



Natural Resources  
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## CANADIAN GEOSCIENCE MAP 27

GEOLOGY

# TECTONIC ASSEMBLAGE

# MAP OF QUTTINIRPAAQ

part of northern Ellesmere Island, Nunavut



Map Information  
Document

**Preliminary**

Geological Survey of Canada  
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## **ABSTRACT**

This map and the related geodatabase illustrate the bedrock geology of part of northern Ellesmere Island including Quttinirpaaq National Park. Major features of the area include: Pearya Terrane; volcanic, deep water and shelf facies of the Clements Markham, Hazen and Central Ellesmere fold belts; rift-related Upper Paleozoic strata; post-rift Permian and Mesozoic strata of Sverdrup basin; and Paleogene strata associated with the Eurekan Orogeny and fault displacements within and bordering Nares Strait.

## **RÉSUMÉ**

Cette carte et la géodatabase qui s'y rapporte documentent la géologie du substratum rocheux dans une partie du nord de l'île d'Ellesmere qui englobe le parc national du Canada Quttinirpaaq. Les principales entités géologiques de la région comprennent le terrane de Pearya; les faciès volcaniques, d'eau profonde et de plate-forme continentale des zones de plissement de Clements Markham, de Hazen et de Central Ellesmere; des strates du Paléozoïque supérieur associées au rifting; des strates permienes et mésozoïques du bassin de Sverdrup, postérieures au rifting; et des strates paléogènes associées à l'orogénèse eurékienne et au jeu des failles à l'intérieur et en bordure du détroit de Nares.

## **ABOUT THE MAP**

### **General Information**

Authors: J.C. Harrison, T. Lynds, A. Ford, U. Mayr, H.P. Trettin, and R. Thorsteinsson

Geological compilation by J.C. Harrison

Source map geology (senior authors) by H.P. Trettin, R. Thorsteinsson, J.C. Harrison, and U. Mayr

GIS development by T. Lynds

Spatial data capture by Gismo Solutions Ltd. (Edmonton)

Cartography by M.J. Baldock and J. Gardner

Critical review by K. Dewing

Initiative of the Geological Survey of Canada, conducted under the auspices of the Tri-Territorial Project as part of Natural Resources Canada's Geo-mapping for Energy and Minerals (GEM) program.

Map projection Lambert Conformal Conic, standard parallels 80°30'N and 82°30'N. North American Datum 1983.

Base map at the scale of 1:250 000 from Natural Resources Canada, with modifications.

Proximity to the North Magnetic Pole causes the magnetic compass to be erratic in this area.

Mean magnetic declination 2015, 54°47'W decreasing 65.6'E annually. Readings vary from 45°32'W in the SE corner to 64°39'W in the NW corner of the map.

This map is not to be used for navigational purposes.

Title photograph: Devonian folds in Upper Cambrian Cass Fiord Formation, Judge Daly Promontory, northeastern Ellesmere Island. Photograph by J.C. Harrison. 2013-063

The Geological Survey of Canada welcomes corrections or additional information from users.

Data may include additional observations not portrayed on this map.  
See documentation accompanying the data.

This publication is available for free download through  
GEOSCAN (<http://geoscan.nrcan.gc.ca/>).

Preliminary publications in this series have not been scientifically edited.

### **Map Viewing Files**

The published map is distributed as a Portable Document File (PDF), and may contain a subset of the overall geological data for legibility reasons at the publication scale.

### **Cartographic Representations Used on Map**

This map utilizes ESRI Cartographic Representations in order to customize the display of standard GSC symbols for visual clarity on the PDF of the map only. The digital data still contains the original symbol from the standard GSC symbol set. The following legend features have Cartographic Representations applied:

Fault: approximate, showing downthrown side  
Fault: assumed, showing downthrown side  
Dextral strike-slip fault: approximate  
Dextral strike-slip fault: assumed  
Sinistral strike-slip fault: approximate  
Sinistral strike-slip fault: assumed  
Thrust fault: approximate, teeth indicate upthrust side  
Thrust fault: assumed, teeth indicate upthrust side  
Diabase dyke

