
EXPLORING THE FATE OF MICROPLASTICS IN THE CONWY RIVER: SOURCES, TRANSPORT, AND ECOLOGICAL IMPACTS

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ACADEMIC BACKGROUND



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Microplastic pollution in high-altitude Nainital lake, Uttarakhand, India[☆]

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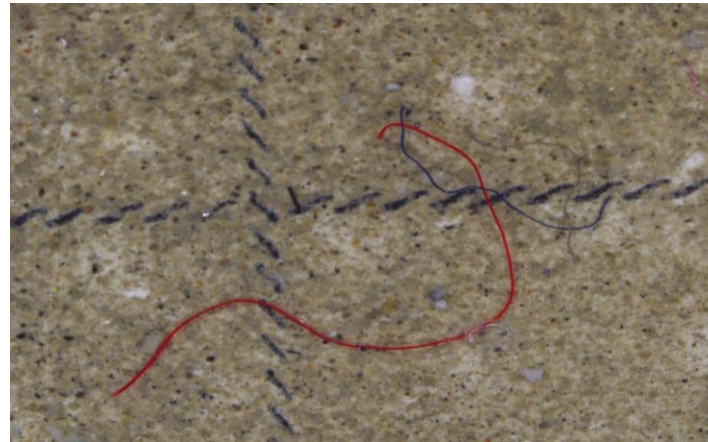
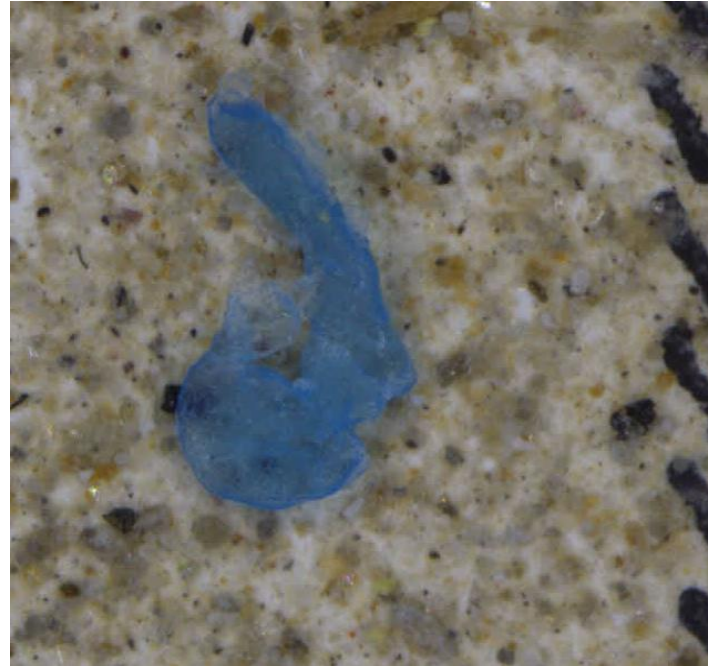
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ABSTRACT

