

## Master Thesis FS 2020



Versuchsanstalt für Wasserbau, Hydrologie und Glaziologie

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## Numerical simulation of bank erosion processes in river widenings

Dynamic river widening is a restoration method applied to channelized, degraded rivers. The goal is to provide the river with the necessary room to allow dynamic sediment erosion and deposition processes. These episodic sediment relocation processes are vital for a healthy river system. To initiate the widening process, the bank protection of the initial channel is removed and the bank erosion advances during subsequent flood events. Comprehensive knowledge on the lateral bank erosion process is necessary to avoid widenings that develop too quickly and lead to flood protection issues or too slowly and thus cannot provide any ecological advantages.

The goal of this thesis is to simulate the lateral erosion processes numerically. The morphodynamic simulations will be performed with the software BASEMENT. The erosion process will be calibrated and validated with experimental data that is provided from a large-scale laboratory experiment (Fig. 1). The comparison to experimental data has the advantage of clearly defined boundary conditions and topographic measurements of high temporal resolution. A systematic parameter study will explore the most relevant parameters. Especially the parameters controlling gravitational bank collapse are of great importance for the simulation of lateral bank erosion.

No specific programming skills are required. However, the lecture 'River Morphodyamic Modelling' is mandatory.



Fig. 1: Eroding bank in (a) the laboratory experiment and (b) a numerical model.

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Notes:	Research oriented Single MSc-Thesis Communication in German or English