ASSEMBLAGE AGE, PERIOD: Series (Stage, Absolute age range)

FORMALLY NAMED TECTONIC SETTING

Label | Unit 2 Label | Unit 1 Label

ASSEMBLAGE NAME: *Assemblage description, in the following form: major rock types; minor rock types; or setting. Assemblages are subjective groupings of stratigraphic or metamorphic rock units that allow correlation and portrayal of lithological continuity on a regional scale.*
2. *Separately distinguished and described components of the assemblage are indicated by units (i.e.* ***1. 2.*** *...) with each unit described as follows: major rock types and component features; minor rock types and features; rare rock types and features; or settings.* ***(each constituent, with names indicated in bold text is a formation, unless indicated otherwise as "...group", "...member", "...suite", "...bed").***
1. *Where indicated, some units within an assemblage are distinguished by their own colour to add detail and clarity to the map.*

PLUTONIC ASSEMBLAGE AGE, PERIOD: Series (Stage, Absolute age range)

Informally named tectonic setting

Label | Unit 2 Label | Unit 1 Label

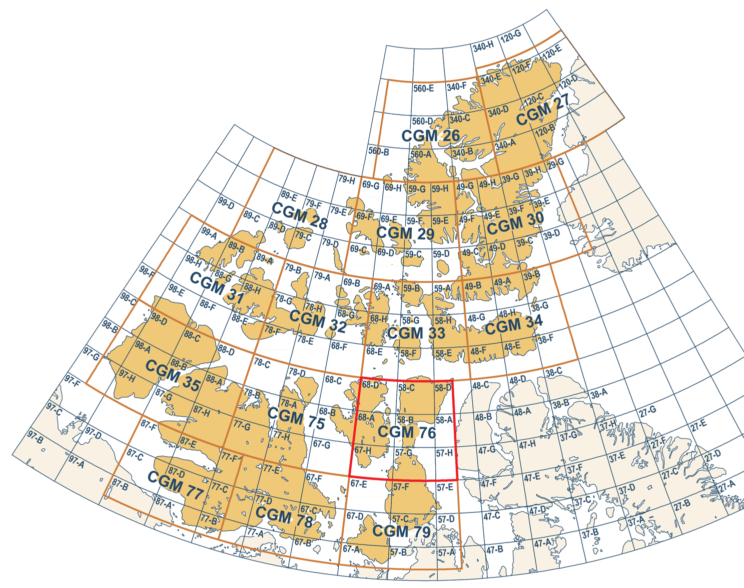
PLUTONIC ASSEMBLAGE NAME: *Plutonic assemblage description, in the following form: major rock types; minor rock types; or setting. Plutonic assemblages are subjective groupings of intrusive rock units that allow correlation and portrayal of lithological continuity on a regional scale.*
2. *Separately distinguished and described components of the assemblage are indicated by units (i.e.* ***1. 2.*** *...) with each unit described as follows: major rock types and component features; minor rock types and features; rare rock types and features; or settings* ***(each constituent "...suite", "...swarm", "...intrusion", "...intrusive complex" names are indicated in bold text).***
1. *Where indicated, some units within an assemblage are distinguished by their own colour to add detail and clarity to the map.*

For clarity at this map scale, not all units in the legend are indicated separately on the map. For example, units of the Scoresby Bay assemblage, labelled Cm-sb1, Cm-sb2, and Cm-sb3 are amalgamated under the colour of their parent (Cm-sb).

Brackets indicate grouping of assemblages and component units by type of tectonic setting and colour coded as follows:

- gold: overlap assemblages (Cenozoic only)
- red: plutonic arc, stitching plutons
- brown: fold/thrust belt-derived clastic wedge
- light green: volcanic arc (continental or oceanic)
- purple: slope and deep water settings
- light blue: shelf, platform
- grey: intracratonic basin
- orange: rift-related
- green: large igneous province (LIP)
- dark blue: orogen, craton

Figure 1. Explanation of map unit features.