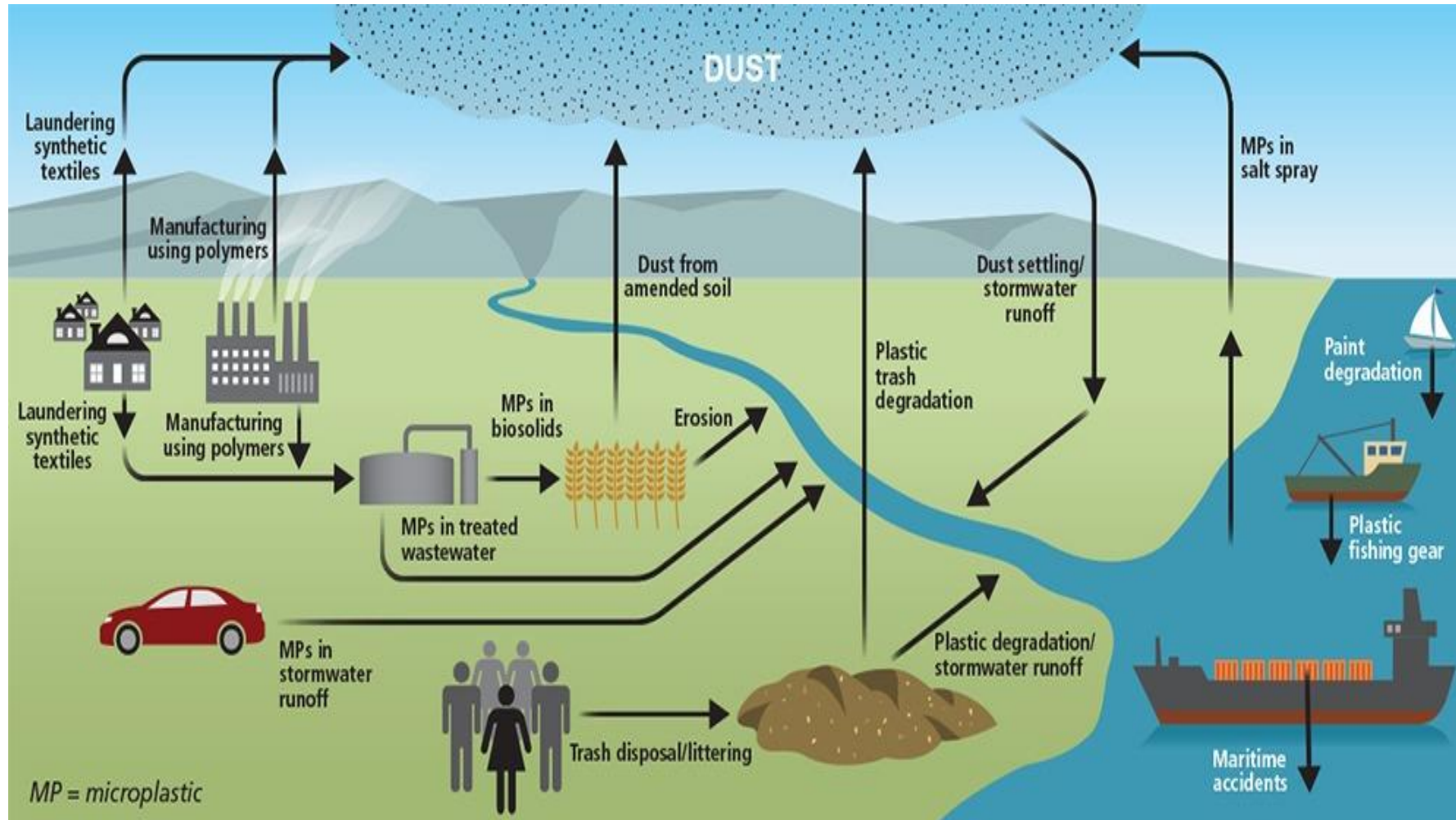
Microplastics (MPs) contamination has been reported in all environmental compartments, but very limited information is available at higher-altitude lakes. Nainital Lake, located at a high altitude in the Indian Himalayas, has various ecosystem services and is the major source of water for Nainital town, but the MP abundance is still unknown. This study presents the first evidence of the abundance and distribution of MP in Nainital Lake. Surface water and sediment samples were analysed from 16 different sites in and around the catchment area of Nainital Lake. The MP were observed in all the samples, and their abundance in surface water was 8.6–56.0 particles L⁻¹ in the lake and 2.4–88.0 particles L⁻¹ in hotspot sites. In the surface sediment, MP abundance ranged from 0.4–10.6 particles g⁻¹, while in the bottom sediment, the mean abundance was 0.6 ± 0.5 particles



MICROPLASTICS IN RIVERS- UNSEEN POLLUTANTS

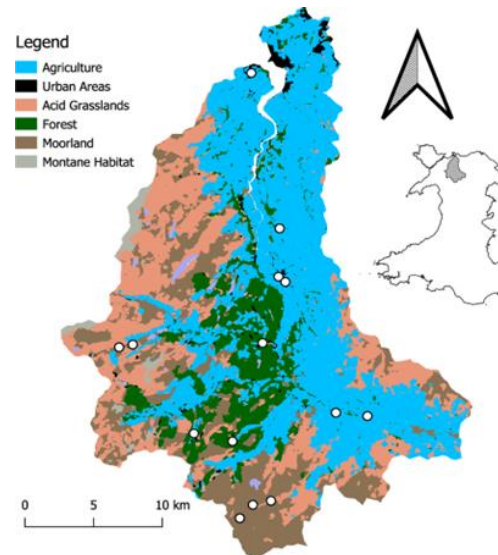
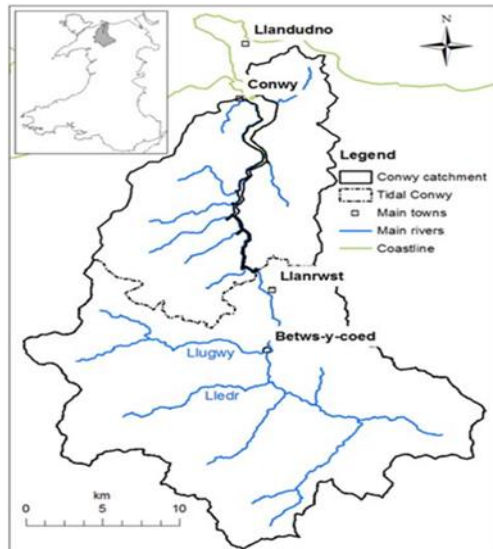
- Rivers account 80% of global ocean plastics.
- These dynamic ecosystems driving 0.4 to 4.0 million tons of plastic debris to oceans annually.
- Multiple sources contribute to their pathways.
- Hydromorphological characteristics influence MPs fate.
- MPs accumulate in the sediments of rivers.
- Adsorb contaminants, such as heavy metals, biofilm formation, posing ecological and health risks.

