Universität Stuttgart

IWS Department of Hydraulic Engineering
and Water Resources Management
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M.Sc. Topic

Make the Inn sustainable again –
2D Numerical Modelling of Sediment Replenishments in the River Inn
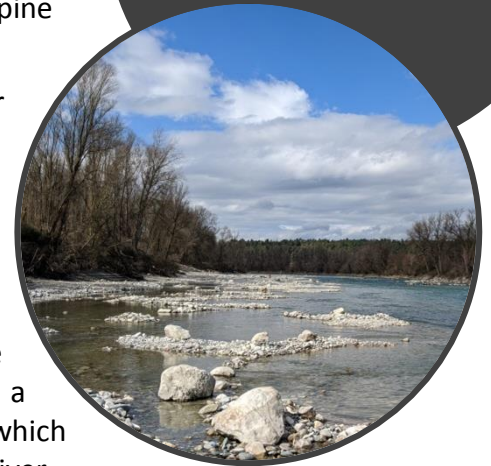
**Sediment
Replenishments
in the River Inn**

Background

The Inn is the river with the highest discharge in Bavaria and at the same time the largest northern alpine tributary of the Danube. With its source in the Swiss Engadine, the upper reaches of the Inn represent a typical Alpine river.

In 1924, the VERBUND-Innkraftwerke GmbH constructed a hydropower plant at Töging with a diverson weir at Jettenbach and the so-called Innwerk artificial channel. As a result, a residual flow section between Jettenbach and Töging shows considerable water management and ecological deficits due to a lack of sediment supply and impaired discharge.

In the next years, several measures will be implemented to improve the physical habitat conditions of the residual flow section. Therefore, a sustainable sediment management concept is currently developed, which also includes ecologically oriented sediment replenishments in the Inn River.

To evaluate morphological changes of rivers over the course of time, two-dimensional numerical models have become a strong tool in recent years. The goal of this study is to develop sediment replenishment scenarios and to verify their effect on the river morphology using a state-of-the-art 2D numerical model.

Thesis Overview

1. Literature review on sediment replenishment and hydro-morphodynamic modelling with 2D numerical models
2. Familiarize with the state-of-the-art hydro-morphodynamic numerical model software "Hydro-FT" and the project region
3. Develop sediment replenishment scenarios based on the literature review
4. Run hydro-morphodynamic models to evaluate and adapt the replenishment scenarios
5. Interpret the results and draw relevant conclusions

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The thesis can be written in German or English.

Examiner: Prof.-Dr. Ing. Silke Wieprecht | Supervisors: Sebastian Schwindt & Maximilian Kunz