

# SALEM SOUND COASTWATCH

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*Committed to enhancing and protecting the environmental quality of Salem Sound and its watershed*



## **Clean Beaches and Streams Program** *Summary Report, Summer 2003*

The following report is a summary of results from water quality testing that has occurred over the past summer by Salem Sound Coastwatch's Clean Beaches and Streams Program and by Salem Sound municipalities. The data is displayed in two tables below: [Table 1.0](#) shows water testing conducted at public bathing beaches by the Salem Sound municipalities, including Beverly, Danvers, Manchester, Marblehead and Salem. [Table 2.0](#) displays results of tests performed by Salem Sound Coastwatch at coastal outfall pipes and streams.

### **Approach and Methods**

While the cities test bathing waters at public beaches, Salem Sound Coastwatch focuses on storm water outfall pipes, many of which are located on bathing beaches and near boating areas. Salem Sound's tests are conducted at the source of runoff, therefore the bacterial counts tend to be much higher than those taken from the water in the middle of a bathing beach. Nonetheless, these results indicate that contaminants are making their way into our area waters.

After conducting studies over the past several years, the EPA has concluded that the indicator organism showing the best correlation with adverse health effects in marine waters was Enterococci, and thus has mandated that all states use this standard by April of 2004. All of the Salem Sound communities are already using Enterococci as the indicator organism for marine water testing. Salem Sound Coastwatch tested for both fecal coliform and Enterococci this summer; therefore both are included in this report.

The numbers shown in [Table 1.0](#) represent the "geometric mean" of test results collected over the summer. This is a statistical averaging method used to even out the average when dealing with a wide range of numbers. Massachusetts state sanitary code (105 CMR 445.000) mandates that "the geometric mean of the most recent five (5) Enterococci levels within the same bathing season shall not exceed 35 colonies per 100ml."



*A stormwater outfall pipe at Juniper Beach in Salem, one of the many sites monitored within the Clean Beaches & Streams Program.*

The Salem Sound municipalities tested bathing waters at least once a week, more frequently if Enterococci levels were shown to be high. Beach closings depended on either a single test reporting high bacterial levels or the geometric mean exceeding 35 per 100ml. However, tests conducted on days where there was precipitation in any amount were not included in the calculations for geometric mean. Rain can affect bacterial counts because of flushing of contaminants from storm drains, runoff from impervious surfaces and other sources of non-point pollution, resulting in temporarily elevated bacteria counts compared to typical dry weather conditions.

Therefore, [Table 1.0](#) below displays two different calculations of the geometric mean: the first includes the results of all tests taken throughout the summer, whereas the second set excludes test results from days with precipitation. The purpose of showing both sets of numbers is to give a more complete picture of the health of a particular beach.

### Definition of Dry vs. Wet Conditions

Within this sampling protocols represented within this report, Salem Sound Coastwatch defines “dry” conditions vs. “wet” differently than the municipalities. Under Salem Sound Coastwatch’s definition, dry conditions are those as having less than .2" of precipitation the day of sampling or less than .5" within the three days preceding sampling. Wet conditions are defined as more than .2" precipitation the day of sampling or more than .5" within three days preceding sampling. The municipalities define wet



*Dry weather drainage from the pipe at Brackenberry Beach, Beverly, taking the form of a small stream running across the beach.*

conditions, or a “storm” event, as any occurrence of precipitation during the sampling or within the 24 hours preceding the sampling.

During the summer of 2003, all of Salem Sound Coastwatch’s water quality testing happened to take place during dry weather conditions. If wet conditions had occurred for the designated test dates, testing would have been conducted as in dry weather.

### Salem Sound Coastwatch Test Results

[Table 2.0](#) below shows the results of samples taken by Salem Sound Coastwatch over the course of the summer. Samples were taken every 2 weeks at low tide.

Since there were too few samples to calculate a meaningful geometric mean, each test result for both fecal coliform and Enterococci is included in the table. Those values that are higher than EPA standards (EPA-823-R-03-008) are indicated in bold: fecal coliform >200 CFU/mL or Enterococci >104 CFU/100mL.

