

## GEOLOGICAL HAZARDS AND DISASTERS IN NEWFOUNDLAND – RECENT DISCOVERIES

D.G. Liverman, M.J. Batterson and D. Taylor  
Geochemistry, Geophysics and Terrain Sciences Section

---

### ABSTRACT

*New information has come to light regarding several geological disasters in Newfoundland and Labrador. These reports, although generally poorly documented, suggest that deaths from geological disasters in the province number at least 160, rather than 80 as previously reported. Ten incidents are described from the period 1782 to 1911. These include an avalanche in the Nain area in 1782 that killed 22, and 42 fatalities in a rock-fall near Ferryland, in 1823. These are amongst the worst mass-movement disasters in Canadian history.*

---

### INTRODUCTION

The publication of the paper “Geological Hazards and Disasters in Newfoundland” in the Canadian Geotechnical Journal (Liverman *et al.*, 2001; based largely on previous articles published in this forum; Batterson *et al.*, 1995, 1999) resulted in considerable local interest. A St. John’s newspaper, The Telegram, published an article outlining the main findings of the paper, as well as an interview with the authors. This coincidentally appeared the same week as a public lecture on the subject was delivered, as well as radio interviews. The publicity arising from these events resulted in a more widespread public awareness of the project, and in subsequent weeks the authors were contacted by several people with ‘anecdotal’ information that greatly enhances the findings of the previously published paper. Several of these incidents occurred early in the history of Newfoundland, and it has proven difficult to corroborate them. However, the published accounts outlined below appear authentic. In addition, further archival research has located some additional fatalities not recorded in previous work.

New incidents located as a result of this information are presented in Table 1 and Figure 1; and are briefly outlined below.

#### EARLIEST RECORDED AVALANCHE IN CANADA

Wallace J. McLean, studying the Moravian Mission papers from Labrador, found that a serious avalanche had occurred in the 18th century, well before the period covered by most of the authors’ previous research. The following appears in a postscript to a 1782 letter signed “your sincere well wishers, the Missionarys at Nain and in their names”:

*“A Lamentable Circumstance has happened this last winter about twelve miles from us (i.e., at Nain), upon the edge of a hill under which was an Esquimaux winter hauss where 31 Esquimaux lived, there gather’d a monstrous body of snow which shot all at once down and pressed the winter hauss even with the ground, with all the people in it excepting one man who was buried in the snow without. Out of 31 only 9 got out alive” (National Archives of Canada 1764-1955).*

Thus, this avalanche is the earliest recorded avalanche in Canada – possibly in North America, the worst avalanche disaster in the history of Newfoundland and Labrador, and the worst avalanche disaster in Canada to affect people in their houses. The coastline around Nain contains numerous steep slopes and the exact location of this incident is unlikely to be discovered, although it has been suggested by local residents that it might have occurred on a south-southeast aspect slope of the southern part of West Red Island (P. Fenton, personal communication, 2002).

#### TRINITY 1873

The Royal Gazette of January 1873 reported the following incident in Trinity:

*“A very sad accident happened on the south side of the harbour on Monday. (Monday was the 6 Jan, previous Monday 31 Dec. 1872). Two men, brothers named CHURCHILL went from their home not many yards distant to dig out a well which was under a hill, when a large quantity of snow fell from 60 feet and buried them. One was dead, the other recovered” (Howard, 1992).*

No comprehensive census exists at this time but various business directories listing householders and occupations were published. In 1871, three Churchills are known to be

