

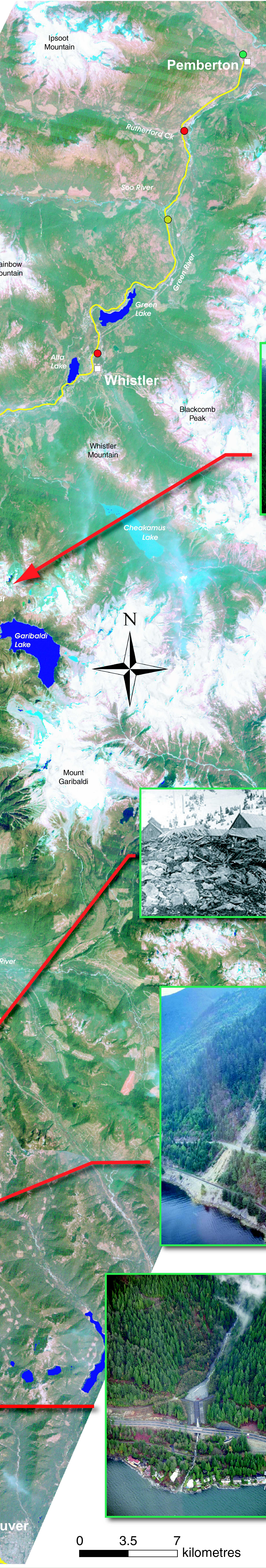
HISTORICAL LANDSLIDE EVENTS ALONG THE SEA TO SKY CORRIDOR



Landslide Type & Number of Events

- 1 ● Debris flow
 - 2 ●
 - 3 ●
 - 4 ●
 - 5-7 ●
-
- 1 ● Rock fall
 - 2 ●
 - 3 ●
 - 4 ●
 - 5-7 ●
-
- 1 ● Rock slide
 - 2 ●
-
- 1 ● Submarine failure
 - 1 ● Rock avalanche
 - 1 ● Debris slide

The Sea to Sky Highway (Hwy. 99) stretches 110 km through the southern Coast Mountains of British Columbia from Horseshoe Bay to Pemberton. Over 18% of Canada's total landslide-related deaths (>600) have occurred along the Sea to Sky corridor. In the last 100 years, we counted 154 landslide events reported in newspapers, technical and scientific reports (Blais-Stevens and Septer, 2006). The two main triggers, when reported, were effects of climate (54%) and construction activities (6%). The most abundant types of landslides were rock falls (44%) and debris flows (28%) based on the classification of Cruden and Varnes (1996). These were considered relatively small in volume, but were the most damaging. The highest concentration of landslide events was located in the southern part of the corridor between Horseshoe Bay and Porteau. The 1980's and 1990's saw an increase in reported events due to an increase in development, greater population, and greater awareness of landslide risk. Evolving mitigative measures undertaken since the 1970's (e.g., catchment basins along Howe Sound) have increased the safety of the population with no reported casualties since the early 1990's.



Description of the satellite image

Satellite imagery is 7-band LANDSAT TM from the United States Geological Survey EROS Data Center. The present image utilizes two images from different dates in the late 1980's. Initial enhancements were produced by RGI Ltd. to reduce cloud cover, with subsequent enhancement being produced by the GSC. Image and DEM resolution are 25 metres.



The landslide at the Barrier was the first documented historical landslide event ca. 1855-1856. Photograph by O. Hungr showing the head scarp of a rockslide. Down slope, the rockslide evolved into a debris flow (Rubble Creek).



