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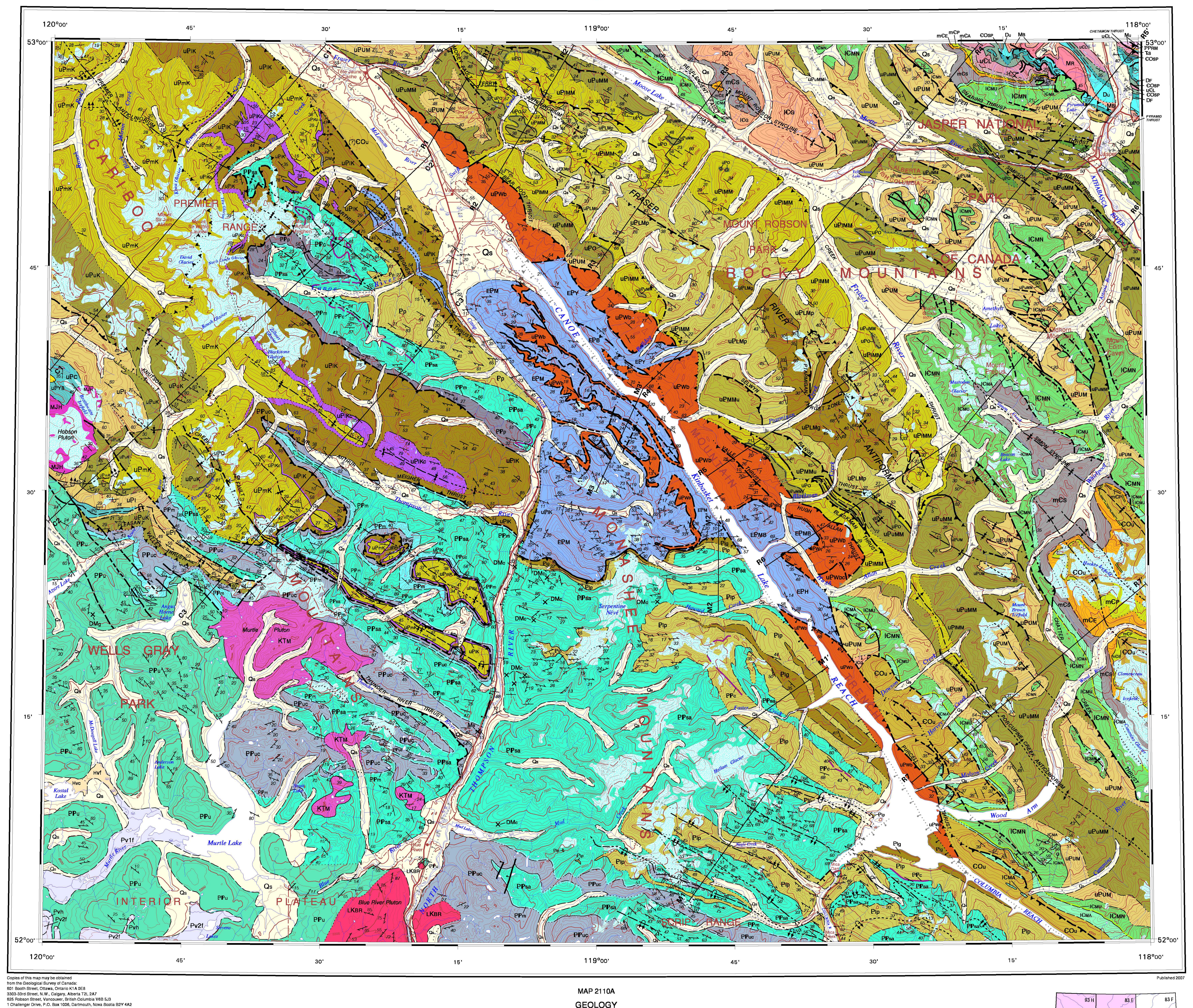

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LOCATION MAP

Published 2007

MAP 2110A

GEOLOGY

CANOE RIVER

BRITISH COLUMBIA–ALBERTA

Scale 1:250 000/Échelle 1/250 000

kilometres 5 0 5 10 15 20 kilomètres

Universal Transverse Mercator Projection
North American Datum 1983

Projection transverse universelle de Mercator
Système de référence géodésique nord-américain, 1983

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Author: D.C. Murphy (comp.)

