Louisiana Department of Health
Office of Public Health
Center for Environmental Health

Louisiana BEACH Grant Report
2020 Swimming Season

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In cooperation with Louisiana Department of Health
Office of Public Health, Center for Environmental Health

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EXECUTIVE SUMMARY

This document was prepared to partially fulfill the Louisiana Department of Health's (LDH; formerly known as Louisiana Department of Health and Hospitals [LDHH]), Office of Public Health, Center for Environmental Health Services (CEHS) reporting obligations under the U.S. Environmental Protection Agency's (USEPA) BEACH grant program, Federal Assistance Agreement Number CU-01F63701-0. Prior to publication of this report, the document was distributed to USEPA and the Louisiana Department of Environmental Quality for comments. The comments provided by both agencies were incorporated into this report. The report was made available to the public through CEHS's Beach Monitoring Program website (http://www.dhh.louisiana.gov/index.cfm/page/288).

As documented in *Louisiana's BEACH Grant Final Report – Grant Year 2001* (LDHH 2003; the Beach Report) and *Louisiana's Beach Program Quality Assurance Project Plan* (QAPP; LDH 2020), CEHS is to submit an annual technical report to USEPA after the end of the recreational period that summarizes the number of beaches monitored in each Tier, lists any additional beaches to be added to the Program or Tier reassignments to be made in the next year, presents a compilation of sampling results, and summarizes beach assessment activities and response actions. The report is to also include for Tier 1 and 2 beaches, the number of beach monitoring stations for which advisories were issued, the number of times beach advisory criteria were exceeded and the number of days under advisories for each beach monitoring station. This report satisfies the reporting obligations set forth in the Beach Report and outlined above.

Between 1 April 2020 and 31 October 2020, a total of 568 samples were collected at 23 sample stations across 9 Tier 1 or 2 continuous beach segments. Monitoring was initiated and conducted on schedule from the start of the monitoring season (1 April) through the end of the season (31 October), although sampler contracting issues and numerous hurricanes reduced the number of samples collected in 2020. Enterococci densities were relatively stable between 2019 and 2020 and comparable to recent years at Constance Beach Complex, Cypremort Point State Park Elmer's Island, Grand Isle State Park and Rutherford Beach, greater at Holly Beach in 2020 than in 2019, and less at Fontainebleau State Park, Grand Isle Beach, Lake Charles North Beach in 2020 than in 2019. Improved enterococci densities in 2020 were likely influenced by the return of more typical salinity during 2020 at all beaches (Figure 4), following the low salinity during 2019 from extremely high discharge of fresh water from the Mississippi River throughout the 2019 monitoring season.

Thirty-eight (38) advisories and 1 closure were issued during the 2020 swim season. Advisories were issued at 19 of 23 Tier 1 or 2 sample stations during 2020 based on observed water quality exceedances. Compliance at stations monitored throughout the swimming season varied between 100% of monitored days in compliance at five stations (ELMR1, GIB3, GISP1, GISP2 and GISP4), to a low of 27% for FNTB1. Across all monitored sample stations, 69% (1,262 of 4,120) of the 2020 swimming season's available station-days (monitored station-days not under closure) were in compliance and not under an advisory.

Beach advisories issued in 2020 resulted from exceedances of enterococci geometric mean or single sample maximum criteria (in compliance if enterococci geometric mean ≤ 35 MPN/100

ml and sample enterococci density ≤ 104 MPN/100 ml). The enterococci GM was exceeded in 173 of 183 (95%) observed noncompliance station-weeks, with 110 (60%) of those noncompliance weeks resulting from enterococci geometric mean exceedances only, 63 (34%) resulting from both enterococci geometric mean and single sample maximum exceedances, and 10 (6%) resulted from exceedance of enterococci single sample maximum criterion alone.

As discussed in previous Louisiana BEACH Grant reports, Louisiana's percentage of station-weeks that were under advisory is not directly comparable with other states that do not use equivalent beach advisory criteria. Louisiana would have issued only 40% of its 2020 advisories if the State's decision rule was based only on the enterococci single sample maximum criterion (≤104 CFU/100mL). If Louisiana had used the Beach Action Value (BAV) criterion of 60 CFU/100mL[1] during 2020 in lieu of its current criteria, 84% of the weekly advisory decisions would be unchanged, 13% of station-weeks placed under advisory for exceedance of Louisiana's criteria would be deemed in compliance, and 52% of 2020 station-weeks exceeded the BAV criteria but were in compliance with Louisiana's beach advisory criteria. Accordingly, Louisiana's beach advisory criteria are more protective of public health than the BAV criterion.

Based on year-end audit and data review, all completeness goals were achieved during 2020, and there were no variances from the QAPP detected. Of the 568 samples successfully processed, all results were considered valid and recorded in the Program's database. All monitoring and notification data collected during 2020 have been uploaded to the appropriate USEPA data storage systems (available through EPA's Water Quality Portal [https://www.waterqualitydata.us/] and BEACON [http://watersgeo.epa.gov/beacon2/about.html]).

In preparation for the 2021 Beach monitoring season, the Program reassessed risk levels at monitored beaches to determine whether additional beaches warranted monitoring. Risk is a function of historical water quality conditions based on past Program sampling and beach use. Based on observed use levels and patterns during the 2020 swimming season and projections of use for the 2021 swimming season, it is anticipated that use levels and patterns will remain at approximately historical levels for all beaches.

The anticipated use and historical water quality risk levels resulted in the 2021 monitoring season classification of six continuous beach segments as Tier 1 beaches (Fontainebleau state Park [FNTB], Elmer's Island [ELMR], Grand Isle [GISP] and Cypremort Point State Parks [CYPTSP], Holly Beach [HOLLY], and North Beach [LCNB]), three beach segments as Tier 2 (Grand Isle Beach [GIB], the Constance Beach Complex [CNSTBC], and Rutherford Beach [RUTH]), and one Tier 4 beach segment (Elmer's Island East). In 2021, it is anticipated that the Program will monitor approximately 6 beach miles as Tier 1 beaches, approximately 14 miles as Tier 2 beaches, and 0 miles of Tier 3 and 4 beaches.

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[1] As recommended in *National Beach Guidance and Required Performance Criteria for Grants*, EPA-820-D-13-001, dated April 18, 2014.

CHAPTER 1. Purpose, Background and 2020 Program Accomplishments

Purpose

According to *Louisiana's BEACH Grant Final Report – Grant Year 2001* (the Beach Report; LDHH 2003) and *Louisiana's Beach Program Quality Assurance Project Plan* (QAPP; LDH 2020), the Louisiana Department of Health (LDH; formerly known as Louisiana Department of Health and Hospitals [LDHH]), Office of Public Health (OPH), Center for Environmental Health Services (CEHS) is to submit an annual technical report to U.S. Environmental Protection Agency (USEPA) after the end of the recreational period. The report should accomplish the following: summarize the number of beaches monitored in each Tier, list any additional beaches to be added to the Program or Tier reassignments to be made in the coming year, provide a compilation of the sampling results, and summarize beach assessment activities and response actions. This report serves as the annual technical report for the 2020 recreational period and satisfies all the requirements described above.

This document consists of four chapters. In this chapter, 2020 Program accomplishments are summarized. Chapter 2 contains a summary of the number of beaches that were monitored in each Tier, and a description of updates to Louisiana's BEACH Program, as anticipated under the Beach Report. Louisiana's BEACH Program updates include descriptions of 2020 Program modifications and changes to Tier assignments and beaches to be monitored under the Program in 2021. In Chapter 3, monitoring and response efforts and results for 2020 are provided. Data quality assessment results for the 2020 swimming season are presented in Chapter 4. Appendices A, B, and C contain station names and USEPA IDs, time series analyses of water quality data, and sample results, respectively. Appendix D provides a summary of how Louisiana's BEACH Program has fulfilled the original BEACH Grant requirements.

Background

In many ways, water could be considered Louisiana's greatest natural resource. Louisiana's vast estuarine basins provide a unique playground for swimming, wading, boating, fishing, and other aquatic activities; however, swimming in waters with high bacteria densities from fecal sources are a known threat to public health, causing elevated rates of gastrointestinal illness. Louisiana Department of Environmental Quality (LDEQ) has historically conducted routine ambient monitoring of state coastal waters designated for primary contact recreation and utilized fecal coliform criteria to assess attainment of ambient water quality standards for swimming uses. However, there were no mechanisms in place to routinely sample water quality at "high-use" swimming waters, which had not been designated in state regulations by LDEQ, or to provide the public with the results of risk-based analyses that allow for an informed decision prior to swimming in selected coastal recreation waters.

In response to growing concern about public health risks posed by polluted bathing beaches, the U.S. Congress passed the BEACH Act in 2000. In 2001, the USEPA, under the provisions of the BEACH Act, made grant funds available to the OPH for the development of a monitoring and notification program for high-use coastal recreation sites, referred to as Louisiana's BEACH

Program. Since initial grants were awarded, Louisiana's BEACH Program has been developed and successfully implemented under the guidance of the CEHS.

Consistent with USEPA's guidance, Louisiana's BEACH Program consists of two primary activities: monitoring and notification. Since bacteriological contaminants cannot be effectively monitored directly, monitoring for fecal contamination of surface waters requires the identification of indicator organisms that are associated with fecal contamination and readily monitored using available technologies. Like most other states, Louisiana historically used fecal coliform densities as the indicator of bacteriological contamination of surface waters. However, under the terms of BEACH grant awards, states must base decisions about marine water quality at sites monitored using BEACH grant funds on enterococci bacteria densities. Enterococci have recently become generally accepted by the scientific community as more closely associated with rates of gastrointestinal illness in marine environments than fecal coliform densities, and thus USEPA believes that the use of enterococci may serve to better protect the public health in marine environments.

The second primary activity under the Program is public notification. Louisiana's BEACH Program issues public health advisories at Tier 1 and 2 monitored sites (tiers are defined in Chapter 2) when water quality samples are found to exceed the beach advisory enterococci criteria. The beach advisory enterococci criteria used are a single sample maximum of ≤104 and a steady state maximum based on a 30-day running geometric mean of ≤35 (quantities expressed as MPN/100 ml). Advisories urge users to abstain from swimming, but do not officially "close" the water body to recreational use. The Program disseminates swim advisories by website postings, and by opening pole-mounted signs which are installed at the beach monitoring sites. When water quality sample results indicate that bacteria levels at beach sites under swim advisories are once again compliant with the decision rule, the public is notified that the advisory has been lifted through beach signage and the website (http://www.dhh.louisiana.gov/index.cfm/page/288).

2020 Program Accomplishments

During 2020, Louisiana's BEACH Program:
1. Monitored all accessible sample sites designated for monitoring in accordance with the requirements of their tier assignment throughout the swimming season; and
2. Continued to meet or exceed the quality assurance/quality control goals established in the Program's QAPP (LDH 2020).

CHAPTER 2 - Update of BEACH Program

Review of Beach Rankings

In 2003, the CEHS completed a systematic process to identify and rank Louisiana's beaches according to risk. The process consisted of the following steps (LDHH 2003):

1. Identification and definition of coastal recreation waters;
2. Identification of beaches or similar points of access used by the public for swimming, bathing, surfing, or similar water contact activities;
3. Review of available information on levels of potential fecal contamination at beaches and intensity of beach use; and
4. Ranking of beaches to decide which beaches would be included in Louisiana's BEACH Program.

Based on levels of beach use and perceptions of water quality from estimated fecal coliform densities in adjacent waters, a qualitative ranking scheme was devised and used to assign each beach to an appropriate monitoring tier. The monitoring tiers provide levels of monitoring and public notification such that beaches with a greater density of swimmers, and thus a greater number of people at risk, receive a higher intensity of monitoring and public notification than lower use beaches. Monitoring and public notification procedures are the same at Tier 1 and Tier 2 beaches but differ in density of sample stations. Sample stations are closer together at Tier 1 beaches, no more than 500 meters apart, than at Tier 2 beaches, where sample stations are no more than 2 miles apart on continuous beach segments. Sample stations at Tier 3 and 4 beaches are at the same density as Tier 2 beaches, but samples are not collected weekly, and accordingly, weekly public advisories are not issued for Tier 3 and 4 beaches. Tier 4 beaches meet the same criteria specified for Tier 3 beaches, which are described below, but due to very limited primary contact recreation use and historically good water quality, are not monitored.

The initial assignments of beach segments to monitoring Tiers was completed in 2003 (LDHH 2003). The estimated number of swimmers at each beach was based on information obtained primarily from law enforcement officials responsible for patrolling the beach and from park managers. The officials provided estimates of the number of beach visitors on a typical weekday, weekend, and holiday during the peak swimming season, May 1 through Labor Day, along with an estimate of the percentage of beach users entering the water. These estimates were combined by adding typical weekday and weekend use to provide an estimate of weekly use. Weekly use was multiplied by the number of weeks in the recreational period and added to the estimated number of holiday visitors during Memorial Day, Fourth of July, Labor Day, and any other beach-specific major events. Because the resulting total was an estimate of unknown precision, those estimates were generalized into broad categories of use for relative comparison as follows:

Category of Use	Estimated Number of Swimmers
Very Low	<5,000
Low	5,000 to <10,000
Moderate	10,000 to <15,000
High	15,000 to 20,000
Very High	>20,000

Because beach water quality was either inferred from the water quality of the surrounding area as a whole, or based on a short period of data, and no studies were available providing a model of the relationship between fecal coliform concentrations and illness rates, the qualitative ranking process relied primarily on beach use. Beaches classified as having very high, high, or moderate to high use were assigned to Tier 1 and receive the most monitoring attention. Beaches classified as having moderate use were assigned to Tier 2. Beaches with low or very low use were assigned to Tier 3 and targeted for additional bacterial indicator monitoring to better characterize risk. Beaches on private land or with existing swimming advisories posted by the State, and with very low public use were excluded from further consideration. A total of 29.16 miles of beach were considered for monitoring under Louisiana's BEACH Program, of which 23 miles were assigned to a monitoring tier (LDHH 2003).

CEHS anticipated that beach use and water quality could change through time and planned to re-evaluate beach rankings on an annual basis at the end of each swimming season (LDHH 2003). In 2006, it was decided that the Program would continue to evaluate risk primarily on the estimated density of swimmers at a beach in accordance with the original categories of use described above, but a new method of assessing water quality risk was developed. The original assessment evaluated water quality based on estimated fecal coliform densities, which was the only beach specific indicator organism data available at the time. Data collected during 2004 and 2005 provided new information about water quality, including enterococci densities, which were not previously available. Because USEPA's chosen indicator organism for marine waters is enterococci, and because greater than 99.8% of all of Louisiana's swim advisories issued through 2005 involved exceedance of beach advisory enterococci criteria, new water quality categories based on enterococci densities were developed for use in the risk-based Tier assignment process (LDHH 2006).

A sample station's annual enterococci geometric mean density was strongly correlated with the percentage of monitored weeks under advisory, so a sample station's geometric mean is a good indicator of the likelihood of exceeding the established limits of acceptable risk. Accordingly, water quality risk categories were based on the ratio of a beach's annual enterococci geometric mean to the enterococci geometric mean decision criterion of 35 MPN/100 ml. Water quality risk categories were established as: "Lower Risk" if the beach's annual geometric mean/35 < 0.5; "Moderate Risk" if the beach's annual geometric mean/35 ≥ 0.5 and < 1; and "Higher Risk" if the beach's annual geometric mean/35 ≥ 1. Using the revised classification scheme, continuous beach segments were reassigned to Tier risk categories at the beginning of 2020 based on 2019 beach segment-specific enterococci geometric mean/35. Table 1 identifies the beaches that were monitored under the Program during 2020, their designated 2020 monitoring Tier, and associated

sample stations. Beach use during 2020 approximated historical levels except for Grand Isle Beach 3 (GIB3), which was closed to the public in early August 2020 due to bank stabilization construction, and periodic hurricane disruptions beginning in August through the end of the 2020 season.

Table 1. Continuous beach segments, beach miles, monitoring Tier assignments for 2020 and 2021, and sample stations.

Continuous Beach Segments	Designated Beach Miles	First Year Sampled	2020 Designated Monitoring Tier[2]	2020 Actual Monitoring Tier[2]	2021 Designated Monitoring Tier[2]	Sample Station State IDs[1]
Lake Pontchartrain Basin Beaches						
Fontainebleau State Park	0.13	2004	1	1	1	FONT1
Barataria River Basin Beaches						
Elmer's Island	0.31	2012	1	1	1	ELMR1
Elmer's Island-East	1.92	2012	4	4	4	ELMR2
Grand Isle State Park	1.03	2004	1	1	1	GISP1-4
Grand Isle Beach	6.20	2005	2	2	2	GIB1-3
Vermilion-Teche River Basin Beaches						
Cypremort Point State Park	0.47	2004	1	1	1	CYPT1
Calcasieu River Basin - Lake Charles Beaches						
North Beach - Lake Charles	0.42	2009	1	1	1	LCNB1
Calcasieu River Basin - Cameron Beaches						
Holly Beach	3.44	2005	1	1	1	HOLLY1-6
Mermentau River Basin Beaches						
Rutherford Beach	1.50	2005	2	2	2	RUTH1
Sabine River Basin Beaches						
Constance Beach Complex (CNSTBC)	6.29	2005	2	2	2	CNST1, DUNG1, GBRZ1, LTFL1, MART1

Note: [1] Sample station names and USEPA IDs are provided in Appendix A.; [2] Tier assignments based on risk categorization; Tier 4 indicates a tier 3 beach that is used by the public and is not monitored.

During 2020, six continuous beach segments were designated as Tier 1 beaches and scheduled for monitoring (Grand Isle, Cypremort Point, and Fontainebleau State Parks; Elmer's Island, Holly Beach, and North Beach in Lake Charles), and three continuous beach segments were designated as Tier 2 (Grand Isle Beach, Rutherford Beach, and the Constance Beach Complex). All beach segments were monitored at their designated tiers during 2020. Elmer's Island East (ELMR2) was assigned to Tier 4 for the 2020 swim season due to very low usage and lower risk water quality in accordance with EPA guidance (the beach is used by the public but not monitored).

In summary, during 2020, the Program monitored all six continuous Tier 1 beach segments (approximately 6 beach miles), including sampling and public notification at all 14 of the Tier 1

sample stations (Table 2). Three Tier 2 continuous beach segments totaling approximately 14 miles were also monitored during 2020, including sampling and public notification at 9 sample stations. One Tier 4 sample station on Elmer's Island East (ELMR2) was not scheduled to be monitored during 2020.

Table 2. Number of continuous beach segments, sample stations, and beach miles monitored by Tier during 2020 and planned for 2021.

Tier	2020 (Actual)				2021 (Projected)			
	1	**2**	**3**	**4**	**1**	**2**	**3**	**4**
Number of Continuous Beach Segments	6	3	0	1	6	3	0	1
Number of Sample Stations	14	9	0	1	14	9	0	1
Total Beach Miles	6	14	0	2	6	14	0	2
Number of Continuous Beach Segments Monitored	6	3	0	0	6	3	0	0
Number of Sample Stations Monitored	14	9	0	0	14	9	0	0
Total Beach Miles Monitored	6	14	0	0	6	14	0	0

In anticipation of the 2021 swimming season, as in past years, monitoring tier assignments were reviewed for all beaches based on expected use levels and historical water quality. It is anticipated that use levels and patterns will remain at approximately historical levels for all beaches.

Using water quality data pooled across sample stations within continuous beach segments, water quality risk categories were calculated for each continuous beach segment for use in establishing 2020 Tier assignments (Table 3). Two systems of beach water quality assessment were used, the Louisiana BEACH Program's beach risk classification, as described above, and the World Health Organization's (WHO) risk categorization system. The WHO's microbial water quality assessment criterion (WHO 2003) was applied to the last three years (2018–2020) of Louisiana's water quality data. In addition to water quality, the WHO classification system uses sanitary inspection categories to classify waters from very good to very poor, depending on the beach's susceptibility to fecal influence as determined by a sanitary survey, but only the microbial criterion was evaluated for the purposes of this report. Rather than rely on the annual enterococci geometric mean for its microbial criterion, the WHO uses the parametric 95th percentile of observed enterococci densities over a longer-term period, typically a minimum of three years. The WHO selected the 95th percentile because it is easily understood and reflects much of the top-end variability in the distribution of water quality data that are of greatest public health concern and is robust against periodic variation in water quality. The WHO classifies water quality into four categories based on enterococci density (cfu/100 ml) and the associated risk of acquiring gastrointestinal illness as follows: A) <1 case in 100 exposures, 95th percentile ≤40 cfu/100 ml; B) between 1 and 5 cases in 100 exposures, 95th percentile 41-200 cfu/100 ml; C) between 5 and 10 cases in 100 exposures, 95th percentile 201-500 cfu/100 ml; and D) >10 cases in 100 exposures, 95th percentile >500 cfu/100 ml. For comparison, the USEPA's gastrointestinal illness rate associated with the 1986 recommended beach advisory enterococci criteria for marine recreational waters is 19 illnesses per 1,000 swimmers and the 2012

recommended enterococci criteria is 32-36 gastrointestinal illnesses per 1,000 swimmers, both of which falls within WHO category B. To facilitate comparison with Louisiana's risk categories, we have categorized WHO classes A and B as lower risk, C as moderate, and D as higher risk.

Table 3. Beach water quality and use risk categories for 2021 swimming season based on anticipated use in 2021 and 2020 water quality data.

Beach	Anticipated 2020 Use	2020 Entero. Geometric Mean	2020 Entero. Geometric Mean / 35	2020 Water Quality Risk Cat.	Entero. 95th Parametric Percentile 2018-2020	WHO Risk Category[1]
CNSTBC	Low	28.6	82%	Moderate	149	B
CYPT	Mod.-High	61.4	175%	Higher	512	D
ELMR	High	16.7	48%	Lower	93	B
FNTB	High	43.4	124%	Higher	1061	D
GIB	Moderate	18.1	52%	Moderate	84	B
GISP	Very High	14.1	40%	Lower	72	B
HOLLY	Mod.-High	33.9	97%	Moderate	164	B
LCNB	Very High	54.2	155%	Higher	785	D
RUTH	Very Low	55.8	159%	Higher	380	C

Note: [1] WHO risk categorization based on 2018-20 water quality data due to the requirement for a three-year evaluation term (risk categories previously defined in body of the report).

Water quality calculated using the Louisiana and the WHO risk categorization systems generally agreed. However, differences between the two categorization schemes can result from using different time periods (Louisiana's risk categorization uses only the prior year, where the WHO uses three prior years), and metrics (geometric mean versus 95th percentile). Using the modified WHO risk categorization results, five continuous beach segments were classified in the B WHO risk category (Constance Beach Complex, Elmer's Island, Grand Isle beaches, Grand Isle State Park, and Holly Beach), one in risk category C (Rutherford Beach), and three in risk category D (Cypremort Point State Park, Fontainebleau State Park, North Beach in Lake Charles). In contrast with the modified WHO categorization, Louisiana's risk categorization resulted in two continuous beach segments classified in the lower water quality risk category (Elmer's Island and Grand Isle State Park), three in the moderate risk category (Constance Beach Complex, Grand Isle beaches and Holly Beach) and four in the higher risk category (Cypremort Point and Fontainebleau State Parks, and North Beach in Lake Charles, and Rutherford Beach).

The Louisiana BEACH Program's beach risk classification was selected for use in assigning beaches to tiers. Combined 2021 anticipated use and 2020 water quality rankings for each continuous beach segment are given in Table 4. As discussed above, tier categories remain based on the same swimmer density categories that were used in the original tier designation system, but low and very low use categories are designated as "Discretionary." For "Discretionary" beach segments, the Louisiana BEACH Program Manager will decide if Tier 2, 3 or 4 level monitoring is warranted at any time during the monitoring season. Because of the very low to low use at Constance Beach Complex and Rutherford Beach, it is anticipated that

they will remain Tier 2 beaches during 2021. The remaining 2020 beach tier assignments are expected to remain in place for 2021 as shown in Table 1. Elmer's Island East (ELMR2) will not be monitored during 2021 due to continued very-low use and lower-risk water quality and is designated as a Tier 4 beach. Therefore, the Program is expected to monitor all Tier 1 beaches totaling 5.8 beach miles, all Tier 2 beaches totaling 14 miles, and 0 of approximately 1.9 Tier 4 beach miles (Table 2) in 2021.

Table 4. Combined beach use and water quality risk categories for 2021.

