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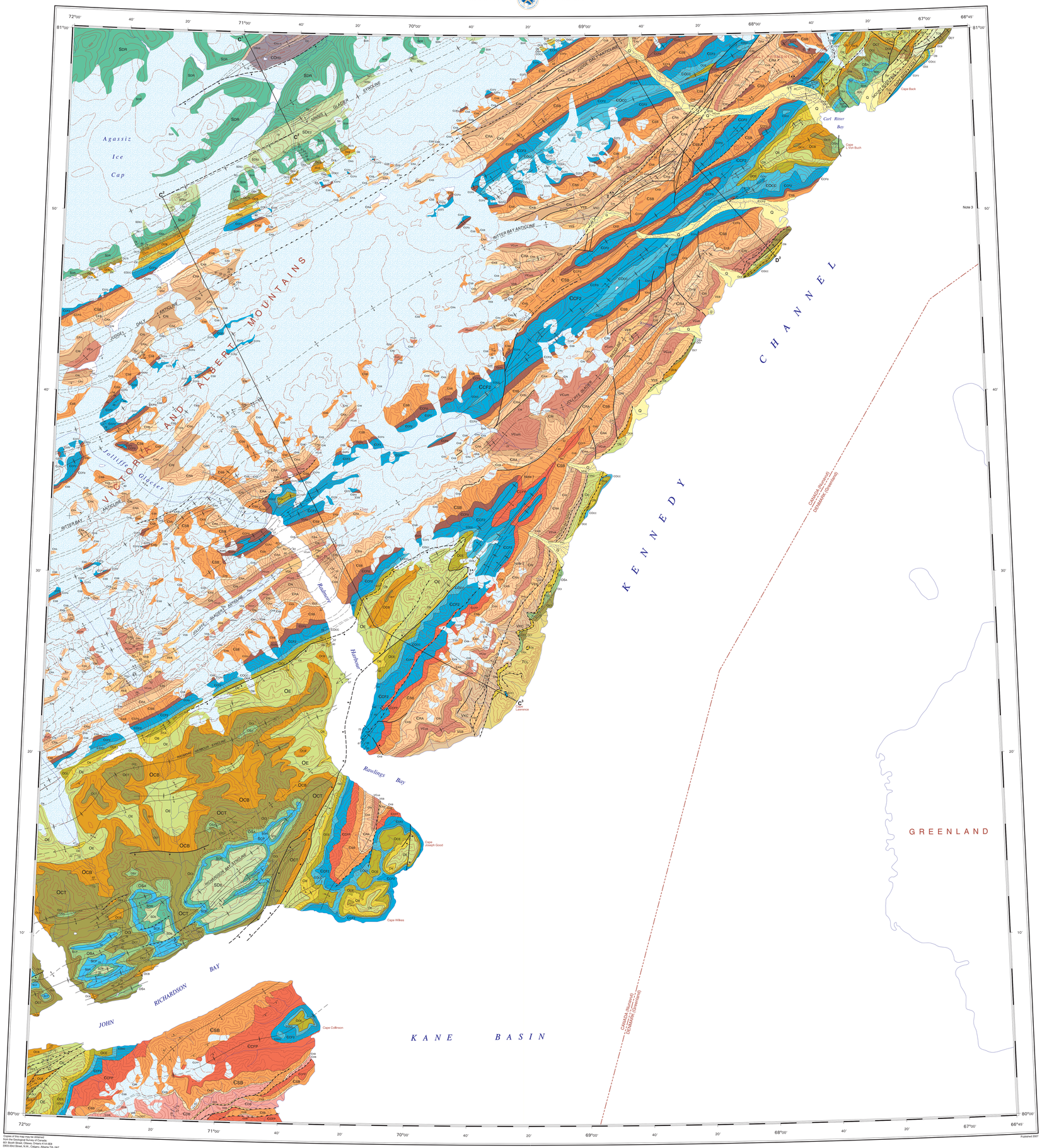
GEOLOGICAL SURVEY OF CANADA / COMMISSION GÉOLOGIQUE DU CANADA



