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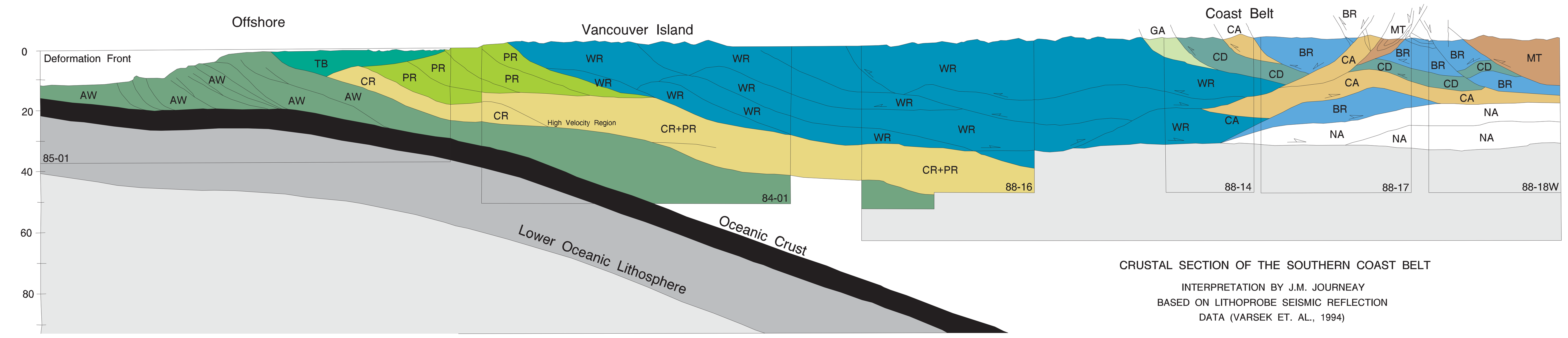


CRUSTAL SECTION OF THE SOUTHERN COAST BELT

INTERPRETATION BY J.M. JOURNEAY
BASED ON LITHOPROBE SEISMIC REFLECTION
DATA (VARSEK ET. AL., 1994)

GEOLOGY AND TERRANES OF THE SOUTHERN COAST MOUNTAINS

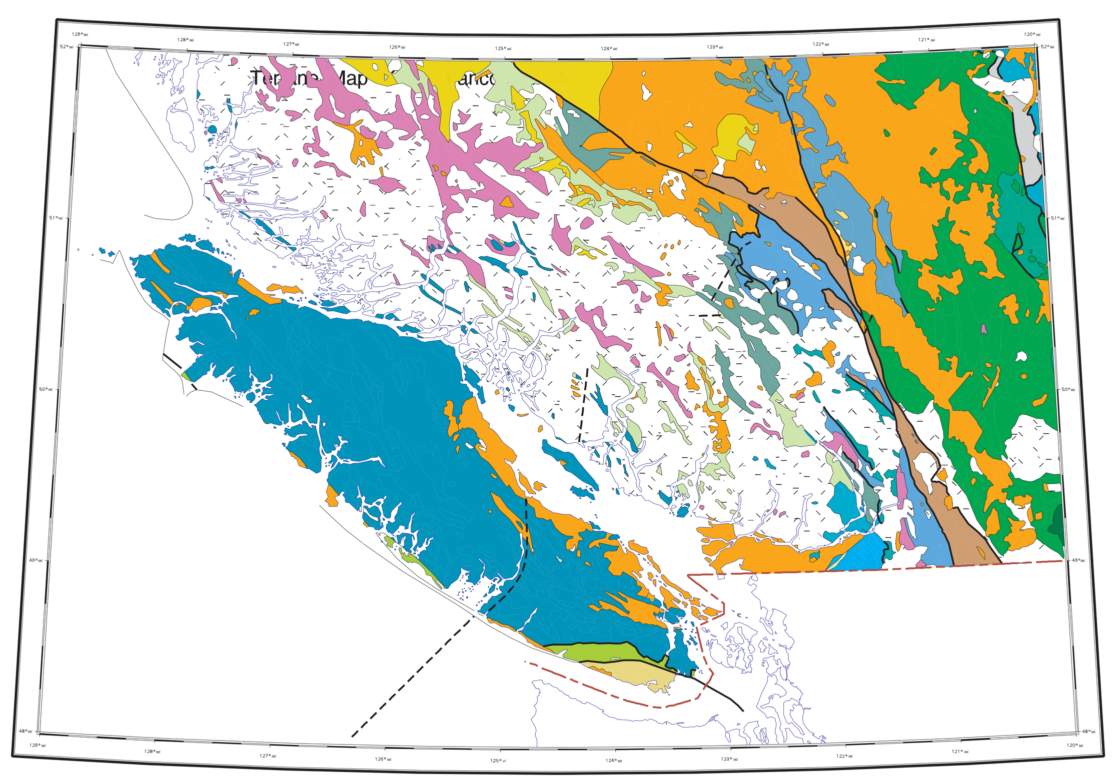
The Coast Mountains between lats. 49° and 51° N is divided into southeastern and southwestern parts based on the distribution of plutonic rocks, terranes and structures. The two-fold division of the southern Coast Mountains was first recognized by Crickmay (1930) who saw the southwestern part as a region of plutonic rocks and "Jurassic structures" which were distinct from the region of "Laramide structures" in the southeastern Coast Mountains and Cascade Range. Mid-Cretaceous (ca. 110-90 Ma) plutonic rocks are emplaced in both parts of the southern Coast Mountains, linking them at a time slightly earlier than that at which the earliest structural linkages can be demonstrated.

