

Testing the Waters

June 2014, 24th Edition

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EXECUTIVE SUMMARY



Acknowledgments

NRDC wishes to acknowledge the support of the Pisces Foundation and the TOSA Foundation.

NRDC would like to thank Glenn Watkins, Cooper Foszcz, and Nick Bruce for reviewing various aspects of the report.

We wish also to thank the U.S. Environmental Protection Agency for sharing data with us again this year, and to the state program coordinators, who provided information for the state chapters along with review of the monitoring data. We recognize that this work is time-consuming and that budgets are tight all around, so we very much appreciate the effort that went into compiling and reviewing these data. Thanks, especially, to all those federal, state, and local officials who work hard every day to keep our beaches clean and to address the sources of beach water pollution.

Thank you to Mary Heglar, Alexandra Kennaugh, and Auden Shim for managing and supporting the production of the report, and to Michael Barrish, Patrick Hensley, Elise Marton, Rumi Matsuyama, and Sue Rossi for their enormous assistance in that effort. Many thanks to members of our media team—Dylan Gasperik, Kate Kiely, Kimiko Martinez, Josh Mogerman, Jenny Powers, and Jacqueline Wei—for orchestrating the release of the report to the press. Thanks to Johanna Dyer, Steve Fleischli, Noah Garrison, Henry Henderson, Karen Hobbs, Larry Levine, Rob Moore, and Melissa Waage for helping to develop, release and publicize the report for NRDC this year. Thank you as well to our outreach partners in Ohio, Michigan and Wisconsin.

EXECUTIVE SUMMARY

NRDC's annual analysis of water quality data at 3,485 coastal U.S. beaches monitored in 2013 found that 10 percent of all monitoring samples exceeded the Environmental Protection Agency's most protective benchmark for assessing swimmer safety, known as the Beach Action Value, or BAV. Contamination levels at the nation's beaches remained essentially unchanged from last year; if one were to assess the monitoring data from 2013 according to the previous (weaker) national standards, 7 percent of beach water samples would have failed to meet those prior standards, the same percentage as in 2012.

NRDC and public health advocates continue to push for improvements in beach water quality standards and test methods. In that respect, NRDC's report this year analyzes water quality in reference to the BAV for two central reasons. First, the national standards NRDC and many individual states used in prior years have been replaced and are thus no longer relevant. Second and more important, because the U.S. Environmental Protection Agency (EPA) considers the BAV to be a precautionary benchmark for making swimming safety decisions and because NRDC believes it is critical to communicate the best available information about the risks to public health from pathogens in beach water, this report uses the BAV as a gauge of how beach water quality compares to public health objectives. The report does not rely on the EPA's November 2012 beach water standards because they leave the public inadequately protected from unsafe levels of disease-causing bacteria and viruses, deeming it acceptable for 36 of every 1,000 beachgoers to become ill with gastroenteritis—including vomiting, nausea, or stomachache—from swimming in waters that just meet its criteria values.

Although protective beach water quality standards are critical, ultimately the most important long-term action to protect beachgoers is to adopt policies that address the sources of beach water pollution, particularly stormwater runoff. The greatest opportunity to make progress today in this regard is for people concerned with beach pollution to provide input on the proposed Clean Water Protection Rule from the EPA and the U.S. Army Corps of Engineers; that initiative proposes to restore pollution control safeguards to a host of streams, wetlands, and other waters that are not clearly protected today, even though they can help protect our beaches by filtering pollution and absorbing stormwater. In addition, improving beach water quality depends on policies to incentivize and implement green infrastructure in our cities—such as green roofs, porous pavement, and street plantings—which stop rain where it falls. Green infrastructure effectively reduces the amount of runoff that makes its way into beach water or triggers harmful sewage overflows, transforming a source of beach pollution into a tremendous local water resource.