		Lower Risk	Moderate Risk	Higher Risk	Unknown	
	VH	GISP		LCNB		**Tier 1**
	H	ELMR1	HOLLY	CYPT, FNTB		
	M		GIB			**Tier 2**
	L		CNSTBC[2]			**Tier3**
	VL	ELMR2[3]		RUTH[4]		
		Discretionary				

Column group header: **Water Quality Risk[1] =▶** (spanning Lower Risk, Moderate Risk, Higher Risk, Unknown). *Row group header:* **▲ # of Swimmers =** (vertical, spanning VH, H, M, L, VL).

Notes: [1]Water quality risk level based on 2020 data using Louisiana's risk classification. [2]CNSTBC will be monitored as tier 2 during 2021. [3]ELMER2 is classified as a Tier 4 beach for 2021 because very low use and Lower Risk water quality and will not be monitored in 2021. [4]RUTH will be monitored as a tier 2 beach during 2021.

In addition to annually re-evaluating risk levels and associated tier designations for beach segments monitored during the previous year, the program determines if any additional beaches warrant monitoring. No additional beaches were identified for inclusion under the Program in 2021.

Program Modifications

Beach segment GIB3 was closed due to beach dune stabilization work in August 2020. It is anticipated that access to GIB3 will be reestablished in 2021, although the GIB3 sample site may need to be relocated within the beach segment to correspond with beach access over the dune. No other modifications were made to the Program's procedures, methods, or decision rule during 2020. The Program followed the procedures, methods and decision rule summarized in *Louisiana's BEACH Program Quality Assurance Project Plan,* which is available on the World Wide Web at http://www.dhh.louisiana.gov/index.cfm/page/288.

CHAPTER 3. Louisiana BEACH Program's 2020 Results

Number of Samples Collected

Between 1 April 2020 and 31 October 2020, a total of 568 samples were collected at 23 sample stations (see Table 5), distributed among four sample types: field duplicates and splits, resample, and routine samples. Each type of sampling is described below.

Table 5. Total number of samples collected by sample station and sample type during 2020 by Louisiana's BEACH Program.

| Sample Station | Sample Type | | | | Station Total |
	Field Duplicate	Field Split	Resample	Routine	
CNST1	1	1	0	21	23
CYPT1	0	2	0	28	30
DUNG1	1	0	0	21	22
ELMR1	1	0	0	20	21
FNTB1	2	2	0	26	30
GBRZ1	1	1	0	21	23
GIB1	0	1	0	26	27
GIB2	1	0	0	26	27
GIB3	1	1	0	16	18
GISP1	0	0	0	26	26
GISP2	2	1	0	26	29
GISP3	0	3	0	26	29
GISP4	2	1	0	26	29
HOLLY1	2	0	0	21	23
HOLLY2	0	0	0	21	21
HOLLY3	2	0	0	21	23
HOLLY4	0	0	0	21	21
HOLLY5	2	1	0	21	24
HOLLY6	0	0	0	21	21
LCNB1	1	1	0	27	29
LTFL1	0	2	0	21	23
MART1	0	1	0	20	21
RUTH1	2	0	0	26	28
Sample Type Total	**21**	**18**	**0**	**529**	**568**

Routine samples are the regularly scheduled weekly samples collected during the designated monitoring period at beaches that are officially part of the Program. A total of 529 routine

samples were collected across 23 sample locations monitored during 2020. Resamples are collected at the BEACH Program Manager's discretion when a routine sample has an unexpectedly high indicator organism density or when the source of an exceedance is known and has been corrected and extra samples are required to calculate a post-event geometric mean. There were no resamples collected during 2020.

Field duplicates and field splits are two types of quality control (QC) samples. Field duplicates were used to estimate the precision of sampling methods by comparing laboratory results for two samples taken consecutively on the same day at the same sampling site (i.e., one grab is considered the routine sample or resample and the other the QC sample). Field splits were used to estimate the precision of laboratory analyses (intra-laboratory) plus any variability induced during sample handling and transport by analyzing two aliquots of the same water sample (i.e., one-half of the split sample is considered the routine sample or resample and the other half the QC sample), which were subdivided in the field. Louisiana's BEACH Program QAPP requires that approximately 10% of scheduled sample events be designated as quality control samples, which are selected at random at the beginning of the sampling period in approximately equal proportions (≈ 5% each) of field duplicate and field split samples. QC samples may also be collected during resample events to improve the precision of estimated indicator organism densities by averaging resample and QC sample results. A total of 56 QC samples were scheduled to be collected concurrent with the 713 routine samples and were to consist of 30 field duplicates and 26 field split samples. Of the 713 scheduled routine samples, 529 were collected (74%), with 3 samples cancelled due to access constraints to ELMR1, 13 at GIB3 due to beach dune restoration work, 86 missed due to four hurricanes impacting the Louisiana coast, and 82 missed at the beginning of the season due to limited personnel availability resulting from contracting issues. For the station-weeks with sample results, 43 QC samples were scheduled (24 field duplicates and 19 field split samples). A total of 21 field duplicates and 18 field split samples were collected during 2020. Twenty-one (21) field duplicates were sampled as scheduled (88%), and 16 field split samples were collected as scheduled (84%), resulting in 86% of QC samples collected as scheduled. Three field duplicates and two field split samples were missed when scheduled, but two replacement field split samples collected. Accordingly, the QC sample goal was not achieved. Of the 568 total samples, all were collected during the designated monitoring period, and those collected at Tier 1 and 2 beaches were used to make weekly water quality decisions. For analysis purposes, samples collected on the same date at the same location were not considered independent, and were averaged together (i.e., arithmetic mean) resulting in a total of 529 independent samples collected during the 2020 designated monitoring season (see Table 6).

Summary Statistics for 2020 Designated Monitoring Period Samples

Results of enterococci density (MPN/100ml) and salinity (parts-per-thousand; ppt) for each sample location during the 2020 designated monitoring period are summarized in Table 7 and depicted graphically in Figures 1 and 2. Because indicator organism densities are lognormal distributed, Table 7 presents $\log_e$ mean and $\log_e$ standard deviations; exponentiation of the $\log_e$ mean produces the geometric mean on the nominal scale. Note that the $\log_e$ enterococci median

shown in the graph and $\log_e$ mean in Table 7 are approximately equal as would be expected for lognormal distributed populations.

Table 6. Number of independent samples collected by sample station during the 2020 monitoring season (1 April – 31 October). Samples collected at the same station on the same day are counted as a single sample.

Sample Station	Number of Samples
CNST1	21
CYPT1	28
DUNG1	21
ELMR1	20
FNTB1	26
GBRZ1	21
GIB1	26
GIB2	26
GIB3	16
GISP1	26
GISP2	26
GISP3	26
GISP4	26
HOLLY1	21
HOLLY2	21
HOLLY3	21
HOLLY4	21
HOLLY5	21
HOLLY6	21
LCNB1	27
LTFL1	21
MART1	20
RUTH1	26
Totals	**529**

Table 7. Summary statistics for enterococci density (MPN/100ml), and salinity for samples collected during the 2020 designated monitoring season by sample station.

State ID	Enterococci			Salinity (ppt)		
	Geo. Mean	Log$_e$ Mean	Log$_e$ St. Dev.	Mean	St. Dev	n
CNST1	23.1	3.14	0.87	21.7	5.2	21
CYPT1	61.4	4.12	1.86	3.2	3.1	28
DUNG1	37.0	3.61	1.15	22.0	4.8	21
ELMR1	16.7	2.81	0.65	20.4	6.1	20
FNTB1	43.4	3.77	1.49	1.5	3.6	26
GBRZ1	27.9	3.33	1.09	21.9	5.1	21
GIB1	16.6	2.81	0.78	19.3	6.1	26
GIB2	19.6	2.98	0.88	19.5	6.1	26
GIB3	18.1	2.90	0.62	16.4	5.4	16
GISP1	12.6	2.53	0.46	18.7	7.1	26
GISP2	13.9	2.64	0.51	19.6	6.2	26
GISP3	14.0	2.64	0.74	19.5	6.1	26
GISP4	16.3	2.79	0.68	19.5	6.1	26
HOLLY1	27.0	3.30	1.27	21.2	5.3	21
HOLLY2	27.0	3.30	1.20	21.3	5.3	21
HOLLY3	33.3	3.51	1.18	21.3	5.3	21
HOLLY4	42.2	3.74	1.35	21.3	5.3	21
HOLLY5	29.5	3.39	1.11	21.4	5.3	21
HOLLY6	49.9	3.91	1.45	21.3	5.3	21
LCNB1	54.2	3.99	1.57	2.6	2.4	27
LTFL1	27.7	3.32	0.86	22.0	5.0	21
MART1	29.1	3.37	1.08	22.0	4.8	20
RUTH1	55.8	4.02	1.33	20.2	6.0	26
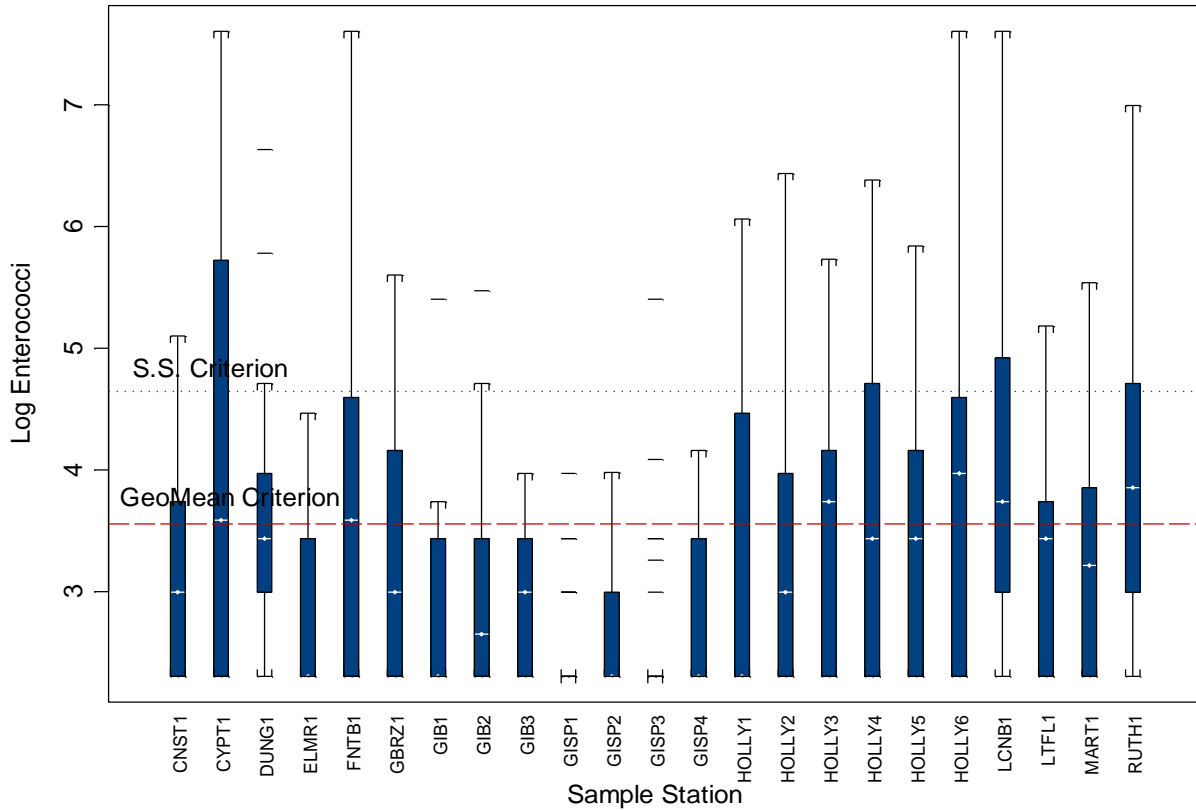
Figure 1. The distribution of log$_e$ transformed enterococci densities (MPN/100ml) by sample station relative to the geometric mean (GeoMean) and single sample (S.S.) maximum criteria for samples collected during the 2020 designated monitoring season. The box represents the inner quartile range (25th to 75th percentiles), and upper and lower whiskers extending from the box represent the smallest and largest observations within one step (1.5 times inner quartile range). The median (◊) is marked by a line through the box, and horizontal bars (—) represent extreme values.
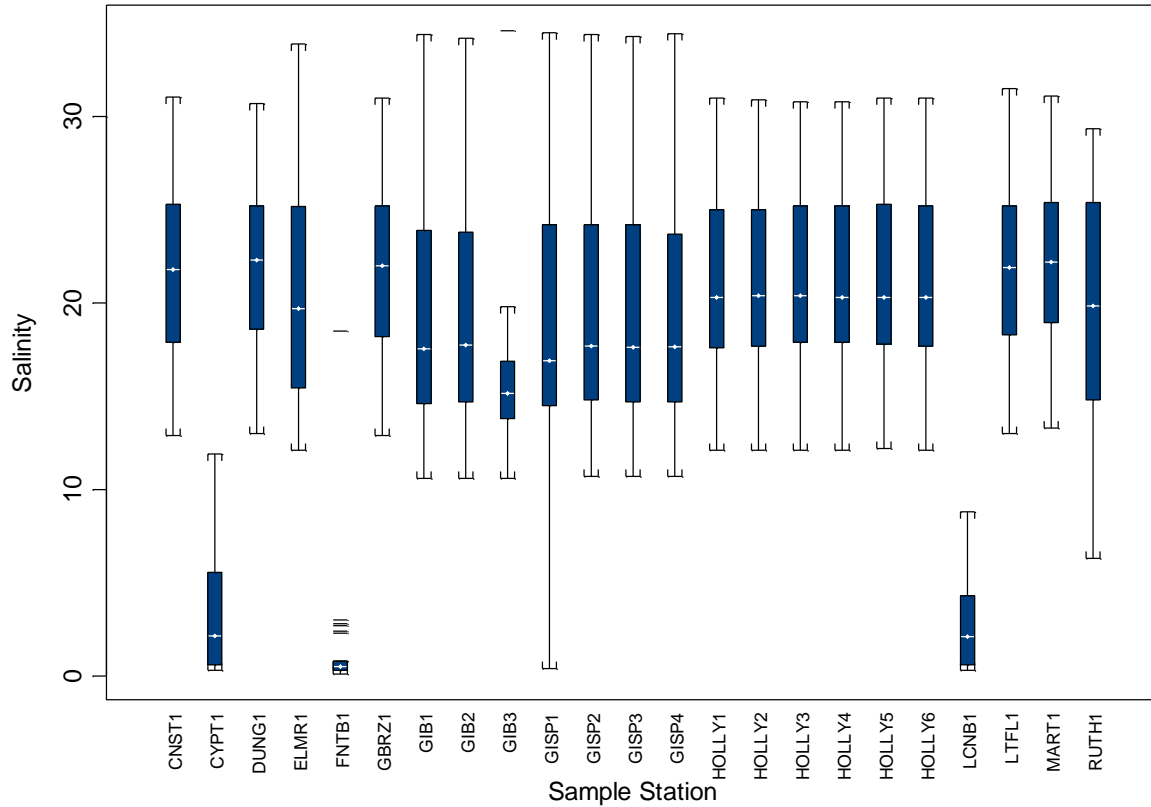
Figure 2. The distribution of salinity (ppt) by sample station for samples collected during the 2020 designated monitoring season.

Time-Series of 2020 Designated Monitoring Period Samples

In addition to calculating summary statistics for each sample station over the 2020 designated monitoring period, results are presented as a time-series (Appendix B, Figures B.1 through B.23; data for each sample event is provided in Appendix C). Because sample results were used during the designated monitoring season to make weekly determinations of whether water quality at each sample station met the Program's beach advisory criteria for Tier 1 and 2 beaches, sample results and the running 30-day geometric mean are shown in the figures. In each week, the last enterococci sample of the week and the running 30-day geometric mean for enterococci must both be less than or equal to their respective criterion for the sample station to be classified as in compliance. If either criterion was exceeded, the sample station was classified as not in compliance and a swimming advisory was issued. The advisory remained in effect until the most recent sample results and the running geometric means were all less than or equal to their respective criterion.

Weekly Decision Rule Outcomes

During the 2020 swimming season (1 May – 31 October), 23 sample stations were monitored at nine Tier 1 or 2 continuous beach segments with a total of 38 advisories and 1 closure issued. Advisories were issued at 19 of 23 Tier 1 or 2 sample stations during 2020 based on observed exceedances of enterococci geometric mean and single sample maximum criteria (see Tables 8 and 9). Compliance at stations monitored throughout the swimming season varied between 100% of monitored days in compliance at five stations (ELMR1, GIB3, GISP1, GISP2 and GISP4), to a low of 27% for FNTB1. Across all monitored sample stations, 69% (1,262 of 4,120) of the 2020 swimming season's available station-days (monitored station-days not under closure) were in compliance and not under an advisory.

Most 2020 advisories were issued due to exceedances of the enterococci geometric mean criterion (Table 10). The enterococci GM was exceeded in 173 of 183 (95%) observed noncompliance station-weeks, with 110 (60%) of those noncompliance weeks resulting from enterococci geometric mean exceedances only, 63 (34%) resulting from both enterococci geometric mean and single sample maximum exceedances, and 10 (6%) resulted from exceedance of enterococci single sample maximum criterion alone.

As discussed in previous Louisiana BEACH Grant reports, Louisiana's percentage of station-weeks that were under advisory is not directly comparable with other states that do not use equivalent beach advisory criteria. Using only the single sample maximum criterion (≤104 CFU/100mL), as some states have, Louisiana would have issued only 40% of its 2020 advisories and would have had no decision criteria for weeks with missed samples. Applying the Beach Action Value (BAV) criterion of 60 CFU/100mL[2] to Louisiana's 2020 monitoring results[3], 84% of the weekly advisory decisions would be unchanged, 13% of station-weeks placed under advisory for exceedance of Louisiana's criteria would be deemed in compliance, and 2% of 2020 station-weeks exceeded the BAV criteria but were in compliance with Louisiana's beach advisory criteria.

When exceedances of beach advisory criteria were detected, an advisory was issued. To notify the public that a swimming advisory was in effect, the BEACH Program's monitoring/advisory sign at the sample site was opened and a notice of the advisory was placed on the OPH BEACH website (http://www.dhh.louisiana.gov/index.cfm/page/288).

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[2] As recommended in *National Beach Guidance and Required Performance Criteria for Grants*, EPA-820-D-13-001, dated April 18, 2014.
[3] Analysis limited to the swimming season sampled week; Weeks without a sample were excluded from analysis.

Table 8. Advisory history by sample station and week for beach segments designated and monitored as either Tier 1 or Tier 2 beaches during the 2020 swimming season.

Station ID	April	May				June				July					August				September					October			
	29	6	13	20	27	3	10	17	24	1	8	15	22	29	5	12	19	26	2	9	16	23	30	7	14	21	28
CNST1											A				A		A	A	A								
CYPT1							A		A	A	A	A	A	A	A		A		A	A	A	A	A	A	A	A	A
DUNG1									A	A	A	A	A	A	A	A	A	A	A								
ELMR1																											
FNTB1					A		A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A			
GBRZ1									A	A	A	A	A	A	A	A	A										
GIB1																									A		
GIB2																			A			A	A		A	A	
GIB3												C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
GISP1																											
GISP2																											
GISP3													A														
GISP4																											
HOLLY1										A	A	A	A	A	A	A	A		A								
HOLLY2									A		A	A	A	A	A	A											
HOLLY3							A	A	A	A	A	A	A	A	A												
HOLLY4					A				A	A	A	A	A	A	A	A	A	A	A	A	A						
HOLLY5									A		A	A	A	A	A	A	A	A									
HOLLY6		A			A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A							
LCNB1					A		A								A	A	A	A	A	A	A	A	A	A	A	A	A
LTFL1											A	A	A	A	A	A											
MART1		A			A	A	A	A	A		A		A														
RUTH1							A		A	A	A	A	A	A	A	A	A			A	A	A	A	A	A	A	A

Notes: **"A"** indicates an advisory was put in place or remained in effect at the beach based on observed water quality data.

Table 9. Summary of 2020 advisories and closures.

State ID	Days Under Closure	% of Station-Days Under Closure	Days Under Advisory	% of Accessible Season Under Advisory	Days Under Closure or Advisory	% of Season Under Closure or Advisory	% of Available Season Open & In Compliance
CNST1	0	0%	35	19%	35	19%	81%
CYPT1	0	0%	122	67%	122	67%	33%
DUNG1	0	0%	77	42%	77	42%	58%
ELMR1	0	0%	0	0%	0	0%	100%
FNTB1	0	0%	133	73%	133	73%	27%
GBRZ1	0	0%	63	34%	63	34%	66%
GIB1	0	0%	7	4%	7	4%	96%
GIB2	0	0%	35	19%	35	19%	81%
GIB3	89	49%	0	0%	89	49%	51%
GISP1	0	0%	0	0%	0	0%	100%
GISP2	0	0%	0	0%	0	0%	100%
GISP3	0	0%	7	4%	7	4%	96%
GISP4	0	0%	0	0%	0	0%	100%
HOLLY1	0	0%	63	34%	63	34%	66%
HOLLY2	0	0%	49	27%	49	27%	73%
HOLLY3	0	0%	63	34%	63	34%	66%
HOLLY4	0	0%	98	54%	98	54%	46%
HOLLY5	0	0%	63	34%	63	34%	66%
HOLLY6	0	0%	119	65%	119	65%	35%
LCNB1	0	0%	108	59%	108	59%	41%
LTFL1	0	0%	42	23%	42	23%	77%
MART1	0	0%	56	31%	56	31%	69%
RUTH1	0	0%	122	67%	122	67%	33%
Totals	**89**	**2%**	**1262**	**31%**	**1351**	**32%**	**68%**

Table 10. Summary of weekly beach advisory decision rule exceedances by cause (2020).

Cause of Exceedance	Number of Observed Exceedances	% of Observed Exceedances
Only Enterococci geometric mean criterion exceeded	110	60.1%
Only Enterococci single sample max criterion exceeded	10	5.5%
Both Enterococci geometric mean and single sample max criteria exceeded	63	34.4%
Total	**183**	**100%**

Relationship between Indicator Organisms and Environmental Conditions

With each water sample collected by the BEACH Program, environmental variables were also collected, including surface water temperature (°F), salinity (ppt), tide conditions, weather conditions, and wind direction and speed. Total precipitation (in.) 0–24 hrs (precip0), 24–48 hrs (preciplag1), 48–72 hrs (preciplag2), and 72–96 hrs (preciplag3) prior to sample collection were estimated using rain basin precipitation values taken from Louisiana's Molluscan Shellfish database. Rain basin daily precipitation was estimated by averaging observed precipitation at

rain gauges within the rain basin, and beaches were assigned to the rain basin in which they occurred. The number of days between sample collection and the most recent prior day with a precipitation record > 0 (DaysSinceLastRain) was estimated, and daily precipitation estimates were summed into measures of total precipitation within 0–48 hrs (precip48) and 0–72 hrs (precip72) prior to sample collection (these data are available upon request).

Using the observed environmental variables, estimated precipitation values and the associated $\log_e$ transformed enterococci densities collected by the Program from 2004 through 2009, CEHS performed a thorough statistical analysis to determine how indicator organism density was influenced by environmental factors at Louisiana's coastal beaches (the 2009 analysis). The results of the 2009 analysis confirmed the findings of previous reported analyses that there were no statistically meaningful differences among sample stations within continuous beach segments (StateID explains almost none of the variation in enterococci density), and that enterococci densities had changed from year to year (Year) at all beach segments except Fourchon, which had remained stable. The complete results of the 2009 analysis were reported in the *Louisiana BEACH Grant Report, 2009 Swimming Season*, which concluded that:

> "given the available data, it is unlikely that models that can reliably predict enterococci densities can be developed for Louisiana's beaches. Different environmental factors are most correlated with enterococci density for different beach segments and area groups, and no single environmental factor is useful in predicting indicator organism density. It also appears that the relationship between environmental factors and enterococci density is complex and will take more investigation to understand, requiring targeted studies that are not funded under current Beach Grants. Better measurement of the environmental variables that are currently being collected and/or collection of additional environmental measures may be required to adequately predict water quality from observable environmental conditions. Louisiana beaches are somewhat different from those of most coastal states in that they represent a wide range of salinity conditions and most are relatively remote from urban runoff, reducing the direct association between environmental conditions and enterococci densities."