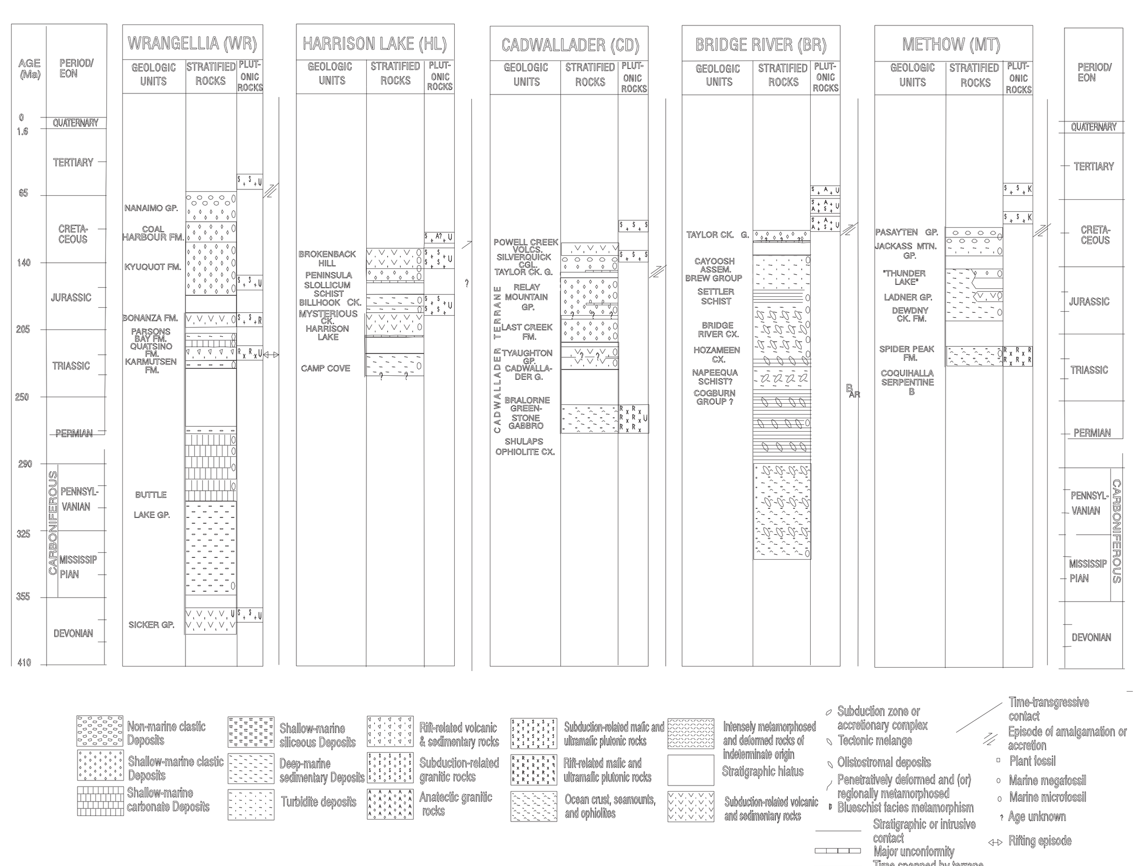
Southwestern Coast Mountains: feature mainly Middle Jurassic to mid-Cretaceous plutons (ca. 165<196>91 Ma), which intrude supracrustal sequences ranging in age from Middle Triassic to late Early Cretaceous of Wrangellia and Harrison Lake terranes, and overlapping Jura-Cretaceous volcanic and sedimentary rocks (Figs. 1; 6; 8). Its western boundary is the western limit of Middle Jurassic intrusions that possibly were localized along pre-and syn-plutonic faults (Nelson, 1979; Monger and McNichol, 1993). Its eastern boundary is delineated by high-grade thrust nappes of the Coast Belt Thrust System (CBTS), derived in large part from basinal strata (Bridge River terrane) characteristic of the southeastern Coast Mountains (Journeay and Friedman, 1993).

