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Fingerprinting the origin of fluvial suspended sediment in the Demer basin, Belgium: a preliminary assessment of spatial provenance

E. Vanlierde (1), A. L. Collins (2), F. Mostaert (3), J. Berckmans (1), R. Van Grieken (4) and P. Jacobs (1)

(1) Department of Geology and Soil Science, Research unit for Sedimentary Geology and Engineering Geology, Ghent University, Belgium, (2) ADAS, Wolverhampton, United Kingdom, (3) Flanders Hydraulics Research, Ministry of the Flemish Community, Borgerhout (Antwerp), Belgium, (4) Department of Chemistry, University of Antwerp, Belgium

(Elin.Vanlierde@ugent.be)

Sediments in rivers can pose problems for policy-makers and river managers, who need to address issues such as dredging, flood control, erosion and water quality. Determining the sources and their relative contribution to the total sediment flux is of primordial importance if these problems want to be addressed.

Therefore statistically verified composite fingerprints and a multivariate mixing model have been employed to establish the relative importance of the sediment inputs from different tributaries of the river Demer, Belgium. The Demer basin has a catchment area of 2163 km^2, upstream of Aarschot, of which the southern half, consisting of loess deposits, is characterized by high land erosion, whereas the northern half, consisting of iron-rich sand deposits, will contribute more authigenic sediment.

Suspended sediment samples were collected with a time-integrated sampler, on eight different tributaries of the river Demer and at a downstream sampling point in Aarschot, in April 2005 and again in February 2006. The chemical composition of these suspended sediment samples, determined by XRF measurements, was utilized to identify composite fingerprints, which were capable of discriminating between the discrete spatial sources represented by the individual tributary sub-catchments. The preliminary results demonstrate that the fingerprinting approach affords considerable potential for investigating the spatial provenance of suspended sediment fluxes. Fur-

ther results will be presented in the poster.