REPORT OF SANITARY SURVEY

AREA E-3

MOREHEAD CITY/ATLANTIC BEACH AREA

FEBRUARY 2009 THROUGH FEBRUARY 2014

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Approved By: _____

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The E-3 area of coastal North Carolina, which includes a portion of Bogue Sound between Morehead City and Atlantic Beach, lies in the central portion of the state off of the Atlantic Ocean. Review of the bacteriological data during the time period of this report indicates some overall improvement in bacteriological water quality. There is an approximate 10 acre area near Hoop Pole Creek that will be reclassified from Approved to Prohibited and closed to shellfish harvest as a result of a series of special samples collected there. Additionally, there will be several adjustments made to the sampling regime in Area E-3.

1.0 SANITARY SURVEY

1.1 INTRODUCTION

The E-3 growing area is bordered in the west by Intracoastal Waterway (IWW) Flashing Beacon #9 and in the east by Beaufort Inlet, and includes the waters of Bogue Sound, Tar Landing Bay, Hoop Pole Creek, Peletier Creek, and Spooners Creek. Overall, the area includes a total of approximately 5,800 water acres (Figure 1). The watershed includes the communities of Morehead City and Atlantic Beach. Oyster production within the area is considered fair, while clam production is considered good. See Figure 2 for a map of the growing area, including sampling station locations. Table 1 contains a description of those sampling stations.

1.2 SHORELINE SURVEY OF POLLUTION SOURCES

Survey Methods

A comprehensive shoreline survey of Area E-3 was completed on December 17, 2013. Evaluations of properties in the area were conducted by NC Shellfish Sanitation staff to determine potential sources of pollution entering shellfish growing waters (Figure 3).

New actual and potential pollution sources for this survey were mapped using GPS, and pollution source data were collected using Trimble's sub-meter Juno 3B GPS receiver with EVEREST multipath rejection technology. Data were collected in the SSF format using real-time corrections from the integrated Wide Area Augmentation System receiver. The data were post-processed using GPS Pathfinder Tools applications in order to get the most precise data. Additionally, a Geographic Information System (GIS) was developed, including pertinent information and digital pictures for each source.

Area E-3: Morehead City Shoreline Survey

A comprehensive shoreline survey of the mainland portion of Area E-3 was completed on December 17, 2013. 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 on-site wastewater discharges discovered.

The mainland side of Area E-3 includes the waters of Spooners Creek, Peletier Creek, a portion of Bogue Sound, and all of the shoreline is contained within the borders of Morehead City. According to U.S. Census data from 2010, the permanent population within this portion of the growing area is about 5,000.

Point Source Pollution

Wastewater Treatment Plants – The majority of this area is served by the Morehead City Wastewater Treatment Plant (WWTP), which is located in and discharges into Area E-4. There are, however, several lift stations for this plant located within the E-3 growing area (Figure 4). Most of these lift stations include generators, so in the event of a power outage they should still continue to function.

Since the last triennial survey report was completed in 2010, there have not been any known collection system malfunctions that resulted in impacts to the E-3 area.

Non-Point Source Pollution

Marinas – Marina facilities are evaluated during the shoreline survey because of their potential to affect the suitability of adjacent shellfish waters 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.

There are 21 marinas or docking facilities within this portion of the growing area, and there have been a few changes worth noting since the 2010 triennial survey was completed (Figure 5).

Portside Marina has a pumpout service after several years of planning for it. They have since received "Clean Marina" status from the Division of Coastal Management (DCM).

A portion of the dockage located at the end of Miami Avenue, on Peletier Creek, is currently involved in a land dispute. There are 6 slips in question that may have to be removed, which would reduce the total number at the facility to 10.

Some renovations to replace old and damaged docks have resulted in 2 additional slips at Coral Bay Marina in Peletier Creek. The total slip count is now at 40.

The marina at the Harborside Club, also in Peletier Creek, has added another finger slip bringing the total to 50. The additional slips do not necessitate any action at either of these facilities as they are both located well within the *Prohibited* classification.

The marina at the Tide Lines development has not yet been built, and construction does not appear imminent. The bulkhead and cutout area for the marina was installed several years ago, but no other work has been done since that time.

Construction of the public restroom facility was completed in 2011 at the public docking facility on the Morehead City waterfront. There are still plans to add a pumpout to the docks there, though it has not yet been installed.

Stormwater – Stormwater can adversely impact shellfish growing waters by rapidly transporting fecal coliform bacteria and other contaminants from the land to the water. Runoff from commercial areas, residential areas, and roadways is the primary contributor to bacterial contamination within the waters of E-3 (Figure 6). There have been no major changes in stormwater drainage patterns since the 2010 survey was completed.

The eastern end of Morehead City is a primarily commercial-use area, with shops, restaurants, offices, and parking lots lining the streets. This area is drained by a large curb and gutter system, which eventually discharges untreated stormwater runoff into the waters of Bogue Sound.

West of downtown, the majority of Morehead City is more residential-use development, with old, established neighborhoods lining the water. This area is also drained by a curb and gutter system, which also discharges untreated stormwater into the waters of Bogue Sound.

Peletier Creek receives stormwater drainage from a relatively large land area that includes schools, industrial and commercial areas, roadways, and residential neighborhoods. The majority of the drainage comes from areas along Arendell Street and Bridges Street, both heavily used 4-lane roads.

Subdivisions – Subdivisions 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 (Figure 7). Most of the homes and neighborhoods in this area are old and established, and not much residential development has occurred since the last triennial survey.

Spooners Creek West is a new subdivision that was developed in 2010 along existing roads just west of Spooners Creek. It consists of 29 lots and has 2 new homes.

Stormwater generated on the northern lots of the development drains to Spooners Creek, however there are also some lots that are located in the E-2 watershed.

The first three homes in the Shores at Spooners Creek are finally under construction. The condominiums associated with the development were completed prior to the last triennial report in 2010, but the 19 residential lots have remained vacant until now. It is unknown how many homes will be built during this phase of construction.

Tide Lines hasn't changed since the last triennial survey in 2010 and remains partially completed. It does not appear as though the subdivision has been abandoned because it is still being maintained and is not overgrown with vegetation.

Onsite Wastewater – Onsite wastewater systems serve only a few small portions of this growing area at the western edge of Morehead City and on Radio Island. These systems were visited during the survey, and were found to be functioning well.

Package Wastewater Treatment Plants – There is one package wastewater treatment plant located within this portion of the growing area (Figure 4). The Hestron Park package treatment plant serves the surrounding shopping centers, and has a daily flow of around 35,000 gallons per day (gpd). After disinfection with chlorine, the wastewater is discharged onto a rotor field, which appeared to be in good condition when visited.

Waste from the Spooners Creek, Shores at Spooners Creek, and Spooners Creek North subdivisions is pumped to the package wastewater treatment plant at Brandywine Bay, which is in growing area E-4, and is discussed in that Sanitary Survey Report.

Wildlife and Domestic Animals – There is relatively little forested land within this portion of the growing area, so only animals adapted to suburban settings, such as raccoons, opossums, and rabbits are common. Shorebirds, wading birds, gulls, and ducks are also common in the creeks and sound, especially during the winter. There are no animal farms within the E-3 watershed, and domestic animals, aside from scattered dogs and cats, are not prevalent. Refer to Figure 8 for relevant locations.

Poisonous or Deleterious Substances – Oils, greases, paints, and other chemicals from boat maintenance and boat washing could potentially have an impact on water quality throughout much of the closed portions of the growing area, especially within Peletier Creek and along the Morehead City waterfront.

The North Carolina State Port is located in Morehead City at the eastern edge of the growing area, and impacts both E-3 and E-4. It has handled an average of just under two million tons of bulk and breakbulk material/year between 2010 and 2013. Primary imports include sulfur products, rubber, and scrap metal, and the primary exports are phosphate and woodchips. The military also uses the port for staging, loading, and

unloading. The port maintains an extensive stormwater pollution prevention plan which is on file in the Morehead City Shellfish Sanitation Office, along with a layout of the stormwater system. All stormwater discharge pipes include shut off valves to prevent leakage in case of a spill on the property, and many of the storage units include containment devices to keep any spilled material from running off into the sound. Despite these safeguards, there is still some risk of bacterial or chemical contamination from the port, either through illicit discharges from docked ships, waste from birds and other animals on the property, or from small oil or other chemical leaks that that occur during normal operation. There is an extensive safety buffer closure extending at least 0.5 miles from the port in all directions however, so any threats to open shellfishing waters are minimal.

Area E-3: Atlantic Beach Shoreline Survey

A comprehensive shoreline survey of the Atlantic Beach portion of Area E-3 was completed on December 17, 2013. 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 on-site wastewater discharges discovered.

The Atlantic Beach portion of Area E-3 includes the waters of Tar Landing Bay, Money Island Bay, and Hoop Pole Creek, as well as a portion of Bogue Sound. Atlantic Beach is primarily a vacation town, so seasonal populations fluctuate greatly. However, US Census block data from 2010 indicates a permanent population of just under 2,000 people within this portion of the growing area.

Non-Point Source Pollution

Marinas - There have been a few changes within the marinas and dockages of Atlantic Beach since the 2010 survey was completed (Figure 5).

A new dockage was constructed in one of the Atlantic Beach canals in 2011. Sleepy Creek Farms Dockage consists of 20 finger slips and is used primarily by the owners and guests of the new condos on the property. It is located between Anglers Cove Marina and the Seascapes Condominium Dockage, well within the permanent closure for that area.

A completely new dockage has been constructed at the Coral Bay Club, on Hoop Pole Creek, in the same location as the old one. The new facility however, consists of 18 slips, which is an additional 4 from the previous layout.

In addition, the Coral Cay Dockage, located adjacent the Coral Bay Club, has also completed a new docking facility in place of their old one. This new structure consists of 16 slips, instead of the old number of 14.

Adjacent the Coral Cay Dockage, the Bogue Shores Dockage added 1 additional slip to bring their total slip count to 11. These three dockage facilities are located within the same buffer closure area, and although there has been an increase of 7 total slips among them, the current closure area is still sufficient to account for the total number of slips (35).

The Pinnacle Marina has a storm damaged slip that has not yet been repaired and remains unusable. It is not known if it will be repaired at all or just removed. The total slip count at this facility (including the damaged slip) is 13.

Subdivisions - Housing density is extremely high throughout much of Atlantic Beach, especially in the areas surrounding the Atlantic Beach canals and the town center (Figure 7). There are also numerous condominium developments around the town. This high housing density and the associated stormwater runoff undoubtedly has an impact on water quality in the area, especially in the summer months when many of the homes are used.

The Grove, which is the name of the Atlantic Beach Circle redevelopment project that has been in the planning stages for nearly a decade is finally underway with the construction of the WWTP (mentioned later in this report) and the first of the single family residences. Some work was done several years ago which included removal of some of the old structures, new sidewalks, and repaving of the streets, however no further work was done until it started back up last year. The redevelopment plans have changed over the years since they were first created, but when completed will include a variety of housing options, shops, restaurants, and some family entertainment, while maintaining the public beach access in that area. The project is believed to take about 10 years to complete.

Otherwise, there has been very little growth within this portion of the growing area since the last triennial in 2010, and no new subdivisions or condominium complexes have been built.

Onsite Wastewater – Onsite wastewater systems serve the majority of private residences on Atlantic Beach. Many of these systems were visited during the shoreline survey, and were found to be functioning properly.

There are several restaurants in Atlantic Beach that, due to small lot sizes, cannot maintain adequately functioning onsite wastewater systems. These restaurants, including The Channel Marker, McCurdy's, El Zarape, Beach Tavern, and Amos Mosquito's, are all permitted by the local health department for pump-and-haul service. The Channel Marker actually maintains their own pump-and-haul truck, which remains on site and pumps as needed, and all others have contracts with local waste hauling services for regular pumping.

Package Wastewater Treatment Plants – There is no centralized sewer system on Atlantic Beach, so many of the hotels and larger condominium complexes instead rely on individual package treatment plants for wastewater disposal. Many of the plants within this area have undergone extensive renovations or been replaced in the last several years, and many of the issues noted in past triennial survey reports have since been resolved. However, some problems still exist. The new plant at Dunescape Condominiums has still not been completed after beginning construction in 2010. There have been problems with contractors and engineers as well as extensive delays, but the current plan is to be online with the new plant by May of 2014. The new plant will be made of concrete, and will include extended aeration with tertiary filters and UV disinfection. The operator is also hoping the rotary sprayers will be replaced with the high rate infiltration spray heads in the disposal field. The existing plant is in very poor condition and is currently receiving notices of violation (NOVs) for some groundwater issues. Were the existing plant to experience any serious malfunctions before the new plant is ready, wastewater would most likely impact the *Conditionally Approved Closed* waters of Hoop Pole Creek.

A new plant the US Coast Guard Station went online in 2010 and the old one was removed. The new plant has a dual path extended aeration treatment process with advanced nutrient removal capabilities and tertiary filters and uses chlorine for disinfection. The old low pressure pipe (LPP) fields were also replaced with 2 new ones for subsurface disposal. The new plant is permitted to handle a flow rate of 10,000 gpd and is currently averaging flow rates at about 5,000-6,000 gpd. The operator of the plant has not reported any problems since it went online.

A new plant has been built near the entrance to the Atlantic Beach Circle and will be used to treat wastewater from all the planned development (The Grove) in that area as it is completed over the next several years. It will also likely serve a few of the surrounding businesses in that area. The plant is an activated sludge treatment plant with denitrification and UV disinfection. It is permitted for a flow of 120,000 gpd and will use drip irrigation for subsurface disposal. The plant is not yet online and it is not known when it will receive enough flow to be able to run efficiently as the development is in the very early stages.

The small plant that serves the AmeriSuites hotel along the Pine Knoll Shores/Atlantic Beach border continues to operate at full capacity during the summer months. Despite these high flows, however, the plant has been functioning well, and there are no plans to upgrade or replace the facility.

Repairs and improvements have continued at the Island Beach and Racquet Club plant. A new catwalk has been constructed between the tanks and with the improvements made prior to the last triennial survey in 2010 the plant is functioning much better. They still hope to have a plan for replacement in the near future.

The Atlantic Station plant, which was experiencing some problems with the rotary fields according to the last triennial report, has made all necessary repairs and the plant is currently functioning well.

The plant at "A Place at the Beach III" was built in 2007 and since that time all 18 pumps have had to be replaced at different times. Despite the problem with pumps wearing out the plant continues to function well.

The remaining plants in this portion of E-3 have not experienced any changes since the last triennial report.

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 roadways and residential areas is the primary contributor to fecal coliform levels throughout the Atlantic Beach portion of Area E-3 (Figure 6).

Some of the residential areas and roadways surrounding the center of Atlantic Beach experience flooding problems during periods of heavy rain. In most cases, the floodwaters are pumped to large infiltration basins among the dunes along the ocean front, which is well away from any shellfishing waters. In other cases, a system of ditches, curb and gutter systems, and pipes rapidly conveys the floodwaters into the waters of E-3. All of these outfalls discharge into *Prohibited* waters.

The main road through Atlantic Beach is drained through a combination of curb and gutter, pipe, and ditch systems that convey stormwater into the sound. The majority of these discharges travel through marshland before reaching shellfishing waters, so most likely receive some treatment before impacting the water quality.

There is a pump station located just west of the Atlantic Station Shopping Center that is used to move stormwater and groundwater into a ditch that eventually drains into a marshy area around Hoop Pole Creek. On the east and north sides of the shopping center there are a few drains (stormwater points) which allow stormwater to flow into the

marsh area behind the shopping center. Currently there is a temporary closure in place for the small tributary that runs along the east side of the shopping center, due to high bacteria counts determined by some recent special sampling of that area.

Most of the stormwater from the western portion of the growing area flows through a series of ditches and pipes to ponds within the golf course at the Country Club of the Crystal Coast. Water from these ponds is used to irrigate the course, and there are no discharges into shellfishing waters.

Wildlife and Domestic Animals – There are very few wild animals within the Atlantic Beach area, aside from raccoons, opossums, and other small mammals. Shorebirds, gulls, and ducks are common within the marshes and the sound, especially in the winter months. There are also several flocks of semi-domesticated ducks that live in and around the Atlantic Beach canals. Aside from scattered cats and dogs, domestic animals are not prevalent within the area.

Poisonous or Deleterious Substances – Due to the density of marinas and private boat docks, oils, greases, paints, and other chemicals from boat washing and maintenance have the potential to impact the E-3 growing area within and around the closed shellfishing areas in the Atlantic Beach canals.

The US Coast Guard Station stores and utilizes some hazardous materials within their facility. These materials are stored in a building located away from the water that contains a concrete retention basin, so should any spills occur, they would most likely be contained and would not impact the growing area.

Otherwise, poisonous or deleterious substances are not a risk within this portion of the growing area.

1.3 HYDROGRAPHIC FACTORS RESPONSIBLE FOR THE SPREAD OF POLLUTION

Currents and tides in the E-3 area are primarily influenced by Beaufort Inlet. Salinities are generally high, and ranged from 24 to 37 during the time frame of this report (Table 8).

Stormwater runoff is one of the major sources of contamination within the area. The *Conditionally Approved Open* portions of E-3 extend from the Intracoastal Waterway 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 E-3 were temporarily closed 20 times for a total of 121 days during the period covered within this survey (Table 9). Six of these closures, totaling 45 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. Sampling data used to reopen waters after temporary closures is contained in Table 10.

There is one small, 25-acre portion of Hoop Pole Creek that is classified primarily as *Conditionally Approved Closed*. This area is typically closed to shellfish harvest, but can be opened when favorable weather conditions make non-point source contamination unlikely. During these periods, water and meat samples can be taken, and if both 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 E-3 within the time frame covered by this report.

There are currently two rain gauge stations within the E-3 area, including one in Pine Knoll Shores, and one at the Marine Fisheries Building in Morehead City. These stations, along with rain gauges in neighboring Area E-2, provide adequate rainfall information for the management of Growing Area E-3 (Table 11). Monthly rainfall averaged to be 4.29” during the time period of this report.

1.4 BACTERIOLOGICAL SURVEY OF SHELLFISH GROWING WATERS

The monitoring of Area E-3 adheres to the systematic random sampling strategy outlined by the National Shellfish Sanitation Program (NSSP), and consists of 30 sample sets from 39 sampling stations (Figure 2).

The bacteriological survey covered within this report includes water samples taken between 2/12/2009 and 2/18/2014. Water samples were collected and analyzed for fecal coliform bacteria in compliance with the systematic random sampling regime. Table 12 lists, for each individual sampling station, the date the sample was obtained, the tidal cycle upon which the sample was taken, and the ambient salinity. Fecal coliform Most Probable Number (MPN) and summary statistics are included as well.

At the time of the last Sanitary Survey in 2010, 4 of the 39 stations monitored within E-3 exceeded approved criteria. Currently, only 1 of the 39 sampling stations exceeds the NSSP standards for *Approved* status. Station #45, located at the mouth of Peletier Creek, has a geometric mean of 11.60 and exceeds approved criteria with an estimated 90^{th} percentile of 55. At the time of the last survey, station #45 had a geometric mean of 19.02 and an estimated 90^{th} percentile of 93.

Other stations that have shown improvement in bacteriological water quality statistics include station #1 in Spooners Creek, station #6 by the Coral Bay Dock in Hoop Pole Creek, and station #10 in the Atlantic Beach canal. Each of these stations exceeded at the time of the last survey with estimated 90^{th} percentile values of 84, 56 and 47

respectively. Each of these stations now meets standards with estimated 90th percentile values of 40, 41 and 30 respectively. These stations and others that are located in closed shellfishing areas, that meet approved criteria, will be left closed as these are areas that either serve as a closed area buffer for marinas or during rain events.

A series of special samples were collected in the Hoop Pole Creek area canal behind the Atlantic Station shopping center in response to a complaint. Thirty-four special samples were collected in this previously open shellfishing area between 12/2/13 and 5/15/14. A temporary closure was put into effect after elevated results were first reported on 12/3/13, and an expanded temporary closure was put into effect after the 12/10/13 results were reported. The samples, which were collected during both wet and dry weather periods, ranged from 2.0 fecal coliform/100 ml Most Probable Number (MPN) to >1,600 fecal coliform/100 ml MPN. The temporary closure remains in effect at the time of this report.

1.5 SUMMARY OF BACTERIOLOGICAL DATA ANALYSIS

The bacteriological survey for Area E-3 indicates overall improvement in the current stations' bacteriological water quality throughout the area. The only current station that exceeds the standards for *Approved* status is located in waters classified as *Prohibited* and is closed to harvest. Table 13 provides a summary of bacteriological data for all stations within the growing area.

1.6 OVERALL EVALUATION AND RECOMMENDATIONS

A permanent shellfish closure will be put into place as a result of the special samples collected in the Hoop Pole Creek area canal behind the Atlantic Station Shopping Center. This area comprises approximately 10 water acres. The samples showed elevated results during both wet and dry weather conditions. The following waters will be reclassified from *Approved* to *Prohibited*:

> *All those waters in the Hoop Pole Creek area upstream of a line beginning on a point of marsh at 34°42.4519' N -76°45.1967' W; running southeasterly across the bay to a point of marsh at 34°42.4429' N -76°45.1829' W; running southeasterly following the shoreline to a point at 34°42.4069' N -76°45.1285' W; running southeasterly across the creek to a point 34°42.3984' N -76°45.1098' W on the eastern shore.*

Although preliminary investigation has occurred, a more comprehensive survey of this area is scheduled to try and determine a cause for the elevated results. Additionally, a new permanent sampling station will be attempted to be added in the bay between this closure line and station #8 in order to ensure the closure is adequate. Another new permanent station will be added approximately 500 yards southwest of station #8 in

order to monitor the small bays near the Cottages at Bay Ridge common area and gazebo.

