



## **Andic soils and catastrophic mudflows in Italy: hydro-pedological cause-effect evidences**

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Mudflows are between the major catastrophic types of landslides occurring in Italy especially in terms of victims and damages.

An integrated pedological and hydrological analysis has been performed in Calabria, Campania, Toscana and Lombardia regions on the detachment crowns of some of the most important catastrophic mudflows occurred in Italy in the last decades, including the slides of Sarno (1998), Salerno (1910, 1924, 1954), Platì (1951), Versilia (1996) and Albaredo (1987, 2002) sites.

A detailed hydro-pedological study performed in the Campania region, using a 2D Richard's based water balance simulation model, addressed the following issues: (i) the importance of hydrological properties of andic soils, namely soils having large quantities of poorly ordered clay minerals; (ii) the interruption of the pedological continuity of the slope and (iii) the relationship with slope aspect. The main results show an increase in soil water storage (more than 30%) in both North facing landscapes and in slope having an interruption in pedo-continuity with respect to some references.

Overall the results at national scale revealed an evident association between the investigated catastrophic mudflows and the presence of andic soils, both in the detachment crowns and on the slopes. We believe that these soils because of the unique hydrological properties and high tixotropy induced high vulnerability in landslide triggering and development mechanisms.