

# Post-glacial induced earthquakes - a review

**Patrick Wu, Holger Steffen**

Department of Geoscience, University of Calgary, 2500 University Dr. NW  
Calgary, Alberta, T2N 1N4, Canada

[sholger@ucalgary.ca](mailto:sholger@ucalgary.ca)

Large (>M5) intraplate earthquakes are found in the once glaciated areas in Eastern Canada (Laurentia/ Laurentide), Northern Europe (Fennoscandia) and around the current ice margins of the Greenland and Antarctica ice sheets. A number of publications have been dedicated to investigate the sources and mechanism of these earthquakes in order to mitigate more effectively the hazards associated with them. In addition, focus is set planning for safe storage of nuclear toxic-waste in underground repositories in Canada and Sweden. Thus, it is vital to understand the spatio-temporal variation of the state of stress, the potential for fault motion and the cause of such earthquakes – in particular the role of glacial loading and unloading in the triggering of earthquakes.

The talk will review the scientific background, the model and computational results and their comparison to selected field observations related to the spatio-temporal evolution of stress and fault stability in glaciated areas. We present a general overview of such related earthquakes in time and space, the failure of rocks, and faulting mechanism. Some recent work and recent progress in understanding the factors that affect fault stability are also discussed. This includes virtual fault investigations and recent work that attempt to treat faults more realistically with 2D and 3D earth models.