are corrected for background radiation and variations due to height deviations. The data were then stripped and equivalent surface concentrations of U, Th and K were calculated after calibration of the equipment at the Risø National Laboratory. The data-smoothing used here favours the display of the regional variation and spot anomalies are suppressed.

(Tapani Tukaianen)

Ground scintillometry

Measurements of total gamma-radiation were carried out together with the sampling of stream sediment and water. At each sample locality five to ten scintillometer readings were made on representative rock surfaces or on boulder assemblages where rock outcrops were absent. The average or typical radiation level was noted. The map (94/2-131) of these values shows a significant regional variation over the survey area. Thus the highest gamma-radiation level occurs over the Neria granite in the south (see map 94/2-001) and the lowest level is associated with granulite facies orthogneisses south of Frederikshåb Isblink. In addition to contributing to mineral exploration and geological mapping, the systematic scintillometer measurements constitute a documentation of the natural gamma-radiation level which is useful in environmental monitoring studies.

(Agnete Steenfelt)

Drainage geochemistry – stream sediment, fine fraction

The element distribution maps are based on analyses of stream sediment and water samples collected during two regional surveys within the framework of the reconnaissance geochemical mapping programme of the Geological Survey of Greenland (Steenfelt, 1993), supplemented by older sample material:

(1) From 64°N to Frederikshåb Isblink 277 stream sediment and 268 stream water samples were collected in 1991 at an average density of 1 sample per 27 km^2. The <0.1 mm grain size fractions of the stream sediment samples were analysed for major oxides and some trace elements by X-ray fluorescence (XRF) at GGU and by Instrumental Neutron Activation

Analysis (INAA) at Activation Laboratories Ltd. (Actlabs), Ontario, Canada. A selection of the samples was further analysed by Fire Assay combined with Inductively Coupled Plasma Emission Spectrometry (ICP-ES) for Au, Pt and Pd and another selection was analysed by Atomic Absorption Spectrophotometry (AAS) for Pb, Cu and Zn. The conductivity and concentrations of U and F were determined in the water samples. The results, excluding those for major oxides, are reported in Erfurt *et al.* (1991).

(2) From Frederikshåb Isblink to Sermiligaarsuk 276 stream sediment and water samples were collected in 1993 at an average density of 1 sample per 26 km^2. The <0.1 mm grain size fractions of the stream sediment samples were analysed for major oxides and some trace elements by XRF and AAS at GGU, and for more trace elements by INAA and XRF at Actlabs, Canada. The conductivity and concentration of F were determined in the water samples. The results were reported by Steenfelt *et al.* (1994).

(3) The 1991 survey left some areas between 63° and 64° N insufficiently covered, and these 'holes' have been filled, partly by supplementary sampling in 1993, and partly by using 24 samples collected during a reconnaissannce survey for scheelite (Appel, 1989). The supplementary samples were analysed by XRF and INAA.

Table 1 lists the elements chosen for inclusion in the present set of thematic maps. these include all elements which are common to the individual data sets. In cases where an element is determined by more than one method the most comprehensive or most reliable data set is presented. The quantity of sample material did not always permit analysis by all methods, hence the number of analysed samples varies from element to element as indicated in the legends of the element distribution maps.

Data quality

The data quality is monitored by the use of duplicate samples and internal standards accompanying each batch of samples submitted for analysis. The main result of these studies is that the regional variations displayed by the maps are valid in that they exceed sampling and analytical variations. The precision and accuracy of the analyses vary with method and element as explained in general terms in the following.

The analyses for major elements by XRF, using fused glass discs have high precision and accuracy, whereas the trace element data (V, Cr, Ni, Rb, Sr and Zn), determined in the same glass discs, are very noisy at low levels (below *c.* 100 ppm), but have reasonable accuracy and precision at higher levels. The contents of volatiles in the samples, determined by loss on ignition, varies considerably (from less than 1% to more than 30% with common values between 5 and 10%) mainly as a result of varying organic matter in the samples. To increase the comparability of the analyses the major element oxide concentrations used in the maps are calculated as volatile-free. The INAA data have reasonable accuracy and precision for most of the elements included in the present set of maps; exceptions are elements which have concentrations close to the lower detection limit (Au, As, Mo, Sb). The AAS analyses (Na_2O and Cu) have high accuracy and precision. The analytical bias (monitored by standards) between results of the 1991 and 1993 surveys were so small that arithmetical calibration of the data sets was unnecessary.

Data presentation

The element distributions are shown as dot plot maps in which the size of a dot is proportional to the concentration of the sample. The scaling of the dot size is chosen so that regional variations in the geochemical background are displayed as clearly as possible. Maximum values and other statistical parameters for the element concentrations are given in the map legends. The distribution of geochemical anomalies relevant to mineral exploration are shown in Erfurt *et al.* (1991) and Steenfelt *et al.* (1994).

General features of the element distribution

The geochemical maps in this volume represent a new compilation of data which reveals regional geochemical differences within the area which had not previously been noticed.

Most of the geochemical variation displayed by the element distribution maps can be attributed to variations in the lithological composition of the gneisses together with the proportion and character of components associated with the gneisses such as occurrences of granites or pegmatites, supracrustal sequences and anorthosites. Thus the Ilivertalik granite and the Neria granite (see Map 94/2-001) are reflected by clusters of high K_2O. Both granite occurrences also have high Rb, but they differ in other trace elements, the Neria granite having higher Th and REE, and lower Ba and Sr than the Ilivertalik granite. High values of Rb also occur in areas of low to medium K_2O, particularly north-east of the head of Bjørnesund and south of 64°N, where they are taken to indicate the presence of pegmatites or high level granitic veins. An orthogneiss area east and south-east of the Ilivertalik granite, which hosts some of the northern occurrences of the Fiskenæsset anorthosite complex, is distinguished by elevated values of REE, but has low Th, and K_2O and is apparently not granitic in composition.

The distribution of Na_2O probably reflects compositional variations of the tonalitic to granodioritic gneisses themselves. An area from inner Bjørnesund (63°N) to Kvanefjord (62°N) has elevated values of Na_2O with fairly well-defined boundaries to the remaining areas of varying but generally lower Na_2O. This feature suggests that the gneisses in various parts of the region could have different origins. Recent research concurs with this suggestion (see Geological summary).

Supracrustal sequences dominated by mafic metavolcanic rocks are reflected by high values of Co, Cu, Sc and V. Thus the major occurrences at Bjørnesund, Kvanefjord and Taartoq as well as frequent enclaves of supracrustal amphibolites within the gneisses in the north are outlined by clusters of high values of these elements. However, regional differences between the supracrustal sequences are indicated by the distribution of other elements. Only some southern occurrences of metavolcanic rocks, north of Kvanefjord and Taartoq, have indications of As enrichment. High values of MgO, Ni and Cr, indicating a considerable proportion of ultramafic rocks, distinguish the sequences at Kvanefjord and Sermilik from the other sequences.

The Fiskenæsset anorthosite complex, known to contain chromite layers (Ghisler, 1976), is clearly outlined by clusters of high Cr values (in combination with generally low values of Co, Cu, Sc and V). Scattered high Ni values in the same area probably reflect the ultramafic rocks associated with the anorthosite (see Geological summary) Stream sediment samples from the north-easternmost occurrence of the anorthosite complex had concentrations of Pt slightly above the detection limits of 5 ppb (Erfurt *et al.*, 1991).

The detection limit for Au (5 ppb) is high in relation to the background concentrations (estimated crustal abundance is 1.2 ppb). The frequent occurrences of values between 5 and 10 ppb does suggest a potential for gold mineralisation. However, the distribution pattern is apparently not related to any particular rock unit. There are small clusters of higher values in the Taartoq and Kvanefjord areas, but the anomalies do not appear in streams draining the supracrustal sequences. It has been suggested that the distribution pattern reflects gold mineralisation hosted by fracture systems surrounding the metavolcanic sequences (Steenfelt *et al.,* 1994). Scattered distribution patterns are also found for Mo and Sb, elements which are typically associated with hydrothermal types of mineralisation.

The frequency distributions and the regional variation patterns of U and Th are very different. The Th map shows a broad regional variation which is attributed to varying amounts of Th bearing minerals in the predominant rock units. By contrast, the U map shows a general low background, lowest in the north and slightly higher south of Paamiut, with scattered clusters of high values. The anomalies around Fiskenæsset and Bjørnesund probably reflect uranium-rich pegmatites, while the anomalies in the Kvanefjord to Sermiligaarsuk area mainly reflect uranium mineralised faults (Steenfelt *et al.*, 1994). In both cases the uranium enrichment in this otherwise uranium-poor region is believed to be a result of late events relative to the formation of the main gneiss terrain. In the Neria area the uranium enrichment is possibly related to late faults which are Proterozoic in age, otherwise the timing is unknown.

(Agnete Steenfelt)

Drainage geochemistry – heavy mineral concentrates

The data that form the basis of the heavy mineral concentrate maps (94/2-301–314) originate from two separate sampling campaigns. During the first campaign (1982-1985) heavy mineral concentrates from stream sediments were collected in an area that included all the major fjords from the north-west corner of Frederikshåb Isblink at approximately 62°30′N to Fiskefjord at approximately 64°30′N. This sampling was done mainly by boat with helicopter support in the inland areas. During this campaign about 10 kg (*c.* 4-6 litres) of gravel was collected at each site. Each sample was sieved through a 1 mm sieve, and then panned in a conventional pan. The coarse fraction was discarded and the fine fraction investigated for scheelite at the sample site and the number of scheelite grains per 4 litres of sediment was calculated. The samples were subsequently analysed by several different methods at the Geological Institute, Copehnagen University (Appel, 1989). Selected results from this first programme are shown on maps representing the following elements: Au, B, Cu, Mo, Th, Ti, V, Zr and the mineral scheelite.

In 1991 GGU carried out a regional survey in the Fiskenæsset area. During this campaign 103 heavy mineral concentrates were produced from stream sediment samples. The samples consisted of 5 to 10 litres of gravel and sand which were sieved on the spot through a 0.5 mm sieve and then concentrated in a mechanical panning device ('Goldhound'). Subsequently the samples were analysed by instrumental neutron activation analysis (Erfurt *et al.*, 1992). The following distribution maps have been produced from the results of the 1991 campaign: Cr, Ni, Pd, Pt and Zn.

The scheelite map (94/2-309) shows that scheelite is found in the supracrustal rocks, and the fairly good correlation with boron supports the suggestion that scheelite and tourmaline in the supracrustal rocks of the region are spatially and genetically related (Appel, 1988). Increased amounts of vanadium and titanium appear to correlate with the granulite facies areas.

The chromium, platinum and palladium distribution maps indicate a close correlation with the anorthosite complex. The island of Qeqertarsuatsiaat north-east of Fiskenæsset is geochemically distinctive in that the heavy mineral concentrates from the island appear to be anomalous in elements such as Ni and Zn. It is also anomalous in rare earth elements as can be seen from the La, Ce and Nd stream sediment, fine fraction maps. The nickel anomalies can be attributed to the anorthosite complex, but this is unlikely to be the origin of the zinc and rare earth elements anomalies.

(Peter W. Uitterdijk Appel)

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Thorning, L. 1984: Aeromagntic maps of parts of southern and central West Greenland: acquisition, compilation and general analysis of data. *Rapp. Grønlands geol. Unders.* **122**, 36 pp.

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Thorning, L., Bower, M., Hardwick, C. D. & Hood, P. J. 1988: Greenland ice cap aeromagnetic survey 1987: completion of the survey over the southern end of the Greenland ice cap. *Rapp Grønlands geol. Unders.* **140**, 70-72.

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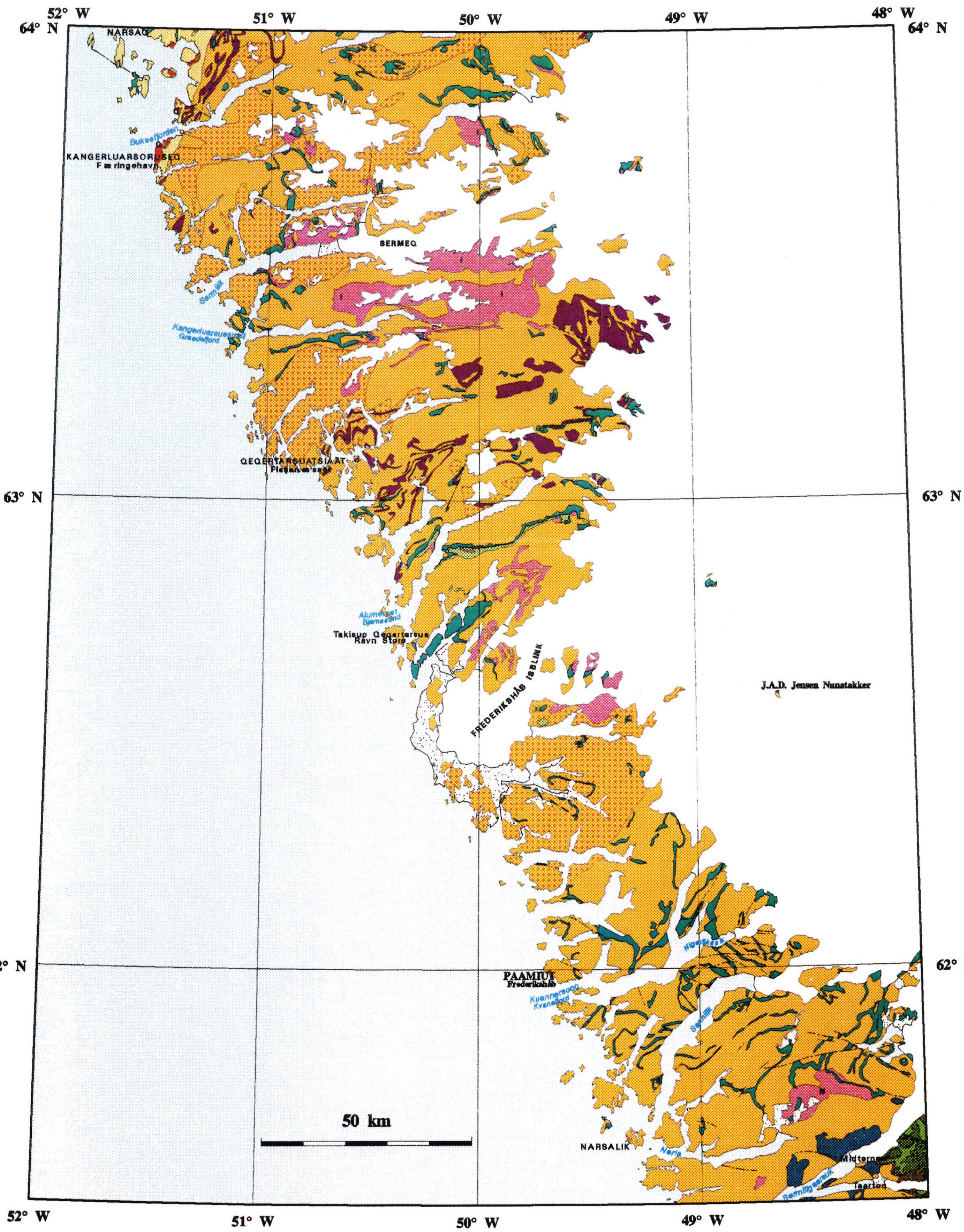
GEOLOGICAL MAP: 1:1 000 000

94/2-001 Paamiut - Buksefjorden

01-MAR-95

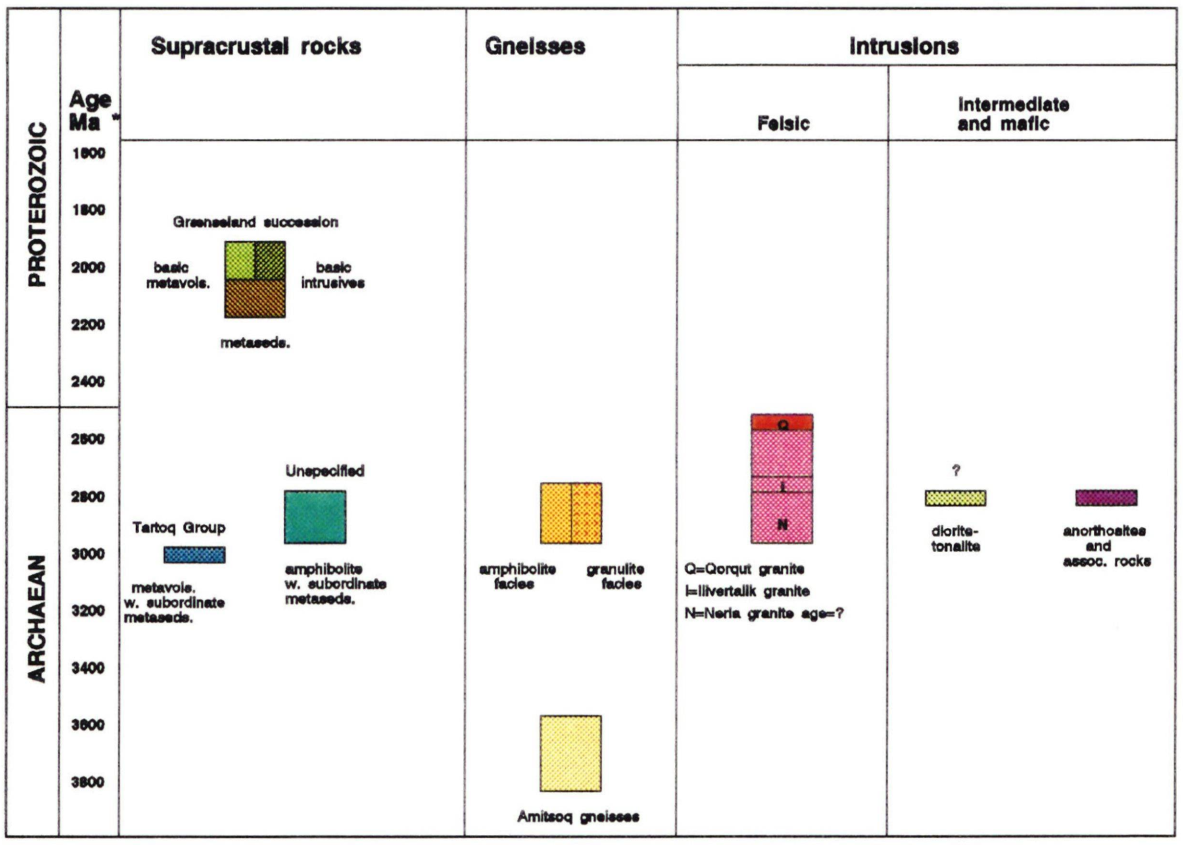


Thematic map 94/2-001

GEOLOGICAL MAP
Paamiut - Buksefjorden

Compiled by Bridget Ady

LEGEND



Quaternary

Fault and Mylonite

Thrust

Geological Boundary - all types

* all age boundaries are approximate with the exception of Qorqut and Ilivertalik granites which are well-defined

DATA SOURCE

Geological Map of Greenland 1:500 000
Sheet 1, Sydgrønland,1975, J.H. Allaart
Sheet 2, Frederikshåb Isblink - Søndre Strømfjord, 1982, J.H. Allaart
Geological Map of Greenland 1:2 500 000
J.C. Escher and T.C.R. Pulvertaft (1995)
(published by Geological Survey of Greenland)

Legend:

Adapted to conform to Geological Map of Greenland 1:2 500 000 (above).

DATA PROCESSING

Geological outlines digitized from 1:500 000 scanned map images. Lithological codes added as centroids to polygons.

Geological time scale:

Harland, W.B. et al., 1990: A geological time scale. Cambridge University Press

Projection: Lambert conformal conic
Standard parallel: 66° 30' 00" N
Scale factor: 0.99700
Ellipsoid: Clarke 1866
Datum: Qornoq
Scale: 1:1 000 000

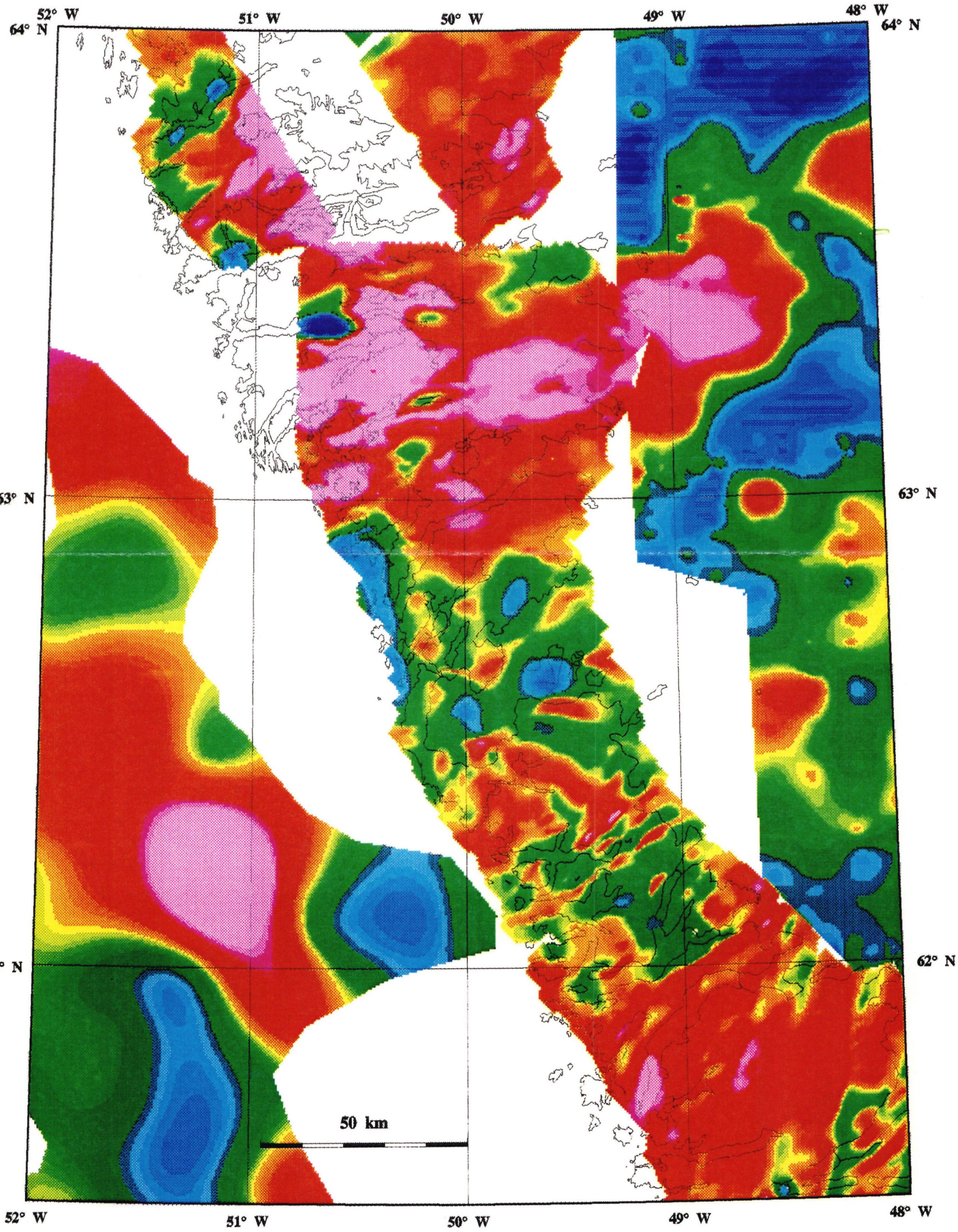
Ice margins and coast lines digitized from 1:250 000 topographic maps.
Permission No: KMS A.200/87

Updated: 01-MAR-95

GRØNLANDS GEOLOGISKE UNDERSØGELSE
The Geological Survey of Greenland
Øster Voldgade 10 DK-1350 København K Danmark

AEROMAGNETIC TOTAL INTENSITY ANOMALY MAP

94/2-101 Paamiut - Buksefjorden 01-DEC-94

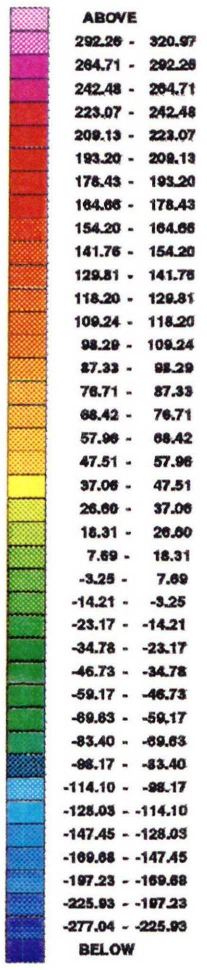


Thematic map 94/2-101

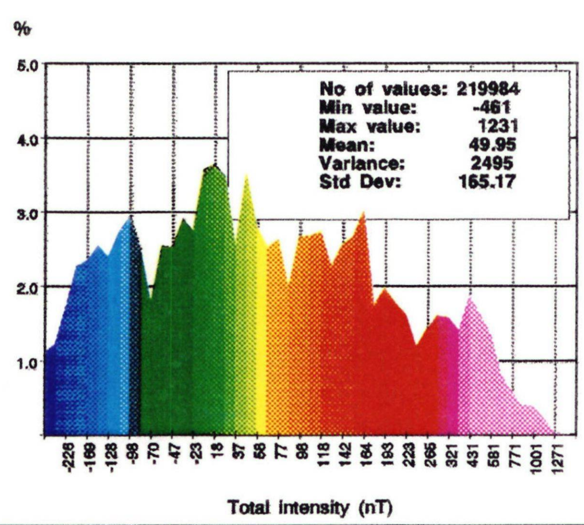
AEROMAGNETIC TOTAL INTENSITY ANOMALY MAP
Paamiut - Buksefjorden

Compiled by Leif Thorning

CONTOUR INTERVALS
Total Intensity (nT)



STATISTICAL PARAMETERS OF GRID VALUES



DATA SOURCE

The data are from three different surveys of varying quality, see introduction for details.