Through 2011, a total of 5,164 independent[4] samples were collected; 1,555 samples beyond those available in 2009. Given the additional data available, the analysis was repeated and yielded the same conclusions as were drawn following the 2009 analysis. That is, year-to-year differences in enterococci density at all beach segments other than FOUR was a significant source of variation, and that for most beach segments, the relationship between the environmental variables and enterococci density changed from year to year. Additionally, the observed year-to-year variation in enterococci density was not explained by corresponding differences in the environmental variables. Because of large year-to-year differences in enterococci densities and associated annual variance within beach segments, and annual differences in the relationship between enterococci density and the environmental variables as shown in the 2011 Annual Beach Report, developing useful statistical models that go beyond describing general patterns of association between environmental conditions and enterococci densities may not be possible for Louisiana's more remote beaches.

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[4] For analysis purposes, single samples collected on a date at a sample location were considered independent; multiple samples collected on a date at a sample location were averaged together.

Figure 3 shows the considerable annual variation in enterococci densities within beach segments from Program inception through 2020 for those continuous beach segments monitored in 2020. Enterococci densities were relatively stable between 2019 and 2020 and comparable to recent years at Constance Beach Complex, Cypremort Point State Park Elmer's Island, Grand Isle State Park and Rutherford Beach, greater at Holly Beach in 2020 than in 2019, and lower at Fontainebleau State Park, Grand Isle Beach, Lake Charles North Beach in 2020 than in 2019. Improved enterococci densities in 2020 were likely influenced by the return of more typical salinity during 2020 at all beaches (Figure 4), following the low salinity during 2019 from extremely high discharge of fresh water from the Mississippi River throughout the 2019 monitoring season.
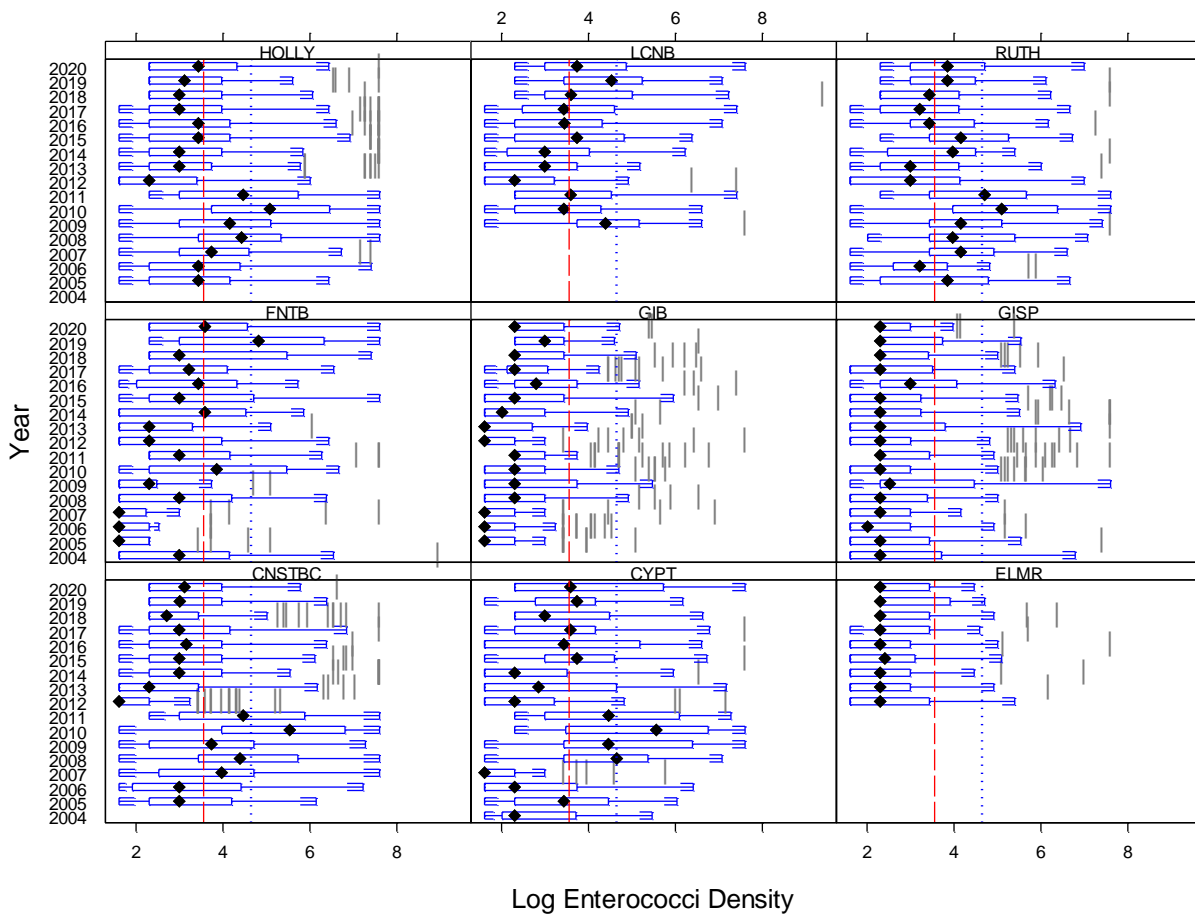
Figure 3. Distribution of $\log_e$ enterococci densities by year within continuous beach segments relative to geometric mean criterion (red dashed lines) and single sample maximum criterion (blue dotted lines).
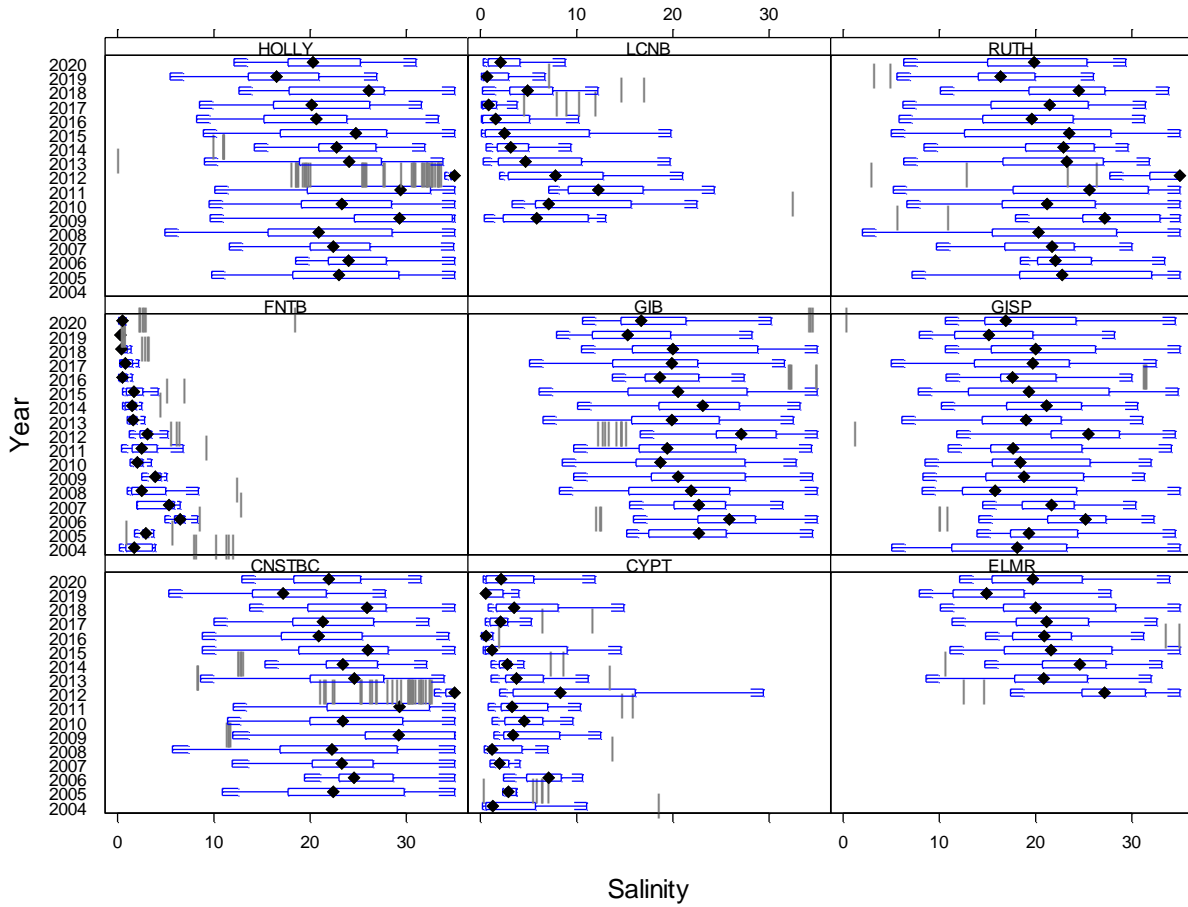
Figure 4. Distribution of salinity (ppt) by year within continuous beach segments.

CHAPTER 4. Evaluation of Program Performance Relative to Data Quality Objectives.

Louisiana's BEACH Program Quality Assurance Project Plan (LDH 2020) states that at the end of each year, the Program Manager shall audit the Program to determine if the Program's data quality objectives are being met. As described in the QAPP (see Table A7.1 of the QAPP), the Program's data quality objectives for those parameters measured in accordance with the QAPP are expressed in terms of precision and completeness goals. Those data quality objectives are repeated below in Table 11, together with their 2020 results.

Table 11. Data quality objectives and 2020 results.

Parameter	Concen-tration Units	QAPP Precision Goals (RPD)	2020 Precision Mean RPD (± 1 SE, n)	QAPP Completeness Goals	2020 Completeness
Enterococci	MPN/ 100ml	Sample 60%; lab 45%	Sample 49.1% (±10.0, 21); lab 42.3% (±12.6, 18)	98%	100%
Salinity	ppt	Sample 10%, lab 5%	Sample 0.5% (±0.0.1, 21); lab 2.4% (±1.4, 18)	98%	100%
Surface Water Temperature	°F	$\pm 2°$	$\pm 2°$ by SOP	98%	100%
Tide Conditions	NA	NA	NA	98%	100%
Weather	NA	NA	NA	98%	100%
Wind Direction	NA	NA	NA	98%	100%
Wind Speed	NA	NA	NA	98%	100%
Precipitation	Inches/ previous 24 hours	NA	NA	98%	100%
River Stage	Feet on flood gauge	NA	NA	98%	100%

To evaluate compliance with the established data quality objectives (DQOs) for sample and laboratory precision on estimated indicator organism densities and salinity, the results from QC samples, which are always collected in conjunction with a routine sample, calibration sample or resample, were compared to the corresponding sample result. Prior to the start of the monitoring period, approximately 10% of scheduled samples (routine and calibration samples) were designated as quality control samples. QC samples were selected at random at the beginning of the sampling period in approximately equal proportions (~ 5% each) of field duplicate and field split samples. Field splits were designed to estimate the variability of the analysis process, or "lab" precision, plus any minor imprecision resulting from sample handling and transport. Field duplicates were designed to incorporate lab variability plus sampling variability to estimate the variability of collecting another sample at approximately the same place and time. Note that

unscheduled QC samples were also collected during some routine sample events, which are also included in the QC evaluation.

Sampling and laboratory precision were estimated from each quality control sample by calculating the relative percent difference (*Sample RPD*) as follows:

$$Sample\ RPD = \frac{|C_1 - C_2|}{(C_1 + C_2)/2}\ x\ 100$$

where C_1 is the routine sample (or calibration or resample) result and C_2 is the quality control sample result. To estimate precision across samples, the mean and standard deviation of Sample RPDs were calculated. Note that the precision goals are expressed as means, and compliance with precision goals is assessed by determining if the observed precision is statistically different from the goal.

As described in Chapter 3, a total of 39 quality control samples were collected during 2020, consisting of 21 field duplicates and 18 field-split samples. To evaluate compliance with QAPP precision goals, means and standard errors of sample RPDs were calculated for the 2020 QC samples and are presented in Table 11. Figures 5-6 show Sample RPD results relative to precision goals; if the lower error bar (lower 95th percentile) shown in the graph is below the goal, then the goal has been achieved. All precision goals were achieved for 2020.
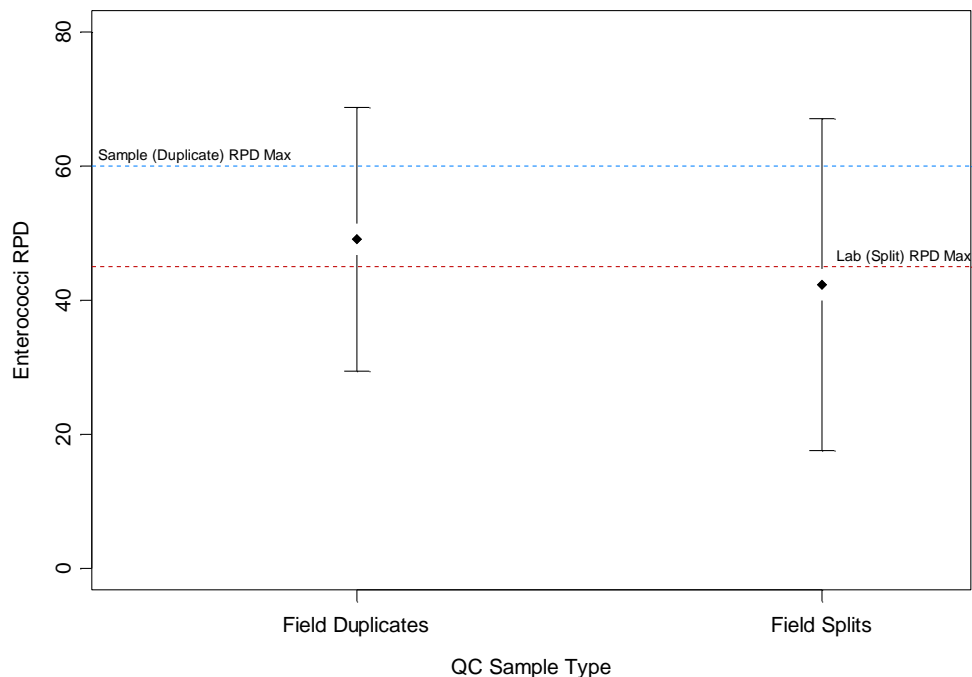
Figure 5. Comparison of 2020 monitoring season mean enterococci relative percent difference (RPD) for field duplicates and field splits with QAPP precision goals. Means are represented by diamonds and upper and lower 95th percentiles of the mean are shown as error bars.
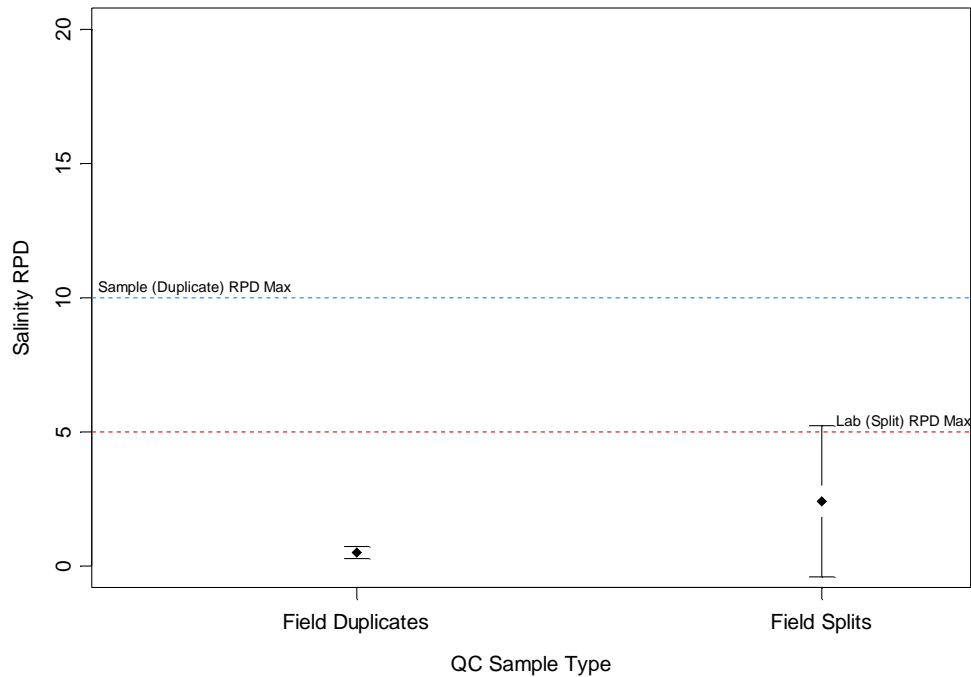
Figure 6. Comparison of 2020 monitoring season mean salinity relative percent difference (RPD) for field duplicates and field splits with QAPP precision goals. Means are represented by diamonds and upper and lower 95th percentiles of the mean are shown as error bars.

Completeness is the percentage of measurements made that are judged to be valid according to specific criteria and entered into the data management system. Percent completeness *(%*C) for measurement parameters was estimated as follows:

$$\%C = \frac{V}{T}\ x\,100$$

where *V* is the number of measurements judged valid and T is the total number of measurements. During 2020, a total of 568 samples were successfully processed, and all results were considered valid and recorded in the Program's database.

Based on a thorough review of the data recorded for the 2020 season, all completeness goals were achieved, and there were no variances from the QAPP detected. In addition to the audit and data review described above, the BEACH Program Manager/Quality Assurance Officer verified throughout the 2020 sampling period that:

- All elements of the QAPP were being correctly implemented as prescribed;
- The quality of the data generated by implementation of the QAPP was adequate; and
- Corrective actions, when needed, were implemented in a timely manner and their effectiveness was confirmed.

All beach monitoring and notification data collected during 2020 have been uploaded to USEPA's BEACH (PRAWN) and STORET data systems via submission of an XML formatted file to the Exchange Network Services Center.

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WHO. 2003. Guidelines for safe recreational water environments. Volume 1, Coastal and fresh waters. World Health Organization. Available at http://www.who.int/water_sanitation_health/bathing/srwg1.pdf, accessed on 8 Feb. 2008.

APPENDIX A

Sample Station Names and USEPA IDs

List of sample stations designated under the Louisiana BEACH Program by State ID, Beach Name, and USEPA IDs.

State ID	Beach Name	USEPA ID
CNST1	Constance Beach	LA134778
CYPT1	Cypremort Point State Park	LA971783
DUNG1	Long Beach	LA860482
ELMR1	Elmer's Island - 1	LA834833
ELMR2	Elmer's Island - 2	LA451844
FNTB1	Fontainebleau State Park	LA733869
GBRZ1	Gulf Breeze	LA725358
GIB1	Grand Isle Beach - 1	LA430483
GIB2	Grand Isle Beach - 2	LA325065
GIB3	Grand Isle Beach - 3	LA799656
GISP1	Grand Isle State Park - 1	LA240078
GISP2	Grand Isle State Park - 2	LA221569
GISP3	Grand Isle State Park - 3	LA204303
GISP4	Grand Isle State Park - 4	LA186192
HACK1	Hackberry Beach	LA720012
HOLLY1	Holly Beach - 1	LA489985
HOLLY2	Holly Beach - 2	LA829030
HOLLY3	Holly Beach - 3	LA109442
HOLLY4	Holly Beach - 4	LA697221
HOLLY5	Holly Beach - 5	LA164373
HOLLY6	Holly Beach - 6	LA467180
LCNB1	North Beach	LA202517
LCSB1	South Beach and Rabbit Island	LA981443
LTFL1	Little Florida	LA595220
MART1	Martin Beach	LA135245
RUTH1	Rutherford Beach	LA284049

APPENDIX B

**Time Series of Water Quality Results
By Sample Station**
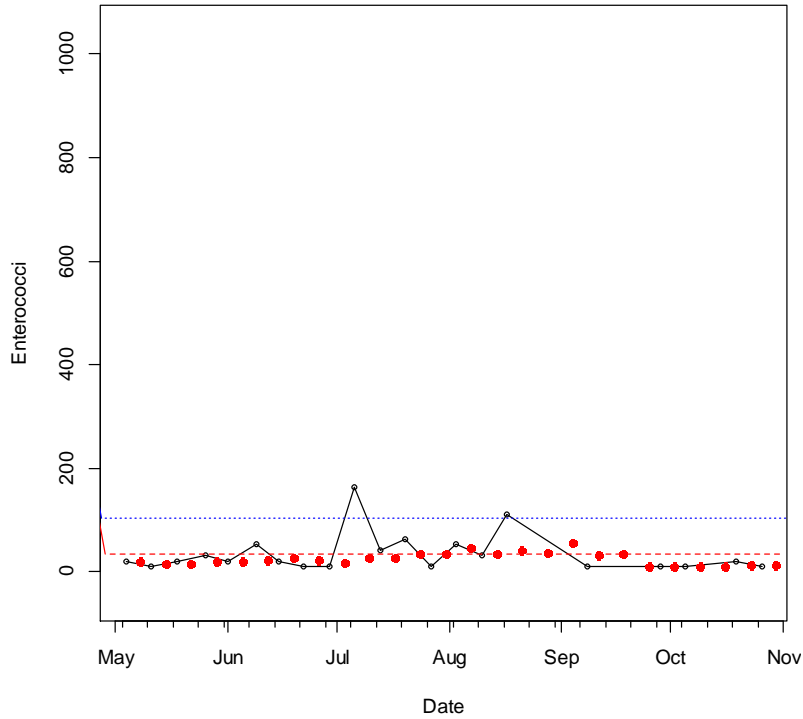
Figure B.1. Time series of enterococci sample results collected during 2020 at CNST1. Sample results are shown as open dots (○), running 30-day geometric means are shown as red dots (●), and geometric mean and single sample maximum criteria are shown as red and blue dashed horizontal lines, respectively.
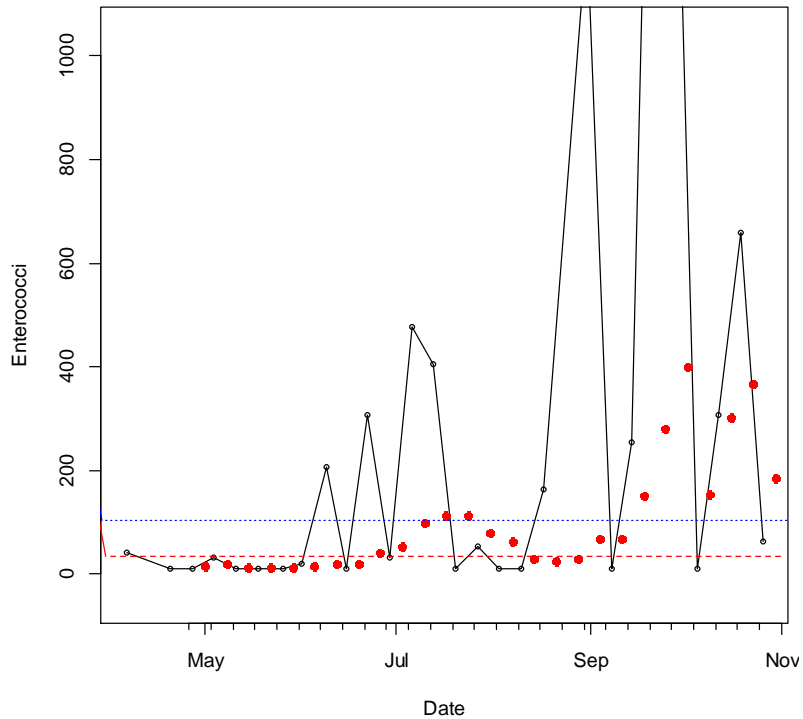

Figure B.2. Time series of sample results collected during 2020 at CYPT1.
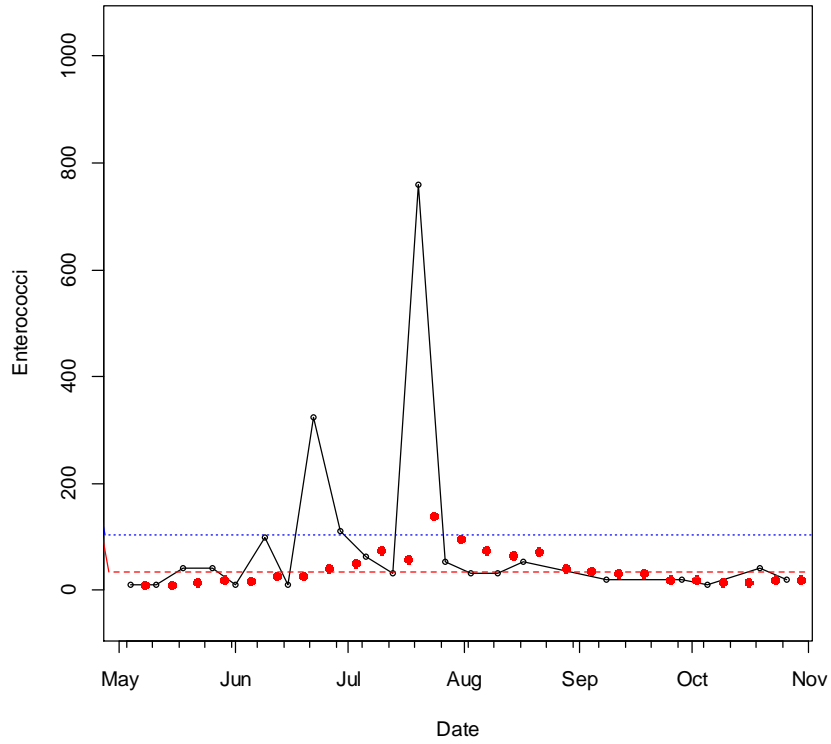
Figure B.3. Time series of sample results collected during 2020 at DUNG1.
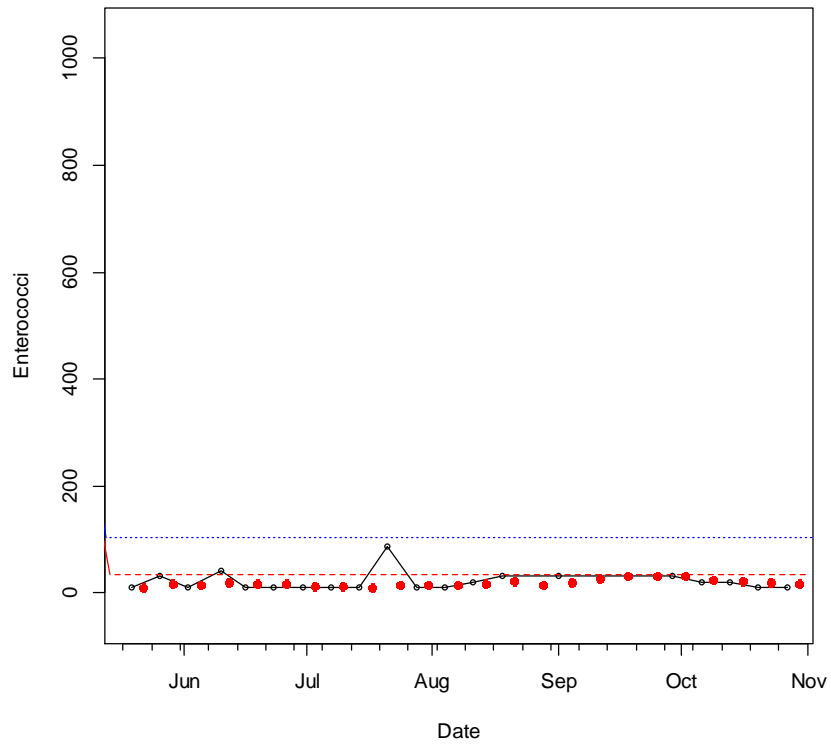
Figure B.4. Time series of sample results collected during 2020 at ELMR1.
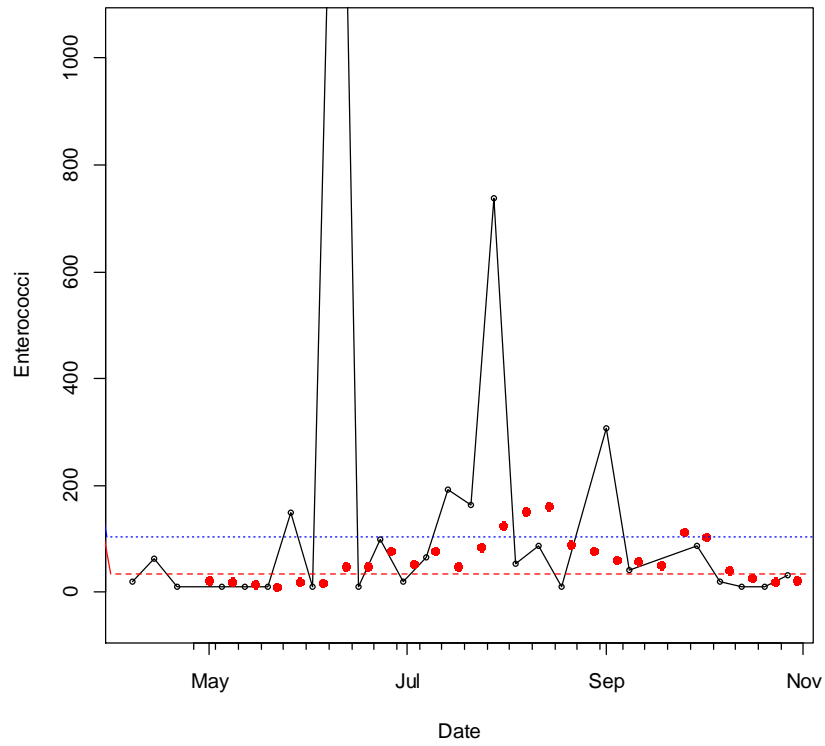
Figure B.5. Time series of sample results collected during 2020 at FNTB1.
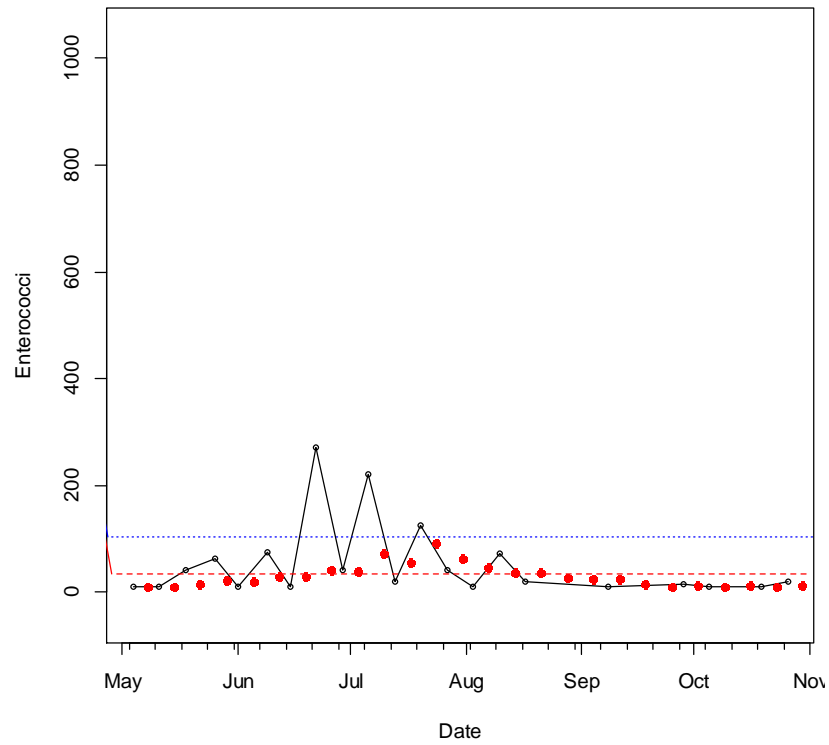
Figure B.6. Time series of sample results collected during 2020 at GBRZ1.
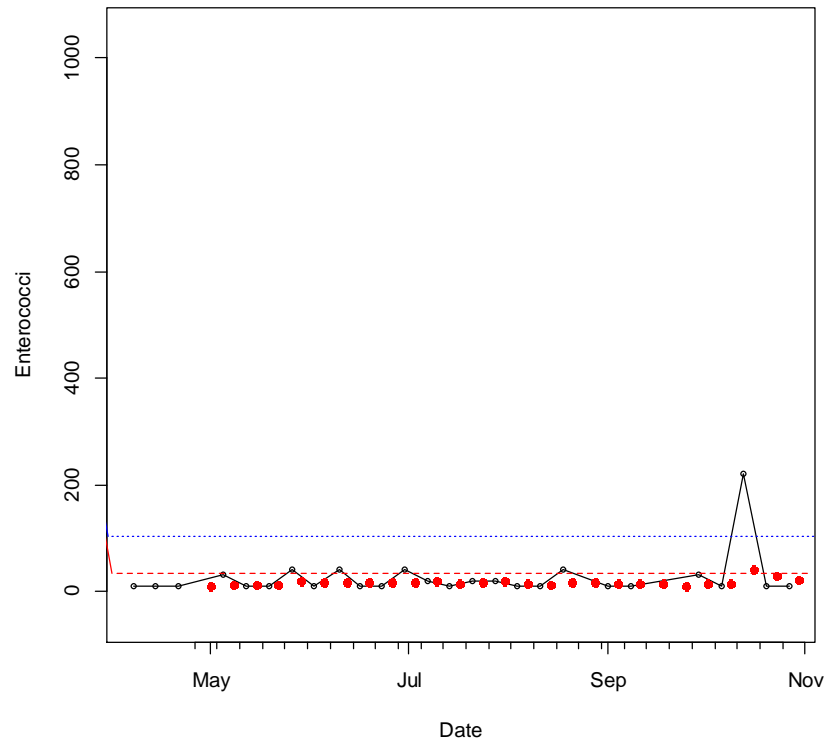
Figure B.7. Time series of sample results collected during 2020 at GIB1.
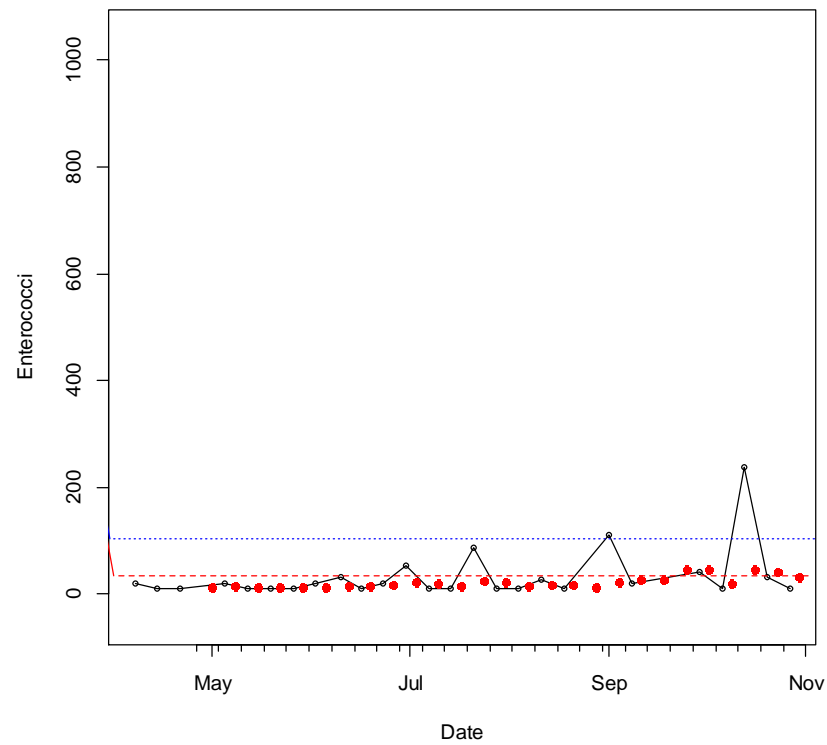
Figure B.8. Time series of sample results collected during 2020 at GIB2.
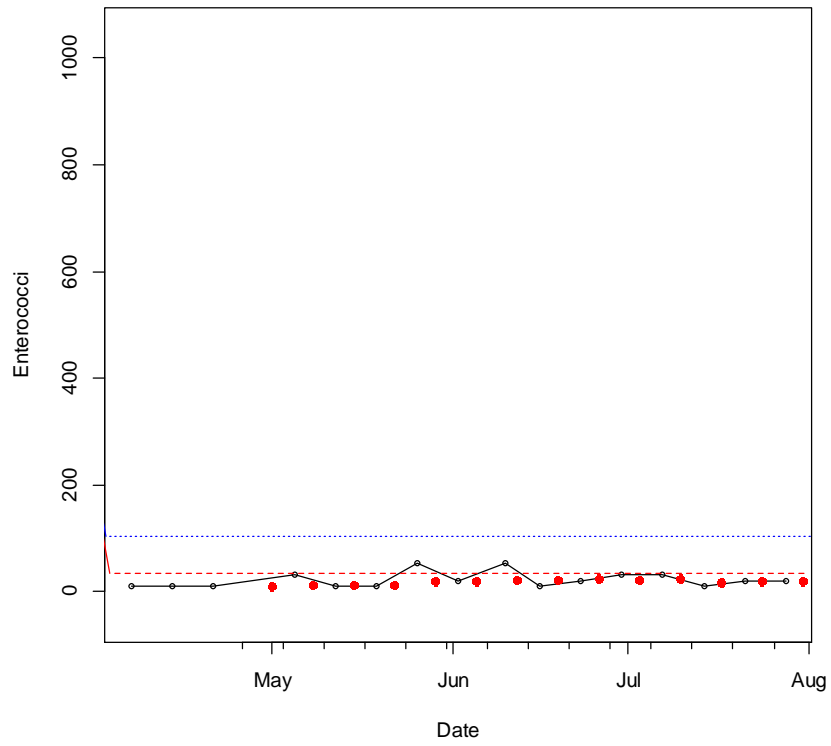
Figure B.9. Time series of sample results collected during 2020 at GIB3.
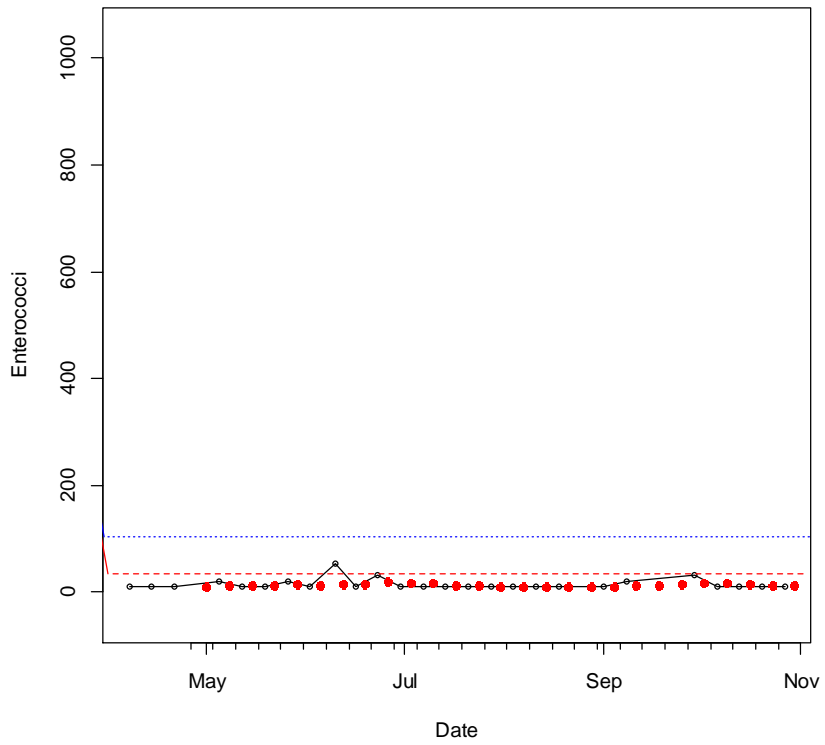
Figure B.10. Time series of sample results collected during 2020 at GISP1.
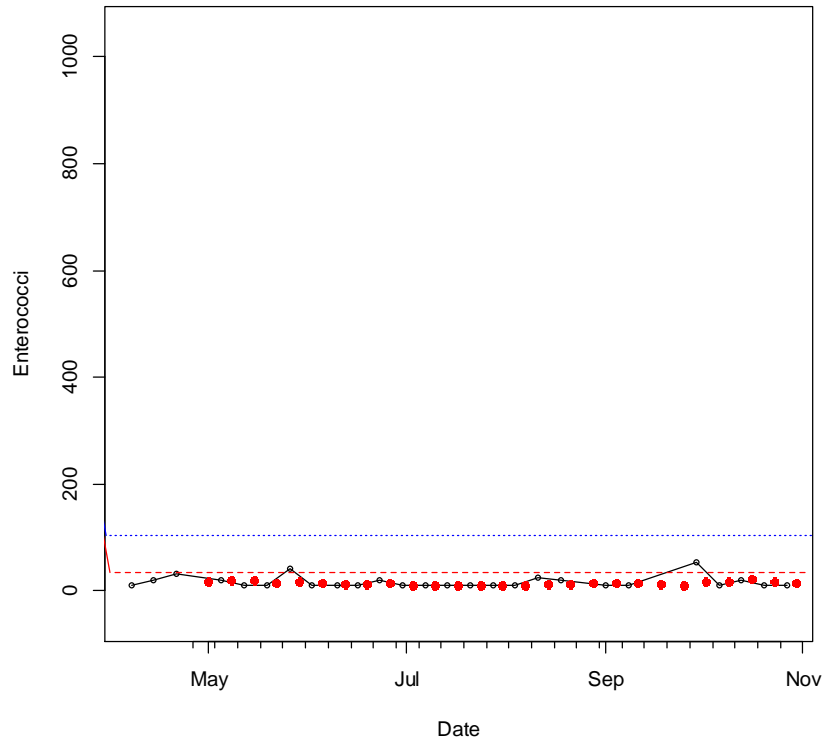
Figure B.11. Time series of sample results collected during 2020 at GISP2.
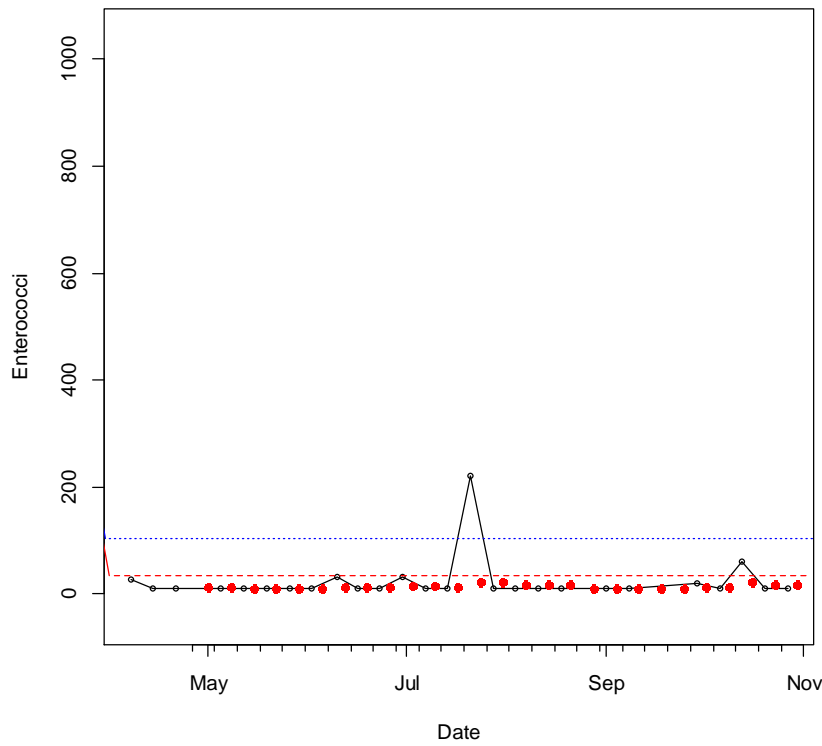
Figure B.12. Time series of sample results collected during 2020 at GISP3.
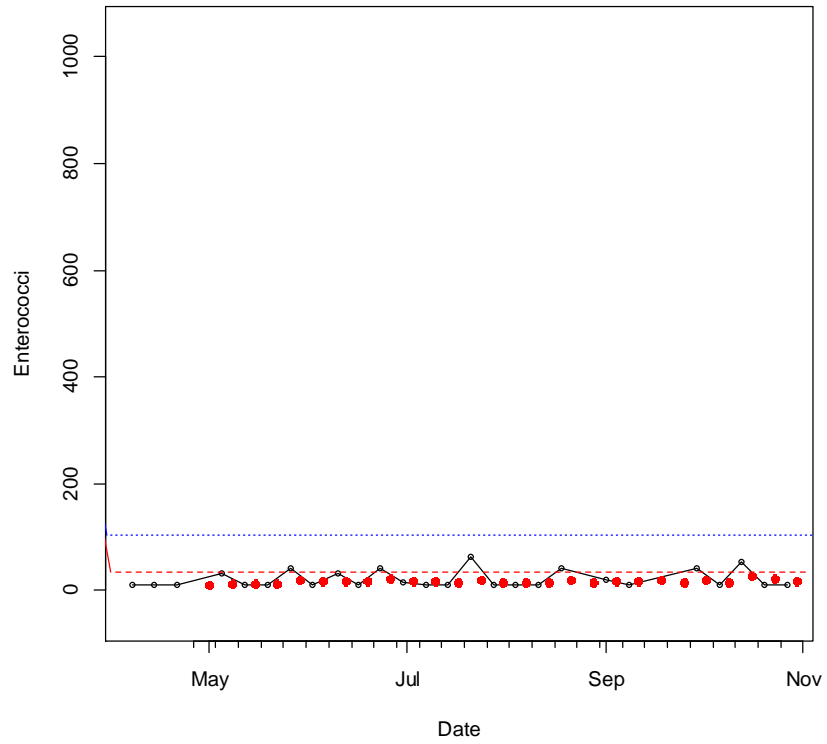
Figure B.13. Time series of sample results collected during 2020 at GISP4.
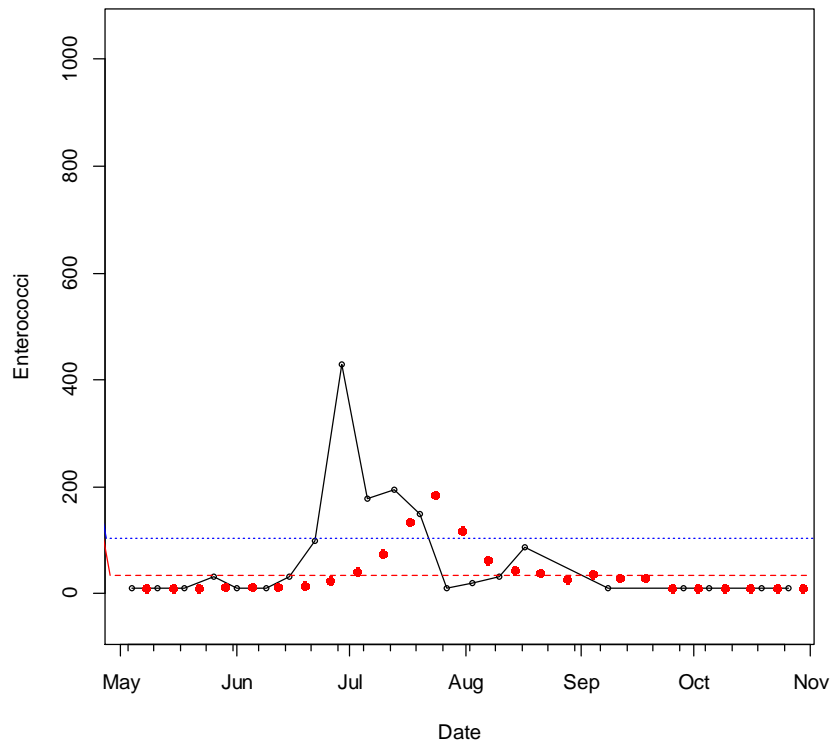
Figure B.14. Time series of sample results collected during 2020 at HOLLY1.
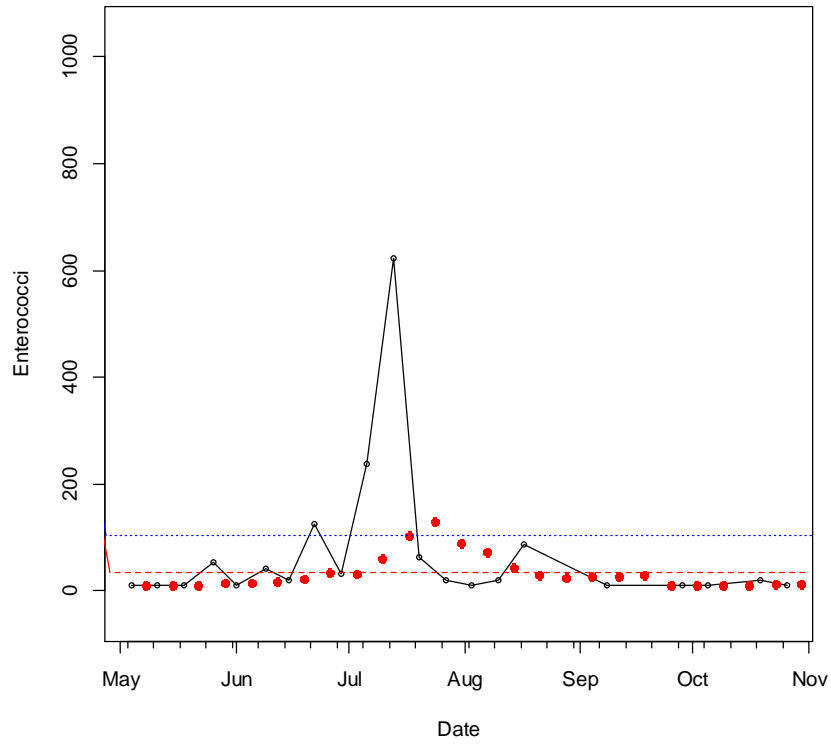
Figure B.15. Time series of sample results collected during 2020 at HOLLY2.
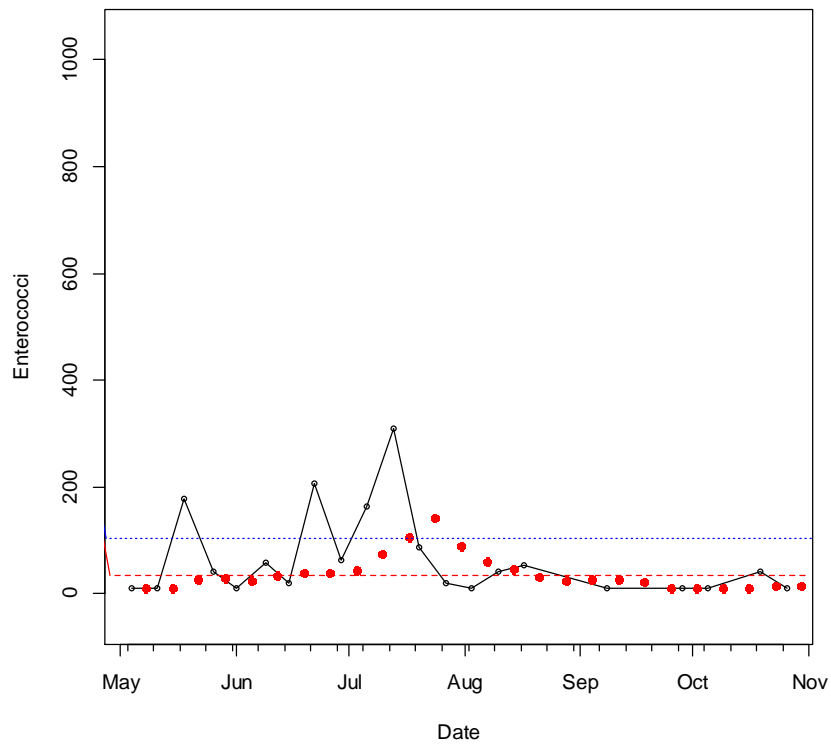
Figure B.16. Time series of sample results collected during 2020 at HOLLY3.
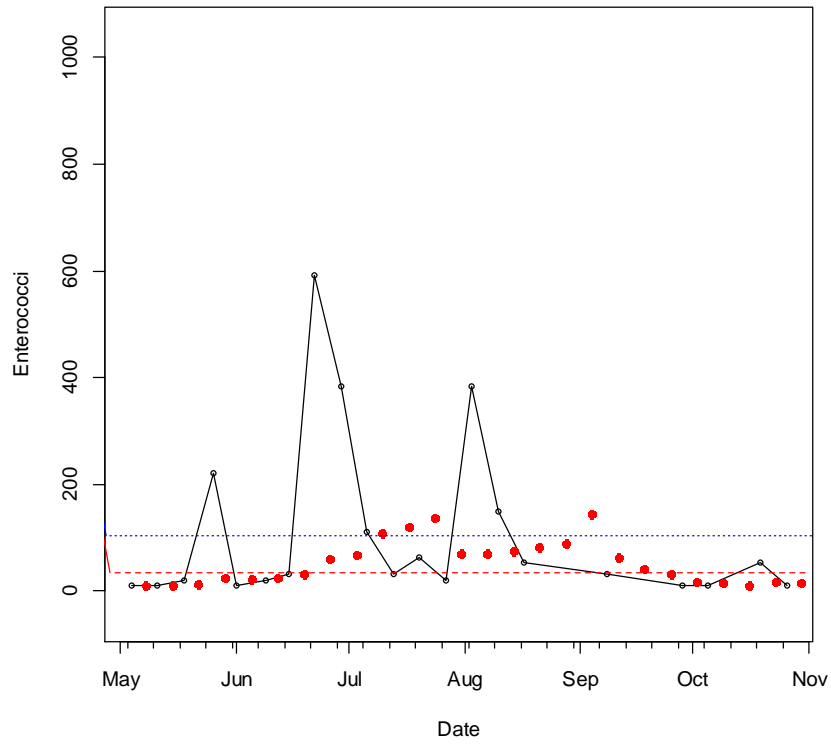
Figure B.17. Time series of sample results collected during 2020 at HOLLY4.
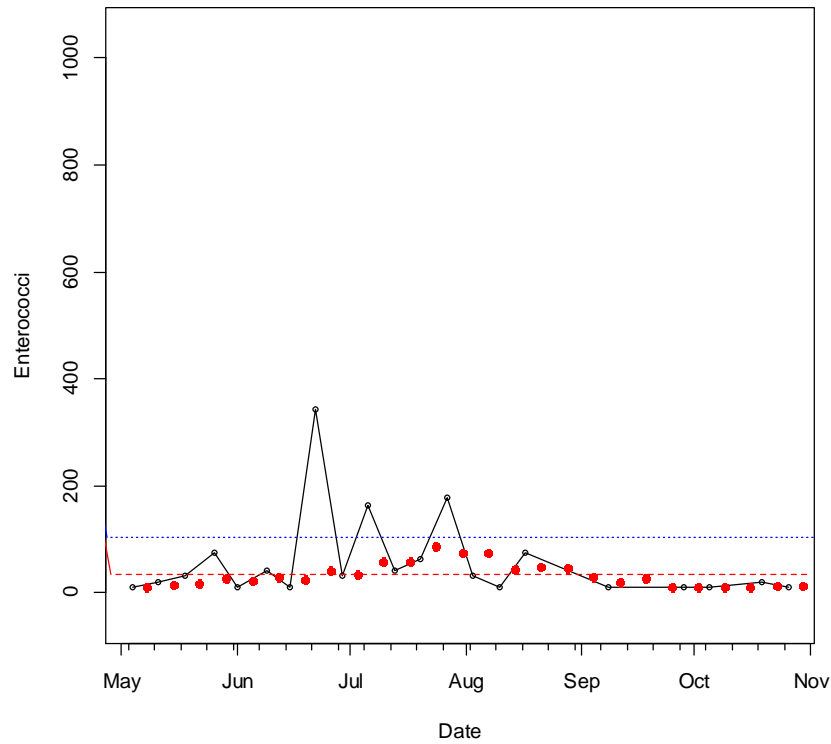
Figure B.18. Time series of sample results collected during 2020 at HOLLY5.
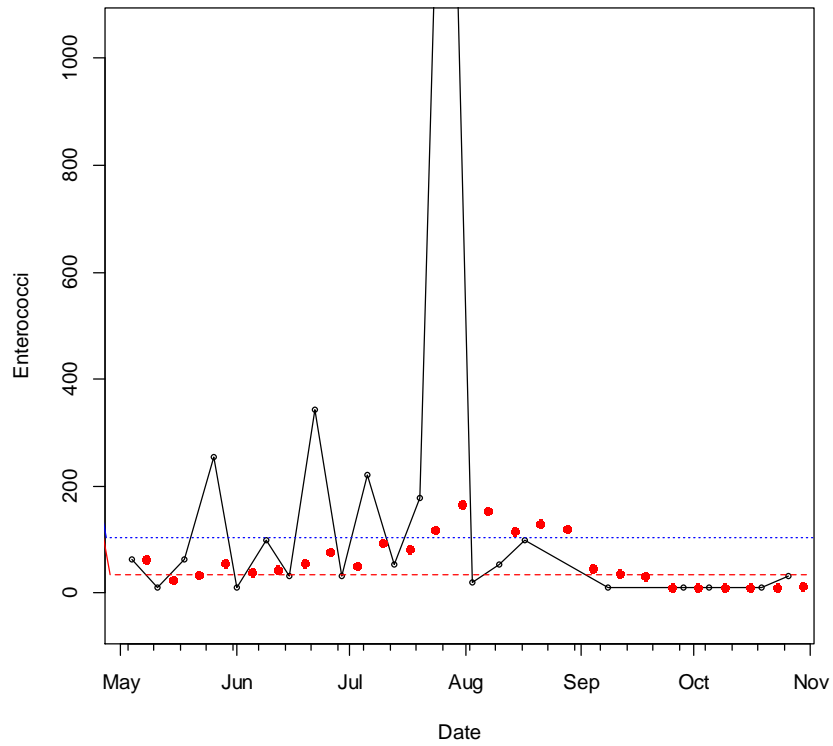
Figure B.19. Time series of sample results collected during 2020 at HOLLY6.
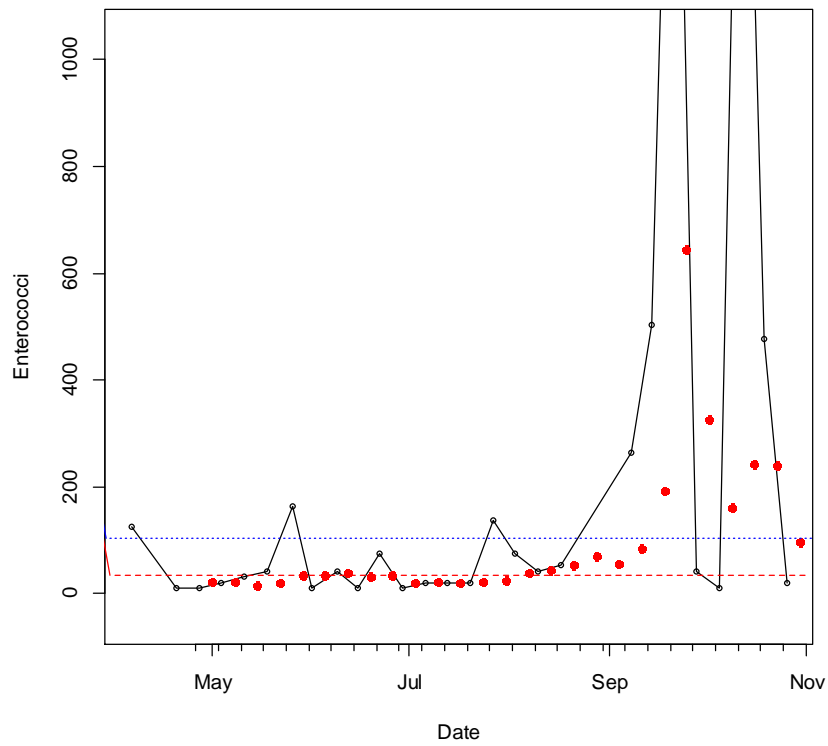
Figure B.20. Time series of sample results collected during 2020 at LCNB1.
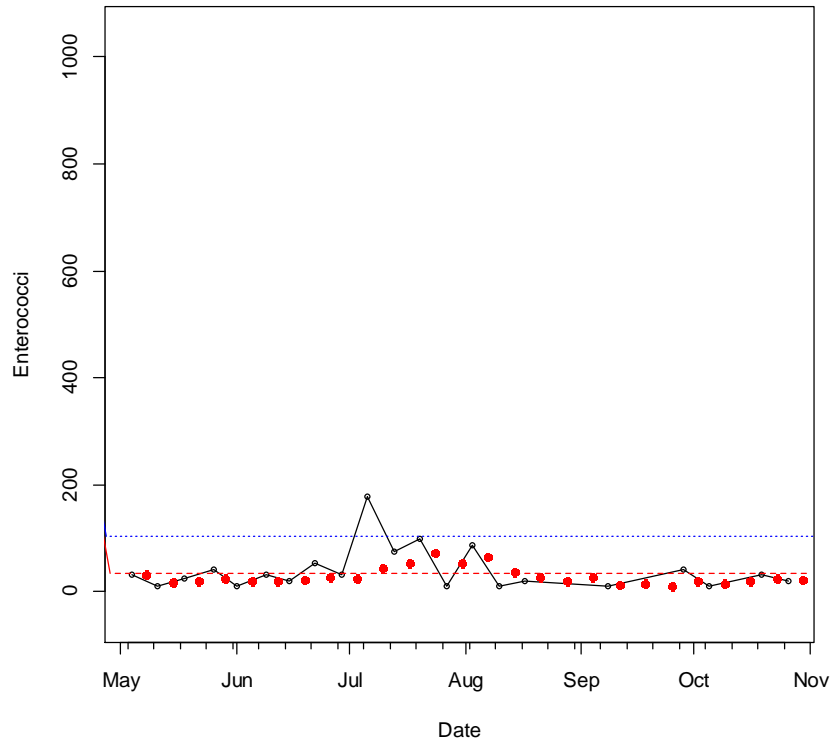
Figure B.21. Time series of sample results collected during 2020 at LTFL1.
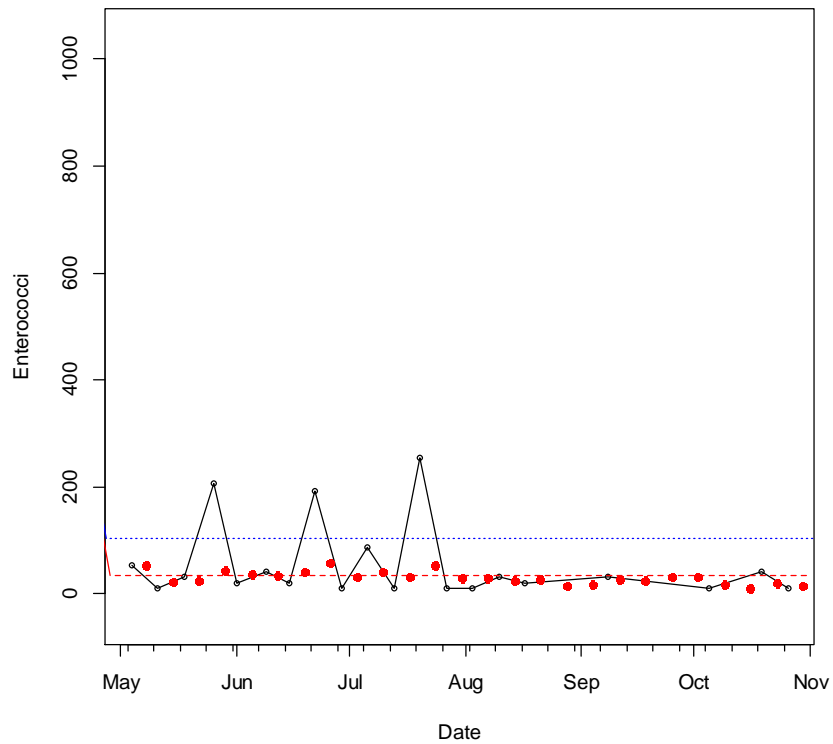
Figure B.22. Time series of sample results collected during 2020 at MART1.
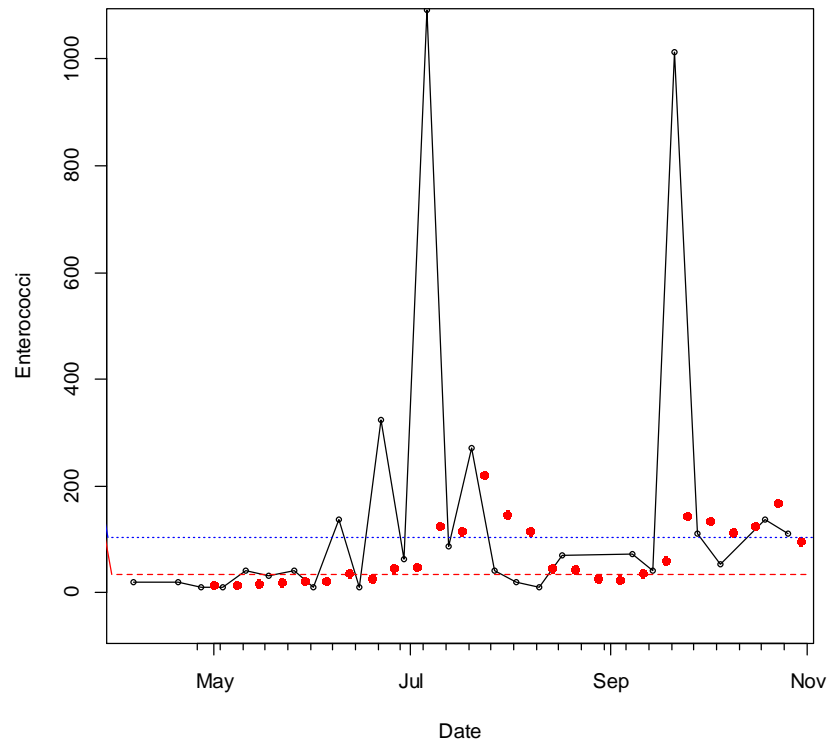
Figure B.23. Time series of sample results collected during 2020 at RUTH1.