Geological compilation by D.C. Murphy (1990–1991), Geological Survey of Canada; currently with Yukon Geological Survey, Whitehorse, Yukon

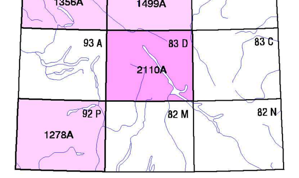
Digital cartography by C.L. Wagner, Data Dissemination Division (DDD)

Any revisions or additional geological information known to the user would be welcomed by the Geological Survey of Canada

Digital base map from data compiled by Geomatics Canada, modified by DDD

Mean magnetic declination 2007, 18°21'E, decreasing 15.0' annually. Readings vary from 17°53'E in the SE corner to 18°51'E in the NW corner of the map

Elevations in feet above mean sea level
Contour interval 500 feet



NATIONAL TOPOGRAPHIC SYSTEM REFERENCE AND INDEX TO ADJOINING GEOLOGICAL SURVEY OF CANADA MAPS

LEGEND

CARIBOO AND MONASHEE MOUNTAINS

QUATERNARY

Qs — *Undifferentiated unconsolidated sand, silt, clay, gravel, till, and colluvium.*

HOLOCENE

Hvc,Hvf — *Basalt: Hvc, cone; Hvf, flow.*

PLEISTOCENE

Pv1f,Pv2f Pvh — *Basalt; Pv1f, CLEARWATER UNIT, flow; Pv2f, WELLS GRAY UNIT, flow; Pvh, hyaloclastite.*

TERTIARY
MIOCENE

Ms — *Lacustrine silt and clay.*

INTRUSIVE ROCKS

CRETACEOUS-(?)TERTIARY

KTM — *MURTLE PLUTON: muscovite-biotite granite and quartz monzonite.*

LATE CRETACEOUS

LKBR — *BLUE RIVER PLUTON: weakly foliated muscovite (rarely biotite) granite; (88 ± 6 Ma, D.C. Murphy and R.R. Parrish (unpub. data, 1990)).*

JURASSIC
MIDDLE JURASSIC

MJH — *HOBSON PLUTON (174 ± 1 Ma, Gerasimoff (1988): biotite granodiorite, minor hornblende-biotite granodiorite, quartz-diorite, and diorite.*

TRIASSIC

Tg — *Small foliated stocks, sills, and dykes of granite in northeastern Wells Gray Park; age approximately 235 Ma (Murphy et al., 1995).*

DEVONIAN-MISSISSIPPIAN

DMg — *Small foliated bodies of granitic to dioritic rocks; age approximately 350 Ma (L.C. Struik and R.R. Parrish, unpub. data, 1986 and D.C. Murphy, unpub. data, 1988).*

DMc — *Carbonatite.*

(?)CAMBRIAN-(?)ORDOVICIAN

(?)ЄOu — *Foliated white and grey, micaceous, locally graphitic, talc- and tremolite-bearing marble and minor pelitic schist found in southern Rocky Mountain Trench. Age unknown, but presumed to be equivalent to unit ЄOu of Rocky Mountains.*

PROTEROZOIC
UPPER PROTEROZOIC
WINDERMERE SUPERGROUP
CARIBOO GROUP

uPYB — *YANKEE BELLE FORMATION: green and grey shale and siltstone, minor quartzite and limestone.*

uPC — *CUNNINGHAM FORMATION: grey limestone, minor shale and siltstone.*

uPI — *ISAAC FORMATION: dark phyllite, slate, limy phyllite; locally important limestone and limestone-pebble conglomerate; quartz-pebble conglomerate and grit at base.*

