

2021 Beach Monitoring Program Sampling and Advisory Data

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Table of Contents

Introduction	1
Functions of the Program	1
Sampling.....	1
Advisories.....	1
Risk Communication	3
<i>Enterococci</i> Data	4
References	6

List of Figures

Figure 1: Number of long-term advisories and temporary advisories issued since 2014.	2
Figure 2: SCDHEC Beach Monitoring webpage visits in comparison to Check My Beach unique visitors during the beach monitoring season from May 1 st to October 1 st	4
Figure 3: Number of <i>Enterococcus</i> samples collected over the past ten (10) years for South Carolina’s Beach Monitoring Program that either met or exceeded the advisory criteria of >104 cfu/100mL.....	5
Figure 4: Percent of <i>Enterococcus</i> samples collected over the past ten (10) years for South Carolina’s Beach Monitoring Program that either met or exceeded the advisory criteria of >104 cfu/100mL.....	5

List of Appendices

Appendix 1: Stations	i
Appendix 2: Decision Flow Chart – Unposted Tier 1 and Tier 2 Beaches	iv
Appendix 3: Advisory Communication with Signs and the SC Beach Monitoring Website	v
Figure 5: Temporary advisory sign.....	v
Figure 6: Long-term advisory sign.....	v
Figure 7: SCDHEC Beach Monitoring Website Advisory Table.	vi
Figure 8: South Carolina Beach Access Guide.....	vi
Appendix 4: Advisory Communication with an example press release.....	vii

Introduction

Coastal pollution has been a growing concern in the United States, especially due to growing health concerns from water contamination and fecal pollution. Sources of coastal pollution include stormwater runoff, agricultural runoff, septic system malfunctions, and sewage overflows. Many states, including South Carolina, have developed monitoring programs to notify and reduce the risk of gastrointestinal illness and disease to people while swimming at the coast. South Carolina Department of Health and Environmental Control (SCDHEC) monitors over 160 miles of coastal beach to protect its residents and the 20 million visitors to South Carolina's coast each year (S.C. Sea Grant, 2019). There are three (3) main coastal regions for South Carolina, which include the Grand Strand (Horry and Georgetown counties), the Tri-County area (Charleston county), and the Lowcountry (Colleton, Beaufort, and Jasper counties).

SCDHEC began its Beach Monitoring Program over 20 years ago when the Beaches Environmental Assessment and Coastal Health (BEACH) Act was established in 2000. SCDHEC monitors the water quality along South Carolina's coastal beaches by measuring bacteria levels, specifically *Enterococcus*, and has developed multiple ways to notify the public when water quality levels are unsafe for recreating, such as swimming. The purpose of this report is to provide the U.S. Environmental Protection Agency (EPA) Region IV with updated information concerning South Carolina's Beach Monitoring Program. This report covers activities that have taken place in 2021.

Functions of the Program

The goal of South Carolina's Beach Monitoring Program is to allow the public to make informed decisions concerning recreating in waters presenting a potential for adverse health effects. To carry out this goal, the South Carolina Department of Health and Environmental Control (SCDHEC) regularly monitors ocean water quality and issues swimming advisories as necessary.

Sampling

The sampling for this grant was done at 122 stations along the ocean facing coast of South Carolina from May 1 to October 1 (Appendix 1). Each station was sampled weekly or twice per month, depending on the tier designation of the beach, for *Enterococci*. All Tier I stations are located in Horry and Georgetown Counties and most have stormwater outfalls to the ocean. Some of these stations have permanent signs warning beach goers about the hazards of exposure to storm water. These Tier I stations are sampled weekly during the dates above. The Tier II stations are located from Garden City south to Hilton Head Island; they have no stormwater outfalls and have had few advisories over the years. These Tier II stations are monitored twice per month during the above dates. Tier III stations are considered those beaches that are not easily accessible, such as requiring boats to access, and are only sampled when funding is available. There were not any Tier III beaches sampled in 2021.

At beaches where temporary advisories are issued, if a sample comes back greater than 104 cfu/100mL a resample is done the following day and continued each successive day until the sample is below 104 cfu/100mL.

Advisories

SCDHEC issues two (2) different types of advisories based on current and past *Enterococci* data: long-term precautionary advisories and temporary exceedance advisories. A long-term advisory is issued for

monitoring locations where more than 10% of the *Enterococcus* data collected over the past five (5) years exceeds the recreational use standard for *Enterococcus* (>104 cfu/100mL). Long term advisories are reevaluated each year, and there were sixteen (16) long term advisories in 2021. Signs are posted in these areas year-round, and these advisories can also be found on the South Carolina Beach Access website (<https://gis.dhec.sc.gov/beachaccess/>). Criteria for long-term advisories was adjusted in 2015, so the amount of long-term advisories has decreased over the years. As a result, temporary advisories have increased since the criteria changes made in 2015 (Figure 1).

