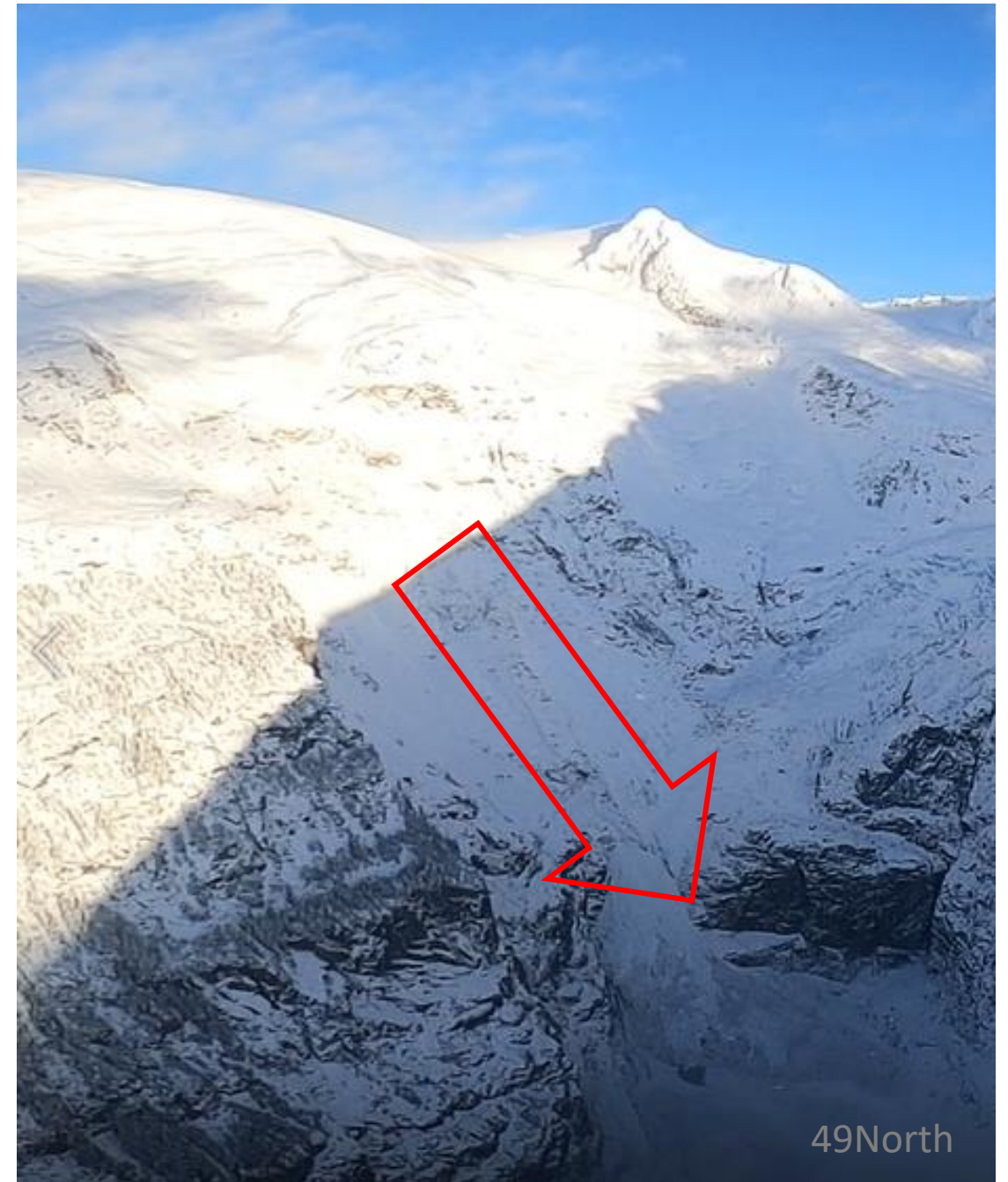


# The November 28<sup>th</sup> 2020 Elliot Creek Debris Flow

At around 6 am on November 28<sup>th</sup>,  
2020 a large block of rock broke  
away from the steep side of the  
Elliot Creek glacial valley and  
rumbled down towards Elliot Lake.

This video has no sound track



# The November 28<sup>th</sup> 2020 Elliot Creek Debris Flow

The rock slide turned into a rock avalanche and when it hit the lake it displaced a large volume of water, creating a glacial lake outburst flood. That triggered a massive debris flow which thundered down the valley of Elliot Creek.