KAZA GROUP

uPuK — *UPPER KAZA GROUP: commonly graded and locally crossbedded quartzofeldspathic metasandstone, granule- and pebble-conglomerate (grit); minor green-grey silty phyllite and slate; calcareous grit at basal contact with unit uPO.*

uPO — *OLD FORT POINT FORMATION: triad of upper carbonaceous and pyritic phyllite or slate, middle light to dark grey limy phyllite and thin-bedded marble, and basal green quartz metasiltstone and fine-grained metasandstone with thin (up to 10 cm) contorted crosslaminated calcareous intervals.*

uPmK — *MIDDLE KAZA GROUP: commonly graded and locally crossbedded quartzofeldspathic metasandstone, granule- and pebble-conglomerate (grit); green-grey silty slate, phyllite, or schist.*

uPlKc — *LOWER KAZA GROUP CARBONATE UNIT: cycles of quartzofeldspathic grit or metasandstone, phyllite, or schist, culminating in clastic grey to brown marble up to 5 m thick; unit thins to west to one band of grey to brown marble between the pelite-rich Lower Kaza Group and the metasandstone and grit-dominated Middle Kaza Group.*

uPlK — *LOWER KAZA GROUP: pelitic (biotite-muscovite-garnet±staurolite±kyanite) schist locally carbonaceous, psammite and grit; lesser orthoamphibolite, marble, and calc-silicate rock; diamictite, conglomerate, grit, and psammite at base; crossbedded quartzite and marble found locally beneath basal conglomerate. Probably equivalent to units uPLMg and uPLMp.*

uPWb — *Undifferentiated basal Windermere Supergroup (structurally interleaved with orthogneiss of Malton Gneiss Complex): grit and locally conglomerate or diamictite; locally mylonitic quartzite at base; kyanite-, garnet-, staurolite-, biotite-, and/or muscovite-bearing pelitic phyllite or schist; psammite; and more rarely marble and calc-silicate rocks above coarse clastic section at base.*

EARLY PROTEROZOIC

EPG, EPM — *EPG GOLD CREEK GNEISS (ca. 2.1 Ga, Murphy et al. (1991)); quartz dioritic orthogneiss in southern Cariboo Mountains; EPM MALTON GNEISS COMPLEX: undifferentiated foliated granitic augen orthogneiss (ca. 2 Ga, McDonough and Parrish (1990)), mafic orthogneiss, and paragneiss in northern Monashee Mountains.*

KOOTENAY TERRANE

PROTEROZOIC AND (?)PALEOZOIC

PPu — *Undifferentiated metamorphic rocks of unknown, but probable Proterozoic and possibly Paleozoic age in the footwall of the Pleasant Valley Thrust.*

PPuc — *UPPER CLASTIC UNIT: quartzofeldspathic psammite and grit, pelitic schist (locally kyanite-, sillimanite-, staurolite-, garnet-, biotite-, and/or muscovite-bearing); minor amphibolite.*

PPp — *Grey-brown pelitic (muscovite-biotite-garnet±staurolite, kyanite) schist and lesser quartzofeldspathic psammite in immediate footwall of Sir Arthur Meighen Thrust between North Thompson and Canoe rivers. Inferred to correlate with locally important clastic member of unit PPm south of North Thompson River (Pell and Simony, 1984).*

PPm — *MARBLE UNIT (Main Marble of Simony et al. (1980) and Raeside and Simony (1983); Middle Marble of Brown et al. (1978), Pell and Simony (1984) and Sevigny and Simony (1989)). Unit locally includes a discontinuous clastic member of pelite, psammite, grit, quartzite, and sandy marble (Pell and Simony, 1984) inferred to correlate with unit PPp.*

PPc — *Conglomerate with clasts of marble, calc-silicate rock, quartzite and granite (ca. 1200 Ma, G.M. Ross, R.R. Parrish, and D.C. Murphy, unpub. data (1991)). Conglomerate occurs in unit PPsa in Cariboo Mountains and unit Plp in Monashee Mountains.*

PPsa — *SEMIPELITE-AMPHIBOLITE UNIT: quartzose psammite, quartzofeldspathic psammite and grit, pelitic (biotite-muscovite-garnet±staurolite, kyanite, or sillimanite) schist, concordant and discordant amphibolite, and minor marble. In Monashee and Selkirk mountains, the lower contact of unit PPsa is locally marked by marble.*

PROTEROZOIC

Pp — *Relatively dark, biotite-rich pelitic (biotite-muscovite-garnet-staurolite±kyanite) schist and psammite with lesser grit; minor garnet±biotite amphibolite and calc-silicate rock. Possibly equivalent to unit Plp.*

Plp — *LOWER PELITE UNIT: pelitic schist; minor quartzofeldspathic psammite; and concordant and discordant amphibolite. Probably equivalent to upper part of units uPlK and uPWb.*

