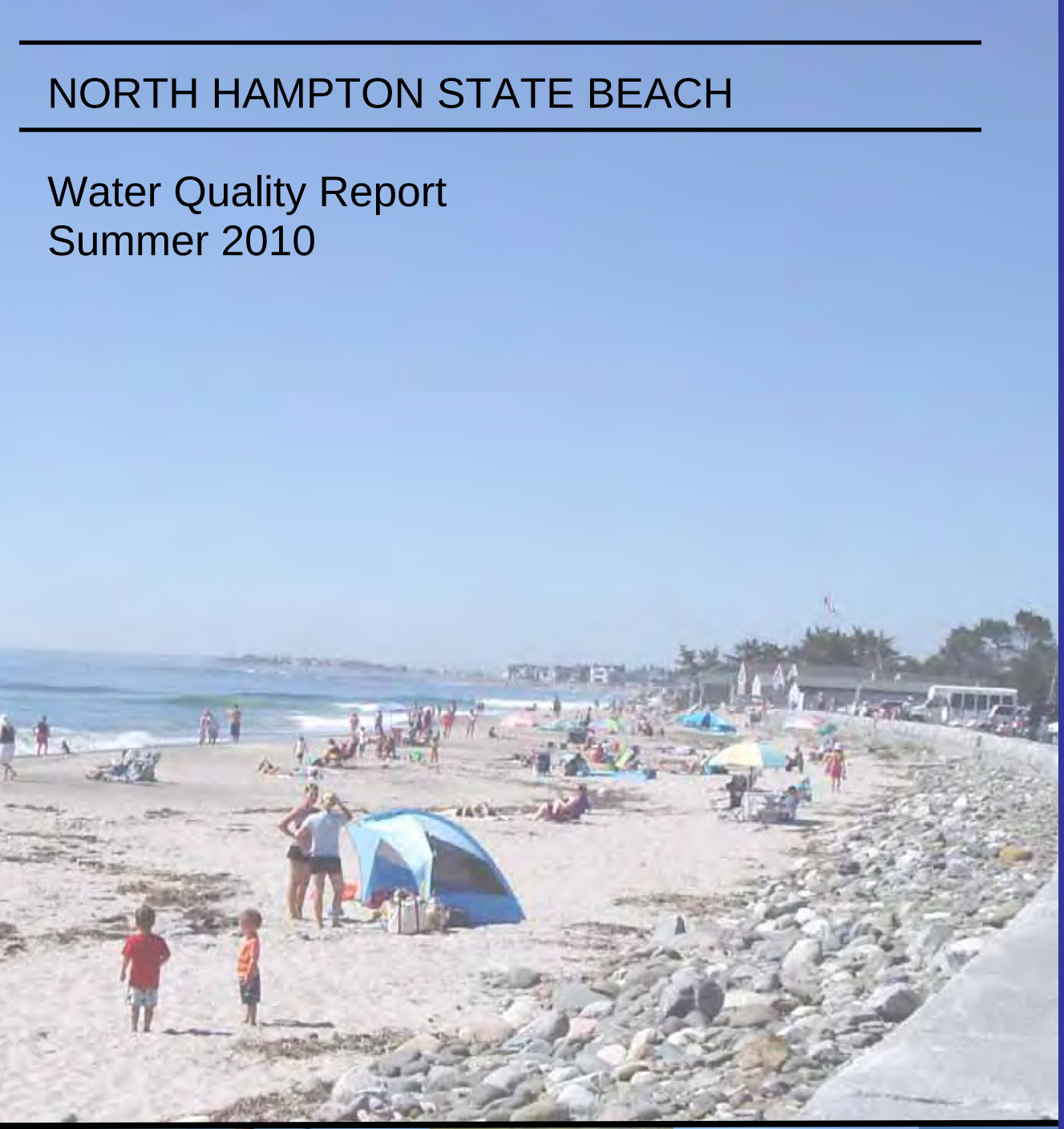
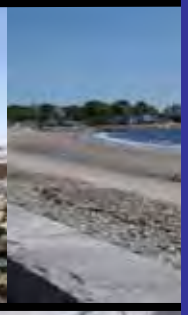
NORTH HAMPTON STATE BEACH

