South Carolina Department of Environmental Services

OFFICE OF LAW ENFORCEMENT

SHELLFISH MANAGEMENT AREA 14

2025 ANNUAL UPDATE COMPREHENSIVE REPORT

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

SC DEPARTMENT *of* ENVIRONMENTAL SERVICES

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SHELLFISH MANAGEMENT AREA 14
2025 ANNUAL UPDATE
COMPREHENSIVE REPORT

[Data Through December 2024]

SC DEPARTMENT *of*
ENVIRONMENTAL
SERVICES

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2025 ANNUAL UPDATE COMPREHENSIVE REPORT
Shellfish Management Area 14

Data Inclusive Dates:
01/01/22 thru 12/31/24

Classification Change:
__X__ Yes ____ No

Shoreline Survey Completed: Yes

Prior Report & Date: 2024 Annual Update Comprehensive Report

(I)ncreased/(D)ecreased/(N)one:
__D__ Approved
__N__ Conditionally Approved
__I__ Restricted
__N__ Prohibited

SUMMARY

For the 2025 Annual Update Comprehensive Report, water quality monitoring data for Shellfish Management Area (SFMA) 14 remained consistent with the previous year's annual update. For this annual update, there will be one classification change recommended for the upcoming 2025-2026 shellfish harvesting season. Station 14-13A (First split on Halfmoon Creek on the southern side of Browns Island) bacteriological water quality data indicates that it now meets the criteria for a Restricted classification.

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 (SCDES) by Section 44-1-140 of the Code of Laws of South Carolina, 1976, as amended. The Department promulgated Regulation 61-47, which 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 National Shellfish Sanitation Program (NSSP) Guide for the Control of Molluscan Shellfish is used by the United States Food and Drug Administration (USFDA) 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 using 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

Shellfish Management Area 14 consists of approximately 47,936 acres of shellfish growing area habitat located in Beaufort and Colleton counties. It consists of portions of the Coosaw River and its tributaries including Huspah Creek, Whale Branch Creek, and the Bull, Combahee, and Ashepoo Rivers. The area west of the Combahee River is located in Beaufort County while areas to the east of the Combahee River are in Colleton County. The boundary of Area 14 was amended in the 1998 sanitary survey to include additional portions of Huspah Creek, with the subsequent boundary extending to S. C. Highway 17 and S. C. Highway 21.

The area's northern boundary includes S. C. Highway 17 at Huspah Creek and extends along an imaginary line crossing the lower portions of Bull River, Combahee River, and Rock Creek, to a point at the confluence of Mosquito Creek and the Ashepoo River. The eastern boundary begins at the confluence of the Ashepoo and Edisto Rivers at Fenwick Cut and ends at the point of Otter Island. The southern boundary line crosses St. Helena Sound to Morgan Island. The southern boundary then follows the shoreline of the Coosaw River and includes the areas that drain to the Coosaw River, such as Morgan Back Creek and a portion of McCalley Creek. The Southern boundary adjoins the Area 17 boundary at Whale Branch Creek. The western boundary runs parallel to Huspah Creek ending at S. C. Highway 17.

The shellfish industry in South Carolina is based on the harvest of the eastern oyster (*Crassostrea virginica*) and hard clams (*Mercenaria mercenaria*). Areas in South Carolina designated for commercial harvest by the South Carolina Department of Natural Resources (SCDNR) include State Shellfish Grounds, Culture Permits, and Kings Grant areas.

SFMA 14 has four (4) Shellfish Culture Permits Grounds (C): C123, C128, C129, and C133. There are four (4) Mariculture (M) Permits in SFMA 14: M126, M701F, M702F, and M704F. There are three (3) State Shellfish Grounds (SSGs): S065 (Morgan Island), S134 (Hutchinson Island) and S135 (Ashepoo River), on which commercial harvesting is allowed. There is one (1) Grant G126 (Chisolm Island.) The public can also recreationally (R) harvest from R132 (Ashe Island). Recreational harvesting is allowed for clams and oysters on Recreational and State Grounds, subject to seasons determined by SCDNR.

The shellfish harvesting season in South Carolina typically 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 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 14 **prior** to this sanitary survey were as follows:

PROHIBITED

1. Campbell Creek, from its headwaters to its confluence with Whale Branch Creek.
2. Halfmoon Creek, from its headwaters to the split near the southern portion of Browns Island.

RESTRICTED

1. Huspah Creek, from its confluence with Whale Branch near Station 14-14, continuing northward past Station 14-18 terminating at the boundary line of SFMA 14.
2. Ashepoo River, from Station 14-19 through Station 14-21 to the boundary line of SFMA 14.
3. Morgan Back Creek, in its entirety, including all tributaries and adjacent marshlands including State Ground S065 (Morgan Island.)

CONDITIONALLY APPROVED

None

APPROVED

1. Whale Branch, from sample station 14-02 extending eastward to its confluence with the Coosaw River, excluding the portion that is Prohibited associated with Station 14-13A.
2. Coosaw River extending eastward to its confluence with the St. Helena Sound, and ultimately to the east boundary of SFMA 14.
3. Broomsfield Creek, from its confluence with Whale Branch to the boundary line of SFMA 14, located at the Brickyard Road North bridge.

