Note this TMDL was approved by the United States Environmental Protection Agency on February 13, 2025. The TMDL Information Session PowerPoint is for informational purposes. See Final TMDL and Appendices for details.

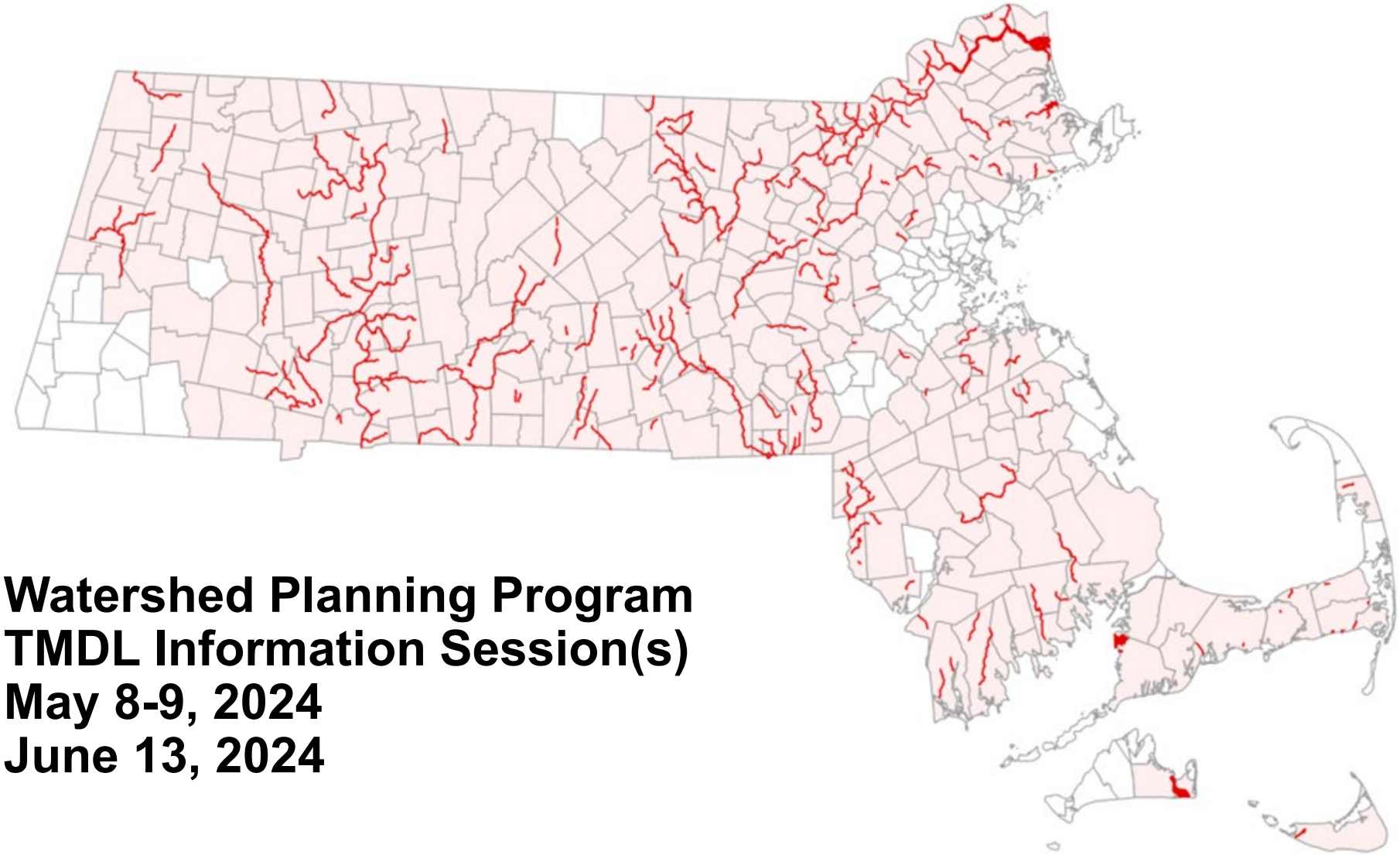
Please Sign Attendance Sheet

Thank you!

