



## **Increased frequency of quick-clay landslides in Norway**

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Quick-clay landslides are large-scale events with large destructive power. In Norway, historic records give some information of large landslides, but many events were probably never recorded, if they did not affect human life or property.

Quick-clay landslides are triggered both naturally and by human impact. For slides known from old historic records, natural factors as erosion along rivers is assumed to be the triggering factor. However, in modern time, human impact has become more important.

After World War II, the frequency of quick-clay landslides in Norway was comparatively high. The foundation of the Norwegian Geotechnical Institute in 1953 was to some extent motivated by a desire to cope with these events. After the very large Rissa landslide in Norway in 1978, a national plan was launched to map the landslide risk related to quick-clay. Through several decades of hazard mapping, combined with research related to the typical geomorphology and soil mechanics of quick-clay landslides, Norway succeeded in reducing the frequency of large quick-clay landslides. Rules for how to deal with the landslide risk for construction projects in quick-clay areas is implemented in the Norwegian legislation, through the technical guidelines to the Planning and Building Act.

From approx. year 2000, however, the positive development with observed reduced landslide frequency through the 1980's and 1990's seems reversed. Several large events have occurred, indicating that knowledge of landslide hazards was after all not disseminated properly among important actors as e.g. municipalities, farmers and construction companies.

The particular landslide geomorphology of quick-clay landslides will be presented, together with examples of landslides triggered by human and natural causes. Also, the recent development of frequency of large quick-clay landslides will be presented.