4. Bull River (including its tributaries and adjacent marshlands), from Station 14-04 continuing upstream to its confluence with Wimbee Creek and ending at the boundary line of SFMA 14.
5. Combahee River, from station 14-05 continuing upstream to the boundary line of SFMA 14, including a portion of the New Chehaw River.
6. The Ashepoo-Coosaw Cutoff, in its entirety.
7. Rock Creek, from its confluence with the St. Helena Sound extending upstream to the boundary line of SFMA 14.
8. Whale Branch, from Station 14-22 eastward to Station 14-02, near the mouth of Campbell Creek.
9. Halfmoon Creek, from the split at the southern portion of Browns Island at Station 14-13A.

Station Addition/Re/Deactivation/Modification: None

POLLUTION SOURCE SURVEY

SURVEY PROCEDURES

The South Carolina Department of Environmental Services (SCDES), Lowcountry – Beaufort Shellfish Sanitation Staff, routinely conducts shoreline survey activities in SFMA 14. Extensive visual examination of lands adjacent to the waters of SFMA 14 was conducted to determine type of activities, location of significant concentrations of domestic animals and other actual and potential sources of pollution entering shellfish growing waters.

POINT SOURCE POLLUTION

A. **Municipal and Community Waste Treatment Facilities** - James J. Davis Elementary School (SC0027481) is permitted to discharge treated wastewater to a ditch leading to Halfmoon Creek and Whale Branch Creek. The treatment plant is an activated sludge system with aeration, secondary clarification, filtration, chlorination, and de-chlorination. The Whale Branch Elementary and Middle schools are located adjacent to the S. C. Highway 21 Bridge on the southern shore of Whale Branch Creek and are served by sewer.

B. **Industrial Waste** - Coastal Demolition and Construction, Inc. (SC0000914) was permitted to discharge into Campbell Creek. The facility is now closed. There is a pending enforcement action for proper close-out of the wastewater treatment plant.

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 Section incorporated the following 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 no marinas located in SFMA 14.

D. **Radionuclides** - Sources of radionuclides have not been identified within SFMA 14 and no other sources of poisonous or deleterious substances have been identified within the area.

NONPOINT SOURCE POLLUTION

A. **Urban and Suburban Stormwater Runoff** - Stormwater runoff may impact water quality by transporting fecal coliform bacteria (and other pollutants) from land to the shellfish growing area. Stormwater from roads, residences, and agricultural land is directed to the lowest point of elevation, which typically is the nearest creek or marsh. In addition, there are freshwater wetland areas, ditches, and impoundments that drain into tidal creeks.

Beaufort County enacted a Stormwater Management Utility which was established by county ordinance in 2001 and amended and enacted most recently in 2015. The Stormwater Utility is guided by a Comprehensive Master Plan and a Stormwater Management Utility Board which is dedicated to stormwater-related activities. The Comprehensive Master Plan identified nine (9) program elements that the utility must address. These elements include Stormwater Control Regulations, Water Quality Controls for Existing Developments, Water Quality Monitoring, Annual Maintenance, Inventory of Secondary Stormwater Management Systems, Additional and On-going studies and analysis, Public Information, and Utility Administration.

The Comprehensive Master Plan is funded through the fees collected by Beaufort County. The Master Plan was designed to identify problem areas related to stormwater, and to recommend a plan to solve problems and better control the impacts on receiving waters in Beaufort County. The Stormwater Management Utility also partners with four Municipalities which include: The Town of Hilton Head Island IGA, Town of Bluffton IGA, Town of Port Royal IGA, and the City of Beaufort IGA. The above information was gathered from the Beaufort County Stormwater webpage which can be found at:

https://www.beaufortcountysc.gov/stormwater/index.html

The Beaufort County Manual for Stormwater Best Management Practices and Design Practices (BMP's) was developed in May 2010 and most recently revised in 2018. This manual has recommended policies and standards for stormwater pollution control for new developments, policies and standards for existing developments, and structural BMP design guidelines. This manual also has the Average Annual Fecal Coliform Runoff Load Calculations for various land uses with percentage reductions required to meet fecal coliform loading targets. This manual not only requires pollutant removal but also considers stormwater volume control to meet the County's antidegradation goals. Sec. 99-107 of the County Codes sets requirements for on-site stormwater systems: enforcement, methods, and inspections.

On June 4, 2014, the South Carolina Department of Health & Environmental Control designated Beaufort County as a Municipal Separate Storm Sewer System (MS4). MS4 is a component of the National Pollutant Discharge Elimination System (NPDES). The notice of intent was submitted, and the expected effective date was October 1, 2015 (Beaufort County Stormwater Utility, 2015).

Most land disturbing activities in South Carolina must comply with the Stormwater Management and Sediment Reduction Act of 1991. The final regulations, effective on June 28, 2002, establish the procedures and minimum standards for a statewide stormwater management program. For activities in the eight coastal counties, additional water quality requirements are imposed. For all

projects, regardless of size, which are located within one-half mile of a receiving water body in the coastal zone, the criteria for permanent water quality ponds having a permanent pool are that they are designed to store the first inch of runoff from the entire site over a 24-hour period or storage of the first one inch of runoff from the built-upon portion of the property, whichever is greater. Storage may be accomplished through retention, detention, or infiltration systems, as appropriate for the specific site. In addition, for those projects that are located within 1000 feet of shellfish beds, the first one and one-half inches of runoff from the built-upon portion of the property must be retained on site. Since 1992, these regulations have been applied to the development of residential subdivisions, golf courses, and business areas.