Zoom meeting recording disclaimer

Please note that we will be recording this meeting and will retain the recording in accordance with the Commonwealth's records retention rules. The recording will be used internally to review the comments and suggestions provided during the meeting.

Draft Massachusetts Statewide Total Maximum Daily Load (TMDL) for Pathogen-Impaired Waterbodies



MassDEP

Watershed Planning Program
TMDL Information Session(s)
May 8-9, 2024
June 13, 2024

Draft Massachusetts Statewide Total Maximum Daily Load (TMDL) for Pathogen-Impaired Waterbodies

Agenda:

-Overview of the MassDEP Watershed Planning Program

-Overview of the Clean Water Act & TMDLs

-Statewide Approach

-TMDLs for Pathogen-Impaired Waterbodies

-Implementation

-Public Comments and Next Steps

MassDEP
Watershed Planning Program

We are stewards of the water resources of Massachusetts. Together with other state environmental agencies, we share in the duty and responsibility to protect, enhance, and restore the quality and value of the waters of the Commonwealth. We are guided by the federal Clean Water Act and work to secure the environmental, recreational, and public health benefits of clean water for the residents of Massachusetts.

MassDEP
Watershed Planning Program

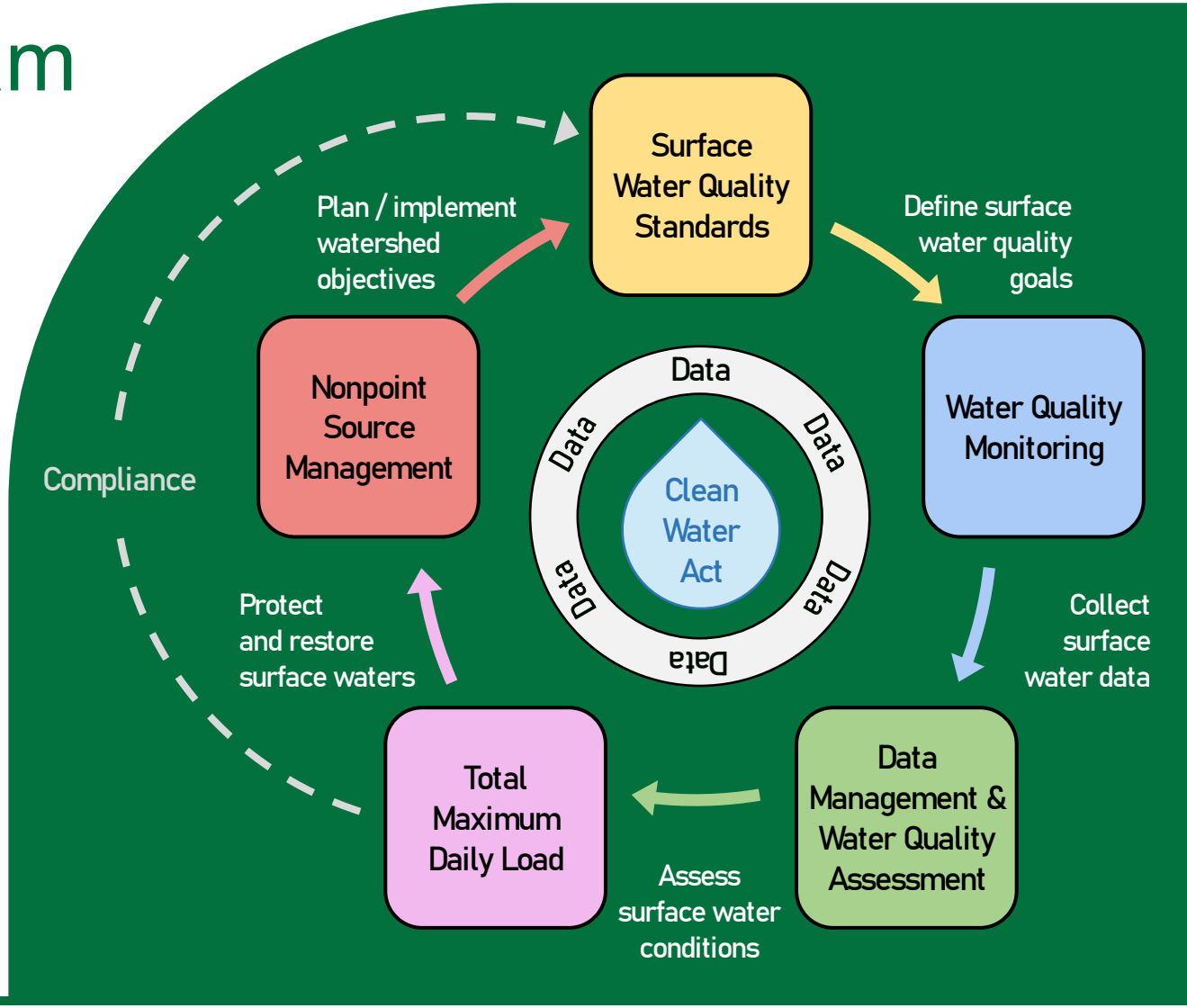
Develop and implement the Massachusetts Surface Water Quality Standards (314 CMR 4.00)

