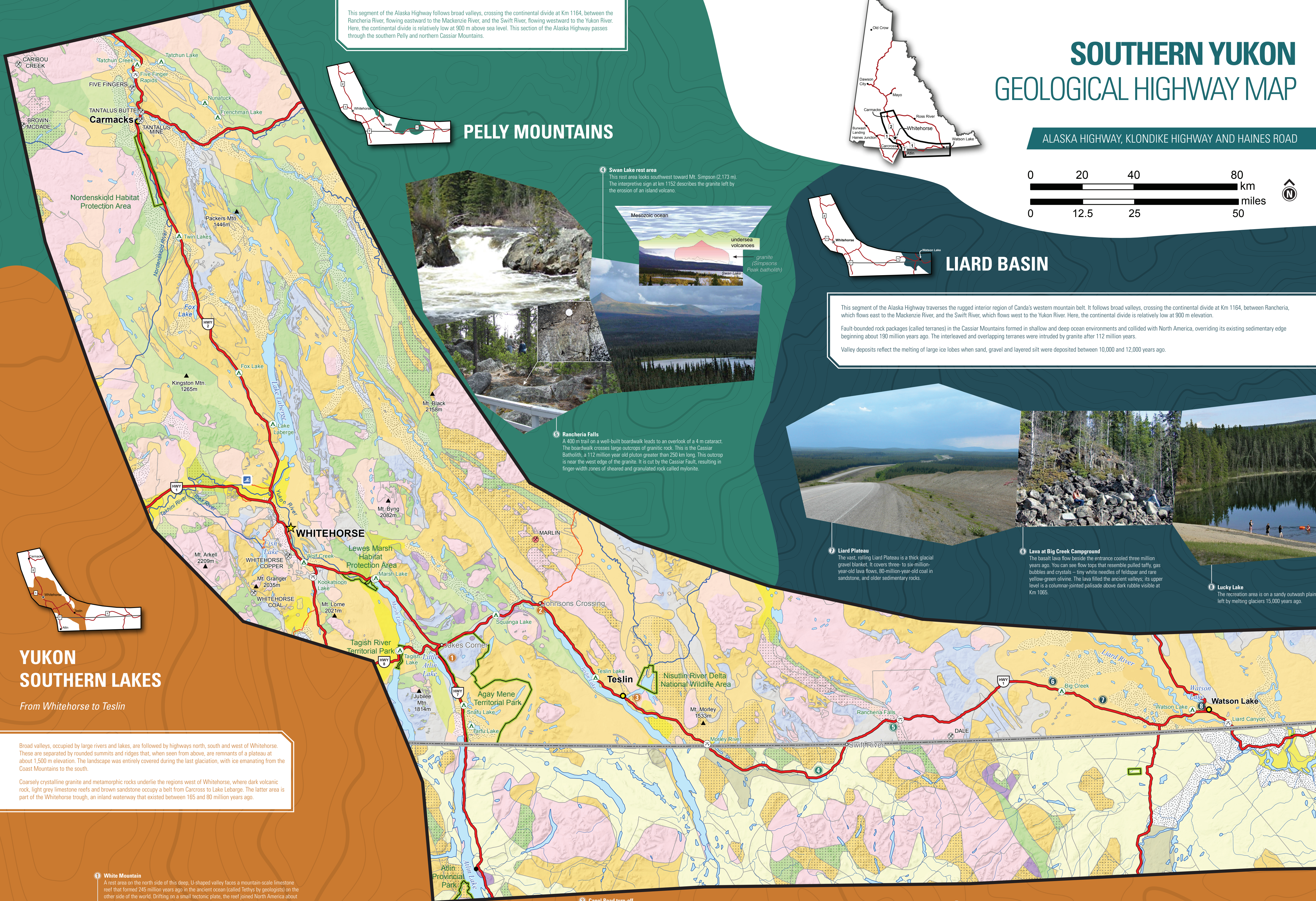
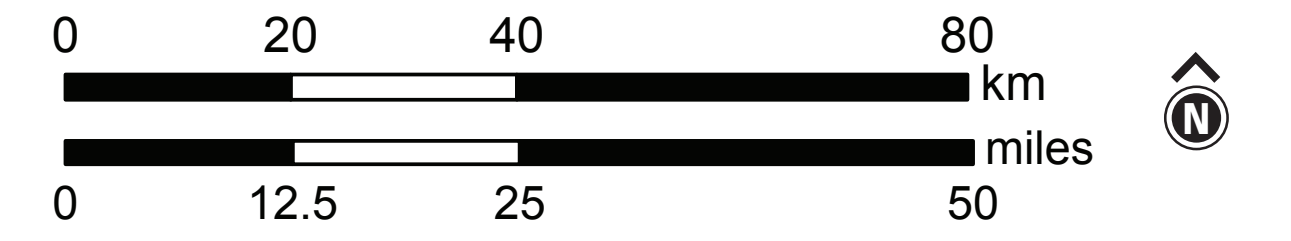


