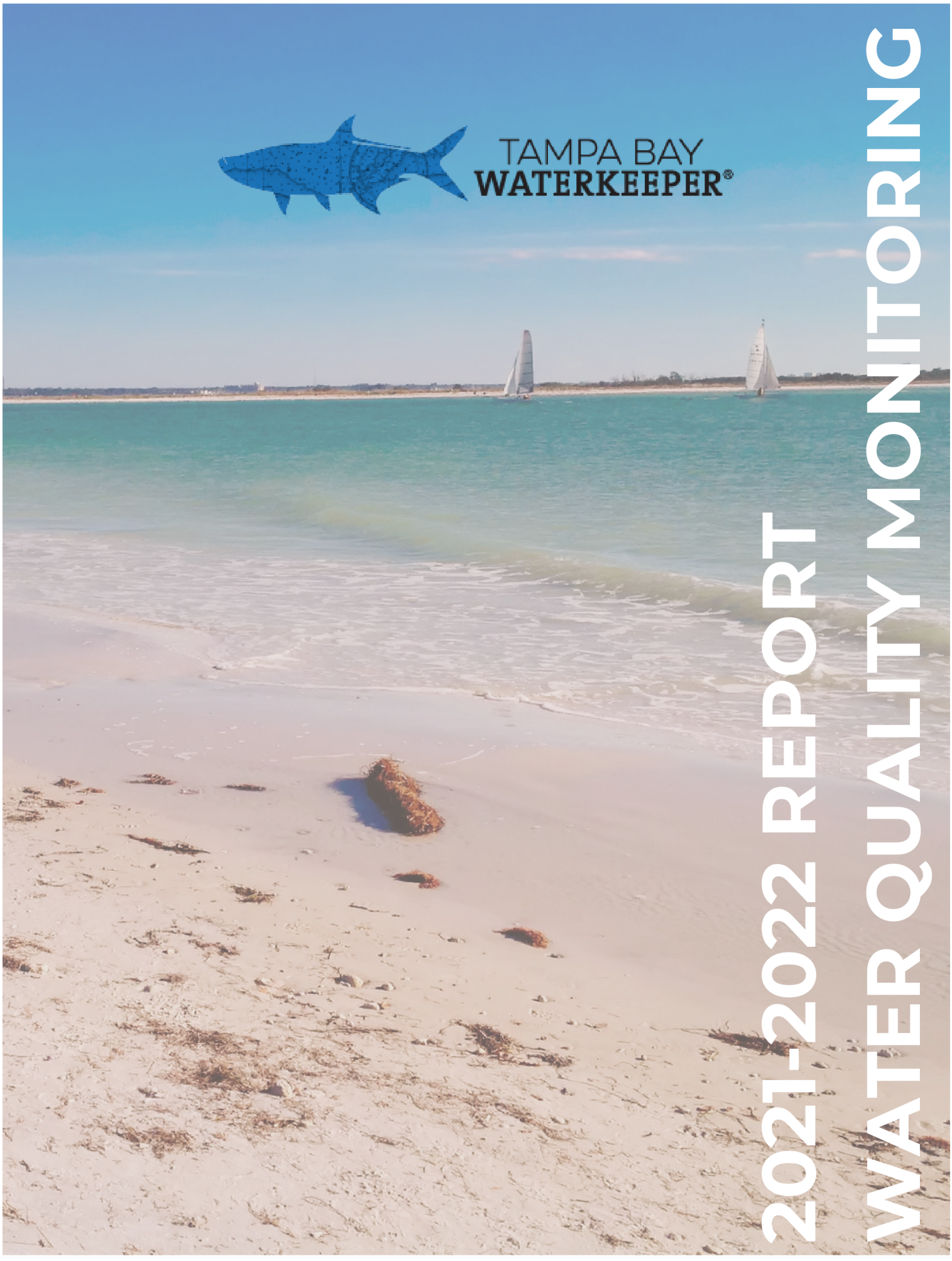
TAMPA BAY
WATERKEEPER®
WATER QUALITY MONITORING
2021-2022 REPORT

Table of Contents

Introduction

Why is water quality important?

Whether you boat, fish, participate in watersports like wakeboarding, enjoy wildlife viewing, or basking in the sun at the beach, you need good water quality to enjoy these activities. Alternatively many people make a living directly from our healthy waters as charter captains and eco tour guides, or indirectly, from the tourist industry. Having healthy water quality is essential to us all; it supports our economy, recreational opportunities, and wildlife habitat.

Tampa Bay Waterkeeper's monitoring program

There are a lot of parameters that make up healthy water quality: dissolved oxygen, nutrients, bacteria, harmful algae blooms, and heavy metals, just to name a few. Tampa Bay Waterkeeper started testing for Enterococcus (Entero), bacteria levels, in 2017. Entero lives in the intestinal tract of warm-blooded animals, including humans. It is a Fecal Indicator Bacteria (FIB); its presence indicates that fecal material is in the water and therefore possibly the presence of disease-causing bacteria, viruses, and protozoa.

Engaging in recreation activities in water contaminated with fecal matter can make you sick, harm aquatic life, and impact nutrient levels in the water. Additionally, it's impossible to tell, without tests, if the water you're recreating in may be contaminated by fecal matter. If the contamination is really bad, you may be able to smell it, but contaminated water is harmful even in small concentrations.

Tampa Bay Waterkeeper tests and reports bacteria levels at specific locations bi-weekly. The results of these tests are posted on our free app called Swim Guide, to our social media channels, and on our webpage. However, the results of an individual test is just a snapshot in time. It tells you the bacteria level at that specific location on a specific date and time. The real value of testing bacteria levels comes over time. With long term data it is possible to determine if a specific site may have persistent water quality issues, or perhaps just a few isolated incidents of high bacteria levels.

Tampa Bay Waterkeeper tests for water quality in order to identify water bodies that have persistent fecal contamination. We then work to identify and resolve the sources of contamination. Additionally testing allows Tampa Bay Waterkeeper to raise awareness about fecal contamination issues and inform the public on where they can find sampling results. Tampa Bay Waterkeeper's testing does not intend to duplicate fecal testing conducted by the state, county, or city agencies. Sites considered for testing are evaluated based on criteria including legal access, public exposure, site safety, monitoring status, and historical data. For more information about site selection see Attachment A in the Quality Assurance Project Plan.

Report Basics

This report presents an analysis of FIB data collected by Tampa Bay Waterkeeper from 2021-2022. Tampa Bay Waterkeeper rates the water quality of each sample in comparison to the U.S. Environmental Protection Agency's (EPA) 2012 Recreational Water Quality Criteria as follows:

- **Safe for swimming**: 0-70 CFU per 100mL enterococci per sample
- **Not safe for Swimming**: 71+ CFU per 100mL enterococci per sample
  CFU = Colony Forming Unit

Tampa Bay Waterkeeper collects bi-weekly water samples from 11 sites. Water samples are delivered to a certified lab for analysis. For a complete description of data collection methods please see our Quality Assurance Project Plan. For each site the percentage of sample results that indicate the water is 'not safe for swimming' is calculated along with the geometric mean of the CFU also referred to as bacteria counts.

The number of samples per site may vary for a variety of reasons. First, sites may have been added to the monitoring program at different times, so newer sites will have fewer samples. Additionally, monitoring may be skipped due to severe weather, or unsafe site conditions, or the sample may have been discovered to be contaminated, therefore the results are not included in the analysis. The results below detail each site's collective test results and note why data is missing, if applicable.

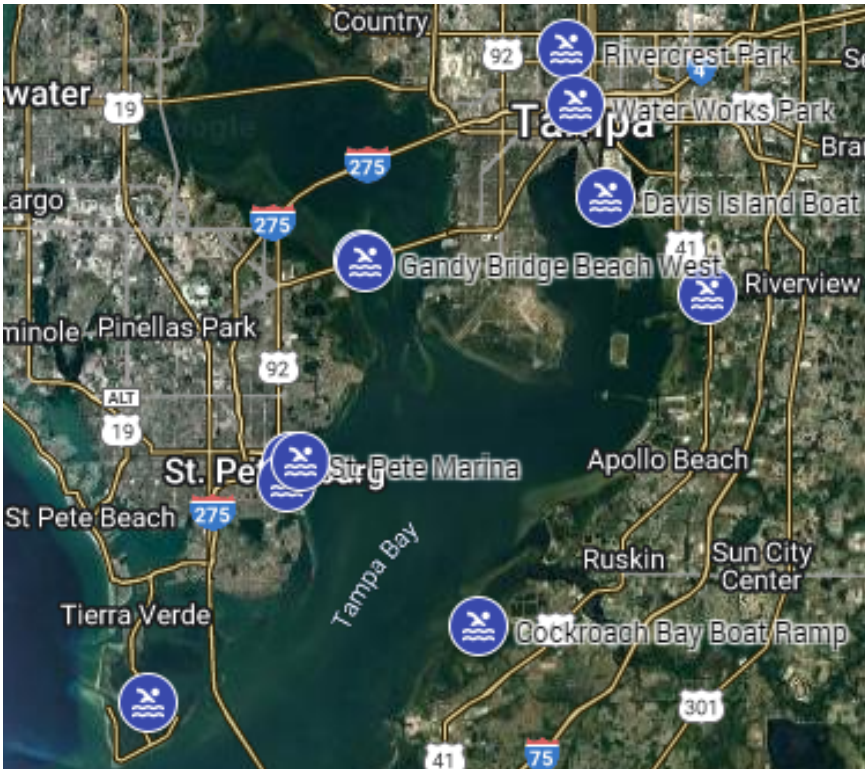

Figure 1. Map of Tampa Bay sampling sites.

Table 1. List of sampling sites.

Site Name	Latitude	Longitude	Sample Frequency
Cockroach Bay Boat Ramp	27.687071	-82.520604	Twice Monthly
Davis Island Boat Ramp	27.911165	-82.445853	Twice Monthly
Fort De Soto Boat Ramp	27.64626	-82.71743	Twice Monthly
Gandy Bridge Beach West	27.878184	-82.589672	Twice Monthly
Gandy Bridge East	27.877039	-82.588117	Twice Monthly
Rivercrest Park	27.989062	-82.468378	Twice Monthly
St. Pete Marina	27.772716	-82.631609	Twice Monthly
St. Pete Pier	27.46254	-82.622075	Twice Monthly
USF Beach	27.7621657	-82.6353269	Twice Monthly
Water Works Park	27.95969	-82.463853	Twice Monthly
William's Park Boat Ramp	27.85999	-82.38466	Twice Monthly

Results

Table 2. Results of 2021 and 2022 sampling analysis by site.

