Section 5-7
Scarborough Marsh Tributaries (Friends of Scarborough Marsh)

Scarborough Marsh and Tributaries

At roughly 3,000 acres, Scarborough Marsh (Marsh) is the largest salt marsh in Maine. Most of the Marsh is owned by the State of Maine and managed by the Maine Department of Inland Fisheries and Wildlife (IFW). State and federal environmental laws further protect it from development and other forms of human encroachment. The health of its saltmarsh ecosystem also depends on the influx of water and nutrients from the feeder rivers and streams that flow in from the upland regions of the Scarborough Marsh Watershed. Increase in land development and an extensive system of roads threaten both the quality and quantity of these waters.

Seven major rivers and streams discharge freshwater into the Marsh. The confluence of these waterways is the estuarine Scarborough River which discharges into Saco Bay. The outlet of the Scarborough River hosts fertile clam flats that are harvested by local commercial clammers. Elevated concentration of fecal coliform bacteria from urban runoff and faulty septic systems have prompted the Maine Department of Marine Resources to close these clam flats to harvesting in the past. A major focus of this volunteer monitoring program is therefore to monitor influx concentrations of bacteria in the seven major rivers and streams as well as assess overall health of these rivers and streams that discharge into the Marsh. FOSM will use these data to assess e. coli or enterococcus bacteria (as indicators of contamination from warm-blooded animals) input into the Marsh watershed and prioritize areas for further assessment (e.g. bracket sampling, watershed surveys) and mitigation.

Monitoring History

- The Maine DEP Biological Monitoring Program has monitored several tributaries. This data is available on DEP's website.

- The Friends of Scarborough Marsh is a nonprofit coalition of concerned citizens, landowners, businesses, state and federal agencies, environmental organizations, and others. This volunteer group was formed in 2000 and is dedicated to the conservation, protection, restoration, and enhancement of the Scarborough Marsh.

- The Friends of Scarborough Marsh joined the Volunteer River Monitoring Program in 2019.

Methods and Sampling Sites

Water quality sampling sites (Table 5-7-1 and Figure 5-7-1) have been established at 8 locations. Three of the sites are freshwater and 5 are brackish.

Following training by, and under the guidance of the MDEP, the volunteer sampling team conducted bi-weekly sampling from June to October. The sampling equipment was provided by the MDEP. Volunteer

monitors took direct measurements of water temperature, dissolved oxygen, and specific conductance using YSI Pro2030 meters. The monitors also collected water samples to measure bacteria for fecal coliform. Bacteria was analyzed using the IDEXX method by Katahdin Analytical Services.

At the freshwater sites, the monitoring was done before 8:00 AM whenever possible, as this is the time of day when dissolved oxygen is at the lowest level. At the tidal sites, monitors attempted to sample during the outgoing or ebb tide.

Table 5-7-1. Friends of Scarborough Marsh sampling sites. Sampling points on upstream side unless noted.

Site ID	Organization Site Code	Sample Location	Freshwater or Brackish	Class
MILL BROOK – SSCMB12 – VRMP	MBSE-01	Mill Brook Stream (East) – Route 1 culvert	Freshwater	C/SA
WILLOWDALE STREAM – SSCMBWD13 – VRMP	WDS-01	Willowdale Stream – Route 1 culvert	Freshwater	C/SA
PHILIPS BROOK – SSCDNPP13 – VRMP	PB-01	Phillips Brook - Payne Rd, downstream of culvert	Freshwater	C/SB
FINNERD BROOK – SSCDNFN02 – VRMP	FB-01	Finnerd Brook - Payne Rd. culvert	Brackish	B/SA
CASCADE BROOK – SSCCD-12 – VRMP	CS-01	Cascade Brook – Pine Point Rd. culvert	Brackish	B/C/SA
JONES CREEK – SSCJN-03 – VRMP	JC-01	Jones Creek - Pine Point Rd. culvert (from Snow's Cannery access road)	Brackish	SB
LIBBY RIVER – SSCLB00 – VRMP	LR-01	Libby River – Black Point Rd.	Brackish	C/SB
NONESUCH RIVER – SSCNN-50 – VRMP	NR-01	Nonesuch River – Black Point Rd. culvert	Brackish	B/C/SA

