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Late Holocene and present-day fluvial morphodynamics in small catchment areas of Central Germany

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During the past decades strong runoff events repeatedly occurred in small drainage basins of the European low mountains. In numerous events runoff was connected with erosion and transport of extensive bed load. Runoff events were predominantly triggered by rainstorms, which were limited to the catchment areas. They partly caused severe economic loss.
The present study focuses on fluvial morphodynamics in northern Hesse and Lower Saxony. In this area runoff and transport of bed load occurred in small tributary catchment areas of the Fulda, Werra and Oberweser rivers. In general, the small drainage basins are used by agriculture and forestry. Drainage channels are developed as gullies and are incised into solid bedrock, Quaternary hillslope sediments, alluvial fills, and anthropogenic deposits. Vertical incision into the bedrock may amount to 1 meter per event. Furthermore, in single cases sediment discharge amounted to 16.000 m^3 in addition to the suspension load.
On the base of historical analyses about 50 severe runoff events with a maximum frequency of 10 events during 1965 are recorded during the past 150 years in the study area. Field survey, sedimentological analyses and dating reveal intensive runoff processes since the Neolithic age in a comparable catchment area. In this context potsherds could be dated to the Linear Pottery culture, which were detected in an alluvial cone of the “Rehgraben gully”, close to the city of.Kassel. Furthermore, findings of fossil wood were recovered in the same alluvial cone. Radiocarbon dating reveals calibrated ages which are for the most parts younger than AD. In younger sediments we suppose the severe runoff event of 1342.
Current studies in the catchment area of the Rehgraben aim to distinguish different processes of the fluvial morphodynamics on a temporal scale and to estimate potential Holocene erosional rates.

References

Damm, B., 2004. Geschiebe führende und murfähige Wildbäche in Mittelgebirgsräumen. Interpraevent 10/3, Themenbereich VII Wildbach, 61-72.

Dreibrodt, S., Lubos, C., Terhorst, B., Damm, B., Bork, H.-R., 2009. Historical Soil Erosion by Water in Germany. A Review. - Quaternary International, doi:10.1016/ j.quatint.2009.06.014.

Kreikemeier, A., Damm, B., Böhner, J., Hagedorn, J., 2004. Wildbäche im Fulda- und Oberwesereinzugsgebiet (Nordhessen und Südniedersachsen) - Fallbeispiele und Ansätze zur Abfluss- und Abtragsmodellierung. Zeitschrift für Geomorphologie N.F., Suppl. Vol. 135, 69-94.