

South Carolina Department of Environmental Services

**OFFICE OF LAW ENFORCEMENT**

# **SHELLFISH MANAGEMENT AREA 08**

---

## **2024 ANNUAL UPDATE COMPREHENSIVE REPORT**

**Shellfish Sanitation Program  
Office of Law Enforcement  
2600 Bull Street  
Columbia, SC 29201**



SC DEPARTMENT of  
**ENVIRONMENTAL  
SERVICES**

**September 2024**

# SHELLFISH MANAGEMENT AREA 08 2024 ANNUAL UPDATE COMPREHENSIVE REPORT

[Data Through December 2023]



SC DEPARTMENT *of*  
**ENVIRONMENTAL  
SERVICES**

**Prepared By:**

Ryan Reed, Regional Shellfish Program Manager  
Office of Law Enforcement  
1362 McMillan Avenue, Suite 300  
Charleston, South Carolina 29405

**Reviewer:**

Mike Marshall, State Shellfish Program Manager  
Office of Law Enforcement  
927 Shine Avenue  
Myrtle Beach, South Carolina 29577



**TABLE OF CONTENTS**  
**Shellfish Management Area 08 Annual Update**

Summary .....2  
Introduction.....2  
Pollution Source Survey .....6  
Survey Procedures.....6  
Point Source Pollution .....7  
    A. Municipal and Community Waste Treatment Facilities .....7  
    B. Industrial Waste.....8  
    C. Marinas.....9  
    D. Radionuclides .....9  
Nonpoint Source Pollution.....9  
    A. Urban and Suburban Stormwater Runoff.....9  
    B. Agricultural Runoff.....10  
    C. Individual Sewage Treatment and Disposal Systems .....10  
    D. Wildlife and Domestic Animals.....10  
    E. Boat Traffic .....11  
    F. Hydrographic and Habitat Modification .....11  
Naturally Occurring Pathogens.....11  
    A. Marine Biotoxins.....11  
    B. *Vibrio Management Plan* .....12  
Hydrographic and Meteorological Characteristics .....12  
Water Quality Studies .....13  
Conclusions.....14  
Recommendations.....14  
References.....16

**Figures and Tables**

**Figures:**

(1) Shellfish Growing Area 08.....17

**Tables:**

(1) Shellfish Water Quality Sampling Stations Description .....18  
(2) Fecal Coliform Bacteriological Data Summary Sheet  
    *(January 01, 2021 - December 31, 2023)* .....19  
(3) Fecal Coliform Historical Trend Sheet .....20  
(4) Water Quality Sampling Station Data .....21  
(5) Rainfall Data *(January 01, 2021 - December 31, 2023)*.....22  
(6) Precautionary & Pollution Event Closures.....26  
(7) Marina Inventory.....27

**2024 ANNUAL UPDATE**  
**Shellfish Management Area 08**

**Data Inclusive Dates:**  
01/01/21 thru 12/31/23

**Classification Change:**  
 X  Yes        No

**Shoreline Survey Completed:** Yes

**(I)increased/(D)ecreased/(N)one:**

**Prior Report & Date:** 2023 Annual Update

I  Approved  
 N  Conditionally Approved  
 D  Restricted  
 N  Prohibited

**SUMMARY**

During this annual review period of Shellfish Management Area 08 (SFMA 08) there will be one classification change recommended at Station 08-17 (Copahee Sound at Porchers Bluff Creek). Bacteriological water quality data at this station now indicate that it be classified as Approved for the upcoming 2024-2025 shellfish harvesting season. Stations 08-04 (Bull Yard Sound, AIWW Marker #104), 08-19 (Toomer Creek at Copahee Sound), and 08-27 (Northern Hamlin Sound) will no longer be boundary stations for the upcoming shellfish harvesting season and will be classified as Approved.

The AIWW, from the SFMA 09A boundary to marker 116 (Station 08-10) and the southern portion of Morgan Creek, from its confluence with the AIWW to its confluence with Cedar Creek will continue to remain as a Prohibited area.

Development continues to occur at a rapid pace along the upland shore of SFMA 08 and the potential for adverse impacts from nonpoint source pollution continues. The multiple ocean inlets in SFMA 08 provide excellent tidal flushing and likely mitigate much of the nonpoint source stormwater runoff. On December 18<sup>th</sup>, 2023, SFMA 08 received 7.68 inches of rain in a 24-hour period due to a Nor'easter storm event. Due to this storm event, SFMA 08 was closed for several weeks until water quality samples were within Approved standards

**INTRODUCTION**

**PURPOSE AND SCOPE**

The authority to regulate the harvest, sanitation, processing, and handling of shellfish is granted to the South Carolina Department of Environmental Services by Section 44-1-140 of the Code of Laws of South Carolina, 1976, as amended. The Department promulgated Regulation 61-47 that provides the rules used to implement this authority and outlines the requirements applied in regulating shellfish sanitation in the State. This regulation specifically addresses classification of

shellfish harvesting areas and requires that all areas be examined by sanitary and bacteriological surveys and classified into an appropriate shellfish harvesting classification.

The United States Food and Drug Administration (USFDA) uses The National Shellfish Sanitation Program's (NSSP) *Guide for the Control of Molluscan Shellfish* to evaluate state shellfish sanitation programs. The NSSP Model Ordinance requires that a sanitary survey be in place for each growing area prior to its use as a source of shellfish for human consumption and prior to the area's classification as Approved, Conditionally Approved, Restricted, or Conditionally Restricted. Each sanitary survey shall be updated on an annual basis and accurately reflect changes which have occurred within the area. Requirement of the annual reevaluation include, at a minimum, field observations of pollution sources, an analysis of water quality data consisting of the past year's data in combination with appropriate previously collected data, review of reports and effluent samples from pollution sources, and review of performance standards for discharges impacting the growing area. A brief report documenting the findings shall also be provided.

The following criteria consistent with the NSSP Model Ordinance and S.C. Regulation 61-47 are used in establishing shellfish harvesting classifications:

**Approved Area** - Growing areas shall be classified approved when the sanitary survey concludes that fecal material, pathogenic microorganisms, and poisonous or deleterious substances are not present in concentrations that would render shellfish unsafe for human consumption. Approved classifications shall be determined upon a sanitary survey that includes water samples collected from stations in the designated area adjacent to actual or potential sources of pollution. For waters sampled under adverse pollution conditions, the median fecal coliform Most Probable Number (MPN) or the geometric mean MPN shall not exceed fourteen per one hundred milliliters, nor shall more than ten percent of the samples exceed a fecal coliform MPN of forty-three per one hundred milliliters (per five tube decimal dilution). For waters sampled under a systematic random sampling plan, the geometric mean fecal coliform MPN shall not exceed fourteen per one hundred milliliters, nor shall the estimated ninetieth percentile exceed an MPN of forty three per one hundred milliliters (per five tube decimal dilution). Computation of the estimated ninetieth percentile shall be determined using the National Shellfish Sanitation Program Guide for the Control of Molluscan Shellfish methodology.

