TECTONIC ASSEMBLAGE LEGEND

STRATIFIED ROCKS
Post-Ordovician Units
Overlap Sequences
Quaternary
Surficial deposits

Q	Glacial, fluviatile and shallow marine deposits of sand gravel and clay

Carboniferous
Deer Lake broad pull-apart basin non-marine and shallow marine sediments

B:D	Fluviatile and lacustrine, siliciclastic and minor carbonate rocks; intercalated marine, siliciclastic, carbonate and evaporitic rocks; minor coal beds and mafic volcanic flows

Devonian and Carboniferous
Anguille narrow pull-apart basin non-marine sediments

DB:A	Fluviatile and lacustrine, siliciclastic and carbonate rocks; localized subaerial, bimodal volcanic rocks; may include some Late Silurian rocks

Devonian
Red Island Acadian foreland basin clastics

D:R	Red, cobble conglomerate interpreted to have been deposited in a high gradient river system

Silurian to Devonian
Clam Bank Salinic foreland basin sediments

SD:C	Shallow marine sandstone, conglomerate, calcareous shale and thin-bedded limestone

Botwood post-collision non-marine and shallow marine clastics and volcanics

SD:B	Subaerial and shallow marine, red, green and grey sandstone, siltstone, shale, and minor conglomerate; subaerial mafic and felsic flows and pyroclastic rocks

Silurian

Sops Arm post-collision marine and non-marine volcanics and sediments

S:SA — Shallow marine siliciclastic and minor carbonate sedimentary rocks; subaerial felsic pyroclastic rocks and flows, minor mafic flows, and conglomerate

Springdale post-collision non-marine caldera volcanics and clastics

S:SP — Subaerial felsic, intermediate and mafic flows and pyroclastic rocks; fluviatile red sandstone, conglomerate and shale

Flatwater Pond pull-apart basin marine volcanics and sediments

S:FP — Pillow lava and breccia, and associated dykes and sills; mafic and felsic volcaniclastic rocks; black slate and boulder conglomerate; possibly deposited in a graben during exhumation of the Appalachian orogen

Dolman Belt post-collision marine volcanics and clastics

S:D — Marine felsic volcanic flows and pyroclastic rocks; lesser amounts of mafic volcanic rocks, amphibolite, siliciclastic sedimentary rocks, and injection gneiss

La Poile post-collision non-marine volcanics and clastics

S:L — Subaerial felsic and mafic flows, pyroclastic and epiclastic rocks; sandstone and conglomerate

Indian Islands post-collision marine clastic and calcareous sediments

S:I — Grey calcareous siltstone with local fossiliferous limestone lenses, overlain by grey to black shale and siltstone; discontinuous basal unit of coral-bearing limestone and limestone breccia

Laurentian Margin

Humber Zone (Shelf and Related Rocks)

Ordovician

Long Point Late Taconic foreland basin sediments

O:L — Shallow marine sequence of basal sandstone overlain by limestone and shale, passing upwards into shale, siltstone, sandstone and minor limestone

Table Head-Goose Tickle Early Taconic foreland basin sediments

O:sTG

Clastic facies: Sandstone and shale turbidite sequences; intercalated limestone conglomerate; melanges, which were formed during emplacement of the Taconic allocthons and include intact slices of other assemblages

O:cTG

Carbonate facies: Limestone, dolostone and black shale. Mainly argillaceous and dolomitic limestone; locally grainstone, fenestral limestone and dolostone; minor bioherms, slump units and carbonate conglomerate; overlain locally by stylonodular and ribbon limestone and shale

Cambrian and Ordovician
Port au Port - St. George shelf carbonates

CO:PG

Variably dolomitized, muddy, carbonate rocks, mudstone and stromatolites; clean and dolomitic limestone and grainstone; dolostone, dololaminite and shale; chert, dolostone conglomerate, sand layers and local dolostone matrix breccias associated with disconformities

Cambrian
Labrador shelf clastics

C:LA

Arkosic conglomerate, sandstone and siltstone; quartz arenite and calcareous sandstone; shale locally containing limestone concretions (metamorphosed to phyllite and slate in deformed areas); limestone and rarely dolostone; local mafic volcanics rocks