DATA SPECIFICATIONS

Onshore surveys: Flown with a 300 m average terrain clearance.
Ice-free area - 2 km line separation.
Inland ice - 10-12 km line separation.
Offshore: gridded data (many sources), details unavailable.

DATA PROCESSING

Each survey processed separately.
Processing includes diurnal correction, de-corrugation, and filtering. Some diurnal errors remain in the data.
Anomalies are relative to appropriate IGRF.
Gridding: 500 m interval, based on minimum total curvature.

Projection: Lambert conformal conic
Standard parallel: 66° 30' 00" N
Scale factor: 0.99700
Ellipsoid: Clarke 1866
Datum: Qornoq
Scale: 1:1 000 000

Ice margins and coast lines digitized from 1:250 000 topographic maps.
Permission No: KMS A.200/87

Released: 01-DEC-94

GRØNLANDS GEOLOGISKE UNDERSØGELSE
The Geological Survey of Greenland
Øster Voldgade 10 DK-1350 København K Danmark

Thematic map 94/2-102

AEROMAGNETIC TOTAL INTENSITY SHADED RELIEF MAP
Paamiut - Buksefjorden

Compiled by Leif Thorning

CONTOUR INTERVALS
Reflectance

0.82 - 10.00
0.80 - 0.82
0.78 - 0.80
0.77 - 0.78
0.75 - 0.77
0.74 - 0.75
0.73 - 0.74
0.72 - 0.73
0.71 - 0.72
0.70 - 0.71
0.69 - 0.70
0.68 - 0.69
0.67 - 0.68
0.66 - 0.67
0.65 - 0.66
0.64 - 0.65
0.63 - 0.64
0.62 - 0.63
0.61 - 0.62
0.59 - 0.61
0.58 - 0.59
0.56 - 0.58
0.54 - 0.56
0.51 - 0.54
BELOW 0.51

DATA SOURCE

The data are from three different surveys of varying quality, see introduction for details. The grid is similar to 94/2-101.

SURVEY SPECIFICATIONS

Onshore surveys: Flown with a 300 m average terrain clearance.
  Ice-free area - 2 km line separation.
  Inland ice - 10-12 km line separation.
Offshore: gridded data (many sources), details unavailable.

DATA PROCESSING

Each survey processed separately. Processing includes diurnal correction, de-corrugation, and filtering. Some diurnal errors remain in the data. Anomalies are relative to appropriate IGRF. Gridding has been performed by a minimum total curvature method (500 m x 500 m).

The shading uses a light source to the North at 45 degrees inclination. Discontinuities between the three surveys are emphasised by the shading.

Projection: Lambert conformal conic
Standard parallel: 66° 30' 00" N
Scale factor: 0.99700
Ellipsoid: Clarke 1866
Datum: Qornoq
Scale: 1:1 000 000

Ice margins and coast lines digitized from 1:250 000 topographic maps.
Permission No: KMS A.200/87

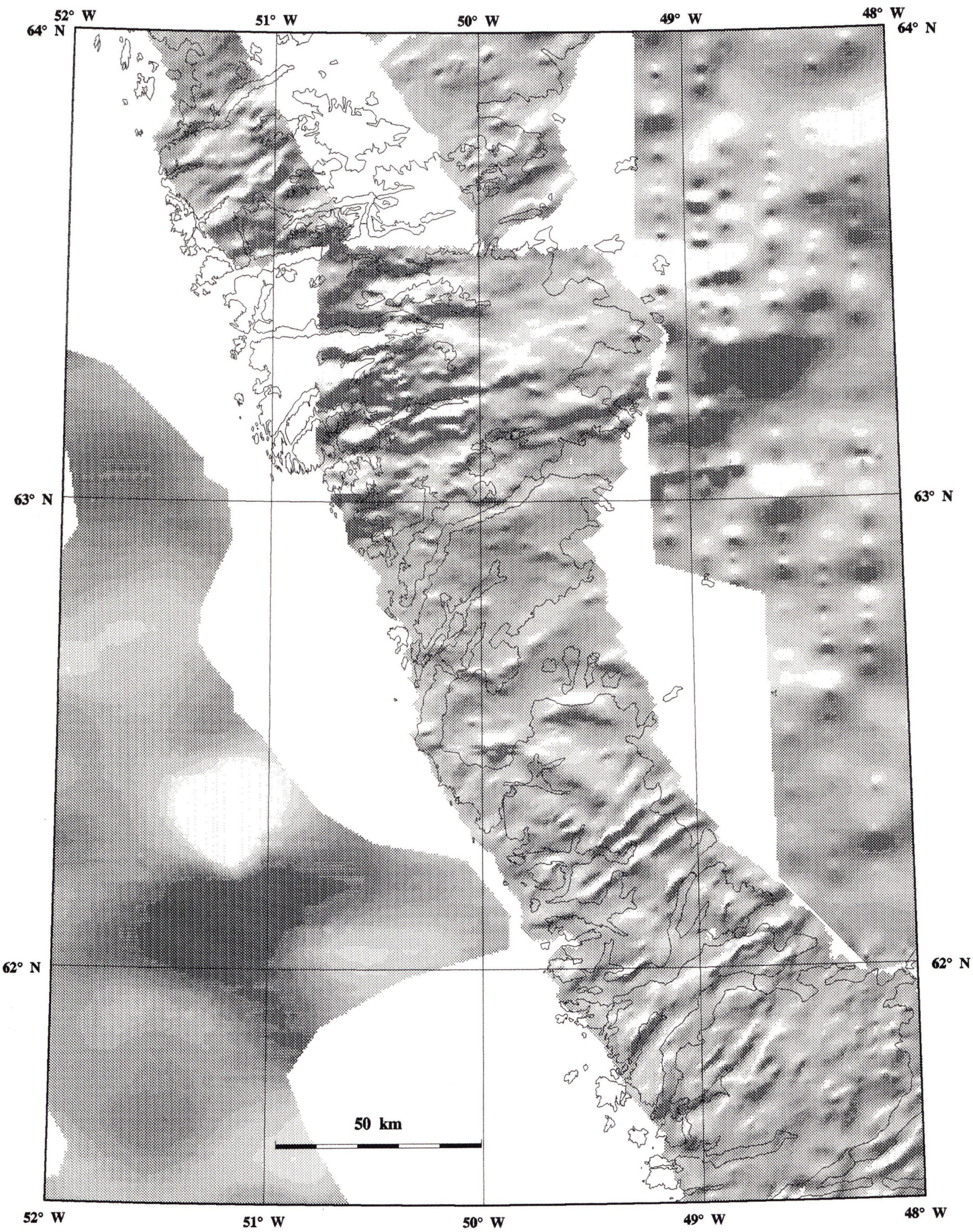
Released: 01-DEC-94

GRØNLANDS GEOLOGISKE UNDERSØGELSE
The Geological Survey of Greenland
Øster Voldgade 10 DK-1350 København K Danmark

AEROMAGNETIC TOTAL INTENSITY SHADED ANOMALY MAP

94/2-102 Paamiut - Buksefjorden

01-DEC-94

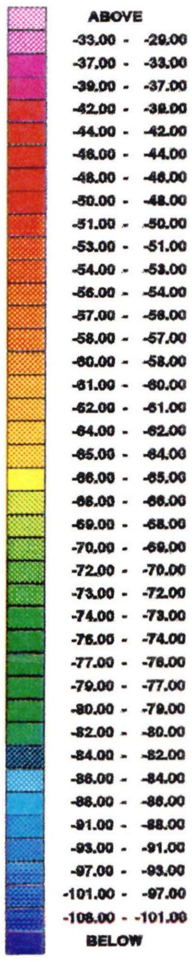


Thematic map 94/2-111

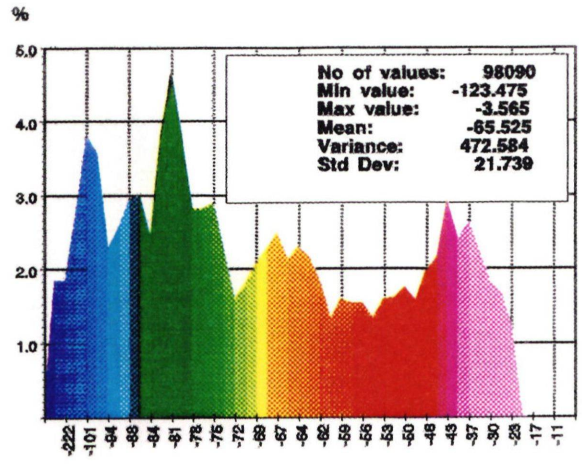
BOUGUER ANOMALY MAP
Paamiut - Buksefjorden

Compiled by Leif Thorning

CONTOUR INTERVALS
Bouguer anomaly (mgal)



STATISTICAL PARAMETERS OF GRID VALUES



DATA SOURCE

The data have been obtained from the gravity data base at Kort- og Matrikelstyrelsen (KMS). The data have been acquired from a number of surveys over the years, the most recent being from a 1993 joint survey by GGU and KMS.

DATA PROCESSING

All processing from measurement to final calculated anomaly have been carried out by KMS. The Bouguer correction used a density of 2.67 g/cm3 for rocks and 1.00 g/cm3 for water. No terrain corrections have been applied. Anomalies are relative to GRS67/IGSN71.

Gridding: 500m interval, based on minimum total curvature.
White areas indicate scarce data density.

Projection: Lambert conformal conic
Standard parallel: 66° 30' 00" N
Scale factor: 0.99700
Ellipsoid: Clarke 1866
Datum: Qornoq
Scale: 1:1 000 000

Ice margins and coast lines digitized from 1:250 000 topographic maps.
Permission No: KMS A.200/87

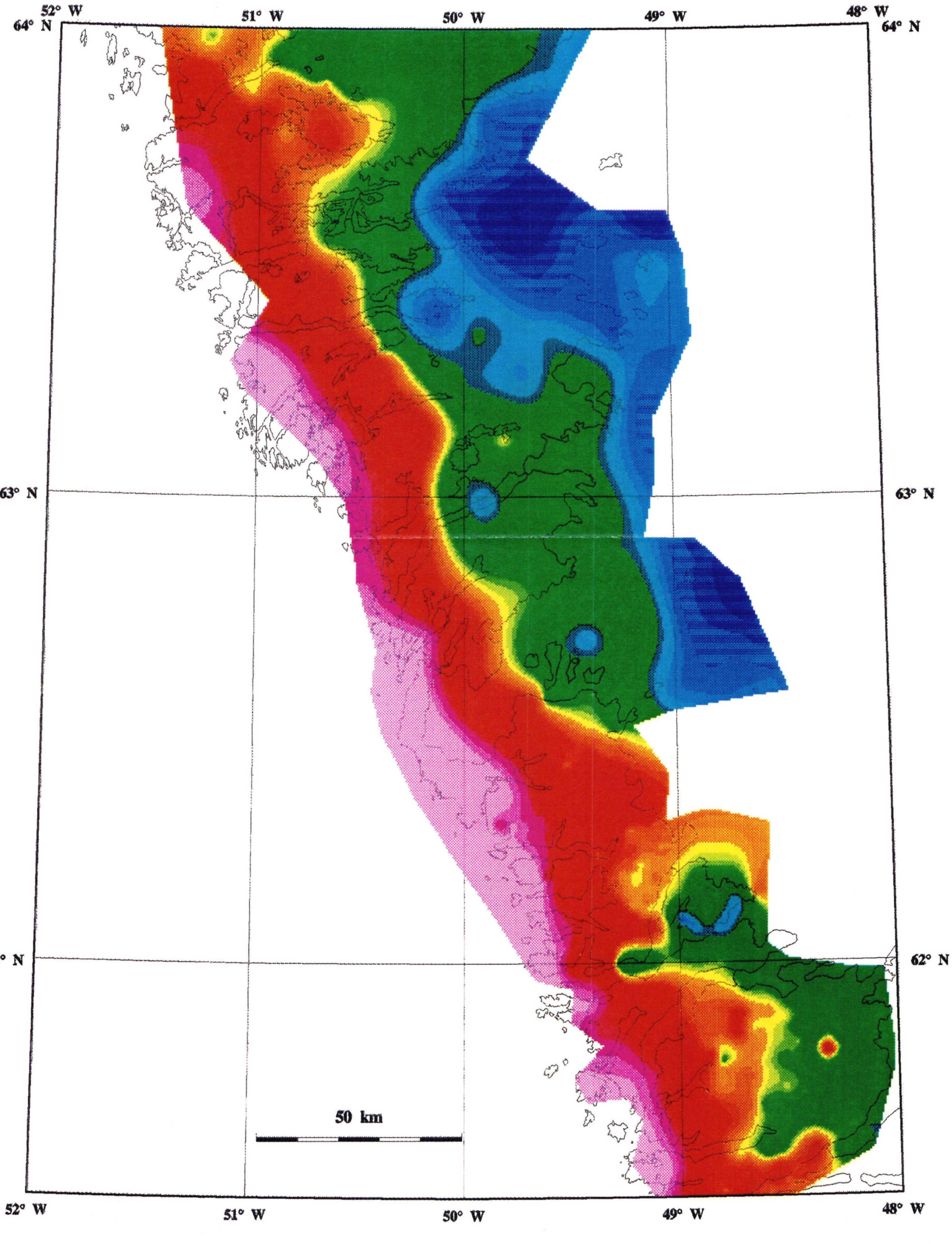
Released: 01-DEC-94

GRØNLANDS GEOLOGISKE UNDERSØGELSE
The Geological Survey of Greenland
Øster Voldgade 10 DK-1350 København K Danmark

BOUGUER ANOMALY MAP

94/2-111 Paamiut - Buksefjorden

01-DEC-94



Thematic map 94/2-112

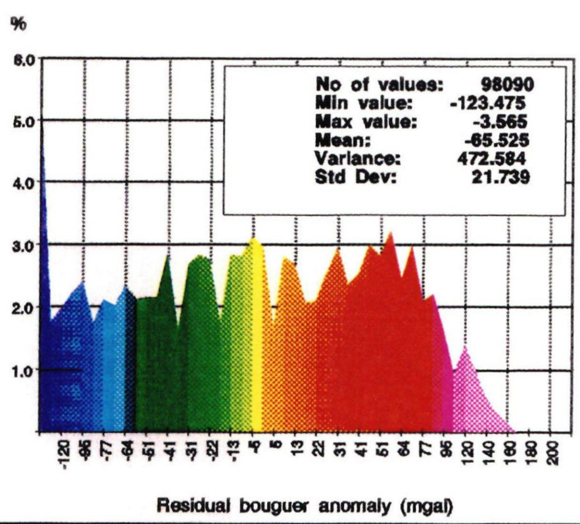
RESIDUAL BOUGUER ANOMALY MAP
Paamiut - Buksefjorden

Compiled by Leif Thorning

CONTOUR INTERVALS
Residual bouguer anomaly (mgal)

ABOVE - 130.00
119.58 - 130.00
107.02 - 119.58
94.97 - 107.02
85.25 - 94.97
76.76 - 85.25
70.66 - 76.76
63.70 - 70.66
57.24 - 63.70
51.21 - 57.24
46.64 - 51.21
41.20 - 46.64
35.97 - 41.20
30.89 - 35.97
26.97 - 30.89
22.18 - 26.97
17.39 - 22.18
12.75 - 17.39
9.12 - 12.75
4.55 - 9.12
-0.02 - 4.55
-4.59 - -0.02
-9.16 - -4.59
-12.79 - -9.16
-17.43 - -12.79
-22.22 - -17.43
-27.01 - -22.22
-30.93 - -27.01
-36.01 - -30.93
-41.24 - -36.01
-46.68 - -41.24
-51.25 - -46.68
-57.28 - -51.25
-63.74 - -57.28
-70.70 - -63.74
-76.80 - -70.70
-85.29 - -76.80
-95.01 - -85.29
-107.06 - -95.01
-119.62 - 107.06
BELOW - 119.62

STATISTICAL PARAMETERS OF GRID VALUES



DATA SOURCE

The data have been obtained from the gravity data base at Kort- og Matrikelstyrelsen (KMS). The data have been acquired from a number of surveys over the years, the most recent being from a 1993 joint survey by GGU and KMS.

DATA PROCESSING

All processing from measurement to final calculated anomaly have been carried out by KMS. The Bouguer correction used a density of 2.67 g/cm3 for rocks and 1.00 g/cm3 for water.
No terrain corrections have been applied.
Anomalies are relative to GRS67/IGSN71.

Gridding: 500m interval, based on minimum total curvature.
White areas indicate scarce data density.

The residual anomaly map was produced from map 94/2-111 by subtracting a second order surface calculated from all valid grid points.

Projection: Lambert conformal conic
Standard parallel: 66° 30' 00" N
Scale factor: 0.99700
Ellipsoid: Clarke 1866
Datum: Qornoq
Scale: 1:1 000 000

Ice margins and coast lines digitized from 1:250 000 topographic maps.
Permission No: KMS A.200/87

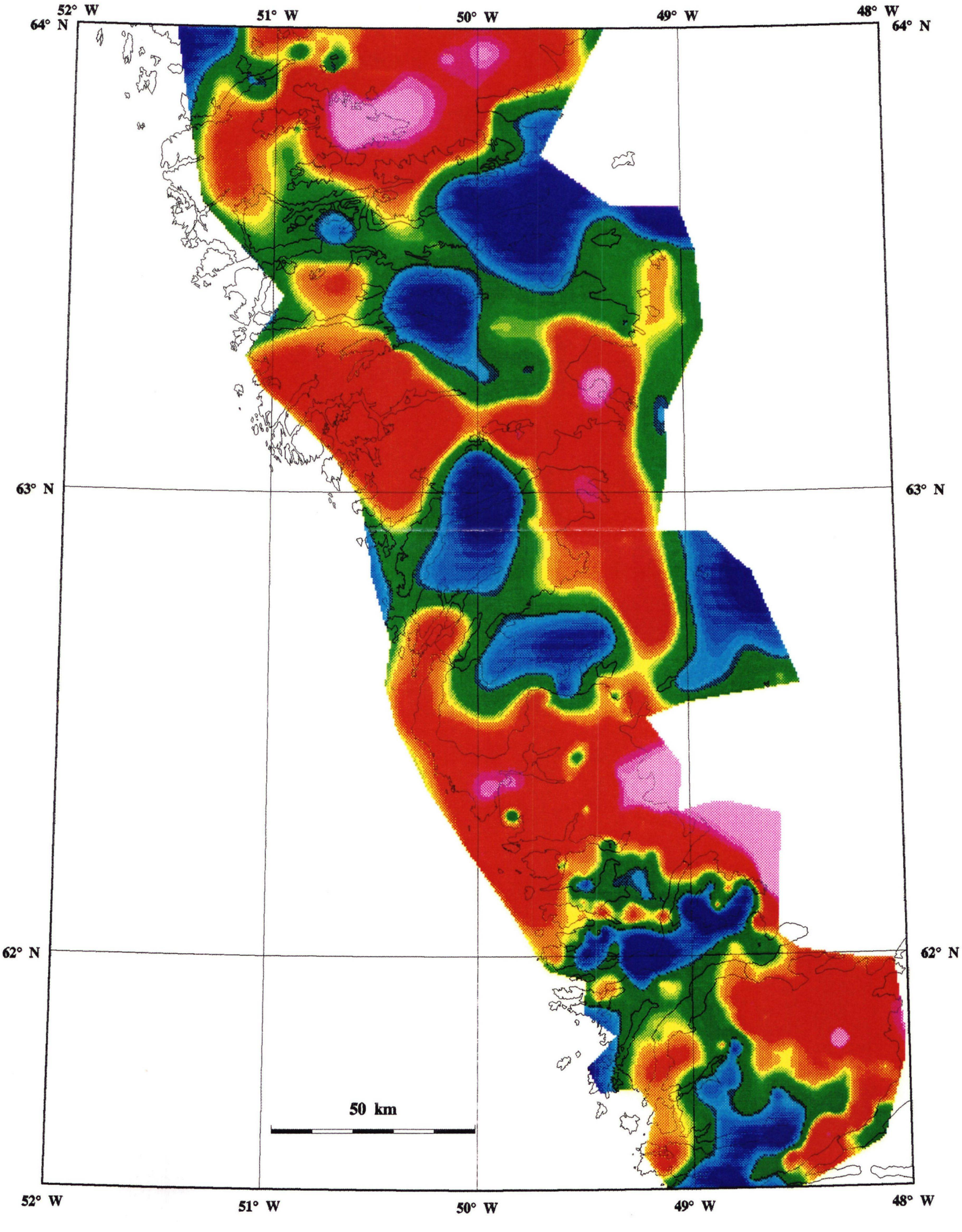
Released: 01-DEC-94

GRØNLANDS GEOLOGISKE UNDERSØGELSE
The Geological Survey of Greenland
Øster Voldgade 10 DK-1350 København K Danmark

RESIDUAL BOUGUER ANOMALY MAP

94/2-112 Paamiut - Buksefjorden

01-DEC-94



Thematic map 94/2-122

AERORADIOMETRIC MAP: eU

Paamiut – Buksefjorden

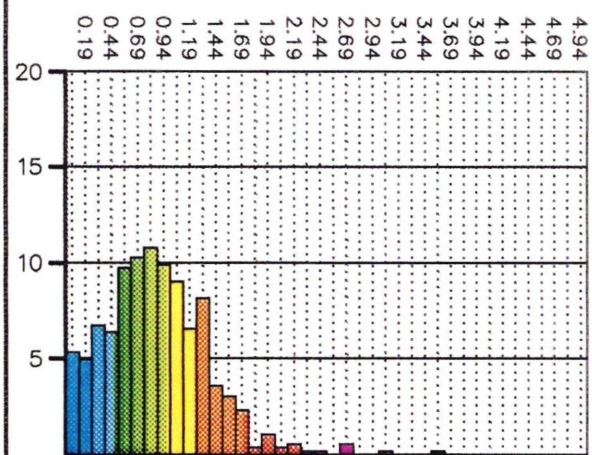
Compiled by Tapani Tukiainen

CONTOUR INTERVALS

ppm eU

- ABOVE
- 2.24 - 2.29
- 1.70 - 2.24
- 1.24 - 1.70
- 0.97 - 1.24
- 0.80 - 0.97
- 0.67 - 0.80
- 0.56 - 0.67
- 0.46 - 0.56
- 0.36 - 0.46
- 0.28 - 0.36
- BELOW

STATISTICAL PARAMETERS OF GRID VALUES



Number of values:	582
Min. value:	−0.34
Max. value:	3.60
Mean:	0.84
Variance:	0.27
Std. Dev.:	0.52

DATA SOURCE

Airborne radiometric survey carried out by the Geological Survey of Greenland and the Risø National Laboratory during the period 1975–1976.

SURVEY SPECIFICATIONS

Four-channel gamma-ray spectrometer
Crystal detector: 11.1 litres (Tl-activated NaI)

Aircraft:	Britten-Norman Islander
Average ground speed:	120 km/h
Average ground-clearance:	100 m
Survey method:	Contour flying

DATA PROCESSING

Data were interpolated into a regular 5000 m x 5000 m grid by the method of total minimum curvature.

