

South Carolina Department of Health and Environmental Control

**ENVIRONMENTAL AFFAIRS**

# **SHELLFISH MANAGEMENT AREA 10A**

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## **2023 ANNUAL UPDATE**

**Shellfish Sanitation Section  
Environmental Affairs  
2600 Bull Street  
Columbia, SC 29201**

**September 2023**



**WEB ADDRESS**  
<http://www.scdhec.gov/FoodSafety/ShellfishMonitoring/>

# SHELLFISH MANAGEMENT AREA 10A 2023 ANNUAL UPDATE

[ Data Through December 2022 ]



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A handwritten signature in black ink, appearing to read 'Mike Marshall'. The signature is written in a cursive, flowing style. Below the signature is a solid horizontal line.

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**2023 ANNUAL UPDATE**  
**Shellfish Management Area 10A**

**Data Inclusive Dates:**  
01/01/20 thru 12/31/22

**Classification Change:**  
  X   Yes      No

**Shoreline Survey Completed:** Yes

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

**Prior Report & Date:** 2022 Annual Update

  D   Approved  
  N   Conditionally Approved  
  I   Restricted  
  N   Prohibited

**SUMMARY**

Shellfish Management Area 10A (SFMA 10A) appears to be influenced primarily by nonpoint source stormwater runoff. There are several classification changes recommended to be implemented for the 2023-2024 shellfish harvesting season. Station 10A-34 (Secessionville Creek at First Dock nearest Clark Sound) will be upgraded to Approved but will retain a Restricted classification as it borders Restricted areas. Station 10A-35 (Right Fork of Schooner Creek, Middle of Docks) will be downgraded to Restricted and Station 10A-19 (Schooner Creek at fork) will become a new boundary station.

During the past several years major storms have impacted SFMA 10A. On April 24, 2020, a major storm event in SFMA 10A brought heavy rainfall totaling 4.44 inches of rain within a 24-hour period. The area was closed for shellfish harvesting until samples justified reopening the growing area. On June 15, 2020, another storm event brought heavy rainfall totaling 4.88 inches of rain within a 24-hour period. The open shellfish season was already closed during this time and there are no summer harvesting operations operating during this time within SFMA 10A therefore a precautionary closure was not implemented. On July 8, 2021, Tropical Storm Elsa produced 3.11 inches of rain in a 24-hour period in SFMA 10A. Although this tropical storm brought in heavy precipitation to the Charleston area, in SFMA 10A, the total 24-hour precipitation was below the 4-inch closure threshold and no summer harvesting activity was permitted during 2021-2022 in SFMA 10A. On September 30, 2022, Hurricane Ian brought heavy rainfall totaling 6.76 inches of rain during a two-day storm event. The area was closed for shellfish harvesting until samples justified reopening the growing area on October 12, 2022.

**INTRODUCTION**

**PURPOSE AND SCOPE**

The authority to regulate the harvest, sanitation, processing, and handling of shellfish is granted to the South Carolina Department of Health and Environmental Control 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 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 deperated 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 deperation 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 deperation 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 deperation, or as source water for deperation, 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 deperation 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 deperation, 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 10A (SFMA 10A). SFMA 10A consists of approximately 15,191 acres of shellfish growing area habitat located in Charleston County, South Carolina. Area 10A extends in a northeasterly to southwesterly direction from the Charleston Harbor to the Stono River. The major water bodies in SFMA 10A include Folly River, Lighthouse Creek, Schooner Creek and Clark Sound. The area is bordered to the northeast by the geographic boundaries of Clark Sound and Parrot Point Creek. An imaginary line from the confluence of the Folly River and the Stono River, northeastward through King Flats, to a point adjacent to Fludd's Creek, at the northwest corner of Clark Sound, defines the area's western boundary. The southern and eastern boundaries consist of the Atlantic Ocean shoreline of Folly and Morris Islands respectively.

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 gathered 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 disallows the harvesting of shellfish for direct marketing purposes from restricted waters. Shellfish harvesting from Prohibited waters for human consumption is not allowed.

There are seven (7) State Shellfish Grounds (SSGs) within SFMA 10A: S189, S196, S201, S203, S205, S206 East, and S206 West. There is one (1) Recreational Shellfish Ground (R), R201, and there are no Kings Grants (G) located within the area. There are ten (10) Culture Permits (C) and three (3) Mariculture Permit (M) leases located throughout SFMA 10A.

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 Health and Environmental Control 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 10A **prior** to this sanitary survey were as follows:

### **PROHIBITED**

1. Those waters and adjacent marshland between 10A-18 from Schooner Creek to the Charleston Harbor.
2. Those waters and adjacent marshland from Bass Creek to the Charleston Harbor.
3. Those waters and adjacent marshland within Parrot Point Creek from Lighthouse Rd down to Schooner Creek and across to the Charleston Harbor.
4. Those waters within 1,000 feet of the old Backman's Commercial Fisheries Dock.
5. Those waters within 1,000 feet of Sunset Cay Marina.
6. Those waters within 1,210 feet of Mariner's Cay Marina.
7. Those waters within 350 feet of Crosby's Commercial Fisheries Dock.

### **RESTRICTED**

1. Those waters and adjacent marshlands of the Folly River from the Folly River Boat Ramp (10A-08) to Station 10A-22 (Folly River State Shellfish Ground at Folly Island).
2. Those waters and adjacent marshlands of Clark Sound from Station 10A-15 (Secessionville Creek at Private Docks) to Station 10A-33 (Lighthouse Creek at Clark Sound) to Station 10A-35 Right Fork of Schooner Creek, Middle of Docks).
3. Holland Island Creek from SFMA 11 to Folly Rd in SFMA 10A behind Sol Legare Island.
4. Station 10A-32 (Block Island Creek at fork) and adjacent waters and marshlands including Station 10A-29 (Block Island Creek at Flats) and Morris Island.

### **CONDITIONALLY APPROVED**

None

### **APPROVED**

All other waters in SFMA 10A.

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

## **POLLUTION SOURCE SURVEY**

### **SURVEY PROCEDURES**

Shoreline surveys of Shellfish Management Area 10A are conducted by the South Carolina Department of Health and Environmental Controls, Environmental Affairs, Lowcountry –

Charleston Shellfish Sanitation Program staff, by watercraft, vehicle, and on foot, during the survey period and are ongoing. Extensive visual examinations of lands adjacent to the waters of SFMA 10A are conducted to determine potential sources of pollution entering shellfish growing waters.

## POINT SOURCE POLLUTION

### A. Municipal and Community Waste Treatment Facilities

| <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> |
| SC0021229   | Chas. Water Systems<br>–Plum Island WWTP | 001 – Ashley<br>River | 34,797,801 GPD                          |

There are no permitted wastewater treatment plants (WWTP) within SFMA 10A. The James Island Public Service District (PSD) and Charleston Water Systems collection systems together service nearly all of James Island. Public sewer also serves a small portion of Folly Beach as well. The Plum Island WWTP (SC0021229), operated by Charleston Water Systems, receives wastewater from James Island and Folly Beach; however, Plum Island is located on the Ashley River adjacent to Dill Creek, and discharges treated wastewater into the Charleston Harbor (SFMA 10B). The table below summarizes all instances where WWTP facilities exceeded their allowed permit values for their Discharge Monitoring Reports (DMRs), the value of that violation, and flow value. For the 2020-2022 reporting years for this Annual Update, Plum Island WWTP had three instances of permit violations of their DMRs.

| <b>WWTP Discharge Monitoring Report Violations 2020-2022</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> |
| Chas. Water Systems<br>–Plum Island WWTP                     | 501<br>Enterococci/100<br>ml | >2420<br>Enterococci/100ml | 001            | January 2019       | 28 MGD                                     |
|  | 501<br>Enterococci/100<br>ml | 1011<br>Enterococci/100ml  | 001            | March 2019         | 21 MGD                                     |
|  | 501<br>Enterococci/100<br>ml | >2420<br>Enterococci/100ml | 001            | June 2019          | 22 MGD                                     |

James Island (James Island PSD and Charleston Water Systems) reported fifty-five (55) sanitary sewer overflows (SSO's) for 2020-2022. Folly Beach had no reported SSO's for 2020-2022.

