Relationship between landslide processes and land use-land cover changes in mountain regions: footprint identification approach.

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The present investigation aims to better understand the relationship between landslide events and land use-land cover (LULC) changes.

Starting from the approach presented last year at national level ("In search of a footprint: an investigation about the potentiality of large datasets and territorial analysis in disaster and resilience research", Geophysical Research Abstracts Vol. 16, EGU2014-11253, 2014) we focused our study at regional scale considering South Tyrol, a mountain region in Italy near the Austrian border.

Based on the concept exploited in the previous work, in which a disaster footprint was shown using land features and changes maps, in this study we start from the hypothesis that LULC can have a role in activation of landslides events.

In this study, we used LULC data from CORINE and from a regional map called REAKART and we used the Italian national database IFFI (Inventario Fenomeni Franosi in Italia, Italian inventory of landslides) from which it is possible to select the landslides present in the national inventory together with other vector layers (the urban areas - Corine Land Cover 2000, the roads and railways, the administrative boundaries, the drainage system) and raster layers (the digital terrain model, digital orthophoto TerraItaly it2000, Landsat satellite images and IGM topographic map). Moreover it's possible to obtain information on the most important parameters of landslides, view documents, photos and videos. For South Tyrol, the IFFI database is updated in real time.

In our investigation we analyzed: 1) LULC from CORINE and from REAKART, 2) landslides occurred nearby a border of two different LULC classes, 3) landslides occurred in a location in which a change in LULC classification in observed in time, 4) landslides occurred nearby road and railroad.

Using classification methods and statistical approaches we investigated relationship between the LULC and the landslides events.

The results confirm that specific LULC classes are more prone to landslides and LULC classification can be an instrument for supporting the identification of landslide area. However, it must be considered that other factors play a more relevant role in landslide occurrences and activations and that LULC classification can be used only as supplementary information, which can assist the identification of dangerous areas. Moreover, this approach, if appropriately developed, could prove useful in understanding how the community could use diverse LULC solutions to make the territory adapted and more resilient when prone to such phenomena.