REPORT OF SANITARY SURVEY

AREA D-4

DEER CREEK AREA

MAY 2008 THROUGH APRIL 2013

Prepared 7/13

Approved By:_____

Date: _____

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FIGURES

TABLES

The D-4 area of coastal North Carolina, which includes the Deer Creek area of Bogue Sound in Carteret County, lies in the central portion of the state off of the Atlantic Ocean. Review of the bacteriological data indicates little overall change in bacteriological water quality within the area since the last Sanitary Survey Report in 2010. Classification is adequate, and no changes are required at this time.

1.0 SANITARY SURVEY

1.1 INTRODUCTION

The D-4 growing area is bordered in the west by Intracoastal Waterway (ICWW) Beacon #45, and in the east by ICWW Channel Marker #28, and includes the waters of Bogue Sound, Deer Creek, Hunting Island Creek, Goose Creek, Sanders Creek, and Archer Creek. Overall, the area includes a total of approximately 7,665 water acres (Figure 1). The watershed includes the communities of Emerald Isle, Cape Carteret, Cedar Point, and Newport, as well as a few smaller, unincorporated towns. Shellfish production throughout much of D-4 is considered good, and both oysters and clams can be harvested.

See Figure 2 for an area map and sampling station locations. Table 1 contains sampling station descriptions.

1.2 SHORELINE SURVEY OF SOURCES OF POLLUTION

Survey Methods

A comprehensive shoreline survey of the mainland side of Area D-4 was completed on November 27th, 2012 (Figure 3). The Carteret County Health Department was notified prior to the survey, and they have agreed to provide corrective action and follow-up for any malfunctioning septic systems or illegal onsite wastewater discharges discovered. Shoreline survey updates are also completed in years that a comprehensive shoreline survey is not conducted.

The mainland side of Area D-4 includes Deer Creek, Hunting Island Bay, Goose Creek, Sanders Creek, and a portion of Bogue Sound. The permanent population surrounding this area is estimated to be 4,650, according to U.S. Census Bureau block data from 2010, which is an increase over the total of 3,400 noted in 2000.

Area D-4: Mainland Shoreline Survey

Non-Point Source Pollution

Marinas - Marina facilities are evaluated during the shoreline survey because of their potential to affect the suitability of shellfish for harvest through inputs of both biological and chemical contaminants. A marina is defined as “any water area with a structure (dock, basin, floating dock, etc.) which is utilized for docking or otherwise mooring vessels and constructed to provide temporary or permanent docking space for more than 10 boats” (15A NCAC 18A .0901). The waters

enclosed by a marina are classified as *Prohibited* for the harvest of shellfish, and an additional area beyond the marina can also be classified as *Prohibited* depending on the number of boat slips present.

Overall, there have been very few changes of note at any of the marinas (Figure 4) along the mainland side of D-4, and no changes that will affect growing area classifications.

Minor construction has occurred at both of the Cape Carteret Community Dockages, which have added three slips and five slips, respectively, since the 2009 survey was completed. All of these slips have been added within the existing footprints of the marinas, however, so no changes in classification are necessary.

Meanwhile, the slip count at the Old Ferry Landing dockage has been reduced by two, as one of the finger piers was damaged and never rebuilt.

The Cannonsgate Marina has begun to see more usage as homes have been built within the subdivision, and a total of 8 boats were noted during this survey. One of these boats was a live-aboard, which is prohibited by the marina by-laws, but the home owners association hopes to have the situation resolved shortly.

Stormwater – Stormwater can adversely impact shellfish growing areas by rapidly transporting fecal coliform bacteria and other contaminants from the land to the water. There have been no notable changes to the stormwater systems of this area since the last comprehensive shoreline survey was completed in 2009, and runoff from impervious surfaces, subdivisions, and other cleared land remains the primary contributor to fecal coliform levels throughout the mainland side of D-4 (Figure 5).

Subdivisions – Subdivisions (Figure 6) are noted in the survey as an indicator of population growth, as well as for their tendency to concentrate potential sources of pollution such as septic systems, pet wastes, and stormwater. There has been relatively little growth within the mainland portion of D-4, although a few subdivisions that were new in the 2009 survey have since begun home development.

Morada Bay now includes 20 homes, while Cannonsgate includes 13. Bogue Watch has added homes as well, and it is expected that the pace of development will increase in the coming months.

Bogue Bluff, which was new in 2009, is now completely built out, with 22 total homes.

Onsite Wastewater – With the exceptions of Cedar Point Villas, Waterway RV Park, Cannonsgate, and Bogue Watch, all homes and businesses within this

portion of the area are served by individual septic systems. Many of these systems were visited and inspected during the survey, and no ongoing failures or illicit discharges were located. Several recently repaired systems were located, however, so it is possible that some onsite wastewater issues may occur during wetter periods of the year.

Wastewater Plants – Currently, there are two operating wastewater treatment plants on the mainland side of the D-4 area, at Cedar Point Villas and at Bogue Field (Figure 7).

A new plant at Cedar Point Villas was completed and went into operation on Labor Day weekend, 2012. This new plant includes tertiary treatment, sand filters, and UV disinfection, with a discharge to the preexisting LPP drainfields. The new plant is built out of concrete, so many of the corrosion issues that were so problematic at the old plant should no longer be an issue.

Increases in base population at the Bogue Field Marine Corps Auxiliary Landing Field were leading to high flows at the wastewater treatment plant that exceeded permitted capacity. In order to remedy this situation, plant operators worked with the North Carolina Division of Water Quality to develop a plan that would allow for an increase in permitted capacity. Operators agreed to a plan that involved increasing contact time within the existing plant structure, as well as the addition of monitoring wells surrounding the facility, and in exchange, the permitted capacity was increased from 3,400 gallons per day (gpd) up to 18,000 gpd. All of these changes were completed in 2011, and the plant continues to operate without any issues.

At the time of the triennial shoreline survey, the package wastewater treatment plants at both Cannonsgate and Bogue Watch remained inactive, as flows were too low to maintain an effective treatment system. Instead, wastewater from the homes in both subdivisions was pumped to the plants, where it is stored in the equalization tanks until being removed from the site through pump and haul.

As of the annual update in May 2013, there were severe infiltration problems at the collection system for the Bogue Watch subdivision, which has lead to overflows. During this survey, wastewater was observed flowing out of a manhole and towards a ditch that eventually drained to *Prohibited* waters of Sanders Creek. A sample was taken from this overflow, which showed an MPN of 9200 fecal coliforms/100 mL. DWQ as well as the operators of this treatment plant, Aqua NC, were notified, and this portion of the system was cut off from the rest of the system until permanent repairs can be made. This area will be monitored closely by Shellfish Sanitation and Aqua NC staff to ensure that there are no further problems.

Operators of the Cannonsgate package wastewater treatment plant are hopeful that there will be enough homes within the subdivision within the next year so

that they can turn the plant on and transition away from the pump and haul system that is currently in place.

Wildlife and Domestic Animals – Wildlife, including raccoon, deer, opossum, and waterfowl, are present throughout the D-4 area. Domestic animals and livestock are also present, although not in great concentrations (Figure 8).

Agricultural Runoff – There are agricultural fields scattered throughout the mainland side of D-4, especially between Goose Creek and Deer Creek. Pollutants such as sediment, nutrients, pesticides, and pathogens can enter shellfishing waters through the drainage ditches of these fields. However, it should be noted that the majority of farmland in this growing area has been purchased and converted to subdivisions.

Poisonous or Deleterious Substances – There are no known problems with poisonous or deleterious substances affecting shellfish in the D-4 area.

Area D-4: Emerald Isle Shoreline Survey

A comprehensive shoreline survey of the Emerald Isle side of Area D-4 was completed on August 16th, 2012 (Figure 3). Shoreline survey updates are also completed in years that a comprehensive shoreline survey is not conducted.

The Emerald Isle side of Area D-4 includes portions of Bogue Sound, as well as all of Archers Creek. US Census Bureau block data from 2010 indicated a permanent population within this portion of the area of 2,900, an increase over the population of 2,350 indicated in 2000. It should be noted that many of the homes in this region are used only seasonally, so summer populations can be much higher.

Non-Point Source Pollution

Marinas – Marina facilities (Figure 4) are evaluated during the shoreline survey because of their potential to affect the suitability of shellfish for harvest through inputs of both biological and chemical contaminants. A marina is defined as “any water area with a structure (dock, basin, floating dock, etc.) which is utilized for docking or otherwise mooring vessels and constructed to provide temporary or permanent docking space for more than 10 boats” (15A NCAC 18A .0901). The waters enclosed by a marina are classified as *Prohibited* for the harvest of shellfish, and an additional area beyond the marina can also be classified as *Prohibited* depending on the number of boat slips present.

At the time of the comprehensive shoreline survey in 2012, the Island Harbor Marina had recently been renovated after receiving severe damage during Hurricane Irene. The total slip count has been reduced significantly, and the marina now includes 88 slips, down from 142 during the last triennial survey in

2009. This reduction in slip count could allow for a decrease in the size of the buffer closure surrounding the facility from 275 feet to 200 feet in all directions. As a condition of their new permit, the marina is now required to maintain a pumpout station. This pumpout is rarely used, however, as all wastewater from the facility is treated through a septic system, and the dockmaster does not want to overwhelm the system. Instead, he typically refers interested boaters to the next nearest pumpout station at Caspers Marina, about 4 miles away.

At the time of the annual survey in May 2013, the Island Harbor Marina in Emerald Isle has closed to the public, and the slips and boat ramp are now available only to members. Additionally, the marina has stopped carrying fuel, and the marina shop has closed. The owners of the facility have put their plans for redevelopment on hold, and are currently reassessing what they want to do with the property. Until a decision is made, usage of the marina is likely to remain low.

The Emerald Plantation subdivision maintains a 10-slip community dock, and there are three privately owned slips less than 100 feet from the facility as well. These slips currently meet the exemption criteria laid out in 15A NCAC 18A .0911, which states that “marinas with less than 30 slips, having no boats over 24 feet in length, no boats with heads, and no boats with cabins” are not required to have a buffer area prohibited to shellfish harvest.

No changes were noted at either the Emerald Landing or Sunset Landing community docking facilities.

Stormwater – Stormwater can adversely impact shellfish growing areas by rapidly transporting fecal coliform bacteria and other contaminants from the land to the water. Runoff from impervious surfaces, subdivisions, and other cleared land is a major contributor to fecal coliform levels on the Emerald Isle side of D-4, especially within Archers Creek (Figure 5).

Subdivisions – Subdivisions (Figure 6) are noted in the survey as an indicator of population growth, as well as for their tendency to concentrate potential sources of pollution such as septic systems, pet wastes, and stormwater.

There have been very few changes within this portion of the growing area since the 2009 survey was completed. No new subdivisions have been developed, and the new subdivisions noted during the 2009 survey have not experienced much growth.

The Shell Cove North project, mentioned within the 2009 survey report, has since been discontinued, and the property is now part of the large regional public boat ramp facility that was build in Emerald Isle.

Onsite Wastewater – Most of the D-4 area is served by individual septic systems. Many of these systems were visited and inspected during the survey, and were found to be functioning properly.

Although no failures were located during this survey, it should be noted that several people with homes along the channelized portion of Archers Creek (between the Emerald Plantation Subdivision and Cedar Street) mentioned having issues with their septic systems within the last few years. Repairs were made in all cases, but this area is likely a hot-spot for potential wastewater issues, especially during the summer months when usage is high.

Package Plants – There are two package wastewater treatment plants located in the Emerald Isle portion of D-4 (Figure 7). The Cape Emerald plant, which serves both the Cape Emerald and Royall Oaks subdivisions, treats and disposes of waste through rapid infiltration via rotary distribution. This plant continues to have issues exceeding its permitted nutrient limits in the groundwater surrounding the disposal site, and there are plans to add a new tank to the plant in order to allow for better nutrient reduction during the treatment process. It is not likely that these issues will have any impact on the surrounding shellfishing waters; however, as the disposal site is located about ¼ of a mile from the nearest *Approved* waters.

The plant at Emerald Plantation has been completely redone, and the new plant went online in the summer of 2010. Although very similar in function to the old plant, this new plant is built of concrete, so many of the corrosion issues that plagued the old plant should be eliminated. Additionally, the new plant has added additional denitrification capabilities, which should help in meeting nutrient limits in the discharge. The plant still disposes of treated waste through the same large LPP field, which continues to function well.

Wildlife and Domestic Animals – Wildlife, including raccoon, deer, opossum, and waterfowl, are present throughout the D-4 area. Pets such as dogs and cats are prevalent as well. One small horse farm was noted along the water off of Coast Guard Road (Figure 8). This farm included 2 horses, as well as geese and chickens. Overall, it is unlikely that any of these animals have a significant impact on the water quality within D-4.

Other - There is no agriculture within this portion of D-4. There are no known problems with poisonous or deleterious substances affecting shellfish in the area.

1.3 HYDROGRAPHIC FACTORS RESPONSIBLE FOR THE SPREAD OF POLLUTION

Tidal movements in the D-4 area are primarily influenced by Bogue Inlet. This inlet, which is located at the western tip of Emerald Isle, provides good flushing to

the area. Salinities are generally high, and ranged from 28 to 38 parts per thousand during the period covered within this survey (Table 7).

Stormwater runoff is one of the major sources of contamination within the area. The *Conditionally Approved Open* portions of D-4 extend from the ICWW to the mainland, and are closed following a rainfall event of 2.5 inches or greater within a 24-hour period. Overall, the waters of D-4 were temporarily closed 26 times for a total of 193 days during the time frame of this report (Table 8). Five of these closures, totaling 52 days, were due to extremely heavy rainfall associated with hurricanes or tropical storms, while the remaining closures were due to individual rainfall events that exceeded the management criteria. Post rainfall sampling results are contained within Table 9.

There are four areas within D-4 that are classified as *Conditionally Approved Closed*, including portions of Deer Creek, Goose Creek, Hunting Island Creek, and Sanders Creek (Figure 2). These waters are typically closed to shellfish harvest, but during dry conditions, bacteria levels have been shown to decline to within the acceptable range for a temporary opening. During these periods, water and meat samples are taken, and if both samples meet the criteria for *Approved* status, the area is temporarily opened to shellfishing until 0.5 inches or greater of rain is received within a 24-hour period, or until 0.75 inches or greater of rain is received within a 48-hour period. There have been no temporary openings of the *Conditionally Approved Closed* waters of D-4 within the time frame covered by this report.

There are currently two rain gauges stations used within the D-4 area, including one in Cape Carteret and one on Emerald Isle. These stations provide adequate rainfall information for the management of Growing Area D-4 (Table 10). Monthly rainfall (mainland) has averaged to be 4.46” during the current survey period.

1.4 BACTERIOLOGICAL SURVEY OF SHELLFISH GROWING WATERS

The monitoring of Area D-4 adheres to the systematic random sampling strategy outlined by the National Shellfish Sanitation Program (NSSP) and consists of 30 sample sets from 23 sampling stations used during this survey period (Figure 2, Table 1).

The bacteriological survey covered for the preparation of this report included water samples from 5/19/08 through 4/18/13. During that time period, a total of 690 water samples were collected during times that the waters were open to the harvest of shellfish, and analyzed for fecal coliform bacteria in compliance with the systematic random sampling regime. Table 11 lists, for each individual sampling station, the date the sample was obtained, the tidal cycle upon which the sample was taken, and ambient salinity. Fecal coliform Most Probable Number (MPN) and summary statistics are listed as well.

1.5 SUMMARY OF BACTERIOLOGICAL DATA ANALYSIS

All of the 23 sampling stations used during this report period meet approved NSSP bacteriological standards. Station #13, located within the Cedar Point Villas/Waterway RV Park Marina closure, continues to show marginal, although still approved, results. The station has a geometric mean of 6.09 and an estimated 90th percentile of 35.

Sampling results indicate little overall change in bacteriological water quality since the last Sanitary Survey Report of 2010. Refer to Table 12 for summary and descriptive bacteriological statistics.

1.6 OVERALL EVALUATION AND RECOMMENDATIONS

It should also be noted that a number of adjustments to marina buffer closures have been made via NC DMF Proclamation during the period of this survey in accordance with marina rules. These include Bayshore Park at Cape Carteret in 2010, Island Harbor Marina in 2012, and Cedar Point Villas/Waterway RV Park and Bogue Sound Yacht Club in 2013.

Classification of the D-4 area appears to be adequate. No changes in classification are necessary at this time.

2.0 CONDITIONAL AREA MANAGEMENT PLAN

2.1 INTRODUCTION

Area D-4 is composed of the waters of Bogue Sound and all tributaries between Intracoastal Waterway Channel Marker #28 in the east, and Beacon #45 in the west. Major tributaries affecting this area include Deer Creek, Hunting Island Creek, Goose Creek, Sanders Creek, and Archer Creek. Overall, the area includes a total of approximately 7,665 water acres. The D-4 watershed includes the communities of Cedar Point, Cape Carteret, Newport, and Emerald Isle, and the permanent population within the area is 4,650, as estimated using US Census Block Data from 2010. Shellfish production throughout much of D-4 is considered good, and both oysters and clams can be harvested.

The portion of D-4 that is considered *Conditionally Approved* and is normally open to shellfish harvest includes all waters from the ICWW to the mainland in Growing Area D-4, excluding the portions of the creeks and tributaries described below (Figure 2).

There are four areas within D-4 that are classified as *Conditionally Approved* and are closed to shellfish harvest on a regular basis (Figure 2). The following water bodies can be opened to shellfish harvest on a temporary basis when management plan criteria are met:

Deer Creek: All those waters in Deer Creek enclosed by a line beginning at a point 34° 41.0448' N - 77° 03.3250' W on the west shore; running northeasterly to a point 34° 41.1826' N - 77° 03.1071' W on the east shore; running northwesterly along the shoreline to a point 34° 41.2137' N - 77° 03.1359' W; running northwesterly to a point 34° 41.2203' N - 77° 03.1405' W; running northwesterly along the shoreline to a point 34° 41.2622' N - 77° 03.1916' W; running westerly to a point 34° 41.2666' N - 77° 03.2218' W; running westerly along the shoreline to a point 34° 41.2615' N - 77° 03.2671' W; running westerly to a point 34° 41.2578' N - 77° 03.2817' W; running westerly along the shoreline to a point 34° 41.2522' N - 77° 03.3347' W; running southwesterly to a point 34° 41.1951' N - 77° 03.4133' W along the west shore; running southerly to a point 34° 41.1718' N - 77° 03.4104' W; running southerly along the shoreline to a point 34° 41.0448' N - 77° 03.3250' W.

Hunting Island Creek: All those waters in Hunting Island Bay enclosed by a line beginning at a point 34° 41.2003' N - 77° 02.6290' W on the west shore; running southeasterly to a point 34° 41.1136' N - 77° 02.3261' W on the east shore; running northerly along the shoreline to a point 34° 41.2839' N - 77° 02.3553' W; running northerly to a point 34° 41.3590' N - 77° 02.3731' W; running westerly along the shoreline to a point 34° 41.3951' N - 77° 02.5346' W; running southerly to a point 34° 41.3780' N - 77° 02.5448' W along the west shore; running southerly along the shoreline to a point 34° 41.2003' N - 77° 02.6290' W.

