



Setting the Course for Improved Water Quality

*The Total Maximum Daily
Load (TMDL) program and
process*

Minnesota Pollution Control Agency



What is a TMDL?

■ TMDL

■ Total Maximum Daily Load

- The amount of a particular pollutant that enter into a waterbody and still meet the standards for that ecoregion

- Long Lake-Northern Central Hardwood Forest Ecoregion

- » Typical Range - Total Phosphorus = 23-50 ppb
- » Typical Range - Chlorophyll-a = 5-22 ppb
- » Typical Range - Secchi Depth = 4.9-10.5 ft



TMDL's cont...

- A **TMDL** describes both a process and a number
 - Involves 2 to 4 year study and intensive stakeholder and public input.
 - Number is a calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards.
- A **TMDL** results in a pollution reduction plan, this plan identifies all the sources of the pollutant and allocates needed reduction among them.



TMDL Process

■ **Assess**

- Assessments are completed every 2 years

■ **List**

- The 2008 list has 336 rivers and 510 lakes
 - This includes no listings prior to 2008

■ **Identify**

- Sources and reductions needed (TMDL study)

■ **Implement**

- Restoration activities (TMDL plan)

■ **Evaluate**

- Are restoration measures improving water quality?



Legal Authority

Federal Clean Water Act (CWA) of 1972 – framework for protecting, restoring water quality

Focus:
CWA Section 303 – establishes national water quality standards and Impaired Waters (TMDL) programs



What does Section 303 of the CWA require?

Develop water quality standards for all MN waters:

1. Designate beneficial uses for Minnesota rivers, drainage ditches, streams, wetlands, lakes
2. Develop water quality criteria to protect beneficial uses

Examples:

- aquatic life support (fishing)
- recreation (swimming, boating)


(Found in: MN Rules Chapter 7050)

How do we determine whether standards are being met?

First, MPCA and other partners monitor water quality statewide

As of 2006, adequate data has been collected on:

- 10% of state streams
- 16% of state lakes



How do we determine whether standards are being met?

Then, MPCA analyzes monitoring data and compares to water quality criteria to determine whether standards are being met

Standards not met?

Section 303 (d) requires placing the water body on the *Impaired Waters List*

Why is the Impaired Waters List Important?



Minn. 2008 Impaired Waters List

To date-
2,575
impairments
on
1,382 water
bodies

303(d) Lists:

- Inform/educate the public
- Ensure that *further study* of impaired waters occurs (**the TMDL Study**)
- Encourage action to restore water quality

What is a Total Maximum Daily Load (TMDL)?