# The November 28<sup>th</sup> 2020 Elliot Creek Debris Flow

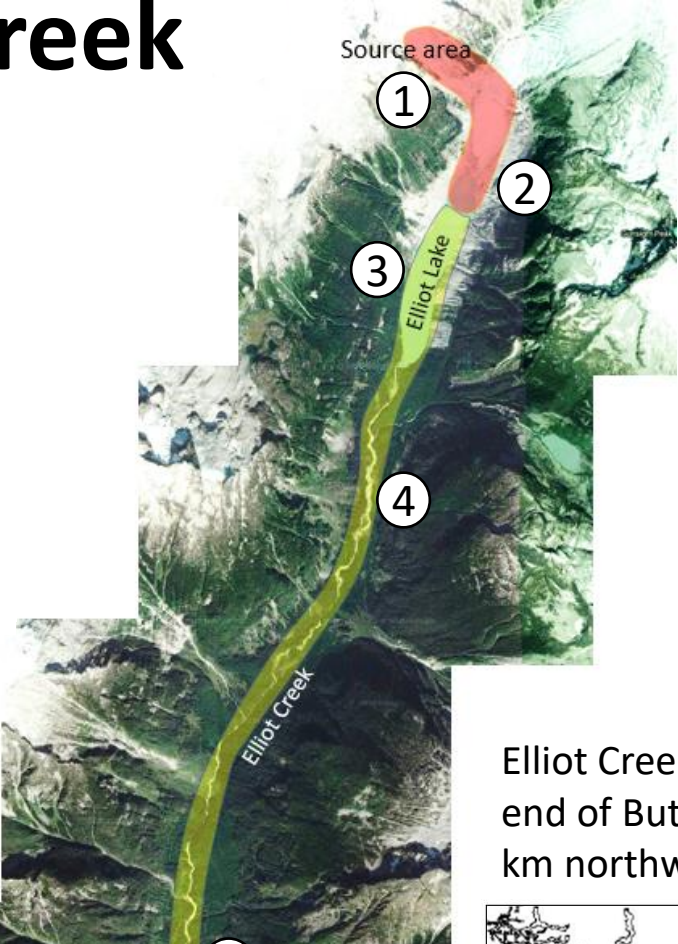
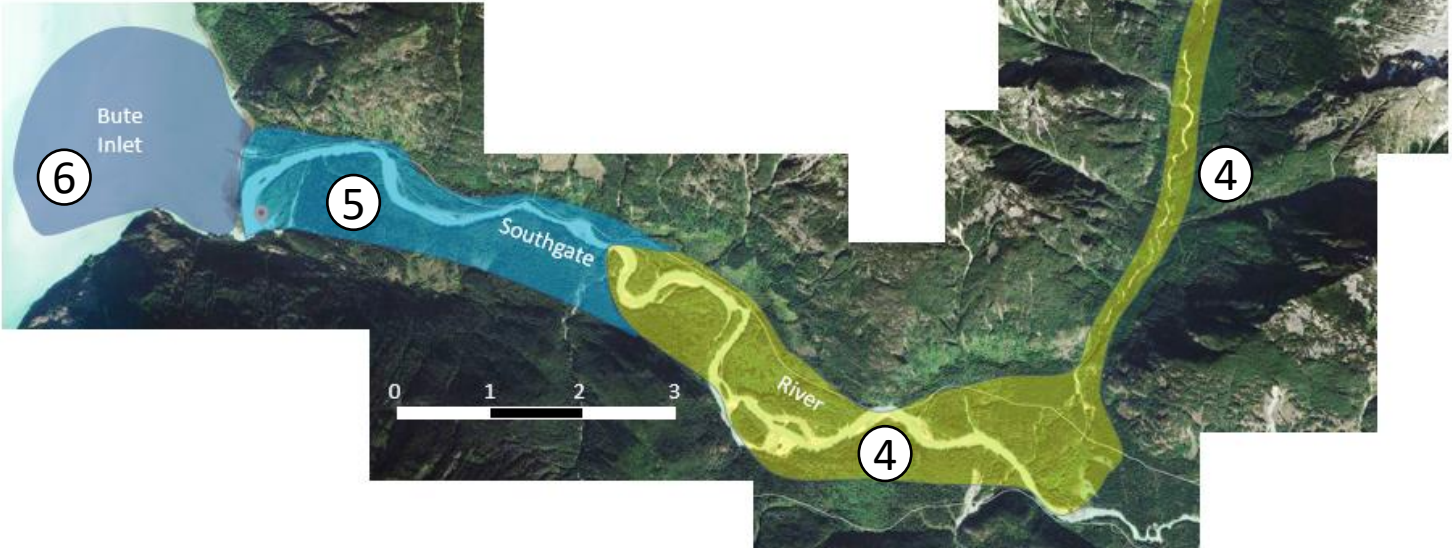
The debris flow continued another 10 km downstream into the valley of the Southgate River where it eventually morphed into a mudflow and a flood.

The devastation continued to the mouth of the Southgate River and out into Bute Inlet.

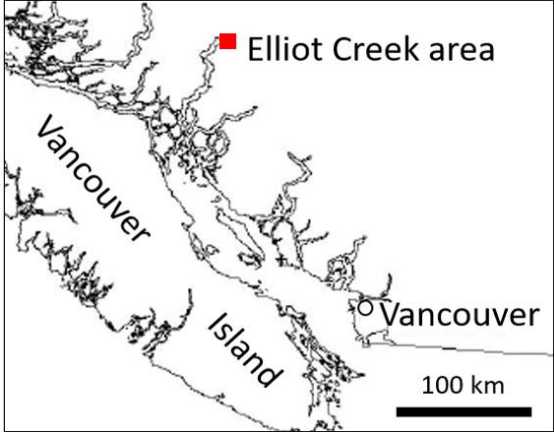


# The November 28<sup>th</sup> 2020 Elliot Creek Debris Flow and related events

- 1) Rock slide and
- 2) Rock avalanche
- 3) Glacial Lake outburst flood
- 4) Debris flow
- 5) Mud flow and flood
- 6) Suspended sediment plume and possible submarine density flow