POLLUTED BEACH WATER MAKES SWIMMERS SICK AND HURTS COASTAL ECONOMIES

The EPA has estimated that up to 3.5 million people become ill from contact with raw sewage from sanitary sewer overflows each year.¹ Many public health experts believe the number of illnesses caused by untreated sewage and other beach pollution sources may be much higher than is currently recognized because people who get sick from swimming in polluted recreational waters are not always aware of the cause of their illness and do not report it to doctors or local health officials.

Illnesses associated with polluted beach water include stomach flu, skin rashes, pinkeye, respiratory infections, meningitis, and hepatitis. Children are especially vulnerable, perhaps because they tend to submerge their heads more often than adults and are more likely to swallow water when swimming. The Centers for Disease Control and Prevention concluded that the incidence of infections associated with recreational water use has steadily increased over the past several decades.² One study found that swimmers at polluted beaches in the Great Lakes region were more likely to have gastrointestinal illnesses than nonswimmers; another study found that fecal contamination at Los Angeles and Orange County beaches caused between 627,800 and 1,479,200 excess gastrointestinal illnesses each year.^{3,4}

Our coasts provide more than just local recreation—approximately 85 percent of all U.S. tourism revenue is generated in coastal states. According to a report by the National Ocean Economics Program, the nation’s shoreline-adjacent counties contributed more than \$6 trillion to the nation’s gross domestic product and more than 47 million jobs in 2011.⁵ With respect to beaches specifically, economists have estimated that a typical swimming day is worth approximately \$35 (in year 2000 dollars) to each individual, so depending on the number of potential visitors to a beach, the “consumer surplus” loss on a day that the beach is closed or under advisory for water quality problems can be quite significant.⁶ For example, one study estimated that economic losses as a result of closing a Lake Michigan beach due to pollution could be as high as \$37,030 per day.⁷ Similarly, the Los Angeles/Orange County study mentioned above concluded that the public health cost of the excess gastrointestinal illnesses caused by poor water quality was \$21 million to \$51 million per year.⁸

BEACH WATER MONITORING FOR 2013

In 2013, 10 percent of all monitoring samples exceeded the health-protective EPA Beach Action Values. Ohio, Alaska, Mississippi, Maine, and Louisiana had the highest percentage of samples exceeding this benchmark (see Table ES-1: Rank of States by Percentage of Beach Water Samples Received Exceeding the BAV in 2013).

Rank	Percent Exceedance	State	2013 Total Samples	Beaches with Reported Monitoring Results
1	3%	Delaware	549	24
2	3%	New Hampshire	1,041	16
3	3%	New Jersey	4,084	288
4	4%	Maryland	772	68
5	4%	North Carolina	6,836	240
6	5%	Virginia	1,085	46
7	6%	Michigan	9,704	237
8	7%	Hawaii	2,432	109
9	8%	Minnesota	1,212	53
10	8%	Georgia	980	27
11	9%	California	25,364	501
12	10%	Connecticut	2,100	70
13	10%	Florida	8,729	265

Table ES-1: Rank of States by Percentage of Beach Water Samples Received Exceeding the BAV in 2013

Rank	Percent Exceedance	State	2013 Total Samples	Beaches with Reported Monitoring Results
14	10%	Massachusetts	8,132	566
15	10%	Illinois	4,358	49
16	10%	Texas	6,895	62
17	11%	Alabama	940	25
18	12%	Oregon	391	16
19	12%	Washington	2,795	60
20	13%	New York	10,189	360
21	13%	Indiana	2,905	32
22	14%	Pennsylvania	1,042	10
23	14%	Wisconsin	3,512	101
24	15%	South Carolina	2,327	23
25	16%	Rhode Island	1,600	69
26	19%	Louisiana	836	25
27	19%	Maine	1,340	55
28	21%	Mississippi	1,249	22
29	24%	Alaska	117	7
30	35%	Ohio	2,726	60

The percent exceedances shown in this table are rounded to the nearest whole number, but state ranks are based on percent exceedances carried to two decimal places.

Regionally, the Great Lakes had the highest exceedance rate (13 percent) in 2013, followed by the Gulf Coast (12 percent), New England (11 percent), the West (9 percent), the New York–New Jersey region (7 percent), the Southeast (7 percent), and the Delmarva region (4 percent).

