Geophysical Research Abstracts, Vol. 8, 08402, 2006
SRef-ID: 1607-7962/gra/EGU06-A-08402

Temporal patterns of rockfall activity prior to large slope failure.

N.J.Rosser, S.A. Dunning, D.N. Petley, M. Lim, R.J. Allison

International Landslide Centre, University of Durham, UK (n.j.rosser@dur.ac.uk / Phone: +44 (0)191 334 1918)

Results are presented from monthly monitoring using 3D laser scanning of 100,000 m^2 of near-vertical coastal rock face over a 3 year period. This approach directly monitors the changes to the rock face from which rockfalls are sourced rather than the resultant debris or impact. During the monitoring period a dataset of in excess of 500,000 rockfalls has been derived, ranging in volume from 0.00001 m^3 to over 10,000 m^3. Temporal aspects of the data are considered, in particular the sequencing of rockfalls generated from these slopes.

Analysis of the magnitude and frequency of rockfalls shows consistent temporal patterns of rockfall activity before each of the largest events recorded. The temporal patterns in the rockfall dataset suggest that this sequencing can be treated as precursory indicator of rockfall occurrence, where the maximum rockfall is ultimately determined by the rockmass geometry and structure. The rockfall monitoring data are combined with environmental monitoring data to identify key controls on both precursory events and the resultant larger failures. The behaviour of the rock mass prior to the largest event recorded has implications for understanding of both the conditions within the rock mass which lead to rockfalls and those environmental factors which bring the rock mass closer to failure.