**Conditionally Approved Area** - Growing areas may be classified conditionally approved when they are subject to temporary conditions of actual or potential pollution. When such events are predictable, as in non-point source pollution from rainfall runoff or discharge of a major river, a management plan describing conditions under which harvesting will be allowed shall be adopted by the Department prior to classifying an area as conditionally approved. Where appropriate, the management plan for each conditionally approved area shall include performance standards for sources of controllable pollution (e.g., wastewater treatment and collection systems), evaluation of each source of pollution, and means of rapidly closing and subsequently reopening areas to shellfish harvesting. Memorandums of agreements shall be a part of these management plans where appropriate. Shellfish shall not be directly marketed from a conditionally approved area until conditions for an approved classification have been met for a period of time likely to ensure the shellfish are safe for consumption. Shellstock

from conditionally approved areas that have been subjected to temporary conditions of actual or potential pollution may be relayed to approved areas for purification or depurated through controlled purification operations only by special permit issued by the Department.

**Restricted Area** - Growing areas shall be classified restricted when sanitary survey data show a moderate degree of pollution or the presence of deleterious or poisonous substances to a degree that may cause the water quality to fluctuate unpredictably or at such a frequency that a conditionally approved classification is not feasible. Shellfish may be harvested from areas classified as restricted only for the purposes of relaying or depuration and only by special permit issued by the Department and under Department supervision. The suitability of restricted areas for harvesting of shellstock for relay or depuration purposes may be determined through the use of comparison studies of background tissue samples with post-process tissue samples, as well as other process verification techniques deemed appropriate by the Department. For restricted areas to be utilized as a source of shellstock for depuration, or as source water for depuration, the fecal coliform geometric mean MPN of restricted waters sampled under adverse pollution conditions shall not exceed eighty-eight per one hundred milliliters nor shall more than ten percent of the samples exceed a MPN of two hundred and sixty per one hundred milliliters for a five tube decimal dilution test. For waters sampled under a systematic random sampling plan, the fecal coliform geometric mean MPN shall not exceed eighty-eight per one hundred milliliters nor shall the estimated ninetieth percentile exceed an MPN of two hundred and sixty (five tube decimal dilution). Computation of the estimated ninetieth percentile shall be obtained using the National Shellfish Sanitation Program Guide for the Control of Molluscan Shellfish methodology.

**Conditionally Restricted Area** - Growing areas may be classified conditionally restricted when they are subject to temporary conditions of actual or potential pollution. When such events are predictable, as in the malfunction of wastewater treatment facilities, non-point source pollution from rainfall runoff, discharge of a major river or potential discharges from dock or harbor facilities that may affect water quality, a management plan describing conditions under which harvesting will be allowed shall be prepared by the Department prior to classifying an area as conditionally restricted. Where appropriate, the management plan for each conditionally restricted area shall include performance standards for sources of controllable pollution, e.g., wastewater treatment and collection systems and an evaluation of each source of pollution, and description of the means of rapidly closing and subsequent reopening areas to shellfish harvesting. Memorandums of agreements shall be a part of these management plans where appropriate. Shellfish may be harvested from areas classified as conditionally restricted only for the purposes of relaying or depuration and only by permit issued by the Department and under Department supervision. For conditionally restricted areas to be utilized as a source of shellstock for depuration, the fecal coliform geometric mean MPN of conditionally restricted waters sampled under adverse pollution conditions shall not exceed eighty-eight per one hundred milliliters nor shall more than ten percent of the samples exceed a MPN of two hundred and sixty per one hundred milliliters for a five tube decimal dilution test. For waters sampled under a systematic random sampling plan, the fecal coliform geometric mean MPN shall not exceed eighty-eight per one hundred milliliters nor shall the estimated ninetieth percentile exceed an MPN of two hundred and sixty per one hundred milliliters (five tube decimal dilution). Computation of the estimated ninetieth percentile shall

be obtained using the National Shellfish Sanitation Program Guide for the Control of Molluscan Shellfish methodology.

**Prohibited Area** - Growing areas shall be classified prohibited if there is no current sanitary survey report or if the sanitary survey report or monitoring data show unsafe levels of fecal material, pathogenic microorganisms, or poisonous or deleterious substances in the growing area or otherwise indicate that such substances could potentially reach quantities that could render shellfish unfit or unsafe for human consumption.

## **BACKGROUND INFORMATION**

This sanitary survey evaluates the current harvesting classification of shellfish growing waters designated as Shellfish Management Area 08 (SFMA 08). SFMA 08 consists of approximately 26,693 acres of shellfish growing area habitat located in Charleston County, South Carolina. Area 08 extends approximately fourteen miles in a general northeasterly to southwesterly direction from Garris Landing (formerly Moore's Landing) to the northern end of Gray Bay. The area consists of large water bodies such as Sewee Bay, Mark Bay, Copahee Sound, Hamlin Sound and the Atlantic Intracoastal Waterway (AIWW). Some of the smaller waters in Area 08 include: Anderson, Capers, Clauson, Dewees, Price, Toomer and Whiteside Creeks. The area is bounded to the northeast by an imaginary line extending between AIWW Marker #65 and the northeastern tip of Bull Island. US Highway 17 defines the northwestern border of the area. The southwestern boundary is an imaginary line extending from approximately one-quarter mile south of the end of 41st Avenue, in the Isle of Palms through the northern end of Gray Bay. The southeastern boundary consists of the Atlantic Ocean shoreline of Bull, Capers and Dewees Islands and northern portions of the Isle of Palms.

The shellfish industry in South Carolina is based primarily on the harvest of the eastern oyster (*Crassostrea virginica*) and hard clams, which include both the northern clam (*Mercenaria mercenaria*) and several small populations of the southern clam (*Mercenaria campechiensis*). The ribbed mussel, (*Geukensia demissa*), is also harvested in South Carolina, primarily on a small scale by the general public for recreational harvest. Areas in South Carolina designated for commercial harvest by the South Carolina Department of Natural Resources (SCDNR) include State shellfish grounds, Culture permits, Mariculture permits and Kings Grant areas. The South Carolina Department of Health and Environmental Control will disallow the harvesting of shellfish within SFMA 08, for direct marketing purposes, from the Restricted waters listed below in the Recommendations.

There are twelve (12) State Shellfish Grounds (SSGs), eleven (11) Culture Permits (C), three (3) Mariculture Permits (M), two (2) King's Grants (G) and two (2) Recreational Shellfish Grounds (R) located in SFMA 08.

The shellfish harvesting season in South Carolina normally extends from October 1 through May 31. The South Carolina Department of Natural Resources (SCDNR) has the authority to alter the shellfish harvesting season for resource management purposes and grant permits for year-round mariculture operations. Additionally, the South Carolina Department of Environmental Services

(SCDES) has the authority to prohibit shellfish harvesting when necessary to ensure that shellfish harvested in South Carolina waters are safe for human consumption.

The harvesting classifications of SFMA 08 **prior** to this sanitary survey were as follows:

### **PROHIBITED**

1. The AIWW, from the SFMA 09A boundary to marker 116 (Station 08-10).
2. The southern portion of Morgan Creek, from its confluence with the AIWW to its confluence with Cedar Creek.

### **RESTRICTED**

1. From the mainland including Station 08-17 (Copahee Sound at Porchers Bluff Creek) to Stations 08-04 (Bull Yard Sound, AIWW Marker #104), 08-19 (Toomer Creek at Copahee Sound), and 08-27 (Northern Hamlin Sound).

