

# The Effect Of Water Type On The Biodiversity In The Marine Ecosystems Of Fire Island

## Method:

With the National Park Service's permission we were able to collect samples from the various water areas such as the salt marsh, freshwater bog, and ocean in the Sunken Forest of Fire Island. We documented the specimens by taking photos and writing down the locations in which they were found. The specimens were identified based upon their physical characteristics and through help from the Fire Island guide. For the specimens that were unidentifiable, we used DNA barcoding to help classify them.

We placed pieces of our samples into test tubes and added lysis solution to grind up the samples. The test tube was incubated for ten minutes at 65 degrees Celsius and placed in a centrifuge for one minute. The supernatant was transferred to a fresh test tube, added silica resin and mixed. To follow, we incubated the test tubes for five minutes at 57 degrees Celsius and then placed them in a centrifuge for 30 seconds. After this we removed the supernatant, added wash buffer and vortexed. This process was repeated to remove all silica. Distilled H<sub>2</sub>O was added and mixed by pipetting in and out. To finish the isolation of the DNA, we incubated again for five minutes at 57 degrees Celsius, placed in a centrifuge for 30 seconds, transferred the supernatant to fresh tube. Next we amplified the DNA by PCR. To do this we added primer mix of rbc1 to a fresh test tube, added DNA, amplified in a thermal cycler.

We analyzed the PCR products by gel electrophoresis. Only samples that showed banding on the gel were sent for sequencing to a laboratory.

## Problem/Question:

How does water type effect the plant species growing in a body of water?

## Hypothesis:

If we can classify the specimens we have collected from Fire Island's water spots such as the salt marsh, freshwater bog, and ocean then we will be able to see the diversity amongst them, based on water type.

## Abstract:

Our goal was to compare the biodiversity of the salt water ecosystems and the freshwater ecosystem on Fire Island. We wanted to barcode to determine the species of the plants. We collected specimen on Fire Island from many of these aquatic ecosystems. Then we grinded out samples in lysis solution. We incubated the samples and centrifuged them. We then transferred the supernatant and incubated and centrifuged again. Silica resin was added and the tube was centrifuged. We removed the silica and analyzed it through PCR. To finally analyze our data, we used DNA subway and found the species. We did not get any results because we did not get enough data. This experiment would have shown the diversity amongst the water locations on Fire Island and see what types of plant species grew in each.

## Cited Works:

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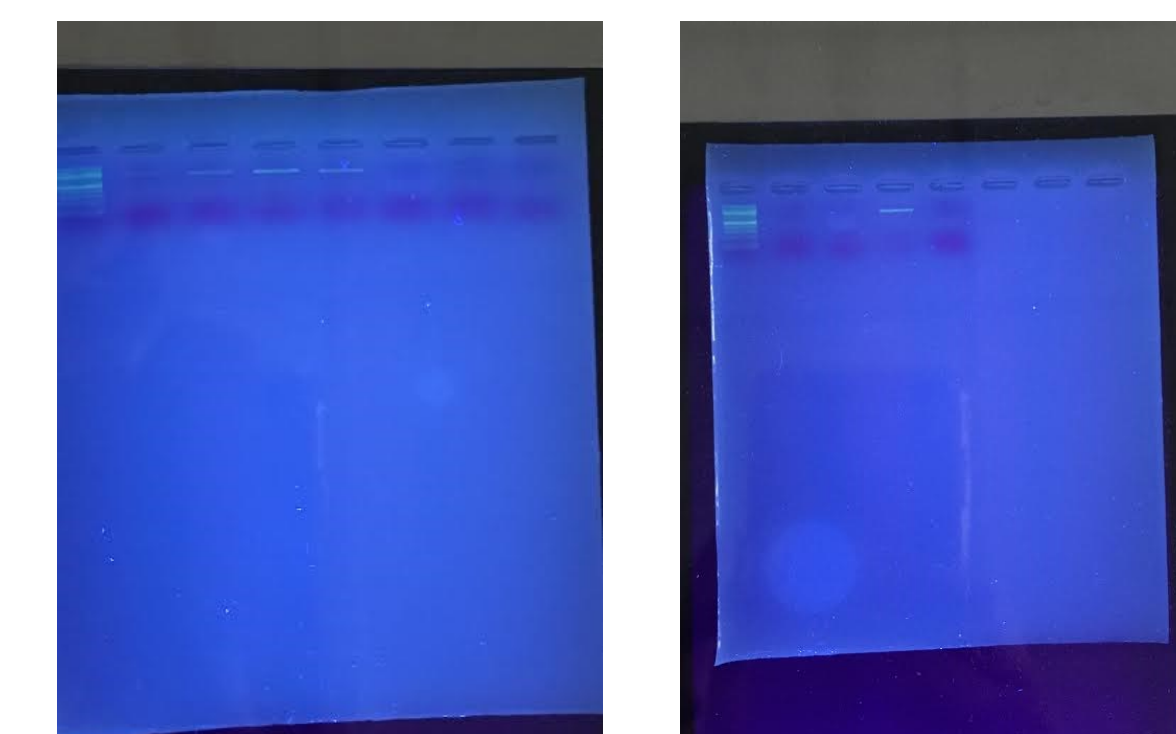
## Results:

The results of this experiment were very unique considering how most of the results did not contain DNA. There are many reasons such as the possibility of errors in DNA extraction. Some of the samples were successful although the majority of them were not.

There were not enough results to support our hypothesis. Different types of plants grow in the different bodies of water because some plants can not survive if they are developing in a body of water with high salt content. There were not enough specimen from each water location to see the diversity between the water spots.

Our research could be continued by finding more specimen in the bodies of water and finding the diversity between them and successfully barcoding and classifying them.

Sample Number	Environment Sample Was Found	GPS Location	Species
NXZ-001	Freshwater Bog	40.65596, -73.11018	Phragmites
NXZ-002	Saltwater Bog	40.65557, -73.11453	Phragmites
NXZ-004	Saltwater Marsh	40.65591, -73.11407	Unidentified
NXZ-006	Fire Island Ocean	40.65534, -73.10332	Unidentified
NXZ-010	Fire Island	40.65553, -73.11242	Unidentified



Sample	Species	Location
NXZ-001 (Freshwater Bogue)	<u>Phragmites australis, Phragmites japonicus</u>	40.65596, -73.11018
NXZ-002 (Salt Water Bogue)	<u>Phragmites australis, Phragmites japonicus</u>	40.65557 -73.11453
NXZ-007 (Salt Water Ocean)	<u>Olav rigida, Ulva scandinavica</u>	40.65534 -73.1033
NXZ-010 (Fresh Water)	<u>Smilax china</u> <u>Smilax rotundifolia</u> <u>Smilax sieboldii</u>	40.65553 -73.11242