Monitor the physical, chemical, and biological characteristics of surface waters in the Commonwealth of Massachusetts

Manage data and report the results of monitoring. Assess surface water quality conditions and attainment of existing and designated uses as defined in the Surface Water Quality Standards

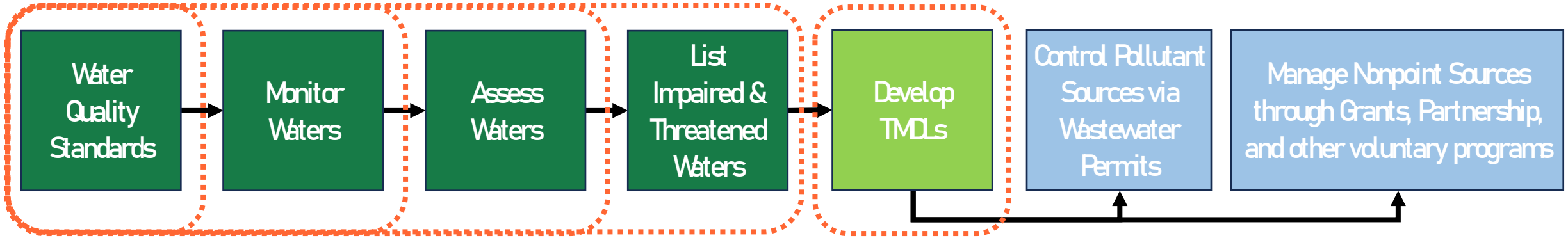
Develop TMDLs and other plans to restore impaired surface waters and to protect high quality waters

Watershed planning through implementation of the Nonpoint Source (319) and Water Quality Management Planning (604b) programs



Clean Water Act (CWA)

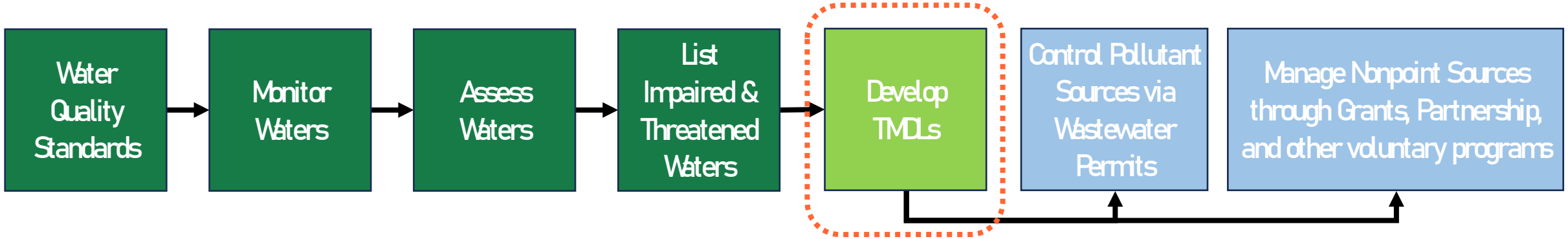
The federal Clean Water Act requires states to establish water quality standards, monitor and report on the condition of their water resources and whether they are healthy or impaired relative to water quality standards..



