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Introduction to the Series on "Current Knowledge in Marine Microplastics—Pollution Down to the Nanoscale"

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Widespread plastic pollution has come into focus as a major threat to our oceans. Shocking images of large areas of floating plastic debris, coastal areas and riverheads cloaked in single-use bags during low tide, and the discovery of plastic in seemingly remote sediment deposits and deep ocean trenches have mobilized responses in the forms of environmental activism, political and economic mandates, and cutting-edge scientific research.

Plastic pollution is intricately associated with a number of top threats to the oceans today, such as overfishing, climate warming, habitat destruction, and coastal and marine pollution. In the public perception, plastic is a material recognizable from daily life and, as such, is an obvious pollutant when found again out at sea, deep in an ocean trench, or embedded in Arctic snow. However, plastics represent a potential vector of disease or toxicity, a reaction surface for biotic and abiotic processes, a marker of the Anthropocene, and a threat to environmental sustainability.

Efforts to curb plastic spread have resulted in political mandates and economic programs like the Sustainable Development Goals of the United Nations Environment Programme (UNEP), the European Union's European Strategy for Plastics in a Circular Economy (Council Directive 2008/56/EC, COM/2018/028), as well as a massive research push on both the national and international scale.

The research effort to advance our understanding of plastics and map their distribution, fate, and impact in our environment is a convergence of expertise marked by interdisciplinary collaboration and communication. The last two decades of plastic research, brought on by the question "Where is all the plastic?" can be viewed as an age of discovery for the field. An appreciation has thus developed that plastics seem to be omnipresent in the environment (even inside animals), take part in both biological and physio-chemical processes, and scale from the macro- to the nanoscale in size. Particularly, the vast size range and variety of plastic in the environment has pushed the field to new boundaries. Sampling and analytical protocols have been developed, mapping plastic's movement from the water to the sediment, in ocean currents, and within biological and elemental cycles across the atmosphere-water-sediment boundary (*e.g.*, Jambeck *et al.*, 2015. *Science* 347: 768; van Sebille *et al.*, 2020. *Environ. Res. Lett.* 15: 023003).

To address this important issue, *The Biological Bulletin* will be publishing select manuscripts on this topic over the next several issues. Research papers will cover the transport, fate, and interaction of microplastics with biological and physio-chemical processes in the marine environment, down to the nanoscale. In this issue, Andersen *et al.* share their findings on the transport and continuous settling behavior of small PVC microplastics (63–125 μm) with other suspended particles, with implications for microplastic loading for benthic life in estuarine and marine settings. A major challenge in the field has been how to best recover all the microplastic debris in structurally complex samples. This problem is addressed by Miller *et al.*, who test a range of different separation methods.

We have always relied on oceans as a source of food, as a place of recreation, and for the elemental cycles that drive the composition of our geosphere, biosphere, and atmosphere. The impacts of marine plastics debris have drawn global awareness, and scientists worldwide are currently working at full speed to determine the extent and severity of plastic pollutants. Understanding how this anthropogenic material interacts with marine systems over large spatial and temporal scales is greatly needed in order to advise stakeholders and policy makers toward developing remediation methods and initiating more sustainable practices.

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