LEGEND

POST-OROGENIC GRAVELS

QUATERNARY
PLEISTOCENE AND HOLOCENE

Q	fluvial and glaciofluvial gravels, diamictite, scattered erratics, minor peat (mapped only where the nature of bedrock cannot be inferred)

NEOGENE AND QUATERNARY
PLIOCENE AND PLEISTOCENE

TBQ	"BRASKERUDS" beds and glacio-fluvial drift, undivided (see also Note 6): Sand, fine to coarse grained, quartzose, unconsolidated, cross-stratified; silt; gravel; minor uncoalified wood, leaves, peat, mud; **fluvial, swamp and lacustrine deposits;** unconformably overlain by unconsolidated or locally cemented glaciofluvial gravels, diamictite and scattered erratics; **periglacial**

SVERDRUP BASIN SUCCESSION

EUREKA SOUND GROUP (TBL – TM)

PALEOGENE

TM	MARGARET FORMATION (Paleocene – Eocene): Sandstone, quartzose, fine to medium grained, yellowish orange and pale yellowish grey weathering; lignite, locally fused and stained red; siltstone; minor mudrock; local conglomerate at base; **deltaic and nonmarine**
TSL, TU	"SPLIT LAKE" beds (TSL; Paleocene): Conglomerate, pebble to boulder grade with granitoid gneiss clasts; arkose; quartz sandstone; minor siltstone, shale and coal; TU: unnamed carbonate clast conglomerate; minor sandstone; **alluvial fan**
TMM	MOUNT MOORE FORMATION (Paleocene): Sandstone, quartzose, variably calcite-cemented or uncemented, cross-stratified, pale to moderate yellowish brown, greyish orange weathering; abundant detrital coal fragments; siltstone; marl; mudrock; **deltaic and nearshore marine**
TBL	MOUNT BELL and MOUNT LAWSON FORMATIONS, undivided (Paleocene, possible Maastrichtian at base): mudrock, with intercalated and thin bedded sandstone and siltstone, moderate to dark brownish grey weathering; minor lignite coal; abundant silicified wood; basal thin unit of sandstone, quartzose, cross-stratified, white to dark yellowish orange weathering; lignite coal; **fluvial and open marine** (see also Note 5)

FRANKLINIAN SUCCESSION

OKSE BAY GROUP (DSF-DHG)

DEVONIAN
UPPER DEVONIAN

DHG	HELL GATE FORMATION (Frasnian): Sandstone, minor siltstone and coal. Sandstone: yellow to orange weathering, fine and medium grained; medium and thin bedded, trough and planar cross-stratified, scattered pebbles, shale chip conglomerate. Siltstone: green and red weathering; thin bedded, recessive, **braided fluvial**
DF	FRAM FORMATION (Frasnian): Sandstone and siltstone. Sandstone: locally calcareous, dusky red and white weathering, fine grained; thick to thin bedded, abundant trough cross-stratification; common fining and coarsening-upward sequences. Siltstone: calcareous dusky red and green weathering; thin bedded, **meandering fluvial**

MIDDLE DEVONIAN

DHB	HECLA BAY FORMATION (Givetian): Sandstone: rare chert pebbles, pale to moderate yellowish orange and yellowish grey weathering, fine to medium grained; thick bedded, planar and trough cross-stratified; **braided fluvial**

LOWER AND MIDDLE DEVONIAN

DSF	STRATHCONA FIORD FORMATION (Emsian and Eifelian): Sandstone, siltstone, mudrock, minor conglomerate and limestone. Sandstone: quartzose, micaceous, and calcareous, dusky red and yellowish green weathering; thin to thick bedded, abundant cross-stratification. Siltstone and mudrock: micaceous, dusky red weathering; thin bedded, planar parallel and cross-stratification, mudcracks. Conglomerate: yellowish grey, pebble and granule grade; thick bedded. Limestone: light brown weathering, thin bedded; abundant crinoids; **meandering, braided fluvial, marine**

