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; setting **(constituent "...group", formation names indicated in bold text):
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.** ...) each unit description, in the following form: major rock types and component features; minor rock types and features; rare rock types and features; settings **(constituent "...group", formation, "...member", "...suite", "...bed" names 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*

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

Informally named tectonic setting

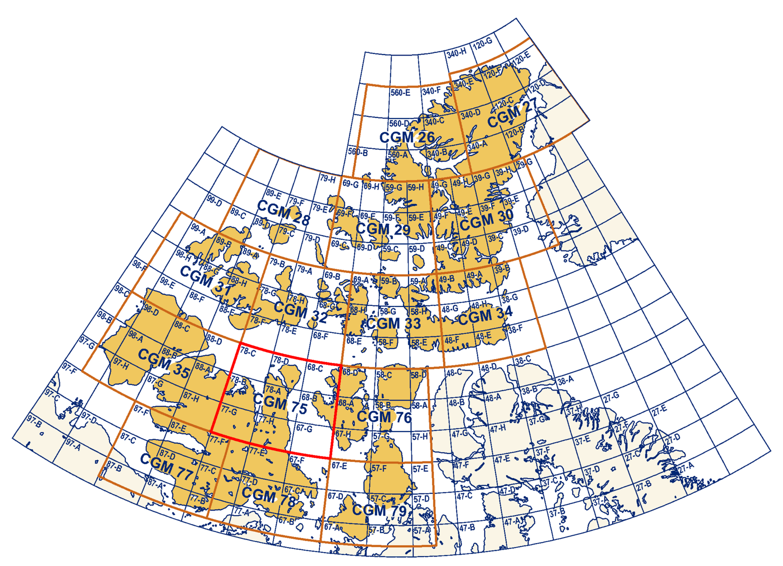
Label; Unit 2 Label; Unit 1 Label

PLUTONIC ASSEMBLAGE NAME:** plutonic assemblage description, in the following form: major rock types; minor rock types; setting **(constituent "...suite", "...swarm", "...intrusion", "...intrusive complex" names indicated in bold text):
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.** ...) each unit description, in the following form: major rock types and component features; minor rock types and features; rare rock types and features; settings **(constituent "...suite", "...swarm", "...intrusion", "...intrusive complex" names 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



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 northeastern Victoria Island, Stefansson Island, and western Prince of Wales Island. Major features of the area include inliers of Neoarchean basement granitoid rocks; clastic rock–dominated sections associated with the late Paleoproterozoic Kilohigok Basin, and Mesoproterozoic Elu Basin; extensive Meso- and Neoproterozoic strata of Amundsen Basin, diabase sills, and extrusive basaltic rocks related to the Franklin Large Igneous Province (ca. 723 Ma) and unconformable Cambrian to Devonian strata of Arctic Platform.

Résumé

Cette carte et la géodatabase qui s'y rapporte documentent la géologie du substratum rocheux dans le centre et le nord-est de l'île Victoria, l'île Stefansson et l'ouest de l'île Prince of Wales. Les principales entités géologiques de la région comprennent des boutonnières de roches granitoïdes du socle néoarchéen; des successions à prédominance de roches clastiques associées au bassin de Kilohigok (Paléoprotérozoïque tardif) et au bassin d'Elu (Mésoprotérozoïque); de vastes strates mésoprotérozoïques et néoprotérozoïque du bassin d'Amundsen, des filons-couches de diabase et des roches basaltiques effusives apparentées à la grande province magmatique de Franklin (env. 723 Ma), ainsi que des strates discordantes d'âge cambrien à dévonien de la Plate-forme de l'Arctique.