Late Neoproterozoic and Cambrian
Bateau aborted rift clastics and volcanics

NC:B

Non-marine arkosic conglomerate and sandstone; quartzite, siltstone and slate; basalt flows, pillow lava and pyroclastic rocks; minor felsic volcanic rocks

Humber Zone (Slope and Related Rocks)
Cambrian and Ordovician
Cow Head slope carbonates and clastics

CO:C

Limestone breccia interbedded with thinly bedded, lime mudstone to grainstone, dolostone, calcareous sandstone, siltstone and shale; siliceous mudstones

Cambrian
Irishtown slope clastics

C:I

Quartz-rich, arkosic sandstone; maroon and grey slate interbedded with quartz-rich arkosic sandstone; graphitic, pyrite-bearing slate and sandstone

Late Neoproterozoic and Cambrian
Fleur de Lys composite assemblage of rift and slope clastics and volcanics

NC:F

Polydeformed psammitic, semipelitic and pelitic schists with minor interlayered marble and mafic igneous rocks; metamorphosed in the upper greenschist and amphibolite facies

Late Neoproterozoic
Skinner Cove rift volcanics

N:S

Mafic pillow basalt, trachyte, interlayered volcanic breccia, minor red siltstone, sandstone and limestone; volcanic rocks are of alkalic affinity

Iapetus Ocean
Dunnage Zone
Silurian
Sops Head tectonic melange

S:SH

Tectonic melange formed from mainly Ordovician protoliths during Silurian deformation related to the closing of the Iapetus Ocean

Dunnage Zone (Notre Dame Subzone)
Ordovician
Windsor Point Ordovician non-marine and marine volcanics and sediments

O:W

Lower part of the Windsor Point complex containing felsic volcanic rocks including ignimbrite and rhyolite flows, volcaniclastic and epiclastic sediments, polymict conglomerate, greywacke, siltstone, limestone, graphitic shale, chlorite-calcite schist, and pillowed, massive and brecciated mafic volcanic rocks and sills

Crabb Brook parallochthonous clastics

O:C

Breccia, shale and red sandstone

Roberts Arm mature arc volcanics and clastics

O:R — Marine, calc-alkalic and tholeiitic, pillow basalt, pillow breccia, tuff and agglomerate; rhyolite and felsic and intermediate pyroclastic rocks; tuffaceous siliciclastic rocks, chert and minor limestone

Annieopsquotch MORB-like non-arc volcanics

O:A — Marine, tholeiitic, pillow basalt, pillow breccia, tuff and chert associated with ophiolite suites

Cambrian and Ordovician

Moretons Harbour oceanic island and arc to back-arc volcanics and clastics

CO:M — Marine, tholeiitic pillow basalt, pillow breccia, aquagene tuff, mafic to felsic dykes and subvolcanic intrusions, and minor chert

Betts Cove primitive arc and back-arc volcanics and clastics

CO:BC — Marine, tholeiitic and boninitic pillow basalt, massive flows, dykes and pyroclastic rocks; calc-alkalic andesitic, dacitic and rhyolitic pyroclastic rocks; siliciclastic sedimentary rocks and ironstone; intensely deformed equivalents close to the Baie Verte Line; amphibolite, orthogneiss and paragneiss probably derived from similar protoliths in the southern Long Range Mountains

Cambrian

Little Port primitive arc volcanics

C:LP — Marine pillow basalt with sheeted dykes, volcanic breccia, local dacite and silicic tuff, conglomerate and sandstone

Lushs Bight primitive arc and back-arc volcanics

C:LB — Marine, mafic volcanic rocks, principally pillow basalt, and sheeted mafic dykes of boninitic and tholeiitic affinity; lesser amounts of pillow breccia, tuff, agglomerate and chert; small gabbro intrusions and ultramafic bodies

Dunnage Zone (Exploits Subzone)
Ordovician and Silurian
Badger flysch clastics

OS:B

Grey, well-bedded greywacke, including conglomerate layers, overlain by grey and minor red conglomerate; sedimentary structures indicate deposition in a mainly turbiditic environment

