



NJ Department of Environmental Protection
Water Resource Management
Division of Water Monitoring & Standards

COOPERATIVE COASTAL MONITORING PROGRAM 2017 Summary Report



March 2018

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New Jersey Department of Environmental Protection
Water Resource Management

Division of Water Monitoring and Standards
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Cover Photo – New Jersey Coastline (photo by Steve Jacobus, NJDEP)

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Introduction

The Cooperative Coastal Monitoring Program (CCMP) is New Jersey's "beach program" which is coordinated by the New Jersey Department of Environmental Protection's Division of Water Monitoring and Standards in cooperation with the New Jersey Department of Health. The CCMP assesses coastal water quality at recreational bathing beaches and investigates sources of water pollution to protect public health and safety. The information collected under the CCMP assists the Department in responding to immediate public health concerns arising from contamination at coastal recreational bathing beaches. Agencies that participate in the CCMP perform sanitary surveys of recreational bathing beaches and monitor concentrations of bacteria in nearshore ocean and estuarine waters to assess the acceptability of these waters for recreational bathing. Funding for the CCMP comes from the NJ Coastal Protection Trust Fund and the United States Environmental Protection Agency (EPA) Beaches Environmental Assessment and Coastal Health (BEACH) Act grants. BEACH Development and Implementation grants have also been awarded in the years 2001 through 2017. The Department designs the beach sampling and administers the communication, notification and response portion of the CCMP. BEACH grant funding is passed through to four county health agencies participating in the CCMP that perform weekly sample collection and analysis. The participating agencies are:

Atlantic County Health Department
Cape May County Health Department
Monmouth County Health Department
Ocean County Health Department

Additional assistance is provided by the following agencies:

Atlantic City Health Department
Long Beach Island Health Department
Long Branch Health Department
Middletown Health Department
Monmouth County Regional Health Commission
New Jersey Department of Health

As part of this program, the Department's Division of Water Compliance and Enforcement routinely inspects 17 wastewater treatment facilities that discharge to the ocean (Appendix 1). The Department also performs aerial surveillance of New Jersey nearshore coastal waters and Hudson-Raritan estuaries six days a week (May thru September) to observe changing coastal water quality conditions as well as look for floatables and other potential pollution sources. The Department's Clean Shores Program, also administered by the Division of Water Monitoring and Standards, provides assistance year-round through the Department's partnership with the New Jersey Department of Corrections by conducting daily clean ups of back bays and beaches removing floatable debris such as wood, recyclables, and medical waste (www.nj.gov/dep/wms/cleanshores.html).

CCMP Procedures

New Jersey State Sanitary Code Chapter IX Public Recreational Bathing N.J.A.C. 8:26 and the *New Jersey Department of Environmental Protection Field Sampling Procedures Manual* prescribe the sampling techniques and beach opening and closing procedures the agencies use for the CCMP.^{1, 2} The agencies perform routine weekly sampling from mid-May through Labor Day. Samples are analyzed for enterococci concentrations by Department-certified laboratories using EPA approved methods; analyses provide results within 24 hours of sampling. Counties submit water monitoring data to the Department in electronic format after each sampling event using the Department's web-based Beach Monitoring System. To satisfy EPA's grant requirements, at the end of each beach season, the Department uploads both beach monitoring and notification data to two

EPA-supported data systems.

In 2017, the CCMP monitored at 217 water quality stations: 186 ocean, 21 bay and 10 river stations. Stations are located at recreational bathing beaches (Figure 1). Stations are sampled to protect recreational bathers from elevated levels of bacteria and to develop long term water quality trends. Monitoring stations are selected to be representative of recreational water quality and to ensure adequate spatial coverage. The sample results from these beaches are intended to represent the water quality at several lifeguarded beaches in an area rather than just one lifeguarded beach. Other ocean beaches are assigned monitoring stations when impacts from potential pollution sources are possible. A monitoring station is assigned at each recreational bay beach because of their noncontiguous locations. All monitoring station selections are done by the participating health agencies in consultation with the Department.

