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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. McClelland, 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.

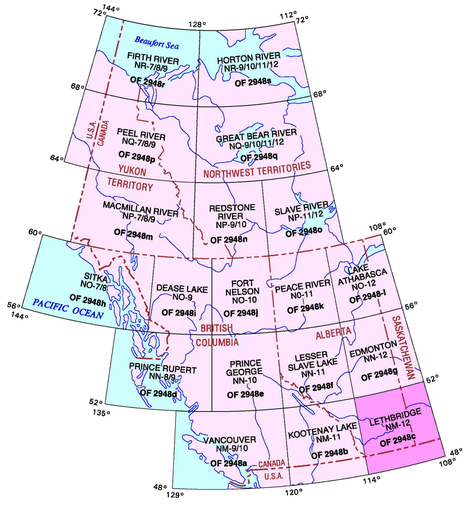
GIS MAP LIBRARY

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).

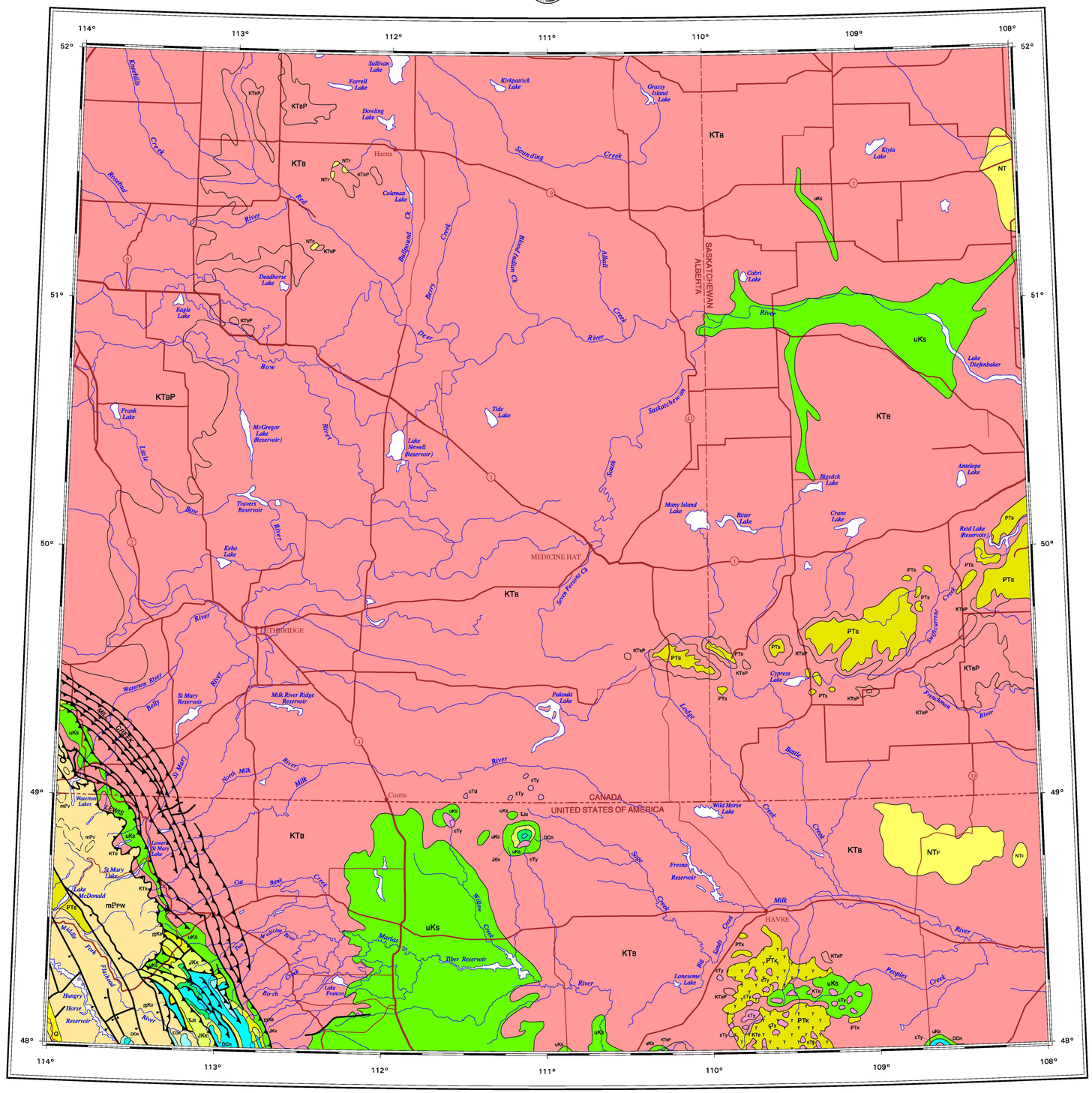
The legend which accompanies Map 1712A was converted to digital format and made available to the GSC by Doug Brownlee, and has been modified and expanded for use as a GIS database. Design and implementation of the digital GIS map library structure, final editing and attributing of all geological and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



OPEN FILE 2948c

TECTONIC ASSEMBLAGE MAP

LETHBRIDGE

ALBERTA - SASKATCHEWAN - U.S.A.

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

kilometres 25 0 25 50 75 kilomètres

Lambert Conformal Conic Projection
Standard Parallels 48°40' and 51°20'
©Her Majesty the Queen in Right of Canada, 2000

Projection conique conforme de Lambert
Parallèles d'échelle conservée 48°40' et 51°20'
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LEGEND

TECTONIC ASSEMBLAGES

QUATERNARY

Q — *Undivided Quaternary alluvium and colluvium*

NEOGENE

NT — *Undivided Neogene clastics*

NTF — *FRASER: alluvial sediments; poorly consolidated alluvial conglomerate, sandstone, mudstone, with local lignite, tuff, breccia and diatomite; nonmarine*

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 (KTaP)*

UPPER CRETACEOUS

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*

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*

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

CAMBRIAN - DEVONIAN

ЄDR — *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 age; marine*

MIDDLE PROTEROZOIC

mPPW — *PURCELL - WERNECKE continental margin sediments, partly within an embayment in the craton margin in the south; mainly shallow-water, grey, green and red argillite, siltstone, quartzite, and orange and buff dolomite, locally stromatolitic, and grey limestone grading from a clastic carbonate platform into offshelf, locally turbiditic, siltstone-quartzite and argillite; mPV (Purcell Volcanics); marine and nonmarine*

PLUTONIC AND ULTRAMAFIC ROCKS

EARLY TERTIARY (40 - 64 Ma)

eT — **eTd** - *undivided diorite, monzodiorite, gabbro, diabase, amphibolite*
eTy - *undivided syenite, syenodiorite, nepheline syenite, sodalite syenite, jacupirangite, ijolite, urtite*

VOLCANIC ROCKS

Alkaline volcanic rocks

Volcanic units too thin to show with volcanic symbols: mPV

SYMBOLS

Geological contact (defined)

Thrust fault (teeth on upper plate)

Extension fault (solid circle indicates downthrow side)

Fault of unknown displacement

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.

BC — Canada

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