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Pawcatuck River Watershed Bacteria TMDLs

Heidi Travers - RI DEM
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Overview of Presentation

- Introduction to the Statewide Bacteria TMDLs
  - Heidi Travers, RIDEM
- Rhode Island Wood-Pawcatuck Rivers Watershed Statewide Bacteria TMDL Updates
  - Heidi Travers, RIDEM
- Connecticut Pawcatuck River Watershed Bacteria TMDL
  - Chris Sullivan, CT DEEP

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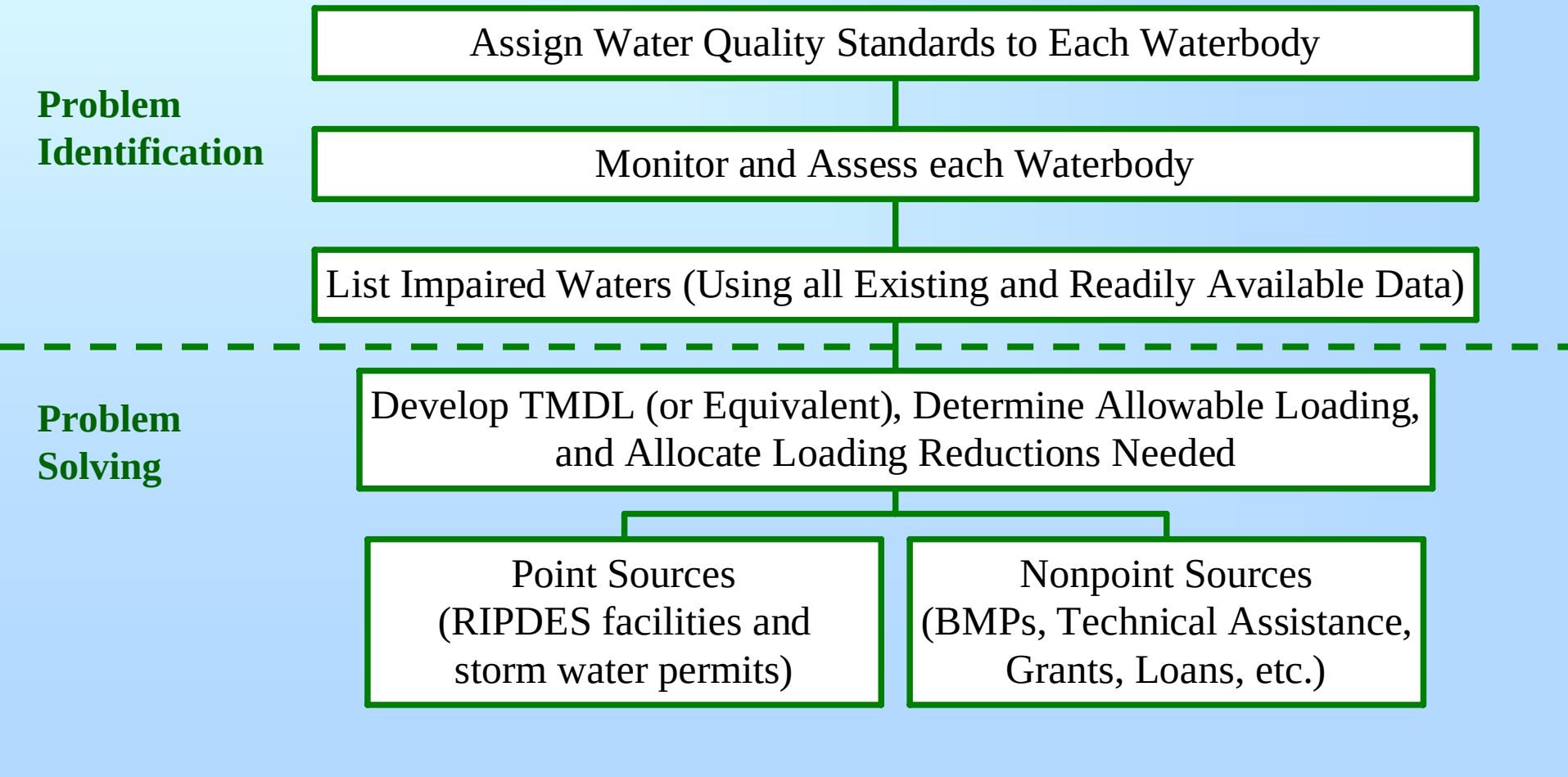
Water Quality Management Framework



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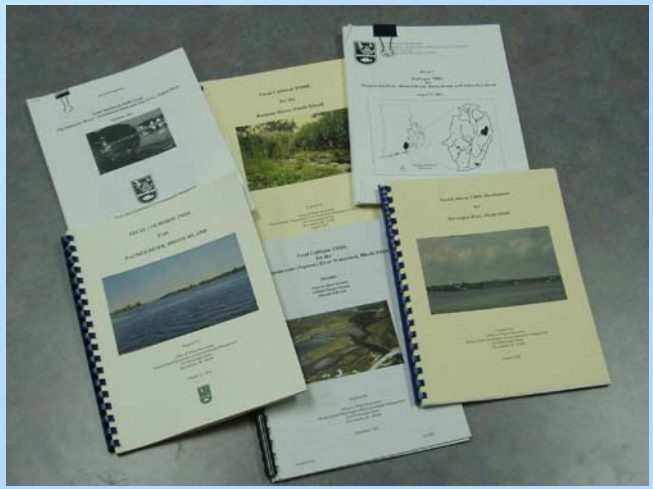
TMDL Studies

- A Total Maximum Daily Load (TMDL) is a prescription designed to restore the health of polluted waters by:
  - Calculating the amount of a pollutant that a waterbody can receive and still meet its water quality standards.
  - Allocating the allowable amount of the pollutant to the its sources.

- TMDL studies are both waterbody and pollutant specific.



