



NJ Department of Environmental Protection
Water Monitoring and Standards

COOPERATIVE COASTAL MONITORING PROGRAM
Summary Report for 2006 and 2007



June 2008

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New Jersey Department of Environmental Protection

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Acknowledgements

Cover Photo – New Jersey Coastline

Introduction

The New Jersey Cooperative Coastal Monitoring Program (CCMP) is in the Department of Environmental Protection's Water Monitoring and Standards program. Agencies that participate in the CCMP perform sanitary surveys of beach areas and monitor concentrations of bacteria in nearshore coastal and estuarine waters to assess the acceptability of these waters for recreational bathing. These activities and the resulting data are used to respond to immediate public health concerns associated with recreational water quality and to eliminate the sources of fecal contamination that impact coastal waters. Partial funding for the CCMP comes from the United States Environmental Protection Agency (EPA) BEACH (Beaches Environmental Assessment and Coastal Health) Act grants. BEACH Development and Implementation grants were awarded in the years 2001 through 2007. BEACH grant funds were passed through to the five county health departments participating in the CCMP. The participating agencies are:

Atlantic County Health Department
Cape May County Health Department
Middlesex 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 Township Health Department
Long Branch Health Department
Middletown Health Department
Monmouth County Regional Health Commission
New Jersey Department of Environmental Protection
New Jersey Department of Health and Senior Services

As part of this program, DEP routinely inspects the 17 wastewater treatment facilities that discharge to the ocean (Appendix 1). DEP also performs aerial surveillance of New Jersey nearshore coastal waters and the Hudson-Raritan estuaries to observe changing coastal water quality conditions and potential pollution sources.

To implement a more comprehensive approach to the enhancement of New Jersey's water quality, DEP has joined with the USEPA and others in the private and public sectors to promote a watershed management approach as a means to further restore and maintain the physical, chemical and biological integrity of our water resources and the surrounding ecosystems on a statewide basis. A watershed management approach is a strategic approach to operating existing regulatory and non-regulatory programs more efficiently and effectively to protect, enhance and restore the state's water resources. This initiative will improve New Jersey's surface and ground water resources by better integrating existing water resource management programs among governmental entities and between public and private sectors. This approach will accelerate improvements in the quality of our natural resources as a result of the increased coordination and pooling of resources.

Procedures

Chapter IX of the State Sanitary Code N.J.A.C. 8:26 and the DEP *Field Sampling Procedures Manual* prescribe the sampling techniques and beach opening and closing procedures the agencies use for the CCMP. The agencies perform routine sampling from mid-May through mid-September on Mondays. Samples are analyzed for enterococci concentrations using DEP-certified laboratories for EPA

approved methods; analyses provide results within 24 hours of sampling. Counties submit water monitoring data to DEP in electronic format after each sampling event through the use of DEP's web-based Beach Monitoring System. This monitoring and beach closing notification data is transferred to EPA's CDX node annually and then transferred electronically to STORET. In 2008 data will be transferred via the new WQX data system.

The CCMP included water quality monitoring at 188 ocean stations and 137 bay stations in 2006 and 188 ocean stations and 76 bays stations in 2007. Most stations coincided with recreational swimming beaches. However, 7 ocean stations and 33 bay stations were not located at recreational beaches. These environmental monitoring stations are used to assess water quality trends only. In 2007 the Cape May County Health Department removed all environmental bay monitoring stations from the program in order to focus limited sampling resources on recreational bathing sites. Recreational stations are sampled to assess trends and to protect recreational bathers from polluted water. Most ocean stations are sampled to evaluate the water quality at several lifeguarded beaches in an area rather than just one lifeguarded beach. These areas consist of contiguous, similar beaches with no likely pollution sources. Individual beaches are assigned monitoring stations when effects from potential pollution sources are possible. A monitoring station is assigned at each recreational bay beach because of their noncontiguous locations.