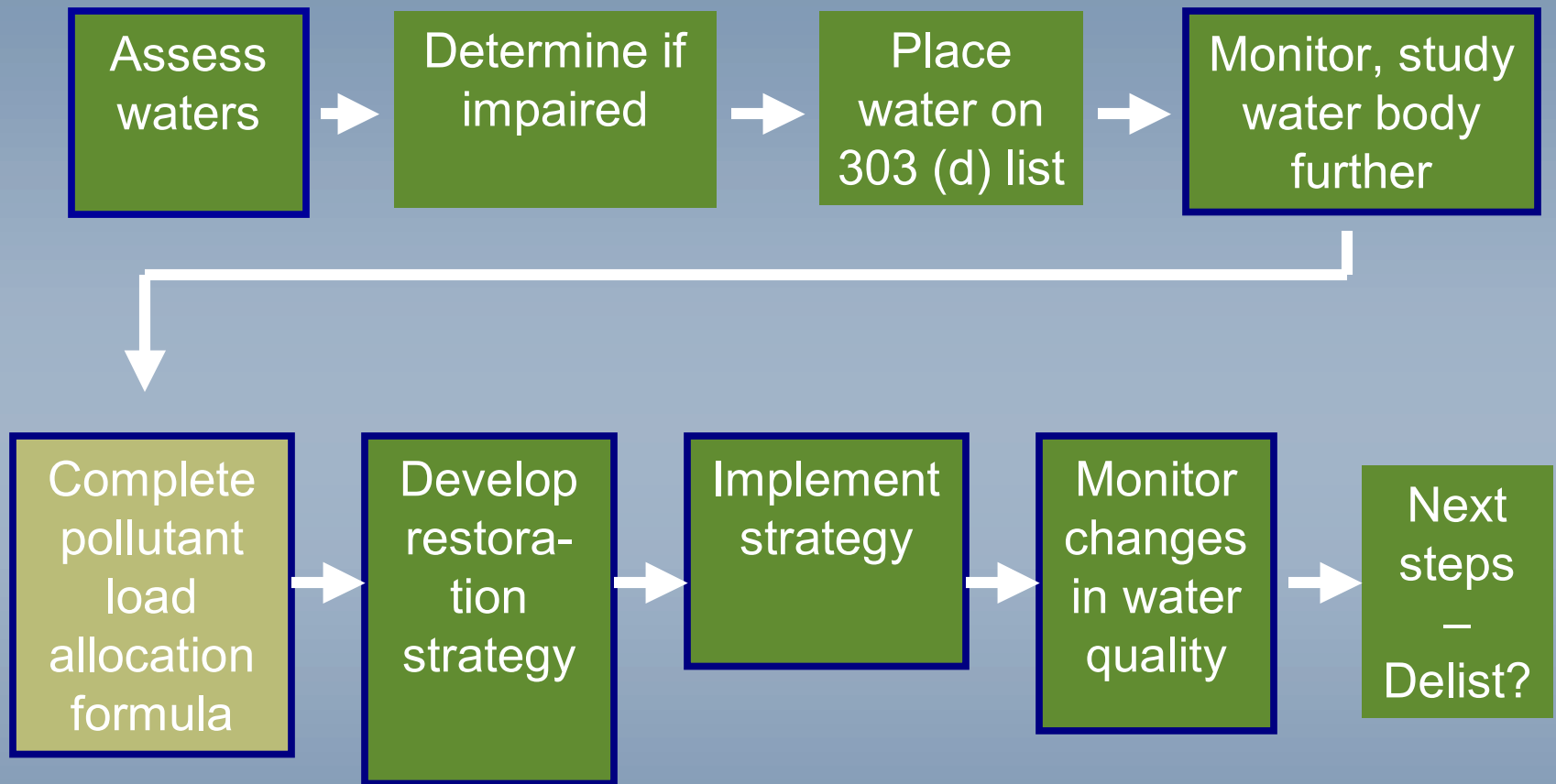
- It is a process



- It is a formula



TMDLs – The Process





TMDL – A Mathematical Formula

A TMDL Study must complete this pollution load allocation formula:

$$\text{LA(s)} + \text{WLA(s)} + \text{Margin of Safety} + \text{Reserve Capacity} = \text{Total Maximum Daily Load}$$

Where:

LA = Load allocations from nonpoint sources

WLA = Waste load allocations from point sources

Margin of Safety = to account for potential scientific error

Reserve capacity = set aside for future development

The allocation formula determines ...

the maximum amount
of a specific
pollutant that can be
discharged to a
waterbody and still
meet water quality
standards





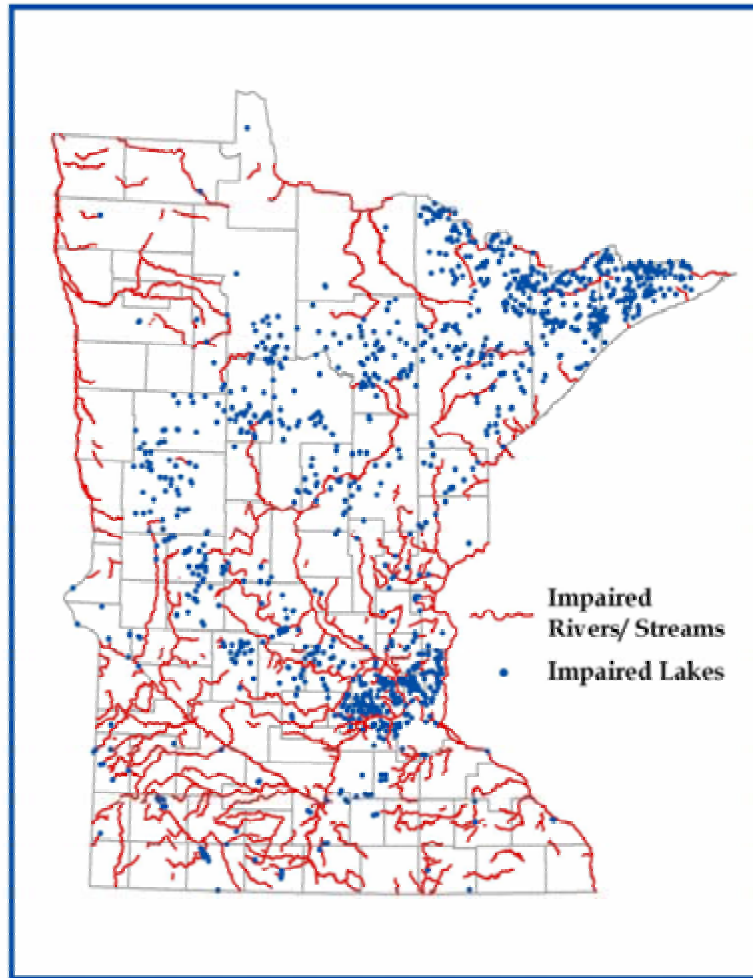
Why are Total Maximum Daily Load Studies Important?

