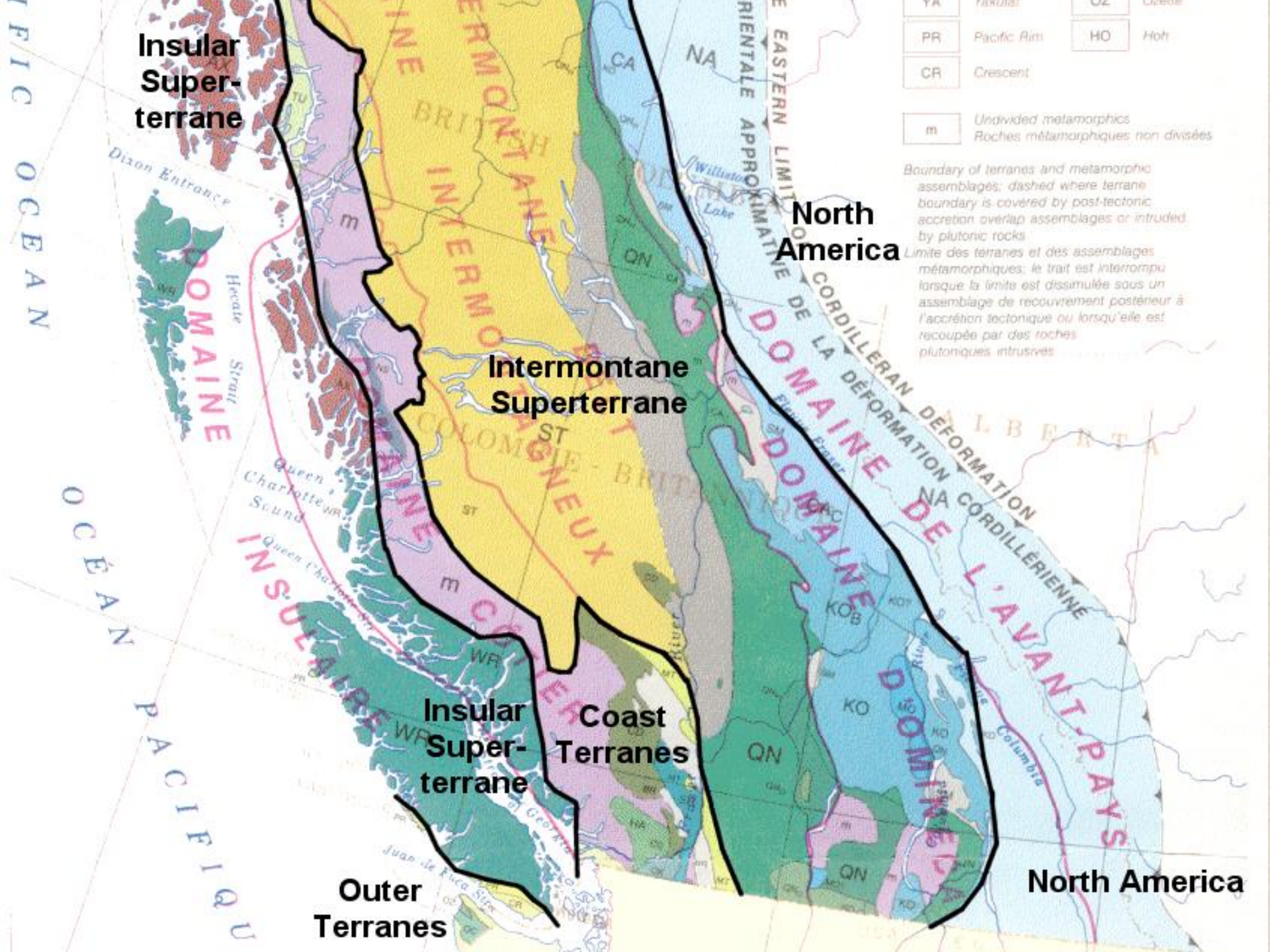

The Geology & Geological History of Vancouver Island

Steven Earle



Insular Superterrane

North America

Intermontane Superterrane

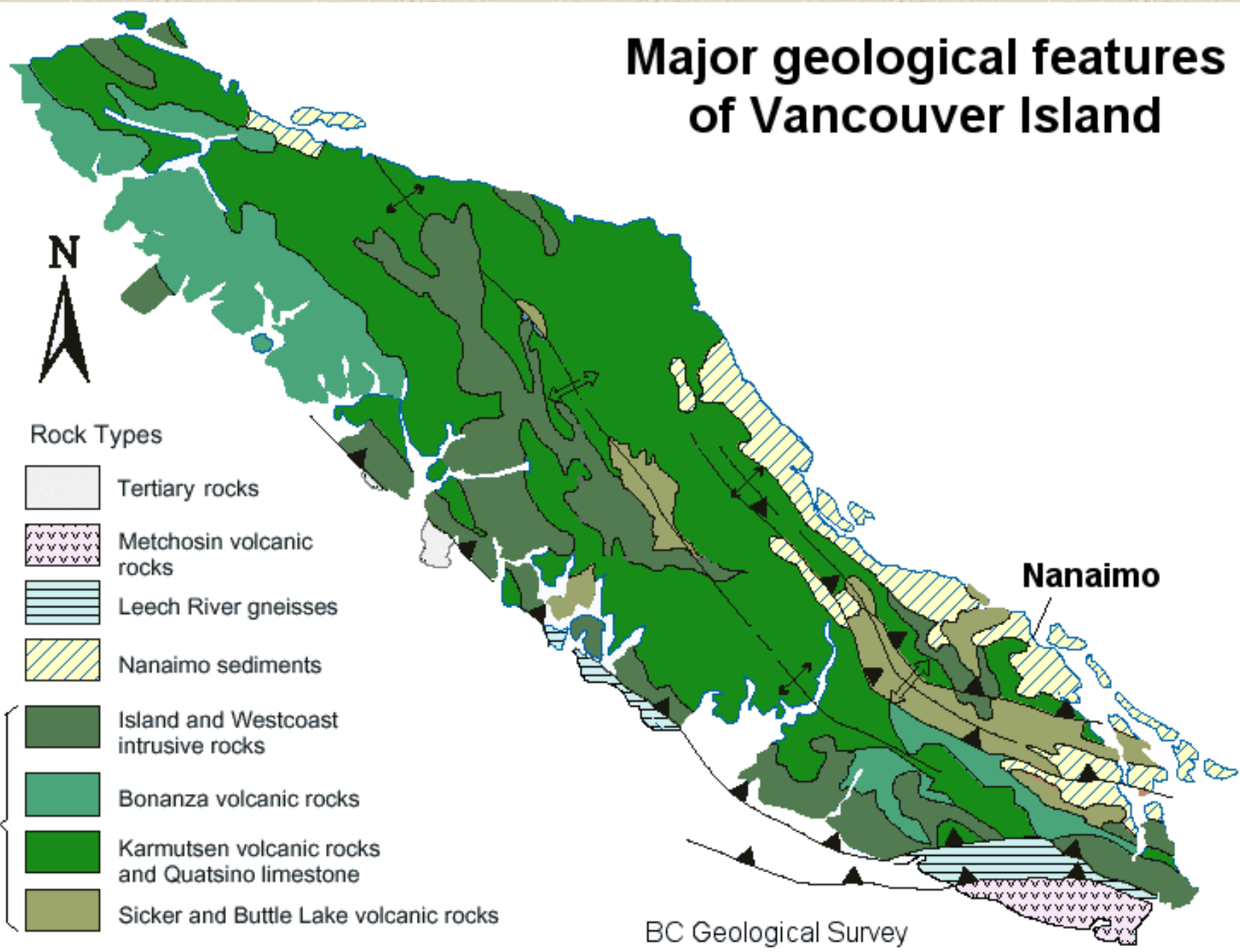
Insular Superterrane

Coast Terranes

Outer Terranes

North America

Major geological features of Vancouver Island

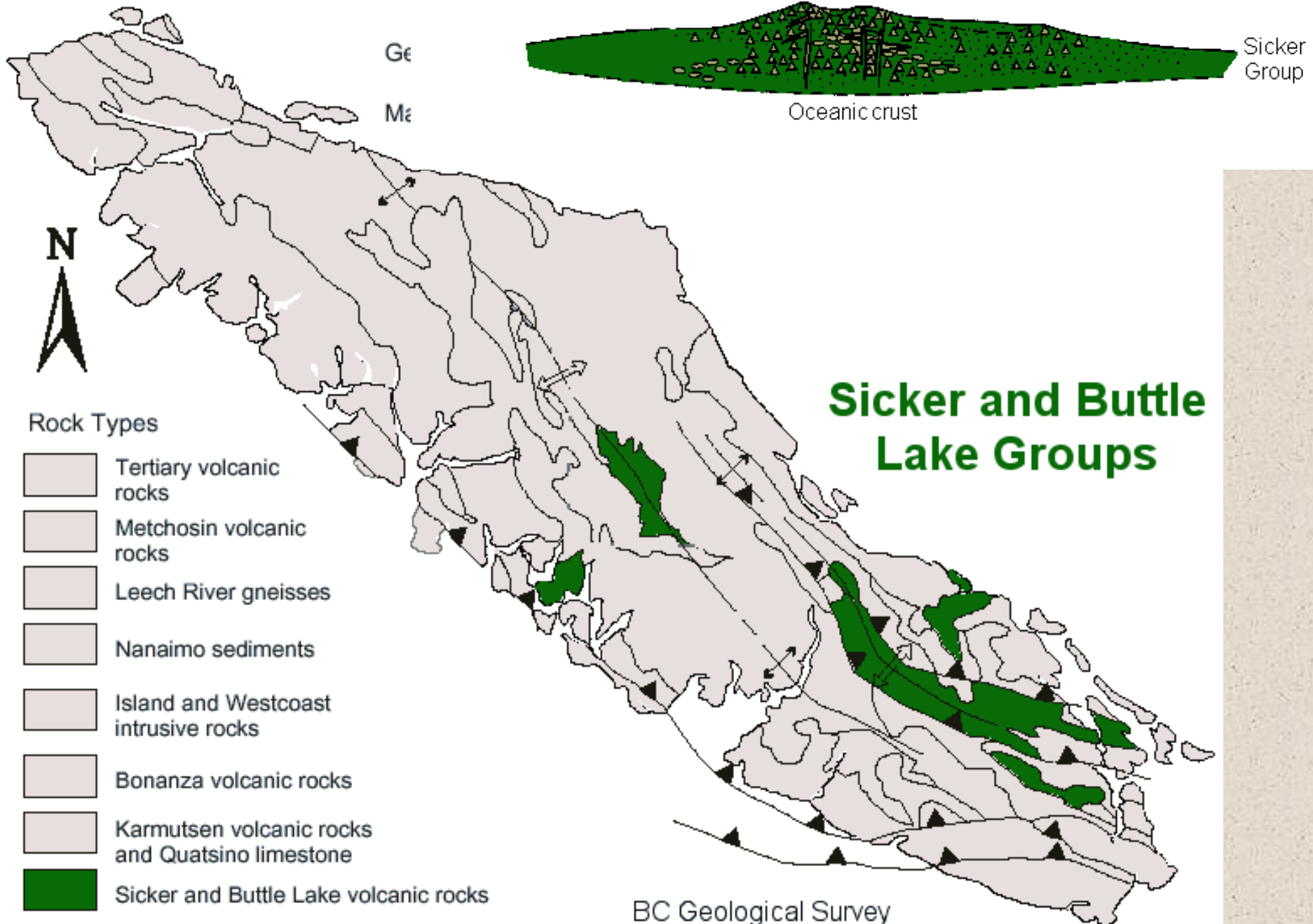


BC Geological Survey

West Coast

Devonian
(~370 m.y.)

East Coast



Ge

Ma

Sicker
Group

Oceanic crust

**Sicker and Buttle
Lake Groups**

Rock Types

- Tertiary volcanic rocks
- Metchosin volcanic rocks
- Leech River gneisses
- Nanaimo sediments
- Island and Westcoast intrusive rocks
- Bonanza volcanic rocks
- Karmutsen volcanic rocks and Quatsino limestone
- Sicker and Buttle Lake volcanic rocks

