

State Beach, North Hampton
BEACH WATER QUALITY REPORT
SUMMER 2004



February 2005

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BACKGROUND

The New Hampshire Department of Environmental Services (NHDES) has operated its Public Beach Inspection Program, or Beach Program, for over twenty years. Coastal beach monitoring began in 1989 and has continued through the present. NHDES recognizes the threat to public health at public beaches and continues to monitor public beaches throughout the state for the presence of pathogenic organisms. Coastal beaches are monitored for the presence of the fecal bacteria Enterococci. These fecal bacteria 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. They are also known as indicator organisms, meaning their presence in water may indicate the presence of other potentially pathogenic organisms.

In October of 2000, the United States Environmental Protection Agency (EPA) signed into law the Beaches Environmental Assessment and Coastal Health (BEACH) Act. The BEACH Act is an amendment to the Clean Water Act that authorizes the EPA to award grants to eligible states. The purpose of the BEACH Act is to reduce the risk of disease to users of the nation's recreational waters. BEACH Act grants provide support for development and implementation of monitoring and notification programs that help protect the public from exposure to pathogenic microorganisms in coastal recreation waters.

NHDES received grant funding in 2002 to develop and implement a beach monitoring and notification program consistent with EPA's performance criteria requirements published in the *National Beach Guidance and Required Performance Criteria for Grants* document (www.epa.gov/waterscience/beaches/grants). NHDES has successfully met all requirements and continues to expand the monitoring and notification program. In 2002, only 9 coastal beaches were monitored, in 2003 fifteen coastal beaches and in 2004 sixteen coastal beach were monitored on a routine basis.

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Beach Description

State Beach is owned and maintained by the New Hampshire Division of Parks and Recreation, State Parks Bureau.

State Beach is a sandy beach with rocky portions at low tide. Its total length is 1,260 feet. State Beach is bordered to the South by Plaice Cove. The beach is frequently used by residents and vacationers for various recreational activities. There are three access points to the beach area from the parking lot off Route 1A. Parking is available for a fee (meters). Lifeguards are present and sanitary facilities are available during the summer. The restrooms were closed for a brief period during the summer of 2004.

Waterfowl are frequently observed at the beach. The most commonly seen are gulls and they are generally found in flocks at State Beach. Dogs were also observed on the beach on a few occasions. There are restrictions for dogs on the beach per the New Hampshire State Parks Division.

Below is a brief description of the sampling stations at North Hampton State Beach.

- The left sample station is located straight in front of the northern entrance to the beach (concrete slab).
- The center sample station is located straight in front of the center entrance to the beach.
- The right sample station is located straight in front of the southern entrance to the beach.
- The Little River sample station is located on the upstream side of Route 1A in the center of the river before it flows through the culvert.

