Upper Mississippi River Bacteria
Total Maximum Daily Load (TMDL) Project

Barb Peichel
TMDL Project Manager
7-22-08
Outline

1. Minnesota’s Impaired Waters
2. TMDL Study Process
3. Upper Mississippi River Bacteria TMDL
Clean Water Act (1972)

**Goal** - Restore and maintain the chemical, physical, and biological integrity of U.S. waters

**Section 303 of CWA**

1. **Assess state waters** - meet water-quality standards?
2. **List impaired waters** - 303(d) List
3. **Conduct TMDL studies** - set pollutant reduction goals
### Beneficial Use Classifications

<table>
<thead>
<tr>
<th>Use Class</th>
<th>Beneficial Use</th>
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<tbody>
<tr>
<td>Class 1</td>
<td>Drinking Water</td>
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<tr>
<td>Class 2</td>
<td>Aquatic life and recreation</td>
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<td>2A</td>
<td>Cold water fisheries, trout waters</td>
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<td>2Bd</td>
<td>Cool and warm water fisheries, drinking water</td>
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<td>2B</td>
<td>Cool and warm water fisheries</td>
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<td>2C</td>
<td>Indigenous fish and associated aquatic community</td>
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<td>2D</td>
<td>Wetlands</td>
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<td>Class 3</td>
<td>Industrial uses and cooling</td>
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<td>Class 4A</td>
<td>Agriculture and wildlife uses</td>
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<td>Class 5</td>
<td>Aesthetics and navigation</td>
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<td>Class 6</td>
<td>Other uses</td>
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<td>Class 7</td>
<td>Limited resource value waters</td>
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Examples of Impairment

- Biotic Integrity
- Bacteria
- Nutrients
- Turbidity
## Numeric Standards

### Aquatic Recreation

*(1° and 2° body contact)*

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<tr>
<td>Fecal Coliform</td>
<td>200 orgs per 100 ml</td>
<td><em>E. coli</em></td>
<td>126 orgs per 100 ml</td>
<td>Geometric mean of ≥ 5 samples/month (April – October)</td>
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MN Impaired Waters

2008 Impaired Waters 303(d) List

All impaired waters 2,575

Impaired waters needing a TMDL 1,475 (510 Lakes, 336 Rivers)
Water Quality

Protecting

Clean Waters

Protection Strategy Development

Protection Activities

Protection & Restoration Tools

Monitoring & Assessment

Delisting

Impaired Waters

List as Impaired 303(d)

Restoration Activities

TMDL Study

Improving

Meets water quality standards

Does not meet water quality standards

Develop pollution reduction plan
Outline

1. Minnesota’s Impaired Waters

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Total Maximum Daily Load (TMDL)

A TMDL Study -

1. Identifies pollutant sources

2. Determines pollution reduction needed to restore the water quality
Quantifying a TMDL Number

Sum of the allowable loads of a single pollutant from all contributing permitted and non-permitted sources

\[
\text{TMDL} = \sum \text{WLA} + \sum \text{LA} + \text{MOS} + \text{RC}
\]

WLA = Wasteload Allocation, “permitted sources”
LA = Load Allocation, “non-permitted sources”
MOS = Margin of Safety, “uncertainties”
RC = Reserve Capacity, “future growth”
TMDL Process

Determine Sources Causing Impairment
• Analyze existing data
• Conduct additional monitoring

Allocate Pollutant Loads
• Use models/other tools - ID stresses/develop loads
• Assign loads – permitted/non-permitted sources
*Deliverable: TMDL Report

Develop Implementation Strategies/Plan
• Identify leads & partners
• Create monitoring and evaluation plan
*Deliverable: Implementation Plan
Bacteria Impairments

Potential sources
- Human, livestock, pet, and wildlife waste

How does it get there?
- Stormwater systems
- Areas with field-applied manure fertilizer or storage
- Non-compliant septic systems
- Connected waterbodies
- Wastewater treatment facilities
- Feedlots
Potential Best Management Practices (Urban Areas)

**Stormwater**  
Inspect/monitor outfalls, ID illicit discharges/connections  
Infiltrate/Filter - rain gardens, infiltration basins, sand filters

