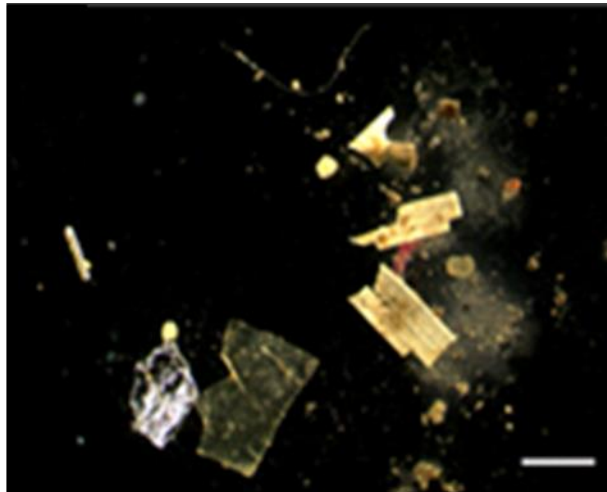


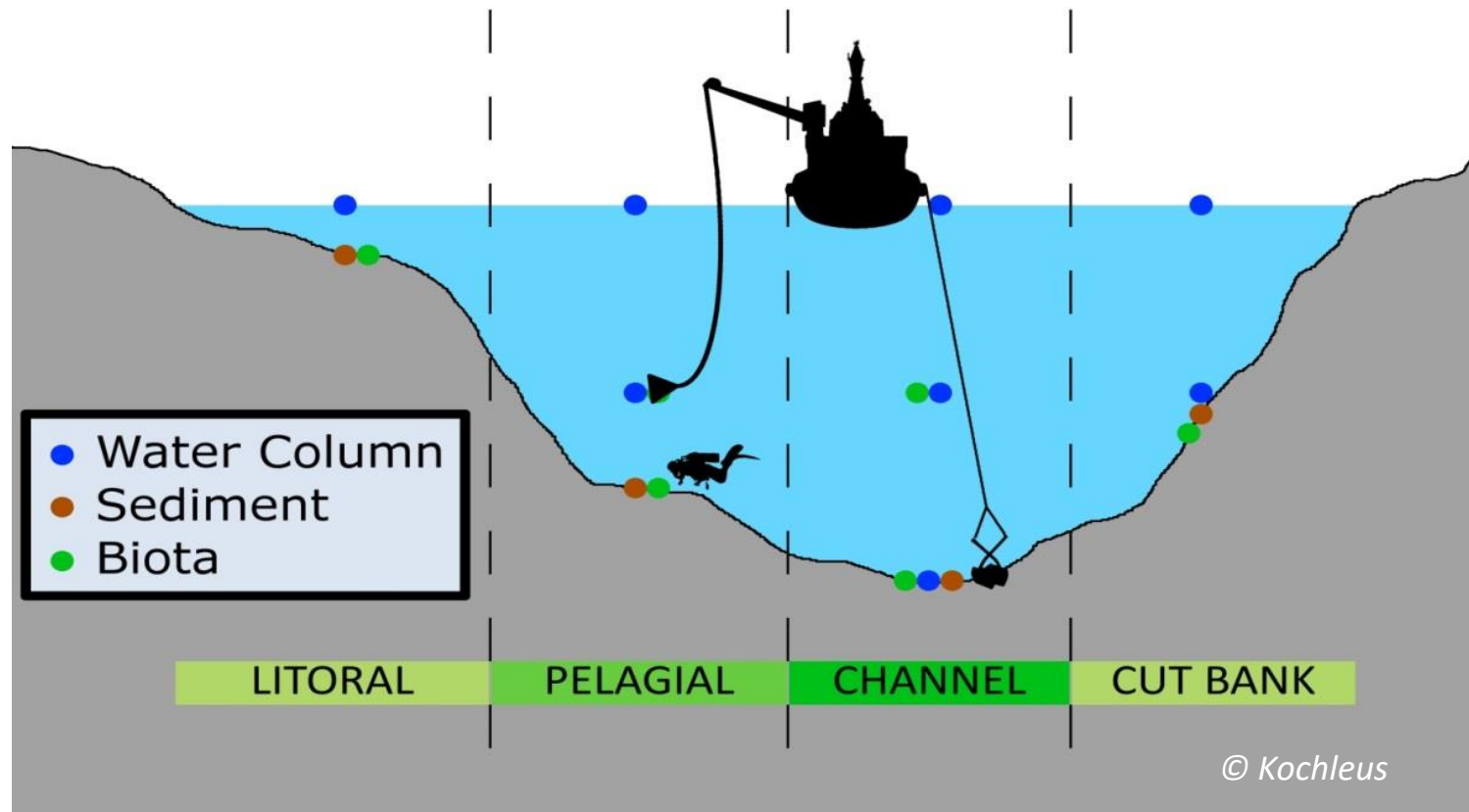
(Micro)plastics in German waterways - from sampling to analytics and effects