2021 Entero Data Results				
Sample Site	**# Samples**	**# Exceedances**	**% Exceedances**	**Bacteria Count Geometric Mean**
Cockroach Bay Boat Ramp	21	3	14%	27
Davis Island Beach	15	2	13%	24
Davis Island Boat Ramp	24	12	50%	93
Gandy Bridge East	22	7	32%	33
Gandy Bridge Beach West	22	5	23%	31
Phillipe Point	3	0	0%	23
Port of Tampa	23	12	52%	78
Rivercrest Park	24	23	96%	455
St. Pete Marina	24	15	63%	291
St. Pete Pier	17	4	24%	29
USF Beach	24	17	71%	270
Water Works	21	18	86%	171

2022 Entero Data Results				
Sample Site	**# Samples**	**#Exceedances**	**%Exceedances**	**Bacteria Count Geometric Mean**
Cockroach Bay Boat Ramp	22	7	32%	45
Davis Island Beach	1	0	0%	10
Davis Island Boat Ramp	23	10	43%	43
Fort De Soto Boat Ramp	8	0	0%	15
Gandy Bridge East	22	9	41%	64
Gandy Bridge Beach West	23	9	39%	68
Port of Tampa	10	2	20%	25
Rivercrest Park	23	19	83%	192
St. Pete Marina	23	18	78%	495
St. Pete Pier	23	11	48%	91
USF Beach	23	11	48%	135
Water Works	23	19	83%	165
Williams Park Boat Ramp	13	8	62%	70

The geometric mean of the bacteria count for each sample location is highlighted in green if it meets water quality standards considered safe for swimming and red if it does not meet water quality standards considered safe for swimming. The geometric mean is one analysis used to show an overall health of a site and does not indicate that site is always safe or unsafe for

swimming. A detailed table of results for each sampling effort is provided on [Tampa Bay Waterkeeper's Water Quality Program webpage](#).

Of the sites sampled, **Rivercrest Park, St. Pete Marina, USF beach, and Water Works** had high geometric means in both 2021 and 2022 that exceeded the threshold considered safe for swimming. These sites also had percent exceedances at or above 48%. These consistently poor water quality results **indicate the need for further investigation** to determine the cause and find a solution to improve water quality.

Cockroach Bay Boat Ramp

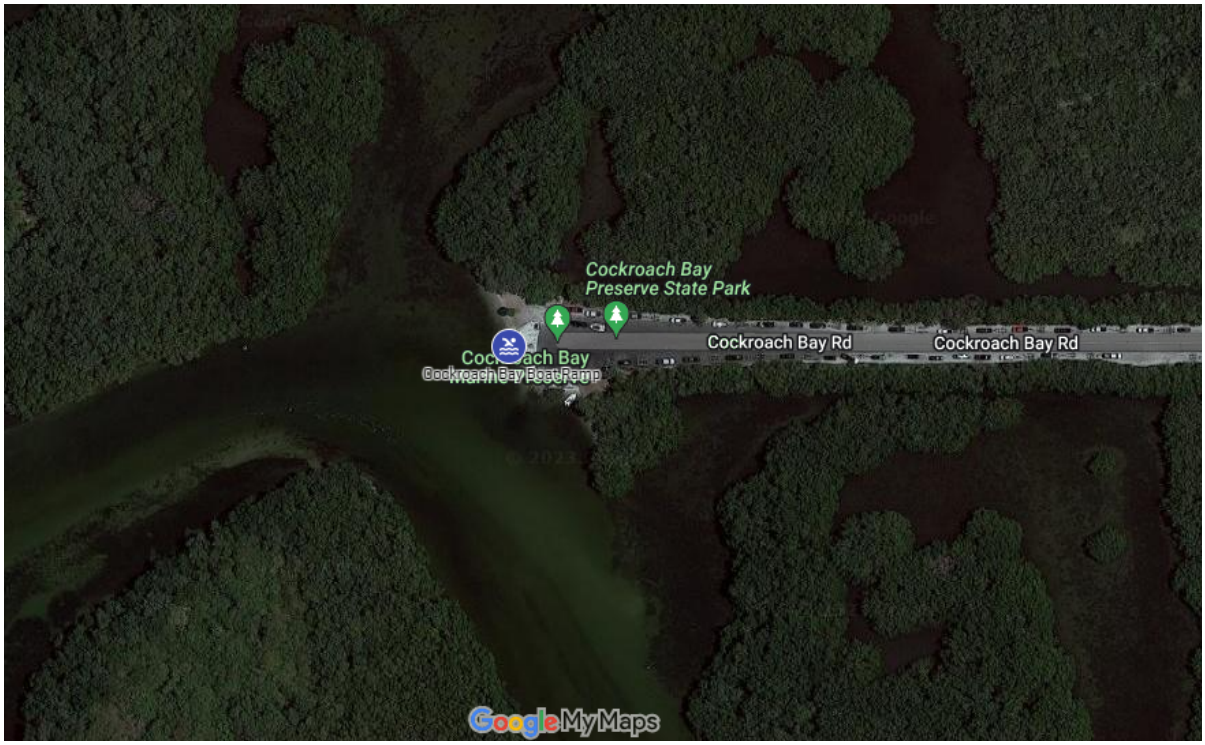

Figure 2. Satellite image of Cockroach Bay Boat Ramp sampling site.

Sample Year	# Samples	# Exceedances	% Exceedances	Bacteria Count Geometric Mean
2021	21	3	14%	27
2022	22	7	32%	45

Cockroach Bay Boat Ramp is located along the southeastern shore of Tampa Bay in Ruskin. It is in the Cockroach Bay Aquatic Preserve approximately three miles south of the mouth of Little Manatee River. Water from this location flows into Tampa Bay. Salinity at this site varies with season and tidal conditions.

In 2021, 21 water quality samples were collected from this site, of which three exceeded bacteria count safety standards. The bacteria count geometric mean at this site in 2021 was 27, which is within standards considered safe for swimming. In 2022, 22 water quality samples were collected from this site, seven of which exceeded bacteria count safety standards. The bacteria count geometric mean at this site in 2023 was 45, which is within standards considered safe for swimming.

Davis Island Beach

Since Davis Island Beach is sampled by the Florida Healthy Beaches program, it was removed from Tampa Bay Waterkeeper's sampling effort in September 2021 to better allocate resources. However one additional sample was collected from this site in November 2022.

Davis Island Boat Ramp

Figure 3. Satellite image of Davis Island Boat Ramp sampling site.

Sample Year	# Samples	# Exceedances	% Exceedances	Bacteria Count Geometric Mean
2021	24	12	50%	93
2022	23	10	43%	43

Davis Island Boat Ramp is located in upper Hillsborough Bay. Water from this location flows into Tampa Bay. Salinity at this site varies with season and tidal conditions.

In 2021, 24 water quality samples were collected from this site, of which half (12 samples) exceeded bacteria count safety standards. The bacteria count geometric mean at this site in 2021 was 93, which also exceeds safety standards. In 2022, 23 water quality samples were collected from this site, ten of which exceeded bacteria count safety standards. The bacteria count geometric mean at this site in 2022 was 43, which is within standards considered safe for swimming.

Fort De Soto Boat Ramp

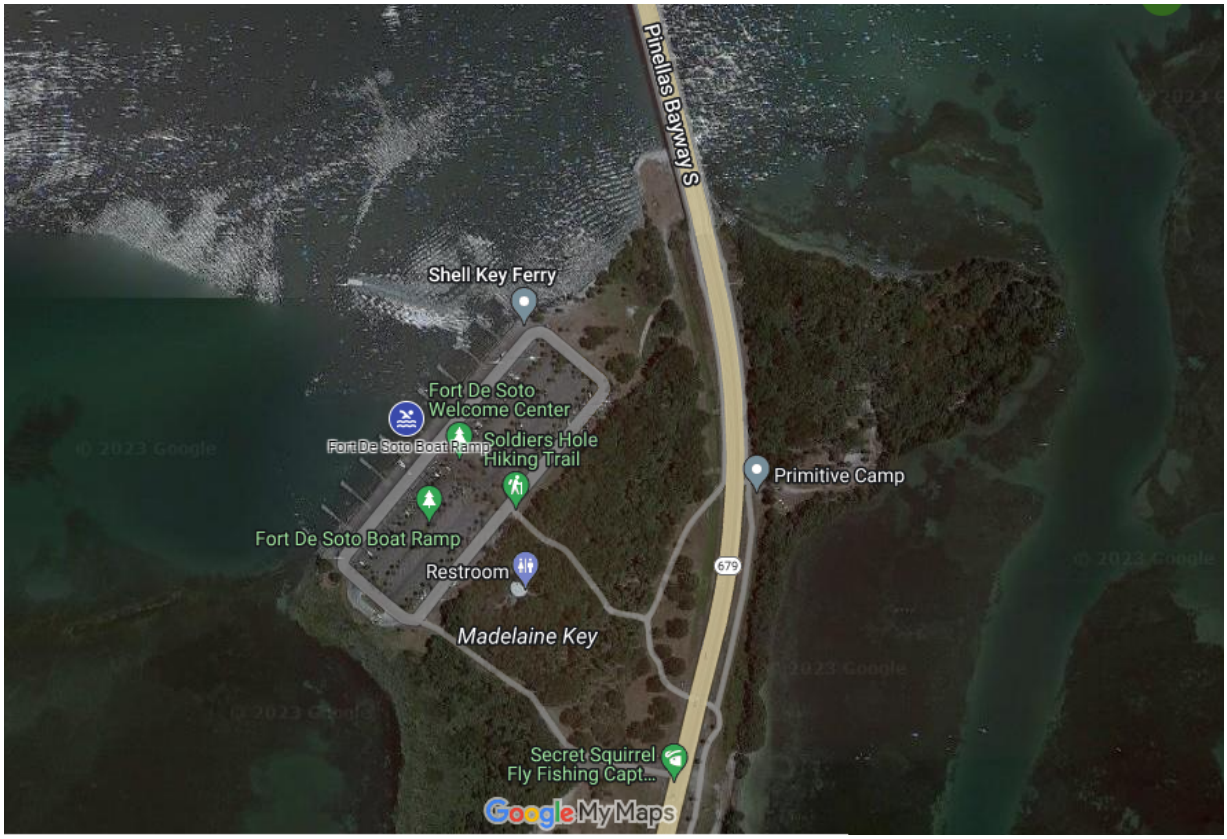

Figure 4. Satellite image of Fort DeSoto Boat Ramp sampling site.

Sample Year	# Samples	# Exceedances	% Exceedances	Bacteria Count Geometric Mean
2022	8	0	0%	15

Fort De Soto Boat Ramp is located at the mouth of Tampa Bay and is considered to have consistently high tidal flushing.This site is located in the Pinellas County Aquatic Preserves. Water from this location has high salinity and flows into the Gulf of Mexico or into Tampa Bay depending on tidal conditions.

Fort De Soto Boat Ramp is a new sampling site that was added to Tampa Bay Waterkeeper's monitoring effort in August of 2022. Thank you to our Fort De Soto site sponsor Hubbard's Marina. In 2022, eight water quality samples were collected from this site, all of which met water quality standards considered safe for swimming. The bacteria count geometric mean at this site in 2022 was 15, which is within standards considered safe for swimming.

Gandy Bridge East & Gandy Bridge West Beach

Figure 5. Satellite image of Gandy Bridge sampling sites.

Sample Site	Sample Year	# Samples	# Exceedances	% Exceedances	Bacteria Count Geometric Mean
East	2021	22	7	32%	33
East	2022	22	9	41%	64
West	2021	22	5	23%	31
West	2022	23	9	39%	68

Gandy Bridge Beach East and Gandy Bridge West sampling sites are located in the lower Old Tampa Bay and are located in the Pinellas County Aquatic Preserves. Salinity at these sites is high. Water from these locations flows into Tampa Bay.

At the Gandy Bridge East site 22 water quality samples were collected in both 2021 and 2022, of which seven and nine exceeded bacteria count safety standards, respectively. The bacteria count geometric mean at this site for both 2021 and 2022 is within standards considered safe for swimming.

At the Gandy Bridge West site 22 water quality samples were collected in 2021 of which five exceeded bacteria count safety standards. In 2022, 23 samples were collected, of which nine exceeded bacteria count safety standards. The bacteria count geometric mean at this site for both 2021 and 2022 is within standards considered safe for swimming.

