



Temporal characteristics of ecohydrological variables in an intensively monitored wetland

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Ecosystems are complex, evolving structures whose characteristics and dynamic properties depend on many interrelated links between direct gradients (nutrients, moisture, temperature), their environmental determinants (climate, geology, topography) and the vegetation cover. The aim of this work is to monitor and analyse important a-biological variables and phenological vegetation characteristics through time along a topographical transect on a fine temporal scale. The transect is situated on an alluvial floodplain of the river Leie near Ghent and comprises the a natural catena of different soil types: clay soils with gleyic properties in the depression, and well drained sandy and silty soils on the natural levees. The hydrologic management of the study site aims at increasing the botanical and ornithological value of the area. During winter months, a floodgate is closed and the gravitational drainage of the area is blocked. The rate of water level raising is dependent on the precipitation volumes during this period. The chemical composition of the inundation water is similar to rainwater. Three data-logging systems were installed along the transect, on which a series of measuring devices at different depths were connected at different depths: (i) soil water content reflectometers for measuring the volumetric water content, (ii) soil temperature probes, and (iii) heat flux plates for measuring the heat flux in the soil. Additionally, piezometers were installed and equipped with divers for groundwater level and temperature monitoring. The sampling interval was one hour. Vegetation monitoring was done on a coarser temporal scale. Every month twelve randomly selected 30 cm x 30 cm plots were harvested at each site. Leaf area was determined and oven dried plant material was weighed to determine above ground biomass. A preliminary statistical analysis using auto-correlations and spectral densities was used to identify temporal

characteristics of stated variables, while cross-correlation were applied to quantify interrelations between them.