



Applications of high-resolution DEMs analysis for geohazards in fjords

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During the 20th century, three major tsunamis struck the Western coast of Norway (leading luckily to only 174 fatalities altogether). These tsunamis were provoked by the fall of large landslides or rock avalanches into the fjords. Because of the geometry of the fjords, waves with run-up 50-70 meters above sea level were generated. In 2003, a regional investigation started in order to detect potential sites of large instabilities along the fjords. Several types of high-resolution digital elevation models (with resolutions of 3 meters or smaller) have been acquired offshore and onshore: interferometric and multibeam sonar, airborne lidar from airplane and helicopter, ground-based lidar. Thanks to this new generation of data, it is possible to extract directly from DEMs essential information about the present slope stability and the deposits of past landslides: fracturation analysis, kinematics feasibility for different types of rupture, block propagation, volume estimations off- and onshore. By these methods we try to answer to some of the first questions occurring during a landslide hazard assessment: which process ? where? how big? how frequent? Nevertheless, it appears that the tools to fully take advantage of these new types of data have to be developed yet. For instance, a large potential of innovations is still open for geoscientists interested by multi-sensors multi-resolutions datasets analysis.