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

ASSEMBLAGE NAME: assemblage description, in the following form: major rock types; minor rock types (geochronological data, tectonic setting and/or other characteristics). Units within assemblages are subjective groupings of stratigraphic or metamorphic rock units that allow representation of complex geology at map scales. Note that:
*1. Separately distinguished and described components of the assemblage are indicated by units in brackets, e.g. *assemblage* (*unit1*, *unit2*, *unit3*) in the text and on the map;*
*and component features: minor rock types and features; rare rock types and features; settings (*assemblage*[1], "*group*", formation, [1]*member*[1], [1]*axite*[1], [1]*dacite*[1] *names indicated in bold text*) *are shown in the text. Units within an assemblage are distinguished by their own colour in solid detail and clarity to the map.*

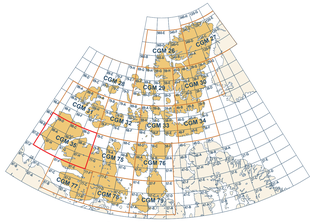
PLUTONIC ASSEMBLAGE AGE, PERIOD: Series (Stage, Absolute age range)

PLUTONIC ASSEMBLAGE NAME: plutonic assemblage description, in the following form: major rock types; minor rock types (geochronological data, tectonic setting and/or other characteristics). Plutonic assemblages are subjective groupings of intrusive rock units that allow representation of complex geology at map scales. Note that:
*2. Separately distinguished and described components of the assemblage are indicated by units in brackets, e.g. *assemblage* (*unit1*, *unit2*, *unit3*) in the text and on the map;*
*and component features: minor rock types and features; rare rock types and features; settings (*assemblage*[1], "*suite*", [1]*axite*[1], [1]*dacite*[1], [1]*intrusive complex*" *names indicated in bold text*) *are shown in the text.*
1. where indicated, some units within an assemblage are distinguished by their own colour in solid 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 Shoreline Bay assemblage, labeled Ch-ab1, Ch-ab2 and Ch-ab3 are amalgamated under the colour of their parent (Ch-ab).

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

- *Cretaceous plutonic assemblages (Cretaceous 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
- dark blue: extensional 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 southern Banks Island (including the greater part of Aulavik National Park of Canada) and northwestern Victoria Island. Major features of the area include Meso- and Neoproterozoic rocks of the Minto Inlier, Neoproterozoic to Devonian basaltic rocks related to the Franklin Large Igneous Province (ca. 723 Ma), Cambrian to Devonian strata of Arctic Platform and the Ellesmerian foreland, unconformably overlain by near-flat-lying Cretaceous to Paleogene strata of the Arctic Basin, and unconsolidated Neogene sediments of the Arctic margin.

Résumé

Cette carte et la géodatabase qui s'y rapporte documentent le géologie du substratum rocheux dans le centre et le sud de l'île Banks (y compris la majeure partie du parc national du Canada Aulavik) et le nord-ouest de l'île Victoria. Les principales entités présentes dans la zone comprennent des roches mésoprotérozoïques et néoprotérozoïques du bassin d'Amundsen, des filons-couches de diabase et des roches basaltiques effusives appareentés à la grande province magmatique de Franklin (env. 723 Ma), des strates cambriennes à dévoniennes de la plateforme Arctique et de l'avant-pays ellesmérien, recouvertes en discordance par des strates presque horizontales d'âge crétacé et paléogène du bassin de Banks, ainsi que des sédiments néogènes non consolidés de la marge continentale de l'Arctique.

Cover Illustration
Shaler Supergroup near the Kuujua River, Minto Inlier, northwestern Victoria Island, Northwest Territories. Photograph by Rob Rainbird, 2013-071

