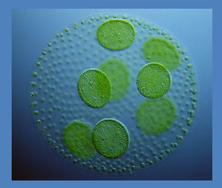

Algal Growth in the Lake Waco Wetlands

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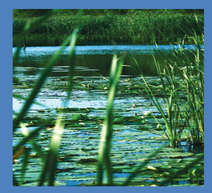


Abstract

The purpose of this project was to determine the growth of algae in different parts of the Lake Waco Wetlands. The intention for this research was to determine if algae can reproduce greater in a specific part of the Wetlands or not. The preliminary experiment was to compare the algal growth in mediums from the first cell and the fifth cell of the Wetlands. The method used to establish this was obtaining water from these different cells in the Wetlands and placing a fixed amount of algae into containers of water from these cells for a four week period to determine which cell has a better growth in algae. After a four week period, the data collected concluded that algae did grow significantly more in the containers from the first cell. This ideal location where algae can grow the most successfully is the first cell of Lake Waco Wetlands.

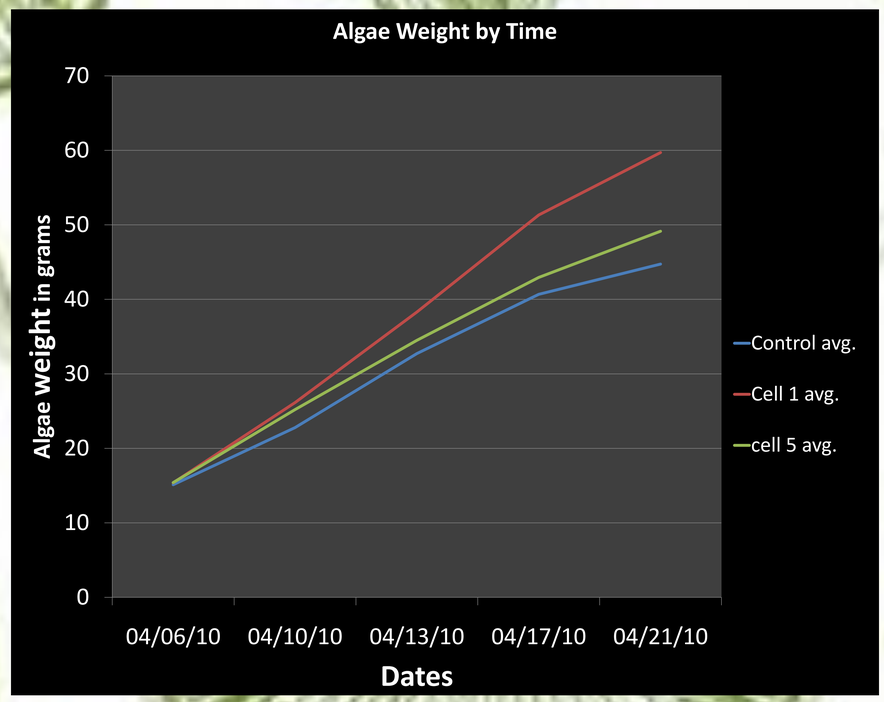
Introduction

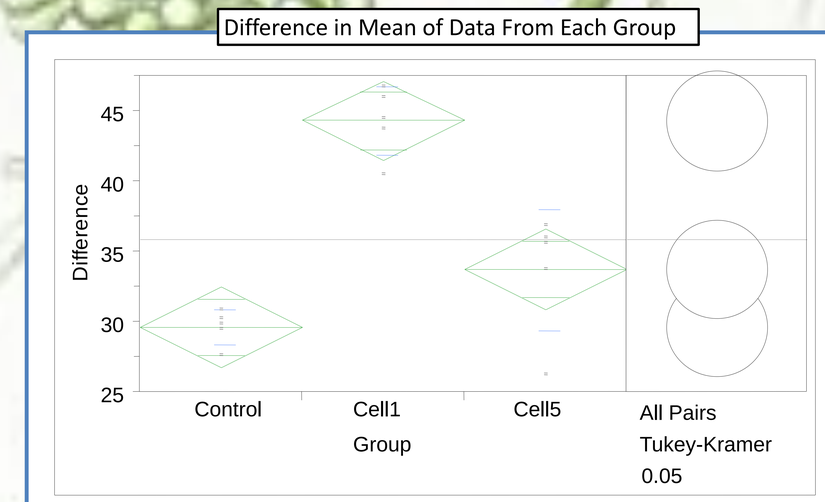
The objective of the experiment was to observe the growth of algae in different locations of the Lake Waco Wetlands. The Lake Waco Wetlands is composed of several major bodies of water called cells (Fig. 1). These cells are home to numerous aquatic habitats for algae and plants to thrive in. One essential value of the Wetlands is its ability of water filtration. As water flows through the Wetlands, the nutrients and pollutants dissolved in it become absorbed by plant roots and microorganisms deposited throughout the cell bodies. In result, the filtration process removes much of the nutrients (Nitrogen and Phosphorus) in the water as it runs through the cells and leaves the Wetlands. This experiment examined the growth of algae in two different cells of the Lake Waco Wetlands. The hypothesis was algae would grow more abundantly in a nutrient rich cell compared to a nutrient poor cell. By observing this algal growth, the experiment will determine the optimal environment in which algae can live in the Wetlands.

