

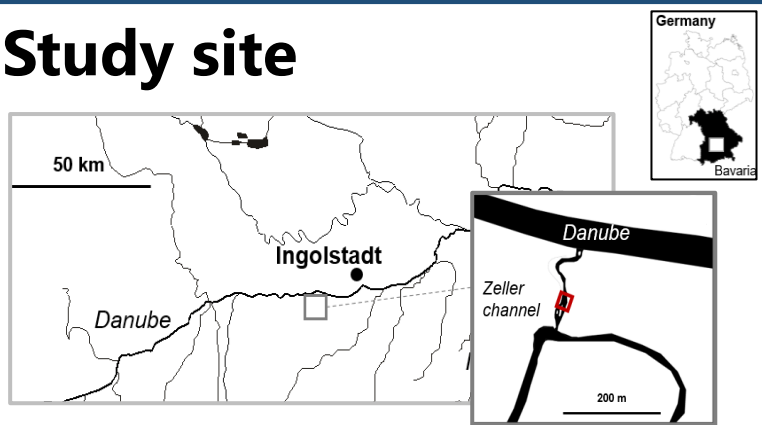
The HydroEcoSedimentary Tool (HEST): an integrated approach to characterise interstitial hydro- sedimentary and associated ecological processes



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Study site



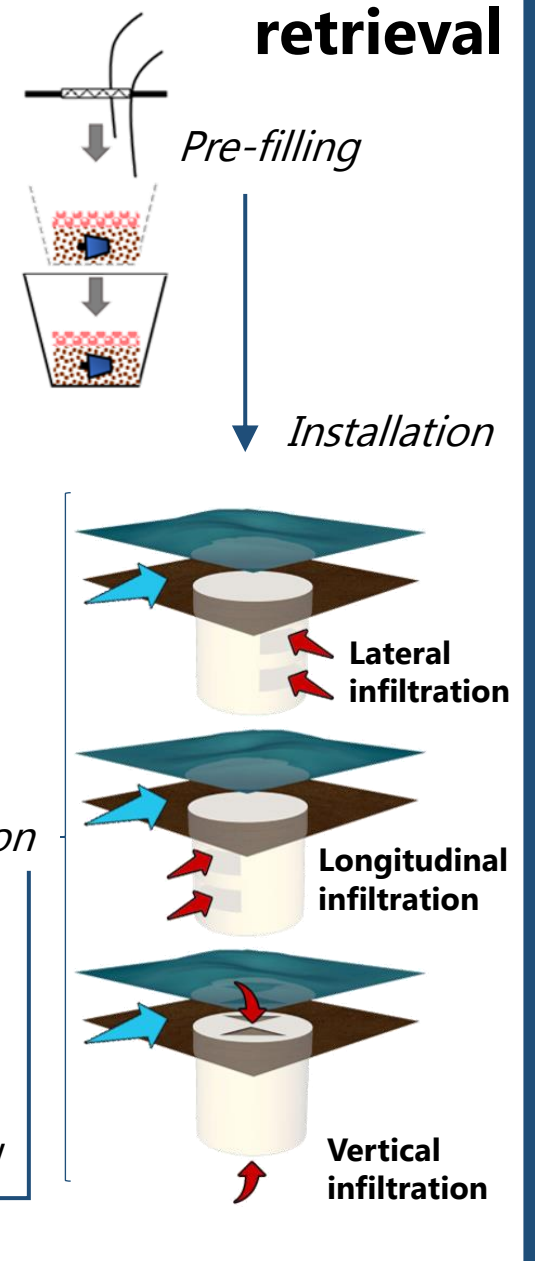
Objectives

- To detail the HEST functionality
- To illustrate all possible field, lab measurements and post-assessments using the HEST
 - To assess its feasibility and reliability

