RIVER BASINS

INTERNATIONAL CONFERENCE
ON MONITORING, MODELLING AND MANAGEMENT
OF RIVER BASINS

ABSTRACTS

Edited by
Máté Krisztián Kardos, Orsolya Szomolányi, Adrienne Clement,
Steffen Kittlaus, Karoline Morling and Stephan Fuchs

Budapest, Hungary
4-5 June 2024

RIVER BASINS 2024

INTERNATIONAL CONFERENCE
ON MONITORING, MODELLING AND MANAGEMENT
OF RIVER BASINS

Jointly organized by:

Budapest University of Technology and Economics
Department of Sanitary and Environmental Engineering

Technical University Vienna
Institute of Water Quality and Resource Management

Karlsruhe Institute of Technology
Institute for Water and Environment

Environment Agency Austria

Environment Agency Germany

German Federal Institute of Hydrology

Deltares

International Committee for Protection of the Danube River

Abstracts of the Conference

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Budapest, Hungary
04-05 June 2024

The conference was supported within the framework of the Széchenyi Plan Plus program with the support of the National Laboratory for Water Science and Water Security (RRF 2.3.1 21 2022 00008) project.

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Responsible publisher: Prof. Dr. Tibor Czigány rector
Budapest University of Technology and Economics,
Faculty of Civil Engineering,
Department of Sanitary and Environmental Engineering
Budapest, Hungary

ISBN 978-963-421-953-8 (pdf)
DOI: 10.3311/rb2024

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Particle-bound nutrients and trace substances in small streams: Implications for the aquatic environment and presentation of a novel sampling method

Peter Flödl[1], Arabel Long[2]; Christoph Hauer[1]; Ottavia Zoboli[2]

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Organic and inorganic pollution pose a threat to rivers and their ecosystems, primarily due to industrial activities, (untreated) wastewater discharge, and excessive use of fertilizers and pesticides in agriculture. The pollution enters rivers through point sources and diffuse inputs from the atmosphere and surface runoff. Detecting the impacts of non-point sources is challenging due to time-delayed and non-linear physico-chemical processes. In order to understand the effects of pollutants on aquatic organisms, it is important to monitor and assess the chemical status of rivers and sediments. This assessment involves measuring transported sediments, fine sediment accumulation, and analyzing nutrients and pollutants bound to sediments. In small (headwater) streams, however, the collection of transported fine sediments is challenging, as flow velocities and/or bed gradients are usually low. These hydraulic and biotic conditions in small streams are a challenge for known samplers (e.g. clogging, bio-fouling, necessary power supply, high maintenance costs).

The novel easy-to-use concept of the "Stationary Organic and Inorganic Sampler" (SOIS) (Flödl et al., 2023) will be presented, which makes it possible to collect mobile (suspended) sediments and floating matter over a certain period of time (tested up to 2 weeks). The results of (particle-bound) nutrient and trace substance concentrations in a small stream in which the SOIS method was applied for the first time will also be presented. The measurement data show clear differences in selected trace substance concentrations (e.g. PFAS, PAH) between deposited and recently transported material. Interesting aspects of a wastewater treatment plant effluent are also revealed, indicating that selective retention of pollutants occurs. Furthermore, implications for the aquatic environment due to trace substance inputs, altered river morphology and the superimposition of climate change are discussed in a broader context (SDGs, EU Green Deal).

References

Flödl, P., Amann, A., Stelzer, S., Mayer, T., Zoboli, O., Hauer, C., 2023. Determination of particle-bound nutrients and micropollutants concentrations and loads in small rivers – A novel sampling method. Limnologica 98. https://doi.org/10.1016/j.limno.2022.125991