**Table 1.** Geological disasters in Newfoundland and Labrador - additional information

Date	Type of Disaster	Location	Deaths	Description	Source
1782	Avalanche	Nain	22	Avalanche struck house containing 30	Letters of the Moravian Missionaries
1823	Rockfall	Ferryland	42	Roof of sea-cave collapsed, crushing fishermen sheltering from storm	Newfoundland Quarterly 1920
1849	Rockfall	Grate's Cove	2	Rockfall from sea-cliff killing two brothers	Howard, 1983
1852	Rockfall	Kelley's Island	1	Rock fell from sea-cliff	Harbour Grace Herald, Howard, 1980
~1860	Landslide	Cape Shore	7	Landslide killed 7 fishermen in camp	1911 newspaper article
1873	Avalanche	Trinity	1	Avalanche buried two, killed one	Royal Gazette 1873, Howard, 1992
~1900	Avalanche	Cartwright	3	Avalanche killed Tom Davis, Solomon Morgan and Andrew Reeves	Them Days, 1995
1903	Rockfall	Pouch Cove	1	David Constantine killed	1903 newspaper
1911	Landslide	Cape Shore	1	Landslide killed Richard Taylor in camp	1911 newspaper
~1910	Avalanche	Burgeo area	1	Avalanche killed Joseph Strickland while traveling in the country	Diary of Burgeo (Small, 1925)

living in Trinity, George, Joseph and Richard, all fishermen. By 1894 only two Churchills are recorded, Richard and Edward, and in 1898 George, Dennis and Richard Churchill are listed (Newfoundland Grand Banks web site, 2002). It is possible that the man killed was Joseph Churchill. Lying across from the town of Trinity, on the other side of South West Arm, Sugar Loaf and Salvage Hill rise steeply from the water's edge to over 100 m above the sea. These north-facing slopes seem to be the most likely site of the avalanche, although fortunately no houses are found there now.

#### **CARTWRIGHT AVALANCHE**

In 1979, Frank Davis recounted a story handed down through his family of a tragedy that occurred around the turn of the century (Davis, 1993). His father (John Davis), grandfather (Thomas Davis), uncle (Tom Davis), great-uncle (Solomon Morgan) and Andrew Reeves decided to climb up Andrew's Hill near Cartwright, southern Labrador, one afternoon in March. John Davis (who was suffering from a nose bleed and was lagging behind the other four) saw the

