

Comparing the amount of microplastics in two of Wrangell's harbors from 2023-2024

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Introduction

Microplastics are pieces of plastic that are smaller than 5 millimeters in size. Microplastics and microfibers come from various sources from clothing to personal care products. Due to the widespread use of plastic products in our daily lives, there are more microplastics entering the water (Belioka et al., 2023). One of the ways to better understand the plastics in the marine environment is to record results in single surveys (Galgani et al., 2021). For example, taking a sample of water or sediments and recording the size, type, shape, and color of each microplastic found in the sample. In this project, we want to see how the amount of microplastics and microfibers has changed in Reliance and Heritage harbors, in Wrangell, Alaska, between January 2023 to February 2024.



Methods

Two water samples were collected using a plankton net tow for 3 minutes at Reliance Harbor and Heritage Harbor, both located in Wrangell, Alaska on February 7 and February 12. Two control water samples were collected from the Cultural Center tap. Each sample contained 900ml of water and was divided into three different 300ml jars. Each filter was marked with a dot to indicate the top of the filter. Then each 300-ml container was vacuum filtered creating 18 filtered samples. To reduce contamination, lab coats were worn, clean tweezers were used, and all equipment was rinsed thoroughly three times. Filters were examined under microscopes going clockwise from the dot. The color and type of microfiber or microplastic found on each filter was recorded on a data sheet specific to the location and sample ID. We conducted burn tests by a heating and observing whether the suspected microplastic caught on fire, melted, or was unaffected. Our 2024 data was compared to the data collected by 2023 RASOR students using the same methods.

