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# Transfer of fine sediments and particulate heavy metals in large river basins

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For heavy metals and other particulate contaminants erosion is an important emission pathway into surface waters. Emissions via erosion can strongly vary depending on land use, morphology, erodibility of the soils and the heavy metal content in the topsoil layer of the source areas. A high spatial resolution of input data is thus necessary to identify hotspots of heavy metal emissions via erosion in large river basins. In addition a part of the suspended solid load which is emitted to surface waters from the catchment areas can be deposited in the river system during transportation. The retention of sediments mainly takes place in lakes, reservoirs and river barrages. Former modelling studies in large river basins of Germany revealed, that the observed suspended sediment loads at monitoring stations were strongly overestimated, if retention processes in the river system were neglected. The objective of this study was therefore to test whether the consideration of sedimentation rates in lakes, reservoirs and river barrages can improve the prediction of observed suspended sediment loads in large river basins.
We choose the German/Austrian part of the Danube basin until Passau (77 156 $km^2$) for this analysis, as the alpine tributaries in the South of the Danube basin deliver high annual sediment rates (i.e. Inn and Isar) which are not fully recovered at the monitoring stations located further upstream of the Danube due to retention processes. The sediment input was quantified for all tributaries and added up along the flow path of the river system. Due to the large scale, sediment production within the catchments was calculated using the USLE for cultivated land and naturally covered areas and specific erosion rates for alpine areas without vegetation cover. Sediment delivery was estimated using an approach based on the location of the sediment source areas in the catchments and the morphology on the way to the surface waters. The location of the lakes, reservoirs and river barrages were mapped along the flow path in the river system and specific sedimentation rates were calibrated. First results show, that the observed suspended sediment loads at monitoring stations were represented realistically if local sedimentation rates were considered.