Friederike Stock, Georg Reifferscheid, Nicole Brennholt

German Federal Institute of Hydrology



Methodology sampling

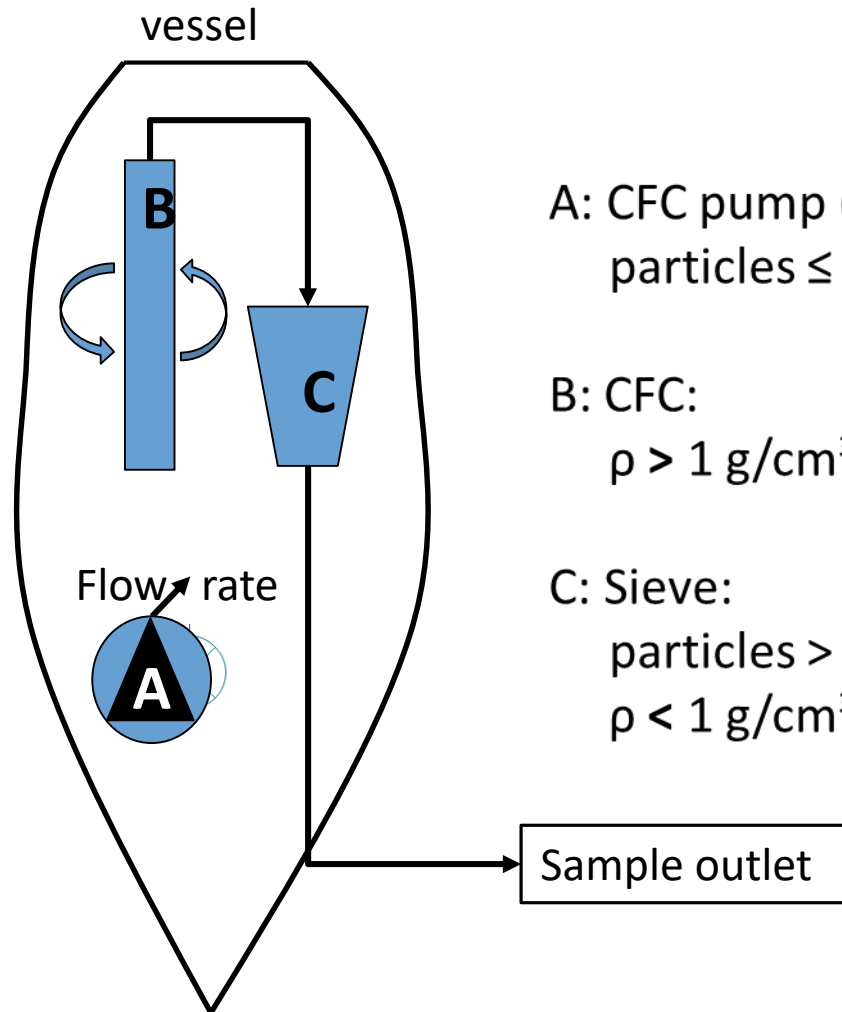


Sediment: van-Veen grasper
drill core

Biota: electrofishing

Method development