Scarborough Marsh Tributaries Sampling Sites
Friends of Scarborough Marsh

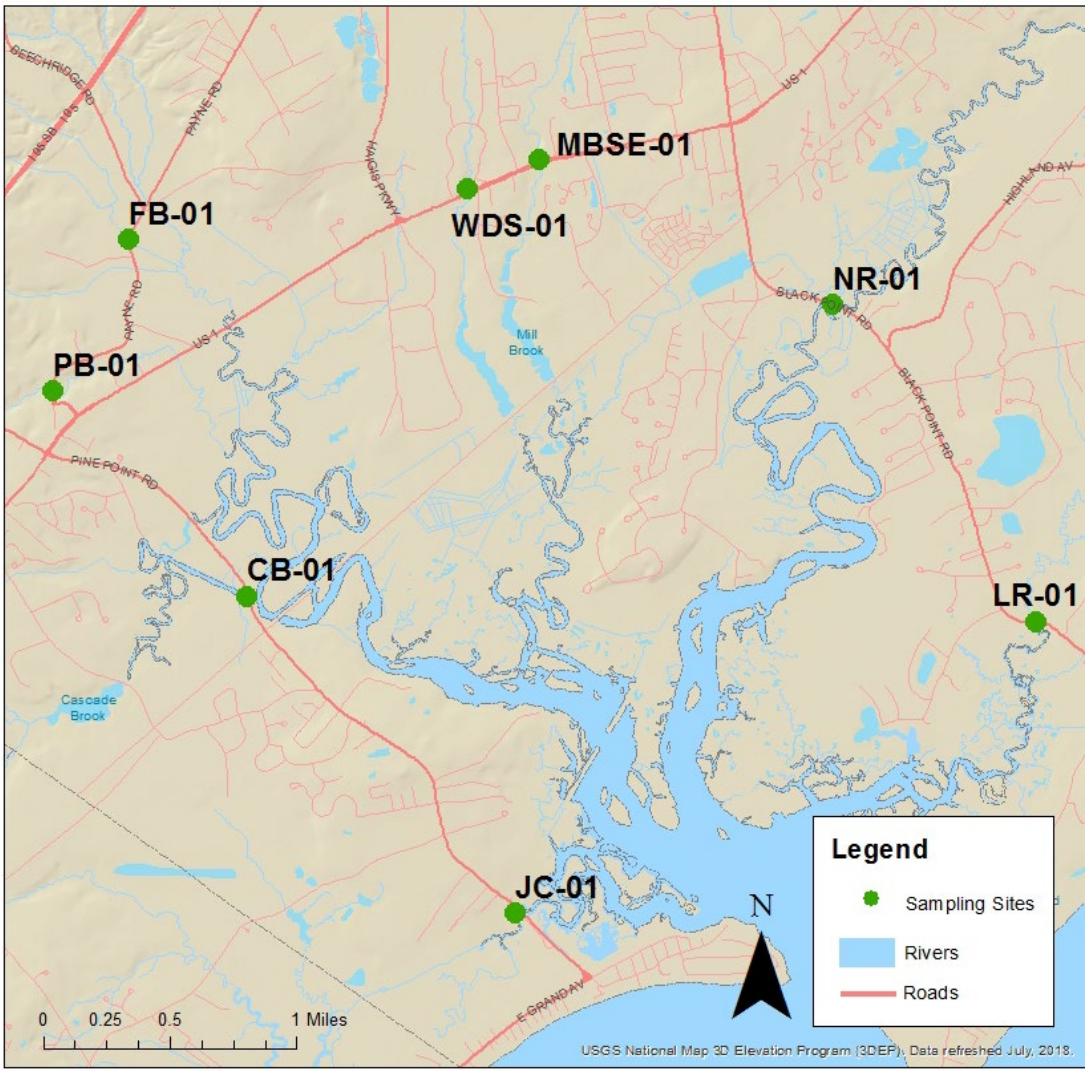

Figure 5-7-1: Map of Friends of Scarborough Marsh sampling sites.

Parameters

Dissolved Oxygen

Dissolved oxygen (DO) levels are generally lowest early in the morning and then increase during the day, peaking in the mid-to-late afternoon. Monitors should try to collect some samples early in the morning. Dissolved oxygen is also affected by flow conditions and temperature. During high flow conditions, more oxygen is added to the river from the atmosphere as the water is more turbulent and there is more

opportunity for mixing. If flow during the summer months is higher or lower than normal, dissolved oxygen will be affected. Class A and Class B criteria for dissolved oxygen are a minimum of 7 mg/l (milligrams/liter) or 75% saturation. Class C criteria for dissolved oxygen are a minimum of 5 mg/l or 60 % saturation. To meet water quality criteria, both concentration and saturation standards must be met. The Class SB standard is 85% saturation and for Class SA dissolved oxygen must be as naturally occurs.

Water Temperature

Maine's regulations relating to temperature (06-096 CMR Chapter 582) require that discharge of pollutants not raise the temperature of any river and stream above the EPA criteria for indigenous species (23 °C maximum and 19 °C weekly average) or 0.3 °C (0.5 °F) above the temperature that would naturally occur outside a mixing zone established by the Board of Environmental Protection. Pollutant is defined in statute as many things including dirt and heat. For tidal waters, discharge of pollutants may not raise the temperature more than 4 °F (2.2 °C) or more than 1.5°F (0.8 °C) from June 1st to September 1st, and may not cause the temperature of any tidal waters to exceed 85 °F (29 °C) at any point outside a mixing zone established by the Board of Environmental Protection. These temperature criteria do not apply to this VRMP data.