Projection:	Lambert conformal conic
Standard parallel:	66° 30'N
Scale factor:	0.99700
Ellipsoid:	Clarke 1866
Datum:	Qornoq
Scale:	1:1 000 000

Ice margins and coastlines digitized from 1:250 000 topographic maps.
Permission No: KMS A.200/87

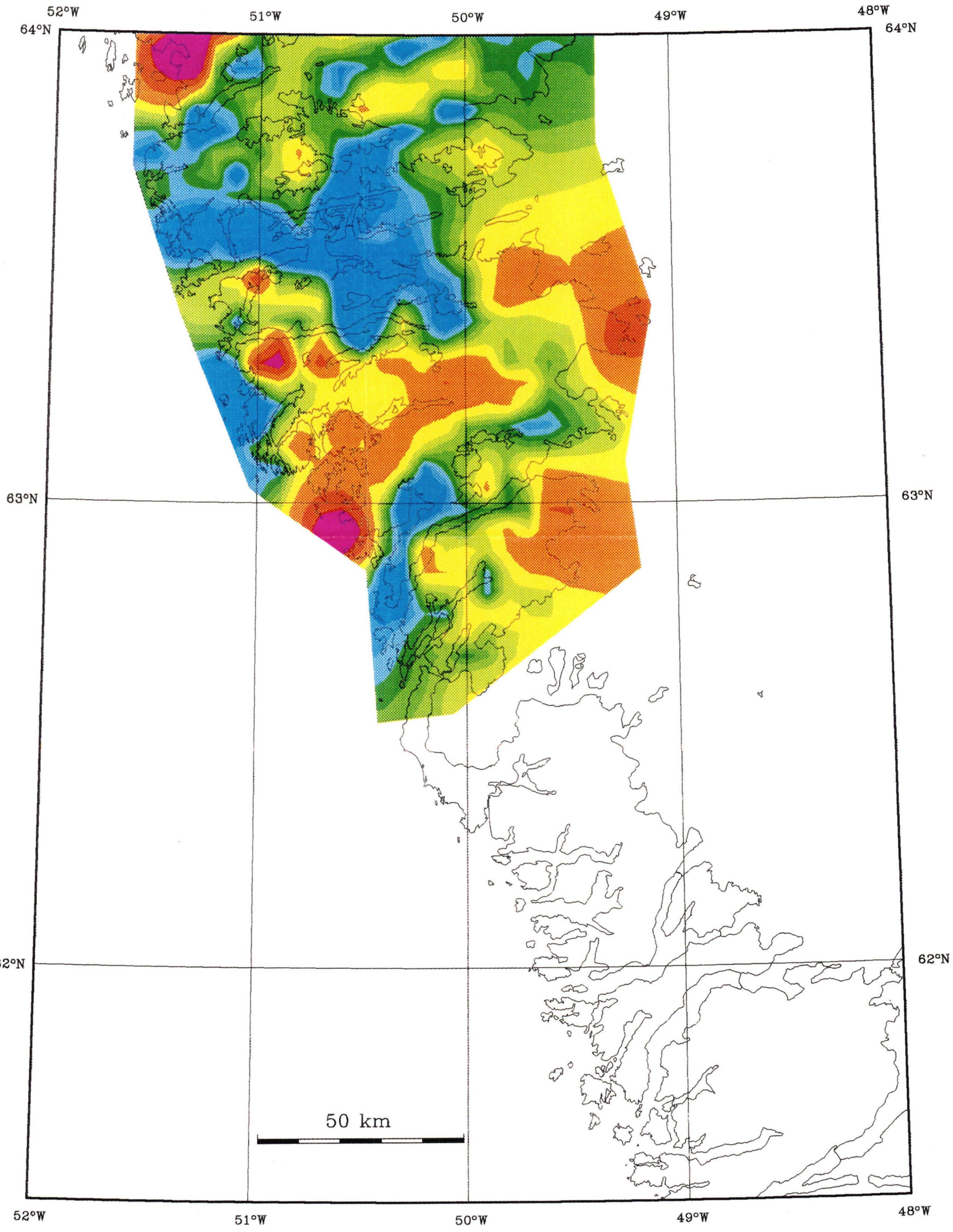
Released: 01-DEC-1994

GRØNLANDS GEOLOGISKE UNDERSØGELSE
The Geological Survey of Greenland
Øster Voldgade 10 DK-1350 København K Danmark

AERORADIOMETRIC MAP: eU

94/2-122: Paamiut - Buksefjorden

01-DEC-94



Thematic map 94/2-123

AERORADIOMETRIC MAP: Th

Paamiut – Buksefjorden

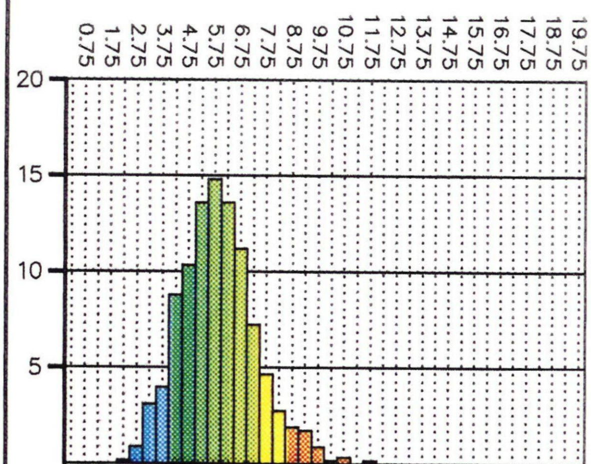
Compiled by Tapani Tukiainen

CONTOUR INTERVALS

ppm Th

- ABOVE
- 14.43 - 17.63
- 11.44 - 14.43
- 8.66 - 11.44
- 7.39 - 8.66
- 6.38 - 7.39
- 5.59 - 6.38
- 4.96 - 5.59
- 4.17 - 4.96
- 3.28 - 4.17
- 2.27 - 3.28
- BELOW

STATISTICAL PARAMETERS OF GRID VALUES



Number of values:	582
Min. value:	2.31
Max. value:	11.97
Mean:	5.90
Variance:	2.16
Std. Dev.:	1.47

DATA SOURCE

Airborne radiometric survey carried out by the Geological Survey of Greenland and the Risø National Laboratory during the period 1975–1976.

SURVEY SPECIFICATIONS

Four-channel gamma-ray spectrometer
Crystal detector: 11.1 litres (Tl-activated NaI)

Aircraft:	Britten-Norman Islander
Average ground speed:	120 km/h
Average ground-clearance:	100 m
Survey method:	Contour flying

DATA PROCESSING

Data were interpolated into a regular 5000 m x 5000 m grid by the method of total minimum curvature.

Projection:	Lambert conformal conic
Standard parallel:	66° 30'N
Scale factor:	0.99700
Ellipsoid:	Clarke 1866
Datum:	Qornoq
Scale:	1:1 000 000

Ice margins and coastlines digitized from 1:250 000 topographic maps.
Permission No: KMS A.200/87

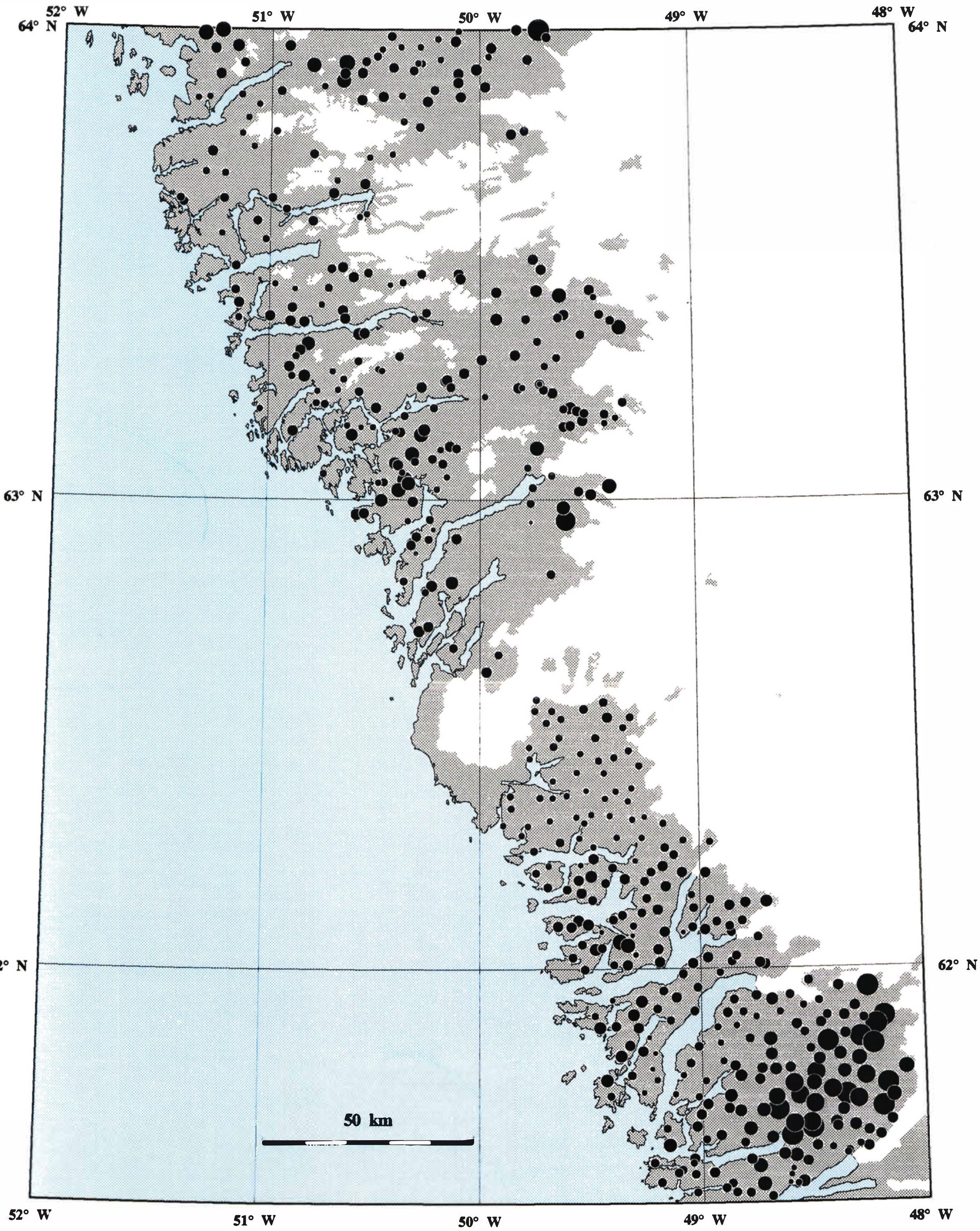
Released: 01-DEC-1994

GRØNLANDS GEOLOGISKE UNDERSØGELSE
The Geological Survey of Greenland
Øster Voldgade 10 DK-1350 København K Danmark

GEOPHYSICAL MAP: TOTAL GAMMA - RADIATION

94/2-131 Paamiut - Buksefjorden

01-DEC-94



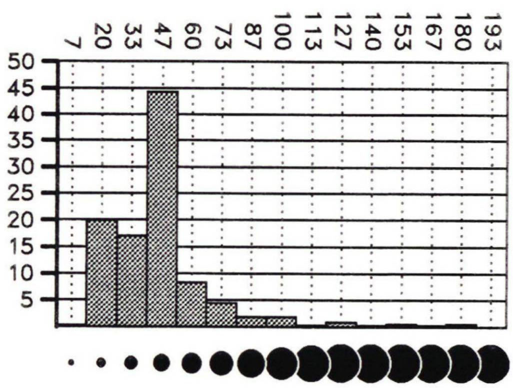
Thematic map 94/2-131

GEOPHYSICAL MAP: TOTAL GAMMA-RADIATION

Paamiut – Buksefjorden

Compiled by Agnete Steenfelt

FREQUENCY DISTRIBUTION AND SYMBOL SIZE



Counts per sec.

STATISTICAL PARAMETERS
OF ANALYTICAL VALUES

Number of samples:	496
Min. value:	8
Max. value:	220
Mean:	46
Median:	40
Variance:	647
Std. Dev.:	25

DATA SOURCE

Scintillometer readings carried out during stream sediment surveys by the Geological Survey of Greenland in 1991, 1993.

SURVEY SPECIFICATIONS

Sample density:
1991 survey average: 1 per 27 km^2
1993 survey average: 1 per 26 km^2
Instrument:
Saphymo – Srat SPP2
Method:
Readings made on rock surfaces or representative boulders.

DATA PROCESSING

Dot plot illustrating average gamma – radiation at sample sites. Scaling of dot size selected in each case to suppress noise at low concentration levels and enhance anomalous areas or regional features.

Projection: Lambert conformal conic	
Standard parallel:	66° 30' N
Scale factor:	0.99700
Ellipsoid:	Clarke 1866
Datum:	Qornoq
Scale:	1:1 000 000

Ice margins and coast lines digitized from 1:250 000 topographic maps.
Permission No: KMS A.200/87

Released: 01-DEC-1994

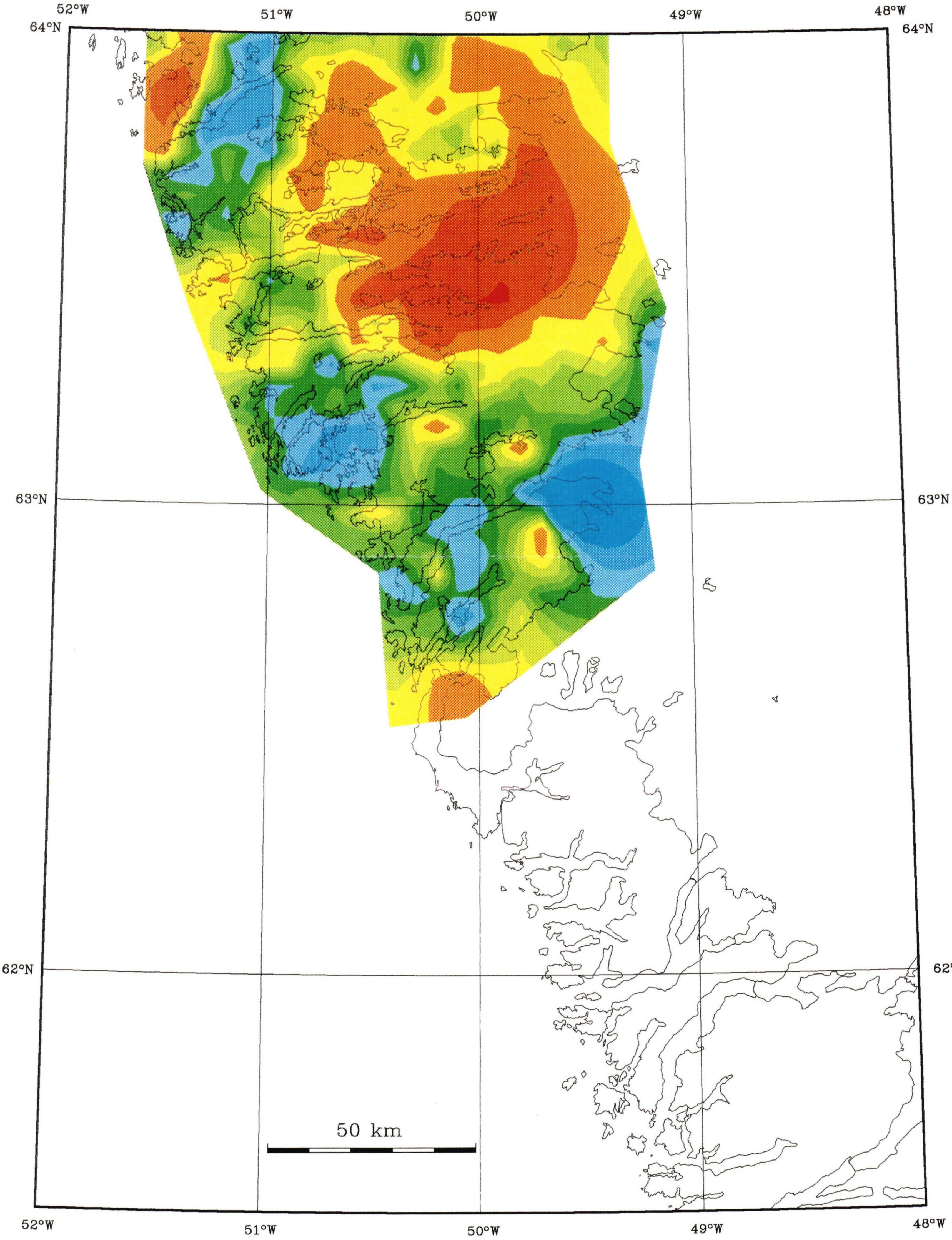
GRØNLANDS GEOLOGISKE UNDERSØGELSE
The Geological Survey of Greenland
Øster Voldgade 10 DK-1350 København K Danmark

GGU

AERORADIOMETRIC MAP: K

94/2-124: Paamiut - Buksefjorden

01-DEC-94



Thematic map 94/2-124

AERORADIOMETRIC MAP: K

Paamiut – Buksefjorden

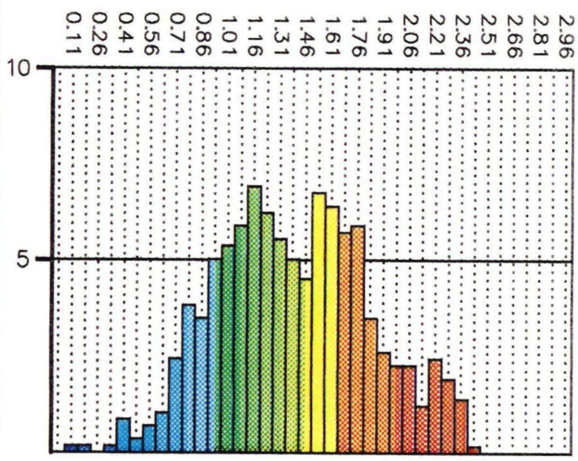
Compiled by Tapani Tukiainen

CONTOUR INTERVALS

% K

% K
ABOVE
2.38 - 2.75
1.99 - 2.38
1.66 - 1.99
1.47 - 1.66
1.33 - 1.47
1.21 - 1.33
1.09 - 1.21
0.95 - 1.09
0.79 - 0.95
0.58 - 0.79
BELOW

STATISTICAL PARAMETERS OF GRID VALUES



Number of values:	582
Min. value:	−0.16
Max. value:	2.43
Mean:	1.39
Variance:	0.21
Std. Dev.:	0.46

DATA SOURCE

Airborne radiometric survey carried out by the Geological Survey of Greenland and the Risø National Laboratory during the period 1975–1976.

SURVEY SPECIFICATIONS

Four-channel gamma-ray spectrometer
Crystal detector: 11.1 litres (Tl-activated NaI)

Aircraft:	Britten-Norman Islander
Average ground speed:	120 km/h
Average ground-clearance:	100 m
Survey method:	Contour flying

DATA PROCESSING

Data were interpolated into a regular 5000 m x 5000 m grid by the method of total minimum curvature.

Projection:	Lambert conformal conic
Standard parallel:	66° 30'N
Scale factor:	0.99700
Ellipsoid:	Clarke 1866
Datum:	Qornoq
Scale:	1:1 000 000

Ice margins and coastlines digitized from 1:250 000 topographic maps.
Permission No: KMS A.200/87

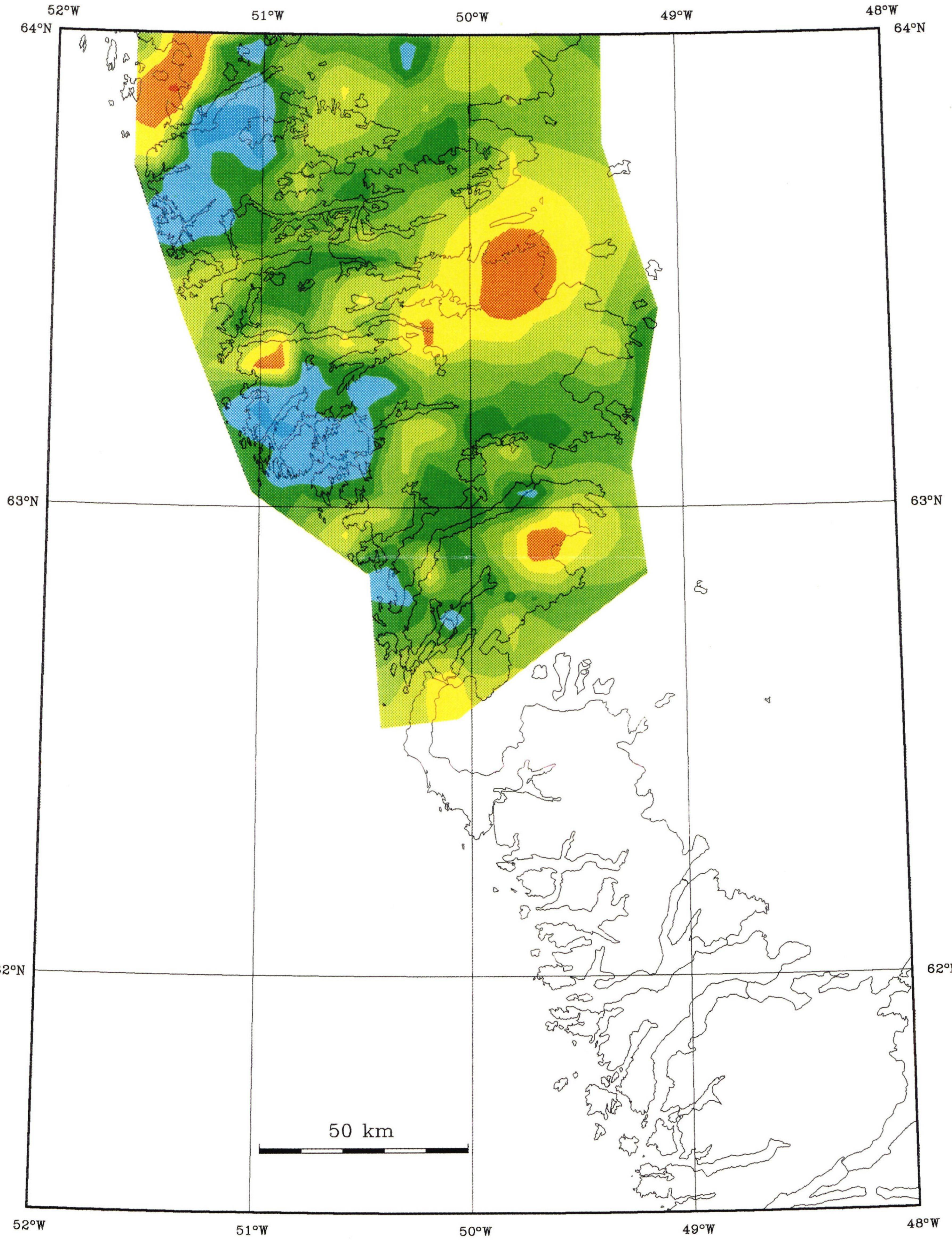
Released: 01-DEC-1994

GRØNLANDS GEOLOGISKE UNDERSØGELSE
The Geological Survey of Greenland
Øster Voldgade 10 DK-1350 København K Danmark

AERORADIOMETRIC MAP: Th

94/2-123: Paamiut - Buksefjorden

01-DEC-94



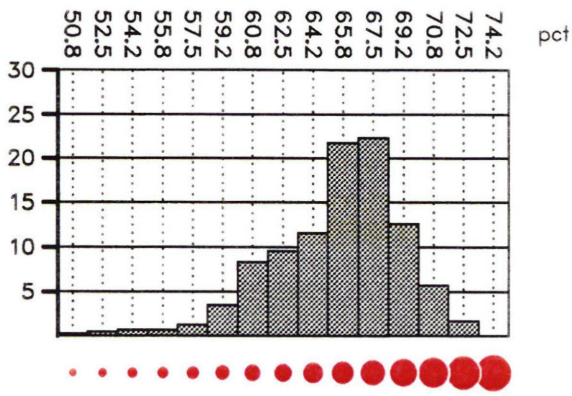
Thematic map 94/2-201

GEOCHEMICAL MAP: SiO_2 IN STREAM SEDIMENT

Paamiut – Buksefjorden

Compiled by Agnete Steenfelt

FREQUENCY DISTRIBUTION AND SYMBOL SIZE



SiO_2 pct

STATISTICAL PARAMETERS
OF ANALYTICAL VALUES

Number of samples:	493
Min. value:	40.6
Max. value:	73.3
Mean:	65.5
Median:	66.2
Variance:	13.6
Std. Dev.:	3.7

DATA SOURCE

Stream sediment surveys carried out by the Geological Survey of Greenland in 1991, 1993.