Water Quality Report
Summer 2010





NH Department of Environmental Services

January 2011

R-WD-11-7M

North Hampton State Beach, North Hampton
Water Quality Report
Summer 2010

Prepared by:
Teresa Ptak, Sonya Carlson
& Jody Connor
Water Division

29 Hazen Drive, PO Box 95
Concord, NH 03302-0095
(603) 271-3503
www.des.nh.gov

February 2011

Table of Contents

List of Figures

List of Tables

Appendices

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

North Hampton State Beach is owned and maintained by the New Hampshire Division of Parks and Recreation, State Parks Bureau. It is located on Route 1A in North Hampton (figure 1). The beach season runs from mid-June to the beginning of September. During the season, beach use is allowed from sunrise to 1 a. m.

State Beach is a 1,260-foot long sandy beach, with rocks exposed during low tide. The beach is used by the public for swimming and general relaxing, among other recreational activities. Lifeguards are present throughout the bathing season between the hours of 10:00 A.M. and 4:45 P.M., and toilet facilities are available.

Waterfowl are frequently observed at the beach; the most commonly observed are gulls, especially at the northern end of the beach. There are restrictions for dogs on the beach, but four dogs were noted during three inspections this summer.

Figure 1. State Beach Access Points and Restroom Facilities.

State Beach Ordinances

The Department of Resources and Economic Development has the following administrative rules that apply to all coastal state beaches:

1. Glass containers of any kind are prohibited.
2. Alcoholic beverages are prohibited.
3. Dogs are not permitted on state beaches at any time.
4. Horses are only permitted on Hampton State Beach from October 1 to April 30.
5. Digging holes is only allowed on beaches if the holes are less than 12 inches deep and completely filled in when done.
6. Fires and portable grills are prohibited.
7. Beaches are open from sunrise to 1 a.m.
8. Inflatables and other floatation equipment, life jackets, swim fins, face masks, diving goggles, snorkel tubes, and skim boards are not permitted.
9. Surfing is only allowed at designated areas of North Beach.
10. Garbage must be carried out.
11. Removing or destroying marine life is prohibited.

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.

State Beach is listed on the 903(d) list as impaired for primary recreational contact since eleven samples exceeded the state standard during the last assessment period. Based on the past beach use, sample results, and 303(d) assessment, State Beach is classified as a Tier I beach indicating high priority and sampling is conducted twice a week. The sampling frequency at State Beach has increased since the launch of the beach evaluation process implemented in the 2003 sampling season. Sampling increased from every other week to weekly sampling in 2004 due to increased beach use. State Beach was listed on the 303(d) impaired list in 2006, thus requiring sampling twice each week.

State Beach samples are collected at the left, center, and right stations regularly (Table 1, Figure 1). All stations are evenly distributed along the shoreline and can be accessed via the parking lot. Samples are also collected from Little River, which is north of State Beach and discharges at the northern end of the beach area (Table 1).

Table 1. State Beach Station Descriptions and Latitude/Longitude Points.

Station Description	Latitude	Longitude
Left Sample Station: Located in front of the northern entrance to the beach, straight out from the concrete steps near the bath house.	42.956003°	-70.780729°
Center Sample Station: Located in front of the center entrance to the beach.	42.955336°	-70.781328°
Right Sample Station: Located in front of the southern entrance to the beach.	42.954702°	-70.781764°
Little River Sample: Located on the west side of Route 1A in the center of the river before it flows through the culvert.	42.9575°	-70.779167°

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 35 days during the summer sampling season, based on precipitation recorded at the Seabrook Power Station. Wetfall during the June sampling totaled 1.83 inches. July and August yielded 2.1 and 4.65 inches of wetfall respectively.