Sampling flow centrifuge



A: CFC pump ($\dot{V} = 1.5 \text{ m}^3/\text{h}$)
particles $\leq 5\text{mm}$

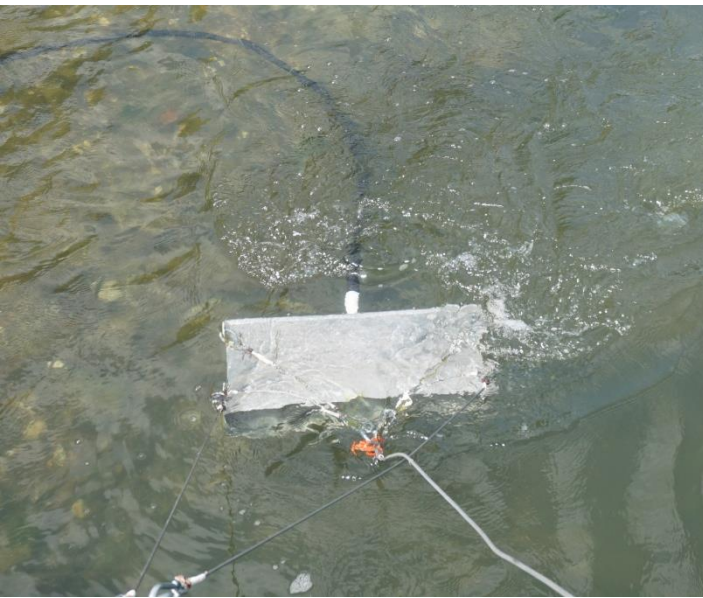
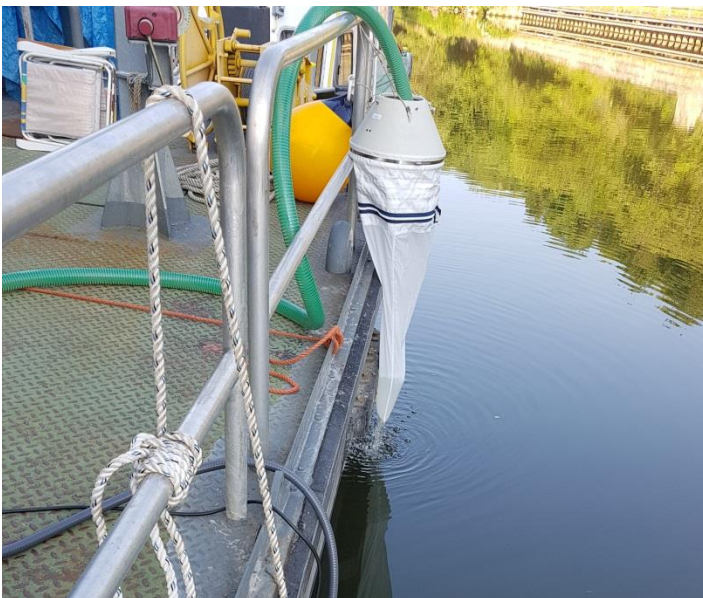
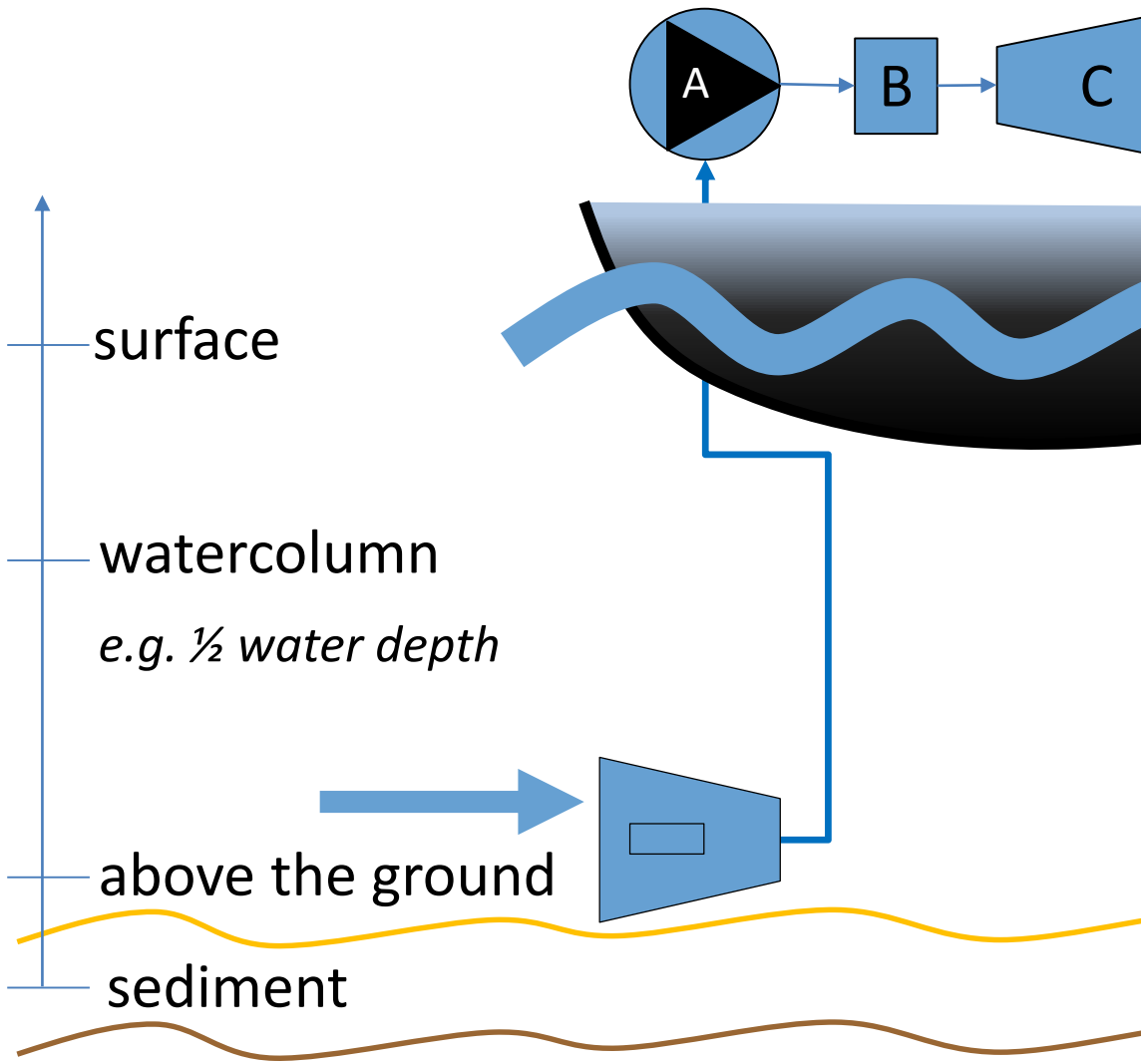
B: CFC:
 $\rho > 1 \text{ g/cm}^3$