National Topographic System reference and index to adjoining published Geological Survey of Canada maps

Abstract

This map and the related geodatabase illustrate the bedrock geology of central and eastern Prince of Wales Island, Somerset Island, and northern Boothia Peninsula. Major features of the area include Archean and Paleoproterozoic granitoid and metasedimentary rocks of Boothia Uplift overlain unconformably by Paleoproterozoic and Mesoproterozoic sediments, which are, in turn, unconformably overlain by Cambrian to Devonian strata of Arctic Platform. The higher Silurian and Lower Devonian interval provides a multiphase depositional record of Boothia Uplift. Youngest events are recorded by Cretaceous kimberlite diatremes and outliers of Paleogene strata.

Résumé

Cette carte et la géodatabase qui s'y rapporte documentent la géologie du substratum rocheux dans le centre et l'est de l'île Prince of Wales, l'île Somerset et le nord de la presqu'île de Boothia. Les principales entités géologiques de la région comprennent des roches granitoïdes et métasédimentaires de l'Archéen et du Paléoprotérozoïque du soulèvement de Boothia, surmontées en discordance par des sédiments paléoprotérozoïques et mésoprotérozoïques qui, à leur tour, sont recouverts en discordance par des strates d'âge cambrien à dévonien de la Plate-forme de l'Arctique. L'intervalle du Silurien supérieur et du Dévonien inférieur témoigne de l'histoire sédimentaire polyphasée du soulèvement de Boothia. Des diatrèmes de kimberlite du Crétacé et des lambeaux d'érosion de strates du Paléogène rendent compte des événements les plus récents.

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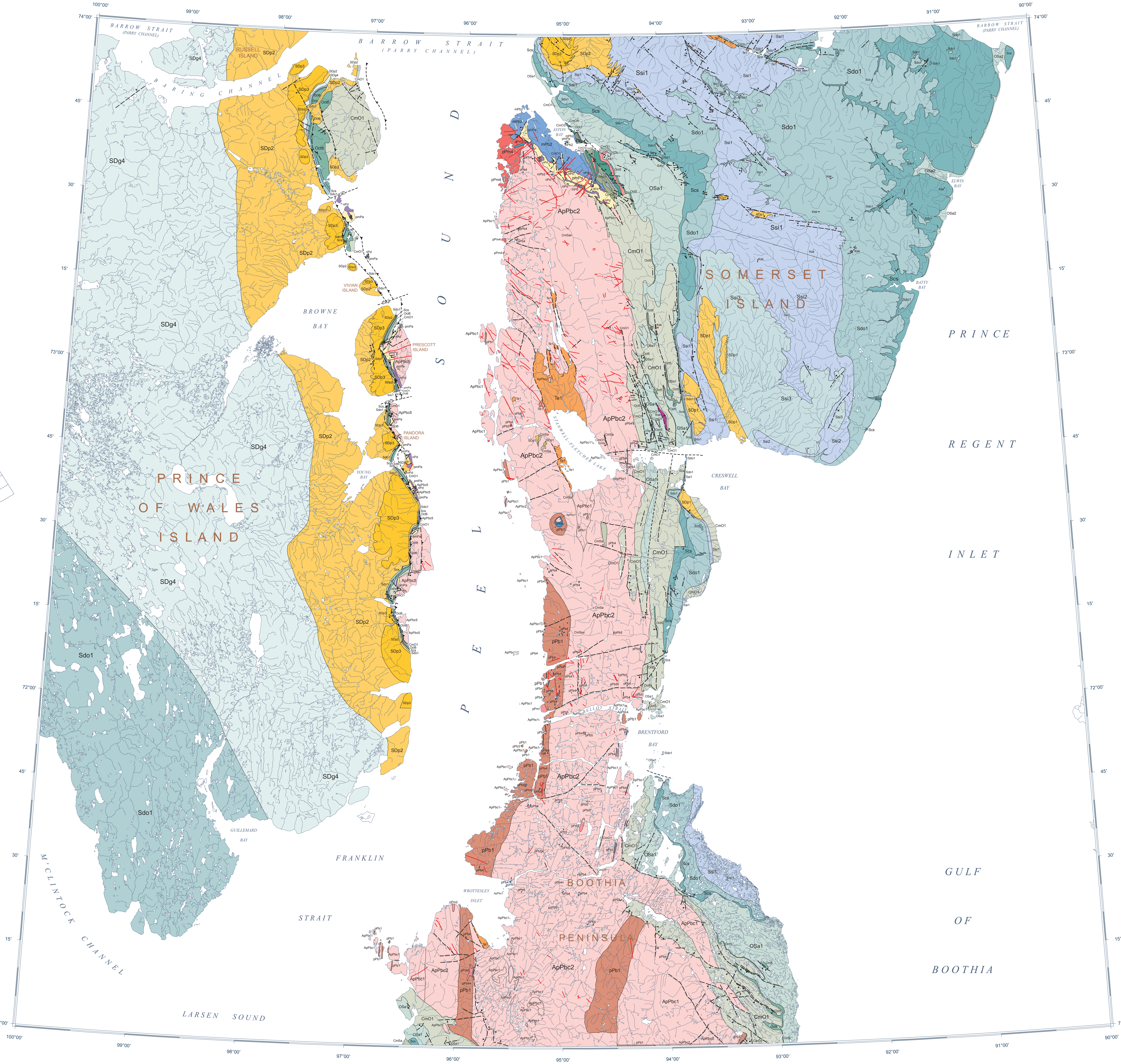
CANADIAN GEOSCIENCE MAP 76

