Mystic River Alternative TMDL*

2023 National Training Workshop on Water Quality Data, Assessment, and Plans

June 21, 2023

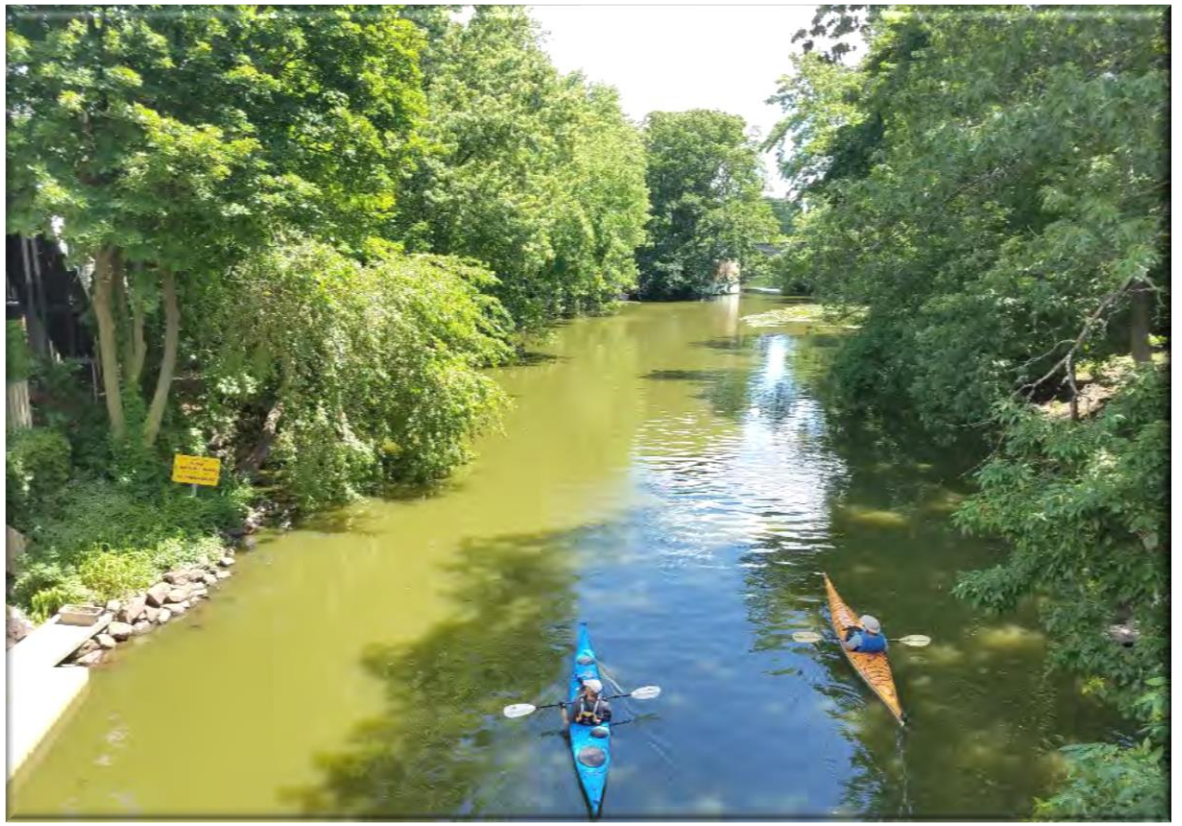
*An advance restoration plan by any other name would smell as sweet 

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.

