3258632975

MS4 Annual Report Cover Page

MCC form for period ending March 9, 2021

SPDES ID: NYR20A304

This cover page must be completed by the report preparer.
Joint reports require only one cover page.

Choose one:

● **This report is being submitted on behalf of an individual MS4.**

Fill in SPDES ID in upper right hand corner.

Name of MS4: INC VILLAGE OF BAYVILLE

OR

○ **This report is being submitted on behalf of a Single Entity**

(Per Part II.E of GP-0-10-002)

Name of Single Entity:

OR

○ **This is a joint report being submitted on behalf of a coalition.**

Provide SPDES ID of each permitted MS4 included in this report. Use page 2 if needed.

Name of Coalition:

SPDES ID NYR20A	SPDES ID NYR20A	SPDES ID NYR20A
SPDES ID NYR20A	SPDES ID NYR20A	SPDES ID NYR20A
SPDES ID NYR20A	SPDES ID NYR20A	SPDES ID NYR20A
SPDES ID NYR20A	SPDES ID NYR20A	SPDES ID NYR20A
SPDES ID NYR20A	SPDES ID NYR20A	SPDES ID NYR20A
SPDES ID NYR20A	SPDES ID NYR20A	SPDES ID NYR20A

9714632978

MS4 Annual Report Cover Page

MCC form for period ending March 9, 2021

Provide SPDES ID of each permitted MS4 included in this report.

SPDES ID	SPDES ID	SPDES ID
NYR20A	NYR20A	NYR20A
NYR20A	NYR20A	NYR20A
NYR20A	NYR20A	NYR20A
NYR20A	NYR20A	NYR20A
NYR20A	NYR20A	NYR20A
NYR20A	NYR20A	NYR20A
NYR20A	NYR20A	NYR20A
NYR20A	NYR20A	NYR20A
NYR20A	NYR20A	NYR20A
NYR20A	NYR20A	NYR20A
NYR20A	NYR20A	NYR20A
NYR20A	NYR20A	NYR20A
NYR20A	NYR20A	NYR20A
NYR20A	NYR20A	NYR20A
NYR20A	NYR20A	NYR20A
NYR20A	NYR20A	NYR20A
NYR20A	NYR20A	NYR20A
NYR20A	NYR20A	NYR20A

MS4 Municipal Compliance Certification(MCC) Form

MCC form for period ending March 9, 2021

Name of MS4 INC. VILLAGE OF BAYVILLE

SPDES ID NYR20A304

Each MS4 must submit an MCC form.

Section 1 - MCC Identification Page

Indicate whether this MCC form is being submitted to certify endorsement or acceptance of:

- ● An Annual Report for a single MS4
- ○ A Single Entity (Per Part II.E of GP-0-10-002)
- ○ A Joint Report

Joint reports may be submitted by permittees with legally binding agreements.

If Joint Report, enter coalition name:

5690581587

MS4 Municipal Compliance Certification(MCC) Form

MCC form for period ending March 9, 2021

Name of MS4: INC. VILLAGE OF BAYVILLE

SPDES ID: NYR20A304

Section 2 - Contact Information

Important Instructions - Please Read

Contact information must be provided for ***each*** of the following positions as indicated below:

1. Principal Executive Officer, Chief Elected Official or other qualified individual (per GP-0-08-002 Part VI.J).
2. Duly Authorized Representative (Information for this contact must only be submitted if a Duly Authorized Representative is signing this form)
3. The Local Stormwater Public Contact (required per GP-0-08-002 Part VII.A.2.c & Part VIII.A.2.c).
4. The Stormwater Management Program (SWMP) Coordinator (Individual responsible for coordination/implementation of SWMP).
5. Report Preparer (Consultants may provide company name in the space provided).

   A separate sheet must be submitted for each position listed above unless more than one position is filled by the same individual. If one individual fills multiple roles, provide the contact information once and check all positions that apply to that individual.

   If a new Duly Authorized Representative is signing this report, their contact information must be provided and a signature authorization form, signed by the Principal Executive Officer or Chief Elected Official must be attached.

For each contact, select all that apply:

◉ Principal Executive Officer/Chief Elected Official

○ Duly Authorized Representative

○ Local Stormwater Public Contact

○ Stormwater Management Program (SWMP) Coordinator

○ Report Preparer

First Name: ROBERT | MI: E | Last Name: DE NATALE

Title: MAYOR

Address: 34 SCHOOL STREET

City: BAYVILLE | State: NY | Zip: 11709 -

eMail: NPARIS@BAYVILLENY.GOV

Phone: (516) 628-1439 | County: NASSAU

MS4 Municipal Compliance Certification(MCC) Form

MCC form for period ending March 9, 2021

Name of MS4: INC. VILLAGE OF BAYVILLE

SPDES ID: NYR20A304

Section 2 - Contact Information

Important Instructions - Please Read

Contact information must be provided for ***each*** of the following positions as indicated below:

1. Principal Executive Officer, Chief Elected Official or other qualified individual (per GP-0-08-002 Part VI.J).
2. Duly Authorized Representative (Information for this contact must only be submitted if a Duly Authorized Representative is signing this form)
3. The Local Stormwater Public Contact (required per GP-0-08-002 Part VII.A.2.c & Part VIII.A.2.c).
4. The Stormwater Management Program (SWMP) Coordinator (Individual responsible for coordination/implementation of SWMP).
5. Report Preparer (Consultants may provide company name in the space provided).

   A separate sheet must be submitted for each position listed above unless more than one position is filled by the same individual. If one individual fills multiple roles, provide the contact information once and check all positions that apply to that individual.

   If a new Duly Authorized Representative is signing this report, their contact information must be provided and a signature authorization form, signed by the Principal Executive Officer or Chief Elected Official must be attached.

For each contact, select all that apply:

○ Principal Executive Officer/Chief Elected Official

◉ Duly Authorized Representative

◉ Local Stormwater Public Contact

◉ Stormwater Management Program (SWMP) Coordinator

○ Report Preparer

First Name: MARIA | MI: | Last Name: ALFANO-HARDY

Title: ADMINISTRATOR

Address: 34 SCHOOL STREET

City: BAYVILLE | State: NY | Zip: 11709-

eMail: MALFANOHARDY@BAYVILLENY.GOV

Phone: (516) 628-1439 | County: NASSAU

MS4 Municipal Compliance Certification(MCC) Form

MCC form for period ending March 9, 2021

Name of MS4: INC. VILLAGE OF BAYVILLE

SPDES ID: NYR20A304

Section 2 - Contact Information

Important Instructions - Please Read

Contact information must be provided for ***each*** of the following positions as indicated below:

1. Principal Executive Officer, Chief Elected Official or other qualified individual (per GP-0-08-002 Part VI.J).
2. Duly Authorized Representative (Information for this contact must only be submitted if a Duly Authorized Representative is signing this form)
3. The Local Stormwater Public Contact (required per GP-0-08-002 Part VII.A.2.c & Part VIII.A.2.c).
4. The Stormwater Management Program (SWMP) Coordinator (Individual responsible for coordination/implementation of SWMP).
5. Report Preparer (Consultants may provide company name in the space provided).

   A separate sheet must be submitted for each position listed above unless more than one position is filled by the same individual. If one individual fills multiple roles, provide the contact information once and check all positions that apply to that individual.

   If a new Duly Authorized Representative is signing this report, their contact information must be provided and a signature authorization form, signed by the Principal Executive Officer or Chief Elected Official must be attached.

For each contact, select all that apply:

○ Principal Executive Officer/Chief Elected Official

○ Duly Authorized Representative

○ Local Stormwater Public Contact

○ Stormwater Management Program (SWMP) Coordinator

◉ Report Preparer

First Name: SHARON | MI: | Last Name: NORTON REMMER

Title: CONSULTANT - H2M

Address: 538 BROAD HOLLOW ROAD 4TH FL WEST

City: MELVILLE | State: NY | Zip: 11747 -

eMail: SREMMER@H2M.COM

Phone: (631) 756-8000 | County: SUFFOLK

MS4 Municipal Compliance Certification (MCC) Form

MCC form for period ending March 9, 2021

Name of MS4: INC. VILLAGE OF BAYVILLE

SPDES ID: NYR20A304

Section 3 - Partner Information

Did your MS4 work with partners/coalition to complete some or all permit requirements during this reporting period? ● Yes ○ No

If Yes, complete information below.

Submit a separate sheet for each partner. Information provided in other formats will not be accepted. If your MS4 cooperated with a coalition, submit one sheet with the name of the coalition. It is not necessary to include a separate sheet for each MS4 in the coalition.

If No, proceed to Section 4 - Certification Statement.

Partner/Coalition Name: OYSTER BAY/COLD SPRING HARBOR

Partner/Coalition Name (con't.): PROTECTION COMMITTEE

SPDES Partner ID - If applicable: NYR20

Address: 111 SOUTH STREET 2 TOWNSEND SQUAR

City: OYSTER BAY

State: NY

Zip: 11771-

eMail: ROB@OYSTERBAYCOLDSPRINGHARBOR.ORG

Phone: (631) 848-2090

Legally Binding Agreement in accordance with GP-0-08-002 Part IV.G.? ○ Yes ● No

What tasks/responsibilities are shared with this partner (e.g. MM1 School Programs or Multiple Tasks)?

- ● MM1: MULTIPLE TASKS
- ● MM2: MULTIPLE TASKS
- ● MM3: SOURCE IDENTIFICATION
- ● MM4: STORMWATER WEBINARS
- ● MM5: SEDIMENT & EROSION TRAINING
- ● MM6: GREEN INFRASTRUCTURE

Additional tasks/responsibilities

- ● *Watershed Improvement Strategy Best Management Practices* required for MS4s in impaired watersheds included in GP-0-08-002 Part IX.

Education on pathogens.

MS4 Municipal Compliance Certification(MCC) Form

MCC form for period ending March 9, 2021

Name of MS4: INC. VILLAGE OF BAYVILLE

SPDES ID: NYR20A304

Section 4 - Certification Statement

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

This form must be signed by either a principal executive officer or ranking elected official, or duly authorized representative of that person as described in GP-0-08-002 Part VI.J.

First Name: ROBERT | MI: E | Last Name: DE NATALE

Title (Clearly print title of individual signing report): MAYOR, VILLAGE OF BAYVILLE

Signature: Robert E. De Natale

Digitally signed by Robert E. De Natale
Date: 2021.05.25 08:31:27 -04'00'

Date: 05 / 25 / 2021

The annual report form and any attachments can be sent to the DEC Central Office clicking the Submit Form link below, or by sending it directly to: MS4compliance@dec.ny.gov. All submissions must include the SPDES ID in the title and must be complete before hitting the Submit Form link below:

Submit Form

If unable to submit electronically, hardcopy submissions can be sent to:

Bureau of Water Compliance
Division of Water
4th Floor
625 Broadway
Albany, New York 12233-3505

MS4 Annual Report Form

This report is being submitted for the reporting period ending March 9, 2021

If submitting this form as part of a joint report on behalf of a coalition leave SPDES ID blank.

Name of MS4/Coalition: INC. VILLAGE OF BAYVILLE

SPDES ID: NYR20A304

Water Quality Trends

The information in this section is being reported (check one):

● On behalf of an individual MS4
○ On behalf of a coalition

How many MS4s are contributed to this report?

1. Has this MS4/Coalition produced any reports documenting water quality trends related to stormwater? If not, answer No and proceed to Minimum Control Measure One. ● Yes ○ No

If Yes, choose one of the following

● Report(s) attached to the annual report (Cold Spring Harbor Pathogen Assessment 2020)

○ Web Page(s) where report(s) is/are provided below

Please provide specific address of page where report(s) can be accessed - not home page.

URL

URL

URL

URL

4286299954

MS4 Annual Report Form

This report is being submitted for the reporting period ending March 9, 2021

If submitting this form as part of a joint report on behalf of a coalition leave SPDES ID blank.

Name of MS4/Coalition: INC. VILLAGE OF BAYVILLE

SPDES ID: NYR20A304

Minimum Control Measure 1. Public Education and Outreach

The information in this section is being reported (check one):

● On behalf of an individual MS4
○ On behalf of a coalition

How many MS4s contributed to this report?

1. Targeted Public Education and Outreach Best Management Practices

Check all topics that were included in Education and Outreach during this reporting period:

● Construction Sites
● General Stormwater Management Information
● Household Hazardous Waste Disposal
● Illicit Discharge Detection and Elimination
● Infrastructure Maintenance
○ Smart Growth
● Storm Drain Marking
● Green Infrastructure/Better Site Design/Low Impact Development
● Other:

● Pesticide and Fertilizer Application
● Pet Waste Management
● Recycling
● Riparian Corridor Protection/Restoration
● Trash Management
● Vehicle Washing
● Water Conservation
● Wetland Protection
○ None

ONSITE WASTEWATER TREATMENT SYSTEMS.
Other

2. Specific audiences targeted during this reporting period:

● Public Employees
● Residential
● Businesses
○ Restaurants
● Other:

○ Contractors
○ Developers
● General Public
○ Industries
○ Agricultural

STUDENTS
Other

MS4 Annual Report Form

This report is being submitted for the reporting period ending March 9, 2021

If submitting this form as part of a joint report on behalf of a coalition leave SPDES ID blank.

Name of MS4/Coalition: INC. VILLAGE OF BAYVILLE

SPDES ID: NYR20A304

3. What strategies did your MS4/Coalition use to achieve education and outreach goals during this reporting period? Check all that apply:

○ Construction Site Operators Trained	# Trained	
◉ Direct Mailings	# Mailings	1
◉ Kiosks or Other Displays	# Locations	1
○ List-Serves	# In List	
◉ Mailing List	# In List	2637
◉ Newspaper Ads or Articles	# Days Run	6
◉ Public Events/Presentations	# Attendees	634
○ School Program	# Attendees	
○ TV Spot/Program	# Days Run	
◉ Printed Materials:	Total # Distributed	500

Locations (e.g. libraries, town offices, kiosks)

VILLAGE HALL, KIOSK

CLEAN UPS

LIBRARY

◉ Other:

BECC MEETINGS

◉ Web Page: Provide specific web addresses - not home page. Continue on next page if additional space is needed.

URL

WWW.BAYVILLENY.GOV/STORM-WATER-MANAGEMENT

URL

WWW.OYSTERBAYCOLDSPRINGHARBOR.ORG

MS4 Annual Report Form

This report is being submitted for the reporting period ending March 9, 2021

If submitting this form as part of a joint report on behalf of a coalition leave SPDES ID blank.

Name of MS4/Coalition: INC. VILLAGE OF BAYVILLE

SPDES ID: NYR20A304

3. Web Page con't.: Provide specific web addresses - not home page.

URL: GETPUMPEDLI.ORG

URL: HTTP://BAYVILLENY.GOV/BECC/

URL: HTTPS://WWW.FACEBOOK.COM/209184035767641/POSTS/1969364389749588

URL: HTTPS://WWW.FACEBOOK.COM/BAYVILLEENVIRONMENTALCONSERVATIONCOMMISSION

URL:

URL:

URL:

MS4 Annual Report Form

This report is being submitted for the reporting period ending March 9, 2021

If submitting this form as part of a joint report on behalf of a coalition leave SPDES ID blank.

Name of MS4/Coalition: INC. VILLAGE OF BAYVILLE

SPDES ID: NYR20A304

4. Evaluating Progress Toward Measurable Goals MCM 1

Use this page to report on your progress and project plans toward achieving measurable goals identified in your Stormwater Management Program Plan (SWMPP), including requirements in Part III.C.1. Submit additional pages as needed.

A. Briefly summarize the Measurable Goal identified in the SWMPP in this reporting period.

The Bayville Environmental Conservation Commission (BECC) will continue to educate the public about stormwater. The Village will continue to post stormwater information on kiosks, in the Village Hall, in the Village's Newsletter and on the MS4 webpage. The Village will provide information on the Rain Garden App developed by The Center for Land Use Education and Research (CLEAR) at the University of Connecticut on the MS4 page. The app will educate homeowners on basic information about rain gardens and each step of rain garden installation. Notification of the Rain Garden App will be mentioned in the Village's Newsletter.

B. Briefly summarize the observations that indicated the overall effectiveness of this Measurable Goal.

The Village posted educational stormwater information on kiosks, in the Village Hall, in the Village's Newsletter and on the MS4 webpage. The BECC provided residents with information regarding stormwater and other environmental topics through virtual meetings and through the BECC website & Facebook page. BECC announced clean up events, and a new recycling station and pharmaceutical take-back kiosk both available for public use. The Village continued its membership with the Oyster Bay Cold Spring Harbor Protection Committee (OBCSHPC). OBCSHPC expanded their Community Shellfish Gardening program, distributed educational materials to the public, and publicized public education and outreach activities through the committee's website, Facebook, signage and email. The Village did not post the Rain Garden App on the MS4 page but will plan to do so in the next reporting period.

C. How many times was this observation measured or evaluated in this reporting period?

1

(ex.: samples/participants/events)

D. Has your MS4 made progress toward this Measurable Goal during this reporting period?

● Yes ○ No

E. Is your MS4 on schedule to meet the deadline set forth in the SWMPP?

● Yes ○ No

F. Briefly summarize the stormwater activities planned to meet the goals of this MCM during the next reporting cycle (including an implementation schedule).

The BECC will continue to educate the public about stormwater. The Village will continue to post stormwater information on kiosks, in the Village Hall, in the Village's Newsletter and on the MS4 webpage. The Village will provide information on the Rain Garden App developed by The Center for Land Use Education and Research (CLEAR) at the University of Connecticut on the MS4 page. The app will educate homeowners on basic information about rain gardens and each step of rain garden installation. Notification of the Rain Garden App will be posted on the BECC Facebook page.

4961183103

MS4 Annual Report Form

This report is being submitted for the reporting period ending March 9, 2021

If submitting this form as part of a joint report on behalf of a coalition leave SPDES ID blank.

Name of MS4/Coalition: INC. VILLAGE OF BAYVILLE

SPDES ID: NYR20A304

Minimum Control Measure 2. Public Involvement/Participation

The information in this section is being reported (check one):

- ● On behalf of an individual MS4
- ○ On behalf of a coalition

How many MS4s contributed to this report? ___

1. What opportunities were provided for public participation in implementation, development, evaluation and improvement of the Stormwater Management Program (SWMP) Plan during this reporting period? Check all that apply:

- ● Cleanup Events — # Events: 2
- ● Comments on SWMP Received — # Comments: 0
- ● Community Hotlines — Phone #: (516) 628-1439
  - Phone #: (516) 571-7535
  - Phone #: ( ) -
  - Phone #: ( ) -
  - Phone #: ( ) -
  - Phone #: ( ) -
  - Phone #: ( ) -
  - Phone #: ( ) -
  - Phone #: ( ) -
  - Phone #: ( ) -
- ● Community Meetings — # Attendees: 200
- ○ Plantings — Sq. Ft.:
- ○ Storm Drain Markings — # Drains:
- ● Stakeholder Meetings — # Attendees: 634
- ● Volunteer Monitoring — # Events: 20
- ● Other: BECC Meetings; Shellfish Gardening

2. Was public notice of availability of this annual report and Stormwater Management Program (SWMP) Plan provided? ● Yes ○ No

- ○ List-Serve — # In List:
- ○ Newspaper Advertising — # Days Run:
- ○ TV/Radio Notices — # Days Run:
- ○ Other:
- ● Web Page URL: Enter URL(s) on the following two pages.

MS4 Annual Report Form

This report is being submitted for the reporting period ending March 9, 2021

If submitting this form as part of a joint report on behalf of a coalition leave SPDES ID blank.

Name of MS4/Coalition: INC. VILLAGE OF BAYVILLE

SPDES ID: NYR20A304

2. URL(s) con't.:

Please provide specific address(es) where notice(s) can be accessed - not home page.

