



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

Louisiana BEACH Grant Report 2023 Swimming Season

**Submitted to U.S. Environmental Protection Agency
In Partial Fulfillment of Federal Assistance Agreement Number
CU-02F14701-0 for Development of Coastal Recreation Water Monitoring
and Public Notification**



Prepared by:
Robert Wagner, Ph.D., Quantitative Ecological Services, Inc.
In cooperation with Louisiana Department of Health
Office of Public Health, Center for Environmental Health

January 2024

**Louisiana BEACH Grant Report
2023 Swimming Season**

**USEPA Federal Assistance Agreement Numbers:
CU-02F14701-0**

**Louisiana Department of Health
Office of Public Health
Center for Environmental Health
Bienville Building
628 North 4th Street
Baton Rouge, LA 70821-4489**

Acknowledgements

Quantitative Ecological Services, Inc. (QES) thanks Jennifer Armentor, Program Administrator, Molluscan Shellfish Program, Office of Public Health, Louisiana Department of Health (LDH), Chris Lemaire, BEACH Program Manager, and Kade Ordoyne, Beach Monitoring Coordinator, for their invaluable guidance and assistance during preparation of this report. Preparation of this document would not have been possible without the assistance, expert opinion, and input of: Brian Warren, Chief Sanitarian, Special Operations, Environmental Health Services, Michael Vidrine, Director of Sanitarian Services, LDH, David Shane Burton and Kori Blich, Louisiana Department of Environmental Quality (LDEQ), and Rob Cook and Jackson Bollinger with the U.S. Environmental Protection Agency. LDH also wishes to acknowledge the contributions of the Town of Grand Isle, the Cameron Parish Police Jury, Louisiana Office of State Parks, and the City of Lake Charles for their contributions to successful program implementation during 2023.

Point of Contact

For more information on any portion of this document, please contact:

Ms. Jennifer Armentor
Beach Monitoring Program
Louisiana Department of Health, Office of Public Health
Bienville Building
628 N. 4th Street
P. O. Box 4489
Baton Rouge, La. 70821-4489

Phone: (225) 342-7563

Table of Contents

EXECUTIVE SUMMARY	7
CHAPTER 1. Purpose, Background and 2023 Program Accomplishments.....	10
Purpose.....	10
Background.....	10
2023 Program Accomplishments	11
CHAPTER 2 - Update of BEACH Program	12
Review of Beach Rankings.....	12
Program Modifications	17
CHAPTER 3. Louisiana BEACH Program’s 2023 Results	18
Number of Samples Collected	18
Summary Statistics for 2023 Designated Monitoring Period Samples.....	19
Time-Series of 2023 Designated Monitoring Period Samples	23
Weekly Decision Rule Outcomes	24
Relationship between Indicator Organisms and Environmental Conditions	26
CHAPTER 4. Evaluation of Program Performance Relative to Data Quality Objectives...30	
REFERENCES.....	34
APPENDIX A	35
APPENDIX B	40
APPENDIX C	53
APPENDIX D	76

List of Tables

Table 1. Continuous beach segments, beach miles, monitoring Tier assignments for 2023 and 2024, and sample stations.	14
Table 2. Number of continuous beach segments, sample stations, and beach miles monitored by Tier during 2023 and planned for 2024.	15
Table 3. Beach water quality and use risk categories for 2023 swimming season based on anticipated use in 2024 and 2023 water quality data.	16
Table 4. Combined beach use and water quality risk categories for 2024.	17
Table 5. Total number of samples collected by sample station and sample type during 2023 by Louisiana’s BEACH Program.....	18
Table 6. Number of independent samples collected by sample station during the 2023 monitoring season (1 April – 31 October). Samples collected at the same station on the same day are counted as a single sample.	20
Table 7. Summary statistics for enterococci density (MPN/100ml), and salinity for samples collected during the 2023 designated monitoring season by sample station.	21
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 2023 swimming season.	25
Table 9. Summary of 2023 advisories and closures.	26
Table 10. Summary of weekly beach advisory decision rule exceedances by cause during 2023.	26
Table 11. Data quality objectives and 2023 results.	30

List of Figures

- 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 2023 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 (\diamond) is marked by a line through the box, and horizontal bars (—) represent extreme values. 22
- Figure 2. The distribution of salinity (ppt) by sample station for samples collected during the 2023 designated monitoring season. 23
- 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). 28
- Figure 4. Distribution of salinity (ppt) by year within continuous beach segments. 29
- Figure 5. Comparison of 2023 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. 32
- Figure 6. Comparison of 2023 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. 33

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-02F14701-0. 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 (<https://ldh.la.gov/page/288>).

As documented in *Louisiana's BEACH Grant Final Report – Grant Year 2001* (LDHH 2003; the Beach Grant Report) and *Louisiana's Beach Program Quality Assurance Project Plan* (QAPP; LDH 2023), 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 and 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 Grant Report and outlined above.

Monitoring was initiated and conducted on schedule from the start of the monitoring season (1 April) through the end of the season (31 October) except for at Grand Isle State Park, which was closed until July 25, 2023, due to ongoing repairs from Hurricane Ida. Of 713 samples scheduled to be collected at 23 sample stations across 9 Tier 1 or 2 continuous beach segments, 64 scheduled routine samples at Grand Isle State Park were not collected due to closure of the park. All of the anticipated 649 routine samples were collected, of which 617 (95%) were successfully processed. The 32 collected unprocessed samples were due to transportation delays and lab closure.

Enterococci densities were relatively stable between 2022 and 2023 and comparable to the recent year averages at Constance Beach Complex and Grand Isle Beach, and Rutherford Beach was stable between 2022 and 2023 but remained higher than prior years. Enterococci densities were higher in 2023 than 2022 but comparable to the recent year averages at Cypremort Point State Park and Lake Charles North Beach but continued an increasing trend over the last two years at Elmer's Island. Enterococci densities improved (lower in 2023 than 2022) at Fontainebleau State Park, Grand Isle State Park, and Holly Beach, returning to recent year averages. The reason for the increasing enterococci trend at Elmer's Island and Rutherford Beach is unknown. During 2023, salinity was noticeably higher at all beach segments than in recent years except for Fontainebleau State Park, which was comparable to recent year averages. Higher salinity was likely due to reduced inland rainfall and lower river discharge rates near monitored beaches but does not correlate with changes in water quality.

During the 2023 swimming season (1 May – 31 October), 64 advisories and 4 closures were issued. Advisories were issued at all monitored Tier 1 or 2 sample stations during 2023 based on observed water quality exceedances. Compliance at stations monitored throughout the swimming season varied between 85% of monitored days in compliance (GIB2 and GIB3), to a low of 5% (ELMR1). Across all monitored sample stations, 64% (2,950 of 4,601) of the 2023 swimming season's available station-days (monitored station-days not under closure) were in compliance and not under an advisory. Grand Isle State Park (GISP1-4) was closed during half of the season (first 85 days or 46% of the season) due to ongoing repairs from Hurricane Ida.

Beach advisories issued in 2023 resulted from exceedances of enterococci geometric mean or single sample maximum criteria (the weekly sample must be ≤ 104 MPN/100 ml and a steady state maximum, based on a 30-day running geometric mean, must be ≤ 35 MPN/100). The enterococci geometric mean was exceeded in 228 of 246 (93%) observed noncompliance station-weeks, with 154 (63%) of those noncompliance weeks resulting from enterococci geometric mean exceedances only, 74 (30%) resulting from both enterococci geometric mean and single sample maximum exceedances, and 18 (7%) resulted from exceedance of enterococci single sample maximum criterion alone.

Louisiana would have issued only 37% of its 2023 advisories if the State's decision rule were 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/100mL¹ during 2023 in lieu of its current criteria, 77% of the weekly advisory decisions would have been unchanged, 20% of station-weeks placed under advisory for exceedance of Louisiana's criteria would have been deemed in compliance, and 3% of 2023 station-weeks would have exceeded the BAV criteria but been in compliance with Louisiana's beach advisory criteria. Accordingly, Louisiana's beach advisory criteria are more protective of public health than the BAV criterion, and Louisiana's geometric mean criterion identifies periods of likely high risk, which result in advisories being extended for weeks with missed samples.

Based on year-end audit and data review, all completeness goals were achieved during 2023, and there were no variances from the QAPP detected. Results for all successfully processed samples were considered valid and recorded in the Program's database. All monitoring and notification data collected during 2023 have been uploaded to the appropriate USEPA data storage systems (available through EPA's Water Quality Portal (<https://www.waterqualitydata.us/>) and BEACON (<https://watersgeo.epa.gov/beacon2/about.html>)).

In preparation for the 2024 Beach monitoring season, risk levels at Program beaches were reassessed to determine whether additional beaches warranted monitoring. Risk is a function of historical water quality conditions, based on past sampling, and beach use. Based on observed use levels and patterns during the 2023 swimming season and projections of use for the 2024 swimming season, it is anticipated that use levels and patterns will remain at approximately historical levels for all beaches.

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

The anticipated use and historical water quality risk levels resulted in the 2024 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 Lake Charles 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). Based on 2023 sampling and 2024 expected use, it is anticipated that approximately 6 beach miles of Tier 1 beaches, approximately 14 miles of Tier 2 beaches, and 0 of 1.96 miles of Tier 4 beaches will be monitored during 2024.

CHAPTER 1. Purpose, Background and 2023 Program Accomplishments

Purpose

According to *Louisiana’s BEACH Grant Final Report – Grant Year 2001* (the Beach Grant Report; LDHH 2003) and *Louisiana’s Beach Program Quality Assurance Project Plan* (QAPP; LDH 2023), 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 and 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 2023 recreational period and satisfies all the requirements described above.

This document consists of four chapters. In this chapter, 2023 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 Grant Report. Louisiana’s BEACH Program updates include descriptions of 2023 Program modifications and changes to tier assignments and beaches to be monitored under the Program in 2024. In Chapter 3, monitoring and response actions for 2023 are provided. Data quality assessment results for the 2023 swimming season are presented in Chapter 4. Appendix A contains station IDs and names, USEPA IDs, locations (latitude and longitude), beach lengths, and maps of beach sample sites. Appendixes B through D contain graphical time series analyses of water quality data, sample results, and a summary of how Louisiana’s BEACH Program has fulfilled the original BEACH Grant requirements, respectively.

Background

Water is one of Louisiana’s greatest natural resources. 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, coastal recreation waters and “high-use” swimming waters had not been designated in state regulations by LDEQ, and there were no mechanisms in place to routinely sample water quality or to provide the public with the results of risk-based analyses that allow for an informed decision prior to swimming at coastal beaches.

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, in cooperation with LDEQ.

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 become 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 advisory criteria consist of a single sample maximum (the weekly sample enterococci density must be ≤ 104 MPN/100 ml) and a steady state maximum, based on a 30-day running geometric mean (≤ 35 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 advisory criteria, the public is notified that the advisory has been lifted through beach signage and the website (<https://ldh.la.gov/page/288>).

2023 Program Accomplishments

During 2023, 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 except for sample sites at Grand Isle State Park, which was closed during the first half of the 2023 season due to Park facility damage from Hurricane Ida; and
2. Continued to meet or exceed the quality assurance/quality control goals established in the Program’s QAPP (LDH 2023), except as noted in Chapter 4.

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 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 define 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 sample station density differs. Sample stations are closer together at Tier 1 beaches, no more than 500 meters apart, while sample stations are no more than 2 miles apart on continuous beach segments at Tier 2 beaches. 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 were 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 Annually
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 or based on a brief period of data, and no studies were available providing a model of the site-specific relationship between fecal coliform concentrations and illness rates, the qualitative ranking process relied primarily on beach use. Beaches classified as having very high, or 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 \geq 0.5 and < 1; and “Higher Risk” if the beach’s annual geometric mean/35 \geq 1. Using the revised classification scheme, continuous beach segments were reassigned to tier risk categories at the beginning of 2024 based on 2023 beach segment-specific enterococci geometric mean/35. Table 1 identifies the beaches that were monitored under the Program during 2023, their designated 2024 monitoring tier, and associated sample stations. Beach use during 2024 will approximately be at historical levels.

During 2023, 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 2023, except for Grand Isle State Park, which was closed during the first half of the 2023 swimming season. Elmer’s Island-East (ELMR2) was assigned to Tier 4 for the 2023 swim season due to very low usage in accordance with EPA guidance (the beach is used by the public but not monitored).

Table 1. Continuous beach segments, beach miles, monitoring tier assignments for 2023 and 2024, and sample stations.

Continuous Beach Segments	Designated Beach Miles	First Year Sampled	2023 Designated Monitoring Tier ²	2023 Actual Monitoring Tier ²	2024 Designated Monitoring Tier ²	Sample Station State IDs ¹
Lake Pontchartrain Basin Beaches						
Fontainebleau State Park	0.15	2004	1	1	1	FONT1
Barataria River Basin Beaches						
Elmer's Island	0.31	2012	1	1	1	ELMR1
Elmer's Island-East	1.96	2012	4	4	4	ELMR2
Grand Isle State Park	1.15	2004	1	1	1	GISP1-4
Grand Isle Beach	6.15	2005	2	2	2	GIB1-3
Vermilion-Teche River Basin Beaches						
Cypremort Point State Park	0.45	2004	1	1	1	CYPT1
Calcasieu River Basin - Lake Charles Beaches						
North Beach - Lake Charles	0.43	2009	1	1	1	LCNB1
Calcasieu River Basin - Cameron Beaches						
Holly Beach	3.45	2005	1	1	1	HOLLY1-6
Mermentau River Basin Beaches						
Rutherford Beach	1.52	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, USEPA IDs and locations 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.

In summary, during 2023, the Program monitored all six continuous Tier 1 beach segments (approximately six 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 2023, including sampling and public notification at all 9 sample stations. One Tier 4 sample station on Elmer's Island East (ELMR2) was not scheduled to be monitored during 2023.

In anticipation of the 2024 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.

Table 2. Number of continuous beach segments, sample stations, and beach miles monitored by Tier during 2023 and planned for 2024.

Tier	2023 (Actual)				2024 (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

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 2024 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 (2021–2023) of Louisiana’s BEACH 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 (colony forming units [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.

Water quality calculated using the Louisiana and the WHO risk categorization systems generally agreed. 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, one continuous beach segment was classified in the B WHO risk category (Grand Isle Beach), five in risk category C (Constance Beach Complex, Cypremort Point, Fontainebleau and Grand Isle State Parks, and Holly Beach) and three in risk category D (Elmer’s Island, Lake Charles North Beach, and Rutherford Beach). Similarly, Louisiana’s risk categorization resulted in one continuous beach segment classified in the lower water quality risk category (Grand Isle Beach), four in the moderate risk category (Constance Beach Complex, Fontainebleau and Grand Isle State Parks, and Holly Beach), and four in the higher risk category (Cypremort Point State Park, Elmer’s Island, Lake Charles North Beach, and Rutherford Beach).

Table 3. Beach water quality and use risk categories for 2023 swimming season based on anticipated use in 2024 and 2023 water quality data.

Beach	Anticipated 2024 Use	2023 Entero. Geometric Mean	2023 Entero. Geometric Mean / 35	2023 Water Quality Risk Cat.	Entero. 95th Parametric Percentile 2021-2023	WHO Risk Category¹
CNSTBC	Low	30.3	87%	Moderate	309	C
CYPT	Mod.-High	40.2	115%	Higher	235	C
ELMR	High	96.4	275%	Higher	1322	D
FNTB	High	19.8	57%	Moderate	207	C
GIB	Moderate	13.5	39%	Lower	146	B
GISP ²	Very High	17.5	50%	Moderate	290	C
HOLLY	Mod.-High	25.7	73%	Moderate	307	C
LCNB	Very High	40.9	117%	Higher	583	D
RUTH	Very Low	70.5	201%	Higher	652	D

Note: ¹ WHO risk categorization based on 2021-2023 water quality data due to the requirement for a three-year evaluation term (risk categories previously defined in body of the report).

The Louisiana BEACH Program’s beach risk classification was used in assigning beaches to tiers. Combined 2024 anticipated use and 2023 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, but Higher Risk water quality determination based on 2023 water quality data, it is anticipated that they will remain Tier 2 beaches during 2024; therefore, all 2023 beach tier assignments are expected to remain in place for 2024 as shown in Table 1. Elmer’s Island-East (ELMR2) will not be monitored during 2024 due to continued very-low use and it is designated as a Tier 4 beach. To summarize, in 2024 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).

Table 4. Combined beach use and water quality risk categories for 2024.

▲ # of Swimmers =	Water Quality Risk ¹ =►			
	Lower Risk	Moderate Risk	Higher Risk	
VH		GISP	LCNB	Tier 1
H		FNTB, HOLLY	CYPT, ELMR1	
M	GIB			Tier 2
L		CNSTBC ²		Tier3
VL			ELMR2 ³ , RUTH ⁴	
	Discretionary			

Notes: ¹Water quality risk level based on 2023 data using Louisiana's risk classification. ²CNSTBC will be monitored as tier 2 during 2024. ³ELMER2 is classified as a Tier 4 beach for 2024 because of very low use and historically Lower Risk water quality and will not be monitored in 2024. ⁴RUTH will be monitored as a tier 2 beach during 2024.

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 2024.

Program Modifications

No modifications were made to the Program's procedures, methods, or decision rule during 2023. 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 <https://ldh.la.gov/page/288>.

CHAPTER 3. Louisiana BEACH Program’s 2023 Results

Number of Samples Collected

Between 1 April 2023 and 31 October 2023, a total of 677 samples were collected at 23 sample stations (see Table 5), distributed among three sample types: field duplicates and splits, and routine samples. Each type of sampling is described below.

Table 5. Total number of samples collected by sample station and sample type during 2023 by Louisiana’s BEACH Program.

Sample Station	Sample Type				Station Total
	Field Duplicate	Field Split	Resample	Routine	
CNST1	0	1	0	29	30
CYPT1	2	4	0	31	37
DUNG1	1	1	0	29	31
ELMR1	1	1	0	30	32
FNTB1	2	0	0	30	32
GBRZ1	2	1	0	29	32
GIB1	1	0	0	30	31
GIB2	3	2	0	30	35
GIB3	3	4	0	30	37
GISP1	1	0	0	14	15
GISP2	1	1	0	14	16
GISP3	1	1	0	14	16
GISP4	1	0	0	14	15
HOLLY1	1	0	0	29	30
HOLLY2	3	0	0	29	32
HOLLY3	1	0	0	29	30
HOLLY4	2	1	0	29	32
HOLLY5	3	0	0	29	32
HOLLY6	1	1	0	29	31
LCNB1	2	1	0	31	34
LTFL1	1	0	0	29	30
MART1	0	1	0	28	29
RUTH1	4	3	0	31	38
Sample Type Total	37	23	0	617	677

Routine samples are the regularly scheduled weekly samples collected during the designated monitoring period at beaches that are officially part of the Program. During the 2023 monitoring

period, 713 routine samples were scheduled to be collected across the 23 monitored sample locations. Sixty-four of the scheduled routine samples to be collected at Grand Isle State Park were not collected due to the continued closure of the Park during the first half of the 2023 season, resulting in 649 scheduled routine samples to be collected during open beach weeks. All 649 scheduled routine samples were collected, of which 617 (95%) were successfully processed. Of those 32 unprocessed samples, 11 were not processed due to lab closure, 20 were not processed because the samples were not received by the lab within the prescribed time limit due to transportation delays, and one sample was mislabeled.

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. Zero resamples were collected during 2023.

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 routine sample events be designated as quality control samples, which are selected at random at the beginning of the sampling period in approximately equal proportions ($\approx 5\%$ 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 69 QC samples were scheduled to be collected concurrent with the 677 routine samples and were to consist of 40 field duplicates and 29 field split samples. A total of 37 field duplicates and 23 field split samples were collected during 2023. Thirty-six (36) field duplicates were sampled as scheduled (90%), and 23 field split samples were collected as scheduled (79%), resulting in 86% of QC samples collected as scheduled. One unscheduled field duplicate QC sample was collected, resulting in a total of 37. Accordingly, 60 of the 69 (87%) anticipated QC samples were collected.

Of the 677 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 617 independent samples collected during the 2023 designated monitoring season (see Table 6).

Summary Statistics for 2023 Designated Monitoring Period Samples

Results of enterococci density (MPN/100ml) and salinity (parts-per-thousand; ppt) for each sample location during the 2023 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 2023 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	29
CYPT1	31
DUNG1	29
ELMR1	30
FNTB1	30
GBRZ1	29
GIB1	30
GIB2	30
GIB3	30
GISP1	14
GISP2	14
GISP3	14
GISP4	14
HOLLY1	29
HOLLY2	29
HOLLY3	29
HOLLY4	29
HOLLY5	29
HOLLY6	29
LCNB1	31
LTFL1	29
MART1	28
RUTH1	31
Totals	617

Table 7. Summary statistics for enterococci density (MPN/100ml), and salinity for samples collected during the 2023 designated monitoring season by sample station.

State ID	Enterococci			Salinity (ppt)		n
	Geo-Mean	Log _e Mean	Log _e St. Dev.	Mean	St. Dev	
CNST1	20.4	3.02	1.17	27.6	6.6	29
CYPT1	40.2	3.69	0.87	10.9	7.1	31
DUNG1	53.3	3.98	1.53	28.6	6.1	29
ELMR1	96.4	4.57	1.80	26.5	5.5	30
FNTB1	19.8	2.98	1.38	1.3	1.3	30
GBRZ1	30.8	3.43	1.44	28.6	6.0	29
GIB1	14.9	2.70	1.23	27.1	6.1	30
GIB2	12.7	2.54	1.07	27.4	5.8	30
GIB3	13.1	2.58	1.00	27.1	5.7	30
GISP1	14.9	2.70	1.18	29.2	2.8	14
GISP2	17.0	2.83	1.21	28.8	3.3	14
GISP3	21.8	3.08	1.52	29.3	2.8	14
GISP4	17.2	2.85	1.45	29.3	2.8	14
HOLLY1	33.5	3.51	1.28	28.6	6.2	29
HOLLY2	24.9	3.22	1.16	28.6	6.2	29
HOLLY3	24.9	3.21	1.07	28.4	6.4	29
HOLLY4	28.6	3.35	1.32	28.5	6.2	29
HOLLY5	21.6	3.07	1.14	28.5	6.2	29
HOLLY6	22.2	3.10	1.37	28.6	6.2	29
LCNB1	40.9	3.71	1.52	11.1	7.7	31
LTFL1	29.2	3.37	1.43	28.8	6.0	29
MART1	26.1	3.26	1.10	28.8	6.1	28
RUTH1	70.5	4.25	1.33	27.1	6.8	31

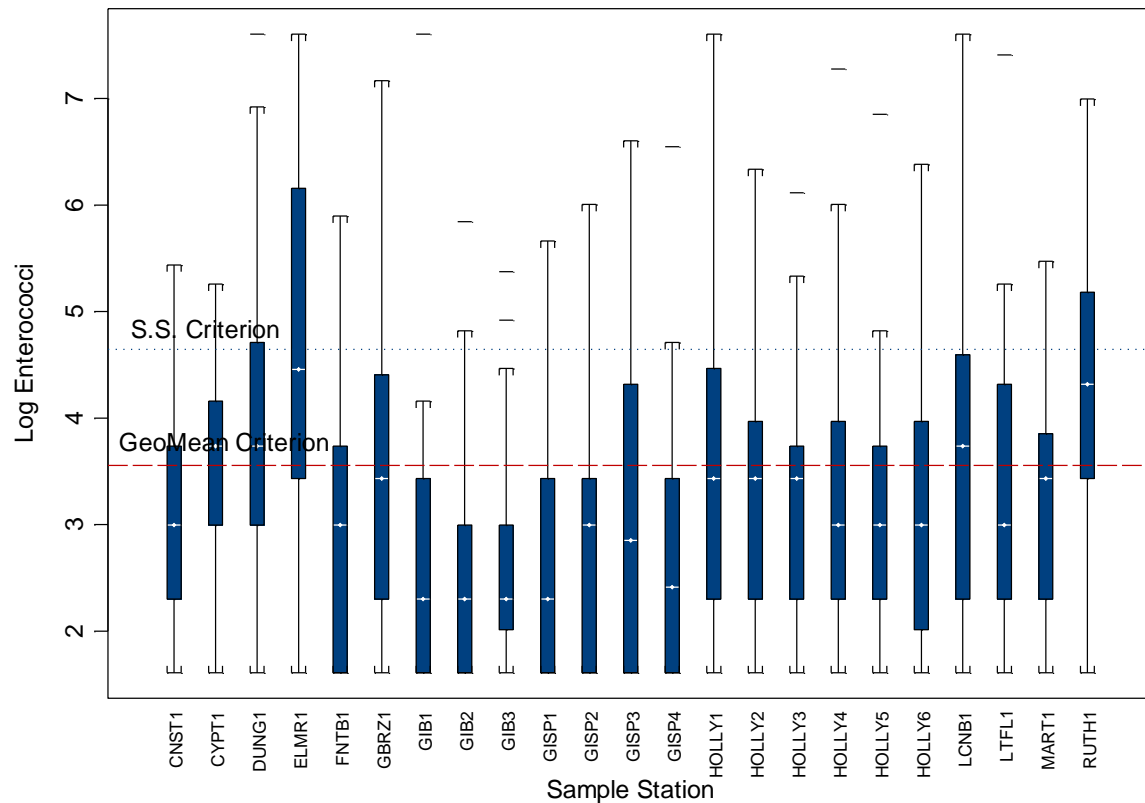


Figure 1. The distribution of \log_e transformed enterococci densities (MPN/100ml) by sample station relative to the geometric mean (GeoMean) and single sample (S.S.) maximum criteria for samples collected during the 2023 designated monitoring season. The box represents the inner quartile range (25th 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 (\diamond) is marked by a line through the box, and horizontal bars (—) represent extreme values.