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490, rue de la Couronne, Québec, Québec G1K 9A9;
1 Challenger Drive, P.O. Box 1006, Dartmouth, Nova Scotia B2Y 4A2

LOCATION MAP

Canada

Authors: U. Mayr, J.C. Harrison, and K. Piepjohn

Geology based on fieldwork by U. Mayr, J.C. Harrison, and K. Piepjohn (Bundesanstalt für Geowissenschaften und Rohstoffe, Hannover, Germany), 1998–2000

Geological compilation by U. Mayr, 2000

Digital compilation by M. Deuling, 2001 and D. Nunez, 2002

Digital cartography by M.J. Couthart, Data Dissemination Division (DDD)

This map was produced from processes that conform to the Scientific and Technical Publishing Services Subdivision (DDD) Quality Management System, registered to the ISO 9001: 2000 standard

MAP 2102A

GEOLOGY

KENNEDY CHANNEL

ELLESMERE ISLAND

NUNAVUT

Scale 1:125 000/Échelle 1/125 000

kilometres 2 0 2 4 6 8 10 kilometres

Universal Transverse Mercator Projection
North American Datum 1983
© Her Majesty the Queen in Right of Canada 2007

Projection transverse universelle de Mercator
Système de référence géodésique nord-américain, 1983
© Sa Majesté la Reine du chef du Canada 2007

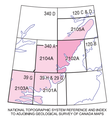
Any revisions or additional geological information known to the user would be welcomed by the Geological Survey of Canada

Digital base map from data compiled by Geomatics Canada, modified by DDD

Some geographical names subject to revision

Proximity to the North Magnetic Pole causes the magnetic compass to be erratic in this area
Mean magnetic declination 2007, 63°08'W, decreasing 70.6' annually.
Readings vary from 60°24'W in the SE corner to 85°51'W in the NW corner of the map

Elevations in feet above mean sea level



NATIONAL TOPOGRAPHIC SYSTEM REFERENCE AND INDEX TO NUNAVUT GEOLOGICAL SURVEY OF CANADA MAPS

LEGEND

MAIN PART OF MAP

CENOZOIC

QUATERNARY

Q — *Gravel, sand, silt and mud.*

TERTIARY

TcB — *CAPE BACK FORMATION, upper member: interbedded siltstone, mudrock and sandstone; yellow weathering; pebble conglomerate with carbonate clasts in upper part; lower member: fine- to medium-grained sandstone, weathers buff to brown; interbeds of yellow-weathering siltstone and dark-grey-weathering mudrock with abundant plant fossils.*

PALEOZOIC

PALEOCENE

TcL — *CAPE LAWRENCE FORMATION: interbedded conglomerate, sedimentary breccia and sandstone; conglomerate thick-bedded to massive, boulder to granule grade, clasts of limestone, dolostone and minor sandstone; weathers reddish brown.*

Tp — *PAVY FORMATION: coarse-grained, volcanic sandstone, trough crossbeds, weathers brownish green; interbedded with mudrock, siltstone and pebble conglomerate; well-rounded clasts of alkali basalt, trachyte, rhyolite and granitic gneiss; abundant plant fossils and petrified logs, rare freshwater bivalves and gastropods; rare coal seams and silicified wood; calcareous sandstone and siltstone (lacustrine) in the lower part of the formation, and basal conglomerate.*

UPPER SILURIAN AND LOWER DEVONIAN (LUDLOW TO PRAGIAN?)

SDe — *EIDS FORMATION: mudrock interbedded with minor sandstone and limestone; mudrock, calcareous, silty and sandy, thin-bedded, weathers light grey; sandstone, fine-grained, thin-bedded, weathers dusky yellow-grey; limestone, silty, fossiliferous and bioturbated, weathers yellow-grey.*

UPPER SILURIAN (WENLOCK AND LUDLOW?)

SDR — *DANISH RIVER FORMATION: very thick-bedded sandstone, calcareous, impure, fine-grained, climbing ripples, flute casts; silaty mudrock; minor crinoidal grainstone in some sections; weathers brown.*

LOWER SILURIAN (LLANDOVERY AND WENLOCK?)