A few other changes in the sampling regime will occur in order to more efficiently monitor the area for changes in bacteriological water quality. Stations #5, #10B, #23, #34, #48A, and #48B will be deleted due to adequate coverage by other nearby stations.

2.0 CONDITIONAL AREA MANAGEMENT PLAN

2.1 INTRODUCTION

Area E-3 is composed of all the waters of Bogue Sound from Beaufort Inlet, west to Intracoastal Waterway (IWW) Flashing Beacon #9. Included in these waters are Tar Landing bay, Money Island Bay, Fish-N-Lake, Hoop Pole Creek, Peletier Creek, and Spooners Creek. The watershed for E-3 is relatively small compared to the size of the area. Oyster production is considered fair, and clam production is considered good throughout the area. See Figure 2 for an area map and Table 1 for a description of sampling station locations.

The portion of Area E-3 classified as *Conditionally Approved* that is normally open to shellfish harvesting includes all those waters from the IWW to the mainland between the permanent closure of the Morehead City waterfront, and Flashing Beacon #9, excluding all creeks and tributaries. The Hoop Pole Creek portion of the area is closed to shellfish harvesting and is also classified as *Conditionally Approved*. This area can be opened to shellfish harvesting on a temporary basis after meeting management plan criteria. There have been no temporary openings during the time period of this report.

2.2 MANAGEMENT PLAN

For coastal North Carolina, rainfall resulting in significant runoff is the element having the most detrimental effect on growing area water quality. The conditionally approved open waters of Area E-3 are normally open to shellfish harvesting and will be recommended closed after 2.5 inches of rain or greater within 24 hours. When such a rain event occurs, the following closure will be recommended:

> *Bogue Sound: All those waters from IWW to the mainland between the permanent shellfish closure at the Morehead City waterfront and the Emerald Isle High Rise Bridge.*

This closure also includes waters in Areas E-1, E-2, and D-4. This area will remain closed until such time as the rainfall event has ended, sampling indicates water quality meets approved area criteria, and shellfish have had sufficient time to cleanse.

The Hoop Pole Creek area is normally closed to shellfish harvesting and is also classified as *Conditionally Approved*. This area is opened to shellfishing on a temporary basis during periods of favorable weather conditions, which make nonpoint source contamination unlikely. Sampling is conducted of both water and shellfish meats prior to recommending a temporary opening. Sampling will continue after the opening with the frequency determined by the area and hydrographic and meteorological conditions. Closure of the temporarily opened area will be recommended after 0.5 inches of rain within a 24-hour period or 0.75 inches of rain within a 48-hour period. Recommended closures are immediate.

The conditionally approved closed portion of Area E-3 consists of the following area:

> *All those waters in Hoop Pole Creek upstream of a line beginning at a point 34˚ 42.1465'N - 76˚46.1560' W on the west shore; running easterly to a point 34˚ 42.1558' N - 76˚ 46.1146' W on the marsh island; running northerly following the shoreline of the marsh island to a point 34˚ 42.1533' N - 76˚ 45.9362' W; running easterly to a point 34˚ 42.1521' N - 76˚ 45.9084' W on the east shore.*

One rain gauge station has been established in Area E-3 at the Morehead City Marine Fisheries Office. An additional station has been established within Pine Knoll Shores. Rainfall information is collected daily and monthly tally sheets are recorded. Rainfall amounts are also called into the DMF Communications Center in Morehead City and are checked by Shellfish Sanitation personnel to determine if closures are needed.

During extremely heavy rainfall events or unusual storm events, additional waters in the E-3 area can be temporarily closed. These types of events would be classified as public health emergencies and would bring about immediate emergency closures. 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 areas, 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 Morehead City/Atlantic Beach area, E-3, 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 E-3 adheres to the systematic random sampling strategy outlined by the NSSP, and consists of 30 sample sets from 39 sampling stations located throughout the area (Figure 2/Table 1). The area has also 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 within a 24-hour period result in a temporary closure of the conditionally approved area. Table 9 contains a list of temporary closures of *Conditionally Approved* waters that have occurred within E-3 during this survey period. Several rain events were shown to exceed 2.5 inches on the Pine Knoll Shores rain gauge during this period that did not result in a closure of the mainland *Conditionally Approved* waters. Rainfall of 2.5 inches was recorded on the calendar for 7/14/10 when it was received at a later date. This

appears to have been an isolated storm localized to Pine Knoll Shores and away from the *Conditionally Approved* waters near the mainland.

A rainfall amount of 4.5 inches was recorded on the Pine Knoll Shores calendar for 7/22/12. Again, this was an isolated storm as an amount of only 0.3 inches was recorded across the sound on the mainland. An amount of 2.75 inches was recorded on the calendar for 9/2/13. When the rain gauge was contacted that morning, only 2.30 inches was reported. Two other events were shown to be rain events isolated to Pine Knoll Shores according to radar maps. Rain amounts of 3.5 and 3.0 inches were recorded on the calendar for 1/11/14 and 1/14/14, but the mainland rain gauge only read 1.7 and 1.55 inches.

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.

Over the time period covered within this report, portions of this area have been closed 20 times for a total of 121 days. Adequate water samples were obtained prior to reopening after these rainfall events (Table 10), to ensure that bacteriological water quality was sufficient to protect public health according to the plan criteria.

There is also one Conditionally Approved area within E-3 that is normally closed to shellfishing and can be temporarily opened when weather conditions are favorable and when water and shellfish samples are suitable. There have been no temporary openings of this area 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 to shellfish water quality. Currently, all management plans for conditionally approved waters are dependent upon the amount of rainfall received within the watershed of a particular growing area. The process of developing management plans for conditionally approved areas is complex. Rainfall amounts can vary tremendously, and there are often significant differences in accumulation within a small area. Current procedures for obtaining rainfall data include the use of local volunteer rainfall stations, as well as NOAA and other commercial weather websites. Rainfall accumulations recorded at the various rain gauges are included in Table 11.

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 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 E-3 indicates overall improvement in bacteriological water quality since the last Sanitary Survey Report. The only sampling station currently exceeding NSSP approved criteria is located in waters classified as *Prohibited* and closed to shellfish harvest.

3.6 FIELD INSPECTION OF POLLUTION SOURCES

A comprehensive shoreline survey of the E-3 area was completed in 2013, in accordance with the requirements of the NSSP “Guide for the Control of Molluscan Shellfish,” Chapter IV, @ .03. Additionally, annual surveys are completed in years where a comprehensive survey is not completed.

3.7 COLLECTION OF WATER SAMPLES

During the time period of this report, Area E-3 has been sampled in accordance with the management plan criteria of the area as required by the conditionally approved classification of the NSSP. Area E-3 current adheres to the systematic random sampling strategy outlined by the NSSP, and consists of 30 sample sets from each of 39 stations located throughout the area.

The bacteriological survey covered within this report includes water samples gathered between 2/12/2009 and 2/18/2014. During that time period samples were collected during periods that the waters were open to shellfish harvesting, and were analyzed for fecal coliform bacteria in compliance with the systematic random sampling regime. Table 12 lists, for each individual sampling station, the date the sample was obtained,

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

In addition, 67 bacteriological samples were collected and analyzed as part of the conditional and temporary area sampling for E-3 (Table 10).

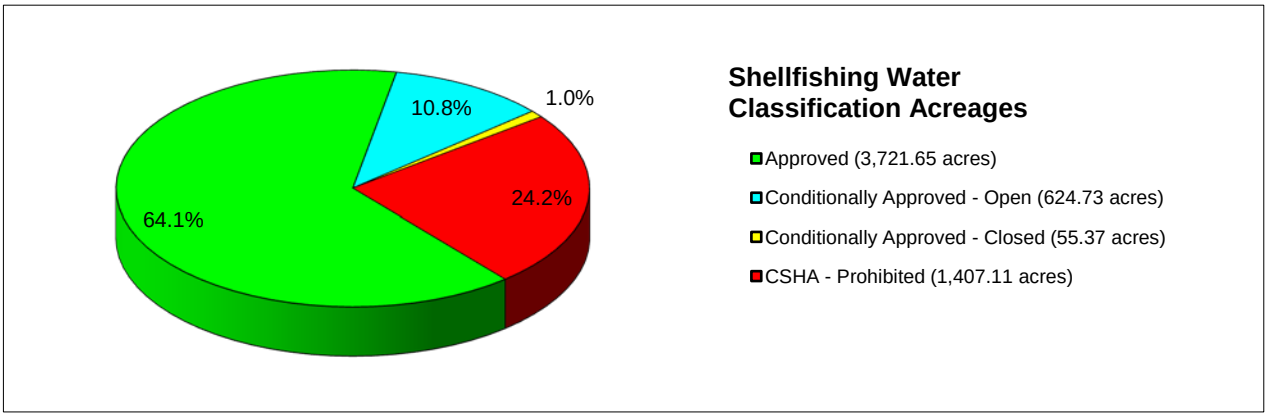
3.8 SUMMARY

The Conditionally 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. Refinement of management plans is critical to assure that shellfish harvested from the conditionally approved growing areas are taken from waters that meet approved area criteria.

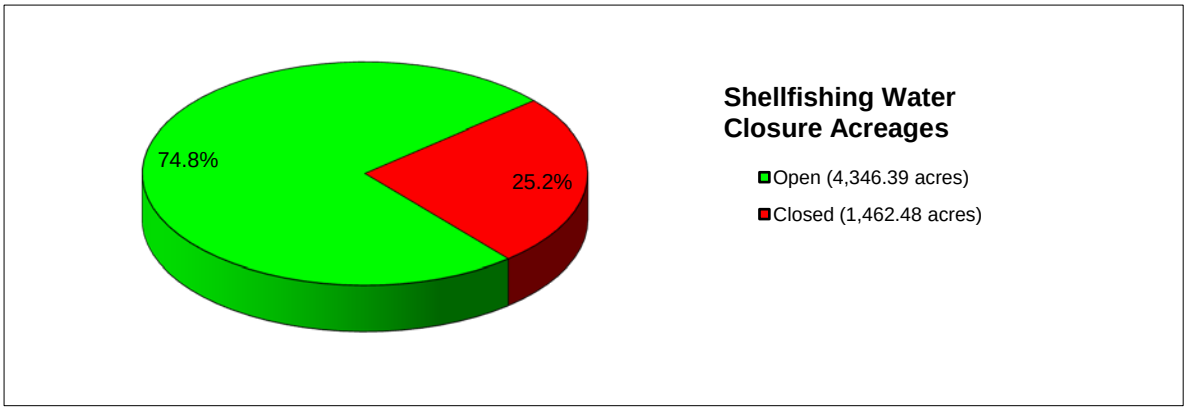
The current Conditional Area Management Plan for Growing Area E-3 appears to be working properly, and no changes will be recommended at this time.

Figure 1: Acreage

REGION: (All)	County: (All)	Growing Area: E3



Classification	Acres	Percent of Total
Approved	3,721.65	64.1%
Conditionally Approved - Open	624.73	10.8%
Conditionally Approved - Closed	55.37	1.0%
CSHA - Prohibited	1,407.11	24.2%
Total	5,808.86	100.0%



Status	Acres	Percent of Total
Open	4,346.39	74.8%
Closed	1,462.48	25.2%
Total	5,808.86	100.0%

E-3 Growing Area:

Shellfishing Water Sampling Stations

Legend

- # Sampling 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

North Carolina Department of Environment and Natural Resources
Division of Environmental Health
Shellfish Sanitation and Recreational Water Quality Section
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Inset Map #1

48B 48A 48

0 150 300 Yards

Inset Map #1

1 2 50 51 46 45 47 52 5 48C 48D 48A 48 37 36 35 49 24 23 34 7 10A 10 11 13 8 10B 40 15 19 44A 20 21 18 42A 42 41 6B 6

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Sampling Stations

Area E-3 Sampling Station Descriptions Table 1

Station	Description
1	In Mouth of Spooners Creek
2	Flashing Beacon #9 - Intracoastal Waterway
5	Flashing Beacon #6
6	By Coral Bay Dock
6B	Outside Closure Line - North of Station #6
7	In Hoop Pole Creek - East End of Hoop Pole Island
8	In Cedar Hammock Creek
10	Coopers Camp
10A	Outside New Closure Line
10B	South of Station #10 In Canal
11	Mouth of Creek East of PA Smith Restaurant
13	By Flemings Restaurant
15	By Tom Mills Cottage
18	Mouth of Creek Leading to 8 1/2 Marina
19	650 Yards East By North of Station #18
20	Mouth McClamrock Slough
21	Tar Landing Bay
23	By Flashing Beacon #2 - Intracoastal Waterway
24	By Flashing Beacon MC - Intracoastal Waterway
34	South Side of Channel By Day Beacon #5A
35	North Side of Channel; 750 Yards East of Highway Bridge
36	North Side of Channel; 200 Yards West of Beach Bridge
37	North Side of Channel By H. Hamilton Restaurant
40	Drum Shoal Channel - West End of Hoop Pole Island
41	900 Yards West By North of Mouth of Coral Bay Creek
42	1600 Yards West By North of Station #41
42A	Approximately 600 Yards West of Station #42 Off Golf Course
44A	Off Mouth Triple S Marina
45	Mouth of Peletier Creek
46	Off Bluffs Condo
47	250 Yards East of Peletier Creek
48	Off Camp Glenn
48A	Marine Fisheries Boat Ramp
48B	Marine Fisheries Hangar Near Shore
48C	C-MAST Building Near Shore
49	350 Yards North of Flashing Beacon #4; At "Y" Morehead Harbor
50	500 Yards From Day Beacon #8; Course 302˚M. MM#210
51	Pink House Inshore of Day Beacon #8
52	200 Yards North-Northwest of Beacon #6

E-3 Growing Area: Actual and Potential Pollution Sources

Legend

- Animals
- Areas of Concern
- Dockage
- Golf Courses
- Stormwater
- Subdivisions
- Wastewater
- # Sampling 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

E-3
Growing Area:

Wastewater

Legend

Wastewater

- LIFTSTATION
- PACKAGE PLANT
- SEPTIC FAILURE
- OTHER- SEE COMMENTS
- 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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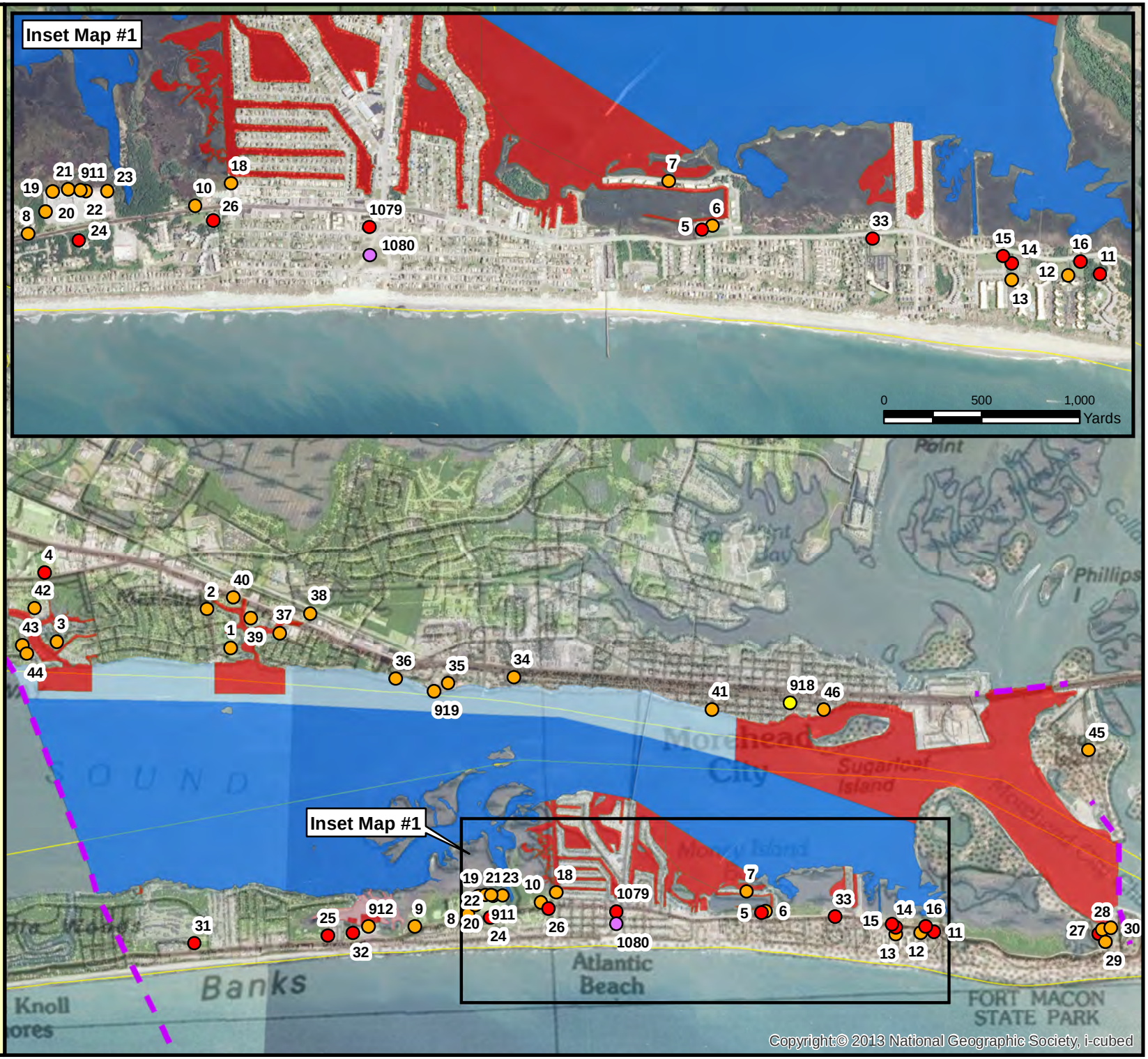

Pollution: Wastewater

Table 2: Wastewater

SGA index	Type	Name	Comments
	Morehead City Side		
1	liftstation	Morehead City Pump Station #14A	-
2	liftstation	Morehead City Pump Station #14	-
3	liftstation	Morehead City Pump Station #15	-
4	WWTP	Hestron Park WWTP	Extended aeration,rotor field disposal
34	liftstation	Morehead City Pump Station #1	-
35	liftstation	Carteret Comm. College Lift Station	-
36	liftstation	Morehead City Pump Station #11	-
37	liftstation	Morehead City Pump Station #13	-
38	liftstation	Morehead City Pump Station #12	-
39	liftstation	Morehead City Pump Station #12A	-
40	liftstation	Morehead City Pump Station #12B	-
41	liftstation	Morehead City Pump Station #2	-
42	liftstation	Carolina Water Services Lift Station #13	-
43	liftstation	Carolina Water Services Lift Station #12	-
44	liftstation	CWS - The Shores Lift Station	-
45	liftstation	Morehead City Pump Station #22	-
46	liftstation	Morehead City Pump Station #3	-
919	liftstation	Carteret Comm. College Lift Station #2	-

	Atlantic Beach Side		
5	WWTP	8 1/2 Marina Village WWTP	LPP subsurface disposal
6	liftstation	8 1/2 Marina Village Lift Station	-
7	liftstation	8 1/2 Marina Village Lift Station	-
8	liftstation	Cottages at Bay Ridge Lift Station	-
9	liftstation	Coral Bay Ridge Lift Station	-
10	liftstation	Needlerush Bay Lift Station	-
11	WWTP	Tar Landing Villages WWTP	Dual Path Extended Aeration, conventional subsurface disp.
12	liftstation	Southwinds Lift Station	-
13	liftstation	A Place at the Beach Lift Station	-
14	WWTP	A Place at the Beach WWTP	Mixed Media Recip Filter System, high-rate infiltration
15	WWTP	Sea Spray WWTP	Sequencing Batch Reactor, subsurface LPP disposal
16	WWTP	Southwinds WWTP	Extended Aeration, subsurface drip disposal
18	liftstation	Palm Suites Lift Station	-
19	liftstation	Atlantic Station Lift Station #4	-
20	liftstation	Atlantic Station Lift Station #5	-
21	liftstation	Atlantic Station Lift Station #3	-
22	liftstation	Atlantic Station Lift Station #2A	-
23	liftstation	Atlantic Station Lift Station #1	-
24	WWTP	Atlantic Station WWTP	Extended aeration, rotary field disposal
25	WWTP	Island Beach & Raquet Club WWTP	
26	WWTP	Peppertree Resort WWTP	Extended aeration w/ tertiary filters, subsurface drip disposal
27	WWTP	US Coast Guard WWTP	New in 2010, extended aeration, dual subsurface LPP disposal
28	liftstation	USCG Pump Station #3	-
29	liftstation	USCG Pump Station #2	-
30	liftstation	USCG Pump Station #1	-
31	WWTP	AmeriSuites WWTP	Extended aeration, subsurface LPP
32	WWTP	Dunscape WWTP	New plant to be online in 2014, extended aeration, rotary fields
33	WWTP	Sands Villas WWTP	Sequencing Batch Reactor, high-rate infiltration
911	liftstation	Atlantic Station Lift Station #2	-
912	liftstation	Bogue Shores Lift Station	-
	WWTP	Atlantic Beach Circle WWTP	New, not yet online. Subsurface drip disposal

