Geophysical Research Abstracts
Vol. 15, EGU2013-7757, 2013
EGU General Assembly 2013

The influence of riparian vegetation on the energy input of the rivers Lafnitz and Pinka

Gerda Holzapfel (1), Hans Peter Rauch (1), Philipp Weihs (2), Heidelinde Trimmel (2), Herbert Formayer (2), Patrick Leitner (3), Wolfram Graf (3), Andreas Melcher (3), and Florian Dossi (3)

(1) University of Natural Resources and Life Sciences, Vienna, Institute of Soil Bioengineering and Landscape Construction, Department of Civil Engineering and Natural Hazards, Vienna, Austria (gerda.holzapfel@boku.ac.at), (2) University of Natural Resources and Life Sciences, Vienna, Institute of Meteorology, Department of Water, Atmosphere and Environment, Vienna, Austria, (3) University of Natural Resources and Life Sciences, Vienna, Institute of Hydrobiology and Aquatic Ecosystem Management, Department of Water, Atmosphere and Environment, Vienna, Austria

In Central Europe freshwater ecosystems have to deal with a loss of habitat structures due to channelisation and standardisation. Unimpaired streams and rivers are very rare, which leads to a few, remaining populations of sensitive invertebrate species which are severely fragmented. This progress is mainly noticed in lowland rivers in agricultural intensely used areas, where habitat degradation and pollution affect the ecosystems. Additional pressures on the freshwater systems will be expected due to climate change effects. In the Austrian Lowlands, an increase of air temperature about 2-2.5 °C is predicted till 2040. This will in turn lead to the highest increase in water temperature in the lowland rivers of the "Hungarian Plains", Ecoregion 11 on which the impacts of climate change will most likely be highest in Austria. Global warming on its own may lead to severe changes in aquatic ecosystems. Human impacts increase the negative effects even more. Main factors for a sustainable survival of benthic invertebrates and fishes are closely connected with parameters like water temperature, the availability of oxygen and nutrients, or radiation and nutrients for primary production which are closely related to climate. Natural bank vegetation reduces the influx of solar radiation as well as it forms a microclimate of its own and could provide very important niches for terrestrial and aquatic stages. Riparian areas with trees provide direct shade for the water body and thus avoiding the corresponding increase in water temperature. Wide riparian wooded areas can even decrease evaporation and increase the relative air humidity, which contributes to reducing water temperature. Input of deadwood like trees or logs represents essential habitats for invertebrates and fish assemblages. Its presence is one essential drivers of bed-morphology creating heterogeneous instream habitat patterns.

In the framework of the project BIO_CLIC the potential of riparian vegetation to mitigate effects of climate change on biological assemblages of small and medium sized running waters will be investigated. The results support river managers in implementing integrative guidelines for sustainable river restoration towards climate change adaptation, ecological services and socio-economic consequences. In this paper the influence of riparian vegetation on the energy input of rivers will be highlighted. As a first step in field works habitat characteristics will be examined and described. First results show riparian vegetation datasets for different riparian vegetation types with 3D spatial distribution of vegetation, riparian vegetation composition and radiation attenuation coefficients for different vegetation types.