LOWER DEVONIAN

DBLU	BLUE FIORD FORMATION (Emsian; see also Note 4) Members 2 and 3 (undivided): Member 3. Dolostone and limestone: yellow and yellowish brown weathering; thick bedded, fenestral; vuggy porosity locally; fossiliferous to unfossiliferous; **open shelf** Member 2. Dolostone, limestone, siltstone, minor gypsum and anhydrite. Limestone and dolostone: silty, dusky red and yellowish green weathering; thin bedded; recessive. Siltstone: dusky red and pale yellowish green weathering; thin bedded; planar, parallel lamination, ripple marks. Gypsum and anhydrite: white and moderate red weathering; nodular and laminated; **restricted marine, paralic, floodplain**
DBLI	Member 1. Limestone, minor dolostone and sandstone. Limestone and dolostone: yellowish grey weathering; medium to thick bedded, bioturbated; abundant fossils; locally fenestral, biostromal, and biohermal. Sandstone: calcareous; pale yellowish brown and dusky yellow weathering; thin bedded, massive; **open shelf**
DV	VENDOM FIORD FORMATION (Emsian): Dolostone, conglomerate, gypsum, rare sandstone and siltstone. Dolostone: variably arenaceous, dusky red, yellowish green, and yellowish brown weathering; thin to thick bedded; rare skeletal fragments; moldic porosity. Sandstone: dusky red and pale yellowish brown weathering; locally cross-stratified. Siltstone: gypsiferous locally, moderate red and yellow grey weathering; thin bedded recessive. Conglomerate; yellowish grey weathering, granule to cobble, rarely boulder, grade carbonate clasts; thick bedded. Gypsum; white, orange and moderate red weathering; planar parallel lamination and nodular; **fluvial, paralic, restricted proximal shelf** (see also Note 3)

SILURIAN AND DEVONIAN
UPPER SILURIAN AND LOWER DEVONIAN

SDG	GOOSE FIORD FORMATION (Ludlow to ?Emsian): Dolostone, limestone, minor sandstone. Dolostone: light grey, yellowish grey, and pale yellowish brown weathering; thin to thick bedded, resistant; locally very fossiliferous. Limestone: yellowish grey and pale yellowish brown weathering; thick to medium bedded; abundant brachiopods, corals, stromatoporoids; numerous chert nodules, silicified trilobites and atrypids in basal part of formation; locally common stromatoporoid-coral bioherms and biostromes. Sandstone: yellowish grey weathering, fine grained; thick to medium bedded, cross-stratified and massive; **restricted and open marine**

SILURIAN
UPPER SILURIAN

SD	DOURO FORMATION (Ludlow): Limestone: locally argillaceous and dolomitic; yellowish grey, pale yellow brown, and pale yellowish green weathering; thick and medium bedded, locally burrow-mottled; abundant atrypid brachiopods and corals; rare coral-sponge bioherms; **open marine**
SCS	CAPE STORM FORMATION (Ludlow): Dolostone: minor silt; light grey and yellowish grey weathering; medium bedded, planar parallel lamination, abundant silicified mudcracks; **restricted marine**

ORDOVICIAN AND SILURIAN
UPPER ORDOVICIAN TO UPPER SILURIAN

OSA	ALLEN BAY FORMATION (Ashgill to Ludlow?) Upper part. Limestone: dolomitic, yellowish grey; very thick bedded, bioturbation structures; domal and laminar stromatolites, rare brachiopods; **restricted and open marine** Middle part. Dolostone: locally abundant silicification, yellowish grey and pale yellowish brown weathering; thick bedded; abundant vuggy and biomoldic porosity; bitumen stained locally; abundant pentamerid brachiopods, stromatoporoids, corals, and crinoids; rare stromatoporoid-coral biostromes; **open marine** Lower part. Limestone: dolomitic, light grey and yellowish grey weathering; thick bedded burrow-mottled; sparsely fossiliferous; **open marine**

CORNWALLIS GROUP (OCB, OCTI)

ORDOVICIAN
UPPER ORDOVICIAN

OCTI	THUMB MOUNTAIN AND IRENE BAY FORMATIONS (undivided): IRENE BAY FORMATION (Ashgill): Limestone and minor mudrock. Limestone: argillaceous, pale greenish yellow and yellowish grey weathering; medium bedded; rubbly weathering; abundant trilobite fragments, receptaculitids, corals, brachiopods, bryozoans, crinoids, and cephalopods. Mudrock: calcareous, pale greenish yellow weathering; thin bedded; limestone nodules; **open marine** THUMB MOUNTAIN FORMATION (Caradoc): Limestone: dolomitic, light grey and yellowish grey weathering; thick bedded; burrow mottled; rare crinoid ossicles, corals, gastropods (**Maclurites**), and cephalopods; white chert nodules in upper part; **open marine**