SCP — *CAPE PHILLIPS FORMATION: thin- to very thin-bedded black mudstone, graptolitic; interbeds of argillaceous dolostone and black chert in lower part of formation; interbeds of brown siltstone in upper part of formation. In some sections this formation contains Upper Ordovician strata at the base.*

UPPER ORDOVICIAN AND LOWER SILURIAN (ASHGILL TO LLANDOVERY)

OSA — *ALLEN BAY FORMATION: thick-bedded to nodular limestone; skeletal wackestone and packstone with burrow mottles. Upper part commonly dolomitized.*

UPPER ORDOVICIAN (ASHGILL)

OCI — *IRENE BAY FORMATION: thin- to medium-bedded, argillaceous and nodular limestone; lime mudstone and wackestone, burrow mottles, fossiliferous; weathers recessive grey-green.*

MIDDLE AND UPPER ORDOVICIAN (CARADOC AND ASHGILL)

OCT — *THUMB MOUNTAIN FORMATION (middle part of Cornwallis Group): thick-bedded to massive limestone, wackestone and packstone, burrow mottled, fossiliferous in upper part; weathers resistant, dark grey.*

UPPER ORDOVICIAN AND SILURIAN (ASHGILL TO PRIDOLI)

OCTI — *IRENE BAY AND THUMB MOUNTAIN FORMATIONS (part of Cornwallis Group), IRENE BAY FORMATION: argillaceous, nodular limestone; lime mudstone and wackestone, medium-bedded, fossiliferous, nodular; weathers recessive, grey-green; THUMB MOUNTAIN FORMATION: thick-bedded to massive limestone; wackie and packstone, with burrow mottles, fossiliferous in upper part; weathers resistant, dark grey.*

MIDDLE ORDOVICIAN (DARRIWILIAN)

OCB — *BAY FIORD FORMATION (lower part of Cornwallis Group), upper part: medium-bedded dolostone, dolomudstone and dolosiltstone, with laminae, mudcracks; weathers grey-green, resistant limestone unit at base; lower part: gypsum and anhydrite interbedded with dolomudstone; formation weathers recessive.*

LOWER ORDOVICIAN (TREMADOC)

OB — *BAUMANN FIORD FORMATION, upper member: interbedded dolostone and gypsum; laminated dolomudstone, middle member: limestone; skeletal grainstone and rudstone; lower member: interbedded gypsum and dolostone.*

LOWER ORDOVICIAN (ARENIG)

OE — *ELEANOR RIVER FORMATION: thick-bedded limestone; lime mudstone and wackestone with burrow mottles; formation weathers resistant with moderately recessive middle part.*

OCE — *CHRISTIAN ELV FORMATION: interbedded limestone and dolostone, sandstone in upper part; limestone and dolomitic lime mudstone with burrow mottles, calcisiltite with laminae and minor flat-pebble conglomerate, locally abundant thrombolites; dolostone fine-crystalline; quartz sandstone white, fine-grained, thin-bedded.*

UPPER CAMBRIAN AND LOWER ORDOVICIAN

COCC — *CAPE CLAY FORMATION: medium- to thick-bedded limestone; lime mudstone and skeletal wackestone with burrow mottles; dolomitic calcisiltite and minor, flat-pebble conglomerate; intervals of thick-bedded stromatolitic boundstone, and quartz arenite at the base; formation weathers very resistant.*

UPPER CAMBRIAN

CCFZ — *CASS FJORD FORMATION, middle and upper members: interbedded thin-bedded limestone and dolostone; thrombolitic and stromatolitic boundstone and abundant intraformational conglomerate; yellow, crossbedded sandstone in upper part; purple intervals in lower part; map unit weathers recessive.*

MIDDLE CAMBRIAN

CCFO — *CASS FJORD FORMATION, lower member (oolitic beds): thick-bedded limestone, interbedded oolitic and oncolitic grainstone and burrow-mottled lime mudstone with shale interbeds; map unit weathers dark grey and resistant.*

