



Identification of seismic records left by different landslide types in Norway

Ragnhild A. Myhre (1), Valerie Maupin (1), Graziella Devoli (1,2)

(1) Norwegian Water Resources and Energy Directorate (NVE), Forecast of flood and landslide hazard, Oslo, Norway (gde@nve.no), (2) Department of Geosciences, University of Oslo, Oslo, Norway

Recent studies in Switzerland have demonstrated that landslides can be detected at distances of up to 100km by seismometers originally installed for earthquake monitoring. It has also been shown that different types of landslides leave a specific seismic signature and that seismic data can therefore be used to detect and characterize landslides.

This project will first investigate if the occurrence of past landslide events in Norway has been registered by seismic stations. Then the study will identify and characterize the signals left by a specific type of landslide or by different landslide types. If positive results are obtained, that specific station could be used for local early warnings.

Landslides in Norway have been gathered in a database since 900 AD. The database is managed by Norwegian Water Resources and Energy Directorate (NVE) and therefore available for this study. It contains thousands of events, whereas in this project only a small number of these have been chosen to undergo further investigations. The seismological database is also large as Norway has had a significant number of seismic stations since late 1960s. The seismic array at NORSAR is particularly useful in this project as seismic array processing enables detecting events of lower magnitude than single stations. Also, seismic data from NNSN is used in the project. All Norwegian seismic data are publicly available and can be used in this project.

By comparing waveform data from the seismological stations located around Norway, with events from the landslide database, the goal is to investigate if landslides in Norway leave a specific signature on the seismograms as presented in research from Switzerland.

This project is performed using the earthquake analysis software SEISAN developed by researchers at the University of Bergen. Also GIS is used for presenting and analyzing landslide data.