Section 303(d) of the federal Clean Water Act requires states to identify those waterbodies that do not meet surface water quality standards and to prioritize them for the development of a total maximum daily load (TMDL).

Total Maximum Daily Load (TMDL)

A TMDL establishes the maximum amount of a pollutant that a waterbody can receive and still attain water quality standards.



- "Pollutant Budget" designed to restore the health of a waterbody
- Useful, long-range planning tool for managing water quality

Total Maximum Daily Load (TMDL)

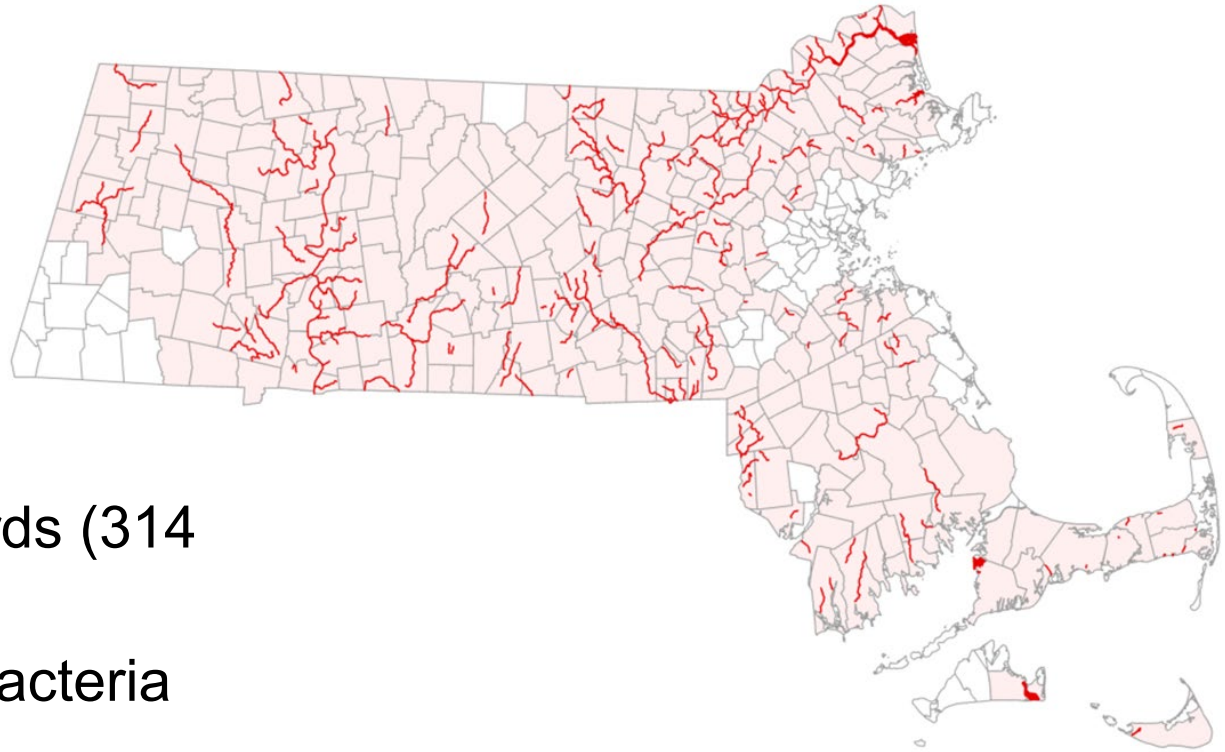
- A TMDL is a planning document that provides a framework for water quality restoration.
- The Statewide Pathogen TMDL:
  - Follows methodology of previous EPA-approved pathogen TMDLs.
  - The goal is to limit disease causing pathogens.
  - Previous EPA-approved pathogen TMDLs are still in place.
  - Replaces draft TMDLs located in the Blackstone, Concord, Merrimack, and Nashua watersheds.
  - Based on the 2018/2020 Impaired Waters List.
  - Future pathogen TMDLs will be developed as part of 2-year listing cycle.

