



UFZ-Seminar "Water and Environment"



19. November 2018, 3 p.m.

Seminar Room 1, Brückstr. 3a, Magdeburg

Gabriele Weigelhofer

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will give a talk on:

Effects of agriculture on nutrient spiraling in headwater streams: decoupling of water and sediments

Agriculture affects nutrient retention in headwater streams in several ways. Elevated nutrient inputs from the terrestrial surroundings can lead to the adaption and/or saturation of the various abiotic and biotic processes, which determine the nutrient retention capacity of the streams. The altered hydrochemistry and stoichiometry is often accompanied by changes of the sediment structure, resulting from the deposition of eroded soil particles. In addition, channel degradation and riparian deforestation impair the hydrological retention and affect the stream metabolism.

Since 2009, we are investigating the effects of increased nutrient and organic matter loads, fine sediment accumulations, and degraded stream morphology on biogeochemical processes in agricultural headwater streams. Our focus lies on the in-stream nutrient uptake, P sorption in the sediments, and the activity of the biofilm. Our results indicate that increased accumulations of fine particles in the upper sediment layers decouple the hyporheic zone from the water column. Due to a reduced exchange between nutrients in the surface water and reactive sites in the sediments, nutrient uptake in polluted systems may be increasingly transport-controlled. Besides, the decoupling of surface and subsurface processes has implications on the realization of the phosphorus buffer and denitrification potential of impacted streams.