



Floodplain mesocosm system for studying environmental fate and effects of engineered nanoparticles

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Once released into the environment, engineered inorganic nanoparticles (EINPs) will undergo chemical and physical transformation processes. The fate, ecotoxicological potential, and mobility of EINPs in environmental compartments will be influenced predominantly by their aging and current speciation status. In order to understand the aging mechanisms and impact of ENP transformations on their distribution and bioavailability in real environmental systems, mesocosm studies can be helpful. The INTERNANO floodplain mesocosm links aquatic and terrestrial aging phases in one system and has been conceived as near-natural test system to evaluate and further develop process understanding on aging and functioning of EINP in the aquatic-terrestrial transition zone. The mesocosm system is run with a pulse input function of EINP in order to investigate the response of the chemical, physico-chemical and biological systems over time. Immission into the soil system is performed via flooding events.

The system is run with natural river water, natural repacked soil but with quartz sand as sediment phase. Convective water exchange between soil and aquatic compartments occurs at high water level. On this poster, we will present the design of the mesocosm system together with first findings on fate and biological effects of silver nanoparticles.