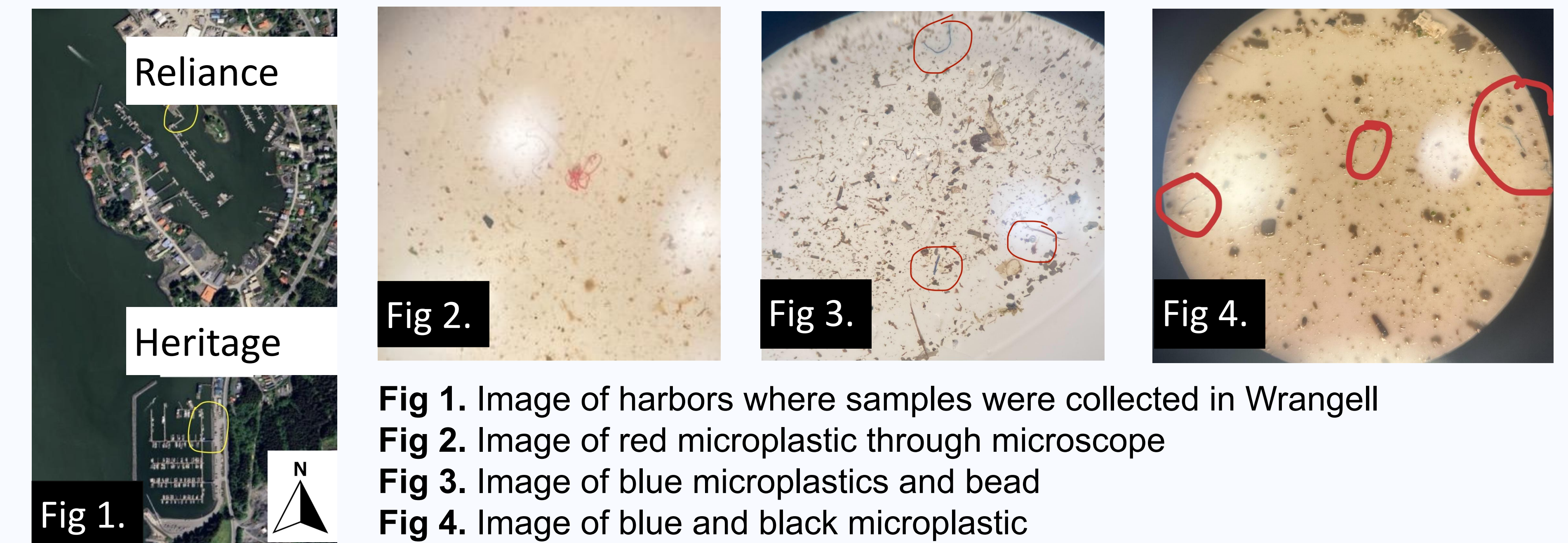
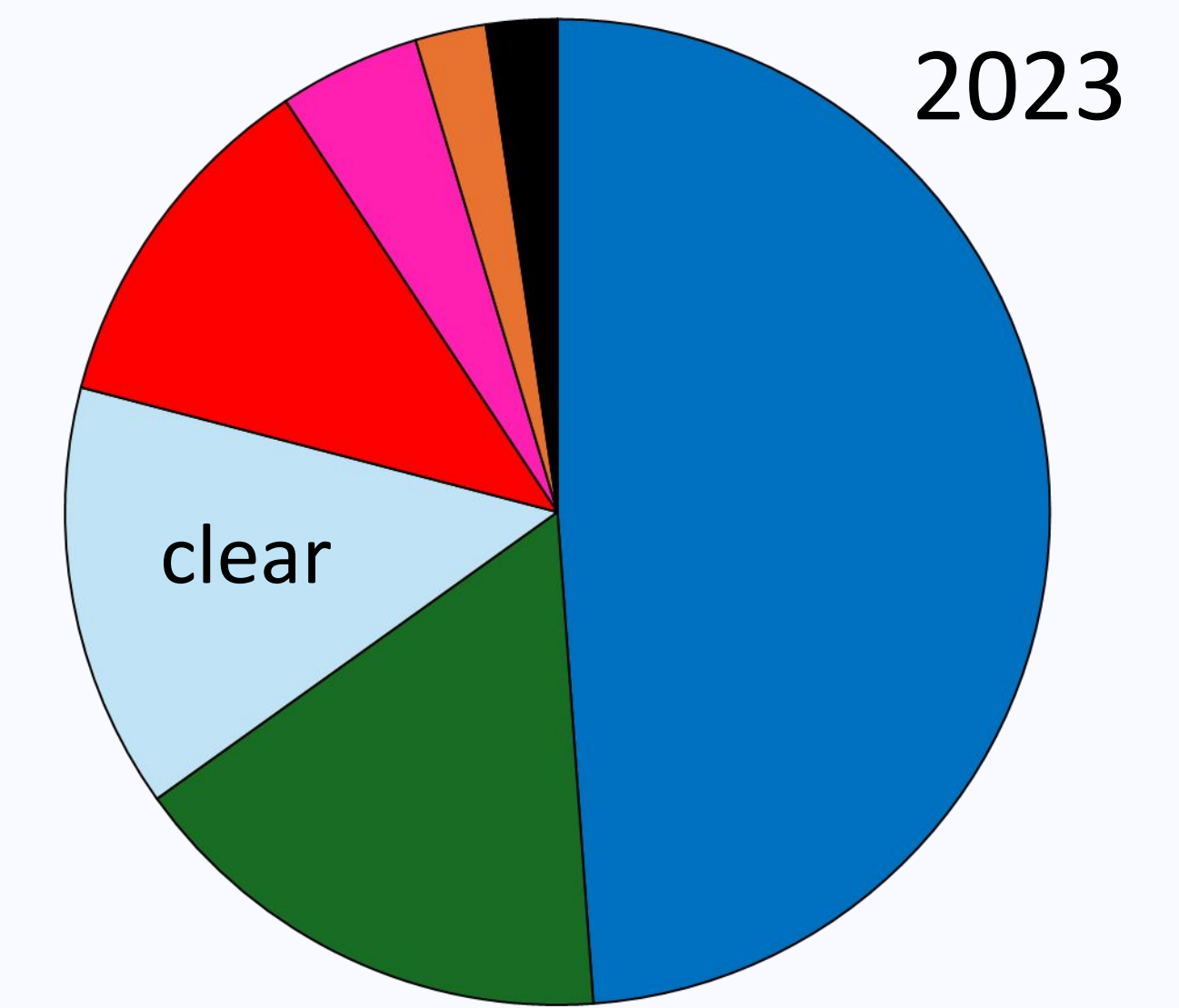