Provides the mechanism for studying a water body so that:

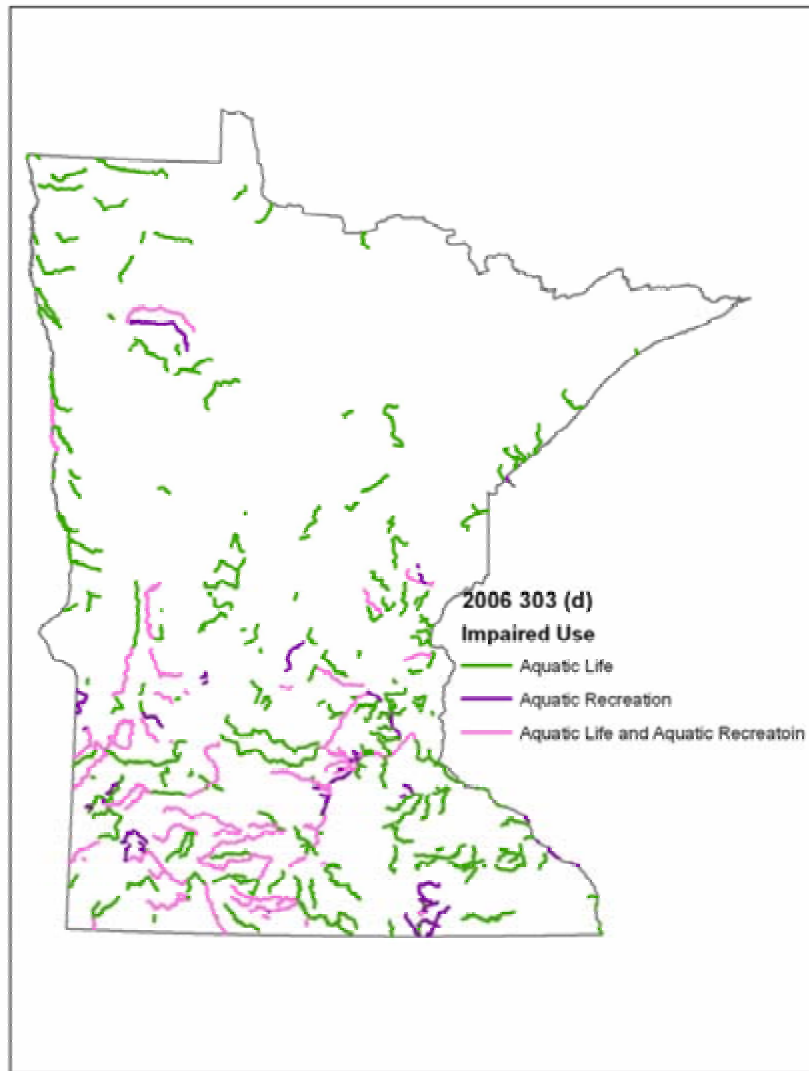
1. You can determine how much pollution must be reduced from all sources