In 2013, the list of beaches exceeding the Beach Action Value more than 25 percent of the time included 245 beaches in 26 states. Seventeen beach areas in 8 states (California, Indiana, Massachusetts, Maine, New Jersey, New York, Ohio, and Wisconsin) not only had more than 25 percent of samples exceed the BAV in 2013, but also had more than 25 percent of samples exceed the national standard then in effect each year from 2009 to 2012 (see Table ES-2: Repeat Offenders: Designated Beach Areas with More than 25 Percent of Samples Worse than the Relevant Public Health Benchmarks Each Year, 2009–2013. Note that Beaches with fewer than 12 monitoring samples reported during the year are excluded from this list). Chronically high bacteria counts indicate that beach water is probably contaminated with human or animal waste. An important caveat about this list: using the more stringent and health-protective value for 2013 led to the inclusion of a beach that would not have made the list if the 2013 results had been evaluated according to the previous (now replaced) national standards. That beach is identified in table ES-2 below.

It is important to note that while a high percent exceedance rate is a clear indication of contaminated coastal recreational waters, it is not necessarily an indication that the state's beach water quality monitoring program is deficient or fails to protect public health when beach water quality is poor. For example, many states always or almost always close a beach or issue an advisory when a sample exceeds the recommended standard. That is, they do not wait for the results of a resample or check additional conditions first, as some other states do. Similarly, states commonly will prioritize monitoring near suspected pollution sources, which can lead to higher exceedance rates. Identifying locations with high contamination levels is a responsible practice that helps local authorities protect swimmers from exposure to pathogens.

Table ES-2: Repeat Offenders: Designated Beach Areas with More than 25 Percent of Samples Worse than the Relevant Public Health Benchmarks Each Year, 2009–2013

State	County	Beach	Would be included if 2013 were evaluated against prior (weaker) national standard?
CA	Los Angeles	Malibu Pier, Malibu, 50 yards east of the pier	No
IN	Lake	Jeorse Park Beach I	Yes
IN	Lake	Jeorse Park Beach II	Yes
MA	Barnstable	Cockle Cove Creek	Yes
ME	Knox	Goodies Beach	Yes
NJ	Ocean	Beachwood Beach West (Beachwood)	Yes
NY	Chautauqua	Main Street Beach	Yes
NY	Chautauqua	Wright Park - East	Yes
NY	Monroe	Ontario Beach	Yes
OH	Ashtabula	Lakeshore Park	Yes
OH	Cuyahoga	Arcadia Beach	Yes
OH	Cuyahoga	Euclid State Park	Yes
OH	Cuyahoga	Noble Beach	Yes
OH	Cuyahoga	Sims Beach	Yes
OH	Cuyahoga	Villa Angela State Park	Yes
OH	Erie	Edson Creek	Yes
WI	Milwaukee	South Shore Beach	Yes

Beaches with fewer than 12 monitoring samples reported during the year are excluded from this list.

For 2013, the NRDC data set includes monitoring results for 116,230 samples at 3,485 beaches and beach segments (most state and local officials divide longer beaches into manageable sections for monitoring).⁹ This is a 6 percent decrease from 2012 in both the number of samples and the number of monitored beaches.

For 2013, NRDC highlights “Superstars”—35 popular beaches in 14 states (Alabama, California, Delaware, Florida, Georgia, Hawaii, Massachusetts, Maryland, North Carolina, New Hampshire, New Jersey, New York, Virginia, and Washington) that exceeded by no more than 2 percent the national standard in place during 2009–2012, and also exceeded the BAV safety threshold by no more than 2 percent in 2013 (see Table ES-3; beaches with fewer than 12 monitoring samples during the year are excluded from this list). The list of “popular” beaches that NRDC drew upon was compiled over several years in consultation with state officials.