# SOUTHERN YUKON GEOLOGICAL HIGHWAY MAP

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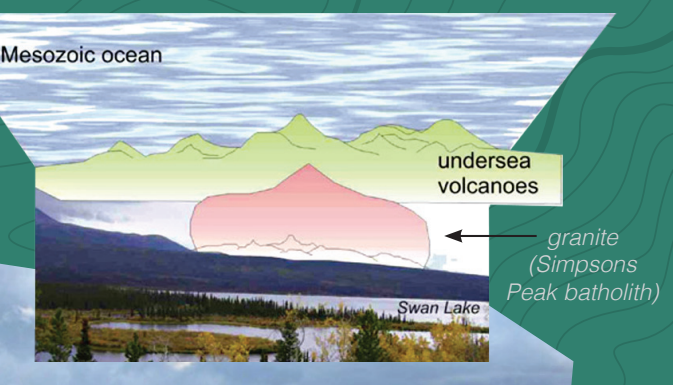
ALASKA HIGHWAY, KLONDIKE HIGHWAY AND HAINES ROAD



This segment of the Alaska Highway follows broad valleys, crossing the continental divide at Km 1164, between the Rancheria River, flowing eastward to the Mackenzie River, and the Swift River, flowing westward to the Yukon River. Here, the continental divide is relatively low at 900 m above sea level. This section of the Alaska Highway passes through the southern Pelly and northern Cassiar Mountains.

## PELTY MOUNTAINS

**4 Swan Lake rest area**  
This rest area looks southwest toward Mt. Simpson (2,173 m). The interpretive sign at km 1152 describes the granite left by the erosion of an island volcano.



## LIARD BASIN

This segment of the Alaska Highway traverses the rugged interior region of Canada's western mountain belt. It follows broad valleys, crossing the continental divide at Km 1164, between Rancheria, which flows east to the Mackenzie River, and the Swift River, which flows west to the Yukon River. Here, the continental divide is relatively low at 900 m elevation.

Fault-bounded rock packages (called terranes) in the Cassiar Mountains formed in shallow and deep ocean environments and collided with North America, overriding its existing sedimentary edge beginning about 190 million years ago. The interleaved and overlapping terranes were intruded by granite after 112 million years.

Valley deposits reflect the melting of large ice lobes when sand, gravel and layered silt were deposited between 10,000 and 12,000 years ago.

**5 Rancheria Falls**  
A 400 m trail on a well-built boardwalk leads to an overlook of a 4 m cataract. The boardwalk crosses large outcrops of granite rock. This is the Cassiar Batholith, a 112 million year old pluton greater than 250 km long. This outcrop is near the west edge of the granite. It is cut by the Cassiar Fault, resulting in finger-width zones of sheared and granulated rock called mylonite.

**7 Liard Plateau**  
The vast, rolling Liard Plateau is a thick glacial gravel blanket. It covers three- to six-million-year-old lava flows, 80 million year-old coal in sandstone, and older sedimentary rocks.