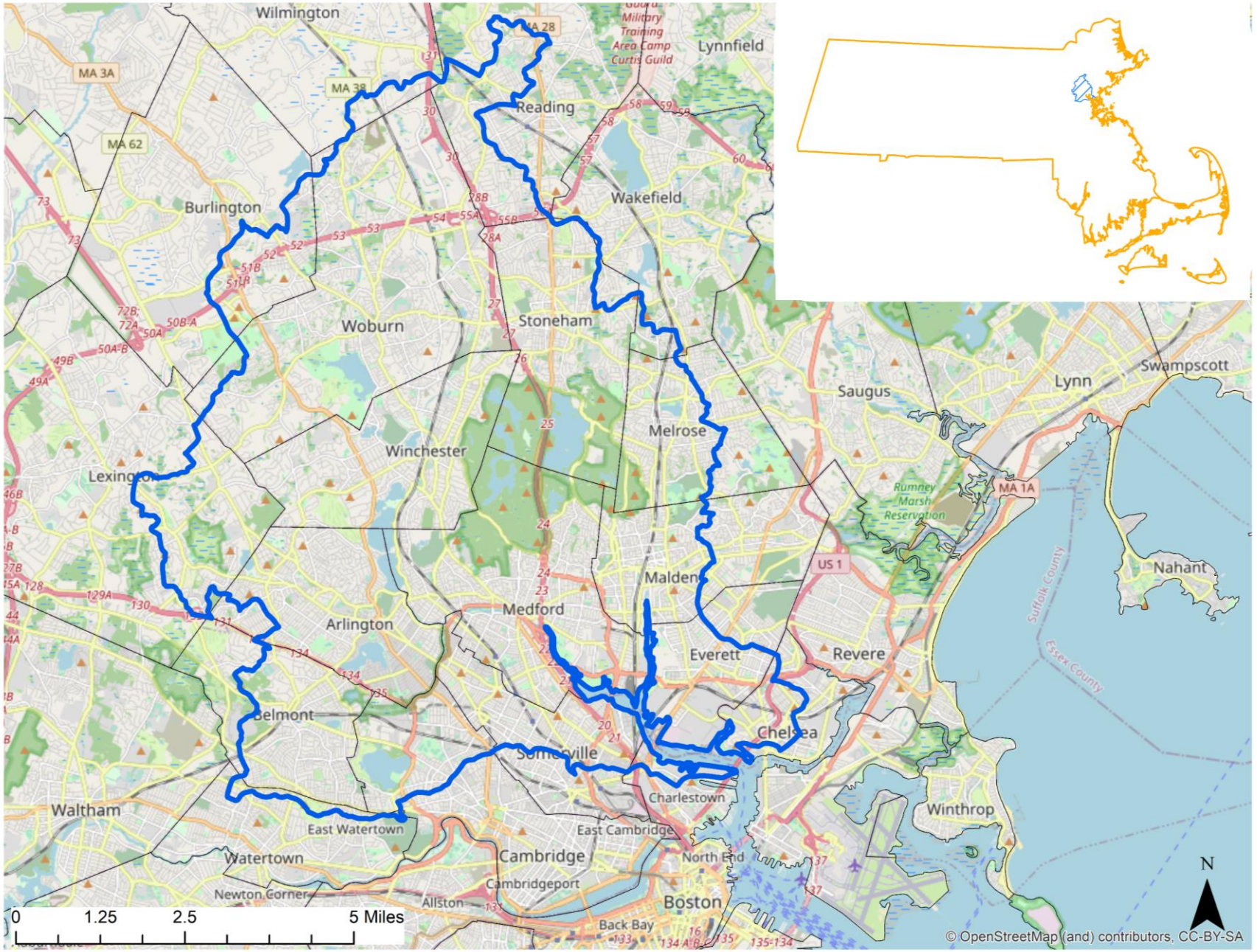
Mystic River Watershed

- 76-square mile watershed that drains to Boston Harbor
- Spans some or all of 22 Greater Boston municipalities
- Nutrients and pathogens - main causes of impairment
- Sources of pollution include:
  - combined sewer overflows (CSO)
  - sanitary sewer overflows (SSO)
  - non-point source pollution
  - stormwater runoff
  - contaminated sediment
  - three Superfund sites



