Geophysical Research Abstracts
Vol. 21, EGU2019-19028, 2019
EGU General Assembly 2019

Investigation program to evaluate drainage as mitigation at the Åknes rockslide, western Norway

Gustav Pless (1), Marie Etchebes (2), Lars Harald Blikra (1), and Lene Kristensen (1)
(1) Norges vassdrags- og energidirektorat - NVE, Norway, (2) Schlumberger Stavanger Research Center, Norway

The Åknes rock slope, located in the county of Møre and Romsdal in western part of Norway, is one of the most hazardous rock slopes in Norway. It has an estimated unstable volume of 54 Mm3 in the largest scenario. The rockslope overlies a fjord where a rockslide may cause a tsunami with potential run-up heights of up to 70-85 m in nearby villages effecting the area of thousands of inhabitants.
Åknes is also the most investigated unstable rock slope in Norway. The rock slope has 12 boreholes totalling 2400 m of cored borehole, extensive geophysics including 11 resistivity profiles and 3 seismic profiles, hydrogeological testing including tracer tests and hydraulic borehole testing. The rocks lope is under continuous monitoring by The Norwegian Water Resources and Energy Directorate (NVE). The monitoring network include an automated total station with 30 prisms, rod extensometers, differential GPS, instrumented boreholes, lasers and a network of geophones. The slope has also been surveyed using groundbased InSAR and LiDAR. Sentinel-1 radardata from reflectors are processed on a weekly basis.
A feasibility study to investigate if the rock slope can be stabilized by drainage of groundwater was started in 2017. Drainage has been implemented with success in several other locations including Dutchman's Ridge and Downie Slide in Canada and Mt. de la Saxe in Italy. The feasibility study includes a data acquisition program, a 3D geological model using Petrel software, a hydrogeological model and a numerical stability analysis. The new data accusation includes water balance measurements, new geophysical surveys, reprocessing of old geophysical data, and drilling of boreholes with a new type of instrumentation. The new borehole instrumentation, including measuring of isolated water pressure, gives a new insight into the hydrological conditions within the rockslope. The first draft of the integrated geological model will be presented, together with selected data from the new investigations. The combined datasets may give insight that can be used to identify the most suitable drainage strategy.