Microplastics vs. sediments: What we know and what we do not know

Kryss Waldschläger*[1]

[1]Hydrology and Quantitative Water Management Group, Wageningen University Research – Wageningen, Netherlands

Abstract

Microplastics research in the aquatic environment is highly interdisciplinary, but rarely uses knowledge on comparable topics in other disciplines. In particular, extensive research in sedimentology can enrich and perhaps accelerate microplastics research. First, however, it must be examined to what extent microplastics are comparable to clastic sediments. For this purpose, we have written an extensive multidisciplinary review paper (DOI: 10.1016/j.earscirev.2022.104021) that compares the aspects of particle properties, transport processes, sampling techniques and ecotoxicology. Based on the literature analysis, we identify seven research objectives that are essential for a better understanding of microplastics and that can be addressed by learning from research on mineral sediments. These objectives address (1) the description of microplastic particles, (2) the interaction of microplastics with environmental substances, (3) the vertical distribution of microplastics, (4) the resuspension and deposition behaviour of microplastics, (5) the influence of biota on microplastic transport, (6) sampling methods, and (7) the toxicity of microplastics. In doing so, we highlight areas where we can draw on knowledge and techniques from sediment research - and areas where we need new, microplastics-specific knowledge - and identify recommendations for future, interdisciplinary microplastics research.

Keywords: transport behaviour, monitoring, particle description, vertical distribution, rivers

*Speaker