

## Risk Posed by Microplastics: Scientific Evidence and Public Perception

### Authors:

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Microplastic pollution has sparked interest from researchers, public, industries and regulators, due to concerns on their effects and to increasing reports on microplastics presence in the environment, household dust, drinking water and food items. However, so far only few studies have reported on microplastic risk for biota, and currently there has been no risk assessment for humans. Even though current evidence indicates that microplastic presents a low risk to biota, the public perception that microplastics are a serious environmental and health risk has motivated political action. The discrepancy between scientific evidence and public risk perception has generated debate among researchers within natural and social sciences. In this work, we will reviewed the evidence on the risks of microplastics to ecosystem and human health, and considered the relation between evidence and public perception of microplastics risk. Despite the fact that risk assessment remains incomplete, scientific attention and the societal relevance of plastic pollution have led to a high public awareness of the topic (including on plastic pollution in general). To have enough weight of evidence to conclude on the risk of microplastics to the environment and to humans, there is a need to improve the quality and confidence on effects assessments. To be able to inform the public, regulators and industries on the risk of microplastics to humans there is a need to assess human exposure and effects, which are currently mostly unknown. Science communications should contextualize scientific findings in order to inform and not alarm the public. Research has shown that communicating uncertainty does not reduce trust in the communicator or “elicits psychological reactance”, thus “people can handle the truth”. We should not delay, however, precautionary measures to combat microplastic pollution until science is ready and reaches a consensus on the toxicity of microplastics for biota and humans. In the context of areas such as Cradle to Cradle, Safe by Design or Green Chemistry, which aim to develop more sustainable chemicals and materials, environmental issues do not compete with each other but are jointly addressed. This is also a matter of science communication.

### **Suggested session:**

7. Think-outside-the-box (fundamentally new concepts, innovative/controversial ideas, interdisciplinary issues)

#### **7.04 - Global plastic contamination: a journey towards scientifically informed policies and solutions**

Plastic contamination is a global concern. With increasing usage and disposal of plastics, waste management is often inefficient in processing the volumes of plastic discarded. A large proportion of plastic waste accumulates in the natural environment where clean-up is difficult, if not impossible. This results in the plastic contamination persisting in the environment for many years, having the potential to cause long-term ecological harm, ultimately affecting humans as well. To mitigate plastic pollution and find solutions to reduce harmful effects, a better understanding of the sources and pathways of plastics in the environment is needed. This should inform social and industrial practices, as well as advise on regulatory changes to address plastic production, consumption and waste management. This will also promote developing a roadmap towards the development and safe usage of alternative materials, to reduce environmental and health implications. The approach aims at bringing together academics from a variety of research fields along with stakeholders from civil society and industry, as well as regulators and policy-makers. The task requires collaboration across disciplines, from environmental sciences, including terrestrial, freshwater and marine biology and chemistry, geosciences, atmospheric sciences and oceanography, to materials science and engineering, social sciences, economics and more. This session will address the key linkages and cross-disciplinary collaborations required for effective progress in this field. We specifically invite presentations featuring successes and challenges in collaboration between academia, industry and regulators. The goal is to inspire research towards informing solutions and providing regulators and policymakers with the evidence needed to make changes. Presentations on tracking plastics and on elucidating connecting mechanisms from human activities through to environmental abundance and impact are encouraged. Studies on biota-plastic interactions, plastic fluxes linked to human activities and environmental changes (from synoptic events to climate change) and studies linking plastic characteristics to toxicological impacts (chemistry, materials science and ecotoxicology) are welcomed. This is a linked session co-organised and co-designed in association with the European Geosciences Union (EGU) 2021 General Assembly by connected convenor teams, to ensure full integration and input across disciplines. Outputs from the linked sessions will be disseminated widely across SETAC and EGU members through online resources, with a view to effective knowledge sharing and building collaborations.