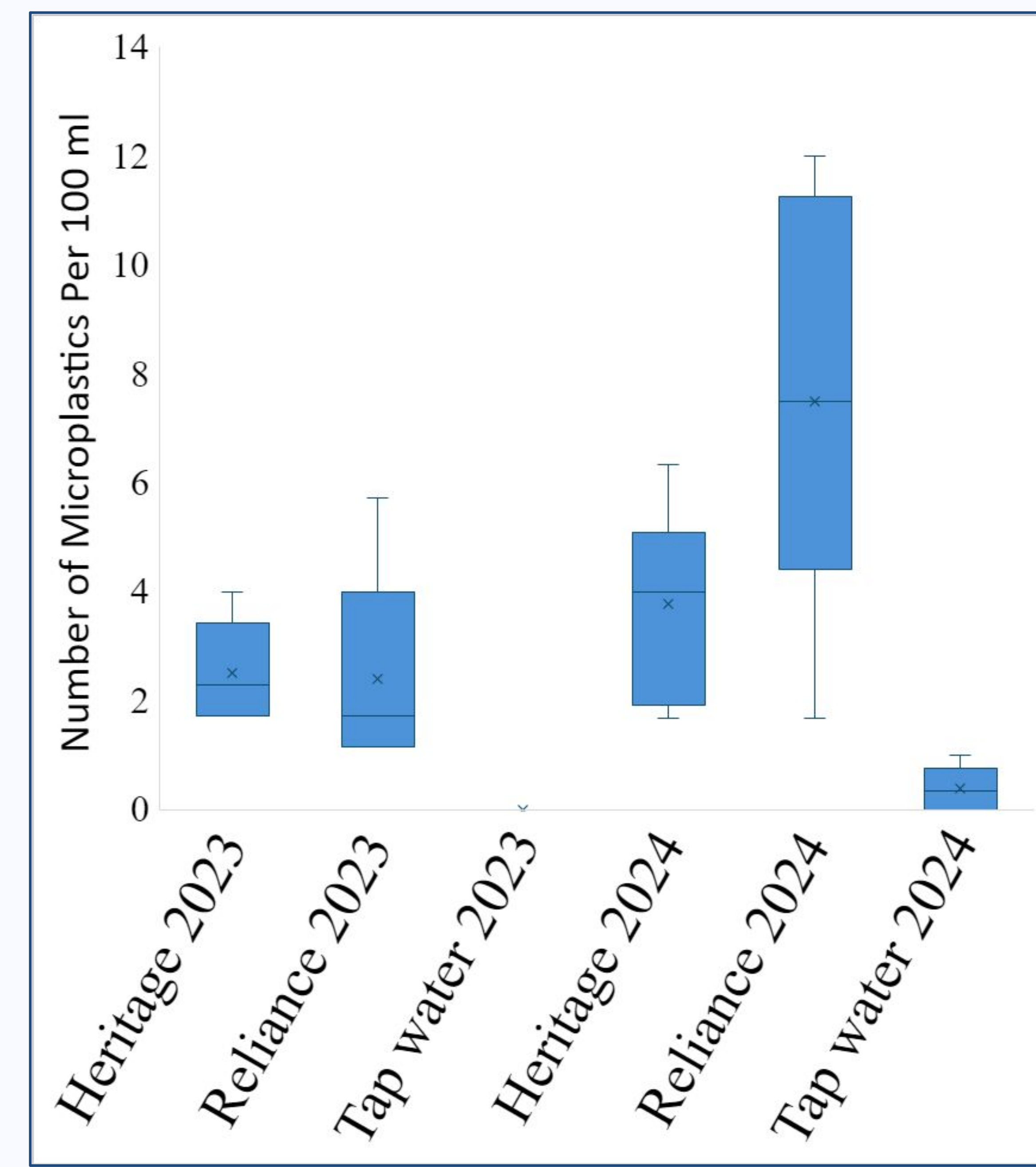