URL: WWW.BAYVILLENY.GOV/STORM-WATER-MANAGEMENT/

URL

URL

URL

URL

URL

URL

URL

MS4 Annual Report Form

This report is being submitted for the reporting period ending March 9, 2021

If submitting this form as part of a joint report on behalf of a coalition leave SPDES ID blank.

Name of MS4/Coalition: INC. VILLAGE OF BAYVILLE

SPDES ID: NYR20A304

2. URL(s) con't.:

Please provide specific address(es) where notices can be accessed - not home page.

URL

URL

URL

URL

URL

URL

URL

MS4 Annual Report Form

This report is being submitted for the reporting period ending March 9, 2021

If submitting this form as part of a joint report on behalf of a coalition leave SPDES ID blank.

Name of MS4/Coalition: INC. VILLAGE OF BAYVILLE

SPDES ID: NYR20A304

3. Where can the public access copies of this annual report, Stormwater Management Program SWMP) Plan and submit comments on those documents?

Enter address/contact info and select radio button to indicate which document is available and whether comments may be submitted at that location. Submit additional pages as needed.

● MS4/Coalition Office ● Annual Report ● SWMP Plan ● Comments

Department: VILLAGE HALL

Address: 34 SCHOOL STREET

City: BAYVILLE State: NY Zip: 11709-

Phone: (516) 628-1439

● Library ● Annual Report ○ SWMP Plan ● Comments

Address: 34 SCHOOL STREET

City: BAYVILLE State: NY Zip: 11709-

Phone: (516) 628-2765

○ Other ○ Annual Report ○ SWMP Plan ○ Comments

Address:

City: State: Zip: -

Phone: ( ) -

● Web Page URL: ● Annual Report ○ SWMP Plan ● Comments

WWW.BAYVILLENY.GOV/STORMWATER-MANAGEMENT/

Please provide specific address of page where report can be accessed - not home page.

● eMail ● Comments

MALFANOHARDY@BAYVILLENY.GOV

MS4 Annual Report Form

This report is being submitted for the reporting period ending March 9, 2021

If submitting this form as part of a joint report on behalf of a coalition leave SPDES ID blank.

Name of MS4/Coalition: INC. VILLAGE OF BAYVILLE

SPDES ID: NYR20A304

4.a. If this report was made available on the internet, what date was it posted?
Leave blank if this report was not posted on the internet. 05 / 17 / 2021

4.b. For how many days was/will this report be posted? 365

If submitting a report for single MS4, answer 5.a.. If submitting a joint report, answer 5.b..

5.a. Was an Annual Report public meeting held in this reporting period? ● Yes ○ No
If Yes, what was the date of the meeting? 05 / 24 / 2021

If No, is one planned? ○ Yes ○ No

5.b. Was an Annual Report public meeting held for all MS4s contributing to this report during this reporting period? ○ Yes ○ No

If No, is one planned for each? ○ Yes ○ No

6. Were comments received during this reporting period? ○ Yes ● No
If Yes, attach comments, responses and changes made to SWMP in response to comments to this report.

MS4 Annual Report Form

This report is being submitted for the reporting period ending March 9, 2021

If submitting this form as part of a joint report on behalf of a coalition leave SPDES ID blank.

Name of MS4/Coalition: INC. VILLAGE OF BAYVILLE

SPDES ID: NYR20A304

7. Evaluating Progress Toward Measurable Goals MCM 2

Use this page to report on your progress and project plans toward achieving measurable goals identified in your Stormwater Management Program Plan (SWMPP), including requirements in Part III.C.1. Submit additional pages as needed.

A. Briefly summarize the Measurable Goal identified in the SWMPP in this reporting period.

The Village will continue to inform residents about stormwater pollution through information on kiosks, in the Village Hall, in the Village's Newsletter and on the MS4 webpage and will continue to report activities of the OBCSHPC at the Board of Trustees meetings. Due to the current gathering restrictions in New York State, the BECC will tentatively plan to host events during the reporting period and continue to embark on clean water projects. The Village will plan to continue to participate in the Community Shellfish Gardening Program. The Village will provide information on the Rain Garden App on the stormwater page of the website so homeowners can participate in installing rain gardens on residential property.

B. Briefly summarize the observations that indicated the overall effectiveness of this Measurable Goal.

The Village continued to inform residents about stormwater pollution through information on kiosks, in the Village Hall, in the Village's Newsletter and on the MS4 webpage and reported activities of the OBCSHPC at the Board of Trustees meetings. The Village continued its membership with the OBCSHPC. The OBCSHPC expanded their Community Shellfish Gardening program and engaged 100+ families to raise 1,000 oysters each (100,000 total) to increase awareness of and involvement in water quality issues affecting the water body. The program also included public meetings, training days, community cleanings, and a year-end celebration. The BECC announced clean up events, and a new recycling station and pharmaceutical take-back kiosk both available for public use. A winter kelp pilot study was conducted at the Village Marina; the study examined the kelp's ability to sequester nitrogen. The Village did not post the Rain Garden App on the MS4 page but will plan to do so in the next reporting period.

C. How many times was this observation measured or evaluated in this reporting period?

1

(ex.: samples/participants/events)

D. Has your MS4 made progress toward this measurable goal during this reporting period?

● Yes ○ No

E. Is your MS4 on schedule to meet the deadline set forth in the SWMPP?

● Yes ○ No

F. Briefly summarize the stormwater activities planned to meet the goals of this MCM during the next reporting cycle (including an implementation schedule).

The Village will continue to inform residents about stormwater pollution through information on kiosks, in the Village Hall, in the Village's Newsletter and on the MS4 webpage and will to continue to report activities of the OBCSHPC at the Board of Trustees meetings. Due to the current gathering restrictions in New York State, the BECC will tentatively plan to host events during the reporting period and continue to embark on clean water projects. The Village will plan to continue to participate in the OBSCHPC programs. The Village will provide information on the Rain Garden App on the stormwater page of the website so homeowners can participate in installing rain gardens on residential property.

MS4 Annual Report Form

This report is being submitted for the reporting period ending March 9, 2021

If submitting this form as part of a joint report on behalf of a coalition leave SPDES ID blank.

Name of MS4/Coalition: INC. VILLAGE OF BAYVILLE

SPDES ID: NYR20A304

Minimum Control Measure 3. Illicit Discharge Detection and Elimination

The information in this section is being reported (check one):

◉ On behalf of an individual MS4
○ On behalf of a coalition
How many MS4s contributed to this report?

1. Enter the number and approx. percent of outfalls mapped: 35 # 100 %

2. How many of these outfalls have been screened for dry weather discharges during this reporting period (outfall reconnaissance inventory)? 0

3.a. What types of generating sites/sewersheds were targeted for inspection during this reporting period?

- ○ Auto Recyclers
- ○ Building Maintenance
- ○ Churches
- ○ Commercial Carwashes
- ○ Commercial Laundry/Dry Cleaners
- ○ Construction Vehicle Washouts
- ○ Cross-Connections
- ○ Distribution Centers
- ○ Food Processing Facilities
- ○ Garbage Truck Washouts
- ○ Hospitals
- ○ Improper RV Waste Disposal
- ○ Industrial Process Water
- ◉ Other: Leaching cesspools
- ○ Sewersheds:
- ○ Landscaping (Irrigation)
- ○ Marinas
- ○ Metal Plateing Operations
- ○ Outdoor Fluid Storage
- ○ Parking Lot Maintenance
- ○ Printing
- ○ Residential Carwashing
- ○ Restaurants
- ○ Schools and Universities
- ○ Septic Maintenance
- ○ Swimming Pools
- ○ Vehicle Fueling
- ○ Vehicle Maint./Repair Shops
- ○ None

MS4 Annual Report Form

This report is being submitted for the reporting period ending March 9, 2021

If submitting this form as part of a joint report on behalf of a coalition leave SPDES ID blank.

Name of MS4/Coalition: INC. VILLAGE OF BAYVILLE

SPDES ID: NYR20A304

3.b.What types of illicit discharges have been found during this reporting period?

- ○ Broken Lines From Sanitary Sewer
- ○ Cross Connections
- ○ Failing Septic Systems
- ○ Floor Drains Connected To Storm Sewers
- ○ Illegal Dumping
- ○ Industrial Connections
- ○ Inflow/Infiltration
- ○ Pump Station Failure
- ○ Sanitary Sewer Overflows
- ○ Straight Pipe Sewer Discharges
- ● Other: Leaching cesspools
- ○ None

4. **How many illicit discharges/potential illegal connections have been detected during this reporting period?** 2

5. **How many illicit discharges have been confirmed during this reporting period?** 1

6. **How many illicit discharges/illegal connections have been eliminated during this reporting period?** 1

7. **Has the storm sewershed mapping been completed in this reporting period?** ● Yes ○ No
   If No, approximately what percent was completed in this reporting period? ___ %

8. **Is the above information available in GIS?** ● Yes ○ No
   Is this information available on the web? ○ Yes ● No
   If Yes, provide URL(s):

Please provide specific address of page where map(s) can be accessed - not home page.

URL

URL

MS4 Annual Report Form

This report is being submitted for the reporting period ending March 9, 2021

If submitting this form as part of a joint report on behalf of a coalition leave SPDES ID blank.

Name of MS4/Coalition: INC. VILLAGE OF BAYVILLE

SPDES ID: NYR20A304

8. URL(s) con't.:
Please provide specific address of page where map(s) can be accessed - not home page

URL

URL

URL

URL

URL

9. Has an IDDE law been adopted for each traditional MS4 and/or have IDDE procedures been approved for all non-traditional MS4s contributing to this report? ● Yes ○ No

10. If Yes, has every traditional MS4 contributing to this report certified that this law is equivalent to the NYS Model IDDE Law? ● Yes ○ No ○ NT

11. What percent of staff in relevant positions and departments has received IDDE training?

33 %

MS4 Annual Report Form

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If submitting this form as part of a joint report on behalf of a coalition leave SPDES ID blank.

Name of MS4/Coalition: INC. VILLAGE OF BAYVILLE

SPDES ID: NYR20A304

12. Evaluating Progress Toward Measurable Goals MCM 3

Use this page to report on your progress and project plans toward achieving measurable goals identified in your Stormwater Management Program Plan (SWMPP), including requirements in Part III.C.1. Submit additional pages as needed.

A. Briefly summarize the Measurable Goal identified in the SWMPP in this reporting period.

The Village will continue to inspect for Illicit Discharges on a regular basis, and eliminate and document in accordance with procedure. As a potential long term goal, the OBCSHPC is pursuing, with the Village of Bayville, connecting businesses in "The Stands" on Bayville Ave to the Glen Cove Sewage Treatment Plants with Nassau County DPW. The Village will seek out IDDE training opportunities.

B. Briefly summarize the observations that indicated the overall effectiveness of this Measurable Goal.

The Village inspected for Illicit Discharges on a regular basis. Two potential Illicit Discharges were detected in the reporting period. The first discharge detected was confirmed and eliminated immediately. The second discharge detected was not an Illicit Discharge and was confirmed as groundwater flow. Village personnel utilized IDDE training available through EPA's online resources. The Village conducted dry weather outfall inspections for 100% of their outfalls for the 2018-2019 reporting period. The Village participated in Nassau County's S.E.P.T.I.C program webinar; the program will provide grant funding to replace existing septic systems with innovative and alternative systems for eligible homeowners and small businesses. The Village continued to pursue connecting businesses in "The Stands" on Bayville Ave to the Glen Cove Sewage Treatment Plant with Nassau County DPW.

C. How many times was this observation measured or evaluated in this reporting period?

1

(ex.: samples/participants/events)

D. Has your MS4 made progress toward this measurable goal during this reporting period?

● Yes ○ No

E. Is your MS4 on schedule to meet the deadline set forth in the SWMPP?

● Yes ○ No

F. Briefly summarize the stormwater activities planned to meet the goals of this MCM during the next reporting cycle (including an implementation schedule).

The Village will continue to inspect for Illicit Discharges on a regular basis, and eliminate and document in accordance with procedure. The OBCSHPC will continue to pursue, with the Village of Bayville, connecting businesses in "The Stands" on Bayville Ave to the Glen Cove Sewage Treatment Plant with Nassau County DPW. The Village will seek out additional IDDE training opportunities through OBCSHPC if available.

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MS4 Annual Report Form

This report is being submitted for the reporting period ending March 9, 2021

If submitting this form as part of a joint report on behalf of a coalition leave SPDES ID blank.

Name of MS4/Coalition: INC. VILLAGE OF BAYVILLE

SPDES ID: NYR20A304

Minimum Control Measures 4 and 5.
Construction Site and Post-Construction Control

The information in this section is being reported (check one):

● On behalf of an individual MS4
○ On behalf of a coalition
How many MS4s contributed to this report? ___

1a. Has each MS4 contributing to this report adopted a law, ordinance or other regulatory mechanism that provides equivalent protection to the NYS SPDES General Permit for Stormwater Discharges from Construction Activities? ● Yes ○ No

1b. Has each Town, City and/or Village contributing to this report documented that the law is equivalent to a NYSDEC Sample Local Law for Stormwater Management and Erosion and Sediment Control through either an attorney cerfification or using the NYSDEC Gap Analysis Workbook? ● Yes ○ No ○ NT

If Yes, Towns, Cities and Villages provide date of equivalent NYS Sample Local Law.
○ 09/2004 ● 03/2006 ○ NT

2. Does your MS4/Coalition have a SWPPP review procedure in place? ● Yes ○ No

3. How many Construction Stormwater Pollution Prevention Plans (SWPPPs) have been reviewed in this reporting period? 0

4. Does your MS4/Coalition have a mechanism for receipt and consideration of public comments related to construction SWPPPs? ● Yes ○ No ○ NT

If Yes, how many public comments were received during this reporting period? 0

5. Does your MS4/Coalition provide education and training for contractors about the local SWPPP process? ● Yes ○ No

6. Identify which of the following types of enforcement actions you used during the reporting period for construction activities, indicate the number of actions, or note those for which you do not have authority:

● Notices of Violation	#	0	○ No Authority
● Stop Work Orders	#	0	○ No Authority
● Criminal Actions	#	0	○ No Authority
● Termination of Contracts	#	0	○ No Authority
● Administrative Fines	#	0	○ No Authority
● Civil Penalties	#	0	○ No Authority
● Administrative Orders	#	0	○ No Authority
● Enforcement Actions or Sanctions	#	0	
○ Other	#		○ No Authority

MS4 Annual Report Form

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Name of MS4/Coalition: INC. VILLAGE OF BAYVILLE

SPDES ID: NYR20A304

Minimum Control Measure 4. Construction Site Stormwater Runoff Control

The information in this section is being reported (check one):

● On behalf of an individual MS4
○ On behalf of a coalition

How many MS4s contributed to this report? ___

1. **How many construction projects have been authorized for disturbances of one acre or more during this reporting period?** 0

2. **How many construction projects disturbing at least one acre were active in your jurisdiction during this reporting period?** 1

3. **What percent of active construction sites were inspected during this reporting period?** ○ NT
   100 %

4. **What percent of active construction sites were inspected more than once?** ○ NT
   100 %

5. **Do all inspectors working on behalf of the MS4s contributing to this report use the NYS Construction Stormwater Inspection Manual?** ● Yes ○ No ○ NT

6. **Does your MS4/Coalition provide public access to Stormwater Pollution Prevention Plans (SWPPPs) of construction projects that are subject to MS4 review and approval?** ● Yes ○ No ○ NT

   If your MS4 is Non-Traditional, are SWPPPs of construction projects made available for public review? ○ Yes ○ No

   If Yes, use the following page to identify location(s) where SWPPPs can be accessed.

MS4 Annual Report Form

This report is being submitted for the reporting period ending March 9, 2021

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Name of MS4/Coalition: INC. VILLAGE OF BAYVILLE

SPDES ID: NYR20A304

6. con't.:

Submit additional pages as needed.

● MS4/Coalition Office

Department: VILLAGE HALL

Address: 34 SCHOOL STREET

City: BAYVILLE NY Zip: 11709-

Phone: (516) 628-1439

○ Library

Address:

City: Zip: -

Phone: ( ) -

○ Other

Address:

City: Zip: -

Phone: ( ) -

○ Web Page URL(s): Please provide specific address where SWPPPs can be accessed - not home page.

URL

URL

MS4 Annual Report Form

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Name of MS4/Coalition: INC. VILLAGE OF BAYVILLE

SPDES ID: NYR20A304

7. Evaluating Progress Toward Measurable Goals MCM 4

Use this page to report on your progress and project plans toward achieving measurable goals identified in your Stormwater Management Program Plan (SWMPP), including requirements in Part III.C.1. Submit additional pages as needed.

A. Briefly summarize the Measurable Goal identified in the SWMPP in this reporting period.

The Village goal is to continue to assure that all construction projects that disturb > 40,000 s.f. have an approved Storm Water Pollution Prevention Plan (SWPPP) in place and that it is executed properly during construction.

B. Briefly summarize the observations that indicated the overall effectiveness of this Measurable Goal.

The inspection and enforcement procedure is in place. Development projects >1.0 acre rarely occur in the Village. All such projects must receive site plan approval by the Board of Trustees or the Planning Board and the site plans are referred to the Village Engineer for review, which assures that a SWPPPP is prepared, and proper inspection is conducted. A Notice of Termination was submitted and accepted by the NYSDEC on Oct. 16th 2020 for the one construction project that was active within the Village during the reporting period.

C. How many times was this observation measured or evaluated in this reporting period?

1

(ex.: samples/participants/events)

D. Has your MS4 made progress toward this measurable goal during this reporting period?

● Yes ○ No

E. Is your MS4 on schedule to meet the deadline set forth in the SWMPP?

● Yes ○ No

F. Briefly summarize the stormwater activities planned to meet the goals of this MCM during the next reporting cycle (including an implementation schedule).

The Village goal is to continue to assure that all construction projects that disturb > 40,000 s.f. have an approved Storm Water Pollution Prevention Plan (SWPPP) in place and that it is executed properly during construction.

1048119251

MS4 Annual Report Form

This report is being submitted for the reporting period ending March 9, 2021

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Name of MS4/Coalition: INC. VILLAGE OF BAYVILLE

SPDES ID: NYR20A304

Minimum Control Measure 5. Post-Construction Stormwater Management

The information in this section is being reported (check one):

● On behalf of an individual MS4
○ On behalf of a coalition

How many MS4s contributed to this report? ___

1. How many and what type of post-construction stormwater management practices has your MS4/Coalition inventoried, inspected and maintained in this reporting period?

	# Inventoried	# Inspections	# Times Maintained	
○ Alternative Practices				
○ Filter Systems				
○ Infiltration Basins				
○ Open Channels				
○ Ponds				
○ Wetlands				
● Other	3	6	6	3 raingardens; all raingardens are inspected and maintained twice in the reporting period.

2. Do you use an electronic tool (e.g. GIS, database, spreadsheet) to track post-construction BMPs, inspections and maintanance? ○ Yes ● No

3. What types of non-structural practices have been used to implement Low Impact Development/Better Site Design/Green Infrastructure principles?

○ Building Codes	○ Municipal Comprehensive Plans
○ Overlay Districts	○ Open Space Preservation Program
● Zoning	● Local Law or Ordinance
○ None	● Land Use Regulation/Zoning
○ Watershed Plans	○ Other Comprehensive Plan

○ Other:

MS4 Annual Report Form

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Name of MS4/Coalition: INC. VILLAGE OF BAYVILLE

SPDES ID: NYR20A304

4a. Are the MS4s contributing to this report involved in a regional/watershed wide planning effort?

○ Yes ● No

4b. Does the MS4 have a banking and credit system for stormwater management practices?

○ Yes ● No

4c. Do the SWMP Plans for each MS4 contributing to this report include a protocol for evaluation and approval of banking and credit of alternative siting of a stormwater management practice?