Goose Creek: All those waters in Goose Creek enclosed by a line beginning at a point 34° 41.8408' W - 77° 00.7144' W on the west shore; running easterly to a point 34° 41.8147' N - 77° 00.5807' W; running northerly to a point 34° 41.8679' N - 77° 00.5782' W; running northeasterly to a point 34° 41.8920' N - 77° 00.5085' W along the east shore; running northerly along the shoreline to a point 34° 42.0244' N - 77° 00.5560' W; running westerly to a point 34° 42.0485' N - 77° 00.7669' W; running southerly to a point 34° 41.9125' N - 77° 00.7934' W along the west shore; running southeasterly along the shoreline to a point 34° 41.8408' N - 77° 00.7144' W.

Sanders Creek: All those waters in Sanders Creek enclosed by a line beginning at a point 34° 42.4693' N - 76° 58.3754' W on the west shore; running easterly to a point 34° 42.4903' N - 76° 58.1430' W on the east shore; running northwesterly along the shoreline to a point 34° 42.5855' N - 76° 58.3585' W; running southerly to a point 34° 42.5305' N - 76° 58.3669' W on the west shore; running southerly along the shoreline to a point 34° 42.4693' N - 76° 58.3754' W.

2.2 MANAGEMENT PLAN

Rainfall resulting in significant runoff is the single largest contributor to the bacterial contamination of shellfishing waters within coastal North Carolina. The *Conditionally Approved Open* waters of Area D-4 are normally open to shellfish harvesting, but will be recommended closed after 2.5 inches of rain or greater

within a 24-hour period. When such a rain event occurs, the following closure will be recommended:

> *Bogue Sound: All those waters from the ICWW to the mainland in Growing Area D-4.*

The *Conditionally Approved Open* waters of D-4 will then remain closed until such time as the rainfall event has ended, sampling indicates that water quality meets approved area criteria.

The *Conditionally Approved Closed* waters of Area D-4 are normally closed to shellfish harvesting, and are only opened to shellfishing on a temporary basis when weather conditions are favorable, making nonpoint source contamination unlikely. Sampling of both shellfish waters and meat is conducted, and satisfactory results are required for both before a temporary opening will be made. Sampling will continue after the opening, with the frequency of sampling being determined by the area, as well as by the local hydrographic and meteorological conditions. The area will be recommended closed after 0.5 inches or greater of rain within a 24-hour period, or 0.75 inches or greater within a 48-hour period. Closures are recommended to the Division of Marine Fisheries (DMF), and take effect immediately. DMF is responsible for implementing and enforcing any closures.

Two rain gauges have been established within the D-4 area, including one on Emerald Isle and one in Cape Carteret. Rainfall amounts are called in to the DMF Communications Center in Morehead City, and are checked regularly by Shellfish Sanitation personnel, to determine if closures are necessary. Monthly tally sheets are also mailed to the Shellfish Sanitation office, and a call sheet is utilized when a rainfall event is suspected.

During extremely heavy rainfall events or unusual storm events, additional waters in the D-4 area can be temporarily closed. These types of events would be classified as emergency closures since the events are infrequent. A public health emergency means any condition that may immediately cause shellfish waters to be unsafe for the harvest of shellfish for human consumption.

2.3 IMPLEMENTATION OF MANAGEMENT PLAN

If the rainfall level in the management plan for the area is exceeded, a proclamation is issued by DMF resulting in an immediate closure of the area. The proclamation is issued by fax, mail, email or by area law enforcement officers who in turn distribute it to local establishments in the affected area for public notification.

After hours and on weekends, Shellfish Sanitation personnel will be in contact with rain gauges contacts and with the DMF Communications Center for

information regarding rainfall reports. The DMF Communications Center is on duty 24 hours per day.

2.4 PATROL OF CLOSED AREA

Patrol of shellfish harvesting areas is the sole responsibility of the Division of Marine Fisheries Marine Patrol Section. For information regarding enforcement of closures and patrol of closed area, see the Patrol Policy of the DMF Marine Patrol Section.

2.5 REOPENING CRITERIA

After the rainfall event has ended and sufficient time has elapsed to allow the area to return to normal, the temporarily closed area will be sampled. If the results indicate fecal coliform levels to be acceptable, a proclamation is issued to reopen the area. DMF issues and distributes the proclamation. In accordance with 15A NCAC 113-221 of the DMF rules, a 12-hour notification is required for reopening of closed shellfishing areas.

3.0 CONDITIONAL AREA EVALUATION

3.1 INTRODUCTION

The National Shellfish Sanitation Program (NSSP) C*onditionally Approved* classification for shellfish growing waters allows the utilization of valuable shellfish resources by permitting harvesting when environmental conditions cause fecal coliform levels to be satisfactory in areas that would otherwise be closed to the harvesting of shellfish. In order for the State to be in compliance with NSSP guidelines, conditionally approved areas must be evaluated yearly in accordance with Model Ordinance, Chapter IV, @ 03, C., (3), (a) and (b) of the NSSP Guide For The Control Of Molluscan Shellfish. This report is intended to comply with that portion of the NSSP yearly evaluation of the *Conditionally Approved* area for the Deer Creek area, D-4, in Carteret County. Each of the six required elements of the evaluation will be included in this report.

3.2 COMPLIANCE WITH MANAGEMENT PLAN

The monitoring of area D-4 adheres to the systematic random sampling strategy outlined by the National Shellfish Sanitation Program (NSSP) and consists of 30 sample sets from 23 sampling stations (Figure 2, Table 1) located throughout the area. The area has additionally been sampled in accordance with management plan criteria for the conditionally approved classification of the NSSP.

Rain events that exceed management plan criteria of 2.5 inches of rain or greater within a 24-hour period result in a temporary closure of the conditionally approved area. Table 8 contains a listing of temporary closures of the

conditionally approved waters of Area D-4. Review of the management plan during the time period of this report indicates that with the possible exception of one event, all closures were made in accordance with the requirements of the plan.

A reading of 3.50” on 8/13/2010 was noted on the monthly tally sheet when received after the month was complete from the Cape Carteret rain gauge contact. Calls made at the time to other rain gauges indicated 1.60” in Emerald Isle and 2.0” at another Cape Carteret rain gauge, so no temporary closure was made. This was likely an isolated rainfall event surrounding that gauge only.

In order to detect all future events that exceed management plan criteria, calls are made to the rain gauge locations after any significant rain event. It is also requested that the rain gauge contact persons call the office after rainfall amounts that exceed the management criteria. Additional resources are now being used to determine the locations and amount of precipitation, such as the NOAA National Weather Service and other commercial weather websites. Additionally, plans are now made to have someone available to check the rain gauge totals on weekends, which was not available up until this time.

The *Conditionally Approved* areas in D-4 that are normally closed to shellfishing can be temporarily opened when weather conditions are favorable and when water and shellfish samples are suitable. There have been no temporary openings during the time period of this report.

3.3 ADEQUACY OF REPORTING

For coastal North Carolina, rainfall and the resultant runoff is the event most detrimental for shellfish water quality. Currently, all management plans for conditionally approved waters are dependent on the amount of rainfall for the particular growing area. The process of developing management plans for conditionally approved areas is complex. Rainfall amounts vary tremendously, and there are often significant differences within a two-mile area. Current procedures for obtaining rainfall information for Area B-8 include the use of rain gauges in the Virginia Creek, Holly Ridge, and Hampstead areas. Monthly tally sheets are received from this station. Rainfall amounts are checked by telephone daily as needed.

NOAA Precipitation charts and radar from NOAA and other commercial weather websites are also accessed online in order to validate reported rainfall totals from our reporting stations. Rainfall amounts recorded by the rain gauge stations are included in Table 10.

3.4 COOPERATION OF PERSONS INVOLVED

The conditionally approved area concept is a cooperative effort involving the Marine Patrol and Shellfish Sanitation Sections of the Division of Marine Fisheries (DMF). The Shellfish Sanitation Section is responsible for monitoring conditionally approved growing areas and developing management plans. Patrol of shellfish harvesting waters and authority to open and close these waters is the sole responsibility of the DMF Marine Patrol. The administrative procedures to implement these actions are outlined in a memorandum of understanding between the Division of Marine Fisheries and the Shellfish Sanitation Section. No major problems have occurred with implementing the conditionally approved area concept in North Carolina.

Rainfall information is gathered from various individuals throughout the state including private citizens, DMF marine patrol and Shellfish Sanitation personnel. Additional resources are used to determine the amount and locations of precipitation, such as the NOAA National Weather Service precipitation website.

3.5 COMPLIANCE WITH APPROVED GROWING AREA CRITERIA

Review of the bacteriological data collected for Area D-4 indicates that all sampling stations used during the current survey period meet NSSP approved criteria.

3.6 FIELD INSPECTION OF POLLUTION SOURCES

A comprehensive shoreline survey of the D-4 area was completed in November 2012, in accordance with requirements of the NSSP “Guide for the Control of Molluscan Shellfish”, Chapter IV, @ .03. Additionally, annual surveys are completed in years that a comprehensive survey is not.

3.7 COLLECTION OF WATER SAMPLES

Area D-4 has been sampled in accordance with the management plan criteria of the area as required by the conditionally approved classification of the National Shellfish Sanitation Program (NSSP). Area D-4 currently adheres to the systematic random sampling strategy outlined by the NSSP and consists of 30 sampling sets from 23 sampling stations located throughout the area.

The bacteriological survey covered for the preparation of this report included water samples from 5/19/08 through 4/18/13. During that time period, a total of 690 water samples were collected during times that the waters were open to the harvest of shellfish, and analyzed for fecal coliform bacteria in compliance with the systematic random sampling regime. Table 11 lists, for each individual sampling station, the date the sample was obtained, the tidal cycle upon which

the sample was taken, and ambient salinity. Fecal coliform MPN and summary statistics are listed here as well.

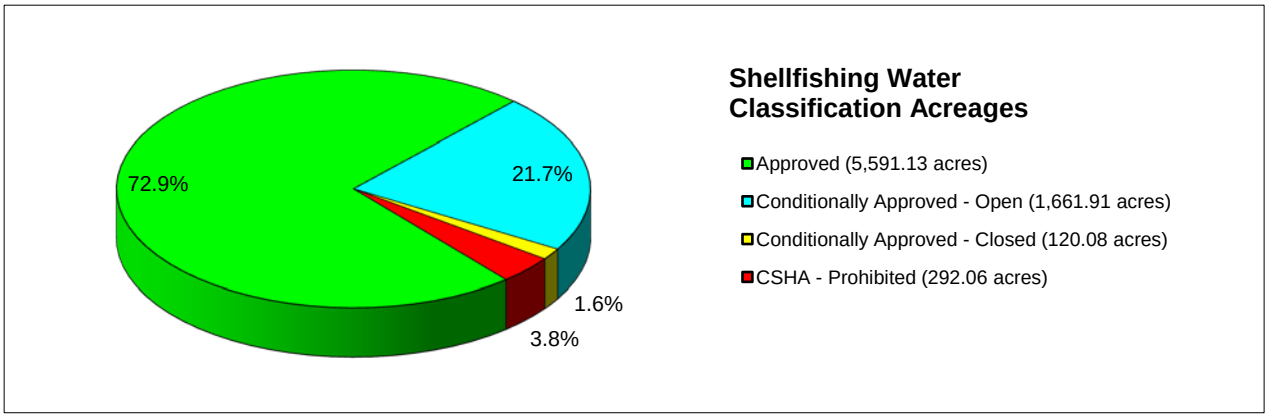
In addition, 151 bacteriological samples were collected and analyzed in order to assess water quality before reopening after emergency closures (Table 9).

3.8 SUMMARY

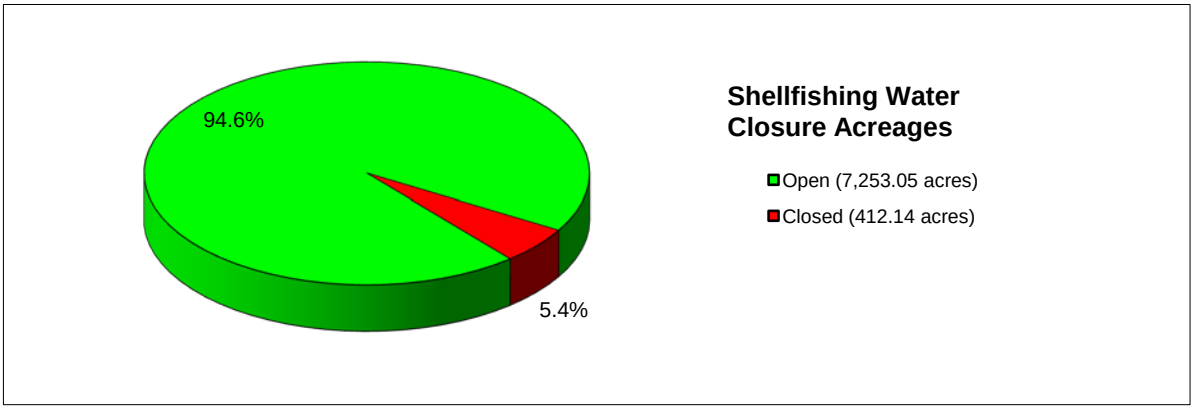
The C*onditionally Approved* area classification of the NSSP provides a way to utilize a resource for direct market purposes that would otherwise only be available for relaying or depuration purposes. Refinement of management plans is critical to assure that shellfish harvested from the conditionally approved growing area are from waters that meet approved area criteria.

Figure 1: Acreage

REGION: (All)	County: (All)	Growing Area: D4



Classification	Acres	Percent of Total
Approved	5,591.13	72.9%
Conditionally Approved - Open	1,661.91	21.7%
Conditionally Approved - Closed	120.08	1.6%
CSHA - Prohibited	292.06	3.8%
Total	7,665.19	100.0%



Status	Acres	Percent of Total
Open	7,253.05	94.6%
Closed	412.14	5.4%
Total	7,665.19	100.0%

D-4
Growing Area:

Shellfishing Water Sampling Stations

Legend

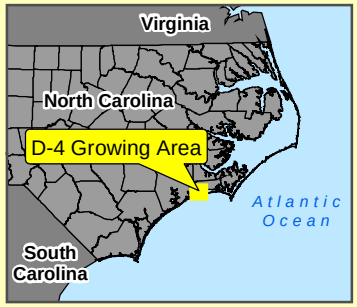
- Stations
- Shellfish Growing Area Boundaries
- 14-digit Hydrologic Units

Shellfish Growing Area Classifications

- Approved
- Conditionally Approved-Open
- Conditionally Approved-Closed
- Prohibited

N
W E
S

0 0.5 1
Miles



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July 5, 2013

Sampling Stations

D-4 SAMPLING STATION DESCRIPTIONS TABLE 1

STATION#	DESCRIPTION OF SITE	COUNTY
1	Flashing Beacon #29	CARTERET
2A	At mouth of Blue Water Bay	CARTERET
3	Mouth of Sanders Creek	CARTERET
5	ICWW Flashing Beacon #33	CARTERET
6	300 yards west by north of Day Beacon #34, in shallow water	CARTERET
7	North of Day Beacon #36, in shallow water	CARTERET
7A	Inshore Peninsula, mouth of culvert	CARTERET
8A	Halfway between Station #8 and Station #29	CARTERET
9A	In Hunting Island Bay	CARTERET
11	700 yards north by east of Flashing Beacon #43, by dock	CARTERET
13	350 Yards northeast of Flashing Beacon #45 in cove	CARTERET
13A	1/2 Way to Bogue Inlet, in Front Channel	CARTERET
13B	Mouth Back Channel off 3 poles on Bank	CARTERET
13C	1/2 between bridge and Bogue Inlet, Back Channel	CARTERET
13D	200 yds. West of Dock at Emerald Isle Woods Park	CARTERET
14	Island Harbor Marina	CARTERET
14A	At mouth of canal, west of marina	CARTERET
25A	Deer Creek 50 yards south of public access, in bay	CARTERET
27	By dock off of Shelly Point	CARTERET
30B	300 yds. east of Archer Creek closure line	CARTERET
30C	Mouth of canal north of Mclean Drive	CARTERET
30D	Mouth of W end of dredged canal N Bogue Sound Dr	CARTERET
30E	Mouth of E end of dredged canal N Bogue Sound Dr	CARTERET

D-4 Growing Area: Actual and Potential Pollution Sources

Legend

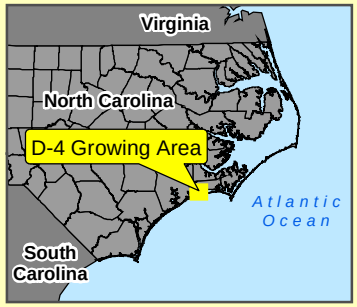
- Animals
- Areas of Concern
- Dockage
- Golf Courses
- Stormwater
- Subdivisions
- Wastewater
- Stations
- Shellfish Growing Area Boundaries
- 14-digit Hydrologic Units

Shellfish Growing Area Classifications

- Approved
- Conditionally Approved-Open
- Conditionally Approved-Closed
- Prohibited