PATHWAY OF MICROPLASTICS

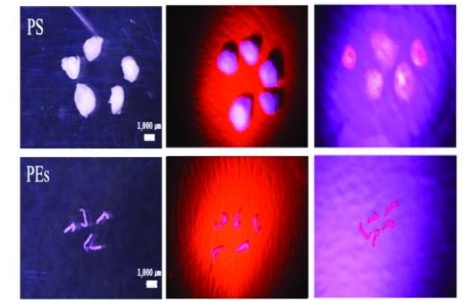
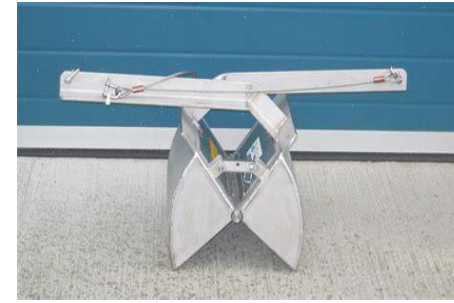
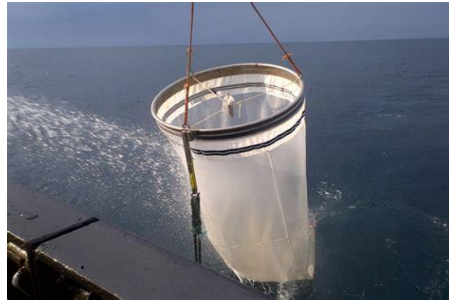


AIMS AND OBJECTIVES

- To quantify and characterize microplastics (MPs) from point and diffuse sources in the Conwy sub-catchments across different seasons, to evaluate their temporal and spatial contributions to microplastic pollution in the river system.
- To investigate the role of hydrological events, on the temporal and spatial transport, distribution, and accumulation of MPs in the Conwy River.
- To investigate the relationship between MPs with co-contaminants in water and sediment samples, to evaluate their effect on the potential ecological and health risks in the river ecosystem.
- To model the transport and distribution of these MPs from key pollution sources within the Conwy sub-catchments along the river system, under different hydrological conditions.



RESEARCH METHODS

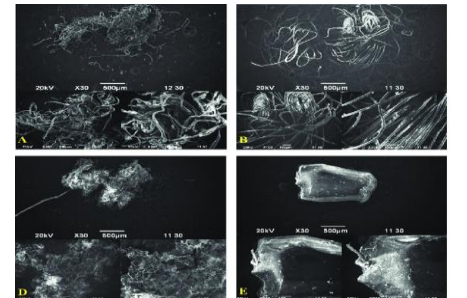
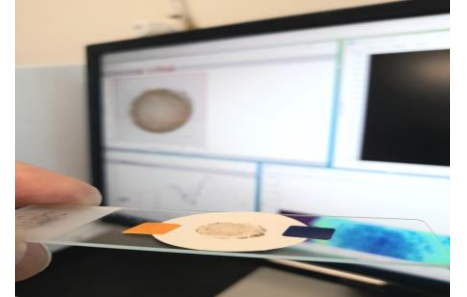


Sampling from various sources in the sub-catchments: Planktonic nets and Sediment corers

Quantification and Characterisation: Nile Red Staining, Stereomicroscopy, and LDIR

Microplastics and Co-contaminants: SEM and qPCR

Modelling microplastic transport



IMPACT ON POLICY AND COMMUNITY ENGAGEMENT



REGULATION OF
MICROPLASTIC SOURCES



MONITORING AND DATA
COLLECTION
INFRASTRUCTURE



FORECASTING AND FUTURE
POLICY IMPLICATIONS



RESEARCH SUPPORT AND
INNOVATION



I WOULD GREATLY APPRECIATE ANY INSIGHTS OR SUGGESTIONS REGARDING MY PROJECT

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