APPENDIX C

Sample Results

2020 Beach Sample Results

Beach
Station ID

	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type

Constance Beach

CNST1   *Beach Name Constance Beach*

	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type
	5/4/2020	7:00	Low Tide	Scattered Clouds	South	Moderate-Light (5-10 mph)	74	20	15.5	Routine
	5/11/2020	7:30	High Tide	Sleet	Northeast	Moderate-Light (5-10 mph)	73	10	12.9	Routine
	5/18/2020	7:00	Low Tide	Clear	North-Northwest	Moderate-Light (5-10 mph)	74	20	21.8	Routine
	5/26/2020	7:10	High Tide	Cloudy	North-Northwest	Moderate-Light (5-10 mph)	78	31	22.2	Routine
	6/1/2020	7:00	Low Tide Falling	Cloudy	North-Northeast	Moderate-Light (5-10 mph)	80	20	21.3	Routine
	6/9/2020	7:00	High Tide	Partly Cloudy	South	Moderate-Strong (15-20 mph)	84	53	15.8	Routine
	6/15/2020	7:00	Low Tide	Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	82	20	24.4	Routine
	6/22/2020	7:00	High Tide	Rain	South	Moderate-Strong (15-20 mph)	84	10	17.6	Routine
	6/29/2020	7:00	High Tide Rising	Cloudy	South	Moderate (10-15 mph)	83	10	12.9	Routine
	7/6/2020	7:00	High Tide Falling	Light Rain	Southwest	Moderate (10-15 mph)	85	164	21.5	Routine
	7/13/2020	7:00	Low Tide Falling	Partly Cloudy	West-Southwest	Moderate-Light (5-10 mph)	85	42	28.8	Field Duplicate
	7/13/2020	7:00	Low Tide Falling	Partly Cloudy	West-Southwest	Moderate-Light (5-10 mph)	85	42	28.8	Routine
	7/20/2020	7:00	High Tide Falling	Cloudy	East-Northeast	Moderate (10-15 mph)	86	64	28.7	Routine
	7/27/2020	7:00	High Tide	Cloudy	East-Northeast	Light (0-5 mph)	85	10	17.9	Routine
	8/3/2020	7:00	High Tide Falling	Clear	Northwest	Light (0-5 mph)	84	53	26.8	Routine
	8/10/2020	7:00	High Tide	Scattered Clouds	South	Light (0-5 mph)	87	31	27.3	Routine
	8/17/2020	7:00	Low Tide	Undetermined	North	Moderate (10-15 mph)	88	87	31.0	Routine
	8/17/2020	7:00	Low Tide	Undetermined	North	Moderate (10-15 mph)	88	137	31.1	Field Split
	9/8/2020	7:00	High Tide Falling	Cloudy	Southeast	Moderate-Light (5-10 mph)	87	10	20.4	Routine
	9/28/2020	7:00	Low Tide	Clear	West-Southwest	Light (0-5 mph)	79	10	23.2	Routine
	10/5/2020	7:00	High Tide Falling	Scattered Clouds	North-Northeast	Moderate (10-15 mph)	77	10	25.3	Routine
	10/19/2020	7:00	High Tide Falling	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	78	20	22.0	Routine
	10/26/2020	7:00	Low Tide	Cloudy	North-Northeast	Moderate-Light (5-10 mph)	76	10	18.9	Routine

Cypremort Point State Park

CYPT1   *Beach Name Cypremort Point State Park*

	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type
	4/6/2020	7:20	Low Tide	Partly Cloudy	East	Light (0-5 mph)	67	42	0.8	Routine
	4/20/2020	7:10	Low Tide Falling	Cloudy	North	Light (0-5 mph)	70	10	0.7	Routine

Beach
Station ID

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type
4/27/2020	7:00	High Tide Rising	Clear	East	Light (0-5 mph)	72	10	0.7	Routine
5/4/2020	7:05	High Tide Falling	Scattered Clouds	East	Light (0-5 mph)	76	31	0.6	Routine
5/11/2020	7:00	Low Tide Falling	Scattered Clouds	South-Southwest	Light (0-5 mph)	69	10	0.5	Routine
5/18/2020	7:00	High Tide	Clear	West	Moderate-Light (5-10 mph)	76	10	0.6	Routine
5/26/2020	6:58	High Tide	Light Rain	North-Northeast	Light (0-5 mph)	80	10	0.4	Field Split
5/26/2020	6:58	High Tide	Light Rain	North-Northeast	Light (0-5 mph)	80	10	0.5	Routine
6/1/2020	7:00	Low Tide	Cloudy	East-Northeast	Light (0-5 mph)	80	20	0.4	Routine
6/9/2020	7:00	High Tide	Scattered Clouds	South-Southeast	Moderate-Light (5-10 mph)	80	207	0.3	Routine
6/15/2020	7:00	High Tide	Clear	North	Light (0-5 mph)	81	10	0.3	Routine
6/22/2020	6:55	High Tide Rising	Light Rain	South	Moderate (10-15 mph)	82	306	0.6	Routine
6/29/2020	7:00	High Tide	Cloudy	South-Southeast	Light (0-5 mph)	84	31	0.5	Routine
7/6/2020	6:50	High Tide Falling	Cloudy	Northwest	Light (0-5 mph)	81	478	0.6	Routine
7/13/2020	6:50	Low Tide Falling	Cloudy	West	Moderate-Light (5-10 mph)	84	406	0.6	Routine
7/20/2020	6:55	High Tide	Cloudy	Northeast	Moderate-Light (5-10 mph)	84	10	11.9	Routine
7/27/2020	6:50	High Tide Rising	Light Rain	East	Moderate-Light (5-10 mph)	80	53	8.6	Routine
8/3/2020	6:50	High Tide Rising	Clear	East-Southeast	Light (0-5 mph)	82	10	4.8	Routine
8/10/2020	6:50	Low Tide Falling	Scattered Clouds	Northeast	Calm (0 mph)	85	10	5.6	Routine
8/17/2020	6:50	High Tide	Cloudy	East	Light (0-5 mph)	85	164	6.4	Routine
8/31/2020	6:50	Extremely High Tide	Cloudy	South-Southwest	Moderate-Light (5-10 mph)	82	1184	5.7	Routine
8/31/2020	6:50	Extremely High Tide	Cloudy	South-Southwest	Moderate-Light (5-10 mph)	82	1298	5.7	Field Split
9/8/2020	6:55	High Tide Falling	Partly Cloudy	East	Light (0-5 mph)	84	10	6.0	Routine
9/14/2020	7:00	High Tide	Clear	North-Northeast	Moderate-Light (5-10 mph)	82	254	6.0	Routine
9/21/2020	6:45	Extremely High Tide	Rain	East-Northeast	Moderate-Strong (15-20 mph)	82	2005	5.5	Routine
9/28/2020	6:50	Extremely High Tide	Cloudy	Calm	Calm (0 mph)	80	1652	4.4	Routine
10/5/2020	6:50	High Tide Falling	Clear	North-Northeast	Moderate-Light (5-10 mph)	72	10	4.7	Routine
10/12/2020	7:00	Extremely High Tide	Cloudy	West-Southwest	Light (0-5 mph)	80	306	3.5	Routine
10/19/2020	6:50	Extremely High Tide	Cloudy	Northeast	Moderate-Light (5-10 mph)	74	659	3.7	Routine
10/26/2020	6:50	High Tide Falling	Clear	Northeast	Moderate-Light (5-10 mph)	70	64	4.6	Routine