Fig 1. Image of harbors where samples were collected in Wrangell
Fig 2. Image of red microplastic through microscope
Fig 3. Image of blue microplastics and bead
Fig 4. Image of blue and black microplastic

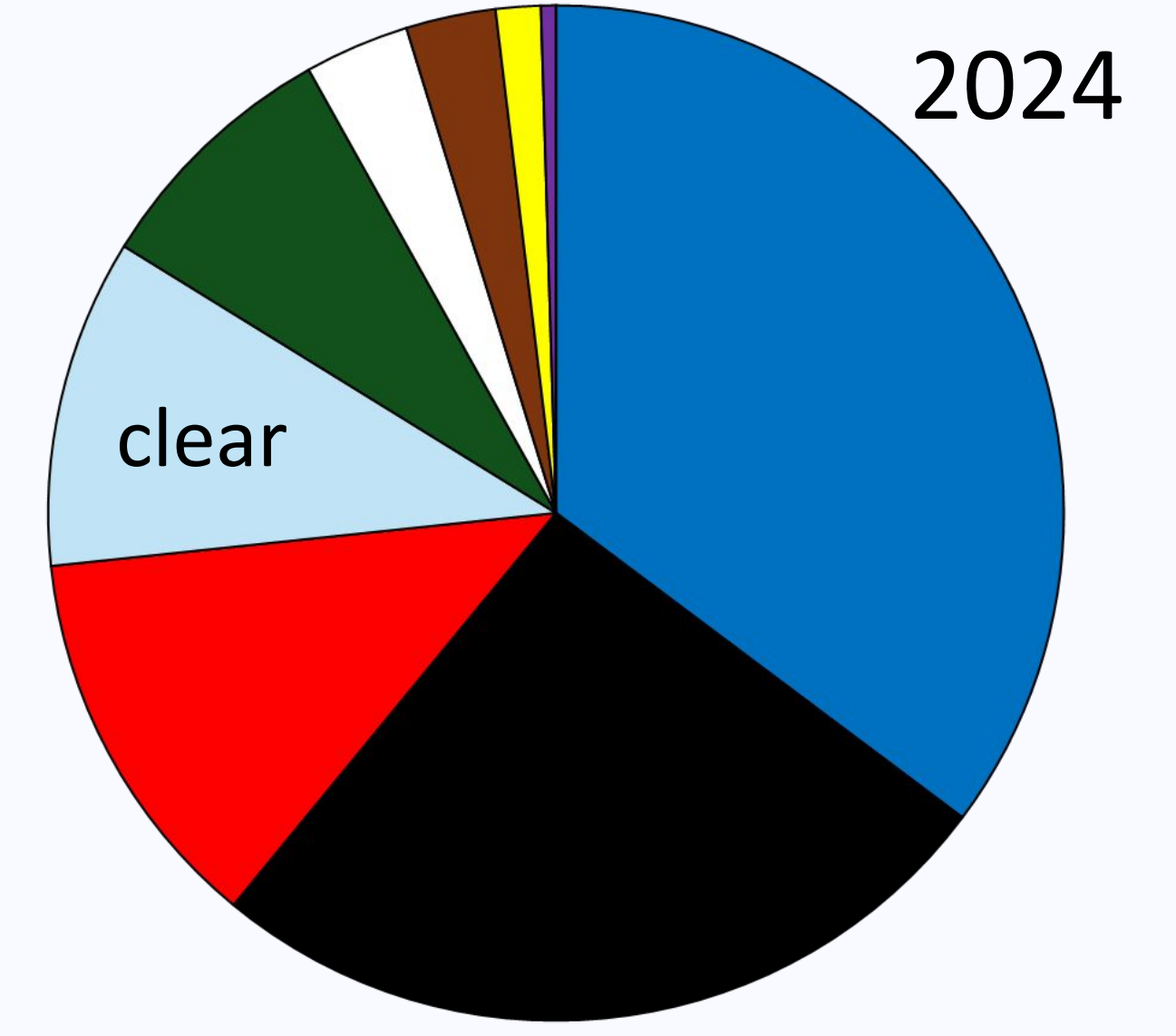
Hypothesis

The levels of microfibers and microplastics in Reliance Harbor and Heritage Harbor will remain consistent or similar with 2023 data. We think this because there has been no significant increase in boat usage or population within the last year.

Results



Color of microplastics found each year



- Tap Water 2024 could have been contaminated by our black clothing
- One of our higher counted samples was contaminated

- Microplastics increased in all locations
- Both 2023 & 2024 had lots of blue microplastics
- Reliance had more microplastics in 2024 than 2023

Discussion

Microplastics can be found in variety of places in Wrangell including the harbors and possibly the tap water. The data we collected did not support our hypothesis. We assumed that the numbers of microplastics would be at the same levels across 2023 and 2024. However, our results showed that the samples from 2024 had more microplastics. The difference between harbors could be due to Reliance having more boats, larger boats, and possibly more boat traffic. Future studies could test this by sampling in the summer and by monitoring boat traffic. One problem we had was our ability to control microplastic contamination in the field and in the lab. For example, we found some black fibers on our control samples that could have been from the microplastics on our clothes.

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