



**NJ Department of Environmental Protection
Water Monitoring and Standards**

**Reappraisal Report of Shellfish Growing Area SE2
(Absecon - Reeds Bay)**



April 2017

Reappraisal Report of Shellfish Growing Area SE2 (Absecon-Reeds Bay)

New Jersey Department of Environmental Protection (NJDEP)

Bureau of Marine Water Monitoring
Robert Schuster, Bureau Chief

April 2017

Data from
April 2011 to August 2016

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Acknowledgements:

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Cover Photo by Lisa DiElmo

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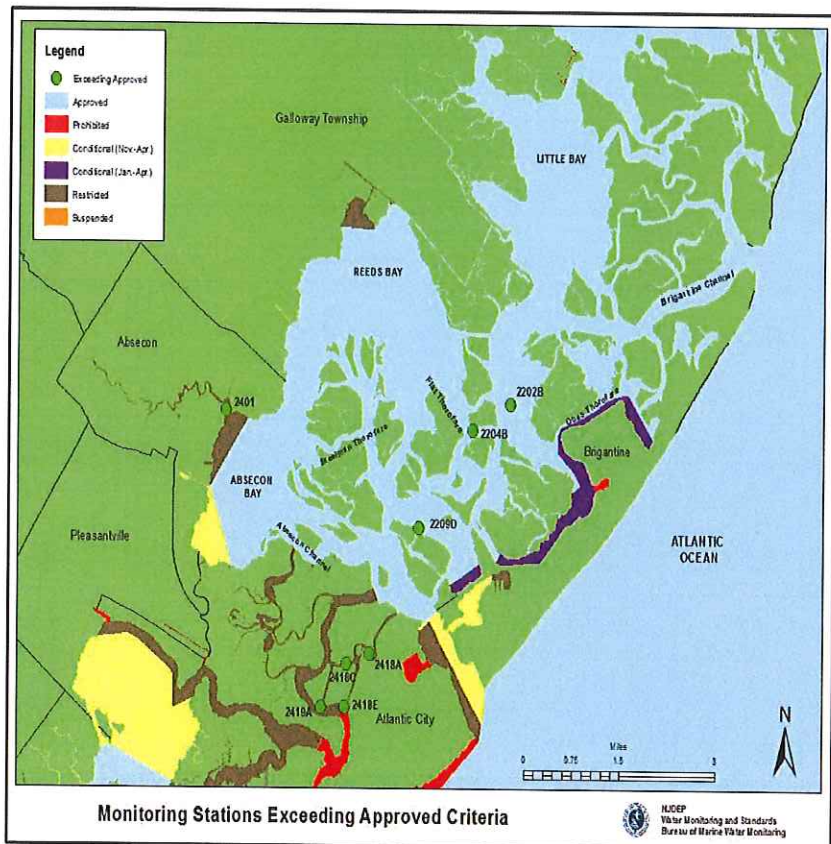
EXECUTIVE SUMMARY

Shellfish Growing Area SE2 is located in southern New Jersey's Atlantic Coastal Plain in Atlantic County. This back bay area includes Absecon Bay, Reeds Bay, Little Bay and Grassy Bay. Enclosed in these waterbodies are numerous thorofares, channels, coves and inlets. The back bay is connected to the Atlantic Ocean via the Absecon Inlet and Brigantine Inlet. The estimated size of this shellfish area is 14,400 acres. Approximately ninety-two percent of the waters in this area are classified as either *Approved* or *Conditionally Approved* for shellfish harvest. Less than eight percent of shellfish waters are designated as either *Prohibited* or *Restricted*.

This growing area is bordered by the following municipalities: Atlantic City, Brigantine City, Galloway Township, Absecon City and Pleasantville. These communities are connected to city sewers that are managed by the Atlantic County Utilities Authority (ACUA). ACUA is located in Atlantic City by Beach Thorofare.

This report is based on data collected from April 2011 to August 2016. A total of 3585 water samples were collected from 109 sampling sites and analyzed for fecal coliform. Based on NSSP Systematic Random Sampling criteria, eight monitoring stations did not meet the *Approved* criteria. Three of these eight stations are in the *Approved* waters of Absecon Bay, Steelman Bay and Reeds Bay. Historically, coliform counts in these areas have always been considerably low.

At these three sites there were rainfall and seasonal components present. Rainfall impact is mainly due to runoff, carrying contaminants to open waters. All three of these sites had a summer seasonal influence. Waterfowl were observed and most likely contributed to the high counts at the failed sites. There were no noticeable changes in shoreline, hydrography or land use that would require modification to the existing shellfish classifications. Since the elevated bacteria counts occur so seldom and likely don't remain elevated for extended periods, no downgrade of waters is recommended at this time.

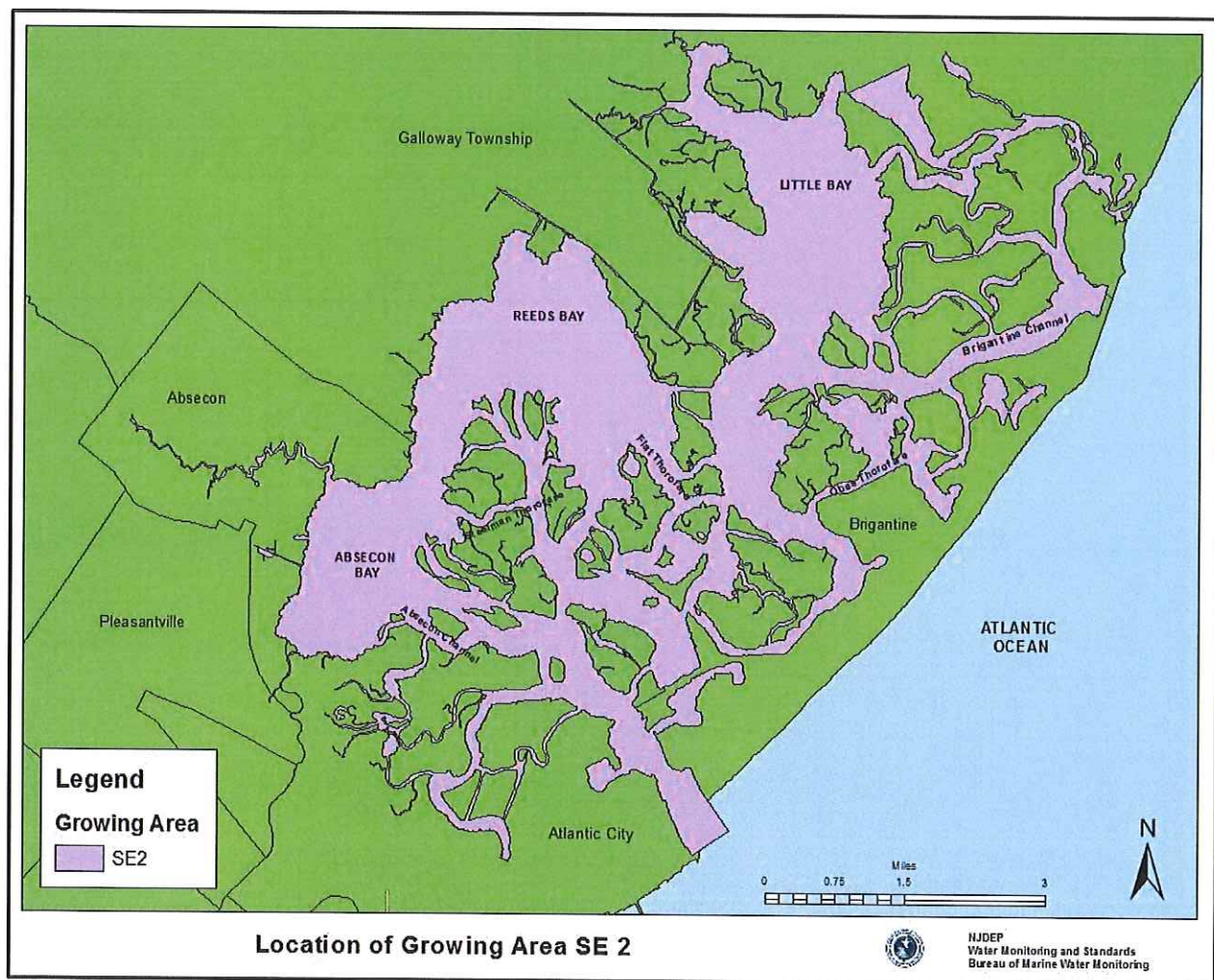


GROWING AREA PROFILE

Location and Description

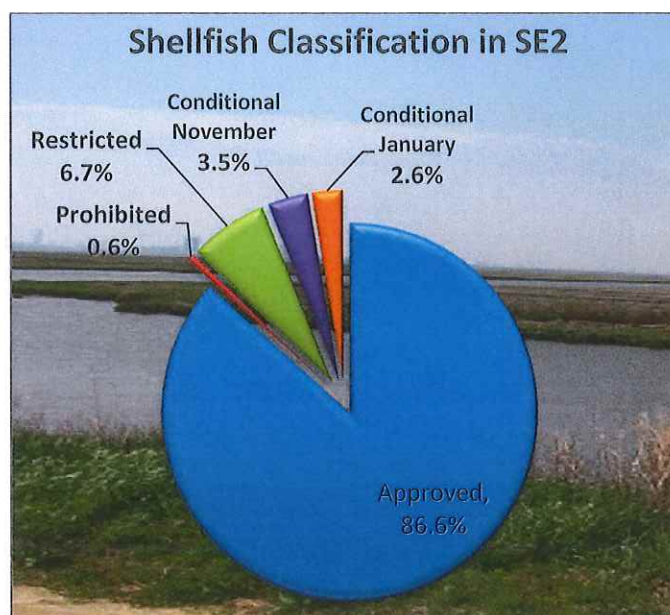
Shellfish Growing Area SE2 is located in southern New Jersey's Atlantic Coastal Plain in Atlantic County. This growing area is bordered by the following municipalities: Atlantic City, Brigantine City, Galloway Township, Absecon City and Pleasantville.