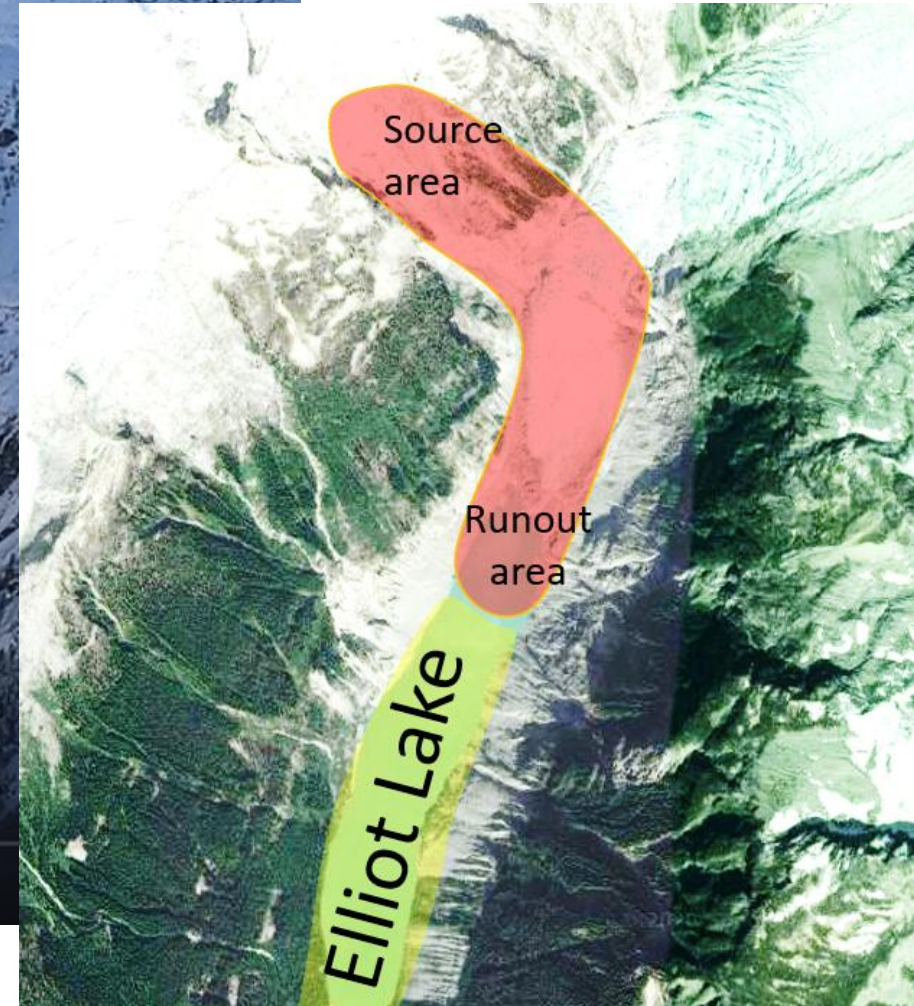
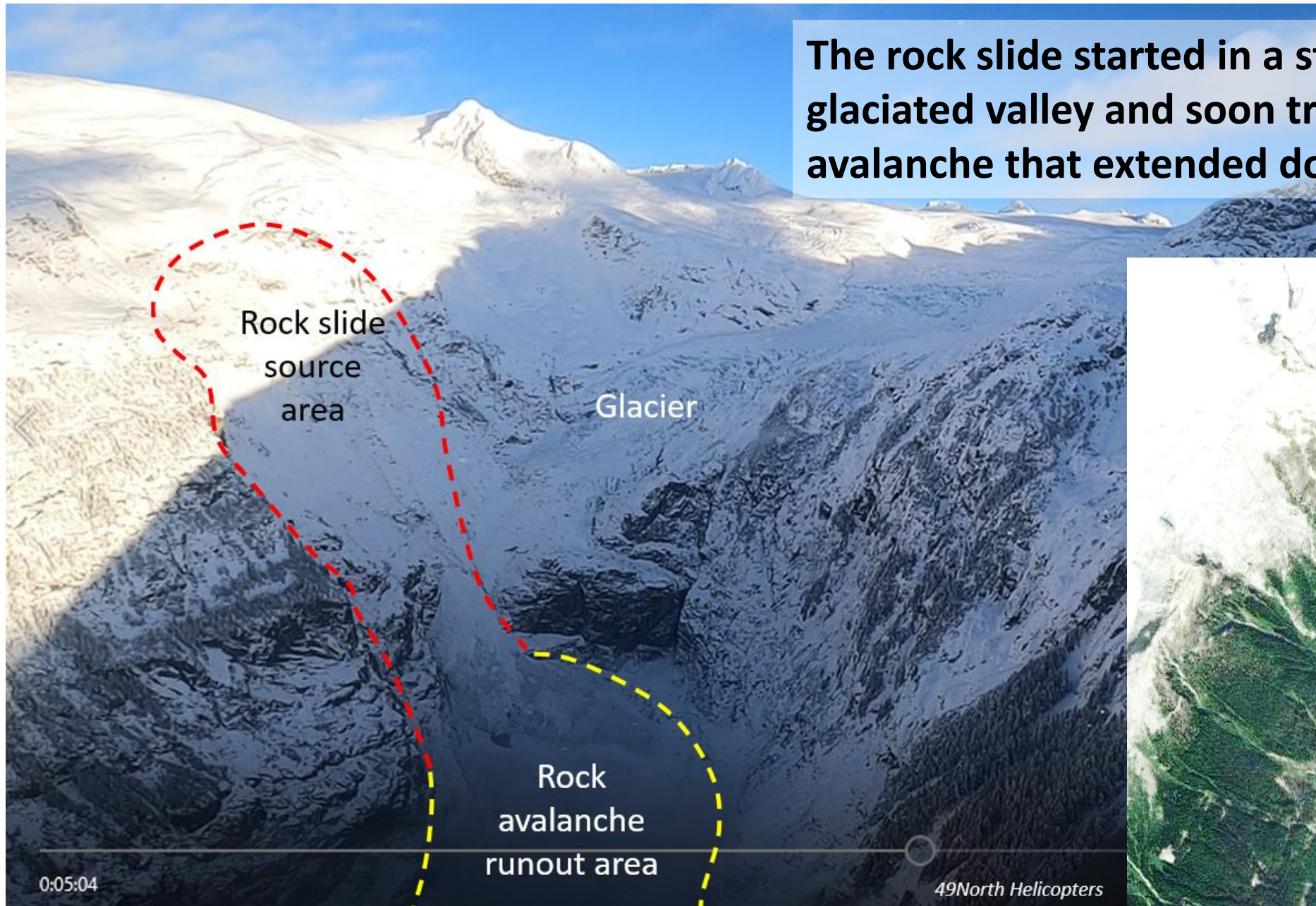


Elliot Creek is at the northern end of Bute Inlet, about 200 km northwest of Vancouver.

