FAIRFIELD COUNTY
RIVER REPORT

Harbor Watch | 2019

Fairfield County River Report: 2019

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This report includes data on:

Belden Hill Brook, Bruce Brook, Comstock Brook, Deep Brook, Farm Creek, Horseneck Brook, Muddy Brook, Noroton River, Norwalk River, Pequonnock River, Pootatuck River, Pussy Willow Brook, Rippowam River, Sasco Brook, Saugatuck River, and Silvermine River.

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About Harbor Watch

The mission of Harbor Watch is to
improve water quality and ecosystem health in Connecticut.

Each day we strive to reach this goal through research in the lab and field, collaboration with our municipal partners, and education of students and the public. Harbor Watch addresses pollution threats to Long Island Sound and educates the next generation of scientists through hands-on research and experiential learning. As part of the larger organization of Earthplace, the work performed by Harbor Watch also supports the mission of Earthplace to build a passion in our community for nature and the environment through education, experience, and action.

Since its inception, Harbor Watch has trained over 1,000 high school students, college interns, and adult volunteers in the work of protecting and improving the biological integrity of Long Island Sound and has monitored hundreds of sites for a variety of physical and biological parameters.

In 2019, Harbor Watch:

- Studied over 400 field sites in Fairfield County, CT
- Conducted biweekly, May-September monitoring of 16 rivers in 16 towns
- Trained 60 high school and college students
- Processed over 1800 water samples for bacteria concentration analysis in our laboratory

Visit www.harborwatch.org for more information!

Acknowledgements

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Key Terms and Information

Acronyms:

- CT DEEP: Connecticut Department of Energy and Environmental Protection
- CFU/100 mL: Colony forming units per 100 mL. This is a unit of measurement for bacteria concentrations. A colony is raised from a single bacterium to a visible colony for counting by providing the preferred heat range and media for 24 hours. (These units are appropriate for direct comparison to those in MPN/100mL.)
- MPN/100 mL: Most probable number per 100 mL. This is a unit of measurement for bacteria concentrations based on statistics rather than specific colonies. (These units are appropriate for direct comparison to those in CFU/100mL.)

Study Site Naming:

- Sites are numbered with the lowest number being closest to the mouth of the river where it meets a larger body of water (e.g. Long Island Sound). Sites with the highest numbers are located furthest upstream.
- Site names that include "SD" indicate that the sample location is a storm drain outfall rather than an instream location. These sites are not held to the same pass/fail assessment standards as instream sites and were not included in the pass or fail assessments.

Terms/Symbols in Tables:

- "n/a" - Indicates that a sample was not taken at that time for reasons including broken or lost sample bag, stagnant water, inaccessibility due to construction, dry river bed, or other factors.
- ">" – Indicates that the results exceeded the reporting limit.
- "Wet" - Rainfall is indicated as "Wet" if > 0.1 inches of rain fell within 2 days prior to sampling.
- "Dry" - Rainfall is indicated as "Dry" if < 0.1 inches of rain fell within 2 days prior to sampling.

Disclaimer: Every effort has been made to ensure the accuracy of the information presented in this report. If you notice anything in this report that you believe may be an error, we welcome that or any other feedback. Please contact us by email at harborwatch@earthplace.org.

Introduction

Harbor Watch is a research and education program based out of Earthplace in Westport, CT. Our mission is to improve water quality and ecosystem health in Connecticut. In this report, we present a study of water quality in rivers throughout Fairfield County. The goal of this monitoring was to assess the health of each river and to identify areas where sources of sewage pollution may be present using *Escherichia coli* (*E. coli*) or *Enterococci* as indicators.

Since 1986, Harbor Watch has been monitoring water quality throughout Fairfield County. The 2019 summer season included sampling in 16 rivers in 16 towns along with dozens of stormwater systems flowing into those rivers and others. Partnering with local municipal leaders allowed us to identify multiple sources of sewage pollution to the Long Island Sound watershed in 2019. This report contains data summaries for the 16 rivers we monitored from May through September, which is a subset of Harbor Watch's monitoring program.

This report includes data on 5 water quality parameters: *E. coli*, *Enterococci*, dissolved oxygen, temperature, and conductivity. *E. coli* and *Enterococci* were selected for study because they are the indicator bacteria of choice for the Environmental Protection Agency (EPA) and Connecticut Department of Energy and Environmental Protection (CT DEEP) for sewage pollution in freshwater systems and saltwater systems respectively. Their presence in high concentrations suggests that there are likely also more harmful pathogens present. Dissolved oxygen is an important water quality indicator because many aquatic species rely on it for survival, similarly to how land animals rely on oxygen in the air. When dissolved oxygen is not available, species like fish and macroinvertebrates will relocate to higher quality waters, or die due to the lack of oxygen. Conductivity is a measure of how easily the water can carry an electrical current by measuring the ionic strength of the water. It can quantify the intrusion of salt water or other sources of salts and other compounds into a waterway. Temperature is also an important parameter for aquatic species, which can be excluded from a given location if the temperature is too high or too low.

Methods

Each river was visited approximately twice per month from May through September for a total of 10 sampling days per river. Sites were selected based on access and representativeness of the river, with effort made to space sites evenly throughout the length of the river. Monitoring was carried out under a Quality Assurance Project Plan approved by the CT DEEP (RFA #17057).

Monitoring teams left Earthplace in Westport, CT in the morning to begin sampling and would return within 2-3 hours. Each team was comprised of fully-trained Harbor Watch employees, sometimes accompanied by volunteers. At each site, a water sample was collected and kept on ice. Water temperature, dissolved oxygen, and conductivity were measured at each site using a YSI Pro2030 meter.

Upon return to the Harbor Watch laboratory, the water samples were analyzed for total coliform and *E. coli* or *Enterococci* using enzyme substrate methods set forth in Standard Methods (SM9223B). *E. coli* concentrations were evaluated using the criteria published in the CT DEEP Surface Water Quality Standards on 10/10/13 (Table 1). Because the rivers we tested do not contain designated swim areas, the "all other recreational uses" criteria will apply.

Table 1. CT DEEP criteria for *E. coli* and *Enterococci* levels as applied to recreational use, effective 10/10/13. Highlighted cells represent criteria Harbor Watch used in this report.

Designated Use	**Class**	**Indicator**	**Criteria**
Designated Swimming	AA, A, B	*Escherichia coli*	Geomean less than 126/100 mL; Single Sample Maximum 235/100 mL
Non-designated Swimming	AA, A, B	*Escherichia coli*	Geomean less than 126/100 mL; Single Sample Maximum 410/100 mL
All Other Recreational Uses	AA, A, B	*Escherichia coli*	Geomean less than 126/100 mL; Single Sample Maximum 576/100 mL
Designated Swimming	SA, SB	*Enterococci*	Geomean less than 35/100 mL; Single Sample Maximum 104/100 mL
All Other Recreational Uses	SA, SB	*Enterococci*	Geomean less than 35/100 mL; Single Sample Maximum 500/100 mL

Results and Discussion

Fairfield County Summary

From May through September 2019, 16 rivers were monitored by Harbor Watch across 16 towns in Fairfield County, CT. There were 123 unique sampling locations that were monitored 10 times each. Many of these rivers did not meet state criteria for bacteria concentrations (Figure 1) and are acting as a pathway for sewage pollution to enter Long Island Sound. Seventy seven percent of sites exceeded either the CT DEEP geometric mean criterion (< 126 MPN/100 mL for freshwater sites or < 35 MPN/100 mL for estuarine sites) (Figure 1), the secondary single sample maximum criterion of < 15% of indicator bacteria samples at each site (> 576 MPN/100 mL for freshwater sites or >500 MPN/100 mL for estuarine sites) (Figure 2), or both. The Silvermine River and Belden Hill Brook had the fewest exceedances of the CT DEEP criteria. There was a 5-way tie for the most exceedances, with 100% of the sites studied on Bruce Brook, Deep Brook, Muddy Brook, Pussy Willow Brook, and Sasco Brook failing either one or both of the CT DEEP criteria (Table 1).

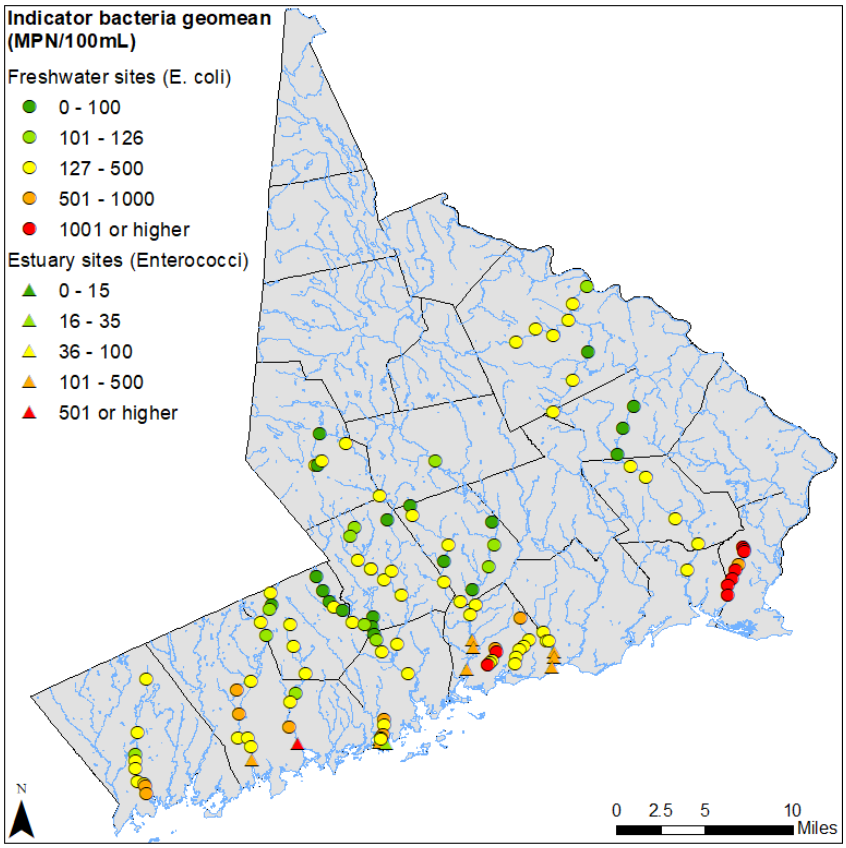


Figure 1. Map of 2019 sampling locations and *E. coli* and *Enterococci* concentrations for each site. The bacteria concentrations for each site were compared to the state criteria for recreational waters (Table 1). Passing sites (light and dark green) have a geomean less than 126/100 mL for E. coli and 35/100 mL for Enterococci.

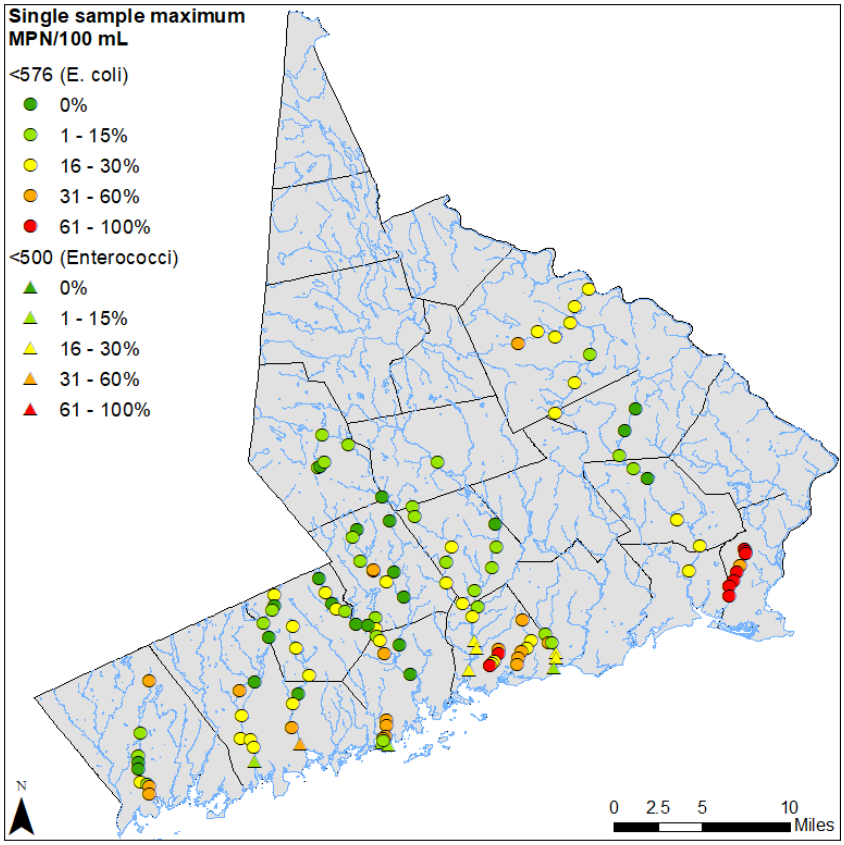


Figure 2. Map of 2019 sampling locations and percentage of *E. coli* and *Enterococci* samples failing the CT DEEP single sample maximum criterion for recreational waters at each site. Passing sites (light and dark green) have less than 15% of their samples exceeding 576/100 mL for *E. coli* and 500/100 mL for *Enterococci.*

	Failing Bacteria	Failing DO
Belden Hill Brook	50%	0%
Bruce Brook	100%	0%
Comstock Brook	67%	0%
Deep Brook	100%	0%
Farm Creek	88%	13%
Horseneck Brook	89%	0%
Muddy Brook	100%	0%
Noroton River	86%	0%
Norwalk River	73%	9%
Pequonnock River	63%	13%
Pootatuck River	80%	0%
Pussy Willow Brook	100%	0%
Rippowam River	75%	0%
Sasco Brook	100%	0%
Saugatuck River	56%	0%
Silvermine River	50%	0%

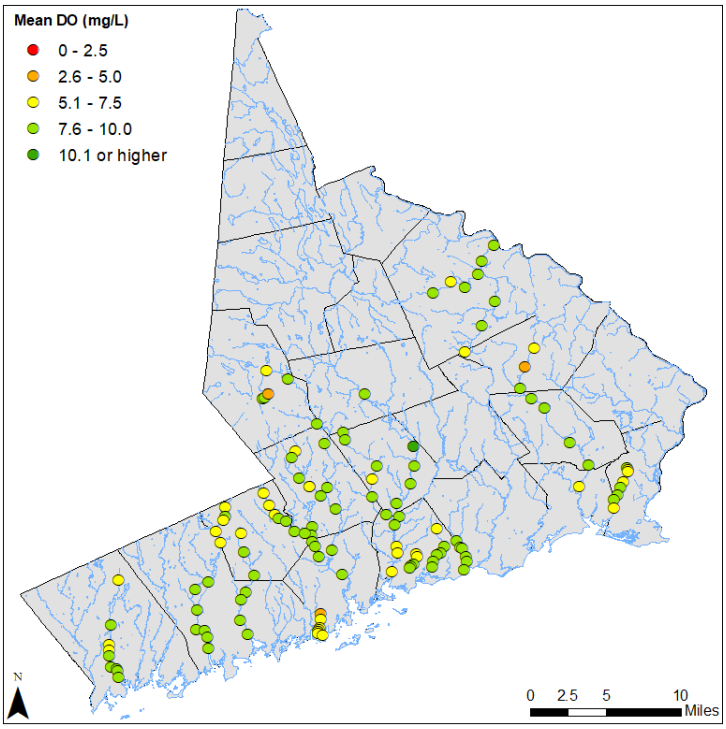


Table 1. (Above, left) Percentage of sites studied in each river that failed one or both of the state criteria for allowable levels of bacteria and the state criterion for dissolved oxygen (DO). **Figure 3.** (Above, right) Map of 2019 river sampling locations and mean dissolved oxygen values. The dissolved oxygen level for each site was compared to the state criterion of a minimum of 5mg/L.