Ordovician
Shoal Arm chert and black shale

O:SA

Red to green and black chert; black carbonaceous argillite and argillaceous siltstone; minor siliceous tuff

Cobbs Arm localized limestones

O:CA

Mid-Ordovician clean crystalline or impure limestones, commonly fossiliferous; occurrences are small and widely scattered across the Exploits Subzone and Gander Zone; they are interpreted as deposited on local submarine uplifts

Penny's Brook mature arc and back-arc volcanics and clastics

O:PB

Marine, calc-alkalic and alkalic, pillow basalt and pyroclastic rocks, turbidite sequences of sandstone, shale and siltstone, argillite, chert, conglomerate and olistostromes; melange

Diversion Lake mature arc volcanics

O:D

Marine, calc-alkalic, mafic to intermediate pillow lava, pillow breccia, and interbedded pyroclastic rocks; unseparated mafic dykes and sills; minor felsic pyroclastic and siliciclastic sedimentary rocks

Harbour Round back-arc volcanics

O:HR

Marine, tholeiitic, MORB-like, pillow basalt and pyroclastic rocks; green to red, thinly bedded siltstone and red chert; black argillite, siltstone, greywacke and minor conglomerate; green sandstone, siltstone and greywacke

Harpoon Brook arc and back-arc clastics and volcanics

O:HB

Greywacke and interbedded siltstone, shale, argillite, conglomerate and rare limestone; lenses of calc-alkalic and tholeiitic pillow basalt and agglomerate

Point of the Woods back-arc and mature arc volcanics and clastics

O:PW

Marine, mafic pillow basalt, massive flows and pyroclastic rocks of tholeiitic MORB-like and calc-alkalic affinities (Pine Falls Formation and Lake Douglas basalts, respectively); quartz-feldspar porphyry, felsic tuff and rhyolite (Carter Lake formation); siliciclastic sedimentary rocks and minor limestone

Summerford within-plate volcanics

O:SU

Marine, tholeiitic and alkalic pillow basalt, breccia and agglomerate; limestone lenses, discontinuous limey tuff and arkose

Baie d'Espoir composite assemblage, including continental rift sediments and volcanics

O:BE

Marine siliciclastic sedimentary rocks, including large amounts of distal and proximal turbidite with a significant volcanogenic component; dominantly felsic, pyroclastic and minor mafic volcanic rocks, tentatively interpreted as erupted in a continental rift environment; in part may be equivalent to the Cobbs Arm, Shoal Arm and Badger assemblages

Cambrian and Ordovician

Tea Arm primitive arc volcanics and clastics

CO:TA

Marine, tholeiitic pillow basalt, pyroclastic rocks, dykes and sills; felsic flows, domes and pyroclastic rocks; fine-grained volcaniclastic rocks, chert and argillite

Tulks Hill primitive arc volcanics

CO:TH

Marine, felsic pyroclastic rocks and tholeiitic mafic flows, pillow basalt and pyroclastic rocks

Pipestone Pond back-arc to MORB-like non-arc volcanics

CO:P

Marine, tholeiitic pillowed and massive basalt and mafic pyroclastic rocks; minor felsic volcanic rocks; thin units of conglomerate, and interbedded shale and sandstone; intrusive rocks of the same ophiolite suites have island-arc tholeiite affinities

Bay du Nord composite assemblage, including continental rift sediments and volcanics

CO:B

Marine sedimentary and volcanic assemblage of wide age range and varied lithology; metamorphic rocks predominate and include siliciclastic schists, amphibolite and migmatite; lower grade parts consist of siliciclastic sedimentary rocks, and rhyolite and felsic pyroclastic rocks; dominantly felsic volcanic rocks tentatively interpreted as erupted in a continental rift environment; in part may be equivalent to the Pipestone Pond and Baie d'Espoir assemblages

Cambrian
Tally Pond primitive arc volcanics

C:TP

Marine, tholeiitic basalt and basaltic andesite, pyroclastic rocks and minor intrusions; felsic flows, tuff, breccia and porphyry

Gondwanan Margin
Gander Zone
Cambrian and Ordovician
Gander continental margin clastics

