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GEOLOGICAL SURVEY OF CANADA | COMMISSION GÉOLOGIQUE DU CANADA

## TECTONIC ASSEMBLAGES AND PLUTONIC SUITES
## (from Wheeler and McFeely, 1991)

Tectonic assemblages represent distinctive successions of stratified rocks, mainly bounded by unconformities or faults, deposited in specific tectonic environments during particular intervals of time. Thus they are fundamental components of Cordilleran geology that reflect its evolution and allow comparisons of the tectonic behaviour of various regions during specific intervals of time.

An assemblage may comprise one or more formations from a single region or from several separate regions. Most assemblages are named for an important constituent or group, although a few are named after the region in which the assemblage is best developed. Very few are not yet named. The age assigned to each assemblage reflects the age range of its components. Each assemblage is characterized in terms of its tectonic or depositional setting, the latter illustrated by descriptions of its principal lithologies, facies variations, source areas and other criteria.

The degrees of confidence in the identification of the associated tectonic or depositional regimes vary considerably and, in some cases are controversial. Most assemblages are categorized in terms of environments currently observable on modern continental margins, island arcs and ocean basins. Others are defined with reference to their positions relative to the orogen (foredeep clastic wedge) or to the craton (passive continental margin sediments).

The plutonic suites are defined mainly by age and subdivided on the basis of composition or other attributes. They are grouped, for the most part, into magmatic episodes (Armstrong, 1985).

## REFERENCES


Armstrong, R.L.
1985: Mesozoic - early Cenozoic plutonism in the Canadian Cordillera - distribution in time and space; Geological Society of America, Abstracts and programs, 1985, v. 17, p 338

Wheeler, J.O. and McFeely, P.
1991: Tectonic Assemblage Map of the Canadian Cordillera and adjacent parts of the United States of America; Geological Survey of Canada, Map 1712A, scale 1:2 000 000


## SOURCES OF INFORMATION

Geological information contained in the GIS map library and the 1:1,000,000 scale folio series is derived directly from John Wheeler's Tectonic Assemblage Map of the Canadian Cordillera (Wheeler and McFeely, 1991; Map 1712A), and is subject to all Copyright laws for distribution in either digital or hard copy form. This map is a revision of the Geological Survey of Canada Map 1505A by Tipper, Woodsworth, and Gabrielse, published in 1981. It is a compilation of published maps, thesis, and unpublished information from officers of the Geological Survey of Canada; from J.G. Abbott, G.W. Lowey, and J.A. Morin of the Geology Section, Department of Indian and Northern Affairs , Whitehorse, Yukon; from D.A. Brew, J.H. Dover, C. Dusel-Bacon, H.L. Foster, J.E. Harrison, W.J. Nokleberg, G. Plafker, and R.W. Tabor of the U.S. Geological Survey; and from R.L. Armstrong, M.T. Brandon, R.L. Brown, D.S. Cowan, P. Erdmer, J. Fillipone, R.M. Friedman, J.T. Fyles, J.M. Hamilton, C.J.R. Hart, R.A. Haugerud, C.J. Hickson, P.M. Holbek, G.A. Jilson, D.L. Jones, A. Jung, W.C. McLelland, E.W. Mountjoy, J.K. Mortensen, D.C. Murphy, J.S. Oldow, R.A. Price, P.B. Read, T.A. Richards, M.E. Rusmore, C.M. Rubin, P.S. Simony, A. Sutherland Brown, R.S. Tolbert, P. van der Heyden, and W.J. Wolfe. Geological cartography for the original version of this map was by M. Sigouin, Geoscience Information Division.

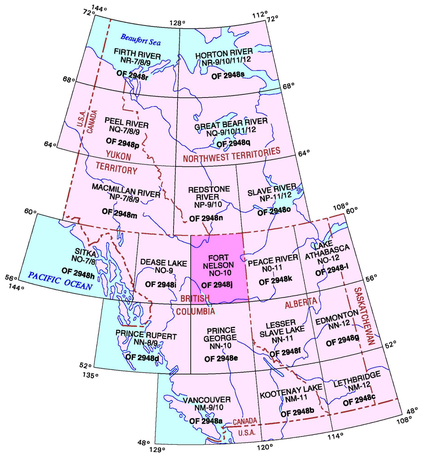
## GIS MAP LIBRARY

The Cordilleran GIS Map Library was initiated in March, 1993 as a collaborative research and development project by the Pacific Division and the Geoscience Information Division (GID) of the Earth Sciences Sector (ESS). The goal is to develop an integrated 1:1,000,000 scale digital geoscience database for the Canadian Cordillera that can be used as an archive and research facility by the Geological Survey of Canada (GSC) and its clients. This map is part of a new series of 1:1,000,000 scale tectonic assemblage maps for the Canadian Cordillera based on the Wheeler and McFeely (1991) Tectonic Assemblage Map of the Canadian Cordillera (Map 1712A). It is one of 19 digital data sets derived from the Cordilleran GIS Map Library CDROM (GSC Open File 2948).