E-3 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

N W E S

0 0.5 1 Miles

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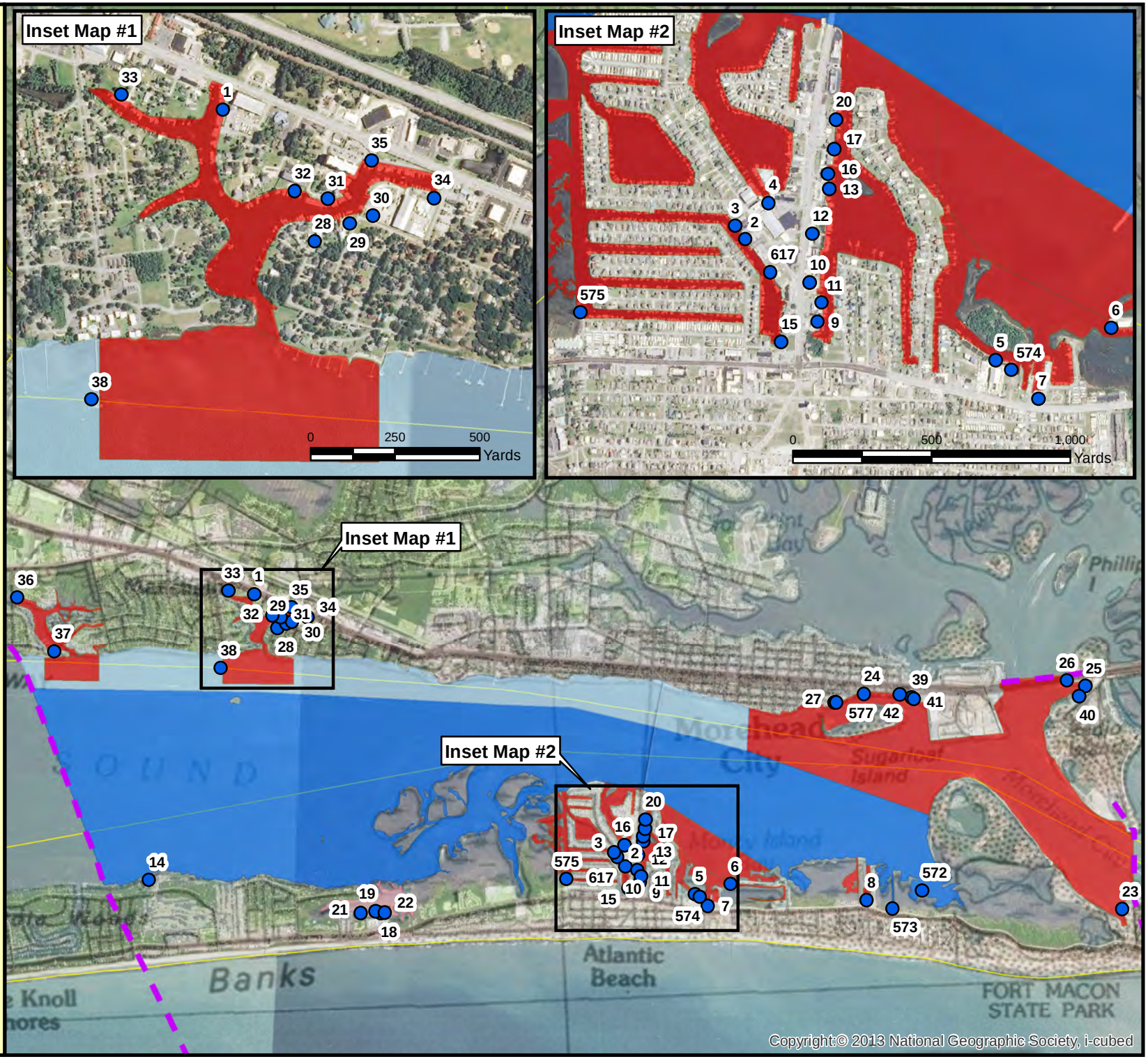

Pollution: Dockage

Table 3: Marinas

SGA index	Marina Name	Total Slips	Pumpout	Comments
	Morehead City Side			
1	Coral Bay Marina	40	No	Minor renovations resulted in 2 additional slips
20	Harbor Master Marina	32	No	-
24	Morehead Gulf Docks	15	No	-
25	Radio Island Marina	34	No	-
26	Radio Island Yachting and Boating Club	80	**Yes**	-
27	Russell Yachts	6	No	Working boatyard
28	Peletier Creek Marina	12	No	-
29	Taylor Boat Works	8	No	Working boatyard
31	Daniels Marina	34	No	Renovations to replace some old or damaged docks, no change in slips
32	Mariner Cove Marina	23	No	-
33	Miami Ave. Dockage	16	No	Currently involved in a land dispute, may lose 6 slips on west side of property
34	70 West Marina	24	No	No permanent slips, all slips for loading/unloading from drystack
35	The Harborside Club Marina	50	No	1 additional slip since last triennial
36	Spooners Creek North	30	No	-
37	Spooners Creek Marina	89	**Yes**	-
38	The Bluffs Marina	26	No	Meets exemption requirements
39	Leeward Harbor	30	No	-
40	Tide Lines Marina	28	**Yes**	Proposed, still not completed
41	Portside Marina	27	**Yes**	Clean Marina, recently added pumpout
42	Dockside Yacht Club	83	**Yes**	-
577	Morehead City Town Docks	18	No	Public facility, hope to have pumpout in future

SGA index	Atlantic Beach Side	Total Slips	Pumpout	Comments
2	Seascape Condominium Dockage	16	No	-
3	Pirates Den Condominium Dockage	14	No	-
4	Crows Nest Yacht Club	63	No	-
5	Fort Macon Marina	15	No	-
6	8 1/2 Marina	121	No	-
7	Anchorage Marina	120	No	Planning to replace some old docks, layout not expected to change
8	Tiple S Marina	66	No	-
9	Freemans Bait & Tackle	10	No	-
10	Mud Bucket Dredging	11	No	-
11	El Zarape Dockage	9	No	-
12	Sea Water Marina	26	No	-
13	Capt Stacy Marina	13	No	-
14	Bogue Pines Dockage	16	No	-
15	Anglers Cove Marina	31	No	-
16	Harborside Mini Storage	9	No	-
17	Marlin Harbor	9	No	-
18	Coral Cay Dockage	16	No	New dockage
19	Bogue Shores Dockage	11	No	1 new slip in 2013
20	Hales Dockage	18	No	-
21	Dunscape Villas Dockage	18	No	-
22	Coral Bay Club Dockage	18	No	New dockage
23	US Coast Guard Docking Area	12	**Yes**	-
572	Estuary Association Dockage	10	No	-
573	Asbury Beach Marina	10	No	3 jet ski slips, not included in count
574	The Pinnacle Marina	13	No	1 damaged slip, still counted
575	Palm Suites Dockage	10	No	-
617	Sleepy Creek Farms Dockage	20	No	-

E-3
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
W E
S

0 0.5 1
Miles

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Pollution: Stormwater

E-3 Growing Area:

Subdivisions

Legend

- Subdivisions
- 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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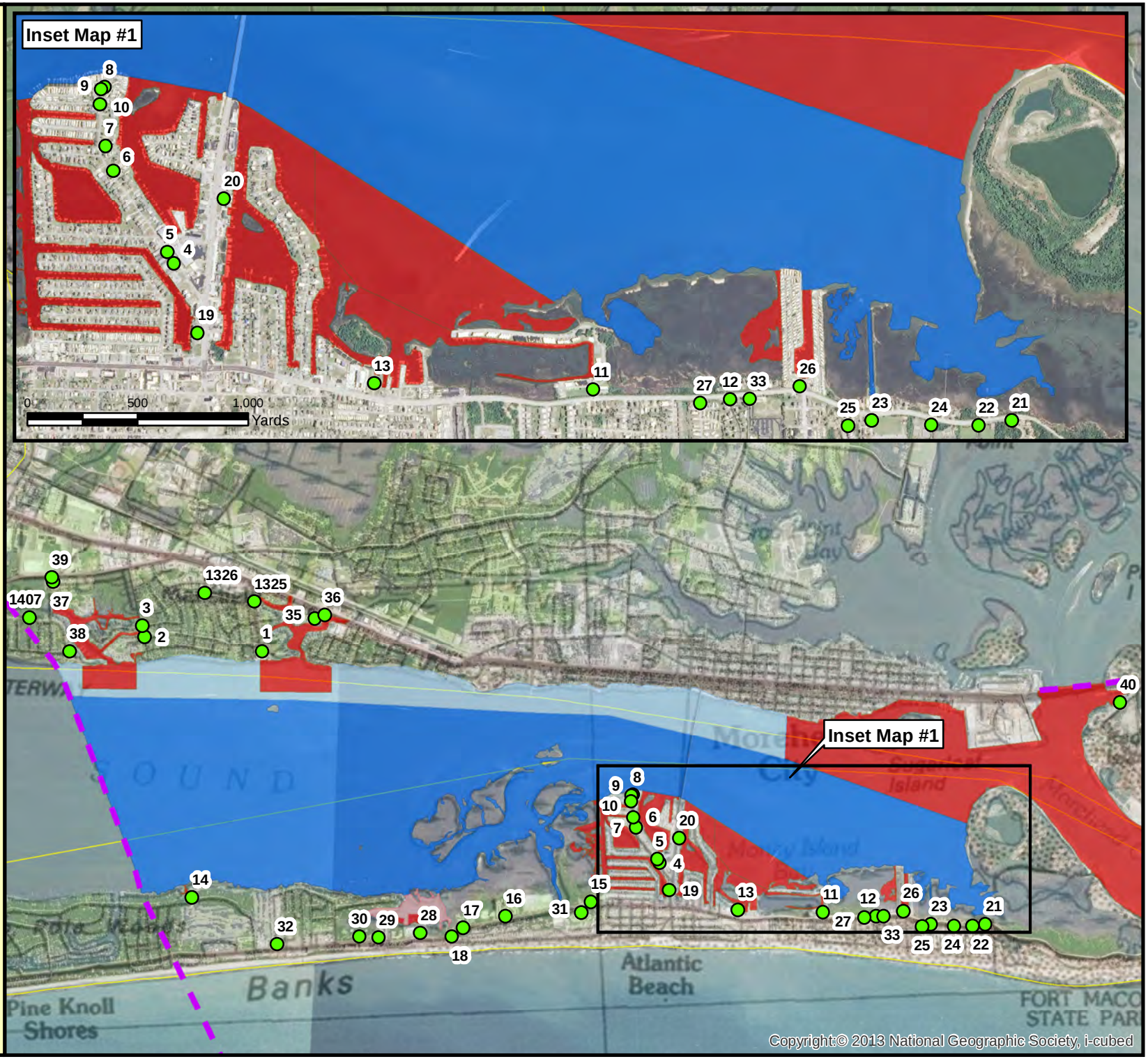

Pollution: Subdivisions

Table 4: Subdivisions

SGA index	Subdivision Name	# Lots	# Homes 2010	# Homes 2013	Comments
	Morehead City Side				
1	The Bluffs	-	-	-	44 condos
2	Spooners Creek South	27	18	18	-
3	Webb Court	40	37	37	-
35	Mariner Cove Condos	-	-	-	24 condos
36	The Harborside Club	-	-	-	63 condos
37	Spooners Creek North	55	35	38	-
38	The Shores at Spooners Creek Marina	19	0	3	34 condos also
39	Spooners Creek	113	82	84	-
40	Tide Lines	14	0	0	No construction yet
1325	Mansfield Park	81	80	80	-
1326	Mitchell Village	258	243	244	-
	Spooners Creek West	29	-	2	Drains mostly to E-3 and a some to E-2

SGA index	Atlantic Beach Side	# Lots	# Homes 2010	# Homes 2013	Comments
4	Seascape Condominiums	-	-	-	16 condos
5	Pirates Den Condominiums	-	-	-	32 condos
6	Green Haven	-	14	14	MHP
7	Above Par	-	8	8	MHP
8	Channel Bay	-	29	29	MHP, centralized peat systems
9	Pelican Park	-	35	35	MHP
10	North Shore	-	95	95	MHP
11	8 1/2 Marina Village	-	-	-	73 condos
12	Island Quay	50	45	46	-
13	The Pinnacle	-	-	-	12 condos, not yet built
14	Bogue Pines	10	10	9	-
15	Needlerush Bay	14	1	1	-
16	The Cottages at Bay Ridge	56	53	53	-
17	Coral Bay Ridge	34	19	20	-
18	Ocean Ridge	191	164	167	-
19	Crystal Coast Condos	-	-	-	18 condos
20	Marlin Harbor	-	-	-	9 condos
21	Tar Landing	-	-	-	condos
22	Southwinds	-	-	-	180 condos
23	Seaspray Condominiums	-	-	-	180 condos
24	A Place at the Beach	-	-	-	279 condos
25	Sea Dreams	28	28	28	-
26	Triple S Village	-	215	215	MHP
27	Crosswinds	-	38	42	MHP
28	Coral Cay	-	-	-	12 condos
29	Croatan Mobile Home Park	-	97	97	MHP
30	Island Beach & Raquet Club	-	-	-	condos
31	Peppertree Resort	-	-	-	217 condos
32	Coastal Mobile Estates	-	143	143	MHP
33	Sands Villas	-	-	-	-

E-3
Growing Area:

Animals

Legend

Animals

- WATERFOWL
- 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 0.1 0.2 Miles

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Pollution: Animals

Table 5: Animals

SGA index	Type	Comments
	Morehead City Side	
	none	

	Atlantic Beach Side	
2	Waterfowl	No Longer Present

E-3
Growing Area:

Golf Courses

Legend

- Golf Courses
- Shellfish Growing Area Boundaries
- 14-digit Hydrologic Units

Shellfish Growing Area Classifications

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

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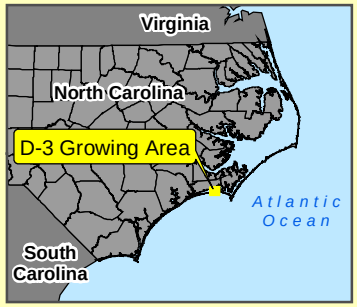

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Pollution: Golf Courses

Table 6: Golf Courses

SGA index	Concern	Comments
	Morehead City Side	
	none	

	Atlantic Beach Side	
44	Country Club of the Crystal Coast	Stormwater ponds, on-site wastewater

E-3
Growing Area:

Areas of Concern

Legend

Areas of Concern

Category

- OTHER-SEE COMMENTS
- 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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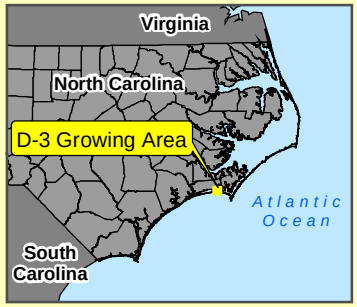
0 0.1 0.2
Miles



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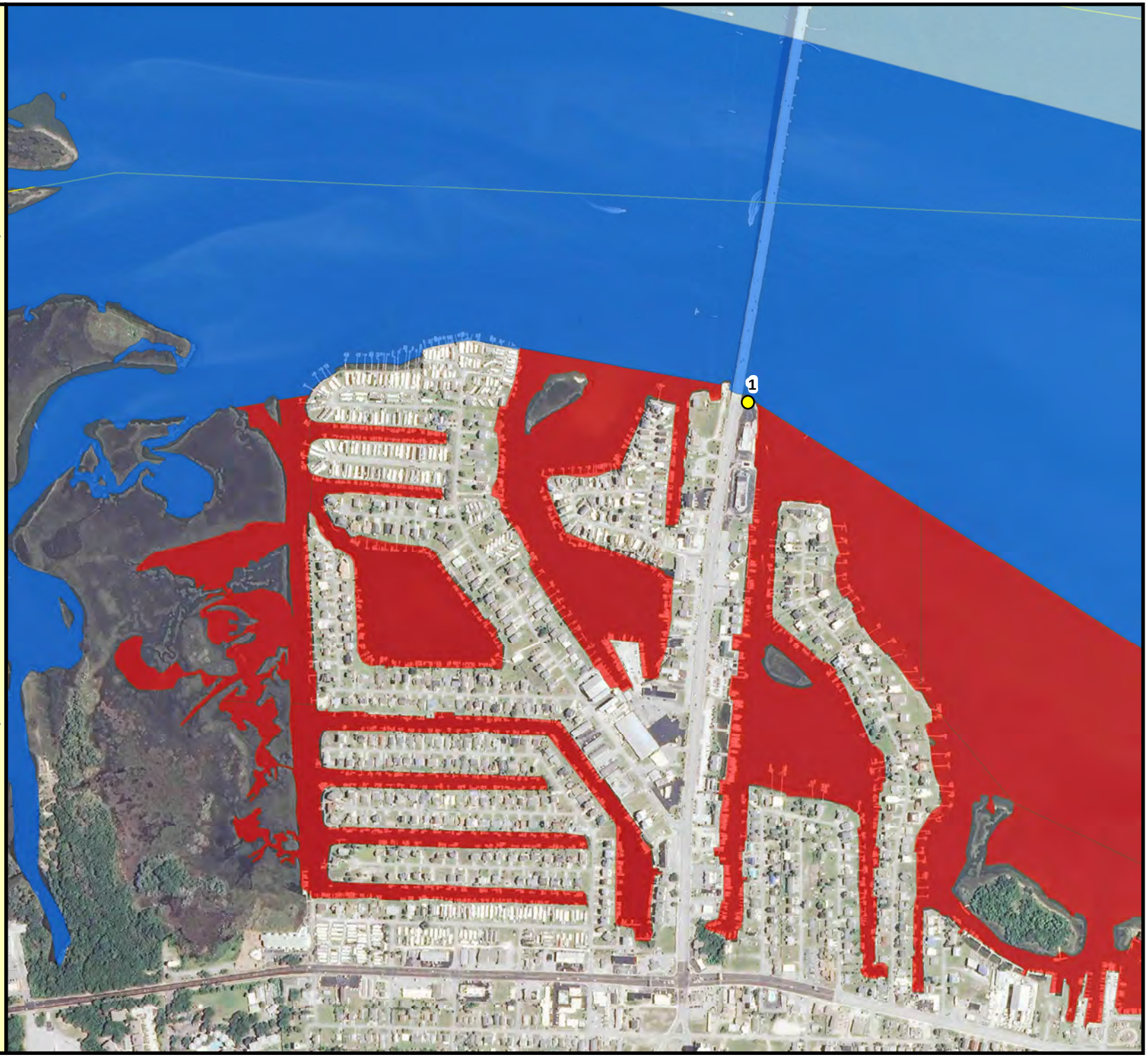