At State Beach, 26 inspections were conducted during the 2010 beach season. Seventy-six samples were collected from beach stations and tested for Enterococci (Figure 2, Appendix B). Also 14 samples were collected from the outlet of Little River on the beach side

of the Route 1A (Appendix B). Five of the samples collected in 2010 exceeded the state standard for Enterococci with one advisory issued for four days in June. The number of exceedences in 2010 was the second most violations recorded at State Beach since 2003 (Figure 3) although there was less summer rainfall in 2010 than in 2006 or 2007.

The sample collected at the left station at State Beach on June 14, 2010, revealed a count of 270 Enterococci/100 ml of water. In the 24 hours previous to the sampling, only 0.01 inches of rain fell in the area. The Beach Program issued an advisory for State Beach on June 15 and an advisory inspection was conducted on June 16. Two of the bacteria results from the advisory inspection were again above the state standard. A second advisory inspection was conducted on June 18. The left station result was 150 counts Enterococci/100 ml of water, resulting in an advisory removal. The results from the subsequent safety inspection were all below the state standard.

A sample collected on July 16 during a special study visit to the coast had a result of 210 Enterococci/100 ml of water after 2.1 inches of precipitation had fallen within the past 48 hours. Due to an administrative oversight, the beach was not re-sampled until July 21. At that time, all samples were again below state standard, so no advisory was issued.

Off-Season Sampling

The New Hampshire chapter of the International Surfrider Foundation has volunteered to collect water samples in the off season since spring 2007. The volunteers are trained according to DES protocol and collect samples in the same manner as DES staff. All samples are returned to the DES Laboratory in Concord for analysis. Previous to 2010, volunteers sampled only North Beach and Jenness Beach weekly from March to late May and from October through November. In the spring of 2010, the sampling locations were spread out along the coast to encompass a wider area where surfers tend to recreate. Samples were collected from the left station of Jenness Beach at Cable Road, Rye, south to the right center station of North Beach, Hampton. Eight stations were sampled along the 4.5 mile stretch of the beach, including the Little River Outlet and left station at State Beach (Results in Appendix B).

The Surfrider volunteer coordinator did not contact the DES Beach Program during late 2010 to schedule fall sampling. Additionally, DES beach program funds are limited so as with other volunteer groups, Surfriders will have to fund future processing costs.

State 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 and clean ups were begun in 2010 at State Beach in North Hampton.