Recreational beaches, both ocean and bay, are subject to opening and closing procedures of the State Sanitary Code and, therefore, must be resampled when during routine sampling bacteria concentrations exceed the primary contact standard. In the years prior to 2004 the primary contact standard was 200 fecal coliforms per 100 mL of sample. Studies performed by EPA determined that enterococci bacteria have a greater correlation with swimming-associated gastrointestinal illness in marine waters than fecal coliform bacteria. In 2004 the State Sanitary Code was amended and the primary contact standard changed to 104 enterococci per 100 mL of sample. Consecutive samples that exceed the standard require the closing of the beach until a sample is obtained that is within the standard. When high bacteria concentrations are recorded at an ocean station, 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 beach closing to contiguous lifeguarded beaches. Sampling is always performed in conjunction with a sanitary survey, which includes identifying possible pollution sources and observing water and shoreline conditions.

Health or enforcement agencies may close beaches at any time at their discretion to protect the public's health and safety.

Beach Closings

The participating health agencies closed 97 and 89 ocean beaches in the 2006 and 2007 summer seasons, respectively. These beach closings are based on measured bacteria levels exceeding the standard. Beach conditions, beach closings and the reasons for beach closings were posted on the DEP web page (www.njbeaches.org) and on the DEP Sandline (800-648-SAND) each day. Additionally, when beach closings are necessary the County or Local health agency post "No Swimming" signs at the beach. Signs remain posted until the swimming ban is lifted. Detailed beach closing information, including the specific beaches closed and reasons for the closings for this period are presented in Appendix 2. Table 1 below presents the numbers of closings from 1997 through 2007.

Table 1: Numbers of Ocean and Bay Beach Closings

<u>Ocean Closings</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004*</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>
for bacteria	18	3	8	8	16	0	9	17	7	18	0
precautionary	0	0	6	3	24	16	58	42	50	79	85
for floatables	0	0	0	0	0	0	13	0	0	0	4
total	18	3	14	11	40	16	80	59	57	97	89
<u>Bay Closings</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>
for bacteria	23	30	21	22	114	7	82	89	4	27	35
precautionary	1	6	0	0	4	8	26	20	18	10	18
for floatables	0	0	0	0	0	0	0	0	0	0	0
total	24	36	21	22	118	15	108	109	22	37	53

* Indicator changed from fecal coliform to enterococci in 2004

Closings include those required for consecutive high fecal coliform or enterococci concentrations and by health agency discretion due to public health concerns. The large majority of the closings in the above-listed years were related to the presence of contaminated stormwater. In 1990, floatable debris was responsible for a total of 10 separate beach closings. In the following twelve years, no closings had been due to floatables, however; in 2003 thirteen separate closings and in 2007 four closings were due to reported washups of trash and debris. The CCMP does not record closings related to rough seas, beach maintenance projects, shark sitings, and fish and clam washups. 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 are included here.

The increase in ocean and bay beach closings in the 2001, 2003, 2004 and 2006 summer seasons may be attributed to frequent periods of intense rainfall and the resulting stormwater discharges. The ocean beaches of Spring Lake were particularly affected by the rainfall's impact on the Wreck Pond discharge. The volume of flow through the Wreck Pond watershed caused significant flows to the ocean and, with those flows, a significant amount of bacteria-laden water. The affected beaches extended through the 2 1/2 miles of Spring Lake for two days in August, 2001. In 2002 a precautionary beach closing plan was implemented in Spring Lake. It requires that the two beaches north of the Wreck Pond outfall, Brown Avenue and York Avenue, close for a specified time period following a rain event. The bathing areas of the two beaches are automatically closed for 24 hours after the end of all rainfalls greater than 0.1 inch or that cause an increased flow in storm drains; and for 48 hours from the end of all rainfalls greater than 2.8 inches within a 24 hour period. In addition, lifeguards (or staff as designated by Spring Lake) will prohibit swimming near any parts of these beaches where the stormwater plume is observed to be mixing within the swimming area. In 2005 the Terrace beach and in 2007 Beacon beach in Sea Girt, just south of the Wreck Pond outfall, were added to the precautionary beach closing plan.