GEOLOGY

TECTONIC ASSEMBLAGE MAP OF PEEL SOUND

Prince of Wales and Somerset islands, Nunavut

1:500 000



PALEOGENE:

PALEOCENE AND EOCENE (Selandian to middle Eocene)

EUREKAN OROGEN, Eurekan foreland

Te1 — **EUREKA SOUND:** Sandstone, siltstone, shale; local conglomerate; minor coal, volcanogenic sandstone; mostly fluvial and deltaic; local syntectonic alluvial fan deposits.
1. Sandstone, fine- to coarse-grained; siltstone, shale; local conglomerate, coal, volcanogenic sandstone; common plant fossils; mostly fluvial and deltaic; local syntectonic alluvial fan deposits **(Eureka Sound group)**.

CRETACEOUS

EARLY AND LATE CRETACEOUS (Albian and Cenomanian; 108 to 98 Ma)

Boothia uplift stitching plutons

Ksk — **SOMERSET plutonic assemblage:** Kimberlite; diatreme **(Somerset kimberlite suite)**.

SILURIAN AND DEVONIAN

LUDLOW TO EARLY DEVONIAN (Pragian)

BOOTHIA UPLIFT

SDp3, SDp2, SDp1 — **PEEL SOUND:** Sandstone, conglomerate, minor shale, siltstone, dolostone; alluvial fans, deltaic, shallow marine.
3. Conglomerate, thick-bedded, red-weathering, carbonate clasts of granule to pebble and rare cobble grade; minor tan and grey sandstone; syntectonic alluvial fans **(Peel Sound conglomerate)**.
2. Sandstone, fine- to medium-grained with chert and limestone grains, yellow to green-grey and red weathering; minor conglomerate and limestone; syntectonic alluvial deposits grading to shallow marine **(Peel Sound sandstone)**.
1. Sandstone, fine- to medium-grained with chert and limestone grains, yellow to green-grey and red weathering; conglomerate, thick-bedded, carbonate clasts of granule to pebble and rare cobble grade; dolostone, fine-grained, laminated, dessication cracks, molar tooth structure; minor limestone, burrowed with stromatoporoids, gastropods in the lower part; syntectonic alluvial fans grading to shallow marine, mostly restricted **(Peel Sound)**.

LUDLOW TO LOCHKOVIAN

Franklinian shelf, ARCTIC PLATFORM

SDg4 — **GOOSE FIORD:** Dolostone, limestone, mudstone; minor wackestone, siltstone, sandstone; nearshore, shelf and shelf edge including reefs and foreslope, mostly unrestricted.
4. Dolostone, white, light brown, tan, medium-grained; limestone including lime mudstone, skeletal wackestone; packstone, fine-grained with ostracodes, crinoids, brachiopods, gastropods; silty limestone; siltstone, calcareous and dolomitic; minor sandstone, calcareous and dolomitic, very fine- to fine-grained; minor shale; nearshore to shallow offshore, unrestricted **(Drake Bay)**.

