The meaning of Suspended Sediment Transport in the Elbe for the coastal area (Germany)

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Introduction: The Elbe River is the third largest river in Central Europe, starting in the Czech Republic and running through the cities of Dresden and Hamburg before empting into the North Sea. Due to extensive historical contamination and redistribution of contaminated sediments throughout the basin, the Elbe River transports significant loads of contaminants downstream, particularly during flood events. Sediment concentrations of organic pollutants, such as HCB, PCBs, and DDt regularly exceed maximum allowable concentrations established by the European Commission in sections of the Elbe River.

Methods: To better understand sediment fate and transport in the Elbe River, a hydrodynamic and suspended sediment model for the Upper and Middle Elbe River was developed. Processes both within the 6,900 groyne fields along the banks of the Elbe River and between the River and the groyne fields are integral to this model. Results of chemical analyses and bioassays of groyne sediments will be used will be used complement the model and enable ecotoxicological assessment of sediments in Elbe River groyne fields

Results: Initial results from the transport model will be shown The influence of the 6900 groyne fields along the Elbe River, which act as both sinks and sources for sediment, as well as the importance of floodplains for sediment loads in the Elbe, will be discussed in relation to their significance for the impact on water quality. Broad-scale suitability of the model to European river basins will be discussed. The results from this modeling effort provide insight into sediment dynamics, areas of historically contaminated sediment, and sources of secondary contamination, as well as aid in identification of potential source control measures.