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Integrated monitoring of transport of persistent organic pollutants in contrasting catchments

P. Grathwohl (1,3), H. Rügner (3), M. Schwientek (3), B. Beckingham (1,3), B. Kuch (2,3)

(1) University Tübingen, Centre for Applied Geoscience, Tübingen, Germany (grathwohl@uni-tuebingen.de, +49-(0)7071-5059), (2) Institute of Sanitary Engineering, Water Quality and Solid Waste Management, Universität Stuttgart, (3) Water Earth System Science Cluster (WESS), Tübingen, Germany

Water quality of rivers depends often on the degree of urbanization and the population density in the catchment. This study shows results of a more than one year monitoring campaign of total concentration of polycyclic aromatic hydrocarbons (PAHs) and suspended particles in water samples from 40 locations in adjacent catchments in Southern Germany with similar geology and climate but different degrees of urbanization. Excellent linear relationships between total concentrations of PAHs in water and the amount of suspended solids were obtained indicating predominance of particle facilitated transport. The slopes of these regressions correspond to the average contamination of suspended particles (Csus) and thus comprise an integrated measure of sediment quality in a catchment. Furthermore, Csus is distinct in the different catchment and correlates well to their degree of urbanization represented by the number of inhabitants per total flux of suspended particles. Finally the results show that the concentration of total suspended solids in water samples correlates very well with turbidity measurements over all catchments indicating that (e.g. on-line) turbidity monitoring might be useful as a proxy to assess particle associated fluxes of pollutants in rivers in high temporal resolution.