Plg — *LOWER GRIT UNIT: quartzofeldspathic psammite and grit, and minor pelitic schist and amphibolite. Prominent diamictite-bearing conglomeratic horizon locally present at base. Probably equivalent to lower part of units uPlK and uPWb.*

ROCKY MOUNTAINS

QUATERNARY

Qs — *Undifferentiated unconsolidated sand, silt, clay, gravel, till, and colluvium.*

TRIASSIC
SPRAY RIVER GROUP

Ts — *SULPHUR MOUNTAIN FORMATION: dark brown silty shale, siltstone, sandstone; minor calcareous sandstone.*

PENNSYLVANIAN AND PERMIAN

PPRM — *ROCKY MOUNTAIN GROUP: light grey, cherty sandstone, massive chert, dolomitic sandstone, and silty dolomite.*

MISSISSIPPIAN

Mu — *Undifferentiated Rundle Group and Banff Formation.*

MR — *RUNDLE GROUP: grey dolostone, crinoidal limestone, and cherty dolostone.*

MB — *BANFF FORMATION: argillaceous limestone, calcareous shale; at base, black, fissile, cherty shale and brown sandstone.*

DEVONIAN

Du — *Undifferentiated Palliser and Sassenach formations: Palliser (upper unit): massive dolomitic limestone; Sassenach (lower unit): sandstone, siltstone, and silty limestone.*

FAIRHOLME GROUP (basinal facies)

DF — *Undifferentiated Mount Hawk, Perdrix, and Flume formations: calcareous mudstone, argillaceous limestone, black shale, and cherty limestone.*

CAMBRIAN-ORDOVICIAN

ЄOu — *Undifferentiated Cambrian or Cambrian-Ordovician limestone or marble.*

ЄOSP — *SURVEY PEAK FORMATION: calcareous shale, micritic limestone, and limestone pebble-conglomerate.*

UPPER CAMBRIAN

uЄL — *LYNX GROUP: dolostone, siltstone, and limestone.*

MIDDLE CAMBRIAN

mЄA — *ARCTOMYS FORMATION: red and green shale; dolomitic siltstone and shaly dolostone.*

mЄP — *PIKA FORMATION: limestone, limestone-pebble conglomerate, oolite; minor shale and dolomite.*

mЄE — *ELDON FORMATION: limestone, locally dolomitized.*

mЄS — *SNAKE INDIAN FORMATION (includes undifferentiated Tatei, Chetang, and Hota formations mapped in north-central part of area): alternating units of limestone and calcareous shale, massive limestone at base locally (Hota Formation).*

LOWER CAMBRIAN
GOG GROUP

lЄG — *Undifferentiated McNaughton, Mural, and Mahto formations.*

lЄMA — *MAHTO FORMATION: fine-grained quartz sandstone and siltstone.*

lЄMU — *MURAL FORMATION: limestone and dolostone with interbeds of shale and siltstone.*

lЄMN — *MCNAUGHTON FORMATION: massive quartz sandstone and siltstone, and minor pebble-conglomerate and phyllite.*

PROTEROZOIC
UPPER PROTEROZOIC
WINDERMERE SUPERGROUP
MIETTE GROUP

uPUM — *UPPER MIETTE GROUP: silty, locally calcareous argillite and mudstone; sandstone; locally includes carbonate accumulations (includes Byng Formation of Mountjoy (1980)).*

uPMMu — *Undifferentiated Middle Miette Group*

uPuMM — *UPPER MIDDLE MIETTE GROUP: commonly graded and locally crossbedded quartzofeldspathic metasandstone, granule- and pebble-conglomerate (grit); siltstone; grey-green silty phyllite; phyllite predominant in thrust sheets near Blackman Creek; base on unit uPO locally calcareous sandstone or limestone-clast conglomerate.*

uPO — *OLD FORT POINT FORMATION: triad of upper dark grey to black carbonaceous phyllite; middle dolomitic and calcareous siltstone and phyllite; and basal green phyllite, slate, and locally calcareous quartz siltstone.*

uPlMM — *LOWER MIDDLE MIETTE GROUP: commonly graded and locally crossbedded quartzofeldspathic metasandstone, granule- and pebble-conglomerate (grit), siltstone, grey-green silty phyllite, and schist.*

uPLMp — *LOWER MIETTE GROUP phyllite: dark silty phyllite, minor quartz-pebble conglomerate.*

uPLMg — *LOWER MIETTE GROUP grit: quartzofeldspathic sandstone, grit, and minor phyllite.*