B. Agricultural Runoff - SFMA 14 has some potential for agricultural nonpoint source pollution. During the shoreline survey, small herds of cattle and horses were located adjacent to Bull River and Huspah Creek. There are also small agricultural operations located in the eastern portion of SFMA 14 for the purpose of hunting.

C. Individual Sewage Treatment and Disposal (ISTD) Systems - Currently, most homes and businesses adjacent to SFMA 14 utilize ISTDS for wastewater disposal, as opposed to central treatment systems. Central treatment systems have less potential to impact shellfish growing waters than ISTD systems, although central treatment system malfunctions can occasionally result in spills of untreated wastewater to the environment.

New home development continues in Bull Point Plantation, a residential development adjacent to Huspah Creek. Wastewater is treated by individual aerobic treatment units (ATU). Coosaw Point is a 368-acre development adjacent to Coosaw River. Sewer services will be provided to commercial buildings while most of the homes will utilize an ISTDS.

D. Wildlife and Domestic Animals - This area supports populations of white-tailed deer, raccoons, wading birds, migratory waterfowl, and other wildlife, which may contribute to fecal coliform levels in some areas. Domestic animals present in the area include dogs, cats, horses, and goats. A commercial monkey farm is located on Morgan Island. The island is owned by the South Carolina Department of Natural Resources, however, for years research has been conducted utilizing free ranging rhesus monkeys that are owned by HHS USFDA. Approximately 3,500 rhesus monkeys are located on Morgan Island and could potentially impact shellfish growing waters in this location of SFMA 14. Additionally, there are several impoundments in the upper reaches of Huspah Creek and along the Combahee, Chehaw, and Ashepoo Rivers that are utilized for waterfowl population management.

E. Boat Traffic - The Coosaw River provides access to St. Helena Sound and the Atlantic Ocean. The Atlantic Intracoastal Waterway (AIWW) is in the Coosaw River between the Ashepoo-Coosaw Cutoff (near Combahee River) and Brickyard Creek. Tugboats, barges, commercial, and recreational vessels frequently utilize this North/South route.

F. Hydrologic 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 14. 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 other coastal areas of the state. There have been no documented reoccurrences of this organism at levels requiring emergency response in South Carolina waters after the 1988 event. Due to the possibility of a *Pfiesteria pisicida* related or other marine biotoxin event, the Department has a Marine Biotoxin Contingency Plan that is updated annually and participates in a State Task Group on Toxic Algae and operates a toxic algae emergency response team.

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 is typically closed from June 1 through September 30th. The Department is currently not opposed to the issuance of special wild-stock harvest permits to Certified Shippers during the closed season if special permit conditions are included. Special permit conditions for mariculture 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 14 is part of the St. Helena Sound estuary which is a drowned river valley/bar-built system containing numerous marsh islands and tidal creeks. It is among the largest of the South Atlantic estuaries. The average depth of the estuary is approximately 12 feet at mid-tide level. Extensive shallow areas and numerous tidal flats exist within the estuary. The AIWW (12 feet at MLW) is the only maintained navigational channel (NOAA, 1994).

In SFMA 14, the Ashepoo River and Salkehatchie/Combahee Rivers are the main sources of freshwater inflow. A river gauging station (USGS 02175500) is located on the Salkehatchie River near Miley, SC. A review of the data from this site shows little to no influence of freshwater from the Salkehatchie River on salinity. Localized rainfall appears to be more of a factor at the Ashepoo River, Combahee River, and Huspah Creek areas. River flow data may be found at the following USGS site: http://waterdata.usgs.gov/sc/nwis/current/?type=flow.

At the eastern boundary of SFMA 14, the South Edisto River originates in the midlands of South Carolina and flows approximately 140 miles through the piedmont and coastal plain until it enters the Atlantic Ocean at Edisto Beach. It is the St. Helena Sound estuary's major freshwater source. The river discharges an annual mean of 2,457 cubic feet per second, based on data collected at the USGS gauging station (USGS 02175000) located at river mile 59.9 (at the Highway 61 bridge in Dorchester County). There is significant impact from freshwater inflow, in the form of low salinity and high fecal coliform concentrations, to stations in the South Edisto River, particularly in the winter and spring. There is some exchange with Area 13 through the Intracoastal Waterway at Fenwick Cut, which connects the South Edisto and Ashepoo Rivers. The closest sampling station in SFMA 14 (14-20) does not appear to be influenced by the South Edisto River.

The tides in SFMA 14 are semidiurnal, consisting of two low and high tides each lunar day. Mean tidal range is 5.9 feet during normal tides and 6.9 feet during spring tides. The greatest tidal ranges

of the year typically occur around full moon during the months of September through December. There is considerable variation in the normal tide range due to the prevailing strength and direction of winds.

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 10-year average rainfall in SFMA 14 was 50.07 inches. The yearly rainfall amount was 63.01 inches in 2024. Normally, approximately 40% of the annual rainfall falls in the three-month period from June to August. Weather patterns during this time are often characterized by thunderstorms and thundershower activity of short duration. In addition, these three months also have the highest numbers of days with rainfall greater than 1.00". The months of December through March historically have the greatest number of days with rainfall exceeding 0.10" and 0.50". Rainfall events during these months are typically of a longer duration.