The state criterion for acceptable dissolved oxygen levels is set at a minimum of 5 mg/L. The majority of sampling sites had mean dissolved oxygen concentrations that met this criterion, but some sites had mean values which fell below 5 mg/L (Figure 3). Prolonged periods of low dissolved oxygen can be harmful to marine and aquatic organisms. Factors observed during the monitoring season such as low flow, decomposition of organic matter, and warm water temperatures have the potential to impact dissolved oxygen values. Only 2% off all study sites failed the dissolved oxygen criterion.

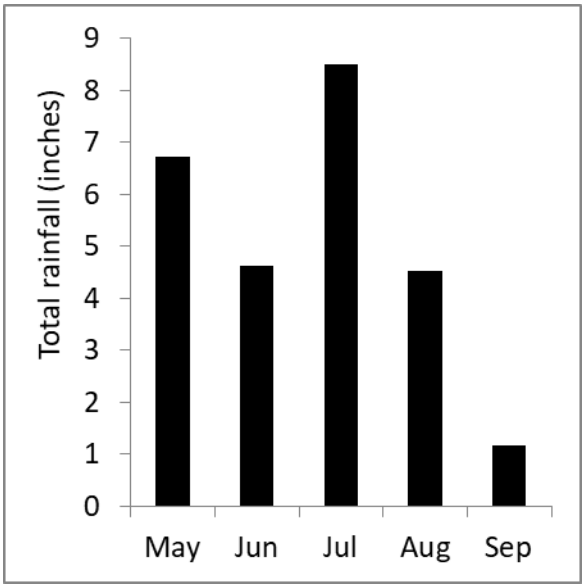


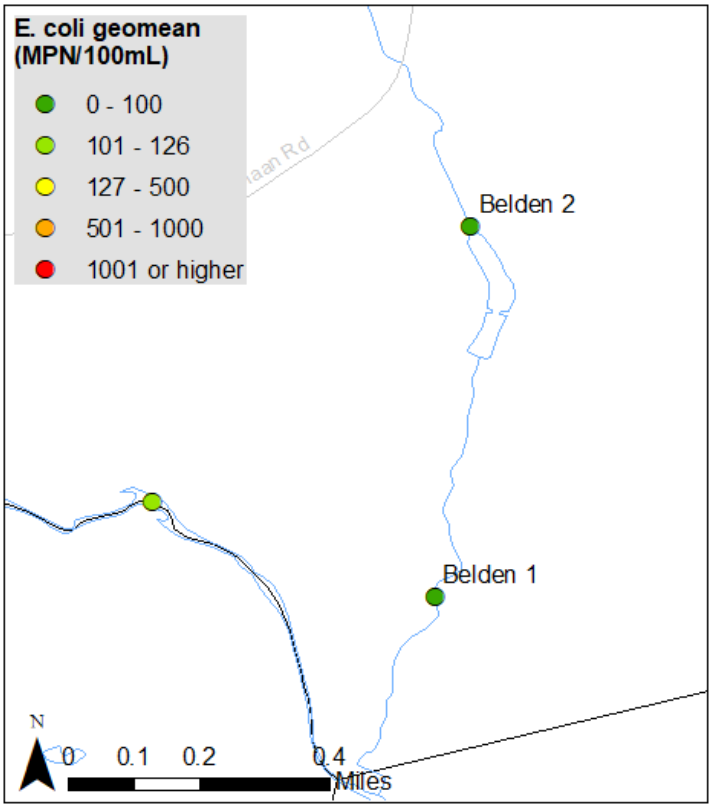
Figure 4. Monthly rainfall totals for 2019 (Norwalk Health Department Raingauge).

Data were collected on these Fairfield County waterways for multiple reasons. Harbor Watch aims to better understand the ecological health of our watersheds by monitoring dissolved oxygen, conductivity, water temperature, and bacteria levels. A secondary objective is to use the data collected to inform where sewage pollution sources may be located so that we can perform further investigation. Once sources are identified, Harbor Watch works with municipal partners to fix the problem. During 2019, track-down surveys were conducted on projects in Bridgeport, Darien, Fairfield, Greenwich, Norwalk, Stamford, Stratford, and Westport. Track-down surveys are ongoing and will continue year-round. Our process of repetitive bacteria testing has been successful in identifying point sources of pollution such as leaking sanitary sewer lines, broken sewer laterals, and pipes illegally hooked into the storm water system. By partnering with municipalities to fix these problems, we have been able to calculate as much as 99% reductions in bacteria concentrations entering our waterways from a single source location. While 11 sources of pollution have already been identified in 2019 and reported to local municipalities, the high incidence of failing bacteria concentrations observed over this monitoring season (Figure 1, Table 1) indicates that there is still considerably more work to be done to improve the overall water quality of the Long Island Sound watershed.

In the chapters to follow, we present a data summary of each of the 16 rivers monitored by Harbor Watch this summer. Additional data for each river can be found in an appendix at the end of this report.

1. Belden Hill Brook

Belden Hill Brook is a tributary to the Silvermine River located in Wilton, CT. It meets the Silvermine River between our monitoring locations Silvermine 4 and Silvermine 3 (see Chapter 16 for Silvermine River). The watershed is primarily residential and is downstream of the South Norwalk Reservoir. 2019 was the first year since 2015 during which Harbor Watch tested water quality in Belden Hill Brook. Both of the sites studied met the CT DEEP geometric mean criteria, but Belden 1 exceeded the single sample maximum criteria. Dissolved oxygen levels met the CT DEEP minimum criteria of 5 mg/L on each monitoring day. See Appendix 1 for additional data.



	Bacteria failed?	DO failed?
Belden 2	No	No
Belden 1	Yes	No

Figure 1.1. (Left) 2019 geometric mean of *E. coli* concentrations at each site studied on Belden Hill Brook.
Table 1.1. (Above) Which sites failed either of the two state criteria for *E. coli* concentrations and the criterion for dissolved oxygen.

2. Bruce Brook

The Bruce Brook watershed lies in both the Town of Stratford and the City of Bridgeport. It spans approximately 2,199 acres and discharges into Bridgeport Harbor. This land use is divided into 94% urban area, 5% forests, 1% water, and less than 1% agriculture (CT DEEP). The brook itself is channelized with cement through most of its length. Bruce Brook acts as a natural boundary between the two municipalities from the Route 1 corridor south to the coastline.

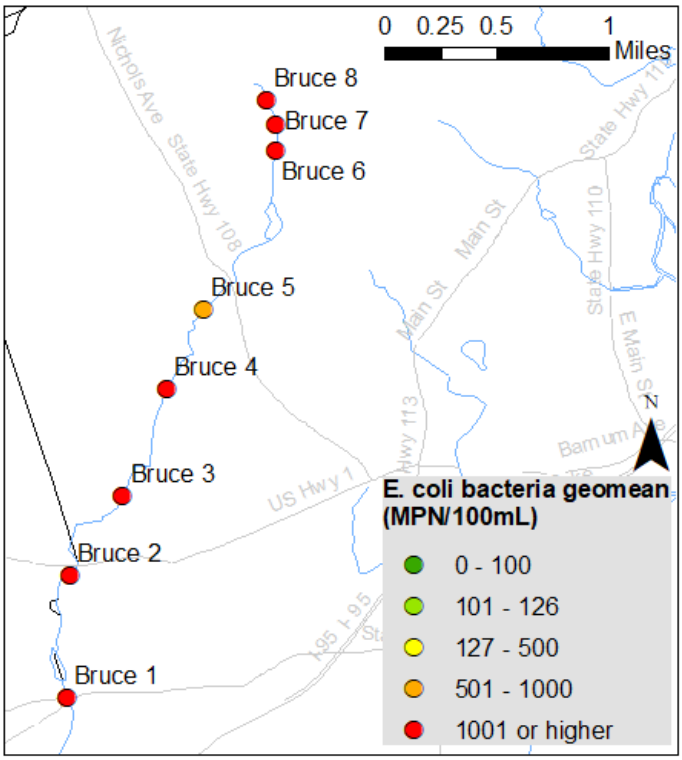


Figure 2.1. 2019 geometric mean of *E. coli* concentrations at each site studied on Bruce Brook.

2017 marked the first year that Harbor Watch monitored Bruce Brook. Monitoring continued in 2018 and 2019 at the same sites. During all three monitoring seasons, all sites exceeded both CT DEEP criteria for *E. coli*. Dissolved oxygen mean values met the CT DEEP minimum criterion at all sites, but individual readings did drop below 5 mg/L on three monitoring days in 2019. Track-down surveys in the watershed are actively ongoing in partnership with both the Town of Stratford and the City of Bridgeport. See Appendix 2 for additional data.

	Bacteria failed?	DO failed?
Bruce 8	Yes	No
Bruce 7	Yes	No
Bruce 6	Yes	No
Bruce 5	Yes	No
Bruce 4	Yes	No
Bruce 3	Yes	No
Bruce 2	Yes	No
Bruce 1	Yes	No

Site	2017 Geomean	2018 Geomean	2019 Geomean
Bruce 8	-	-	1347
Bruce 7	-	-	1500
Bruce 6	1241	1712	2185
Bruce 5	512	435	760
Bruce 4	794	1333	1653
Bruce 3	2573	2181	2202
Bruce 2	3298	4004	77232
Bruce 1	41243	36264	41027

Table 2.1. (Left) Which sites failed either of the two state criteria for *E. coli* concentrations and the criterion for dissolved oxygen levels. **Table 2.2.** (Right) Comparison of geometric mean by site from 2017-2019.

3. Comstock Brook

Comstock Brook is a tributary of the Norwalk River located in Wilton, CT. It meets the Norwalk River between our monitoring locations Norwalk 9 and Norwalk 6 (see Chapter 9 for Norwalk River). The watershed is primarily residential. 2018 was the first year since 2012 during which Harbor Watch tested water quality in Comstock Brook. One stormwater outfall (Wilton SD1) located adjacent to site Comstock 2 was also monitored due to a history of pollution at that site. Three of the 5 sites studied failed both of the state criteria for allowable levels of bacteria, indicating that this brook is a potential conduit for sewage pollution to the Norwalk River and ultimately Long Island Sound. See Appendix 3 for additional data.

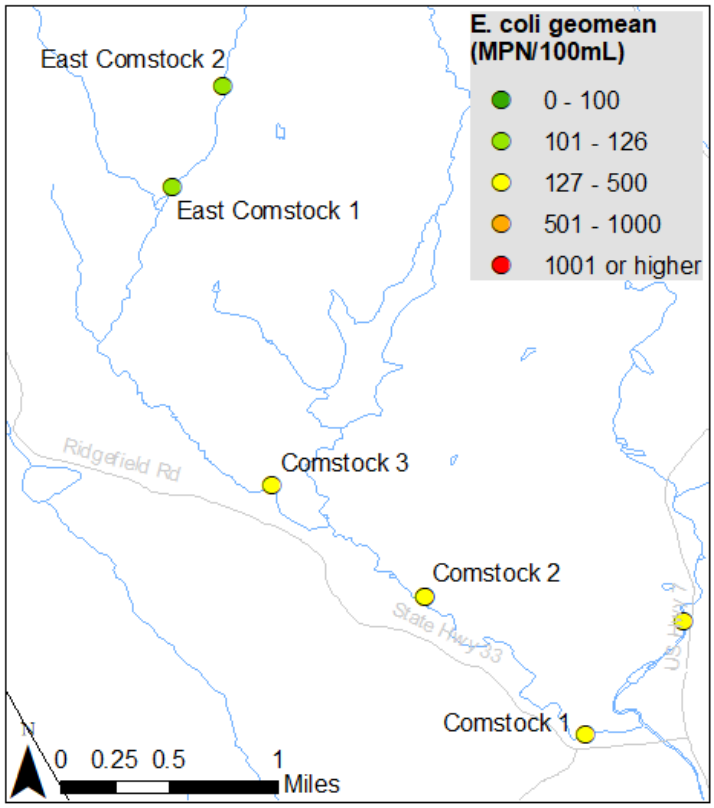


Figure 3.1. 2019 geometric mean of *E. coli* concentrations at each site. Wilton SD1 is in the same location as Comstock 2, but the geomean is not calculated because the CT DEEP criteria are not for stormwater.

	Bacteria failed?	DO failed?
East Comstock 2	No	No
East Comstock 1	No	No
Comstock 3	Yes	No
Comstock 2	Yes	No
Comstock 1	Yes	No

	2018 Geomean	2019 Geomean
East Comstock 2	79	110
East Comstock 1	72	119
Comstock 3	226	198
Comstock 2	533	415
Comstock 1	315	244

Table 3.1. (Left) Which sites failed either of the two state criteria for *E. coli* and the criterion for dissolved oxygen levels. **Table 3.2.** (Right) Comparison of geometric mean by site from 2018 and 2019.

4. Deep Brook

The Deep Brook watershed is located entirely within the boundaries of Newtown, CT. Deep Brook starts on Castle Hill Road and flows northeast towards the center of Newtown. It is a tributary of the Pootatuck River (discussed in Chapter 11) and is mostly used for recreation, such as trout fishing (Town of Newtown). This was the 3rd year during which Harbor Watch monitored Deep Brook. Deep Brook was added to our monitoring regime at the request of the Town of Newtown due to its impaired status on the CT DEEP impaired waters list. All sites exceeded one or both of the CT DEEP criteria for bacteria and mean dissolved oxygen levels met the CT DEEP minimum criteria at all sites, although individual readings did drop below 5 mg/L on 5 of the monitoring days. See Appendix 4 for additional data.