**6 Lava at Big Creek Campground**  
The basalt lava flow beside the entrance cooled three million years ago. You can see flow tops that resemble pulled taffy, gas bubbles and crystals – tiny white needles of feldspar and rare yellow-green olivine. The lava filled the ancient valleys; its upper level is a columnar-jointed palisade above dark rubble visible at Km 1065.

**8 Lucky Lake**  
The recreation area is on a sandy outwash plain left by melting glaciers 15,000 years ago.

## YUKON SOUTHERN LAKES

From Whitehorse to Teslin

Broad valleys, occupied by large rivers and lakes, are followed by highways north, south and west of Whitehorse. These are separated by rounded summits and ridges that, when seen from above, are remnants of a plateau at about 1,500 m elevation. The landscape was entirely covered during the last glaciation, with ice emanating from the Coast Mountains to the south.

Coarsely crystalline granite and metamorphic rocks underlie the regions west of Whitehorse, where dark volcanic rock, light grey limestone reefs and brown sandstone occupy a belt from Carcross to Lake Laberge. The latter area is part of the Whitehorse trough, an inland waterway that existed between 165 and 80 million years ago.

**1 White Mountain**  
A rest area on the north side of this deep, U-shaped valley faces a mountain-scale limestone reef that formed 245 million years ago in the ancient ocean (called Tetthys by geologists) on the other side of the world. Drifting on a small tectonic plate, the reef joined North America about 150 million years ago. Keen hikers can ascend White Mountain from the Atlin Road, about 8 km south of Jake's Corner.

**2 Canol Road turn-off**  
In 1942, when the southern terminus of the Canol Road was a large army encampment, a 4-inch pipeline briefly brought oil from the Mackenzie River (625 km northeast). Here, thick silt was the floor of a temporary lake approximately 12,000 years ago, when melting glaciers dammed drainage. Note the bedding warped by compaction of layers and stains from plant roots.

**3 Teslin**  
A pullout overlooks Teslin village and a 600 m long bridge (the longest on the Alaska Highway) across Nisutlin Bay. "Teslin-too" means "long narrow water" in Southern Tutchone. The valley was dammed by sand and gravel left by the glaciers 15,000 years ago. The mountains across the lake are oceanic volcanic rock of the Cache Creek terrane.



For more information visit [www.geology.gov.yk.ca](http://www.geology.gov.yk.ca)



Laxton, S., Roots, C., and Elliot, B., 2016  
Southern Yukon Geological Highway Map  
Yukon Geological Survey