BC Geological Survey



Myra Falls Mine



Dyke in
pillow basalt



Chert overlain by Cretaceous
conglomerate

Devonian
(Sicker Group)
Rocks

Metamorphic and igneous rocks of Wrangellia in Victoria



Late Triassic
(~220 m.y.)

Karmutsen Fm.

Gean

Sicker

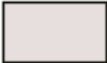



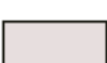



and Buttle Lk.

Major

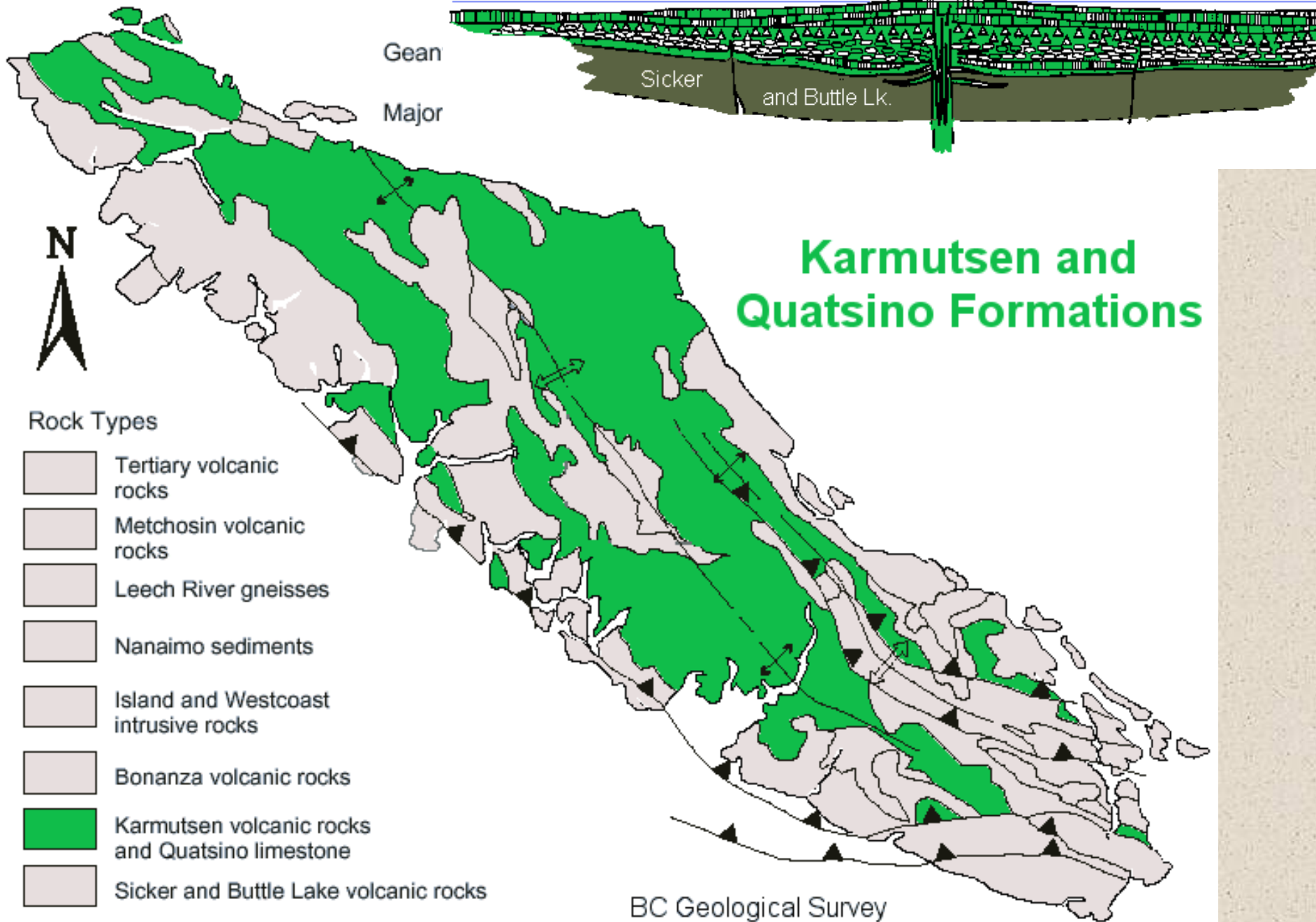
Karmutsen and Quatsino Formations



Rock Types

-  Tertiary volcanic rocks
-  Metchosin volcanic rocks
-  Leech River gneisses
-  Nanaimo sediments
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BC Geological Survey



**Karmutsen Formation
(Triassic) sea-floor
pillowed basalt**

**Quatsino Formation
limestone (with a
mafic dyke).**



Bonanza Gp.