SURVEY SPECIFICATIONS

Sample density:
  1991 survey average: 1 per 27 km^2
  1993 survey average: 1 per 26 km^2
Sample type:
  minerogenic sediment from stream bed or bank as composite of 3–10 subsamples
Size fraction:
  < 0.1 mm dry–sieved in laboratory
Method and laboratory:
  1991 survey: XRF at GGU
  1993 survey: XRF at GGU

DATA PROCESSING

Dot plot illustrating element concentrations at sample sites. Scaling of dot size selected in each case to suppress noise at low concentration levels and enhance anomalous areas or regional features.

Projection: Lambert conformal conic

Standard parallel:	66° 30' N
Scale factor:	0.99700
Ellipsoid:	Clarke 1866
Datum:	Qornoq
Scale:	1:1 000 000

Ice margins and coast lines digitized from 1:250 000 topographic maps.
Permission No: KMS A.200/87

Released: 01–DEC–1994

GRØNLANDS GEOLOGISKE UNDERSØGELSE
The Geological Survey of Greenland
Øster Voldgade 10 DK–1350 København K Danmark

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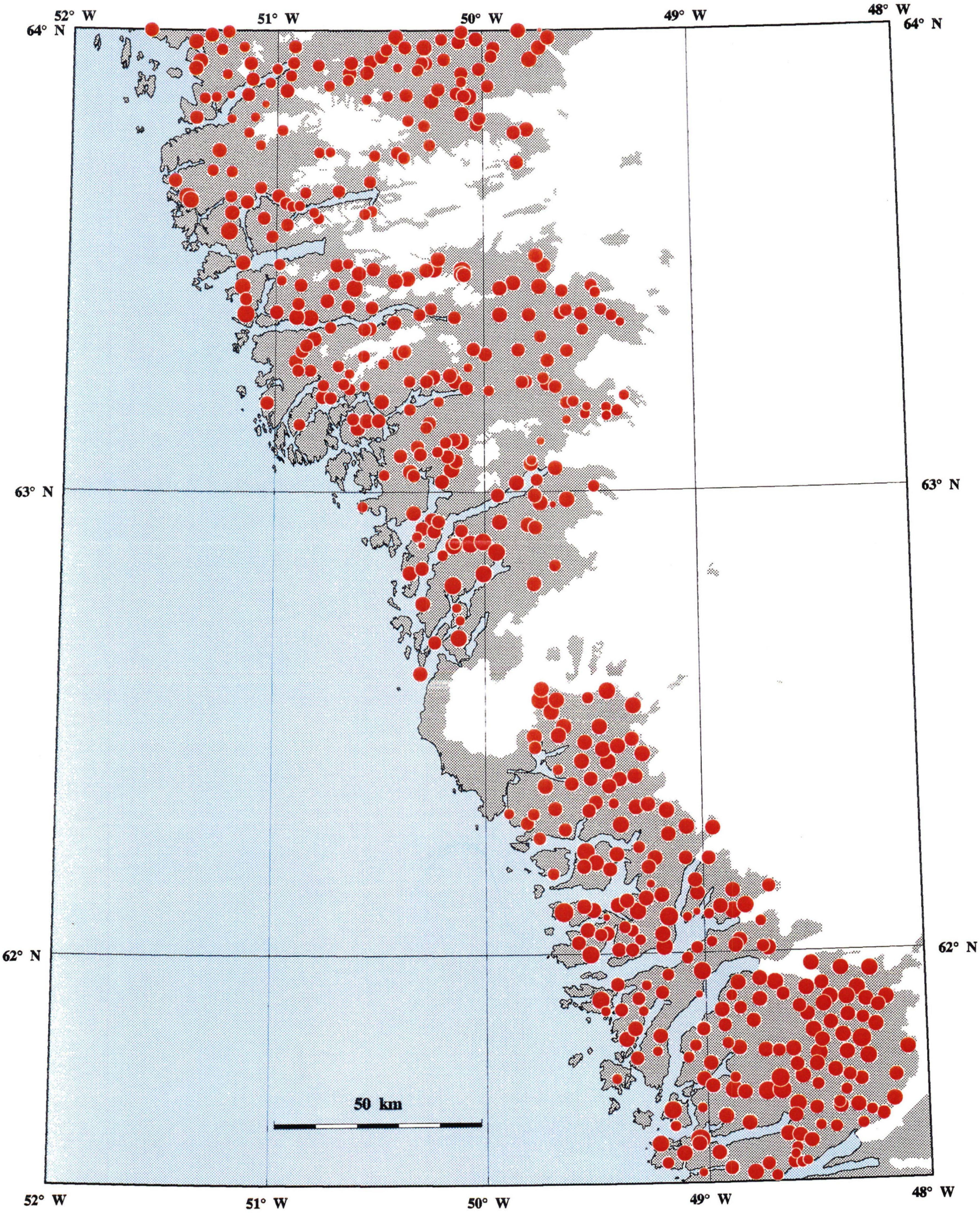
GEOCHEMICAL MAP: SiO_2 IN STREAM SEDIMENT

94/2-201 Paamiut - Buksefjorden 01-DEC-94



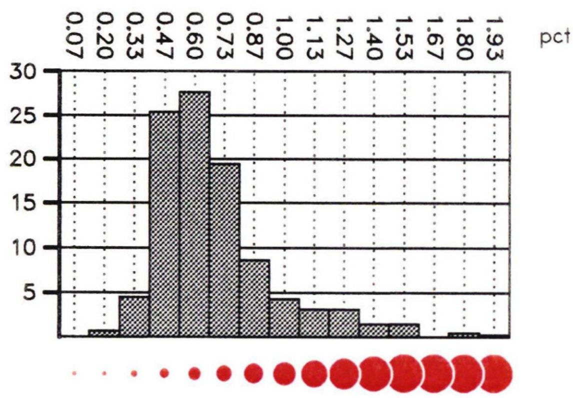
Thematic map 94/2-202

GEOCHEMICAL MAP: TiO_2 IN STREAM SEDIMENT

Paamiut – Buksefjorden

Compiled by Agnete Steenfelt

FREQUENCY DISTRIBUTION AND SYMBOL SIZE



TiO_2 pct

STATISTICAL PARAMETERS
OF ANALYTICAL VALUES

Number of samples:	493
Min. value:	0.23
Max. value:	2.70
Mean:	0.70
Median:	0.63
Variance:	0.09
Std. Dev.:	0.30

DATA SOURCE

Stream sediment surveys carried out by the Geological Survey of Greenland in 1991, 1993.

SURVEY SPECIFICATIONS

Sample density:
1991 survey average: 1 per 27 km^2
1993 survey average: 1 per 26 km^2
Sample type:
minerogenic sediment from stream bed or bank as composite of 3–10 subsamples
Size fraction:
< 0.1 mm dry–sieved in laboratory
Method and laboratory:
1991 survey: XRF at GGU
1993 survey: XRF at GGU

DATA PROCESSING

Dot plot illustrating element concentrations at sample sites. Scaling of dot size selected in each case to suppress noise at low concentration levels and enhance anomalous areas or regional features.

Projection:	Lambert conformal conic
Standard parallel:	66° 30' N
Scale factor:	0.99700
Ellipsoid:	Clarke 1866
Datum:	Qornoq
Scale:	1:1 000 000

Ice margins and coast lines digitized from 1:250 000 topographic maps.
Permission No: KMS A.200/87

Released: 01–DEC–1994

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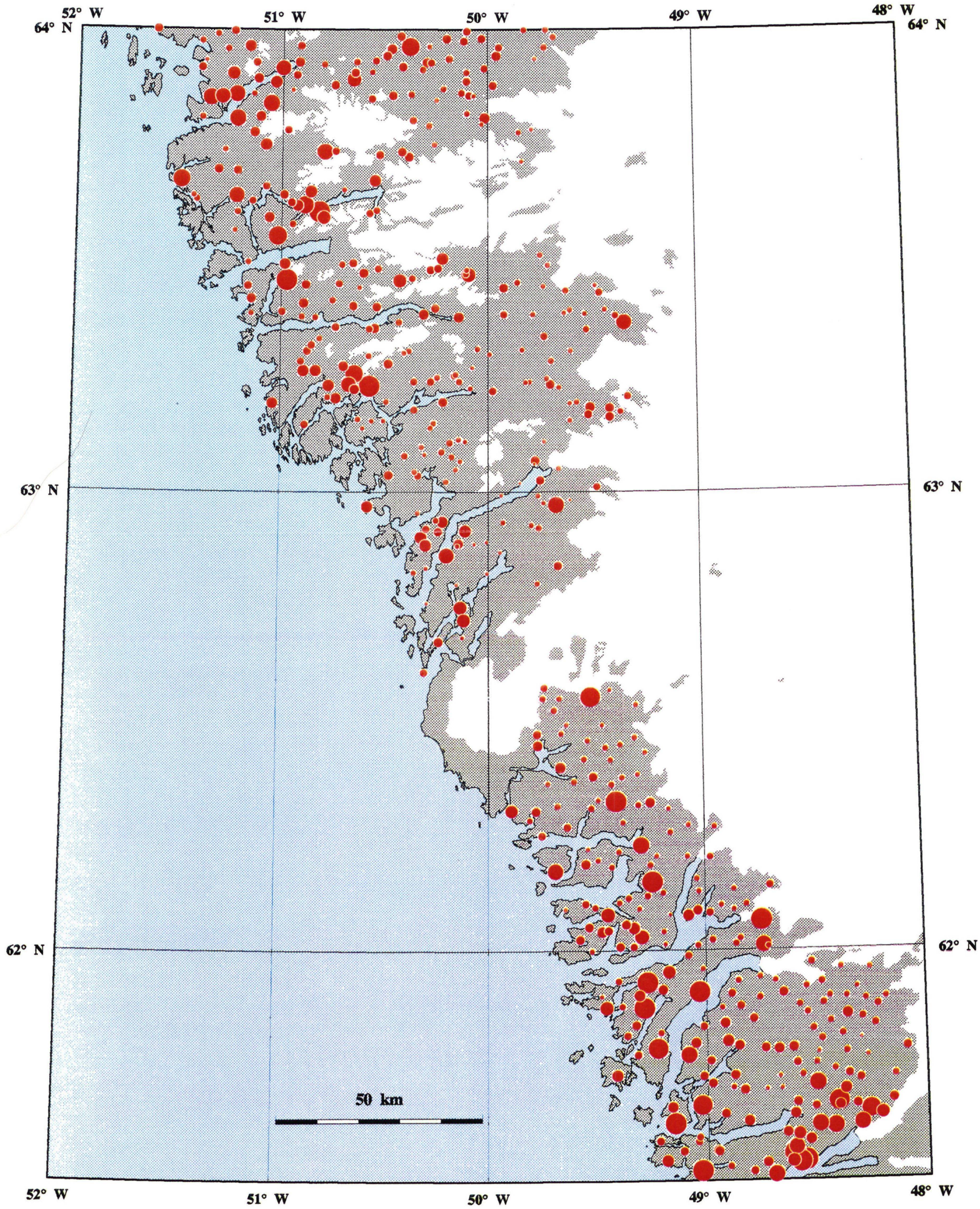
GGU

GEOCHEMICAL MAP: TiO_2 IN STREAM SEDIMENT

94/2-202 Paamiut - Buksefjorden

01-DEC-94



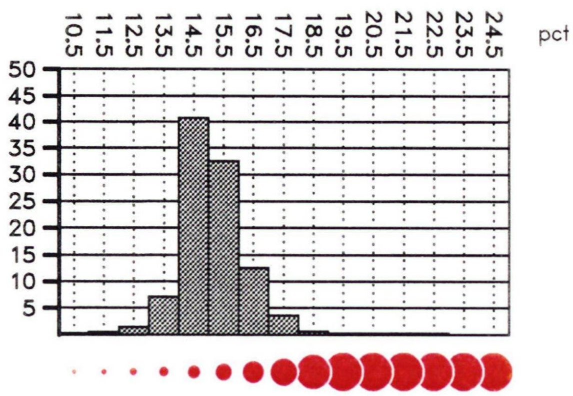
Thematic map 94/2-203

GEOCHEMICAL MAP: Al_2O_3 IN STREAM SEDIMENT

Paamiut – Buksefjorden

Compiled by Agnete Steenfelt

FREQUENCY DISTRIBUTION AND SYMBOL SIZE



Al_2O_3 pct

STATISTICAL PARAMETERS
OF ANALYTICAL VALUES

Number of samples:	493
Min. value:	10.0
Max. value:	22.2
Mean:	15.2
Median:	15.0
Variance:	1.3
Std. Dev.:	1.1

DATA SOURCE

Stream sediment surveys carried out by the Geological Survey of Greenland in 1991, 1993.

SURVEY SPECIFICATIONS

Sample density:
- 1991 survey average: 1 per 27 km^2
- 1993 survey average: 1 per 26 km^2

Sample type:
- minerogenic sediment from stream bed or bank as composite of 3–10 subsamples

Size fraction:
- < 0.1 mm dry–sieved in laboratory

Method and laboratory:
- 1991 survey: XRF at GGU
- 1993 survey: XRF at GGU

DATA PROCESSING

Dot plot illustrating element concentrations at sample sites. Scaling of dot size selected in each case to suppress noise at low concen–tration levels and enhance anomalous areas or regional features.

Projection: Lambert conformal conic	
Standard parallel:	66° 30' N
Scale factor:	0.99700
Ellipsoid:	Clarke 1866
Datum:	Qornoq
Scale:	1:1 000 000

Ice margins and coast lines digitized from 1:250 000 topographic maps.
Permission No: KMS A.200/87

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The Geological Survey of Greenland
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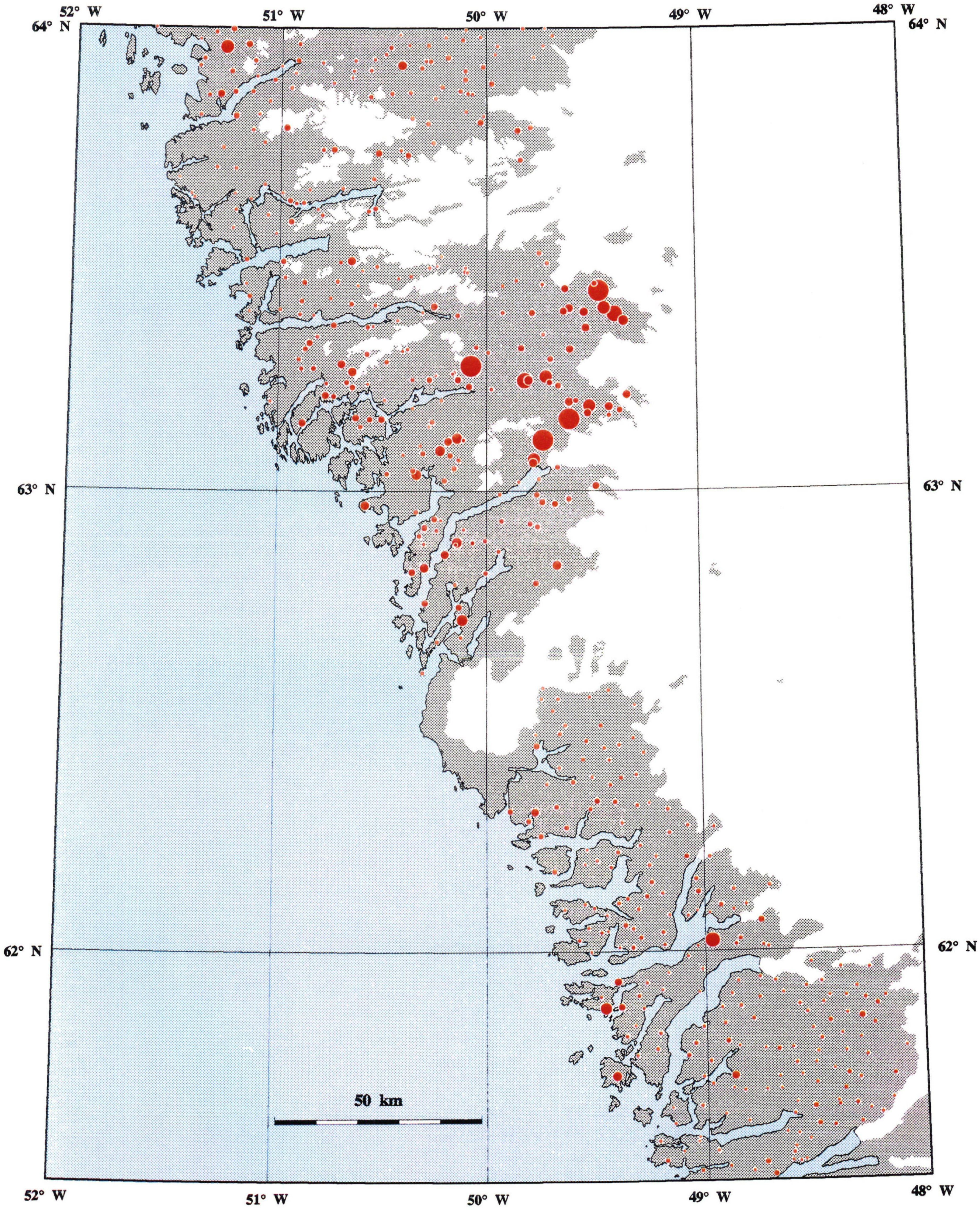
GEOCHEMICAL MAP: Al_2O_3 IN STREAM SEDIMENT

94/2-203 Paamiut - Buksefjorden

01-DEC-94



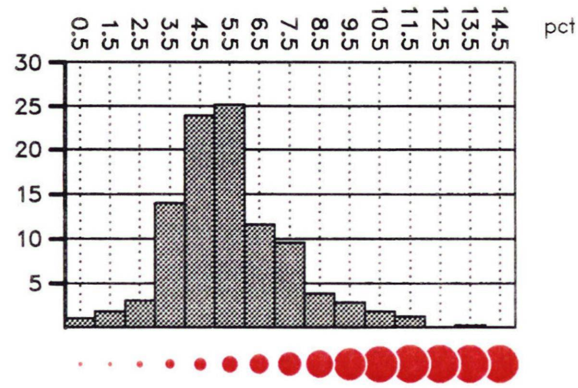
Thematic map 94/2-204

GEOCHEMICAL MAP: Fe_2O_3 IN STREAM SEDIMENT

Paamiut – Buksefjorden

Compiled by Agnete Steenfelt

FREQUENCY DISTRIBUTION AND SYMBOL SIZE



Fe_2O_3 pct

STATISTICAL PARAMETERS
OF ANALYTICAL VALUES

Number of samples:	493
Min. value:	0.3
Max. value:	13.3
Mean:	5.5
Median:	5.2
Variance:	3.8
Std. Dev.:	2.0

DATA SOURCE

Stream sediment surveys carried out by the Geological Survey of Greenland in 1991, 1993.

SURVEY SPECIFICATIONS

Sample density:
- 1991 survey average: 1 per 27 km^2
- 1993 survey average: 1 per 26 km^2

Sample type:
- minerogenic sediment from stream bed or bank as composite of 3–10 subsamples

Size fraction:
- < 0.1 mm dry–sieved in laboratory

Method and laboratory:
- 1991 survey: XRF at GGU
- 1993 survey: XRF at GGU

DATA PROCESSING

Dot plot illustrating element concentrations at sample sites. Scaling of dot size selected in each case to suppress noise at low concentration levels and enhance anomalous areas or regional features.

Projection: Lambert conformal conic

Standard parallel:	66° 30' N
Scale factor:	0.99700
Ellipsoid:	Clarke 1866
Datum:	Qornoq
Scale:	1:1 000 000

Ice margins and coast lines digitized from 1:250 000 topographic maps.
Permission No: KMS A.200/87

Released: 01–DEC–1994

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The Geological Survey of Greenland
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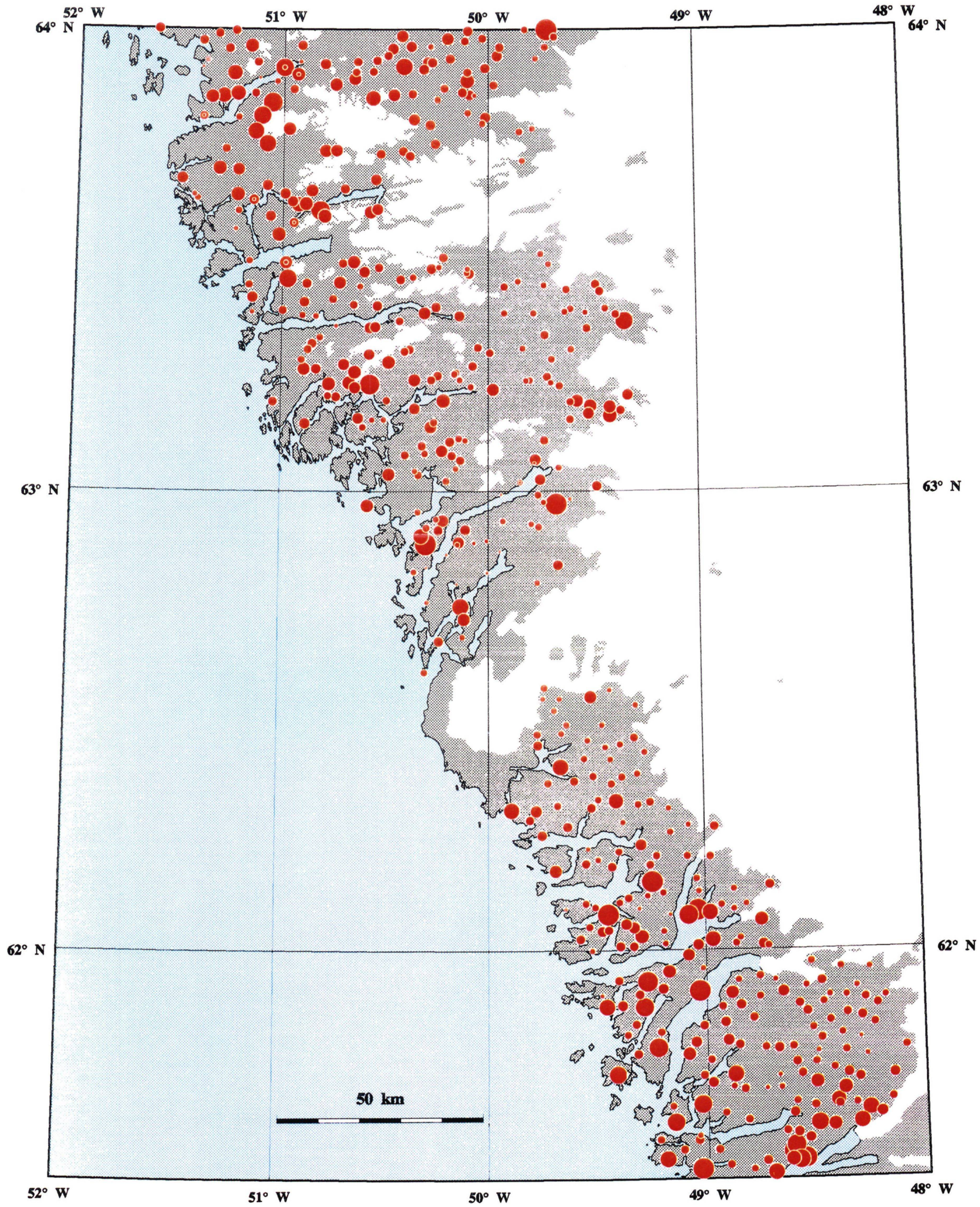
GEOCHEMICAL MAP: Fe_2O_3 IN STREAM SEDIMENT

94/2-204 Paamiut - Buksefjorden

01-DEC-94



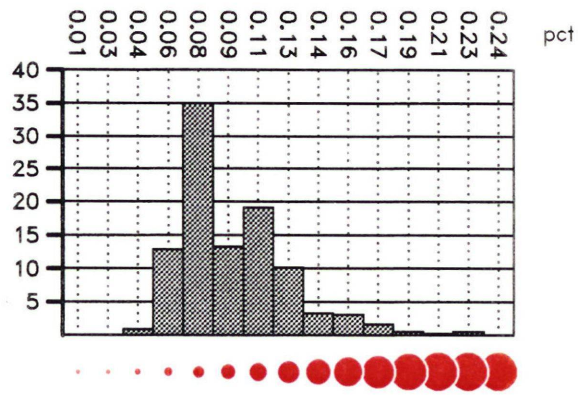
Thematic map 94/2–205

GEOCHEMICAL MAP: MnO IN STREAM SEDIMENT

Paamiut – Buksefjorden

Compiled by Agnete Steenfelt

FREQUENCY DISTRIBUTION AND SYMBOL SIZE



MnO pct

STATISTICAL PARAMETERS
OF ANALYTICAL VALUES

Number of samples:	493
Min. value:	0.04
Max. value:	0.47
Mean:	0.09
Median:	0.09
Variance:	0.00
Std. Dev.:	0.03

DATA SOURCE

Stream sediment surveys carried out by the Geological Survey of Greenland in 1991, 1993.