2. You can plan an effective strategy for reducing existing pollutant loads to meet water quality standards

All Impairments as of 2006



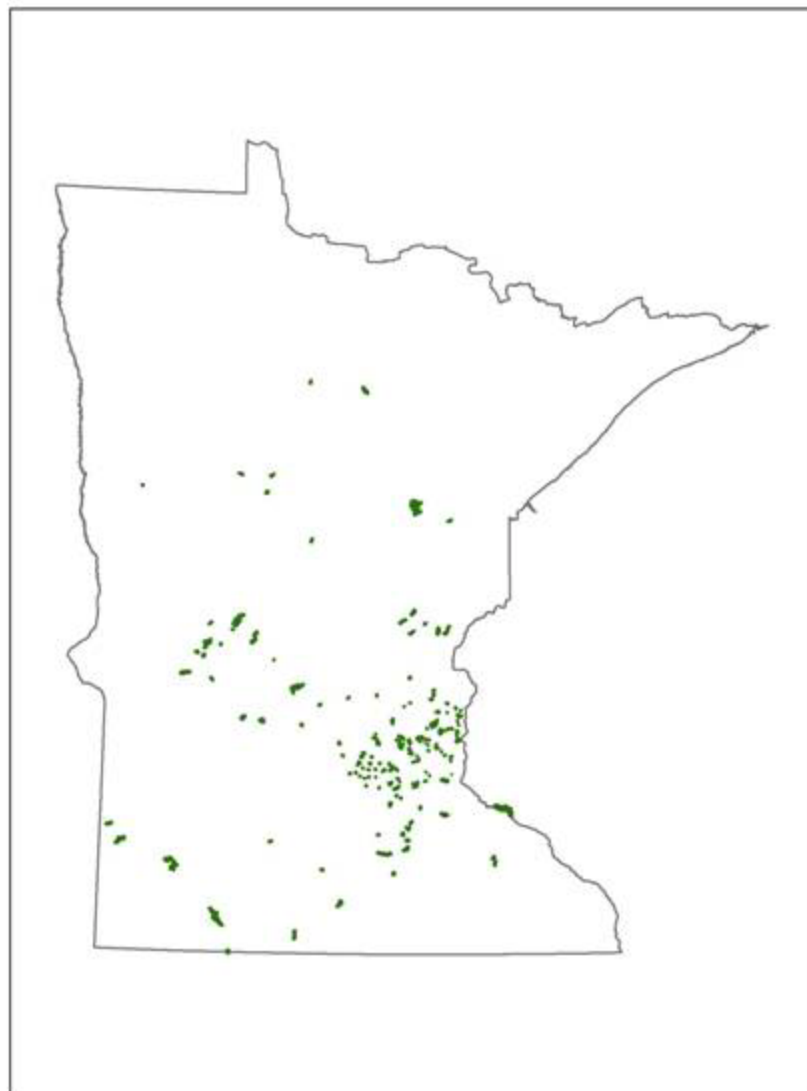
Conventional Parameter Listings



Most impairments:
Turbidity, low DO,
excess nutrients,
fecal coliform/ E.
coli, low Index of
Biotic Integrity
scores