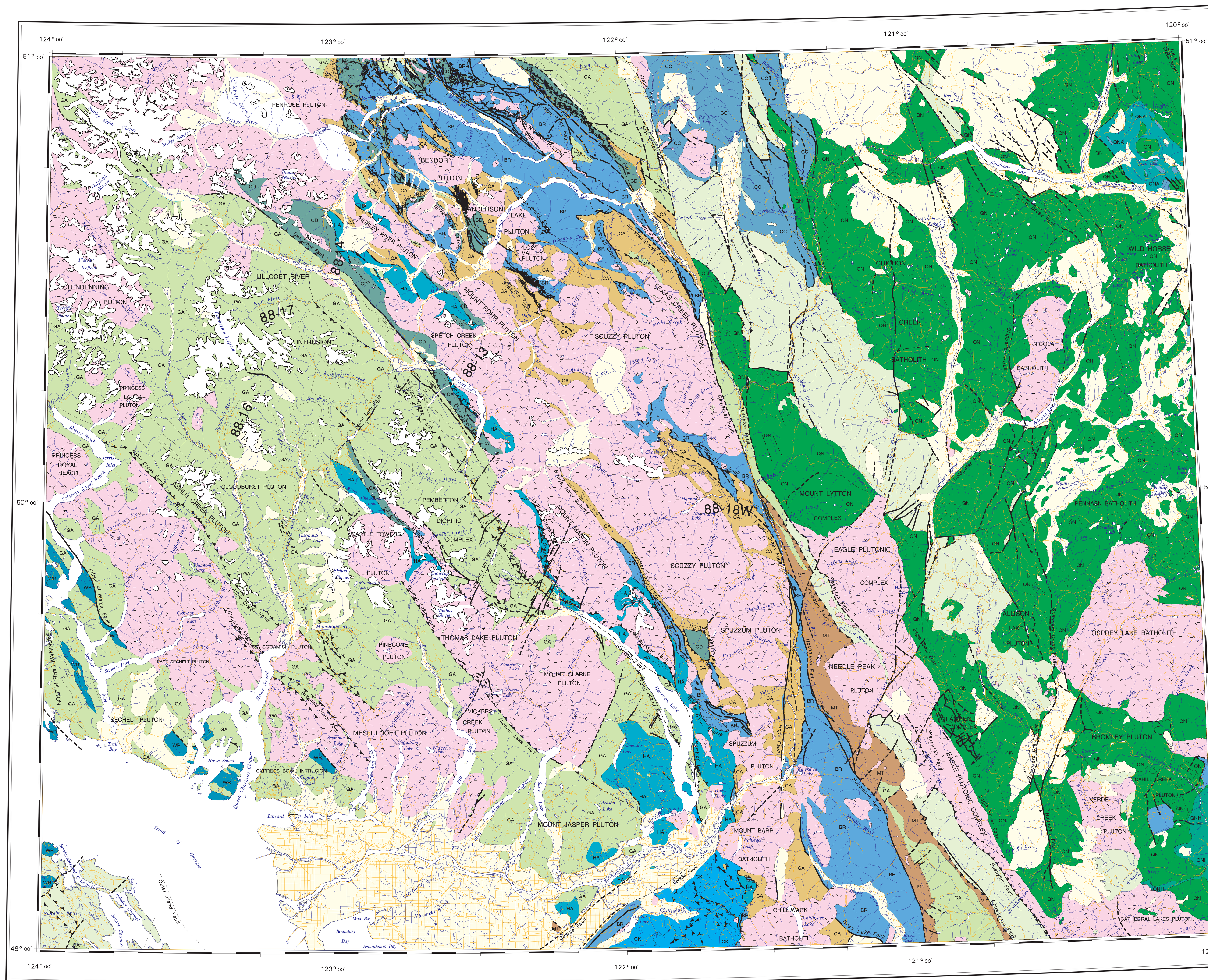
Southeastern Coast Mountains: feature mid-Cretaceous through early Tertiary (103-47 Ma) plutonic rocks, emplaced within (mainly) Bridge River, Cadwallader and Methow terranes. This part of the Coast Mountains was the site of the most intense deformation and highest grade metamorphism in Late Cretaceous- early Tertiary time. All three terranes in the southeastern Coast Mountains appear to be founded on oceanic crust. Of these, the Bridge River terrane consists of lithologies characteristic of oceanic crust, such as pillow basalts associated with radiolarian chert and alpine-type ultramafic rocks, whereas the other terranes are predominantly of arc affinity. Bridge River terrane contains fossils in chert facies ranging in age from Mississippian to late Middle Jurassic (350-160 Ma; Cordey and Schiarizza) and possibly Late Jurassic (Oxfordian, 155 Ma; F.Cordey, pers. comm. 1994). The long time spanned by this terrane, at least 190 million years, suggests that it represents remnants of a former large ocean basin. In addition, Journeay and Northcote (1992) found that locally chert grades into clastic rocks of the Cayoosh assemblage of Jurassic(?) and Early Cretaceous age. The Bridge River and overlying strata occur both as highly disrupted tectonic melange and relatively coherent units. Rare Triassic blueschist in the Bridge River terrane indicates that parts of the complex underwent early Mesozoic subduction; other 40Ar/39Ar data show that the terrane underwent no other thermal perturbation until the Cretaceous (Archibald et al., 1991). Monger (1991a) argued that the Darrington Phyllite and Shuksan Greenschist of the North Cascades, which contain blueschist yielding Jura-Cretaceous ages (peaking at 140-120 Ma) can be traced northwards into Settler Schist which is correlated with the Cayoosh Assemblage. The Bridge River terrane is disposed in thrust slices structurally interleaved with Cadwallader and(?) Methow terranes, variably metamorphosed and intruded by Late Cretaceous and early Tertiary plutons.