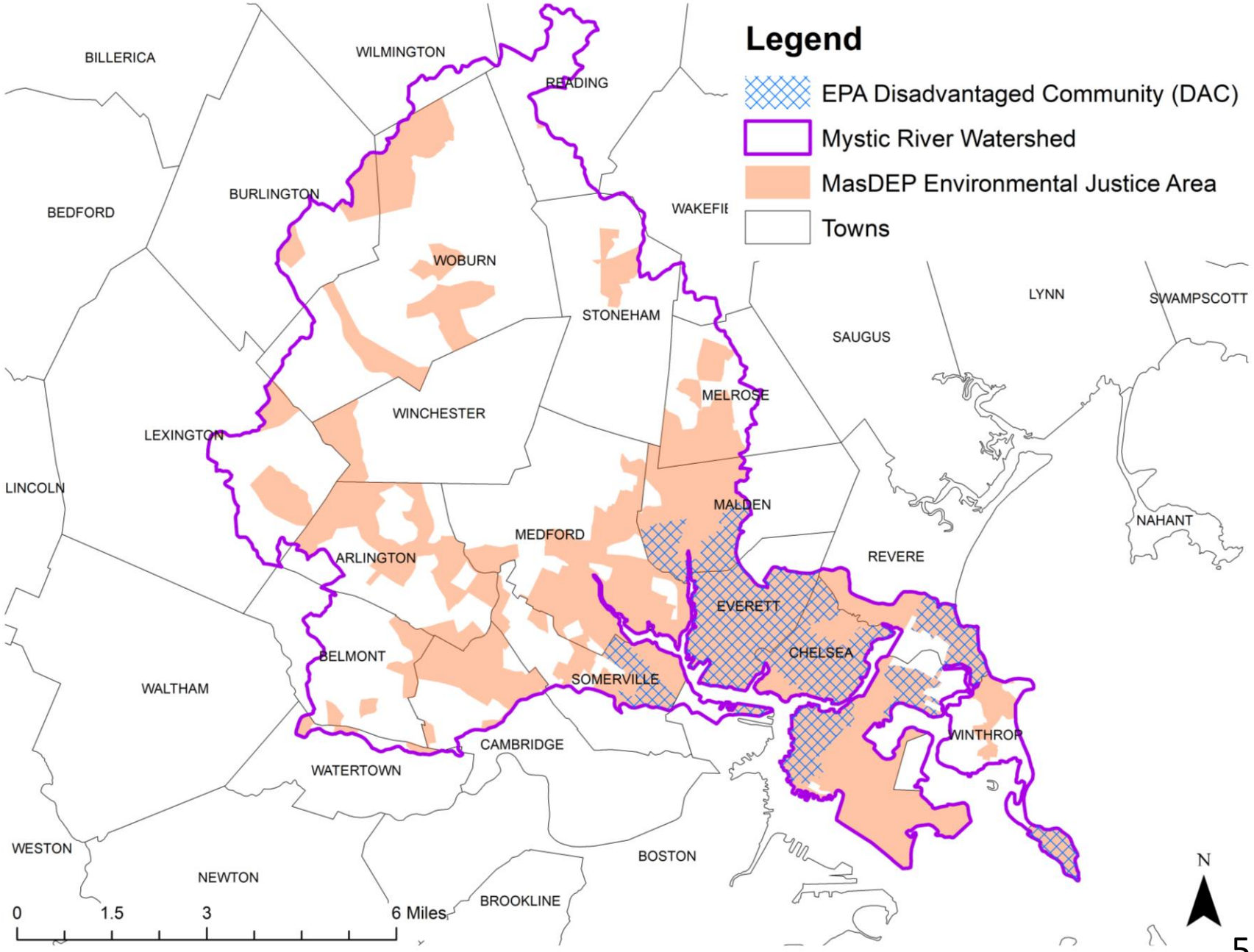
Cyanobacteria bloom in the freshwater segment of the Mystic River between Arlington and Medford in June of 2017. Photo credit: Jack Bitney.

