



UNIVERSITY OF MARYLAND
HONORS COLLEGE

Team MARINE: Microplastic Analysis and Removal in Industrial and Natural Ecosystems

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GEMSTONE
Honors College
University of Maryland

Introduction

Microplastics...

- Are pieces of plastic < 5mm
- Never decompose
- Continuously break down into smaller and smaller pieces
- Act as substrates for accumulation of other harmful substances

Research Questions

Collection: What are the primary sources of microplastics entering the Anacostia/Potomac watershed (ultimately the Chesapeake Watershed)?

Quantification: Which method of processing yields the most accurate data?

Study Area

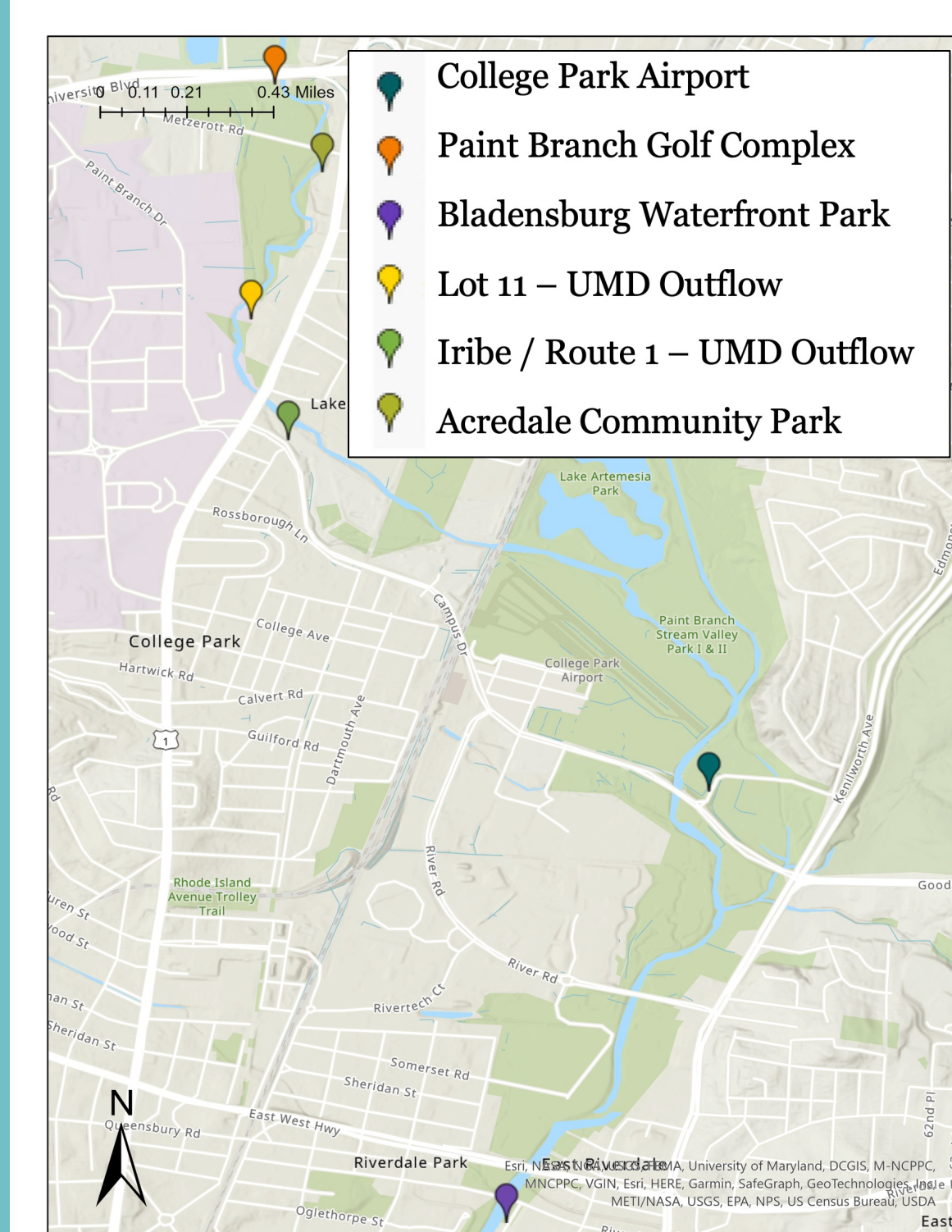


Figure 1: Map of Study Area

- Seven sites sampled within Anacostia Watershed
- Along Paint Branch and Northeast Branch which meets with Northwest Branch above Bladensburg

