

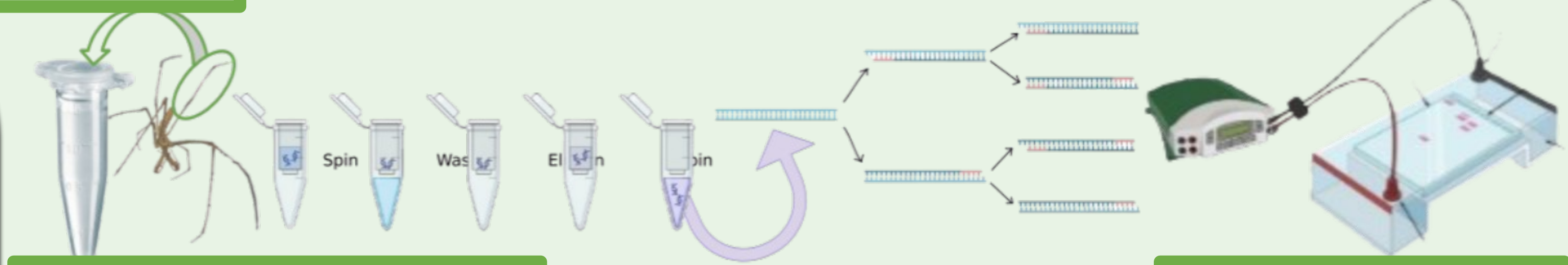
# A Temporal Investigation into Aquatic Macroinvertebrate Biodiversity in the Massapequa Preserve using Innovative DNA Barcode Technology

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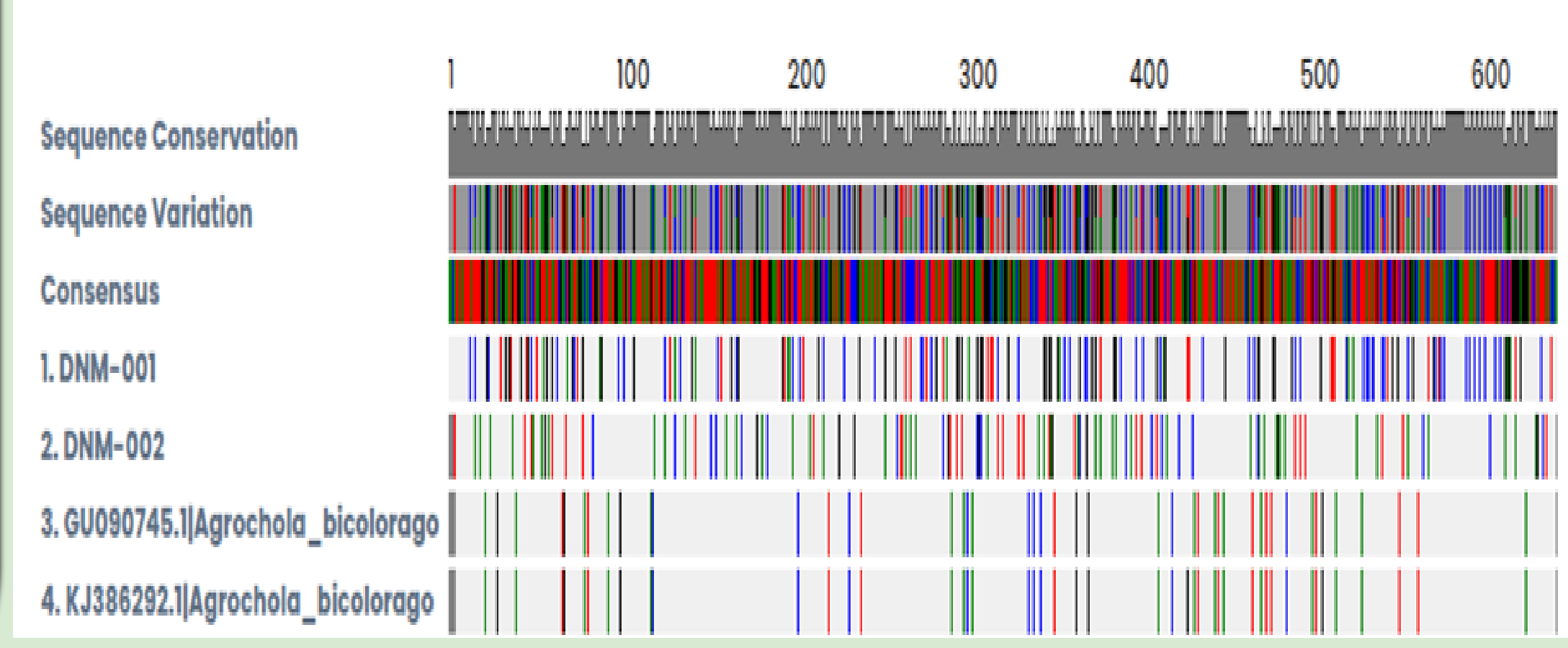
## Abstract