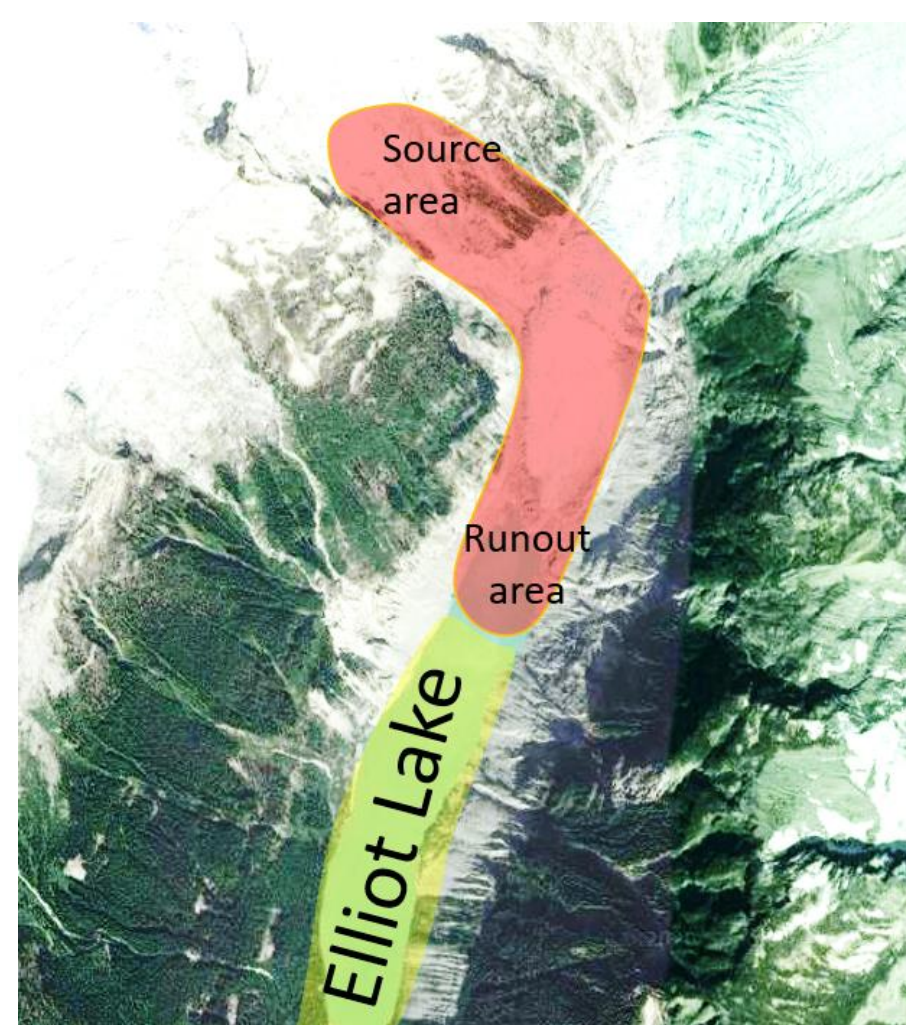




The rock slide started in a steep part of the glaciated valley and soon transformed into a rock avalanche that extended down into Elliot Lake.







The rock avalanche displaced the water in Elliot Lake creating a Glacial Lake Outburst Flood – a massive flow of water that was then channelled into Elliot Creek.

The trim line here shows that the water and debris extended several tens of metres above the normal level of the lake.