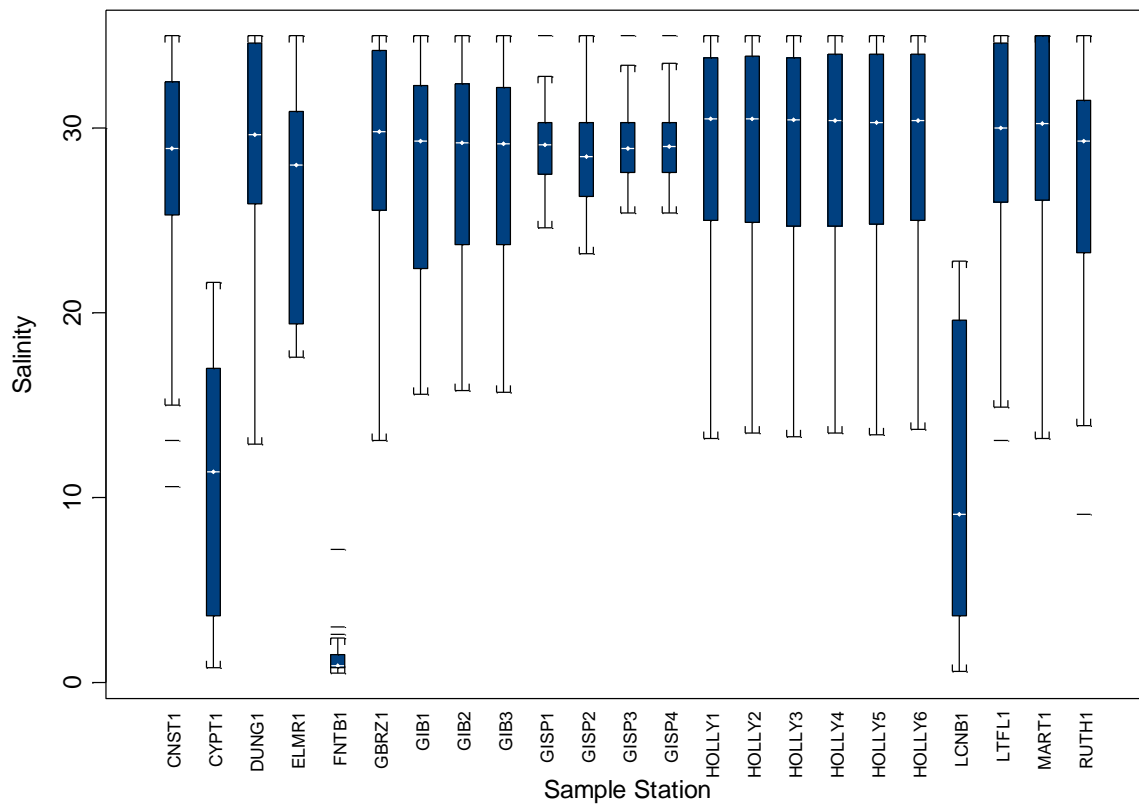


Figure 2. The distribution of salinity (ppt) by sample station for samples collected during the 2023 designated monitoring season.

Time-Series of 2023 Designated Monitoring Period Samples

In addition to calculating summary statistics for each sample station over the 2023 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 out of compliance and a swimming advisory was issued. The advisory remained in effect until the most recent sample results and the running geometric mean were each less than or equal to their respective criterion.

Weekly Decision Rule Outcomes

During the 2023 swimming season (1 May – 31 October), 23 sample stations were monitored at 9 Tier 1 or Tier 2 continuous beach segments with a total of 64 advisories and 4 closures issued. Advisories were issued at all monitored Tier 1 or 2 sample stations during 2023 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 85% of monitored days in compliance (GIB2 and GIB3), to a low of 5% (ELMR1). Across all monitored sample stations, 64% (2,950 of 4601) of the 2023 swimming season's available station-days (monitored station-days not under closure) were in compliance and not under an advisory. Grand Isle State Park (GISP1-4) was closed during the half of the season (first 85 days or 46% of the season) due to ongoing repairs from Hurricane Ida.

As in past years, most 2023 advisories were issued due to exceedances of the enterococci geometric mean criterion (Table 10). The enterococci geometric mean (GeoMean) was exceeded in 228 of 246 (93%) observed noncompliance station-weeks, with 154 (63%) of those noncompliance weeks resulting from enterococci geometric mean exceedances only, 74 (30%) resulting from both enterococci geometric mean and single sample maximum exceedances, and 18 (7%) 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. Limiting comparison of advisory decision outcomes to sampled weeks, if Louisiana had used only the single sample maximum criterion (≤ 104 cfu/100mL) as some states have, Louisiana would have issued only 37% (95 of 254) of its 2023 advisories. Applying the Beach Action Value (BAV) criterion of 60 cfu/100mL² to Louisiana's 2023 monitoring results³, 77% of the weekly advisory decisions would be unchanged, 20% of station-weeks placed under advisory for exceedance of Louisiana's criteria would be deemed in compliance, and 3% of 2023 station-weeks exceeded the BAV criteria but were in compliance with Louisiana's beach advisory criteria. Additionally, Louisiana's GeoMean criterion identifies periods of likely high risk, which result in advisories being extended during weeks with missed samples.

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 (<https://ldh.la.gov/page/288>).

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 2023 swimming season.

Station ID	Advisory Condition as of Midweek of Each Week - 2023 Swimming Season																											
	May					June				July				August					September				October					
	3	10	17	24	31	7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25		
CNST1																A	A	A	A				A	A	A			
CYPT1	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	A		A	A	A	A	A	A	A	A	A	A	A		
ELMR1	A	A	A	A		A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A		
FNTB1											A	A	A		A	A			A			A						
GBRZ1												A	A		A	A	A	A	A	A			A	A		A		
GIB1														A	A	A	A	A										
GIB2														A				A		A	A							
GIB3													A		A	A	A											
GISP1	C	C	C	C	C	C	C	C	C	C	C	C		A	A	A												
GISP2	C	C	C	C	C	C	C	C	C	C	C	C			A	A		A										
GISP3	C	C	C	C	C	C	C	C	C	C	C	C	A	A	A	A	A	A										
GISP4	C	C	C	C	C	C	C	C	C	C	C	C	A	A	A	A	A	A										
HOLLY1									A	A	A	A	A		A	A	A	A	A	A	A	A	A	A	A			
HOLLY2						A				A			A		A		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			
HOLLY5															A				A		A				A			
HOLLY6						A				A					A		A	A	A		A							
LCNB1	A	A					A				A							A	A	A	A	A	A	A	A			
LTFL1			A	A	A	A	A	A	A	A	A	A	A				A			A	A		A	A				
MART1				A	A	A	A	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	A	A	A	A	A		

Notes: “A” indicates an advisory was in effect at the beach based on observed water quality data; “C” indicates a beach closure was in effect.

Table 9. Summary of 2023 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%	49	27%	49	27%	73%
CYPT1	0	0%	96	53%	96	53%	47%
DUNG1	0	0%	158	87%	158	87%	13%
ELMR1	0	0%	173	95%	173	95%	5%
FNTB1	0	0%	52	28%	52	28%	72%
GBRZ1	0	0%	74	40%	74	40%	60%
GIB1	0	0%	34	19%	34	19%	81%
GIB2	0	0%	27	15%	27	15%	85%
GIB3	0	0%	27	15%	27	15%	85%
GISP1	85	46%	22	22%	107	58%	42%
GISP2	85	46%	22	22%	107	58%	42%
GISP3	85	46%	41	42%	126	69%	31%
GISP4	85	46%	41	42%	126	69%	31%
HOLLY1	0	0%	112	61%	112	61%	39%
HOLLY2	0	0%	80	44%	80	44%	56%
HOLLY3	0	0%	63	34%	63	34%	66%
HOLLY4	0	0%	56	31%	56	31%	69%
HOLLY5	0	0%	32	18%	32	18%	82%
HOLLY6	0	0%	47	26%	47	26%	74%
LCNB1	0	0%	91	50%	91	50%	50%
LTFL1	0	0%	109	60%	109	60%	40%
MART1	0	0%	82	45%	82	45%	55%
RUTH1	0	0%	160	87%	160	87%	13%
Totals	340	7%	1651	36%	1991	40%	60%

Table 10. Summary of weekly beach advisory decision rule exceedances by cause during 2023.

Cause of Exceedance	Number of Observed Exceedances	% of Observed Exceedances
Only Enterococci geometric mean criterion exceeded	154	62.6%
Only Enterococci single sample max criterion exceeded	18	7.3%
Both Enterococci geometric mean and single sample max criteria exceeded	74	30.1%
Total	246	100.0%

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 (precip1), 48–72 hrs (precip2), and 72–96 hrs (precip3) prior to sample collection were estimated using rain basin precipitation values taken from Louisiana’s Molluscan Shellfish database. Rain basins are the coastal portion of river basins to which nearby rain gauges were

associated; large basins (basins 2, 4, and 12) were split to limit the distance of associated rain gauges to <30 miles. 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 (those 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 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 independent⁴ 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

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.

describing general patterns of association between environmental conditions and enterococci densities may not be possible for Louisiana's more remote beaches.

Figure 3 shows the considerable annual variation in enterococci densities within beach segments from Program inception through 2023. Enterococci densities were relatively stable between 2022 and 2023 and comparable to the recent year averages at Constance Beach Complex and Grand Isle Beach, and Rutherford Beach was stable between 2022 and 2023 but remained higher than prior years. Enterococci densities were higher in 2023 than 2022 but comparable to the recent year averages at Cypremort Point State Park and Lake Charles North Beach but continued an increasing trend over the last two years at Elmer's Island. Enterococci densities improved (lower in 2023 than 2022) at Fontainebleau State Park, Grand Isle State Park, and Holly Beach, returning to recent year averages. The reason for the increasing enterococci trend at Elmer's Island and Rutherford Beach is unknown.

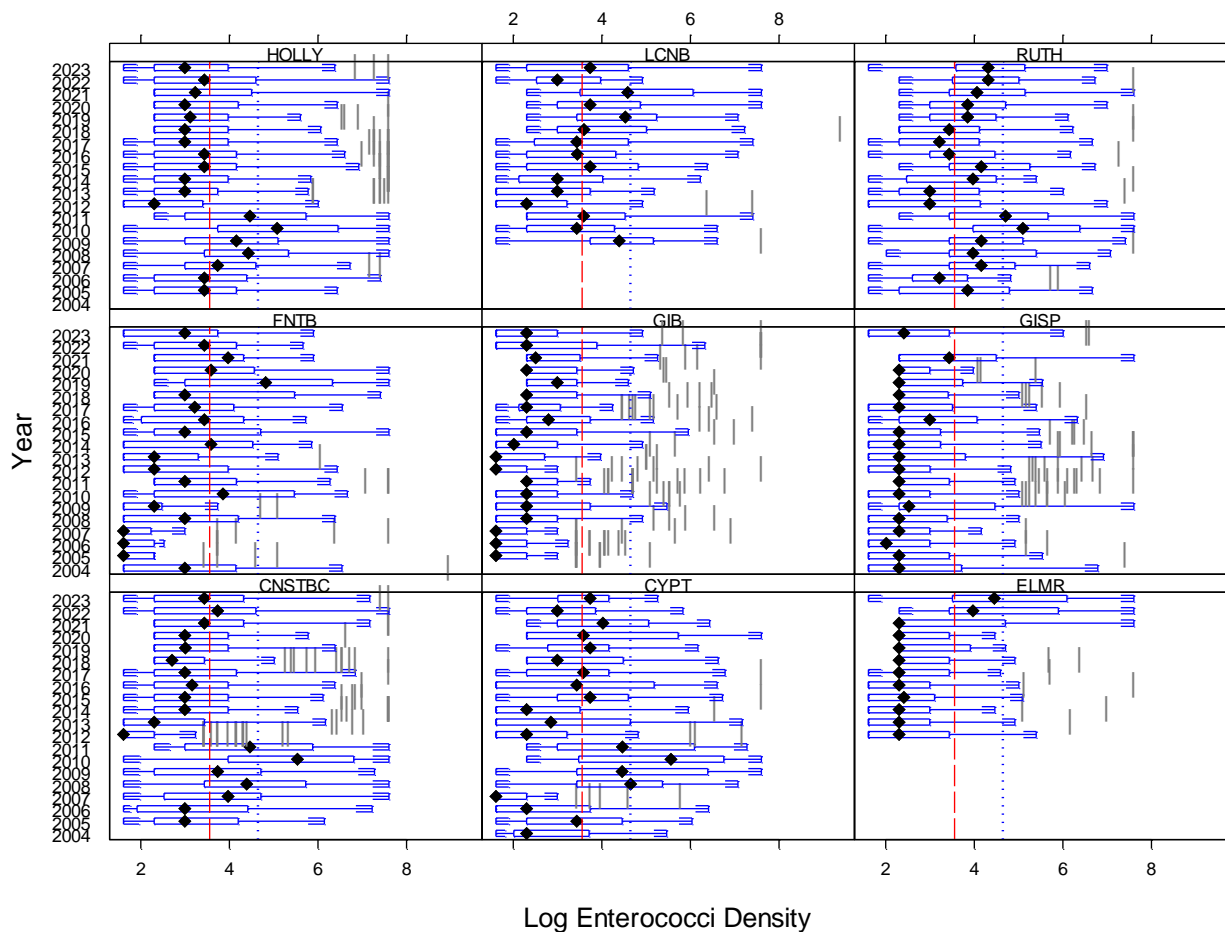


Figure 3. Distribution of \log_e enterococci densities by year within continuous beach segments relative to geometric mean criterion (red dashed lines) and single sample maximum criterion (blue dotted lines).

During 2023, salinity was noticeably higher at all beach segments than in recent years except for Fontainebleau State Park, which was comparable to recent year averages (Figure 4). Higher salinity was likely due to reduced inland rainfall and lower river discharge rates near monitored beaches but does not correlate with changes in water quality.

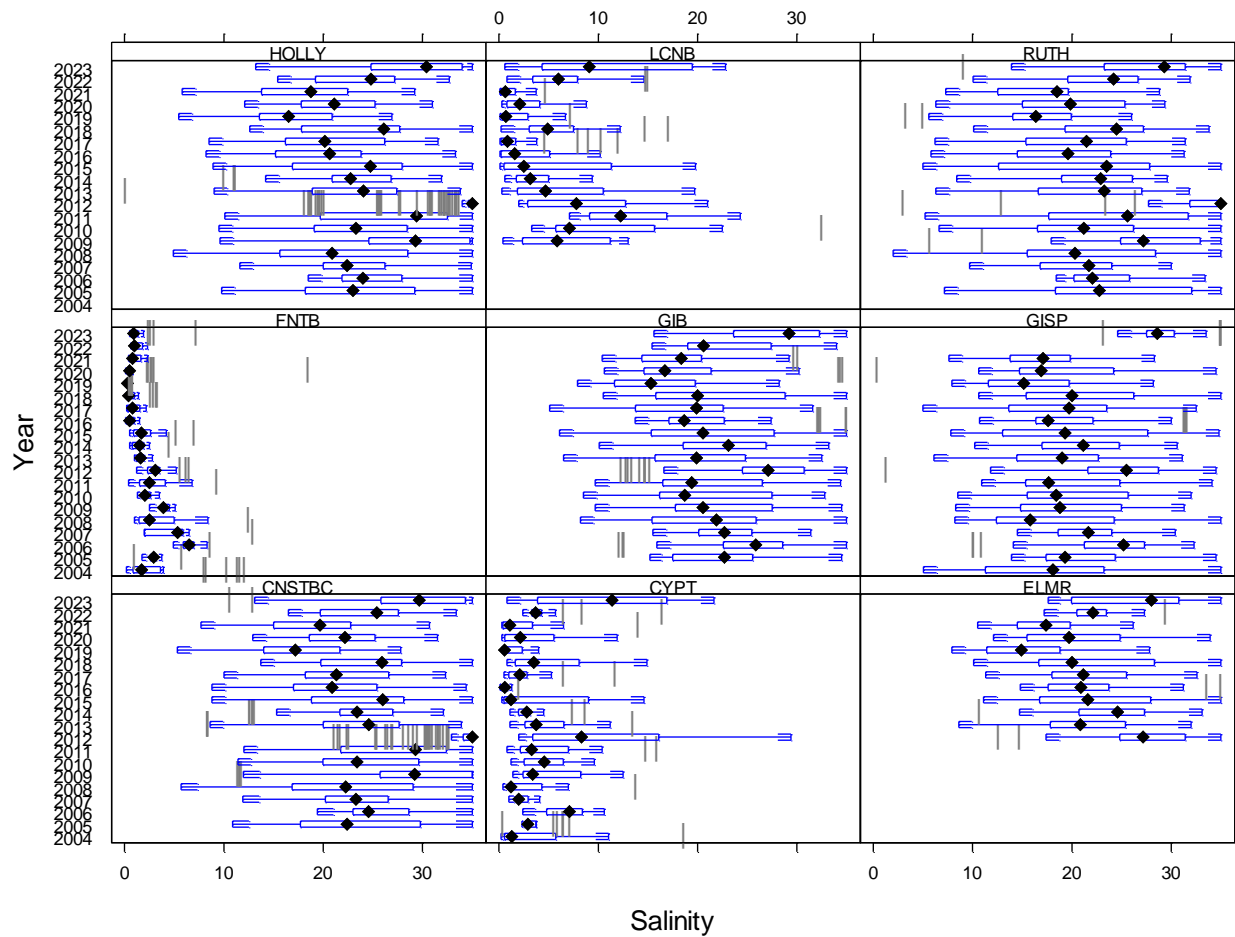


Figure 4. Distribution of salinity (ppt) by year within continuous beach segments.

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

Louisiana’s BEACH Program Quality Assurance Project Plan (LDH 2023) 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 2023 results.

Table 11. Data quality objectives and 2023 results.

Parameter	Concentration Units	QAPP Precision Goals (RPD)	2023 Precision Mean RPD (± 1 SE, n)	QAPP Completeness Goals	2023 Completeness
Enterococci	MPN/100ml	Sample 60%; lab 45%	Sample 52.0% (± 6.8 , 37); lab 42.3% (± 8.5 , 23)	98%	100%
Salinity	ppt	Sample 10%, lab 5%	Sample 0.6% (± 0.2 , 37); lab 2.8% (± 1.6 , 23)	98%	100%
Surface Water Temperature	°F	$\pm 2^\circ$	$\pm 2^\circ$ 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 or resample, were compared to the corresponding sample result. Prior to the start of the monitoring period, approximately 10% of scheduled routine 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. Any unscheduled QC samples that were collected during routine sample events were 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:

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

where C_1 is the routine sample (or resample) result and C_2 is the quality control sample result. To estimate precision across samples, the mean and standard error 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 60 quality control samples were collected during 2023, consisting of 37 field duplicates and 23 field-split samples. To evaluate compliance with QAPP precision goals, means and standard errors of sample RPDs were calculated for the 2023 QC samples and are presented in Table 11. Figures 5 and 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 sample (field duplicate) and lab (field split) precision goals for enterococci and salinity were achieved in 2023.

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

$$\%C = \frac{V}{T} \times 100$$

where V is the number of measurements judged valid and T is the total number of measurements. During 2023, a total of 617 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 2023 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 to the best of their ability throughout the 2023 sampling period that:

- All elements of the QAPP were being correctly implemented as prescribed; and
- 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 2023 have been uploaded to USEPA's BEACH (PRAWN) and Water Quality Data systems via submission of an XML formatted file to the Exchange Network Services Center.

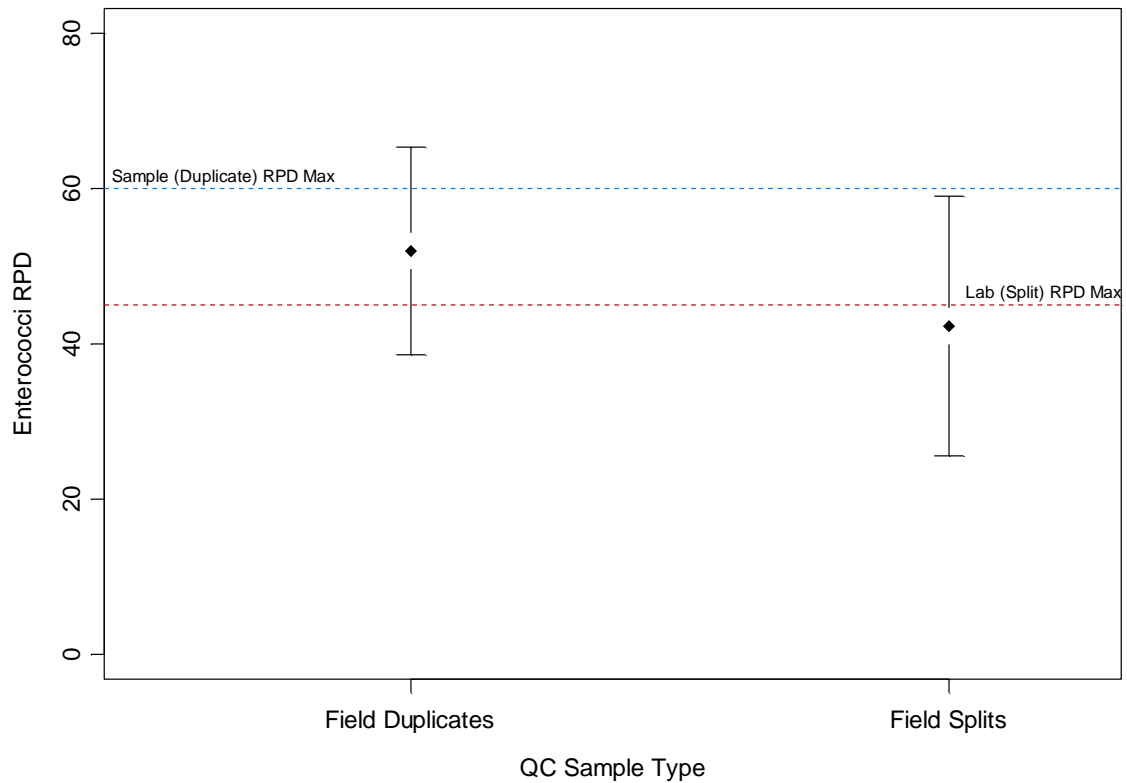


Figure 5. Comparison of 2023 monitoring season mean enterococci relative percent difference (RPD) for field duplicates and field splits with QAPP precision goals. Means are represented by diamonds and upper and lower 95th percentiles of the mean are shown as error bars.

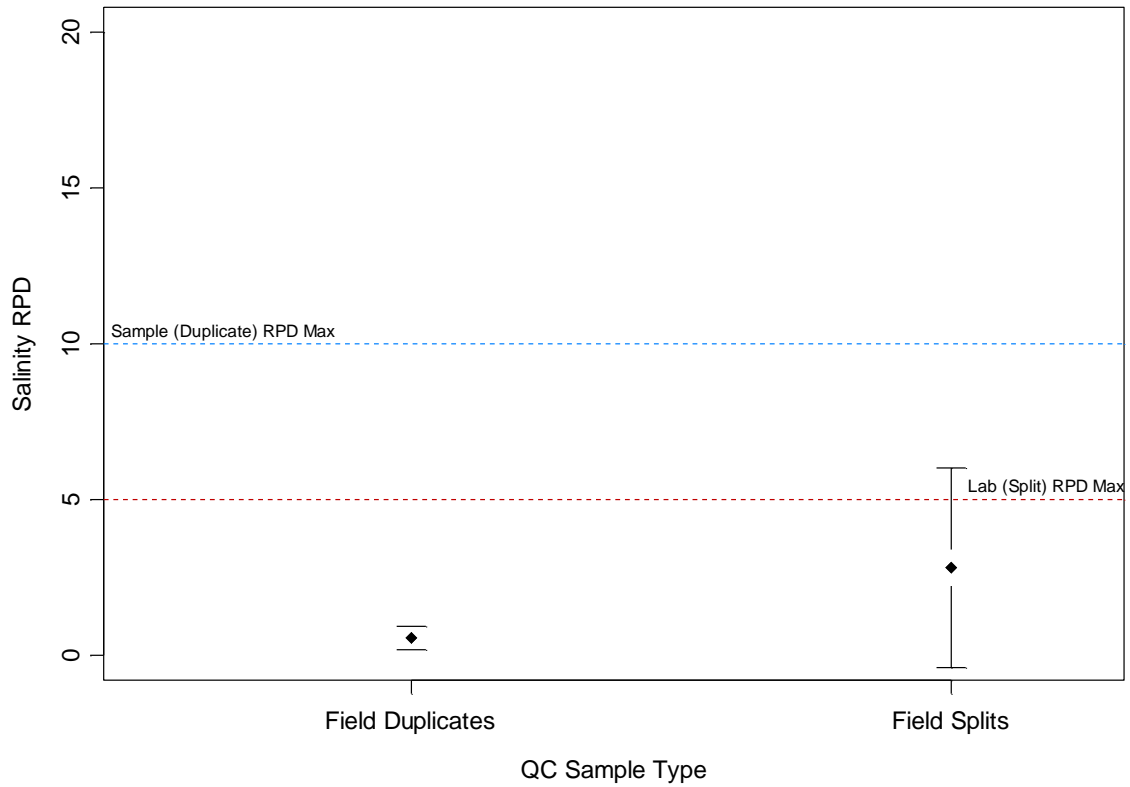


Figure 6. Comparison of 2023 monitoring season mean salinity relative percent difference (RPD) for field duplicates and field splits with QAPP precision goals. Means are represented by diamonds and upper and lower 95th percentiles of the mean are shown as error bars.

