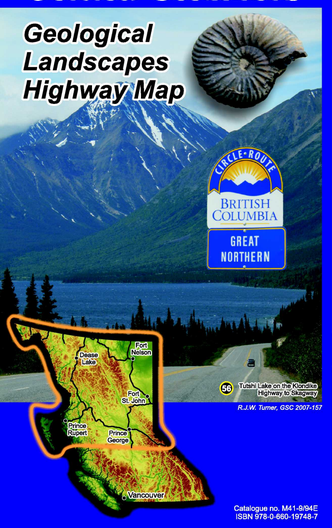
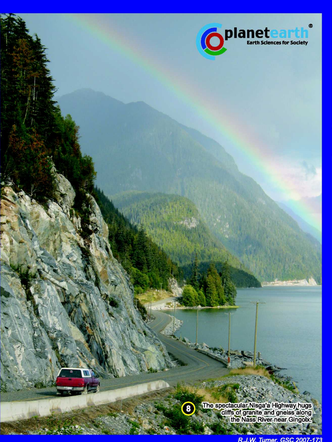
Northern British Columbia

Geological Landscapes Highway Map



Catalogue no. M41-9/94E
ISSN 978-0-660-19748-7

planet earth
Earth Sciences for Society


8 The spectacular Alaska Highway hugs the cliff of granite and gneiss along the Nass River near Dingdal.
R.J.W. Turner, GSC 2007-173

Geological Survey of Canada, Popular Geoscience 94E
(also British Columbia Geological Survey, Geofile 2007-1)

For more information
www.geoscape.nrcan.gc.ca
www.mapplace.ca

BRITISH COLUMBIA The Best Place on Earth

Natural Resources Canada | Ressources naturelles Canada

EXPLORATION Geoscience Centre and Museum

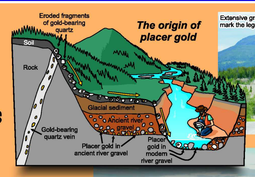
Recommended citation:
Turner, R.J.W., Franklin, R., Ceh, M., Evenchick, C., Hastings, N., Massey, N., and Wojdak, P. 2007: Northern British Columbia: geological landscapes highway map; Geological Survey of Canada, Popular Geoscience 94E (also British Columbia Geological Survey, Geofile 2007-1)

© Her Majesty the Queen in Right of Canada 2007

The far northwest: Atlin and Coast Mountains

The roads to Atlin, Skagway, and Haines

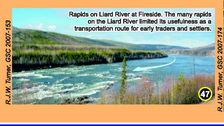
Three short roads cross the northwest corner of B.C. and connect the Alaska Highway to coastal Alaska and Atlin. The spectacular Haines Highway rises above tree line at Chilkat Pass before descending to the ocean at Haines. The Klondike Highway follows narrow lakes and mountain passes and then descends abruptly to the sea at Skagway. The Atlin road skirts glacier-carved Atlin Lake with its backdrop of Coast Range mountains. Atlin has a colourful history of placer gold mining that continues today.



Liard River and Liard Plain

Liard River Hot Springs to Watson Lake on Highway 97 (Alaska Highway), and northernmost Highway 37

The forested Liard Plain is underlain by soft shale-rich rocks that rivers and glaciers have eroded into a gently rolling lowland. Only a few bedrock hills poke through the thick blanket of glacial till and river gravel left behind by Ice Age glaciers. The Alaska Highway follows the Liard River that drains this lowland. The famous Liard River Hot Springs are one of the most visited sites on the Alaska Highway.



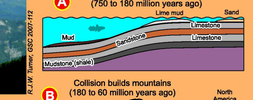
Northern Rockies

Summit Pass to Liard River Hot Springs Park on the Alaska Highway

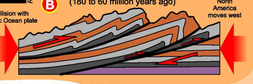
The Alaska Highway crosses the dramatic northern Rocky Mountains. These mountains are carved from layered sedimentary rocks that are tilted and folded in sometimes dramatic style. Grey limestone, grey to tan dolostone (magnesium-rich limestone), grey to pink quartzite (very hard sandstone), and black to brown shale were originally mud and sand on an ancient seafloor. They were crumpled into mountains as western North America collided with Pacific Ocean plate millions of years ago.

