National Overview

In 2006, the number of closing and advisory days at ocean, bay, and Great Lakes beaches jumped 28 percent to a record high of 25,643 days nationwide—the largest percent increase since 2003, when the number of beaches monitored at least weekly doubled thanks to federal BEACH Act grants administered by the EPA (see Figure 1). In 2006, there was a less than 1 percent increase in the number of beaches monitored at least weekly, but a dramatic increase in the amount of rain in some parts of the country which appears to the overriding factor for the increase in closing/advisory days.

During 2006, there were 25,643 days of closings and advisories at U.S. ocean, bay, and Great Lakes beaches.

Regionally, the largest percent increases from 2005 levels were along the New York–New Jersey coastline (96%) followed by the West (91%), New England (75%), the DelMarVa Penninsula (43%), and the Great Lakes (7%). There were overall decreases in closing/advisory days in the Gulf (–14%) and the Southeast (–3%).

In 2006, the percent of all samples exceeding national health standards decreased to 7 percent in 2006 from 8 percent in 2005. Regionally, the highest percent exceedances were along the Great Lakes shoreline (14%), followed by Western states (8%), the DelMarVa Penninsula, the Gulf, New England, and New York–New Jersey (each at 6%), and the Southeast (3%).

Across the United States, beach officials continue to use traditional methods that require about 24 hours to detect bacterial indicator levels in beachwater samples. Some states, such as California and New Jersey, are piloting rapid testing methods that could provide results in about four hours. At least some communities in seven states (**Indiana, Maryland, Ohio, New Hampshire, New York, South Carolina,** and **Wisconsin**) are using or developing computer models that allow them to predict bacterial indicator concentrations in about an hour using physical measurements at the beach, such as rainfall levels, wind speed and direction, tides, and wave heights. At least some communities in 15 states preemptively close beaches or issue an advisory based on rainfall levels alone (**California, Connecticut, Delaware, Florida, Hawaii, Maine, Mississippi, North Carolina, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, South Carolina, and Wisconsin**); **Louisiana** is developing preemptive rainfall standards.

MAJOR FINDINGS

This section provides a national perspective on the major findings of NRDC's *Testing the Waters* report regarding 2006 beachwater quality, closings and advisories, sources of pollution, associated health risks, and economic impacts. For more information on state programs and specific beaches, see the individual state summaries in Chapter 5.

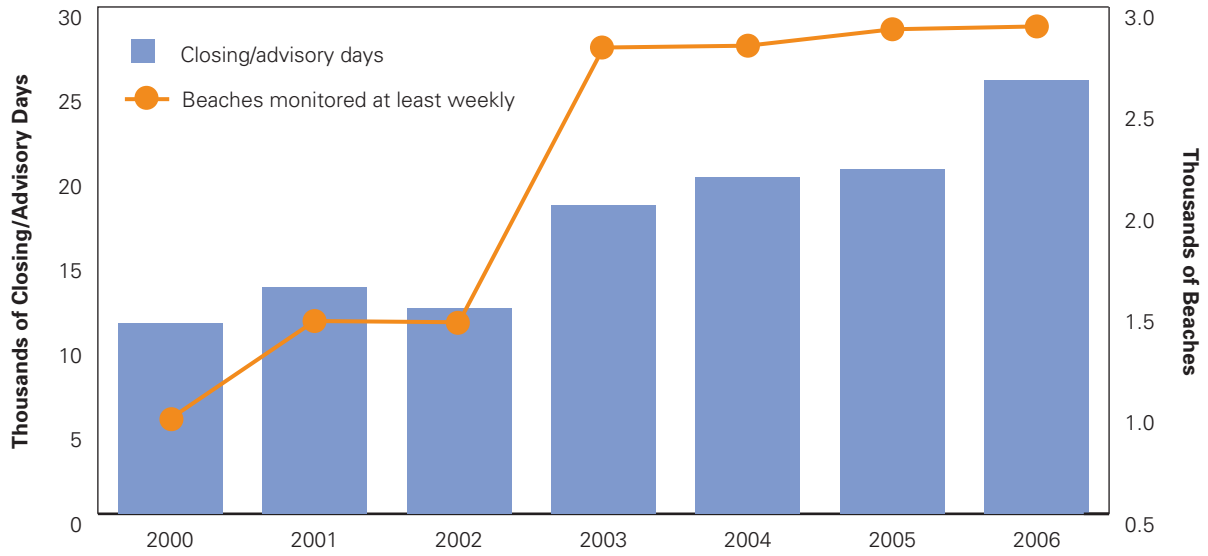
Beach Closings/Advisories and Pollution Sources

• During 2006, U.S. ocean, bay, Great Lakes, and some freshwater beaches had 25,643 days of closings and advisories, 73 extended closings and advisories (seven to 13 consecutive weeks), and 69 permanent closings and advisories (more than 13 consecutive weeks). Including extended days, the total comes to 29,785 beach closing and advisory days.

• Since 1992, there have been more than 155,286 days of closings and advisories and 562 extended closings and advisories. (See Figure 1 and Table 3.)