N W E S

0 0.5 1 Miles



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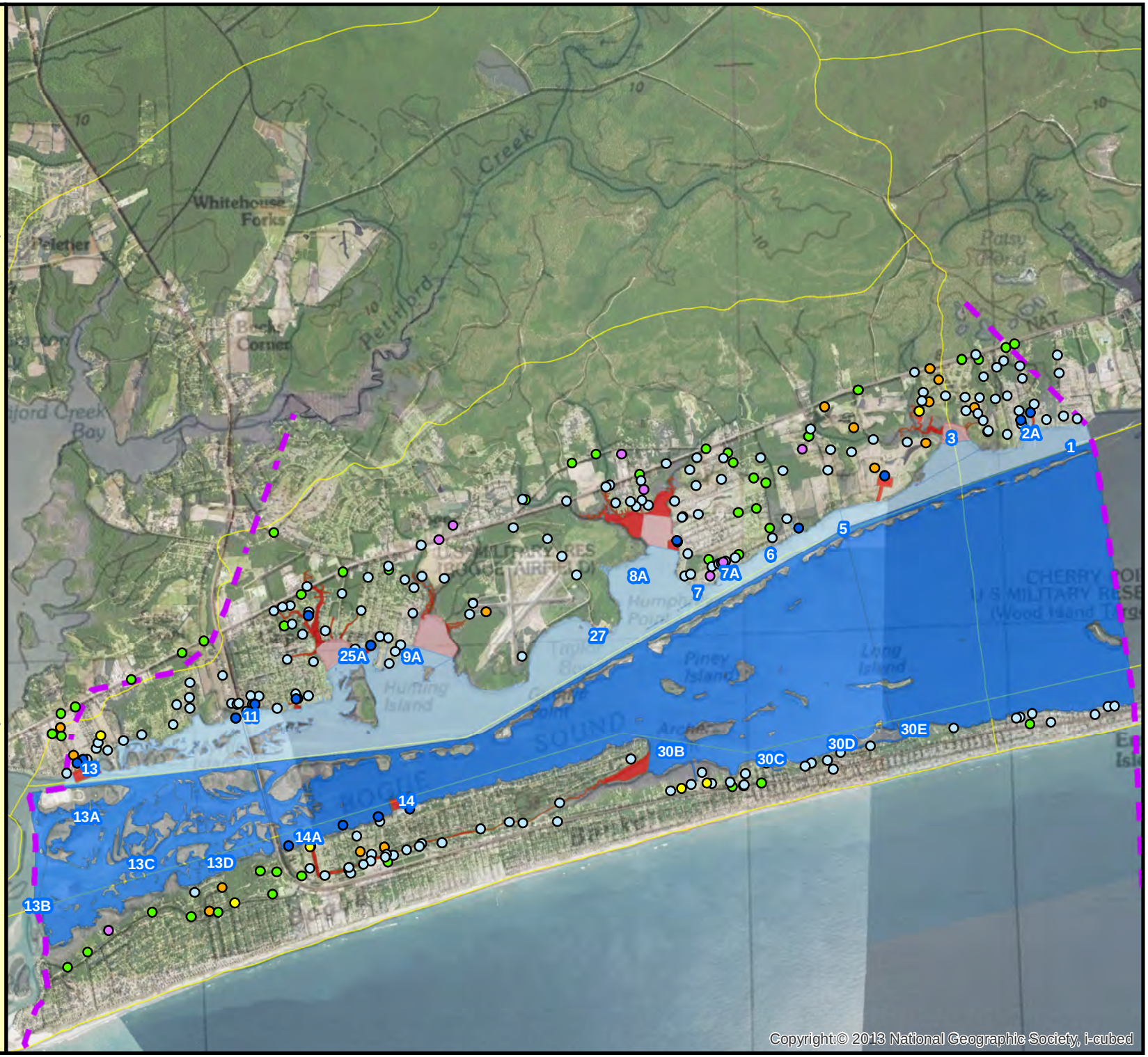

Pollution: All Sources

D-4
Growing Area:

Dockage

Legend

- Dockage
- Shellfish Growing Area Boundaries
- 14-digit Hydrologic Units

Shellfish Growing Area Classifications

- Approved
- Conditionally Approved-Open
- Conditionally Approved-Closed
- Prohibited

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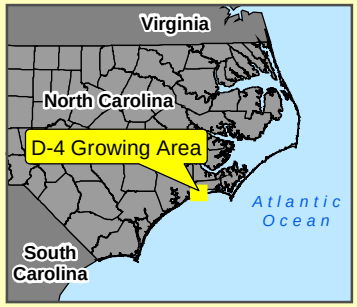

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Table 2: Dockage

SGA Index	*Marina Name*	*Total Slips*	*Pumpout?*	*Comments*
47	Old Ferry Landing	13	No	-
48	Cedar Point Villas Marina	53	No	Closure Combined With Waterway RV Park
49	Waterway RV Park Marina	29	No	Meets Exemption Requirements
50	Island Harbor Marina	88	Yes	Docks Redone After Storm Damage
51	Bogue Sound Yacht Club	70	No	Plans to Add More Slips
52	Blue Heron Bay	29	No	Meets Exemption Requirements
53	Cannonsgate Marina	75	Yes	-
54	Cape Point Marina	10	No	-
55	Cape Carteret Community Dockage #1	16	No	Repairs Made
56	Cape Carteret Community Dockage #2	17	No	Additions Continue
57	Bogue Sound RV Park Community Dockage	10	No	New Owners; Formerly Vacation Village
105	Sunset Landing Community Dockage	9	No	-
405	Bogue View Court Community Dockage	10	No	-
535	Goose Creek Landing Community Dockage	10	No	Pier Redone
536	Goose Creek Resort Community Marina	16	No	Closure Combined With Goose Creek Landing
541	Emerald Landing Community Marina	10	No	Unpermitted Slips Being Used
542	Emerald Plantation Community Dockage	10	No	Two Private Slips Less Than 100 Feet Away

D-4 Growing Area:

Stormwater

Legend

- Stormwater
- Shellfish Growing Area Boundaries
- 14-digit Hydrologic Units

Shellfish Growing Area Classifications

- Approved
- Conditionally Approved-Open
- Conditionally Approved-Closed
- Prohibited

N
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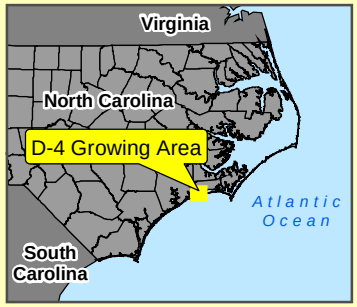
0 0.5 1 Miles



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D-4 Growing Area:

Subdivisions

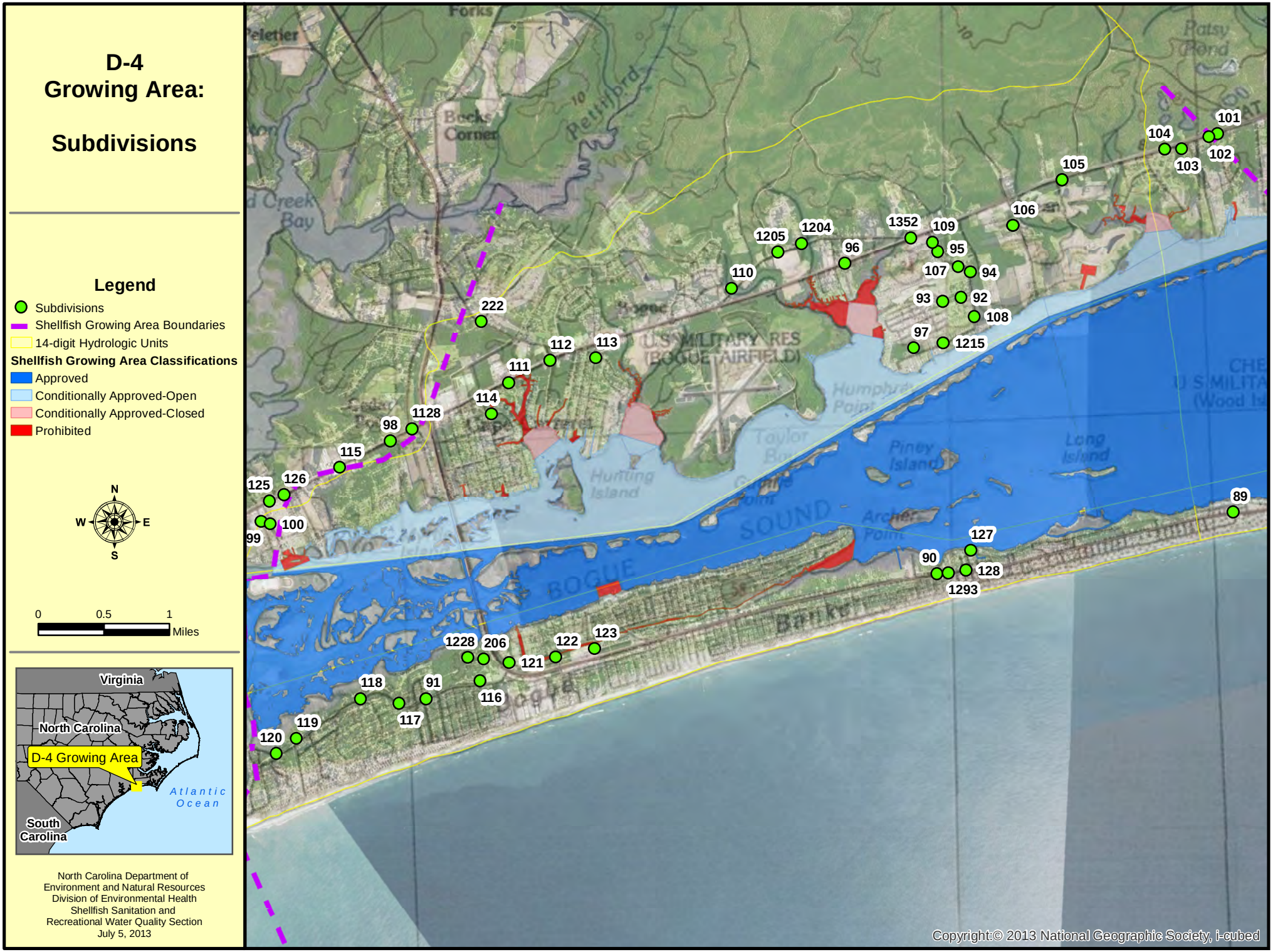

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Table 3: Subdivisions

SGA Index	Subdivision Name	# Lots	# Homes 2009	# Homes 2012
89	Watersedge Mobile Home Park	NA	114	114
90	Marsh Cove	26	21	21
91	Cape Emerald	77	68	68
92	Goose Creek Landing	NA	239	239
93	Goose Creek Resort	NA	480	480
94	Bogue View Court	43	34	34
95	Bogue Forest	35	33	33
96	Baywater Mobile Home Park	NA	20	22
97	Emerald View	23	3	3
98	Magens Bay	123	97	109
99	Cedar Point Beach	26	20	20
100	Cedar Point Villas	NA	Condos	Condos
101	Bogue Sound Yacht Club	61	50	51
102	Blue Heron Bay	66	53	54
103	Island View Shores	62	19	19
104	Bogue Watch	287	0	3
105	Cannonsgate	525	1	9
106	Morada Bay	50	1	17
107	Hickory Shores	56	40	40
108	Sanders Point	35	30	30
109	Cedar Key	121	82	82
110	Lake Arthur Estates	115	58	58
111	Cape Point	43	13	13
112	Country Club Point	65	50	51
113	Hunting Bay	95	70	70
114	Deer Creek	34	16	17
115	Crystal Shores	82	61	61
116	Osprey Ridge	45	42	42
117	Royall Oaks	45	31	31
118	Spinnakers Landing	16	8	8
119	Pointe Bogue	13	5	5
120	West End	23	1	3
121	Sunset Landing	31	3	5
122	Emerald Landing	55	28	28
123	Emerald Plantation	84	65	65
125	Waterway RV Park	333	NA	NA
126	John Comers Cove	65	61	59
127	Surf Landing Cove	67	55	55
128	Shorewood	28	22	22
206	Bell Cove Village	11	0	0
222	Ardan Oaks	30	7	10
1128	Bogue Sound RV Park	87	86	37
1204	Bogue Bluff	22	0	22
1205	Stonegate Estates	71	56	56
1215	Lobinger Point	25	15	15
1228	Osprey Bluff	12	3	3
1293	Sea Crest North	16	13	13
1352	Eli's Landing	16	0	4

D-4 Growing Area:

Wastewater

Legend

Wastewater

- LIFTSTATION
- MUNICIPAL WWTP
- PACKAGE PLANT
- Shellfish Growing Area Boundaries
- 14-digit Hydrologic Units

Shellfish Growing Area Classifications

- Approved
- Conditionally Approved-Open
- Conditionally Approved-Closed
- Prohibited

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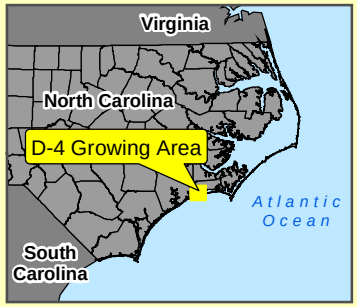

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Table 4: Wastewater

SGA Index	*Comments*
62	Cedar Point Villas Package Wastewater Treatment Plant; New Plant Complete September 2012
63	Bogue Field Wastewater Treatment Plant Lagoons; Improvements Complete; Permitted Flow Upgraded To 18,000 GPD
64	Bogue Field Sprayfield
65	Cape Emerald Package Wastewater Treatment Plant; Nutrient Limit Violations; Hope To Add New Tank To Resolve Problem
66	Emerald Plantation Package Wastewater Treatment Plant; New Plant In Place
69	Cannonsgate Package Wastewater Treatment Plant; Not In Use
823	Bogue Watch Lift Station
824	Bogue Watch Lift Station
825	Bogue Watch Lift Station
826	Cedar Point Villas Lift Station
840	Bogue Watch Package Wastewater Treatment Plant; Not In Use
844	Cannonsgate Lift Station
845	Cannonsgate Lift Station
846	Cannonsgate Lift Station
861	Cape Emerald Lift Station
862	Emerald Plantation Lift Station
1037	Bogue Watch Lift Station

D-4
Growing Area:

Animals

Legend

Animals

- HORSES
- POULTRY
- Shellfish Growing Area Boundaries
- 14-digit Hydrologic Units

Shellfish Growing Area Classifications

- Approved
- Conditionally Approved-Open
- Conditionally Approved-Closed
- Prohibited

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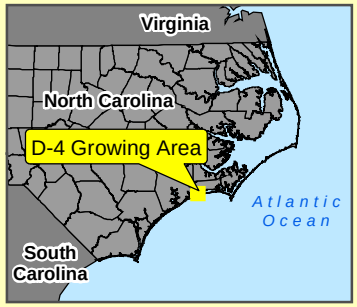

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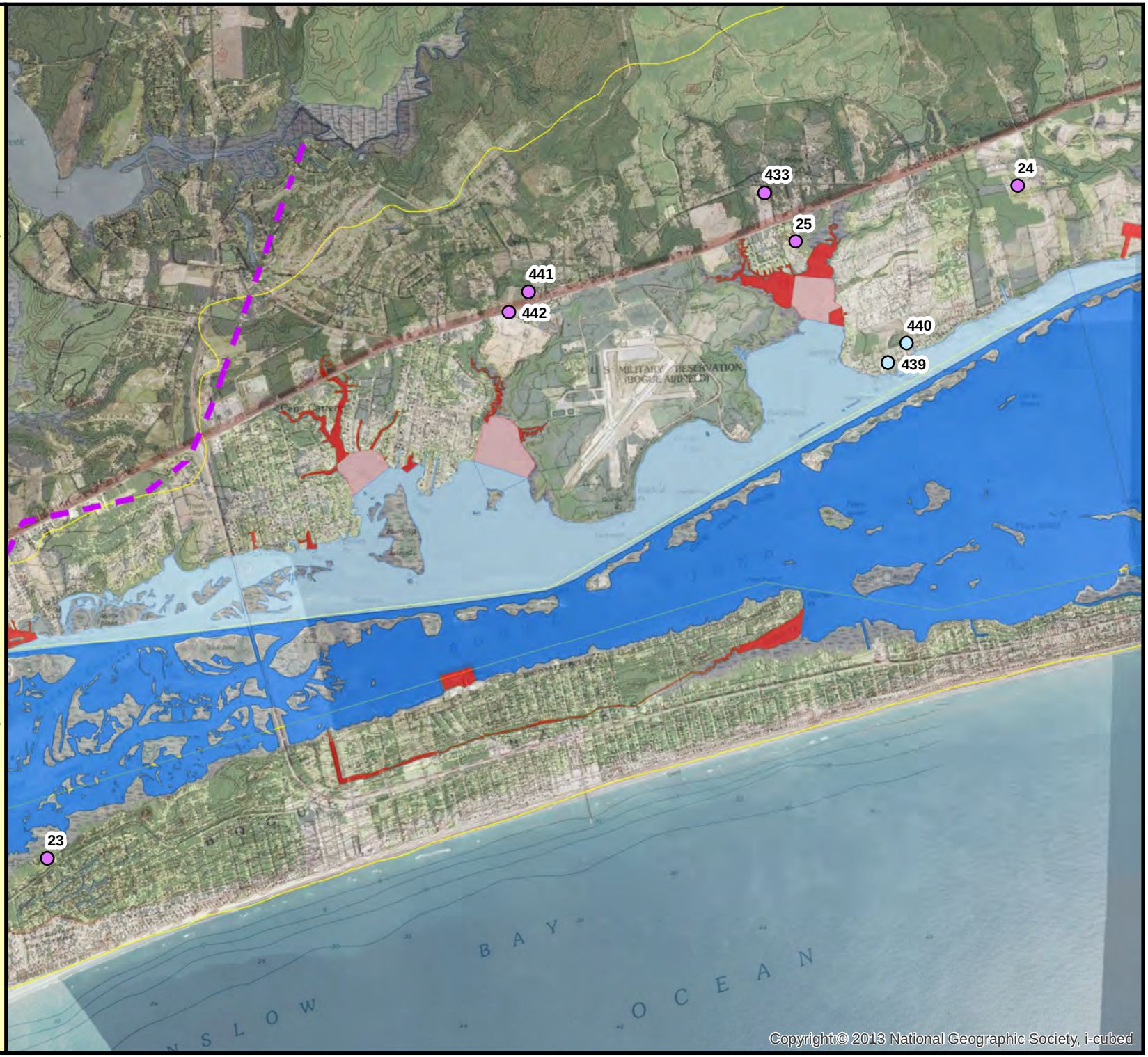

Table 5: Animals

SGA Index	*Comments*
23	2 Horses, 25 Geese, 5 Chickens, Dogs
24	Horses, Goats, and Alpacas
25	Horses in Pasture Along Goose Creek
433	Horses
439	Chicken Pen Near To Shoreline
440	Chicken Pen Near To Shoreline
441	Horses
442	Horses and Pigs

D-4
Growing Area:

Areas of Concern

Legend

- Areas of Concern
- Shellfish Growing Area Boundaries
- 14-digit Hydrologic Units

Shellfish Growing Area Classifications

- Approved
- Conditionally Approved-Open
- Conditionally Approved-Closed
- Prohibited

N
W E
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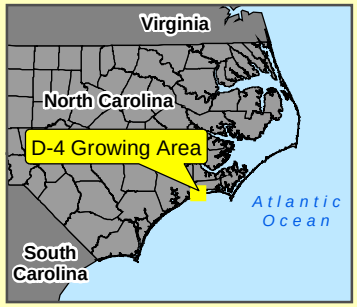
0 0.5 1 Miles



