The Total Maximum Daily Load (TMDL) process and the Northeast Lakeshore TMDL
Northeast Lakeshore TMDL

Study area
Cover nearly 2,000 square miles
Includes many major river basins

Impaired waters (Draft 2020 list)
Stream Segments
TP impaired: 74
TSS impaired: 3
TP & TSS impaired: 3
Lakes
TP impaired: 13

Focused on streams and rivers
(not Lake Michigan)
Funding from legislature in 2017
Clean Water Act

- TMDL development and implementation is part of the Clean Water Act

- Federal Law
  - Established in 1972
  - Amended in 1977

- Goal of “fishable, swimmable waters”
Clean Water Act

1) Adopt and revise water quality standards

2) Monitor and assess waters

3) Determine status and list impaired waters

4) Develop protection and restoration plans

5) Manage pollution sources through permits and grants

→ TMDL Development

→ TMDL Implementation
Clean Water Act

1) Adopt and revise water quality standards

Water Quality Standards- defined in two different ways

1) Activities or “Designated Uses”:
   - Fish & Aquatic Life
   - Recreation
   - Public Health

2) Water Quality Criteria:
   - **Numeric**: phosphorus, dissolved oxygen, pH, bacteria, toxic substances, etc.

   - **Narrative**: “no objectionable deposits”, “substances in concentrations or combinations shall not be harmful to humans, fish, plants, or other aquatic life.”

Per Wis. Stat. s. 281.15 water quality standards must be adopted by rule
Clean Water Act

1) Adopt and revise water quality standards

2) Monitor and assess waters

Assessments in the NE Lakeshore TMDL area

- 5,000 acres of lakes
  - ~90% assessed (4600 acres)

- 3,000 miles of streams,
  - ~55% assessed (1700 miles)

Mary Gansberg, DNR biologist, NE Region

Craig Helker, DNR biologist, SE Region
1) Adopt and revise water quality standards

2) Monitor and assess waters

3) Determine status and list impaired waters

Section 303(d)- Impaired waters list
- States submit their impaired waters list to EPA every 2 years
- Wisconsin’s most recent list submitted April 1, 2020

NE Lakeshore waterbodies on the 2020 Draft Impaired Waters List

Streams
- TP impaired: 593 miles
- TSS impaired: 13 miles
- TP & TSS impaired: 15 miles

Lakes
- TP impaired: 500 acres
1) Adopt and revise water quality standards
2) Monitor and assess waters
3) Determine status and list impaired waters
4) Develop protection and restoration plans
5) Manage pollution sources through permits and grants

→ TMDL Development

→ TMDL Implementation
1) Adopt and revise water quality standards
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TMDLs do not create new rules or regulatory requirements but rather rely on existing rules for implementation.
TMDLs help prioritize the use of existing programs and resources to target areas with the highest pollutant runoff.

→ TMDL Development
→ TMDL Implementation
NEL TMDL addresses TP and TSS; studies N

**Nutrients**
- Phosphorus (TP)
- Nitrogen (N)

- Fuel excess algae growth
- Decrease dissolved oxygen, harming certain fish and aquatic organisms
- Decrease recreation

**Sediment**
- (Total Suspended Solids – TSS)

- Covers rocky habitat needed by certain fish and aquatic insects
Watersheds, Phosphorus, and Sediment

All together, a "little" polluted run-off adds up to BIG PROBLEMS.

- Destroyed Habitats
- Silt covered spawning beds
- Fewer game fish
- More rough fish
- Too much weed and algae growth

Unpleasant Views
Total Maximum Daily Load (TMDL)
A framework for watershed restoration

TMDLs address pollution from many different sources.

TMDLs address pollution in surface waters, not groundwater.

Naturally occurring from wetlands, forests

Agricultural Runoff

Industrial Wastewater

Municipal Wastewater

Non-permitted urban stormwater runoff

Permitted urban stormwater outfalls (MS4)
Total Maximum Daily Load (TMDL): Amount of a pollutant a waterbody can receive and still meet water quality standards.

