

PRELIMINARY 2025 Analysis of Microplastics in Bed Sediment of the Salish Sea



Kristina Conrad, Kamille Sebastian Foronda, Sophia Weaver, Mentor: Julie Masura

INTRODUCTION

Microplastics (MPs) are polymers <5mm in size, eroded by chemical or physical processes of plastic products. MPs have become persistent in our marine and sediment environments. MPs introduce potential negative physiological and biological effects on living organisms and humans. The University of Washington-Tacoma collaborated with the Department of Ecology's Marine Sediment Monitoring Team for sediment samples to quantify and identify MPs in bed sediment.

This study continued the examination of microplastic abundance within sediment beds throughout the Salish Sea.

QUICK MICROPLASTIC FACTS

- > Polymers <5mm in size. (NOAA, 2024)
- > Shape classifications include fibers, films, fragments, foam, pellets. (NOAA, 2024)
- > Can release harmful toxicants in aquatic environments. (Yu et al. 2024)

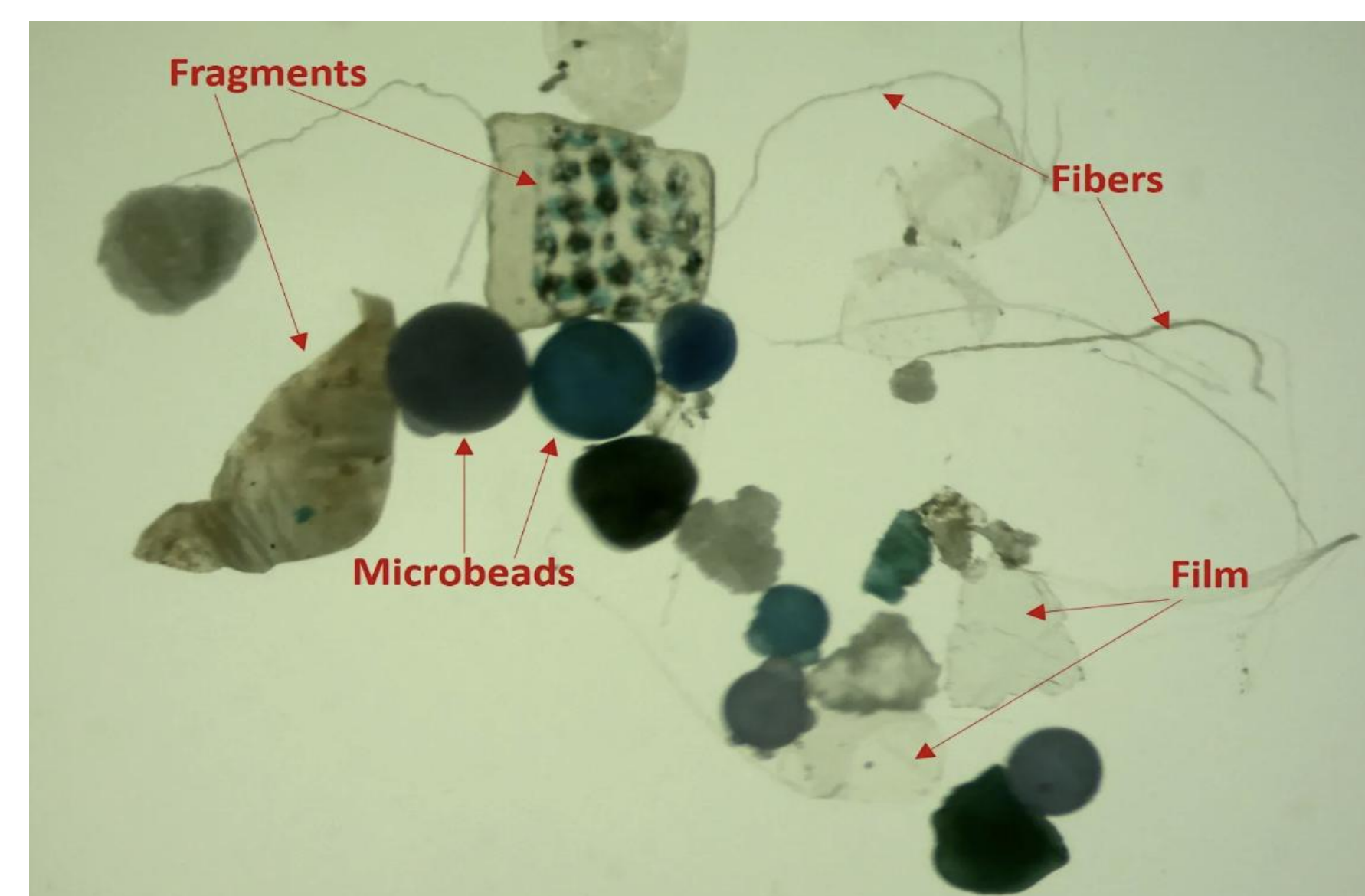


Figure 1. Microplastics collected from Lake Superior. Image from Hemphill (2021), Microplastics proliferate in Lake Superior, Agate Magazine.

METHODS

Collect Sample: Department of Ecology's Marine Sediment Monitoring Team.

Stored: Samples kept in a climate-controlled environment until processing.

Disaggregated: Potassium metaphosphate and sieved through a 0.3 mm mesh to isolate the target particle size.

Oxidation: Wet peroxide, followed by density separation to isolate buoyant MP particles.

Collect Particles: Examined under a 40× dissecting microscope.

Classification: Type (fiber, fragment, film), color, and length (mm), and weighed to determine microplastic concentration.

RESULTS

Microplastics were detected in 8 samples, with fibers being the most common particle type. Particle counts ranged from 1–96 per sample, with the location, Dabob Bay, having the highest count (96). Particle sizes ranged from 0.33–9.57 mm. White and clear fibers were the most frequently observed colors.

