Geophysical Research Abstracts, Vol. 7, 04757, 2005 SRef-ID: 1607-7962/gra/EGU05-A-04757 © European Geosciences Union 2005



## Spatial prediction models for natural hazards: a review

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Computational models using statistical and heuristic methods or artificial intelligence approaches have become very popular in the regional analysis and prediction of natural hazards such as landslides.

Statistical models have the great advantage of representing the uncertainties that are inherent to the predictions. Furthermore, they constitute a valuable analytical tool since the power of explanatory variables can be tested, and because of their rather simple, interpretable structure, which contrasts with black-box models such as artificial neural networks. A frequently-used statistical method is logistic regression, which is able to directly predict probabilities of occurrence while preserving the structure of the well-known linear regression models.

In the context of spatial modelling, the specific structure of spatial random fields implies several problems including spatial autocorrelation (or pseudoreplication) and the confounding of correlated explanatory variables that are related to topography and geology. Several exampled are presented that show how these issues may affect model predictions and the analytical interpretation of the fitted model. While it is easier to recognize these problems in statistical models, in principle they apply to any other kind of prediction model. Further research on explicitly-spatial models and careful model application are therefore needed to avoid the mentioned problems.