○ Yes ● No

4d. How many stormwater management practices have been implemented as part of this system in this reporting period?

N/A

5. What percent of municipal officials/MS4 staff responsible for program implementation attended training on Low Impace Development (LID), Better Site Design (BSD) and other Green Infrastructure principles in this reporting period?

100 %

MS4 Annual Report Form

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Name of MS4/Coalition: INC. VILLAGE OF BAYVILLE

SPDES ID: NYR20A304

6. Evaluating Progress Toward Measurable Goals MCM 5

Use this page to report on your progress and project plans toward achieving measurable goals identified in your Stormwater Management Program Plan (SWMPP), including requirements in Part III.C.1. Submit additional pages as needed.

A. Briefly summarize the Measurable Goal identified in the SWMPP in this reporting period.

To continue to monitor projects which result in land disturbance activities to assure that they meet Village Code and submission of SWPPPs. As a long term goal, The Village will consider installing permeable pavers and shoreline stabilization plantings, and undertake a wetland restoration project.

B. Briefly summarize the observations that indicated the overall effectiveness of this Measurable Goal.

The goal is enforced by site plan reviews conducted by the Planning Board and Board of Trustees both of which utilize the Village Engineer to review site plans and assure the containment and disposal of all storm water runoff on-site. 3 raingardens on Village property are inspected and maintained twice a year. The Village has set a tentative schedule for installing green infrastructure practices on Village property in the form of permeable pavers and shoreline stabilization plantings.

C. How many times was this observation measured or evaluated in this reporting period?

1

(ex.: samples/participants/events)

D. Has your MS4 made progress toward this measurable goal during this reporting period?

● Yes ○ No

E. Is your MS4 on schedule to meet the deadline set forth in the SWMPP?

● Yes ○ No

F. Briefly summarize the stormwater activities planned to meet the goals of this MCM during the next reporting cycle (including an implementation schedule).

To continue to monitor projects which result in land disturbance activities to assure that they meet Village Code including the submission of SWPPPs where required. The Village tentatively plans to install green infrastructure practices on Village property in the form of permeable pavers and shoreline stabilization plantings.

MS4 Annual Report Form

This report is being submitted for the reporting period ending March 9, 2021

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Name of MS4/Coalition: INC. VILLAGE OF BAYVILLE

SPDES ID: NYR20A304

Minimum Control Measure 6. Stormwater Management for Municipal Operations

The information in this section is being reported (check one):

● On behalf of an individual MS4
○ On behalf of a coalition

How many MS4s contributed to this report? ___

1. Choose/list each municipal operation/facility that contributes or may potentially contribute Pollutants of Concern to the MS4 system. For each operation/facility indicate whether the operation/facility has been addressed in the MS4's/Coalition's Stormwater Management Program(SWMP) Plan and whether a self-assessment has been performed during the reporting period. A self-assessment is performed to: 1) determine the sources of pollutants potentially generated by the permittee's operations and facilities; 2) evaluate the effectiveness of existing programs and 3) identify the municipal operations and facilities that will be addressed by the pollution prevention and good housekeeping program, if it's not done already.

Operation/Activity/Facility	Addressed in SWMP?		Self-Assessment Operation/Activity/Facility performed within the past 3 years?	
Street Maintenance	● Yes	○ No	● Yes	○ No
Bridge Maintenance	○ Yes	● No	● Yes	○ No
Winter Road Maintenance	● Yes	○ No	● Yes	○ No
Salt Storage	● Yes	○ No	● Yes	○ No
Solid Waste Management	● Yes	○ No	● Yes	○ No
New Municipal Construction and Land Disturbance	○ Yes	● No	● Yes	○ No
Right of Way Maintenance	● Yes	○ No	● Yes	○ No
Marine Operations	○ Yes	● No	● Yes	○ No
Hydrologic Habitat Modification	○ Yes	● No	○ Yes	● No
Parks and Open Space	● Yes	○ No	● Yes	○ No
Municipal Building	● Yes	○ No	● Yes	○ No
Stormwater System Maintenance	● Yes	○ No	● Yes	○ No
Vehicle and Fleet Maintenance	● Yes	○ No	● Yes	○ No
Other	● Yes	○ No	● Yes	○ No

MS4 Annual Report Form

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Name of MS4/Coalition: INC. VILLAGE OF BAYVILLE

SPDES ID: NYR20A304

2. Provide the following information about municipal operations good housekeeping programs:

● Parking Lots Swept (Number of acres X Number of times swept)	# Acres	5
● Streets Swept (Number of miles X Number of times swept)	# Miles	29.5
● Catch Basins Inspected and Cleaned Where Necessary	#	102
● Post Construction Control Stormwater Management Practices Inspected and Cleaned Where Necessary	#	3
● Phosphorus Applied In Chemical Fertilizer	# Lbs.	0
● Nitrogen Applied In Chemical Fertilizer	# Lbs.	0
● Pesticide/Herbicide Applied (Number of acres to which pesticide/herbicide was applied X Number of times applied to the nearest tenth.)	# Acres	0000.0

3. How many stormwater management trainings have been provided to municipal employees during this reporting period? 1

4. What was the date of the last training? 12 / 02 / 2020

5. How many municipal employees have been trained in this reporting period? 1

6. What percent of municipal employees in relevant positions and departments receive stormwater management training? 33 %

MS4 Annual Report Form

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Name of MS4/Coalition: INC. VILLAGE OF BAYVILLE

SPDES ID: NYR20A304

7. Evaluating Progress Toward Measurable Goals MCM 6

Use this page to report on your progress and project plans toward achieving measurable goals identified in your Stormwater Management Program Plan (SWMPP), including requirements in Part III.C.1. Submit additional pages as needed.

A. Briefly summarize the Measurable Goal identified in the SWMPP in this reporting period.

The Village will continue to seek funding in support of good housekeeping operations. The Village will continue annual inspections, removal of materials from structures and prohibit the use of fertilizers and pesticides on public property. The Village will seek out additional stormwater training on Good Housekeeping for municipal employees and will plan to enhance record-keeping of all self-assessments performed at municipal facilities and operations. As a long term goal, the Village is looking to install shoreline stabilization plantings and undertake a wetland restoration project to improve water quality in the Long Island Sound by reducing the pollutants carried by stormwater runoff.

B. Briefly summarize the observations that indicated the overall effectiveness of this Measurable Goal.

Approximately 13.92 tons of sweepings were collected and 102 storm drains were inspected and cleaned where necessary. The Village continues to prohibit the use of fertilizers and pesticides on public property. Village personnel utilized stormwater management trainings available through EPA and NYSDEC's online resources. The Village enhanced documentation of self-assessments by utilizing a new comprehensive checklist. Pet waste stations continued to be available for public use on Village property. A tentative schedule for installing shoreline stabilization plantings and permeable pavers has been set for late Spring 2021. The Village required Fleet Wash to provide a Third Party Certification. The wetland restoration project will not be moving forward at this time.

C. How many times was this observation measured or evaluated in this reporting period?

1

(ex.: samples/participants/events)

D. Has your MS4 made progress toward this measurable goal during this reporting period?

● Yes ○ No

E. Is your MS4 on schedule to meet the deadline set forth in the SWMPP?

● Yes ○ No

F. Briefly summarize the stormwater activities planned to meet the goals of this MCM during the next reporting cycle (including an implementation schedule).

The Village will seek funding in support of good housekeeping operations. The Village will continue annual inspections, removal of materials from structures and prohibition of the use of fertilizers and pesticides on public property. The Village tentatively plans to install shoreline stabilization plantings with the goal of slowing stormwater runoff and stabilizing sediment at West Harbor Beach. The Village tentatively plans to install permeable pavers at Creek Beach with the goal of slowing/cleaning stormwater runoff before it enters Mill Neck Creek.

Cornell Cooperative Extension
Suffolk County

FINAL REPORT
Cold Spring Harbor Watershed

Initial Characterization and Management of Pathogens Affecting Sanitary Condition of Shellfish Lands

&

Assessment of the Spring Street Outfall #273 and Associated Conveyance as it Pertains to Pathogens Affecting Sanitary Condition of Shellfish Lands

Prepared for

Nassau County Soil and Water Conservation District
&
Oyster Bay - Cold Spring Harbor Protection Committee

Submitted by:
Cornell Cooperative Extension of Suffolk County
423 Griffing Avenue, Suite 100
Riverhead, NY 11901-3071

Contact:
Carolyn Sukowski, Water Quality Program Coordinator
E-mail: cs424@cornell.edu
Phone: 631-239-1800 ex.6

PURPOSE

Surface water impairment by fecal coliform bacteria is a water quality issue of national scope and importance. Cold Spring Harbor currently has a year-round shellfish land closure for the area including tributaries south and east of a line extending southerly from the seaward end of the dock serving the Cold Spring Harbor Beach Club to the western extremity of the 'Gale House' located on the shoreline immediately west of Cold Spring Beach, on the campus of Cold Spring Harbor Laboratory. Additionally, the area including tributaries south and east of a line extending westerly from the seaward end of the dock serving the Cold Spring Harbor Beach Club to the flag pole situated near the village hall of the Village of Laurel Hollow is closed to shellfishing seasonally.

The purpose of this project is to characterize and manage fecal coliform contamination in the Cold Spring Harbor Watershed as a first step towards identifying and reducing the sources of bacterial contamination that are causing shellfish closures in southern Cold Spring Harbor with the ultimate goal of opening these shellfish lands. The Oyster Bay – Cold Spring Harbor Protection Committee (OBCSHPC) has committed to pursuing this effort in the Spring Street subwatershed which lies within the Town of Huntington boundary. The Nassau County Soil and Water Conservation District (NCSWCD) has additionally committed to pursuing this effort in the Laurel Hollow and Cold Spring Brook Subwatersheds. This project aligns with the recommended actions identified in the Friends of the Bay Watershed Action Plan and involves identifying preliminary fecal coliform loads during dry weather and storm events for three significant subwatersheds to Cold Spring Harbor. All samples have been processed and preserved for future microbial source tracking (MST) and recommendations have been provided on prioritizing sample selection. A review of existing fecal coliform data as it compares to the U.S. Food and Drug Administration's National Shellfish Sanitary Program and additional assessments in these subwatersheds has been conducted. Additionally, training of Oyster Bay-Cold Spring Harbor Protection Committee (OBCSHPC) members and volunteers in ways they can continue efforts in identifying potential illicit discharges to the storm sewer system will be used to guide efforts to identify problem areas and manage fecal coliform contamination in the watershed.

FINDINGS

TASK I (NCSWCD): Review of Existing Water Quality Data

Existing fecal coliform data from inner Cold Spring Harbor has been compiled and analyzed as it relates to the U.S. Food and Drug Administration's National Shellfish Sanitary Program recommendations. Data review included New York State Department of Environmental Conservation (NYS DEC) Division of Marine Resources Shellfish Harvest Area Classification Unit Report on Cold Spring Harbor Shellfish Growing Area #48 (Annual Evaluation 2020 and 2019) as well as data collected by Friends of the Bay (FOB). Local bathing beach data from EPA Water Quality Data portal (WQX) / STORET database and EPA Beacon2 database was also reviewed.

Ambient Water Quality Monitoring (FOB, NYS DEC)

A review of ambient water quality monitoring data was conducted in order to highlight most recent conditions. The analysis provided below presents the most recent data available including NYS DEC data from 2009 through 2019 as well as data provided by Friends of the Bay (FOB) from 2011 through 2019.

The NYS DEC conducts an annual sanitary survey and evaluation of Cold Spring Harbor Shellfish Growing Area #48. Systematic random sampling is conducted throughout the growing area. This field sampling and data analysis design presumes that if intermittent, unfavorable changes in water quality occur, they will be revealed in the bacteriological sampling results. These unfavorable sampling results will then contribute to the variation of the data set. Data sets displaying greater levels of variation will consequently exhibit an elevated estimated 90th percentile. The estimated 90th percentile serves as the statistic to measure the variance of a data set. This statistic, along with the geometric mean, is used when evaluating each sampling station for compliance with the National Shellfish Sanitation Program (NSSP) growing area criteria. For fecal coliform, a geomean threshold of 14 MPN/100mL and a 90^{th} percentile of 49 MPN/100mL are used as standards to determine an area as approved.

The approved, or 'open', classification for a growing area requires that the sanitary survey has determined that there are no unacceptable concentrations of fecal material, pathogenic microorganisms, or poisonous and deleterious substances. There are no NSSP limitations on the harvest of shellstock from growing areas placed in this classification.

The conditional, or 'seasonal', classifications are designed to address growing areas that are subject to intermittent microbiological pollution. This classification applies when during certain times of the year or under certain conditions, the shellstock from the growing area may be safely harvested. For example, during periods of low runoff and/or cooler temperatures, these areas may be below thresholds.

The restricted, prohibited, or 'uncertified/closed' area classifications are designed to address growing areas that do not meet approved area criteria and which may be subject to administrative closures such as areas in proximity to waste water treatment plant outfalls. This classification is commonly used for areas affected by non-point pollution from either urban or rural sources that cause the water quality to fluctuate unpredictably or of sufficient frequency that a conditionally approved area is not feasible.

The following maps include NYS DEC and Friends of the Bay (FOB) data going back enough full years to be able to highlight the geomeans and 90th percentiles for at least 30 data points. Friends of the Bay monitoring data is only included in the closed period map since data is only collected in these warmer months, not year-round. The extent of the maps focus on inner-Cold Spring Harbor stations only, specifically out to NYS DEC station 48-8 located off of Jennings Beach. One NYS DEC monitoring station, 48-24, was only recently added in December of 2019 so there is insufficient data to present values. NYS DEC stations located in the year-round closed area (48-11, 48-13, 48-13.1, 48-14, and 48-15) have been marked by NYS DEC as 'inactive' and were not included in the State's most recent Annual Evaluation (2020) for these stations. However, data was collected at these stations in 2019, and is included in our analyses.

Figure 1 represents a year-round (1/1-12/31) NYS DEC data summary that includes a minimum of 30 data points per station going back as far as 2013. Stations in areas closed year-round are failing both the geomean and 90th percentile standards. Seasonal stations are either failing one of the metrics or approaching a threshold value. Nearshore stations in the open area (48-8 and 48-10) would not necessarily be considered to be approaching thresholds for this year-round analysis. However the 90th percentiles are relatively higher than that of the open station located in the middle of the harbor, 48-9.

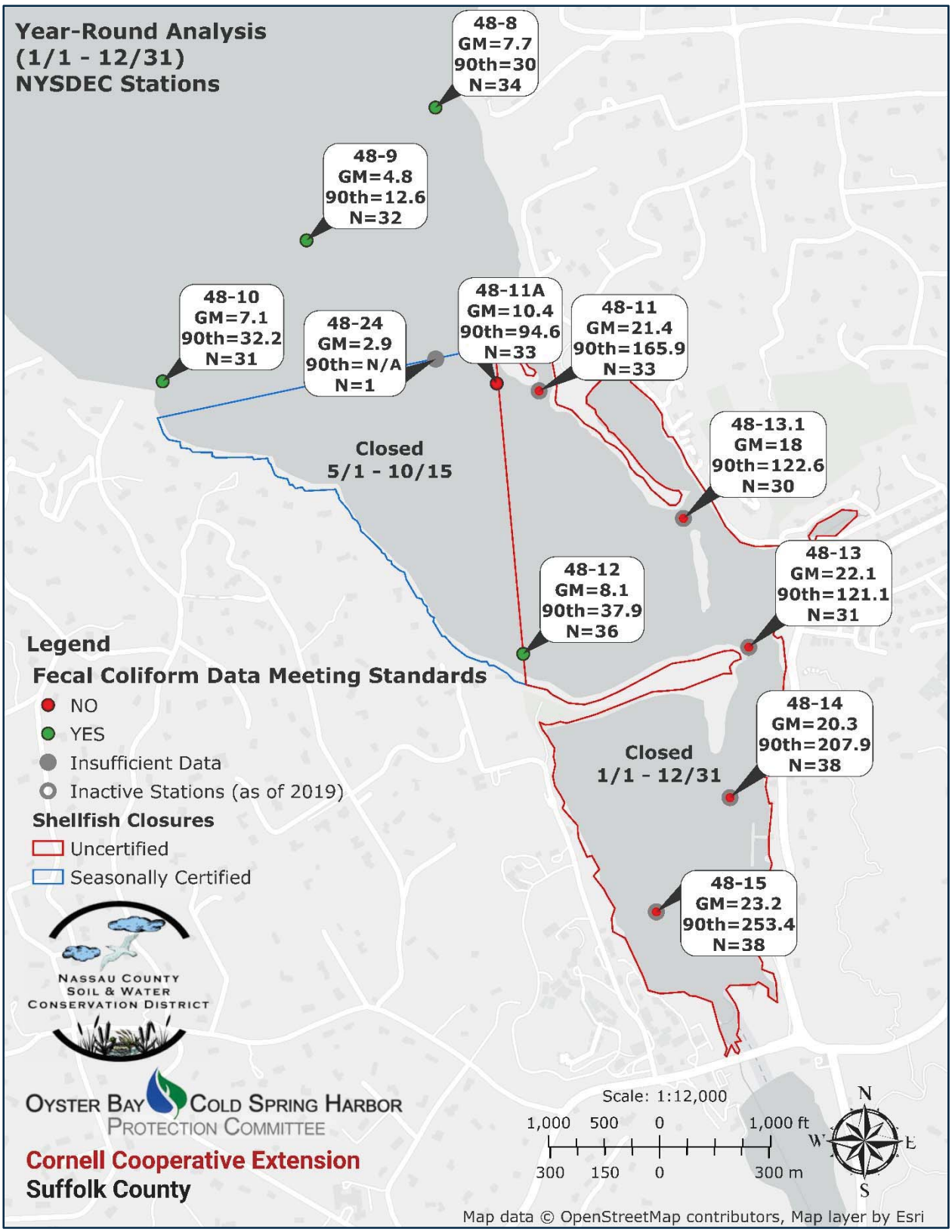


Figure 1. Year-Round (1/1 – 12/31) Analysis:
NYS DEC Fecal Coliform Data in Inner Cold Spring Harbor

Figure 2 represents a seasonally closed (5/1-10/15) NYS DEC and FOB data summary going back to (2010 for NYS DEC data and 2017 for FOB data). This seasonal closed analysis includes the most recent year of data available (2019) whereas the 2020 NYS DEC Annual Evaluation leaves 2019 data out for the closed areas as these stations have been marked as inactive. With the inclusion of the most recent year of data (2019), when compared to the NYS DEC Annual Evaluation, there is still no improvement seen in these stations. All NYS DEC stations and FOB stations, FB-1 and FB-2, in areas closed year-round are failing both the geomean and 90th percentile standards for this period. Seasonal stations, including FOB station FB-3, are also failing both the geomean and 90th percentile standards for this period. Nearshore stations (48-8 and 48-10) in the open year-round area could be considered to be approaching thresholds for both the geomean and 90th percentile. However, additional years of data would be needed to continue to assess status.

It should be noted that in the 2020 NYS DEC Annual Evaluation, which uses station data from 5/1-10/31 despite the closed period being from 5/1-10/15, station 48-10 is identified as approaching threshold values with a geomean of 8.8 MPN/100mL and 90th percentile of 42.8 MPN/100mL (N=31). Our review, which includes data from the seasonally closed window of 5/1-10/15 and contains an additional year of data produced a geomean of 8.5 MPN/100mL and 90th percentile of 38.5 MPN/100mL (N=35). The difference is not significant, but is worth mentioning considering the importance of this year-round open station. Additionally, when analyzing the 5/1-10/15 period for this station using the same data years as DEC we see a geomean of 9.4 MPN/100mL and a 90th percentile of 46.6 MPN/100mL (N=29). NSSP uses a minimum of the 30 most recent randomly collected samples to calculate the geomean and the 90th percentile which is why the CCE analysis went back an additional year. This additional analysis of this station was considered as it is the year-round open station closest to the seasonally closed area and therefore could be used to consider potential future extensions of closed areas.