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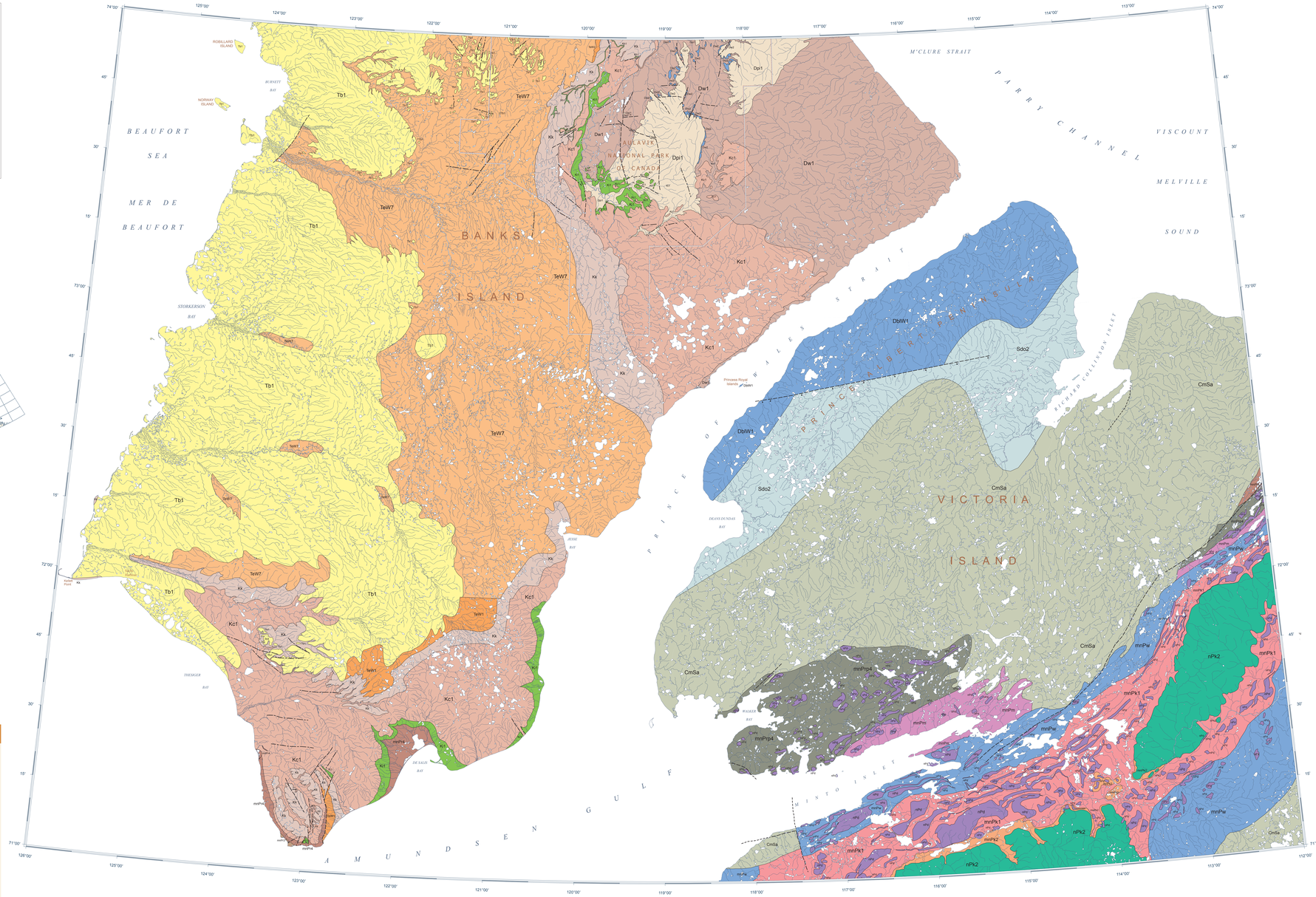
CANADIAN GEOSCIENCE MAP 35

GEOLOGY

TECTONIC ASSEMBLAGE MAP OF AULAVIK

Banks Island and northwestern Victoria Island, Northwest Territories

1:500 000



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NEOGENE

(Miocene, Pliocene)

Tb1 — **BEAUFORT:** Sand, gravel, minor peat; mostly fluvial braidplain.
1. Sand, unconsolidated, fine-grained, quartzose, pale yellowish orange, massive, parallel laminated, ripple cross-laminated; fluvial braidplain and overbank. **(Ballast Brook, Beaufort)**

PALEOGENE

PALEOCENE AND EOCENE (Selandian to middle Eocene)

