

# Comparing Influence of Low to High Foot Traffic on Microplastic Presence in Ocean Water Samples in Petersburg, Alaska

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## Background

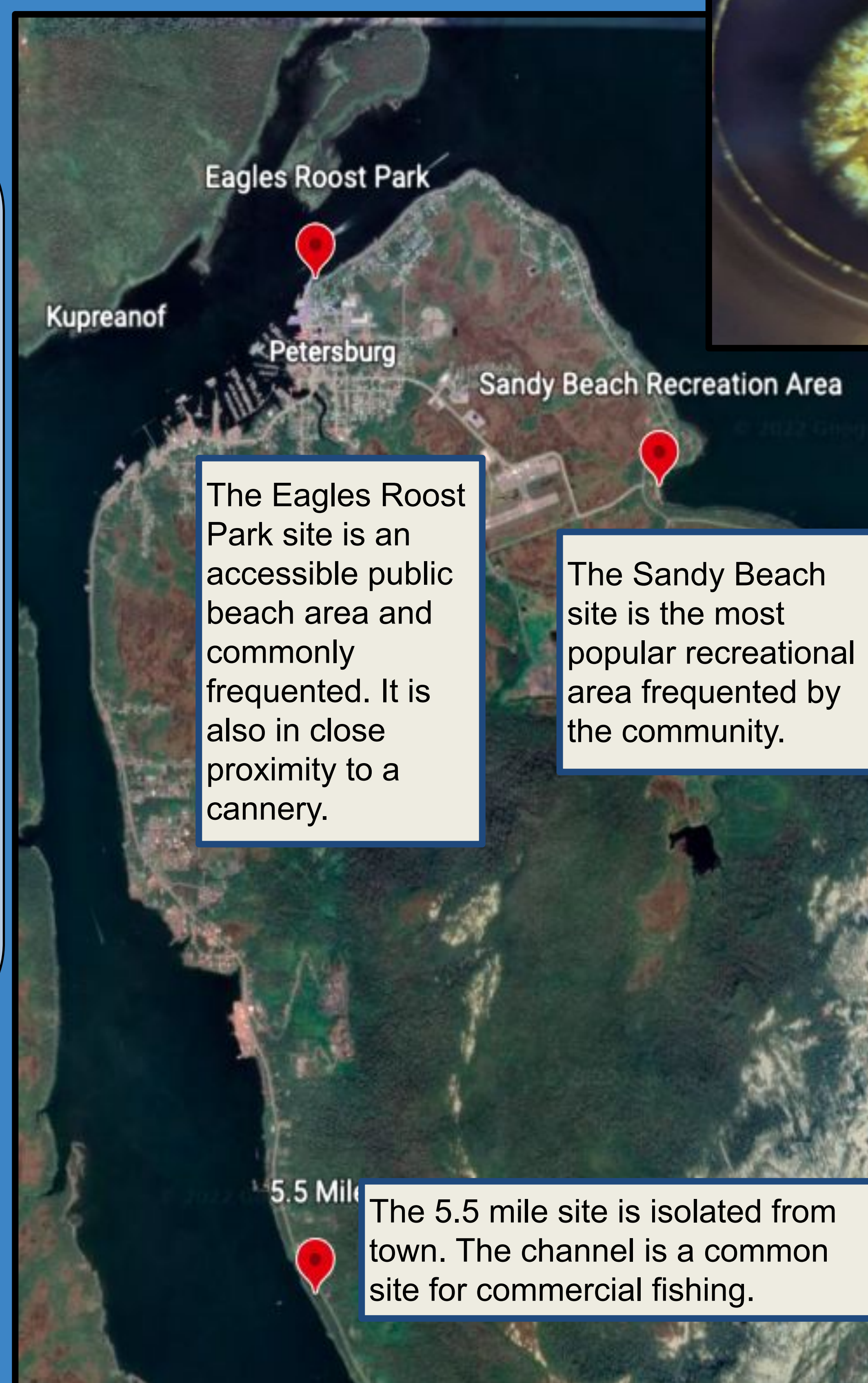
Microplastics are ocean plastics that are 5mm in size or less (Andrady, 2011). Microplastics were first reported in the early 1970s, and since then, concern has greatly increased. Microplastics are a problem because they do not biodegrade, harming small organisms and the environment as they deteriorate continuously. They matter because our survey sites are public recreational or occupational areas—areas the Petersburg community frequents. There have been many studies on how microplastics affect health, and depending on the size, location of them, and how they can cause harm to organisms. It is easy for animals to digest these plastics which decreases their capabilities to develop correctly, their reproductive ability, and affects their behavioral ability.

## Hypothesis

In areas where there is more foot traffic present at a location, there will be more microplastics present in the beachwater of that area.

