



Universität
Basel

Research Project

Unveiling temporal and spatial patterns of microplastic burial in freshwaters through a reservoir as a stepping stone

Third-party funded project

Project title Unveiling temporal and spatial patterns of microplastic burial in freshwaters through a reservoir as a stepping stone

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Organisation / Research unit

Faculty of Science

Departement Umweltwissenschaften

Department

Departement Umweltwissenschaften

Project start 01.06.2022

Probable end 31.05.2023

Status Completed

The main goal of the proposed project is to determine the flux and pool of microplastics in the largest water reservoir of the Lange Erlen groundwater replenishment system (Basel Stadt). The study will test whether an increase in microplastic pollution can be observed after the onset of large-scale plastic production. To achieve this, a combination of cutting-edge methods from microplastics and geoecology research fields will be applied to dated sediment cores, whose sedimentation history includes the onset of plastic production. Temporally reconstructed data on effective microplastic burial in freshwaters are urgently needed, because the fate of microplastics in these systems remains largely unknown, resulting in uncertain estimates of global plastic fluxes in rivers. Such problems in the field of plastic pollution can be addressed by adopting a novel, more holistic approach, i.e., by considering a global “plastic cycle”—as inspired by the carbon cycle. The field's predominant focus on marine systems thus highlights the other compartments of the global plastic cycle as crucial scientific blind spots. Yet, plastics have been declared emergent pollutants of concern to numerous nations, including Switzerland, which lists research on plastic pollution among its priorities. The proposed project will meet these challenges by adopting a novel approach in the field to uncover the effective microplastic burial rate in a water reservoir of importance for Basel Stadt's potable water resources. The project will break new ground by providing estimates of plastic carbon, enabling integration of plastic pollution in a global carbon cycle. The completed project however, represents a stepping stone for a study of the plastic cycle (i.e., determining pools and fluxes) in inland waters via an up-scaled project, which considers a range of freshwater environmental archetypes with different pollution histories in Switzerland.

Financed by

University of Basel

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ID	Kreditinhaber	Kooperationspartner	Institution	Laufzeit - von	Laufzeit - bis
4661606	Erni Cassola, Gabriel	Courtney-Mustaphi, Colin, Dr.	University basel	01.06.2022	31.05.2023