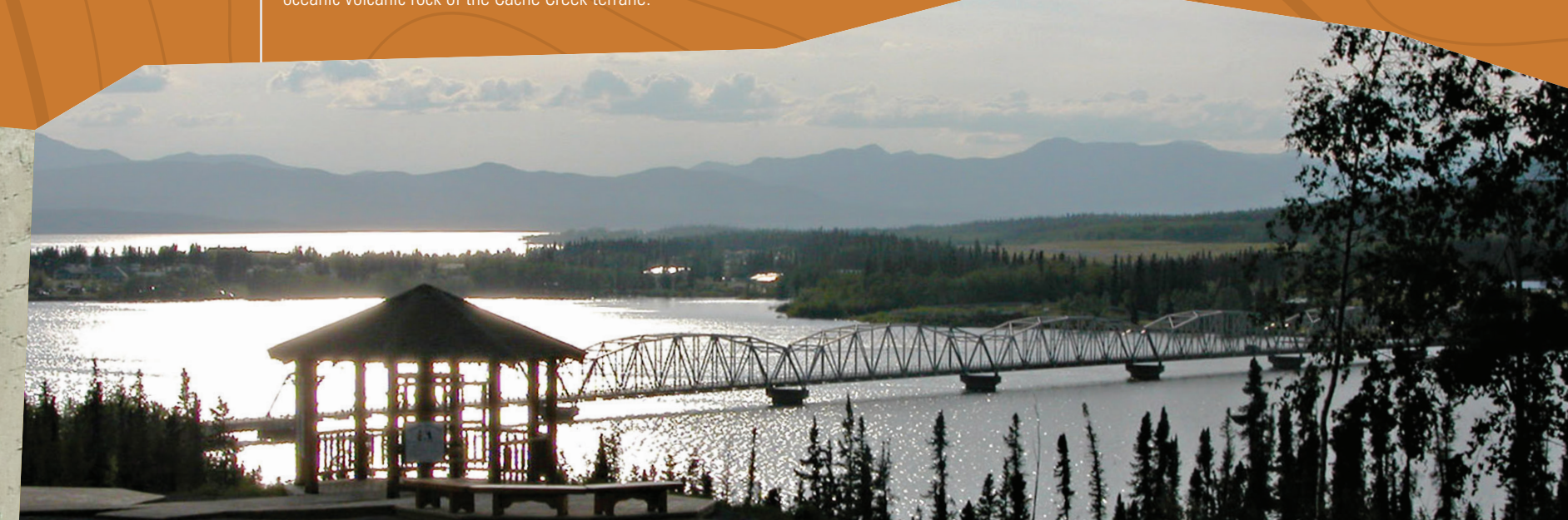
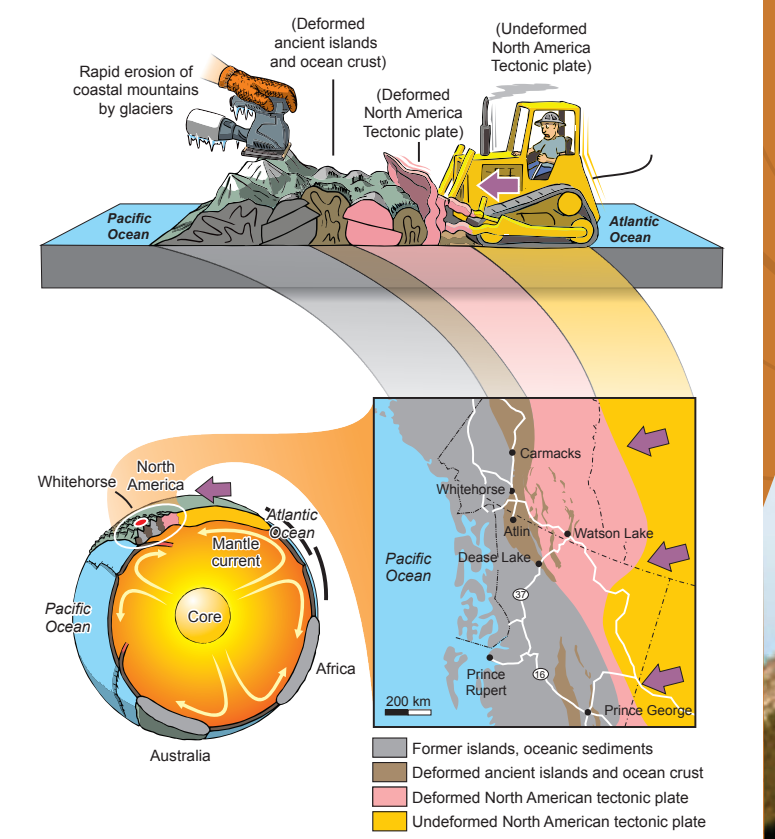


We'd like to acknowledge the work of previous Yukon Geological Survey employees towards this map and thank Richard Franklin for providing the block diagrams.

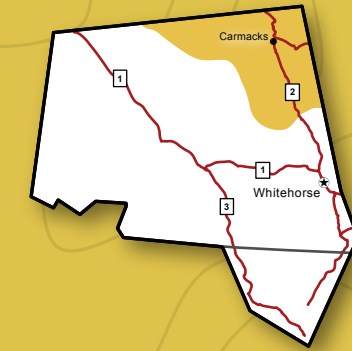
## BUILDING OF YUKON

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, Yukon's landmass is a collision zone of deformed volcanic islands, sea floor, and North American continental margin.



The Klondike Highway traverses the Yukon central plateau, typified by the landscape around Fox Lake and along the Nordenskiöld River. Valley bottoms are densely forested and rock knobs common. West of the highway, the Dawson Range, the southern extent of the Klondike plateau ecoregion, is a largely treeless rolling upland.