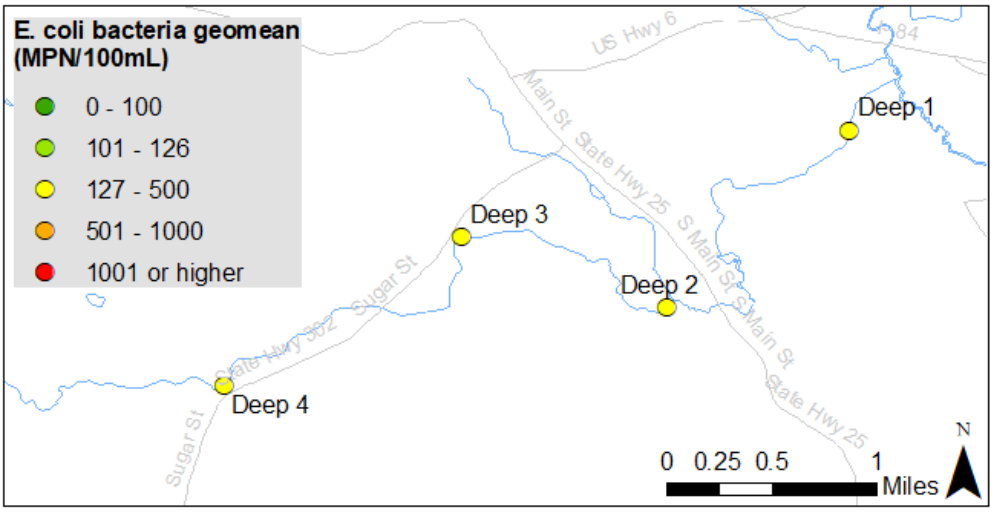


Figure 4.1. 2019 geometric mean of *E. coli* concentrations at each site.

	Bacteria failed?	DO failed?
Deep 4	Yes	No
Deep 3	Yes	No
Deep 2	Yes	No
Deep 1	Yes	No

Site	2017 Geomean	2018 Geomean	2019 Geomean
Deep 4	369	353	443
Deep 3	182	283	165
Deep 2	232	297	353
Deep 1	94	125	159

Table 4.1. (Above, left) Which sites failed either of the two state criteria for *E. coli* concentrations and the criterion for dissolved oxygen levels. **Figure 4.2.** (Above, right) Change in geometric mean by site from 2017-2019.

5. Farm Creek

Farm Creek is a small tributary to Long Island Sound located in Norwalk, CT. The creek begins north of Roton Middle School, flows south to where the creek opens up to an estuary surrounded by salt marsh, and ultimately discharges to Wilson Cove. Most of the watershed is residential with a few school campuses with large sports fields. Sites Farm 1, Farm, 2, and Farm 3 were monitored for *Enterococci*, while the other sites were monitored for *E. coli* as the indicator bacteria. Harbor Watch has monitored Farm Creek for 6 years, with the past 4 of those years being completed during our summer monitoring season. In 2019, all but one of the sites failed the CT DEEP criteria for *E. coli* and 1 site failed the criterion for dissolved oxygen. A pollution track-down project was initiated during the 2017 monitoring season and is ongoing, but has not yet yielded definitive source identification. Further investigation of Farm Creek is necessary to identify sources of pollution entering the watershed. See Appendix 5 for additional data.

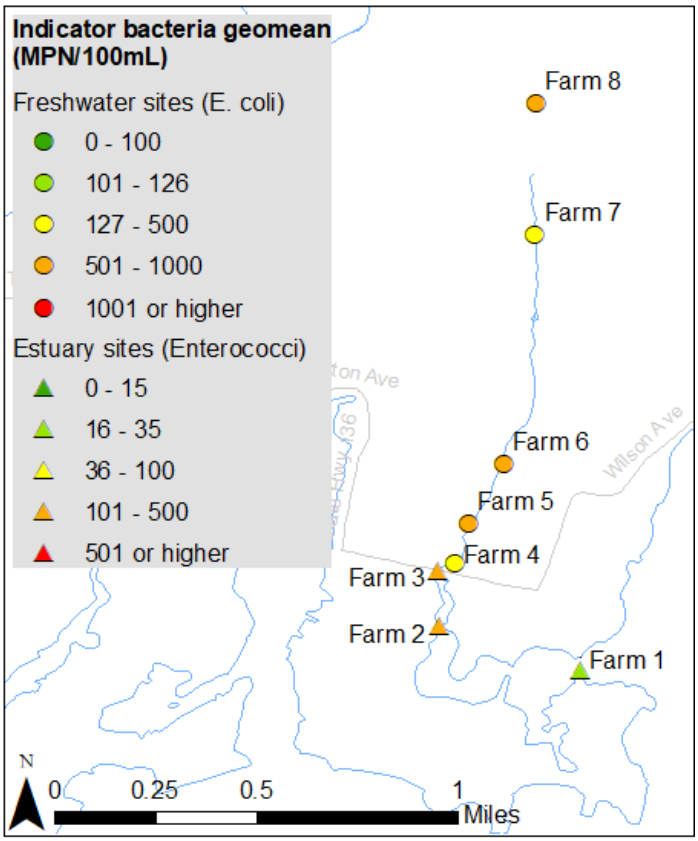


Figure 5.1. 2019 geometric mean of *E. coli* concentrations at each site.

	Bacteria failed?	DO failed?
Farm 8	Yes	Yes
Farm 7	Yes	No
Farm 6	Yes	No
Farm 5	Yes	No
Farm 4	Yes	No
Farm 3	Yes	No
Farm 2	Yes	No
Farm 1	No	No

	2016 Geomean	2017 Geomean	2018 Geomean	2019 Geomean
Farm 8	n/a	n/a	460	523
Farm 7	631	354	727	492
Farm 6	2349	475	767	717
Farm 5	667	284	474	519
Farm 4	411	55	140	128
Farm 3	600	197	407	273
Farm 2	63	137	162	166
Farm 1	17	9	15	29

Table 5.1. (Left) Which sites failed either of the two state criteria for indicator bacteria concentrations and the criterion for dissolved oxygen levels. **Table 5.2.** (Right) Comparison of geometric mean by site from 2016-2019. Note that the indicator bacteria tested at Farm 3, Farm 2, and Farm 1 from 2016-2018 was *E. coli* but in 2019 it was *Enterococci.*

6. Horseneck Brook

Horseneck Brook is located in Greenwich, CT. The northern part of its watershed is largely residential, with some schools and golf courses. Closer to the harbor, the land use is dominated by higher density single and multi-family homes and businesses. Horseneck Brook discharges into Greenwich Harbor in Central Greenwich. 2018 marked the first year during which Harbor Watch monitored Horseneck Brook. In 2019, none of the sites failed the dissolved oxygen criterion and all but one site failed the bacteria criteria. One track-down project started in late 2018 resulted in the identification and removal of a major source of contamination in the vicinity of Horseneck 1, which resulted in the reduction of bacteria observed. See Appendix 6 for additional data.

	Bacteria failed?	DO failed?
Horseneck 10	Yes	No
Horseneck 8	Yes	No
Horseneck 7	No	No
Horseneck 6	Yes	No
Horseneck 5	Yes	No
Horseneck 4	Yes	No
Horseneck 3	Yes	No
Horseneck 2	Yes	No
Horseneck 1	Yes	No

	2018 Geomean	2019 Geomean
Horseneck 10	300	273
Horseneck 8	123	285
Horseneck 7	109	125
Horseneck 6	119	138
Horseneck 5	149	152
Horseneck 4	605	303
Horseneck 3	426	282
Horseneck 2	575	535
Horseneck 1	1488	873

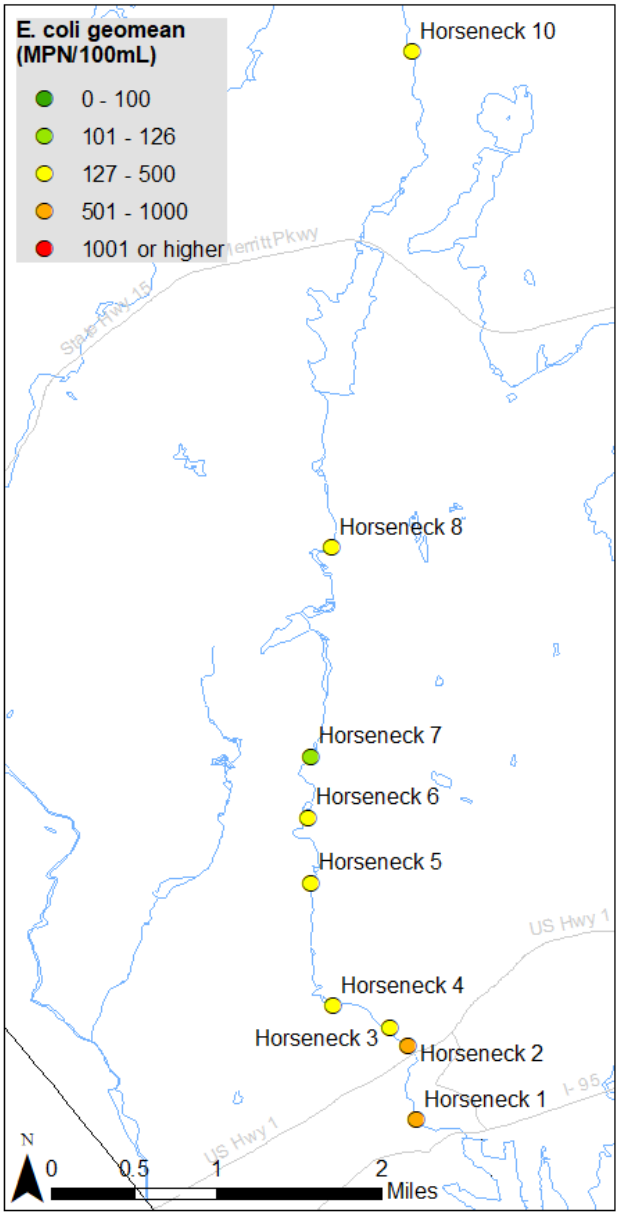


Figure 6.1. (Above) 2019 geometric mean of *E. coli* concentrations at each site. **Table 6.1.** (Left, above) Which sites failed either of the two state criteria for *E. coli* concentrations and the criterion for dissolved oxygen levels. **Table 6.2.** (Left, below) Comparison of geometric mean by site from 2018 and 2019.

7. Muddy Brook

Muddy Brook is part of the CT DEEP designated "Southwest Shoreline sub-regional basin" which is 2.8 square miles. Muddy Brook is located entirely in Westport, CT and discharges into the Sherwood Island Mill Pond. The land use for the Southwest Shoreline sub-regional basin consists of 45% developed areas, 27% turf and grasses, 24% forests, and 4% agriculture, wetlands, and utility right of ways (CT DEEP).

Harbor Watch has monitored Muddy Brook in the past, but often sampling occurred from September through April when colder temperatures are prevalent and reduced bacteria concentrations were observed. 2017 marked the first year during which Harbor Watch conducted a study of Muddy Brook during the May through September monitoring season. The brook is of interest to the Town of Westport because the Sherwood Island Mill Pond is a historic area known for its swimming and shellfishing. In 2019, all sites exceeded at least one of the CT DEEP *E. coli* criteria. Continued monitoring is suggested in order to identify potential sources of pollution. See Appendix 7 for additional data.

Site	2017 Geomean	2018 Geomean	2019 Geomean
Muddy 6	299	251	502
Muddy 5	160	227	256
Muddy 4	277	494	307
Muddy 3	515	583	421
Muddy 2	525	480	466
Muddy 1	273	357	430

	Bacteria failed?	DO failed?
Muddy 6	Yes	No
Muddy 5	Yes	No
Muddy 4	Yes	No
Muddy 3	Yes	No
Muddy 2	Yes	No
Muddy 1	Yes	No

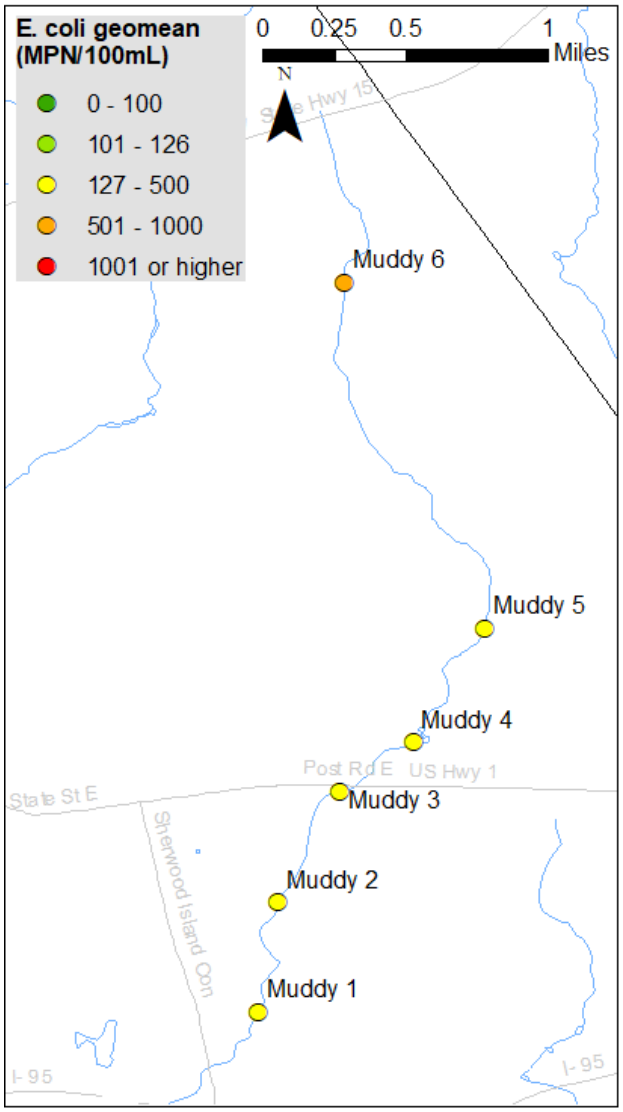
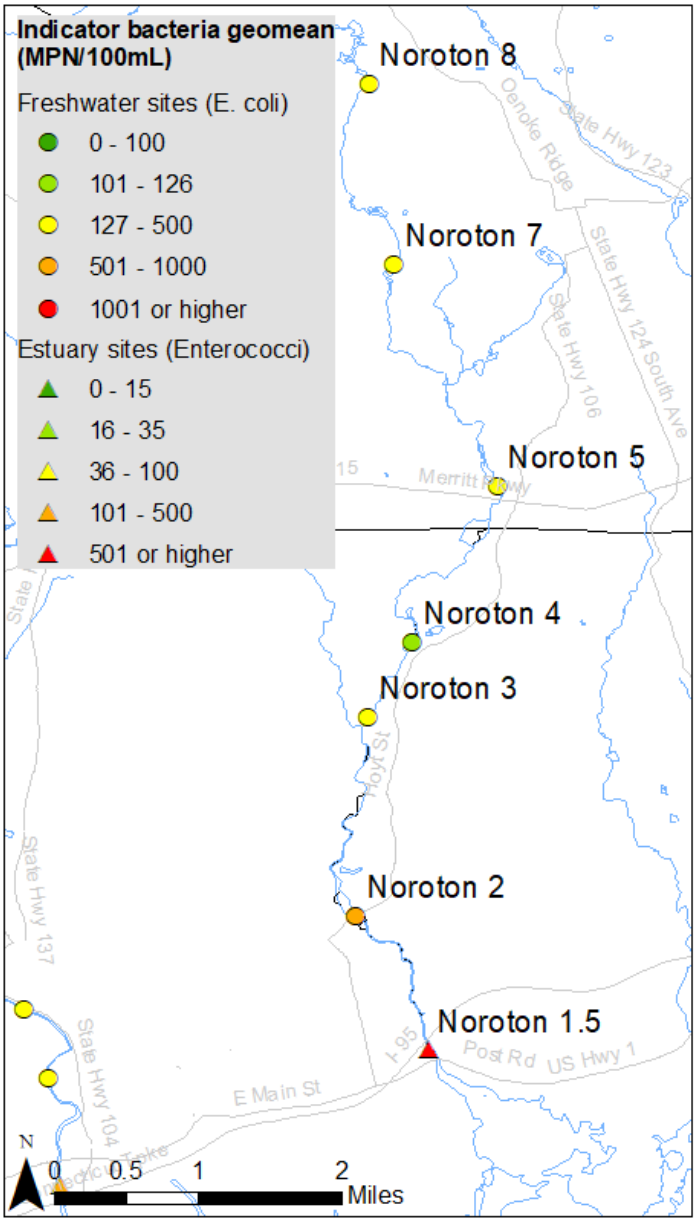


Figure 7.1. (Above) 2019 geometric mean of *E. coli* concentrations at each site. **Table 7.1.** (Left, top) Geometric mean by site from 2017-2019. **Table 7.2.** (Left, bottom) Which sites failed either of the two state criteria for *E. coli* concentrations and the criterion for dissolved oxygen levels in 2019.