Available hydrographic information suggests the potential of an impact from pollution sources located outside the growing area. The portion of the area from the Charleston Harbor extending southwest to Schooner Creek appears to be adversely impacted during certain hydrographic conditions by waters originating in the Charleston Harbor (Moore, 1984).

Outfalls from wastewater treatment plants discharging into the harbor are subsequently discharging into northeastern portions of SFMA 10A. Flow calculations have established time and distance of travel and place the effluent plumes within Schooner Bay near Fort Sumter. Due to public health concerns, waters from the confluence of Schooner Creek and Schooner Bay and all associated creeks and marshland to Charleston Harbor will remain Administratively Prohibited.

| <b>Sanitary Sewer Overflows – 2020-2022</b>  |   |                         |  |                     |
|--|---|-------------------------|--|---------------------|
| <b>James Island/Charleston Water Systems</b> |   |                         |  |                     |
| <b>Date</b>                                  | <b>Location</b>   | <b>Gallons Released</b> | <b>Waterbody Entered</b>   | <b>Growing Area</b> |
| 1/12/20                                      | CHARLESTON CPW PLUM ISLAND  | 3,750                   | N/A  | N/A                 |
| 4/24/20                                      | CHARLESTON CPW PLUM ISLAND  | 3,850                   | STORM WATER POND TO MARSH TO ASHLEY RIVER                            | 10B                 |
| 5/20/20                                      | CHARLESTON CPW PLUM ISLAND  | 2,400                   | MARSH LEADING TO ASHLEY RIVER  | 10B                 |
| 8/13/20                                      | CHARLESTON CPW PLUM ISLAND  | 4,000                   | N/A  | N/A                 |
| 8/25/20                                      | CHARLESTON CPW PLUM ISLAND  | 3,340                   | STORM WATER POND TO MARSH TO ASHLEY RIVER                            | 10B                 |
| 9/18/20                                      | CHARLESTON CPW PLUM ISLAND  | 1,200                   | STORM DRAIN TO MARSH TO ASHLEY RIVER                                 | 10B                 |
| 9/18/20                                      | CHARLESTON CPW PLUM ISLAND  | 600                     | STORM WATER POND TO MARSH TO ASHLEY RIVER                            | 10B                 |
| 9/19/20                                      | CHARLESTON CPW PLUM ISLAND  | 4,800                   | STORM DRAIN TO ASHLEY RIVER  | 10B                 |
| 9/29/20                                      | CHARLESTON CPW PLUM ISLAND  | 12,000                  | STORM WATER POND TO MARSH TO ASHLEY RIVER                            | 10B                 |
| 10/17/20                                     | CHARLESTON CPW PLUM ISLAND  | 960                     | N/A  | N/A                 |
| 11/5/20                                      | CHARLESTON CPW PLUM ISLAND  | 25,800                  | WEST ASHLEY TIDAL CREEK TO STONO RIVER                               | 11 & 12B            |
| 11/5/20                                      | CHARLESTON CPW PLUM ISLAND  | 4,000                   | STORM WATER POND NEAR 454 CESSNA DRIVE (NO OUTFALL)                  | 11 & 12B            |
| 1/14/2021                                    | Charleston CPW Plum Island – Manhole FF1-00                             | 150                     | Possibly ditch to Long Branch Creek                                  | 11                  |
| 2/1/2021                                     | Charleston CPW Plum Island  | 2,100                   | Marsh leading to Wappoo Cut to the Ashley River                      | 10B, 11             |
| 5/11/2021                                    | Charleston CPW Plum Island<br>Across from 625 WHITE Oaks Dr West Ashley | 1,500                   | Storm Pipe leading possibly to the marsh (approximately 1 mile away) | 11                  |
| 5/19/2021                                    | Charleston CPW Plum Island<br>160 Main Road in front of Gilligan's      | 100                     | Drain to an adjacent marsh   | 11                  |

|           |  |        |  |         |
|-----------|--|--------|--|---------|
|           | Restaurant, West Ashley  |        |  |         |
| 5/29/2021 | Charleston CPW Plum Island<br>Concord St between Laurens Rd & Gadsdenboro St     | 660    | Maybe to Cooper River  | 10B     |
| 6/12/2021 | Charleston CPW Plum Island<br>MANHOLE (V1-294)                                   | 27,000 | Marsh leading to Wappoo Cut to the Ashley River                | 10B, 11 |
| 6/12/2021 | Charleston CPW MANHOLE (V1-198)  | 18,000 | Marsh leading to Wappoo Cut to the Ashley River                | 10B, 11 |
| 6/12/2021 | Charleston CPW Plum Island<br>MANHOLE (V3-10)                                    | 900    | Marsh leading to Wappoo Cut to the Ashley River                | 10B, 11 |
| 6/12/2021 | Charleston CPW Plum Island<br>MANHOLE (D-10)                                     | 150    | Ditch leading to Wappoo Cut to the Ashley River                | 10B, 11 |
| 6/13/2021 | Charleston CPW Plum Island<br>MANHOLE (58C)                                      | 37,530 | Storm water collection system leading to the Charleston Harbor | 10B     |
| 7/8/2021  | Charleston CPW Plum Island<br>MANHOLE (39-20)                                    | 22,800 | Storm water pond to marsh to Ashley River                      | 10B     |
| 7/8/2021  | Charleston CPW Plum Island   | 15,600 | Marsh to Ashley River  | 10B     |
| 7/8/2021  | Charleston CPW Plum Island   | 600    | Storm drain to marsh to Ashley River                           | 10B     |
| 7/8/2021  | Charleston CPW Plum Island<br>MANHOLE (39-20)                                    | 7,500  | Storm ditch to creek to marsh to Ashley River                  | 10B     |
| 7/8/2021  | Charleston CPW Plum Island   | 1,800  | N/A  | 10B     |
| 7/8/2021  | Charleston CPW Plum Island   | 75     | Marsh to Ashley River  | 10B     |
| 7/20/2021 | Charleston CPW Plum Island<br>501 Stinson Dr, West Ashley                        | 500    | N/A  | 11      |
| 7/22/2021 | Charleston CPW Plum Island<br>MANHOLE (39-185)                                   | 500    | Storm drain to Marsh to Ashley River                           | 10B     |
| 7/31/2021 | Charleston CPW Plum Island   | 7,140  | Storm Ditch to creek to Ashley River                           | 10B     |
| 8/4/2021  | Charleston CPW Plum Island<br>Across from 3050 Ashley Town Center Dr-West Ashley | 4,500  | Marsh leading to West Ashley tidal creek to Stono River        | 11      |