Statewide Pathogen TMDL Approach

- Improve efficiency – common sources, common implementation strategies, quicker TMDL development
- Watershed approach
- Readily available data
- Defined types and categories of sources based on different land use types
- Existing guidance to help implementation

Draft Massachusetts Statewide TMDL for Pathogen-Impaired Waterbodies

- TMDLs for 228 pathogen-impaired segments identified in *Massachusetts Integrated List of Waters for the Clean Water Act 2018/2020 Reporting Cycle*
- Indicator bacteria include:
  - Enterococci
  - *E. coli*
  - Fecal coliform
- All TMDL targets are based on meeting water quality criteria established in the Massachusetts Surface Water Quality Standards (314 CMR 4.00)
- TMDL reduction goals are based on existing bacteria data



Statewide Pathogen TMDL - Document Structure

Core Document

- Consistent with previously-approved pathogen TMDLs
- Includes all **general** components of a TMDL Document:
  - Regulatory background
  - Pollutant of Concern and Pollutant Sources
  - Applicable SWQS & Numeric Water Quality Target
  - TMDL Calculation Methodology
  - Development of Load & Waste-Load Allocations
  - Loading Capacity
  - Margin of Safety
  - Seasonal Variation
  - Implementation tasks
  - Monitoring
  - Reasonable Assurance

No revisions to Core Document needed for future TMDLs

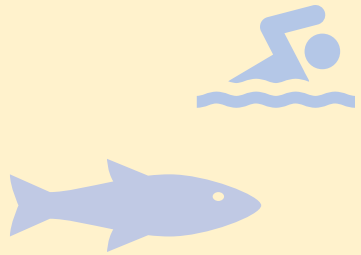
Appendices

- Includes **specific** waterbody information
- Overview of watershed
- Segment-by-segment descriptions, land use, data and sources
- Summarizes existing water quality data
- Pathogen Sources
- Existing Local Management
  - Town-specific information
  - Local bylaws & ordinances
  - Watershed-based Plans

Appendices will be added as new pathogen impairments are listed

Pathogens

Pathogens are disease-causing organisms



Pathogens can infect humans (consumption of fish/shellfish, skin contact, ingestion of water)

Fecal coliform, enterococci, *E. coli* are indicator bacteria of potentially harmful pathogens

Massachusetts Surface Water Quality Standards define numeric water quality criteria for indicator bacteria

Indicator Bacteria

Enterococci	• Current indicator applicable to all waters in Massachusetts (fresh water and coastal and marine waters).
E. coli	• Current indicator applicable to fresh waters only.
Fecal coliform	• Current indicator at water supply intakes in unfiltered public water supplies (Total or Fecal Coliform) and Massachusetts Division of Marine Fisheries (DMF) National Shellfish Sanitation Program monitoring (Fecal Coliform only).

Massachusetts Surface Water Quality Standards (SWQS) (314 CMR 4.00)

- Class A & B (freshwater, primary contact recreation)
  - *E. coli*
    - ≤ 126 CFU per 100mL (geometric mean*)
    - ≤ 410 CFU per 100mL (Statistical Threshold Value*)
  - Enterococci
    - ≤ 35 CFU per 100mL (geometric mean*)
    - ≤ 130 CFU per 100mL (Statistical Threshold Value*)

* Both geomean and Statistical Threshold Value are calculated on either a 30-day or 90-day rolling basis

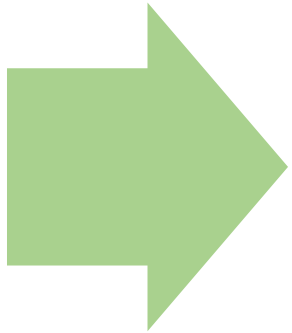
Massachusetts Surface Water Quality Standards (SWQS) (314 CMR 4.00)

