



## **Rainfall-induced shallow landslides in weathered rock masses (Sila Massif, Calabria, Italy)**

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By means of a multi-disciplinary approach we intend to provide a contribution to the analysis of the predisposing factors and of the triggering causes that determined a shallow landslides event, in concomitance with high intensity rainfalls, in an area of northern Calabria (Southern Italy). The investigated area, of about 70 km<sup>2</sup>, is located on the western side of the Sila Massif. Outcropping, fractured and deeply weathered crystalline rock masses, determining geologic homogeneous conditions, are present. In the same area suitable and homogeneous climatic features have also been also found. During the period between December 2004 and January 2005, several landslides, of different typologies, were triggered by a high intensity rainfall event. Most of the failures were shallow landslides: about 200 soil slip of small size were triggered causing damages to anthropic infrastructures and to human activity. These phenomena, for the most part, took place on man shaped slopes: agricultural terraces and road cuts. An inventory map at 1:25.000 scale of the shallow landslides was obtained through the field investigations carried out just afterwards the event. Following up the field investigations for each shallow landslide a data form has been compiled reporting the following elements: the morphometric attributes of each phenomenon and of the involved slope, the lithology and the land use. In addition some samples of the soil involving in a representative number of instabilities were examined to obtain a preliminary geotechnical characterization. The whole of recorded data were added to those included in a detailed database, relevant to the different typology of landslides and connected to the GIS of the territory of the Calabria region. We were able to determine the predisposing and the triggering conditions of the shallow landslides occurred on the outcropping weathered and altered geomaterials in the study area. We attained this purpose by means of tools aimed to the hydrological and geostatistical analysis,

applied to the database including geomorphological, hydrological and geotechnical data recorded in account of the shallow landslide event.