TeW7 — **EUREKA SOUND-WEST:** Sandstone, siltstone, shale; local conglomerate; minor coal, volcanogenic sandstone; mostly fluvial and deltaic; local syntectonic alluvial fan deposits
TeW6 — **2.** Shale, medium to dark grey, locally bioturbated; minor sandstone, quartz arenite in upper part; fine to medium-grained, locally trough cross-stratified; minor coal; prodeltaic with barrier island bars in the upper part **(Strand Bay)**
TeW1 — **3.** Sandstone, fine to coarse-grained, locally pebbly; shale; local conglomerate; local volcanogenic sandstone; common plants fossils; mostly fluvial and deltaic; local syntectonic alluvial fan deposits **(Eureka Sound)**

CRETACEOUS

LATE CRETACEOUS (Cenomanian to Campanian)

Kk — **KANGUK:** Shale, grey to dark greenish grey weathering, variably silty; calcareous concretions; rare bentonite; local sandstone, tuff, and bentonite; minor tuff, local sandstone in the southern and western Arctic Islands, rare pebble conglomerate **(Eglinton Island)**; outer shelf, sediment starved, initially anoxic **(Kanguk)**; may locally include other Cretaceous, Paleogene and Pliocene strata.

EARLY AND LATE CRETACEOUS (Albian to Cenomanian)

Kb1 — **HASSEL:** Sandstone, siltstone, minor shale, basalt; fluvial delta plain and delta front, local extrusive flows
1. Sandstone, quartzose, fine to coarse-grained, pale olive grey and yellowish orange weathering, massive, parallel laminated, ripple cross-laminated, unconsolidated; siltstone, minor shale, coarsening-upward cycles; local mafic volcanic flows **(Amund Ringnes Island)**; fluvial delta plain and delta front **(Hassel)**.

EARLY CRETACEOUS (Aptian and Albian)

Kc1 — **CHRISTOPHER:** Shale, siltstone, minor sandstone, local carbonate, tuff, bentonite; coal climate offshore shelf, distant volcanic activity.
1. Shale, dark grey, brownish grey and brownish black weathering; siltstone; minor sandstone, tuff, bentonite; local carbonate concretions, local limestone concretions, locally abundant bivalves; local methygenic carbonate mounds, tuff, bentonite; cool climate, deep outer shelf **(Christopher)**; may locally include younger Cretaceous, Paleogene and Pliocene strata.

EARLY CRETACEOUS (Valanginian to Aptian)

Ki1 — **ISACHSEN:** Quartz sandstone, siltstone, shale; minor conglomerate, coal; local basalt; temperate climate, deltaic, fluvial channel and overbank deposits, local extrusives flows.
1. Quartz sandstone, fine- to coarse-grained, white, light yellowish brown and light olive grey weathering, massive, parallel laminated, ripple cross-laminated; and shale, dark grey; minor conglomerate, mudstone, coal; local mafic volcanic flows **(Axel Heiberg, northern Ellesmere Islands)**; temperate climate, deltaic, fluvial channel and overbank deposits **(Isachsen)**; may locally include younger Cretaceous strata.

DEVONIAN

LATE DEVONIAN (Frasnian and Famennian)

Dp1 — **PARRY ISLANDS:** Sandstone, minor siltstone, shale, coal; humid tropical, braided and meandering fluvial systems, deltaic; locally shallow marine.
1. Sandstone, quartzose and cherty, fine to coarse-grained, yellowish orange, pale grayish green and white weathering, coalified wood and plant fragments; minor siltstone, shale, coal; fining-upward cycles, local coarsening-upward cycles; rare fossiliferous limestone; humid tropical, braided and meandering fluvial systems, deltaic; locally shallow marine **(Parry Islands)**.

LATE DEVONIAN (Frasnian)

Dw2 — **WEATHERALL:** Siltstone, sandstone, shale; humid climate, delta front and inner to outer clastic shelf
2. Limestone, biotromal; peritidal wackestone, packstone; bioherms; corals, stromatoporoids; reef and unrestricted inter-reef shelf facies **(Mercy Bay mountain)**
Dw1 — **1.** Siltstone and sandstone, fine-grained, thin-bedded, variably calcareous, grey-green weathering, common plant fragments, bivalves and brachiopods; shale, dark grey-green; numerous coarsening-upward cycles; humid climate, delta front and inner to outer clastic shelf **(Weatherall)**.