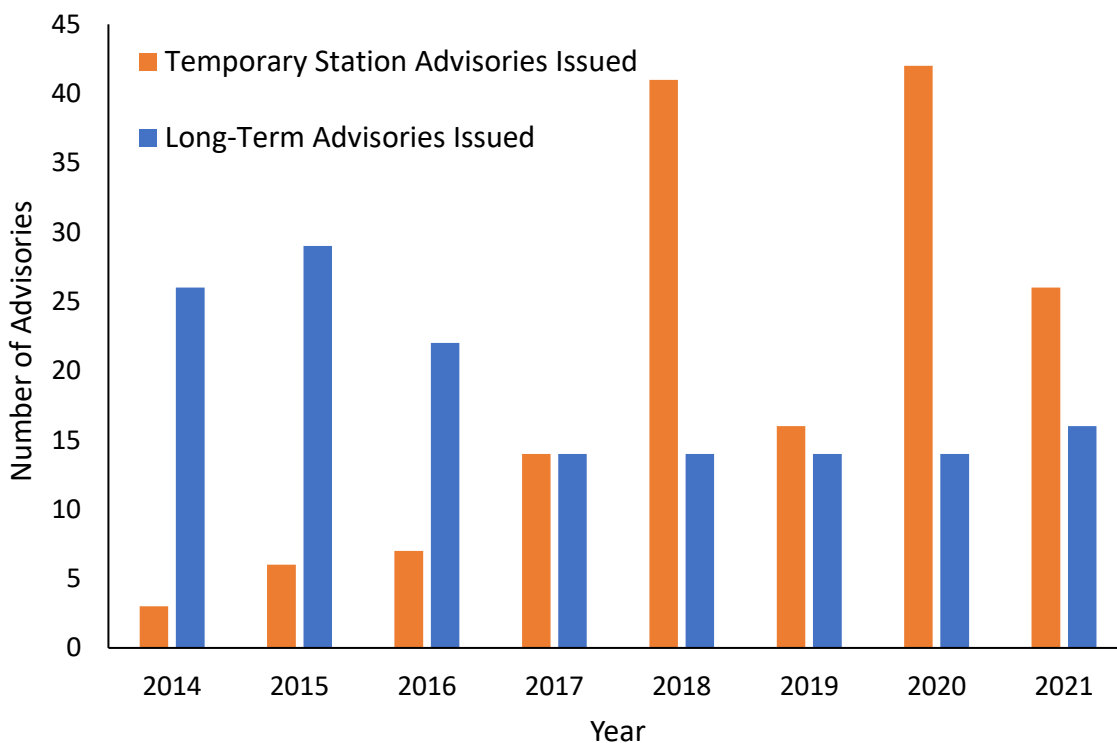


Figure 1: Number of long-term advisories and temporary advisories issued since 2014. Criteria for long-term advisories was adjusted in 2015, which resulted in decreasing long-term advisories and increases in temporary advisories.

A temporary advisory is issued at routine monitoring locations based off SCDHEC’s decision making process (Appendix 2) where long term advisories are not present. When a routine sample exceeds 104 cfu/100mL, a resample is collected within 24 hours. If the repeat sample also exceeds 104 cfu/100mL, an advisory is issued. If there is a potential source of bacteria nearby, such as a stormwater drain, a temporary advisory may be issued with the first sample collected. Also, if any single routine sample exceeds 500 cfu/100mL, a temporary advisory is immediately issued. All temporary advisories are continuously resampled until a sample comes back below 104 cfu/100mL. Repeat samples are not collected and temporary water quality advisories are not posted where long-term advisories already exist.

Any temporary advisories issued are promptly forwarded by the region’s Beach Monitoring Program Manager to each coastal Environmental Affairs Bureau of Environmental Health Services Regional Office, Central Office personnel, and local government officials, as discussed in the “Overall Notification and Risk Communication Plan” in the South Carolina Beach Monitoring Program QAPP. Signs are placed on the

beach 200ft on either side of the sampling station where the advisory occurred (Appendix 3). Beach advisories are also posted on SCDHEC's Beach Monitoring website (<https://scdhec.gov/beachmonitoring>) and South Carolina's Beach Access Guide (<https://gis.dhec.sc.gov/beachaccess/>) (Appendix 3). Media outlets (i.e., newspapers, local television, and radio stations, etc.) are contacted via press release (Appendix 4) for beaches not participating in the Check My Beach Program (see Risk Communication section for further information). Temporary advisories are lifted upon confirmation of sample results below the action level of 104 cfu/100mL.

There were 26 temporary station advisories issued in 2021 due to elevated bacteria levels, which is a 38% decrease in station advisories that were issued in 2020. The two (2) longest station advisories were at WAC-033 in Surfside Beach (lasted three days) and WAC-008 in North Myrtle Beach (lasted two days). The other 24 station advisories lasted for one day. The decrease in temporary advisories in 2021 is most likely attributed to South Carolina receiving fifteen (15) inches of precipitation less than it did in 2020 (NOAA, 2021). A strong positive correlation (Pearson Correlation Test ran in Microsoft Excel with a correlation of 0.88) has been observed between statewide precipitation totals and temporary advisories since 2017.