8. Noroton River



The Noroton River watershed encompasses portions of Stamford, Darien, and New Canaan, CT. The watershed is approximately 7,000 acres (11 mi^2). The river begins in New Canaan and flows south along the border of Stamford and Darien. The river discharges into Long Island Sound through Holly Pond. The land use along the river is a mixture of residential and light commercial.

This is the 4th consecutive year during which Harbor Watch has monitored the Noroton River. Bacteria concentrations, except for Noroton 4, failed one or both of the CT DEEP criteria. Mean dissolved oxygen values at all sites met the CT DEEP criterion for dissolved oxygen. Work is beginning with Harbor Watch leading a joint effort between the Town of Darien and the City of Stamford to locate pollution sources to this river in the lower portion of the watershed. See Appendix 8 for additional data.

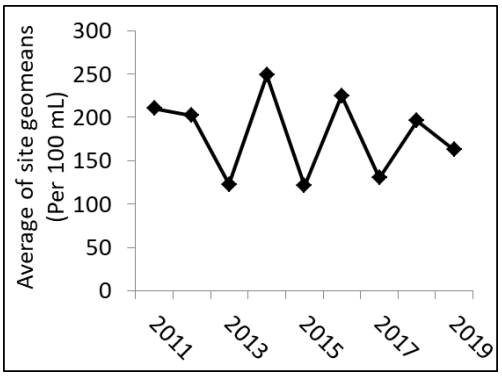
	Bacteria failed?	DO failed?
Noroton 8	Yes	No
Noroton 7	Yes	No
Noroton 5	Yes	No
Noroton 4	No	No
Noroton 3	Yes	No
Noroton 2	Yes	No
Noroton 1.5	Yes	No

Figure 8.1. (Above) 2019 geometric mean of indicator bacteria concentrations at each site. **Table 8.1.** (Right, top) Which sites failed either of the two state criteria for indicator bacteria concentrations and the criterion for dissolved oxygen levels in 2019, and **Table 8.2.** (Right, bottom) Geometric mean by site from 2016-2019. In 2019, site Noroton 1 was inaccessible due to construction so site Noroton 1.5 was added approximately 500 feet upstream. Note that the indicator bacteria tested at Noroton 1/1.5 from 2016-2018 was *E. coli* but in 2019 it was *Enterococci*.

Site	2016 Geomean	2017 Geomean	2018 Geomean	2019 Geomean
Noroton 8	135	67	123	227
Noroton 7	149	70	114	239
Noroton 5	64	23	66	130
Noroton 4	304	99	172	118
Noroton 3	971	304	451	329
Noroton 2	504	153	336	630
Noroton 1/1.5	1477	253	601	732

9. Norwalk River

The Norwalk River watershed includes New Canaan, Norwalk, Redding, Ridgefield, Weston and Wilton, CT, as well as Lewisboro, NY. The watershed is roughly 40,000 acres (64.1 mi^2), 64% of which is developed by commercial/light industry uses and residential neighborhoods (NRWI, 1998). The main stem of the Norwalk River is approximately 20 miles in length, beginning in the Great Swamp in Ridgefield, ultimately discharging in Norwalk Harbor where the last 3 miles are a tidal estuary (NRWI, 1998). Harbor Watch has monitored the Norwalk River year-round for over 20 years. In 2019, all but 2 of the sites exceeded one or both of the CT DEEP criteria for *E. coli*, but only 1 site failed the CT DEEP dissolved oxygen criterion. In addition to instream monitoring, we partnered with the Town of Wilton to add water level loggers at 4 sites. These loggers will allow us to track river flow throughout the monitoring season in the future. See Appendix 9 for additional data.



	Bacteria failed?	DO failed?
Norwalk 23	Yes	No
Norwalk 21	Yes	Yes
Norwalk 19	No	No
Norwalk 15	Yes	No
Norwalk 13	Yes	No
Norwalk 9.5	No	No
Norwalk 9	Yes	No
Norwalk 6	Yes	No
Norwalk 4	Yes	No
Norwalk 1	Yes	No

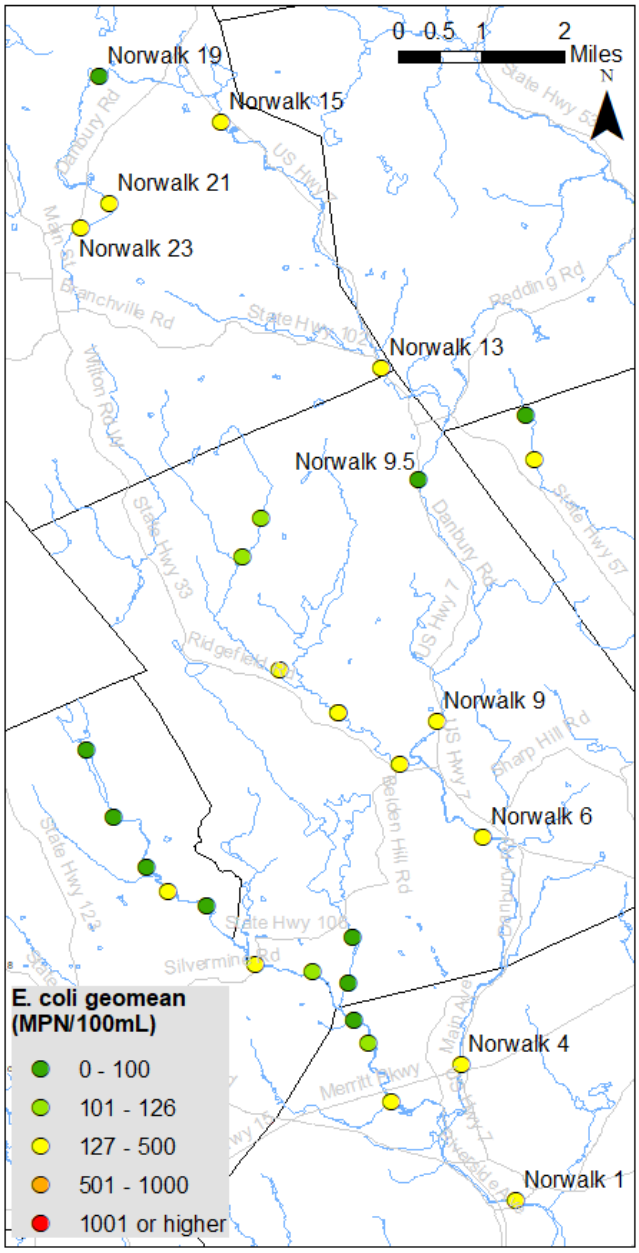
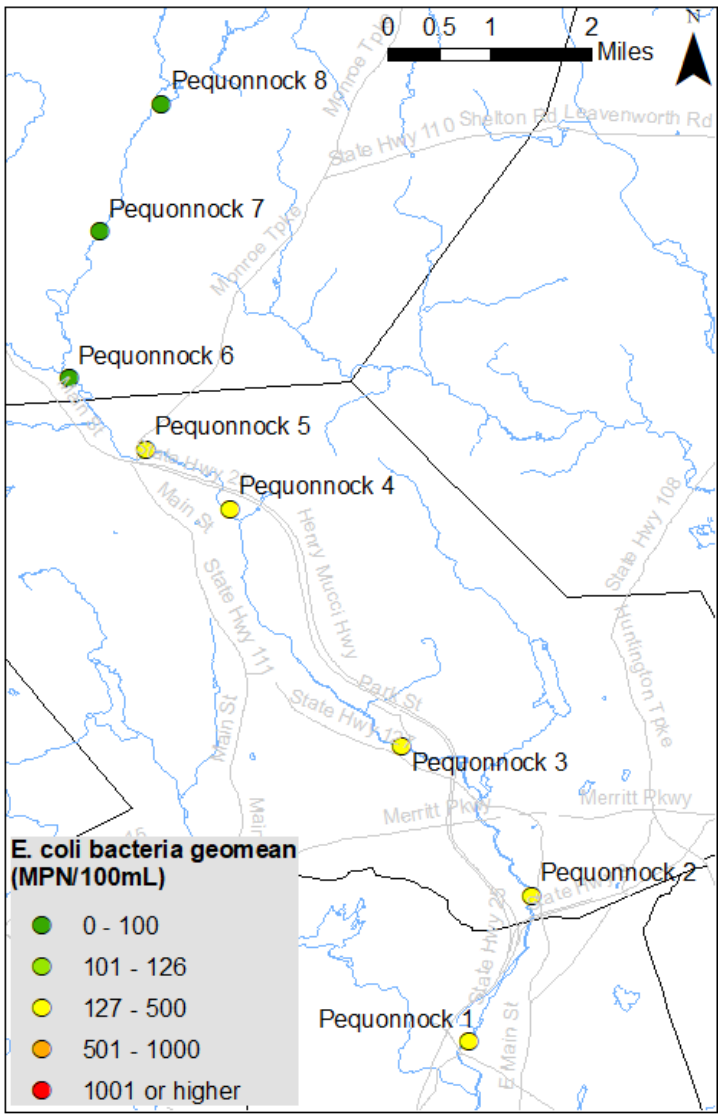


Figure 9.1. (Right) 2019 geometric mean of *E. coli* concentrations at each site. Unlabeled sites are Saugatuck River (chapter 15), Comstock Brook (chapter 3), Silvermine River (chapter 16), and Belden Hill Brook (chapter 1). **Table 9.1.** (Above, bottom) Which sites failed either of the two state criteria for *E. coli* concentrations and the criterion for dissolved oxygen levels, and **Figure 9.2.** (Above, top) Average of site geometric means from 2011-2019.

10. Pequonnock River

The Pequonnock River watershed is located primarily in Monroe, Trumbull, and Bridgeport, with small portions in Shelton and Newtown. The watershed is roughly 29 mi^2. Land use within the watershed transitions from lightly developed in Monroe, to residential in Trumbull and northern Bridgeport, then into commercial and old industrial uses near the mouth at Bridgeport Harbor (Pequonnock River Initiative, 2011). Harbor Watch initially monitored the entire river from 2009-2010. From 2013-2015 the river was monitored only in the upper portion of the watershed. In 2019, Harbor Watch returned to monitoring the entire river. The river is of interest because historically portions have not met minimum state water quality standards. In 2019, 5 sites exceeded one or both of the CT DEEP criteria for *E. coli*, and one site failed the CT DEEP dissolved oxygen criterion. See Appendix 10 for additional data.



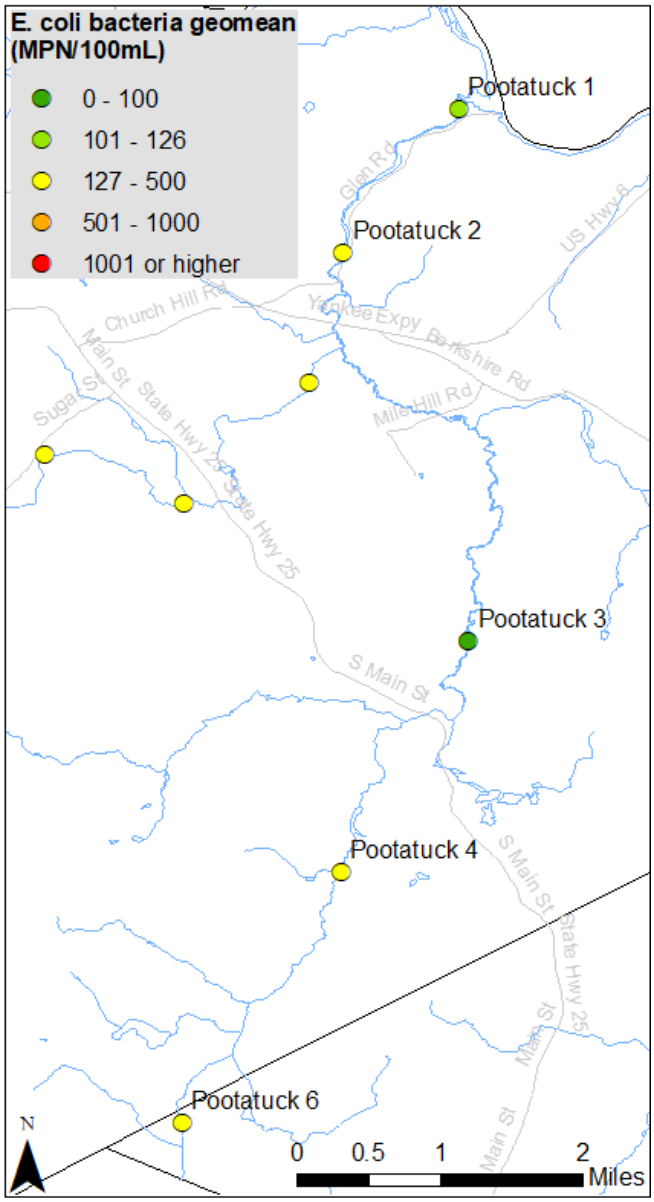
	Bacteria failed?	DO failed?
Pequonnock 8	No	No
Pequonnock 7	No	Yes
Pequonnock 6	No	No
Pequonnock 5	Yes	No
Pequonnock 4	Yes	No
Pequonnock 3	Yes	No
Pequonnock 2	Yes	No
Pequonnock 1	Yes	No

Figure 10.1. (Left) 2019 geometric mean of *E. coli* concentrations at each site. **Table 9.1.** (Above) Which sites failed either of the two state criteria for *E. coli* concentrations and the criterion for dissolved oxygen levels.

11. Pootatuck River

The Pootatuck River begins in Easton and flows east into Monroe before it discharges into the Housatonic River in Newtown, CT. Deep Brook is one of the larger tributaries which drains to the Pootatuck River (discussed in Chapter 4 of this report). The watershed spans a total of 26.1 square miles (Carlson et al. 2010). Much of the watershed land use is defined by residential plots and Rocky Glen State Park.

