Heal the Bay's

2010-2011 Annual Beach Report Card

BEACH REPORT CARD

Heal the Bay

Heal the Bay is a nonprofit environmental organization dedicated to making Southern California coastal waters and watersheds, including Santa Monica Bay, safe, healthy and clean. We use research, education, community action and advocacy to pursue our mission.

The Beach Report Card program is funded by grants from

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Manhattan Beach Pier. Photo: Anthony Barbatto

Heal the Bay's
21st Annual Beach Report Card

MAY 25, 2011

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Ocean water quality monitoring is vital to ensuring the health protection of the millions who recreate in coastal waters.

El Segundo. Photo: Anthony Barbatto

Executive Summary

Heal the Bay's 21st Annual Beach Report Card℠

provides water quality information to the millions of people who swim, surf or dive in California, Oregon and Washington coastal waters. This is the first annual report to cover the entire West Coast, with the debut of beach water quality grades from our northern neighbors, Oregon and Washington.

The 2011 Annual Beach Report Card incorporates more than 150 additional monitoring locations along the coasts of Washington and Oregon. Essential reading for ocean users, the report card grades approximately 600 locations along the West Coast for summer dry weather and more than 324 locations year-round on an A-to-F scale based on the risk of adverse health effects to beachgoers. The grades are based on fecal bacteria pollution concentrations in the surf zone. The program has evolved from an annual review of beaches in the Santa Monica Bay to weekly updates of beach monitoring locations throughout California, Oregon and Washington. All of this information is available on Heal the Bay's website, www.healthebay.org, and at www.beachreportcard.org.

Recreating in waters with increased bacteria concentrations has been associated with increased risks to human health, such as stomach flu, nausea, skin rashes, eye infections and respiratory illness. Beach water quality monitoring agencies collect and analyze samples, then post the necessary health warnings to protect public health. Poor water quality not only directly threatens the health of swimmers and beachgoers, but is also directly linked to ocean-dependent economies.

Ocean water quality monitoring is vital to ensuring the health protection of the millions who recreate in coastal waters. Since the Annual Beach Report Card was first published more than twenty years ago, beachgoers throughout California have come to rely on the grades as vital public health protection tools. Now, residents and visitors of Oregon and Washington beaches will have the same critical information at their fingertips.

West Coast Beach Water Quality Overview

Most California beaches had very good to excellent water quality this past year, with 400 of 445 (90%) locations receiving very good to excellent (A and B) grades during the summer dry time period (California's AB411 mandated monitoring from April to October). Year-round dry weather grades were also very good, with 284 of 324 (88%) locations earning A or B grades. Lower grades during year-round dry weather included 12 Cs (4%), 12 Ds (4%) and 16 Fs (5%).

Southern California (Santa Barbara through San Diego counties) summer dry (AB411) weather grades (91% A and B grades) were actually slightly better than the state average. In the San Francisco Bay Area (Marin through San Mateo counties), the summer dry weather ocean-side grades were excellent with 95% (40 of 42) of locations receiving an A or B grade. The bay-side's water quality slipped slightly with 73% (19 of 26) A or B grades compared to 81% (21 of 26) last year. 60% (41 of 68) of these Bay Area lo-

Cabrillo Beach harborside. Photo: Joy Aoki

cations were monitored frequently enough to earn year-round grades. Year-round dry weather water quality on the ocean-side was good, with 90% (18 of 20) of the monitoring locations receiving an A or B grade. It was fair on the bay-side with 67% (14 of 21) locations receiving A or B grades.

The disparity between dry and wet weather water quality continues to be dramatic, thereby demonstrating that California is not successfully reducing stormwater runoff pollution. This year's (April 2010 – March 2011) report shows 46% of the 324 statewide locations monitored during wet weather received fair to poor (C–F) grades. In Southern California, 50% of sampling locations earned fair to poor wet weather grades. Despite higher than normal precipitation levels this past year, wet weather grades were slightly better than the seven-year average (years since new methodology implementation) for both Southern California and statewide.

While 60 locations were monitored throughout the summer in Oregon, only 13 were monitored frequently enough (at least weekly) to be considered for this report. All of Oregon's 13 regularly monitored locations received A grades. Washington monitoring locations were also typically clean, with 93% of the 141 monitored receiving A and B grades.

[T]he complete elimination of state funding by Gov. Schwarzenegger in 2008 sent a message from Sacramento to the oceangoing public that its health is not a priority. It is imperative that [the government and NGOs] strive towards a long term solution that will permanently restore funding to beach water quality monitoring programs.

California's Dry Weather Honor Roll

Sixty-eight of the 324 beaches (21%) with year-round dry weather grades this year scored a perfect A+. These beaches had zero exceedances of state bacterial standards for ocean water quality during dry weather throughout the entire time frame of this report. These beaches demonstrated that superb water quality can be found in areas impacted by wildlife, but without anthropogenic sources of fecal bacteria. Heal the Bay proudly places these beaches on the 2010-2011 Beach Report Card Honor Roll. *(A list of*

TOP TEN BEACH BUMMERS

	BEACH/COUNTY	GRADE
1.	**Cowell Beach at the Wharf** Santa Cruz County	F
2.	**Avalon Harbor Beach, Catalina Island** Los Angeles County	F
3.	**Cabrillo Beach, harborside at restrooms** Los Angeles County	F
4.	**Topanga State Beach** Los Angeles County	F
5.	**Poche Beach** Orange County	F
6.	**North Beach Doheny** Orange County	F
7.	**Arroyo Burro Beach** Santa Barbara County	F
8.	**Baker Beach at Lobos Creek** San Francisco County	F
9.	**Colorado Lagoon, Long Beach** Los Angeles County	F
10.	**Capitola Beach** Santa Cruz County	F

FIGURE 1-1

these locations can be found in Appendix B on Page 78.)

California Beach Bummers

Numerous California beaches vied for the Beach Bummer crown this year (the monitoring location with the poorest dry weather water quality). Four of the 10 most polluted beaches in the state were in Los Angeles County. Though most of these beaches are no strangers to the Beach Bummer list, Topanga State Beach made its first appearance since 2005-2006 *(see Figure 1-1)*.

The data from Santa Barbara County through San Diego County was analyzed to determine whether there were significant differences in water quality based on beach type. As in previous years, water quality at open ocean beaches during year-round dry weather was significantly better than water quality at those beaches located within enclosed bays or harbors, or those impacted by storm drains. 99% of open ocean beaches received an A grade for year-round dry weather compared to 76% at beaches

found within an enclosed bay, harbor or marina, and 76% at beaches impacted by a storm drain. The data demonstrate that visitors at open ocean beaches with no pollution source are nearly always swimming in clean water during dry weather.

Funding California's Beach Monitoring Program

Monitoring efforts have been at risk statewide since then-Governor Arnold Schwarzenegger's 2008 line-item veto of nearly $1 million in California beach monitoring funds. Fortunately, some municipalities have temporarily allocated additional local funding in order to provide this invaluable service to the beachgoing public. The State Water Resources Control Board (SWRCB) directed Proposition 13 Clean Beach Initiative (CBI) grant funds to backfill the beach monitoring funds from July 1, 2008 through June 30, 2010. In addition, federal American Recovery and Reinstatement Act (ARRA) stimulus funds were approved to cover the monitoring season through 2010. On Nov. 2, 2010, the SWRCB approved a resolution to commit $984,000 from available funds, Proposition 13 or 50, to continue the state's beach monitoring program through the end of 2011. The SWRCB has been working with members of the Beach Water Quality Group in order to explore options for sustainable, long-term funding; as the state cannot afford to fund any of the beach monitoring program after 2011.

There is no secured state source of funding for beach monitoring in 2012 and current federal Beaches Environmental Assessment and Coastal Health (BEACH) Act funding to California (about $500,000) is woefully inadequate. A protective beach monitoring program would cost about $2 million a year for

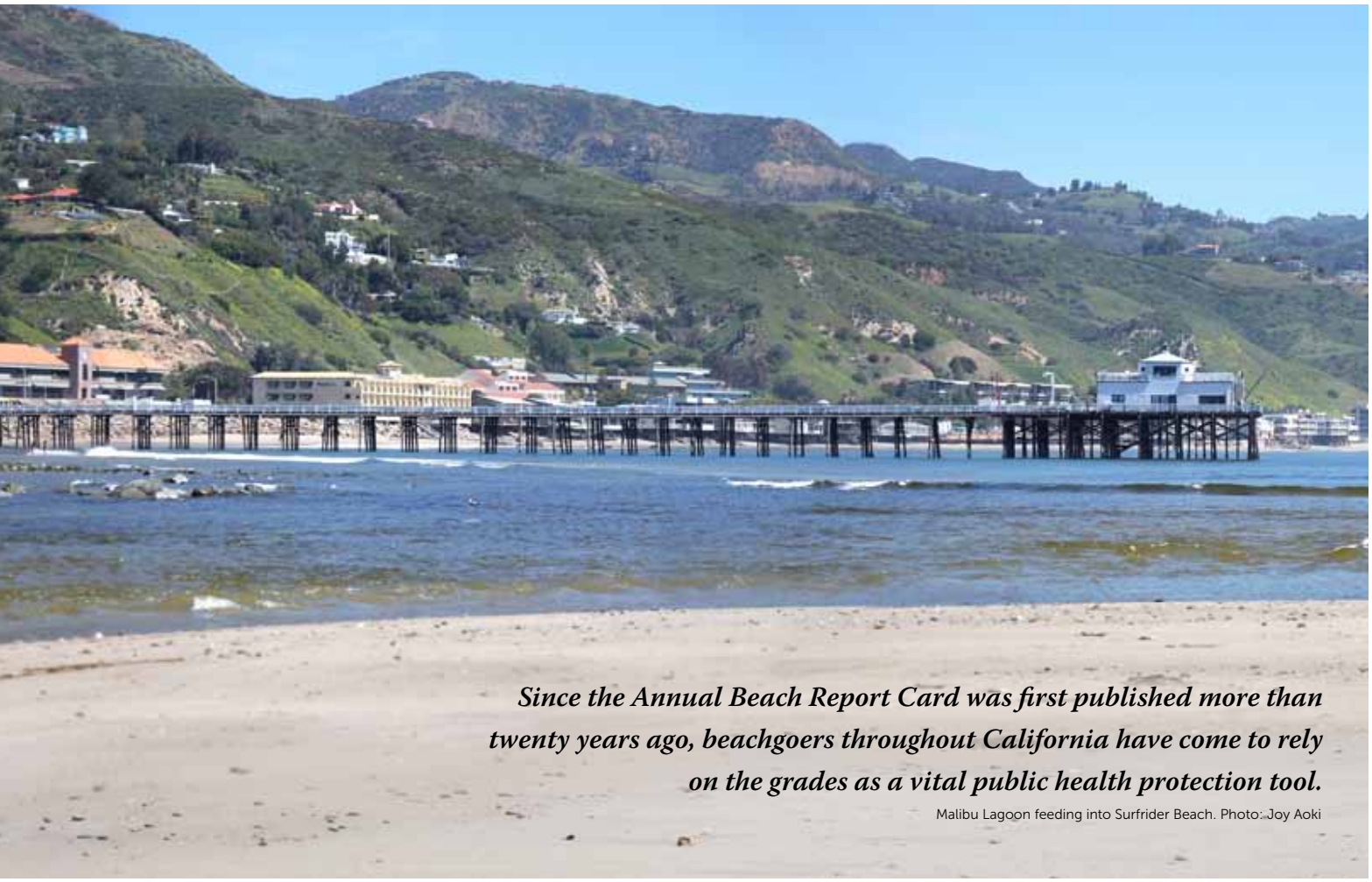
conventional analytical methods, and approximately $3 million a year if rapid methods are used at California's most polluted beaches. Heal the Bay will continue working with the state and local governments throughout California to ensure that future funding is secured.

Although beach water quality monitoring funding has seen cutbacks before (state funding was reduced by 10% in 2007), the complete elimination of state funding in 2008 by Gov. Schwarzenegger sent a message from Sacramento to the oceangoing public that its health is not a priority. It is imperative that government officials, county and state health departments, and non-governmental organizations (NGOs) strive towards a long term solution that will permanently restore funding to counties' beach and bay water quality monitoring programs.

We have seen a marked and steady decline in the number of beaches monitored throughout California as a direct result of this funding uncertainty. Seventy-two beaches were not monitored during the summer dry (AB411) period and 47 were not monitored year-round compared to before 2008. This is equivalent to 2,770 fewer samples taken year-round compared to before 2008. Continued efforts must be made to ensure that adequate and sustainable funding becomes available for beach water quality monitoring immediately.

General Observations

Children play directly in front of storm drains and in runoff-filled ponds and lagoons. Monitoring at 'point-zero' (the mouth of storm drains or creeks) is the best way to ensure that the health risks to



Since the Annual Beach Report Card was first published more than twenty years ago, beachgoers throughout California have come to rely on the grades as a vital public health protection tool.

Malibu Lagoon feeding into Surfrider Beach. Photo: Joy Aoki

swimmers are minimized.

This is one recommendation among several that Heal the Bay has made to state officials to improve water quality monitoring and better protect public health. *(A complete list of recommendations can be found at the end of this document. See Page 68.)*

The Beach Report Card is based on the routine monitoring of beaches conducted by local health agencies and dischargers. Water samples are analyzed for bacteria that indicate pollution from numerous sources, including fecal waste. The better the grade a beach receives, the lower the risk of illness to ocean users. The report is not designed to measure the amount of trash or toxins found at beaches. The Beach Report Card would not be possible without the cooperation of all of the shoreline monitoring agencies in California, Oregon and Washington.

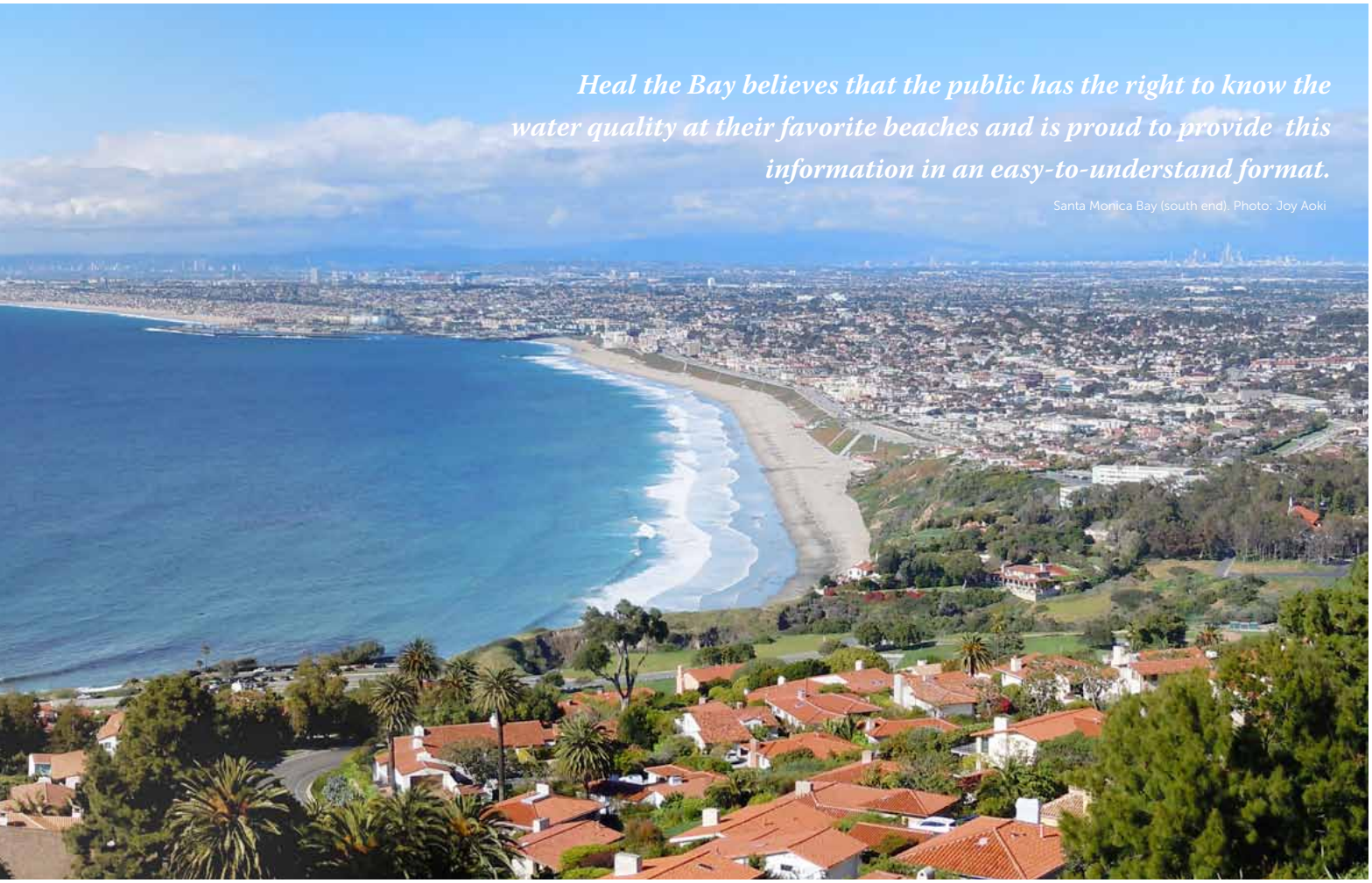
Health officials and Heal the Bay recommend that beach users never swim within 100 yards on either side of a flowing storm drain, in any coastal waters during a rainstorm, and for at least three days after a storm has ended.

Heal the Bay believes that the public has the right to know the water quality at their favorite beaches and is proud to provide West Coast residents and visitors with this information in an easy-to-understand format. We hope that beachgoers will use this information to make the decisions necessary to protect their health.

Health officials and Heal the Bay recommend that beach users never swim within 100 yards on either side of a flowing storm drain, in any coastal waters during a rainstorm, and for at least three days after

a storm has ended. Storm drain runoff is the greatest source of pollution to local beaches, flowing untreated to the coast and often contaminated with motor oil, animal waste, pesticides, yard waste and trash. After a rain, indicator bacteria densities often far exceed state health criteria for recreational water use.

For more information, please visit www.beachreportcard.org or call 800 HEAL BAY.



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Santa Monica Bay (south end). Photo: Joy Aoki

The 21st Annual Beach Report Card summarizes the results of beach water quality monitoring data from Washington through California.

Malaga Cove, Palos Verdes Peninsula. Photo: Joy Aoki

Introduction

Heal the Bay's first Beach Report Card℠ was published in 1990 and covered about 60 monitoring locations in Los Angeles County, from Leo Carrillo Beach near the Ventura County line, south to Cabrillo Beach in San Pedro. At that time, beachgoers knew little about the health risks of swimming in polluted waters or the water quality at any of their favorite beaches in Los Angeles County.

Beach water quality was a public issue only when a substantial sewage spill occurred. Although beaches were routinely monitored, the data were either inaccessible or unusable to the public. Since then, a great deal of work has been completed to reduce urban runoff pollution and sewage spills at our local beaches. Scientific studies such as the Santa Monica Bay Restoration Project's epidemiological study on swimmers at runoff polluted beaches and the Southern California Coastal Water Research Project's (SCCWRP) bight-wide shoreline bacteria and laboratory inter-calibration study have been completed. Legislation, such as the statewide beach bathing water standards and public notification bill (AB411), and the protocol for identifying sources of fecal indicator bacteria (FIB) at high-use beaches that are impacted by flowing storm drains (AB538) have been signed into law. Structural best management practices, such as the Santa Monica Urban Runoff Recycling Facility, dry weather runoff diversions, and nearly $100 million in California's Clean Beach Initiative (CBI) projects throughout the state have been constructed. The city of Los Angeles is also spending more than $100 million of Proposition O funds to make Santa Monica Bay beaches cleaner and safer for public use. All the while, Heal the Bay's Beach Report Card has grown in coverage, expanding from Los Angeles County to the entire western United States coastline.

The 21st Annual Beach Report Card summarizes the results of beach water quality monitoring program data from Washington through California. In this report, Oregon's and Washington's monitoring data from the dry weather summer swimming season (Memorial Day through Labor Day 2010) was used. *[Due to Oregon and Washington's infrequent winter monitoring, wet weather samples were not included in this report.]*

California's coastline was monitored from Humboldt County to San Diego County from April 2010 through March 2011. This summary includes an analysis of water quality during four time periods: summer dry season (the months covered under AB411 [April – October]), winter dry weather (November 2010–March 2011), year-round dry weather, and year-round wet weather conditions. In addition to summarizing marine water quality, the report includes a brief review of the number of sewage spills that impacted ocean waters over the past year. The information derived from this analysis is used to develop recommendations for cleaning up problem beaches to make them safe for recreation.

This year's Annual Beach Report Card (BRC) covers nearly 600 locations for summer dry weather (324 locations year-round) from Washington through California. Heal the Bay urges coastal beachgoers to use the information before they go to any beach on the West Coast in order to better protect their health and the health of their families. The weekly BRC is available online at www.beachreportcard.org.

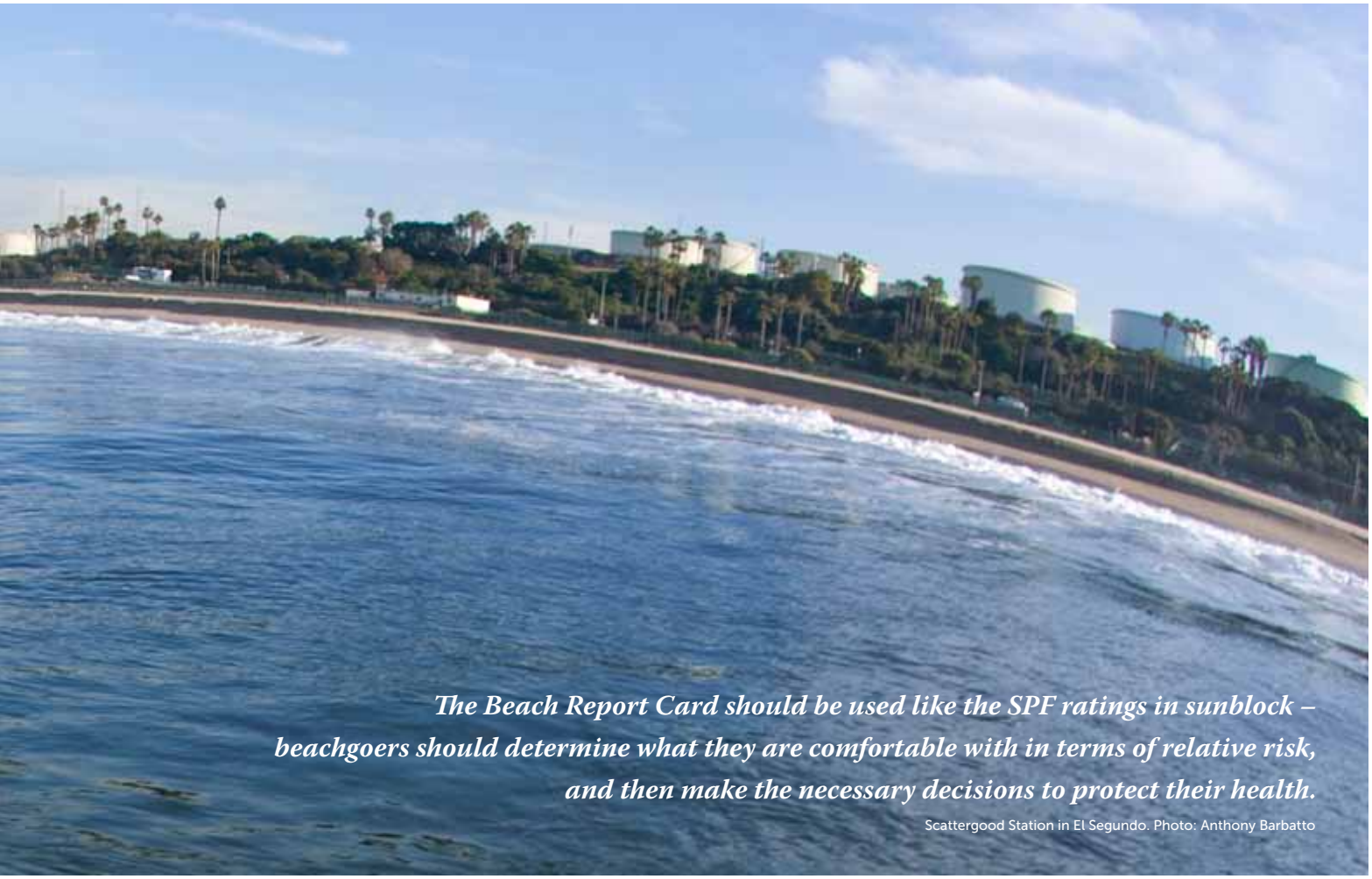
The Beach Report Card should be used like the SPF ratings in sunblock – beachgoers should determine what they are comfortable with in terms of relative risk, and then make the necessary decisions to protect their health.

What type of water quality pollution is measured?

Runoff from creeks, rivers and storm drains are sources of pollution to California, Oregon and Washington beaches. Runoff may contain toxic heavy metals, pesticides, fertilizers, petroleum hydrocarbons, animal waste, trash and even human sewage. The Beach Report Card includes an analysis of shoreline (ankle-deep) water quality data collected by more than 25 different state, county, and city public agencies for fecal indicator bacteria. At present, the BRC contains no information on toxins or trash in the water or on the beach.

The amounts of indicator bacteria present in runoff, and consequently in the surf-zone, is currently the best indication of whether or not a beach is safe for recreational water contact. Indicator bacteria are not usually the microorganisms that cause bather illness. Instead, their presence indicates the potential for water contamination from other pathogenic microorganisms such as bacteria, viruses and protozoa that do pose a health risk to humans. The link between swimming in waters containing elevated levels of indicator bacteria from polluted runoff and health risk was confirmed in the groundbreaking 1995 epidemiological study conducted by USC, the Orange County Sanitation District, the city of Los Angeles and Heal the Bay, under the auspices of the Santa Monica Bay Restoration Project.

Most sample locations are selected by monitoring, health, and regulatory agencies to specifically target popular beaches, shellfish beaches and/or those beaches frequently affected by runoff. The majority of Oregon and Washington beach water quality monitoring occurs during the summer swim-



The Beach Report Card should be used like the SPF ratings in sunblock – beachgoers should determine what they are comfortable with in terms of relative risk, and then make the necessary decisions to protect their health.

Scattergood Station in El Segundo. Photo: Anthony Barbatto

ming season (Memorial Day through Labor Day). Although Oregon and Washington state agencies monitor beaches on a selective basis throughout the winter months, the sampling frequency did not meet the BRC's minimum grading criterion of at least one sample per week.

This is the Beach Report Card's first full year of grading water quality along the entire U.S. West Coast. A total of 582 shoreline monitoring locations were analyzed from Whatcom County in Washington to San Diego County at the Mexican border. According to the U.S. Environmental Protection Agency (EPA) Beaches Environmental Assessment and Coastal Health Act (BEACH Act) of 2000, each state with coastal recreation waters has to adopt water quality standards for bacteria in order to qualify for federal beach monitoring funding. Therefore, each state has the ability to adopt its own standards. The most common types of indicator bacteria include: total coliform, fecal coliform (or E. coli) and Enterococcus. Total coliform, which contains coliform of all types, originates from many sources, including soil, plants, animals and humans. Fecal coliform and Enterococcus bacteria are found in the fecal matter of mammals and birds. This fecal matter does not necessarily come from humans, although numerous prior studies have demonstrated that there is a significant possibility of human sewage contamination in storm drain runoff at any given time.

Our first challenge in expanding the BRC throughout the Pacific Northwest was that Oregon and Washington monitor only one indicator bacteria (Enterococcus) versus California's three indicator bacteria (total coliform, fecal coliform [or E. coli] and Enterococcus). Heal the Bay has developed an Enterococcus-based grading methodology exclusively for Oregon and Washington. *(Grading methodologies can be found in Appendices A1 and A2.)*

In California, water quality samples are collected by the appropriate agency at a minimum of once a week from April through October, as required under the California Beach Bathing Water Quality Stan-

dards (AB411) and recommended by the EPA's National Beach Guidance and Performance Criteria for Recreational Waters (EPA's BEACH program). Some agencies conduct year-round sampling while others scale back their monitoring programs dramatically from November through March, despite the fact that many surfers and ocean swimmers are in the water year-round.

Heal the Bay's Grading System

Heal the Bay's grading system takes into consideration the magnitude and frequency of an exceedance above indicator thresholds over the course of the specified time period. Those beaches that exceed multiple indicator thresholds (if applicable) in a given time period receive lower grades than those beaches that exceeded just one indicator threshold.

The grades are based on a 100-point scale. For each monitoring location, points are subtracted from a perfect score of 100 depending on the severity of bacterial count exceedances of single sample standards and/or exceedances of 30-day geometric mean standards. As the magnitude or frequency of bacteria density threshold exceedances increases, the number of points subtracted increases. *(The threshold points and grading system can be found in Appendices A1 and A2.)*

Water quality typically drops dramatically during and immediately after a rainstorm but often rebounds to its previous level within a few days. For this reason, year-round wet weather data throughout California were analyzed separately in order to avoid artificially lowering a location's year-round grade and to provide better understanding of statewide beach water quality impacts. Due to infrequent year-round monitoring, Oregon's and Washington's wet weather samples were not included in this report. California's wet weather data are comprised of samples collected during or within three days following the cessation of a rainstorm. Heal the Bay's annual and weekly Beach Report Cards utilize a definition of a 'significant rainstorm' as precipitation greater than or equal to one-tenth of an inch (>0.1").

What does this mean to the beach user?

Simply put, the higher the grade a beach receives, the better the water quality at that beach. The lower the grade, the greater the health risk. Potential illnesses include stomach flu, ear infection, upper respiratory infection and major skin rash (full body). The known risks of contracting illnesses associated with each threshold are based on a one-time, single day of exposure (head immersed while swimming) to polluted water. Increasing frequency of exposure or the magnitude of bacteria densities may significantly increase an ocean user's risk of contracting any one of a number of these illnesses.

It is important to note that the grades from the Beach Report Card represent the most current information available to the public, but they do not represent real-time water quality conditions. Currently, laboratory analyses of beach water quality samples take 18 to 24 hours to complete; then the data must be entered into a database before they are sent to Heal the Bay for a grade calculation. Rapid indicator methods (results in 2-4 hours) for Enterococcus bacteria should be widely available to monitoring agencies within the next five years. A pilot study of rapid indicator testing at nine Orange County beaches took place last summer and led to two major findings. First, the capital and training costs were a smaller obstacle for new method adoption then was initially expected. Second, there are no public benefits to rapidity, if results from weekly samples are extrapolated over a week. In other words, rapid methods will only provide increased public health protection if used on a routine continuous basis for risk management decisions on the day samples are collected.

The most current information available on beach closures due to sewage spills can be found online at www.beachreportcard.org. The BRC can also give the beachgoer historical information on the water quality at a given beach to help them make informed decisions about which beach to visit safely.

Why not test for viruses?

