

How does water quality at the Fairfield Osborn Preserve affect the biodiversity of macroinvertebrates?

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Background

- ❖ The first site is the Perennial Creek, meaning it runs year round, so we predict it has a high biodiversity. (Cardinale)
- ❖ The second site is the Ephemeral Creek, meaning it only runs during the wet season. As a result, we predict it has less biodiversity. (Cardinale)
- ❖ The third site is the Spring, and the water quality has yet to be tested from.

*We are comparing of L. Serpa's master's thesis to identify any new species. (Serpa)



<http://www.arcgis.com/home/webmap/viewer.html?webmap=22cb3e9fb6db4d2c81f38c44e2a5fc71&extent=-122.6237,38.3344,-122.5636,38.3587>

Introduction

Why do we want to know if the water at F.O.P affects Macroinvertebrate species?

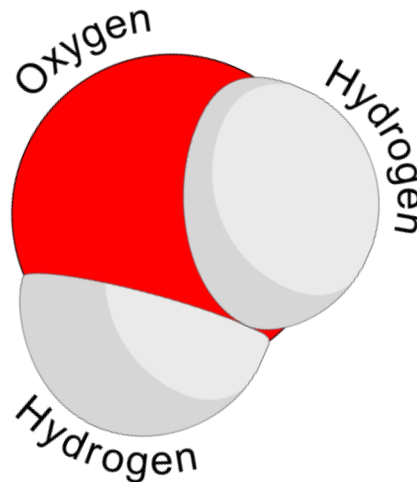
- ❖ First, we would like to know if there are any unique macroinvertebrates native to the spring water versus the Perennial and Ephemeral creeks.
- ❖ Second, we want to compare the spring's biodiversity to the high, perennial creek, biodiversity and the the low biodiversity in the ephemeral creek.



https://blogs.montclair.edu/njsoc/files/2012/05/mayfly_larva.jpg

Objective

Our group hypothesis is if there is a high biodiversity found in the Perennial creek, then we predict the spring will also have a higher abundance of macroinvertebrates because they are both year-round water sources.