EARLY AND MIDDLE DEVONIAN (Emsian and Eifelian)

Dbiw1 — **BLUE FIORD-WEST:** Limestone, dolostone; minor mudstone, wackestone, grainstone, rudstone; local bitumen, mostly shallow subtidal, restricted and hypersaline
1. Limestone, light grey and light brown, thick-bedded, including mudstone, wackestone, grainstone, stromatoporoid rudstone; lesser fenestral dolostone, light grey; petroliferous dolostone, yellowish brown, biomicritic porosity, bitumen, corals, stromatoporoids; mostly shallow subtidal, restricted and unrestricted **(Blue Fiord)**.

SILURIAN AND DEVONIAN

LUDLOW TO LOCHKOVIAN

Sdo2 — **DOURO:** Limestone; minor dolostone, shale; local bioherms; shallow to deep subtidal shelf ramp **(Douro)**.
2. Dhoro, **Barlow Inlet**, undivided.

CAMBRIAN TO SILURIAN

LATE CAMBRIAN TO LUDLOW

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)**.

NEOPROTEROZOIC

CRYOGENIAN (723 to 718 Ma)

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

nPk2 — **NATKUSIAK:** Basalt; minor volcaniclastic rock, agglomerate; subaerial tholeiitic 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)**.

MESOPROTEROZOIC, NEOPROTEROZOIC

STENIAN TO CRYOGENIAN (1033 to 723 Ma)

mnPk2 — **KILIAN:** Limestone, dolostone; gypsum/anhydrite, lesser quartz arenite, rudstone; minor mudstone, arenaceous and argillaceous carbonate; cyclically subtidal to supratidal **(Kilian)**, grading to fluvial braidplain and playas **(Kuujjua)**.
2. Sand, grained quartz arenite, tabular cross bedded; minor calcareous siltstone, fine sandstone; fluvial braidplain with abandoned channel playas **(Kuujjua)**.
mnPk1 — **1.** Cyclically interbedded gypsum/anhydrite and red to tan limestone and dolostone, argillaceous and arenaceous carbonate; often stromatolitic; cyclically shallow subtidal to intertidal and supratidal **(Kilian)**.

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

mnPs — **MINTO INLET:** Gypsum/anhydrite; minor red siltstone and sandstone cyclically interbedded with dolosiltite and dolomitic grey shale; thin to massive stromatolite hummocks and stromatolites; three shoaling cycles; shallow subtidal restricted to supratidal **(Minto Inlet)**.

mnPp4 — **REYNOLDS POINT:** Quartz arenite, dolobulite, dolosiltite, grainstone; minor shale, glauconitic sandstone; inner to shallow outer clastic shelf, fluvial deltaic and nearshore
4. Quartz arenite, yellow cross-bedded; dolosiltite, dolobulite; laminated, stromatolite bioherms; shallow subtidal to intertidal and supratidal **(Jago Bay)**.

mnPr4 — **RAE:** Dolosiltite, dolobulite, quartz arenite; minor tillite; arenite, intraclast conglomerate; clastic shelf, offshore platform and fluvial-interior.
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 protodeltaic; deltaic, fluvial **(Nelson Head)**.

mnPr3 — **3.** Dolosiltone, stromatolitic; dolosiltite, dolarenite; dolostone intraclast conglomerate, minor chert; shallow subtidal to supratidal **(Mikkelsen Islands)**.

Contacts
Geological boundary: defined or approximate

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

Strike-slip Faults
Fault: dextral strike-slip, approximate

Lineaments
Structural lineament, approximate

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GEOLOGY
TECTONIC ASSEMBLAGE MAP OF AULAVIK
Banks Island and northwestern Victoria Island, Northwest Territories
1:500 000

10 0 10 20 30 40km

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, 23°18'E, decreasing 59'W annually. Readings vary from 25°38'E in the SW corner to 15°14'E in the NE 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 35
GEOLOGY
TECTONIC ASSEMBLAGE MAP OF AULAVIK
Banks Island and northwestern Victoria Island, Northwest Territories

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