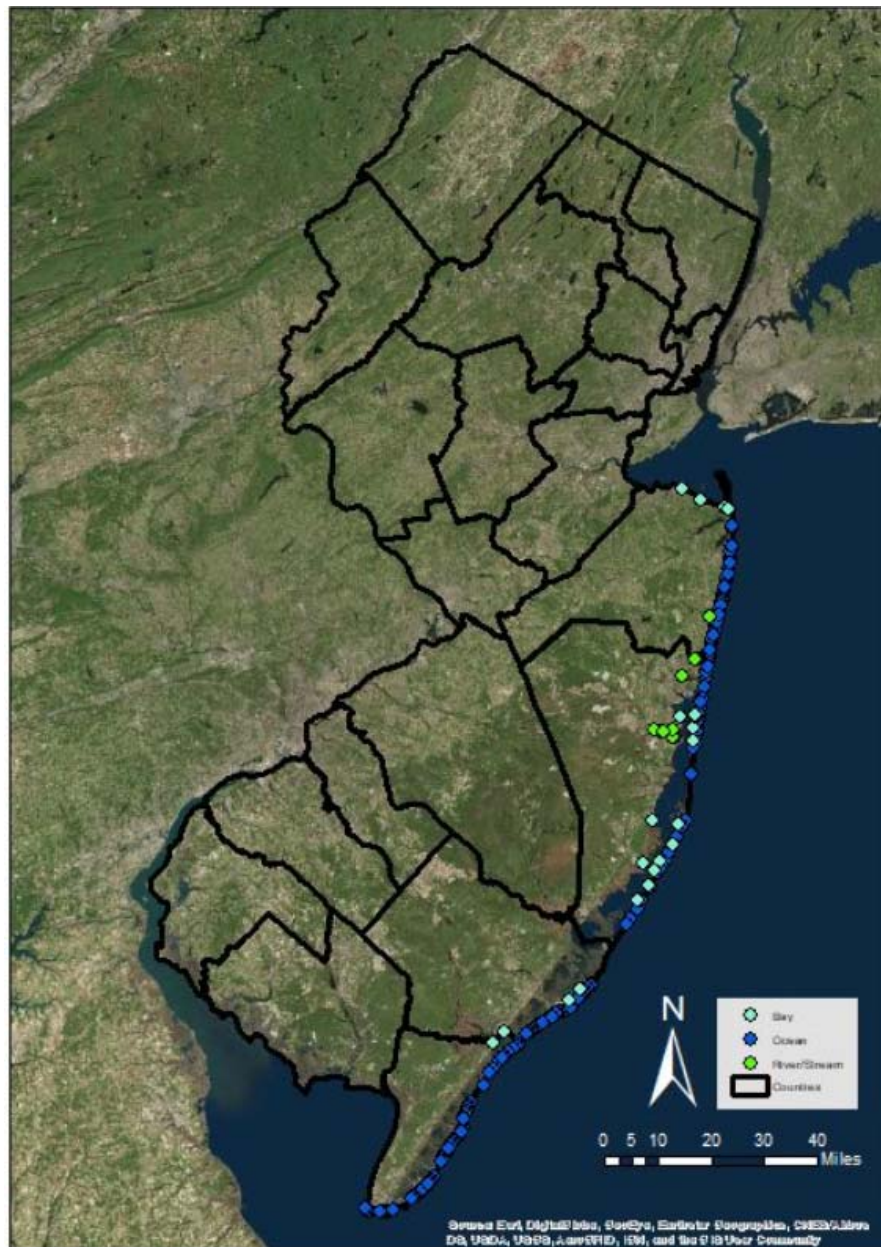


Figure 1. New Jersey's 2017 CCMP Beach Stations

Recreational beaches are subject to the opening and closing procedures of the State Sanitary Code and, therefore, must be resampled when bacteria concentrations exceed the water quality standard. Since 2004, the State Sanitary Code has required monitoring for enterococci bacteria with a water quality standard of 104 colony forming units (cfu) per 100 mL of sample. In 2012, EPA released revised recreational criteria for marine beaches. A new Statistical Threshold Value (STV) of 110 cfu of enterococci per 100 mL of sample was shown to be most protective. Since New Jersey’s current water quality standard of 104 cfu/100 mL is at least as protective as the revised EPA criteria, no change has been made to the New Jersey State Sanitary Code.

Since 2012, all health agencies now issue advisories to the public on an initial exceedance of the water quality standard. Consecutive samples that exceed the water quality standard require the closure of the beach until a sample is obtained that is within the water quality standard. When high bacteria concentrations are recorded, the sampling is extended linearly along the beach to determine the extent of the problem and the pollution source. This “bracket sampling” can result in an extension of the ocean beach closing to contiguous lifeguarded beaches. Resamples are always performed in conjunction with a sanitary survey, which includes identifying possible pollution sources and observing water and shoreline conditions.

Beaches may be closed when bacteria levels exceed the water quality standard or as a precautionary measure in response to an environmental condition, such as a heavy rain event or an infrastructure issue such as a sanitary sewer overflow. Health or enforcement agencies may close beaches at any time at their discretion to protect the public’s health and safety.

2017 Results and Discussion

A beach action is defined as an initial exceedance advisory, precautionary closure, a closure due to floatables or a closure due to exceedance of the water quality standard. In 2017, the total number of beach actions was 106; 66% of the actions were at ocean beaches and 34% at bay and river beaches. During the beach season, there were only 23 days where action was taken. In 2017, there were 54 advisories posted at ocean beaches and 24 advisories at bay or river beaches, down from 76 and 44 advisories, respectively in 2016. There were 16 closures of 15 ocean beaches; however, all 16 closures occurred during only 5 days throughout the season. There was one ocean beach in Ventnor City closed as a precaution because a nearby beach exceeded the water quality standard (Figure 2). There were 12 closures of 10 bay or river beaches; however, all 12 closures occurred during only 6 days throughout the season (Figure 3).

Table 1: Number of Ocean Beach Actions from 2010-2017

<u>Ocean Beaches</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>
Bacterial Closure	0	3	5	0	5	2	3	15
Precautionary Closure	4	0	7	4	0	2	1	1
Rainfall Provisional Closure	60	87	57	76	15	0	0	0
Floatables Closure ¹	0	0	101	0	3	0	0	0
Advisories	15	9	10	3	12	20	76	54
Total Actions	79	99	180	83	35	24	80	70

Note: Precautionary rainfall beach closing policy at the four ocean beaches surrounding the Wreck Pond outfall from 2010-2013. The policy was removed at these ocean beaches beginning in 2014.

¹ In 2012, an unusually heavy rain event in the New York Harbor area the previous week caused combined sewers in New York and northern New Jersey to overflow into shared waters. Trash and debris from this event is the probable cause of the washup on Long Beach Island.