Mystic River Watershed



Mystic River Watershed

- 100 % MS4
- ~ 41 % MA EJ Area
- ~ 11 % EPA DAC



Mystic River Advance Restoration Plan

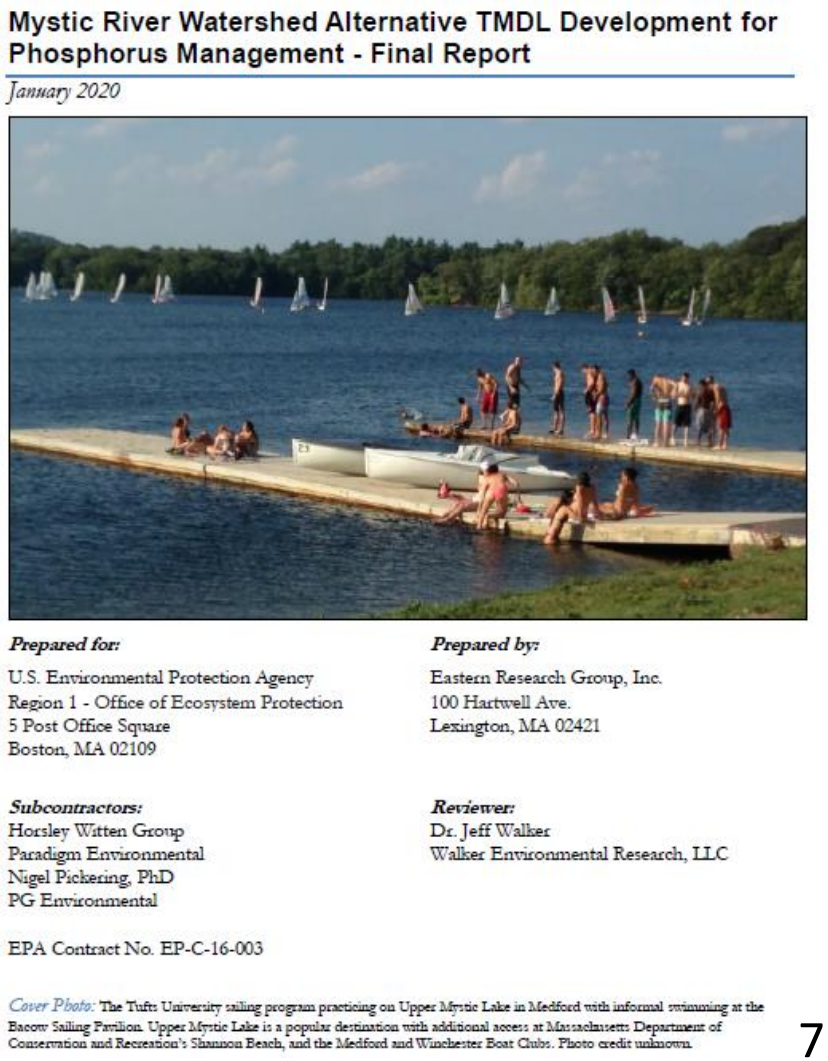
Partners include:

- US EPA Region 1 - Urban Water Initiative since early 1990s
- USGS
- Massachusetts Water Resources Authority
- Mystic River Watershed Association
- Watershed Towns

Mystic River Watershed - Phosphorus Management

Under this project, partners:

- Developed conceptual model of hydrology and nutrient dynamics
- Evaluated existing water quality monitoring data
- Reviewed modeling endpoint approaches
- Estimated watershed phosphorus loading
- Evaluated combined sewer overflow (CSO) and sanitary sewer overflow (SSO) data
- Conducted BATHTUB modeling and calibrated results
- Evaluated watershed phosphorus load reduction analysis
- Developed stormwater management strategies using EPA Opti-Tool (stormwater BMP optimization tool)



Mystic River Watershed Alternative TMDL Development for Phosphorus Management - Final Report

January 2020

Prepared for:

U.S. Environmental Protection Agency
Region 1 - Office of Ecosystem Protection
5 Post Office Square
Boston, MA 02109

Prepared by:

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Reviewer:

Dr. Jeff Walker
Walker Environmental Research, LLC

EPA Contract No. EP-C-16-003

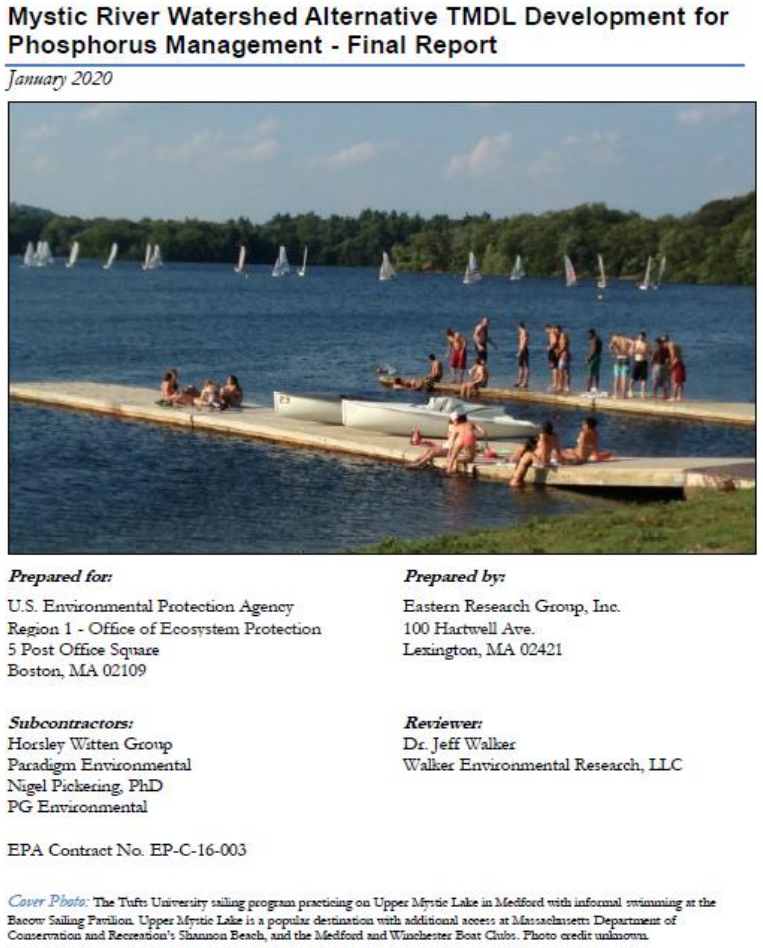
Cover Photo: The Tufts University sailing program practicing on Upper Mystic Lake in Medford with informal swimming at the Bacow Sailing Pavilion. Upper Mystic Lake is a popular destination with additional access at Massachusetts Department of Conservation and Recreation's Shannon Beach, and the Medford and Winchester Boat Clubs. Photo credit unknown.

Mystic River Watershed - Phosphorus Management

Overall, under existing conditions, the report indicated the need for:

- 67 percent reduction in stormwater phosphorus loads
- 33 percent reduction in sediment flux/internal load
- 24 percent reduction in CSO/SSO loads

Also conducted an Opti-Tool analysis in a pilot subwatershed.



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Mystic River Watershed Implementation

- An integral part of meetings with municipalities was to work with communities to develop stormwater management strategies to implement effective stormwater control measures (SCMs).
- A standard design for infiltration trench emerged from the Alternative TMDL workshops; this represented a collaboration between the towns and the University of New Hampshire Stormwater Center.
- The Alternative TMDL was the catalyst for grant-funded projects.
- 319 Watershed Based Plans developed.

Straight to Implementation

Infiltration consists of a stone-filled trench connected to a catch basin in which the “first flush” of runoff is diverted into a perforated pipe and rainwater is able to percolate into the soil

