



## **Evaluation of rainfall triggering threshold of a large landslide in clay material: an application on the Nevissano landslide (Central Piedmont, Italy).**

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The triggering factor for different types of gravitational phenomena is rainfall. Then, the evaluation of rainfall thresholds for landslide triggering is a useful technique for forecasting such phenomena and can therefore be useful to the public authorities and local population by providing the critical rainfall values beyond which it is appropriate to consider a state of alert. This study evaluates the performances of the “Moving sum of daily rainfall” method in assessing Nevissano landslide triggering threshold near Castelnuovo Don Bosco (Piedmont, Italy). In order to establish a relationship between landslide occurrence and the amount of rainfall, an inventory of all the movements of the landslides occurred in the area in the past 30 years has been carried out by field survey, archive investigation, analysis of stratigraphy. The landslide has been affected by paroxysmal events over the last twenty years due to heavy rainfall occurred in November 1994, February-March 2002, December 2008, April 2009, March 2011 and March 2014. In particular the last one involved the road down the slope, isolating two dwellings. Correlations between heavy rainfall events and the downstream slope movement historical records have been sought. The analysis showed a noticeable correspondence between the precipitation events and the paroxysmal phases of the landslide reactivations. Through the “Moving Sum” method it was possible to obtain the most probable threshold rainfall values which could trigger a slope movement: they are fixed at 105 mm and 193 mm respectively in the 3 and 30 days prior to the event. It also emerged that the landslide seems now to be active, but only with millimetric displacements, corresponding to preferential rupture surfaces highlighted by inclinometric informations at specific depths, have been localized. It is desirable that the automated rainfall monitoring station, calibrated and supported by real time underground data detection, is used as a prevent alert tool in order to mitigate risk close-by tested slope.

Key words: archive investigation, drillings, rainfall threshold.