

EPA Stormwater Monitoring and Research Effort Summary

Mystic River Science Committee Meeting

January 7, 2010

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Mystic River Watershed Enforcement

- EPA Region 1 enforcement has been using Clean Water Act to address Mystic River water quality violations.
 - At least 13 CWA Section 308 Information Requests
 - 9 Administrative Orders
 - Judicial Referrals
- Illicit discharges still a significant problem



Overview

- Region 1 applied for and received Regional Applied Research Effort (RARE) and Regional Methods (RM) ORD grants to develop bacterial source tracking “Stormwater Toolbox”
- Building off last years urban stormwater monitoring presented at Science Committee meeting in 2009
- Summary of goals, sample locations, preliminary results and next steps

Mystic River Watershed Stormwater Sampling

2008 Season:

- 142 sample sets were collected at 94 sites.
- 438 laboratory samples.
- 184 field kits or bench-top methods.

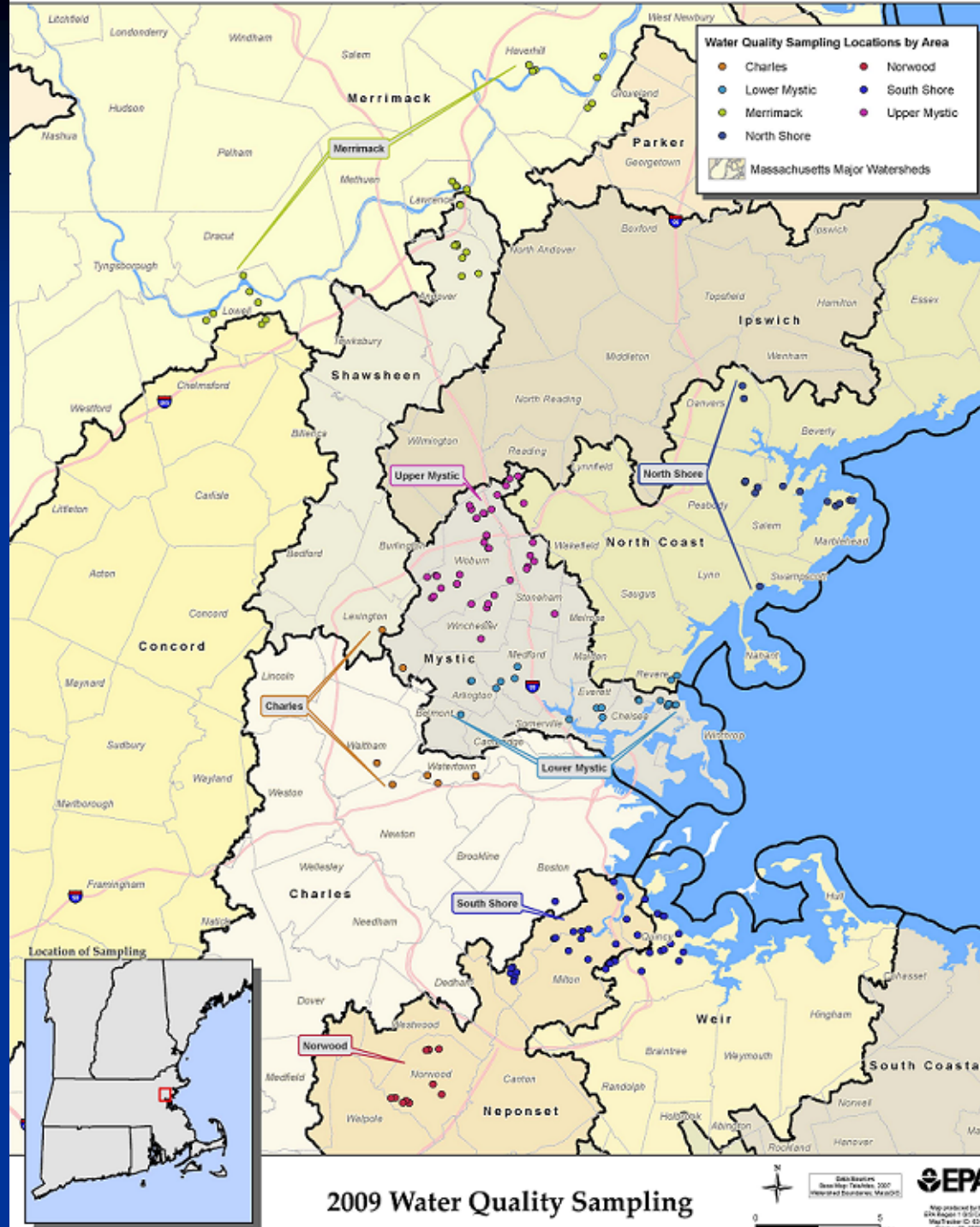
2009 Season:

- 118 sample sets were collected at 80 sites.
- 709 laboratory samples.
- 658 field kits or bench-top methods

Project Goals

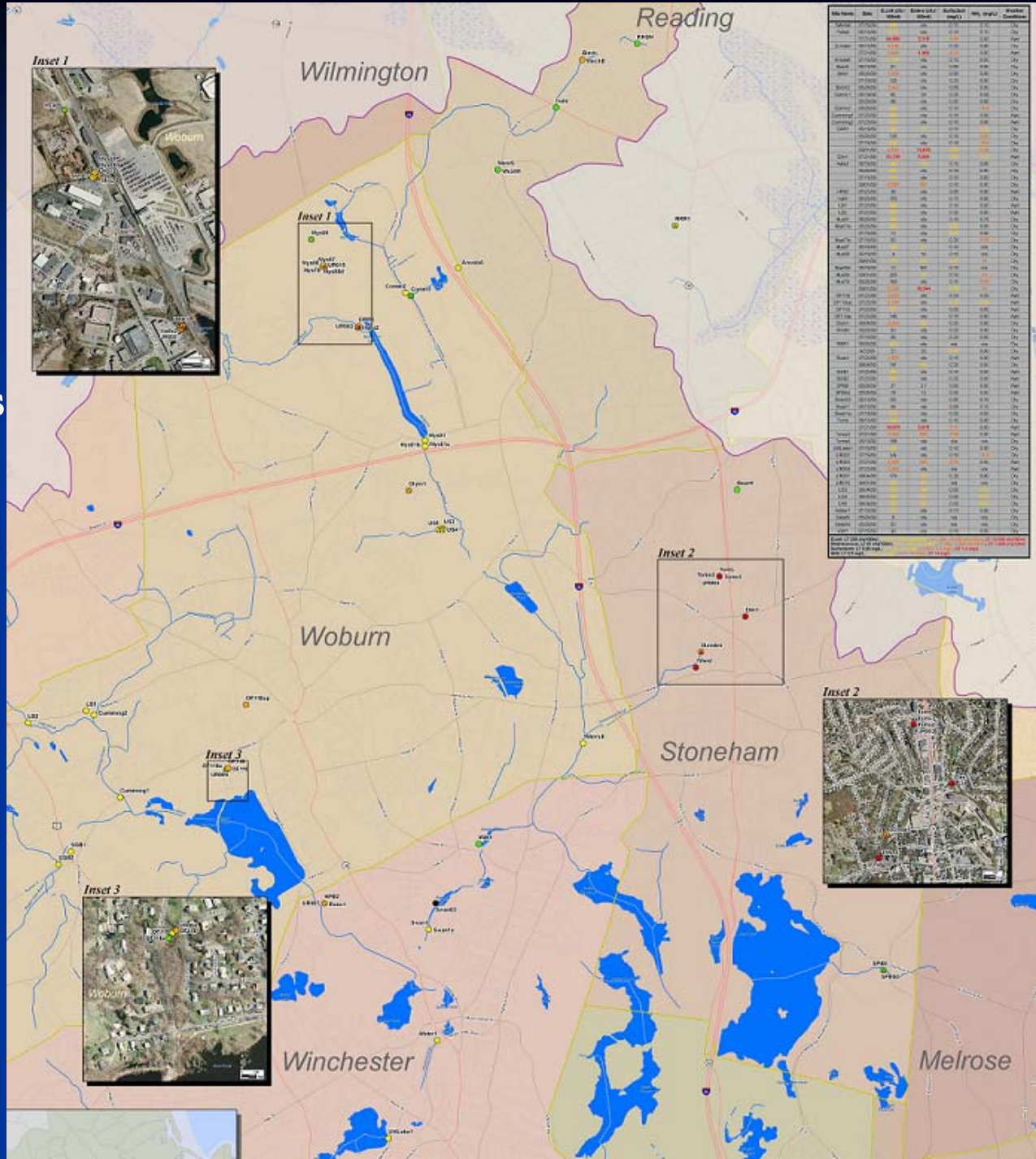
- Identify most effective and cost-efficient screening parameters; and
- Delineate and examine areas of possible illicit discharges; and
- Bacterial source tracking; and
- Broaden sample locations; and
- Sampling coordination and collaboration within watershed.