Table 2: Number of Bay & River Beach Actions from 2010-2017

Bay & River Beaches	2010	2011	2012	2013	2014	2015	2016	2017
Bacterial Closure	7	8	13	8	1	18	10	12
Precautionary Closure	3	0	0	0	0	0	0	0
Rainfall Provisional Closure	17	21	4	0	2	0	0	0
Floatables Closure	0	0	0	0	0	0	0	0
Advisories	1	4	48	15	19	40	44	24
Total Actions	28	33	65	23	22	58	54	36

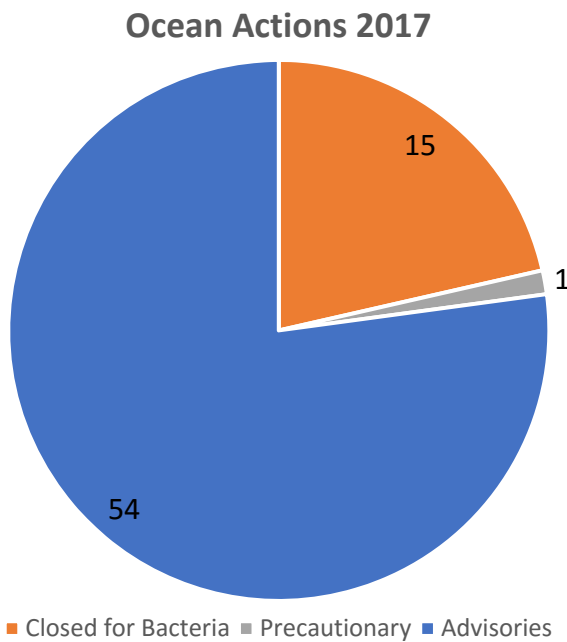


Figure 2: Ocean beach actions in the 2017 season

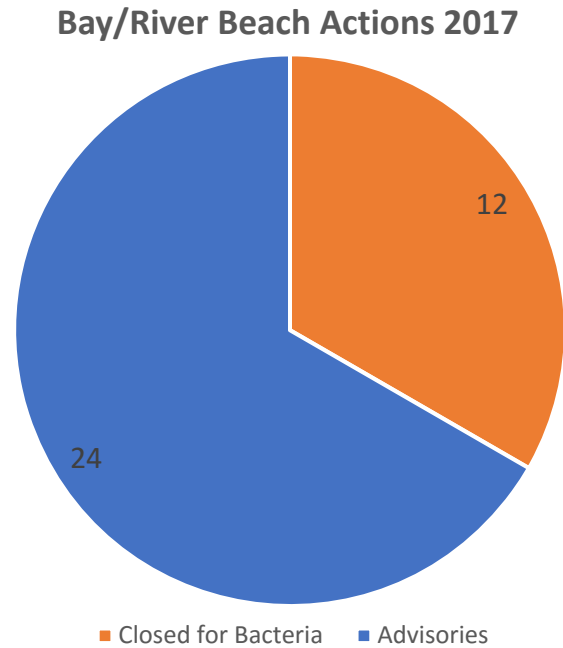


Figure 3: Bay/river beach actions in the 2017 season

Ocean Summary

Figure 4 depicts the number of ocean exceedances each year from 2010-2017 compared to the total number of samples taken for that year. Samples include both primary and bracket station results. In 2017, only 2.7% of all ocean samples exceeded the water quality standard (94 exceedances out of 3,398 samples). Figure 5 indicates the total number of beach actions (advisories, precautionary closures, closures due to floatables, and closures due to exceedance of the water quality standard) at ocean beaches from 2010-2017. *Note that during 2010-2014, many of the beach closings were due to precautionary rainfall closings.*

Beaches may be closed as a precaution for any reason at any time to protect public health and may occur without water testing. Most precautionary closings were a result of beaches, with known stormwater pollution problems, automatically closing after rain events (precautionary rainfall closings). When it rains, water flows across the landscape, over lawns, parking lots, and streets. The water is typically untreated when traveling along gutters, into catchment basins, through storm drain pipes and ditches, until finally arriving at stormwater outfall pipes that flow into local waterbodies. Along the way, the stormwater picks up trash (fast-food wrappers, cigarette butts, styrofoam cups, etc.), toxins, and various pollutants (gas, motor oil, antifreeze, fertilizers, pesticides and pet waste). Thus, rainfall has the potential to increase bacterial contamination in these waters depending on the proximity of stormwater outfall pipes to recreational bathing beaches.