- Class SA & SB (coastal and marine waters, Primary Contact Recreation)
  - Enterococci-same criteria as Class A & B
- Class SA (coastal and marine waters, Shellfishing)
  - Fecal Coliform
    - ≤ 14 MPN per 100mL (geometric mean*)
    - ≤ 28 MPN per 100mL (Statistical Threshold Value*)
- Class SB (coastal and marine waters, Shellfishing)
  - Fecal Coliform
    - ≤ 88 MPN per 100mL (geometric mean*)
    - ≤ 260 MPN per 100mL (Statistical Threshold Value*)

* Both geomean and Statistical Threshold Value are calculated on either a 30-day or 90-day rolling basis

TMDL Target

TMDL Target and numeric endpoint



Numeric Water Quality Criteria for indicator bacteria defined in Massachusetts SWQS

(314 CMR 4.00)

Source Assessment

Core Document

Discuss **all** potential point and nonpoint sources of pathogens

Appendices

- Includes **specific** waterbody information
- Land use information
- % impervious area
- Permitted discharge outfalls (CSO, WWTF, MS4)

Source Assessment – Common Sources

Urban & Suburban Areas

- LEAKING SEWERS/CSOs
- STORMWATER/ ILLICIT CONNECTIONS
- FAILING SEPTIC SYSTEMS

Coastal & Other Recreational Areas

- SWIMMER IMPACTS/ IMPACTS IN SWIMMING AREAS
- BOAT WASTE/ MARINAS

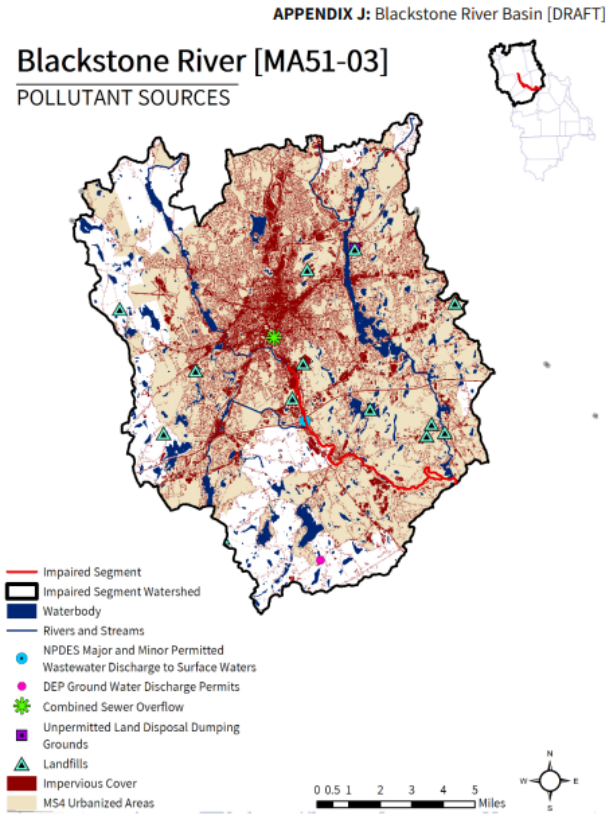
Agriculture

- LIVESTOCK
- MANURE APPLICATION/ STORAGE
- ANIMAL FEEDING OPERATIONS

Other

- WILDLIFE (Including Birds)
- DOMESTIC PETS

Source Assessment - Appendices



Waterbody Overview including land use information

Detailed maps and tables identifying permitted discharges

Table 5-1. National Pollutant Discharge Elimination System (NPDES) permits for Wastewater Treatment Facilities (WWTF) in the segment watershed. Only permits unique to this segment watershed are shown. WWTF are identified as either municipal (MUN) or other (OTH), if applicable.

