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Natural Hazards and Earth System Sciences

Preface

"Methods and strategies to evaluate landslide hazard and risk"

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The special issue of Natural Hazards and Earth System Sciences entitled "Methods and strategies to evaluate landslide hazard and risk", which we had the fortune to edit, contains a selected set of contributions originally presented at the General Assembly of the European Geosciences Union, in Vienna, Austria, on 13–18 April 2008. The meeting proved to be a valuable opportunity to discuss and compare methods, techniques and tools for discovering, evaluating, avoiding and mitigating landslide hazards and the related risk. Novel approaches and case studies of heuristic, statistical, and physically based models to evaluate landslide hazards and risk at different geographical scales and in different physiographic environments were presented. During the meeting, Theo van Asch, 2008 Sergey Soloviev medallist, gave an inspiring presentation on "*Some issues and challenges in landslide hazard modelling*". This presentation summarized the state-of-the-art, physically based landslide modelling, and set the path for future research on this challenging topic.

The special issue contains six of the 29 oral and poster contributions originally presented and discussed by more than 50 authors at the meeting. The six papers cover a large spectrum of topics, from site-specific investigations to global-scale landslide hazard assessments. van Asch and Malet (2009) focused on the potential transition of sliding blocks (slumps) into flow-like processes due to the generation of excess pore water pressure in undrained conditions. The generation of excess pore water pressure may be the consequence of the deformation of the landslide body during motion. The authors propose and discuss two model concepts that are tested on two slumps that have developed in secondary scarps of the Super-Sauze mudslide in the Barcelonnette area, Southern Alps, France.

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Günther and Thiel (2009) evaluated structurally-controlled failure susceptibility of fractured Cretaceous chalk rocks and topographically-controlled shallow landslide susceptibility of overlying glacial sediments in the Jasmund cliff area, Rügen Island, Germany. These authors adopted a combined methodology that involved spatially distributed kinematical rock slope failure testing with tectonic fabric data, and physically-based and inventory-based shallow landslide susceptibility analyses. Romstad et al. (2009) presented an innovative approach for regional hazard assessment of Norwegian lakes exposed to tsunamis that can generate catastrophic rockslides. The method successfully distinguished between lakes with high and low rockslide potential. For each lake, the rockfall potential was determined based on the topographical setting. For this reason, the rockfall potential does not measure the probability of rockslides in the lakes. Van Den Eeckhaut et al. (2009) discussed a combined landslide inventory and susceptibility assessment based on different mapping units carried out in the Flemish Ardennes, Belgium. The landslide susceptibility zonation was prepared through heuristic combination of, (i) a regional landslide inventory, (ii) a grid-cell-based map showing susceptibility to landslide initiation, and (iii) a topographic-unit-based map showing the susceptibility to landslide spatial occurrence. García-Rodríguez and Malpica (2010) presented an approach for assessing earthquake-triggered landslide susceptibility using artificial neural networks (ANN) in El Salvador. Modelling results were checked using independent landslide information, and revealed a good agreement between the landslide inventory and the high susceptibility zoning. The new susceptibility zonation was compared critically to an existing susceptibility zonation obtained through logistic regression analysis. Kirschbaum et al. (2009) presented a preliminary global landslide hazard algorithm developed to estimate areas of potential landslide occurrence in near real-time by combining a calculation of landslide susceptibility with satellite-derived rainfall estimates to forecast areas with

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increased potential for landslide conditions. The paper presents a stochastic methodology to compare the landslide hazard algorithm for rainfall-triggered landslides with a newly available inventory of global landslide events, in order to determine the predictive skill and limitations of the global estimation technique.

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References

García-Rodríguez, M. J. and Malpica, J. A.: Assessment of earthquake-triggered landslide susceptibility in El Salvador based on an Artificial Neural Network model, Nat. Hazards Earth Syst. Sci., 10, 1307–1315, doi:10.5194/nhess-10-1307-2010, 2010.

Günther, A. and Thiel, C.: Combined rock slope stability and shallow landslide susceptibility assessment of the Jasmund cliff area (Rügen Island, Germany), Nat. Hazards Earth Syst. Sci., 9, 687–698, doi:10.5194/nhess-9-687-2009, 2009.

Kirschbaum, D. B., Adler, R., Hong, Y., and Lerner-Lam, A.: Evaluation of a preliminary satellite-based landslide hazard algorithm using global landslide inventories, Nat. Hazards Earth Syst. Sci., 9, 673–686, doi:10.5194/nhess-9-673-2009, 2009.

Romstad, B., Harbitz, C. B., and Domaas, U.: A GIS method for assessment of rock slide tsunami hazard in all Norwegian lakes and reservoirs, Nat. Hazards Earth Syst. Sci., 9, 353–364, doi:10.5194/nhess-9-353-2009, 2009.

van Asch, T. W. J. and Malet, J.-P.: Flow-type failures in fine-grained soils: an important aspect in landslide hazard analysis, Nat. Hazards Earth Syst. Sci., 9, 1703–1711, doi:10.5194/nhess-9-1703-2009, 2009.

Van Den Eeckhaut, M., Reichenbach, P., Guzzetti, F., Rossi, M., and Poesen, J.: Combined landslide inventory and susceptibility assessment based on different mapping units: an example from the Flemish Ardennes, Belgium, Nat. Hazards Earth Syst. Sci., 9, 507–521, doi:10.5194/nhess-9-507-2009, 2009.