Classifying & Assessing Waterbodies: 3 Water Quality Standards Rules

- **Designated Uses**
  
  NR 102, 104, 105

  What are our expectations for this waterbody?

- **Biological Criteria**
  
  NR 102

  Can biology tell us whether it’s meeting these expectations?

- **Site-Specific Criteria for Phosphorus**
  
  NR 119

  Is the phosphorus criteria right for the waterbody?
Designated Uses…The Foundation

- All waters are assigned “Uses” they are expected to support
- Criteria are set based on protection of the Uses
- The Uses & criteria are the foundation for management actions, including permit limits
All waters are assigned Designated Uses

- Fish & Aquatic Life
- Recreation
- Public Health & Welfare
- Wildlife
Wisconsin’s current Designated Uses

- Fish & Aquatic Life
- Recreation
- Public Health & Welfare
- Wildlife

- Coldwater
  - Warmwater Sport Fish
  - Warmwater Forage Fish
  - Limited Forage Fish
  - Limited Aquatic Life

Needs Improvements:

- System was designed in the 70’s
- Current categories don’t accurately reflect the wide variety of waterbodies in WI
  - Need Stream categories for Cool, Large River, & small Non-Fish streams
  - Need Lake categories
  - Thousands of waters have no classification
- Needs adjustment to better classify & protect different waterbody types
- Goal: Set correct expectations for permits & resource management
New structure for Fish & Aquatic Life (FAL) Designated Uses

- Implementing a new Use structure: FAL Use will have two parts:
  - Natural Community + Tier
    - (waterbody type) (quality expectation)

- Implements the national concept of “Tiered Aquatic Life Uses”
- MN & other states are working on similar updates
Coldwater criteria
- Cold
- Cool-Cold 29%

Warmwater criteria
- Warmwater (default) 93%
- Warm 5%
- River 2%

Macroinvertebrate criteria
- Macroinvertebrate 18%

~12% of receiving waters

LAL criteria
Classifying & Assessing Waterbodies: 3 Water Quality Standards Rules

**Designated Uses**
NR 102, 104, 105

What are our expectations for this waterbody?

**Biological Criteria**
NR 102

Can biology tell us whether it’s meeting these expectations?

**Site-Specific Criteria for Phosphorus**
NR 119

Is the phosphorus criteria right for the waterbody?
Using Biology to Assess Waters

- The best way to assess the overall quality of a waterbody is by measuring the health of the *living things* in it.

- To do this, we’re developing “Biological Criteria” for each waterbody type:
  - Assess health of fish, plants, aquatic insects, algae
  - Many are well-established
  - Not likely to affect permits
Using Biology to Assess Waters

Use biology to tell us two things:

• How’s the overall biological health? → **Community-level biocriteria**
  - Fish, insects, plants

• Is the biology showing a response to phosphorus? → **Phosphorus response indicators**
  - Algae, chlorophyll, plants
Using Phosphorus Response Indicators:
1. For Assessment & Impairment Decisions

- Use **biology & phosphorus in conjunction** to determine TP impairments
  - If phosphorus exceeds criteria (within certain range), check biology for impairment
  - If no biological impairment, water is not listed as impaired
- Similar to ME’s & MN’s approach
2. To determine Site-Specific Criteria eligibility

Designated Uses
NR 102, 104, 105

What are our expectations for this waterbody?

Biological Criteria
NR 102

Can biology tell us whether it’s meeting these expectations?

Site-Specific Criteria for Phosphorus
NR 119

Is the phosphorus criteria right for the waterbody?
Site-Specific Criteria for Phosphorus (SSC)

• Use SSC if the statewide phosphorus criteria are over- or under- protective; modify accordingly

• There’s a wide range of waterbody responses to P levels, based on physical/chemical factors

• Enables more appropriate assessments & permit limits
Site-Specific Criteria for Phosphorus (SSC)

- SSC are based on protecting the receiving water (& downstream waters).
  - Protect Fish & Aquatic Life uses & Recreation uses
  - Demonstrated using biological metrics (P response)

- SSC are not based on economics, and they’re not for every waterbody
There are two main types of SSC:

- **Less-stringent SSC** (raise the TP criterion)
- **More-stringent SSC** (lower the TP criterion)

Which one depends on 2 questions:

1. Is waterbody meeting its statewide TP criterion?
2. Is the waterbody meeting its biological criteria?
Compare TP & Biology

**Biology Not Met**
- TP Criterion Exceeded: Not eligible for an SSC
- TP Criterion Attained: CASE B. May be eligible for a more stringent SSC

**Biology Met**
- CASE A. May be eligible for a less stringent SSC
- CASE C. Not eligible for an SSC except for ORW/ERW waters

