



[Home](#)

[Search Abstracts](#)

[Author Index](#)

[Symposia Programmes](#)

[Sponsors](#)

[Help](#)

[GSM-01 General contributions to geomorphology](#)

Interdisciplinary approach for geomorphological study of an high slope instability area in the northern Apennines mountains

Alice Ciulli, *University of Siena (Italy)*
 Leonardo Disperati, *University of Siena (Italy)*
 Enrico Guastaldi, *University of Siena (Italy)*
 Andrea Rindinella, *University of Siena (Italy)*
 Salvatore Viridis, *University of Siena (Italy)*

The Corniglio landslide (CL) is one of the most significant landslides in the Northern Apennines which covers an area of about 3 km x 1 km close to the Corniglio village (Pr, Italy). It is an active composite retrogressive landslide where deep-seated sliding deformation develops together with shallower earth slumps. Geophysical surveys from the literature suggested the occurrence of high deformation phenomena up to the depth of about 120 m.

A geomorphologic survey and photogeologic interpretation were performed along with ground displacement monitoring related to the last 30 years in order to study reasonable relationships among the CL and other large scale gravitational processes within the study area.

The state of activity from 1978 to 2005 was analysed by evaluating the displacement of homologous ground targets on multitemporal orthophotographs related to 1988, 1994, 1996, 1998, 2005 and a Quickbird imagery related to 2003. This set data was registered to the Regione Emilia Romagna topographic map of year 1978, at the scale of 1:5,000. Periods of little or no activity separated by rapid and occasionally dramatic sliding (e.g. the October-November 1996 event with ground displacements of more than 30 m) were recognized.

These investigations allowed us to suppose the main triggering factors for reactivation of the CL. Heavy rainfalls of October-November 1994 and October 1998 occurred before reactivations of the end of 1994 and 1998. Moreover, low-medium intensity (from 2.2 to 5.4 Richter magnitude) seismic events were recorded within the Emilia Apennines before reactivations of January and October 1996.

The CL has been referred to as a complex landslide. However, the fieldwork and photogeologic interpretation suggested an alternative model for the gravitational evolution of the study area.

The hill among the Bratica river (east) the CL (west) and the Parma river (north), where is located the Corniglio village, is made up, from the bottom, of the "Argille e Calcari" and the "Arenarie del Bratica" formations (Canetolo Unit, Eocene-Oligocene), tectonically covered by the marly limestones flysch of the Mt. Caio Unit (Late Cretaceous).

The local occurrence of the rigid behaviour lithotypes of Mt. Caio flysch and "Arenarie del Bratica" (sandstones) over the plastic low-shear strength "Argille e Calcari" (marly clays), may represent a critical configuration for the stability of the area.

Moreover, the above hill is affected by relevant east-west trending lineaments, involving also the Corniglio village, which toward south originate a huge near-vertical trench where the Mt. Caio flysch is thrown down to the north of the trench. This trench is bounded to the east by the Bratica river, while to the west by the CL main scarp area, where also the Mt. Caio flysch thrust converges. This framework suggests that the CL may be part of a larger deep seated gravitational slope deformation also including the hill among the Bratica river the CL main body and the Parma river.

CD-ROM Produced by [X-CD Technologies](#)