SILURIAN

LUDLOW

Ssi3, Ssi2, Ssi1 — **SOMERSET ISLAND:** Dolostone, limestone; minor sandstone, wackestone; intertidal to supratidal.
3. Dolostone, limestone; finely crystalline; siltstone; red, grey, green-grey, yellowish brown; thin- to medium-bedded; ripples, mud cracks, halite casts; minor sandstone, skeletal wackestone; cyclical deposition; intertidal to supratidal **(Somerset Island, Upper member)**.
2. Dolostone, limestone; finely crystalline; grey, green-grey, yellowish brown; thin- to medium-bedded; ripples, mud cracks, oncolites, domal stromatolites; minor skeletal wackestone; subtidal to peritidal **(Somerset Island, Lower member)**.
1. Dolostone, limestone, dolositite. planar laminated, grey, greenish grey, buff weathering; siltstone, mudstone; red, green, variegated; minor skeletal limestone, burrow mottled; locally common domal stromatolites, oncolites, fossil fish; rare gypsum nodules; cyclical deposition; arid setting, variably shallow subtidal to intertidal **(Somerset Island)**.

Sdo1 — **DOURO:** Limestone; minor dolostone, shale; local bioherms; shallow to deep subtidal shelf ramp.
1. Argillaceous limestone, limestone, dolomitic limestone; nodular, burrow-mottled, minor dolostone, calcareous shale, calcisiltite; local sponge-coral-stromatoporoid mud mounds on Somerset Island, and favositid-microbial biostromes in basal beds on Grinnell Peninsula; shallow to deep subtidal outer shelf ramp **(Douro)**.

Scs — **CAPE STORM:** Dolostone, dolomitic limestone, limestone; minor silty dolostone, siltstone, shale; arid subtidal to supratidal settings. Dolostone; grey, buff and brown weathering, very fine- to fine-grained, thin- to thick-bedded, laminated, mud-cracked, molar-tooth structures, stromatolitic, microbial; lesser dolomitic limestone, oolitic and peloidal; minor silty dolostone, siltstone, shale; mostly restricted intertidal and supratidal **(Cape Storm)**.

ORDOVICIAN TO SILURIAN

RICHMONDIAN TO LUDLOW

OSa2, OSa1 — **ALLEN BAY:** Dolostone, limestone; local bioherms, anhydrite; arid subtidal to supratidal settings.
2. Dolostone, laminated to thin-bedded, stromatolitic; dolostone intraclast conglomerate; anhydrite, limestone, minor siltstone; cyclical sedimentation; peritidal lagoon cyclically grading to supratidal and hypersaline **(Cape Crauford)**.
1. Dolostone, medium- to thick-bedded, light grey to yellowish brown, medium-grained, in part fossiliferous, bitumen stained; lesser dolomitic limestone, burrow mottled; minor flat pebble conglomerate; local stromatoporoid bioherms; local gypsum and anhydrite (on Somerset Island); common shallowing upward cycles; semi-arid to arid subtidal to supratidal settings **(Allen Bay)**.

ORDOVICIAN

MIDDLE AND LATE ORDOVICIAN (Blackriverian to Richmondian)

Oct6, Oct5 — **THUMB MOUNTAIN:** Limestone, mudstone, grainstone, wackestone, dolostone; subtidal and intertidal, restricted and unrestricted.
6. Dolostone; light grey, burrow-mottled, thick-bedded; corals, stromatoporoids and cephalopods; unrestricted subtidal shelf.
5. Thumb Mountain, Irene Bay, undivided.

MIDDLE ORDOVICIAN (Whiterockian)

Ocb1 — **BAY FIORD:** Dolostone, limestone; minor anhydrite, rock salt, breccia; initially hypersaline grading to mostly restricted peritidal.
1. Dolostone, dolomitic limestone; very fine- to fine-grained, thin- to medium-bedded, grey to grey-green weathering; limestone, pale to dark brown, massive-bedded, burrow mottled, locally bioclastic; basal discontinuous member of gypsum, anhydrite, solution breccia and, in the Parry Islands, subsurface rock salt; initially hypersaline grading up into mostly restricted peritidal **(Bay Fiord)**.