Early Jurassic (~200 m.y.)

Geantici

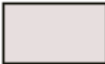

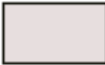




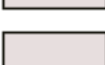
Karmutsen and Quatsino

Major thr

Sicker and Buttle Lk.

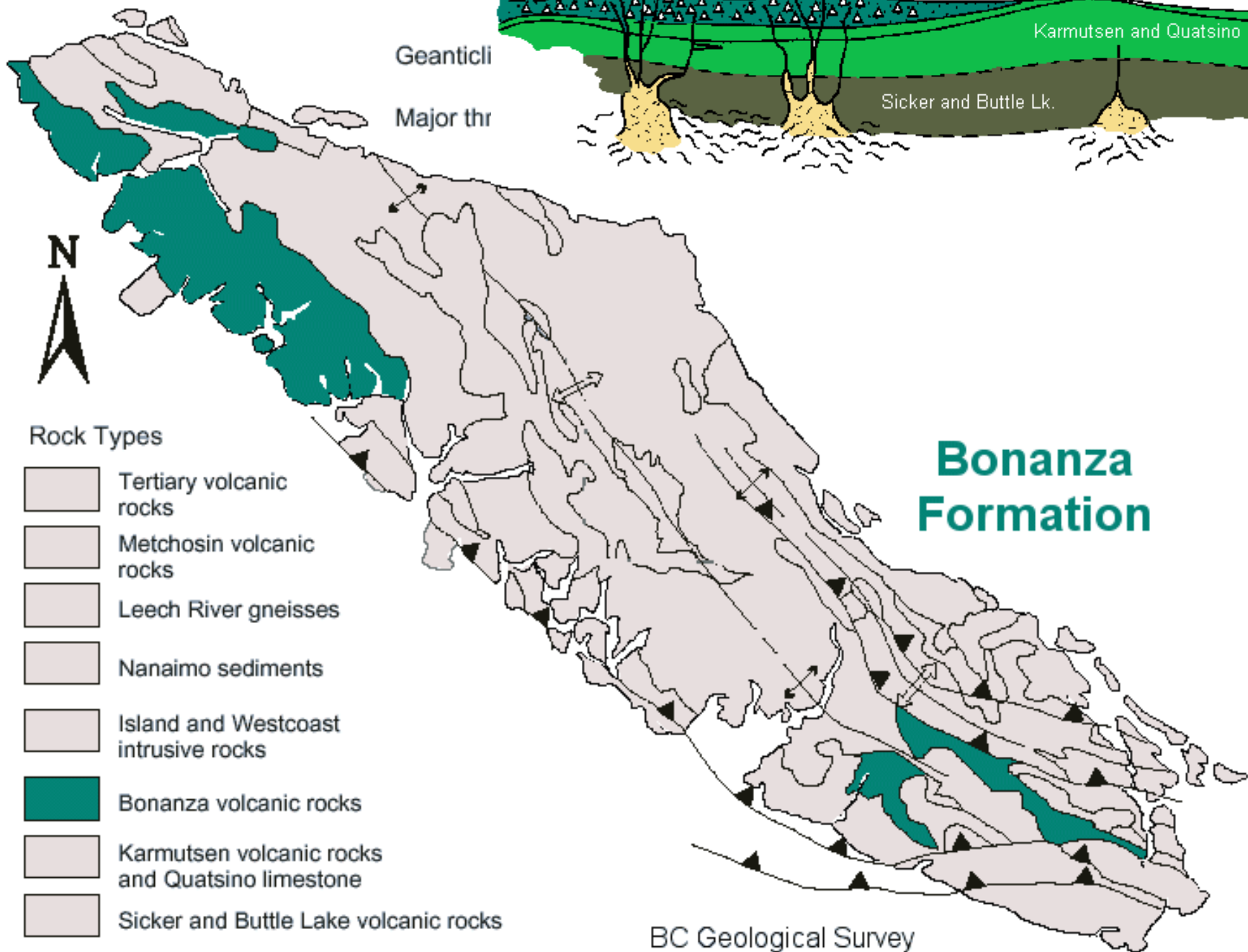


Rock Types

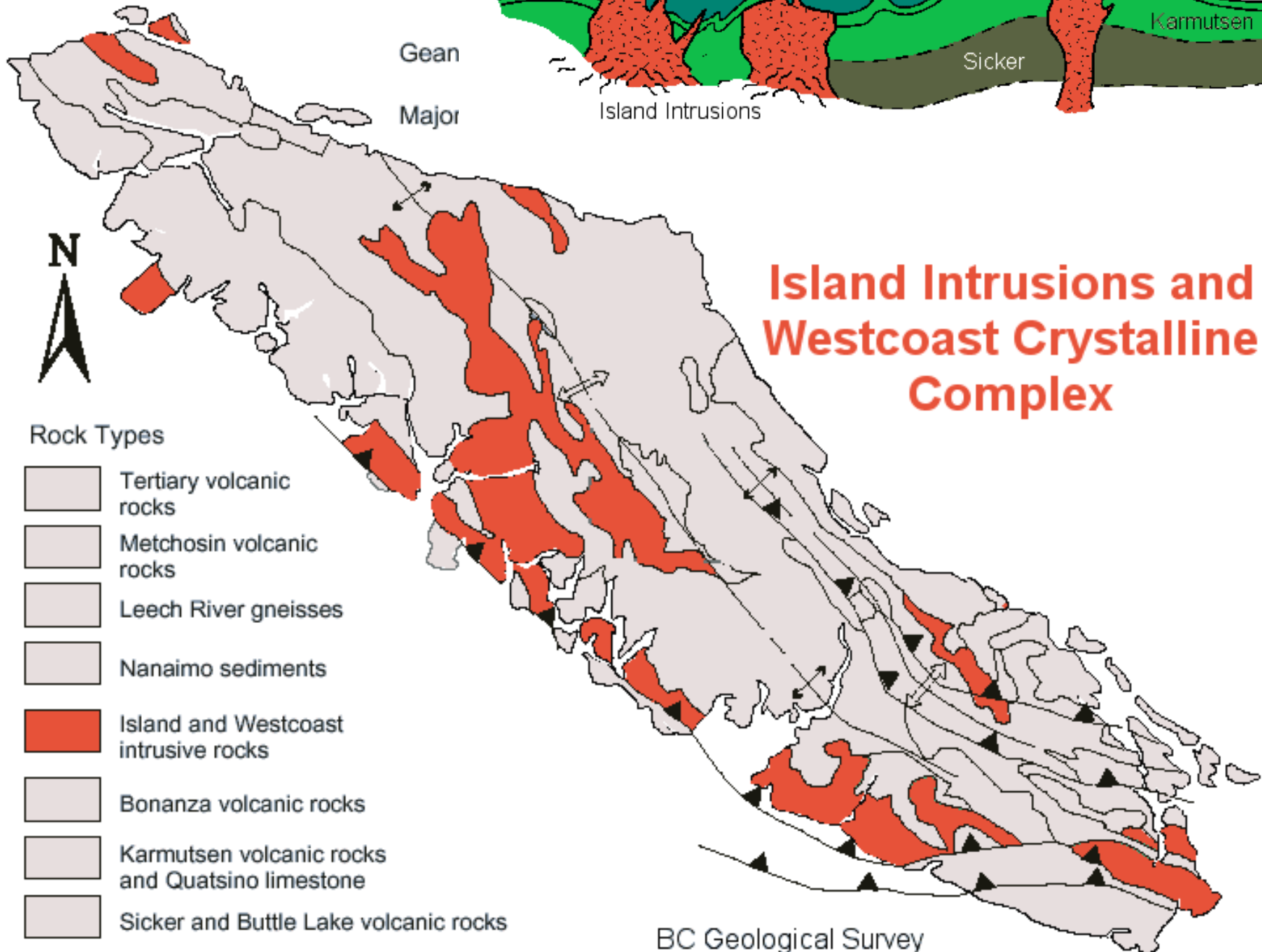
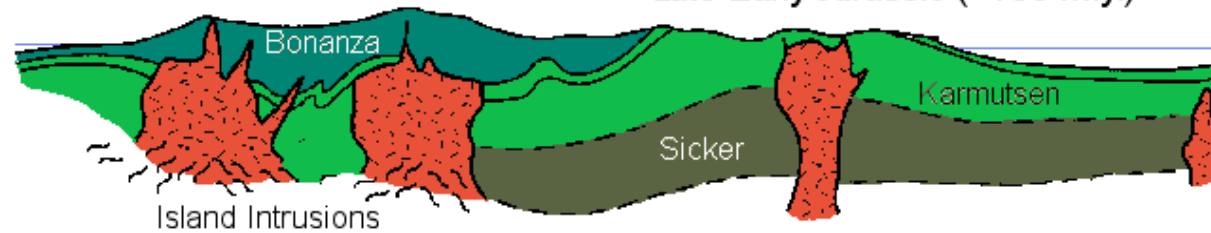
-  Tertiary volcanic rocks
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-  Sicker and Buttle Lake volcanic rocks