C: Sieve:
particles $> 20 \mu\text{m}$
 $\rho < 1 \text{ g/cm}^3$

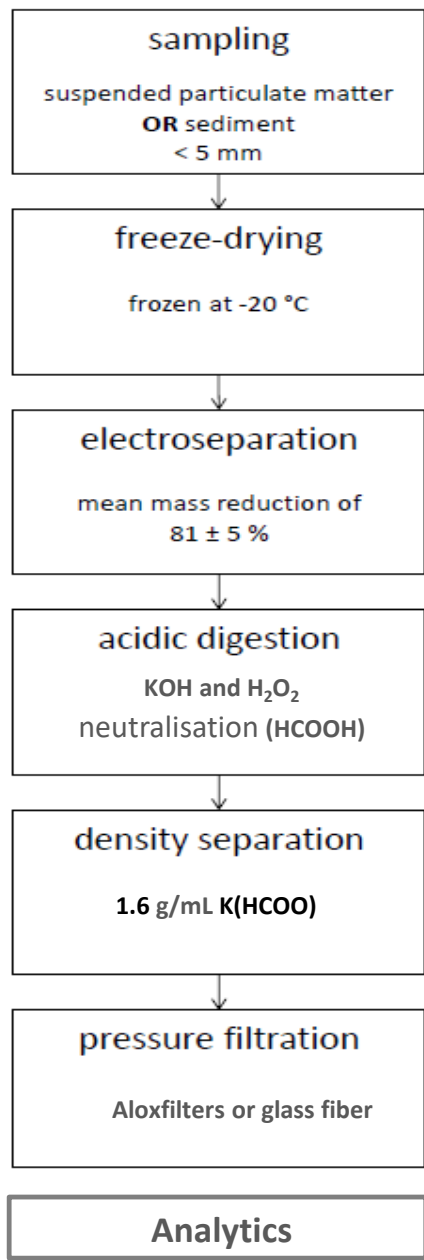
Sample outlet

Method development

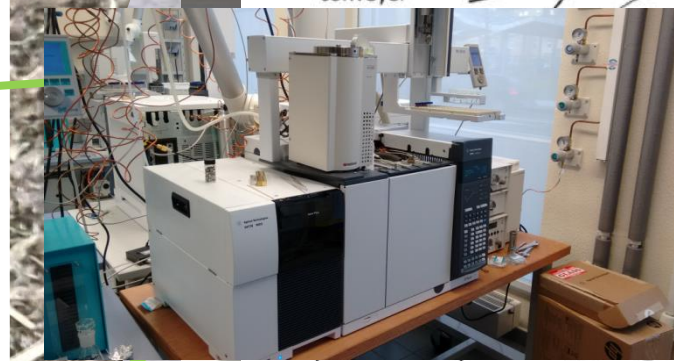
Sampling strategy



Sample preparation



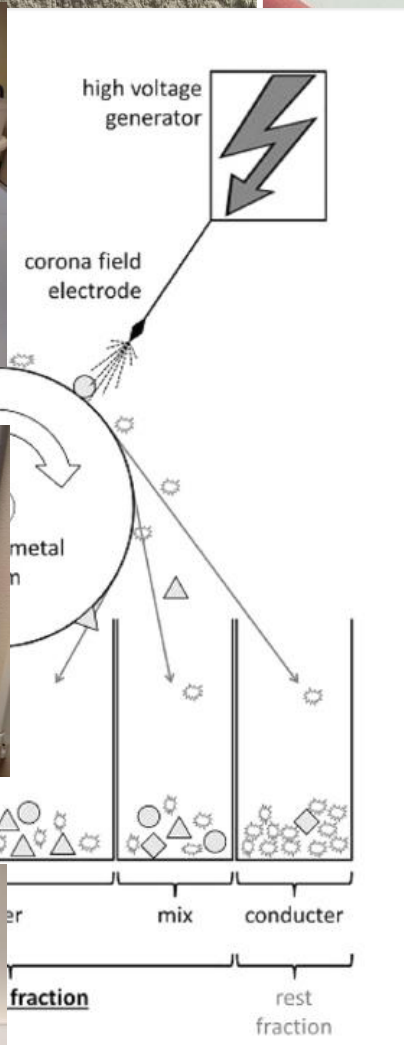
Microscope



Pyrolysis-GC/MS



