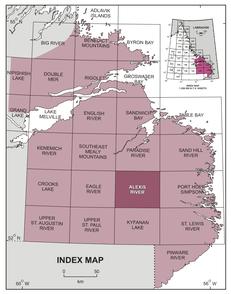
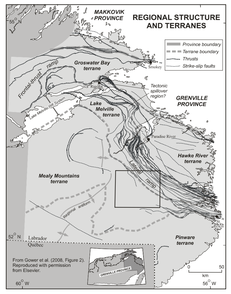
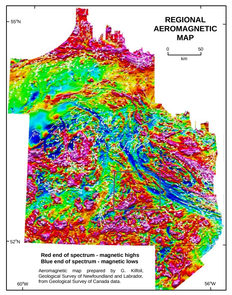
Newfoundland Labrador
NATURAL RESOURCES

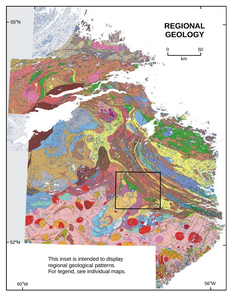
MAP 2010-19
OPEN FILE 013A/0081

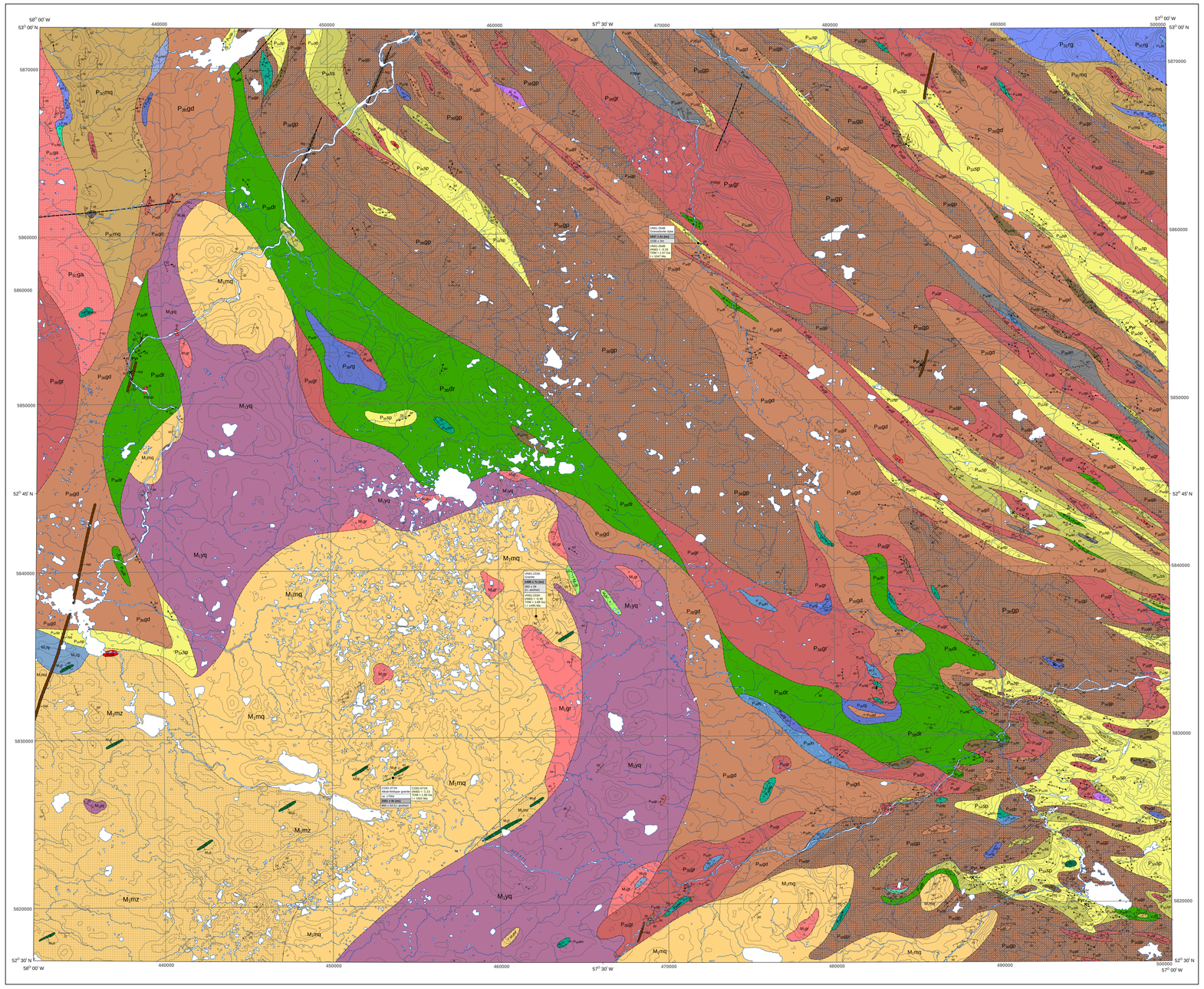
GEOLOGY OF THE ALEXIS RIVER AREA (NTS SHEETS 13A/11, 12, 13 & 14) SOUTHEASTERN LABRADOR