Pollution: Areas of Concern

Table 7: Areas of Concern

SGA index	Concern	Comments
	Morehead City Side	
	none	

	Atlantic Beach Side	
1	wastewater	Channel Marker Resturant Pump & Haul Truck

Table 8: Tides and Salinities

		Station ID																																						
Date	**Tidal Stage**	***1***	***2***	***5***	***6***	***6B***	***7***	***8***	***10***	***10A***	***10B***	***11***	***13***	***15***	***18***	***19***	***20***	***21***	***23***	***24***	***34***	***35***	***36***	***37***	***40***	***41***	***42***	***42A***	***44A***	***45***	***46***	***47***	***48***	***48A***	***48B***	***48C***	***49***	***50***	***51***	***52***
1/28/2009	**1/2 FLD**								32																															
2/12/2009	**1/2 FLD - 3/4 FLD**	30	30	32	32	30	30	32		32	32	32	32	32	32	30	32	32	32	32	32	32	32	32	30	30	32	30	30	30	30	30	32	30	32	30	32	30	30	32
3/10/2009	**3/4 FLD**	30	32	33	32	32	32	32	32	32	30	32	32	32	32	32	32	32	34	34	34	32	32	32	32	32	32	32	32	30	32	32	32	32	32	34	32	32	32	32
6/15/2009	**1/2 FLD**	32	32	32	32	34	34	34	34	34	32	34	32	34	34	34	32	34	34	34	34	34	34	32	32	34	32	34	32	32	32	32	32	32	32	32	34	32	32	32
9/2/2009	**LAST FLD - 1ST EBB**	32	34	34	36	34	36	36	36	36	36	34	36	34	34	36	34	36	36	34	34	36	34	36	36	36	36	36	36	32	34	36	36	36	36	34	36	36	34	34
9/30/2009	**1/2 EBB**	28	30	33	30	29	31	30	30	30	30	31	31	31	31	32	31	32	35	34	35	34	32	33	31	30	31	30	31	27	32	31	34	33	33	32	32	30	29	32
2/25/2010	**1/4 EBB - 1/2 EBB**	30	30	32	28	30	30	30	30	30	30	30	30	30	30	32	32	32	30	32	32	34	32	32	30	35	30	30	32	30	32	34	32	32	30	32	32	30	30	34
3/25/2010	**1/2 EBB**	24	26	28	24	26	28	28	30	28	28	30	28	30	28	30	30	30	30	32	30	32	30	32	28	28	28	28	30	24	28	28	30	30	30	30	32	26	28	28
5/7/2010	**2/3 EBB - 3/4 EBB**	32	34	34	34	34	34	34	34	33	33	34	34	34	34	34	34	34	35	35	34	35	35	34	34	34	34	34	34	31	34	34	35	34	34	34	35	33	33	34
6/29/2010	**1/4 FLD - 1/4 EBB**	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
8/19/2010	**1/2 EBB - 3/4 EBB**	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36
10/25/2010	**1/2 FLD**	26	26	32	26	28	30	28	30	29	30	28	30	30	30	32	32	32	34	34	34	32	32	30	30	28	26	26	32	26	24	26	30	30	30	30	34	24	24	30
1/3/2011	**3/4 FLD**	30	31	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	28	32	32	32	32	32	32	32	32	32	32
2/21/2011	**3/4 FLD - LAST FLD**	32	28	30	30	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	30	34	32	32	32	32	32	28	28	28	30	30	30	30	32	30	30	30
3/30/2011	**1/2 EBB**	32	32	32	32	32	32	32	32	32	32	30	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
5/31/2011	**1/4 EBB**	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
8/18/2011	**1/2 FLD - 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	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36
12/5/2011	**LAST EBB**	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33	32	32	32
1/23/2012	**1ST EBB - 1/4 EBB**	32	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
2/21/2012	**3/4 FLD - LAST FLD**	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	34	35	35	35	35	35	35	35	35	35	35	35	35
3/22/2012	**3/4 FLD - LAST FLD**	35	35	35	35	35	35	35	35	35	35	35	33	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
6/14/2012	**1/2 EBB - 2/3 EBB**	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
10/10/2012	**1/2 EBB - 2/3 EBB**	33	35	35	34	34	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	37	34	34	34	34	35	35	35	35	35	35	35	35	35	35	35	35
12/5/2012	**1ST FLD - 1/4 FLD**	30	32	32		32	32	30	30	32	30	30	30	30	32	30	30	30	30	32	30	30	30	32	32	32	34	34	30	30	30	32	34	34	34	34	30	32	30	32
2/19/2013	**3/4 EBB TO LAST EBB - 3/4 FLD**	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
5/30/2013	**1/4 FLD**	32	32	31	32	32	33	33	33	33	33	32	33	33	33	34	33	34	34	34	33	33	34	34	32	33	32	32	33	31	31	32	34	32	32	32	34	33	32	32
8/15/2013	**LAST EBB - 1ST FLD**	33	35	35	35	33	35	35	35	33	33	33	35	33	33	35	35	35	35	35	33	35	33	33	35	35	35	35	35	33	35	35	35	35	35	35	33	35	33	35
10/2/2013	**1ST EBB**	34	35	32	33	33	33	33	33	33	33	32	32	33	33	32	33	34	34	33	34	34	35	34	34	33	33	34	33	35	33	32	33	33	32	33	35	33	32	32
11/6/2013	**LAST FLD**	30	30	32	32	32	30	31	31	31	32	32	30	30	31	32	32	30	31	32	32	31	30	31	32	32	32	32	32	32	31	31	31	32	32	32	31	31	32	30
11/22/2013	**3/4 FLD**	32	33	32	34	33	32	32	33	33	33	33	33	32	33	33	33	33	34	34	32	33	32	32	34	34	34	33	32	34	33	34	32	34	32	32	33	33	32	33
2/18/2014	**1/2 FLD**	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	35	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32

Table 9: Temporary Closures

Date	Closure Description	Date Closed	Date Opened	Reason
8/13/2009	All Waters From the ICWW to the Mainland Between the Morehead City Port and Channel Marker #65A	8/13/2009		Rainfall
8/18/2009	All Waters From the ICWW to the Mainland Between the Morehead City Port and Channel Marker #65A		8/19/2009	Sampling
9/7/2009	All Waters From the ICWW to the Mainland Between the Morehead City Port and Channel Marker #65A	9/7/2009		Rainfall
9/8/2009	E-3 - All Waters	9/8/2009		Rainfall
9/10/2009	All Waters From the ICWW to the Mainland Between the Morehead City Port and Channel Marker #45 Remain Closed		9/11/2009	Sampling
9/16/2009	E-3 - Normal Boundaries		9/17/2009	Sampling
9/22/2009	All Waters From the ICWW to the Mainland Between Channel Marker #7 and Flashing Beacon #29	9/22/2009		Rainfall
9/30/2009	All Waters From the ICWW to the Mainland Between Channel Marker #7 and Flashing Beacon #29		10/1/2009	Sampling
11/12/2009	E-3 - All Waters	11/12/2009		Tropical Storm Ida
11/19/2009	All Waters West of a Line From Spooners Creek to the Pine Knoll Shores Canals Remain Closed		11/20/2009	Sampling
11/24/2009	E-3 - Normal Boundaries		11/25/2009	Sampling
08/22/10	All those waters between the Atlantic Beach High Rise Bridge ICWW Channel Marker #25, near Broad Creek.	8/22/2010		Rainfall
08/27/10	E-3 - Normal Boundaries		8/28/2010	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.	9/12/2010		Rainfall
09/15/10	E-3 - Normal Boundaries		9/16/2010	Sampling

Table 9: Temporary Closures

Date	Closure Description	Date Closed	Date Opened	Reason
09/27/10	All those waters in Bogue Sound between IWW Marker #29 and Fort Macon, to include Broad Creek and Tar Landing Bay.	9/27/2010		Rainfall
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.	9/30/2010		Nicole Remnants
10/06/10	A portion of Bogue Sound returns to normal boundaries except Pine Knoll Shores – All those waters in Bogue Sound 100 yards offshore of Pine Knoll Shores between the permanent closure line at 34º 42.2026' N -76º 48.0601' W and the Bogue Pines boat basin at 34º 42.2346' N -76º 47.7094' W.		10/7/2010	Sampling
10/13/10	E-3 - Normal Boundaries		10/14/2010	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.	1/18/2011		Rainfall
01/21/11	E-3 - Normal Boundaries		1/22/2011	Sampling
08/29/11	All Coastal waters close.	8/29/2011		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.		9/1/2011	Sampling
08/31/11	Tar Landing Bay returns to status prior to 8/27/11 Hurricane Irene remnants.		9/1/2011	Sampling
09/01/11	E-3 - Normal Boundaries		9/2/2011	Sampling

Table 9: Temporary Closures

Date	Closure Description	Date Closed	Date Opened	Reason
10/20/11	l area closure line at Fort Macon to the Emerald Isle High Rise Bridge. This includes Ta	10/20/2011		Rainfall
10/25/11	E-3 - Normal Boundaries		10/26/2011	Sampling
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.	5/31/2012		TD Beryl
06/02/12	E-3 - Normal Boundaries		6/3/2012	Sampling
09/04/12	All those waters in Bogue Sound from the IWW to the mainland between IWW Beacon #7 near Peletier Creek and the permanent closure line near 16th Street in Morehead City.	9/4/2012		Rainfall
09/06/12	E-3 - Normal Boundaries		9/7/2012	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.	10/28/2012		Hurricane Sandy
11/01/12	E-3 - Normal Boundaries		11/2/2012	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.	2/8/2013		Rainfall
02/13/13	IWW to ocean side returns to normal boundaries including Tar Landing Bay and Hoop Pole Creek - IWW to mainland remains closed.		2/14/2013	Sampling
02/15/13	E-3 - Normal Boundaries		2/16/2013	Sampling
02/19/13	All those waters from the ICWW to the mainland between the Morehead City State Port permanent closure line near 16th Street and the Atlantic Beach High-rise Bridge.	2/19/2013		Investigation
02/26/13	Bogue Sound returns to normal boundaries.		2/27/2013	Investigation completed
10/09/10	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.	10/9/2013		TS Karen remants

Table 9: Temporary Closures

Date	Closure Description	Date Closed	Date Opened	Reason
10/11/13	E-3 - Normal Boundaries		10/12/2013	Sampling
11/27/13	Bogue Sound - All those waters from the IWW to the mainland between the Morehead City State Port permanent closure line near 16th Street and Emerald Isle High-Rise Bridge.	11/27/2013		Rainfall
12/03/13	E-3 - Normal Boundaries		12/4/2013	Sampling
12/03/13	Hoop Pole Creek- All those waters in the Hoop Pole Creek area upstream of a straight line beginning on the west shore at 34 42.2590' N -76 45.1278' W; running easterly to the eastern shore at 34 42.2590' N -76 45.0960' W.	12/3/2013		Sampling
12/10/13	ADDITIONAL AREA of Hoop Pole Creek- All those waters in the Hoop Pole Creek area upstream of a line beginning on a point of marsh at 34°42.4519' N -76°45.1967' W; running southeasterly across the bay to a point of marsh at 34°42.4429' N -76°45.1829' W; running southeasterly following the shoreline to a point at 34°42.4069' N -76°45.1285' W; running southeasterly across the creek to a point 34°42.3984' N -76°45.1098' W on the eastern shore.	12/10/2013		Sampling
03/07/14	All those waters from the Intracoastal Waterway to the mainland between Morehead Ctiy 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, Freeman Creek, and Salliers Bay.	3/7/2014		Rainfall
03/11/14	E-3 - Normal Boundaries		3/12/2014	Sampling

Table 10: Conditional Sampling Results

STATION	08/17/09	09/09/09	09/15/09	09/23/09	09/29/09	11/16/09	11/17/09	11/18/09	11/23/09	08/26/10	09/14/10	10/05/10	01/20/11	08/30/11
2				**22.0**	1.7				2.0					
50	1.7		2.0	7.8	4.5		**17.0**			1.7			4.5	
5														
48	2.0						**22.0**				11.0	1.7	4.0	
15 ABB	1.7		1.7				7.8			1.7	4.5	2.0	1.7	1.7
6						**23.0**					9.3			
21		**17.0**				**22.0**	**33.0**	**17.0**			1.7	4.5		4.5
TLB middle of marsh														
Hoop Pole Creek		**17.0**					**33.0**							
Tar Landing Bay														

STATION	08/31/11	10/24/11	06/01/12	09/05/12	10/31/12	02/12/13	02/14/13	10/10/13	12/02/13	03/10/14	05/19/14			
2			1.7								1.7			
50	4.5	2.0			4.5		7.8		4.5	4.5				
5				1.7										
48	4.5	2.0	1.7	2.0	1.7		7.8	**14.0**	1.7	2.0				
15 ABB		1.7	2.0	1.7	2.0		2.0	4.5	1.7	7.8				
6		13.0				11.0		**17.0**						
21		13.0				2.0		11.0						
TLB middle of marsh														
Hoop Pole Creek														
Tar Landing Bay						2.0								

Table 11: Rainfall Calendars

2014 - Pine Knoll Shores

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	0.15		0.01									
2			0.15									
3	0.50		0.05									
4		0.05	0.01									
5	0.15	0.01	0.2									
6	0.05	0.55	1.7									
7												
8		0.25										
9												
10	0.05	0.05										
11	3.5											
12		1.70										
13		0.70	0.15									
14	3											
15		0.05										
16	0.01											
17												
18	0.20											
19		0.01										
20												
21	0.20		0.15									
22		0.2	0.2									
23			0.15									
24			0.05									
25			0.8									
26												
27												
28	3.0 snow & ice	0.01										
29			0.5									
30	0.01											
31	0.05											

2014 - Morehead City

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1												
2	0.80											
3												
4												
5			0.20									
6		0.50										
7		0.17	1.90									
8		0.55										
9												
10			0.35									
11	1.70	0.65										
12												
13		1.21										
14												
15	1.55											
16												
17			0.75									
18			0.40									
19			0.18									
20												
21												
22												
23	0.05											
24												
25												
26												
27												
28	.65 snow											
29												
30			0.30									
31												

Table 11: Rainfall Calendars

2013 - Pine Knoll Shores

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	0.10			0.20			0.10	0.75				0.01
2	0.20				0.15		0.15		2.75		1.25	0.05
3	0.15			1.45		0.60			0.80	0.25		0.65
4					1.20			0.55	0.01			
5					0.09				0.25			0.05
6	trace		0.01		0.55				0.01		0.09	0.01
7		3.15			0.35	1.25					0.15	
8						0.09		0.01	0.65	3.35		0.40
9										0.50		0.15
10										0.20		
11	0.2	0.50					0.20					
12		0.40	1.05	2		0.05	3.35	0.15		0.05		
13						0.40	0.30	0.25				
14	trace									0.01		0.55
15	0.3						0.35	0.95		0.01	0.01	0.20
16					0.60				0.01		0.09	
17	0.45	0.20										
18		0.25				0.40				0.05	1.00	
19			0.4	0.25		1.30		0.01		0.45		0.05
20				1.45				0.20				
21					0.01	0.65	0.2				0.09	0.01
22				0.20		0.10						0.15
23		0.6				0.01	0.1			0.50		0.8
24		0.09	0.5		0.65	0.20						0.1
25	0.20			0.15		0.01		0.01		0.01		0.01
26		0.85						0.09	0.01			0.15
27								0.01			0.09	0.01
28	0.10			0.70		0.15	0.50			0.01	2.55	0.5
29							0.25	0.09				
30	0.40					1.65						0.05
31										0.05		

2013 - Morehead City

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	1.25						1.60	0.20			0.95	
2	0.14				0.10							
3					0.37		0.40					
4				2.25		0.42	0.10	0.50				
5							0.32					
6												0.52
7	0.03				0.70	0.75					0.30	
8		4.75								0.50		
9												
10												
11												
12		0.15										
13		0.50	1.12				2.52	0.85				
14						0.35		0.47				2.50
15								0.15				
16	0.15			0.55				0.75				
17												
18	0.48											
19			0.45	0.50		1.38		0.60				
20		0.30		1.50				0.32				
21												
22		0.72				0.80			0.85			
23				0.40	0.12					0.45		0.75
24			0.45		0.89							
25												
26												
27		1.00										
28						0.10						
29												
30				0.52								
31												

Table 11: Rainfall Calendars

2012 - Pine Knoll Shores

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1							0.55	0.60		0.10		
2		0.25							<.1	0.90		
3			0.1						0.85	trace		
4			2.05			0.10					0.25	trace
5						trace		0.65				
6				0.2	1.30						0.35	
7								0.85		0.40	<.1	0.40
8	0.20								0.15		0.15	0.10
9			<.1		0.15		0.55					
10		0.55					<.10	0.75	0.20			
11	1.3	trace				?	0.60	0.85				
12								0.20				0.2
13											<.10	0.85
14		0.50									0.20	
15								0.3	trace			
16			trace		0.35				trace			0.45
17	0.35	0.60	<.1		0.50							0.15
18									0.75			0.20
19		0.4		trace				0.25	0.80	<.10		
20								1.05				
21							<.1	0.35				0.60
22		trace					4.5	0.20				
23	trace		0.1		<.1	0.55	0.75	1.75				
24		0.35	0.45					0.65				0.15
25			trace		0.15	0.10		0.15			trace	
26	0.30		<.1		<.10	0.15	out of town	trace		0.15		1.65
27		trace						0.15		1.40	<.10	
28				1.35				trace		0.35	0.15	0.95
29								trace	0.25	trace		
30			0.15	trace	3.05							
31			trace									

2012 - Morehead City

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1								0.45	2.50	0.55		
2								0.30		0.25		
3										0.46		
4												
5									0.15			
6											0.50	
7								0.24	1.30			
8								0.30				
9								0.40		0.27		
10							trace	1.25				0.60
11							0.80					0.15
12							0.50					
13												
14												1.30
15								0.05				
16												
17								0.90				
18									0.70			
19									0.55			
20								1.35				
21								0.75				2.50
22								0.48				
23							0.30					
24							0.65	1.90				
25								1.15				
26												
27										2.80		
28								1.35			0.35	
29								0.40				
30							0.40					
31							0.12					

Table 11: Rainfall Calendars

2011 - Pine Knoll Shores

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1			0.70					1.10			0.15	
2	TRACE	0.30										
3												
4								trace			0.85	
5		2.30		0.2		trace		0.15				0.10
6		0.40			trace		0.20					
7	0.55	0.75	1.1		trace			0.40				
8				0.2			1.05					
9							0.65					
10	snow		0.20							<.1		
11		0.15										trace
12				trace					0.15	trace		
13					0.40	0.20		VAC		0.15		trace
14							trace			trace		
15			vacation									
16				0.35					0.10		trace	trace
17					0.15	0.20			trace	10p - 1pm	0.95	
18	3.50								<.1			trace
19	0.15					0.10						trace
20					0.15	1.50			0.30			
21				0.15								
22	snow			trace				0.15	trace			trace
23						0.35			0.45		0.55	
24								3.2* 2 day total				
25		0.2							0.90			
26	1.00	trace					0.40		1.65			
27		trace		0.95		0.15	trace	4.9				0.65
28												
29						1.70					0.35	
30								trace	0.30			
31	trace						0.20			<.1		

2009 - Morehead City

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1			1.25									
2				0.10								
3				0.40	trace			0.80				
4					trace							
5												
6									trace			
7							0.80					
8					0.20				6.0+			
9												
10												
11				trace								
12					0.30							
13						trace		2.50				
14				0.20			2.00					
15				1.25	trace	trace		1.75				
16			trace			trace						
17			1.00		1.00							
18					0.25		1.25					
19		1.30										
20				trace								
21												
22												
23						0.40						
24												
25							0.30					
26									1.00			
27						0.21			0.70			
28		trace			1.00							
29												
30			0.50									
31												

Table 11: Rainfall Calendars

2010 - Pine Knoll Shores												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	0.15	0.65		VACATION				0.40				0.90
2								<.1		<.1		
3			1.05			<.10				0.15		0.35
4			<.10		0.35			0.25			0.40	
5		1.50						0.55			0.45	
6								0.10				
7								>.1				
8				0.4								
9								trace				
10	vacation	0.50				trace	1.30					
11			0.85		<.10							0.45
12			0.40						2.00			0.7
13		5 " snow					0.60	0.25				
14						0.15	2.50			trace		
15		<.1		trace								
16	2.90				trace						0.40	trace
17			VACATION		<.10		0.80	<.1				
18					0.15		0.35	0.25				0.45
19							trace	<.1				
20					trace	0.45		0.40				
21	1.50			0.45			0.75	3.10				
22		0.85		<.10				0.20				
23					trace	trace		trace				
24		0.65						1.30				
25	1.45				<.10					0.35		
26					0.65				<0.1			
27									3.00			0.45
28		trace		<.10		<.10		<.1	1.10			
29							0.15		0.70		0.1	
30						0.65			>8.5		trace	
31	1.10						trace					

Table 11: Rainfall Calendars

2009 - Pine Knoll Shores												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1			vacation	0.25					trace			0.65
2				0.50								
3		0.60							0.10	0.70		2.35
4						trace			trace			1.05
5					trace	0.85		trace	0.10	0.40		0.25
6	0.10				0.45	0.20						
7	0.15					0.35			5.70			
8					0.20				trace			
9				0.50	0.10							0.75
10				0.65		<.1						
11										0.10	2.60	
12					0.20			0.60			3.50	
13	0.85			trace		0.15	2.35	0.65		0.45	0.70	
14		0.10		1.30	0.30	1.60		0.90			trace	0.35
15			0.15		0.95					0.80		
16			0.95	trace		0.35	<.10			0.45		
17		0.85			1.80	<.1	0.85					
18		vacation							0.26	0.85		
19	0.30		<.10		trace		vacation				0.80	1.80
20	0.15			0.50	0.25							
21								0.10				
22				0.15		trace			3.00		0.40	
23											0.35	
24					0.25	<.1				trace	vacation	
25			trace		trace				0.13	trace		
26			<.10			trace			1			
27	0.60				0.85	0.25			1.05	0.45		
28								0.15				
29	trace		0.75		0.30			0.80			trace	
30								trace			<.10	
31					0.10			0.75				1.20

Table 12: Bacteriological Sampling Results

Station ID: 1

# Samples:	30	**Log Avg:**	1.0256
# > 43 MPN:	4	**Log Std Dev:**	0.4518
# > 260 MPN:	0	**Geomean:**	10.6077
Median:	12	**Estimated 90th:**	40

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	1/2 FLD	30	11.0	1.0414
3/10/2009	3/4 FLD	30	4.0	0.6021
6/15/2009	1/2 FLD	32	2.0	0.301
9/2/2009	1ST EBB	32	**17.0**	1.2304
9/30/2009	1/2 EBB	28	**49.0**	1.6902
2/25/2010	1/4 EBB	30	11.0	1.0414
3/25/2010	1/2 EBB	24	13.0	1.1139
5/7/2010	2/3 EBB - 3/4 EBB	32	13.0	1.1139
6/29/2010	1/4 EBB	35	1.7	0.2304
8/19/2010	1/2 EBB	36	**33.0**	1.5185
10/25/2010	1/2 FLD	26	**46.0**	1.6628
1/3/2011	3/4 FLD	30	6.8	0.8325
2/21/2011	3/4 FLD	32	**17.0**	1.2304
3/30/2011	1/2 EBB	32	**49.0**	1.6902
5/31/2011	1/4 EBB	35	4.5	0.6532
8/18/2011	3/4 FLD	36	11.0	1.0414
12/5/2011	LAST EBB	32	4.5	0.6532
1/23/2012	1ST EBB	32	13.0	1.1139
2/21/2012	LAST FLD	35	4.5	0.6532
3/22/2012	3/4 FLD	35	13.0	1.1139
6/14/2012	1/2 EBB	35	**33.0**	1.5185
10/10/2012	1/2 EBB	33	13.0	1.1139
12/5/2012	1/4 FLD	30	1.7	0.2304
2/19/2013	3/4 FLD	30	11.0	1.0414
5/30/2013	1/4 FLD	32	2.0	0.301
8/15/2013	LAST EBB	33	**79.0**	1.8976
10/2/2013	1ST EBB	34	4.5	0.6532
11/6/2013	LAST FLD	30	**17.0**	1.2304
11/22/2013	3/4 FLD	32	7.8	0.8921
2/18/2014	1/2 FLD	32	**23.0**	1.3617