SURVEY SPECIFICATIONS

Sample density:
1991 survey average: 1 per 27 km^2
1993 survey average: 1 per 26 km^2
Sample type:
minerogenic sediment from stream bed or bank as composite of 3–10 subsamples
Size fraction:
< 0.1 mm dry–sieved in laboratory
Method and laboratory:
1991 survey: XRF at GGU
1993 survey: XRF at GGU

DATA PROCESSING

Dot plot illustrating element concentrations at sample sites. Scaling of dot size selected in each case to suppress noise at low concen–tration levels and enhance anomalous areas or regional features.

Projection: Lambert conformal conic	
Standard parallel:	66° 30' N
Scale factor:	0.99700
Ellipsoid:	Clarke 1866
Datum:	Qornoq
Scale:	1:1 000 000

Ice margins and coast lines digitized from 1:250 000 topographic maps.
Permission No: KMS A.200/87

Released: 01–DEC–1994

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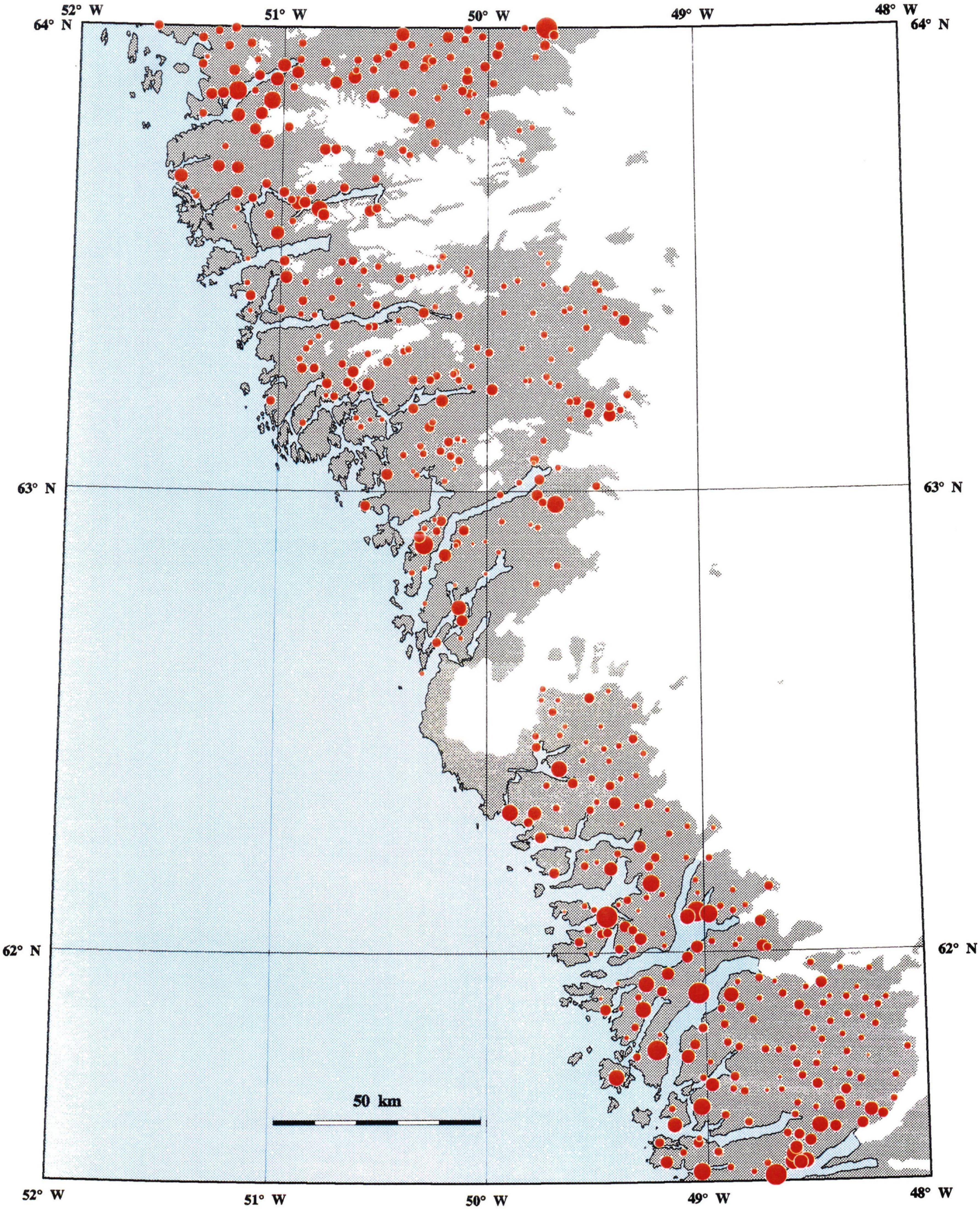
GEOCHEMICAL MAP: MnO IN STREAM SEDIMENT

94/2-205 Paamiut - Buksefjorden

01-DEC-94



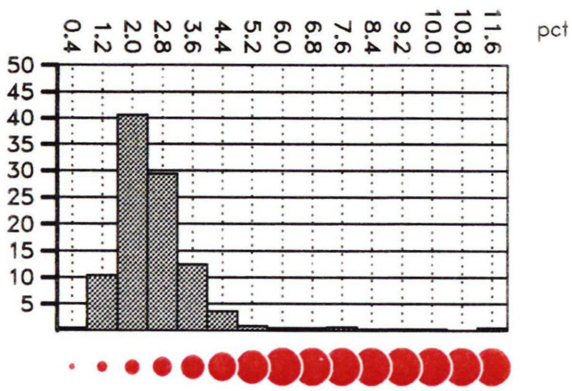
Thematic map 94/2-206

GEOCHEMICAL MAP: MgO IN STREAM SEDIMENT

Paamiut – Buksefjorden

Compiled by Agnete Steenfelt

FREQUENCY DISTRIBUTION AND SYMBOL SIZE



MgO pct

STATISTICAL PARAMETERS
OF ANALYTICAL VALUES

Number of samples:	493
Min. value:	0.8
Max. value:	11.7
Mean:	2.6
Median:	2.4
Variance:	1.5
Std. Dev.:	1.2

DATA SOURCE

Stream sediment surveys carried out by the Geological Survey of Greenland in 1991, 1993.

SURVEY SPECIFICATIONS

Sample density:
1991 survey average: 1 per 27 km^2
1993 survey average: 1 per 26 km^2
Sample type:
minerogenic sediment from stream bed or bank as composite of 3–10 subsamples
Size fraction:
< 0.1 mm dry–sieved in laboratory
Method and laboratory:
1991 survey: XRF at GGU
1993 survey: XRF at GGU

DATA PROCESSING

Dot plot illustrating element concentrations at sample sites. Scaling of dot size selected in each case to suppress noise at low concentration levels and enhance anomalous areas or regional features.

Projection: Lambert conformal conic	
Standard parallel:	66° 30' N
Scale factor:	0.99700
Ellipsoid:	Clarke 1866
Datum:	Qornoq
Scale:	1:1 000 000

Ice margins and coast lines digitized from 1:250 000 topographic maps.
Permission No: KMS A.200/87

Released: 01–DEC–1994

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The Geological Survey of Greenland
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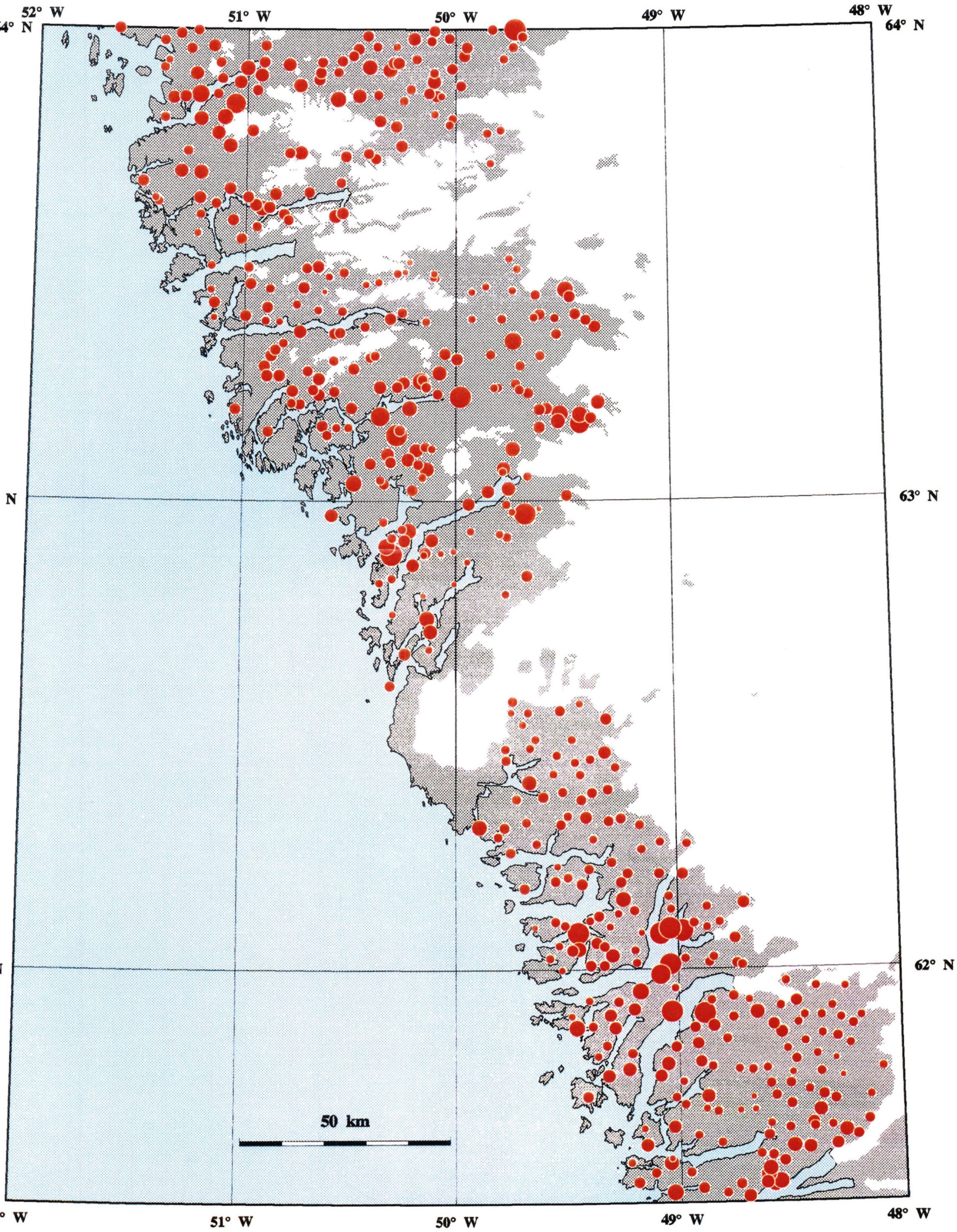
GEOCHEMICAL MAP: MgO IN STREAM SEDIMENT

94/2-206 Paamiut - Buksefjorden 01-DEC-94



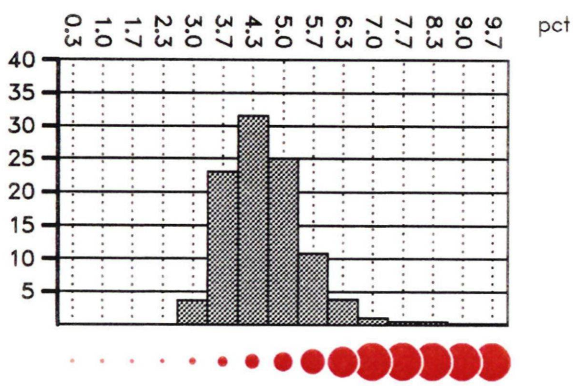
Thematic map 94/2-207

GEOCHEMICAL MAP: CaO IN STREAM SEDIMENT

Paamiut – Buksefjorden

Compiled by Agnete Steenfelt

FREQUENCY DISTRIBUTION AND SYMBOL SIZE



CaO pct

STATISTICAL PARAMETERS
OF ANALYTICAL VALUES

Number of samples:	493
Min. value:	2.9
Max. value:	16.1
Mean:	4.6
Median:	4.5
Variance:	1.1
Std. Dev.:	1.0

DATA SOURCE

Stream sediment surveys carried out by the Geological Survey of Greenland in 1991, 1993.

SURVEY SPECIFICATIONS

Sample density:
 1991 survey average: 1 per 27 km^2
 1993 survey average: 1 per 26 km^2
Sample type:
 minerogenic sediment from stream bed or bank as composite of 3–10 subsamples
Size fraction:
 < 0.1 mm dry–sieved in laboratory
Method and laboratory:
 1991 survey: XRF at GGU
 1993 survey: XRF at GGU

DATA PROCESSING

Dot plot illustrating element concentrations at sample sites. Scaling of dot size selected in each case to suppress noise at low concentration levels and enhance anomalous areas or regional features.

Projection:	Lambert conformal conic
Standard parallel:	66° 30' N
Scale factor:	0.99700
Ellipsoid:	Clarke 1866
Datum:	Qornoq
Scale:	1:1 000 000

Ice margins and coast lines digitized from 1:250 000 topographic maps.
Permission No: KMS A.200/87

Released: 01–DEC–1994

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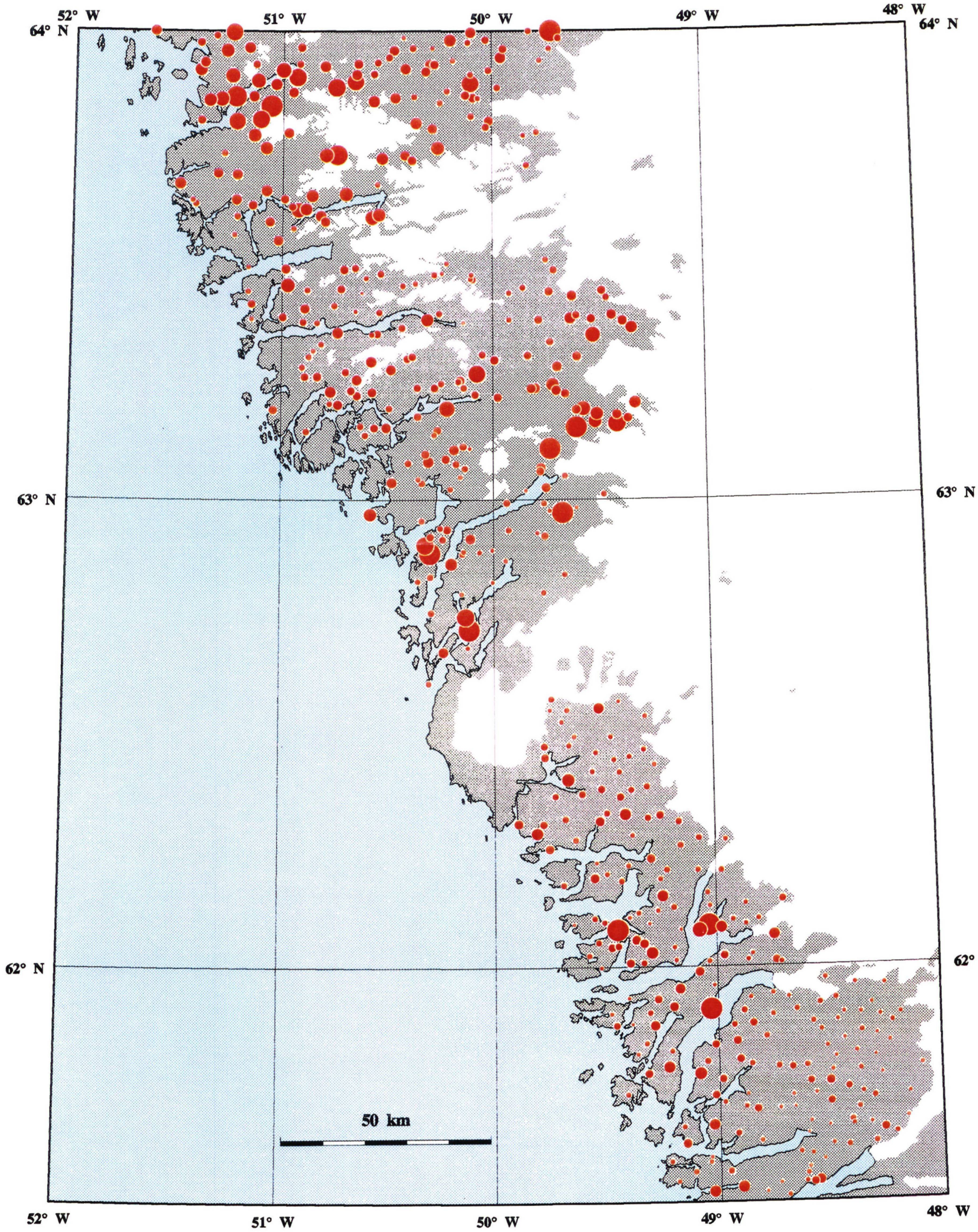
GEOCHEMICAL MAP: CaO IN STREAM SEDIMENT

94/2-207 Paamiut - Buksefjorden

01-DEC-94



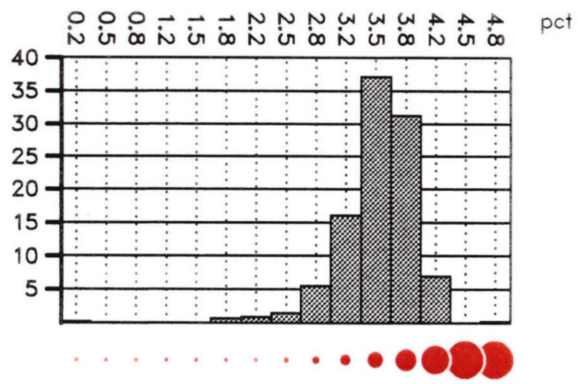
Thematic map 94/2-208

GEOCHEMICAL MAP: Na_2O IN STREAM SEDIMENT

Paamiut – Buksefjorden

Compiled by Agnete Steenfelt

FREQUENCY DISTRIBUTION AND SYMBOL SIZE



Na_2O pct

STATISTICAL PARAMETERS
OF ANALYTICAL VALUES

Number of samples:	493
Min. value:	0.0
Max. value:	5.0
Mean:	3.5
Median:	3.6
Variance:	0.2
Std. Dev.:	0.4

DATA SOURCE

Stream sediment surveys carried out by the Geological Survey of Greenland in 1991, 1993.

SURVEY SPECIFICATIONS

Sample density:
1991 survey average: 1 per 27 km^2
1993 survey average: 1 per 26 km^2
Sample type:
minerogenic sediment from stream bed or bank as composite of 3–10 subsamples
Size fraction:
< 0.1 mm dry-sieved in laboratory
Method and laboratory:
1991 survey: AAS at GGU
1993 survey: AAS at GGU

DATA PROCESSING

Dot plot illustrating element concentrations at sample sites. Scaling of dot size selected in each case to suppress noise at low concentration levels and enhance anomalous areas or regional features.

Projection: Lambert conformal conic	
Standard parallel:	66° 30' N
Scale factor:	0.99700
Ellipsoid:	Clarke 1866
Datum:	Qornoq
Scale:	1:1 000 000

Ice margins and coast lines digitized from 1:250 000 topographic maps.
Permission No: KMS A.200/87

Released: 01-DEC-1994

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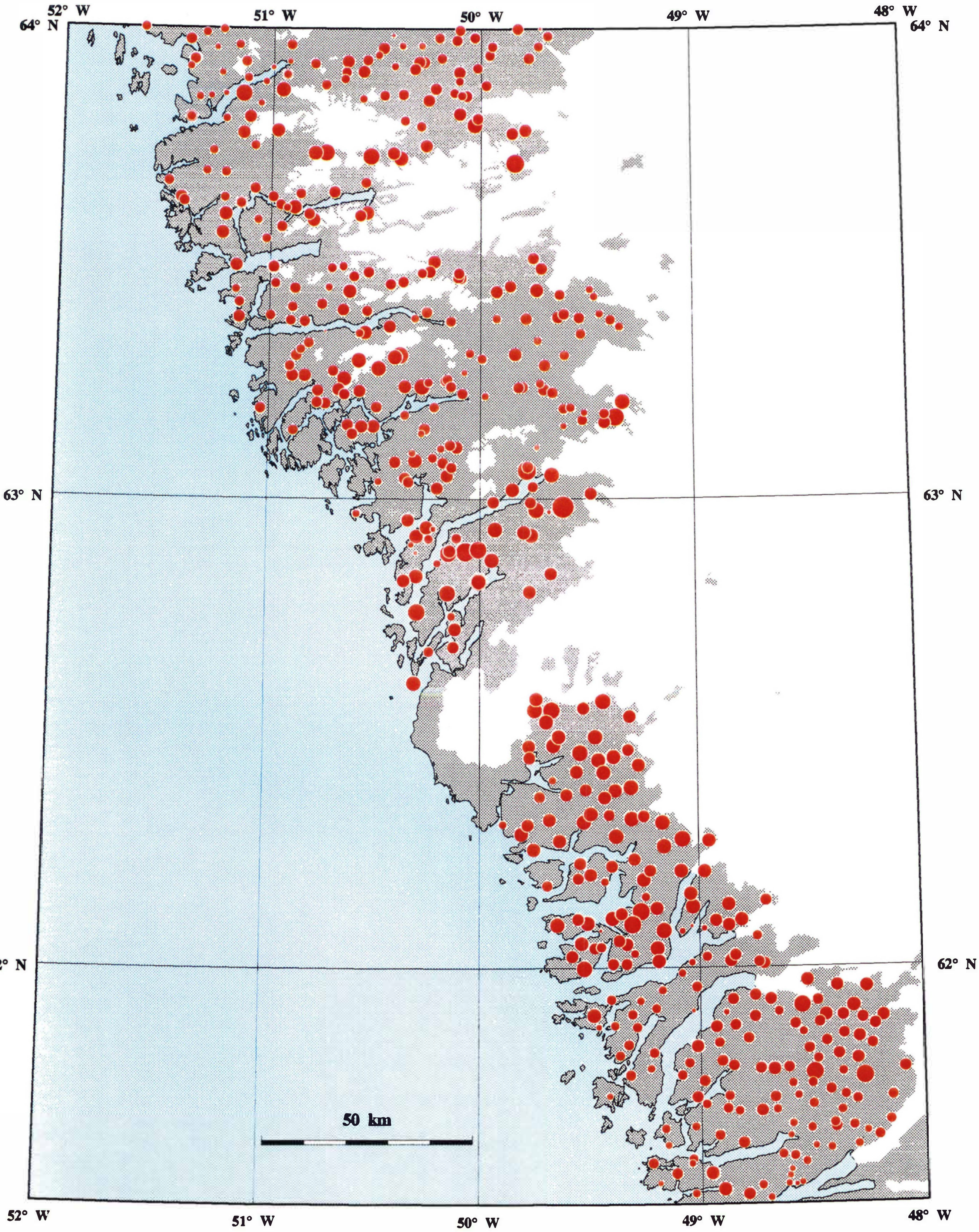
GEOCHEMICAL MAP: Na_2O IN STREAM SEDIMENT

94/2-208 Paamiut - Buksefjorden

01 - DEC - 94



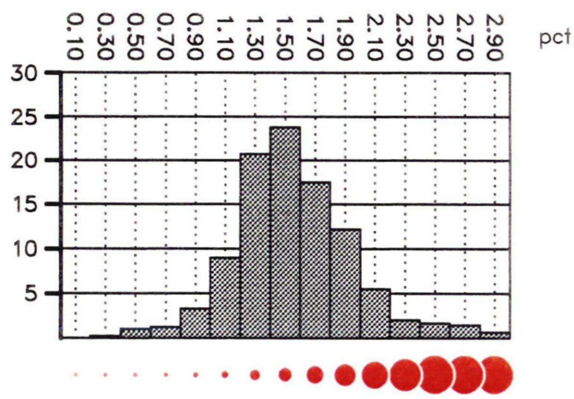
Thematic map 94/2-209

GEOCHEMICAL MAP: K_2O IN STREAM SEDIMENT

Paamiut – Buksefjorden

Compiled by Agnete Steenfelt

FREQUENCY DISTRIBUTION AND SYMBOL SIZE



K_2O pct

STATISTICAL PARAMETERS
OF ANALYTICAL VALUES

Number of samples:	493
Min. value:	0.39
Max. value:	3.05
Mean:	1.56
Median:	1.51
Variance:	0.16
Std. Dev.:	0.40

DATA SOURCE

Stream sediment surveys carried out by the Geological Survey of Greenland in 1991, 1993.