### **CONDITIONALLY APPROVED**

None

### **APPROVED**

All other waters of SFMA 08.

**Station Additions/Deactivations/Modifications:** None

## **POLLUTION SOURCE SURVEY**

### **SURVEY PROCEDURES**

The South Carolina Department of Environmental Services (SCDES), Lowcountry – Charleston, Shellfish Sanitation Staff, routinely conducts shoreline survey activities in SFMA 08, by watercraft, vehicle, and on foot, during the survey period and are ongoing.

The Department’s Bureau of Coastal Management (BCM) developed Geographical Information System (GIS) data layers documenting rural, non-MS4 (Municipal separate storm sewer system) areas in Charleston County on septic tanks. A one-mile buffer was drawn around all impaired shellfish water bodies in the county. County parcel data was cross referenced with Department septic tank permit data in those areas to develop share files of all parcels on septic tanks, to include the number of tanks on the property and the property owner's names(s) and address(s). A physical shoreline survey of these same areas was conducted, taking GPS coordinates of any observed animal farms, to include the parcel information of the farm, the type and number of animals observed, and their distance from shellfish harvesting waters. Together, the septic data and animal farm data should provide focus for future shoreline survey efforts in locating and evaluating potential non-point source impacts near impaired shellfish harvesting waters.



**POINT SOURCE POLLUTION**

**A. Municipal and Community Waste Treatment Facilities**

There are four permitted wastewater treatment plants (WWTP) within SFMA 08. The Forest Trails WWTP (SC0025283), located on Isle of Palms, discharges treated effluent into the AIWW adjacent to 41st Avenue (Outfall 001) and land applies to the Wild Dunes Beach and Racquet Club Golf Course (Outfall 002). The AIWW discharge is encompassed by an approximate 1000’ closure (north & south, full AIWW width). The Wild Dunes WWTP (ND0062260), also located on the Isle of Palms, does not have a direct discharge into shellfish waters. The facility utilizes extended aeration with a holding pond and the treated effluent is land applied to the Wild Dunes Links and Harbor Golf Course (Outfall 001) and on 2 acres at the Forest Trails WWTP itself (Outfall 003). Wild Dunes WWTP also has the ability to use the Forest Trails discharge if needed (Outfall 002). The remaining SFMA 08 WWTP is located on Dewees Island (ND0069329). It utilizes an approved community tile field and has no direct discharge into shellfish waters. Dewees Island also has a Reverse Osmosis plant (SC0046817) with a discharge to an impoundment that ultimately flows to Dewees Creek. All facilities are depicted on the attached Potential Pollution Source Map.

<b>National Pollutant Discharge Elimination System (NPDES) Permitted Facilities</b>			
<b>Permit #</b>	<b>Facility</b>	<b>Outfalls</b>	<b>Permitted Flow (Gallons Per Day)</b>
SC0025283	IOP Forest Trails WWTP	001-Discharge to AIWW 002-Land App. (Golf Course)	300,000 GPD
ND0062260	IOP Wild Dunes WWTP	001-Land App. (Golf Course) 002-Discharge to Forest Trails 003-Land App. (WWTP)	1,070,000 GPD
ND0069329	Dewees Island WWTP	001-Tile Field	24,600 GPD
SC0046817	Dewees Island Reverse Osmosis	001-Dewees Creek	N/A

The table below summarizes all instances where WWTP facilities exceeded their allowed permit values for fecal coliform, the Discharge Monitoring Report (DMR) value of that violation, and flow value. For the 2021-2023 reporting years and this Annual Update, SFMA 08 WWTPs had no permit violations for fecal coliform.

<b>WWTP Discharge Monitoring Report Violations 2021-2023</b>					
<b>Facility</b>	<b>Limit</b>	<b>Violation</b>	<b>Outfall</b>	<b>Report Date</b>	<b>Monthly Avg. Flow (Gallons Per Day)</b>
IOP/Forest Trails SD	14 FC/100 ml	None			
	43 FC/100 ml	None			
IOP/Water & Sewer Wild Dunes	14 FC/100 ml	None			
	43 FC/100 ml	None			

Dewees Island Utility Corporation	14 FC/100 ml	None			
	43 FC/100 ml	None			

The Town of Isle of Palms wastewater collection system, serviced by the Forest Trails WWTP and Wild Dunes WWTP, had no reported sanitary sewer overflows (SSO's) for 2021-2023. Dewees Island had no reported SSO's for 2021-2023. The Town of Mt. Pleasant wastewater collection system services located in the southern portion of SFMA 08 had no reported SSOs during 2021-2023 that affected SFMA 08. Sullivans Island had no SSO's that impacted SFMA 08.

Sanitary Sewer Overflows 2021-2023				
Mt. Pleasant				
Date	Location	Gallons Released	Waterbody Entered	Growing Area
6/20/21	Retention Pond at the end of Stratton Ferry Court	3,500	N/A	09B
8/7/21	Near 1450 Chandler Rd.	150	N/A	10A
2/14/22	Von Kolnitz Rd	3,000	Shem Creek	10B
5/6/22	Shem Creek	4,500	Shem Creek	10B
6/21/22	Storm Catch Basin 206	375	Marsh	09A
Isle of Palms				
N/A	N/A	N/A	N/A	09A
Dewees Island				
N/A	N/A	N/A	N/A	N/A
Sullivans Island				
N/A	N/A	N/A	N/A	N/A

**B. Industrial Waste (Discharges)**

There are two permitted industrial wastewater discharges located within SFMA 08. The Sewee Outpost (SCG750021) gas station on the boundary of SFMA's 08 and 09B has a permit to discharge vehicle wash water. However, the vehicle washing station has yet to be built and the owner is unsure if the discharge permit will ever be used. The other permit was issued based on dewatering concerns associated with borrow pit excavations. Charleston CPW/Bean Pit, is operated by Charleston CPW (SCG730226) and is located immediately north of Station 08-25 in Palmetto Point Creek. Groundwater absent of excess sedimentation is permitted for discharge under a general mining permit. There are no hazardous bacteriological or chemical components. Although these facts suggest no impact from these sources, discharge sites are shown on the Potential Pollution Sources map.

National Pollutant Discharge Elimination System (NPDES) Permitted Facilities		
Permit #	Facility Name	Facility Type – Outfall Type
SCG730226	Charleston CPW/Bean Pit	Borrow Pit - Discharge
SCG750021	Sewee Outpost	Car Wash – Vehicle Wash Water

- C. **Marinas** - In 2007, prompted by the Department's Bureau of Coastal Management (BCM and formally known as the Office of Coastal Resource Management-OCRM) marina definition change, the Shellfish Sanitation Program adopted the following marina definition. S.C. Regulation 61-47, Shellfish defines Marina as any of the following: (1) locked harbor facility; (2) any facility which provides fueling, pump-out, maintenance or repair services (regardless of length); (3) any facility which has effective docking space of greater than 250 linear feet or provides moorage for more than 10 boats; (4) any water area with a structure which is used for docking or otherwise mooring vessels and constructed to provide temporary or permanent docking space for more than ten boats, such as a mooring field; or (5) a dry stack facility.

