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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.

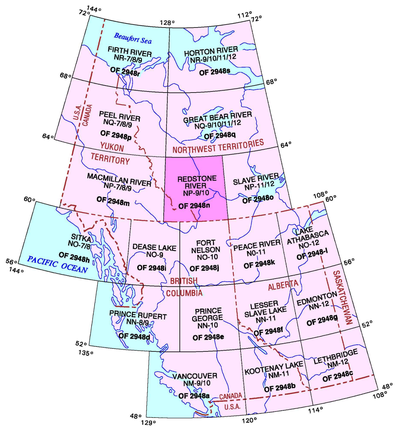
GIS MAP LIBRARY

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).

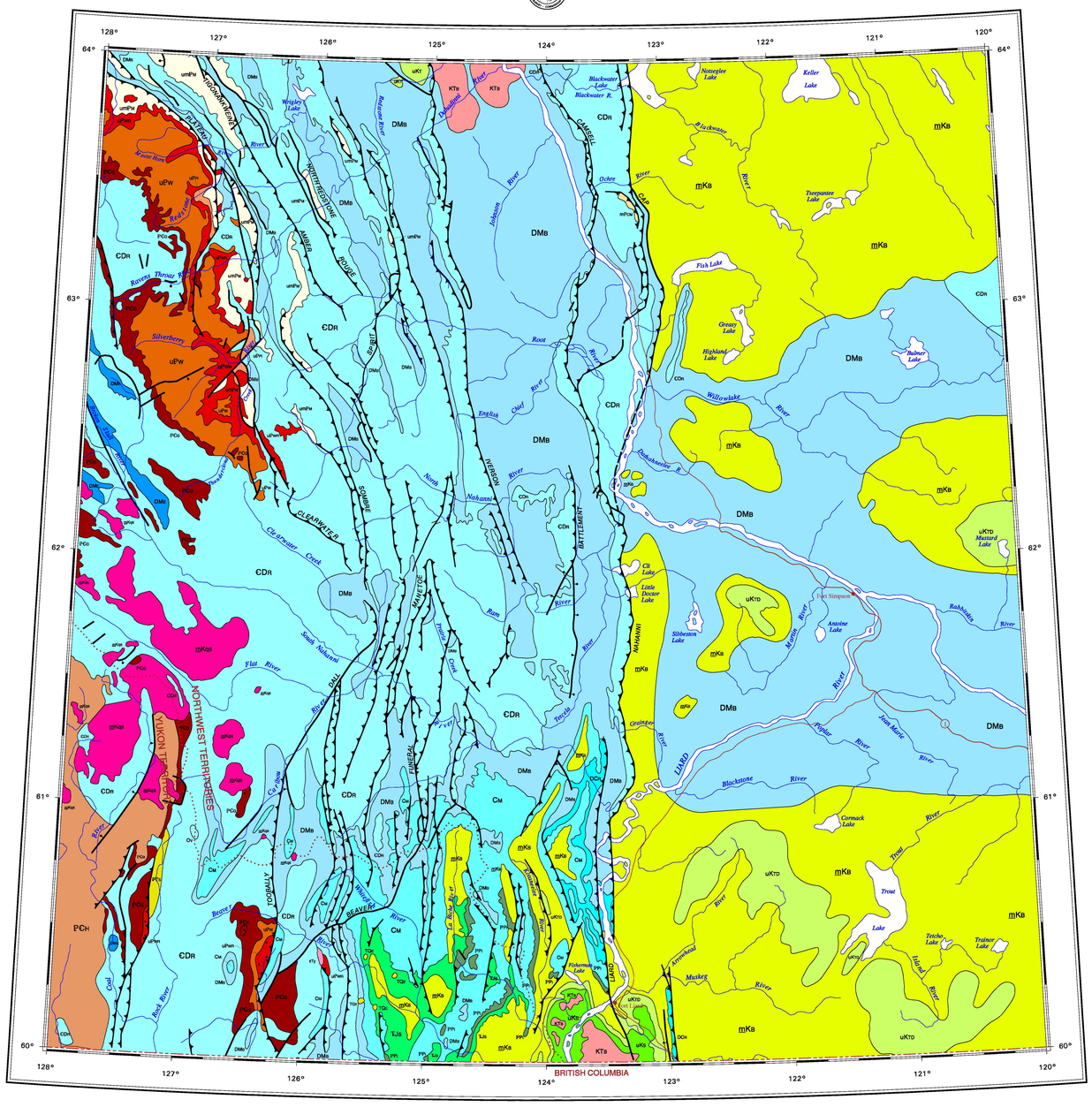
The legend which accompanies Map 1712A was converted to digital format and made available to the GSC by Doug Brownlee, and has been modified and expanded for use as a GIS database. Design and implementation of the digital GIS map library structure, final editing and attributing of all geological and 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
REDSTONE RIVER MAP AREA
1:1 000 000
GSC OPEN FILE 2948n



