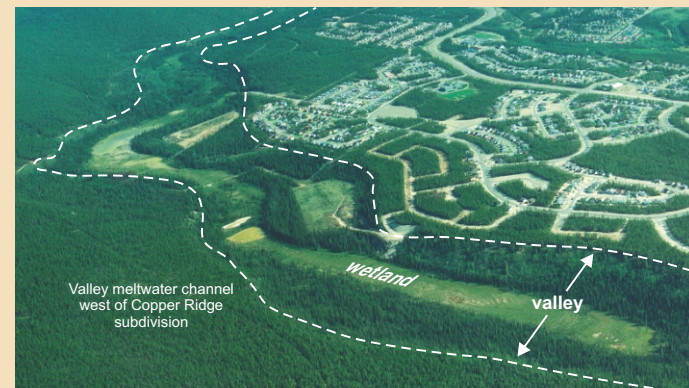


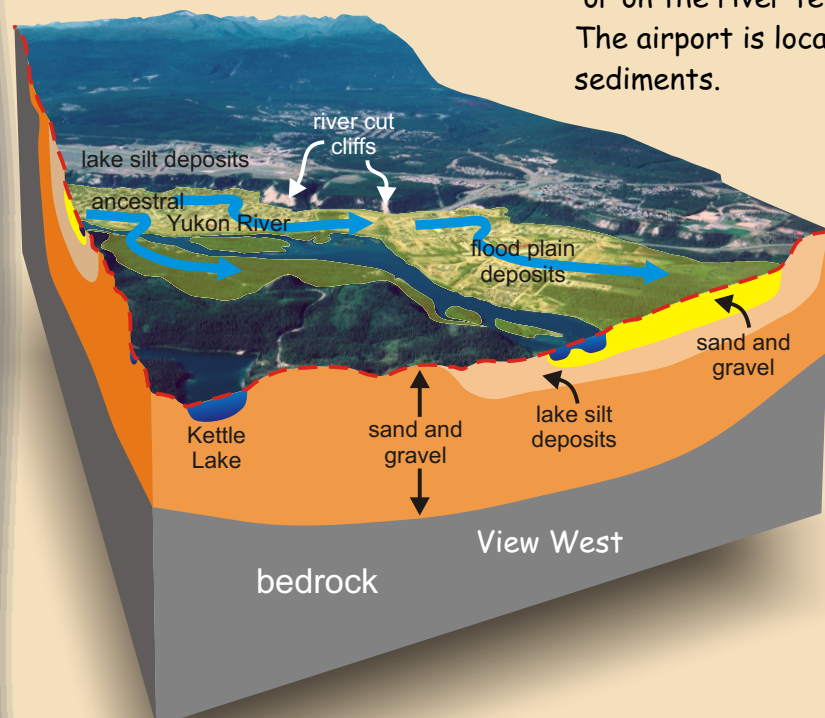
## Our Landscape Today

Once the glaciers were gone and the glacial lakes drained, the river claimed back its valley, eroding its sinuous course into the soft friable silt and clay, and leaving sandy and gravelly terraces.



Thus the glaciers have left a landscape organized by deposit type. Bedrock and till are found at high elevations, with layers of sand and gravel deposited by gushing meltwater streams. Terraces at lower elevations represent shorelines at different levels of Glacial Lake Champagne, and lower down, cliffs where the lake beds have been eroded. The valley bottom contains river-washed sand and gravel in flood-plain deposits. Now the river is controlled by the hydroelectric dam and the river banks encased by broken rock "rip-rap".

The landforms in turn have guided land use. Residential subdivisions are located on gently undulating, well-drained sand and gravel (Wolf Creek and Porter Creek) or on the river terraces (Riverdale and Downtown). The airport is located on the nearly level glacial lake sediments.



### Want Information?

Yukon Geological Survey  
2099 2<sup>nd</sup> Ave.  
Whitehorse, YT  
Y1A 1B5  
Ph: (867) 667-8508  
[www.geology.gov.yk.ca](http://www.geology.gov.yk.ca)



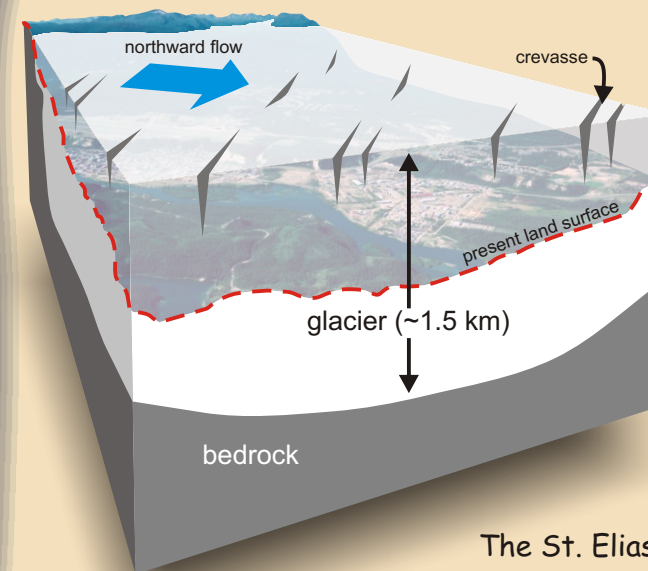
Geological Survey of Canada  
101-605 Robson St.  
Vancouver, BC  
V6B 5J3  
Ph: (604) 668-0271  
[www.nrcan.gc.ca/gsc](http://www.nrcan.gc.ca/gsc)



