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Mapping and analysing “badass gullies” in the loess regions of Lower Austria

Sarah Diem and Ronald Pöppl
University of Vienna, Department of Geography and Regional Research, Austria

Gully erosion represents a core process of land degradation and a serious threat to ecosystems and their services. Loess regions in the northern part of Lower Austria can be considered as particularly susceptible to the development of gullies. However, relatively little attention has been paid to gully erosion in these areas (e.g. neither gully inventories, nor information on gully characteristics are available). Therefore, the aim of this study was to map, document and geomorphometrically analyse gullies and to further delineate gully hot spot areas in the loess regions of Lower Austria.
A Digital Elevation Model (DEM) with a spatial resolution of 1 m has been used to visualise, map and geomorphometrically analyse gully erosion features in the research area in a GIS. Moreover, calculations of gully volumes have been adduced to determine the amount of eroded material in a selected gully hot spot catchment. The main focus throughout the study has been put on sunken lanes and permanent gullies, which have been explicitly identifiable in this region.
The results show strong concentrations of gullying in the loess areas of the eastern Waldviertel and the Weinviertel regions, both being characterised by intensive agricultural use. Sunken lanes are mainly found in the hilly and terraced landscapes of vineyards, while clusters of permanent gullies are usually found in agricultural fields but also forests surrounded by agriculture and used for silviculture. The hot spot areas exhibit a gully density of up to 17 permanent gullies per km² and 5 sunken lanes per km². Permanent gullies are often of remarkable size, showing volumes of up to 100,000 m³, more than 500 m in length and depths reaching 20 m and more. The longest observable sunken lane has a length of 1.6 km and a volume of nearly 70.000 m³.
More detailed results will be presented at the EGU General Assembly 2022.