



## **DOODE BEMDE CASI-SWIR 2002 CAMPAIGN: HYPERSENSITIVE SENSING, FIELD MEASUREMENTS AND INITIAL RESULTS OF MOISTURE GRADIENTS**

**O. Batelaan** (1), B. Verbeiren (1) and L.Q. Hung (1)

(1) Department of Hydrology and Hydraulic Engineering, Vrije Universiteit Brussel,  
Pleinlaan 2, 1050 Brussels, Belgium (Fax: 00-32-2-6293022, Email: batelaan@vub.ac.be)

Determination of groundwater systems is essential for the management and development of ecological values of valleys and wetlands. At the land surface, groundwater systems appear as infiltration and discharge zones; the latter are relatively wet because of the upward groundwater seepage, while the former are relatively dry. Groundwater discharge zones offer a high potential for nature values because of their constant moisture presence and their specific water quality. Valleys usually have a complicated pattern of moisture gradients, caused by a complex interaction of regional groundwater flow with local influences of differences in soil type, vegetation and local topography. Current methods for the determination of discharge and infiltration zones use either detailed time-consuming fieldwork or data intensive numerical simulation. Consequently, there is a direct need for mapping possibilities for the determination of moisture gradients and discharge-infiltration zones.

Within the framework of the CASI-SWIR campaign 2002 an airborne hyperspectral remote sensing and hydrological field campaign was executed aiming at the analyses of moisture gradients in the Doode Bemde riparian wetland. The main objective of the study is to test the best hyperspectral analysis method, using the 96 CASI-SWIR spectral bands, for the known, based upon field and simulation data, moisture gradients in the Doode Bemde wetland. Extensive hydro-ecological research was carried out in the study area during the last five years, providing a detailed dataset and knowledge about the flow systems. The area is hydrochemically uniform, and has clear, relatively constant moisture gradients with associated differences in vege-

tation on a small scale caused by groundwater flow differences. Simultaneously with the airborne hyperspectral campaign, field measurements of soil moisture, groundwater levels, vegetation temperature and spectral characteristics of some key vegetation species (phreatophytes) were performed. The method of analysis consists of statistical comparison of moisture gradients, obtained from measurements and simulations, with individual bands, a combination of bands and multivariate derivatives.

The presentation describes the set-up of the field and airborne measurement campaign, the methodology of analysis as well as first analysis results.