Geophysical Research Abstracts
Vol. 13, EGU2011-11851, 2011
EGU General Assembly 2011

Riparian vegetation dynamic modelling using the succession-retrogression concept: the RIPFLOW project

Felix Frances (1), Gregory Egger (2), Teresa Ferreira (3), Karoline Angermann (2), Francisco Martínez-Capel (1), and Emilio Politti (2)

(1) Technical University of Valencia, Spain (ffrances@hma.upv.es), (2) Environmental Consulting-Klagenfurt, Austria, (3) Technical University of Lisbon, Portugal

Riparian habitats are important by their self and for their ecological services. They play an important role in the hydromorphological processes and the ecosystem functioning, therefore, they should be taken into account in the rivers ecological status evaluation, in a wide sense or from the WFD point of view. To accomplish this evaluation in the long-term, it is necessary to have a tool capable to predict the riparian vegetation response to its driving forces, as far as these drivers will or can change in the future.

Two general goals were proposed in RIPFLOW project. In the first goal the main scientific objective was to develop a flexible dynamic model of riparian habitats and vegetation to be easily applied in a wide range of conditions across Europe, from alpine regions of Austria to Mediterranean conditions, including rivers with permanent and non-permanent flow regimes. Two important key elements of this model are the soil-moisture submodel (to consider the effect of low flows and/or droughts) and the succession submodel (to consider the effect of floods).

The second RIPFLOW goal consisted in applying the model to some case studies in the countries involved in this project (Austria, Portugal and Spain). The application not only validated the model, but also will serve as an instrument to deliver tools that support water managers decisions related with the riparian vegetation and river ecological status.

The model concept assumes that vegetation development depends on the functional relationship between hydrology, physical processes and climate. In the model conceptualization, physical processes are represented by height over mean water, shear stress and flood duration, while the link to the climate is represented by the soil moisture. These factors allow the successful establishment and development of the vegetation or its retrogression to a previous succession phase. On these premises, the model concept has been divided in two main components. The first, static, component provides an initial landscape to run the model; upon this, the second and dynamic component simulates the vegetation succession or retrogression in space and time. The dynamic component is further divided in modules, namely: recruitment, shear stress, flood duration and soil moisture.