Geophysical Research Abstracts
Vol. 15, EGU2013-5323-2, 2013
EGU General Assembly 2013

Landslides and rock fall processes in the proglacial area of the Gepatsch glacier, Tyrol, Austria - Quantitative assessment of controlling factors and process rates

Lucas Vehling, Joachim Rohn, and Michael Moser

Friedrich Alexander Universität Erlangen Nürnberg, Geozentrum Nordbayern, Lehrstuhl für Angewandte Geologie, Germany (lucas.vehling@gzn.uni-erlangen.de)

Due to the rapid deglaciation since 1850, lithological structures and topoclimatic factors, mass movements like rock fall, landslides and complex processes are important contributing factors to sediment transport and modification of the earth's surface in the steep, high mountain catchment of the Gepatsch reservoir. Contemporary geotechnical processes, mass movement deposits, their source areas, and controlling factors like material properties and relief parameters are mapped in the field, on Orthofotos and on digital elevation models. The results are presented in an Arc-Gis based geotechnical map. All mapped mass movements are stored in an Arc-Gis geodatabase and can be queried regarding properties, volume and controlling factors, so that statistical analyses can be conducted. The assessment of rock wall retreat rates is carried out by three different methods in multiple locations, which differ in altitude, exposition, lithology and deglaciation time: Firstly, rock fall processes and rates are investigated in detail on five rock fall collector nets with an overall size of 750 m^2. Rock fall particles are gathered, weighed and grain size distribution is detected by sieving and measuring the diameter of the particles to distinct between rock fall processes and magnitudes. Rock wall erosion processes like joint formation and expansions are measured with high temporal resolution by electrical crack meters, together with rock- and air temperature. Secondly, in cooperation with the other working groups in the PROSA project, rock fall volumes are determined with multitemporal terrestrial laserscanning from several locations. Lately, already triggered rock falls are accounted by mapping the volume of the deposit and calculating of the bedrock source area. The deposition time span is fixed by consideration of the late Holocene lateral moraines and analysing historical aerial photographs, so that longer term rock wall retreat rates can be calculated. In order to limit homogenous bedrock sections for calculating specific rock wall retreat rates and to extrapolate the local determinated rock wall retreat rates to larger scale, bedrock areas will be divided into units of similar morphodynamic intensities which will be therefore classified by a rock mass strength (RMS) system. The RMS-System contains lithological and topoclimatic factors but also takes the measured rock wall retreat rates into account.