Specific Conductance

Specific conductance (SPC) is related to the amount of dissolved materials in the water. While there are no numerical standards, a relationship exists between conductivity and chloride which has numerical criteria. In general, streams located in urban areas tend to have higher specific conductance due to polluted urban stormwater runoff. This may also in large part be due to salt buildup in surface and groundwater from road maintenance practices.

Bacteria

Enterococcus bacteria are used as the indicator organism for marine waters and *Escherichia coli* (*E. coli*) bacteria are used as the indicator organism for freshwaters. While this type of bacteria is not a pathogen, its presence in the water may indicate the presence of other organisms including bacteria and viruses that can cause gastrointestinal illnesses. Monitoring should include at least six samples and include a mix of dry and storm event sampling.

Class B criteria for bacteria (effective August 1, 2018) are as follows: "Between April 15th and October 31st, the number of Escherichia coli bacteria in these waters may not exceed a geometric mean of 64 CFU per 100 milliliters over a 90-day interval or 236 CFU per 100 milliliters in more than 10% of the samples in any 90-day interval."

Class C criteria for bacteria (effective August 1, 2018) are as follows: "Between April 15th and October 31st, the number of Escherichia coli bacteria in Class C waters may not exceed a geometric mean of 100 CFU per 100 milliliters over a 90-day interval or 236 CFU per 100 milliliters in more than 10% of the samples in any 90-day interval."

The bacteria content of Class SA waters must be as naturally occurs, except that the number of enterococcus bacteria in these waters may not exceed a geometric mean of 8 CFU per 100 milliliters in any 90-day interval or 54 CFU per 100 milliliters in more than 10% of the samples in any 90-day interval.

Class SB criteria (effective August 1, 2018) are as follows: "Between April 15th and October 31st, the number of enterococcus bacteria in these waters may not exceed a geometric mean of 8 CFU per 100 milliliters in any 90-day interval or 54 CFU per 100 milliliters in more than 10% of the samples in any 90-day interval."

Geometric means are calculated instead of averages because it is more appropriate to use this calculation for something like bacteria where there may be one or more high or low values that can skew the mean.

Discussion and Recommendations

There are numerous sources of pollution and other stresses to the Scarborough Marsh watershed that could potentially have an impact on water quality. Some of those sources of pollution and stress may include:

- Non-point source pollution (e.g., eroded soil, fertilizers, pesticides, heavy metals, petroleum residues, road salt, wildlife and pet feces) and polluted stormwater originating from impervious surfaces (e.g., streets, parking lots, driveways, rooftops), agriculture, and forestry.
- Dams and impoundments (which often create more pond-like aquatic habitat conditions that may have higher water temperatures and lower dissolved oxygen concentrations than if the river section was free-flowing).
- Natural effects of wetlands (such as contributing waters to a stream/river that have low dissolved oxygen levels due to the decomposition of large amounts of organic matter, respiration of abundant plant matter, and low re-aeration rates that is characteristic of many wetlands).
- Point sources (e.g., failing private septic systems, wastewater treatment plants, combined sewer overflows [CSO], and industrial discharges) of pollution.

The following are recommendations for future monitoring:

- Bacteria samples should be collected at least six times over the sampling season and include both baseflow and storm event samples.
- Continue monitoring at all stations to develop a long-term trend database.

Summary of Data by Site and Parameter

See the Maine DEP VRMP Survey Dashboard for water quality data and graphs of data collected by the Friends of Scarborough Marsh in the tributaries to the Scarborough Marsh in 2019 and 2020.

Summary of Data by Site and Parameter (2019-2020)

A summary of mean, minimum and maximum dissolved oxygen concentration (mg/l) values at Friends of Scarborough Marsh monitoring station: **CB-01**

Year	Class	# Sample Points	Mean	Minimum	Maximum	Criterion	# Not Meeting Criterion
2019	B	9	7.4	5.0	9.6	7	4
2020	B	7	4.7	2.8	6.1	7	7

A summary of mean, minimum and maximum dissolved oxygen saturation (%) values at Friends of Scarborough Marsh monitoring station: **CB-01**

Year	Class	# Sample Points	Mean	Minimum	Maximum	Criterion	# Not Meeting Criterion
2019	B	9	86.0	64.0	117.0	75	3
2020	B	7	56.3	36.5	67.6	75	7

A summary of mean, minimum and maximum water temperature (°C) values at Friends of Scarborough Marsh monitoring station: **CB-01**

Year	Class	# Sample Points	Mean	Minimum	Maximum	Criterion	# Not Meeting Criterion
2019	B	9	19.2	10.5	22.8	n/a	n/a
2020	B	7	18.6	12.7	23.1	n/a	n/a

A summary of mean, minimum and maximum specific conductance (micro-ohms/cm, µS/cm) values at Friends of Scarborough Marsh monitoring station: **CB-01**