Risk Communication

When an advisory is issued for a beach, water contact activities in that area may pose a risk to public health. Thus, SCDHEC must disseminate the information to a population that consists of local governments, tourists, and residents. SCDHEC has recognized the importance of providing efficient and effective water quality communication to South Carolina's beachgoers. As a result, SCDHEC has worked with local partners to provide the necessary educational tools for people to learn about SCDHEC's Beach Monitoring Program and to also improve advisory communication. This collaboration led to developing the Check My Beach Program, which involved creating and promoting a website called CheckMyBeach.com. This website provides educational information about water quality, beach safety, local guidance, and links to SCDHEC's Beach Monitoring website to easily look up any current advisories while at the beach. A pilot study was conducted in 2019 on the potential effectiveness of the Check My Beach Program, which involved posting signs and handing out brochures about CheckMyBeach.com at a small area in Myrtle Beach. The web traffic data from the pilot study showed that on average 30% of the daily views for SCDHEC's Beach Monitoring Program came from CheckMyBeach.com. This was a large impact for such a small area, so plans for the Check My Beach Program moved forward and is now being implemented in phases across different areas in South Carolina.

In 2020, the Check My Beach Program was promoted for Tier I beaches, which involved local presentations, an online video about the program, more than 450 signs posted along beach access points, online referrals, and social media posts. A survey was also provided with the local presentations and the online video in order to receive public feedback about the Check My Beach Program. The survey responses were overall very positive, and a majority of people planned to use the website. The web traffic data in 2020 also showed promising results during the beach season despite the COVID-19 pandemic. In 2020, Checkmybeach.com had 16,318 unique visitors from May 1 to October 1, and 77% of views were from mobile devices. In 2021, Checkmybeach.com had 21,707 unique visitors (+5,389 from 2020) from May 1 to October 1, and 89% were mobile users (+12% from 2020). This data suggests that the program's goal of targeting people at the beach was being accomplished. Also, in 2020 and 2021 47% of people that visited Checkmybeach.com proceeded onto the SCDHEC Beach Monitoring website from May 1 to October 1. There was a consistent data pattern when comparing Checkmybeach.com unique visits to the

SCDHEC Beach Monitoring website page visits (Figure 2), and the web traffic data also showed that 63% of the SCDHEC Beach Monitoring webpage views were directed from Checkmybeach.com. This data and the web traffic trends in Figure 2 display that Checkmybeach.com was fulfilling the program’s goal of directing people to the SCDHEC Beach Monitoring website where they could easily look up advisories.

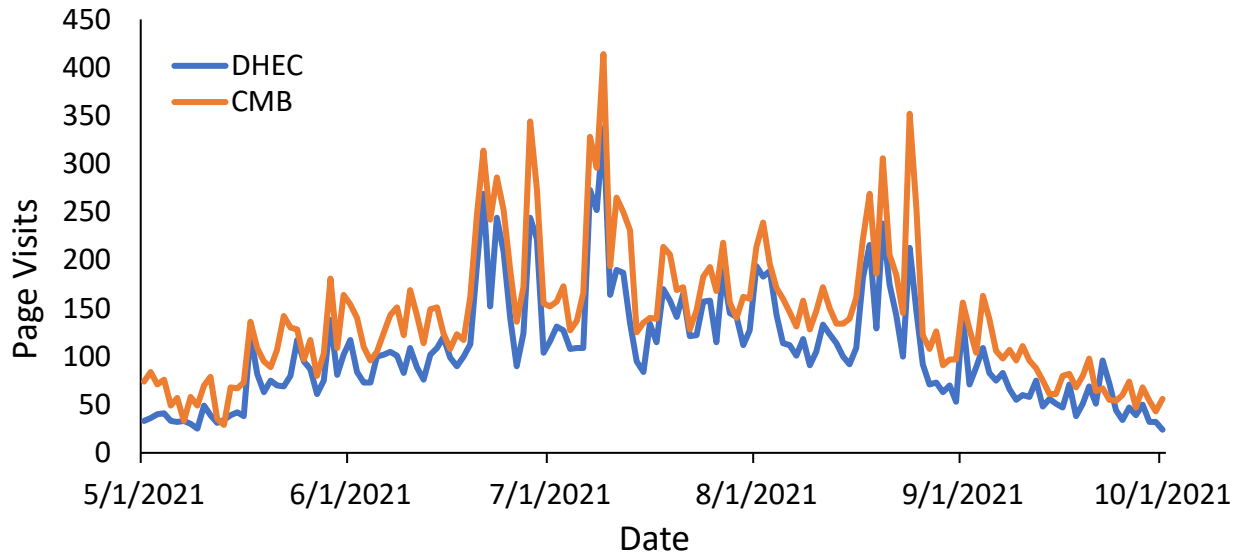


Figure 2: SCDHEC Beach Monitoring webpage visits in comparison to Check My Beach unique visitors during the beach monitoring season from May 1st to October 1st.