CCFP — *CASS FJORD FORMATION, lower member (Parrish Glacier beds): interbedded limestone and dolostone; medium- and thick-bedded, burrow mottles, laminae, flat-pebble conglomerate; purple intervals; unit weathers moderately resistant.*

LOWER CAMBRIAN

CSB — *SCORESBY BAY FORMATION: thick-bedded, calcareous dolostone, medium-crystalline; some limestone in lower part; formation weathers yellow-orange and resistant.*

CKB — *KANE BASIN FORMATION: interbedded sandstone and siltstone; sandstone fine- to medium-grained, thin-bedded, laminated; minor mudstone in lower part; weathers distinctly dark and recessive.*

CRA — *RAWLINGS BAY FORMATION: thin- to thick-bedded sandstone, quartz arenite, fine- to coarse-grained, crossbedded, **Skolithos** burrows, weathers light grey to pink; interbeds of thin-bedded siltstone, yellow to rusty weathering; interbeds of dark grey mudstone.*

CRI — *RITTER BAY FORMATION: dark grey shale and slate, locally silty, laminated; formation weathers dark and recessive.*

PROTEROZOIC

NEOPROTEROZOIC (VENDIAN?) AND LOWER CAMBRIAN

VCU — *Undifferentiated unnamed formation; facies not known.*

VCUS — *Sandstone facies: thin- and medium-bedded sandstone, quartz arenite, fine- to coarse-grained; quartz-granule conglomerate; minor interbeds of dark grey shale and slate; facies weathers reddish brown, resistant.*

VCUM — *Mixed facies: dark grey shale and slate, micaceous, locally gradational to siltstone; thin interbeds of sandstone; interbeds of oolitic grainstone, stromatolites and thrombolites; facies weathers dark grey, recessive.*

NEOPROTEROZOIC (VENDIAN?)

VEB — *ELLA BAY FORMATION, upper part: dolostone, coarse-crystalline, thick-bedded, oncolitic, brecciated, weathers yellowish grey to light grey and resistant; middle part: slate, pyritic lime mudstone and minor quartz sandstone; dark grey and recessive weathering; lower part: crinkly laminated lime mudstone, dolostone, microbialite, arenaceous calcisiltite, some flat-pebble conglomerate; variously red, yellow and green weathering.*

VKC — *KENNEDY CHANNEL FORMATION: interbedded siltstone and slate: laminated, black and dark grey, weathered surfaces carry a white sulphate precipitate; minor interbedded sandstone; formation weathers recessive.*

Some features on this map have been projected to surface through younger cover of Quaternary sediments, glacier ice, and bodies of water.

Geological boundary (defined, approximate, assumed)

Marker bed (thin formation)

Bedding, top known (overturned, inclined, vertical, horizontal) — 10 / 75 / 75

Bedding, estimated from distance (inclined)

Fault, strike-slip, arrows indicate relative movement (defined, approximate, assumed) — 74 / 74 / 74

Thrust fault (defined, approximate, assumed; teeth indicate upthrust side)

Fault; undetermined (defined, approximate, assumed; solid circle indicates downthrown side)

Anticline and syncline (defined, approximate, assumed; arrow indicates plunge)

Anticline and syncline, overturned (defined) — C^1 C^2

Structure cross-section — C^1 C^2

Structure cross-section (Piepjohn et al., in press) — 74 / 74

Mineral showings — 1 / 2

1 *GSC loc. C-412151: Unidentified copper sulfides, weathers to azurite and malachite.*
2 *GSC loc. C-412018: Disseminated pyrite.*

NORTHWEST PART OF MAP

UPPER SILURIAN AND LOWER DEVONIAN (PRIDOLI TO PRAGIAN?)