NPDES ID	NAME	TOWN	WWTF
MA0102369	UPPER BLACKSTONE WPAD	MILLBURY	MUN

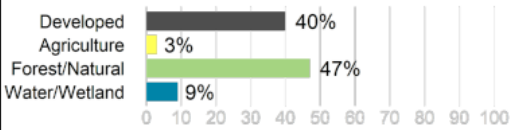
Table 5-2. Groundwater discharge permits in the segment watershed. Only permits unique to this segment watershed are shown. PERR = permit number plus renewal number. TYPE = type of groundwater discharge. FLOW = permitted effluent in gallons per day (gpd).

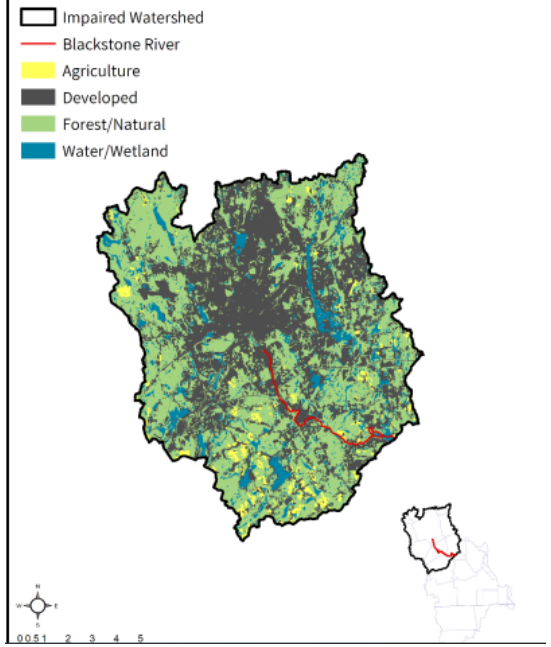
PERR	NAME	TOWN	TYPE	FLOW (GPD)
641-2M1	SUTTON PUBLIC SCHOOLS	SUTTON	Sanitary Discharge	10,880

Table 5-3 Combined Sewer Overflows (CSOs) discharging to the segment.

NPDES ID	NAME	TOWN	DEP OUTFALL ID
MA0102997	CITY OF WORCESTER	Worcester	WOR001

Reduction from Highest Calculated Geomean: 97%
Watershed Area (Acres): 86,589
Segment Length (Miles): 10.4
Impairment(s): *E. coli* (Primary Contact Recreation)
Class (Qualifiers): B (Warm Water, CSO Receiving Water)
Impervious Area (Acres, %): 16,566 (19%)
DCIA Area (Acres, %): 12,064.75 (14%)





TMDL Types

Concentrations of indicator bacteria (expressed as bacteria counts/100mL of water)

Loads of indicator bacteria (expressed as numbers of bacteria/day)

TMDL Calculation

Core Document

Details **how** TMDLs and percent reductions are calculated, including **equations** and **examples**.

Details approach used to set the waste load allocation, load allocation and margin of safety.

Appendices

Includes **calculations** for each impaired segment:

- flow-based and concentration-based **TMDLs and allocations**
- **maximum geomeans** based on existing data,
- **percent reductions** needed to meet SWQS

Implementation - Recommendations

- Review TMDL report
- Review information on sources
- Conduct source identification and characterization program
- Prioritize sources for mitigation
- Refer to Massachusetts Clean Water Toolkit
- Develop site specific designs & program
- Identify funding options
- Implement best management practices
- Monitor changes
- Repeat until SWQS are met

Implementation – Prioritization ranking for each segment

- **High priority** was assigned to those segments where either dry or wet weather concentrations were equal to or greater than 10,000 CFU /100 ml.
- **Medium priority** was assigned to segments where concentrations ranged from 1,000 to 9,999 CFU/100ml
- **Low priority** was assigned to segments where concentrations were observed less than 1,000 CFU/100 ml.
- Prioritization is adjusted upward one level for dry weather exceedances, CSO, POTW discharges, proximity to sensitive areas, >10% MS4 area

Implementation – Wet/Dry Weather Analysis

Examples of **wet** weather sources:	Examples of **dry** weather sources:
• wildlife and domesticated animals (including pets), • stormwater runoff including point sources from municipal separate storm sewer systems (MS4s) • CSOs and SSOs.	• leaking sewer pipes, • stormwater drainage systems (illicit connections of sanitary sewers to storm drains), • failing septic systems, • recreational activities, and • wildlife, including birds.

