



## **Erosion rates assessment in landslides prone areas**

F. Catani, L. Lombardi, S. Menci, S. Moretti

Department of Earth Sciences, University of Firenze, Firenze, Italy ([smoretti@geo.unifi.it](mailto:smoretti@geo.unifi.it) /  
Fax: +39 055-2756296)

The research concerns the prediction of soil erosion and sediment yield in the Armea basin (Imperia, North-West Italy) where the morphology and topography have changed since last November 2000, when a two-month cumulative rainfall of 1000 mm and a 12-hour 200 mm event on 23-24 November triggered important mass wasting surface processes like landslides, debris-flows, bank and slope erosion. This research seeks to provide a methodology to estimate the material reached the drainage network by sheet and rill erosion and mass movements from hillslopes as a consequence of the alluvial event and how the changed topographic conditions affect the sediment production after landslides.

For each landslide a pre-event and a post-event high resolution DTM has been generated and, in a second phase, reciprocally compared and elaborated with the aim to compute the final detached sediment volume.

The post-event DTMs have been generated automatically by means of a digital semi-automatic stereo-photogrammetric technique which is suitable for bare soils like the examined ones, but it is less indicated for the pre-event simulation, when vegetation covered the studied sites. In this case the DTMs were extracted from digital topographic maps.

Furthermore Armea basin 3D orthophotos have been generated thanks to a new algorithm which allows the automatic fusion of photograms to form a mosaic by choosing the optimized cut lines.

To estimate rill and sheet soil erosion the GEOWEPP hydrological-erosive model was applied, which allows the WEPP model to run in a GIS environment. In particular, in this research the 23-24 November event was simulated to estimate the volume of sediment that reached the channel.

Some new simulations were then repeated with the post-event topography and with the changed soil characteristics in order to evidence the contribution of the material which reaches the drainage network from the remodelled slopes by making a comparison with the pre-event situation.