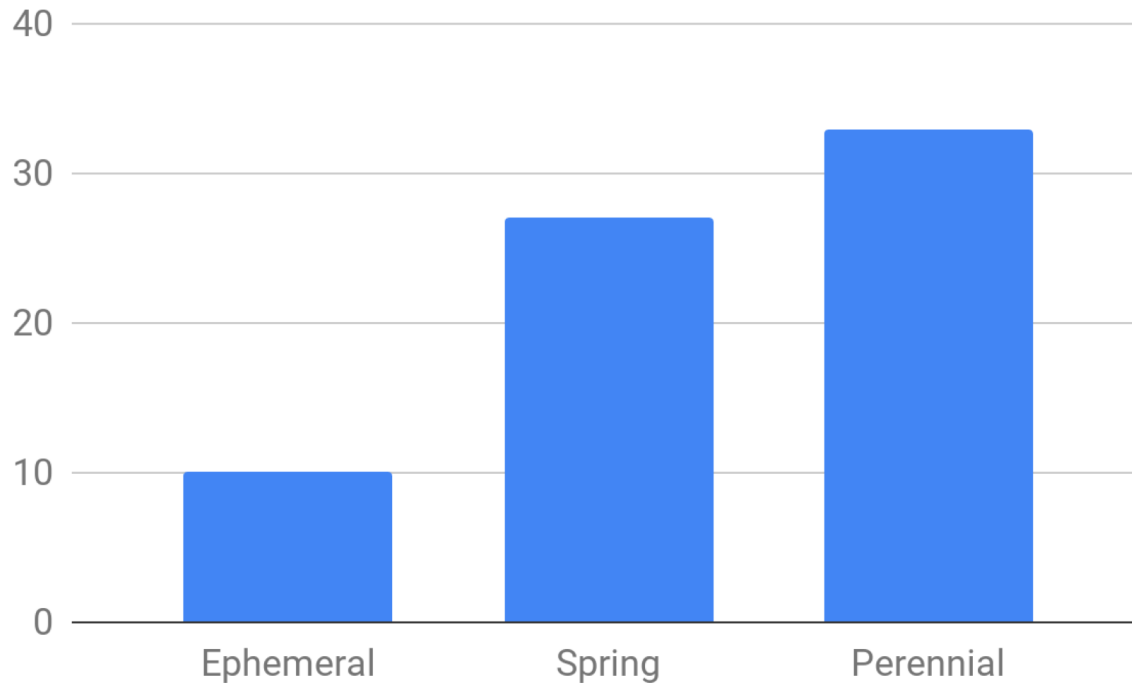
Methods

- ❖ We collected three samples at each of the sites
- ❖ We used the D-net method:
 - Measuring out a 10x10 inch sample area in front of the net
 - Holding the net upright on the floor of the stream. In order for a group member to rub the rocks (found within the grid) upstream from the net (approx. 1-3-inches)
 - Dump what the D-net collected into a bowl
 - Sort the visible organisms from debris
- ❖ We collected the organism into 9 glass vials filled with ethanol
- ❖ Lastly, we sorted the macroinvertebrates by microscope to sort difference in species (S.)



Results

Figure 1: Distribution of Total Macroinvertebrates



The total number of Macroinvertebrates found at each location:

Spring: 27

Perennial: 33

Ephemeral: 10

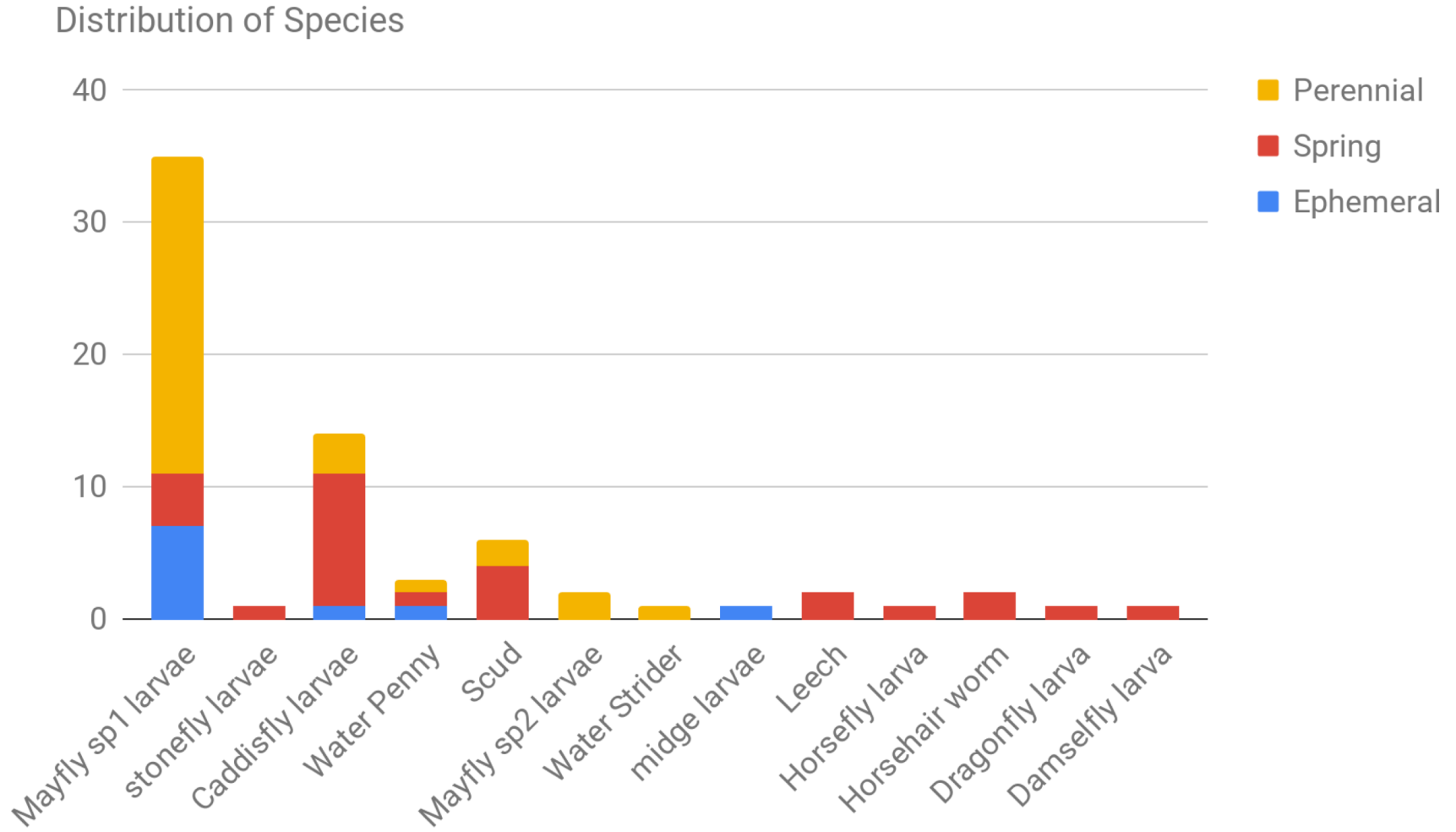
* Species were divided by microscopes and 70 organisms found in total.