Year	Class	# Sample Points	Mean	Minimum	Maximum	Criterion	# Not Meeting Criterion
2019	B	7	25273	14780	40970	n/a	n/a
2020	B	7	34174	13770	42824	n/a	n/a

A summary of mean, minimum and maximum dissolved oxygen concentration (mg/l) values at Friends of Scarborough Marsh monitoring station: **FB-01**							
Year	**Class**	**# Sample Points**	**Mean**	**Minimum**	**Maximum**	**Criterion**	**# Not Meeting Criterion**
2019	B	9	7.0	3.9	9.6	7	5
2020	B	7	4.2	2.7	5.2	7	7

A summary of mean, minimum and maximum dissolved oxygen saturation (%) values at Friends of Scarborough Marsh monitoring station: **FB-01**							
Year	**Class**	**# Sample Points**	**Mean**	**Minimum**	**Maximum**	**Criterion**	**# Not Meeting Criterion**
2019	B	9	78.5	49.3	117.0	75	5
2020	B	7	48.6	32.4	62.3	75	7

A summary of mean, minimum and maximum water temperature (°C) values at Friends of Scarborough Marsh monitoring station: **FB-01**							
Year	**Class**	**# Sample Points**	**Mean**	**Minimum**	**Maximum**	**Criterion**	**# Not Meeting Criterion**
2019	B	10	19.1	7.8	23.2	n/a	n/a
2020	B	7	18.4	11.3	23.8	n/a	n/a

A summary of mean, minimum and maximum specific conductance (micro-ohms/cm, µS/cm) values at Friends of Scarborough Marsh monitoring station: **FB-01**							
Year	**Class**	**# Sample Points**	**Mean**	**Minimum**	**Maximum**	**Criterion**	**# Not Meeting Criterion**
2019	B	8	10258	749	30060	n/a	n/a
2020	B	7	23164	11550	35343	n/a	n/a

A summary of mean, minimum and maximum dissolved oxygen concentration (mg/l) values at Friends of Scarborough Marsh monitoring station: **JC-01**

Year	Class	# Sample Points	Mean	Minimum	Maximum	Criterion	# Not Meeting Criterion
2019	SB	9	7.6	5.7	9.6	7	3
2020	SB	7	4.9	3.3	6.4	7	7

A summary of mean, minimum and maximum dissolved oxygen saturation (%) values at Friends of Scarborough Marsh station: **JC-01**

Year	Class	# Sample Points	Mean	Minimum	Maximum	Criterion	# Not Meeting Criterion
2019	SB	9	89.4	68.0	117.0	85	4
2020	SB	7	59.8	41.9	78.9	85	7

A summary of mean, minimum and maximum water temperature (°C) values at Friends of Scarborough Marsh monitoring station: **JC-01**

Year	Class	# Sample Points	Mean	Minimum	Maximum	Criterion	# Not Meeting Criterion
2019	SB	10	19.4	10.6	27.7	n/a	n/a
2020	SB	7	18.6	12.7	22.1	n/a	n/a

A summary of mean, minimum and maximum specific conductance (micro-ohms/cm, µS/cm) values at Wells NERR monitoring station: **JC-01**

Year	Class	# Sample Points	Mean	Minimum	Maximum	Criterion	# Not Meeting Criterion
2019	SB	8	27331	13240	42490	n/a	n/a
2020	SB	7	35652	11880	44436	n/a	n/a

A summary of mean, minimum and maximum dissolved oxygen concentration (mg/l) values at Friends of Scarborough Marsh monitoring station: **LR-01**							
Year	**Class**	**# Sample Points**	**Mean**	**Minimum**	**Maximum**	**Criterion**	**# Not Meeting Criterion**
2019	C	9	7.1	4.2	9.6	5	1
2020	C	7	4.9	2.9	6.4	5	4

A summary of mean, minimum and maximum dissolved oxygen saturation (%) values at Friends of Scarborough Marsh station: **LR-01**							
Year	**Class**	**# Sample Points**	**Mean**	**Minimum**	**Maximum**	**Criterion**	**# Not Meeting Criterion**
2019	C	9	74.8	49.1	103.0	60	2
2020	C	7	59.0	37.9	70.4	60	4

A summary of mean, minimum and maximum water temperature (°C) values at Friends of Scarborough Marsh monitoring station: **LR-01**							
Year	**Class**	**# Sample Points**	**Mean**	**Minimum**	**Maximum**	**Criterion**	**# Not Meeting Criterion**
2019	C	10	18.2	9.9	22.5	n/a	n/a
2020	C	7	18.3	12.3	22.8	n/a	n/a

A summary of mean, minimum and maximum specific conductance (micro-ohms/cm, µS/cm) values at Friends of Scarborough Marsh monitoring station: **LR-01**							
Year	**Class**	**# Sample Points**	**Mean**	**Minimum**	**Maximum**	**Criterion**	**# Not Meeting Criterion**
2019	C	8	25244	8670	40830	n/a	n/a
2020	C	7	35299	14080	44363	n/a	n/a