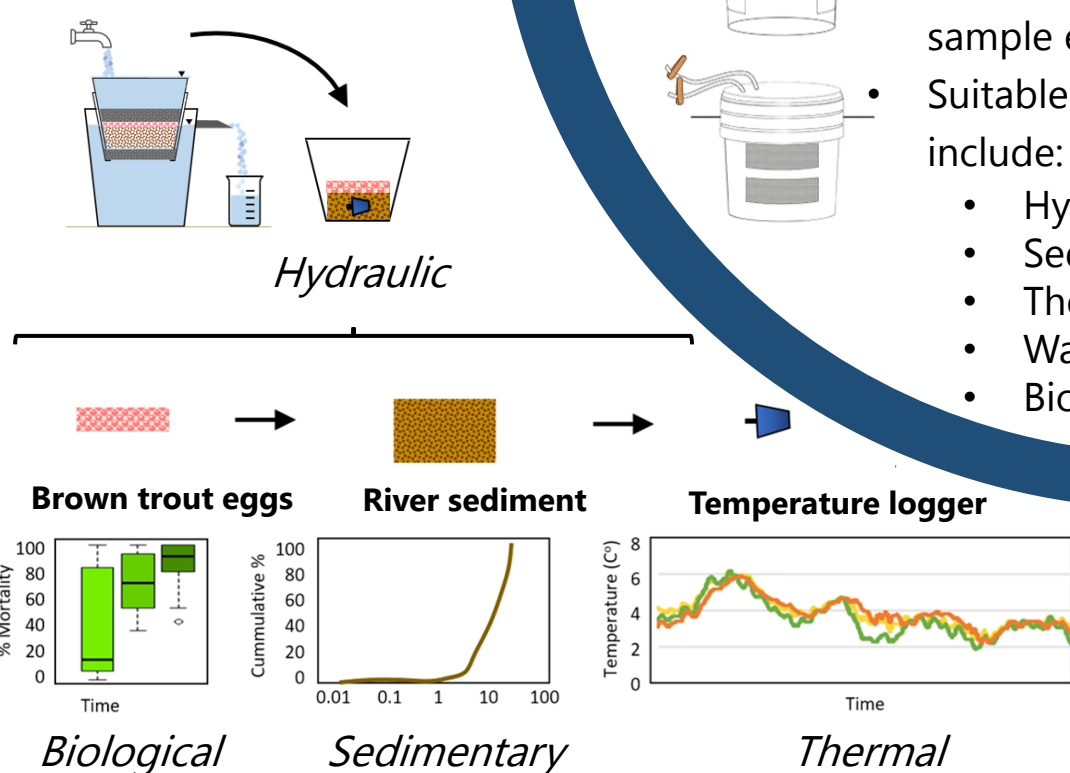
HEST components and features

- Integrates / differentiates top-down (vertical) and horizontal (longitudinal and lateral) infiltration of sediments
- Differentiates upper and lower sediment layers
- Accounts for sediment loss upon installation and retrieval
- Allows multi-level water sample extraction and logging
- Suitable assessments include:
 - Hydraulic
 - Sedimentary
 - Thermal
 - Water Quality
 - Biological

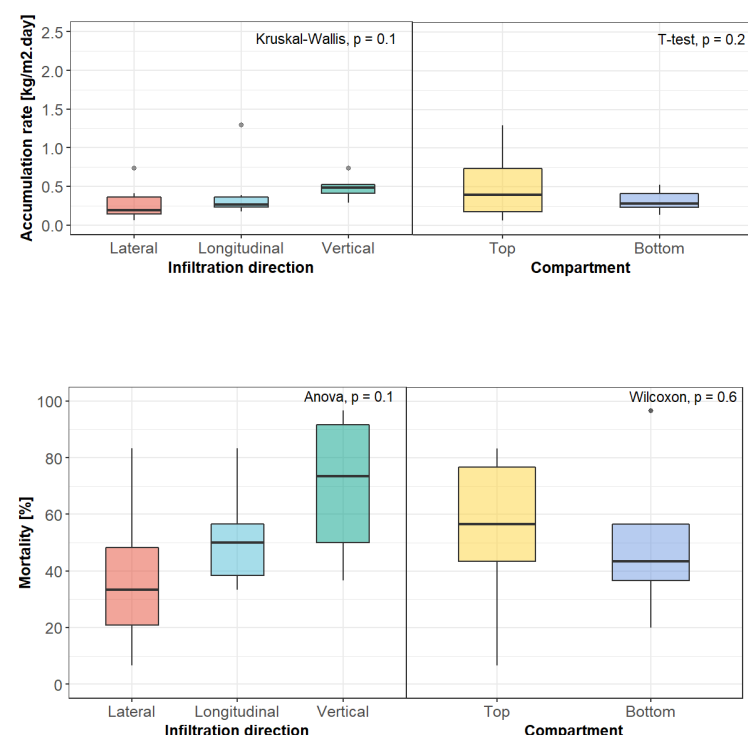
Field installation, operation and retrieval



Post-assessment



Preliminary results



- HESTs successfully recorded key hydrosedimentary and ecologically relevant factors
- Brown trout mortality was higher in vertical HESTs and top compartments, following the same pattern of fine sediment accumulation rates; however, differences were not significant
- Water quality values were within requirements for brown trout
- Continuous water temperature monitoring illustrated minimum differences between interstitial and surface waters

Discussion

- We provided a proof of concept of the use and feasibility of the HESTs.
- The HESTs can be used as a screening approach to target hyporheic assessment locations in complex systems.
- This case study provided an initial indication of the links between high fine deposition and brown trout mortality
- The HESTs are a promising tool to assess integrated hydroecosedimentary processes and can be used to mechanistically understand sediment-biota interactions.

Many thanks to:

