ETH
Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

VAW
Laboratory of Hydraulics,
Hydrology and Glaciology

**Project Work or Master's Thesis
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From bare ground to forests
Effect of floodplain forest traits on flood attenuation

Floodplains in compound river channels are essential for flood management and play key roles in both ecological and geomorphological processes. They provide natural storage for excess flow, helping to regulate water levels during floods. Additionally, floodplains support sediment and deadwood deposition, serving as vital corridors connecting inland ecosystems with the main river. In compound channels like those of the Rhine River, the interaction between the main channel and forested floodplains shapes the river's physical evolution, affecting navigability and preserving floodplain ecosystems. Along the Rhine, these floodplain forests are found in various stages of succession, from initial colonization to mature forests over centuries old. The forest age significantly influences the hydrodynamic interactions with the main channel during flood events, as factors like vegetation density, species type, and sediment characteristics vary with forest maturity.
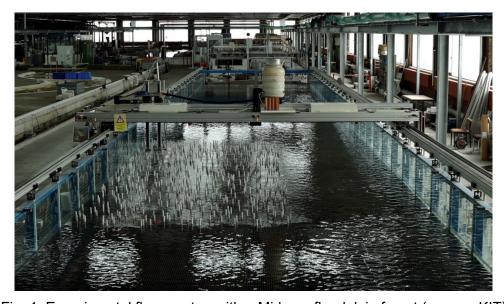

Fig. 1: Experimental flume setup with a Mid age floodplain forest (source: KIT)

A recent study at KIT (Fig. 1) explored how the age of floodplain forests impacts hydrodynamic processes and examined implications for floodplain forest management under steady flow conditions. This thesis will build on that research by focusing on dynamic, real flood scenarios, assessing how forest succession and management influence flood attenuation and retention capacity. The project will involve data analysis and numerical simulations using BASEMENT.

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Remarks:	Research-oriented thesis;
	Skills in numerical modelling and scripting with Python required;
	Thesis can be written in English or German