Sources of pollution to the pond include stormwater discharges directly to the pond, a large migratory and non-migratory bird population, pet waste and lawn fertilization. All of these factors can contribute to the elevated levels of fecal coliform bacteria discharged to the ocean during rain events. DEP is currently working with local stakeholders to address the elevated bacteria levels in the pond. In early 2006 DEP completed a 300 foot extension of the Wreck Pond outfall into the ocean. In 2007 DEP's Water Monitoring and Standards began an intensive stormwater source trackdown study to more fully examine the potential sources of bacteria to the pond and surrounding beaches.

In 2007 DEP joined with EPA, Monmouth and Ocean County Health Departments and the Ocean County Utilities Authority in a joint sampling program to study the correlation between three different methods for the analysis of enterococcus bacteria in marine waters. EPA Method 1600 is the traditional method used by the CCMP and by Monmouth County for this study. Enterolert was used by Ocean County for the 2007 bathing season only and for this comparative study. Additional sample was collected and analyzed by EPA using quantitative polymerase chain reaction (qPCR) a method for the rapid detection of enterococcus bacteria in bathing water. Samples were collected at 20 ocean and bay stations between June 18 and August 20. Final study results will be published by EPA in the summer of 2008.

Coastal Pollution Incidents of Note

The following pollution incidents received public, DEP, and local health agency attention, although the incidents did not always require beach closings:

2006

On June 7 DEP received several reports of hundreds of greaseballs washing onto beaches along the Raritan Bayshore and bayside beaches at Sandy Hook. Many of the greaseballs were collected and disposed of by DEP's Clean Shores program. Earlier heavy rainfall and New York City reports of wet weather bypasses at sewage treatment plants are likely sources of the greaseballs. No beaches were closed.

From July 1 through July 4 a significant number of mussels washed onto beaches from Atlantic City south to Longport. The DEP hotline received numerous complaints about the odor and amount of mussels on the beach. The towns removed some of the mussels using front end loaders and some washed back into the ocean. Water quality samples were collected and there was no increase in bacteria levels so no beaches were closed.

On August 30 there was a bright green discharge coming out of the Deal Lake outfall and staining the water and sand at the beach at the Village Beach Club in Loch Arbour. The Monmouth County Health Department sampled the water in the lake and identified the algae as Microcystis sp., a common species of algae that blooms in fresh and low-salinity water. This algae bloom is not uncommon in Deal Lake.

On September 8 the DEP hotline received several complaints of trash washing onto about 3 miles of beaches at Sandy Hook. The Monmouth County Health Department and DEP responded to the complaints and Sandy Hook maintenance staff cleaned the trash the following morning. The source of the trash was unknown but a previous storm and a full-moon high tide were likely factors in carrying floating trash onto the beach.

2007

Late May, 2007 – Over Memorial Day weekend the DEP hotline received numerous complaints of brown, foamy water in Raritan Bay and along the beaches in central Monmouth County. Samples collected identified the algae as predominantly diatoms in bloom concentrations. The bloom was greatly diminished after approximately one week.

On June 5 the Asbury Park sewage treatment plant released approximately 250,000 gallons of chlorinated, primary treated sewage to the ocean through the 1700-foot long outfall in about 33 feet of water. All ocean beaches in the area were posted with “No Swimming” signs however, only one ocean beach in Allenhurst was open for the season. That beach was closed as a precaution. Water quality results collected along the coast were all within the standard and all precautions were removed the next day.

On June 21 several hundred dead menhaden were reported washing up on the beach in Keyport. Water quality samples were all within standards and algae samples showed some dinoflagellates in the water but not in bloom concentrations. It was determined that the fish were likely caught for bait and the catch was either lost or dumped.

On July 17 four 55-gallon drums washed onto beaches between Ventnor and Longport. Two of the drums broke open and the contents spilled onto the beach. The contents were identified as fish bones, scallops, clams and other bait items. The contents were cleaned and removed by local public works crews and bacteria samples were collected. No beaches were closed due to the event.

On August 15 A fish kill was reported in North Wildwood. First reported as bluefish and later confirmed as bunker, dead fish washed up on the beach at First Street. Most of the fish were cleaned up by public works. The source was likely a net spill. No beaches were closed.

