



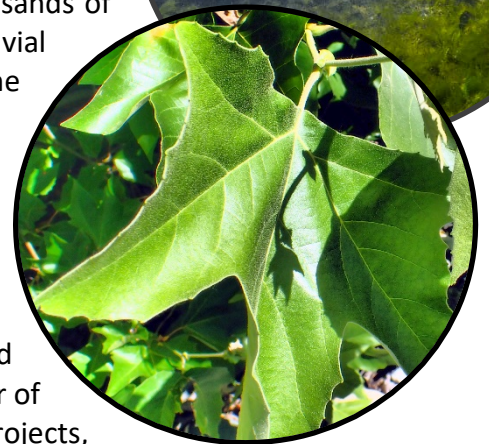
B.Sc. Topic

Biodynamic river engineering: Building ecosystems with native vegetation

Background

Changes in natural systems resulting from human activities are called legacy. Fluvial ecosystems are marked by many legacies, such as channelization for navigation purposes or the use of rivers for hydropower. Today, thousands of river restoration projects worldwide attempt to repair damage to fluvial ecosystems through legacies. With centuries-old legacies, however, the question arises as to which state rivers should be restored. Consensus is on the use of natural, vegetative building materials for river restoration, but the determination of the plant species to be used often ignores fundamental parameters. For instance, plant species have different preferences and resistances regarding stagnant water or the forces of floods. In addition, plants must not compromise flood safety as a result of increased roughness owing to their branches and leaves. From an ecological point of view, the broadest possible number of different plant species should be applied. Many restoration projects, however, employ no more than a handful of different plant species. This study analyzes a broad spectrum of native plant species in Europe regarding their hydraulic properties and environmental preferences. The student will extract and translate ecohydraulic requirements into parameters for use with numerical model outputs. Similar studies have already been conducted in North America, but on a very limited number of plants from the Pacific coast. The results of this project will integrate into a novel concept of river restoration with a focus on biodynamic interventions.

Biodynamic river
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Thesis Overview

1. Review literature on native European plant species
2. Extract relevant data regarding hydraulic, substrate, ecological, climatic, and geographical aspects
3. Establish and integrate plant species parameter into a database for tests with numerical model output



Apply now!

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The thesis can be written in German or English.

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