A common question asked by beachgoers is: "Because viruses are thought to cause many of the swimming-associated illnesses, why don't health agencies monitor directly for viruses instead of indicator bacteria?" Although virus monitoring is incredibly useful in identifying sources of fecal pollution, there are a number of drawbacks to the currently available virus measurement methods. There have been tremendous breakthroughs in the use of gene probes to analyze water samples for virus or human pathogenic bacteria but currently these techniques are still relatively expensive, highly technical and not very quantitative. In addition, since human viruses are not found in high densities in ocean water and their densities are highly variable, setting standards for viruses is not currently feasible. Interference from other pollutants in runoff can make virus quantification very difficult. Also, interpretation of virus monitoring data is difficult because, unlike bacterial indicators, there are currently no data available that link health risks associated with swimming in beach water to virus densities. Local epidemiology studies, a component of which is an effort to identify and quantify viral pathogens, began three and a half years ago. These large scale epidemiology studies (using over 30 microbial indicators) was led by the SCCWRP, UC Berkeley, Orange County Sanitation Districts, the U.S. EPA, and Heal the Bay. The studies, which took place at Doheny Beach, Avalon Beach, and Surfrider Beach in Malibu were completed this past year, and are undergoing comprehensive data interpretation before publication later in 2011.

Until the U.S. EPA's recommendation for a rapid method for bacteria criteria is made public in 2012, indicator bacteria monitoring is currently the best, most timely and cost effective method for protecting the health of beachgoers.

Runoff from creeks, rivers and storm drains are sources of pollution to beaches. Runoff may contain toxic heavy metals, pesticides, fertilizers, petroleum hydrocarbons, animal waste, trash and even human sewage.

Santa Monica Beach. Photo: Joy Aoki

The disparity between dry and wet weather water quality continues to be dramatic, thereby demonstrating that [California] is not successfully reducing stormwater runoff pollution.

Dockweiler Beach. Photo: Joy Aoki

2010-2011 Analyses

Overall water quality during the summer dry (AB411) time period in California this past year was very good and was equivalent to the seven-year average (years since new methodology implementation). Of the 445 ocean water quality monitoring locations throughout California, 400 (90%) received very good to excellent water quality marks (A or B grades) from April through October 2010 *(see Figure 3-1)*.

Southern California (Santa Barbara through San Diego) summer dry (AB411) grades (91% A and B grades) were slightly better than the statewide average. There were 45 (10%) monitoring locations statewide that received fair to poor water quality marks (C–F grades) during the same time period.

During year-round dry weather, most California beaches had very good water quality, with 284 of 324 (88%) locations receiving very good to excellent (A and B) grades. Lower grades during the same time period include: 12 Cs (4%), 12 Ds (4%) and 16 Fs (5%). Southern California (Santa Barbara through San Diego counties) year-round dry weather grades (89% A and B grades) were just slightly better than the statewide average. Los Angeles County again exhibited some of the lowest grades in the state (76% A and B grades) for year-round dry weather.

In the San Francisco Bay Area (Marin through San Mateo counties), summer dry weather grades were excellent on the ocean-side with 95% (40 of 42) of the locations receiving A or B grades, and fair on the bay-side with 19 of 26 (73%) receiving A or B grades. Forty-one of 68 (60%) of Bay Area locations were monitored year-round. Year-round dry weather water quality at ocean-side monitoring locations was very good with 18 of 20 (90%) of receiving an A or B grade, and fair on the bay-side with 14 of 21 (67%) receiving A or B grades.

In California, the disparity between dry and wet weather water quality continues to be dramatic and demonstrates that the state is not successfully reducing stormwater runoff pollution. 46% percent of monitoring locations received fair to poor grades during the wet weather season with 22% F grades *(see Figure 3-1)*. This marked seasonal difference in water quality is why Heal the Bay and California's public health agencies continue to recommend that no one swim in the ocean during, and for at least three days after, a significant rainstorm. With the exception of educational programs, there have been no major efforts made by public agencies along the coast to target reductions in fecal bacteria densities in stormwater. *(A list of all the California grades can be found in Appendix C1.)*

With the exception of educational programs, there have been no major efforts made by public agencies along the coast to target reductions in fecal bacteria densities in stormwater.

While 60 monitoring locations were monitored throughout the summer in Oregon, only 13 were monitored frequently enough (at least weekly) to be considered for this report. All of Oregon's 13 regularly monitored locations received A grades. Washington locations were also typically clean with 93% of the 141 monitored receiving A and B grades.

California's Dry Weather Honor Roll

Sixty-eight of the 324 (21%) beaches with year-round dry weather grades this year scored a perfect A+. These beaches had zero exceedances of state bacterial standards for ocean water quality during dry weather throughout the entire time frame of this report. These beaches demonstrated that superb water quality can be found in areas impacted by wildlife, but without anthropogenic sources of fecal bacteria. Heal the Bay proudly places these beaches on the 2010-2011 Beach Report Card Honor Roll. *(A complete list of these locations can be found in Appendix B.)*

California's Beach Bummers

Numerous California beaches vied for the Beach Bummer crown this year (the monitoring location with the poorest dry weather water quality). Four of the 10 most polluted beach areas in the state were in Los Angeles County (*see Table 3-1).*

This is **Cowell Beach**'s second consecutive year on the Beach Bummer list and its first time earning the #1 slot. This year, the area surrounding the Cowell Beach wharf exhibited severely poor water quality, scoring an F grade during AB411 in 2010. Researchers from Stanford University are doing a major sanitary

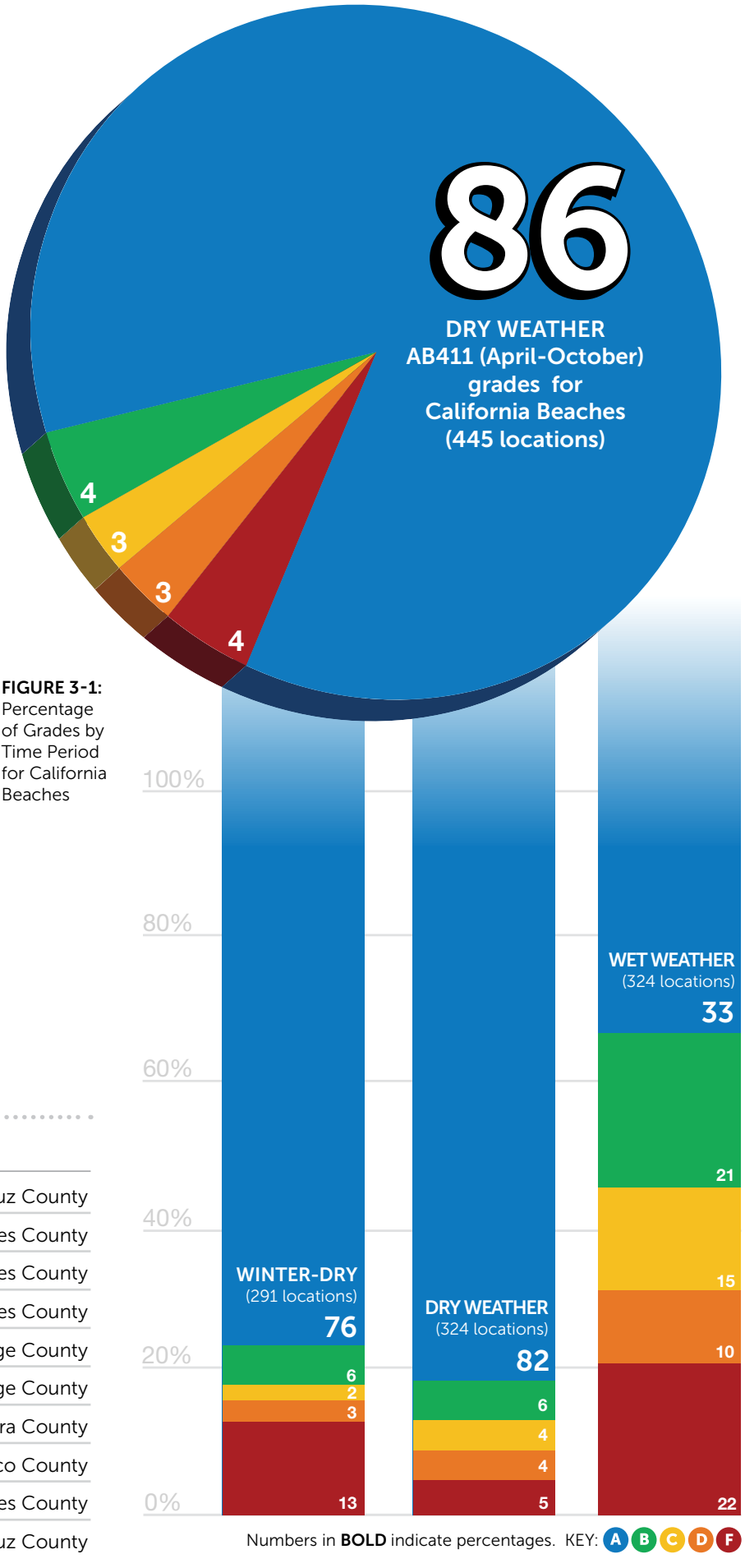


FIGURE 3-1: Percentage of Grades by Time Period for California Beaches

TABLE 3-1: TOP TEN CALIFORNIA BEACH BUMMERS

1.	Cowell Beach, at the wharf	Santa Cruz County
2.	Avalon Harbor Beach, Catalina Island	Los Angeles County
3.	Cabrillo Beach, harborside	Los Angeles County
4.	Topanga State Beach, at creek mouth	Los Angeles County
5.	Poche Beach	Orange County
6.	North Beach Doheny	Orange County
7.	Arroyo Burro Beach	Santa Barbara County
8.	Baker Beach, at Lobos Creek	San Francisco County
9.	Colorado Lagoon	Los Angeles County
10.	Capitola Beach, west of the wharf	Santa Cruz County

survey at Cowell Beach this year in hopes of identifying problematic sources affecting beach water quality.

Avalon Beach has been on the Bummer list for a decade, yet Los Angeles County still only monitors the beach once a week and only during the AB411 time period. Of the five monitoring locations at this beach, none received better than a D grade during AB411 in 2010. Four years ago, a $4.5 million swimmer health effects study included Avalon Beach as a research location due to its perpetually poor water quality. Also, researchers from Stanford University and UC Irvine completed separate source tracking, fate and transport, and modeling studies that demonstrated that sewage contaminated groundwater is a major source of beach pollution at Avalon.

Avalon Beach continues its reign as one of the most polluted beaches in California. After the Los Angeles Regional Water Quality Control Board inspected Avalon's sewage infrastructure in October 2010, they issued a Notice of Violation (NOV) on Feb. 23, 2011 for consistent violations of state water quality standards. In part as a result of the NOV, the city of Avalon has moved forward with several initiatives. After a nearly 20-year partnership, the city of Avalon and United Water Services mutually ended their sewage services contract in February. Meanwhile, the city of Avalon has contracted Environ Strategy (ES) to resume operation of its Waste Water Treatment Plant (WWTP). In March, the city of Avalon hired RBF Consulting to perform a sewer and manhole condition assessment, which estimated that $4.6 million was needed for repairs. An additional $250,000 in repairs was also recommended to upgrade the city's WWTP. The city of Avalon has allocated $5.1 million towards sewer improvements, which are planned to proceed this summer.

Avalon Beach continues its reign as one of the most polluted beaches in California. The city of Avalon has allocated $5.1 million towards sewer improvements, which are planned to proceed this summer.

Avalon. Photo: Heal the Bay

Cabrillo Beach harborside. Photo: Joy Aoki

[E]ven with more than $15 million in cleanup project efforts, Cabrillo Beach harborside still continues to receive extremely poor water quality grades and is in almost constant violation of beach bacteria TMDL limits.

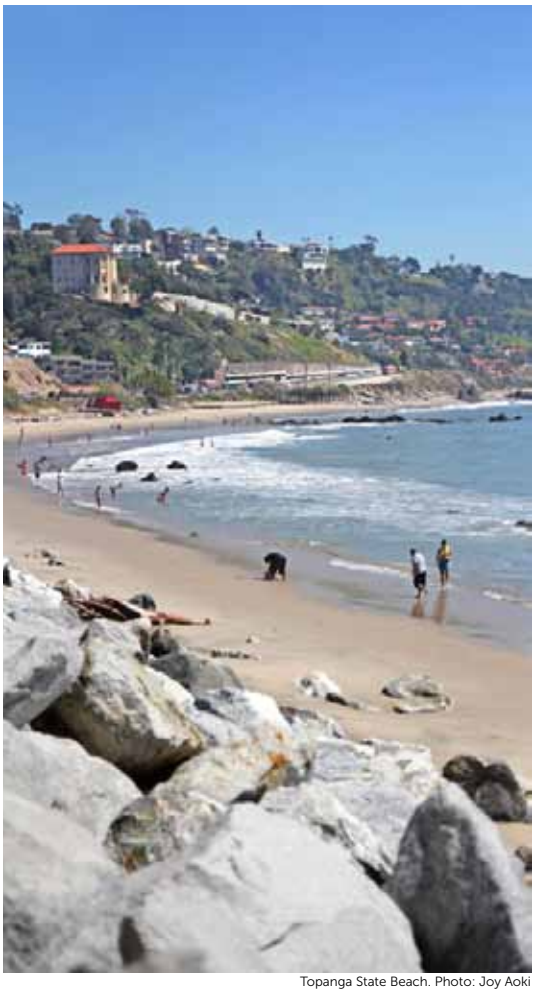
These improvements are positive steps towards improving water quality at Avalon and we hope they are adequate to improve beach water quality. Heal the Bay continues to advocate for the Los Angeles Regional Water Quality Control Board to develop a bacteria TMDL for Avalon Beach so that agencies will be held accountable for the increased public health risk due to poor water quality.

Cabrillo Beach harborside has earned F grades for all time periods over the last eight years, earning the #3 spot on the Beach Bummer list. In August 2009, pilot circulators were installed in the beach water in hopes of improving circulation and water quality. Ultimately, the circulators failed to improve water quality but there were noted implementation errors so this project may be retried in the future. The last step of Phase II in the Cabrillo Beach cleanup project (bird excluder devices) was completed in the spring of 2010. Modification of the monofilament array is needed to better exclude the birds. Although a short beach maintenance program pilot (physically picking up bird feces every morning) did not show substantial results, the program should be enhanced in light of the success at Dana Point's Baby Beach. Unfortunately, even with more than $15 million in cleanup project efforts, Cabrillo Beach harborside still continues to receive extremely poor water quality grades and is in almost constant violation of beach bacteria TMDL limits.

Topanga State Beach at the creek mouth has not been on the Beach Bummer list since 2005-06. A Source Identification Pilot Program (SIPP) is currently underway at this location, with researchers from Stanford University, UCSB, UCLA, U.S. EPA Office of Research and Development and the Southern California Coastal Water Resource Project (SCCWRP). They are developing and implementing sani-

tary survey/source tracking protocols at 12 to 16 of California's most polluted beaches, including Topanga. Researchers will test methods to identify human and a variety of different animal sources. The study will also compare results between the different laboratories in order to ensure that methods are comparable.

One of the final products will be a source tracking protocol that can be used to find microbial pollution sources at beaches chronically polluted by fecal indicator bacteria. The tool has been sorely needed since the passage of AB538 in 1999, which requires source identification and abatement efforts to proceed at chronically polluted beaches. To date, AB538 requirements have been largely ignored.



Topanga State Beach. Photo: Joy Aoki

Poche Beach continues to struggle with poor water quality taking the #5 place on the Beach Bummer list. A dry weather filtration/UV disinfection plant at the Poche Creek outlet was completed over two years ago (March 2009) but has yet to meet its design performance specifications. Despite a 94% water treatment efficiency average, treated outflow exceeded the single sample and geometric mean standards for Enterococcus 15% and 57% of the time, respectively. An extended period of treatment performance trials was completed in May 2010. Treated discharge was unable to be delivered to the surfzone, as it is required by resource agencies to discharge into a nearby beach pond prior to ocean entry. Data collected during the 2010 performance trials were highly suggestive that a pond bypass of treated outflow would substantially lower the extent of surfzone exceedances. Due to these results, on May 11, 2011 the Coastal Commission approved the county's proposal for a 2011 summer demonstration trial, which would relocate the treated outflow around the beach pond. The trial will demonstrate whether a beach pond bypass can in fact improve surfzone beach water quality at Poche Beach.

Poche Beach. Photo: Joy Aoki

The County of Orange continues to initiate an effort towards improving surfzone water quality at Poche Beach. Funding from the Clean Beaches Initiative (CBI) and San Clemente has allowed extensive source identification work in the lower watershed. Runoff and groundwater have been identified as potential sources. Also, the posted area on the beach is a potentially significant source of fecal indicator organisms. The final report should be out within the year.

Heal the Bay advises coastal beachgoers to use the Beach Report Card before they go to any beach on the West Coast in order to better protect their health and the health of their families.

Hermosa Beach strand. Photo: Joy Aoki

BEACH REPORT CARD

The 2010-2011 Beach Report Card: County by County

We strongly commend

those agencies that continued their monitoring programs beyond the summer dry weather (AB411) required dates of April through October. This action provided more than 20 additional weeks of water sampling. This meant that beachgoers, particularly surfers going out for the winter swells, could continue receiving information about water quality and have the ability to make better health risk decisions. In addition we commend those agencies that have continued to monitor beach water quality despite the state funding cutbacks experienced over the last two and a half years.

Heal the Bay presents grades for all coastal county monitoring locations in California (except for Del Norte County which didn't provide us with beach water quality data). Most grades are updated weekly and can be viewed at www.beachreportcard.org. Following is a brief summary of each California county's monitoring program throughout California over the past year, associated water quality issues and the number of beach closures caused by sewage spills. Also included – for the first time – are summaries of Oregon's and Washington's water quality grades (summer 2010).

San Diego County

There are five agencies within San Diego County that provided monitoring information directly to Heal the Bay's Beach Report Card: the City of Oceanside, the City of San Diego, Encina Wastewater Authority, San Elijo Joint Powers Authority and the County of San Diego Department of Environmental Health (DEH). A majority of the 76 monitoring locations monitored during summer dry weather (AB411) and covered by the Beach Report Card were sampled and analyzed by the city and county of San Diego. Samples were generally collected at the wave wash (where runoff and ocean water mix) or 25 yards away from a flowing storm drain, creek or river. For additional water quality information, visit the county of San Diego Department of Environmental Health's website at http://www.sdcounty.ca.gov/deh/water/beach_bay.html.

Shoreline year-round monitoring in San Diego County was scaled back during the winter seasons in 2008 and 2009 due to lack of state program funding. In 2009, the county of San Diego's Board of Supervisors stepped in and provided more than $100,000 to the DEH to get the program back up and running. Federal ARRA funds managed by the state allowed a semblance of normalcy to return to beach monitoring in San Diego County during the 2009-2010 winter season. Currently, San Diego County's summer dry (AB411) period for 2011 is covered by state and federal ARRA funds. The San Diego County Board of Supervisors continues to seek alternate funding sources for San Diego's critical water quality monitoring program and looks towards SB482 *(see Page 68)* as a possible road to increased funding.

Dry weather water quality at beaches that were consistently monitored in San Diego County was excellent. Of the 76 summer dry weather water quality monitoring locations, 100% received good to excellent water quality marks *(see Figure 4-1)*. San Diego County's water quality during the winter dry weather was similar with 93% of the monitored locations receiving A or B grades. The same beaches that scored poorly last year once again earned San Diego County's only poor grades (F) during winter dry weather: San Luis Rey River outlet in Oceanside and Border Field State Park at Monument Road.

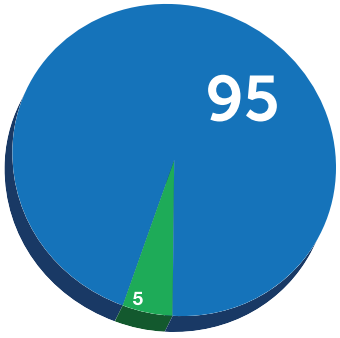
Figure 4-2 illustrates San Diego County's water quality grades for this year compared to the past seven-year average. AB411 grades were 100% A and B grades this year compared to the 95% average since 2003. The percentage of wet weather A and B grades improved by 12% over last year for a total of 72% A and B grades. Year-round dry weather water quality was among the best on record with 96% A and B grades compared to the average of 90%.

Tijuana River Bacterial Source Identification Study

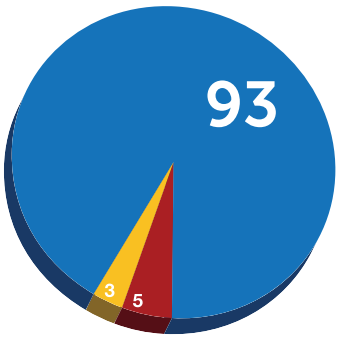
The purpose of the Tijuana River Bacterial Source Identification Study is to identify the natural and anthropogenic sources of fecal indicator bacteria (FIB) in the Tijuana River Watershed and prioritize potential best management practices (BMPs) that reduce bacterial loads from the U.S. portion of the watershed.

Wet weather monitoring, designed to assess flows and FIB loads from the U.S. and Mexican portions of the watershed, indicated that the majority of the bacterial load during storm events originates from the Mexican side of the border. Two large storm events have been monitored to date, consisting of samples collected over the course of the storm event (i.e. pollutograph) and analyzed for FIB as well as human-specific bacteroides (an indicator of bacteria originating from human sources). The latter analysis indicated the presence of human

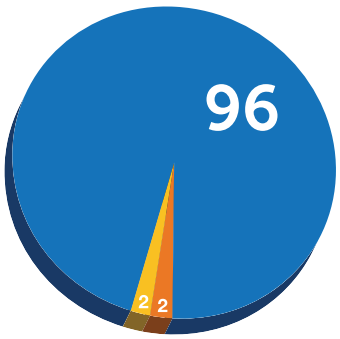
FIGURE 4-1
Percentage of Grades by Time Period for San Diego County Beaches



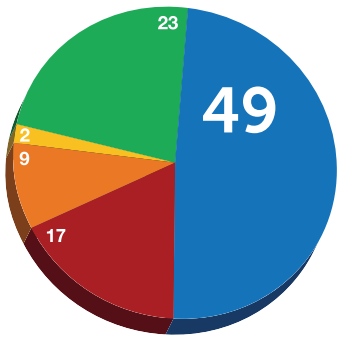
AB411: April-October (76 locations)



WINTER-DRY (40 locations)



DRY WEATHER (47 locations)

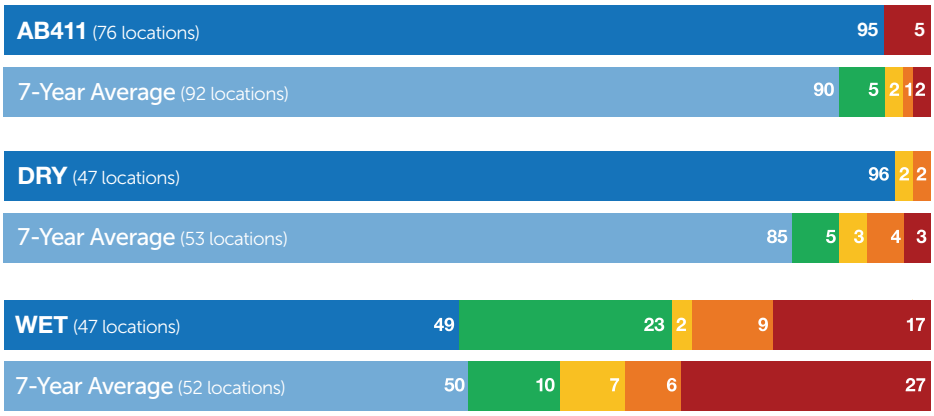


WET WEATHER (47 locations)

KEY: A B C D F
Numbers in **BOLD** indicate percentages

Cassidy Beach. Photo: Joy Aoki

FIGURE 4-2
2010-2011 San Diego County Water Quality and Seven-Year Average 2003-2010 (in percentages)



AB411: April thru October. Numbers in **BOLD** indicate percentages.

KEY: A B C D F

fecal contamination in the Tijuana River during storm events. During dry weather, extensive sanitary surveys consisting of hundreds of samples collected and analyzed for FIB and human-specific bacteroides have been conducted to identify bacterial sources. Rogue flows originating from Mexico during dry weather conditions have been identified as sources of bacteria to the Tijuana River.

Groundwater continues to be monitored for FIB at numerous sites throughout the U.S. side of the watershed. To date, FIB concentrations in groundwater have been low, with few exceptions. In addition, fate and transport studies using rhodamine dye have been conducted in the city of Imperial Beach to assess the potential for leaking sewer lines as a source of FIB to the Tijuana River Estuary. The results of FIB and human-specific bacteroides analyses from this study indicate that the sewer system is not a source of bacteria to the estuary and area beaches. Based on these results, BMPs are currently being considered, including concept designs to help reduce FIB loads during storm events on the U.S. side of the border as well as monitoring flows that cross to the U.S. side from Mexico that may impact U.S. beaches with FIB.

Sewage Spill Summary

This past year saw massive sewage spills in San Diego County, with nine spills (not including the Tijuana River) of known volume totaling more than eight million gallons. Those spills were responsible for numerous beach closures between April 1, 2010 and March 31, 2011. The worst period of sewage spills occurred Dec. 21-28, 2010, with more than eight million gallons of raw sewage discharged into local waterways (more than the rest of California coastal counties combined). The spills were linked to heavy storm damage to the sewage systems, such as broken pipes.

There were 21 beach closure events from Coronado to the U.S. border due to model projections or field observation suspicions of sewage contaminated plumes moving north from the Tijuana Estuary *(see next page for details)*. The four southernmost beaches in San Diego County were closed for a total of 237 total days between April 1, 2010 and March 31, 2011 as a precaution to keep the public from being exposed to sewage contaminated plumes from the Tijuana River. Portions of or all of Imperial Beach were included in these closures. The longest closure for border beaches this year began on Dec. 18, 2010 and continued beyond the March 31, 2011 ending of this report's time frame.

More on the Tijuana River Slough

When sewage contamination in the Tijuana River moves from the estuary mouth and north along the coast, water quality at southern San Diego County beaches could potentially be heavily impacted.

In 2003, to create a real-time Tijuana River plume model, the Scripps Institute of Oceanography compared previous monitoring data with measured hourly ocean currents from Southern California Coastal Ocean Observing System (http://www.sccoos.org/data/tracking/IB. When the model predicts poor water quality, or other field observations indicate the possibility of sewage contamination (as was the case this year), large stretches of southern San Diego beaches can be closed from the Mexican border, to all the way north of Imperial Beach (more than 10 miles of beach when Coronado beaches are closed). As a precautionary measure, San Diego County Environmental Health closed the beaches near the estuary when rain, current and sewage spill conditions posed a potential health risk to swimmers. This approach led to an enormous increase in beach closure days. Border beaches were closed for almost one-third of the year-long time frame of this report.

There have been several significant infrastructure advancements in both San Diego and Tijuana to improve beach water quality at U.S.-Mexico border beaches.

Since its construction in 1997, the International Wastewater Treatment Plant (IWTP) in San Ysidro has discharged inadequately treated wastewater into the Pacific Ocean in violation of the Clean Water Act. In accordance with a binational treaty that includes a cost-sharing agreement with Mexico, the plant treats 25 million gallons, per day, of sewage collected in Tijuana. In 2008, the decision was made to upgrade the IWTP and in November 2010, the plant began full secondary treatment in order to meet federal standards.

The Tijuana water authority, with support from the U.S. EPA, has recently put two new sewage treatment plants online: Arturo Herrera and La Morita. These plants began operations in 2009 and 2010, respectively, and are able to treat the collected wastewater of more than 300,000 Tijuana residents. These infrastructure improvements are part of an effort by U.S. and Mexican authorities to eliminate the coastal discharge of untreated sewage from Tijuana and should improve water quality at San Diego and Tijuana beaches.

A growing concern to beach users is the increase in contaminated dry weather flows observed in the Tijuana River which have resulted in increased beach closures. A diversion system in Tijuana has the ability to collect dry-weather river flow for treatment, however, its operation is inconsistent. The San Diego Regional Water Quality Control Board has yet to determine when it is appropriate to have dry weather flow in the Tijuana River. This determination is critical to binational efforts to improve water quality and reduce beach closures.

Despite open access to river flow data, nearshore current models, and water quality information, authorities in Mexico are yet to implement an effective public advisory system at beaches impacted by sewage-contaminated water from the Tijuana River. The lack of an effective beach advisory system in Tijuana was further highlighted by an estimated 30-million gallon sewage spill into the ocean at Playas de Tijuana in December 2010. Despite the severity of the spill, the there was no official notification to the public or authorities in the U.S. for two weeks. In response to public concerns, authorities in Mexico and the United States have improved protocols for cross-border communication of sewage spills. In addition to this, the Clean Beaches Committee, convened by Mexican authorities, is working to develop and implement a public beach advisory system to address water quality concerns in the Tijuana and Rosarito regions. *[Information courtesy of WiLDCOAST www.wildcoast.net]*

Orange County

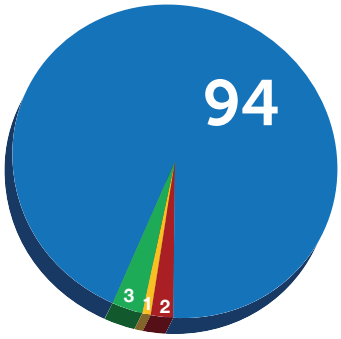
There are three agencies within Orange County that provide monitoring information to Heal the Bay's Beach Report Card: the South Orange County Wastewater Authority, the County of Orange's Environmental Health Division, and the Orange County Sanitation District. Samples were collected throughout the year along open coastal and bay beaches, as well as near flowing storm drains, creeks or rivers. For additional water quality information, visit the county of Orange Environmental Health Division's website at www.ocbeachinfo.com.

Orange County has begun to integrate the multiple agencies' efforts into a model monitoring program by attempting to integrate the sampling resources of wastewater facilities, stormwater programs and environmental health programs. With the uncertain future of state funding for local monitoring efforts, Orange County has begun to eliminate monitoring locations deemed redundant or overlapping and plans to drop consistently clean locations to afford continued monitoring of high-use and problematic locations. Currently, Orange County is awaiting the Regional Water Quality Control Board's approval to implement this program. Heal the Bay provided feedback on the proposed plan and is concerned with the reductions in monitoring frequency at some beaches. Also, any allowed decrease in monitoring frequency should be accompanied by a requirement to move beach sample sites to 'point-zero' (directly in front of the storm drain and creek flows). Currently, some sample sites are over 80 yards away from runoff pollution sources. We will monitor progress as Orange County moves forward on maximizing available county resources for health protection of the beachgoing public.

