

## Major Landslides Causing Fatalities

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### Abstract

Landslides are the downslope movements of sediment and rock. They can be found in any part of Canada, even in areas with very little relief. They happen in bedrock or in loose sediment, on land or under water. They can be large or small, rapid or slow, and generally occur without warning.

This map depicts 45 landslides in Canada that have resulted in more than 600 fatalities in historical times (post-1840). This number is a minimum value, based on the definition of a landslide disaster as three or more deaths in a single event. Events with one to two fatalities are difficult to trace and have not been included in the database. In some of these disasters, the death can be attributed to secondary effects (flood waves and tsunamis) triggered by the landslide.

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### Map Sources

#### Areas Vulnerable to Landslides

This map shows 4 areas vulnerable to landslides in Canada. Areas of glaciolacustrine and glaciomarine silts and clays are based on the map of Surficial Geology - Map 1880A. Areas of Cretaceous bedrock on the Plains are based on the Rock Era and Geological Provinces elements of the Geological Map of Canada - Map D1860A. The area of the Canadian Cordillera is taken from the Geological Map of Canada - Map D1860A.

Geological Map of Canada - Map D1860A [CD-ROM]. (1997) Ottawa, Ontario: Geological Survey of Canada, Natural Resources Canada.

Fulton, R.J. 1995. Surficial Materials of Canada, Geological Survey of Canada, Map 1880A.

#### Major Landslides 1840 - 2006

This map depicts 45 landslides in Canada that have resulted in over 600 fatalities in historic times (post-1840). This number is a minimum value, based on the definition of a landslide disaster as 3 or more deaths in a single event. Events with 1 to 2 fatalities are difficult to trace and have not been included in the database. In some of these disasters the death can be attributed to secondary effects (flood waves and tsunamis) triggered by the landslide. Geological Survey of Canada, Natural Resources Canada.

#### Permafrost

This map was produced from Canada-Permafrost, Fifth Edition of the National Atlas of Canada [map], printed in 1993. The data was derived from the Geological Survey

of Canada, Terrain Sciences Division. It portrays the extent of the zones covered by permafrost and ground ice in Canada.

### **Population Density by Census Division, 2001**

Canada. Statistics Canada. 2001 Census of Population.

### **Relief**

Elevation data were derived from Canada-Relief, Fifth Edition of the National Atlas of Canada [map], printed in 1986.

### **References**

Evans, S.G. 2001. Landslides; in A Synthesis of Geological Hazards in Canada (ed.) G.R. Brooks, Geological Survey of Canada, Bulletin 548, p. 43-79.

### **Related Web sites (1999 – 2009)**

#### **Federal Government**

Canadian Broadcasting Corporation. Archives de Radio-Canada, Glissement de terrain à Saint-Jean-Vianney

[http://archives.radio-canada.ca/environnement/catastrophes\\_naturelles/dossiers/51/](http://archives.radio-canada.ca/environnement/catastrophes_naturelles/dossiers/51/)

News footage filmed in the days following the disastrous landslide at Saint-Jean-Vianney, Quebec, can be seen on the CBC Archives. (French only)

Natural Resources Canada. Canada Landslide Loss Reduction Initiative

<http://gsc.nrcan.gc.ca/landslides/>

Landslides Canada, the main landslide website of Natural Resources Canada contains information on landslides, recent events, an interactive Canadian landslides map and queriable database and a great photo collection. And through 'Related Links' on this website, you can access the federal and provincial emergency preparedness organizations and also follow links to websites of international municipalities that have developed strategies for planning, zoning, and risk mitigation.

Natural Resources Canada. Geological Survey of Canada. Landslides, photo collection

[http://gsc.nrcan.gc.ca/landslides/photo\\_library\\_all\\_e.php](http://gsc.nrcan.gc.ca/landslides/photo_library_all_e.php)

A collection of downloadable photographs of landslides in Canada

Public Safety and Emergency Preparedness Canada

<http://www.publicsafety.gc.ca/>

Public Safety Canada. Is your family prepared?

<http://www.getprepared.gc.ca/index-eng.aspx>



## **Provincial/Territorial Government**

Government of British Columbia. Landslides in British Columbia

<http://www.em.gov.bc.ca/Mining/Geolsurv/Surficial/landslid/default.htm>

Good coverage of landslides in British Columbia, including what to do to minimize risk.

## **Other**

Frank Slide Interpretive Centre

<http://www.frankslide.com/faq.html>

Information on the 1903 landslide at Frank, Alberta, can be found on the website of the Frank Slide Interpretive Centre

United States Geological Survey

<http://www.usgs.gov/>

Information on landslide hazard can be found on the website of the United States Geological Survey.