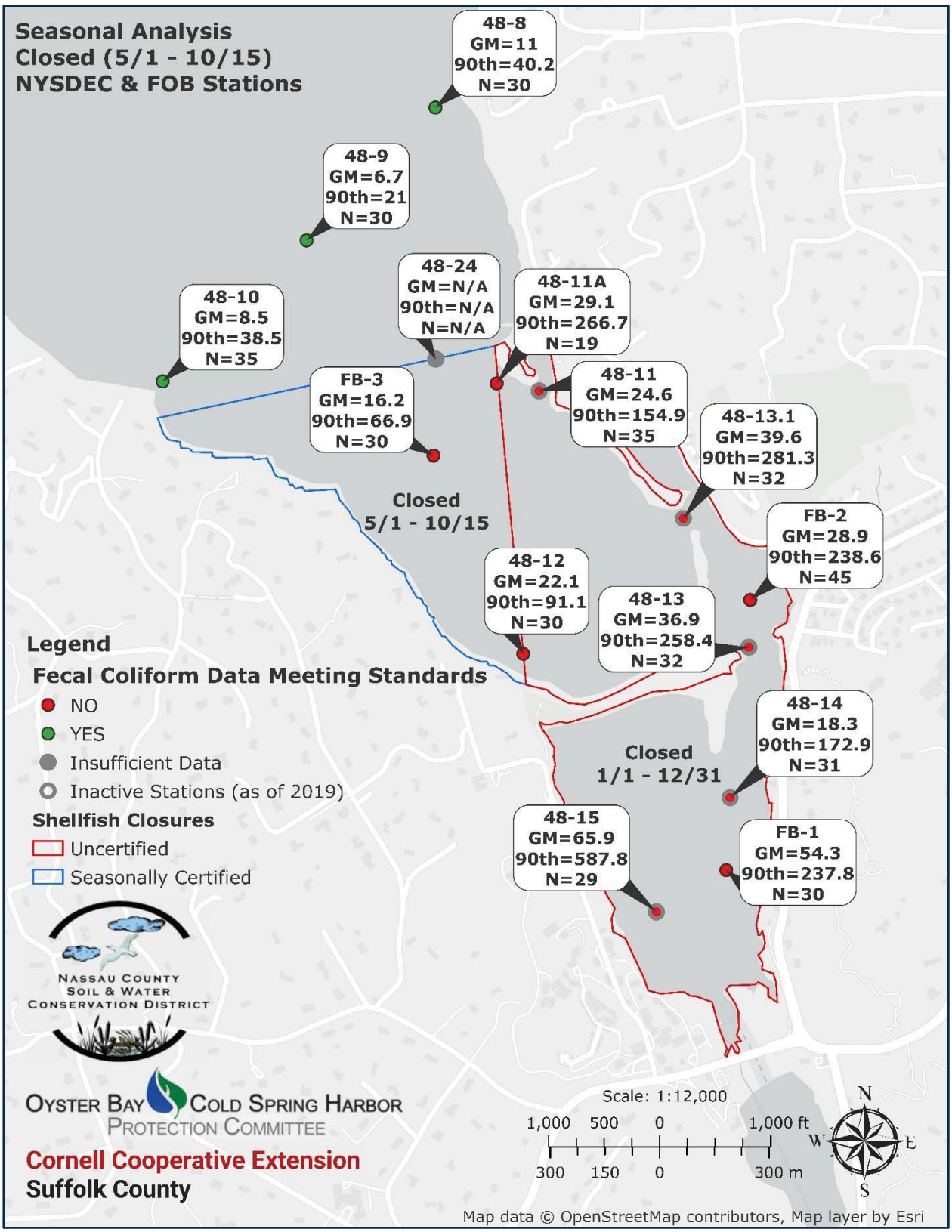


Figure 2. Seasonally Closed Period (5/1–10/15) Analysis:
NYSDEC & FOB Fecal Coliform Data in Inner Cold Spring Harbor

Figure 3 represents a seasonally open (10/16 - 4/30) NYS DEC data summary going back to 2009. Two NYS DEC stations (48-14, 48-15) in the area closed year-round are failing both the geomean and 90th percentile standards for this period. The other three NYS DEC stations in the annually closed area (48-11, 48-13, 48-13.1) are below thresholds between October 16th and April 30th. However, there is a significant difference between these stations and those located on the seasonal line boundary. The difference can be seen specifically in the 90th percentile values indicating that the stations located in the year-round closed area show a higher level of variation which reveals that intermittent unfavorable changes in water quality are occurring, just not to the level they do in the warmer months and to the extent that they trigger failure of standards during colder months. All seasonally open stations and all stations open year-round are also below thresholds between October 16th and April 30th.

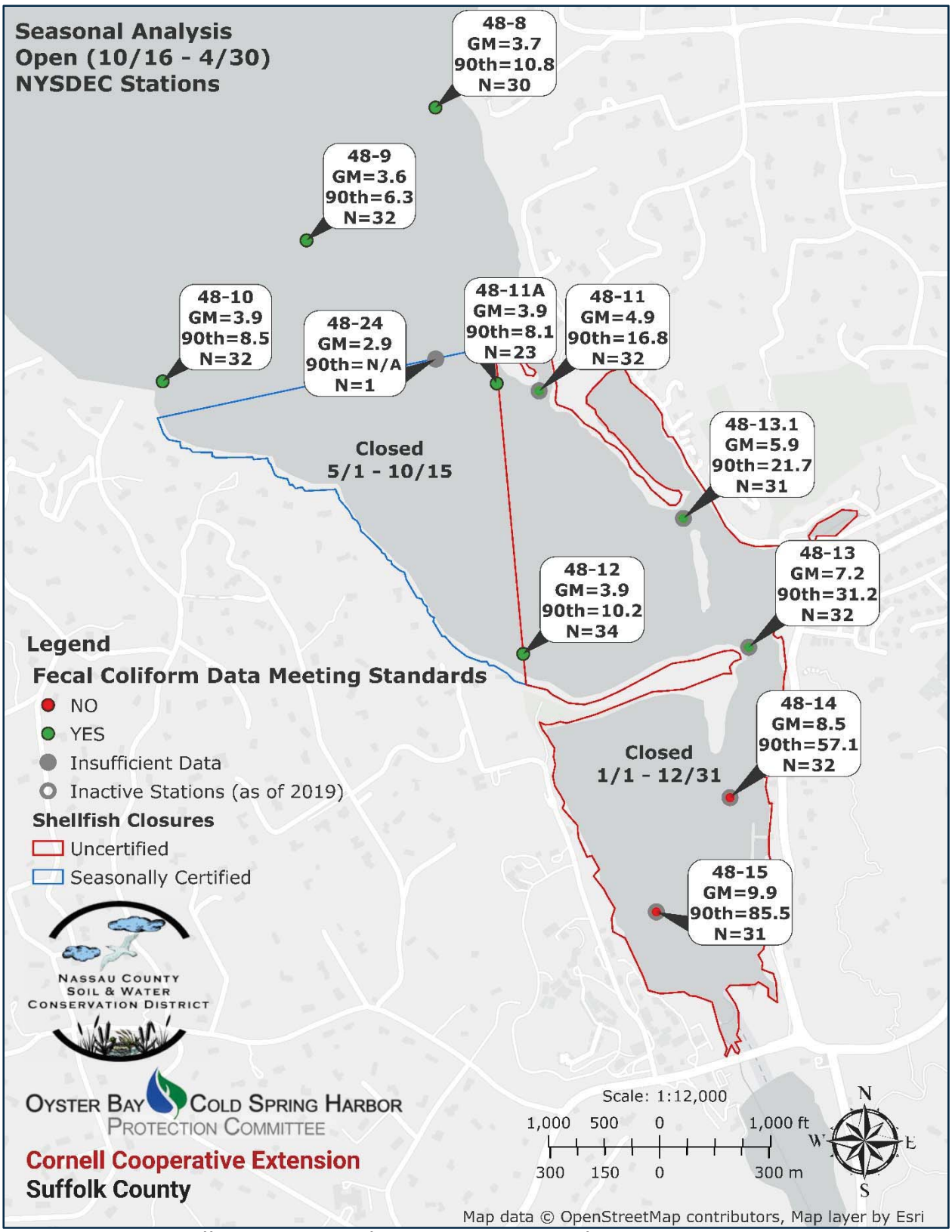


Figure 3. Seasonally Open Period (10/16 – 4/30) Analysis:
NYSDEC Fecal Coliform Data in Inner Cold Spring Harbor

NYS DEC and FOB data was additionally processed for annual trends during the closed period (5/1-10/15). *Figure 4* presents the annual analysis of geometric means and 90th percentiles for NYS DEC fecal coliform data for the seasonally closed period (May 1-October 15) of combined stations in the open, closed, and seasonal areas. *Figure 5* presents the same but for FOB fecal coliform data. The NYS DEC and FOB analyses align with one another except for the open areas, which is expected, since the FOB open water station, FB-4, is located in outer Cold Spring Harbor, whereas the NYS DEC open water stations analyzed were located closer to inner Cold Spring Harbor and the closed areas. This explains the lower geomeans for the open area in the FOB graph versus the NYS DEC graph.

For the most recent data year, 2019, NYS DEC open area stations (48-8, 48-9, 48-10) failed both the geomean and 90th percentile standard during the May 1st to October 15th period. This has occurred once before, in 2014. The FOB open area station located in outer Cold Spring Harbor had a geomean below the threshold, but a 90th percentile that failed. Additionally, in 2019, both the closed area and the seasonal area failed the geomean and 90th percentile standards.

An analysis of variance was completed to assess trends between years for both the NYS DEC data and the FOB data. The NYS DEC data in *Figure 4*, indicates that the open area had significantly higher fecal coliform geomeans in 2014 and 2019; the closed area had a significantly lower fecal coliform geomean in 2012 and a significantly higher fecal coliform geomean in 2018 and 2019; and the seasonal area showed a significantly higher fecal coliform geomean in 2019. The FOB data in *Figure 5*, indicates that the open and seasonal areas have no significant differences between years, whereas the closed area did show a significantly higher geomean in 2011 and a significantly lower geomean in 2018. 2019 FOB data fell in between the lowest year (2018) and the highest year (2011).

Geomeans and 90th percentiles were compared to annual rainfall data from a local NOAA station during the closed period of 5/1-10/15. A correlation between fecal coliform values and annual rainfall was not found.

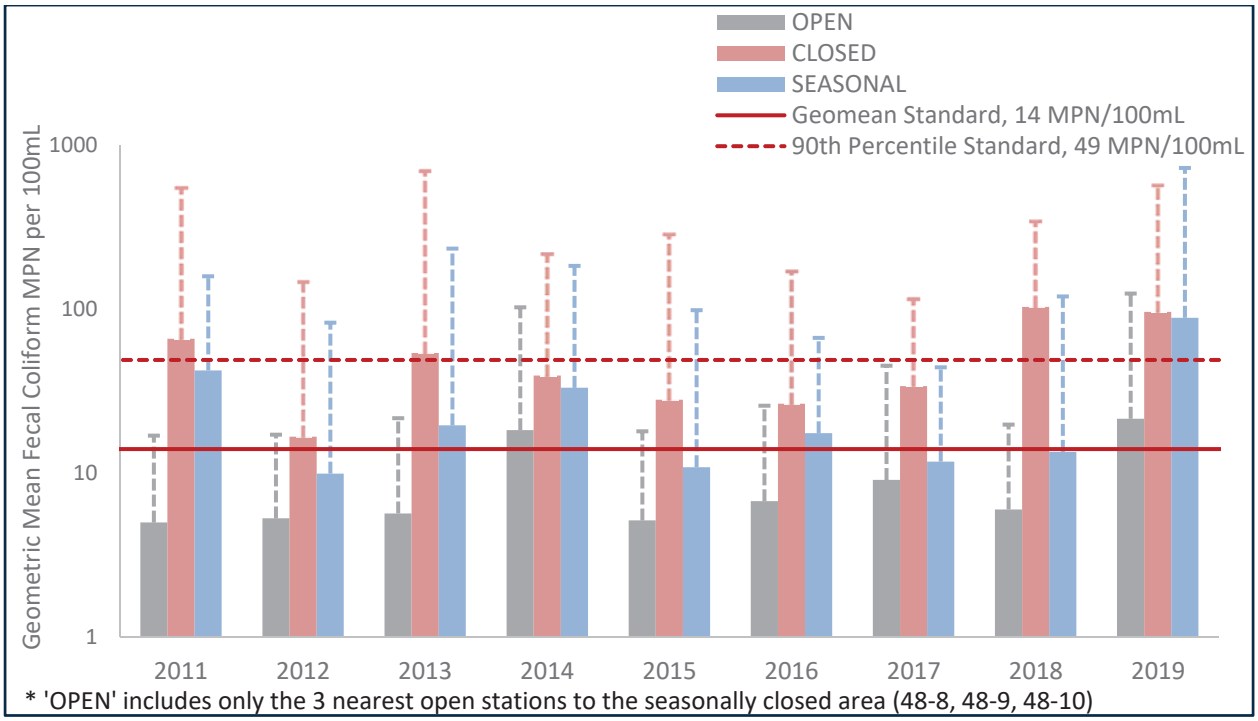


Figure 4. NYS DEC Data - Seasonal (May 1-October 15):
Geometric Mean Fecal Coliform MPN per 100mL and 90th Percentile of Stations in Open, Closed, and Seasonal Areas by Year

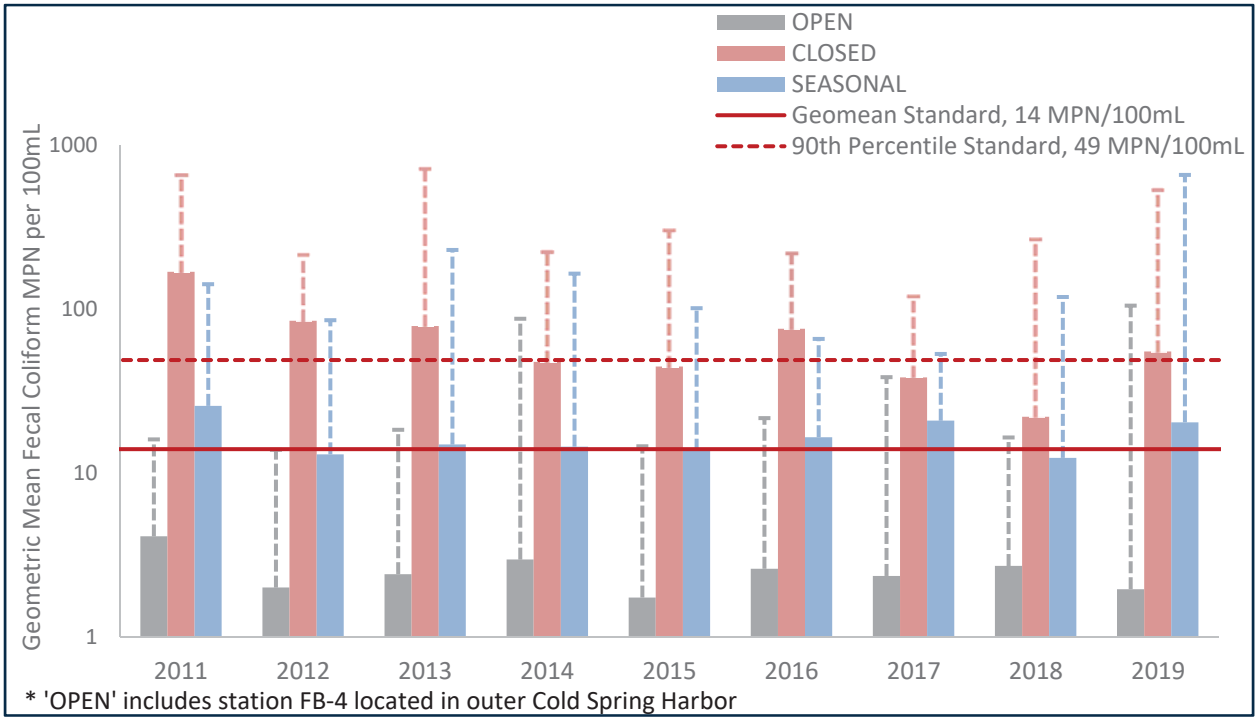


Figure 5. FOB Data - Seasonal (May 1-October 15):
Geometric Mean Fecal Coliform MPN per 100mL and 90th Percentile of Stations in Open, Closed, and Seasonal Areas by Year

Outfall and Stream Monitoring

Friends of the Bay

The Stream and Outfall Monitoring Program that has been implemented by Friends of the Bay complements the existing open water body monitoring program within the Oyster Bay/Cold Spring Harbor estuary. Sampling data has been reviewed for the 2015-2017 years. Monitoring was discontinued after 2017, however the Program may continue in subsequent years. The Stream and Outfall Monitoring Program involves collecting samples from 10 major discharges into the Estuary. These discharges include streams, ponds, an untreated sewage discharge, and a 'rotating' outfall that changes for each event in an effort to identify other pollutant sources. Samples are collected four times per year. Two of these monitoring events occur following a period without precipitation ("dry" events), and the remaining two occur during precipitation events ("wet" events). Samples are analyzed for a variety of biological, chemical, and physical parameters including fecal coliform bacteria.

In 2015 through 2017, sampling involved 2 dedicated stream sample sites (Deforest Pond Outflow, St. Johns Pond Outflow) and 2 stormwater outfalls that were sampled on a rotating basis (Spring Street Outfall, Laurel Hollow Beach Outfall)

A summary of data collected by location can be viewed in *Table 1*. While there was not enough data collected annually to be able to determine trends for outfall locations or to be able to compare to sampling data of this current study, the stream outflows sampled have significantly lower fecal coliform enumeration values than the stormwater outfalls sampled on average ($p = 0.008$).

Table 1. Friends of the Bay Stream and Outfall Monitoring Summary from 2015 to 2017 for Cold Spring Harbor Watershed. Values indicate Fecal Coliform Enumeration (FC/100mL) for individual samples.

	Winter		**Spring**		**Summer**		**Fall**	
Sampling Location	**Dry**	**Wet**	**Dry**	**Wet**	**Dry**	**Wet**	**Dry**	**Wet**
DeForest Pond	10	35/19	35/21	5	23	260	35/31	ND
St. Johns Pond	1	21/10	21/17	4	25/25	0.99	82/3	ND
Spring Street Outfall	55	27/7100	120	ND	270	570	2200/145	ND
Laurel Hollow Beach Outfall	ND	260	ND	590	ND	ND	4200	ND

Suffolk County Department of Health

Suffolk County Department of Health has collected stream data in the past, however, there is not a significant amount of more recent data for streams in the Cold Spring Harbor watershed to aid in determining trends. A station located in Cold Spring Brook was sampled 7 times since 1993 as follows: April 1993, Jan 1995, Aug 1995, May 1997, Aug 1999, July 2003, July 2004.

Cornell Cooperative Extension of Suffolk County (2009)

In 2009, wet weather and dry weather sampling in the Town of Huntington was conducted at stormwater outfall locations, including Spring Street outfall #273. Sampling results for fecal coliform enumeration were comparable to this current study of fecal coliform concentrations from the Spring Street outfall #273 sampled in 2020. The average of dry weather samples was 934 FC/100mL in 2009 whereas the average of dry weather samples was 298 FC/mL in 2020. For comparable sampling months, the average of wet weather samples was 16,600FC/mL whereas for the current study, the average of wet weather samples was 25,295 FC/100mL.