REFERENCES

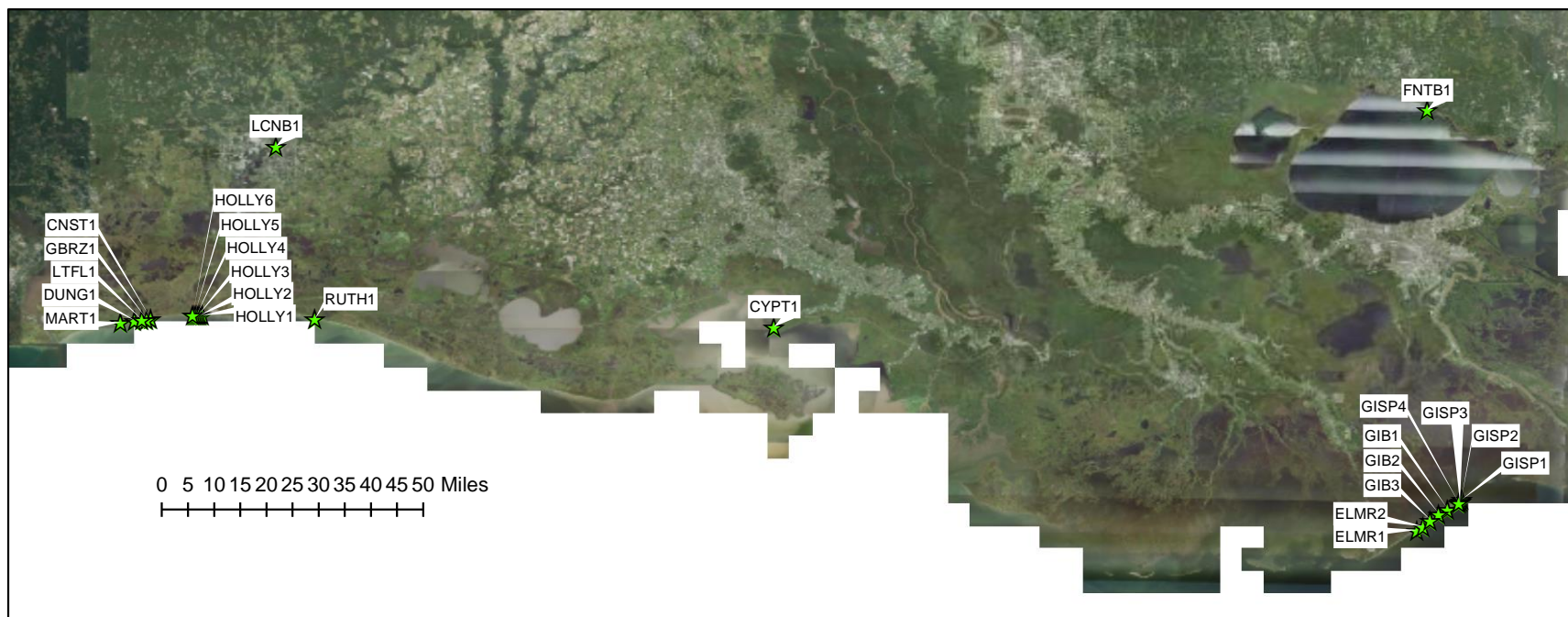
- LDH (Louisiana Department of Health). 2023. Louisiana's BEACH Program Quality Assurance Project Plan; Version 6. Louisiana Department of Health, Office of Public Health.
- LDHH (Louisiana Department of Health and Hospitals). 2003. Louisiana's BEACH Grant Final Report, Grant Year 2001. Louisiana Department of Health and Hospitals, Office of Public Health.
- LDHH. 2006. Final Louisiana's BEACH Grant Report, 2005 Swim Season. Louisiana Department of Health and Hospitals, Office of Public Health.
- 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

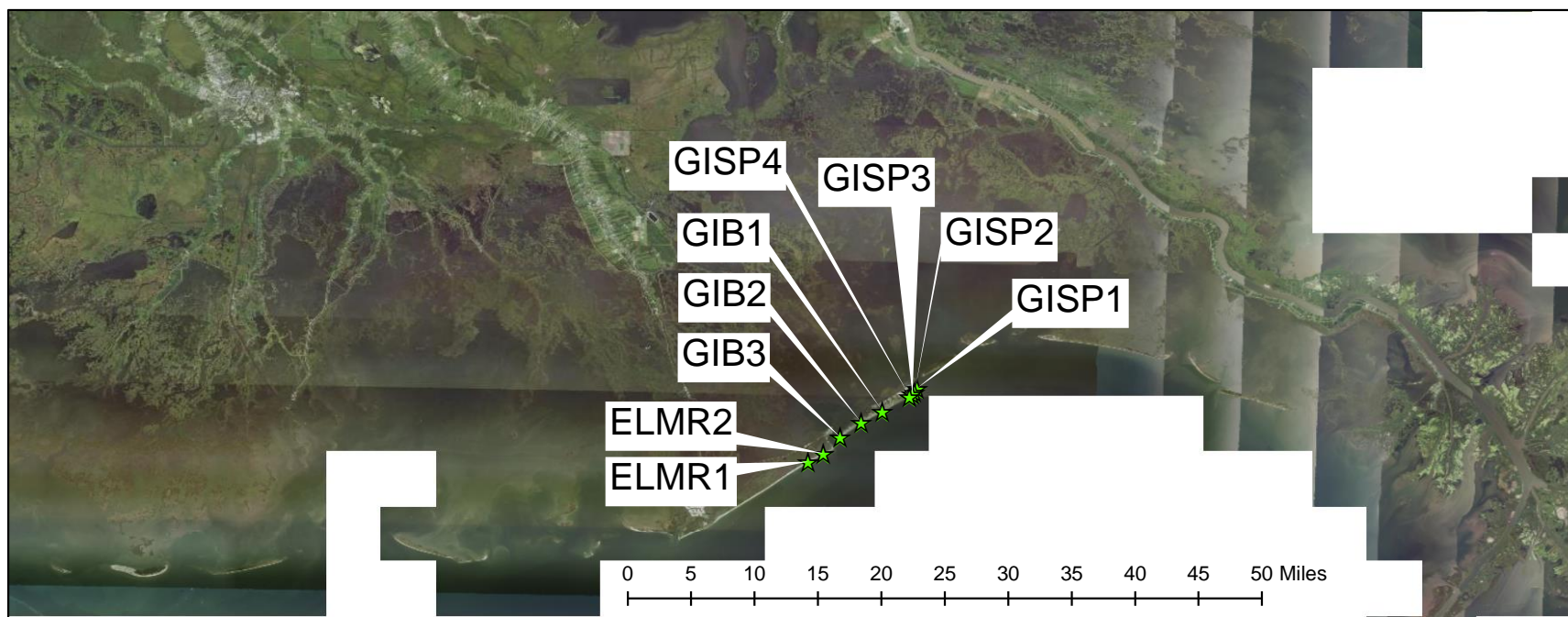
Sample Station Names, Locations, USEPA IDs and Location Maps

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

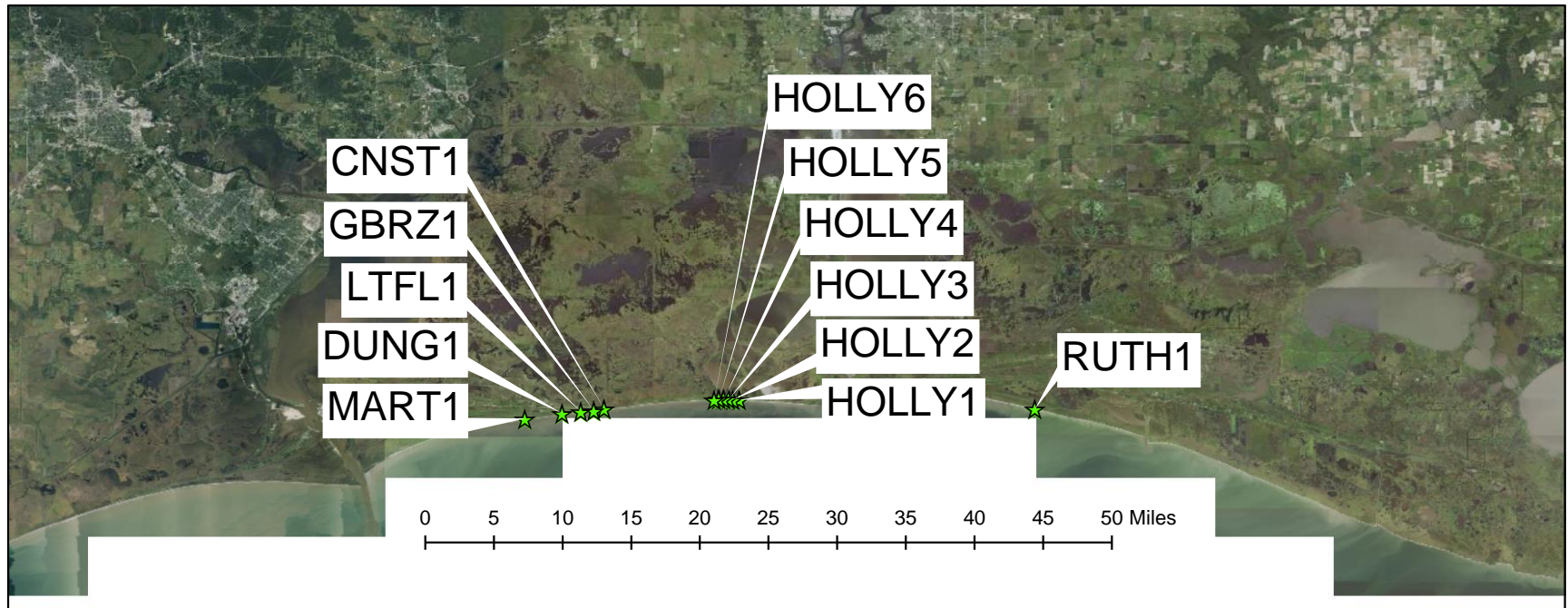
State ID	Beach Name	USEPA ID	Latitude	Longitude	Beach Length (miles)
CNST1	Constance Beach	LA134778	29.75874	-93.58030	1.40
CYPT1	Cypremort Point State Park	LA971783	29.73695	-91.85398	0.45
DUNG1	Long Beach	LA860482	29.75413	-93.62446	1.79
ELMR1	Elmer's Island - 1	LA834833	29.17515	-90.07414	0.31
ELMR2	Elmer's Island - 2	LA451844	29.18465	-90.05670	1.96
FNTB1	Fontainebleau State Park	LA733869	30.33554	-90.04550	0.15
GBRZ1	Gulf Breeze	LA725358	29.75696	-93.59099	0.73
GIB1	Grand Isle Beach - 1	LA430483	29.23291	-89.98940	3.06
GIB2	Grand Isle Beach - 2	LA325065	29.22006	-90.01364	1.81
GIB3	Grand Isle Beach - 3	LA799656	29.20716	-90.03206	1.28
GISP1	Grand Isle State Park - 1	LA240078	29.25956	-89.94976	0.49
GISP2	Grand Isle State Park - 2	LA221569	29.25513	-89.95265	0.26
GISP3	Grand Isle State Park - 3	LA204303	29.25232	-89.95545	0.24
GISP4	Grand Isle State Park - 4	LA186192	29.24972	-89.95828	0.16
HOLLY1	Holly Beach - 1	LA489985	29.76848	-93.43767	1.21
HOLLY2	Holly Beach - 2	LA829030	29.76882	-93.44417	0.36
HOLLY3	Holly Beach - 3	LA109442	29.76913	-93.44932	0.30
HOLLY4	Holly Beach - 4	LA697221	29.76912	-93.45425	0.30
HOLLY5	Holly Beach - 5	LA164373	29.76914	-93.45948	0.30
HOLLY6	Holly Beach - 6	LA467180	29.76907	-93.46424	0.98
LCNB1	North Beach	LA202517	30.23596	-93.23362	0.43
LTFL1	Little Florida	LA595220	29.75594	-93.60497	1.01
MART1	Martin Beach	LA135245	29.74891	-93.66383	1.36
RUTH1	Rutherford Beach	LA284049	29.75897	-93.12616	1.52



Area map of sample stations



Map of Grand Isle area sample stations



Map of Constance Beach Complex, Holly, and Rutherford beaches.

APPENDIX B

Time Series of Water Quality Results By Sample Station

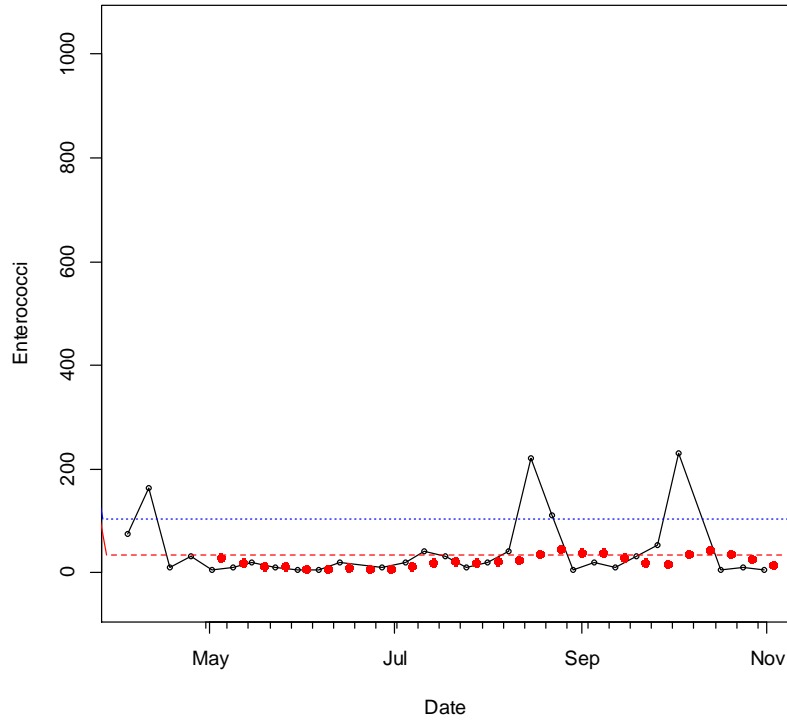


Figure B.1. Time series of enterococci sample results collected during 2023 at CNST1. Sample results are shown as open dots (○), running 30-day geometric means are shown as red dots (●), and geometric mean and single sample maximum criteria are shown as red and blue dashed horizontal lines, respectively.

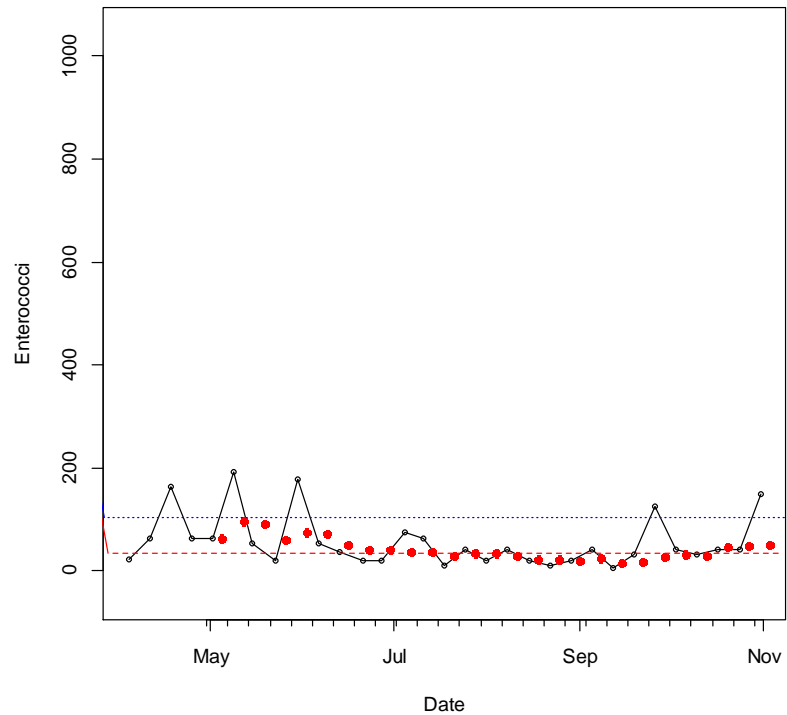


Figure B.2. Time series of sample results collected during 2023 at CYPT1.

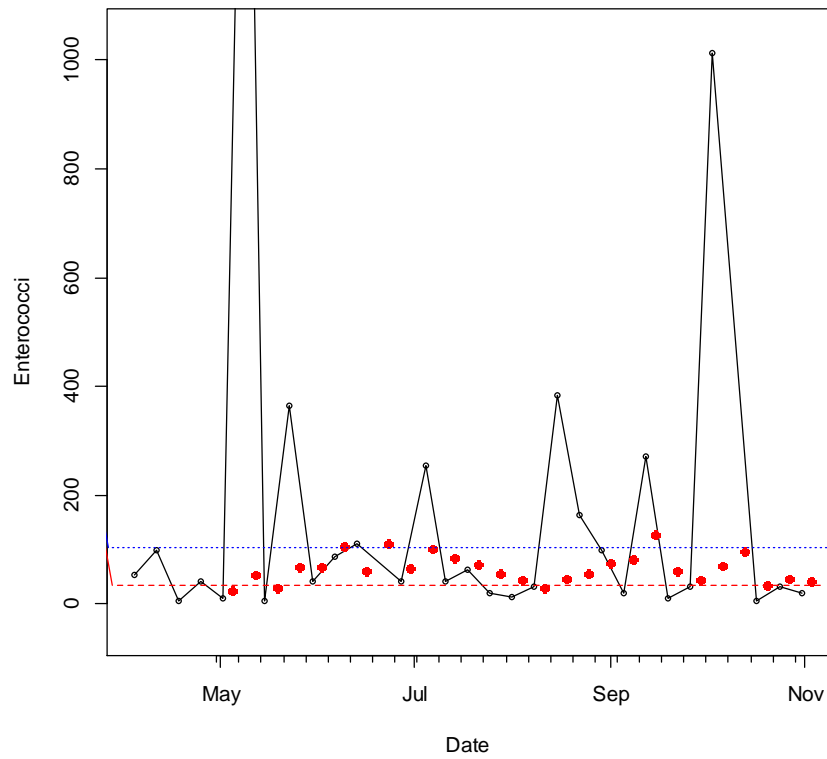


Figure B.3. Time series of sample results collected during 2023 at DUNG1.

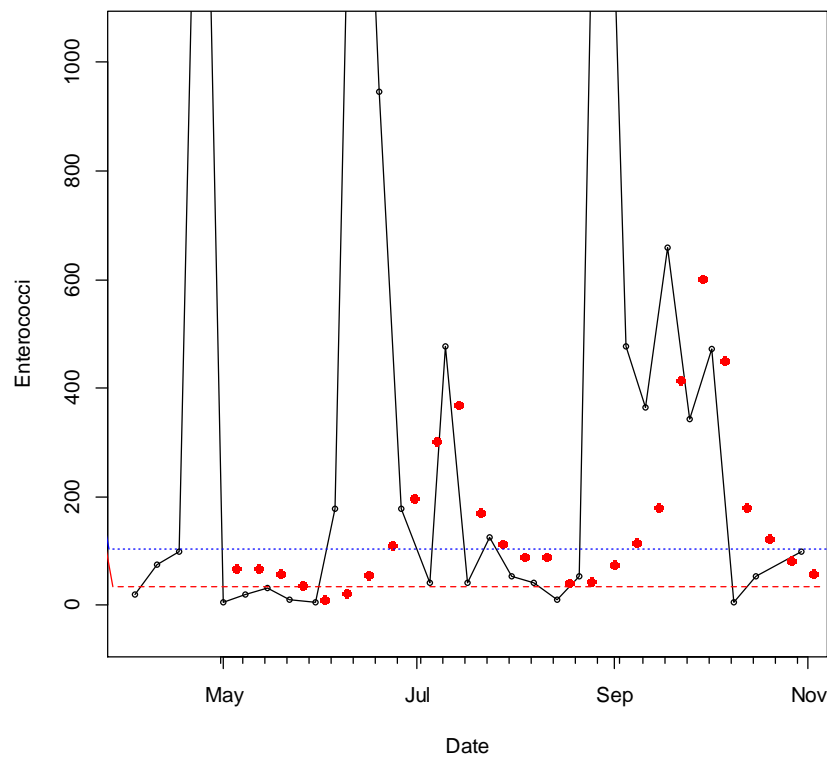


Figure B.4. Time series of sample results collected during 2023 at ELMR1.

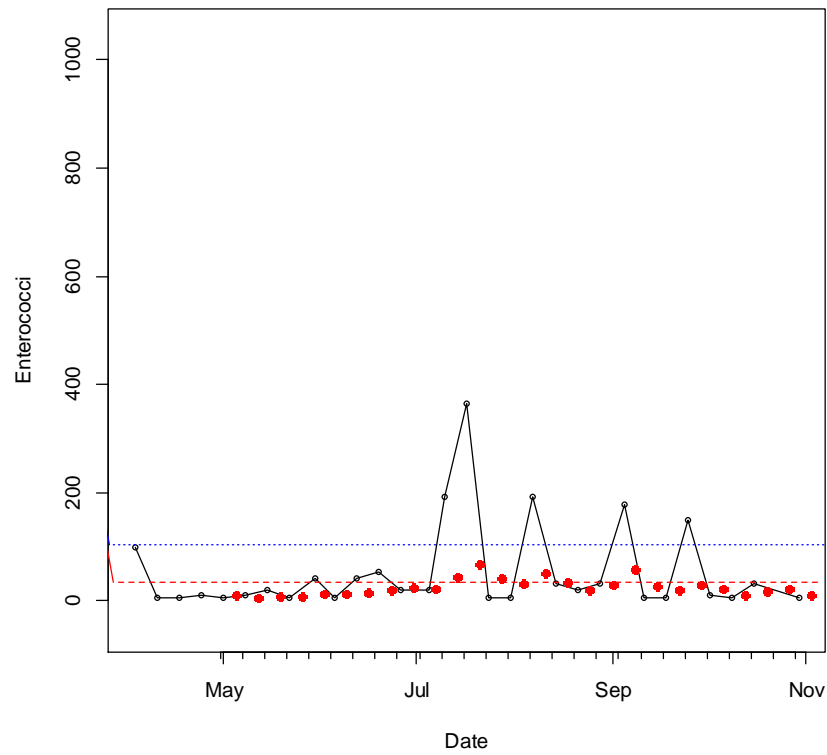


Figure B.5. Time series of sample results collected during 2023 at FNTB1.

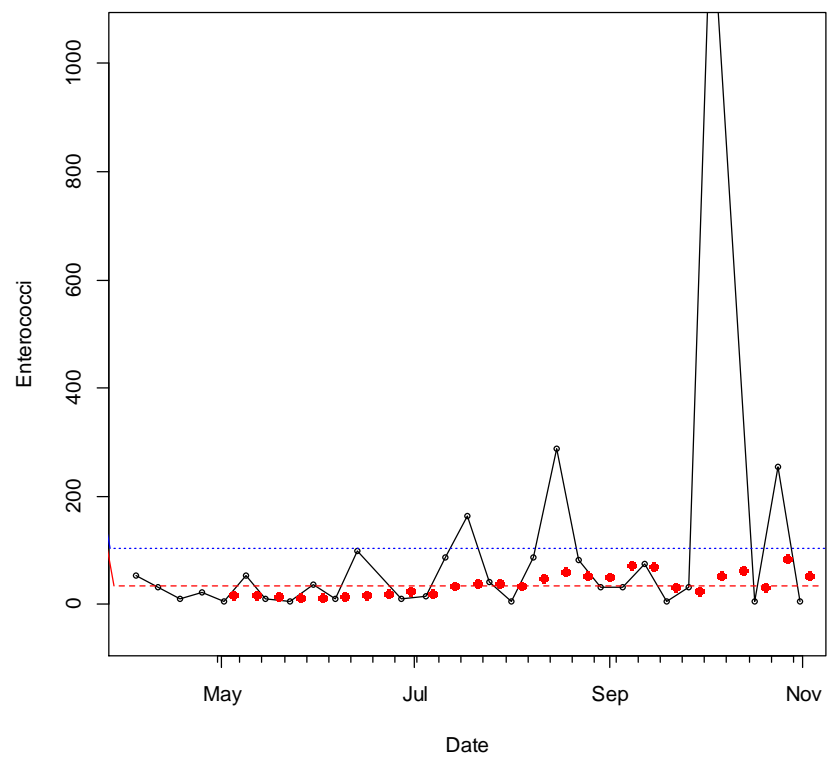


Figure B.6. Time series of sample results collected during 2023 at GBRZ1.