Station ID: 2

# Samples:	30	**Log Avg:**	0.3830
# > 43 MPN:	0	**Log Std Dev:**	0.2559
# > 260 MPN:	0	**Geomean:**	2.4155
Median:	1.7	**Estimated 90th:**	5

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	1/2 FLD	30	6.8	0.8325
3/10/2009	3/4 FLD	32	1.7	0.2304
6/15/2009	1/2 FLD	32	2.0	0.301
9/2/2009	1ST EBB	34	7.8	0.8921
9/30/2009	1/2 EBB	30	1.7	0.2304
2/25/2010	1/4 EBB	30	**17.0**	1.2304
3/25/2010	1/2 EBB	26	1.7	0.2304
5/7/2010	2/3 EBB - 3/4 EBB	34	2.0	0.301
6/29/2010	1/4 EBB	35	1.7	0.2304
8/19/2010	1/2 EBB	36	1.7	0.2304
10/25/2010	1/2 FLD	26	1.7	0.2304
1/3/2011	3/4 FLD	31	1.7	0.2304
2/21/2011	3/4 FLD	28	4.0	0.6021
3/30/2011	1/2 EBB	32	1.7	0.2304
5/31/2011	1/4 EBB	35	1.7	0.2304
8/18/2011	3/4 FLD	36	1.7	0.2304
12/5/2011	LAST EBB	32	1.7	0.2304
1/23/2012	1ST EBB	35	2.0	0.301
2/21/2012	LAST FLD	35	2.0	0.301
3/22/2012	3/4 FLD	35	2.0	0.301
6/14/2012	1/2 EBB	35	1.7	0.2304
10/10/2012	1/2 EBB	35	4.5	0.6532
12/5/2012	1/4 FLD	32	1.7	0.2304
2/19/2013	3/4 FLD	30	1.7	0.2304
5/30/2013	1/4 FLD	32	1.7	0.2304
8/15/2013	LAST EBB	35	1.7	0.2304
10/2/2013	1ST EBB	35	1.7	0.2304
11/6/2013	LAST FLD	30	4.0	0.6021
11/22/2013	3/4 FLD	33	4.0	0.6021
2/18/2014	1/2 FLD	32	4.5	0.6532

Table 12: Bacteriological Sampling Results

Station ID: 5

# Samples:	30	**Log Avg:**	0.4135
# > 43 MPN:	1	**Log Std Dev:**	0.3515
# > 260 MPN:	0	**Geomean:**	2.5914
Median:	1.7	**Estimated 90th:**	7

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	1/2 FLD	32	**49.0**	1.6902
3/10/2009	3/4 FLD	33	1.7	0.2304
6/15/2009	1/2 FLD	32	1.7	0.2304
9/2/2009	1ST EBB	34	1.7	0.2304
9/30/2009	1/2 EBB	33	2.0	0.301
2/25/2010	1/4 EBB	32	4.5	0.6532
3/25/2010	1/2 EBB	28	1.7	0.2304
5/7/2010	2/3 EBB - 3/4 EBB	34	1.7	0.2304
6/29/2010	1/4 EBB	35	1.7	0.2304
8/19/2010	1/2 EBB	36	1.7	0.2304
10/25/2010	1/2 FLD	32	2.0	0.301
1/3/2011	3/4 FLD	32	1.7	0.2304
2/21/2011	3/4 FLD	30	1.7	0.2304
3/30/2011	1/2 EBB	32	2.0	0.301
5/31/2011	1/4 EBB	35	4.0	0.6021
8/18/2011	3/4 FLD	36	1.7	0.2304
12/5/2011	LAST EBB	32	1.7	0.2304
1/23/2012	1ST EBB	35	1.7	0.2304
2/21/2012	LAST FLD	35	1.7	0.2304
3/22/2012	3/4 FLD	35	2.0	0.301
6/14/2012	1/2 EBB	35	1.7	0.2304
10/10/2012	1/2 EBB	35	6.8	0.8325
12/5/2012	1/4 FLD	32	7.8	0.8921
2/19/2013	3/4 FLD	30	1.7	0.2304
5/30/2013	1/4 FLD	31	1.7	0.2304
8/15/2013	LAST EBB	35	1.7	0.2304
10/2/2013	1ST EBB	32	1.7	0.2304
11/6/2013	LAST FLD	32	11.0	1.0414
11/22/2013	3/4 FLD	32	2.0	0.301
2/18/2014	1/2 FLD	32	11.0	1.0414

Station ID: 6

# Samples:	30	**Log Avg:**	0.9490
# > 43 MPN:	3	**Log Std Dev:**	0.5211
# > 260 MPN:	0	**Geomean:**	8.8919
Median:	11	**Estimated 90th:**	41

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	3/4 FLD	32	7.8	0.8921
3/10/2009	3/4 FLD	32	1.7	0.2304
6/15/2009	1/2 FLD	32	7.8	0.8921
9/2/2009	LAST FLD	36	11.0	1.0414
9/30/2009	1/2 EBB	30	**17.0**	1.2304
2/25/2010	1/2 EBB	28	**49.0**	1.6902
3/25/2010	1/2 EBB	24	13.0	1.1139
5/7/2010	3/4 EBB	34	**17.0**	1.2304
6/29/2010	1/4 FLD	35	**33.0**	1.5185
8/19/2010	3/4 EBB	36	**130.0**	2.1139
10/25/2010	1/2 FLD	26	**33.0**	1.5185
1/3/2011	3/4 FLD	32	4.5	0.6532
2/21/2011	LAST FLD	30	**79.0**	1.8976
3/30/2011	1/2 EBB	32	**14.0**	1.1461
5/31/2011	1/4 EBB	35	2.0	0.301
8/18/2011	1/2 FLD - 2/3 FLD	36	6.8	0.8325
12/5/2011	LAST EBB	32	2.0	0.301
1/23/2012	1/4 EBB	35	2.0	0.301
2/21/2012	3/4 FLD	35	2.0	0.301
3/22/2012	LAST FLD	35	1.8	0.2553
6/14/2012	2/3 EBB	35	11.0	1.0414
10/10/2012	1/2 EBB	34	**27.0**	1.4314
12/5/2012	1ST FLD		7.8	0.8921
2/19/2013	3/4 EBB TO LAST EBB	30	2.0	0.301
5/30/2013	1/4 FLD	32	1.7	0.2304
8/15/2013	1ST FLD	35	**17.0**	1.2304
10/2/2013	1ST EBB	33	4.5	0.6532
11/6/2013	LAST FLD	32	11.0	1.0414
11/22/2013	3/4 FLD	34	11.0	1.0414
2/18/2014	1/2 FLD	32	**14.0**	1.1461

Table 12: Bacteriological Sampling Results

Station ID: 6B

# Samples:	30	**Log Avg:**	0.7532
# > 43 MPN:	1	**Log Std Dev:**	0.4240
# > 260 MPN:	0	**Geomean:**	5.6647
Median:	4.5	**Estimated 90th:**	19

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	3/4 FLD	30	4.5	0.6532
3/10/2009	3/4 FLD	32	2.0	0.301
6/15/2009	1/2 FLD	34	2.0	0.301
9/2/2009	LAST FLD	34	**17.0**	1.2304
9/30/2009	1/2 EBB	29	**33.0**	1.5185
2/25/2010	1/2 EBB	30	11.0	1.0414
3/25/2010	1/2 EBB	26	4.0	0.6021
5/7/2010	3/4 EBB	34	11.0	1.0414
6/29/2010	1/4 FLD	35	1.7	0.2304
8/19/2010	3/4 EBB	36	**17.0**	1.2304
10/25/2010	1/2 FLD	28	**17.0**	1.2304
1/3/2011	3/4 FLD	32	7.8	0.8921
2/21/2011	LAST FLD	32	**17.0**	1.2304
3/30/2011	1/2 EBB	32	2.0	0.301
5/31/2011	1/4 EBB	35	6.8	0.8325
8/18/2011	1/2 FLD - 2/3 FLD	36	1.7	0.2304
12/5/2011	LAST EBB	32	6.8	0.8325
1/23/2012	1/4 EBB	35	7.8	0.8921
2/21/2012	3/4 FLD	35	4.0	0.6021
3/22/2012	LAST FLD	35	1.7	0.2304
6/14/2012	2/3 EBB	35	4.0	0.6021
10/10/2012	1/2 EBB	34	**49.0**	1.6902
12/5/2012	1ST FLD	32	13.0	1.1139
2/19/2013	3/4 EBB TO LAST EBB	30	1.7	0.2304
5/30/2013	1/4 FLD	32	1.7	0.2304
8/15/2013	1ST FLD	33	13.0	1.1139
10/2/2013	1ST EBB	33	4.5	0.6532
11/6/2013	LAST FLD	32	4.5	0.6532
11/22/2013	3/4 FLD	33	1.7	0.2304
2/18/2014	1/2 FLD	32	4.5	0.6532

Station ID: 7

# Samples:	30	**Log Avg:**	0.7101
# > 43 MPN:	2	**Log Std Dev:**	0.4461
# > 260 MPN:	0	**Geomean:**	5.1295
Median:	4.5	**Estimated 90th:**	19

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	3/4 FLD	30	1.7	0.2304
3/10/2009	3/4 FLD	32	7.8	0.8921
6/15/2009	1/2 FLD	34	1.7	0.2304
9/2/2009	LAST FLD	36	11.0	1.0414
9/30/2009	1/2 EBB	31	6.8	0.8325
2/25/2010	1/2 EBB	30	**17.0**	1.2304
3/25/2010	1/2 EBB	28	4.5	0.6532
5/7/2010	3/4 EBB	34	6.8	0.8325
6/29/2010	1/4 FLD	35	4.5	0.6532
8/19/2010	3/4 EBB	36	**23.0**	1.3617
10/25/2010	1/2 FLD	30	2.0	0.301
1/3/2011	3/4 FLD	32	2.0	0.301
2/21/2011	LAST FLD	32	11.0	1.0414
3/30/2011	1/2 EBB	32	**49.0**	1.6902
5/31/2011	1/4 EBB	35	11.0	1.0414
8/18/2011	1/2 FLD - 2/3 FLD	36	3.7	0.5682
12/5/2011	LAST EBB	32	7.8	0.8921
1/23/2012	1/4 EBB	35	2.0	0.301
2/21/2012	3/4 FLD	35	7.8	0.8921
3/22/2012	LAST FLD	35	2.0	0.301
6/14/2012	2/3 EBB	35	1.7	0.2304
10/10/2012	1/2 EBB	35	**17.0**	1.2304
12/5/2012	1ST FLD	32	2.0	0.301
2/19/2013	3/4 EBB TO LAST EBB	30	2.0	0.301
5/30/2013	1/4 FLD	33	1.7	0.2304
8/15/2013	1ST FLD	35	7.8	0.8921
10/2/2013	1ST EBB	33	4.5	0.6532
11/6/2013	LAST FLD	30	1.8	0.2553
11/22/2013	3/4 FLD	32	1.7	0.2304
2/18/2014	1/2 FLD	32	**49.0**	1.6902

Table 12: Bacteriological Sampling Results

Station ID: 8

# Samples:	30	**Log Avg:**	0.8148
# > 43 MPN:	1	**Log Std Dev:**	0.4300
# > 260 MPN:	0	**Geomean:**	6.5277
Median:	6.8	**Estimated 90th:**	23

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	3/4 FLD	32	7.8	0.8921
3/10/2009	3/4 FLD	32	7.8	0.8921
6/15/2009	1/2 FLD	34	2.0	0.301
9/2/2009	LAST FLD	36	**79.0**	1.8976
9/30/2009	1/2 EBB	30	6.8	0.8325
2/25/2010	1/2 EBB	30	**33.0**	1.5185
3/25/2010	1/2 EBB	28	2.0	0.301
5/7/2010	3/4 EBB	34	1.8	0.2553
6/29/2010	1/4 FLD	35	**23.0**	1.3617
8/19/2010	3/4 EBB	36	4.5	0.6532
10/25/2010	1/2 FLD	28	4.5	0.6532
1/3/2011	3/4 FLD	32	7.8	0.8921
2/21/2011	LAST FLD	32	**17.0**	1.2304
3/30/2011	1/2 EBB	32	13.0	1.1139
5/31/2011	1/4 EBB	35	7.8	0.8921
8/18/2011	1/2 FLD - 2/3 FLD	36	2.0	0.301
12/5/2011	LAST EBB	32	4.5	0.6532
1/23/2012	1/4 EBB	35	**17.0**	1.2304
2/21/2012	3/4 FLD	35	11.0	1.0414
3/22/2012	LAST FLD	35	2.0	0.301
6/14/2012	2/3 EBB	35	11.0	1.0414
10/10/2012	1/2 EBB	35	6.8	0.8325
12/5/2012	1ST FLD	30	4.5	0.6532
2/19/2013	3/4 EBB TO LAST EBB	30	1.7	0.2304
5/30/2013	1/4 FLD	33	2.0	0.301
8/15/2013	1ST FLD	35	**31.0**	1.4914
10/2/2013	1ST EBB	33	6.8	0.8325
11/6/2013	LAST FLD	31	2.0	0.301
11/22/2013	3/4 FLD	32	4.5	0.6532
2/18/2014	1/2 FLD	32	7.8	0.8921

Station ID: 10

# Samples:	30	**Log Avg:**	0.9294
# > 43 MPN:	3	**Log Std Dev:**	0.4362
# > 260 MPN:	0	**Geomean:**	8.4988
Median:	7.8	**Estimated 90th:**	30

Date	Tidal Stage	Salinity	FC	Log FC
1/28/2009	1/2 FLD	32	4.5	0.6532
3/10/2009	3/4 FLD	32	7.8	0.8921
6/15/2009	1/2 FLD	34	2.0	0.301
9/2/2009	HIGH	36	**130.0**	2.1139
9/30/2009	1/2 EBB	30	**33.0**	1.5185
2/25/2010	1/2 EBB	30	13.0	1.1139
3/25/2010	1/2 EBB	30	7.8	0.8921
5/7/2010	3/4 EBB	34	7.8	0.8921
6/29/2010	1/4 FLD	35	7.8	0.8921
8/19/2010	3/4 EBB	36	**17.0**	1.2304
10/25/2010	1/2 FLD	30	**23.0**	1.3617
1/3/2011	3/4 FLD	32	4.5	0.6532
2/21/2011	LAST FLD	32	6.8	0.8325
3/30/2011	1/2 EBB	32	2.0	0.301
5/31/2011	1/4 EBB	35	6.8	0.8325
8/18/2011	1/2 FLD - 2/3 FLD	36	4.5	0.6532
12/5/2011	LAST EBB	32	4.5	0.6532
1/23/2012	1/4 EBB	35	11.0	1.0414
2/21/2012	3/4 FLD	35	7.8	0.8921
3/22/2012	LAST FLD	35	2.0	0.301
6/14/2012	2/3 EBB	35	**17.0**	1.2304
10/10/2012	1/2 EBB	35	**49.0**	1.6902
12/5/2012	1ST FLD	30	13.0	1.1139
2/19/2013	3/4 EBB TO LAST EBB	30	2.0	0.301
5/30/2013	1/4 FLD	33	4.5	0.6532
8/15/2013	1ST FLD	35	11.0	1.0414
10/2/2013	1ST EBB	33	**49.0**	1.6902
11/6/2013	LAST FLD	31	4.5	0.6532
11/22/2013	3/4 FLD	33	6.8	0.8325
2/18/2014	1/2 FLD	32	4.5	0.6532

Table 12: Bacteriological Sampling Results

Station ID: 10A

# Samples:	30	**Log Avg:**	0.9442
# > 43 MPN:	1	**Log Std Dev:**	0.3871
# > 260 MPN:	0	**Geomean:**	8.7935
Median:	11	**Estimated 90th:**	27

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	3/4 FLD	32	**14.0**	1.1461
3/10/2009	3/4 FLD	32	4.5	0.6532
6/15/2009	1/2 FLD	34	2.0	0.301
9/2/2009	HIGH	36	**70.0**	1.8451
9/30/2009	1/2 EBB	30	**31.0**	1.4914
2/25/2010	1/2 EBB	30	11.0	1.0414
3/25/2010	1/2 EBB	28	7.8	0.8921
5/7/2010	3/4 EBB	33	4.5	0.6532
6/29/2010	1/4 FLD	35	4.5	0.6532
8/19/2010	3/4 EBB	36	4.5	0.6532
10/25/2010	1/2 FLD	29	**23.0**	1.3617
1/3/2011	3/4 FLD	32	**17.0**	1.2304
2/21/2011	LAST FLD	32	**17.0**	1.2304
3/30/2011	1/2 EBB	32	4.5	0.6532
5/31/2011	1/4 EBB	35	13.0	1.1139
8/18/2011	1/2 FLD - 2/3 FLD	36	2.0	0.301
12/5/2011	LAST EBB	32	13.0	1.1139
1/23/2012	1/4 EBB	35	11.0	1.0414
2/21/2012	3/4 FLD	35	**22.0**	1.3424
3/22/2012	LAST FLD	35	13.0	1.1139
6/14/2012	2/3 EBB	35	**17.0**	1.2304
10/10/2012	1/2 EBB	35	**17.0**	1.2304
12/5/2012	1ST FLD	32	7.8	0.8921
2/19/2013	3/4 EBB TO LAST EBB	30	**14.0**	1.1461
5/30/2013	1/4 FLD	33	2.0	0.301
8/15/2013	1ST FLD	33	4.5	0.6532
10/2/2013	1ST EBB	33	11.0	1.0414
11/6/2013	LAST FLD	31	13.0	1.1139
11/22/2013	3/4 FLD	33	4.5	0.6532
2/18/2014	1/2 FLD	32	1.7	0.2304

Station ID: 10B

# Samples:	30	**Log Avg:**	1.0165
# > 43 MPN:	4	**Log Std Dev:**	0.4728
# > 260 MPN:	0	**Geomean:**	10.3868
Median:	10.15	**Estimated 90th:**	41

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	3/4 FLD	32	13.0	1.1139
3/10/2009	3/4 FLD	30	2.0	0.301
6/15/2009	1/2 FLD	32	4.5	0.6532
9/2/2009	HIGH	36	**22.0**	1.3424
9/30/2009	1/2 EBB	30	**49.0**	1.6902
2/25/2010	1/2 EBB	30	7.8	0.8921
3/25/2010	1/2 EBB	28	6.8	0.8325
5/7/2010	3/4 EBB	33	**17.0**	1.2304
6/29/2010	1/4 FLD	35	11.0	1.0414
8/19/2010	3/4 EBB	36	7.8	0.8921
10/25/2010	1/2 FLD	30	**23.0**	1.3617
1/3/2011	3/4 FLD	32	2.0	0.301
2/21/2011	LAST FLD	32	4.0	0.6021
3/30/2011	1/2 EBB	32	**14.0**	1.1461
5/31/2011	1/4 EBB	35	11.0	1.0414
8/18/2011	1/2 FLD - 2/3 FLD	36	7.8	0.8921
12/5/2011	LAST EBB	32	7.8	0.8921
1/23/2012	1/4 EBB	35	4.5	0.6532
2/21/2012	3/4 FLD	35	**22.0**	1.3424
3/22/2012	LAST FLD	35	**79.0**	1.8976
6/14/2012	2/3 EBB	35	**49.0**	1.6902
10/10/2012	1/2 EBB	35	**23.0**	1.3617
12/5/2012	1ST FLD	30	4.5	0.6532
2/19/2013	3/4 EBB TO LAST EBB	30	9.3	0.9685
5/30/2013	1/4 FLD	33	1.7	0.2304
8/15/2013	1ST FLD	33	**130.0**	2.1139
10/2/2013	1ST EBB	33	**23.0**	1.3617
11/6/2013	LAST FLD	32	11.0	1.0414
11/22/2013	3/4 FLD	33	2.0	0.301
2/18/2014	1/2 FLD	32	4.5	0.6532

Table 12: Bacteriological Sampling Results

Station ID: 11

# Samples:	30	**Log Avg:**	0.8453
# > 43 MPN:	1	**Log Std Dev:**	0.4227
# > 260 MPN:	0	**Geomean:**	7.0039
Median:	7.8	**Estimated 90th:**	24