Bathing Beach Data

Bathing beach standards use enterococcus concentrations of samples whereas shellfish standards use fecal coliform concentrations, which is the focus of this study. However, since the source of pathogens may be the same for bathing beach and shellfishing waters, we reviewed local bathing beach data from EPA Water Quality Data portal (WQX) / STORET database and EPA Beacon2 database. This data is best summarized in the Sound Health Explorer, a Save the Sound project, at soundhealthexplorer.org/swimmable. Appendix A provides the summaries for each of the 6 bathing beaches in Cold Spring Harbor in 2019 along with an explanation of the grading.

Of note would be that bathing beaches with the worst grades tended to have a greater percentage of samples that failed water quality standards during wet weather events versus dry weather events.

TASK I (OBCSHPC): Mapping and Verification of Spring Street Outfall #273 and Associated Conveyance

All stormwater structures found to connect to the Spring Street Outfall, regardless of jurisdiction, were field verified and mapped along with associated attributes into GIS. Structures were surveyed for illicit connections but none were found. Completion of conveyance mapping will ensure proper assessment of Spring Street Outfall #273 and aid in future trackdown of any pollutant sources. Mapping can be seen in *Figure 6*. A total of 111 structures were verified and associated data was collected.

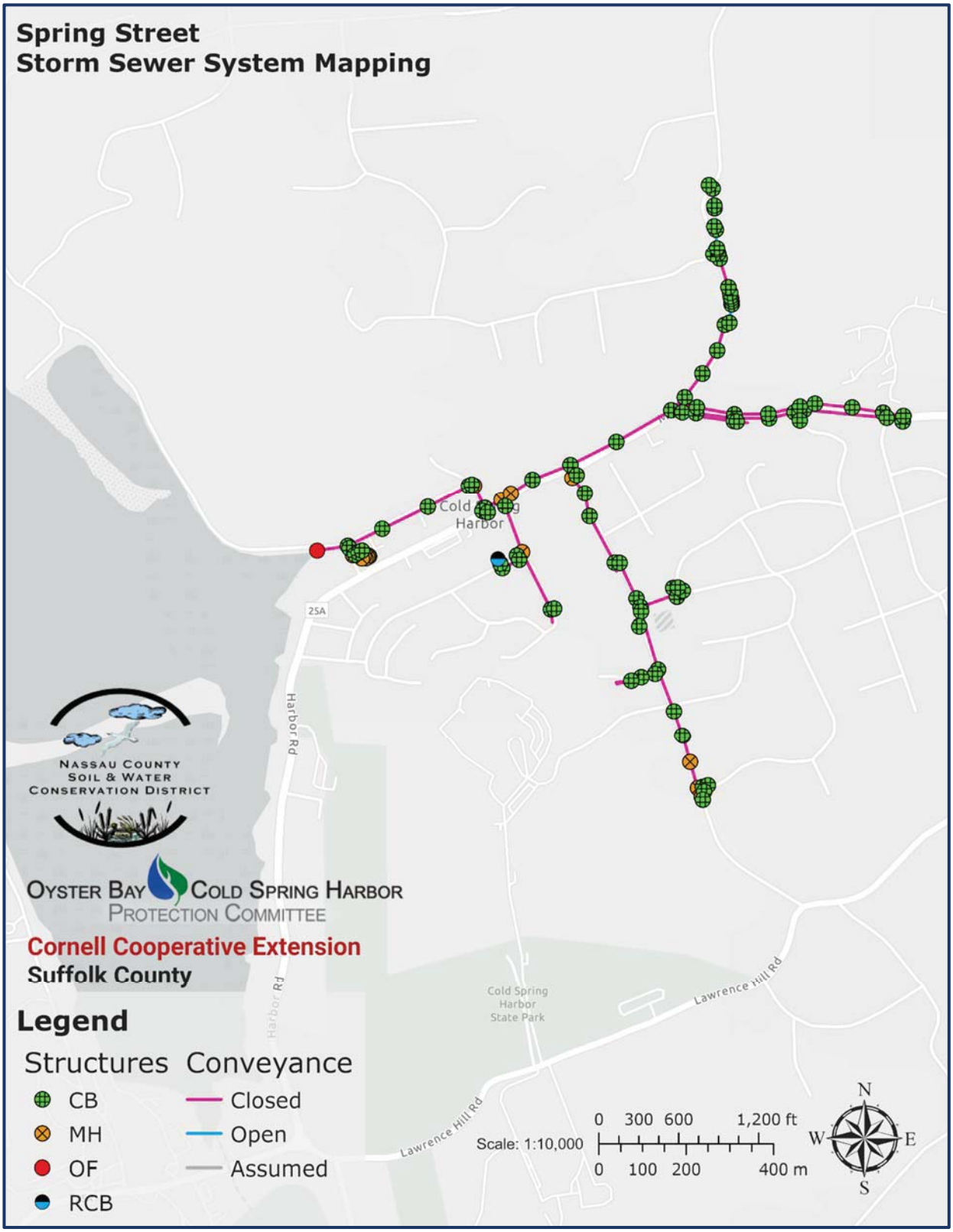


Figure 6. Spring Street Outfall # 273 storm sewer system conveyance mapping.

TASK II (NCSWCD): On-site Wastewater Treatment System Survey

In areas which have shallow depth to groundwater, an On-Site Wastewater Treatment System (OWTS) Parcel Survey was completed. Parcels were surveyed from municipal roads, without entering properties, to conduct a Surface Condition Analysis. Adjacent stormwater structures were also surveyed for illicit connections. Observations were made that could indicate parcels where OWTSs could be failing. The areas having shallow depth to groundwater based on USGS data are indicated in *Figure 7*. OWTS parcel surveys were conducted in the Laurel Hollow and Cold Spring Brook subwatersheds.

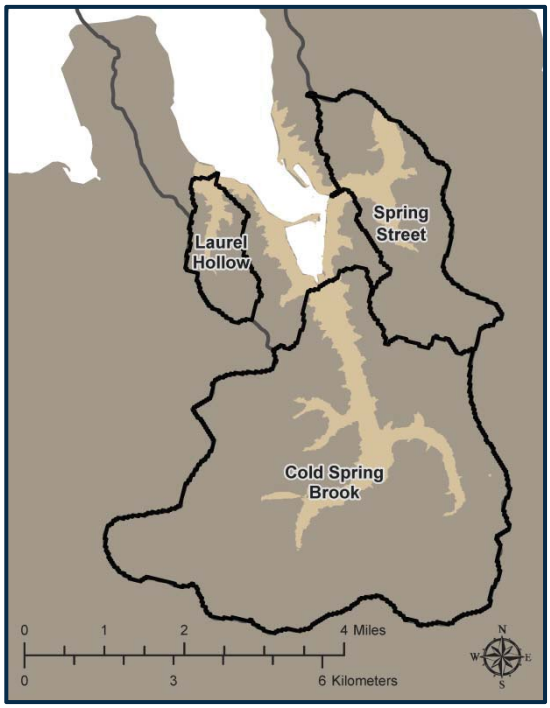


Figure 7. Cold Spring Harbor Watershed along with areas of shallow depth to groundwater indicated in tan

235 priority parcels were selected in areas of shallow ground water (less than 100ft) in the Laurel Hollow and Cold Spring Brook subwatersheds. Parcels were surveyed for indicators such as geometric patterns of burnt grass or lush plant growth, spongy ground, and discharges other than stormwater. *Figure 8* indicates parcel locations marked for surveys.

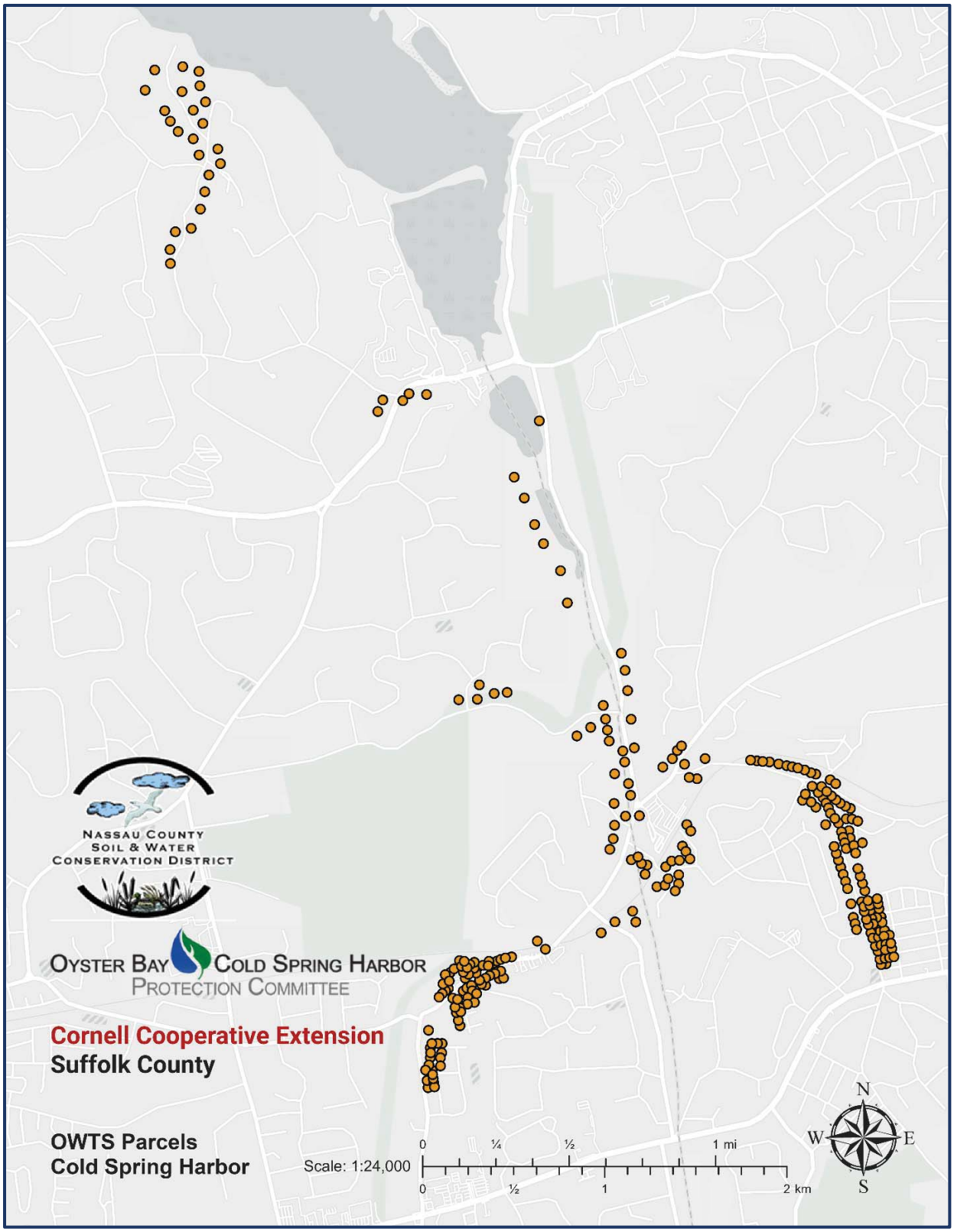


Figure 8: Priority parcels in areas of shallow ground water in the Laurel Hollow and Cold Spring Brook subwatersheds.

Stormwater structures at two parcel locations were selected to be sampled during a dry weather event as survey results showed more than one indicator of potential failing on-site systems at these locations. Both locations were south of the train tracks/Pulaski Road/Woodbury Road. A summary of these locations is provided, and it has been concluded that there is not likely to be failing septic systems at these sites.

NYS Real Property Tax Service Parcel ID # 472600311500
Visited on 7/21/2020 and 9/21/2020 which were both dry weather days with no rainfall in the 72 hours prior to survey. Excessive amount of weeds near curb box opening and some large rocks on front lawn were observed. Excessive plant growth can indicate higher than normal nutrient inputs to the storm sewer system. Heavy objects located in yards can crush underground OWTS piping leading to leaks. There were no signs of any illicit discharge during both visits so it is concluded that this location is not likely to have OWTS discharges into the storm sewer system or surrounding natural waters.

Photo of Parcel ID # 472600311500 on 7/21/2020

NYS Real Property Tax Service Parcel ID # 282400224630
Visited on 8/5/2020 where there had been significant rainfall in the last 48 hours and 9/21/2020 which was a dry weather day with no rainfall in the 72 hours prior to the survey. On 8/5/2020 it was observed that there is a pipe within the curb adjacent to this parcel that appears to drain towards an adjacent catch basin. Additionally, there was about a foot of standing water in the adjacent basin with temperature of 25.60°C and salinity of 0.20ppt. On 9/21/2020 the basin and surrounding area was completely dry. There were no other indicators of failing OWTS. It is concluded that this location is not likely to have OWTS discharges into the storm sewer system or surrounding natural waters.

Photo of Parcel ID # 282400224630 on 8/5/2020

Task II (OBCSHPC): Monitoring of the Spring Street Outfall #273 During Dry Weather Events

The Spring Street Outfall # 273 and associated conveyance system was monitored for illicit discharges during dry weather events. Dry weather events (48 hours without significant rainfall) allow for stormwater outfalls to be monitored for any discharges that may be occurring in the system that are not associated with stormwater and that may be illicit. The Spring Street Outfall #273 and associated system were monitored during a total of four (4) distinct dry weather events between August and September (8/10/2020, 8/24/2020, 8/26/2020, 9/21/2020).

Three separate catch basin locations along Spring Street were monitored for dry weather flow and can be seen in *Figure 9*. Sampling locations labeled 'LH' and 'CSB' are located in the Laurel Hollow and Cold Spring Brook subwatersheds respectively. Sampling locations labeled 'SS' are located in the Spring Street subwatershed.

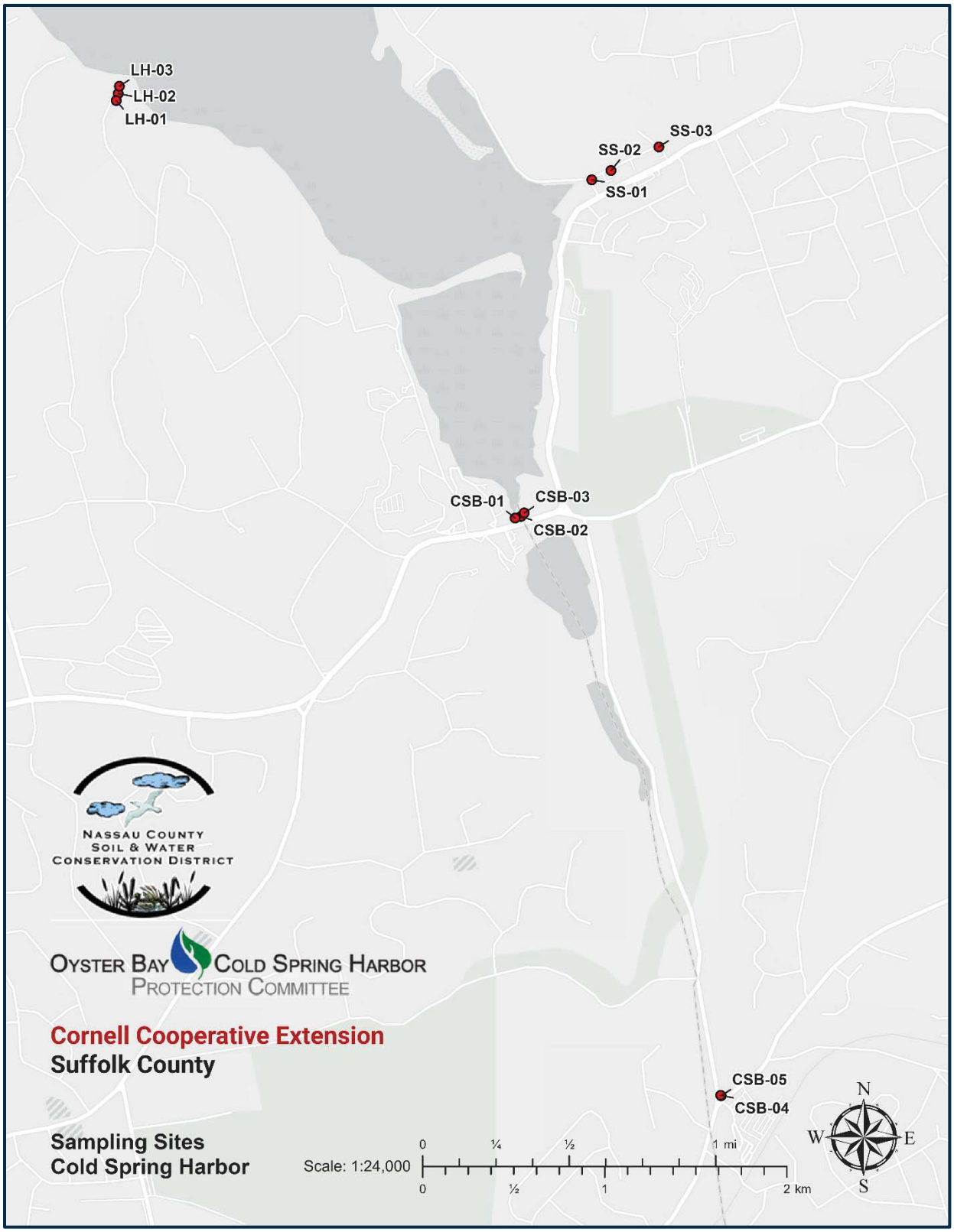


Figure 9: Monitoring and Sampling locations identified within the Laurel Hollow, Cold Spring Brook, and Spring Street subwatersheds

SS-03 was found to be dry on each event monitored, while SS-02 and SS-01 always had flow. The average temperature of flows in SS-01 and SS-02 in August was 19.86°C and dropped to 16.1°C in September. The salinity in both structures was under 0.5ppt for every event. There was no evidence of any illicit connections or of illicit discharges to these structures. Field observations noted that there were orange deposits in SS-01 and SS-02 that were submerged in the baseflow.

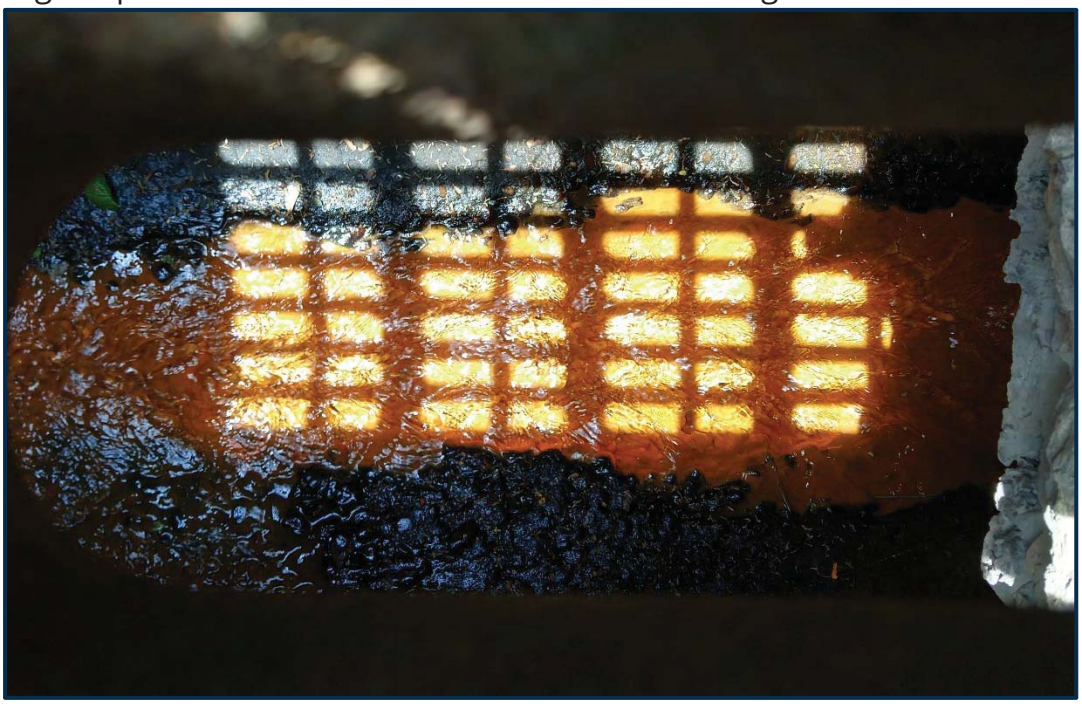


Photo of baseflow in SS-01 where orange deposits can be seen.

