
NEW CASTLE TOWN BEACH

Water Quality Report Summer 2010



**New Castle Town Beach, New Castle
Water Quality Report
Summer 2010**



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February 2011

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History of the Beach Program

The New Hampshire Department of Environmental Services (NHDES) recognizes a public health threat may exist within recreational waters and tests the water at the state's beaches to ensure swimmers are not exposed to disease-causing pathogens or cyanobacteria scums. The NHDES has operated a Public Beach Inspection Program, commonly called the Beach Program, for over 20 years.

The New Hampshire coastal beach monitoring program was initiated in 1989 with the DES inspecting five beaches. In October 2000, the United States Congress amended the Clean Water Act to include the BEACH Act. The Environmental Protection Agency (EPA) was then authorized to award grants to eligible states to develop and implement monitoring and notification programs. These programs protect the public from exposure to pathogenic microorganisms in coastal recreation waters.

The DES first received grant funds in 2002. Since then the New Hampshire Beach Program has successfully met all of the EPA's performance criteria requirements (National Beach Guidance and Required Performance Criteria for Grants) and continues to expand the monitoring and notification program. Weekly summer monitoring throughout the state was conducted at nine beaches in 2002, and has since nearly doubled to 16 by 2010. The Beach program strives to expand sampling to include all coastal New Hampshire beaches.

Coastal beaches are monitored for the presence of the fecal bacteria *Enterococci* which are present in the intestines of warm-blooded animals including humans. Fecal bacteria, when present in high concentrations and ingested, can commonly cause gastrointestinal illnesses such as nausea, vomiting and diarrhea. These indicator organisms signify the possible presence of other potentially disease-causing organisms in the waterbody.

Beach monitoring and bacteria source tracking have been implemented to protect public health. In a collaborative effort, the NHDES Beach program, towns, beach managers, recreational directors and health inspectors encourage public awareness of sources of pollution and environmental responsibilities. Thank you for your interest and concern in New Hampshire's water quality.

Beach Statistics

New Castle Town Beach is owned and maintained by the town of New Castle. It is located on Route 1B in the Great Island Common. The Great Island Common is open 365 days a year from 9 a.m. to closing.

The Great Island Common recreational facility offers visitors a beach and picnic area along with a playground. New Castle Town Beach is an 840-foot long area offering sand and rocky outcroppings. The beach is used by the public for swimming and general recreation. There are two access points to the beach area from the Great Island Common and Ocean Street (Figure 1). Lifeguards are not present throughout the summer, but toilet facilities are available.

Waterfowl are frequently observed at the beach. There are restrictions for dogs on the beach and no dogs were observed during routine inspections in 2010.



Figure 1. New Castle Town Beach sampling locations, access point, and restrooms.

New Castle Great Island Common Ordinances

The Town of New Castle has the following ordinances that apply to the New Castle beaches:

1. Glass containers of any kind are prohibited. Alcohol is also prohibited.
2. Dogs are not permitted from May 15th to September 15th.
3. Collecting of rocks, sand, and shells is prohibited
4. Parking is not allowed on the grass
5. Fires and portable grills are prohibited.
6. No climbing trees, peeling the bark, or breaking branches.
7. Chipping or driving of golf balls is not permitted.
8. Garbage must be carried out.

Assessing Your Beach

Sampling Frequency and Location

In 2003, the beach program developed a risk-based evaluation process to determine how often a beach should be monitored. Beaches with increased potential impacts to public health are monitored more often than beaches with lesser impacts. Each beach is evaluated annually by the beach program on several criteria within three main categories: beach history, microbial pathogen sources, and beach use. Additionally, a beach that appears on the most recent 303(d) list as “not supporting primary recreational contact” is elevated to a more intense inspection schedule. The Federal Clean Water Act (CWA) requires each state to present a 303(d) list to the EPA every two years that indicates impaired or threatened surface waters due to a pollutant or pollutants. A coastal beach is listed if two or more exceedences of the state standard of 104 Enterococci counts/100 ml are measured during sampling in the last five years. Exceptions to the rule can be made if a large number of recent samples are all within the state standard.

