Developing Goals and Strategies to Improve Water Quality

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Outline

• How to use state water quality standards to set goals for streams and lakes

• How to identify/deal with factors that may prevent or delay the achievement of water quality goals

• How to prioritize watershed projects
Wisconsin Surface Water Quality Standards

Phosphorus (NR102)

• Streams and Rivers (Median of 6 samples from May – Oct.)
  - 100 µg/L for rivers named in statute
  - 75 µg/L for all other streams and rivers
  - Median of 6 monthly samples (May-Oct)

• Lakes (Average of 6 samples from June 1 – Sept. 15)
  - 40 µg/L for shallow lakes
  - 30 µg/L for deep drainage lakes
  - 20 µg/L for deep drainage lakes
  - 15 µg/L for two-story fishery lakes
What P Index threshold will meet water quality standards?
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Wisconsin Lake Modeling Suite (WiLMS)
http://www.dnr.state.wi.us/lakes/model/
Why does water quality improvement lag behind BMP implementation?

- Natural variability
- Soil P drawdown is slow
- Channel storage
- Baseflow vs. Stormflow
Problem: Natural Variability
Solution: Power Analysis

- 6 samples
- 12 samples
- 24 samples
Problem: Soil P drawdown is slow.

Solutions:

• Promote practices that limit soil erosion.

• Use stormflow loads to evaluate BMP effectiveness.
Problem: Channel storage of fine sediment may mask reductions from uplands.

Solutions:

• Include channel sources in sediment budget.
• Extend post-BMP monitoring.
**Problem:** Baseflow and stormflow loads may respond differently to management practices.

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<thead>
<tr>
<th>Target</th>
<th>Short-term</th>
<th>Long-term</th>
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</thead>
<tbody>
<tr>
<td>Baseflow (streams)</td>
<td>Minimize tile drainage Wetland restoration</td>
<td>Reduce soil P</td>
</tr>
<tr>
<td>Stormflow (lakes)</td>
<td>Reduce manure P loss Reduce soil erosion</td>
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</tbody>
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How to prioritize watershed projects

- Watershed size
- Opportunity
- Minimize limiting factors
- Aim for ecological thresholds
Aim for ecological thresholds.
Summary

• Water quality standards can be used to set goals for watershed projects.

• Promote practices based on water quality goals.

• Account for lag times in monitoring design and practice selection.

• Select watershed projects that are most likely to achieve goals.