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USING SATELLITE REMOTE SENSING TO UNCOVER THE ABUNDANCE OF MICROPLASTICS IN OCEAN ENVIRONMENTS

Abstract

As human consumption increases with its population, so too has the use of plastics. The unfortunate net effect is the ecosystem's marine litter, including all living creatures and the environments they thrive in. These findings are valid across the entire ocean biome. Microplastics are defined as particles ¡ 5mm in size. Salgado-Hernanz et al., 2022 discovered in the Rayong province, Thailand, where investigations for the study took place. The average microplastic abundance in beach sand and seawater was 338.89 264.94 particles/kg d.w. and 1781.48 1598.36 particles/m3, respectively. Beach sand and seawater had the most yellow-brown particles and transparent microfibers.

We propose developing a satellite or using existing instrumentation on board a satellite currently in operation, either Landsat-9 or comparable, which can discern the heat signatures at lower frequencies, through the interpretation of the thermal radiation of oceans and beaches. Plastics appear as a heat sink from elevation, and the locations of these potentially heavily polluted areas along coastlines across the planet will enable researchers to geo-locate these potential areas of high plastic pollution, assisting in the mitigation thereof.

Several satellites in operation possess multiple instruments capable of determining the heat signatures of these microplastic pollution zones. These litter windrows are the aggregations of seafoam, seaweeds, plankton, and natural debris on the ocean surface. Here, we define a "litter windrow" as any aggregation of floating litter at the submesoscale domain (2 cm) per 10 m2. Litter windrows are generally overlooked in research due to their dispersion, small size, and ephemeral nature.