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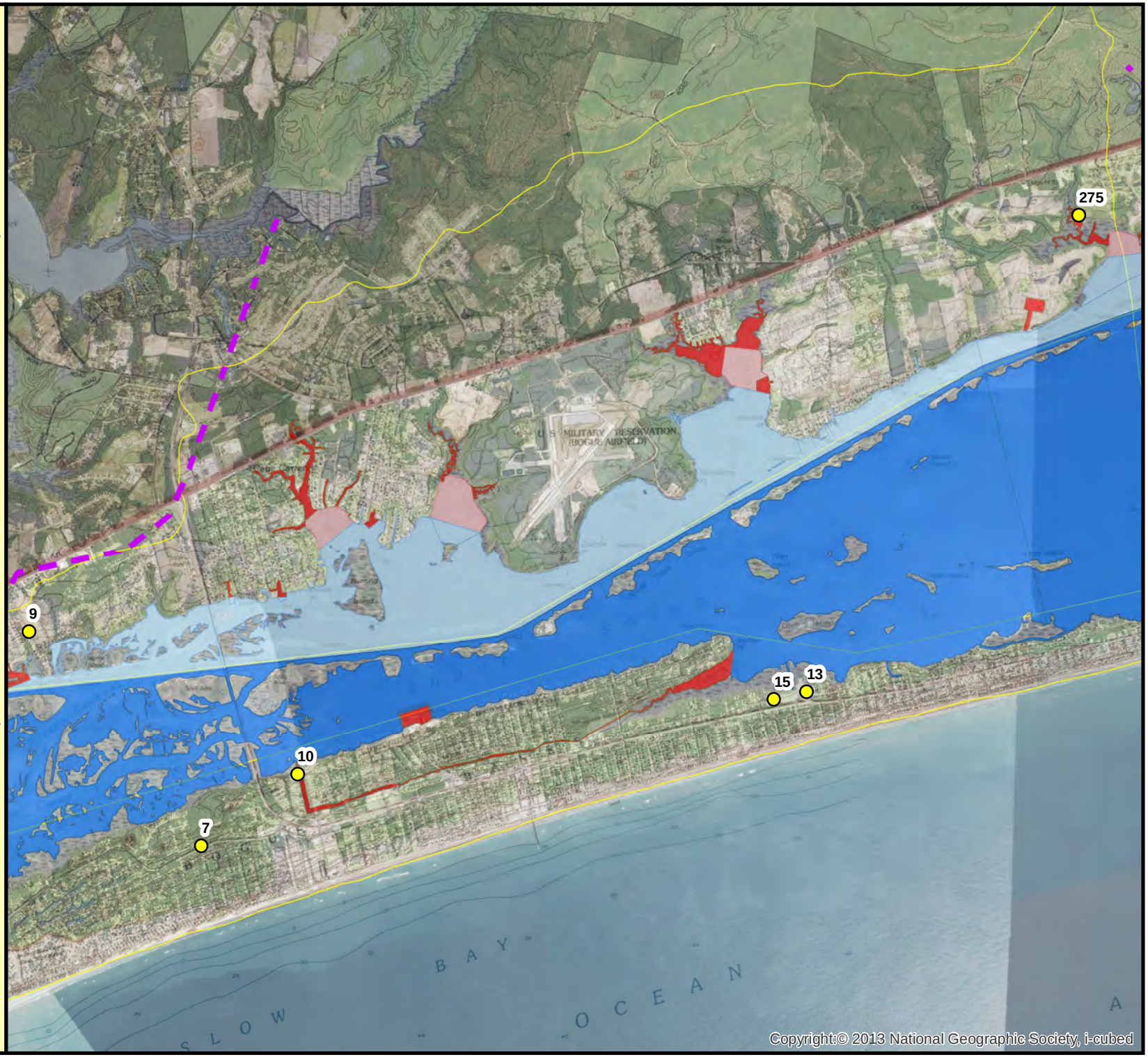

Table 6: Areas of Concern

SGA Index	*Comments*
7	Emerald Isle Woods Stormwater Disposal Area
9	Ducks in Pond
10	Creek Draining to Sound; Manicured Lawns and Waterfowl
13	New Regional Public Boat Ramp
15	Vulnerable Sewage Line
275	Infiltration Problems Causing Manhole Overflow; No Sewage

Table 7: D-4 Tides and Salinities 2013

		Station ID																						
Date	**Tidal Stage**	***1***	***2A***	***3***	***5***	***6***	***7***	***7A***	***8A***	***9A***	***11***	***13***	***13A***	***13B***	***13C***	***13D***	***14***	***14A***	***25A***	***27***	***30B***	***30C***	***30D***	***30E***
5/19/2008	**LAST FLD**	34	34	38	34	34	34	34	34	34	34	34	34	36	36		36	34	34	34	36	36	36	36
6/16/2008	**1/2 EBB**	36	36	36	36	36	36	36	35	36	36	34	36	34	36		34	34	36	36	36	36	34	36
7/31/2008	**1/4 EBB**	37	37	38	38	37	38	37	38	38	36	36	36	38	37		37	38	38	38	38	38	38	38
8/25/2008	**LAST EBB**	36	36	36	37	37	36	36	37	36	37	37	36	38	37		38	37	36	36	37	38	37	37
2/5/2009	**1/2 EBB**	34	32	32	36	34	34	34	34	34	34	34	34	34	34		34	34	34	34	34	34	32	34
3/11/2009	**3/4 FLD**	34	34	34	36	34	32	34	34	39	34	34	34	34	34		34	36	34	34	32	34	34	32
4/13/2009	**1/4 FLD**	32	32	32	30	33	33	32	32	32	32	32	34	35	33		31	34	32	32	32	32	33	32
5/12/2009	**1/4 FLD**	36	36	36	36	36	36	36	34	36	36	36	36	36	36		36	36	36	36	36	36	36	34
7/28/2009	**LOW**	35	34	35	34	36	34	34	34	36	34	35	35	36	36		36	36	36	34	36	36	34	34
11/3/2009	**LAST FLD**	32	31	31	31	32	33	32	32	34	35	35	35	34	35		33	34	35	34	30	30	30	30
3/10/2010	**1/2 EBB**	28	28	28	28	28	30	30	30	30	30	30	33	34	30		30	30	30	30	30	30	30	30
4/13/2010	**1/2 EBB**	32	32	32	32	32	32	32	32	32	34	34	34	35	34		32	32	32	32	33	33	32	32
5/20/2010	**LAST EBB**	36	36	34	36	36	36	36	34	36	35	36	36	36	34		36	36	36	36	36	36	36	36
7/12/2010	**3/4 FLD**	36	36	36	36	36	36	36	36	36	36	36	36	36	36		36	36	36	36	36	36	36	36
8/31/2010	**1ST FLD**	34	34	32	34	34	34	34	34	34	32	32	34	34	34	34	34	34	34	34	34	34	34	34
11/8/2010	**3/4 FLD**	32	32	32	32	32	32	32	32	32	35	35	35	35	35	35	32	35	32	32	32	32	32	32
1/6/2011	**3/4 FLD**	32	32	34	32	32	34	32	32	32	34	35	34	35	35	35	34	35	32	32	32	32	32	32
3/23/2011	**1/2 FLD**	30	30	30	31	30	32	31	32	32	32	33	33	33	33	33	32	34	32	32	33	32	32	32
4/19/2011	**3/4 FLD**	32	32	32	34	32	32	32	33	34	32	32	34	33	34	32	32	32	32	33	33	33	32	32
6/14/2011	**1ST EBB**	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
8/3/2011	**1/2 FLD**	37	36	36	36	36	36	36	36	38		36	36	36	36	36	36	36	36	38	36	36	36	36
11/8/2011	**1/4 EBB**	32	32	32	32	30	30	30	30	32	32	34	34	34	32	32	32	32	32	32	32	32	30	30
1/25/2012	**3/4 FLD**	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
2/23/2012	**3/4 FLD**	32	32	32	34	34	32	34	32	34	34	36	34	34	34	34	34	34	34	34	34	33	32	32
4/9/2012	**3/4 FLD**	34	34	34	34	37	34	34	34	34	35	36	36	36	36	36	34	36	34	34	34	34	34	34
5/29/2012	**3/4 EBB**	35	36	36	36	35	35	35	35	35	36	35	36	35	35	35	35	35	35	35	35	35	35	35
7/31/2012	**1ST EBB**	34	34	34	34	35	35	35	35	35	35	36	36	36	36	36	35	35	34	34	35	35	35	34
10/16/2012	**LAST FLD**	33	32	31	32	33	33	34	34	34	34	35	35	35	35	36	36	35	35	34	34	33	31	31
1/22/2013	**1/2 EBB**	30	30	30	30	31	31	31	30	31	30	30	31	31	30	30	30	30	30	30	30	30	30	30
4/18/2013	**LAST EBB**	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30

Table 8: Temporary Closures Area D-4

DATE	DESCRIPTION	CLOSE	OPEN	REASON
07/16/08	All those waters from the Intracoastal Waterway to the mainland between the Emerald Isle High Rise Bridge to ICWW Channel Marker # 65A, located just west of Salliers Bay near New River Inlet, to include White Oak River, Queens Creek and Bear Creek.	16-Jul		Rain
07/18/08	D-4 returns to normal boundaries		19-Jul	Sampling
09/10/08	All those waters between the Emerald isle Highrise Bridge and the Intracoastal Waterway marker "36" near Goose Creek, from the Intracoastal Waterway to the mainland.	10-Sep		Rainfall
09/12/08	All those waters between the Emerald isle Highrise Bridge and the Intracoastal Waterway marker "36" near Goose Creek, from the Intracoastal Waterway to the mainland.		13-Sep	Sampling
09/26/08	All those waters from the ICWW to the mainland between the Morehead City State Port closure line and ICWW Channel Marker #65A, located just west of Salliers Bay, near New River Inlet, to include White Oak River, Queens Creek and Bear Creek.	26-Sep		Rainfall, flooding
09/30/08	All those waters from the ICWW to the mainland between the Morehead City State Port closure line and ICWW Channel Marker #65A, located just west of Salliers Bay, near New River Inlet, to include White Oak River, Queens Creek and Bear Creek.		1-Oct	Sampling
11/04/08	All those waters from the Intracoastal Waterway to the mainland between the Emerald Isle High Rise Bridge to ICWW Channel Marker # 65A, located just west of Salliers Bay near New River Inlet, to include White Oak River, Queens Creek and Bear Creek.	4-Nov		Rainfall
11/04/08	Tar River Landing - Bogue Sound All those waters from the permanent prohibited area closure line at Fort Macon to the Emerald Isle High Rise Bridge. This includes Tar Landing Bay, the south side of Bogue Sound and all other tributaries within the described area.	4-Nov		Rainfall
11/07/08	All those waters in Bogue Sound return to normal boundaries except from the Intracoastal Waterway to the Mainland at Marker #30 near Sanders Creek and the Emerald Isle Bridge		8-Nov	Sampling
11/10/08	Bogue Sound returns to normal boundaries.		11-Nov	Sampling
11/13/08	All those waters from the Intracoastal Waterway to the mainland between the Emerald Isle High Rise Bridge to ICWW Channel Marker # 65A, located just west of Salliers Bay near New River Inlet, to include White Oak River, Queens Creek and Bear Creek.	13-Nov		Rainfall
11/18/08	Bogue Sound returns to normal boundaries except from the ICWW to the mainland between ICWW #25 near Broad Creek and ICWW #32 near Sanders Creek.		19-Nov	Sampling
11/20/08	Bogue Sound returns to normal boundaries.		21-Nov	Sampling
08/13/09	All those waters from the ICWW to the mainland between the Morehead City State Port permanent closure line near 16th Street and ICWW Channel Marker #65A, located just west of Salliers Bay, near New River Inlet, to include White Oak River, Queens Creek and Bear Creek.	13-Aug		Rainfall
08/18/09	A portion of D-4 returns to normal boundaries: All those waters from the ICWW to the mainland between the Morehead City State Port permanent closure line near 16th Street and to the Emerald Isle High-Rise Bridge.		19-Aug	Sampling
08/19/09	D-4 returns to normal boundaries		20-Aug	Sampling
09/07/09	All those waters from the ICWW to the mainland between the Morehead City permanent closure line near 16th Street and Intracoastal Waterway Channel Marker #65A, located just west of Salliers Bay near New River Inlet, to include White Oak River, Queens Creek, Bear Creek, and Freeman Creek.	7-Sep		Rainfall
09/08/09	All those waters between the Figure Eight Island Bridge in New Hanover County and a straight line beginning at Hall Point near Thorofare Bay; running southeasterly through Fl. Beacon # 20 in Core Sound to a point on the Core Banks shoreline in Carteret County. This includes Stump Sound, Chadwick Bay, New River, Freeman Creek, Bear Creek, Queens Creek, White Oak River, Bogue Sound, Newport River, North River, The Straits, Back Sound and Core Sound, including Jarrett Bay, Oyster Creek, Brett Bay, and Nelson Bay.	8-Sep		Rainfall
09/10/09	A portion of D-4 returns to normal boundaries: All those waters from the ICWW to the ocean side between the Morehead City permanent closure line near 16th Street (including Tar Landing Bay) and ICWW Beacon #45, near Cedar Point.		11-Sep	Sampling
09/12/09	A portion of D1, D2, D3, D4 return to normal boundaries: All those waters from the ICWW to the ocean side between ICWW Beacon #45, near Cedar Point and Fl. Beacon #59, near Bear Creek.		13-Sep	Sampling
09/16/09	Bogue Sound returns to normal boundaries except from the ICWW to the mainland between ICWW Beacon #23 and Fl. Beacon #29 to include Broad Creek.		17-Sep	Sampling
10/02/09	Bogue Sound returns to normal boundaries.		3-Oct	Sampling

Table 8: Temporary Closures Area D-4

DATE	DESCRIPTION	CLOSE	OPEN	REASON
11/12/09	All those waters bordered on the east and south by a line beginning at Long Point near Rumley Bay thence in a straight line to Lookout Point on the east shore of Thorofare Bay, thence in a straight line across Thorofare Bay to Hall Point near Atlantic, thence in a straight line to Fl. Beacon #20 in Core Sound, thence in a straight line to Fl. Beacon #27 in Core Sound, thence in a straight line to Fl. Beacon #37 in Core Sound, thence in a straight line to Shell Point on Harkers Island, thence in a straight line across Back Sound to a point on Shackleford Banks near Banks Bay to the South Carolina State Line; to include all of Thorofare Bay, Rumley Bay, Barry Bay, Styron Bay, Nelson Bay, Fulchers Creek, Brett Bay, Oyster Creek, Bells Creek, Tusk Creek, Middens Creek, Jarrett Bay, The Straits, North River, Back Sound; Carrot Island, Newport River, Bogue Sound, White Oak River, Queens Creek, Bear Creek, New River, Stump Sound, Topsail Sound, Myrtle Grove, Masonboro Sound, The Basin, Buzzards Bay, Cape Fear River, Lockwoods Folly River, Shallotte River and all other tributaries within said boundaries.	12-Nov		TS Ida / Excessive Rainfall
11/24/09	All those waters in Bogue Sound east of the Emerald Isle High Rise Bridge return to status prior to 11/12/09 TS Ida remnants.		25-Nov	Sampling
11/25/09	A portion of those waters between ICWW Marker #65A and the Emerald Isle Bridge returns to status prior to 11/12/09 TS Ida remnants.		26-Nov	Sampling
11/29/09	A portion of the ICWW between Fl. Beacon #49 and the Emerald Isle Bridge		30-Nov	Sampling
12/03/09	All those waters from the ICWW to the mainland between ICWW Fl. Beacon #25 in Bogue Sound, near Broad Creek, and ICWW Channel Marker #65A near Salliers Bay, to include Freeman Creek, Bear Creek, Queens Creek, White Oak River, and all other tributaries within said boundaries.	3-Dec		Rainfall
12/08/09	A portion of Bogue Sound returns to normal boundaries except all those waters fro the ICWW to the mainland between ICWW Fl. Beacon #25 near Broad Creek and the Emerald Isle High Rise Bridge.		9-Dec	Sampling
12/14/09	D-4 returns to normal boundaries.		15-Dec	Sampling
12/26/09	All those waters from the ICWW to the mainland between Fl. Beacon #25 in Bogue Sound, near Broad Creek and ICWW Channel Marker #65A near Salliers Bay, to include Freeman Creek, Bear Creek, Queens Creek, White Oak River, and all other tributaries within said boundaries.	26-Dec		Rainfall
01/03/10	All those waters from the ICWW to the mainland between Fl. Beacon #25 in Bogue Sound, near Broad Creek and ICWW Channel Marker #65A near Salliers Bay, to include Freeman Creek returns to status - except Bear Creek, Queens Creek, White Oak River, and Hunting Island Creek		4-Jan	Sampling
01/05/10	Hunting Island Creek returns to normal boundaries.		6-Jan	Sampling
01/17/10	All those water from the Intracoastal Waterway to the mainland between the Emerald Isle High Bridge and ICWW Fl. Beacon #65A, located just west of Salliers Bay, near New River Inlet, to include Freeman Creek, Bear Creek, Queens Creek, White Oak River and all other creeks and tributaries within said boundaries.	17-Jan		Rainfall
01/21/10	ICWW area between FL. Beacon #55 near Sanders Creek and Emerald Isle High Rise Bridge returns to normal boundaries .		22-Jan	Sampling
03/30/10	All those waters from the Intracoastal Waterway to the mainland between the Emerald Isle High Rise Bridge and ICWW Fl. Beacon #65A, located just west of Salliers Bay, near New River Inlet, to include Freeman Creek, Bear Creek, Queens Creek, White Oak River, and all other creeks and tributaries within said boundaries.	30-Mar		Rainfall
04/01/10	All those waters from the ICWW to the mainland between the Emerald Isle High-Rise Bridge and ICWW Fl. Beacon #65A returns to normal boundaries.		2-Apr	Sampling
07/22/10	All those waters from the Intracoastal Waterway to the mainland between Fl. Beacon #45 near Cedar Point Villas Marina and ICWW Marker #58 near Bear Creek, to include Bear Creek, Queens Creek, and White Oak River.	22-Jul		Rainfall
07/27/10	All those waters from the Intracoastal Waterway to the mainland between Fl. Beacon #45 near Cedar Point Villas Marina and ICWW Marker #58 near Bear Creek, to include Bear Creek, Queens Creek, and White Oak River.		28-Jul	Sampling
09/12/10	All those waters in Bogue Sound between the Emerald Isle High Rise Bridge and Fort Macon, to include Tar Landing Bay.	12-Sep		Rainfall
09/15/10	D-4 returns to status.		16-Sep	Sampling
09/30/10	All those waters between the South Carolina State Line and a straight line beginning at Hall Point near Thorofare Bay in Carteret County; running southeasterly through Fl. Beacon # 20 in Core Sound to a point on the Core Banks shoreline in Carteret County. This includes Tubbs Inlet, Shallotte River, Lockwoods Folly River, Cape Fear River, Myrtle Grove Sound, Topsail Sound, Stump Sound, Chadwick Bay, New River, Freeman Creek, Bear Creek, Queens Creek, White Oak River, Bogue Sound, Newport River, North River, The Straits, Back Sound and Core Sound, including Jarrett Bay, Oyster Creek, Brett Bay, and Nelson Bay.	30-Sep		Nicole Remnants
10/08/10	A portion of Bogue Sound between Fl. Beacon #33 to a point on the mainland near Camp Morehead returns to normal boundaries except all those waters in Bogue Sound 100 yards offshore of Pine Knoll Shores between the permanent closure line and the Bogue Pines boat basin.		9-Oct	Sampling
10/09/10	A portion of D-4 returns to normal boundaries: the sound between Bear Creek and the Emerald Isle High Rise Bridge.		10-Oct	Sampling
10/12/10	Bogue Sound returns to normal boundaries.		13-Oct	Sampling
01/18/11	All those waters from the ICWW to the mainland between the Morehead City State Port permanent closure line near 16th Street and ICWW Channel Marker #65A, located just west of Salliers Bay, near New River Inlet, to include White Oak River, Queens Creek and Bear Creek.	18-Jan		Rainfall