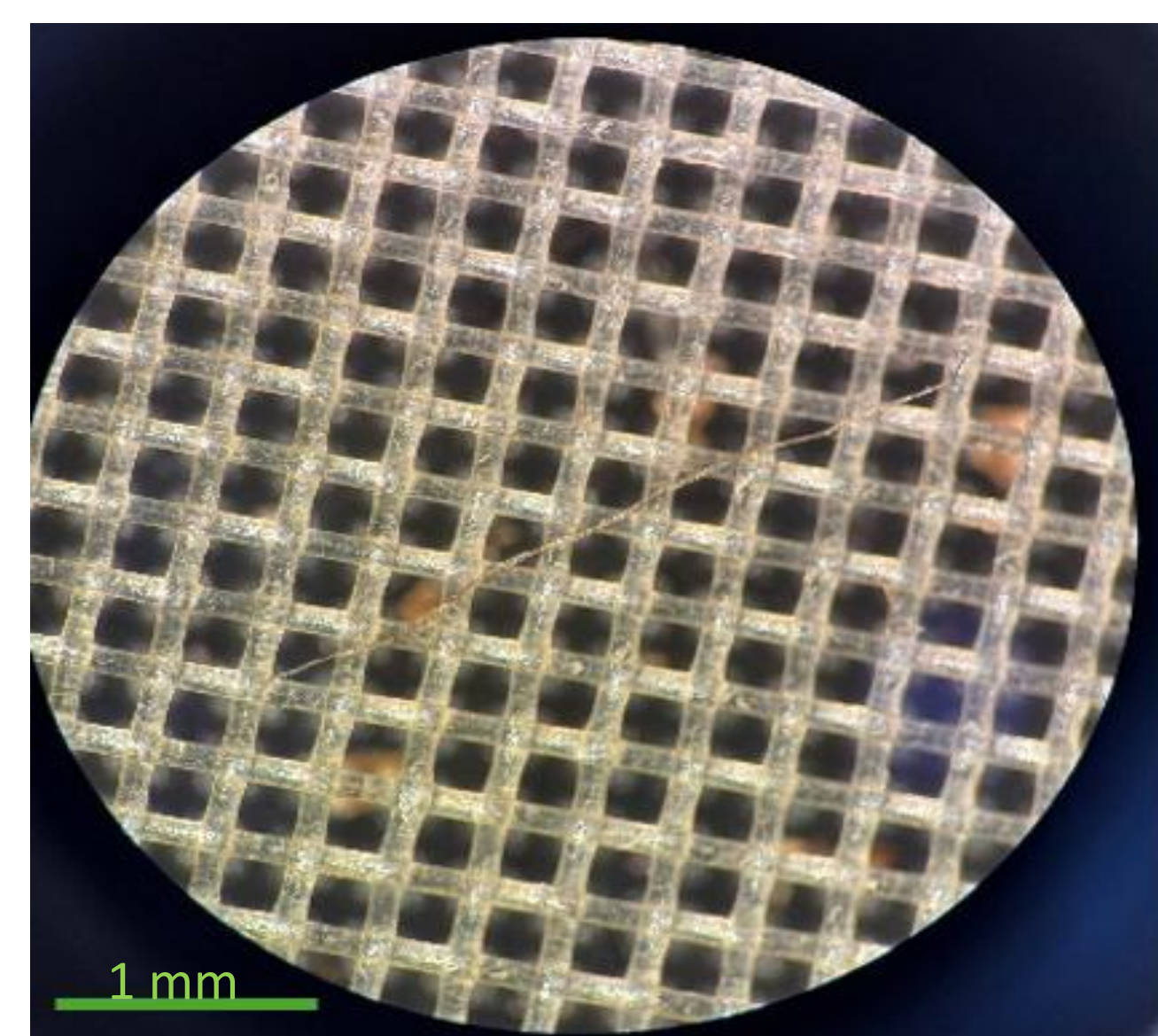


Figure 2. Fiber microplastic found in our sediment sample from the Salish Sea under the microscope.