Phillipe Point

Phillipe Point is an inactive site. This it was a short term study site with three samples collected from April to May 2021.

Port of Tampa

Port of Tampa was removed from sampling efforts in June 2022 because the access point for this site is not publicly accessible. As an alternative site Williams Park Boat Ramp was added to the monitoring effort.

Rivercrest Park

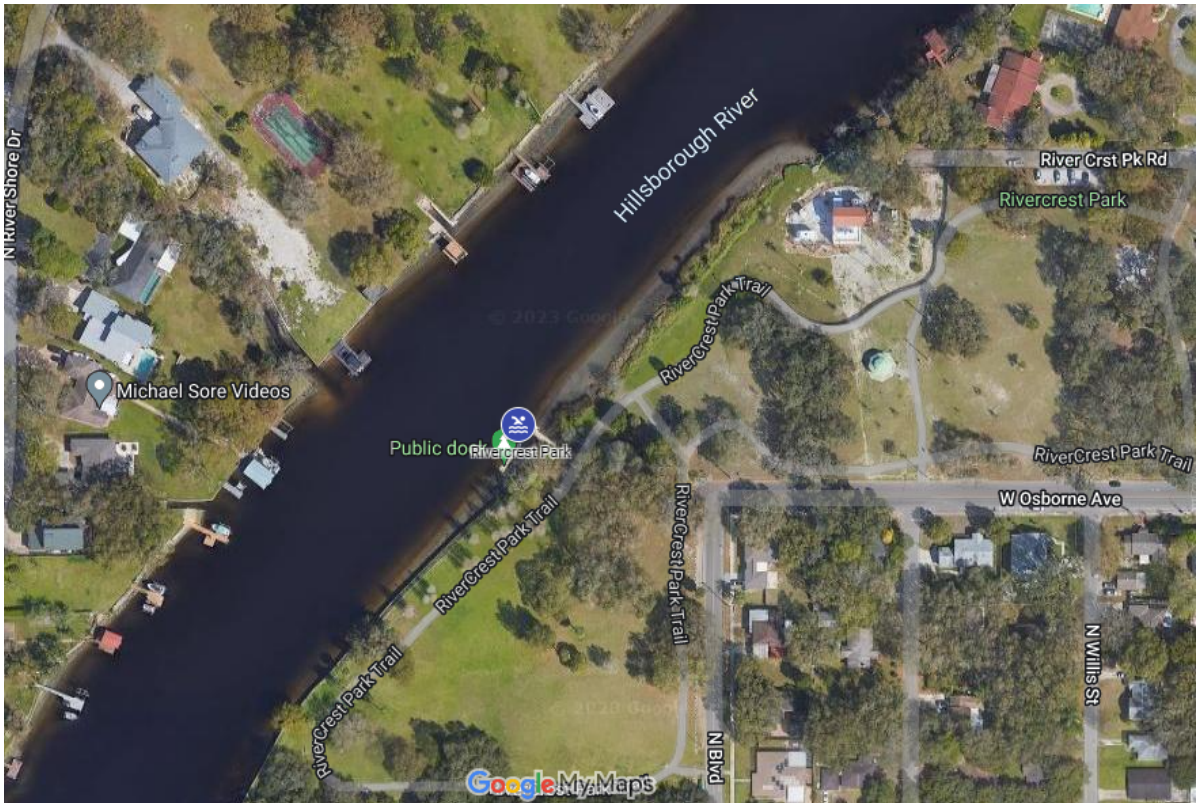

Figure 6. Satellite image of Rivercrest Park sampling site.

Sample Year	# Samples	# Exceedances	% Exceedances	Bacteria Count Geometric Mean
2021	24	23	96%	455
2022	23	19	83%	192

Rivercrest Park sampling site is located in the lower Hillsborough River. Salinity at this site varies with season and tidal conditions. Water from this location flows into upper Hillsborough Bay.

In 2021, 24 water quality samples were collected from this site, of which 23 samples exceeded bacteria count safety standards. The geometric mean for 2021 was 455 which is above the threshold deemed safe for swimming.

In 2022, 23 water quality samples were collected from this site of which 19 samples exceeded bacteria count safety standards. The geometric mean for 2022 was 192 which is above the threshold deemed for safe swimming.

St. Pete Marina

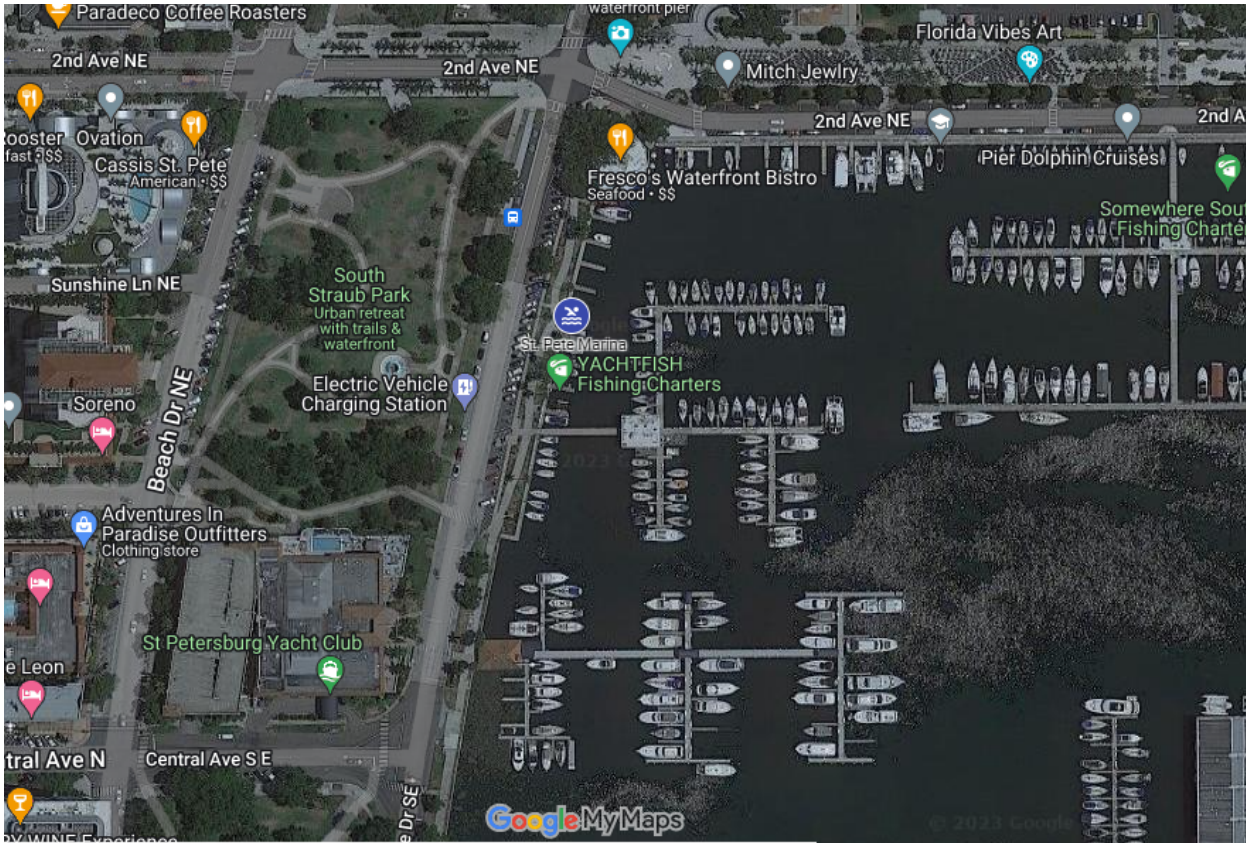

Figure 7. Satellite image of St. Pete Marina sampling site.

Sample Year	# Samples	# Exceedances	% Exceedances	Bacteria Count Geometric Mean
2021	24	15	63%	291
2022	23	18	78%	495

St. Pete Marina sampling site is located in lower Tampa Bay within the Pinellas County Aquatic Preserves. Salinity at this site is high. Water from this location flows into the Gulf of Mexico.

In 2021, 24 water quality samples were collected from this site, of which 15 samples exceeded bacteria count safety standards; the geometric mean for 2021 was 291 which is above the threshold deemed safe for swimming.

In 2022, 23 water quality samples were collected from this site of which 18 samples exceeded bacteria count safety standards; the geometric mean for 2022 was 495 which is above the threshold deemed for safe swimming.

St. Pete Pier

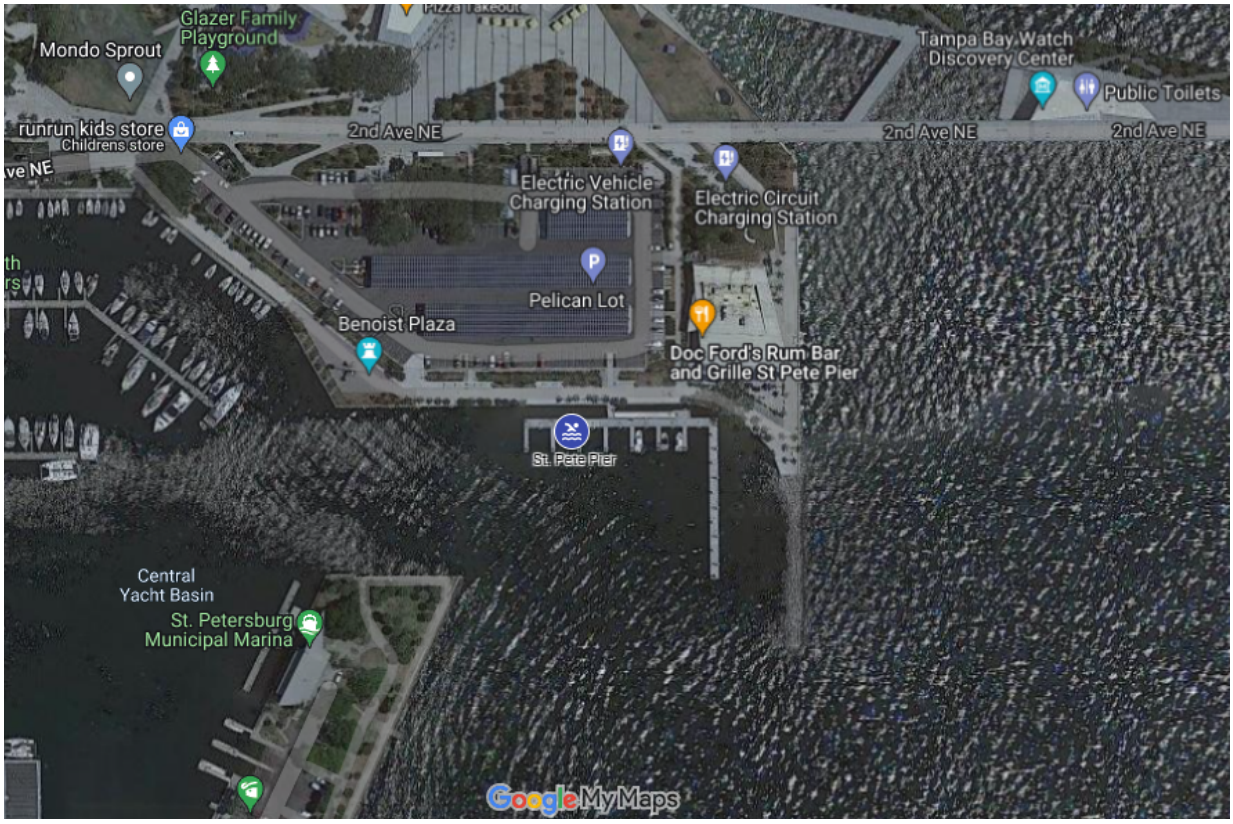

Figure 8. Satellite image of St. Pete Pier sampling site.