2009 Sample Location Overview

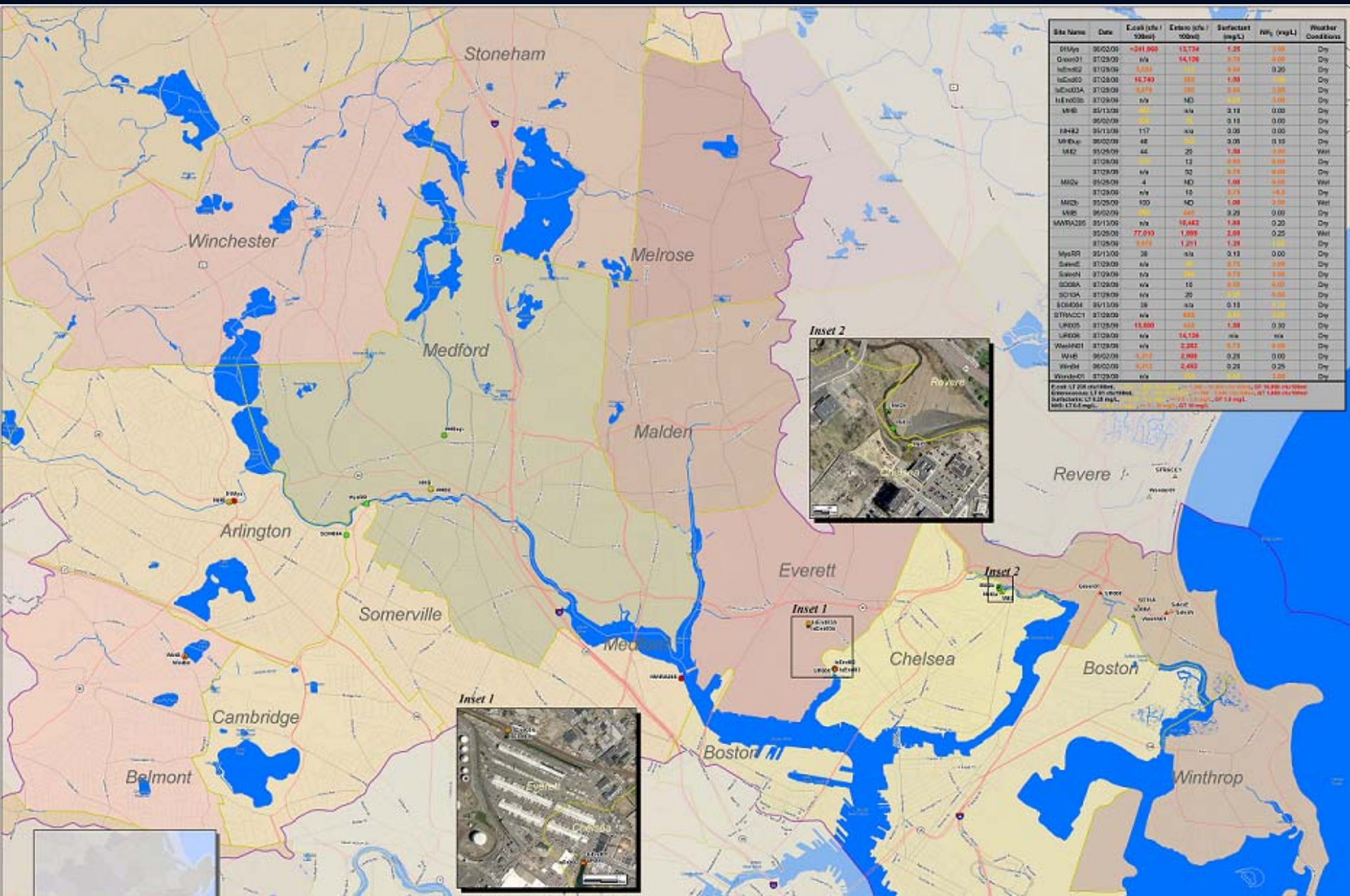


Map Created by:
EPA Region 1 GIS Dept.

