



## **High precision GPS monitoring applied to deep seated gravitational slope deformations (DSGSD) and big landslides in Falerna - Capo Suvero territory (Tyrrhenian Calabria region - Southern Italy)**

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The high precision GPS monitoring, carried out in the Falerna - Capo Suvero territory (Tyrrhenian Calabria region - Southern Italy) by means of two different networks, is finalized to evaluate the rates of the mass movements which involve the Palaeozoic low grade metamorphites and the Pleistocene marine, terraced, sandy-gravel soils resting on these last, outcropping there. The tectonic rupture mechanism, with the consequent release of the Reventino Mount (1410m a.s.l.), located in the hinterland of the study area, has displaced and lowered the whole Mancuso Mount block at the foot of which the study area falls. This relief, through displacements towards W-SW, has produced numerous radial traction fractures, the most important of which is that taken up by the Tridattoli torrent, and numerous DSGSD. Prevalent slips and flows, in the Schipano locality, involve also the A3 Salerno-Reggio Calabria highway and the Battipaglia-Reggio Calabria railway. Other potential and present failures have been also recognized in the Petraro and Guori localities, where the elevations discontinuity is due to an ancient generalized lowering which involved the whole area, where "creep" phenomena are active. During January 2003, in the Borgo San Pietro locality, an important multiple type landslide, whose prevalent features are typical of flows, a re-activation of an ancient landslide, involved buildings and road. It induced, moreover, a remarkable upsetting in the left side of the Cartolano torrent. To evaluate the movement rates of some of the landslides, in Lago La Vota and Pozzo localities high precision GPS monitoring surveys have been carried out in 2002 and 2003 years, using the double frequency LEICA GPS System 500. The surveys are still going on. The

results in the mentioned period point out high rates of the displacements (Lago La Vota: 5.5 centimetres per year in plane and 6 centimetres per year in elevation; Pozzo: 1.7 centimetres per year in plane and 2.7 centimetres per year in elevation), so that important engineering structural interventions to protect buildings, roads and railways in the whole Falerna - Capo Suvero area are necessary. The same DSGSD movements, which add to seasonal seastorms, represent an important, however neglected, cause of increasing of the spread and documented erosion all along the Falerna and Capo Suvero coastline, as well in other places in Italy involved in analogous phenomena.