This was the 3rd consecutive year Harbor Watch monitored the Pootatuck River. Sites were picked with consultation from the Town of Newtown and the Pootatuck Watershed Association to supplement their own data collection. All sites exceeded one or both of the CT DEEP *E. coli* criteria during the 2019 monitoring season, however mean dissolved oxygen values at all of the sites met the CT DEEP minimum criterion. See Appendix 11 for additional data.



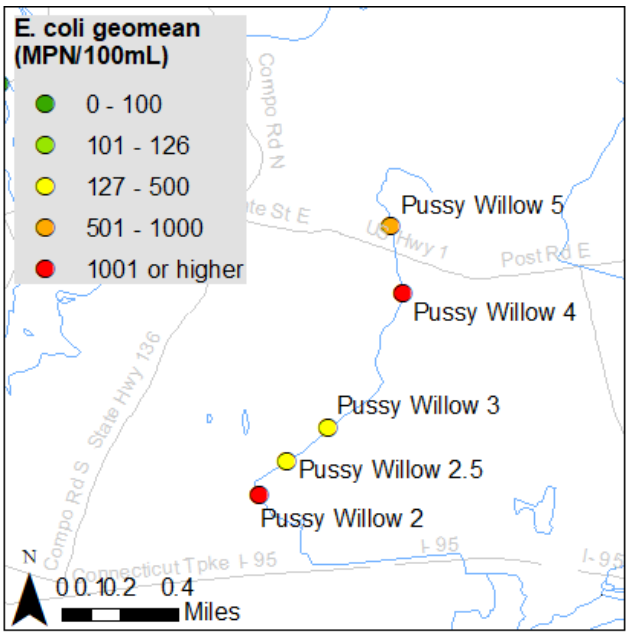
	Bacteria failed?	DO failed?
Pootatuck 6	Yes	No
Pootatuck 4	Yes	No
Pootatuck 3	No	No
Pootatuck 2	Yes	No
Pootatuck 1	Yes	No

Site	2017 Geomean	2018 Geomean	2019 Geomean
Pootatuck 6	197	290	194
Pootatuck 4	191	320	190
Pootatuck 3	129	219	95
Pootatuck 2	126	179	186
Pootatuck 1	62	195	119

Figure 11.1. (Left) 2019 geometric mean of *E. coli* concentrations at each site. **Table 11.1.** (Above, top) Which sites failed either of the two state criteria for *E. coli* concentrations and the criterion for dissolved oxygen levels. **Table 11.2** (Above, bottom) site *E. coli* geomean values from 2017-2019.

12. Pussy Willow Brook

Pussy Willow Brook is a tributary to the Sherwood Island Mill Pond. Located entirely in Westport, CT, the land use in the watershed is a mix of light commercial and residential. The brook is of interest to the Town of Westport because the Sherwood Island Mill Pond has a history of swimming and shellfishing activities. Harbor Watch has previously tested Pussy Willow Brook, but predominantly outside of the May through September monitoring season when the interpretation of indicator bacteria data is more challenging. This is the first year since 2011 during which the brook was monitored during the May through September monitoring season. All sites exceeded the CT DEEP *E. coli* criteria during the 2019 monitoring season, however mean dissolved oxygen values at all of the sites met the CT DEEP minimum criterion. See Appendix 12 for additional data.

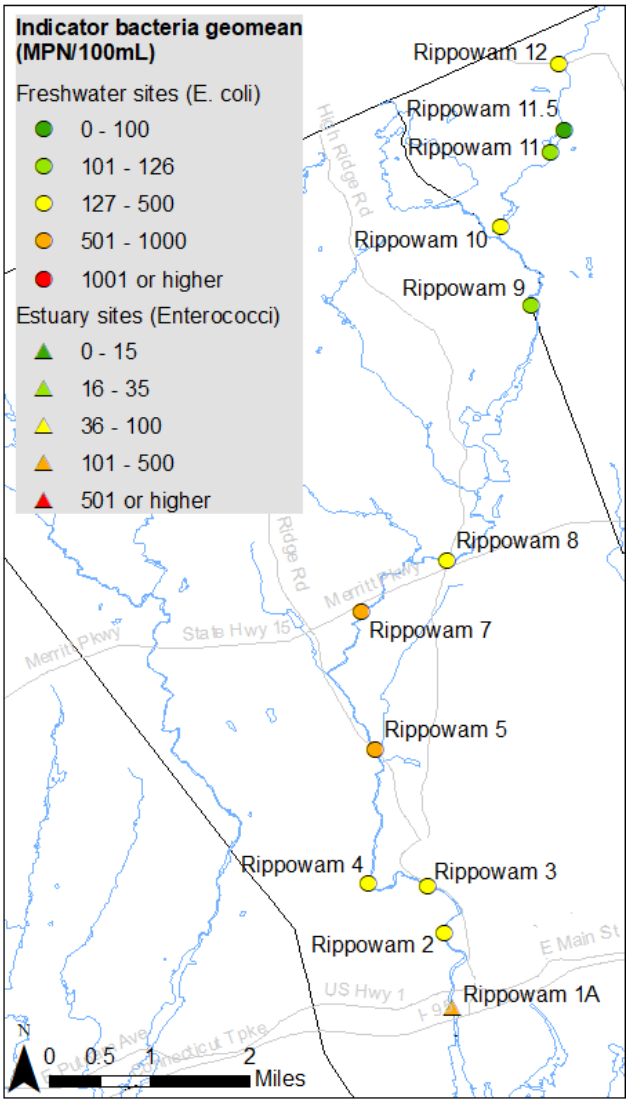


	Bacteria failed?	DO failed?
Pussy Willow 5	Yes	No
Pussy Willow 4	Yes	No
Pussy Willow 3	Yes	No
Pussy Willow 2.5	Yes	No
Pussy Willow 2	Yes	No

Figure 12.1. (Left) 2019 geometric mean of *E. coli* concentrations at each site.
Table 12.1. (Above) Which sites failed either of the two state criteria for *E. coli* concentrations and the criterion for dissolved oxygen levels.

13. Rippowam River

The Rippowam River, sometimes referred to as the Mill River, watershed covers 37.5 square miles from the NY State border, through parts of New Canaan, Ridgefield, and Stamford, where it discharges into Stamford Harbor. The southern portion of the basin is commercial, industrial and residential and the northern portion is largely residential, forested and agricultural (CT DEEP). 2017 was the first year during which Harbor Watch monitored the Rippowam River. The water quality in the river did not meet CT DEEP criteria for bacteria at the majority of sites in 2019. All sites met the CT DEEP minimum criterion for dissolved oxygen. We are working with the City of Stamford to identify and remediate any pollution sources. See Appendix 13 for additional data.



	Bacteria failed?	DO failed?
Rippowam 12	Yes	No
Rippowam 11.5	No	No
Rippowam 11	No	No
Rippowam 10	Yes	No
Rippowam 9	No	No
Rippowam 8	Yes	No
Rippowam 7	Yes	No
Rippowam 5	Yes	No
Rippowam 4	Yes	No
Rippowam 3	Yes	No
Rippowam 2	Yes	No
Rippowam 0.5	Yes	No

Site	2018 Geomean	2019 Geomean
Rippowam 12	102	252
Rippowam 11.5	85	96
Rippowam 11	51	113
Rippowam 10	130	144
Rippowam 9	89	114
Rippowam 8	177	197
Rippowam 7	317	548
Rippowam 5	767	568
Rippowam 4	373	327
Rippowam 3	323	434
Rippowam 2	569	443
Rippowam 0.5	2023	158

Figure 13.1. (Top) 2019 geometric mean of indicator bacteria concentrations at each site. **Table 13.1.** (Right, top) Which sites failed either of the two state criteria for indicator bacteria concentrations and the criterion for dissolved oxygen levels. **Table 13.2.** (Right, bottom) Geometric mean by site in 2018-2019. Note that the indicator bacteria tested at Rippowam 0.5 in 2018 was *E. coli* but in 2019 it was *Enterococci*.

14. Sasco Brook

The Sasco Brook watershed falls within Westport, Fairfield, and Easton, CT. The watershed is approximately 6,600 acres. The land use consists of residential housing on 2+ acres of land, private farms (horses, sheep, llamas), a golf course (Patterson Country Club), wildlife preserves (Brentwood Park, Connecticut Audubon Society), and the Fairfield County Hunt Club. Residential housing at the southern end of the watershed near the Route 1 corridor where monitoring took place is on smaller properties consisting of 0.5 acres, and is on the municipal sewer system. A large portion of housing in the upper Sasco Brook watershed, however, is on septic systems. Sasco Brook discharges into Long Island Sound at Southport Beach. Harbor Watch monitored Sasco Brook most recently from 2011-2016, then again in 2018 and 2019. In 2019, all of the sites failed the CT DEEP criteria for bacteria, but all sites had mean dissolved oxygen values above the CT DEEP 5 mg/L minimum criterion. See Appendix 14 for additional data.

	Bacteria failed?	DO failed?
Sasco 9	Yes	No
Sasco 7	Yes	No
Sasco 6	Yes	No
Sasco 3	Yes	No
Sasco 2	Yes	No
Sasco 1	Yes	No

Site	2016 Geomean	2018 Geomean	2019 Geomean
Sasco 9	147	142	208
Sasco 7	165	150	375
Sasco 6	71	102	203
Sasco 3	566	394	263
Sasco 2	144	292	263
Sasco 1	32	165	128

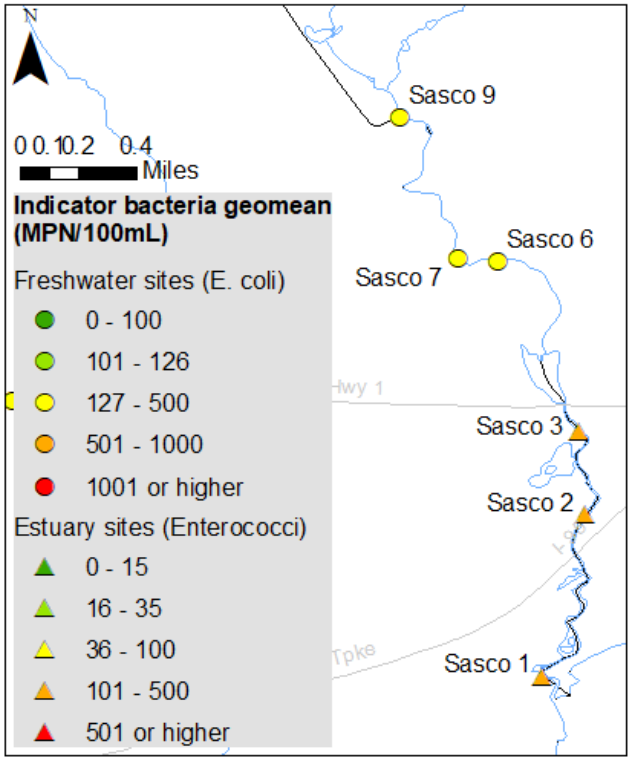
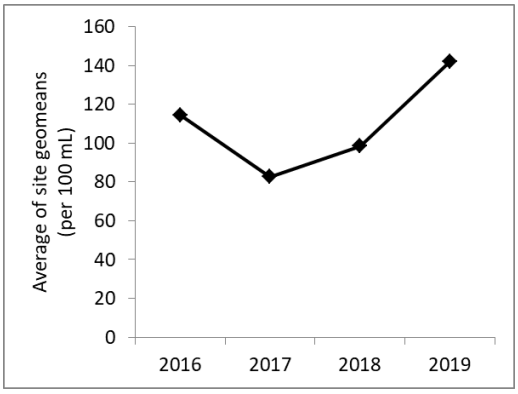


Figure 14.1. (Right) 2019 geometric mean of indicator bacteria concentrations at each site. **Table 14.1.** (Left, top) Which sites failed either of the two state criteria for indicator bacteria concentrations and the criterion for dissolved oxygen levels. **Table 14.2** (Left, bottom) Site indicator bacteria geomean values for 2016, 2018, and 2019. Note that the indicator bacteria tested at Sasco 3, Sasco 2, and Sasco 1 in 2016 and 2018 was *E. coli* but in 2019 it was *Enterococci*.

15. Saugatuck River

The Saugatuck River watershed is located in Danbury, Ridgefield, Bethel, Redding, Wilton, Weston, Easton, Westport, and Norwalk, CT. The watershed is approximately 38,704 acres (60.5 mi^2) and is defined by 2 main drainage basins and a tributary: the Saugatuck River, the West Branch of the Saugatuck River, and Poplar Plains Brook. The land use is a combination of protected preserve around the Saugatuck Reservoir, residential, and light commercial. The Saugatuck River discharges into Long Island Sound at Saugatuck Harbor. Harbor Watch has monitored the Saugatuck River for over 10 years. In 2019, 9 sites failed the CT DEEP bacteria criteria, and none of the sites failed the dissolved oxygen criterion. Two sewage spills in the harbor were reported by the Town of Westport in August 2019 which may be the cause for elevated *Enterococci* concentrations observed at Saugatuck 0.25 in the earlier portion of the monitoring season. See Appendix 15 for additional data.

	Bacteria failed?	DO failed?
West Saug 6	No	No
West Saug 5	Yes	No
West Saug 4	Yes	No
West Saug 3	No	No
West Saug 2	Yes	No
West Saug 1	Yes	No
Saugatuck 7	No	No
Saugatuck 6	No	No
Saugatuck 5	No	No
Saugatuck 4	No	No
Saugatuck 3	No	No
Saugatuck 2	Yes	No
Saugatuck 1	Yes	No
Saugatuck 0.75	Yes	No
Saugatuck 0.5	Yes	No
Saugatuck 0.25	Yes	No



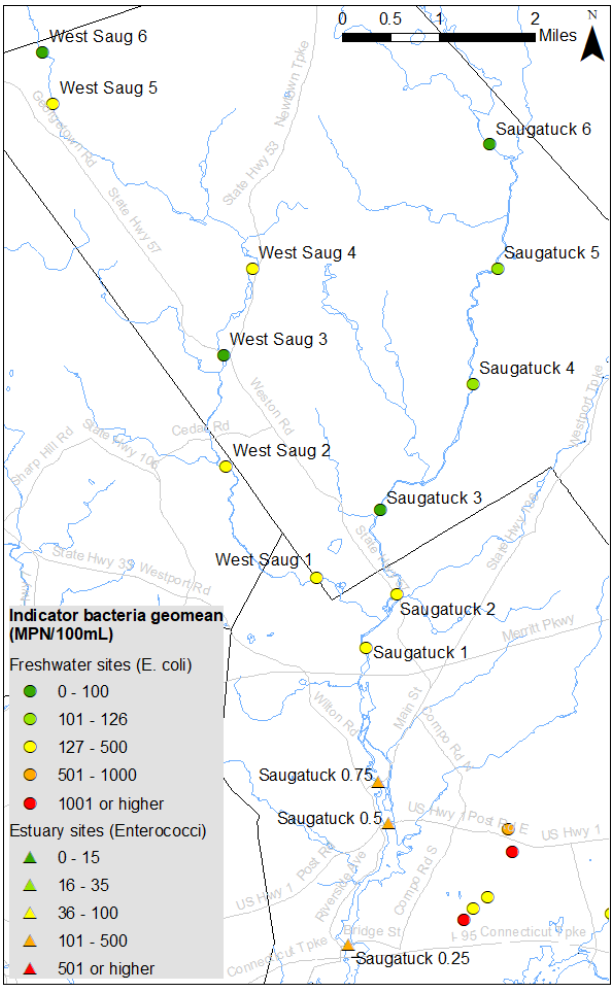


Figure 15.1. (Above) 2019 geometric mean of indicator bacteria concentrations at each site. Unlabeled sites in the lower right portion of the map are Pussy Will Brook sites (see chapter 12) **Table 15.1.** (Left, top) Which sites failed either of the two state criteria for indicator bacteria concentrations and the criterion for dissolved oxygen levels. **Figure 15.2** (Left, bottom) Average site geomean from 2016-2019 for Saugatuck 1 upstream to West Saug 6.