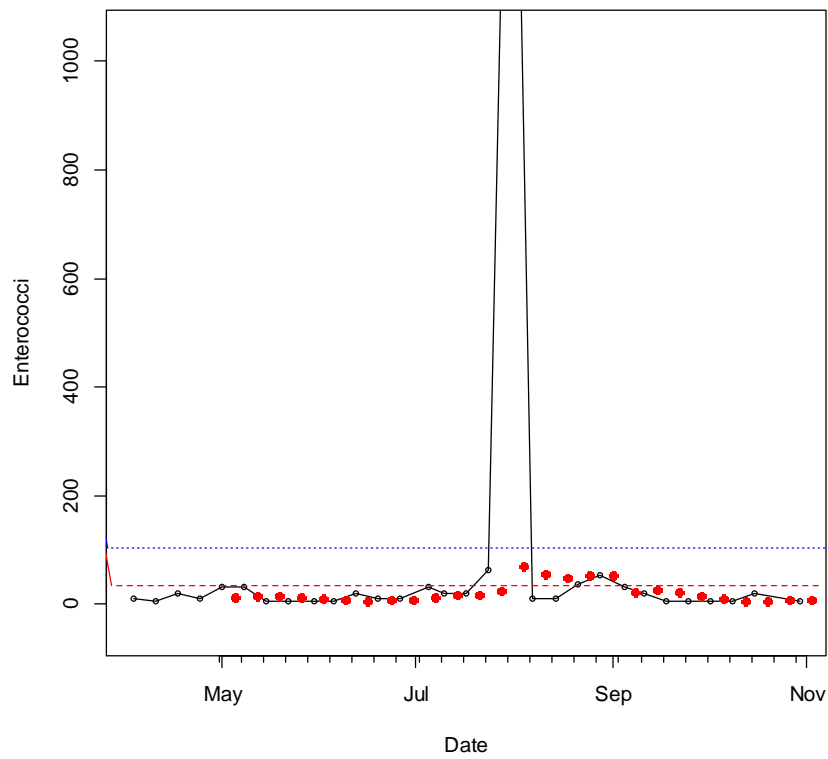


Figure B.7. Time series of sample results collected during 2023 at GIB1.

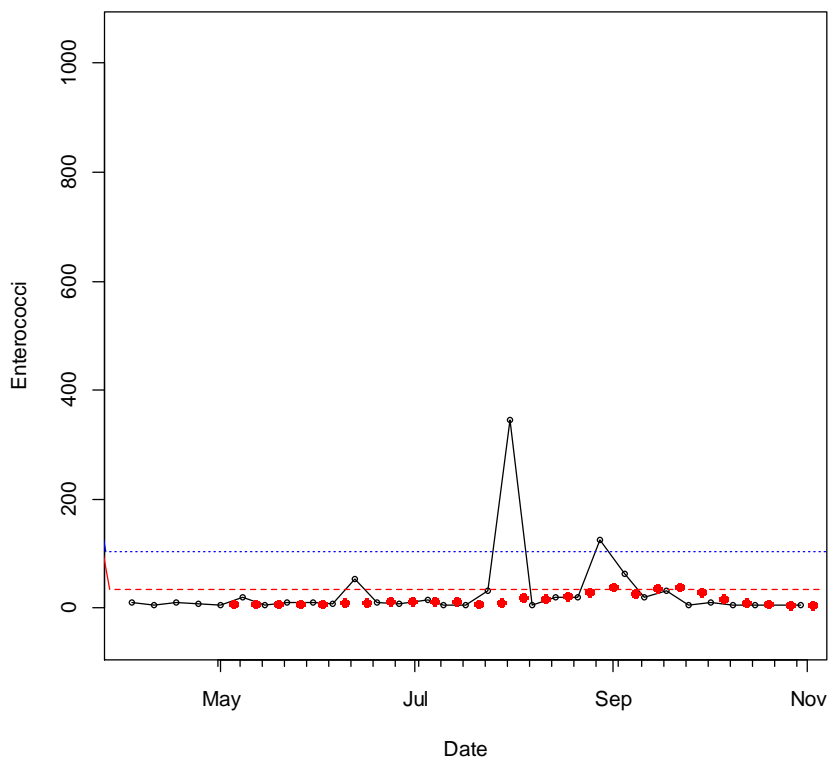


Figure B.8. Time series of sample results collected during 2023 at GIB2.

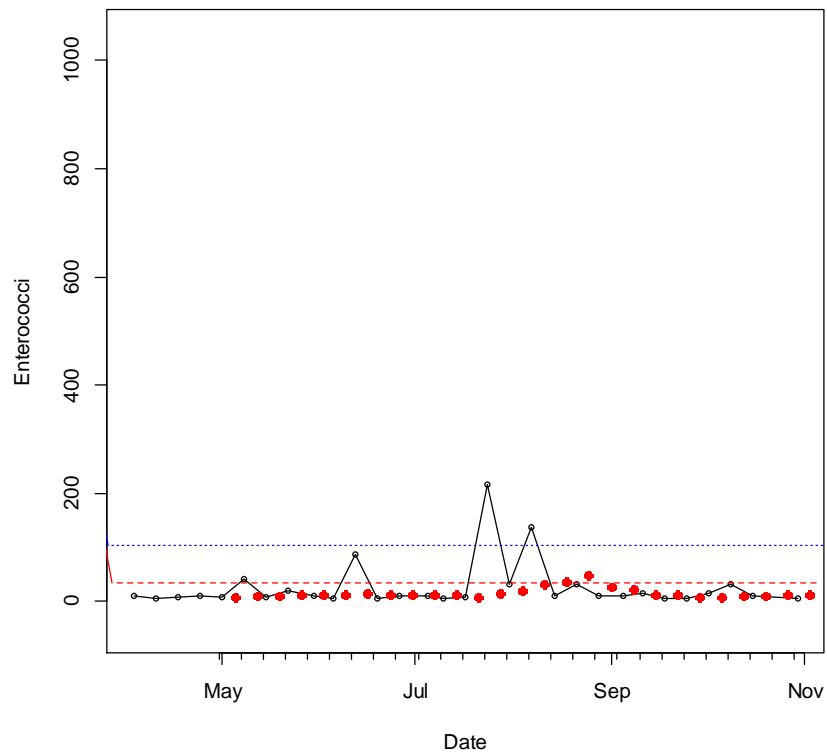


Figure B.9. Time series of sample results collected during 2023 at GIB3.

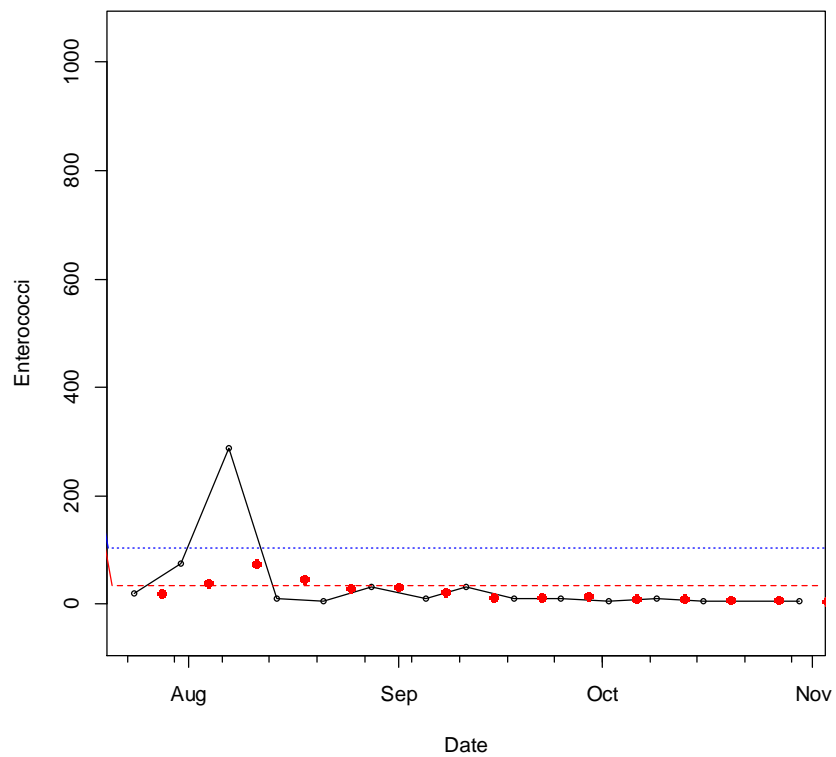


Figure B.10. Time series of sample results collected during 2023 at GISP1.

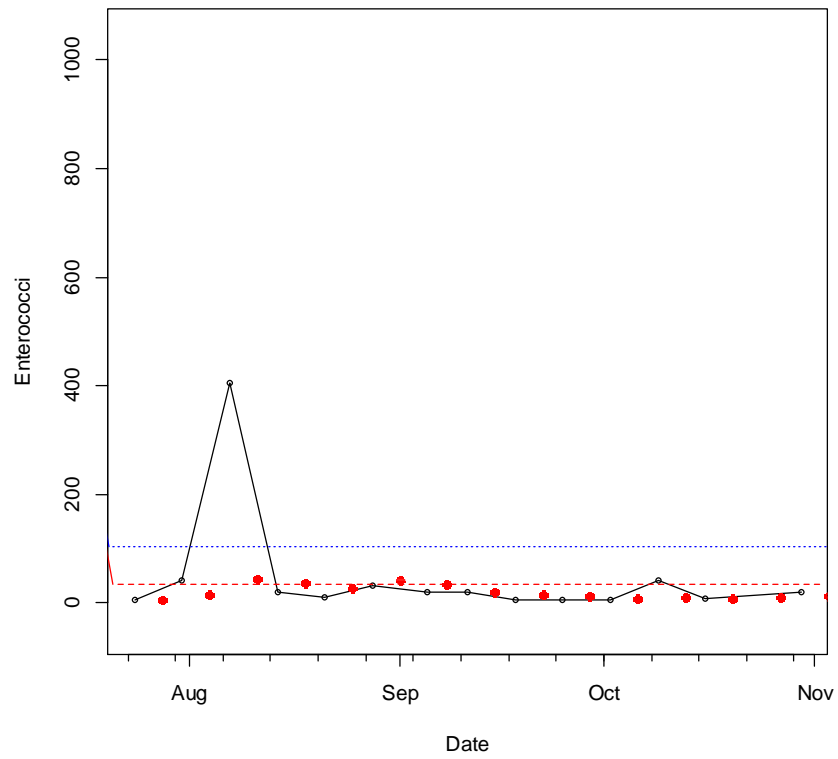


Figure B.11. Time series of sample results collected during 2023 at GISP2.

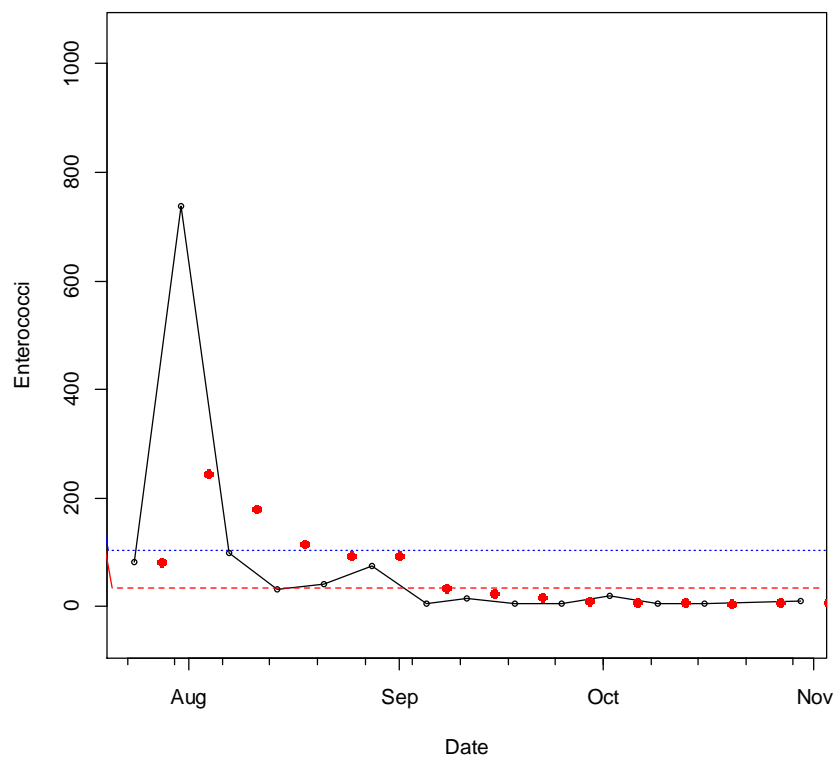


Figure B.12. Time series of sample results collected during 2023 at GISP3.

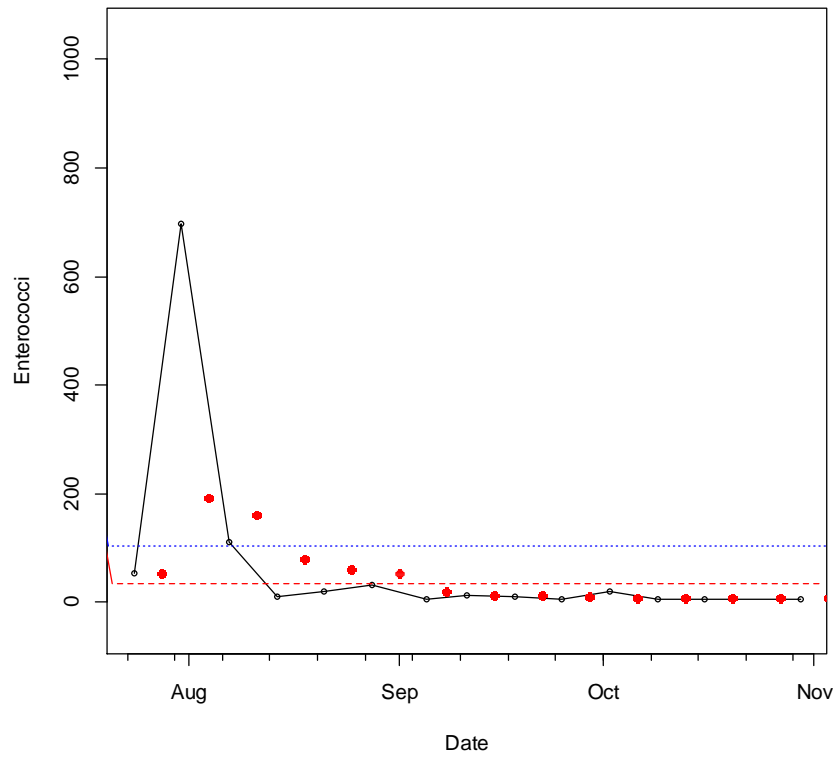


Figure B.13. Time series of sample results collected during 2023 at GISP4.

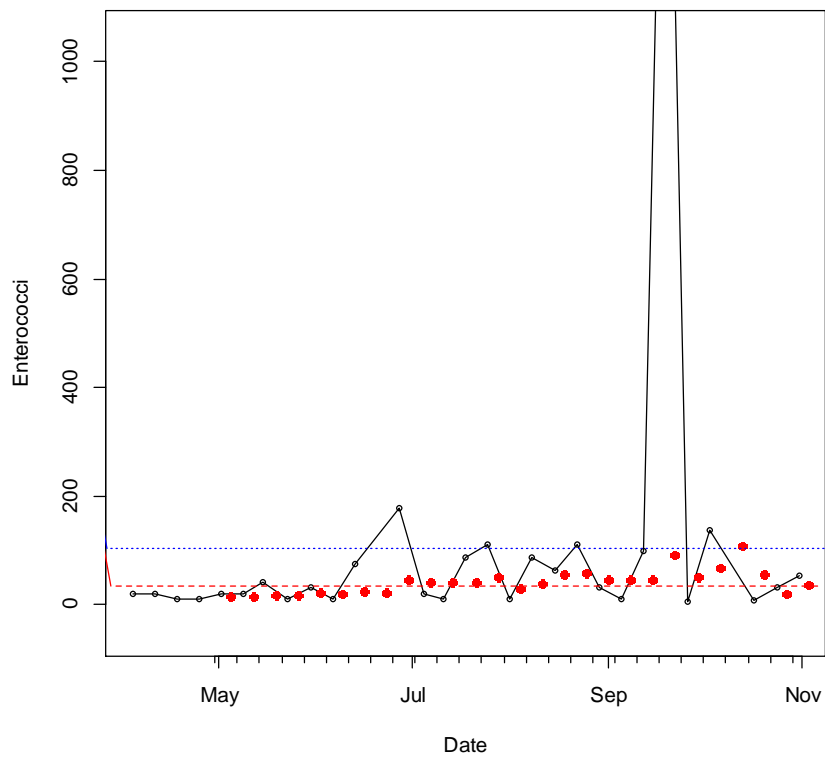


Figure B.14. Time series of sample results collected during 2023 at HOLLY1.

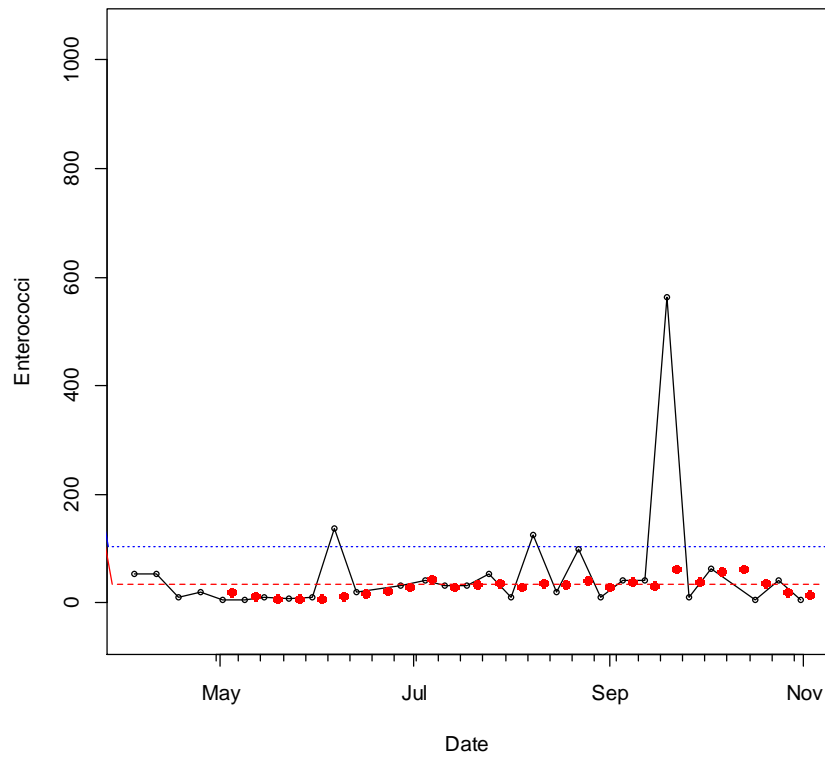


Figure B.15. Time series of sample results collected during 2023 at HOLLY2.

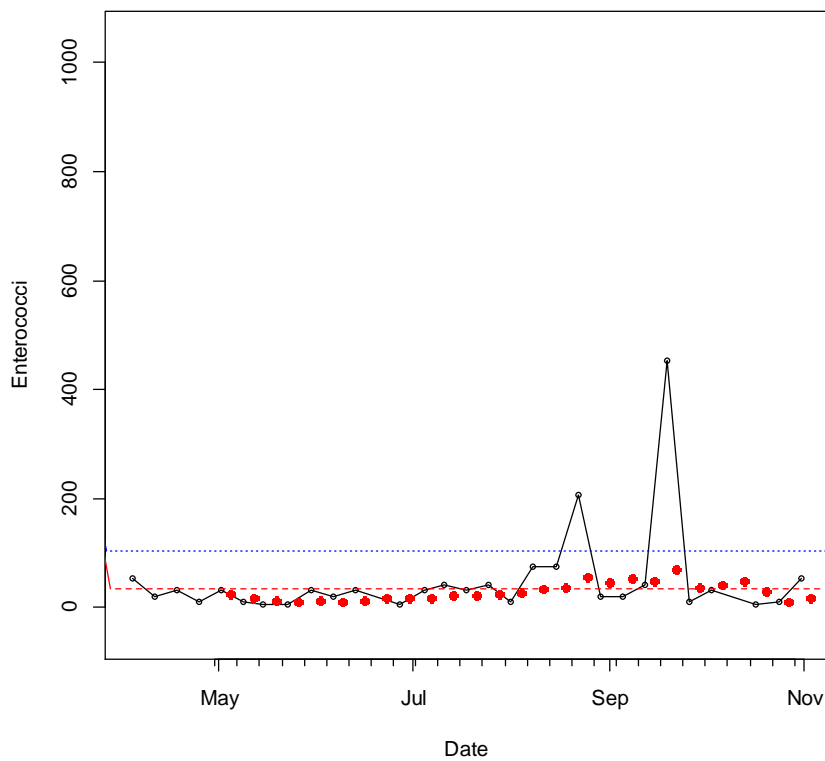


Figure B.16. Time series of sample results collected during 2023 at HOLLY3.

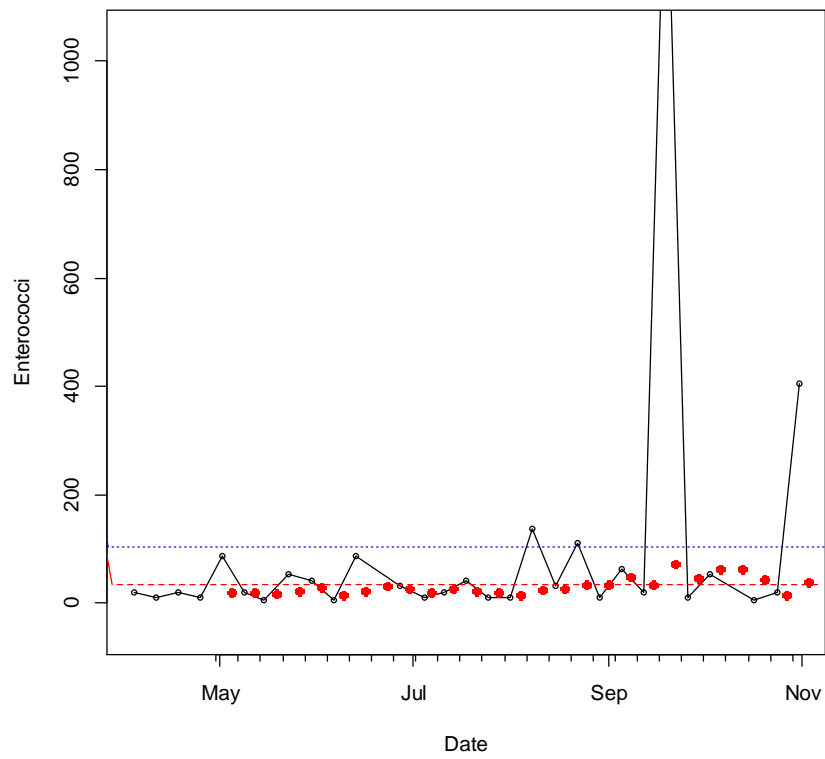


Figure B.17. Time series of sample results collected during 2023 at HOLLY4.

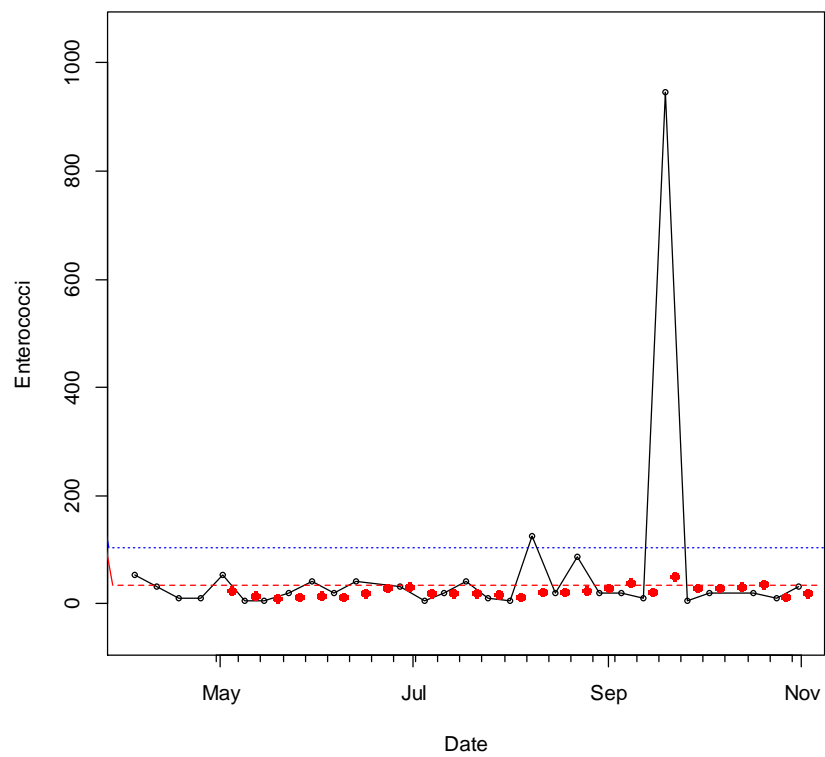


Figure B.18. Time series of sample results collected during 2023 at HOLLY5.

