
BEACH REPORT CARD
Heal the Bay
2015-16
Beach Report Card

Heal the Bay

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

The Beach Report Card program is funded by grants from

SIMA SURF INDUSTRY MANUFACTURERS ASSOCIATION

SWAIN BARBER FOUNDATION

BEACH REPORT CARD

TABLE OF CONTENTS

Section I: Executive Summary

Photo: Arroyo Burro (Hendry's Beach), Santa Barbara County

EXECUTIVE SUMMARY

Heal the Bay's 26th Annual Beach Report Card℠ provides essential water quality information to the millions of people who swim, surf, or dive in the coastal waters of the West Coast. Essential reading for ocean users, the report card grades over 600 locations during the peak beach-going summer season on an A-F scale based on the risk of adverse health effects to swimmers and surfers. The report is not designed to measure the amount of trash or toxins found at beaches. The grades are based on daily and weekly fecal indicator bacteria (FIB) pollution levels in the surfzone. The program has developed from an annual review of beaches in Santa Monica Bay to weekly updates of all monitored beaches along the Pacific Coast. This information is available at www.healthebay.org.

The 2015-2016 Annual Beach Report Card shows that most beaches along the Pacific had near excellent water quality during the summer dry weather, with 548 of 620 (88%) locations receiving A grades. Also, there were 38 (6%) Bs, 14 (2%) Cs, eight (1%) Ds and 12 (2%) Fs. As in previous years, there continues to be a great disparity in water quality between dry and wet weather conditions. Of the 592 locations that were monitored during wet weather, 367 (62%) received very-good-to-excellent water quality marks during wet weather. There were 126 (21%) locations that received a grade of F during wet weather compared to only 2% during summer dry weather.

In California, numerous California beaches vied for the "Beach Bummer" crown this year (the monitoring location with the poorest dry weather water quality). The 10 finalists were: Pismo Beach Pier, south in San Luis Obispo County (10th), Pillar Point Harbor at Westpoint Ave. in San Mateo County (9th), Candlestick Point, Sunnydale Cove in San Francisco County (8th), Redondo Municipal Pier in Los Angeles County (7th), Mother's Beach—Marina del Rey in Los Angeles County (6th), Santa Monica Pier in Los Angeles County (5th), Monarch Beach, north at Salt Creek in Orange County (4th), Shoreline Beach Park at Shelter Island—San Diego Bay in San Diego County (3rd), Clam Beach County Park near Strawberry Creek in Humboldt County (2nd), and Cowell Beach, west of the Wharf in Santa Cruz County (1st).

This past year there were a number of Beach news-worthy stories to report, including changes in the monitoring locations which may have impacted grades, and the kick off of Heal the Bay's Nowcast project, which will provide daily predictions of beach water quality. In addition to these, which are discussed in further detail in this report, two Southern California stories stood out because they made national news and impacted local water quality. The first story involved an oil spill in Santa Barbara County that impacted beaches for nearly two months during the summer season. With 100,000 gallons of crude oil spilling into the ocean near Refugio State Beach, local beaches from Gaviota State Beach to Coal Oil Point in Isla Vista were closed to fishing and swimming during the cleanup. The oil spread as far south as Crystal Cove in Orange County, and impacted a number of beaches in Ventura and Los Angeles counties as well. The second story was an unintended discharge of Materials of Sewage Origin (MOSO) from the City of Los Angeles' Hyperion Wastewater Treatment Plant during its 1-mile diversion. Within days of starting the project—this involved switching the 250 million gallons of effluent per day (mgd) from the 5-mile outfall pipe to the 1-mile emergency while work was completed on the pump-head for the 5-mile pipe—beachgoers began finding large amounts of tampon applicators, condoms, and needles washing ashore. The beaches were closed from September 23rd through the 26th as a public safety precaution. The City's Technical Advisory Committee determined the MOSO came from a 2005 sewage spill. It remains to be seen what actions will be required by the State to remediate these impacts and ensure they do not happen again. Both items should be heard by a regulatory authority this year.

The Beach Report Card is based on the routine water quality monitoring of beaches conducted by local health agencies and dischargers. Without these monitoring programs, the public health of beachgoers is seriously jeopardized. As such federal and state funding are critical to support local beach monitoring programs. Yet, once again the President's FY 2016 BEACH ACT grant funds, which amount to a total of approximately $10 million, were 'red-lined'. Thankfully the Senate Appropriations Committee has reinstated the budgetary line item for 2016. This and several other beach policy related issues are discussed in further detail in this report.