On August 16 the Monmouth County Health Department reported two fish kills in northern Monmouth County. Several thousand dead adult-sized bunker were found near the shore in Belford and Atlantic Highlands and were also reported floating near the pound nets in the bay. The source of these fish was unknown, but may be spillage from a fishing net or caused by low dissolved oxygen due to rotting vegetation. Another fish kill was reported in Turtle Mews Creek in Oceanport Boro. Several thousand juvenile bunker were found along the banks of the creek. Dissolved oxygen levels were measured by the Monmouth County Health Department and were extremely low in the creek. There is evidence that enormous schools of bunker swimming in enclosed waterways such as tidal creeks use up all of the available oxygen and are then unable to move back into open water. ¹

On August 24 Thompson Avenue beach in Middletown was closed late in the afternoon due to a washup of trash and debris. The beach was reopened the following day.

On August 30 the DEP hotline received several complaints of trash and greaseballs washing up on beaches along the Raritan bayshore and at some ocean beaches in Monmouth County. DEP’s Central Bureau of Water Compliance and Enforcement and the Monmouth County Health Department responded to the complaints. In a separate incident, one syringe was reported on the beach in Sea Isle City. It was removed by local health officials.

On September 2 the DEP hotline received many complaints of large amounts of trash and debris, including approximately 30 syringes, washing onto beaches in Brick, Normandy Beach and Lavallette with more reports of smaller amounts of trash at other beaches in northern Ocean County. The trash came in on the high tide in the afternoon. A total of four beaches in Normandy Beach and Lavallette were closed due to the washup. A second wave of trash came in on the next high tide early the next morning. The municipalities cleaned and raked the beaches as the trash came in and the beaches were clean the following morning. The Ocean County Health Department reinspected all of the beaches in northern Ocean County and reopened the four closed beaches by 10:00 a.m. the following morning. Investigations by DEP’s Bureau of Solid Waste Compliance and Enforcement identified the source of the majority of the trash as coming from combined sewer overflows in the New York Harbor area.

¹ Menhaden Resource Council http://www.menhaden.org/biology_mortality.htm

On September 2 and 3, in a separate incident a total of six syringes were found in Sea Isle City and Strathmere. They were removed by the Cape May County Office of Emergency Management.

In February 2008 DEP initiated a meeting of the partners of the multi-agency Floatables Action Plan. Changes and recommendations were made to the plan and the updated version can be viewed on the U.S. Environmental Protection Agency website at:

http://www.epa.gov/Region2/water/action_plan/index.html

Ocean Beach Closings 1992 - 2007

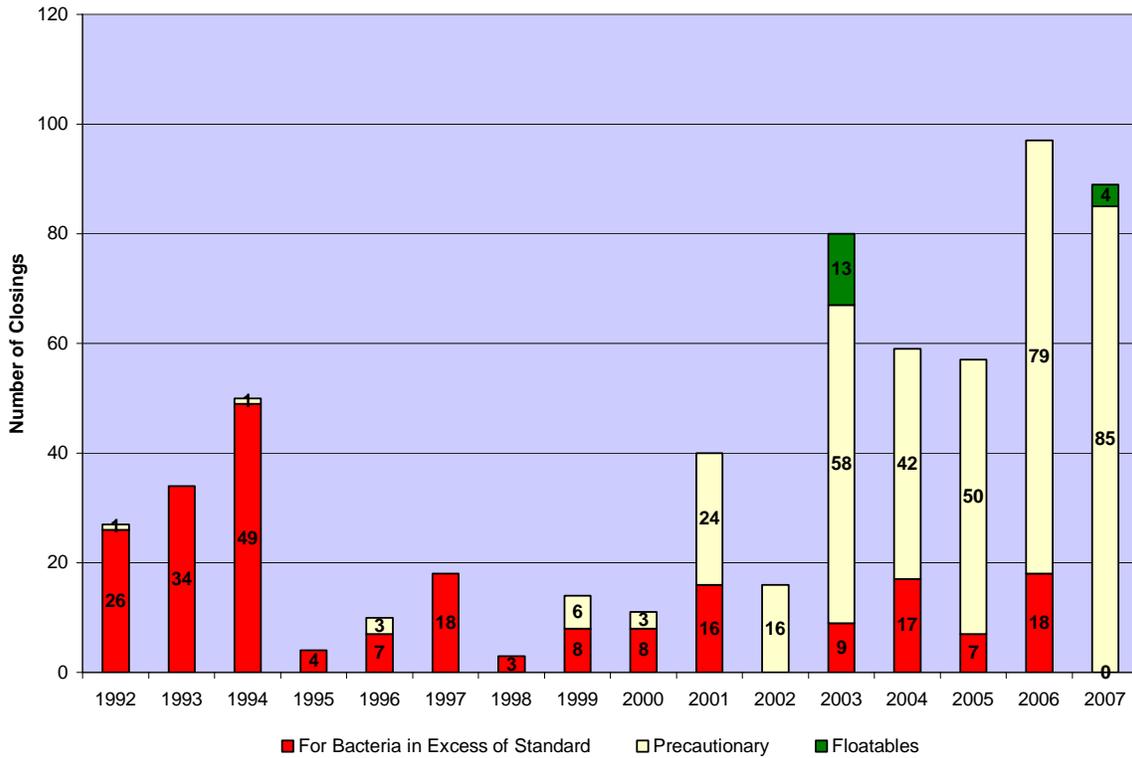


Figure 1. Trend in NJ ocean beach closings.

As shown in Figure 1, closures at New Jersey's ocean beaches due to exceedances of the water quality standard have been down since the early 1990's. In fact, there were no closures due to water quality exceedances in 2007. However, the overall number of closures is up due to precautionary closures since 2000. These precautionary closures represent an enhanced level of public health protection that have been implemented by county and local health officials with the support of NJDEP. Even with these additional closures, New Jersey beaches are open to bathing over 99.7% of the time (see Figure 2). The national average was 95% in 2007².

² USEPA, Water Headlines for June 2, 2008

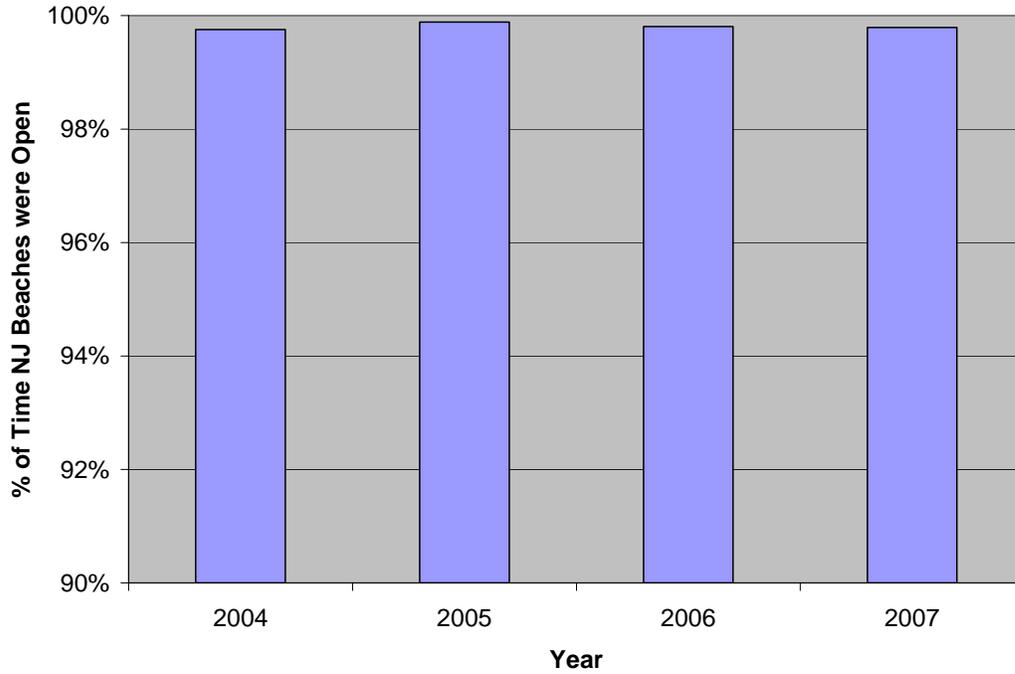


Figure 2. Percent of time NJ beaches are open for bathing by year.