Based on the evaluations, beaches are assigned a Tier I, Tier II, or Tier III status. Tier I beaches are considered “high priority” and have an increased potential to impact public health due to heavy beach use, previous elevated bacteria levels, potential bacteria sources to the beach, inclusion on the 303(d) list, or a combination of these factors. Tier II beaches are “medium priority” and Tier III are “low priority” beaches that have less potential to impact public health. Beach sample frequency is based on Tier status; Tier I beaches are sampled twice per week, Tier II beaches are sampled once per week, and Tier III beaches are sampled every other week.

The number of samples collected at each beach is determined by beach length. Beaches less than 100 feet are sampled at left and right locations one-third of the distance from either end of the beach. Beaches greater than 100 feet are bracketed into thirds and sampled at left, center and right locations. Routine sample collection may be enhanced by sampling known or suspected pollution sources to the beach area. Storm event sampling may be conducted at beaches where watershed runoff resulting from wetfall is expected to impact beach water quality.

New Castle Town Beach is listed as impaired for primary recreational contact since 18 samples exceeded the state standard during the last assessment period. As mentioned earlier, the assessment period for the Surface Water Quality Assessment (SWQA) program spans five sampling years and is re-evaluated every two years. Based on the past beach use, sample results, and 303(d) assessment, New Castle Town Beach is classified as a Tier I

beach and sampling is conducted twice a week. The frequency of sampling at the beach has increased since the launch of the beach evaluation process implemented in the 2003 sampling season. Sampling at New Castle Beach increased from weekly to biweekly in 2006 due to a Consolidated Assessment and Listing Methodology (CALM) impairment. New Castle Beach has been sampled by the NH DES since 1994.

Samples are collected at the left, center, and right stations of New Castle Beach regularly (Table 1). All stations are evenly distributed along the shoreline and can be accessed via the Great Island Common (Figure 1). Samples are also collected at low tide from a pipe draining a man made waterfowl pond located north of the beach area.

Table 1. New Castle Town Beach Station Descriptions and Latitude/Longitude Points.

Station Description	Latitude	Longitude
Left Station: The sample is collected in front of the wood clapboard house near the north end of the beach.	43.067764°	-70.713275°
Center Station: The sample is collected out from a point half way between the gulley and brown house with a chimney and sunroom.	43.06701°	-70.71339°
Right Station: The sample is collected in front of the first pine tree upon entering beach area from the parking lot.	43.066516°	-70.713309°
Pipe Station: The station is just across a berm north of the New Castle Town Beach. The station is accessible from the beach or from Ocean Drive off Route 1B. During high tide the pipe is covered.	43.068844°	-70.712881°

Coastal Water Quality Standards and 2010 Results

Beaches are monitored to ensure compliance with state water quality standards. Marine waters are analyzed for the presence of the fecal bacteria Enterococci. Enterococci are known as indicator organisms, meaning their presence may indicate the presence of other pathogenic organisms. The state standard for Enterococci at coastal public beaches is 104 counts/100 ml of water in one sample. The protocol for issuing coastal beach advisories was implemented in 2003 with the establishment of the formal coastal Beach Program in New Hampshire. According to protocol, when either two or more samples collected at a beach exceed the standard or when one sample exceeds 174 counts/100 ml, a beach advisory is issued. At that time, the advisory is posted on the beach website, beach managers are notified, and signs are placed at the entrances to the beach to warn the public of the potential health threat posed by water contact at the beach. Beach advisories remain in effect until subsequent beach sampling reflects results below the state standard.

The 2010 sampling season began June 1. The summer sampling season encompassed 92 days. Sampling at coastal beaches concluded on September 1. Precipitation was recorded on 33 days during the summer sampling season, based on precipitation recorded at the Pease Air National Guard weather station. Wetfall during the

June sampling totaled 3.44 inches. July and August yielded 3.21 and 5.48 inches of wetfall respectively.