LOWER AND MIDDLE ORDOVICIAN

OCB	BAY FIORD FORMATION (Arenig to Llandeilo): Upper part. Dolostone: greyish green and yellowish grey weathering; thin bedded, abundant planar parallel lamination, rare mudcracks; **restricted marine** Middle part. Limestone and minor dolostone. Dolostone: as in upper part. Limestone: dolomitic, pale yellowish brown; thick bedded; burrow-mottled and locally fenestral; petroliferous; sparse fossils, including fragmentary and disarticulated trilobites, gastropods, crinoids, and brachiopods; **open marine** Lower part. Limestone, dolostone, mudrock, locally abundant gypsum and/or breccia at the base. Dolostone and limestone: light grey, pale yellowish green, and yellowish grey weathering; thin to medium bedded, abundant planar parallel lamination. Mudrock: calcareous and locally gypsiferous, light grey weathering; fissile, friable. Gypsum: white weathering; planar parallel laminated; intensely tectonized. Breccia: particulate rubble packbreccia; angular dolostone and limestone lithoclasts; **restricted marine**

LOWER ORDOVICIAN

OE	ELEANOR RIVER FORMATION (Tremadoc and Arenig): Limestone and dolostone. Limestone: dolomitic, pale yellowish brown and light grey weathering; thick bedded, massive and burrow mottled; abundant chert nodules and silicified mottles. Dolostone: light grey weathering; thin to medium bedded, planar parallel lamination and mudcracks; **restricted and open marine**
OB	BAUMANN FIORD FORMATION (Tremadoc): Upper part. Limestone and gypsum. Gypsum: as in lower part. Limestone: yellowish grey weathering; thin bedded; recessive; **restricted marine** Middle part. Limestone: dolomitic, yellowish grey weathering; thick bedded; burrow mottled; resistant; **open marine** Lower part. Gypsum (uncommon or absent in easternmost exposures): white and light grey weathering; planar parallel lamination; intensely tectonized; recessive; **restricted marine**
OCE	CHRISTIAN ELV FORMATION (Tremadoc): Limestone, minor dolostone and sandstone. Limestone and dolostone: medium grey and dark grey weathering; medium to thick bedded; numerous intraclast beds; rare algal-microbial mounds. Sandstone: calcareous; white and light grey weathering, medium and fine grained; medium to thick bedded, cross-stratified; **open and restricted marine**
OCC	CAPE CLAY FORMATION (Tremadoc): Limestone and dolostone: yellowish brown and brownish orange weathering; thick bedded; burrow mottled; abundant stromatolite-microbial boundstone; vuggy porosity; **open marine**

CAMBRIAN AND ORDOVICIAN
UPPER CAMBRIAN TO LOWER ORDOVICIAN

€OCF	CASS FJORD FORMATION: Upper part. Limestone, minor dolostone, mudrock and sandstone. Limestone and dolostone: yellowish grey and greyish yellow green weathering; thin to thick bedded; abundant algal-microbial mounds and intraclast beds; locally abundant fossils including fragmentary trilobites and brachiopods. Sandstone: quartzose and calcareous, white and yellowish grey; medium bedded; locally with carbonate intraclasts and ooids. Mudrock: greyish yellow green weathering; thin bedded; **open and restricted marine** Lower part. Limestone, dolostone, sandstone, siltstone, minor mudrock. Limestone and dolostone: variably silty and sandy, pale yellowish orange and moderate red weathering; thick bedded; abundant intraclast beds, cross-stratification, and planar parallel lamination; rare fossils including fragmentary trilobites and brachiopods. Mudrock and siltstone: moderate red weathering; thin bedded; recessive; planar parallel lamination, mudcracks; **restricted marine**