The prevailing wind direction during January through February is generally from the west to northwest with an average speed of 8-12 MPH. During the months of March through August, wind direction is typically a southerly component at an average speed of 7-10 MPH and September through December normally maintains a north-north easterly wind direction with an average speed of 6-8 MPH (NOAA).

WATER QUALITY STUDIES

DESCRIPTION OF PROGRAM

The Department utilizes a systematic random sampling (SRS) strategy within SFMA 14 in lieu of sampling under adverse pollution conditions. 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 calendar year 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 data analysis 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 samples, lab error, breakdowns, etc. This also allows each annual report to meet the NSSP Triennial Review sampling criteria.

During the period 01/01/22 through 12/31/24, five hundred eighty-two (582) surface water samples (<1.0 ft. deep) were collected at the seventeen (17) currently active Area 14 monitoring stations for bacteriological analyses. These samples were utilized for classification purposes in accordance with the Department's systematic random sampling plan. Samples were collected in 120 ml bottles,

immediately placed on ice, and transported to the South Carolina Department of Environmental Services, Lowcountry – Beaufort laboratory in Burton, South Carolina. An additional 120 ml water sample was included with each shipment as a temperature control. Upon receipt at the laboratory, sample sets that exceeded a 30-hour holding time or contained a temperature control >10 degrees Celsius (C) were discarded. Samples collected after September 1, 1986 have been analyzed using the five-tube/three dilution modified A-1 method described by Nuefeld (1985).

Surface water temperatures were measured utilizing hand-held, laboratory-quality calibrated centigrade thermometers. Salinity measurements were measured in the laboratory using automatic temperature compensated refractometers. Additional field data include ambient air temperature, wind direction, tidal stage and date and time of sampling. Tidal stages were determined using the National Oceanic and Atmospheric Administration, 2018 Tides and Currents Predictions website located at http://tidesandcurrents.noaa.gov/curr_pred.html.

MONITORING RESULTS

All monitoring stations within Shellfish Management Area (SFMA) 14 meet the fecal coliform indicator organism criteria for an Approved classification geometric mean value of 14 MPN except for Station 14-21.

All monitoring stations except Stations 14-13A, 14-18, and 14-21 meet the estimated 90th percentile value of 43 MPN.

No stations exceeded a MPN geometric mean of 88 or a 90^{th} percentile of 260.

A fecal coliform bacteriological data summary is included as Table #2.

CONCLUSIONS AND RECOMMENDATIONS

Rainfall/stormwater runoff will continue to be a major factor in the water quality of the receiving waters of this shellfish management area. During this review period there will be one classification change implemented in SFMA 14 for the 2025-2026 shellfish harvesting season. Station 14-13A does not meet the water quality standards for an Approved classification. It will be classified as Restricted with station 14-13 being the new boundary station.

A commercial monkey farm is located on Morgan Island. During the 2021 review period, concerns about the island were identified by the Department of Health and Human Services (HHS), United States Food and Drug Administration (USFDA.) The island is owned by the South Carolina Department of Natural Resources, however, for years research has been conducted utilizing free ranging rhesus monkeys that are owned by HHS USFDA that are located on Morgan Island. Approximately 3,500 rhesus monkeys are located on the island and could potentially impact shellfish growing waters in this location of SFMA 14. Therefore, Station 14-09 will retain a Restricted classification and act as a boundary station for the upcoming shellfish harvesting season.

Sewage overflows are infrequent and will continue to be managed in accordance with National Shellfish Sanitation Program emergency closure guidelines.

During the harvest season, all Approved portions of the estuary should continue to be placed under a precautionary closure upon issuance of an official National Weather Service Hurricane Warning or

upon receipt of four or more inches of rainfall within twenty-four hours, as recorded by the National Weather Service, Southeastern River Forecast Center.

Based upon the findings of this Annual Update Comprehensive Report, the following classifications are recommended:

PROHIBITED

1. Campbell Creek, from its headwaters to its confluence with Whale Branch Creek.
2. Halfmoon Creek, from its headwaters to the split near the southern portion of Browns Island.

RESTRICTED

1. Huspah Creek, from its confluence with Whale Branch near Station 14-14, continuing northward past Station 14-18 terminating at the boundary line of SFMA 14.
2. Ashepoo River, from Station 14-19 through Station 14-21 to the boundary line of SFMA 14.
3. Morgan Back Creek, in its entirety, including all tributaries and adjacent marshlands including State Ground S065 (Morgan Island.)
4. Halfmoon Creek, from the split at the southern portion of Browns Island at Station 14-13A.

CONDITIONALLY APPROVED

None

APPROVED

1. Whale Branch, from sample station 14-02 extending eastward to its confluence with the Coosaw River, excluding the portion that is Prohibited associated with Station 14-13A.
2. Coosaw River extending eastward to its confluence with the St. Helena Sound, and ultimately to the east boundary of SFMA 14.
3. Broomsfield Creek, from its confluence with Whale Branch to the boundary line of SFMA 14, located at the Brickyard Road North bridge.
4. Bull River (including its tributaries and adjacent marshlands), from Station 14-04 continuing upstream to its confluence with Wimbee Creek and ending at the boundary line of SFMA 14.
5. Combahee River, from station 14-05 continuing upstream to the boundary line of SFMA 14, including a portion of the New Chehaw River.
6. The Ashepoo-Coosaw Cutoff, in its entirety.
7. Rock Creek, from its confluence with the St. Helena Sound extending upstream to the boundary line of SFMA 14.
8. Whale Branch, from Station 14-22 eastward to Station 14-02, near the mouth of Campbell Creek.

