



WHAT IS IN THE WATER? WATER QUALITY IN PROSPECT PARK

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HYPOTHESIS

If pH is an important determining factor in water quality, then we will observe fewer macroinvertebrates in acidic and basic water sites.

INTRODUCTION

During the Fall of 2007 from November to December and in the Spring of April to May, we study the water quality of the sites at Prospect Park. To find the levels of the chemicals at Prospect Park we would take samples of water from sites and we would test the levels of pH, dissolved oxygen, chlorine, nitrogen and phosphate. Testing the water quality of the park sites lets us know the health of the water in the park.

Alone more than half of the world's living organisms live in the earth's water. The human body alone requires approximately 2 liters of water daily, if the body fails to obtain the amount of water required the body would perish in just mere days. But it is not the body that requires daily amounts of water to survive for example organisms that are vegetables and fruits like tomatoes, spinach, apples and potatoes also have a dependency on water. The lack of water causes fatigue in the body.

With the results that were collected through the duration of the experiment we were close to determining what kind of organisms live in the water. Also, since the experiment was conducted in two different times of the year it helps us determine waters were more inhabitable and healthier, as well as determining the chemical diversity during the two different seasons.

MATERIALS & METHODS

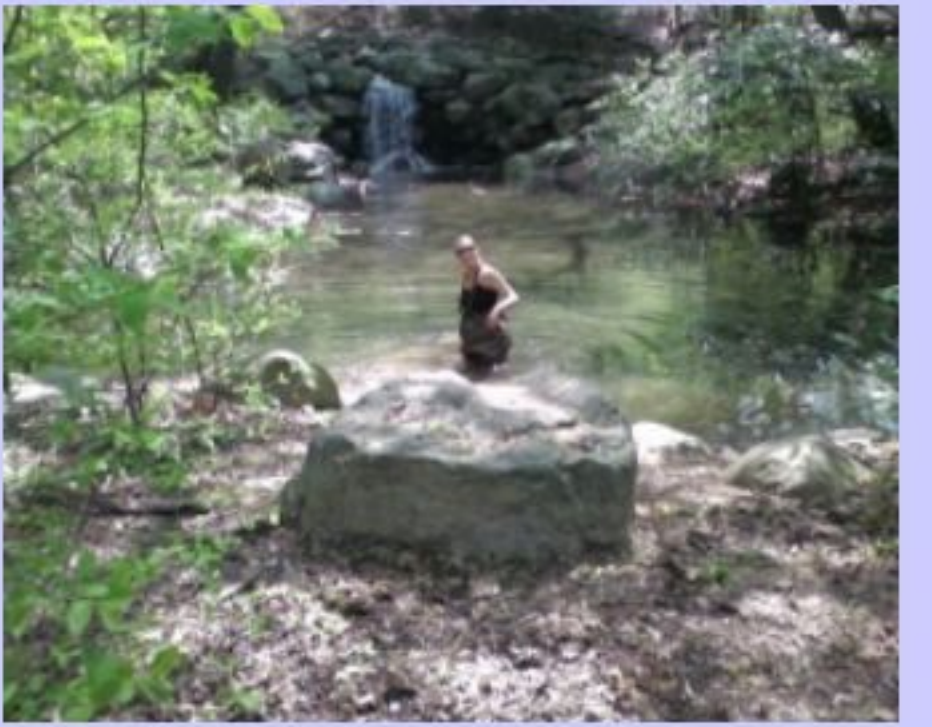
Water Properties Testing (Fall, Spring)

- Test tubes and caps
- Testing tablets
- Water from Prospect Park sites
- Indicator charts



Each week at Prospect Park our group collected water samples from the park. These sites included Fallkill Falls, Dog Beach, Binnen Water, and Lily Pond. Before testing the water we made initial observations, such as the water description, the cloud coverage and water and air temperature. After collecting water we conducted various experiments of the water such as the chlorine, phosphate, dissolved oxygen, nitrate and pH levels. By following the instructions with the LaMonte water chemistry kit we were able to get accurate results.