SURVEY SPECIFICATIONS

Sample density:
1991 survey average: 1 per 27 km^2
1993 survey average: 1 per 26 km^2
Sample type:
minerogenic sediment from stream bed or bank as composite of 3–10 subsamples
Size fraction:
< 0.1 mm dry–sieved in laboratory
Method and laboratory:
1991 survey: XRF at GGU
1993 survey: XRF at GGU

DATA PROCESSING

Dot plot illustrating element concentrations at sample sites. Scaling of dot size selected in each case to suppress noise at low concentration levels and enhance anomalous areas or regional features.

Projection: Lambert conformal conic	
Standard parallel:	66° 30' N
Scale factor:	0.99700
Ellipsoid:	Clarke 1866
Datum:	Qornoq
Scale:	1:1 000 000

Ice margins and coast lines digitized from 1:250 000 topographic maps.
Permission No: KMS A.200/87

Released: 01–DEC–1994

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The Geological Survey of Greenland
Øster Voldgade 10 DK–1350 København K Danmark

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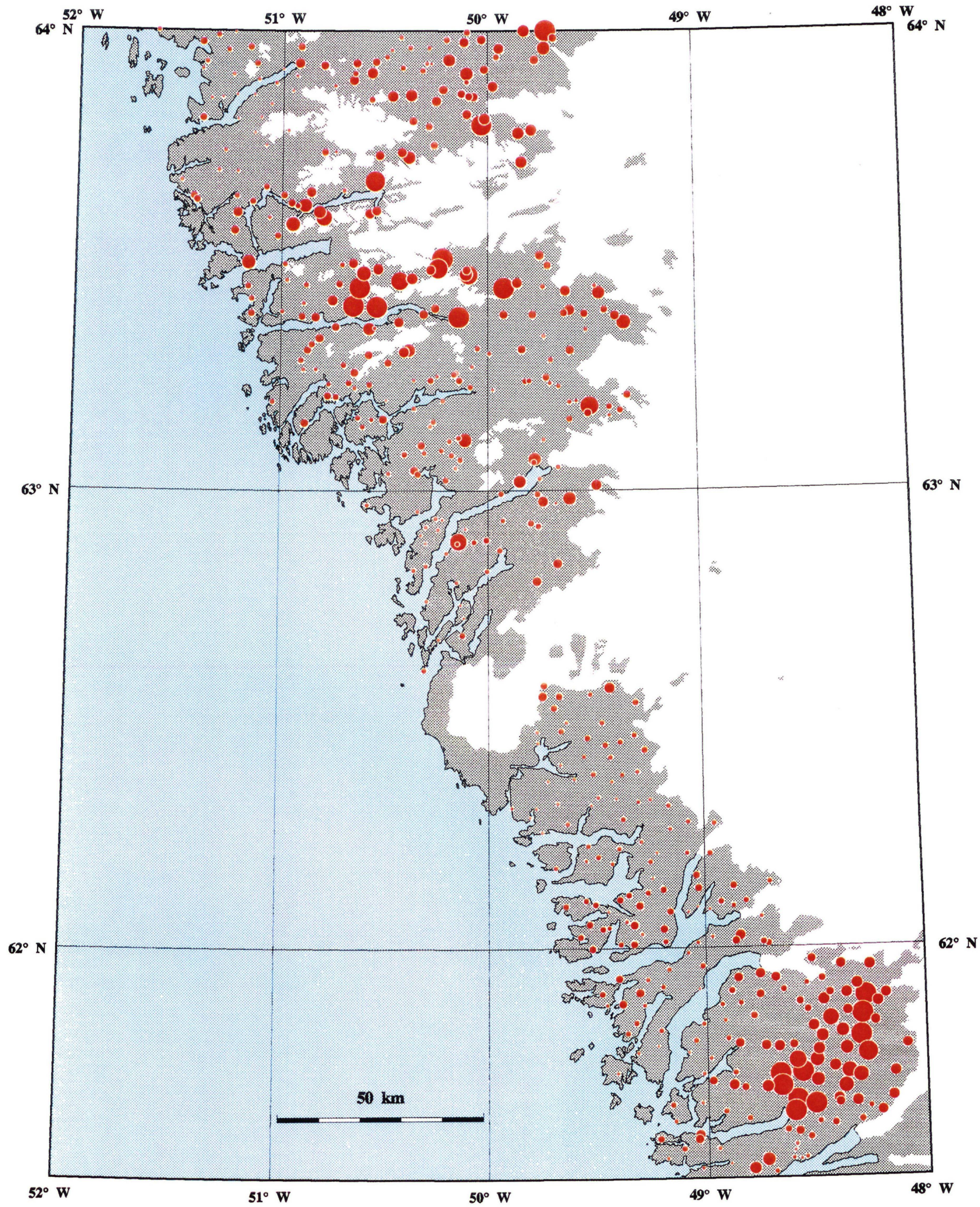
GEOCHEMICAL MAP: K_2O IN STREAM SEDIMENT

94/2-209 Paamiut - Buksefjorden

01-DEC-94



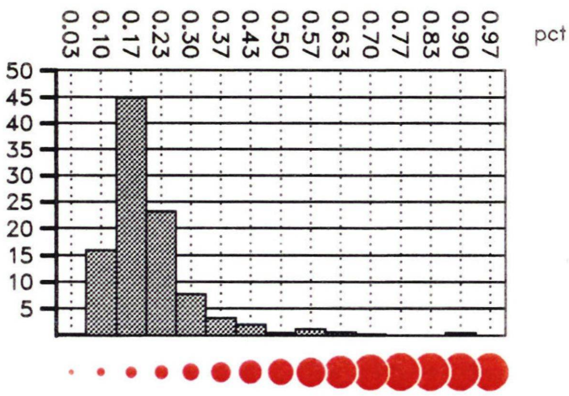
Thematic map 94/2-210

GEOCHEMICAL MAP: P_2O_5 IN STREAM SEDIMENT

Paamiut – Buksefjorden

Compiled by Agnete Steenfelt

FREQUENCY DISTRIBUTION AND SYMBOL SIZE



P_2O_5 pct

STATISTICAL PARAMETERS
OF ANALYTICAL VALUES

Number of samples:	493
Min. value:	0.06
Max. value:	3.92
Mean:	0.22
Median:	0.18
Variance:	0.04
Std. Dev.:	0.20

DATA SOURCE

Stream sediment surveys carried out by the Geological Survey of Greenland in 1991, 1993.

SURVEY SPECIFICATIONS

Sample density:
1991 survey average: 1 per 27 km^2
1993 survey average: 1 per 26 km^2
Sample type:
minerogenic sediment from stream bed or bank as composite of 3–10 subsamples
Size fraction:
< 0.1 mm dry–sieved in laboratory
Method and laboratory:
1991 survey: XRF at GGU
1993 survey: XRF at GGU

DATA PROCESSING

Dot plot illustrating element concentrations at sample sites. Scaling of dot size selected in each case to suppress noise at low concentration levels and enhance anomalous areas or regional features.

Projection: Lambert conformal conic	
Standard parallel:	66° 30' N
Scale factor:	0.99700
Ellipsoid:	Clarke 1866
Datum:	Qornoq
Scale:	1:1 000 000

Ice margins and coast lines digitized from 1:250 000 topographic maps.
Permission No: KMS A.200/87

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The Geological Survey of Greenland
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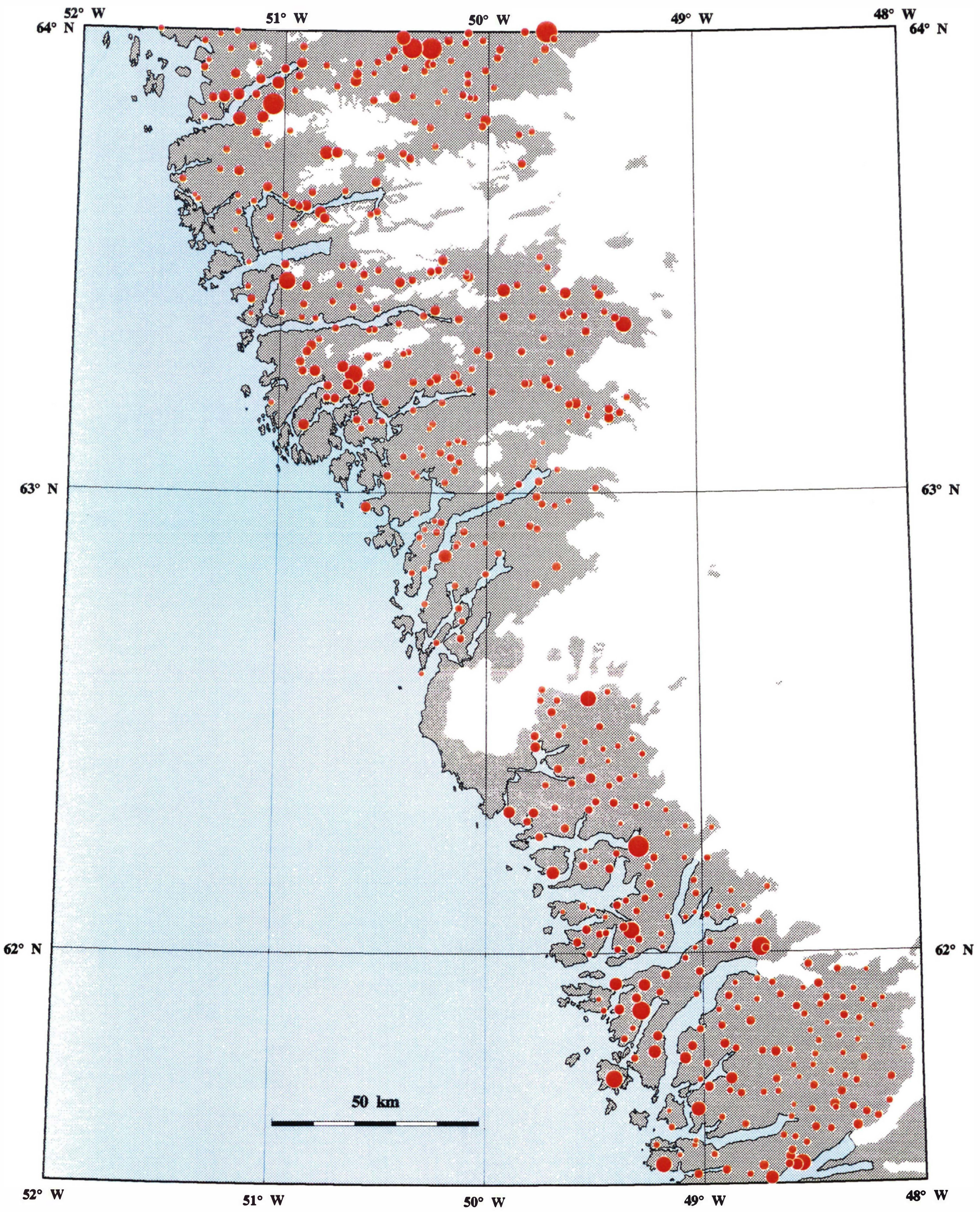
GEOCHEMICAL MAP: P_2O_5 IN STREAM SEDIMENT

94/2-210 Paamiut - Buksefjorden

01-DEC-94



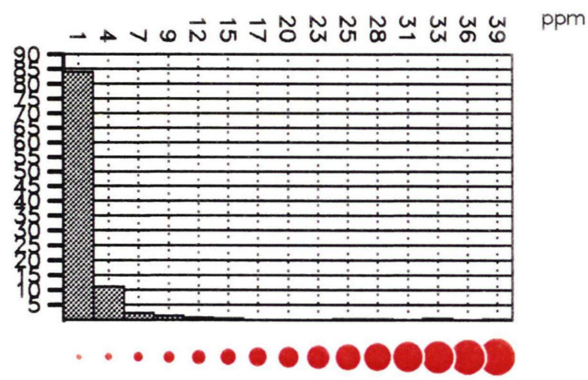
Thematic map 94/2-211

GEOCHEMICAL MAP: As IN STREAM SEDIMENT

Paamiut – Buksefjorden

Compiled by Agnete Steenfelt

FREQUENCY DISTRIBUTION AND SYMBOL SIZE



As ppm

STATISTICAL PARAMETERS
OF ANALYTICAL VALUES

Number of samples:	591
Min. value:	0
Max. value:	140
Mean:	2
Median:	0
Variance:	125
Std. Dev.:	11

DATA SOURCE

Stream sediment surveys carried out by the Geological Survey of Greenland in 1991, 1993.

SURVEY SPECIFICATIONS

Sample density:
  1991 survey average: 1 per 27 km^2
  1993 survey average: 1 per 26 km^2
Sample type:
  minerogenic sediment from stream bed or bank as composite of 3–10 subsamples
Size fraction:
  < 0.1 mm dry–sieved in laboratory
Method and laboratory:
  1991 survey: INA at Actlabs
  1993 survey: INA at Actlabs

DATA PROCESSING

Dot plot illustrating element concentrations at sample sites. Scaling of dot size selected in each case to suppress noise at low concentration levels and enhance anomalous areas or regional features.

Projection:	Lambert conformal conic
Standard parallel:	66° 30' N
Scale factor:	0.99700
Ellipsoid:	Clarke 1866
Datum:	Qornoq
Scale:	1:1 000 000

Ice margins and coast lines digitized from 1:250 000 topographic maps.
Permission No: KMS A.200/87

Released: 01–DEC–1994

GRØNLANDS GEOLOGISKE UNDERSØGELSE
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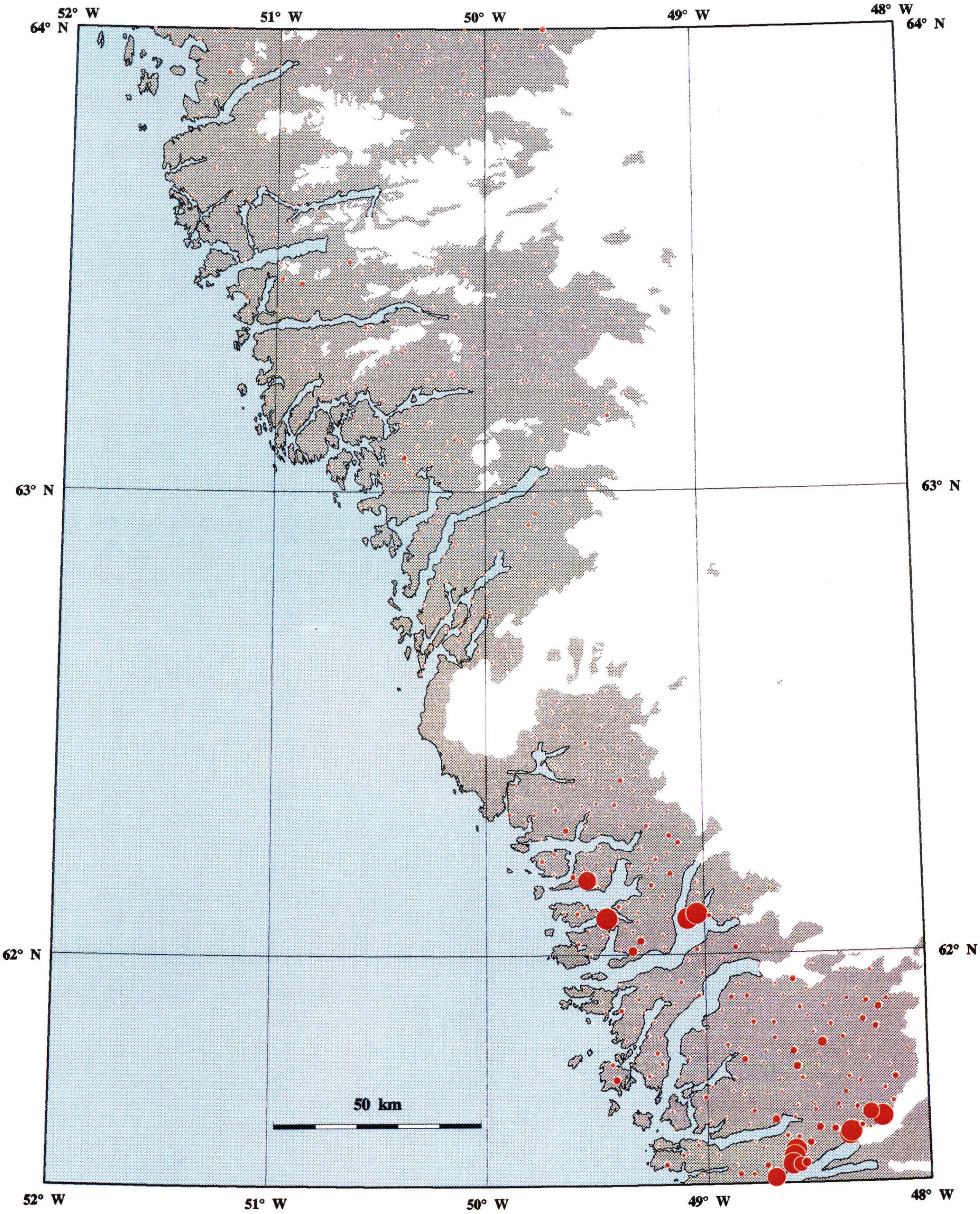
GEOCHEMICAL MAP: As IN STREAM SEDIMENT

94/2-211 Paamiut - Buksefjorden

01-DEC-94



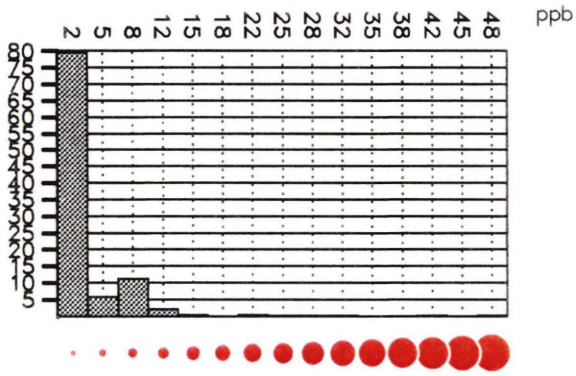
Thematic map 94/2-212

GEOCHEMICAL MAP: Au IN STREAM SEDIMENT

Paamiut – Buksefjorden

Compiled by Agnete Steenfelt

FREQUENCY DISTRIBUTION AND SYMBOL SIZE



Au ppb

STATISTICAL PARAMETERS
OF ANALYTICAL VALUES

Number of samples:	591
Min. value:	0
Max. value:	200
Mean:	3
Median:	0
Variance:	115
Std. Dev.:	11

DATA SOURCE

Stream sediment surveys carried out by the Geological Survey of Greenland in 1991, 1993.

SURVEY SPECIFICATIONS

Sample density:
1991 survey average: 1 per 27 km^2
1993 survey average: 1 per 26 km^2
Sample type:
minerogenic sediment from stream bed or bank as composite of 3–10 subsamples
Size fraction:
< 0.1 mm dry–sieved in laboratory
Method and laboratory:
1991 survey: INA at Actlabs
1993 survey: INA at Actlabs

DATA PROCESSING

Dot plot illustrating element concentrations at sample sites. Scaling of dot size selected in each case to suppress noise at low concentration levels and enhance anomalous areas or regional features.

Projection:	Lambert conformal conic
Standard parallel:	66° 30' N
Scale factor:	0.99700
Ellipsoid:	Clarke 1866
Datum:	Qornoq
Scale:	1:1 000 000

Ice margins and coast lines digitized from 1:250 000 topographic maps.
Permission No: KMS A.200/87

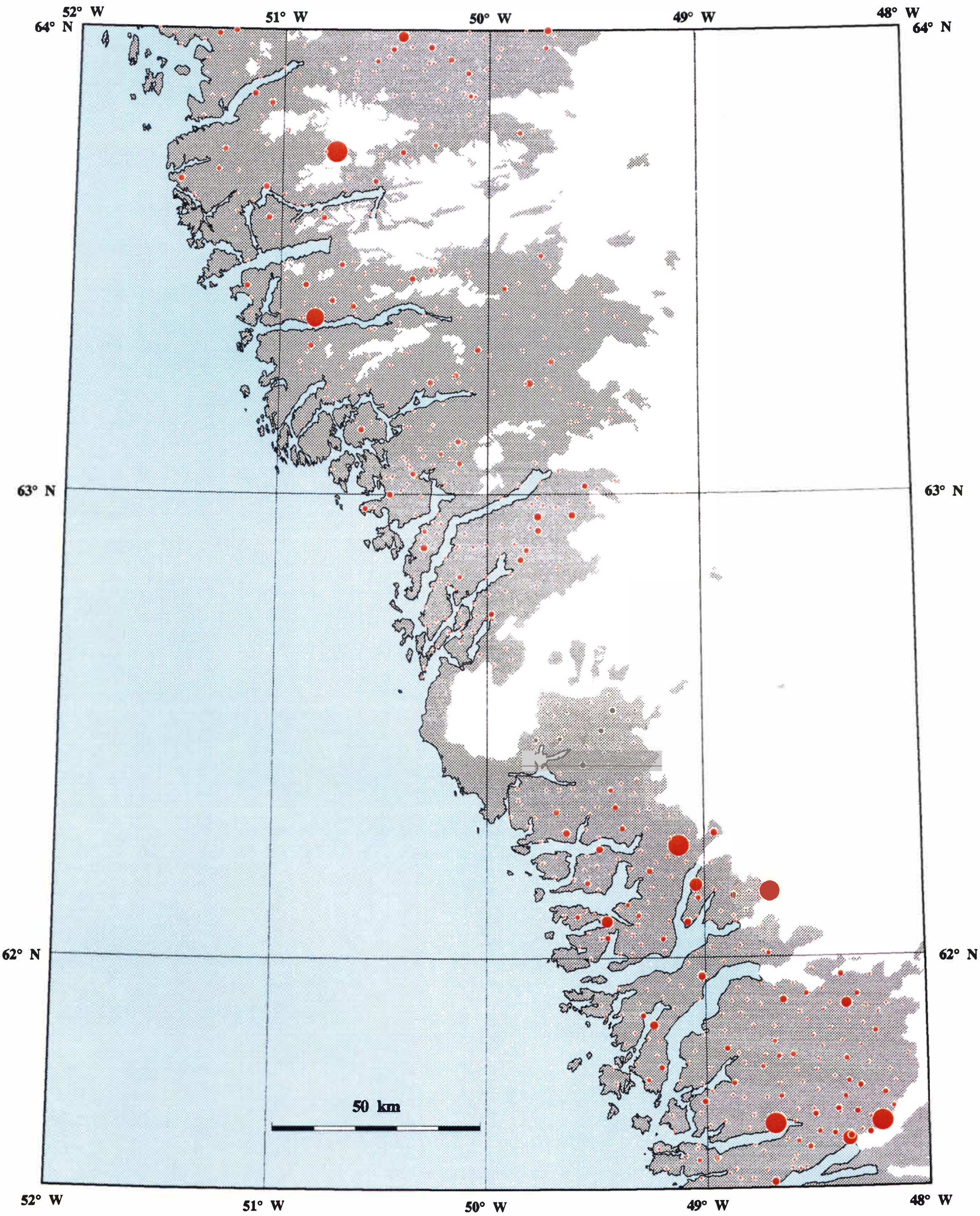
Released: 01–DEC–1994

GRØNLANDS GEOLOGISKE UNDERSØGELSE
The Geological Survey of Greenland
Øster Voldgade 10 DK–1350 København K Danmark

GEOCHEMICAL MAP: Au IN STREAM SEDIMENT

94/2-212 Paamiut - Buksefjorden

01-DEC-94



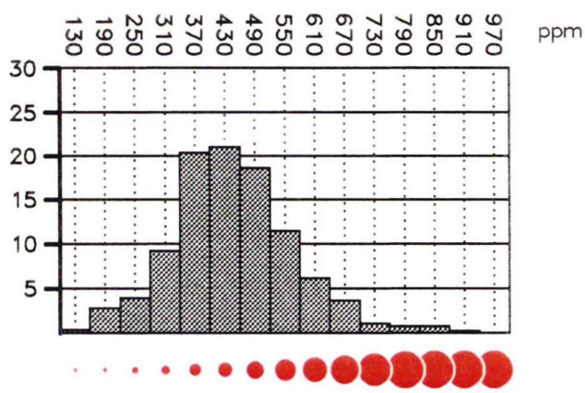
Thematic map 94/2-213

GEOCHEMICAL MAP: Ba IN STREAM SEDIMENT

Paamiut – Buksefjorden

Compiled by Agnete Steenfelt

FREQUENCY DISTRIBUTION AND SYMBOL SIZE



Ba ppm

STATISTICAL PARAMETERS
OF ANALYTICAL VALUES

Number of samples:	591
Min. value:	0
Max. value:	4400
Mean:	448
Median:	430
Variance:	44450
Std. Dev.:	211

DATA SOURCE

Stream sediment surveys carried out by the Geological Survey of Greenland in 1991, 1993.