ALEXIS RIVER

A map of the area was published uncoloured with an accompanying report (van Nostrand, 1992), which superseded an article by van Nostrand et al. (1992). Most of T. van Nostrand's map is based on mapping carried out in 1991, but includes data collected by C.F.Gower in 1986. The present map also includes investigations by C.F. Gower along Highway 510 in 2003 and 2007 and incorporates field data collected by Eade (1962), making use of original field notes recorded by K.E. Eade and assistants.

The map and report of T. van Nostrand embedded follow-up examination of stained slabs and petrographic thin sections. U-Pb geochronological results (Wasteneys et al., 1997) and Nd-Sm isotopic data (J.S. Daly, unpublished - see digital database) are shown. Localities designated as mineral occurrences are based mostly on observations made during the 1991 field season, but include a reported later discovery (see Mineral Occurrence Table; current to 2009).

Since the previous map was published, interpretation for the region has evolved, so there are some differences between the current and previous version of this map, particularly in the depiction of strike-slip faults, most of which are yet to be confirmed. Unit modification is partly related to a compilation approach applied to the whole of eastern Labrador, but border regions of the map have been revised as a result of data integration with adjacent map areas. Geological boundaries are poorly controlled and have been extrapolated using structural interpretations, regional aeromagnetic data and topographic trends. Pre-1984 data station locations have been digitized from where originally located on aerial photographs or (rarely) on topographic maps, so reliability of location is likely mostly dependent on initial plotting accuracy. Subsequent locations are based on GPS-supported readings.

As is characteristic of metamorphic and plutonic terranes, individual outcrops are typically very complex, and commonly embody several different rock types. Generally, the unit polygon depicted is based on what was deemed to be the dominant rock type present, but this approach was not universally followed, due to the exigencies of specific situations, such as the need to emphasize minor rock types deemed to have high significance. All rock types recorded from any individual outcrop may be determined by consulting the 'Unit designator' string for that locality given in the digital database. The user is alerted to the fact that, in the digital database, no attempt has been made to reconcile rock names applied to field outcrops, versus those applied to stained slabs, or petrographic thin sections. Differences may be due to subsequent, more refined identifications, but other reasons may apply, such the sample (or thin section) not being representative of its source material. Unit designator and polygon labels applied are based on an awareness of such factors.

REFERENCES

Eade, K.E.
1962: Geology, Battle Harbour - Cartwright, coast of Labrador, Newfoundland. Geological Survey of Canada, Map 22-1962.

Gower, C.F., Kamo, S. and Krogh, T.E.
2008: Indentor tectonism in the eastern Grenville Province. Precambrian Research, Volume 167, pages 201-212.

van Nostrand, T.
1992: Geology of the Alexis River region, Grenville Province, southeastern Labrador. Newfoundland Department of Mines and Energy, Report 92-3, 27 pages.

van Nostrand, T., Dunphy, D. and Eddy, D.
1992: Geology of the Alexis River map region, Grenville Province, southeastern Labrador. In Current Research. Newfoundland Department of Mines and Energy, Geological Survey Branch, Report 92-1, pages 399-412.