Heal the Bay believes the public has the right to know the water quality at their favorite beaches, and is proud to provide Californians this information in an easy-to-understand format. We hope that beachgoers will use this information to decide what they are most comfortable with in terms of relative risk, and then make the necessary decisions to protect their health. The Beach Report Card would not be possible without the cooperation of all of the shoreline monitoring agencies in the state.

Regardless of the grades, county health officials and Heal the Bay recommend that beach users never swim or surf within 100 yards of any flowing storm drain, or in any coastal water during, and for three days after, a rainstorm. Storm drain runoff can be 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 counts usually far exceed state health criteria for recreational water use.

For more information, please log onto www.healthebay.org, or call 1-800-HEAL BAY.

Section II: West Coast Summary

West Coast Beach Water Quality Overview
California Overview
California Honor Roll
California Beach Bummers
Analysis by Beach Type

Photo: View of Los Angeles County South Bay from Manhattan Beach Pier

WEST COAST SUMMARY

Beaches in the U.S. accommodate nearly two billion beach visits each year[1] and provide enormous economic benefits to their communities. Beach visitors contribute to an estimated $90 billion coastal tourism economy[2] yet recreating at polluted beaches can also result in significant economic loss. A study conducted in Los Angeles County and Orange County concluded that the regional public health cost of gastrointestinal illnesses caused by recreating in polluted ocean waters was between $21 million and $51 million each year[3]. Beach water quality monitoring data helps to ensure the health protection of the millions of beachgoers who recreate in U.S. coastal waters.

Heal the Bay's Beach Report Card (BRC) was first published in 1991 for Los Angeles County on an annual basis. It has since grown to include an analysis of beach water quality for the entire west coast of the United States on a weekly basis. The BRC provides beachgoers throughout Washington, Oregon, and California with easy to understand water quality grades for their local beaches updated each week at beachreportcard.org.

The Beach Report Card (BRC) is based on the routine monitoring of beaches conducted by local health agencies and dischargers.

Water samples are analyzed for bacteria that indicate fecal pollution from numerous sources. Sample results are used to assign each location with an A-F grade, which represents the risk of adverse health effects to beachgoers based upon water quality. The better the grade a beach receives, the lower the risk of illness to ocean users.

This 2015-2016 Annual Beach Report Card is a summary of the past year's water quality at more than 600 beach monitoring locations along the West Coast for three distinct periods:

- Summer dry weather – months covered under Assembly Bill 411 [AB 411] in California – April through October 2015
- Winter dry weather – November 2015 through March 2016
- Year-round wet weather conditions – April 2015 through March 2016

The section concludes with an analysis of beaches by type (open ocean, enclosed, and storm drain impacted) for each of the three time periods.

For the first time in the Annual Report, Los Angeles County will not be alone in sampling directly at the outfall—point zero, where the discharge meets the ocean. Last summer, the State Water Resources Control Board required all coastal counties receiving state funds to monitor their beaches at 'point zero' (see discussion on "Point Zero Monitoring" on page 17). Heal the Bay believes that monitoring closest to a potential pollution source or outlet (point zero) gives the most accurate picture of water quality at these types of beaches and is also the most protective of public health.

In addition to summarizing ocean water quality, this report includes a brief review of the number of sewage spills[4] that impacted recreational waters over the past year.

WEST COAST BEACH WATER QUALITY OVERVIEW

The Pacific Northwest, specifically Washington, had excellent water quality last summer. Once again, over 90% of the 164 monitoring locations received an A grade, with only 12 shoreline locations (7%) receiving a grade of C or lower. As for Oregon, unfortunately due to funding constraints to the monitoring program, the frequency of sampling was not robust enough at the 44 beaches last summer for this report to produce a grade. Oregon's program relies entirely on funding from the Federal Beaches Environmental Assessment and Coastal Health Act (BEACH Act). As Federal support for the BEACH Act continues to be in flux, the state has not identified alternative funds to support a model monitoring program. Oregon and Washington monitor beach water quality at most locations from Memorial Day through Labor Day only.

Similar to Washington, beaches in California had excellent water quality overall this past year, with 434 of 456 (95%) locations receiving A or B grades during the summer dry weather period (Figure 2-1). For those beachgoers who braved the unseasonably warm water, the winter dry grades were on par with the summer season, with 319 of the 349 (92%) locations receiving A or B grades. Statewide, the increased rain this past year compared to previous years had a slight impact on wet weather water quality, which regressed with 57% A or B grades relative to last year's near all-time high of 69%.