The boundary of this growing area, starting from north to south, begins at the southern end of Great Bay and terminates at the intersection of Beach Thorofare and Great Channel by Lakes Bay. The waters of the Atlantic Ocean and Great Channel are not included in this growing area. The approximate size of this shellfish growing area is 14,400 acres. The main waterbodies in this shellfish area include Absecon Bay, Reeds Bay, Little Bay and Grassy Bay. Enclosed in these main waterbodies are numerous thorofares, channels, coves and inlets. Some of the larger thorofares and channels are the Absecon Channel, Beach Thorofare, Bonita Tideway, Golden Hammock Thorofare and Brigantine Channel. The back bay is connected to the Atlantic Ocean via the Absecon Inlet and Brigantine Inlet.

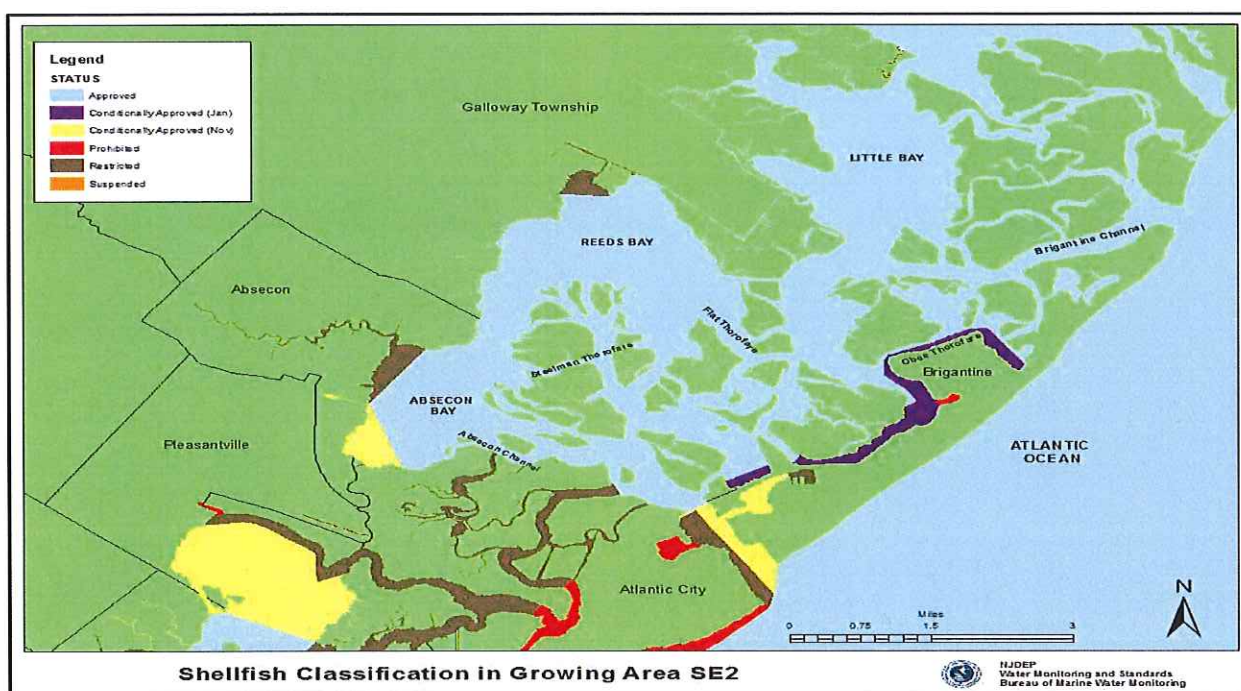


Growing Area Classification Summary

This growing area includes 14,343 acres of marine water. In the past, much of this growing area was classified as *Prohibited*. This included Absecon Bay, Absecon Channel, Bonita Tideway, Broad Creek, Beach Thorofare and a portion of Reeds Bay. Water quality degradation was a result of malfunctioning septic systems, illegal dumping, runoff and the direct discharge of effluent to the back bay. Over time water quality began to improve, mainly due to the elimination of direct discharges and the implementation of city sewer systems, administered by the Atlantic County Utilities Authority (ACUA). The elimination of pollution to the back bay has resulted in the reclassification of shellfish waters. Today, over ninety percent of shellfish waters in this area are either classified as *Approved* or *Conditionally Approved* and less than eight percent of shellfish waters are designated as *Prohibited* or *Restricted*. Lesser water quality still exists in areas where there are numerous marinas and stormwater outfalls.

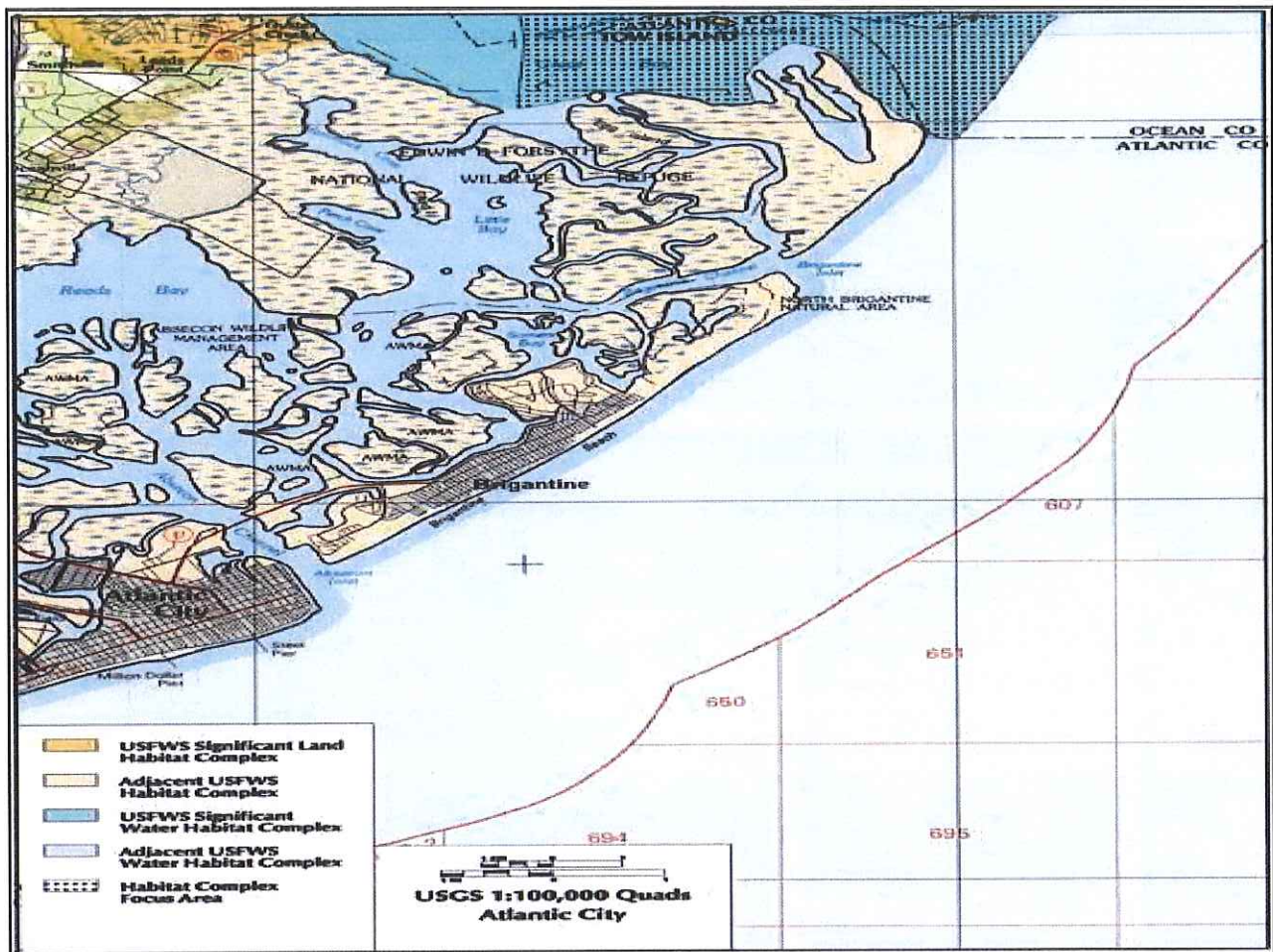


The figure below illustrates the shellfish classifications for this growing area. It can also be found on the 2016 State of New Jersey Shellfish Growing Water Classification Charts # 12 or on WM&S/BMWM website at <http://www.state.nj.us/dep/bmw/>.



Evaluation of Biological Resources

Biological resources in this shellfish growing area are abundant because of its proximity to wildlife refuges. The Edwin B. Forsythe National Wildlife Refuge and the Absecon Wildlife Management Area support a very large seasonal population of waterfowl, wading birds and shore birds that use these lands for nesting and hunting. The refuge covers approximately 46,000 acres, which includes portions of the following counties: Atlantic, Burlington and Ocean. Nearly 80% of the refuge is tidal salt meadow and marshes. The remaining acreage is wooded land that is dominated by pitch pines, oaks and white cedar. The map shows the location of the wildlife management areas that are situated in this growing area. Additional information about these wildlife refuges can be found on <http://www.fws.gov/refuges/?ref=topbar>



Reeds Bay and Absecon Bay are very shallow, approximately 5-7 feet in depth, which makes them very productive in generating hard clams (*Mercenaria mercenaria*). According to the 1963 survey conducted by the U.S. Fish and Wildlife Service in cooperation with the Bureau of Shellfisheries, there was an abundance of hard clams in this area that were commercially valuable. However, the most recent study in this area, conducted in 2003 by the Bureau of Shellfisheries, found low to moderate density of hard clams.