## ABOUT THE GEOLOGY

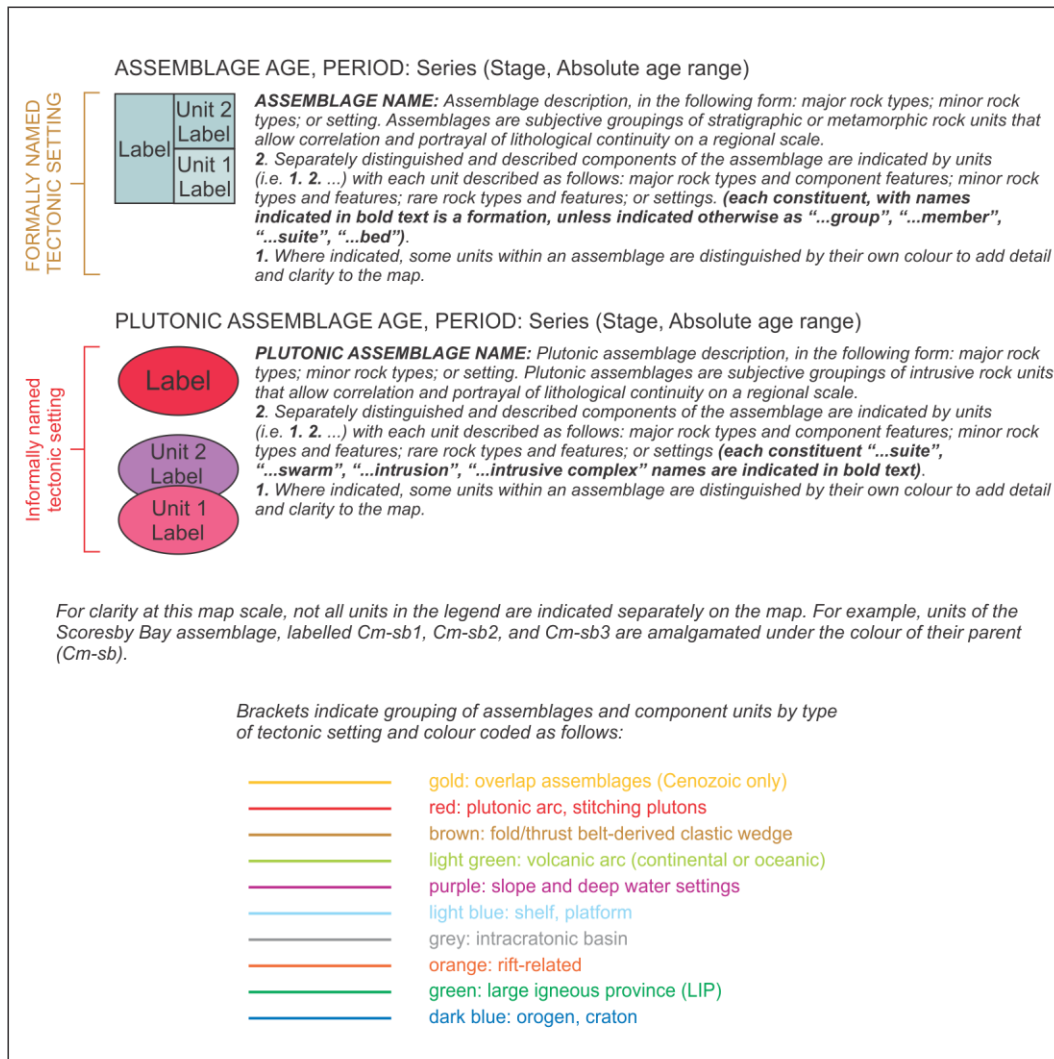


Figure 1. Explanation of map unit features.

## References

de Freitas, T.A. and Mayr, U., 2007. Geology, Sawyer Bay, Ellesmere Island, Nunavut; Geological Survey of Canada, Map 2103A, 1 CD-ROM. doi:10.4095/223620

de Freitas, T.A., Harrison, J.C., and Mayr, U., 1997. Sequence stratigraphic correlation chart of the lower Paleozoic Franklinian succession, Canadian Arctic Islands and parts of north Greenland; Geological Survey of Canada, Open File 3410. doi:10.4095/208912

de Freitas, T.A., Mayr, U., Harrison, J.C., Piepjohn, K., and Tessensohn, F., 2007. Geology, Dobbin Bay, Ellesmere Island, Nunavut; Geological Survey of Canada, Map 2101A, scale 1:125 000. doi:10.4095/223548

Dewing, K. and Nowlan, G.S., 2004. Correlation chart of Cambrian and Ordovician stratigraphy, Arctic Islands, Nunavut, Canada; Geological Survey of Canada, Open File 1837, 1 sheet. doi:10.4095/214889

Dewing, K., Harrison, J.C., Pratt, B.R., and Mayr, U., 2004. A probable Late Neoproterozoic age for the Kennedy Channel and Ella Bay formations, northeastern Ellesmere Island and its implications for passive margin history of the Canadian Arctic; Canadian Journal of Earth Sciences vol. 41, no. 9, 2004; p. 1013–1025. doi:10.1139/E04-044