Wasteneys, H., Kamo, S., Moser, D., Krogh, T.E., Gower, C.F. and Owen, J.V.
1997: U-Pb geochronological constraints on the geological evolution of the Pinware terrane and adjacent areas, Grenville Province, southeast Labrador, Canada. Precambrian Research, Volume 81, pages 101-128.

Recommended citation
van Nostrand, T. and Gower, C.F., 2010. Geology of the Alexis River area (NTS sheets 13A/11, 12, 13 and 14), southeastern Labrador. Geological Survey, Mines Branch, Department of Natural Resources, Government of Newfoundland and Labrador, Map 2010-19, Open File 013A/0081.

Geological cartography by T. Paltanavage, Cartographic Unit, Department of Natural Resources.

Digital NTS base maps (NTS 13A/11, 12, 13 and 14) used for this map are available from Surveys and Mapping Branch, Natural Resources Canada.
Magnetic declination at the centre of the map at the start of 2010 was 22° 23' W.
Elevations are in metres above sea level. Contour interval is 20 metres.
UTM (Universal Transverse Mercator) Grid Zone 21, NAD (North American Datum) 27.

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Copies of this map may be obtained from the Geoscience Publications and Information Section, Geological Survey, Mines Branch, Department of Natural Resources, Government of Newfoundland and Labrador, P.O. Box 8700, St. John's, NL, A1B 4J6, Canada. Email: pub@gov.nl.ca.

NOTE: Map 2010-19 is one of twenty-five maps on the geology of the Grenville Province in eastern Labrador and adjacent eastern Makkovik Province produced by the Geological Survey, Mines Branch, Department of Natural Resources, Government of Newfoundland and Labrador.

Mines Branch website: http://www.nr.gov.nl.ca/nr/mines/index.html.

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MINERAL OCCURRENCE DATA SOURCES

Inventory No.	Map label	Status	Easting	Northing	Reference
013A/11/Fe 001	Mgt	Indication	493089	5834135	GSNL (field notes; VN91-078)
013A/11/Pyr001	Pyr	Indication	494858	5819830	GSNL (field notes; VN91-266)
013A/11/Pyr002	Pyr, Ms	Indication	488140	5821467	GSNL (field notes; VN91-388)
013A/11/U 001	U	Showing	490700	5843200	www.kinrinresources.com/s/AlexisRiver.asp
013A/13/Pyr001	Pyr	Indication	438144	5851923	GSNL (field notes; CG91-014)
013A/14/Pyr001	Pyr	Indication	485283	5852040	GSNL (field notes; DD91-080)
013A/14/Pyr002	Pyr	Indication	484471	5865203	GSNL (field notes; CG03-354)
013A/14/Pyr003	Pyr	Indication	497573	5854019	GSNL (field notes; CG03-364)

GSNL (Geological Survey of Newfoundland and Labrador)

LEGEND

DEVONIAN (?)
- Dd — Sandwich Bay and Battle Harbour dykes

EARLY CAMBRIAN
- ForFm — Forteau Formation
- BdrFm — Bradore Formation (subdivided into L'Anse-au-Clair, Crow Head and Blanc-Sablon members)

NEOPROTEROZOIC – EARLY CAMBRIAN
- NcLc — Lighthouse Cove Formation
- RcBa — Bateau Formation

NEOPROTEROZOIC
- NDm — Double Mer Formation
- NGi — Gilbert arkose
- NSb — Sandwich Bay conglomerate
- Nc — Clastic dykes
- Nd — Long Range dykes
- Nq — Quartz veins