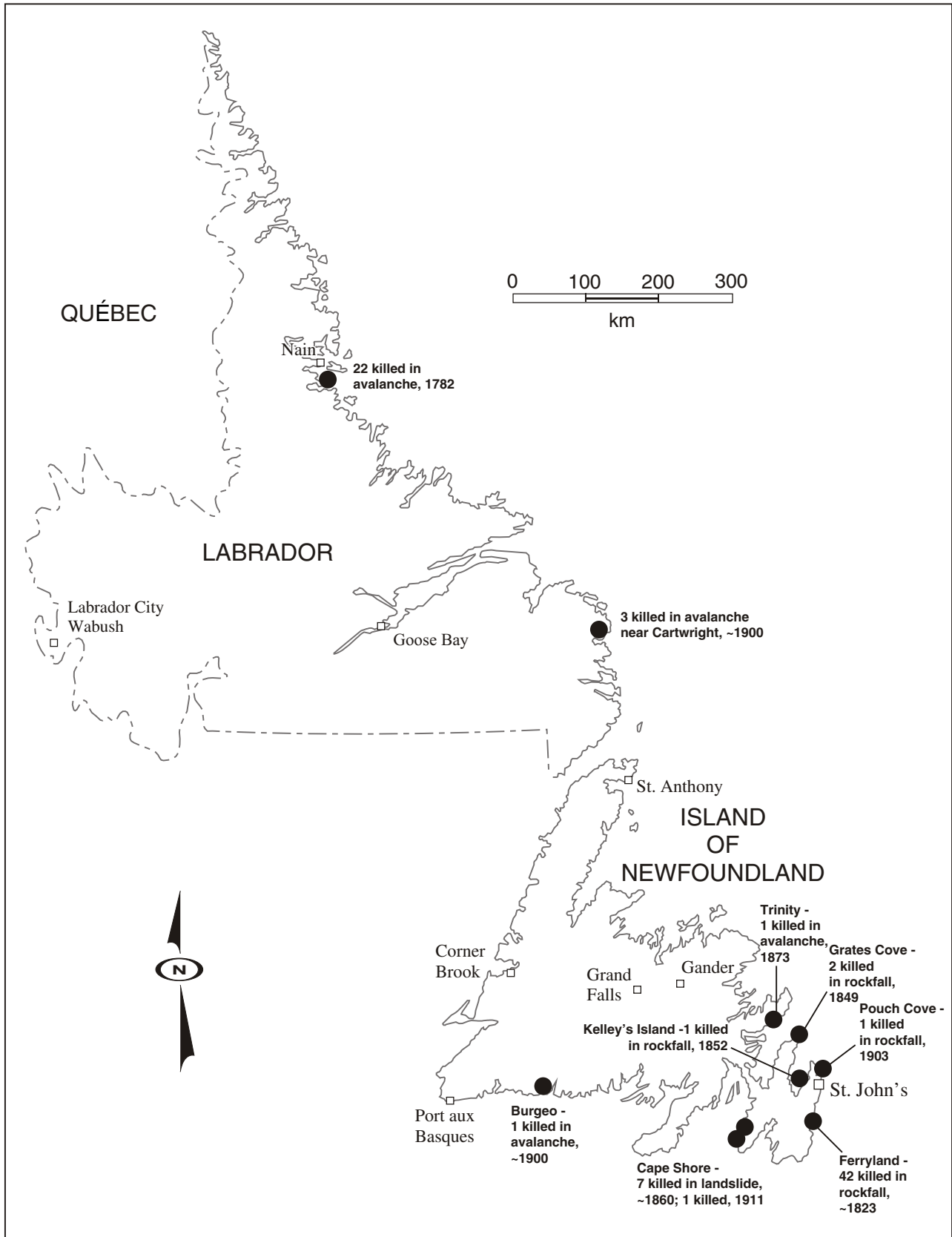


Figure 1. Location of disasters described in text.

overhang give way, avalanching down the slope and burying his four companions. He rushed to the scene and was able to extract his father by digging with his snowshoe. The two then quickly returned to the community to get shovels and help, but when the other three were dug out, they were all dead.

### BURGEO AVALANCHE

A hint of another avalanche victim comes from the diary of Joseph Small. Small (1923) was the enumerator for the 1921 census in the Burgeo area, and wrote about the area in his “Diary of Burgeo”. When discussing the people of the small community of Bay de Lieu, he outlines the history of the Strickland family. He writes:

*“William married first, a woman at Hunt’s, who did not live very long. There was no family. In 1860, he married Sarah Timberley, who is still living with her daughter, Mrs. (George) Sutton. They had quite a family. Edward died a young man. James married a daughter of John Crant. Both are still living. John married Sarah Kinslow of Red Island. Both of them are also still living. Joseph never married; he was killed in the country by an avalanche of snow fifteen years ago.”*

This is the only indication we have of this tragedy, that apparently took place around 1910.

### LANDSLIDES ON THE CAPE SHORE

A landslide death on the Cape Shore was reported in the Daily News of 5 June, 1911, and this points to an earlier, more serious tragedy in the same area. Richard Taylor of Placentia was killed by a landslide while camped under Lord’s Rock, near Cape Cove, Placentia Bay. There was heavy rain overnight and “some tons of rock and clay became loose from an overhanging cliff”. Taylor was killed; and three others escaped. In the report of this tragedy, an earlier incident was outlined as follows:

*“About 50 years ago at almost the same spot where deceased was killed, a landslide took place and seven fisherman lost their lives, their bodies being crushed beyond recognition.”*

Without an exact date, newspaper reports of this incident have been hard to track down.

### FERRYLAND ROCKFALL

The Newfoundland Quarterly of March, 1902, reports a story about a cave-in at the Gulch in Ferryland Harbour that apparently occurred in 1823 (White, 1902). White (*op. cit.*) tells the story in considerable detail but does not indicate the source of this information. Corroboration of the story has proved difficult – few newspapers were published in this period, and those that were published have much of 1823 missing in the archived copies.