CAMBRIAN
LOWER AND MIDDLE CAMBRIAN

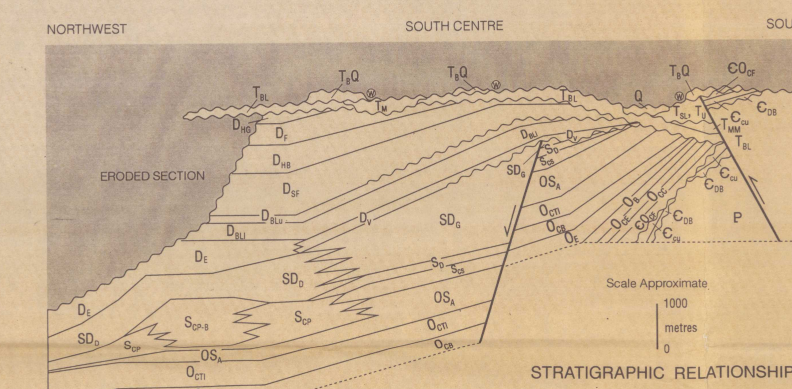
€CU	CAPE LEIPER, CAPE INGERSOLL, POLICE POST, CAPE KENT AND CAPE WOOD FORMATIONS (undivided). Dolostone and limestone: variably argillaceous, arenaceous, peloidal, and oolitic, pale yellowish orange, greyish yellow, and yellowish brown weathering; medium to thick bedded; rare burrow mottles; minor rubbly weathering; locally abundant trilobite fragments; vuggy porosity with local bitumen stain; **open and restricted marine**

LOWER CAMBRIAN

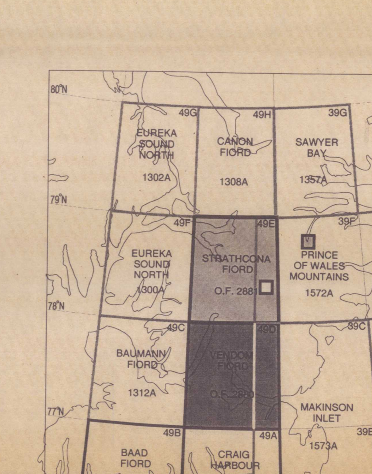
€DB	DALLAS BUGT FORMATION: Sandstone: quartzose, locally arkosic and argillaceous, dolomitic in the upper part, yellowish grey and greenish grey weathering; thin to thick bedded; abundant horizontal and vertical (**Skolithos**) traces; **marine**

EARLY PROTEROZOIC

P	Orthopyroxene granulite and retrograde amphibolite facies granitoid orthogneiss, quartzofeldspathic and peraluminous paragneiss; minor marble, and pyroxenite (undivided; see GSC Memoir 409 by T. Frisch, 1988 for details)



STRATIGRAPHIC RELATIONSHIPS



NTS REFERENCE AND INDEX TO ADJOINING GSC MAPS

DEVONIAN
LOWER DEVONIAN

DE	EIDS FORMATION (Emsian). Mudrock, minor sandstone, siltstone, and limestone. Mudrock and siltstone: calcareous and variably micaceous, light grey and greyish green weathering; thin bedded, friable, fissile. Limestone: argillaceous, silty, and rare limestone clast conglomerate; yellowish grey weathering; thin to thick bedded; locally fossiliferous. Sandstone: yellowish grey, fine grained; thin bedded; graded (turbidites); **slope**

SILURIAN AND DEVONIAN
UPPER SILURIAN AND LOWER DEVONIAN

SDD	DEVON ISLAND FORMATION, undivided (Ludlow to Emsian). Mudrock and minor limestone. Mudrock: medium and dark grey and bluish black weathering; thin bedded and fissile. Limestone: yellowish grey weathering; thin bedded, planar parallel lamination; **slope and basin**

SILURIAN
LOWER AND UPPER SILURIAN

SCP-B	CAPE PHILLIPS FORMATION (SCP-B, SCP; Llandovery to Ludlow) Dolostone, limestone, minor mudrock, limestone conglomerate, rare fracture-filling barite and fluorite. Dolostone: oolitic locally, light grey weathering, coarsely crystalline; thick bedded, massive, rare planar parallel lamination, cross-stratification; vuggy porosity with bitumen-stained pores; abundant megalodont bivalves; coral-microbial boundstone locally. Limestone: light grey weathering; thick and medium bedded, bioturbated, rare planar parallel lamination; abundant coral-microbial and stromatoporoid boundstone. Mudrock: calcareous, yellowish grey weathering; thin bedded, laminated; rare lithistid sponge biostromes. Limestone conglomerate: dolomitic, commonly silicified, yellowish grey weathering; thick bedded, locally very fossiliferous, coral-microbial boundstone clasts up to 20 m diameter; **marine slope, reef-associated environments** (see also Note 2)
SCP	Limestone, mudrock, minor dolostone. Limestone and dolostone: locally chert rich, yellowish grey weathering; thin to medium bedded, abundant planar parallel lamination; petroliferous. Mudrock: calcareous; medium grey; thin bedded and fissile; abundant graptolites; **basin floor and slope**

Geology in 1989 and 1993 by R. Thorsteinsson, J.C. Harrison and T. de Freitas with additional observations by J. Fyles and K. Leigh. Thanks are extended to the Polar Continental Shelf Project for logistical support in the field.