• The number of beach closing and advisory days increased 28 percent to 5,568 days in 2006 (see Figure 1). The two major factors leading to the increase in 2006 appear to be heavy rainfall in some areas, particularly Hawaii, and

Figure 1. Total Closing/Advisory Days, 2000–2006 (excluding extended and permanent)



Note: Because of inconsistencies in monitoring and closing/advisory practices among states and the different levels of data submission over time, it is difficult to make comparisons between states or to assess trends based on the closing/advisory data.

unaddressed bacteria-laden stormwater and sewage pollution that contaminate beachwaters. The percent of beaches monitored at least once a week remained steady at 79 percent.

• The continued high level of closings/advisories is an indication that regular monitoring continues to reveal serious water pollution at our nation's coastal, bay, and Great Lakes beaches. Figure 2 (page vii) shows that 15,738 (63%) of the 2006 beach closings and advisories were issued because water quality monitoring revealed bacteria levels exceeding health and safety standards.

Major causes of beach closings and advisories in 2006 were as follows (see Figure 2):

• 63 percent (15,738) were based on monitoring that detected bacteria levels exceeding beachwater quality standards (a decrease from 75 percent in 2005);

• 33 percent (8,334) were precautionary, due to rainfall known to carry pollution to swimming waters (an increase from 21 percent in 2005);

• 4 percent (966) were in response to known pollution events, such as sewage treatment plant failures or breaks in sewage pipes. In other words, localities did not wait for monitoring results to decide whether to close beaches or issue advisories (an increase from 3 percent in 2005);

• Less than 1 percent (89) was due to other causes, such as dredging and algal blooms (a decrease from 2 percent in 2005).

• Major pollution sources listed as responsible for 2006 beach closings and advisories include the following. The total is greater than 25,643 and 100 percent because more than one source may have contributed to a given closing or advisory (see Figure 4):

Figure 2. Reported Causes of Closings/Advisories in 2006

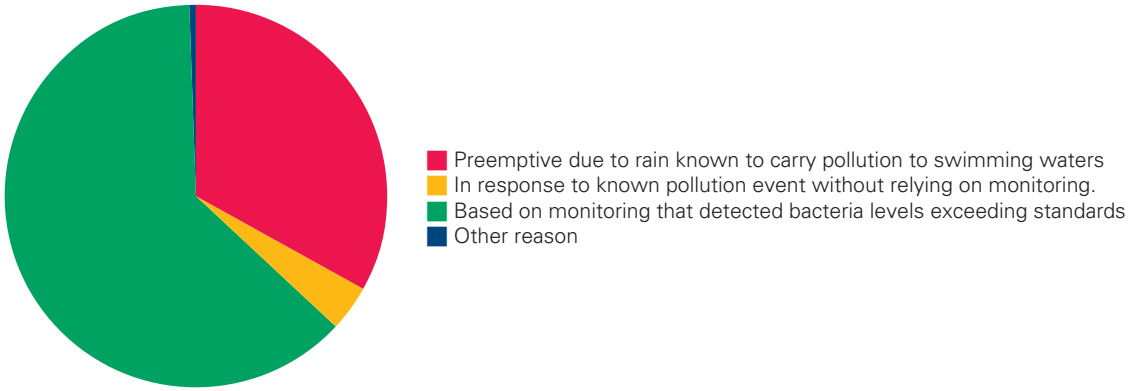
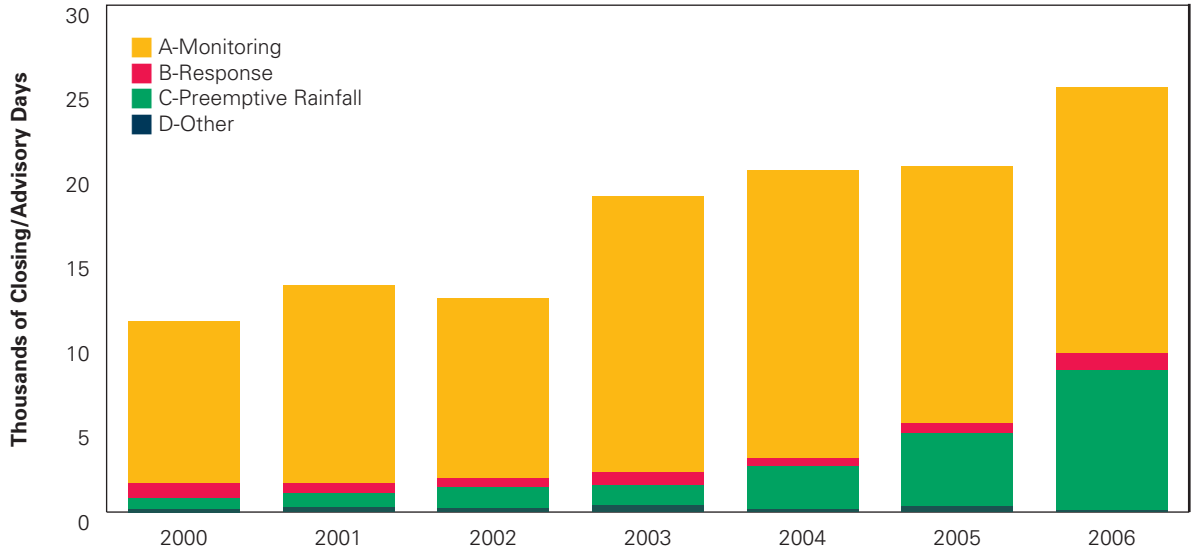