Currently there are three marinas identified in SFMA 08. The original Wild Dunes Yacht Harbor on Morgan Creek was split up and sold in the 1990's, the front portion nearest the AIWW was bought by the Isle of Palms Marina and the back portion was sold to various condo developments and homeowner associations on Wild Dunes for private recreational use of the homeowners. Two property management companies manage the docks for the various Wild Dunes homeowners, which have 260 slips total. No fuel or sewage pump-out services are provided. Isle of Palms Marina, a recreational marina on Morgan Creek adjacent to the AIWW, now has 100 slips total, 25 slips devoted to transients, and provides fuel and pump-out services to the boating public. Finally, Dewees Island Marina, located adjacent to the Isle of Palms Marina on Morgan Creek, has approximately 28 slips, and is used solely by the residents of Dewees Island for docking small boats used as personal transportation to and from Dewees Island. The two Dewees Island ferries also use this marina. Diesel fuel is provided for use by the ferries only, no pump-out service is provided.

Table #7 is included at the end of this report, describing the above facilities in more detail. Additionally, a Jet Ski and parasail rental company exists on the AIWW adjacent to the Isle of Palms Marina, and although it does not meet the definition of a marina, is listed as well. A single Prohibited closure zone encompasses all of these facilities.

- D. **Radionuclides** - Sources of radionuclides have not been identified within SFMA 08 and no other source of poisonous or deleterious substances has been identified within the area.

## NONPOINT SOURCE POLLUTION

- A. **Urban and Suburban Stormwater Runoff** - Previous shoreline surveys conducted in SFMA 08 revealed the highest concentration of homes to be on the north end of the Isle of Palms and along the mainland shore from Awendaw to Mount Pleasant. Single-family homes continue to be built along the mainland shore from Copahee Sound to Sewee Bay. Stormwater runoff from the Isle of Palms and Goat Island has the potential to impact the southern end of Area 8 in Morgan Creek and Cedar Creek.

Several dredge spoil areas are located along the AIWW. The Army Corps of Engineers has not conducted any dredging projects within SFMA 08 recently.

The uplands surrounding the shellfish growing waters of SFMA 08 consist of various soil textures defined by the United States Department of Agriculture (USDA), Soil

Conservation Service (1971) utilizing general classifications and descriptions. Although lands within Area 08 consist of numerous soil types, the area is generally comprised of Rutlege-Scranton-Pamlico soils, made up of low, broad flats and long, nearly level, sandy ridges. The USDA (1971) further describes these soils as "somewhat poorly drained to very poorly drained, nearly level to depressional, sandy and mucky soils."

- B. Agricultural Runoff** - There are no permitted agricultural facilities located in SFMA 08, however, the northern portion of SFMA 08 near Awendaw is still fairly rural, with many small farms, mostly horse farms and the occasional cattle farm. There is a horse farm located one-half mile from U. S. Highway 17 on the south side of Sewee Road. This farm is adjacent to Clauson Creek, directly north of Station 08-21. Palmetto Point Creek and its tributary system, north of Clauson Creek along the AIWW, may also receive storm water runoff from the farm. There is a cattle farm on the south side of Sewee Road at Pt. Brittany. A ditch runs through the property and discharges into the Sewee Bay area. Additionally, several tracts of land between U.S. Highway 17 and the AIWW are used as crop farmland. An additional tract, north of Whiteside Creek and adjacent to U.S. Highway 17, is used as a plant nursery.
- C. Individual Sewage Treatment and Disposal Systems** - Many of the homes on Isle of Palms and all of the homes on Goat Island utilize individual septic systems. Isle of Palms and Goat Island are mostly the only historically impaired water sampling stations in SFMA 08 (see Table #3), Stations 08-01, 08-10 and 08-18, are located adjacent to these islands. On Isle of Palms, many of the yards of homes on septic systems have been found flood after heavy rainfall on occasion, and the Isle of Palms Fire Department has been observed in the past utilizing their trucks to pump the floodwaters out of streets and yards, either onto the beach or into the AIWW behind the island. Standing floodwaters over septic tile fields would be a considerable source of fecal coliform bacteria being introduced into shellfish growing waters.

New homes also continue to be built along the mainland of Mount Pleasant and Awendaw, as well as the northern end of Goat Island, utilizing individual septic systems. Mount Pleasant Waterworks has reported that the homes in the Sewee Road area are on individual septic systems. This area is adjacent to Stations 08-09, 08-21 and 08-25. They also report that the homes from Hamlin Road to the southern boundary of the area remain on individual septic systems. Each system requires inspection by the South Carolina Department of Environmental Services, Lowcountry – Charleston, On-site Wastewater Section for approval before final installation.

- D. Wildlife and Domestic Animals** - SFMA 08 supports substantial populations of both wildlife and domestic animals. Isle of Palms, Bull Island, Capers Island and Dewees Island are the four barrier islands within the area. Isle of Palms has a heavy residential human population, with accompanying domestic animal populations of dogs and cats, as well as a moderate wildlife population typical of a suburban residential area. Dewees Island, restricted by covenant to only 150 home sites on the island, is only sparsely populated, allowing more opportunity for wildlife population growth. Dewees Island has a deer management plan, selectively harvesting to control the population.

Source: [http://www.deweesislandpoa.org/item\\_list.asp?subcat=155&subtitle=Wildlife](http://www.deweesislandpoa.org/item_list.asp?subcat=155&subtitle=Wildlife).

Bull Island and Capers Island are completely uninhabited, providing for substantial wildlife populations such as white-tailed deer, raccoons, opossums, rabbits, various rodents, and bird populations typical of the coastal Carolinas.

Capers Island is a SCDNR managed State Heritage Preserve, encompassing 850 acres of maritime uplands and over 100 acres of brackish water impoundments.

Source: <http://www.dnr.sc.gov/managed/heritage/capersisland/description.html>

Bull Island is the largest barrier island of the Cape Romain National Wildlife Refuge, particularly known for its bird populations. Over 277 species of birds have been found on or near Bull Island. During the fall and winter seasons, black ducks, canvasback, scaup, and wigeon can be found in the impoundments.

Source: <http://www.fws.gov/caperomain/bullisland.html>

The entire area has an extensive network of small tidal creeks. This creek system provides a possible conduit for animal fecal coliform bacteria to be transported to the adjacent shellfish growing waters. However, the tidal flushing provided by the Area's Ocean inlets around these barrier islands likely mitigates much of the observed fecal coliform levels that wildlife and domestic animals on the barrier islands contribute to.

The upland shoreline near Mt. Pleasant in the southern portion of SFMA 08 is being rapidly developed for residential and commercial use, with associated increasing dog and cat populations. The northern portion of SFMA 08 near Awendaw is only sporadically developed, and is more rural in nature, with potential pollution sources ranging from small animal farms to wildlife.

- E. **Boat Traffic** - Boat traffic is moderate throughout the area throughout the year. Shrimp baiting season, which typically begins in September and ends in November, contributes to moderate levels of recreational boat traffic throughout the area. Commercial traffic in the AIWW consists primarily of tugs and barges and is consistent throughout the year. Commercial fisheries boats, ranging in size from 16 to 50 feet, operate as long as product demand exists.
- F. **Hydrographic and Habitat Modification** - Hydrographic and habitat modification in estuarine areas requires both State and Federal approval. Portions of the AIWW require maintenance dredging. The U.S. Army Corps of Engineers utilizes designated tracts of land adjacent to the AIWW as dredge spoil sites.