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	3/4 FLD	32	7.8	0.8921
3/10/2009	3/4 FLD	32	2.0	0.301
6/15/2009	1/2 FLD	34	4.5	0.6532
9/2/2009	HIGH	34	**23.0**	1.3617
9/30/2009	1/2 EBB	31	**33.0**	1.5185
2/25/2010	1/2 EBB	30	6.8	0.8325
3/25/2010	1/2 EBB	30	11.0	1.0414
5/7/2010	3/4 EBB	34	7.8	0.8921
6/29/2010	1/4 FLD	35	2.0	0.301
8/19/2010	3/4 EBB	36	6.8	0.8325
10/25/2010	1/2 FLD	28	11.0	1.0414
1/3/2011	3/4 FLD	32	13.0	1.1139
2/21/2011	LAST FLD	32	4.5	0.6532
3/30/2011	1/2 EBB	30	**49.0**	1.6902
5/31/2011	1/4 EBB	35	13.0	1.1139
8/18/2011	1/2 FLD - 2/3 FLD	36	1.7	0.2304
12/5/2011	LAST EBB	32	2.0	0.301
1/23/2012	1/4 EBB	35	12.0	1.0792
2/21/2012	3/4 FLD	35	**22.0**	1.3424
3/22/2012	LAST FLD	35	7.8	0.8921
6/14/2012	2/3 EBB	35	7.8	0.8921
10/10/2012	1/2 EBB	35	**23.0**	1.3617
12/5/2012	1ST FLD	30	2.0	0.301
2/19/2013	3/4 EBB TO LAST EBB	30	6.8	0.8325
5/30/2013	1/4 FLD	32	1.7	0.2304
8/15/2013	1ST FLD	33	**23.0**	1.3617
10/2/2013	1ST EBB	32	4.5	0.6532
11/6/2013	LAST FLD	32	2.0	0.301
11/22/2013	3/4 FLD	33	2.0	0.301
2/18/2014	1/2 FLD	32	11.0	1.0414

Station ID: 13

# Samples:	30	**Log Avg:**	0.8496
# > 43 MPN:	1	**Log Std Dev:**	0.4037
# > 260 MPN:	0	**Geomean:**	7.0733
Median:	7.8	**Estimated 90th:**	23

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	3/4 FLD	32	7.8	0.8921
3/10/2009	3/4 FLD	32	7.8	0.8921
6/15/2009	1/2 FLD	32	2.0	0.301
9/2/2009	HIGH	36	**22.0**	1.3424
9/30/2009	1/2 EBB	31	7.8	0.8921
2/25/2010	1/2 EBB	30	11.0	1.0414
3/25/2010	1/2 EBB	28	**49.0**	1.6902
5/7/2010	3/4 EBB	34	13.0	1.1139
6/29/2010	1/4 FLD	35	6.8	0.8325
8/19/2010	3/4 EBB	36	**17.0**	1.2304
10/25/2010	1/2 FLD	30	7.8	0.8921
1/3/2011	3/4 FLD	32	**17.0**	1.2304
2/21/2011	LAST FLD	32	**17.0**	1.2304
3/30/2011	1/2 EBB	32	7.8	0.8921
5/31/2011	1/4 EBB	35	6.1	0.7853
8/18/2011	1/2 FLD - 2/3 FLD	36	1.7	0.2304
12/5/2011	LAST EBB	32	13.0	1.1139
1/23/2012	1/4 EBB	35	4.0	0.6021
2/21/2012	3/4 FLD	35	**14.0**	1.1461
3/22/2012	LAST FLD	33	4.5	0.6532
6/14/2012	2/3 EBB	35	7.8	0.8921
10/10/2012	2/3 EBB	35	**17.0**	1.2304
12/5/2012	1ST FLD	30	1.8	0.2553
2/19/2013	3/4 EBB TO LAST EBB	30	1.7	0.2304
5/30/2013	1/4 FLD	33	2.0	0.301
8/15/2013	1ST FLD	35	**17.0**	1.2304
10/2/2013	1ST EBB	32	1.7	0.2304
11/6/2013	LAST FLD	30	**17.0**	1.2304
11/22/2013	3/4 FLD	33	1.7	0.2304
2/18/2014	1/2 FLD	32	4.5	0.6532

Table 12: Bacteriological Sampling Results

Station ID: 15

# Samples:	30	**Log Avg:**	0.7839
# > 43 MPN:	1	**Log Std Dev:**	0.4460
# > 260 MPN:	0	**Geomean:**	6.0794
Median:	4.5	**Estimated 90th:**	22

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	3/4 FLD	32	7.8	0.8921
3/10/2009	3/4 FLD	32	4.5	0.6532
6/15/2009	1/2 FLD	34	4.0	0.6021
9/2/2009	HIGH	34	4.5	0.6532
9/30/2009	1/2 EBB	31	11.0	1.0414
2/25/2010	1/2 EBB	30	13.0	1.1139
3/25/2010	1/2 EBB	30	4.5	0.6532
5/7/2010	3/4 EBB	34	4.5	0.6532
6/29/2010	1/4 FLD	35	4.5	0.6532
8/19/2010	3/4 EBB	36	2.0	0.301
10/25/2010	1/2 FLD	30	4.0	0.6021
1/3/2011	3/4 FLD	32	7.8	0.8921
2/21/2011	LAST FLD	32	**17.0**	1.2304
3/30/2011	1/2 EBB	32	**23.0**	1.3617
5/31/2011	1/4 EBB	35	4.5	0.6532
8/18/2011	1/2 FLD - 2/3 FLD	36	1.7	0.2304
12/5/2011	LAST EBB	32	6.8	0.8325
1/23/2012	1/4 EBB	35	4.5	0.6532
2/21/2012	3/4 FLD	35	13.0	1.1139
3/22/2012	LAST FLD	35	2.0	0.301
6/14/2012	2/3 EBB	35	**33.0**	1.5185
10/10/2012	2/3 EBB	35	7.8	0.8921
12/5/2012	1ST FLD	30	2.0	0.301
2/19/2013	3/4 EBB TO LAST EBB	30	2.0	0.301
5/30/2013	1/4 FLD	33	1.7	0.2304
8/15/2013	1ST FLD	33	**170.0**	2.2304
10/2/2013	1ST EBB	33	7.8	0.8921
11/6/2013	LAST FLD	30	4.0	0.6021
11/22/2013	3/4 FLD	32	1.7	0.2304
2/18/2014	1/2 FLD	32	**17.0**	1.2304

Station ID: 18

# Samples:	30	**Log Avg:**	0.8689
# > 43 MPN:	3	**Log Std Dev:**	0.5303
# > 260 MPN:	0	**Geomean:**	7.3946
Median:	5.65	**Estimated 90th:**	35

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	3/4 FLD	32	2.0	0.301
3/10/2009	3/4 FLD	32	1.7	0.2304
6/15/2009	1/2 FLD	34	**33.0**	1.5185
9/2/2009	1ST EBB	34	4.5	0.6532
9/30/2009	1/2 EBB	31	4.5	0.6532
2/25/2010	1/2 EBB	30	**49.0**	1.6902
3/25/2010	1/2 EBB	28	1.7	0.2304
5/7/2010	3/4 EBB	34	**48.0**	1.6812
6/29/2010	1/4 FLD	35	1.8	0.2553
8/19/2010	3/4 EBB	36	**26.0**	1.415
10/25/2010	1/2 FLD	30	4.5	0.6532
1/3/2011	3/4 FLD	32	**22.0**	1.3424
2/21/2011	LAST FLD	32	4.5	0.6532
3/30/2011	1/2 EBB	32	**23.0**	1.3617
5/31/2011	1/4 EBB	35	**22.0**	1.3424
8/18/2011	1/2 FLD - 2/3 FLD	36	1.7	0.2304
12/5/2011	LAST EBB	32	**49.0**	1.6902
1/23/2012	1/4 EBB	35	9.3	0.9685
2/21/2012	3/4 FLD	35	**14.0**	1.1461
3/22/2012	LAST FLD	35	11.0	1.0414
6/14/2012	2/3 EBB	35	**33.0**	1.5185
10/10/2012	2/3 EBB	35	**33.0**	1.5185
12/5/2012	1ST FLD	32	2.0	0.301
2/19/2013	3/4 EBB TO LAST EBB	30	4.0	0.6021
5/30/2013	1/4 FLD	33	1.7	0.2304
8/15/2013	1ST FLD	33	4.5	0.6532
10/2/2013	1ST EBB	33	7.8	0.8921
11/6/2013	LAST FLD	31	6.8	0.8325
11/22/2013	3/4 FLD	33	1.7	0.2304
2/18/2014	1/2 FLD	32	1.7	0.2304

Table 12: Bacteriological Sampling Results

Station ID: 19

# Samples:	30	**Log Avg:**	0.6138
# > 43 MPN:	0	**Log Std Dev:**	0.3758
# > 260 MPN:	0	**Geomean:**	4.1094
Median:	4.25	**Estimated 90th:**	12

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	3/4 FLD	30	11.0	1.0414
3/10/2009	3/4 FLD	32	1.7	0.2304
6/15/2009	1/2 FLD	34	2.0	0.301
9/2/2009	1ST EBB	36	1.7	0.2304
9/30/2009	1/2 EBB	32	1.7	0.2304
2/25/2010	1/2 EBB	32	4.5	0.6532
3/25/2010	1/2 EBB	30	2.0	0.301
5/7/2010	3/4 EBB	34	6.8	0.8325
6/29/2010	1/4 FLD	35	13.0	1.1139
8/19/2010	3/4 EBB	36	2.0	0.301
10/25/2010	1/2 FLD	32	7.8	0.8921
1/3/2011	3/4 FLD	32	1.7	0.2304
2/21/2011	LAST FLD	32	11.0	1.0414
3/30/2011	1/2 EBB	32	**23.0**	1.3617
5/31/2011	1/4 EBB	35	7.8	0.8921
8/18/2011	1/2 FLD - 2/3 FLD	36	1.7	0.2304
12/5/2011	LAST EBB	32	**17.0**	1.2304
1/23/2012	1/4 EBB	35	7.8	0.8921
2/21/2012	3/4 FLD	35	4.0	0.6021
3/22/2012	LAST FLD	35	1.7	0.2304
6/14/2012	2/3 EBB	35	11.0	1.0414
10/10/2012	2/3 EBB	35	4.5	0.6532
12/5/2012	1ST FLD	30	7.8	0.8921
2/19/2013	3/4 EBB TO LAST EBB	30	4.5	0.6532
5/30/2013	1/4 FLD	34	1.7	0.2304
8/15/2013	1ST FLD	35	11.0	1.0414
10/2/2013	1ST EBB	32	1.7	0.2304
11/6/2013	LAST FLD	32	2.0	0.301
11/22/2013	3/4 FLD	33	1.7	0.2304
2/18/2014	1/2 FLD	32	2.0	0.301

Station ID: 20

# Samples:	30	**Log Avg:**	0.7422
# > 43 MPN:	2	**Log Std Dev:**	0.5109
# > 260 MPN:	0	**Geomean:**	5.5230
Median:	4.5	**Estimated 90th:**	24

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	3/4 FLD	32	6.8	0.8325
3/10/2009	3/4 FLD	32	1.7	0.2304
6/15/2009	1/2 FLD	32	2.0	0.301
9/2/2009	1ST EBB	34	11.0	1.0414
9/30/2009	1/2 EBB	31	1.8	0.2553
2/25/2010	1/2 EBB	32	**22.0**	1.3424
3/25/2010	1/2 EBB	30	2.0	0.301
5/7/2010	3/4 EBB	34	1.7	0.2304
6/29/2010	1/4 FLD	35	7.8	0.8921
8/19/2010	3/4 EBB	36	4.5	0.6532
10/25/2010	1/2 FLD	32	2.0	0.301
1/3/2011	3/4 FLD	32	11.0	1.0414
2/21/2011	LAST FLD	32	11.0	1.0414
3/30/2011	1/2 EBB	32	4.5	0.6532
5/31/2011	1/4 EBB	35	**130.0**	2.1139
8/18/2011	1/2 FLD - 2/3 FLD	36	4.5	0.6532
12/5/2011	LAST EBB	32	**23.0**	1.3617
1/23/2012	1/4 EBB	35	6.8	0.8325
2/21/2012	3/4 FLD	35	**130.0**	2.1139
3/22/2012	LAST FLD	35	7.8	0.8921
6/14/2012	2/3 EBB	35	4.5	0.6532
10/10/2012	2/3 EBB	35	**17.0**	1.2304
12/5/2012	1ST FLD	30	1.8	0.2553
2/19/2013	3/4 EBB TO LAST EBB	30	2.0	0.301
5/30/2013	1/4 FLD	33	2.0	0.301
8/15/2013	1ST FLD	35	4.5	0.6532
10/2/2013	1ST EBB	33	4.5	0.6532
11/6/2013	LAST FLD	32	2.0	0.301
11/22/2013	3/4 FLD	33	1.7	0.2304
2/18/2014	1/2 FLD	32	4.0	0.6021

Table 12: Bacteriological Sampling Results

Station ID: 21

# Samples:	30	**Log Avg:**	0.6031
# > 43 MPN:	0	**Log Std Dev:**	0.3802
# > 260 MPN:	0	**Geomean:**	4.0099
Median:	4.25	**Estimated 90th:**	12

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	3/4 FLD	32	7.8	0.8921
3/10/2009	3/4 FLD	32	1.8	0.2553
6/15/2009	1/2 FLD	34	1.7	0.2304
9/2/2009	1ST EBB	36	7.8	0.8921
9/30/2009	1/2 EBB	32	4.5	0.6532
2/25/2010	1/2 EBB	32	1.7	0.2304
3/25/2010	1/2 EBB	30	2.0	0.301
5/7/2010	3/4 EBB	34	**23.0**	1.3617
6/29/2010	1/4 FLD	35	1.7	0.2304
8/19/2010	3/4 EBB	36	4.5	0.6532
10/25/2010	1/2 FLD	32	4.5	0.6532
1/3/2011	3/4 FLD	32	7.8	0.8921
2/21/2011	LAST FLD	32	4.0	0.6021
3/30/2011	1/2 EBB	32	**17.0**	1.2304
5/31/2011	1/4 EBB	35	7.8	0.8921
8/18/2011	1/2 FLD - 2/3 FLD	36	1.7	0.2304
12/5/2011	LAST EBB	32	1.7	0.2304
1/23/2012	1/4 EBB	35	**14.0**	1.1461
2/21/2012	3/4 FLD	35	**17.0**	1.2304
3/22/2012	LAST FLD	35	2.0	0.301
6/14/2012	2/3 EBB	35	1.7	0.2304
10/10/2012	2/3 EBB	35	11.0	1.0414
12/5/2012	1ST FLD	30	1.7	0.2304
2/19/2013	3/4 EBB TO LAST EBB	30	1.7	0.2304
5/30/2013	1/4 FLD	34	1.7	0.2304
8/15/2013	1ST FLD	35	4.5	0.6532
10/2/2013	1ST EBB	34	13.0	1.1139
11/6/2013	LAST FLD	30	2.0	0.301
11/22/2013	3/4 FLD	33	2.0	0.301
2/18/2014	1/2 FLD	32	4.5	0.6532

Station ID: 23

# Samples:	30	**Log Avg:**	0.2951
# > 43 MPN:	0	**Log Std Dev:**	0.1882
# > 260 MPN:	0	**Geomean:**	1.9731
Median:	1.7	**Estimated 90th:**	3

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	1/2 FLD	32	1.7	0.2304
3/10/2009	3/4 FLD	34	1.7	0.2304
6/15/2009	1/2 FLD	34	1.7	0.2304
9/2/2009	1ST EBB	36	1.7	0.2304
9/30/2009	1/2 EBB	35	1.7	0.2304
2/25/2010	1/4 EBB	30	1.7	0.2304
3/25/2010	1/2 EBB	30	1.7	0.2304
5/7/2010	2/3 EBB - 3/4 EBB	35	13.0	1.1139
6/29/2010	1/4 EBB	35	2.0	0.301
8/19/2010	1/2 EBB	36	1.7	0.2304
10/25/2010	1/2 FLD	34	1.7	0.2304
1/3/2011	3/4 FLD	32	1.7	0.2304
2/21/2011	3/4 FLD	32	4.5	0.6532
3/30/2011	1/2 EBB	32	1.7	0.2304
5/31/2011	1/4 EBB	35	1.7	0.2304
8/18/2011	3/4 FLD	36	2.0	0.301
12/5/2011	LAST EBB	33	1.7	0.2304
1/23/2012	1ST EBB	35	1.7	0.2304
2/21/2012	LAST FLD	35	1.7	0.2304
3/22/2012	3/4 FLD	35	1.7	0.2304
6/14/2012	1/2 EBB	35	2.0	0.301
10/10/2012	1/2 EBB	35	1.7	0.2304
12/5/2012	1/4 FLD	30	1.7	0.2304
2/19/2013	3/4 FLD	30	1.7	0.2304
5/30/2013	1/4 FLD	34	1.7	0.2304
8/15/2013	LAST EBB	35	4.5	0.6532
10/2/2013	1ST EBB	34	1.7	0.2304
11/6/2013	LAST FLD	31	1.7	0.2304
11/22/2013	3/4 FLD	34	1.7	0.2304
2/18/2014	1/2 FLD	35	1.7	0.2304

Table 12: Bacteriological Sampling Results

Station ID: 24

# Samples:	30	**Log Avg:**	0.3049
# > 43 MPN:	0	**Log Std Dev:**	0.1420
# > 260 MPN:	0	**Geomean:**	2.0181
Median:	1.7	**Estimated 90th:**	3

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	1/2 FLD	32	1.8	0.2553
3/10/2009	3/4 FLD	34	1.7	0.2304
6/15/2009	1/2 FLD	34	1.7	0.2304
9/2/2009	1ST EBB	34	1.7	0.2304
9/30/2009	1/2 EBB	34	4.5	0.6532
2/25/2010	1/4 EBB	32	4.5	0.6532
3/25/2010	1/2 EBB	32	2.0	0.301
5/7/2010	2/3 EBB - 3/4 EBB	35	1.8	0.2553
6/29/2010	1/4 EBB	35	4.5	0.6532
8/19/2010	1/2 EBB	36	1.7	0.2304
10/25/2010	1/2 FLD	34	1.7	0.2304
1/3/2011	3/4 FLD	32	1.7	0.2304
2/21/2011	3/4 FLD	32	2.0	0.301
3/30/2011	1/2 EBB	32	1.7	0.2304
5/31/2011	1/4 EBB	35	1.7	0.2304
8/18/2011	3/4 FLD	36	1.7	0.2304
12/5/2011	LAST EBB	32	1.7	0.2304
1/23/2012	1ST EBB	35	1.7	0.2304
2/21/2012	LAST FLD	35	2.0	0.301
3/22/2012	3/4 FLD	35	1.7	0.2304
6/14/2012	1/2 EBB	35	1.7	0.2304
10/10/2012	1/2 EBB	35	2.0	0.301
12/5/2012	1/4 FLD	32	2.0	0.301
2/19/2013	3/4 FLD	30	4.5	0.6532
5/30/2013	1/4 FLD	34	1.7	0.2304
8/15/2013	LAST EBB	35	1.7	0.2304
10/2/2013	1ST EBB	33	2.0	0.301
11/6/2013	LAST FLD	32	1.7	0.2304
11/22/2013	3/4 FLD	34	1.7	0.2304
2/18/2014	1/2 FLD	32	2.0	0.301

Station ID: 34

# Samples:	30	**Log Avg:**	0.4014
# > 43 MPN:	1	**Log Std Dev:**	0.3753
# > 260 MPN:	0	**Geomean:**	2.5201
Median:	1.7	**Estimated 90th:**	7

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	1/2 FLD	32	1.7	0.2304
3/10/2009	3/4 FLD	34	1.7	0.2304
6/15/2009	1/2 FLD	34	1.7	0.2304
9/2/2009	1ST EBB	34	1.7	0.2304
9/30/2009	1/2 EBB	35	1.7	0.2304
2/25/2010	1/4 EBB	32	**17.0**	1.2304
3/25/2010	1/2 EBB	30	6.8	0.8325
5/7/2010	2/3 EBB - 3/4 EBB	34	2.0	0.301
6/29/2010	1/4 EBB	35	1.7	0.2304
8/19/2010	1/2 EBB	36	1.7	0.2304
10/25/2010	1/2 FLD	34	1.7	0.2304
1/3/2011	3/4 FLD	32	1.7	0.2304
2/21/2011	3/4 FLD	32	2.0	0.301
3/30/2011	1/2 EBB	32	1.7	0.2304
5/31/2011	1/4 EBB	35	1.7	0.2304
8/18/2011	3/4 FLD	36	1.7	0.2304
12/5/2011	LAST EBB	32	4.5	0.6532
1/23/2012	1ST EBB	35	1.7	0.2304
2/21/2012	LAST FLD	35	1.7	0.2304
3/22/2012	3/4 FLD	35	2.0	0.301
6/14/2012	1/2 EBB	35	1.7	0.2304
10/10/2012	1/2 EBB	35	4.5	0.6532
12/5/2012	1/4 FLD	30	2.0	0.301
2/19/2013	3/4 FLD	30	**79.0**	1.8976
5/30/2013	1/4 FLD	33	1.7	0.2304
8/15/2013	LAST EBB	33	7.8	0.8921
10/2/2013	1ST EBB	34	1.7	0.2304
11/6/2013	LAST FLD	32	2.0	0.301
11/22/2013	3/4 FLD	32	1.7	0.2304
2/18/2014	1/2 FLD	32	1.7	0.2304

Table 12: Bacteriological Sampling Results

Station ID: 35

# Samples:	30	**Log Avg:**	0.4788
# > 43 MPN:	1	**Log Std Dev:**	0.3583
# > 260 MPN:	0	**Geomean:**	3.0117
Median:	2	**Estimated 90th:**	8