Figure 3. Reported Causes of Closings/Advisories, 2000–2006



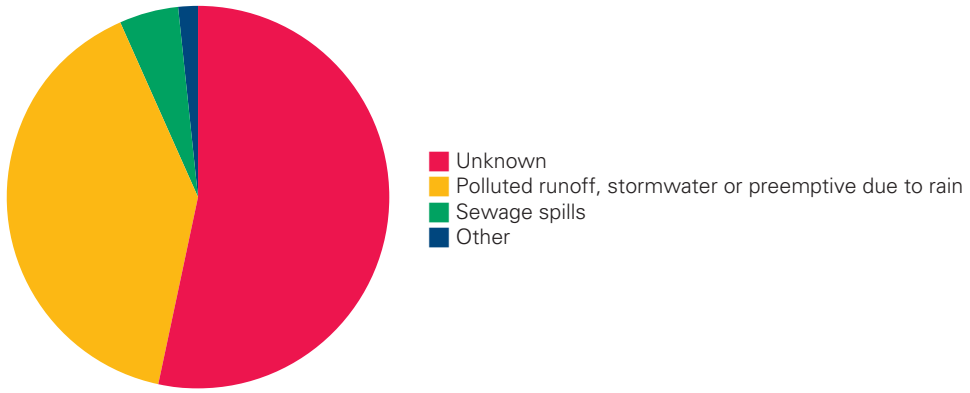
Key: (A) Based on monitoring that detected bacteria levels exceeding standards. (B) In response to known pollution event without relying on monitoring. (C) Preemptive due to rain known to carry pollution to swimming waters. (D) Other reason.

• Unknown sources of pollution caused 14,167 closing/advisory days (54 percent of this year's total)—a decrease of 435 days from 2005—plus 58 extended and 37 permanent closings or advisories. Sewage or stormwater discharges usually cause elevated bacteria levels, but efforts to determine the causes of increased bacteria levels have not kept pace with new or more frequent monitoring practices;

• Polluted runoff and stormwater caused or contributed to 10,597 closing/advisory days (40 percent of this year's total)—an increase of 5,264 days from 2005—plus three permanent closings or advisories;

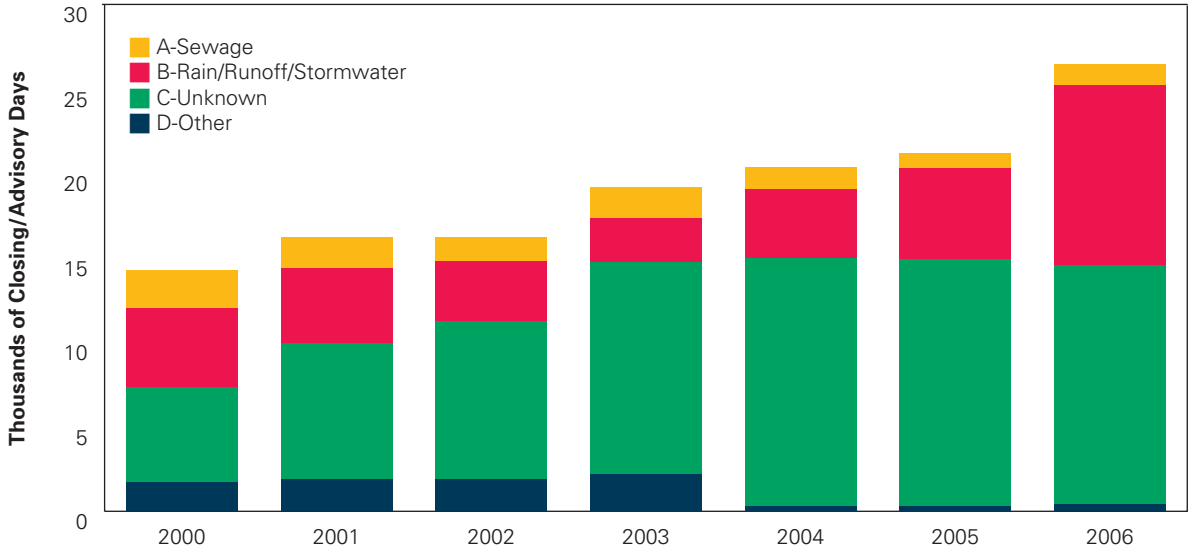
• Sewage spills and overflows caused or contributed to 1,301 closing/advisory days (5 percent of this year's total)—an increase of 402 days from 2005—plus six extended and two permanent closings or advisories (includes combined sewer overflows, sanitary sewer overflows, breaks or blockages in sewer lines, and faulty septic systems);

Figure 4. Sources of Pollution That Caused Closings/Advisories, 2006



Totals shown are greater than annual totals because more than one pollution source may have contributed to each closing/advisory.