A summary of mean, minimum and maximum dissolved oxygen concentration (mg/l) values at Friends of Scarborough Marsh monitoring station: **MBSE-01**							
Year	**Class**	**# Sample Points**	**Mean**	**Minimum**	**Maximum**	**Criterion**	**# Not Meeting Criterion**
2019	C	9	9.2	8.2	10.8	5	0
2020	C	7	9.2	8.0	10.2	5	0

A summary of mean, minimum and maximum dissolved oxygen saturation (%) values at Friends of Scarborough Marsh station: **MBSE-01**							
Year	**Class**	**# Sample Points**	**Mean**	**Minimum**	**Maximum**	**Criterion**	**# Not Meeting Criterion**
2019	C	9	93.5	84.2	117.0	60	0
2020	C	7	92.1	86.0	98.9	60	0

A summary of mean, minimum and maximum water temperature (°C) values at Friends of Scarborough Marsh monitoring station: **MBSE-01**							
Year	**Class**	**# Sample Points**	**Mean**	**Minimum**	**Maximum**	**Criterion**	**# Not Meeting Criterion**
2019	C	10	15.6	7.8	17.9	n/a	n/a
2020	C	7	15.6	10.7	18.6	n/a	n/a

A summary of mean, minimum and maximum specific conductance (micro-ohms/cm, µS/cm) values at Wells NERR monitoring station: **MBSE-01**							
Year	**Class**	**# Sample Points**	**Mean**	**Minimum**	**Maximum**	**Criterion**	**# Not Meeting Criterion**
2019	C	7	299	159	505	n/a	n/a
2020	C	5	366	176	483	n/a	n/a

A summary of geometric mean, minimum and maximum bacteria (MPN/100 ml) values at Friends of Scarborough Marsh monitoring site: **MBSE-01**								
Year	**Class**	**Bacteria Type**	**# Sample Points**	**Geo-Mean**	**Minimum**	**Maximum**	**Criterion (Insta/geo)**	**# Exceeding Criterion**
2020	C	E. Coli	6	358.4	83.3	1986.3	236/64	4

A summary of mean, minimum and maximum dissolved oxygen concentration (mg/l) values at Friends of Scarborough Marsh monitoring station: **NR-01**

Year	Class	# Sample Points	Mean	Minimum	Maximum	Criterion	# Not Meeting Criterion
2019	B	9	8.1	6.9	9.2	7	1
2020	B	7	6.9	5.2	7.6	7	3

A summary of mean, minimum and maximum dissolved oxygen saturation (%) values at Friends of Scarborough Marsh station: **NR-01**

Year	Class	# Sample Points	Mean	Minimum	Maximum	Criterion	# Not Meeting Criterion
2019	B	9	90.7	77.0	103.0	75	0
2020	B	7	82.0	64.0	90.7	75	1

A summary of mean, minimum and maximum water temperature (°C) values at Friends of Scarborough Marsh monitoring station: **NR-01**

Year	Class	# Sample Points	Mean	Minimum	Maximum	Criterion	# Not Meeting Criterion
2019	B	10	20.9	10.4	28.9	n/a	n/a
2020	B	7	20.8	15.4	25.1	n/a	n/a

A summary of mean, minimum and maximum specific conductance (micro-ohms/cm, µS/cm) values at Friends of Scarborough Marsh monitoring station: **NR-01**

Year	Class	# Sample Points	Mean	Minimum	Maximum	Criterion	# Not Meeting Criterion
2019	B	8	14009	614	34710	n/a	n/a
2020	B	7	19585	5570	27189	n/a	n/a

A summary of mean, minimum and maximum dissolved oxygen concentration (mg/l) values at Friends of Scarborough Marsh monitoring station: **PB-01**

Year	Class	# Sample Points	Mean	Minimum	Maximum	Criterion	# Not Meeting Criterion
2019	C	8	9.2	7.9	10.4	5	0
2020	C	7	6.9	6.2	7.9	5	0

A summary of mean, minimum and maximum dissolved oxygen saturation (%) values at Friends of Scarborough Marsh monitoring station: **PB-01**

Year	Class	# Sample Points	Mean	Minimum	Maximum	Criterion	# Not Meeting Criterion
2019	C	8	91.0	82.9	99.0	60	0
2020	C	7	68.7	55.6	77.3	60	1

A summary of mean, minimum and maximum water temperature (°C) values at Friends of Scarborough Marsh monitoring station: **PB-01**

Year	Class	# Sample Points	Mean	Minimum	Maximum	Criterion	# Not Meeting Criterion
2019	C	9	14.7	7.4	17.9	n/a	n/a
2020	C	7	15.0	9.7	18.5	n/a	n/a

A summary of mean, minimum and maximum specific conductance (micro-ohms/cm, µS/cm) values at Friends of Scarborough Marsh monitoring station: **PB-01**