Cover illustration
Shaler Supergroup near Wynniatt Bay, Minto Inlier, northwestern Victoria Island.
Photograph by Rob Rainbird. 2013-072

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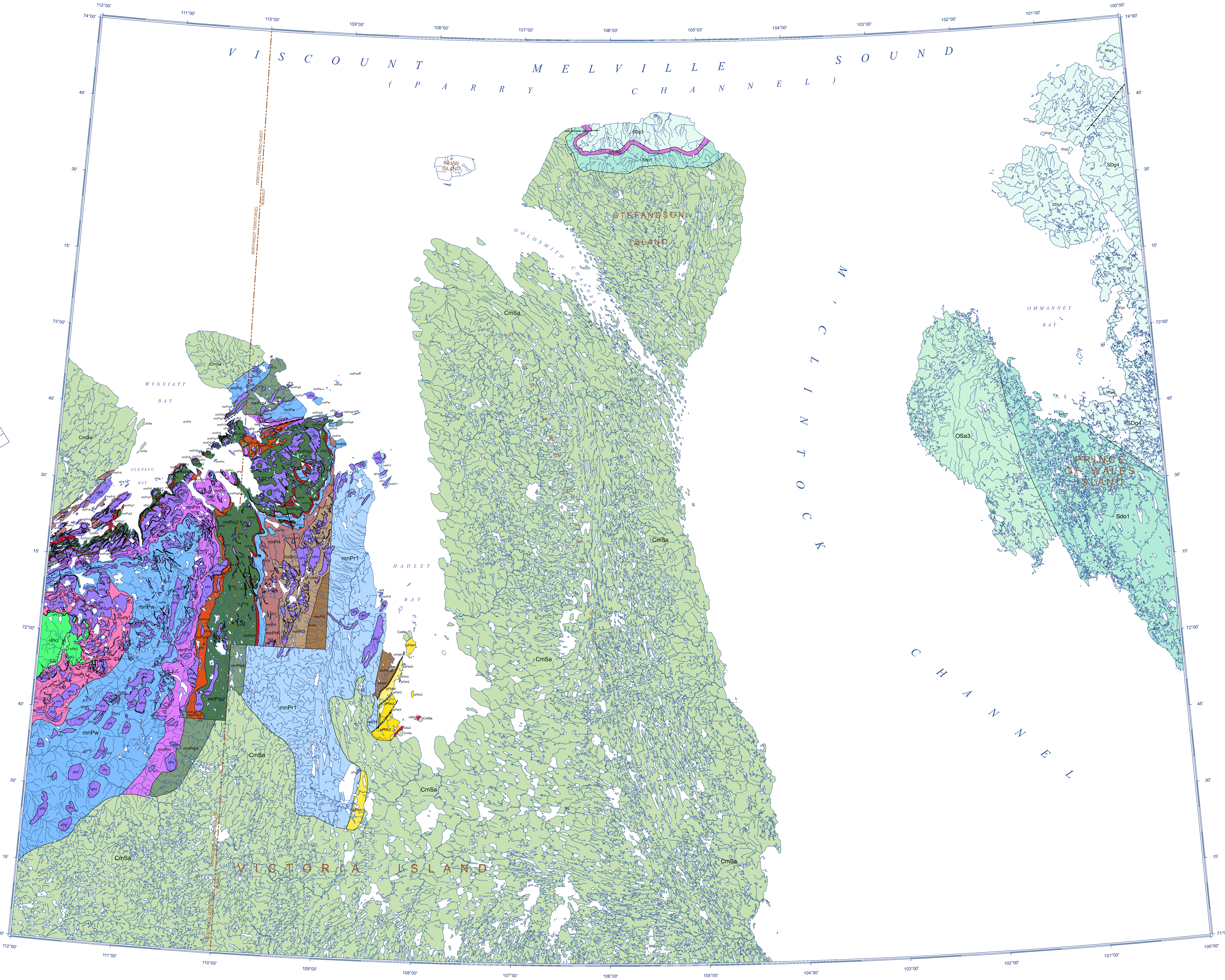
CANADIAN GEOSCIENCE MAP 75

GEOLOGY

TECTONIC ASSEMBLAGE MAP OF HADLEY BAY

Victoria and Prince of Wales islands, Nunavut–Northwest Territories

1:500 000



SILURIAN AND DEVONIAN

LUDLOW TO EARLY DEVONIAN (Lochkovian)

Cape Phillips embayment

SDdW2 — **DEVON ISLAND - WEST:** Shale, limestone; local olistostromes, bioherms; deep water and sediment starved, locally grading to shelf ramp.
2. Devon Island and Victoria Island; Ludlow only.