## Methods

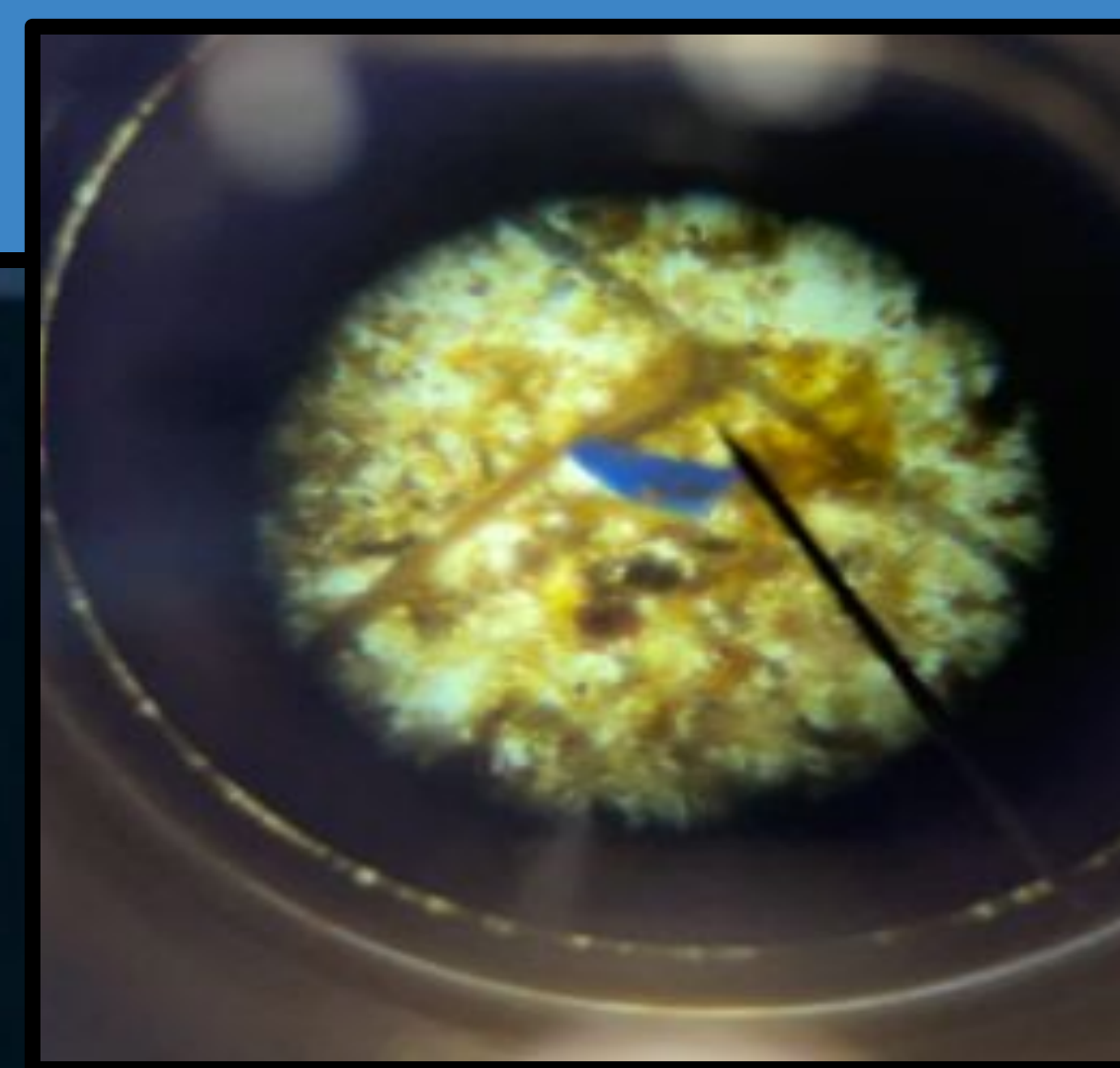
The areas Sandy Beach, 5.5 Mile, and Eagles Roost Beach were surveyed. Methods to take samples were to tow a net in the water for one minute per sample. All samples were filtered at Petersburg Indian Association and examined under a microscope for microplastics. Results were recorded as absent or present depending on the amount of microplastics the sample contained. The study took place from October 5th to November 11th, 2021.



The Eagles Roost Park site is an accessible public beach area and commonly frequented. It is also in close proximity to a cannery.

