Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

Versuchsanstalt für Wasserbau,
Hydrologie und Glaziologie

Master's Thesis or Project Work
HS 2023

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Hydromorphological characterization of a natural widening - TiRiLab thesis

River widenings are of particular interest because of the complex and mutual interactions between hydro-morphodynamic processes and riparian vegetation. They also generally host variegate fluvial habitats and are critical elements for river conservation and restoration.

The case study for this thesis is a semi-natural floodplain of the Brenno River at Loderio (Fig. 1), in Canton Tessin. The main goals of the thesis are: i) to conduct a topographical survey of the site and create a DEM ii) to setup and execute a 2D hydrodynamic model ii) to identify relevant thresholds for ecological (e.g. habitat suitability) and morphological (e.g. incipient sediment transport) characterization.

Fig. 1: Brenno River at Loderio, Canton Tessin

The investigation will be based on GIS and data analysis, and simulations with the software BASEMENT. An affinity for numerical simulations and some scripting skills are expected from the candidate. The prior attendance of the course "River Morphodynamic Modelling" is a prerequisite.

This thesis is part of TiRiLab, a river research and education laboratory in environmental engineering at ETH Zürich. More information and potential other research ideas at https://hyd.ifu.ethz.ch/education/tirilab.html

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Remarks: Correspondence and report in English; 2 students for Project work or 1 student for Master's thesis