The Massapequa preserve is a commonly used greenspace, filled with biodiversity. Biodiversity is the variety of life in a particular habitat or ecosystem. Biodiversity is important because it creates a more resilient ecosystem. This project explores how humans influence biodiversity. Aquatic invertebrates were collected from the Preserve and DNA barcoding was used to determine the biodiversity of the area. To do this, nine different organisms were collected by entering the preserve in waist high waders and using a net to catch any possible macro-invertebrates and then putting them into test tubes filled with ethyl alcohol. In this experiment, we attempted taxonomic identification of specimens. Our samples were then brought to Cold Spring Harbor Lab to be DNA barcoded. After this process, DNA barcodes were used to determine the species and level of biodiversity of the collected aquatic invertebrates. Overall, there were approximately eight organisms collected and dna barcoded. It was observed that all the organism expressed the CO1 gene.

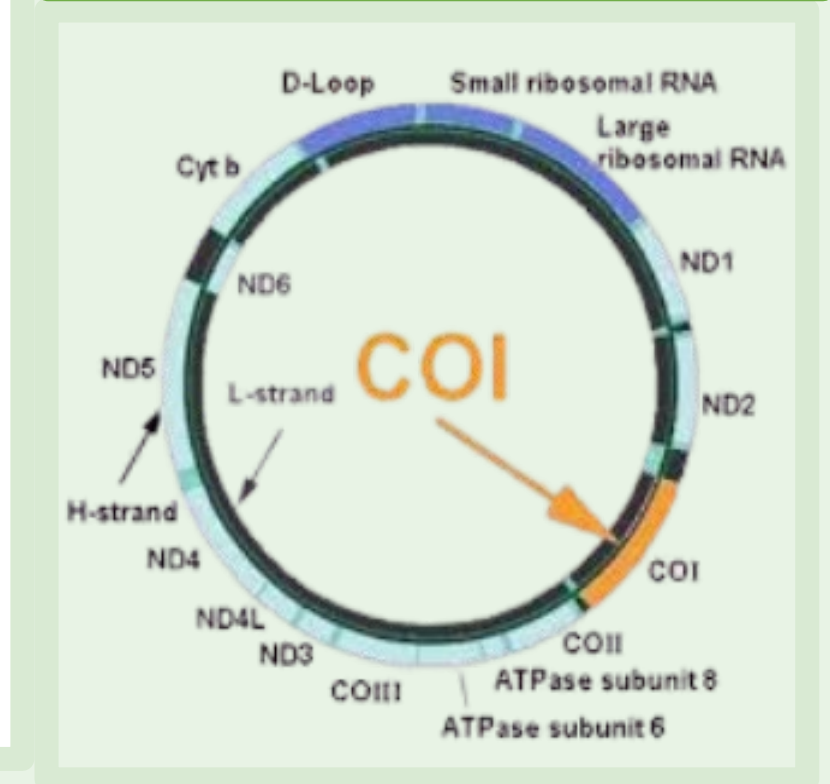
## Methods



### Muscle Alignment



### Mitochondrial DNA

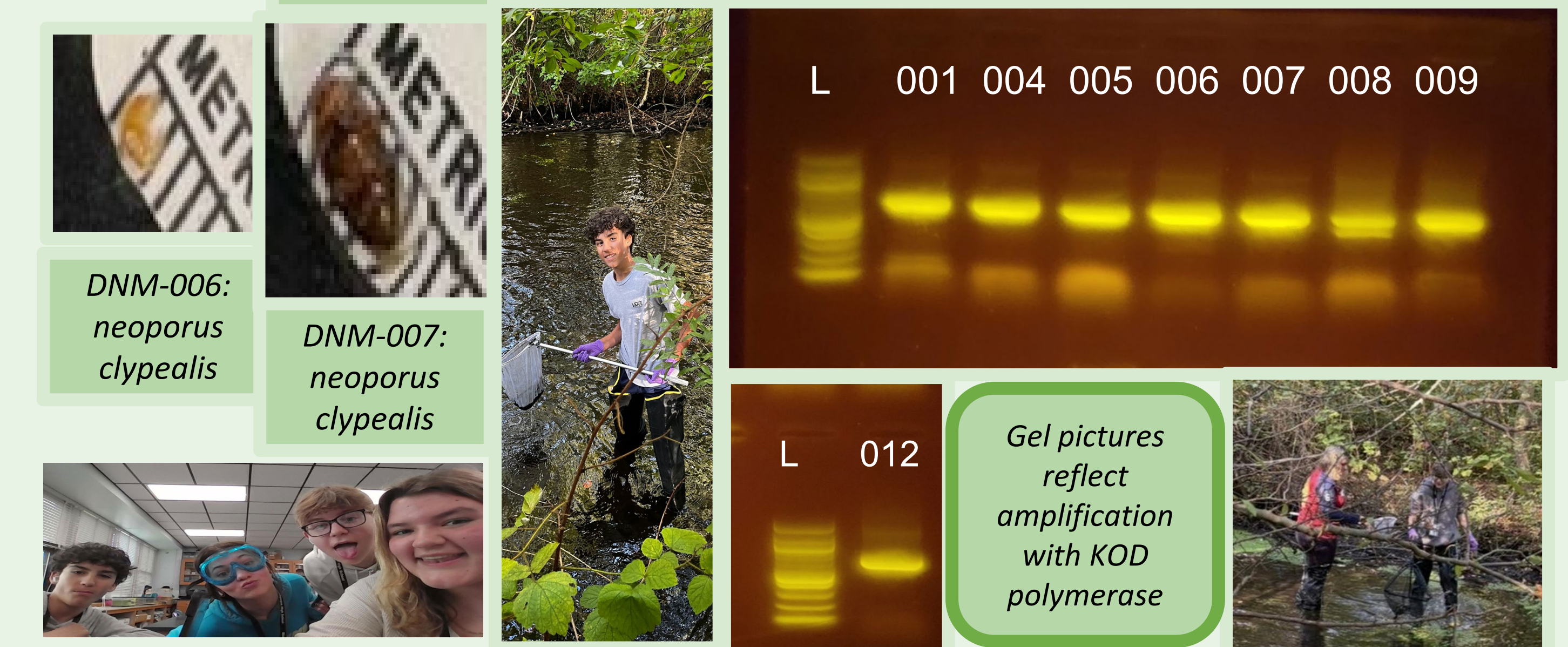
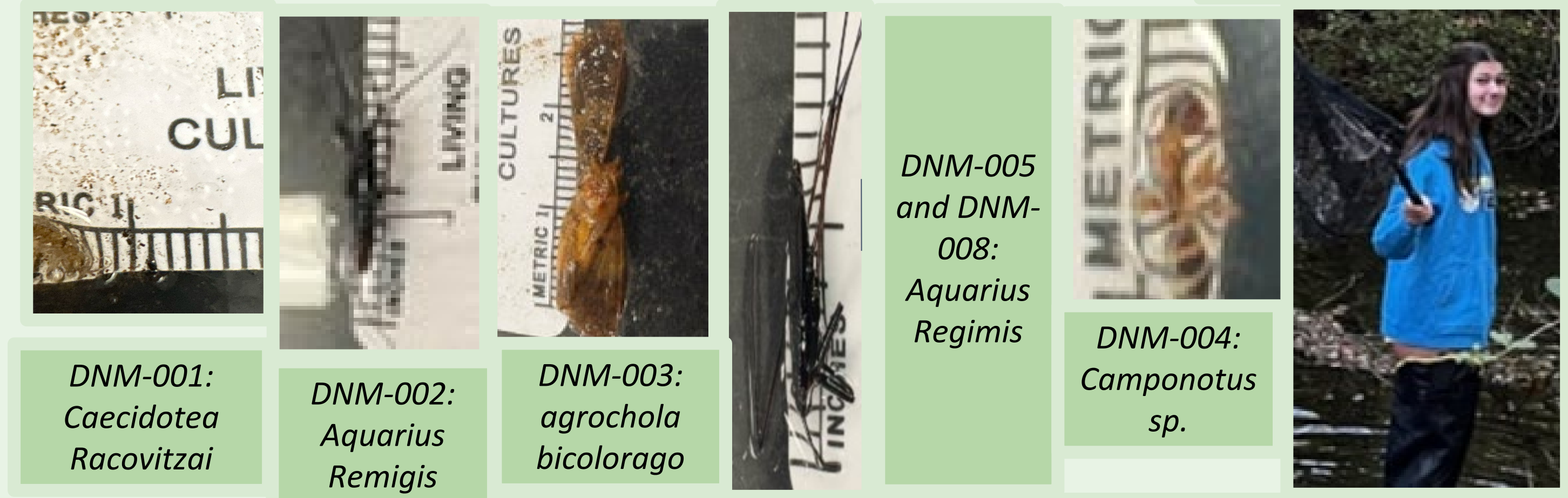


