



Debris-flow runout susceptibility mapping for the French Alps.

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Debris-flows are one of the most important gravity-driven hazards in mountainous areas mainly due to their high velocity and long travel distance. Estimation of potential initiation areas and delineation of the down-slope endangered zones possibly affected by debris-flow deposits are crucial.

The objective of this work is to propose a first delineation of debris flow susceptibility for the French Alps by combining information from a debris flow catalogue and runout analyses with a large scale debris flow model.

The landslide source areas are estimated from statistics of recorded events in catchments and the dominant lithology, landcover and slope conditions observed in the catchments. The runout areas are estimated from a probabilistic approach using multiple flow routing algorithms and the angle of reach concept. Since the reliability of such an approach is closely linked to the accuracy of the topography, a digital elevation model at 25m resolution is used. The susceptibility analysis is carried out for each catchment and the reliability of the results (i.e. number of pixels as sources, etc.) is assessed by comparison with the landslide catalogues.

Results indicate the most susceptible catchments where further detailed assessments are needed at smaller spatial scales.