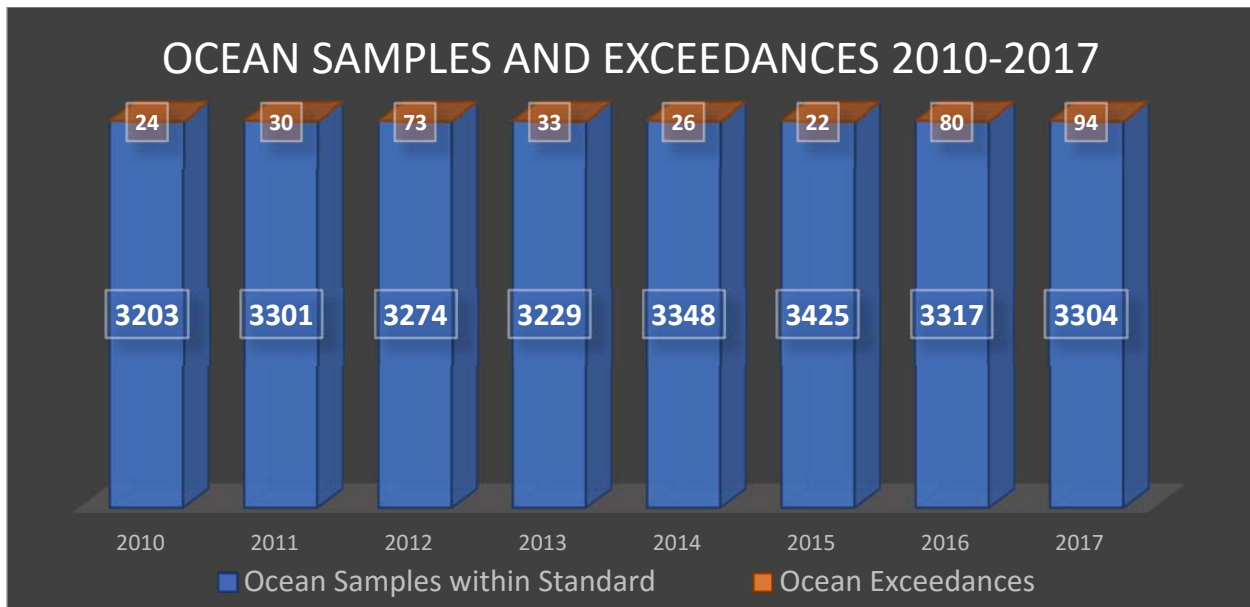


Figure 4: Annual Ocean Beach Exceedances vs Acceptable Samples Between 2010-2017

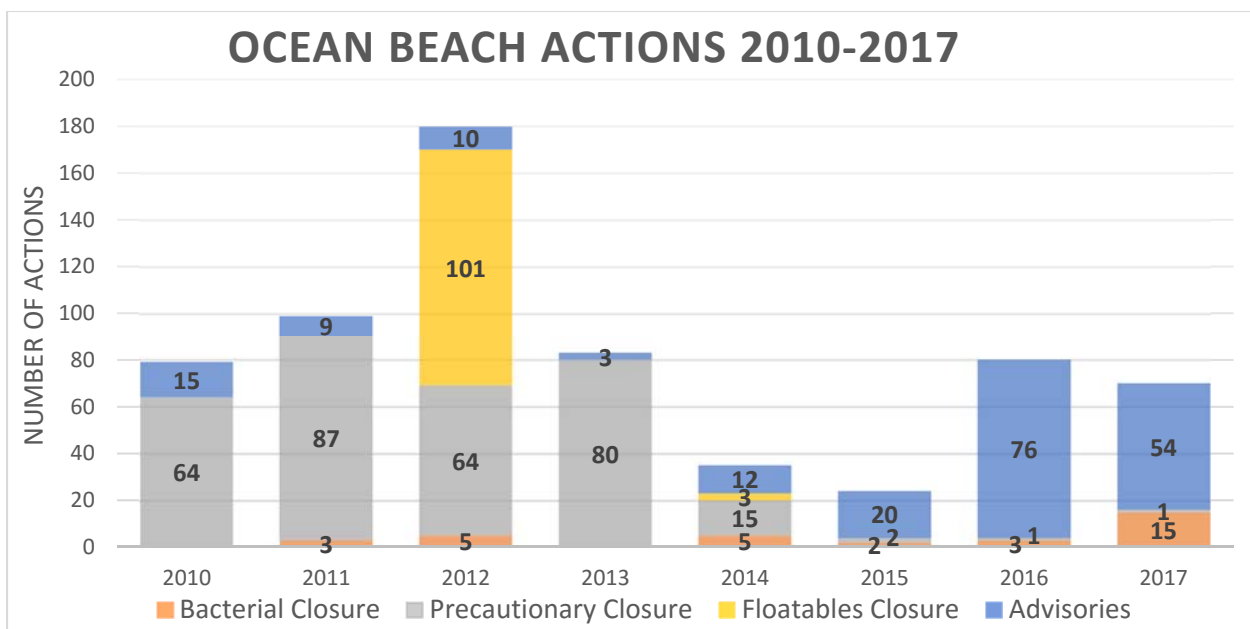


Figure 5: Ocean Beach Actions taken between 2010 and 2017

There are no longer precautionary rainfall closure policies at NJ beaches. However, the majority of NJ's beach closings are still impacted by stormwater. Typically, beach seasons with greater rainfall amounts correlate to more advisories and bacterial exceedances. While ocean beaches are normally impacted by stormwater for less than 24 hours, it is not advised to swim near a stormwater or coastal lake outfall pipe during this period.

According to the Office of the NJ State Climatologist (ONSC), for the NJ coast from May through September, there was 25.64 inches of rainfall in 2017. Generally, there is a correlation between the amount of rainfall during the beach season and the number of exceedances and beach actions during the same time period. However, in 2017 the number of beach actions dropped even with increased precipitation compared to the previous year. According to the ONSC in 2016, there was a total of 21.82 inches of rainfall from May through September for the NJ coast. Although 2017 had almost 4 more inches of rain than in 2016, there were 28 fewer actions taken (Tables 1 & 2).