SILURIAN AND DEVONIAN

LUDLOW TO EARLY DEVONIAN (Pragian)

Franklinian shelf ARCTIC PLATFORM

SDg4, SDg3 — **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)**.
3. Argillaceous limestone, dolomitic limestone; thin-bedded, very-fine to fine-grained; lime mudstone, wackestone; thick- to massive-bedded, fine-grained, crinoidal, stromatoporoidal coral bioherms; dolostone, medium-grained, massive-bedded; shale in the lower part, dark grey, calcareous; minor sandstone; numerous shallowing-upward cycles; tidal flat, shelf lagoon, back-barrier, shelf edge including reefs, foreslope **(Barlow Inlet)**.

SILURIAN

LUDLOW

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)**.

ORDOVICIAN TO SILURIAN

RICHMONDIAN TO LUDLOW

OSa3 — **ALLEN BAY:** Dolostone, limestone; local bioherms, anhydrite; arid subtidal to supratidal settings.
3. Allen Bay, Cape Storm, undivided.

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).

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)**.

NEOPROTEROZOIC

CRYOGENIAN (723 to 718 Ma)

nPk2, nPk1 — **NATKUSIAK:** Basalt, minor volcaniclastic rock, agglomerate; subaerial continental tholeiite flows phreatomagmatic and volcaniclastic units.
2. Basalt flows, massive and amygdaloidal, to 30 m thick; minor volcaniclastic units. Common native copper and copper sulphides; subaerial continental tholeiite flows and phreatomagmatic units **(Natkusiak)**.
1. Volcanic breccia, green to maroon; conglomerate, arenite; framework with locally-derived sedimentary clasts; volcaniclastic and proximal pyroclastic settings **(Natkusiak, lower volcaniclastic member)**.

MESOPROTEROZOIC, NEOPROTEROZOIC

STENIAN TO CRYOGENIAN (1033 to 723 Ma)

AMUNDSEN BASIN

mnPk1 — **KILIAN:** Limestone, dolostone, gypsum/anhydrite; lesser quartz arenite, redbeds; minor mudstone, arenaceous and argillaceous carbonate; cyclically subtidal to supratidal.
1. Cyclically interbedded gypsum/anhydrite and red to tan limestone and dolostone, argillaceous and arenceous carbonate; often stromatolitic; cyclically shallow subtidal to intertidal and supratidal **(Kilian)**.

mnPw — **WYNNIATT:** Cyclic dolosiltite, dololutite, intraclast breccia, sandstone, black mudstone; minor quartz arenite, microbialite limestone; common desiccation cracks, stromolitic bioherms; shallow subtidal with reef complex and cyclical intertidal facies **(Wynniatt)**.

mnPm — **MINTO INLET:** Gypsum/anhydrite; minor red siltstone and calcisiltite cyclically alternating with dolarenite and dolosiltite; grey, thin- to massive-bedded; local hummocks and stromatolites; three shoaling cycles: shallow subtidal restricted to supratidal **(Minto Inlet)**.