Dewing, K., Mayr, U., Harrison, J.C., and de Freitas, T., 2008a. Upper Neoproterozoic to Lower Devonian stratigraphy of northeast Ellesmere Island, in Geology of northeast Ellesmere Island adjacent to Kane Basin and Kennedy Channel, Nunavut; (ed.) U. Mayr; Geological Survey of Canada, Bulletin no. 592, p. 31–108, 1 CD-ROM. doi:10.4095/226135

Embry, A.F., 1983. Stratigraphic subdivision of the Heiberg Formation, eastern and central Sverdrup Basin, Arctic Islands, in Current Research, Part B; Geological Survey of Canada, Paper no. 83-1B; p. 205–213. doi:10.4095/109286

Embry, A.F., 1984a. The Wilkie Point group [Lower-Upper Jurassic], Sverdrup Basin, Arctic Islands; in Current Research, Part B; Geological Survey of Canada, Paper no. 84-1B; p. 299–308. doi:10.4095/119557

Embry, A.F., 1984b. The Schei Point and Blaa Mountain groups [middle-upper Triassic], Sverdrup Basin, Canadian Arctic Archipelago, in Current Research, Part B; Geological Survey of Canada, Paper no. 84-1B; p. 327–336. doi:10.4095/119557

Embry, A.F., 1984c. Stratigraphic subdivision of the Roche Point, Hoyle Bay and Barrow formations [Schei Point group], western Sverdrup Basin, Arctic Islands, in Current Research, Part B; Geological Survey of Canada, Paper no. 84-1B; p. 275–283. doi:10.4095/119557

Embry, A.F., 1985. Stratigraphic subdivision of the Isachsen and Christopher formations [Lower Cretaceous], Arctic Islands, in Current Research, Part B; Geological Survey of Canada, Paper no. 85-1B; p. 239–246. doi:10.4095/120220

Embry, A.F., 1991. Chapter 14: Mesozoic History of the Arctic Islands; in Geology of the Inuitian Orogen and Arctic Platform of Canada and Greenland; (ed.) H.P. Trettin ; Geological Survey of Canada, Geology of Canada Series no. 3; p. 371–433. doi:10.4095/133959

Embry, A.F. and Osadetz, K.G., 1988. Stratigraphy and Tectonic Significance of Cretaceous Volcanism in the Queen Elizabeth Islands, Canadian Arctic Archipelago; Canadian Journal of Earth Sciences vol. 25, no. 8, 1988, p. 1209–1219.

Harrison, J.C. and de Freitas, T.A., 2007. Geology, Agassiz Ice Cap, Ellesmere Island, Nunavut; Geological Survey of Canada, Map 2104A, 1 CD-ROM. doi:10.4095/223622

Harrison, J.C., Dewing, K., and Mayr, U., 2007a. Geology of Hans Island and adjacent parts of Kennedy Channel, northwest Greenland (Kalaalit Nunaat) and northern Nunavut (Canada). Geological Survey of Canada, Open File 5321, 1 CD-ROM. doi:10.4095/224255

Harrison, J.C., Mayr, U., McNeil, D.H., Sweet, A.R., McIntyre, D.J., Eberle, J.J., Harington, C.R., Chalmers, J.A., Dam, G., and Nøhr-Hansen, H., 1999. Correlation of Cenozoic sequences of the Canadian Arctic region and Greenland; implications for the tectonic history of northern North America; *Bulletin of Canadian Petroleum Geology* vol. 47, no. 3; p. 223–254.

Harrison, J.C., Mayr, U., and Piepjohn, K., 2007b. Geology, Lady Franklin Bay, Ellesmere Island, Nunavut; Geological Survey of Canada, Map 2105A, 1 CD-ROM, doi:10.4095/223624.

Lee, C.C., Lehnert, O., and Nowlan, G.S., 2008. Sedimentology, stratigraphy, and clast biostratigraphy of Cretaceous and Tertiary strata, northeastern Ellesmere Island, Nunavut; Geology of northeast Ellesmere Island adjacent to Kane Basin and Kennedy Channel, Nunavut; (ed.) U. Mayr; Geological Survey of Canada, Bulletin no. 592, p. 115–167, 1 CD-ROM. doi:10.4095/226135

Mayr, U., 1992. Reconnaissance and Preliminary Interpretation of Upper Devonian To Permian Stratigraphy of northeastern Ellesmere Island, Canadian Arctic Archipelago; Geological Survey of Canada, Paper no. 91-8, 117 p. doi:10.4095/133669

Mayr, U. and Trettin, H.P., 1996a. Geology, Tanquary Fiord, District of Franklin, Northwest Territories; Geological Survey of Canada, Map 1886A, scale 1:250 000. doi:10.4095/208960

Mayr, U. and Trettin, H.P., 1996b. Geology, Clements Markham Inlet-Robeson Channel, District of Franklin, Northwest Territories; Geological Survey of Canada, Map 1883A, scale 1:250 000. doi:10.4095/208957