Figure 5. Sources of Pollution That Caused Closings/Advisories, 2000–2006



Totals shown are greater than annual totals because more than one pollution source may have contributed to each closing/advisory. Key: (A) Sewage spills and overflows. (B) Polluted runoff, stormwater, or preemptive due to rain. (C) Unknown. (D) Other reasons (including those with no source information provided).

• Elevated bacteria levels from miscellaneous sources, such as boat discharges or wildlife, accounted for 410 closing/advisory days (2 percent of this year's total)—an increase of 77 days from 2005—plus two extended and 28 permanent closings or advisories;

• Preemptive rainfall advisories, usually due to polluted stormwater or sewage overflows, accounted for 8,334 closing/advisory days (33 percent of this year's total)—an increase of 4,005 days from 2005.

Beachwater Quality

For the second consecutive year, NRDC used the percentage of all beachwater samples collected in 2006 that exceeded the BEACH Act–required daily maximum standards to compare water quality at beaches ringing our nation from the Pacific Northwest to Southern California, from New England to the Florida Keys, and all along the U.S. Great Lakes shoreline. For marine waters, the standard is 104 enterococcus colony forming units per 100 milliliters (ml) and for the freshwater, the standard is 235 *E .coli* colony forming units per 100 ml.

For the 2006 beach season, the NRDC dataset includes monitoring results for 109,950 samples at 3,492 beaches and beach segments (most state and local officials divide longer beaches into manageable monitoring segments). Nationally, the percent of all samples exceeding the BEACH Act standard remained constant at 8 percent between 2005 and 2006.

Sources of Information

For the fourth consecutive year, our research for *Testing the Waters* is based primarily on the EPA's new electronic reporting system designed to meet the requirements of federal BEACH Act grants to all 35 coastal and Great Lakes states and territories. From 1998 through 2003, the report had been based on the EPA's annual Beaches Environmental Assessment, Closure and Health (BEACH) Program survey, supplemented by NRDC interviews with state and local officials. The EPA's electronic reporting system replaced the BEACH survey.

Although it is improving, there are still technical problems with EPA's electronic data submission system. In some cases, the EPA's 2006 closing/advisory or beach detail data were incomplete or inaccurate and were replaced or supplemented with data requested by NRDC and received directly from the states. In three cases, the EPA closing/advisory data were completely replaced with data received directly from the state (**California, Rhode Island,** and **Washington**). NRDC updated the EPA's state beach lists with information solicited from all 30 coastal and Great Lakes states and contacted state and local officials with specific questions regarding their beach programs.

In addition to closing/advisory data, NRDC has compiled and analyzed, for the second consecutive year, each state's beach monitoring results. With these data, we are now able to present a comparative analysis of water quality at beaches across the United States—thanks to provisions of the BEACH Act which require the EPA to collect and publicize beach monitoring data from all states receiving BEACH Act grants. NRDC obtained 2006 beach season monitoring data through the EPA's STORET data warehouse (the EPA's main repository of water quality monitoring data) for 26 states (**Alabama, Alaska, California, Connecticut, Delaware, Florida, Georgia, Hawaii, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, New Jersey, New York, North Carolina, Ohio, Oregon, Rhode Island, South Carolina, Texas, Virginia, Washington,** and **Wisconsin**). EPA data for **California, New Hampshire**, and **Washington** were found to be in error, so NRDC requested and received monitoring data directly from these states. Data for **Indiana** and **Pennsylvania** beaches were not available through STORET; they were obtained directly from these states. Lake County in **Illinois** provided monitoring data for Lake Michigan beaches in its jurisdiction, but no data were obtained for Lake Michigan beaches in Cook County—the Illinois Department of Public Health is the only agency in all 30 coastal or Great Lakes states that did not provide 2006 monitoring data to either the EPA or NRDC. NRDC included U.S. territories for the purpose of comparing total closing/advisory days to earlier years. However, we did not include them in our more detailed 2006 beach season analysis by state in Chapter 5.

Special Focus: America's Highest Risk Beaches

For the first time this year, our report puts a special focus on our nation's highest risk beaches—those with the greatest amount of use and/or proximity to potential pollution sources. States must identify their highest risk beaches when they receive federal Beach Act grants from the EPA. We found that closing/advisory days at these so-called "Tier 1" beaches steadily increased at a rate of 3 percent per year from 2004 through 2006. Heavy rains in some areas as well as more frequent monitoring appear to be the major factors contributing to the steady increase. In 2005, 97 percent (1,834) of Tier 1 beaches were monitored at least once a week compared to 79 percent of all monitored beaches. This is an increase from 2005 when 94 percent (1,765) of Tier 1 beaches were monitored at least once a week.

In 2006, Tier 1 beaches in **Ohio, Indiana, Illinois, Rhode Island,** and **Minnesota** ranked highest in percent of samples exceeding national standards. It is important to note that a top-ranking state, while a clear indication of dirty coastal recreational waters, is not necessarily an indication of a bad actor. For example, Ohio and Indiana always issue an advisory when a sample exceeds the standard; they do not wait for the results of a resample, or check other conditions first as some other states do. Although Rhode Island does wait for the result of a resample before taking action, it has the highest average closing/advisory days per beach among the top ranking states indicating that the public is frequently notified when conditions are unsafe. **Ohio** goes even further by monitoring more of its Tier 1 beaches more frequently than once a week (see Table 1).