How the Rockies formed

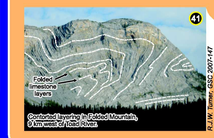
Ancient tropical seafloor (750 to 180 million years ago)



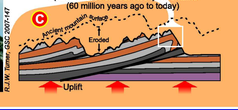
Collision builds mountains (180 to 60 million years ago)



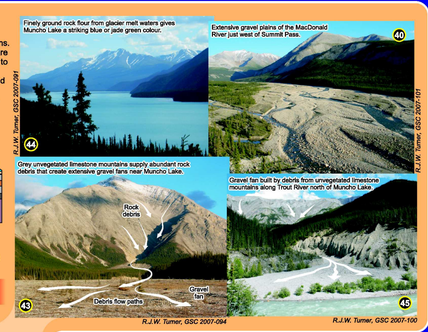
The Rockies are limestone country! The northern Rockies are part of a belt of limestone that extends from the U.S.A. border to the northern Yukon along the east side of the Rocky Mountains.



Uplift and erosion: our Rocky Mountains (60 million years ago to today)



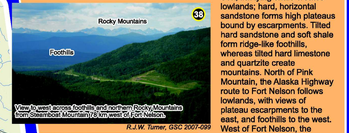
Surprisingly desert-like landscapes occur near Muncho Lake where the Alaska Highway crosses broad gravel fans. These fans are occasionally swept by debris flows, gravel landslides triggered by summer rain storms.

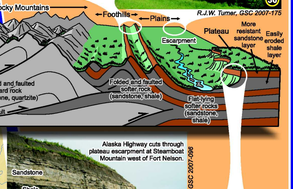


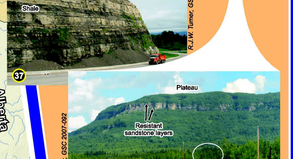
Foothills, escarpments, and plains

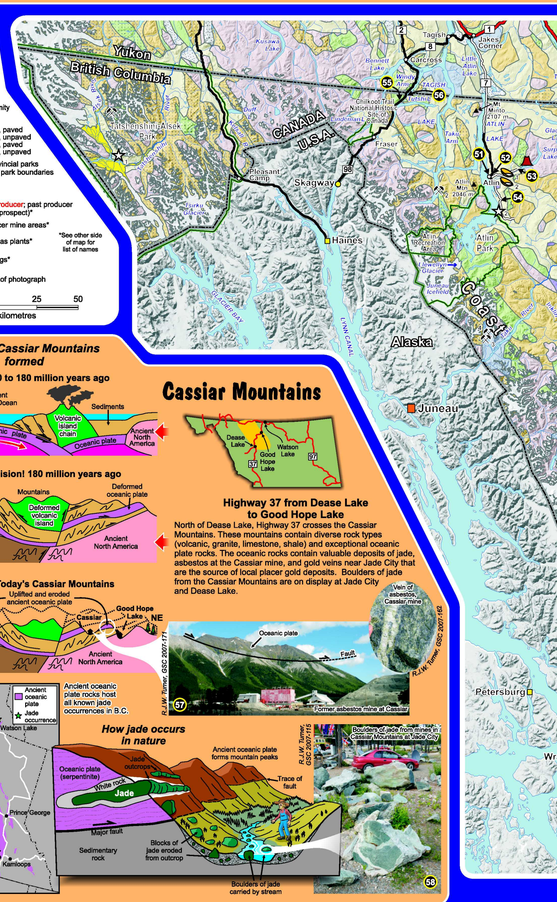
Pink Mountain to Summit Pass along the Alaska Highway

Layered sedimentary rocks that underlie this region form different landscapes depending on their resistance to erosion and orientation. Soft, flat-lying shale creates lowlands; hard, horizontal sandstone forms high plateaus bound by escarpments. Tilted hard sandstone and soft shale form ridge-like foothills, whereas tilted hard limestone and quartzite create mountains. North of Pink Mountain, the Alaska Highway route to Fort Nelson follows lowlands, with views of plateau escarpments to the east, and foothills to the west. West of Fort Nelson, the highway climbs a plateau at Steamboat Mountain, and then enters the foothills before rising into the mountains.









