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Assessing soil erosion in a small agricultural catchment in Austria using OSL-dating, modelling, ^{137}Cs and field measurements: a critical comparison

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Soil erosion causes severe on- and off-site effects, such as reductions in soil depth, eutrophication of water bodies, loss of organic matter, and clogging and smothering of riverine habitats. Attempts to assess water-induced soil erosion by water include modelling, measuring/monitoring, the use of tracers, and dating. All of these approaches have shown to have shortcomings (Parsons, 2019). The main objective of this research is to assess soil erosion in a small agricultural catchment (HOAL, Lower Austria) using modelling, OSL-dating, ^{137}Cs and field measurements and to compare the gained results in the light of the shortcomings of each method. The study has been conducted in a small catchment (ca. 66 ha), located in the Northern foothills of the Eastern Alps in Austria (i.e. an area intensively agriculturally used since the Middle Ages). The catchment elevation ranges from 268 to 323 m a.s.l. and has a mean slope angle of 8 %. The lithology mainly consists of Tertiary marly to sandy deposits which are superimposed by Quaternary sediments (e.g. loess). The climate in this region is characterized as humid. The results of this study reveal significant – partly even dramatic – differences in soil erosion rates as derived from the different assessment methods. Details as well as a critical method comparison will be provided at the EGU General Assembly 2024.

References:

Parsons, A. J. (2019). How reliable are our methods for estimating soil erosion by water? *Science of the Total Environment*, 676, 215-221.