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Compiling a landslide inventory from different data sources for state wide susceptibility modelling in Lower Austria

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Landslide inventories form an essential basis for landslide susceptibility, hazard and risk analysis. In contrast to this, only a few complete/consistent landslide inventories are available covering larger areas.
Within this study, the main objective is to identify past and present slope instabilities in Lower Austria and to compile a landslide inventory which is sufficient complete to enable the modelling of reliable landslide susceptibility maps. Therefore, different data sources are used and a strategy is developed how such an inventory for a study area of 10.200 km^2 can be set up under the restriction of limited time and manpower.
The study area is characterised by five major geological units (from North to South): the Bohemian Masif, the Molasse Zone and related basin sediments, the Flysch- and the Klippen Zone, the Northern Calcareous Alps and different types of eastalpine crystalline. Each of them showing a different susceptibility to landsliding, with the Flysch- and Klippen Zone showing the highest susceptibility.
Different institutions are acquiring spatial data on landslides: e.g. the Geological Survey of the Federal state government of Lower Austria, the Geological Survey of Austria and the Torrent and Avalanche Control of Austria. According to the background of the institution and the purpose of the archive, landslide data is collected and archived in different ways. Either point, line or polygon information is available. The accuracy of landslide location varies significantly between the different data sets.
Since an accurate location of the landslides is absolutely essential for carrying out reliable landslide susceptibility modelling, the spatial accuracy of the data sets must be carefully checked. With the state wide availability of a Lidar digital terrain model (DTM) with a resolution of 1m x 1m, the control of spatial accuracy can be carried out at the required accuracy level. However, even using the Lidar DTM there are some limitations due to the fact that past landslides might have already been disappeared from the earth surface by natural erosion or human impact. Recent landslides might also be not visible just because they are younger than the Lidar DTM. Above all time and manpower are restricted, so that not all landslides visible in the Lidar DTM can be mapped to provide an absolutely complete landslide inventory.
Thus, a strategy is developed and presented how a sufficient complete landslide inventory can be created mainly based on mapping from the Lidar DTM but also taking the other data sources into account. The main mapping criteria are that all geological units must be sufficiently covered, the minimum landslide size is 100m^2 and that only easy to detect landslides are mapped. The strategy is tested in the most landslide prone district of Waidhofen/Ybbs. Furthermore, the potential and limitations of all data sets are discussed regarding their value for landslide susceptibility modelling.
The final strategy will be applied to almost the whole state of Lower Austria. The resulting landslide inventory will then serve as the basis for preparing landslide susceptibility maps which will be implemented in the spatial planning strategies of Lower Austria.
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