Eutrophication Tracking through Interconnected Kettle Lakes in Agricultural Indiana

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Abstract

The project is designed to explore the impact of eutrophication on lake ecosystems. We propose to investigate the ecological and biological impact of nutrient enrichment on lake ecosystems. Our study will be conducted with the assistance of Shana Shepard, Erica McCune, Tina Williams, and Kima Schindler.

Methods

(FIELD WORK)

• Modern planktonic samples collected from each lake
• One short (0.5cm) core was taken from each of the nine lakes
• One long (~1cm) core was taken from Long Lake

(LAB WORK)

• Comes sampled every 0.5cm, sized, and weighed before/or after dying
• Dyes and hydrogen peroxide was added to remove organic content
• Concentration per gram was determined by adding microscopes
• Microscope slides were made using Naphrax mounting media
• Slides counted to 300, eutrophication based on abundance

Prevalent Research

The six westernmost lakes sampled every 0.5cm and weighed before/after drying from the on site. The Indiana Division of State Parks and the Indiana Department of Community Affairs were contacted to determine the pre-eutrophication signal.

Lake Characteristics

<table>
<thead>
<tr>
<th>Lake</th>
<th>Date Sampled</th>
<th>Depth (cm)</th>
<th>Nutrients (µg/L)</th>
<th>Phytoplankton Abundance</th>
<th>B:P Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>River Lake</td>
<td>3.2e7</td>
<td>3.6</td>
<td>60</td>
<td>3.2e7</td>
<td>3.6</td>
</tr>
<tr>
<td>Miller Lake</td>
<td>7e7</td>
<td>18</td>
<td>60</td>
<td>7e7</td>
<td>18</td>
</tr>
<tr>
<td>Mud Lake</td>
<td>8e7</td>
<td>12</td>
<td>60</td>
<td>8e7</td>
<td>12</td>
</tr>
<tr>
<td>Sand Lake</td>
<td>9e7</td>
<td>15.7</td>
<td>60</td>
<td>9e7</td>
<td>15.7</td>
</tr>
</tbody>
</table>

Conclusions

Each lake was once an oligotrophic reed marsh system. River, lakes, and streams within the lake have increased over a period of time.

Future Work

• Proceeds to long-term core from Long Lake
• Use dated core to determine the introduction of nutrients to each lake

Acknowledgements

The authors would like to thank the Indiana Division of State Parks for their assistance with this project. Our project is designed to explore the impact of eutrophication on lake ecosystems.