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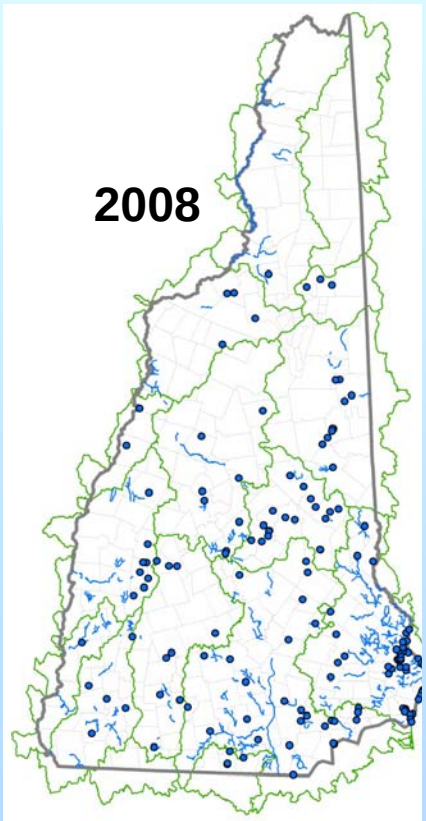
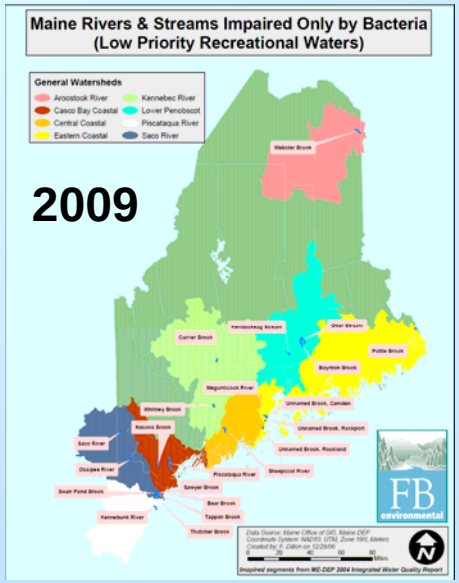
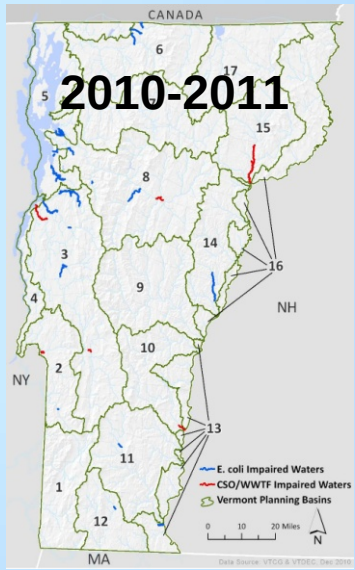
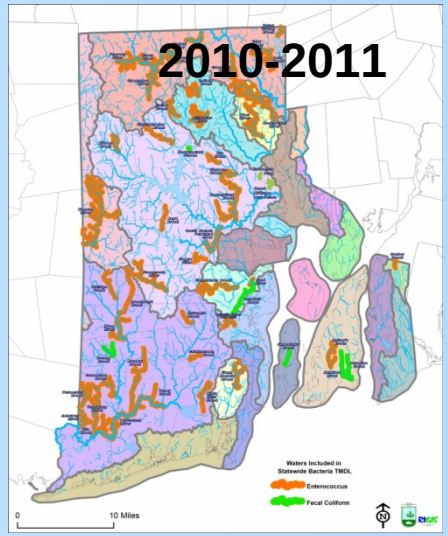
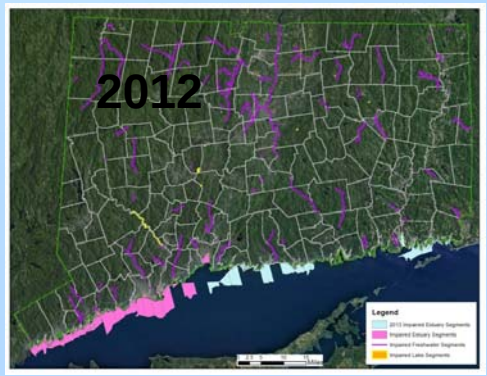
New England Statewide Bacteria TMDL Documents











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Statewide Bacteria TMDL Components

- Core Document
  - Explanation of state water quality standards
  - Description of point and nonpoint pollution sources
  - Details of bacteria TMDL development
  - Guidance for implementation efforts
- Individual waterbody-specific summaries

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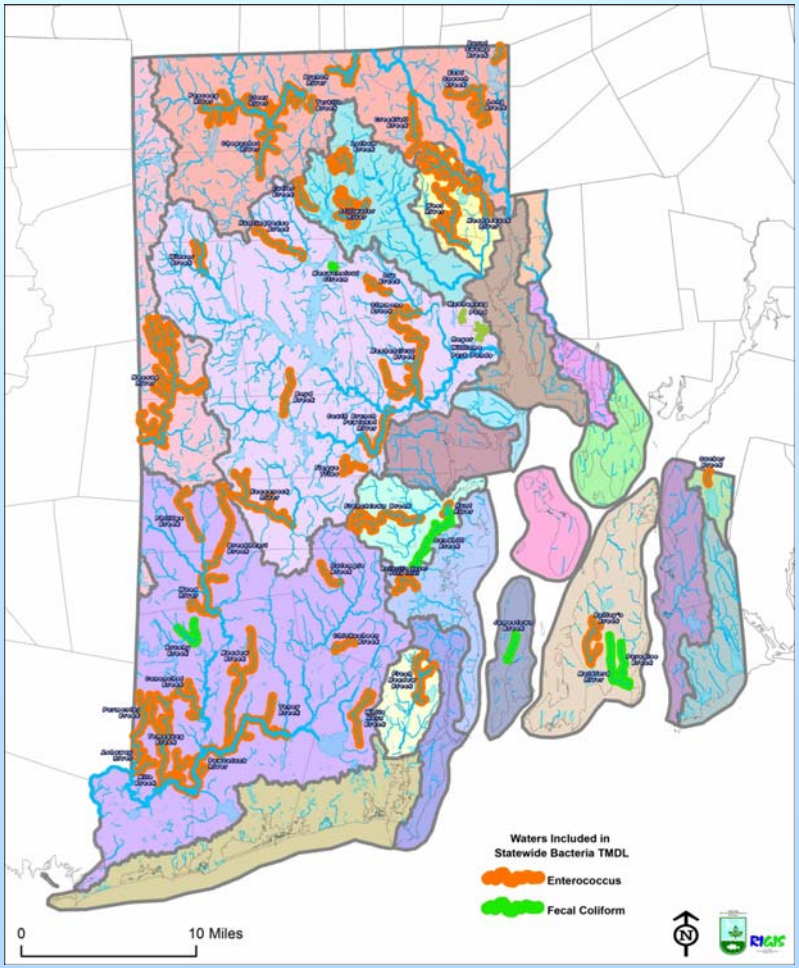
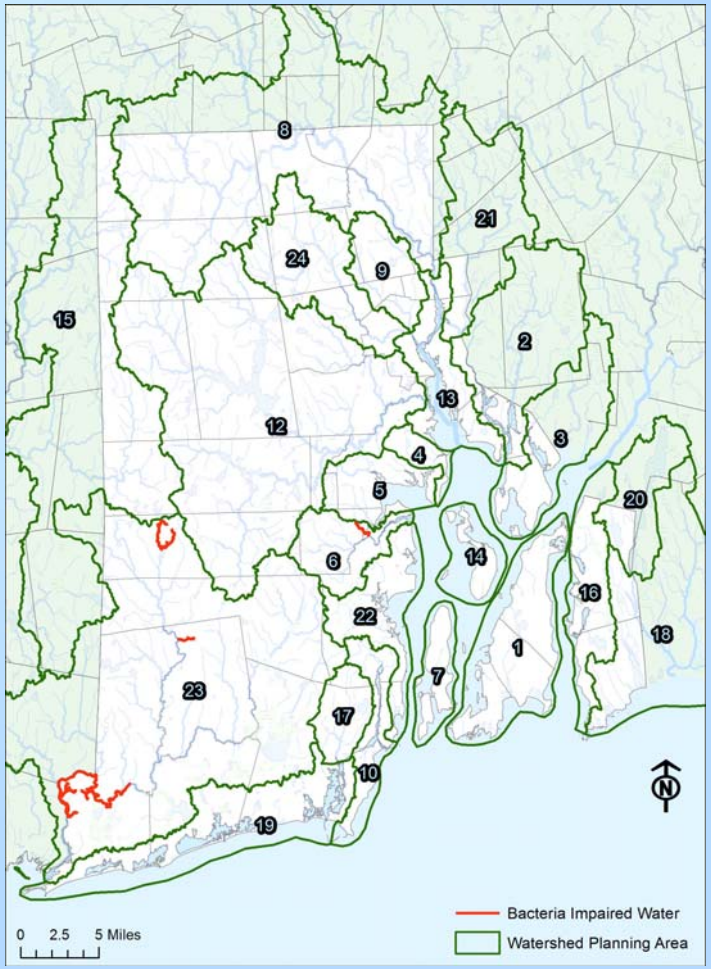
RI Statewide Bacteria TMDL
57 Waterbody Segments - 2011