16. Silvermine River

The Silvermine River is a tributary to the Norwalk River and flows from Lewisboro, NY into New Canaan, through Wilton, and into Norwalk. It meets the Norwalk River between our monitoring locations Norwalk 4 and Norwalk 1 (see Chapter 9 for Norwalk River). The watershed is primarily residential with a few reservoirs located in the upper reaches of the watershed. 2019 was the first year since 2015 during which Harbor Watch tested water quality in the Silvermine River. Five of the sites studied failed either one or both of the state criteria for allowable levels of bacteria, and none of mean dissolved oxygen values failed the CT DEEP minimum criterion. For the 2019 monitoring seasons, the Silvermine River, along with its tributary Belden Hill Brook (see Chapter 1 for Belden Hill Brook), had the fewest exceedances of the CT DEEP criteria out of all the rivers monitored by Harbor Watch. See Appendix 16 for additional data.

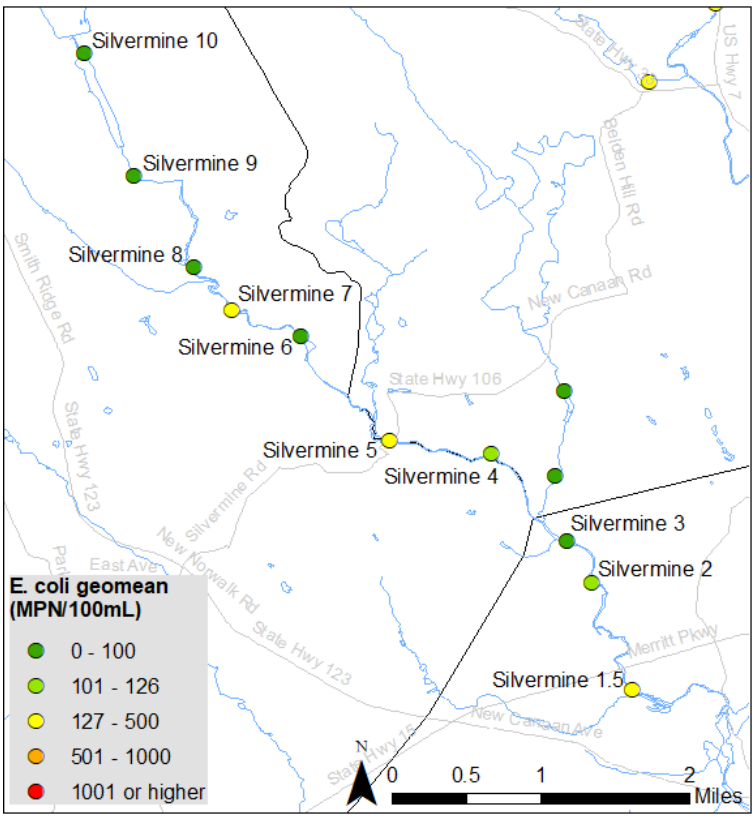


Figure 16.1. 2019 geometric mean of indicator bacteria concentrations at each site.

	Bacteria failed?	DO failed?
Silvermine 10	No	No
Silvermine 9	Yes	No
Silvermine 8	No	No
Silvermine 7	Yes	No
Silvermine 6	No	No
Silvermine 5	Yes	No
Silvermine 4	No	No
Silvermine 3	No	No
Silvermine 2	Yes	No
Silvermine 1.5	Yes	No

Table 15.1. Which sites failed either of the two state criteria for indicator bacteria concentrations and the criterion for dissolved oxygen levels.

Appendix 1: Belden Hill Brook

Table A1.1. GPS coordinates and site locations for Belden Hill Brook

Site Name	Latitude	Longitude	Site location notes	Town
Belden 2	41.16582	-73.4457	Old Boston Road	Wilton
Belden 1	41.15761	-73.44651	Musket Ridge Road	Wilton

Table A1.2. Belden Hill Brook *E. coli* concentrations and relation to CT DEEP water quality criteria (Rainfall data: P. DiPietro, Personal communication, October 3, 2019)

	5/9/19	5/29/19	6/5/19	6/19/19	7/11/19	7/29/19	8/13/19	8/22/19	9/9/19	9/24/19	Geomean	%>576
Belden 2	10	4	11	104	111	37	>2420	130	49	151	58	10%
Belden 1	93	26	21	727	66	82	770	142	40	29	87	20%
Weather	Dry	Wet	Dry	Wet	Dry	Dry	Wet	Dry	Wet	Dry		

Table A1.3. Belden Hill Brook average water temperature, dissolved oxygen, and conductivity for each site

Site	Water temperature (°C)	Dissolved oxygen (mg/L)	Conductivity (µS)
Belden 2	19.0	8.14	235
Belden 1	20.1	8.08	245

Appendix 2: Bruce Brook

Table A2.1. GPS coordinates and site locations for Bruce Brook

Site Name	Latitude	Longitude	Site location notes	Town
Bruce 8	41.22280	-73.14172	Bunnell Ave	Stratford
Bruce 7	41.22115	-73.14089	Connors Lane	Stratford
Bruce 6	41.21949	-73.14091	Old Spring Road	Stratford
Bruce 5	41.20915	-73.14565	Albright Avenue	Stratford
Bruce 4	41.20397	-73.14803	2340 Broadbridge Avenue	Stratford
Bruce 3	41.19699	-73.15085	380 Canaan Road	Stratford
Bruce 2	41.19188	-73.15427	102 Bowe Avenue	Stratford
Bruce 1	41.18386	-73.15447	Connecticut Avenue	Bridgeport

Table A2.2. Bruce Brook *E. coli* concentrations and relation to CT DEEP water quality criteria (Rainfall data: Weather Underground – Tweed New Haven Regional Airport Station, October 9, 2019)

	5/9/19	5/20/19	6/3/19	6/18/19	7/8/19	8/1/19	8/12/19	8/26/19	9/5/19	9/19/19	Geomean	%>576
Bruce 8	248	291	775	4839	1549	6212	3080	639	4813	796	1347	80%
Bruce 7	260	922	821	>4839	4479	3922	2069	1844	1741	519	1500	80%
Bruce 6	303	615	977	>4839	9678	4185	1741	3683	4185	2595	2185	90%
Bruce 5	210	570	94	>4839	461	3466	1195	334	600	3080	760	50%
Bruce 4	585	1095	358	>4839	1741	3466	1164	1379	1462	>9678	1653	90%
Bruce 3	311	449	731	>4839	3683	3466	2747	5199	>9678	3080	2202	80%
Bruce 2	>4839	>24196	77010	54750	241957	57943	77010	>241960	>241960	>241960	77232	100%
Bruce 1	6488	10462	15531	>24196	34480	14081	77010	>241960	>241960	241960	41027	100%
Weather	Dry	Dry	Dry	Wet	Wet	Dry	Dry	Dry	Dry	Dry		

Table A2.3. Bruce Brook average water temperature, dissolved oxygen, and conductivity for each site

Site	Water temperature (°C)	Dissolved oxygen (mg/L)	Conductivity (µS)
Bruce 8	18.0	7.95	342
Bruce 7	18.0	7.16	341
Bruce 6	17.9	6.55	386
Bruce 5	19.8	6.77	364
Bruce 4	20.5	9.21	341
Bruce 3	19.5	9.34	273
Bruce 2	19.4	7.94	349
Bruce 1	19.9	5.70	441

Appendix 3: Comstock Brook

Table A3.1. GPS coordinates and site locations for Comstock Brook

Site Name	Latitude	Longitude	Site location notes	Town
East Comstock 2	41.23927	-73.46164	Whipstick Road	Wilton
East Comstock 1	41.23247	-73.46502	Millstone Road	Wilton
Comstock 3	41.21262	-73.45841	Nod Hill Road	Wilton
Wilton SD1	41.20519	-73.44824	Middlebrook Farm Road	Wilton
Comstock 2	41.20518	-73.44822	Middlebrook Farm Road	Wilton
Comstock 1	41.19597	-73.43747	Lovers Lane	Wilton

Table A3.2. Comstock Brook *E. coli* concentrations and relation to CT DEEP water quality criteria (Rainfall data: P. DiPietro, Personal communication, October 3, 2019)

	5/13/19	5/28/19	6/11/19	6/17/19	7/11/19	7/29/19	8/13/19	8/29/19	9/3/19	9/18/19	Geomean	%>576
East Comstock 2	73	1	365	31	488	76	488	479	345	n/a	110	0%
East Comstock 1	148	16	548	77	82	104	613	222	19	261	119	10%
Comstock 3	179	57	1553	104	210	64	172	365	361	185	198	10%
Wilton SD1	67	43	>2420	26	86	31	>2420	133	2599	n/a	n/a	n/a
Comstock 2	138	70	461	63	2420	122	>2420	370	1733	1159	415	40%
Comstock 1	163	53	1553	308	387	122	488	649	93	131	244	20%
Weather	Wet	Wet	Wet	Wet	Dry	Dry	Wet	Wet	Wet	Dry		

Table A3.3. Comstock Brook average water temperature, dissolved oxygen, and conductivity for each site

Site	Water temperature (°C)	Dissolved oxygen (mg/L)	Conductivity (µS)
East Comstock 2	17.5	6.48	211
East Comstock 1	18.1	8.28	219
Comstock 3	17.2	9.01	234
Wilton SD1	n/a	n/a	n/a
Comstock 2	16.7	5.43	302
Comstock 1	17.7	7.57	304

Appendix 4: Deep Brook

Table A4.1. GPS coordinates and site locations for Deep Brook

Site Name	Latitude	Longitude	Site location notes	Town
Deep 4	41.39217	-73.32881	Head of Meadow Road	Newtown
Deep 3	41.40242	-73.31227	Boggs Hill Road	Newtown
Deep 2	41.39755	-73.29807	Elm Drive	Newtown
Deep 1	41.40980	-73.28536	Old Farm Road	Newtown

Table A4.2. Deep Brook *E. coli* concentrations and relation to CT DEEP water quality criteria (Rainfall data: Weather Underground – Danbury Muni Station, October 9, 2019)

	5/7/19	5/21/19	6/6/19	6/18/19	7/18/19	7/30/19	8/12/19	8/29/19	9/11/19	9/25/19	Geomean	%>576
Deep 4	47	199	93	>2420	>4839	3973	344	300	731	95	443	40%
Deep 3	67	238	192	1733	1733	345	29	99	57	30	165	20%
Deep 2	75	236	328	>2420	3466	109	217	192	313	428	353	20%
Deep 1	105	517	96	>2420	3106	51	8	240	40	66	159	20%
Weather	Wet	Wet	Dry	Wet	Dry	Dry	Dry	Dry	Dry	Dry		

Table A4.3. Deep Brook average water temperature, dissolved oxygen, and conductivity for each site

Site	Water temperature (°C)	Dissolved oxygen (mg/L)	Conductivity (µS)
Deep 4	18.2	8.39	319
Deep 3	20.7	5.12	220
Deep 2	19.0	8.19	224
Deep 1	18.4	9.39	318

Appendix 5: Farm Creek

Table A5.1. GPS coordinates and site locations for Farm Creek

Site Name	Latitude	Longitude	Site location notes	Town
Farm 8	41.08163	-73.43704	Bridge between Rowayton Woods Drive and Watson Court	Norwalk
Farm 7	41.07687	-73.43706	55 Crooked Trail	Norwalk
Farm 6	41.06866	-73.43820	3 Indian Spring Road	Norwalk
Farm 5	41.06646	-73.43946	8 Roton Ave	Norwalk
Farm 4	41.06506	-73.43994	29 McKinley Street	Norwalk
Farm 3	41.06478	-73.44056	25 McKinley Street	Norwalk
Farm 2	41.06279	-73.44051	7 Sammis Street	Norwalk
Farm 1	41.06118	-73.43543	86 Bluff Avenue	Norwalk

Table A5.2. Farm Creek *E. coli* concentrations and relation to CT DEEP water quality criteria (Rainfall data: P. DiPietro, Personal communication, October 3, 2019)

	Indicator bacteria	5/8/19	5/22/19	6/3/19	6/17/19	7/10/19	7/23/19	8/5/19	8/28/19	9/4/19	9/25/19	Geomean	%>576
Farm 8	*E. coli*	201	166	299	411	>2420	>4839	65	579	921	921	523	50%
Farm 7	*E. coli*	50	127	1553	293	775	1095	115	1414	1733	1203	492	60%
Farm 6	*E. coli*	178	457	250	1046	1120	4839	866	921	n/a	548	717	56%
Farm 5	*E. coli*	158	579	613	579	687	4839	579	299	304	248	519	60%
Farm 4	*E. coli*	326	40	31	76	397	>2420	55	n/a	66	83	128	11%
Farm 3	*Enterococci*	52	185	85	292	301	19863	548	249	98	121	273	20%
Farm 2	*Enterococci*	41	85	63	85	75	17329	246	135	379	52	166	10%
Farm 1	*Enterococci*	10	10	10	122	10	7270	20	10	20	10	29	10%
Weather	-	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Wet	Dry		

Table A5.3. Farm Creek average water temperature, dissolved oxygen, and conductivity for each site

Site	Water temperature (°C)	Dissolved oxygen (mg/L)	Conductivity (µS)
Farm 8	18.5	3.35	284
Farm 7	20.5	6.10	293
Farm 6	18.4	7.11	312
Farm 5	18.6	7.35	355
Farm 4	21.4	6.81	295
Farm 3	20.8	6.01	18717
Farm 2	22.0	7.35	20704
Farm 1	20.3	7.38	37076