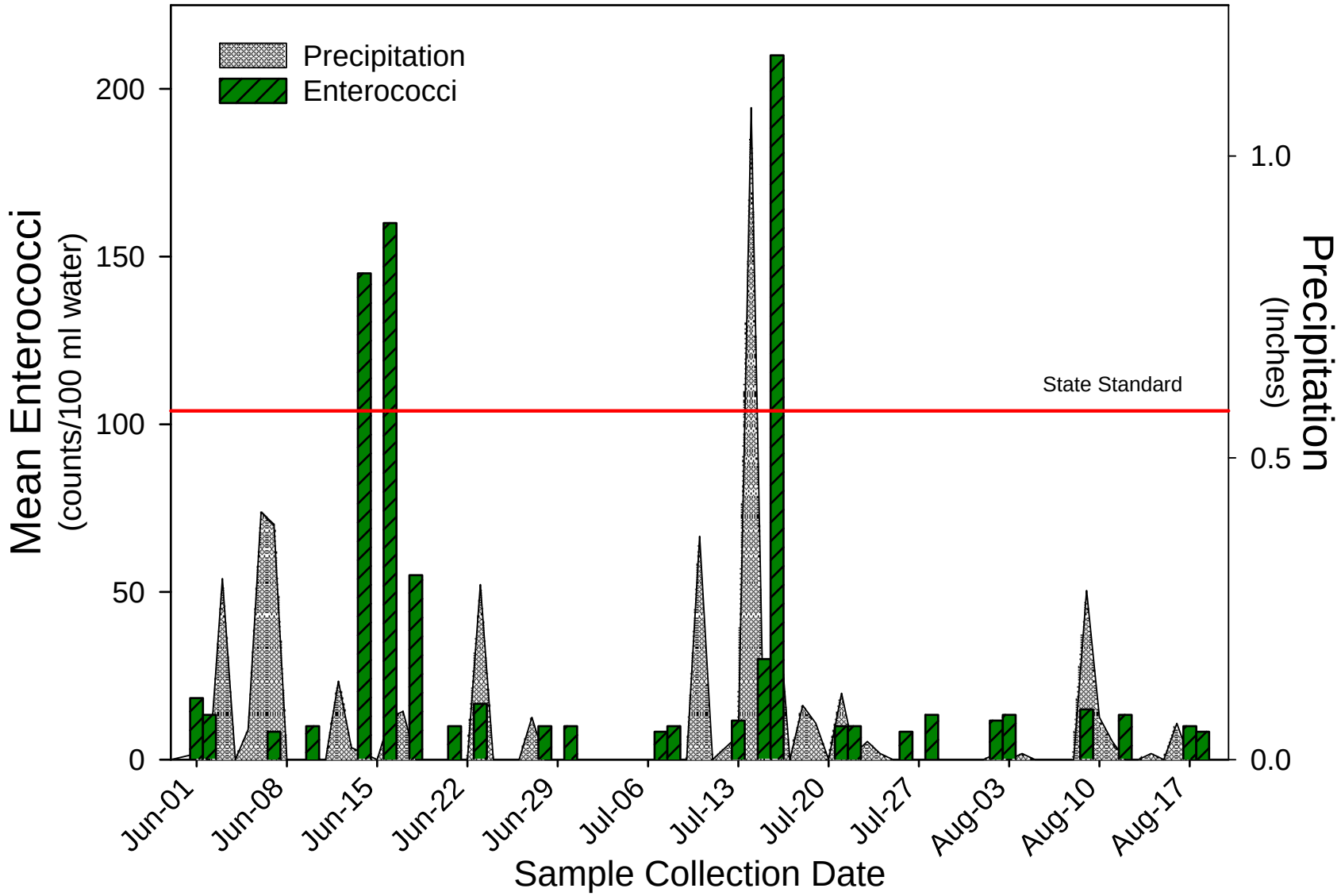


Figure 2. State Beach 2010 Enterococci Data. Enterococci values are the means of the three samples collected at the beach during each inspection. One advisory was posted from June 15 through June 19 as indicated by the bacteria value exceeding the state standard. The lone elevated value on July 16 was erroneously missed in the examination of results returned on July 17th. See Appendix B for all results from all stations for the 2010 sampling season.