White (1902) describes the events at “Deadman’s Gulch”, a feature now clearly apparent on aerial photographs as a gulch or notch in the cliff edge, extending several hundred metres inland from the coast on the south side of the Narrows that lead into Ferryland Harbour. He describes the incident as follows:

*“In 1823 or thereabouts it did not thus appear. It was then a mammoth cave, with an entrance to the ocean, in and out from which fishermen were accustomed to go from time to time to secure bait fish that used to frequent the gulch. But in the year of which I write forty-two fishermen in about 14-15 boats entered the cave to avoid being swamped by a severe storm of wind and rain, accompanied by the usual heavy sea which had overtaken them while on the fishing ground.”*

No sign of the boats or fishermen was ever found. Residents of Ferryland heard a sound resembling a very loud clap of thunder, and the next morning

*“They arrived at the Gulch (as gulch it was then) and discovered that during the night its roof had fallen in, burying the 42 fishermen – not one having been rescued. None of the bodies were ever picked up; having been buried, no doubt, beneath the crushing mass of stone which had fallen on them.”*

If this story is authentic, this is the worst geologically related disaster in the Province of Newfoundland and Labrador (with 14 more deaths than the Burin Peninsula tsunami), and the third worst landslide disaster in Canadian history (Evans, 1999), with more people being killed only in the Frank slide (75 fatalities in 1903) and in Quebec City (50 killed in 1889).

The site was visited in the summer of 2002. It is apparent that a major rockfall has occurred at this location. The mouth of the gulch is choked with large, angular boulders ranging from 1 to 7 m in diameter (Plate 1). The bedrock in this area consists mainly of sandstone of the Ferryland Head Formation (King, 1988), dipping to the east at 75°. The gulch appears to have formed when wave action exploited a more easily erodible bed, forming a sea cave extending back from the coast over 100 m. The current floor of the gulch contains a well grassed area on the surface, of which well-rounded erratic boulders are found (Plate 2). These boulders are not found elsewhere in the gulch. This may be the upper roof of the cave, preserved after the collapse. Thus, there is sound geological evidence of a major cave collapse and rockfall in the gulch that lends credence to White’s account.

### OTHER ROCKFALLS

Two additional fatal rockfalls come from the Mildred Howard collection, a summary of major events in 19<sup>th</sup> century Newfoundland newspapers held at the Provincial Archives. On 4 November, 1849, in Grates Cove, two brothers lost their lives Solomon and Azariah Martin were



**Plate 1.** *Deadman's Gulch, Ferryland.*

*“dreadfully crushed by falling stone while with many others in the act of securing their craft from heavy seas”*. The elder brother, Azariah was rescued alive but died later, the younger (Solomon) was washed out to sea. Three years later James Bradbury was killed when a stone fell from a cliff 12' above, hitting him on the head. He was mooring his boat on Kelley's Island, Conception Bay.

Further archival research located another rockfall fatality, in May 1903, when David Constantine was killed at Pouch Cove (reported in the Daily News). Constantine was working on building a wharf when a boulder came loose from the cliff above him.

*“The boulder struck the man on the back and head, cleaving open the latter, and mutilating his back and he died instantly. He leaves a wife and eight children to mourn their loss.”*

## DISCUSSION

Further work is required to corroborate these new reported incidents. In particular, the Ferryland rockfall must be considered to some degree speculative, although the amount of detail in the account of White (1902) is impressive. It may not be possible, however, to gather further evidence of these incidents, given the length of time that has elapsed since their occurrence, and the very limited sources available. Table 2 is a revised version of that found in Liverman *et al.* (2001) in the light of these new incidents. Liverman *et al.* (2001) estimated mortality rates due to hazards as being 0.21 deaths / 100 000 population / year over the last 160 years. If the period of study is extended to 225 years, then a lower estimate of population is warranted (the population of Newfoundland was approximately 20 000 in 1790, and 40 000 in 1815). If the total number of deaths is 161 rather than 80, the period extended from 160 years to 225 years, and using 175 000 as an average for the population, the mortality rate can be re-calculated as 0.4 deaths / 100 000 population / year. Given the incomplete nature of the record, this should be considered a minimum. This further confirms the conclusion of Liverman *et al.* (2001) that, “the historical risk of