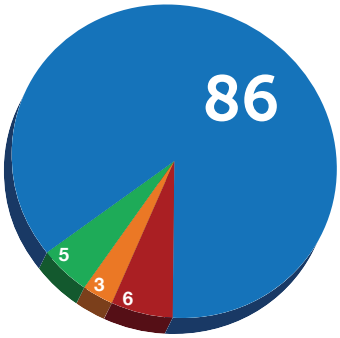
Orange County monitored 21 fewer beaches year-round this past year than before the state funding problems began but has essentially maintained the same number of beaches moni-

Huntington Harbor. Photo: Mari Reynolds

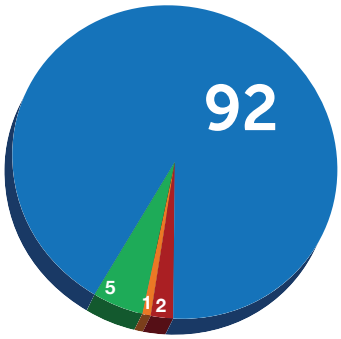
FIGURE 4-3
Percentage of Grades by Time Period for Orange County Beaches



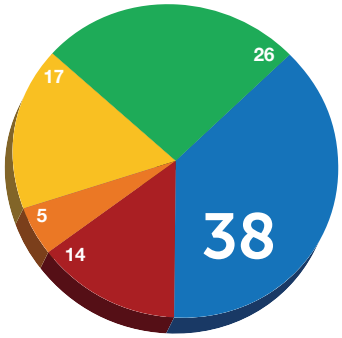
AB411: April-October (101 locations)



WINTER-DRY (78 locations)



DRY WEATHER (84 locations)



WET WEATHER (84 locations)

KEY: A B C D F
Numbers in **BOLD** indicate percentages

tored during the AB411 time period.

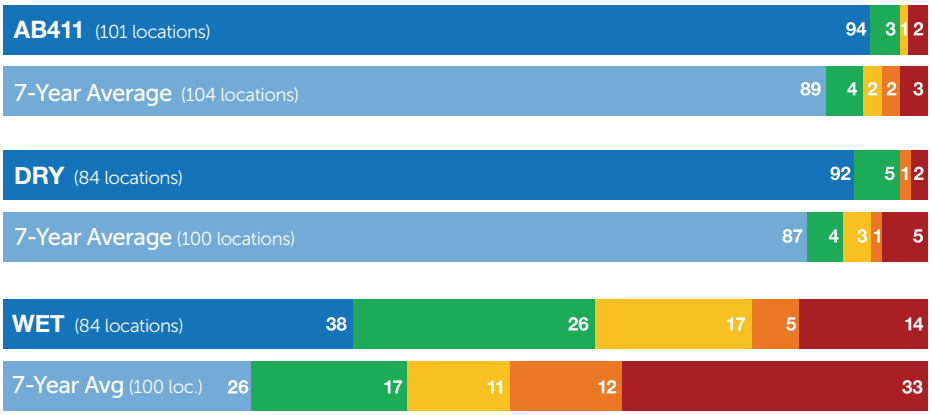
Orange County's grades for both year-round dry weather and the AB411 time period were excellent, and again above the state average. 97% of monitoring locations received an A or B during the AB411 time period and 96% did so during year-round dry weather *(see Figure 4-3)*. Poche Beach and Doheny Beach displayed the only poor water quality grades (F) in the county during the AB411 time period.

Winter dry weather grades between November and March were 8% better than last year's with 91% of beaches receiving A or B grades. All sites between Doheny Beach to 4000 feet south of San Juan Creek exhibited poor dry weather water quality during the winter months.

A dry weather filtration/UV disinfection plant at the Poche Creek outlet was completed over two years ago (March 2009) but has yet to meet its design performance specifications. Despite a 94% water treatment efficiency average, treated outflow exceeded the single sample and geometric mean standards for Enterococcus 15% and 57% of the time, respectively. An extended period of treatment performance trials was completed in May 2010. Treated discharge was unable to be delivered to the surfzone, as it is required by resource agencies to discharge into a nearby beach pond prior to ocean entry. Data collected during the 2010 performance trials were highly suggestive that a pond bypass of treated outflow would substantially lower the extent of surfzone exceedances. Due to these results, on May 11, 2011 the Coastal Commission approved the County's proposal for a 2011 summer demonstration trial, which would relocate the treated outflow around the beach pond. The trial will demonstrate whether a beach pond bypass can in fact improve surfzone beach water quality at Poche Beach. A Source Identification Pilot Program (SIPP) project starting this summer will hopefully identify the lingering causes of poor water quality.

Wet weather water quality in Orange County this past year was fair, with 64% of monitoring locations receiving A or B grades during wet weather compared to 42% in 2009-2010.

FIGURE 4-4
2010-2011 Orange County Water Quality and Seven-Year Average 2003-2010 (in percentages)



AB411: April thru October. Numbers in **BOLD** indicate percentages.

KEY: A B C D F

Figure 4-4 illustrates an assessment of this year's grade percentages at Orange County beaches compared to the seven-year average. Orange County once again displayed excellent dry weather water quality and exceeded the AB411 seven-year average (93%) with 97% A or B grades. Year-round dry weather water quality results exceeded the seven-year average by 5% with 96% A or B grades.

Sewage Spill Summary

Orange County experienced 16 sewage spills (with known volumes totaling approximately 160,900 gallons) that led to beach closures this past year. Seven of these were major spills (>1000 gallons), accounting for nearly 99% of the known spill volume for the county. 78% of these major spills occurred during the late December storms and account for 43.2 beach mile days of closure.

Major spills included an approximately 21,000-gallon sewage release via a line break, resulting in the closure of all Little Corona Beach for three days in early July 2010. A pump station failure released approximately 7,000 gallons of sewage on Jan. 8, 2011, resulting in a two-day closure of one-quarter of a mile upcoast and downcoast of Aliso Creek at Aliso County Beach in Laguna Beach.

Los Angeles County

There are four agencies within the county of Los Angeles that contributed monitoring information to Heal the Bay's Beach Report Card. The City of Los Angeles' Environmental Monitoring Division (EMD) at the Hyperion Sewage Treatment Plant provided daily or weekly beach data for 34 locations. The Los Angeles County Department of Health Services (DHS) monitored 33 locations on a weekly basis. The Los Angeles County Sanitation Districts monitored eight locations weekly. The city of Long Beach's Environmental Health Division monitored 15 (down from 25 historically) locations on a weekly basis. The city of Redondo Beach solely monitored two locations and gathered supplemental data at five EMD sites. All monitoring programs, except Long Beach, collect samples throughout the year at the mouth of a storm drain or creek. Most Long Beach monitoring locations are not near storm drains, but the Los Angeles and San Gabriel rivers receive stormwater runoff from approximately 1,500 square miles and they outlet near these beaches. For additional water quality information, please visit Los Angeles County's Department of Health Services website at http://lapublichealth.org/phcommon/public/eh/rechlth/ehrecocdata.cfm; or the city of Long Beach at http://www.longbeach.gov/health/eh/water/water_samples.asp.

While other counties shut down or cut back on their ocean water quality monitoring programs, Los Angeles County has been able to continue sampling and protecting public health as before.

Los Angeles County's monitoring program has been one of the least impacted by the state funding cuts. While other counties shut down

Malibu. Photo: Anthony Barbatto

or cut back on their ocean water quality monitoring programs, Los Angeles County has been able to continue sampling and protecting public health as before. This is due to the structure of the program, sewage treatment plant and stormwater permit monitoring requirements, and the shared monitoring responsibilities between agencies in the county.

Los Angeles County's summer dry (AB411) weather water quality fell from 80% A or B grades last year to 75%, which is 15% below the statewide average. Water quality was fair with 75% of the locations receiving an A or B for the summer months and 76% year-round for dry weather *(see Figure 4-5)*. There were some stretches of very good to excellent summer water quality in western Malibu, from Leo Carrillo to Zuma Beach on Point Dume, and all of Santa Monica Beach locations through Venice Beach. The South Bay saw excellent water quality during the summer months from Marina del Rey all the way to Cabrillo Beach Oceanside. All South Bay locations received A grades, with the exception of Dockweiler State Beach at Ballona Creek and the south side of Redondo Municipal Pier, which received B grades.

Overall, 2010-2011 dry weather water quality was slightly better than the seven-year average for A or B grades (74% average), with 76% of the locations receiving A or B grades this past year *(see Figure 4-8)*.

AB411 water quality in Santa Monica Bay was excellent last year with 91% of Santa Monica Bay beaches (from Leo Carrillo to Palos Verdes) receiving A or B grades during the time period *(see Figure 4-9)*. This percentage is the same as last year and markedly better than the seven-year average (82%) for Santa Monica Bay.

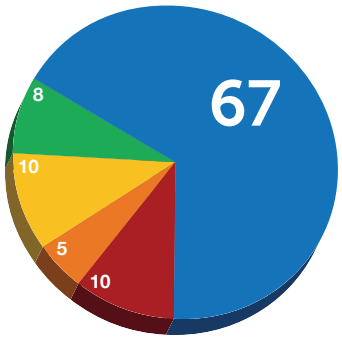
Poor grades for year-round dry weather in Santa Monica Bay were received at Paradise Cove (F) , Solstice Canyon at Surfrider Beach (F), Marie Canyon storm drain (D), Surfrider Beach (F), Topanga Beach (F), Will Rogers drain at 16801 Pacific Coast Highway (D), Cabrillo Beach harborside at the restrooms (F), Long Beach at Molino and Coronado Ave. (D), Long Beach's Mother's Beach (F), Alamitos Bay (D), and Colorado Lagoon (north) (F) and south (F).

Overall wet weather water quality in Los Angeles County showed poor results, with only 25 of 87 (29%) receiving A or B grades compared to 50% last year. Sixty-two of 87 (71%) of sample sites received poor grades, with 40 out of 87 (46%) of sample sites receiving an F grade. The county's wet weather water quality this past year was 7% below the seven-year average and well below the statewide average, most likely from the intense rainfall this past winter.

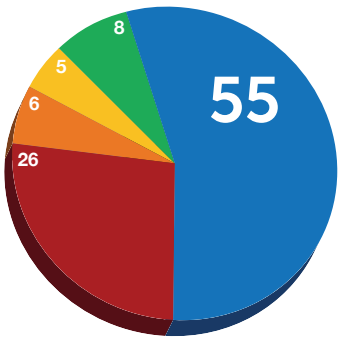
Los Angeles County's move to sample at the mouth of flowing storm drains and creeks due to the Santa Monica Bay Beach Bacteria TMDL has historically contributed to the county's grades being well below the state average. However, it is important to note that not all water quality problems in the county can be attributed to the sampling location. For example, the beaches at Avalon and Cabrillo had very poor water quality again this year, even though storm drains are not a major contributor to pollution at these locations. Heal the Bay believes that sampling at the outfall ('point-zero') of drains and creeks gives a more accurate picture of water quality and is far more protective of human health. Statewide, most monitoring locations associated with storm drains or creeks are actually sampled at a substantial distance from the outfall.

Although Paradise Cove improved to a B grade last AB411 (2009) period from its persistently poor grades, this year it fell to a D grade. This was surprising due to the completion of the long overdue wastewater treatment facility and sewers at the Paradise Cove Mobilehome Park, and the installation of a new dry weather runoff treatment facility at the bottom of the watershed (completed last July). Kelp wrack and algae have been observed by Heal the Bay at the outflow of treated water discharged from the treatment facility. The point of discharge may be harboring high concentrations of bacteria, thereby introducing bacteria into newly treated waters and contributing to poor

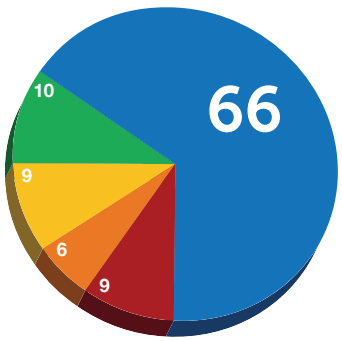
FIGURE 4-5
Percentage of Grades by Time Period for Los Angeles County Beaches



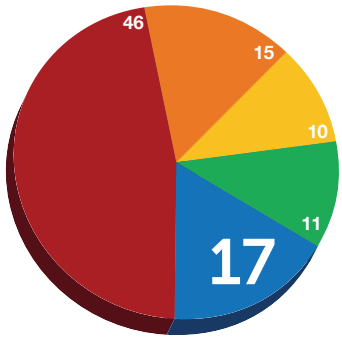
AB411: April-October (92 locations)



WINTER-DRY (87 locations)



DRY WEATHER (87 locations)



WET WEATHER (87 locations)

KEY: A B C D F
Numbers in **BOLD** indicate percentages

Los Angeles River. Photo: Joy Aoki

Extensive studies throughout the city have demonstrated that the Los Angeles River, an enormous pollution source because of its nearly-1,000 square mile drainage, is the predominant source of fecal bacteria to Long Beach waters.

water quality grades.

Last AB411 (2009) grading period, Marie Canyon earned its best ever score with a B grade, which unfortunately fell to a D grade for both year-round dry weather and AB411 (2010) period in this report. Heal the Bay made a site visit in April 2011 which revealed large amounts of organic material downstream from the discharge. This material may be harboring bacteria and contributing to poor water quality. L.A. County is currently working to fix issues with the filtration system, including sediment diversions to limit inefficient filtration, as well as increasing dry weather pump capacity. Heal the Bay will continue to encourage local agencies to create a routine maintenance program to improve water quality at Marie Canyon.

All five monitoring locations at Avalon Beach on Catalina Island received poor dry-weather grades this past year, earning this location the distinction of being one of the most polluted beaches in the entire state. As usual, Avalon Beach was not monitored year-round despite the attraction of the idyllic town to tourists year-round.

Despite millions of dollars spent on water quality improvements, Cabrillo Beach harborside has earned F grades for all time periods over the last eight years. Regardless of the attempted water quality improvement projects to date, Cabrillo Beach is in near-constant violation of beach bacteria TMDL limits.

After three years of improved water quality during the dry weather AB411 time period, Long Beach water quality dipped by 40% from last year to this year with only 27% (four beaches) receiving an A or B grade. During year-round dry weather only 33% of Long Beach beaches received A or B grades *(see Figure 4-6)*. Long Beach has made significant efforts to locate pollution sources and improve water quality. Extensive studies throughout the city have demonstrated that the Los Angeles River, an enormous pollution source because of its nearly-1,000 square mile drainage, is the predominant source of fecal bacteria to Long Beach waters. Every monitoring location in Long Beach scored a poor grade during wet weather this year. This is the second year Long Beach continued to monitor 10 fewer sites than in 2008-2009 due to cost cutting measures.

Long Beach's Colorado Lagoon earned a spot on the Beach Bummer list this year due to consistently poor water quality. On March 16, 2010, the State Water Resources Control Board (SWRCB) passed a resolution allocating $1,799,803 towards the Colorado Lagoon Restoration Project. However, on April 5, 2011, due to much more widespread sediment contamination than was anticipated, the SWRCB approved the city of Long Beach's request for an additional $3.3 million from the Cleanup and Abatement Account. The primary goals of the project are to dredge and remove sediment, install pollution reduction devices and re-vegetate these portions of the lagoon with native plants.

While the Los Angeles River will continue to be

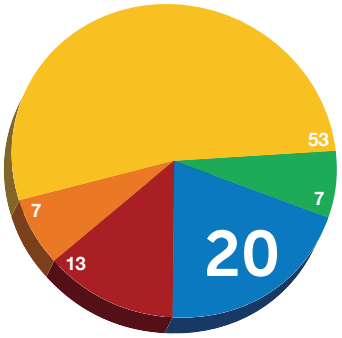
the major source of contamination for Long Beach beaches, the city's investigations have resulted in the discovery and repair of leaking or disconnected sewage pump lines and improperly working storm drain diversions. The city has also implemented an innovative pilot technology to disinfect runoff in the storm drains. Ultimately however, most Long Beach water quality will be directly tied to rainfall amounts and runoff volumes from the Los Angeles River. Unfortunately, as discussed later in this report, the Los Angeles Regional Water Quality Control Board did not take Heal the Bay's recommendation for a tight compliance timeline in the Los Angeles River Bacteria TMDL to ensure that Long Beach beaches do not remain impacted for many years to come. Instead, the TMDL allows 25 years to comply with water quality standards in both dry and wet weather – far too long for Long Beach residents and visitors to wait for clean water.

Santa Monica Bay Total Maximum Daily Loads (TMDLs)

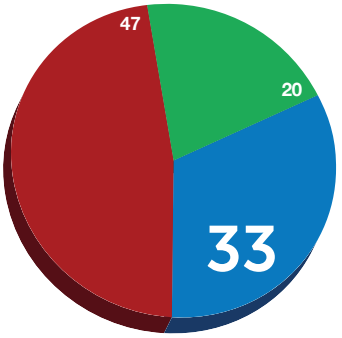
Every beach from the Ventura County line south to Palos Verdes was mandated to meet state beach bacteria health standards 100% of the time during the AB411 time period (April 1–Oct. 31) by July 15, 2006 and only three allowable violations during the winter dry period (Nov. 1–March 31) by July 15, 2009 or face penalties. In addition, the first winter wet weather compliance point passed in 2009; specifically the TMDL requires a 10% cumulative percentage reduction from the total exceedance day reductions required for each jurisdictional group. Marina del Rey's Mother's Beach and Back Basins had a compliance deadline for summer and winter dry weather of March 18, 2007 and Los Angeles Harbor (Inner Cabrillo Beach and Main Ship Channel) passed the compliance deadline for both the AB411 time period and winter dry and winter wet weather on March 10, 2010. The 100% compliance requirement for the AB411 time period means that all of these beaches must be safe for swimming every day for the seven months from April through October. In the winter dry and winter wet time periods, beaches are allowed a specified number of exceedances in order to account for reference conditions. These requirements are within the fecal bacteria TMDLs for Santa Monica Bay, Mother's

Santa Monica Bay. Photo: Joy Aoki

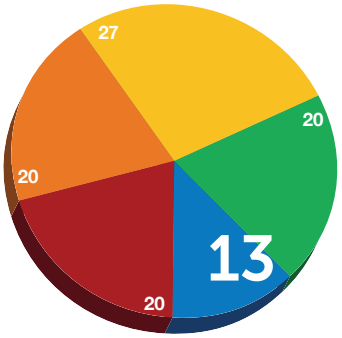
FIGURE 4-6
Percentage of Grades by Time Period for Long Beach



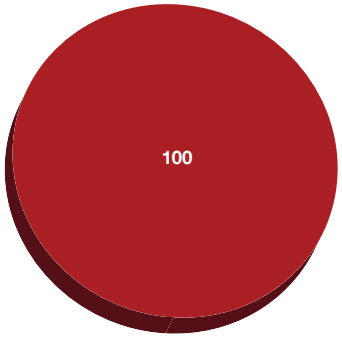
AB411: April-October (15 locations)



WINTER-DRY (15 locations)



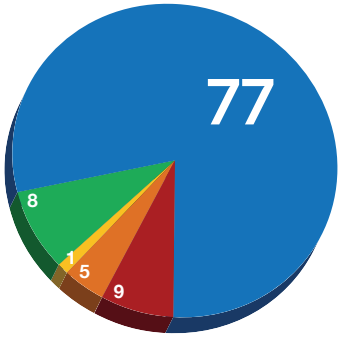
DRY WEATHER (15 locations)



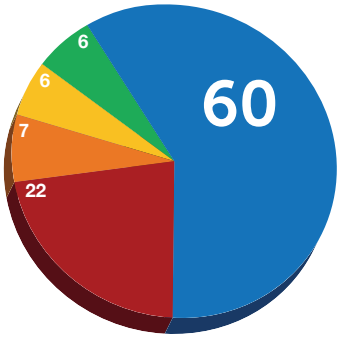
WET WEATHER (15 locations)

KEY: A B C D F
Numbers in **BOLD** indicate percentages

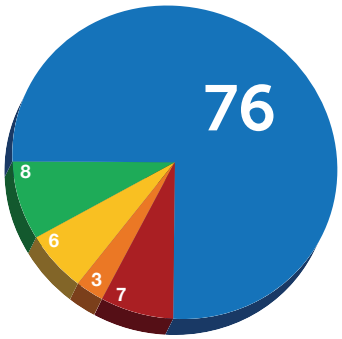
FIGURE 4-7
Percentage of Grades by Time Period for L.A. County (excl. Long Beach)



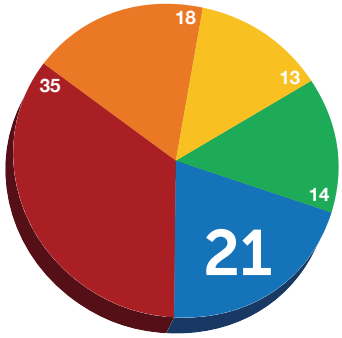
AB411: April-October (77 locations)



WINTER-DRY (72 locations)



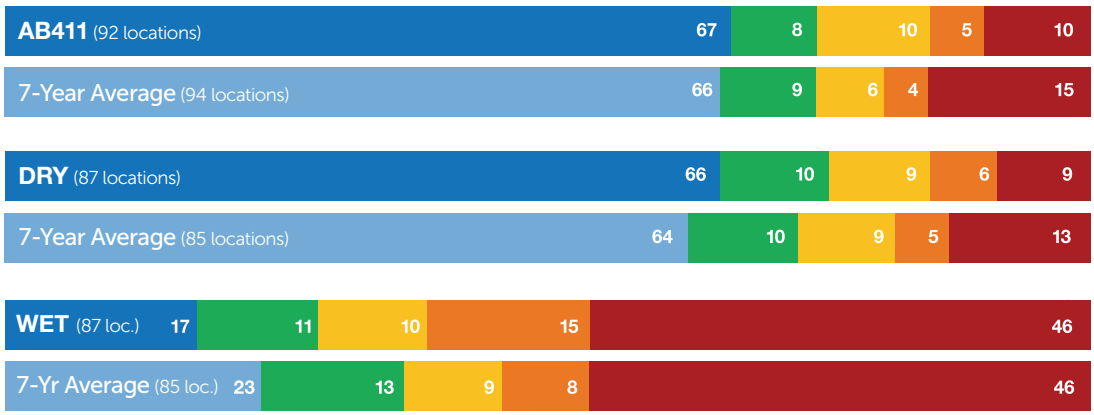
DRY WEATHER (72 locations)



WET WEATHER (72 locations)

KEY: A B C D F
Numbers in **BOLD** indicate percentages

FIGURE 4-8
2010-2011 Los Angeles County Water Quality and Seven-Year Average 2003-2010 (in percentages)



AB411: April thru October. Numbers in **BOLD** indicate percentages.

KEY: A B C D F

Beach and Los Angeles Harbor.

Unfortunately, the compliance deadlines have come and gone and many of Santa Monica Bay's beaches like Surfrider Beach, Topanga State Beach at creek mouth, Redondo Municipal Pier, Mother's Beach, Dockweiler State Beach at Ballona Creek mouth and inner Cabrillo Beach still frequently had elevated bacteria concentrations above the TMDL limits. While some cities have made noticeable improvements in identifying and rectifying sources of ocean pollution, measures to fix chronically polluted beaches like Dockweiler State Beach at Ballona Creek mouth, Cabrillo Beach and Surfrider have been inadequate. *(For more information on the beach bacteria TMDLs please see "Beach Report Card Impacts 2010-2011" on Page 61.)*

Clean Beach Initiative (CBI) Projects Update

Avalon Beach

Four years ago, a $4.5 million swimmer health effects study included Avalon Beach as a research location due to its perpetually poor water quality. The Avalon study was completed in 2010 and the paper should be released before the end of 2011. Also, researchers from Stanford University and UC Irvine completed source tracking, fate and transport, and modeling studies that demonstrated that sewage contaminated groundwater is a major source of beach pollution at Avalon. Researchers also found human enteroviruses using molecular methods.

In September 2008, the SWRCB and the city of Avalon completed a grant agreement for Proposition 13–Clean Beaches Initiative (CBI) funding for the Avalon Bay Water Quality Improvement Project. This project's goal was to inspect, repair and/or replace approximately 370 residential sewer laterals; and to install monitoring wells along Avalon's main beaches and at inland locations. Once the temporary freeze of state funding for the project ended, the sewer repair portion was completed last summer. Despite completion of the project, water quality at Avalon Beach has remained poor. A major sewer infrastructure replacement, which includes privately owned sewer systems, is imperative for Avalon to come off the Beach Bummer list. Recently, newspapers reported that $11 million would be spent in the near future on tourism amenity improvements with a long-term spending price tag of up to $100 million, yet inadequate attention has gone towards the necessary sewer system overhaul. In contrast, if chronically-leaking raw sewage was found on a beach on the mainland, local health agencies would have closed it as required under AB411 and there would be intense

public pressure to upgrade the sewer system.

After receiving a Notice of Violation (NOV) from the Regional Water Board for consistent violations of water quality standards, the board inspected the city of Avalon's treatment facility in October 2010. Much progress seems to have been made after the inspection visit, which the city of Avalon states was already underway. After a nearly twenty-year partnership, the city of Avalon and United Water Services ended their relationship this past February. Meanwhile, the city contracted Environ Strategy (ES) to resume operation of the Waste Water Treatment Plant (WWTP). In March 2011, the city of Avalon hired RBF Consulting to perform a sewer and manhole condition assessment, which estimated that $4.6 million was needed in repairs. An additional $250,000 in repairs was also recommended to fix the city's WWTP. The city of Avalon funded $5.1 million towards sewer improvement projects, which will hopefully be underway this summer. Although these improvements are positive steps towards improving water quality at Avalon, they are long overdue.

Heal the Bay continues to advocate at the Regional Water Board to develop a bacteria TMDL for Avalon Beach to hold the city of Avalon accountable for decades of poor water quality. In order to ensure that water quality standards are finally attained in Avalon, the Regional Water Board should begin development of a Total Maximum Daily Load for the fecal bacteria impairments at Avalon Beach. Although the beach is not listed in the federal TMDL consent decree for the Los Angeles region, the beach has been listed on the state and federal list of impaired waters for years. The magnitude of the problem and the ease of writing the TMDL (it could easily be modeled on the TMDLs for Santa Monica Bay, Marina Del Rey and Cabrillo Beach) should make this one of the Regional Water Board's highest priorities. Monitoring should occur at Avalon on a year-round basis because Catalina Island is a year-round tourist destination. Also, beach monitoring should increase to at least three times a week during the AB411 time period.

Santa Monica Pier success

The city of Santa Monica has completed the Santa Monica Pier improvement project, funded under Measure V approved by Santa Monica voters in 2006. Measure V projects are intended to reduce stormwater pollution and runoff from entering Santa Monica Bay. The project began in February 2009 and involved replacing the severely degraded storm drain underneath the Santa Monica Pier. The new storm drain was designed and constructed in a manner to reduce or eliminate ponding of runoff under the pier. Santa Monica also put in a new dry weather runoff diversion to replace the previous faulty system using CBI funds. The city also installed netting under the pier to keep pigeons and other birds from nesting underneath the pier and adding their fecal bacteria to the already problematic water quality. This netting was completed in February 2010.

Santa Monica Pier. Photo: Joy Aoki

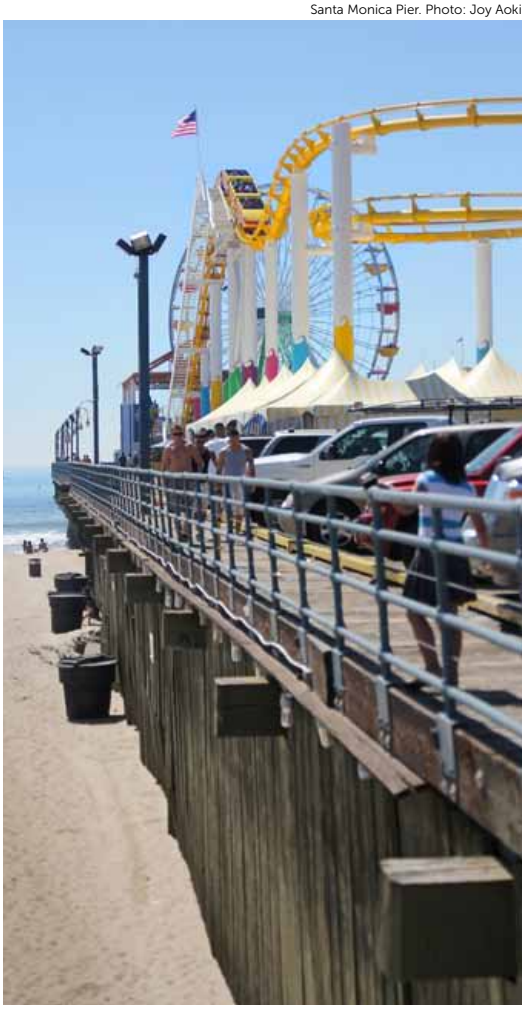
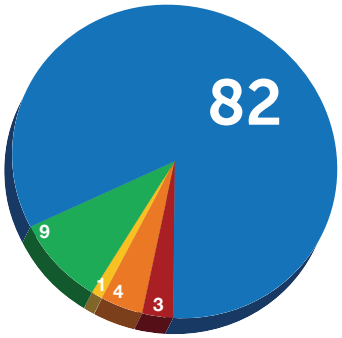
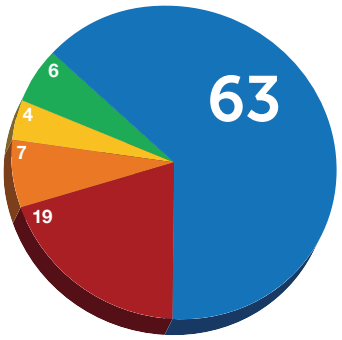


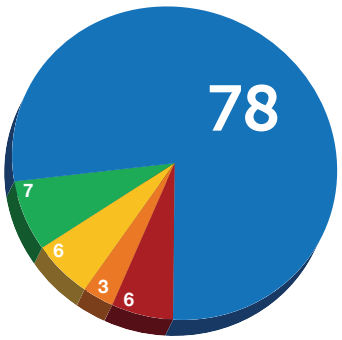
FIGURE 4-9
Percentage of Grades by Time Period for Santa Monica Bay



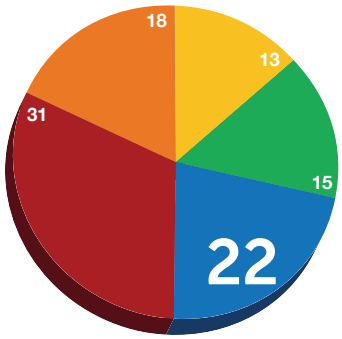
AB411: April-October (67 locations)



WINTER-DRY (67 locations)



DRY WEATHER (67 locations)



WET WEATHER (67 locations)

KEY: A B C D F
Numbers in **BOLD** indicate percentages

Mother's Beach in Marina del Rey. Photo: Joy Aoki

[E]nclosed bays are typically found to have poor water quality due to a lack of water circulation, which allows bacteria numbers to persist for longer periods of time without dispersion.

Santa Monica hired researchers from UCLA to complete a thorough source tracking study to identify any remaining sources of fecal bacteria at the beach. Results from this study have not identified any sources of human-specific bacteria under or around the pier. They continued to study the effects of ultraviolet (UV) light and bacteria levels in sand, to further investigate how UV light contributes to the degradation of bacteria.

This research will hopefully help in facilitating the contained abatement of elevated bacteria concentrations underneath the pier. Water quality at the beach (south of the pier) has improved dramatically over last year and received A grades during both year-round dry weather and the summer dry (AB411) time period The removal of this location from the Beach Bummers list was a huge accomplishment for the city of Santa Monica, which has dedicated many years and millions of dollars towards improving water quality at and around the pier. We hope this encouraging trend continues.