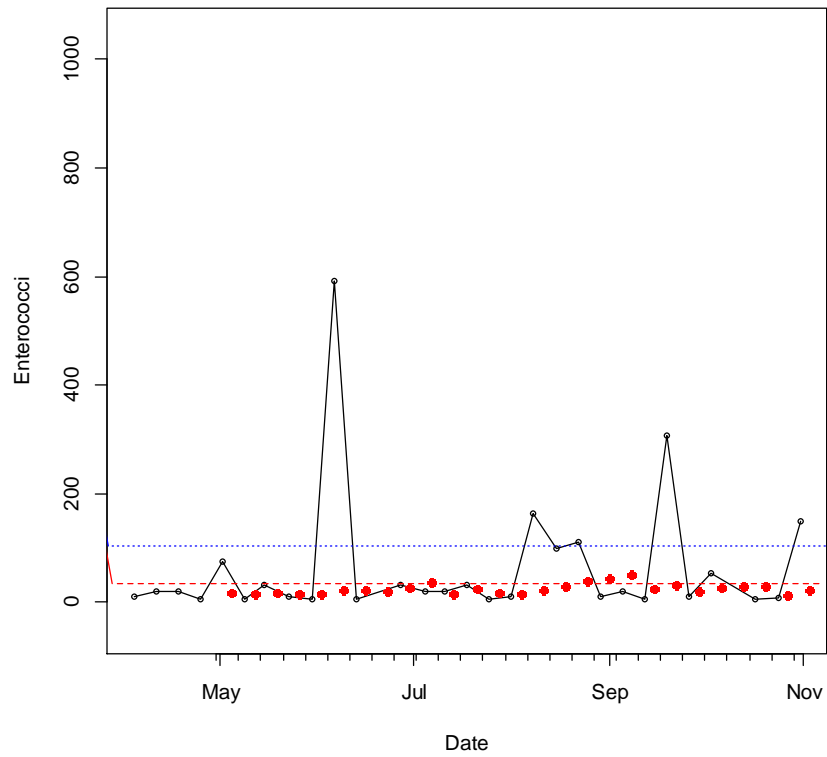


Figure B.19. Time series of sample results collected during 2023 at HOLLY6.

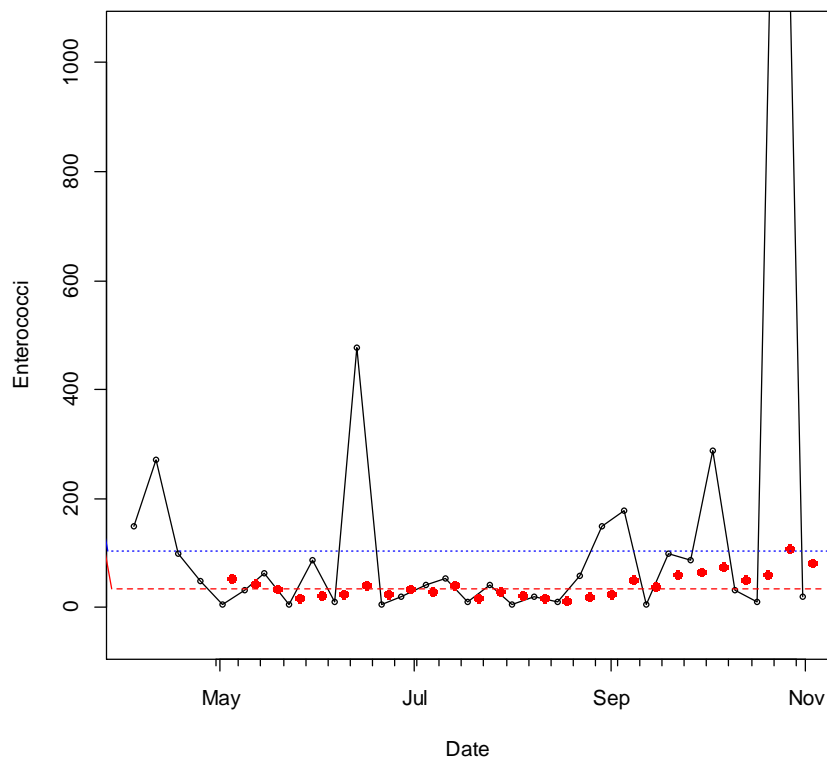


Figure B.20. Time series of sample results collected during 2023 at LCNB1.

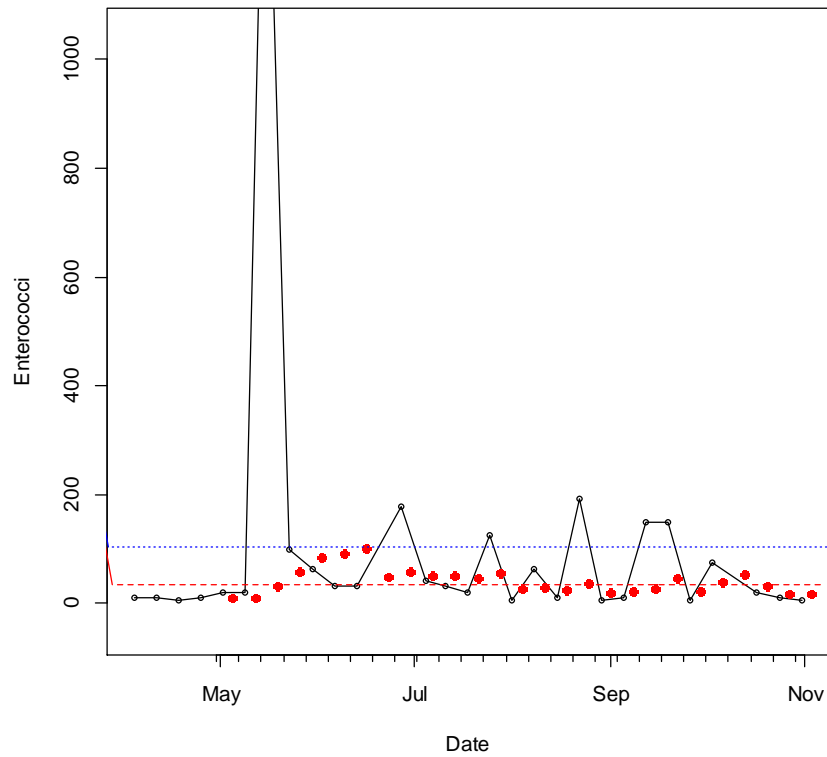


Figure B.21. Time series of sample results collected during 2023 at LTFL1.

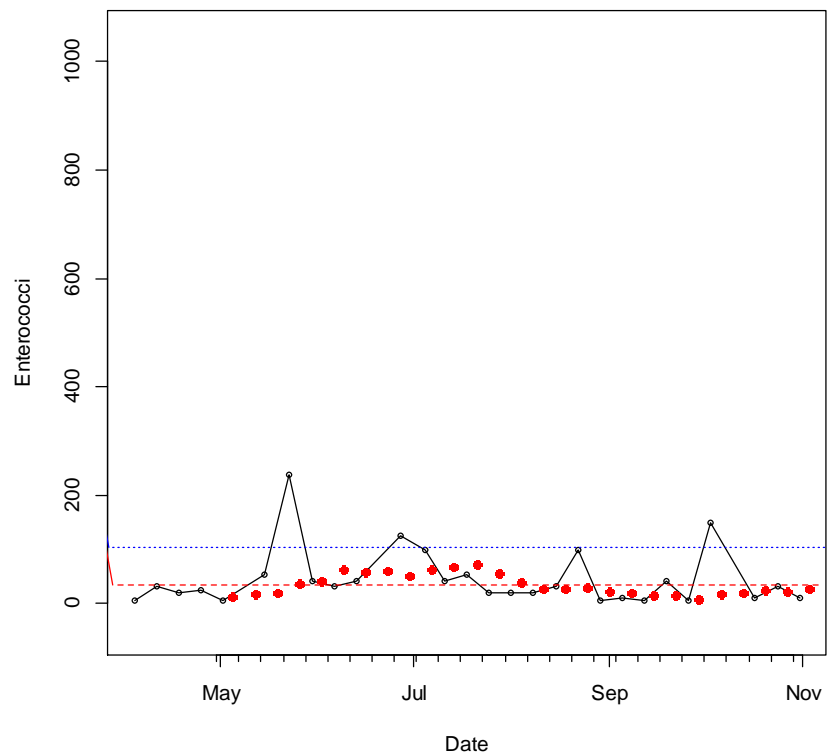


Figure B.22. Time series of sample results collected during 2023 at MART1.

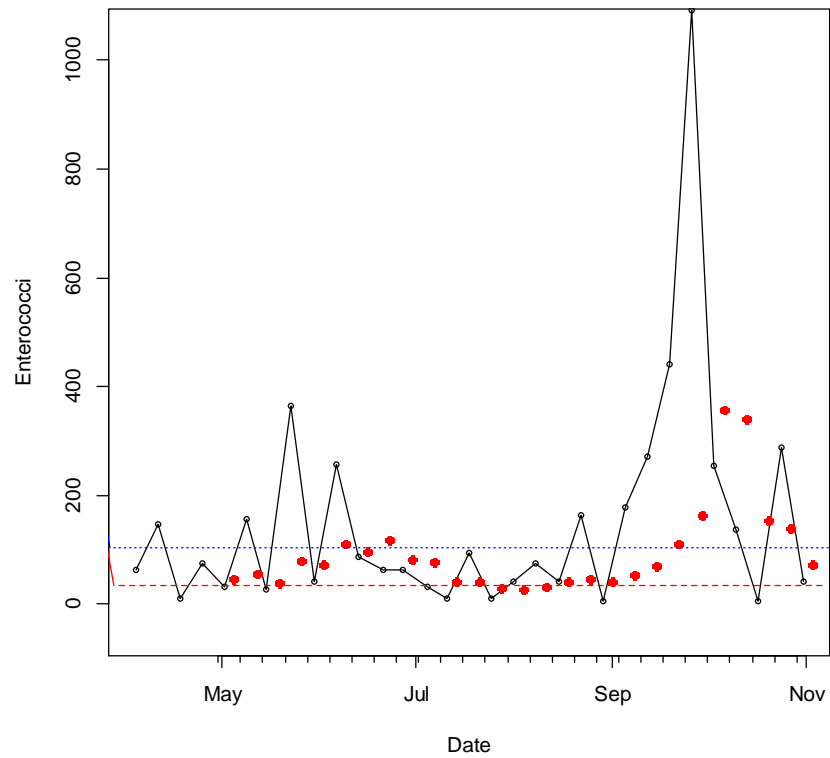


Figure B.23. Time series of sample results collected during 2023 at RUTH1.

APPENDIX C

Sample Results

2023 Beach Sample Results

Beach

Station ID

<i>Station ID</i>	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type	
Constance Beach											
<i>CNST1</i>	<i>Beach Name Constance Beach</i>										
	4/4/2023	7:00	High Tide	Falling	Cloudy	Southeast	Moderate-Strong (15-20 mph)	73	75	19.3	Routine
	4/11/2023	6:30	Low Tide	Falling	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	64	164	23.7	Routine
	4/18/2023	7:00	Low Tide		Cloudy	Southeast	Moderate-Light (5-10 mph)	70	10	22.2	Routine
	4/25/2023	7:00	High Tide		Cloudy	Northeast	Moderate (10-15 mph)	72	31	15.0	Routine
	5/2/2023	7:00	Low Tide		Fog	Northwest	Light (0-5 mph)	72	5	28.0	Routine
	5/9/2023	7:00	High Tide		Cloudy	South	Moderate-Light (5-10 mph)	76	10	23.9	Routine
	5/15/2023	7:00	Low Tide		Partly Cloudy	Northeast	Light (0-5 mph)	76	20	13.1	Routine
	5/23/2023	7:00	High Tide		Clear	North	Light (0-5 mph)	82	10	26.8	Routine
	5/30/2023	7:00	Low Tide		Clear	North	Light (0-5 mph)	81	5	25.8	Routine
	6/6/2023	7:00	High Tide		Cloudy	East	Moderate-Light (5-10 mph)	82	5	25.3	Routine
	6/13/2023	7:00	Low Tide		Scattered Clouds	South	Moderate (10-15 mph)	84	20	28.4	Routine
	6/27/2023	7:00	Low Tide	Falling	Scattered Clouds	Southwest	Moderate-Light (5-10 mph)	86	10	29.5	Routine
	7/5/2023	7:00	High Tide		Partly Cloudy	South	Moderate-Light (5-10 mph)	88	20	33.2	Routine
	7/11/2023	7:00	Low Tide	Falling	Scattered Clouds	Southeast	Light (0-5 mph)	87	42	32.5	Routine
	7/18/2023	7:00	High Tide	Falling	Scattered Clouds	Southwest	Moderate-Light (5-10 mph)	87	31	34.2	Routine
	7/25/2023	7:00	Low Tide	Falling	Scattered Clouds	Southwest	Light (0-5 mph)	88	10	35.0	Routine
	8/1/2023	7:00	High Tide	Falling	Clear	Northwest	Light (0-5 mph)	89	20	35.0	Routine
	8/8/2023	7:00	High Tide		Scattered Clouds	Southwest	Moderate (10-15 mph)	89	42	35.0	Routine
	8/15/2023	7:00	High Tide	Falling	Scattered Clouds	West	Moderate-Light (5-10 mph)	89	222	35.0	Routine
	8/22/2023	7:00	High Tide		Scattered Clouds	East	Moderate (10-15 mph)	88	111	35.0	Routine
	8/29/2023	7:06	High Tide	Falling	Clear	North	Moderate-Light (5-10 mph)	91	5	32.2	Routine
	9/5/2023	6:39	High Tide		Scattered Clouds	South	Moderate-Light (5-10 mph)	89	20	10.6	Routine
	9/12/2023	11:34	High Tide	Falling	Scattered Clouds	North	Light (0-5 mph)	89	10	30.4	Routine
	9/19/2023	7:00	High Tide	Falling	Clear	Northeast	Moderate-Light (5-10 mph)	86	31	30.8	Routine
	9/26/2023	7:00	High Tide	Falling	Rain	South	Moderate-Light (5-10 mph)	84	53	28.9	Routine
	10/3/2023	7:00	High Tide		Scattered Clouds	East	Moderate (10-15 mph)	84	222	26.6	Field Split
	10/3/2023	7:00	High Tide		Scattered Clouds	East	Moderate (10-15 mph)	84	238	26.4	Routine
	10/17/2023	7:17	Low Tide		Clear	North	Light (0-5 mph)	77	5	29.4	Routine

Beach*Station ID*

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Enterococci	Salinity	Sample Type
10/24/2023	7:20	Low Tide	Clear	East	Moderate (10-15 mph)	75	10	30.7	Routine
10/31/2023	7:22	Low Tide	Cloudy	North	Strong (20-35 mph)	78	5	26.0	Routine

Cypremort Point State Park*CYPT1**Beach Name Cypremort Point State Park*

4/4/2023	6:45	High Tide Falling	Cloudy	North	Moderate-Light (5-10 mph)	75	23	2.9	Routine
4/11/2023	6:40	Low Tide Falling	Cloudy	South-Southwest	Moderate-Light (5-10 mph)	67	64	2.2	Routine
4/18/2023	6:40	High Tide Falling	Cloudy	North	Light (0-5 mph)	68	164	1.5	Routine
4/25/2023	6:40	Low Tide	Cloudy	South-Southwest	Light (0-5 mph)	67	53	1.2	Field Split
4/25/2023	6:40	Low Tide	Cloudy	South-Southwest	Light (0-5 mph)	67	75	1.2	Routine
5/2/2023	6:40	Low Tide Falling	Partly Cloudy	North	Light (0-5 mph)	74	64	0.8	Routine
5/9/2023	6:40	Normal	Cloudy	West	Gale or Stronger (> 35 mph)	75	192	2.7	Routine
5/15/2023	6:45	High Tide Falling	Scattered Clouds	West	Light (0-5 mph)	80	53	3.6	Routine
5/23/2023	6:40	Low Tide Falling	Cloudy	North	Light (0-5 mph)	80	20	3.6	Routine
5/30/2023	6:35	High Tide Falling	Scattered Clouds	North	Light (0-5 mph)	81	178	4.7	Routine
6/6/2023	6:30	High Tide Falling	Partly Cloudy	South-Southeast	Light (0-5 mph)	79	53	4.9	Routine
6/13/2023	6:30	High Tide	Scattered Clouds	South-Southwest	Light (0-5 mph)	84	31	4.2	Routine
6/13/2023	6:30	High Tide	Scattered Clouds	South-Southwest	Light (0-5 mph)	84	42	4.1	Field Split
6/21/2023	6:35	High Tide Rising	Cloudy	West	Light (0-5 mph)	83	20	4.3	Routine
6/27/2023	6:40	High Tide Rising	Scattered Clouds	Northeast	Light (0-5 mph)	85	20	7.3	Routine
7/5/2023	6:35	High Tide Rising	Scattered Clouds	West	Light (0-5 mph)	86	75	11.3	Routine
7/11/2023	6:35	High Tide Rising	Scattered Clouds	North-Northeast	Light (0-5 mph)	84	64	11.4	Routine
7/18/2023	6:40	High Tide Falling	Cloudy	South-Southeast	Light (0-5 mph)	85	10	11.4	Routine
7/25/2023	6:40	High Tide Falling	Cloudy	North-Northeast	Light (0-5 mph)	88	42	21.6	Field Split
7/25/2023	6:40	High Tide Falling	Cloudy	North-Northeast	Light (0-5 mph)	88	42	21.7	Routine
8/1/2023	6:30	Low Tide	Cloudy	South	Light (0-5 mph)	88	20	18.3	Routine
8/8/2023	6:30	Low Tide Falling	Scattered Clouds	Southeast	Moderate-Light (5-10 mph)	86	42	16.8	Routine
8/15/2023	6:35	Low Tide Falling	Cloudy	East	Moderate-Light (5-10 mph)	87	20	11.6	Routine
8/22/2023	6:35	High Tide Falling	Cloudy	South-Southwest	Light (0-5 mph)	84	10	20.9	Routine
8/29/2023	6:45	Normal	Cloudy	South	Moderate-Light (5-10 mph)	83	10	20.4	Field Duplicate
8/29/2023	6:45	Normal	Cloudy	South	Moderate-Light (5-10 mph)	83	31	20.4	Routine
9/5/2023	6:35	High Tide Rising	Scattered Clouds	South-Southwest	Light (0-5 mph)	86	42	19.5	Routine
9/12/2023	6:35	High Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	83	5	17.4	Field Split
9/12/2023	6:35	High Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	83	5	17.4	Routine

Beach*Station ID*

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Enterococci	Salinity	Sample Type
9/19/2023	6:35	Normal	Scattered Clouds	South	Light (0-5 mph)	83	31	17.7	Routine
9/26/2023	6:40	Normal	Cloudy	South	Light (0-5 mph)	85	124	17.0	Routine
10/3/2023	6:35	Extremely High Tide	Scattered Clouds	Southwest	Moderate-Light (5-10 mph)	82	75	16.6	Field Duplicate
10/3/2023	6:35	Extremely High Tide	Scattered Clouds	Southwest	Moderate-Light (5-10 mph)	82	10	16.7	Routine
10/10/2023	6:35	Normal	Partly Cloudy	West	Moderate-Light (5-10 mph)	83	31	16.4	Routine
10/17/2023	6:35	Low Tide Falling	Clear	South	Light (0-5 mph)	63	42	14.6	Routine
10/24/2023	6:35	High Tide Falling	Clear	West	Moderate-Light (5-10 mph)	69	42	16.1	Routine
10/31/2023	6:30	Extremely Low Tide	Cloudy	South	Moderate (10-15 mph)	60	150	15.9	Routine

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

4/3/2023	6:20	Low Tide Falling	Scattered Clouds	South-Southwest	Moderate (10-15 mph)	71	20	21.6	Routine
4/10/2023	6:24	High Tide Rising	Cloudy	West	Moderate (10-15 mph)	76	75	18.4	Routine
4/17/2023	6:26	Low Tide Falling	Clear	North-Northeast	Moderate (10-15 mph)	72	99	18.2	Routine
4/24/2023	6:20	High Tide Rising	Cloudy	Northeast	Strong (20-35 mph)	73	2005	17.6	Routine
5/1/2023	6:17	Low Tide Falling	Clear	West-Northwest	Moderate (10-15 mph)	74	5	19.0	Routine
5/8/2023	6:28	Low Tide Falling	Partly Cloudy	South	Moderate-Light (5-10 mph)	77	20	19.4	Routine
5/15/2023	6:18	Low Tide Falling	Clear	North-Northeast	Moderate-Light (5-10 mph)	80	31	19.3	Routine
5/22/2023	6:20	High Tide Rising	Partly Cloudy	North	Moderate-Light (5-10 mph)	85	10	24.3	Routine
5/30/2023	6:15	High Tide Rising	Partly Cloudy	North-Northeast	Light (0-5 mph)	82	5	18.7	Routine
6/5/2023	6:55	High Tide Rising	Scattered Clouds	East-Northeast	Moderate (10-15 mph)	83	178	19.2	Routine
6/12/2023	6:28	High Tide	Partly Cloudy	West-Southwest	Moderate-Light (5-10 mph)	85	2005	29.6	Field Split
6/12/2023	6:28	High Tide	Partly Cloudy	West-Southwest	Moderate-Light (5-10 mph)	85	2005	21.8	Routine
6/19/2023	6:28	High Tide Rising	Cloudy	Southwest	Gale or Stronger (> 35 mph)	86	945	31.6	Routine
6/26/2023	6:18	High Tide	Partly Cloudy	West	Moderate-Light (5-10 mph)	84	178	28.0	Routine
7/5/2023	6:10	Low Tide Falling	Cloudy	West-Southwest	Moderate-Light (5-10 mph)	89	42	30.3	Routine
7/10/2023	6:25	High Tide	Cloudy	West-Southwest	Moderate (10-15 mph)	88	478	29.5	Routine
7/17/2023	6:20	Low Tide Falling	Cloudy	Northwest	Moderate-Light (5-10 mph)	88	42	30.9	Routine
7/24/2023	6:10	High Tide Falling	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	90	124	30.9	Routine
7/31/2023	6:10	High Tide Rising	Clear	Northwest	Moderate-Light (5-10 mph)	90	53	31.1	Routine
8/7/2023	6:05	High Tide Falling	Partly Cloudy	Southwest	Moderate-Light (5-10 mph)	90	42	32.4	Routine
8/14/2023	6:12	High Tide Rising	Clear	West	Moderate-Light (5-10 mph)	89	10	34.8	Routine
8/21/2023	6:05	High Tide Falling	Partly Cloudy	East	Strong (20-35 mph)	90	53	35.0	Routine
8/28/2023	6:15	High Tide	Partly Cloudy	North-Northwest	Moderate-Light (5-10 mph)	89	2005	29.7	Routine

Beach*Station ID*

Station ID					Wind	Wind	Water	Entero-			
	Date	Time	Tide	Weather	Direction	Speed	Temp	cocci	Salinity	Sample Type	
	9/5/2023	6:05	High Tide	Falling	Clear	Southeast	Moderate (10-15 mph)	87	478	25.9	Routine
	9/11/2023	6:08	High Tide	Rising	Clear	Northeast	Light (0-5 mph)	87	364	28.0	Routine
	9/18/2023	6:05	Low Tide	Falling	Clear	East	Moderate (10-15 mph)	87	659	28.8	Routine
	9/25/2023	6:05	High Tide		Cloudy	East-Northeast	Moderate-Light (5-10 mph)	81	344	27.1	Routine
	10/2/2023	6:15	High Tide	Falling	Clear	East-Northeast	Moderate-Strong (15-20 mph)	79	384	27.2	Field Duplicate
	10/2/2023	6:15	High Tide	Falling	Clear	East-Northeast	Moderate-Strong (15-20 mph)	79	560	27.3	Routine
	10/9/2023	6:18	High Tide		Clear	North	Light (0-5 mph)	81	5	29.2	Routine
	10/16/2023	6:12	Low Tide		Clear	North	Moderate-Strong (15-20 mph)	75	53	30.3	Routine
	10/30/2023	6:18	Low Tide	Falling	Clear	South-Southeast	Light (0-5 mph)	77	99	32.3	Routine