Twenty three routine inspections and three advisory inspections were conducted at New Castle Town Beach during the summer of 2010. Additionally, one special study sampling event was conducted during the swim season. At New Castle, 79 Enterococci samples were collected from the beach and 14 samples were collected from the pipe to the north of the beach (Appendix B). During the 2010 sampling season, three of the Enterococci samples collected at the beach exceeded the state standards for Enterococci (Figure 3), resulting in two beach advisories being issued by DES.

The first elevated result was collected from the left sampling station on June 15 with a result of 240 counts of Enterococci/100 ml of water. An advisory was posted and the beach was re-sampled as scheduled on June 16. Results from this subsequent sampling showed that bacteria levels had decreased to <10 counts/100mL for the left with the remaining two sampling sites also below the state standard. The New Castle Beach advisory was removed on June 17 as laboratory results are available 24 hours after sampling.

The second elevated result of 340 counts/100mL was collected from the center sampling station at New Castle Town Beach on July 12th. An advisory was posted on July 13 and the beach was resampled on July 14 and 16. Sampling on July 14th resulted in an acceptable center station concentration of 70 counts/100mL but an unacceptable left station concentration of 220 counts/100mL. Results from the three sampling sites on July 16th were all <10 counts/100mL, well below the state's standard for tidal swimming waters. The advisory was removed on July 17 when the results became available.