CO:G

Interbedded quartz-rich sandstone and shale turbidites, mostly metamorphosed to quartzite, and psammitic, semipelitic and pelitic schists and migmatites; intruded by mafic sills and dykes

Avalon Zone
Late Neoproterozoic to Ordovician
Wabana shallow marine platform sediments

N-O:W

Basal orthoquartzite, siltstone, algal limestone, red, grey and black shales, passing upward into sandstone, quartzite, oolitic ironstone and shale; minor alkali pillow basalt and tuff; the assemblage is distinguished by a rich Atlantic-realm trilobite fauna

Late Neoproterozoic
St. John's rift marine and non-marine clastics and volcanics

N:SJ

Siliceous volcaniclastic turbidites, including a glaciogenic mass-flow deposit, passing upwards into shales and sandstones of a shallowing-upwards deltaic sequence and then into alluvial sandstones and conglomerates; bimodal, alkaline to peralkaline, subaerial flows and pyroclastic rocks; age range of assemblage is about 570-545 Ma

Marystown arc volcanics and sediments

N:M — Bimodal, calc-alkaline, subaerial flows and pyroclastic rocks associated with marine to subaerial siliciclastic sedimentary rocks; age range of assemblage is about 595-570 Ma

Connecting Point arc sediments and volcanics

N:CP — Bimodal, tholeiitic to calc-alkaline, subaerial and marine volcanic flows and pyroclastic rocks associated with thick volcaniclastic submarine fan turbidites and tuffs; age range of assemblage is about 635-600 Ma

Tickle Point arc volcanics

N:T — Calc-alkaline felsic flows and pyroclastic rocks, and local andesite and basalt, associated with siliciclastic and carbonate sedimentary rocks; age range of assemblage is about 685-670 Ma

INTRUSIVE ROCKS
Post-Ordovician Units
Various ages
Quartz veins

qv — Quartz veins of various ages

Mesozoic
Budgells Harbour rift-related intrusions

M:m — Analcite gabbro, hornblende gabbro, hornblende pyroxenite, and biotite-titanaugite gabbro

Devonian
Ackley-age post-tectonic granites

D:gA — Equigranular and potassium-feldspar megacrystic biotite granites with evolved and locally peralkaline compositions; mainly intruded into the Gander and Avalon zones

Silurian and Devonian
Miscellaneous Siluro-Devonian mafic intrusions

SD:m — Unclassified Silurian and Devonian mafic intrusions

Miscellaneous Siluro-Devonian granitoid intrusions

SD:g — Unclassified Silurian and Devonian granitoid intrusions

Mount Peyton-type intrusive suites

SD:gP — Granitoid components of bimodal intrusive suites containing granite, granodiorite, diorite and gabbro, and intruded mainly into the Exploits subzone

SD:mP — Gabbroic components of bimodal intrusive suites containing granite, granodiorite, diorite and gabbro, and intruded mainly into the Exploits subzone

North Bay S-type granite and granodiorite suites

SD:gN — Syntectonic, biotite-muscovite and biotite-hornblende granite and granodiorite plutons, commonly peraluminous and containing garnetiferous phases; mainly intruded into the Exploits Subzone and the Gander Zone

Silurian

Topsails A-type intrusive suites

S:gT — Granitoid components of alkali-calcic to peralkaline granite, granodiorite, syenite and gabbro suites; associated with caldera-type subaerial volcanism and principally intruded into the Notre Dame Subzone

S:mT — Mafic components of alkali-calcic to peralkaline granite, granodiorite, syenite and gabbro suites; associated with caldera-type subaerial volcanism and principally intruded into the Notre Dame Subzone

Burgeo I-type granitoid suites

S:gB — Syntectonic granite, granodiorite, tonalite and minor gabbro suites, characterized by large foliated megacrystic granitoid intrusions and intruded mainly into the Gander Zone and high-grade Avalonian rocks of south-central Newfoundland

Laurentian Margin
Humber Zone
Late Neoproterozoic
Hare Hill-type intrusive suites

N:gHH — Deformed, bimodal alkali granite and gabbro suites, including peralkaline phases; age range 610-600 Ma