Bonanza Formation

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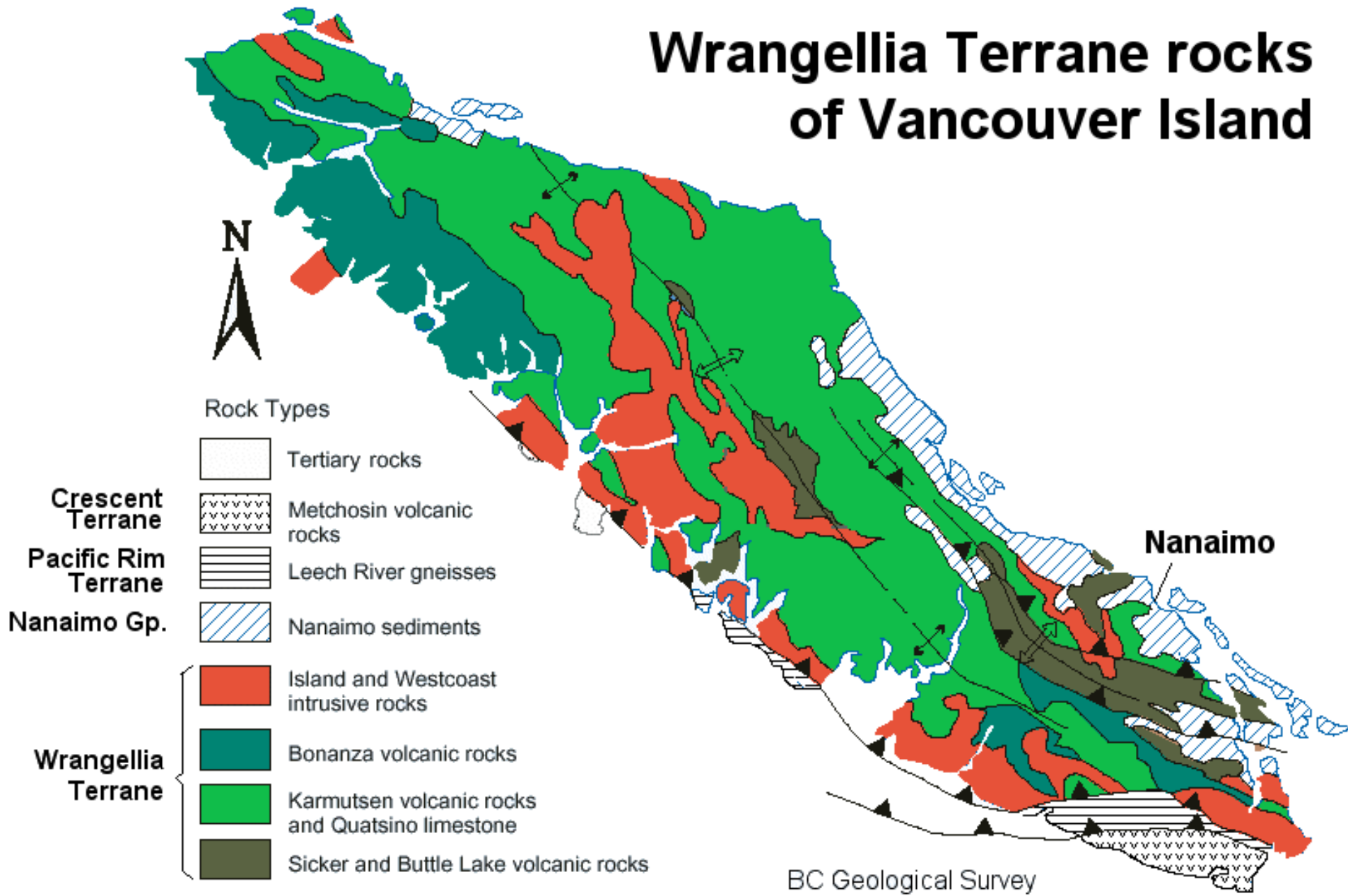
Late Early Jurassic (~185 m.y.)



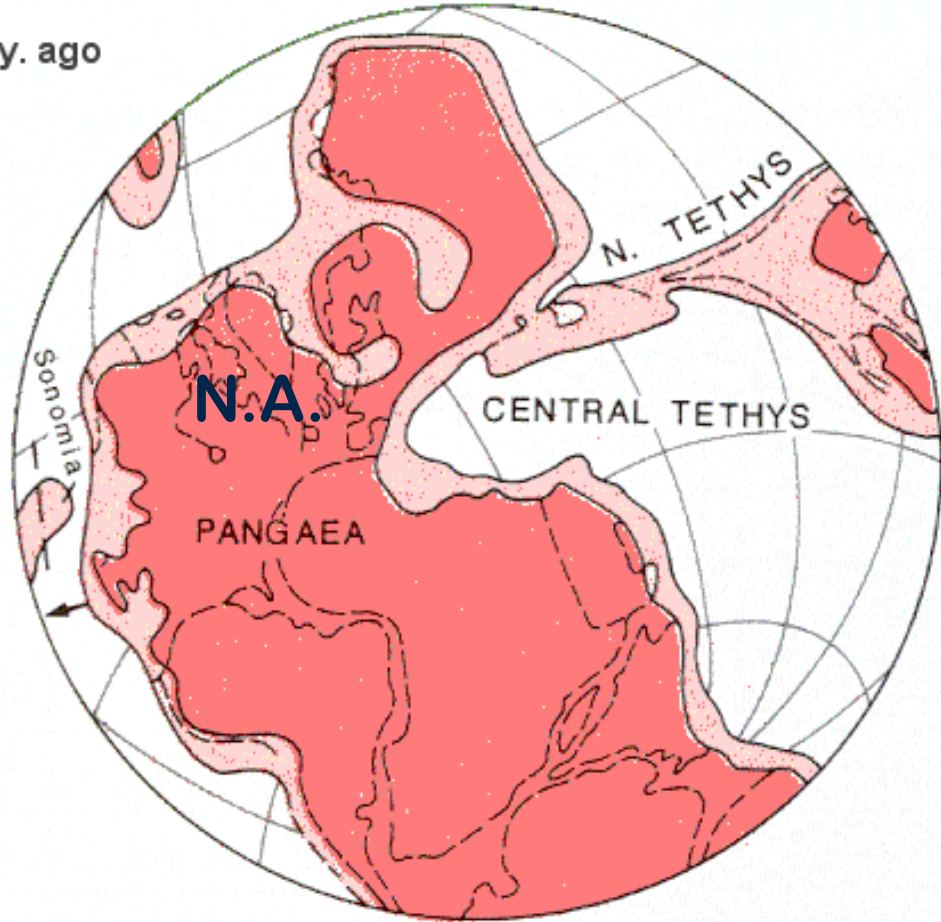
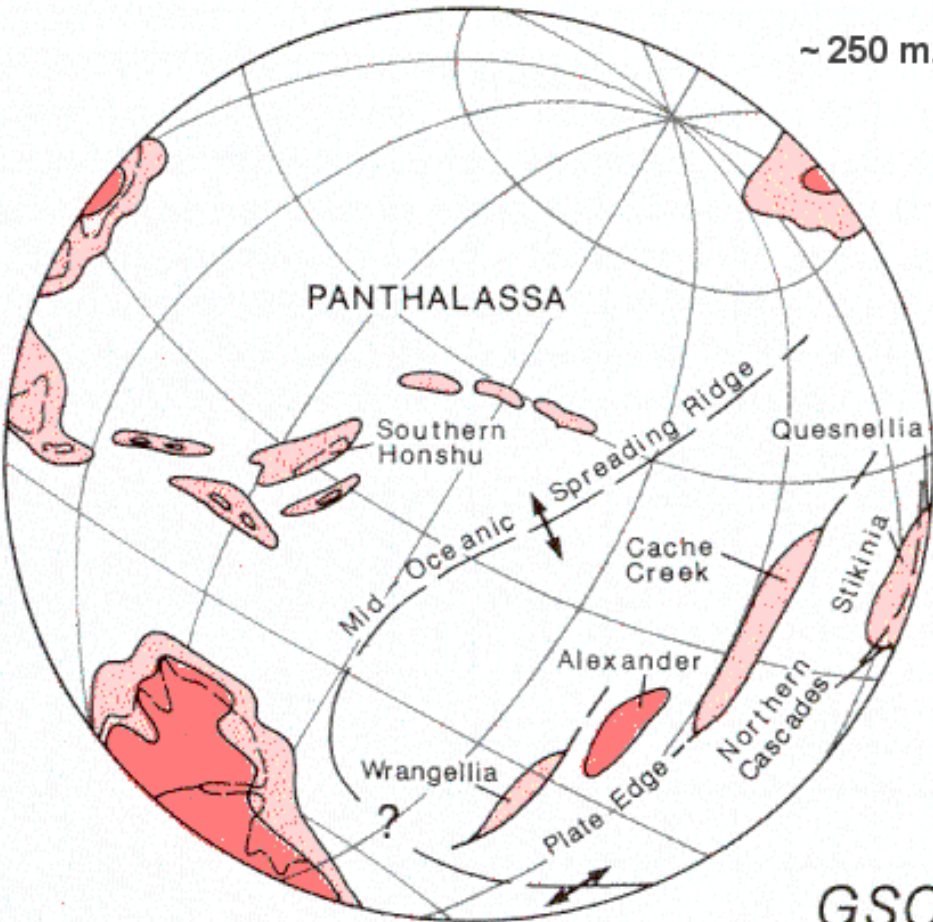
Jurassic aged
Island Intrusion
granite with a
quartz-feldspar
vein