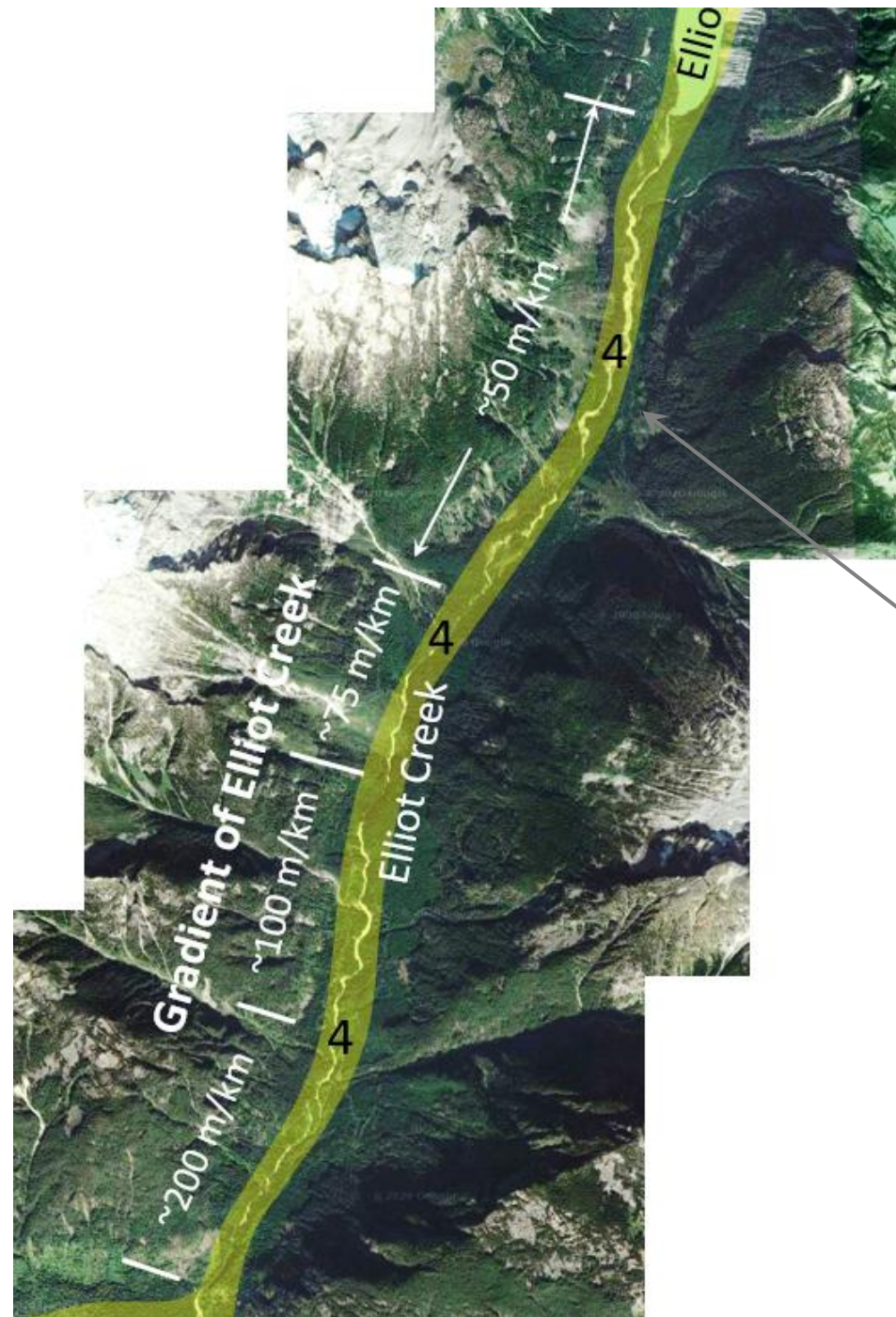


Elliot Lake



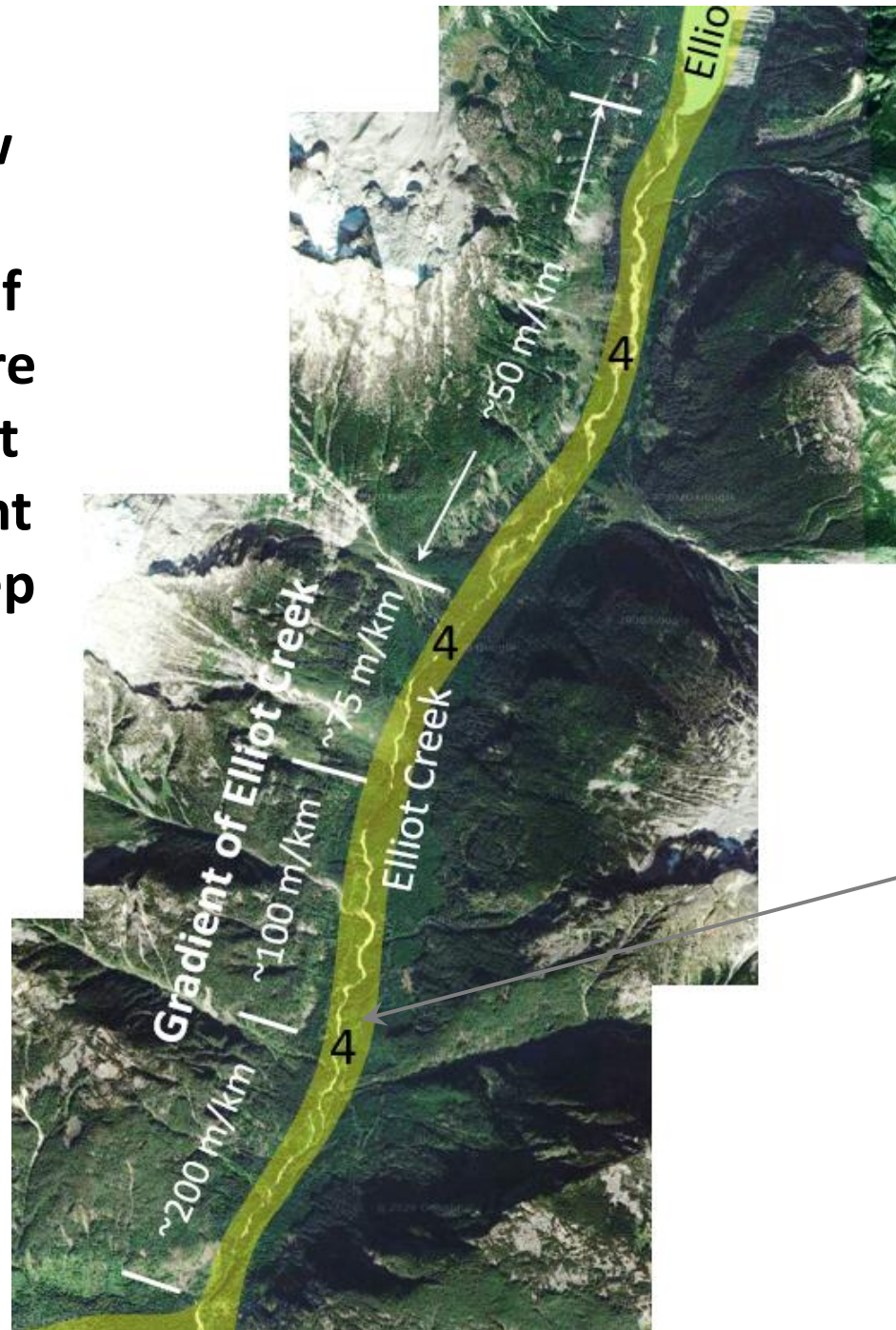
The outburst flood quickly eroded sediments in the valley of Elliot Creek and ripped up trees, creating a debris flow that raced down the valley towards the Southgate River.

As shown on the map, the gradient of Elliot Creek increases significantly in the downstream direction, so the debris flow likely accelerated on its way down.