Population

- 50 000–100 000
- 10 000–50 000
- 5000–10 000
- 1000–5000
- 500–1000
- 0–500
- First Nations community

- Major roads, paved
- Major roads, unpaved
- Minor roads, paved
- Minor roads, unpaved
- Provincial parks and park boundaries
- Volcano
- Mines (producer; past producer or major prospect)*
- Gold placer mine areas*
- Natural gas plants*
- Hot springs*
- Location of photograph

*See other side of map for list of names

25 0 25 50 kilometres

How the Cassiar Mountains formed

350 to 180 million years ago

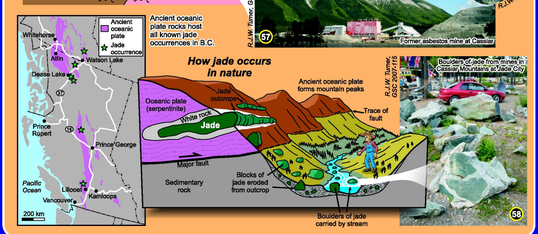
Collision! 180 million years ago

Today's Cassiar Mountains

Cassiar Mountains

Highway 37 from Dease Lake to Good Hope Lake

North of Dease Lake, Highway 37 crosses the Cassiar Mountains. These mountains contain diverse rock types (volcanic, granite, limestone, shale) and exceptional oceanic plate rocks. The oceanic rocks contain valuable deposits of jade, asbestos at the Cassiar mine, and gold veins near Jade City that are the source of local placer gold deposits. Boulders of jade from the Cassiar Mountains are on display at Jade City and Dease Lake.



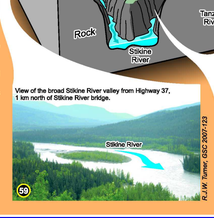
How jade occurs in nature

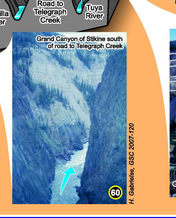
Stikine River country

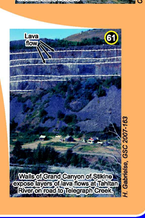
Schematic view of Stikine River country looking south from road to Telegraph Creek

Highway 37 from Iskut to Dease Lake, and the road to Telegraph Creek

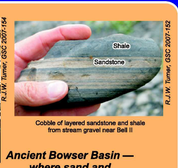
The Stikine River valley is broad and open at the Highway 37 bridge. Nearby is Mount Edziza, northern British Columbia's largest and most famous volcano. During the last 10 000 years, glaciers or lava flows from Mount Edziza blocked the ancient valley of the Stikine River downstream from the bridge, diverting the river into a new channel. The big river quickly cut the very narrow and deep Grand Canyon of the Stikine, visible today from viewpoints along the Telegraph Creek Road. Over time the river will erode the canyon into a broader valley. Lava flows with column-like cracks are visible in the canyon walls.







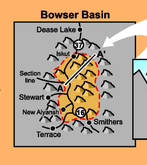
Skeena Mountains



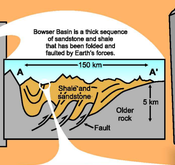
Highway 37 between Highway 16 and Iskut

Highway 37 crosses a mountainous region of sandstone and shale from Highway 16 in the south to Iskut in the north. Tilted layers of black shale and grey sandstone are visible in highway rock cuts and mountain peaks. These rocks, referred to by geologists as the "Bowser Basin", formed from sand and mud deposited at the edge of an ancient ocean, and were later folded and faulted as they were squeezed by Earth's forces. They contain important deposits of coal and possibly natural gas. Geologists have discovered both marine fossils and dinosaur tracks in these rocks, confirming their ancient coastal origin.

