M.Sc./ B.Sc. Topic
"Approaches to assessing four-dimensional (4d) river connectivity"

Approaches to assessing 4d river connectivity

Background

River connectivity conceptually provides an integrative and interdisciplinary framework to study river ecosystems and guide river restoration. Connectivity is defined as the degree to which matter, energy, and organisms can move along defined units in a natural system. A commonly used connectivity model in hydrology and ecology involves conceptualizing connectivity as operating in four dimensions: longitudinal, lateral, vertical, and temporal. Longitudinal connectivity describes the river upstream-downstream continuum and has been intensively investigated in the last decades as a result of anthropogenic actions hampering fish migration and sediment continuity, such as weirs and dams. Lateral and vertical river connectivity encompass river-banks-floodplain and surface-groundwater interactions, the latter mediated by the hyporheic zone. The evolution of the three spatial dimensions of connectivity constitutes the temporal connectivity dimension. This thesis involves intensively engaging with available scientific knowledge on river ecosystems through the concept of connectivity. The student will perform a macro-analysis on the available parametrization methods for river connectivity. To identify trends and research needs, approaches should be categorized and quantified, potentially through Python-based web-scrapping in addition to crisp knowledge.
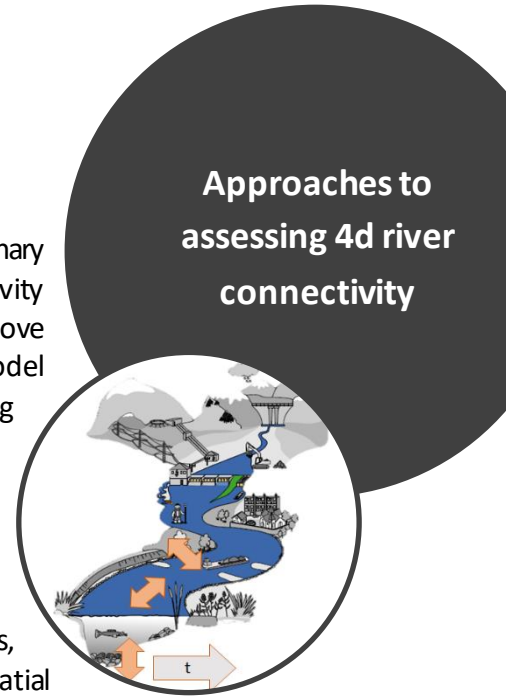
Thesis Overview

1. Revise relevant river connectivity models
2. Identify key approaches for quantifying connectivity
3. Perform categorization and revision of available literature (e.g., using ISI Web of Science)
4. Identify research needs

Desirable Skills

Interest in river ecosystems and reading

Apply now!
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