

ESTIMATION OF CRITICAL SOURCE AREAS AND SPATIAL DISTRIBUTED SDR FOR QUANTIFYING SEDIMENT DISCHARGE OF SURFACE WATERS IN MESOSCALE

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Soil accumulation is close connected to soil erosion. Investigations show that only a small number of high-grade connected areas within a watershed are responsible for sediment dislocation into surface waters in larger river basins. Nevertheless sediment input can be very intensive on those „hotspot“-sites. We assume, that approximately 90 % of the sediment input into surface waters is realized on 10% of a catchment 's area. These critical source areas can be detected at medium scale by the concept of the so-called “area connectivity”. First we have to do a separation between connected areas and those areas, which have no hydraulic connection to the river net, using GIS-functions. Barriers on the flow path, like roads, railways, etc. are considered in the modelling of sediment input. The likelihood of connectivity, describing the probability and the intensity of an area to participate on sediment dislocations up to the watercourse, is only computed on those areas with a given hydraulic connection. Driving forces are the distances to the watercourse, transportation capacity of surface runoff and the deposition of soil in landscape. Non-connected areas are neglected in the modelling.

We calculate sediment inputs in the watercourse in dependence on land use, slope, average distance to the watercourse and likelihood of connectivity, following the concept of sediment delivery ratio, adapted to regional scale. Main targets are the spatial differentiated computation of sediment delivery considering the main driving forces, the calculation of sediment input in the whole river basin and the computation of hotspot and source areas of sediment input in detail. The methodological approaches will be described and exemplified.