|           |  |         |  |     |
|-----------|--|---------|--|-----|
| 8/18/2021 | Charleston CPW Plum Island<br>MANHOLE (39-20)  | 11,400  | Storm water pond to marsh to Ashley River                | 10B |
| 8/18/2021 | Charleston CPW Plum Island<br>MANHOLE (S-09.1)   | 6,900   | Storm system to a ditch to marsh to Ashley River         | 10B |
| 10/5/2021 | Charleston CPW Plum Island<br>Magnolia Rd near 1144 Anita Dr & Magnolia Rd at Paula Dr – West Ashley | 4,400   | Ditch to marsh to Ashley River (a mile away)             | 10B |
| 1/31/2022 | Charleston CPW Plum Island   | 4,500   | Church Creek   | 12A |
| 5/23/2022 | Charleston CPW Plum Island   | 1,800   | STORM INLET TO UNKNOWN LOCATION                          | N/A |
| 7/10/2022 | Charleston CPW Plum Island   | 3,000   | STORM WATER POND TO MARSH TO ASHLEY RIVER                | 10B |
| 7/23/2022 | Charleston CPW Plum Island   | 30,000  | DITCH TO MARSH ASHLEY RIVER                              | 10B |
| 7/23/2022 | Charleston CPW Plum Island   | 36,000  | STORM WATER POND TO MARSH TO ASHLEY RIVER                | 10B |
| 8/29/2022 | Charleston CPW Plum Island   | 9,000   | STORM WATER POND TO MARSH TO ASHLEY RIVER                | 10B |
| 9/1/2022  | Charleston CPW Plum Island   | 32,250  | STORM WATER POND TO MARSH TO ASHLEY RIVER                | 10B |
| 9/2/2022  | Charleston CPW Plum Island   | 200     | MARSH LEADING TO WAPPOO CUT TO THE ASHLEY RIVER          | 10B |
| 9/2/2022  | Charleston CPW Plum Island   | 1,400   | STORM SYSTEM TO A DITCH TO MARSH ASHLEY RIVER            | 10B |
| 9/9/2022  | Charleston CPW Plum Island   | 16,500  | STORM SYSTEM TO THE MARSH ABOUT A MILE FROM ASHLEY RIVER | N/A |
| 9/30/2022 | Charleston CPW Plum Island   | 150,000 | Dill Creek   | 10B |
| 9/30/2022 | Charleston CPW Plum Island   | 4,200   | STORM WATER POND TO MARSH TO ASHLEY RIVER                | 10B |
| 9/30/2022 | Charleston CPW Plum Island   | 4,950   | STORM COLLECTION   | N/A |

|                    |                               |       |  |               |
|--------------------|-------------------------------|-------|--|---------------|
|                    |                               |       | SYSTEM,<br>UNKNOWN FROM<br>THERE                                 |               |
| 9/30/2022          | Charleston CPW Plum<br>Island | 500   | STORM<br>COLLECTION<br>SYSTEM,<br>UNKNOWN FROM<br>THERE          | N/A           |
| 9/30/2022          | Charleston CPW Plum<br>Island | 1,350 | STORM DITCH TO<br>CREEK TO MARSH<br>ASHLEY RIVER                 | 10B           |
| 9/30/2022          | Charleston CPW Plum<br>Island | 500   | POSSIBLE<br>OVERLAND FLOW<br>TO A SMALL<br>BACKYARD<br>CREEK     | N/A           |
| 10/1/2022          | Charleston CPW Plum<br>Island | 1,200 | STROMWATER<br>COLLECTION<br>SYSTEM TO<br>ASHLEY RIVER            | 10B           |
| 10/1/2022          | Charleston CPW Plum<br>Island | 500   | STORMWATER<br>RETENTION POND                                     | N/A           |
| 10/1/2022          | Charleston CPW Plum<br>Island | 2,350 | MARSH TO<br>ASHLEY RIVER   | 10B           |
| 10/15/2022         | Charleston CPW Plum<br>Island | 460   | MARSH LEADING<br>TO WEST ASHLEY<br>TIDAL CREEK TO<br>STONO CREEK | 11            |
| <b>FOLLY BEACH</b> |                               |       |  |               |
| N/A                | N/A                           | N/A   | N/A  | None reported |

**B. Industrial Waste (Discharges)** – There are currently no permitted active industrial waste discharges into the waters of SFMA 10A.

**C. Marinas** - In 2007, prompted by a SCDHEC Office of Coastal Resource Management (OCRM) marina definition change, SCDHEC Shellfish 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); or, 3) any facility which has permanent docking space of 250 linear feet or greater. 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. 5) A dry stack facility. SCDHEC is currently in the process of identifying all facilities meeting the new marina definition. Once identified, they will be mapped, and adequate closure zones established to protect public health.

Prior to the 2007 definition change, there were two recreational marinas located within SFMA 10A. Mariner's Cay Marina is located on the Folly River adjacent to Folly Road.

Mariners Cay has 87 wet slips, approximately 60% of which are currently occupied, and offers fueling and wastewater pump-out services. Sunset Cay Marina (formerly Folly Marina) is located on the Folly River approximately one mile southwest of Mariner's Cay. Sunset Cay Marina has 118 wet slips, approximately 50% of which are currently occupied, and offers wastewater pump-out services. Additionally, two commercial fisheries facilities were located within SFMA 10A. The owner of Backman's Seafood, which is now out-of-business, still operates a dock located in Backman's creek, north of Bowen's Island. This dock has approximately 150 ft. to 200 ft. of dockage and accommodates between 1 and 2 shrimp trawlers. It has above ground diesel fuel tanks, but the tanks are currently empty. Crosby's Fish and Shrimp Company operates a dock located in Folly Creek adjacent to Folly Road. Crosby's has approximately 300 ft. of dockage and typically accommodates 2 shrimp trawlers and 2 fishing vessels. There is no on-site fuel; a fuel truck accomplishes all boat fueling. Table #7 is included at the end of this report, providing additional detail on SFMA 10A boat docking facilities.

- D. Radionuclides** - Sources of radionuclides have not been identified within SFMA 10A and no other sources of poisonous or deleterious substances have been identified within the area.

#### **NONPOINT SOURCE POLLUTION**

- A. Urban and Suburban Stormwater Runoff** – Past shoreline surveys conducted in SFMA 10A revealed numerous homes adjacent to shellfish growing areas. Single-family homes continue to be built sporadically along the mainland shores as well as on several marsh islands. Heavy development continues to occur around Folly Creek and Oak Island. Run-off from these locations has the potential to affect shellfish growing waters in the Folly River.

The Army Corps of Engineers has not conducted any dredging projects in SFMA 10A recently. The Folly River entrance occasionally requires maintenance dredging. The dredge material is usually either placed on the ocean side of the southernmost portion of Folly Island for beach renourishment or placed in an offshore spoil site. Morris Island is the only dredge spoil area within SFMA 10A. The Army Corps of Engineers reserves the right to use the spoil area at any time. The State Ports Authority (SPA) conducts maintenance dredging adjacent to their terminals (SFMA 10B). The Drum Island spoil area is the primary site used by the SPA in the Cooper River. The site is reaching its capacity and will soon be permanently closed. The SPA may then use Morris Island more frequently.

The uplands surrounding the shellfish growing waters of SFMA 10A 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 SFMA 10A consist of numerous soil types, the area is generally comprised of Wando-Seabrook soils and occur on flat ridges and lower lying bands. The USDA (1971) further describes these soils as "moderately well drained to excessively drained, nearly level to gently sloping, sandy soils."

- B. Agricultural Runoff** - There are no permitted agricultural facilities located in SFMA 10A. The lack of concentrated agricultural activity near the shoreline of the growing waters minimizes the potential for contamination of shellfish waters from agricultural runoff.
- C. Individual Sewage Treatment and Disposal Systems** - Homes adjacent to shellfish growing waters on James Island and Folly Island are primarily served by sanitary sewer, although some homes in the outlying areas, primarily on the northern end of Folly Island, are serviced by individual septic systems. Each system requires inspection by the South Carolina Department of Health and Environmental Control's, Environmental Affairs, Bureau of Environmental Health Services Lowcountry – Charleston, On-site Wastewater Section and approval before final installation.
- D. Wildlife and Domestic Animals** - SFMA 10A supports a large population of domestic animals attributable to numerous private residences along the shores of both James Island and Folly Island. The area also supports a moderate amount of wildlife, primarily various types of marine birds and mammals. The entire growing 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 adjacent growing waters.