Relative Status of New Jersey Beach Water Quality

According to the latest data from an assessment report of the nation's beaches³, New Jersey's beach water quality is among the best on the East Coast of the U.S. As shown in Figure 3. East Coast bathing beaches relative to the criterion for safe water quality.

³ NRDC Testing the Waters, A Guide to Water Quality at Vacation Beaches, Seventeenth Edition

% of Beach-Days affected by a Closure/Advisory

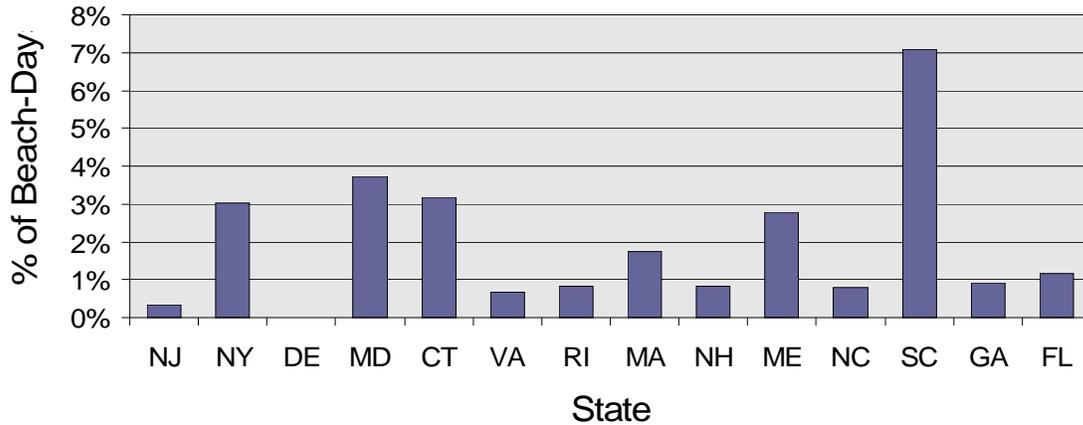


Figure 4 below, New Jersey had among the lowest exceedances of the safe water quality criterion and lowest percentage of beach closings/advisories of the East Coast states in both 2005 and 2006. This high water quality is also reflected in the number of days the beaches were open to the public in NJ. With 325 monitored marine beaches in NJ and 16 weeks to the bathing season, NJ has a total of 36,400 beach-days available each summer⁴. In 2006, there were a total of 134 beach closings, representing 0.37% of the available beach days. Put another way, when the public in NJ went to the beach in 2006, they found the beach was open for bathing 99.6 percent of the time. As 5 shows, NJ had among the highest percentage of beaches open on the East Coast in 2006.

⁴ If both the monitored and non-monitored beaches are counted, New Jersey has 750 lifeguarded marine beaches