Bay Summary

New Jersey has 21 bay beaches and 10 river beaches. Bay and river beaches react differently to rain and stormwater inputs than ocean beaches due to longer residence time and less dilution. Bay beaches are primarily located in Barnegat Bay and river beaches are primarily located on the Toms River (Figure 6). In 2017, there were 612 samples taken from bay/river beaches. Samples include both primary and bracket station results. In 2017, only 10.9% of all bay or river samples exceeded the water quality standard (67 exceedances out of 612 samples) (Figure 7). There are generally more water quality exceedances at bay/river beaches due to the lingering effects of stormwater which is impacted by tide cycles, currents, wind, and geographical features. Figure 8 indicates the total number of beach actions (advisories, precautionary closures, and closures due to exceedances) at bay/river beaches from 2010-2017. The majority of bay and river beach closings are also due to nonpoint source/stormwater impacts resulting from rainfall. The Department has committed to an active source tracking and mitigation program designed to identify and eliminate sources of bacteria. Resources in the form of wet-weather monitoring, source track-down and, when necessary, infrastructure repair are being allocated to make the necessary water quality improvements at these beaches.



Figure 6. Barnegat Bay 2017 CCMP Beach Stations

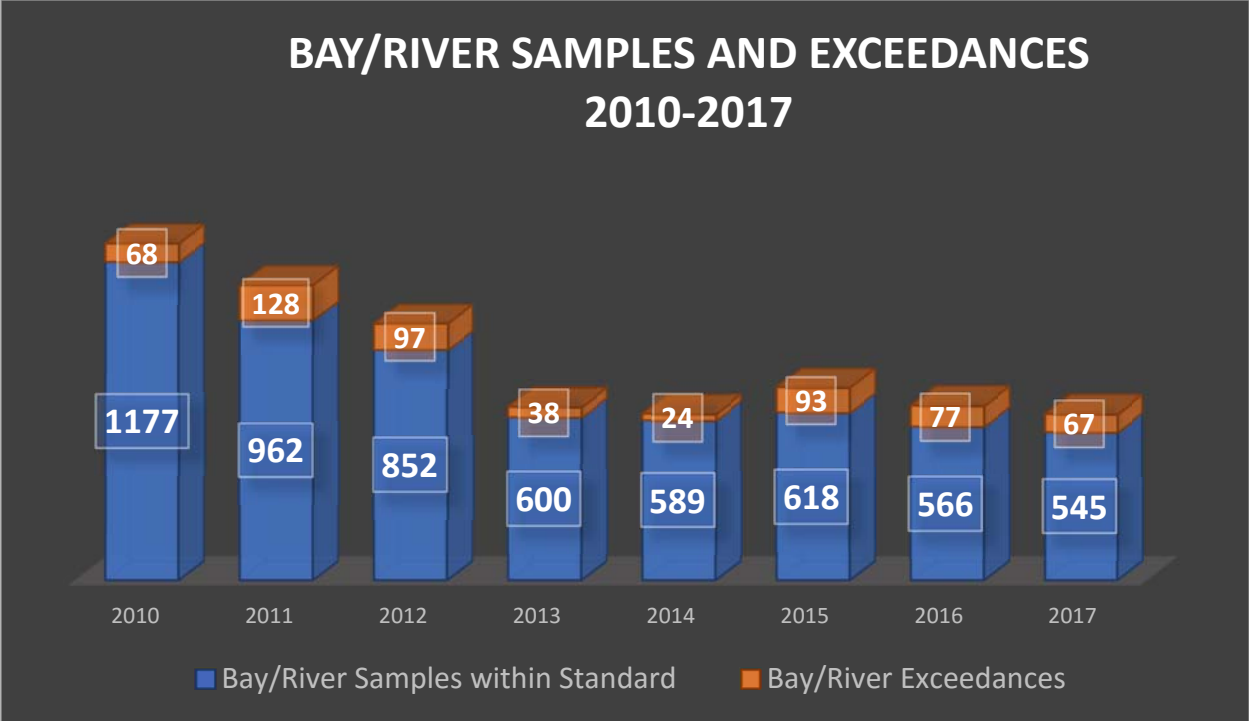


Figure 7: Annual Bay/River Beach Exceedances vs Acceptable Samples Between 2010-2017

