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Late Holocene sedimentary floodplain architecture & human interaction of the Wiesent River (Northern Franconian Alb, Bavaria, Germany)

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Riverine landscapes and their floodplains are subject to constant changes throughout geologic time spans. In the Late Holocene the direct and indirect human activity on the floodplain increases and became the dominant factor in many European catchments, which led to a change from a natural- to a human-dominated floodplain system latest since the Early Middle Ages. This change also caused a transformation in the sedimentary system, causing a general change of the fluvial and therefore the floodplain morphology.

The Wiesent River and its tributaries in the Northern Franconian Alb, northern Bavaria, seems to illustrate this transformation quite well, because direct (e. g. water mills, bridges, river regulations) and indirect (e. g. catchment wide agriculture and soil erosion) transformation processes increase since the Middle Ages. Catchment wide soil erosion due to increased agricultural activities and increased hydrotechnical constructions lead for example to thick overbank deposits and increased sedimentation rates during the Middle Ages as reported for some northern Franconian valley floors (e.g. Fuchs et al. 2011). Sediment dynamics are therefore most likely related to human activity in the catchment, especially direct water management activities along the river course, such as the installation of weirs and water mills, as well as the agricultural use of the floodplain. The identification and quantification of the anthropogenic impact on the sedimentary floodplain architecture and its temporal evolution since the Middle Ages is therefore the main objective of the study.

Here, we present preliminary results of sedimentological, (chrono)stratigraphical and geophysical investigations for several sites along the Wiesent River floodplain. A combination of percussion drilling and trenching with electrical resistivity tomography and electromagnetic induction measurements was used to gain insight into the stratigraphy of the overbank deposits. The chronostratigraphy for reconstructing the sediment dynamics and floodplain evolution is established by OSL dating techniques. Furthermore, the consideration of paleoenvironmental proxies such as phytoliths, biomarkers and ostracods facilitates the attribution of environmental changes in floodplains to anthropogenic and/or natural influences.

References:

Fuchs, M., Will, M., Kunert, E., Kreutzer, S., Fischer, M. & Reverman, R. (2011): *The temporal and spatial quantification of Holocene sediment dynamics in a meso-scale catchment in northern Bavaria, Germany. The Holocene 21 (7): 1093-1104. DOI:10.1177/0959683611400459*

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