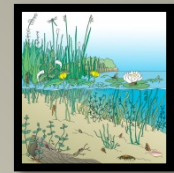




Aquatic habitat connectivity between fragmented forest preserves of Dupage county.

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Abstract

Water runoff from roads, landfills, and urbanization increases the flow of foreign nutrients and toxins into lakes and ponds, which decreases species diversity¹. Macroinvertebrates are aquatic organisms that are sensitive to water conditions and in turn are excellent indicators of water quality². In this project, Macroinvertebrates were sampled at Blackwell and Herrick Lake Forest Preserves. Separate bodies of water within Blackwell were sampled to determine the connectivity between location sites. Samples were organized into two location types - pipe and non-pipe - to determine if there was a significant impact from direct water runoff on populations at each site. Upon reviewing locations based on the Shannon-Weiner Diversity Index, our findings expressed no significant difference between pipe and non-pipe location diversity. The highest connectivity was between the White Pine and Sand Ponds which were had the shortest distance away from each other of all bodies of water.

Objectives

OBJECTIVE 1: To compare the water quality of specified bodies of water present at two forest preserves and attempt to determine the effects of drainwater runoff by collecting and identifying the present Macroinvertebrates.
OBJECTIVE 2: To determine the connectivity of specified bodies of water present at two fragmented forest preserves through the comparison of present Macroinvertebrate species.

Materials & Methods



Surveyed four bodies of water to determine pipe locations. Specific sampling sites were established and GPS coordinates recorded.



Took two Macroinvertebrate samples one meter from shore at every pipe and nonpipe location.



Net and Sifter filtration system used to collect Macroinvertebrates in 50 mL aliquot of two 500 mL container units.



Observe under microscope and tally organisms based on a Macroinvertebrate Water Quality Chart.

Results

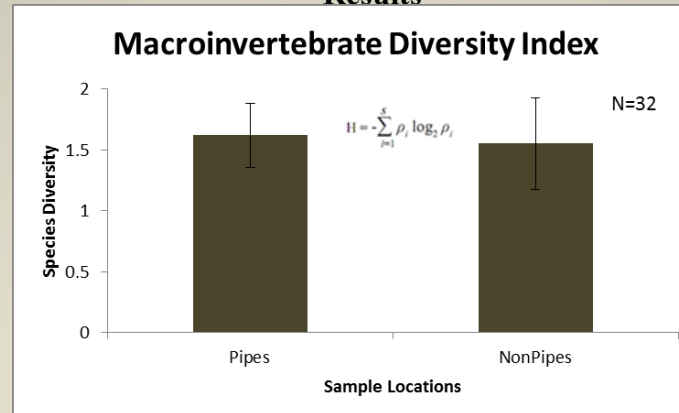
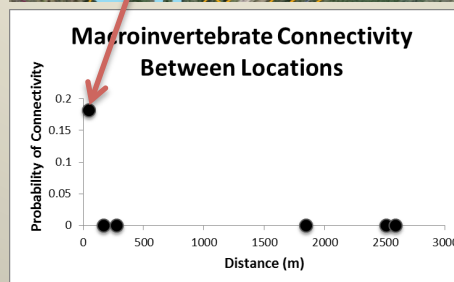


Figure 1: species diversity is slightly higher at pipe locations.



Macroinvertebrate Connectivity is highest between sites closest in proximity to each other.

Conclusions

Samples analyzed with the Shannon-Wiener index showed that pipe locations overall had a higher species diversity compared to non-pipe locations. In comparison there is no significant difference in macroinvertebrate species diversity between non-pipe and pipe locations. The bodies of water closest to each other, White Pine Pond and Sand pond, were found to have the highest probability of connectivity.



Future Investigations

- Proximity of Pipe and Non-Pipe locations
- Larger Lake areas
- Increase number of samples taken
- Consider depth of sample locations

Acknowledgements

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References

1. Puche, Helena and Holt J. (2012). Using Scientific Inquiry to Teach Students about Water Quality. The American Biology Teacher Inquiry and Investigation. 74: (in press).
2. Duan, X., Wang, Z. and Xu, M. (2011). Effects of fluvial processes and human activities on stream macro-invertebrates. International Journal of Sediment Research. 26: 416-430.
3. Figure: 2012. <http://www.sjrwmd.com/education/macroinvertebrates.html>.
4. Figure: 2012. <http://www.sjrwmd.com/education/macroinvertebrates.html>.