LATE MESOPROTEROZOIC (M_3 1200 – 900 Ma)
LATE POST-GRENVILLIAN INTRUSIONS (M_{3c} ca. 975 – 955 Ma)
e.g., Chateau Pond granite
- M_{3c}gp — Massive to weakly foliated megacrystic/porphyritic granite to quartz monzonite
- M_{3c}gr — Massive to weakly foliated granite to alkali-feldspar granite
- M_{3c}ln — Massive to weakly foliated leucogabbro to leuconorite
- M_{3c}mn — Massive to weakly foliated monzogabbro and monzonorite
- M_{3c}mq — Massive to weakly foliated quartz monzonite; mantled feldspar textures
- M_{3c}mz — Massive to weakly foliated monzonite to monzodiorite
- M_{3c}yq — Massive to weakly foliated syenite, quartz syenite and alkali-feldspar quartz syenite
- M_{3c}d — Unnamed mafic dykes

EARLY POST-GRENVILLIAN INTRUSIONS (M_{3b} ca. 985 – 975 Ma)
e.g., Beaver Brook and Picton Pond plutons
- M_{3b}gr — Weakly to moderately foliated granite to alkali-feldspar granite
- M_{3b}ln — Weakly to moderately foliated leucogabbro to leuconorite
- M_{3b}mn — Weakly to moderately foliated monzogabbro to monzonorite
- M_{3b}mq — Weakly to moderately foliated monzonite to quartz monzonite
- M_{3b}rg — Weakly to moderately foliated gabbro, norite and troctolite
- M_{3b}yq — Weakly to moderately foliated syenite, quartz syenite and alkali-feldspar syenite
- M_{3b}d — L'Anse-au-Diable, York Point, Gilbert Bay *mafic dykes*

SYN-GRENVILLIAN INTRUSIONS (M_{3a} ca. 1085 – 985 Ma)
- M_{3a}gd — Moderately to strongly foliated granodiorite to quartz diorite
- M_{3a}gp — Moderately to strongly foliated megacrystic/porphyritic granodiorite to quartz diorite
- M_{3a}gr — Moderately to strongly foliated granite to alkali-feldspar granite
- M_{3a}yn — Moderately to strongly foliated aegerine- or nepheline-bearing syenite
- M_{3a}d — Unnamed mafic dykes (Makkovik Province and adjacent Grenville Province)

PRE-GRENVILLIAN INTRUSIONS (M_{3x} ca. 1200 – 1085 Ma)
e.g., Gilbert Bay pluton
- M_{3x}gr — Weakly to strongly foliated granite
- M_{3x}mn — Weakly to strongly foliated monzonite to monzonorite

MIDDLE MESOPROTEROZOIC (M_2 1350 – 1200 Ma)
e.g., Upper North River intrusion
- M_2gr — Weakly to strongly foliated granite and alkali-feldspar granite
- M_2rg — Weakly to strongly foliated gabbronorite (in database only - Lourdes-de-Blanc-Sablon intrusion, Quebec)
- M_2yq — Weakly to strongly foliated syenite, quartz syenite and alkali-feldspar syenite
- M_2d — Mealy dykes

EARLY MESOPROTEROZOIC (M_1 1600 – 1350 Ma)
e.g., Upper Paradise River, Kyfanan Lake and 13B/12 intrusions, and Michael Gabbro
- M_1an — Massive or weakly foliated anorthosite to leucogabbronorite, indistinctly layered in places
- M_1am — Massive to weakly foliated amphibolite, plus leucocratic and melanocratic variants; granulite facies equivalents
- M_1dr — Massive, weakly or strongly foliated diorite to amphibolite, may be metamorphic derivative of monzodiorite or leucogabbronorite
- M_1gp — Moderately to strongly foliated megacrystic/porphyritic granitoid rocks
- M_1gr — Massive, weakly or strongly foliated granite to quartz monzonite
- M_1ln — Massive, weakly or strongly foliated leucogabbronorite and anorthositic gabbro, locally grading into gabbronorite, locally coronitic
- M_1mn — Moderately to strongly foliated monzonorite
- M_1mq — Moderately to strongly foliated monzonite to quartz monzonite
- M_1mz — Moderately to strongly foliated monzonite to monzodiorite
- M_1rg — Massive to strongly foliated gabbro, norite and troctolite, commonly layered; subophitic and locally coronitic; includes recrystallized derivatives retaining igneous textures
- M_1um — Massive, weakly or strongly foliated ultramafic rocks, commonly layered and locally showing cumulate textures
- M_1yq — Moderately to strongly foliated syenite and quartz syenite
- M_1d — Mafic dykes; includes Michael Gabbro