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	1/2 FLD	32	4.5	0.6532
3/10/2009	3/4 FLD	32	1.7	0.2304
6/15/2009	1/2 FLD	34	1.7	0.2304
9/2/2009	1ST EBB	36	2.0	0.301
9/30/2009	1/2 EBB	34	4.5	0.6532
2/25/2010	1/4 EBB	34	4.5	0.6532
3/25/2010	1/2 EBB	32	2.0	0.301
5/7/2010	2/3 EBB - 3/4 EBB	35	7.8	0.8921
6/29/2010	1/4 EBB	35	4.5	0.6532
8/19/2010	1/2 EBB	36	7.8	0.8921
10/25/2010	1/2 FLD	32	4.5	0.6532
1/3/2011	3/4 FLD	32	4.5	0.6532
2/21/2011	3/4 FLD	32	1.8	0.2553
3/30/2011	1/2 EBB	32	1.7	0.2304
5/31/2011	1/4 EBB	35	2.0	0.301
8/18/2011	3/4 FLD	36	1.7	0.2304
12/5/2011	LAST EBB	32	2.0	0.301
1/23/2012	1ST EBB	35	2.0	0.301
2/21/2012	LAST FLD	35	7.8	0.8921
3/22/2012	3/4 FLD	35	2.0	0.301
6/14/2012	1/2 EBB	35	1.7	0.2304
10/10/2012	1/2 EBB	35	1.7	0.2304
12/5/2012	1/4 FLD	30	2.0	0.301
2/19/2013	3/4 FLD	30	2.0	0.301
5/30/2013	1/4 FLD	33	1.7	0.2304
8/15/2013	LAST EBB	35	6.8	0.8325
10/2/2013	1ST EBB	34	2.0	0.301
11/6/2013	LAST FLD	31	**79.0**	1.8976
11/22/2013	3/4 FLD	33	1.7	0.2304
2/18/2014	1/2 FLD	32	1.7	0.2304

Station ID: 36

# Samples:	30	**Log Avg:**	0.4067
# > 43 MPN:	1	**Log Std Dev:**	0.4219
# > 260 MPN:	0	**Geomean:**	2.5511
Median:	2	**Estimated 90th:**	8

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	1/2 FLD	32	2.0	0.301
3/10/2009	3/4 FLD	32	1.7	0.2304
6/15/2009	1/2 FLD	34	1.7	0.2304
9/2/2009	1ST EBB	34	2.0	0.301
9/30/2009	1/2 EBB	32	2.0	0.301
2/25/2010	1/4 EBB	32	11.0	1.0414
3/25/2010	1/2 EBB	30	1.7	0.2304
5/7/2010	2/3 EBB - 3/4 EBB	35	2.0	0.301
6/29/2010	1/4 EBB	35	1.7	0.2304
8/19/2010	1/2 EBB	36	1.7	0.2304
10/25/2010	1/2 FLD	32	1.7	0.2304
1/3/2011	3/4 FLD	32	1.7	0.2304
2/21/2011	3/4 FLD	30	4.5	0.6532
3/30/2011	1/2 EBB	32	2.0	0.301
5/31/2011	1/4 EBB	35	1.7	0.2304
8/18/2011	3/4 FLD	36	1.8	0.2553
12/5/2011	LAST EBB	32	2.0	0.301
1/23/2012	1ST EBB	35	7.8	0.8921
2/21/2012	LAST FLD	35	1.7	0.2304
3/22/2012	3/4 FLD	35	1.7	0.2304
6/14/2012	1/2 EBB	35	2.0	0.301
10/10/2012	1/2 EBB	35	2.0	0.301
12/5/2012	1/4 FLD	30	2.0	0.301
2/19/2013	3/4 FLD	30	1.7	0.2304
5/30/2013	1/4 FLD	34	1.7	0.2304
8/15/2013	LAST EBB	33	2.0	0.301
10/2/2013	1ST EBB	35	2.0	0.301
11/6/2013	LAST FLD	30	**240.0**	2.3802
11/22/2013	3/4 FLD	32	2.0	0.301
2/18/2014	1/2 FLD	32	4.0	0.6021

Table 12: Bacteriological Sampling Results

Station ID: 37

# Samples:	30	**Log Avg:**	0.3933
# > 43 MPN:	0	**Log Std Dev:**	0.2583
# > 260 MPN:	0	**Geomean:**	2.4735
Median:	2	**Estimated 90th:**	5

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	1/2 FLD	32	1.8	0.2553
3/10/2009	3/4 FLD	32	1.7	0.2304
6/15/2009	1/2 FLD	32	1.7	0.2304
9/2/2009	1ST EBB	36	4.0	0.6021
9/30/2009	1/2 EBB	33	4.5	0.6532
2/25/2010	1/4 EBB	32	1.7	0.2304
3/25/2010	1/2 EBB	32	1.7	0.2304
5/7/2010	2/3 EBB - 3/4 EBB	34	2.0	0.301
6/29/2010	1/4 EBB	35	1.7	0.2304
8/19/2010	1/2 EBB	36	2.0	0.301
10/25/2010	1/2 FLD	30	1.7	0.2304
1/3/2011	3/4 FLD	32	1.7	0.2304
2/21/2011	3/4 FLD	34	2.0	0.301
3/30/2011	1/2 EBB	32	4.5	0.6532
5/31/2011	1/4 EBB	35	1.7	0.2304
8/18/2011	3/4 FLD	36	2.0	0.301
12/5/2011	LAST EBB	32	1.7	0.2304
1/23/2012	1ST EBB	35	**17.0**	1.2304
2/21/2012	LAST FLD	35	2.0	0.301
3/22/2012	3/4 FLD	35	4.5	0.6532
6/14/2012	1/2 EBB	35	2.0	0.301
10/10/2012	1/2 EBB	37	2.0	0.301
12/5/2012	1/4 FLD	32	1.7	0.2304
2/19/2013	3/4 FLD	30	4.5	0.6532
5/30/2013	1/4 FLD	34	1.7	0.2304
8/15/2013	LAST EBB	33	1.7	0.2304
10/2/2013	1ST EBB	34	2.0	0.301
11/6/2013	LAST FLD	31	11.0	1.0414
11/22/2013	3/4 FLD	32	1.7	0.2304
2/18/2014	1/2 FLD	32	4.5	0.6532

Station ID: 40

# Samples:	30	**Log Avg:**	0.7935
# > 43 MPN:	0	**Log Std Dev:**	0.4915
# > 260 MPN:	0	**Geomean:**	6.2158
Median:	6.15	**Estimated 90th:**	26

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	3/4 FLD	30	**21.0**	1.3222
3/10/2009	3/4 FLD	32	9.2	0.9638
6/15/2009	1/2 FLD	32	7.8	0.8921
9/2/2009	LAST FLD	36	13.0	1.1139
9/30/2009	1/2 EBB	31	11.0	1.0414
2/25/2010	1/2 EBB	30	**33.0**	1.5185
3/25/2010	1/2 EBB	28	1.7	0.2304
5/7/2010	3/4 EBB	34	**23.0**	1.3617
6/29/2010	1/4 FLD	35	4.5	0.6532
8/19/2010	3/4 EBB	36	1.7	0.2304
10/25/2010	1/2 FLD	30	4.0	0.6021
1/3/2011	3/4 FLD	32	**23.0**	1.3617
2/21/2011	LAST FLD	32	1.7	0.2304
3/30/2011	1/2 EBB	32	2.0	0.301
5/31/2011	1/4 EBB	35	**17.0**	1.2304
8/18/2011	1/2 FLD - 2/3 FLD	36	**31.0**	1.4914
12/5/2011	LAST EBB	32	**22.0**	1.3424
1/23/2012	1/4 EBB	35	**17.0**	1.2304
2/21/2012	3/4 FLD	35	**23.0**	1.3617
3/22/2012	LAST FLD	35	**23.0**	1.3617
6/14/2012	1/2 EBB	35	2.0	0.301
10/10/2012	2/3 EBB	34	4.5	0.6532
12/5/2012	1ST FLD	32	2.0	0.301
2/19/2013	3/4 EBB TO LAST EBB	30	1.7	0.2304
5/30/2013	1/4 FLD	32	2.0	0.301
8/15/2013	1ST FLD	35	1.7	0.2304
10/2/2013	1ST EBB	34	2.0	0.301
11/6/2013	LAST FLD	32	1.7	0.2304
11/22/2013	3/4 FLD	34	2.0	0.301
2/18/2014	1/2 FLD	32	13.0	1.1139

Table 12: Bacteriological Sampling Results

Station ID: 41

# Samples:	30	**Log Avg:**	0.7416
# > 43 MPN:	1	**Log Std Dev:**	0.4348
# > 260 MPN:	0	**Geomean:**	5.5163
Median:	4.5	**Estimated 90th:**	19

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	3/4 FLD	30	4.5	0.6532
3/10/2009	3/4 FLD	32	**33.0**	1.5185
6/15/2009	1/2 FLD	34	2.0	0.301
9/2/2009	LAST FLD	36	6.8	0.8325
9/30/2009	1/2 EBB	30	1.7	0.2304
2/25/2010	1/2 EBB	35	4.5	0.6532
3/25/2010	1/2 EBB	28	4.5	0.6532
5/7/2010	3/4 EBB	34	2.0	0.301
6/29/2010	1/4 FLD	35	4.5	0.6532
8/19/2010	3/4 EBB	36	1.8	0.2553
10/25/2010	1/2 FLD	28	6.8	0.8325
1/3/2011	3/4 FLD	32	**21.0**	1.3222
2/21/2011	LAST FLD	32	4.5	0.6532
3/30/2011	1/2 EBB	32	**79.0**	1.8976
5/31/2011	1/4 EBB	35	2.0	0.301
8/18/2011	1/2 FLD - 2/3 FLD	36	7.8	0.8921
12/5/2011	LAST EBB	32	**17.0**	1.2304
1/23/2012	1/4 EBB	35	**23.0**	1.3617
2/21/2012	3/4 FLD	35	7.8	0.8921
3/22/2012	LAST FLD	35	1.7	0.2304
6/14/2012	1/2 EBB	35	1.7	0.2304
10/10/2012	1/2 EBB	34	4.5	0.6532
12/5/2012	1ST FLD	32	9.3	0.9685
2/19/2013	3/4 TO LAST EBB	30	**14.0**	1.1461
5/30/2013	1/4 FLD	33	1.7	0.2304
8/15/2013	1ST FLD	35	4.5	0.6532
10/2/2013	1ST EBB	33	4.0	0.6021
11/6/2013	LAST FLD	32	**14.0**	1.1461
11/22/2013	3/4 FLD	34	2.0	0.301
2/18/2014	1/2 FLD	32	4.5	0.6532

Station ID: 42

# Samples:	30	**Log Avg:**	0.6968
# > 43 MPN:	1	**Log Std Dev:**	0.4391
# > 260 MPN:	0	**Geomean:**	4.9750
Median:	4.5	**Estimated 90th:**	18

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	3/4 FLD	32	**49.0**	1.6902
3/10/2009	3/4 FLD	32	7.8	0.8921
6/15/2009	1/2 FLD	32	1.7	0.2304
9/2/2009	LAST FLD	36	13.0	1.1139
9/30/2009	1/2 EBB	31	11.0	1.0414
2/25/2010	1/2 EBB	30	4.5	0.6532
3/25/2010	1/2 EBB	28	6.1	0.7853
5/7/2010	3/4 EBB	34	6.8	0.8325
6/29/2010	1/4 FLD	35	2.0	0.301
8/19/2010	3/4 EBB	36	11.0	1.0414
10/25/2010	1/2 FLD	26	2.0	0.301
1/3/2011	3/4 FLD	32	4.5	0.6532
2/21/2011	LAST FLD	32	2.0	0.301
3/30/2011	1/2 EBB	32	1.7	0.2304
5/31/2011	1/4 EBB	35	1.8	0.2553
8/18/2011	1/2 FLD - 2/3 FLD	36	1.7	0.2304
12/5/2011	LAST EBB	32	4.5	0.6532
1/23/2012	1/4 EBB	35	**14.0**	1.1461
2/21/2012	3/4 FLD	35	**27.0**	1.4314
3/22/2012	LAST FLD	35	1.8	0.2553
6/14/2012	1/2 EBB	35	1.7	0.2304
10/10/2012	1/2 EBB	34	1.7	0.2304
12/5/2012	1ST FLD	34	1.7	0.2304
2/19/2013	3/4 TO LAST EBB	30	**14.0**	1.1461
5/30/2013	1/4 FLD	32	1.7	0.2304
8/15/2013	1ST FLD	35	7.8	0.8921
10/2/2013	1ST EBB	33	7.8	0.8921
11/6/2013	LAST FLD	32	**33.0**	1.5185
11/22/2013	3/4 FLD	34	4.0	0.6021
2/18/2014	1/2 FLD	32	7.8	0.8921

Table 12: Bacteriological Sampling Results

Station ID: 42A

# Samples:	30	**Log Avg:**	0.6445
# > 43 MPN:	0	**Log Std Dev:**	0.4419
# > 260 MPN:	0	**Geomean:**	4.4108
Median:	3	**Estimated 90th:**	16

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	3/4 FLD	30	2.0	0.301
3/10/2009	3/4 FLD	32	4.5	0.6532
6/15/2009	1/2 FLD	34	1.7	0.2304
9/2/2009	LAST FLD	36	13.0	1.1139
9/30/2009	1/2 EBB	30	2.0	0.301
2/25/2010	1/2 EBB	30	11.0	1.0414
3/25/2010	1/2 EBB	28	2.0	0.301
5/7/2010	3/4 EBB	34	2.0	0.301
6/29/2010	1/4 FLD	35	2.0	0.301
8/19/2010	3/4 EBB	36	4.5	0.6532
10/25/2010	1/2 FLD	26	4.5	0.6532
1/3/2011	3/4 FLD	32	**17.0**	1.2304
2/21/2011	LAST FLD	32	**23.0**	1.3617
3/30/2011	1/2 EBB	32	2.0	0.301
5/31/2011	1/4 EBB	35	4.5	0.6532
8/18/2011	1/2 FLD - 2/3 FLD	36	1.8	0.2553
12/5/2011	LAST EBB	32	2.0	0.301
1/23/2012	1/4 EBB	35	**17.0**	1.2304
2/21/2012	3/4 FLD	34	**33.0**	1.5185
3/22/2012	LAST FLD	35	1.7	0.2304
6/14/2012	1/2 EBB	35	1.7	0.2304
10/10/2012	1/2 EBB	34	2.0	0.301
12/5/2012	1ST FLD	34	1.7	0.2304
2/19/2013	3/4 TO LAST EBB	30	**23.0**	1.3617
5/30/2013	1/4 FLD	32	1.7	0.2304
8/15/2013	1ST FLD	35	11.0	1.0414
10/2/2013	1ST EBB	34	6.8	0.8325
11/6/2013	LAST FLD	32	1.7	0.2304
11/22/2013	3/4 FLD	33	4.0	0.6021
2/18/2014	1/2 FLD	32	**22.0**	1.3424

Station ID: 44A

# Samples:	30	**Log Avg:**	0.5840
# > 43 MPN:	0	**Log Std Dev:**	0.3622
# > 260 MPN:	0	**Geomean:**	3.8371
Median:	4.25	**Estimated 90th:**	11

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	3/4 FLD	30	8.2	0.9138
3/10/2009	3/4 FLD	32	2.0	0.301
6/15/2009	1/2 FLD	32	1.7	0.2304
9/2/2009	1ST EBB	36	1.7	0.2304
9/30/2009	1/2 EBB	31	7.8	0.8921
2/25/2010	1/2 EBB	32	**17.0**	1.2304
3/25/2010	1/2 EBB	30	2.0	0.301
5/7/2010	3/4 EBB	34	4.5	0.6532
6/29/2010	1/4 FLD	35	4.5	0.6532
8/19/2010	3/4 EBB	36	4.5	0.6532
10/25/2010	1/2 FLD	32	1.7	0.2304
1/3/2011	3/4 FLD	32	2.0	0.301
2/21/2011	LAST FLD	32	4.5	0.6532
3/30/2011	1/2 EBB	32	**22.0**	1.3424
5/31/2011	1/4 EBB	35	7.8	0.8921
8/18/2011	1/2 FLD - 2/3 FLD	36	1.7	0.2304
12/5/2011	LAST EBB	32	4.5	0.6532
1/23/2012	1/4 EBB	35	**14.0**	1.1461
2/21/2012	3/4 FLD	35	1.7	0.2304
3/22/2012	LAST FLD	35	4.5	0.6532
6/14/2012	2/3 EBB	35	4.5	0.6532
10/10/2012	2/3 EBB	35	**23.0**	1.3617
12/5/2012	1ST FLD	30	2.0	0.301
2/19/2013	3/4 TO LAST EBB	30	1.7	0.2304
5/30/2013	1/4 FLD	33	2.0	0.301
8/15/2013	1ST FLD	35	1.8	0.2553
10/2/2013	1ST EBB	33	1.7	0.2304
11/6/2013	LAST FLD	32	7.8	0.8921
11/22/2013	3/4 FLD	32	2.0	0.301
2/18/2014	1/2 FLD	32	4.0	0.6021

Table 12: Bacteriological Sampling Results

Station ID: 45

# Samples:	30	**Log Avg:**	1.0645
# > 43 MPN:	4	**Log Std Dev:**	0.5326
# > 260 MPN:	0	**Geomean:**	11.6012
Median:	13	**Estimated 90th:**	55

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	1/2 FLD	30	**14.0**	1.1461
3/10/2009	3/4 FLD	30	6.8	0.8325
6/15/2009	1/2 FLD	32	13.0	1.1139
9/2/2009	1ST EBB	32	**33.0**	1.5185
9/30/2009	1/2 EBB	27	**33.0**	1.5185
2/25/2010	1/4 EBB	30	**33.0**	1.5185
3/25/2010	1/2 EBB	24	2.0	0.301
5/7/2010	2/3 EBB - 3/4 EBB	31	**33.0**	1.5185
6/29/2010	1/4 EBB	35	13.0	1.1139
8/19/2010	1/2 EBB	36	**49.0**	1.6902
10/25/2010	1/2 FLD	26	4.5	0.6532
1/3/2011	3/4 FLD	28	13.0	1.1139
2/21/2011	3/4 FLD	28	1.8	0.2553
3/30/2011	1/2 EBB	32	4.5	0.6532
5/31/2011	1/4 EBB	35	**79.0**	1.8976
8/18/2011	3/4 FLD	36	2.0	0.301
12/5/2011	LAST EBB	32	**33.0**	1.5185
1/23/2012	1ST EBB	35	4.5	0.6532
2/21/2012	LAST FLD	35	8.3	0.9191
3/22/2012	3/4 FLD	35	**17.0**	1.2304
6/14/2012	1/2 EBB	35	**22.0**	1.3424
10/10/2012	1/2 EBB	35	**49.0**	1.6902
12/5/2012	1/4 FLD	30	11.0	1.0414
2/19/2013	3/4 FLD	30	2.0	0.301
5/30/2013	1/4 FLD	31	2.0	0.301
8/15/2013	LAST EBB	33	**130.0**	2.1139
10/2/2013	1ST EBB	35	**23.0**	1.3617
11/6/2013	LAST FLD	32	4.5	0.6532
11/22/2013	3/4 FLD	34	2.0	0.301
2/18/2014	1/2 FLD	32	**23.0**	1.3617

Station ID: 46

# Samples:	30	**Log Avg:**	0.5259
# > 43 MPN:	0	**Log Std Dev:**	0.3947
# > 260 MPN:	0	**Geomean:**	3.3569
Median:	2	**Estimated 90th:**	10

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	1/2 FLD	30	4.0	0.6021
3/10/2009	3/4 FLD	32	4.0	0.6021
6/15/2009	1/2 FLD	32	1.7	0.2304
9/2/2009	1ST EBB	34	**33.0**	1.5185
9/30/2009	1/2 EBB	32	7.8	0.8921
2/25/2010	1/4 EBB	32	13.0	1.1139
3/25/2010	1/2 EBB	28	1.7	0.2304
5/7/2010	2/3 EBB - 3/4 EBB	34	7.8	0.8921
6/29/2010	1/4 EBB	35	1.7	0.2304
8/19/2010	1/2 EBB	36	2.0	0.301
10/25/2010	1/2 FLD	24	2.0	0.301
1/3/2011	3/4 FLD	32	2.0	0.301
2/21/2011	3/4 FLD	28	2.0	0.301
3/30/2011	1/2 EBB	32	1.7	0.2304
5/31/2011	1/4 EBB	35	**33.0**	1.5185
8/18/2011	3/4 FLD	36	1.7	0.2304
12/5/2011	LAST EBB	32	1.7	0.2304
1/23/2012	1ST EBB	35	7.8	0.8921
2/21/2012	LAST FLD	35	1.7	0.2304
3/22/2012	3/4 FLD	35	1.7	0.2304
6/14/2012	1/2 EBB	35	1.7	0.2304
10/10/2012	1/2 EBB	35	13.0	1.1139
12/5/2012	1/4 FLD	30	2.0	0.301
2/19/2013	3/4 FLD	30	1.8	0.2553
5/30/2013	1/4 FLD	31	1.7	0.2304
8/15/2013	LAST EBB	35	4.0	0.6021
10/2/2013	1ST EBB	33	2.0	0.301
11/6/2013	LAST FLD	31	4.0	0.6021
11/22/2013	3/4 FLD	33	1.7	0.2304
2/18/2014	1/2 FLD	32	6.8	0.8325