Base map was assembled from the topographic map published at the same scale by the Canada Centre for Mapping (Ottawa), Energy, Mines and Resources, Canada, 1988.

Copies of the topographic map covering this area may be obtained from the Canada Map Office, Department of Natural Resources, Ottawa, Ontario K1A 0E9.

Magnetic declination in 1988 varied from 83°26' westerly at centre of west edge to 80°13' westerly at centre of east edge. Mean annual change decreasing 1°02.4' annually. The daily change in the position of the North Magnetic Pole may cause the magnetic compass to be erratic in this area.

Elevations in feet above mean sea level

Geological boundary (defined, approximate, assumed)
Bedding, tops known (horizontal, vertical, inclined, overturned)
Bedding (from aerial photographs)
Fault, strike-slip (arrows indicate relative movement; solid circle indicates local, relative, down thrown side; defined and approximate, assumed)
Fault, thrust (synonymous with contraction fault; teeth indicate inferred dip direction of fault and upthrust side; defined and approximate, assumed)
Fault, undetermined (solid circle indicates down thrown side; defined and approximate, assumed)
Lineament (from aerial photographs)
Anticline (trace of axial plane; upright or inclined, overturned; arrow indicates plunge direction; defined and approximate, assumed)
Syncline (trace of axial plane; upright or inclined, overturned; arrow indicates plunge direction; defined and approximate, assumed)
Location of uncoalified wood (assignable to Pliocene "Braskeruds" beds)
Mineral occurrence (bitumen, coal, barite)
Unconformity (stratigraphic relations diagram only)
Limit of mapping
Facies change

NOTES

1. A semi-circular exposure of the Allen Bay Formation straddles a major fault at a point located 700 m west of the head of Makinson Inlet. This exposure is probably a gravitational slide block transported in fairly recent times from bedrock exposures of the same formation that outcrop at a higher elevation and in the same area to the west.
2. Shallow marine carbonate build-ups located west of Vendom Fiord are included and mapped within the Cape Phillips Formation. These build-ups are late Llandovery to Ludlow in age and are correlatives of the upper Allen Bay, Cape Storm, and Douro formations. Most build-ups appear to have been deposited in an offshore setting surrounded by deep-water graptolitic rocks. However, this interpretation is questionable in cases where the strata lying between the build-ups and the Silurian carbonate platform sequence to the east are not exposed.
3. The Vendom Fiord Formation is a distinctive red-weathering unit comprising a wide variety of marine and nonmarine lithofacies. The unit is prominently exposed throughout the belt of faulted rocks located east and southeast of Vendom Fiord. It has also been documented on the adjacent map sheets both to the north and south. However, the Vendom Fiord Formation has not been recognized in its usual stratigraphic position between the Goose Fiord and Blue Fiord formations along the southern boundary of this map sheet. Its absence in this area may be due to a disappearance of the red weathering beds either as a consequence of facies change or removal by erosion beneath a sub-Blue Fiord disconformity.
4. The contact between the upper and lower members of the Blue Fiord Formation is marked by a recessive middle member consisting of tentaculitid-rich thin bedded limestone. In several areas around the head of Makinson Inlet, these medial beds of the Blue Fiord Formation are represented by a distinctive red weathering siliciclastic, partly nonmarine facies. In many other areas along the eastern side of the map area, a disconformity at the base of the overlying Strathcona Fiord Formation cuts out the upper and medial members of the Blue Fiord Formation.
5. Outliers of the Eureka Sound Group, scattered throughout the map area, are dominated by dark coloured mudrocks, sandstone and siltstone of the Mount Lawson Formation. The underlying Mount Bell Formation is a thin, possibly discontinuous, unit of white to yellowish orange sandstone that is currently recognized in several areas including exposures north of Split Lake. Although the Mount Bell Formation may prove to be extensive and mappable on its own, there has been no attempt to delineate the full extent of this unit and the depositional relationship of these beds to the overlying Mount Lawson Formation.
6. Unconsolidated sands and gravels assignable to the Pliocene Braskeruds beds are believed to underlie large areas of the Braskeruds Plain, part of which extends from the Strathcona map area (NTS 49E) onto this map sheet west of the head of Vendom Formation. Other exposures are found and suspected on high level gravel benches located north and east of Makinson Inlet. Occurrences of uncoalified wood and peat are diagnostic features of these deposits. In most areas, Pliocene beds are disconformably overlain by Quaternary gravels. There has been no attempt to map out the true combined extent of either, except where mapping of Paleogene and older bedrock is precluded by the excessive thickness and lateral continuity of the younger deposits.