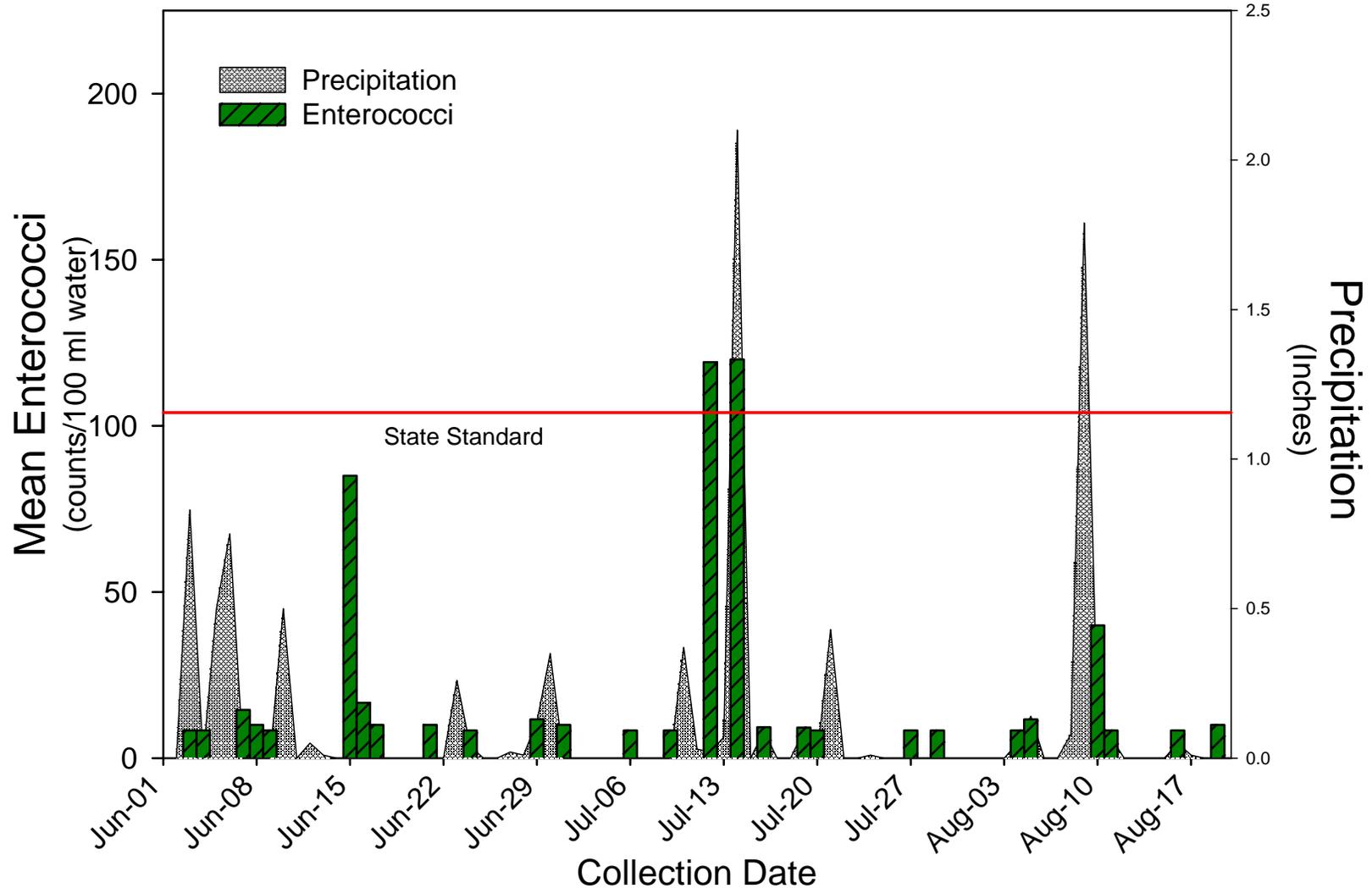


Figure 2. New Castle Town Beach 2010 mean Enterococci results. Values are the mean of the three samples collected at the beach during each inspection. One advisory was posted after the sample collected at the left station on June 15, 2010, was 240 counts of Enterococci/100 ml of water although the results at the two other stations were both less than 10. A second advisory was posted at New Castle Town Beach after the sampling on July 12, 2010. The advisories were removed after subsequent sample results were below the state standard. See Appendix B for all results from New Castle Town Beach stations for the 2010 sampling season.