# Geoscape Whitehorse

Geoscience for a Yukon community

## Glaciation!



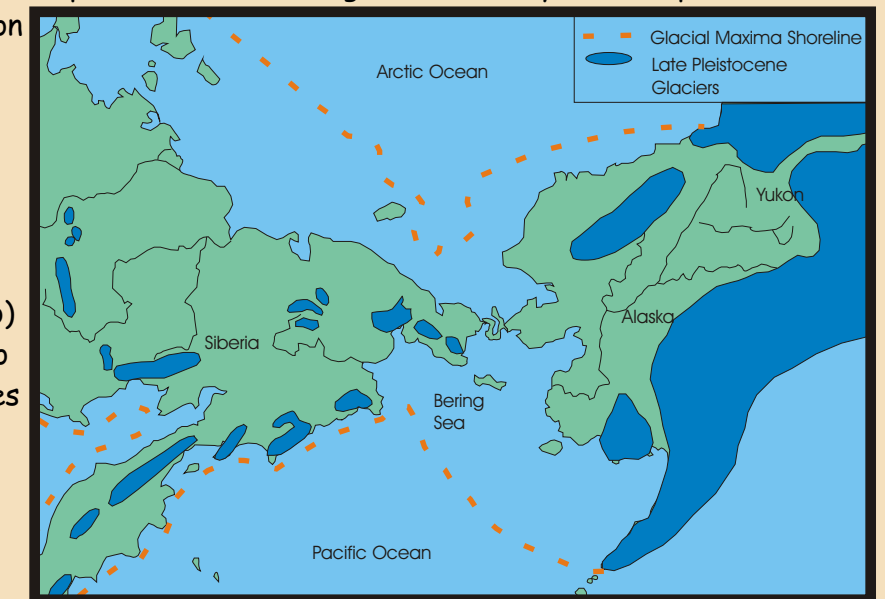
At the height of the last glaciation of the Ice Ages (from 25,000 until 12,000 years ago) known as the McConnell Glaciation, an ice sheet approximately 1.5 km thick lay in the valley where Whitehorse is now. The landscape would have been similar to the icefields presently covering most of the St Elias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

The St. Elias ice sheet today



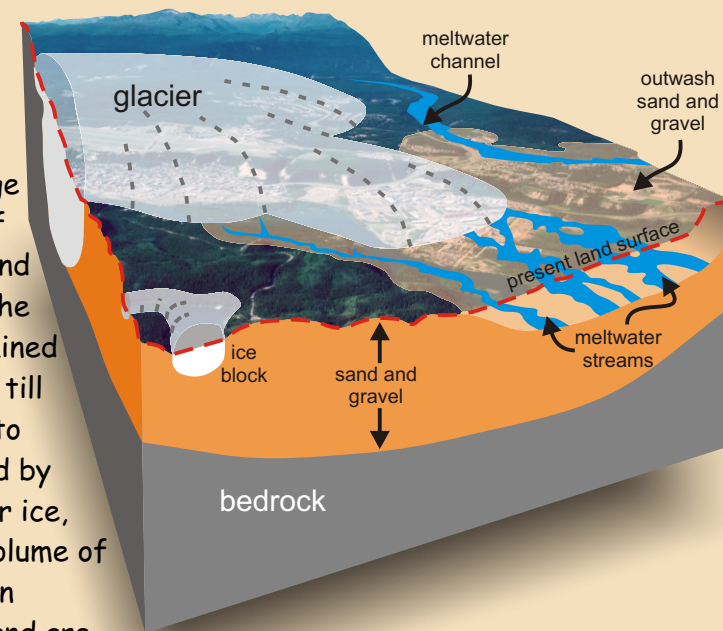
## Beringia

When glaciers covered most of North America, dry land extended between Alaska and Russia disrupting circulation between the Pacific and Arctic oceans. A large area received too little precipitation for glaciers to form. This area was known as Beringia. It was a lost continent of 3200 km, separated from the south by an ice barrier, and was home to the giant beaver, Jefferson's ground sloth, short-faced bear, western camel, American mastodon, woolly mammoth, steppe bison, Saiga antelope and a Yukon ice age horse. They lived on plains that were covered in shrub vegetation such as cotton-grass, dwarf willow and birch, cinquefoil, columbine, sage and Jacob's ladder. Although the large mammals are now extinct (the last mammals lived on Wrangell Island 6000 years ago) many Beringia plants continue to thrive on dry south-facing slopes in Southern Yukon.



