

Biodiversity of Aquatic Macroinvertebrates in a Freshwater Location at Shu Swamp, Mill Neck Versus in a Freshwater Source near Oyster Bay Harbor in Cove Neck



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Abstract

Aquatic macroinvertebrates are significant organisms to the environment. Our goal was to understand the difference in biodiversity of these organisms in two different freshwater sources. To do this, we collected organisms and identified them to compare the biodiversity in these locations. We also questioned how water quality affects biodiversity. There was a difference in biodiversity between these locations but the difference in water quality was not drastic. We still question what caused this difference in biodiversity, as we are unsure if the water quality was the main indicator of this relationship.

Introduction

We plan on studying and analyzing the biodiversity of aquatic macroinvertebrates living in the Cove Neck location compared to the aquatic macroinvertebrates found at Shu Swamp. Due to the different ecosystems they may have different pH, nitrate and alkalinity levels. We assume the extent of biodiversity and species will differ in these two environments. We predict we will find higher levels of nitrate and a more alkaline pH at the Cove Neck location because of its proximity to human activity, and as a result we expect to see less biodiversity at this location the Cove Neck location.

Methods and Materials

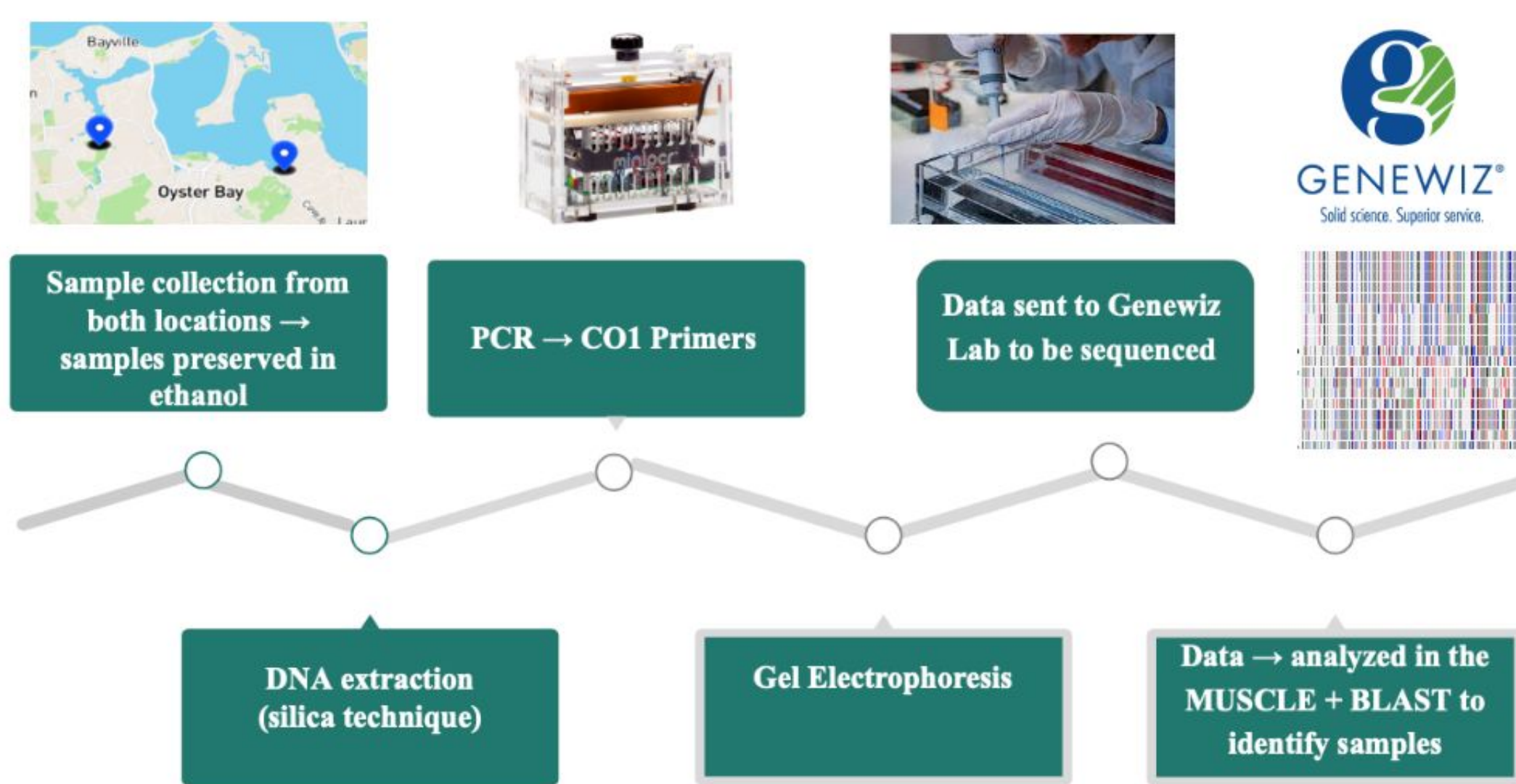


Figure 1 - Infographic of Laboratory Procedure for DNA Extraction and Sequencing

Results

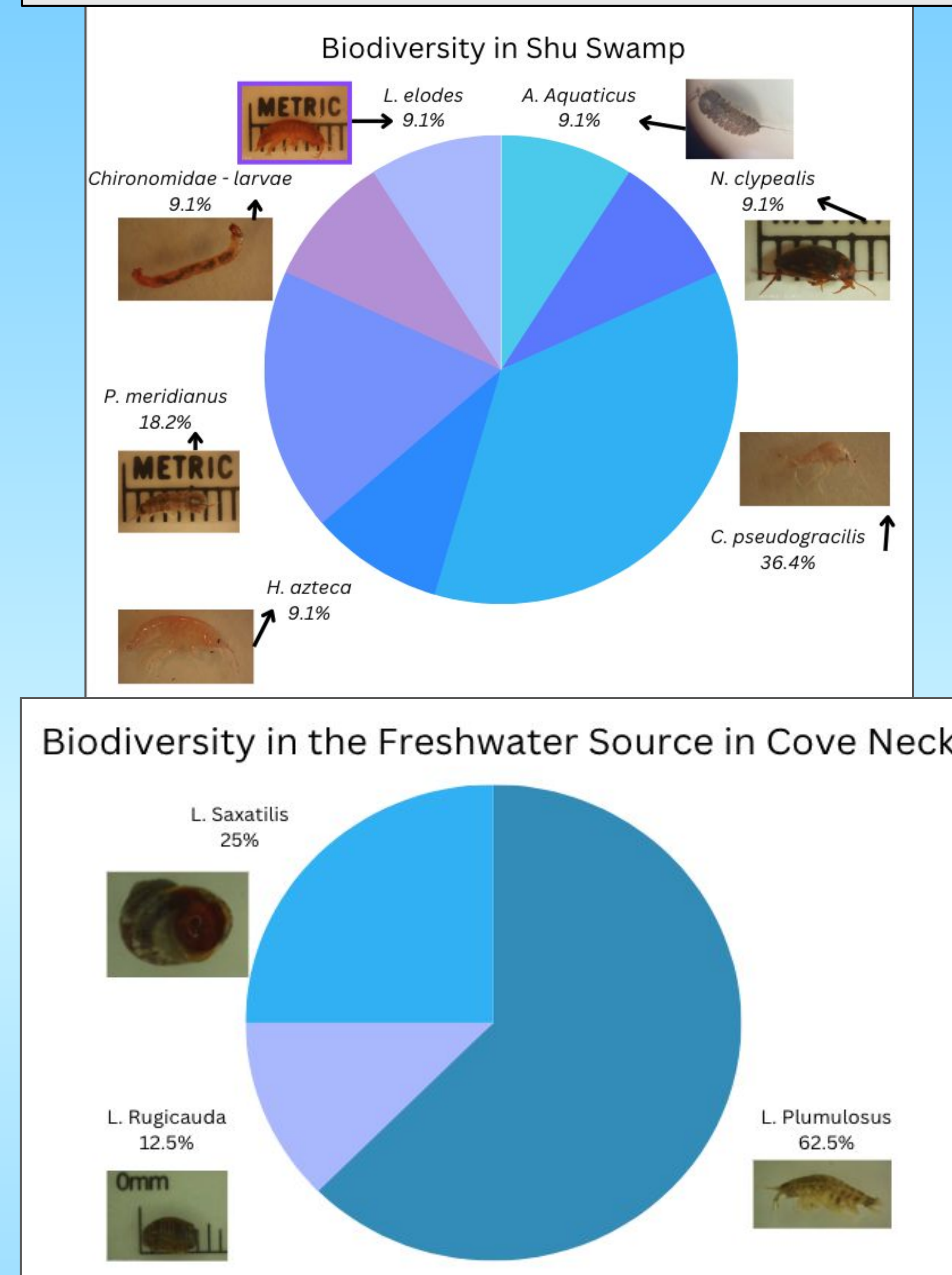


Figure 2 - Pie Charts of Biodiversity at Two Sites - Site 1 above (Shu Swamp), Site 2 below (Freshwater location in Cove neck)

