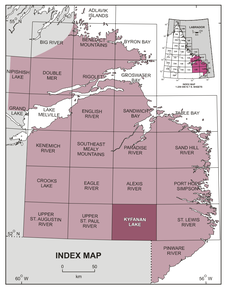
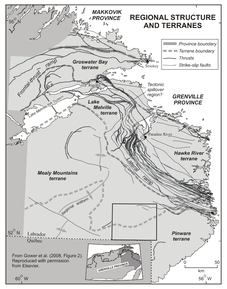
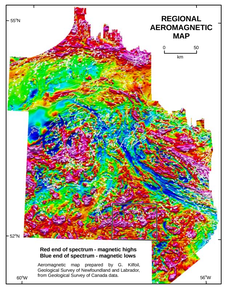
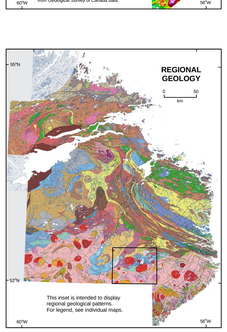
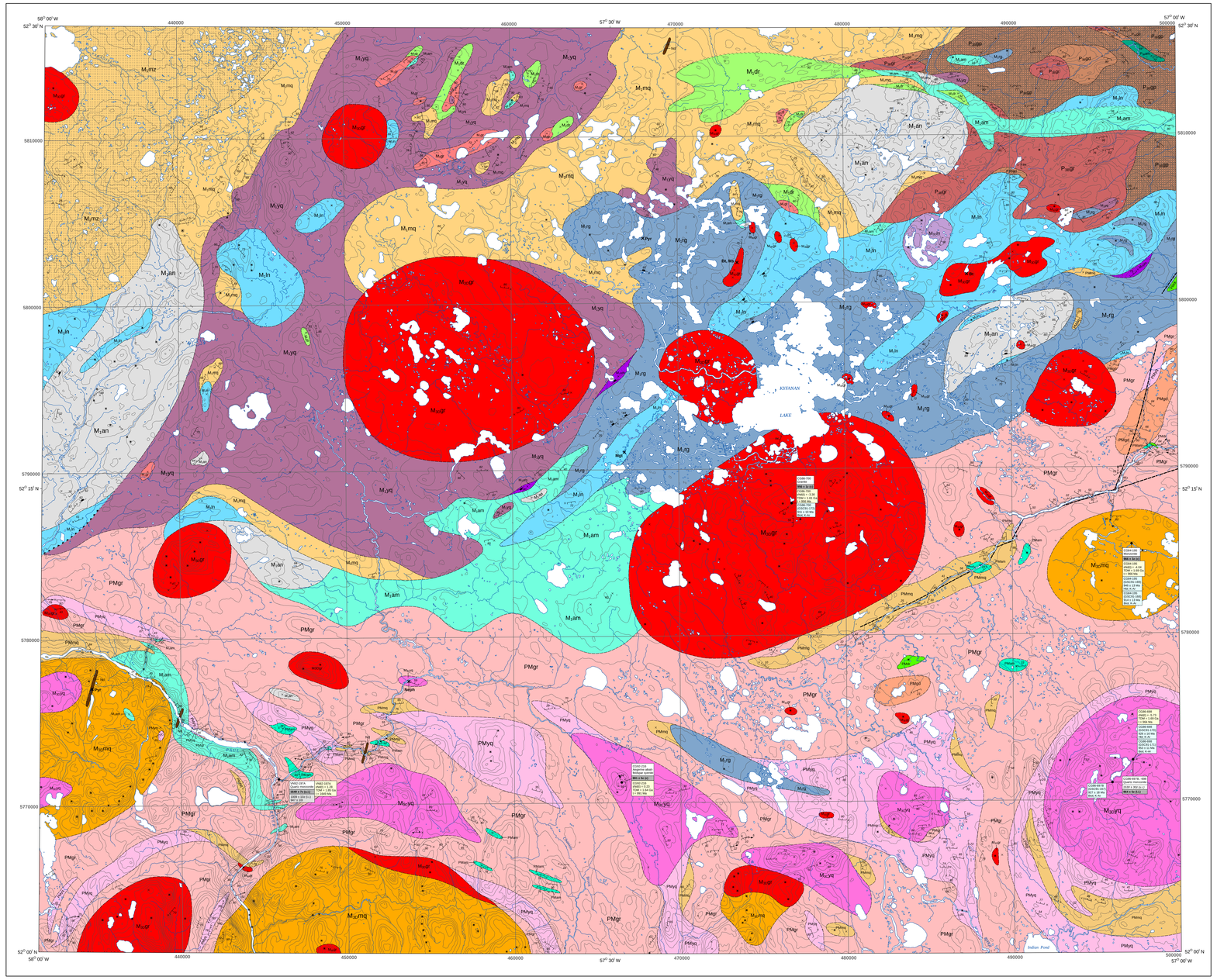
Newfoundland Labrador
NATURAL RESOURCES