Santa Monica Bay beaches

Although the city of Los Angeles was scheduled to complete the majority of their large scale year-round dry-weather runoff diversion projects last summer, the city continues to work on the last phase of the $40-plus million project (funded by Proposition O, CBI and ARRA funds). The project diverts runoff from eight storm drains into the Coastal Interceptor Relief Sewer (CIRS) that flows to the Hyperion Treatment Plant. This is the first time that large scale, highly engineered year-round runoff diversions will be completed in California. Currently, the eight Low Flow Diversions (LFDs) and the county-maintained LFD at Santa Monica Canyon (SMC), funded by Proposition O and led by the city, have already been completed. The rubber dam and its companion concrete pipe construction at SMC is being led and funded by Los Angeles County. Work will begin in April 2012 and construction should be complete by the end of December 2012. The CIRS construction, funded and led by the city of Los Angeles, is already underway and expected to be complete in the spring of 2013.

Los Angeles' enclosed beaches

Both Mother's Beach in Marina del Rey and Cabrillo Beach are enclosed beaches that chronically exceed beach bathing water standards and often receive poor grades on the Beach Report Card. Beaches in enclosed bays are typically found to have poor water quality due to a lack of water circulation, which allows bacteria numbers to persist for longer periods of time without dispersion. Public agencies responsible for oversight at these beaches have received funding from the Clean Beach Initiative to embark on circulation improvement projects.

In 2006, water circulating pumps were put in place at Mother's Beach in an attempt to reduce high bacteria concentrations, but an inconsistent pump schedule made it difficult to determine water quality improvement. In September 2010, the pumps finally started on

a continuous schedule for seven days a week. Additionally, in April 2010 numerous bird deterrent devices were installed around the beach area, possibly leading to reduced bacteria concentrations in the beach water. Improved water quality may be a combination of these improvement projects, as this year Mother's Beach earned A grades during the AB411 period at all three sampling locations (playground area, lifeguard tower and boat dock).

Heal the Bay remains concerned with the poor water quality still observed at Cabrillo Beach despite extensive water quality improvement projects, including replacement of beach sand in the intertidal zone, removal of rock jetty, removal of abandoned storm drains and sewers, and the newly installed bird exclusion devices. With more than $15 million invested in improving water quality at Cabrillo's harborside beach, the city is still violating TMDL limits. A recent workshop hosted by the city of Los Angeles investigated possible next steps towards improving water quality at this problematic location, in order for the city to meet bacteria compliance standards at this site.

Paradise Cove

Historically, the beach adjacent to the mouth of Ramirez Canyon Creek at Paradise Cove in Malibu has exhibited high levels of fecal indicator bacteria. In February 2009, Kissel Company, owner of the Paradise Cove Mobilehome Park in Malibu, was issued a proposed $1.65 million fine by the Regional Water Board for allowing raw or partially treated sewage to spill into Ramirez Creek and the ocean. Specifically, the proposed fine covered the failure to comply with numerous prescribed Time Schedule Orders, discharge of raw sewage and failure to submit monitoring reports. The Regional Water Board, due to perceived administrative errors in their enforcement case, reduced the fine to $54,500.

Heal the Bay appealed this greatly reduced fine to the SWRCB. The appeal has been pending for more than 18 months now, which is unacceptable. The SWRCB needs to deem the petition complete and schedule a hearing on the enforcement action as soon as possible. The good news, however, is that the Kissel Company finally completed the sewer system and sewage treatment plant for the mobile home park.

Several years ago, the owner of these properties, working with the Santa Monica Baykeeper, installed a runoff treatment facility near the mouth of Ramirez Creek. However, the facility was under-designed and needed to be replaced with a bigger facility. A project for an improved runoff treatment facility near the mouth of Ramirez Creek facility was approved by the SWRCB as part of the CBI. This project was completed July 2010 under the city of Malibu's leadership. Though Paradise Cove showed improvement in the first four months, water quality became sporadic throughout the winter months with consistently poor grades through the end of March 2011. After these unexpected results, Heal the Bay made a site visit to Paradise Cove and observed algae and other organic material near the treatment facility's discharge pipe and adjacent storm drain. This organic material may be harboring bacteria and re-suspending it into the treated or pond-

Paradise Cove. Photo: Luwin Kwan

Though Paradise Cove showed improvement in the first four months, water quality became sporadic throughout the winter months with consistently poor grades through the end of March 2011.

ed creek water. Further investigation is needed to determine the source of increased bacteria concentrations. Heal the Bay will continue to encourage local agencies to develop a routine maintenance plan for the storm drain at this popular swimming location.

Marie Canyon

Los Angeles County's LFD at Marie Canyon has no sewer line at this location. Instead the LFD works as a type of stormwater treatment through filtration, with the cleansed flow returned to the storm drain. L.A. County is currently working to fix issues with the filtration system, including sediment diversions to limit inefficient filtration, as well as increasing dry weather pumping capacity. Routine maintenance plans, including removing material at the discharge location and ponding prevention in the larger outfall pipes (not the treated runoff pipe), might be the answer to improved water quality at this location. Heal the Bay will continue to monitor water quality data and work with the city of Malibu and Los Angeles County to address the poor water quality at both Paradise Cove and the Marie Canyon storm drain.

Redondo Beach Pier

Los Angeles County Sanitation Districts and Redondo Beach undertook a source identification study at Redondo Beach Pier to shed light on the sources of high fecal bacteria densities at the beach south of the pier. The model project included the design and development of source identification methods and the implementation of a source identification study. The Sanitation Districts found that the storm drain under the pier is a likely source of high bacteria counts on the beach. The final report was submitted to the Regional Water Board over a year ago, but further actions by the city of Redondo Beach to reduce fecal bacteria, like better managing the runoff, have not gone forward. Water quality results at the Redondo Beach Pier continued to score a B grade during the AB411 period, while year-round dry weather grades improved from an F to a C grade. The Regional Water Board should urge the city to comply with study recommendations, including increased beach grooming under and around the pier and proper discharge pipe maintenance.

Redondo Beach Pier. Photo: Joy Aoki

[T]he storm drain under the [Redondo Beach] pier is a likely source of high bacteria counts on the beach.

Hermosa Beach Pier

The city of Hermosa Beach completed an innovative CBI project with the help of state and ARRA funds. The project included infiltration systems along Pier Avenue and an infiltration trench south of the pier along the Strand. The dry weather runoff that makes it to the pier flows through trash and sediment removal devices and then gets directed to the infiltration trench. The low-tech approach relies on the

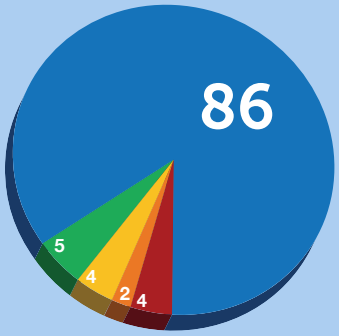
ability of sand to filter and infiltrate, thereby reducing maintenance and energy costs for the project. The project was built to a large enough scale to handle year-round dry weather runoff, but the county has yet to approve the project for use outside the AB411 time period.

Sewage Spill Summary

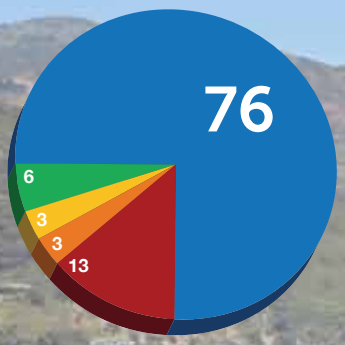
There were five sewage spills to receiving waters in Los Angeles County that resulted in beach closures this past year. The largest spill (~500,000 gallons) was due to debris blockage backup in a main sewer line in Culver City and resulted in a closure of four monitoring locations for two days (Sept. 29-Oct. 1, 2010). A major sewer overflow (~250,000 gallons), due to massive rainfall in Studio City, prompted the closure of nine monitoring locations in Long Beach for approximately nine days in late March 2011.

Another significant sewage spill (~50,000 gallons) in early November 2010, due to a broken sewer line in Burbank, drained into the Los Angeles River and caused the closure of nine monitoring locations from 3rd Place to 72nd Place in Long Beach. Finally, two spills (~300 and ~17,000 gallons) occurred on Catalina Island in August 2010, due to the wastewater treatment plant's pump failure, resulting in closures at Avalon Beach.

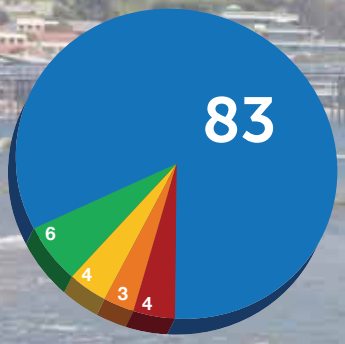
FIGURE 4-10
Percentage of Grades by Time Period for Southern California



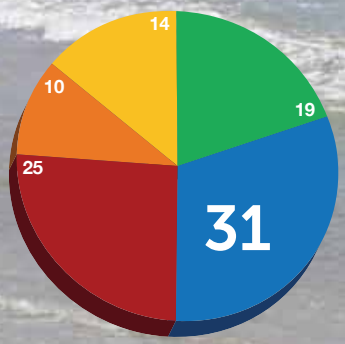
AB411: April-October (77 locations)



WINTER-DRY (72 locations)



DRY WEATHER (72 locations)



WET WEATHER (72 locations)

KEY: A B C D F

Numbers in **BOLD** indicate percentages

Southern California Beaches

Combined grades of

Santa Barbara County
Ventura County
Los Angeles County
Orange County
San Diego County

Ventura County

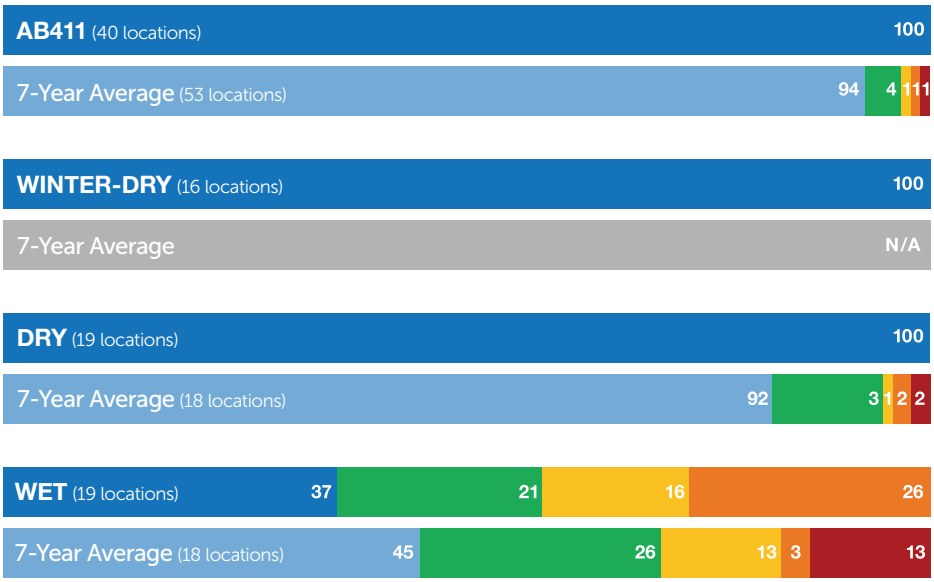
The County of Ventura Environmental Health Division (EHD) monitored 40 locations on a weekly basis from April through October (16 fewer than 2007), from as far upcoast as Rincon Beach (south of Rincon Creek, near the Santa Barbara County line) to a downcoast location at Staircase Beach at the north end of Leo Carrillo State Beach. Most samples were collected weekly between 25 to 50 yards north or south of the mouth of a storm drain or creek. For additional water quality information, visit Ventura County's Environmental Health Division website at http://www.ventura.org/rma/envhealth/programs/tech_serv/ocean.

AB411 2010 water quality at Ventura County beaches was excellent (*see Figure 4-11)*. Of the 40 water quality monitoring sites during summer dry weather (19 sites during year-round dry weather) 100% of the locations received A grades. There were no F grades in Ventura during any of the grading periods. Five locations received D grades during wet weather: Surfer's Point at Seaside, Promenade Park at Figueroa Street, San Buenaventura Beach at San Jon Road, Surfer's Knoll and Channel Islands Harbor Beach Park.

Ventura County's AB411 and year-round dry grades were all better than the previous seven-year averages.

On July 8, 2010, the Regional Water Board adopted a new Ventura County municipal stormwater permit. The permit was groundbreaking for several reasons: it was the first time that such a permit was adopted with all applicable TMDL limits and implementation requirements, and it includes a requirement for weekly year-round monitoring of 10 county beaches near storm drains, creeks and other potential sources of fecal bacteria (in the event that the current monitoring program is cut). Like Los Angeles County in the 1990s, this can serve as an important model for future permit development in ensuring the continuation of beach water quality monitoring, regardless of the status of state and federal funding.

FIGURE 4-11
2010-2011 Ventura County Water Quality and Seven-Year Average 2003-2010 (in percentages)



AB411: April thru October. Numbers in **BOLD** indicate percentages.

KEY: A B C D F

As a Supplemental Environmental Project resulting from a Regional Water Board Administrative Civil Liability Order (ACL) against the city, Ventura will apply $298,500 of the penalties assessed under the ACL to undertake construction of the Oak Street Urban Runoff Diversion Project. Project planning could potentially start as soon as this summer in Ventura. The construction phase will likely not occur until the summer of 2012 at the earliest.

Sewage Spill Summary

There was only one known sewage spill in Ventura County that was reported to Heal the Bay this past year. The spill (~800 gallons) on Jan. 20, 2011 closed Mussel Shoals Beach 100 yards south of the pier area for five days as a result of a valve failure.

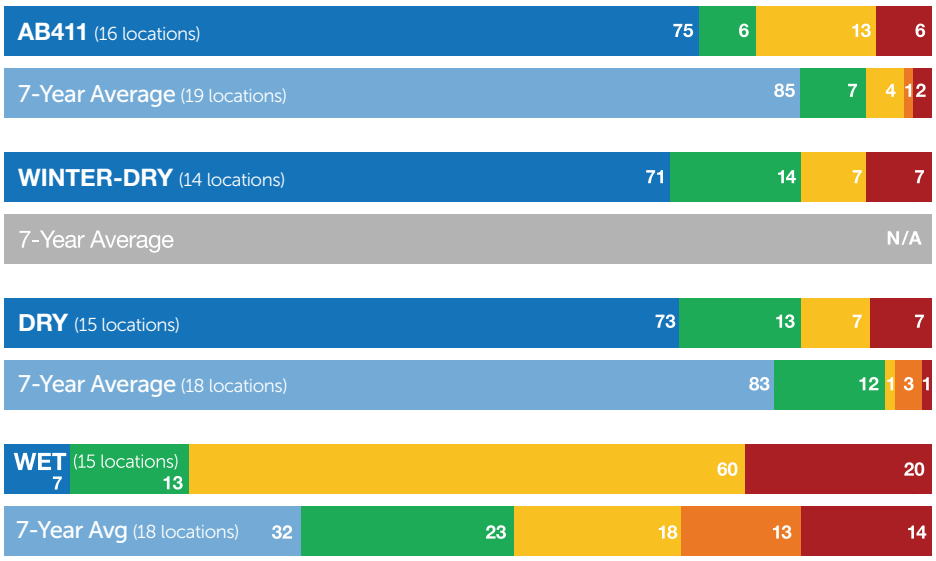
Santa Barbara County

The County of Santa Barbara's Environmental Health Agency monitored 16 locations on a weekly basis from April through October 2010, from as far upcoast as Guadalupe Dunes (south of the Santa Maria River outside the city of Guadalupe) to a downcoast location at Carpinteria State Beach. Most samples were collected 25 yards north or south of the mouth of a storm drain or creek. During the winter months, Santa Barbara Channelkeeper (SBCK) received funding from the county of Santa Barbara to monitor 14 locations (two fewer than last year) each week from as far upcoast as Refugio State Beach downcoast to Rincon. For additional water quality information, visit Santa Barbara Channelkeeper at http://www.sbck.org or Santa Barbara County's Environmental Health Agency website at http://www.sbcphd.org/ehs/ocean.htm.

This was the county's final year of the two-year funding commitment towards the SBCK winter monitoring program. Routine dry weather AB411 monitoring funding is unsecured past the end of 2011.

Summer dry weather water quality in Santa Barbara County was good, with 13 of 16 monitoring locations (81%) receiving A or B grades. Thirteen of 15 (87%) received A or B grades for year-round dry weather. Arroyo Burro Beach had the lowest (F) grade during AB411 and was included on this year's Beach Bummer list. Last year, Gaviota Beach received the worst (C) grade during AB411, which improved this year to an A grade. East Beach at Mission Creek has seen marked improvement during the AB411 time period over the last few years. Last year was the fourth beach season following the completion of a diversion/UV disinfection system designed to treat dry weather flows from the Westside storm drain. East Beach at Mission Creek (F) and Butterfly Beach (C) scored the only fair-to-poor grades in the county for the winter dry weather period.

FIGURE 4-12
2010-11 Santa Barbara County Water Quality and Seven-Year Average 2003-10 (in percentages)



AB411: April thru October. Numbers in **BOLD** indicate percentages. KEY: A B C D F

Two of the three F grades during wet weather were located at East Beach (Mission Creek and Sycamore Creek), with Arroyo Burro Beach also earning an F grade during wet weather. Santa Barbara County's overall wet weather water quality was poor with only three of 15 (20%) beaches receiving A or B grades.

Santa Barbara County's AB411, year-round dry and year-round wet grades were all worse than the previous seven-year averages. Wet weather scores were 35% below the seven-year average.

The county has two ongoing CBI projects: a Laguna Channel Watershed Study and Feasibility Analysis and a Microbial Source Tracking Protocol Development Project. Both projects were stalled due to the state's freeze on funding. Time frame extension requests have been filed with the State Board for both projects. The Laguna Channel project is designed to identify ways to improve water quality coming out of thechannel prior to it mixing with Mission Lagoon. DNA-based source tracking has found signs of human fecal material in the storm drains and additional testing is being conducted. The final recommendation for improving water quality will likely be a UV disinfection facility.

Sewage Spill Summary

There was only one reported sewage spill in Santa Barbara County that led to a precautionary closure. Goleta Beach was closed for two days starting May 12, 2010 as a result of an approximately 800-gallon sewage spill.

San Luis Obispo County

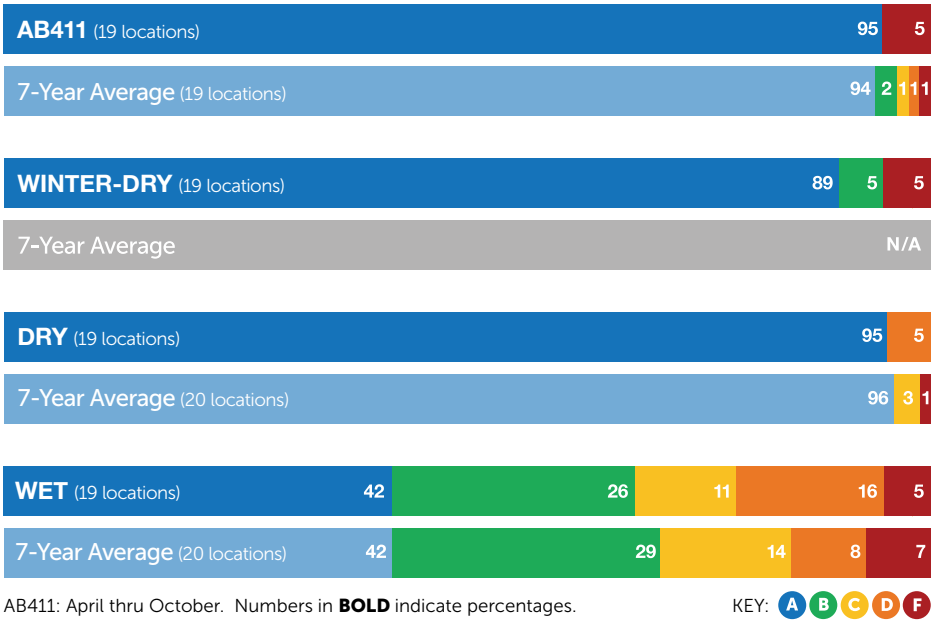
The County of San Luis Obispo's Environmental Health Department monitored 19 locations this year, from as far upcoast as Pico Avenue in San Simeon to a downcoast location at Pismo State Beach at the end of Strand Way. Most samples were collected weekly 25 yards north or south of the mouth of a storm drain or creek. For additional water quality information, visit San Luis Obispo County's Environmental Health Department website at http://www.slocounty.ca.gov/health/publichealth/ehs/beach.htm.

Dry weather water quality in San Luis Obispo County was excellent. All but one of the monitoring locations received A grades *(see Figure 4-13)* for year-round dry weather and the AB411 period. Pismo Beach Pier continues to score the county's lowest grades during dry weather with an F grade during AB411 and a D grade for year-round dry weather. Though the Pismo Beach Pier location is no stranger to the Beach Bummer list, this year it managed to narrowly avoid being one of California's 10 most polluted beaches.

Wet weather water quality in San Luis Obispo County was worse this year than last year with 13 of 19 (68%) beaches receiving A or B grades. This was still well above the state average of 54% A or B grades. Four of 19 (21%) locations monitored received poor grades during wet weather. These monitoring locations were at Avila Beach at San Juan Street (D), Sewers at Silver Shoals Dr. (D), Pismo Beach Pier (F), and Pismo Beach projection of Ocean View (D).

In response to poor water quality at Pismo Beach Pier, a microbial source tracking study funded by the CBI was approved in April 2008, with a final report completed in August 2010. According to the "Pismo Beach Fecal Contamination Source Identification Study" final report, the main source of fecal contamination at the pier was bird droppings. Other sources that were identified at much lower concentrations were human and dog sources. Future recommendations for source abatement include making the underside of the pier inaccessible to roosting and resting birds, increasing public restroom access, covering trash cans, and enforcing stricter dog dropping pickup laws. In the meantime, it is critical that signs are posted at Pismo Creek lagoon to ensure that the public is informed of potential health risks. Heal the Bay looks forward to seeing the implementation of these recommendations and long-overdue water quality improvement at the Pismo Beach Pier.

FIGURE 4-13
2010-11 San Luis Obispo County Water Quality and Seven-Year Average 2003-10 (in percentages)



AB411: April thru October. Numbers in **BOLD** indicate percentages. KEY: A B C D F

Sewage Spill Summary

There were three reported sewage spills in San Luis Obispo County that led to beach closures this past year. All three sewage spills occurred during the strong storms in December 2010, which affected water quality at numerous beaches throughout California. One spill (~50,000 gallons) caused closures at Pismo State Beach for nine days.

Monterey County

The County of Monterey's Environmental Health Agency monitored eight locations on a weekly basis from April through October, from as far upcoast as the Monterey Beach Hotel at Roberts Lake in Seaside to a downcoast location of Carmel City Beach in Carmel by the Sea. For additional water quality information, visit Monterey County's Environmental Health Agency website at http://www.mtyhd.org.

During the summer AB411 time period, five of eight (63%) monitoring locations in Monterey County received an A grade *(see Figure 4-14)*. Lover's Point Park scored the county's lowest grade (D). The five locations that received A grades were Monterey State Beach, San Carlos Beach, Asilomar State Beach, Spanish Bay and Carmel City Beach.

Monterey Beaches were not monitored often enough during the winter to earn year-round grades.

Researchers from Stanford University have tested the water and sand at Lover's Point and found the human bacteroides marker and high bacteria counts in both the storm drain and sand. Because of historic inconsistencies between the Environmental Health Agency data and independent studies, we recommend that the county move their monitoring location to 'point-zero' at the pipe outlet. This will capture data that will give a clearer picture of the water quality at this location. Additionally, starting this summer, researchers from Stanford University will be leading a SIPP source identification study at Lover's Point in hopes of identifying and tracking sources leading to poor beach water quality at this beach.

Monterey State Beach. Photo: Sean O'Flaherty

FIGURE 4-14

2010-2011 Monterey County Water Quality and Seven-Year Average 2003-2010 (in percentages)

AB411: April thru October. Numbers in **BOLD** indicate percentages.

KEY: A B C D F

Sewage Spill Summary

Although there were no reported spills in Monterey County, Monterey Municipal Beach underwent a precautionary closure on July 8, 2010.

Santa Cruz County

This past year, the County of Santa Cruz's Environmental Health Services (EHS) monitored 13 shoreline locations frequently enough to be included in this report (three fewer than last year). The beaches monitored weekly range from Natural Bridges State Beach to Rio Del Mar Beach. Most samples are collected at the wave wash (where runoff meets surf), or 25 yards north or south of the mouth of a storm drain or creek. For additional water quality information, visit the county's Environmental Health Services website at: http://sccounty01.co.santa-cruz.ca.us/eh

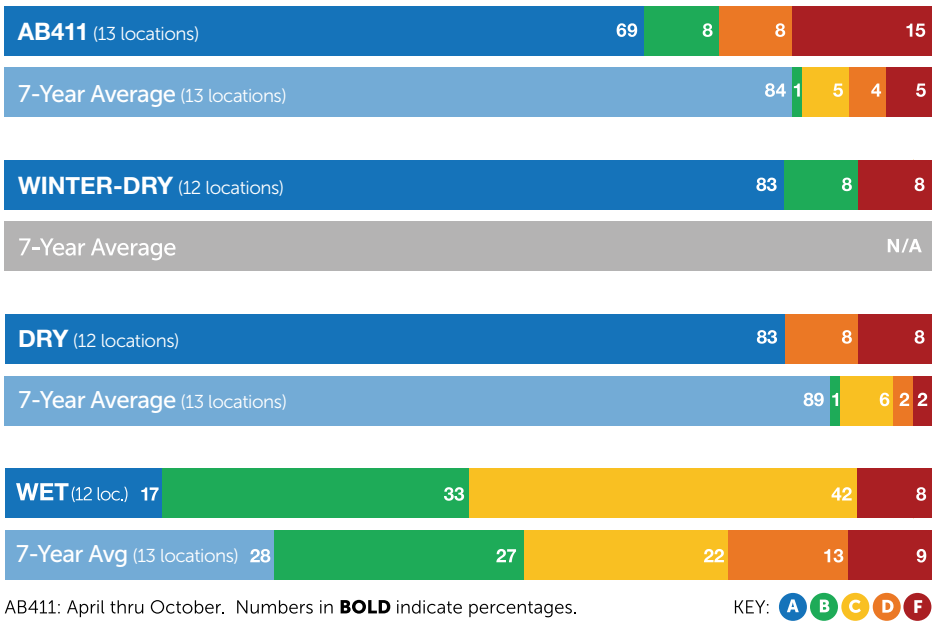
All but three beaches in Santa Cruz County received A or B grades during the summer AB411 time period. Continuing the trend from last year, Capitola Beach west of the jetty scored a poor grade (F) during AB411, along with Cowell Beach at the wharf (F) and Lifeguard Tower 1 (D). Cowell Beach returns to California's Beach Bummer list for the second time, and has been named the most polluted beach in California this year.

Overall, dry weather water quality at beaches in Santa Cruz County was similar to AB411 water quality, with only two locations receiving poor grades: Cowell Beach Lifeguard Tower 1 (D) and Capitola Beach (F). Winter dry weather beach water quality was excellent with all monitoring locations, except Capitola Beach (F), receiving A or B grades. Cowell Beach at the wharf was not monitored year-round.

Santa Cruz County beaches earned 50% A or B grades during wet weather. Although this is a 25% improvement from last year it is still below the state average of 54% A or B grades. Twin Lakes and Seacliff State beaches were the only two locations to score an A grade during wet weather.

A large problem area (five monitoring locations) centered on Cowell Beach wharf presented itself two summers ago (2009). The beach from the west edge of Dream Inn all the way to Main Beach at Lifeguard Tower 2 was affected. As a result, the beach was posted with advisories from May 13, 2009 through the end of October 2009. This is Cowell Beach's second consecutive year on the Beach Bummer list and its first time earning the #1 slot as the beach with the poorest dry-weather water quality in California. On June 3, 2010, Cowell Beach had its first advisory posting lasting three days. Shortly after, on June 24, the beach was re-posted and stayed posted through the end of October (end of AB411).

FIGURE 4-15
2010-2011 Santa Cruz County Water Quality and Seven-Year Average 2003-2010 (in percentages)



AB411: April thru October. Numbers in **BOLD** indicate percentages. KEY: A B C D F

The EHS reported a huge influx of sea lions and kelp at Cowell Beach over the past two years. Although human-specific bacteria have been found in the sand and water at Cowell Beach in the past, no human specific bacteria has been found this year. Starting this summer, researchers from Stanford University will be leading a SIPP source identification study at Cowell Beach in hopes of tracking sources possibly leading to poor beach water quality at this location.

Sewage Spill Summary

About 200 gallons of sewage spilled onto Sunny Cove beach after a sewer line was ruptured on April 1, 2010. Signs were posted around the spill and samples were taken from the ocean. Low sample results indicated that the spill most likely did not impact the ocean.

San Mateo County

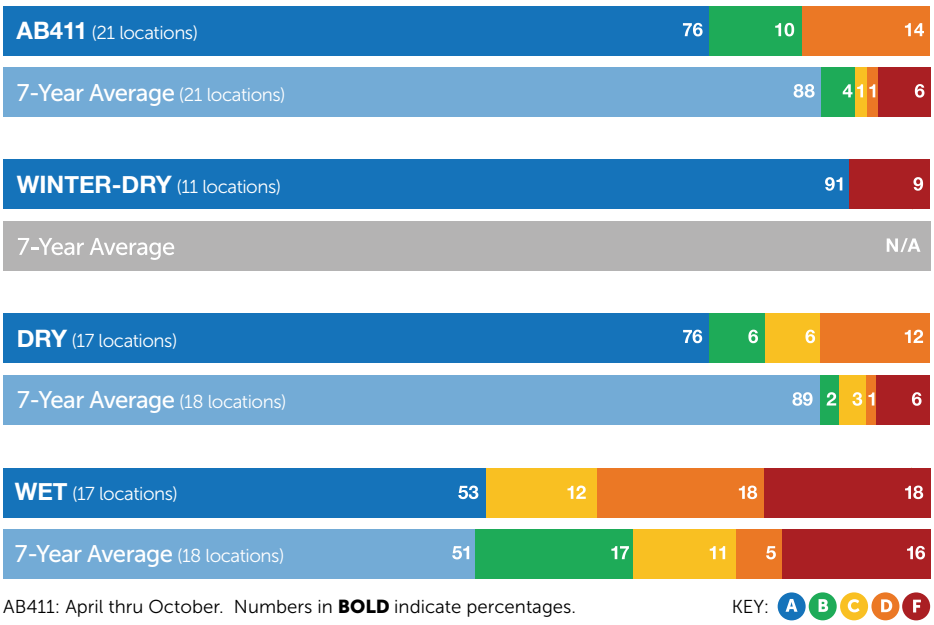
The County of San Mateo Environmental Health Department regularly monitored 21 ocean and bayside locations (one more than last year) on a weekly basis during the summer months, from as far upcoast as Rockaway Beach at Calera Creek to a downcoast location of Gazos Beach at Gazos Creek. Seventeen of these locations were monitored frequently enough year-round to earn grades for all time periods. Samples were collected at a distance of 25 yards north or south of the mouth of a storm drain or creek. For additional water quality information, visit San Mateo County's website at http://www.co.sanmateo.ca.us.