Enterococci Data

In 2021 there were a total of 2,981 samples collected, of those 240 samples exceeded 104 cfu/100mL (Figure 3). The sample exceedances in 2021 decreased by 85 sample exceedances in comparison to 2020. Over the past ten (10) years, samples exceeded 104 cfu/100 mL on average 8% of the time (Figure 4). Years with higher rainfall, such as 2018 and 2020, typically result in a higher number of exceedances.

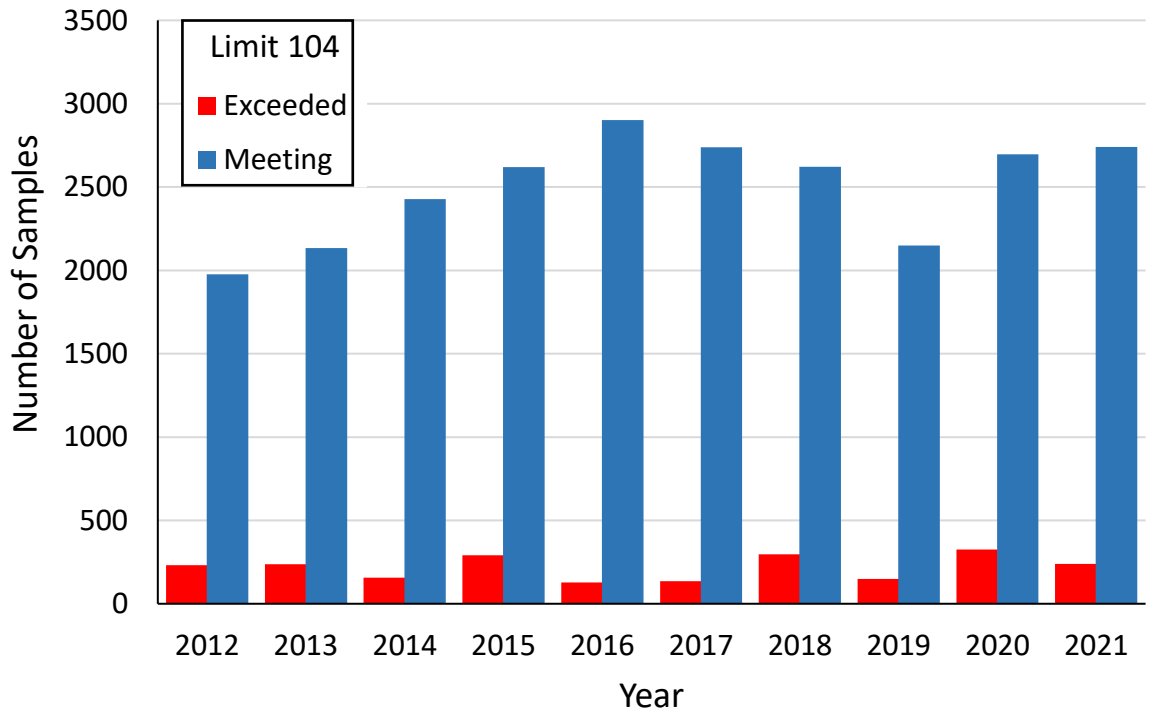


Figure 3: Number of *Enterococcus* samples collected over the past ten (10) years for South Carolina’s Beach Monitoring Program that either met or exceeded the advisory criteria of >104 cfu/100mL. Higher exceedances typically occur in years with heavy rainfall, such as 2018 and 2020.