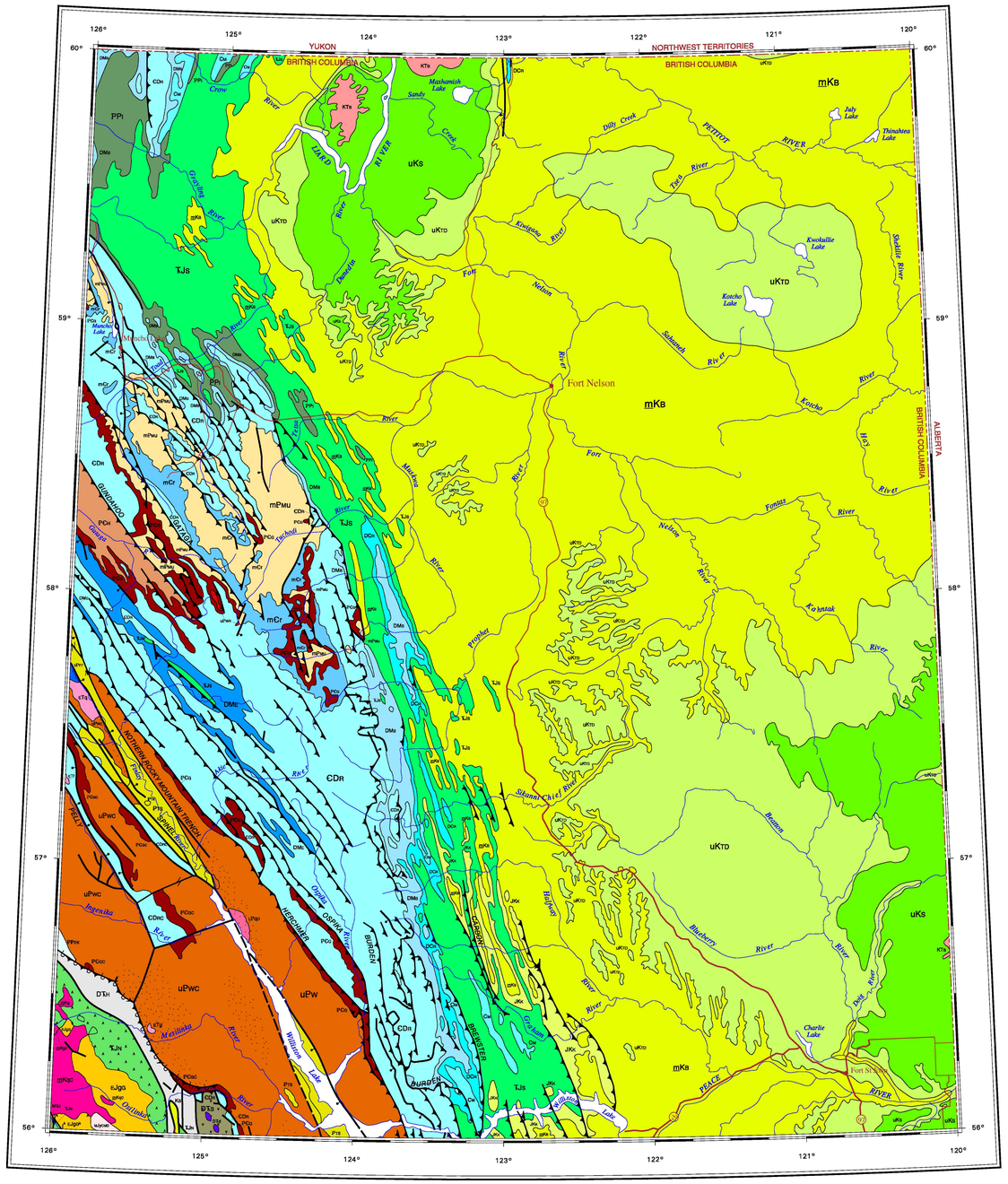
The legend which accompanies Map 1712A was converted to digital format and made available to the GSC by Doug Brownlee, and has been modified and expanded for use as a GIS database. Design and implementation of the digital GIS map library structure, final editing and attributing of all geological and geographic features and cartographic production of the 1:1,000,000 scale folio series were performed by Stephen Williams and Murray Journeay of the GSC Pacific Division, and Richard Allard of the Geoscience Information Division.