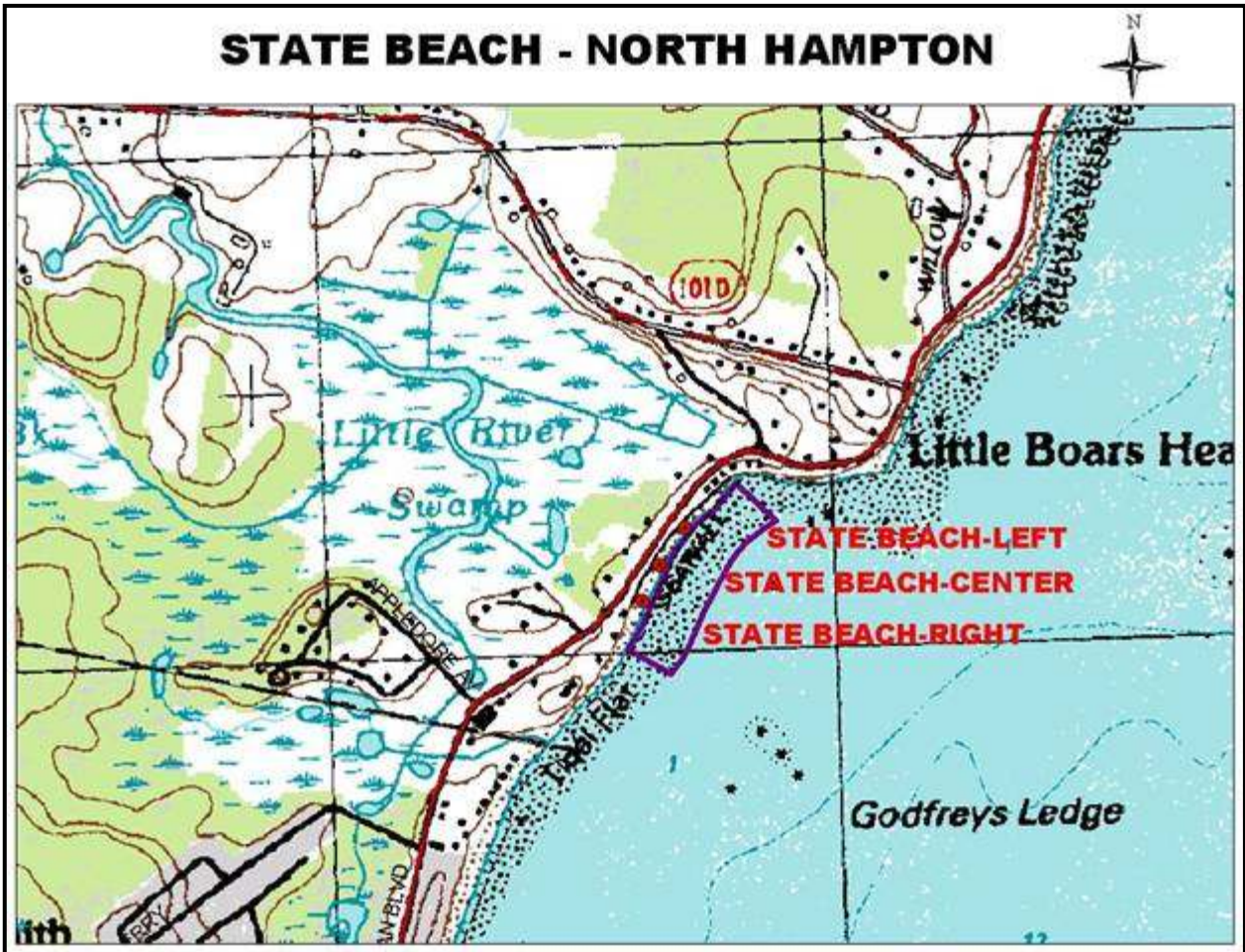


Figure 1. Map of State Beach

Tier Status and Sampling Frequency

The Beach Program developed a risk-based beach evaluation process and tiered monitoring approach and implemented this approach during the 2003 beach season. Beach evaluations are conducted annually to determine potential health threats to the public. Evaluations are based on several criteria in three main categories: beach history, microbial pathogen sources, and beach use. Based on these criteria, beaches are assigned either a Tier I or Tier II status. Tier I are high priority beaches that have an increased potential to affect public health while Tier II are low priority beaches that have less potential to affect public health. Beach sample frequency is based on the Tier statuses; Tier I beaches are sampled weekly and Tier II beaches are sampled every other week.

State Beach was categorized as a Tier I beach based on the Beach Program's Risk-Based Evaluation ranking system. This ranking indicates that the beach is frequently used by the public and there are potential pollution sources present that may negatively affect public health, specifically Little River. Ranking of the beach has changed since 2002, when the ranking system

was implemented. State Beach was a Tier II beach however, based on beach bacteria levels, public use, and impacts from Little River, State Beach became a Tier I beach in 2003.

Current Year Water Quality

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 pathogenic bacteria. The state standard for Enterococci at public beaches is 104 counts/100 mL in one sample, or a geometric mean of 35 counts/100 mL in three samples collected over sixty days. Standard exceedances require the issuance and posting of a beach advisory. Beach advisories remain in effect until subsequent beach sampling indicates safe water quality conditions.

The number of samples collected at each beach is determined by the beach length. Beaches less than 100 feet in length are sampled at left and right locations 1/3 of the distance from either end of the beach. Beaches greater than 100 feet in length 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. Also, storm event sampling may be conducted at beaches where wet-weather events are expected to affect beach water quality.

The 2004 sampling season began June 1st. June was cooler and drier than normal, July was cooler and wetter than normal, while August was warmer and wetter than normal. The sampling season encompassed 108 days, of which precipitation was recorded on 42 days (based on Seabrook WWTF recorded precipitation). Twenty beach days (normal beach hours are considered 9:00 a.m. to 5:00 p.m.) were directly affected by precipitation.

State Beach was sampled three times during the pre-season and then once per week from June 1st through Labor Day. Three samples were collected at left, center and right stations (Figure 1). There were a total of 15 routine inspections performed and 45 samples collected in 2004.

