

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 2026-2027

Save the lake: improve the ecological resilience of the urban lake at Fort 4 by piloting nature based solutions.

Research group: ECOSPHERE

Hosting laboratory: CDE

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

Daily supervision: Jonas Schoelynck, Vincent Bellinkx, Tom Maris



Water quality report and algae FORT 4 lake - source: PIH 2026

- 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:

The student will investigate the water quality of the Fort 4 pond in Mortsel, where high nutrient concentrations, leaf litter, sediment accumulation and limited water exchange contribute to eutrophication. The aim is to determine how nutrient levels can be reduced in a structural, affordable and non-invasive way.

The student will monitor water quality and nutrient cycling over a twelve-month period and identify the main sources and flows of nitrogen and phosphorus. This will involve periodic water and sediment sampling, laboratory analyses, groundwater and water-level measurements, and experiments on nutrient leaching and decomposition. In addition, a water and nutrient balance will be established, examining the influence of factors such as leaf litter, surface runoff, groundwater and fish.

A Best Available Techniques (BAT) study will compare potential solutions, including fixed or floating helophyte filters, skimmers, phosphorus-binding techniques and sediment management, in terms of effectiveness, practical feasibility and cost.

A field experiment using small helophyte filters or floating treatment wetlands will be monitored for approximately twelve months to assess, among other aspects, nitrogen and phosphorus uptake. The results should ultimately provide scientifically substantiated recommendations to the City of Mortsel on the most suitable measures for sustainably improving the water quality of Fort 4.

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