Monitoring of vegetation stress and water quality of the Sonian Forest (CASI-TIR 2003 campaign)

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PRESENTATION ABSTRACT

Forests and ponds in the vicinity of urban areas require on-time monitoring of their health status. The Sonian Forest and the ponds in the Woluwe valley in the South-East part of Brussels are currently checked on a regular basis on their health status by taking multiple measurements in situ, which is very intensive and time consuming and for which hyperspectral remote sensing is a powerful alternative. In this presentation, the results of the CASI-TIR 2003 campaign “Monitoring of vegetation stress and water quality of the Sonian Forest” are discussed.

During this study, the differences in spectral reflectance behaviour between 405nm and 947nm (CASI) of tree canopies belonging to healthy and unhealthy areas of beech cover in the Sonian Forest were investigated. The distributions of the intensity of the observed reflectance radiances of selected canopies in the healthy region have been compared to those observed in the unhealthy region for different wavelengths. Although small differences in the histograms could be detected for both regions, the vegetation indices revealed no significant difference for healthy and unhealthy tree canopies.

During the campaign, different chemical, physical and biological composition values were measured for 17 different ponds in the Woluwe valley. A Spearman rank order correlation test was performed on the reflection intensities of the homogeneous regions of these ponds and their composition values. Significant p-values were found between the population densities of 4 taxonomic groups of algae (Bacillariophyta, Chlorophyta, Cyanobacteria and Xanthophyta) and the reflection intensities in 12 different wavelengths of the hyperspectral data set.