Table 8: Temporary Closures Area D-4

DATE	DESCRIPTION	CLOSE	OPEN	REASON
01/21/11	D-4 returns to status.		22-Jan	Sampling
08/29/11	All Coastal waters close.	29-Aug		Hurricane Irene
08/31/11	A portion of Bogue Inlet AND a portion of Bogue Sound returns to normal boundaries except All those waters from the IWW to the mainland between IWW Fl. Beacon #55 near Sanders Creek in Onslow County and the Morehead City permanent closure line near 16th Street in Carteret County, to include Queens Creek, White Oak River, and all other creeks and tributaries within said boundaries.		1-Sep	Sampling
09/01/11	All those waters in Bogue Sound between the Emerald Isle High-rise Bridge and the permanent closure line near 16th Street in Morehead City returns to status prior to 8/27/11 Hurricane Irene.		2-Sep	Sampling
09/08/11	All those waters from the IWW to the mainland between IWW Beacon #58 near Bear Creek in Onslow County and the Emerald Isle High-rise Bridge in Carteret County, to include Bear Creek, Queens Creek, White Oak River, and all other creeks and tributaries within said boundaries.	8-Sep		Rainfall
09/13/11	All those waters from the IWW to the mainland between IWW Beacon #58 near Bear Creek in Onslow County and the Emerald Isle High-rise Bridge in Carteret County, to include Bear Creek, Queens Creek, White Oak River, and all other creeks and tributaries within said boundaries.		14-Sep	Sampling
10/20/11	All those waters from the Intracoastal Waterway to the mainland between the Emerald Isle High Bridge and ICWW Fl. Beacon #65A, located just west of Salliers Bay, near New River Inlet, to include Freeman Creek, Bear Creek, Queens Creek, White Oak River and all other creeks and tributaries within said boundaries.	20-Oct		Rainfall
10/20/11	Tar Landing Bay / Bogue Sound - All those waters from the permanent prohibited area closure line at Fort Macon to the Emerald Isle High Rise Bridge. This includes Tar Landing Bay, Bogue Sound and all other tributaries within the described area.	20-Oct		Rainfall
10/22/11	The Intracoastal Waterway to the mainland between the Emerald Isle High Bridge and ICWW Fl. Beacon #65A, located just west of Salliers Bay, near New River Inlet returns to normal boundaries.		23-Oct	Sampling
10/25/11	A portion of Bogue Sound returns to normal boundaries except All those waters in Bogue Sound from the ICWW to the mainland between ICWW Beacon #23 and Fl. Beacon #29 to include Broad Creek.		26-Oct	Sampling
05/31/12	All those waters from the Emerald Isle High-Rise Bridge and ICWW Fl. Beacon #65A, located just west of Salliers Bay, near New River Inlet, to include Salliers Bay, Freeman Creek, Bear Creek, Queens Creek, White Oak River, and all other creek and tributaries within said boundaries.	31-May		TD Beryl
05/31/12	All those waters from the ICWW to the mainland between the Morehead City State Port permanent closure line near 16th Street and the Emerald Isle High-Rise Bridge.	31-May		TD Beryl
06/02/12	The sound area between Fl. Beacon #65A and the Emerald Isle Bridge returns to normal boundaries.		3-Jun	Sampling
06/05/12	Bogue Sound, from the IWW to the mainland, from the Emerald Isle High Rise Bridge to IWW Beacon #21, near GalesCreek, returns to normal boundaries.		6-Jun	Sampling
06/24/12	All those waters from the IWW to the mainland between IWW Beacon #65A near Salliers Bay and the Emerald Isle High-rise Bridge, to include Salliers Bay, Freeman Creek, Bear Creek, Queens Creek, White Oak River, and all other creeks and tributaries within said boundaries.	24-Jun		Rainfall
06/26/12	All those waters from the IWW to the mainland between IWW Beacon #65A near Salliers Bay and the Emerald Isle High-rise Bridge, to include Salliers Bay, Freeman Creek, Bear Creek, Queens Creek, White Oak River, and all other creeks and tributaries within said boundaries.		27-Jun	Sampling
08/25/12	All those waters from the Intracoastal Waterway to the mainland in Bogue Sound between IWW Fl. Beacon #49, near Swansboro, and IWW Beacon #20, near Gales Creek, to include White Oak River, Deer Creek, Hunting Island Creek, Goose Creek, Sanders Creek, Broad Creek and Gales Creek.	25-Aug		Rainfall
08/28/12	A portion of Bogue Sound returns to normal boundaries except IWW to the mainland between FL. Beacon #45, near Cedar Point, and IWW Beacon #20, near Gales Creek.		29-Aug	Sampling
08/31/12	Bogue Sound returns to normal boundaries.		1-Sep	Sampling

Table 8: Temporary Closures Area D-4

DATE	DESCRIPTION	CLOSE	OPEN	REASON
09/07/12	All those waters from the Intracoastal Waterway to the mainland in Bogue Sound between IWW Fl. Beacon #49, near Swansboro, and IWW Beacon #20, near Gales Creek, to include White Oak River, Deer Creek, Hunting Island creek, Goose Creek, Sanders Creek, Broad Creek, and Gales Creek.	7-Sep		Rainfall
09/11/12	All those waters from the Intracoastal Waterway to the mainland in Bogue Sound between IWW Fl. Beacon #49, near Swansboro, and IWW Beacon #20, near Gales Creek returns to normal boundaries EXCEPT All those waters from the IWW to the mainland between Channel Marker #36 and Channel Marker #38 near Goose Creek and All those waters from the ICWW to mainland between Fl.Beacon 25 & Channel Marker #27 near Broad Ck.		12-Sep	Sampling
09/13/12	All those waters from the IWW to the mainland between Channel Marker #36 and Channel Marker #38 near Goose Creek returning D-4 to normal boundaries.		14-Sep	Sampling
10/28/12	All those waters from the IWW to the mainland between Salliers Bay and the Atlantic Beach High-Rise Bridge, to include Salliers Bay, Freeman Creek, Bear Creek, Queens Creek, White Oak River, Deer Creek, Hunting Island Creek, Goose Creek, Sanders Creek, Broad Creek, and Gales Creek.	28-Oct		Hurricane Sandy
11/01/12	A portion of D-4 returns to normal boundaries EXCEPT IWW to the mainland between Marker "32" and "30" to include Sanders Creek.		2-Nov	Sampling
11/07/12	Bogue Sound returns to normal boundaries.		8-Nov	Sampling
02/08/13	All those waters between the Morehead City State Port closure line and ICWW Channel Marker #65A, located just west of Salliers Bay, near New River Inlet, to include Bogue Sound, Tar Landing Bay, Hoop Pole Creek, Gales Creek, Broad Creek, Sanders Creek, Goose Creek, Hunting Island Creek, Deer Creek, White Oak River, Queens Creek, Bear Creek, Freeman Creek, and Salliers Bay.	8-Feb		Rainfall
02/13/13	IWW to ocean side returns to normal boundaries - IWW to mainland remains closed.		14-Feb	Sampling
02/15/13	D-4 returns to normal boundaries.		16-Feb	Sampling

Bacteriological Results (MPN), Conditional Sampling

Table 9

STATION	NO.	09/11/08	09/29/08	11/06/08	11/09/08	11/17/08	11/19/08	08/17/09	09/09/09	09/15/09	11/16/09	11/17/09	11/18/09	11/23/09	11/24/09
EIB		13.0	1.7	4.5	2.0	1.7		13.0		4.5	**Field Acc**	6.8		**33.0**	
9		6.8	4.5	2.0	1.7	6.8		4.5		4.5	**170.0**	13.0			
8	A	**21.0**	1.7	**17.0**	**17.0**	2.0		4.5		7.8	**Field Acc**	**17.0**		13.0	
5				**49.0**	2.0	1.7		1.7		1.7					
3			1.7	4.0	2.0	**110.0**	7.8	2.0		13.0		**17.0**		7.8	
30				**17.0**									13.0		
18														**33.0**	
12															
13			1.7			1.7					**Field Acc**				**23.0**
#42 off bogue banks				13.0											
Archer Point - open area									**17.0**						
33 - marker #33 waterway															
28 - marker #28 waterway															
13	D														
13	B														
13	C														
30	D														

STATION	NO.	11/28/09	12/07/09	12/10/09	12/13/09	12/28/09	12/30/09	01/02/10	01/04/10	01/19/10	03/31/10	07/26/10	09/14/10	10/05/10	10/06/10
EIB			1.7	**33.0**	7.8	**17.0**							1.7	33.0	
9			**21.0**	**17.0**	2.0	**33.0**	**17.0**	**23.0**	4.5				1.7		
8	A		7.8	**49.0**	4.5	7.8							7.8	17.0	
5			13.0	**17.0**	4.5										
3			**46.0**	**33.0**	2.0	12.0									
30													7.8	33.0	
18															
12															
13		4.0	1.7							**17.0**	4.5	1.7			11.0
#42 off bogue banks															
Archer Point - open area															
33 - marker #33 waterway						11.0									
28 - marker #28 waterway						**22.0**									
13	D														13.0
13	B														
13	C														
30	D														

Bacteriological Results (MPN), Conditional Sampling

Table 9

STATION	NO.	10/07/10	10/11/10	01/20/11	08/30/11	08/31/11	09/12/11	10/21/11	10/24/11	06/01/12	06/04/12	06/25/12	08/30/12	09/10/12	09/12/12
EIB		4.5		4.0	7.8				2.0	2.0	1.7	2.0	11.0	2.0	
9		4.5		17.0		11.0			7.8	1700.0	2.0		1.7	1.7	
8	A	23.0	4.5	1.8		2.0			1.7	4.5	1.7		4.5	27.0	1.7
5									2.0		1.7		13.0	2.0	
3		1.7		2.0		17.0			13.0	6.8	1.7		2.0	1.7	
30		33.0	6.8		7.8				2.0						
18															
12															
13				1.7			1.7	4.5		2.0		6.8		17.0	
#42 off bogue banks															
Archer Point - open area															
33 - marker #33 waterway															
28 - marker #28 waterway															
13	D														
13	B				2.0										
13	C														
30	D														

STATION	NO.	10/31/12	11/05/12	02/12/13	02/14/13
EIB		4.0			4.5
9		1.7			1.7
8	A	2.0			2.0
5					
3		17.0	1.7		2.0
30				1.7	
18					
12					
13					1.7
#42 off bogue banks					
Archer Point - open area					
33 - marker #33 waterway					
28 - marker #28 waterway					
13	D			4.5	
13	B				
13	C			2.0	
30	D			2.0	

Table 10: D-4 Rainfall

RAINFALL - 2013
DEER CREEK

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1				0.07	0.09							
2	0.28				0.05							
3	0.05											
4				1.41	0.05							
5				0.10	0.03							
6			0.19		0.41							
7		1.80			0.15							
8		1.12										
9				0.07	0.04							
10				0.03								
11	0.40	0.14		0.07	0.09							
12		0.02	0.90	1.28								
13		0.42			0.09							
14												
15				0.45	0.09							
16	0.06	0.18		0.07								
17	0.32	0.06		0.07								
18				0.10								
19		0.23	0.49	0.07								
20				1.41								
21												
22												
23		0.75			0.45							
24			0.51	0.07								
25	0.16											
26		0.76		0.09								
27				0.08								
28												
29				0.84								
30												
31	0.21											
TOTAL	1.48	5.48	2.09	6.28	1.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00

RAINFALL 2013
EMERALD ISLE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1				0.06								
2	0.34											
3	trace				0.15							
4												
5				1.15	0.08							
6			0.13									
7					0.6							
8		3.15										
9												
10												
11		0.08										
12	0.28	0.10	0.22									
13		0.46	0.78	1.35								
14												
15												
16				0.64								
17		trace snow										
18	0.42											
19			0.56									
20				1.75								
21												
22												
23		0.84										
24		0.34	0.54		0.50							
25												
26	0.22											
27		0.70										
28												
29												
30				0.80								
31	0.22											
TOTAL	1.48	5.67	2.23	5.75	1.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 10: D-4 Rainfall

RAINFALL - 2012
DEER CREEK

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1			0.02	0.16			0.50	0.81	0.15	0.16		
2								0.20	0.21	0.70		
3			0.38					0.15	0.27	0.02		
4			1.15					0.11	0.03		0.46	
5		0.20		0.04				0.27				
6				0.75		0.07	0.06	0.35	1.06		0.38	
7		0.05			0.97		0.07	0.27	0.59	0.46	0.03	0.86
8		0.05						0.37	1.38	0.27		0.02
9	0.45		0.03		0.09							
10		0.14					0.79	0.39				0.24
11	0.81						0.52	1.20				0.93
12						0.25	0.18	0.22			0.05	0.19
13						0.30	0.17		0.11	0.06	0.07	0.29
14							0.14		0.78			0.06
15							0.06	0.43		0.20	0.31	
16		0.50	0.02		0.05		0.04	0.16			0.05	
17			0.06				0.08	0.08		0.18	0.47	
18	0.34				0.36			0.25	1.16	0.02	0.06	
19		0.56						0.67		0.32		
20					0.10	0.17		0.53				
21	0.45			0.10		0.16	0.49	0.22		0.11		
22				0.59	0.03	0.15	0.29	1.33				
23		0.12				0.90	0.09	1.80				0.40
24		0.36	0.08				0.93	0.45				0.03
25			0.33		0.18			1.73	0.25			
26			0.05		0.06	0.15	0.04		0.28	0.12		1.32
27	0.12							0.13	0.20	1.73	0.12	
28		0.02		0.80	0.07		0.30	0.54		0.58	0.02	
29					0.13		0.10	0.13	0.41			1.04
30					2.70		1.30		0.07			
31			0.06				0.19					
TOTAL	2.17	2.00	2.18	2.44	4.74	2.15	6.34	12.79	6.95	4.93	2.02	5.38

RAINFALL 2012
EMERALD ISLE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1				0.34								
2		0.18					0.40	0.82		0.62		
3												
4		0.22	1.75							0.24		
5											0.28	
6				0.42	0.9	0.08						0.12
7		0.07						0.72	1.85			
8								0.44	1.00	0.52		1.25
9												
10	0.32				0.13							0.30
11		0.15					1.00	1.20				0.56
12	1.10						0.66	0.88				0.20
13						0.30	0.10					0.86
14												
15												
16												0.64
17		0.56			0.30			0.50				
18	0.08				0.20							
19	0.26	0.30		0.30					0.40		1.35	
20		0.36						1.35				
21	0.36				0.08			0.34				
22	trace			0.68			0.2					
23				trace				2.85				
24						1.70	0.76	2.10				
25		0.58	0.68		0.22		0.06	2.20				1.95
26			0.05			0.07	trace					
27					0.18					2.05		
28	0.10			0.86								
29							0.50	0.48				
30					2.25			0.08				
31							1.10					
TOTAL	2.22	2.42	2.48	2.60	4.26	2.15	4.78	13.96	3.25	3.43	1.63	5.88

Table 10: D-4 Rainfall

RAINFALL - 2011
DEER CREEK

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	out of town a lot over these 3 months and couldn't keep up with the rain so it was not recorded							0.40			0.08	
2												
3				0.07				0.01				
4											0.90	
5				0.55								
6					0.15							
7							0.02		1.70			
8							0.55					
9				0.35			0.54	0.03				
10				0.05								
11												
12				0.05				0.03	0.12	0.21		
13						0.02	0.11			0.03		
14					0.46			1.02				
15				0.07				0.41				
16				0.26		0.05					0.02	
17				0.06		0.59					0.38	
18										0.63		
19				0.10		0.02		0.20		2.12		
20						0.62						
21				0.21					0.09			
22				0.02				0.33	0.18			
23						0.43			0.48		0.32	
24							0.10		1.37			
25				0.01			0.02		0.87			
26				0.13				3.64				
27				0.13		0.09	0.05	5.66				0.61
28				0.30			0.08					
29				0.01		0.23					0.44	
30									0.15			
31							0.47			0.15		
TOTAL	0.00	0.00	0.00	2.37	0.61	2.05	1.94	11.73	4.96	3.14	2.14	0.61

RAINFALL 2011
EMERALD ISLE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1			0.68	0.15				0.90		0.14	0.08	
2	trace	0.26										
3												
4												
5		2.35									0.74	
6			0.24	0.30								
7			0.28		0.42							
8	0.18	0.64					0.60		2.00			
9				0.10			0.60					
10			0.12	0.17			0.24	0.20				
11	0.38		0.40							trace		
12										0.12		
13				0.05								
14					1.9		trace	0.72				
15								0.04				
16			0.08						0.50			
17				0.18							0.30	
18	1.90					0.88						
19										1.35		
20	0.12									1.60		
21					0.15				0.22			
22				0.40				0.07				trace
23	0.28							0.50	0.34		out of town - 0.72 total	
24			trace			0.36	trace		1.50			
25												
26	1.15	0.38							0.86			
27			0.48	0.30				6+	trace			
28						0.07	0.20	0.70	trace			0.6
29												
30						1.00						
31			0.76									
TOTAL	4.01	3.63	3.04	1.65	2.47	2.31	1.64	9.13+	5.42	3.21	1.84	0.60

Table 10: D-4 Rainfall

RAINFALL - 2010
DEER CREEK

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0.02					0.03	0.02	0.14				
2		0.70	1.56			0.16						
3		0.02	0.05			0.65			0.15			
4				0.01	0.20							
5		1.95						1.05				
6								0.06				
7												
8	0.04						0.01		0.04			
9		0.41		0.41				0.02				
10			0.03			0.22	0.48	0.02				
11			0.88				0.01		1.50			
12			0.18									
13		0.33	0.07			0.14	0.02	3.50				
14		0.03				0.01	1.00					
15		0.07					0.02					
16	0.01											
17	2.17		0.01	0.04			1.21					
18	0.01		0.25				0.94	1.12				
19					0.10							
20						0.01		0.23				
21	0.80			0.27			1.41	0.91				
22	0.08	0.66	0.41	0.01			0.03	0.82				
23			0.01					0.03				
24		0.13			0.05			1.06				
25	0.40	0.05		0.08	0.05	0.09						
26			0.17		0.27							
27				0.01					0.50			
28				0.01		0.23		0.15	1.75			
29	0.03		2.00				0.23		3.35			
30	0.50					0.60			12.50			
31												
TOTAL	4.06	4.35	5.62	0.84	0.67	2.14	5.38	9.11	19.79	0.00	0.00	0.00

out of town a lot over these 3 months and couldn't keep up with the rain so it was not recorded