Water Quality Results

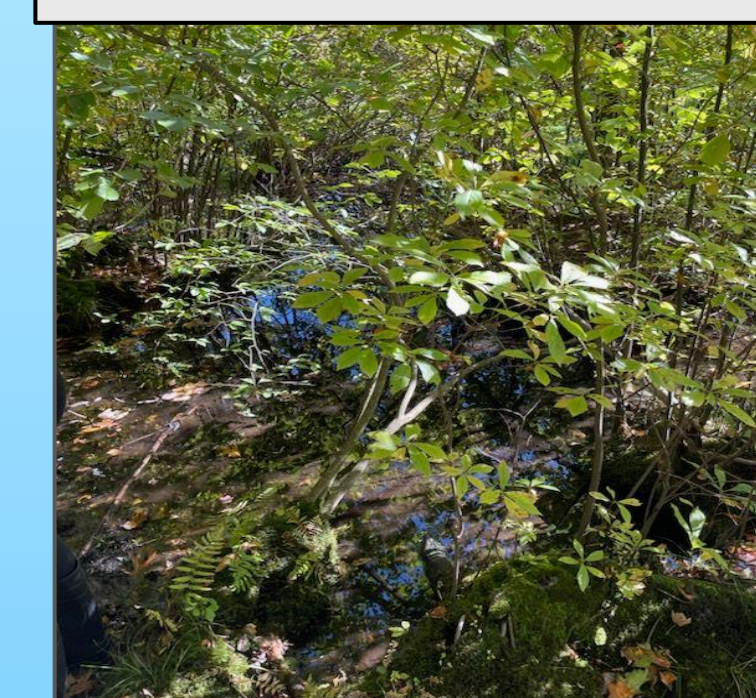
Location:	Date + Time of Collection:	pH:	Temperature in °F:	Alkalinity:	Nitrate
Shu Swamp	October 22th, 2022 10 AM	7	68°F	120 ppm	0
Cove Neck Location	October 21, 2022 4:30 AM	7.8	57°F	180 ppm	0

Figure 3 - Water Quality Test Results - used test strips and hydrometer for results

Discussion

- The biodiversity of macroinvertebrates at Shu Swamp is greater than the biodiversity at the Cove Neck location.
- At Shu Swamp we were able to find seven different species. At the Cove Neck location we were only able to find three; however, the limited amount of samples that could be collected could have affected these results.
- The Cove Neck location is next to a road where cars continuously drive by ultimately releasing CO₂
- Shu Swamp pond is more isolated from human activity. The surrounding vegetation at this location could allow a decrease in CO₂, allowing a more neutralized pH at the Shu Swamp pond
- This 60ppm difference in alkalinity is not vast, but it could be a possible indicator for the difference in species that were found in the two locations. One of the main sources that could increase alkalinity is the presence of calcium carbonate.
- The Shu Swamp pond had a temperature of 68°F in contrast to the 57°F temperature at the Cove Neck location. There was a 10 day gap between the two collections. With these different conditions the cooler temperature at Cove Neck could have prevented certain organisms from surviving the weather conditions.
- CJB-002, a sample collected at Shu Swamp, was identified as N. Clypealis. According to The Macroinvertebrates Field guide by Data Classroom, this organism is intolerant to pollution and requires a clean environment to live in. In contrast, sample CJB-007 found at Shu Swamp, the Chironomidae larvae, is tolerant to pollution. This speaks to the healthier water quality at Shu Swamp

Shu Swamp



Cove Neck

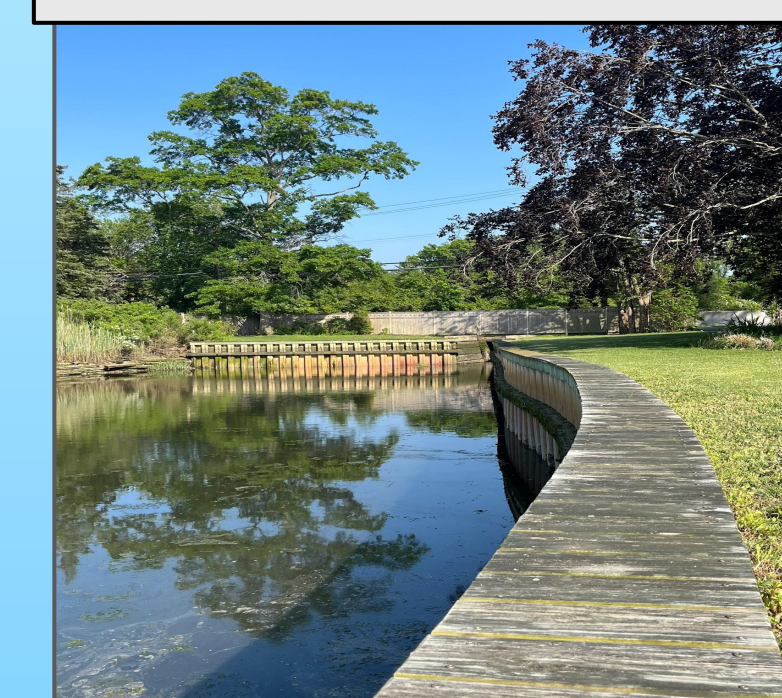


Figure 4 - Photos of our Locations of Sampling

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Lab Report & References

