

COMBINED DETERMINISTIC AND STOCHASTIC MODELING OF EROSION PROCESSES IN A RIVER RESERVOIR

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Numerical models are widely applied to design hydraulic structures and evaluate alternative strategies of river water management. Due to interaction of hydrological , hydrodynamic and sedimentological processes suspended sediment transport has to be modeled by a deterministic transport model, in combination with stochastic input in terms of river discharge and suspended sediment concentration and, other stochastic parameters to describe the beginning and rate of erosion and sedimentation . Coping with stochastic parameters and uncertainties of data the following aspects are addressed: Quantification of model parameters and, estimation of their specific probability density function based on a small set of available field data. For a 11 km lock regulated river section a long term Monte Carlo simulation is applied based on a stochastic generated discharge data in combination with the suspended sediment inflow and the spatial variation of cohesive sediment properties in terms of critical erosion shear stress and erosion rate. The simulation concept allows a probabilistic quantification of the output data such as sediment or pollution concentration, sediment erosion volume or mass of resuspended particulate contaminants which are important data for sediment quality management.