



Simulating landslide frequency-magnitude relationships

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While great progress has been made in recent years in the statistical characterization of frequency-magnitude relationships in landslides, the same cannot be said for the process-based modelling of these relationships. This paper will present results that attempt to address this deficiency. A process-based modelling approach has been used to simulate initial sites for the triggering of landslides using a combination of hydrological modelling and the infinite slope model. We then employ a cellular model to evaluate different rule sets for the cascading of individual landslides through the landscape. Results are evaluated in two ways. First, we compare the simulations of specific storm events for a region in central Italy where landslide occurrence has been intensively mapped. Secondly, we generate frequency-area statistics and compare them to a range of heavy-tailed distributions. This approach provides a useful first step in the convergence of statistical and process-based simulation of landslides.