# MAP 2010-23
OPEN FILE 013A/0082

# GEOLOGY OF THE KYFANAN LAKE AREA (NTS SHEETS 13A/03, 04, 05 & 06) SOUTHEASTERN LABRADOR

## LEGEND

**DEVONIAN (?)**

Dd Sandwich Bay and Battle Harbour dykes

**EARLY CAMBRIAN**

Cbf Forteau Formation

Cbr Bradore Formation (subdivided into L'Anse-au-Clair, Crow Head and Blanc-Sablon members)

**NEOPROTEROZOIC – EARLY CAMBRIAN**

NCLc Lighthouse Cove Formation

NCBa Bateau Formation

**NEOPROTEROZOIC**

NDm NGl NSb

NDm Double Mer Formation

NGl Gilbert arkose

NSb Sandwich Bay conglomerate

Nc Nd Nq

Nc Clastic dykes

Nd Long Range dykes

Nq Quartz veins

**LATE MESOPROTEROZOIC ($M_3$ 1200 – 900 Ma)**

**LATE POST-GRENVILLIAN INTRUSIONS ($M_{3D}$ ca. 975 – 955 Ma)**
**e.g., Chateau Pond granite**

$M_{3}gp$ $M_{3}gr$ $M_{3}dh$ $M_{3}mm$ $M_{3}mz$ $M_{3}zq$ $M_{3}yq$ $M_{3}d$

$M_{3}gp$ Massive to weakly foliated megacrystic/porphyritic granite to quartz monzonite

$M_{3}gr$ Massive to weakly foliated granite to alkali-feldspar granite

$M_{3}dh$ Massive to weakly foliated leucogabbro to leuconorite

$M_{3}mm$ Massive to weakly foliated monzogabbro and monzonorite

$M_{3}mq$ Massive to weakly foliated quartz monzonite; mantled feldspar textures

$M_{3}mz$ Massive to weakly foliated monzonite to monzodiorite

$M_{3}yq$ Massive to weakly foliated syenite, quartz syenite and alkali-feldspar quartz syenite

$M_{3}d$ Unnamed mafic dykes

**EARLY POST-GRENVILLIAN INTRUSIONS ($M_{3C}$ ca. 985 – 975 Ma)**
**e.g., Beaver Brook and Picton Pond plutons**

$M_{3}gr$ $M_{3}dh$ $M_{3}mm$ $M_{3}mq$ $M_{3}mz$ $M_{3}yq$ $M_{3}cd$

$M_{3}gr$ Weakly to moderately foliated granite to alkali-feldspar granite

$M_{3}dh$ Weakly to moderately foliated leucogabbro to leuconorite

$M_{3}mm$ Weakly to moderately foliated monzogabbro to monzonorite

$M_{3}mq$ Weakly to moderately foliated monzonite to quartz monzonite

$M_{3}rg$ Weakly to moderately foliated gabbro, norite and troctolite

$M_{3}yq$ Weakly to moderately foliated syenite, quartz syenite and alkali-feldspar syenite