Elmer's Island

ELMR1   ***Beach Name*** *Elmer's Island - 1*

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type
5/19/2020	6:15	Normal	Clear	West-Southwest	Light (0-5 mph)	77	10	15.4	Routine
5/26/2020	6:15	Normal	Partly Cloudy	East-Southeast	Moderate-Light (5-10 mph)	80	31	14.9	Routine
6/2/2020	6:10	Normal	Cloudy	East-Northeast	Moderate-Light (5-10 mph)	81	10	12.1	Routine

Beach

Station ID

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type
6/10/2020	6:10	High Tide	Light Rain	South	Moderate (10-15 mph)	81	42	16.5	Routine
6/16/2020	6:10	Normal	Scattered Clouds	North-Northeast	Moderate-Light (5-10 mph)	82	10	14.5	Routine
6/23/2020	6:00	High Tide	Cloudy	Southwest	Moderate (10-15 mph)	82	10	16.7	Routine
6/30/2020	6:10	High Tide	Cloudy	Southwest	Light (0-5 mph)	84	10	13.0	Routine
7/7/2020	6:10	Normal	Cloudy	Southwest	Light (0-5 mph)	80	10	19.8	Routine
7/14/2020	6:15	Low Tide	Cloudy	Southwest	Light (0-5 mph)	84	10	33.9	Routine
7/21/2020	6:15	Low Tide Falling	Rain	Southeast	Moderate (10-15 mph)	85	87	16.8	Routine
7/28/2020	6:17	High Tide Rising	Mist	East-Southeast	Moderate-Light (5-10 mph)	81	10	15.5	Routine
8/4/2020	6:15	Low Tide Falling	Clear	East-Northeast	Moderate-Light (5-10 mph)	88	10	19.6	Routine
8/11/2020	6:20	High Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	88	20	20.0	Routine
8/18/2020	6:20	Normal	Scattered Clouds	Northeast	Calm (0 mph)	88	31	20.5	Routine
9/1/2020	6:20	Normal	Partly Cloudy	South	Moderate-Light (5-10 mph)	85	31	26.1	Field Duplicate
9/1/2020	6:20	Normal	Partly Cloudy	South	Moderate-Light (5-10 mph)	85	31	25.6	Routine
9/29/2020	6:35	High Tide Falling	Cloudy	North	Moderate-Strong (15-20 mph)	81	31	23.1	Routine
10/6/2020	6:40	High Tide Falling	Light Rain	Northeast	Moderate (10-15 mph)	74	20	26.8	Routine
10/13/2020	7:00	High Tide	Scattered Clouds	West-Northwest	Moderate-Light (5-10 mph)	78	20	30.1	Routine
10/20/2020	6:45	Normal	Scattered Clouds	East	Moderate (10-15 mph)	76	10	27.6	Routine
10/27/2020	6:35	High Tide	Cloudy	East-Northeast	Moderate (10-15 mph)	76	10	24.5	Routine

Fontainebleau State Park

FNTB1   ***Beach Name*** *Fontainebleau State Park*

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type
4/7/2020	8:54	High Tide	Partly Cloudy	Southeast	Light (0-5 mph)	72	20	18.5	Routine
4/14/2020	8:50	High Tide	Cloudy	North-Northeast	Moderate-Light (5-10 mph)	73	64	0.5	Routine
4/21/2020	9:15	Low Tide Falling	Clear	North	Light (0-5 mph)	70	10	0.5	Routine
5/5/2020	8:45	Low Tide	Clear	North-Northwest	Light (0-5 mph)	76	10	0.5	Field Duplicate
5/5/2020	8:45	Low Tide	Clear	North-Northwest	Light (0-5 mph)	76	10	0.5	Routine
5/12/2020	9:15	High Tide Falling	Clear	North	Moderate-Light (5-10 mph)	74	10	0.3	Routine
5/19/2020	9:00	Low Tide Falling	Scattered Clouds	West	Moderate-Light (5-10 mph)	74	10	0.5	Routine
5/26/2020	9:00	High Tide Falling	Cloudy	East-Northeast	Light (0-5 mph)	82	150	0.4	Routine
6/2/2020	9:05	Low Tide Falling	Cloudy	East-Northeast	Light (0-5 mph)	82	10	0.4	Routine
6/10/2020	9:00	High Tide Falling	Rain	West-Southwest	Moderate-Light (5-10 mph)	82	2005	0.4	Routine
6/16/2020	9:10	Low Tide Falling	Clear	North-Northeast	Light (0-5 mph)	82	10	0.4	Routine
6/16/2020	9:10	Low Tide Falling	Clear	North-Northeast	Light (0-5 mph)	82	10	0.4	Field Split
6/23/2020	9:03	Low Tide	Partly Cloudy	West-Southwest	Moderate-Light (5-10 mph)	86	99	0.5	Routine

Beach

Station ID

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type
6/30/2020	9:00	Low Tide	Partly Cloudy	South-Southwest	Light (0-5 mph)	85	20	0.6	Routine
7/7/2020	9:00	Low Tide	Partly Cloudy	West	Moderate-Light (5-10 mph)	85	87	0.2	Routine
7/7/2020	9:00	Low Tide	Partly Cloudy	West	Moderate-Light (5-10 mph)	85	42	0.2	Field Split
7/14/2020	9:01	Low Tide Falling	Partly Cloudy	Calm	Calm (0 mph)	86	192	0.2	Routine
7/21/2020	9:03	Low Tide	Cloudy	East	Light (0-5 mph)	87	164	0.2	Routine
7/28/2020	9:10	Low Tide Falling	Partly Cloudy	South-Southwest	Moderate-Light (5-10 mph)	87	738	0.2	Routine
8/4/2020	9:02	Low Tide	Clear	West	Light (0-5 mph)	86	53	0.1	Routine
8/11/2020	9:10	Low Tide	Clear	Northwest	Light (0-5 mph)	90	87	0.3	Routine
8/18/2020	9:05	Low Tide	Clear	North-Northeast	Light (0-5 mph)	88	10	0.1	Routine
9/1/2020	9:05	Low Tide	Cloudy	South-Southwest	Moderate-Light (5-10 mph)	85	306	0.5	Routine
9/8/2020	9:10	Low Tide Falling	Partly Cloudy	East-Northeast	Light (0-5 mph)	87	42	0.8	Routine
9/29/2020	8:45	Low Tide Falling	Partly Cloudy	North-Northeast	Light (0-5 mph)	79	87	3.0	Routine
10/6/2020	8:50	Low Tide	Partly Cloudy	North-Northeast	Moderate-Light (5-10 mph)	73	10	2.4	Field Duplicate
10/6/2020	8:50	Low Tide	Partly Cloudy	North-Northeast	Moderate-Light (5-10 mph)	73	31	2.4	Routine
10/13/2020	9:50	Low Tide Falling	Clear	North-Northeast	Moderate-Light (5-10 mph)	75	10	2.3	Routine
10/20/2020	9:05	Low Tide	Clear	East-Northeast	Moderate-Light (5-10 mph)	76	10	2.8	Routine
10/27/2020	9:05	Low Tide	Partly Cloudy	East-Northeast	Moderate-Light (5-10 mph)	76	31	2.7	Routine

Grand Isle Beach

GIB1   ***Beach Name*** *Grand Isle Beach - 1*

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type
4/7/2020	6:30	Low Tide	Clear	South	Moderate-Light (5-10 mph)	71	10	18.3	Routine
4/14/2020	6:30	Low Tide Falling	Cloudy	North-Northeast	Moderate (10-15 mph)	73	10	13.8	Routine
4/21/2020	6:20	Low Tide	Partly Cloudy	East-Southeast	Moderate-Light (5-10 mph)	72	10	13.7	Routine
5/5/2020	6:20	Low Tide	Partly Cloudy	South	Light (0-5 mph)	72	31	10.6	Routine
5/12/2020	6:20	Normal	Scattered Clouds	Northeast	Moderate-Light (5-10 mph)	73	10	14.6	Routine
5/19/2020	6:15	Normal	Clear	West-Southwest	Light (0-5 mph)	77	10	15.5	Routine
5/26/2020	6:15	Normal	Partly Cloudy	East-Southeast	Moderate-Light (5-10 mph)	80	42	14.6	Routine
6/2/2020	6:10	Normal	Cloudy	East-Northeast	Moderate-Light (5-10 mph)	81	10	12.2	Routine
6/10/2020	6:10	High Tide	Light Rain	South	Moderate (10-15 mph)	81	42	16.6	Routine
6/16/2020	6:10	Normal	Scattered Clouds	North-Northeast	Moderate-Light (5-10 mph)	82	10	14.5	Routine
6/23/2020	6:00	High Tide	Cloudy	Southwest	Moderate (10-15 mph)	82	10	16.7	Routine
6/30/2020	6:10	High Tide	Cloudy	Southwest	Light (0-5 mph)	84	42	12.9	Routine
7/7/2020	6:10	Normal	Cloudy	Southwest	Light (0-5 mph)	81	20	19.6	Routine
7/14/2020	6:15	Low Tide	Cloudy	Southwest	Light (0-5 mph)	84	10	34.4	Routine

Beach

Station ID

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero- cocci	Salinity	Sample Type
7/21/2020	6:15	Low Tide Falling	Rain	Southeast	Moderate (10-15 mph)	84	20	16.8	Routine
7/28/2020	6:17	High Tide Rising	Mist	East-Southeast	Moderate-Light (5-10 mph)	80	20	15.5	Routine
8/4/2020	6:15	Low Tide Falling	Clear	East-Northeast	Moderate-Light (5-10 mph)	88	10	19.7	Routine
8/4/2020	6:15	Low Tide Falling	Clear	East-Northeast	Moderate-Light (5-10 mph)	88	10	19.7	Field Split
8/11/2020	6:20	High Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	88	10	20.0	Routine
8/18/2020	6:20	Normal	Scattered Clouds	Northeast	Calm (0 mph)	89	42	20.7	Routine
9/1/2020	6:20	Normal	Partly Cloudy	South	Moderate-Light (5-10 mph)	84	10	26.0	Routine
9/8/2020	6:45	Normal	Partly Cloudy	East-Southeast	Moderate-Light (5-10 mph)	85	10	23.9	Routine
9/29/2020	6:35	High Tide Falling	Cloudy	North	Moderate-Strong (15-20 mph)	81	31	23.3	Routine
10/6/2020	6:40	High Tide Falling	Light Rain	Northeast	Moderate (10-15 mph)	74	10	26.7	Routine
10/13/2020	7:00	High Tide	Scattered Clouds	West-Northwest	Moderate-Light (5-10 mph)	78	222	30.2	Routine
10/20/2020	6:45	Normal	Scattered Clouds	East	Moderate (10-15 mph)	77	10	27.6	Routine
10/27/2020	6:35	High Tide	Cloudy	East-Northeast	Moderate (10-15 mph)	76	10	24.6	Routine

Grand Isle Beach

GIB2   *Beach Name Grand Isle Beach - 2*

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero- cocci	Salinity	Sample Type
4/7/2020	6:30	Low Tide	Clear	South	Moderate-Light (5-10 mph)	71	20	18.4	Routine
4/14/2020	6:30	Low Tide Falling	Cloudy	North-Northeast	Moderate (10-15 mph)	73	10	13.9	Routine
4/21/2020	6:20	Low Tide	Partly Cloudy	East-Southeast	Moderate-Light (5-10 mph)	72	10	13.8	Routine
5/5/2020	6:20	Low Tide	Partly Cloudy	South	Light (0-5 mph)	73	20	10.6	Routine
5/12/2020	6:20	Normal	Scattered Clouds	Northeast	Moderate-Light (5-10 mph)	72	10	14.7	Routine
5/19/2020	6:15	Normal	Clear	West-Southwest	Light (0-5 mph)	77	10	15.6	Routine
5/26/2020	6:15	Normal	Partly Cloudy	East-Southeast	Moderate-Light (5-10 mph)	80	10	14.6	Routine
6/2/2020	6:10	Normal	Cloudy	East-Northeast	Moderate-Light (5-10 mph)	81	20	12.3	Routine
6/10/2020	6:10	High Tide	Light Rain	South	Moderate (10-15 mph)	81	31	16.7	Routine
6/16/2020	6:10	Normal	Scattered Clouds	North-Northeast	Moderate-Light (5-10 mph)	82	10	14.7	Routine
6/23/2020	6:00	High Tide	Cloudy	Southwest	Moderate (10-15 mph)	82	20	16.7	Routine
6/30/2020	6:10	High Tide	Cloudy	Southwest	Light (0-5 mph)	84	53	13.0	Routine
7/7/2020	6:10	Normal	Cloudy	Southwest	Light (0-5 mph)	81	10	20.1	Routine
7/14/2020	6:15	Low Tide	Cloudy	Southwest	Light (0-5 mph)	84	10	34.2	Routine
7/21/2020	6:15	Low Tide Falling	Rain	Southeast	Moderate (10-15 mph)	85	87	17.1	Routine
7/28/2020	6:17	High Tide Rising	Mist	East-Southeast	Moderate-Light (5-10 mph)	80	10	15.5	Routine
8/4/2020	6:15	Low Tide Falling	Clear	East-Northeast	Moderate-Light (5-10 mph)	88	10	20.0	Routine
8/11/2020	6:20	High Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	88	42	20.0	Routine

Beach

Station ID

	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type
	8/11/2020	6:20	High Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	88	10	19.9	Field Duplicate
	8/18/2020	6:20	Normal	Scattered Clouds	Northeast	Calm (0 mph)	88	10	20.7	Routine
	9/1/2020	6:20	Normal	Partly Cloudy	South	Moderate-Light (5-10 mph)	84	111	25.9	Routine
	9/8/2020	6:45	Normal	Partly Cloudy	East-Southeast	Moderate-Light (5-10 mph)	86	20	23.8	Routine
	9/29/2020	6:35	High Tide Falling	Cloudy	North	Moderate-Strong (15-20 mph)	81	42	23.5	Routine
	10/6/2020	6:40	High Tide Falling	Light Rain	Northeast	Moderate (10-15 mph)	74	10	28.1	Routine
	10/13/2020	7:00	High Tide	Scattered Clouds	West-Northwest	Moderate-Light (5-10 mph)	78	238	30.2	Routine
	10/20/2020	6:45	Normal	Scattered Clouds	East	Moderate (10-15 mph)	76	31	27.5	Routine
	10/27/2020	6:35	High Tide	Cloudy	East-Northeast	Moderate (10-15 mph)	76	10	24.6	Routine

Grand Isle Beach

GIB3   **Beach Name** *Grand Isle Beach - 3*

	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type
	4/7/2020	6:30	Low Tide	Clear	South	Moderate-Light (5-10 mph)	71	10	18.4	Routine
	4/14/2020	6:30	Low Tide Falling	Cloudy	North-Northeast	Moderate (10-15 mph)	73	10	13.8	Routine
	4/21/2020	6:20	Low Tide	Partly Cloudy	East-Southeast	Moderate-Light (5-10 mph)	71	10	13.8	Routine
	5/5/2020	6:20	Low Tide	Partly Cloudy	South	Light (0-5 mph)	72	31	10.6	Routine
	5/12/2020	6:20	Normal	Scattered Clouds	Northeast	Moderate-Light (5-10 mph)	73	10	14.7	Routine
	5/19/2020	6:15	Normal	Clear	West-Southwest	Light (0-5 mph)	78	10	15.7	Routine
	5/26/2020	6:15	Normal	Partly Cloudy	East-Southeast	Moderate-Light (5-10 mph)	80	53	14.8	Routine
	6/2/2020	6:10	Normal	Cloudy	East-Northeast	Moderate-Light (5-10 mph)	81	20	12.3	Routine
	6/10/2020	6:10	High Tide	Light Rain	South	Moderate (10-15 mph)	81	53	16.7	Routine
	6/16/2020	6:10	Normal	Scattered Clouds	North-Northeast	Moderate-Light (5-10 mph)	82	10	14.7	Routine
	6/16/2020	6:10	Normal	Scattered Clouds	North-Northeast	Moderate-Light (5-10 mph)	82	10	14.8	Field Split
	6/23/2020	6:00	High Tide	Cloudy	Southwest	Moderate (10-15 mph)	82	20	16.9	Routine
	6/30/2020	6:10	High Tide	Cloudy	Southwest	Light (0-5 mph)	84	31	12.9	Routine
	7/7/2020	6:10	Normal	Cloudy	Southwest	Light (0-5 mph)	81	31	19.8	Routine
	7/14/2020	6:15	Low Tide	Cloudy	Southwest	Light (0-5 mph)	84	10	34.6	Routine
	7/21/2020	6:15	Low Tide Falling	Rain	Southeast	Moderate (10-15 mph)	85	10	16.9	Field Duplicate
	7/21/2020	6:15	Low Tide Falling	Rain	Southeast	Moderate (10-15 mph)	85	31	16.8	Routine
	7/28/2020	6:17	High Tide Rising	Mist	East-Southeast	Moderate-Light (5-10 mph)	80	20	15.5	Routine

Grand Isle State Park

GISP1   **Beach Name** *Grand Isle State Park - 1*

	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type
	4/7/2020	6:30	Low Tide	Clear	South	Moderate-Light (5-10 mph)	71	10	0.4	Routine

Beach

Station ID

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type
4/14/2020	6:30	Low Tide Falling	Cloudy	North-Northeast	Moderate (10-15 mph)	73	10	13.8	Routine
4/21/2020	6:20	Low Tide	Partly Cloudy	East-Southeast	Moderate-Light (5-10 mph)	72	10	13.4	Routine
5/5/2020	6:20	Low Tide	Partly Cloudy	South	Light (0-5 mph)	73	20	10.6	Routine
5/12/2020	6:20	Normal	Scattered Clouds	Northeast	Moderate-Light (5-10 mph)	73	10	14.8	Routine
5/19/2020	6:15	Normal	Clear	West-Southwest	Light (0-5 mph)	78	10	15.8	Routine
5/26/2020	6:15	Normal	Partly Cloudy	East-Southeast	Moderate-Light (5-10 mph)	80	20	15.0	Routine
6/2/2020	6:10	Normal	Cloudy	East-Northeast	Moderate-Light (5-10 mph)	81	10	12.3	Routine
6/10/2020	6:10	High Tide	Light Rain	South	Moderate (10-15 mph)	81	53	16.8	Routine
6/16/2020	6:10	Normal	Scattered Clouds	North-Northeast	Moderate-Light (5-10 mph)	82	10	14.5	Routine
6/23/2020	6:00	High Tide	Cloudy	Southwest	Moderate (10-15 mph)	82	31	16.9	Routine
6/30/2020	6:10	High Tide	Cloudy	Southwest	Light (0-5 mph)	84	10	13.0	Routine
7/7/2020	6:10	Normal	Cloudy	Southwest	Light (0-5 mph)	81	10	19.6	Routine
7/14/2020	6:15	Low Tide	Cloudy	Southwest	Light (0-5 mph)	84	10	34.5	Routine
7/21/2020	6:15	Low Tide Falling	Rain	Southeast	Moderate (10-15 mph)	84	10	16.9	Routine
7/28/2020	6:17	High Tide Rising	Mist	East-Southeast	Moderate-Light (5-10 mph)	80	10	15.6	Routine
8/4/2020	6:15	Low Tide Falling	Clear	East-Northeast	Moderate-Light (5-10 mph)	88	10	20.4	Routine
8/11/2020	6:20	High Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	88	10	20.0	Routine
8/18/2020	6:20	Normal	Scattered Clouds	Northeast	Calm (0 mph)	89	10	21.0	Routine
9/1/2020	6:20	Normal	Partly Cloudy	South	Moderate-Light (5-10 mph)	84	10	26.1	Routine
9/8/2020	6:45	Normal	Partly Cloudy	East-Southeast	Moderate-Light (5-10 mph)	85	20	24.2	Routine
9/29/2020	6:35	High Tide Falling	Cloudy	North	Moderate-Strong (15-20 mph)	81	31	23.5	Routine
10/6/2020	6:40	High Tide Falling	Light Rain	Northeast	Moderate (10-15 mph)	74	10	28.3	Routine
10/13/2020	7:00	High Tide	Scattered Clouds	West-Northwest	Moderate-Light (5-10 mph)	78	10	27.7	Routine
10/20/2020	6:45	Normal	Scattered Clouds	East	Moderate (10-15 mph)	77	10	27.7	Routine
10/27/2020	6:35	High Tide	Cloudy	East-Northeast	Moderate (10-15 mph)	76	10	24.6	Routine

Grand Isle State Park

GISP2   *Beach Name Grand Isle State Park - 2*

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type
4/7/2020	6:30	Low Tide	Clear	South	Moderate-Light (5-10 mph)	71	10	18.5	Routine
4/14/2020	6:30	Low Tide Falling	Cloudy	North-Northeast	Moderate (10-15 mph)	73	20	13.8	Routine
4/21/2020	6:20	Low Tide	Partly Cloudy	East-Southeast	Moderate-Light (5-10 mph)	72	31	13.6	Routine
5/5/2020	6:20	Low Tide	Partly Cloudy	South	Light (0-5 mph)	73	20	10.7	Routine
5/12/2020	6:20	Normal	Scattered Clouds	Northeast	Moderate-Light (5-10 mph)	73	10	14.8	Routine
5/19/2020	6:15	Normal	Clear	West-Southwest	Light (0-5 mph)	77	10	15.7	Routine

Beach

Station ID

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type
5/26/2020	6:15	Normal	Partly Cloudy	East-Southeast	Moderate-Light (5-10 mph)	80	42	15.0	Routine
6/2/2020	6:10	Normal	Cloudy	East-Northeast	Moderate-Light (5-10 mph)	81	10	12.3	Field Duplicate
6/2/2020	6:10	Normal	Cloudy	East-Northeast	Moderate-Light (5-10 mph)	81	10	12.3	Routine
6/10/2020	6:10	High Tide	Light Rain	South	Moderate (10-15 mph)	81	10	16.8	Routine
6/16/2020	6:10	Normal	Scattered Clouds	North-Northeast	Moderate-Light (5-10 mph)	82	10	14.6	Routine
6/23/2020	6:00	High Tide	Cloudy	Southwest	Moderate (10-15 mph)	82	20	16.9	Routine
6/30/2020	6:10	High Tide	Cloudy	Southwest	Light (0-5 mph)	84	10	13.0	Routine
7/7/2020	6:10	Normal	Cloudy	Southwest	Light (0-5 mph)	81	10	19.7	Routine
7/14/2020	6:15	Low Tide	Cloudy	Southwest	Light (0-5 mph)	84	10	34.4	Routine
7/21/2020	6:15	Low Tide Falling	Rain	Southeast	Moderate (10-15 mph)	84	10	16.8	Routine
7/28/2020	6:17	High Tide Rising	Mist	East-Southeast	Moderate-Light (5-10 mph)	80	10	15.5	Routine
8/4/2020	6:15	Low Tide Falling	Clear	East-Northeast	Moderate-Light (5-10 mph)	88	10	20.0	Routine
8/11/2020	6:20	High Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	88	31	20.2	Routine
8/11/2020	6:20	High Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	88	20	19.9	Field Split
8/18/2020	6:20	Normal	Scattered Clouds	Northeast	Calm (0 mph)	88	20	21.2	Routine
9/1/2020	6:20	Normal	Partly Cloudy	South	Moderate-Light (5-10 mph)	84	10	26.4	Routine
9/8/2020	6:45	Normal	Partly Cloudy	East-Southeast	Moderate-Light (5-10 mph)	85	10	24.2	Routine
9/29/2020	6:35	High Tide Falling	Cloudy	North	Moderate-Strong (15-20 mph)	81	20	23.9	Routine
9/29/2020	6:35	High Tide Falling	Cloudy	North	Moderate-Strong (15-20 mph)	81	87	23.6	Field Duplicate
10/6/2020	6:40	High Tide Falling	Light Rain	Northeast	Moderate (10-15 mph)	74	10	28.5	Routine
10/13/2020	7:00	High Tide	Scattered Clouds	West-Northwest	Moderate-Light (5-10 mph)	78	20	30.0	Routine
10/20/2020	6:45	Normal	Scattered Clouds	East	Moderate (10-15 mph)	76	10	27.7	Routine
10/27/2020	6:35	High Tide	Cloudy	East-Northeast	Moderate (10-15 mph)	76	10	24.7	Routine