Table 1 includes Enterococci data from each beach sampling event in 2004. Overall, the Enterococci levels were moderate. No bacteria advisories were issued this season, however, Enterococci levels exceeded the state standard on two occasions. Both instances occurred prior to the start of the beach season (mid-June through Labor Day). The Beach Program does not issue bacteria advisories prior to the season start.

The center sample station exceeded the state standard on May 27, 2004. There is no evidence to what caused the elevated levels. Rainfall totaled 0.27 inches prior to sample collection (data obtained from Seabrook WWTF). The tide was low, allowing Little River to discharge at the left end of the beach. Enterococci levels in Little River on May 27, 2004 were elevated and may have caused the elevated counts at the center sample station. Because the tide was low, ocean currents likely transported the discharge to the center beach area.

Enterococci levels at the left sample station were elevated on June 7, 2004. There is no evidence to what caused the elevated levels. Bacteria data was unavailable for Little River on that day. Inspection data indicate that the water was turbid with seaweed and brown in color on the left

end of the beach. Seaweed can harbor bacteria and, when disturbed, the bacteria may be re-distributed into the water column contributing to elevated levels.

Table 1. State Beach Enterococci Data 2004

Sample Date	Station Name	Results (counts per 100 mL)
04/15/2004	State Beach – Left	<10
	State Beach – Center	<5
	State Beach – Right	<10
05/11/2004	State Beach – Left	<10
	State Beach – Center	<10
	State Beach – Right	<10
05/27/2004	State Beach – Left	20
	State Beach – Center	140
	State Beach – Right	40
06/01/2004	State Beach – Left	<10
	State Beach – Center	<10
	State Beach – Right	<10
06/07/2004	State Beach – Left	250
	State Beach – Center	40
	State Beach – Right	10
06/09/2004	State Beach – Left	10
	State Beach – Center	<10
	State Beach – Right	20
06/15/2004	State Beach – Left	<10
	State Beach – Center	<10
	State Beach – Right	<10
06/21/2004	State Beach – Left	<10
	State Beach – Center	<10
	State Beach – Right	<5
06/29/2004	State Beach – Left	<10
	State Beach – Center	30
	State Beach – Right	10
07/07/2004	State Beach – Left	20
	State Beach – Center	<10
	State Beach – Right	5
07/13/2004	State Beach – Left	5
	State Beach – Center	<10
	State Beach – Right	<10
07/19/2004	State Beach – Left	10
	State Beach – Center	30
	State Beach – Right	30
07/27/2004	State Beach – Left	<10
	State Beach – Center	<5
	State Beach – Right	<10

Table 1 continued on next page

Sample Date	Station Name	Results (counts per 100 mL)
08/03/2004	State Beach – Left	10
	State Beach – Center	20
	State Beach – Right	40
08/10/2004	State Beach – Left	<10
	State Beach – Center	<10
	State Beach – Right	<5
08/17/2004	State Beach – Left	50
	State Beach – Center	<10
	State Beach – Right	<10
08/23/2004	State Beach – Left	60
	State Beach – Center	<10
	State Beach – Right	<10
08/30/2004	State Beach – Left	20
	State Beach – Center	<10
	State Beach – Right	<5

Table 2 includes Enterococci data from Little River. Enterococci levels in Little River fluctuated throughout the summer months (Figure 3). Data was normally collected during low tide conditions when flow from the salt marsh was directed towards the beach area. Precipitation preceded two sample events on May 27, 2004 and August 23, 2004. Enterococci levels after the events were elevated on both occasions indicating wet weather negatively impacts Little River.

Little River was subject to a microbial source tracking study in 2003. The study was designed to identify specific sources of fecal contamination as wildlife, human, domestic animals, or waterfowl. The study indicated that otters were a significant contributor to fecal pollution in the river. Other wildlife, mainly fox and raccoon, were also identified, as well as human sources.

Table 2. Little River Enterococci Data 2004

Sample Date	Results (counts per 100 mL)
04/15/2004	50
05/11/2004	40
05/27/2004	150
06/15/2004	5
07/07/2004	190
07/13/2004	10
07/19/2004	20
07/27/2004	60
08/03/2004	160
08/10/2004	<10
08/23/2004	290

Figure 2 depicts the Enterococci data in relation to the state standard for coastal beaches.