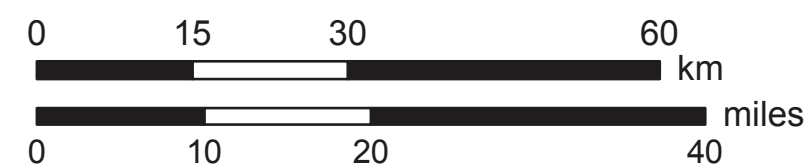


## KLONDIKE AND YUKON CENTRAL PLATEAU

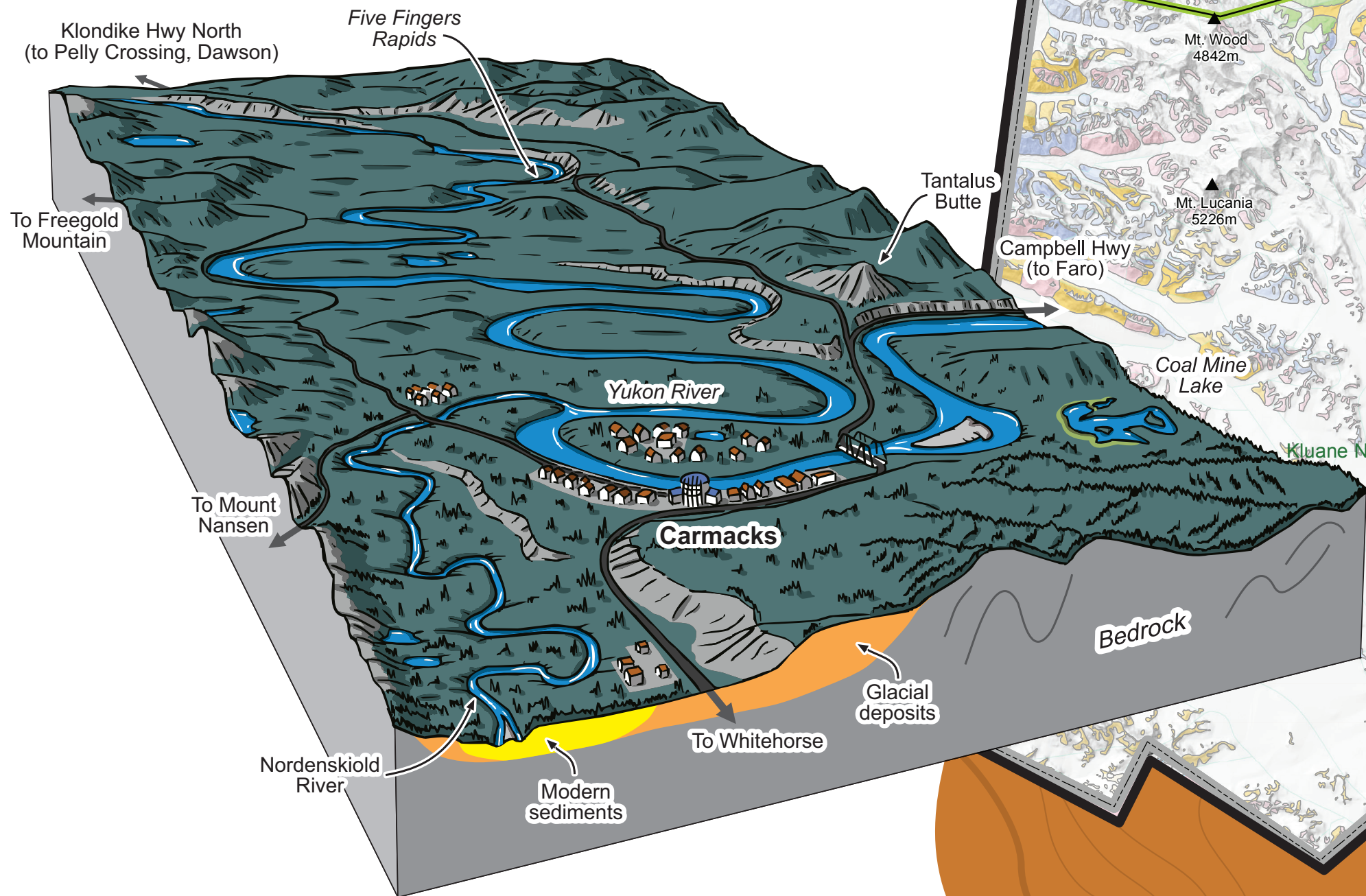
North of Lake Lebarge to Pelly River

# SOUTHWESTERN YUKON GEOLOGICAL HIGHWAY MAP

### HOW TO USE THIS MAP



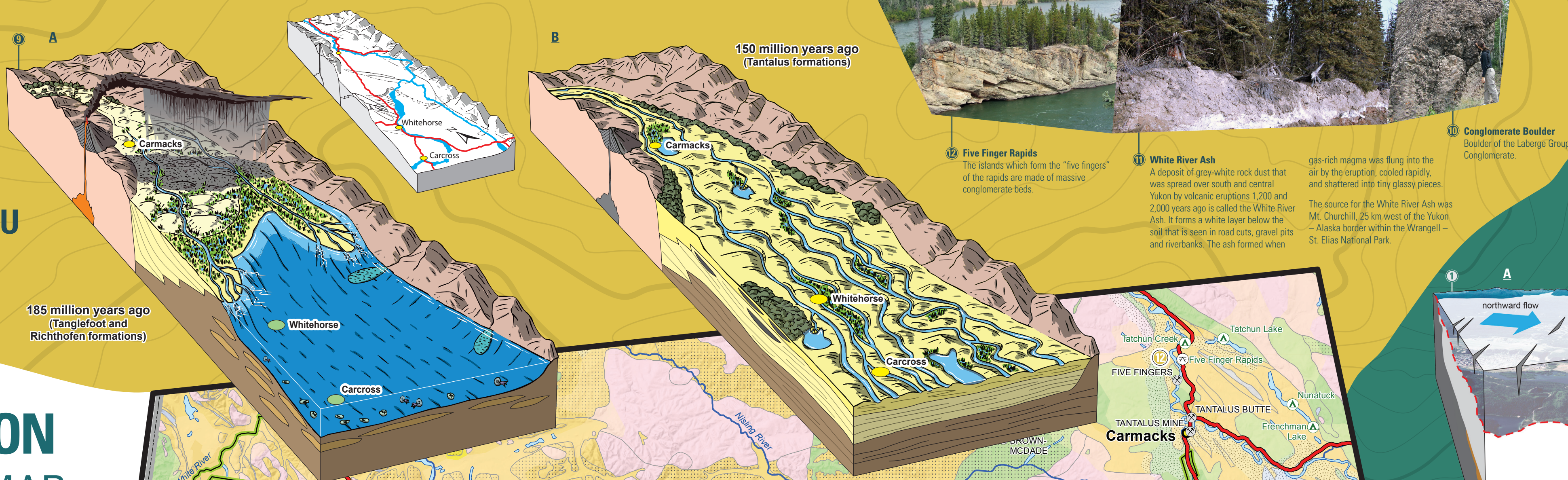
The colours on this map represent the different geological materials that underlie the Yukon landscape. The diagram uses the example of the Carmacks area to show how the map's three major types of geological material (rock, Ice Age sediment, modern sediment) typically lie. All of southern Yukon is underlain by rock, but in many places, such as valley bottoms, rock is buried by thick deposits of Ice Age sediments. Rivers that exist in Yukon today have eroded Ice Age sediment and have deposited modern sand and gravel sediments.