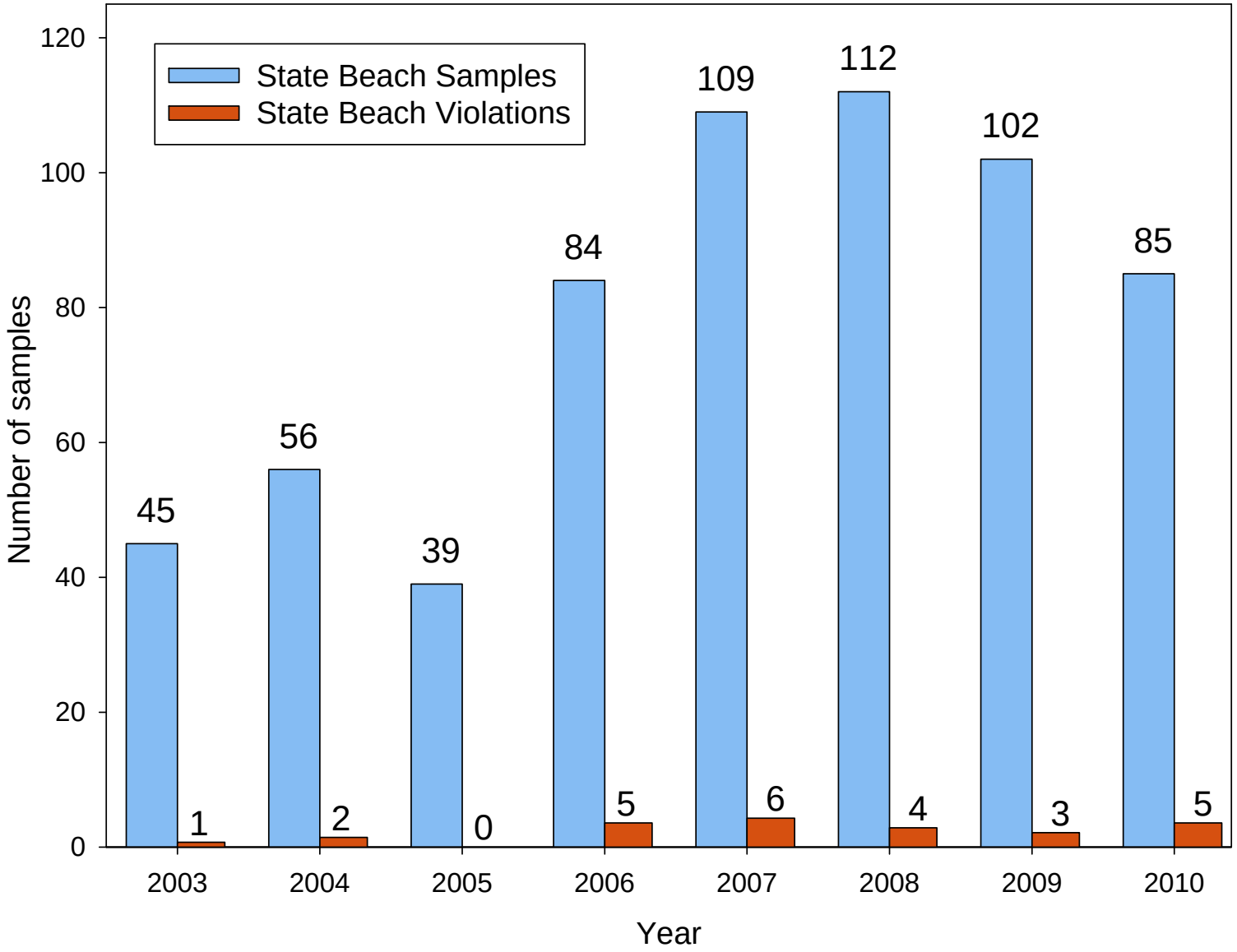


Figure 3. Annual Enterococci samples collected and violations recorded at State Beach. An exceedence of the state standard for Enterococci bacteria is a violation.