Bird Key - Stono Heritage Preserve is a DNR managed heritage preserve, a sand spit island formed in the mouth of the Folly and Stono River. The preserve provides nesting, roosting and foraging habitat for a variety of sea and shore birds. Beginning in the mid-1980's, thousands of eastern brown pelicans, several species of terns, black skimmers, laughing gulls, two species of herons and other incidental species successfully nested on Bird Key Stono every year. Due to bird nesting activity, this Preserve is closed to public use from March 15 thru October 15. Bird Key is a likely contributor to fecal coliform levels in the area during that time however those levels are likely mitigated by Bird Key's proximity to Stono Inlet and the immediate ocean water tidal flushing ocean inlets provide.

- E. Boat Traffic** - Recreational boat traffic is moderate in the area throughout the year. Commercial fisheries boats, ranging in size from 16 to 50 feet, operate throughout the area. There are heavy clam mariculture interests within this area. Folly River and Folly Creek are used on nearly a daily basis by these permit holders. During the recreational shrimp-baiting season, typically extending from mid-September through mid-November, recreational traffic is heavy.
- F. Hydrographic and Habitat Modification** - Hydrographic and habitat modification in estuarine areas requires both State and Federal approval. Portions of Folly River require maintenance dredging. The United States Army Corps of Engineers also utilize a designated tract of land adjacent to Lighthouse Creek on Morris Island as a dredge spoil site.

#### **NATURALLY OCCURRING PATHOGENS**

- A. Marine Biotoxins** - Bivalve shellfish contamination from marine biotoxins has not been

shown to be a human health concern within SFMA 10A. 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 Biotoxin 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 10A consists of the waters of the Folly River system and the Clark Sound basin. Connections with the Atlantic Ocean are via Charleston Harbor, Lighthouse Inlet and Stono Inlet. Influence of high salinity ocean water entering the area by way of these inlets provide high flow and a subsequent flushing action which assists in maintaining high water quality. The creeks within the area range from 30 to 500 feet in width and average 3 to 25 feet in depth. The entire area is approximately four miles wide (northwest to southeast) and eleven miles long (southwest to northeast).

Tides in SFMA 10A are semidiurnal, consisting of two low and two high tides occurring each lunar day. Mean tidal ranges in Folly Creek, at the Folly Road Bridge, are 5.5 feet during normal tides and 7.1 feet during spring tides. Wind direction and intensity, as well as atmospheric pressure, typically cause variations in predicted tidal ranges.

Precipitation in SFMA 10A 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.

On April 24, 2020, a major storm event in SFMA 10A brought heavy rainfall totaling 4.44 inches of rain within a 24-hour period. The area was closed for shellfish harvesting until samples justified reopening the growing area. On June 15, 2020, another storm event brought heavy rainfall totaling 4.88 inches of rain within a 24-hour period. The open shellfish season was already closed during this time and there are no summer harvesting operations operating during this time within SFMA 10A therefore a precautionary closure was not implemented. On July 8, 2021, Tropical Storm Elsa produced 3.11 inches of rain in SFMA 10A which did not meet the requirements for a rainfall closure event. On September 30, 2022, Hurricane Ian brought heavy rainfall totaling 6.76 inches of rain during a two-day storm event. The area was closed for shellfish harvesting until samples justified reopening the growing area on October 12, 2022. The 2022 precipitation total recorded for SFMA 10A was 54.28 inches.

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.

Freshwater rivers do not discharge directly into SFMA 10A. Freshwater influence is primarily due to rainfall.

## **WATER QUALITY STUDIES**

### **DESCRIPTION OF THE PROGRAM**

The Department currently utilizes a systematic random sampling (SRS) strategy within SFMA 10A 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.

Nine hundred and twenty-one (921) routine SRS surface water quality samples (<1.0 ft deep) were collected for bacteriological analyses and classification purposes from twenty-eight (28) active water quality sampling stations in SFMA 10A during the period 01/01/20 through 12/31/22. Multiple bacteriological samples were collected during the review period for non-classification purposes. Samples were collected in 120 ml amber glass bottles, immediately placed on ice, and transported to the South Carolina Department of Health and Environmental Control's, Environmental Affairs, 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 more than 10 degrees C. were discarded (APHA, 1970).

Surface water temperatures are measured utilizing hand-held, laboratory-quality calibrated centigrade thermometers. Salinity measurements are obtained 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 stations exceeded a fecal coliform geometric mean MPN value of 14.

Stations 10A-08, 10A-15, 10A-16, 10A-16B, 10A-29A, 10A-34A, and 10A-35 exceeded a fecal coliform MPN estimated ninetieth percentile value of 43.

No stations exceeded a geometric mean MPN value of 88 and no stations exceeded a fecal coliform MPN estimated 90<sup>th</sup> percentile value of 260.

## **CONCLUSIONS**

Based on the review of the fecal coliform bacteriological data and the pollution source survey for SFMA 10A, SFMA 10A appears to be impacted by both point and nonpoint source pollution.

## **POINT SOURCE POLLUTION**

Available hydrographic information suggests the potential of an impact from pollution sources located outside the growing area. The portion of the area from the Charleston Harbor extending southwest to Schooner Creek appears to be adversely impacted during certain hydrographic conditions by waters originating in the Charleston Harbor (Moore, 1984). Outfalls from wastewater treatment plants discharging into the harbor are subsequently discharging into northeastern portions of SFMA 10A. Flow calculations have established time and distance of travel and place the effluent plumes within Schooner Bay near Fort Sumter. Due to public health concerns, waters from the confluence of Schooner Creek and Schooner Bay and all associated creeks and marshland to the Charleston Harbor will remain Administratively Prohibited.

## **NONPOINT SOURCE POLLUTION**

Nearly all SFMA 10A upland shoreline has residential development bordering the marsh. Impervious surfaces typically result in increased volumes of stormwater runoff and a more rapid movement of stormwater into adjacent shellfish harvesting waters. Increases in rainfall typically result in increased stormwater runoff, which often results in elevated fecal coliform levels. These factors increase the potential for water quality to be adversely impacted within the immediate area.

The majority of stations within SFMA 10A meet the statistical criteria for an Approved classification. Stormwater runoff continues to be the major source of minimal fecal coliform contamination throughout the area. The moderate populations of domestic and wild animals likely impact water quality in the area. Over land runoff in SFMA 10A appears to be mitigated by ocean water flushing through Charleston Harbor, Lighthouse Inlet and Stono Inlet.

## **RECOMMENDATIONS**

There will be two recommended classification changes for the 2023-2024 shellfish harvesting season within SFMA 10A. The below classification are recommended for SFMA 10A:

### **PROHIBITED**

1. Those waters and adjacent marshland between 10A-18 from Schooner Creek to the Charleston Harbor.
2. Those waters and adjacent marshland from Bass Creek to the Charleston Harbor.
3. Those waters and adjacent marshland within Parrot Point Creek from Lighthouse Rd down to Schooner Creek and across to the Charleston Harbor.
4. Those waters within 1,000 feet of the old Backman's Commercial Fisheries Dock.
5. Those waters within 1,000 feet of Sunset Cay Marina.
6. Those waters within 1,210 feet of Mariner's Cay Marina.
7. Those waters within 350 feet of Crosby's Commercial Fisheries Dock.