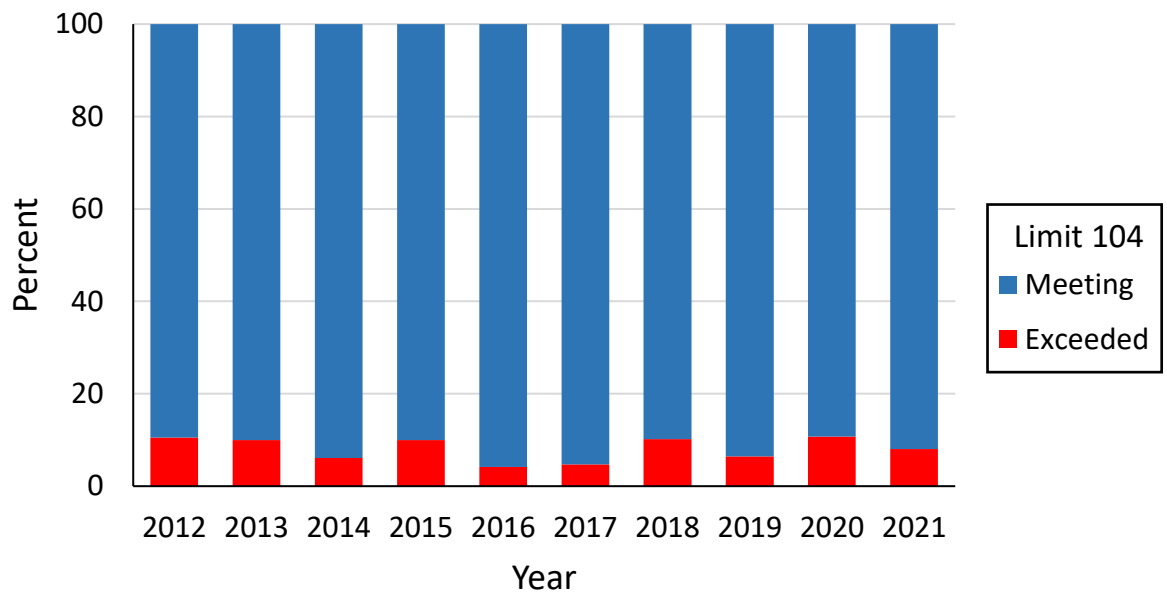


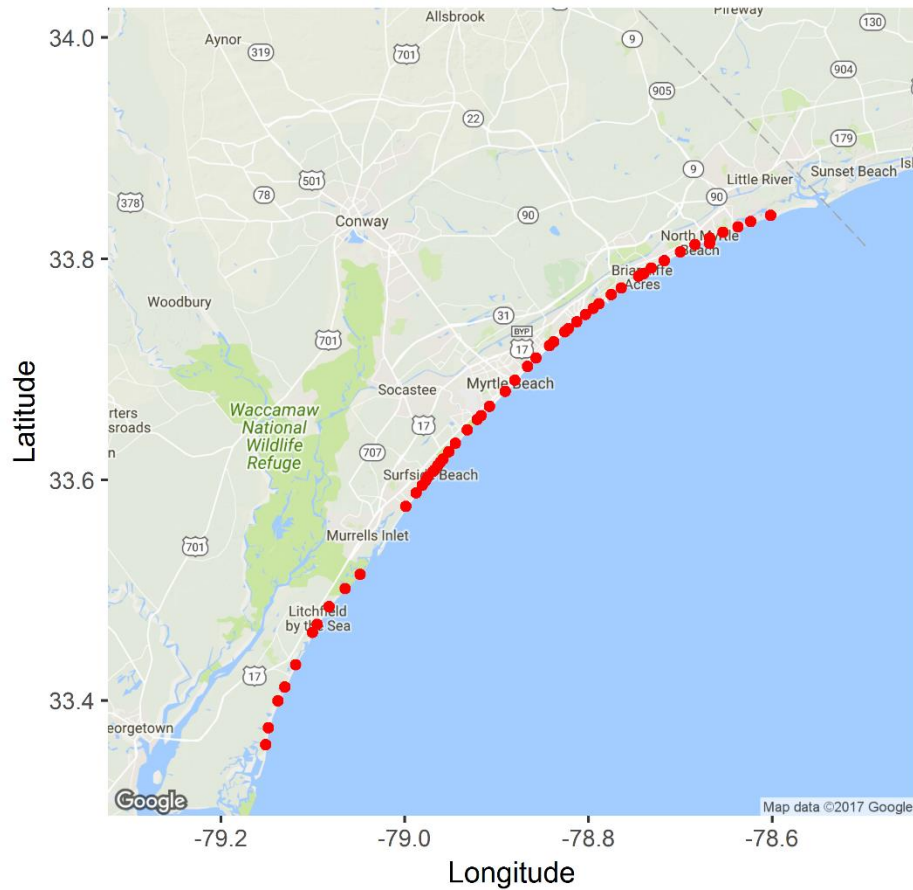
Figure 4: Percent of *Enterococcus* samples collected over the past ten (10) years for South Carolina’s Beach Monitoring Program that either met or exceeded the advisory criteria of >104 cfu/100mL. Over the past ten (10) years, samples exceed 104 cfu/100mL on average 8% of the time.

References

- NOAA. (2021, November). *National Centers for Environmental Information, Climate at a Glance: Statewide Time Series*. Retrieved November 29, 2021, from <https://www.ncdc.noaa.gov/cag/>
- S.C. Sea Grant. (2019, September 26). *About Coastal South Carolina*. Retrieved from S.C. Sea Grant Consortium: <https://www.scseagrant.org/south-carolina-coast/>

