



Factors governing sediment quality (PAH) in rivers

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The contamination of riverine sediments and suspended matter with hydrophobic pollutants is typically associated with urban land use. It is, however, rarely related to the sediment supply of the watershed. We show for a suite of catchments in two regions of Germany with contrasting land use and geology, that the contamination of suspended particles with polycyclic aromatic hydrocarbons (PAH) may be predicted based on the ratio of inhabitants residing within the catchment and the catchment's sediment yield. The applicability of this concept is demonstrated for catchments ranging in size from 100 to >3000 km². This implies that the loading of particles with PAH is more or less time invariant which is also indicated by long term measurements from sub catchments of the upper Neckar River in Southwest Germany. Data on sediment yields are rare and the installation of appropriate measurement stations is expensive, the establishment of data series time-consuming. Therefore, modeling of sediment yields based on the universal soil loss equation is proposed. Although this method lacks a physical basis, it is feasible at larger scales and is shown to lead to reasonable results at low costs. The importance of catchment properties in terms of sediment supply and the implications of the presented concept for water resources management are discussed. For instance, it may easily be used to estimate the vulnerability of river systems to particle-associated urban pollutants with similar input pathways as the PAH or to indicate if contaminant point sources such as sites of legacy pollution exist in a river catchment.