CAMBRIAN TO SILURIAN

LATE CAMBRIAN TO LUDLOW

ARCTIC PLATFORM

CmSa — **ARCTIC PLATFORM:** Dolostone, dolomitic limestone, limestone; minor sandstone, shale, intraclast conglomerate, breccia; nearshore and intertidal to supratidal; mostly restricted **(Turner Cliffs, Ship Point, Irene Bay, Thumb Mountain, Allen Bay, Cape Storm,** undivided**)**.

CAMBRIAN AND ORDOVICIAN

LATE CAMBRIAN (Furongian) TO EARLY ORDOVICIAN (Tremadoc)

CmO4, CmO3, CmO2, CmO1 — **TURNER CLIFFS:** Dolostone, limestone, intraclast conglomerate; minor shale, sandstone, gypsum; local bioherms; peritidal grading to subtidal shelf.
4. Dolostone, very-fine to medium-grained, grey to greenish grey, variably bioturbated, arenaceous, oolitic, domal stromatolitic; locally abundant gastropods, brachiopods; minor dolomitic sandstone, dolomitic siltstone, flat pebble conglomerate, breccia; local replacement chert, local subsurface anhydrite; shallow subtidal to intertidal, mostly restricted **(Ship Point)**.
3. Dolostone, pale grey to buff, fine-grained, cherty, thick- to massive-bedded; resistant; shallow marine, mostly unrestricted **(Turner Cliffs, upper member)**.
2. Dolostone, green, grey to buff, laminated, thin- to medium-bedded, stromatolitic; sandstone, grey, white, red brown; carbonate intraclast breccia, conglomerate; nearshore to restricted shallow marine **(Turner Cliffs, lower member)**.
1. Dolostone, grey to buff, laminated and thin-bedded grading to massive; minor sandstone; grey, locally red brown; intraclast breccia and conglomerate; local stromatolitic units; nearshore to shallow marine **(Turner Cliffs)**; dolostone, very fine- to medium-grained, grey to greenish grey, bioturbated, arenaceous, oolitic, domal stromatolitic; gastropods, brachiopods; minor dolomitic sandstone and siltstone, intraclast conglomerate, breccia; local subsurface anhydrite; shallow subtidal to intertidal, mostly restricted **(Ship Point)**.

NEOPROTEROZOIC:

CRYOGENIAN (723 to 718 Ma)

FRANKLIN LARGE IGNEOUS PROVINCE

nPd — **FRANKLIN plutonic assemblage:** Diabase, mostly high titanium tholeiite, olivine-bearing, brown to black, subophitic; plagioclase often saussuratized, olivine replaced by carbonate; local ultramafic rock; LIP intrusives, olivine tholeiite association **(Franklin and Thule swarms)**.

MESOPROTEROZOIC

ECTASIAN AND STENIAN (1270 to 1000 Ma)

BORDEN BASIN

mPb2 — **BORDEN:** Siltstone, shale, sandstone, dolostone; syntectonic alluvial fans grading to fluvial and shallow marine.
2. Dolostone, variably arenaceous, grey, bluish grey, buff and red weathering, thin- to thick-bedded, commonly stromatolitic, replacement chert; minor shale, red to buff; siltstone, purple; sandstone, conglomerate; shallow marine to peritidal **(Hunting)**.

ECTASIAN (1270 Ma)

MACKENZIE LARGE IGNEOUS PROVINCE

mPd — **MACKENZIE plutonic assemblage:** Diabase; LIP intrusives, olivine tholeiite association. Diabase, mostly high titanium tholeiite, olivine-bearing, brown to black, subophitic; plagioclase often saussuratized, olivine replaced by carbonate **(Mackenzie swarm)**.

PALEOPROTEROZOIC TO MESOPROTEROZOIC

STATHERIAN TO ECTASIAN (1700 to 1270 Ma)

ASTON BASIN

pmPa — **ASTON:** Arkose, quartz sandstone; minor siltstone, dolostone; shallow marine with clastic material of local granitoid provenance. Arkose, lesser quartz sandstone, planar crossbedded, pink to red weathering, fine- to medium-grained; minor siltstone, red to purple weathering, common desiccation cracks; stromatolitic dolostone, chert in the upper part; basal breccia, conglomerate; shallow marine with clastic material of local granitoid provenance **(Aston)**.