Table ES-3: Beaches with 2% or Less Exceedance of the Previous National Standard in 2009–2012 and 2% or Less Exceedance of the BAV in 2013

State	County	Beach	2013% Exceeding BAV	2012 % Exceeding National Standards	2011 % Exceeding National Standards	2010 % Exceeding National Standards	2009 % Exceeding National Standards
AL	Baldwin	Gulf Shores Public Beach	2.0%	0.0%	0.0%	0.0%	0.0%
AL	Baldwin	Gulf State Park Pavilion	2.0%	0.0%	0.0%	0.0%	0.0%
AL	Mobile	Dauphin Island Public Beach	0.0%	0.0%	0.0%	0.0%	0.0%
CA	Orange	Newport Beach, 38th St.	0.0%	1.2%	2.0%	0.0%	2.0%

Table ES-3: Beaches with 2% or Less Exceedance of the Previous National Standard in 2009–2012 and 2% or Less Exceedance of the BAV in 2013

State	County	Beach	2013% Exceeding BAV	2012 % Exceeding National Standards	2011 % Exceeding National Standards	2010 % Exceeding National Standards	2009 % Exceeding National Standards
DE	Sussex	Dewey Beach - Swedes	0.0%	0.0%	0.0%	0.0%	0.0%
FL	Lee	Bowman's Beach	0.0%	0.0%	0.0%	0.0%	1.9%
FL	Manatee	Coquina Beach South	0.0%	0.0%	0.0%	0.0%	0.0%
FL	Pinellas	Fort Desoto North Beach	0.0%	0.0%	0.0%	0.0%	0.0%
GA	Chatham	Tybee Island North	0.0%	0.0%	1.9%	0.0%	1.9%
HI	Big Island	Hapuna Beach St. Rec. Area	0.0%	0.0%	0.0%	0.0%	0.0%
HI	Kauai	Po'ipu Beach Co. Park	0.0%	0.0%	1.2%	1.3%	1.1%
HI	Maui	Wailea Beach Park	1.6%	0.0%	1.5%	0.0%	1.3%
MA	Essex	Singing	0.0%	0.0%	0.0%	0.0%	0.0%
MD	St Mary's	Point Lookout State Park	0.0%	0.0%	0.0%	0.0%	0.0%
MD	Worcester	Assateague State Park	0.0%	0.0%	0.0%	0.0%	0.0%
NC	Brunswick	Ocean Pier at Main St. and Sunset Blvd.	0.0%	0.0%	0.0%	0.0%	0.0%
NC	Dare	Beach at Cape Hatteras Lighthouse	0.0%	0.0%	0.0%	0.0%	0.0%
NC	New Hanover	Ocean Pier at Salisbury Street in Wrightsville Beach	0.0%	0.0%	0.0%	0.0%	0.0%
NC	Pender	Ocean Pier at Ocean Blvd. and Crews Ave. in Topsail Beach	0.0%	0.0%	0.0%	0.0%	0.0%
NH	Rockingham	Hampton Beach State Park	0.0%	0.0%	0.6%	0.0%	0.0%
NH	Rockingham	Wallis Sands Beach at Wallis Rd.	0.0%	1.2%	0.0%	1.0%	0.8%
NH	Rockingham	Wallis Sands State Park	1.2%	0.0%	0.0%	0.0%	0.0%
NJ	Atlantic	Washington (Margate)	0.0%	0.0%	0.0%	0.0%	0.0%
NJ	Cape May	40th St. (Avalon)	0.0%	0.0%	0.0%	0.0%	0.0%
NJ	Cape May	40th St. (Sea Isle City)	0.0%	0.0%	0.0%	0.0%	0.0%
NJ	Cape May	Stone Harbor at 96th St.	0.0%	0.0%	0.0%	0.0%	0.0%
NJ	Cape May	Upper Township at Webster Rd.	0.0%	0.0%	0.0%	0.0%	0.0%
NJ	Cape May	Wildwood Crest at Orchid	0.0%	0.0%	0.0%	0.0%	0.0%
NJ	Ocean	Broadway (Pt. Pleasant Beach)	0.0%	0.0%	0.0%	0.0%	0.0%
NY	Nassau	Long Beach City	0.0%	0.0%	0.0%	0.0%	0.0%
VA	Virginia Beach	Virginia Beach at 28th St.	0.0%	0.0%	0.0%	0.0%	0.0%
VA	Virginia Beach	Virginia Beach at 45th St.	0.0%	0.0%	0.0%	0.0%	0.0%
VA	Virginia Beach	Back Bay Beach	0.0%	0.0%	0.0%	0.0%	0.0%
VA	Virginia Beach	Virginia Beach - Little Island Beach North	0.0%	0.0%	0.0%	0.0%	0.0%
WA	Grays Harbor	Westhaven State Park, South Jetty	0.0%	0.0%	0.0%	0.0%	0.0%