Fontainebleau State Park*FNTBI**Beach Name Fontainebleau State Park*

4/3/2023	8:56	High Tide	Falling	Partly Cloudy	South-Southwest	Moderate (10-15 mph)	72	99	1.0	Routine
4/10/2023	8:37	Low Tide		Scattered Clouds	Northeast	Moderate-Light (5-10 mph)	68	5	1.0	Routine
4/17/2023	8:20	Low Tide		Clear	North	Light (0-5 mph)	65	5	0.9	Routine
4/24/2023	8:16	High Tide	Falling	Cloudy	North-Northeast	Moderate (10-15 mph)	67	10	1.0	Routine
5/1/2023	8:26	Low Tide		Clear	North	Light (0-5 mph)	68	5	0.9	Routine
5/1/2023	8:26	Low Tide		Clear	North	Light (0-5 mph)	68	5	0.9	Field Duplicate
5/8/2023	8:02	Low Tide	Falling	Partly Cloudy	East-Northeast	Light (0-5 mph)	77	10	0.9	Routine
5/15/2023	8:16	Low Tide		Clear	North-Northeast	Moderate-Light (5-10 mph)	83	20	0.9	Routine
5/22/2023	8:21	Low Tide		Scattered Clouds	East-Northeast	Light (0-5 mph)	81	5	0.9	Routine
5/30/2023	8:10	Low Tide		Scattered Clouds	North	Light (0-5 mph)	80	42	0.9	Routine
6/5/2023	8:50	Low Tide		Partly Cloudy	East-Northeast	Light (0-5 mph)	82	5	0.9	Routine
6/12/2023	8:30	High Tide	Falling	Scattered Clouds	West-Southwest	Moderate-Light (5-10 mph)	83	42	1.0	Routine
6/19/2023	8:20	Low Tide		Cloudy	Southwest	Moderate-Light (5-10 mph)	84	53	0.9	Routine
6/26/2023	8:16	Low Tide		Cloudy	Northwest	Light (0-5 mph)	86	20	0.6	Routine
7/5/2023	8:25	High Tide	Falling	Partly Cloudy	North-Northwest	Light (0-5 mph)	86	20	0.6	Routine
7/10/2023	8:40	Low Tide		Partly Cloudy	West	Light (0-5 mph)	83	192	0.5	Routine
7/17/2023	8:34	Low Tide		Scattered Clouds	Northwest	Light (0-5 mph)	83	364	0.6	Routine
7/24/2023	8:30	Low Tide		Partly Cloudy	North-Northeast	Light (0-5 mph)	86	5	0.6	Routine
7/31/2023	8:28	Low Tide		Scattered Clouds	Northwest	Light (0-5 mph)	86	5	0.8	Routine
8/7/2023	8:42	Low Tide	Falling	Partly Cloudy	Southwest	Moderate-Light (5-10 mph)	86	192	0.6	Routine
8/14/2023	8:43	Extremely Low Tide		Clear	Northwest	Light (0-5 mph)	87	31	0.5	Routine
8/21/2023	8:40	High Tide	Rising	Scattered Clouds	Northeast	Light (0-5 mph)	88	20	0.8	Routine

Beach*Station ID*

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Enterococci	Salinity	Sample Type
8/28/2023	8:35	High Tide Rising	Cloudy	North	Light (0-5 mph)	86	31	0.9	Routine
9/5/2023	8:23	High Tide	Cloudy	Northeast	Light (0-5 mph)	85	192	1.7	Routine
9/5/2023	8:23	High Tide	Cloudy	Northeast	Light (0-5 mph)	85	164	1.7	Field Duplicate
9/11/2023	8:35	Low Tide	Clear	North-Northeast	Light (0-5 mph)	82	5	2.4	Routine
9/18/2023	8:31	High Tide	Clear	Northeast	Light (0-5 mph)	81	5	1.5	Routine
9/25/2023	8:31	Low Tide Falling	Cloudy	West-Southwest	Light (0-5 mph)	81	150	1.8	Routine
10/2/2023	8:35	High Tide	Clear	North-Northeast	Moderate-Light (5-10 mph)	78	10	1.9	Routine
10/9/2023	8:29	High Tide	Scattered Clouds	North	Light (0-5 mph)	70	5	3.0	Routine
10/16/2023	8:31	Low Tide	Clear	North	Moderate (10-15 mph)	64	31	2.6	Routine
10/30/2023	8:31	High Tide	Fog	East-Northeast	Light (0-5 mph)	76	5	7.2	Routine

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

4/3/2023	6:20	Low Tide Falling	Scattered Clouds	South-Southwest	Moderate (10-15 mph)	71	10	21.6	Routine
4/10/2023	6:24	High Tide Rising	Cloudy	West	Moderate (10-15 mph)	76	5	15.7	Routine
4/17/2023	6:26	Low Tide Falling	Clear	North-Northeast	Moderate (10-15 mph)	72	20	15.6	Routine
4/24/2023	6:20	High Tide Rising	Cloudy	Northeast	Strong (20-35 mph)	73	10	17.7	Routine
5/1/2023	6:17	Low Tide Falling	Clear	West-Northwest	Moderate (10-15 mph)	74	31	33.2	Routine
5/8/2023	6:28	Low Tide Falling	Partly Cloudy	South	Moderate-Light (5-10 mph)	77	31	18.3	Routine
5/15/2023	6:18	Low Tide Falling	Clear	North-Northeast	Moderate-Light (5-10 mph)	80	5	22.4	Routine
5/22/2023	6:20	High Tide Rising	Partly Cloudy	North	Moderate-Light (5-10 mph)	85	5	24.2	Routine
5/30/2023	6:15	High Tide Rising	Partly Cloudy	North-Northeast	Light (0-5 mph)	82	5	16.9	Routine
6/5/2023	6:55	High Tide Rising	Scattered Clouds	East-Northeast	Moderate (10-15 mph)	83	5	17.8	Routine
6/12/2023	6:28	High Tide	Partly Cloudy	West-Southwest	Moderate-Light (5-10 mph)	85	20	29.6	Routine
6/19/2023	6:28	High Tide Rising	Cloudy	Southwest	Gale or Stronger (> 35 mph)	86	10	33.3	Routine
6/26/2023	6:18	High Tide	Partly Cloudy	West	Moderate-Light (5-10 mph)	84	10	32.5	Routine
7/5/2023	6:10	Low Tide Falling	Cloudy	West-Southwest	Moderate-Light (5-10 mph)	89	31	29.4	Routine
7/10/2023	6:25	High Tide	Cloudy	West-Southwest	Moderate (10-15 mph)	88	20	32.6	Routine
7/17/2023	6:20	Low Tide Falling	Cloudy	Northwest	Moderate-Light (5-10 mph)	88	20	32.3	Routine
7/24/2023	6:10	High Tide Falling	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	90	64	32.2	Routine
7/31/2023	6:10	High Tide Rising	Clear	Northwest	Moderate-Light (5-10 mph)	90	2005	30.9	Routine
8/7/2023	6:05	High Tide Falling	Partly Cloudy	Southwest	Moderate-Light (5-10 mph)	90	10	34.6	Routine
8/14/2023	6:12	High Tide Rising	Clear	West	Moderate-Light (5-10 mph)	89	10	35.0	Routine
8/21/2023	6:05	High Tide Falling	Partly Cloudy	East	Strong (20-35 mph)	90	20	30.8	Field Duplicate

Beach*Station ID*

<i>Station ID</i>											
	Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type	
	8/21/2023	6:05	High Tide	Falling	Partly Cloudy	East	Strong (20-35 mph)	90	53	30.7	Routine
	8/28/2023	6:15	High Tide		Partly Cloudy	North-Northwest	Moderate-Light (5-10 mph)	89	53	28.9	Routine
	9/5/2023	6:05	High Tide	Falling	Clear	Southeast	Moderate (10-15 mph)	87	31	23.6	Routine
	9/11/2023	6:08	High Tide	Rising	Clear	Northeast	Light (0-5 mph)	87	20	26.8	Routine
	9/18/2023	6:05	Low Tide	Falling	Clear	East	Moderate (10-15 mph)	87	5	29.1	Routine
	9/25/2023	6:05	High Tide		Cloudy	East-Northeast	Moderate-Light (5-10 mph)	81	5	26.2	Routine
	10/2/2023	6:15	High Tide	Falling	Clear	East-Northeast	Moderate-Strong (15-20 mph)	79	5	29.5	Routine
	10/9/2023	6:18	High Tide		Clear	North	Light (0-5 mph)	81	5	29.3	Routine
	10/16/2023	6:12	Low Tide		Clear	North	Moderate-Strong (15-20 mph)	75	20	32.7	Routine
	10/30/2023	6:18	Low Tide	Falling	Clear	South-Southeast	Light (0-5 mph)	77	5	29.3	Routine

Grand Isle Beach*GIB2**Beach Name Grand Isle Beach - 2*

4/3/2023	6:20	Low Tide	Falling	Scattered Clouds	South-Southwest	Moderate (10-15 mph)	71	10	20.9	Routine
4/10/2023	6:24	High Tide	Rising	Cloudy	West	Moderate (10-15 mph)	76	5	15.8	Routine
4/17/2023	6:26	Low Tide	Falling	Clear	North-Northeast	Moderate (10-15 mph)	72	10	25.6	Routine
4/24/2023	6:20	High Tide	Rising	Cloudy	Northeast	Strong (20-35 mph)	73	10	17.7	Field Duplicate
4/24/2023	6:20	High Tide	Rising	Cloudy	Northeast	Strong (20-35 mph)	73	5	17.7	Routine
5/1/2023	6:17	Low Tide	Falling	Clear	West-Northwest	Moderate (10-15 mph)	74	5	33.3	Routine
5/8/2023	6:28	Low Tide	Falling	Partly Cloudy	South	Moderate-Light (5-10 mph)	77	20	18.3	Routine
5/15/2023	6:18	Low Tide	Falling	Clear	North-Northeast	Moderate-Light (5-10 mph)	80	5	22.4	Routine
5/22/2023	6:20	High Tide	Rising	Partly Cloudy	North	Moderate-Light (5-10 mph)	85	10	24.2	Routine
5/30/2023	6:15	High Tide	Rising	Partly Cloudy	North-Northeast	Light (0-5 mph)	82	10	16.9	Routine
6/5/2023	6:55	High Tide	Rising	Scattered Clouds	East-Northeast	Moderate (10-15 mph)	83	5	17.8	Routine
6/5/2023	6:55	High Tide	Rising	Scattered Clouds	East-Northeast	Moderate (10-15 mph)	83	10	17.7	Field Split
6/12/2023	6:28	High Tide		Partly Cloudy	West-Southwest	Moderate-Light (5-10 mph)	85	53	29.6	Routine
6/19/2023	6:28	High Tide	Rising	Cloudy	Southwest	Gale or Stronger (> 35 mph)	86	10	33.3	Routine
6/26/2023	6:18	High Tide		Partly Cloudy	West	Moderate-Light (5-10 mph)	84	5	32.5	Routine
6/26/2023	6:18	High Tide		Partly Cloudy	West	Moderate-Light (5-10 mph)	84	10	32.6	Field Duplicate
7/5/2023	6:10	Low Tide	Falling	Cloudy	West-Southwest	Moderate-Light (5-10 mph)	89	10	29.4	Field Duplicate
7/5/2023	6:10	Low Tide	Falling	Cloudy	West-Southwest	Moderate-Light (5-10 mph)	89	20	29.3	Routine
7/10/2023	6:25	High Tide		Cloudy	West-Southwest	Moderate (10-15 mph)	88	5	32.4	Routine
7/17/2023	6:20	Low Tide	Falling	Cloudy	Northwest	Moderate-Light (5-10 mph)	88	5	32.5	Routine
7/24/2023	6:10	High Tide	Falling	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	90	31	32.2	Routine

Beach*Station ID*

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Enterococci	Salinity	Sample Type
7/31/2023	6:10	High Tide Rising	Clear	Northwest	Moderate-Light (5-10 mph)	90	31	30.4	Field Split
7/31/2023	6:10	High Tide Rising	Clear	Northwest	Moderate-Light (5-10 mph)	90	659	30.7	Routine
8/7/2023	6:05	High Tide Falling	Partly Cloudy	Southwest	Moderate-Light (5-10 mph)	90	5	34.3	Routine
8/14/2023	6:12	High Tide Rising	Clear	West	Moderate-Light (5-10 mph)	89	20	35.0	Routine
8/21/2023	6:05	High Tide Falling	Partly Cloudy	East	Strong (20-35 mph)	90	20	30.8	Routine
8/28/2023	6:15	High Tide	Partly Cloudy	North-Northwest	Moderate-Light (5-10 mph)	89	124	28.9	Routine
9/5/2023	6:05	High Tide Falling	Clear	Southeast	Moderate (10-15 mph)	87	64	23.7	Routine
9/11/2023	6:08	High Tide Rising	Clear	Northeast	Light (0-5 mph)	87	20	26.8	Routine
9/18/2023	6:05	Low Tide Falling	Clear	East	Moderate (10-15 mph)	87	31	29.2	Routine
9/25/2023	6:05	High Tide	Cloudy	East-Northeast	Moderate-Light (5-10 mph)	81	5	26.1	Routine
10/2/2023	6:15	High Tide Falling	Clear	East-Northeast	Moderate-Strong (15-20 mph)	79	10	29.7	Routine
10/9/2023	6:18	High Tide	Clear	North	Light (0-5 mph)	81	5	29.2	Routine
10/16/2023	6:12	Low Tide	Clear	North	Moderate-Strong (15-20 mph)	75	5	32.7	Routine
10/30/2023	6:18	Low Tide Falling	Clear	South-Southeast	Light (0-5 mph)	77	5	29.1	Routine

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

4/3/2023	6:20	Low Tide Falling	Scattered Clouds	South-Southwest	Moderate (10-15 mph)	71	10	20.7	Routine
4/10/2023	6:24	High Tide Rising	Cloudy	West	Moderate (10-15 mph)	76	5	15.7	Routine
4/17/2023	6:26	Low Tide Falling	Clear	North-Northeast	Moderate (10-15 mph)	72	10	26.1	Routine
4/17/2023	6:26	Low Tide Falling	Clear	North-Northeast	Moderate (10-15 mph)	72	5	26.1	Field Duplicate
4/24/2023	6:20	High Tide Rising	Cloudy	Northeast	Strong (20-35 mph)	73	10	17.1	Routine
5/1/2023	6:17	Low Tide Falling	Clear	West-Northwest	Moderate (10-15 mph)	74	10	33.0	Field Duplicate
5/1/2023	6:17	Low Tide Falling	Clear	West-Northwest	Moderate (10-15 mph)	74	5	33.0	Routine
5/8/2023	6:28	Low Tide Falling	Partly Cloudy	South	Moderate-Light (5-10 mph)	77	42	18.1	Routine
5/15/2023	6:18	Low Tide Falling	Clear	North-Northeast	Moderate-Light (5-10 mph)	80	5	21.6	Field Duplicate
5/15/2023	6:18	Low Tide Falling	Clear	North-Northeast	Moderate-Light (5-10 mph)	80	10	22.4	Routine
5/22/2023	6:20	High Tide Rising	Partly Cloudy	North	Moderate-Light (5-10 mph)	85	20	23.7	Routine
5/30/2023	6:15	High Tide Rising	Partly Cloudy	North-Northeast	Light (0-5 mph)	82	10	16.6	Routine
6/5/2023	6:55	High Tide Rising	Scattered Clouds	East-Northeast	Moderate (10-15 mph)	83	5	17.8	Routine
6/12/2023	6:28	High Tide	Partly Cloudy	West-Southwest	Moderate-Light (5-10 mph)	85	87	29.2	Routine
6/19/2023	6:28	High Tide Rising	Cloudy	Southwest	Gale or Stronger (> 35 mph)	86	5	33.3	Routine
6/26/2023	6:18	High Tide	Partly Cloudy	West	Moderate-Light (5-10 mph)	84	10	32.2	Routine
7/5/2023	6:10	Low Tide Falling	Cloudy	West-Southwest	Moderate-Light (5-10 mph)	89	10	29.6	Routine

Beach*Station ID*

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Enterococci	Salinity	Sample Type
7/10/2023	6:25	High Tide	Cloudy	West-Southwest	Moderate (10-15 mph)	88	5	32.4	Routine
7/17/2023	6:20	Low Tide Falling	Cloudy	Northwest	Moderate-Light (5-10 mph)	88	5	32.4	Field Split
7/17/2023	6:20	Low Tide Falling	Cloudy	Northwest	Moderate-Light (5-10 mph)	88	10	32.6	Routine
7/24/2023	6:10	High Tide Falling	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	90	254	22.9	Field Split
7/24/2023	6:10	High Tide Falling	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	90	178	29.3	Routine
7/31/2023	6:10	High Tide Rising	Clear	Northwest	Moderate-Light (5-10 mph)	90	31	30.6	Routine
8/7/2023	6:05	High Tide Falling	Partly Cloudy	Southwest	Moderate-Light (5-10 mph)	90	137	33.9	Routine
8/14/2023	6:12	High Tide Rising	Clear	West	Moderate-Light (5-10 mph)	89	10	35.0	Routine
8/21/2023	6:05	High Tide Falling	Partly Cloudy	East	Strong (20-35 mph)	90	31	30.8	Routine
8/28/2023	6:15	High Tide	Partly Cloudy	North-Northwest	Moderate-Light (5-10 mph)	89	10	28.9	Routine
9/5/2023	6:05	High Tide Falling	Clear	Southeast	Moderate (10-15 mph)	87	10	24.6	Routine
9/11/2023	6:08	High Tide Rising	Clear	Northeast	Light (0-5 mph)	87	20	26.4	Field Split
9/11/2023	6:08	High Tide Rising	Clear	Northeast	Light (0-5 mph)	87	10	26.5	Routine
9/18/2023	6:05	Low Tide Falling	Clear	East	Moderate (10-15 mph)	87	5	29.1	Routine
9/25/2023	6:05	High Tide	Cloudy	East-Northeast	Moderate-Light (5-10 mph)	81	5	26.1	Routine
10/2/2023	6:15	High Tide Falling	Clear	East-Northeast	Moderate-Strong (15-20 mph)	79	10	29.9	Routine
10/2/2023	6:15	High Tide Falling	Clear	East-Northeast	Moderate-Strong (15-20 mph)	79	20	29.9	Field Split
10/9/2023	6:18	High Tide	Clear	North	Light (0-5 mph)	81	31	29.8	Routine
10/16/2023	6:12	Low Tide	Clear	North	Moderate-Strong (15-20 mph)	75	10	32.5	Routine
10/30/2023	6:18	Low Tide Falling	Clear	South-Southeast	Light (0-5 mph)	77	5	29.2	Routine

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

7/24/2023	6:10	High Tide Falling	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	90	20	32.4	Routine
7/31/2023	6:10	High Tide Rising	Clear	Northwest	Moderate-Light (5-10 mph)	90	75	29.6	Routine
8/7/2023	6:05	High Tide Falling	Partly Cloudy	Southwest	Moderate-Light (5-10 mph)	90	288	32.8	Routine
8/14/2023	6:12	High Tide Rising	Clear	West	Moderate-Light (5-10 mph)	89	10	35.0	Routine
8/21/2023	6:05	High Tide Falling	Partly Cloudy	East	Strong (20-35 mph)	90	5	27.6	Routine
8/28/2023	6:15	High Tide	Partly Cloudy	North-Northwest	Moderate-Light (5-10 mph)	89	31	28.4	Routine
9/5/2023	6:05	High Tide Falling	Clear	Southeast	Moderate (10-15 mph)	87	10	24.6	Routine
9/11/2023	6:08	High Tide Rising	Clear	Northeast	Light (0-5 mph)	87	31	26.3	Routine
9/18/2023	6:05	Low Tide Falling	Clear	East	Moderate (10-15 mph)	87	10	27.5	Routine
9/25/2023	6:05	High Tide	Cloudy	East-Northeast	Moderate-Light (5-10 mph)	81	10	26.1	Routine
10/2/2023	6:15	High Tide Falling	Clear	East-Northeast	Moderate-Strong (15-20 mph)	79	5	30.0	Routine

Beach*Station ID*

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Enterococci	Salinity	Sample Type
10/9/2023	6:18	High Tide	Clear	North	Light (0-5 mph)	81	10	28.6	Routine
10/16/2023	6:12	Low Tide	Clear	North	Moderate-Strong (15-20 mph)	75	5	30.3	Field Duplicate
10/16/2023	6:12	Low Tide	Clear	North	Moderate-Strong (15-20 mph)	75	5	30.3	Routine
10/30/2023	6:18	Low Tide Falling	Clear	South-Southeast	Light (0-5 mph)	77	5	30.2	Routine

Grand Isle State Park*GISP2**Beach Name Grand Isle State Park - 2*

7/24/2023	6:10	High Tide Falling	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	90	5	32.3	Routine
7/31/2023	6:10	High Tide Rising	Clear	Northwest	Moderate-Light (5-10 mph)	90	42	23.2	Routine
8/7/2023	6:05	High Tide Falling	Partly Cloudy	Southwest	Moderate-Light (5-10 mph)	90	406	33.3	Routine
8/14/2023	6:12	High Tide Rising	Clear	West	Moderate-Light (5-10 mph)	89	20	35.0	Routine
8/21/2023	6:05	High Tide Falling	Partly Cloudy	East	Strong (20-35 mph)	90	10	27.7	Routine
8/21/2023	6:05	High Tide Falling	Partly Cloudy	East	Strong (20-35 mph)	90	10	27.7	Field Split
8/28/2023	6:15	High Tide	Partly Cloudy	North-Northwest	Moderate-Light (5-10 mph)	89	31	28.3	Routine
9/5/2023	6:05	High Tide Falling	Clear	Southeast	Moderate (10-15 mph)	87	20	24.8	Routine
9/11/2023	6:08	High Tide Rising	Clear	Northeast	Light (0-5 mph)	87	20	26.3	Routine
9/18/2023	6:05	Low Tide Falling	Clear	East	Moderate (10-15 mph)	87	5	27.5	Routine
9/25/2023	6:05	High Tide	Cloudy	East-Northeast	Moderate-Light (5-10 mph)	81	5	26.2	Routine
10/2/2023	6:15	High Tide Falling	Clear	East-Northeast	Moderate-Strong (15-20 mph)	79	5	30.0	Routine
10/9/2023	6:18	High Tide	Clear	North	Light (0-5 mph)	81	42	28.6	Routine
10/16/2023	6:12	Low Tide	Clear	North	Moderate-Strong (15-20 mph)	75	5	30.1	Field Duplicate
10/16/2023	6:12	Low Tide	Clear	North	Moderate-Strong (15-20 mph)	75	10	30.5	Routine
10/30/2023	6:18	Low Tide Falling	Clear	South-Southeast	Light (0-5 mph)	77	20	30.2	Routine

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

7/24/2023	6:10	High Tide Falling	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	90	87	32.4	Field Duplicate
7/24/2023	6:10	High Tide Falling	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	90	75	32.4	Routine
7/31/2023	6:10	High Tide Rising	Clear	Northwest	Moderate-Light (5-10 mph)	90	738	29.8	Routine
8/7/2023	6:05	High Tide Falling	Partly Cloudy	Southwest	Moderate-Light (5-10 mph)	90	99	33.4	Routine
8/14/2023	6:12	High Tide Rising	Clear	West	Moderate-Light (5-10 mph)	89	31	35.0	Routine
8/21/2023	6:05	High Tide Falling	Partly Cloudy	East	Strong (20-35 mph)	90	42	27.7	Routine
8/28/2023	6:15	High Tide	Partly Cloudy	North-Northwest	Moderate-Light (5-10 mph)	89	75	28.3	Routine
9/5/2023	6:05	High Tide Falling	Clear	Southeast	Moderate (10-15 mph)	87	5	25.4	Routine

Beach*Station ID**Wind**Wind**Water**Entero-**Sample***Beach***Station ID*

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Entero-cocci	Salinity	Sample Type
9/11/2023	6:08	High Tide Rising	Clear	Northeast	Light (0-5 mph)	87	10	26.2	Routine
9/11/2023	6:08	High Tide Rising	Clear	Northeast	Light (0-5 mph)	87	20	26.3	Field Split
9/18/2023	6:05	Low Tide Falling	Clear	East	Moderate (10-15 mph)	87	5	27.6	Routine
9/25/2023	6:05	High Tide	Cloudy	East-Northeast	Moderate-Light (5-10 mph)	81	5	26.1	Routine
10/2/2023	6:15	High Tide Falling	Clear	East-Northeast	Moderate-Strong (15-20 mph)	79	20	30.1	Routine
10/9/2023	6:18	High Tide	Clear	North	Light (0-5 mph)	81	5	28.5	Routine
10/16/2023	6:12	Low Tide	Clear	North	Moderate-Strong (15-20 mph)	75	5	29.3	Routine
10/30/2023	6:18	Low Tide Falling	Clear	South-Southeast	Light (0-5 mph)	77	10	30.3	Routine

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

7/24/2023	6:10	High Tide Falling	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	90	53	32.3	Routine
7/31/2023	6:10	High Tide Rising	Clear	Northwest	Moderate-Light (5-10 mph)	90	697	30.0	Routine
8/7/2023	6:05	High Tide Falling	Partly Cloudy	Southwest	Moderate-Light (5-10 mph)	90	111	33.5	Routine
8/14/2023	6:12	High Tide Rising	Clear	West	Moderate-Light (5-10 mph)	89	10	35.0	Routine
8/21/2023	6:05	High Tide Falling	Partly Cloudy	East	Strong (20-35 mph)	90	20	27.6	Routine
8/28/2023	6:15	High Tide	Partly Cloudy	North-Northwest	Moderate-Light (5-10 mph)	89	31	28.3	Routine
9/5/2023	6:05	High Tide Falling	Clear	Southeast	Moderate (10-15 mph)	87	5	25.4	Routine
9/11/2023	6:08	High Tide Rising	Clear	Northeast	Light (0-5 mph)	87	5	26.2	Routine
9/11/2023	6:08	High Tide Rising	Clear	Northeast	Light (0-5 mph)	87	20	26.3	Field Duplicate
9/18/2023	6:05	Low Tide Falling	Clear	East	Moderate (10-15 mph)	87	10	27.6	Routine
9/25/2023	6:05	High Tide	Cloudy	East-Northeast	Moderate-Light (5-10 mph)	81	5	26.2	Routine
10/2/2023	6:15	High Tide Falling	Clear	East-Northeast	Moderate-Strong (15-20 mph)	79	20	29.9	Routine
10/9/2023	6:18	High Tide	Clear	North	Light (0-5 mph)	81	5	28.6	Routine
10/16/2023	6:12	Low Tide	Clear	North	Moderate-Strong (15-20 mph)	75	5	29.4	Routine
10/30/2023	6:18	Low Tide Falling	Clear	South-Southeast	Light (0-5 mph)	77	5	30.3	Routine

