Geophysical Research Abstracts
Vol. 17, EGU2015-13656, 2015
EGU General Assembly 2015

AschFlow - A dynamic landslide run-out model for medium scale hazard analysis.

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Landslides and debris flow hazard assessments require a scale-dependent analysis in order to mitigate damage and other negative consequences at the respective scales of occurrence. Medium or large scale landslide run-out modelling for many possible landslide initiation areas has been a cumbersome task in the past. This arises from the difficulty to precisely define the location and volume of the released mass and from the inability of the run-out models to compute the displacement with a large amount of individual initiation areas (computational exhaustive). Most of the existing physically based run-out models have complications in handling such situations and therefore empirical methods have been used as a practical mean to predict landslides mobility at a medium scale (1:10,000 to 1:50,000). In this context, a simple medium scale numerical model for rapid mass movements in urban and mountainous areas was developed. The deterministic nature of the approach makes it possible to calculate the velocity, height and increase in mass by erosion, resulting in the estimation of various forms of impacts exerted by debris flows at the medium scale

The established and implemented model (“AschFlow”) is a 2-D one-phase continuum model that simulates, the entrainment, spreading and deposition process of a landslide or debris flow at a medium scale. The flow is thus treated as a single phase material, whose behavior is controlled by rheology (e.g. Voellmy or Bingham). The developed regional model “AschFlow” was applied and evaluated in well documented areas with known past debris flow events.