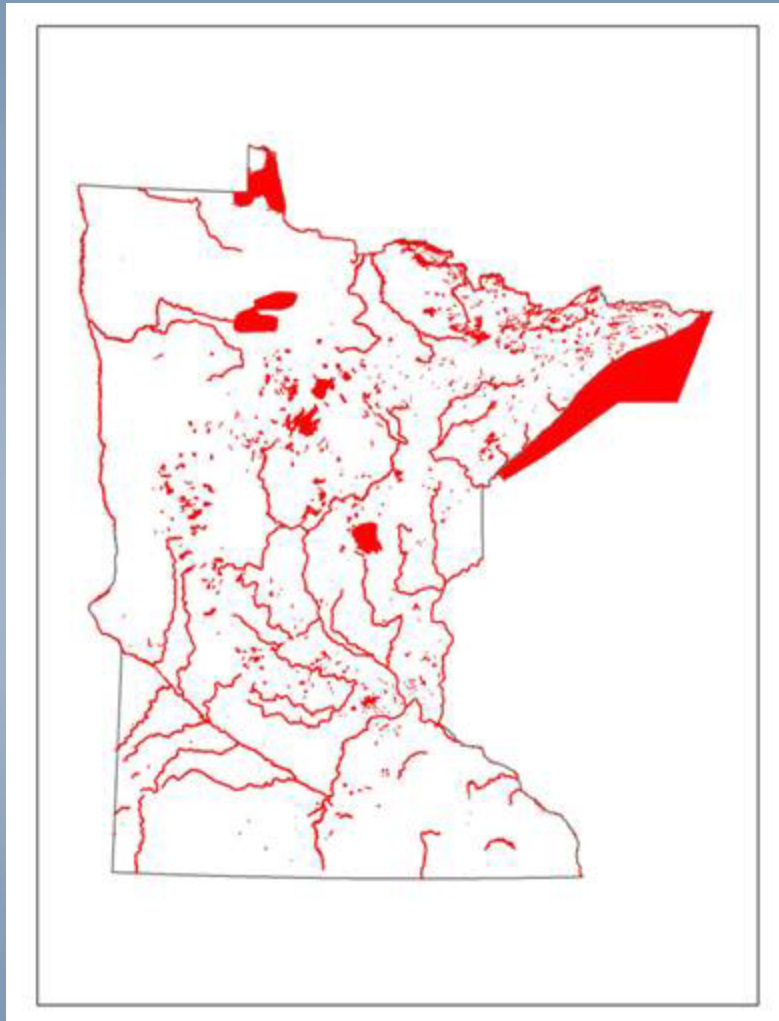


Nutrients/Lakes Listings





Bioaccumulative Toxics Listings



Impairments
mainly
caused by
mercury and
PCBs



Impairments, by Parameter

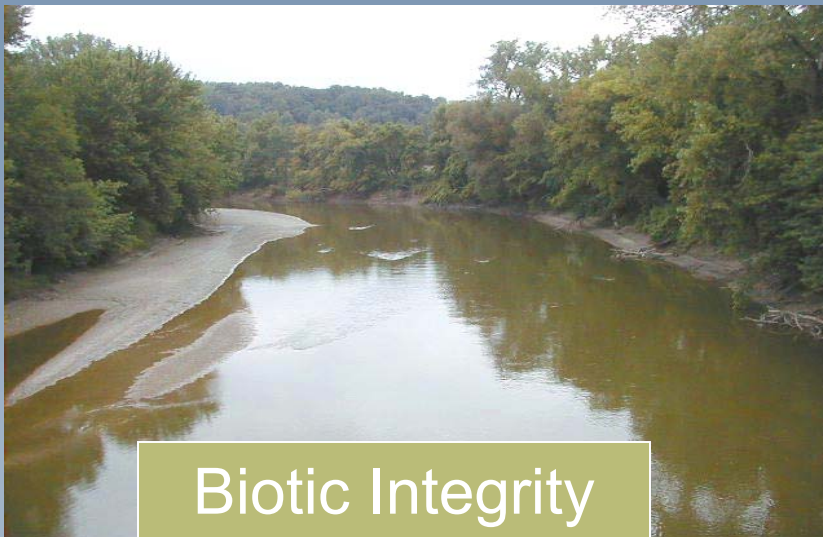
- Mercury – 1,312
- Turbidity - 218
- Eutrophication/P - 208
- Impaired Biota – 144
- PCBs - 141
- Fecal Coliform - 139
- Low Dissolved Oxygen – 54
- Others - 34



All Impairments, by Basin

- Upper Mississippi River – 595
- Minnesota River – 497
- Rainy River – 310
- Lake Superior – 271
- Red River – 200
- St. Croix - 158
- Lower Mississippi R. & Cedar R. – 154
- Des Moines R. and Missouri R. – 38/27

Examples of Impairment



Biotic Integrity



Fecal Coliform

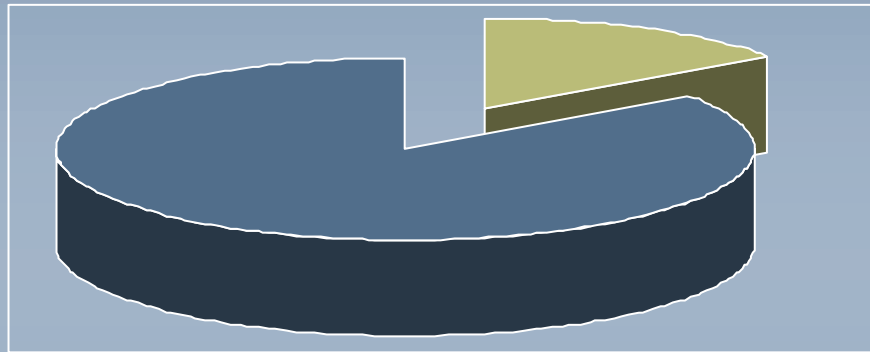


Nutrients



Turbidity

General Causes of Impairment Statewide



From the 305 (b) Report



Why develop a TMDL Study?