The geographic base for the GIS library and the 1:1,000,000 scale folio series is derived from the National Atlas Information System (NAIS) 1: 2,000,000 digital map series and is subject to all Copyright laws for distribution in either digital or hard copy form.

## CORDILLERAN TECTONIC ASSEMBLAGE MAP LIBRARY




TECTONIC ASSEMBLAGES
OF THE
FORT NELSON MAP AREA
1:1 000 000
GSC OPEN FILE 2948j




OPEN FILE 2948j

TECTONIC ASSEMBLAGE MAP

# FORT NELSON

BRITISH COLUMBIA

Scale 1:1 000 000 - Échelle 1/1 000 000

kilometres 25 0 25 50 75 kilometres

Lambert Conformal Conic Projection
Standard Parallels 58°40' and 59°20'
Projection conique conforme de Lambert
Parallèles d'échelle conservée 58°40' et 59°20'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## LEGEND

### TECTONIC ASSEMBLAGES

**PALEOGENE**

**PTK** — *KAMLOOPS: transtensional arc volcanics; alkali-rich, calc-alkaline andesite, basaltic andesite, dacite, rhyolite and basalt flows, pyroclastics and epiclastic deposits. In south and southeast, highly alkaline rhomb-porphyry flows and breccia; bimodal basalt-rhyolite along Tintina Fault; includes alkaline volcanics east of Foreland Belt; all nonmarine*

**PTS** — *SIFTON: nonmarine fault-trough clastics (locally includes upper Upper Cretaceous strata); shale, siltstone, sandstone, conglomerate, local lignite, marl and dacitic volcanics; nonmarine*

**UPPER CRETACEOUS - OLIGOCENE**

**KTB** — *BRAZEAU: foredeep clastic wedge; eastward prograding alluvial sandstone, conglomerate, shale, coal and local tuff and bentonite. In southern foredeep lower part grades eastward into marine shale; upper part nonmarine Paleocene*

**UPPER CRETACEOUS**

**uKT** — *TREVOR: southwesterly derived clastic wedge; interbedded calcareous and glauconitic sandstone and mudstone, bentonitic shale, and local ironstone lenses; also includes Dunvegan conglomerate, sandstone, siltstone and shale (uKTD); marine*

**uKS** — *SMOKY: foredeep marine shales; siderritic and calcareous shale, siltstone and sandstone forming two megacycles; marine*

**CRETACEOUS**

**KS** — *SKEENA: easterly derived back-arc clastics; mostly easterly derived clastics; volcanic wacke, sandstone with detrital mica, siltstone, shale, conglomerate, with granitic clasts, chert-pebble conglomerate, ironstone lenses, coal; marine and nonmarine*

**MID-CRETACEOUS**

**mKB** — *BLAIRMORE: foredeep clastic wedge; mainly eastward prograding deltaic clastics: basal chert-pebble conglomerate, sandstone, locally with metamorphic, granitic and volcanic detritus, shale, coal; alkaline volcanics at top; marine and nonmarine*

**UPPER JURASSIC - LOWER CRETACEOUS**

**JKK** — *KOOTENAY: foredeep clastic wedge; marine sandstone and mudstone grading westward and southward into northward prograding fluvial deltaic sandstone, chert-pebble conglomerate, mudstone, and coal; marine and nonmarine*

**TRIASSIC - JURASSIC**

**TJS** — *SPRAY RIVER: continental margin prism: Jurassic shale, organic-rich paper shale, sandstone, phosphatic and cherty limestone; Triassic shoaling-upward marine siltstone, sandstone, limestone, dolostone, collapse breccia, rare gypsum; marine*

**UPPER TRIASSIC - LOWER JURASSIC**

**TJN** — *NICOLA: arc volcanics in Quesnellia; calc-alkaline andesite, dacite, rhyolite subaerial flows, ignimbrite, minor limestone passing eastwards into augite and feldspar porphyry, andesite and dacite flows and volcanic clastics grading further eastward into relatively alkaline augite porphyry flows, analcite trachybasalt and trachyandesite, volcanic clastics and finally into shale, siltstone, limestone and minor quartzite; marine and nonmarine*

**PENNSYLVANIAN - PERMIAN**

**PPI** — *ISHBEL: faulted passive continental margin sediments; Permian siltstone, sandstone, chert, phosphate, siliceous mudstone; Pennsylvanian dolomitic siltstone, chert breccia, sandstone, orthoquartzite; marine*

