UNIVERSITÄT BAYREUTH

Bayceer
Bayreuther Zentrum für Ökologie und Umweltforschung

Sommersemester 2010

Gebäude GEO I
Hörsaal H6

BayCEER Kolloquium

Vortragsreihe Ökologie und Umweltforschung

Donnerstag 24.06.2010, 16:15 Uhr, H6

Anschließend Postkolloquium mit Bier und Brezeln im Foyer H6

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Patterns and Dynamics of Groundwater-Surface Water Exchange, Characterization, Simulation and Implications for Water Quantity and Quality

Exchange processes between groundwater (GW) and surface water (SW) are important for a wide range of questions in hydrology, water resources management and ecology. Besides classical questions in water resources management (e.g. conjunctive use of GW & SW, bank filtration for drinking water supply) the interface between GW and SW has recently gained much attention as a catalytic layer for transformations. Fluxes of water, energy (e.g. heat) and solutes across the interface between surface- and groundwater can create steep hydraulic, biogeochemical and thermal gradients that characterize a highly reactive environment. Stream-aquifer exchange influences the transport of nutrients and contaminants within the river corridor and controls the supply of heat, oxygen, and organic matter to the microorganisms and macroinvertebrates in the streambed sediments. In turn exchange fluxes are governed by hydrologic controls at different spatial (e.g. river channel, alluvial aquifer, regional groundwater flow) and temporal scales (e.g. individual flow events, seasonal cycles, climate change). Our mechanistic understanding of the processes and boundary conditions that control exchange patterns and the resulting reactions and transformations is only gradually emerging. However, process based understanding of flow, transport and reactions in and at the interface between GW and SW is a key to better assess the potential for natural attenuation in streams and riparian zones and thus for managing water quality in rivers and entire catchments.
Examples for the refinement, application and testing of new methodologies (e.g. DTS, heat as a natural tracer) to characterize GW-SW exchange processes at different spatial and temporal scales are presented. New developments in the simulation of complex exchange processes are outlined and discussed based on applications of physically based numerical models to flow and transport problems in different GW-SW systems. Finally an outlook
on new directions in research will be given.

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Gäste sind herzlich willkommen

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