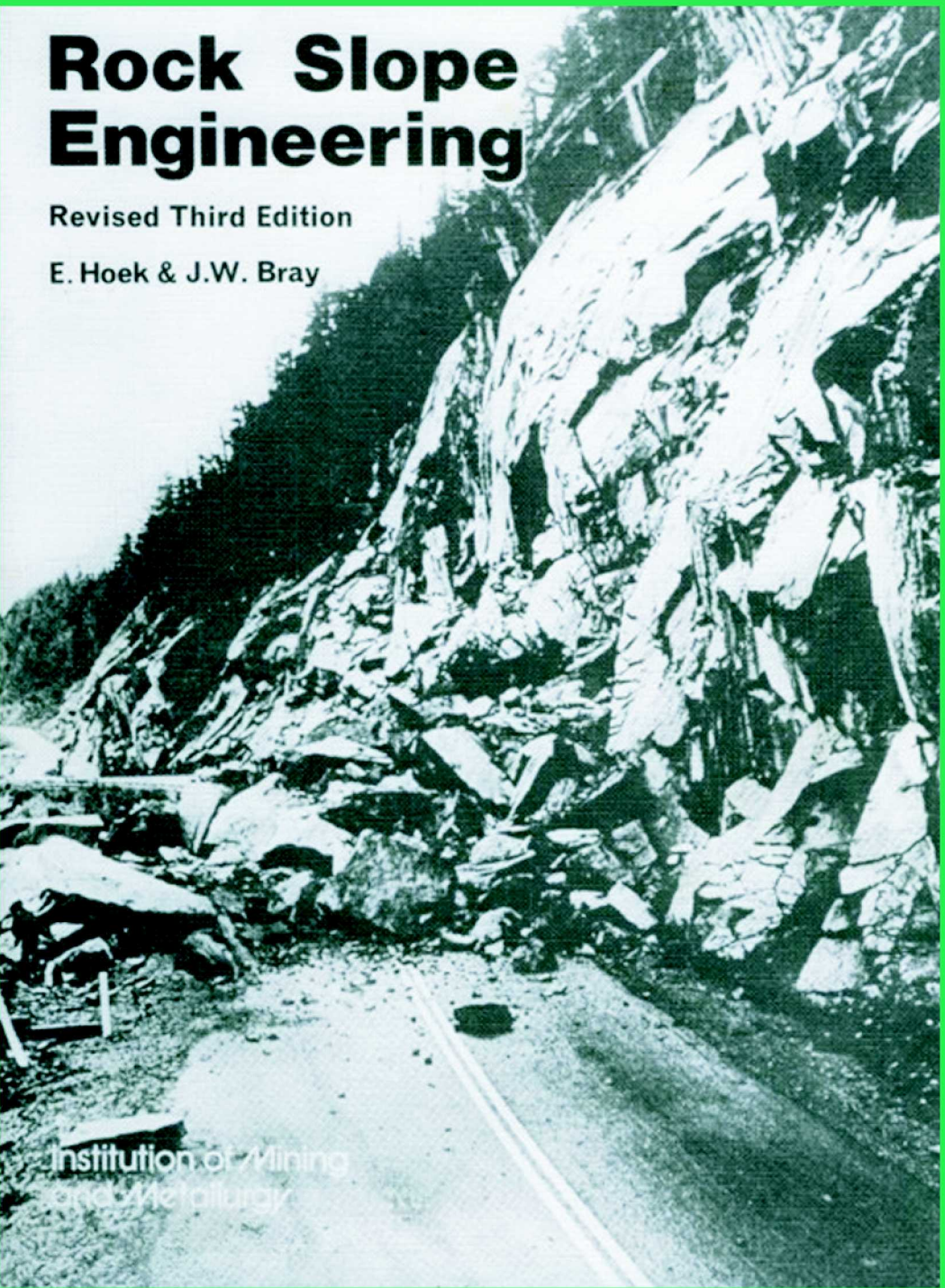
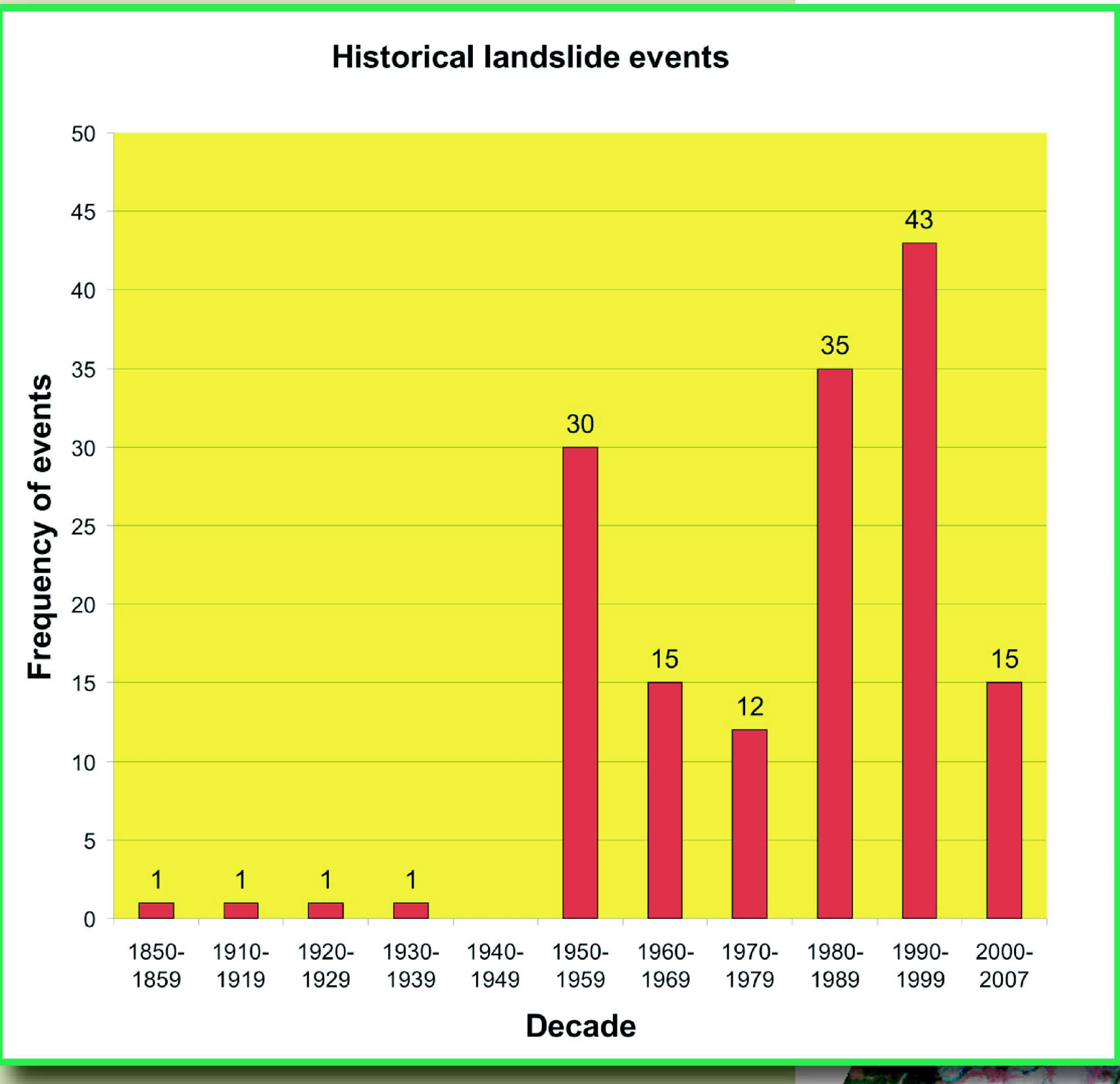
Britannia Mines' Jane Camp, March 1915. Canada's 2nd worst landslide disaster, which caused 54 casualties. Photographs of the rock avalanche provided by the GSC library and Vancouver Public library.



Photograph of rockslide at Loggers Creek, October 1990, taken by O. Hungr. Damage was estimated at > \$7M when a large rockslide closed the highway and rail line for 13 days.



Mitigation measures at work. Catchment basin built to stop debris flow deposits at Charles Creek. Photograph taken by O. Hungr, November 2006.



Several rockslides occurred between Brunswick Point and Porteau Cove in 1964, 1969, and 1982, which caused 4 casualties. Photograph appeared on the cover of Rock slope engineering text book by Hoek and Bray, 1981, courtesy of D. VanDine.



Debris flow at M-Creek, October 1981, which caused 9 casualties. Photograph by O. Hungr.

Acknowledgements

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References

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Citation

Blais-Stevens, A. 2007. Historical landslide events along the Sea to Sky corridor, Geological Survey of Canada, Open File 5678.