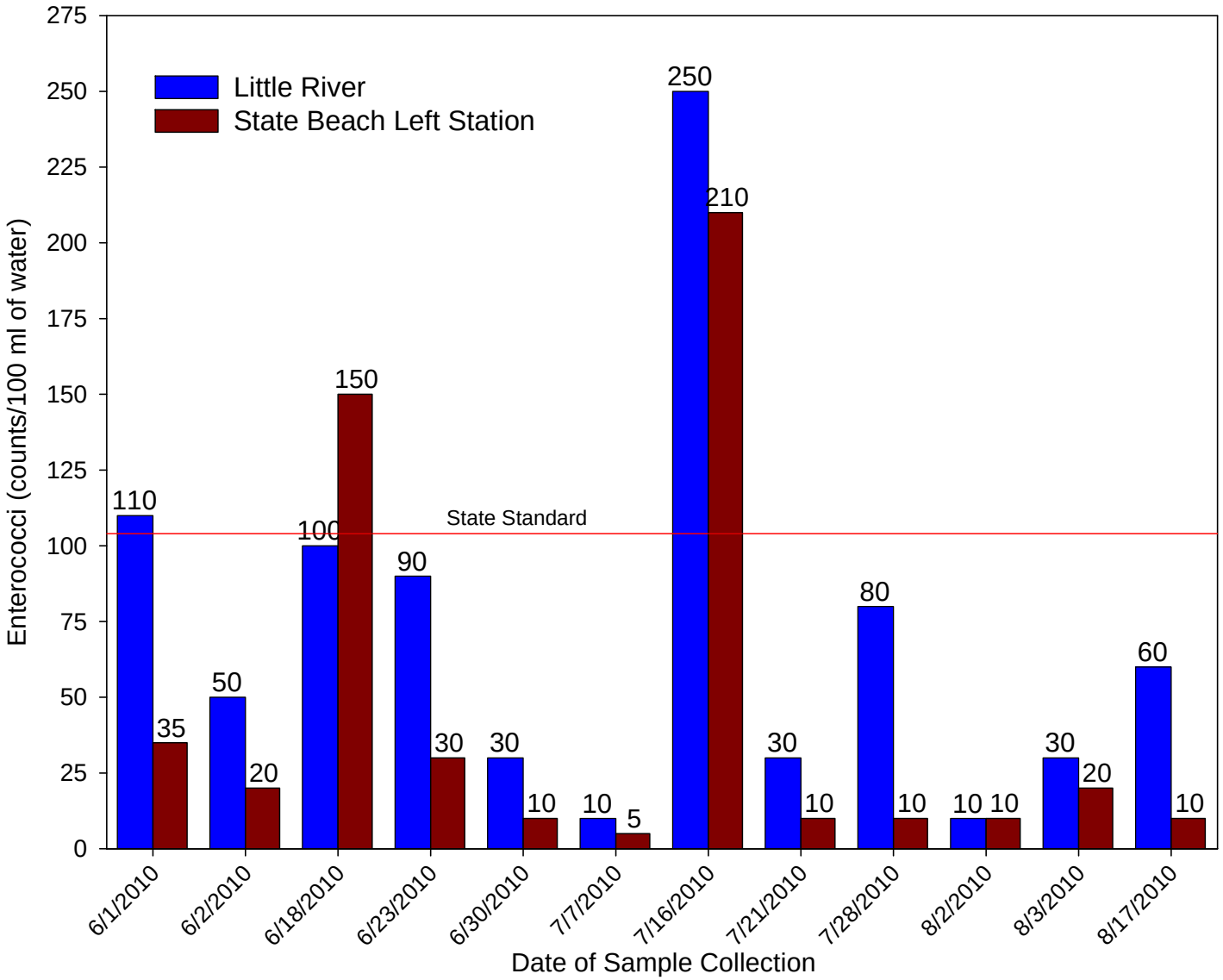


Figure 4. Enterococci data from the Little River and State Beach left stations. On four of the 12 sample days at Little River, the result from Little River was more than 20 counts higher than the State Beach left station result. Two results were over the standard on the left side of the beach, but only on July 16th was the result higher at Little River.

Volunteers conduct beach clean-ups monthly. 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 State Beach in 2010 were cigarette butts, plastic bottles, metal cans, rope and plastic bags. During two clean up events, 53 pounds of trash was collected in 2010. 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

Little River continues to be a cause for concern at State Beach. The river was identified as a pollution source to coastal waters, contributing to elevated bacteria levels. Precipitation and associated stormwater run-off to Little River and the subsequent discharge of this bacteria-laden water to the beach area continue to influence Enterococci levels at State Beach. The discharge from Little River especially impacts the left side of the bathing area (Figure 4), posing a potential health risk to the public.

The Little River station is sampled only at low tide. Sampling conducted at high tide would result in ocean backflow diluting the water and not reflecting the bacteria count contributed by the river. High levels of Enterococci at Little River did not always indicate exceedences of the state standard at the left station of State Beach (Figure 4, Appendix B). State Beach was sampled 14 times this summer and bacteria levels were over 104 counts of Enterococci/100 ml water on two of those occasions. Only on June 18, 2010 was the sample result collected at the left beach station higher than the sample collected at the outlet.