Orange deposits such as what can be seen in the photo above are an indicator of groundwater flow in the storm sewer system and are not an indicator of an illicit discharge or poor water quality. This along with the salinity and temperature of these flows indicates that the baseflow in this system is natural groundwater flow and there is no illicit discharge suspected.

Since SS-03 was dry during all visits, and there were no other indicators of illicit discharge, there is no illicit discharge suspected at this structure or in connecting structures. While SS-03 was dry an all visits during this study, flow in SS-03 may be observed depending on groundwater depth which can vary between years and seasons.

TASK III (OBCSHPC): Sampling of the Spring Street Outfall #273 During Dry Weather Events

Dry Weather Flow samples were collected along the conveyance system for the Spring Street Outfall #273. Four (4) distinct dry weather events were sampled at locations SS-01, SS-02, and SS-03 on the following dates: 8/10/20, 8/24/20, 8/26/20, 9/21/20. Samples were processed for temperature, salinity, chlorine, surfactants, ammonia, potassium, pH, turbidity, and fecal coliform enumeration. All samples have been preserved for potential future microbial source tracking.

There were no active illicit discharges detected during these dry events. SS-03 was found to be dry during all sampling events. SS-01 and SS-02 had flow during all events and samples were collected and processed. Water quality parameters measured did not detect any potential for presence of an illicit discharge. Fecal coliform enumerations were relatively low with an average of 184 FC/100mL across events and sample locations. There was no significant difference between water quality parameters measured and fecal coliform concentrations for SS-01 and SS-02 ($p = 0.2$). A data summary table for dry weather samples collected for the Spring Street Outfall #273 system can be viewed in Appendix B.

TASK IV (OBCSHPC): Sampling of the Spring Street Outfall #273 During Wet Weather Events

Wet Weather samples were collected along the conveyance system for the Spring Street Outfall #273. Four (4) distinct wet weather events were sampled at locations SS-01, SS-02, and SS-03 on the following dates: 8/19/20, 9/1/20, 9/10/20, 9/30/20. Samples were processed for temperature, salinity, and fecal coliform enumeration. All samples have been preserved for potential future microbial source tracking.

Fecal coliform enumeration for this system during wet weather had an average of 30,828 FC/100mL across events and sample locations. This is well within a reasonable range for wet weather fecal coliform concentrations and a greater analysis of wet weather fecal coliform loading for this system can be found in the next section. There was no significant difference between fecal coliform concentrations for SS-01 and SS-02 ($p = 0.69$). A data summary table for wet weather samples collected for the Spring Street Outfall #273 system can be viewed in Appendix C.

Average fecal coliform concentrations for the system per event ranged from 11,390 FC/100mL to 16,650 FC/100mL for all but one event. The average fecal coliform concentration for the system for the 9/1/20 event was 80,940 FC/100mL. Due to the variability of pathogen concentrations in stormwater runoff, this is not considered a statistically significant difference between events. Additional study and more intensive sampling would be required to make determinations on differences between dated wet weather events, as this was not the focus of this study.

TASK III (NCSWCD): Ranking of the Major Subwatershed Catchment Areas by Fecal Coliform Contribution During Baseflow and Storm Events

Fecal coliform and hydrological data was used to rank tributary contributions of fecal coliform to Cold Spring Harbor. The Cold Spring Harbor Watershed has three major subwatersheds contributing to the impaired segments of Cold Spring Harbor. The Laurel Hollow, Cold Spring Brook, and Spring Street subwatersheds were sampled at significant branches for fecal coliform concentrations. Sample stations can be viewed in *Figure 9* above. There were three sampling locations in the Spring Street subwatershed, three sampling locations in the Laurel Hollow subwatershed, and five sampling locations in the Cold Spring Brook subwatershed. An estimate of tributary flows was conducted during sampling. The Laurel Hollow, Cold Spring Brook, and Spring Street subwatersheds, which align with Friends of the Bay's Watershed Action Plan, were included in this study and can be seen in *Figure 10*. Sampling was conducted during four (4) distinct baseflow events (72 hours of no rainfall) and during four (4) distinct storm events from August through September. Baseflow, or 'dry' events can be used to characterize background inputs whereas storm events, or 'wet' events, can be used to estimate additional fecal coliform loadings that occur as a result of runoff. All samples were processed and preserved for potential future microbial source tracking (MST).

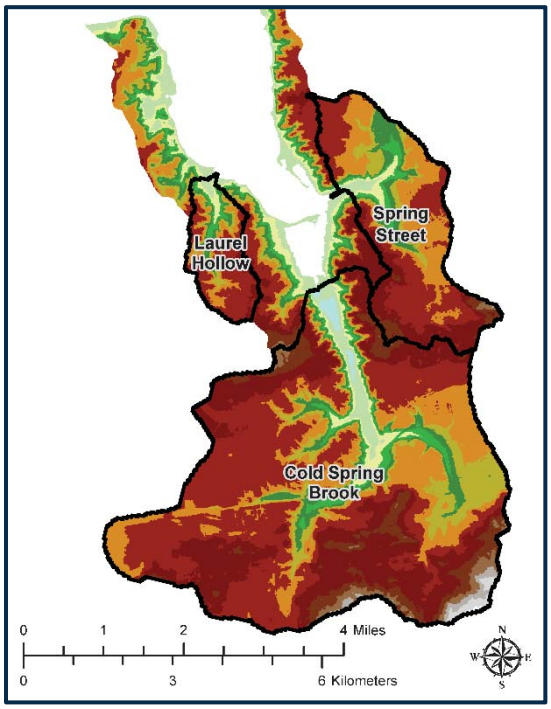


Figure 10. Cold Spring Harbor Watershed and major subwatersheds along with USGS depth to groundwater data.

Catchment areas were delineated for each of these significant branches within each subwatershed and can be seen in *Figure 11*. Flow estimates and fecal coliform enumeration results were used to evaluate fecal coliform loading for each surface water outfall located in the study watersheds. Sewershed areas were delineated in Esri ArcGIS Pro desktop software for each of the 11 surface water outfalls included in the study using the USGS National Hydrography Dataset High Resolution data.

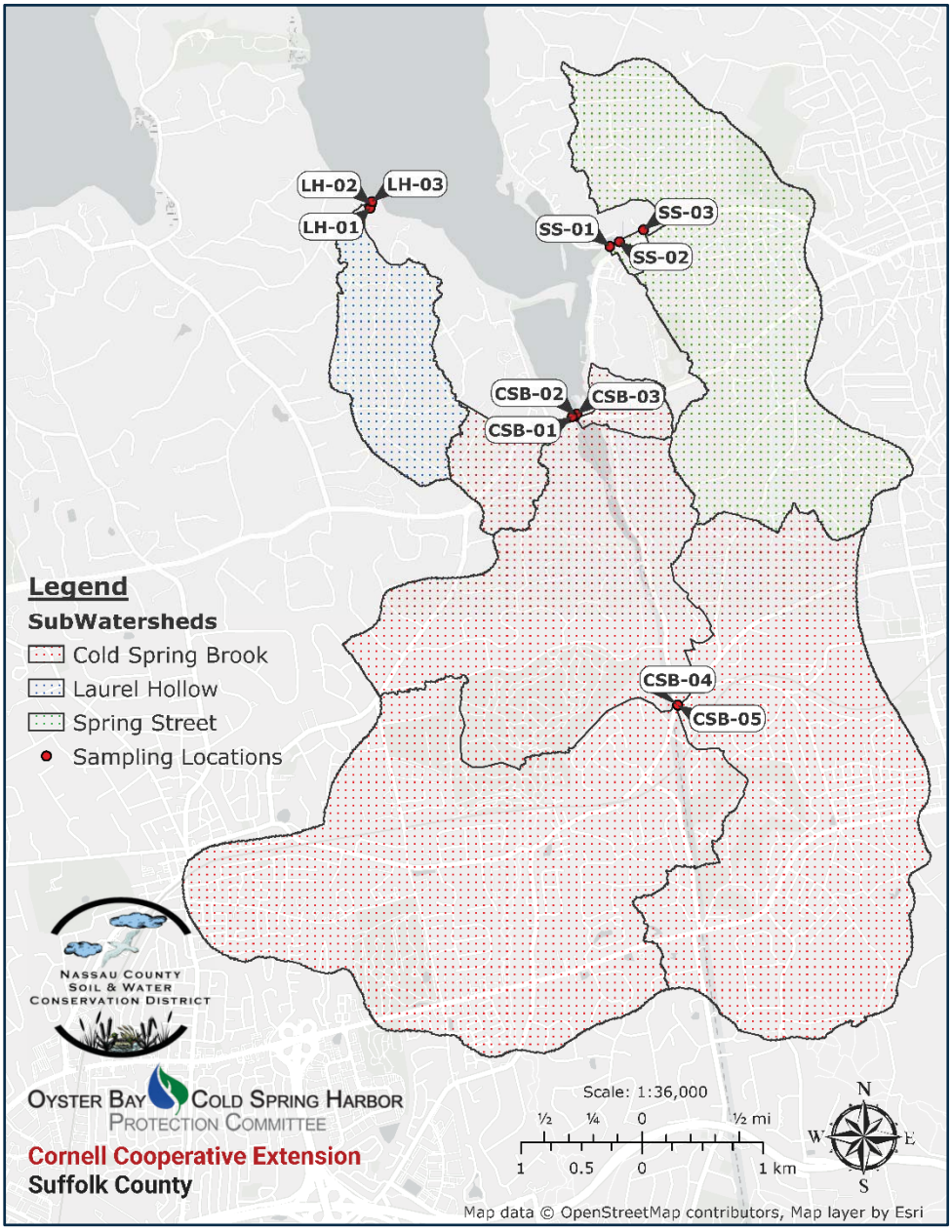


Figure 11. Catchment areas for each of the significant branches within the major subwatersheds of Cold Spring Harbor.

Baseflow events occurred on 8/10/20, 8/24/20, 8/26/20, and 9/21/20. Fecal coliform loading ranged from 1,010 FC/hr to 52.7 million FC/hr. A summary of dry weather sampling data can be found in Appendix D. The table summarizes the fecal coliform enumeration results as well as calculated hourly fecal coliform loading values for each sample. Each sample is ranked by hourly fecal coliform loading (Green dot indicates samples within the 50th percentile or at or below 544,000 FC/hr; Yellow dot indicates samples between 50th and 90th percentile; and Red dot indicates samples at or above the 90th percentile of 18.8 million FC/hr).

Wet weather events occurred on 8/19/20, 8/29/20, 9/01/20, 9/10/20, and 9/30/20. Fecal coliform loading ranged from 2.04 million FC/hr to 920 billion FC/hr. A summary of wet weather sampling data can be found in Appendix E. The table summarizes the catchment areas, precipitation data, and fecal coliform enumeration results as well as calculated hourly fecal coliform loading values for each sample. Each sample is ranked by hourly fecal coliform loading (Green dot indicates samples within the 50th percentile or at or below 926 million FC/hr; Yellow dot indicates samples between 50th and 90th percentile; and Red dot indicates samples at or above the 90th percentile of 29.5 billion FC/hr).

RECOMMENDATIONS

Data collected and presented here will allow for identification of problem areas and aid in future management planning. Based on fecal coliform loading calculated for catchments in this study, samples have been prioritized for future microbial source tracking (MST). Sources identified through processing of these samples may aid in management of these catchments. MST for human, dog, and goose biomarkers is suggested. Based on land use and that none of the 3 subwatersheds in this study are sewered, it is suspected that human and dog would be the most significant sources in these systems. Nearby parks, trails, and public spaces as well as highly residential areas are likely to have a large number of dog walkers. Pet waste has a high concentration of fecal coliform and can easily contribute to a daily pathogen loading. Trails, in particular, may be where pet owners do not pick up after their pets. Additionally, all wastewater treatment within the study area is performed by on-site wastewater treatment systems. On-site wastewater treatment systems (OWTS) can contaminate surface waters with pathogens if they are failing, but also can contribute pathogens to shallow groundwater through leaching if conditions allow. The study area is not only a shallow groundwater area, but there are a few major stream inputs to Cold Spring Harbor. This study has also indicated that there is continual baseflow in storm sewer systems that discharge to surface water outfalls, particularly in the Spring Street and Cold Spring Brook subwatersheds. Therefore, it is possible that on-site septic systems could be leaching pathogens into shallow groundwater which has a number of routes available to make it to Cold Spring Harbor. Canada geese can be a significant source of pathogen pollution in areas where they congregate. Canada goose waste does not have as high of a concentration of fecal coliform as dog and human waste, however Canada geese tend to congregate in large flocks in areas that provide open water or fields that offer safety and a food source. Public feeding of Canada geese can also contribute to excess fecal coliform loading. Within the Spring Street subwatershed, there is a golf course as well as a school with ballfields that may offer a place for geese to congregate. Within the Cold Spring Brook subwatershed, it is believed that geese would likely only congregate in the catchment area associated with CSB-02, however there is a portion of Uplands Farm Field Station (Cold Spring Harbor Lab) located within the CSB-03 catchment that could provide a place for geese to congregate.

Fecal coliform loading values estimated for the baseflow and wet weather events, which can be viewed in Appendix D and Appendix E, allow for a ranking of the catchment areas delineated. Priority catchments that contributed the highest loading

on average during baseflows and wet weather events were identified and ranked as follows:

1) CSB-03: Discharges to the head of Cold Spring Harbor under State Road 25A from the east. The catchment area is about 75 acres and encompasses a portion of Cold Spring Harbor State Park, a portion of Uplands Farm Field Station (Cold Spring Harbor Lab), as well as the intersection of 25A/Harbor Rd/Lawrence Hill Road. For both dry and wet events, CSB-03 had the highest loading on average. This sample location had an average fecal coliform loading of 24.7 million FC/hr during dry events and a 238 billion FC per hour during wet events. For baseflow events, CSB-03 had three (3) out of four (4) events in the 90th percentile for hourly fecal coliform loading and one (1) out of four (4) events between the 50th and 90th percentile. For wet weather events, CSB-03 had two (2) out of four (4) events in the 90th percentile for hourly fecal coliform loading, one (1) out of four (4) events between the 50th and 90th percentiles, and one (1) out of four (4) events under the 50th percentile.
   ➔ MST Suggestion: One or more baseflow events and one or more wet weather events are recommended for MST analysis for human, dog, and goose biomarkers.

2) SS-01: Discharges through Spring Street Outfall #273 directly into Cold Spring Harbor and is the first structure in line for this system. The catchment area is about 1,284 acres and encompasses predominantly residential areas, Cold Spring Harbor downtown, a portion of the Huntington Country Club Gold Course, and Goose Hill Primary School. For dry events SS-01 had the fourth highest loading on average and the second highest loading on average for wet events. This sample location had an average fecal coliform loading of 2.71 million FC/hr during dry events and a 38.2 billion FC/hr during wet events. For baseflow events, SS-01 had three (3) out of four (4) events between the 50th and the 90th percentile for hourly fecal coliform loading, and one (1) out of four (4) events below the 50th percentile. For wet weather events, SS-01 had two (2) out of four (4) events in the 90th percentile for hourly fecal coliform loading and two (2) out of four (4) events between the 50th and 90th percentile.
   ➔ MST Suggestion: One or more baseflow events and one or more wet weather events are recommended for MST analysis for human and dog biomarkers. Since there is a golf course and school located within the catchment, processing samples for goose biomarker could also be considered.

3) CSB-02: Discharges to the head of Cold Spring Harbor under State Road 25A from the south. The catchment area is about 5,000 acres and encompasses large areas of natural undeveloped land as well as residential areas, St. Johns Pond, Cold Spring Country Club, Oheka Castle, and Town of Oyster Bay Golf Course. For dry events CSB-02 had the second (2) highest loading on average and for wet events it was not in the top four (4) highest loading on average. This sample location had an average fecal coliform loading of 18.3 million FC/hr during dry events and a 1.15 billion FC/hr during wet events. For baseflow events, CSB-02 had one (1) out of four (4) events in the 90th percentile and three (3) out of four (4) events between the 50th and the 90th percentile for hourly fecal coliform loading. For wet weather events, CSB-02 had two (2) out of four (4) events between the 50th and the 90th percentile for hourly fecal coliform loading and two (2) out of four (4) events under the 50th percentile.
   ➔ MST Suggestion: One or more baseflow events are recommended for MST analysis for human, dog, and goose biomarkers.

4) CSB-01: Discharges to the head of Cold Spring Harbor under State Road 25A from the west. The catchment area is about 150 acres and encompasses predominantly low density residential areas along the 25A corridor. For dry events CSB-01 had the third (3) highest loading on average and for wet events it was not in the top four (4) highest loading on average. This sample location had an average fecal coliform loading of 8.07 million FC/hr during dry events and a 3.58 billion FC/hr during wet events. For baseflow events, CSB-01 had four (4) out of four (4) events between the 50th and the 90th percentile for hourly fecal coliform loading. For wet weather events, CSB-01 had two (2) out of four (4) events between the 50th and the 90th percentile for hourly fecal coliform loading and two (2) out of four (4) events under the 50th percentile.
   ➔ MST Suggestion: One or more baseflow events are recommended for MST analysis for human and dog biomarkers. If resources allow, samples could be processed for goose biomarkers, however, it is not believed that geese frequent this catchment.

5) SS-02: Discharges through Spring Street Outfall #273 directly into Cold Spring Harbor, is the second structure in line up Spring Street, and is included in the catchment area for SS-01. On three sampling events (one dry and 2 wet) an alternate sampling site was used at the third structure in line due to inability to access the primary structure as it was blocked by a vehicle. For dry events SS-02 was not in the top four (4) highest loading on average and the third highest loading on average for wet events. This sample location had an

average fecal coliform loading of 303,000 FC/hr during dry events and a 15.9 billion FC/hr during wet events. For baseflow events, SS-02 had four (4) out of four (4) events under the 50th percentile for hourly fecal coliform loading. For wet weather events, SS-02 had one (1) out of four (4) events in the 90th percentile for hourly fecal coliform loading, two (2) out of four (4) events between the 50th and 90th percentile, and one (1) event under the 50th percentile.

➔ MST Suggestion: Samples from SS-01 should be prioritized for MST analysis over SS-02. If resources allow, one or more wet events are recommended for MST analysis for human and dog biomarkers. Since there is a golf course and school located within the catchment, processing samples for goose biomarker could also be considered.

6) SS-03: Discharges through Spring Street Outfall #273 directly into Cold Spring Harbor, is the fourth structure in line up Spring Street, and is included in the catchment area for SS-01. For dry events SS-03 never had any baseflow and was dry and had the fourth highest loading on average for wet events. This sample location had an average fecal coliform loading of 9.94 billion FC/hr during wet events. For wet weather events, SS-03 had three (3) out of four (4) events between the 50th and 90th percentile, and one (1) event under the 50th percentile.

   ➔ MST Suggestion: Samples from SS-01 should be prioritized for MST analysis over SS-03. If resources allow, one or more wet events are recommended for MST analysis for human and dog biomarkers. Since there is a golf course and school located within the catchment, processing samples for goose biomarker could also be considered.