Collection

- Two replicates and a control at each site
- Monthly sampling accounting for seasonal variation
- Collection apparatus made from PVC tubing

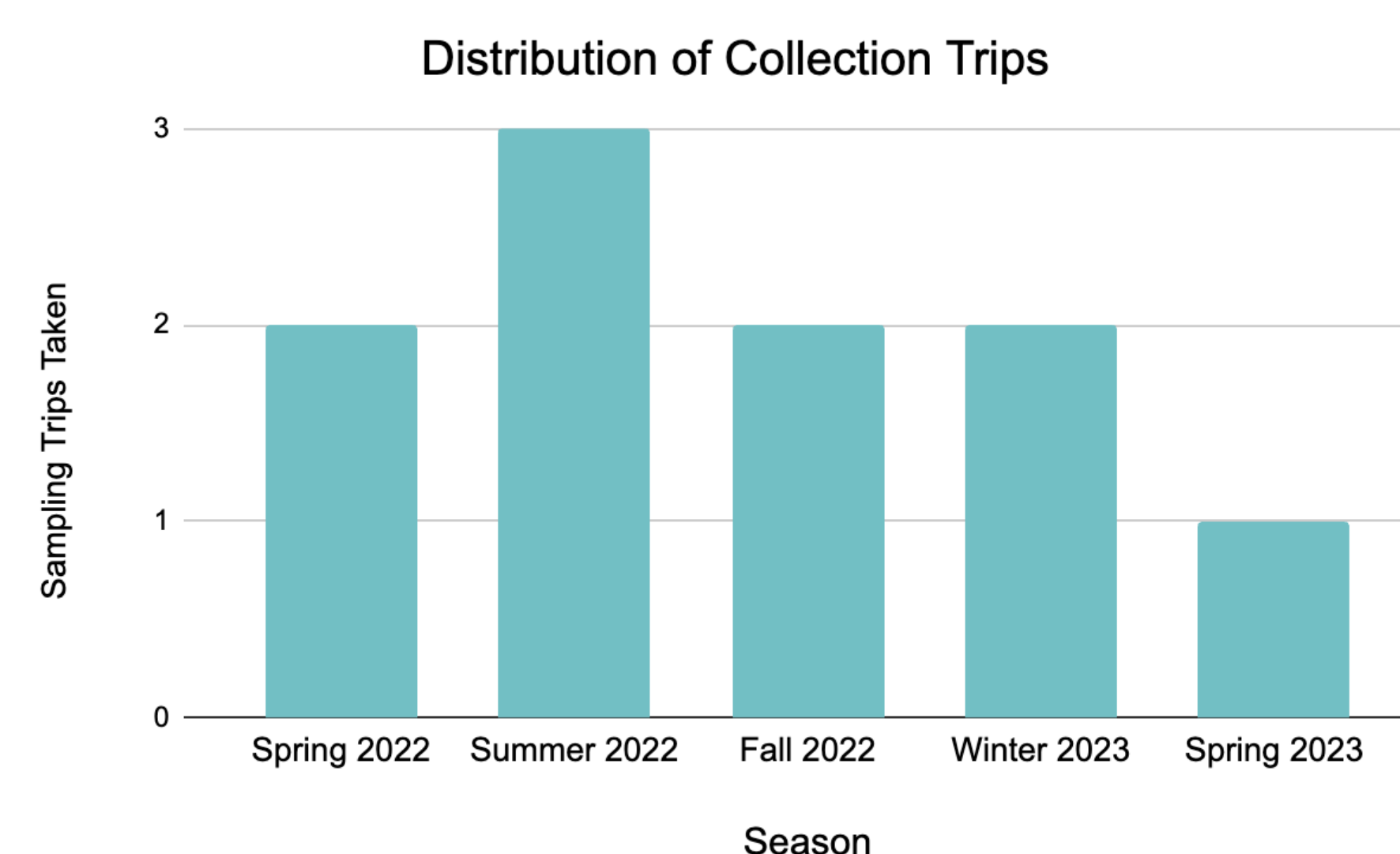


Figure 2: Distribution of when collection trips were conducted



Figure 3: Researchers Jonah and Quin using our novel water collection apparatus



Microscopic Fluorescent Imaging

- Slide color from ultra-fine sediment accumulated in stormwater runoff
- Microplastic fluorescence comes from Nile Red stain