Table 1. Rank of States by Percent of Tier 1 Beachwater Samples Exceeding the National Standard in 2006

State	Total Samples	Percent Exceedance	2006 Tier 1 Beach Closing/Advisory Days	Average Closing/Advisory Days Per Tier 1 Beach	Percent of Tier 1 Beaches Monitored More Frequently Than Once a Week	Resample or Other Information Needed Before Action
OH	1,066	22%	319	16	100%	no
IN	516	19%	38	5	63%	no
IL	3,682	15%	97	7	72%	no
RI	493	14%	240	27	70%	yes
MN	411	14%	65	8	100%	no
MD	688	13%	241	5	0%	yes
NY	2,431	13%	704	9	7%	sometimes
ME	651	12%	134	3	7%	sometimes
SC	1,300	12%	676	17	0%	yes
CA	30,582	12%	4,641	9	8%	no
PA	1,502	11%	52	7	90%	no
WI	963	11%	469	18	100%	no
MS	1,221	9%	0	0	100%	no
MA	702	8%	444	44	0%	no
TX	4,243	8%	470	8	0%	sometimes
AL	326	6%	18	2	100%	yes
FL	15,729	6%	2,686	9	0%	yes
WA	3,299	5%	157	2	0%	yes
MI	2,470	4%	124	1	14%	sometimes
CT	914	4%	54	1	0%	yes
GA	884	4%	135	8	0%	no
HI	3,070	3%	728	16	98%	yes
NH	622	3%	17	2	100%	no
NJ	3,894	3%	122	1	0%	yes
OR	435	3%	15	4	0%	no
LA	167	2%	5	1	0%	yes
NC	3,057	2%	283	3	0%	no
DE	299	1%	0	0	0%	yes
VA	886	1%	43	1	0%	no

NRDC identified 92 beaches in 19 states that exceeded the standard more than 25 percent of the time (**California, Connecticut, Delaware, Florida, Illinois, Indiana, Maine, Maryland, Michigan, Minnesota, Mississippi, New Jersey, New York, Ohio, Rhode Island, South Carolina, Texas, Virginia,** and **Wisconsin**) (see Table 2). Those violations are pretty good indications that the beachwater was contaminated with human and animal waste, and that beachgoers were either swimming in that waste or banned from doing so due to the health risks.

Table 2. Tier 1 Beaches with More Than 25 Percent of Samples Exceeding National Standards in 2006, by Percent Exceedance

State	County	Beach	Monitoring Frequency	Total Samples	Percent Exceedance
NJ	Ocean	Beachwood Beach West	1/wk	35	60%
MD	Cecil	Hacks Point	1/wk	10	60%
CA	San Mateo	Venice State Beach	1/wk	35	57%
MD	Kent	Bay Country Campground And Beach	1/wk	16	56%
IL	Cook	Jackson Park Beach	5/wk	71	54%
CA	Los Angeles	Avalon Beach-North of GP Pier	1/wk	34	53%
MD	Kent	YMCA Camp Tockwogh (Youth Camp)	1/wk	16	50%
FL	Dixie	Shired Island	1/wk	34	50%
DE	Sussex	Delaware Seashore State Park, Tower Road Bayside	1/wk	18	50%
TX	Nueces	Ropes Park	1/wk	69	48%
IL	Lake	North Point Marina North Beach	Daily	90	47%
FL	Taylor	Dekle Beach	1/wk	37	46%
CA	Orange	Doheny State Beach-Surfzone At Outfall	2/wk	85	45%
SC	Horry	Myrtle Beach City of-Withers Swash	1/wk	45	44%
OH	Cuyahoga	Villa Angela St. Pk.	Daily	72	44%
MD	Kent	Ferry Park	1/wk	16	44%
ME	York	Goose Rock (Kennebunkport)	5/wk	23	43%
FL	Taylor	Keaton Beach	1/wk	37	43%
MD	Cecil	Red Point Beach	1/wk	7	43%
OH	Cuyahoga	Euclid St. Pk.	4/wk	72	42%
MN	St Louis	Beach: Lk Sup, Park Point, Southworth Marsh, Duluth	2/wk	63	41%
MD	Kent	Tolchester Marina And Beach	1/wk	22	41%
CA	Sonoma	Campbell Cove State Beach	1/wk	37	41%
CA	Los Angeles	Santa Monica State Beach-Santa Monica Canyon	1/wk	236	40%
NJ	Ocean	Money Island	1/wk	20	40%
MD	Kent	Betterton Beach And Public Landing	1/wk	15	40%
MD	Worcester	Public Landing	1/wk	15	40%
CA	Los Angeles	Long Beach-B-70	1/wk	63	38%
FL	Taylor	Cedar Island	1/wk	37	38%
SC	Horry	South Carolina State Park And Campground-Pirateland-Lakewood Campground	1/wk	40	38%