mnPrp4, mnPrp3, mnPrp2, mnPrp1 — **REYNOLDS POINT:** Quartz arenite, dololutite, dolosiltite, grainstone; minor shale, glauconitic sandstone; inner to shallow outer clastic shelf, fluvial deltaic and nearshore.
4. Quartz arenite, yellow, crossbedded; dolosiltite, dololutite; laminated, mud-cracked; linked and digitate stromatolites; intertidal and lagoonal **(Jago Bay)**.
3. Quartz arenite; medium-bedded, fine- to medium-grained; planar beds, herringbone cross-stratification; minor glauconitic sandstone; shallow subtidal to intertidal clastic shelf **(Fort Collinson)**.
2. Ooid grainstone, stromatolitic dolostone, dolosiltite; cyclically arranged; minor quartz arenite increasing upward; storm-dominated inner to outer shelf **(Boot Inlet)**.
1. Quartz arenite, fine- to medium-grained, planar crossbedded; basal shale; minor hummocky quartz arenite and dololutite in upper part; prodelta and fluvial grading up to shoreface and nearshore **(Grassy Bay)**.

mnPr5, mnPr4, mnPr3, mnPr2, mnPr1 — **RAE:** Dolostone, dolosiltite, quartz arenite, minor ilithic arenite, intraclast conglomerate; clastic shelf, offshore platform and fluvial-deltaic.
5. Dolostone, sideritic to ankeritic, cream to orange brown, columnar and digitate stromatolites; minor dololutite and wavy dolosiltite; marine platform below wave base **(Aok)**.
4. Siltstone, red, green; quartz arenite, fine- to medium-grained, white to pink, planar cross-stratified; minor, shale, pyritic, black; glauconitic sandstone, hummocky cross-stratified; marine prodeltaic, deltaic, fluvial **(Nelson Head)**.
3. Dolostone, stromatolitic; dolositite, dolarenite; dolostone intraclast conglomerate, minor chert; shallow subtidal to supratidal **(Mikkelsen Islands)**.
2. Quartz arenite, lithic arenite, fine- to medium-grained, crossbedded; siltstone, crosslaminated; minor limestone, argillaceous; dolostone, stromatolitic, concretionary; subtidal to intertidal shelf; in part storm-dominated **(Escape Rapids)**.
1. Dolostone, dolosiltite, quartz arenite, minor ilithic arenite, intraclast conglomerate; clastic shelf, offshore platform and fluvial-deltaic **(Rae group)**.

MESOPROTEROZOIC

ECTASIAN (1380 TO 1270 Ma)

ELU BASIN

mPeN2, mPeN1 — **ELLICE-NORTH:** quartzite, minor siltstone, sandstone, grit, local conglomerate; braided fluvial, shoreface and nearshore.
2. Quartzite, trough cross-stratified; minor pebble conglomerate; local shale near base; unrestricted storm-dominated, shallow marine shelf **(Ellice, upper part)**.
1. Boulder conglomerate, red with quartzite clasts; minor grit, pebbly sandstone, trough cross-stratified; transgressive nearshore and shoreface **(Ellice, lower part)**.

PALEOPROTEROZOIC

OROSIRIAN (2050 to 1810 Ma)

KILOHIGOK BASIN

pPbh4, pPbh3, pPbh2, pPbh1 — **BURNSIDE:** Quartz arenite, sandstone; minor conglomerate, siltstone, shale; local dolostone, breccia; braided fluvial, locally unrestricted shallow marine.
4. Quartzite, red and grey weathering; sandstone; local planar crossbedded; siltstone; minor shale; local conglomerate to boulder grade; braided fluvial **(Hadley, upper member)**.
3. Dolostone,stromatolitic , columnal and biohermal; dolarenite, oolitic; siltstone and shale, grey-green; shallow marine, unrestricted **(Hadley, middle member)**.
2. Quartzite, red weathering; minor immature sandstone, in part micaceous; shale; local quartz pebble conglomerate; braided fluvial **(Hadley, lower member)**.
1. Quartzite, red weathering; minor immature sandstone, in part micaceous; shale, dolostone, stromatolitic; local quartz pebble conglomerate; braided fluvial; periodically shallow marine **(Hadley)**.