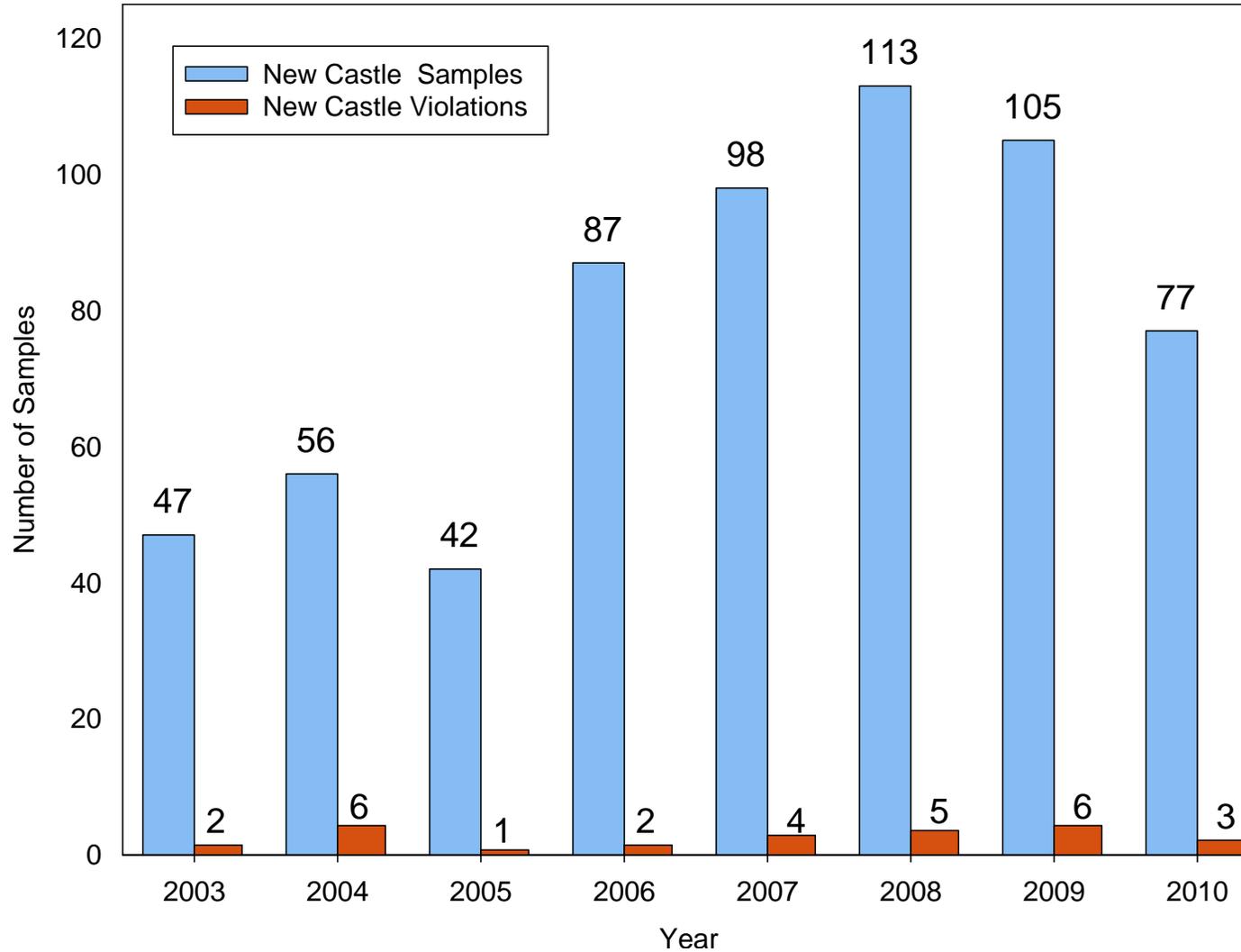


Figure 3. Samples collected and violations recorded at New Castle Beach. An exceedence of the state standard for Enterococci bacteria is a violation. Violations recorded at NH coastal beaches, including New Castle, during the same time period:

Year	2003	2004	2005	2006	2007	2008	2009	2010
Violations at all coastal beaches	5	22	3	23	12	21	15	10