State	County	Beach	Monitoring Frequency	Total Samples	Percent Exceedance
MI	Wayne	Crescent Sail Yacht Club	2/wk	40	38%
CA	San Mateo	Marina Lagoon	1/wk	40	38%
CA	Los Angeles	Long Beach-Alamitos Bay Beach-2nd St Bridge & Bayshore	1/wk	67	37%
WI	Sheboygan	Kohler Andrae State Park North Picnic Beach	4/wk	27	37%
CA	Orange	Doheny State Beach-250' S of San Juan Creek	2/wk	54	37%
VA	King George	Fairview Beach	1/wk	19	37%
CA	Orange	Doheny State Beach-2000' South Outfall	2/wk	22	36%
NJ	Monmouth	L Street Beach	1/wk	25	36%
CA	Orange	Huntington Harbour-Clubhouse	1/wk	62	35%
CA	San Diego	Tijuana Slough National Wildlife Refuge-Tijuana Rivermouth	1/wk	65	35%
NY	Chautauqua	Main Street Beach	1/wk	17	35%
NY	Chautauqua	Wright Park East	1/wk	20	35%
CA	Orange	Doheny State Beach-3000' South Outfall	2/wk	84	35%
CA	Los Angeles	Avalon Beach-Near Busy B Cafe	1/wk	32	34%
CA	Santa Barbara	East Beach- Mission Creek	1/wk	67	34%
MS	Harrison	Gulfport East Beach	10/mo	89	34%
CA	Los Angeles	Cabrillo Beach	Daily	224	33%
MI	St Clair	Conger-Lighthouse Beach	1/wk	15	33%
ME	Cumberland	Pine Point	1/wk	15	33%
CA	San Francisco	Candlestick Point-Windsurfer Circle	1/wk	78	33%
CA	Orange	Doheny State Beach-North Of San Juan Creek	2/wk	79	33%
CA	Los Angeles	Malibu Beach-Paradise Cove	1/wk	55	33%
CA	Orange	Newport Bay-Newport Blvd Bridge	1/wk	49	33%
MN	St Louis	Beach: Lk Sup, St. Louis Bay, Pk Pt 20th/ Hearding Is, Duluth	2/wk	65	32%
WI	Sheboygan	Kohler Andrae State Park Nature Center Beach	4/wk	28	32%
WI	Sheboygan	Kohler Andrae State Park North Beach	4/wk	28	32%
CA	Orange	Salt Creek County Beach Park	2/wk	69	32%
OH	Cuyahoga	Huntington_Beach	4/wk	73	32%
TX	Nueces	Cole Park	1/wk	121	31%
CA	Orange	Doheny State Beach-1000' South Outfall	2/wk	80	31%
NY	Monroe	Ontario Beach	Daily	93	31%
TX	Galveston	Texas City Dike	1/wk	26	31%
SC	Horry	Myrtle Beach City Of-Midway Swash	1/wk	39	31%
MI	Cheboygan	Mackinaw City Lighthouse Park	3/wk	13	31%
MI	Emmet	Wilderness State Park	1/wk	13	31%
CA	Orange	Newport Bay-Ski Zone	1/wk	13	31%
OH	Ottawa	Camp Perry	4/wk	49	31%
IN	La Porte	Washington Park	3/wk	147	31%

State	County	Beach	Monitoring Frequency	Total Samples	Percent Exceedance
CA	Los Angeles	Trancas Beach	1/wk	236	30%
ME	York	Riverside (Ogunquit)	1/wk	20	30%
MD	Cecil	Crystal Beach Manor	1/wk	10	30%
CA	Los Angeles	Avalon Beach-South Of GP Pier	1/wk	30	30%
CA	San Francisco	Crissy Field, New Beach	1/wk	77	30%
WI	Sheboygan	Kohler Andrae State Park South Picnic Beach	4/wk	27	30%
CA	Santa Barbara	Arroyo Burro	1/wk	71	30%
CT	New London	Kiddie's Beach	1/wk	17	29%
RI	Bristol	Warren Town Beach	2/wk	42	29%
NY	Chautauqua	Wright Park West	1/wk	21	29%
FL	Escambia	Bayview Park	1/wk	53	28%
CA	Los Angeles	Trancas Beach	1/wk	236	28%
IL	Cook	Calumet South Beach	5/wk	68	28%
NY	Suffolk	Valley Grove Beach	1/wk	54	28%
CA	Orange	Huntington Harbour-Sunset Aquatic Park	1/wk	55	27%
CA	Orange	Salt Creek County Beach Park	2/wk	92	27%
CA	Los Angeles	Will Rogers State Beach-Temescal Canyon Sd	1/wk	52	27%
OH	Ashtabula	Lakeshore Park	4/wk	45	27%
NY	Monroe	Durand Beach	Daily	90	27%
CA	Los Angeles	Long Beach-B-69	1/wk	50	26%
WI	Sheboygan	Blue Harbor Beach	4/wk	27	26%
FL	Wakulla	Mash Island	1/wk	27	26%
SC	Horry	MYRTLE BEACH CITY OF-24th Ave. N	1/wk	35	26%
CA	Orange	Doheny State Beach-4000' South Outfall	2/wk	78	26%

Health Risks

• Because pathogens in sewage-contaminated waters can cause a wide range of diseases—including ear, nose, and throat problems, gastroenteritis, dysentery, hepatitis, and respiratory illness—beachwater pollution threatens public health. The consequences of these swimming-associated illnesses can be worse for children, elderly people, pregnant women, cancer patients, and others with weakened immune systems.