Microplastic Type

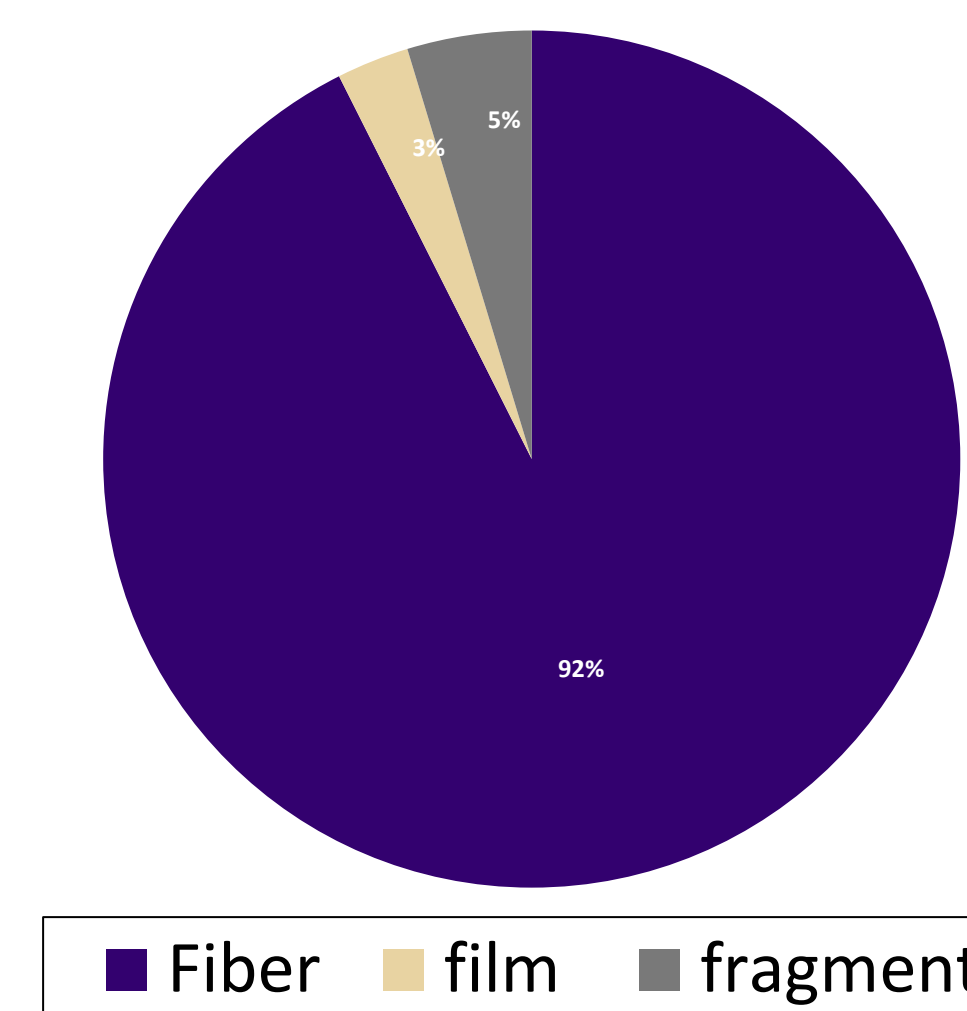


Figure 3. Distribution of microplastic types.