OPEN FILE 2948n

TECTONIC ASSEMBLAGE MAP

REDSTONE RIVER

NORTHWEST TERRITORIES - YUKON TERRITORY

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

kilometres 25 0 25 50 75 kilomètres

Lambert Conformal Conic Projection
Standard Parallels 60°40' and 63°20'
©Her Majesty the Queen in Right of Canada, 2000

Projection conique conforme de Lambert
Parallèles d'échelle conservée 60°40' et 63°20'
©Sa Majesté la Reine du chef du Canada, 2000

LEGEND

TECTONIC ASSEMBLAGES

TERTIARY AND QUATERNARY
TQe — *EDDIZA: transtentional rift volcanics; alkali basalt and peralkaline trachyte-comendite shield volcanoes; alkali olivine basalt cones with therzolite nodules; flows and tuyas; nonmarine*

PALEOGENE
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 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 (uKTb); marine*

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

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*

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*

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

CARBONIFEROUS
CM — *MATTSON: distal, northerly derived clastic wedge, northward and northeasterly 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
DMs — *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*

DMs — *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
DCn — *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 Exshaw Formation; Upper Devonian platform and reef limestone and dolomite, detrital carbonate channel deposits, grey, green and red shale, sandstone, breccia; marine*

CAMBRIAN - DEVONIAN
CDn — *ROCKY MOUNTAINS: passive continental margin sediments; 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 (Ov) age; marine*

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; shallow-water crossbedded orthoquartzite, feldspathic quartzite, locally graded-bedded quartzite, quartz-pebble conglomerate, mafic flows, breccia and tuff (PCv) overlain by interbedded quartzite, siltstone, shale, and limestone with archeocyathid reefs; metamorphic equivalents; marine*

UPPER PROTEROZOIC
uPw — *WINDERMERE: mainly clastic continental margin sediments; 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*

uPpi — *PINGUICULA: passive continental margin sediments with local rift assemblage at the base; upper: quartzite, dolomitic siltstone, stromatolitic limestone, chert, cryptalgal dolomite, red silicic laminates; lower: copper-bearing calcareous turbidite, maroon mudstone, evaporite, local conglomerate, and basal tholeiitic to intermediate volcanics; marine*

MIDDLE AND UPPER PROTEROZOIC
umPM — *MACKENZIE MOUNTAINS: platformal continental margin sedments (equivalent to Rae Group on the craton); shallow-water platformal assemblage of red and green mudcracked shale, siltstone and sandstone, gypsum and anhydrite, basinal limestone, rhythmite, nodular limestone, stromatolite reefs, platform carbonate grainstone, fluvial-deltaic orthoquartzite and mudstone, stromatolitic and argillaceous dolomite; marine and nonmarine*

MIDDLE PROTEROZOIC
mPCm — *CAP MOUNTAIN: long-lived rift-embayment sedments equivalent to Dismal Lakes and Hornby Bay groups on the craton (Coppermine River Group on the craton); Wernecke Supergroup contains distremes and breccia complexes. Purcell Supergroup contains altered basaltic to andesitic volcanics, upper, white and grey crossbedded orthoquartzite, olive grey shale and purple and red mudstone, minor siltstone and conglomerate, lower, brick red and purple sandy and silty mudstone, red, purple and green siltstone and sandstone with interbeds of stromatolitic dolomite; marine*

PLUTONIC ROCKS

Plutonic suite.....Selwyn

EARLY TERTIARY (40 - 64 Ma)
eT — *eTy - undivided syenite, syenodiorite, nepheline syenite, sodalite syenite, jacupirangite, ijolite, urtite*

MID-CRETACEOUS (87 - 130 Ma)
mK — *mKgs - Selwyn: subalkaline, calc-alkaline, discordant, biotite- and lesser muscovite or hornblende-bearing quartz monzonite; granite, and granodiorite*

VOLCANIC ROCKS

Tholeiitic volcanic rocks

SYMBOLS

Geological contact (defined)
Thrust fault (teeth on upper plate)
Extension fault (solid circle indicates downthrow side)
Right lateral transcurrent fault
Fault of unknown displacement
Submerged faults and those buried by younger strata

Mineral Development Agreement
Canada — Northern 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 signée en vertu de l'Entente Canada - Colombie Britannique de développement économique et régional.

BC — Ministry of Energy and Mines
Canada

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