$M_{3}cd$ L'Anse-au-Diable, York Point, Gilbert Bay mafic dykes

**SYN-GRENVILLIAN INTRUSIONS ($M_{3B}$ ca. 1085 – 985 Ma)**

$M_{3}gd$ $M_{3}gb$ $M_{3}gr$ $M_{3}ajm$ $M_{3}d$

$M_{3}gd$ Moderately to strongly foliated granodiorite to quartz diorite

$M_{3}gb$ Moderately to strongly foliated megacrystic/porphyritic granodiorite to quartz diorite

$M_{3}gr$ Moderately to strongly foliated granite to alkali-feldspar granite

$M_{3}ajm$ Moderately to strongly foliated aegerine- or nepheline-bearing syenite

$M_{3}d$ Unnamed mafic dykes (Makkovik Province and adjacent Grenville Province)

**PRE-GRENVILLIAN INTRUSIONS ($M_{3A}$ ca. 1200 – 1085 Ma)**
**e.g., Gilbert Bay pluton**

$M_{3}gr$ $M_{3}mm$

$M_{3}gr$ Weakly to strongly foliated granite

$M_{3}mm$ Weakly to strongly foliated monzonite to monzonorite

**MIDDLE MESOPROTEROZOIC ($M_2$ 1350 – 1200 Ma)**
**e.g., Upper North River intrusion**

$M_{2}gr$ $M_{2}rg$ $M_{2}yq$ $M_{2}d$

$M_{2}gr$ Weakly to strongly foliated granite and alkali-feldspar granite

$M_{2}rg$ Weakly to strongly foliated gabbronorite (in database only - Lourdes-de-Blanc-Sablon intrusion, Quebec)

$M_{2}yq$ Weakly to strongly foliated syenite, quartz syenite and alkali-feldspar syenite

$M_{2}d$ Mealy dykes

**EARLY MESOPROTEROZOIC ($M_1$ 1600 – 1350 Ma)**
**e.g., Upper Paradise River, Kyfanan Lake and 13B/12 intrusions, and Michael Gabbro**

$M_{1}an$ $M_{1}am$ $M_{1}dr$ $M_{1}gr$ $M_{1}gr$ $M_{1}h$ $M_{1}mm$ $M_{1}mq$ $M_{1}mz$ $M_{1}rg$ $M_{1}ymm$ $M_{1}yq$ $M_{1}d$

$M_{1}an$ Massive or weakly foliated anorthosite to leucogabbronorite, indistinctly layered in places

$M_{1}am$ Weakly to markedly foliated amphibolite, plus leucocratic and melanocratic variants; granulite facies equivalents

$M_{1}dr$ Massive, weakly or strongly foliated diorite to amphibolite, may be metamorphic derivative of monzodiorite or leucogabbronorite

$M_{1}gp$ Moderately to strongly foliated megacrystic/porphyritic granitoid rocks

$M_{1}gr$ Massive, weakly or strongly foliated granite to quartz monzonite

$M_{1}h$ Massive, weakly or strongly foliated leucogabbronorite and anorthositic gabbro, locally grading into gabbronorite, locally coronitic

$M_{1}mm$ Moderately to strongly foliated monzonorite

$M_{1}mq$ Moderately to strongly foliated monzonite to quartz monzonite

$M_{1}mz$ Moderately to strongly foliated monzonite to monzodiorite

$M_{1}rg$ Massive to strongly foliated gabbro, norite and troctolite, commonly layered; subophitic and locally coronitic; includes recrystallized derivatives retaining igneous textures

$M_{1}ymm$ Massive, weakly or strongly foliated ultramafic rocks, commonly layered and locally showing cumulate textures

$M_{1}yq$ Moderately to strongly foliated syenite and quartz syenite

$M_{1}d$ 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 PMgd PMgb PMgr PMfc PMmd PMmq PMtn PMyq PMam

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

PMtn 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 PMsp PMsq PMss PMsx PMvf PMvm

**Sedimentary protolith**

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 (dilatexite), 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 ($P_{3L}$ 1660 – 1600 Ma)**
**e.g., Paradise Arm intrusion and Hawke Bay intrusive suite**

$P_{3L}gr$ $P_{3L}gs$ $P_{3L}gd$ $P_{3L}gp$ $P_{3L}gb$ $P_{3L}mm$ $P_{3L}mq$ $P_{3L}mz$ $P_{3L}yq$ $P_{3L}cd$