RI Statewide Bacteria TMDL Updates
6 Waterbody Segments - 2014



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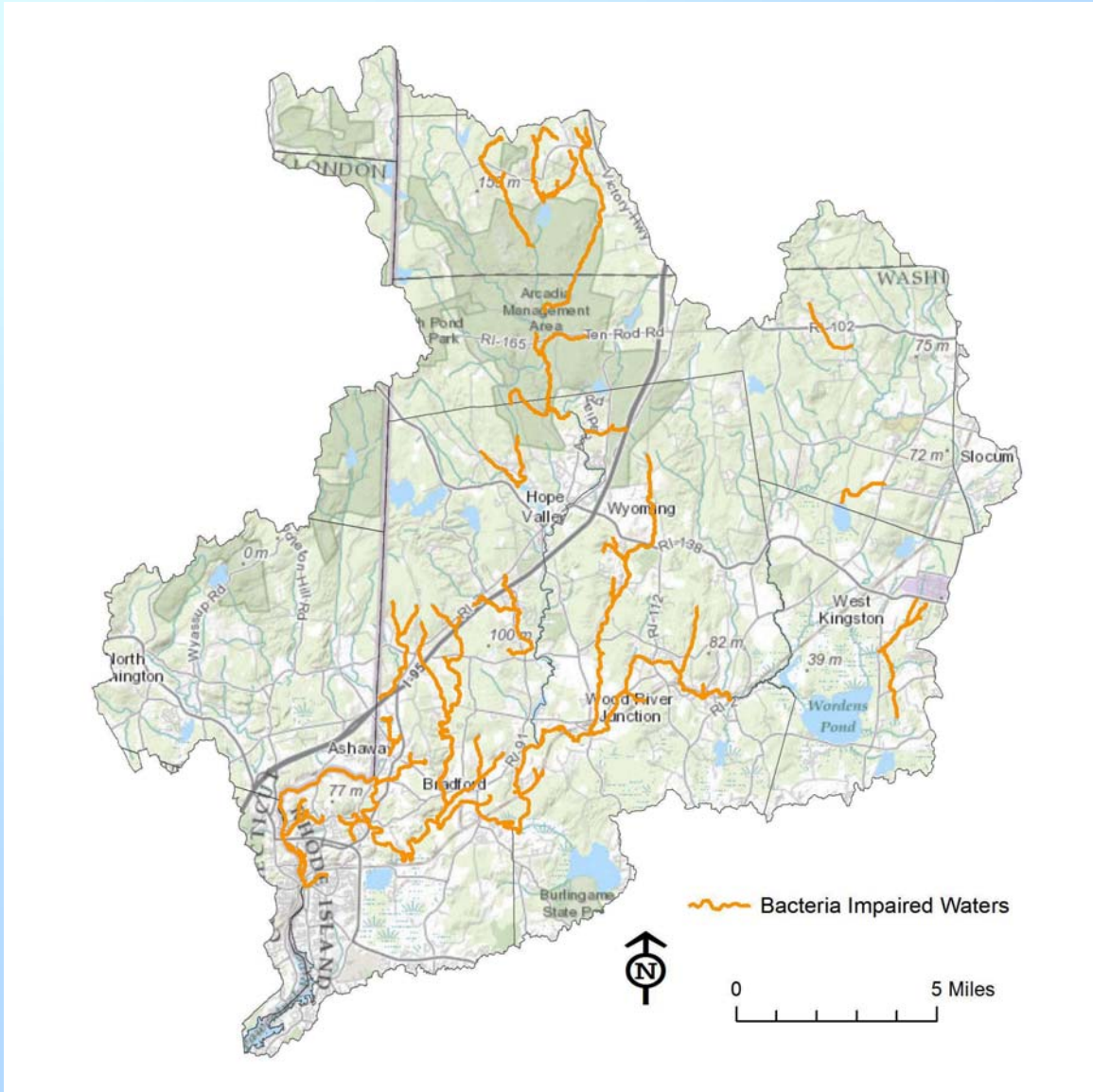

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Study Approach

Use State Water Quality Standards to Set Limits for Pollutant

Measure or Evaluate Current Water Quality Targets
and Identify Pollutant Sources

Calculate the Percent Reductions Needed to Meet Water Quality Standards

Establish Mitigation Methods to Meet Target Reductions

Monitor Water Quality to Ensure that Goals are Met

Water Quality Standards

Rhode Island uses enterococci to determine risk associated with primary and secondary contact recreation activities in all the state's fresh and salt waters. Other states, including Connecticut and Massachusetts use e-*coli* for freshwaters and enterococci for salt waters.