**MISSISSIPPIAN - UPPER TRIASSIC**

**M'TC** — *CACHE CREEK: oceanic volcanics and sediments and local accretionary prism mélange; mainly MORB-like tholeiitic to alkaline basalt, some alkali-enriched seamount basalt, serpentinized peridotite and dunite, gabbro, trondhjemite and diabase; most sub-greenschist, local blueschist; mélange with blocks of Upper Triassic Nicola Assemblage; radiolarian ribbon chert, argillite, volcanic sandstone, and limestone, locally as bank, reef and lagoon complexes with Tethyan fossils; includes Jurassic radiolarian east of Fraser River fault; marine*

**DEVONIAN - TRIASSIC**

**D'TH** — *HARPER RANCH: arc clastics; basement of Quesnellia; volcanic sandstone derived from andesitic and dacite volcanics and chert, minor basalt, andesite and dacite flows and pyroclastics, Devonian to Permian limestone blocks in upper Paleozoic to Triassic matrix; marine*

**D'TS** — *SLIDE MOUNTAIN: oceanic marginal basin volcanics and sediments; variably sheared, ophiolite-like assemblage of oceanic, alkalic to transitional pillowed basalt, tuff, breccia, serpentinized peridotite and gabbro, radiolarian chert, argillite and volcanic clastics; marine - east of McLeod Lake Fault - fragmental basalt, diorite, volcanic clastics and limestone that may be a distal North American assemblage*

**CARBONIFEROUS**

**CM** — *MATTSON: distal, northerly derived clastic wedge; includes Endicott Group in Arctic Alaska Terrane; northward and northeastly derived, mainly south- and southwestward prograding deltaic quartz sandstone, shale, minor quartz- and chert-pebble conglomerate, limestone and coal; includes Endicott clastics basal to Lisburne Assemblage; marine and nonmarine*

**DEVONIAN - MISSISSIPPIAN**

**DME** — *EARN: fault-trough clastic wedge: westerly derived, chert-pebble conglomerate, chert-quartz sandstone, pebbly mudstone, blue-black siliceous shale, locally containing barite, brown shale, alkaline trachyte and rhyolite flows, breccia, tuff, pillow basalt and breccia; chert, and limestone; marine and nonmarine*

**DMB** — *BESA RIVER: most distal part of northerly derived Imperial Assemblage and westerly derived Earn Assemblage; upper Devonian shale partly derived from craton; shale, mudstone, and siltstone; marine*

**DEVONIAN - CARBONIFEROUS**

**DCR** — *RUNDLE: continental shelf carbonate and shale; Carboniferous shelf and slope limestone, lime grainstone, dolomite, sandy dolomite, crossbedded sandstone, shale, dark, locally bituminous shale, dolomitic shale; tuff in Eshaw Formation; Upper Devonian platform and reef limestone and dolomite, detrital carbonate channel deposits, grey, green and red shale, sandstone, breccia; marine*

**UPPER PROTEROZOIC - PALEOZOIC**

**PPEK** — *EAGLE BAY: clastics and volcanics of pericratonic Kootenay Terrane and Devonian and older magmatic arc rocks in Yukon-Tanana Terrane; Paleozoic phyllite, siltstone, sandstone, grit, minor limestone, which near Quesnel Lake contains fossil fragments, Devonian felsic metavolcanics and older magmatic arc rocks and fragmentals overlying black siliceous argillite, ribbon chert, quartzite, and local archeocyathid-bearing limestone in mafic metavolcanics, Proterozoic olive green and grey grit, quartzite and carbonate, and metamorphic equivalents; mainly marine*

**CAMBRIAN - DEVONIAN**

**CDR** — *ROCKY MOUNTAINS: passive continental margin sediments; CDnc in Cassiar displaced passive margin terrane; resistant dolomite, limestone, and local sandstone interbedded with recessive red, green, and grey shale and detrital carbonate that together form several carbonate-shale grand cycles. These pass westward into offshelf shale, siltstone and thin-bedded carbonate with minor alkalic tuff, breccia and amygdaloidal basalt of Cambrian, Cambro-Ordovician, Silurian, and Devonian ages but mainly of Ordovician age; marine*

**MIDDLE CAMBRIAN**

**mCr** — *Rift assemblage; fanglomerate, block breccia, conglomerate, brick-red sandstone, limestone, siltstone, sandstone; marine and nonmarine*

**UPPER PROTEROZOIC - LOWER CAMBRIAN**

**PCH** — *HYLAND: mainly clastic offshelf passive continental margin sediments; upper unit: blue-grey, apple-green and maroon slate with minor siltstone and sandstone; lower unit: interbedded graded sequence of sandstone, locally conglomeratic, and shale with limestone in upper part; marine*

