Geophysical Research Abstracts
Vol. 12, EGU2010-14671, 2010
EGU General Assembly 2010

Performance and reliability of empirical mobility relationships for the prediction of Debris Flow inundated areas

Alessandro Simoni, Matteo Berti, and Maria Mammoliti
Dipartimento di Scienze della Terra e Geologico-Ambientali, University of Bologna, Italy (alessandro.simoni@unibo.it)

Empirical mobility relationships can be used for preliminary DF Hazard assessment. An adaptation of the original relationships has been proposed for alpine debris flows (DFLOWZ model; Berti and Simoni, 2007). Once a reference debris flow volume is chosen, the code DFLOWZ allows to estimate the area potentially affected by the event based on the mutual relationships between channel cross-sectional area, planimetric area of the deposit and overall volume.
We back-analyzed 25 DF events occurred in the Bolzano province (Italy), ranging in volume from 3,000 to 300,000 m3 and evalutated the performance of the automated method through an objective reliability index. Our aim is:
- evaluate the effects of uncertainty associated with the empirical mobility relationships;
- assess other possible sources of error or violations of the assumptions that underlie the model.
Results indicate that a high-resolution DEM ($\leq$ 2.5 m) is essential to get a reliable inundation prediction over a fan. The code itself performs well, in a wide range of situations, demonstrating the conceptual correctness of underlying assumptions. The most relevant source of error remains the uncertainty associated with the empirical mobility relationships, due mainly to errors in volume measurements of DF deposits. Their improvement can be achieved through the collection of high quality field data of DF events.