Enterococci Criteria

	Geometric Mean colonies/100 mL
Saltwater Class SA, SA{b}, SB, SB1	**35**
Freshwater Class A, B, B1	**54**

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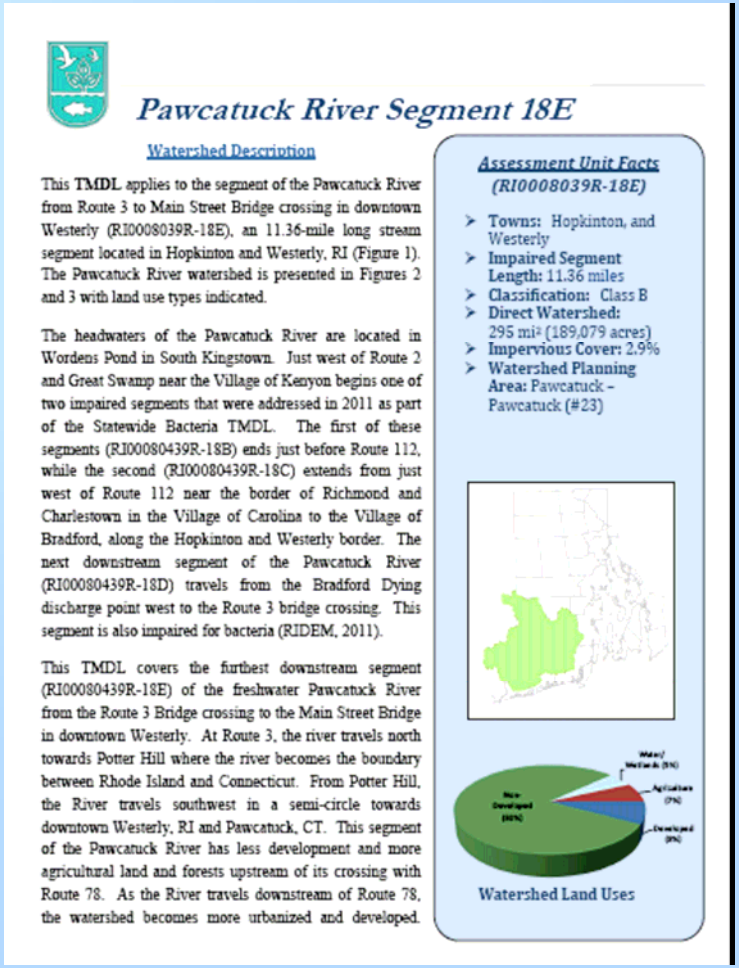
Waterbody Summary Content

- Watershed Description
- Maps
- Monitoring Data Description
- Actual/Potential Sources of Bacteria in the Watershed
- Existing Management and Recommended Next Steps
- Data Summary Tables and Necessary Pollutant Reductions



Pawcatuck River Segment 18E

Watershed Description

This **TMDL** applies to the segment of the Pawcatuck River from Route 3 to Main Street Bridge crossing in downtown Westerly (RI0008039R-18E), an 11.36-mile long stream segment located in Hopkinton and Westerly, RI (Figure 1). The Pawcatuck River watershed is presented in Figures 2 and 3 with land use types indicated.

The headwaters of the Pawcatuck River are located in Wordens Pond in South Kingstown. Just west of Route 2 and Great Swamp near the Village of Kenyon begins one of two impaired segments that were addressed in 2011 as part of the Statewide Bacteria TMDL. The first of these segments (RI0008039R-18B) ends just before Route 112, while the second (RI0008039R-18C) extends from just west of Route 112 near the border of Richmond and Charlestown in the Village of Carolina to the Village of Bradford, along the Hopkinton and Westerly border. The next downstream segment of the Pawcatuck River (RI0008039R-18D) travels from the Bradford Dying discharge point west to the Route 3 bridge crossing. This segment is also impaired for bacteria (RIDEM, 2011).

This TMDL covers the furthest downstream segment (RI0008039R-18E) of the freshwater Pawcatuck River from the Route 3 Bridge crossing to the Main Street Bridge in downtown Westerly. At Route 3, the river travels north towards Potter Hill where the river becomes the boundary between Rhode Island and Connecticut. From Potter Hill, the River travels southwest in a semi-circle towards downtown Westerly, RI and Pawcatuck, CT. This segment of the Pawcatuck River has less development and more agricultural land and forests upstream of its crossing with Route 78. As the River travels downstream of Route 78, the watershed becomes more urbanized and developed.

Assessment Unit Facts
(RI0008039R-18E)

- **Towns:** Hopkinton, and Westerly
- **Impaired Segment Length:** 11.36 miles
- **Classification:** Class B
- **Direct Watershed:** 295 mi² (189,079 acres)
- **Impervious Cover:** 2.9%
- **Watershed Planning Area:** Pawcatuck – Pawcatuck (#23)

Watershed Land Uses

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Information Used to Develop the Waterbody Summaries

- Maps
- Municipal Stormwater Management Plans and MS4 Annual Reports
- Municipal Onsite Wastewater Management Plans
- Municipal Wastewater Facilities Plans
- Municipal Websites
- Existing TMDLs
- Water Quality Data

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2014 Updates Data Sources

Title	Primary Organization	Date of Study
Ambient River Monitoring (ARM) Program	Rhode Island Department of Environment Management, Office of Water Resources	Ongoing
TMDL Program	Rhode Island Department of Environment Management, Office of Water Resources	As Needed
Freshwater Pawcatuck River and Tributary Monitoring	Connecticut Department of Energy and Environmental Protection	2011
TMDL Analysis for the Pawcatuck River and Little Narragansett Bay Waters: Bacteria Impairments	Rhode Island Department of Environment Management, Office of Water Resources	2010

