



*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 2023

Concentrations of per- and polyfluoroalkyl substances (PFAS) in feathers of aquatic birds at Blokkersdijk and relationships with environmental concentrations

Research group: ECOSPHERE and BECO

Hosting laboratory: CGB – Building U

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Nature reserve Blokkersdijk, adjacent to a well-known PFAS hotspot, is home to many bird species that may be exposed differently to PFAS. Through non-destructive sampling of feathers, species-specific differences in accumulated concentrations and profiles will be investigated. In addition, we want to gain an understanding of the uptake pathways in the bird species.

- 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 Per- and polyfluoroalkyl substances (PFAS) are highly fluorinated aliphatic substances that have distinctive physicochemical properties. Their production and use in consumer products have resulted in a global contamination of the environment, wildlife and humans. PFAS are very persistent and can bioaccumulate and biomagnify in food chains. Despite restrictions and regulatory measures for some PFAS, their concentrations in the environment remain high. Furthermore, these PFAS have often been replaced by substitutes that have been studied less frequently and are expected to pose similar threats.

Wild birds have been shown to be important biomonitors of environmental contaminants. Because of both ethical and practical aspects, the use of non-destructive or less-destructive sampling methods, including feathers, has increased in research. However, unlike other organic pollutants, insufficient information is available to draw conclusions on the suitability of feathers as bioindicator for environmental PFAS contamination. In addition, different bird species may be exposed differently to PFAS contamination. Such species-specific differences in PFAS accumulation have been studied sporadically.

The main objective of this topic is to investigate the PFAS concentrations in feathers of various aquatic bird species at Blokkersdijk, a nature reserve adjacent to a well-known PFAS hotspot in Zwijndrecht, and to look for species-specific differences in accumulated concentrations and profiles. In addition, the concentrations in the feathers will be related to those in environmental and other biological samples (e.g. water, feed items of the various birds) to gain an understanding of the uptake pathways in the bird species.

This study gives a great balance between field- and laboratory work. You will do fieldwork, consisting of sampling biological and environmental samples, in a unique nature reserve in Antwerp. In addition, you will perform laboratory extractions and analyses to investigate the PFAS concentrations in these samples.

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