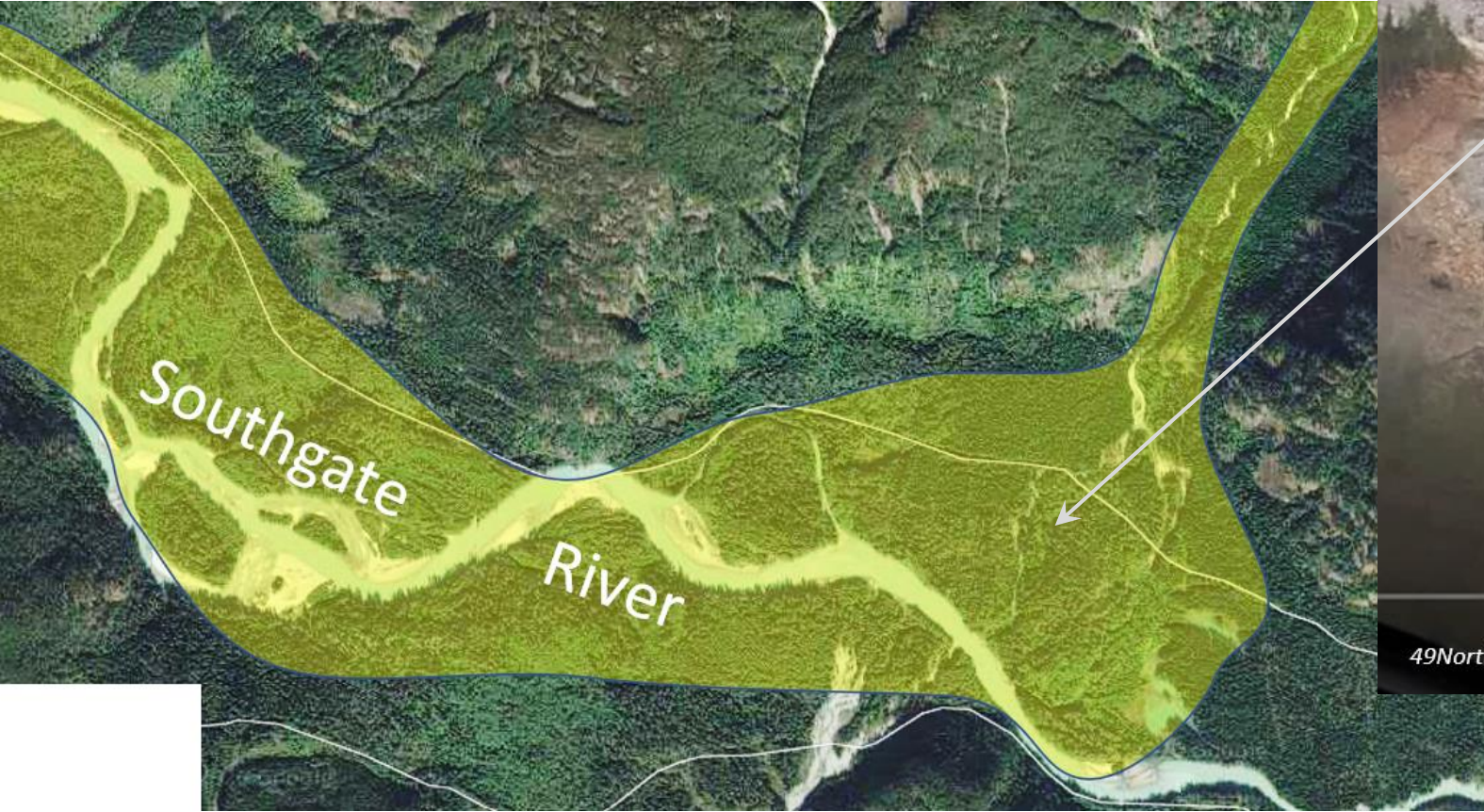


Existing sediments were eroded and new sediments deposited. Trees on either side of the stream valley were destroyed as a torrent of water and sediment roared down the steep valley...





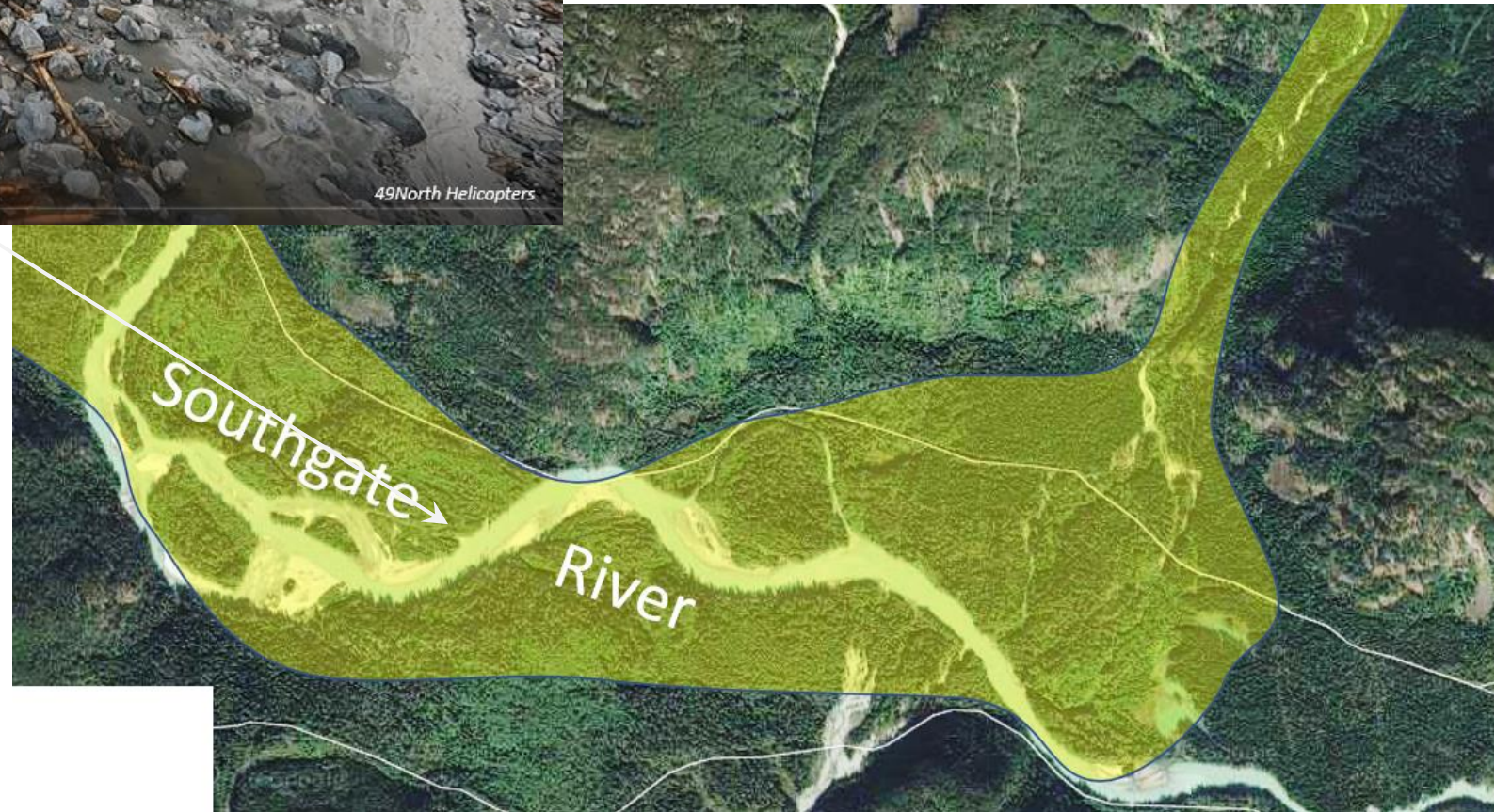
**...and out into the wide and much flatter valley of the Southgate River, where it continued to uproot large trees.**