- Protects community assets and quality of life (*development potential, sense of place*)
- Restores beneficial uses of surface waters
- Required by Clean Water Act



Why develop a TMDL Study?

- Can provide an opportunity for local leadership
- Provides mechanism for integrating resource planning activities at local level (zoning, utility planning, water plans, etc.)
- TMDLs can provide a useful, long-range planning tool for managing water quality



Why develop a TMDL Study?


■ Benefits tourism industry in your community

- *Annually, tourism generates \$9 Billion in MN*
- *\$1.1 Billion a year in state and local tax revenues*
- *Paying for many roads, libraries, airports, and other amenities we value*

(Source: MN Office of Tourism)


■ Clean Water protects property values

- Public support for clean water is strong
--It's MPCA's top priority



What might happen *without* a TMDL Study?

- Human health and safety may be compromised
- Growth and development may be postponed until TMDL Study is approved by EPA
- Our greatest natural assets remain impaired for present and future generations




TMDLs require technical skills and people skills

A quantitative analysis which determines the maximum amount of a specific pollutant that a waterbody can safely handle and still meet beneficial uses

A collaborative process bringing together

- Citizens
- Industry
- Agriculture
- Local, state and federal governments
- Forestry

to solve a water quality problem




What must a TMDL Study include?

1. A ***public participation plan*** to ensure engagement, collaboration, success

2. An ***assessment of what's causing impairment***
(*may include biological, chemical, habitat, flow, etc.*)

3. A ***technical analysis*** of existing pollutant loads from point and nonpoint sources



What must a TMDL Study include?

4. An ***allocation*** of acceptable pollutant loads from point and nonpoint sources

5. An ***implementation strategy***

6. A ***monitoring strategy*** to determine effectiveness of restoration activities



TMDL Scale and Scope

- Location of impairments determine scale
- Majority done on a watershed scale
- Work with MPCA to determine appropriate scale

