Universität Stuttgart

IWS Department of Hydraulic Engineering
and Water Resources Management
Prof. Dr.-Ing. Silke Wieprecht

M.Sc. Topic

"Develop an open-source habitat suitability assessment tool"

Background

Habitat suitability modeling involves evaluating hydro-environmental factors influencing the physical habitat quality for target fish species. Abiotic parameters describing the physical environment of a river ecosystem stem from spatially explicit numerical models. Such analysis is gaining in importance because rivers have been impacted for hundreds of years by anthropogenic activities. Thus, it is essential to reinstate or at least improve their ecological status. To this end, habitat suitability maps are one of the most important baselines for decision-making in river restoration. The objective of this thesis is to develop an open-source habitat suitability assessment tool with reference to available literature and code resources (cf. River Architect; Schwindt, 2020). The student will work with (geospatial) open-source libraries in Python 3, which can be packaged along with the developed tool without the need for paid third-party licenses. The developed code will be tested at a river in Southern Germany, where available numerical model outputs and habitat suitability maps enable a proof of concept.

Develop an open-source habitat suitability assessment tool
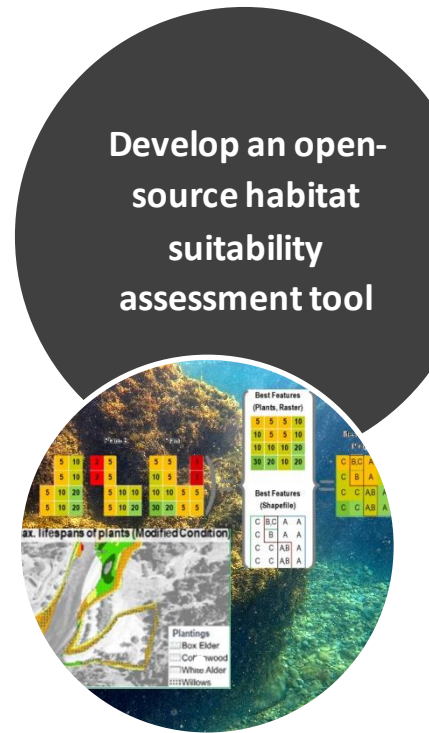
Thesis Overview

1. Revise relevant river ecosystem components and habitat suitability parameters
2. Familiarize with the programming language Python 3
3. Adapt available codes and implement novel open-source solutions
4. Apply the scheme to a test case in Southern Germany

Desirable Skills

*   Understand fundamentals of in river engineering, hydro-morphology, and/or 2d numerical modeling
*   Knowledge of Python or a strong commitment to learning Python is an advantage

Apply now!
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Please send a few lines on why you would like to work on this topic.

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