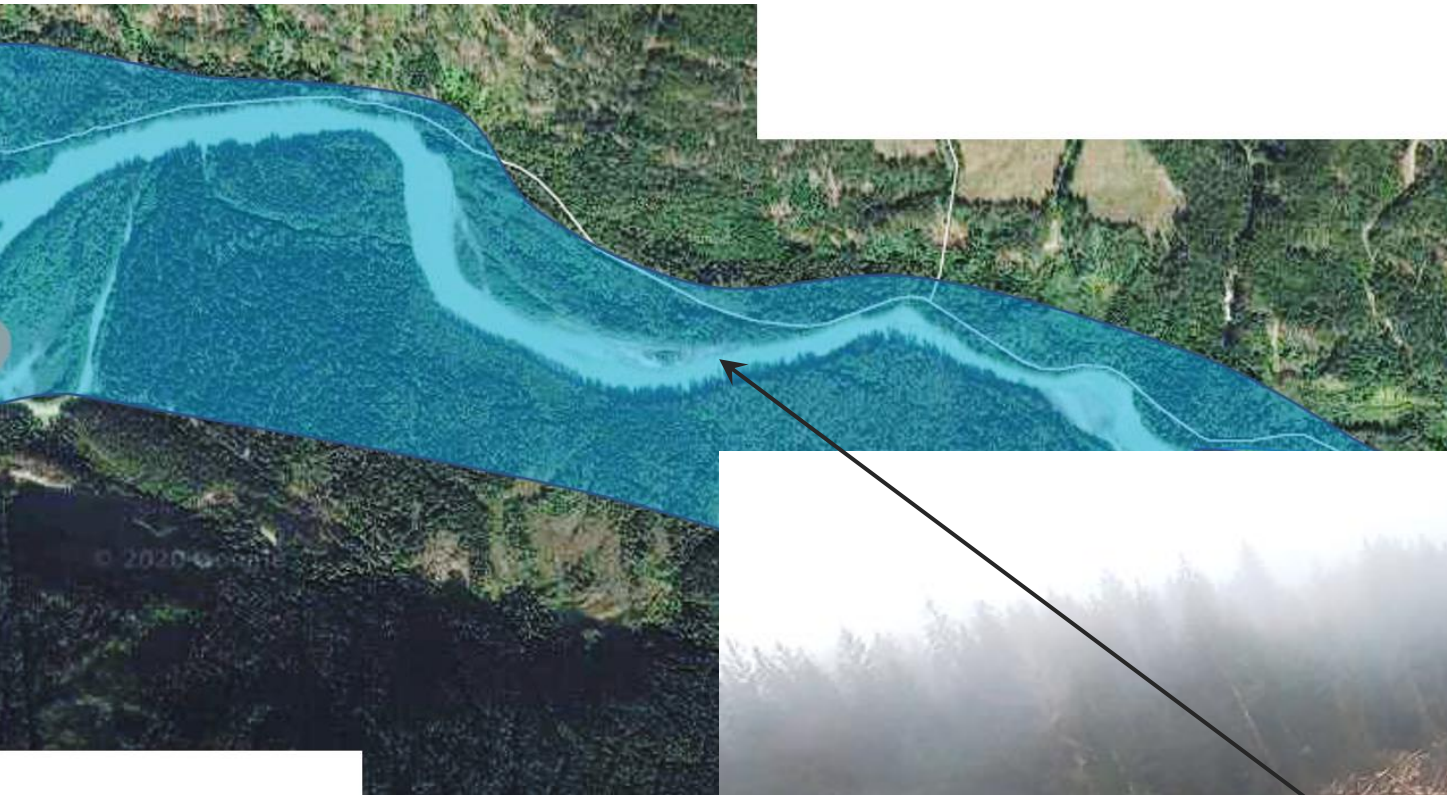


**The torrent of boulder-sized rocks and logs continued down the Southgate River, but it eventually slowed to the point where it no longer had the power to rip up trees.**





