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Estimating sediment fluxes at the outlet of 400 French rivers in relation with the sediment redistribution processes in their contributing areas

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Estimating and understanding sediment exports in rivers is an important issue in river basin studies. Sediment fluxes result indeed from combined continental surface processes, as hillslope erosion, sediment transport, deposition and re-entrainment within the drained areas.
We worked on over 400 river basins in order to cover a wide range of sediment discharge values and to gain insights on the spatial distribution of sediment exports. For each basin outlet, a data base was created from continuous (daily) measurements of stream flow and discrete (infrequent) measurements of concentration of suspended solids. Different methods were used to estimate sediment fluxes from available data. Resulting sediment fluxes could thus be compared between the different river basins. This part of the study emphasized the idea, based on the study of seldom basins with a larger SS data, that different methods pertain to different situations.
Thereby a spatially distributed sediment budget was obtained for the major French river basins, including sub-catchments with unevenly distributed areas. The set of catchments covers the different kinds of French river basins with reference to their biogeomorphology, from mountainous natural settings to cultivated lowlands and also from temperate to Mediterranean areas.
Based on sediment budget the source-to-sink dynamic of the sediment cycle, can be interestingly examined by considering the redistribution processes within the landscape and the rivers networks. Our method is based on the use of
indicators to describe hillslope processes, potential downstream retention , attempting to link river basin characteristics to a prediction of sediment exports in rivers. It provides insight in the identification of the most influent sediment redistribution processes on the total sediment fluxes, and the difference between various basin typologies.