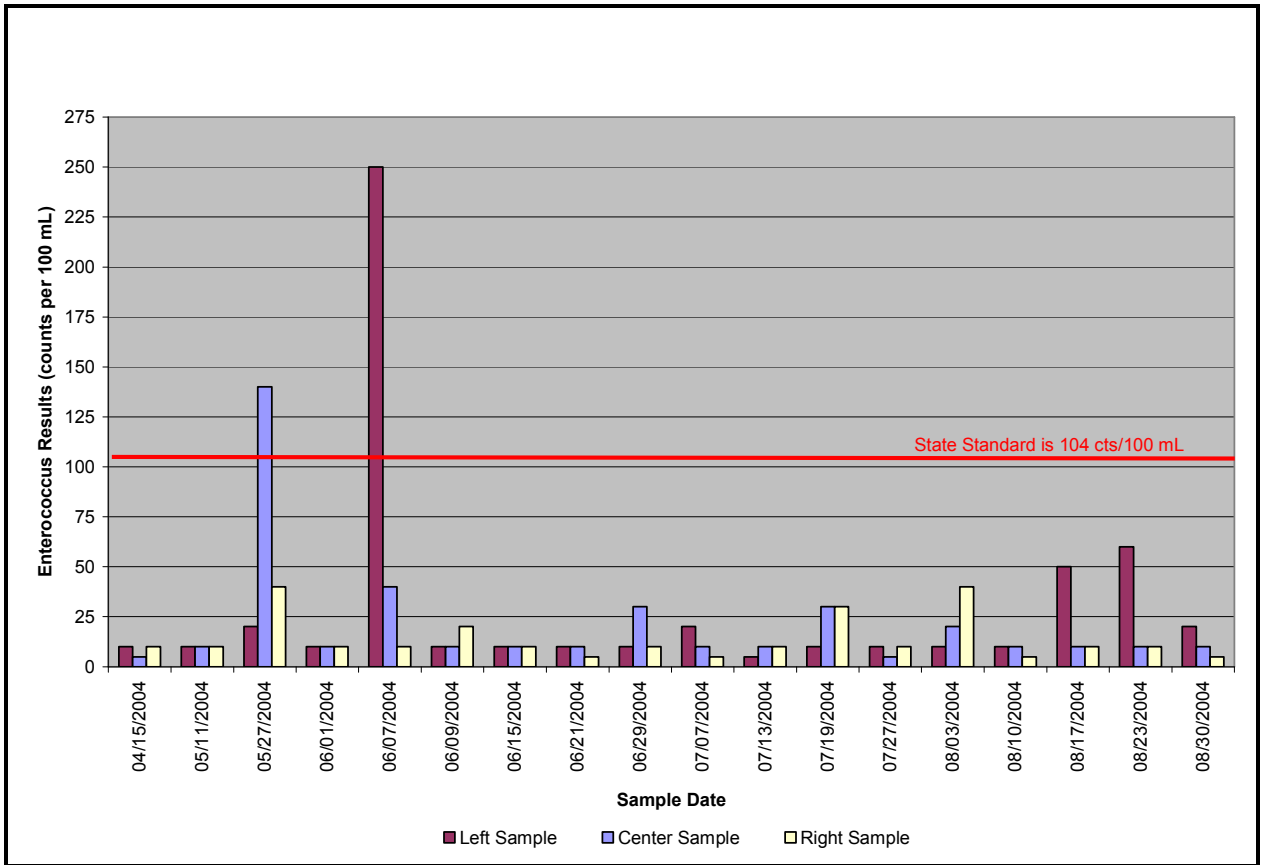


Figure 2. State Beach Enterococci Data 2004

Figure 3 depicts the Enterococci data from Little River.

