Geophysical Research Abstracts, Vol. 7, 08741, 2005
SRef-ID: 1607-7962/gra/EGU05-A-08741

Landslides in the Northern Lake Como, Italy:

"Madonnina Macialli" rockslide

Figaroli M.*, Gambillara R.*, Mannucci G.**, Terrana S.*, Centurini A.*

* Dipartimento di Scienze Chimiche e Ambientali, Università dell'Insubria, via Lucini 3, I-22100 Como

** ARPA Lombardia, Settore "suolo e risorse naturali", V.le Restelli 3/1, I-20124 Milano

The "Madonnina Macialli" rockslide is located in the area of Montemezzo, in the North of Gera Lario (Northern Western Como Lake basin). It is on the hydrographic left of San Vincenzo river, on a SW facing slope, having a NW-SE direction. It is laterally wide 159m and it has a height of 210m (the top of this rockslide has an altitude of 660m a.s.l.).

First evidences of this rockslides were observed in 1997.

The rock-mass is characterized by gneiss, amphibolites of the Bellinzona Dascio Zone (Adula nappe) and tonalites highly fractured..

The tectonic setting is influenced by the Insubric Line, a destral strike-slip (E-W oriented) fault, which divides Austroalpine domain (in the North) to Southalpine domain (in the South).

The stereoscopic analysis of aerial photographs (from 1951 to 1995) permit us to observe the main morpho-tectonic structures related to the lineaments that might have determined the rock-mass weakness.

A preliminary structural-geological field work has been carried out related to the lineaments and 14 Schmidt diagrams have been prepared. From the structural analysis we have noticed three main fracture systems: two of these systems are ESE-WNW oriented and NNE or SSW dipping; the third one is NNW-SSE oriented and has a ESE

dip direction. The observed trenches has the same arrangement of the last fracture system.

The next step of this work regards the search of relationship existing between rainfall and rockslide movements. Movements (in millimetres) are detected by a extensometers network, which is sited near the main trench. The rain water is measured by a rain gauge (in millimetres) located at 670m a.s.l. Data acquisition is continuous (every 30 min, 24/24 h) with alarm threshold. The data recorder provides to transmit data from field to office. This system is connected to warning and evacuation procedures that will be realized by Civil Protection Technical Service.

The data trends analyzed, starts in the June 1998 and finishes in the December 2003. From this analysis we can observe that the rockslide activation is often connected to rainfall events.

We have estimated the total unsteady mass in 80000m^3 but actually the mass that threats to fall is about 25000m^3; this body can block the river forming a dammed lake. The San Vincenzo valley is almost completely inaccessible so it would be difficult to remove the dam. A flood due to the bursting of natural dam would sweep away the town of Gera Lario.

Our purpose is to understand the evolution of this rockslide in the next five years, so we've started to investigate the "Madonnina Macialli" rockslide with a laser-scanner (RIEGL, LMS-Z420i), in August 2004.

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