All students separated into small groups, then each group tested one of the five water properties. First water test tubes were filled with 5ml of water collected from Prospect Park. Next was added a tablet that came equip with the testing kit was added to the water then securely fastened with its top then vigorously shaken until the tablet was dissolved. The next step was to wait a few minutes for the tablet to take effect on the water getting accurate results. Then we used the provided color chart to compare the color of the water to the color on the chart to see how much of that chemical was in the water. The numbers were recorded in ppm (parts per million).



Biotic Index (Spring)

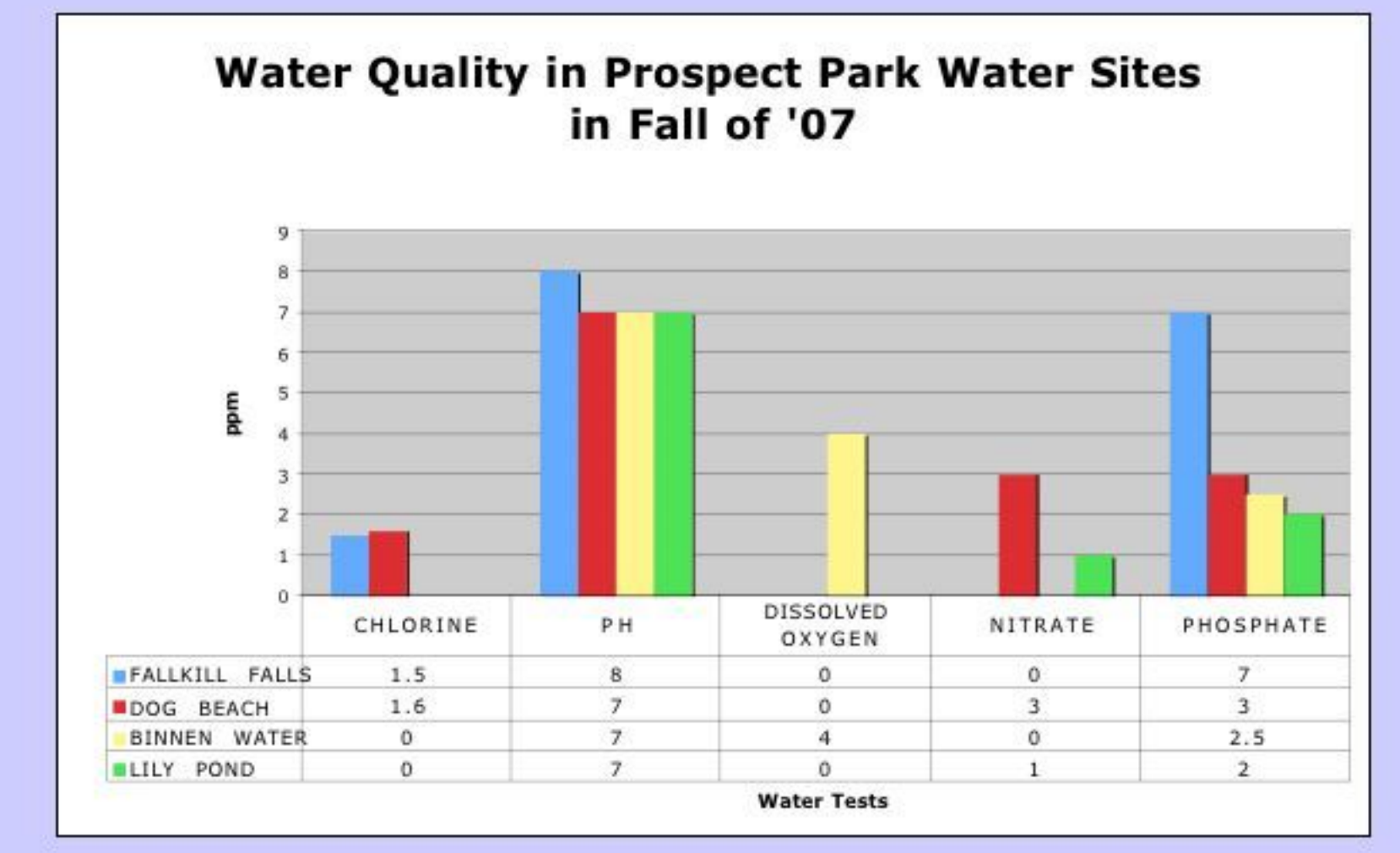
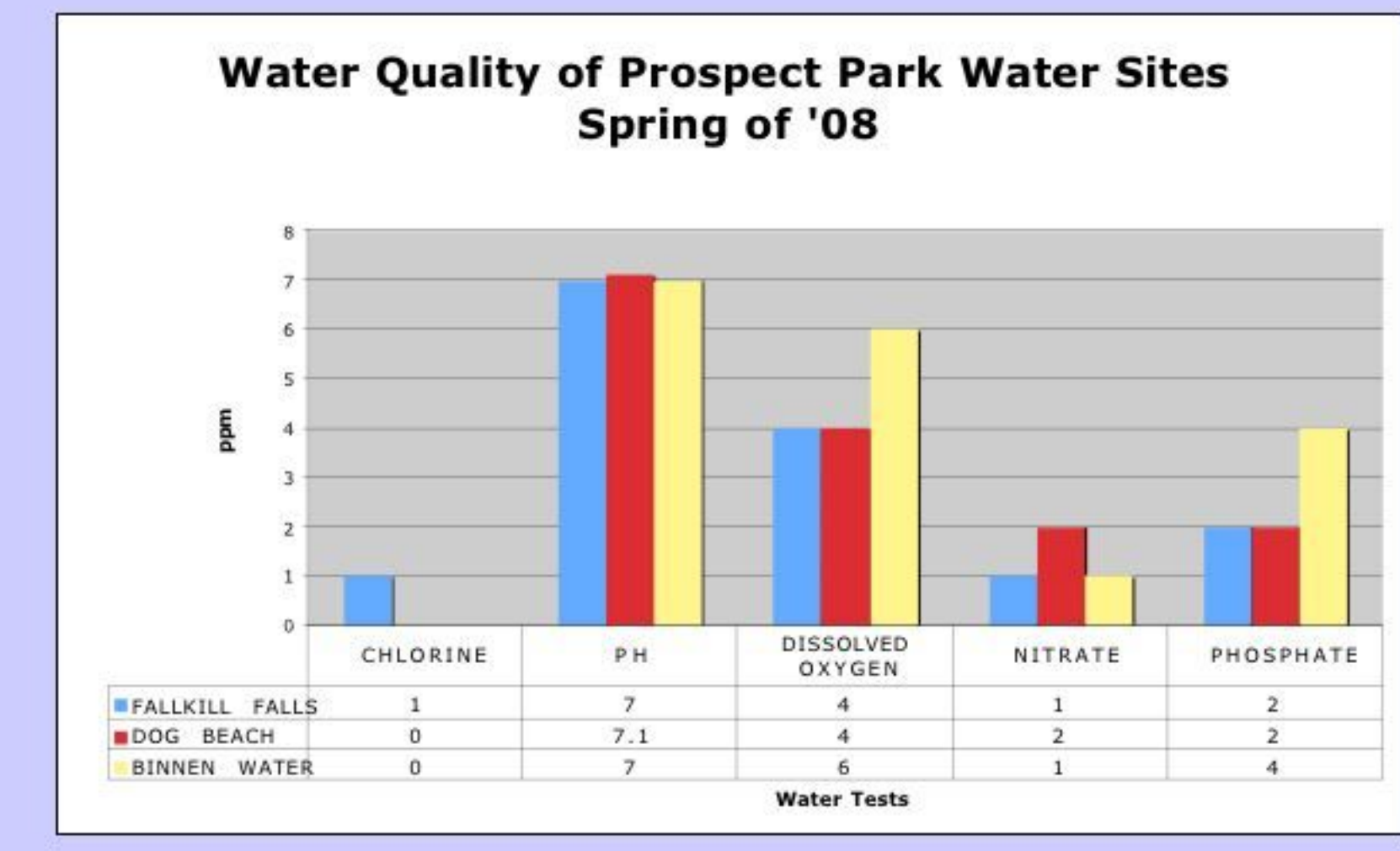
- Petri dish
- Tweezers
- Leaf bags
- Wadding boots
- Trays for leaf samples
- Macroinvertebrate identification sheets

Leaf packs were placed in the water system earlier in the year. Each week Ms. Winn retrieved one of the leaf bags. After removing leaf packs, we used the tweezers to lift the leaves and observe macroinvertebrates. If found, they were collected in a Petri dish and recorded. We searched, collected, classified and counted macroinvertebrates.