Station Addition/Re/Deactivation/Modification: None

Analysis of sampling data for SFMA 14 demonstrates the probability of a significant impact from

rainfall exceeding 4.00" in a 24-hour period. Therefore, a precautionary closure of SFMA 14 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). PMP estimates for the coastal United States have been published in a series of hydro-meteorological reports (HMRs) by the National Weather Service (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., 1970. *Recommended Procedures for the Examination of Seawater and Shellfish.* Fourth Edition. American Public Health Association, Inc., New York, N.Y. 105 p.

Beaufort County Stormwater Utility, Beaufort County Stormwater Management Plan, Beaufort County Beaufort, SC

National Oceanic and Atmospheric Administration, 1994. *Salinity Characteristics of South Atlantic Estuaries*. National Oceanic and Atmospheric Administration, Silver Spring, Md.

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.

NOAA, National Weather Service database.

Nuefeld, N. 1985. "Procedures for the Bacteriological Examination of Seawater and Shellfish". In: A.E. Greenberg and D.A. Hunt (eds.) *Laboratory Procedures for the Examination of Seawater and Shellfish, Fifth Edition.* American Public Health Association, Washington, D.C. p. 37-63.

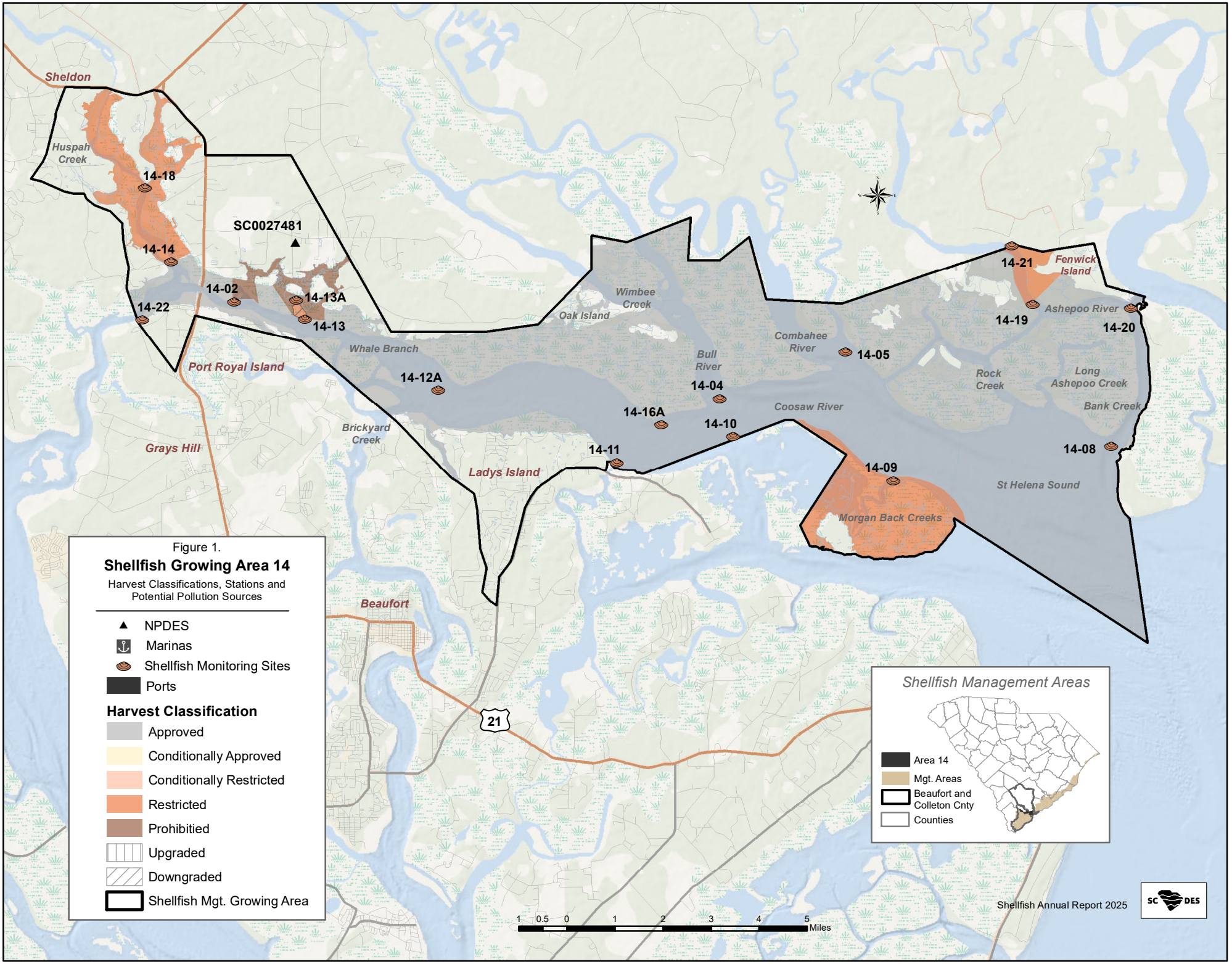
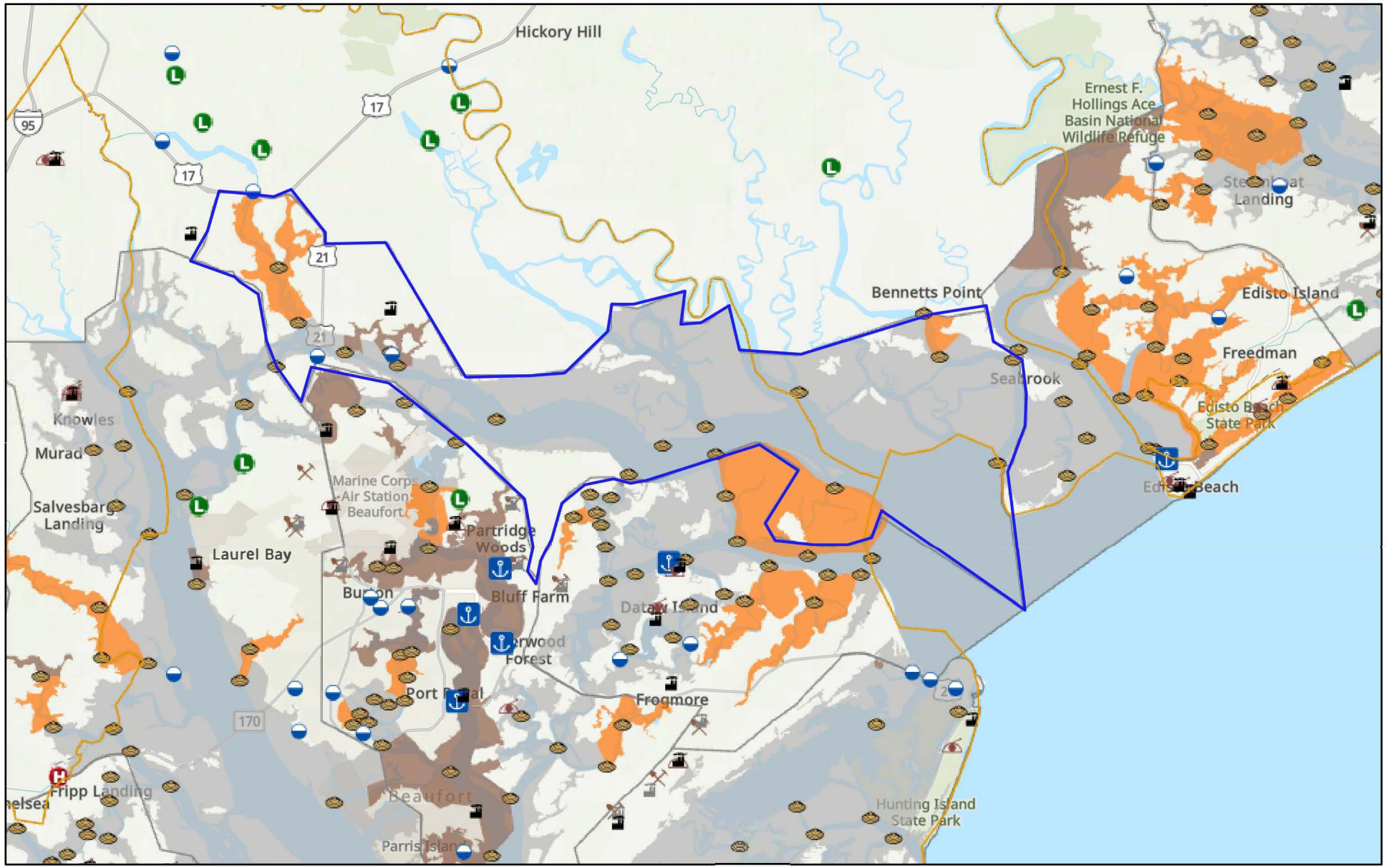