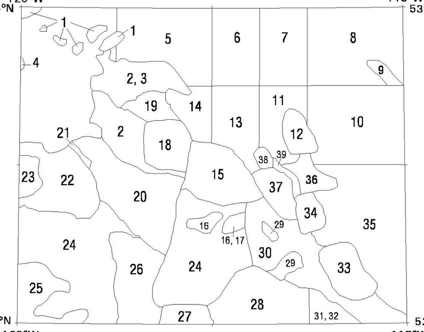
uPWb — *Undifferentiated basal Windermere Supergroup (overlying basement in hanging wall of Bear Foot Thrust): grit and locally conglomerate or diamictite; locally mylonitic quartzite at base (uPWq); kyanite-, garnet-, staurolite-, biotite-, and/or muscovite-bearing pelitic phyllite or schist; psammite; and more rarely marble and calc-silicate rocks above coarse clastic section at base (uPWbc); may be equivalent in part to units uPLMg and uPLMp.*

EARLY PROTEROZOIC

EP — *Undifferentiated gneiss (seen in Fig. 2); EPY YELLOWJACKET GNEISS (ca. 1.87 Ga, McDonough and Parrish (1990)): foliated and locally crenulated granitic and granodioritic orthogneiss, locally with augen. EPB BULLDOG GNEISS: quartzose paragneiss and amphibolitic mafic gneiss intruded by ca. 1.87 Ga granitic augen gneiss (McDonough and Parrish, 1990), minor amphibolite. EPMB MOUNT BLACKMAN GNEISS: amphibolitic mafic gneiss and granitic gneiss. EPH HUGH ALLAN GNEISS (ca. 750 Ma, McDonough and Parrish (1990)): granitic gneiss.*

Symbols

Geological contact (defined, approximate, assumed)
Fault or shear zone, sense unknown (defined, approximate, assumed)
Dextral strike-slip fault, sense unknown (defined, approximate, assumed)
Thrust fault or shear zone (defined, approximate, assumed)
Dextral-thrust oblique slip fault or shear zone (defined, approximate, assumed)
Normal fault or shear zone (defined, approximate, assumed)
Dextral-normal oblique slip fault or shear zone (approximate, assumed)
Fault projected from beneath younger cover (sense unknown, normal)
Fault projected from beneath younger cover (thrust, dextral-thrust)
Upright anticline or antiform (approximate, assumed)
Upright syncline or synform (approximate, assumed)
Overturned anticline or antiform (approximate, assumed)
Overturned syncline or synform (approximate, assumed)
Strike and dip of bedding
Strike and dip of bedding, upright, top known
Strike and dip of bedding, overturned
Strike and dip of bedding, overturned, top known
Strike and dip of prominent foliation
Dextral strike-slip fault, on cross-sections only (displacement into section, out of section)
Line of cross-section C3 — C3′



1. Murphy (1986)
2. Murphy (1990)
3. D.C. Murphy (unpub. mapping, 1990)
4. G.M. Ross (unpub. mapping, 1990)
5. Re-interpretation of McDonough and Murphy (1990)
6. McDonough and Mountjoy (1990)
7. R.G. Dechesne and E.W. Mountjoy (unpub. mapping, 1990)
8. Mountjoy and Price (1985)
9. Dechesne and Mountjoy (1988)
10. Mountjoy and Price (1989)
11. Dechesne (1990)
12. Forest (1985)
13. McDonough and Morrison (1990)
14. McDonough et al. (1991a)
15. Morrison (1982)
16. Digel et al. (1989)
17. McDonough et al. (1991b)
18. Currie (1988)
19. Walker (1989)
20. Pell and Simony (1984)
21. Murphy (1987)
22. Struik (1986)
23. Pigage (1978)
24. Campbell (1968)
25. Hickson (1986)
26. Dechesne (1986)
27. Sevigny and Simony (1989)
28. Raeside (1982)
29. Robbins (1976)
30. Simony et al. (1980)
31. Mitchell (1976)
32. Perkins (1983)
33. Craw (1977)
34. Klein and Mountjoy (1988)
35. E.W. Mountjoy (unpub. mapping, 1991)
36. Mountjoy and Grasby (1991)
37. Oke (1982)
38. Charland (1989)
39. Leonard (1985)

