9 Lakes Shoreline Erosion

Lake County Health Department
Environmental Services
Kelly Deem
Process of Erosion

- Erosion is the Natural Process of wearing away of the land surface by the action of wind, water, ice, or gravity.

- The erosion process can be accelerated or slowed by the practices you adopt, and that sediment going into the lake or river is a pollutant.
Impacts

- Sedimentation
  - deposition of eroded soils in waterways
- Loss of Vegetation and Shoreline Habitats
- Interference with Light
- Release of Nutrients
- Stressed Fish and Wildlife Populations
Identifying Causes of Erosion

- **Removal of Vegetation**
  - Root systems of woody and native plants help to strengthen all types of soils.

- **Power Boat Waves**
  - Larger more powerful boats increase the rate of erosion by increasing wave activity.

- **Ice**
  - May subject shorelines and structures to crushing forces and abrasion.

- **Urbanization**
  - Increased runoff with the increase in impervious surfaces at a much quicker rate.
Assessment

- **GPS**
- **Categorical Data**
  - None
    - No signs of erosion
  - Slight
    - 1-3” of eroded shoreline
  - Moderate
    - 3-6” of eroded shoreline
  - Severe
    - >6” of eroded shoreline
- **Mapping Software**
  - Placed over an Arial photo

Mr. Pfister 2000
No Erosion

- Native Plants
- Armored
  - Rip Rap
  - Seawalls
- Gradual Slopes
- Lakes with less lake level fluctuation
Slight Erosion

- Large or small gullies caused by overland runoff along the shoreline
Moderate Erosion

- Exposed roots
- Noticeable recession of shoreline overtime
Severe Erosion

- Large patches of unusually cloudy water
- Leaning or downed trees
- Large area of bare soil
Bangs Lake

<table>
<thead>
<tr>
<th>Year</th>
<th>% All Erosion</th>
<th>% Moderate</th>
<th>% Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2009</td>
<td>25</td>
<td>3</td>
<td>0.2</td>
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</tbody>
</table>
## Ozaukee Lake

<table>
<thead>
<tr>
<th>Year</th>
<th>% All Erosion</th>
<th>% Moderate</th>
<th>% Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>77</td>
<td>46</td>
<td>0</td>
</tr>
<tr>
<td>2009</td>
<td>85</td>
<td>36</td>
<td>40</td>
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</tbody>
</table>
### Timber Lake South

#### 2007 vs. 2013

<table>
<thead>
<tr>
<th>Year</th>
<th>% All Erosion</th>
<th>% Moderate</th>
<th>% Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>55</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>2013</td>
<td>61</td>
<td>16</td>
<td>6</td>
</tr>
</tbody>
</table>
Lake Fairview

<table>
<thead>
<tr>
<th>Year</th>
<th>% All Erosion</th>
<th>% Moderate</th>
<th>% Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>15</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>2013</td>
<td>45</td>
<td>20</td>
<td>8</td>
</tr>
</tbody>
</table>

- All Erosion:
  - 2007: 15%
  - 2013: 45%
- Moderate:
  - 2007: 2%
  - 2013: 20%
- Severe:
  - 2007: 0%
  - 2013: 8%
Lake Barrington

<table>
<thead>
<tr>
<th></th>
<th>% All Erosion</th>
<th>% Moderate</th>
<th>% Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>22</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>2013</td>
<td>32</td>
<td>15</td>
<td>4</td>
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</tbody>
</table>
Tower Lake

<table>
<thead>
<tr>
<th></th>
<th>% All Erosion</th>
<th>% Moderate</th>
<th>% Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>62</td>
<td>22</td>
<td>5</td>
</tr>
<tr>
<td>2013</td>
<td>44</td>
<td>16</td>
<td>6</td>
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</table>
## North Tower Lake

<table>
<thead>
<tr>
<th>Year</th>
<th>% All Erosion</th>
<th>% Moderate</th>
<th>% Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>96</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2013</td>
<td>41</td>
<td>2</td>
<td>0</td>
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</table>

**Diagram**: Comparing erosion levels in 2007 and 2013.
<table>
<thead>
<tr>
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<th>% All Erosion</th>
<th>% Moderate</th>
<th>% Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>36</td>
<td>29</td>
<td>0</td>
</tr>
<tr>
<td>2013</td>
<td>16</td>
<td>4</td>
<td>0</td>
</tr>
</tbody>
</table>

Slocum Lake
Island Lake

<table>
<thead>
<tr>
<th></th>
<th>% All Erosion</th>
<th>% Moderate</th>
<th>% Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2013</td>
<td>16</td>
<td>5</td>
<td>4</td>
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</table>
9 Lakes Summary

- NapaSuwe, Slocum, and Tower Lakes reduced shoreline erosion
- North Tower Lake reduced shoreline erosion by 55%
- Lake Fairview had the largest increase in Erosion (30%)
- Ozaukee shoreline is exhibiting the most erosion (85%) and the most severe (40%)
- Island and Slocum shorelines are currently exhibiting the least amount of erosion at 16%
Methods to Prevent Erosion

- Limit access to sensitive areas to promote vegetation growth and limit soil compaction
- Limit the removal of rocks, trees, and vegetation in beach and nearshore areas
- Careful water craft operation,
  - limit boat motors and enforce wave restrictions based on lake size
- VEGETATED BUFFERS
- Wetland protection,
  - helps reduce erosion caused by flooding
- Support watershed management,
  - regulations that reduce development in erosion susceptible areas
Additional Resources

- Completed 2013 Lake Reports ETA March 2014
- Understanding, Living with and Controlling Shoreline Erosion