### For Additional Information

For additional information about Salem Sound Coastwatch’s Clean Beaches & Streams Program, including information on how you can get involved as a volunteer in this environmental monitoring program, please check out SSCW’s website: [www.salemsound.org](http://www.salemsound.org), call Salem Sound Coastwatch at 978-741-7900, or email [rob.gough@salemsound.org](mailto:rob.gough@salemsound.org).



**Table 1.0. Salem Sound Bathing Beaches: Tested by local Boards of Health**

Figures listed in this table are the geometric mean of available results of water quality testing over the summer for each municipality. Numbers higher than 351 are indicated in bold.

City	Enterococci (including rain events)	Enterococci (excluding rain events)
<b>Beverly</b>		
Brackenbury Beach	26	10
Dane St. Bathhouse	<b>54</b>	32
Dane St. Jetty	19	29
Dane St. (mid-beach)	<b>49</b>	<b>39</b>
Goat Hill	32	<b>37</b>
Independence Park	21	17
Lynch Park	14	14
Mingo Beach	18	8
Ober Park	<b>40</b>	<b>41</b>
Rice Beach	15	12
Sandy Point	28	21
West Beach	10	5
Woodbury Beach	16	12
<b>Danvers</b>		
Sandy Beach East	<b>40</b>	21
Sandy Beach West	<b>61</b>	<b>36</b>
<b>Manchester</b>		
Black Beach	9	7
Magnolia Beach	11	10
Manchester Bath and Tennis	6	4
Singing Beach	7	7
Singing Beach (right of pkg. lot)	7	7
Tucks Point Beach	21	22
West Manchester Beach	15	13
White Beach	6	6

(Continued below)

<b>City</b>	<b>Enterococci (including rain events)</b>	<b>Enterococci (excluding rain events)</b>
<b>Marblehead</b>		
Crocker Park	15	12
Devereaux Beach	9	6
Gas House Beach	21	31
Grace Oliver Beach	29	23
Stramski Beach	35	31
Village Beach	15	18
<b>Salem</b>		
Collins Cove	22	21
Dead Horse Beach	34	24
Forest River Point	20	30
Juniper Point	30	18
Mackey Beach	<b>37</b>	<b>45</b>
Naumkeag	24	23
Ocean Ave. Beach	<b>41</b>	32
Osgood Beach	<b>37</b>	<b>56</b>
Pickman Park	<b>56</b>	<b>44</b>
Pioneer	14	14
Steps Beach	<b>45</b>	29
Willow Ave.	23	23
Willows Pier	<b>41</b>	28
Winter Island	13	11

<sup>1</sup>Massachusetts state sanitary code (105 CMR 445.000) mandates that “the geometric mean of the most recent five (5) Enterococci levels within the same bathing season shall not exceed 35 colonies per 100ml.”

**Table 2.0. Salem Sound Coastwatch—Outfall Pipes and Streams**

NOTE: Salem Sound Coastwatch site numbers are shown in parentheses.