Grand Isle State Park

GISP3   *Beach Name* *Grand Isle State Park - 3*

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type
4/7/2020	6:30	Low Tide	Clear	South	Moderate-Light (5-10 mph)	71	10	18.3	Field Split
4/7/2020	6:30	Low Tide	Clear	South	Moderate-Light (5-10 mph)	71	42	18.4	Routine
4/14/2020	6:30	Low Tide Falling	Cloudy	North-Northeast	Moderate (10-15 mph)	73	10	13.9	Routine
4/21/2020	6:20	Low Tide	Partly Cloudy	East-Southeast	Moderate-Light (5-10 mph)	72	10	13.6	Routine
5/5/2020	6:20	Low Tide	Partly Cloudy	South	Light (0-5 mph)	73	10	10.7	Routine
5/12/2020	6:20	Normal	Scattered Clouds	Northeast	Moderate-Light (5-10 mph)	73	10	14.7	Routine
5/19/2020	6:15	Normal	Clear	West-Southwest	Light (0-5 mph)	77	10	15.5	Routine
5/26/2020	6:15	Normal	Partly Cloudy	East-Southeast	Moderate-Light (5-10 mph)	80	10	15.0	Routine

Beach

Station ID

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type
6/2/2020	6:10	Normal	Cloudy	East-Northeast	Moderate-Light (5-10 mph)	81	10	12.3	Routine
6/10/2020	6:10	High Tide	Light Rain	South	Moderate (10-15 mph)	81	31	16.8	Routine
6/16/2020	6:10	Normal	Scattered Clouds	North-Northeast	Moderate-Light (5-10 mph)	82	10	14.5	Routine
6/23/2020	6:00	High Tide	Cloudy	Southwest	Moderate (10-15 mph)	82	10	16.9	Routine
6/23/2020	6:00	High Tide	Cloudy	Southwest	Moderate (10-15 mph)	82	10	16.9	Field Split
6/30/2020	6:10	High Tide	Cloudy	Southwest	Light (0-5 mph)	84	31	13.0	Routine
7/7/2020	6:10	Normal	Cloudy	Southwest	Light (0-5 mph)	81	10	20.1	Routine
7/14/2020	6:15	Low Tide	Cloudy	Southwest	Light (0-5 mph)	84	10	34.3	Routine
7/21/2020	6:15	Low Tide Falling	Rain	Southeast	Moderate (10-15 mph)	84	222	16.8	Routine
7/28/2020	6:17	High Tide Rising	Mist	East-Southeast	Moderate-Light (5-10 mph)	80	10	15.4	Routine
8/4/2020	6:15	Low Tide Falling	Clear	East-Northeast	Moderate-Light (5-10 mph)	88	10	19.9	Routine
8/11/2020	6:20	High Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	88	10	20.2	Routine
8/18/2020	6:20	Normal	Scattered Clouds	Northeast	Calm (0 mph)	88	10	20.6	Routine
9/1/2020	6:20	Normal	Partly Cloudy	South	Moderate-Light (5-10 mph)	84	10	26.2	Routine
9/8/2020	6:45	Normal	Partly Cloudy	East-Southeast	Moderate-Light (5-10 mph)	85	10	24.2	Routine
9/29/2020	6:35	High Tide Falling	Cloudy	North	Moderate-Strong (15-20 mph)	81	20	23.6	Routine
10/6/2020	6:40	High Tide Falling	Light Rain	Northeast	Moderate (10-15 mph)	74	10	28.4	Routine
10/13/2020	7:00	High Tide	Scattered Clouds	West-Northwest	Moderate-Light (5-10 mph)	78	99	29.9	Field Split
10/13/2020	7:00	High Tide	Scattered Clouds	West-Northwest	Moderate-Light (5-10 mph)	78	20	30.0	Routine
10/20/2020	6:45	Normal	Scattered Clouds	East	Moderate (10-15 mph)	76	10	27.5	Routine
10/27/2020	6:35	High Tide	Cloudy	East-Northeast	Moderate (10-15 mph)	76	10	24.6	Routine

Grand Isle State Park

GISP4   *Beach Name* *Grand Isle State Park - 4*

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type
4/7/2020	6:30	Low Tide	Clear	South	Moderate-Light (5-10 mph)	71	10	18.4	Routine
4/14/2020	6:30	Low Tide Falling	Cloudy	North-Northeast	Moderate (10-15 mph)	73	10	13.9	Routine
4/21/2020	6:20	Low Tide	Partly Cloudy	East-Southeast	Moderate-Light (5-10 mph)	71	10	13.3	Routine
5/5/2020	6:20	Low Tide	Partly Cloudy	South	Light (0-5 mph)	73	31	10.7	Routine
5/12/2020	6:20	Normal	Scattered Clouds	Northeast	Moderate-Light (5-10 mph)	73	10	14.7	Routine
5/19/2020	6:15	Normal	Clear	West-Southwest	Light (0-5 mph)	78	10	15.8	Routine
5/26/2020	6:15	Normal	Partly Cloudy	East-Southeast	Moderate-Light (5-10 mph)	80	42	14.9	Routine
6/2/2020	6:10	Normal	Cloudy	East-Northeast	Moderate-Light (5-10 mph)	81	10	12.2	Routine
6/10/2020	6:10	High Tide	Light Rain	South	Moderate (10-15 mph)	81	31	16.7	Routine
6/16/2020	6:10	Normal	Scattered Clouds	North-Northeast	Moderate-Light (5-10 mph)	82	10	14.6	Routine

Beach

Station ID

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type
6/23/2020	6:00	High Tide	Cloudy	Southwest	Moderate (10-15 mph)	82	42	16.8	Routine
6/30/2020	6:10	High Tide	Cloudy	Southwest	Light (0-5 mph)	84	20	13.0	Routine
6/30/2020	6:10	High Tide	Cloudy	Southwest	Light (0-5 mph)	84	10	13.0	Field Duplicate
7/7/2020	6:10	Normal	Cloudy	Southwest	Light (0-5 mph)	81	10	19.9	Routine
7/14/2020	6:15	Low Tide	Cloudy	Southwest	Light (0-5 mph)	84	10	34.5	Routine
7/14/2020	6:15	Low Tide	Cloudy	Southwest	Light (0-5 mph)	84	10	34.4	Field Split
7/21/2020	6:15	Low Tide Falling	Rain	Southeast	Moderate (10-15 mph)	85	64	16.9	Routine
7/28/2020	6:17	High Tide Rising	Mist	East-Southeast	Moderate-Light (5-10 mph)	80	10	15.5	Routine
8/4/2020	6:15	Low Tide Falling	Clear	East-Northeast	Moderate-Light (5-10 mph)	88	10	20.1	Routine
8/11/2020	6:20	High Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	88	10	20.4	Field Duplicate
8/11/2020	6:20	High Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	88	10	20.2	Routine
8/18/2020	6:20	Normal	Scattered Clouds	Northeast	Calm (0 mph)	88	42	20.4	Routine
9/1/2020	6:20	Normal	Partly Cloudy	South	Moderate-Light (5-10 mph)	84	20	26.0	Routine
9/8/2020	6:45	Normal	Partly Cloudy	East-Southeast	Moderate-Light (5-10 mph)	86	10	23.7	Routine
9/29/2020	6:35	High Tide Falling	Cloudy	North	Moderate-Strong (15-20 mph)	81	42	23.6	Routine
10/6/2020	6:40	High Tide Falling	Light Rain	Northeast	Moderate (10-15 mph)	74	10	28.1	Routine
10/13/2020	7:00	High Tide	Scattered Clouds	West-Northwest	Moderate-Light (5-10 mph)	78	53	29.9	Routine
10/20/2020	6:45	Normal	Scattered Clouds	East	Moderate (10-15 mph)	76	10	27.5	Routine
10/27/2020	6:35	High Tide	Cloudy	East-Northeast	Moderate (10-15 mph)	76	10	24.5	Routine

Gulf Breeze

GBRZ1   **Beach Name** *Gulf Breeze*

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type
5/4/2020	7:00	Low Tide	Scattered Clouds	South	Moderate-Light (5-10 mph)	74	10	15.8	Routine
5/11/2020	7:30	High Tide	Sleet	Northeast	Moderate-Light (5-10 mph)	73	10	13.1	Routine
5/18/2020	7:00	Low Tide	Clear	North-Northwest	Moderate-Light (5-10 mph)	74	42	22.0	Routine
5/26/2020	7:10	High Tide	Cloudy	North-Northwest	Moderate-Light (5-10 mph)	78	64	22.7	Routine
6/1/2020	7:00	Low Tide Falling	Cloudy	North-Northeast	Moderate-Light (5-10 mph)	80	10	21.5	Routine
6/9/2020	7:00	High Tide	Partly Cloudy	South	Moderate-Strong (15-20 mph)	84	75	16.3	Routine
6/15/2020	7:00	Low Tide	Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	82	10	24.5	Routine
6/22/2020	7:00	High Tide	Rain	South	Moderate-Strong (15-20 mph)	84	271	17.7	Routine
6/29/2020	7:00	High Tide Rising	Cloudy	South	Moderate (10-15 mph)	83	42	12.9	Routine
7/6/2020	7:00	High Tide Falling	Light Rain	Southwest	Moderate (10-15 mph)	85	222	21.7	Routine
7/13/2020	7:00	Low Tide Falling	Partly Cloudy	West-Southwest	Moderate-Light (5-10 mph)	85	20	28.6	Routine
7/20/2020	7:00	High Tide Falling	Cloudy	East-Northeast	Moderate (10-15 mph)	86	124	28.8	Routine

Beach

Station ID

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero- cocci	Salinity	Sample Type
7/27/2020	7:00	High Tide	Cloudy	East-Northeast	Light (0-5 mph)	85	42	18.2	Routine
8/3/2020	7:00	High Tide Falling	Clear	Northwest	Light (0-5 mph)	84	10	26.8	Routine
8/10/2020	7:00	High Tide	Scattered Clouds	South	Light (0-5 mph)	87	137	27.1	Field Split
8/10/2020	7:00	High Tide	Scattered Clouds	South	Light (0-5 mph)	87	10	27.1	Routine
8/17/2020	7:00	Low Tide	Undetermined	North	Moderate (10-15 mph)	88	20	31.0	Routine
9/8/2020	7:00	High Tide Falling	Cloudy	Southeast	Moderate-Light (5-10 mph)	87	10	20.4	Routine
9/28/2020	7:00	Low Tide	Clear	West-Southwest	Light (0-5 mph)	79	10	23.5	Routine
9/28/2020	7:00	Low Tide	Clear	West-Southwest	Light (0-5 mph)	79	20	23.3	Field Duplicate
10/5/2020	7:00	High Tide Falling	Scattered Clouds	North-Northeast	Moderate (10-15 mph)	77	10	25.2	Routine
10/19/2020	7:00	High Tide Falling	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	78	10	22.7	Routine
10/26/2020	7:00	Low Tide	Cloudy	North-Northeast	Moderate-Light (5-10 mph)	76	20	18.9	Routine

Holly Beach

HOLLY1   *Beach Name Holly Beach - 1*

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero- cocci	Salinity	Sample Type
5/4/2020	7:00	Low Tide	Scattered Clouds	South	Moderate-Light (5-10 mph)	74	10	18.1	Routine
5/11/2020	7:30	High Tide	Sleet	Northeast	Moderate-Light (5-10 mph)	73	10	13.1	Routine
5/18/2020	7:00	Low Tide	Clear	North-Northwest	Moderate-Light (5-10 mph)	74	10	19.0	Routine
5/26/2020	7:10	High Tide	Cloudy	North-Northwest	Moderate-Light (5-10 mph)	78	31	17.9	Routine
6/1/2020	7:00	Low Tide Falling	Cloudy	North-Northeast	Moderate-Light (5-10 mph)	80	10	21.8	Routine
6/9/2020	7:00	High Tide	Partly Cloudy	South	Moderate-Strong (15-20 mph)	84	10	15.8	Routine
6/15/2020	7:00	Low Tide	Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	82	31	24.3	Routine
6/22/2020	7:00	High Tide	Rain	South	Moderate-Strong (15-20 mph)	84	99	17.2	Routine
6/29/2020	7:00	High Tide Rising	Cloudy	South	Moderate (10-15 mph)	83	429	12.1	Routine
7/6/2020	7:00	High Tide Falling	Light Rain	Southwest	Moderate (10-15 mph)	85	178	20.3	Routine
7/13/2020	7:00	Low Tide Falling	Partly Cloudy	West-Southwest	Moderate-Light (5-10 mph)	85	288	28.9	Field Duplicate
7/13/2020	7:00	Low Tide Falling	Partly Cloudy	West-Southwest	Moderate-Light (5-10 mph)	85	99	28.8	Routine
7/20/2020	7:00	High Tide Falling	Cloudy	East-Northeast	Moderate (10-15 mph)	86	150	29.2	Routine
7/27/2020	7:00	High Tide	Cloudy	East-Northeast	Light (0-5 mph)	84	10	16.4	Routine
8/3/2020	7:00	High Tide Falling	Clear	Northwest	Light (0-5 mph)	84	20	25.8	Routine
8/10/2020	7:00	High Tide	Scattered Clouds	South	Light (0-5 mph)	87	31	27.2	Routine
8/17/2020	7:00	Low Tide	Undetermined	North	Moderate (10-15 mph)	88	87	31.0	Routine
9/8/2020	7:00	High Tide Falling	Cloudy	Southeast	Moderate-Light (5-10 mph)	87	10	18.9	Routine
9/28/2020	7:00	Low Tide	Clear	West-Southwest	Light (0-5 mph)	79	10	22.1	Routine
10/5/2020	7:00	High Tide Falling	Scattered Clouds	North-Northeast	Moderate (10-15 mph)	77	10	25.0	Routine

Beach

Station ID

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type
10/5/2020	7:00	High Tide Falling	Scattered Clouds	North-Northeast	Moderate (10-15 mph)	77	10	25.0	Field Duplicate
10/19/2020	7:00	High Tide Falling	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	78	10	23.0	Routine
10/26/2020	7:00	Low Tide	Cloudy	North-Northeast	Moderate-Light (5-10 mph)	76	10	17.6	Routine

Holly Beach

HOLLY2   ***Beach Name*** *Holly Beach - 2*

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type
5/4/2020	7:00	Low Tide	Scattered Clouds	South	Moderate-Light (5-10 mph)	74	10	18.3	Routine
5/11/2020	7:30	High Tide	Sleet	Northeast	Moderate-Light (5-10 mph)	73	10	13.3	Routine
5/18/2020	7:00	Low Tide	Clear	North-Northwest	Moderate-Light (5-10 mph)	74	10	19.3	Routine
5/26/2020	7:10	High Tide	Cloudy	North-Northwest	Moderate-Light (5-10 mph)	78	53	18.1	Routine
6/1/2020	7:00	Low Tide Falling	Cloudy	North-Northeast	Moderate-Light (5-10 mph)	80	10	22.1	Routine
6/9/2020	7:00	High Tide	Partly Cloudy	South	Moderate-Strong (15-20 mph)	84	42	15.7	Routine
6/15/2020	7:00	Low Tide	Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	82	20	24.2	Routine
6/22/2020	7:00	High Tide	Rain	South	Moderate-Strong (15-20 mph)	84	124	17.2	Routine
6/29/2020	7:00	High Tide Rising	Cloudy	South	Moderate (10-15 mph)	83	31	12.1	Routine
7/6/2020	7:00	High Tide Falling	Light Rain	Southwest	Moderate (10-15 mph)	85	238	20.4	Routine
7/13/2020	7:00	Low Tide Falling	Partly Cloudy	West-Southwest	Moderate-Light (5-10 mph)	85	624	28.9	Routine
7/20/2020	7:00	High Tide Falling	Cloudy	East-Northeast	Moderate (10-15 mph)	86	64	29.1	Routine
7/27/2020	7:00	High Tide	Cloudy	East-Northeast	Light (0-5 mph)	84	20	16.6	Routine
8/3/2020	7:00	High Tide Falling	Clear	Northwest	Light (0-5 mph)	84	10	25.8	Routine
8/10/2020	7:00	High Tide	Scattered Clouds	South	Light (0-5 mph)	87	20	27.2	Routine
8/17/2020	7:00	Low Tide	Undetermined	North	Moderate (10-15 mph)	88	87	30.9	Routine
9/8/2020	7:00	High Tide Falling	Cloudy	Southeast	Moderate-Light (5-10 mph)	87	10	18.9	Routine
9/28/2020	7:00	Low Tide	Clear	West-Southwest	Light (0-5 mph)	79	10	22.6	Routine
10/5/2020	7:00	High Tide Falling	Scattered Clouds	North-Northeast	Moderate (10-15 mph)	77	10	25.0	Routine
10/19/2020	7:00	High Tide Falling	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	78	20	23.1	Routine
10/26/2020	7:00	Low Tide	Cloudy	North-Northeast	Moderate-Light (5-10 mph)	76	10	17.7	Routine

Holly Beach

HOLLY3   ***Beach Name*** *Holly Beach - 3*

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type
5/4/2020	7:00	Low Tide	Scattered Clouds	South	Moderate-Light (5-10 mph)	74	10	18.3	Routine
5/11/2020	7:30	High Tide	Sleet	Northeast	Moderate-Light (5-10 mph)	73	10	13.2	Routine
5/18/2020	7:00	Low Tide	Clear	North-Northwest	Moderate-Light (5-10 mph)	74	178	19.0	Routine
5/26/2020	7:10	High Tide	Cloudy	North-Northwest	Moderate-Light (5-10 mph)	78	42	18.2	Routine

Beach

Station ID

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type
6/1/2020	7:00	Low Tide Falling	Cloudy	North-Northeast	Moderate-Light (5-10 mph)	80	10	22.1	Routine
6/9/2020	7:00	High Tide	Partly Cloudy	South	Moderate-Strong (15-20 mph)	84	53	15.7	Routine
6/9/2020	7:00	High Tide	Partly Cloudy	South	Moderate-Strong (15-20 mph)	84	64	15.8	Field Duplicate
6/15/2020	7:00	Low Tide	Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	82	20	24.2	Routine
6/22/2020	7:00	High Tide	Rain	South	Moderate-Strong (15-20 mph)	84	207	17.3	Routine
6/29/2020	7:00	High Tide Rising	Cloudy	South	Moderate (10-15 mph)	83	64	12.1	Routine
7/6/2020	7:00	High Tide Falling	Light Rain	Southwest	Moderate (10-15 mph)	85	164	20.4	Routine
7/13/2020	7:00	Low Tide Falling	Partly Cloudy	West-Southwest	Moderate-Light (5-10 mph)	85	453	28.9	Routine
7/13/2020	7:00	Low Tide Falling	Partly Cloudy	West-Southwest	Moderate-Light (5-10 mph)	85	164	29.0	Field Duplicate
7/20/2020	7:00	High Tide Falling	Cloudy	East-Northeast	Moderate (10-15 mph)	86	87	29.3	Routine
7/27/2020	7:00	High Tide	Cloudy	East-Northeast	Light (0-5 mph)	84	20	16.7	Routine
8/3/2020	7:00	High Tide Falling	Clear	Northwest	Light (0-5 mph)	84	10	25.9	Routine
8/10/2020	7:00	High Tide	Scattered Clouds	South	Light (0-5 mph)	87	42	27.1	Routine
8/17/2020	7:00	Low Tide	Undetermined	North	Moderate (10-15 mph)	88	53	30.8	Routine
9/8/2020	7:00	High Tide Falling	Cloudy	Southeast	Moderate-Light (5-10 mph)	87	10	19.0	Routine
9/28/2020	7:00	Low Tide	Clear	West-Southwest	Light (0-5 mph)	79	10	22.7	Routine
10/5/2020	7:00	High Tide Falling	Scattered Clouds	North-Northeast	Moderate (10-15 mph)	77	10	25.2	Routine
10/19/2020	7:00	High Tide Falling	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	78	42	23.3	Routine
10/26/2020	7:00	Low Tide	Cloudy	North-Northeast	Moderate-Light (5-10 mph)	76	10	17.9	Routine

Holly Beach

HOLLY4   ***Beach Name*** *Holly Beach - 4*

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type
5/4/2020	7:00	Low Tide	Scattered Clouds	South	Moderate-Light (5-10 mph)	74	10	18.2	Routine
5/11/2020	7:30	High Tide	Sleet	Northeast	Moderate-Light (5-10 mph)	73	10	13.1	Routine
5/18/2020	7:00	Low Tide	Clear	North-Northwest	Moderate-Light (5-10 mph)	74	20	18.6	Routine
5/26/2020	7:10	High Tide	Cloudy	North-Northwest	Moderate-Light (5-10 mph)	78	222	18.2	Routine
6/1/2020	7:00	Low Tide Falling	Cloudy	North-Northeast	Moderate-Light (5-10 mph)	80	10	22.0	Routine
6/9/2020	7:00	High Tide	Partly Cloudy	South	Moderate-Strong (15-20 mph)	84	20	15.9	Routine
6/15/2020	7:00	Low Tide	Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	82	31	24.2	Routine
6/22/2020	7:00	High Tide	Rain	South	Moderate-Strong (15-20 mph)	84	591	17.3	Routine
6/29/2020	7:00	High Tide Rising	Cloudy	South	Moderate (10-15 mph)	83	384	12.1	Routine
7/6/2020	7:00	High Tide Falling	Light Rain	Southwest	Moderate (10-15 mph)	85	111	20.3	Routine
7/13/2020	7:00	Low Tide Falling	Partly Cloudy	West-Southwest	Moderate-Light (5-10 mph)	85	31	28.9	Routine
7/20/2020	7:00	High Tide Falling	Cloudy	East-Northeast	Moderate (10-15 mph)	86	64	29.1	Routine

Beach

Station ID

	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero- cocci	Salinity	Sample Type
	7/27/2020	7:00	High Tide	Cloudy	East-Northeast	Light (0-5 mph)	84	20	16.8	Routine
	8/3/2020	7:00	High Tide Falling	Clear	Northwest	Light (0-5 mph)	84	384	26.0	Routine
	8/10/2020	7:00	High Tide	Scattered Clouds	South	Light (0-5 mph)	87	150	27.2	Routine
	8/17/2020	7:00	Low Tide	Undetermined	North	Moderate (10-15 mph)	88	53	30.8	Routine
	9/8/2020	7:00	High Tide Falling	Cloudy	Southeast	Moderate-Light (5-10 mph)	87	31	19.1	Routine
	9/28/2020	7:00	Low Tide	Clear	West-Southwest	Light (0-5 mph)	79	10	23.0	Routine
	10/5/2020	7:00	High Tide Falling	Scattered Clouds	North-Northeast	Moderate (10-15 mph)	77	10	25.2	Routine
	10/19/2020	7:00	High Tide Falling	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	78	53	22.9	Routine
	10/26/2020	7:00	Low Tide	Cloudy	North-Northeast	Moderate-Light (5-10 mph)	76	10	17.9	Routine

Holly Beach

HOLLY5   ***Beach Name*** *Holly Beach - 5*

	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero- cocci	Salinity	Sample Type
	5/4/2020	7:00	Low Tide	Scattered Clouds	South	Moderate-Light (5-10 mph)	74	10	18.3	Routine
	5/11/2020	7:30	High Tide	Sleet	Northeast	Moderate-Light (5-10 mph)	73	20	13.2	Routine
	5/18/2020	7:00	Low Tide	Clear	North-Northwest	Moderate-Light (5-10 mph)	74	31	19.1	Routine
	5/26/2020	7:10	High Tide	Cloudy	North-Northwest	Moderate-Light (5-10 mph)	78	75	18.0	Routine
	6/1/2020	7:00	Low Tide Falling	Cloudy	North-Northeast	Moderate-Light (5-10 mph)	80	10	22.1	Routine
	6/9/2020	7:00	High Tide	Partly Cloudy	South	Moderate-Strong (15-20 mph)	84	31	15.9	Routine
	6/9/2020	7:00	High Tide	Partly Cloudy	South	Moderate-Strong (15-20 mph)	84	53	15.7	Field Duplicate
	6/15/2020	7:00	Low Tide	Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	82	10	24.2	Routine
	6/22/2020	7:00	High Tide	Rain	South	Moderate-Strong (15-20 mph)	84	344	17.3	Routine
	6/22/2020	7:00	High Tide	Rain	South	Moderate-Strong (15-20 mph)	84	344	17.2	Field Duplicate
	6/29/2020	7:00	High Tide Rising	Cloudy	South	Moderate (10-15 mph)	83	31	12.2	Routine
	7/6/2020	7:00	High Tide Falling	Light Rain	Southwest	Moderate (10-15 mph)	85	164	20.3	Routine
	7/13/2020	7:00	Low Tide Falling	Partly Cloudy	West-Southwest	Moderate-Light (5-10 mph)	85	42	28.9	Routine
	7/20/2020	7:00	High Tide Falling	Cloudy	East-Northeast	Moderate (10-15 mph)	86	64	29.4	Routine
	7/27/2020	7:00	High Tide	Cloudy	East-Northeast	Light (0-5 mph)	84	178	17.0	Routine
	8/3/2020	7:00	High Tide Falling	Clear	Northwest	Light (0-5 mph)	84	31	26.2	Routine
	8/10/2020	7:00	High Tide	Scattered Clouds	South	Light (0-5 mph)	87	10	27.3	Routine
	8/17/2020	7:00	Low Tide	Undetermined	North	Moderate (10-15 mph)	88	75	31.0	Routine
	9/8/2020	7:00	High Tide Falling	Cloudy	Southeast	Moderate-Light (5-10 mph)	87	10	19.2	Routine
	9/28/2020	7:00	Low Tide	Clear	West-Southwest	Light (0-5 mph)	79	10	23.0	Routine
	10/5/2020	7:00	High Tide Falling	Scattered Clouds	North-Northeast	Moderate (10-15 mph)	77	10	25.3	Routine
	10/19/2020	7:00	High Tide Falling	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	78	20	23.0	Routine