RAINFALL 2010
EMERALD ISLE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	0.06						0.22	0.32		8.40		1.10
2						0.05						
3		0.62	1.65			0.94			0.52		1.15	
4			0.08									
5								1.40				0.28
6		1.60										
7												
8												
9				0.38								
10		0.38										
11						0.28	0.78					
12			0.80						2.80			0.80
13			0.25			0.05	trace					0.24
14								1.65				
15							0.68					
16		0.04										
17	1.80										0.32	
18							1.15					
19			0.32				0.24	1.20				0.58
20					0.10			0.10				
21												
22	1.55			0.32				1.10				
23	0.13	0.68	0.22					0.24				
24		0.20						trace				
25	0.84							1.25				
26			0.32	0.17						0.46		0.64 rain/ snow
27					0.44	0.04			0.23		0.08	
28				0.07		0.07			1.30	0.30		
29	0.94								0.88	0.22		
30			2.20				0.06		5.65			
31												
TOTAL	5.32	3.52	5.84	0.94	0.62	1.43	4.28	7.26	11.38	9.38	1.55	3.64

0.08

away-total 1.15

Table 10: D-4 Rainfall

RAINFALL - 2009
DEER CREEK

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1			0.39								0.04	
2		0.16			0.73			0.70		0.67		2.33
3		0.10						0.94				0.10
4								0.01			0.01	0.07
5					0.10	0.08	0.14			0.26	0.01	0.76
6	0.02					0.10	1.16	0.01		0.04		
7	0.17				0.27				7.01			0.01
8					0.02	0.01			0.01			0.08
9						0.16					0.01	0.38
10											0.01	
11	0.17				0.13						4.84	
12	0.01							1.68	0.27	0.09	2.61	
13	0.51					0.48	1.66	0.16	0.01		0.04	0.29
14	0.01	0.03		0.93	0.12	1.27	0.01	2.38		0.57	0.01	
15			0.01	0.07		0.01	0.01		0.01	0.05		0.06
16			0.88		0.42	0.30					0.01	
17			0.09		0.57		0.22			0.01		
18	0.27	0.90			0.33		0.05				2.28	0.73
19	0.01	0.12							0.01		1.27	0.01
20	0.06			0.36	0.05		0.02					
21	0.03			0.01					0.45	0.01		
22		0.03		0.01	0.01		0.51	0.06	1.50	0.01	0.22	
23						0.28	0.09	0.33	0.51	0.37	0.10	
24	0.01				0.01		1.57			0.02		
25									1.19		0.13	2.58
26			0.08	0.01		0.13		0.01	0.44	0.05		
27	0.02			0.01	0.04				0.04	0.01		
28	0.32	0.75	0.23			0.01		0.43	0.01	0.12		
29	0.22		0.41		0.19			0.01		0.01		
30					0.02							
31					0.01							0.87
TOTAL	1.83	2.09	2.09	1.40	3.02	2.83	5.44	6.72	11.46	2.29	11.59	8.27

RAINFALL 2009
EMERALD ISLE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1			0.80									0.30
2			0.54	0.22								
3		0.30	0.03	0.50				1.15		1.20		3.10
4								0.78				
5						0.12						0.76
6					0.10		0.05		5.70	0.42		0.22
7	0.30			0.46			1.85	trace	2.20			
8	0.05				0.58							
9									0.05			0.38
10						0.42						
11	0.16										0.10	
12				0.52							9.95	
13								2.60	0.06		0.20	0.15
14	0.76			trace		0.18	2.35	0.30				
15		0.04		1.25	0.06	2.30		3.55		0.94		
16			0.07		1.25	trace				0.07		
17			1.15			0.05						
18					1.25		0.19				0.10	
19	0.34	1.15			0.28						3.75	0.92
20				0.03							trace	
21	0.20			0.74			0.08					
22		trace				0.08			1.80			2.85
23						0.28	0.62		0.86		0.30	
24							0.14	0.52	0.03		0.06	
25	0.03						1.05					
26									1.00	0.50		
27			0.05			0.13			0.44			
28			0.12		0.10	0.06			0.04	0.15	0.15	
29	0.62		0.88		0.25			0.08				
30	0.05											
31												1.25
TOTAL	2.51	1.49	3.64	3.72	3.87	3.62	6.33	8.98	12.18	3.28	14.61	9.93

Table 10: D-4 Rainfall

RAINFALL - 2008
DEER CREEK

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1				0.10		0.67		0.01		0.11		
2		0.40				0.02						0.15
3				0.30							2.07	0.01
4					0.07			0.04			0.12	
5			0.58	1.43	0.12		0.42	0.01	0.58		0.01	
6				0.01	0.01		0.43		0.15			0.05
7			0.37				0.10	0.76				0.01
8			0.61					0.13				
9							0.03	0.03	1.14	0.07		
10					0.44		0.21		0.34	0.25		0.40
11	0.42				1.88	0.01	1.31	0.69	0.63	1.35		0.87
12	0.37								0.01	0.03		0.01
13		1.41						0.41			2.48	
14											0.18	
15			0.47			0.79	2.32			0.01	0.04	0.03
16					0.21		0.01		0.01	0.01	0.01	0.26
17								0.03		0.02		
18	1.18	1.58			0.01		0.19	0.01		0.49		
19							0.12			0.05		0.01
20	0.59		0.26	0.41	0.78	0.02	0.11					0.42
21	0.04	0.19		0.02		0.29	0.81					0.13
22		0.99		0.96		0.60						
23	0.01	0.06				1.07	0.13					
24		0.07			0.07		0.07			0.02		
25									1.45	0.07		0.03
26		0.31					0.02	0.01	1.01			
27	0.16							0.10	0.01	0.03		0.01
28				0.02	0.64		0.01	0.07				0.06
29			0.05	0.01	0.01	0.05					0.35	0.63
30	0.19		0.37								1.22	
31			0.08				0.20					
TOTAL	2.96	5.01	2.79	3.26	4.24	3.52	6.49	2.30	5.33	2.51	6.48	3.08

RAINFALL 2008
EMERALD ISLE

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1		0.12		0.14								0.86
2		0.38		0.08		0.62						
3				0.15				0.30				0.18
4				0.18	0.06						2.40	
5			0.56		0.12		0.05				0.06	
6				0.23					0.84			
7				0.23			0.05					
8			0.58	0.23				0.84				
9			0.48	0.23								
10				0.24	0.54		trace	0.05	0.34	0.06		0.06
11				0.24				0.70	0.52	1.60		0.70
12	0.88				1.65		2.05		0.19	0.80		1.25
13	1.00	-									0.34	
14	0.05	1.25						0.48			2.20	
15									0.18		0.44	
16			0.64			1.60	1.00				0.10	0.34
17												
18	0.90						0.34	0.10		0.20		
19		1.60								0.44		
20	0.58		0.32				0.26					
21				0.50	1.00	0.05	trace					0.48
22		0.82		0.52		0.38	0.06					
23	0.06	0.30		0.66		0.96						
24				trace		0.52	0.09					
25		0.08							0.14	0.13	trace	
26									2.55			0.98
27	0.15	0.36					0.10		0.48			
28							trace	0.38		trace		
29					0.62			trace				
30	0.15		0.22			0.05					0.98	
31	0.05		0.15									
TOTAL	3.82	4.91	2.95	3.63	3.99	4.18	4.00	2.85	5.24	3.23	6.52	4.85

Table 11: D-4 Formatted Data 2013

Station ID: 1

# Samples:	30	**Log Avg:**	0.3854
# > 43 MPN:	0	**Log Std Dev:**	0.2826
# > 260 MPN:	0	**Geomean:**	2.4287
Median:	1.7	**Estimated 90th:**	5

Date	Tidal Stage	Salinity	FC	Log FC
5/19/2008	LAST FLD	34	1.7	0.2304
6/16/2008	1/2 EBB	36	1.7	0.2304
7/31/2008	1/4 EBB	37	4.5	0.6532
8/25/2008	LAST EBB	36	1.7	0.2304
2/5/2009	1/2 EBB	34	1.7	0.2304
3/11/2009	3/4 FLD	34	2.0	0.301
4/13/2009	1/4 FLD	32	1.7	0.2304
5/12/2009	1/4 FLD	36	2.0	0.301
7/28/2009	LOW	35	1.7	0.2304
11/3/2009	LAST FLD	32	**22.0**	1.3424
3/10/2010	1/2 EBB	28	4.5	0.6532
4/13/2010	1/2 EBB	32	7.8	0.8921
5/20/2010	LAST EBB	36	1.7	0.2304
7/12/2010	3/4 FLD	36	1.7	0.2304
8/31/2010	1ST FLD	34	1.7	0.2304
11/8/2010	3/4 FLD	32	11.0	1.0414
1/6/2011	3/4 FLD	32	1.7	0.2304
3/23/2011	1/2 FLD	30	1.7	0.2304
4/19/2011	3/4 FLD	32	2.0	0.301
6/14/2011	1ST EBB	35	2.0	0.301
8/3/2011	1/2 FLD	37	1.7	0.2304
11/8/2011	1/4 EBB	32	2.0	0.301
1/25/2012	3/4 FLD	35	2.0	0.301
2/23/2012	3/4 FLD	32	1.7	0.2304
4/9/2012	3/4 FLD	34	4.0	0.6021
5/29/2012	3/4 EBB	35	1.7	0.2304
7/31/2012	1ST EBB	34	1.7	0.2304
10/16/2012	LAST FLD	33	4.5	0.6532
1/22/2013	1/2 EBB	30	1.7	0.2304
4/18/2013	LAST EBB	30	1.7	0.2304

Station ID: 2A

# Samples:	30	**Log Avg:**	0.5369
# > 43 MPN:	0	**Log Std Dev:**	0.3711
# > 260 MPN:	0	**Geomean:**	3.4428
Median:	2	**Estimated 90th:**	10

Date	Tidal Stage	Salinity	FC	Log FC
5/19/2008	LAST FLD	34	4.0	0.6021
6/16/2008	1/2 EBB	36	1.7	0.2304
7/31/2008	1/4 EBB	37	2.0	0.301
8/25/2008	LAST EBB	36	1.8	0.2553
2/5/2009	1/2 EBB	32	1.7	0.2304
3/11/2009	3/4 FLD	34	4.5	0.6532
4/13/2009	1/4 FLD	32	2.0	0.301
5/12/2009	1/4 FLD	36	4.5	0.6532
7/28/2009	LOW	34	1.7	0.2304
11/3/2009	LAST FLD	31	**21.0**	1.3222
3/10/2010	1/2 EBB	28	2.0	0.301
4/13/2010	1/2 EBB	32	1.7	0.2304
5/20/2010	LAST EBB	36	2.0	0.301
7/12/2010	3/4 FLD	36	1.7	0.2304
8/31/2010	1ST FLD	34	4.5	0.6532
11/8/2010	3/4 FLD	32	11.0	1.0414
1/6/2011	3/4 FLD	32	2.0	0.301
3/23/2011	1/2 FLD	30	2.0	0.301
4/19/2011	3/4 FLD	32	13.0	1.1139
6/14/2011	1ST EBB	35	7.8	0.8921
8/3/2011	1/2 FLD	36	**17.0**	1.2304
11/8/2011	1/4 EBB	32	**23.0**	1.3617
1/25/2012	3/4 FLD	35	1.7	0.2304
2/23/2012	3/4 FLD	32	4.0	0.6021
4/9/2012	3/4 FLD	34	1.7	0.2304
5/29/2012	3/4 EBB	36	1.7	0.2304
7/31/2012	1ST EBB	34	7.8	0.8921
10/16/2012	LAST FLD	32	2.0	0.301
1/22/2013	1/2 EBB	30	4.5	0.6532
4/18/2013	LAST EBB	30	1.7	0.2304

D-4 Formatted Data 2013

Station ID: 3

# Samples:	30	Log Avg:	0.6564
# > 43 MPN:	2	Log Std Dev:	0.4769
# > 260 MPN:	0	Geomean:	4.5335
Median:	4	Estimated 90th:	18

Date	Tidal Stage	Salinity	FC	Log FC
5/19/2008	LAST FLD	38	1.7	0.2304
6/16/2008	1/2 EBB	36	2.0	0.301
7/31/2008	1/4 EBB	38	1.7	0.2304
8/25/2008	LAST EBB	36	9.3	0.9685
2/5/2009	1/2 EBB	32	2.0	0.301
3/11/2009	3/4 FLD	34	**70.0**	1.8451
4/13/2009	1/4 FLD	32	13.0	1.1139
5/12/2009	1/4 FLD	36	**17.0**	1.2304
7/28/2009	LOW	35	1.7	0.2304
11/3/2009	LAST FLD	31	11.0	1.0414
3/10/2010	1/2 EBB	28	4.5	0.6532
4/13/2010	1/2 EBB	32	1.7	0.2304
5/20/2010	LAST EBB	34	**79.0**	1.8976
7/12/2010	3/4 FLD	36	4.0	0.6021
8/31/2010	1ST FLD	32	13.0	1.1139
11/8/2010	3/4 FLD	32	1.7	0.2304
1/6/2011	3/4 FLD	34	2.0	0.301
3/23/2011	1/2 FLD	30	4.0	0.6021
4/19/2011	3/4 FLD	32	2.0	0.301
6/14/2011	1ST EBB	35	13.0	1.1139
8/3/2011	1/2 FLD	36	1.7	0.2304
11/8/2011	1/4 EBB	32	7.8	0.8921
1/25/2012	3/4 FLD	35	1.7	0.2304
2/23/2012	3/4 FLD	32	4.0	0.6021
4/9/2012	3/4 FLD	34	4.5	0.6532
5/29/2012	3/4 EBB	36	1.7	0.2304
7/31/2012	1ST EBB	34	7.8	0.8921
10/16/2012	LAST FLD	31	7.8	0.8921
1/22/2013	1/2 EBB	30	2.0	0.301
4/18/2013	LAST EBB	30	1.7	0.2304

Station ID: 5

# Samples:	30	Log Avg:	0.3980
# > 43 MPN:	0	Log Std Dev:	0.3432
# > 260 MPN:	0	Geomean:	2.5004
Median:	1.7	Estimated 90th:	6

Date	Tidal Stage	Salinity	FC	Log FC
5/19/2008	LAST FLD	34	1.8	0.2553
6/16/2008	1/2 EBB	36	1.7	0.2304
7/31/2008	1/4 EBB	38	1.7	0.2304
8/25/2008	LAST EBB	37	1.7	0.2304
2/5/2009	1/2 EBB	36	1.7	0.2304
3/11/2009	3/4 FLD	36	1.8	0.2553
4/13/2009	1/4 FLD	30	1.7	0.2304
5/12/2009	1/4 FLD	36	7.8	0.8921
7/28/2009	LOW	34	1.7	0.2304
11/3/2009	LAST FLD	31	**33.0**	1.5185
3/10/2010	1/2 EBB	28	1.7	0.2304
4/13/2010	1/2 EBB	32	1.7	0.2304
5/20/2010	LAST EBB	36	1.7	0.2304
7/12/2010	3/4 FLD	36	1.7	0.2304
8/31/2010	1ST FLD	34	1.8	0.2553
11/8/2010	3/4 FLD	32	**22.0**	1.3424
1/6/2011	3/4 FLD	32	1.8	0.2553
3/23/2011	1/2 FLD	31	1.7	0.2304
4/19/2011	3/4 FLD	34	4.5	0.6532
6/14/2011	1ST EBB	35	2.0	0.301
8/3/2011	1/2 FLD	36	4.5	0.6532
11/8/2011	1/4 EBB	32	2.0	0.301
1/25/2012	3/4 FLD	35	2.0	0.301
2/23/2012	3/4 FLD	34	1.7	0.2304
4/9/2012	3/4 FLD	34	1.7	0.2304
5/29/2012	3/4 EBB	36	1.7	0.2304
7/31/2012	1ST EBB	34	9.3	0.9685
10/16/2012	LAST FLD	32	1.7	0.2304
1/22/2013	1/2 EBB	30	2.0	0.301
4/18/2013	LAST EBB	30	1.7	0.2304

D-4 Formatted Data 2013

Station ID: 6

# Samples:	30	Log Avg:	0.5158
# > 43 MPN:	2	Log Std Dev:	0.4806
# > 260 MPN:	0	Geomean:	3.2793
Median:	2	Estimated 90th:	13

Date	Tidal Stage	Salinity	FC	Log FC
5/19/2008	LAST FLD	34	7.8	0.8921
6/16/2008	1/2 EBB	36	2.0	0.301
7/31/2008	1/4 EBB	37	**33.0**	1.5185
8/25/2008	LAST EBB	37	1.8	0.2553
2/5/2009	1/2 EBB	34	2.0	0.301
3/11/2009	3/4 FLD	34	2.0	0.301
4/13/2009	1/4 FLD	33	2.0	0.301
5/12/2009	1/4 FLD	36	**110.0**	2.0414
7/28/2009	LOW	36	2.0	0.301
11/3/2009	LAST FLD	32	**49.0**	1.6902
3/10/2010	1/2 EBB	28	1.7	0.2304
4/13/2010	1/2 EBB	32	7.8	0.8921
5/20/2010	LAST EBB	36	4.5	0.6532
7/12/2010	3/4 FLD	36	7.8	0.8921
8/31/2010	1ST FLD	34	1.7	0.2304
11/8/2010	3/4 FLD	32	4.5	0.6532
1/6/2011	3/4 FLD	32	1.7	0.2304
3/23/2011	1/2 FLD	30	1.8	0.2553
4/19/2011	3/4 FLD	32	2.0	0.301
6/14/2011	1ST EBB	35	1.7	0.2304
8/3/2011	1/2 FLD	36	2.0	0.301
11/8/2011	1/4 EBB	30	1.7	0.2304
1/25/2012	3/4 FLD	35	1.7	0.2304
2/23/2012	3/4 FLD	34	1.7	0.2304
4/9/2012	3/4 FLD	37	1.7	0.2304
5/29/2012	3/4 EBB	35	1.7	0.2304
7/31/2012	1ST EBB	35	6.8	0.8325
10/16/2012	LAST FLD	33	1.7	0.2304
1/22/2013	1/2 EBB	31	1.8	0.2553
4/18/2013	LAST EBB	30	1.7	0.2304

Station ID: 7

# Samples:	30	Log Avg:	0.5044
# > 43 MPN:	0	Log Std Dev:	0.3581
# > 260 MPN:	0	Geomean:	3.1948
Median:	2	Estimated 90th:	9

Date	Tidal Stage	Salinity	FC	Log FC
5/19/2008	LAST FLD	34	1.7	0.2304
6/16/2008	1/2 EBB	36	1.7	0.2304
7/31/2008	1/4 EBB	38	1.7	0.2304
8/25/2008	LAST EBB	36	1.7	0.2304
2/5/2009	1/2 EBB	34	2.0	0.301
3/11/2009	3/4 FLD	32	1.7	0.2304
4/13/2009	1/4 FLD	33	2.0	0.301
5/12/2009	1/4 FLD	36	6.8	0.8325
7/28/2009	LOW	34	1.7	0.2304
11/3/2009	LAST FLD	33	13.0	1.1139
3/10/2010	1/2 EBB	30	2.0	0.301
4/13/2010	1/2 EBB	32	2.0	0.301
5/20/2010	LAST EBB	36	**14.0**	1.1461
7/12/2010	3/4 FLD	36	1.7	0.2304
8/31/2010	1ST FLD	34	2.0	0.301
11/8/2010	3/4 FLD	32	11.0	1.0414
1/6/2011	3/4 FLD	34	1.7	0.2304
3/23/2011	1/2 FLD	32	1.7	0.2304
4/19/2011	3/4 FLD	32	2.0	0.301
6/14/2011	1ST EBB	35	4.5	0.6532
8/3/2011	1/2 FLD	36	4.0	0.6021
11/8/2011	1/4 EBB	30	13.0	1.1139
1/25/2012	3/4 FLD	35	4.5	0.6532
2/23/2012	3/4 FLD	32	1.7	0.2304
4/9/2012	3/4 FLD	34	1.7	0.2304
5/29/2012	3/4 EBB	35	1.7	0.2304
7/31/2012	1ST EBB	35	**17.0**	1.2304
10/16/2012	LAST FLD	33	2.0	0.301
1/22/2013	1/2 EBB	31	6.8	0.8325
4/18/2013	LAST EBB	30	11.0	1.0414