Examples of TMDL Scale - Subwatershed

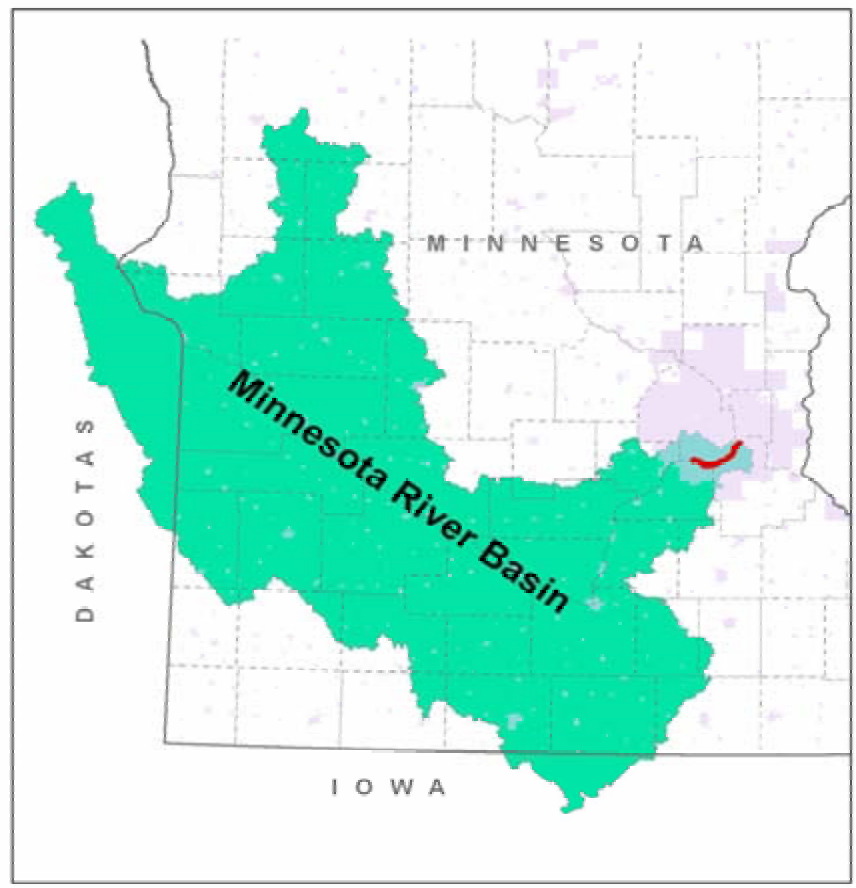


TMDL Scale - Watershed

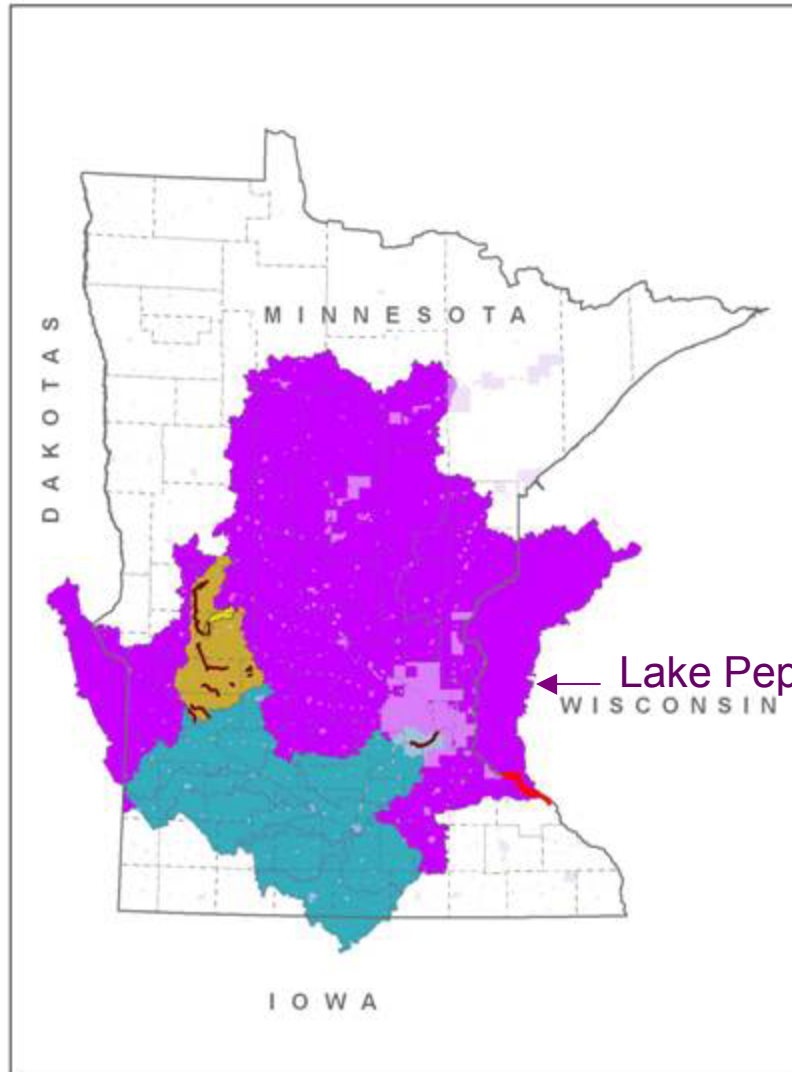




Scale - Basin



Scale – Multi-basin





TMDL Scope

- The scope of the study is determined by the number of parameter listings
- Where there are single parameters or where parameters have similar sources, the scope may be limited