### **RESTRICTED**

1. Those waters and adjacent marshlands of the Folly River from the Folly River Boat Ramp Station 10A-08 (Folly River at SC Hwy 171 Bridge) to Station 10A-22 (Folly River State Shellfish Ground at Folly Island).
2. Those waters and adjacent marshlands of Clark Sound from Station 10A-15 (Secessionville Creek at Private Docks) to Station 10A-33 (Lighthouse Creek at Clark Sound) including Station 10A-35 Right Fork of Schooner Creek, Middle of Docks) to the Prohibited Closure Zone at Station 10A-19 (Schooner Creek at fork).
3. Holland Island Creek from SFMA 11 to Folly Rd in SFMA 10A behind Sol Legare Island.
4. Station 10A-32 (Block Island Creek at fork) and adjacent waters and marshlands including Station 10A-29 (Block Island Creek at Flats) and Morris Island.

## **CONDITIONALLY APPROVED**

None

## **APPROVED**

All other waters of SFMA 10A.

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

Analysis of sampling data for SFMA 10A demonstrates the probability of a significant impact from rainfall exceeding 4.00" in a 24-hour period. Therefore, a precautionary closure of SFMA 10A 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*).

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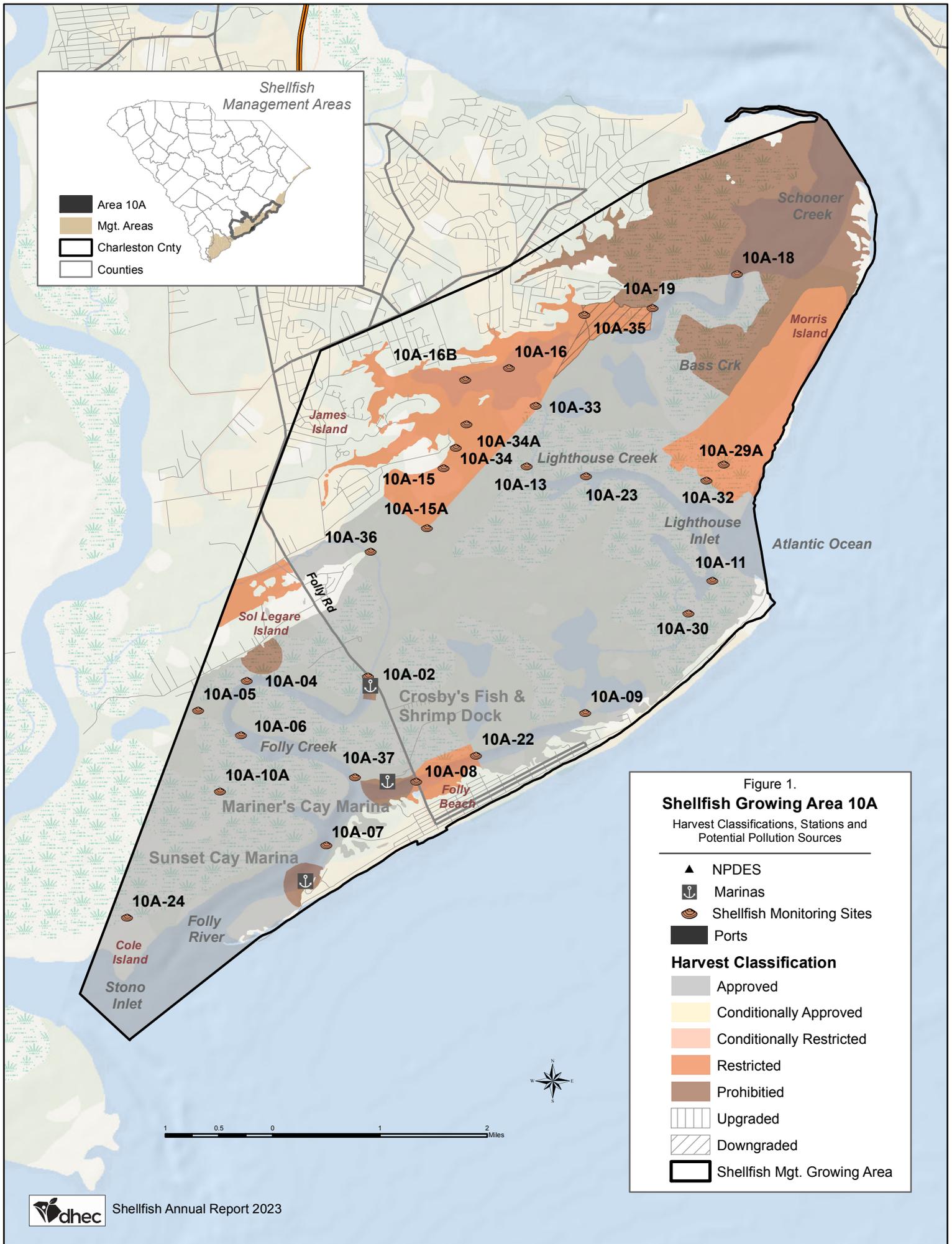
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**TABLE #1**  
**Shellfish Management Area 10A**  
**Water Quality Sampling Stations Description**

| <b>Station</b> | <b>Description</b>  |
|----------------|---|
| 10A-02 .....   | Folly Creek at SC Hwy 171 Bridge                              |
| 10A-04 .....   | Folly Creek at Backman Creek                                  |
| 10A-05 .....   | King Flats Creek  |
| 10A-06 .....   | Folly Creek at northern end of Little Island                  |
| 10A-07 .....   | Folly Creek north of old Folly Marina                         |
| 10A-08 .....   | Folly River at SC Hwy 171 Bridge                              |
| 10A-09 .....   | Folly River at Last Dock North                                |
| 10A-10A .....  | Robbins Creek at the first bend upstream from Cutoff Reach    |
| 10A-11 .....   | Rat Island Creek at first creek on left from Lighthouse Creek |
| 10A-13 .....   | Lighthouse Creek at Folly Creek                               |
| 10A-15 .....   | Secessionville Creek at Private Docks                         |
| 10A-15A .....  | Folly Creek at Secessionville Creek                           |
| 10A-16 .....   | Clark Sound at Ocean View Flats                               |
| 10A-16B.....   | Clark Sound, 550 yds East of Station 10A-16A                  |
| 10A-18 .....   | Schooner Creek at Schooner Bay                                |
| 10A-19 .....   | Schooner Creek at fork  |
| 10A-22 .....   | Folly River State Shellfish Ground at Folly Island            |
| 10A-23 .....   | Lighthouse Creek at First Sister Creek                        |
| 10A-24 .....   | Cole Creek - Second Bend                                      |
| 10A-29A .....  | Block Island Creek at Flats                                   |
| 10A-30 .....   | Rat Island Creek - Second Bend                                |
| 10A-32 .....   | Block Island Creek at fork                                    |
| 10A-33 .....   | Lighthouse Creek at Clark Sound                               |
| 10A-34 .....   | Secessionville Creek at First Dock nearest Clark Sound        |
| 10A-34A .....  | Lighthouse Creek at Secessionville Creek and Clark Sound      |
| 10A-35 .....   | Right Fork of Schooner Creek, Middle of Docks                 |
| 10A-36 .....   | Unnamed Creek at Fork near RiverFront Subdivision             |
| 10A-37 .....   | Folly Creek at Oak Island Creek                               |

**(Total Active – 28)**

**TABLE #2**

**Shellfish Management Area 10A  
FECAL COLIFORM BACTERIOLOGICAL DATA SUMMARY  
From Shellfish Water Quality Sampling Stations Between**