$P_{3L}gr$ Granite and minor alkali-feldspar granite

$P_{3L}gp$ Megacrystic/porphyritic granite to granodiorite

$P_{3L}gb$ Granite to granodiorite forming discrete unmigmatized plutons

$P_{3L}gs$ Alkali-feldspar granite, granite and quartz syenite forming discrete plutons

$P_{3L}gd$ Granite to granodiorite forming discrete unmigmatized plutons

$P_{3L}mm$ Monzonorite and monzogabbro

$P_{3L}mq$ Quartz monzonite, including rare quartz syenite

$P_{3L}mz$ Monzonite, including minor syenite

$P_{3L}yq$ Syenite to quartz syenite forming discrete plutons

$P_{3L}cd$ Unnamed mafic dykes

**LATE LABRADORIAN ANORTHOSITIC AND MAFIC INTRUSIONS ($P_{3C}$ 1660 – 1600 Ma)**
**e.g., White Bear Arm complex and Sand Hill Big Pond intrusion**

$P_{3C}ag$ $P_{3C}am$ $P_{3C}an$ $P_{3C}gg$ $P_{3C}ih$ $P_{3C}it$ $P_{3C}um$

$P_{3C}ag$ Weakly to markedly foliated mafic granulite, plus leucocratic and melanocratic variants

$P_{3C}am$ Weakly to markedly foliated amphibolite, plus leucocratic and melanocratic variants

$P_{3C}an$ Massive to strongly foliated anorthosite and leucogabbronorite

$P_{3C}rg$ Massive to strongly foliated gabbro and norite, commonly layered; subophitic and locally coronitic

$P_{3C}ih$ Primary textured to recrystallized leucogabbronorite and leucogabbro; coronitic locally

$P_{3C}it$ Primary textured to recrystallized leucotroctolite

$P_{3C}um$ 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)**

$P_{3A}ag$ $P_{3A}an$ $P_{3A}gr$ $P_{3A}mm$ $P_{3A}rg$ $P_{3A}um$

$P_{3A}ag$ Weakly foliated to gneissic amphibolite and mafic granulite, plus leucocratic and melanocratic variants

$P_{3A}an$ Weakly foliated to gneissic anorthosite and leucogabbronorite

$P_{3A}ih$ Weakly foliated to gneissic leucogabbronorite and leucogabbro; coronitic locally

$P_{3A}mm$ 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**

$P_{3E}gd$ $P_{3E}gd$ $P_{3E}gb$ $P_{3E}gr$ $P_{3E}mq$ $P_{3E}mz$ $P_{3E}yq$ $P_{3E}am$

$P_{3E}gr$ Foliated to gneissic diorite to quartz diorite, and compositionally equivalent well-banded gneiss; in part derived from leucogabbronorite

$P_{3E}gd$ Foliated to gneissic granodiorite and compositionally equivalent well-banded gneiss

$P_{3E}gb$ Foliated to gneissic megacrystic/porphyritic granitoid rocks, augen gneiss

$P_{3E}gr$ Foliated to gneissic granite and alkali-feldspar granite, and compositionally equivalent well-banded gneiss

$P_{3E}mq$ Foliated to gneissic quartz monzonite, grading into diorite or syenite, and compositionally equivalent well-banded gneiss

$P_{3E}mz$ Foliated to gneissic monzonite and monzodiorite, and compositionally equivalent well-banded gneiss

$P_{3E}yq$ Foliated to gneissic syenite, alkali-feldspar syenite and alkali-feldspar granite, and compositionally equivalent well-banded gneiss

$P_{3E}am$ Amphibolite skialiths, lenses and layers (mainly remnants of former dykes)

**PRE-LABRADORIAN GRANITOID ROCKS ($P_{3P}$ 1800 – 1710 Ma)**

$P_{3P}ag$ $P_{3P}dr$ $P_{3P}gd$ $P_{3P}gb$ $P_{3P}gr$ $P_{3P}it$ $P_{3P}am$

$P_{3P}ag$ Mafic granulite skialiths, lenses and layers

$P_{3P}dr$ Foliated to gneissic diorite to quartz diorite, and compositionally equivalent well-banded gneiss

