

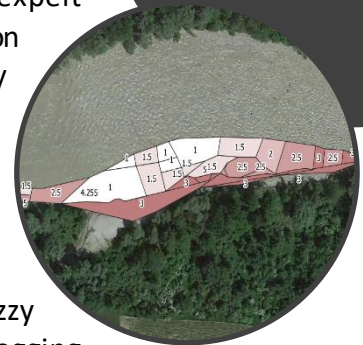


M.Sc./ B.Sc. Topic

“Spatial analysis of riverbed clogging with fuzzy map comparisons”

Background

An often-identified problem in regulated rivers stretches is the infiltration and accumulation of fine sediment in the riverbed, i.e., riverbed clogging (also known as colmation). Several methods for riverbed clogging assessment exist, one of which involves mapping riverbed clogging according to visual expert evaluation. Although this method enables to obtain spatial information on the levels (i.e., classes) of riverbed clogging over large areas, it has many uncertainties. These uncertainties are e.g. the subjective perception of the expert (i.e., rater) and georeferencing errors during the mapping on field. In view of this, a temporal analysis of riverbed clogging maps (comparison of maps over time) via pixel-by-pixel map comparisons is not appropriate, since they disregard these uncertainties. Instead, the approach of this Thesis involves fuzzy map comparisons, which use fuzzy logic to account for both uncertainty in space and/or in the riverbed clogging classification. The fuzzy map comparisons will be performed in maps of riverbed clogging obtained in two points in time at the Inn River (Bavaria). This Thesis is part of a large set of studies in the framework of river restoration efforts.



Spatial analysis of
riverbed clogging
with fuzzy map
comparisons

Thesis Overview

1. Revise the state-of-the-art method for mapping riverbed clogging (i.e., outer colmation).
2. Familiarize with available fuzzy map comparison tools (Python Package *fuzzycorr*).
3. Prepare the input spatial data, perform fuzzy map comparisons to detect temporal changes between the maps of riverbed clogging, and analyze the resulting comparison maps.
4. M.Sc. only: Generate interpolated maps from available point datasets of riverbed clogging (i.e., inner colmation), perform fuzzy map comparisons analyze the results.

Desirable Skills

Interest in river ecosystems and spatial data analysis | Knowledge in Python is advantageous.



Apply now!

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This Thesis can be written in English or in German

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