



Human impact and past soil erosion dynamics in central Europe

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This paper will review the current state of knowledge about the dynamics of past soil erosion and gullyling in small catchments, their effects on adjacent fluvial systems, and possible feedback mechanisms to land-use changes over the last 7,000 years in central Europe. The discussed studies were conducted on hillslopes and gully systems in low mountain range areas. They are characterized by coupled slope-channel systems as well as uncoupled systems like closed depressions in Pleistocene lowlands, maars, lakes, and sunken areas. The studies show that sediment fluxes in small catchments are highly sensitive to local land-use changes, while river sediments show regional trends in land use and climate change. Peaks of soil erosion and gullyling occurred during phases of rapid climate change. Extreme precipitation events in particular caused intensive runoff on slopes used for agriculture. The most significant phases occurred in the first half of the 14th century and in the mid-18th to the early 19th century. Most of the gully systems in Europe today are a result of these catastrophic occurrences, which triggered land abandonment and influenced the ecosystem dynamics and the socio-economic situation. The results imply that a future increase in land-use intensity as well as in extreme precipitation events resulting from climatic change might have severe consequences regarding soil erosion, flood risk, and ecological aspects.