Beaches with fewer than 12 monitoring samples reported during the year are excluded from this list.

METHODS BEACH OFFICIALS USE TO SAMPLE, MONITOR, AND/OR PREDICT BEACH WATER QUALITY

Beach officials in all states continue to use traditional, EPA-approved methods that take about 24 hours to quantify bacterial indicator levels in beach water samples. Because of this time requirement, beachgoers who swim on a given day generally do not know until the next day if the water they swam in was contaminated. Also because of this delay, beaches may be closed even after water quality improves and meets standards. There is a great deal of interest in technologies that can provide same-day beach water quality results.

Beach water quality generally depends on many complex factors, but for some beaches, predictions of water quality can be calculated fairly accurately on the basis of measurements of a few physical conditions. Some states have taken advantage of this by creating computer models that rely on data such as rainfall level, wind speed and direction, tides, wave height, and currents. These models rapidly prepare predictions of beach water quality and allow officials to close beaches or place them under advisory on the day that bacterial levels are expected to be high, rather than 24 hours later.

Because the water quality at many beaches is adversely impacted by contaminated stormwater runoff, another means of protecting public health—less sophisticated, but often effective—is to preemptively close beaches or issue advisories after rainfall events when indicator bacteria levels are expected to be high. Many states report that they have developed standards for issuing preemptive rainfall advisories based on rainfall intensity or some other rain-related factor for at least some of their beaches. Some states also issue standing advisories warning the public to avoid beach water contact after heavy rainfall or when storm drains are running.

RECOMMENDATIONS FOR IMPROVING BEACH WATER QUALITY

Summer 2014 is filled with opportunities to improve water quality throughout the United States and to better protect people's health in the process. Everyone can now support a long-awaited rule to enhance protections for small streams and wetlands, which benefit beach water quality in two important ways, filtering out harmful contaminants and minimizing polluted runoff. State and federal officials can start using the ample legal tools they have today to rein in stormwater pollution at the city and regional scale. And beach managers can use a new and important tool—the health-protective Beach Action Value—to make swimming advisory decisions that more fully safeguard public health.

Require Pollution Controls for Discharges into All Tributary Streams, and Protect Pollution-Filtering Wetlands

The most immediate and high-priority action that must be taken to address water pollution at the nation's beaches and in water bodies throughout the country is to adopt updated national rules that ensure important surface waters are protected from pollution by the Clean Water Act. Specifically, the Obama administration should complete its proposed rulemaking to restore pollution control safeguards for small, seasonal, and rain-dependent streams and for a variety of wetlands. All beachgoers should make themselves heard in support of this rule.

By removing various pollutants from water that passes through them and by retaining stormwater that often causes pollution problems, wetlands and small streams help ensure that larger water bodies within the watershed are safe for various uses. Headwater, seasonal, and rain-dependent tributaries can affect beach water quality for the same reason. Because small streams and wetlands perform critical functions, it is important to prevent them from being polluted to the point of losing their effectiveness or being destroyed altogether.

