Water Quality in Marl Lake and West Branch Mill Pond

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Center for Watershed Science and Education
UW-Stevens Point
Tonight’s discussion

- How do we measure water quality?
- How is the water quality in Fish and Pine Lakes?
- How does the landscape affect the lakes?
- What can be done to sustain or improve the water quality for future generations?
A lake is a reflection of its watershed...
Water Quality

- Dissolved Oxygen
- Water Clarity
- Nutrients
- Minerals and Pollutants
Dissolved Oxygen

- Comes from atmosphere/aquatic plants
- Important to aquatic organisms
- Changes with depth and season
Dissolved Oxygen

West Branch Mill Pond Dissolved Oxygen (mg/L)

Marl Lake Dissolved Oxygen (mg/L)
Water Clarity

- Measure of light penetration in water

- Effected by
  - Color
  - Sediment
  - Algae

- Controls depth aquatic plants can grow
Water Clarity

Marl Lake Secchi Depth

West Branch Mill Pond (White River) Secchi Depth
Nutrients

- Phosphorus
- Nitrogen

Common Sources of Nutrients in Lakes

- Wetlands
- Soils
- Plants
- Animals
- Septic Systems
- Fertilizers
- Wastewater
- Erosion/runoff
- Livestock waste
Wisconsin Phosphorus Standard
Shallow Seepage Lakes
(40 µg/L)
~Flag Value~
(15 µg/L)
Marl Lake “Nutrient Scorecard”

<table>
<thead>
<tr>
<th></th>
<th>GOOD</th>
<th>FAIR</th>
<th>POOR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total P (ppb)</strong></td>
<td>15.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Median summer concentration)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Inorganic N (ppm)</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>(Spring)</td>
<td></td>
<td></td>
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<tr>
<td><strong>Chlor-a (µg/L)</strong></td>
<td>2.1</td>
<td></td>
<td></td>
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</tbody>
</table>
West Branch “Nutrient Scorecard”

<table>
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</thead>
<tbody>
<tr>
<td><strong>Total P (ppb)</strong> (Summer)</td>
<td>11.5</td>
<td></td>
<td></td>
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<tr>
<td><strong>Inorganic N (ppm)</strong> (Spring)</td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td><strong>Chlor a (µg/L)</strong></td>
<td>3</td>
<td></td>
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</tbody>
</table>
Pollutants

- Sulfate
- Chloride
- Potassium
- Sodium
## Marl Lake Potential Contaminants

<table>
<thead>
<tr>
<th>(mg/L)</th>
<th>LOW</th>
<th>MEDIUM</th>
<th>HIGH</th>
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</thead>
<tbody>
<tr>
<td>Chloride</td>
<td>3.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potassium</td>
<td>1.12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sodium</td>
<td>2.3</td>
<td></td>
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</table>

| Atrazine (ug/L) | <0.01 ug/L |
## West Branch Potential Contaminants

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</thead>
<tbody>
<tr>
<td>Chloride</td>
<td></td>
<td>3.3</td>
<td></td>
</tr>
<tr>
<td>Potassium</td>
<td></td>
<td>0.73</td>
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<tr>
<td>Sodium</td>
<td></td>
<td>2.0</td>
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</tbody>
</table>

Atrazine (ug/L) < 0.01 ug/L
Conclusions/Recommendations

- Water quality in Marl Lake is ‘good’.
  - Phosphorus below State standard
  - Hard water helps buffer excess phosphorus
  - Chloride, sodium, potassium indicate impacts from watershed
- Nitrate concentrations are elevated.
  - Private well should be tested for drinking water quality
  - Nitrate can increase growth of aquatic plants and algae
  - Over-application of nutrients should be avoided. Landowners in the watershed should be made aware of their connection to the lake.
- Regular water quality monitoring should be conducted.
Acknowledgements

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Waushara County

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Nancy Turyk, Paul McGinley, Ryan Haney, Danielle Rupp

UW-Stevens Point Undergraduate Students
Questions?