Total Maximum Daily Load Process

Phase 1: TMDL Development

Phase 2: TMDL Implementation

Impaired Waters

Restored Waters
Total Maximum Daily Load (TMDL): Amount of a pollutant a waterbody can receive and still meet water quality standards.

Total Maximum Daily Load Process

Impaired Waters → Phase 1: TMDL Development → Phase 2: TMDL Implementation → Restored Waters
TMDL Development

1. Calculate Baseline loads
   What are the current pollutant loads and how much is coming from each source?

2. Determine loading capacity
   What amount of pollutant can a waterbody receive?

3. Allocate load among sources
   What amount of pollutant reduction is needed from each source?

Public outreach/communication
TMDL Development

1. Calculate Baseline loads
   - What are the current pollutant loads and how much is coming from each source?

2. Determine loading capacity
   - What amount of pollutant can a waterbody receive?

3. Allocate load among sources
   - What amount of pollutant reduction is needed from each source?

Public outreach/communication
TMDL Example

Waterbody: Stream
Pollutant: phosphorus
Criteria: 75 μg/L

1) Baseline Load Analysis, Uses watershed surveys and watershed models

Phosphorus = 150 μg/L
Status = Impaired

10,000 lb of P per year
TMDL Example

Waterbody: Stream
Pollutant: phosphorus
Criteria: 75 $\mu$g/L

1) Baseline Load Analysis
2) Loading Capacity

Loading capacity = Water quality criteria * Streamflow
3,000 lb per year = 75 $\mu$g/L * 20 million liters

10,000 lb of P per year
TMDL Example

Waterbody: Stream
Pollutant: phosphorus
Criteria: 75 μg/L

1) Baseline Load Analysis
2) Loading Capacity
3) Allocations

Baseline load = 10,000 lb of P per year
Loading capacity = 3,000 lb per year

70% reduction needed to meet water quality standards

3,000 lb of P per year

Urban runoff: 70% reduction
Wastewater: 70% reduction
Agricultural runoff: 70% reduction
Naturally occurring: No reduction for natural load
Development Efforts for the NE Lakeshore TMDL

Many involved...

Legislature funding
Statute 281.145

EPA funding to contract the Cadmus Group

Local Watershed Groups

Citizen Monitoring Volunteers

County Land and Water Conservation Departments
Brown, Calumet, Door, Kewaunee, Fond du Lac, Manitowoc, Ozaukee, Sheboygan
**TMDL development – How to stay engaged**

**Stream monitoring**

<table>
<thead>
<tr>
<th>Year</th>
<th>Description</th>
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<tbody>
<tr>
<td>2017</td>
<td>WI legislature supports NE Lakeshore TMDL</td>
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<td>2018</td>
<td>Completed inventory of WPDES permit holders and effluent monitoring data</td>
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<td>2021</td>
<td>Stakeholder meetings/webinar: Spring 2021, Present draft allocation results, Public comment period on draft allocations, Conduct Public Hearing, Mid to late 2021, Present draft TMDL report, Public comment period on TMDL report</td>
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**Watershed model contract:** Nov. 2018 – May 2021

**Mid June, webinar 1:** TMDL Overview

**Early July, webinar 2:** Water quality data and impairments (3 separate presentations for each basin).

**Late July, webinar 3:** Watershed model introduction and data inputs

**August, webinar 4:** Watershed model setup

**Public comment period on model setup report**

**Public comment period on model report**

**Public comment period on draft allocations**

**Conduct Public Hearing, Mid to late 2021**

**Public comment period on TMDL report**
TMDL development – How to stay engaged

Completed inventory of WPDES permit holders and effluent monitoring data

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Completed analysis of stream monitoring data

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August, webinar 4: Watershed model setup

Public comment period on model setup report

Stakeholder meetings/webinar. Late 2020 to early 2021.
Present draft watershed modeling report, baseline load results, and allocation methods

Public comment period on model report.

Stakeholder meetings/webinar: Spring 2021
Present draft allocation results.