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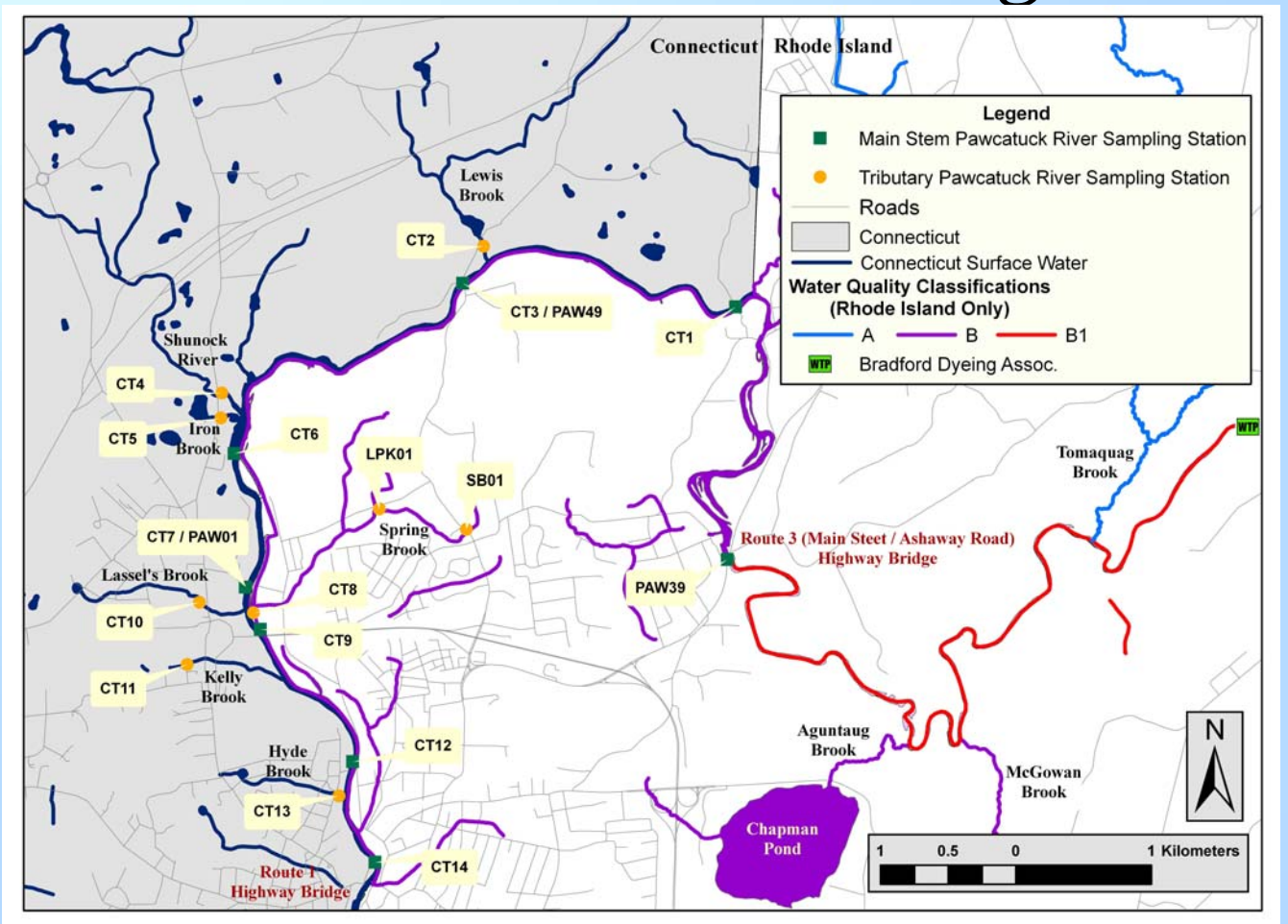
2011 Freshwater Pawcatuck River and Tributaries Monitoring



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Data Calculations

- Geometric Mean
- Percent Reduction to Meet TMDL Target

Single Sample Enterococci (colonies /100 mL) Results for Mile Brook (2005-2006) with Geometric Mean Statistics

Station Name	Station Location	Date	Result	Wet/Dry	Geometric Mean
PAW11	Mile Brook at Nooseneck Hill Road (Rt 3) near Maxson St, Hopkinton	10/27/2006	1	Dry	58 (12%)*
PAW11	Mile Brook at Nooseneck Hill Road (Rt 3) near Maxson St, Hopkinton	8/9/2006	410	Dry	
PAW11	Mile Brook at Nooseneck Hill Road (Rt 3) near Maxson St, Hopkinton	5/31/2006	170	Dry	
PAW11	Mile Brook at Nooseneck Hill Road (Rt 3) near Maxson St, Hopkinton	9/21/2005	160	Dry	

Shaded cells indicate an exceedance of water quality criteria
*Includes 5% Margin of Safety

Data Calculations

- Wet/Dry Analysis

Wet and Dry Weather Geometric Mean Enterococci Values for Station PAW11

Station Name	Station Location	Years Sampled	Number of Samples		Geometric Mean		
			Wet	Dry	All	Wet	Dry
PAW11	Mile Brook at Nooseneck Hill Road (Rt 3) near Maxson St, Hopkinton	2005-2006	0	4	58	NA	58

Shaded cells indicate an exceedance of water quality criteria
Weather condition determined from rain gage at URI in Kingston, RI

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2014 RI Statewide Bacteria TMDL Updates

Impaired Water	Impairment / Pollutant	Municipality
Watershed Planning Area 6: Hunt River		
Pierce Brook (RI0007028R-07)	Enterococci	East Greenwich, Warwick
Watershed Planning Area 23: Wood - Pawcatuck Rivers		
Pawcatuck River (RI0008039R-18D)	Enterococci	Hopkinton, Westerly
Pawcatuck River (RI0008039R-18E)	Enterococci	Hopkinton, Westerly
Spring Brook (RI0008039R-41)	Enterococci	Westerly
Acid Factory Brook (RI0008040R-01)	Enterococci	West Greenwich
Baker Brook (RI0008040R-18)	Enterococci	Richmond