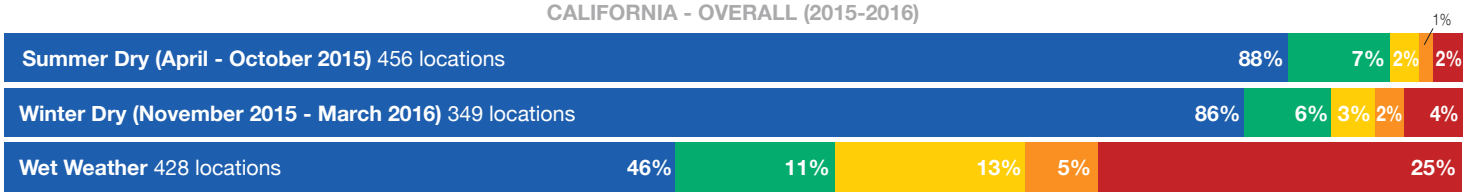
The wet weather component often associated with El Niño this past year materialized more for some counties than others. The northern counties down through Monterey County met their respective historic rainfalls. However, from San Luis Obispo down to San Diego County, San Diego was the only one to meet its 10.4" average with 10.73" of rain for this reporting year. Once again, rainfall levels in Southern California were below average. For example, precipitation levels in Santa Barbara and Orange were about 45% and 40% lower than their historic averages, respectively (Figure 4-1 on page 23). Beach water quality grades may be higher in a given year due to less runoff, yet the resulting improved water quality should not provide a false sense of long-term beach water quality improvement.

A list of all grades can be found in Appendix C.

1 http://water.epa.gov/type/oceb/beaches/basicinfo.cfm
2 National Ocean Economics Program, State of the U.S. Ocean and Coastal Economies, Center for the Blue Economy at the Monterey Institute of International Studies (2014)
3 Given, S. et al, Regional Public Health Cost Estimates of Contaminated Coastal Waters: A Case Study of Gastroenteritis at Southern California Beaches, 40 Environ. Sci. Technol. 4851 (2006)
4 All California Sewage Summary data came from the California State Water Resource Control Board and or the respective Health Departments.

FIGURE 2-1: CALIFORNIA GRADES

CALIFORNIA - OVERALL (2015-2016)



PREVIOUS FIVE YEAR AVERAGE (2010-2014)

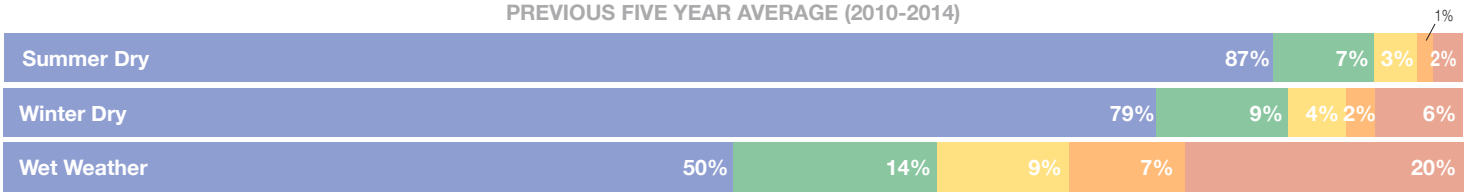
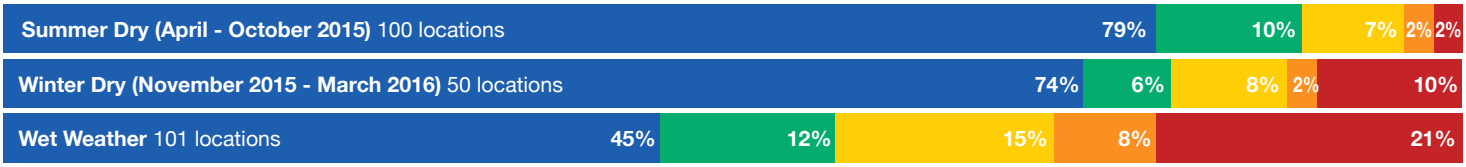


FIGURE 2-2: NORTHERN CALIFORNIA GRADES

Combined grades for Santa Cruz, San Mateo, Alameda, San Francisco, Contra Costa, Marin, Sonoma, Mendocino, Humboldt, and Del Norte Counties