#### NATURALLY OCCURRING PATHOGENS

- A. **Marine Biotoxins** - Bivalve shellfish contamination from marine biotoxins has not been shown to be a human health concern within SFMA 08. During the winter and spring of 1988, South Carolina experienced an occurrence of "Red Tide", specifically *Ptychodiscus brevis* (K. brevis), which affected water quality in SFMA 01. There have been no

documented reoccurrences of this organism at levels requiring emergency response in South Carolina waters subsequent to the 1988 event. Due to the vast media coverage of events related to *Pfiesteria piscicida*, the Department participates in a State Task Group on Toxic Algae and operates a toxic algae emergency response team. The Department also has a Marine Biotxin Contingency Plan in place that must be evaluated and updated annually.

- B. *Vibrio Management Plan*** – Because State water temperatures exceed 81 degrees Fahrenheit (F) during June through September; *Vibrio* management controls must be implemented during these months. Management controls for permitted Aquaculture facilities are specifically addressed in R.61-47. The season for wild-stock harvest of oysters is typically closed from June 1 through September 30<sup>th</sup>. Because R.61-47 does not specifically address control of wild-stock harvest from waters exceeding 81 degrees F, the Department will recommend to and request of SCDNR that the wild stock harvesting season not be opened until October 1. The Department is currently not opposed to the issuance of special wild-stock harvest permits to Certified Shippers during the closed season as long as special permit conditions are included. Special permit conditions for maricultured triploid oysters during the vibrio control months must include current R.61-47 and NSSP temperature control requirements to be included in the Certified Shipper's HACCP plan.

## HYDROGRAPHIC AND METEOROLOGICAL CHARACTERISTICS

### PHYSIOGRAPHY

Shellfish Management Area 08 is comprised of several large, shallow bays and numerous deep-water creeks. The creeks within the area range from 40 to 900 feet in width and average 9 to 30 feet in depth. Additionally, the AIWW traverses the area's entire length in a north-south direction. The AIWW is maintained at a mean low water depth of 12 feet by the US Army Corps of Engineers. The major conduits of water flowing into and out of the area are Capers Inlet, Dewees Inlet, Prices Inlet and Bulls Bay. The influence of high-salinity ocean water, entering the area by way of these inlets, provides high flow and a subsequent flushing action that assists in maintaining high water quality. The entire area is approximately five miles wide (northwest to southeast) and fourteen miles long (southwest to northeast).

Tides in SFMA 08 are semidiurnal, consisting of two low and two high tides occurring each lunar day. Mean tidal ranges in the center of the area along Capers Island are 5.0 feet during normal tides and 6.5 feet during spring tides. Wind direction and intensity, as well as atmospheric pressure, typically cause variations in predicted tidal ranges.

Precipitation in SFMA 08 is heaviest during late summer and early autumn. Tropical storms and hurricanes occasionally produce extremely large amounts of rainfall. During winter months heavy rainfall events are uncommon, yet occasional intense thunderstorms associated with rapidly moving low-pressure systems generate heavy rains. Precipitation rarely occurs in the form of snow

or ice. Spring weather patterns may be dynamic with associated thunderstorms and severe weather conditions.

In 2017, the collection of rainfall data has been improved for a more consistent, accurate, and reliable data set that can be accessed directly from a shellfish staff member's computer or phone. With assistance from the National Weather Service's Southeastern River Forecast Center, the development of the South Carolina Shellfish Rainfall Program was introduced and utilized. This new technology provides shellfish program staff with real-time daily updates for rainfall accumulation in each of the South Carolina shellfish growing management areas, as well as providing critical triggers that alert staff to when rainfall thresholds for closures are exceeded.

The 2023 annual rainfall total recorded was 60.67 inches, which was above the 10-year average of 54.78 inches. On December 18<sup>th</sup>, 2023, SFMA 08 received 7.68 inches of rain in a 24-hour period due to a Nor'easter storm event. Due to this storm event, SFMA 08 was closed for several weeks until water quality samples were within Approved standards.

The prevailing winds along the central portion of the South Carolina coast are from the south and west during spring and summer and from the north during autumn and winter. Wind speeds are generally less than 15 miles per hour (mph); however, strong weather systems may generate winds in excess of 25 mph. Tropical storms and hurricanes occur occasionally.

## **WATER QUALITY STUDIES**

### **DESCRIPTION OF THE PROGRAM**

The Department currently utilizes a systematic random sampling (SRS) strategy within SFMA 08 in lieu of sampling under adverse pollution conditions. In order to comply with NSSP guidelines, a minimum of thirty samples are required to be collected and analyzed from each station during the review period. Sampling dates are computer generated prior to the beginning of each quarterly period thereby insuring random selection with respect to tidal stage and weather. Day of week selection criteria is limited to Mondays, Tuesdays and Wednesdays due to shipping requirements and laboratory manpower constraints. Sample schedules are rarely altered.

During July 1998, an updated shellfish water quality data scheduling and collection procedure was formalized. Samples utilized for classification purposes are limited to those samples collected in accordance with the SRS for a 36-month period beginning January 1 and ending December 31. This allows for a maximum of 36 samples per station, yet provides a six-sample 'cushion' (above the NSSP required 30 minimum) for broken sample bottles, lab error, breakdowns, etc. This also allows each annual report's water quality data to meet the requirements for the NSSP Triennial Review sampling criteria.

Six hundred seventy-eight (678) SRS surface water quality samples (<1.0 ft. deep) were collected for bacteriological analyses and classification purposes from twenty (20) active water quality sampling stations in SFMA 08 during the period 01/01/21 through 12/31/23. Multiple special samples were also taken for non-classification purposes, associated with reopening after

precautionary closures. The samples were collected in 120 ml amber glass bottles, immediately placed on ice and transported to the South Carolina Department of Environmental Services, Lowcountry – Charleston Laboratory in North Charleston, South Carolina. An additional 120 ml water sample was included with each shipment as a temperature control. At the laboratory, sample sets exceeding a 30-hour holding time or containing a temperature control in excess of 10 degrees C. were discarded (APHA, 1970).

Surface water temperatures were measured utilizing hand-held, laboratory-quality calibrated centigrade thermometers. Salinity measurements were measured in the laboratory using an automatic temperature compensated refractometer. Additional field data include ambient air temperature, wind direction, tidal stage and date and time of sampling.

### **MONITORING RESULTS**

No station exceeded a fecal coliform geometric mean MPN value of 14.

No station exceeded a fecal coliform MPN estimated 90th percentile value of 43. Fecal coliform data summaries are provided in Table #2.

### **CONCLUSIONS**

Based on the review of fecal coliform bacteriological data and the pollution source survey, SFMA 08 appears to be only minimally impacted by nonpoint source pollution.