<b>Beverly</b>	<b>Indicator*</b>	<b>6/17</b>	<b>7/1</b>	<b>7/15</b>	<b>7/29</b>	<b>8/12</b>	<b>8/26</b>
Brackenbury Beach	FC	100	100	<b>700</b>	ns	<b>1,600</b>	<b>1,900</b>
SW storm drain on beach (222)	Ent	<100	100	<b>400</b>	ns	<b>200</b>	<b>300</b>
Brackenbury Beach	FC	<b>2,700</b>	<b>2,400</b>	<b>1,700</b>	<b>1,700</b>	<b>1,400</b>	<b>1,900</b>
Stream from cement culvert (213)	Ent	<b>400</b>	<b>500</b>	<b>1,400</b>	<b>700</b>	<b>200</b>	<b>200</b>
Dane St. Beach	FC	<100	100	<b>500</b>	<b>500</b>	<b>700</b>	<b>11,000</b>
Northern storm drain (322)	Ent	<100	<100	<b>600</b>	<100	100	<b>400</b>
Dane St. Beach	FC	100	<b>400</b>	<b>400</b>	<100	<100	<b>300</b>
Lawrence St. brook at beach (321)	Ent	<b>400</b>	<b>200</b>	<100	<100	<100	<100
Mingo Beach	FC	ns	100	<b>400</b>	ns	<b>600</b>	ns
Storm drain on beach (212)	Ent	ns	<100	100	ns	<100	ns
Rice Beach	FC	<b>700</b>	<b>600</b>	<b>800</b>	<b>6,000</b>	<b>2,600</b>	ns
Stream draining across beach (214)	Ent	<b>500</b>	<b>1,100</b>	<b>1,000</b>	<b>300</b>	100	ns
<b>Danvers</b>							
Eden Glen Ave.	FC	100	<b>9,500</b>	<b>3,400</b>	<b>4,400</b>	<b>300</b>	<b>1,400</b>
Storm drain (491b)	Ent	<100	<b>300</b>	<b>200</b>	<100	<b>200</b>	100
Waters River at Route 35 (403)	FC	100	200	<b>400</b>	<b>400</b>	<b>1,200</b>	ns
	Ent	100	<100	<b>400</b>	<100	<b>200</b>	ns
<b>Manchester</b>							
Bennett's Brook at Bennett St. (149)	FC	<100	<b>500</b>	<b>1,100</b>	ns	<b>900</b>	<b>4,400</b>
	Ent	<100	<100	<b>400</b>	ns	100	<b>200</b>
Sawmill Brook	FC	100	<100	200	100	<100	ns
Storm drain at high school (127)	Ent	<b>300</b>	<100	100	<100	<100	ns
<b>Marblehead</b>							
Riverhead Beach	FC	<b>1,200</b>	<b>2,400</b>	<b>500</b>	<b>900</b>	<b>1,100</b>	<b>4,300</b>
Storm drain at boat landing (701)	Ent	<b>1,500</b>	<b>200</b>	<b>500</b>	100	<b>600</b>	<b>300</b>
Stramski Beach	FC	100	<b>400</b>	<b>700</b>	<b>1,200</b>	<b>800</b>	<b>1,800</b>
Stream draining across beach (722)	Ent	<b>300</b>	100	<b>400</b>	<b>200</b>	<b>700</b>	<b>200</b>
<b>Salem</b>							
Juniper Beach	FC	<b>27,000</b>	<b>640,000</b>	<b>970,000</b>	<b>1,300,000</b>	<b>290,000</b>	<b>26,000</b>
Storm drain on beach (620)	Ent	<b>700</b>	<b>36,000</b>	<b>37,000</b>	<b>26,000</b>	<b>2,900</b>	<b>12,000</b>
Juniper Cove	FC	ns	ns	200	ns	ns	<b>6,500</b>
Storm drain on Steps Beach (625)	Ent	ns	ns	<100	ns	ns	<100
Palmer Cove	FC	ns	ns	ns	<b>3,700</b>	<b>6,700</b>	ns
Storm drain at Shetland Park (629)	Ent	ns	ns	ns	100	<b>200</b>	ns
Palmer Cove	FC	<b>1,000</b>	<b>100,000</b>	<b>9,000</b>	<b>3,000</b>	<b>68,000</b>	ns
Storm drain near playground (631)	Ent	<b>800</b>	<b>400</b>	<b>200</b>	<100	100	ns
Pickman Park	FC	<100	<b>400</b>	<b>12,000</b>	ns	ns	ns
Pickman River at low tide (646)	Ent	<100	<100	100	ns	ns	ns
North River	FC	<b>400</b>	<b>5,900</b>	<b>400</b>	200	<100	ns
Culvert-Harmony Grove Rd (500)	Ent	<100	<100	100	<100	<100	ns
North River-at Route 114 (501)	FC	<b>31,000</b>	<b>2,100</b>	<b>5,600</b>	<b>33,000</b>	<b>8,200</b>	<b>34,000</b>
	Ent	<b>400</b>	<b>200</b>	<b>600</b>	<b>400</b>	100	<b>400</b>
Willow Ave. Beach	FC	100	<b>400</b>	<100	ns	ns	ns
Storm drain on beach (642)	Ent	<100	<100	<100	ns	ns	ns

\*FC = Fecal coliform      Numbers in bold exceed standards as specified by the EPA (EPA-823-R-03-008):  
 Ent = Enterococci      Fecal coliform >200 CFU/100mL, Enterococci >104 CFU/100mL