$P_{3P}gd$ Foliated to gneissic granodiorite and compositionally equivalent well-banded gneiss

$P_{3P}gb$ Foliated to gneissic megacrystic/porphyritic granitoid rocks, augen gneiss

$P_{3P}gr$ Foliated to gneissic granite and alkali-feldspar granite, and compositionally equivalent well-banded gneiss

$P_{3P}it$ Foliated to gneissic leucogabbronorite, and compositionally equivalent well-banded gneiss

$P_{3P}am$ 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)**

$P_{3S}sc$ $P_{3S}sp$ $P_{3S}sq$ $P_{3S}ss$ $P_{3S}vf$ $P_{3S}vm$

**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 and commonly rusty-weathering

$P_{3S}sx$ 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**

$P_{2C}gb$ $P_{2C}gs$ $P_{2C}gd$ $P_{2C}gp$ $P_{2C}gr$ $P_{2C}mq$ $P_{2C}mz$ $P_{2C}yq$ $P_{2C}yq$

$P_{2C}gr$ Foliated to gneissic diorite to quartz diorite, and compositionally equivalent well-banded gneiss

$P_{2C}gs$ Alkali-feldspar granite, granite and quartz syenite

$P_{2C}gd$ Foliated to gneissic granodiorite and compositionally equivalent well-banded gneiss

$P_{2C}gb$ 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**

$P_{2C}am$ $P_{2C}rg$ $P_{2C}cd$

$P_{2C}am$ 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

$P_{2C}cd$ Unnamed mafic dykes

**Sedimentary protolith**

$P_{2C}sc$ $P_{2C}sp$ $P_{2C}sq$ $P_{2C}sq$ $P_{2C}ss$

$P_{2C}sc$ Calc-silicate rocks, compositionally layered, medium grained

$P_{2C}sp$ 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**

$P_{2C}vb$ $P_{2C}vf$ $P_{2C}vl$ $P_{2C}vm$ $P_{2C}vp$

$P_{2C}vb$ 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

$P_{2C}vl$ 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

**Sedimentary protolith**

$P_{2S}sc$ $P_{2S}sp$ $P_{2S}sq$ $P_{2S}ss$

$P_{2S}sc$ Calc-silicate rocks, compositionally layered, medium grained

$P_{2S}sp$ Conglomerate and agglomerate, partially of volcanic origin

$P_{2S}sp$ Fine- to medium-grained pelitic schist and gneiss

$P_{2S}sq$ Quartzite, meta-arkose, thin to thick bedded

$P_{2S}ss$ Quartz-feldspar psammitic schist and gneiss; medium grained and commonly rusty-weathering

**Volcanic protolith**

$P_{2S}vb$ $P_{2S}vf$ $P_{2S}vl$ $P_{2S}vm$ $P_{2S}vp$

$P_{2S}vb$ Volcanic breccia, angular clasts, grading into agglomerate

$P_{2S}vf$ Fine- to medium-grained, banded quartzofeldspathic rocks; locally have lensoid shapes, possibly indicating felsic volcaniclastic protolith

$P_{2S}vl$ Intermediate volcanic rocks

$P_{2S}vm$ Fine- to medium-grained, banded amphibolite containing quartz-feldspar layers and calc-silicate pods; interpreted as mafic volcanic rocks

$P_{2S}vp$ Felsic volcanic porphyry interpreted to be hypabyssal

**Sedimentary protolith**

$P_{2P}sc$ $P_{2P}sp$ $P_{2P}sq$ $P_{2P}ss$

$P_{2P}sc$ Calc-silicate rocks, compositionally layered, medium grained

$P_{2P}sp$ Conglomerate and agglomerate, partially of volcanic origin

$P_{2P}sp$ Fine- to medium-grained pelitic schist and gneiss

$P_{2P}sq$ Quartzite, meta-arkose, thin to thick bedded

$P_{2P}ss$ Quartz-feldspar psammitic schist and gneiss; medium grained and commonly rusty-weathering