PALEOPROTEROZOIC

OROSIRIAN TO STATHERIAN (1940 to 1708 Ma)

THELON OROGEN

pPm4, pPm3, pPm2, pPm1 — **M'CLURE BAY plutonic assemblage:** Anorthosite, granite, syenite; mostly syn- and post-kinematic plutonic rocks.
4. Granite; pink; massive or porphyritic with K-feldspar phenocrysts **(M'Clure Bay suite)**.
3. Anorthosite; white; pale green to grey weathering; coarse-grained **(M'Clure Bay suite)**.
2. Sodic pyroxene syenite.
1. Two-pyroxene syenite.

SIDERIAN TO OROSIRIAN (2480 to 1920 Ma)

THELON OROGEN, Rae craton cover

pPb5, pPb4, pPb3, pPb2, pPb1 — **BOOTHIA:** Paragneiss, metapelite; lesser marble, calcsilicate, granitoid gneiss; local ultramafic rocks, quartzite, meta-iron-formation; mostly metamorphosed supracrustal rocks.
5. Metaperidotite, serpentinite, pyroxenite, hornblendite; ultramafic sheets, lenses and boudins.
4. Marble, calcsilicate with diopside, serpentine, olivine, wollastonite; coarse-grained, white weathering; pure and impure metasedimentary magnesian carbonate.
3. Orthopyroxene garnet gneiss; orthopyroxene magnetite gneiss; silicate facies meta-iron-formation.
2. Pyrrhotite pyrite paragneiss; sulphidic two pyroxene gneiss, sulphidic pyribolite; metamorphosed sulphidic supracrustal rocks.
1. Pelitic gneiss with garnet, biotite, sillimanite, cordierite, graphite; lesser marble, calcsilicate, quartzite, orthopyroxene granitoid gneiss; metamorphosed supracrustal rocks.

ARCHEAN AND PALEOPROTEROZOIC: 3000 to 1920 Ma

THELON OROGEN, RAE CRATON

ApPbc — **BOOTHIA COMPLEX:** Granite, granitoid gneiss; lesser paragneiss, metapelite, local marble, calcsilicate, pyribolite; syn-orogenic plutonic complex interlayered with supracrustal rocks.
5. Orthopyroxene-bearing garnet gneiss, commonly retrograded and locally migmatitic; minor metabasite and garnetiferous metasedimentary gneiss.
4. Granite; red coloured, massive textured.
3. Granitoid gneiss; amphibolite facies rocks retrograded from granulite grade.
2. Orthopyroxene granitoid gneiss, paragneiss.
1. Orthopyroxene granitoid gneiss; sheets of granite, pegmatite; lesser pelitic gneiss, marble, calcsilicate, pyribolite.

Contacts
- Geological boundary: defined or approximate

Faults
- Fault: approximate
- Fault: assumed
- Fault: approximate, showing downthrown side

Strike-slip faults
- Dextral strike-slip fault: approximate
- Dextral strike-slip fault: assumed
- Sinistral strike-slip fault: assumed

Thrust faults
- Thrust fault: approximate, teeth indicate upthrust side
- Thrust fault: assumed, teeth indicate upthrust side

Monoclines
- Monocline, (arrow indicates direction of down flexure)

Dykes
- Diabase dyke
- Diabase dyke (solid circle indicates downthrown side of fault intruded by dyke)

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GEOLOGY

TECTONIC ASSEMBLAGE MAP OF PEEL SOUND

Prince of Wales and Somerset islands, Nunavut

1:500 000

10 0 10 20 30 40 km

Map projection Lambert Conformal Conic, standard parallels 71°30'N and 73°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, 17°24'W, decreasing 21.1'E annually.
Readings vary from 3°52'W in the SW corner to 30°52'W in the NE corner of the map.

This map is not to be used for navigational purposes.

Title Photograph: Paleoproterozoic basement including metasediments and marble, Bellot Strait and southern Somerset Island, Nunavut. Photograph by T. Frisch. 2013-073

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.

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Preliminary publications in this series have not been scientifically edited.

Canada

CANADIAN GEOSCIENCE MAP 76

GEOLOGY

TECTONIC ASSEMBLAGE MAP OF PEEL SOUND

Prince of Wales and Somerset islands, Nunavut