• Pollution contributed to the contamination of popular beaches. In 2006, known sewage contamination from spills, storm drains, runoff, or leaky septic systems was reported in such popular vacation destinations as Surfrider Beach in California, Ogen Dunes Beach in Indiana, Orchard Beach in the Bronx, and two beaches in Newport, Rhode Island.

• Aside from the disease-causing organisms present in sewage, its high nutrient content acts as fertilizer that can spur massive blooms of microscopic organisms. Harmful algal blooms (HAB), or "red tides," pose a serious risk to aquatic and human health. They are natural phenomenon occurring for a variety of reasons, but can be exacerbated by nutrient overloads into coastal waters. Nutrients spur harmful algae species such as the photosynthetic dinoflagellates *Karenia*

brevis or *Alexandrium tamarense* and the diatom *Pseudo-nitzschia australis* to multiply rapidly, producing red or green pigmented algal blooms that last for days, weeks, or months. Red tides may result in serious and potentially life-threatening human illnesses that have a slew of symptoms, including diarrhea, nausea, vomiting, abdominal cramping, chills, diminished temperature sensation, muscular aches, dizziness, anxiety, sweating, seizures, numbness and tingling of the mouth and digits, and paralysis, as well as cardiovascular and respiratory symptoms.[1] Although red tides are a growing problem off the coasts of Florida and NewEngland, no closings or advisories were attributed to red tides in 2006.

Bacterial Standards

The high level of closings/advisories indicates that new and more frequent monitoring continues to reveal serious water pollution at our beaches.

• The BEACH Act of 2000 required states and local agencies to use EPA standards or standards equally protective of public health to monitor their coastal waters. The current EPA standards, which were adopted in 1986, include a geometric mean value for multiple samples, generally taken over 30 days, and an instantaneous, single-sample value. Some state and local agencies measure both the geometric mean and the single sample when taking beachwater samples, and issue beach closings or advisories if either standard is exceeded; others measure the geometric mean or the single sample but not both.

• In 2006, all coastal and Great Lakes states reported using at least one of the BEACH Act–required standards. Four states went beyond these requirements by setting either stricter standards or by adding additional indicators to trigger beach closing/advisory decisions (**California, Florida, Hawaii,** and **Louisiana**).

• The BEACH Act also required the EPA to update its public health–based standards, which are based on out-of-date science, but the EPA has failed to do so. NRDC sued EPA to force it to update those standards, which provide incomplete information to beachgoers about health risks and do so one to two days after the water is tested.

Economic Impact

• Beaches are the top vacation destination in the country. Coastal tourism, dependent in part on clean beaches, generates substantial revenues for state and local governments. According to the *Report of the U.S. Commission on Ocean Policy,* ocean-related tourism and recreation contributed roughly $29 billion and 1.67 million jobs to the U.S. economy in 2000.

• The economic benefit of faster beachwater testing methods and earlier posting of advisories or closings was found to be about $202,000 per year for two Great Lakes beaches.

• Economic activity associated with the ocean contributed more than $117 billion to the U.S. economy in 2000.[2] About 85 percent of all tourism revenue is received in coastal states.[3]

• Researchers conclude that higher property values are associated with proximity to beaches and open water, and that people are willing to pay more to be closer to these attractive environmental features.

• Beach-related products, such as swimsuits, sunscreen, beach chairs, towels, boogie boards, and surfboards, generate hundreds of millions, if not billions, of dollars each year in sales. Sunscreen lotions and potions alone earn manufacturers revenues of about $640 million a year.[4]

• In a September 2000 report, the Woods Hole Oceanographic Institution estimated that red tides cost an average of $49 million per year.[5]

• Water pollution has a significant economic effect on coastal states. Failing to invest in clean water costs coastal states jobs, job productivity, tourism, property-tax dollars, and economic growth.

• Polluted waters cause economic losses when beachgoers cannot use the beach or go in the water.

CONCLUSION: START IDENTIFYING AND CONTROLLING THE SOURCES OF BEACHWATER POLLUTION

The shortcomings of our development and land use practices and sewage and stormwater management practices lead to increasing pollution of our coastal recreational waters. The more we look, the more we find contamination in our beachwater: as the number of beaches monitored and sampling frequencies increase, we can expect more beach closing/advisory days until we start identifying and controlling the sources of beachwater pollution.

Notes

1 Woods Hole Oceanographic Institution http://www.whoi.edu/redtide/

2 U.S. Commission on Ocean Policy, *An Ocean Blueprint for the 21st Century Final Report of the U.S. Commission on Ocean Policy*, Washington, D.C., September 2004, Appendix C, p. 3, available at: http://www.oceancommission.gov.