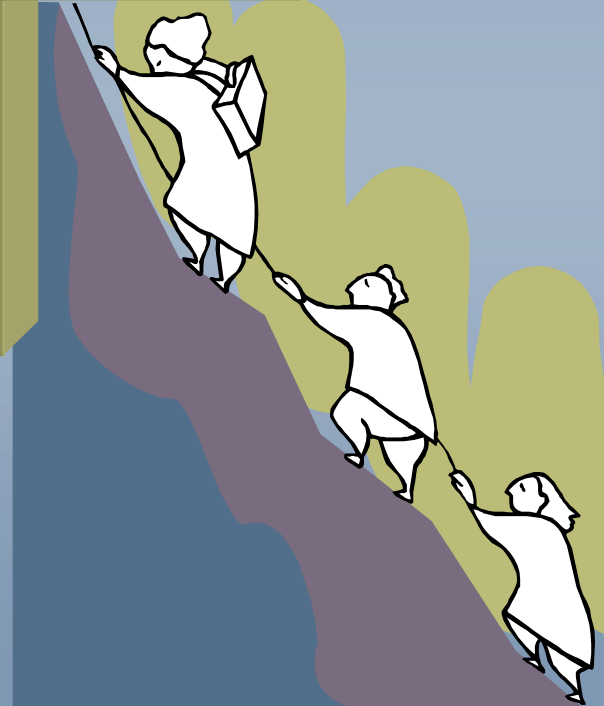
If you help develop a TMDL, what can you expect?

Better
Partnerships

Integrated
planning
process

More and
better
knowledge

Challenging
process





Resources Available to Start a TMDL Study



Funding for TMDL
Studies


MPCA staff
assistance

Consultant
pool



Frequently Asked Questions

(and Answers)



Q: Can previous studies (CWPs) fulfill requirements of a TMDL?

A. No.


- However, some or all data from previous projects may be useful in completing a TMDL
- TMDLs require completion of a load allocation formula which previous studies would not have done



Q: Who has legal responsibility for content of a TMDL Study?

A. The MPCA and US EPA

- MPCA reviews all TMDLs for quality and completeness
- MPCA and EPA responsible for legally defending the technical accuracy of the document



Q: Who will pay for TMDL implementation activities?

A. There are several possible sources of funds:

- State and federal funds
- Local government funds
- Private funds
- Others?



Q: Do TMDLs mean more regulation?

- A.** MPCA's regulatory authorities do not change as a result of a TMDL
- It is illegal to pollute waters of the state regardless of whether or not a TMDL has been completed



Q: Do TMDLs mean more regulation?

A. However, There may be legal implications to a TMDL:

- As a result of TMDL study, some National Pollutant Discharge Elimination System (NPDES) Permits may be modified
- Permit requirements are enforceable



Q: Do TMDLs mean more regulation?

- NPDES/SDS permits --may need to have effluent limits or other requirements modified:
 - 1) Wastewater/industrial NPDES/SDS permits
 - 2) Feedlot permits (if over 1000 animal units, or over 500 animal units in sensitive areas)
 - 3) ISTS (over 10,000 gpd) permits
 - 4) Permitted municipal separate storm sewer systems (MS4s)
 - 5) Construction stormwater permits



Q: Do TMDLs mean more regulation?

■ For Nonpoint Sources –

We will continue to rely on existing authorities and financial incentives and education to address certain nonpoint sources:


- 1) Agriculture
- 2) Forestry
- 3) Development/urbanization
- 4) Shoreland development



Q: Do TMDLs mean more regulation?

- Local units of government have authority to develop new regulatory tools to control nonpoint sources

(Examples: construction, zoning, shoreland, soil loss, and feedlot ordinances, drainage system management)



Q: Will TMDLs limit expansion of existing facilities?

A. TMDLs have mechanism in place to address this issue

- Specifically, the load allocation includes reserve capacity for future growth and development



Q: How Will We Implement TMDLs?

A:

Through collaborative efforts of public, private and non-profit organizations

With significant involvement from the public

With a long-term perspective in mind

Consistently, over a long period of time



Status of TMDL Studies in Minnesota*

- 77 TMDL studies currently underway for a total of 320 listings
- 90 Impaired waters listings from 14 studies with completed TMDLs
- 9 Delistings due to point and nonpoint improvements
- 19 Delistings due to better data
- 1 Statewide Mercury TMDL approved for 511 listings

*August 2007 data



Summary

- Impaired waters are waters not meeting state water quality standards
- The **Clean Water Act** requires that impaired waters be restored to meet beneficial uses
- A TMDL is the tool to accomplish water quality improvements
- TMDLs can provide a long-term holistic planning framework for managing water quality



Summary

- A TMDL is a process and a formula
- There are benefits – *and challenges* – to your community for developing a TMDL
- Funds and assistance are available to local units of government that develop TMDLs

“To understand water is to understand the cosmos, the marvels of nature, and life itself. “ -- Masaru Emoto