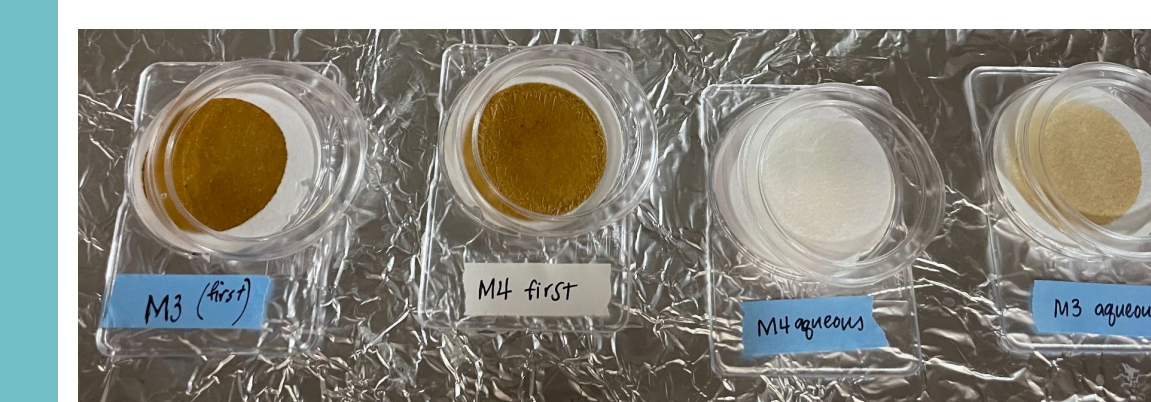


Figure 4: Microscope slides made from samples at various stages of processing

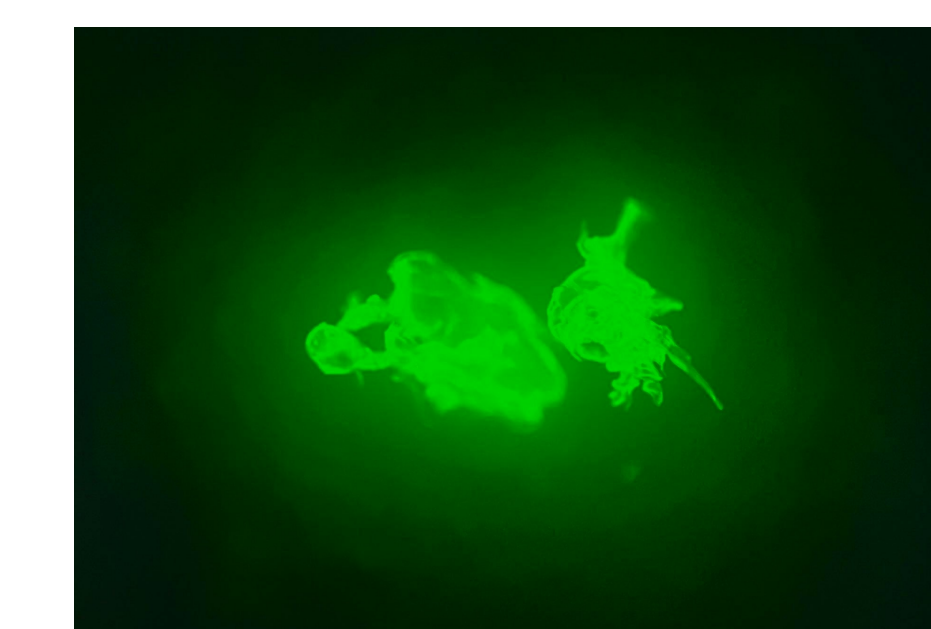
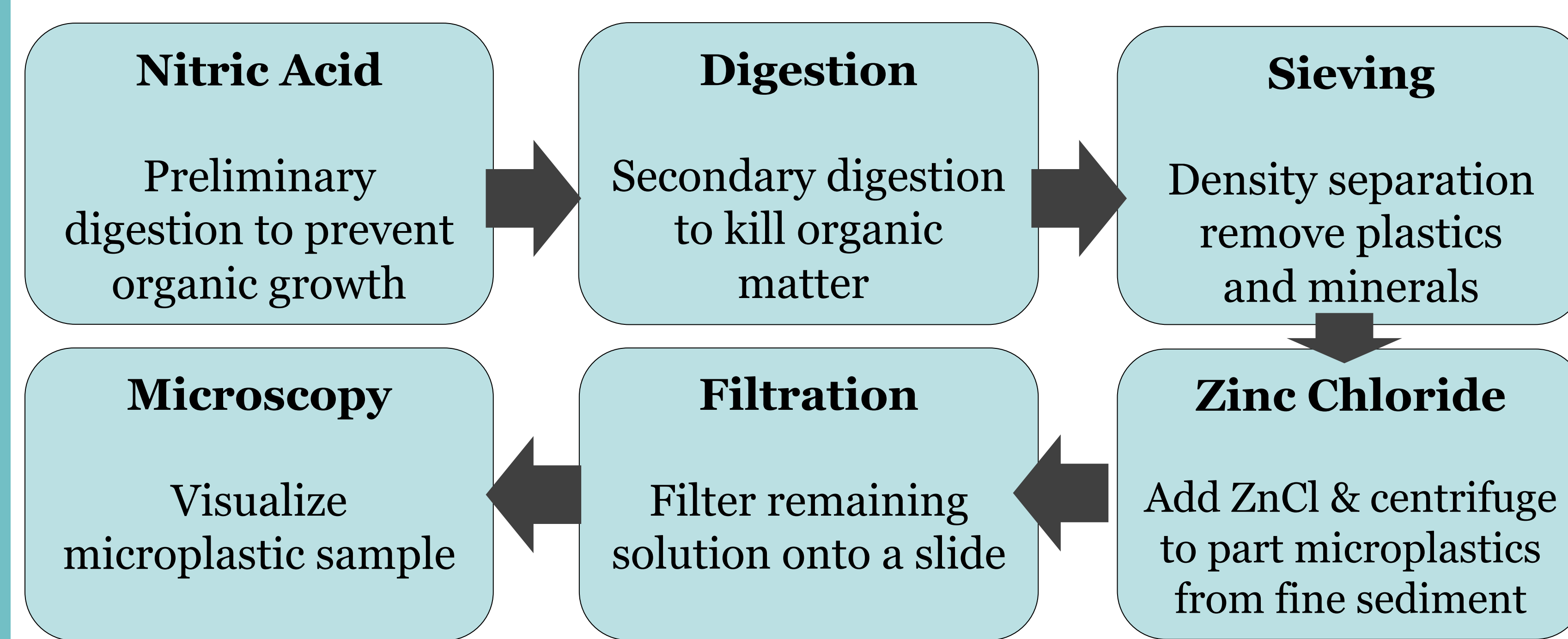


Figure 5: Microplastics seen in microscopic analysis

Future Research Plans

- Guarantee processing accuracy
- Establish quantification procedures
- Analyze local potential sources and environmental impacts
- Policy implications and recommendations
- Microplastic removal from water

Sample Processing



Acknowledgements

References



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