**Reduce Sediment**  
Runoff - street sweeping

**Preserve/Restore Riparian Buffers**  
“Hot spots” near waterways

**Pet Waste**  
Evaluate ordinances, Create educational materials

**Wildlife**  
ID wildlife populations, Wildlife feeding bans, Geese control
Outline

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Upper Mississippi River Bacteria TMDL Project

Joint Effort of MDH & MPCA
- Beneficial use designation
- CWA/SDWA
- MDH Source Water Protection/MPCA TMDL

Overall Goal
- Improve and restore the water quality of the Upper Mississippi River

Project Objectives
- Describe pollutant reduction and actions – how do we get Upper Mississippi River reaches to meet water quality standard (E. coli)
- Develop a TMDL Report & Implementation Plan for at least five mainstem Mississippi River impaired (bacteria) reaches
TMDL Project Scope & Bacteria Impairments

Upper Mississippi River Bacteria TMDL - Project Area - July 2008

Legend:
- Mississippi River Reaches Impaired for Fecal Coliform (TMDL Project)
- Mississippi River Reaches Impaired for other Parameters
- Streams Impaired for Fecal Coliform
- Streams Impaired for other Parameters or Unimpaired
- Subwatershed Drainage (HWD100K)
- Dams

Key Points:
- Fecal coliform (07010206-574)
- Not currently listed (07010203-574)
- Fecal coliform (07010206-510)
- Fecal coliform (07010206-568)
- Fecal coliform (07010206-599)
- Fecal coliform (07010206-593)
- Fecal coliform (07010206-505)
Upper Mississippi River Bacteria TMDL Project

**Stakeholder Involvement**

- Stakeholder Advisory Team (SAT), Technical Advisory Committee (TAC), Policy Advisory Committee (PAC)

- Roles & Responsibilities – Review documents, attend meetings, make recommendations, partner to conduct project tasks

- Metro & St. Cloud based meetings

- Annual Meetings
Bacteria Data

Upper Mississippi River (07010206-509) Fecal Coliform Concentrations over Time

Fecal Coliform (orgs/100 ml)
# Bacteria Data

Geometric Mean of Fecal Coliform (# orgs/100 ml) for the Mississippi River (reach 07010206-509)

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For More Information

• Final TMDLs (8/1)
  – Blue Earth River
  – Carver-Bevens-Silver Creeks
  – Chippewa River
  – Lower Mississippi River Basin
  – Pipestone Creek*
  – Pomme de Terre
  – Rock River
  – Sunrise River (North Branch)
  – Yellow Medicine (South Branch)

• TMDL Bacteria Protocol & Fact Sheet

• Guidance Manual - Assessing MN Surface Waters
For More Information

www.pca.state.mn.us
For More Information

www.pca.state.mn.us/water/tmdl/
Upper Mississippi River - Bacteria TMDL

Status: Work began on the Upper Mississippi River Bacteria TMDL Project in March 2008 and it is currently estimated that the TMDL Report and Implementation Plan will be completed by 2012.

Other Documents

- MPCA Fact Sheet – Bacteria, Sources, Types, and Impact on Water Quality
- Minnesota Department of Health Fact Sheet – Beaches and Recreational Waters in MN: Waterborne Pathogens

Meetings and Events

- July 22, 2008 - Joint Metro Stakeholder Advisory Team and Technical Advisory Committee Meeting, 8:30 a.m.-12:30 p.m., Minneapolis Park & Recreation Board, 2117 West River Road, Minneapolis, MN 55411

See the TMDL Meetings, Events and News page for notices of general interest and event-related information on impaired waters/TMDLs.

Links

- MPCA: Upper Mississippi River Basin
- MPCA: Minnesota’s Impaired Waters and TMDLs
- Minnesota Department of Health
- Upper Mississippi River Source Water Protection Project
- University of Minnesota E. coli Source Tracking Research
- Lake Superior Beach Monitoring Program

Information Contact

Reh Reichel, Project Manager
Upper Mississippi River - Bacteria TMDL DRAFT Timeline

Summer/Fall 2008
- Create Work Plan
- Hold 1st stakeholder meetings
- Start summarizing existing data
- Discuss CWA/SDWA

2009-2011
- Conduct additional monitoring
- Identify pollution sources

2011/2012
- Develop TMDL Report

2012/2013
- Develop Implementation Plan