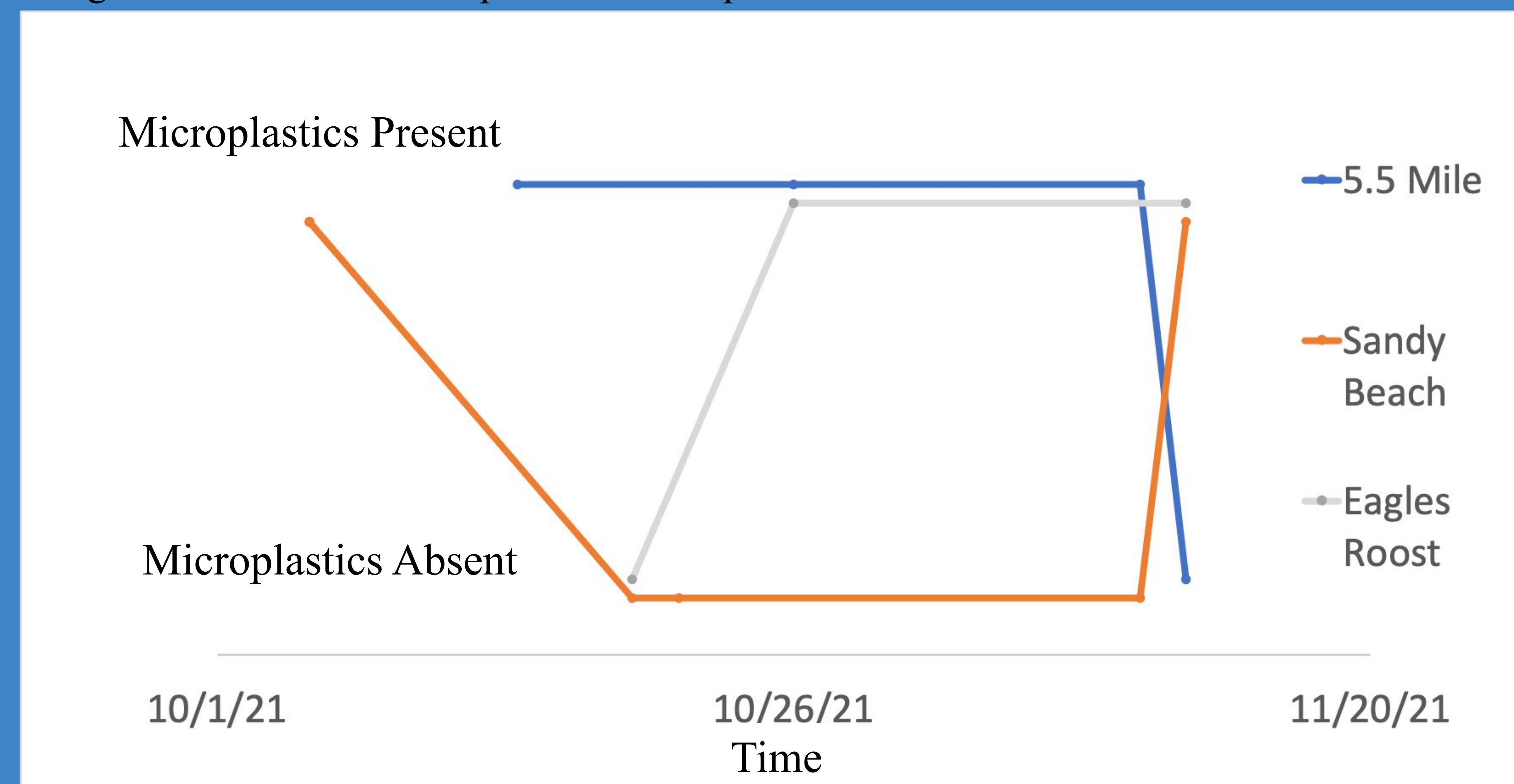
The Sandy Beach site is the most popular recreational area frequented by the community.

The 5.5 mile site is isolated from town. The channel is a common site for commercial fishing.



## Results

The presence of microplastics was detected at Sandy Beach on October 14th, 2021 until October 26th, 2021. Microplastics were not detected after that date. Microplastics were detected at 5.5 Mile Site from October 14 through November 10. No microplastics were detected at 5.5 Mile Site after November 10. Microplastics were found at Eagles Roost after October 26 through November 12. Microplastics that were found consisted mostly of colors that were blue and orange. Sandy Beach was responsible for where most of the plastics was found. Eagles Roost and Sandy Beach had a significant amount of thin pieces of microplastics that were hair-like.



## Discussion

Though microplastics were detected at all sites, our hypothesis was not supported. A possible explanation for the results generated are the seasonal component: storms in fall cause extra debris in the water and an abnormal winter season in 2021. Within a 2021 RASOR study, more microplastics were detected at the Sandy Beach site in March. Another possibility is the microplastics detected could be microfibers in actuality. A different approach to examining samples could be a more powerful microscope. Different methods of collecting microplastics also might yield different results. Other methods of collecting microplastics could include different types of filters or separation methods. Another factor that could have affected the collected data is the season data was collected. Different amounts of microplastics could be collected when there are more people at these sites or not.

### References:

- Andrady, A. L. (2011). Microplastics in the marine environment. *Marine Pollution Bulletin*, 62(8), 1596-1605. doi:10.1016/j.marpolbul.2011.05.030
- Hale, R. C., Seeley, M. E., Guardia, M. J., Mai, L., & Zeng, E. Y. (2020). A Global Perspective on Microplastics. *Journal of Geophysical Research: Oceans*, 125(1). doi:10.1029/2018jc014719