The Geological Formation of BC

In the distant past the west coast of Canada was near Salmon Arm. The continent was made of a granite batholith, that formed as the Earth cooled 4.5 billion years ago, and sedimentary rocks from erosion. Sediments were also building up into layers on the west coast as erosion washed them toward the Pacific Ocean. In the tropical climate that existed here, due to our more southern location on the globe (as a part of Pangea), there were many swamps where vegetation lived, died and fell into. There was an inland sea covering Alberta and Northeastern BC where marine organisms lived, died and were buried. (Dinosaurs also lived in this area.)

About 200 million years ago Pangea broke up.

About 170 million years ago several strings of volcanic islands (a terrane) collided with the coast (the collision took many, many years at the rate of a few centimeters a year). The sedimentary layers that had been piling up were folded and faulted (thrust faults) by the compressional forces and became the Rocky Mountains. BC would have been 300 km wider if the crumpling had not occurred. Erosion wore the Rockies down at the same time (and ever since) or they would be 10 km higher than they are now.

These volcanic islands (that collided) had their tops eroded off over time and isostacy caused their roots (batholiths, magma cooled underground) to be raised up. These are the current Coast Mountains that we see north of Vancouver.

More "recently" lava has extruded through the Coast Mountains forming Mt Garibaldi (near Squamish) and Mt Edziza (recent, north of Terrace).

A hot spot has formed the Anahim chain of volcanoes Southeast of the Queen Charlotte Islands. The North American plate moved northwest over the stationary hot spot forming the chain with the youngest (most recently formed) furthest east.

Also, the Juan de Fuca plate is subducting under the North American plate. This causes the composite volcanoes in the Cascade Mountains (i.e. Mount St Helen's, Mount Baker, etc.). It also causes the threat of the "BIG" 9.5 earthquake we are expecting here.

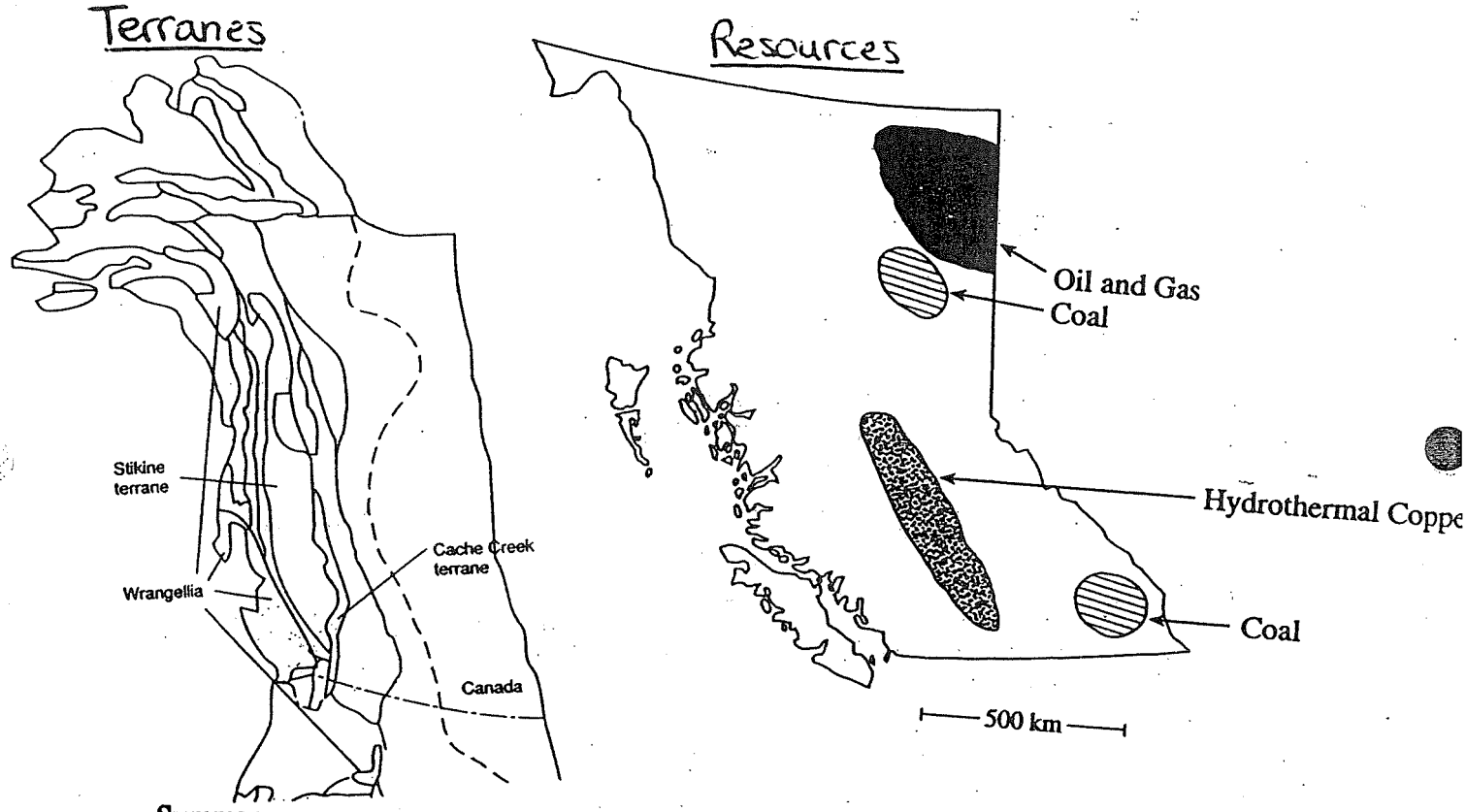
<u>The Rock Types</u>
BC has all three rock types:
Igneous - wherever there are volcanoes, roots of volcanoes, or dikes slicing through
Sedimentary - in the Rockies and all over BC from the erosion that has occurred (3/4 of the continent's exposed rock is sedimentary)
Metamorphic - in collision zones (from 170 million years ago or the subduction right now), involved significant T, P and water content changes yielding altered rocks

The Resources

The sedimentary layers in the Rockies contain coal that formed from vegetation falling into the swamps prior to the collision.

Northeastern BC and AB have oil and gas from the marine organisms that lived and died in the inland sea.

Metallic minerals (such as copper) are formed by magmatic processes and consequently are found near the Coast Mountains (roots of ancient volcanoes), Anahim chain (hot spot volcanoes), and Cascade Mountains (subduction volcanoes).



Summary

BC formed by elongated segments of mini-continents (terranes) that drifted across the Pacific and docked onto the older part of North America. This pushed up the Rockies. Erosion (glaciers, streams, mass wasting, wind) has formed/is forming what we see today.