

PhD projects at the Research Group of Hydrogeology

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Hydrogeology and water quality of wetlands in East Africa

Keywords: Africa, environmental isotopes, groundwater/surface water interactions, hydrochemistry, hydrogeology, inverse modelling, Tanzania, Uganda, wetlands

The presented PhD project aims at the characterization of the hydrogeological settings of two super test-sites in Tanzania and Uganda on wetland and catchment scale and the determination of different flow and mixing processes in the wetlands and their surroundings. Groundwater contributes to wetland hydrology in terms of temporal and spatial patterns of in- and outflow and interactions with different surface waters.

A hydrogeological mapping is carried out including the identification of potential aquifers and determination of their physical properties and chemical composition. As widely accepted tools, hydrochemical and isotopic investigations of the wetland systems will provide the identification of groundwater flow patterns, groundwater recharge, residence times, interactions between ground- and surface waters, and will give an overview of water quality. Hence snapshot samplings of the different water types in and around the wetlands are carried out twice a year, representing the major wet and dry seasons. Sampling includes in situ measurements of physicochemical parameters and laboratory analyses of major and trace ions and selected environmental isotopes. In order to understand flow patterns and mixing processes in the wetlands, regular sampling of selected hydrochemical and isotopic tracers is performed along transects across the wetlands. Accompanied by a tracer-based residence assessment, inverse modeling will be applied to determine the chemical evolution of wetland water and to assess the mass flow between various compartments of the wetlands.



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Work Package	A5 - Water and matter fluxes, B2 - Environmental effects of alternative options
Countries of work	Tanzania, Uganda
1 st Supervisor	Prof. Barbara Reichert
2 nd Supervisor	
Subject	Geosciences
Faculty	Faculty of mathematics and natural science
University	University of Bonn
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