Long Range rift-related mafic dyke swarm

N:mLR — Diabase dykes geochemically transitional between within-plate basalt and oceanic tholeiite; age range 620-610 Ma

Late Mesoproterozoic and Early Neoproterozoic
Grenvillian granitoid suites

MN:gG — Granite, granodiorite, monzonite and charnockite plutons, commonly megacrystic and intruded into pre-Grenvillian gneisses; age range 1090-920 Ma

Mesoproterozoic
Elsonian anorthosite suites

M:aE — Anorthosite and related mafic and granitoid intrusions; age range 1300-1250 Ma

Late Paleoproterozoic and Mesoproterozoic
Laurentian craton basement gneisses

PM:gL — Granitoid orthogneiss and subordinate mafic gneiss and paragneiss, metamorphosed in the amphibolite and granulite facies; age range 1540-1450 Ma

Iapetus Ocean
Dunnage Zone (Notre Dame Subzone)
Cambrian and Ordovician
Notre Dame Subzone mainly arc-related granitoid intrusions

CO:gN — Tonalite, granodiorite and granite intrusions of calc-alkaline affinity related to Notre Dame Subzone volcanic sequences, and trondhjemite of ophiolite complexes

Notre Dame Subzone mainly ophiolite and arc-related mafic intrusions

CO:mN — Mafic intrusions related to Notre Dame Subzone ophiolite complexes, and arc/back-arc volcanic sequences and intrusive suites

Notre Dame Subzone ophiolite-related ultramafic intrusions

Ultramafic rocks related to Notre Dame Subzone ophiolite complexes

Dunnage Zone (Exploits Subzone)
Cambrian and Ordovician
Exploits Subzone mainly arc-related granitoid intrusions

Granite and granodiorite intrusions, including peraluminous S-type intrusions, small intrusions related to Exploits Subzone volcanic sequences, and trondhjemites of ophiolite complexes

Exploits Subzone mainly ophiolite and arc-related mafic intrusions

Mafic intrusions related to Exploits Subzone ophiolite complexes, and arc/back-arc volcanic sequences and intrusive suites

Exploits Subzone ophiolite-related ultramafic intrusions

Ultramafic rocks related to Exploits Subzone ophiolite complexes

Gondwanan Margin
Gander Zone
Ordovician
Gander Zone mafic intrusions

Gabbro, diabase and amphibolite intruded into Gander Zone rocks

Gander Zone granitoid intrusions

Moderately to strongly peraluminous granitoid intrusions restricted to the Gander Zone, including equigranular and megacrystic biotite granite and granodiorite, and minor garnetiferous muscovite granite

Avalon Zone
Late Neoproterozoic and Cambrian
Cross Hills A-type bimodal plutonic suites

NC:mC — Gabbro component of Neoproterozoic alkaline to peralkaline intrusive suites (age range about 570-550 Ma); Cambrian alkali gabbro intrusions

NC:gC — Granite, granodiorite and syenite components of Neoproterozoic alkaline to peralkaline intrusive suites; age range about 570-550 Ma

Cinq Cerf basement complex

NC:C — Banded amphibolitic gneiss, migmatite, schist, and agmatite screens; subordinate hornblende and granite porphyry, metagabbro, equigranular granitoid, and nebulitic granite sheets; age range about 690-540 Ma

Late Neoproterozoic
Swift Current-age arc plutonic suites

N:gS — Calc-alkaline granite, granodiorite and tonalite; age range about 595-570 Ma

N:mS — Calc-alkaline diorite and gabbro; age range about 595-570 Ma

Holyrood-age arc plutonic suites

N:mHR — Calc-alkaline diorite and gabbro; age range about 635-600 Ma

N:gHR — Calc-alkaline granite, granodiorite and tonalite; age range about 635-600 Ma

Furby's Cove-age arc plutonic suites

NC:mF — Calc-alkaline diorite and gabbro, intruded by diabase and granite dyke swarms and cut by mylonitic shear zones; age range about 685-670 Ma

N:gF — Calc-alkaline granite and granodiorite, intruded by diabase and granite dyke swarms and cut by mylonitic shear zones; age range about 685-670 Ma