Understanding Lakes: Field Experience at Wintergreen Lake

Lake and Stream Leaders Institute
Kellogg Biological Station
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What factors influence lake ecology?

- Lake Type
- Water Chemistry
- Human Activities
- Basin Morphometry
- Thermal Stratification
- Lake Zones
- Trophic Status
- Light Penetration
- Biota & Interactions

Lake Zonation

- Terrestrial Plants
- Littoral Zone
- Limnetic Zone (Open Water)
- Epilimnion
- Thermocline
- Metalimnion
- Hypolimnion
- Depressions in depth

Is the lake stratified?
Bathymetric Map

Water Chemistry

Oxygen
- Source: Atmospheric & Photosynthesis
- Respiration of Aerobic Organisms
- Decomposition of Organic Matter
- Influence on Solubility of Minerals; Nutrient Availability

Lake Profile of a Stratified Lake

<table>
<thead>
<tr>
<th>Depth (m)</th>
<th>Temp. °C</th>
<th>Oxygen (mg/L)</th>
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<td>9.5</td>
</tr>
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<td>25</td>
<td>9.5</td>
</tr>
<tr>
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<td>25</td>
<td>9.4</td>
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</tr>
<tr>
<td>9</td>
<td>6</td>
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</tr>
</tbody>
</table>

pH

At pH 5 or below, most fish eggs cannot hatch
Tolerance levels for various aquatic organisms:
- Clams – pH 6.0
- Smallmouth bass – pH 5.5
- Mayflies and Stoneflies – pH 5.5
- Trout, walleye – pH 5.2
- Frogs – pH 4.0

Collecting Water Sample for other Measurements

Light Penetration using a Secchi Disk
Sampling for Plants and Animals in Water and Sediments

Trophic Status

Oligotrophic → Mesotrophic → Eutrophic