Microplastic Colors

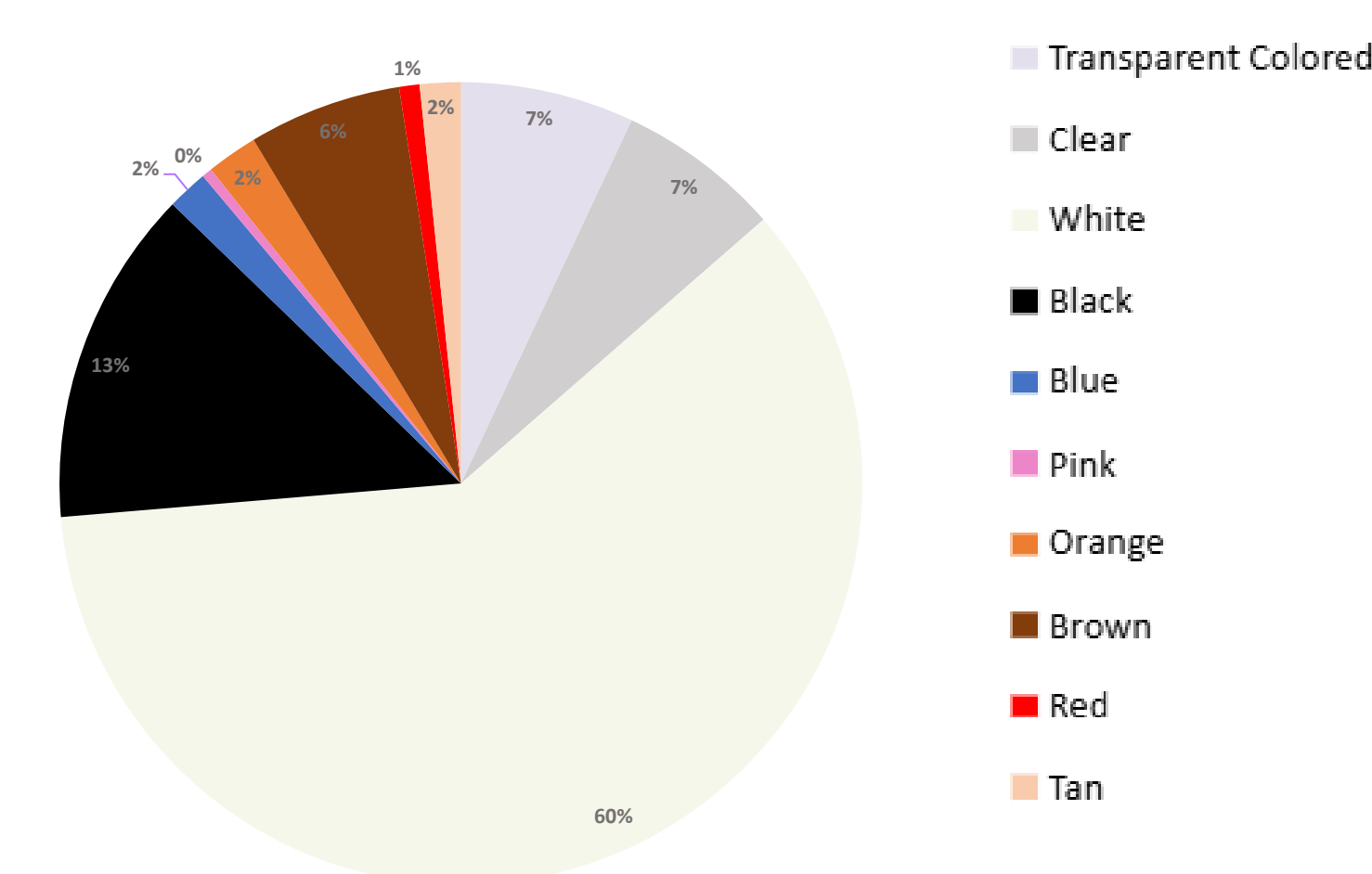


Figure 4. Distribution of microplastic colors.

DISCUSSION

Microplastics were detected in most samples, demonstrating their widespread presence within Washington's coastal environments. The variety of particle types, colors, and sizes observed suggests that multiple sources contribute to microplastic pollution. Fibers were the most common identified particles, consistent with previous studies that attribute their abundance to wastewater discharge, textile fibers, and fishing activities.