7) CSB-04: Discharges to the headwaters of Cold Spring Brook from the Nassau County side of Woodbury Road. The catchment area is about 2,100 acres of the southwest reach of the catchment area for CSB-02. For dry and wet events CSB-04 was not in the top four (4) highest loading on average. This sample location had an average fecal coliform loading of 339,000 FC/hr during dry events and 4.27 billion FC/hr during wet events. For baseflow events, CSB-04 had one (1) out of four (4) events between the 50th and the 90th percentile and for hourly fecal coliform loading and three (3) out of four (4) events below the 50th percentile. For wet weather events, CSB-04 had two (2) out of four (4) events between the 50th and the 90th percentile for hourly fecal coliform loading and two (2) out of four (4) events under the 50th percentile.

➔ MST Suggestion: Samples from CSB-01, CSB-02, and CSB-03 should be prioritized for MST analysis over CSB-04. If resources allow, one or more baseflow and wet weather events are recommended for MST analysis for human, dog, and goose biomarkers.

8) CSB-05: Discharges to the headwaters of Cold Spring Brook from the Suffolk County side of Woodbury Road. The catchment area is about 1,700 acres of the southeast reach of the catchment area for CSB-02. For dry and wet events CSB-05 was not in the top four (4) highest loading on average. This sample location had an average fecal coliform loading of 348,000 FC/hr during dry events and 4.62 billion FC/hr during wet events. For baseflow events, CSB-05 had one (1) out of four (4) events between the 50th and the 90th percentile and for hourly fecal coliform loading and three (3) out of four (4) events below the 50th percentile. For wet weather events, CSB-05 had three (3) out of four (4) events between the 50th and the 90th percentile for hourly fecal coliform loading and one (1) out of four (4) events under the 50th percentile.
   ➔ MST Suggestion: Samples from CSB-01, CSB-02, and CSB-03 should be prioritized for MST analysis over CSB-05. If resources allow, one or more baseflow and wet weather events are recommended for MST analysis for human, dog, and goose biomarkers.

9) All Laurel Hollow (LH) catchments were not in the top four (4) highest loading on average for both dry and wet events. Typically, sample structures were either dry or had standing water and no measurable flow. In these instances of standing water, a flow of 0.01 cubic feet per second was used to assume there is a slow drainage of these structures into the stormwater treatment area. There is essentially no baseflow in these catchments and it is believed that much of the runoff is captured and held in the treatment area.
   ➔ MST Suggestion: Laurel Hollow catchments had relatively low fecal coliform loading on average compared to all other catchments so MST analysis is not recommended at this time unless alternative reasons beyond the findings of this study exist.

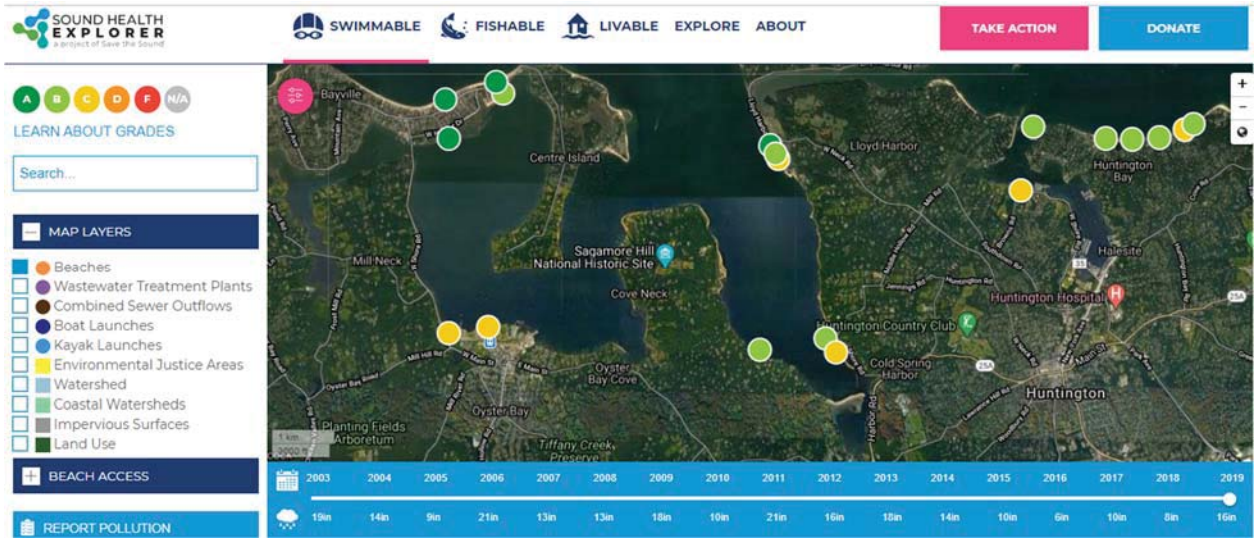
Due to the variable nature of pathogens in baseflow and wet weather flow it is always recommended to analyze a maximum amount of samples for MST as resources will allow. Based on the findings the most efficient use of resources would be to process the following six samples at a minimum:

- CSB-03 baseflow sample on 9/21/20 (Human, Dog, Goose)
- CSB-03 wet weather sample on 9/30/20 (Human, Dog, Goose)
- SS-01 baseflow sample on 8/24/20 (Human, Dog, Goose)
- SS-01 wet weather sample on 8/19/20 (Human, Dog, Goose)
- CSB-02 baseflow sample on 9/21/20 (Human, Dog, Goose)
- CSB-01 baseflow sample on 9/21/20 (Human, Dog, Goose)

CCE will present the results of the sampling conducted for the purpose of selecting certain samples for potential microbial source tracking (MST) at a future OBCSHPC meeting where members will discuss options for sample selection for MST. It should be noted that while MST is a powerful tool that may lead to actionable results and guide stormwater management, samples are being collected as a snapshot in time. These snapshot samples may not be wholly representative of sources of pathogens being discharged from the system.

APPENDIX

Appendix A
Sound Health Explorer (Save the Sound) Excerpts



a project of

Save the Sound®

Action for our region's environment.

How the Swimmable are Calculated

The beach grading system was created in consultation with scientists who study water quality in Long Island Sound. Our approach is designed to capture, for each beach, how frequently water quality was found to be unsafe for swimming (frequency) according to state water quality criteria, and a measure of how high the level of contamination is (magnitude) on the worst sampling day of the season. Because sources and concentration of contamination can vary with weather, the frequency and magnitude grades are provided for both dry and wet weather conditions.

The beach grades are a combination of four sub-category scores, equally weighted. Those sub-category scores are:

Frequency Dry (FD) = represents the percentage of samples, collected at the site during periods of prolonged dry weather, that meet the state water quality criteria for safe swimming (see above). This indicates how often a site is likely to be unsafe for recreation in dry weather. A high percentage of FD failure would indicate a consistent source of pollution that is unrelated to wet weather (e.g. groundwater discharge).

Frequency Wet (FW) = represents the percentage of samples, collected at the site after rain (greater than 1/4 inch of rain in prior 48 hours), that fail to meet the state water quality criteria for safe swimming. This indicates how often a site is likely to be unsafe for recreation in wet weather. A higher percentage of FW failure than FD failure would indicate the presence of pollution sources triggered by precipitation (e.g. CSO or urban stormwater).

Magnitude Dry (MD) = represents the highest concentration of fecal indicator bacteria measured in any sample collected at the site during periods of prolonged dry weather. Higher bacteria levels are associated with more risk of illness to swimmers, and therefore MD represents a measure of water quality on the worst dry weather sampling of the season.

Magnitude Wet (MW) = represents the highest concentration of fecal indicator bacteria measures in any sample collected at the site after rain (greater than 1/4 inch of rain in prior 48 hours). Higher bacteria levels are associated with more risk of illness to swimmers, and therefore MW represents a measure of water quality on the worst wet weather sampling of the season.

NY & CT State Water Quality Criteria

There are multiple sources of water quality concern for beachgoers (e.g. garbage, algae, pharmaceuticals, murkiness/turbidity), but the most common risk when swimming in polluted water is coming in contact with, or ingesting, disease-causing microorganisms such as bacteria, viruses, and protozoa associated with fecal pollution. Collectively, these agents are known as pathogens. This is why fecal bacteria concentration measured at beaches is used to determine if the water is safe for swimming.

Due to the wide variety of potential pathogens, it is not practical to test for them directly. Instead, beach water quality is assessed by testing for the bacteria Enterococci (Entero), which reliably indicates the presence of feces in water.. Following is the criteria used by the health departments in New York and Connecticut for coastal beach monitoring and management.*

Indicators

Marine Beach Criteria: Single Sample Maximum

Enterococcus ("Entero") = greater than or equal to 104 cfu/100mL

Any sample equal to or greater than 104 Entero colony-forming units per 100 milliliters (cfu) is considered unsafe for swimming and should result in a beach closure. Once closed, the beach should not be reopened until acceptably low bacterial counts have been restored.

Marine Beach Criteria: Geometric Mean

Enterococcus ("Entero") = greater than or equal to 35 cfu/100mL

A geometric mean is a weighted average used to track water quality overtime. Beach managers typically track a rolling geometric mean average for each beach (each new sample updates the average, which is based on 5 samples). When a geometric mean is equal to or greater than 35 Entero that beach is considered unsafe for swimming and should be closed until the average returns to acceptable levels.

The levels in the guidelines are based on an anticipated illness rate of 19 or more illnesses per 1,000 swimmers. This means that at concentrations of 104/100 ml Enterococcus, approximately 19 out of 1,000 swimmers can be reasonably expected to contract a waterborne illness. Therefore, below the acceptable level of 104/100 ml there is still a chance of contracting a waterborne illness, but the risk decreases with lower bacteria levels.

More on Waterborne Illnesses.

Terminology

Wet weather sample: cumulative rain fall equal to or greater than 1/4 inch in prior 48 hours.

Dry weather sample: cumulative rain fall of less than 1/4 inch in prior 48 hours.

Fecal contamination: water pollution that is the result of high concentration of fecal matter in the water. The source could be human or animal.

Pathogens: disease-producing agents including viruses, bacteria, and parasites.

Enterococcus ("Entero"): fecal-indicating bacteria that lives in the intestines of warm-blooded animals.

Colony-forming unit (CFU): a unit used to estimate the number of viable bacteria in a sample. Usually measured as CFU per 100 milliliters of water when evaluating bacterial water quality.

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* New York and Connecticut follow the federal guidelines for recreational water quality that EPA issued in 2004. In 2012, based on new scientific research, EPA updated and reissued their guidelines for beach monitoring and management practices (Recreational Water Quality Criteria). The 2012 federal guidelines have not yet been adopted by New York or Connecticut.

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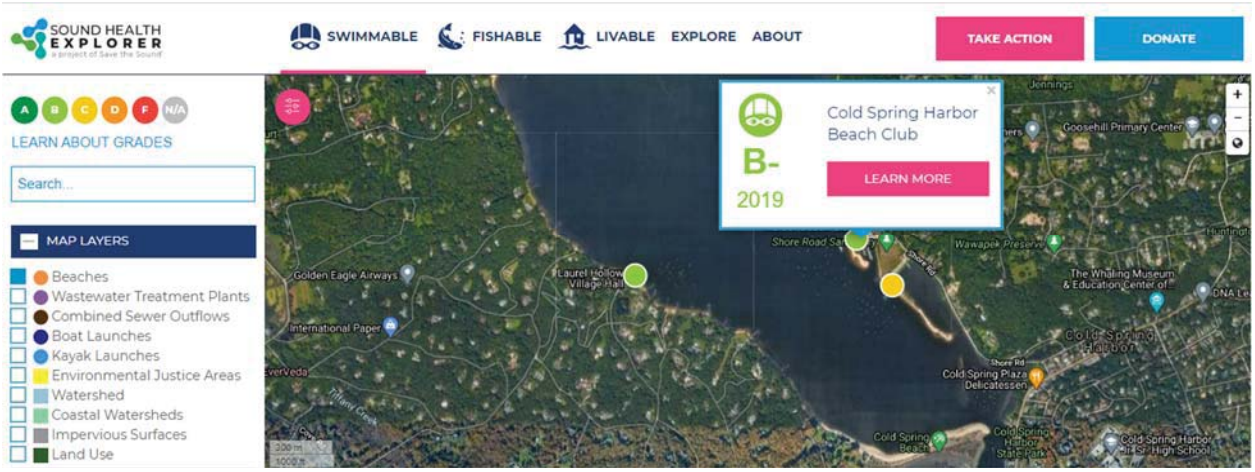
Save the Sound®
Action for our region's environment.

Cold Spring Harbor Beach Club



Cold Spring Harbor Beach Club is a private beach club in Cold Spring Harbor, New York. It is open to members and their guests only.

- AMENITIES
- BEACH ACCESS
- CHALLENGES
  - Marine Debris
  - Sewer Discharges
  - Algae Blooms / Excess Nitrogen
- HELP US STAY UP TO DATE

In 2019, water quality samples at Cold Spring Harbor Beach Club failed 13% of the time.

Water quality samples fail when bacteria levels are ≥104 colony forming units (cfu) of *Enterococcus* per 100mL.

27% of samples failed after wet weather

4% of samples failed after dry weather

39 total samples were analyzed with 15 wet samples and 24 dry samples.

The most recent sample date was September 13, 2019.

Dry Weather

FRQ Consistently Passes

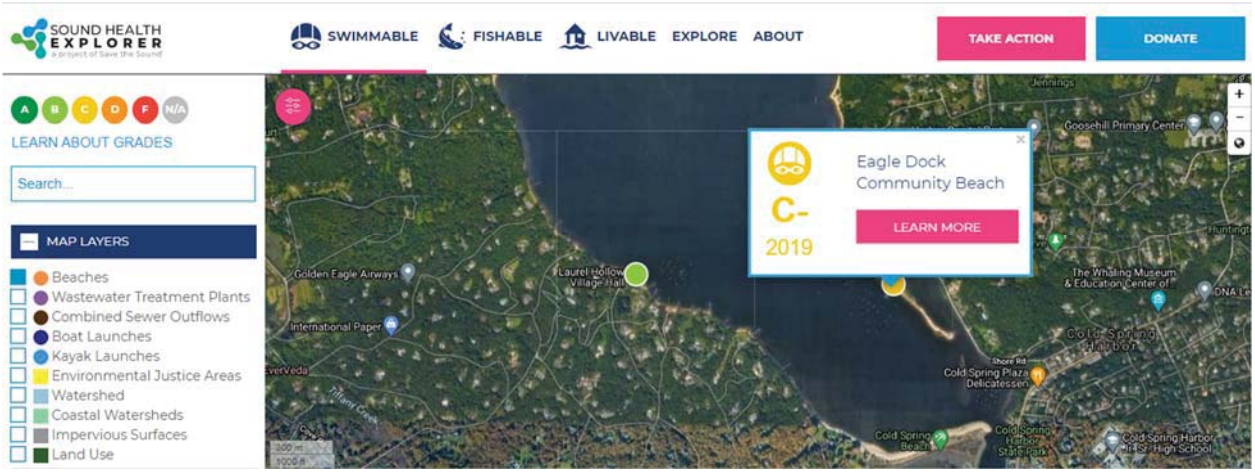
MAG Low Intensity Failure

Wet Weather

FRQ Consistently Fails

MAG Low Intensity Failure

Eagle Dock Community Beach



Eagle Dock Community Beach is a resident-only beach in Cold Spring Harbor, York. The goal of this community beach is to promote a better understanding of the local marine environment.

- AMENITIES
- BEACH ACCESS
- CHALLENGES
  - Marine Debris
  - Algae Blooms / Excess Nitrogen
  - Stormwater Runoff
  - Climate Change
- HELP US STAY UP TO DATE

In 2019, water quality samples at Eagle Dock Community Beach failed 21% of the time.

Water quality samples fail when bacteria levels are ≥104 colony forming units (cfu) of *Enterococcus* per 100mL.

27% of samples failed after wet weather

17% of samples failed after dry weather

39 total samples were analyzed with 15 wet samples and 24 dry samples.

The most recent sample date was September 13, 2019.

Dry Weather

FRQ Sometimes Fails

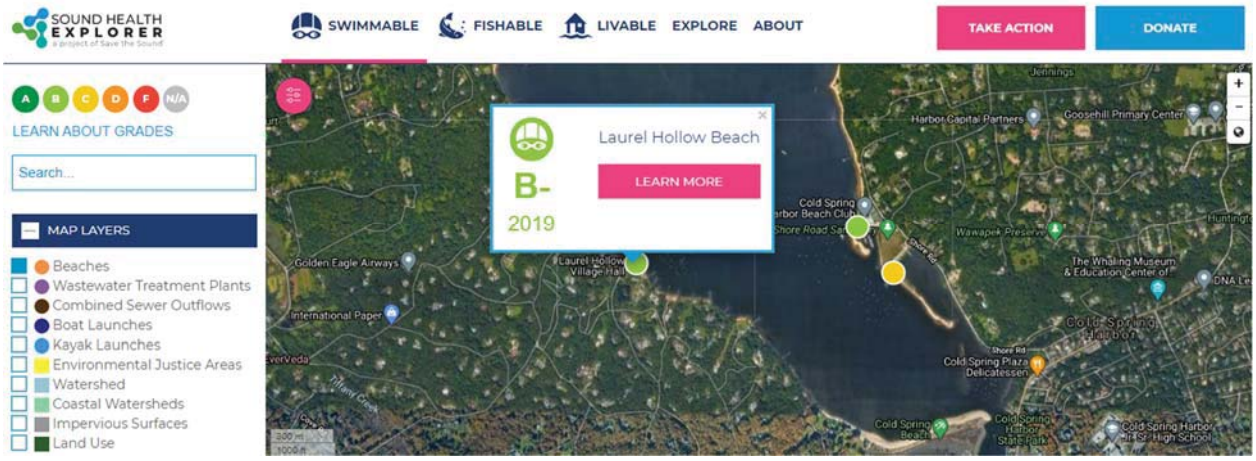
MAG Low Intensity Failure

Wet Weather

FRQ Consistently Fails

MAG Medium Intensity Failure

Laurel Hollow Beach



Laurel Hollow Beach is a town operated beach in Laurel Hollow, New York. It is only open to residents of Laurel Hollow and their guests.

AMENITIES

BEACH ACCESS

CHALLENGES

- Marine Debris
- Algae Blooms / Excess Nitrogen
- Climate Change

HELP US STAY UP TO DATE

In 2019, water quality samples at Laurel Hollow Beach failed 5% of the time.

Water quality samples fail when bacteria levels are ≥104 colony forming units (cfu) of *Enterococcus* per 100mL.

7% of samples failed after wet weather

5% of samples failed after dry weather

55 total samples were analyzed with 14 wet samples and 41 dry samples.

The most recent sample date was September 18, 2019.

