

A Study of Lichen Biodiversity

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Goals

The goal of the project was to examine the diversity of the species of lichen in three locations on Long Island: Long Beach, Lido Beach, and Point Lookout. Samples of lichen were collected off of trees from all three locations, and the DNA was sequenced.

Introduction

This project attempts to find the diversity of lichens (a symbiosis between a fungus and a photosynthetic organism) between Point Lookout, Long Beach, and Lido Beach. By doing this we will be able to better understand pollution across these regions, and how it affects the lichen species, because lichen frequency is often an indicator of pollution.

Methods

- Lichens were collected from trees in Long Beach and Point Lookout using a scalpel
- Samples were placed into a plastic bag
- Samples were moistened for preservation.
- Samples were refrigerated before barcoding and analysis
- CO2 Measurements were collected from anywhere a sample was taken.

Results

In Long Beach we found an average CO2 measurement (taken from each location a lichen was collected) of 719 ppm, and in Point Lookout we found an average of 447 parts per million. Point Lookout had less air pollution than Long Beach.



A Tree Containing Lichen In LB



A Tree Containing Lichen In LB

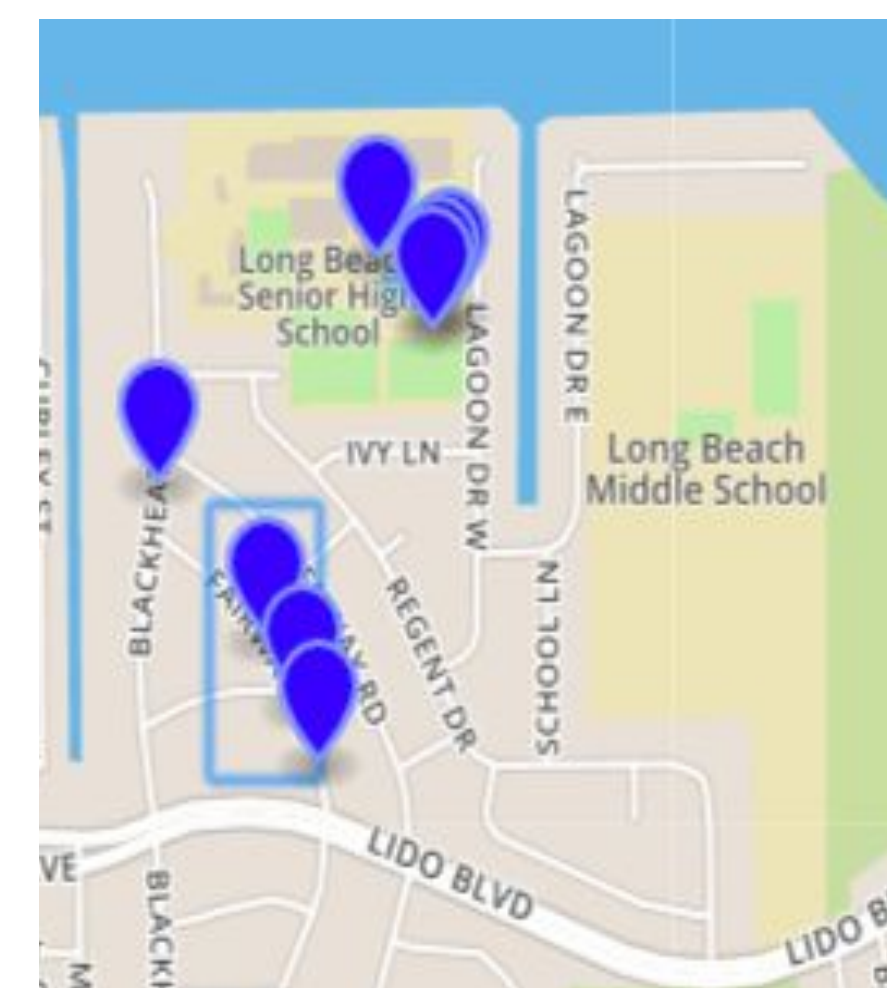


A Tree Containing Lichen in PL

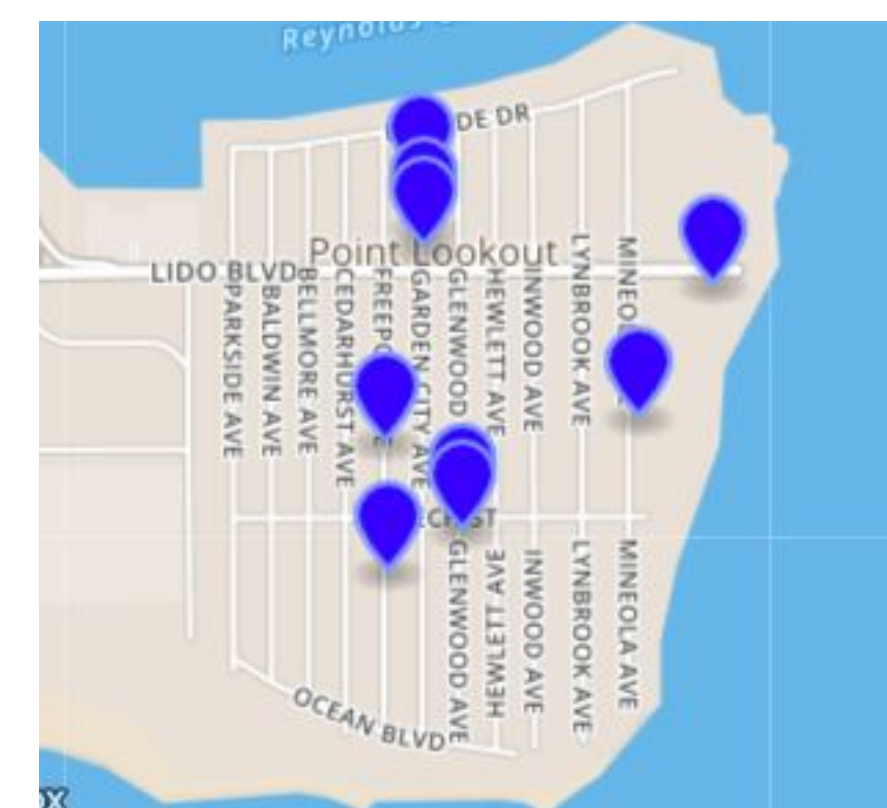


A Tree Containing Lichen in LB

**GATCATTACTGACGGGTCATCCTAAACCTAGGTTTANAGCCCG -
A Segment of DNA from Pleosporales fungi in lichen**



**Long Beach
719 ppm CO2**



**Point Lookout
447 ppm CO2**

Discussion

From the CO2 levels, it appears that Point Lookout has less air pollution than Long Beach by 272 ppm. Both Long Beach and Point Lookout have levels that would be considered average for an occupied space. One thing that should be taken into account is population density. Point Lookout has a population of 1,219, giving it a population density of 6,100/sq mi, as it measures 0.2 square miles. Long Beach has a population of 33,750, giving it a population density of 15,222.12/ sq mi, as it measures 3.89 square miles. Point Lookout's lower population density may be related to the lower rate of pollution. The lichen found in Long Beach and the lichens found in Point Lookout had no discernable visual differences, but lichen were more abundant in Point Lookout.