

The Niscemi 1996 large-scale landslide: a case of gravitational adjustment to tectonic deformation

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It is common opinion that gravitational phenomena are little influenced by tectonic stress. Studies carried out in the last two years on a large landslide (southern border of Niscemi village, Sicily, Italy), that at the end of the dry season (12 October 1996) mobilised for a few meters -slowly and at once- a clayey slope capped with sands over a surface of about 2km^2 , proved that tectonics play a role not only on the structural predisposition and weakening of earth masses, but also on establishing a significant stress field that interfere with the gravitational stress. Gathered data, including several deep and surface AGIP seismic profiles, historiography on previous events, rain amount, morphological and stratigraphic evidences, and inhabitants witness, allowed us to define a precise cinematic and structural model of the upper 500m layers of the crust, where several slip surfaces have been detected that can be referred to as due to gravitational adjustment to the ongoing tectonic deformations. The obtained results of this study are compared with those of other case studies where the interference between gravitational and tectonic stress appear as strongly probable, thus they can give a key to understand the role of a relevant cause of large and deep instability processes in tectonic areas.