SURVEY SPECIFICATIONS

Sample density:
- 1991 survey average: 1 per 27 km^2
- 1993 survey average: 1 per 26 km^2

Sample type:
- minerogenic sediment from stream bed or bank as composite of 3–10 subsamples

Size fraction:
- < 0.1 mm dry–sieved in laboratory

Method and laboratory:
- 1991 survey: INA at Actlabs
- 1993 survey: INA at Actlabs

DATA PROCESSING

Dot plot illustrating element concentrations at sample sites. Scaling of dot size selected in each case to suppress noise at low concen–tration levels and enhance anomalous areas or regional features.

Projection: Lambert conformal conic	
Standard parallel:	66° 30' N
Scale factor:	0.99700
Ellipsoid:	Clarke 1866
Datum:	Qornoq
Scale:	1:1 000 000

Ice margins and coast lines digitized from 1:250 000 topographic maps.
Permission No: KMS A.200/87

Released: 01–DEC–1994

GRØNLANDS GEOLOGISKE UNDERSØGELSE
The Geological Survey of Greenland
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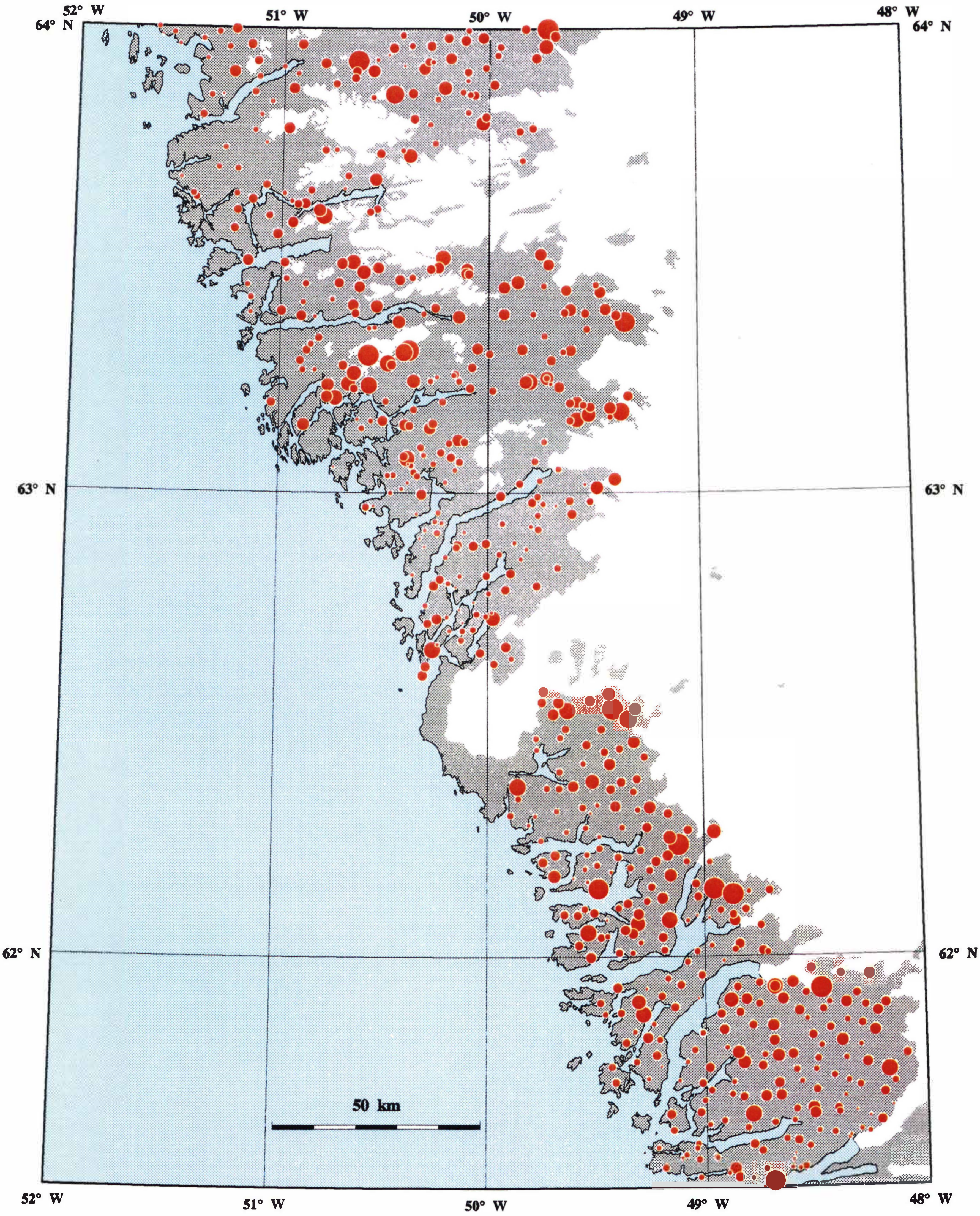
GEOCHEMICAL MAP: Ba IN STREAM SEDIMENT

94/2-213 Paamiut - Buksefjorden 01-DEC-94



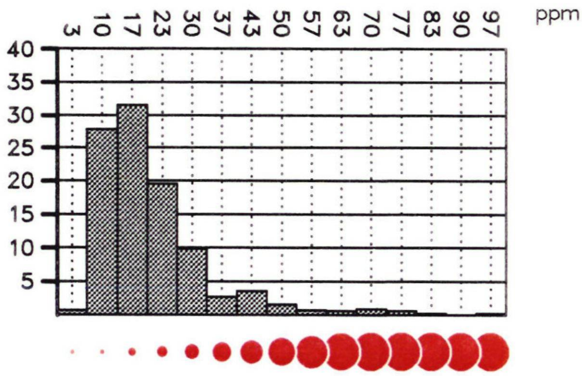
Thematic map 94/2-214

GEOCHEMICAL MAP: Co IN STREAM SEDIMENT

Paamiut – Buksefjorden

Compiled by Agnete Steenfelt

FREQUENCY DISTRIBUTION AND SYMBOL SIZE



Co ppm

STATISTICAL PARAMETERS
OF ANALYTICAL VALUES

Number of samples:	591
Min. value:	0
Max. value:	100
Mean:	21
Median:	17
Variance:	164
Std. Dev.:	13

DATA SOURCE

Stream sediment surveys carried out by the Geological Survey of Greenland in 1991, 1993.

SURVEY SPECIFICATIONS

Sample density:
1991 survey average: 1 per 27 km^2
1993 survey average: 1 per 26 km^2
Sample type:
minerogenic sediment from stream bed or bank as composite of 3–10 subsamples
Size fraction:
< 0.1 mm dry–sieved in laboratory
Method and laboratory:
1991 survey: INA at Actlabs
1993 survey: INA at Actlabs

DATA PROCESSING

Dot plot illustrating element concentrations at sample sites. Scaling of dot size selected in each case to suppress noise at low concentration levels and enhance anomalous areas or regional features.

Projection: Lambert conformal conic

Standard parallel:	66° 30' N
Scale factor:	0.99700
Ellipsoid:	Clarke 1866
Datum:	Qornoq
Scale:	1:1 000 000

Ice margins and coast lines digitized from 1:250 000 topographic maps.
Permission No: KMS A.200/87

Released: 01–DEC–1994

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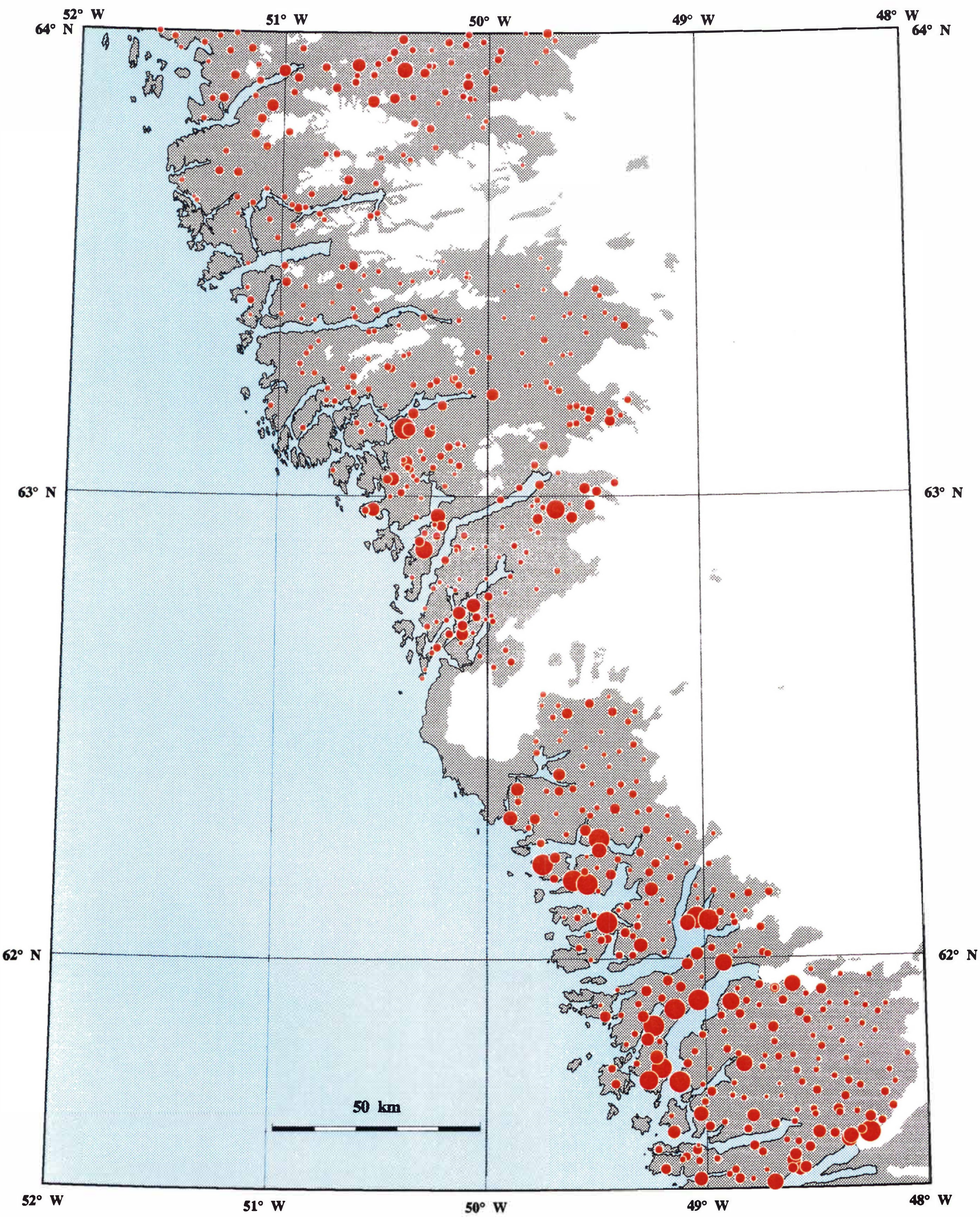
GEOCHEMICAL MAP: Co IN STREAM SEDIMENT

94/2-214 Paamiut - Buksefjorden 01-DEC-94



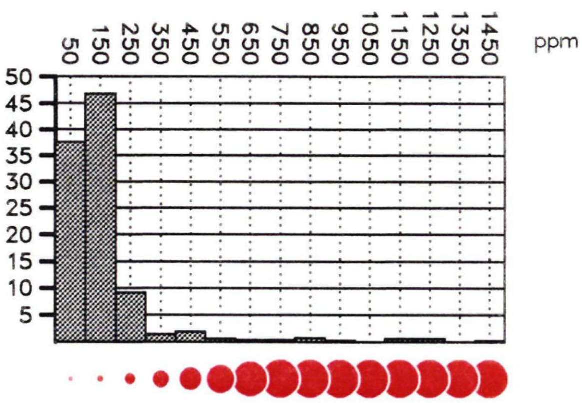
Thematic map 94/2–215

GEOCHEMICAL MAP: Cr IN STREAM SEDIMENT

Paamiut – Buksefjorden

Compiled by Agnete Steenfelt

FREQUENCY DISTRIBUTION AND SYMBOL SIZE



Cr ppm

STATISTICAL PARAMETERS
OF ANALYTICAL VALUES

Number of samples:	591
Min. value:	0
Max. value:	2300
Mean:	156
Median:	110
Variance:	33126
Std. Dev.:	182

DATA SOURCE

Stream sediment surveys carried out by the Geological Survey of Greenland in 1991, 1993.

SURVEY SPECIFICATIONS

Sample density:
1991 survey average: 1 per 27 km^2
1993 survey average: 1 per 26 km^2
Sample type:
minerogenic sediment from stream bed or bank as composite of 3–10 subsamples
Size fraction:
< 0.1 mm dry–sieved in laboratory
Method and laboratory:
1991 survey: INA at Actlabs
1993 survey: INA at Actlabs

DATA PROCESSING

Dot plot illustrating element concentrations at sample sites. Scaling of dot size selected in each case to suppress noise at low concen–tration levels and enhance anomalous areas or regional features.

Projection: Lambert conformal conic

Standard parallel:	66° 30' N
Scale factor:	0.99700
Ellipsoid:	Clarke 1866
Datum:	Qornoq
Scale:	1:1 000 000

Ice margins and coast lines digitized from 1:250 000 topographic maps.
Permission No: KMS A.200/87

Released: 01–DEC–1994

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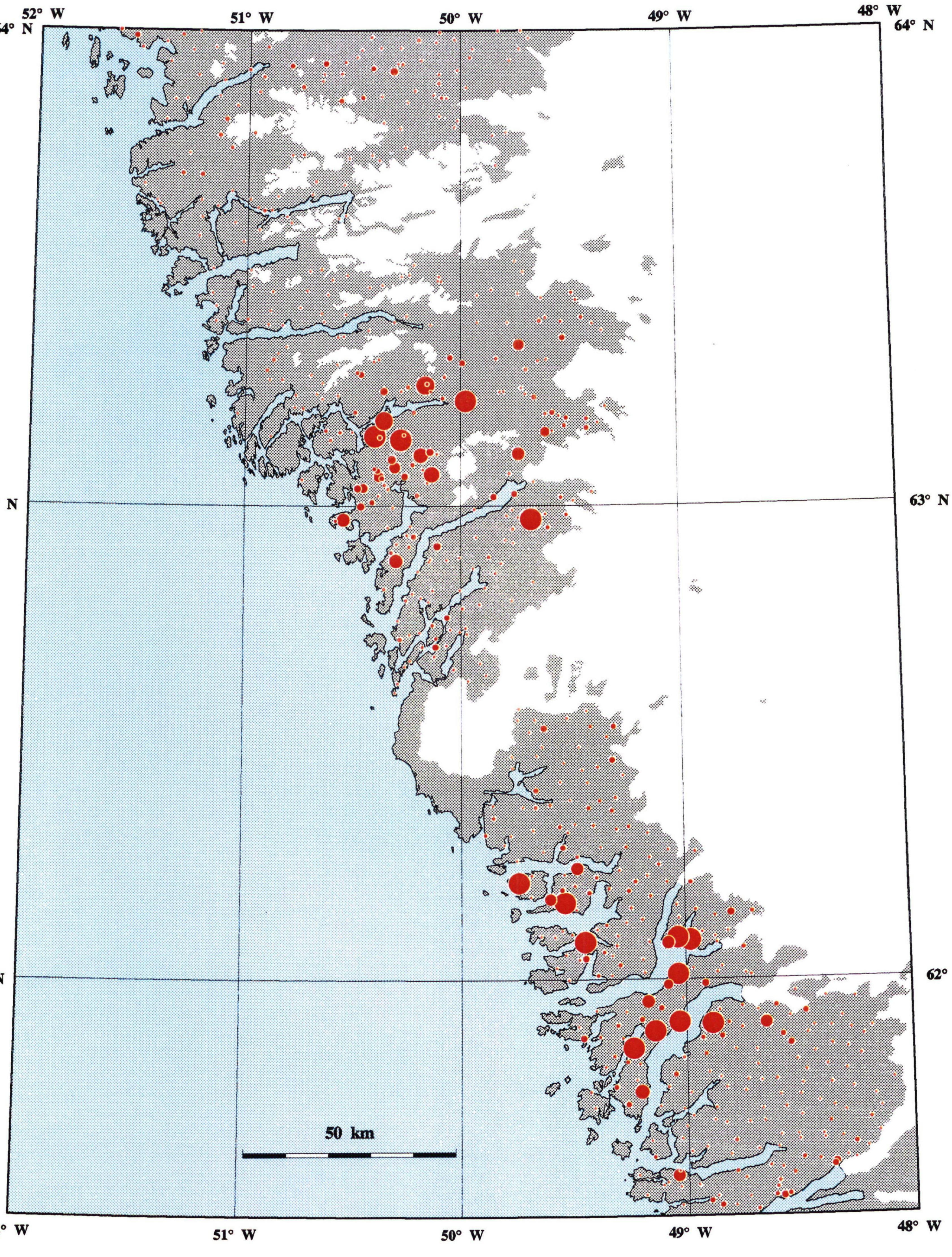
The Geological Survey of Greenland
Øster Voldgade 10 DK–1350 København K Danmark

GGU

GEOCHEMICAL MAP: Cr IN STREAM SEDIMENT

94/2-215 Paamiut - Buksefjorden

01-DEC-94



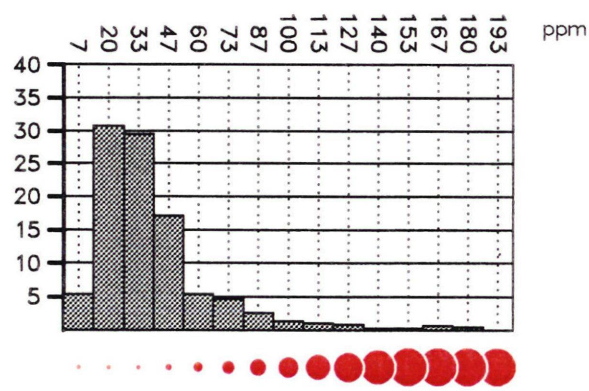
Thematic map 94/2-216

GEOCHEMICAL MAP: Cu IN STREAM SEDIMENT

Paamiut – Buksefjorden

Compiled by Agnete Steenfelt

FREQUENCY DISTRIBUTION AND SYMBOL SIZE



Cu ppm

STATISTICAL PARAMETERS
OF ANALYTICAL VALUES

Number of samples:	471
Min. value:	5
Max. value:	265
Mean:	40
Median:	32
Variance:	975
Std. Dev.:	31

DATA SOURCE

Stream sediment surveys carried out by the Geological Survey of Greenland in 1991, 1993.

SURVEY SPECIFICATIONS

Sample density:
- 1991 survey average: 1 per 27 km^2
- 1993 survey average: 1 per 26 km^2

Sample type:
- minerogenic sediment from stream bed or bank as composite of 3–10 subsamples

Size fraction:
- < 0.1 mm dry–sieved in laboratory

Method and laboratory:
- 1991 survey: AAS at GGU
- 1993 survey: AAS at GGU

DATA PROCESSING

Dot plot illustrating element concentrations at sample sites. Scaling of dot size selected in each case to suppress noise at low concentration levels and enhance anomalous areas or regional features.

Projection:	Lambert conformal conic
Standard parallel:	66° 30' N
Scale factor:	0.99700
Ellipsoid:	Clarke 1866
Datum:	Qornoq
Scale:	1:1 000 000

Ice margins and coast lines digitized from 1:250 000 topographic maps.
Permission No: KMS A.200/87

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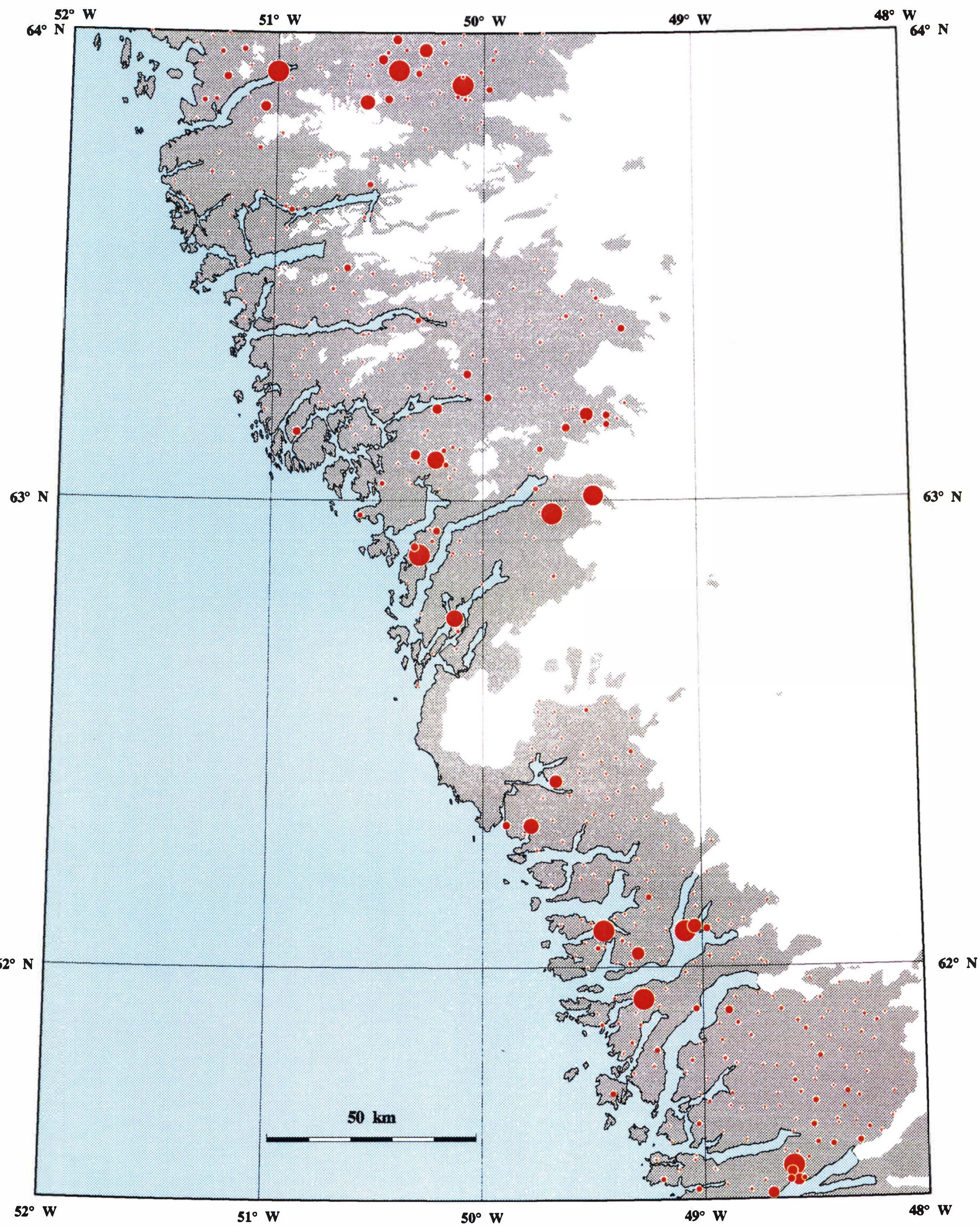
GEOCHEMICAL MAP : Cu IN STREAM SEDIMENT

94/2-216 Paamiut - Buksefjorden

01-DEC-94



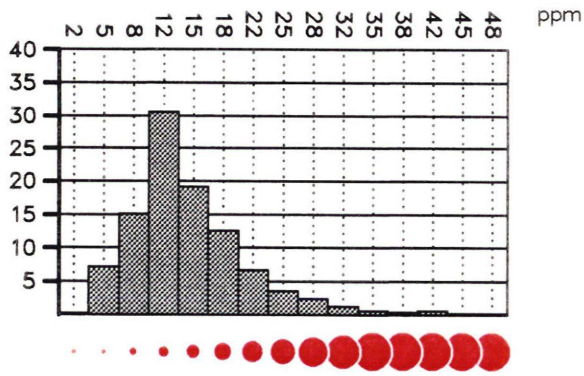
Thematic map 94/2-217

GEOCHEMICAL MAP: Hf IN STREAM SEDIMENT

Paamiut – Buksefjorden

Compiled by Agnete Steenfelt

FREQUENCY DISTRIBUTION AND SYMBOL SIZE



Hf ppm

STATISTICAL PARAMETERS
OF ANALYTICAL VALUES

Number of samples:	591
Min. value:	3
Max. value:	63
Mean:	14
Median:	13
Variance:	47
Std. Dev.:	7

DATA SOURCE

Stream sediment surveys carried out by the Geological Survey of Greenland in 1991, 1993.