Wrangellia Terrane rocks of Vancouver Island

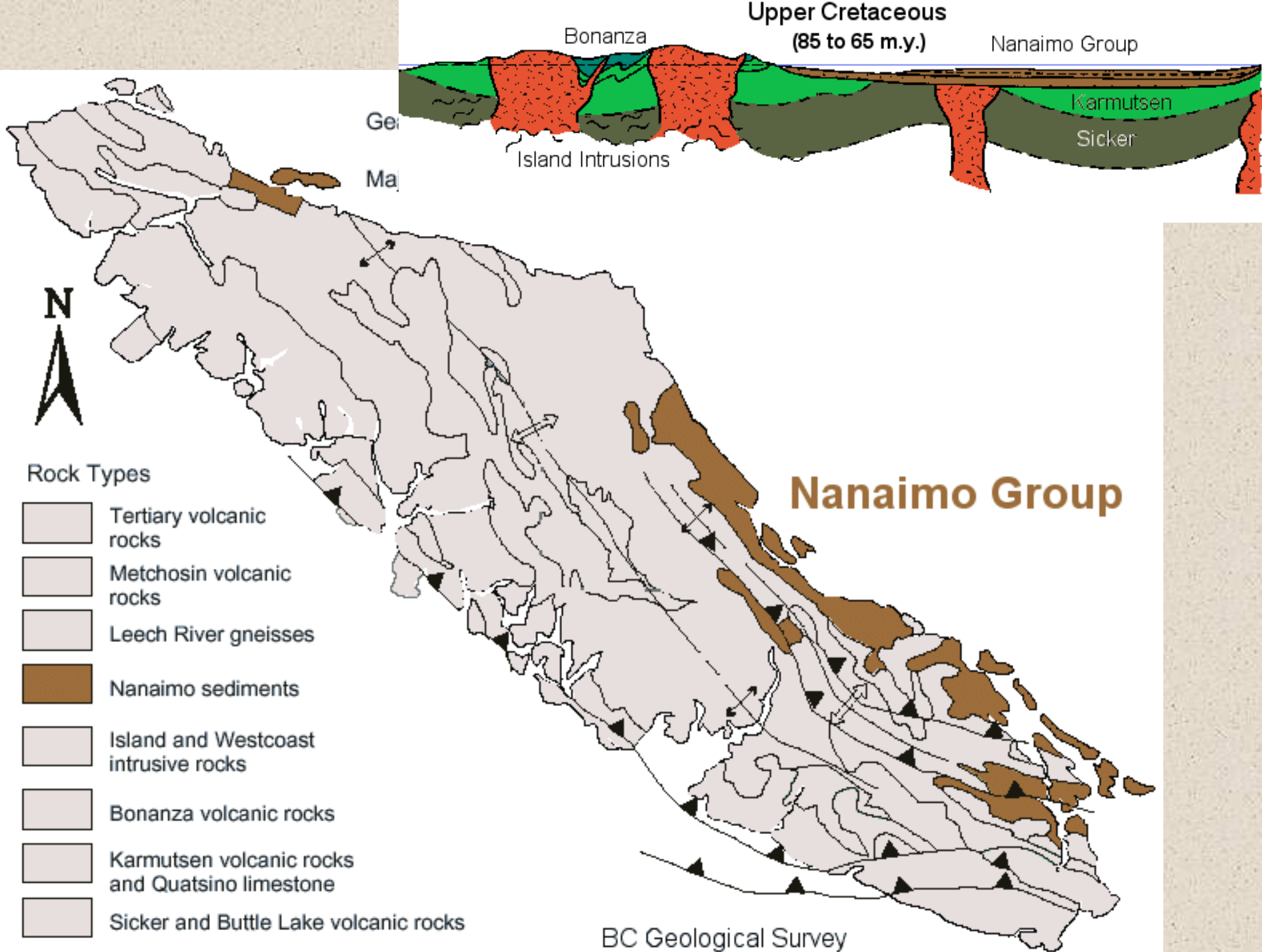


~ 250 m.y. ago

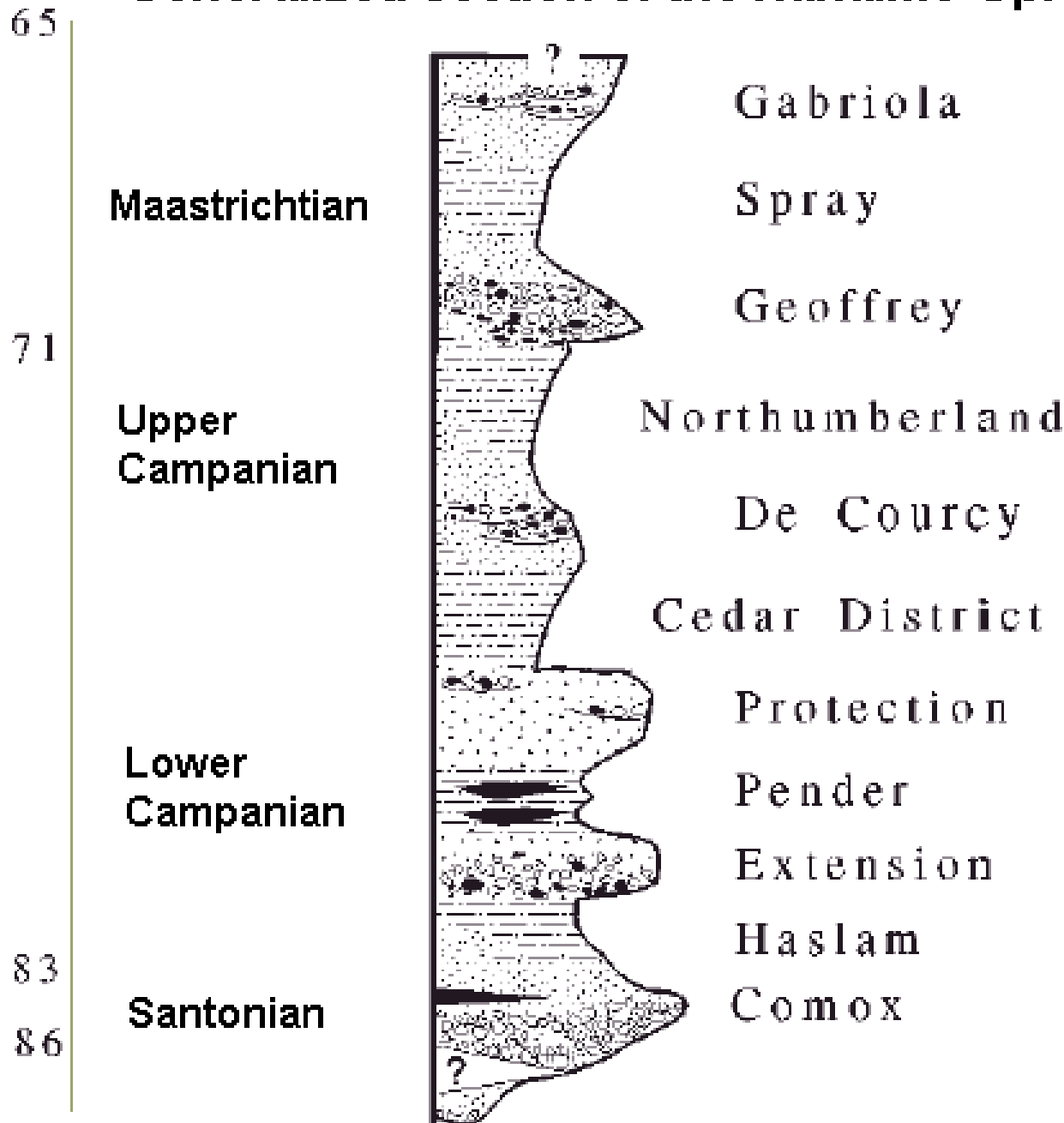


GSC

Wrangellia was accreted onto N.A. around 100 m.y. ago



Generalized section of the Nanaimo Gp.