Materials and Methods

Water enters the Wetlands through a major pump that delivers water directly from Lake Waco into the first cell of the Wetlands site. The cells are all connected from one to another. As the water comes into the first cell, it flows all the way down and ends into the fifth cell. This experiment sampled water from cell 1 and cell 5; cell 1 being nutrient rich and cell 5 being nutrient poor. For the experiment fifteen samples of algae were obtained, each weighing approximately 15 grams (Fig. 2). Each sample of algae was placed into a tub containing 30 L of the sampled water. The fifteen tubs were divided into three categories: Five trials for Cell 1, Cell 5, and for Control (Tap Water) (Fig. 3). Each sample was grown for a period of four weeks to obtain results determining which cell would be the optimal environment for algal growth. Every three days, data was collected by weighing the algal samples. This was done by emptying the water tubs into a bucket while meshing the algae through a net (Fig. 4). The algae was then placed onto a measuring plate on a rough weight balance. The sample water was recycled back into the tubs with the algae as well as fresh sample water in addition to maintain a stable water volume.

Results and Statistics





The graph to the left shows that cell 1 had a higher average weight of algal growth than cell 5 or control. The graph above shows a Tukey-Kramer statistical method of determining the difference in the means of the trials from Cell 1, Cell 5, and the Control.

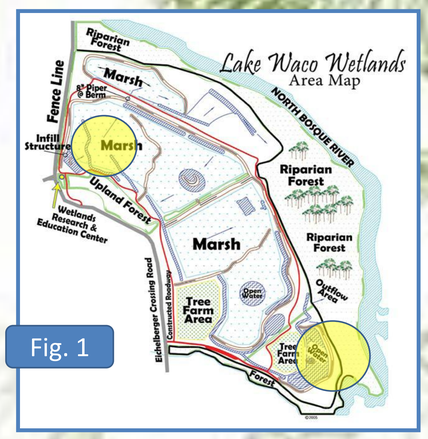


Fig. 1

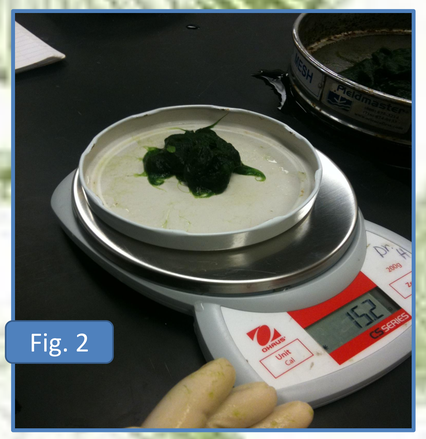


Fig. 2

Fig. 3

Fig. 4

Conclusions and Discussions

It was observed that the algae in cell 1 had a higher average growth than both cell 5 and the control samples. The data collected proves a preliminary conclusion that cell 1, which had a higher nutrient concentration than cell 5, is the more favorable environment than cell 5 for the growth of algae. This supports the hypothesis that was proposed as well as agrees with the literary sources used that the first cell had the highest concentration of nutrients, and therefore had the highest weight in algal growth. The ideal location of cell 1 indicates a better environment than the other cells in the Wetlands for algal growth.

Acknowledgments

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