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Station ID: 7A

# Samples:	30	Log Avg:	0.7111
# > 43 MPN:	3	Log Std Dev:	0.5986
# > 260 MPN:	1	Geomean:	5.1413
Median:	3.25	Estimated 90th:	30

Date	Tidal Stage	Salinity	FC	Log FC
5/19/2008	LAST FLD	34	2.0	0.301
6/16/2008	1/2 EBB	36	4.5	0.6532
7/31/2008	1/4 EBB	37	1.7	0.2304
8/25/2008	LAST EBB	36	**49.0**	1.6902
2/5/2009	1/2 EBB	34	1.7	0.2304
3/11/2009	3/4 FLD	34	4.5	0.6532
4/13/2009	1/4 FLD	32	2.0	0.301
5/12/2009	1/4 FLD	36	7.8	0.8921
7/28/2009	LOW	34	1.7	0.2304
11/3/2009	LAST FLD	32	**22.0**	1.3424
3/10/2010	1/2 EBB	30	13.0	1.1139
4/13/2010	1/2 EBB	32	1.7	0.2304
5/20/2010	LAST EBB	36	**17.0**	1.2304
7/12/2010	3/4 FLD	36	**22.0**	1.3424
8/31/2010	1ST FLD	34	1.7	0.2304
11/8/2010	3/4 FLD	32	2.0	0.301
1/6/2011	3/4 FLD	32	2.0	0.301
3/23/2011	1/2 FLD	31	4.5	0.6532
4/19/2011	3/4 FLD	32	4.5	0.6532
6/14/2011	1ST EBB	35	**350.0**	2.5441
8/3/2011	1/2 FLD	36	**49.0**	1.6902
11/8/2011	1/4 EBB	30	1.7	0.2304
1/25/2012	3/4 FLD	35	7.8	0.8921
2/23/2012	3/4 FLD	34	1.7	0.2304
4/9/2012	3/4 FLD	34	4.5	0.6532
5/29/2012	3/4 EBB	35	2.0	0.301
7/31/2012	1ST EBB	35	**33.0**	1.5185
10/16/2012	LAST FLD	34	1.7	0.2304
1/22/2013	1/2 EBB	31	1.7	0.2304
4/18/2013	LAST EBB	30	1.7	0.2304

Station ID: 8A

# Samples:	30	Log Avg:	0.3927
# > 43 MPN:	0	Log Std Dev:	0.3288
# > 260 MPN:	0	Geomean:	2.4703
Median:	1.7	Estimated 90th:	6

Date	Tidal Stage	Salinity	FC	Log FC
5/19/2008	LAST FLD	34	1.7	0.2304
6/16/2008	1/2 EBB	35	1.7	0.2304
7/31/2008	1/4 EBB	38	1.7	0.2304
8/25/2008	LAST EBB	37	1.7	0.2304
2/5/2009	1/2 EBB	34	2.0	0.301
3/11/2009	3/4 FLD	34	2.0	0.301
4/13/2009	1/4 FLD	32	**14.0**	1.1461
5/12/2009	1/4 FLD	34	1.7	0.2304
7/28/2009	LOW	34	1.7	0.2304
11/3/2009	LAST FLD	32	13.0	1.1139
3/10/2010	1/2 EBB	30	1.7	0.2304
4/13/2010	1/2 EBB	32	1.7	0.2304
5/20/2010	LAST EBB	34	**22.0**	1.3424
7/12/2010	3/4 FLD	36	1.7	0.2304
8/31/2010	1ST FLD	34	1.7	0.2304
11/8/2010	3/4 FLD	32	7.8	0.8921
1/6/2011	3/4 FLD	32	4.5	0.6532
3/23/2011	1/2 FLD	32	1.7	0.2304
4/19/2011	3/4 FLD	33	1.7	0.2304
6/14/2011	1ST EBB	35	1.7	0.2304
8/3/2011	1/2 FLD	36	1.7	0.2304
11/8/2011	1/4 EBB	30	1.7	0.2304
1/25/2012	3/4 FLD	35	1.7	0.2304
2/23/2012	3/4 FLD	32	1.7	0.2304
4/9/2012	3/4 FLD	34	1.7	0.2304
5/29/2012	3/4 EBB	35	1.7	0.2304
7/31/2012	1ST EBB	35	7.8	0.8921
10/16/2012	LAST FLD	34	1.7	0.2304
1/22/2013	1/2 EBB	30	2.0	0.301
4/18/2013	LAST EBB	30	1.7	0.2304

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Station ID: 9A

# Samples:	30	Log Avg:	0.5148
# > 43 MPN:	0	Log Std Dev:	0.4114
# > 260 MPN:	0	Geomean:	3.2720
Median:	2	Estimated 90th:	11

Date	Tidal Stage	Salinity	FC	Log FC
5/19/2008	LAST FLD	34	2.0	0.301
6/16/2008	1/2 EBB	36	**23.0**	1.3617
7/31/2008	1/4 EBB	38	2.0	0.301
8/25/2008	LAST EBB	36	2.0	0.301
2/5/2009	1/2 EBB	34	1.7	0.2304
3/11/2009	3/4 FLD	39	13.0	1.1139
4/13/2009	1/4 FLD	32	**26.0**	1.415
5/12/2009	1/4 FLD	36	2.0	0.301
7/28/2009	LOW	36	2.0	0.301
11/3/2009	LAST FLD	34	**17.0**	1.2304
3/10/2010	1/2 EBB	30	1.7	0.2304
4/13/2010	1/2 EBB	32	1.7	0.2304
5/20/2010	LAST EBB	36	**23.0**	1.3617
7/12/2010	3/4 FLD	36	4.5	0.6532
8/31/2010	1ST FLD	34	2.0	0.301
11/8/2010	3/4 FLD	32	4.5	0.6532
1/6/2011	3/4 FLD	32	11.0	1.0414
3/23/2011	1/2 FLD	32	2.0	0.301
4/19/2011	3/4 FLD	34	6.8	0.8325
6/14/2011	1ST EBB	35	4.5	0.6532
8/3/2011	1/2 FLD	38	1.7	0.2304
11/8/2011	1/4 EBB	32	1.7	0.2304
1/25/2012	3/4 FLD	35	1.8	0.2553
2/23/2012	3/4 FLD	34	1.7	0.2304
4/9/2012	3/4 FLD	34	1.7	0.2304
5/29/2012	3/4 EBB	35	1.7	0.2304
7/31/2012	1ST EBB	35	1.7	0.2304
10/16/2012	LAST FLD	34	1.7	0.2304
1/22/2013	1/2 EBB	31	1.7	0.2304
4/18/2013	LAST EBB	30	1.7	0.2304

Station ID: 11

# Samples:	30	Log Avg:	0.6158
# > 43 MPN:	1	Log Std Dev:	0.3853
# > 260 MPN:	0	Geomean:	4.1281
Median:	4	Estimated 90th:	12

Date	Tidal Stage	Salinity	FC	Log FC
5/19/2008	LAST FLD	34	1.7	0.2304
6/16/2008	1/2 EBB	36	**49.0**	1.6902
7/31/2008	1/4 EBB	36	7.8	0.8921
8/25/2008	LAST EBB	37	1.7	0.2304
2/5/2009	1/2 EBB	34	1.7	0.2304
3/11/2009	3/4 FLD	34	1.8	0.2553
4/13/2009	1/4 FLD	32	2.0	0.301
5/12/2009	1/4 FLD	36	11.0	1.0414
7/28/2009	LOW	34	2.0	0.301
11/3/2009	LAST FLD	35	4.0	0.6021
3/10/2010	1/2 EBB	30	13.0	1.1139
4/13/2010	1/2 EBB	34	1.8	0.2553
5/20/2010	LAST EBB	35	7.8	0.8921
7/12/2010	3/4 FLD	36	2.0	0.301
8/31/2010	1ST FLD	32	11.0	1.0414
11/8/2010	3/4 FLD	35	4.5	0.6532
1/6/2011	3/4 FLD	34	7.8	0.8921
3/23/2011	1/2 FLD	32	4.0	0.6021
4/19/2011	3/4 FLD	32	1.7	0.2304
6/14/2011	1ST EBB	35	2.0	0.301
8/3/2011	1/2 FLD		1.7	0.2304
11/8/2011	1/4 EBB	32	11.0	1.0414
1/25/2012	3/4 FLD	35	2.0	0.301
2/23/2012	3/4 FLD	34	4.5	0.6532
4/9/2012	3/4 FLD	35	1.7	0.2304
5/29/2012	3/4 EBB	36	7.8	0.8921
7/31/2012	1ST EBB	35	7.8	0.8921
10/16/2012	LAST FLD	34	6.8	0.8325
1/22/2013	1/2 EBB	30	11.0	1.0414
4/18/2013	LAST EBB	30	2.0	0.301

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Station ID: 13

# Samples:	30	Log Avg:	0.7851
# > 43 MPN:	4	Log Std Dev:	0.6003
# > 260 MPN:	0	Geomean:	6.0962
Median:	4.5	Estimated 90th:	35

Date	Tidal Stage	Salinity	FC	Log FC
5/19/2008	LAST FLD	34	1.8	0.2553
6/16/2008	1/2 EBB	34	**170.0**	2.2304
7/31/2008	1/4 EBB	36	**23.0**	1.3617
8/25/2008	LAST EBB	37	4.5	0.6532
2/5/2009	1/2 EBB	34	1.7	0.2304
3/11/2009	3/4 FLD	34	4.5	0.6532
4/13/2009	1/4 FLD	32	2.0	0.301
5/12/2009	1/4 FLD	36	2.0	0.301
7/28/2009	LOW	35	**110.0**	2.0414
11/3/2009	LAST FLD	35	2.0	0.301
3/10/2010	1/2 EBB	30	**17.0**	1.2304
4/13/2010	1/2 EBB	34	1.7	0.2304
5/20/2010	LAST EBB	36	**70.0**	1.8451
7/12/2010	3/4 FLD	36	4.5	0.6532
8/31/2010	1ST FLD	32	6.1	0.7853
11/8/2010	3/4 FLD	35	4.5	0.6532
1/6/2011	3/4 FLD	35	2.0	0.301
3/23/2011	1/2 FLD	33	4.5	0.6532
4/19/2011	3/4 FLD	32	4.5	0.6532
6/14/2011	1ST EBB	35	**31.0**	1.4914
8/3/2011	1/2 FLD	36	2.0	0.301
11/8/2011	1/4 EBB	34	6.8	0.8325
1/25/2012	3/4 FLD	35	4.5	0.6532
2/23/2012	3/4 FLD	36	2.0	0.301
4/9/2012	3/4 FLD	36	2.0	0.301
5/29/2012	3/4 EBB	35	**79.0**	1.8976
7/31/2012	1ST EBB	36	4.5	0.6532
10/16/2012	LAST FLD	35	1.8	0.2553
1/22/2013	1/2 EBB	30	2.0	0.301
4/18/2013	LAST EBB	30	**17.0**	1.2304

Station ID: 13A

# Samples:	30	Log Avg:	0.3701
# > 43 MPN:	0	Log Std Dev:	0.2616
# > 260 MPN:	0	Geomean:	2.3450
Median:	1.7	Estimated 90th:	5

Date	Tidal Stage	Salinity	FC	Log FC
5/19/2008	LAST FLD	34	1.7	0.2304
6/16/2008	1/2 EBB	36	13.0	1.1139
7/31/2008	1/4 EBB	36	1.7	0.2304
8/25/2008	LAST EBB	36	2.0	0.301
2/5/2009	1/2 EBB	34	2.0	0.301
3/11/2009	3/4 FLD	34	1.7	0.2304
4/13/2009	1/4 FLD	34	2.0	0.301
5/12/2009	1/4 FLD	36	13.0	1.1139
7/28/2009	LOW	35	2.0	0.301
11/3/2009	LAST FLD	35	1.7	0.2304
3/10/2010	1/2 EBB	33	2.0	0.301
4/13/2010	1/2 EBB	34	1.7	0.2304
5/20/2010	LAST EBB	36	2.0	0.301
7/12/2010	3/4 FLD	36	2.0	0.301
8/31/2010	1ST FLD	34	1.7	0.2304
11/8/2010	3/4 FLD	35	1.7	0.2304
1/6/2011	3/4 FLD	34	1.7	0.2304
3/23/2011	1/2 FLD	33	4.5	0.6532
4/19/2011	3/4 FLD	34	1.7	0.2304
6/14/2011	1ST EBB	35	4.5	0.6532
8/3/2011	1/2 FLD	36	4.5	0.6532
11/8/2011	1/4 EBB	34	1.7	0.2304
1/25/2012	3/4 FLD	35	1.7	0.2304
2/23/2012	3/4 FLD	34	1.7	0.2304
4/9/2012	3/4 FLD	36	1.7	0.2304
5/29/2012	3/4 EBB	36	1.7	0.2304
7/31/2012	1ST EBB	36	1.7	0.2304
10/16/2012	LAST FLD	35	1.7	0.2304
1/22/2013	1/2 EBB	31	7.8	0.8921
4/18/2013	LAST EBB	30	1.7	0.2304

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Station ID: 13B

# Samples:	30	Log Avg:	0.3940
# > 43 MPN:	0	Log Std Dev:	0.3172
# > 260 MPN:	0	Geomean:	2.4777
Median:	1.7	Estimated 90th:	6

Date	Tidal Stage	Salinity	FC	Log FC
5/19/2008	LAST FLD	36	1.7	0.2304
6/16/2008	1/2 EBB	34	1.7	0.2304
7/31/2008	1/4 EBB	38	1.7	0.2304
8/25/2008	LAST EBB	38	2.0	0.301
2/5/2009	1/2 EBB	34	1.7	0.2304
3/11/2009	3/4 FLD	34	1.7	0.2304
4/13/2009	1/4 FLD	35	1.7	0.2304
5/12/2009	1/4 FLD	36	1.7	0.2304
7/28/2009	LOW	36	2.0	0.301
11/3/2009	LAST FLD	34	4.5	0.6532
3/10/2010	1/2 EBB	34	6.8	0.8325
4/13/2010	1/2 EBB	35	1.7	0.2304
5/20/2010	LAST EBB	36	**33.0**	1.5185
7/12/2010	3/4 FLD	36	4.5	0.6532
8/31/2010	1ST FLD	34	1.7	0.2304
11/8/2010	3/4 FLD	35	1.7	0.2304
1/6/2011	3/4 FLD	35	1.7	0.2304
3/23/2011	1/2 FLD	33	1.8	0.2553
4/19/2011	3/4 FLD	33	1.7	0.2304
6/14/2011	1ST EBB	35	1.7	0.2304
8/3/2011	1/2 FLD	36	1.7	0.2304
11/8/2011	1/4 EBB	34	2.0	0.301
1/25/2012	3/4 FLD	35	1.7	0.2304
2/23/2012	3/4 FLD	34	2.0	0.301
4/9/2012	3/4 FLD	36	1.7	0.2304
5/29/2012	3/4 EBB	35	1.7	0.2304
7/31/2012	1ST EBB	36	**17.0**	1.2304
10/16/2012	LAST FLD	35	2.0	0.301
1/22/2013	1/2 EBB	31	4.0	0.6021
4/18/2013	LAST EBB	30	4.5	0.6532

Station ID: 13C

# Samples:	30	Log Avg:	0.4391
# > 43 MPN:	0	Log Std Dev:	0.2958
# > 260 MPN:	0	Geomean:	2.7486
Median:	1.85	Estimated 90th:	6

Date	Tidal Stage	Salinity	FC	Log FC
5/19/2008	LAST FLD	36	1.7	0.2304
6/16/2008	1/2 EBB	36	6.8	0.8325
7/31/2008	1/4 EBB	37	4.5	0.6532
8/25/2008	LAST EBB	37	4.5	0.6532
2/5/2009	1/2 EBB	34	2.0	0.301
3/11/2009	3/4 FLD	34	2.0	0.301
4/13/2009	1/4 FLD	33	1.7	0.2304
5/12/2009	1/4 FLD	36	13.0	1.1139
7/28/2009	LOW	36	2.0	0.301
11/3/2009	LAST FLD	35	7.8	0.8921
3/10/2010	1/2 EBB	30	6.8	0.8325
4/13/2010	1/2 EBB	34	1.7	0.2304
5/20/2010	LAST EBB	34	1.7	0.2304
7/12/2010	3/4 FLD	36	2.0	0.301
8/31/2010	1ST FLD	34	4.0	0.6021
11/8/2010	3/4 FLD	35	1.7	0.2304
1/6/2011	3/4 FLD	35	1.7	0.2304
3/23/2011	1/2 FLD	33	6.8	0.8325
4/19/2011	3/4 FLD	34	1.7	0.2304
6/14/2011	1ST EBB	35	1.7	0.2304
8/3/2011	1/2 FLD	36	1.7	0.2304
11/8/2011	1/4 EBB	32	1.7	0.2304
1/25/2012	3/4 FLD	35	1.7	0.2304
2/23/2012	3/4 FLD	34	1.7	0.2304
4/9/2012	3/4 FLD	36	1.7	0.2304
5/29/2012	3/4 EBB	35	1.7	0.2304
7/31/2012	1ST EBB	36	**14.0**	1.1461
10/16/2012	LAST FLD	35	4.5	0.6532
1/22/2013	1/2 EBB	30	2.0	0.301
4/18/2013	LAST EBB	30	1.7	0.2304

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Station ID: 13D

# Samples:	16	Log Avg:	0.4030
# > 43 MPN:	0	Log Std Dev:	0.2544
# > 260 MPN:	0	Geomean:	2.5294
Median:	2	Estimated 90th:	5

