Geophysical Research Abstracts
Vol. 21, EGU2019-7442, 2019
EGU General Assembly 2019

Insights on rock mass disintegration at the Moosfluh slope, Switzerland

Andrea Manconi, Simon Loew, and Franziska Glueer
ETH Zürich, Dept. of Earth Science, Zürich, Switzerland (andrea.manconi@erdw.ethz.ch)

The Moosfluh slope, located in the vicinity of the current tongue of the Great Aletsch glacier, Switzerland, hosts one of the largest active instabilities of the European Alps. Despite at this location accelerated slope displacement has been detected over the past decade, the rapid evolution observed between September and November 2016, locally reaching tens of meters, was largely unexpected. During this “crisis phase”, the rock mass experienced substantial internal deformation mainly composed of toppling, formation of tensile scarps, and basal sliding. The large internal deformation caused also several local failure events in the form of single block falls and/or rock mass collapses of moderate size.

Here we focus on the post-crisis, i.e. the period going between spring 2017 until today. The deformation occurring at the Moosfluh slope is still consistent and rock failure events are regularly going on, however, not in a dramatic fashion as observed in fall 2016. We show the results obtained by jointly investigating satellite, airborne, and ground based imagery, exploiting optical and radar sensors, as well as the data recorded from a local seismic network. In particular, we focus on the joint analysis of the information obtained from the optical imagery acquired with high temporal frequencies and the seismic waveforms associated to rock failure events. The combined remote sensing and geophysical dataset presented here is unique, and allows for a detailed interpretation of the rapid spatial and temporal rock mass disintegration in an alpine slope. Our results are of interest to understand mutual influences between predisposing slope instability factors (i.e. mainly due to geological, structural, and geomorphological conditions), and external driving factors (i.e. seismicity and meteo-climatic effects) on the progressive evolution of rock mass, specifically at the Moosfluh slope but also in similar case scenarios.