Appendix 6: Horseneck Brook

Table A6.1. GPS coordinates and site locations for Horseneck Brook

Site Name	Latitude	Longitude	Site location notes	Town
Horseneck 10	41.11419	-73.63283	Lower Cross Road	Greenwich
Horseneck 8	41.07068	-73.63984	Lake Avenue	Greenwich
Horseneck 7	41.05232	-73.64170	Round Hill Road	Greenwich
Horseneck 6	41.04696	-73.64195	Winding Lane	Greenwich
Horseneck 5	41.04121	-73.64171	Zaccheus Mead Lane	Greenwich
Horseneck 4	41.03046	-73.63974	Valley Drive	Greenwich
Horseneck 3	41.02853	-73.63472	Brookside Park	Greenwich
Horseneck 2	41.02629	-73.63274	West Putnam Avenue (Route 1)	Greenwich
Horseneck 1	41.02008	-73.63227	Horseneck Lane	Greenwich

Table A6.2. Horseneck Brook *E. coli* concentrations and relation to CT DEEP water quality criteria (Rainfall data: M. Long, personal communication, October 7, 2019)

	5/9/19	5/20/19	6/13/19	6/27/19	7/10/19	7/24/19	8/7/19	8/19/19	9/11/19	9/26/19	Geomean	%>576
Horseneck 10	19	326	2420	1414	126	613	214	n/a	579	42	273	44%
Horseneck 8	74	345	>2420	263	146	545	46	n/a	436	483	285	11%
Horseneck 7	23	43	914	124	82	260	59	n/a	153	345	125	11%
Horseneck 6	16	81	488	128	276	345	155	n/a	276	54	138	0%
Horseneck 5	24	82	501	86	313	365	n/a	n/a	517	56	152	0%
Horseneck 4	43	161	>2420	303	387	398	139	n/a	579	345	303	22%
Horseneck 3	49	172	501	344	365	276	206	n/a	1733	219	282	11%
Horseneck 2	54	461	>2420	498	449	651	570	n/a	1373	523	535	33%
Horseneck 1	127	551	>4839	1989	3448	613	487	n/a	1145	369	873	56%
Weather	Dry	Dry	Wet	Wet	Dry	Wet	Dry	Dry	Dry	Dry		

Table A6.3. Horseneck Brook average water temperature, dissolved oxygen, and conductivity for each site

Site	Water temperature (°C)	Dissolved oxygen (mg/L)	Conductivity (µS)
Horseneck 10	19.1	7.08	346
Horseneck 8	20.3	7.53	372
Horseneck 7	21.3	6.06	326
Horseneck 6	20.9	7.06	342
Horseneck 5	21.0	7.61	358
Horseneck 4	19.9	8.27	373
Horseneck 3	19.8	8.92	387
Horseneck 2	19.6	8.79	441
Horseneck 1	19.9	8.93	419

Appendix 7: Muddy Brook

Table A7.1. GPS coordinates and site locations for Muddy Brook

Site Name	Latitude	Longitude	Site location notes	Town
Muddy 6	41.16444	-73.32521	Bayberry Lane	Westport
Muddy 5	41.14686	-73.31809	Long Lots Road	Westport
Muddy 4	41.14107	-73.32172	Turkey Hill Road N	Westport
Muddy 3	41.13857	-73.32546	Morningside Drive S	Westport
Muddy 2	41.13293	-73.32859	Center Street	Westport
Muddy 1	41.12735	-73.32958	Greens Farms Road	Westport

Table A7.2. Muddy Brook *E. coli* concentrations and relation to CT DEEP water quality criteria (Rainfall data: P. DiPietro, Personal communication, October 3, 2019)

	5/6/19	5/21/19	6/4/19	6/20/19	7/9/19	7/31/19	8/14/19	8/20/19	9/9/19	9/16/19	Geomean	%>576
Muddy 6	127	102	82	435	1986	365	1120	2420	461	>2420	502	40%
Muddy 5	161	66	117	281	249	185	1120	1414	184	261	256	20%
Muddy 4	260	53	114	816	517	326	866	2420	115	140	307	30%
Muddy 3	214	128	193	1414	n/a	1986	457	>2420	167	153	421	33%
Muddy 2	548	308	260	921	156	816	687	>2421	219	260	466	40%
Muddy 1	579	378	461	613	192	461	727	>2422	167	135	430	40%
Weather	Wet	Wet	Dry	Wet	Dry	Dry	Wet	Wet	Wet	Dry		

Table A7.3. Muddy Brook average water temperature, dissolved oxygen, and conductivity for each site

Site	Water temperature (°C)	Dissolved oxygen (mg/L)	Conductivity (µS)
Muddy 6	17.2	7.05	265
Muddy 5	18.0	9.35	352
Muddy 4	18.0	9.07	376
Muddy 3	17.1	7.93	385
Muddy 2	18.1	8.20	444
Muddy 1	18.2	8.37	427

Appendix 8: Noroton River

Table A8.1. GPS coordinates and site locations for Noroton River

Site Name	Latitude	Longitude	Site location notes	Town
Noroton 8	41.15925	-73.51421	West Road and Greenley Road	New Canaan
Noroton 7	41.14108	-73.51167	209 Frogtown Road	New Canaan
Noroton 5	41.11868	-73.50130	47 Jellif Mill Road	New Canaan
Noroton 4	41.10290	-73.50982	137 Woodway Road	Stamford
Noroton 3	41.09540	-73.51430	Camp Avenue	Stamford
Noroton 2	41.07530	-73.51550	668 Connecticut 106	Stamford
Noroton 1.5	41.06186	-73.50814	Smokey Joes BBQ parking lot	Stamford

Table A8.2. Noroton River *E. coli* and *Enterococci* concentrations and relation to CT DEEP water quality criteria (Rainfall data: M. Long, personal communication, October 7, 2019)

	Indicator bacteria	5/7/19	5/23/19	6/5/19	6/20/19	7/16/19	7/25/19	8/8/19	8/21/19	9/5/19	9/26/19	Geomean	%>576
Noroton 8	*E. coli*	131	248	488	1733	75	79	687	236	129	105	227	20%
Noroton 7	*E. coli*	127	161	172	1553	36	210	>2420	196	365	86	239	20%
Noroton 5	*E. coli*	172	49	42	488	21	88	1414	41	>2420	31	130	20%
Noroton 4	*E. coli*	41	n/a	69	411	119	66	548	88	105	96	118	0%
Noroton 3	*E. coli*	79	186	141	727	461	162	866	435	378	921	329	30%
Noroton 2	*E. coli*	291	1414	1300	1986	190	214	>2420	411	313	727	630	50%
Noroton 1.5	*Enterococci*	n/a	n/a	n/a	n/a	404	292	9804	272	2495	197	732	33%
Weather	-	Wet	Dry	Dry	Wet	Dry	Wet	Wet	Dry	Dry	Dry		

Table A8.3. Noroton River average water temperature, dissolved oxygen, and conductivity for each site

Site	Water temperature (°C)	Dissolved oxygen (mg/L)	Conductivity (µS)
Noroton 8	21.6	6.92	280
Noroton 7	19.4	8.35	250
Noroton 5	21.0	8.90	283
Noroton 4	21.7	8.82	287
Noroton 3	20.9	8.40	300
Noroton 2	20.7	7.82	403
Noroton 1.5	22.1	7.76	6827

Appendix 9: Norwalk River

Table A9.1. GPS coordinates and site locations for Norwalk River

Site Name	Latitude	Longitude	Site location notes	Town
Norwalk 23	41.29005	-73.49349	22 South Street	Ridgefield
Ridgefield SD1	41.29077	-73.49155	Ligi's Way	Ridgefield
Norwalk 21	41.29444	-73.48843	68 Farmingville Road	Ridgefield
Norwalk 19	41.31672	-73.49001	Limestone Road	Ridgefield
Norwalk 15	41.30909	-73.46909	30 Stonehenge Road	Ridgefield
Norwalk 13	41.26550	-73.44079	787 Branchville Road	Ridgefield
Norwalk 9.5	41.24590	-73.43409	Old Mill Road	Wilton
Norwalk 9	41.20354	-73.43094	School Road	Wilton
Norwalk 6	41.18341	-73.42276	187 Danbury Road	Wilton
Norwalk 4	41.14349	-73.42669	10 Glover Avenue	Norwalk
Norwalk 1	41.11947	-73.41701	40 Cross Street	Norwalk

Table A9.2. Norwalk River *E. coli* concentrations and relation to CT DEEP water quality criteria (Rainfall data: P. DiPietro, Personal communication, October 3, 2019). Data are not available from 8/19/19 due to a power outage that disrupted the bacteria processing

	5/6/19	5/29/19	6/12/19	6/24/19	7/9/19	7/22/19	8/15/19	8/19/19	9/10/19	9/17/19	Geomean	%>576
Norwalk 23	461	219	210	308	147	687	248	n/a	172	197	260	11%
Ridgefield SD1	<1	<1	<1	<1	1	<1	1	n/a	n/a	n/a	n/a	n/a
Norwalk 21	248	411	231	687	387	517	238	n/a	99	206	293	11%
Norwalk 19	980	345	248	35	9	35	43	n/a	12	20	59	11%
Norwalk 15	579	387	166	172	139	148	291	n/a	58	214	199	11%
Norwalk 13	276	222	186	167	249	147	129	n/a	129	517	203	0%
Norwalk 9.5	172	54	38	43	38	39	291	n/a	55	120	70	0%
Norwalk 9	102	122	101	125	225	124	236	n/a	205	548	170	0%
Norwalk 6	148	517	156	228	172	145	148	n/a	140	114	176	0%
Norwalk 4	130	150	365	231	166	248	179	n/a	208	214	201	0%
Norwalk 1	185	326	272	276	108	153	108	n/a	74	93	156	0%
Weather	Wet	Wet	Wet	Dry	Dry	Dry	Wet	Wet	Dry	Dry		

Table A9.3. Norwalk River average water temperature, dissolved oxygen, and conductivity for each site

Site	Water temperature (°C)	Dissolved oxygen (mg/L)	Conductivity (µS)
Norwalk 23	18.9	9.20	1266
Ridgefield SD1	18.7	9.60	833
Norwalk 21	19.4	3.59	835
Norwalk 19	21.4	7.00	732
Norwalk 15	20.1	8.13	691
Norwalk 13	20.5	8.36	516
Norwalk 9.5	20.7	8.37	474
Norwalk 9	19.0	8.83	440
Norwalk 6	19.5	8.83	444
Norwalk 4	20.0	9.35	471
Norwalk 1	20.6	9.30	433

Appendix 10: Pequonnock River

Table A10.1. GPS coordinates and site locations for Pequonnock River

Site Name	Latitude	Longitude	Site location notes	Town
Pequonnock 8	41.33878	-73.23153	W Maiden Lane	Monroe
Pequonnock 7	41.32053	-73.24030	Cutler's Farm Road	Monroe
Pequonnock 6	41.29946	-73.24480	Victoria Drive	Monroe
Pequonnock 5	41.28928	-73.23387	Old Mine Road	Trumbull
Pequonnock 4	41.28073	-73.22187	Whitnet Avenue	Trumbull
Pequonnock 3	41.24690	-73.19718	Daniels Farm Road	Trumbull
Pequonnock 2	41.22546	-73.17870	Rail Trail off Quarry Road	Trumbull
Pequonnock 1	41.20460	-73.18765	Glenwood Park	Bridgeport

Table A10.2. Pequonnock River *E. coli* concentrations and relation to CT DEEP water quality criteria (Rainfall data: Weather Underground – Tweed New Haven Regional Airport Station, October 9, 2019). On 6/4/19, a laboratory error led to the samples being removed from the incubators for counting 2 hours earlier than the end of their 24 hour incubation period and are therefore should be treated as a likely underestimate of the concentrations in the water on that day.

	5/9/19	5/22/19	*6/4/19*	6/25/19	7/15/19	8/1/19	8/8/19	8/26/19	9/12/19	9/19/19	Geomean	%>576
Pequonnock 8	1	39	*20*	32	138	22	156	5	165	13	26	0%
Pequonnock 7	99	33	*27*	65	58	308	548	56	99	160	93	0%
Pequonnock 6	29	24	*28*	816	185	52	128	53	276	101	88	10%
Pequonnock 5	192	78	*91*	1986	75	166	285	34	121	32	129	10%
Pequonnock 4	121	82	*67*	387	137	517	345	102	91	24	130	0%
Pequonnock 3	126	51	*83*	>2420	125	1046	870	120	275	49	218	30%
Pequonnock 2	114	60	*145*	727	172	n/a	n/a	n/a	260	n/a	179	17%
Pequonnock 1	56	47	*228*	770	199	461	166	365	>2420	687	290	30%
Weather	Dry	Wet	*Dry*	Dry	Dry	Dry	Dry	Dry	Dry	Dry		

Table A10.3. Pequonnock River average water temperature, dissolved oxygen, and conductivity for each site

Site	Water temperature (°C)	Dissolved oxygen (mg/L)	Conductivity (µS)
Pequonnock 8	22.6	7.08	286
Pequonnock 7	19.0	2.76	245
Pequonnock 6	18.7	8.26	290
Pequonnock 5	18.8	8.11	349
Pequonnock 4	18.3	9.29	357
Pequonnock 3	17.6	9.69	351
Pequonnock 2	18.4	9.24	354
Pequonnock 1	21.5	7.43	328

Appendix 11: Pootatuck River

Table A11.1. GPS coordinates and site locations for Pootatuck River

Site Name	Latitude	Longitude	Site location notes	Town
Pootatuck 6	41.33469	-73.29826	Mountainside Drive	Monroe
Pootatuck 4	41.36009	-73.28211	Meadow Brook Road	Newtown
Pootatuck 3	41.38355	-73.26919	Turkey Hill Road	Newtown
Pootatuck 2	41.42292	-73.28190	Rocky Glen State Park	Newtown
Pootatuck 1	41.43745	-73.27017	Walnut Tree Hill	Newtown

Table A11.2. Pootatuck River *E. coli* concentrations and relation to CT DEEP water quality criteria (Rainfall data: Weather Underground – Danbury Muni Station, October 9, 2019)

	5/7/19	5/21/19	6/6/19	6/18/19	7/18/19	7/30/19	8/12/19	8/29/19	9/11/19	9/25/19	Geomean	%>576
Pootatuck 6	35	39	50	1120	>2420	238	51	291	308	365	194	20%
Pootatuck 4	50	38	131	866	>2420	328	37	517	248	75	190	20%
Pootatuck 3	28	42	80	313	>2420	54	23	96	93	79	95	10%
Pootatuck 2	82	75	101	1553	>2420	122	91	285	84	80	186	20%
Pootatuck 1	n/a	93	113	1553	>2420	40	8	179	52	40	119	22%
Weather	Wet	Wet	Dry	Wet	Dry	Dry	Dry	Dry	Dry	Dry		

Table A11.3. Pootatuck River average water temperature, dissolved oxygen, and conductivity for each site

Site	Water temperature (°C)	Dissolved oxygen (mg/L)	Conductivity (µS)
Pootatuck 6	19.2	7.10	187
Pootatuck 4	19.4	8.59	192
Pootatuck 3	18.4	8.11	247
Pootatuck 2	18.4	9.66	309
Pootatuck 1	19.5	9.26	343

