



Geomorphologic study and numerical modeling of the T. Regoud debris flows, in Rhemes Valley, Aosta (NW Italy)

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The T. Regoud is a small stream in a secondary valley of Aosta Valley, NW Italy. Its bedrock is formed by polymetamorphic rock masses with thin covers of slope deposits. The morphometric analysis and geomorphological survey have allowed the identification, based on existing maps and through the use of GIS applications, of the main elements of the river basin. In particular, between 2260 and 2880 m a.s.l.m. there is a large debris accumulation. This accumulation is fed by two rock falls: the first acts directly on the rocky wall, the second, coinciding with the watershed between the Regoud and the Bioula (a stream immediately to the right), which insists on ablation of glacial deposits.

The T. Regoud study focused also reconstruction of past events and corresponding analysis of their distribution in time, identifying the highest risk period between June and September in conjunction with short but intense rainfall, typical summerlike in the Alps.

The research of mobilized material volumes was carried out by comparing orthophotos from 2006 and 2012. Through the superposition of these images, it has identified the areal extent of the reservoir of the debris.

The code used for the simulation of the flows is called r.massmov and is capable of simulating the propagation of a debris flow on topographies particularly complex. The model is the result of the implementation MassMov2D as a plugin of GRASS GIS. The plugin requires as input the volume of material taken over from the event. The volume obtained from aerial photo comparison (about 19000 m³) was considered as the solid volume but adding the liquid volume (estimated in the 30% of the solid volume) we reached a volume of 25.000 cubic meters.

The software have allowed the construction of a realistic model of detachment, very usefull for future simulations..