Geophysical Research Abstracts
Vol. 20, EGU2018-14898, 2018
EGU General Assembly 2018

Use of today's hydrogeological data to predict future land slide risk. A case study at the Ångermanälven river, Sweden

Hanna Blomén (1), Miriam S. Zetterlund (2), Karin Bergdahl (2), and Karin Odén (2)

(1) Swedish Geotechnical Institute, Gothenburg, Sweden (hanna.blomen@swedgeo.se), (2) Swedish Geotechnical Institute, Gothenburg, Sweden

Hydrogeological data such as groundwater levels and pore pressures are important input to slope stability analysis and thereby assessment of landslide risks. However, increased precipitation due to climate change is assumed to affect the ground water levels and pore pressures in the soil. Therefore, climate change must be considered in hydrogeological estimations, and there is a need to develop methods to predict future groundwater levels and pore pressures, both positive and negative.

The presented study is in its initial phase and is part of an extensive landslide risk assessment project along the Ångermanälven river in northern Sweden. The quaternary geology in the area consists of various layers of postglacial silt, sand and clay, and the banks of the river are often 30 to 40 meters high and exposed to erosion in both the slope and at the toe. Negative pore pressures occur in the silt layers which has an impact on the slope stability.

A review of existing models for estimation of future groundwater and pore pressure situations showed that adjustment and further development of the models are needed for the landslide risk analysis of the Ångermanälven river with its silty soil conditions. A refined model for the Ångermanälven river requires investigations of the present situation, and hence geotechnical field and laboratory tests are conducted in addition to installation of groundwater loggers and tensiometers at different levels in the soil profile at several locations along the river.

The final landslide risk analysis is an important basis for municipal decision regarding risk reduction measures and sustainable spatial planning in today's climate as well as in the future.