



# Canada's Ten Largest Earthquakes

Seismologists locate more than 4000 earthquakes every year in Canada and the surrounding areas. Most of these earthquakes are smaller than magnitude 3 (M3) and are not felt.

However, there have also been many large earthquakes in Canada. While some have occurred in remote regions, others have occurred in populated regions causing damage, injury and even death. These large earthquakes generally measure M6 or greater.

The earthquakes listed below are the 10 largest earthquakes known to have occurred in Canada.



Road damage north of Campbell River, BC from the 1946 Earthquake.



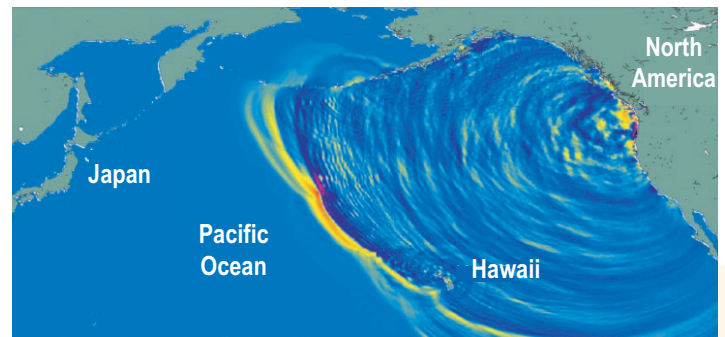
Locations of the 10 largest earthquakes in Canada.

## Cascadia Subduction Zone, off British Columbia January 26, 1700 – estimated M9

Written records in Japan of the tsunami generated by this earthquake provided the precise date and time of this event. Vancouver Island and First Nations' oral histories describe how the tsunami destroyed a village at Pachena Bay on the west coast of the island leaving no survivors. They also say the shaking damaged houses in the Cowichan Lake region of south central Vancouver Island.

## Offshore Haida Gwaii, British Columbia August 22, 1949 – M8.1; June 24, 1970 – M7.4; and May 26, 1929 – M7.0

The Queen Charlotte Fault was the site of three of the largest earthquakes in Canada's history, including the largest one in 150 years. This fault, known as a transform fault, separates two plates that are sliding past each other. The San Andreas Fault in California is another well-known example of a transform fault. The 1949 earthquake was felt as far north as the Yukon Territory and as far south as Oregon, U.S. Damage was limited due to the very sparse population. Nonetheless, on Haida Gwaii, chimneys toppled and cows were knocked off their feet. On the mainland, windows shattered and buildings swayed.



This mathematical simulation shows the tsunami created by the Cascadia Subduction Zone earthquake on January 26, 1700 as it reaches Hawaii on its way across the Pacific Ocean (Satake, K. et al. 2003).

Damage to the interior of the elementary school, Courtenay, BC.

## Vancouver Island, British Columbia

June 23, 1946 – M7.3

This remains Canada's largest recorded onshore earthquake and it resulted in two deaths. One was due to drowning, when an earthquake-induced wave capsized a small boat, and the other was due to a heart attack. This earthquake triggered numerous landslides across central Vancouver Island and the adjacent mainland. In nearby communities, 75 per cent of the chimneys toppled, brick façades were damaged and windows were broken.

## Charlevoix, Quebec

February 5, 1663 – estimated M7.0

This earthquake was felt over the entire eastern part of North America. It caused massive landslides which altered the landscape around the St. Maurice and Saguenay rivers. Despite the landslides, there was only minor structural damage and no reported deaths.

## Vancouver Island, British Columbia

December 6, 1918 – M6.9

This earthquake occurred just after midnight and awakened people all over Vancouver Island and Greater Vancouver. Amongst the damage was a wharf in Ucluelet and a lighthouse at Estevan Point. At the lighthouse the shaking was so severe that the entire length of the 33 metre steel-reinforced concrete tower cracked. The glass lens also shattered, rendering the lighthouse inoperable.

## Baffin Bay, Nunavut

November 20, 1933 – M7.3

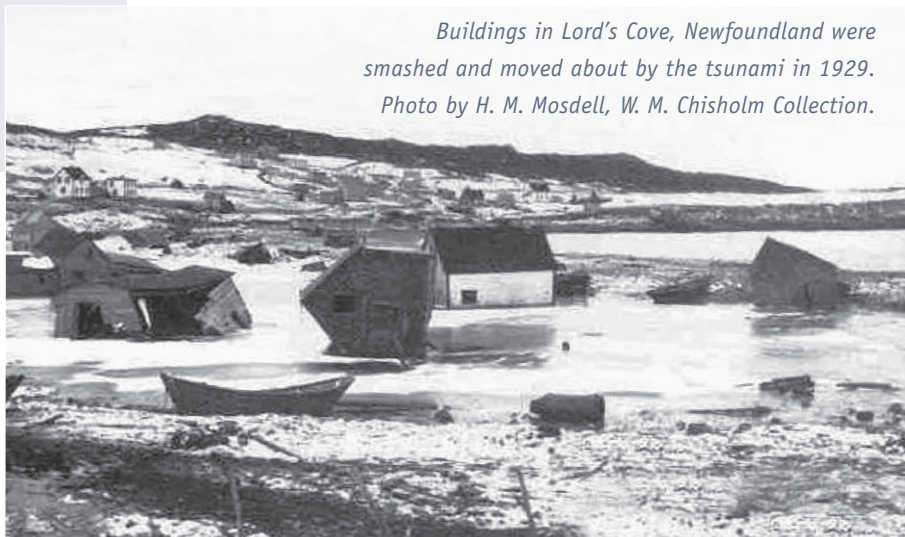
This is one of the largest earthquakes ever recorded north of the Arctic Circle. Due to the offshore location and limited infrastructure in the region, there was no reported damage.

## "Grand Banks," Newfoundland

November 18, 1929 – M7.2; also known as the Laurentian Slope Earthquake and the South Shore Disaster

This earthquake south of Newfoundland generated a tsunami that resulted in the deaths of 28 people on Newfoundland's Burin Peninsula. Homes, ships, businesses, livestock and fishing gear were destroyed. Property losses totalled more than one million 1929 dollars. The adjacent photograph shows buildings that were tossed and smashed by the tsunami.

*Buildings in Lord's Cove, Newfoundland were smashed and moved about by the tsunami in 1929. Photo by H. M. Mosdell, W. M. Chisholm Collection.*



## Nahanni Region, Northwest Territories

December 23, 1985 – M6.9

Before 1985, the Nahanni Range experienced very little earthquake activity. This earthquake caused widespread alarm as most people in the Northwest Territories had never felt an earthquake. No major structural damage was reported as the nearest communities were located 100 kilometres or more away from the epicentre.

Government of Canada monitoring and research on earthquakes is undertaken by Natural Resources Canada's Earth Sciences Sector.

For more information on earthquakes visit the Geological Survey of Canada, NRCan website:

[EarthquakesCanada.nrcan.gc.ca](http://EarthquakesCanada.nrcan.gc.ca)

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