LATE PALEOPROTEROZOIC AND EARLY MESOPROTEROZOIC (PM 1800 – 1350 Ma)
(Ages generally unknown, but ca. 1650 Ma and 1500 – 1470 Ma rocks identified)
RECRYSTALLIZED IGNEOUS ROCKS
- PMdr — Medium-grained, equigranular, recrystallized weakly to strongly foliated diorite, quartz diorite and to leucoamphibolite
- PMgd — Weakly to strongly foliated granite to granodiorite
- PMgp — Megacrystic/porphyritic recrystallized granite to quartz monzonite
- PMgr — Medium- to coarse-grained, recrystallized weakly to strongly foliated granite and alkali-feldspar granite
- PMln — Medium- to coarse-grained, recrystallized leuconorite, leucogabbro
- PMmd — Medium- to coarse-grained, recrystallized, weakly to strongly foliated, monzodiorite to monzonite
- PMmq — Medium- to coarse-grained, recrystallized, weakly to strongly foliated quartz monzonite
- PMrg — Medium- to coarse-grained, gabbro, norite and troctolite
- PMtn — Medium- to coarse-grained, recrystallized, weakly to strongly foliated tonalite to granodiorite
- PMyq — Medium- to coarse-grained, recrystallized, weakly to strongly foliated syenite, alkali-feldspar syenite and quartz syenite
- PMam — Amphibolite; generally thought to be derived from mafic dykes

SUPRACRUSTAL ROCKS PROVISIONALLY ASSIGNED AS PITTS HARBOUR GROUP
- PMsc — Calc-silicate rocks, compositionally layered, medium grained
- PMsp — Pelitic schist and gneiss
- PMsq — Quartzite, meta-arkose, thin to thick bedded
- PMss — Quartz-feldspar psammitic schist and gneiss; medium grained
- PMsx — Coarse-grained to pegmatitic-granitic material (diatexite), characteristically associated with psammitic gneiss and quartzite

Volcanic protolith
- PMvf — Fine- to medium-grained, banded quartzofeldspathic rocks; locally having lensoid shapes, possibly indicating felsic volcaniclastic protolith
- PMvm — Fine- to medium-grained, banded amphibolite containing quartz-feldspar layers and calc-silicate pods; interpreted as mafic volcanic rocks

LATE PALEOPROTEROZOIC (P_3 1800 – 1600 Ma)
LATE LABRADORIAN GRANITOID INTRUSIONS (P_{3c} 1660 – 1600 Ma)
e.g., Paradise Arm intrusion and Hawke Bay intrusive suite
- P_{3c}dr — Diorite, quartz diorite and tonalite; locally grading into leucogabbronorite
- P_{3c}ga — Alkali-feldspar granite, granite and quartz syenite forming discrete plutons
- P_{3c}gd — Granite to granodiorite forming discrete unmigmatized plutons
- P_{3c}gp — Megacrystic/porphyritic granite to granodiorite
- P_{3c}gr — Granite and minor alkali-feldspar granite
- P_{3c}mn — Monzonorite and monzogabbro
- P_{3c}mq — Quartz monzonite, including rare quartz syenite
- P_{3c}mz — Monzonite, including minor syenite
- P_{3c}yq — Syenite to quartz syenite forming discrete plutons
- P_{3c}d — Unnamed mafic dykes