Gulf Breeze*GBRZ1**Beach Name Gulf Breeze*

4/4/2023	7:00	High Tide Falling	Cloudy	Southeast	Moderate-Strong (15-20 mph)	73	53	19.4	Routine
4/11/2023	6:30	Low Tide Falling	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	64	31	24.0	Routine
4/18/2023	7:00	Low Tide	Cloudy	Southeast	Moderate-Light (5-10 mph)	70	10	22.1	Routine
4/25/2023	7:00	High Tide	Cloudy	Northeast	Moderate (10-15 mph)	72	22	14.9	Routine
5/2/2023	7:00	Low Tide	Fog	Northwest	Light (0-5 mph)	72	5	27.8	Routine

Beach*Station ID*

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Enterococci	Salinity	Sample Type
5/9/2023	7:00	High Tide	Cloudy	South	Moderate-Light (5-10 mph)	76	53	24.0	Routine
5/15/2023	7:00	Low Tide	Partly Cloudy	Northeast	Light (0-5 mph)	76	10	13.1	Routine
5/23/2023	7:00	High Tide	Clear	North	Light (0-5 mph)	82	5	27.0	Routine
5/30/2023	7:00	Low Tide	Clear	North	Light (0-5 mph)	81	31	25.5	Routine
5/30/2023	7:00	Low Tide	Clear	North	Light (0-5 mph)	81	42	25.6	Field Split
6/6/2023	7:00	High Tide	Cloudy	East	Moderate-Light (5-10 mph)	82	10	25.4	Routine
6/13/2023	7:00	Low Tide	Scattered Clouds	South	Moderate (10-15 mph)	84	99	28.5	Routine
6/27/2023	7:00	Low Tide Falling	Scattered Clouds	Southwest	Moderate-Light (5-10 mph)	86	10	29.8	Routine
7/5/2023	7:00	High Tide	Partly Cloudy	South	Moderate-Light (5-10 mph)	88	10	32.9	Field Duplicate
7/5/2023	7:00	High Tide	Partly Cloudy	South	Moderate-Light (5-10 mph)	88	20	33.6	Routine
7/11/2023	7:00	Low Tide Falling	Scattered Clouds	Southeast	Light (0-5 mph)	87	87	32.6	Routine
7/18/2023	7:00	High Tide Falling	Scattered Clouds	Southwest	Moderate-Light (5-10 mph)	87	164	34.2	Routine
7/25/2023	7:00	Low Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	88	42	35.0	Routine
8/1/2023	7:00	High Tide Falling	Clear	Northwest	Light (0-5 mph)	89	5	35.0	Routine
8/8/2023	7:00	High Tide	Scattered Clouds	Southwest	Moderate (10-15 mph)	89	87	35.0	Routine
8/15/2023	7:00	High Tide Falling	Scattered Clouds	West	Moderate-Light (5-10 mph)	89	288	35.0	Routine
8/22/2023	7:00	High Tide	Scattered Clouds	East	Moderate (10-15 mph)	88	111	35.0	Field Duplicate
8/22/2023	7:00	High Tide	Scattered Clouds	East	Moderate (10-15 mph)	88	53	35.0	Routine
8/29/2023	7:06	High Tide Falling	Clear	North	Moderate-Light (5-10 mph)	91	31	35.0	Routine
9/5/2023	6:39	High Tide	Scattered Clouds	South	Moderate-Light (5-10 mph)	89	31	34.7	Routine
9/12/2023	11:34	High Tide Falling	Scattered Clouds	North	Light (0-5 mph)	89	75	30.4	Routine
9/19/2023	7:00	High Tide Falling	Clear	Northeast	Moderate-Light (5-10 mph)	86	5	30.8	Routine
9/26/2023	7:00	High Tide Falling	Rain	South	Moderate-Light (5-10 mph)	84	31	29.9	Routine
10/3/2023	7:00	High Tide	Scattered Clouds	East	Moderate (10-15 mph)	84	1298	26.9	Routine
10/17/2023	7:17	Low Tide	Clear	North	Light (0-5 mph)	77	5	29.6	Routine
10/24/2023	7:20	Low Tide	Clear	East	Moderate (10-15 mph)	75	254	31.0	Routine
10/31/2023	7:22	Low Tide	Cloudy	North	Strong (20-35 mph)	78	5	25.8	Routine

Holly Beach*HOLLY1**Beach Name Holly Beach - 1*

4/4/2023	7:00	High Tide Falling	Cloudy	Southeast	Moderate-Strong (15-20 mph)	73	20	18.0	Routine
4/11/2023	6:30	Low Tide Falling	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	64	20	25.0	Routine
4/18/2023	7:00	Low Tide	Cloudy	Southeast	Moderate-Light (5-10 mph)	70	10	19.2	Routine
4/25/2023	7:00	High Tide	Cloudy	Northeast	Moderate (10-15 mph)	72	10	15.8	Routine

Beach*Station ID*

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Enterococci	Salinity	Sample Type
5/2/2023	7:00	Low Tide	Fog	Northwest	Light (0-5 mph)	72	20	28.3	Routine
5/9/2023	7:00	High Tide	Cloudy	South	Moderate-Light (5-10 mph)	76	20	22.8	Routine
5/15/2023	7:00	Low Tide	Partly Cloudy	Northeast	Light (0-5 mph)	76	42	13.2	Routine
5/23/2023	7:00	High Tide	Clear	North	Light (0-5 mph)	80	10	27.0	Routine
5/30/2023	7:00	Low Tide	Clear	North	Light (0-5 mph)	81	31	24.9	Routine
6/6/2023	7:00	High Tide	Cloudy	East	Moderate-Light (5-10 mph)	82	10	24.6	Routine
6/13/2023	7:00	Low Tide	Scattered Clouds	South	Moderate (10-15 mph)	84	75	28.3	Routine
6/27/2023	7:00	Low Tide Falling	Scattered Clouds	Southwest	Moderate-Light (5-10 mph)	86	178	30.8	Routine
7/5/2023	7:00	High Tide	Partly Cloudy	South	Moderate-Light (5-10 mph)	88	20	33.5	Routine
7/11/2023	7:00	Low Tide Falling	Scattered Clouds	Southeast	Light (0-5 mph)	87	10	33.8	Routine
7/18/2023	7:00	High Tide Falling	Scattered Clouds	Southwest	Moderate-Light (5-10 mph)	87	87	35.0	Routine
7/25/2023	7:00	Low Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	88	111	35.0	Routine
8/1/2023	7:00	High Tide Falling	Clear	Northwest	Light (0-5 mph)	89	10	35.0	Routine
8/8/2023	7:00	High Tide	Scattered Clouds	Southwest	Moderate (10-15 mph)	89	87	35.0	Routine
8/15/2023	7:00	High Tide Falling	Scattered Clouds	West	Moderate-Light (5-10 mph)	89	64	35.0	Routine
8/22/2023	7:00	High Tide	Scattered Clouds	East	Moderate (10-15 mph)	88	111	35.0	Routine
8/29/2023	7:06	High Tide Falling	Clear	North	Moderate-Light (5-10 mph)	91	31	33.8	Routine
9/5/2023	6:39	High Tide	Scattered Clouds	South	Moderate-Light (5-10 mph)	89	10	34.5	Routine
9/12/2023	11:34	High Tide Falling	Scattered Clouds	North	Light (0-5 mph)	89	99	30.6	Routine
9/19/2023	7:00	High Tide Falling	Clear	Northeast	Moderate-Light (5-10 mph)	86	2005	31.0	Routine
9/26/2023	7:00	High Tide Falling	Rain	South	Moderate-Light (5-10 mph)	84	5	30.5	Routine
10/3/2023	7:00	High Tide	Scattered Clouds	East	Moderate (10-15 mph)	84	137	26.6	Routine
10/17/2023	7:17	Low Tide	Clear	North	Light (0-5 mph)	77	5	29.8	Field Duplicate
10/17/2023	7:17	Low Tide	Clear	North	Light (0-5 mph)	77	10	29.9	Routine
10/24/2023	7:20	Low Tide	Clear	East	Moderate (10-15 mph)	75	31	31.2	Routine
10/31/2023	7:22	Low Tide	Cloudy	North	Strong (20-35 mph)	78	53	25.6	Routine

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

4/4/2023	7:00	High Tide Falling	Cloudy	Southeast	Moderate-Strong (15-20 mph)	73	53	18.1	Routine
4/11/2023	6:30	Low Tide Falling	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	64	53	25.2	Routine
4/18/2023	7:00	Low Tide	Cloudy	Southeast	Moderate-Light (5-10 mph)	70	10	19.2	Field Duplicate
4/18/2023	7:00	Low Tide	Cloudy	Southeast	Moderate-Light (5-10 mph)	70	10	19.2	Routine
4/25/2023	7:00	High Tide	Cloudy	Northeast	Moderate (10-15 mph)	72	20	15.8	Routine

Beach*Station ID*

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Enterococci	Salinity	Sample Type
5/2/2023	7:00	Low Tide	Fog	Northwest	Light (0-5 mph)	72	5	28.5	Routine
5/9/2023	7:00	High Tide	Cloudy	South	Moderate-Light (5-10 mph)	76	5	22.9	Routine
5/15/2023	7:00	Low Tide	Partly Cloudy	Northeast	Light (0-5 mph)	76	10	13.5	Routine
5/23/2023	7:00	High Tide	Clear	North	Light (0-5 mph)	80	10	27.0	Field Duplicate
5/23/2023	7:00	High Tide	Clear	North	Light (0-5 mph)	80	5	27.1	Routine
5/30/2023	7:00	Low Tide	Clear	North	Light (0-5 mph)	81	10	24.9	Routine
6/6/2023	7:00	High Tide	Cloudy	East	Moderate-Light (5-10 mph)	82	137	24.5	Routine
6/13/2023	7:00	Low Tide	Scattered Clouds	South	Moderate (10-15 mph)	84	20	28.6	Routine
6/27/2023	7:00	Low Tide Falling	Scattered Clouds	Southwest	Moderate-Light (5-10 mph)	86	31	31.1	Routine
7/5/2023	7:00	High Tide	Partly Cloudy	South	Moderate-Light (5-10 mph)	88	42	33.7	Routine
7/11/2023	7:00	Low Tide Falling	Scattered Clouds	Southeast	Light (0-5 mph)	87	31	33.9	Routine
7/18/2023	7:00	High Tide Falling	Scattered Clouds	Southwest	Moderate-Light (5-10 mph)	87	31	35.0	Routine
7/25/2023	7:00	Low Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	88	53	35.0	Routine
8/1/2023	7:00	High Tide Falling	Clear	Northwest	Light (0-5 mph)	89	10	35.0	Routine
8/8/2023	7:00	High Tide	Scattered Clouds	Southwest	Moderate (10-15 mph)	89	124	35.0	Routine
8/15/2023	7:00	High Tide Falling	Scattered Clouds	West	Moderate-Light (5-10 mph)	89	20	35.0	Routine
8/22/2023	7:00	High Tide	Scattered Clouds	East	Moderate (10-15 mph)	88	99	35.0	Routine
8/29/2023	7:06	High Tide Falling	Clear	North	Moderate-Light (5-10 mph)	91	10	33.5	Routine
9/5/2023	6:39	High Tide	Scattered Clouds	South	Moderate-Light (5-10 mph)	89	42	34.6	Routine
9/12/2023	11:34	High Tide Falling	Scattered Clouds	North	Light (0-5 mph)	89	42	30.8	Routine
9/19/2023	7:00	High Tide Falling	Clear	Northeast	Moderate-Light (5-10 mph)	86	624	31.1	Routine
9/19/2023	7:00	High Tide Falling	Clear	Northeast	Moderate-Light (5-10 mph)	86	504	30.9	Field Duplicate
9/26/2023	7:00	High Tide Falling	Rain	South	Moderate-Light (5-10 mph)	84	10	30.5	Routine
10/3/2023	7:00	High Tide	Scattered Clouds	East	Moderate (10-15 mph)	84	64	26.3	Routine
10/17/2023	7:17	Low Tide	Clear	North	Light (0-5 mph)	77	5	30.1	Routine
10/24/2023	7:20	Low Tide	Clear	East	Moderate (10-15 mph)	75	42	31.3	Routine
10/31/2023	7:22	Low Tide	Cloudy	North	Strong (20-35 mph)	78	5	24.7	Routine

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

4/4/2023	7:00	High Tide Falling	Cloudy	Southeast	Moderate-Strong (15-20 mph)	73	53	18.1	Routine
4/11/2023	6:30	Low Tide Falling	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	64	20	25.0	Routine
4/18/2023	7:00	Low Tide	Cloudy	Southeast	Moderate-Light (5-10 mph)	70	31	19.2	Routine
4/25/2023	7:00	High Tide	Cloudy	Northeast	Moderate (10-15 mph)	72	10	15.8	Routine

Beach*Station ID*

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Enterococci	Salinity	Sample Type
5/2/2023	7:00	Low Tide	Fog	Northwest	Light (0-5 mph)	72	31	28.5	Routine
5/9/2023	7:00	High Tide	Cloudy	South	Moderate-Light (5-10 mph)	76	10	22.8	Routine
5/15/2023	7:00	Low Tide	Partly Cloudy	Northeast	Light (0-5 mph)	76	5	13.3	Routine
5/23/2023	7:00	High Tide	Clear	North	Light (0-5 mph)	80	5	20.8	Routine
5/30/2023	7:00	Low Tide	Clear	North	Light (0-5 mph)	81	31	24.7	Routine
6/6/2023	7:00	High Tide	Cloudy	East	Moderate-Light (5-10 mph)	82	20	25.4	Routine
6/13/2023	7:00	Low Tide	Scattered Clouds	South	Moderate (10-15 mph)	84	31	28.5	Routine
6/27/2023	7:00	Low Tide Falling	Scattered Clouds	Southwest	Moderate-Light (5-10 mph)	86	5	30.7	Routine
7/5/2023	7:00	High Tide	Partly Cloudy	South	Moderate-Light (5-10 mph)	88	31	33.8	Routine
7/11/2023	7:00	Low Tide Falling	Scattered Clouds	Southeast	Light (0-5 mph)	87	42	33.8	Routine
7/18/2023	7:00	High Tide Falling	Scattered Clouds	Southwest	Moderate-Light (5-10 mph)	87	31	35.0	Routine
7/25/2023	7:00	Low Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	88	42	35.0	Routine
8/1/2023	7:00	High Tide Falling	Clear	Northwest	Light (0-5 mph)	89	10	35.0	Routine
8/8/2023	7:00	High Tide	Scattered Clouds	Southwest	Moderate (10-15 mph)	89	75	35.0	Routine
8/15/2023	7:00	High Tide Falling	Scattered Clouds	West	Moderate-Light (5-10 mph)	89	75	35.0	Routine
8/22/2023	7:00	High Tide	Scattered Clouds	East	Moderate (10-15 mph)	88	207	35.0	Routine
8/29/2023	7:06	High Tide Falling	Clear	North	Moderate-Light (5-10 mph)	91	20	33.4	Routine
9/5/2023	6:39	High Tide	Scattered Clouds	South	Moderate-Light (5-10 mph)	89	20	34.3	Routine
9/12/2023	11:34	High Tide Falling	Scattered Clouds	North	Light (0-5 mph)	89	42	30.6	Routine
9/19/2023	7:00	High Tide Falling	Clear	Northeast	Moderate-Light (5-10 mph)	86	453	30.8	Routine
9/26/2023	7:00	High Tide Falling	Rain	South	Moderate-Light (5-10 mph)	84	10	30.4	Field Duplicate
9/26/2023	7:00	High Tide Falling	Rain	South	Moderate-Light (5-10 mph)	84	10	30.5	Routine
10/3/2023	7:00	High Tide	Scattered Clouds	East	Moderate (10-15 mph)	84	31	26.2	Routine
10/17/2023	7:17	Low Tide	Clear	North	Light (0-5 mph)	77	5	30.2	Routine
10/24/2023	7:20	Low Tide	Clear	East	Moderate (10-15 mph)	75	10	31.3	Routine
10/31/2023	7:22	Low Tide	Cloudy	North	Strong (20-35 mph)	78	53	24.6	Routine

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

4/4/2023	7:00	High Tide Falling	Cloudy	Southeast	Moderate-Strong (15-20 mph)	73	20	18.0	Routine
4/11/2023	6:30	Low Tide Falling	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	64	10	24.7	Routine
4/18/2023	7:00	Low Tide	Cloudy	Southeast	Moderate-Light (5-10 mph)	70	20	19.3	Routine
4/25/2023	7:00	High Tide	Cloudy	Northeast	Moderate (10-15 mph)	72	10	15.6	Routine
5/2/2023	7:00	Low Tide	Fog	Northwest	Light (0-5 mph)	72	87	28.4	Routine

Beach*Station ID*

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Enterococci	Salinity	Sample Type
5/9/2023	7:00	High Tide	Cloudy	South	Moderate-Light (5-10 mph)	76	20	22.8	Routine
5/15/2023	7:00	Low Tide	Partly Cloudy	Northeast	Light (0-5 mph)	76	5	13.5	Routine
5/23/2023	7:00	High Tide	Clear	North	Light (0-5 mph)	80	53	27.0	Routine
5/30/2023	7:00	Low Tide	Clear	North	Light (0-5 mph)	81	42	24.8	Routine
6/6/2023	7:00	High Tide	Cloudy	East	Moderate-Light (5-10 mph)	82	5	24.4	Routine
6/13/2023	7:00	Low Tide	Scattered Clouds	South	Moderate (10-15 mph)	84	87	28.3	Routine
6/27/2023	7:00	Low Tide Falling	Scattered Clouds	Southwest	Moderate-Light (5-10 mph)	86	31	30.6	Routine
7/5/2023	7:00	High Tide	Partly Cloudy	South	Moderate-Light (5-10 mph)	88	10	34.0	Routine
7/11/2023	7:00	Low Tide Falling	Scattered Clouds	Southeast	Light (0-5 mph)	87	20	33.7	Routine
7/18/2023	7:00	High Tide Falling	Scattered Clouds	Southwest	Moderate-Light (5-10 mph)	87	42	35.0	Routine
7/25/2023	7:00	Low Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	88	10	35.0	Routine
8/1/2023	7:00	High Tide Falling	Clear	Northwest	Light (0-5 mph)	89	10	35.0	Routine
8/8/2023	7:00	High Tide	Scattered Clouds	Southwest	Moderate (10-15 mph)	89	137	35.0	Routine
8/15/2023	7:00	High Tide Falling	Scattered Clouds	West	Moderate-Light (5-10 mph)	89	20	35.0	Field Duplicate
8/15/2023	7:00	High Tide Falling	Scattered Clouds	West	Moderate-Light (5-10 mph)	89	42	35.0	Routine
8/22/2023	7:00	High Tide	Scattered Clouds	East	Moderate (10-15 mph)	88	87	35.0	Field Split
8/22/2023	7:00	High Tide	Scattered Clouds	East	Moderate (10-15 mph)	88	137	35.0	Routine
8/29/2023	7:06	High Tide Falling	Clear	North	Moderate-Light (5-10 mph)	91	10	33.4	Routine
9/5/2023	6:39	High Tide	Scattered Clouds	South	Moderate-Light (5-10 mph)	89	64	34.7	Routine
9/12/2023	11:34	High Tide Falling	Scattered Clouds	North	Light (0-5 mph)	89	20	30.4	Routine
9/19/2023	7:00	High Tide Falling	Clear	Northeast	Moderate-Light (5-10 mph)	86	1445	30.9	Routine
9/26/2023	7:00	High Tide Falling	Rain	South	Moderate-Light (5-10 mph)	84	10	30.5	Routine
10/3/2023	7:00	High Tide	Scattered Clouds	East	Moderate (10-15 mph)	84	64	26.4	Field Duplicate
10/3/2023	7:00	High Tide	Scattered Clouds	East	Moderate (10-15 mph)	84	42	26.3	Routine
10/17/2023	7:17	Low Tide	Clear	North	Light (0-5 mph)	77	5	30.1	Routine
10/24/2023	7:20	Low Tide	Clear	East	Moderate (10-15 mph)	75	20	31.0	Routine
10/31/2023	7:22	Low Tide	Cloudy	North	Strong (20-35 mph)	78	406	24.6	Routine

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

4/4/2023	7:00	High Tide Falling	Cloudy	Southeast	Moderate-Strong (15-20 mph)	73	53	18.0	Routine
4/11/2023	6:30	Low Tide Falling	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	64	31	24.8	Routine
4/18/2023	7:00	Low Tide	Cloudy	Southeast	Moderate-Light (5-10 mph)	70	10	19.3	Routine
4/25/2023	7:00	High Tide	Cloudy	Northeast	Moderate (10-15 mph)	72	10	15.6	Routine

Beach*Station ID*

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Enterococci	Salinity	Sample Type
5/2/2023	7:00	Low Tide	Fog	Northwest	Light (0-5 mph)	72	53	28.5	Routine
5/9/2023	7:00	High Tide	Cloudy	South	Moderate-Light (5-10 mph)	76	5	22.9	Routine
5/15/2023	7:00	Low Tide	Partly Cloudy	Northeast	Light (0-5 mph)	76	5	13.4	Routine
5/23/2023	7:00	High Tide	Clear	North	Light (0-5 mph)	80	31	27.2	Field Duplicate
5/23/2023	7:00	High Tide	Clear	North	Light (0-5 mph)	80	10	27.1	Routine
5/30/2023	7:00	Low Tide	Clear	North	Light (0-5 mph)	81	42	24.9	Routine
6/6/2023	7:00	High Tide	Cloudy	East	Moderate-Light (5-10 mph)	82	20	24.5	Routine
6/13/2023	7:00	Low Tide	Scattered Clouds	South	Moderate (10-15 mph)	84	42	28.3	Routine
6/27/2023	7:00	Low Tide Falling	Scattered Clouds	Southwest	Moderate-Light (5-10 mph)	86	31	30.8	Routine
6/27/2023	7:00	Low Tide Falling	Scattered Clouds	Southwest	Moderate-Light (5-10 mph)	86	31	30.9	Field Duplicate
7/5/2023	7:00	High Tide	Partly Cloudy	South	Moderate-Light (5-10 mph)	88	5	33.5	Routine
7/11/2023	7:00	Low Tide Falling	Scattered Clouds	Southeast	Light (0-5 mph)	87	20	33.8	Routine
7/18/2023	7:00	High Tide Falling	Scattered Clouds	Southwest	Moderate-Light (5-10 mph)	87	42	35.0	Routine
7/25/2023	7:00	Low Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	88	10	35.0	Routine
8/1/2023	7:00	High Tide Falling	Clear	Northwest	Light (0-5 mph)	89	5	35.0	Routine
8/8/2023	7:00	High Tide	Scattered Clouds	Southwest	Moderate (10-15 mph)	89	124	35.0	Routine
8/15/2023	7:00	High Tide Falling	Scattered Clouds	West	Moderate-Light (5-10 mph)	89	20	35.0	Routine
8/22/2023	7:00	High Tide	Scattered Clouds	East	Moderate (10-15 mph)	88	87	35.0	Routine
8/29/2023	7:06	High Tide Falling	Clear	North	Moderate-Light (5-10 mph)	91	20	34.0	Routine
9/5/2023	6:39	High Tide	Scattered Clouds	South	Moderate-Light (5-10 mph)	89	20	34.7	Field Duplicate
9/5/2023	6:39	High Tide	Scattered Clouds	South	Moderate-Light (5-10 mph)	89	20	34.7	Routine
9/12/2023	11:34	High Tide Falling	Scattered Clouds	North	Light (0-5 mph)	89	10	30.3	Routine
9/19/2023	7:00	High Tide Falling	Clear	Northeast	Moderate-Light (5-10 mph)	86	945	31.0	Routine
9/26/2023	7:00	High Tide Falling	Rain	South	Moderate-Light (5-10 mph)	84	5	30.4	Routine
10/3/2023	7:00	High Tide	Scattered Clouds	East	Moderate (10-15 mph)	84	20	26.6	Routine
10/17/2023	7:17	Low Tide	Clear	North	Light (0-5 mph)	77	20	30.0	Routine
10/24/2023	7:20	Low Tide	Clear	East	Moderate (10-15 mph)	75	10	31.1	Routine
10/31/2023	7:22	Low Tide	Cloudy	North	Strong (20-35 mph)	78	31	24.2	Routine

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

4/4/2023	7:00	High Tide Falling	Cloudy	Southeast	Moderate-Strong (15-20 mph)	73	10	18.1	Routine
4/11/2023	6:30	Low Tide Falling	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	64	20	25.0	Routine
4/18/2023	7:00	Low Tide	Cloudy	Southeast	Moderate-Light (5-10 mph)	70	20	19.4	Routine

