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Results

Introduction

The ocean's wildlife are a vital source of human food. Considering their minute size, microplastics can be eaten by a large variety of organisms (Shim & Thomposon, 2015). Microplastics are known to harbour toxicants and chemicals that can harm any organism that ingests it, including shellfish (Shim & Thomposon, 2015). The degradation of macroplastics to macroplastics can be caused by weathering, wave action, and oxidation (Bråte et. al, 2017). Previous studies in Sitka have shown that microplastics have been found in subsistence foods (Dangel, et. al 2018) but those studies have not been linked to the amount of microplastics to a specific area.

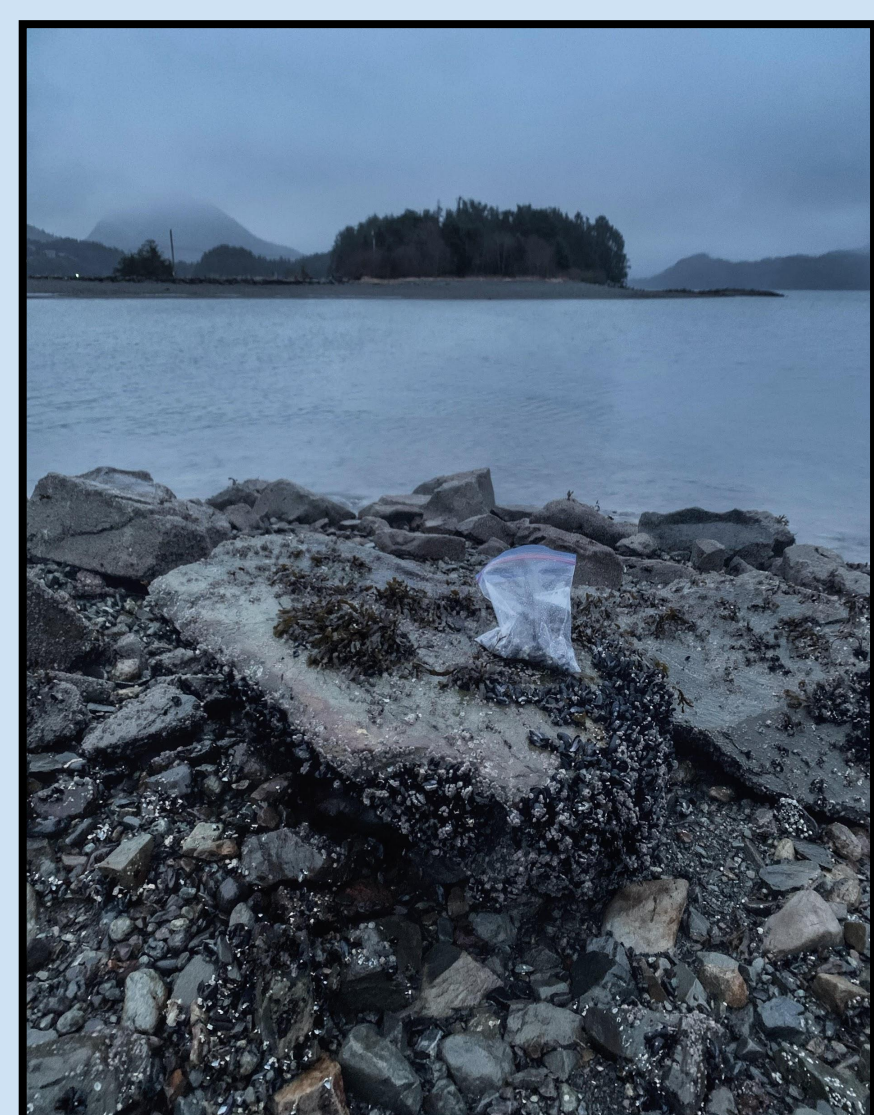
Hypothesis

We predict that there will be a positive relationship between the amount of macroplastics found on beaches and the amount of microplastics found in ocean water and in shellfish on those beaches.