Chlorine, Phosphate, pH, Dissolved Oxygen and Nitrate Levels

Results:

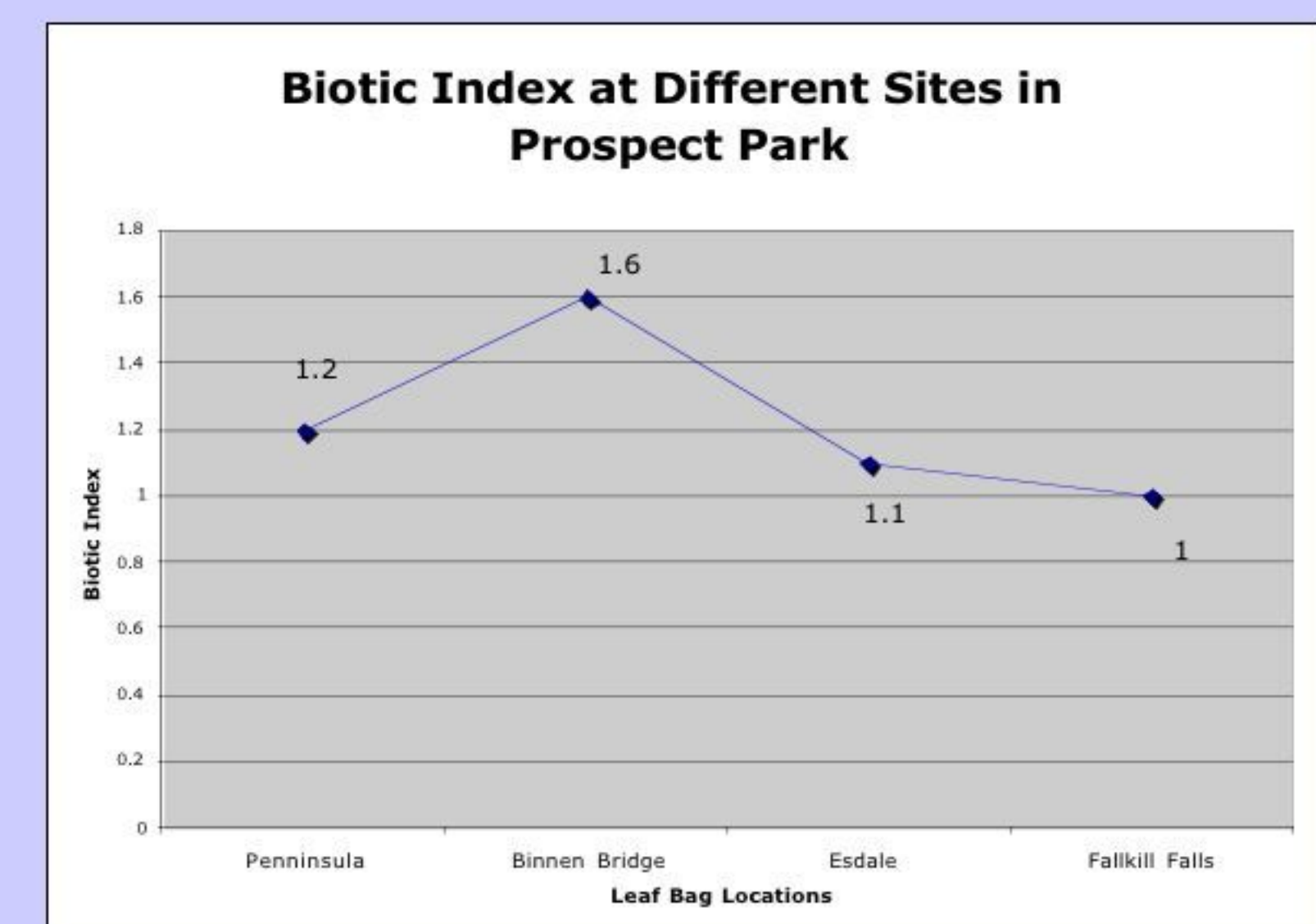
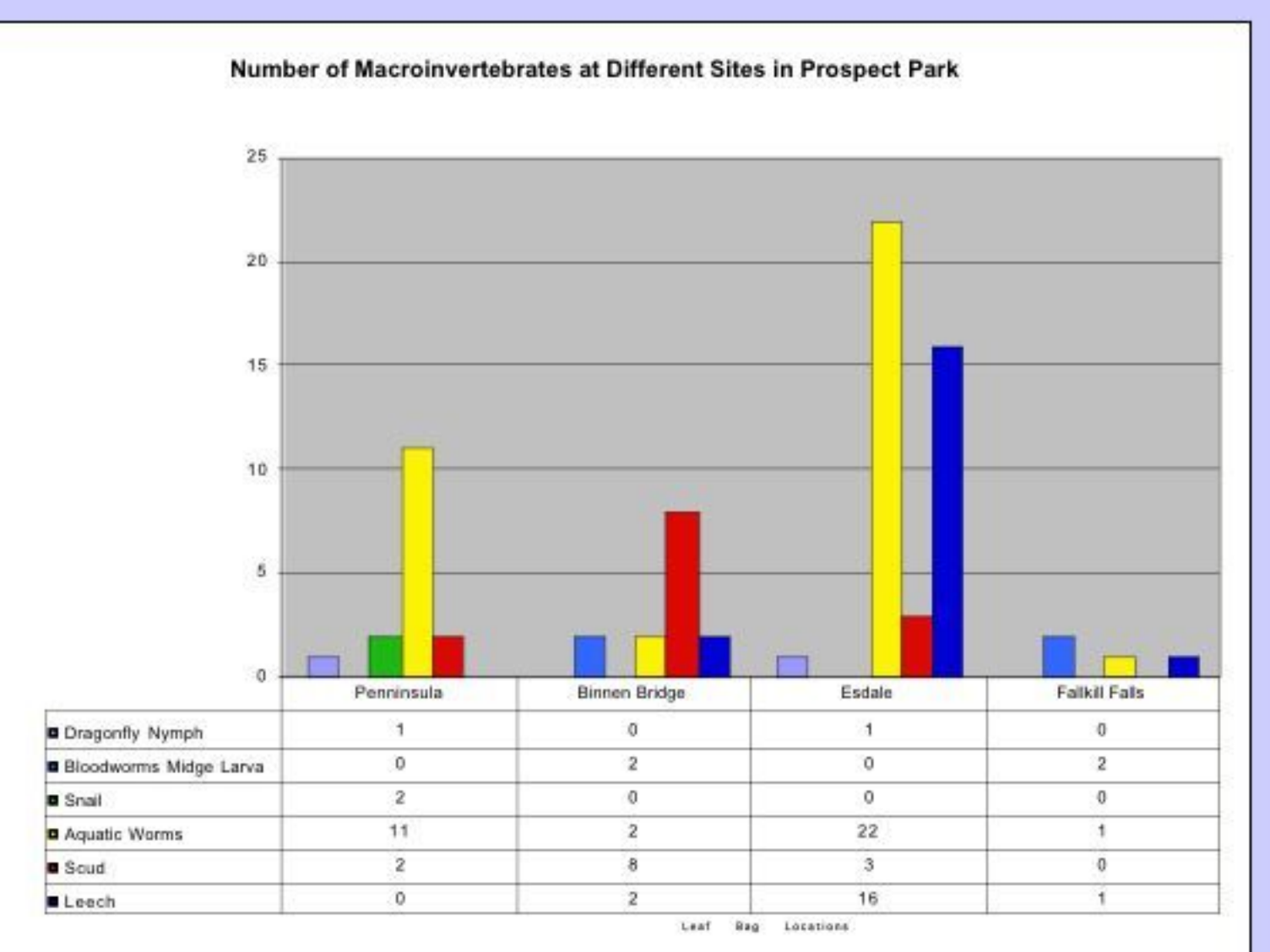
- In the fall and the spring the highest pH level was recorded at the source of the water system, Fallkill Falls.
- The chlorine levels are highest at test sites that are close to the source of the water system and lowest at sites far away
- The only positive dissolved oxygen values are at Binnen Water
- Phosphate values fluctuate the most at the different sites.