Public comment period on draft allocations

Conduct Public Hearing. Mid to late 2021
Present draft TMDL report

Public comment period on TMDL report

Mid 2022: Anticipated submittal of TMDL report to EPA for approval

2023: Anticipated start of the TMDL implementation phase
Total Maximum Daily Load (TMDL) Process

Phase 1: TMDL Development

Phase 2: TMDL Implementation

Impaired Waters

Restored Waters
Implementation of TMDL plans relies on the use of...

- Existing Programs
- Existing Regulations
- Existing Resources
- Existing Rules
Implementation Mechanisms

- **Point sources (wastewater dischargers and permitted MS4s):** Wisconsin Pollutant Discharge Elimination System (WPDES) permits
- **Nonpoint sources:** NR 151 Agricultural & Non-Agricultural Performance Standards
- **Others:** Local construction site erosion control ordinances, manure storage ordinances, shoreland zoning, etc.
Wastewater Allocations
(municipal and industrial dischargers)

• Once EPA has approved the TMDL, the next permit must contain an expression of the WLA consistent with the TMDL.

• Implemented through NR 217 and permits.

• Baseline loads and conditions included in the TMDL.

• Allocations listed by facility.

• Reserve capacity will be included in this TMDL.
Permitted MS4s

• Assigned individual allocations for each subbasin.

• Implemented in permit with an extended compliance schedule with specified benchmarks.

• See existing general permit for more information

Nonpoint Implementation

• Allocations will be expressed as an edge of field targets consistent with the SnapPlus model.

• The TMDL baseline will be also expressed as an edge of field target allowing for the use of a percent reduction framework for implementation.

• Compliance with TMDL agricultural targets is voluntary unless promulgated through NR 151.004. Cost share requirements still in place.
Nonpoint Implementation: 9 Key Element Plans

1. Identify the causes and sources that need to be controlled to achieve pollutant load reductions. This includes quantifying significant sources and background levels using maps and tables.

2. Estimate the pollutant load reductions expected from selected management measures.

3. Describe management measures that need to be implemented to achieve load reductions. Map priority areas for implementing practices.

4. Estimate amounts of technical and financial assistance needed, associated costs, and/or the sources and authorities that will be relied upon, to implement the Plan.

5. Develop an information & education component to encourage participation and Plan implementation.

6. Develop a schedule for implementing the management measures identified in the Plan.

7. Describe interim, measurable milestones to assess if the Plan is being implemented.

8. Identify a set of criteria to determine whether Plan objectives are or are not being achieved over time. Outline how and when the Plan will be revised if progress is not being made.

9. Develop a monitoring component to evaluate the effectiveness of the implementation efforts over time using criteria from elements 6, 7 and 8.
Nine Key Element Plan areas

[Map showing various regions and tributary basins, including Ahnapee, Black, Sauk, Sucker, Kewaunee, Manitowoc, Pine Creek, Fond du Lac, Plymouth, Howards Grove, Sheboygan, Oostburg, Sheboygan, and Twin.]
Summer 2020 Webinar Series

**Webinar 1: TMDL process and introduction to the NE Lakeshore TMDL**
- Overview development and implementation process
- Project progress
- Future outreach

**Wednesday June 25 10 AM CT**

**Webinar 2: Water Quality Data and Impairments**
- Stream monitoring methods
- Impaired waters and water quality
- Data for each major drainage basin
  - Kewaunee/Twin/Ahnapee
  - Manitowoc
  - Sheboygan

**Thursday July 9 10 AM CT**

**Webinar 3: Watershed Model Introduction and Data inputs**
- Overview of the Soil and Water Assessment Tool and relation to TMDL development
- Model inputs
  - TMDL subbasins
  - Permitted point sources
  - Permitted urban stormwater areas (MS4s)
  - Agricultural land use and practice data

**Anticipated Late July**

**Webinar 4: Watershed Model setup**
- Model parameters and assumptions
- Development of Hydrologic Response Units (HRUs)
- Calibration and Validation methods

**Anticipated Late August**
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