Dissolved mussel tissue on a filter

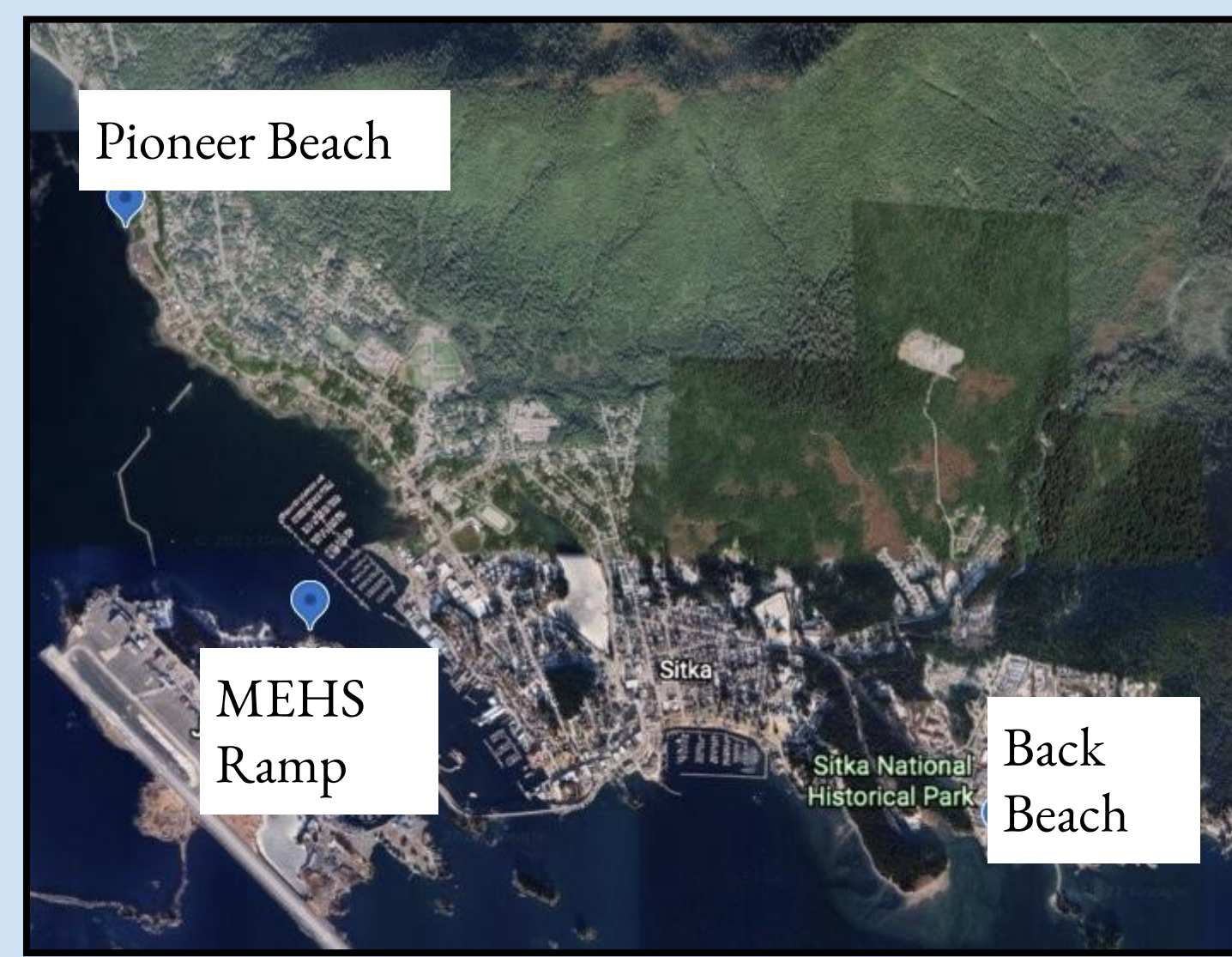
Methods



Mussel collection occurred from a rock on Back Beach.