Sample Year	# Samples	# Exceedances	% Exceedances	Bacteria Count Geometric Mean
2021	17	4	24%	29
2022	23	11	48%	91

St. Pete Pier sampling site is located in lower Tampa Bay within the Pinellas County Aquatic Preserves. Salinity at this site is high. Water from this location flows into the Gulf of Mexico.

In 2021, 17 water quality samples were collected from this site, of which 4 samples exceeded bacteria count safety standards; the geometric mean for 2021 was 29 which is within the standard deemed safe for swimming.

In 2022, 23 water quality samples were collected from this site of which 11 samples exceeded bacteria count safety standards; the geometric mean for 2022 was 91 which is over the threshold deemed for safe swimming.

USF Beach

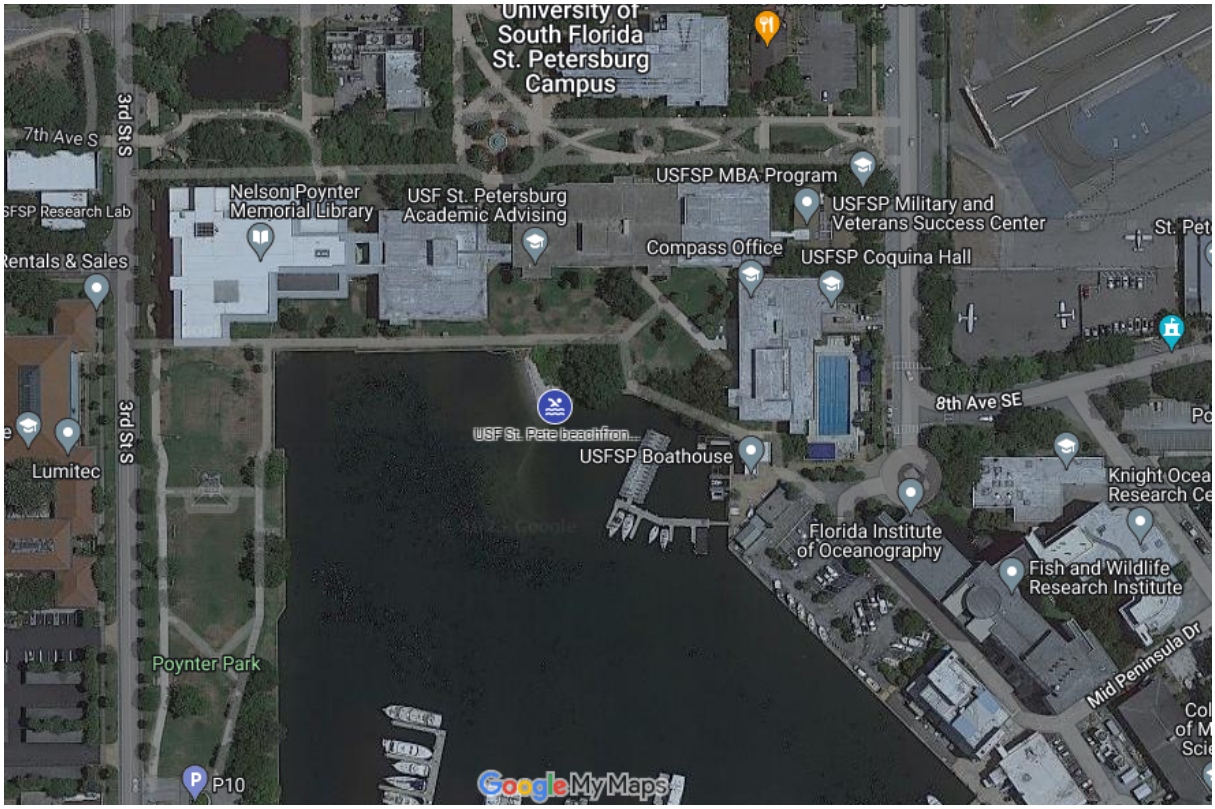

Figure 9. Satellite image of USF Beach sampling site.

Sample Year	# Samples	# Exceedances	% Exceedances	Bacteria Count Geometric Mean
2021	24	17	71%	270
2022	23	11	48%	135

USF Beach sampling site is located in lower Tampa Bay within the Pinellas County Aquatic Preserves. Salinity at this site is high. Water from this location flows into the Gulf of Mexico.

In 2021, 24 water quality samples were collected from this site, of which 17 samples exceeded bacteria count safety standards; the geometric mean for 2021 was 270 which is over the threshold deemed safe for swimming.

In 2022, 23 water quality samples were collected from this site of which 11 samples exceeded bacteria count safety standards; the geometric mean for 2022 was 135 which is over the threshold deemed for safe swimming.

Water Works

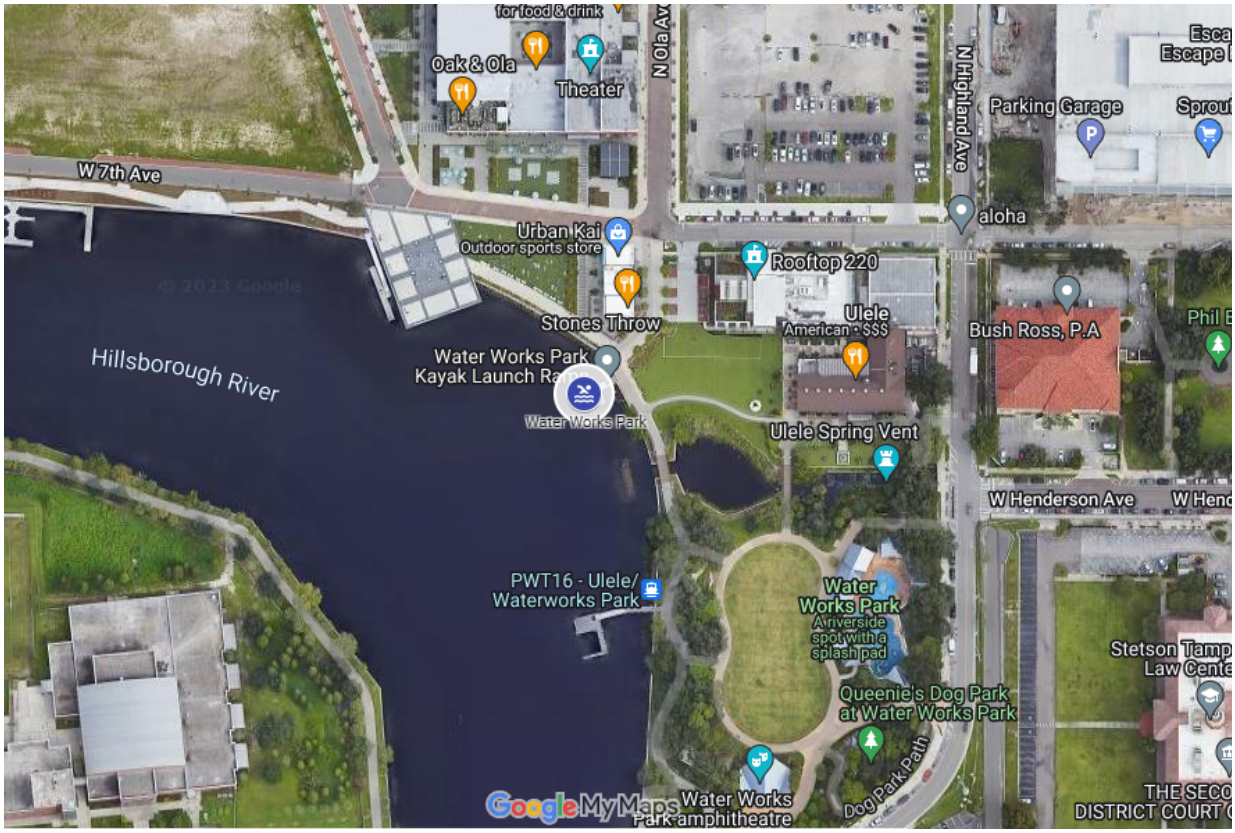

Figure 10. Satellite image of Water Works sampling site.

Sample Year	# Samples	# Exceedances	% Exceedances	Bacteria Count Geometric Mean
2021	21	18	86%	171
2022	23	19	83%	165

Water Works sampling site is located in the lower Hillsborough River. Salinity at this site varies with season and tidal conditions. Water from this location flows into upper Hillsborough Bay.

In 2021, 21 water quality samples were collected from this site, of which 18 samples exceeded bacteria count safety standards; the geometric mean for 2021 was 171 which is over the threshold deemed safe for swimming.

In 2022, 23 water quality samples were collected from this site of which 19 samples exceeded bacteria count safety standards; the geometric mean for 2022 was 165 which is over the threshold deemed for safe swimming.

Williams Park Boat Ramp

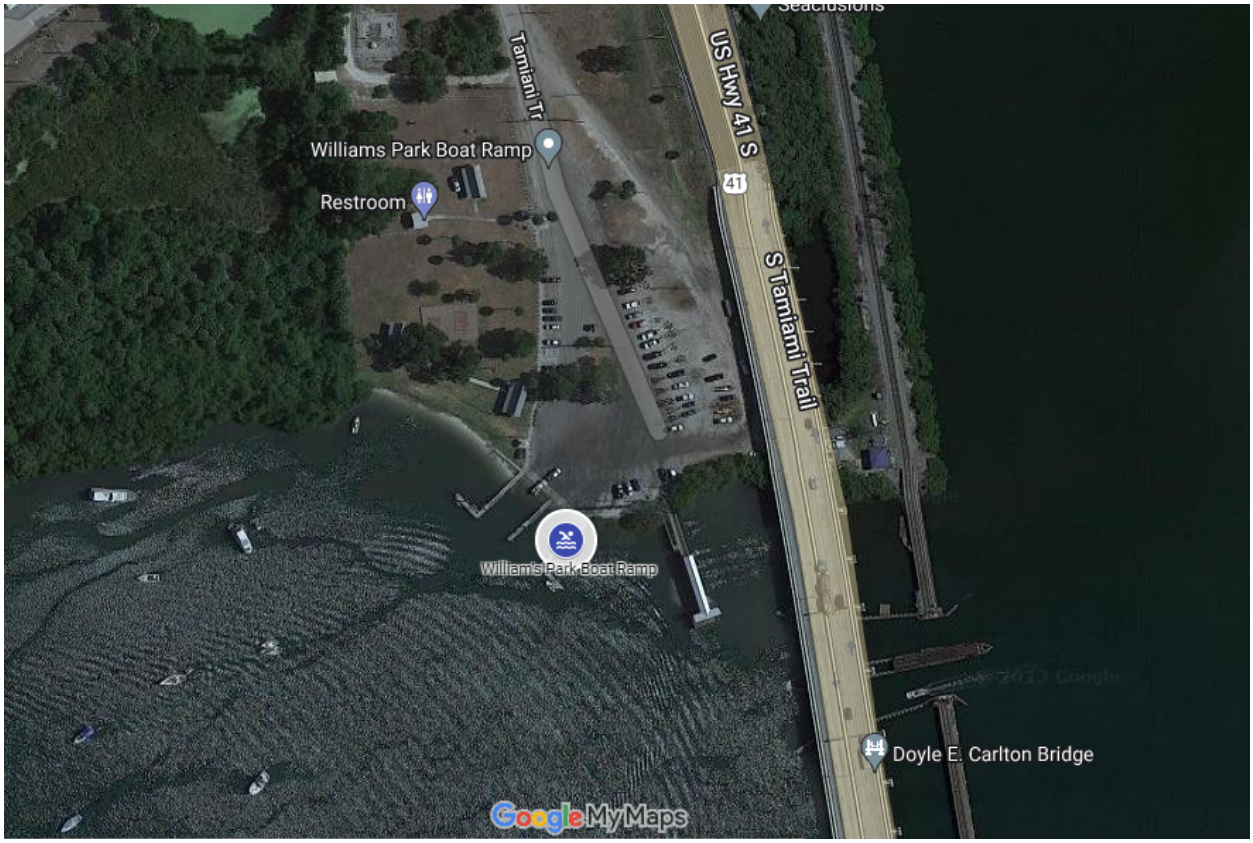

Figure 11. Satellite image of Williams Park sampling site.