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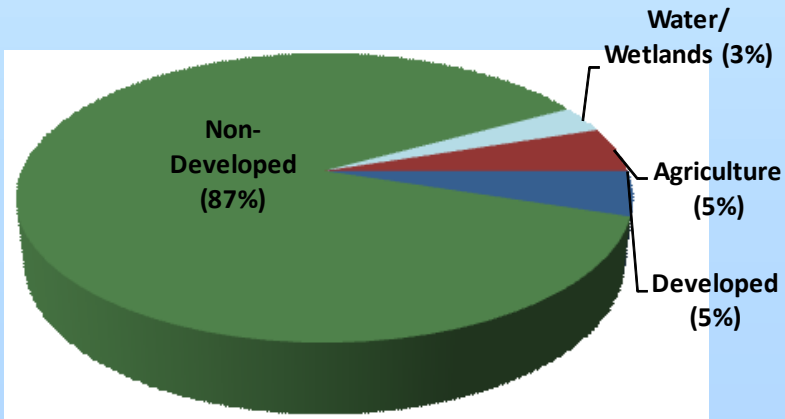
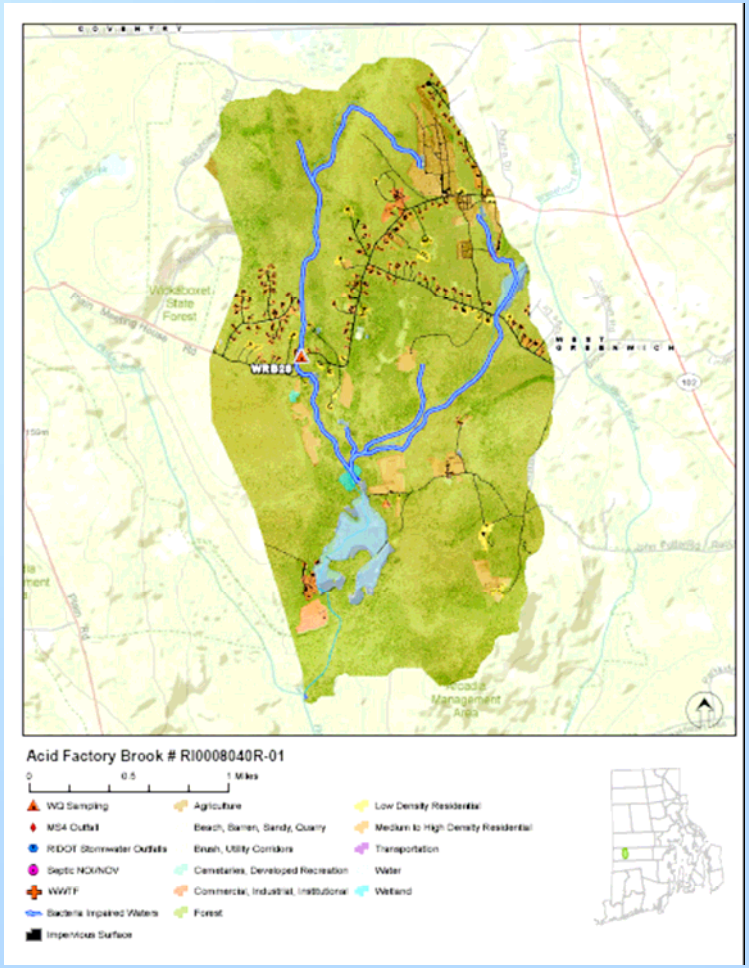
Acid Factory Brook





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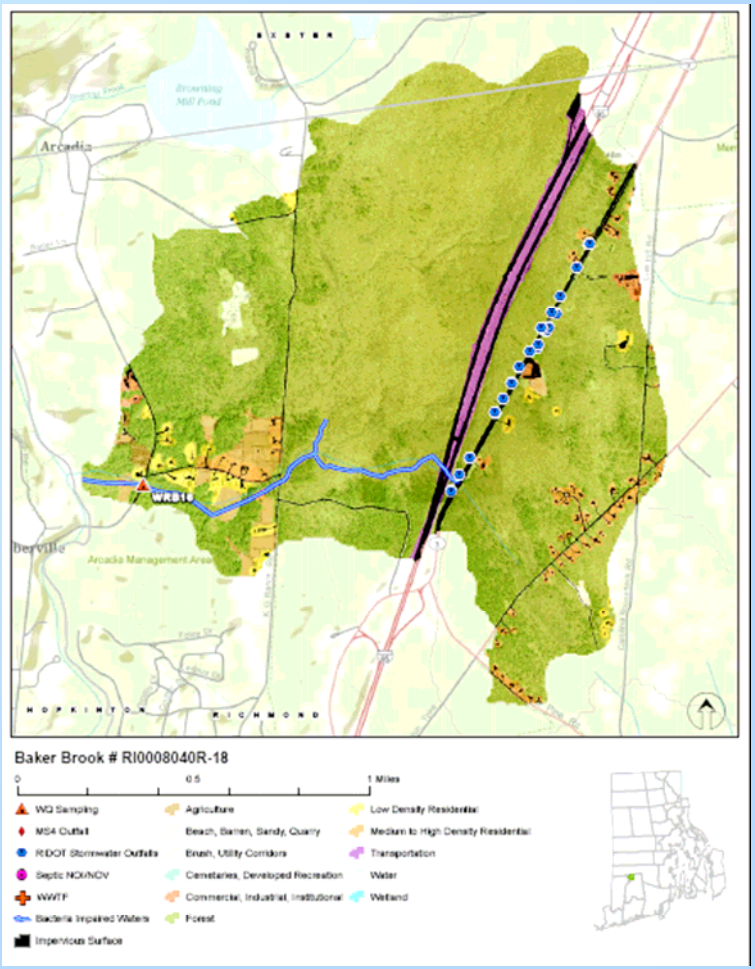
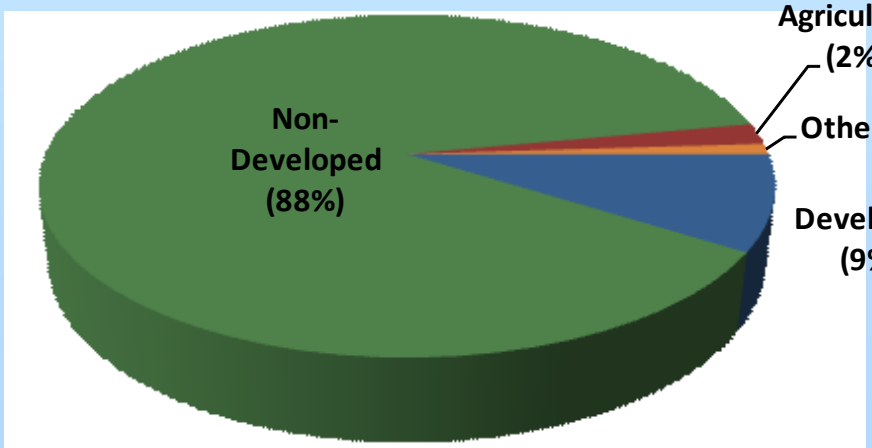
Baker Brook





