INTRODUCTION
Sediment connectivity index is usually applied to quantify sediment dynamics in alpine catchments (Cavalli et al., 2013). In this work a different use of the connectivity index map as an informative layer to detect geomorphological features and processes is presented.

METHODS
An open source, stand-alone and freely available tool named SedInConnect (Crema et al., 2015) was used for the computation of the connectivity index in an area subject to different kinds of landslide processes. The output of the model is a topography-based index aiming at evaluating the potential connection between hillslopes and features acting as targets (e.g., catchment outlet, roads) or sink areas (lakes, retention basins) for transported sediment. If the connection potential for the sediment to reach a specific target of interest is high the connectivity index features high values. The index comprises an upslope and a downslope component. The first represents the forcing for downward routing of the sediment potentially available upslope and the latter considers the flow path length that a sediment particle has to travel to reach the nearest target or sink (Cavalli et al., 2013). In both components, two weighting factors are used: the slope and a proxy of the impedance to sediment fluxes. Thus, as it incorporates information on upslope area, slope, impedance and preferential flow paths, the connectivity index map may be used as an informative layer that highlights a broad range of geomorphological features, not exclusively related to water-laden processes or debris flows.

STUDY AREA
The test area consists of a large Deep-seated Gravitational Slope Deformation (DGSD) covering more than 4 km$^2$ located in the Eastern Italian Alps some kilometers north the city of Merano (Autonomous Province of Bozen-Bolzano, Italy). The phenomenon, known as Ganderberg landslide, has been broadly studied in the last years [3] and different features, like double crests, unstable rock slabs, rock-fall prone areas along with the general geometry of a DGSD in advanced deformative stage, were identified.

RESULTS
In the study area SedInConnect was applied on a high-resolution Digital Terrain Model (DTM) with cell size of 2.5 m derived by airborne LiDAR data provided by the Autonomous Province of Bolzano. The DTM was not hydrologically corrected in order to preserve all the geomorphological elements. The connectivity index map was used to evaluate its potentiality as an interpretative layer to assist geomorphological analysis, cross checking what was previously identified by means of in situ investigations, photointerpretation and monitoring data. The area in figure 1 covers the DGDS extension and a small catchment located on the south-eastern side of the landslide. While the debris-flow prone catchment shows a well defined and gradually increasing pattern of sediment connectivity, a quite remarkable different situation can be observed in the DGDS area. At the center of the DGSD a large number of sinks appear as the deformation of the landslide induce a concavity in the central part of the phenomenon. Moreover it is possible to detect the areas with rock-fall activity as the trails left by the falling blocks are clearly highlighted; besides the presence of the block remnants creates a sink where the connectivity algorithm alts. Other
features that are highlighted in the connectivity index map are the double crests as in these areas the flow directions diverge from the general drainage pattern, which is directed towards the Passer River. In particular a rock-slab that shows clear sign of incumbent detachment (Bossi et al., 2013) is emphasized in the connectivity map due to the influence of the presence of traction trenches and reverse slope.

**FINAL REMARKS**

The connectivity index map can be considered therefore a valuable tool for geomorphological analysis. It allows to highlight different gravitational processes and could be used as an informative layer for remote interpretation along with aerial images and shaded relief maps. Moreover, on large areas it may allow to identify the best zones on which focus monitoring efforts.

**REFERENCES**


**KEYWORDS**

connectivity; Gandenberg; landslide; DGSD; rock-fall

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Figure 1. connectivity index map for the Ganderberg landslide