Sheldon
Huspah Creek
14-18
14-14
SC0027481
14-02
14-13A
14-22
14-13
Port Royal Island
Whale Branch
Wimbee Creek
Oak Island
Combahee River
Bull River
14-05
14-12A
14-04
14-16A
14-10
Coosaw River
Brickyard Creek
Grays Hill
14-11
Ladys Island
14-09
Morgan Back Creeks
St Helena Sound
14-08
Bank Creek
Rock Creek
Long Ashepoo Creek
Ashepoo River
14-19
14-20
14-21
Fenwick Island
Beaufort
21
Figure 1.
Shellfish Growing Area 14
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
Shellfish Management Areas
Area 14
Mgt. Areas
Beaufort and Colleton Cnty
Counties
1 0.5 0 1 2 3 4 5
Miles
Shellfish Annual Report 2025
SC DES

Figure 2. - Shellfish Management Area 14 - Point Source Map



SFMA 14 Boundary
Counties (Websites)
NationWide Permits

State Regulated Dams
Class 1 - High
Class 2 - Significant
Class 3 - Low
Marinas
Livestock Operations
Land Applications-Provisional
Mines
General Permits - NPDES

1:288,895

0 2 4 8 mi
0 3.25 6.5 13 km

Esri, NASA, NGA, USGS, Esri, TomTom, Garmin, SafeGraph, METI/NASA, USGS, EPA, NPS, USDA, USFWS

SCDES

Esri, NASA, NGA, USGS | Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA, USFWS | SCDHEC |

TABLE # 1
Shellfish Management Area 14
WATER QUALITY SAMPLING STATIONS DESCRIPTION