Beach

Station ID

	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type
	10/26/2020	7:00	Low Tide	Cloudy	North-Northeast	Moderate-Light (5-10 mph)	76	10	17.8	Routine
	10/26/2020	7:00	Low Tide	Cloudy	North-Northeast	Moderate-Light (5-10 mph)	76	10	17.8	Field Split

Holly Beach

HOLLY6   ***Beach Name** Holly Beach - 6*

	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type
	5/4/2020	7:00	Low Tide	Scattered Clouds	South	Moderate-Light (5-10 mph)	74	64	18.4	Routine
	5/11/2020	7:30	High Tide	Sleet	Northeast	Moderate-Light (5-10 mph)	73	10	13.3	Routine
	5/18/2020	7:00	Low Tide	Clear	North-Northwest	Moderate-Light (5-10 mph)	74	64	19.1	Routine
	5/26/2020	7:10	High Tide	Cloudy	North-Northwest	Moderate-Light (5-10 mph)	78	254	18.0	Routine
	6/1/2020	7:00	Low Tide Falling	Cloudy	North-Northeast	Moderate-Light (5-10 mph)	80	10	22.1	Routine
	6/9/2020	7:00	High Tide	Partly Cloudy	South	Moderate-Strong (15-20 mph)	84	99	15.7	Routine
	6/15/2020	7:00	Low Tide	Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	82	31	24.1	Routine
	6/22/2020	7:00	High Tide	Rain	South	Moderate-Strong (15-20 mph)	84	344	17.3	Routine
	6/29/2020	7:00	High Tide Rising	Cloudy	South	Moderate (10-15 mph)	83	31	12.1	Routine
	7/6/2020	7:00	High Tide Falling	Light Rain	Southwest	Moderate (10-15 mph)	85	222	20.3	Routine
	7/13/2020	7:00	Low Tide Falling	Partly Cloudy	West-Southwest	Moderate-Light (5-10 mph)	85	53	28.9	Routine
	7/20/2020	7:00	High Tide Falling	Cloudy	East-Northeast	Moderate (10-15 mph)	86	178	29.3	Routine
	7/27/2020	7:00	High Tide	Cloudy	East-Northeast	Light (0-5 mph)	84	2005	16.2	Routine
	8/3/2020	7:00	High Tide Falling	Clear	Northwest	Light (0-5 mph)	84	20	26.0	Routine
	8/10/2020	7:00	High Tide	Scattered Clouds	South	Light (0-5 mph)	87	53	27.2	Routine
	8/17/2020	7:00	Low Tide	Undetermined	North	Moderate (10-15 mph)	88	99	31.0	Routine
	9/8/2020	7:00	High Tide Falling	Cloudy	Southeast	Moderate-Light (5-10 mph)	87	10	19.2	Routine
	9/28/2020	7:00	Low Tide	Clear	West-Southwest	Light (0-5 mph)	79	10	23.2	Routine
	10/5/2020	7:00	High Tide Falling	Scattered Clouds	North-Northeast	Moderate (10-15 mph)	77	10	25.2	Routine
	10/19/2020	7:00	High Tide Falling	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	78	10	22.9	Routine
	10/26/2020	7:00	Low Tide	Cloudy	North-Northeast	Moderate-Light (5-10 mph)	76	31	17.7	Routine

Little Florida

LTFL1   ***Beach Name** Little Florida*

	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type
	5/4/2020	7:00	Low Tide	Scattered Clouds	South	Moderate-Light (5-10 mph)	74	31	15.7	Routine
	5/11/2020	7:30	High Tide	Sleet	Northeast	Moderate-Light (5-10 mph)	73	10	13.2	Routine
	5/18/2020	7:00	Low Tide	Clear	North-Northwest	Moderate-Light (5-10 mph)	74	20	22.4	Field Split
	5/18/2020	7:00	Low Tide	Clear	North-Northwest	Moderate-Light (5-10 mph)	74	31	19.2	Routine
	5/26/2020	7:10	High Tide	Cloudy	North-Northwest	Moderate-Light (5-10 mph)	78	42	23.0	Routine

Beach

Station ID

	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type
	6/1/2020	7:00	Low Tide Falling	Cloudy	North-Northeast	Moderate-Light (5-10 mph)	80	10	21.7	Routine
	6/9/2020	7:00	High Tide	Partly Cloudy	South	Moderate-Strong (15-20 mph)	84	31	17.3	Routine
	6/15/2020	7:00	Low Tide	Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	82	20	24.7	Routine
	6/22/2020	7:00	High Tide	Rain	South	Moderate-Strong (15-20 mph)	84	53	17.8	Routine
	6/29/2020	7:00	High Tide Rising	Cloudy	South	Moderate (10-15 mph)	83	31	13.0	Routine
	7/6/2020	7:00	High Tide Falling	Light Rain	Southwest	Moderate (10-15 mph)	85	178	21.9	Routine
	7/13/2020	7:00	Low Tide Falling	Partly Cloudy	West-Southwest	Moderate-Light (5-10 mph)	85	75	28.5	Routine
	7/20/2020	7:00	High Tide Falling	Cloudy	East-Northeast	Moderate (10-15 mph)	86	99	28.6	Routine
	7/27/2020	7:00	High Tide	Cloudy	East-Northeast	Light (0-5 mph)	85	10	18.3	Routine
	8/3/2020	7:00	High Tide Falling	Clear	Northwest	Light (0-5 mph)	84	87	26.8	Routine
	8/10/2020	7:00	High Tide	Scattered Clouds	South	Light (0-5 mph)	87	10	27.0	Routine
	8/17/2020	7:00	Low Tide	Undetermined	North	Moderate (10-15 mph)	88	20	31.5	Routine
	9/8/2020	7:00	High Tide Falling	Cloudy	Southeast	Moderate-Light (5-10 mph)	87	10	20.4	Routine
	9/28/2020	7:00	Low Tide	Clear	West-Southwest	Light (0-5 mph)	79	42	23.3	Routine
	10/5/2020	7:00	High Tide Falling	Scattered Clouds	North-Northeast	Moderate (10-15 mph)	77	10	25.2	Routine
	10/19/2020	7:00	High Tide Falling	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	78	20	23.2	Routine
	10/19/2020	7:00	High Tide Falling	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	78	42	22.8	Field Split
	10/26/2020	7:00	Low Tide	Cloudy	North-Northeast	Moderate-Light (5-10 mph)	76	20	19.6	Routine

Long Beach

DUNG1   ***Beach Name*** *Long Beach*

	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type
	5/4/2020	7:00	Low Tide	Scattered Clouds	South	Moderate-Light (5-10 mph)	74	10	15.2	Routine
	5/11/2020	7:30	High Tide	Sleet	Northeast	Moderate-Light (5-10 mph)	73	10	13.0	Routine
	5/18/2020	7:00	Low Tide	Clear	North-Northwest	Moderate-Light (5-10 mph)	74	42	22.3	Routine
	5/26/2020	7:10	High Tide	Cloudy	North-Northwest	Moderate-Light (5-10 mph)	78	42	23.0	Routine
	6/1/2020	7:00	Low Tide Falling	Cloudy	North-Northeast	Moderate-Light (5-10 mph)	80	10	21.1	Routine
	6/9/2020	7:00	High Tide	Partly Cloudy	South	Moderate-Strong (15-20 mph)	84	99	18.6	Routine
	6/15/2020	7:00	Low Tide	Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	82	10	24.8	Routine
	6/22/2020	7:00	High Tide	Rain	South	Moderate-Strong (15-20 mph)	84	324	18.3	Routine
	6/29/2020	7:00	High Tide Rising	Cloudy	South	Moderate (10-15 mph)	83	111	13.5	Routine
	7/6/2020	7:00	High Tide Falling	Light Rain	Southwest	Moderate (10-15 mph)	85	64	21.6	Routine
	7/13/2020	7:00	Low Tide Falling	Partly Cloudy	West-Southwest	Moderate-Light (5-10 mph)	85	31	27.9	Routine
	7/20/2020	7:00	High Tide Falling	Cloudy	East-Northeast	Moderate (10-15 mph)	86	782	28.2	Field Duplicate
	7/20/2020	7:00	High Tide Falling	Cloudy	East-Northeast	Moderate (10-15 mph)	86	738	28.3	Routine

Beach

Station ID

	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type
	7/27/2020	7:00	High Tide	Cloudy	East-Northeast	Light (0-5 mph)	85	53	18.2	Routine
	8/3/2020	7:00	High Tide Falling	Clear	Northwest	Light (0-5 mph)	84	31	27.0	Routine
	8/10/2020	7:00	High Tide	Scattered Clouds	South	Light (0-5 mph)	87	31	26.5	Routine
	8/17/2020	7:00	Low Tide	Undetermined	North	Moderate (10-15 mph)	88	53	30.7	Routine
	9/8/2020	7:00	High Tide Falling	Cloudy	Southeast	Moderate-Light (5-10 mph)	87	20	20.4	Routine
	9/28/2020	7:00	Low Tide	Clear	West-Southwest	Light (0-5 mph)	79	20	23.4	Routine
	10/5/2020	7:00	High Tide Falling	Scattered Clouds	North-Northeast	Moderate (10-15 mph)	77	10	25.2	Routine
	10/19/2020	7:00	High Tide Falling	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	78	42	22.8	Routine
	10/26/2020	7:00	Low Tide	Cloudy	North-Northeast	Moderate-Light (5-10 mph)	76	20	19.4	Routine

Martin Beach

MART1 **Beach Name** *Martin Beach*

	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type
	5/4/2020	7:00	Low Tide	Scattered Clouds	South	Moderate-Light (5-10 mph)	74	53	15.0	Routine
	5/11/2020	7:30	High Tide	Sleet	Northeast	Moderate-Light (5-10 mph)	73	10	13.3	Routine
	5/18/2020	7:00	Low Tide	Clear	North-Northwest	Moderate-Light (5-10 mph)	74	31	22.6	Routine
	5/26/2020	7:10	High Tide	Cloudy	North-Northwest	Moderate-Light (5-10 mph)	78	207	23.5	Routine
	6/1/2020	7:00	Low Tide Falling	Cloudy	North-Northeast	Moderate-Light (5-10 mph)	80	20	21.8	Routine
	6/9/2020	7:00	High Tide	Partly Cloudy	South	Moderate-Strong (15-20 mph)	84	42	18.8	Routine
	6/15/2020	7:00	Low Tide	Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	82	20	25.0	Routine
	6/22/2020	7:00	High Tide	Rain	South	Moderate-Strong (15-20 mph)	84	192	19.7	Routine
	6/29/2020	7:00	High Tide Rising	Cloudy	South	Moderate (10-15 mph)	83	10	13.9	Routine
	7/6/2020	7:00	High Tide Falling	Light Rain	Southwest	Moderate (10-15 mph)	85	87	21.6	Routine
	7/13/2020	7:00	Low Tide Falling	Partly Cloudy	West-Southwest	Moderate-Light (5-10 mph)	85	10	27.2	Routine
	7/20/2020	7:00	High Tide Falling	Cloudy	East-Northeast	Moderate (10-15 mph)	86	254	28.1	Routine
	7/27/2020	7:00	High Tide	Cloudy	East-Northeast	Light (0-5 mph)	85	10	18.3	Routine
	8/3/2020	7:00	High Tide Falling	Clear	Northwest	Light (0-5 mph)	84	10	27.1	Routine
	8/10/2020	7:00	High Tide	Scattered Clouds	South	Light (0-5 mph)	87	31	25.8	Routine
	8/17/2020	7:00	Low Tide	Undetermined	North	Moderate (10-15 mph)	88	20	31.1	Routine
	9/8/2020	7:00	High Tide Falling	Cloudy	Southeast	Moderate-Light (5-10 mph)	87	31	20.6	Routine
	10/5/2020	7:00	High Tide Falling	Scattered Clouds	North-Northeast	Moderate (10-15 mph)	77	10	24.9	Routine
	10/19/2020	7:00	High Tide Falling	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	78	53	23.2	Field Split
	10/19/2020	7:00	High Tide Falling	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	78	31	23.1	Routine
	10/26/2020	7:00	Low Tide	Cloudy	North-Northeast	Moderate-Light (5-10 mph)	76	10	19.1	Routine

Beach

Station ID					Wind	Wind	Water	Entero-		Sample
	Date	Time	Tide	Weather	Direction	Speed	Temp	cocci	Salinity	Type

North Beach

LCNB1   ***Beach Name*** *North Beach*

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type
4/6/2020	7:10	High Tide Falling	Clear	East-Northeast	Light (0-5 mph)	71	124	1.0	Routine
4/20/2020	7:18	Low Tide Falling	Partly Cloudy	Northeast	Light (0-5 mph)	70	10	5.9	Field Split
4/20/2020	7:18	Low Tide Falling	Partly Cloudy	Northeast	Light (0-5 mph)	70	10	5.9	Routine
4/27/2020	7:25	Low Tide	Clear	East	Light (0-5 mph)	70	10	4.4	Routine
5/4/2020	7:30	High Tide Falling	Clear	South	Light (0-5 mph)	75	20	1.2	Routine
5/11/2020	7:20	Low Tide Falling	Clear	North-Northeast	Light (0-5 mph)	71	31	0.5	Routine
5/18/2020	7:15	Low Tide Falling	Clear	Northwest	Light (0-5 mph)	71	42	0.4	Routine
5/26/2020	7:18	Low Tide Falling	Cloudy	West	Moderate-Light (5-10 mph)	80	164	0.6	Routine
6/1/2020	7:15	High Tide Falling	Cloudy	East-Northeast	Light (0-5 mph)	77	10	1.0	Routine
6/9/2020	7:20	Low Tide Falling	Partly Cloudy	South	Moderate-Light (5-10 mph)	80	42	3.1	Routine
6/15/2020	7:17	High Tide Falling	Clear	North-Northeast	Light (0-5 mph)	81	10	2.9	Routine
6/22/2020	7:15	Normal	Cloudy	South-Southeast	Moderate-Light (5-10 mph)	82	75	5.0	Routine
6/29/2020	7:15	High Tide Falling	Partly Cloudy	South-Southeast	Moderate-Light (5-10 mph)	83	10	4.3	Routine
7/6/2020	7:14	Low Tide Falling	Light Rain	East-Southeast	Light (0-5 mph)	84	20	2.4	Routine
7/13/2020	7:15	Low Tide Falling	Clear	West-Southwest	Moderate-Light (5-10 mph)	86	20	1.1	Routine
7/20/2020	7:14	High Tide Rising	Cloudy	North-Northeast	Light (0-5 mph)	84	20	2.1	Routine
7/27/2020	7:15	High Tide Falling	Cloudy	East-Northeast	Light (0-5 mph)	82	137	8.7	Routine
8/3/2020	7:10	Low Tide Falling	Clear	Northwest	Light (0-5 mph)	83	75	3.9	Routine
8/10/2020	7:15	Low Tide Falling	Clear	Southeast	Light (0-5 mph)	85	42	2.1	Routine
8/17/2020	7:15	Low Tide Falling	Partly Cloudy	North-Northwest	Moderate (10-15 mph)	86	53	3.0	Routine
9/8/2020	7:20	Low Tide Falling	Partly Cloudy	South-Southeast	Moderate-Light (5-10 mph)	85	164	0.5	Routine
9/8/2020	7:20	Low Tide Falling	Partly Cloudy	South-Southeast	Moderate-Light (5-10 mph)	85	364	0.5	Field Duplicate
9/14/2020	7:12	High Tide	Clear	North	Moderate-Light (5-10 mph)	83	504	1.5	Routine
9/21/2020	7:10	High Tide	Cloudy	Northeast	Moderate (10-15 mph)	76	2005	8.8	Routine
9/28/2020	7:12	High Tide	Partly Cloudy	East-Southeast	Light (0-5 mph)	79	42	4.3	Routine
10/5/2020	7:10	Normal	Clear	Northeast	Moderate-Light (5-10 mph)	70	10	1.4	Routine
10/12/2020	7:08	High Tide Falling	Partly Cloudy	South-Southwest	Moderate-Light (5-10 mph)	76	2005	0.3	Routine
10/19/2020	7:08	High Tide Rising	Fog	Southeast	Moderate-Light (5-10 mph)	73	478	0.3	Routine
10/26/2020	7:15	Normal	Partly Cloudy	East-Northeast	Moderate-Light (5-10 mph)	70	20	0.3	Routine

Rutherford Beach

Beach

Station ID

	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero- cocci	Salinity	Sample Type
RUTH1				**Beach Name** *Rutherford Beach*						
	4/6/2020	7:14	Low Tide	Scattered Clouds	North-Northeast	Light (0-5 mph)	74	20	13.8	Routine
	4/20/2020	7:25	Low Tide	Clear	North	Light (0-5 mph)	77	20	14.6	Routine
	4/27/2020	7:23	Low Tide Falling	Clear	East-Southeast	Moderate-Light (5-10 mph)	77	10	19.9	Routine
	5/4/2020	7:20	Low Tide	Scattered Clouds	South	Moderate-Light (5-10 mph)	80	10	17.6	Routine
	5/11/2020	7:15	High Tide	Clear	Northeast	Light (0-5 mph)	73	42	13.1	Routine
	5/18/2020	7:14	Low Tide	Clear	North-Northwest	Light (0-5 mph)	80	31	20.2	Routine
	5/26/2020	7:20	Low Tide Falling	Rain	West-Southwest	Light (0-5 mph)	82	42	14.2	Routine
	6/1/2020	7:20	Low Tide Falling	Cloudy	Northeast	Light (0-5 mph)	84	10	15.6	Routine
	6/9/2020	7:25	High Tide Rising	Cloudy	South	Moderate-Strong (15-20 mph)	82	137	27.9	Routine
	6/15/2020	7:15	Low Tide	Clear	East-Northeast	Light (0-5 mph)	80	10	19.7	Routine
	6/22/2020	7:35	High Tide	Rain	South	Moderate-Strong (15-20 mph)	82	324	13.4	Routine
	6/29/2020	7:21	High Tide	Cloudy	South	Moderate (10-15 mph)	82	64	6.3	Routine
	7/6/2020	7:25	High Tide	Cloudy	Southwest	Moderate-Light (5-10 mph)	82	1091	19.8	Routine
	7/13/2020	7:21	Low Tide	Scattered Clouds	West-Southwest	Moderate-Light (5-10 mph)	84	87	25.4	Routine
	7/20/2020	7:24	Low Tide Falling	Cloudy	East	Moderate-Light (5-10 mph)	82	271	28.0	Routine
	7/27/2020	7:31	Low Tide Falling	Light Rain	East	Light (0-5 mph)	80	42	14.8	Routine
	8/3/2020	7:23	Low Tide	Clear	Calm	Calm (0 mph)	82	20	24.5	Routine
	8/10/2020	7:25	Low Tide Falling	Scattered Clouds	South	Light (0-5 mph)	86	10	26.7	Routine
	8/17/2020	7:13	Low Tide	Rain	South	Light (0-5 mph)	85	87	29.3	Routine
	8/17/2020	7:13	Low Tide	Rain	South	Light (0-5 mph)	85	53	29.4	Field Duplicate
	9/8/2020	7:20	Low Tide Falling	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	90	53	17.6	Field Duplicate
	9/8/2020	7:20	Low Tide Falling	Partly Cloudy	South-Southeast	Moderate (10-15 mph)	90	90	17.5	Routine
	9/14/2020	7:20	Low Tide	Clear	North	Light (0-5 mph)	83	42	16.5	Routine
	9/21/2020	7:31	High Tide	Light Rain	East	Moderate (10-15 mph)	78	1013	27.0	Routine
	9/28/2020	7:19		Clear	South-Southeast	Light (0-5 mph)	83	111	22.2	Routine
	10/5/2020	7:19	Low Tide	Scattered Clouds	North	Moderate-Light (5-10 mph)	74	53	26.5	Routine
	10/19/2020	7:24	Low Tide Falling	Scattered Clouds	East-Southeast	Moderate-Light (5-10 mph)	77	137	24.6	Routine
	10/26/2020	7:22	Low Tide	Cloudy	East	Light (0-5 mph)	73	111	25.1	Routine

APPENDIX D

Summary of Louisiana BEACH Program's
Fulfillment of U.S. EPA's BEACH Grant Requirements

**Summary of Louisiana BEACH Program's
Fulfillment of USEPA's BEACH Grant Requirements**

USEPA established nine performance criteria that eligible coastal or Great Lakes state, tribal, or local governments must meet to receive grants to implement coastal recreation water monitoring and public notification programs under the BEACH Act. Those criteria, together with a brief summary of how Louisiana has fulfilled each, are provided below.

Category	Performance Criterion	Louisiana's Fulfillment of Criterion
Evaluation and Classification	1. Develop risk-based beach evaluation and classification plan	Identification of factors used to evaluate and rank beaches are provided in Chapter 2 of the *Louisiana's BEACH Grant Final Report, Grant Year 2001* (the "Initial BEACH Report"; LDHH, 2003). More specifically: • Coastal recreation waters are identified in Section 2.1. • Beaches used by the public for water contact activities within coastal recreation waters are identified in Section 2.2. • The original information describing (1) the potential risk to human health presented by pathogens and (2) the use of the beaches is provided in Sections 2.3-2.4 of the Initial Report. Information on the prior year's water quality and projected level of use for each beach monitored under the Program are provided in Chapter 2 of the Program's annual report. • EPA is notified annually of any change in beach rankings and other program changes in Chapter 2 of the Program's annual report.
Monitoring	2. Develop tiered monitoring plan	• Chapter 3 of the Initial BEACH Report describes the Program's monitoring plan, addressing the frequency and location of beach monitoring, and assessment criteria. • Chapter 2 of the Initial BEACH Report describes periods of recreational use of the waters, and nature and extent of use during certain periods. • Sample stations were established based on spatial use patterns as described in Chapter 2 of the Initial BEACH Report, adjusted for the proximity to known point and nonpoint sources of pollution. • Section 3.1 of the Initial BEACH Report outlines the Program's quality control plan, which is described more completely in the Program's current Quality Assurance Project Plan (QAPP).
	3. Monitoring report submission and delegation	The Program reports monitoring data to the public, EPA, and other agencies through timely annual submission of those data to EPA's STORET database. Additionally, the full dataset and summaries are provided in the Program's Annual Report.

	4. Methods and assessment procedures	Methods for detecting levels of pathogen indicators in coastal recreation areas are described in Section 3.3 of the Initial BEACH Report and the QAPP.
Public Notification and Prompt Risk Communication	5. Public notification and risk communication plan	Measures to notify the public, EPA and local governments when indicator bacteria levels exceed a water quality standard are provided in Chapter 4 of the Initial BEACH Report.
	6. Measures to notify EPA and local governments	Measures to notify local governments and EPA when water quality standards are exceeded are provided in Chapter 4 of the Initial BEACH Report. The Program submits notification data and actions taken to notify the public to EPA's PRAWN database annually.
	7. Measures to notify the public	Measures to notify the public when water quality standards are exceeded are provided in Chapter 4 of the Initial BEACH Report. Upon observing an exceedance of beach advisory criteria, the Program immediately issues a public notification or resamples for bacterial exceedance of a water quality standard in accordance with the QAPP. The notification is placed on the Program's website, disseminated to the media, and signs posted at each station are changed to indicate that an advisory is in effect.
	8. Notification report submission and delegation	• EPA and local governments are notified annually of any notification plan changes and any delegation of responsibilities in the Program's annual work plan. • The Program reports actions taken to notify the public when water quality standards are exceeded in its annual PRAWN submission and in the Program's annual report.
Public Evaluation	9. Public evaluation of program	The Initial Beach Report and all subsequent annual reports have been made available to the public for review and comment. The Program publishes a public notice informing the public of the availability of the annual report and the duration of the comment period, and the report is made available on the Program's website.