Sample Year	# Samples	# Exceedances	% Exceedances	Bacteria Count Geometric Mean
2022	13	8	62%	70

Williams Park sampling site is located in the Alafia River. Salinity at this site varies with season and tidal conditions. Water from this location flows into middle Hillsborough Bay.

Williams Park is a new sampling site that was added to Tampa Bay Waterkeeper's monitoring effort in June of 2022. Thirteen water quality samples were collected from this site, of which 8 exceeded bacteria count safety standards. The geometric mean for this site was 70 in 2022 which meets water quality standards considered safe for swimming.

Take Action

Thank you for taking the time to read this report and for caring about water quality. You can reduce bacteria loading in our waterways by:

- Always pick up your pet's waste.
- Never flush 'flushable' wipes. They can cause pipes to clog, break, and spill sewage.
- Never pour oil, fat, or grease down the drain. Let them cool in a disposable container and throw it in the trash. Recycle oil, fat or grease through your County's waste disposal programs.
- Trash excess food scraps and use your garbage disposal sparingly.
- If you're on septic, make sure your system is functioning properly and well maintained.
- Properly maintain your sewage lateral lines.
- Sponsor a Water Quality Monitoring Site.
- Use your voice and your vote to support funding for wastewater treatment facilities.

Resources

Tampa Bay's Water Quality Report is just a fraction of data available to the public. Here are links for more water quality data you may be interested in.

City of St. Pete Water Quality Program- multiple water quality parameters including nutrients, chlorophyll a, dissolved oxygen, FIB and more
https://www.stpete.org/residents/public_safety/recreational_water_quality.php

Florida Healthy Beaches- Entero data
https://www.floridahealth.gov/environmental-health/beach-water-quality/index.html

Tampa Bay Water Atlas-multiple water quality parameters
https://www.tampabay.wateratlas.usf.edu/

Florida Fish and Wildlife Conservation Commission Red Tide-
https://myfwc.com/research/redtide/statewide/

Tampa Bay Waterkeeper

Water Quality Testing Program

Quality Assurance Project Plan

July 2022

Title and Approval Page

Tampa Bay Waterkeeper.

Community Science Water Quality Testing

Program Effective Date of Plan: July 2022

_____ Date_____

Project Manager

_____ Date_____

Data Manager

_____ Date_____

QA Manager

_____ Date_____

Sample Collector

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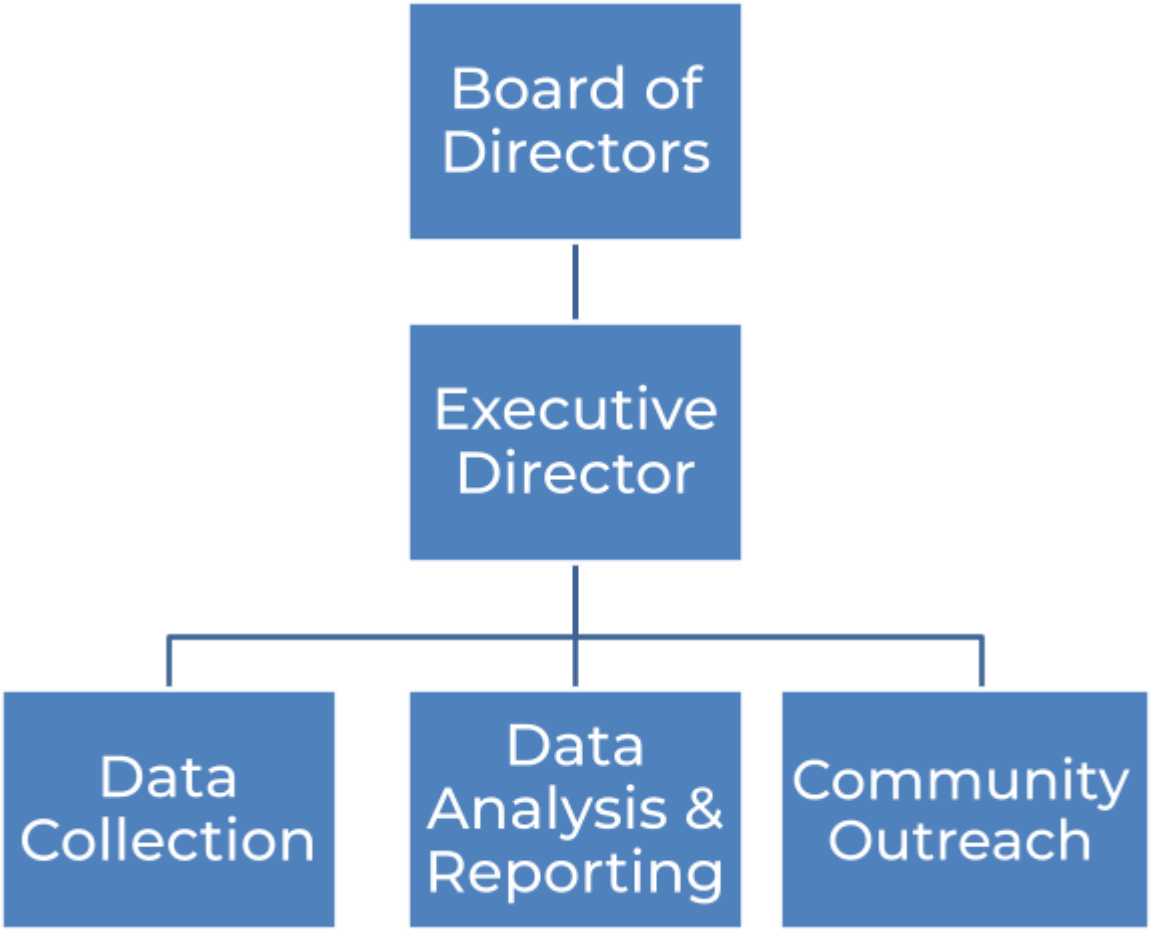
1 Project Organization Chart



Tampa Bay Waterkeeper will investigate water quality; build a grassroots network of water quality stewards; engage communities through hands-on science; provide training; and strengthen relationships among local and regional stakeholders. The sampling and other activities cover five watersheds: Hillsborough Bay, Old Tampa Bay, Middle Tampa Bay, Lower Tampa Bay and a coastal region of the Gulf of Mexico.

2 Document Distribution List

Name/Title	Contact Information
Justin Tramble/ Project Manager	justin.tramble@tampabaywaterkeeper.org
Alex Caruso/ Data Manager	info@tampabaywaterkeeper.org
John Troutt/ Quality Assurance Manager	info@tampabaywaterkeeper.org
Alex Caruso/ Sample Collector	info@tampabaywaterkeeper.org
Community Scientists	info@tampabaywaterkeeper.org

In addition to being directly distributed to the individuals above, this document will be posted on the Tampa Bay Waterkeeper website where it may be downloaded by the general public.

3 Project and Task Organization

Name	Title	Responsibilities
Justin Tramble	Project Manager	Manage overall project, conduct public policy and outreach programs, purchase supplies and equipment, recruit community scientists, and manage project safety protocol.
Alex Caruso	Data Manager	Coordinates sample collection with collaborators, manages sampler training and supervises samplers and community scientists. Enters data into SWIM Guide and appropriate database(s). Compile data for reporting purposes.
John Troutt	Quality Assurance Manager	Maintain the QA Project Plan, review data QA checks and data results. Generates Quality Assurance reports. Monitors Laboratory certification status.
Alex Caruso	Sample Collector	Collects samples and submit them to the laboratory. Completes all sample related documentation.
Community Scientists	Sample Collector	Collects samples and submit them to the laboratory. Completes all sample related documentation.
Any NELAC Certified	Laboratory	Receives samples and documents. Analyzes all samples and submits reports to Data Manager.

4 Problem Definition and Project Objectives

4.1 Problem Definition

Tampa Bay and the surrounding water bodies are used by residents and visitors for recreational purposes. Humans are in direct contact with the water and consume food harvested from these waters, which can make them sick if the water is contaminated with fecal matter. Many recreators are not aware the waters may be contaminated with fecal matter, the risks associated with that contamination, and where to find data regarding water quality.

It is known that wastewater discharges are a major contributing factor to water quality in the Tampa Bay region. Aging wastewater infrastructure is expected to further degrade Tampa Bay regional waters in the future. There are 23 domestic wastewater treatment plants with NPDES discharge permits in the Tampa Bay region. They are permitted to discharge a maximum of 363 million gallons/day of treated wastewater into the region. Generally, these wastewater treatment plants maintain compliance to their permits but there have been periodic permit violations due to mechanical failures or system overloads. Additionally, some of the regional wastewater infrastructure could be characterized as in a “deteriorating” state or operating past their design life span or with outdated technology.

There are also numerous industrial facilities with NPDES discharge permits, raw stormwater and non-point source discharges that could impact water quality in the Tampa Bay region.

4.2 Project Objectives

The Tampa Bay Waterkeeper’s Water Quality Testing Program objectives are to:

1. Identify where fecal contamination is present in the Tampa Bay region and reduce the number of contaminated sites over time.
2. Identify and reduce the frequency and severity of fecal contamination.
3. Increase the community’s awareness and knowledge about fecal contamination.

5 Background and History

Despite the Clean Water Act's goal of "swimmable" water, there is currently insufficient testing, or modeling and prediction, of water quality to properly assess whether it is safe to swim in the Tampa Bay region and its tributaries. Tributaries not only influence water quality near Tampa Bay regional bathing beaches, but also contain popular swimming holes well inland from the Tampa Bay region's shoreline. People also come in contact with the water while kayaking, canoeing, boating, tubing, and wading in tributaries.

The majority of beach closures and advisories in the United States are due to high levels of sewage contamination. In the Tampa Bay watershed, aging wastewater infrastructure and overburdened sewage systems are major causes of stream and river impairment.

In 2017, Tampa Bay Waterkeeper started testing for *Enterococcus* ("Entero"), an indicator of fecal contamination, at fixed locations in the Tampa Bay region. We observed that fecal contamination continues to be an issue in the region. While it is common for elevated Entero counts to be triggered by wet weather, some sites exhibited high counts during dry weather. Tampa Bay Waterkeeper's water quality testing results demonstrate the need for continued testing, analysis, and solution seeking.