LATE LABRADORIAN ANORTHOSITIC AND MAFIC INTRUSIONS (P_{3b} 1660 – 1600 Ma)
e.g., White Bear Arm complex and Sand Hill Big Pond intrusion
- P_{3b}ag — Weakly to markedly foliated mafic granulite, plus leucocratic and melanocratic variaties
- P_{3b}am — Weakly to markedly foliated amphibolite, plus leucocratic and melanocratic variants
- P_{3b}an — Massive to strongly foliated anorthosite and leucogabbronorite
- P_{3b}rg — Massive to strongly foliated gabbro and norite, commonly layered; subophitic and locally coronitic
- P_{3b}ln — Primary textured to recrystallized leucogabbronorite and leucogabbro; coronitic locally
- P_{3b}lt — Primary textured to recrystallized leucotroctolite
- P_{3b}um — Massive, weakly or strongly foliated ultramafic rocks, commonly layered and locally showing cumulate textures

EARLY LABRADORIAN MAFIC AND ASSOCIATED ROCKS (P_{3a} 1710 – 1660 Ma)
e.g., Alexis River anorthosite (assigned here although age is uncertain)
- P_{3a}ag — Weakly foliated to gneissic amphibolite and mafic granulite, plus leucocratic and melanocratic variants
- P_{3a}an — Weakly foliated to gneissic anorthosite and leucogabbronorite
- P_{3a}ln — Weakly foliated to gneissic leucogabbronorite and leucogabbro; coronitic locally
- P_{3a}mn — Weakly foliated to gneissic monzonorite and monzogabbro
- P_{3a}rg — Weakly foliated to gneissic gabbro and norite
- P_{3a}um — Massive, weakly or strongly foliated ultramafic rocks, commonly layered and locally showing cumulate textures

EARLY LABRADORIAN GRANITOID AND ASSOCIATED ROCKS (ca. 1678 and 1671 Ma)
e.g., Nevesisk Island and Red Island events
- P_{3a}dr — Foliated to gneissic diorite to quartz diorite, and compositionally equivalent well-banded gneiss; in part derived from leucogabbronorite
- P_{3a}gd — Foliated to gneissic granodiorite and compositionally equivalent well-banded gneiss
- P_{3a}gp — Foliated to gneissic megacrystic/porphyritic granitoid rocks, augen gneiss
- P_{3a}gr — Foliated to gneissic granite and alkali-feldspar granite, and compositionally equivalent well-banded gneiss
- P_{3a}mq — Foliated to gneissic quartz monzonite, grading into diorite or syenite, and compositionally equivalent well-banded gneiss
- P_{3a}mz — Foliated to gneissic monzonite and monzodiorite, and compositionally equivalent well-banded gneiss
- P_{3a}yq — Foliated to gneissic syenite, alkali-feldspar syenite and alkali-feldspar granite, and compositionally equivalent well-banded gneiss
- P_{3a}am — Amphibolite skialiths, lenses and layers (mainly remnants of former dykes)

PRE-LABRADORIAN GRANITOID ROCKS (P_{3x} 1800 – 1710 Ma)
- P_{3x}ag — Mafic granulite skialiths, lenses and layers
- P_{3x}dr — Foliated to gneissic diorite to quartz diorite, and compositionally equivalent well-banded gneiss
- P_{3x}gd — Foliated to gneissic granodiorite and compositionally equivalent well-banded gneiss
- P_{3x}gp — Foliated to gneissic megacrystic/porphyritic granitoid rocks, augen gneiss
- P_{3x}gr — Foliated to gneissic granite and alkali-feldspar granite, and compositionally equivalent well-banded gneiss
- P_{3x}ln — Foliated to gneissic leucogabbronorite, and compositionally equivalent well-banded gneiss
- P_{3x}am — Amphibolite skialiths, lenses and layers (mainly remnants of former dykes)

PRE-LABRADORIAN SUPRACRUSTAL ROCKS (P_{3s} 1800 – 1710 Ma)
(Age uncertain; certainly pre-1670 Ma, probably 1800 – 1770 Ma)

Sedimentary protolith
- P_{3s}sc — Calc-silicate rocks, compositionally layered, medium grained
- P_{3s}sp — Fine- to medium-grained pelitic schist and gneiss
- P_{3s}sq — Quartzite, meta-arkose, thin to thick bedded
- P_{3s}ss — Quartz-feldspar psammitic schist and gneiss; medium grained to pegmatitic
- P_{3s}sx — Metasedimentary diatexite; coarse grained to pegmatitic and characteristically white-weathering