Table 12: Bacteriological Sampling Results

Station ID: 47

# Samples:	30	**Log Avg:**	0.5347
# > 43 MPN:	0	**Log Std Dev:**	0.3452
# > 260 MPN:	0	**Geomean:**	3.4253
Median:	2	**Estimated 90th:**	9

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	1/2 FLD	30	**14.0**	1.1461
3/10/2009	3/4 FLD	32	4.5	0.6532
6/15/2009	1/2 FLD	32	2.0	0.301
9/2/2009	1ST EBB	36	**17.0**	1.2304
9/30/2009	1/2 EBB	31	4.5	0.6532
2/25/2010	1/4 EBB	34	**17.0**	1.2304
3/25/2010	1/2 EBB	28	2.0	0.301
5/7/2010	2/3 EBB - 3/4 EBB	34	9.3	0.9685
6/29/2010	1/4 EBB	35	2.0	0.301
8/19/2010	1/2 EBB	36	4.5	0.6532
10/25/2010	1/2 FLD	26	1.7	0.2304
1/3/2011	3/4 FLD	32	2.0	0.301
2/21/2011	3/4 FLD	28	2.0	0.301
3/30/2011	1/2 EBB	32	1.7	0.2304
5/31/2011	1/4 EBB	35	1.7	0.2304
8/18/2011	3/4 FLD	36	1.7	0.2304
12/5/2011	LAST EBB	32	1.7	0.2304
1/23/2012	1ST EBB	35	2.0	0.301
2/21/2012	LAST FLD	35	2.0	0.301
3/22/2012	3/4 FLD	35	4.5	0.6532
6/14/2012	1/2 EBB	35	4.5	0.6532
10/10/2012	1/2 EBB	35	2.0	0.301
12/5/2012	1/4 FLD	32	2.0	0.301
2/19/2013	3/4 FLD	30	4.5	0.6532
5/30/2013	1/4 FLD	32	2.0	0.301
8/15/2013	LAST EBB	35	**17.0**	1.2304
10/2/2013	1ST EBB	32	1.7	0.2304
11/6/2013	LAST FLD	31	9.3	0.9685
11/22/2013	3/4 FLD	34	2.0	0.301
2/18/2014	1/2 FLD	32	4.5	0.6532

Station ID: 48

# Samples:	30	**Log Avg:**	0.4241
# > 43 MPN:	0	**Log Std Dev:**	0.3018
# > 260 MPN:	0	**Geomean:**	2.6552
Median:	1.7	**Estimated 90th:**	6

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	1/2 FLD	32	1.7	0.2304
3/10/2009	3/4 FLD	32	1.7	0.2304
6/15/2009	1/2 FLD	32	1.7	0.2304
9/2/2009	LAST FLD	36	4.5	0.6532
9/30/2009	1/2 EBB	34	1.7	0.2304
2/25/2010	1/4 EBB	32	6.1	0.7853
3/25/2010	1/2 EBB	30	1.7	0.2304
5/7/2010	2/3 EBB - 3/4 EBB	35	4.5	0.6532
6/29/2010	1/4 EBB	35	1.7	0.2304
8/19/2010	1/2 EBB	36	1.7	0.2304
10/25/2010	1/2 FLD	30	1.7	0.2304
1/3/2011	3/4 FLD	32	1.7	0.2304
2/21/2011	3/4 FLD	30	2.0	0.301
3/30/2011	1/2 EBB	32	1.7	0.2304
5/31/2011	1/4 EBB	35	13.0	1.1139
8/18/2011	3/4 FLD	36	1.7	0.2304
12/5/2011	LAST EBB	32	1.7	0.2304
1/23/2012	1ST EBB	35	4.5	0.6532
2/21/2012	LAST FLD	35	4.5	0.6532
3/22/2012	3/4 FLD	35	4.5	0.6532
6/14/2012	1/2 EBB	35	1.7	0.2304
10/10/2012	1/2 EBB	35	1.7	0.2304
12/5/2012	1/4 FLD	34	6.8	0.8325
2/19/2013	3/4 FLD	30	1.7	0.2304
5/30/2013	1/4 FLD	34	1.7	0.2304
8/15/2013	LAST EBB	35	1.8	0.2553
10/2/2013	1ST EBB	33	1.7	0.2304
11/6/2013	LAST FLD	31	**22.0**	1.3424
11/22/2013	3/4 FLD	32	1.8	0.2553
2/18/2014	1/2 FLD	32	4.5	0.6532

Table 12: Bacteriological Sampling Results

Station ID: 48A

# Samples:	30	**Log Avg:**	0.6570
# > 43 MPN:	1	**Log Std Dev:**	0.4065
# > 260 MPN:	0	**Geomean:**	4.5392
Median:	4	**Estimated 90th:**	15

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	1/2 FLD	30	4.0	0.6021
3/10/2009	3/4 FLD	32	4.0	0.6021
6/15/2009	1/2 FLD	32	4.5	0.6532
9/2/2009	LAST FLD	36	1.7	0.2304
9/30/2009	1/2 EBB	33	4.0	0.6021
2/25/2010	1/4 EBB	32	4.0	0.6021
3/25/2010	1/2 EBB	30	1.7	0.2304
5/7/2010	2/3 EBB - 3/4 EBB	34	2.0	0.301
6/29/2010	1/4 EBB	35	1.7	0.2304
8/19/2010	1/2 EBB	36	11.0	1.0414
10/25/2010	1/2 FLD	30	1.7	0.2304
1/3/2011	3/4 FLD	32	7.8	0.8921
2/21/2011	3/4 FLD	30	4.5	0.6532
3/30/2011	1/2 EBB	32	6.1	0.7853
5/31/2011	1/4 EBB	35	**17.0**	1.2304
8/18/2011	3/4 FLD	36	2.0	0.301
12/5/2011	LAST EBB	32	2.0	0.301
1/23/2012	1ST EBB	35	4.5	0.6532
2/21/2012	LAST FLD	35	**23.0**	1.3617
3/22/2012	3/4 FLD	35	**27.0**	1.4314
6/14/2012	1/2 EBB	35	1.7	0.2304
10/10/2012	1/2 EBB	35	13.0	1.1139
12/5/2012	1/4 FLD	34	2.0	0.301
2/19/2013	3/4 FLD	30	4.0	0.6021
5/30/2013	1/4 FLD	32	1.7	0.2304
8/15/2013	LAST EBB	35	**46.0**	1.6628
10/2/2013	1ST EBB	33	1.7	0.2304
11/6/2013	LAST FLD	32	4.0	0.6021
11/22/2013	3/4 FLD	34	9.3	0.9685
2/18/2014	1/2 FLD	32	6.8	0.8325

Station ID: 48B

# Samples:	30	**Log Avg:**	0.6763
# > 43 MPN:	2	**Log Std Dev:**	0.4868
# > 260 MPN:	0	**Geomean:**	4.7456
Median:	4	**Estimated 90th:**	19

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	1/2 FLD	32	2.0	0.301
3/10/2009	3/4 FLD	32	2.0	0.301
6/15/2009	1/2 FLD	32	**49.0**	1.6902
9/2/2009	LAST FLD	36	13.0	1.1139
9/30/2009	1/2 EBB	33	1.7	0.2304
2/25/2010	1/4 EBB	30	2.0	0.301
3/25/2010	1/2 EBB	30	4.5	0.6532
5/7/2010	2/3 EBB - 3/4 EBB	34	1.7	0.2304
6/29/2010	1/4 EBB	35	6.8	0.8325
8/19/2010	1/2 EBB	36	7.8	0.8921
10/25/2010	1/2 FLD	30	4.5	0.6532
1/3/2011	3/4 FLD	32	2.0	0.301
2/21/2011	3/4 FLD	30	4.5	0.6532
3/30/2011	1/2 EBB	32	2.0	0.301
5/31/2011	1/4 EBB	35	1.7	0.2304
8/18/2011	3/4 FLD	36	1.7	0.2304
12/5/2011	LAST EBB	32	4.0	0.6021
1/23/2012	1ST EBB	35	1.7	0.2304
2/21/2012	LAST FLD	35	2.0	0.301
3/22/2012	3/4 FLD	35	13.0	1.1139
6/14/2012	1/2 EBB	35	4.0	0.6021
10/10/2012	1/2 EBB	35	4.5	0.6532
12/5/2012	1/4 FLD	34	7.8	0.8921
2/19/2013	3/4 FLD	30	2.0	0.301
5/30/2013	1/4 FLD	32	1.7	0.2304
8/15/2013	LAST EBB	35	**23.0**	1.3617
10/2/2013	1ST EBB	32	**23.0**	1.3617
11/6/2013	LAST FLD	32	**130.0**	2.1139
11/22/2013	3/4 FLD	32	3.7	0.5682
2/18/2014	1/2 FLD	32	11.0	1.0414

Table 12: Bacteriological Sampling Results

Station ID: 48C

# Samples:	30	**Log Avg:**	0.5060
# > 43 MPN:	1	**Log Std Dev:**	0.3939
# > 260 MPN:	0	**Geomean:**	3.2065
Median:	2	**Estimated 90th:**	10

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	1/2 FLD	30	6.8	0.8325
3/10/2009	3/4 FLD	34	1.7	0.2304
6/15/2009	1/2 FLD	32	1.7	0.2304
9/2/2009	1ST EBB	34	**14.0**	1.1461
9/30/2009	1/2 EBB	32	1.7	0.2304
2/25/2010	1/4 EBB	32	6.8	0.8325
3/25/2010	1/2 EBB	30	2.0	0.301
5/7/2010	2/3 EBB - 3/4 EBB	34	1.8	0.2553
6/29/2010	1/4 EBB	35	1.7	0.2304
8/19/2010	1/2 EBB	36	2.0	0.301
10/25/2010	1/2 FLD	30	2.0	0.301
1/3/2011	3/4 FLD	32	6.8	0.8325
2/21/2011	3/4 FLD	30	4.5	0.6532
3/30/2011	1/2 EBB	32	4.5	0.6532
5/31/2011	1/4 EBB	35	4.5	0.6532
8/18/2011	3/4 FLD	36	1.7	0.2304
12/5/2011	LAST EBB	32	1.7	0.2304
1/23/2012	1ST EBB	35	6.8	0.8325
2/21/2012	LAST FLD	35	2.0	0.301
3/22/2012	3/4 FLD	35	2.0	0.301
6/14/2012	1/2 EBB	35	1.7	0.2304
10/10/2012	1/2 EBB	35	2.0	0.301
12/5/2012	1/4 FLD	34	6.8	0.8325
2/19/2013	3/4 FLD	30	1.7	0.2304
5/30/2013	1/4 FLD	32	1.7	0.2304
8/15/2013	LAST EBB	35	4.0	0.6021
10/2/2013	1ST EBB	33	2.0	0.301
11/6/2013	LAST FLD	32	**110.0**	2.0414
11/22/2013	3/4 FLD	32	1.7	0.2304
2/18/2014	1/2 FLD	32	4.0	0.6021

Station ID: 49

# Samples:	30	**Log Avg:**	0.5342
# > 43 MPN:	2	**Log Std Dev:**	0.4647
# > 260 MPN:	0	**Geomean:**	3.4216
Median:	2	**Estimated 90th:**	13

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	1/2 FLD	32	2.0	0.301
3/10/2009	3/4 FLD	32	1.7	0.2304
6/15/2009	1/2 FLD	34	1.7	0.2304
9/2/2009	1ST EBB	36	7.8	0.8921
9/30/2009	1/2 EBB	32	1.8	0.2553
2/25/2010	1/4 EBB	32	1.7	0.2304
3/25/2010	1/2 EBB	32	2.0	0.301
5/7/2010	2/3 EBB - 3/4 EBB	35	4.5	0.6532
6/29/2010	1/4 EBB	35	6.8	0.8325
8/19/2010	1/2 EBB	36	1.7	0.2304
10/25/2010	1/2 FLD	34	1.7	0.2304
1/3/2011	3/4 FLD	32	4.5	0.6532
2/21/2011	3/4 FLD	32	2.0	0.301
3/30/2011	1/2 EBB	32	1.7	0.2304
5/31/2011	1/4 EBB	35	4.5	0.6532
8/18/2011	3/4 FLD	36	2.0	0.301
12/5/2011	LAST EBB	33	1.7	0.2304
1/23/2012	1ST EBB	35	11.0	1.0414
2/21/2012	LAST FLD	35	1.7	0.2304
3/22/2012	3/4 FLD	35	6.8	0.8325
6/14/2012	1/2 EBB	35	1.7	0.2304
10/10/2012	1/2 EBB	35	13.0	1.1139
12/5/2012	1/4 FLD	30	2.0	0.301
2/19/2013	3/4 FLD	30	1.7	0.2304
5/30/2013	1/4 FLD	34	**130.0**	2.1139
8/15/2013	LAST EBB	33	2.0	0.301
10/2/2013	1ST EBB	35	4.5	0.6532
11/6/2013	LAST FLD	31	**49.0**	1.6902
11/22/2013	3/4 FLD	33	2.0	0.301
2/18/2014	1/2 FLD	32	1.7	0.2304

Table 12: Bacteriological Sampling Results

Station ID: 50

# Samples:	30	**Log Avg:**	0.4237
# > 43 MPN:	0	**Log Std Dev:**	0.2959
# > 260 MPN:	0	**Geomean:**	2.6529
Median:	2	**Estimated 90th:**	6

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	1/2 FLD	30	4.5	0.6532
3/10/2009	3/4 FLD	32	1.7	0.2304
6/15/2009	1/2 FLD	32	1.7	0.2304
9/2/2009	1ST EBB	36	4.5	0.6532
9/30/2009	1/2 EBB	30	2.0	0.301
2/25/2010	1/4 EBB	30	13.0	1.1139
3/25/2010	1/2 EBB	26	2.0	0.301
5/7/2010	2/3 EBB - 3/4 EBB	33	**14.0**	1.1461
6/29/2010	1/4 EBB	35	1.7	0.2304
8/19/2010	1/2 EBB	36	2.0	0.301
10/25/2010	1/2 FLD	24	1.7	0.2304
1/3/2011	3/4 FLD	32	1.7	0.2304
2/21/2011	3/4 FLD	30	2.0	0.301
3/30/2011	1/2 EBB	32	1.7	0.2304
5/31/2011	1/4 EBB	35	1.7	0.2304
8/18/2011	3/4 FLD	36	2.0	0.301
12/5/2011	LAST EBB	32	1.8	0.2553
1/23/2012	1ST EBB	35	4.5	0.6532
2/21/2012	LAST FLD	35	4.5	0.6532
3/22/2012	3/4 FLD	35	1.7	0.2304
6/14/2012	1/2 EBB	35	1.7	0.2304
10/10/2012	1/2 EBB	35	2.0	0.301
12/5/2012	1/4 FLD	32	7.8	0.8921
2/19/2013	3/4 FLD	30	**14.0**	1.1461
5/30/2013	1/4 FLD	33	1.7	0.2304
8/15/2013	LAST EBB	35	1.7	0.2304
10/2/2013	1ST EBB	33	2.0	0.301
11/6/2013	LAST FLD	31	2.0	0.301
11/22/2013	3/4 FLD	33	2.0	0.301
2/18/2014	1/2 FLD	32	2.0	0.301

Station ID: 51

# Samples:	30	**Log Avg:**	0.5108
# > 43 MPN:	0	**Log Std Dev:**	0.3765
# > 260 MPN:	0	**Geomean:**	3.2419
Median:	2	**Estimated 90th:**	9

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	1/2 FLD	30	2.0	0.301
3/10/2009	3/4 FLD	32	2.0	0.301
6/15/2009	1/2 FLD	32	4.0	0.6021
9/2/2009	1ST EBB	34	13.0	1.1139
9/30/2009	1/2 EBB	29	7.8	0.8921
2/25/2010	1/4 EBB	30	7.8	0.8921
3/25/2010	1/2 EBB	28	1.8	0.2553
5/7/2010	2/3 EBB - 3/4 EBB	33	7.8	0.8921
6/29/2010	1/4 EBB	35	1.7	0.2304
8/19/2010	1/2 EBB	36	4.5	0.6532
10/25/2010	1/2 FLD	24	2.0	0.301
1/3/2011	3/4 FLD	32	2.0	0.301
2/21/2011	3/4 FLD	30	2.0	0.301
3/30/2011	1/2 EBB	32	1.7	0.2304
5/31/2011	1/4 EBB	35	2.0	0.301
8/18/2011	3/4 FLD	36	1.7	0.2304
12/5/2011	LAST EBB	32	1.7	0.2304
1/23/2012	1ST EBB	35	2.0	0.301
2/21/2012	LAST FLD	35	**17.0**	1.2304
3/22/2012	3/4 FLD	35	2.0	0.301
6/14/2012	1/2 EBB	35	1.8	0.2553
10/10/2012	1/2 EBB	35	1.7	0.2304
12/5/2012	1/4 FLD	30	1.7	0.2304
2/19/2013	3/4 FLD	30	**17.0**	1.2304
5/30/2013	1/4 FLD	32	1.7	0.2304
8/15/2013	LAST EBB	33	**33.0**	1.5185
10/2/2013	1ST EBB	32	1.7	0.2304
11/6/2013	LAST FLD	32	4.5	0.6532
11/22/2013	3/4 FLD	32	4.5	0.6532
2/18/2014	1/2 FLD	32	1.7	0.2304

Table 12: Bacteriological Sampling Results

Station ID: 52

# Samples:	30	**Log Avg:**	0.4895
# > 43 MPN:	1	**Log Std Dev:**	0.3451
# > 260 MPN:	0	**Geomean:**	3.0865
Median:	2	**Estimated 90th:**	8

Date	Tidal Stage	Salinity	FC	Log FC
2/12/2009	1/2 FLD	32	4.5	0.6532
3/10/2009	3/4 FLD	32	1.7	0.2304
6/15/2009	1/2 FLD	32	1.7	0.2304
9/2/2009	1ST EBB	34	7.8	0.8921
9/30/2009	1/2 EBB	32	2.0	0.301
2/25/2010	1/4 EBB	34	4.5	0.6532
3/25/2010	1/2 EBB	28	2.0	0.301
5/7/2010	2/3 EBB - 3/4 EBB	34	2.0	0.301
6/29/2010	1/4 EBB	35	2.0	0.301
8/19/2010	1/2 EBB	36	6.8	0.8325
10/25/2010	1/2 FLD	30	2.0	0.301
1/3/2011	3/4 FLD	32	2.0	0.301
2/21/2011	3/4 FLD	30	2.0	0.301
3/30/2011	1/2 EBB	32	2.0	0.301
5/31/2011	1/4 EBB	35	2.0	0.301
8/18/2011	3/4 FLD	36	1.7	0.2304
12/5/2011	LAST EBB	32	1.7	0.2304
1/23/2012	1ST EBB	35	4.5	0.6532
2/21/2012	LAST FLD	35	2.0	0.301
3/22/2012	3/4 FLD	35	4.5	0.6532
6/14/2012	1/2 EBB	35	4.5	0.6532
10/10/2012	1/2 EBB	35	7.8	0.8921
12/5/2012	1/4 FLD	32	2.0	0.301
2/19/2013	3/4 FLD	30	2.0	0.301
5/30/2013	1/4 FLD	32	1.7	0.2304
8/15/2013	LAST EBB	35	4.5	0.6532
10/2/2013	1ST EBB	32	4.5	0.6532
11/6/2013	LAST FLD	30	**79.0**	1.8976
11/22/2013	3/4 FLD	33	1.7	0.2304
2/18/2014	1/2 FLD	32	4.0	0.6021

Table 13: Bacteriological Sampling Summary

Summary of sampling data through 2/18/2014. Shaded cells indicate stations in waters closed to shellfish harvest.

Station ID:	# Samples:	Median:	Geomean:	Estimated 90th:
1	30	12	10.6077	40
2	30	1.7	2.4155	5
5	30	1.7	2.5914	7
6	30	11	8.8919	41
6B	30	4.5	5.6647	19
7	30	4.5	5.1295	19
8	30	6.8	6.5277	23
10	30	7.8	8.4988	30
10A	30	11	8.7935	27
10B	30	10.15	10.3868	41
11	30	7.8	7.0039	24
13	30	7.8	7.0733	23
15	30	4.5	6.0794	22
18	30	5.65	7.3946	35
19	30	4.25	4.1094	12
20	30	4.5	5.5230	24
21	30	4.25	4.0099	12
23	30	1.7	1.9731	3
24	30	1.7	2.0181	3
34	30	1.7	2.5201	7
35	30	2	3.0117	8
36	30	2	2.5511	8
37	30	2	2.4735	5
40	30	6.15	6.2158	26
41	30	4.5	5.5163	19
42	30	4.5	4.9750	18
42A	30	3	4.4108	16
44A	30	4.25	3.8371	11
45	30	13	11.6012	**55**
46	30	2	3.3569	10
47	30	2	3.4253	9
48	30	1.7	2.6552	6
48A	30	4	4.5392	15
48B	30	4	4.7456	19
48C	30	2	3.2065	10
49	30	2	3.4216	13
50	30	2	2.6529	6
51	30	2	3.2419	9
52	30	2	3.0865	8