NEOARCHEAN? TO PALEOPROTEROZOIC

(SIDERIAN)

SLAVE CRATON

nAw2 — **WELLINGTON plutonic assemblage:** Granodiorite, syenogranite, monzogranite; collisional plutonic complex restricted.
2. Granodiorite, pink, coarse-grained **(Hadley suite)**.

Contacts
- Geological boundary: defined or approximate

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

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

REFERENCES

Campbell, F.H.A., 1979. Stratigraphy and sedimentation in the Helikian Elu Basin and Hiukitak Platform, Bathurst Inlet-Melville Sound, Northwest Territories; Geological Survey of Canada, Paper no. 79-8.

Campbell, F.H.A., 1981. Stratigraphy and Tectono-depositional Relationships of the Proterozoic Rocks of the Hadley Bay Area, northern Victoria Island, District of Franklin, in; Current Research Part A / Recherches En Cours Partie A; Geological Survey of Canada, Paper no. 81-1A; pages 15-22.

Christie, R.L., Fyles, J.G., Thorsteinsson, R., and Tozer, E.T., 1963. Geology Banks, Victoria and Stefansson Islands, District of Franklin; Geological Survey of Canada, Map 1135A, scale 1:1 013 760.

Cook, D.G. and MacLean, B.C., 2004. Subsurface Proterozoic stratigraphy and tectonics of the western plains of the Northwest Territories. Geological Survey of Canada, Bulletin 575, 91p.

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.

Dostal, J., Baragar, W.R.A., and Dupuy, C., 1986. Petrogenesis of the Natkusiak continental basalts, Victoria Island, Northwest Territories, Canada; Canadian Journal of Earth Sciences. Volume 23, Issue 5, Pages 622-632.

Hulbert, L.J., Rainbird, R.H., Jefferson, C.W., and Friske, P., 2005. Map of mafic and ultramafic bodies related to the Franklin magmatic event, Minto Inlier, Victoria Island; Geological Survey of Canada, Open File 4928, scale 1:500 000.

Rainbird, R.H., 1998. Bedrock and surficial geology, Wynniatt Bay, District of Franklin, Northwest Territories; Geological Survey of Canada, Open File 3671, scale 1:125 000.

Rainbird, R.H., Jefferson, C.W., and Young, G.M., 1996. The early Neoproterozoic sedimentary Succession B of northwestern Laurentia: Correlations and paleogeographic significance. Geological Society of America Bulletin, 108, 454-470.

Rainbird, R.H., Jefferson, C.W., Hildebrand, R.S. and Worth, J.K., 1994. The Shaler Supergroup and revision of Neoproterozoic stratigraphy in Amundsen Basin, Northwest Territories. Geological Survey of Canada, Current Research 1994-C, 61-70.

Thorsteinsson, R. and Tozer, E.T., 1962. Banks, Victoria, and Stefansson Islands, Arctic Archipelago; Geological Survey of Canada, Memoir 330; 85 pages.

Thorsteinsson, R. (ed.) and Uyeno, T.T., (ed.)1980. Stratigraphy and conodonts of Upper Silurian and Lower Devonian rocks in the environs of the Boothia Uplift, Canadian Arctic Archipelago; Geological Survey of Canada, Bulletin 292; 75 pages.

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GEOLOGY

TECTONIC ASSEMBLAGE MAP OF HADLEY BAY

Victoria and Prince of Wales islands, Nunavut–Northwest Territories

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 2013, 6°10'E, decreasing 46'W annually.
Readings vary from 4°09'W in the SE corner to 15°14'E in the NW corner of the map.

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

The 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/).

This map is not to be used for navigational purposes

Preliminary publications in this series have not been scientifically edited.

CANADIAN GEOSCIENCE MAP 75

GEOLOGY

TECTONIC ASSEMBLAGE MAP OF HADLEY BAY

Victoria and Prince of Wales islands, Nunavut–Northwest Territories