Beach*Station ID*

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Enterococci	Salinity	Sample Type
4/25/2023	7:00	High Tide	Cloudy	Northeast	Moderate (10-15 mph)	72	5	15.8	Routine
5/2/2023	7:00	Low Tide	Fog	Northwest	Light (0-5 mph)	72	75	28.6	Routine
5/9/2023	7:00	High Tide	Cloudy	South	Moderate-Light (5-10 mph)	76	5	22.9	Routine
5/15/2023	7:00	Low Tide	Partly Cloudy	Northeast	Light (0-5 mph)	76	31	13.7	Routine
5/23/2023	7:00	High Tide	Clear	North	Light (0-5 mph)	80	10	26.9	Routine
5/30/2023	7:00	Low Tide	Clear	North	Light (0-5 mph)	81	5	25.0	Routine
6/6/2023	7:00	High Tide	Cloudy	East	Moderate-Light (5-10 mph)	82	591	24.6	Routine
6/13/2023	7:00	Low Tide	Scattered Clouds	South	Moderate (10-15 mph)	84	5	28.4	Routine
6/27/2023	7:00	Low Tide Falling	Scattered Clouds	Southwest	Moderate-Light (5-10 mph)	86	31	30.9	Routine
7/5/2023	7:00	High Tide	Partly Cloudy	South	Moderate-Light (5-10 mph)	88	20	33.7	Routine
7/11/2023	7:00	Low Tide Falling	Scattered Clouds	Southeast	Light (0-5 mph)	87	20	34.0	Routine
7/18/2023	7:00	High Tide Falling	Scattered Clouds	Southwest	Moderate-Light (5-10 mph)	87	31	35.0	Routine
7/25/2023	7:00	Low Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	88	5	35.0	Field Duplicate
7/25/2023	7:00	Low Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	88	5	35.0	Routine
8/1/2023	7:00	High Tide Falling	Clear	Northwest	Light (0-5 mph)	89	10	35.0	Routine
8/8/2023	7:00	High Tide	Scattered Clouds	Southwest	Moderate (10-15 mph)	89	164	35.0	Routine
8/15/2023	7:00	High Tide Falling	Scattered Clouds	West	Moderate-Light (5-10 mph)	89	99	35.0	Routine
8/22/2023	7:00	High Tide	Scattered Clouds	East	Moderate (10-15 mph)	88	111	35.0	Routine
8/29/2023	7:06	High Tide Falling	Clear	North	Moderate-Light (5-10 mph)	91	10	33.9	Routine
9/5/2023	6:39	High Tide	Scattered Clouds	South	Moderate-Light (5-10 mph)	89	20	34.8	Routine
9/12/2023	11:34	High Tide Falling	Scattered Clouds	North	Light (0-5 mph)	89	5	30.4	Routine
9/19/2023	7:00	High Tide Falling	Clear	Northeast	Moderate-Light (5-10 mph)	86	306	31.2	Routine
9/26/2023	7:00	High Tide Falling	Rain	South	Moderate-Light (5-10 mph)	84	10	30.5	Routine
10/3/2023	7:00	High Tide	Scattered Clouds	East	Moderate (10-15 mph)	84	53	26.4	Routine
10/17/2023	7:17	Low Tide	Clear	North	Light (0-5 mph)	77	5	30.0	Routine
10/24/2023	7:20	Low Tide	Clear	East	Moderate (10-15 mph)	75	10	31.5	Field Split
10/24/2023	7:20	Low Tide	Clear	East	Moderate (10-15 mph)	75	5	31.3	Routine
10/31/2023	7:22	Low Tide	Cloudy	North	Strong (20-35 mph)	78	150	24.2	Routine

Little Florida*LTFLI**Beach Name Little Florida*

4/4/2023	7:00	High Tide Falling	Cloudy	Southeast	Moderate-Strong (15-20 mph)	73	10	19.7	Routine
4/11/2023	6:30	Low Tide Falling	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	64	10	24.0	Routine
4/18/2023	7:00	Low Tide	Cloudy	Southeast	Moderate-Light (5-10 mph)	70	5	22.4	Routine

Beach*Station ID*

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Enterococci	Salinity	Sample Type
4/25/2023	7:00	High Tide	Cloudy	Northeast	Moderate (10-15 mph)	72	10	14.9	Routine
5/2/2023	7:00	Low Tide	Fog	Northwest	Light (0-5 mph)	72	20	27.9	Routine
5/9/2023	7:00	High Tide	Cloudy	South	Moderate-Light (5-10 mph)	76	20	24.3	Routine
5/15/2023	7:00	Low Tide	Partly Cloudy	Northeast	Light (0-5 mph)	76	1652	13.1	Routine
5/23/2023	7:00	High Tide	Clear	North	Light (0-5 mph)	82	99	27.0	Routine
5/30/2023	7:00	Low Tide	Clear	North	Light (0-5 mph)	81	64	26.0	Routine
6/6/2023	7:00	High Tide	Cloudy	East	Moderate-Light (5-10 mph)	82	31	25.4	Routine
6/13/2023	7:00	Low Tide	Scattered Clouds	South	Moderate (10-15 mph)	84	31	28.7	Routine
6/27/2023	7:00	Low Tide Falling	Scattered Clouds	Southwest	Moderate-Light (5-10 mph)	86	178	30.0	Routine
7/5/2023	7:00	High Tide	Partly Cloudy	South	Moderate-Light (5-10 mph)	88	42	33.3	Routine
7/11/2023	7:00	Low Tide Falling	Scattered Clouds	Southeast	Light (0-5 mph)	87	31	32.8	Routine
7/18/2023	7:00	High Tide Falling	Scattered Clouds	Southwest	Moderate-Light (5-10 mph)	87	20	34.8	Routine
7/25/2023	7:00	Low Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	88	111	35.0	Field Duplicate
7/25/2023	7:00	Low Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	88	137	35.0	Routine
8/1/2023	7:00	High Tide Falling	Clear	Northwest	Light (0-5 mph)	89	5	35.0	Routine
8/8/2023	7:00	High Tide	Scattered Clouds	Southwest	Moderate (10-15 mph)	89	64	35.0	Routine
8/15/2023	7:00	High Tide Falling	Scattered Clouds	West	Moderate-Light (5-10 mph)	89	10	35.0	Routine
8/22/2023	7:00	High Tide	Scattered Clouds	East	Moderate (10-15 mph)	88	192	35.0	Routine
8/29/2023	7:06	High Tide Falling	Clear	North	Moderate-Light (5-10 mph)	91	5	35.0	Routine
9/5/2023	6:39	High Tide	Scattered Clouds	South	Moderate-Light (5-10 mph)	89	10	34.6	Routine
9/12/2023	11:34	High Tide Falling	Scattered Clouds	North	Light (0-5 mph)	89	150	30.5	Routine
9/19/2023	7:00	High Tide Falling	Clear	Northeast	Moderate-Light (5-10 mph)	86	150	31.0	Routine
9/26/2023	7:00	High Tide Falling	Rain	South	Moderate-Light (5-10 mph)	84	5	30.7	Routine
10/3/2023	7:00	High Tide	Scattered Clouds	East	Moderate (10-15 mph)	84	75	26.8	Routine
10/17/2023	7:17	Low Tide	Clear	North	Light (0-5 mph)	77	20	29.6	Routine
10/24/2023	7:20	Low Tide	Clear	East	Moderate (10-15 mph)	75	10	31.2	Routine
10/31/2023	7:22	Low Tide	Cloudy	North	Strong (20-35 mph)	78	5	26.6	Routine

Long Beach*DUNGI**Beach Name Long Beach*

4/4/2023	7:00	High Tide Falling	Cloudy	Southeast	Moderate-Strong (15-20 mph)	73	53	18.2	Routine
4/11/2023	6:30	Low Tide Falling	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	64	99	23.7	Routine
4/18/2023	7:00	Low Tide	Cloudy	Southeast	Moderate-Light (5-10 mph)	70	5	21.8	Routine
4/25/2023	7:00	High Tide	Cloudy	Northeast	Moderate (10-15 mph)	72	42	14.4	Routine

Beach*Station ID*

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Enterococci	Salinity	Sample Type
5/2/2023	7:00	Low Tide	Fog	Northwest	Light (0-5 mph)	72	10	27.7	Routine
5/9/2023	7:00	High Tide	Cloudy	South	Moderate-Light (5-10 mph)	76	2005	24.2	Routine
5/15/2023	7:00	Low Tide	Partly Cloudy	Northeast	Light (0-5 mph)	76	5	12.9	Routine
5/23/2023	7:00	High Tide	Clear	North	Light (0-5 mph)	82	364	26.3	Routine
5/30/2023	7:00	Low Tide	Clear	North	Light (0-5 mph)	81	42	25.9	Routine
6/6/2023	7:00	High Tide	Cloudy	East	Moderate-Light (5-10 mph)	82	87	25.7	Routine
6/13/2023	7:00	Low Tide	Scattered Clouds	South	Moderate (10-15 mph)	84	111	28.2	Routine
6/27/2023	7:00	Low Tide Falling	Scattered Clouds	Southwest	Moderate-Light (5-10 mph)	86	42	29.5	Routine
7/5/2023	7:00	High Tide	Partly Cloudy	South	Moderate-Light (5-10 mph)	88	254	33.8	Routine
7/11/2023	7:00	Low Tide Falling	Scattered Clouds	Southeast	Light (0-5 mph)	87	42	32.6	Routine
7/18/2023	7:00	High Tide Falling	Scattered Clouds	Southwest	Moderate-Light (5-10 mph)	87	64	34.6	Routine
7/25/2023	7:00	Low Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	88	20	35.0	Routine
8/1/2023	7:00	High Tide Falling	Clear	Northwest	Light (0-5 mph)	89	20	35.0	Routine
8/1/2023	7:00	High Tide Falling	Clear	Northwest	Light (0-5 mph)	89	5	35.0	Field Duplicate
8/8/2023	7:00	High Tide	Scattered Clouds	Southwest	Moderate (10-15 mph)	89	31	35.0	Routine
8/15/2023	7:00	High Tide Falling	Scattered Clouds	West	Moderate-Light (5-10 mph)	89	384	35.0	Routine
8/22/2023	7:00	High Tide	Scattered Clouds	East	Moderate (10-15 mph)	88	164	35.0	Routine
8/29/2023	7:06	High Tide Falling	Clear	North	Moderate-Light (5-10 mph)	91	99	35.0	Routine
9/5/2023	6:39	High Tide	Scattered Clouds	South	Moderate-Light (5-10 mph)	89	20	34.8	Routine
9/12/2023	11:34	High Tide Falling	Scattered Clouds	North	Light (0-5 mph)	89	271	30.4	Routine
9/19/2023	7:00	High Tide Falling	Clear	Northeast	Moderate-Light (5-10 mph)	86	10	30.7	Routine
9/26/2023	7:00	High Tide Falling	Rain	South	Moderate-Light (5-10 mph)	84	31	30.4	Routine
10/3/2023	7:00	High Tide	Scattered Clouds	East	Moderate (10-15 mph)	84	1013	27.2	Routine
10/17/2023	7:17	Low Tide	Clear	North	Light (0-5 mph)	77	5	29.6	Routine
10/17/2023	7:17	Low Tide	Clear	North	Light (0-5 mph)	77	5	29.7	Field Split
10/24/2023	7:20	Low Tide	Clear	East	Moderate (10-15 mph)	75	31	30.7	Routine
10/31/2023	7:22	Low Tide	Cloudy	North	Strong (20-35 mph)	78	20	27.5	Routine

Martin Beach*MARTI**Beach Name Martin Beach*

4/4/2023	7:00	High Tide Falling	Cloudy	Southeast	Moderate-Strong (15-20 mph)	73	5	18.5	Routine
4/11/2023	6:30	Low Tide Falling	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	64	31	23.3	Routine
4/18/2023	7:00	Low Tide	Cloudy	Southeast	Moderate-Light (5-10 mph)	70	20	22.4	Routine
4/25/2023	7:00	High Tide	Cloudy	Northeast	Moderate (10-15 mph)	72	31	14.4	Field Split

Beach*Station ID*

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Enterococci	Salinity	Sample Type
4/25/2023	7:00	High Tide	Cloudy	Northeast	Moderate (10-15 mph)	72	20	14.4	Routine
5/2/2023	7:00	Low Tide	Fog	Northwest	Light (0-5 mph)	72	5	27.5	Routine
5/15/2023	7:00	Low Tide	Partly Cloudy	Northeast	Light (0-5 mph)	76	53	13.2	Routine
5/23/2023	7:00	High Tide	Clear	North	Light (0-5 mph)	82	238	27.1	Routine
5/30/2023	7:00	Low Tide	Clear	North	Light (0-5 mph)	81	42	26.1	Routine
6/6/2023	7:00	High Tide	Cloudy	East	Moderate-Light (5-10 mph)	82	31	26.1	Routine
6/13/2023	7:00	Low Tide	Scattered Clouds	South	Moderate (10-15 mph)	84	42	28.0	Routine
6/27/2023	7:00	Low Tide Falling	Scattered Clouds	Southwest	Moderate-Light (5-10 mph)	86	124	30.1	Routine
7/5/2023	7:00	High Tide	Partly Cloudy	South	Moderate-Light (5-10 mph)	88	99	32.6	Routine
7/11/2023	7:00	Low Tide Falling	Scattered Clouds	Southeast	Light (0-5 mph)	87	42	31.9	Routine
7/18/2023	7:00	High Tide Falling	Scattered Clouds	Southwest	Moderate-Light (5-10 mph)	87	53	35.0	Routine
7/25/2023	7:00	Low Tide Falling	Scattered Clouds	Southwest	Light (0-5 mph)	88	20	35.0	Routine
8/1/2023	7:00	High Tide Falling	Clear	Northwest	Light (0-5 mph)	89	20	35.0	Routine
8/8/2023	7:00	High Tide	Scattered Clouds	Southwest	Moderate (10-15 mph)	89	20	35.0	Routine
8/15/2023	7:00	High Tide Falling	Scattered Clouds	West	Moderate-Light (5-10 mph)	89	31	35.0	Routine
8/22/2023	7:00	High Tide	Scattered Clouds	East	Moderate (10-15 mph)	88	99	35.0	Routine
8/29/2023	7:06	High Tide Falling	Clear	North	Moderate-Light (5-10 mph)	91	5	35.0	Routine
9/5/2023	6:39	High Tide	Scattered Clouds	South	Moderate-Light (5-10 mph)	89	10	35.0	Routine
9/12/2023	11:34	High Tide Falling	Scattered Clouds	North	Light (0-5 mph)	89	5	30.4	Routine
9/19/2023	7:00	High Tide Falling	Clear	Northeast	Moderate-Light (5-10 mph)	86	42	30.9	Routine
9/26/2023	7:00	High Tide Falling	Rain	South	Moderate-Light (5-10 mph)	84	5	30.4	Routine
10/3/2023	7:00	High Tide	Scattered Clouds	East	Moderate (10-15 mph)	84	150	27.4	Routine
10/17/2023	7:17	Low Tide	Clear	North	Light (0-5 mph)	77	10	29.7	Routine
10/24/2023	7:20	Low Tide	Clear	East	Moderate (10-15 mph)	75	31	30.5	Routine
10/31/2023	7:22	Low Tide	Cloudy	North	Strong (20-35 mph)	78	10	26.1	Routine

North Beach*LCNBI**Beach Name North Beach*

4/4/2023	7:14	High Tide Falling	Cloudy	South	Moderate (10-15 mph)	71	150	3.6	Routine
4/11/2023	7:10	Low Tide	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	63	238	1.7	Routine
4/11/2023	7:10	Low Tide	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	63	306	1.6	Field Duplicate
4/18/2023	7:10	High Tide Falling	Partly Cloudy	East	Light (0-5 mph)	67	99	22.5	Routine
4/25/2023	7:10	Low Tide Falling	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	66	42	2.3	Routine
4/25/2023	7:10	Low Tide Falling	Partly Cloudy	Northeast	Moderate-Light (5-10 mph)	66	53	2.3	Field Split

Beach*Station ID*

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Enterococci	Salinity	Sample Type
5/2/2023	7:10	Normal	Clear	North-Northwest	Light (0-5 mph)	68	5	1.7	Routine
5/9/2023	7:05	Low Tide Falling	Cloudy	East-Northeast	Light (0-5 mph)	72	31	2.7	Routine
5/15/2023	7:06	Low Tide Falling	Fog	East-Northeast	Light (0-5 mph)	75	64	1.1	Routine
5/23/2023	7:06	Low Tide	Clear	Northeast	Light (0-5 mph)	76	5	1.9	Routine
5/30/2023	7:04	Normal	Clear	North-Northeast	Light (0-5 mph)	78	87	6.8	Routine
6/6/2023	7:10	Low Tide Falling	Clear	East-Northeast	Light (0-5 mph)	77	10	9.1	Routine
6/13/2023	7:05	Normal	Clear	South-Southeast	Light (0-5 mph)	81	478	7.2	Routine
6/21/2023	7:05	Low Tide	Clear	North	Moderate-Light (5-10 mph)	84	5	8.5	Routine
6/27/2023	7:05	Low Tide Falling	Clear	West	Light (0-5 mph)	84	20	0.6	Routine
7/5/2023	7:10	Low Tide	Clear	North	Light (0-5 mph)	84	42	8.2	Routine
7/11/2023	7:06	Normal	Clear	Southwest	Moderate-Light (5-10 mph)	83	53	5.1	Routine
7/18/2023	7:05	Low Tide Falling	Clear	Southwest	Moderate-Light (5-10 mph)	85	10	5.6	Routine
7/25/2023	7:10	Low Tide	Clear	North-Northeast	Light (0-5 mph)	85	42	6.6	Routine
8/1/2023	7:10	Low Tide Falling	Clear	Northwest	Light (0-5 mph)	85	5	11.9	Routine
8/8/2023	7:05	Low Tide Falling	Clear	South-Southwest	Moderate-Light (5-10 mph)	85	20	11.0	Routine
8/15/2023	7:05	Low Tide Falling	Clear	West-Southwest	Moderate-Light (5-10 mph)	89	10	11.7	Routine
8/22/2023	7:05	Normal	Cloudy	East-Northeast	Moderate-Light (5-10 mph)	83	53	15.1	Field Duplicate
8/22/2023	7:05	Normal	Cloudy	East-Northeast	Moderate-Light (5-10 mph)	83	64	14.9	Routine
8/29/2023	7:06	High Tide	Clear	North-Northwest	Moderate-Light (5-10 mph)	81	150	16.9	Routine
9/5/2023	7:05	Normal	Partly Cloudy	East-Northeast	Light (0-5 mph)	84	178	18.6	Routine
9/12/2023	7:10	Normal	Partly Cloudy	South-Southwest	Light (0-5 mph)	79	5	19.6	Routine
9/19/2023	7:00	High Tide Rising	Clear	Calm	Light (0-5 mph)	79	99	19.3	Routine
9/26/2023	7:06	High Tide Rising	Cloudy	North	Calm (0 mph)	79	87	20.7	Routine
10/3/2023	7:01	High Tide Rising	Partly Cloudy	East-Northeast	Moderate-Light (5-10 mph)	77	288	22.8	Routine
10/10/2023	7:05	High Tide	Clear	North	Calm (0 mph)	72	31	20.3	Routine
10/17/2023	7:07	Normal	Clear	North-Northwest	Moderate-Light (5-10 mph)	65	10	21.0	Routine
10/24/2023	7:02	Normal	Cloudy	East	Moderate-Light (5-10 mph)	72	2005	19.6	Routine
10/31/2023	7:05	Low Tide Falling	Partly Cloudy	North	Moderate (10-15 mph)	65	20	21.8	Routine

Rutherford Beach*RUTH1**Beach Name Rutherford Beach*

4/4/2023	6:57	Low Tide	Undetermined	South	Moderate-Strong (15-20 mph)	79	64	17.2	Routine
4/11/2023	7:02	High Tide	Scattered Clouds	North	Light (0-5 mph)	67	207	21.0	Routine
4/11/2023	7:02	High Tide	Scattered Clouds	North	Light (0-5 mph)	67	87	21.3	Field Split

Beach*Station ID*

Date	Time	Tide	Weather	Wind Direction	Wind Speed	Water Temp	Enterococci	Salinity	Sample Type
4/18/2023	4:18	Low Tide	Cloudy	East-Northeast	Moderate (10-15 mph)	68	10	22.5	Routine
4/25/2023	6:51	High Tide	Partly Cloudy	East	Light (0-5 mph)	67	75	13.9	Routine
5/2/2023	7:06	Extremely Low Tide	Clear	Calm	Calm (0 mph)	72	31	27.0	Routine
5/9/2023	6:59	High Tide	Undetermined	East-Northeast	Moderate-Light (5-10 mph)	79	164	16.6	Field Split
5/9/2023	6:59	High Tide	Undetermined	East-Northeast	Moderate-Light (5-10 mph)	79	150	16.6	Routine
5/15/2023	6:50	Low Tide	Fog	Northeast	Light (0-5 mph)	80	10	9.1	Field Duplicate
5/15/2023	6:50	Low Tide	Fog	Northeast	Light (0-5 mph)	80	42	9.1	Routine
5/23/2023	6:59	Low Tide	Mist	North	Light (0-5 mph)	77	364	29.3	Routine
5/30/2023	6:58	Low Tide	Scattered Clouds	Northeast	Light (0-5 mph)	80	53	23.2	Routine
5/30/2023	6:58	Low Tide	Scattered Clouds	Northeast	Light (0-5 mph)	80	31	23.3	Field Split
6/6/2023	6:59	High Tide	Partly Cloudy	Northeast	Light (0-5 mph)	79	306	23.3	Field Duplicate
6/6/2023	6:59	High Tide	Partly Cloudy	Northeast	Light (0-5 mph)	79	207	23.2	Routine
6/13/2023	6:58	Low Tide	Partly Cloudy	South-Southwest	Moderate (10-15 mph)	81	87	27.8	Routine
6/21/2023	6:51	High Tide	Clear	South	Moderate-Strong (15-20 mph)	84	64	30.6	Routine
6/27/2023	6:56	Normal	Scattered Clouds	South-Southwest	Moderate-Light (5-10 mph)	84	64	31.2	Routine
7/5/2023	6:51	High Tide	Scattered Clouds	South	Moderate-Light (5-10 mph)	88	31	31.5	Routine
7/11/2023	7:00	Low Tide	Partly Cloudy	South	Moderate-Strong (15-20 mph)	87	10	33.7	Routine
7/18/2023	6:44	High Tide Falling	Scattered Clouds	South-Southwest	Moderate-Light (5-10 mph)	84	64	34.4	Field Duplicate
7/18/2023	6:44	High Tide Falling	Scattered Clouds	South-Southwest	Moderate-Light (5-10 mph)	84	124	34.5	Routine
7/25/2023	6:53	Low Tide Falling	Clear	East	Light (0-5 mph)	89	10	35.0	Routine
8/1/2023	6:53	Low Tide	Scattered Clouds	North	Light (0-5 mph)	86	42	34.5	Routine
8/8/2023	7:09	High Tide	Clear	South	Strong (20-35 mph)	90	75	35.0	Routine
8/15/2023	6:51	Low Tide	Scattered Clouds	West-Southwest	Light (0-5 mph)	88	42	17.2	Routine
8/22/2023	6:57	High Tide	Scattered Clouds	East-Northeast	Moderate-Light (5-10 mph)	87	164	35.0	Routine
8/29/2023	6:55	Normal	Scattered Clouds	North-Northeast	Light (0-5 mph)	82	5	32.7	Routine
9/5/2023	6:55	High Tide	Partly Cloudy	South	Moderate-Strong (15-20 mph)	87	178	30.9	Routine
9/12/2023	6:49	Low Tide	Scattered Clouds	North	Light (0-5 mph)	80	271	29.9	Routine
9/19/2023	6:56	Low Tide	Clear	North	Light (0-5 mph)	78	453	30.4	Field Duplicate
9/19/2023	6:56	Low Tide	Clear	North	Light (0-5 mph)	78	429	30.3	Routine
9/26/2023	6:52	Low Tide	Cloudy	North	Light (0-5 mph)	89	1091	25.2	Routine
10/3/2023	6:54	High Tide	Cloudy	East-Northeast	Moderate-Light (5-10 mph)	80	254	23.8	Routine
10/10/2023	6:54	Low Tide	Partly Cloudy	North	Light (0-5 mph)	70	137	28.7	Routine
10/17/2023	6:55	Low Tide	Clear	North	Light (0-5 mph)	63	5	30.2	Routine
10/24/2023	6:58	Low Tide Falling	Clear	East	Light (0-5 mph)	78	288	31.3	Routine
10/31/2023	7:04	Extremely Low Tide	Cloudy	North	Moderate-Strong (15-20 mph)	62	42	26.5	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 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	<p>Identification of factors used to evaluate and rank beaches are provided in Chapter 2 of the <i>Louisiana's BEACH Grant Final Report, Grant Year 2001</i> (the "Initial BEACH Report"; LDHH, 2003). More specifically:</p> <ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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 data set 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, and signs posted at each station are changed to indicate that an advisory is in effect.
	8. Notification report submission and delegation	<ul style="list-style-type: none"> • 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.