East Coast Bathing Beach Water Quality

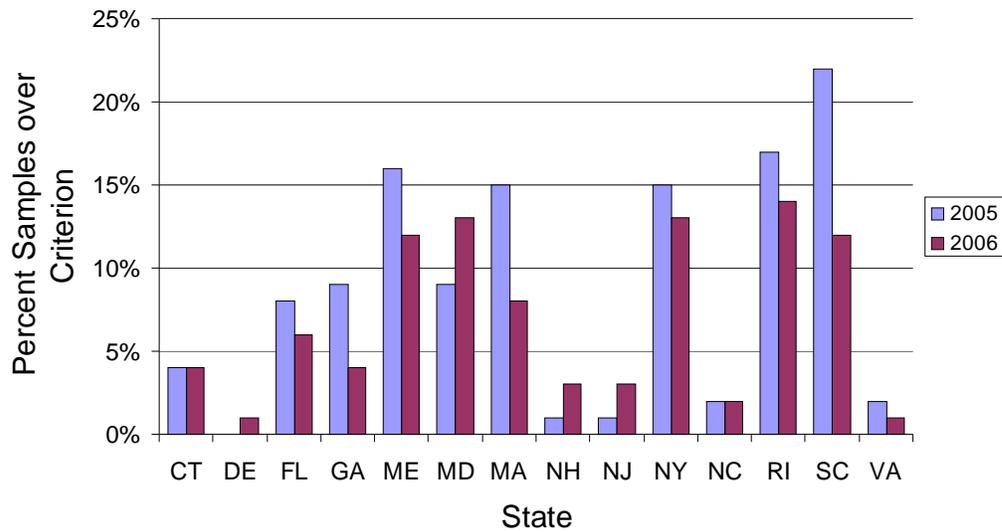


Figure 3. East Coast bathing beaches relative to the criterion for safe water quality.

% of Beach-Days affected by a Closure/Advisory

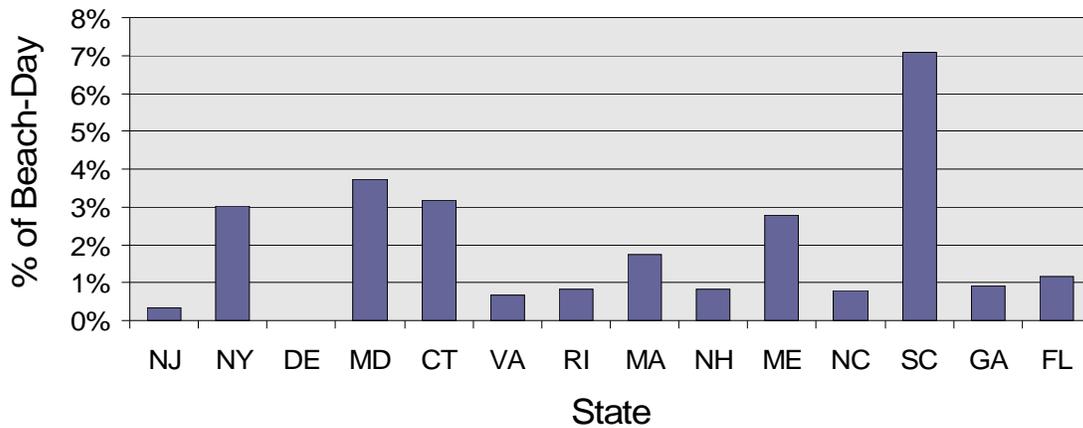


Figure 4. East Coast bathing beaches affected by a closure or advisory.