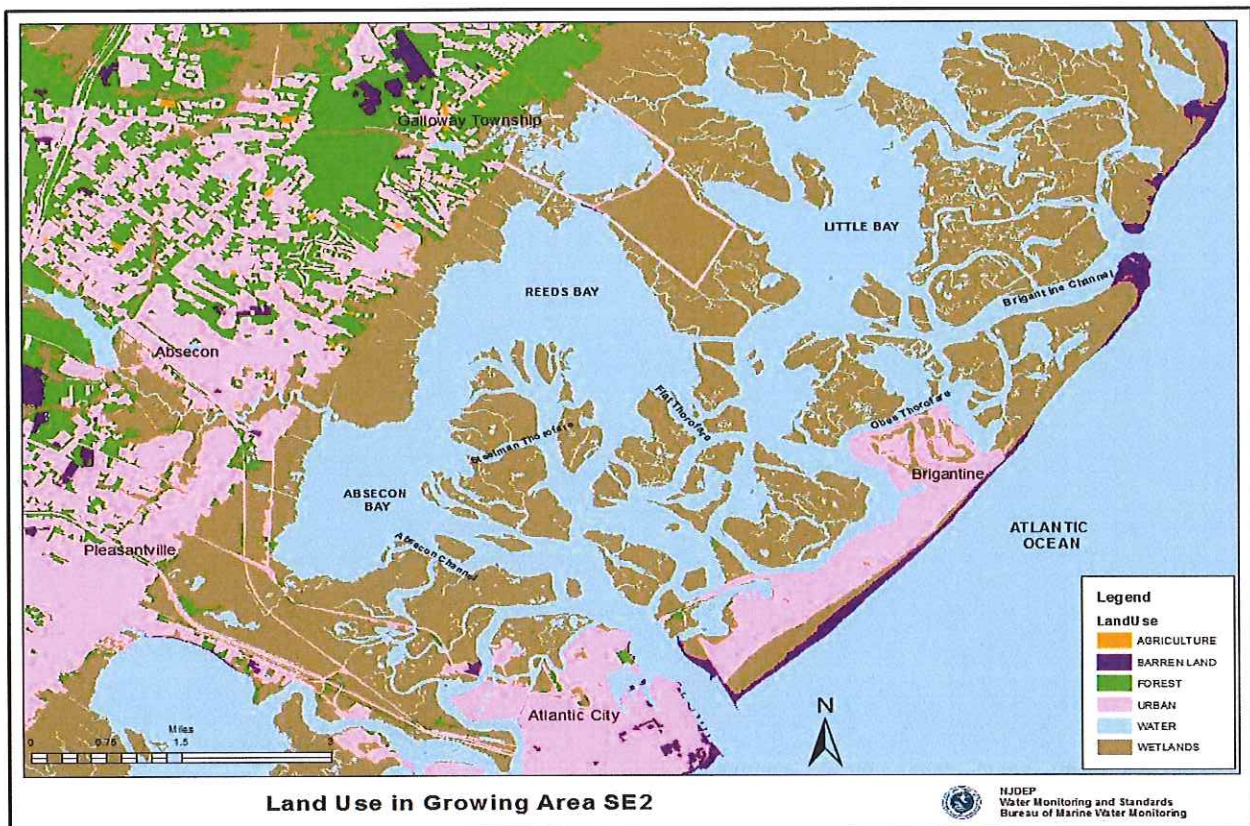
Shoreline Survey: Evaluation of Potential Pollution Sources

Shoreline surveys or site-specific visits of areas nearby or bordering shellfish growing waters can provide insight as to the location and nature of land use, surface water discharges, marinas, unpermitted discharges and stormwater inputs. Shoreline surveys of growing area SE2 were conducted during the timeframe of this report. The following sections detail information derived collectively from these surveys.

Land Use

Surrounding this shellfish growing area are urban communities. Absecon City, Brigantine City and Galloway Township are primarily residential communities with very few large commercial businesses. The largest industry in this area is the casino industry, located in Atlantic City.

The surrounding landscape has not changed significantly since the last shoreline survey. Wetlands still dominate the region surrounding this growing area. These wetlands are part of the Edwin B. Forsythe National Wildlife Refuge and the Absecon Wildlife Management Area; therefore, they cannot be utilized for urban development. The shellfish waters are enclosed within these wetlands, which act as a barrier from the surrounding population centers. The wetlands utilize the nutrients obtained for plant growth and act as a purifier against pollutants. By doing so, these wetlands help to reduce pollutants entering into the shellfish waters.



Surface water discharges

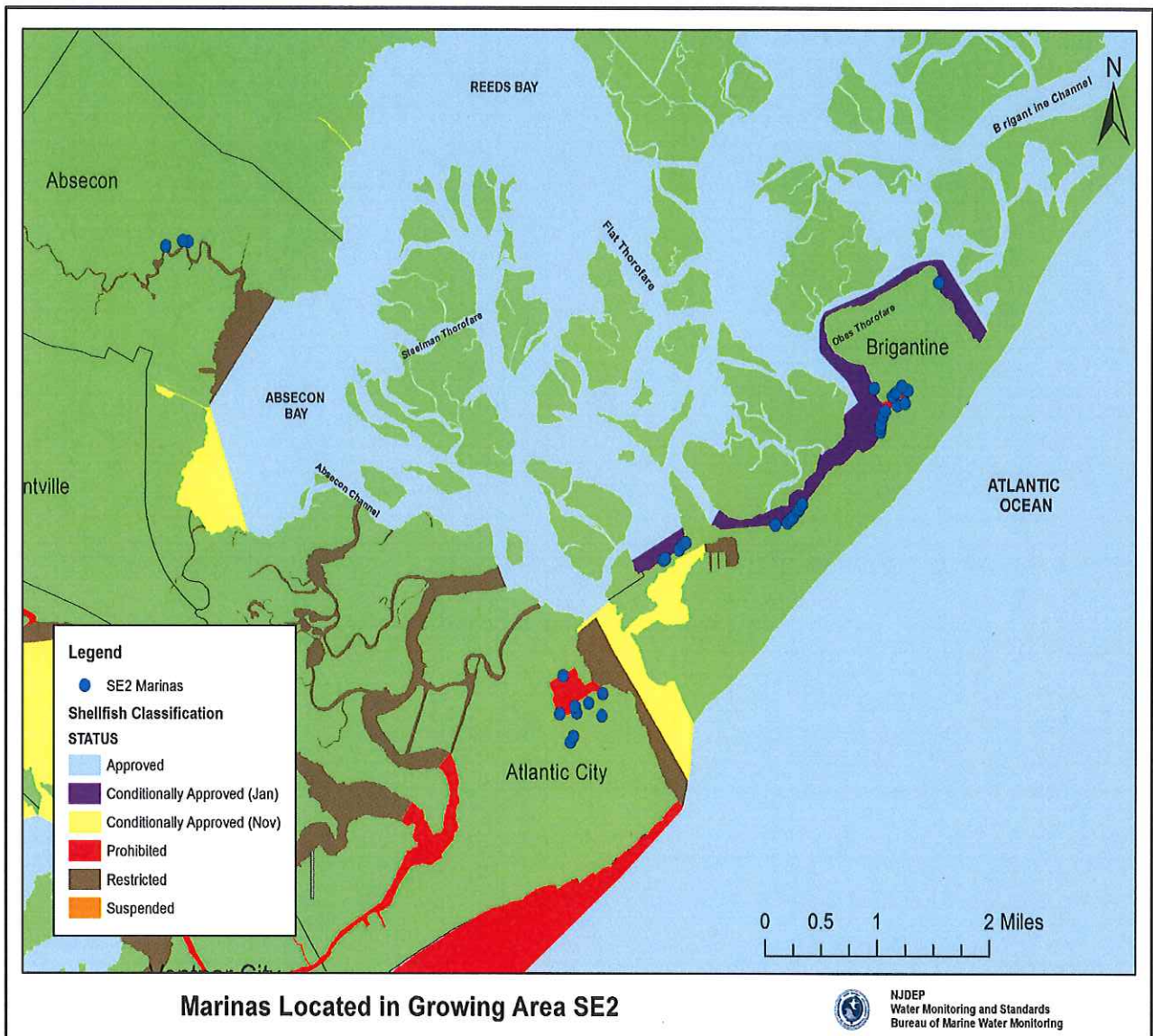
A surface water discharge involves the release of treated effluent from various municipal and industrial facilities directly into a river, stream or the ocean. The discharge of pollutants from a point source is authorized under the New Jersey Pollutant Discharge Elimination System (NJPDES) and the regulations are found at N.J.A.C. 7:14A. The main purpose of the NJPDES program is to ensure proper treatment and discharge of wastewater. According to the NJPDES program, there are several surface discharges in this shellfish growing area. The only facility that does have the potential to impact water quality is the Atlantic County Utilities Authority (ACUA), located in Atlantic City. This wastewater facility became operational in 1978 and provides service to the surrounding communities. Before ACUA came into existence, effluents were being discharged directly into the back bay. Today, treated effluents are diverted to the Atlantic Ocean, roughly 1.59 miles off shore of Raleigh Avenue in Atlantic City. This transition has significantly reduced the pollution loading to the back bay, thus enhancing water quality for the entire shellfish growing area. The wastewater treatment plant is located within this growing area and could potentially affect the water quality if there were an unexpected emergency discharge however; under normal operating conditions, treated effluents are diverted off shore into the Atlantic Ocean.

Marinas

The discharge of sewage from vessels into the waterways can contribute to the degradation of the marine environment by introducing disease-causing microorganisms (pathogens), such as bacteria, protozoan and viruses into the marine environment. Chemical compounds, such as oil and gasoline resulting from spills, leaks and pressure washing from vessels can poison fish and other marine organisms. By-products from the biological breakdown of petroleum products can be harmful to fish and wildlife and pose threats to human health if ingested. (Klein, 2009) For this reason, waters within the marina basin are restricted to shellfish harvest.