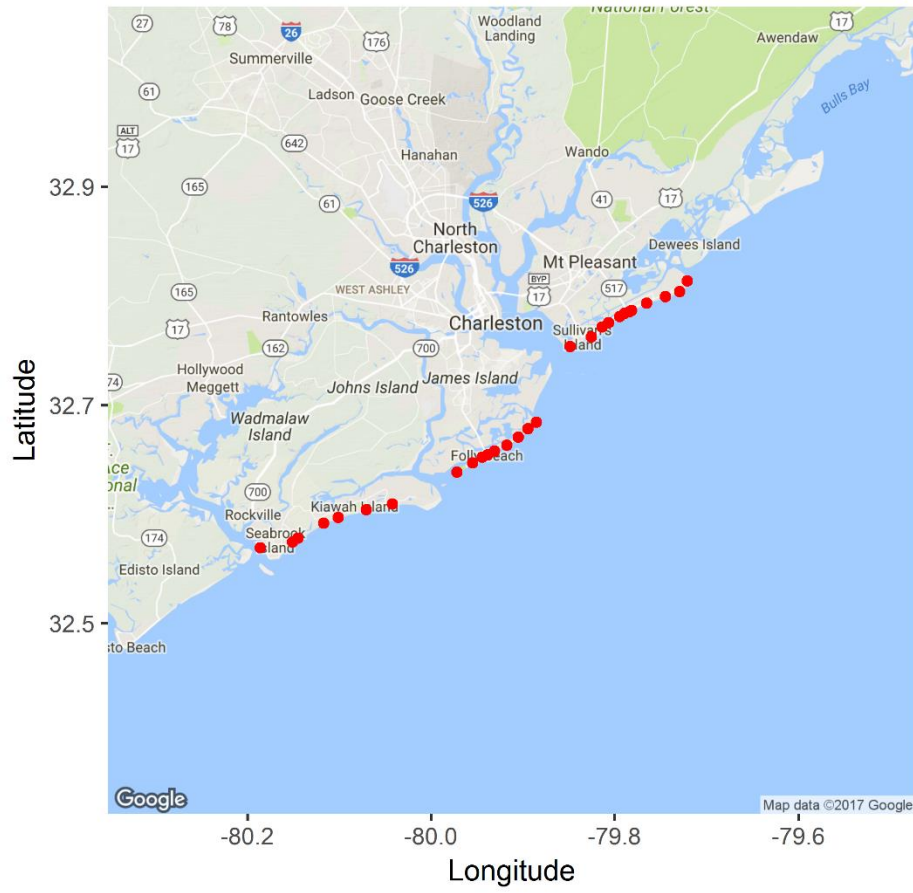
Appendix 1: Stations

Waccamaw Beach Monitoring Locations



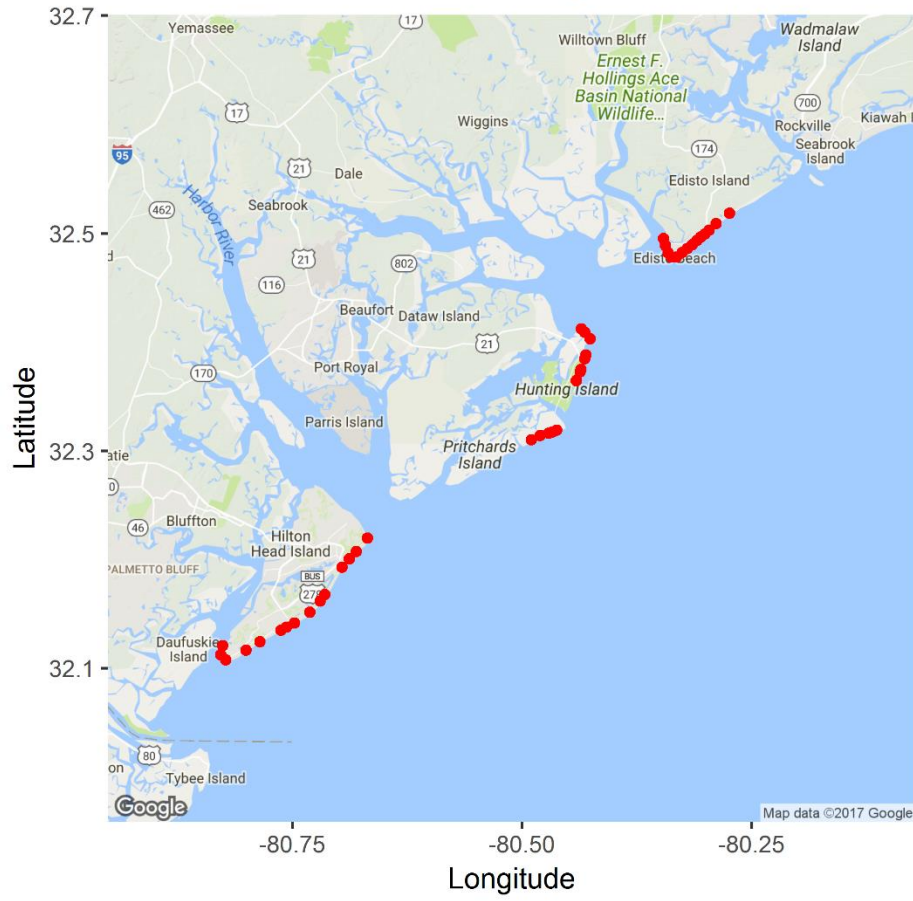
Stations					
WAC-001	WAC-009A	WAC-017	WAC-026	WAC-035	WAC-046
WAC-002	WAC-010	WAC-017A	WAC-027	WAC-036	WAC-047
WAC-003	WAC-011	WAC-018	WAC-028	WAC-037	WAC-048
WAC-004	WAC-012	WAC-019	WAC-029	WAC-039	
WAC-005	WAC-013	WAC-020	WAC-029A	WAC-040	
WAC-005A	WAC-014	WAC-021	WAC-030	WAC-041	
WAC-006	WAC-015	WAC-022A	WAC-031	WAC-042	
WAC-007	WAC-015A	WAC-023	WAC-031A	WAC-043A	
WAC-008	WAC-016	WAC-024	WAC-033	WAC-044A	
WAC-009	WAC-016A	WAC-025A	WAC-034	WAC-045A	

