that MNP properties are often not measured and largely lack reporting (e.g., zeta potentials/surface charges are only rarely reported). We argue that standardized experimental setups could help increase comparability of results. Also, a stronger focus on characterizing MNP traits is needed to disentangle the specific effects of different MNP properties. By identifying key toxicological MNP properties, models similar to the ones we present here will be able to recognize less toxic combinations of microplastic traits, which can support reliable hazard and risk assessments, as well as the development of new, environmentally safer materials. This study was funded by the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) SFB 1357 391977956.

1.10.P Exploring the Complex Dynamics and Ecotoxicological Impacts of Micro- and Nanoplastics in Aquatic Systems

1.10.P-Tu058 Assessing the Plastic Removal Efficiency of Riverine Litter Collection and Prevention Solutions

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Rivers play a key role in the global plastic pollution crisis, by connecting sources of plastic litter from anthropogenic to natural environments. However, efforts to mitigate plastics in rivers have been scarce. In this work, we focus on solutions to reduce the current levels of pollution, which include technologies and actions designed to collect plastics already polluting rivers or to prevent them from entering waterways. Estimating the plastic removal efficiency of each solution is essential for evaluating its costs and benefits, enabling policymakers and stakeholders to advance with informed decision-making. Furthermore, it supports the development of customized and sustainable strategies to reduce plastic pollution. The assessment method should account for the diversity of solutions developed so far, but also the range of locations where they can be deployed (e.g., urban/rural river section, ports, water treatment facilities), and the spatial and temporal variability of the plastic pollution in rivers (e.g., due to tides, seasonality, hydroclimatic changes, and irregular pollution inputs). Due to this complexity, no harmonised method has been adopted to evaluate the efficiency and effectiveness of the solutions, hampering their comparison. In the INSPIRE project, we developed a new harmonized method to assess the efficiency of plastic removal solutions in the field. With it, we cover manual cleanups and ten technologies that are being deployed and tested in different river, urban water, and wastewater treatment plant locations in Europe (Danube, Douro, Kamni ka Bistrica, Rhine, Po, Scheldt). To do so, we revised existing methodologies and organised the assessment method in a modular approach that combines versatile protocols with pre-defined and qualified test materials that mimic the environmental plastics target by the solution. This combination enables us to carry out release-catch experiments to determine the percentage of plastic litter removed by the technology or action and its characteristics (e.g., plastic size range). This approach resulted from an effort between academia and industry to create improved guidelines for quantifying plastic removal efficiencies in a way that is both comparable and unbiased. It also ensures flexibility and adaptability to accommodate a wide range of solutions with diverse characteristics, that target different plastic sizes, and under distinct conditions. Innovative Solutions for Plastic Free European Rivers (INSPIRE) is funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Climate, Infrastructure and Environment Executive Agency (CINEA). Neither the European Union nor the granting authority can be held responsible for them. This project has received funding under grant agreement No 101112879 (INSPIRE).

1.10.P-Tu059 Evaluation of the Effectiveness of Flocculants in the Removal of Plastics in Wastewater Treatment Plants and Related Ecotoxicological Impacts

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