



## **Integrated Danube River Engineering Project East of Vienna**

### **Abiotic Monitoring of Restoration, Bed Stabilisation and Navigation**

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One of the last free flowing reaches of the Danube River in Austria, between Vienna (Freudenau) and the Austrian-Slovak border (Bratislava), is currently subject to an integrated river engineering and restoration project. The reach, heavily regulated at the end of the 19<sup>th</sup> century, is today a critical spot for inland navigation due to water depth, characterised by a steady riverbed erosion of 2 to 3.5 cm per year. Water depth is too low and fluctuates too much during the seasons to provide reliable and competitive navigation conditions. Furthermore most of the region is part of the National Park “Donau Auen”, which leads to a high public interest regarding the ecological situation. The sediment balance is in danger and may cause serious ecological problems. Hence the Austrian Ministry for Transport, Innovation and Technology (BMVIT) and the ViaDonau launched the “Integrated River Engineering Project to the East of Vienna” with three main objectives:

1. To reduce riverbed erosion by adding larger gravel sizes within the natural grain size spectrum.
2. To improve navigation conditions, particularly during low flow periods, by raising water levels using modified groyne shapes.

3. To achieve improved ecological conditions by riparian restoration measures and the reconnection of side arms.

In order to ensure effectiveness of the measures planned, a comprehensive monitoring concept is compiled. It covers and interrelates between both abiotic and biotic investigations to allow integrative conclusions. In a first step the measures are applied to a 3 km test reach where the effectiveness of measures and the monitoring concept can be approved. The following implementation over the entire length of 40 km is divided into five sections. It is planned to accompany the construction process by monitoring presumably until the year 2017.

The abiotic part of the monitoring concept, which has been developed at the University of Natural Resources and Applied Life Sciences, consists of several work packages which include measurements concerning hydrology and hydraulics, sediment budget and transport, changes in morphology, river bed deformation and considerations regarding navigation. An extensive amount of numerical simulations is planned. For instance a high-resolution 3-D flow simulation model, covering sections up to 12 km and a sediment transport simulation model will be applied. The poster gives an overview of the project, the abiotic monitoring concept, and first experiences of the integrative measurements.