Implementation - Sources and Management Practices

Urban and Suburban

- Control Stormwater
- Repair Septic Systems
- Eliminate CSOs
- Eliminate Illicit Connections

Agricultural

- Application of manure
- Grazing Management
- BMP Controls on Animal Feed Operations

Recreation

- Strict BMP Controls near Swimming Beaches
- Control Boat & Marina Sewage Wastes

Implementation – Sources and Management Practices

Pathogen Sources in Urban & Suburban Areas

- Leaking sewer, CSOs
- Stormwater, illicit connections
- Failing Septic Systems

Photo credit: Massachusetts Rivers Alliance

Remediation Actions

- CSO controls, long-term control plans, repair or replace failing infrastructure
- Stormwater controls, fix illicit connections
- Repairing or replacing failed septic systems (regulated under Title 5)

Implementation – Sources and Management Practices

Pathogen Sources in Agricultural Areas

- Livestock
- Manure application and storage
- Animal feeding operations

Photo credit: UMASS Amherst Extension

Photo credit: Philip Gruber

Remediation Actions

- Implement MDAR Nutrient Management Plan guidelines
- Application of best management practices (BMPs) to manage/reduce runoff
- Application of BMPs to keep animals out of the impaired waterbodies

Implementation – Sources and Management Practices

Pathogen Sources in Coastal and Other Recreational Areas

- Swimmer impacts/impacts in swimming areas
- Boat waste/marinas

Photo Credit: NBC10 Boston

Remediation Actions

- Availability of bathroom and shower facilities
- Proper disposal of used diapers
- Ensure availability of boat pump-out services

Implementation – Sources and Management Practices

Other Pathogen Sources

- Wildlife (including birds)
- Domestic Pets

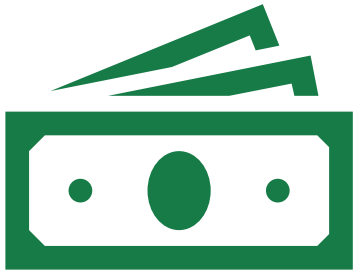
Remediation Actions

- Bi-laws and ordinances
- Targeted education and outreach
- Installing signage, provide receptacles

Implementation - Actions Needed

- CSO Controls/Long-Term Control Plans/ Fix Illicit Connections
- Stormwater Controls
- Repairing or Replacing Failed Septic Systems
- Sound Agricultural Practices (application of BMPs)
- Public Education to Control Pet Waste and Impacts of feeding birds, ducks, gulls, etc.
- Controlling Boat Waste in Coastal Areas
- Assist with Funding for Remediation

Funding Sources



- Grants administered by MassDEP Watershed Planning Program:
  - CWA Section 604(b) grants (EPA/MassDEP)
  - CWA Section 319 grants (EPA/MassDEP)
  - Water Quality Monitoring grants
- Environmental Quality Incentives Program (EQIP funds) (NRCS)
- State Revolving Fund (SRF) Loan Program
- Massachusetts Stormwater MS4 Municipal Assistance Grant Program
- CZM Coastal Pollution Remediation grant program

TMDL Timeline

Public / Municipalities:
Submit comments to MassDEP by ~~**June 10, 2024,**~~ **June 21, 2024 at 5:00pm**

MassDEP:
Revise draft TMDL (based on public input)

EPA:
Review TMDL and approve within 30 days of receiving

MassDEP:
Submit final TMDL to EPA

Municipalities:
Continue Comprehensive Wastewater Management Planning (CWMP)

Public Comment Period

Comments due by **Friday – June 21st** at 5:00 pm

Email Address:
Timothy.m.fox@mass.gov

Email Subject:
Statewide Pathogen TMDL (CN 515.0) comments

Mailing Address:

MassDEP
Watershed Planning Program
Attn: Timothy Fox
8 New Bond Street
Worcester, MA, 01606

Thank You

Massachusetts Department of
Environmental Protection