Geophysical Research Abstracts,
Vol. 11, EGU2009-8402-2, 2009
EGU General Assembly 2009

The "Redynamisation of the Old Rhine", an international and interdisciplinary INTERREG project focused on for channel braiding restoration - 2009-2013

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The Upper Rhine between France and Germany has been heavily impacted by channelization for navigation and then by dams works during the last two centuries. Most of the flows are now conveyed in a canalized section, a minimum discharge been reserved in the old section, so called the “Old Rhine”. Between Huningue and Neuf-Breisach (45 km), the longest disconnected section, engineering works induced simplification and stabilization of the channel pattern from a formerly braiding reach to a single incised channel (incision of 7m between 184 and 1920 before Kembs dam construction), hydrological modifications, channel bottom armouring due to bedload decrease, and thus ecological alterations.

Within the framework of current research works on river restoration, a new international and interdisciplinary project on the Upper Rhine entitled “INTERREG IV - Redynamisation of the Old Rhine” began in early 2009 running for four years. The purpose of this project is to evaluate the feasibility of an important hydro-morphological and ecological restoration plan on the 45 km reach, expanding and gathering some independent national projects, by a closed partnership between French and German scientists, water management organisations and practitioners. The finality of the project is to provide possible prospective scenarios, in order to partially restore a braiding channel pattern on the Old Rhine channel, by promoting left bank erosion, channel enlargement and/or artificial sediment inputs. The Alsace Region will conduct the project administratively, and the scientific group will be coordinated by the University of Lyon (UMR 5600 CNRS).

The study will involve historical, hydro-morphological, ecological and sociological parts. On one hand a historical approach, led by UMR 5600 and Electricité de France (EDF), will be necessary to understand long term channel changes since 1800 and thus to orientate restoration strategies. This task will be based on old maps, aerial photographs and topographical data analysis using a GIS. On the other hand, a hydro-morphological approach will be performed to determine the equilibrium between the sediment transport capacity of the channel and the sediment volume to be introduced in order to restore the morphological dynamics without increasing overflows. It will consist (i) in in situ experiments (controlled bank erosion conducted by EDF and artificial sediment introduction, and field monitoring by UMR 5600) and (ii) in hydro-dynamic modelling (LWI laboratory and the Cemagref). Lastly, an ecological approach (University of Strasbourg and environmental organisations – Conservatoire des Sites Alsaciens and Association de la Petite Camargue Alsacienne) will evaluate gravel introduction benefits on the different components of the ecosystem. The compromise of conciliation between social uses and ecological issues will also be evaluated using a sociological approach (University of Strasbourg).

Results of these complementary approaches will permit to propose large scale and long term innovative, international and inter-disciplinary restoration scenarios, on the large scale of one of the largest rivers in Europe, over a twenty year period.