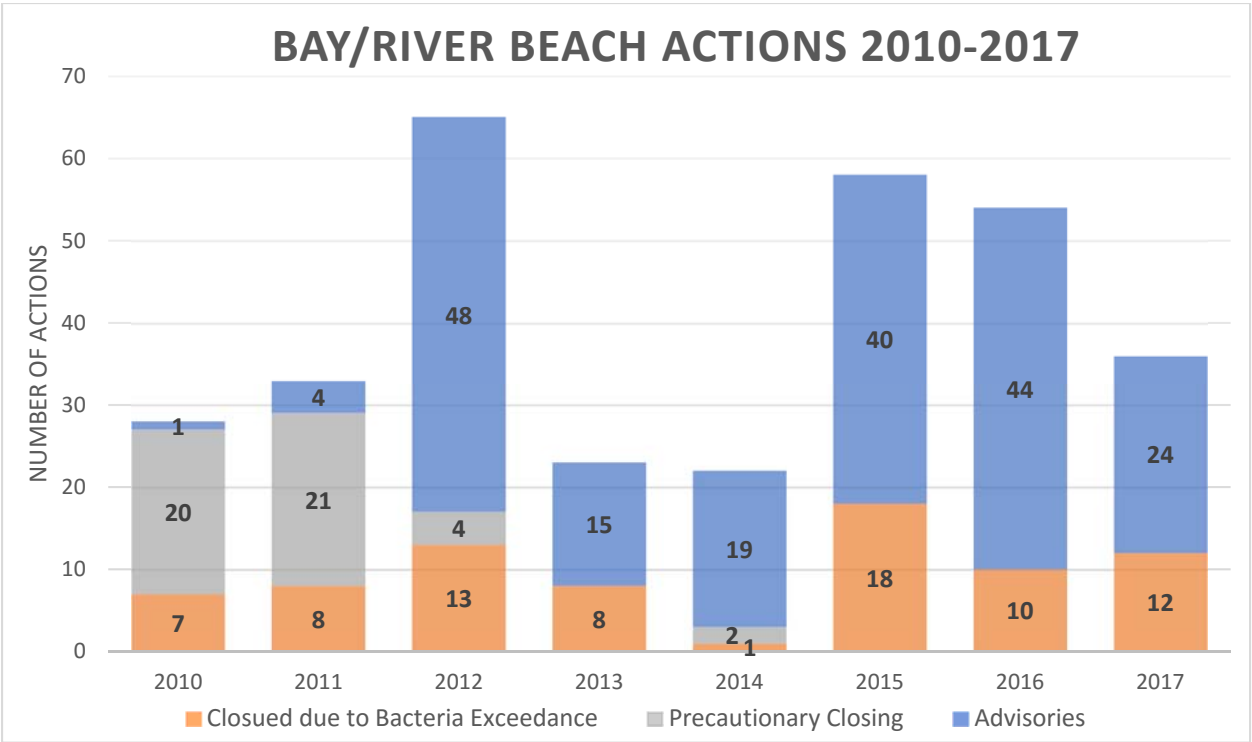


Figure 8: River Beach Actions between 2010 and 2017

Additional Information

In 2017, there were a total of 60 coastal flights, using the Department's Forest Service fixed wing aircraft, to complete visual aerial surveys of New Jersey's coast. 26 flights were cancelled due to poor flying conditions. During flights, various instances of marine biology were reported.

	Dolphins	Whales	Rays	Sea Turtle	Algal Blooms
# of Flights Reported	35	3	15	1	2

Algal blooms were spotted twice, which was followed with testing for potentially harmful phytoplankton at the affected areas. Tests came back negative for harmful algal species.

The CCMP does not record closings related to rough seas, rip tides, beach maintenance projects, shark sightings, and fish and clam wash ups. The CCMP also does not include those closings that are briefly in effect during the assessment of water conditions by local officials. Only those beach closings ordered by local health officials which are a result of water quality are included.

Beach conditions, advisories, and beach closings, and the reasons for beach closings were posted on the DEP web page (www.njbeaches.org) each day. Additionally, when beach closings were necessary, the county or local health agency posted "No Swimming" signs at the beach. Signs remained posted until the swimming ban was lifted.

Special Areas of Interest

Geographic Mean

The Department utilizes geomeans to find areas with water quality issues. To calculate the geomean, results from 5 sampling events are needed during a 30-day period. The water quality standard is that a bathing beach shall not have a geomean over 30 cfu/100mL. If this occurs, a sanitary survey is required to investigate potential sources of pollution. Seasonal geomeans are calculated for beaches when they have reached the threshold once in the season. Seasonal geomeans utilize all the data from that season to determine which areas may have persistent problems that need to be further addressed. In 2017, 5 beaches obtained seasonal geomeans over 30 cfu/100mL. Those beaches were Beachwood Beach West, Windward, Highland Rec Center, Ideal, and Miller Beach. Specific actions undertaken, as a result of this information, are below. In addition, Wreck Pond and Margate garnered special attention during 2017.

Beachwood Beach West

Beachwood Beach West is a recreational bathing beach in Beachwood Borough, Ocean County, located on the Toms River which has experienced frequent beach closures due to bacteria exceedances. These closures have been associated with rainfall conditions as the waters of this beach are impacted by as little as 0.1 inch of rain. The Department conducted a sanitary survey to identify potential sources of pollution; sampling stations were strategically picked to represent potential problem sources identified in the sanitary survey. Fourteen (14) stations were sampled over ten (10) sampling events during dry weather, numerous tide cycles, and intensive wet weather storm events. The results identified two nearby stormwater outfalls as the main contributors of bacterial pollution at the beach. In addition, it was found that the tidal movement and shoreline configuration held the water inland near the beach resulting for a longer duration, limiting mixing and thereby causing multi-day exceedances. Working with local stakeholders, infrastructure repairs were completed and the two nearby stormwater outfalls were combined and relocated away from the recreational bathing beach. This resulted in a reduction in the number of beach closures during rain events with 0.5 inches of rain or less.

Windward

Windward beach is located on the Metedeconk River in Ocean County. The Metedeconk River flows into northern Barnegat Bay. Water here, due to topography, has a high residence time, meaning that water stays in

this region for a long period of time without being flushed out into the ocean. The Department has been focusing on the health of Barnegat Bay for over 10 years and, in October 2017, published the Barnegat Bay Restoration, Enhancement, and Protection Strategy (BB REP) (<http://www.nj.gov/dep/barnegatbay/docs/BarnBay-REPS.pdf>). The BB REP is a comprehensive watershed wide plan to improve water quality through several initiatives including the implementation of the Metedeconk Watershed Restoration Plan. Windward beach will benefit from the implementation of this plan.

Highlands Rec Center

During the 2017 beach season, Highlands Recreational Center beach in Monmouth County experienced abnormally high bacteria levels and was closed to recreational bathing until further investigation. Analysis found an association between enterococcus levels and rainfall intensity. The Department conducted a sanitary survey and began monitoring. Results indicated elevated levels of bacteria near the stormwater outfall. Using Antibiotic Resistance Analysis (ARA), it was determined that a human source was contributing to the bacterial pollution. In collaboration with local stakeholders, dye testing and video of the storm and sanitary infrastructure was completed and found to be compromised. Repairs were completed and follow up samples confirmed the fix was effective. The beach was then able to be reopened.