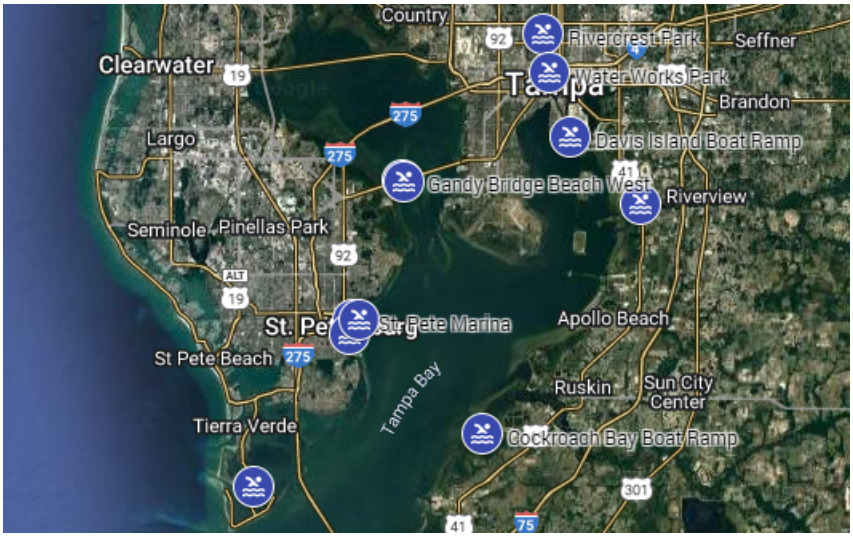
In the Tampa Bay Watershed, there is no comprehensive program in place to monitor sewage contamination, identify its sources, and work to resolve the root cause of contamination. Tampa Bay Waterkeeper's sampling program seeks to raise public awareness about the need for better water quality monitoring and provide information that will help communities resolve water quality problems.

6 Project Location

Our sampling program includes 11 sites located in the Tampa Bay region; all sites listed below are sampled by Tampa Bay Waterkeeper representatives.. Sites were selected based on a variety of factors including level of recreational use, access, and safety. If a site becomes inaccessible, relocation will be considered on a case-by-case basis. See Site Selection Criteria (Attachment A) for more details. From time to time, we may also test water quality at additional exploratory sites.

#	Site	Latitude	Longitude	Sample Frequency
1	Cockroach Bay Boat Ramp	27.687071	-82.520604	Twice Monthly
2	Davis Island Boat Ramp	27.911165	-82.445853	Twice Monthly
3	Fort De Soto Boat Ramp	27.64626	-82.71743	Twice Monthly
4	Gandy Bridge Beach West	27.878184	-82.589672	Twice Monthly
5	Gandy Bridge East	27.877039	-82.588117	Twice Monthly
6	Rivercrest Park	27.989062	-82.468378	Twice Monthly
7	St. Pete Marina	27.772716	-82.631609	Twice Monthly
8	St. Pete Pier	27.46254	-82.622075	Twice Monthly
9	USF St. Pete beachfront in Bayboro Harbor	27.7621657	-82.6353269	Twice Monthly
10	Water Works Park	27.95969	-82.463853	Twice Monthly
11	William's Park Boat Ramp	27.85999	-82.38466	Twice Monthly

Site Map- All Watersheds



7 Project Schedule

Activities	Person Responsible	Timeframe
Program Review and Design	Project Team (Tampa Bay Waterkeeper)	October 2021-June 2022
Training and Introductory Event	Project Team	March 2023
Water Quality Sampling	Sample Collector/ Community Scientists	On-Going: biweekly
Web Posting of Raw and Interpreted Data	Data Manager	On-Going: biweekly
Public Workshops	Project Team	Annually
Volunteer Trainings	Project Team	Annually
Data Analysis and Report	Project Team	On-Going: annually

8 Quality Control

The Tampa Bay region and its tributaries include saltwater, freshwater, and brackish environments. We use *Enterococcus* as an indicator of fecal contamination because it can be used in all salinities, allowing us to compare results directly among all of our sampling sites.

Tampa Bay Waterkeepers and community scientists will collect and analyze samples from the ten sites identified above, biweekly, year round totaling 260 samples. We intend to collect and analyze 26 duplicate samples. One duplicate sample will be processed on each sampling date by collecting two grab samples consecutively. Duplicate sites will be selected randomly at the start of the calendar year. Duplicate results will be used to understand environmental variation, as background information for data analysis, and for comparison with methodological variation. Because these controls are collected solely for information, there are no acceptable relative percent difference criteria for these samples.

Sampling will be conducted unless weather conditions or other factors make access unsafe for samplers. If a sampling event must be canceled or rescheduled, we will sample when conditions are clear, as scheduling permits, and duplicate samples will be included in the altered schedule. If the community scientist(s) assigned to a particular site are unavailable, for planned or unplanned reasons, the sampling coordinator will attempt to find a replacement sampler or if unable to, will conduct the sampling themselves.

Instructions on how to avoid introduction of bias during sample collection will be given during sampler training. First, samplers will be given precise access point information for their assigned sampling sites. Second, samplers will be trained to always access the water at the same point (insofar as natural changes in water level and bank configuration allow). Finally, samplers will be trained to take detailed notes of any suspicious or unusual conditions they encounter, especially those that prevent their ability to sample at their precise access point.

Since this project is a long-term monitoring study, rare gaps in sample coverage will not present a great challenge to the project. Data to be collected in the future are an extension of existing data sets, so they will provide information about average watershed conditions and site-by-site trends as long as data gaps are occasional and spread out in space. At an individual site, loss of 50% of samples or more, or loss of two months' worth of consecutive samples, will pose a challenge to interpreting trends at that site, and will make it difficult to compare that site's seasonal average with other sites. From time to time, changes in site access (e.g., road construction) may require a site to be dropped temporarily, moved or replaced. All available data will be posted on the Tampa Bay Waterkeeper website, regardless of data discontinuities. However, discontinued sites and sites with data gaps may be excluded from data summary reports and watershed data analyses, or footnoted with a disclaimer about data limitations.

9 Data Collection Methods

9.1 Site Names

Each site is assigned a unique ID (e.g. St.Pete Pier).

9.2 Sampling Design

The Tampa Bay Waterkeeper sampler and each community scientist will receive a copy of our Water Sample Data Sheet (Attachment B) and sampling Standard Operating Procedures (Attachment C) at the time of training.

Sampling will occur approximately bi-weekly. Water samples will be collected for *Enterococcus* using sterile containers provided by the laboratory. Samples will be taken from the stream banks or shoreline with minimal disturbance to sediments. Samplers will wear disposable gloves to avoid contamination.

Samplers will record the location and time of sampling on the bottle or on waterproof labels (U- Line item #S-16643 or similar) with a permanent marker and on the water sample data sheet.
Samples will be immediately placed on ice in a dark container for transport to the laboratory. Upon sample delivery, laboratory staff will note on the Chain of Custody spreadsheet (Attachment D) the time of receipt and the name of the sampler for each sample.

Maximum sample holding time is six hours. In each watershed, there will be a designated sampling start time and lab drop-off time to ensure that the maximum holding time will not be exceeded. The sampling sites will be grouped into routes that a sampler or sampling team can visit within the designated time frame, with time to reach the drop-off point and time to spare. The site groupings will be determined prior to the start of the calendar year.

Field duplicates will be assigned prior to the start of the calendar year. One field duplicate will be processed per sampling day.

9.3 Non-Direct Measurements

The Tampa Bay Waterkeeper sampler and each community scientist will record three non-direct measurements at each site during sample collection; evidence of beach wrack, weather conditions and previous day rainfall presence or absence.

Beach wrack is natural material that washes onto the beach and includes algae, sea grasses, and some invertebrates such as sponges and soft corals. Wrack serves as the primary source of nutrients to beach communities and is the foundation for the food chain. Samplers will record if beach wrack is visibly evident at or near the sampling location. Beach wrack may act as a surface for Enterococci bacteria to adhere to and proliferate on, resulting in high bacteria counts and giving the false impression of a waterbody highly contaminated with fecal waste.

Weather conditions are specific to the sample location and time of collection. Samplers should estimate wind direction and speed in real time just prior to sampling. Samplers will record wind direction by the direction from which it originates. For example, a north or northerly wind blows from the north to the south. Wind speed is estimated in miles per hour and recorded with the wind direction. If no wind is detected during collection, samplers can record “no wind” on the Water Sample Data Sheet.

Rainfall conditions are regionally specific. Samplers will note the presence or absence of rain within the last 24 hours at each site. If the sampler is not local to the area, they are encouraged to use cell phone based applications such as “Weather Channel” or local news channels to access daily rainfall records.

10 Equipment List and Instrument Calibration

10.1 Equipment

Field:

- Cooler with ice to completely cover samples (no ice packs/blocks) *If using a Styrofoam cooler, place samples inside a black bag inside the cooler
- Sterile sample containers, note these contain a sodium thiosulfate tablet
- Individual plastic bags for each sample container to be placed in
- Rubber gloves
- Permanent marker & pen
- Watch
- Chain of Custody form
- Water Sample Data Sheet
- Salinity meter
- Deionized Water

10.2 Instrument Calibration and Maintenance

Instruments are to be calibrated according to the manufacturer's calibration procedure prior to analysis of samples, each day compliance monitoring is performed. For most meters, this is a one-standard calibration.

Instruments will be kept clean and dry when not in use.

10.3 Inspection/Acceptance of Supplies and Consumables

- Equipment will be inspected before and after each sampling event by Tampa Bay Waterkeeper staff or community scientist and documented in the 'notes' section of the Water Sample Data Sheet.
- Cooler or Ice Chest will be inspected for cleanliness before each sampling event
- IDEXX 100-ml sealed sterile disposable plastic bottles with sodium thiosulfate will be visually inspected for damages or broken seals.

11 Analytical Method

Tampa Bay Waterkeeper will submit all samples to a NELAC certified laboratory. The laboratory will be centrally located in the region to allow the sample staff to get samples to the laboratory within the six hour holdtime. The laboratory must be certified to complete *Enterococcus* analysis on surface water samples using the IDEXX Enterolert method (Standard Methods 9230). Multiple geographically dispersed labs may be utilized.

12 Training and Specialized Experience

12.1 Training

Personnel to be Trained	Description of Training	Frequency of Training
Sample Collectors and Community Scientists	Introduction to water quality, fecal indicator bacteria and project purpose. How to sample How to avoid sample contamination How to handle samples How to obtain consistent samples How to operate, maintain, and calibrate instrumentation. How to complete Water Sample Data Sheet	Prior to the first sampling trip and annual refreshers available and required if regular quality control issues are discovered.

Field personnel will be trained in sample collection and handling by project staff listed in section 13.2, or by experienced samplers. The Project Manager will keep a list of trained samplers. Training will include information listed in the above table. Samplers will receive a copy of the approved Water Sample Data Sheet (Attachment B), Standard Operating Procedure for both Enterococci sampling and measuring salinity (Attachment C), Chain of Custody (Attachment D), and Safety Protocol (Attachment E). Sample teams will also be given all the supplies needed to conduct sampling after they've completed the training, signed a waiver, and shadowed the Sample Collector in the field during at least one site sampling effort.