For decades after Congress passed the Clean Water Act in 1972, that federal law worked to prevent unregulated pollution from entering all kinds of surface waters. However, Supreme Court decisions in 2001 and 2006 undermined this bedrock environmental legislation by creating uncertainty about what types of waters were protected by the law. Agency policies issued under former president George W. Bush further limited the ability of pollution control officials to protect our waters,

making implementation of the law difficult, time-consuming, and expensive. As a result, it became more unclear whether the law protected a variety of waters, especially those that are geographically isolated from others or that lack permanent flow. Over the past decade, tens of millions of wetland acres, which provide crucial flood protection as well as wildlife habitat, and about 2 million miles of streams, which provide drinking water for 117 million people, have been in legal limbo.

To address this problem, the EPA and the U.S. Army Corps of Engineers recently proposed a new rule, the Clean Water Protection Rule, to better protect critical waters in a way that will be consistent with the Clean Water Act's history and purpose. If finalized, the rule will reestablish full protections for tributary streams and nearby waters. The proposed rule also provides an opportunity for the public to weigh in to support protections for waters outside of the tributary network, which perform significant functions for downstream waters. As proposed, the rule would only likely protect a small fraction of these water bodies. Americans should stress their support for protecting the critical aquatic resources that help keep beach water and other waterways clean. The agencies are accepting public comment on the rule until October 20, 2014.

Cleaning Up Polluted Runoff: As NRDC has reported over many years, stormwater runoff is the most frequently identified source of beach closings and advisory days, and the EPA estimates that more than 10 trillion gallons of untreated stormwater make their way into our surface waters each year.¹⁰

Often, the best way of avoiding runoff-related pollution is to reduce the volume of stormwater flowing into the storm drains that carry it to nearby water bodies or, in some cases, into sewage systems that can overflow. Green infrastructure, which restores or mimics natural conditions, allows rainwater to infiltrate into the soil or return to the atmosphere, thereby reducing the volume of runoff. Green infrastructure includes the use of porous pavement, green roofs, parks, roadside plantings, and rain barrels to stop rain where it falls. This keeps stormwater runoff from overloading sewage systems and triggering overflows or from carrying pollutants into natural bodies of water.

These smarter water practices on land not only prevent pollution at the beach but also beautify neighborhoods, cool and cleanse the air, reduce asthma and heat-related illnesses, save on heating and cooling energy costs, boost economies, and support American jobs. Many cities and states have embraced green infrastructure practices.

Although the EPA promised several years ago to reform the national stormwater regulations and evaluate performance-based retention standards for various kinds of stormwater sources, the agency recently acknowledged that it has shelved this initiative, even while it continued to express concern about polluted runoff. The EPA's failure to lead on this issue does not diminish its importance or the need to develop broad-scale solutions to the nation's polluted runoff problems. The agency should reconsider its retreat on national rules; in the meantime, the EPA and the states should fully enforce the existing requirements governing runoff pollution.

The Clean Water Act provides citizens with the opportunity to petition the EPA for "residual designation" of stormwater sources that are causing pollution problems. If granted, a residual designation petition would lead to requirements that problem-causing sites take steps to reduce their pollution impacts. The EPA can also exercise this authority on its own initiative. Unfortunately, the EPA has not yet aggressively used its residual designation authority, and it refused to act in response to petitions NRDC, American Rivers, the Conservation Law Foundation, and several regional watershed groups filed last summer with three EPA regional offices. The agency must more fairly evaluate future residual designation petitions, especially where requiring pollution controls at existing sites will help address identified pollution problems associated with stormwater runoff. In addition, the agency should work to identify watersheds where this tool is particularly needed and should designate sources in such watersheds for pollution controls.

Likewise, federal, state, and municipal leaders must use existing authorities—such as Clean Water Act permitting, development of sewage overflow control plans, and local planning responsibilities—to promote green infrastructure and reduce runoff-related contamination problems. NRDC's 2011 report *Rooftops to Rivers II* (together with a 2013 update) spotlights how numerous cities around the country are embracing green infrastructure to address runoff pollution and improve the health of our communities.¹¹ Leaders in these cities have demonstrated the feasibility of green infrastructure solutions and are paving the way for policies that advance green infrastructure nationally.