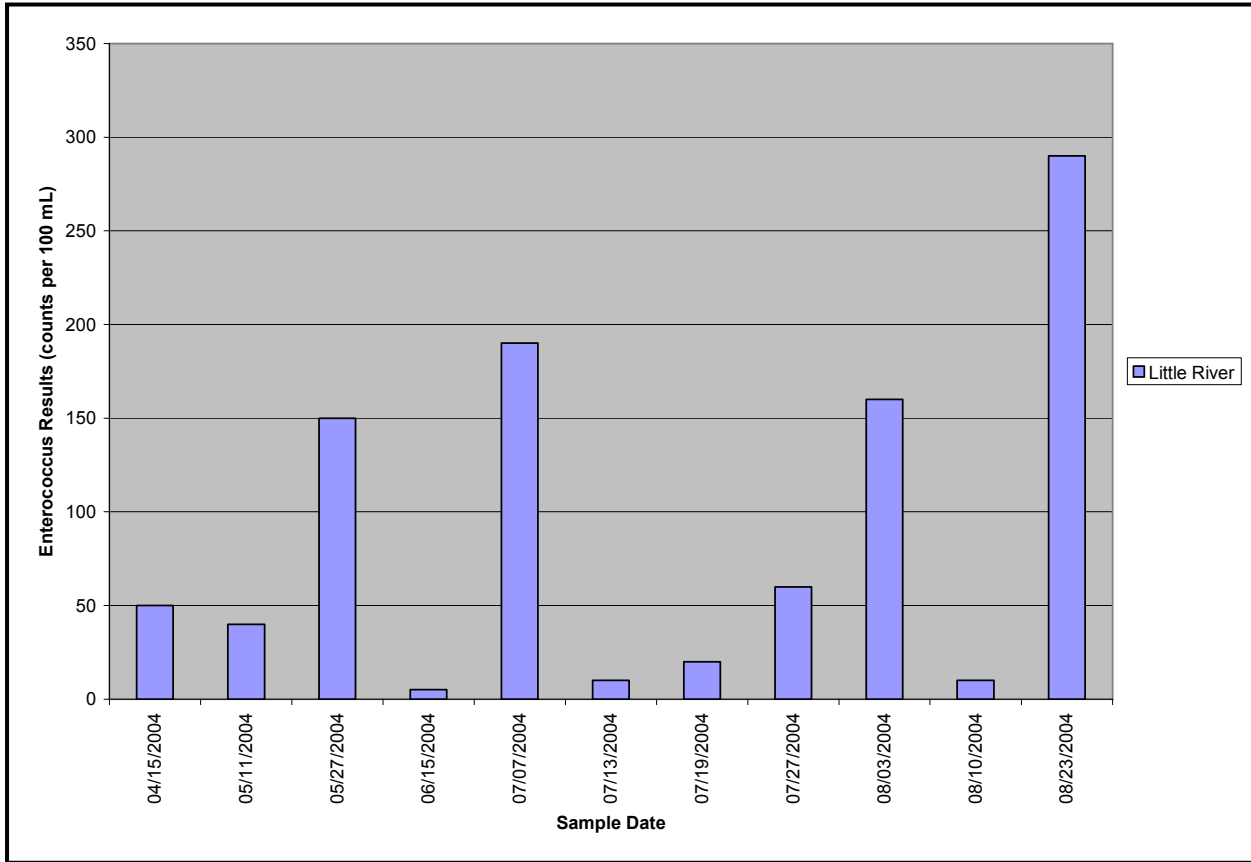


Figure 3. Little River Enterococci Data 2004

The Beach Program staff analyzed whether a relationship exists between elevated Enterococci levels and precipitation at State Beach. Analyses of the data indicate no direct correlation. DES will continue to monitor precipitation data and Enterococci levels. Precipitation often causes elevated bacteria levels due to runoff in the watershed.

Areas of Concern

Little River is an area of concern at State Beach. The river has been identified as a pollution source to coastal waters contributing to elevated bacteria levels. As mentioned previously, Little River was subject to a microbial source tracking study to identify specific sources of fecal pollution. Remediation actions are being planned for Little River to target human sources of bacteria.

The sanitary facilities at State Beach were temporarily closed in June this season. Signs directed the public to North Beach for facilities. On several occasions, inspection data noted that at least one toilet was clogged in the women's restroom. Inspection data also noted that there were strong sewage odors around the facility. Properly kept and working sanitary facilities are essential during the summer months in the presence of beach goers. Unsanitary conditions could allow the growth of bacteria and potential transport to beach waters.

Waterfowl were frequently observed during the season. There were also occasions when the public were feeding waterfowl on the beach resulting in 50-100 seagulls present. Feeding waterfowl is not recommended as they will tend to congregate on the beach waiting for food. Waterfowl can defecate up to 28 times per day, contributing to fecal pollution at the beach. The tides can then cause the fecal material and associated bacteria to become suspended in the water, contributing to a public health risk.

Thoughts for the Future

- The State Parks division, local businesses, or school groups should consider joining NHDES' Adopt-a-Beach Program. The program would consist of beach clean-ups and water quality monitoring. DES would conduct training sessions and participate in education and outreach activities for the community. If you are interested, please contact Sara Sumner at 603-271-8803 or ssumner@des.state.nh.us.
- The State Parks division should consider posting signs warning the public not to feed waterfowl at the beach. The Beach Program is willing to collaborate on this effort.
- In the event that the restroom facilities are closed again for an extended period, at least one portable facility should be made available.