CASE A.
- May be eligible for a less stringent SSC

CASE B.
- May be eligible for a more stringent SSC

CASE C.
- Not eligible for an SSC except for ORW/ERW waters
Compare TP & Biology

**Not eligible**

**TP Criterion Exceeded**

- **Biology Not Met**
  - Not eligible for an SSC

**TP Criterion Attained**

- **CASE A.** May be eligible for a less stringent SSC
- **CASE B.** May be eligible for a more stringent SSC
- **CASE C.** Not eligible for an SSC except for ORW/ERW waters

Phosphorus: Exceeding 75 ug/L TP
Biology: Algae problem
Compare TP & Biology

**Not eligible**

- **Biology Not Met**
  - Not eligible for an SSC

- **Biolog Met**
  - **CASE A.** May be eligible for a *less stringent* SSC
  - **CASE B.** May be eligible for a *more stringent* SSC
  - **CASE C.** Not eligible for an SSC except for ORW/ERW waters

- **TP Criterion Exceeded**
  - Needs to go on the Impaired Waters List
  - Clean-up/ restoration

- **TP Criterion Attained**
  - Biology: Algae problem
  - Phosphorus: Exceeding 75 ug/L TP

*Needs to go on the Impaired Waters List*
CASE A: Setting a Less-stringent (higher) SSC target

**Biology Not Met**
- Not eligible for an SSC

**Biology Met**
- CASE A. May be eligible for a less stringent SSC

**TP Criterion Exceeded**
- CASE B. May be eligible for a more stringent SSC

**TP Criterion Attained**
- CASE C. Not eligible for an SSC except for ORW/ERW waters
CASE A: Setting a Less-stringent (higher) SSC target

**Most Likely for Less-Stringent SSC**

Reservoirs (lake-like)
- Lake statewide criteria (ex. 40);
- If P=60 but biology is good, may be set too low.
- Set SSC at ambient concentration.

**TP Criterion Exceeded**

- **Biology Not Met**
  - Not eligible for an SSC

- **Biology Met**
  - CASE A. May be eligible for a less stringent SSC

**TP Criterion Attained**

- CASE B. May be eligible for a more stringent SSC
- CASE C. Not eligible for an SSC except for ORW/ERW waters
CASE A: Setting a Less-stringent (higher) SSC target

**Most Likely for Less-Stringent SSC**

<table>
<thead>
<tr>
<th>TP Criterion</th>
<th>Biology Met</th>
<th>Biology Not Met</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exceeded</td>
<td>Not eligible for an SSC</td>
<td>CASE A. May be eligible for a less stringent SSC</td>
</tr>
<tr>
<td>Attained</td>
<td>CASE B. May be eligible for a more stringent SSC</td>
<td>CASE C. Not eligible for an SSC except for ORW/ERW waters</td>
</tr>
</tbody>
</table>

Reservoirs (lake-like)
- Lake statewide criteria (ex. 40); If P=60 but biology is good, may be set too low.
- Set SSC at ambient concentration.

High Natural Background TP (geology, etc.)
- Exceeds 40 but biology good
CASE B & C: Setting a More-stringent (lower) SSC

**TP Criterion Exceeded**

- Biology Not Met:
  - Not eligible for an SSC

- Biology Met:
  - CASE A. May be eligible for a less stringent SSC

**TP Criterion Attained**

- CASE B. May be eligible for a more stringent SSC
- CASE C. Not eligible for an SSC except for ORW/ERW waters

*Most Likely for More-Stringent SSC*

Impoundments (river-like)
- Stream/River statewide criteria (ex. 100);
  - If TP=80 but biology is poor, criteria may be too high

Other waters attaining TP but problems with algae, plants, bugs
CASE B & C: Setting a More-stringent (lower) SSC

**Biology Not Met**
- **Not eligible for an SSC**

**Biology Met**
- **CASE A.** May be eligible for a *less stringent* SSC
- **CASE B.** May be eligible for a *more stringent* SSC
- **CASE C.** Not eligible for an SSC except for ORW/ERW waters

**TP Criterion Exceeded**
- Impoundments
  - Stream/River statewide criteria (ex. 100)
  - If TP=80 but biology is poor, criteria may be too high

**TP Criterion Attained**
- Other waters attaining TP but problems with algae, plants

"Outstanding/ Exceptional Resource Waters"
- Set lower for protection

**Most Likely for More-Stringent SSC**
- Setting a More-stringent (lower) SSC
- Most Likely for More-Stringent SSC
- "Outstanding/ Exceptional Resource Waters"
Economic Impact & Public Input

- Determining Economic Impact
  1. Assess which receiving waters will change use categories
  2. Identify which permits those changes will affect
  3. Solicit input on costs to dischargers

- External Advisory Team (summer)
- Public hearings & comment period
Summary of changes for waters near you…

- Designated Uses may be adjusted/updated
- Some permits may be affected
- Biological criteria used for assessments & impairment decisions
- Some waters may be eligible for Site-Specific Criteria
Discussion? Questions?

Kristi Minahan, DNR Water Evaluation Section
Kristi.minahan@wisconsin.gov; 608-266-7055