San Mateo beaches had good summer dry weather water quality this past year *(see Figure 4-16)*. Eighteen of the 21 (86%) beach monitoring locations received A or B grades. Venice Beach at Frenchman's Creek (A+) has exhibited excellence for the fifth year in a row during dry weather. The county's only poor grades during summer dry weather were found at Aquatic Park (D), Lakeshore Park behind the Recreation Center (D), and Pillar Point Harbor at the end of Westpoint Ave. (D).

Wet weather water quality in San Mateo, though slightly better than last year, was poor overall and below the state average. 53% of beaches received A or B grades during wet weather.

FIGURE 4-16

2010-11 San Mateo County Water Quality and Seven-Year Average 2003-10 (in percentages)



AB411: April thru October. Numbers in **BOLD** indicate percentages.

KEY: A B C D F

Sewage Spill Summary

Aquatic Park, Lakeshore Park, Rockaway Beach and Linda Mar Beach at San Pedro Creek were affected by sewage overflows (~150,250 gallons) due to heavy rainfall volumes and underwent closures starting Dec. 19, 2010 and lasted between two and 30 days.

Aquatic Park and Lakeshore Park also experienced beach closures (March 24-29, 2011) due to an undetermined volume of sewage from a sanitary sewer overflow.

San Francisco County

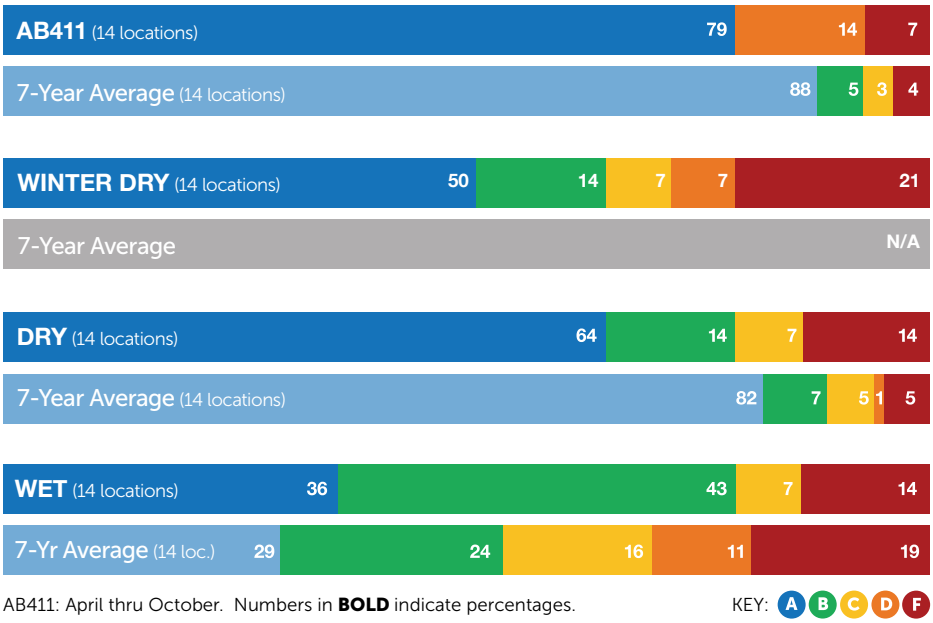
The County of San Francisco, in partnership with the San Francisco Public Utilities Commission, continued its weekly monitoring program for ocean and bay shoreline locations. The monitoring program is funded in part through an Environmental Protection Agency BEACH grant program. The county monitored 14 locations on a weekly basis year-round, from Aquatic Park Beach (Hyde Street Pier) to Ocean Beach at Sloat Blvd., and three sites at Candlestick Point. For additional water quality information please visit the San Francisco Public Utilities Commission website at http://beaches.sfwater.org

San Francisco's overall water quality grades for the AB411 time period dropped from the previous year, with 11 of 14 (79%) monitoring locations receiving A or B grades (from 93% in 2009). The three beaches that received poor water quality grades during AB411 were Baker Beach at Lobos Creek (F), Candlestick Point at Windsurfer Circle (D) and Sunnydale Cove (D).

Year-round dry weather water quality at San Francisco County beaches this past year was fair with 11 of 14 locations receiving A or B grades *(see Figure 4-17)*. Windsurfer Circle at Candlestick Point and Baker Beach at Lobos Creek were the only two locations to receive an F grade during year-round dry weather. Poor water quality at Baker Beach at Lobos Creek this past year has earned it a slot on our Beach Bummer list of the 10 most polluted beaches in California for the second year in a row.

Wet weather water quality at San Francisco County monitoring sites was markedly better than 2009-2010 with 11 out of 14 (79%) locations receiving A or B grades (up from 50% in 2009). This is well above the state average of 54% A or B grades during wet weather. Wet weather water quality grades were also well above the seven-year average San Francisco County.

FIGURE 4-17
2010-11 San Francisco County Water Quality and Seven-Year Average 2003-10 (in percentages)



AB411: April thru October. Numbers in **BOLD** indicate percentages. KEY: A B C D F

Sewage Spill Summary

This year a total of seven CSDs occurred in San Francisco County, with the majority due to heavy rainfall volumes this past December. *(See sidebar on the next page for details).*

Background information on the

San Francisco Public Utilities Commission

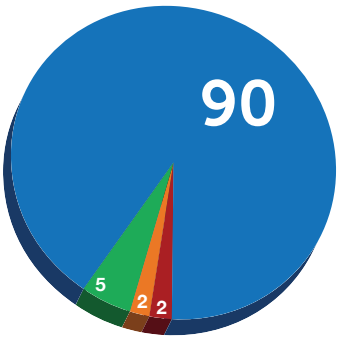
The city and county of San Francisco have a unique storm water infrastructure that occurs in no other California coastal county – a combined sewer and storm drain system (CSS). This system provides treatment to most of San Francisco's stormwater flows. All street runoff during dry weather receives full secondary treatment and all storm flow receives at least the wet weather equivalent of primary treatment, while most storm flows receive full secondary treatment before being discharged through a designated outfall.

During heavy rain events, the CSS can discharge combined treated urban runoff and sewage waste water, typically comprised of 94% treated stormwater and 6% treated sanitary flow. In an effort to reduce the number of combined sewer discharges (CSDs), San Francisco has built a system of underground storage, transport and treatment boxes to handle major rain events. CSDs are legally, quantitatively and qualitatively distinct from raw sewage spills that occur in communities with separate sewers.

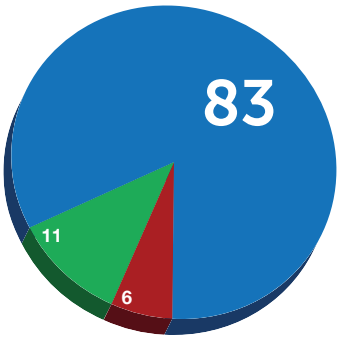
In addition to most CSS stormwater discharges being treated, they are also of much shorter duration and lower volume than discharges in communities with separate storm drain systems. Because of the CSS, San Francisco's ocean shoreline has no flowing storm drains in dry weather throughout the year, and therefore is not subject to AB411 monitoring requirements. However, the city does have a year-round program that monitors beaches each week. Although most of San Francisco is served by the CSS, there are some areas of federally owned land and areas operated by the Port of San Francisco that have separate storm drains.

FIGURES 4-18 and 4-19
Percentage of Grades by Time Period for San Francisco Bay Area
(incl. San Francisco, Contra Costa, Alameda, Marin and San Mateo counties)

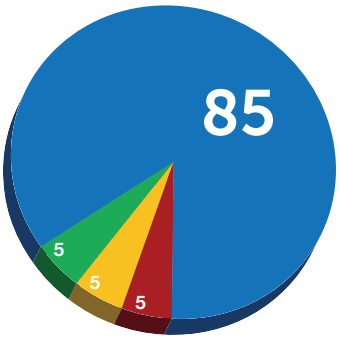
GREATER BAY AREA: OCEAN SIDE



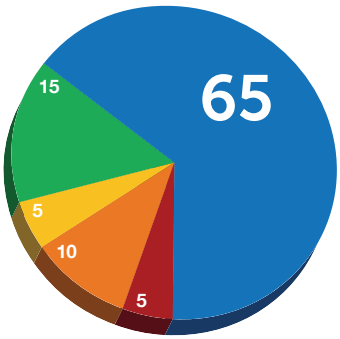
AB411: April-October (42 locations)



WINTER-DRY (18 locations)

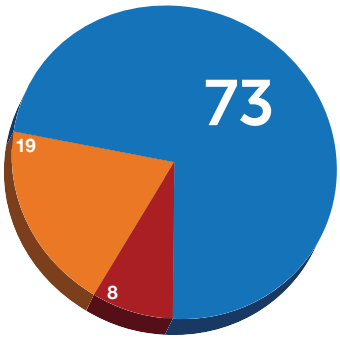


DRY WEATHER (20 locations)

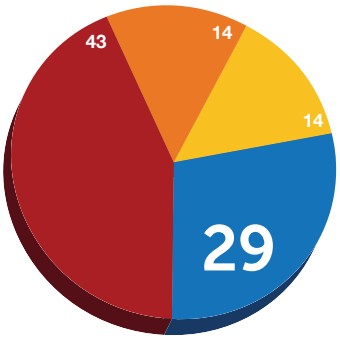


WET WEATHER (20 locations)

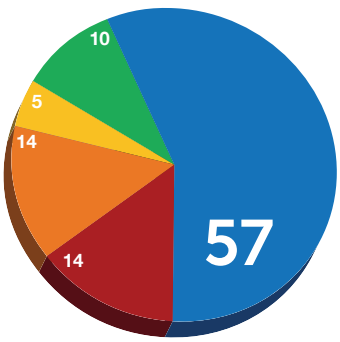
GREATER BAY AREA: BAY SIDE



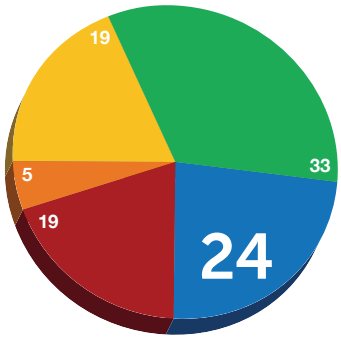
AB411: April-October (26 locations)



WINTER-DRY (7 locations)



DRY WEATHER (21 locations)



WET WEATHER (21 locations)

KEY: A B C D F
Numbers in **BOLD** indicate percentages

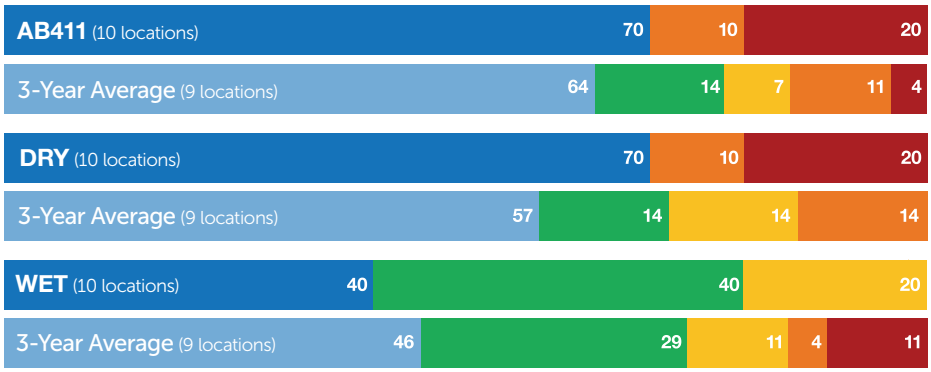
East Bay Beaches: Contra Costa and Alameda Counties

The East Bay Regional Park District consistently monitored 10 shoreline locations again this year, including three in Contra Costa County and seven in Alameda County. Samples were collected weekly during AB411 and at least twice a month throughout the winter. For more information, please visit http://www.ebparks.org.

All seven monitoring locations in Alameda County scored excellent (A or A+) water quality grades for both dry-weather time periods. All three locations at Keller Beach in Contra Costa displayed poor water quality again during both summer and year-round dry weather mostly due to geometric mean exceedances of the state standard for total coliforms. The East Bay Regional Park District attributes these exceedances to dense aquatic vegetation in the swim area.

Wet weather grades for monitoring locations in both Contra Costa and Alameda counties were very good and well above the state average. 80% of locations received either an A or B grade during year-round wet weather. The only two monitoring locations that earned lower grades during wet weather were Alameda Point North (C) and Crown Beach Bird Sanctuary (C).

FIG. 4-20: 2010-11 East Bay Co. Water Quality and Three-Year Average 2007-10 (in percentages)



AB411: April thru October. Numbers in **BOLD** indicate percentages. KEY: A B C D F

Sewage Spill Summary

There were no reported sewage spills in Contra Costa County or Alameda County that led to beach closures this past year.

Marin County

Marin County's water quality monitoring program gathered data from 23 bayside and oceanside monitoring locations. Ocean locations included Dillon, Bolinas (Wharf Road), Stinson, Muir, Rodeo and Baker beaches. These locations were monitored on a weekly basis from April through October. There was little or no monitoring during the winter months. For additional water quality information, visit Marin County's Department of Environmental Health website at http://www.co.marin.ca.us/ehs.

Water quality was excellent at all beach monitoring locations in Marin County *(see Figure 4-21)*. All locations in Marin County received A or A+ grades for the AB411 time period. There was an insufficient amount of non-AB411 dry weather and wet weather data for further analysis.

FIG. 4-21: 2010-11 Marin County Water Quality and Seven-Year Average 2003-10 (in percentages)

AB411: April thru October. Numbers in **BOLD** indicate percentages. KEY: A B C D F

Sewage Spill Summary

There were no sewage spills that led to beach closures this past year.

Sonoma County

This year, the County of Sonoma Environmental Health Division sampled only one monitoring location frequently enough (at least once a week) to be included in this report. Last year, Sonoma monitored seven locations weekly. This year, due to budget-cuts and the uncertainty of sustainable funding for the program, no locations were monitored year-round. For additional water quality information, visit Sonoma County's Department of Environmental Health website at: http://www.sonoma-county.org/health/eh/ocean_testing.htm.

Campbell Cove, which received an A grade, was the only location monitored frequently enough during the summer dry (AB411) period to receive a grade. This was the second consecutive year that Campbell Cove received excellent water quality grades; not suffering from historical late summer water quality problems.

FIG. 4-22: 2010-11 Sonoma County Water Quality and Seven-Year Average 2003-10 (in percentages)

AB411: April thru October. Numbers in **BOLD** indicate percentages. KEY: A B C D F

More on Campbell Cove can be found in the report entitled "The Bodega Bay-Campbell Cove Tidal Circulation Study, Water Quality Testing, and Source Abatement Measures Project". This report can be found on Sonoma County's Environmental Health Department's website.

There was an insufficient amount of non-AB411 dry weather and wet weather data for further analysis.

Sewage Spill Summary

There were no reported sewage spills in that led to beach closures.

Mendocino County

This past year, Mendocino County consistently monitored five locations during the AB411 time period: MacKerricher Beach State Park at Mill Creek and Virgin Creek, Pudding Creek ocean outlet, Big River near Pacific Coast Highway, and Van Damme State Park at the Little River.

All five beaches received an A+ grade for the AB411 time period. The Environmental Health Department, with assistance from the Mendocino County Chapter of the Surfrider Foundation, monitored sampling locations from April through October.

Mendocino County locations were not monitored year-round.

FIG. 4-23: 2010-11 Mendocino Co. Water Quality and Seven-Year Average 2003-10 (in percentages)

AB411: April thru October. Numbers in **BOLD** indicate percentages. KEY: A B C D F

Sewage Spill Summary

There was one reported "unknown substance" spill in Mendocino County that led to a precautionary beach closure at Casper Beach by Caspar Creek (Oct. 21-26, 2010). The spill volume and substance were undetermined.

Humboldt County

In an effort to proactively protect public health, the Humboldt County Division of Environmental Health (DEH) moved their monitoring locations to "point-zero" in 2006. Six locations were sampled in the mixing zone on a weekly basis from April through October. The monitoring program is funded by the Environmental Protection Agency's National BEACH Program. For additional water quality information, please visit Humboldt County's Department of Environmental Health website at www.co.humboldt.ca.us/health/envhealth/beachinfo.

This was the first year since its inclusion in this report that Humboldt County did not monitor beaches year-round. AB411 dry weather water quality in Humboldt was excellent again this year, with all beaches scoring A grades.

FIG. 4-24: 2010-11 Humboldt Co. Water Quality and Seven-Year Average 2003-10 (in percentages)

AB411: April thru October. Numbers in **BOLD** indicate percentages. KEY: A B C D F

There was an insufficient amount of non-AB411 dry weather and wet weather data for further analysis.

Sewage Spill Summary

There were no reported sewage spills that led to beach closures.

Del Norte County

Historically, monitoring in Del Norte County was conducted in the Crescent City area at Pebble Beach, Crescent City Harbor, and Crescent Beach. Despite our best efforts, Heal the Bay has been unable to obtain any data to include in this report.

Sewage Spill Summary

The county did not provide Heal the Bay with a summary of beach closures due to sewage spills.

NEW Beach Report Card for 2011: Oregon

Heal the Bay's Beach Report Card presents coastal water quality monitoring grades for all coastal monitoring locations, meeting grading criteria (at least weekly monitoring), throughout the State of Oregon. Oregon's beach monitoring program is administered by the Department of Human Services (DHS) and is implemented in close conjunction with the Department of Environmental Quality (DEQ) and the Oregon Parks and Recreation Department (OPRD). Most grades are updated weekly throughout Oregon's summer swimming season (Memorial Day through Labor Day) and can be viewed online at www.beachreportcard.org. Look for new weekly beach water quality grades in June.

On this page is a brief summary of Oregon's monitoring program and BRC grades throughout the summer of 2010. For more information regarding Oregon's beach water quality and beach program, please visit http://public.health.oregon.gov/HealthyEnvironments/Recreation/BeachWaterQuality/Pages/index.aspx.

Beach monitoring and public notification funded fully by the U.S. Environmental Protection Agency (EPA) under the federal BEACH Act began in Oregon in 2003. During the summer months, beach water is monitored weekly, bi-weekly or monthly, based on the priority ranking of the beach. Beach priority is based on beach use, pollution hazards, stakeholder input or previous monitoring results. During the winter months, beach water is sampled every two weeks at beaches with high winter water recreation. Unfortunately, the majority of Oregon's winter monitoring frequencies and summer season frequencies do not meet the Beach Report Card's grading criteria (at least weekly), thus leaving out some beaches with known pollution concerns.

Oregon monitors beach water quality using a single fecal indicator bacteria (Enterococcus), which differs from California's three indicator bacteria monitoring (total coliform, fecal coliform and Enterococcus) protocol. In order to account for Oregon's simpler beach monitoring program, we have created a new modified methodology, specifically for a single indicator. *(See Appendix A2.)*

FIGURE 4-25
2010 Summer Oregon Water Quality, Overall (in percentages)

FIGURE 4-26
2010 Summer Oregon Water Quality Grades by County (in percentages)

Numbers in **BOLD** indicate percentages

KEY: A B C D F

For Oregon's first Beach Report Card, the state exhibited excellent water quality, earning all A grades during the summer of 2010. However, even though Oregon monitored more than 60 locations throughout the state this past summer, only 13 (22%) of these locations were monitored frequently enough (at least once a week) to receive a grade in this report. Heal the Bay looks forward to working with Oregon agencies to increase the number of monitoring locations covered by the Beach Report Card in order to maximize public health protection.

NEW Beach Report Card for 2011: Washington

Heal the Bay's Beach Report Card presents water quality grades for all coastal monitoring locations meeting grading criteria (at least weekly monitoring) throughout the state of Washington. The beach monitoring program is administered jointly by the Washington State Departments of Ecology and Health and consists of efforts from county and local agencies, tribal nations and volunteers. Most grades are updated weekly throughout Washington's summer swimming season (Memorial Day through Labor Day) and can be viewed online at www.beachreportcard.org. Look for new weekly grades in June.

On this page is a brief summary of Washington's monitoring program and grades throughout the summer of 2010. Additional information regarding Washington's beach water quality and beach program can be found at http://www.ecy.wa.gov/programs/eap/beach.

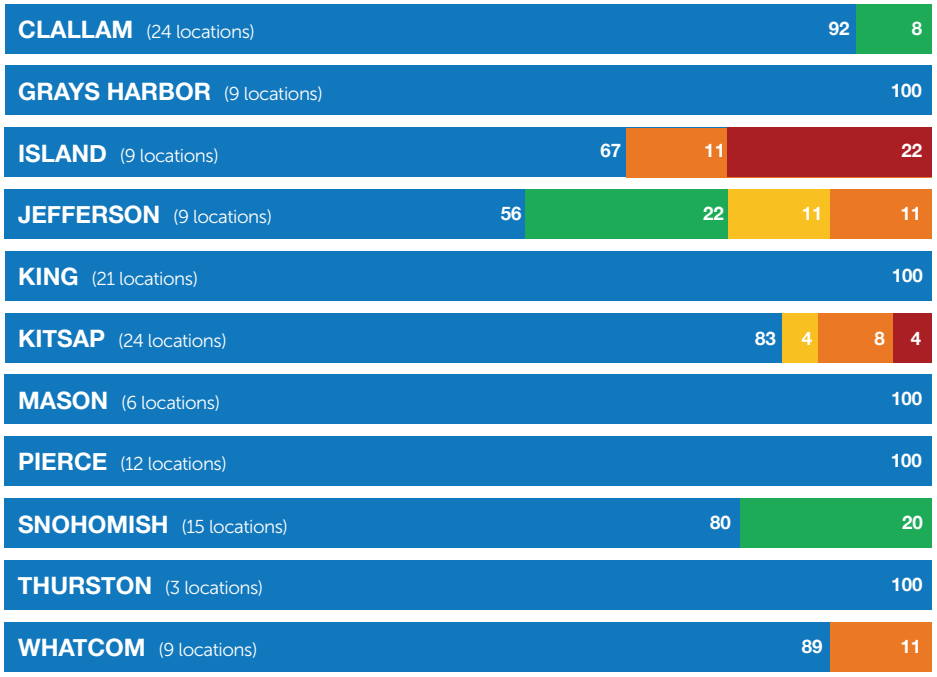
Washington's BEACH program is a state administered and locally implemented program funded fully under the federal BEACH Act. The program is designed to monitor Washington's popular marine swimming locations for fecal contamination, as well as inform the public when an increased risk of illness is identified. One hundred-twenty priority locations, designated as high use and/or high risk, were identified for the summer swimming season in 2010. Due to limited funding, only 49 of these locations were monitored in 2010, which was a decrease from 73 monitored in 2009. Washington monitors water quality using Enterococcus bacteria, which differs from California's three indicator bacteria monitoring protocol. Washington's simpler methodology can be found in Appendix A2.

The state of Washington makes a very strong Annual Beach Report Card debut by earning 93% A and B grades during the summer of 2010. Ten out of 49 monitoring locations received fair to poor water quality grades with only three of these locations (all located in Puget Sound) receiving F grades: Oak Harbor City Beach Park west, Freeland County Park Holmes Harbor east, and Pomeroy Park's Manchester Beach north. Fair to poor beach water quality grades were seen at the following locations: Birch Bay County Park south (C) and Point Whitney Tidelands west (C), Freeland County Park Holmes Harbor west (D), Herb Beck Marina mid (D), Silverlake County Park mid (D), Eagle Harbor Waterfront Park mid (D), Birch Bay County Park south (D), Oak Harbor City Beach Park west (F), Freeland County Park Holmes Harbor east (F), and Pomeroy Park-Manchester Beach south (F).

Heal the Bay looks forward to working with Washington to highlight and address issues at those monitoring locations that demonstrate poor water quality.

FIGURE 4-27
2010 Summer Washington State Water Quality, Overall (in percentages)

FIGURE 4-28
2010 Summer Washington Water Quality Grades by County (in percentages)



Numbers in **BOLD** indicate percentages

KEY: A B C D F

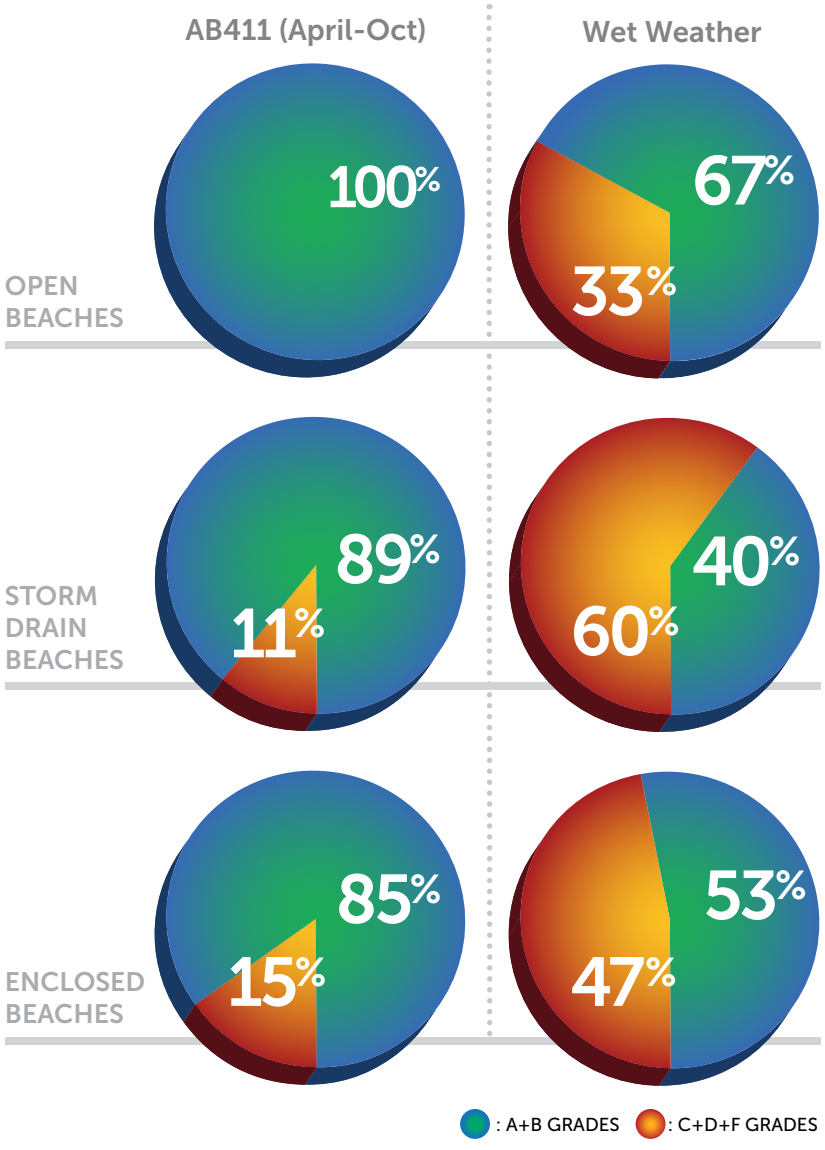
[A] swimmer has a nearly 100% chance of finding excellent water quality at an open ocean beach with no known pollution source during dry weather. At enclosed beaches and those affected by storm drains, the chance of swimming in excellent water quality drops dramatically.

Playa del Rey. Photo: Anthony Barbatto

Beach Types and Water Quality

Southern California data (Santa Barbara to San Diego counties) was analyzed to determine differences in water quality based on beach type. Most Southern California beaches were divided into three categories: open ocean beaches, beaches adjacent to a creek, river, or storm drain (natural or concrete), and beaches located within enclosed water bodies.

FIGURE 5-1: "GOOD" AND "POOR" GRADES BY TYPE



The grades were analyzed for all four time periods: summer dry season (the months covered under California's AB411: April–October), winter dry weather (November 2010–March 2011), year-round dry weather, and year-round wet weather conditions. Figures 5-4 through 5-6 illustrate the grades by percentage during AB411, winter dry, and year-round conditions.

This comparison clearly demonstrates that water quality at open ocean beaches is far superior to water quality at enclosed and storm drain impacted beaches. In essence, a swimmer has a nearly 100% chance of finding excellent water quality at an open ocean beach with no known pollution source during dry weather *(see Figure 5-1)*.

Most of California's beaches are very clean during dry weather. The results show that natural sources like wildlife and beach wrack are not causing poor water quality at open beaches – by far the most prevalent type of beach in Southern California. However, this does not mean that wildlife and beach wrack do not contribute to high bacteria densities in areas with greater anthropogenic influences, like storm drain impacted beaches and enclosed beaches. At enclosed beaches and those affected by storm drains, the chance of swimming in

excellent water quality drops dramatically (to 82% and 86% respectively). These differences are similarly telling during wet weather: There are 43% A grades at open ocean beaches, compared to 26% for enclosed beaches and 24% for storm drain impacted beaches). These results are similar to what has been found in previous years, and demonstrate why routine monitoring is far more critical at enclosed beaches and at storm drain- and stream- impacted beaches.

Heal the Bay always recommends swimming at least 100 yards on either side of flowing storm drains and avoiding these beaches altogether within 72 hours of a rain event. Although enclosed beaches and storm drain- or creek-formed ponds on the beach appear safe and inviting to children, parents should research water quality conditions carefully before allowing their children to swim at these beaches.