Upper Mystic 2009 Locations



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Site Name	Date	Cook (ph / 100ml)	Enteric (ph / 100ml)	Surface Water (mg/L)	Wqy (mg/L)	Weather Conditions
01Myn	06/02/09	241,899	15,734	1.25	3.00	Dry
02W01	07/02/09	n/a	14,126	0.73	0.00	Dry
02W02	07/02/09	0.00	n/a	0.00	0.20	Dry
02W03	07/02/09	14,740	100	1.00	n/a	Dry
02W03A	07/02/09	0.75	100	0.00	0.00	Dry
02W03B	07/02/09	n/a	ND	n/a	0.00	Dry
02W03C	06/02/09	0	n/a	0.11	0.00	Dry
02W03D	06/02/09	157	n/a	0.00	0.00	Dry
02W03E	06/02/09	48	n/a	0.00	0.10	Dry
02W03F	06/02/09	44	25	1.00	1.00	Wet
02W03G	07/02/09	n/a	13	0.00	0.00	Dry
02W03H	07/02/09	n/a	52	0.75	0.00	Dry
02W03I	07/02/09	4	ND	1.00	0.00	Wet
02W03J	07/02/09	n/a	10	0.75	0.00	Dry
02W03K	07/02/09	100	ND	1.00	0.00	Wet
02W03L	06/02/09	n/a	400	0.20	0.00	Dry
02W03M	06/02/09	n/a	14,442	1.00	0.20	Dry
02W03N	06/02/09	77,010	1,000	2.00	0.20	Wet
02W03O	07/02/09	0.00	1,211	1.20	n/a	Dry
02W03P	06/13/09	38	n/a	0.10	0.00	Dry
02W03Q	07/02/09	n/a	n/a	0.75	0.00	Dry
02W03R	07/02/09	n/a	n/a	0.75	0.00	Dry
02W03S	07/02/09	n/a	10	0.00	0.00	Dry
02W03T	07/02/09	n/a	20	0.75	0.00	Dry
02W03U	06/13/09	38	n/a	0.10	0.00	Dry
02W03V	07/02/09	n/a	0.00	0.75	0.00	Dry
02W03W	07/02/09	n/a	14,126	n/a	n/a	Dry
02W03X	07/02/09	n/a	2,202	0.75	0.00	Dry
02W03Y	06/02/09	1,201	2,000	0.20	0.00	Dry
02W03Z	06/02/09	1,201	2,400	0.20	0.20	Dry
02W03AA	07/02/09	n/a	n/a	0.75	0.00	Dry

Cook: 1.0 mg/L = 100,000 CFU/100ml
 Enteric: 1.0 mg/L = 1,000,000 CFU/100ml
 Surface Water: 1.0 mg/L = 1,000,000 CFU/100ml
 Wqy: 1.0 mg/L = 1,000,000 CFU/100ml

Lower Mystic (2009 locations)

Map Created by:
EPA Region 1 GIS Dept.

Analytes tested for...

- ***E. coli**
- ***Enterococcus**
- ***Ammonia**
 - Alpha Analytical lab
 - Benchtop (DR-850 Hach)
 - Test kit – Hach (2 types)
 - Test strips
- ***Surfactants**
 - Alpha Analytical lab
 - Benchtop (DR-850 Hach)
 - Test kit – Chemetrics
- **Potassium**
- **Free and Total Chlorine**
 - Alpha Analytical lab
 - Test kit – Hach
 - Test strips
- **Total Phosphorus**
- **Fluoride**
 - Alpha Analytical lab
 - Benchtop (DR-850 Hach)
- **Pharmaceuticals**
 - Atenolol
 - Acetaminophen
 - Cotinine
 - 1,7-Dimethylxanthine
 - Caffeine
 - Azithromycin
 - Primidone
 - Urobilin
 - Carbamazepine
- **Urine test strips**

