

## Engineered logjams in mobile bed: physical scale modelling.

The implementation of wood in rivers has been recently reevaluated as a useful tool for river restoration projects. On the one hand, macro-roughness elements like rootwads or engineered logjams can enhance flow heterogeneity and riverbed morphologies, increasing diversity of habitats for aquatic species (Fig. 1). On the other hand, such structures alter flow dynamics and hence sediment transport, making it difficult to predict their development under flood conditions. As Switzerland is targeting to restore 4000 km of river reaches by 2090 (Swiss Waters Protection Act 2011), further research is needed on this topic.



Fig. 1: Engineered logjams at the Emme River close to Solothurn (photo by IUB Engineering).

This Master's thesis focuses on the interaction between logjams and sediment transport in physical laboratory scale-model experiments. Different grain size distributions are tested as mobile beds in a hydraulic flume under steady state conditions. Scaled models of engineered logjams are investigated, with different porosity and width. Conditions of low and high flows are tested, until equilibrium with the riverbed is reached. The objectives are to 1) measure the flow conditions and the riverbed morphologies around the structure, and 2) infer these results with possible different scenarios and layouts. The results will help river practitioners to better understand the behavior of engineered logjams in rivers.

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**Remarks:** Laboratory experiments;  
Project language: English  
1 student for Master or up to 2 students for Project thesis