Mayr, U., Harrison, J.C., and Piepjohn, K., 2007. Geology, Kennedy Channel, Ellesmere Island, Nunavut; Geological Survey of Canada, Map 2102A, scale 1:125 000, 1 CD-ROM. doi:10.4095/223623

Miall, A.D., 1991. Chapter 15: Late Cretaceous and Tertiary Basin Development and Sedimentation, Arctic Islands, in *Geology of the Innuitian Orogen and Arctic Platform of Canada and Greenland*; (ed.) H.P. Trettin; Geological Survey of Canada, *Geology of Canada Series* no. 3; p. 437–458. doi:10.4095/133959

Osadetz, K.G. and Moore, P.R., 1988. Basic volcanics in the Hassel Formation [mid - Cretaceous] and associated intrusives, Ellesmere Island, District of Franklin, Northwest Territories; Geological Survey of Canada, Paper 87-21, 19 p. doi:10.4095/126101

Thorsteinsson, R., 1971. Geology, Greely Fiord West, District of Franklin; Geological Survey of Canada, Map 1311A, scale 1:250 000. doi:10.4095/109133

Thorsteinsson, R., 1974. Carboniferous and Permian stratigraphy of Axel Heiberg Island and western Ellesmere Island, Canadian Arctic Archipelago; Geological Survey of Canada, Bulletin 224, 115 p. doi:10.4095/103460

Thorsteinsson, R. and Kerr, J.W., 1972a. Geology, Greely Fiord East, District of Franklin; Geological Survey of Canada, Map 1348A, scale 1:250 000. doi:10.4095/109140

Thorsteinsson, R. and Trettin, H.P., 1972b. Geology, Otto Fiord, District of Franklin, Geological Survey of Canada, Map 1309A; scale 1:250 000. doi:10.4095/109131

Trettin, H.P., 1994. Pre-Carboniferous geology of the northern part of the Arctic Islands, Hazen Fold Belt and adjacent parts of central Ellesmere Fold Belt, Ellesmere Island; Geological Survey of Canada, Bulletin 430, 260 p. doi:10.4095/194326

Trettin, H.P., 1996. Geology, Greely Fiord, District of Franklin, Northwest Territories; Geological Survey of Canada, Map 1888A, scale 1:250 000. doi:10.4095/208962

Trettin, H.P., 1998. Pre-Carboniferous geology of the northern part of the Arctic Islands: Northern Heiberg Fold Belt, Clements Markham Fold Belt, and Pearya; northern Axel Heiberg and Ellesmere islands; Geological Survey of Canada, Bulletin 425, 401 p. doi:10.4095/209572

Trettin, H.P. and Frisch, T.O., 1996. Geology, Yelverton Inlet, District of Franklin, Northwest Territories; Geological Survey of Canada, Map 1881A, scale 1:250 000. doi:10.4095/208955

Trettin, H.P. and Mayr, U., 1996a. Geology, Otto Fiord, District of Franklin, Northwest Territories; Geological Survey of Canada, Map 1885A, scale 1:250 000. doi:10.4095/208959

Trettin, H.P. and Mayr, U., 1996b. Geology, M'Clintock Inlet, District of Franklin, Northwest Territories; Geological Survey of Canada, Map 1882A; scale 1:250 000. doi:10.4095/208956

Trettin, H.P. and Mayr, U., 1996c. Geology, Lady Franklin Bay, District of Franklin, Northwest Territories; Geological Survey of Canada, Map 1887A, scale 1:250 000. doi:10.4095/208961

Villeneuve, M. and Williamson, M-C., 2006.  $^{40}\text{Ar}/^{39}\text{Ar}$  dating of mafic magmatism from Sverdrup basin Magmatic Province; Proceedings of the Fourth International Conference on Arctic Margins, p. 206–215.



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## **Coordinate System**

Projection: Lambert Conformal Conic  
False Easting: 0.0°  
False Northing: 0.0°  
Central Meridian: -68.0°  
Standard Parallel 1: 80.5°  
Standard Parallel 2: 82.5°  
Latitude of Origin: 40.0°  
Units: metres  
Horizontal Datum: NAD83  
Vertical Datum: mean sea level

## **Bounding Coordinates**

Western longitude: 80°00'00"W  
Eastern longitude: 56°00'00"W  
Northern latitude: 83°15'00"N  
Southern latitude: 80°00'00"N

## **Data Model Information**

This Canadian Geoscience Map does not conform to the Bedrock Mapping Geodatabase Data Model v.3.1. Therefore, some of the feature classes and feature attributes require explanation. Consult "Explanation\_of\_attributes.rtf" in Data folder for complete description of the feature classes and feature attributes.

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