

The [ECOSPHERE research group](#) aims to study aquatic and valley ecosystems that are continuously challenged by natural and anthropogenic stressors. The research focuses on acquiring fundamental and applied knowledge at different levels of structural and functional organisation in order to underpin environmental management decisions.

MASTER THESIS SUBJECT 2024

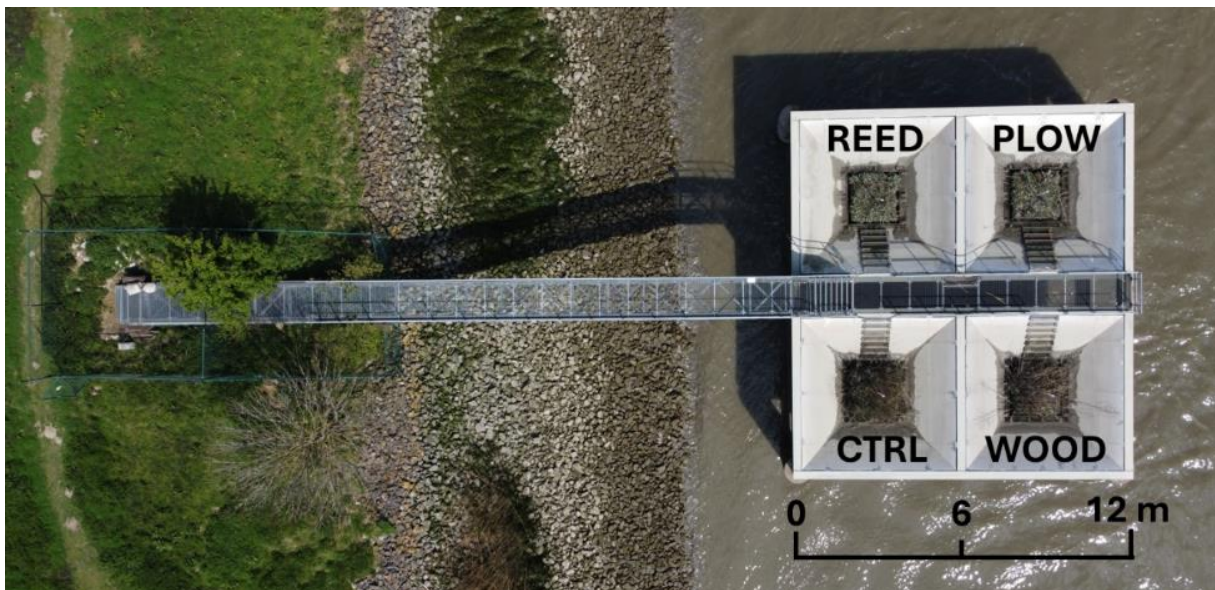
Long-terms effects of soil modifications on water quality: a mesocosm study near Kruibeke

Research group: ECOSPHERE

Hosting laboratory: CDE – building C, CGB

Promotor(s): Jonas Schoelynck jonas.schoelynck@uantwerpen.be

Daily supervision: Roy Münstermann roy.munstermann@uantwerpen.be



An aerial view of the mesocosm installation near Kruibeke where the field experiment for this thesis will take place. Picture taken by Tim van den Broeck.

- This topic mostly contains literature study, lab work, field work, experimental work, GIS, numerical modelling, other:
- Possession of driver's license B is needed, recommended, not needed
- Possession of certificates needed: FELASA C, other:



Summary – Within the Scheldt River basin, many tidal wetlands have been restored for their ecosystem service provisioning. The methods used to restore this nature are known to have a large influence on the biogeochemical functioning. One factor that influences the functioning of recently restored tidal marshes is soil organic matter content. If present in insufficient concentrations to support soil processes, this can be added to help jumpstart these processes. What the long-term effects are of the addition of these soil modifications to the biogeochemical functioning of restored tidal marshes remains unknown.

To now properly evaluate whether the long-term effects of soil amendment implementation are beneficial for the creation of functional nature, water quality is one of the key aspects that needs to be monitored. Tidal marshes are after all known for their nutrient exchange capacity and water quality regulation. Other important factors to study in this context are soil properties in bulk density and soil porosity, both significantly contributing to soil hydrology and thus water quality regulation. Within the larger research framework of tidal estuarine nature restoration (e.g. Sigmaplan for the Scheldt estuary) the information gained from this study is valuable and can be linked to various other biotic and abiotic factors including e.g. benthos and vegetation presence.

For this thesis, you will help field-technicians with water quality samplings focussing on e.g. nutrients, heavy metals,... and the study of various other linked biotic and abiotic factors. Afterwards, you will assist in the processing of the taken samples and analyses of the resulting data. The findings of this study can be compared to prior experiments performed in this mesocosm, and literature data. This will result in an improvement of our understanding of the effects of soil modifications on ecosystem service delivery in restored tidal marshes with regards to water quality. A sense for adventure, perseverance, and detail is recommended.

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