### **NONPOINT SOURCE RUNOFF**

Although an Approved classification is in effect for the majority of the growing area, stormwater runoff still appears to be the source of minimal fecal coliform bacteria levels. The large wildlife populations on Bull, Capers and Dewees Islands do not appear to be a significant problem, probably due to significant ocean water flushing in and around the islands and neighboring creeks. The shellfish water quality stations near the uplands, from Mount Pleasant to Awendaw, are being closely monitored. To date, the increased development along this section of land does not appear to have adversely affected the water quality within the shellfish growing area. Also, many of the homes on Isle of Palms and all of the homes on Goat Island utilize individual septic systems. Many of the low-lying areas on the islands are prone to flooding after heavy rain events, thereby introducing fecal coliform contamination from these septic tile fields and are a source of concern.

### **RECOMMENDATIONS**

One classification change is recommended in SFMA 08 for the 2024-2025 shellfish harvesting season at Station 08-17 (Copahee Sound at Porchers Bluff Creek) which will now have an Approved classification. The following harvesting classifications are recommended for SFMA 08:



## **PROHIBITED**

1. The AIWW, from the SFMA 09A boundary to marker 116 (Station 08-10).
2. The southern portion of Morgan Creek, from its confluence with the AIWW to its confluence with Cedar Creek.

## **RESTRICTED**

None

## **CONDITIONALLY APPROVED**

None

## **APPROVED**

All other waters of SFMA 08.

**Station Additions/Deactivations/Modifications:** None

Analysis of sampling data for SFMA 08 demonstrates the probability of a significant impact from rainfall exceeding 4.00" in a 24-hour period. Therefore, a precautionary closure of SFMA 08 will be implemented following rainfall events of greater than 4.00" in a 24-hour period, as measured by the National Weather Service's Southeastern River Forecast Center. This methodology is associated with the concept of the Probable Maximum Precipitation (PMP). The National Weather Service publishes PMP estimates for the coastal United States in a series of hydro-meteorological reports (HMRs) (*National Weather Service*). PMP estimates for South Carolina's growing areas are derived from HMRs 51, 52, and 53 (*National Research Council, 1985*).

## REFERENCES

American Public Health Association, Inc. *Procedures for the bacteriologic examination of sea water and shellfish*, 1970. p. 28-47. In *Recommended procedures for the examination of sea water and shellfish*, 4th ed. Library of Congress, Washington, D.C.

National Research Council, 1985, "*Safety of Dams - Flood and Earthquake Criteria*" National Academy Press, Washington DC.

National Weather Service. The National Oceanic and Atmospheric Administration. *Precipitation Frequency Atlas of the Western US: NOAA Atlas II*. Superintendent of Documents, US Government Printing Office - Washington DC.

National Shellfish Sanitation Program (NSSP), Guide for the Control of Molluscan Shellfish, 2017 Revision. Model Ordinance. United States Food and Drug Administration.

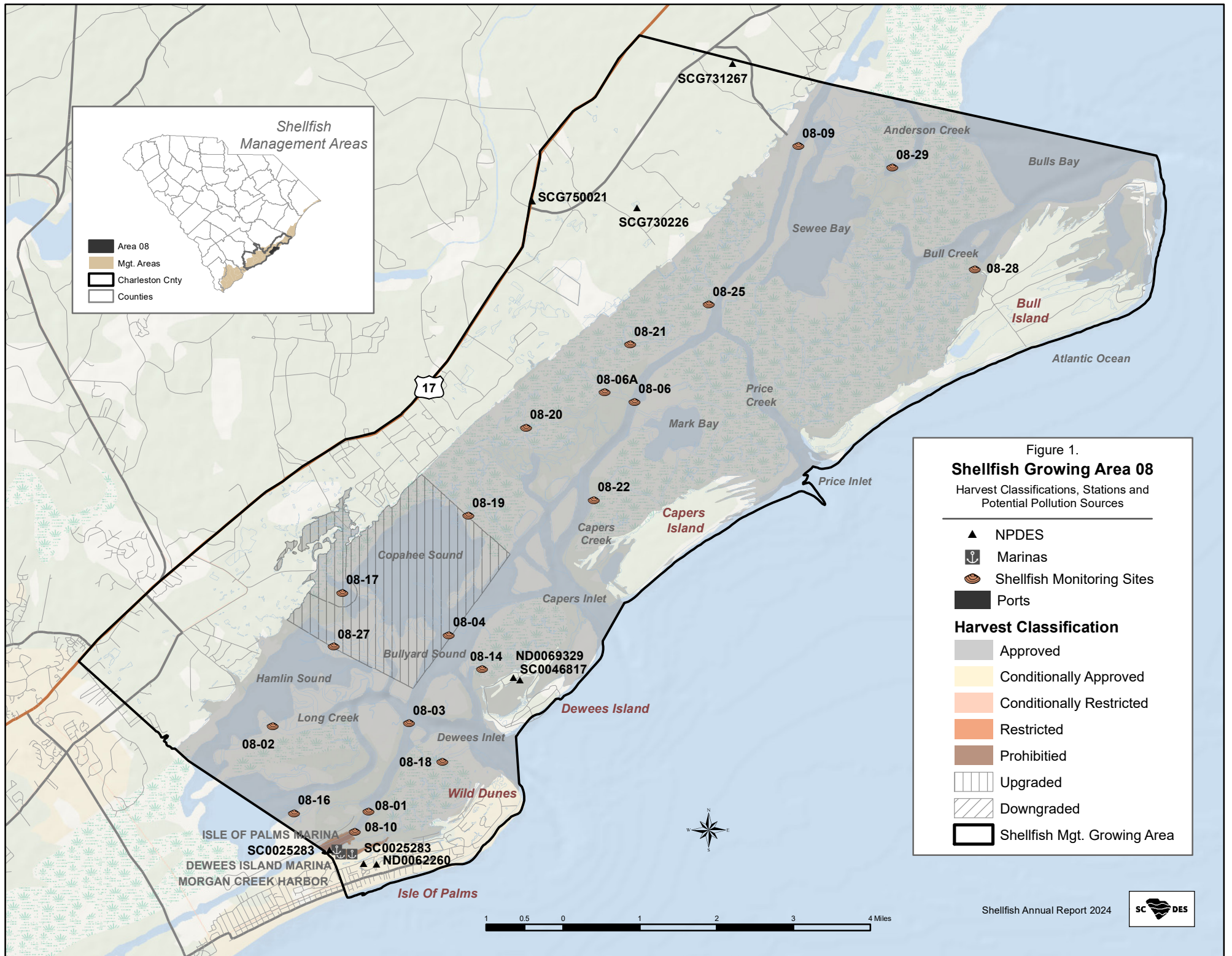
<https://www.fda.gov/media/117080/download>

NOAA, National Weather Service database.

South Carolina Department of Environmental Services (SCDES), Bureau of Water, 2017, Regulation 61-47, Shellfish. p. 9-12.

<https://www.des.sc.gov/sites/des/files/Library/Regulations/R.61-47.pdf>

United States Department of Agriculture, Soil Conservation Service, 1971. *Soil survey of Charleston County, South Carolina*. In cooperation with South Carolina Agricultural Experiment Station and South Carolina Land Resources Conservation Commission, National Cooperative Soil Survey, Washington, D.C. p. 78.