Volcanic protolith
- P_{3s}vf — Fine- to medium-grained, banded quartzofeldspathic rocks; locally have lensoid shapes, possibly indicating felsic volcaniclastic protolith
- P_{3s}vm — Fine- to medium-grained, banded amphibolite containing quartz-feldspar layers and calc-silicate pods; interpreted as mafic volcanic rocks

MID PALEOPROTEROZOIC (P_2 2100 – 1800 Ma)
LATE MID PALEOPROTEROZOIC (P_{2c} 1900 – 1800 Ma)
Granitoid and related intrusive rocks
- P_{2c}dr — Foliated to gneissic diorite to quartz diorite, and compositionally equivalent well-banded gneiss
- P_{2c}gb — Alkali-feldspar granite, granite and quartz syenite
- P_{2c}gd — Foliated to gneissic granodiorite and compositionally equivalent well-banded gneiss
- P_{2c}gp — Foliated to gneissic megacrystic/porphyritic granitoid rocks, augen gneiss
- P_{2c}gr — Foliated to gneissic granite and alkali-feldspar granite, and compositionally equivalent well-banded gneiss
- P_{2c}mq — Foliated to gneissic quartz monzonite, grading into diorite or syenite, and compositionally equivalent well-banded gneiss
- P_{2c}mz — Foliated to gneissic monzonite to monzodiorite, and compositionally equivalent well-banded gneiss
- P_{2c}yq — Foliated to gneissic syenite to alkali-feldspar syenite, and compositionally equivalent well-banded gneiss
- P_{2c}yq — Syenite to quartz syenite

Mafic and associated intrusive rocks
- P_{2c}dm — Amphibolite skialiths, lenses and layers (mainly remnants of former dykes)
- P_{2c}rg — Massive to strongly foliated gabbro and norite, commonly layered; subophitic and locally coronitic
- P_{2c}d — Unnamed mafic dykes

Sedimentary protolith
- P_{2c}sc — Calc-silicate rocks, compositionally layered, medium grained
- P_{2c}so — Conglomerate and agglomerate, partially of volcanic origin
- P_{2c}sp — Fine- to medium-grained pelitic schist and gneiss
- P_{2c}sq — Quartzite, meta-arkose, thin to thick bedded
- P_{2c}ss — Quartz-feldspar psammitic schist and gneiss; medium grained and commonly rusty-weathering

Volcanic protolith
- P_{2c}vb — Volcanic breccia, angular clasts, grading into agglomerate
- P_{2c}vf — Fine- to medium-grained, banded quartzofeldspathic rocks; locally have lensoid shapes, possibly indicating felsic volcaniclastic protolith
- P_{2c}vi — Intermediate volcanic rocks
- P_{2c}vm — Fine- to medium-grained, banded amphibolite containing quartz-feldspar layers and calc-silicate pods; interpreted as mafic volcanic rocks
- P_{2c}vp — Felsic volcanic porphyry interpreted to be hypabyssal

AGE GENERALLY POORLY CONSTRAINED
- β — Brittle deformation; cataclastic rocks, pseudotachylite
- δ — Ductile deformation; mylonite, straight gneiss

AGE GENERALLY POORLY CONSTRAINED
- t — Aplite, microgranite (felsite)
- k — Carbonate vein
- p — Pegmatite
- q — Quartz vein

NOTES
1. Legend is common to all maps (Map 2010-01 to Map 2010-25), but all units do not appear on every map.
2. Uncoloured units do not appear as polygons on maps, but are in unit-designator strings in database.
3. Some mafic dykes also shown as polygons (especially where orientation is unknown).