Ideal and Miller Beach

Ideal and Miller Beach, in Monmouth County, are about 9 miles away from one another. These beaches are located on the bay side of Sandy Hook. Water from the Navesink and Shrewsbury Rivers passes by these beaches before it reaches the ocean. In 2015, the Department downgraded 565.7 acres of shellfish growing waters from a Restricted to Prohibited classification due to elevated bacteria levels in the Navesink River. The Department continued pollution source track downs in the Navesink River in 2016 by conducting ebb and flood tide studies in July. In January, March, and May of 2017, storm surveys were conducted to measure fecal coliforms levels. The Department and its partner, Clean Ocean Action, initiated a citizen science project in the Navesink River in June 2017. The goal of this initiative is to address water quality issues by obtaining data on a weekly basis across all seasons to quantify water quality in all possible weather and seasonal conditions. Eighteen sampling locations were strategically chosen. Between June and December, a total of 29 sampling events took place and 343 samples were analyzed. Through this initiative, mitigation and infrastructure repairs have been addressed. The Department is committed to this project and anticipates continued sampling and repair efforts that address water quality issues in this area.

Wreck Pond

From 2002-2013, the beaches surrounding the Wreck Pond outfall experienced significant numbers of precautionary beach closings due to potential contamination from the pond reaching bathing beaches after rainfall. For years, the Department worked with local stakeholders to look at sources of contamination to the pond, flooding around the pond, and options for addressing these problems. In 2011, the Department developed the Wreck Pond Restoration Action Plan to focus efforts to remediate sources of bacteria and reduce flooding. After years of collecting extensive data, several restoration projects, infrastructure assessment and infrastructure improvements, the provisional rainfall closure policy was lifted beginning with the 2014 beach season. For more information, reports and monitoring data on Wreck Pond and the progress of restoration, go to: <http://www.nj.gov/dep/wreckpond/>.

Restoration projects include:

- In 2009, Monmouth County Department of Public Works and Engineering installed 14 stormwater manufactured treatment devices in the Wreck Pond watershed using a Corporate Business Tax and 1985 Wastewater Treatment grant. The funding also supported the Department-approved Wreck Pond Watershed Restoration Implementation Plan, a Conceptual Design and Feasibility Study for a Living Shoreline and Berm at Wreck Pond, the Manufactured Treatment Device Post Installation Review, and an Anadromous Fish Study conducted in the spring and fall of 2014.
- In 2013, a Hurricane Irene FEMA grant was used to install a sluice gate on the existing outfall pipe and reconstruct a berm to inhibit a coastal storm surge.

- The Borough of Spring Lake used an EPA grant to conduct an infrastructure assessment in 2013. The assessment revealed an illicit connection that was immediately terminated. They also received an Environmental Infrastructure Trust principal forgiveness loan to conduct needed repairs revealed during the assessment. Improvements were completed in May 2015.
- Monmouth County has conducted four phases of spot dredging at Wreck Pond, removing about 55,000 cubic yards of sediment.
- The US Fish & Wildlife Service received a Department of Interior Hurricane Sandy grant to improve aquatic conductivity in Wreck Pond. The Borough of Spring Lake also received a Corporate Business Tax grant to improve water quality in Wreck Pond, and received a US Department of Housing and Urban Development, Community Development Block Grant-Disaster Recovery Program Flood Hazard Risk Reduction and Resiliency Grant (CDBG) to reduce flood risk. Together, these grants funded the construction of a second outfall at Wreck Pond. The new concrete culvert measures 5.5 feet by 8 feet by 600 feet and includes a knife gate that can be closed during storm events, if necessary. The new pipe improves water quality by increasing natural tidal flow resulting in increased tidal flushing, improves aquatic conductivity with natural lighted vents, and more than doubles the capacity of water discharging from Wreck Pond during flood conditions thereby minimizing flood risk to the surrounding community. The outfall was completed in November of 2016.

In 2017, the four beaches adjacent to the Wreck Pond outfall exceeded the water quality standard 16 times with 13 advisories and 3 closures. Therefore, the new outfall will remain closed during the summer to mitigate impacts to the recreational bathing beaches.

Margate

Overnight from July 28 to 29, more than 3 inches of rain fell in a short period of time. Consequently, rainwater pooled on the Margate beach near a beach replenishment operation. To remedy the situation, since the rainwater was not infiltrating into the ground, the US Army Corps of Engineers began to pump the water into the ocean on August 1st. The Department and the Atlantic County Health Department (ACHD) were onsite to monitor and assess the water quality impacts. The beach was temporarily closed during the discharge. ACHD collected 8 samples on August 2nd. All results were within the water quality standard and the Department and ACHD determined there was no water quality impact at the recreational bathing beaches. As a result of the recent drainage issues caused by the beach replenishment, five new stormwater outfalls are being installed. These new outfalls will be monitored closely to ensure there is no impact to the adjacent recreational bathing beaches.