### LEGEND

- Past Producer
- Producer
- Hotspots
- Campgrounds
- Communities
- Whitehorse
- Major Road
- Protected Areas

	glacier ice		limestone and dolomite		metamorphic volcanic rock
	mud, sand, and gravel		sandstone and shale		ultramafic rock
	silt		metamorphic sandstone and shale		gneiss
	sand and gravel		volcanic rock		granite
	till				



185 million years ago (Tanglefoot and Richtigofen formations)

150 million years ago (Tantalus formations)



Sheep Mountain 8

St. Elias Mountains 7

## ST-ELIAS MOUNTAINS

St. Elias Mountains and Mt Logan

West of the Shakwak valley is a uniform mountain wall, which rises up into the rugged Front and Icefield ranges beyond. The glaciers carved broad, steep-sided valleys, feeding silt-laden torrents crossed by the Alaska Highway.

Deformed sedimentary and volcanic rocks are intruded by relatively small granitic plutons. Most of the rocks are well-fractured by uplift and faulting.

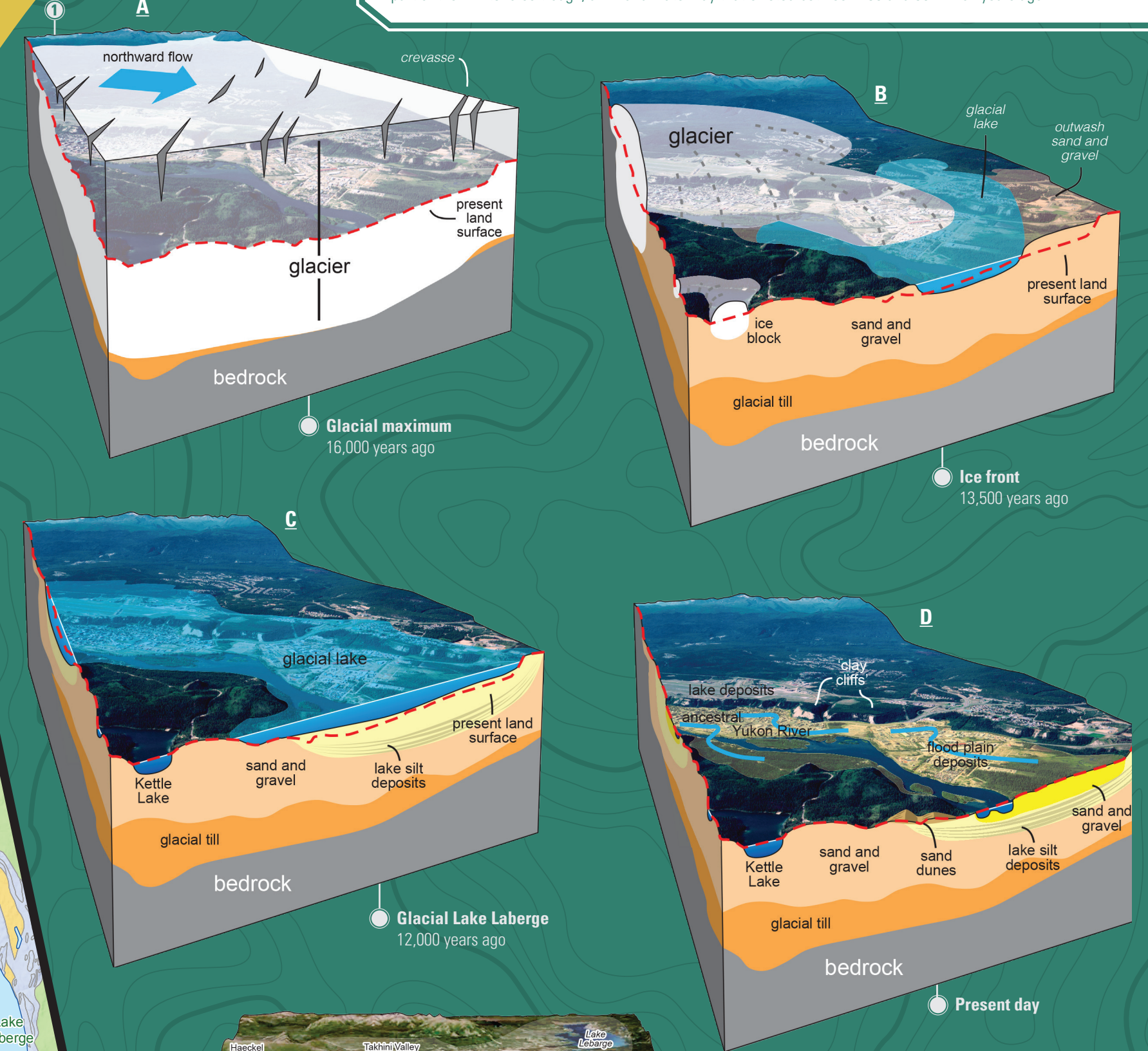


## YUKON SOUTHERN LAKES

From Carcross to Lake Lebarge

Broad valleys, occupied by large rivers and lakes, are followed by highways north, south, and west of Whitehorse. These are separated by rounded summits and ridges that, when seen from above, are remnants of a plateau at about 1,500 m elevation. The landscape was entirely covered during the last glaciation 20,000 years ago, with ice emanating from the Coast Mountains to the south.

Coarsely crystalline granite and metamorphic rocks underlie the ecoregions west of Whitehorse, where dark volcanic rock, light grey limestone reefs and brown sandstone occupy a belt from Carcross to Lake Lebarge. The latter area is part of the Whitehorse trough, an inland waterway that existed between 165 and 80 million years ago.



**Glaciation**  
At the height of the last glaciation of the Ice Ages (from 25,000 until 12,000 years ago), an ice sheet approximately 1.5 km thick lay in the valley where Whitehorse is now. The landscape would have been similar to the icefields presently covering most of the St. Elias Mountains. Glacial movement sculpted the mountains and polished rock outcrops. When the ice melted, the sand and gravel hills and terraces were formed.

## YUKON STIKINE HIGHLANDS

Kluksu to British Columbia – Yukon border

The Haines Road south of Klukshu, and the Klondike Highway south of Tutshi Lake generally follow deep, twisting valleys through the Coast Mountains, a rugged belt with glaciers at higher elevations, and high-gradient streams.

