MSc Thesis Project in Engineering Geology No.2

Topic:
Hydrogeology of the Aknes Rockslide, Norway

Project Framework:
The Aknes rockslope in western Norway is situated in crystalline rocks along the shore line of a famous fjord. The slope shows significant movements in the upper part and many signs of instability. In the worst case a volume of 10 to 100 million m3 of rock could be released from this slope, generating a large rock avalanche and a subsequent tsunami wave in the fjord area. In order to understand such rockslope hazards in a larger area around Aknes, and to design and setup early warning systems a large national project (The Aknes-Tafjord Project) has been established http://www.aknes-tafjord.no. The Engineering Geology Chair of ETH is a scientific partner of this project and supports the project management in the steering board.

MSc Thesis Project Goals:
It has to be assumed that the stability and future evolution (eventually failure) of the Aknes rockslide is strongly influenced by pore pressures and groundwater flow within the unstable rock mass. The distribution of groundwater pressures and flow within a fractured crystalline rock mass is very heterogeneous and difficult to predict: Some fractures or channels within fault zones carry high groundwater fluxes, pore pressures can dramatically change across faults and the locations of the groundwater tables are affected by topography, geologic structure and unloading phenomena. In this project we want to contribute as much as possible to the understanding of these hydrogeological conditions of the Aknes rockslide. The project is based on several weeks of field work during the period of July to September 2007, and could include hydraulic borehole tests, tracer tests and hydrogeologic field mapping. Data analysis will be based on this new data set, geophysical and geological borehole logs carried out by ETH and NGU, and long term pore pressure and climate monitoring data supplied by partners. The data will be integrated within a numerical groundwater flow model.

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