"Good" and "Poor" Grades

Percentage of Grades by Beach Type, Time Period and Weather for 2010-2011

FIGURE 5-2: GOOD GRADES – COMBINED "A" AND "B" GRADES

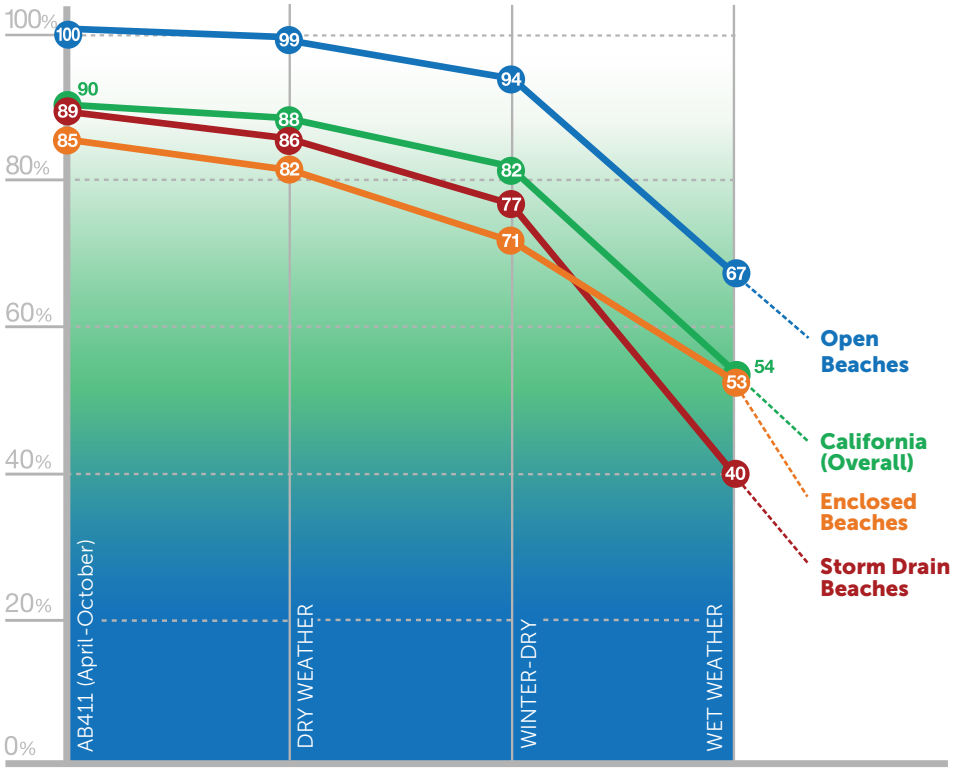
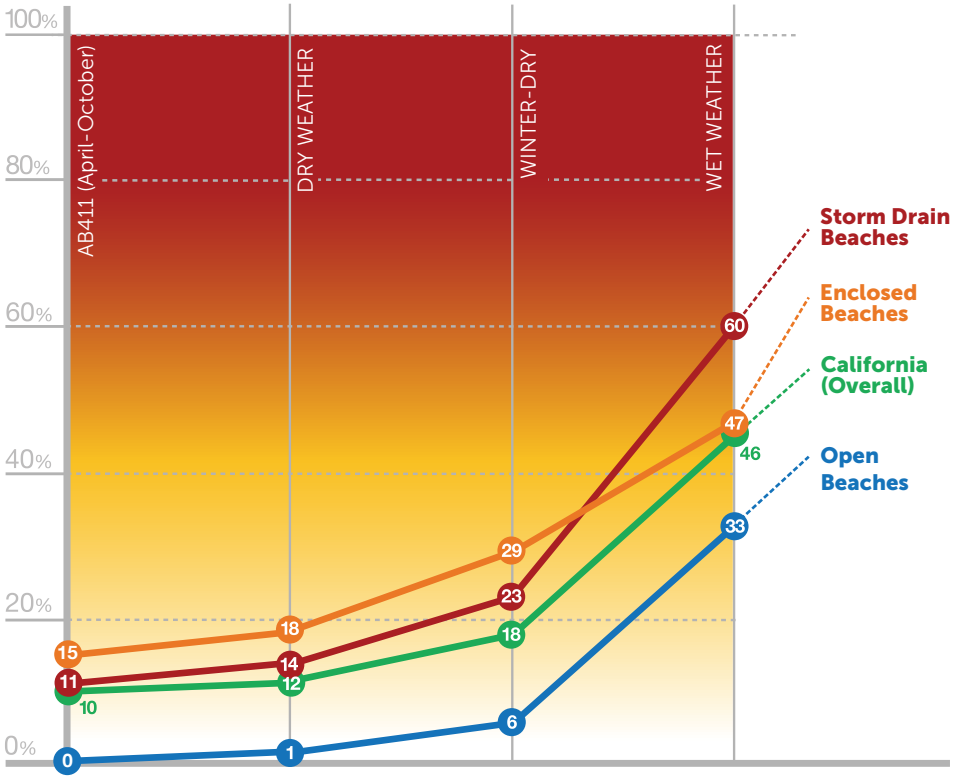


FIGURE 5-3: POOR GRADES – COMBINED "C", "D" AND "F" GRADES



Beach Pollution Patterns

Percentage of Grades by Beach Type, Time Period and Seven-Year Average

FIGURE 5-4: OPEN BEACHES

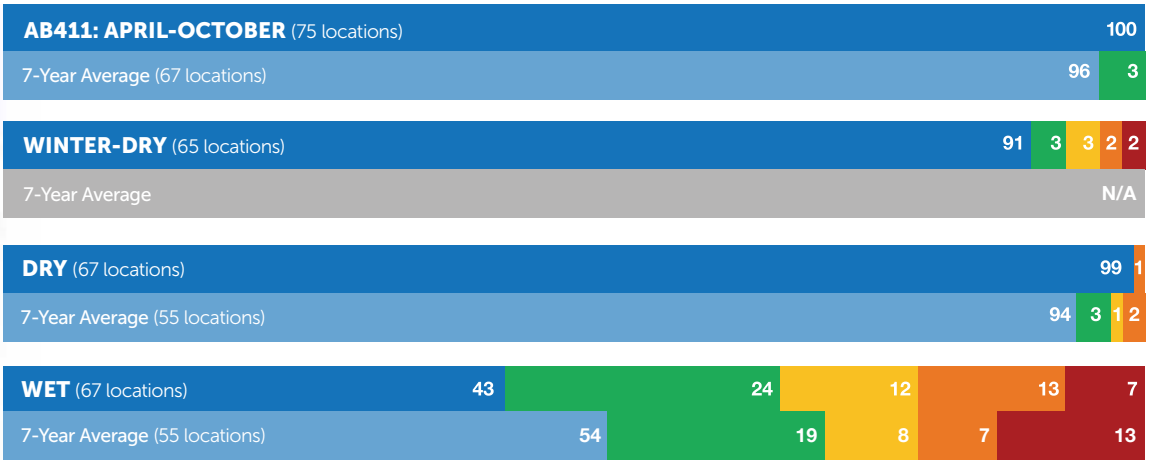


FIGURE 5-5: STORM DRAIN BEACHES

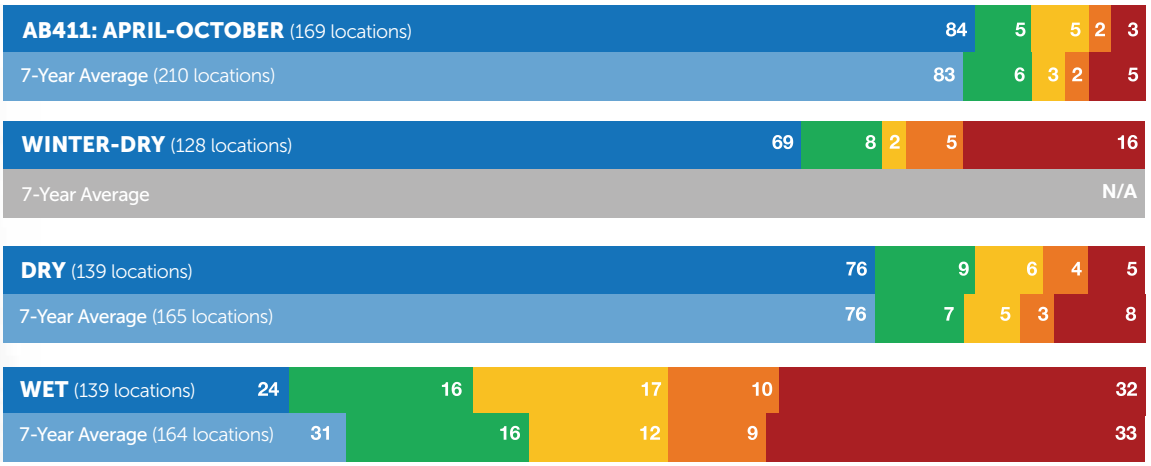
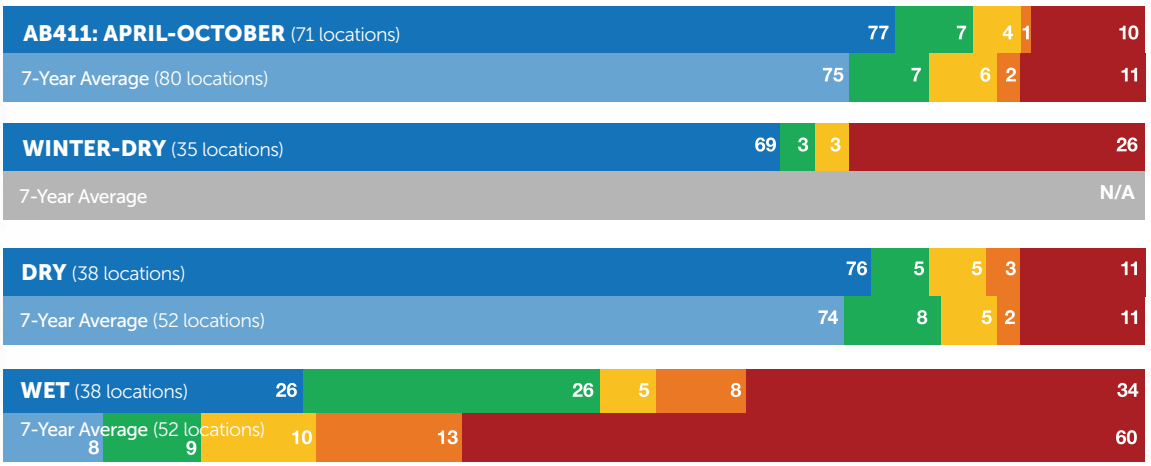
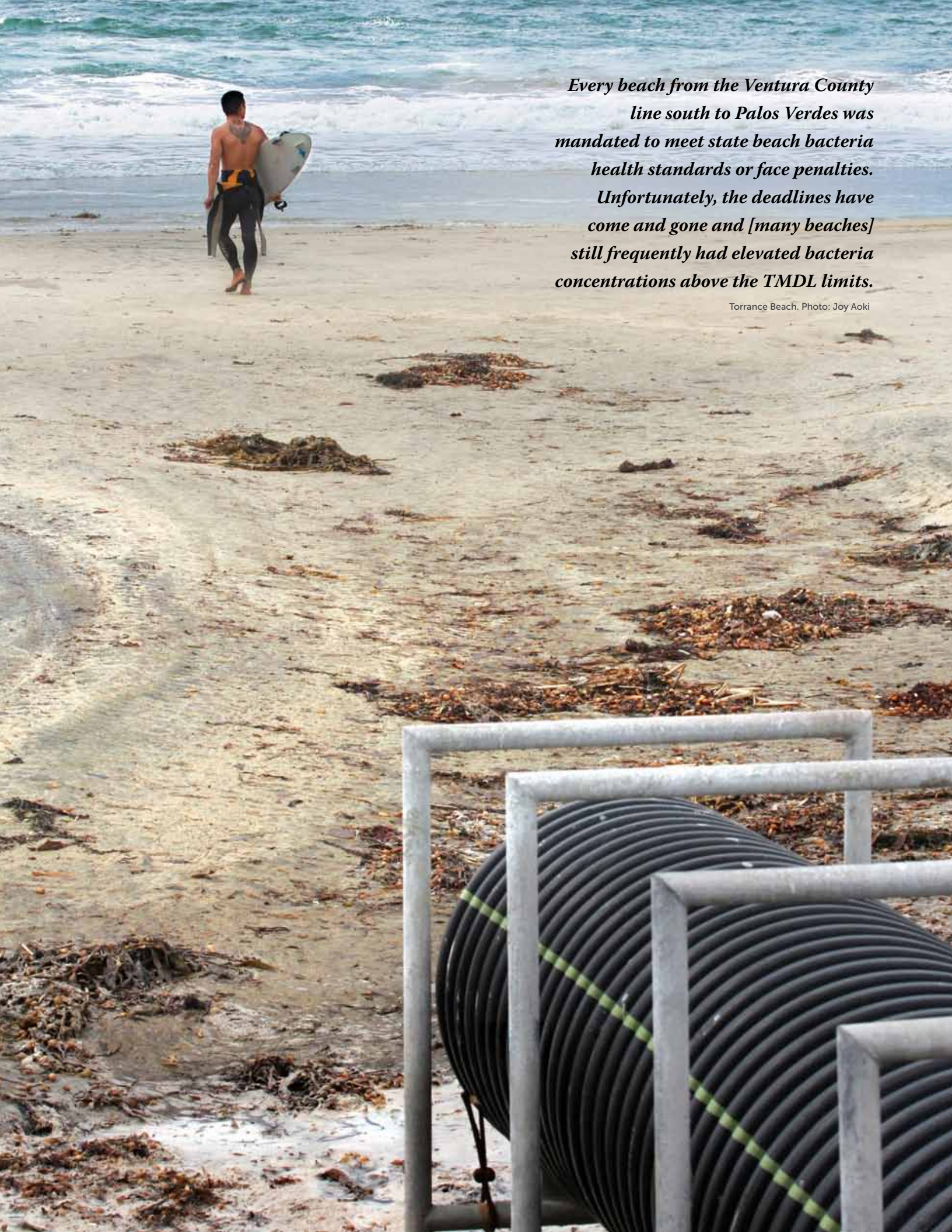


FIGURE 5-6: ENCLOSED BEACHES



Numbers indicate percentages. Percentages may not add up to 100 due to rounding.

KEY: A B C D E



Every beach from the Ventura County line south to Palos Verdes was mandated to meet state beach bacteria health standards or face penalties. Unfortunately, the deadlines have come and gone and [many beaches] still frequently had elevated bacteria concentrations above the TMDL limits.

Torrance Beach. Photo: Joy Aoki

Major Beach News

- Swimmer Health Effects Study
- Clean Beach Initiative
- Beaches Environmental Assessment and Coastal Health Act Update
- Santa Monica Bay Total Maximum Daily Loads
- Los Angeles River and Santa Clara River Total Maximum Daily Loads
- Ventura County Total Maximum Daily Loads
- San Diego County Total Maximum Daily Loads

Swimmer Health Effects Study

In 2007, Heal the Bay joined the Southern California Coastal Water Research Project (SCCWRP), UC Berkeley, the Orange County Sanitation District, the U.S. EPA and others for a three-year, $4.5 million health effects study on swimmers at contaminated beaches. The study, funded by the state of California, National Institute of Health, National Oceanic and Atmospheric Administration, U.S. EPA, and the city of Dana Point, has focused on three chronically polluted beaches: Doheny Beach in Dana Point, Avalon Beach on Catalina Island and Malibu's Surfrider Beach. All of these beaches have frequently been on Heal the Bay's annual list of Beach Bummers.

This is the most comprehensive health effects study of ocean users ever undertaken in terms of the number of microbes that were analyzed. More than 40 analytical techniques were used to analyze beach water for more than 20 different microbes. Most of these microbes have never been used before in a health effects study. Researchers from around the country analyzed samples from water at Doheny, Avalon and Surfrider beaches. Study team members at each location screened and interviewed beachgoers, and then followed up with a health survey 10-14 days later. After all data were collected, exposures (water contact and indicator levels) were compared to the frequency of adverse symptoms through appropriate health surveys. The field study has been finalized but data analysis and interpretation are still being completed. The Doheny study should be finalized and publicly released in the next few months, with the Avalon and Surfrider studies coming out about six months later.

As the EPA's deadline for a rapid method recommendation quickly approaches, traditional and rapid method results were compared for consistency. Traditional methods (18-24 hours for results) are currently used to predict tomorrow's health risk for beachgoers. At Doheny, both the traditional and rapid methods resulted in equivalent relationships to health outcomes: those swimmers with greater exposure due to behavior (immersed head or swallowing water) or high bacteria densities (when the San Juan Creek berm was open) were far more likely to become ill with stomach flu.

The potential ramifications of this study could be enormous, as the EPA is currently developing new national beach water quality criteria due in 2012. The results of this study could have a tremendous influence on the development of national criteria that will drive beach water quality monitoring, health warnings, discharge permit limits, water quality assessments for impaired waters and TMDLs for decades to come.

Even though the EPA's water quality criteria deadline is quickly approaching, the agency is not giving strong clues as to the direction in which it is heading. A draft of the new criteria is scheduled to be released in June for a BEACH Act workshop in New Orleans on June 14-15. In addition, the EPA recently finished analyses on two epidemiological studies this year: one in South Carolina and one in Puerto Rico. The South Carolina study was the EPA's first large-scale epidemiology study on swimmers in runoff-polluted waters. The Puerto Rico study was the first EPA tropical waters health effects study ever performed. Both beaches had unusually clean water quality during the course of the study, despite the fact that both beaches had a history of chronically high fecal indicator bacteria densities. Water quality was so good during the course of the study (no samples exceeded the single sample Enterococcus criterion of 104 colony forming units per 100 milliliters) that no association was found between water quality and the incidence of illness among swimmers.

The results of [the Swimmers Health Effects] study could have a tremendous influence on the development of national criteria that will drive beach water quality monitoring, health warnings, discharge permit limits, water quality assessments for impaired waters and TMDLs for decades to come.

This is not Heal the Bay's first involvement with a critical health effects study. We participated in the 1995 Santa Monica Bay Restoration Commission epidemiology study led by Dr. Robert Haile at USC, which found that one out of every 25 people who swam in front of a flowing storm drain contracted stomach flu or an upper respiratory infection. This new study followed a similar design, comparing the health risks of swimming in polluted water near a fecal bacteria source (creek or storm drain) versus swimming at a clean beach nearby.

Rapid methods pilot study

In July 2010, the SCCWRP, Orange County Department of Health Services, Orange County Sanitation Districts and other agencies initiated a pilot beach monitoring study using rapid Enterococcus methods. One of the primary goals of the study was to test if rapid methods were ready for everyday use to protect public health. Ideally, results from sample analysis will be obtained in as little as two to three hours instead of the typical 18-24 hours that it takes for standard culture-based methods.

Samples were collected in the early morning (five days a week) and then taken to a lab to perform rapid Enterococcus measurement techniques. These results were relayed to the health department for health risk management decisions. In addition, health warning notifications were electronically updated to display water quality conditions through permanently installed LED monitors at each beach location. The goal was to display real-time water quality results to the beach monitors (ideally before noon) for increased public health protection.

The successful study took place from July 6, 2010 to August 31, 2010 at nine locations (impacted by non-point sources of fecal contamination) in Orange County, including three locations at Doheny Beach and three at Huntington Beach. Three separate microbiology labs participated in the project to represent a broad range of experience levels and simulate real-life technology transfer. The Orange County environmental group Miocean assisted county public health officials in posting water quality information on the LED beach screens at Doheny and Huntington beaches as soon as the data was available. Additional methods of communicating results to the public included posting results on the health department's website and tweeting to subscribers via Twitter.

The [pilot beach monitoring] demonstration project showed that the use of rapid methods is feasible and samples can be collected in the early morning with results posted before noon.

This demonstration project showed that the use of rapid methods is feasible and samples can be collected in the early morning with results posted before noon. Some of the greatest obstacles are logistics and cost. Rapid methods are unlikely to be performed at all beaches

initially. For example, using rapid methods would be a waste of resources at an open ocean beach because they are nearly always clean. There were some interference issues from beaches impacted by polluted runoff that posed an issue, but those can be managed in the lab. Other impediments include capital and training costs, as well as the lack of public benefit to rapidity if results from weekly samples are extrapolated over an entire week. In other words, rapid methods will only provide increased public health protection if used on a routine continuous basis for at least three consecutive days weekly (Friday through Sunday).

Overall, the use of rapid methods is promising. The city of Los Angeles, the Los Angeles County Department of Public Health and others will work with SCCWRP to institute a pilot study in the county this summer. If state funding is in place, there is a distinct possibility that many beaches in California will start using rapid methods as early as the summer of 2012.

Clean Beach Initiative (CBI)

In 2000, then-Governor Gray Davis and Assemblywoman Fran Pavley proposed $34 million in the state budget for protecting and restoring the health of California's beaches. This funding became known as the Clean Beach Initiative (CBI). To date, more than $100 million has been allocated to projects to clean up California's most polluted beaches and fund research on rapid pathogen indicators and pathogen source identification efforts. Since the implementation of this funding, dozens of projects have been completed or are nearing completion. Sadly, however, the December 2008 statewide freeze on bond funds meant all projects that were underway were put on hold. Funding for these projects underway has been recently restored. American Recovery and Reinstatement Act (ARRA) money also helped fund some projects during the bond freeze. No new beach cleanup projects have been reviewed or approved under the CBI in nearly three years.

The CBI is funding a $4 million, three-year Source Identification Pilot Program (SIPP) is currently underway with researchers from Stanford University, UCSB, UCLA, U.S. EPA Office of Research and Development and the SCCWRP. They are developing and implementing sanitary survey/source tracking protocols at 12 to 16 of California's most polluted beaches. The goals of the study are to develop a suite of the best available methods for identifying the sources of fecal contamination in environmental samples; to conduct a reconnaissance of fecal pollution along the coast of California; to develop methods to conduct upstream source identification in problem watersheds; and to transfer technology to other laboratories across California.

Ideally, one of the final products will be a source tracking protocol that can be used to find microbial pollution sources at beaches chronically polluted by fecal indicator bacteria. This tool has been sorely needed since the passage of AB538 in 1999, which requires source identification and abatement efforts to proceed at chronically polluted beaches. To date, AB538 requirements have been largely ignored by state and local health and water quality agencies.

Beaches Environmental Assessment and Coastal Health (BEACH) Act update

In 2006, the Natural Resources Defense Council (NRDC) sued the U.S. EPA over its failure to implement the requirements of the 2000 BEACH Act. In particular, the EPA failed to develop new national beach water quality criteria, including criteria for rapid indicator methods, by Congress's specified deadline of 2005. In April 2008, the NRDC won an important summary judgment ruling on their BEACH Act litigation. A federal judge held that the EPA violated the BEACH Act by failing to meet statutory deadlines. As a result, the NRDC and EPA reached a settlement later that year.

The settlement resulted in the EPA agreeing to complete epidemiology studies in Alabama and Rhode

Island and perform additional epidemiology studies at an urban runoff-impacted beach in South Carolina and a tropical, sewage-impacted beach in Puerto Rico. The EPA also agreed to use Quantitative Microbial Risk Assessment techniques to assess the potential health risk from exposure to pathogens at an agriculturally-impacted freshwater beach. The new statutory deadline for the beach water quality criteria is 2012. By the same date, the EPA will have a new method for the rapid detection of at least one fecal indicator (Enterococcus), and possibly two (Enterococcus and E. coli), included in the 2012 criteria. As stated earlier, the EPA is required to release a draft framework for BEACH Act recreational water criteria in June.

Heal the Bay will continue to advocate for the EPA to modify their BEACH Act funding strategy to better incentivize states to move towards a model monitoring program. We will also urge that weekly monitoring be performed at heavily used beaches at 'point-zero' (near potential beach pollution sources) and that samples should be collected at ankle- to shin-depth and analyzed for microbes recommended in the EPA criteria.

Santa Monica Bay Total Maximum Daily Loads

Every beach from the Ventura County line south to Palos Verdes was mandated to meet state beach bacteria health standards 100% of the time during the AB411 time period (April 1–Oct. 31) by July 15, 2006 and only three allowable violations during the winter dry period (Nov. 1–March 31) by July 15, 2009 or face penalties. In addition, the first winter wet weather compliance point passed in 2009; specifically the Total Maximum Daily Load (TMDL) requires a 10% cumulative percentage reduction from the total exceedance day reductions required for each jurisdictional group. Marina del Rey's Mother's Beach and Back Basins had a compliance deadline for summer and winter dry weather of March 18, 2007 and Los Angeles Harbor (Inner Cabrillo Beach and Main Ship Channel) passed the compliance deadline for both the AB411 time period and winter dry and winter wet weather on March 10, 2010. The 100% compliance requirement for the AB411 time period means that all of these beaches must be safe for swimming every day for the seven months from April through October. In the winter dry and winter wet time periods, beaches are allowed a specified number of exceedances in order to account for reference conditions. These requirements are within the fecal bacteria TMDLs for Santa Monica Bay, Mother's Beach and Los Angeles Harbor.

Unfortunately, the compliance deadlines have come and gone and many of Santa Monica Bay's beaches like Surfrider Beach, Topanga State Beach at creek mouth, Redondo Municipal Pier, Mother's Beach, Dockweiler State Beach at Ballona Creek mouth and inner Cabrillo Beach still frequently had elevated bacteria concentrations above the TMDL limits. While some cities have made noticeable improvements in identifying and rectifying sources of ocean pollution, measures to fix chronically polluted beaches like Dockweiler State Beach at Ballona Creek mouth, Cabrillo Beach and Surfrider have been inadequate.

In order for the bacteria TMDL pollution limits to be readily enforceable, the Los Angeles Regional Water Quality Control Board incorporated them into the language of the Los Angeles County Storm Water Permit on Sept. 14, 2006 and Aug. 9, 2007. Once the TMDL limits were put into the permit, cities and other dischargers became subject to fines of up to $10,000 per day, per violation. On March 4, 2008, in a precedent-setting move, the Regional Water Board sent strongly-worded notices of violation and Section 13383 orders to 20 cities and Los Angeles County to clean up Santa Monica Bay beaches. The cities of Santa Monica, Los Angeles and Malibu were among those threatened with fines. The action marked the first time nationally that a regulatory body had threatened fines to ensure cities' compliance with beach bacteria limits from a TMDL. Unfortunately, due to a recent court decision discussed in this chapter, these violations will likely never be enforced.

On Feb. 18, 2010, the Regional Water Board issued an Administrative Civil Liability to the Los Angeles County Flood Control District in the amount of $274,896 for violations of the Marina del Rey Bacteria TMDL. However, the Regional Water Board decided not to issue an amended complaint due to additional information submitted by the county and fixes to the pumping system that has improved water circulation at the beach.

Soon after the Regional Water Board incorporated the Santa Monica Bay Beaches Bacteria TMDL pollution limits into the language of the Los Angeles County Storm Water Permit, the county filed a petition on the newly-adopted permit. They held this permit in abeyance for almost two years. On Sept. 18, 2008, the county took the petition out of abeyance and asked for formal review by the SWRCB. The petition was heard by the board on Aug. 4, 2009, which unanimously voted to adopt the staff's order and deny the county's petition. This was a great win for the environment, as the SWRCB validated that the stormwater permit is the appropriate place for TMDL limits.

TABLE 6-1: SM BAY TMDL POOR PERFORMERS

Heal the Bay's Assessment of the most frequent Santa Monica Bay and Marina Del Rey Beach Bacteria TMDL Exceedances during AB411 2010 (beaches with > 1- exceedances)

Exceedance Days in 2010	
126	Cabrillo Beach
61	Topanga State Beach
47	Dockweiler State Beach
41	Redondo Municipal Pier
31	Surfrider Beach
19	Santa Monica Municipal Pier
18	Mothers' Beach, Marina del Rey
16	Will Rogers State Beach
15	Solstice Canyon
14	Marie Canyon
13	Herondo Street
12	Paradise Cove Pier
12	Will Rogers State Beach
10	Malibu Pier

Unfortunately, the county petitioned the California Superior Court to set aside the stormwater permit incorporating the TMDLs and the recent SWRCB order that denied the county's petition. Heal the Bay intervened in the case on behalf of the state. On June 2, 2010 the court ruled that the attorney for the Regional Water Board did not correctly follow administrative procedures. The judge ruled that the board's attorney acted as advisor and advocate on the decision to add the beach bacteria TMDL limits into the county stormwater permit. The ruling did not discuss the merits of the TMDLs themselves or the Regional Water Board's action to place the TMDLs in the stormwater permit. However, the Writ of Mandate forced the Regional Water Board to remove the two TMDLs from the municipal stormwater permit. This action was taken on March 14, 2011.

Despite the fact that the TMDLs are no longer in the stormwater permit, we are hopeful that the cities and Los Angeles County will take appropriate aggressive actions to ensure that bacteria limits are not exceeded and that Santa Monica Bay, Marina del Rey and Long Beach Harbor beaches are safe for beachgoers. The TMDLs are still in effect, and the compliance deadlines should not change when they are put back in the permit (likely to occur in 2012). The Beach Report Card will continue to identify beaches that exceed bacteria limits and track TMDL compliance efforts. Heal the Bay will also continue to advocate for the TMDLs to be placed back in the stormwater permit as soon as possible.

Los Angeles River and Santa Clara River TMDLs

The Regional Water Board adopted two additional bacteria TMDLs in June 2010: the Santa Clara River Bacteria TMDL and the Los Angeles River Bacteria TMDL. Unfortunately, both have very lengthy compliance timelines. The Santa Clara River Bacteria TMDL allows 17 years for final compliance. The Los Angeles River Bacteria splits up compliance timelines by river segments. No significant action is required for the first four years and the final segments have 25 years to meet pollution limits for both dry and wet weather, the longest ever in the region. As a result, Heal the Bay is concerned that Long Beach beaches will remain frequently unsafe for more than two decades because the Los Angeles River has been identified as a main source of their beach pollution.

Ventura County TMDLs

On July 8, 2011, the Regional Water Board adopted a new Ventura County municipal stormwater permit (the permit was initially adopted on May 7, 2009 but was brought back for hearing due to administrative errors). It was groundbreaking because, for the first time, a permit was adopted with all applicable TMDL limits and implementation requirements. The Harbor Beaches of Ventura County Bacteria TMDL was included in the permit and is now enforceable. The Malibu Creek and Lagoon Bacteria TMDL was also incorporated into this permit, which is a positive step toward helping clean up Surfrider Beach. Another important aspect of the Ventura County Stormwater Permit is that it includes weekly year-round monitoring of 10 Ventura County beaches, in the event that the current monitoring program is cut. This can serve as an important model for future permit development in ensuring the continuation of beach water quality monitoring, regardless of the state funding situation.

San Diego Region TMDLs

Although the Los Angeles region has been far ahead in the state regarding the development of beach bacteria TMDLs, we have seen some recent action in San Diego County. The first bacteria TMDL project in the San Diego region is referred to as Total Maximum Daily Loads for Indicator Bacteria, Project I – Beaches and Creeks in the San Diego Region. This TMDL was adopted by the San Diego Water Board on Feb. 10, 2010, after changes were made to the version that was originally adopted in December 2007.

On June 11, 2008, the San Diego Water Board adopted bacteria TMDLs for Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay. The TMDL Basin Plan amendment went into effect on Oct. 26, 2009.

California's beach monitoring program is essentially unfunded starting in 2012, thereby putting the public health of millions of beachgoers in jeopardy.

Drain at Poche Beach, San Clemente. Photo: Joy Aoki

Recommendations for the Coming Year

- California needs a sustainable funding source for beach monitoring
- Standardized monitoring is necessary
- Continue to encourage monitoring agencies to monitor water quality at popular beaches year-round (beyond the AB411 required dates of April-October).
- Continue to advocate for the state to enforce sanitary survey protocol requirements as established in AB538 and the California Ocean Plan
- Finalize California on-site wastewater treatment systems regulations
- Rapid methods pilot study

California needs a sustainable funding source for beach monitoring

The California budget crisis has demonstrated the precarious position of the state's beach monitoring program. The mandatory funding provisions of AB411 are tied to the state and federal government's ability to fund monitoring. If there is no funding available to implement the program, then there is no legal obligation for local governments to implement the monitoring provisions under AB411. Two years ago, state and federal efforts were successful in getting stopgap ARRA funds to implement the program, but these funds ran out by the end of 2010. Last year, the SWRCB tapped bond funds again to keep California beach monitoring efforts going. In what has become an annual tradition, state and local agencies are looking for funds for next year (2012). This means that California's beach monitoring program is essentially unfunded starting in 2012, thereby putting the public health of millions of beachgoers in jeopardy. A comprehensive statewide, year-round monitoring program needs approximately $2 million annually to successfully protect public health. An additional $1 million dollars per year is needed to begin using rapid fecal bacteria detection methods at some of the state's most polluted beaches. Currently, the federal government only provides about $500,000 to California.