RASOR student Carry Fenno collecting plastics and mussel samples. Photo by Hunter Littlefield.



Satellite view of the location of three beaches, Back Beach, MEHS Ramp, and Pioneer Beach, that data was collected from.

MICROPLASTICS IN SHELLFISH

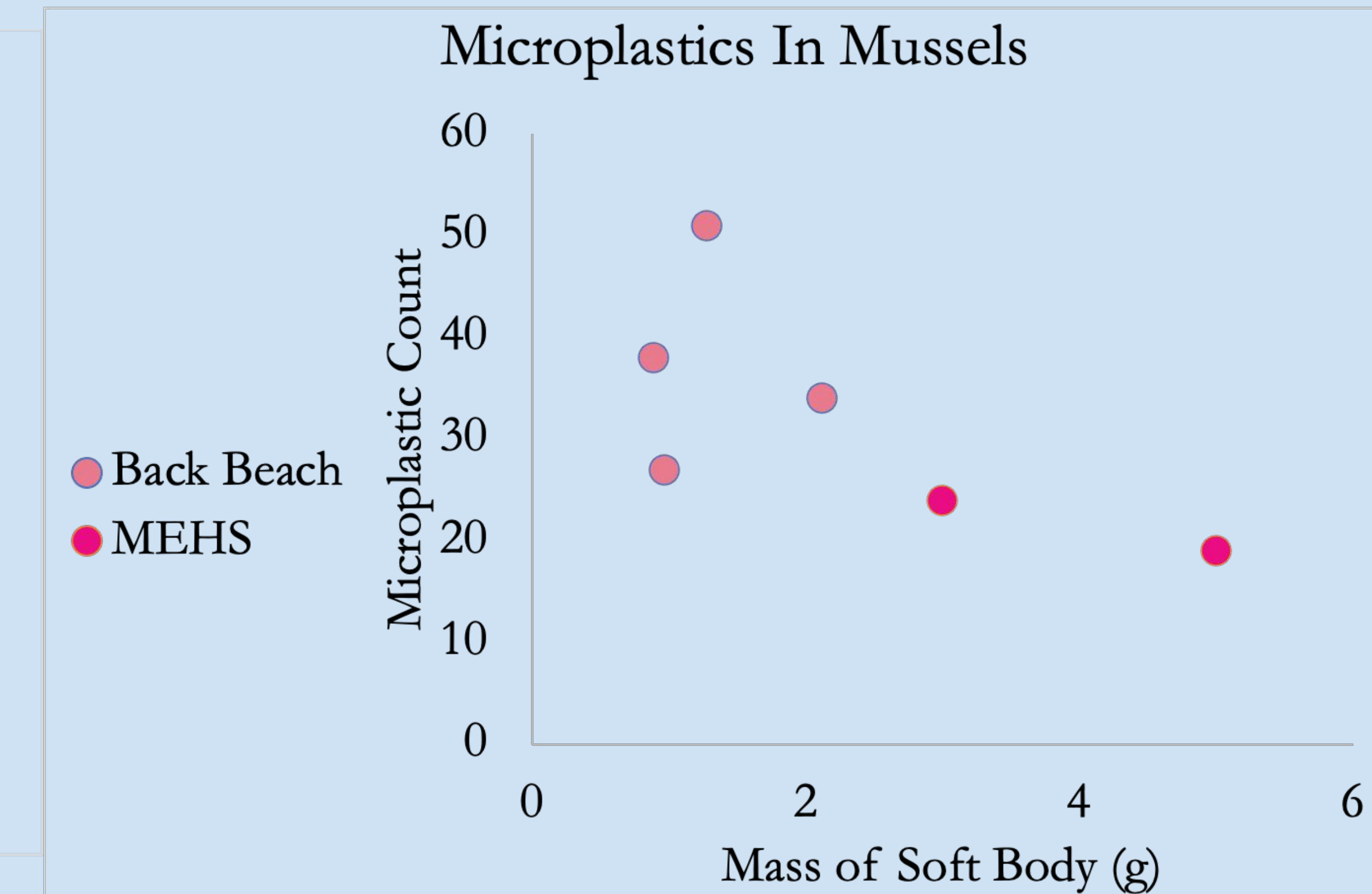
