

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

Developing a state-of-the-art measurement technique for daily erosion- and deposition dynamics to predict mangrove growth

Research group: ECOSPHERE

Hosting laboratory: CDE

Promotor(s): Ignace Pelckmans (ignace.pelckmans@uantwerpen.be) & Ken Schoutens (ken.schoutens@uantwerpen.be)

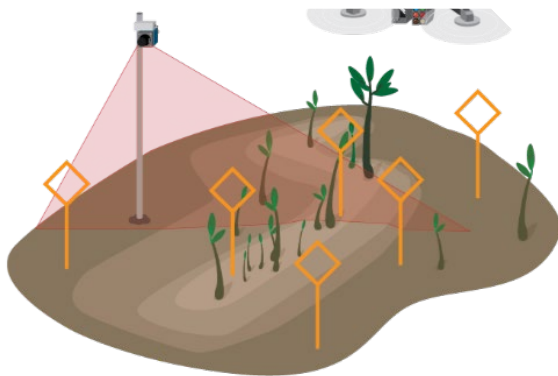


Illustration of the setup (pole on the left).

Mangrove forests are among the most efficient ecosystems in sequestering carbon, are crucial for coastal protection against storm surges and tsunamis and act as local biodiversity hotspots. After decades of global mangrove loss, restoration efforts are turning the tide but yet, over 50 % of restoration projects fail with little to no mangrove surviving after planting. Naturally expanding mangroves imply that microtopographies (creeks & ridge-runnel patterns) could offer very local favourable conditions for mangrove growth. For mangroves to grow, daily erosion and deposition dynamics should remain limited, i.e. young mangrove seedlings like morphodynamically 'calm' conditions.

This research will involve using a PICOSCAN LiDAR sensor to build an in-situ measuring setup which can measure daily erosion and deposition dynamics along a 5 to 10 m transect. The setup will be deployed in a naturally expanding mangrove forest in New Zealand (in the wide region of Hamilton, hosted by Julia Mullarney, University of Waikato) to relate morphodynamics to mangrove growth. The thesis student would be invited to participate in the field activities in New Zealand during the

- 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:



summer of 2027 (July - September). Duration of the stay can be discussed. The current project funds are likely insufficient to cover transportation and accommodation costs for the student, and therefore the student might be expected to (partly) fund this him/her/themselves. The work will be carried out parallel with other field measurement tasks (drone flights, plant measurements, etc.) in which the student will be very welcome to join.

We are looking for a curious and hands-on student who is not afraid to get dirty. Expanding mangroves are very muddy surroundings which require a good physical condition to work in. Note that mangroves grow in (sub-)tropical coasts but that July - September is the winter period in New Zealand (Northern Island). After the field work, data processing would require coding (preferably in Python) and might go beyond basic statistics. No background in Python is required, but the student is expected to learn, partly independently through online courses.

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