The federal BEACH Act funding has been stuck at $10 million nationally on an annual basis because Congress has not appropriated the full $30 million amount allowable under law. Like the Bush administration, the Obama administration has not pushed Congress to increase the BEACH Act appropriation to the full amount needed. This needs to change as part of the BEACH Act criteria process in 2012. Without additional funding, monitoring programs around the country will not improve, nor be able to adequately implement the use of rapid methods for beach monitoring.

Without additional funding, monitoring programs around the country will not improve, nor be able to adequately implement the use of rapid methods for beach monitoring.

While federal funding helps, it is not the sole solution to the problem. The governor and legislature need to fully fund the program, ideally in a manner that does not compete with the General Fund. SB482 (Kehoe), as proposed to be amended, could provide a sustainable funding source for local environmental health programs throughout California to monitor beach water quality and warn beach users where the water is not safe to swim. At a minimum, if the bill passes, AB411 administration requirements

will move from the State Department of Public Health to the SWRCB. Other possible funding solutions include: adding a small beach protection fee to beach parking fees, and/or adding beach monitoring requirements for beaches impacted by storm drains and creeks to municipal stormwater permit monitoring programs.

State and beach stakeholders need to develop an effective and sustainable funding program. Relying on incomplete county costs estimates from 1999 has not been effective, especially after funding was cut by 10% in 2007. Cost estimates also need to include year-round monitoring costs. Counties need to provide these updated costs soon.

Standardized monitoring is necessary

Los Angeles County was one of the first counties in the state (along with Humboldt, San Francisco and portions of San Diego counties) to modify its monitoring program to collect samples directly in front of flowing storm drains and creeks. This change was a result of the Santa Monica Bay Beach Bacteria TMDL. Other counties collect water samples directly at creek, river or storm drain ocean outlets, or as far as 83 yards from a drain. Since children often play directly in front of storm drains or in the runoff-filled ponds and lagoons, monitoring at 'point-zero' is the best way to ensure that the health risks to swimmers are minimized. If the water is clean at 'point-zero', then the public will know the entire beach is safe for swimming.

Since children often play directly in front of storm drains or runoff-filled ponds and lagoons, monitoring at 'point-zero' is the best way to ensure the health risks to swimmers are minimized.

The state and regional water boards should require beach monitoring locations to be moved to 'point-zero'. They have this authority under their National Pollutant Discharge Elimination System (NPDES) permitting programs for both Stormwater Discharges From Municipal Separate Storm Sewer Systems (MS4s) and sewage treatment plant permits. Also, any discussions on integrating and streamlining beach monitoring efforts, like in Orange County, should come with a requirement to move monitoring locations to 'point-zero' in order to better protect public health. The lack of a truly standardized beach monitoring program has put public health needlessly at risk for far too long.

In order to further standardize California's beach monitoring program throughout all counties:

- All beaches impacted by flowing storm drains should be posted with health warning signs when the flow reaches the beach. Signs should be posted along the entire length of beach impacted by runoff flows.
- Beaches should be posted in the event single sample standards are exceeded *and* when geometric mean standards are exceeded. Many counties just post when single sample standards are exceeded, yet it is the geometric mean standard that better protects public health because it is a more accurate reflection of water quality at that beach over the previous month. As many studies have demonstrated, a sample collected and analyzed today at a beach with highly variable water quality, doesn't predict water quality very well the next day.

Advocate for year-round monitoring at popular beaches (beyond the CA AB411 required dates of April-October).

Year-round monitoring provides winter beachgoers, oftentimes surfers who frequent the beach for winter swells, with important information about water quality. In California there is no set beach season. Surfers, swimmers, divers, wind-surfers and kayakers use the water year-round. Some very popular surf sites are no longer monitored during the winter months. All of these ocean enthusiasts have the right to know about water quality at their favorite beaches on a year-round basis.

Encourage California to enforce sanitary survey protocol requirements established in AB538 and the California Ocean Plan

In an effort to do more than just notify beachgoers of potential water quality problems at their favorite beaches (per AB411), AB538 was passed to require sanitary surveys (source investigations) to be completed where water quality problems persisted. The idea was to identify the sources of beach water quality impairment and implement necessary strategies to abate the pollution. The requirement of a source investigation was not a new concept created by AB538 in 1999 – the Ocean Plan has required this procedure since 1988. The issue is that the state never enforced nor required municipalities to implement these surveys when exceedances occur. The Ocean Plan states: "...if a shore station consistently exceeds a coliform objective or exceeds a geometric mean...the Regional Board shall require the appropriate agency to conduct a survey to determine if that agency's discharge is the source of the contamination." *[State Water Resources Control Board Ocean Plan 1997]*

In California there is no set beach season. Surfers, swimmers, divers, wind-surfers, and kayakers use the water year-round [and they] have the right to know about water quality at their favorite beaches on a year-round basis.

AB538 states that source investigations shall be conducted "if bacteriological standards are exceeded in any three weeks of a four-week period or, for areas where testing is done more than once a week, 75% of testing days that produce an exceedence of those standards." Although there have been a number of source identification efforts for chronically polluted beaches throughout the state, many of them have never been investigated. Examples of completed sanitary surveys are: Mission Bay, Redondo Pier, Ramirez Canyon at Paradise Cove, Escondido Beach, Huntington Beach, Rincon, Campbell Cove, Lover's Point in Monterey, Baby Beach, Kiddie Beach, Santa Monica Pier, Long Beach, Malibu Lagoon, Santa Monica Canyon, Cabrillo Beach, Avalon and a few other locations.

Identifying sources of fecal bacteria pollution is critical before successful source abatement efforts can be undertaken. With substantial funds finally becoming available under the CBI, a consortium of scientists from Stanford University, UCSB, UCLA, EPA and SCCWRP will be working on identifying the most effective source tracking techniques. The multi-year study will investigate the latest source tracking techniques and test them out in the field at beaches throughout central and southern California. The final work product should be the cornerstone of the long overdue model sanitary survey protocol for problem beaches.

Finalize California on-site wastewater treatment systems regulations

The SWRCB must finally complete and approve final AB885 regulations.

The year 2000 law required the SWRCB to set final regulations for siting, monitoring and water treatment performance for California's on-site waste water treatment systems (OWTSs) by January 2004. While the regulatory process has been extremely controversial and incredibly slow, water quality problems caused by OWTSs continue to be a major risk to public health and aquatic life. Three years ago, the SWRCB released draft regulations and a Draft Environmental Impact Report (DEIR). The regulations and the DEIR were roundly opposed by everyone from septic system owners to health officials to environmental groups. The draft regulations were far too strict and expensive for the OWTSs that posed little risk to groundwater or surface water, yet, they were not strict enough for systems that cause or contribute to water quality impairment.

Due to the continued lack of progress over the years, Heal the Ocean, Heal the Bay and Coast Law Group sued the SWRCB in February to force them to finalize the regulations. The SWRCB has made completion of the regulations one of their highest priorities and they are currently undergoing the Cali-

fornia Environmental Quality Act Scoping process. The final regulations are scheduled to be approved by the SWRCB in July 2012.

The state is recommending a new, four-tiered approach to regulating OWTSs. There would be trivial requirements for existing systems that pose negligible risk to groundwater, rivers and beaches; and very few requirements for new and rebuilt systems. There would be more monitoring, inspections and on-site system site and construction requirements for systems that pose a moderate risk to groundwater and surface water. Finally, those systems that cause or contribute to water quality impairment would have more stringent monitoring requirements, inspections and advanced treatment requirements by a certain date. There are 1.2 million systems in the state and very few of them cause or contribute to water quality impairment, so the cost of compliance with the needed law would drop by over a billion dollars a year. Despite the fact that the Heal the Bay approach seems to be accepted as a good idea by the state's local health agencies and SWRCB, final regulations continue to get delayed and we have a major concern that the middle-tier requirements will be too weak to protect water quality and public health. At this point, the lack of progress on this critical issue is an embarrassment for the SWRCB and the state of California.

One of our greatest concerns is that the regulations must require on-site system upgrades meet performance standards for all systems within 600 feet of fecal bacteria and nutrient-impaired waters or tributaries upstream of the impaired waters. Heal the Bay is concerned that the most stringent tier for on-site systems near impaired waters will not be tough enough to eliminate septic systems as a nutrient and/or fecal bacteria source to those polluted waters. As such, those impaired waters will continue to pose health risks to swimmers and cause harm to aquatic ecosystems. Also, there must be a clear regulatory deadline for existing systems that have degraded water quality and pose health risks. The draft regulations should apply to tributaries that cause or contribute to fecal bacteria and/or nutrient impairment problems downstream. Since these regulations would apply throughout the state, they will have special importance at California beaches and coastal watersheds that are impaired for fecal bacteria.

El Segundo. Photo: Anthony Barbatto

APPENDIX A1

Heal the Bay's Annual Beach Report Card Methodology for California

Four times in the 21-year history of the program, Heal the Bay has modified its Beach Report Card grading methodology to better characterize local beach water quality. Amendments to the grading methodology include: (1) the inclusion of the geometric mean into the calculation, (2) a firm zero-to-100 point scale, (3) greater significance given to the most recent sample(s) relative to past samples, and (4) greater weight for Enterococcus and the total to fecal ratio relative to total coliform and fecal coliform.

These modifications stem from comments made by California's State Water Resources Control Board (SWRCB) and the Beach Water Quality Workgroup. With these improvements to the methodology, Heal the Bay's Beach Report Card grading system is now endorsed by the SWRCB and the Beach Water Quality Workgroup as an effective way to communicate beach water quality to the public.

FIGURE 8-1

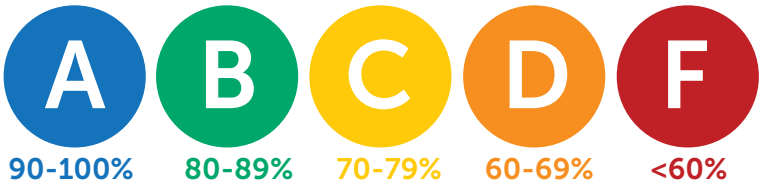


TABLE 8-1:
TOTAL POINTS AVAILABLE BY COMPONENT

Geometric Mean	29 points
Single Sample Standard	71 points
Total	100 points

The new methodology retains past modifications to the report card, such as the inclusion of new indicator bacteria thresholds (namely the total-to-fecal ratio), developed by the Santa Monica Bay Restoration Commission in the 1996 health effects studies of Santa Monica Bay beachgoers. It also retains the implementation of standard deviations for each indicator bacteria threshold, which was developed by the Southern California Coastal Water Research Project and Orange County Sanitation Districts during the 1998 Southern California Bight Study. Each threshold is based on the prescribed standards set in the California Department Health Service's Beach Bathing Water Standards.

As seen in Figure 8-1, the new methodology continues to use a standard A through F grading system, and grades are now based on the following formula:

$$\textbf{\% Grade} = \frac{\text{'Total Points Available'} - \text{'Total Points Lost'}}{\text{'Total Points Available'}}$$

[Note: The Annual and End-of-Summer Beach Report Card methodology is modified slightly to accommodate the longer time period. For example: no greater significance is given to the most recent samples.]

Total Points Available

'Total Points Available' is derived from adding together two point components (if applicable): the Geometric Mean and the Single Sample Standard. The points for each component are listed in Table 8-1.

APPENDIX A1

In order for the points in each component to become available, certain criteria must be met. For example, the Geometric Mean points will be added to the 'Total Points Available' only if there are a minimum of four dry weather samples collected within the allotted time frame (for the Annual Report Card, this is April 2010–March 2011). Wet weather data is graded separately from dry weather data, and does not include a geometric mean component. Therefore, it is possible for 'Total Points Available' to be less than 100. The new grading methodology allows for a relative grade to be determined based on the actual monitoring completed.

Once the 'Total Available Points' has been determined for a specific location, then the 'Total Points Lost' can be calculated for the applicable grade components.

Total Points Lost

Separate calculations are used to quantify 'Total Points Lost' for each applicable component from the 'Total Available Points'. The following describes the two calculations.

Geometric Mean

Calculating the 'Total Points Lost' for the Geometric Mean component involves using California's Beach Bathing Standards for the geometric mean. The standards for each of these criteria are presented in Table 8-2.

TABLE 8-2:
CALCULATING THE TOTAL POINTS LOST FOR THE GEOMETRIC MEAN COMPONENT

Indicator Exceeded	California Beach Bathing Water Standard*	% of Total Available Points Lost** Due to Exceedance	Total Available Points
Enterococcus	35	80%	29
Fecal Coliform	200	40%	
Total Coliform	1000	40%	

** Colony forming units per 100 milliliters of ocean water*
*** Total Percentage Points Lost cannot add up to be >1*

Each geometric mean criterion exceeded for the time frame is assigned a specific percentage of points lost. Non-exceedances are given 0%. The percentage of points lost from each of the three criteria are then added together and multiplied by the 'Total Available Points' (any sum of percentages exceeding 100% automatically loses all 29 points available in the geometric mean component).

The following additional procedures apply to the Annual and Summer Beach Report Cards only:

If the number of 'Total Points Lost' is less than 29, then the frequency of the sample location's exceedances of the 30-day geometric mean throughout the time frame is taken into consideration. If a given location exceeded any state 30-day geometric mean standard more than 20% of sample days, then an additional 10 points are lost for the geometric mean component (up to but not to exceed 29 total points). If the location exceeded any state 30-day geometric mean standard for more than 40% of sample days, then another 10 points are lost for the geometric mean component (up to but not to exceed 29 total points). If the location exceeds any state 30-day geometric mean standard for more than 50% of samples days, then the location automatically loses all 29 points available for the geometric mean component.

Single Sample Standard

Calculating the 'Total Points Lost' for the Single Sample Standard component is similar to the calculation used for deriving the points lost for the Geometric Mean. However, the Single Sample Standard component uses a gradient to calculate the 'Total Points Lost'. The gradient of percentage points lost used in

TABLE 8-3:
SINGLE SAMPLE GRADIENT THRESHOLDS IN CFU/100ML*

Indicator Bacteria	SLIGHT T – 1 SD	MODERATE T + 1 SD	HIGH > T + 1 SD	EXTREME Very High Risk
Total Coliform	6,711-9,999	**10,000**-14,900	> 14,900	N/A
Fecal Coliform	268-399	**400**-596	> 596	N/A
Enterococcus	70-103	**104**-155	> 155	N/A
Total: Fecal Ratio (when total ≥ 1,000)	10.1-13	7.1-**10**	2.1-7	< 2.1

** Colony forming units per 100 milliliters of ocean water*
SD = Standard Deviation
***Bold** = California State Health Department standards for a single sample*
N/A = Not applicable

TABLE 8-4:
CALCULATING THE TOTAL POINTS FOR THE SINGLE SAMPLE STANDARD COMPONENT

Indicator Exceeded	SLIGHT % Points Lost	MODERATE % Points Lost	HIGH % Points Lost	EXTREME % Points Lost	Total Available Points
Total Coliform	10%	30%	40%	N/A	71
Fecal Coliform	10%	30%	40%	N/A	
Enterococcus	20%	40%	60%	N/A	
Ratio (when total ≥ 1,000)	25%	50%	75%	100%	

calculating the number of points lost is derived from work completed by the Southern California Coastal Water Research Project and Orange County Sanitation District as part of the 1998 Southern California Coastal Bight Study *(see Table 8-3)*.

'Percentage of points lost' is allocated depending upon the threshold exceeded by each of the four criteria. Each single sample criterion exceeded is given a 'percentage of points lost'. These amounts are presented in Table 8-4.

Non-exceedances are given 0%. The 'percentage of points lost' from each of the four criteria for each sample during the time period are added together and divided by the total number of samples. Once this number is calculated (total 'percentage of points lost' divided by total number of samples), it is multiplied by the 'Total Available Points'. In the Single Sample Standard component, more points are lost as the magnitude or frequency of exceedances increases.

Points lost from the Single Sample Standard component are added to the points lost in the Geometric Mean component (if applicable) and this sum becomes 'Total Points Lost'. Once the 'Total Points Available' and the 'Total Points Lost' are calculated, a grade for a particular sample site can be determined.

Determining a Grade

$$\textbf{\% Grade} = \frac{\text{'Total Points Available'} - \text{'Total Points Lost'}}{\text{'Total Points Available'}}$$

Most dry and wet weather annual grades are calculated with 100 'Total Available Points', although there is no Geometric Mean component for wet weather grading. Wet weather grades are calculated by the total 'percentage of points lost' divided by the total number of samples and then multiplied by 100. This gives the location's score for wet weather 'Total Points Lost'. This number is then subtracted from 100 to give the percentage grade.

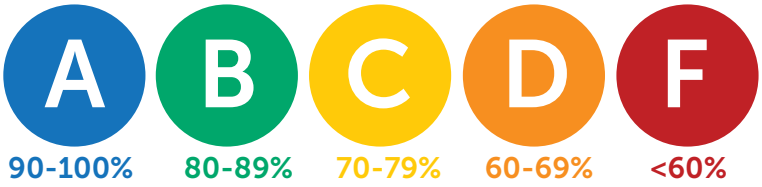
APPENDIX A2

Heal the Bay's Annual Beach Report Card Methodology for Oregon and Washington

The Oregon and Washington state grade methodology (two Enterococcus-only standards) was adapted as fairly as possible from the seven standard California methodology *(see Appendix A1)*.

[Note: The Annual and End-of-Summer Beach Report Card methodology is modified slightly to accommodate the longer time period. For example: no greater significance is given to the most recent samples.]

FIGURE 8-2



Total Points Available

As seen in Figure 8-5, the methodology uses a standard A through F grading system, and grades are based on the following formula:

$$\textbf{\% Grade} = \frac{\text{'Total Points Available'} - \text{'Total Points Lost'}}{\text{'Total Points Available'}}$$

TABLE 8-5
TOTAL POINTS AVAILABLE BY COMPONENT

Geometric Mean	50 points
Single Sample Standard	50 points
Total	100 points

Wet weather data (>=0.25 inches of rain in previous 72 hours) is graded separately from dry weather data and does not currently include a geometric mean component.

'Total Points Available' is derived from adding together two point components (if applicable): the Geometric Mean and the Single Sample Standard. The points for each component are listed in Table 8-5. In order for the points in each component to become available certain criteria must be met. Oregon and Wasington Summer Beach Report Card methodology calculations only include Geometric Mean scores when four or more dry weather samples are available in determining a location's 30-day geometric mean. Therefore, it is possible for 'Total Points Available' to be less than 100. The grading methodology allows for a relative grade to be determined based on the actual monitoring completed.

Once the 'Total Available Points' has been determined for a specific location, then the 'Total Points Lost' is calculated for the applicable grade components.

Total Points Lost

Separate calculations are used to quantify 'Total Points Lost' for each applicable component from the 'Total Available Points'. The following describes the two calculations:

Geometric Mean

Calculating the 'Total Points Lost' for the Geometric Mean component involves using EPA's beach bathing indicator density of 35 for the geometric mean. If there are four or more samples included in the 30-day geometric mean calculation then the 50 points for the Geometric Mean component become available. Oregon and Washington Beach Report Card methodology calculates the percentage of geometric mean exceedance days based on the number of valid (four or more) geometric means scored during the extended time period. The percentage of geometric exceedance sample days out of valid

TABLE 8-6:
SINGLE SAMPLE GRADIENT THRESHOLDS IN CFU/100ML*

Indicator Bacteria	SLIGHT T – 1 SD	MODERATE T + 1 SD	HIGH > T + 1 SD
Enterococcus	70-103	**104**-155	> 155

** Colony forming units per 100 milliliters of ocean water*
SD = Standard Deviation
***Bold** = California State Health Department standards for a single sample*

TABLE 8-7:
CALCULATING THE TOTAL POINTS LOST FOR THE SINGLE SAMPLE STANDARD COMPONENT

Indicator Exceeded	SLIGHT % Points Lost	MODERATE % Points Lost	HIGH % Points Lost	Total Available Points
Enterococcus	25%	75%	100%	50

geometric mean sample days is multiplied by the 50 available points to determine the 'Total Points Lost' for the Geometric Mean component.

Single Sample Standard

The Single Sample Standard component uses a gradient to calculate the 'Total Points Lost'. The gradient of percentage of points lost used in calculating the number of points lost is derived from the EPA's Ambient Water Quality Criteria for Bacteria and is found in Table 8-6.

'Percentage of points lost' is allocated depending upon the threshold exceeded. The penalties for threshold exceedances are presented in Table 8-7. Non-exceedances lose zero points. The 'percentage of points lost' for each sample during the time period are added together and divided by the total number of samples and multiplied by the 'Total Available Points'. More points are lost as the magnitude or frequency of exceedances increases.

Points lost from the Single Sample Standard component are added to the points lost in the Geometric Mean component (if applicable) and this sum becomes 'Total Points Lost'. Once the 'Total Points Available' and the 'Total Points Lost' are calculated a grade for a particular sample site can be determined.

Determining a Grade

$$\textbf{\% Grade} = \frac{\text{'Total Points Available'} - \text{'Total Points Lost'}}{\text{'Total Points Available'}}$$

Most Oregon and Washington summer grades are calculated with 100 'Total Available Points'. Wet weather data was not included in this analysis.

APPENDIX B

2010-2011 Annual Beach Report Card

Honor Roll

California's year-round monitored beaches with zero bacterial standards exceedances during dry weather.

San Diego County

- OCEANSIDE
  - projection of Tyson Street
  - projection of Forster Street
  - St. Malo Beach, downcoast from St. Malo Road
- CARLSBAD
  - projection of Cerezo Drive
  - projection of Palomar Airport Road
- ENCINITAS
  - San Elijo State Park, Pipes surf break
  - San Elijo State Park, north end of State Park stairs
  - San Elijo State Park, proj. of Liverpool Drive
- CARDIFF STATE BEACH
  - Charthouse parking, slight south of Kilkeny
  - Las Olas, 100 yards south of Charthouse
  - Seaside State Park
- SOLANA BEACH
  - Fletcher Cove, proj. of Lomas Santa Fe Drive
- DEL MAR
  - projection of 15th Street
- OCEAN BEACH
  - Ocean Pier, projection of Narragansett Avenue
- SUNSET CLIFFS
  - projection of Ladera Street
- POINT LOMA
  - Point Loma Treatment Plant
  - Point Loma Lighthouse
- CORONADO
  - North Beach, near navy fence at Ocean Boulevard
  - North Beach, NASNI Beach
  - projection of Loma Avenue

Orange County

- BALBOA BEACH
  - The Wedge
- NEWPORT BAY
  - Ruby Avenue Beach
  - 19th Street Beach
  - 10th Street Beach
- CRESCENT BAY BEACH
- ALISO CREEK – 1000' NORTH
- TABLE ROCK
- LAGUNA LIDO APT.
- 9TH ST. 1000 STEPS BEACH
- OCEAN INSTITUTE BEACH (SERRA)
- SAN CLEMENTE
  - Trafalgar Street Beach
  - Avenida Calafia
  - Las Palmeras

Los Angeles County

- MALIBU
  - El Pescador State Beach
  - Malibu Colony Fence
  - Pena Creek at Las Tunas County Beach
- VENICE BEACH
  - Fishing Pier, 50 yards south
- EL SEGUNDO
  - Hyperion Treatment Plant One Mile Outfall
- PALOS VERDES PENINSULA
  - Palos Verdes (Bluff) Cove
  - Abalone Cove Shoreline Park

Ventura County

- RINCON BEACH
  - 25 yards south of creek mouth
- OIL PIERS BEACH
  - south of drain, bottom of wood staircase
- CHANNEL ISLANDS HARBOR
  - Hobie Beach, Lakshore Drive
- SILVERSTRAND
  - San Nicholas Avenue, south of jetty
  - Santa Paula Drive, south of drain
  - Sawtelle Avenue, south of drain
- ORMOND BEACH
  - Oxnard Industrial drain, 50 yards north of drain
  - Arnold Road

San Luis Obispo County

- **SAN SIMEON** Pico Avenue
- **MONTANA DE ORO STATE PARK**
  Hazard Canyon
- **AVILA BEACH** projection of San Luis Street
- **PISMO STATE BEACH**
  330 yards north of Pier Avenue
  571 yards south of Pier Avenue, end of Strand Way

Santa Cruz County

- **COWELL BEACH**
  at the Stairs

San Mateo County

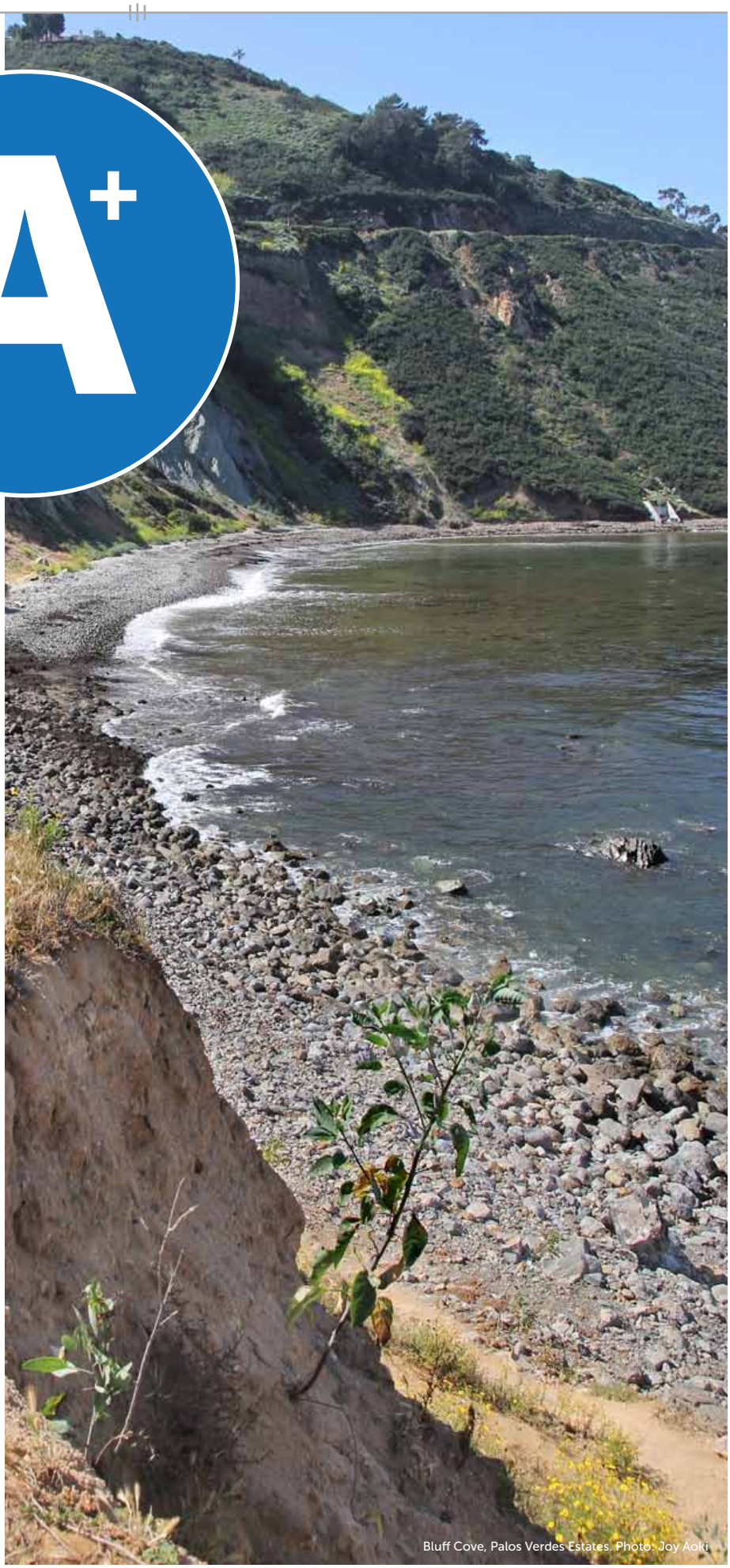
- **SHARP PARK BEACH**
  projection of Birch Lane
  projection of San Jose Avenue
- **ROCKAWAY BEACH** at Calera Creek
- **MONTARA STATE BEACH** at Martini Creek
- **SURFER'S BEACH** south end of riprap
- **DUNES BEACH**
- **VENICE BEACH** at Frenchman's Creek
- **FRANCIS BEACH** at the foot of the steps
- **COYOTE POINT**

East Bay Counties

- **CROWN BEACH**
  Crown Beach Bath House
  Windsurfer Corner
  Sunset Road

San Francisco County

- **OCEAN BEACH**
  projection of Balboa Avenue
  projection of Sloat Boulevard



Bluff Cove, Palos Verdes Estates. Photo: Joy Aoki

APPENDIX C1

2010-2011 Beach Report Card Grades by County for California

San Diego County	AB411 (April-Oct)	Dry Year-Round	Wet Year-Round	Winter Dry (Nov-Mar)
OCEANSIDE				
San Luis Rey River outlet	A	C	F	F
projection of Tyson Street	A+	A+	A	A+
projection of Forster Street	A+	A+	B	A+
500' north of Loma Alta Creek outlet	A	A	D	A
projection of Cassidy Street	A+	A	B	A
St. Malo Beach, downcoast from St. Malo Road	A+	A+	B	A+
CARLSBAD				
projection of Tamarack Avenue	A			
warm water jetty	A			
projection of Cerezo Drive	A+	A+	A	A+
projection of Palomar Airport Road	A+	A+	A	A+
Encina Creek outlet	A	A	B	A+
projection of Ponto Drive	A	A	A+	A+
projection of Poinsettia Lane	A	A	A+	A+
Batiquitos Lagoon outlet	A			
ENCINITAS				
Moonlight Beach, Cottonwood Creek outlet	A	A	A	A
Swami's Beach, Seacliff Park	A+			
San Elijo State Park, Pipes surf break	A+	A+	A	A+
San Elijo State Park, north end of State Park stairs	A+	A+	A	A+
San Elijo State Park, projection Liverpool Drive	A+	A+	A	A+
CARDIFF STATE BEACH				
San Elijo Lagoon outlet	A	A	B	A
Charthouse parking, slight south of Kilkeny	A+	A+	A	A+
Las Olas, 100 yards south of Charthouse	A+	A+	B	A+
Seaside State Park	A+	A+	A	A+
SOLANA BEACH				
Tide Beach Park, projection of Solana Vista Drive	A+	A	B	A
Fletcher Cove, projection of Lomas Santa Fe Drive	A+	A+	B	A+
Seascape Surf Beach Park	A+			
DEL MAR				
San Dieguito River Beach	A	A	A	A+
projection of 15th Street	A+	A+	A+	
TORREY PINES				
Los Penasquitos Lagoon outlet	A+	A	A+	A