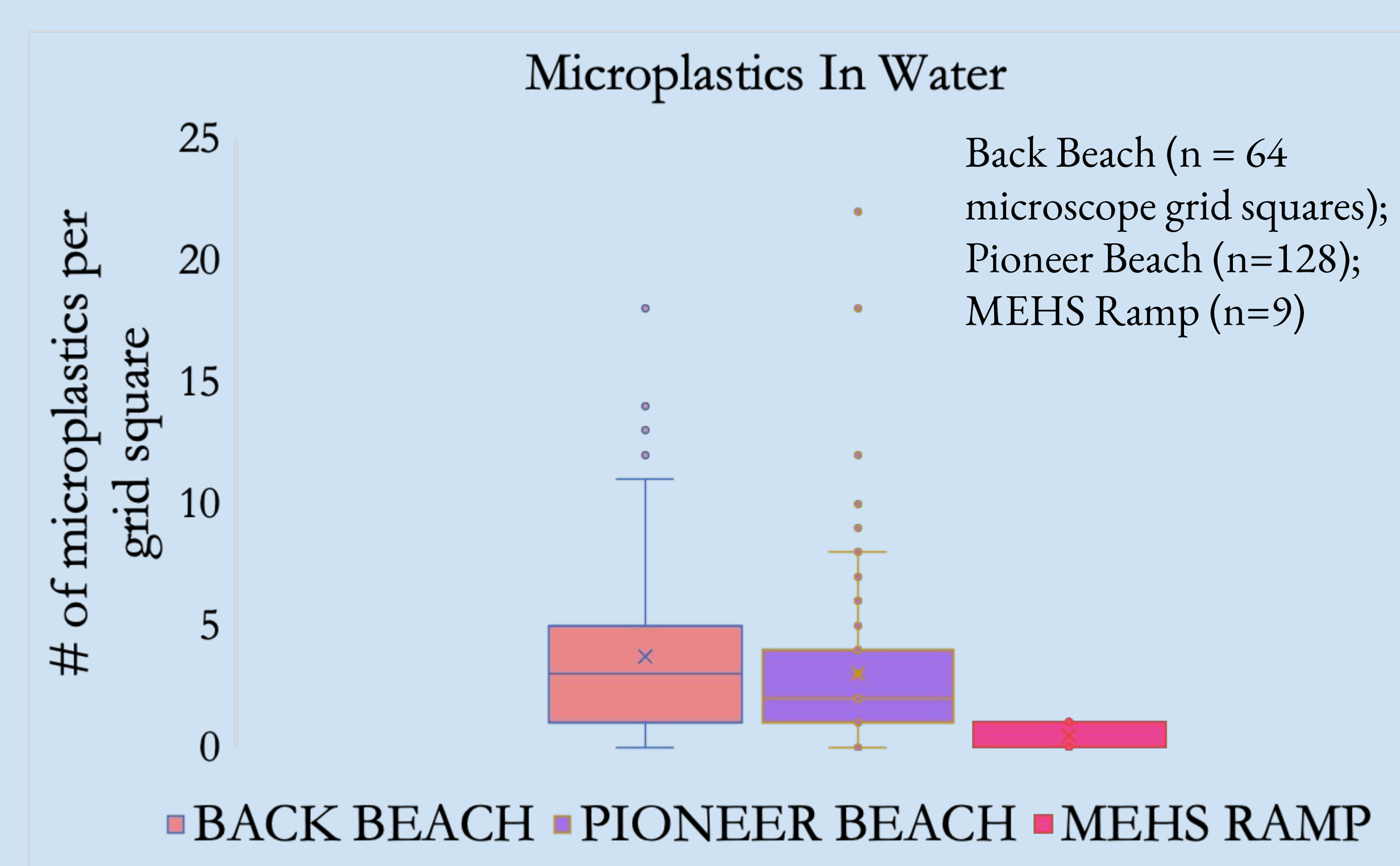
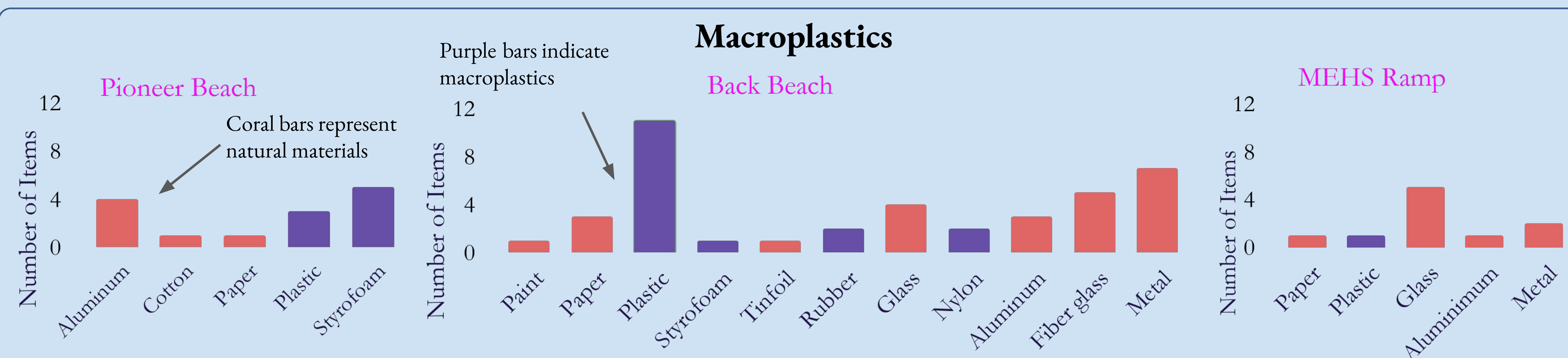
- Mussels were weighed and measured inside the shell
- Mussel was shucked and tissue was weighed
- Tissue was submerged into concentrated KOH (3x weight) and left to filter for 7 days.
- Substrate was then drained and vacuumed through a filter.
- Microplastic were then analyzed under a compound microscope.
- A wet lab/biotoxin control sample was left exposed to the air (1 of each).
- When collecting at back beach/pioneer beach, macro/mussel samples were taken.