Date	Tidal Stage	Salinity	FC	Log FC
8/31/2010	1ST FLD	34	7.8	0.8921
11/8/2010	3/4 FLD	35	2.0	0.301
1/6/2011	3/4 FLD	35	4.0	0.6021
3/23/2011	1/2 FLD	33	2.0	0.301
4/19/2011	3/4 FLD	32	4.5	0.6532
6/14/2011	1ST EBB	35	2.0	0.301
8/3/2011	1/2 FLD	36	1.7	0.2304
11/8/2011	1/4 EBB	32	1.7	0.2304
1/25/2012	3/4 FLD	35	2.0	0.301
2/23/2012	3/4 FLD	34	1.7	0.2304
4/9/2012	3/4 FLD	36	1.7	0.2304
5/29/2012	3/4 EBB	35	1.7	0.2304
7/31/2012	1ST EBB	36	11.0	1.0414
10/16/2012	LAST FLD	36	2.0	0.301
1/22/2013	1/2 EBB	30	2.0	0.301
4/18/2013	LAST EBB	30	2.0	0.301

Station ID: 14

# Samples:	30	Log Avg:	0.5580
# > 43 MPN:	0	Log Std Dev:	0.4005
# > 260 MPN:	0	Geomean:	3.6137
Median:	2	Estimated 90th:	11

Date	Tidal Stage	Salinity	FC	Log FC
5/19/2008	LAST FLD	36	1.7	0.2304
6/16/2008	1/2 EBB	34	**17.0**	1.2304
7/31/2008	1/4 EBB	37	13.0	1.1139
8/25/2008	LAST EBB	38	1.7	0.2304
2/5/2009	1/2 EBB	34	1.7	0.2304
3/11/2009	3/4 FLD	34	4.5	0.6532
4/13/2009	1/4 FLD	31	2.0	0.301
5/12/2009	1/4 FLD	36	1.7	0.2304
7/28/2009	LOW	36	1.8	0.2553
11/3/2009	LAST FLD	33	**33.0**	1.5185
3/10/2010	1/2 EBB	30	1.7	0.2304
4/13/2010	1/2 EBB	32	1.7	0.2304
5/20/2010	LAST EBB	36	4.5	0.6532
7/12/2010	3/4 FLD	36	1.7	0.2304
8/31/2010	1ST FLD	34	1.7	0.2304
11/8/2010	3/4 FLD	32	4.5	0.6532
1/6/2011	3/4 FLD	34	4.0	0.6021
3/23/2011	1/2 FLD	32	**26.0**	1.415
4/19/2011	3/4 FLD	32	2.0	0.301
6/14/2011	1ST EBB	35	2.0	0.301
8/3/2011	1/2 FLD	36	2.0	0.301
11/8/2011	1/4 EBB	32	4.0	0.6021
1/25/2012	3/4 FLD	35	4.5	0.6532
2/23/2012	3/4 FLD	34	1.7	0.2304
4/9/2012	3/4 FLD	34	1.7	0.2304
5/29/2012	3/4 EBB	35	13.0	1.1139
7/31/2012	1ST EBB	35	11.0	1.0414
10/16/2012	LAST FLD	36	7.8	0.8921
1/22/2013	1/2 EBB	30	1.7	0.2304
4/18/2013	LAST EBB	30	4.0	0.6021

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Station ID: 14A

# Samples:	30	Log Avg:	0.4697
# > 43 MPN:	1	Log Std Dev:	0.4046
# > 260 MPN:	0	Geomean:	2.9492
Median:	2	Estimated 90th:	9

Date	Tidal Stage	Salinity	FC	Log FC
5/19/2008	LAST FLD	34	1.8	0.2553
6/16/2008	1/2 EBB	34	**130.0**	2.1139
7/31/2008	1/4 EBB	38	11.0	1.0414
8/25/2008	LAST EBB	37	1.7	0.2304
2/5/2009	1/2 EBB	34	2.0	0.301
3/11/2009	3/4 FLD	36	11.0	1.0414
4/13/2009	1/4 FLD	34	2.0	0.301
5/12/2009	1/4 FLD	36	2.0	0.301
7/28/2009	LOW	36	1.7	0.2304
11/3/2009	LAST FLD	34	6.8	0.8325
3/10/2010	1/2 EBB	30	4.5	0.6532
4/13/2010	1/2 EBB	32	2.0	0.301
5/20/2010	LAST EBB	36	1.7	0.2304
7/12/2010	3/4 FLD	36	7.8	0.8921
8/31/2010	1ST FLD	34	1.7	0.2304
11/8/2010	3/4 FLD	35	4.5	0.6532
1/6/2011	3/4 FLD	35	1.7	0.2304
3/23/2011	1/2 FLD	34	1.7	0.2304
4/19/2011	3/4 FLD	32	4.0	0.6021
6/14/2011	1ST EBB	35	1.7	0.2304
8/3/2011	1/2 FLD	36	1.7	0.2304
11/8/2011	1/4 EBB	32	1.7	0.2304
1/25/2012	3/4 FLD	35	1.7	0.2304
2/23/2012	3/4 FLD	34	4.0	0.6021
4/9/2012	3/4 FLD	36	2.0	0.301
5/29/2012	3/4 EBB	35	1.7	0.2304
7/31/2012	1ST EBB	35	4.0	0.6021
10/16/2012	LAST FLD	35	2.0	0.301
1/22/2013	1/2 EBB	30	1.7	0.2304
4/18/2013	LAST EBB	30	1.7	0.2304

Station ID: 25A

# Samples:	30	Log Avg:	0.5189
# > 43 MPN:	1	Log Std Dev:	0.4497
# > 260 MPN:	0	Geomean:	3.3032
Median:	2	Estimated 90th:	12

Date	Tidal Stage	Salinity	FC	Log FC
5/19/2008	LAST FLD	34	2.0	0.301
6/16/2008	1/2 EBB	36	**130.0**	2.1139
7/31/2008	1/4 EBB	38	1.7	0.2304
8/25/2008	LAST EBB	36	1.7	0.2304
2/5/2009	1/2 EBB	34	2.0	0.301
3/11/2009	3/4 FLD	34	1.7	0.2304
4/13/2009	1/4 FLD	32	13.0	1.1139
5/12/2009	1/4 FLD	36	2.0	0.301
7/28/2009	LOW	36	2.0	0.301
11/3/2009	LAST FLD	35	**21.0**	1.3222
3/10/2010	1/2 EBB	30	2.0	0.301
4/13/2010	1/2 EBB	32	2.0	0.301
5/20/2010	LAST EBB	36	1.7	0.2304
7/12/2010	3/4 FLD	36	1.8	0.2553
8/31/2010	1ST FLD	34	4.5	0.6532
11/8/2010	3/4 FLD	32	6.8	0.8325
1/6/2011	3/4 FLD	32	1.7	0.2304
3/23/2011	1/2 FLD	32	**23.0**	1.3617
4/19/2011	3/4 FLD	32	2.0	0.301
6/14/2011	1ST EBB	35	4.5	0.6532
8/3/2011	1/2 FLD	36	2.0	0.301
11/8/2011	1/4 EBB	32	2.0	0.301
1/25/2012	3/4 FLD	35	1.7	0.2304
2/23/2012	3/4 FLD	34	1.7	0.2304
4/9/2012	3/4 FLD	34	1.8	0.2553
5/29/2012	3/4 EBB	35	1.7	0.2304
7/31/2012	1ST EBB	34	4.5	0.6532
10/16/2012	LAST FLD	35	7.8	0.8921
1/22/2013	1/2 EBB	30	1.8	0.2553
4/18/2013	LAST EBB	30	4.5	0.6532

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Station ID: 27

# Samples:	30	**Log Avg:**	0.3398
# > 43 MPN:	1	**Log Std Dev:**	0.3487
# > 260 MPN:	0	**Geomean:**	2.1868
Median:	1.7	**Estimated 90th:**	6

Date	Tidal Stage	Salinity	FC	Log FC
5/19/2008	LAST FLD	34	1.7	0.2304
6/16/2008	1/2 EBB	36	1.7	0.2304
7/31/2008	1/4 EBB	38	1.7	0.2304
8/25/2008	LAST EBB	36	1.7	0.2304
2/5/2009	1/2 EBB	34	1.7	0.2304
3/11/2009	3/4 FLD	34	1.7	0.2304
4/13/2009	1/4 FLD	32	1.7	0.2304
5/12/2009	1/4 FLD	36	1.7	0.2304
7/28/2009	LOW	34	1.7	0.2304
11/3/2009	LAST FLD	34	7.8	0.8921
3/10/2010	1/2 EBB	30	1.7	0.2304
4/13/2010	1/2 EBB	32	1.7	0.2304
5/20/2010	LAST EBB	36	**79.0**	1.8976
7/12/2010	3/4 FLD	36	1.7	0.2304
8/31/2010	1ST FLD	34	1.7	0.2304
11/8/2010	3/4 FLD	32	1.7	0.2304
1/6/2011	3/4 FLD	32	1.7	0.2304
3/23/2011	1/2 FLD	32	2.0	0.301
4/19/2011	3/4 FLD	33	1.7	0.2304
6/14/2011	1ST EBB	35	1.7	0.2304
8/3/2011	1/2 FLD	38	1.7	0.2304
11/8/2011	1/4 EBB	32	2.0	0.301
1/25/2012	3/4 FLD	35	1.7	0.2304
2/23/2012	3/4 FLD	34	1.7	0.2304
4/9/2012	3/4 FLD	34	1.7	0.2304
5/29/2012	3/4 EBB	35	1.7	0.2304
7/31/2012	1ST EBB	34	11.0	1.0414
10/16/2012	LAST FLD	34	1.7	0.2304
1/22/2013	1/2 EBB	30	1.7	0.2304
4/18/2013	LAST EBB	30	1.7	0.2304

Station ID: 30B

# Samples:	30	**Log Avg:**	0.3525
# > 43 MPN:	0	**Log Std Dev:**	0.3092
# > 260 MPN:	0	**Geomean:**	2.2514
Median:	1.7	**Estimated 90th:**	5

Date	Tidal Stage	Salinity	FC	Log FC
5/19/2008	LAST FLD	36	1.7	0.2304
6/16/2008	1/2 EBB	36	9.3	0.9685
7/31/2008	1/4 EBB	38	1.8	0.2553
8/25/2008	LAST EBB	37	1.7	0.2304
2/5/2009	1/2 EBB	34	1.7	0.2304
3/11/2009	3/4 FLD	32	1.7	0.2304
4/13/2009	1/4 FLD	32	1.7	0.2304
5/12/2009	1/4 FLD	36	1.7	0.2304
7/28/2009	LOW	36	1.7	0.2304
11/3/2009	LAST FLD	30	**23.0**	1.3617
3/10/2010	1/2 EBB	30	2.0	0.301
4/13/2010	1/2 EBB	33	1.7	0.2304
5/20/2010	LAST EBB	36	1.7	0.2304
7/12/2010	3/4 FLD	36	1.7	0.2304
8/31/2010	1ST FLD	34	1.7	0.2304
11/8/2010	3/4 FLD	32	4.0	0.6021
1/6/2011	3/4 FLD	32	1.7	0.2304
3/23/2011	1/2 FLD	33	1.7	0.2304
4/19/2011	3/4 FLD	33	1.7	0.2304
6/14/2011	1ST EBB	35	2.0	0.301
8/3/2011	1/2 FLD	36	2.0	0.301
11/8/2011	1/4 EBB	32	1.7	0.2304
1/25/2012	3/4 FLD	35	1.7	0.2304
2/23/2012	3/4 FLD	34	1.7	0.2304
4/9/2012	3/4 FLD	34	2.0	0.301
5/29/2012	3/4 EBB	35	1.7	0.2304
7/31/2012	1ST EBB	35	**22.0**	1.3424
10/16/2012	LAST FLD	34	1.7	0.2304
1/22/2013	1/2 EBB	30	1.7	0.2304
4/18/2013	LAST EBB	30	1.7	0.2304

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Station ID: 30C

# Samples:	30	Log Avg:	0.4601
# > 43 MPN:	0	Log Std Dev:	0.3764
# > 260 MPN:	0	Geomean:	2.8849
Median:	1.75	Estimated 90th:	8

Date	Tidal Stage	Salinity	FC	Log FC
5/19/2008	LAST FLD	36	1.7	0.2304
6/16/2008	1/2 EBB	36	**17.0**	1.2304
7/31/2008	1/4 EBB	38	1.7	0.2304
8/25/2008	LAST EBB	38	1.7	0.2304
2/5/2009	1/2 EBB	34	1.7	0.2304
3/11/2009	3/4 FLD	34	7.8	0.8921
4/13/2009	1/4 FLD	32	2.0	0.301
5/12/2009	1/4 FLD	36	4.5	0.6532
7/28/2009	LOW	36	2.0	0.301
11/3/2009	LAST FLD	30	**22.0**	1.3424
3/10/2010	1/2 EBB	30	1.8	0.2553
4/13/2010	1/2 EBB	33	1.7	0.2304
5/20/2010	LAST EBB	36	4.5	0.6532
7/12/2010	3/4 FLD	36	4.5	0.6532
8/31/2010	1ST FLD	34	1.7	0.2304
11/8/2010	3/4 FLD	32	11.0	1.0414
1/6/2011	3/4 FLD	32	1.7	0.2304
3/23/2011	1/2 FLD	32	2.0	0.301
4/19/2011	3/4 FLD	33	4.0	0.6021
6/14/2011	1ST EBB	35	1.7	0.2304
8/3/2011	1/2 FLD	36	1.7	0.2304
11/8/2011	1/4 EBB	32	1.7	0.2304
1/25/2012	3/4 FLD	35	1.7	0.2304
2/23/2012	3/4 FLD	33	2.0	0.301
4/9/2012	3/4 FLD	34	1.7	0.2304
5/29/2012	3/4 EBB	35	1.7	0.2304
7/31/2012	1ST EBB	35	**33.0**	1.5185
10/16/2012	LAST FLD	33	1.7	0.2304
1/22/2013	1/2 EBB	30	1.7	0.2304
4/18/2013	LAST EBB	30	2.0	0.301

Station ID: 30D

# Samples:	30	Log Avg:	0.6242
# > 43 MPN:	0	Log Std Dev:	0.5086
# > 260 MPN:	0	Geomean:	4.2093
Median:	2	Estimated 90th:	18

Date	Tidal Stage	Salinity	FC	Log FC
5/19/2008	LAST FLD	36	6.1	0.7853
6/16/2008	1/2 EBB	34	1.7	0.2304
7/31/2008	1/4 EBB	38	**23.0**	1.3617
8/25/2008	LAST EBB	37	1.7	0.2304
2/5/2009	1/2 EBB	32	**31.0**	1.4914
3/11/2009	3/4 FLD	34	6.8	0.8325
4/13/2009	1/4 FLD	33	2.0	0.301
5/12/2009	1/4 FLD	36	**33.0**	1.5185
7/28/2009	LOW	34	1.7	0.2304
11/3/2009	LAST FLD	30	11.0	1.0414
3/10/2010	1/2 EBB	30	1.7	0.2304
4/13/2010	1/2 EBB	32	2.0	0.301
5/20/2010	LAST EBB	36	4.5	0.6532
7/12/2010	3/4 FLD	36	**33.0**	1.5185
8/31/2010	1ST FLD	34	1.7	0.2304
11/8/2010	3/4 FLD	32	13.0	1.1139
1/6/2011	3/4 FLD	32	2.0	0.301
3/23/2011	1/2 FLD	32	**17.0**	1.2304
4/19/2011	3/4 FLD	32	2.0	0.301
6/14/2011	1ST EBB	35	1.7	0.2304
8/3/2011	1/2 FLD	36	1.7	0.2304
11/8/2011	1/4 EBB	30	1.7	0.2304
1/25/2012	3/4 FLD	35	1.7	0.2304
2/23/2012	3/4 FLD	32	**17.0**	1.2304
4/9/2012	3/4 FLD	34	1.7	0.2304
5/29/2012	3/4 EBB	35	1.7	0.2304
7/31/2012	1ST EBB	35	**33.0**	1.5185
10/16/2012	LAST FLD	31	1.7	0.2304
1/22/2013	1/2 EBB	30	1.7	0.2304
4/18/2013	LAST EBB	30	1.7	0.2304

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Station ID: 30E

# Samples:	30	**Log Avg:**	0.6371
# > 43 MPN:	4	**Log Std Dev:**	0.6415
# > 260 MPN:	1	**Geomean:**	4.3364
Median:	1.7	**Estimated 90th:**	28

Date	Tidal Stage	Salinity	FC	Log FC
5/19/2008	LAST FLD	36	1.7	0.2304
6/16/2008	1/2 EBB	36	1.7	0.2304
7/31/2008	1/4 EBB	38	1.7	0.2304
8/25/2008	LAST EBB	37	1.7	0.2304
2/5/2009	1/2 EBB	34	6.8	0.8325
3/11/2009	3/4 FLD	32	1.7	0.2304
4/13/2009	1/4 FLD	32	**31.0**	1.4914
5/12/2009	1/4 FLD	34	**49.0**	1.6902
7/28/2009	LOW	34	1.7	0.2304
11/3/2009	LAST FLD	30	9.3	0.9685
3/10/2010	1/2 EBB	30	1.7	0.2304
4/13/2010	1/2 EBB	32	1.7	0.2304
5/20/2010	LAST EBB	36	**350.0**	2.5441
7/12/2010	3/4 FLD	36	4.5	0.6532
8/31/2010	1ST FLD	34	1.7	0.2304
11/8/2010	3/4 FLD	32	1.7	0.2304
1/6/2011	3/4 FLD	32	1.7	0.2304
3/23/2011	1/2 FLD	32	1.7	0.2304
4/19/2011	3/4 FLD	32	**49.0**	1.6902
6/14/2011	1ST EBB	35	1.8	0.2553
8/3/2011	1/2 FLD	36	4.5	0.6532
11/8/2011	1/4 EBB	30	2.0	0.301
1/25/2012	3/4 FLD	35	1.7	0.2304
2/23/2012	3/4 FLD	32	1.7	0.2304
4/9/2012	3/4 FLD	34	6.8	0.8325
5/29/2012	3/4 EBB	35	1.7	0.2304
7/31/2012	1ST EBB	34	**79.0**	1.8976
10/16/2012	LAST FLD	31	**23.0**	1.3617
1/22/2013	1/2 EBB	30	1.7	0.2304
4/18/2013	LAST EBB	30	1.8	0.2553

Table 12: D-4 Station Summary 2013

Summary of sampling data through 4/18/2013. Shaded cells indicate stations in waters closed to shellfish harvest.

Station ID:	# Samples:	Median:	Geomean:	Estimated 90th:
1	30	1.7	2.4287	5
2A	30	2	3.4428	10
3	30	4	4.5335	18
5	30	1.7	2.5004	6
6	30	2	3.2793	13
7	30	2	3.1948	9
7A	30	3.25	5.1413	30
8A	30	1.7	2.4703	6
9A	30	2	3.2720	11
11	30	4	4.1281	12
13	30	4.5	6.0962	35
13A	30	1.7	2.3450	5
13B	30	1.7	2.4777	6
13C	30	1.85	2.7486	6
13D	16	2	2.5294	5
14	30	2	3.6137	11
14A	30	2	2.9492	9
25A	30	2	3.3032	12
27	30	1.7	2.1868	6
30B	30	1.7	2.2514	5
30C	30	1.75	2.8849	8
30D	30	2	4.2093	18
30E	30	1.7	4.3364	28