Hyporheic Groundwater Fluxes at the lower Aa River, Belgium

C. Anibas (1), **O. Batelaan** (1) and the FWO-EXECO Team

(1) Department of Hydrology and Hydraulic Engineering, Vrije Universiteit Brussel, Belgium
(canibas@vub.ac.be, batelaan@vub.ac.be, +3226293022)

The presented work is part of a multidisciplinary research project on the fundamental exchange processes in river ecosystems. The overall aim of the project is to get a better understanding in the diverse physical and biological processes in margins and inundation areas of water courses and how their interactions determine the exchange of water, dissolved compounds and particulate matter. To estimate these processes surface, groundwater and eco-biogeochemical models are developed, integrated and tested. GIS is used for data management, while FEMME (Soetaert et al., 2002) serves as a platform for integrating different models, such as MODFLOW, DAFLOW, WetSpa(ss), etc. Several study sites have been selected for studying the different riparian interaction zones. One of these locations covers a 1.4 km long section of the Aa River, Flanders, Belgium. Applied fieldwork aims at spatial and temporal delineation and quantification of the ground water discharge through the hyporheic zone, primarily by using streambed temperatures.

Measuring ground water fluxes through streambed temperatures is in general a simple, quantitative, relative unobtrusive and inexpensive method, capable of characterizing the spatial variation. A combination of longitudinal, cross sectional and vertical stream bed temperature profiles have been used at the site on a bi-monthly basis since August 2004. Since August 2005 a continuous measurement of groundwater temperatures in different depths by nests of piezometers has been added. Based on the other project components comparison is made between the results gained from the streambed temperature measurements with methods like seepage meter measurements, porewater profiles of chloride or mass-balance calculations for the stream reach.