Dry Weather

FRQ Consistently Passes

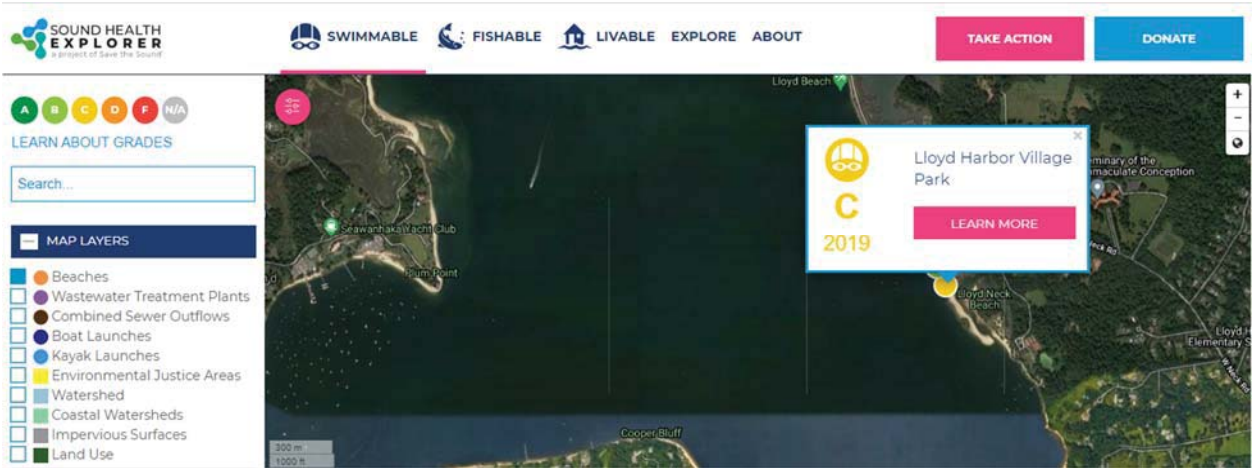
MAG Medium Intensity Failure

Wet Weather

FRQ Rarely Fails

MAG Medium Intensity Failure

Lloyd Harbor Village Park



Lloyd Harbor Village Park is a town operated beach located in Lloyd Harbor, New York. Residents may purchase seasonal beach passes while there is an associated daily fee for non-residents.

AMENITIES

BEACH ACCESS

CHALLENGES

- Marine Debris
- Climate Change

HELP US STAY UP TO DATE

In 2019, water quality samples at Lloyd Harbor Village Park failed 17% of the time.

Water quality samples fail when bacteria levels are ≥104 colony forming units (cfu) of *Enterococcus* per 100mL.

20% of samples failed after wet weather

15% of samples failed after dry weather

41 total samples were analyzed with 15 wet samples and 26 dry samples.

The most recent sample date was September 13, 2019.

Dry Weather

FRQ Sometimes Fails

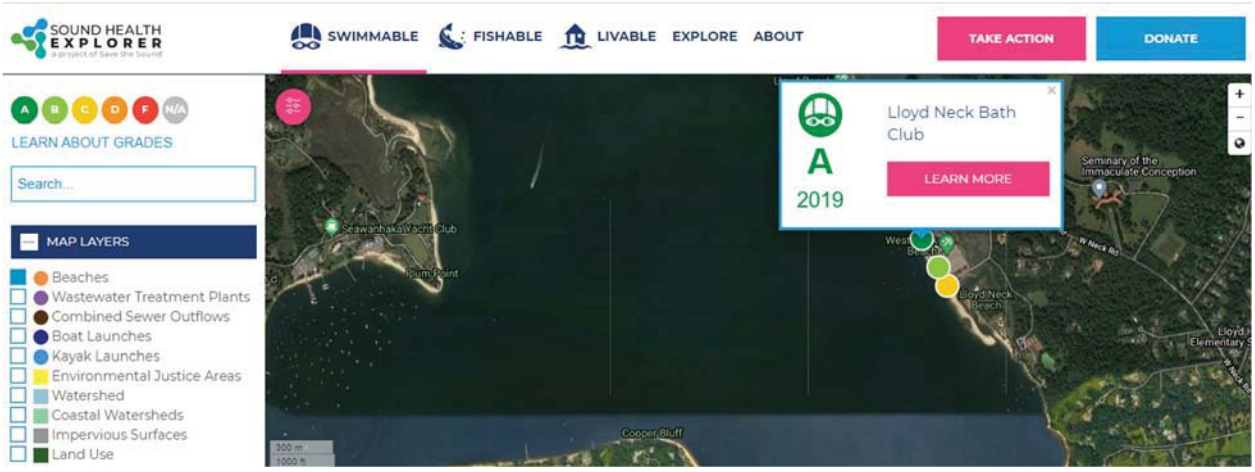
MAG Low Intensity Failure

Wet Weather

FRQ Sometimes Fails

MAG Medium Intensity Failure

Lloyd Neck Bath Club



Lloyd Neck Bath Club is a private beach club in Lloyd Neck, New York. It is open to members and their guests only.

- AMENITIES
- BEACH ACCESS
- CHALLENGES
  - Marine Debris
  - Climate Change
- HELP US STAY UP TO DATE

In 2019, water quality samples at Lloyd Neck Bath Club failed 3% of the time.

Water quality samples fail when bacteria levels are ≥104 colony forming units (cfu) of *Enterococcus* per 100mL.

0% of samples failed after wet weather

5% of samples failed after dry weather

35 total samples were analyzed with 13 wet samples and 22 dry samples.

The most recent sample date was September 13, 2019.

Dry Weather

FRQ Consistently Passes

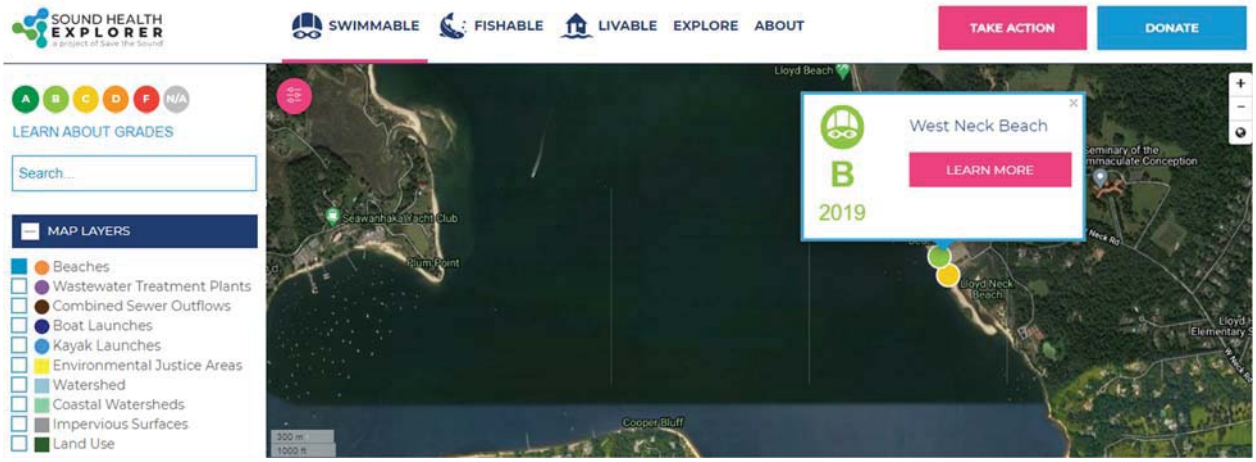
MAG Low Intensity Failure

Wet Weather

FRQ Consistently Passes

MAG No Sample Failure

West Neck Beach



West Neck Beach is a town operated beach in Lloyd Neck, New York. It is open to the public, with a $15 fee for non-residents.

8/18/2020 - Due to Covid-19, West Neck Beach is open only to residents of Huntington. Please check current conditions before visiting.

AMENITIES

BEACH ACCESS

CHALLENGES

Marine Debris

HELP US STAY UP TO DATE

In 2019, water quality samples at West Neck Beach failed 9% of the time.

Water quality samples fail when bacteria levels are ≥104 colony forming units (cfu) of *Enterococcus* per 100mL.

8% of samples failed after wet weather

9% of samples failed after dry weather

35 total samples were analyzed with 13 wet samples and 22 dry samples.

The most recent sample date was September 13, 2019.

Dry Weather

FRQ Rarely Fails

MAG Low Intensity Failure

Wet Weather

FRQ Rarely Fails

MAG Low Intensity Failure

Appendix B
Dry Weather Sample Data for Spring Street System

Sample Date	Sample Time	CCE_ID	Sample Temp (°C)	Salinity (ppt)	Comments	Chlorine (Free) mg/L	Chlorine (Total) mg/L	Surfactants (mg/L)	Ammonia (mg/L)	Potassium (mg/L)	Ammonia: Potassium Ratio	pH	Turbidity (FTU)	Fecal Coliform (MPN/100mL)
8/10/20	11:57	SS-01	20.3	0.3		0	0.02	0.123	3.11	6	0.518333	7.72	11.00	228
8/10/20	12:11	SS-02	19.4	0.3		0.1	0.03	0.181	3.28	5.7	0.575439	7.36	21.00	132
8/10/20	12:26	SS-03	NA	NA	Dry, no sample.	NA	NA	NA	NA	NA	NA	NA	NA	NA
8/24/20	11:56	SS-01	20.2	0.3		0.01	0.01	0.216	3.22	5.6	0.575	7.8	10.00	148
8/24/20	12:09	SS-02	19.5	0.3		0.01	0.02	0.141	3.24	5.5	0.589091	7.43	13.00	75
8/24/20	12:14	SS-03	NA	NA	Dry, no sample.	NA	NA	NA	NA	NA	NA	NA	NA	NA
8/26/20	11:47	SS-02	19.8	0.3	Alternate sampling site.	0	0.01	0.121	2.54	6.2	0.409677	7.63	5.00	10
8/26/20	11:55	SS-01	19.5	0.3		0.01	0.02	0.171	3.11	5.6	0.555357	7.8	10.00	754
8/26/20	11:58	SS-03	NA	NA	Dry, no sample.	NA	NA	NA	NA	NA	NA	NA	NA	NA
9/21/20	10:40	SS-03	NA	NA	Dry, no sample.	NA	NA	NA	NA	NA	NA	NA	NA	NA
9/21/20	10:48	SS-02	16.4	0.4		0.01	0.01	0.21	2.24	5.3	0.422642	7.59	23.00	63
9/21/20	10:58	SS-01	15.8	0.4		0.01	0.01	0.23	1.69	5.5	0.307273	7.47	31.00	63

Appendix C
Wet Weather Sample Data for Spring Street System

Sample Date	Sample Time	CCE_ID	Sample Temp (°C)	Salinity (ppt)	Fecal Coliform (MPN/100mL)
8/19/2020	11:10	SS-01	21.4	0	10860
8/19/2020	11:25	SS-02	22	0	10170
8/19/2020	11:32	SS-03	21.2	0	13140
9/1/2020	9:11	SS-01	21	0.1	57940
9/1/2020	9:17	SS-02	21.4	0.1	141360
9/1/2020	9:27	SS-03	22.4	0.1	43520
9/10/2020	9:30	SS-01	23	0	15150
9/10/2020	9:38	SS-02	23	0	14500
9/10/2020	9:48	SS-03	23.1	0	13340
9/30/2020	7:23	SS-01	19.7	0.1	17230
9/30/2020	7:36	SS-03	20.6	0	17890
9/30/2020	7:43	SS-02	20	0.1	14830

Appendix D
Baseflow Event Fecal Coliform Loading Sample Data

Sample Date	Sample Time	CCE_ID	Sample Temp (°C)	Salinity (ppt)	Comments	Fecal Coliform Concentration (MPN/100mL)	Fecal Coliform Loading (FC/hour)
8/10/20	10:40	CSB-01	20.1	0.1		31	5.29E+06
8/24/20	9:54	CSB-01	19.8	0.2		72	7.86E+06
8/26/20	12:14	CSB-01	18.3	0.1		31	7.15E+06
9/21/20	9:25	CSB-01	14	0.1		41	1.20E+07
8/10/20	10:52	CSB-02	22.1	0.1		31	7.66E+06
8/24/20	10:02	CSB-02	22.4	0.1		20	4.19E+06
8/26/20	12:24	CSB-02	21.6	0.1		41	8.59E+06
9/21/20	9:31	CSB-02	15.1	0.1		299	5.27E+07
8/10/20	11:03	CSB-03	15.9	0.1		216	2.85E+07
8/24/20	10:14	CSB-03	15	0.3		122	2.02E+07
8/26/20	12:32	CSB-03	15.7	0.1		122	1.74E+07
9/21/20	9:37	CSB-03	12.6	0.2		259	3.26E+07
8/10/20	9:59	CSB-04	19.5	0.2		41	7.14E+04
8/24/20	11:24	CSB-04	20.5	0.2		62	3.50E+05
8/26/20	10:35	CSB-04	19.1	0.2		97	5.48E+05
9/21/20	11:23	CSB-04	14.8	0.2		52	3.86E+05
8/10/20	10:03	CSB-05	20.1	0.1		275	2.12E+05
8/24/20	11:32	CSB-05	23.3	0.2		199	2.07E+05
8/26/20	10:41	CSB-05	21.2	0.2		399	2.02E+05
9/21/20	11:30	CSB-05	14.3	0.3		933	7.71E+05
8/10/20	11:42	LH-01	22.1	0.2	Standing water in manhole, no flow.	399	4.07E+05
8/24/20	10:56	LH-01	21.2	0.2	Standing water in manhole, no flow.	246	2.51E+05
8/26/20	11:31	LH-01	21.1	0.2	Standing water in manhole, no flow.	199	2.03E+05
9/21/20	10:28	LH-01	15.9	0.2		74	7.54E+04
8/10/20	11:25	LH-02	21.3	0.3	Standing water in manhole, no flow.	1842	1.88E+06
8/24/20	10:42	LH-02	21.4	0.2	Standing water in manhole, no flow.	161	1.64E+05
8/26/20	11:20	LH-02	22	0.1	Standing water in manhole, no flow.	20	2.04E+04
9/21/20	10:15	LH-02	17.7	0.1		0.99	1.01E+03
8/10/20	11:19	LH-03	NA	NA	Dry, no sample.	NA	ND
8/24/20	10:33	LH-03	NA	NA	Dry, no sample.	NA	ND
8/26/20	11:10	LH-03	NA	NA	Dry, no sample.	NA	ND
9/21/20	10:02	LH-03	NA	NA	Dry, no sample.	NA	ND
8/10/20	11:57	SS-01	20.3	0.3		228	5.40E+05
8/24/20	11:56	SS-01	20.2	0.3		148	5.94E+06
8/26/20	11:55	SS-01	19.5	0.3		754	3.36E+06
9/21/20	10:58	SS-01	15.8	0.4		63	9.95E+05
8/10/20	12:11	SS-02	19.4	0.3		132	2.13E+05
8/24/20	12:09	SS-02	19.5	0.3		75	5.02E+05
8/26/20	11:47	SS-02	19.8	0.3	Alternate sampling site.	10	5.57E+03
9/21/20	10:48	SS-02	16.4	0.4		63	4.92E+05
8/10/20	12:26	SS-03	NA	NA	Dry, no sample.	NA	ND
8/24/20	12:14	SS-03	NA	NA	Dry, no sample.	NA	ND
8/26/20	11:58	SS-03	NA	NA	Dry, no sample.	NA	ND
9/21/20	10:40	SS-03	NA	NA	Dry, no sample.	NA	ND

Appendix E
Storm Event Fecal Coliform Loading Sample Data

Sample Date	Sample Time	CCE_ID	Sample Temp (°C)	Salinity (ppt)	Comments	Fecal Coliform Concentration (MPN/100mL)	Fecal Coliform Loading FC/hour	Cumulative Rainfall 72 hours prior to sampling (inches)	Catchment Area (ac)
8/19/2020	3:13	CSB-01	18.4	0.3		100	1.43E+08	0.77	148.29
8/29/2020	3:16	CSB-01	17.3	0.1		100	3.66E+08	0.19	148.29
9/10/2020	10:27	CSB-01	17.9	0.1		1890	4.86E+09	0.92	148.29
9/30/2020	6:09	CSB-01	17.1	0.2		3690	8.94E+09	0.93	148.29
8/19/2020	3:23	CSB-02	21.6	0.1		100	2.47E+08	0.73	5000.60
8/29/2020	3:21	CSB-02	23.3	0.1		99	2.25E+08	0.19	5000.60
9/10/2020	10:31	CSB-02	20.9	0.1		510	1.26E+09	0.92	5000.60
9/30/2020	6:12	CSB-02	18.2	0.1		2180	2.88E+09	0.93	5000.60
8/19/2020	3:36	CSB-03	15.1	0.6		300	1.01E+09	0.66	75.49
8/29/2020	3:26	CSB-03	15.2	0.1		310	5.06E+08	0.19	75.49
9/10/2020	10:35	CSB-03	15.9	0.4		11690	3.07E+10	0.93	75.49
9/30/2020	6:17	CSB-03	15	0.4		435200	9.20E+11	0.93	75.49
8/19/2020	12:23	CSB-04	20	0.1		6970	7.34E+09	1.23	2093.57
8/29/2020	1:33	CSB-04	19	0.2		1210	8.54E+07	0.19	2093.57
9/10/2020	10:04	CSB-04	22.8	0		12740	8.81E+09	0.92	2093.57
9/30/2020	8:07	CSB-04	18.7	0.1		8200	8.38E+08	0.93	2093.57
8/19/2020	12:33	CSB-05	19.8	0.1		7170	3.54E+09	1.22	1734.74
8/29/2020	1:39	CSB-05	23.6	0.2		9060	9.51E+07	0.19	1734.74
9/10/2020	10:06	CSB-05	21.1	0.1		27550	1.03E+10	0.92	1734.74
9/30/2020	8:11	CSB-05	18.8	0.1		24890	4.53E+09	0.93	1734.74
8/19/2020	12:07	LH-01	19.9	27.9	Tidal water in CB, sample taken from curb. No flow.	2920	2.98E+07	1.23	379.66
8/29/2020	2:18	LH-01	22.6	0.1	Standing water in CB, no flow.	200	2.04E+06	0.19	379.66
9/10/2020	11:16	LH-01	22.9	0	Standing water in CB, no visible flow between structures	3230	3.29E+07	0.93	379.66
9/30/2020	7:08	LH-01	20.4	0		7940	8.09E+07	0.93	379.66
8/19/2020	12:00	LH-02	20.7	20.9	Tidal water in CB, sample taken from curb. No flow.	1830	1.87E+07	1.24	0.37
8/29/2020	2:06	LH-02	23.5	0.2	Standing water in CB, no flow.	8600	8.77E+07	0.19	0.37
9/10/2020	11:10	LH-02	23.3	0	Standing water in CB, no visible flow between structures	1320	1.35E+07	0.93	0.37
9/30/2020	7:02	LH-02	20.5	0		43520	4.44E+08	0.93	0.37
8/19/2020	11:48	LH-03	22.1	0	Standing water in CB, no flow.	14670	1.50E+08	1.25	0.12
9/1/2020	9:47	LH-03	22	0.1		12540	3.36E+07	0.11	0.12
9/10/2020	11:02	LH-03	24.7	0	Standing water in CB, no visible flow between structures	200	2.04E+06	0.93	0.12
9/30/2020	6:55	LH-03	21	0		200	2.04E+06	0.93	0.12
8/19/2020	11:10	SS-01	21.4	0		10860	8.72E+10	1.26	1283.90
9/1/2020	9:11	SS-01	21	0.1		57940	3.66E+10	0.11	1283.90
9/10/2020	9:30	SS-01	23	0		15150	2.66E+10	0.9	1283.90
9/30/2020	7:23	SS-01	19.7	0.1		17230	2.43E+09	0.93	1283.90
8/19/2020	11:25	SS-02	22	0	Alternate sampling site.	10170	3.63E+10	1.27	1276.42
9/1/2020	9:17	SS-02	21.4	0.1		141360	2.10E+10	0.11	1276.42
9/10/2020	9:38	SS-02	23	0		14500	5.66E+09	0.9	1276.42
9/30/2020	7:43	SS-02	20	0.1	Alternative structure sampled, car parked on top of primary.	14830	7.44E+08	0.93	1276.42
8/19/2020	11:32	SS-03	21.2	0		13140	2.11E+10	1.26	1266.89
9/1/2020	9:27	SS-03	22.4	0.1		43520	3.64E+09	0.11	1266.89
9/10/2020	9:48	SS-03	23.1	0		13340	1.49E+10	0.91	1266.89
9/30/2020	7:36	SS-03	20.6	0		17890	1.66E+08	0.93	1266.89