Trident Beach Monitoring Locations



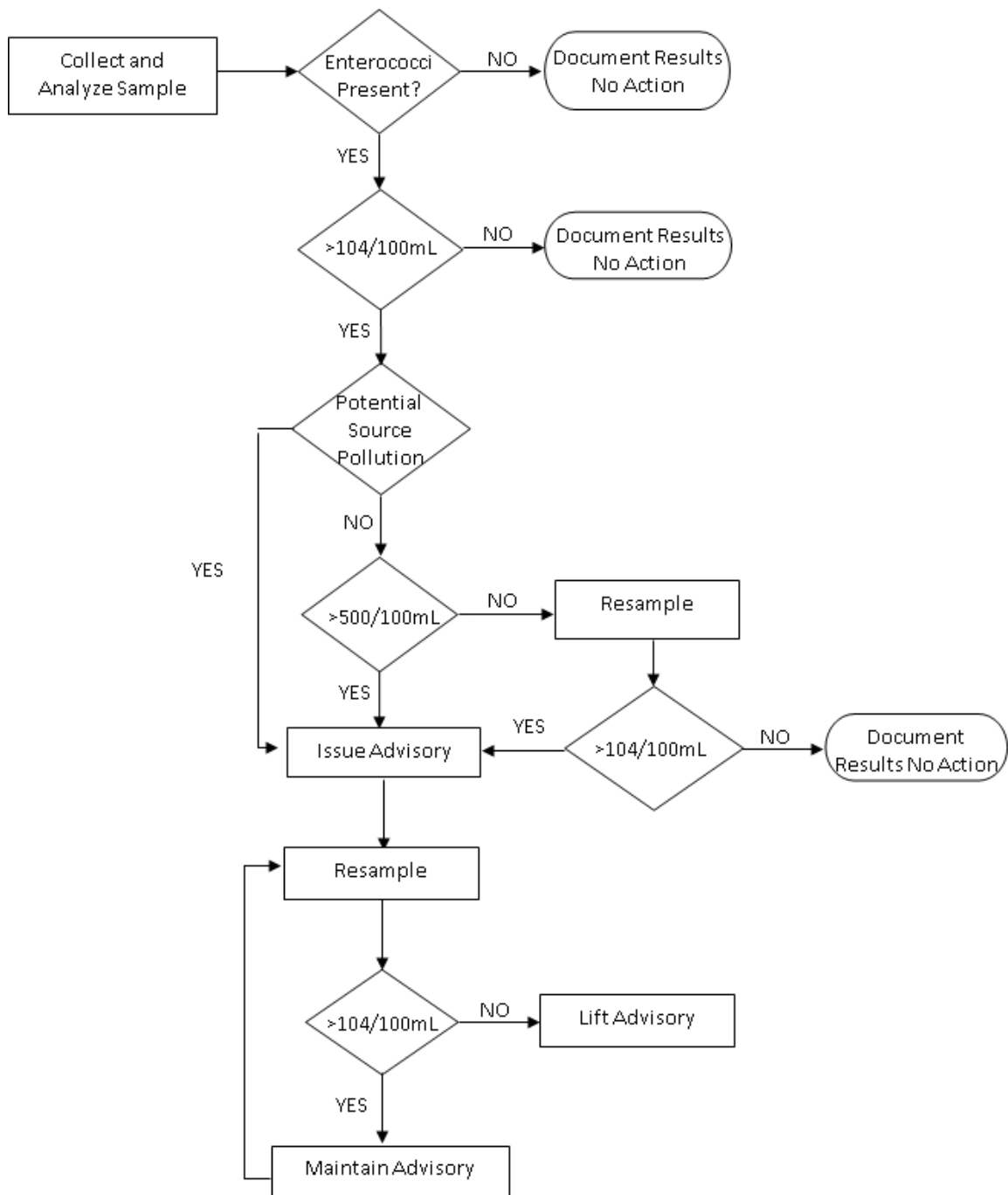
Stations		
TRI-050	TRI-058	TRI-068
TRI-051	TRI-059	TRI-069
TRI-052	TRI-060A	TRI-070
TRI-053	TRI-061	TRI-071
TRI-054	TRI-062	TRI-072
TRI-054B	TRI-063A	TRI-073
TRI-054C	TRI-064	TRI-074
TRI-055	TRI-065	
TRI-056	TRI-066	
TRI-057	TRI-067	