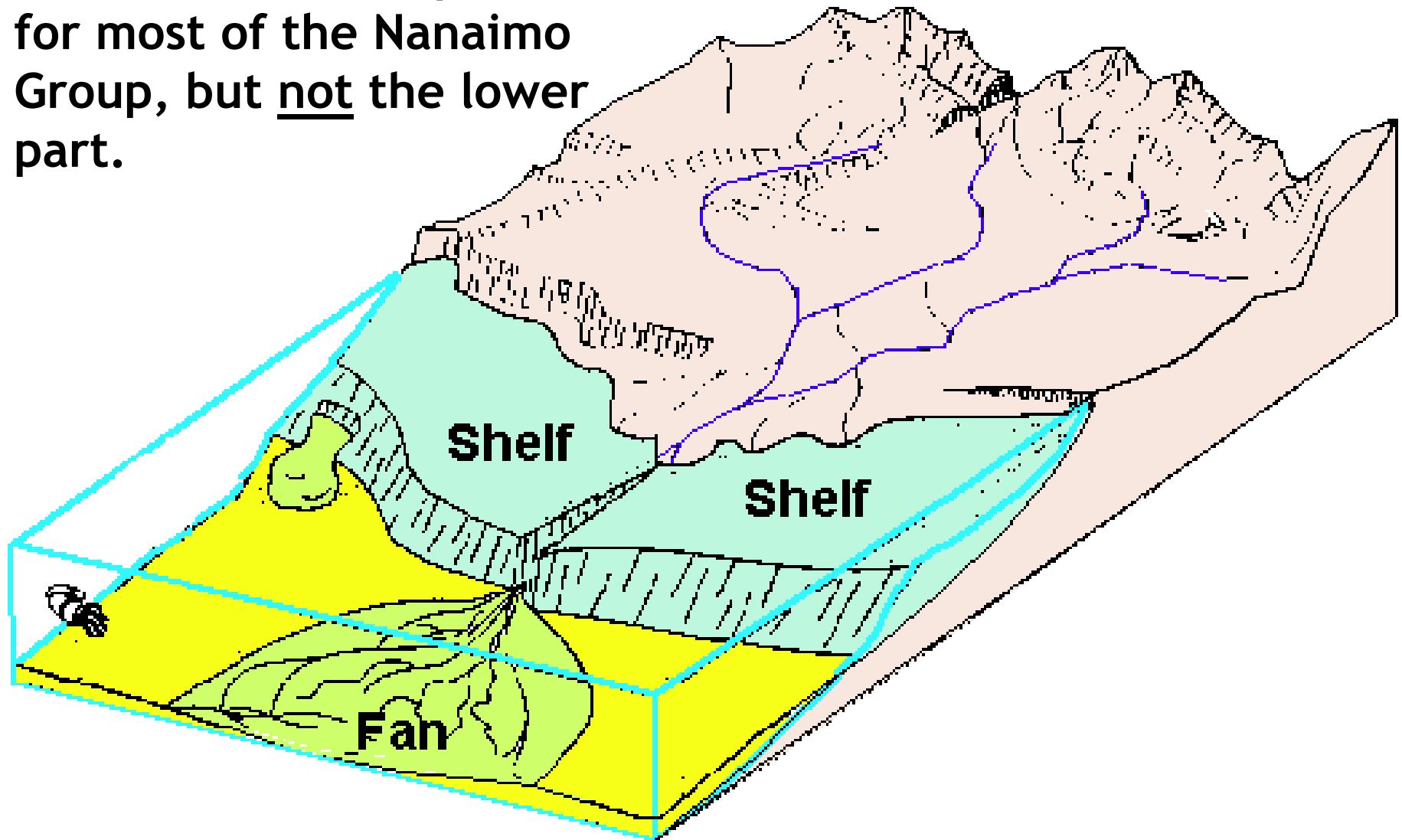
In total the Nanaimo Group is roughly 5000 m thick.

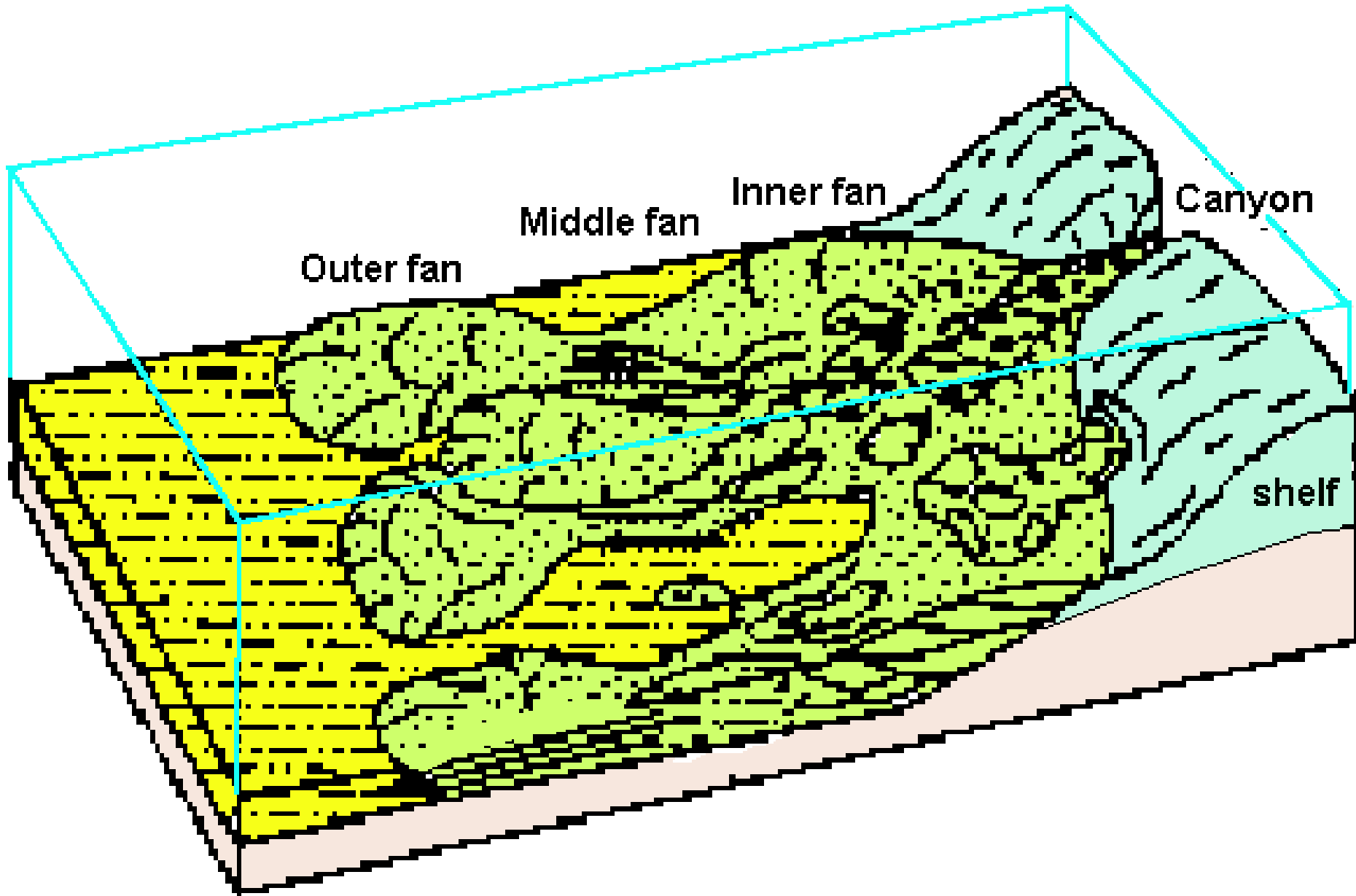
The oldest rocks may be as old as 92 m.y. but most basal units, such as the Malaspina Cut, are no more than 86 m.y.