Station	Description
14-02	Campbell Creek at Whale Branch
14-04	Bull River Inlet and Coosaw River
14-05	Combahee River Inlet and Coosaw River
14-08	Ashepoo River at St. Helena Sound - Black Can Buoy
14-09	St. Helena Sound at Morgan Back Creek
14-10	Parrot Creek and Coosaw River, Marker #1
14-11	Sam's Point and Coosaw River
14-12A	Confluence of Coosaw River and Whale Branch
14-13	Halfmoon Creek at Whale Branch
14-13A	First split on Halfmoon Creek on the southern side of Browns Island
14-14	Huspah Creek at Railroad Trestle
14-16A	2000 Feet Southeast of Mouth of Fish Creek
14-18	Huspah Creek at Bull Point - Whale Branch POG
14-19	Ashepoo River POG
14-20	Cut between the South Edisto River and the Ashepoo River
14-21	Confluence of Mosquito Creek and Ashepoo River
14-22	Eastside of SS RR Swing Bridge on Whale Branch

(**Total Active - 17**)

TABLE #2

Shellfish Management Area 14
Fecal Coliform Bacteriological Data Summary
From Shellfish Water Quality Sampling Stations Between

January 01, 2022 to December 31, 2024

Station #	02	04	05	08	09	10	11	12A	13	13A	14
SAMPLES	35	34	34	34	34	34	33	34	35	35	35
GEOMEAN	6.5	2.2	2.8	2.9	3.8	2.5	3.1	2.3	5.7	9.4	10.3
90TH %ILE	23	5	8	7	14	6	10	5	22	51	40
WATER QLTY	A	A	A	A	A	A	A	A	A	R	A
CLASSIFICATION	A	A	A	A	R	A	A	A	R	P	R

Station #	16A	18	19	20	21	22
SAMPLES	34	34	34	34	34	35
GEOMEAN	2.2	13.6	12.4	6.5	16.2	9.9
90TH %ILE	4	45	40	21	70	32
WATER QLTY	A	R	A	A	R	A
CLASSIFICATION	A	R	R	A	R	A

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

TABLE #3 Fecal Coliform Historical Trend Sheet											
Area 14 Stations 90th%ile Values for Annual Updates Related to Rainfall											
Station #	**2024**	**2023**	**2022**	**2021**	**2020**	**2019**	**2018**	**2017**	**2016**	**2015**	**2014**
14-02	23	25	30	29	21	16	27	28	31	33	57
14-04	5	5	4	5	4	3	4	6	6	5	3
14-05	8	8	7	9	6	7	7	8	6	7	5
14-08	7	8	9	10	8	9	12	17	15	15	11
14-09	14	10	19	25	24	15	13	14	13	9	11
14-10	6	5	3	4	3	4	5	4	4	4	5
14-11	10	10	9	11	8	10	14	16	23	20	18
14-12A	5	4	6	7	7	6	8	8	6	4	4
14-13	22	21	29	33	30	36	52	54	38	36	41
14-13A	51	36	49	49	49	36	46	54	55	56	56
14-14	40	32	42	35	38	29	53	54	50	46	41
14-16A	4	4	5	5	5	3	4	4	4	3	3
14-18	45	46	61	60	48	37	74	99	94	75	53
14-19	40	37	31	35	27	33	30	31	27	29	29
14-20	21	23	22	24	19	19	18	22	19	20	16
14-21	70	57	44	42	40	39	51	60	59	53	41
14-22	32	27	34	33	27	19	38	43	38	32	26
Annual Rainfall (inches)	**63.01**	**52.17**	**49.37**	**58.16**	**50.33**	**47.19**	**47.89**	**52.03**	**51.15**	**48.14**	**44.35**
ND = No Data Red = Impaired Water Quality											

TABLE #4

WATER QUALITY
SAMPLING STATION DATA

Shellfish Management Area 14

Detailed data for each shellfish monitoring station listed in this report's "Fecal Coliform Bacteriological Data Summary Table" and in other shellfish reports can be obtained by writing South Carolina's Department of Environmental Service's – 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 14

Source:

2022 – 2024 Data
National Weather Service - Southeastern River Forecast Center
Location: Beaufort, South Carolina

2022 Annual Rainfall Summary
Source: National Weather Service - Southeastern River Forecast Center
Location: Beaufort, South Carolina

2022	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
1	0.01			0.26		0.03	0.37		0.01	1.13		0.20
2						0.02	0.99		1.37			
3	0.18					0.04			0.04			
4					0.01	0.06		0.13	0.01			
5	0.01	0.48			0.01	0.64	0.03	0.03	0.26		0.03	
6				0.66		0.33	0.01	0.04	0.41		0.28	0.20
7		0.23		0.55	0.06	0.05		0.01				
8		0.06		0.06		0.16	0.68	0.29				
9			0.26			0.12	0.19	0.30	2.26			
10	0.25		0.22			0.22	1.05		1.58			0.39
11							0.59	0.02			1.28	
12			0.05			0.53	0.08	0.38	0.11	0.01	0.09	
13		0.07	0.11		0.07			0.67		1.59		
14					0.23		0.16					
15							0.21				0.02	0.28
16	0.12		0.05				0.13	0.01			0.42	0.18
17	1.16	0.01	0.12	0.07	0.04	0.01		0.11				
18		0.01		0.38		0.38	0.23		0.04			
19		0.11	0.12	0.14			0.05	1.39	0.02			
20			0.04				0.77	0.59	0.12		0.04	0.04
21	0.33						0.54					1.15
22	0.26	0.01			0.01			0.27				0.40
23					1.49		0.81	1.01				0.05
24			0.43		0.04	0.06		0.38				
25			0.51				0.19	0.01			0.01	
26	0.01							2.18			0.04	
27				0.16	1.15						0.03	
28		0.11			0.05			0.14			0.05	
29						2.49		0.28				
30						0.45		1.79	1.62			0.03
31					0.01					0.05		0.05
Total	**2.33**	**1.09**	**1.91**	**2.28**	**3.17**	**5.59**	**7.08**	**10.03**	**7.85**	**2.78**	**2.29**	**2.97**

