

**IMPACT OF VEGETATION DEVELOPMENT ON THE HYDRAULIC CHARACTERISTICS AND FLOW PATTERNS IN LOWLAND RIVERS**

**De Doncker L., Verhoeven R., Bal K., Meire P., Okruszko T., Świątek D., Chormański J.**

It is a well known phenomenon that vegetation growth drastically influences water levels and flow patterns in lowland rivers. As soon as plants start to grow in spring, the flow resistance and by this the upstream water levels increase to reach a maximum in early summer. The mowing of vegetation in order to meet the requirements of protecting riparians against summer floods is directly opposing the need for a sound environment and a well balanced ecosystem. Studies aiming at finding a solution for both these problems by limited but well-considered mowing and at the same time guaranteeing safe evacuation of floods should lead to a better river ecosystem management.

The universities of Gent and Antwerp, in cooperation with the Agricultural university of Warsaw are conducting scientific research in de river AA in Belgium and Biebrza river in Poland in order to better understand the phenomena involved and to come to a more accurate determination of the different parameters involved.

Several measurement campaigns on both rivers allow to determine the variation of the friction factor (Manning n) as a function of time, type and density of vegetation, hydraulic parameters etc. and to evaluate flow pattern changes in between and around vegetation patches. During these measurement campaigns, velocity and discharge measurements are performed in multiple cross-sections in presence of and after careful removal of vegetation. Removing the vegetation allows for determining species and vegetation density as well as for studying of the influence of plants on flow distribution and patterns.