The youngest rocks are probably more than 65 m.y. old, but could be younger.

(after Mustard, 1994)

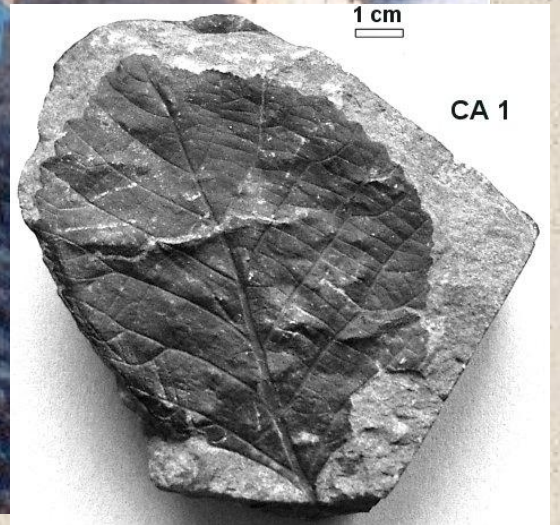
Sub-marine fan deposition
for most of the Nanaimo
Group, but not the lower
part.





Nanaimo Group (Cretaceous)

Sandstone, mudstone, conglomerate

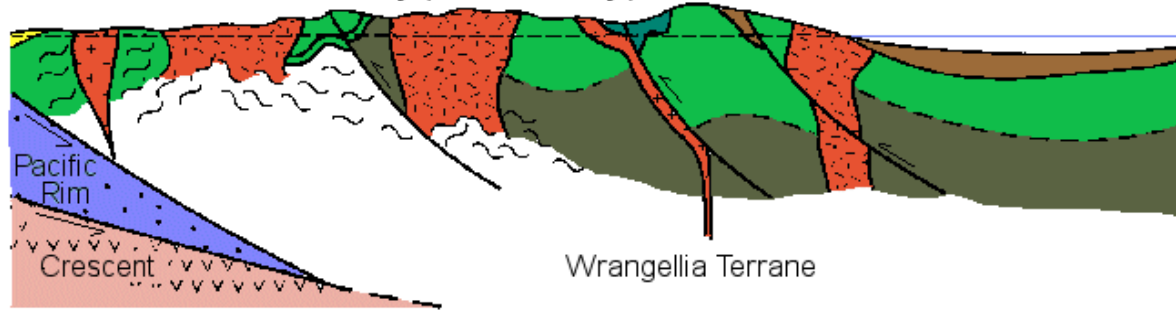


The City of Nanaimo exists because of coal mining, which took place from around 1850 to 1950. It could be argued that this is also why British Columbia is part of Canada.

The only coal mining at present is from the Quinsam mine (below) near to Campbell River.



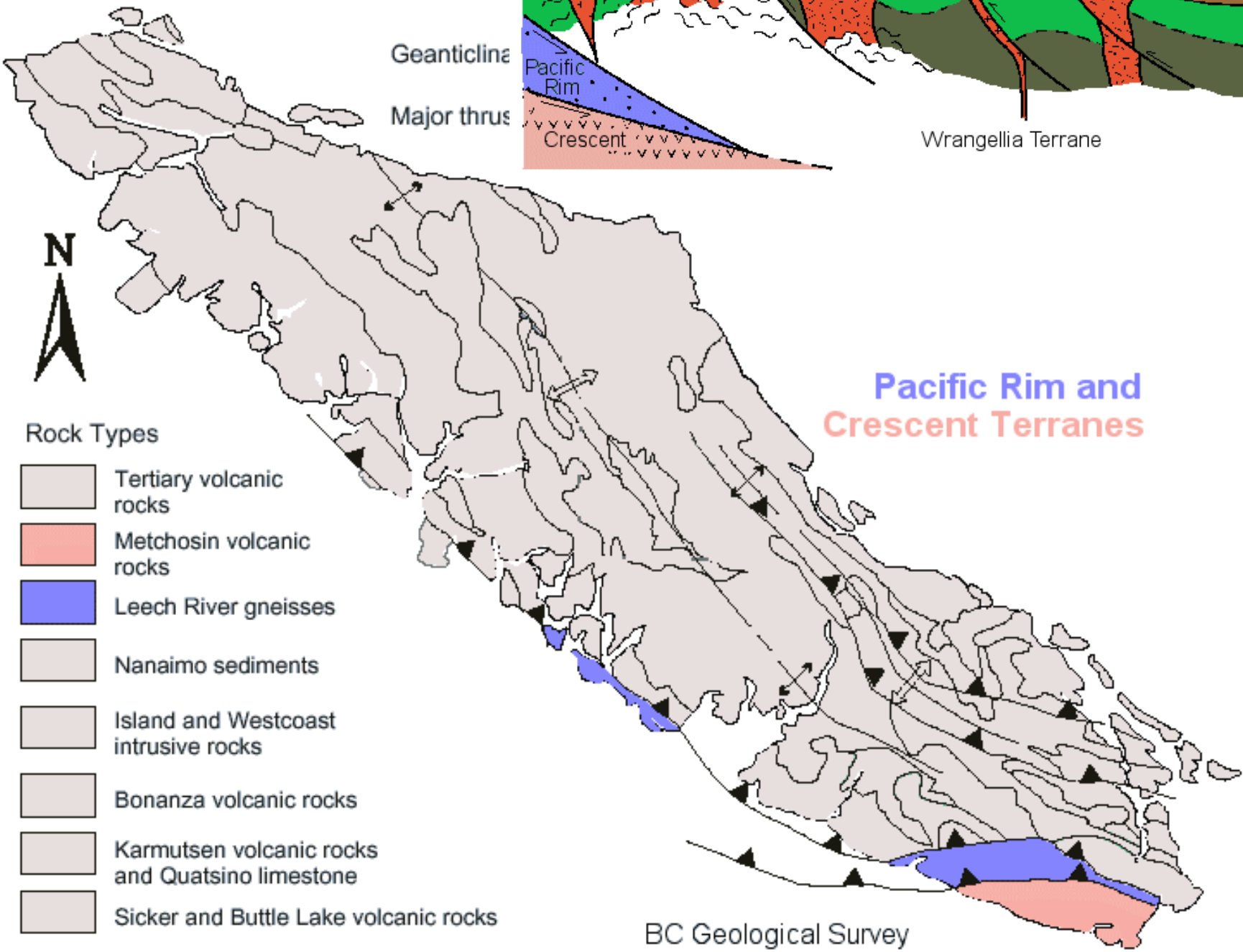
Tertiary (~42 - 55 m.y.)