Southwestern Intermontane Belt: contains Quesnel, Cache Creek and Stikine terranes and plutonic rocks ranging in age from Late Triassic to earliest Tertiary (212-62 Ma). Between lat. 51°-52° N, Late Cretaceous-early Tertiary plutons are emplaced in possible Stikine strata and in Early Cretaceous strata that may be correlative with the Gambier Group in southwestern Coast Belt.

Cascade Range: comprises Late Cretaceous-early Tertiary plutons and high-grade metamorphic rocks, equivalent to rocks in southeastern Coast Mountains, but offset dextrally by ca. 130 km on the early Tertiary Fraser-Straight Creek Fault. The Cascade core is flanked by little metamorphosed strata; on the east are Methow and Bridge River terranes, and on the west rocks of Bridge River (?), Chilliwack and Harrison terranes. Not recognized in the Cascades are Wrangellian strata (Dickinson, 1976; Davis et al., 1978), and the voluminous Middle Jurassic to Early Cretaceous plutonic rocks abundant in the southwestern Coast Mountains.







PRELIMINARY MAP

GEOLOGY - TERRANES

TERRANES OF THE SOUTHERN COAST AND INTERMONTANE BELTS

BRITISH COLUMBIA

Scale 1:500 000 - Échelle 1/500 000

Kilometres 10 0 10 20 30 40 Kilomètres

Universal Transverse Mercator Projection | Projection transverse universelle de Mercator

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Geology by J.M. Journeay and J.W.H. Monger (1994)
Map compilation by J.M. Journeay

Digital base map from Geomatics Canada published at the same scale. Generalized and modified by the Geological Survey of Canada

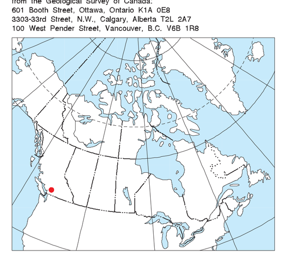
Any revisions or additional geological information known to the user would be welcomed by the Geological Survey of Canada

Digital geological cartography by S. Churchill, R. Cocking, D. Dunn, J.M. Journeay, G. Rae and M. Sandhu

Magnetic declination 1994, 20°30' East, decreasing 7.3' annually. Readings vary from 20°23' E in the SW corner to 20°37' in the NE corner of the map

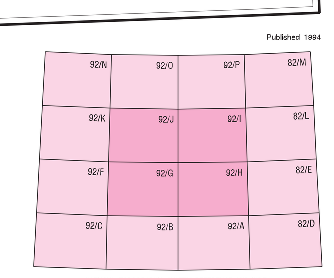
Elevations in feet above mean sea level

Copies of this map may be obtained from the Geological Survey of Canada:
601 Booth Street, Ottawa, Ontario K1A 0E8
3303-33rd Street, N.W., Calgary, Alberta T2L 2A7
100 West Pender Street, Vancouver, B.C. V6B 1R8



LOCATION MAP

Published 1994



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

Terranes of the southern Coast Belt (49°-54°N), which include island arc assemblages of Wrangellia, Cadwallader and Harrison terranes and flanking oceanic rocks of the Bridge River terrane (Figure 1), appear to have remained outboard of the ancestral continental margin (Intermontane Belt) throughout much of the Jurassic. Early to mid-Cretaceous fluvial conglomerates and shallow marine clastic rocks (Gambier, Taylor Creek and Jackass Mountain groups), the oldest demonstrable overlap assemblage in the southern Coast Belt, indicate that outboard terranes associated with the Bridge River ocean were stratigraphically linked prior to the onset of crustal shortening and large-scale crustal imbrication. It is, however, not clear whether these outboard terranes were amalgamated prior to the early Cretaceous and situated near the ancestral continental margin in a back-arc setting, or whether they may have been added incrementally as part an accretionary / fore-arc complex in response to ongoing post-middle Jurassic subduction of the Bridge River ocean.

