Geophysical Research Abstracts,
Vol. 10, EGU2008-A-10402, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-10402
EGU General Assembly 2008

Rock falls on steep rockwalls in the Mont Blanc massif in 2007: a GIS approach

L. Ravanel (1), F. Allignol (1), P. Deline (1) and M. Ravello (2)

(1) EDYTEM Lab, Université de Savoie, CNRS, 73376 Le Bourget du Lac, France; (2) Fondazione Montagna Sicura, Courmayeur, Italy (ludovic.ravanel@univ-savoie.fr)

Rock falls in steep rockwalls are usually assigned to existing fractures (passive factors) along which rock masses are destabilized by one or more triggering factors (active factors). In high alpine rockwalls, three main factors that can be combined explain the occurrence of rock falls (> 100 m3) and rock avalanches (> 100,000 m3): (i) the debuttressing of glacial cirque and valley slopes which follows glacier retreat and increases the self-weight stresses within the rock mass; (ii) seismicity; and (iii) climate changes during the last 12 000 years. Indeed, permafrost degradation appears to be an essential mechanism through which the climate controls high mountain slope stability. Nevertheless, due to a lack of systematic observations, magnitude and frequency of high mountain rockfalls remain poorly known. Since 2005, the EU Interreg PERMAdataROC program aims at studying the relation between permafrost degradation and high rockwall instability in the Mont Blanc massif. One of the program research axes is the development of a present-day rock fall/avalanche database. It contains information collected during a systematic survey by local people (mountain guides, hut keepers, researchers). In spite of its difficulties, this approach seems the best way to systematically record slope instabilities of all sizes related to climate variations. For 2007, detachment zones (scar topography, lithology, fracturation, dip, slope, aspect) and deposit areas (slope, nature of the deposition surface) of c. 20 events are described. These spatial and temporal data were implemented into a GIS to analyse the morphological characteristics of source areas and determine the part of the different active factors in the rock-slope instability of the massif. These 2007 data add to the data obtained since 2005. Here, some 2007 events (at S face of Rognon inférieur du Plan,

N face of les Droites, S face of Col de la Tour des Jorasses, and SE face of Arête inférieure des Cosmiques) are exposed and a first data analysis is presented. We finally define the different types of 2007 rock-instabilities and discuss the trigerring factors.