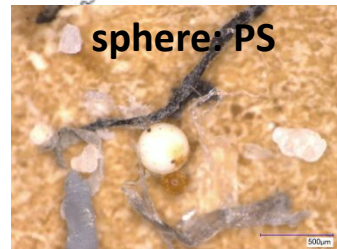
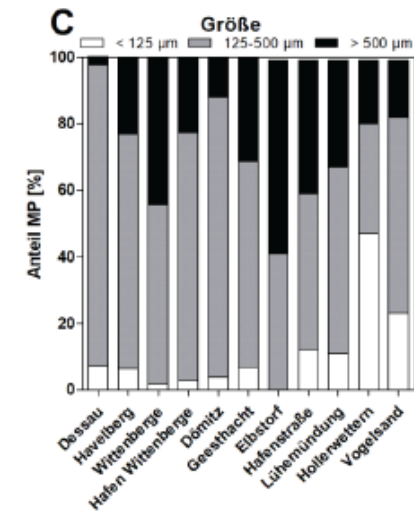
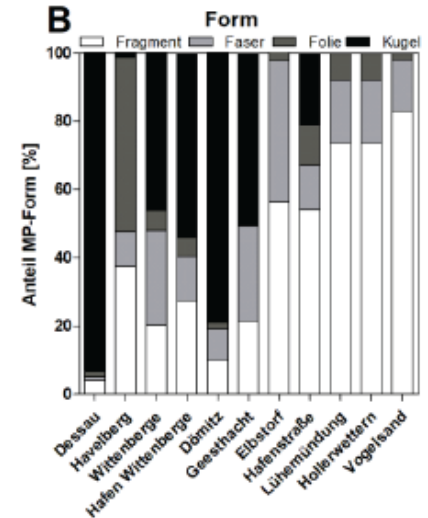
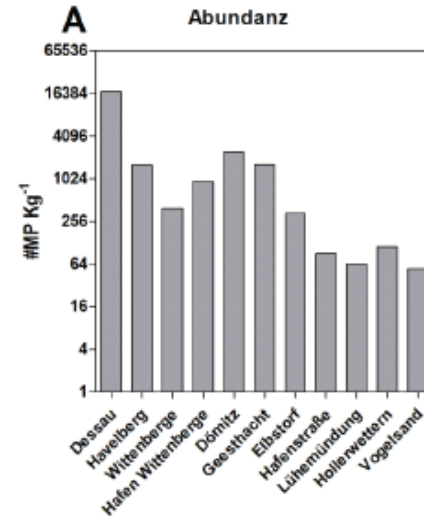
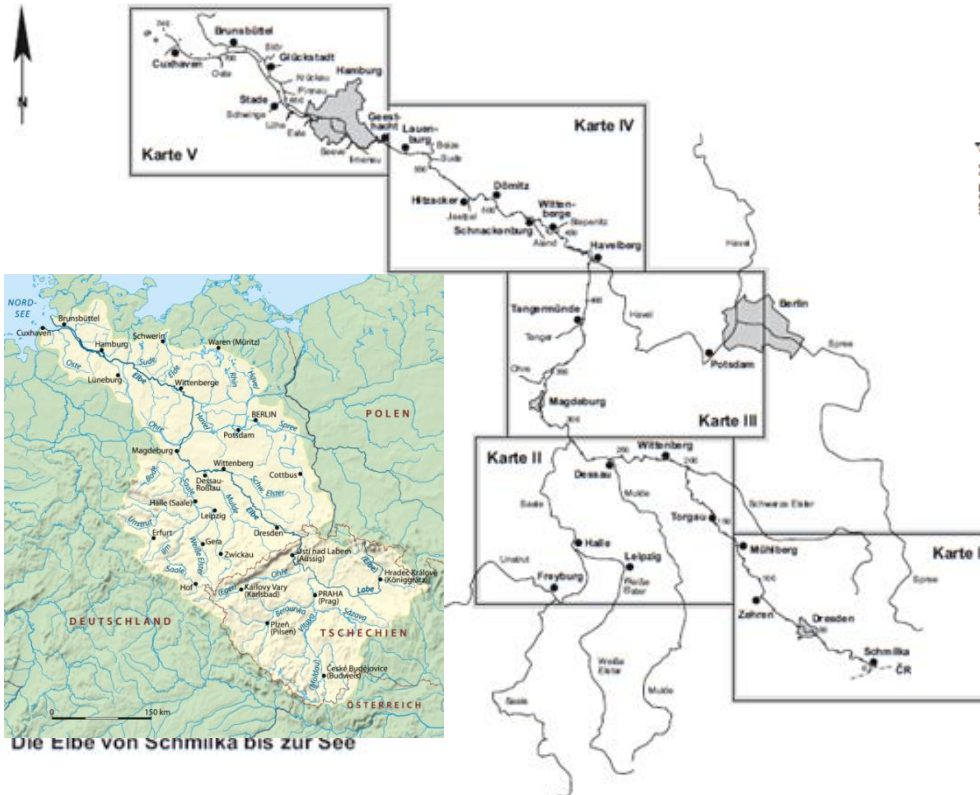
μFT-IR



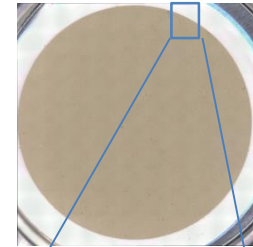
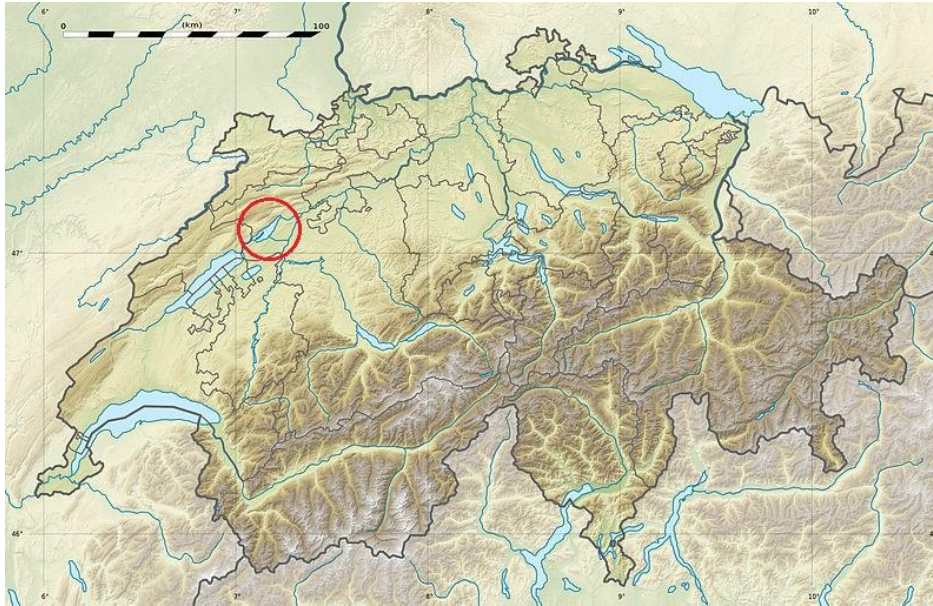
Sediment