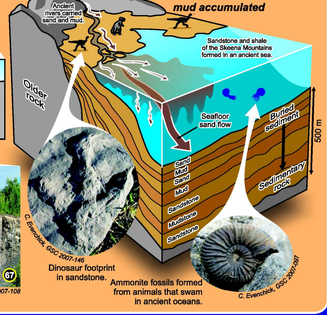
Bowser Basin

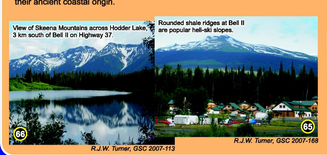


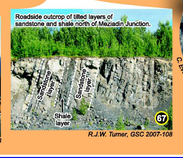
Bowser Basin is a thick sequence of sandstone and shale that has been folded and faulted by Earth's forces.



Ancient Bowser Basin — where sand and mud accumulated







Dinosaur footprint in sandstone.

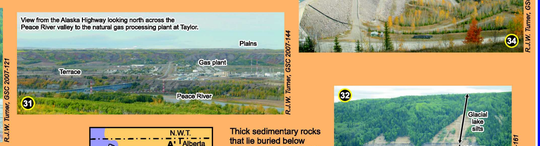
Ammonite fossils formed from animals that swam in ancient oceans.

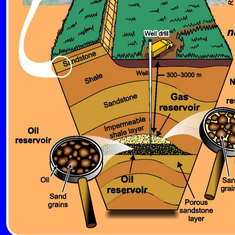
C. Evenchick, GSC 2007-087

The northeast

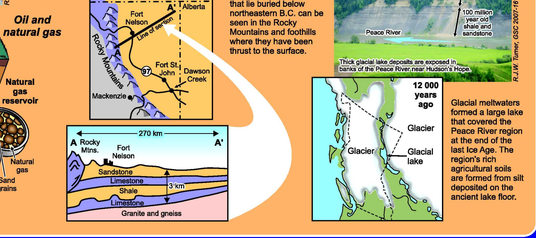
Chetwynd to Fort St. John and Dawson Creek

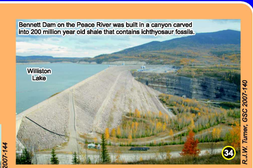
East of the foothills, northeastern B.C. is underlain by a thick sequence of sedimentary rock that contains important natural gas and oil reserves. Large gas processing plants are visible from the Alaska Highway at Taylor and Fort Nelson. The Peace River, draining the interior of B.C., flows through the region in a narrow valley. The Bennett Dam, in the foothills west of Hudson's Hope, backs up the waters of the Peace River to form Williston Lake, B.C.'s largest lake. The rich agricultural soils of the Peace River region are the floor of an ancient glacial lake that once covered the area.

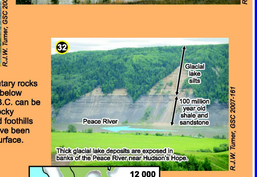




Thick sedimentary rocks that lie buried below northeastern B.C. can be seen in the Rocky Mountains and foothills where they have been thrust to the surface.





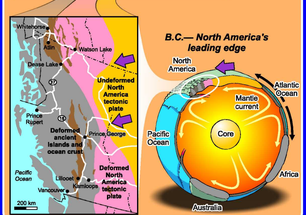


Glacial meltwaters formed a large lake that covered the Peace River region at the end of the last Ice Age. The region's rich agricultural soils are formed from silt deposited on the ancient lake floor.

How B.C. was built: an analogy

180 million years ago: As the Atlantic Ocean began to open, North America moved westward and collided with nearby ocean floor and volcanic islands, in a process somewhat like a bulldozer pushing soil and boulders from a field.

Today: B.C.'s landmass is a collision zone of deformed volcanic islands, seafloor, and North American continental margin.



B.C.— North America's leading edge