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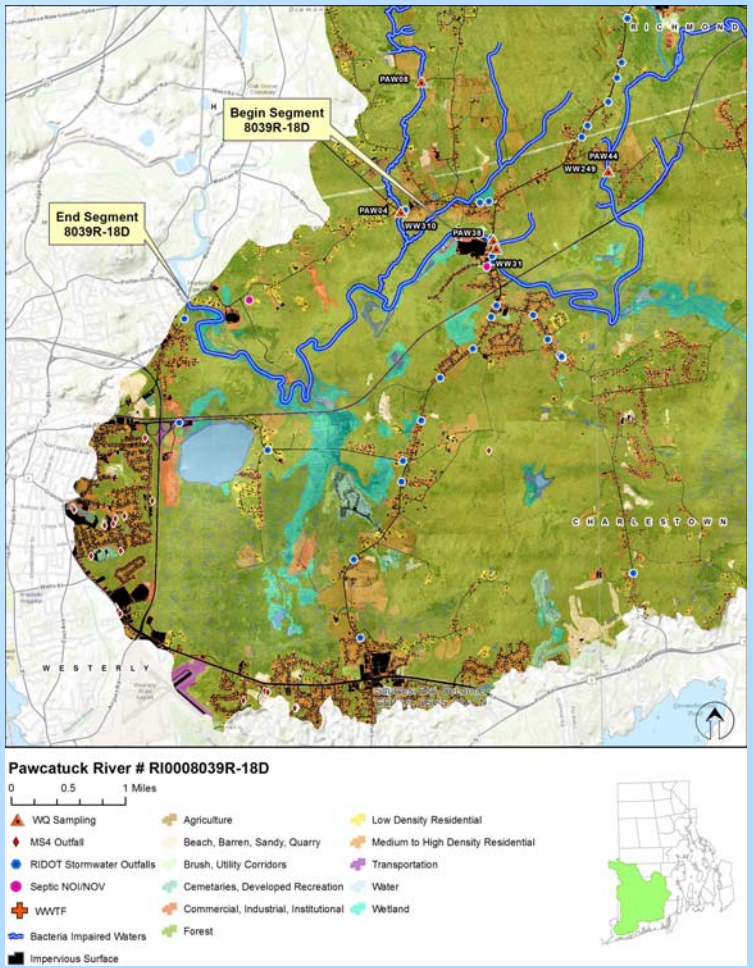
Pawcatuck River (18D)



RIDEM Pawcatuck River Segment 18D – Bradford Dye to Route 3

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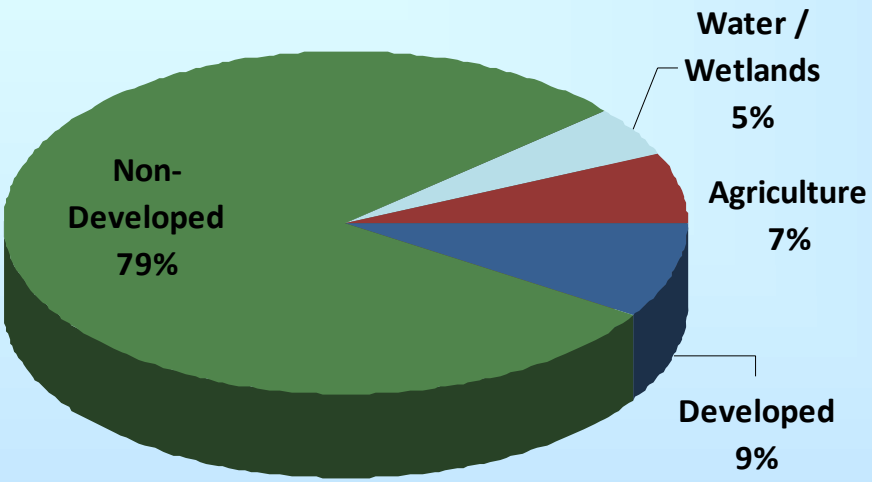
Pawcatuck River (18E)



RIDEM Pawcatuck River Segment 18E – Route 3 to Route 1

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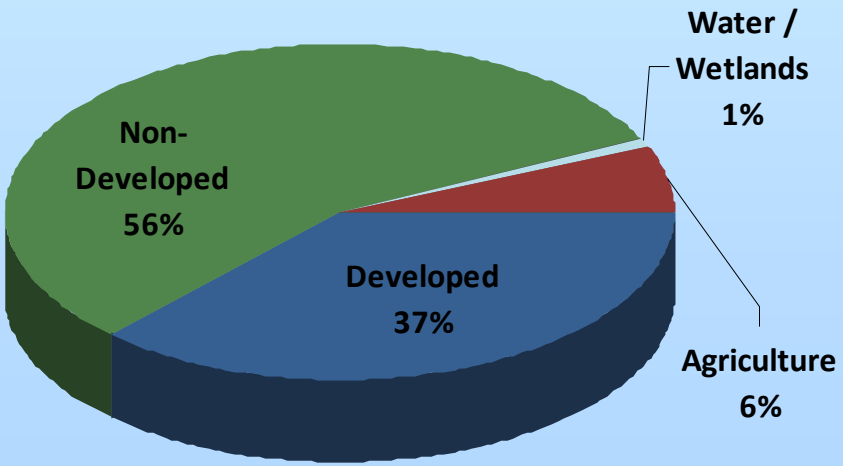
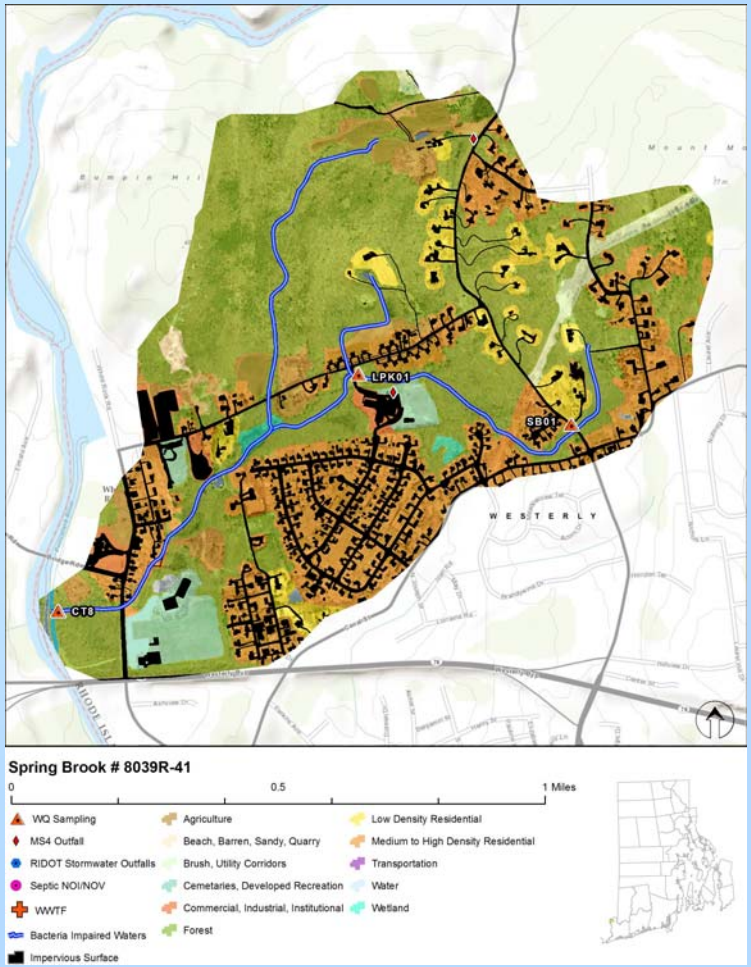
Spring Brook