Environmental Pollution

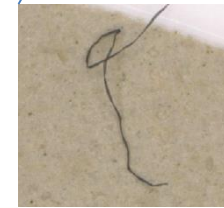
Results – River Elbe



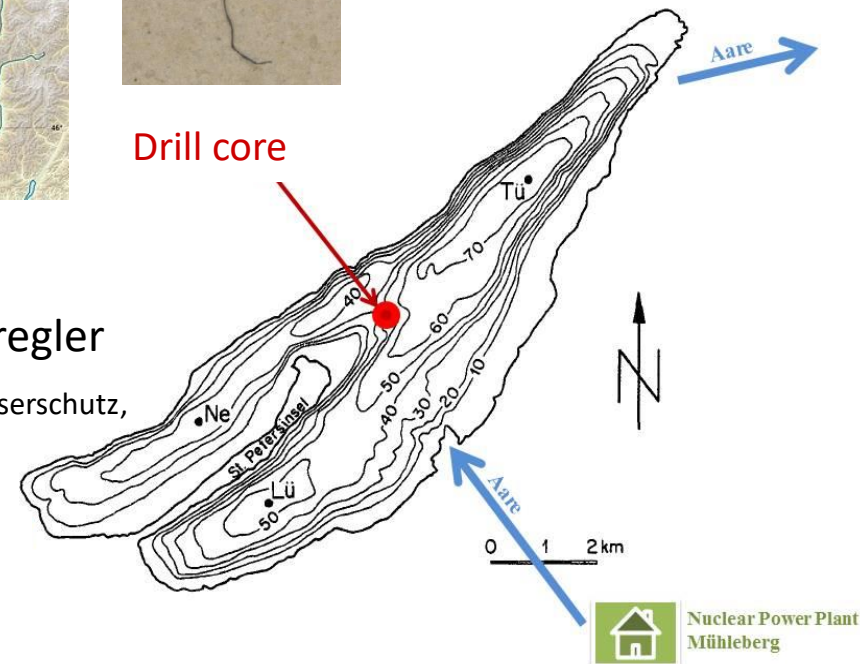
Lake Biel - drill core



Aluminiumoxide
filter



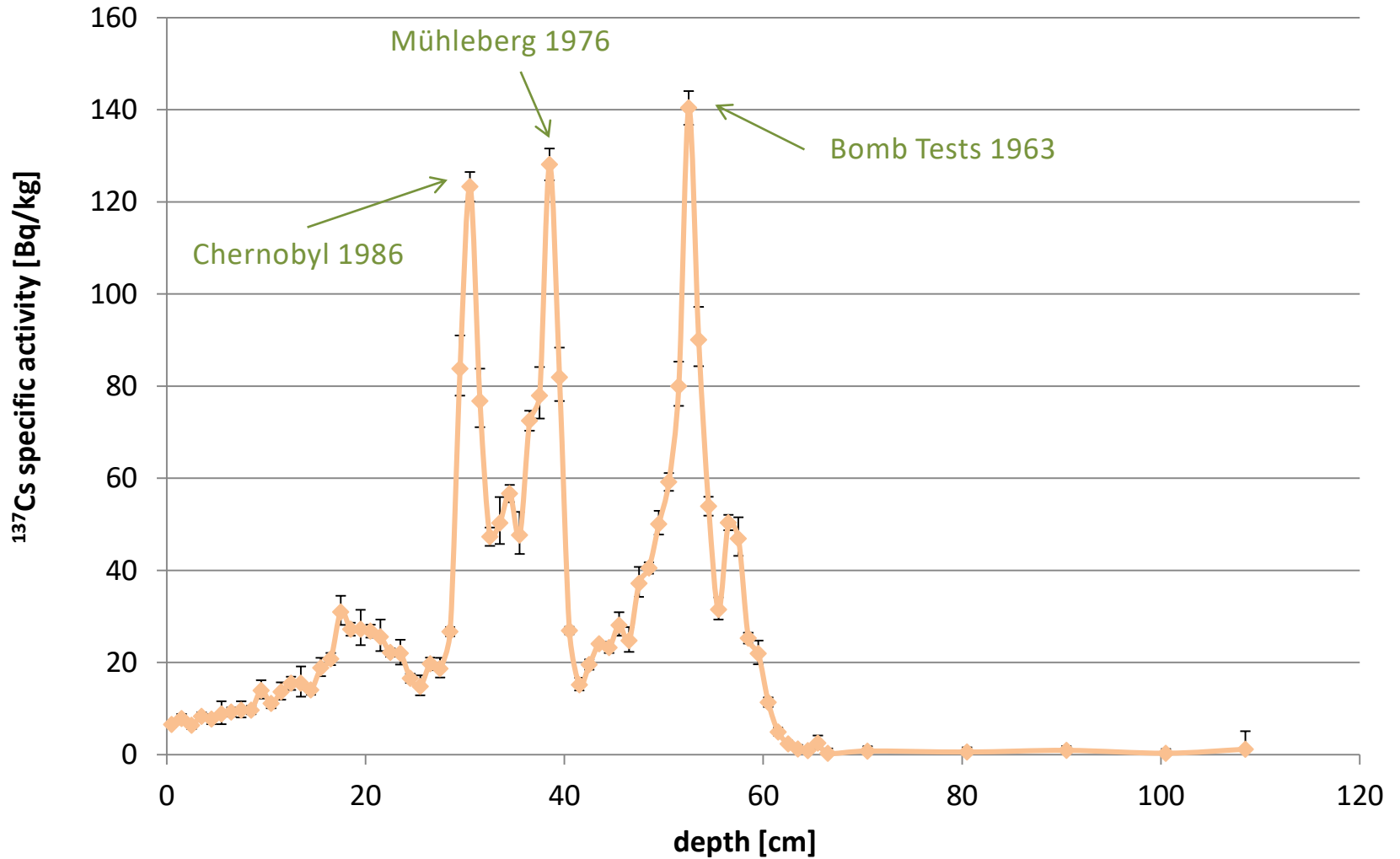
fibre



- sampling April 2014
- In cooperation with EAWAG and PSI; Anja Pregler
(Eidg. Anstalt für Wasserversorgung, Abwasserreinigung & Gewässerschutz,
Paul Scherrer Institut)
- Water depth: 53.1 m
- Length of drill core: 109 cm