The waters enclosed by the marina are classified as *Prohibited*. Depending on the size of the marina, the water quality, flushing rates and water depth, shellfish waters immediately adjacent to each marina, known as the buffer zone, may be classified as *Prohibited*, *Restricted* or *Conditionally Approved* (no harvest during summer months when the marina is normally active). Marina buffers are calculated using the NJ Marina Buffer Equation. For additional information on the marina buffer equation, see the *Shellfish Growing Area Report Guidance Document 2011*.

There are thirty-eight marinas in this shellfish growing area. The locations of these marinas are displayed on the following map:



Marina Name	Address	Municipality	County	# of Boat Slips	Dates of Operation	Facility Services
Absecon Bay Sportsman Center	81 Natalie Terrace	Absecon	Atlantic	20	Year Round	Fuel, Rest Rooms, Restaurant, Fish Cleaning Table, Boat Lift
Absecon Marina	151 E. Faunce Landing Rd.	Absecon	Atlantic	24	Year Round	Rest Rooms, Fish Cleaning Table
Barneys Dock	700 N. Rhode Island Ave.	Atlantic City	Atlantic	7	Year Round	Rest Rooms, Fish Cleaning Table
Bayside Marina	4401 Atlantic Brigantine Blvd.	Brigantine	Atlantic	82	Year Round	Pump Out, Fuel, Rest Rooms, Restaurant, Fish Cleaning Table
Bobs Marine	486 W. Shore Dr.	Brigantine	Atlantic	38	Year Round	
Brigantine BPO Elks	400 W. Shore Dr.	Brigantine	Atlantic	33	Seasonal	
Brigantine Yacht Club	1001 Bayshore Dr.	Brigantine	Atlantic	16	Seasonal	Rest Rooms, Restaurant, Fish Cleaning Table
Deebold Boatyard	434 W. Shore Dr.	Brigantine	Atlantic	30	Year Round	
Fish Finder Marina	3645 Atlantic Brigantine Blvd.	Brigantine	Atlantic	10	Seasonal	
Gardeners Basin Marina	800 N. New Hampshire Ave.	Atlantic City	Atlantic	47	Seasonal	Rest Rooms
Jolly Rogers Marina	3101 Bayshore Ave.	Brigantine	Atlantic	10	Seasonal	
North Point Marina	1225 E. Shore Dr.	Brigantine	Atlantic	30	Year Round	Rest Rooms
SE2 Condo 1	3219 & 3301 Bayshore Ave.	Brigantine	Atlantic	32	Seasonal	Restaurant
SE2 Condo 2	837-851 Massachusetts Ave.	Atlantic City	Atlantic	8	Seasonal	Rest Rooms, Boat Lift
SE2 Condo 3	3307 Bayshore Dr.	Brigantine	Atlantic	12	Seasonal	Maintenance, Rest Rooms, Fish Cleaning Table
SE2 Condo 4	4601-4609 Atlantic Brigantine Blvd.	Brigantine	Atlantic	14	Seasonal	Maintenance, Fuel, Rest Rooms, Fish Cleaning Table, Boat Lift
SE2 Condo 5	444 W. Shore Dr.	Brigantine	Atlantic	10	Seasonal	Maintenance, Fuel, Rest Rooms, Fish Cleaning Table, Boat Lift
SE2 Condo 6	428-432 W. Shore Dr.	Brigantine	Atlantic	8	Seasonal	Rest Rooms
SE2 Condo 7	701-715 Bayshore Ave.	Brigantine	Atlantic	28	Seasonal	Restaurant, Fish Cleaning Table
SE2 Condo 8	1113 Bayshore Ave.	Brigantine	Atlantic	18	Seasonal	Fuel, Maintenance, Rest Rooms, Fish Cleaning Table
SE2 Condo 9	1037 Bayshore Dr.	Brigantine	Atlantic	6	Seasonal	Maintenance, Rest Rooms, Fish Cleaning Table, Boat Lift
SE2 Condo 10	3007 Bayshore Dr.	Brigantine	Atlantic	24	Seasonal	Fish Cleaning Table

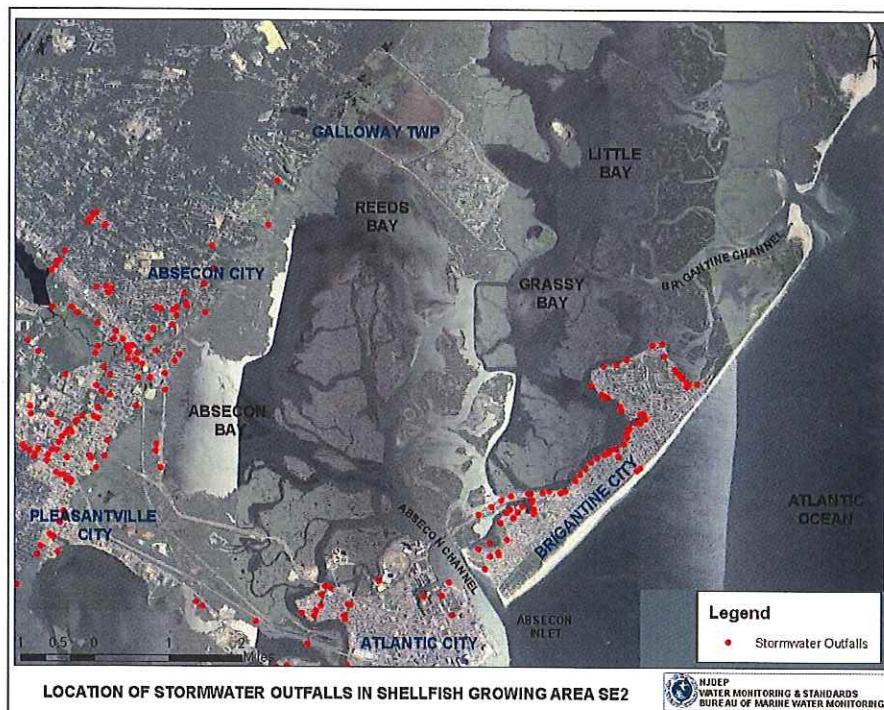
Marina Name	Address	Municipality	County	# of Boat Slips	Dates of Operation	Facility Services
SE2 Private Property 1	N. Delaware Ave.	Atlantic City	Atlantic	7	Seasonal	Fish Cleaning Table
SE2 Private Property 2	557 New Jersey Ave.	Atlantic City	Atlantic	10	Seasonal	
SE2 Private Property 3	449 Maryland Ave.	Atlantic City	Atlantic	5	Seasonal	Maintenance, Rest Rooms, Fish Cleaning Table, Boat Lift
SE2 Private Property 4	601 Bayshore Ave.	Brigantine	Atlantic	24	Seasonal	Rest Rooms
SE2 Private Property 5	4329 Atlantic Brigantine Blvd.	Brigantine	Atlantic	16	Seasonal	
SE2 Private Property 6	4425 Atlantic Brigantine Blvd.	Brigantine	Atlantic	6	Seasonal	
SE2 Private Property 7	4615 Atlantic Brigantine Blvd.	Brigantine	Atlantic	7	Seasonal	
SE2 Private Property 8	416 W. Shore Dr.	Brigantine	Atlantic	8	Seasonal	Fish Cleaning Table
SE2 Private Property 9	913 Bayshore Ave.	Brigantine	Atlantic	9	Seasonal	
SE2 Private Property 10	1201 12 th Ave	Brigantine	Atlantic	9	Year Round	
SE2 Private Property 11	2919 30 th St. South	Brigantine	Atlantic	8	Seasonal	
Senator Frank S. Farley State Marina	600 Huron Ave.	Atlantic City	Atlantic	630	Year Round	Fuel, Rest Rooms Restaurant, Fish Cleaning Table
Snug Harbor Condo	619-641 Carson Ave.	Atlantic City	Atlantic	10	Seasonal	
Tide Runner Marina	3201 Bayshore Ave.	Brigantine	Atlantic	33	Seasonal	
TMT Marine Terminal	725 N. Maryland Ave.	Atlantic City	Atlantic	3	Year Round	
Up The Creek Marina	139 E. Faunce Landing Rd.	Absecon	Atlantic	34	Seasonal	

Spills, Unpermitted Discharges and Closures

Indirect discharges are groundwater discharges, malfunctioning septic systems, known contaminated sites, spills and dredging projects. Under normal circumstances, these indirect discharges do not routinely affect water quality. However, on occasion they have the potential to result in the closure of shellfish waters due to accidental discharges that result in higher than normal bacteria counts. In 2012 there was a precautionary closure due to Hurricane Sandy. The entire growing area was closed for several weeks and was reopened once it was confirmed that bacteria counts were at acceptable levels.

Storm Water Discharges

Non-point source pressures on shellfish beds in New Jersey originate in materials that enter the water via stormwater. Stormwater runoff is generated when precipitation from rain and snowmelt flows over land or impervious surfaces and does not percolate into the ground. As the runoff flows over the land or impervious surfaces (paved streets, parking lots and building rooftops), it accumulates debris, chemicals, sediment or other pollutants that could adversely affect water quality if the runoff is discharged untreated. The typical pollutants that are associated with stormwater run-off are bacteria, heavy metals, pesticides, herbicides, fertilizers, chlorides, petroleum and nutrients. (NJStormwater.Org) Most of the stormwater outfalls within this growing area are near residential and urbanized areas. (Illustration by: morgan-hill.ca.gov)



Stormwater outfalls in this area usually discharge to nearby creeks and lagoons. The highest emphases are placed on the stormwater outfalls that discharge directly to shellfish waters. WM&S/BMWM has identified several potential stormwater impacted areas. Stormwater impacted areas include Absecon Bay, Bonita Tideway, Golden Hammock Thorofare and St. George Thorofare. These areas tend to have higher bacteriological counts after a rainfall event.