County "Beach Bummer" names appear in **bold.**

APPENDIX C1

	AB411 (April-Oct)	**Dry** Year-Round	**Wet** Year-Round	**Winter Dry** (Nov-Mar)
LA JOLLA				
La Jolla Shores, projection of Ave De La Playa	A+	A	F	
La Jolla Cove	A+			
South Casa Beach	A			
Ravina, south of Nicholson Point	A			
WINDANSEA BEACH				
projection of Playa Del Norte	A+			
PACIFIC BEACH				
Pacific Beach Point, downcoast of Linda Way	A+			
Tourmaline Surf Park, projection of Tourmaline Street	A+	A	A+	
MISSION BEACH				
Belmont Park	A	A	A	A+
MISSION BAY				
Bonita Cove, east cove	B			
Bahia Point, northside, apex of Gleason Road	A			
Fanuel Park, projection of Fanuel Street	A			
Crown Point Shores	A			
Wildlife Refuge near fence, projection of Lamont Street	A			
Campland, west of Rose Creek	A			
DeAnza Cove, mid-cove	A			
Visitor's Center, projection of Clairemont Drive	B			
Comfort Station, north of Leisure Lagoon	A+			
Leisure Lagoon, swim area	A+			
Tecolote Playground, watercraft area	A+			
Tecolote Shores, swim area	A			
Vacation Isle Ski Beach	A			
Vacation Isle North Cove Beach	B			
OCEAN BEACH				
San Diego River outlet (Dog Beach)	B	A	B	A
Stub Jetty	A	A	A	A+
Ocean Beach Pier, northside at Newport Avenue	A	A	A	A+
Ocean Pier, projection of Narragansett Avenue	A+	A+	A	A+
projection of Bermuda Avenue	A	A	C	A+
SUNSET CLIFFS				
projection of Ladera Street	A+	A+	B	A+
POINT LOMA				
Point Loma Treatment Plant	A+	A+	B	A+
Point Loma Lighthouse	A+	A+	A	A+
SAN DIEGO BAY				
Shelter Island, Shoreline Beach Park	A			
Spanish Landing Park beach	A			
Bayside Park, projection of J Street	A			
Glorietta Bay Park at boat launch	A			
Tidelands Park, projection of Mullinix Drive	A			

County "Beach Bummer" names appear in **bold.**

San Diego County, cont'd.	AB411 (April-Oct)	Dry Year-Round	Wet Year-Round	Winter Dry (Nov-Mar)
CORONADO				
at North Beach, near navy fence at Ocean Boulevard	A+	A+	A+	
at North Beach, NASNI Beach	A+	A+	A+	
projection of Loma Avenue	A+	A+	A+	
projection of Ave del Sol	A	A	D	A+
Silver Strand	A	A	D	A+
IMPERIAL BEACH				
projection of Carnation Avenue	A+	A	F	A
Imperial Beach Pier	A+	A	D	
south end of Seacoast Drive	A	A	F	A
TIJUANA SLOUGH				
NWRS, 3/4 mile north of TJ River	A	A	F	A
NWRS, Tijuana Rivermouth	A	A	F	A
BORDER FIELD STATE PARK				
projection of Monument Road	**A+**	**D**	**F**	**F**
Border Fence, northside	A+	A	F	C
Orange County				
SEAL BEACH				
projection of 1st Street	A	A	F	D
projection of 8th Street	A	A	C	A
Seal Beach Pier, 100 yards south of pier	A	A	C	A
projection of 14th Street	A+	A	C	A
SURFSIDE BEACH				
projection of Sea Way	A	A	A	A
projection of Broadway	A+	A	B	A
BOLSA CHICA				
beach across from the Reserve Flood Gates	A	A	B	A
reserve at the downcoast end of the State Beach	A	A	B	A
HUNTINGTON CITY BEACH				
bluffs	A	A	C	A
projection of 17th Street	A	A	C	A
Jack's Snack Bar	A	A	C	A
projection of Beach Boulevard	A	A	C	A
HUNTINGTON STATE BEACH				
projection of Newland Street, SCE Plant	A	A	B	A
projection of Magnolia Street	A	A	B	A
projection of Brookhurst Street	A	A	B	A
Santa Ana River Mouth	A	A	D	B
NEWPORT BEACH				
projection of Orange Street	A	A	C	A
projection of 52nd/53rd Street	A+	A	A	A
projection of 38th Street	A	A	A	A

County "Beach Bummer" names appear in **bold.**

APPENDIX C1

	AB411 (April-Oct)	**Dry** Year-Round	**Wet** Year-Round	**Winter Dry** (Nov-Mar)
BALBOA BEACH				
projection of 15th/16th Street	A	A	A	A
Balboa Beach Pier	A	A	A	A
The Wedge	A+	A+	A	A+
HUNTINGTON HARBOR				
Mother's Beach (Orange County)	A			
Trinidad Lane Beach	A			
Sea Gate	A			
Humboldt Beach	A			
Davenport Beach	A+			
Coral Cay Beach	A			
11th Street Beach	A			
NEWPORT BAY				
Newport Dunes, North	B	A	F	A+
Newport Dunes, East	A	A	F	B
Newport Dunes, Middle	A	A	D	A
Newport Dunes, West	A	A	F	A+
Bayshore Beach	A	A	B	A+
Via Genoa Beach	A	A	B	A+
Lido Yacht Club Beach	A	A	C	A
Garnet Avenue Beach	B	B	A	A+
Sapphire Avenue Beach	A	A	B	A
Abalone Avenue Beach	A+	A	A	A
Park Avenue Beach	A	A	A	A+
Onyx Avenue Beach	A	A	A	A+
Ruby Avenue Beach	A+	A+	A	A+
Grand Canal	A	A	A	A
43rd Street Beach	A	A	B	A
38th Street Beach	B	A	A	A+
19th Street Beach	A+	A+	B	A+
15th Street Beach	A	A	B	A+
10th Street Beach	A+	A+	B	A+
Alvarado/ Bay Isle Beach	A	A	A	A+
N Street Beach	A+	A	A	A
Harbor Patrol Beach	A	A	B	A+
Rocky Point Beach	A+	A	A	A
CORONA DEL MAR				
Corona Del Mar, CSDOC	A	A	B	A
Little Corona Beach	A			
PELICAN POINT	A			
CRYSTAL COVE STATE PARK				
Crystal Cove, CSDOC	A	A	B	A+
Crystal Cove, weekly	A	A	A+	
Muddy Creek	A+			

County "Beach Bummer" names appear in **bold.**

APPENDIX C1

Orange County, cont'd.	AB411 (April-Oct)	Dry Year-Round	Wet Year-Round	Winter Dry (Nov-Mar)
LAGUNA BEACH				
Emerald Bay	A+			
Crescent Bay Beach	A+	A+	A+	
Laguna Main Beach	A+			
Laguna Hotel	A	A	C	A
Projection of Bluebird Canyon	A+	A	C	A
Victoria Beach	A	A	A	A+
Blue Lagoon	A	A	A	A
Treasure Island Pier, AWMA	A+	A	A	A
Treasure Island Sign	A+	A	A	A
Aliso Creek, 1000' north	A+	A+	A	A+
Aliso Creek, outlet	A	A	F	A
Aliso Creek, 1000' south	A+	A	B	A
Camel Point	A+	A	A	A
Table Rock	A+	A+	A	A+
Laguna Lido Apt.	A+	A+	A	A+
9th Street, 1000 Steps Beach	A+	A+	A	A+
Three Arch Bay	A	A	A	A
DANA POINT				
Monarch Beach, north	A			
Salt Creek Beach	A+	A	B	A
Dana Strand Beach, AWMA	A	A	B	A+
Ocean Institute Beach, SERRA	A+	A+	A	A+
North Beach - Doheny	**F**	**F**	**F**	
Doheny Beach, north of San Juan Creek	A	B	F	F
San Juan Cr/Ocean Interface	**C**	**D**	**F**	**F**
1000' south of SERRA Outfall	A	B	F	F
2000' south of SERRA Outfall	A	B	F	F
3000' south of SERRA Outfall	A	A	F	F
4000' south of SERRA Outfall	A	A	D	D
5000' south of SERRA Outfall	A	A	C	B
7500' south Outfall, projection of Camino Estrella	A	A	D	A+
10000' south of SERRA Outfall, #5505 Beach Road	A	A	B	A
SAN CLEMENTE				
14000' so. of SERRA Outfall, San Clemente Poche Beach	**F**	**F**	**F**	**B**
20000' so. Outfall - San Clemente, proj. of Avenida Pico	A	A	C	A
Lifeguard Building, north of San Clemente Pier	A	A	B	A+
Trafalgar Street Beach	A+	A+	A+	
Avenida Calafia	A+	A+	A	A+
Las Palmeras	A+	A+	A	A+
DANA POINT HARBOR				
Baby Beach, West End	A			
Baby Beach, Buoy Line	A			
Baby Beach, Swim Area	A	A	B	
Baby Beach, East End	A	A	C	
Guest Dock, End, West Basin	A+			
Youth Dock	A			

County "Beach Bummer" names appear in **bold.**

APPENDIX C1

Los Angeles County	AB411 (April-Oct)	Dry Year-Round	Wet Year-Round	Winter Dry (Nov-Mar)
MALIBU				
Leo Carrillo Beach at Arroyo Sequit Creek mouth	A+	A	C	B
Nicholas Beach at San Nicholas Canyon Creek mouth	A	A	A	A+
El Pescador State Beach between Lachusa and Los Aliso creeks	A+	A+	A	A+
Encinal Canyon at El Matador State Beach	A	A	A	A
Broad Beach at Trancas Creek mouth	A	A	F	D
Zuma Beach at Zuma Creek mouth	A	A	D	A+
Walnut Creek, projection of Wildlife Road (private)	A+	A	A+	A
unnamed creek, projection of Zumirez Drive, Little Dume	B	C	D	F
Paradise Cove Pier at Ramirez Canyon Creek mouth	**D**	**F**	**F**	**F**
Escondido Creek, just east of Escondido State Beach	A	C	F	F
Latigo Canyon Creek mouth	A+	A	C	A
Solstice Canyon at Dan Blocker County Beach	**C**	**F**	**F**	**F**
Puerco Beach at 24822 Malibu Road	A	A	A	A
Puerco State Beach at creek mouth	B	B	D	F
Marie Canyon storm drain at Puerco Beach	**D**	**D**	**F**	**B**
Malibu Colony Fence	A+	A+	B	A+
Surfrider Beach, breach point (daily)	**B**	**F**	**F**	**F**
Malibu Pier, 50 yards east	B	C	F	F
Carbon Beach at Sweetwater Canyon	A+	A	D	F
Las Flores State Beach at Las Flores Creek	A	A	B	A
Big Rock Beach at 19948 PCH stairs	A	A	C	A+
Pena Creek at Las Tunas County Beach	A+	A+	A	A+
Topanga State Beach at creek mouth	**F**	**F**	**F**	**F**
Castlerock storm drain at Castle Rock Beach	A	A	A	A+
WILL ROGERS STATE BEACH				
17200 Pacific Coast Hwy, 1/4 mile east of Sunset drain	A	A	C	A+
16801 Pacific Coast Hwy, drain near fence	**F**	**D**	**D**	**A**
Pulga Canyon storm drain	A	A	B	A+
Temescal Canyon drain	**D**	**B**	**F**	**A+**
Santa Monica Canyon drain	A	B	F	F
SANTA MONICA				
at Montana Avenue drain	A	A	F	A+
at Wilshire Boulevard drain	A	B	F	F
Santa Monica Municipal Pier	A	A	F	C
at Pico/Kenter storm drain	A	A	F	F
at Strand Street, in front of the restrooms	A	A	D	A+
Ocean Park Beach at Ashland Avenue drain	A	A	D	A
VENICE CITY BEACH				
at the Rose Avenue storm drain	A	A	F	A
at Brooks Avenue drain	A	A	F	A+
at Windward Avenue drain	A	A	C	A

County "Beach Bummer" names appear in **bold.**

APPENDIX C1

Los Angeles County, cont'd.	AB411 (April-Oct)	Dry Year-Round	Wet Year-Round	Winter Dry (Nov-Mar)
VENICE CITY BEACH				
Fishing Pier, 50 yards south	A+	A+	D	A+
at Topsail Street	A	A	F	A
MARINA DEL REY				
Mothers' Beach, playground area	A	B	F	F
Mothers' Beach, lifeguard tower	A	A	F	C
Mothers' Beach, between tower and boat dock	A	A	F	A+
DOCKWEILER STATE BEACH				
at Ballona Creek mouth	B	B	F	D
at Culver Boulevard drain	A	A	B	A+
N. Westchester storm drain at Dockweiler State Beach	A	A	A	A+
at World Way, south of D&W jetty	A	A	C	A+
at Imperial Highway drain	A	A	A	D
Hyperion Treatment Plant, One Mile Outfall	A+	A+	C	A+
at Grand Avenue drain	A	A	F	A
MANHATTAN BEACH				
Manhattan State Beach at 40th Street	A	A	B	A
at 28th Street drain	A	A	F	C
Manhattan Beach Pier drain	A	A	B	A+
HERMOSA BEACH				
at 26th Street	A+	A	D	D
Hermosa Beach Pier, 50 yards south	A	A	A	A
Herondo Street storm drain, in front of drain	A	A	F	D
REDONDO BEACH				
Redondo Municipal Pier, south side	B	C	D	F
Redondo Municipal Pier, 100 yards south	A	A	D	A
at Sapphire Street	A	A	D	A
at Topaz Street, north of jetty	A	A	C	B
TORRANCE				
Torrance Beach at Avenue I drain	A	A	C	A
PALOS VERDES PENINSULA				
Malaga Cove, Palos Verdes Estates (daily)	A	A	A	A+
Malaga Cove, Palos Verdes Estates (weekly)	A	A	A	A+
Bluff Cove, Palos Verdes Estates	A+	A+	A+	A+
Long Point, Rancho Palos Verdes	A+	A	A	A
Abalone Cove Shoreline Park	A+	A+	B	A+
Portuguese Bend Cove, Rancho Palos Verdes	A	A	B	A+
SAN PEDRO				
Royal Palms State Beach	A	A	A	C
Wilder Annex, San Pedro	A+	A	B	A
CABRILLO BEACH				
oceanside	A+	A	B	B
harborside at restrooms	**F**	**F**	**F**	**F**
harborside at boat launch	A	A	D	F

County "Beach Bummer" names appear in **bold.**

	AB411 (April-Oct)	Dry Year-Round	Wet Year-Round	Winter Dry (Nov-Mar)
AVALON BEACH, CATALINA ISLAND				
between BB restaurant and Tuna Club	**F**			
between Pier and BB restaurant, 2/3	**F**			
between Pier and BB restaurant, 1/3	**F**			
between storm drain and Pier, 2/3	**F**			
between storm drain and Pier, 1/3	**D**			
LONG BEACH CITY BEACH				
projection of 5th Place	C	C	F	A+
projection of 10th Place	C	C	F	A
projection of Molino Avenue	**D**	**D**	**F**	**A**
projection of Coronado Avenue	**C**	**D**	**F**	**F**
Belmont Pier, westside	C	B	F	B
projection of Prospect Avenue	C	B	F	A
projection of Granada Avenue	A	A	F	B
projection of 55th Place	A	A	F	B
projection of 72nd Place	B	B	F	A
ALAMITOS BAY				
2nd Street Bridge and Bayshore	C	C	F	F
shore float	A	C	F	F
Mother's Beach, Long Beach, north end	C	F	F	F
56th Place, on bayside	C	D	F	F
COLORADO LAGOON				
north	**F**	**F**	**F**	**F**
south	**F**	**F**	**F**	**F**

Ventura County

RINCON BEACH				
25 yards south of creek mouth	A+	A+	C	A+
100 yards south of creek mouth	A+			
MUSSEL SHOALS BEACH				
south the drain	A+			
OIL PIERS BEACH				
south of drain, bottom of wood staircase	A+	A+	B	A+
HOBSON COUNTY PARK				
base of stairs to the beach	A+			
FARIA COUNTY PARK				
south of drain at north end of park	A+	A	C	A
MANDOS COVE				
south of drain	A+			
SOLIMAR BEACH				
south, end of east gate access road	A	A	C	A
EMMA WOOD STATE BEACH				
50 yards south of first drain	A+	A	B	A

County "Beach Bummer" names appear in **bold.**

APPENDIX C1

Ventura County, cont'd.	AB411 (April-Oct)	Dry Year-Round	Wet Year-Round	Winter Dry (Nov-Mar)
SURFER'S POINT				
at Seaside, end of access path via wooden gate	A	A	D	A
PROMENADE PARK				
Figueroa Street	A	A	D	A
Redwood Apts.	A			
Holiday Inn, south of drain at California Street	A			
SAN BUENAVENTURA BEACH				
south of drain at Kalorama Street	A			
south of drain at San Jon Road	A	A	D	A
south of drain at Dover Lane	A			
south of drain at Weymouth Lane	A			
VENTURA HARBOR				
Marina Park, beach at north end of playground	A			
Peninsula Beach, beach area north of South Jetty	A			
Surfer's Knoll, beach adjacent to parking lot	A	A	D	A
OXNARD BEACH				
5th Street, south of drain	A+			
Outrigger Way, south of drain	A+			
Oxnard Beach Park, Falkirk Avenue, south of drain	A+			
Oxnard Beach Park, Starfish Drive, south of drain	A+			
HOLLYWOOD BEACH				
La Crescenta Street, south of drain	A+			
Los Robles Street, south of drain	A	A	A	A+
CHANNEL ISLANDS HARBOR				
Hobie Beach Lakshore Drive	A+	A+	B	
Beach Park at south end of Victoria Avenue	A+	A	D	A
SILVERSTRAND				
San Nicholas Avenue, south of jetty	A+	A+	B	A+
Santa Paula Drive, south of drain	A+	A+	A	A+
Sawtelle Avenue, south of drain	A+	A+	A	A+
PORT HUENEME BEACH PARK				
50 yards north of Pier	A	A	A	A+
ORMOND BEACH				
J Street drain, 50 yards south of drain	A	A	A	A+
Oxnard Industrial drain, 50 yards north of drain	A+	A+	A	
Arnold Road	A+	A+	A	
Point Mugu Beach, adjacent to parking lot entry	A+			
THORNHILL BROOME BEACH				
adjacent to parking lot entry	A+			
SYCAMORE COVE BEACH				
50 yards south of the creek mouth	A+			
COUNTY LINE BEACH				
50 yards south of the creek mouth	A+			
STAIRCASE BEACH				
bottom of staircase	A+			

County "Beach Bummer" names appear in **bold.**

Santa Barbara County	AB411 (April-Oct)	Dry Year-Round	Wet Year-Round	Winter Dry (Nov-Mar)
GUADALUPE DUNES	A			
JALAMA BEACH	A	A	C	
GAVIOTA STATE BEACH	A	A	A+	
REFUGIO STATE BEACH	A	A	C	A
EL CAPITAN STATE BEACH	A	A	B	A
SANDS AT COAL OIL POINT	A	A	C	A
GOLETA BEACH	C	B	C	A
HOPE RANCH BEACH	A	A	C	A
Arroyo Burro Beach	**F**	**F**	**F**	**B**
LEADBETTER BEACH	C	B	C	B
EAST BEACH				
at Mission Creek	B	C	F	F
at Sycamore Creek	A	A	F	A
BUTTERFLY BEACH	A	A	C	C
HAMMOND'S BEACH	A	A	C	A
SUMMERLAND BEACH	A	A	B	A+
CARPINTERIA STATE BEACH	A	A	C	A
RINCON BEACH				
at creek mouth				A
San Luis Obispo County				
SAN SIMEON				
at Pico Avenue	A+	A+	A+	A+
CAYUCOS STATE BEACH				
halfway between Cayucos Creek and the Pier	A	A	B	B
downcoast of the pier	A+	A	C	A
Studio Drive parking lot, near Old Creek	A+	A	A+	A
MORRO STRAND STATE BEACH				
projection of Beachcomber Drive	A	A	A	A
MORRO BAY CITY BEACH				
projection of Atascadero	A	A	A	F
Morro Creek, south side	A+	A	A+	A
75 feet north of main parking lot	A+	A	A	A
MONTANA DE ORO STATE PARK				
Hazard Canyon	A+	A+	A+	A+
OLDE PORT BEACH				
Harford Beach, north	A	A	C	A
AVILA BEACH				
projection of San Juan Street	A	A	D	A+
projection of San Luis Street	A+	A+	B	A+
PISMO BEACH				
sewers at Silver Shoals Drive	A	A	D	A+

County "Beach Bummer" names appear in **bold.**

San Luis Obispo County, cont'd.	AB411 (April-Oct)	Dry Year-Round	Wet Year-Round	Winter Dry (Nov-Mar)
PISMO BEACH				
projection of Wadsworth Street	A	A	B	A
Pismo Beach Pier, 50 feet south of the pier	**F**	**D**	**F**	**A**
projection of Ocean View	A	A	D	A+
330 yards north of Pier Avenue	A+	A+	A	A+
projection of Pier Avenue	A	A	B	A+
571 yards south of Pier Avenue, end of Strand Way	A+	A+	B	A+
Monterey County				
MONTEREY BEACH HOTEL				
downcoast of Robert's Lake outlet	A	A	A	
MONTEREY PENINSULA				
Monterey Municipal Beach, at the commercial wharf	**C**	**D**	**B**	
San Carlos Beach at San Carlos Beach Park	A	A	A+	
Lover's Point Park, projection of 16th Street	**D**	**D**	**B**	
Sunset Drive @ Asilomar	A	A	A+	
Spanish Bay, Moss Beach, end of 17 mile drive	A	A	A+	
Stillwater Cove, at Beach and Tennis Club	**C**	**D**	**A+**	
CARMEL CITY BEACH				
projection of Ocean Avenue, west end	A	A	A	
Santa Cruz County				
SANTA CRUZ				
Natural Bridges State Beach	A	A	C	A
Cowell Beach, at the Stairs	A+	A+	B	A+
Cowell Beach, Lifeguard Tower 1	**D**	**D**	**B**	**A+**
Cowell Beach, at wharf	**F**			
Santa Cruz Main Beach at the Boardwalk	A	A	B	A+
Santa Cruz Main Beach at the San Lorenzo River	B	A	C	A
Seabright Beach	A	A	C	A+
Twin Lakes Beach	A+	A	A	B
SOQUEL COVE				
Capitola Beach	**F**	**F**	**F**	**F**
Capitola Beach at jetty	A	A	C	A
New Brighton Beach	A	A	C	A
Seacliff State Beach	A	A	A	A+
Rio Del Mar Beach	A	A	B	A+

County "Beach Bummer" names appear in **bold.**

San Mateo County	AB411 (April-Oct)	Dry Year-Round	Wet Year-Round	Winter Dry (Nov-Mar)
PACIFICA				
Sharp Park Beach, projection of San Jose Avenue	A+	A+	A+	
Sharp Park Beach, projection of Birch Lane	A+	A+	A+	
Rockaway Beach at Calera Creek	A+	A+	A	A+
Linda Mar Beach at San Pedro Creek	A+	A	C	A
MONTARA STATE BEACH				
at Martini Creek	A+	A+	A	A+
MOSS BEACH				
Fitzgerald Marine Reserve at San Vicente Creek	B	B	D	A
PILLAR POINT				
#8 Mavericks Beach Westpoint Avenue	A	A	D	A+
Pillar Point Harbor, end of Westpoint Avenue # 7	**D**	**C**	**F**	**F**
HALF MOON BAY				
Surfer's Beach, south end of riprap	A+	A+	A	A+
Roosevelt Beach, south end of parking lot	A	A	A	A
Dunes Beach	A+	A+	A	A+
Venice Beach at Frenchman's Creek	A+	A+	A	A+
Francis Beach at the foot of the steps	A+	A+	A	A+
POMPONIO STATE BEACH at Pomponio Creek	A+			
PESCADERO STATE BEACH at Pescadero Creek	B			
SOUTH COASTSIDE				
Bean Hollow State Beach	A			
Gazos Beach at Gazos Creek	A+			
BAYSIDE				
Oyster Point	A	A	D	
Coyote Point	A+	A+	C	
Aquatic Park	**D**	**D**	**F**	
Lakeshore Park, behind Rec Center	**D**	**D**	**F**	

East Bay - Alameda/Contra Costa Co.				
ALAMEDA POINT				
North	A	A	C	
South	A+	A	A	
CROWN BEACH				
Bath House	A+	A+	A	
Windsurfer Corner	A+	A+	B	
Sunset Road	A+	A+	B	
2001 Shoreline Drive	A+	A	B	
Bird Sanctuary	A	A	C	
KELLER BEACH				
North Beach	**F**	**F**	**A**	
Mid Beach	**F**	**F**	**A**	
South Beach	**D**	**D**	**B**	

County "Beach Bummer" names appear in **bold.**

San Francisco County	AB411 (April-Oct)	Dry Year-Round	Wet Year-Round	Winter Dry (Nov-Mar)
AQUATIC PARK BEACH				
Hyde Street Pier, projection of Larkin Street	A+	A	A	C
211 Station	A	B	B	D
CRISSY FIELD BEACH				
East, 202.4 Station	A+	B	C	F
West 202.5 station	A+	A	B	F
BAKER BEACH				
East, Ocean #15 East	A	A	A	A
Lobos Creek	**F**	**F**	**B**	**B**
West, Ocean #16	A	A	A	B
CHINA BEACH, end of Sea Cliff Avenue	A+	A	A	A
OCEAN BEACH				
projection of Balboa Avenue	A+	A+	B	A+
projection of Lincoln Way	A+	A	B	A
projection of Sloat Boulevard	A+	A+	A	A+
CANDLESTICK POINT				
Jackrabbit Beach	A	A	B	A+
Windsurfer Circle	**D**	**F**	**F**	**F**
Sunnydale Cove	**D**	**C**	**F**	**A+**

Marin County				
TOMALES BAY				
Dillon Beach	A+			
Lawson's Landing	A			
Miller Park	A+			
Heart's Desire	A+			
Shell Beach	A			
Millerton Point	A			
DRAKES BAY				
Drake's Beach	A+			
Limantour Beach	A+			
BOLINAS BAY				
Bolinas Beach, Wharf Road	A+			
Stinson Beach, North	A+			
Stinson Beach, Central	A+			
Stinson Beach, South	A+			
MUIR BEACH				
North	A			
Central	A			
South	A+			
RODEO BEACH				
North	A+			
Central	A			
South	A			

County "Beach Bummer" names appear in **bold.**

	AB411 (April-Oct)	**Dry** Year-Round	**Wet** Year-Round	**Winter Dry** (Nov-Mar)
BAKER BEACH				
Horseshoe Cove SW	A			
Horseshoe Cove NW	A			
Horseshoe Cove NE	A			
SCHOONMAKER BEACH	A+			
CHINA CAMP	A			
Sonoma County				
CAMPBELL COVE STATE PARK BEACH	A			
Mendocino County				
MACKERRICHER STATE PARK at Mill Creek	A+			
MACKERRICHER STATE PARK at Virgin Creek	A+			
PUDDING CREEK OCEAN OUTLET	A+			
BIG RIVER NEAR PCH	A+			
VAN DAMME STATE PARK at the Little River	A+			
Humboldt County				
TRINIDAD STATE BEACH near Mill Creek	A+			
OLD HOME BEACH	A			
LUFFENHOLTZ BEACH near Luffenholtz Creek	A			
MOONSTONE COUNTY PARK Little River State Beach	A			
CLAM BEACH COUNTY PARK near Strawberry Creek	A			
MAD RIVER MOUTH north	A+			

County "Beach Bummer" names appear in **bold.**

APPENDIX C2

2010 Summer Beach Report Card Grades by County for Washington

Clallan County		North	Mid	South	East	West
Dakwas Park Beach, Neah Bay			A+		A	A
Front Street Beach East, at Kal Chate Street	A+					
Front Street Beach East, at Pine Street	A					
Front Street Beach East, mid	A+					
Hobuck Beach		A+	A+ (midsouth)	A+		
Sooes Beach		A+	A+	A+		
Salt Creek Recreation Area		A+	A	A		
Cline Spit County Park		A+	A+	A+		
Hollywood Beach			A		B	A+
Port Williams Boat Launch		A+	A	B		
Grays Harbor						
Westport, The Groynes			A+		A+	A+
Westhaven State Park, Half Moon Bay		A+	A+	A		
Westhaven State Park, South Jetty		A+	A+	A+		
Island County						
Oak Harbor Lagoon		A+ (northwest)	A+	A+ (southeast)		
Oak Harbor City Beach Park			A		A+	F
Freeland County Park, Holmes Harbor			A+		F	D
Jefferson County						
Fort Worden State Park		A+	A	A+		
Herb Beck Marina			D		B	B
Point Whitney Tidelands			A+		A	C
King County						
Carkeek Park		A+	A+	A+		
Golden Gardens		A+	A	A		
Alki Beach Park		A+	A+	A+		
Lincoln Park		A+	A+	A+		
Seahurst County Park		A+	A+	A		
Saltwater State Park		A	A+	A+		
Redondo County Park		A	A+	A+		

Kitsap County		North	Mid	South	East	West
Indianola Dock			A		A+	A+
Fay Bainbridge State Park		A+	A	A+		
Scenic Beach State Park			A		A	A+
Silverdale County Park			D		A	A
Eagle Harbor Waterfront Park			D		A	A
Illahee State Park		A+	A	A		
Evergreen Park		A	A+	A		
Pomeroy Park, Manchester Beach		F	C	A		
Mason County						
Twanoh State Park, east of point	A					
Twanoh State Park, west of dock	A					
Twanoh State Park, west of point	A+					
Potlatch State Park		A+	A+	A		
Pierce County						
Purdy Sandspit County Park			A		A	A+
Owens Beach, Point Defiance Park		A+	A+	A		
Waterfront Dock, Ruston Way		A+	A	A		
Titlow Park		A	A	A+		
Snohomish County						
Kayak Point County Park		A+	A+	A+		
Howarth Park		B	A	A		
Picnic Point County Park		A	B	B		
Edmonds Underwater Park		A	A+	A		
Marina Beach Edmonds (No Dogs)		A	A	A+		
Thurston County						
Burfoot County Park		A+	A	A+		
Whatcom County						
Birch Bay County Park		A+	A+	D		
Marine Park Bellingham, outer	A+					
Marine Park Bellingham, inner east	A					
Marine Park Bellingham, inner west	A					
Larrabee State Park Wildcat Cove			A	A		A

APPENDIX C3

2010 Summer Beach Report Card Grades by County for Oregon

Clatsop County

SEASIDE BEACH	
at 12th Avenue	A+
at Broadway turn around	A+
at U Avenue	A+
INDIAN BEACH	
at the mouth of Indian Creek	A+
at the mouth of Canyon Creek	A+
CANNON BEACH	
at Ecola Creek mouth, 2nd Avenue	A+
ocean near Ecola Court storm outfall	A+
TOLOVANA STATE PARK BEACH	A+
HUG POINT	
Middle of cove at creek and beach access	A
South end of cove	A+

Tillamook County

OSWALD STATE PARK	
Short Sand Beach, north end	A+
Short Sand Beach, middle	A+
Short Sand Beach, at Short Sand creek	A+

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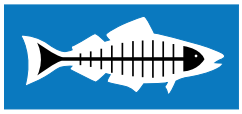
Location photography: Joy Aoki, Anthony Barbatto, Mari Reynolds, Luwin Kwan, Sean O'Flaherty, Heal the Bay
Surf photography courtesy of Anthony Barbatto www.barbatto.com
Production: Jessica Belsky, Mike Grimmer

Printed on recycled paper.



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