A bacteria source project is being conducted on the North Hampton State Beach watershed to isolate possible sources of Enterococci to Little River and the beach. In an effort to inform the public of the potentially high levels of Enterococci in Little River, the DES can provide a sign to the state park which can be posted near the Little River outflow north of the beach area. The sign would inform the public of possible health concerns. Signage information would indicate that this area may be unsafe for water contact due to potentially elevated bacteria during low tide.

Future Projects

- The DES Beach Program applauds the participation between the State Parks Division, local businesses, or school groups and the Adopt-a-Beach Program. The DES can support the Blue Ocean Society by providing supplies as needed for clean up events.
- Beach officials should consider erecting a sign to warn the public of associated health risks from high bacteria levels measured in Little River. The State Parks division may also consider posting signs warning the public not to feed waterfowl at the beach. The Beach Program could collaborate on this effort by providing funds to purchase signs.
- Analysis of historical bacteria data and wetfall through the current bacteria identification study, scheduled for a March 2011 release date may show a predictive relationship between certain wetfall amounts and elevated beach Enterococci levels. An increase of Enterococci levels may potentially increase of the occurrences advisory postings. A pre-emptive advisory plan would need to be devised and discussed by the beach manager and the Beach Coordinator.

If you are interested in any of these future projects, please contact Sonya Carlson at (603) 271-0698 or sonya.carlson@des.nh.gov.

Appendix A: Special Topic 2010– 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 public[1]. 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: State Beach 2010 Data by Date

Data collected during inspections of Wallis Sands Beach at Wallis Road in 2010. Samples could not always be collected at Parson's Creek 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	Rainfall in previous 24 hours (inches)	Number of bathers	Animal Presence
	Left	Center	Right	Little River				
3/21/10	<10	—	—	—	Off-Season	0	0	0
4/6/10	<10	—	—	10	Off-Season	0	0	0
4/20/10	<10	—	—	—	Off-Season	0	0	0
6/1/10	35*	<10	<10	110	Routine	0	4	2 dogs, 3 birds
6/2/10	20	<10	10	50	Routine	0	5	15 birds
6/7/10	<10	<5	<10	45*	Routine	0.75	0	72 birds
6/10/10	10	10	<10	—	Routine	0	0	0
6/14/10	***270***	85*	80	—	Routine	0.01	6	1 bird
6/16/10	***290***	60	***130***	—	Advisory	0	2	11 birds
6/18/10	***150***	<10	<5	100	Advisory	0	17	0
6/21/10	<10	<10	<10	—	Safety	0	8	1 dog
6/23/10	30*	<10	<10	90	Routine	0	10	0
6/28/10	10	<10	<10	—	Routine	0.02	9	10 birds
6/30/10	<10*	<10	<10	30	Routine	0.12	10	0
7/7/10	5	<10*	10	10	Routine	0	28	2 birds
7/8/10	<10	<10	<10*	—	Routine	0	0	0
7/13/10	<10	<10	15*	—	Routine	0.02	9	0
7/15/10	40	40*	10	—	Routine	2.1	46	14 birds
7/16/10	***210***	—	—	250	Special Study	0	0	0
7/21/10	10	<10	10	30	Routine	0	19	7 birds
7/22/10	<10	<10	<10	—	Routine	0.43	6	0
7/26/10	5	<10	<10	—	Routine	0	52	17 birds
7/28/10	<10	<10*	20	80	Routine	0	6	1 bird
8/2/10	10	<10	15*	<10	Routine	0	3	5 birds
8/3/10	20	10	<10	30	Routine	0	20	31 birds
8/9/10	10	20	15*	—	Routine	0.08	2	1 dog, 35 birds
8/12/10	20	<10	<10	—	Routine	0.07	0	5 birds
8/17/10	10	10*	<10	60	Routine	0.05	0	0
8/18/10	<10	<5	<10	60	Routine	0.01	0	0