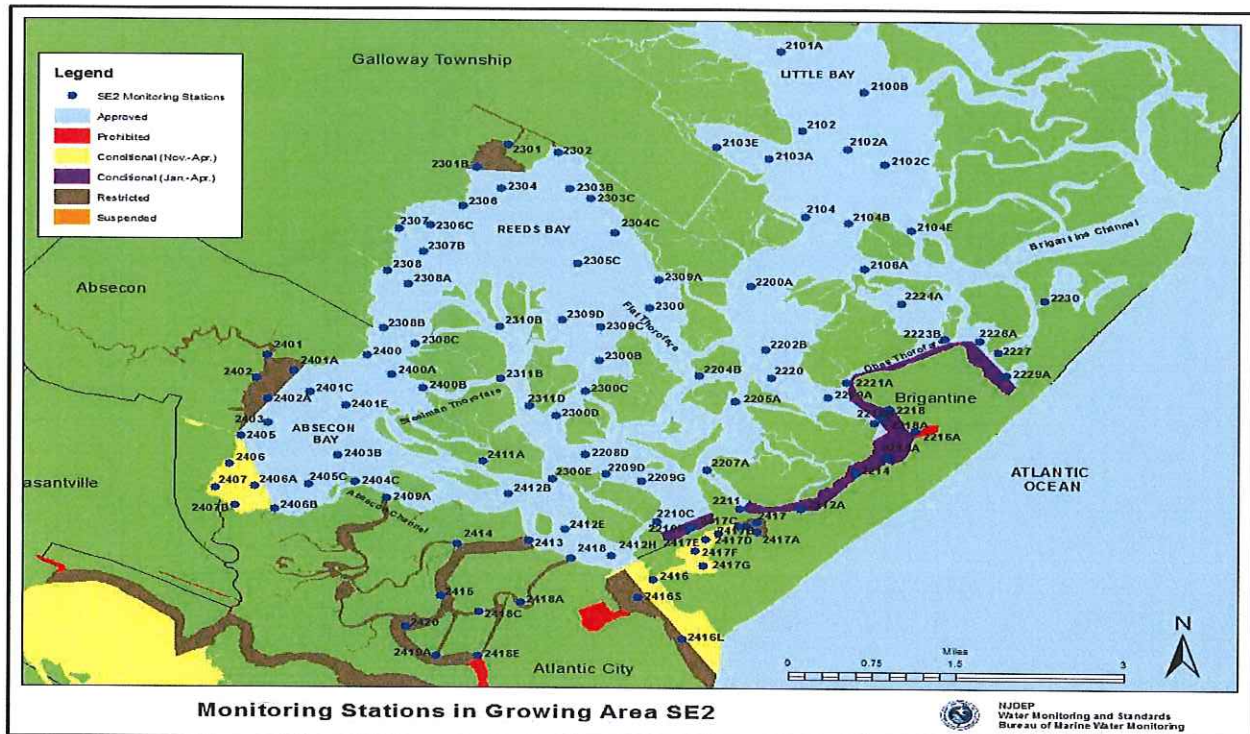
WATER QUALITIES STUDIES

Sampling Strategy

The State shellfish control authority has the option of choosing one of two water monitoring sampling strategies for each growing area, Systematic Random Sampling (SRS) or Adverse Pollution Conditions sampling strategy (APC). For additional information on the types of sampling strategies, see the *Shellfish Growing Area Report Guidance Document, 2011*. There is a wastewater treatment plant located within the area that could potentially affect the water quality if there were an unexpected emergency discharge however; under normal operating conditions, treated effluents are diverted off shore into the Atlantic Ocean. This shellfish growing area is not impacted by direct discharges; therefore it is sampled using the SRS sampling strategy.

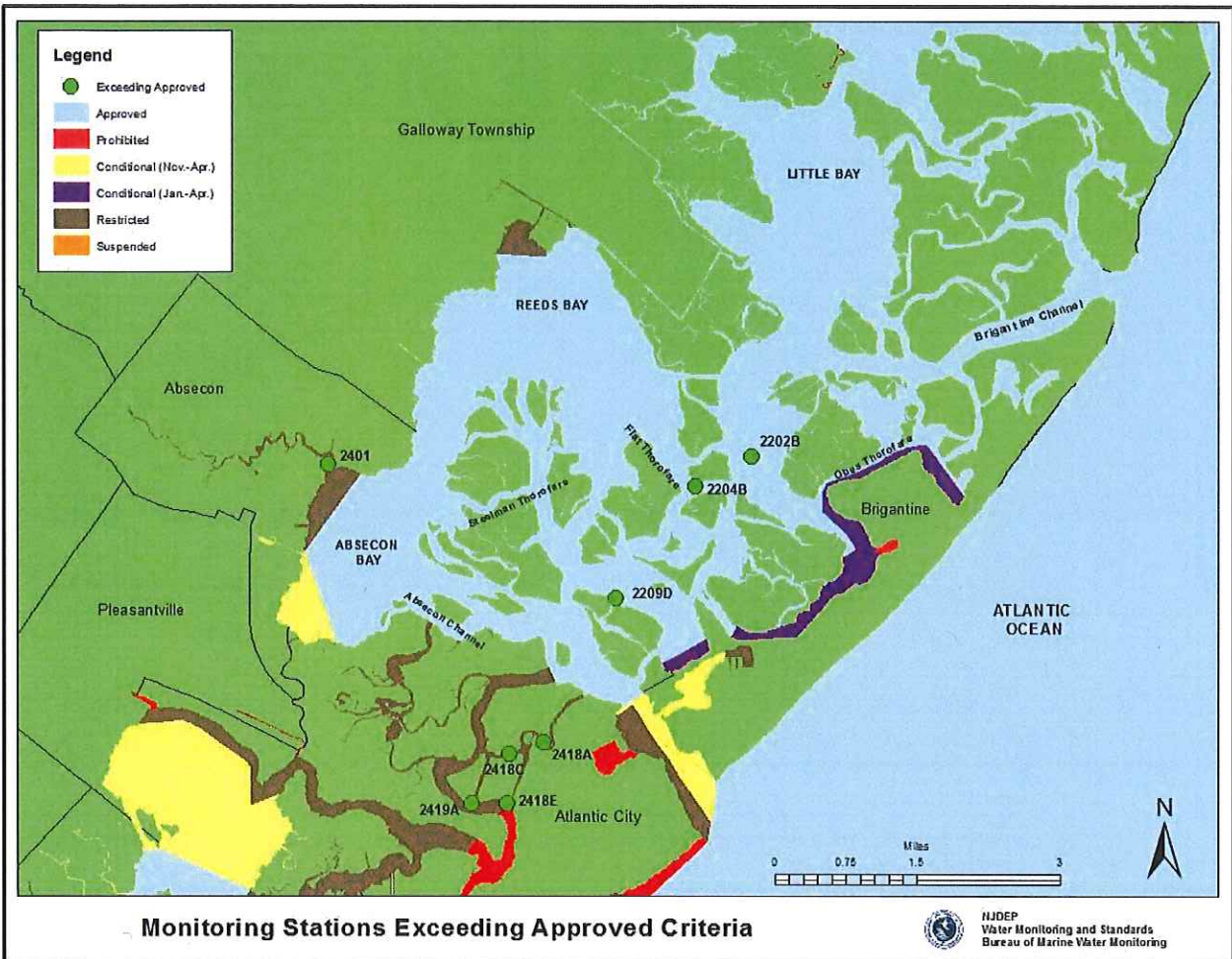
Each shellfish producing state is directed to adopt either the total coliform or fecal coliform criterion to classify its waters. The criteria were developed to ensure that shellfish harvested from designated waters would be free of pathogenic (disease-producing) bacteria. In 2013, New Jersey adopted the fecal coliform criterion for classifying shellfish waters. See, the *Shellfish Growing Area Report Guidance Document, 2011* for additional information.

Water sampling was performed in accordance with the Field Procedures Manual (NJDEP, 2005). From 2011 through 2016, approximately 3585 water samples were collected for fecal coliform bacteria from 109 monitoring stations. The locations of these stations are shown in the map below. Data management and analysis was accomplished using database applications developed for the Bureau. Mapping of pollution data was performed with the use of Geographic Information System (GIS: ArcGIS).