Appendix 12: Pussy Willow Brook

Table A12.1. GPS coordinates and site locations for Pussy Willow Brook

Site Name	Latitude	Longitude	Site location notes	Town
Pussy Willow 5	41.14004	-73.34506	Crescent Road	Westport
Pussy Willow 4	41.13666	-73.34445	Spicer Road	Westport
Pussy Willow 3	41.12990	-73.34824	Valley Road	Westport
Pussy Willow 2.5	41.12822	-73.35032	Guyer Road	Westport
Pussy Willow 2	41.12650	-73.35170	Lakeview Road	Westport

Table A12.2. Pussy Willow Brook *E. coli* concentrations and relation to CT DEEP water quality criteria (Rainfall data: P. DiPietro, Personal communication, October 3, 2019)

	5/8/19	5/22/19	6/3/19	6/17/19	7/10/19	7/23/19	8/5/19	8/28/19	9/4/19	9/25/19	Geomean	%>576
Pussy Willow 5	115	1300	816	>2420	980	>4839	158	198	615	288	615	60%
Pussy Willow 4	387	548	1986	>4839	437	4839	1842	>4839	615	3106	1537	70%
Pussy Willow 3	51	126	127	2420	387	n/a	n/a	n/a	n/a	311	249	17%
Pussy Willow 2.5	66	121	162	2420	435	>4839	498	449	334	403	427	20%
Pussy Willow 2	>2420	275	521	1733	>2420	>4839	1226	2240	1842	1842	1519	80%
Weather	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Wet	Dry		

Table A12.3. Pussy Willow Brook average water temperature, dissolved oxygen, and conductivity for each site

Site	Water temperature (°C)	Dissolved oxygen (mg/L)	Conductivity (µS)
Pussy Willow 5	18.0	6.35	286
Pussy Willow 4	18.5	5.46	757
Pussy Willow 3	16.4	8.05	504
Pussy Willow 2.5	18.1	7.90	470
Pussy Willow 2	18.3	9.01	459

Appendix 13: Rippowam River

Table A13.1. GPS coordinates and site locations for Rippowam River

Site Name	Latitude	Longitude	Site location notes	Town
Rippowam 12	41.18524	-73.52999	Oenoke Ridge	New Canaan
Rippowam 11.5	41.17561	-73.52919	West Road	New Canaan
Rippowam 11	41.17234	-73.53126	Dans Highway	New Canaan
Rippowam 10	41.16153	-73.53843	Ponus Ridge Road	New Canaan
Rippowam 9	41.15023	-73.53412	Cascade Road	New Canaan
Rippowam 8	41.11302	-73.54619	High Ridge Road	Stamford
Rippowam 7	41.10559	-73.55860	Cedar Heights Road	Stamford
Rippowam 5	41.08559	-73.55664	Long Ridge Road	Stamford
Rippowam 4	41.06617	-73.55763	Cold Spring Road	Stamford
Rippowam 3	41.06593	-73.54912	Bridge Street	Stamford
Rippowam 2	41.05904	-73.54664	W North Street	Stamford
Rippowam 0.5	41.04813	-73.54542	Richmonnd Hill Avenue	Stamford

Table A13.2. Rippowam River *E. coli* and *Enterococci* concentrations and relation to CT DEEP water quality criteria (Rainfall data: M. Long, personal communication, October 7, 2019)

	Indicator bacteria	5/8/19	5/20/19	6/6/19	6/25/19	7/16/19	7/31/19	8/14/19	8/21/19	9/10/19	9/23/19	Geomean	%>576
Rippowam 12	*E. coli*	22	67	36	>2420	690	411	548	727	387	184	252	30%
Rippowam 11.5	*E. coli*	31	201	68	238	42	119	81	130	129	99	96	0%
Rippowam 11	*E. coli*	46	152	20	73	142	61	51	143	>2420	225	113	10%
Rippowam 10	*E. coli*	55	387	63	2420	104	88	114	147	47	167	144	10%
Rippowam 9	*E. coli*	32	167	135	548	225	172	93	62	54	78	114	0%
Rippowam 8	*E. coli*	43	411	210	n/a	285	261	179	291	152	210	197	0%
Rippowam 7	*E. coli*	57	308	236	1986	548	613	488	1553	488	2420	548	40%
Rippowam 5	*E. coli*	140	411	228	>2420	523	>2420	276	548	411	1414	568	30%
Rippowam 4	*E. coli*	167	461	387	>2420	177	214	121	155	2420	112	327	20%
Rippowam 3	*E. coli*	178	548	308	>2420	519	199	261	435	387	727	434	20%
Rippowam 2	*E. coli*	435	770	248	>2420	256	179	308	365	548	517	443	20%
Rippowam 0.5	*Enterococci*	74	631	211	n/a	121	22	146	341	402	119	158	11%
Weather	-	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry		

Table A13.3. Rippowam River average water temperature, dissolved oxygen, and conductivity for each site

Site	Water temperature (°C)	Dissolved oxygen (mg/L)	Conductivity (µS)
Rippowam 12	20.0	6.68	235
Rippowam 11.5	20.5	8.18	225
Rippowam 11	23.0	6.49	207
Rippowam 10	22.8	7.04	219
Rippowam 9	20.4	6.69	271
Rippowam 8	20.5	8.11	359
Rippowam 7	20.8	8.45	393
Rippowam 5	20.1	9.06	449
Rippowam 4	20.3	8.60	475
Rippowam 3	20.4	9.00	484
Rippowam 2	20.6	9.22	464
Rippowam 0.5	21.6	8.10	14650

Appendix 14: Sasco Brook

Table A14.1. GPS coordinates and site locations for Sasco Brook

Site Name	Latitude	Longitude	Site location notes	Town
Sasco 9	41.15280	-73.30605	210 Hulls Farm Road	Fairfield
Sasco 7	41.14573	-73.30314	8 Ulbrick Lane	Westport
Sasco 6	41.14556	-73.30111	Old Road and Wakeman Lane	Westport
Sasco 3	41.13702	-73.29708	408 Greens Farm Road	Westport
Sasco 2	41.13293	-73.29675	32 Westway Road	Westport
Sasco 1	41.12478	-73.29888	1505 Pequot Avenue	Westport

Table A14.2. Sasco Brook *E. coli* concentrations and relation to CT DEEP water quality criteria (Rainfall data: P. DiPietro, Personal communication, October 3, 2019)

	Indicator Bacteria	5/6/19	5/21/19	6/4/19	6/20/19	7/9/19	7/31/19	8/14/19	8/20/19	9/9/19	9/16/19	Geomean	%>576
Sasco 9	*E. coli*	228	96	158	179	166	167	387	>2420	142	66	208	10%
Sasco 7	*E. coli*	1120	99	n/a	770	238	308	299	>2420	260	126	375	33%
Sasco 6	*E. coli*	261	93	64	291	130	140	186	>2420	n/a	161	203	11%
Sasco 3	*Enterococci*	359	52	86	383	1043	119	411	17329	10	295	263	20%
Sasco 2	*Enterococci*	364	41	187	657	109	41	563	17329	161	120	263	30%
Sasco 1	*Enterococci*	305	52	10	481	148	10	10	19863	331	160	128	10%
Weather	-	Wet	Wet	Dry	Wet	Dry	Dry	Wet	Wet	Wet	Dry		

Table A19.3. Sasco Brook average water temperature, dissolved oxygen, and conductivity for each site

Site	Water temperature (°C)	Dissolved oxygen (mg/L)	Conductivity (µS)
Sasco 9	19.0	8.30	208
Sasco 7	18.9	8.33	225
Sasco 6	18.8	8.78	214
Sasco 3	19.2	7.58	5938
Sasco 2	20.7	8.23	15280
Sasco 1	20.9	7.63	27617

Appendix 15: Saugatuck River

Table A15.1. GPS coordinates and site locations for Saugatuck River

Site Name	Latitude	Longitude	Site location notes	Town
West Saug 6	41.25730	-73.41533	86 Old Farm Road	Weston
West Saug 5	41.24954	-73.41377	20 Indian Valley Road	Weston
West Saug 4	41.22465	-73.38366	3 Michaels Way	Weston
West Saug 3	41.21162	-73.38800	Georgetown Road and Old Mill Road	Weston
West Saug 2	41.19480	-73.38763	23 Stonebridge Road	Wilton
West Saug 1	41.17809	-73.37404	21 Cavalry Road	Weston
Saugatuck 7	41.29439	-73.39480	Route 53 and Route 107 intersection	Redding
Saugatuck 6	41.24343	-73.34785	153 Valley Forge Road	Weston
Saugatuck 5	41.22469	-73.34670	18 Davis Hill Road	Weston
Saugatuck 4	41.20722	-73.35043	1 Cartbridge Road	Weston
Saugatuck 3	41.18830	-73.36441	27 River Road	Weston
Saugatuck 2	41.17553	-73.36193	Weston Road	Westport
Saugatuck 1	41.16748	-73.36647	Clinton Avenue	Westport
Saugatuck 0.75	41.14719	-73.36469	Kings Highway North	Westport
Saugatuck 0.5	41.14098	-73.36312	State Street East	Westport
Saugatuck 0.25	41.12274	-73.36912	Bridge Street	Westport

Table A15.2. Saugatuck River *E. coli* concentrations and relation to CT DEEP water quality criteria (Rainfall data: P. DiPietro, Personal communication, October 3, 2019)

	Indicator bacteria	5/6/19	5/30/19	6/5/19	6/26/19	7/18/19	8/1/19	8/15/19	8/27/19	9/12/19	9/23/19	Geomean	%>576
West Saug 6	*E. coli*	46	365	2	75	816	299	192	12	n/a	n/a	79	13%
West Saug 5	*E. coli*	32	236	13	326	>2420	248	151	43	n/a	n/a	138	13%
West Saug 4	*E. coli*	119	1733	44	96	>2420	1414	30	32	276	461	227	30%
West Saug 3	*E. coli*	112	461	11	299	2420	178	17	11	152	20	92	10%
West Saug 2	*E. coli*	122	1046	53	153	>2420	435	285	99	1300	179	306	30%
West Saug 1	*E. coli*	90	1414	37	172	>2420	411	172	61	435	88	224	20%
Saugatuck 7	*E. coli*	105	299	33	84	770	162	61	57	119	48	108	10%
Saugatuck 6	*E. coli*	4	2	<1	5	25	11	7	6	81	7	7	0%
Saugatuck 5	*E. coli*	21	59	25	76	>2420	517	140	57	112	64	105	10%
Saugatuck 4	*E. coli*	23	91	22	74	>2420	345	79	99	186	61	109	10%
Saugatuck 3	*E. coli*	72	206	23	72	1414	141	48	42	162	54	98	10%
Saugatuck 2	*E. coli*	91	272	41	135	1986	291	46	114	79	120	144	10%
Saugatuck 1	*E. coli*	111	649	111	108	>2420	488	93	60	210	131	209	20%
Saugatuck 0.75	*Enterococci*	171	2382	86	75	2143	173	20	10	110	31	121	20%
Saugatuck 0.5	*Enterococci*	31	3255	41	52	1396	318	52	20	41	41	105	20%
Saugatuck 0.25	*Enterococci*	537	1483	216	122	5172	175	<10	<10	<10	<10	107	30%
Weather	-	Wet	Wet	Dry	Wet	Wet	Wet	Wet	Dry	Dry	Dry		

Table A15.3. Saugatuck River average water temperature, dissolved oxygen, and conductivity for each site

Site	Water temperature (°C)	Dissolved oxygen (mg/L)	Conductivity (µS)
West Saug 6	17.6	9.54	333
West Saug 5	18.1	8.71	183
West Saug 4	20.3	8.42	196
West Saug 3	20.4	6.88	212
West Saug 2	19.8	8.45	231
West Saug 1	19.6	9.06	229
Saugatuck 7	19.4	8.74	275
Saugatuck 6	15.5	10.31	201
Saugatuck 5	16.8	9.42	193
Saugatuck 4	17.2	9.25	198
Saugatuck 3	18.2	8.93	203
Saugatuck 2	18.5	9.13	208
Saugatuck 1	19.1	8.03	212
Saugatuck 0.75	21.3	7.24	11048
Saugatuck 0.5	21.5	5.72	23528
Saugatuck 0.25	21.2	6.57	28787

Appendix 16: Silvermine River

Table A16.1. GPS coordinates and site locations for Silvermine River

Site Name	Latitude	Longitude	Site location notes	Town
Silvermine 10	41.19871	-73.49241	North Wilton Road	New Canaan
Silvermine 9	41.18679	-73.48749	Valley Road	New Canaan
Silvermine 8	41.17791	-73.48174	Hickok Road	New Canaan
Silvermine 7	41.17371	-73.47799	Mariomi Road	New Canaan
Silvermine 6	41.17121	-73.47128	Huckleberry Hill Road	New Canaan
Silvermine 5	41.16107	-73.46265	New Canaan Road	Wilton
Silvermine 4	41.15971	-73.45277	Borglum Road	Wilton
Silvermine 3	41.15126	-73.44539	Perry Avenue	Norwalk
Silvermine 2	41.14726	-73.44293	Walking path/bridge from Silvermine Avenue to Silvermine Elementary	Norwalk
Silvermine 1.5	41.13685	-73.43902	Bonnie Doone Lane	Norwalk

Table A16.2. Silvermine River *E. coli* concentrations and relation to CT DEEP water quality criteria (Rainfall data: P. DiPietro, Personal communication, October 3, 2019)

	5/9/19	5/29/19	6/5/19	6/19/19	7/11/19	7/29/19	8/13/19	8/22/19	9/9/19	9/24/19	Geomean	%>576
Silvermine 10	<1	1	1	33	11	44	17	9	4	4	6	0%
Silvermine 9	3	3	4	54	48	63	>2420	731	420	106	59	20%
Silvermine 8	16	31	34	276	162	93	228	63	67	101	76	0%
Silvermine 7	15	46	36	649	166	488	687	328	74	108	137	20%
Silvermine 6	56	54	50	649	56	65	63	68	19	28	62	10%
Silvermine 5	26	197	48	517	135	140	214	326	135	68	132	0%
Silvermine 4	20	91	36	387	210	133	102	196	99	142	107	0%
Silvermine 3	23	64	16	649	57	344	154	143	77	31	83	10%
Silvermine 2	20	68	36	579	78	272	>2420	214	111	4	104	20%
Silvermine 1.5	23	261	74	687	>2420	435	1733	387	579	488	379	40%
Weather	Dry	Wet	Dry	Wet	Dry	Dry	Wet	Dry	Wet	Dry		

Table A16.3. Silvermine River average water temperature, dissolved oxygen, and conductivity for each site

Site	Water temperature (°C)	Dissolved oxygen (mg/L)	Conductivity (µS)
Silvermine 10	21.1	5.95	254
Silvermine 9	19.1	5.11	246
Silvermine 8	19.0	6.67	230
Silvermine 7	19.2	7.92	230
Silvermine 6	19.6	8.28	237
Silvermine 5	20.1	7.83	263
Silvermine 4	19.8	7.57	261
Silvermine 3	20.2	7.72	259
Silvermine 2	20.1	8.47	243
Silvermine 1.5	19.7	7.89	282

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