**January 1, 2020 to December 31, 2022**

| <b>Station #</b>      | <b>2</b> | <b>4</b> | <b>5</b> | <b>6</b> | <b>7</b> | <b>8</b> | <b>9</b> | <b>10A</b> | <b>11</b> | <b>13</b> |
|-----------------------|----------|----------|----------|----------|----------|----------|----------|------------|-----------|-----------|
| <b>SAMPLES</b>        | 33       | 32       | 33       | 33       | 32       | 33       | 33       | 33         | 33        | 33        |
| <b>GEOMEAN</b>        | 4.9      | 4.4      | 4.2      | 4.1      | 3.9      | 8.8      | 4.9      | 5.1        | 3.9       | 2.8       |
| <b>90TH %ILE</b>      | 18       | 16       | 15       | 13       | 12       | 60       | 17       | 21         | 11        | 8         |
| <b>WATER QLTY</b>     | A        | A        | A        | A        | A        | R        | A        | A          | A         | A         |
| <b>CLASSIFICATION</b> | P        | A        | A        | A        | A        | P        | A        | A          | A         | A         |

| <b>Station #</b>      | <b>15</b> | <b>15A</b> | <b>16</b> | <b>16B</b> | <b>18</b> | <b>19</b> | <b>22</b> | <b>23</b> | <b>24</b> | <b>29A</b> |
|-----------------------|-----------|------------|-----------|------------|-----------|-----------|-----------|-----------|-----------|------------|
| <b>SAMPLES</b>        | 33        | 33         | 33        | 33         | 33        | 33        | 33        | 33        | 33        | 33         |
| <b>GEOMEAN</b>        | 8.5       | 3.5        | 8.7       | 12.7       | 4.2       | 6.9       | 4         | 2.9       | 4.7       | 11.2       |
| <b>90TH %ILE</b>      | 44        | 11         | 47        | 69         | 15        | 34        | 15        | 9         | 21        | 80         |
| <b>WATER QLTY</b>     | R         | A          | R         | R          | A         | A         | A         | A         | A         | R          |
| <b>CLASSIFICATION</b> | R         | R          | R         | R          | P         | P         | R         | A         | A         | R          |

| <b>Station #</b>      | <b>30</b> | <b>32</b> | <b>33</b> | <b>34</b> | <b>34A</b> | <b>35</b> | <b>36</b> | <b>37</b> |
|-----------------------|-----------|-----------|-----------|-----------|------------|-----------|-----------|-----------|
| <b>SAMPLES</b>        | 32        | 33        | 33        | 33        | 33         | 33        | 33        | 33        |
| <b>GEOMEAN</b>        | 4.8       | 5.5       | 4         | 8.6       | 9.3        | 8.9       | 5.9       | 4.1       |
| <b>90TH %ILE</b>      | 20        | 29        | 17        | 43        | 51         | 50        | 36        | 14        |
| <b>WATER QLTY</b>     | A         | A         | A         | A         | R          | R         | A         | A         |
| <b>CLASSIFICATION</b> | A         | R         | R         | R         | R          | R         | R         | A         |

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

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

Area 10A Stations 90<sup>th</sup>ile Values for Annual Updates Related to Rainfall

| Station #                          | 2022         | 2021         | 2020         | 2019         | 2018         | 2017         | 2016         | 2015         | 2014        | 2013        | 2012        |
|------------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-------------|-------------|-------------|
| 10A-02                             | 18           | 18           | 11           | 7            | 7            | 8            | 12           | 10           | 11          | 6           | 6           |
| 10A-04                             | 16           | 15           | 9            | 5            | 7            | 8            | 10           | 10           | 10          | 6           | 6           |
| 10A-05                             | 15           | 15           | 12           | 7            | 6            | 6            | 7            | 7            | 6           | 4           | 6           |
| 10A-06                             | 13           | 14           | 12           | 9            | 10           | 8            | 10           | 9            | 9           | 7           | 6           |
| 10A-07                             | 12           | 14           | 12           | 9            | 10           | 9            | 7            | 7            | 8           | 7           | 5           |
| 10A-08                             | 60           | 52           | 23           | 9            | 8            | 9            | 9            | 9            | 12          | 9           | 11          |
| 10A-09                             | 17           | 16           | 9            | 9            | 8            | 8            | 6            | 6            | 7           | 7           | 9           |
| 10A-10A                            | 21           | 19           | 9            | 7            | 8            | 9            | 10           | 9            | 8           | 5           | 5           |
| 10A-11                             | 11           | 9            | 6            | 3            | 4            | 5            | 7            | 7            | 8           | 6           | 6           |
| 10A-13                             | 8            | 8            | 8            | 5            | 5            | 4            | 5            | 6            | 6           | 6           | 6           |
| 10A-15                             | 44           | 47           | 26           | 21           | 27           | 30           | 40           | 31           | 26          | 13          | 11          |
| 10A-15A                            | 11           | 11           | 6            | 5            | 6            | 8            | 9            | 7            | 6           | 5           | 5           |
| 10A-16                             | 47           | 53           | 34           | 27           | 21           | 26           | 50           | 46           | 35          | 15          | 12          |
| 10A-16B                            | 69           | 89           | 88           | 67           | 43           | 27           | 39           | 36           | 39          | 24          | 24          |
| 10A-18                             | 15           | 11           | 8            | 8            | 11           | 12           | 16           | 15           | 13          | 7           | 7           |
| 10A-19                             | 34           | 30           | 22           | 15           | 12           | 14           | 15           | 17           | 11          | 10          | 7           |
| 10A-22                             | 15           | 14           | 11           | 9            | 9            | 8            | 6            | 6            | 7           | 6           | 9           |
| 10A-23                             | 9            | 6            | 5            | 4            | 4            | 4            | 5            | 5            | 4           | 4           | 5           |
| 10A-24                             | 21           | 16           | 17           | 14           | 14           | 8            | 11           | 10           | 9           | 4           | 4           |
| 10A-29A                            | 80           | 71           | 52           | 14           | 15           | 12           | 19           | 23           | 26          | 19          | 14          |
| 10A-30                             | 20           | 17           | 12           | 5            | 5            | 5            | 7            | 8            | 8           | 6           | 5           |
| 10A-32                             | 29           | 27           | 16           | 9            | 12           | 13           | 11           | 11           | 12          | 10          | 12          |
| 10A-33                             | 17           | 19           | 13           | 8            | 8            | 7            | 9            | 9            | 9           | 8           | 8           |
| 10A-34                             | 43           | 54           | 44           | 27           | 24           | 22           | 30           | 25           | 27          | 19          | 16          |
| 10A-34A                            | 51           | 55           | 39           | 27           | 32           | 32           | 32           | 31           | 34          | 26          | 12          |
| 10A-35                             | 50           | 41           | 29           | 19           | 22           | 25           | 31           | 34           | 34          | 21          | 12          |
| 10A-36                             | 36           | 36           | 29           | 17           | 21           | 15           | 23           | 16           | 23          | 15          | 13          |
| 10A-37                             | 14           | 14           | 8            | 7            | 10           | 11           | 13           | 11           | 10          | 7           | 5           |
| <b>Annual Rainfall (in inches)</b> | <b>54.28</b> | <b>49.40</b> | <b>60.45</b> | <b>47.47</b> | <b>55.25</b> | <b>60.24</b> | <b>45.49</b> | <b>64.58</b> | <b>56.8</b> | <b>27.9</b> | <b>37.4</b> |

ND = No Data    Red = Impaired Water Quality

**TABLE #4**

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**WATER QUALITY  
SAMPLING STATIONS DATA**

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**Shellfish Management Area 10A**

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 Health and Environmental Control – Freedom of Information Office at the address below.