12.2 Specialized Experience

The Project Manager and Data Manager or an outside qualified party will complete training of Community Scientists on approved sample collection and handling procedures. The training may be conducted by a team of professionals that include community engagement professionals to inspire and motivate volunteers and water quality scientists to ensure proper training of standard operating and quality control procedures.

13 Assessments and Oversight

Assessment Type	Frequency of Assessment	What Is Being Assessed	Who Will Conduct the Assessment	How Issues or Deviations Will Be Addressed	How Results Will Be Documented	Who Results Will Be Reported To
Sampling protocol	Each sampling date	Sample container and transport Sample volume Data recording (sampling time, location, etc.)	Sampler	Personal communication with community scientists. Updates or clarifications to SOPs and QAPP if needed.	Affirmative checks (i.e., no problems found) will not be recorded Negative checks will be noted on chain of custody sheet	QA Manager
Data transcription	Each sampling date	Completeness and accuracy of online data Accuracy of water quality rating	Data Manager r	Correct errors	End-of-year report	Project Manager
Data quality check	End of year	Completeness and accuracy of master data sheet	QA Manager	Correct errors	End-of-year report	Project Manager

14 Data Management

Scanned Water Sample Data Sheets and Chain of Custody sheets will be delivered or emailed to the Data Manager and QA Manager. Entero count results will be transcribed into a digital spreadsheet by the Data Manager, who will oversee uploading to the Tampa Bay Waterkeeper website. A minimum of 10% of sites will be checked online for accuracy immediately after uploading by the QA Manager.

15 Data Review and Usability Determination

Field/Lab	Data Management
• Field duplicate results • Sample holding times • Sample handling	• Rating errors • Transcription errors • Data completeness by site • Unexplained data gaps

Annual Checks Prior to Sampling

The QA Manager will verify the laboratory has maintained NELAC certification for enterococci bacteria using the Enterolert.

Data Checks During Sampling

The Sample Collector and Community Scientist will check for handling error, sampling time recording and missed sampling sites as samples are delivered. Problems will be noted on the Chain of Custody sheet. Sample holding times will be evaluated when field sample results are recorded.

Data Checks after Analysis and Reporting

Results of sample analysis and QC samples (Lab Qualifiers and field duplicates) will be recorded by the Data Manager in a dedicated QC sample spreadsheet. The spreadsheet will contain formulas to automatically check acceptance criteria and flag samples that do not meet QC goals. The QA Manager will review the QC sample spreadsheet periodically for quality control issues and will generate an exception report for samples failing to meet the QA criteria.

If QA criteria are not met, samples will be qualified as follows in the master spreadsheet:

- "HA" – Sample handling did not meet criteria (individual samples will be qualified)
- "HT" – Sample holding time was exceeded (individual samples will be qualified)
- "LQ" – Lab qualifiers

Except in severe cases (e.g., severe violation of sample handling criteria resulting in clear evidence of sample degradation, such as temperature), sample results will be posted on the Tampa Bay Waterkeeper website and shared with samplers. These communications methods include background information to guide interpretation of results and prevent misapplication of data, including disclaimers that the study is designed to assess long-term trends and that sample data cannot be used to predict conditions at specific times and places.

Annual Data Checks

All data will be compiled annually at the end of the calendar year. The number of data lines for the year will be checked against the number of samples planned to ensure that there are no missing data lines. Discrepancies will be referenced with Chain of Custody and Water Sample Data Sheets, and missing data will be added to the master spreadsheet. After all data has been compiled, 3% of data lines in the master spreadsheet will be selected at random to check for data entry errors.

A data line contains the site ID, date, time, Entero count, duplicate salinity measurements, beach wrack presence/absence, wind direction & velocity, recent precipitation presence/ absence, and any relevant notes. The values in the master spreadsheet for each entry on the selected data lines will be verified against the Chain of Custody and Water Sample Data Sheets. If discrepancies are found, the data lines for all samples collected on that date will also be verified. Any errors will be corrected in the master spreadsheet and on the Tampa Bay Waterkeeper website. The QC reports and QC sample spreadsheet will be reviewed for trends by the QA Manager and Project Manager at the end of the year. The team will also assess data record completeness site by site. The team will consider separately whether

violations of acceptance criteria preclude data from being used for site-specific analyses and overall watershed analyses; data may be deemed useable for one purpose and not the other. If data are determined to be unusable the lines will be removed from the master spreadsheet and archived in the QC sample spreadsheet. Limitations on data usability will be noted in the master spreadsheet.

A summary of sampling statistics (number of sites sampled, total number of samples) and a qualitative explanation of data variability will be disseminated to the public in annual reports.

16 Reporting

After each sampling date, raw Enterococci count data will be saved in a shared Google Spreadsheet that is uploaded to the Tampa Bay Waterkeeper website (www.tampabaywaterkeeper.org/water-quality-monitoring) and analyzed data will be uploaded to the SWIM Guide website. Scanned water quality data sheets and chain of custody sheets will be saved indefinitely on Tampa Bay Waterkeeper's server. All data will be transcribed to the master data sheet at the end of the calendar year. The master data sheet will be saved indefinitely on Tampa Bay Waterkeeper's server.

Tampa Bay Waterkeeper rates the water quality of each sample in comparison to the U.S. Environmental Protection Agency's (EPA) 2012 Recreational Water Quality Criteria as follows:

- 0-70 CFU per 100mL enterococci per sample: Safe for swimming
- 71+ CFU per 100mL enterococci per sample: Not safe for swimming

Tampa Bay Waterkeeper's website explains the rating system that is used. Tampa Bay Waterkeeper urges participants in the sampling program, and the wider public, to use data from this program to inform themselves and others about water quality conditions in their communities and to pursue solutions to local pollution problems. Tampa Bay Waterkeeper staff use the water quality data to advocate for increased investment in wastewater infrastructure, better enforcement of existing water quality protections, more frequent water quality sampling, and better prediction and public notification of sewage contamination.

Periodic reports summarizing data and findings are released. These reports explain methods, highlight key findings, and rank sites based on Enterococci sampling results . Tampa Bay Waterkeeper's reports include guidance about how our water quality data should be interpreted. The reports are available on the Tampa Bay Waterkeeper website for viewing or download.

Criteria for Selecting a Water Quality Monitoring Site for Enterococci Bacteria

Background

The current list of sampling sites was originally selected by the staff of the Suncoast Waterkeepers and monitoring has continued after the formation of the Tampa Bay Waterkeepers chapter. These sites were selected by soliciting input from community watershed groups, state and local environmental agency staff, members of sports and outdoor associations, and other people with local knowledge. Ease of access, permanence of access, and volunteer safety were also considered during sample site selection. The purpose of this document is to establish criteria for justifying the continued monitoring of current sites and possible addition of future sites.

Site Selection Criteria

While there are many factors to consider when selecting a water quality monitoring site, there are five critical factors. These are listed in order of priority.

1. Legal Access
2. Public Exposure
3. Site Safety
4. Monitoring Status
5. Historical Data

Legal access is required for each sample site location. If the site is privately owned, Tampa Bay Waterkeeper should seek written permission to collect samples at the site. If written permission is not granted the site will not be added to the sampling effort and an investigation for a nearby alternative public site should be conducted.

Public exposure is a concern as the presence of enterococci bacteria is an indicator of other harmful bacteria in a body of water used for recreational purposes. The water bodies where the general public are in direct contact or swim in the water should be a higher priority for monitoring over a site primarily used for other recreational activities with minimal direct contact, such as boating or fishing. Sites in, near, or utilized by disadvantaged communities will be a high priority, as historically disadvantaged communities are disproportionately affected by environmental pollutants.

Site safety is a concern for any staff or volunteer involved in sample collection. The site must have safe parking with less than 1000 feet of direct access to the water body. The procedure requires access to the water body to collect a representative sample either by wading into the water or from a structure over the water, such as a dock or pier. If wading the site must be clear of potential submerged trip hazards, sharp objects or deep holes that could injure the sampler.

Monitoring status, sites currently included in an active monitoring program by outside agencies should be given lesser priority over a new, inactive or seldom sampled monitoring site where the general public is frequently in direct contact with the water body such as swimming or wading areas.

Historical data, if the site displays a chronic or intermittent history for the presence of enterococci bacteria, it should be given a higher priority over a site with historically no detection or low incidence of the presence of enterococci bacteria. Additionally, long term data sets are important for determining changes in site condition over time, therefore caution should be used when deciding to change or remove a site.

While the above criteria are critical, other factors may also be taken into considerations:

- Ease of sampling
- Proximity to point source discharges especially waste water discharge
- Proximity to stormwater discharges

Site Evaluation Process

Tampa Bay Waterkeepers should maintain a list of all actively monitored sites in their region regardless of the monitoring agency. This list should be evaluated annually by an internal committee of at least three staff members or volunteers using the criteria listed above.

Attachment B

Tampa Bay Waterkeeper

Water Sample Data Sheet

Benchmark EnviroAnalytical, Inc
1711 12th Street East
Palmetto, FL 34221
941-723-9986

Tampa Bay Waterkeeper
260 1st Avenue South, Box 226
St. Petersburg, FL 33701
chairman@tampabaywaterkeeper.org
alexander.caruso15@suncoastwaterkeeper.org

Laboratory Submission #:							
					Weather Conditions		
Sample Name/ID	Date & Time	Salinity #1	Salinity #2	Beach Wrack (Y/N)	Wind Direction & Velocity (mph)	Recent Precipitation (Y/N)	Notes

Salinity Probe

Calibration Standard Documentation

Instrument serial number:	True Value:	Date Opened:	Lot Number:	Manufacturer:

Collector Name: _____

Collector Signature: _____

TAMPA BAY WATERKEEPER®

PROCEDURE FOR THE COLLECTION OF SURFACE WATER SAMPLES FOR ENTEROCOCCI ANALYSIS

This document provides an approved procedure for the collection of surface water samples for Enterococci per FS 2100.

Purpose

This document describes general and specific procedures, methods and considerations to be used and observed when collecting surface water samples for field screening or laboratory analysis.

Scope/Application

The procedures contained in this document are to be used by field personnel when collecting and handling surface water samples in the field. On the occasion that TBWK field personnel determine that any of the procedures described in this section are either inappropriate, inadequate, impractical, or unsafe and that another procedure must be used to obtain a surface water sample, the variant procedure will be documented on the Water Sample Data Sheet, along with a description of the circumstances requiring its use.

General Information

- Proper safety precautions must be observed when collecting surface water samples. All TBWK field personnel must follow all safety protocols and wear a Coast Guard Approved Personal Flotation Device (PFD) when working around water. Be observant of any physical, chemical or biologic hazards that pose specific toxicity or safety concerns and follow any other relevant requirements, as appropriate.
- Special care must be taken not to contaminate samples. Samplers must be careful to not touch the inside of the pre-sterilized bottle or cap during any part of the sampling collection process.
- Collected samples are in the custody of the sampler or sample custodian until the samples are relinquished to another party.
- If samples are transported by the sampler, they will remain under his/her custody or be secured until they are relinquished.
- Documentation of field sampling is done on the Water Sample Data Sheet.
- Chain-of-custody (COC) documents shall be filled out and remain with the samples until custody is relinquished.

Special Precautions for Surface Water Sampling

- A clean pair of new, non-powdered, disposable gloves will be worn each time a different location is sampled, and the gloves should be donned immediately prior to sampling.
- Samples suspected of containing high concentrations of contaminants shall be stored separately. This can be accomplished by placing the sample into an individual plastic bag and/or dividing the cooler into sections with a physical barrier.
- If possible, one member of the field sampling team should complete the Water Sample Data Sheet, COC, take photographs, and fill out bottle labels, etc., while the other member(s) collect the samples.