**Shellfish Management Areas**

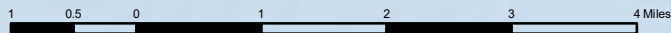
■ Area 08  
 ■ Mgt. Areas  
 ■ Charleston Cnty  
 ■ Counties

**Figure 1.**  
**Shellfish Growing Area 08**  
 Harvest Classifications, Stations and Potential Pollution Sources

- ▲ NPDES
- ⚓ Marinas
- 🍤 Shellfish Monitoring Sites
- Ports

**Harvest Classification**

- Approved
- Conditionally Approved
- Conditionally Restricted
- Restricted
- Prohibited
- ▨ Upgraded
- ▨ Downgraded
- ▭ Shellfish Mgt. Growing Area



**TABLE #1**  
**Shellfish Management Area 08**  
**Water Quality Sampling Stations Description**

<b>Station</b>	<b>Description</b>
08-01 .....	Morgan Creek at northernmost confluence w/AIWW, Marker #115
08-02 .....	Hamlin Sound
08-03 .....	Dewees Inlet at AIWW, North of Marker #110
08-04 .....	Bull Yard Sound, AIWW Marker #104
08-06 .....	AIWW near Mark Bay, AIWW Marker #90
08-06A .....	Unnamed Creek East of Marker #90 at Fork
08-09 .....	AIWW at Marker #74, Garris Landing
08-10 .....	AIWW at Marker #116
08-14 .....	Horsebend Creek, 1/4 mile from mouth
08-16 .....	Seven Reaches at Gray Bay
08-17 .....	Copahee Sound at Porchers Bluff Creek
08-18 .....	Cedar Creek, 1/2 mile from Dewees Inlet
08-19 .....	Toomer Creek at Copahee Sound
08-20 .....	Upper reaches Whiteside Creek
08-21 .....	Upper reaches Clauson Creek
08-22 .....	Capers Creek at Santee Pass
08-25 .....	AIWW at Palmetto Point Creek, adjacent to Marker #84
08-27 .....	Northern Hamlin Sound
08-28 .....	Summerhouse Creek at Bull Island Ferry Dock
08-29 .....	Anderson Creek at the Bull Island Ferry Channel

**(Total Active – 20)**

**TABLE #2**

**Shellfish Management Area 08  
FECAL COLIFORM BACTERIOLOGICAL DATA SUMMARY  
From Shellfish Water Quality Sampling Stations Between**

**January 1, 2021 and December 31, 2023**

<b>Station #</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>6</b>	<b>6A</b>	<b>9</b>	<b>10</b>	<b>14</b>	<b>16</b>
<b>SAMPLES</b>	34	34	34	34	34	34	34	33	34	34
<b>GEOMEAN</b>	4.1	2.1	2.1	1.8	2	1.9	2.7	4.4	2.2	2.2
<b>90TH %ILE</b>	16	5	5	3	4	3	8	17	5	4
<b>WATER QLTY</b>	A	A	A	A	A	A	A	A	A	A
<b>CLASSIFICATION</b>	A	A	A	A	A	A	A	P	A	A

<b>Station #</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>	<b>21</b>	<b>22</b>	<b>25</b>	<b>27</b>	<b>28</b>	<b>29</b>
<b>SAMPLES</b>	34	34	34	34	34	34	34	34	33	34
<b>GEOMEAN</b>	5	2.7	2.4	2.7	3.1	1.9	2.2	2.4	2.1	1.9
<b>90TH %ILE</b>	34	6	5	6	10	3	4	7	4	3
<b>WATER QLTY</b>	A	A	A	A	A	A	A	A	A	A
<b>CLASSIFICATION</b>	A	A	A	A	A	A	A	A	A	A

**A - Approved      CA - Conditionally Approved      R - Restricted**  
**RND - Restricted/No Depuration      P – Prohibited**

**Table #3  
Fecal Coliform Historical Trend Sheet**

Area 08 Stations 90<sup>th</sup>ile Values for Annual Updates Related to Rainfall

Station #	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013
08-01	16	20	19	15	14	20	19	16	16	14	12
08-02	5	6	3	5	8	8	6	2	3	3	2
08-03	5	6	5	6	6	6	5	3	3	2	2
08-04	3	4	4	5	5	5	5	3	2	2	2
08-06	4	5	6	4	3	3	3	3	2	3	3
08-06A	3	4	5	9	9	8	5	4	4	4	5
08-09	8	7	7	10	12	17	9	7	4	5	4
08-10	17	20	19	21	16	18	10	10	15	15	15
08-14	5	8	8	8	8	10	8	5	7	7	7
08-16	4	5	5	7	6	6	4	3	3	3	2
08-17	34	45	19	28	43	46	22	7	11	13	12
08-18	6	11	11	18	20	20	12	7	7	7	6
08-19	5	7	7	12	9	10	5	3	3	2	2
08-20	6	8	7	10	8	9	5	4	3	3	4
08-21	10	10	8	8	10	12	8	5	3	6	6
08-22	3	3	3	3	4	5	5	3	3	2	2
08-25	4	4	4	5	6	8	6	4	4	3	3
08-27	7	4	3	6	9	9	5	3	3	3	3
08-28	4	4	4	5	5	7	6	6	4	3	3
08-29	3	5	4	4	3	4	3	2	2	2	2
<b>Annual Rainfall (In inches)</b>	<b>60.67</b>	<b>43.83</b>	<b>41.71</b>	<b>65.47</b>	<b>47.16</b>	<b>66.30</b>	<b>58.01</b>	<b>41.74</b>	<b>72.27</b>	<b>50.65</b>	<b>61.14</b>

ND = No Data    Red = Impaired Water Quality

**TABLE #4**

---

**WATER QUALITY  
SAMPLING STATIONS DATA**

---

**Shellfish Management Area 08**

Detailed data for each shellfish station listed in this report's "Fecal Coliform Bacteriological Data Summary Table" and in other shellfish reports, can be obtained through South Carolina's Department of Environmental Services – Freedom of Information office at the address below.

Freedom of Information  
SC Dept. of Environmental Services  
2600 Bull Street  
Columbia, SC 29201

Any explanation or clarity needed on the report's content can be obtained by contacting the preparer(s), and/or reviewer(s) listed on the cover page.

**TABLE #5**

---

---

**RAINFALL DATA**

---

---

**Shellfish Management Area 08**

**SOURCE:**

**2021 – 2023 Data**

*National Weather Service - Southeastern River Forecast Center  
Location: Charleston County, South Carolina*



**2021 Annual Rainfall Summary**  
**Source: NOAA National Weather Service – Southeastern River Forecast Center**  
**Charleston County, South Carolina**