BACTERIOLOGICAL QUALITY

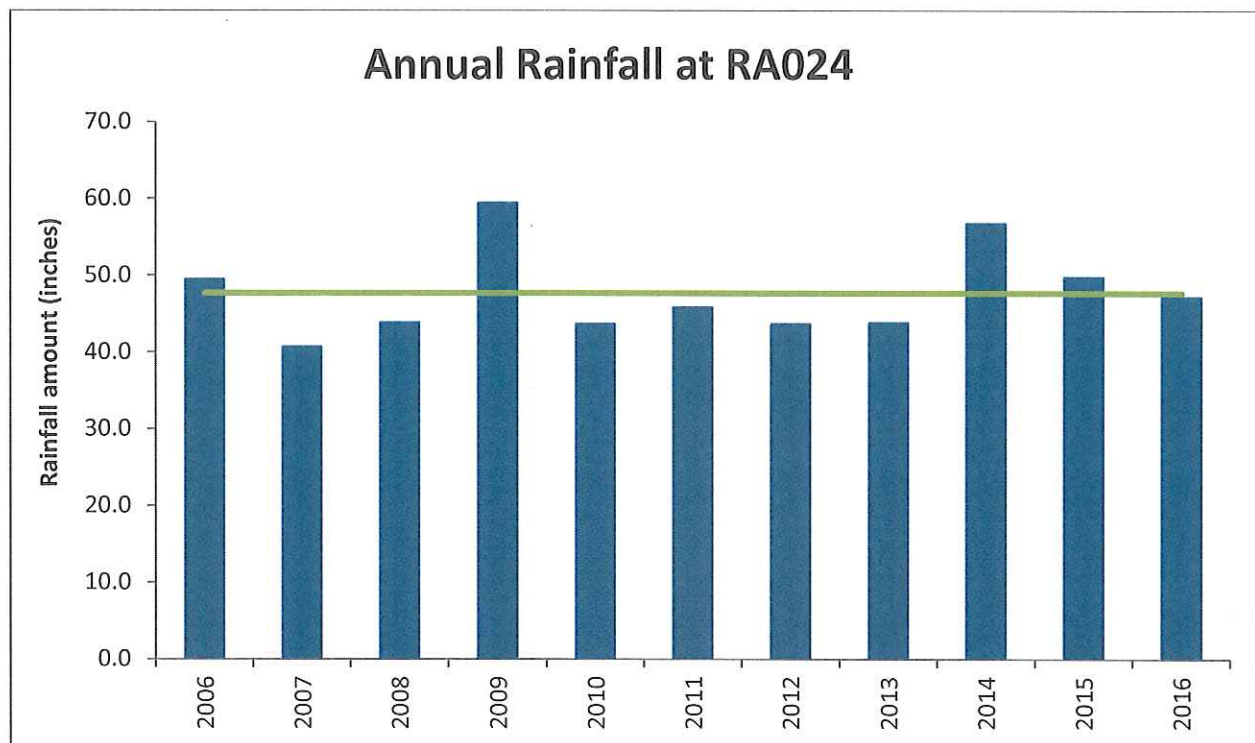
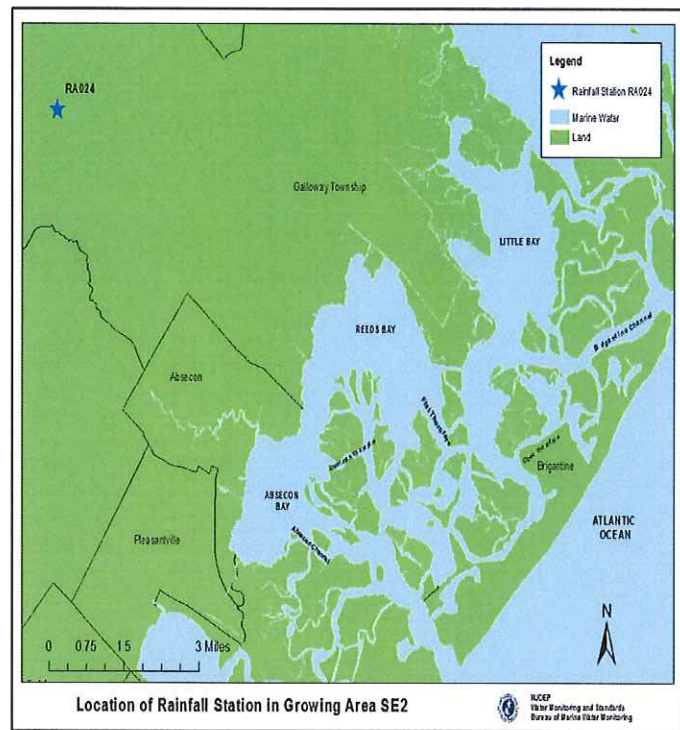
Compliance with NSSP SRS Criteria



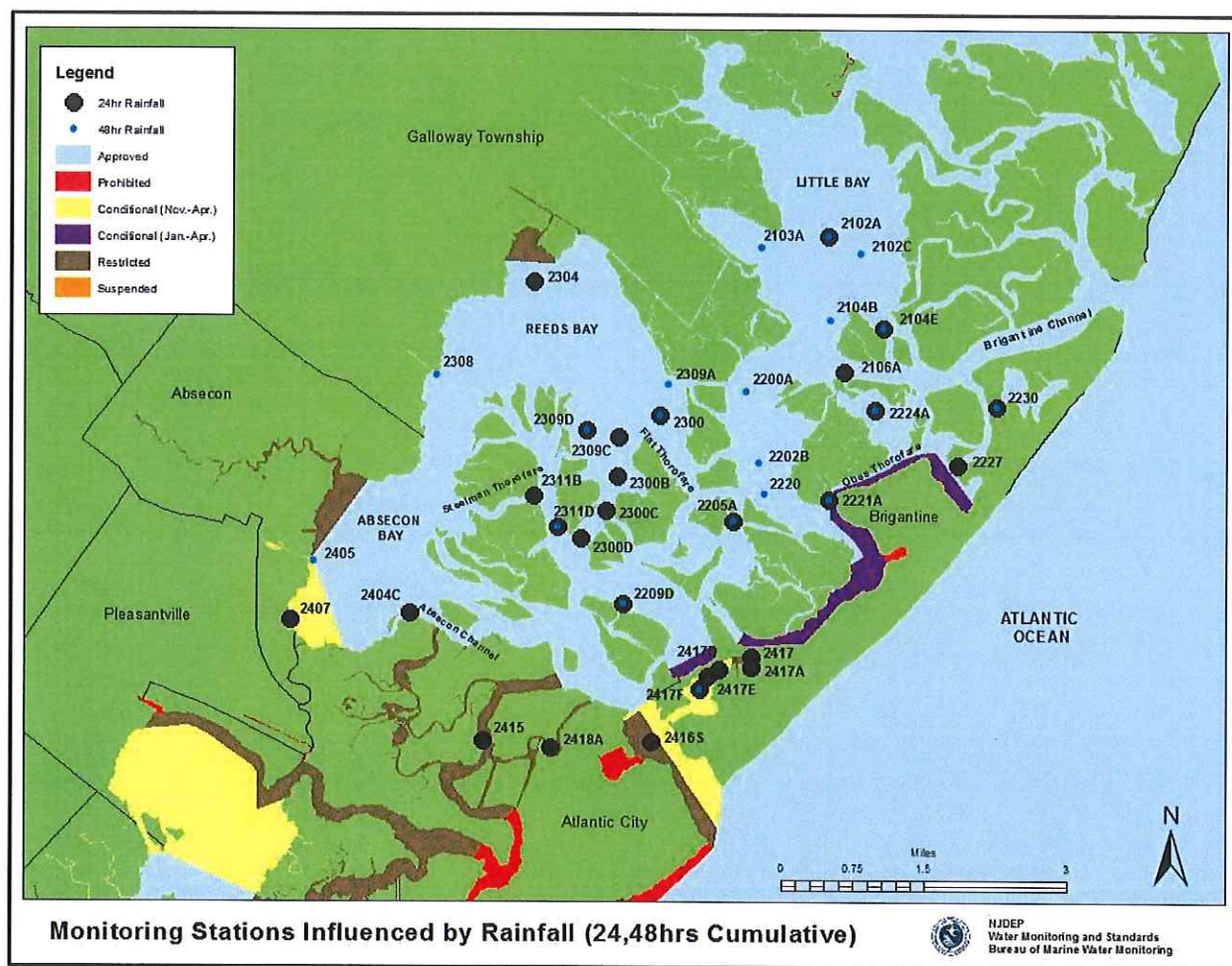
There are eight monitoring stations exceeding the SRS *Approved* criteria, however only three of these stations are located in *Approved* waters. At these three sites there were rainfall and seasonal components present. These stations are located in the wildlife refuge. Waterfowl were observed at these locations and most likely contributed to the high counts at the failed sites. Rainfall impact is mainly due to runoff, carrying contaminants to these sites from nearby land masses. All three of these sites had a summer seasonal influence. There were no noticeable changes in shoreline, hydrography or land use that would require modification to the existing shellfish classifications. The bacteria levels at these stations are historically low and there seems to be no pattern to the higher counts. Since the elevated bacteria counts occur so seldom and likely don't remain elevated for extended periods, no downgrade of waters is recommended at this time.