3 Ibid., p. E-6.

4 "New-Wave Sunscreens," *Chemical & Engineering News,* Vol. 83, No. 15, American Chemical Society, Washington, D.C., April 11, 2005, pp. 18–22, available at: http://pubs.acs.org/cen/coverstory/83/print/8315sunscreens.html.

5 Woods Hole Oceanographic Institution, *Estimated Annual Economic Impacts from Harmful Algal Blooms (HAB) in the United States,* September 2000, p.7, at http://www.whoi.edu/redtide/pertinentinfo/Economics_report.pdf.

Table 3. U.S. Ocean, Bay, Great Lakes, and Some Freshwater Beach Closings/Advisories, 2000–2006							
State	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
AL	6	53	16	64	24	27	44
CA	At least 5,780 + 17(e) + 23(p)	At least 6,568 + 13(e) + 36(p)	At least 4,553 + 10(e) + 36(p)	5,384 + 9(e) + 31(p)	3,985+12(e)+7(p))	5,175+13(e)+7(p)	4,644 + 16(e) + 14(p)
CT	At least 397	At least 290	At least 115	At least 176	178	200	224
DE	5	19	33	60	19	0	2(p)
FL	At least 527 + 9(e) + 8(p)	At least 686 + 5(e) + 3(p)	1,745 + 7(e) +8(p)	3,986 + 21(e) + 9(p)	3,345+22(e)+4(p)	3,428+13(e)+20(p)	2,686 + 13(e) + 9(p)
GA	0	0	14	0	364+1(e)+2(p)	528+3(e)+2(p)	203 + 2(e) + 1(p)
GU	1,691 + 15(e) + 5(p)	1,862 + 19(e) + 15(p)	2,429 + 18(e) + 12(p)	2,679 + 18(e) + 13(p)	2,178+25(e)+17(p)	1,541+12(e)+14(p)	2,215 + 20(e) + 10(p)
HI	15	11	52 + 1(p)	0	1,169+1(e)+4(p)	2,228	6,507 + 2(e) + 2(p)
IL	103	At least 154	342	391	790	585+1(p)	591 + 2(p)
IN	341 + 1(p)	347	At least 176	88	61	131	111
LA	4(p)	4(p)	4(p)	0	153	406+23(e)	5
MA	At least 390 + 2(p)	At least 653 + 1(e) + 2(p)	At least 313 + 1(e) + 3(p)	461 + 1(e)	653+1(e)	680+2(e)	1,092 + 6(e)
MD	111 + 1(e)	262 + 1(e) + 1(p)	At least 206 +2(p) +2(e)	99 + 1(e)	197	209+2(e)+1(p)	317
ME	At least 13	At least 15	At least 5	0	56	92	134
MI	At least 276	At least 119 + 1(e) + 2(p)	At least 209 + 2(e)	93	255	234+1(p)	124 + 1(e) + 3(p)
MN	1(p)	0	0	33 + 1(e)	143+1(e)+1(p)	143+4(e)	73 + 4(e)
MP			71	944	1,095+2(p)	780	767
MS	15 1(e)	83	41	179 + 1(e) + 1(p)	17	41	21(p)
NC	128 + 1(p)	110 + 1(e)	0	567 + 5(e) + 1(p)	259+2(e)+2(p)	56+1(e)+1(p)	346 + 2(e)
NH	21 + 1(e)	146 + 1(e)	72	3	6	1	23
NJ	33	125	45	188	168	79	134
NY	At least 388 + 1(p)	At least 229 + 2(e) + 4(p)	291 + 1(e) + 2(p)	692 + 4(p)	1,503+1(e)	827+2(e)	1,280
OH	501	314 + 1(e)	227 +2(e)	255 +6(e)	271+1(e)	182	629
OR	**	**	**	146	231+3(e)	117	66

PA	41	7	0	0	3	39	53
PR	At least 3	0	0	No data	4	140+1(e)	460 + 7(e)
RI	62 + 3(p)	272 + 6(p)	103	305 +1(e) + 1(p)	251+8(e)+2(p)	73+1(e)	256 + 2(p)
SC	118	129	226	593	395	626	684
TX	4(e)	317	At least 182	71	834	420	473
VA	0	0	0	0	186+1(e)	42	43
VI	At least 34	0	8	80	101	134	64
WA	At least 34 + 1(p)	0	0	9	721(p)	216+2(p)	294 + 3(p)
WI	At least 237	At least 176	At least 468	738	984	1,018	1,101
Total	At least 11,270 + 48(e) + 50(p)	At least 13,410 + 46(e) + 73(p)	At least 12,184 + 45(e) + 73(p)	18,284 +64(e) +60(p)	19,496 +79(e) +42(p)	20,397+77(e)+49(p)	25,643 + 73(e) + 69(p)

NRDC counts every day of an advisory/closure as one beach closing/advisory day. Because of inconsistencies in monitoring and closing/advisory practices among states and over time, it is difficult to make comparisons between states or to assess trends over time based on the closing/advisory data.

** NRDC received no data.

(e) Extended beach closure or advisory (7 to 13 consecutive weeks).

(p) Permanent beach closure or advisory (more than 13 consecutive weeks).