Supplies Needed for Sampling

- Cooler with ice to completely cover samples (no ice packs/blocks) *If using a Styrofoam cooler, place samples inside a black bag inside the cooler
- Sterile sample containers, note these contain a sodium thiosulfate tablet
- Individual plastic bags for each sample container to be placed in
- Rubber gloves
- Permanent marker
- Watch
- Chain of Custody form
- Water Sample Data Sheet
- Salinity Meter

Steps to Follow when Sampling

1. Always sample from the same location!
2. Measure salinity using the salinity meter and record.
3. Write the location, time, and sampler name on the sample container.
4. Put rubber gloves on both hands.
5. Look for moving water. If you can't reach it from the bank, wade into the water body (move carefully to avoid stirring up sediment) or step out on rocks until able to reach moving water.
6. Submerge the bottle upside-down to a depth of approximately 6 to 12 inches. While still underwater, pop the cap off slightly to allow for water to enter, then tilt the bottle upwards until air escapes, with the opening facing upstream, fill the container to the "shoulder" of the bottle.
7. Cap the bottle and remove from the water body.

8. Immediately place the sample in the sealed plastic bag and store upright in the cooler on ice.
9. If you see anything unusual while sampling (e.g., outfall pipes flowing in dry weather, extensive algal growth, beach wrack), take close-up and wide-angle photos, and record observations on the Water Sample Data Sheet.
10. Deliver the sample to the lab within 6 hours of sample collection.

Documentation

The following must be documented on the Water Sample Data Sheet and/or Chain of Custody form, as needed, in indelible ink whenever a sample collection is performed:

- Sample site name or coordinates (ID or location)
- Date and time of sample collection
- Salinity measurement results and calibrations (if applicable).
- Field meter serial numbers (if applicable)
- Date and lot numbers for all calibration standards (if applicable)
- Presence or absence of beach wrack
- Weather conditions including wind direction & velocity, and if there was recent precipitation
- Any relevant notes
- Sample collector's name and signature

DEP Procedures Link

https://floridadep.gov/dear/quality-assurance/content/dep-sops

TAMPA BAY WATERKEEPER®

PROCEDURE FOR THE ANALYSIS OF SALINITY

(Electrical Conductivity Method)

This document provides an approved procedure for the analysis of salinity for monitoring per FT 1300.

Holding Time

- Salinity is measured in situ in the field.

General Information

- Sample duplicates are required as a quality control element for field parameters.
- Sample results are to be reported in units of parts per thousand (ppt) which is equivalent to Practical Salinity Units (PSU).
- Salinity should be measured directly in the field with the meter and probe.
- Keep the probe clean and dry when not in use.

Standards

Potassium Chloride (KCl) conductivity standards may be purchased or prepared according to Table 2510:I of Standard Methods, 2510 A - 2011.

Calibration

1. Instruments are to be calibrated according to the manufacturer's calibration procedure prior to analysis of samples, each day compliance monitoring is performed. For most meters, this is a one-standard calibration.
2. Thoroughly rinse the probe with one or more portions (three recommended) of the standard prior to calibration.

Steps to Follow when Sampling

1. Thoroughly rinse the probe with one or more portions of deionized water.
2. Immerse the probe in the sample stream and allow it to come to temperature, about 3 minutes while stirring. If salinity is fluctuating, estimate an average value after the 3 minute time period.
3. Read and record salinity in PSU/ppt units.
4. Remove the probe from the sample stream and then immerse the probe back into the stream to collect duplicate results. If salinity is fluctuating, estimate an average value after the 3 minute time period.
5. Read and record the second duplicate salinity in PSU/ppt units.
6. Remove the probe from the sample stream and rinse the probe with deionized water and store dry.

Documentation

The following must be documented in indelible ink whenever sample analysis is performed:

1. Date and time of sample measurement.
2. Sample site (ID or location)
3. Collector's/analyst's name or initials
4. True value of the standard used for calibration
5. Duplicate sample measurement values
6. Units of measure (ppt)
7. Traceability for standard (Manufacturer, date opened and lot number)
8. Instrument identification (serial number preferred)

DEP Procedures Link

https://floridadep.gov/dear/quality-assurance/content/dep-sops

This document was prepared using Standard Methods 2520 B-2011 and Standard Methods 2510 B – 2011 as a reference.

Attachment D

Benchmark EnviroAnalytical,Inc
1711 12th Street East
Palmetto, Fl 34221
941-723-9986
941-723-6061 Fax

Results reported by Friday Morning

Sample Temperature checked upon receipt with Temperature Gun ID #258

Client Information: **Tampa Bay Waterkeeper**
260 1st Avenue South
Box 226
St. Petersburg, FL 33701
chairman@tampabaywaterkeeper.org
alexander.caruso15@suncoastwaterkeeper.org

Project Name: TBWK ROUTINE SAMPLING

Laboratory Submission #

Sample Name / ID	Sample Type[1] / Sample Matrix[2]	Collection		Container			Preservative[4]	Parameters for Analysis	Laboratory Sample #
		Date	Time	Qty	Capacity	Type[3]			
	G / SSW			1	100mL	Sterile Plastic	NaThio	Enterococci (Enterolert)	
	G / SSW			1	100mL	Sterile Plastic	NaThio	Enterococci (Enterolert)	
	G / SSW			1	100mL	Sterile Plastic	NaThio	Enterococci (Enterolert)	
	G / SSW			1	100mL	Sterile Plastic	NaThio	Enterococci (Enterolert)	
	G / SSW			1	100mL	Sterile Plastic	NaThio	Enterococci (Enterolert)	
	G / SSW			1	100mL	Sterile Plastic	NaThio	Enterococci (Enterolert)	
	G / SSW			1	100mL	Sterile Plastic	NaThio	Enterococci (Enterolert)	
	G / SSW			1	100mL	Sterile Plastic	NaThio	Enterococci (Enterolert)	
	G / SSW			1	100mL	Sterile Plastic	NaThio	Enterococci (Enterolert)	
	G / SSW			1	100mL	Sterile Plastic	NaThio	Enterococci (Enterolert)	

1 "Sample Type" is used to indicate whether the sample was a grab (G) or whether it was a composite (C).
2 "Sample Matrix" is used to indicate whether the sample is being discharged to drinking water (DW), groundwater (GW), surface water (SW), fresh surface water (FSW), saline surface water (SSW), soil, sediment (SDMNT), or sludge (SLDG).
3 "Container Type" is used to indicate whether the container is plastic (P) or glass (G).
4 Sample must be refrigerated or stored in wet ice after collection. The temperature during storage should be less than or equal to 6°C(42.8°F).
Under "Preservative," list any preservatives that were added to the sample container.

Laboratory Sample Acceptability:
Temperature:

Instructions:
1. Each bottle has a label identifying sample ID, premeasured preservative contained in the bottle, sample type, client ID, and parameters for analysis.
2. The following information should be added to each bottle label after collection with permanent black ink: date and time of collection, sampler's name or initials, and any field number or ID.
3. All bottles not containing preservative may be rinsed with appropriate sample prior to collection.
4. The client is responsible for documentation of the sampling event. Please note special sampling events on the sample custody form.

1	Collected By (Print):	Date	Time	Received By (Print):	Date	Time
	Collected By (Sign):			Received By (Sign):		
2	Relinquished By (Print):	Date	Time	Received By (Print):	Date	Time
	Relinquished By (Sign):			Received By (Sign):		

Water Sampling Safety Protocol

Surrounding conditions

It is very important that you are aware of your surroundings while sampling (weather, animals, plants, people). If a sampler feels unsafe or uncomfortable under any circumstances, immediately abandon the effort; and seek safety. Call law enforcement if necessary.

General Public: While sampling you may be approached by people interested in what you are doing. This is a great opportunity to engage with the community. However, you are under no obligation to engage with anyone. If someone is making you feel uncomfortable, disengage and leave. Use your best judgment and never put yourself in a situation that you can't get out of.

Insects: Protect yourself from insects: wear light-colored clothing that covers your body, avoid scented products, use insect repellent, and if you'll be walking through high grass tuck your pants into your socks to prevent tick bites. Remember: many insect bites result in mild reactions: redness, itching, or minor swelling. However some insects bites and stings can cause severe reactions and also carry disease.

Plants: Know and avoid plants that can cause rashes such as poison ivy, poison oak, poison sumac, and poison wood. Learn more here. Additionally some plants have thorns, prickly seeds and other irritants. Be aware of your surroundings and be careful where you walk.

Wildlife: While encountering dangerous critters in the field is rare, always be alert.

Physical conditions: While sampling be on the lookout for potentially unsafe conditions including slip hazards, debris, and unstable ground, such as mud, which you may sink into. Rocks and boulders may appear to be safe to walk on but can be covered with a thin layer of extremely slippery algae. Any rock that appears black is probably covered with algae and should not be walked on. Carefully touch rocks before walking on them to test if they are slippery. Launch ramps can be especially slippery at and below the high water line.

Additionally wooden docks could cause splinters. If sampling from a wooden dock, consider bringing a towel to lay down if you need to get on your hands and knees.

Water Safety: Wearing a Personal Flotation Device (PFD) during sampling is strongly encouraged. Due to the nature of this work, all samplers certify they are able to swim at least 50 yards, and tread water for at least 5 minutes.

Thunderstorms & inclement weather

Sampling is expressly forbidden during thunderstorms: a sampler who hears thunder or sees lightning should immediately abandon the effort and return to their vehicle for shelter. At this point, the sampler should seek a weather forecast (using a mobile device) to determine if the storm will pass soon.

If the storm will pass soon: The sampler may wait in order to finish sampling. The waiting time recommended by the National Weather Service is 30 minutes after the last clap of thunder.

If the storm will not pass soon: The sampler may go ahead and move on to the next station or, depending on the forecast, abandon the rest of the day's effort and deliver collected samples to the laboratory.

In the case of the following inclement weather situations, the sampler must abandon the remaining sites and return to safety...

Tornadoes (warnings & watches), Hurricanes, Extreme Wind & Hail Storms.

If there is ever a situation where you are caught on the road in the midst of a storm, pull over to safety.

Contact with Contamination

Don't forget why we are sampling. We're looking for fecal indicator bacteria. Protect yourself from potentially contaminated water. Keep the water away from your eyes, nose, and mouth. If you have any cuts or abrasions ensure they are protected from contact with the water. Shaving may cause small micro-cuts, consider not shaving the day of sampling to allow any micro-cuts that may come in contact with the water a chance to heal.

Health

Being in the field, especially for extended periods or during high temperatures, can take a toll on any person. Make sure to take care of your needs.

- Stay hydrated: bring and drink plenty of water.
- Protect yourself from the sun: wear sunscreen, long sleeves, a hat, and sunglasses.
- If you'll be in the field for extended periods, bring snacks.
- Have a basic first aid kit handy.
- Don't forget the bug spray.

If you feel faint, dizzy, or have signs of heat stroke, call for help immediately and move to a safe location out of direct sunlight.

Driving

Driving is the most hazardous activity during the sampling process. Be sure to obey all traffic laws, park in safe locations out of the right of way, avoid aggressive drivers, secure sampling equipment in the vehicle, and avoid distractions: no texting, phone calls, multi-tasking, etc.