

## **NUTRIENT RETENTION AND TRANSFORMATION IN SHALLOW GROUNDWATER**

*Johanna Frings, Institute for Land Use, University of Rostock  
Sandra Schönemann, Institute for Land Use, University of Rostock  
Andreas Bauwe, Institute for Land Use, University of Rostock  
B. Lennartz, Institute for Land Use, University of Rostock*

Numerous studies document the efficiency of vegetated buffer strips in reducing sediment and nutrient emissions into surface waters via surface runoff. In contrast, little is known about the retention performance of buffer strips in the groundwater domain, especially if narrow strips of less than 10 m width are considered. This study was initiated to gain insight into the governing processes of nitrogen transport and transformation in the shallow groundwater of small sized vegetated buffer strips. Three buffer strip segments (30 m each) of 1, 3 and 7 m width were established along a ditch draining a small agricultural catchment. The experimental field plot was instrumented with several dip wells allowing to sample the groundwater depth-specifically between 1 and 4 m below soil surface.

Water table measurements indicate the dynamic behaviour of the groundwater in response to precipitation and a clear gradient inducing a flux from the agricultural field to the ditch. First results from groundwater sampling revealed that the nitrate-nitrogen concentration decreases significantly with groundwater depth independent of location (in-field or buffer strip). Likewise, nitrate concentrations decreased along the groundwater flow direction being almost zero in the vicinity of the ditch. The concentration reduction was observed in all three buffer strips showing that at this early stage of the project no specific effect of the buffer strip occurred. It is believed that the low saturated hydraulic conductivity of the soil at groundwater depth may have caused denitrification and low nitrate concentrations. Future work will concentrate on the quantification of the groundwater influx into the ditch and the assessment of the denitrification potential of the groundwater in various depths.

*Contact:*

*Johanna Frings  
University of Rostock  
Faculty of Agricultural and Environmental Sciences  
Institute for Land Use  
Justus- von-Liebig-Weg 6  
18059 Rostock  
Germany  
johanna.frings@uni-rostock.de*