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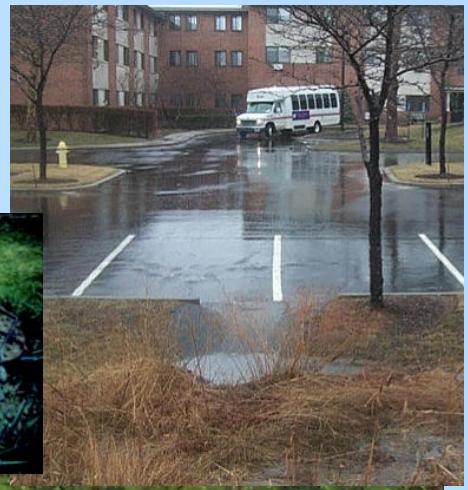
Actual and Potential Bacteria Sources



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Recommended Pollution Reduction Strategies

- Stormwater Management
  - Municipal Stormwater Management Program Plans (SWMPP)
- Wastewater Management
  - On-site Wastewater Treatment Systems
  - Sewer Infrastructure
- Animal Waste Control
- Land Use Protection

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Municipal Stormwater Management Plans Minimum Measures

- Public education and outreach program
- Public involvement/participation program
- Illicit discharge detection and elimination program
- Construction site stormwater runoff control program for sites disturbing 1 or more acres
- Post-construction stormwater runoff control program for new and re-development disturbing 1 or more acres
- Pollution prevention and good housekeeping program

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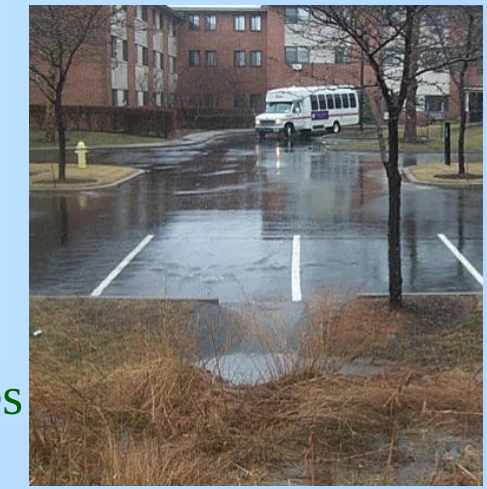
Municipal Stormwater Management Plans Requirements for Improving Pollution Control

- <10% Impervious Cover
  - Unless watershed-specific information, bacteria impairments assumed caused by sources other than urban stormwater
  - No change to Phase II Permit Requirements
- Between 10% and 15% Impervious Cover
  - Revise post-construction ordinances
- >15% Impervious Cover
  - Revise post-construction ordinances
  - Evaluate the sufficiency of the minimum measures
- Structural BMP Requirements
  - Determined on a case-by-case basis, generally where specific information identifies significant sources or where previous TMDL has required structural BMPs.



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Municipal Stormwater Management Plans Additional Requirements

Revise Stormwater Management Program Plan (SWMPP) in a TMDL Implementation Plan (TMDL IP).

- Revise local ordinances to require:
  - new development sites to use stormwater controls to prevent **any net increase** in bacteria
  - re-development sites to use stormwater controls to reduce bacteria to the **maximum extent feasible**
- Use of LID (Low Impact Development) techniques wherever feasible

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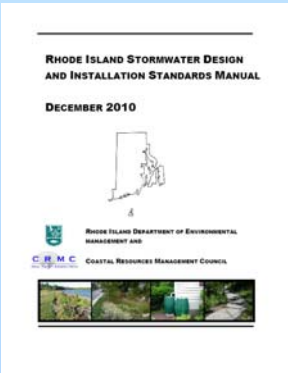
Pawcatuck River (18E) Implementation: Stormwater

- Impervious Cover is <10% **BUT** developed area is adjacent to River segment and 2010 TMDL identified as a wet weather source
- Partial watershed regulated under the Phase II Program
- Modify Six Minimum Measures to incorporate TMDL recommendations.
  - Revise local ordinances to require:
    - new development sites to use stormwater controls to prevent **any net increase** in bacteria
    - re-development sites to use stormwater controls to reduce bacteria to the **maximum extent feasible**
  - Use of LID (Low Impact Development) techniques wherever feasible



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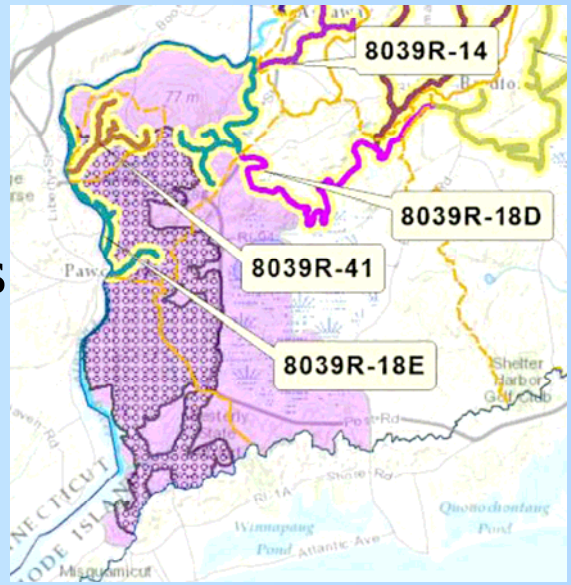
Pawcatuck River (18E) Implementation: Wastewater

- Watershed is a mix of sewered areas and On-Site Wastewater Treatment Systems.
- On-Site Wastewater Treatment Systems (OWTS)
  - Enforceable mechanisms to ensure the proper operation and maintenance of OWTS in parts of the watershed without sewers.
  - Detailed Property Records
  - Identify and replace sub-standard systems through inspections
- Sewer Infrastructure
  - Continue with inspections and other actions to prevent leaks and overflows



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Animal Waste Control

- Domestic Pets
  - Dispose waste away from waters and storm drains
  - Identify problem areas and install signage and receptacles
- Farms
  - Restrict access to wetlands and streams
  - Establish vegetative buffers
  - Use proper animal waste handling, disposal, and storage practices
  - Develop conservation plans.

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Animal Waste Control

- Waterfowl
  - Install and maintain vegetative buffers to reduce desirability of natural habitat for waterfowl.
  - Prevent feeding by humans.
  - Develop education programs that emphasize that feeding waterfowl can be harmful to waterfowl, humans, and the environment.

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Public Comment Period Ends
June 20, 2014

DEM TMDL Program Website
http://www.dem.ri.gov/programs/benviron/water/quality/rest/index.htm

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