SDE2 — *EIDS FORMATION, upper member: fine-grained lithic quartz arenite, greywacke, and shale; weathers greenish brown.*

UPPER SILURIAN (LUDLOW)

SE1 — *EIDS FORMATION, lower member: black shale; minor fine-grained sandstone and crinoidal grainstone; member weathers very recessive. (The top of this unit as indicated on the map is slightly higher than the actual top. It was mapped at a change from siltstone to sandstone.)*

LOWER AND UPPER SILURIAN (LUDLOW AND WENLOCK)

SDR — *DANISH RIVER FORMATION: very thick-bedded sandstone, calcareous and impure, fine-grained, climbing ripples, flute casts and related sole markings; siltstone; slate; rock types commonly arranged in fining-upward cycles; weathers brown.*

LOWER ORDOVICIAN TO LOWER SILURIAN (TREMADOC TO LLANDOVERY)

OSHE — *HAZEN FORMATION, Division E: interbedded limestone, shale and chert: lime mudstone, medium- to thick-bedded, weathers brown; shale variable, mostly black, laminated; chert black, thin-bedded; minor crinoidal wackestone and sedimentary breccia.*

NORTHEAST PART OF MAP

LOWER ORDOVICIAN (TREMADOC)

ONG — *NINNIS GLACIER FORMATION: interbedded lime mudstone and dolosiltite, laminated to thin-bedded, abundant shallow-water sedimentary structures; interbeds of calcarenite and flat-pebble conglomerate.*

UPPER CAMBRIAN TO LOWER ORDOVICIAN

COHD — *HAZEN FORMATION, Division D: thinly interbedded lime mudstone, dolomudstone, light grey and yellow-brown; common thin to thick interbeds of lime-mudstone-clast conglomerate and sedimentary breccia, in part arenaceous; basin-and-slope deposits.*

LOWER AND MIDDLE CAMBRIAN

CHA–C — *HAZEN FORMATION, Divisions A to C: Division C (Middle Cambrian), thinly interbedded black pyritic slaty shale and dark grey lime mudstone; minor interbeds of fine-grained, quartz arenite and black chert; Division B (Middle? Cambrian), dolostone breccia, weathers yellowish grey and forms a distinct, resistant marker unit; Division A (Lower Cambrian), thinly interbedded, slaty, calcareous shale and lime mudstone; occasional **olenellid** trilobites; weathers dark grey and recessive. Basinal and lowland deposits.*

ELLESMERE GROUP

CE — *(RAWLINGS BAY AND KANE BASIN FORMATIONS) undivided: sandstone, shale and slate.*

SOUTHWEST PART OF MAP

LOWER CAMBRIAN

CDB — *DALLAS BUGT FORMATION: thick-bedded quartz sandstone; medium-grained with scattered quartz granules and pebbles; minor interbedded quartz and chert granule conglomerate; formation weathers white, hematitic red in the lower part; and resistant.*

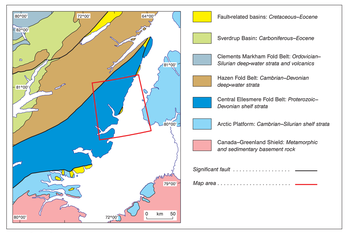


Figure 1: Tectonic index

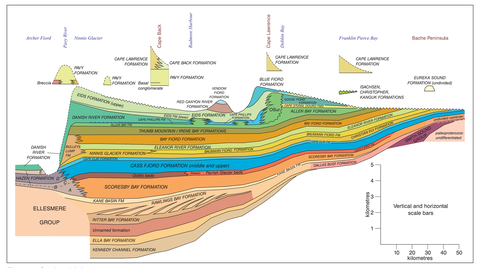


Figure 2: Stratigraphic index

NOTES

1. The lateral contact of the "Parrish Glacier beds" and "oolitic beds" of the Cass Fjord Formation is an extended facies change on both sides of Radmore Harbour. The contact indicated on the map is arbitrary.
2. The Ritter Bay Formation consists of major interfingering units of shale and sandstone. The upper contact of the formation and of the Archer Fiord member are diachronous.
3. An account of the geology of Hans Island has been prepared separately (Harrison et al., in press)

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in press: Geology of Hans Island and adjacent parts of Kennedy Channel, northwest Greenland (Kalaallit Nunaat) and northern Nunavut (Canada); Geological Survey of Canada, Open File 5321 (CD-ROM).

Cross-sections accompany this map

Recommended citation:
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2007: Geology, Kennedy Channel, Ellesmere Island, Nunavut; Geological Survey of Canada, Map 2102A, scale 1:125 000.