## Conclusion

In this project, many organisms were found. In total, nine organisms were collected, representing approximately seven different species. The majority of the organisms were found in an aquatic setting, meaning they thrived in water-filled environments. Across the preserve, sample evidence of biodiversity was observed, as different species, organisms, and subspecies were all located in the same geographic area. The majority of the collected specimens fit into the "beetle" category and exhibited similar physical characteristics across the board. Even though many organisms were present, several limitations impacted the ability to catch them. One limitation was the broad net; due to the wide circumference of the net, captured organisms easily escaped. Another limitation was the open space, as the preserve river contained miles of open water. This created a limitation because aquatic organisms tended to rest on physical objects, of which very few were present. The final limitation involved the size of the organisms; because most specimens were tiny, it was very difficult to detect them with the naked human eye.

## Introduction

Urbanization is affecting aquatic invertebrate biodiversity on Long Island, New York. (Eisenhauer, 2021). Due to pollution and development, biodiversity has been decreasing, causing a lack of resources and a decline in ecosystem stability. Having biodiversity in a given area is beneficial for the environment because it provides sources of food, energy, atmospheric oxygen, buffers against new diseases, pests, predators, and protects against food shortages and global climate change (Heflic, 2025). A decrease in biodiversity can lead to a decreased lifestyle, a limited supply of medicines, scarce career opportunities, etc. (Heflic, 2025). Communities of aquatic animals have decreased due to the increase of dense populations and improvement of cities and engineering (Eisenhauer 2021). People depend on biodiversity and the results it produces. The point of this project is to determine how humans influence the biodiversity in the Massapequa Preserve (40.6915° N, 73.456° W) with DNA barcoding technology. DNA barcoding is a scientific method for identifying various species which is important because it provides a new method to find the species of damaged or small samples.



## Sample Identifications

Sample Code	Organism Name
DNM-001	<i>Caecidotea racovitzai</i>
DNM-002	<i>Aquarius remigis</i>
DNM-003	<i>Agrochola bicolorago</i>
DNM-004	<i>Camponotus sp.</i>
DNM-005	<i>Aquarius remigis</i>
DNM-006	<i>Neoporus clypealis</i>
DNM-007	<i>Neoporus clypealis</i>
DNM-008	<i>Agaurius regimis</i>

In the results, it was observed that there was not great biodiversity in the massapequa preserve due to there only being 5 genera out of 8 organisms found.

## References & Acknowledgments

