



Holocene sediment dynamics in a small river catchment in central Belgium

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Very few quantitative data on long-term sediment dynamics are available. In this study, late-Holocene soil erosion and sediment deposition were investigated at various spatial scales in a typical loess catchment in central Belgium. First of all, a Holocene sediment budget for the Nethen River catchment (55 km²) was reconstructed. The total eroded sediment mass was estimated at c. 55×10^6 t. More or less 38% of this mass (c. 21×10^6 t) was stored in colluvial sediment sinks on the footslopes and in dry valleys, whereas another 23% was deposited further downstream, in the floodplains. Finally, 39% of the eroded volume was exported out of the catchment. Secondly, a time frame for the Holocene sediment dynamics was established, based on the deposition chronologies of colluvial and alluvial sediment archives using radiocarbon and optically stimulated luminescence (OSL). In the dry zero-order valleys, no significant sedimentation took place until the Late Bronze Age, but sediment accumulated fast from the Iron Age onwards (c. 800 BC). On the other hand, the alluvial plain only faced a rapid accumulation from medieval times onwards (c. 1000 AD). This shows that changing erosion intensities do not necessarily lead to immediate responses downstream the sediment cascade. Higher sedimentation rates in the upstream catchment areas were only followed by higher sedimentation rates in the alluvial plain after a few centuries. The complex response mechanism probably depends on the degree of coupling between different subsystems, or the connectivity between different landscape elements.