Recommended Minimum Screening Tests



Bacteria test

E. Coli or
Enterococcus



Ammonia test strips



Surfactant test kit

Island End – Everett/Chelsea, MA

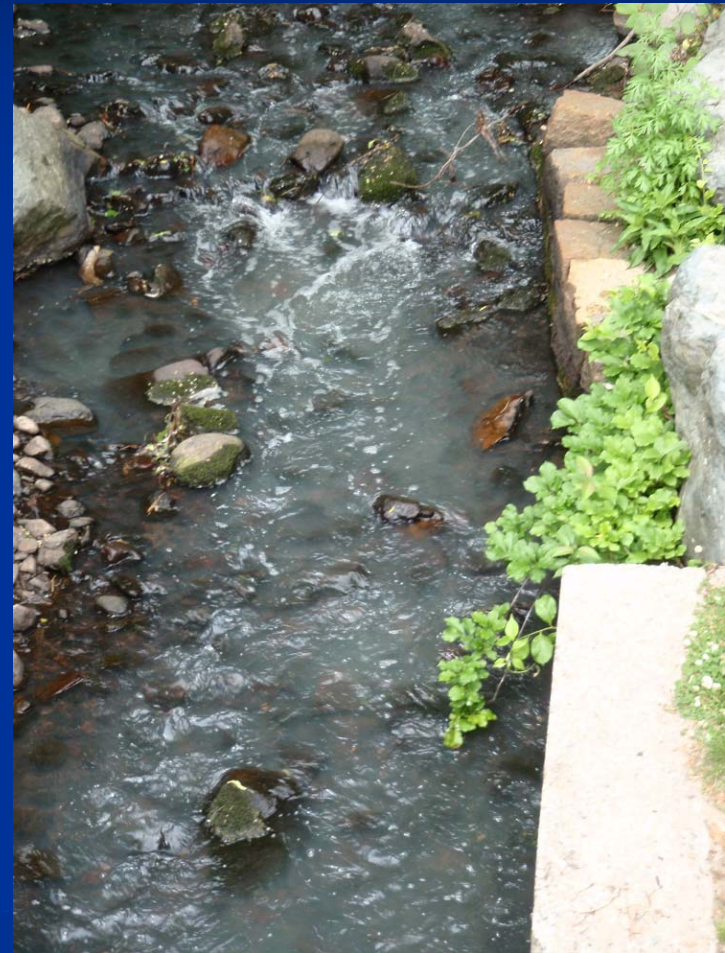


Site	Date	E.coli MPN	Surf mg/L	NH 3 mg/L	
IsEnd01	7/21/08	2595	0.08*	ND *	Wet
IsEnd02*	7/28/09	5654	0.6	0.2	Dry
IsEnd03*	7/28/09	16740	1.5	1	Dry
IsEnd03a*	7/28/09	9678	0.8	3	Dry

Mill Brook - Arlington, MA



Site name: 91Mys



Site name: MillB

Site	Date	E.coli MPN	Surf mg/L	NH 3 mg/L	
91Mys*	6/2/0 9	>241960	1.25	3	Dry
MillB*	6/2/0 9	550	0.2	ND	Dry

MWRA205 – Somerville, MA



Site	Date	E.coli MPN	Entero MPN	Surf mg/ L	NH 3 mg/ L	
MWRA205	5/13/09	na	10462	1.8	0.2	Dry
MWRA205*	5/26/0	77010	1989	2	0.25	Wet

Woburn, MA



Site name: OF118



Site name: OF118up



Site name: OF119

Site	Date	E.coli MPN	Surf mg/ L	NH 3 mg/ L	
OF118*	7/22/09	2452	0.24	0.2	Wet
OF118up*	7/22/09	5199	0.3	2	Wet
OF119*	7/22/09	875	0.2	ND	Wet

New Boston St - Woburn, MA



Site name:
DRR1



Site name: Mys78



Site	Date	E.coli MPN	Entero MPN	Surf mg/L	NH ₃ mg/L	
DRR1*	5/19/09	626	~171	0.1	1	Dry
DRR1*	9/1/09	4185	12976	0.25	6	Dry
Halls2*	5/19/09	606	~146	0.1	ND	Dry
Halls2*	9/1/09	2595	602	0.1	ND	Dry

Stoneham, MA



Site name: 1West



Site	Date	E.coli MPN	Entero MPN	Surf mg/ L	NH 3 mg/ L	
1West*	7/21/09	~64880	~2318	0.6	ND	Wet
2Linden	5/13/09	2190	na	0.2	ND	Dry

Stoneham, MA



Site name: Elm1



Site name: Toms/Toms3

Site	Date	E.coli MPN	Entero MPN	Surf mg/ L	NH 3 mg/ L	
Elm1*	7/21/09	~51720	~5654	0.3	1.5	Wet
Toms*	7/21/09	~16070	~5818	0.75	ND	Wet
Toms3*	7/21/09	~3080	~924	0.75	ND	Wet

Outfalls to Mill Creek – Chelsea, MA



Site name: Mill2a



Site name: Mill2



Site name: Mill2b

Site	Date	E.coli MPN	Surf mg/ L	NH ₃ mg/ L	
Mill2*	5/26/09	44	1.5	3	Wet
Mill2*	7/28/09	310	0.8	6	Dry
Mill2a*	5/26/09	100	1	6	Wet

Summary

- Collected ~2000 samples in the Mystic over the past 2 years testing for a wide variety of parameters.
- Recommended minimum sampling tests include; bacteria, surfactants and ammonia at each site for screening and to help prioritize locations.
- Through enforcement and community action pollutant load is being reduced but still have areas of concern.
- Waiting on pharmaceutical data and method development.

Next Steps

- Complete data review and assessment
- Complete summary and recommendations
- Continued enforcement
- Volunteer monitoring equipment loan program
- Possible collaboration/coordination
- Will post results, maps and related information on EPA Region 1 website for Mystic River, which can be found at:
www.epa.gov/ne/mysticriver

Questions?