Geanticline









Major thrust

Wrangellia Terrane



Pacific Rim and Crescent Terranes

Rock Types


-  Tertiary volcanic rocks
-  Metchozin volcanic rocks
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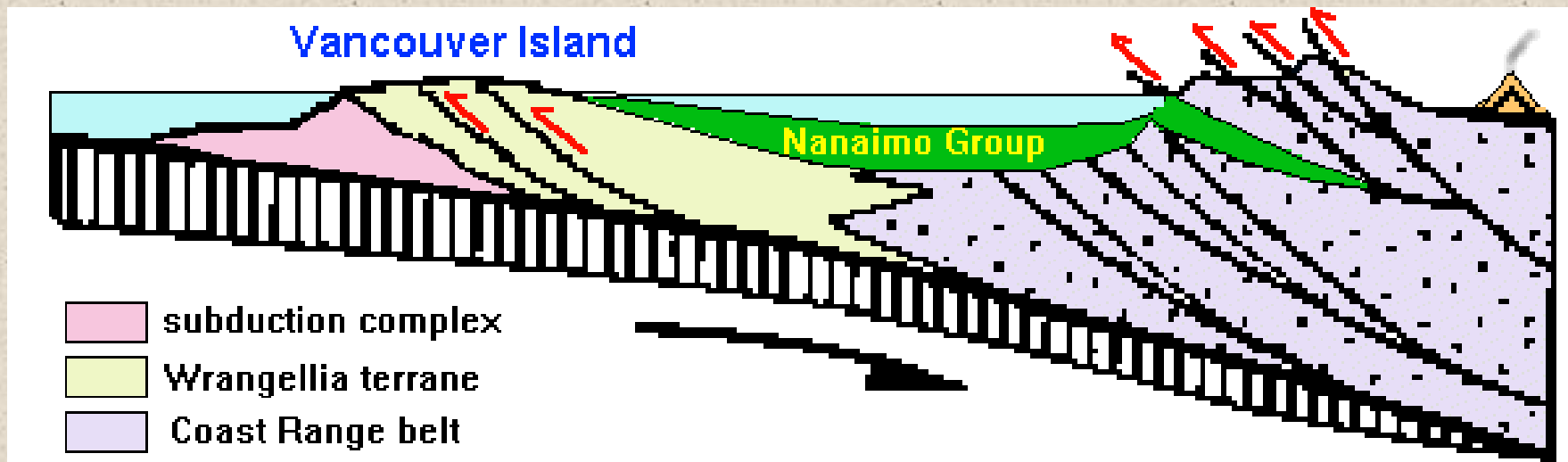
**Leech River Complex
(Pacific Rim Terrane)
Phyllite at Niagara Falls**

**and at the Chinese
Cemetery in Victoria**

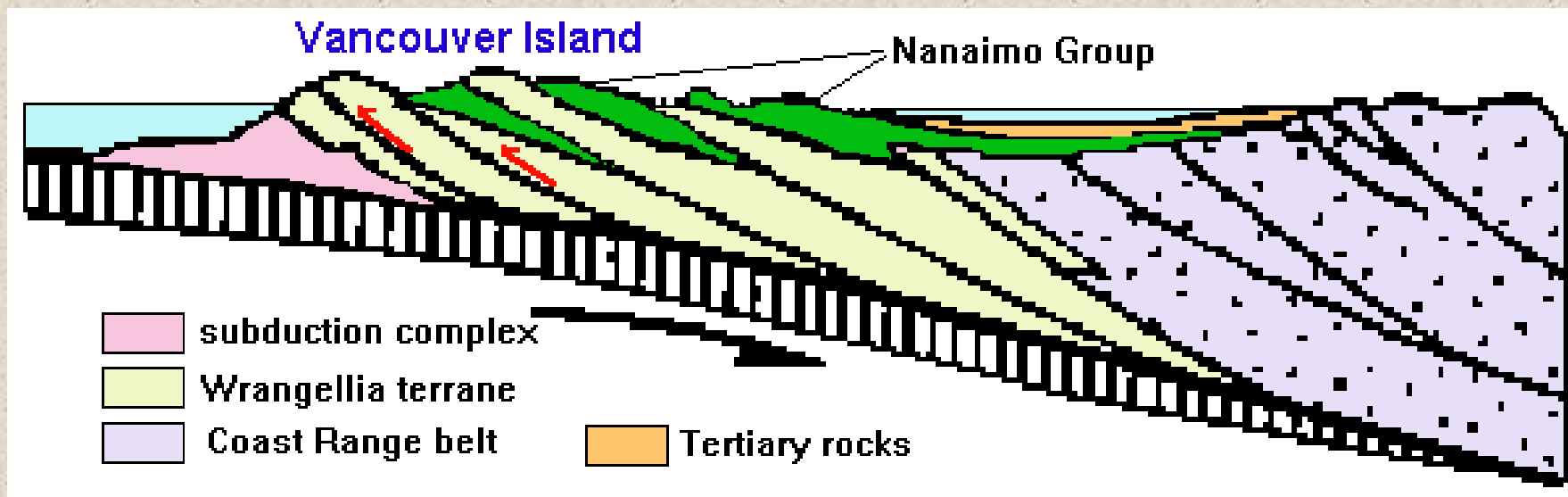


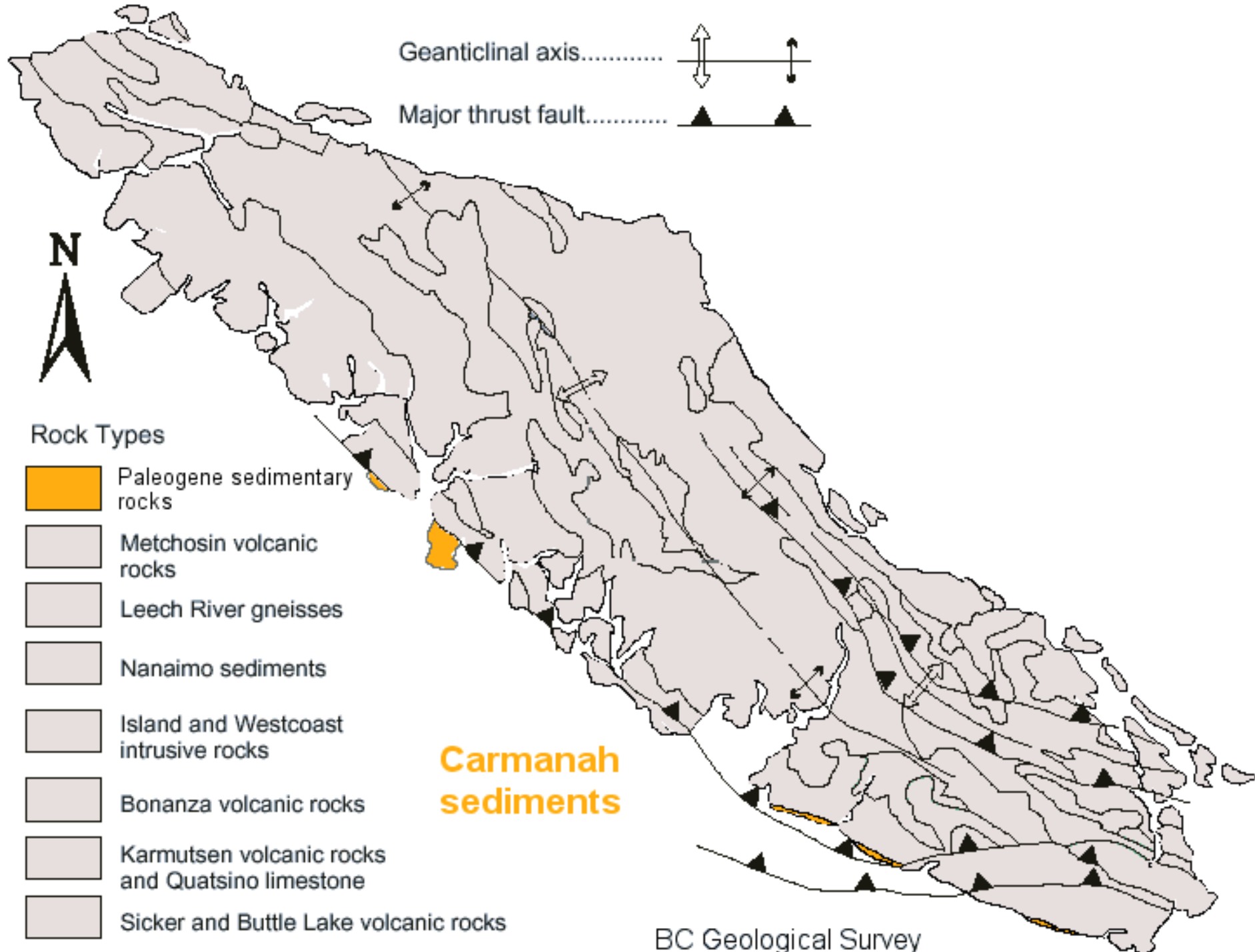


Crescent Terrane
Tertiary, Metchosin
Igneous Complex,
Sea-floor pillowed
basalt



Continued compression of western North America
 Up-thrusting of Nanaimo Group Rocks onto Vancouver Island





Cross-section from the edge of the North American plate at the subduction front, across Vancouver Island to the Strait of Georgia

