

Effect of initial measures on dynamic river widening

The wide range of restoration measures in channelized, morphologically degraded rivers includes dynamic river widening. This method is based on the reactivation of bank erosion, sediment redistribution, and channel shifting processes within certain spatial limitations. The goal is to restore the morphodynamic processes typical for river-floodplain systems and to increase the diversity of aquatic and terrestrial habitats.

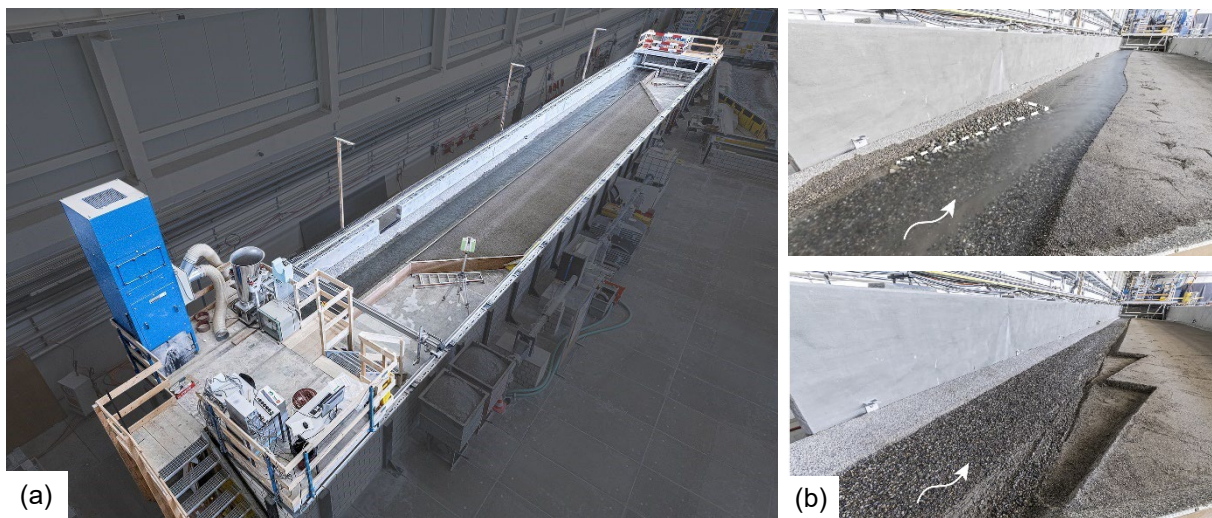


Fig. 1: (a) Hydromorphological flume at VAW and (b) initial measures

The temporal and spatial development of a dynamic river widening is of substantial interest for flood safety and the assessment of its ecological effectiveness. However, the impacts and interactions of the multitude of influencing parameters are still insufficiently understood. In addition, the use of different initial measures (e.g., flow deflector or initial widening) to increase the widening speed and initiate a morphodynamic active widening needs to be discussed in more detail (Fig. 1b).

In this study, hydromorphological experiments will be performed in a large-scale physical model (Fig. 1a) at the Laboratory of Hydraulics, Hydrology and Glaciology (VAW). The objectives of the thesis are to investigate (i) the temporal and spatial channel width development using different initial measures and (ii) the overall morphological processes in a dynamic river widening. Modern measurement techniques such as terrestrial laser scanning are used, and the results will contribute to recommendations on the design of dynamic river widening.

Contact:

Paul Demuth
River Engineering group, HIA C 53
demuth@vaw.baug.ethz.ch

Remarks:

Hydraulic laboratory experiments
Project language: English or German
1 student for Master's or up to 2 students for project thesis