Low Country Beach Monitoring Locations



Stations				
LC-075	LC-080	LC-090	LC-100	LC-110
LC-076	LC-080A	LC-091	LC-101	LC-111
LC-077	LC-081	LC-092	LC-102	
LC-077A	LC-082	LC-093	LC-103	
LC-077A2	LC-084	LC-094	LC-104	
LC-077B	LC-085	LC-095	LC-104A	
LC-078	LC-085A	LC-096	LC-106	
LC-078B	LC-086	LC-098	LC-107	
LC-079	LC-087	LC-098A	LC-108	
LC-079A	LC-088	LC-099	LC-109	

Appendix 2: Decision Flow Chart – Unposted Tier 1 and Tier 2 Beaches



Appendix 3: Advisory Communication with Signs and the SC Beach Monitoring Website



Figure 5: Temporary advisory sign.



Figure 6: Long-term advisory sign.

← → ↻ 🏠 scdhec.gov/environment/pollution-types-advisories-monitoring/pollution-services-advisorie/beach-monitoring

☰ Full Menu Environment Health Vital Records Maps & Apps 🔍 🌐

How many beach water locations are monitored in the state? +

What time of year and how often does DHEC sample beaches? +

Beach Monitoring Advisories

Advisory	Beach	Location
Temporary Swimming Advisory	North Myrtle Beach	30th Ave N

*If two consecutive samples from a monitoring station come back as greater than 104 colonies forming units (cfu)/100 milliliter (mL) of enterococcus bacteria, a temporary advisory is issued. If there is a potential source of bacteria nearby, such as a swash or stormwater drainage pipe, a temporary advisory may be issued with the first sample greater than 104 cfu/100mL. If any single sample exceeds 500 cfu/100mL, a temporary advisory is issued immediately.

Figure 7: SCDHEC Beach Monitoring Website Advisory Table.

S.C. Beach Guide Quick Navigation Choose

The Dye Club at Barefoot Resort, Grand Strand Airport, Azalea Sands Golf Club, Barefoot Resort Bridge Rd, Poinsett St, 27th Ave S, N Kings Hwy, Madison Dr, Edge Dr, Hillside Dr S, Havens Dr, Holly Dr, 32nd Ave S, Atlantic Beach, N Gate Rd, Barefoot Landing, Seaside St.

Legend Click Description for Details

- No Active Swimming Advisory
- Long-term Swimming Advisory
- Temporary Swimming Advisory

dhec

Figure 8: South Carolina Beach Access Guide.

Appendix 4: Advisory Communication with an example press release

*Please note that orange words would need to be changed based on site and regional office:

DHEC issues temporary swimming advisory for 33rd Avenue South in North Myrtle Beach

For Immediate Release

[Date]

COLUMBIA, S.C. – A section of beach along South Carolina's coast has been placed under a short-term swimming advisory, the Department of Health and Environmental Control (DHEC) reports today.

The advisory is for water at the public access point at **33rd Avenue South in North Myrtle Beach**. This swimming advisory is not a beach closing, nor does this advisory affect the entire beach.

Bacteria levels that are above state and federal standards have been detected in this area of water, and swimming is not advised in the area until bacteria levels return to normal.

It's safe to wade, collect shells and fish within this swimming advisory area. However, it's advised that people entering the water in this area refrain from swallowing it, and that people with open wounds or compromised immune systems avoid contact with the water.

DHEC tests water quality along the oceanfront in accordance with federal and state laws. The water is tested for enterococci bacteria, which are naturally found in warm-blooded animals, including humans. However, high levels of enterococci bacteria in water indicates the potential risk for other organisms that may cause disease in humans, such as gastrointestinal illness or skin infections.

This advisory only affects the area noted above. Short-term swimming advisories typically last just a few days and are lifted once follow-up water sampling shows bacteria levels have returned to normal.

DHEC routinely collects water samples at more than 120 locations along South Carolina's beaches to monitor bacteria levels. Please visit [scdhec.gov/Beach Monitoring](https://scdhec.gov/Beach%20Monitoring) for more information and to view recent water sampling results along the coast.

For more information, call your local DHEC office:

- Myrtle Beach [843-238-4378](tel:843-238-4378)
- Charleston [843-953-0150](tel:843-953-0150)
- Beaufort [843-846-1030](tel:843-846-1030)