



RIVERBANK MACROPLASTICS STOCKS FLUSHED TOWARDS THE INDIAN OCEAN DURING MAJOR FLOODING IN SOUTH AFRICA'S UMGENI RIVER

Scientific Sessions > SS090 Plastic Pollution in Aquatic Systems: The Role of Biogenic Habitats in the Dynamics and Accumulation of Plastics

Rivers are major contributors of plastic waste entering the oceans. The Umgeni River in Kwazulu-Natal, South Africa, runs through the densely populated city of Durban, with 3.5 million inhabitants and models estimate 400 tons of plastic waste annually emitted into the Indian Ocean. The banks of the Umgeni River are lined with plastic waste accumulations, derived from accidental, intentional, and natural accumulation. This study presents the use of Unmanned Aerial Vehicles (UAVs) and hydro-meteorological measuring sensors in the catchment to (1) identify, monitor, and quantify macroplastic waste hotspots along the Umgeni River; and (2) investigate the influence of hydro-meteorological factors driving the spatio-temporal evolution of the hotspots. Preliminary findings from two of the eleven monitored hotspots indicate a gradual build-up of surface area impacted by plastic pollution by 40–50% from January–April 2022. In April 2022, alone, a sharp decrease of –40–60% was recorded following a major flood event in Durban, when most parts of the city received rainfall between 200–400 mm within 24-hours (average April rainfall: 33.1 mm). Post flooding the surface area impacted by plastic pollution begins to gradually build-up again by 40–60% between April–June 2022. The findings suggest that macroplastics riverine transport and ocean emissions are considerably influenced by the flushing of waste stocks in discrete hydro-meteo events. Such information will help refine temporal resolution of riverine pollution contributions to the receiving coastal environments. The mapping of waste hotspots and the prediction of their mobilisation into the river supports policymakers in planning and timing to mitigate environmental pollution and protect water infrastructure from flood-exacerbating debris-induced waterway blockage.

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