GEOLOGICAL DATA SOURCES

Personnel	Stations	Year(s) data collected	Project name	Mapping references
T. van Nostrand (project geologist)	468	1991	Alexis River	van Nostrand et al. (1992), van Nostrand (1992)
D. Dunphy (assistant geologist)	178	1991	Alexis River	van Nostrand et al. (1992), van Nostrand (1992)
D. Eddy (assistant geologist)	177	1991	Alexis River	van Nostrand et al. (1992), van Nostrand (1992)
C.F. Gower (supporting geologist)	129	1986, -87, -91, 2003, -07	Alexis River & other visits	van Nostrand et al. (1992), van Nostrand (1992); additional data
D. Mahaffy (assistant geologist)	4	1961	Battle Harbour - Cartwright	Eade (1962)
K.E. Eade (project geologist)	3	1961	Battle Harbour - Cartwright	Eade (1962)
S. Neuland (assistant geologist)	1	1986	Port Hope Simpson	Additional data

ISOTOPIC DATA

U/Pb Geochronology
Sample number
Rock type
Inherited/detrital age
Emplacement age
Metamorphism/closure/ cooling/undefined
Pb loss age

Mineral abbreviations:
b - allanite
b - baddeleyite
m - monazite
r - rutile
t - titanite
x - xenotime
z - zircon
Concordia abbreviations:
c - concordant
nc - near-concordant
i.i. - lower intercept
u.i. - upper intercept

Nd/Sm Geochronology
Sample number
Rock type
Epsilon value
Depleted mantle age
Age of rock
(? age inferred)

Rb/Sr Geochronology
Sample number
Rock type
Initial Sr ratio calculated from time t
Age of rock
(? age inferred)
(* one of two or more analyses)

K/Ar Geochronology
Sample number
Rock type
Age
Mineral; Method
(* average of two or more analyses)
Biot - biotite
Hbl - hornblende
Musc - muscovite
WR - whole rock
plat - plateau age
tot. gas - total gas age

ISOTOPIC DATA SOURCES

Method	Reference(s)	Samples
U-Pb	Wasteneys et al. (1997)	CG91-072A; VN91-233A; VN91-264B
Nd-Sm	Daly (unpublished)	CG91-072A; VN91-233A; VN91-264B
Rb-Sr	no data	
K, Ar	no data	

MINERAL OCCURRENCE ABBREVIATIONS

Amz	Amazonite
Au	Gold
Bt	Biotite
Cly	Clay
Cr	Chromium
Cu	Copper
Fe	Iron
Fel	Feldspar
Fl	Fluorite
Grt	Garnet
Ilm	Ilmenite
Lst	Limestone
Mgt	Magnetite
Mo	Molybdenite
Ms	Muscovite
Neph	Nepheline
Ni	Nickel
Pb	Lead
Pd	Palladium
Po	Pyrrhotite
Pt	Platinum
Pyr	Pyrite
Saph	Sapphire
Si	Silica
Stn	Dimension stone
Th	Thorium
Tourm	Tourmaline
Tpz	Topaz
U	Uranium
V	Vanadium
Zn	Zinc
Zr	Zirconium
(?)	Occurrence reported but validity suspect

NOTE:
All mineral occurrence and structural symbols do not appear on each map.

Vertical structures use 90° dip value.

* Generation of structure only applicable at observation site.

PALEOMAGNETIC DATA
Paleomagnetic site number
Reference source

Scale 1:100 000
0 2 4 6 8 10
Kilometres

SYMBOLS
- Geological contact
- Normal fault
- Strike-slip fault
- Thrust fault
- Normal fault reactivating thrust
- Fold axial plane (1st, 2nd, 3rd generation)*
- S-fold axis (1st generation)
- Z-fold axis (1st generation)
- Dyke (affinity unspecified)
- Fault (sense of movement unknown, dextral, sinistral, normal)
- Joint
- Linear fabric (1st, 2nd, 3rd generation)*
- Fold axis (1st, 2nd, 3rd generation)*
- Slickenside
- Geological data station
- Geological data station (no fabric measured)
- Bedding (tops known, unknown)
- Enclave
- Foliation (1st, 2nd, 3rd generation)*
- Gneissosity (1st, 2nd generation)*
- Igneous layering (tops known, unknown)
- Vein
- Shear zone (sense of movement unknown, dextral, sinistral, reverse)
- Mineral occurrence
- Geochronology location