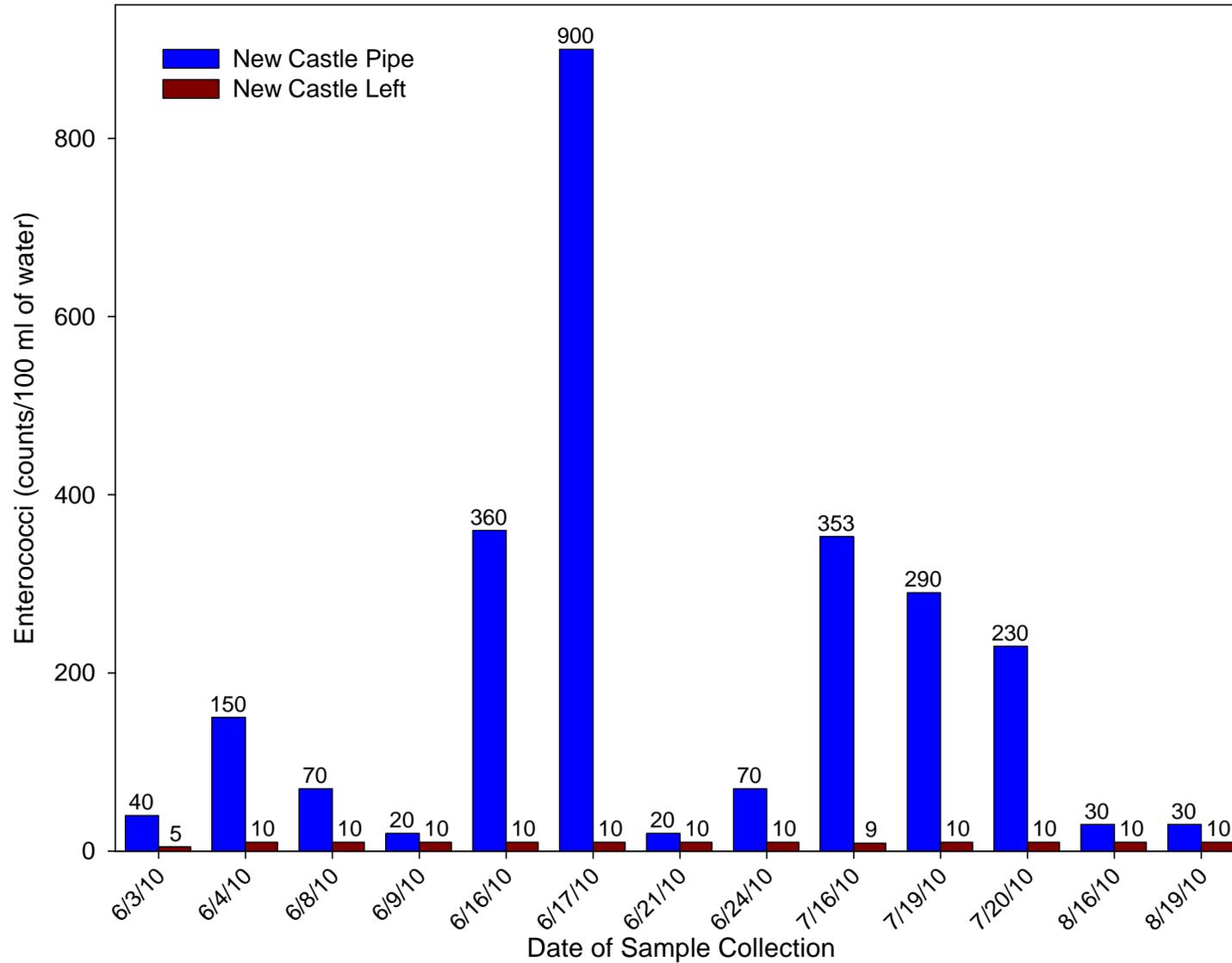


Figure 4. Results when samples were collected at both the pipe and left stations. Six of the 13 samples collected at the pipe had results over the state standard for Enterococci. The result at the left beach station was never over the state Enterococci standard of 104 counts/100 ml of water on any of these days.

New Castle Town Beach Adopt-a-Beach Program

In response to growing concern over the amount of litter and marine debris impacting visual and environmental aspects of Hampton Beach, the beach program partnered with the Blue Ocean Society for Marine Protection (BOS) from Portsmouth, N.H. Both parties met to discuss the development of an Adopt-a-Beach Program at Hampton Beach in the spring of 2005. A formal Memorandum of Agreement stated that the Blue Ocean Society would add Hampton Beach to their Adopt-a-Beach Program and that the beach program would supply materials such as gloves, garbage bags, scales and pencils to volunteers who clean Hampton Beach.

In the fall of 2009, the Memorandum of Agreement between the DES and the BOS was revised to acknowledge the 16 mainland coastal beaches monitored by DES and divided into 22 sections available for adoption through the BOS. Previously, only five sections at Hampton Beach State Park were recognized. Currently, 19 sections are adopted including the New Castle Town Beach. Employees of Seacoast Mental Health Center are the current stewards of New Castle Beach, also known as the Great Common Island Beach.

Volunteers conduct monthly beach clean-ups. All litter washed up or left behind at the beach is weighed, categorized and recorded for analysis by the BOS. The most numerous items found at New Castle Town Beach in 2010 were straps, rope, Styrofoam cups, plastic bags, and bottle caps. During 2010, approximately 80 pounds of garbage was removed by volunteers from New Castle Town Beach. The BOS produces an annual summary of clean-ups and litter collected at coastal areas in New Hampshire and Maine. The 2010 report will be available for downloading in early 2011 on the BOS website:

www.blueoceansociety.org/Research/pollution_research.html.