Enforce Effective Standards to Protect Beachgoers

The EPA is responsible for ensuring that recreational waters are safe for people. One element of this responsibility is establishing criteria for contaminants in the water, which are supposed to be set at a level sufficient to protect public health. Unfortunately, in issuing its 2012 Recreational Water Quality Criteria, the EPA missed a critical opportunity to better protect the public from the dangers of swimming in polluted water. In fact, in some respects the new criteria for allowable levels of bacteria in recreational waters are even less protective than the 25-year-old standards they replace. Ironically, as the EPA developed this weak approach, the agency also identified a precautionary beach action value (BAV) that would far better protect public health than would the EPA bacteria criteria if it were used as the basis of swimming advisories. Although use of the BAV is not required, local beach managers and state officials responsible for beach policies should rely on it to provide important safety information to the public.

The EPA needs to correct the 2012 Recreational Water Quality Criteria so that the multiple flaws in the agency's approach are addressed. In the meantime, beach managers and public health officials can better protect public health by using the Beach Action Value, which the EPA recognizes as a "conservative, precautionary tool for making beach notification decisions."¹² In addition, the EPA's proposed National Beach Guidance and Required Performance Criteria for Grants would condition states' eligibility for BEACH Act funding on those states using the BAV to trigger beach notifications. NRDC strongly encourages state officials to pursue this approach and to use the more protective BAV.

ENDNOTES

- 1 U.S. Environmental Protection Agency (EPA), *Notice of Proposed Rulemaking, NPDES Permit Requirements for Municipal Sanitary Sewer Collection Systems, Municipal Satellite Collection Systems, and Sanitary Sewer Overflows*, January 4, 2001, withdrawn January 20, 2001.
- 2 J.S. Yoder et al., *Surveillance for Waterborne Disease and Outbreaks Associated with Recreational Water Use and Other Aquatic Facility-Associated Health Events, United States, 2005-2006*, Centers for Disease Control and Prevention, September 12, 2008/57(SS09), pp. 1-29, available at www.cdc.gov/mmwr/pdf/ss/ss5709.pdf.
- 3 T.J. Wade et al., "Rapidly Measured Indicators of Recreational Water Quality Are Predictive of Swimming-Associated Gastrointestinal Illness," *Environmental Health Perspectives* 114, No. 1, January 2006, pp. 24-28.
- 4 S. Given et al., "Regional Public Health Cost Estimates of Contaminated Coastal Waters: A Case Study of Gastroenteritis at Southern California Beaches," *Environmental Science and Technology* 40, 2006, p. 4851.
- 5 National Ocean Economic Program, Market Data, Coastal Economy Data, Shore Adjacent Coastal Zone Counties, available at noep.mbari.org/Market/coastal/coastalEcon.asp.
- 6 S.J. Rabinovici et al., "Economic and Health Risk Trade-Offs of Swim Closures at a Lake Michigan Beach," *Environmental Science and Technology* 38, No. 10, 2004, p. 2742.
- 7 Ibid.
- 8 Given et al., "Regional Public Health Cost Estimates."
- 9 Beginning with our 2012 report, NRDC began to count each managed beach segment of longer beaches in California as individual beaches themselves. This was prompted by California's update of the beach identification system it uses to report beach monitoring and notification data to the EPA. For purposes of comparison with previous years, however, NRDC used the older beach identification/counting system.
- 10 U.S. Environmental Protection Agency, *Report to Congress: Impacts and Control of CSOs and SSOs*, April 26, 2004, EPA 833-R-04-001, pp. 4-29, available at cfpub.epa.gov/npdes/cso/cpolicy_report2004.cfm.
- 11 Natural Resources Defense Council, *Rooftops to Rivers II: Green Strategies for Controlling Stormwater and Combined Sewer Overflows*, November 2011, available at www.nrdc.org/water/pollution/rooftopsII/default.asp.
- 12 U.S. EPA Office of Water, Recreational Water Quality Criteria, 820-F-12-058, at 44 (Nov. 26, 2012).