**Volcanic protolith**

$P_{2P}vb$ $P_{2P}vf$ $P_{2P}vl$ $P_{2P}vm$ $P_{2P}vp$

$P_{2P}vb$ Volcanic breccia, angular clasts, grading into agglomerate

$P_{2P}vf$ Fine- to medium-grained, banded quartzofeldspathic rocks; locally have lensoid shapes, possibly indicating felsic volcaniclastic protolith

$P_{2P}vl$ Intermediate volcanic rocks

$P_{2P}vm$ Fine- to medium-grained, banded amphibolite containing quartz-feldspar layers and calc-silicate pods; interpreted as mafic volcanic rocks

$P_{2P}vp$ Felsic volcanic porphyry interpreted to be hypabyssal

**MINOR OCCURRENCE ABBREVIATIONS**

| | |
|---|---|
| **Amz** | Amazonite |
| **Au** | Gold |
| **Bt** | Biotite |
| **Cly** | Clay |
| **Cr** | Chromium |
| **Cu** | Copper |
| **Fe** | Iron |
| **Fsl** | 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 |
| **Sn** | Tin |
| **Stn** | Dimension stone |
| **Thm** | 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.

**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*

**AGE GENERALLY POORLY CONSTRAINED**

β δ

β Brittle deformation; cataclastic rocks, pseudotachylite

δ Ductile deformation; mylonite, straight gneiss

**AGE GENERALLY POORLY CONSTRAINED**

f k p q

f 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).

## KYFANAN LAKE

A preliminary uncoloured version of this map originally appeared page-size, together with a report, and was based on data collected during the 1992 field season (Gower et al., 1993), but was superseded by a preliminary coloured 1:100,000 map (Gower et al., 1995). Note that the map name 'Kyfanan Lake' replaced the earlier-used name 'Upper St. Lewis River' for the same map area. The current map incorporates field data collected by Eade (1962), making use of original field notes recorded by K.E. Eade and assistants. It also includes data stations resulting from projects straying from adjacent map areas (e.g., Bostock, 1983).

The present map is augmented by follow-up examination of stained slabs, petrographic thin sections, and whole-rock geochemical analyses. U-Pb geochronological results (Gower and Loveridge, 1987; Gower et al., 1991; Wasteneys et al., 1997), Nd-Sm isotopic data (R.A. Creaser, unpublished - see digital database and J.S. Daly, unpublished - see digital database), and K-Ar isotopic data (Gower et al., 1991) are included. Localities designated as mineral occurrences are based partly on observations made during the 1992 field season, but include later discoveries (see Mineral Occurrence Table; current to 2009).

Since the preliminary map was published, interpretation for the region has evolved, so there are some differences between the current and earlier versions of this map. Unit modification is partly related to an integrated compilation approach applied to the whole of eastern Labrador, but border regions of the map have been revised as a result of data collected from adjacent map areas. Geological boundaries are poorly constrained, and have been extrapolated using structural observations, regional aeromagnetic data and topographic trends. Interpretation in the central and eastern segments was refined using industry high-resolution aeromagnetic data. Data station sites 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.

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 judged 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. Unit designator and polygon labels applied are based on an awareness of such factors.

### REFERENCES


Bostock, H.H.
1983: Precambrian rocks of the Strait of Belle Isle area, in Bostock, H.H., Cumming, L.M., Williams, H. and Smyth, W.R. Geology of the Strait of Belle Isle, Northwestern Insular Newfoundland, Southern Labrador, and Adjacent Quebec. Geological Survey of Canada, Memoir 400, pages 1-73.

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

Eveleigh, A.
1996: 1996 Drill program. Sharpe (Hawk) property Kyfanan Lake area, Labrador NTS 13A/5 and 13A/6, Licence 4745M. Cartaway Resources Corporation. Newfoundland and Labrador Geological Survey, Assessment File 013A/0037, 10 pages plus appendices.

Gower, C.F. and Loveridge, W.D.
1987: Grenvillian plutonism in the eastern Grenville Province. In Radiogenic age and isotopic studies: Report 1. Geological Survey of Canada, Paper 87-2, pages 55-58.