Please contact Sonya Carlson, beach program coordinator, or Jen Kennedy, (603) 431-0260 or **jen@blueoceansociety.org** for information about adopting orphaned beach sections.

Concerns

The New Castle Beach watershed includes wetland areas that drain to a small duck pond. The discharge from the duck pond enters the ocean through a pipe adjacent to the left sampling station at the New Castle Town Beach. Samples are collected from the pipe during beach inspections if the tide is low enough to allow access to the draining water. Although the pipe discharge area is not designated as part of the New Castle Beach, the Enterococci results are often over the state standard for tidal swimming waters. Recreational activities within the pipe discharge area during elevated bacteria levels can result in increased risk of contracting any number of waterborne diseases. Elevated bacteria results from the pipe do not always indicate elevated bacteria levels at the New Castle Town Beach left station. Although six of 13 samples collected from the pipe had results exceeding 104 counts Enterococci/100 ml water, the results from samples collected at the left side of the designated bathing area were not at concentrations over the state standard (Figure 4). Although high bacteria discharge from the pipe does not always correlate with high designated beach bacteria concentration, the discharge itself could present problems to the public swimming in this area of the shoreland especially during high runoff events.

Bull Toad Marsh is another potential area contributing bacteria to the beach. The marsh is located west of the New Castle Town Beach area and drains to the beach between the right and center stations during high water levels. Samples were not collected in 2010 because of the lack of running water during inspections. Wet weather sampling is recommended for this

location, but scheduled beach inspections are conducted twice a week during the summer making rain event sampling difficult.

In order to investigate bacteria sources to coastal beaches, a special study was conducted at three coastal watersheds to isolate possible Enterococci sources to the respective designated beach areas. The project is in its second phase and is scheduled for completion in the summer of 2011. An Illicit Discharge Detection and Elimination (IDDE) Findings and Recommendations report is being drafted for New Castle Town Beach based on the study findings. Possible bacteria sources and suggested mitigation processes will be outlined in the IDDE and available to the public and municipal officials for reference.

Future Projects

- Discharge at the New Castle Pipe will continue to be monitored as conditions allow. DES recommends restricting access to the discharge as past monitoring has revealed elevated bacteria levels. Young children tend to play in these warmer waters and may be subjected to a health risk. The area can be marked with a warning sign that states “this water may contain elevated bacteria levels”. The Beach Program is willing to collaborate on this effort by suggesting text and possibly providing funds to assist in the purchase.

For more information regarding Adopt-A-Beach, possible studies, or signage for the beach, please contact Sonya Carlson at (603) 271-0698 or sonya.carlson@des.nh.gov.

Appendix A: 2010 Special Report – New Hampshire is First in Beach Water Quality

The water quality at coastal New Hampshire beaches was recognized by the National Resources Defense Council (NRDC) as one of the best coastal beaches in the United States for 2010. New Hampshire Public Coastal Beach water bacteria results were compared to results from coastal and Great Lake beaches in the United States and its territories. Less than 1% of the 1,712 samples collected at coastal New Hampshire beaches exceeded the NH Designated Public Beach bacteria standard. In addition to recognizing all NH coastal waters, the NRDC recognized both Hampton Beach State Park and Wallis Sands at Wallis Road with a five star rating for less than 5% of the bacteria samples exceeding standards, frequent sampling, and speedy reporting of results and advisories to the public¹. Of the 359 popular beaches rated in the United States, only 19 received a five star rating.

The NRDC is “an international nonprofit environmental organization with more than 1.3 million members and online activists. Since 1970, [NRDC] lawyers, scientists, and other environmental specialists have worked to protect the world’s natural resources, public health, and the environment.”²

Also highlighted by the NRDC report was New Hampshire’s low percentage of violations since 2006. In 2006, only 3% of samples collected exceeded the state standard for designated public beaches. In all subsequent years, only 1% of samples collected surpassed the state water quality standards. In 2010, violations were recorded in only 12 of the 1,155 samples collected at coastal beaches.