Results

Lake Biel ^{137}Cs -dating

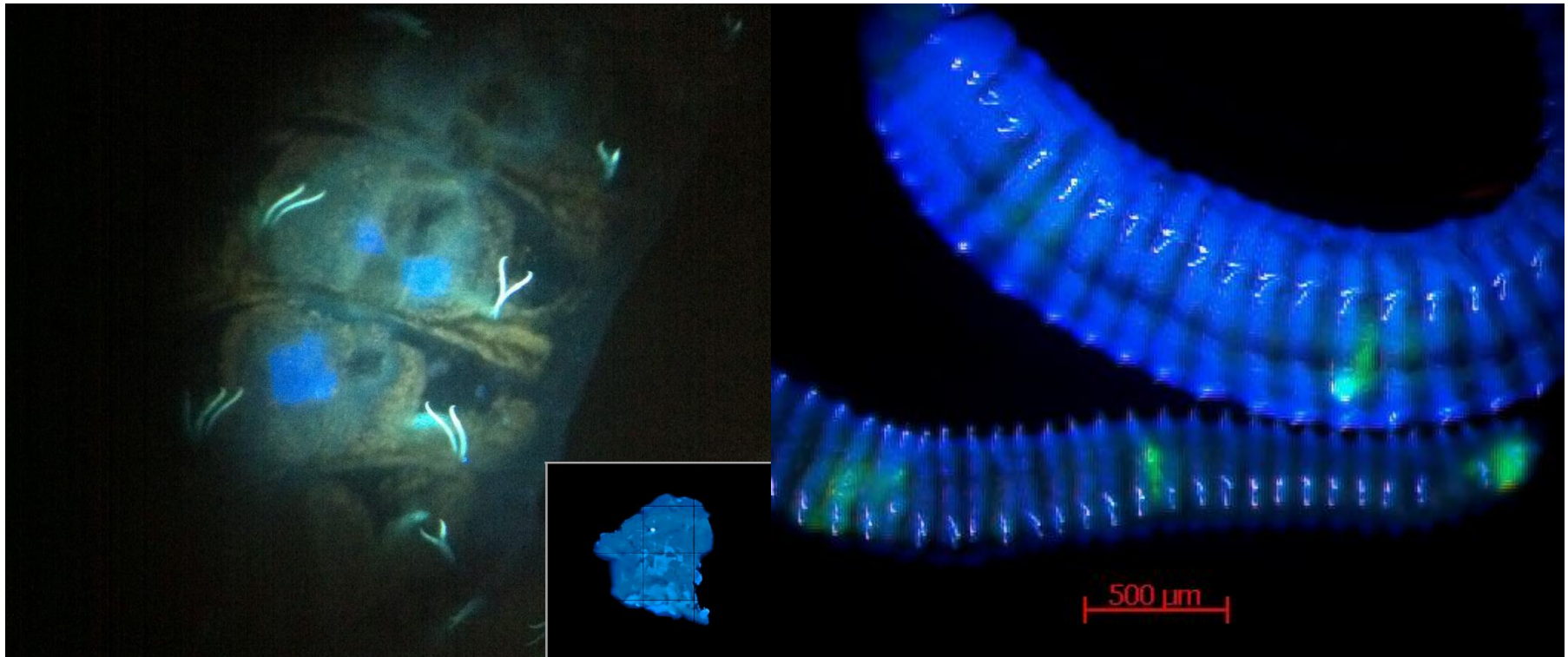


Results

Lumbricus

Uptake and excretion test

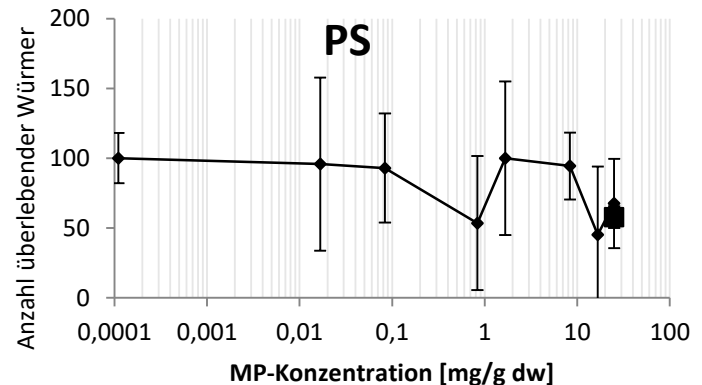
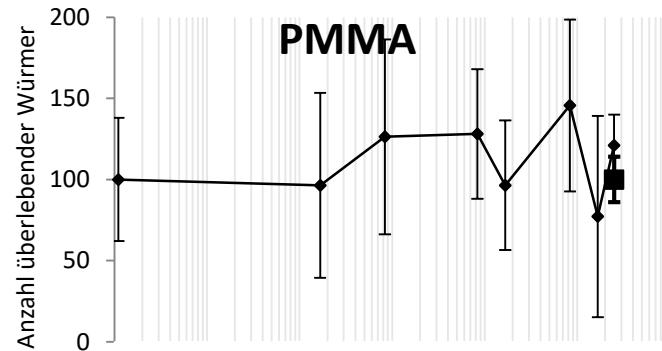
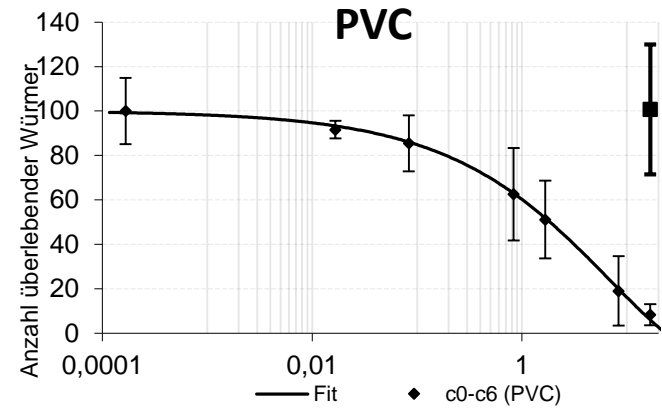
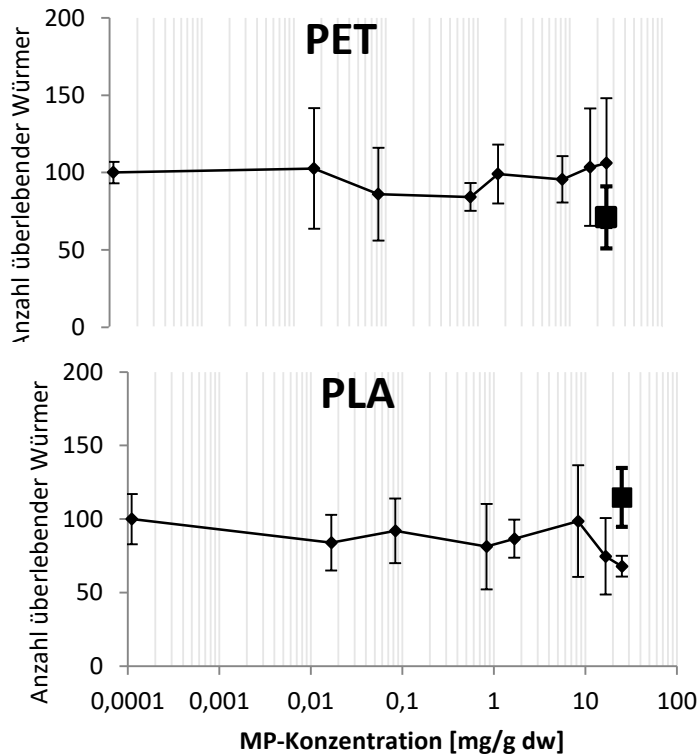
- Feeding of *L. variegatus* with microplastics $\leq 200 \mu\text{m}$
- Observation under fluorescence microscope
- Removal of exceeding microplastics after uptake of particles



Fluorescence photos of *L. variegatus* after ingestion of PVC (left) and PET (right); small picture: PVC particle

Results - Lumbricus

- Uptake and excretion of all microplastic particles
- Impact of microplastics possible
 - ▶ Results suggest that this is due to additives (due to a milieu change in the organisms)
 - ▶ Injury in the body or the digestive tract can be excluded



New homepage

PLA-NET The Plastic Network

Everybody is invited to join the network and present the projects about plastics.



<http://www.plastic-network.org/>