## Thawing Out

As the climate warmed 13,000 years ago, the ice sheet thinned and melted. The edge of the ice retreated southward. Blocks of ice remained in the valley bottom. Rocks and dirt carried within and at the bottom of the ice were released during melting and remained as blankets of till along the hillsides. The till blanket covered ice blocks, which melted to leave depressions, some of which are filled by kettle lakes. Along the edge of the glacier ice, streams formed carrying away the huge volume of meltwater formed. These channels contain very small streams and peat bogs today, and are, important natural habitat in our community.



### Glacial Features of the Whitehorse Area

#### How They Formed

	<b>Kettles and Kettle Lakes</b> Depressions in the landscape which may have been filled in with water, forming lakes. The Hidden Lakes are examples of these.	As a glacier melts, blocks of ice break off of it and become partially or completely buried by sediment. When this ice melts depressions form. If they extend below the water table, they become lakes.
	<b>Eskers</b> Long, linear, raised features.	Formed from deposition of sediment within a meltwater channel running beneath a glacier.
	<b>Striations</b> Scratches and grooves in rocks.	Produced when the glacier drags rock, sediment and other material beneath it, gouging the underlying bedrock.
	<b>Glacial Till</b> Layers of unconsolidated, glacially deposited sediment and rock. Till is dense and water does not easily flow through it, so wells in the Whitehorse area must be dug below the till layers.	Sediment and rock that has been carried on top of, within and beneath the glacier is deposited in thick layers as the glacier melts.
	<b>Erratics</b> Large boulders, commonly resting on the surface.	Rocks transported by the glacier and left behind when the ice melted.
	<b>Polished Bedrock &amp; Whalebacks</b> Bedrock which has been smoothed and polished.	Ice movement across bedrock scours and polishes the rock face. Streams of meltwater containing crushed rock have the same effect.

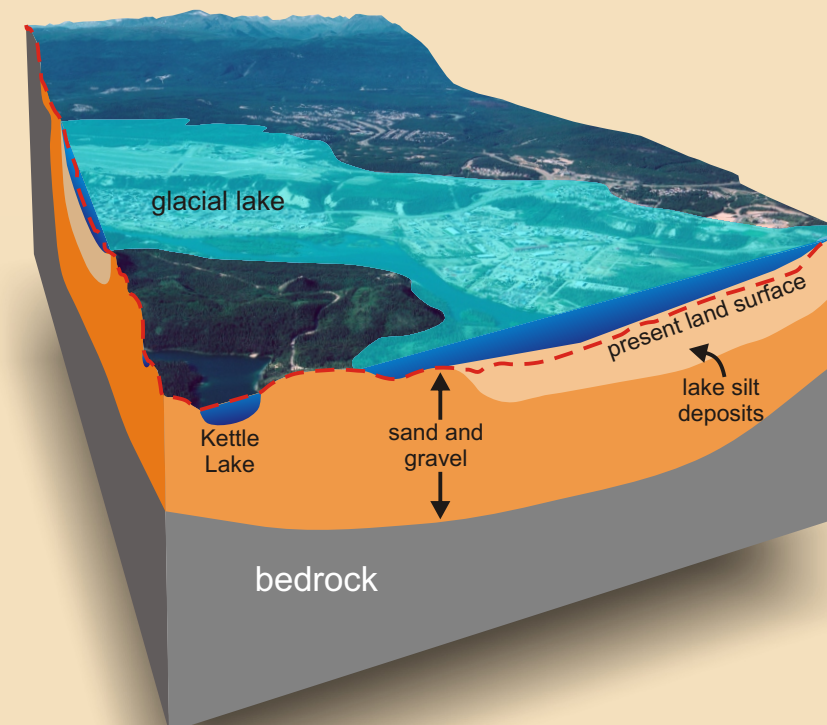
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## Glacial Lake Champagne

As the ice continued to melt, a dam of gravel, sand and clay formed near the northern end of modern-day Lake Laberge. The continued meltwater developed into a large lake known as Glacial Lake Champagne. At its highest level the lake extended from near the modern village of Champagne and included Marsh and Little Atlin lakes.



Sediments deposited in the bottom of Glacial Lake Champagne are visible as the "Clay Cliffs" which lie behind downtown Whitehorse. The cliffs consist mostly of silt, fine sand and clay deposited in thin, nearly level beds. They are rich in lime because the silt was derived from local rocks such as the Grey Mountain limestone, and cavities contain grey, star-shaped crystals of gypsum.



Eventually the lake breached the sand and gravel dam. The drying lake beds were blown into sand dunes along the Yukon River and the south end of Lake Laberge.

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