

# **Occurrence, spatial distribution, and source apportionment of microplastics in Durban Bay, South Africa**

## **Regional Studies in Marine Science**

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Globally, microplastics have been identified in a diverse range of environments. However, the extent of microplastic pollution in South Africa's context is largely lacking. In this study, an investigation of microplastic pollution was conducted across the Durban Bay harbour located in the province of KwaZulu-Natal, South Africa. Microplastic evaluation was performed both on surface water and sediment samples, collected from various spots across the harbour. Microplastics were extracted and analysed for their characteristics using visual identification on stereomicroscopes, and chemical characterisation using Raman-microscopy. Microplastics were detected in all samples, with abundances of up to 80.72 MP m<sup>-3</sup> in surface water samples, and 1.76 MP g<sup>-1</sup> in sediments. Fibres and fragments were the most observed morphologies in both surface water and sediment samples. In this case, the detected fibres comprised up to 75.68% in surface waters, and 45.54% in sediments, while fragments reached 19.84% in surface waters, and 41.07% in sediment samples. Polyethylene, polypropylene, and polyester were the most dominant polymers observed in the investigated samples. In general, higher microplastic abundances were found in the study sites located near the river inflows and stormwater drains, with anthropogenic activities such as shipping bays. Overall, the microplastic abundance in Durban Bay was comparable with the levels found in other studies within South Africa and across the globe.