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Variations in Holocene alluvial sediment storage for contrasting environments in Belgium

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Sediment storage in floodplains is one of the key components of a catchments sediment budget. We calculated the total mass of Holocene alluvial sediment storage for three medium-sized Belgian river catchments (360-1080 km^2) that are characterized by contrasting environmental conditions. Topography is most pronounced in the Amblève catchment and least in the Dijle catchment. The Dijle and Geul catchment have a comparable and rather intense land use history, with intensive agriculture starting in Roman times. On the other hand, land use within the Amblève catchment is less intensive and developed more recently. In total 1070 hand augerings, spread over 96 cross sections, were made to quantify the fluvial deposition. Average sediment deposition masses per unit floodplain area were calculated for each cross section. These data were extrapolated to estimate the average floodplain deposition of the different catchments at different spatial scales.

The results show a large variation in alluvial sediment storage between the catchments. Sediment storage within the floodplains is much higher for the Dijle catchment (4.6 Mg ha^{-1} catchment area) compared to the Geul (1.3 Mg ha^{-1}) and Amblève catchment (0.2 Mg ha^{-1}). Comparison with data from other West-European catchments shows that the alluvial sediment storage within the Dijle catchment is rather high, while it is very low for the Amblève. These differences between catchments can mainly be attributed to the differences in land use history. Land use plays a role in both soil erosion and sediment transport processes and thus has a major influence on the amount of sediment entering the fluvial system. Radiocarbon dating from the Dijle floodplains show that major changes in land use are responsible for changes in flood-

plain sedimentation rate. On the other hand, internal catchment variability in alluvial sediment storage for the Dijle catchment (2.4-4.8 Mg ha^{-1} for various river reaches) can be explained by differences in catchment morphology.