Figure 2: Data table of species found after separation.

| | Ephemeral | Spring | Perennial |
|-------------------|-----------|--------|-----------|
| Mayfly sp1 larvae | 7 | 4 | 24 |
| stonefly larvae | | 1 | |
| Caddisfly larvae | 1 | 10 | 3 |
| Water Penny | 1 | 1 | 1 |
| Scud | | 4 | 2 |
| Mayfly sp2 larvae | | | 2 |
| Water Strider | | | 1 |
| midge larvae | 1 | | |
| Leech | | 2 | |
| Horsefly larva | | 1 | |
| Horsehair worm | | 2 | |
| Dragonfly larva | | 1 | |
| Damselfly larva | | 1 | |
| Total | 10 | 27 | 33 |

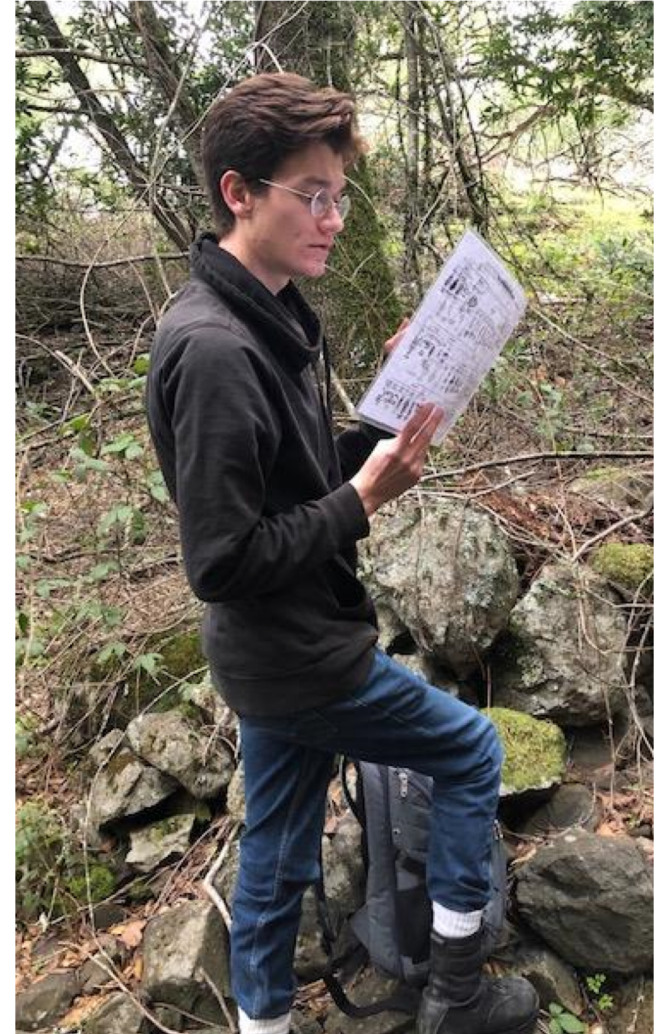
| |
|----------------------|
| Marsh Macroinverts. |
| Stream Macroinverts. |

Figure 3: Distribution of Unique and Common Species



Conclusion

- ❖ We can infer that the Spring location has a diverse set of macroinvertebrates.
- ❖ While the Perennial creek had the most abundance of Macroinvertebrates.
- ❖ What we did find:
 1. The Mayfly were more prominent in the perennial and ephemeral creeks.
 2. The Spring can support marsh and creek macroinvertebrates.
 3. The Perennial creek and the Spring had high biodiversity of macroinvertebrates.
- ❖ Based on the Macroinvertebrates we found, we can determine that all three sources have healthy water quality. This would suggest land management efforts on the preserve are working as intended and should not be changed.



References

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