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# Landslide persistence and human impact in Lower Austria assessed by lidar data and aerial photography

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Landslide inventories provide an essential basis for studies on sediment budgets, landform evolution and landslide hazard and risk. Thus, landslide activity in a given region should be well understood and substantial complete landslide inventories should be set up. Beside others airborne lidar data and multi-temporal interpretation of aerial photographs are an excellent source for landslide mapping and analyzing landslide activity. However, both datasets provide only information on given time steps which are defined by their acquiring date. Thus, detailed information on landslide activity and subsequently landslide persistence, the time period the morphological features of a landslide remain recognizable in the terrain, cannot be derived. Only few studies investigated landslide persistence so far, but only focusing on different landslide process types and landslide sizes.
Within this study, human impact on landslide persistence is assessed and quantified based on the combined usage of airborne lidar data (from 2008/2009), aerial photographs (from 2002/2004 or 2007) and age information derived from the building ground register of the Geological Survey of Lower Austria. Fresh landslides were mapped from aerial photographs and their existence was proved in hillshades of the airborne lidar digital terrain model. If landslides disappeared the landslide persistence was estimated and the respective land cover was analyzed.
In the study area landslide persistence is in the range of values given in other studies. However, persistence times of 23 to 25 years for landslides of 1000 $m^2$ and 2000 $m^2$, respectively, were reduced to one year or even less when landslides occurred on agricultural land because of planation by farmers. In total 27 landslides disappeared in less than 7 years after occurrence. Furthermore, the analysis of the land cover shows that human impact plays a major role in landslide persistence. However, based on these findings, more studies are needed to investigate this influence and their possible implications on setting up landslide inventories and subsequently on sediment budgets, landform evolution and landslide hazard and risk.