SURVEY SPECIFICATIONS

Sample density:
1991 survey average: 1 per 27 km^2
1993 survey average: 1 per 26 km^2
Sample type:
minerogenic sediment from stream bed or bank as composite of 3–10 subsamples
Size fraction:
< 0.1 mm dry–sieved in laboratory
Method and laboratory:
1991 survey: INA at Actlabs
1993 survey: INA at Actlabs

DATA PROCESSING

Dot plot illustrating element concentrations at sample sites. Scaling of dot size selected in each case to suppress noise at low concentration levels and enhance anomalous areas or regional features.

Projection: Lambert conformal conic

Standard parallel:	66° 30' N
Scale factor:	0.99700
Ellipsoid:	Clarke 1866
Datum:	Qornoq
Scale:	1:1 000 000

Ice margins and coast lines digitized from 1:250 000 topographic maps.
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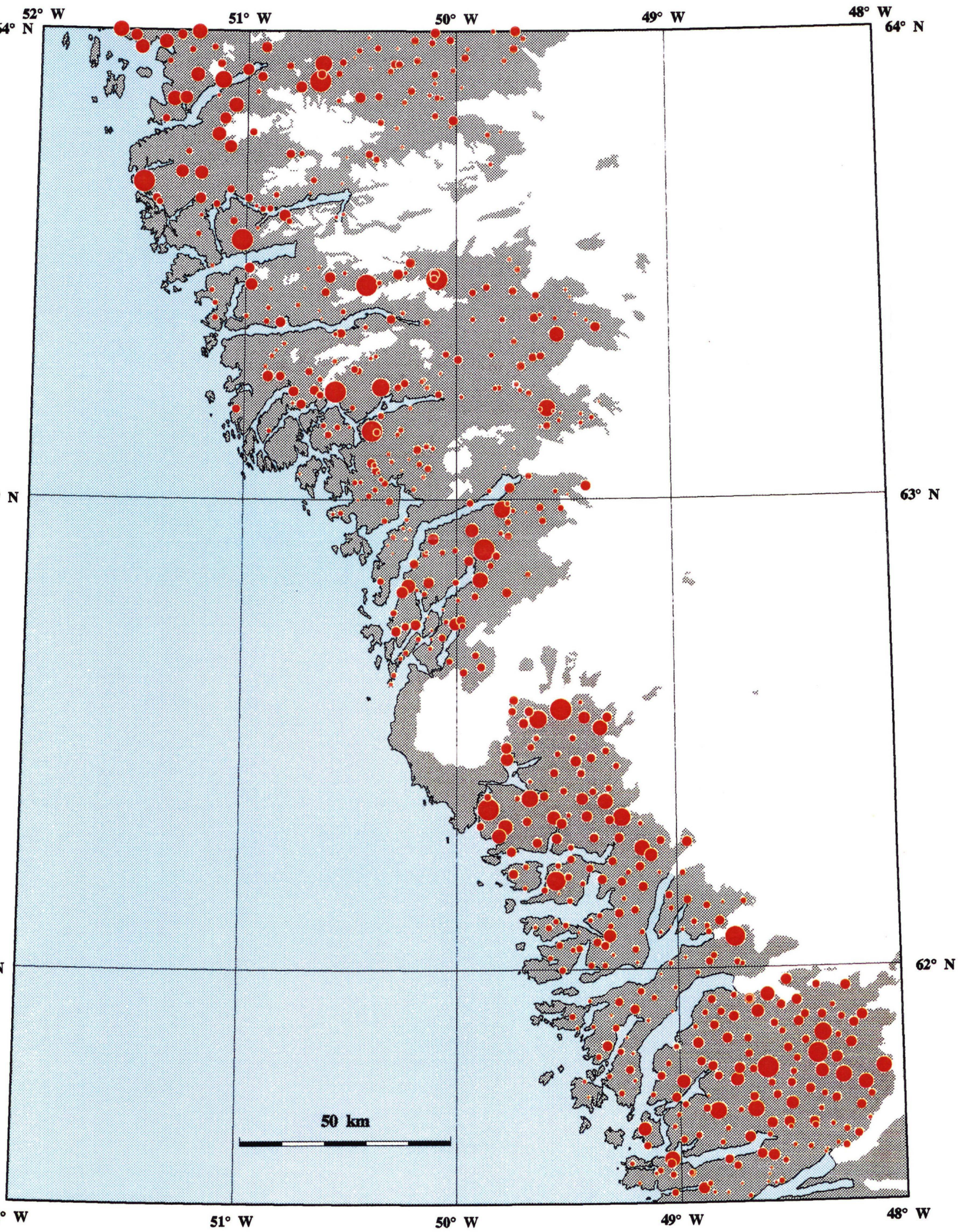
GGU

GEOCHEMICAL MAP: Hf IN STREAM SEDIMENT

94/2-217 Paamiut - Buksefjorden

01-DEC-94



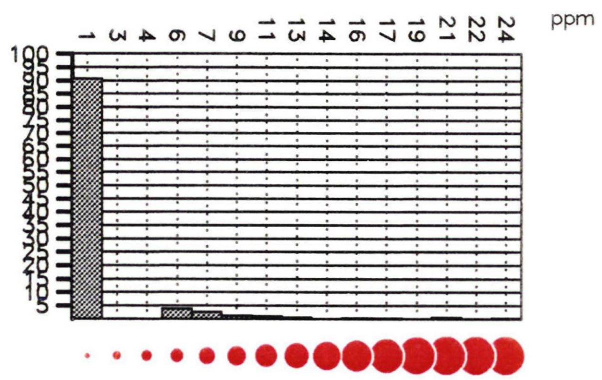
Thematic map 94/2–218

GEOCHEMICAL MAP: Mo IN STREAM SEDIMENT

Paamiut – Buksefjorden

Compiled by Agnete Steenfelt

FREQUENCY DISTRIBUTION AND SYMBOL SIZE



Mo ppm

STATISTICAL PARAMETERS
OF ANALYTICAL VALUES

Number of samples:	590
Min. value:	0
Max. value:	24
Mean:	1
Median:	0
Variance:	8
Std. Dev.:	3

DATA SOURCE

Stream sediment surveys carried out by the Geological Survey of Greenland in 1991, 1993.

SURVEY SPECIFICATIONS

Sample density:
1991 survey average: 1 per 27 km^2
1993 survey average: 1 per 26 km^2
Sample type:
minerogenic sediment from stream bed or bank as composite of 3–10 subsamples
Size fraction:
< 0.1 mm dry–sieved in laboratory
Method and laboratory:
1991 survey: INA at Actlabs
1993 survey: INA at Actlabs

DATA PROCESSING

Dot plot illustrating element concentrations at sample sites. Scaling of dot size selected in each case to suppress noise at low concen–tration levels and enhance anomalous areas or regional features.

Projection: Lambert conformal conic	
Standard parallel:	66° 30' N
Scale factor:	0.99700
Ellipsoid:	Clarke 1866
Datum:	Qornoq
Scale:	1:1 000 000

Ice margins and coast lines digitized from 1:250 000 topographic maps.
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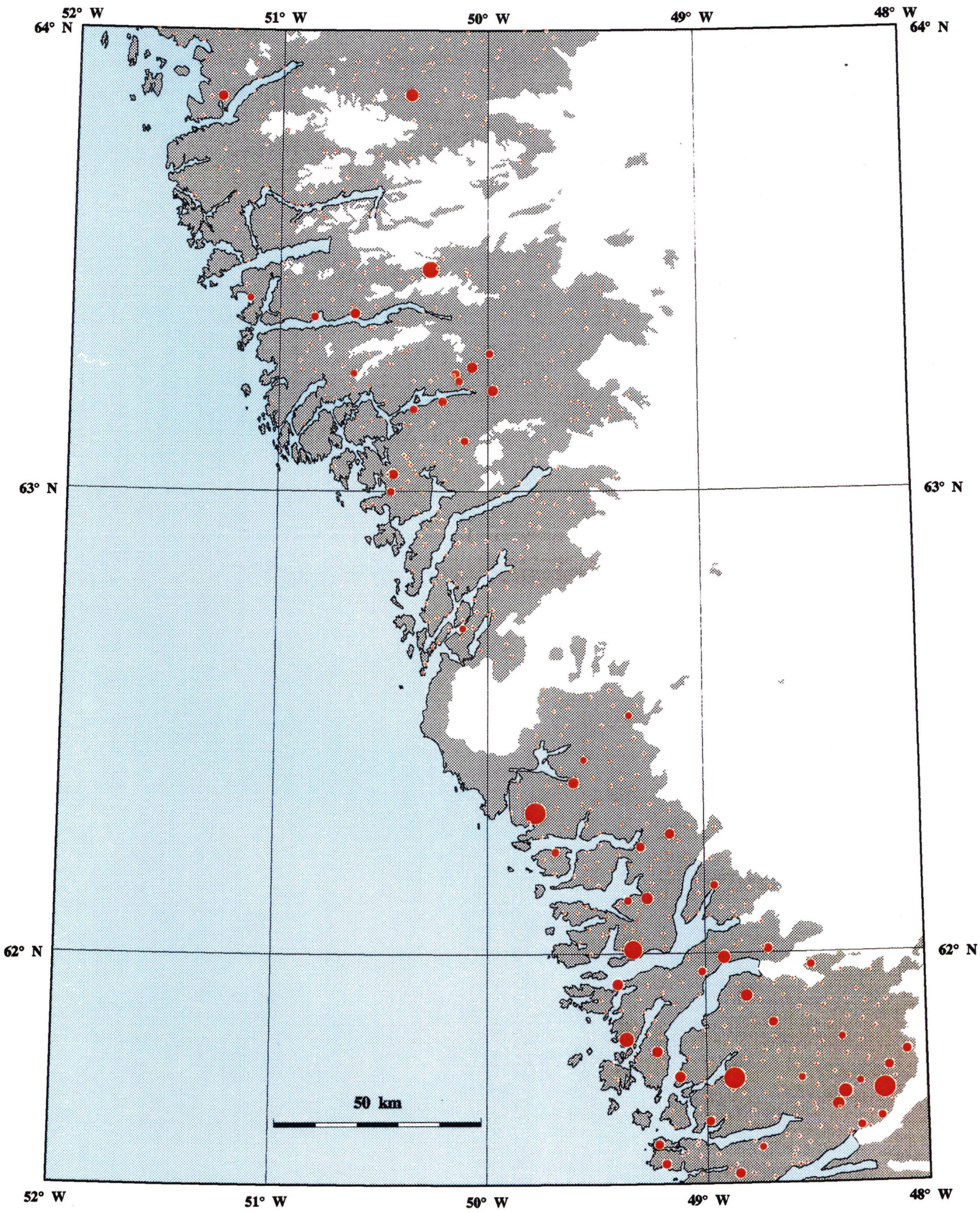
GEOCHEMICAL MAP: Mo IN STREAM SEDIMENT

94/2-218 Paamiut - Buksefjorden

01-DEC-94



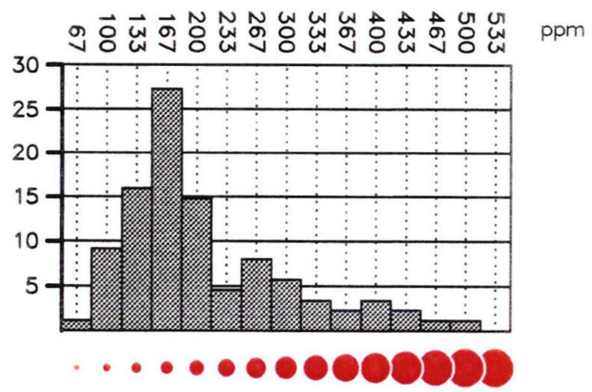
Thematic map 94/2-219

GEOCHEMICAL MAP: Ni IN STREAM SEDIMENT

Paamiut – Buksefjorden

Compiled by Agnete Steenfelt

FREQUENCY DISTRIBUTION AND SYMBOL SIZE



Ni ppm

STATISTICAL PARAMETERS
OF ANALYTICAL VALUES

Number of samples:	591
Min. value:	0
Max. value:	610
Mean:	33
Median:	0
Variance:	7782
Std. Dev.:	88

DATA SOURCE

Stream sediment surveys carried out by the Geological Survey of Greenland in 1991, 1993.

SURVEY SPECIFICATIONS

Sample density:
1991 survey average: 1 per 27 km^2
1993 survey average: 1 per 26 km^2
Sample type:
minerogenic sediment from stream bed or bank as composite of 3–10 subsamples
Size fraction:
< 0.1 mm dry-sieved in laboratory
Method and laboratory:
1991 survey: INA at Actlabs
1993 survey: INA at Actlabs

DATA PROCESSING

Dot plot illustrating element concentrations at sample sites. Scaling of dot size selected in each case to suppress noise at low concentration levels and enhance anomalous areas or regional features.

Projection: Lambert conformal conic	
Standard parallel:	66° 30' N
Scale factor:	0.99700
Ellipsoid:	Clarke 1866
Datum:	Qornoq
Scale:	1:1 000 000

Ice margins and coast lines digitized from 1:250 000 topographic maps.
Permission No: KMS A.200/87

Released: 01-DEC-1994

GRØNLANDS GEOLOGISKE UNDERSØGELSE
The Geological Survey of Greenland
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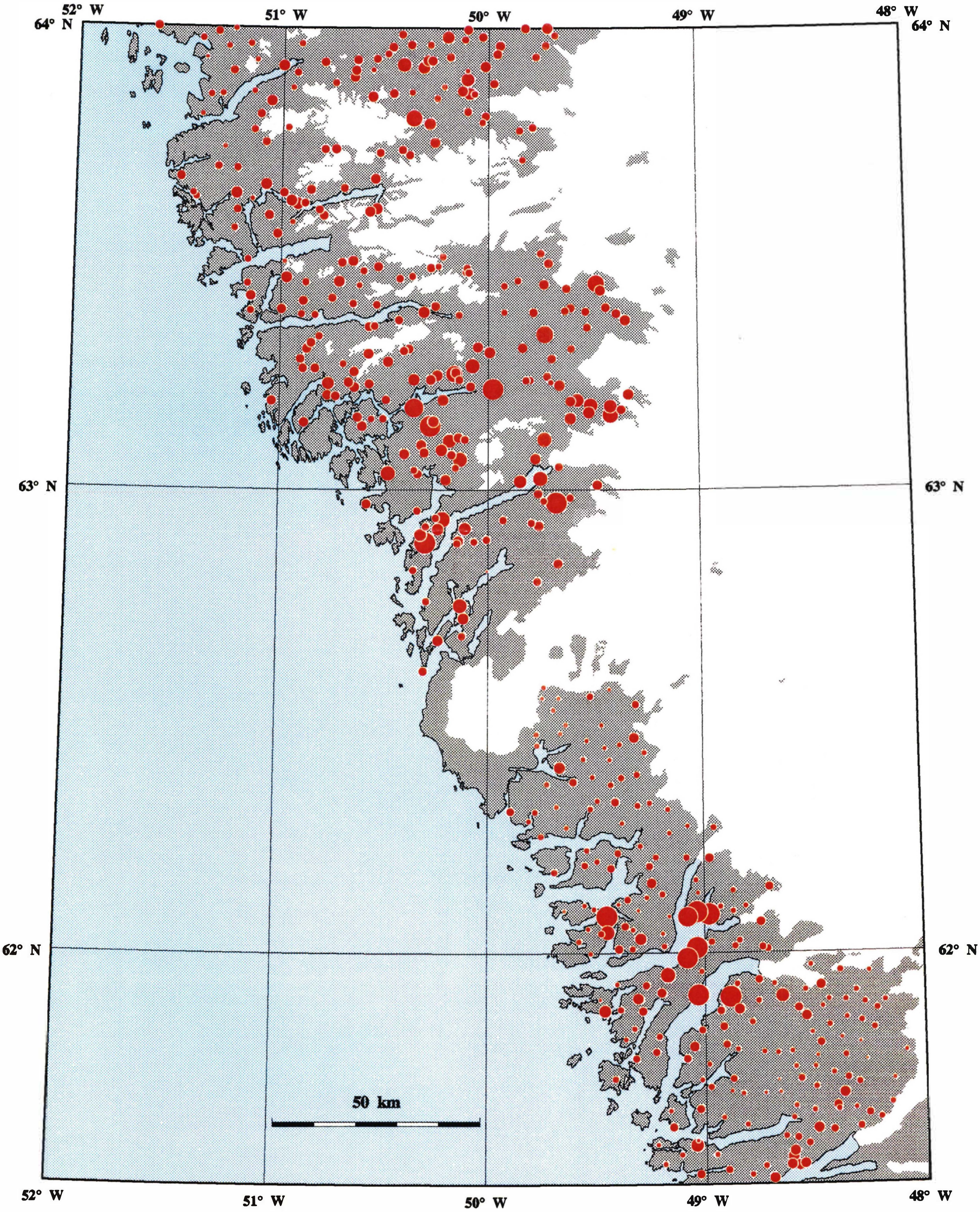
GEOCHEMICAL MAP: Ni IN STREAM SEDIMENT

94/2-219 Paamiut - Buksefjorden

01-DEC-94



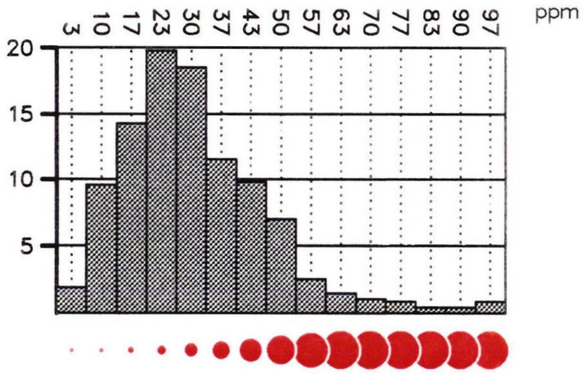
Thematic map 94/2-220

GEOCHEMICAL MAP: Rb IN STREAM SEDIMENT

Paamiut – Buksefjorden

Compiled by Agnete Steenfelt

FREQUENCY DISTRIBUTION AND SYMBOL SIZE



Rb ppm

STATISTICAL PARAMETERS
OF ANALYTICAL VALUES

Number of samples:	471
Min. value:	0
Max. value:	101
Mean:	31
Median:	28
Variance:	282
Std. Dev.:	17

DATA SOURCE

Stream sediment surveys carried out by the Geological Survey of Greenland in 1991, 1993.

SURVEY SPECIFICATIONS

Sample density:
- 1991 survey average: 1 per 27 km^2
- 1993 survey average: 1 per 26 km^2

Sample type:
- minerogenic sediment from stream bed or bank as composite of 3–10 subsamples

Size fraction:
- < 0.1 mm dry–sieved in laboratory

Method and laboratory:
- 1991 survey: XRF at GGU
- 1993 survey: XRF at GGU

DATA PROCESSING

Dot plot illustrating element concentrations at sample sites. Scaling of dot size selected in each case to suppress noise at low concentration levels and enhance anomalous areas or regional features.

Projection: Lambert conformal conic	
Standard parallel:	66° 30' N
Scale factor:	0.99700
Ellipsoid:	Clarke 1866
Datum:	Qornoq
Scale:	1:1 000 000

Ice margins and coast lines digitized from 1:250 000 topographic maps.
Permission No: KMS A.200/87

Released: 01–DEC–1994

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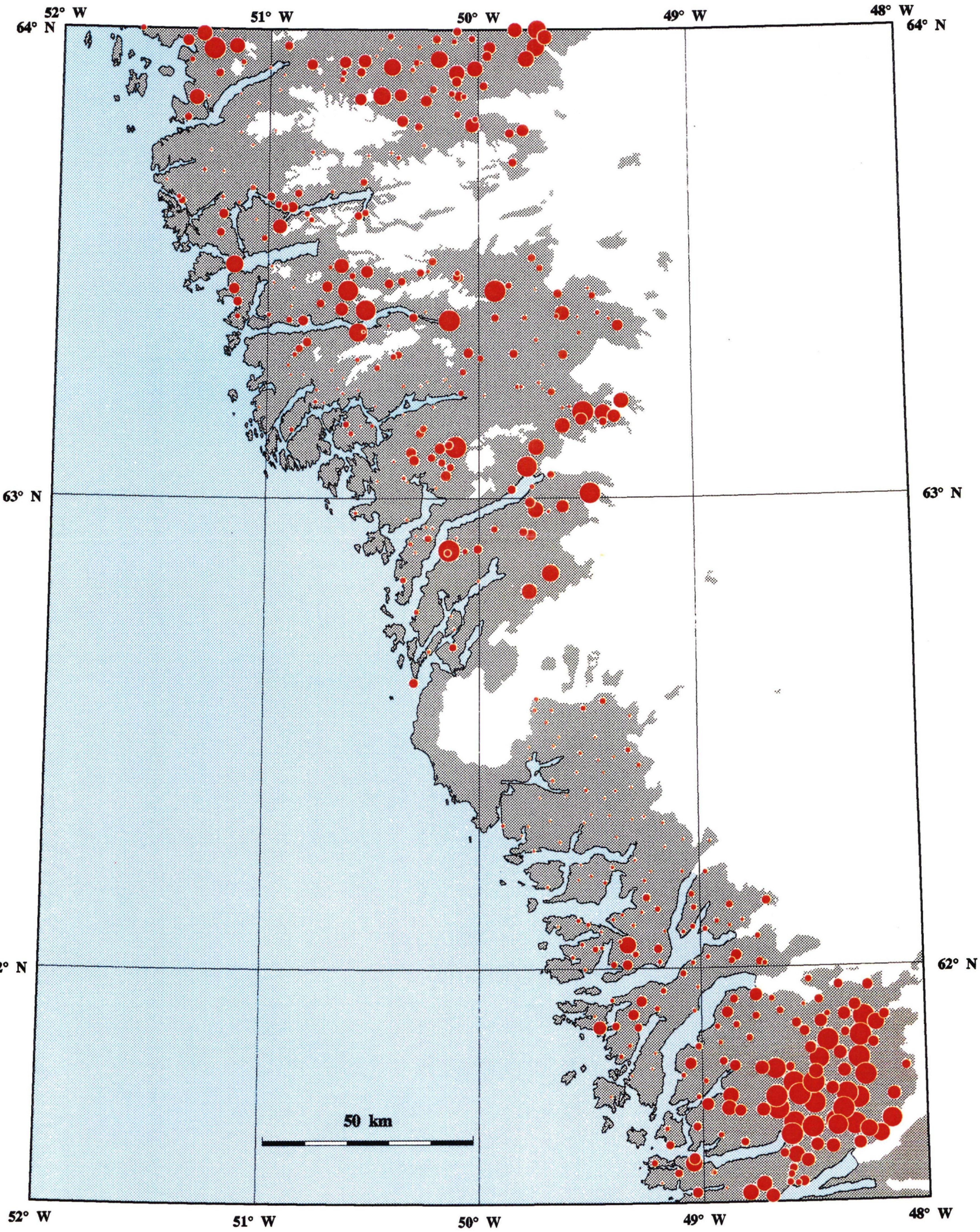
GEOCHEMICAL MAP: Rb IN STREAM SEDIMENT

94/2-220 Paamiut - Buksefjorden

01-DEC-94



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