More than 60% of the area is underlain by granitic rock, which is usually light-colored and breaks into large boulders and coarse sand. The older rocks west of the Haines highway are part of Alexander terrane, a crustal siver attached to North America about 250 million years ago.

**1. Rock Glacier**  
A short hike takes you through marshlands to the top of a rock glacier where a well-defined trail leads you directly into the heart of this structure. The rock glacier formed when water entered rock debris upslope and froze underground to form permafrost between the rocks. Eventually the ice and rock accumulated to a sufficient mass to begin moving very slowly downslope, probably in the order of one metre a year. The ice has long since melted, leaving behind the fossil rock glacier.

**2. Carcross Desert**  
The wind-blown sands forming the "world's smallest desert" originate from pro-glacial lakes, which covered much of southwest Yukon during the last ice retreat, some 10,000 to 15,000 years ago. South-prevailing winds that funnel through the Bennett Lake corridor continue to shift the dunes today, making the establishment of vegetation almost impossible.

**3. Bove Island rest stop**  
This is a good place to see thrust faults that are typical of the Western Cordillera (mountain belt). The view across Windy Arm of Tagish Lake shows southwesterly directed thrust faulting that has resulted in limestone rocks of the same age being stacked upon each other with a slice of similar age basaltic rock in between. The faulting occurs when external pressure causes the rocks to buckle and override similar adjacent rocks. The same limestone across the highway (behind you) is sliced and fractured by 100 million years of tectonic activity.

**4. Canyon Creek Bridge**  
Exposed on the west side of the bridge is the Klunne Schist, a metamorphic rock. Here, it is a brown-weathering, quartz-plagioclase-muscovite-biotite schist.

**5. Million Dollar Falls**  
Exposed along the impressive trail are interbedded mudstone, siltstone and sandstone turbidite sequences characteristic of the Decadeash Formation. Turbidites are formed by deep-water turbidity currents – bottom currents laden with suspended sediment that move swiftly downslope and spread out laterally on the ocean floor. Turbidites can originate in the following ways: as storm waves, tsunamis, earthquakes, or as rivers that are heavily laden with sediments when they enter the sea.

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