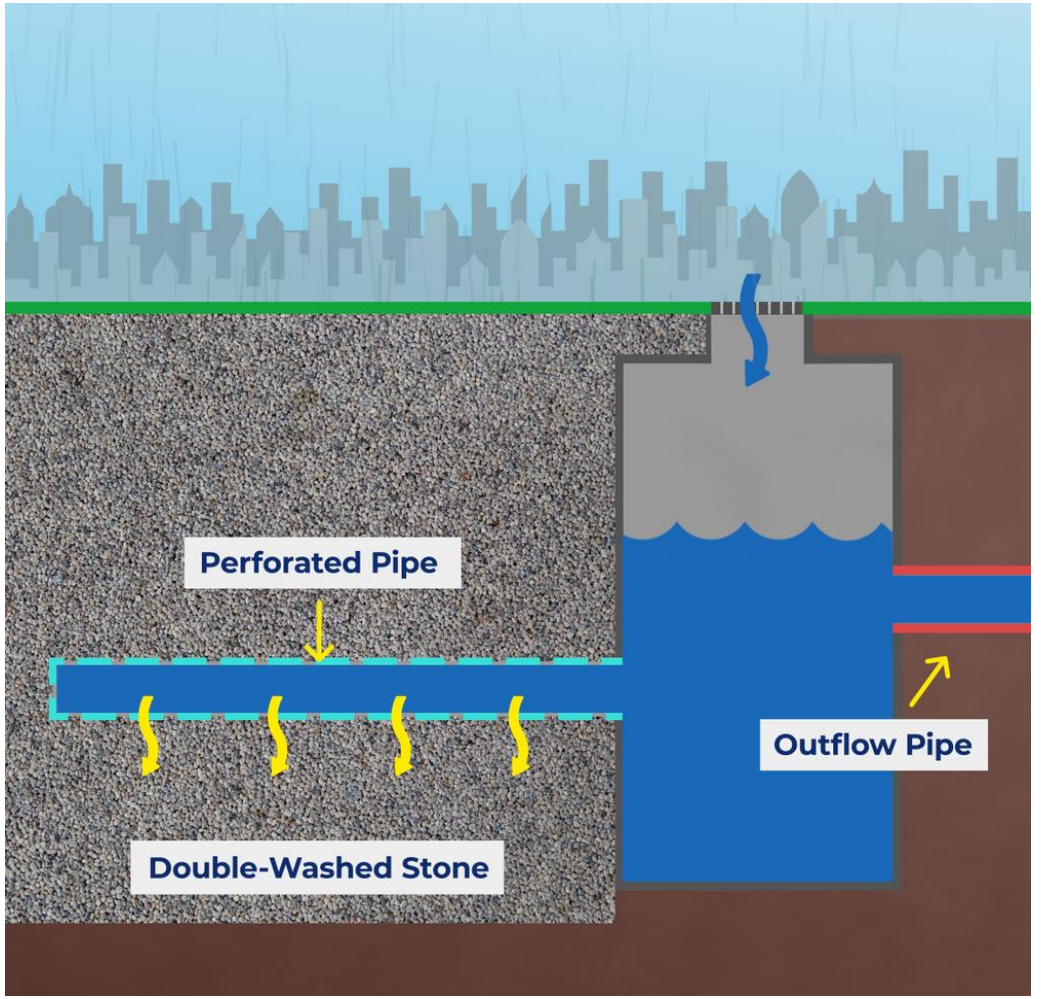

Diagram of an infiltration trench.
Source: Nick Naculich

Straight to Implementation

Grants Awarded

Source	Grant Project Title	Year	Project Cost
CZM-CPR	Implementation of Bioretention and Multiple Gravel Infiltration Trenches to Address Nutrient Impairment Negatively Impacting Anadromous Fish	2020	$135,000
MassDEP 604b	Mystic Infiltration Trench Siting and Design Project	2020	$48,802
CZM-CPR	Implementation of multiple, cost-efficient infiltration trenches in two municipalities to address nutrient impairment negatively impacting anadromous fish	2021	$184,774
MassDEP 319	Distributed small-scale street trenches for Phosphorus load reduction (Medford, Arlington, Winchester)	2021	$868,715
		Subtotal for Implementation related	**$1,237,291**

Mystic River Watershed - Process

- Internal briefings were conducted to explain the Alt TMDL/ARP process to MassDEP upper management.
- MassDEP sent a letter to EPA May 13, 2020 which included a summary of the alternative TMDL and waterbodies with impairments to be covered.
- EPA sent a letter dated May 14, 2020 which "accepted" the alternative TMDL.
  - "….*we accept the Alternative TMDL to be counted towards WQ-27, which is a performance measure used to track the progress in implementing the CWA 303(d) Program Vision, for FY2020."*
- Impaired waterbodies remain on the most recent Integrated List (2022, draft).

References

- Mystic River Watershed Alternative TMDL Development for Phosphorus Management
- MassDEP letter
- EPA Response letter
- Overview of trench stormwater controls -
  - Infiltration Trenches in the Mystic
  - Small but Mighty: Stormwater Trenches Roll Out Across the Watershed — Mystic River Watershed Association
  - Infiltration Trench YouTube Video

Contact:

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Total Maximum Daily Loads (TMDLs) | Mass.gov