BR

Bridge River Terrane (BR; Accretionary Wedge / Subduction Complex)
Rock units: **Bridge River and Hozameen complexes**, and correlative units, including the **Cogburn Group**, **Elbow Lake Formation**, and **Napeequa Schist**

The Bridge River Complex is an oceanic assemblage of greenstone, chert, siliceous siltstone and serpentinite, locally interleaved with greywacke, limestone, and alpine-type ultramafic rock. Two distinct zones of structural imbrication (tectonic melange) are recognized in the Bridge River Complex. The eastern and structurally highest melange belt is well-exposed in the eastern Cayoosh and Chilcotin ranges. It is flanked by the Downton Creek and Fraser Fault zones, and contains dismembered cherts, greenstones and olistostromal carbonates that range in age from Mississippian to late Middle Jurassic (Callovian) and possibly younger. Late Triassic and Early Jurassic fossils are dominant. Metamorphic grade is mainly sub-greenschist to greenschist facies, except in the footwall of the Mission Ridge Fault, where metamorphic grade is lower to middle amphibolite facies. Triassic blueschist occurs in one locality in the western Chilcotin Range. The western melange belt, well-exposed in the eastern Cadwallader Range, is flanked by the Noel Creek and Bralorne fault zones. It ranges in grade from greenschist to middle amphibolite facies, but is similar in composition and structural style to its eastern counterpart. This lower melange belt extends southwestward into the metamorphic core of the Eastern Coat Belt, and is correlated with high-grade schists and gneisses of the Cogburn Group. Situated between these two melange belts and flanked by the Bralorne and Downton Creek faults, is a deformed but coherent succession of Bridge River greenstone, thin-bedded ribbon chert, calcareous greenschist, graphitic siltstone and fine-grained volcaniclastic sandstone. This section, locally containing Late Triassic conodonts, grades upwards with apparent conformity into turbidites and fine-grained volcaniclastic rocks of the overlying Cayoosh Assemblage.

Deep water pelagic cherts in the Bridge River Complex, which range in age from Mississippian to Callovian (ca. 330-160 Ma) and overlying fine-grained clastic rocks of the Cayoosh Assemblage, the youngest of which are early Cretaceous in age, suggest that the Bridge River ocean was both large and long-lived, and remained open to marine sedimentation until early Cretaceous time.

CD

Cadwallader Terrane (CD; Island Arc)
Rock units: **Pioneer Formation, Hurley Formation (Cadwallader Group), Tyaughton Group** and **Last Creek Formation**

The Cadwallader Group, as defined by Rusmore (1985), comprises a sequence of metavolcanic greenstone (Pioneer Formation) and conformably overlying turbidite and siltstone (Hurley Formation). The Pioneer Formation is made up primarily of basaltic flows, flow breccias and metavolcanic greenstone, with major and trace element geochemical signatures that are transitional between modern island arc tholeiites and mid-ocean ridge basalts. These arc volcanics grade upwards into Upper Triassic, fine-grained volcaniclastic siltstone, sandstone and limestone, and distinctive carbonate-volcanic-plutonic clast conglomerates of the Hurley Formation. In the Birkenhead region, Upper Triassic sedimentary rocks of the Hurley Formation are disconformably overlain by Middle Jurassic (Toarcian) volcanic rocks of the Harrison Lake Formation. Along strike to the south, this Middle Jurassic arc overlaps Triassic rocks of the Camp Cove Formation. This implies the Cadwallader Group and Camp Cove Formation are either part of the same Triassic arc complex, or fragments of separate terranes that were amalgamated prior to the development of the Harrison Lake arc in Middle Jurassic time.

In fault contact with the Cadwallader Group are interlayered Upper Triassic conglomerates and siltstones of the Tyaughton Group, and Lower and Middle Jurassic fine grained, non-volcanic clastics of the Last Creek Formation. These rocks are, in turn, overlain by Jura-Cretaceous clastic rocks (Relay Mountain Group and Cayoosh assemblage), and are structurally interleaved with the Bridge River Complex along early Late Cretaceous thrust faults.

CA

Cayoosh Assemblage (CA; Turbidite)
Rock Units: **Cayoosh Assemblage, Gun Lake Assemblage**, and metamorphosed equivalents of the **Chism Creek** and **Settler Schist**.

The Cayoosh Assemblage is an upward-coarsening succession of metamorphosed phyllitic argillite, siltstone and sandstone that conformably overlies oceanic rocks of the Bridge River Complex. Basal turbidites of the Cayoosh Assemblage overly Upper Triassic (Norian) limestone-bearing volcanic rocks of the Bridge River Complex with apparent conformity. The uppermost clastic facies of the Cayoosh Assemblage contains shallow marine volcanic sandstones that yield bivalves of early Neocomian age.

Stratigraphic associations and the age range of the Cayoosh Assemblage support correlation with Lower and Middle Jurassic rocks of the Ladner Group (Methow Terrane), and with Lower Jurassic clastic successions (Last Creek Formation) that overly Triassic and Middle Jurassic island arc assemblages of the Cadwallader and Harrison Lake Terranes. Stratigraphic ties with Jurassic clastic successions of the Tyaughton and Relay Mountain Groups are probable, but have not yet been established. These correlations suggest a complex and protracted history of basin evolution in which parts of the Bridge River ocean began to receive clastic detritus from volcanic source terranes in the Late Triassic / Early Jurassic, while other parts of the basin, presumably more distal, remained open to marine sedimentation until late Middle Jurassic time.

