

Using large volume samplers for the monitoring of particle bound micro pollutants in rivers

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Problem Statement

- Requirements of the Water Framework Directive and validation of substance emission modelling need stable monitoring data for river loads of micro pollutants (MP).
- Local authorities and scientist often use single sampling techniques and small sample volumes.
- Single sampling techniques are not able to monitor all hydrologic situations: Flooding are mostly underrepresented in data sets.
- Small sample volumes contain even smaller amounts of particles which often lead to values below the LOQ for particle bound MP.

Approach

- Using large volume samplers (1000 L) to gain discharge proportional samples over a long period (e.g. a total flood event).
- Using a 3-directional valve for flushing of sampling-equipment before each sampling
- Separation of water and sediment after event by sedimentation within three days
- Sampling of the water phase (4 L) and extraction of the total sediment mass (10 L of suspension).
- Separated analysis of water sample (dissolved MP) and dried sediment mass (easy to gain values above the LOQ for MP).
- Calculation of the river load using the measured values in water and sediment phase, the total sample volume and the corresponding river discharge at the river gauging station

Advantages

- Stable river load estimations
- Low costs for analysis because of the small sample number
- Results for MP which are hard to detect in the water phase
- Large sediment bulk:
 - Detection of MP in different particle size classes after sieving
 - Enough material for substance extraction batch experiments

Ongoing Applikation

- 6 rivers in the Inn river catchment (Austria and Germany)
- 4 rivers in Baden Wuerttemberg (Germany)

Results are expected in 2016