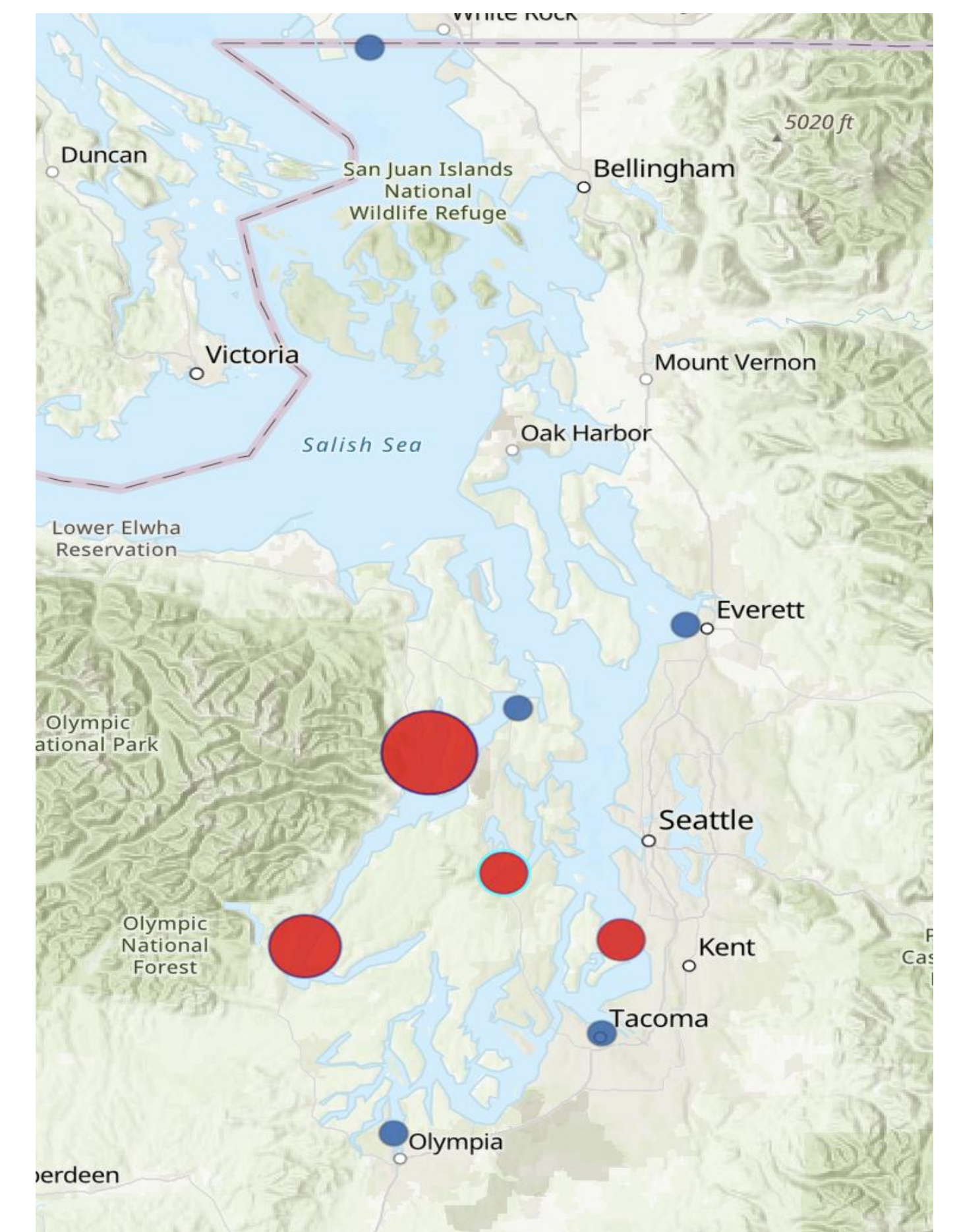


Figure 5. Map of microplastic sample stations and correlations between microplastic findings.

FUTURE WORK

- > Complete the remaining 2025 and 2026 sediment samples.
- > Increase all samples to be processed, spreading across urban and rural sampling sites for comparison.
- > Continue monitoring sediments to understand MP trends in accumulation and impacts on organisms.

REFERENCES

