



Can climate changes influence the triggering of a DGSD? A possible example in northern Italy.

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An active Deep-seated Gravitational Slope Deformation (DGSD) has been recently identified in the Carnic Alps above the Cercevesa Torrent in northern part of Friuli Venezia Giulia Region (Italy). The phenomenon interests an area of about 1 km² and involves Devonian verticalized limestones and mudstones over standing Hockwipfel Formation. The most evident morphological feature of the Cercevesa DGSD is a double-crested ridge on the top of the slope (1650 m). The opening movement between the two crests, with an actual offset of 20 m, started in the '90s and nowadays forms a persistent trench. The first measurements, recorded since June 2008, when the present research began, indicate a constant opening rate of about 0.8 m/yr, a really rare value for gravitational phenomena in the Alps.

Due to the high rate of movement, prevention measures have been taken by the regional authority in order to avoid any danger for the population or the trekkers that frequent the area. Some tracks have been closed and the area has been included in the regional landslide register.

The phenomenon was initially studied by the geologists of the Geological Survey Office of the Friuli Venezia Giulia Region, later, the team increased including researchers from the Geosciences Department of Trieste University.

The present paper wants to highlight the first observations realized in the area and the first obtained results. Initially the distances between the points selected for the survey have been obtained with a Leica DI3000 Laser distance meter. Twenty different points were monitored. Recently three new benchmarks have been fixed along the opening crests and a GPS system (Leica 1200) used for the determination of positions and movement direction. Three surveys one in July 2009, one in March 2010 and one in June 2010 gave the possibility to determine with accuracy, the rate of movement and the direction of it.

To individuate the triggering factors, meteorological series have been analyzed (temperature and daily rainfall, available since 1977) and seismological data. Has been indeed evaluated the option of a rapid stream erosion. The comparative analysis realized highlighted that the persistent rainfall of mid-November 1996, and only this among all the potential triggering factors hypothesized, is identifiable as the root cause of the analyzed phenomenon by virtue of the correspondence between the main persistent precipitation of an almost century-old series and the time window identified for the first movement detected.

Frisia (2007) shows that the paleoclimate data store represented by the cave concretions in the Eastern Alps show clearly the decrease, in medium-light altitude, of the remaining period of the snow cover with unpredictable consequences for forest ecosystems. Is the triggering of FVG DSGD depending not only by the precipitations but also by the absence of snow cover in the late autumn period when persistent rainfall are concentrated?