Freedom of Information  
SC Dept. of Health & Environmental Control  
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**

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**RAINFALL DATA**

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**Shellfish Management Area 10A**

**Source:**

**2020 – 2022 Data**

*National Weather Service - Southeastern River Forecast Center*

*Location: Folly Beach, South Carolina*

**2020 Annual Rainfall Summary**  
**Source: National Weather Service - Southeastern River Forecast Center**  
**Location: Folly Island, South Carolina**

| 2020  | JAN         | FEB         | MAR         | APR         | MAY         | JUNE         | JULY        | AUG         | SEPT                   | OCT         | NOV          | DEC         |
|---|-------------|-------------|-------------|-------------|-------------|--------------|-------------|-------------|------------------------|-------------|--------------|-------------|
| 1   |             | 0.43        |             | 0.70        | 0.38        | 0.02         | 0.58        |             | 0.01                   |             | 0.03         | 0.82        |
| 2   |             |             |             |             |             |              | 0.02        |             |                        |             | 0.06         |             |
| 3   |             |             | 0.41        |             |             |              | 0.24        | 0.10        |                        |             |              |             |
| 4   | 0.11        |             | 0.01        |             |             |              |             | 1.53        |                        | 0.03        |              |             |
| 5   | 0.10        |             | 1.17        |             |             | 0.33         |             | 0.08        |                        |             |              | 0.07        |
| 6   |             |             | 1.54        |             |             |              | 0.03        | 0.05        | 0.01                   | 0.01        |              |             |
| 7   |             | 0.77        |             |             |             | 0.60         | 0.73        | 0.28        | 0.07                   | 0.02        | 0.05         |             |
| 8   |             |             |             |             |             |              | 1.88        | 0.15        |                        |             | 0.02         | 0.15        |
| 9   |             |             |             |             |             | 0.09         | 0.60        | 0.07        | 1.13                   |             | 0.13         |             |
| 10  |             |             |             | 0.01        |             | 0.04         | 0.02        |             | 0.18                   |             | 0.02         |             |
| 11  |             |             |             |             |             | 0.29         | 0.04        | 0.15        |                        | 1.63        | 0.52         |             |
| 12  | 0.02        |             | 0.09        |             |             | 0.02         | 0.02        | 0.04        | 0.09                   |             | 0.49         |             |
| 13  | 0.05        |             |             | 0.01        |             | 1.22         |             | 0.01        |                        |             | 1.77         |             |
| 14  |             | 0.15        |             | 1.27        |             | 0.01         |             | 0.20        |                        |             |              |             |
| 15  | 0.01        | 0.03        |             | 0.36        |             | *4.88        | 0.04        | 0.75        | 0.03                   |             | 0.01         |             |
| 16  |             |             | 0.02        | 0.40        |             |              |             | 0.05        | 0.01                   | 0.16        |              | 0.03        |
| 17  | 0.06        | 0.19        |             |             |             |              |             |             | 1.50                   |             |              | 0.32        |
| 18  |             |             | 0.02        |             |             |              |             |             | 0.64                   |             |              |             |
| 19  |             | 0.57        |             |             |             | 0.03         |             | 0.09        |                        |             |              |             |
| 20  | 0.01        | 0.03        |             | 1.72        | 0.13        | 0.27         |             | 0.16        |                        |             |              |             |
| 21  |             | 0.55        |             | 0.01        | 1.20        | 0.06         |             | 1.95        |                        |             |              | 0.25        |
| 22  |             |             |             |             |             |              |             | 0.19        |                        | 0.08        |              |             |
| 23  |             |             | 0.02        | 0.07        | 0.18        |              |             | 0.49        |                        | 0.02        |              |             |
| 24  |             |             | 0.21        | *4.44       |             | 0.64         |             | 0.21        |                        |             |              | 0.05        |
| 25  | 0.21        | 0.70        | 0.04        |             |             | 0.86         | 0.32        | 1.22        | 0.06                   | 0.22        |              | 0.72        |
| 26  |             | 0.09        | 0.01        |             | 0.20        |              | 0.10        | 0.29        | 0.51                   |             | 0.05         |             |
| 27  | 0.14        | 0.13        |             |             | 1.89        |              | 0.02        | 0.88        |                        |             |              |             |
| 28  | 0.01        |             |             |             | 0.18        | 0.07         |             |             | 0.23                   |             |              |             |
| 29  |             |             |             |             |             |              | 0.05        | 0.05        | 0.72                   |             | 0.12         |             |
| 30  | 0.33        |             |             | 0.70        | 0.23        | 0.07         | 0.04        |             | 0.23                   | 0.18        | 0.72         |             |
| 31  |             |             |             |             | 0.38        |              | 0.24        | 0.12        |                        |             |              | 0.01        |
| <b>Total</b>  | <b>1.05</b> | <b>3.64</b> | <b>3.54</b> | <b>9.69</b> | <b>4.77</b> | <b>9.50</b>  | <b>4.97</b> | <b>9.11</b> | <b>5.42</b>            | <b>2.35</b> | <b>3.99</b>  | <b>2.42</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</b> |             | <b>60.45</b> |             |

**2021 Annual Rainfall Summary**  
**Source: National Weather Service - Southeastern River Forecast Center**  
**Location: Folly Island, South Carolina**

| 2021  | JAN         | FEB         | MAR         | APR         | MAY         | JUNE         | JULY        | AUG         | SEPT                   | OCT         | NOV          | DEC         |
|---|-------------|-------------|-------------|-------------|-------------|--------------|-------------|-------------|------------------------|-------------|--------------|-------------|
| 1   | 0.15        | 0.64        |             | 0.86        |             |              |             | 0.10        | 0.02                   |             |              |             |
| 2   | 0.03        |             | 0.06        |             |             |              | 0.01        | 0.29        |                        |             |              | 0.01        |
| 3   | 0.18        |             | 1.26        |             |             | 0.01         | 0.45        | 0.01        |                        | 0.15        |              |             |
| 4   |             |             | 0.23        |             | 0.31        | 0.12         |             | 0.43        |                        | 0.12        |              |             |
| 5   |             | 0.01        |             |             | 0.04        | 0.77         |             | 0.01        |                        |             |              |             |
| 6   |             | 0.12        |             |             |             | 0.02         |             | 0.25        | 0.12                   | 0.87        | 0.33         |             |
| 7   |             | 0.45        | 0.05        |             |             |              |             | 0.07        | 0.02                   | 0.47        | 0.87         |             |
| 8   | 0.63        |             |             |             |             |              | 3.11        | 0.04        |                        | 0.04        | 0.13         | 0.10        |
| 9   | 0.01        |             |             |             |             |              |             | 0.20        | 0.98                   | 0.05        |              | 0.93        |
| 10  |             | 0.04        |             | 0.01        |             | 0.20         | 0.61        |             | 1.90                   | 0.02        |              |             |
| 11  |             |             |             |             |             |              | 0.01        |             |                        |             |              |             |
| 12  | 0.06        | 0.03        |             |             | 0.65        | 0.05         |             |             |                        |             | 0.04         | 0.17        |
| 13  |             | 0.16        |             |             | 0.37        | 3.71         |             | 0.01        |                        |             |              |             |
| 14  | 0.03        | 0.22        |             |             |             | 0.40         | 0.12        |             |                        |             |              |             |
| 15  |             | 1.18        |             |             |             |              | 0.06        | 0.28        | 0.01                   |             |              |             |
| 16  | 0.20        | 0.23        | 0.04        |             |             | 1.29         |             | 0.12        | 0.01                   |             |              |             |
| 17  |             |             |             |             |             | 0.28         |             | 0.74        |                        |             |              |             |
| 18  |             |             |             |             |             |              | 0.01        | 1.01        | 0.03                   |             |              |             |
| 19  |             | 0.33        | 1.59        |             |             |              | 0.10        | 0.19        | 0.03                   |             |              |             |
| 20  |             | 0.46        |             |             |             | 0.16         | 0.17        | 0.04        | 0.09                   |             |              | 0.07        |
| 21  |             |             | 0.10        |             |             | 2.77         | 0.57        | 0.02        | 2.03                   |             |              | 0.18        |
| 22  | 0.22        | 0.02        | 0.12        |             |             |              |             | 0.78        | 0.48                   |             |              | 0.38        |
| 23  | 0.18        |             |             |             |             | 0.49         | 0.31        | 0.30        | 0.12                   |             | 0.02         |             |
| 24  |             |             |             |             |             |              |             | 0.12        |                        |             |              |             |
| 25  |             |             |             | 1.70        |             |              |             |             |                        | 0.69        |              |             |
| 26  |             |             |             |             |             |              | 0.02        |             |                        | 0.10        | 0.02         |             |
| 27  | 0.52        |             | 0.12        |             |             | 0.09         | 0.04        |             |                        |             |              |             |
| 28  | 0.52        |             |             |             |             |              | 0.75        |             |                        |             |              |             |
| 29  |             |             | 0.02        |             |             | 0.36         | 0.64        |             |                        | 0.44        |              |             |
| 30  |             |             |             |             | 0.11        |              |             |             |                        |             |              |             |
| 31  |             |             | 0.01        |             |             |              |             |             |                        |             |              | 0.38        |
| <b>Total</b>  | <b>2.73</b> | <b>3.89</b> | <b>3.60</b> | <b>2.57</b> | <b>1.48</b> | <b>10.72</b> | <b>6.98</b> | <b>5.01</b> | <b>5.84</b>            | <b>2.95</b> | <b>1.41</b>  | <b>2.22</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</b> |             | <b>49.40</b> |             |