Metamorphosed equivalents of the Cayoosh Assemblage occur in the upper plate of the Coast Belt Thrust System and in the lower plate of the Bralorne-Kwoiek Creek Fault zone, where they are mapped as part of the Chism Creek Schist and Settler Schist. They are characterized by thin- and thick-bedded turbidite successions that locally contain evidence of soft sediment deformation. The chaotic fabric of these disrupted clastic rocks is reminiscent of that developed in modern accretionary complexes. Remnants of this distinctive clastic succession are recognized to the south in greenschist grade rocks of the Darrington Phyllite and Shuksan Greenschist of the northwest Cascades, and have been used by Monger (1991) as the basis for a possible correlation between these units. This represents a significant correlation in that rocks of the Shuksan record evidence of Early Cretaceous (120-130 Ma; based on K-Ar and Rb-Sr dates). The implication of this correlation is that the Jura-Cretaceous clastic basin may have closed in part by subduction, as suggested for different reasons by Monger (1987) and Thorkelson and Smith (1989).

GA

Gambier Assemblage (GA; Overlap Assemblage)
Rock Units: **Cheakamus** and **Helm formations** of the **Gambier Group**, **Peninsula** and **Brokenback Hill formations** of the **Fire Lake Group**.

Uplift and unroofing of the Jurassic arc and its volcanic edifice (Harrison Terrane) are recorded by a regional erosional unconformity of early Cretaceous age. The erosion surface cuts down-section to the west from Lat Jurassic rocks of the Billhook Creek Formation near Harrison Lake, through Late Jurassic plutonic rocks of the Thornborough intrusion (156 ± 2 Ma) into Early and Middle Jurassic rocks of the Bowen Island Group. Above this erosional unconformity are granite boulder conglomerates and sandstones of the Peninsula,Cheakamus and Helm formations, the oldest of which contain Neocomian fossils of Lower Valanginian age. Granitic boulders from these conglomerates yield Late Jurassic U-Pb zircon crystallization ages. These conglomerates and associated clastic rocks of the Fire Lake and Gambier groups define an overlap assemblage that stratigraphically links pre-Early Cretaceous tectonic elements of the Western Coast Belt.

Conformably overlying this Early Cretaceous clastic succession is a late Early Cretaceous volcanic arc sequence comprising upper Valanginian to middle Albian volcanic flows, breccias and associated volcaniclastic rocks of the Brokenback Hill Formation. These and related volcanic rocks of the Gambier Group define a widespread zone of early Cretaceous arc magmatism. Middle Albian volcanics near the top of this succession indicate that the arc remained active until late Early Cretaceous time, when it was overridden from the east by high-grade thrust nappes of the Coast Belt Thrust System.

HA

Harrison Terrane (HA; Island Arc)
Rock units: **Camp Cove** and **Harrison Lake formations**.

The Harrison Lake Formation, and its western counterpart the Bowen Island Group, are dominated by a thick succession of intermediate to acidic flows and pyroclastic rocks. Both of these volcanic successions represent relics of a volcanic arc succession constructed either within or along the inboard margin of Wrangellia in Early Jurassic time. The Harrison Lake Formation unconformably overlies Middle Triassic cherty argillites and mafic volcanic rocks of the Camp Cove Formation in the Harrison Lake region, and Upper Triassic volcanics and related volcaniclastic rocks of the Cadwallader Group further to the north in the Pemberton region. Near Harrison Lake, this volcanic succession is unconformably overlain by Middle Jurassic (Lower Callovian) shale and siltstone of the Mysterious Creek Formation and by Late Jurassic (lower Oxfordian) sandstone and volcanic rocks of the Billhook Creek Formation, both of which are part of the Gambier overlap assemblage.

The plutonic component of this arc complex is represented by a suite of Late Jurassic intrusions that include the Cloudburst quartz-diorite (148-145 Ma), several unnamed plutons west of Harrison Lake (162-160 Ma), and a narrow tract of granitic plutons (158-153 Ma) that extend northwestward from the end of Howe Sound to Jervis Inlet. These plutonic suites are coeval and interpreted to be comagmatic with Late Jurassic volcanic complexes that shed detritus eastward into the Mysterious Creek and Billhook Creek Formations.

WR

Wrangellia (WR; Island Arc)
Rock units: **Sicker and Buttle Lake groups, Karmutsen, Quatsino, Parsons Bay** and **Harbledown** and **Bonanza formations** and comagmatic granitic rocks in the Insular Belt and southwestern Coast Belt.