**By the time it reached the lower part of the Southgate River the velocity had dropped so that large rocks were no longer transported. It became a mud flow and a flood.**









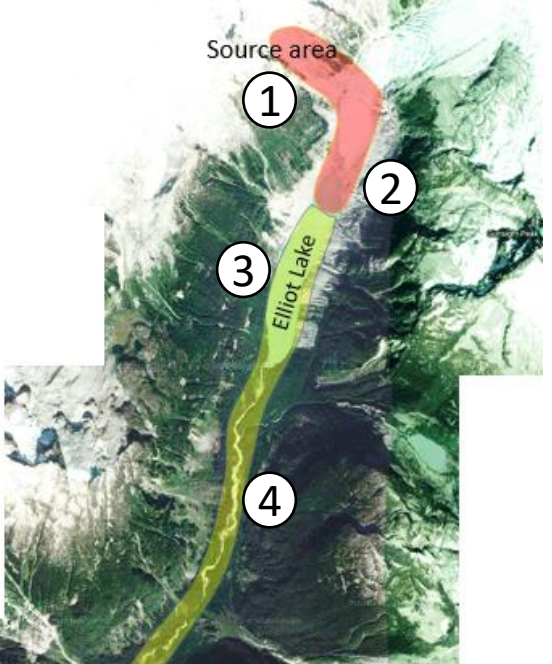
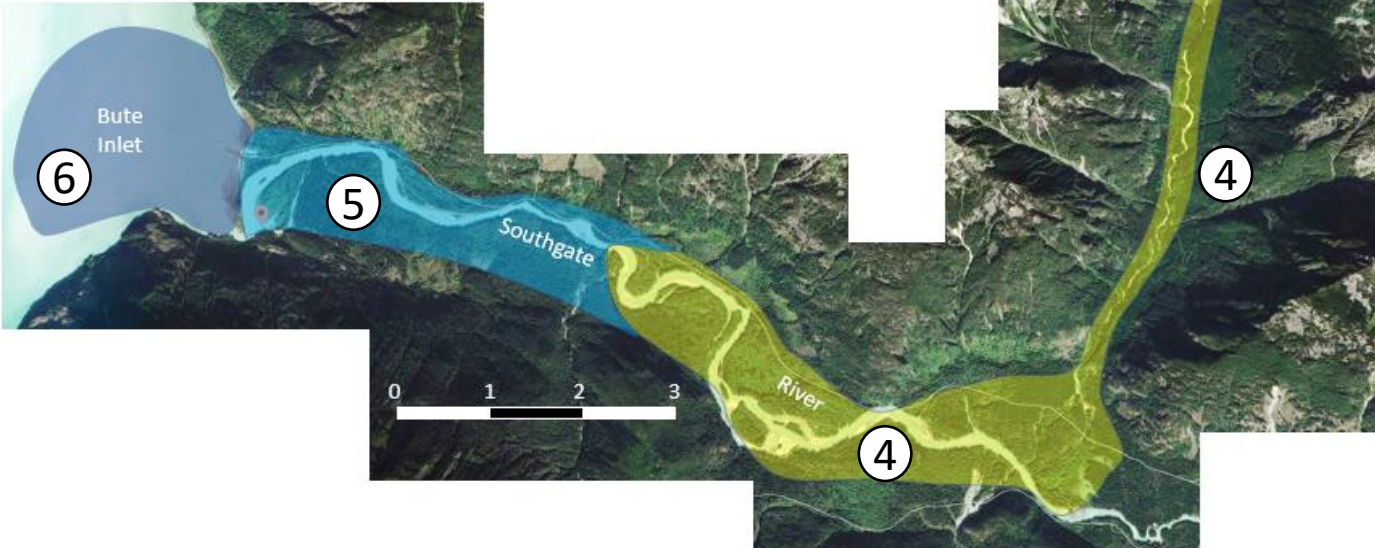
**The flood continued out into Bute Inlet with a massive pulse of suspended sediment. It may also have triggered a submarine density flow.**



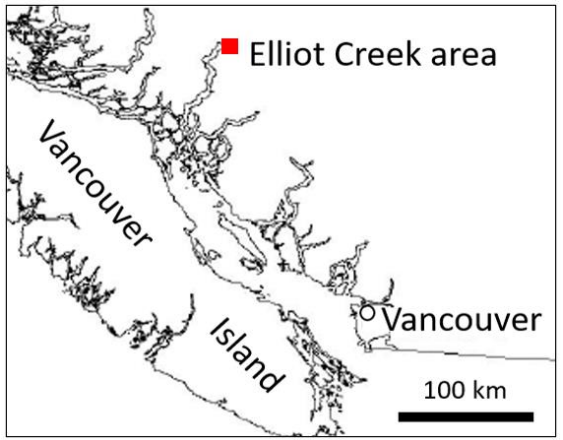


# Thanks to Bastian Fleury of 49North Helicopters for access to video images

-  1) Rock slide and
-  2) Rock avalanche
-  3) Glacial Lake outburst flood
-  4) Debris flow
-  5) Mud flow and flood
-  6) Suspended sediment plume and possible submarine density flow



Elliot Creek is at the northern end of Bute Inlet, about 200 km northwest of Vancouver.





# **Text summary for: Elliot Creek Debris Flow video**

The video includes a summary of the events of November 28<sup>th</sup> 2020, when a massive block of rock adjacent to a retreating glacier high in the Elliot Creek drainage basin failed. That transformed into a rock avalanche that flowed in the lake at the headwaters of Elliot Creek. That triggered a glacial lake outburst flood and a massive debris flow that thundered 10 km down Elliot Creek valley and then into the valley of the Southgate River, eventually reaching the ocean at Bute Inlet as a muddy flood.

The progress of the slide is illustrated with satellite images and photos that were taken by a helicopter pilot a few days after it happened.

The area is remote, and it is believed that nobody was in the path of the flow when it took place.