Macroinvertebrates

Results:

- The most macroinvertebrates were found at Esdale Bridge
- The biotic index is higher for sites further away from the source and lowest at the source, Fallkill Falls
- The water quality at Prospect Park is poor in terms of the biotic index at all sites we tested



DISCUSSION

What is healthy water? Most people consider healthy water to be the kind of water that's safe to drink, but actually that's not entirely true. Health water is filled with organisms and thriving with life. Water with no animals in it is obviously deadly. Organisms can only live in the water with the right amount of pH, dissolved oxygen and nitrate. These are determining factors. Good water should have a pH of about 6 or 7, a nitrate level of 1-3 and a dissolved oxygen level of 1 or 2.

In general, macroinvertebrates are very resistant and usually find ways to live in harsh conditions but some of them are pollution sensitive. If macroinvertebrates wont live there, it may make you think the water is unsafe. Sometimes healthy water is when something is living in it, so don't get mad at all the creepy crawly stuff you see in the water, they are just a sign that the water is healthy. During the experiment there were many possible errors that may have tampered with the results of the experiments. For example, we started testing water quality during the early spring and the eggs of the macroinvertebrates may not have hatched or may not have been laid yet. We were also restricted by time and some parts of the experiment was rushed so we did not have enough time to collect enough or all of the data. Also, we feel that the more experience we had with the test kits and the macroinvertebrate identification the less errors we made.



CONCLUSIONS

We tested the levels of nutrients in the Prospect park water sites such as Binnen Falls, Dog Beach, and Fallkill Falls. The water properties we tested were chlorine, pH, dissolved oxygen, nitrate and phosphate which can determine the life of macroinvertebrates in the water. The more types and total macroinvertebrates that may live in a body of water increases the biodiversity in the water.

We know that Prospect Park water system originates from tap water because the Prospect Park water system is man made. Since the water system is man made a lot of chlorine is at the source because it is added as a disinfectant. We feel it can damage macroinvertebrates. Therefore, the farther away the water travels from the primary source which is Fallkill Falls the chlorine in the water declines. Thus, slowly increasing the amount of macroinvertebrates in the water.

In this project our hypothesis was that pH is the most important characteristic of water quality. We did not have enough data at this time to accept or reject our hypothesis. We had a limited amount of time to do this project, but based on the data we don't enough evidence that our hypothesis to be true or false. pH is a measurement of how much hydrogen is in the water and determines whether the water is basic, acidic or neutral. A pH of 7 is neutral and a pH between 6-8 is appropriate for drinking. The highest pH value we recorded was 8 at Fallkill Falls. We had no extreme pH values so we were unable to really test our hypothesis.

After looking at various sites in Prospect Park we find that the water quality is poor. For each site the biotic index showed poor water quality and at some sites there were few macroinvertebrates. To prevent the decline of biodiversity in a body of water the use of chlorine should be minimized to the most possible extent. Thus, increasing the biotic index at Prospect