% of Beach-Days Open for Bathers in 2006

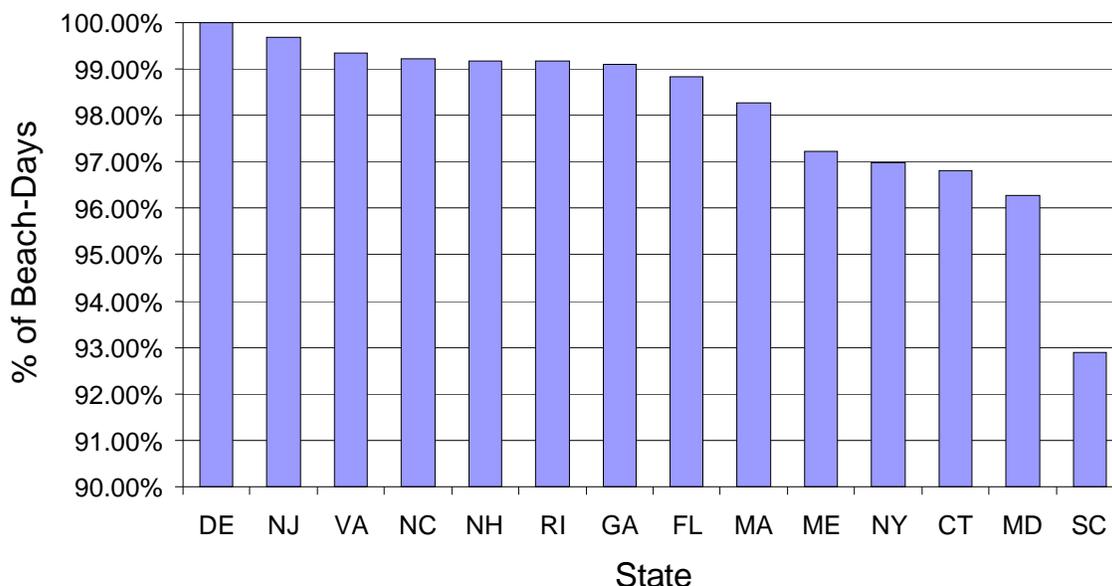


Figure 5. Percent of beach days not available to bathers due to closures or advisories based on NRDC data. Beach days are defined as the # of beaches x the # of days in the beach season.

Standards

As previously stated, the State Sanitary Code recreational or primary contact standard is 104 enterococci per 100 mL of sample. Two consecutive concentrations exceeding this standard require the health agency to close the beach where the concentrations were recorded.

The DEP Surface Water Quality Standards (SWQS) require that the enterococcus concentrations not exceed a geometric average of 35 enterococci per 100 mL of sample for a minimum of 5 samples over 30 days. For the CCMP, all samples taken from a monitoring station during the summer sampling season are averaged geometrically and compared to the standard. Seasonal averages are presented in Appendix 3. Table 2 presents the number of recreational monitoring stations that exceeded the applicable surface water quality standard.

Table 2: Recreational Monitoring Stations that Exceeded Surface Water Quality Standards

<u>Ocean Stations</u>	<u>Enterococcus Average</u>	<u>Enterococcus SWQS Standard</u>
2006 – none, 100% met SWQS		35
2007 – none, 100% met SWQS		35
<u>Bay Stations</u>		
2006 – L Street, Belmar	36.9	35
Beachwood West, Beachwood	142.9	
Money Island, Dover	80.6	
West Beach, Pine Beach	36.5	

Windward Beach, Brick	57.8	
2007 – L Street, Belmar	43.1	35
Maxon Ave., Pt. Pleasant	50.7	
River Ave., Pt. Pleasant	71.7	
Windward Beach, Brick	36	
Reese Ave., Lavallette	44	
Brooklyn Ave., Lavallette	35.9	
Hancock Ave., Seaside	136.2	
5 th , Seaside Park	49.8	
Summit, Island Heights	35.4	
Money Island, Dover	76.8	
Beachwood West, Beachwood	114.4	
West Beach, Pine Beach	64.2	
East Beach, Pine Beach	41	
Anglesea, Ocean Gate	36	

In 2006 100% of recreational ocean stations and 96.4% of recreational bay stations were within the enterococcus SWQS and in 2007 100% of recreational ocean stations and 81.6% of recreational bay stations were within SWQS.

Clean Shores Program

DEP uses state inmates to remove floatable debris from the shorelines of the Hudson, Raritan, and Delaware estuaries and barrier island bays. Non-recreational shorelines that have been left unattended serve as reservoirs of floatable debris that can be refloated during extreme high tides and can wash up on recreational beaches, become floating hazards to navigation, or impact marine life. The Clean Shores Program conducts shoreline cleanups year-round. In the years 2006 and 2007, the Clean Shores Program removed 5.3 and 4.1 million pounds of debris from 155.3 and 130.5 miles of shoreline, respectively.

Adopt A Beach Program

This program fosters citizen stewardship of coastal beaches and teaches the public about the hazards of marine debris to marine life by providing information and field experience. Twice a year, volunteers in groups or as individuals clean their selected beaches and count and categorize the debris. The cleanup activities prevent marine debris from returning to the coastal waters and assist the DEP in tracking pollution sources. Volunteers in 60 groups removed 16,036 items in 2006 and 19,004 items in 2007 from the state's beaches. DEP forwards the marine debris information to EPA to be included in the Floatables Action Plan Annual Summary and the Ocean Conservancy to be included in its national and international marine debris databases.