**Plate 2.** *Erratic preserved on roof of collapsed cave, Deadman's Gulch, Ferryland.*

Liverman *et al.* (2001) estimated mortality rates due to hazards as being 0.21 deaths / 100 000 population / year over the last 160 years. If the period of study is extended to 225 years, then a lower estimate of population is warranted (the population of Newfoundland was approximately 20 000 in 1790, and 40 000 in 1815). If the total number of deaths is 161 rather than 80, the period extended from 160 years to 225 years, and using 175 000 as an average for the population, the mortality rate can be re-calculated as 0.4 deaths / 100 000 population / year. Given the incomplete nature of the record, this should be considered a minimum. This further confirms the conclusion of Liverman *et al.* (2001) that, “the historical risk of

**Table 2.** Deaths from geological phenomena in Newfoundland and Labrador

Type of Disaster	Deaths
Landslide	19
Rockfall	51
Avalanche	61
Coastal flooding	30
<b>TOTAL</b>	<b>161</b>

death in landslide or avalanche in Newfoundland is considerably higher than the Canadian average, and likely as high or higher than British Columbia.”

### ACKNOWLEDGMENTS

The authors are most grateful to those who contacted us with regard to the events listed above. Wallace McLean pointed us to the Nain and Cartwright avalanches. Ray Curran told us about the Ferryland rockfall. Moira Baird of the Telegram wrote the excellent article that prompted these responses. Don Tate, Director of the “Newfoundland’s Grand Banks Genealogy Site” provided pointers that led us to the Burgeo avalanche and the Cape Shore landslides. Paul Fenton of Nain has provided us with valuable information as to avalanche hazard in northern Labrador. To all of these, many thanks. Shirley McCuaig is thanked for her review of this article.

### REFERENCES

Batterson, M.J., Liverman, D.G.E. and Taylor, D.M.

1995: The assessment of geological hazards and disasters in Newfoundland. *In* Current Research. Newfoundland Department of Natural Resources, Geological Survey, Report 95-1, pages 55-75.

Batterson, M.J., Liverman, D.G.E., Taylor, D. and Ryan, J.

1999: The assessment of geological hazards in Newfoundland - an update. *In* Current Research. Newfoundland Department of Mines and Energy, Geological Survey Branch, Report 99-1, pages 95-124.

Davis, F.

1993: Three killed at Murdering Corner. *Them Days*, Volume 18, page 42.

Evans, S.G.

1999: Landslide Disasters in Canada 1840-1998. Geological Survey of Canada, Open File 3712 (map with marginal notes).

Howard, M.

1980: Vital Statistics and items from newspapers of Newfoundland 1834 to 1854, Volume 3, published by author.

1983: Vital Statistics and items from newspapers of Newfoundland 1831 to 1872, Volume 6, published by author.

1992: Royal Gazette and Newfoundland Advertiser 1863-1865. Vital statistics and items, Volume 3, published by auher.

King, A.F.

1988: Geology of the Avalon Peninsula, Newfoundland (parts of 1K, 1L, 1M, 1N and 2C). Newfoundland Department of Mines and Energy, Mineral Development Division, Map 88-001.

Liverman, D.G.E., Batterson, M.J., Taylor, D. and Ryan, J.

2001: Geological hazards and disasters in Newfoundland. *Canadian Geotechnical Journal*, Volume 38, pages 936-956.

National Archives of Canada

1764-1955: Moravian Bretheren Fonds: Labrador Mission Papers, MG17-D1B-X-1, page 38, 750 et ff., microfilm reel -509.

Newfoundland Grand Banks

2002: Web site, <http://ngb.chebucto.org/>

Small, J.

1923: “Diary of Burgeo”. Hand-written manuscript in the Newfoundland Collections of the Newfoundland and Labrador Genealogical Society.

White, J.L.

1902: Ferryland (what doth not appear in history). *Newfoundland Quarterly*, March issue, pages 19-21.