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Modelling strategies to cope with limitations of statistical landslide susceptibility models applied for large areas. A national scale study for the Austrian territory

Pedro Lima (1), Stefan Steger (2), and Thomas Glade (1)

(1) University of Vienna, Department of Geography and Regional Research, Vienna, Austria (pedro.lima@univie.ac.at), (2) EURAC Research, Institute for Earth Observation, Bolzano, Italy

Several examples available on the literature demonstrate researchers modelling shallow-landslide susceptibility for very large areas (e.g. national, continental, global scale) adopting statistical classifiers. However, the discussion of considerable part of these studies revealed that the explanatory power of subsequent spatial predictions is usually hampered, mainly as a consequence of input data of heterogeneous quality. For large areas, available landslide inventories are often incomplete, imprecise and biased while also high quality and homogeneously available data sets related to potential predisposing factors are scarce. In many cases, a detailed improvement of data sets is not possible for such large areas, also due to limited resources (i.e. time, budget). Therefore, an adaptation of the modelling design, which considers input data errors, might be of value if compared to a simple statistical classification prediction, usually applied on the literature. An adaptation of landslide and non-landslide sampling strategies, the application of specific classifiers, a selection of alternative mapping units already proved useful when modelling with biased or imprecise input data. Most studies however, seem to ignore a potential propagation or input data errors into their models. Earlier pioneer attempt also applied to model shallow landslide susceptibility for the entire Austrian territory (84000 km^2) was found to be substantially affected by some before mentioned limitations. Therefore, this research aims to actively tackle these drawbacks by continuously taking into account input data restraints during model construction and validation. Several modelling strategies (e.g. diverse sampling strategies, different classifiers, different mapping units) will be tested and compared in terms of quantitative responses (e.g. predictive performances, modelled relationships) and geomorphic plausibility, always keeping a focus on potential errors due to input data limitations. The results presented during the European Geosciences Union 2018 aim to contribute to an improved statistical landslide susceptibility modelling for large areas that often suffers from error-prone input data.