

PhD project at the Hydrology Research Group

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Modeling wetland Surface & Subsurface Soil Water Dynamics under different land use and Management systems of Uganda and Tanzania, East Africa

Keywords: Wetland, Soil water dynamics, land use, management systems

The availability of surface and subsurface water at wetland and watershed scale determines soil quality parameters hence the production potential for crops at plot scale. However, land use and management systems influence the dynamics of surface and subsurface water fluxes spatially and temporally. This in the long run will affect the functioning of wetland ecosystem services. Therefore, this PhD research investigates the impact of land use on wetland surface and shallow ground water at different hydrological situations for the different management systems as well as their effects on wetland ecosystem services in East Africa. It is part of GlobE wetlands project- reconciling future food production with environmental protection. To achieve the research objective, understanding and modeling of small-scale hydrological processes and water-related ecosystem services in wetlands under different kinds of usage; modeling the surface and subsurface water dynamics and soil water availability of the wetland and quantification of water-related ecosystem services will be conducted. A fully distributed 3D hydrological model MODHMs will be applied to model surface/ subsurface water dynamics at high temporal and spatial resolution at a wetland scale. For the calibration/validation of model, field measurements of hydrological parameters like stream discharge, soil water content- using FDR sensors, shallow ground water-piezometers, sediment flux-multiparameter probes, soil related properties as well as rainfall will be performed. Therefore, this modeling approach will help to understand the hydrological functioning of the wetland systems; inland and floodplains in East Africa and to target the land use and management strategies which sustain wetland food production.



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Countries of work	Uganda and Tanzania
1 st Supervisor	Prof. Dr. Bernd Diekkruger
2 nd Supervisor	
Subject	Geography
Faculty	Faculty of mathematics and natural sciences
University	Bonn
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