**PCG** — *GOG: rifted and passive continental margin sediments; PCsc in Cassiar Terrane; shallow-water crossbedded orthoquartzite, feldspathic quartzite, locally graded-bedded quartzite, quartz-pebble conglomerate, mafic flows, breccia and tuff overlain by interbedded quartzite, siltstone, shale, and limestone with archeocyathid reefs, metamorphic equivalents; marine*

**UPPER PROTEROZOIC**

**uPW** — *WINDERMERE: mainly clastic continental margin sediments; uPwc in Cassiar Terrane; graded-bedded assemblage of interbedded quartz-feldspar grit, sandstone, siltstone and shale, commonly maroon and green; diamictite in Rocky Mountains, limestone in upper part, local greenstone flows, breccia and tuff, and metamorphic equivalents; marine*

**uPWR** — *RAPITAN: rift assemblage; Rapitan: upper tillite, hematite-jaspilite iron formation, silicic turbidite and red, maroon and green argillite, lower tillite; local tholeiite above calc-alkaline basalt and minor felsite; Toby: andesite flows and tuffs above diamictite and conglomerate; marine*

**MIDDLE PROTEROZOIC**

**mPMU** — *MUSKWA: passive continental margin sediments; silty, sandy, calcareous, dolomitic and chamositic mudstone, pebbly mudstone, slate, carbonaceous shale, crossbedded and turbiditic quartzite, argillaceous and stromatolitic dolomite; marine*

### PLUTONIC AND ULTRAMAFIC ROCKS

Plutonic Suite....Cassiar Pluton....(Deserters)

**EARLY TERTIARY (40 - 64 Ma)**

**ET** — **ETg** - *undivided granodiorite and quartz diorite; commonly has concordant U-Pb and K-Ar ages in Coast Plutonic Complex*
**ETq** - *undivided granite*
**ETf** - *undivided felsite, quartz feldspar porphyry*

**MID-CRETACEOUS (87 - 130 Ma)**

**mK** — **mKqc** - *Cassiar: mainly elongate, partly discordant plutons of grey and pinkish grey, biotite quartz monzonite and granodiorite whose western margins are sheared and altered to muscovite-quartz-feldspar mylonite;*
**mKgc** - *undivided granodiorite, leucogranodiorite, quartz monzonite, quartz diorite, tonalite*
**mKg** - *variably foliated hornblende quartz diorite, tonalite, and hornblende diorite intrusive into Gravina-Nutzotin rocks of S. E. Alaska and forming part of western Coast Plutonic Complex*

**MIDDLE JURASSIC (155 - 187 Ma)**

**MJ** — **MJycmd** - *(Duckling Creek): syenite*

**EARLY JURASSIC (187 - 214 Ma)**

**eJ** — **eJgs** - *Guichon: elongate, partly concordant, calc-alkaline, grey, green and pink, hornblende-biotite granodiorite and quartz diorite, lesser biotite granodiorite, quartz monzonite, leucogranodiorite, pyroxene-hornblende diorite and syenodiorite. Altered and foliated near shear zones*

**DEVONIAN - TRIASSIC**

**D'I** — **D'Id** - *diorite and amphibolite of Slide Mountain Terrane, Yukon*

**LATE PROTEROZOIC**

**LP** — **LPqp** - *(Deserters): leucocratic gneissic granite*

**EARLY PROTEROZOIC**

**EP** — **EPmt** - *(Tochieka): partly mylonitic potash feldspar augen orthogneiss*

### VOLCANIC ROCKS

*Calc-alkaline volcanic rocks*

*Tholeiitic volcanic rocks*

### METAMORPHIC ROCKS (protolith uncertain)

*protolith metamorphosed to amphibolite facies*

### SYMBOLS

*Geological contact (defined)*

*Thrust fault (teeth on upper plate)*

*Overturned thrust fault (teeth on upper plate, dip of fault overturned)*

*Extension fault (solid circle indicates downthrow side)*

*Right lateral transcurrent fault*

*Left lateral transcurrent fault*

*Fault of unknown displacement*

*Submerged faults and those buried by younger strata*


Mineral Development Agreement
Canada — British Columbia

Contribution to Canada - British Columbia Agreement on Mineral Development ( 1991 - 1995 ), a subsidiary agreement under the Canada - British Columbia Economic and Regional Development Agreement.

Contribution à l'Entente Canada - Colombie Britannique sur l'exploitation minérale ( 1991 - 1995 ), entente auxiliaire négociée en vertu de l'Entente Canada - Colombie Britannique de développement économique et régional.

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