Gower, C.F., Heaman, L.M., Loveridge, W.D., Schärer, U. and Tucker, R.D.
1991: Grenvillian magmatism in the eastern Grenville Province, Canada. Precambrian Research, Volume 51, pages 315-336.

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

Gower, C.F., van Nostrand, T., Peckham, V. and Anderson, J.
1993: Geology of the upper St Lewis River map region, southeast Labrador. In Current Research, Newfoundland Department of Mines and Energy, Geological Survey Branch, Report 93-1, pages 17-34.

Gower, C.F., van Nostrand, T., Peckham, V. and Anderson, J.
1995: Upper St. Lewis River (13A/03, 04, 05, 06) Map 95-19, 1:100 000.

Hutchings, C.
1996: Geological report, Kyfanan Lake west property, Labrador, N.T.S. No. 13A/6 Licence No. 793M, 1088M, 870M Assessment Year 1. Kasner Group of Companies. Unpublished report, Newfoundland and Labrador Geological Survey, Assessment File 013A/0600030, 11 pages plus additional material.

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

Digital NTS base maps (NTS 13A/03, 04, 05 and 06) 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° 05' 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 2010-23 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/04/Fe001 | Neph | Indication | 453701 | 5777385 | GSNL (field notes; CG92-178) |
| 013A/04/Py001 | Pyr | Indication | 434653 | 5777040 | GSNL (field notes; JA92-144) |
| 013A/06/Fe 001 | Mgt | Indication | 466734 | 5791056 | Eveleigh (1996) |
| 013A/06/Mc001 | Bt | Indication | 467375 | 5801650 | GSNL (field notes; CG92-081) |
| 013A/06/Mc002 | Bt, Ms | Indication | 473583 | 5802409 | GSNL (field notes; VN92-105) |
| 013A/06/Py001 | Pyr | Indication | 467932 | 5803897 | Hutchings (1996) |

GSNL (Geological Survey of Newfoundland and Labrador)

### GEOLOGICAL DATA SOURCES

| *Personnel* | *Stations* | *Year(s) data collected* | *Project name* | *Mapping references* |
|---|---|---|---|---|
| T. van Nostrand (assistant geologist) | 309 | 1992 | Kyfanan Lake | Gower et al. (1993, 1995) |
| C.F. Gower (project geologist) | 290 | 1984, -86, -92, -99 | Kyfanan Lake & other visits | Gower et al. (1993, 1995); additional data |
| V.H. Peckham (assistant geologist) | 199 | 1992 | Kyfanan Lake | Gower et al. (1993, 1995) |
| J.W. Anderson (assistant geologist) | 181 | 1992 | Kyfanan Lake | Gower et al. (1993, 1995) |
| K.E. Eade (project geologist) | 6 | 1961 | Battle Harbour - Cartwright | Eade (1962) |
| H.H. Bostock (project geologist) | 2 | 1971 | Strait of Belle Isle region | Bostock (1983) |
| W. Nesbitt (assistant geologist) | 1 | 1968 | Battle Harbour - Cartwright | Eade (1962) |
| F. Reynolds (assistant geologist) | 1 | 1961 | Battle Harbour - Cartwright | Eade (1962) |

### ISOTOPIC DATA

**U/Pb Geochronology**

Sample number
Rock type
*Inherited/dentral age*
**Emplacement age**
Metamorphism/closure/ cooling/undefined
Pb loss age

**Mineral abbreviations:**
a - 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 | Gower and Loveridge (1987) | CG84-195 |
| U-Pb | Gower et al. (1991) | CG86-697B, -698; CG86-700 |
| U-Pb | Wasteneys et al. (1997) | CG92-216; VN92-197A |
| Nd-Sm | Creaser (unpublished) | CG92-216 |
| Nd-Sm | Daly (unpublished) | CG84-195; CG86-698; CG85-700; VN92-197A |
| Rb-Sr | no data | |
| K-Ar | Gower et al. (1991) | GSC91-167; GSC91-168; GSC91-169; GSC91-170; GSC91-171; GSC91-172 |