MICROPLASTICS IN OCEAN WATER

- The net with bottle was waded through the water for three minutes (fully submerged), while slowly walking so that it was constantly in motion, then the bottle was detached and sealed.
- After three minutes, the net was taken out of the water and the squeeze bottle was used to rinse the concentrated sample water into the bottle.
- Qualitative data of weather via notes/camera was recorded
- 3 drops of sample water were then analyzed for microplastics with microscope using: glass slide, pipet, and cover slip).
- Microplastics were counted in each grid square, while noting the color and shape, and recorded finding onto data sheet.
- Samples were collected around every other week.

BEACH MACROPLASTICS

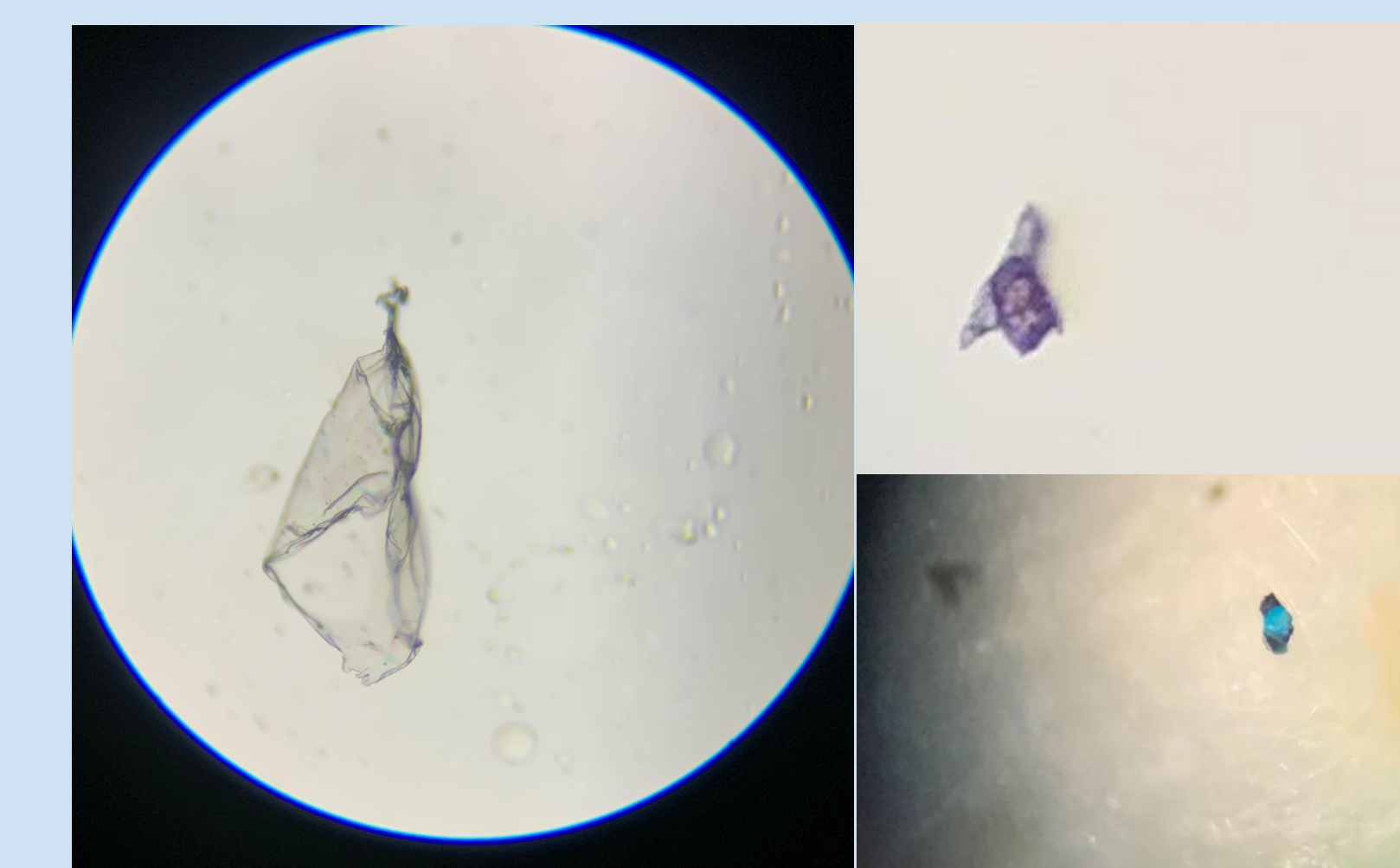
Trash pieces were then weighed, measured in length, categorized by type, and described in appearance.



- Back beach had the most microplastics in water and shellfish and beach macroplastics.
- MEHS ramp had the least microplastics in water and shellfish, as well as the least macroplastics.
- The most common type of beach debris found was generic plastic.

Discussion

Our hypothesis was supported because there were more microplastics in the water and shellfish near beaches that had more macroplastics. Back beach is an area that is near the road system, is a common fishing ground, and is a heavier foot traffic spot compared to our other beaches. Further questions include; how is this impacting other wildlife? If we were to extend this, we would monitor fish stomach contents for microplastics (Foster, 1977). Despite these results, our evidence doesn't suggest that practice of eating shellfish for both traditional and recreational purposes should be stopped simply for safety reasons.



Microplastics seen under a compound microscope

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