Year	Class	# Sample Points	Mean	Minimum	Maximum	Criterion	# Not Meeting Criterion
2019	C	7	604	398	1480	n/a	n/a
2020	C	7	463	412	513	n/a	n/a

A summary of geometric mean, minimum and maximum bacteria (MPN/100 ml) values at Friends of Scarborough Marsh monitoring site: **PB-01**

Year	Class	Bacteria Type	# Sample Points	Geo-Mean	Minimum	Maximum	Criterion (Insta/geo)	# Exceeding Criterion
2020	C	E. Coli	7	408.5	185	>2419.6	236/64	6

A summary of mean, minimum and maximum dissolved oxygen concentration (mg/l) values at Friends of Scarborough Marsh monitoring station: **WDS-01**

Year	Class	# Sample Points	Mean	Minimum	Maximum	Criterion	# Not Meeting Criterion
2019	C	9	9.0	8.1	10.1	5	0
2020	C	7	8.7	7.1	10.0	5	0

A summary of mean, minimum and maximum dissolved oxygen saturation (%) values at Friends of Scarborough Marsh station: **WDS-01**

Year	Class	# Sample Points	Mean	Minimum	Maximum	Criterion	# Not Meeting Criterion
2019	C	9	92.7	84.0	117.0	60	0
2020	C	7	87.2	77.6	93.4	60	0

A summary of mean, minimum and maximum water temperature (°C) values at Friends of Scarborough Marsh monitoring station: **WDS-01**

Year	Class	# Sample Points	Mean	Minimum	Maximum	Criterion	# Not Meeting Criterion
2019	C	10	15.3	8.4	18.4	n/a	n/a
2020	C	7	15.8	10.6	20.0	n/a	n/a

A summary of mean, minimum and maximum specific conductance (micro-ohms/cm, µS/cm) values at Friends of Scarborough Marsh monitoring station: **WDS-01**

Year	Class	# Sample Points	Mean	Minimum	Maximum	Criterion	# Not Meeting Criterion
2019	C	7	596	259	1012	n/a	n/a
2020	C	7	734	505	1008	n/a	n/a

A summary of geometric mean, minimum and maximum bacteria (MPN/100 ml) values at Friends of Scarborough Marsh monitoring site: **WDS-01**

Year	Class	Bacteria Type	# Sample Points	Geo-Mean	Minimum	Maximum	Criterion (Insta/geo)	# Exceeding Criterion
2020	C	E. Coli	7	149.5	60.5	980.4	236/64	2

Appendix A

* Sampling depths are only reported for Tier 1 VRMP sites.

** "N/A" = normal environmental sample ; "D" = field duplicate; "L" = lab duplicate.

*** D.O. = dissolved oxygen; "Spec. Cond" = specific conductance; "TDS" = Total disolved solids; "TSS" = total suspended solids."

Organization Site Code	VRMP Site ID	Date	Time	** Sample Type Qualifier	* Sample Depth	Depth Unit	Water Temp (DEG C)	*** D.O. (MG/L)	*** D.O. Sat. (%)	*** Spec. Cond. (US/CM)	E coli Bacteria (MPN/100ML)
CB-01	CASCADE BROOK - SSCCD-12 - VRMP	7/9/2020	9:26 AM	NA			21.2	4.3	50.1	13770	
CB-01	CASCADE BROOK - SSCCD-12 - VRMP	7/22/2020	8:15 AM	NA			23.1	2.8	36.5	30730	
CB-01	CASCADE BROOK - SSCCD-12 - VRMP	8/7/2020	8:20 AM	NA							
CB-01	CASCADE BROOK - SSCCD-12 - VRMP	8/8/2020	8:50 AM	NA			21.9	4.1	54.2	37780	
CB-01	CASCADE BROOK - SSCCD-12 - VRMP	8/21/2020	8:12 AM	NA			19.7	5.1	66.2	41757	
CB-01	CASCADE BROOK - SSCCD-12 - VRMP	9/4/2020	8:10 AM	NA			18.9	4.6	55.9	35042	
CB-01	CASCADE BROOK - SSCCD-12 - VRMP	9/19/2020	8:15 AM	NA			12.7	5.7	63.8	42824	
CB-01	CASCADE BROOK - SSCCD-12 - VRMP	10/3/2020	8:07 AM	NA			12.9	6.1	67.6	37313	
FB-01	FINNERD BROOK - SSCDNFN02 - VRMP	7/9/2020	8:51 AM	NA			21.2	4.6	53.9	11550	
FB-01	FINNERD BROOK - SSCDNFN02 - VRMP	7/22/2020	7:48 AM	NA			23.8	2.7	32.9	16840	
FB-01	FINNERD BROOK - SSCDNFN02 - VRMP	8/7/2020	7:54 AM	NA							
FB-01	FINNERD BROOK - SSCDNFN02 - VRMP	8/8/2020	7:42 AM	NA			21.7	2.7	32.4	17920	
FB-01	FINNERD BROOK - SSCDNFN02 - VRMP	8/21/2020	7:46 AM	NA			19.6	5.0	62.3	33687	
FB-01	FINNERD BROOK - SSCDNFN02 - VRMP	9/4/2020	7:44 AM	NA			18.2	5.2	59.9	23368	
FB-01	FINNERD BROOK - SSCDNFN02 - VRMP	9/19/2020	7:45 AM	NA			12.8	4.8	52.3	35343	
FB-01	FINNERD BROOK - SSCDNFN02 - VRMP	10/3/2020	7:44 AM	NA			11.3	4.7	46.8	23442	
JC-01	JONES CREEK - SSCJN-03 - VRMP	7/9/2020	9:38 AM	NA			21.9	4.8	56.6	11880	
JC-01	JONES CREEK - SSCJN-03 - VRMP	7/22/2020	8:30 AM	NA			22.1	3.3	41.9	30430	
JC-01	JONES CREEK - SSCJN-03 - VRMP	8/7/2020	8:40 AM	NA							
JC-01	JONES CREEK - SSCJN-03 - VRMP	8/8/2020	8:41 AM	NA			21.1	4.0	53.0	41650	
JC-01	JONES CREEK - SSCJN-03 - VRMP	8/21/2020	8:26 AM	NA			19.7	6.0	78.9	43862	
JC-01	JONES CREEK - SSCJN-03 - VRMP	9/4/2020	8:23 AM	NA			19.0	4.4	55.1	37131	
JC-01	JONES CREEK - SSCJN-03 - VRMP	9/19/2020	8:28 AM	NA			12.7	6.4	72.2	44436	
JC-01	JONES CREEK - SSCJN-03 - VRMP	10/3/2020	8:22 AM	NA			13.8	5.4	61.0	40172	