***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** | **ANNUAL RAINFALL** | **49.37**

2023 Annual Rainfall Summary
Source: National Weather Service - Southeastern River Forecast Center
Location: Beaufort, South Carolina

2023	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
1	0.05				0.10	0.01		0.85				
2												
3		0.29	0.04					0.17				0.04
4		0.22	0.04	0.09		0.16		0.15				0.01
5	0.39	0.01					0.18	0.25				
6					0.02		0.69					
7						0.12	0.09	0.28				
8				0.04	0.02	0.80	0.14	0.26	0.02			
9	0.03			0.88	0.01	0.06	0.05	0.06				
10		0.04	0.30			0.06	0.01		0.26			
11		0.76	0.46				0.79	0.01	0.14			0.22
12		1.64				0.67		0.15	0.15	0.85	0.06	
13	0.41	0.06	0.52			0.41	0.01		0.77	0.51	0.03	
14	0.01			0.25		0.01	0.09		0.05	0.27		
15				0.09	0.09	0.51			0.25			
16				0.04		0.07	0.05	0.26			0.06	
17				0.03	0.11			2.37			0.06	1.42
18		0.07	0.43		0.21	0.01	0.02	0.04	1.13		0.11	2.78
19			0.17		0.57							
20						0.99	0.06	0.03				
21						0.40	0.01	0.02	0.11	0.31	0.11	
22	0.16			0.02	0.22	0.61	0.02		0.09		0.92	
23	1.49		0.03	0.16		0.77					0.36	
24					0.01	0.02	2.77				0.04	
25		0.81									0.05	
26	0.59		0.01	0.03	0.02			0.05				0.67
27				0.04	1.77	0.05			0.24		0.23	1.26
28			0.22	0.62	0.32		0.54					
29			0.08				0.90	0.39				
30	1.15			0.59			0.34	1.59				
31	0.38						0.28	1.68				
Total	**4.66**	**3.90**	**2.30**	**2.88**	**3.47**	**5.73**	**7.04**	**8.61**	**3.21**	**1.94**	**2.03**	**6.40**

***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**	**ANNUAL RAINFALL**	**52.17**

2024 Annual Rainfall Summary
Source: National Weather Service - Southeastern River Forecast Center
Location: Beaufort, South Carolina

2024	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
1			0.03		0.69		0.08	0.01				
2	0.01		2.70			0.01	1.18		0.04			
3				0.03			0.03	0.16	0.28			
4	0.05			0.77				0.32			0.01	
5		1.07			0.02			0.50			0.19	
6	0.51	0.63	0.31		0.05	2.00		*10.54	0.03	0.04	0.02	
7	0.14		0.84		0.60			1.51	0.17		1.70	
8								0.92	0.18		0.95	
9	0.08		1.39				0.30	0.33	0.49			
10	1.44		2.00		0.50	0.10	0.94			0.05		0.16
11				2.38	0.30	0.22					0.12	0.09
12		0.12		0.96				0.86	0.01		0.11	0.24
13	0.17	1.46					0.15		0.04			
14					0.10		0.71		0.03			
15					0.43				0.05		0.14	
16			0.09				0.03		0.01			
17							0.05					
18			0.04				0.01					0.09
19					0.72		0.01		0.03			0.01
20					0.68		1.59		0.03		0.03	
21				0.01			1.01		0.01		0.01	
22				1.16		0.47	0.05					
23			0.91			0.16	0.01					
24	0.01	0.13	0.04			0.18	0.01					0.63
25	0.20				0.80	0.01	0.86					
26					0.10		0.89		0.11			
27			0.02				0.49		1.64		0.01	0.57
28	0.03		0.79			0.47						0.12
29			0.01			0.11					0.07	0.68
30						0.03	0.02			0.05	0.02	0.84
31	0.05						0.01					
Total	**2.69**	**3.41**	**9.17**	**5.31**	**4.99**	**3.76**	**8.43**	**15.15**	**3.15**	**0.14**	**3.38**	**3.43**

***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** | **ANNUAL RAINFALL** | **63.01**

TABLE #6
Shellfish Management Area 14
Precautionary & Pollution Event Closures
2022 – 2024

Event	Date(s)	Sample Date(s)	Opening Date	Comments
Tropical Storm Debby	08/05/2024-08/07/2024	08/12/2024	08/15/2024	Storm produced 10.54 inches of rainfall during summer harvesting season. Sampling was completed to reopen the area.

TABLE #7
Shellfish Management Area 14
MARINA INVENTORY

Marina	Total Slips	Pump-out Facility	Fuel Dock
N/A	N/A	N/A	N/A