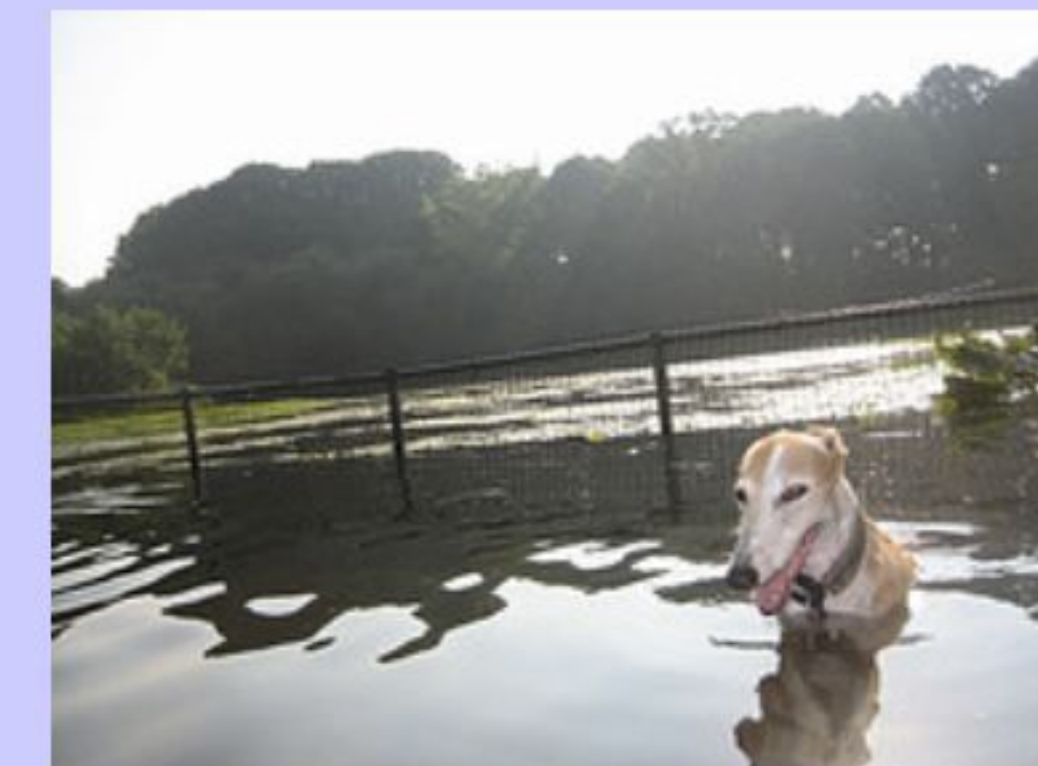
Prospect Park Test Sites



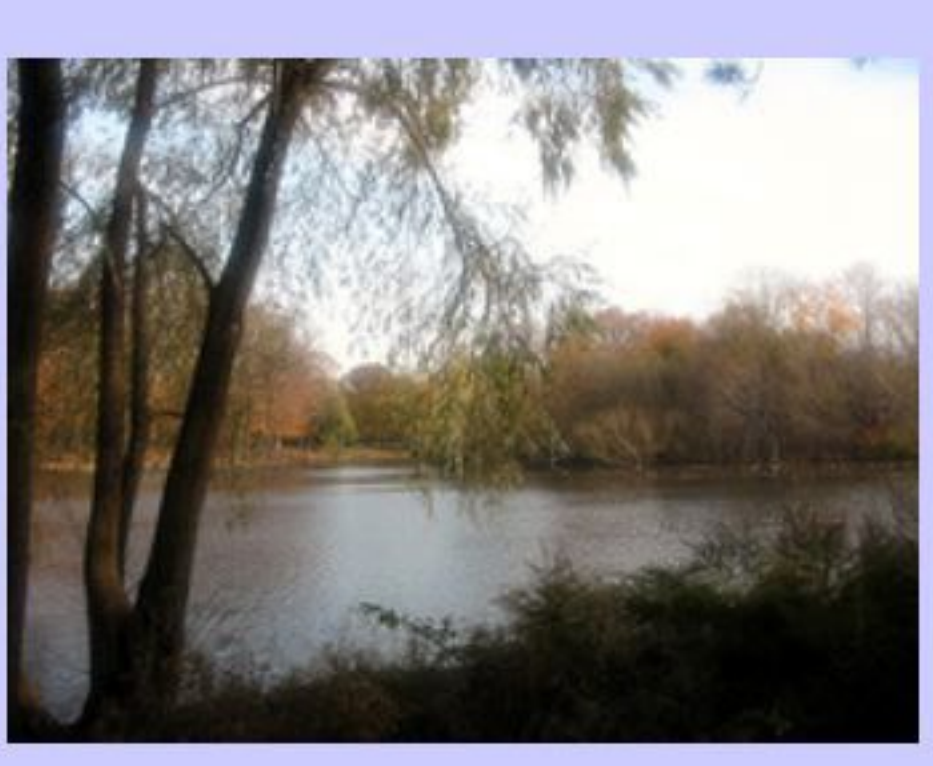
FALLKILL FALLS (SOURCE)



BINNEN BRIDGE



DOG BEACH



PENNINSULA



BINNEN WATER



BOAT HOUSE