Related Program

Clean Shores

Non-recreational shorelines that have been left unattended serve as reservoirs for floatable debris and trash that can be refloated during coastal storms and extreme high tides. This trash and debris can wash up on recreational beaches, become floating hazards to navigation, or impact marine life. The Department has a unique program that uses state correctional facility inmates to remove floatable debris from the shorelines of the Hudson, Raritan, and Delaware estuaries, tidal shorelines, and barrier island bays. The Clean Shores Program conducts these shoreline cleanups year-round (www.state.nj.us/dep/bmw/cleanshore.html). The program is entirely funded by the sale of the “Shore to Please” license plates. In 2017, 2.26 million pounds of debris was removed from 149.8 miles of shoreline (Figure 9). The mileage cleaned and total number of pounds of debris removed changes each year depending on the number and severity of coastal storms and their impact on tidal shorelines. More than 150 million pounds of debris has been removed from New Jersey’s tidal shorelines since the program began in 1989. The Clean Shores Program has cleaned and re-cleaned more than 3,310 miles of the state’s coastal shores in the last 28 years.

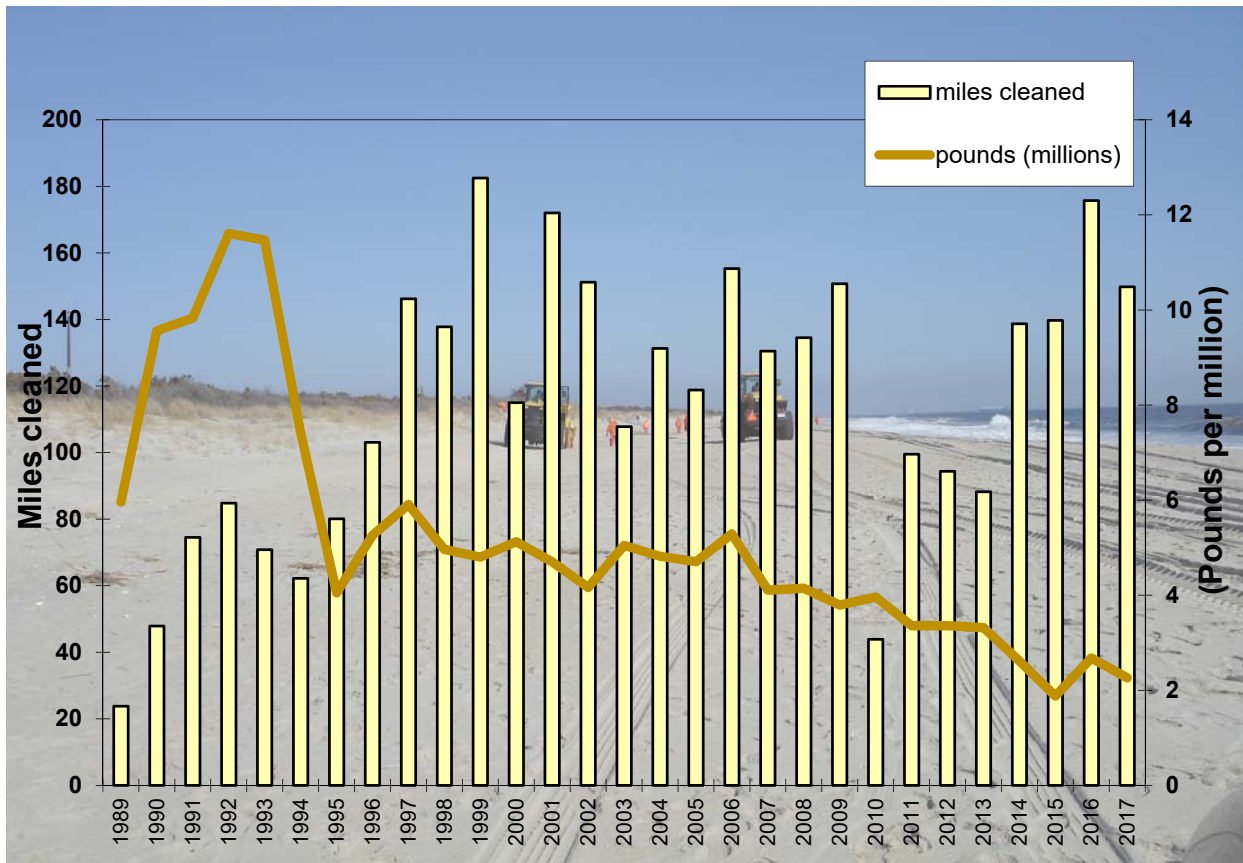


Figure 9: Total amount of debris removed by Clean Shores Program since start of program

Additional Information

For additional information about the CCMP, the Clean Shores Program, or New Jersey’s beach monitoring in general, contact Sheri Shifren at 609-984-0289 or Sheri.Shifren@dep.nj.gov or visit the Program’s website at www.njbeaches.org.



GET BEACH WATER INFO - WWW.NJBEACHES.ORG

Appendix 1

Wastewater Treatment Facilities Discharging to the Nearshore Coastal Waters

- 1 Monmouth County Bayshore Regional Sewage Authority
- 2 Township of Middletown Sewage Authority
- 3 Northeast Monmouth Regional Sewerage Authority
- 4 Long Branch Sewerage Authority
- 5 Township of Ocean Sewerage Authority
- 6 Asbury Park Sewerage Authority
- 7 Township of Neptune Sewerage Authority
- 8 South Monmouth Regional Sewerage Authority
- 9 Ocean County Utilities Authority, Northern
- 10 Ocean County Utilities Authority, Central
- 11 Ocean County Utilities Authority, Southern
- 12 Atlantic County Utilities Authority
- 13 Cape May County Municipal Utilities Authority, Ocean City
- 14 Cape May County Municipal Utilities Authority, Seven Mile Middle
- 15 Cape May County Municipal Utilities Authority, Wildwood
- 16 Cape May County Municipal Utilities Authority, Cape May Point
- 17 Lower Township Municipal Utilities Authority