Figure 1. Sources of geological information (*see* References)

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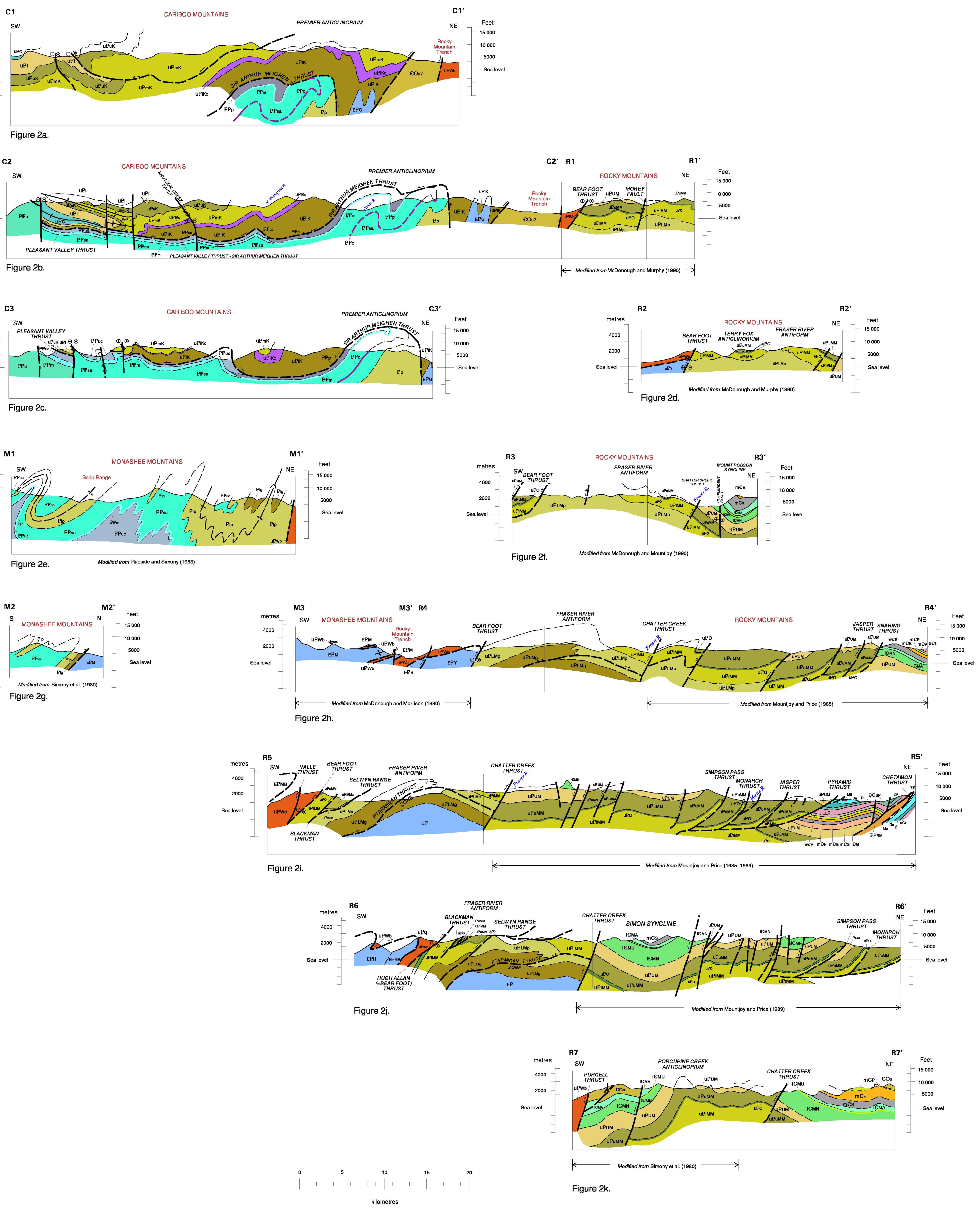

Figure 2. Interpretive vertical cross-sections

Recommended citation:
Murphy, D.C. (comp.)
2007: Geology, Canoe River, British Columbia–Alberta; Geological Survey of Canada, Map 2110A, scale 1:250 000.

Canada