Organization Site Code	VRMP Site ID	Date	Time	** Sample Type Qualifier	* Sample Depth	Depth Unit	Water Temp (DEG C)	*** D.O. (MG/L)	*** D.O. Sat. (%)	*** Spec. Cond. (US/CM)	E coli Bacteria (MPN/100ML)
LR-01	LIBBY RIVER - SSCLB00 - VRMP	7/9/2020	10:20 AM	NA			20.5	5.3	61.6	14080	
LR-01	LIBBY RIVER - SSCLB00 - VRMP	7/22/2020	9:11 AM	NA			22.8	2.9	37.9	34220	
LR-01	LIBBY RIVER - SSCLB00 - VRMP	8/7/2020	9:09 AM	NA							
LR-01	LIBBY RIVER - SSCLB00 - VRMP	8/8/2020	9:17 AM	NA			21.7	4.6	59.4	36810	
LR-01	LIBBY RIVER - SSCLB00 - VRMP	8/21/2020	9:04 AM	NA			19.4	4.5	57.5	43103	
LR-01	LIBBY RIVER - SSCLB00 - VRMP	9/4/2020	9:06 AM	NA			18.9	4.6	56.1	36276	
LR-01	LIBBY RIVER - SSCLB00 - VRMP	9/19/2020	9:06 AM	NA			12.3	6.2	69.8	44363	
LR-01	LIBBY RIVER - SSCLB00 - VRMP	10/3/2020	8:58 AM	NA			12.5	6.4	70.4	38238	
MBSE-01	MILL BROOK - SSCMB12 - VRMP	7/9/2020	8:22 AM	NA			18.6	8.0	89.0	396.1	1986.3
MBSE-01	MILL BROOK - SSCMB12 - VRMP	7/9/2020	8:22 AM	D			18.6	8.2	87.0	392.3	
MBSE-01	MILL BROOK - SSCMB12 - VRMP	7/22/2020	7:16 AM	NA			18.6	8.1	86.0	291.5	686.7
MBSE-01	MILL BROOK - SSCMB12 - VRMP	7/22/2020	7:16 AM	D			18.6	8.7	85.9	292.4	
MBSE-01	MILL BROOK - SSCMB12 - VRMP	8/7/2020	7:42 AM	NA							186
MBSE-01	MILL BROOK - SSCMB12 - VRMP	8/8/2020	7:08 AM	NA			17.9	8.8	92.7		
MBSE-01	MILL BROOK - SSCMB12 - VRMP	8/8/2020	7:08 AM	D			17.9	8.3	87.6		
MBSE-01	MILL BROOK - SSCMB12 - VRMP	8/21/2020	7:24 AM	NA			15.9	9.8	98.9		290.9
MBSE-01	MILL BROOK - SSCMB12 - VRMP	8/21/2020	7:24 AM	D			15.9	9.1	92.4		
MBSE-01	MILL BROOK - SSCMB12 - VRMP	9/4/2020	7:22 AM	NA			16.6	9.3	94.9	176.4	344.8
MBSE-01	MILL BROOK - SSCMB12 - VRMP	9/4/2020	7:22 AM	D			16.6	9.0	91.8	135.4	
MBSE-01	MILL BROOK - SSCMB12 - VRMP	9/19/2020	7:23 AM	NA			10.7	10.1	91.1	483	
MBSE-01	MILL BROOK - SSCMB12 - VRMP	9/19/2020	7:23 AM	D			10.6	9.6	86.5	466	
MBSE-01	MILL BROOK - SSCMB12 - VRMP	10/3/2020	7:11 AM	NA			10.9	10.2	92.4	481	83.3
MBSE-01	MILL BROOK - SSCMB12 - VRMP	10/3/2020	7:11 AM	D			10.8	9.5	85.6	471	