Rainfall Effects

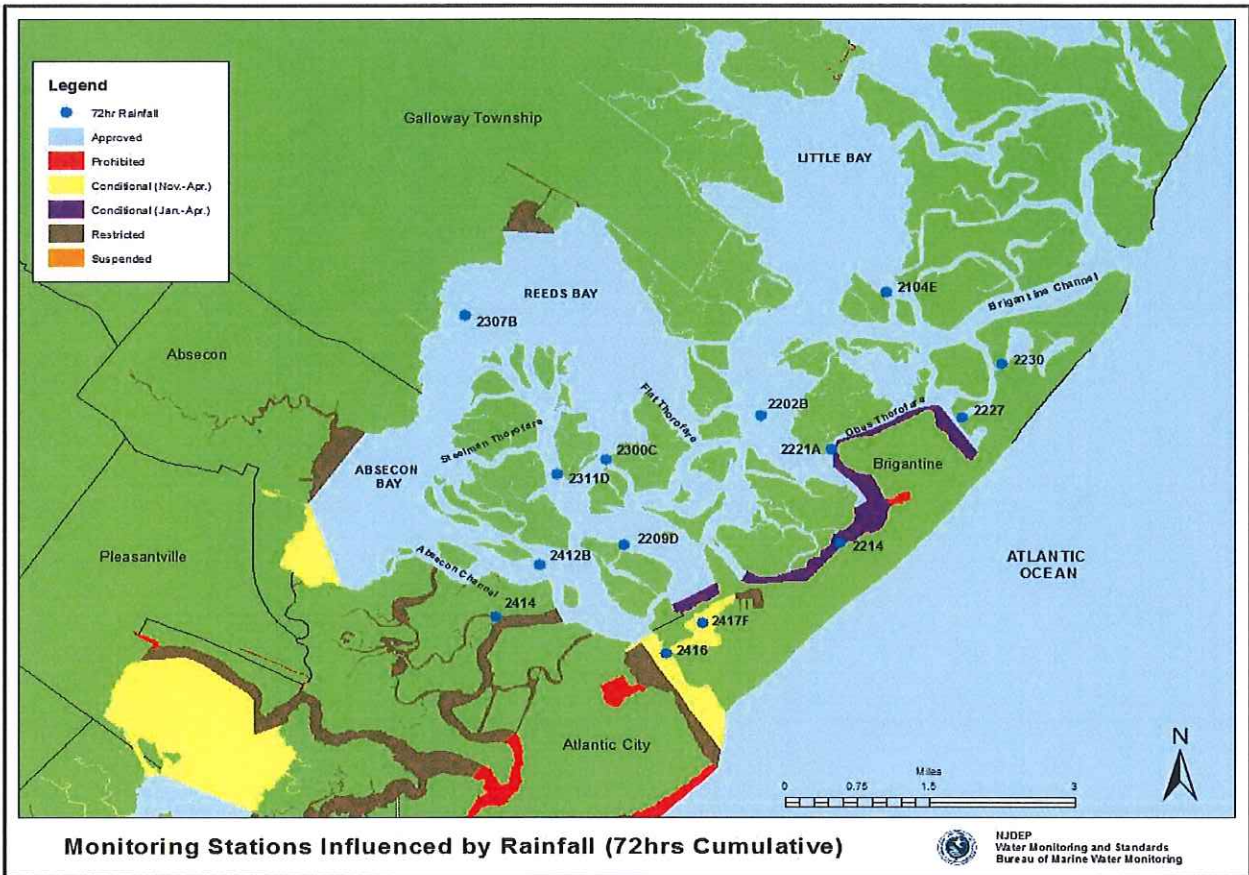
The meteorological monitoring provides valuable contextual data for interpreting water quality implications of short-term weather events and for investigating estuarine responses to longer-term climatic variability (NERRS, 2008). Rainfall amounts are based on the closest established NOAA/National Weather Service station; each assignment run is assigned to a weather station to accurately reflect the rainfall at the sampling stations. Precipitation assessment for this shellfish growing area was based on rainfall data collected at Station RA024. This rainfall station was selected to help determine whether run-off would affect the shellfish waters within this growing area. The annual and average precipitation reported at Station RA024 from 2006 through 2016 is shown in the chart below.



WM&S/BMWM uses the t-test method to assess rainfall effects. This method compares the coliform MPN values from samples collected during dry weather to samples collected during wet weather and identifies areas where runoff can potentially affect water quality. The wet/dry cutoff determines whether a sample was collected under wet or dry conditions. For this growing area, the wet/dry cutoff criterion was set at 0.2 inches, which is the typical standard used for assessing rainfall effects. The t-test calculated the statistical probability for each station based on 24, 48 and 72 hours of rainfall cumulative. Any stations with a t-statistical probability of less than 0.05 are believed to be impacted. Stations that are found to be impacted tend to have a higher coliform count during a rainfall event. However, if they are impacted by rain it does not necessarily mean they are also out of compliance with NSSP.



There are thirty-seven sampling stations in this growing area that are affected by rainfall at 24 and 48 hours cumulative. They are spread evenly throughout the growing area and are most likely affected by runoff.

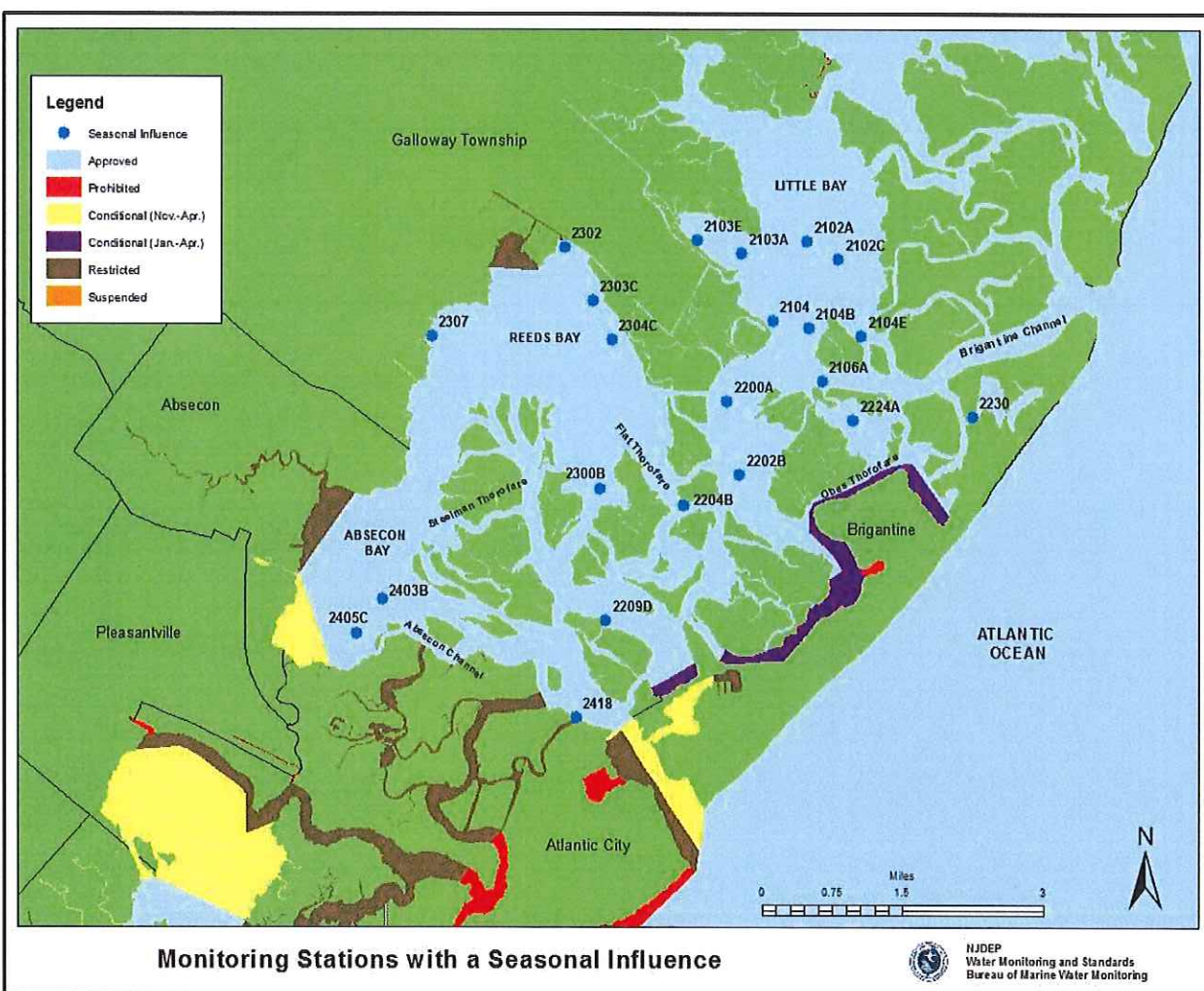


There are fourteen stations in this growing area that were affected by rainfall at 72 hours cumulative. The delayed effect of the rainfall can be explained by the fact that some of these stations are surrounded by salt marshes and it takes longer for the contaminants to filter through. Two of the stations affected by rainfall did not meet their current classification criteria. These two stations (2202B and 2209D) are located near small land masses where waterfowl gather. The elevated coliform levels following rain events are likely due to runoff from the nearby land masses and don't remain elevated therefore no downgrade of growing waters is being recommended at this time. These stations will be closely monitored moving forward and reevaluated as necessary.

Seasonal Effects

Temperature, precipitation, wind and the general circulation of the atmosphere have seasonal variations that also affect the marine environment (Ingmanson and Wallace, 1989). Seasonal variation may also be the result of a variety of conditions, including specific agricultural land-use practices, biological activity, stream flow and/or sediment.

To determine whether seasonal variation can influence bacteria counts, WM&S/BMWM uses a t-test to compare the coliform MPN values from samples collected during the summer season versus samples collected during the winter season. Based on the t-test results, twenty-two monitoring stations had a t-statistical probability of less than 0.05. Three of the stations affected by season did not meet their current classification criteria. These three stations (2202B, 2204B and 2209D) show a higher summer geometric mean. The elevated coliform levels are likely due to summer and wildlife related activities and don't remain elevated therefore no downgrade of growing waters is being recommended at this time. These stations will be closely monitored moving forward and reevaluated as necessary.