Oldest rocks of Wrangellia on Vancouver Island comprise Upper Devonian (367 Ma) island arc-related volcanic and sedimentary rocks and intrusions comagmatic with the volcanics (Sicker Group), and overlying mainly sedimentary strata of Late Carboniferous-Early Permian ages (Buttle Lake Group). Locally overlying these rocks on Vancouver Island are Ladinian black argillites. The most distinctive elements of Wrangellia, are Middle(?) to Late Triassic tholeiitic basalt (Karmutsen Formation) and associated mafic intrusions and overlying shallow water carbonates (Quatsino limestone) grading up wards into deeper water clastics; these rocks may represent the remnants of a large oceanic volcanic plateau and associated overlying deposits. In turn this sequence is succeeded on Vancouver Island by Lower and Middle Jurassic arc volcanics (Bonanza Formation) and comagmatic granitic intrusions (ca. 200-180 Ma).

Permian fossils are high-latitude Boreal or Uralian cool Water mainly brachiopod and bryozoa faunas, with local Early Permian fusulinid faunas (Mamkomen Formation) correlative with those in the Canadian Arctic and Greenland. Pliensbachian faunas indicate that northern Wrangellia was at similar latitudes to Stikinia (northern California-Nevada) in the Early Jurassic. Paleomagnetic data from the Triassic Nikolai Greenstone in southern Alaska appears to have shifted northward by about 2500 km relative to the craton, whereas the correlative Karmutsen Formation on Vancouver Island shows little displacement. Assuming a northern latitude location, early Mesozoic Wrangellia was located at northern Oregon-southern British Columbia latitudes.

Intermontane Belt

Quesnel, Methow and Bridge River terranes of the Southern Coast and adjacent Intermontane belts were associated by Albian time. Current directions, lithologies and a U-Pb dated 156 Ma clast in Albian Jackass Mountain conglomerate in Methow terrane indicate that its provenance was in part the Eagle Plutonic Complex of southwesternmost Quesnel terrane, which was uplifted at this time. Chert-rich clastics in the Albian Virginian Ridge Formation interfinger with Jackass Mountain equivalents and were derived from Bridge River terrane to the west. An Early Jurassic clast from the basal Ladner Group of Methow terrane yields a discordant U-Pb date of 235±10 Ma. The Mount Lytton Complex, which forms the westernmost margin of Quesnellia yields comparable U-Pb ages of 225 and 257 Ma.

CC

Cache Creek Terrane (CC; Accretionary Wedge / Subduction Complex)
Rock unit: **Cache Creek Complex.**

In its type-area of southern British Columbia, the Cache Creek Complex is in part disrupted, in part coherent, and comprises Permian to Lower and(?) Middle Jurassic chert and pelite, with melange blocks of basalt, alpine type ultramafic rocks, and carbonates; the latter of which are Middle Pennsylvanian and Permian in age. A distinctive large body of shallow water Late Permian and Triassic reefoidal carbonate is called Marble Canyon Formation. On the west side, Late Triassic volcaniclastic rocks are of possible arc origin. The terrane is mainly of sub-greenschist grade, but blueschists of Late Triassic age (210-217 Ma) occur in central British Columbia (ca. lat. 55°N).

Carbonates of the Cache Creek Complex contain Late Permian fusulinid, coral and conodont faunas similar to those in regions bordering the western Pacific and the Permian Tethys, and are the only clearly "exotic" faunas recognized in the Canadian Cordillera. The Marble Canyon carbonate contains both latest Permian (late Dzhulfian to Changxingian) and earliest Triassic (Griesbachian) conodonts (Beyers and Orchard, 1991). Although a continuous section is not proven, recognition of these two faunas in one rock body is unique to western North America. Coeval faunas only occur together in south China, Tibet and Armenia, regions with "Permian Tethyan" faunas. The character and position of the Cache Creek Complex, relative to the west-facing early Mesozoic Quesnel arc, together with local intermixing of possible Quesnel lithologies in the melange belt, suggest that it may represent the accretionary complex that is complementary to the Quesnellian arc.

The western Cache Creek terrane (i.e. west of the Fraser River) is separated from the Bridge River terrane to the south by a 70 km-wide cover of Cretaceous and Tertiary strata, and an unknown amount of dextral strike-slip displacement across the Yalakom Fault. Important differences between these two terranes include: (1) abundant Early Jurassic chert in the Bridge River; known Jurassic rocks in the Cache Creek are pelitic, and (2) regionally extensive Late Permian and Triassic limestone units in the Cache Creek; the only limestones in the Bridge River are small (up to 0.1 km long) Late Triassic olistoliths. These differences could be be due in part to facies changes. Both terranes are characterized by Triassic blueschist facies metamorphism. Blueschists of the Bridge River terrane occur in fault slivers of the southern Chilcotin Range and are dated at 221 Ma. Comparable blueschist facies rocks in the Cache Creek terrane occur in central British Columbia and are dated at 210-217 Ma.

CK

Chilliwack Terrane (CK; Island Arc)
Rock units: **Chilliwack Group**, and **Cultus Formation.**

Devonian to Permian arc volcanics, clastics and carbonates of the Chilliwack Group are stratigraphically overlain by Upper Triassic and Lower Jurassic arc-related clastics of the Cultus Formation and are structurally overlain by Upper Jurassic pelites, of mainly sub-greenschist (lawsonite-albite) grade. These rocks are folded and internally imbricated on early Late Cretaceous thrust faults of the Northwest Cascades System. Early Permian fossils resemble those of Quesnel and Stikine terranes.