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

| 2022  | JAN         | FEB         | MAR         | APR         | MAY         | JUNE         | JULY         | AUG          | SEPT                   | OCT         | NOV          | DEC         |
|---|-------------|-------------|-------------|-------------|-------------|--------------|--------------|--------------|------------------------|-------------|--------------|-------------|
| 1   |             |             |             | 0.15        |             |              | 0.41         |              | 0.22                   | *6.76       |              | 0.19        |
| 2   |             |             |             |             |             |              | 3.63         |              | 1.12                   |             |              |             |
| 3   | 0.02        |             |             |             |             |              |              |              |                        |             |              |             |
| 4   |             |             |             |             |             | 0.08         |              |              |                        |             |              |             |
| 5   |             | 0.31        |             |             |             | 0.01         | 0.01         | 0.01         | 0.08                   |             | 0.02         | 0.01        |
| 6   | 0.02        |             |             | 0.53        |             | 0.13         |              | 0.01         | 0.10                   |             |              | 0.16        |
| 7   |             | 0.05        |             | 0.38        | 0.01        |              | 0.08         | 0.08         |                        |             |              |             |
| 8   |             | 0.07        |             | 0.05        |             |              | 0.07         | 0.31         |                        |             |              |             |
| 9   |             |             | 0.41        |             |             | 0.52         | 0.01         | 0.88         | 2.11                   |             |              |             |
| 10  | 0.14        |             | 0.41        |             |             | 0.15         | 0.38         | 0.10         | 1.16                   |             |              | 0.08        |
| 11  |             |             |             |             |             |              | 1.42         |              |                        |             | 1.86         |             |
| 12  |             |             | 0.13        |             |             | 0.40         |              | 0.74         |                        |             | 0.05         | 0.07        |
| 13  |             | 0.05        | 0.03        |             | 0.39        |              | 0.07         | 0.45         | 0.02                   | 0.51        |              |             |
| 14  |             | 0.02        |             |             | 0.25        |              | 0.03         |              |                        |             |              |             |
| 15  |             |             |             |             |             |              | 0.03         |              |                        |             | 0.04         | 0.11        |
| 16  | 0.40        |             | 0.03        |             |             |              | 0.55         |              |                        |             | 0.07         | 0.13        |
| 17  | 0.92        | 0.46        | 0.29        | 0.04        | 0.25        | 0.16         | 0.01         | 0.56         |                        |             |              |             |
| 18  |             | 0.04        |             | 0.29        |             | 0.15         | 0.23         | 0.49         | 0.34                   |             |              |             |
| 19  |             | 0.06        | 0.07        | 0.04        |             |              | 0.03         | 0.51         | 0.25                   |             |              |             |
| 20  |             |             | 0.09        |             |             |              | 0.22         | 0.36         |                        |             | 0.03         |             |
| 21  | 0.10        |             |             |             |             |              | 0.67         |              |                        |             |              | 0.91        |
| 22  | 0.31        |             |             |             | 0.06        |              |              | 0.66         |                        |             |              | 0.35        |
| 23  |             |             |             |             | 0.85        |              | 2.31         | 0.43         | 0.08                   |             |              | 0.05        |
| 24  |             |             | 0.59        |             |             |              | 0.11         | 0.14         |                        |             |              |             |
| 25  |             |             | 0.74        |             |             |              |              | 0.02         |                        |             | 0.01         |             |
| 26  | 0.01        |             |             |             |             |              |              | 0.59         |                        |             |              |             |
| 27  |             |             |             | 0.04        | 0.14        |              |              |              | 0.03                   |             | 0.04         |             |
| 28  |             | 0.04        |             |             | 1.02        |              |              |              |                        |             | 0.01         |             |
| 29  | 0.06        |             |             |             |             | 1.65         |              | 0.55         |                        |             |              |             |
| 30  |             |             |             |             |             | 0.49         |              | 3.72         | 2.04                   |             |              | 0.01        |
| 31  |             |             |             |             |             |              |              | 0.20         |                        | 0.08        |              |             |
| <b>Total</b>  | <b>1.98</b> | <b>1.10</b> | <b>2.79</b> | <b>1.52</b> | <b>2.97</b> | <b>3.74</b>  | <b>10.27</b> | <b>10.81</b> | <b>7.55</b>            | <b>7.35</b> | <b>2.13</b>  | <b>2.07</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</b> |             | <b>54.28</b> |             |

**TABLE #6**  
**Shellfish Management Area 10A**  
**Precautionary & Pollution Event Closures**  
**2020 – 2022**

| <b>Event</b>      | <b>Date(s)</b> | <b>Sample Date(s)</b> | <b>Opening Date</b> | <b>Comments</b>   |
|-------------------|----------------|-----------------------|---------------------|---|
| April Storm Event | 04/24/2020     | 5/4/2020              | 5/5/2020            | 4.44 inches of rain produced during a 24-hr period. Area reopened after special sampling indicated it was safe to reopen the area.                |
| June Storm Event  | 06/15/2020     | N/A                   | N/A                 | 4.88 inches of rain produced during the storm event. Open Shellfish Harvesting Season was closed. No summer harvest in SFMA 10A during this time. |
| Hurricane Ian     | 9/30/2022      | 10/9/2022             | 10/12/2022          | 6.76 inches of rain produced during this two-day rain event. Area reopened after special sampling indicated it was safe to reopen the area.       |

**TABLE #7**  
**Shellfish Management Area 10A**  
**MARINA INVENTORY**

| <b>Marina</b>                       | <b>Total Slips</b> | <b>Pump-out Facility</b> | <b>Fuel Dock</b> |
|-------------------------------------|--------------------|--------------------------|------------------|
| Sunset Cay                          | 118                | Yes                      | No               |
| Mariners Cay                        | 89                 | Yes                      | Diesel-Gas       |
| Crosby's Fish & Shrimp Co.          | 7                  | No                       | Fuel Truck       |
| Backman's Seafood (Out-of-Business) | 3                  | No                       | Diesel           |