Funded by the EPA BEACH Act grant, DES samples, monitors and provides timely reporting for all designated public beaches. The top water quality assessment and five star ranking of New Hampshire coastal beaches demonstrates how well New Hampshire residents, local town officials and state organizations work cooperatively to keep our beaches and coastal waters clean. New Hampshire residents should be proud of our coastal beach water quality and strive to maintain these levels. Currently, the DES Beach Program is completing management plans for two coastal watersheds. Management plans will contain specific recommendations regarding septic systems, pet waste, and other sources to reduce bacteria loads at tidal beaches. Cooperative efforts will identify pollution sources, determine sources of contamination, and then develop and implement bacteria management plans to reduce beach pollution.

By following these 4 simple steps everyone throughout the coastal watershed can work to minimize beach pollution:

- Pick up and dispose of pet waste properly
- Maintain septic systems
- Put swim diapers with plastic covers on babies
- Keep trash off the beach

Together, everyone can work to maintain New Hampshire’s top rated beaches.

¹ NRDC: Testing the Waters 2010 website. Accessed December 14, 2010, <http://www.nrdc.org/water/oceans/ttw/200beaches.asp>

² M. Dorfman and K.S. Rosselot. Testing the Waters: A Guide to Water Quality at Vacation Beaches Twentieth Annual Report. July 2010

Appendix B: New Castle Town Beach 2010 Data by Date

Data collected during inspections of New Castle Beach in 2010. Samples could not always be collected from the pipe due to high tide conditions.

“—“ indicates sample not collected

(*) indicates mean value from the routine and duplicate sample collected at the station

Values in ***BOLDED ITALICS*** are violations of the state standard for Enterococci

Date	Enterococci (count/100 ml)				Inspection Type	Previous 24 hour rainfall (inches)	Number of bathers	Animal Presence
	Left	Center	Right	Pipe				
6/3/10	<5	<10	<10	40	Routine	0	1	0
6/4/10	<10	<10	<5	150	Routine	0.83	2	0
6/7/10	—	—	14.5*	60	Special Study	0.75	2	0
6/8/10	<10	<10	<10	70	Routine	0	0	37 birds
6/9/10	10	10	<5	20	Routine	0	5	15 birds
6/15/10	240	<5	<10	—	Routine	0	3	1 bird
6/16/10	<10	10	30	360	Advisory	0	7	0
6/17/10	10*	<10	<10	900	Routine	0	0	18 birds
6/21/10	<10*	10	<10	20	Routine	0	12	1 bird
6/24/10	<10*	<5	<10	70	Routine	0.26	28	0
6/29/10	20	<10	<10	—	Routine	0.01	35	0
7/1/10	<10*	<10	<10	—	Routine	0.35	4	7 birds
7/6/10	10	<10	<5	—	Routine	0	48	5 birds
7/9/10	<10	<10	<5	—	Routine	0	21	0
7/12/10	<10	340	7.5*	—	Routine	0.03	14	4 birds
7/14/10	220	70	70	—	Advisory	0.07	0	0
7/16/10	<9	<9	<10	353*	Advisory	0	2	7 birds
7/19/10	<10	<10	7.5*	290	Routine	0	1	3 birds
7/20/10	10*	<5	<10	230	Routine	0.09	27	1 cormorant, 2 gulls
7/27/10	<10	<10	5	—	Routine	0	25	16 birds
7/29/10	<10*	<5	<10	—	Routine	0	20	13 birds
8/4/10	<10	<5	10*	—	Routine	0	25	0
8/5/10	<10	<10	<10*	—	Routine	0.05	9	6 birds
8/10/10	15*	30	80	—	Routine	1.79	8	2 gulls
8/11/10	7.5*	10	10*	—	Routine	0.13	26	26 birds
8/16/10	<10	5	<10	30	Routine	0	0	16 birds
8/19/10	10	<10*	<10	30	Routine	0	18	0