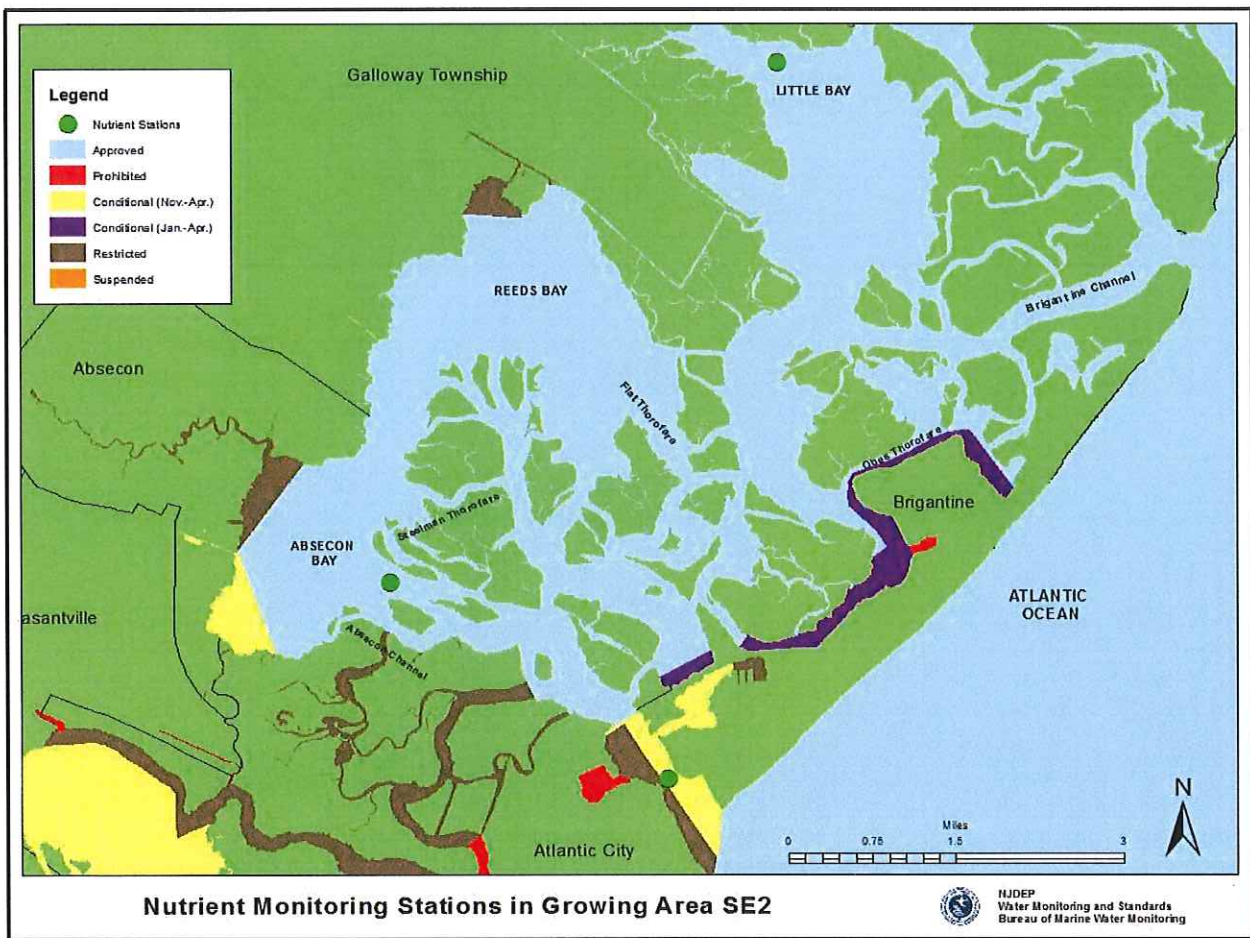
RELATED STUDIES

Nutrients

WM&S/BMWM performs additional water quality studies related to the bacteriological monitoring program. Nutrient monitoring and the collection of nutrient data as part of the NJ Coastal Monitoring Network is an example of one of those studies.

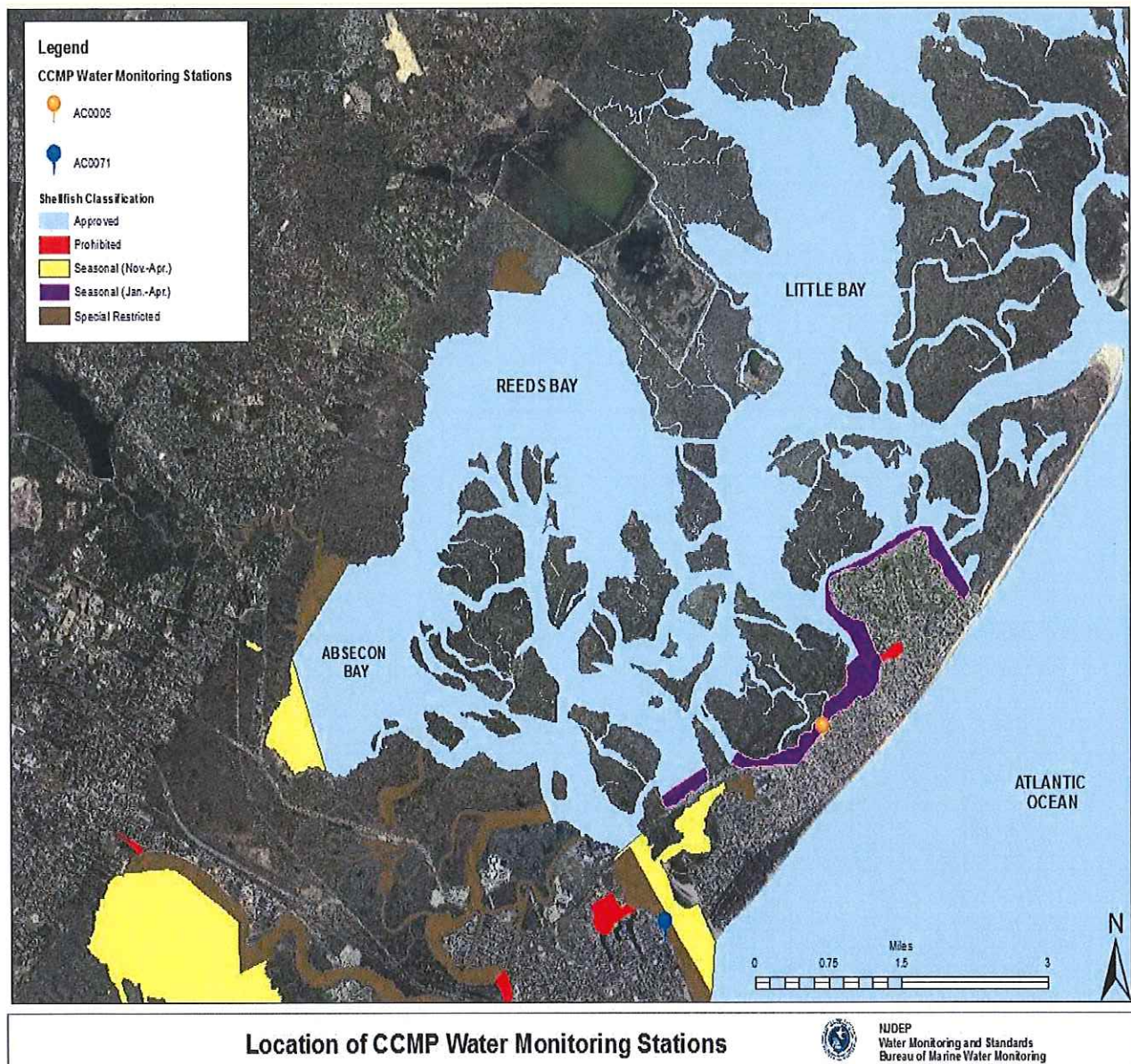
Nutrient stations are sampled monthly on a biennial basis. The 90 nutrient stations are spread throughout the State's back bay waters and tidally impacted rivers. At these nutrient monitoring sites, various parameters are measured including water temperature, biogenic silica, chlorophyll a, pH, salinity, secchi depth, total suspended solids, dissolved oxygen, ammonia, nitrate and nitrite, orthophosphate, total nitrogen and total phosphorus. WM&S/BMWM compiles the results of nutrient levels from such stations and then prepares a separate report. For full nutrient assessment, see the Estuarine Monitoring Reports, available at: <http://www.state.nj.us/dep/bmw/>.

Three nutrient monitoring sites sampled under the estuarine monitoring program are located within this shellfish area. Between 2011 and 2016, water samples were collected and analyzed for various parameters (listed above). The map below displays the location of the nutrient monitoring site.



Cooperative Coastal Monitoring Program

NJDEP, along with the New Jersey Department of Health and Senior Services and local health agencies, implements the Cooperative Coastal Monitoring Program (CCMP) which is responsible for conducting sanitary surveys of beaches and monitors the concentration of bacteria in coastal and estuarine waters that are open to the public for recreational bathing. Samples are taken once a week, usually on Monday, for the entire summer. The samples collected at these sites are tested for Enterococci. Local health agencies and law enforcement may close a beach at any time if the results exceed the State Sanitary Code of 104 Enterococci per 100mL. WM&S/BMWM utilizes these data as adjunct information. The closure of shellfish waters does not necessarily correspond to these results. There are two CCMP sampling sites located within this growing area. For more information regarding this program, bathing beach data and closures, see <https://www.njbeaches.org/>.



CONCLUSIONS

The following conclusions are based on the water quality data from April 2011 through August 2016. Based on NSSP Systematic Random Sampling criteria, three monitoring stations are out of compliance with NSSP *Approved* criteria. These stations are in the *Approved* waters of Absecon Bay, Steelman Bay and Reeds Bay. Historically, coliform counts in these areas have been considerably low. At these three sites there were rainfall and seasonal components present. Rainfall impact is mainly due to runoff, carrying contaminants to open waters via storm drains. All three of these sites had a summer seasonal influence. Waterfowl were observed and most likely contributed to the high counts at the failed sites. There were no noticeable changes in shoreline, hydrography or land use that would require modification to the existing shellfish classifications. Since the elevated bacteria counts occur so seldom and likely don't remain elevated for extended periods, no downgrade of waters is recommended at this time.

RECOMMENDATIONS

Even though the data suggests a downgrade due to elevated bacteria counts, no downgrade is recommended at this time. WM&S/BMWM will continue to closely monitor the area and if water quality continues to decline, WM&S/BMWM will downgrade waters appropriately.

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Supporting Documentation

Data Sheets - Reappraisal Report for Shellfish Growing Area SE2 (Absecon Bay-Reeds Bay), April 2017 see the Shellfish Growing Area Reports section at www.state.nj.us/dep/wms/bmw.

Shoreline survey field notes and pictures - Reappraisal Report for Shellfish Growing Area SE2 (Absecon Bay-Reeds Bay), April 2017 see the Shellfish Growing Area Reports section at www.state.nj.us/dep/wms/bmw.

APPENDICES

A. Data Listing – April, 2011 through August , 2016

1. Seasonal Evaluation
2. Wet/Dry Statistics
3. Rainfall Amount

B. Shoreline Survey Sheets