PHANEROZOIC GEOLOGY VENDOM FIORD MAP AREA

(NTS 49D)

DISTRICT OF FRANKLIN
NORTHWEST TERRITORIES

Scale 1:125 000

OPEN FILE
DOSSIER PUBLIC
2880
GEOLOGICAL SURVEY
COMMISSION GÉOLOGIQUE
OTTAWA

Recommended citation:
R. Thorsteinsson, J.C. Harrison, and T. de Freitas
1994: Phanerozoic Geology of Vendom Fiord map area (NTS 49D), District of Franklin, Northwest Territories, Geological Survey of Canada, Open File 2880, scale 1:125,000.

This map has been produced from a scanned version of the original map
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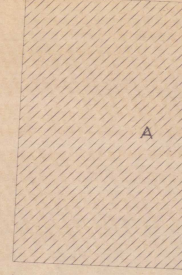
RELIABILITY DIAGRAM - CROQUIS D'EXACTITUDE



A Compiled, photogrammetrically, from 1959 aerial photography.
A Rédigée photogrammétriquement d'après des photographies aériennes prises en 1959.

Produced, 1965-66, by the SURVEYS AND MAPPING BRANCH, DEPARTMENT OF ENERGY, MINES AND RESOURCES. Field surveys 1961. Printed 1967.

The daily change of the North Magnetic Pole renders the magnetic compass unreliable in this area. Magnetic declination 1966 varies from 95°32' westerly at centre of west edge to 90°19' westerly at centre of east edge.

For complete reference see reverse side.

VENDOM FIORD

DISTRICT OF FRANKLIN
NORTHWEST TERRITORIES

Scale 1:250,000 Échelle

Miles 5 0 5 10 15 20 Milles
Kilometres 5 0 5 10 15 20 25 30 Kilometres

Transverse Mercator Projection
North American Datum 1927
Contour interval 200 feet
Elevations in feet above Mean Sea Level

Projection Transverse de Mercator
Niveau de référence nord-américain 1927
Équidistance des courbes 200 pieds
Élévations en pieds au-dessus du niveau moyen de la mer

Copies may be obtained from the Map Distribution Office, Department of Energy, Mines and Resources, Ottawa.

Ces cartes sont en vente au Bureau de distribution des cartes, ministère de l'Énergie, des Mines et des Ressources, Ottawa.

Établie en 1965-66, par la DIRECTION DES LEVÉS ET DE LA CARTOGRAPHIE, MINISTÈRE DE L'ÉNERGIE, DES MINES ET DES RESSOURCES. Levés sur le terrain en 1961. Imprimée en 1967.

La variation diurne du pôle Nord magnétique rend le compas magnétique peu sûr dans cette région. La déclinaison magnétique pour 1966 varie de 95°32' Ouest au centre de la limite Ouest à 90°19' Ouest au centre de la limite Est.

Pour une liste complète des signes, voir au verso.

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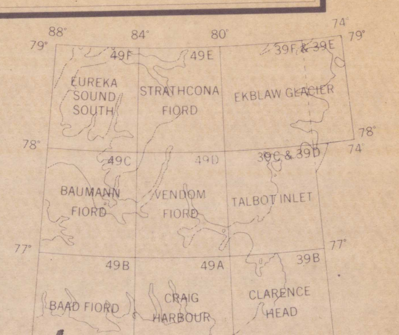

Index to adjoining sheets of National Topographic System
Tableau d'assemblage du Système national de référence cartographique