2021	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
1	0.43	0.77		0.47				0.30	0.01			
2	0.01		0.10				0.10	0.06	0.08			
3	0.18		1.15			0.05	0.07	0.46		0.06		
4			0.30		0.37	0.26		0.51				
5					0.03	1.09		0.05				
6		0.10				0.07		0.15	0.01	0.45	0.28	
7		0.28	0.03			0.05	0.01	0.08	0.04	0.59	0.98	
8	0.77						1.92	0.21	0.08		0.08	0.15
9	0.01					0.03	0.02	0.33	0.55	0.14		0.69
10				0.01		0.22	0.15		0.84			
11					0.01							
12	0.06				1.03	0.16					0.06	0.18
13		0.16			0.22	1.75	0.03	0.01				
14	0.02	0.31				0.07	0.08					
15		1.34					0.04	0.28				
16	0.16	0.17	0.06			0.81		0.08	0.02			
17			0.02			0.32		0.39				
18							0.01	0.69	0.05			
19		0.36	2.17				0.06	0.21	0.03			
20		0.55				0.18	0.66	0.15				0.13
21			0.06			1.21	0.36	0.16	1.08			0.19
22	0.15	0.01	0.12			0.02		0.48	0.63			0.63
23	0.12	0.01				0.31	0.09	0.64	0.25		0.03	
24												
25				1.38						0.54		
26							0.01			0.12	0.03	
27	0.50		0.01			0.19	0.02				0.01	
28	0.37						0.15					
29			0.01			0.26	0.52			0.39		
30					0.70							
31			0.01							0.01		0.61
<b>Total</b>	<b>2.78</b>	<b>4.06</b>	<b>4.04</b>	<b>1.86</b>	<b>2.36</b>	<b>7.05</b>	<b>4.30</b>	<b>5.24</b>	<b>3.67</b>	<b>2.30</b>	<b>1.47</b>	<b>2.58</b>
*Days highlighted indicate 4 or more inches of rain in a 24-hour period. Blank fields indicate no rainfall.												
* Sample dates are indicated in blue.						ND = No Data			<b>ANNUAL RAINFALL 41.71</b>			

**2022 Annual Rainfall Summary**  
**Source: NOAA National Weather Service – Southeastern River Forecast Center**  
**Charleston County, South Carolina**

2022	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
1				0.24			1.29		0.05	1.80	0.01	0.15
2						0.22	1.98	0.05	0.47			
3	0.01				0.01				0.16			
4						0.30			0.05			
5		0.32			0.04	0.03	0.09	0.02	0.02		0.03	0.01
6	0.02			0.47		0.07	0.06	0.07	0.02		0.01	0.16
7		0.05		1.01	0.01		0.01	0.19				
8		0.05		0.02		0.02	0.03	0.10				
9			0.50			0.14	0.03	0.09	0.61			
10	0.10		0.42			0.08	0.26	0.03	1.24			0.08
11			0.01				2.11	0.01	0.01		1.68	
12			0.13			0.01		0.35			0.04	0.12
13		0.04	0.03		0.01		0.06	0.76	0.01	0.87		
14		0.02			0.22		0.04					
15						0.06	0.43				0.02	0.25
16	0.41		0.02				0.95				0.26	0.06
17	1.09	0.16	0.39	0.35	0.06	0.08	0.03	1.01				
18		0.02		0.53		0.44	0.15	0.46	0.01	0.01		
19		0.03	0.04	0.06			0.11	0.45	0.07			
20			0.02				0.48	0.48	0.01		0.06	
21	0.17				0.01		0.71					0.74
22	0.36				0.03			0.61				0.27
23					1.05		1.07	0.36	0.01			0.11
24			0.61				0.60	0.16				
25			0.79				0.14	0.06			0.03	
26								0.56			0.02	
27				0.09	0.06						0.04	
28		0.03			0.87						0.01	
29	0.05					0.82		0.17				
30						0.63		1.76	1.44			
31							0.12	0.05		0.33		
<b>Total</b>	<b>2.21</b>	<b>0.72</b>	<b>2.96</b>	<b>2.77</b>	<b>2.37</b>	<b>2.90</b>	<b>10.75</b>	<b>7.80</b>	<b>4.18</b>	<b>3.01</b>	<b>2.21</b>	<b>1.95</b>
*Days highlighted indicate 4 or more inches of rain in a 24-hour period. Blank fields indicate no rainfall.												
* Sample dates are indicated in blue.						ND = No Data			<b>ANNUAL RAINFALL 43.83</b>			

**2023 Annual Rainfall Summary**  
**Source: NOAA National Weather Service – Southeastern River Forecast Center**  
**Charleston County, South Carolina**

2023	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
1	0.04	0.13			0.34			0.38				
2								0.01				0.01
3		0.35	0.06				0.01					0.04
4		0.21	0.03	0.10				0.22				0.01
5	0.09	0.02					0.25	0.57				
6		0.86	0.10		0.03		0.50					
7						0.03	0.04					
8				0.02		0.32	0.15	0.24				
9	0.01			0.44	0.31		0.10	0.07				
10		0.12	0.10		1.10				0.08			
11		0.62	0.25				2.98	0.01	0.65			0.13
12		1.70				0.52		0.14	0.08	0.49	0.15	
13	0.14	0.09	0.36			0.14			0.10	0.35	0.04	
14	0.06			0.48				0.06	0.05	1.09		
15				0.24	0.09	0.22			0.01			
16				0.01		0.03	0.08	0.15			0.01	
17				0.07	0.01		0.22	0.42			0.45	0.97
18		0.06	0.19		2.32		0.01	0.18	2.45		0.12	7.68
19			0.27		1.97	0.01						
20						0.73	0.13	1.50				
21						0.03	0.30		0.12	0.21	0.05	
22	0.13			1.50	0.05	0.49	0.35		0.02		0.14	
23	1.37		0.08	0.76		0.77		0.01	0.03		0.28	
24						0.01	0.65				0.02	
25		0.13									0.07	0.01
26	0.36		0.01			0.01		0.03				1.98
27					1.71	0.02			0.19		0.30	1.54
28			0.18	0.20	0.50		0.12	0.01	0.01			
29			0.02				0.63					
30	0.64			0.40			0.95	0.54				
31	0.20						0.23	3.54				
<b>Total</b>	<b>3.04</b>	<b>4.29</b>	<b>1.65</b>	<b>4.22</b>	<b>8.43</b>	<b>3.33</b>	<b>7.70</b>	<b>8.08</b>	<b>3.79</b>	<b>2.14</b>	<b>1.63</b>	<b>12.37</b>
*Days highlighted indicate 4 or more inches of rain in a 24-hour period. Blank fields indicate no rainfall.												
* Sample dates are indicated in blue.						ND = No Data			<b>ANNUAL RAINFALL 60.67</b>			

**TABLE #6**

**Shellfish Management Area 08  
Precautionary & Pollution Event Closures  
2021 – 2023**

<b>Event</b>	<b>Date(s)</b>	<b>Sample Date(s)</b>	<b>Opening Date</b>	<b>Comments</b>
December 2023 Nor'easter	12/18/2023	12/27/2023 & 1/3/2024	1/5/2024	SFMA 08 was closed due to 7.68 inches of rain in a 24-hour period and remained closed until special sampling met an Approved classification.
Hurricane Ian	9/30/2022	N/A	10/2/2022	SFMA 08 was closed as a precautionary closure due to the Hurricane Warning. SFMA 08 was not affected by rainfall due to the hurricane.

**TABLE #7**  
**Shellfish Management Area 08**  
**MARINA INVENTORY**

<b>Marina</b>	<b>Total Slips</b>	<b>Pump-out Facility</b>	<b>Fuel Dock</b>
Isle of Palms Marina	125	Yes	Diesel-Gas
Tidal Wave Water Sports	18	No	No
Morgan Creek Harbor Association	260	No	No
Deweese Island Marina	31	No	No