

*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

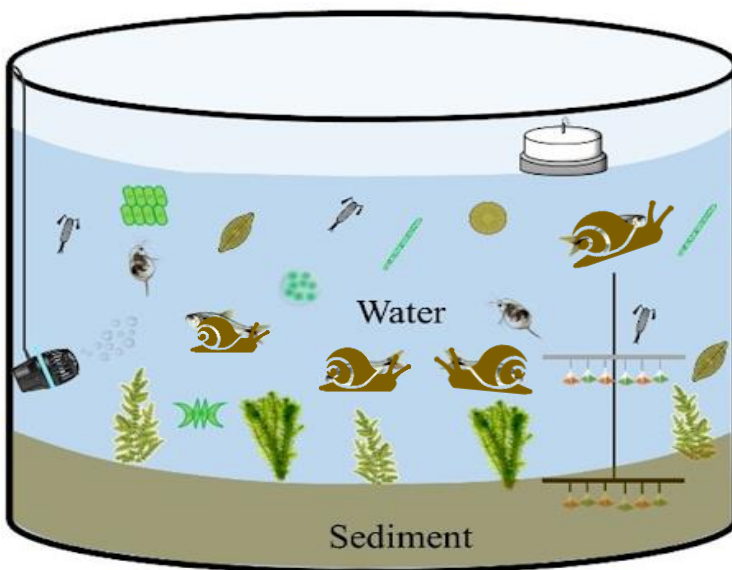
Assessing Ecological Risks of Chemical Mixtures: A Mesocosm Approach

Research group: ECOSPHERE

Hosting Laboratories: Campus Drie Eiken and Groenenborger

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Mesocosm setup with multiple organisms of different trophic levels exposed to a combination of contaminants (metals and organic compounds) to understand the effects of dynamic exposure conditions in (semi)natural conditions.

- 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

The QTOX project aims to enhance our mechanistic understanding and develop predictive models for assessing the ecological impacts of chronic, time-varying exposures to chemical mixtures. It focuses on mesocosm experiments that involve a variety of organisms, such as algae, macrophytes, and macroinvertebrates, exposed to combinations of metal ions (e.g., Cu and Ni) and organic pollutants, including pesticides and pharmaceuticals. These chemicals are selected based on their different environmental fates and modes of action. The mesocosms simulate realistic environmental conditions to provide insights into how these chemical mixtures impact biological organization, from individuals to ecosystems.

As part of this thesis, the student will assist in conducting mesocosm experiments. Responsibilities will include setting up and maintaining mesocosms seeded with various organisms. The student will help in sampling water, sediment, algae, macrophytes, zooplankton, and macroinvertebrates to monitor chemical speciation, bioavailability, bioaccumulation of the contaminants, and physiological endpoints like mortality, growth, reproduction, etc. Additional tasks will include sample processing and monitoring environmental parameters within the mesocosms to support data collection and analysis. This provides an excellent opportunity to gain practical experience in the field of ecotoxicology.

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