Organization Site Code	VRMP Site ID	Date	Time	** Sample Type Qualifier	* Sample Depth	Depth Unit	Water Temp (DEG C)	*** D.O. (MG/L)	*** D.O. Sat. (%)	*** Spec. Cond. (US/CM)	E coli Bacteria (MPN/100ML)
NR-01	NONESUCH RIVER - SSCNN-50 - VRMP	7/9/2020	10:01 AM	NA			22.6	6.5	76.8	7580	
NR-01	NONESUCH RIVER - SSCNN-50 - VRMP	7/22/2020	9:00 AM	NA			25.1	5.2	64.0	5570	
NR-01	NONESUCH RIVER - SSCNN-50 - VRMP	8/7/2020	9:01 AM	NA							
NR-01	NONESUCH RIVER - SSCNN-50 - VRMP	8/8/2020	9:07 AM	NA			24.6	6.6	86.3	22670	
NR-01	NONESUCH RIVER - SSCNN-50 - VRMP	8/21/2020	8:48 AM	NA			21.8	7.2	90.7	27022	
NR-01	NONESUCH RIVER - SSCNN-50 - VRMP	9/4/2020	8:50 AM	NA			20.2	7.6	89.5	19881	
NR-01	NONESUCH RIVER - SSCNN-50 - VRMP	9/19/2020	8:52 AM	NA			15.4	7.3	81.5	27189	
NR-01	NONESUCH RIVER - SSCNN-50 - VRMP	10/3/2020	8:45 AM	NA			15.9	7.6	85.0	27182	
PB-01	PHILLIPS BROOK - SSCDNPP13 - VRMP	7/9/2020	9:14 AM	NA			18.5	7.3	77.3	446.7	2419.6
PB-01	PHILLIPS BROOK - SSCDNPP13 - VRMP	7/22/2020	8:00 AM	NA			18.5	6.5	69.4	476	613.1
PB-01	PHILLIPS BROOK - SSCDNPP13 - VRMP	8/7/2020	8:08 AM	NA							343.3
PB-01	PHILLIPS BROOK - SSCDNPP13 - VRMP	8/8/2020	7:52 AM	NA			17.2	6.6	68.3	442.5	
PB-01	PHILLIPS BROOK - SSCDNPP13 - VRMP	8/21/2020	7:57 AM	NA			14.9	7.6	75.7	468	290.9
PB-01	PHILLIPS BROOK - SSCDNPP13 - VRMP	9/4/2020	7:53 AM	NA			15.6	6.5	65.2	483	290.9
PB-01	PHILLIPS BROOK - SSCDNPP13 - VRMP	9/19/2020	8:00 AM	NA			10.4	6.2	55.6	411.9	238.2
PB-01	PHILLIPS BROOK - SSCDNPP13 - VRMP	10/3/2020	7:54 AM	NA			9.7	7.9	69.5	513	185
WDS-01	WILLOWDALE STREAM - SSCMBWD13 - VRMP	7/9/2020	8:42 AM	NA			18.1	8.5	90.0	862	980.4
WDS-01	WILLOWDALE STREAM - SSCMBWD13 - VRMP	7/22/2020	7:32 AM	NA			20.0	7.1	77.6	598	141.4
WDS-01	WILLOWDALE STREAM - SSCMBWD13 - VRMP	8/7/2020	7:42 AM	NA							245.2
WDS-01	WILLOWDALE STREAM - SSCMBWD13 - VRMP	8/8/2020	7:20 AM	NA			18.5	7.8	83.1	592	
WDS-01	WILLOWDALE STREAM - SSCMBWD13 - VRMP	8/21/2020	7:34 AM	NA			16.2	9.1	93.4	1008	150
WDS-01	WILLOWDALE STREAM - SSCMBWD13 - VRMP	9/4/2020	7:34 AM	NA			16.6	8.8	90.4	714	65
WDS-01	WILLOWDALE STREAM - SSCMBWD13 - VRMP	9/19/2020	7:33 AM	NA			10.6	9.5	85.6	505	60.5
WDS-01	WILLOWDALE STREAM - SSCMBWD13 - VRMP	10/3/2020	7:29 AM	NA			10.8	10.0	90.2	859	83.3