A possible, but not proven, linkage between Chilliwack and Harrison terranes is based on the presence of schwagerinid fusulinids and bryozoans in carbonate cobbles in Toarcian conglomerate at the base of the Harrison Lake Formation (Harrison terrane). These fauna resemble those found in Permian limestone of the Chilliwack terrane. However, the Triassic-Jurassic stratigraphy of these two terranes is different

MT

Methow Terrane (MT; Turbidite)
Rock units: **Spider Peak Formation, Ladner Group (Dewdney Creek and Boston Bar formations), Thunder Lake sequence**, and **Jackass Mountain** and **Pasayten groups.**

Methow terrane comprises rocks representing three different tectonic settings: (1) Basal Triassic MORB basalt (Spider Peak Formation) associated with gabbro and serpentinized ultramafic rocks of the Coquihalla serpentinite belt ; (2) overlying Jurassic (Sinemurian(?), Pliensbachian to Bajocian; and (?) Oxfordian) pelites, siltstones and tuffs (Boston Bar Formation, Ladner Group) and laterally interfingering arc-related flows and volcaniclastics of Aalenian-Bajocian age (ca. 170-178 Ma; Dewdney Creek Formation, Ladner Group), and Upper Jurassic (Oxfordian to Tithonian; ca. 155-145 Ma) volcanic sandstone and argillite. The last is (mostly) lithologically inseparable from the Boston Bar Formation; (3) uppermost are thick (4500 m) Lower to Upper Cretaceous (Hauterivian to Turonian; ca. 135-90 Ma) argillite, sandstone and conglomerate of the Jackass Mountain and Pasayten groups.

Dated granitic clasts (of 235 Ma) from the basal Ladner can be most closely correlated in the region with rocks of the Mount Lytton Complex, which is part of Quesnel terrane; a Late Jurassic clast in east-derived Albian Jackass Mountain conglomerate is from granitic rocks in the western edge of Quesnel terrane; westerly-derived chert-rich Albian-Cenomanian clastics are probably derived from the Bridge River terrane.

QN

QNH

QNA

Quesnel Terrane (QN; Island Arc)
Rock units: **Harper Ranch Group** and **Apex Mountain Complex, Nicola** and **Rossland groups**, and **Ashcroft Formation**.

Quesnel terrane is characterized by a west-facing, Late Triassic-Early Jurassic arc (Nicola-Rossland volcanics). Comagmatic intrusions range in age from 212-193 Ma. The arc overlies an older assemblage of late Paleozoic island arc and oceanic rocks (Apex Mtn. Complex and Harper Ranch Group) that was deformed and juxtaposed with parts of Kootenay terrane to the east, some time prior to the Late Triassic. It is unconformably overlain by non-volcanic clastic rocks of the Lower to Middle Jurassic (late Pliensbachian to earliest Callovian; ca. 190-160 Ma) Ashcroft Formation. The early Mesozoic Quesnellian arc probably formed on the western edge of the North American plate, but was not emplaced on continental margin rocks to the east until late Early Jurassic time (ca. 185 Ma).

Permian faunas of Quesnellia are a mixture of western Cordilleran forms similar to those in Stikinia, Chilliwack terrane and the eastern Klamaths, with some Tethyan elements. Pliensbachian faunas of Quesnellia appear to be latitudinally comparable to those of Stikine, that is south of their present position with respect to cratonic North America. However, May and Butler (1986) conclude from their analysis of paleomagnetic data that there is no evidence for northward displacement in the Triassic-Jurassic rocks. Plutonic rocks in southwestern Quesnellia include early Mesozoic arc-related magmatism (212-195 Ma), post-accretionary Late Jurassic (168-155 Ma) granitic rocks, and mid-Cretaceous (ca. 105-100 Ma) plutonics, probably related to the Spences Bridge arc.

Post accretionary plutons

Geologic contact (defined, approximate, assumed)

Limit of Quaternary cover

Fault contact, displacement uncertain (defined, approximate, assumed)

Crustal suture, teeth indicate upthrust block (defined, approximate, assumed)

Reverse or thrust fault, teeth indicate upthrust block (defined, approximate, assumed)

Normal fault, solid dot indicates downthrown block (defined, approximate, assumed)

Strike-slip fault, arrows indicate relative sense of displacement (defined, approximate, assumed)

Anticline, upright/overturned (defined, approximate, assumed)

Syncline, upright/overturned (defined, approximate, assumed)

Recommended citation:
J.M. Journeay and J.W.H. Monger
1994: Geology and crustal structure of the southern Coast and Intermontane Belts, southern Canadian Cordillera, British Columbia; Geological Survey of Canada, Open File ????, scale 1:500 000

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