NORTHERN CALIFORNIA (2015-2016)



PREVIOUS FIVE YEAR AVERAGE (2010-2014)

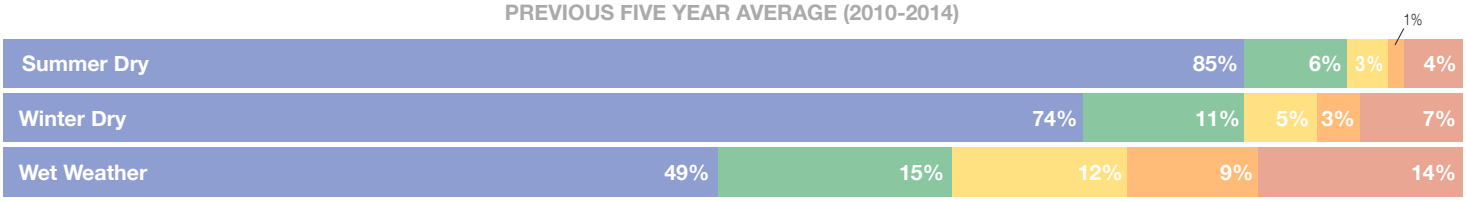
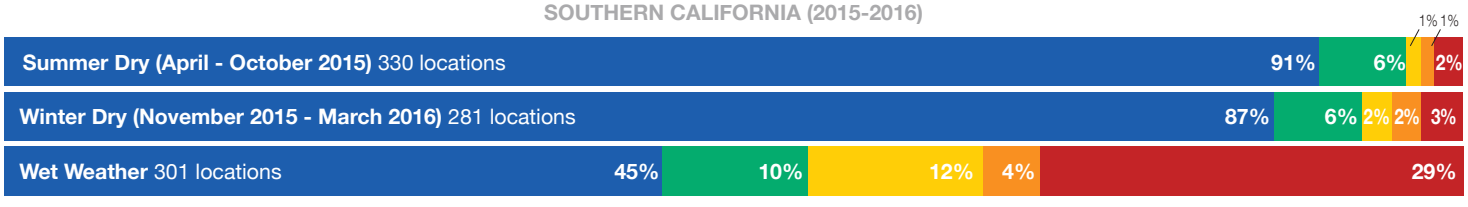


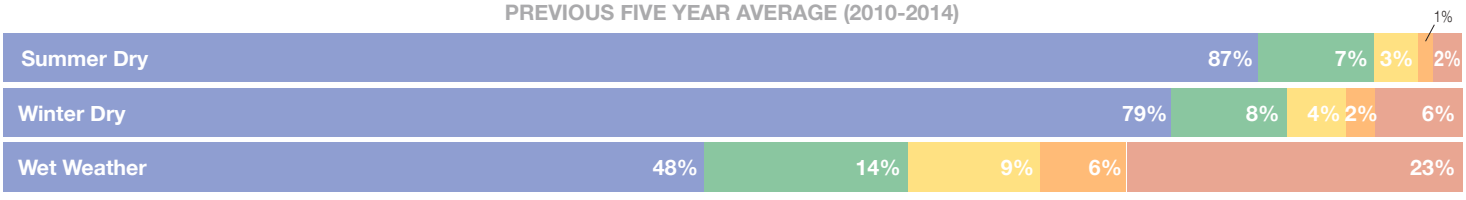
FIGURE 2-3: SOUTHERN CALIFORNIA GRADES

Combined grades for Santa Barbara, Ventura, Los Angeles, Orange and San Diego Counties

SOUTHERN CALIFORNIA (2015-2016)



PREVIOUS FIVE YEAR AVERAGE (2010-2014)



Key: A B C D F

CALIFORNIA OVERVIEW

Like last year, California's overall water quality during the summer dry time period was excellent with 95% (434 of 456) A or B grades, which was slightly above the five-year average (Figure 2-1). Also similar to last year, there were 22 monitoring locations that received fair to poor water quality marks (C-F grades) for the same time period. During winter dry weather, most California beaches mirrored the summer months, with 319 of 349 (92%) locations monitored receiving A or B grades—which is an all-time record. Lower grades during the winter dry weather time period include: 10 C grades (3%), 6 D grades (2%) and 14 F grades (4%).

As for Northern California beaches, we saw almost excellent summer dry weather water quality with 89% (89 of 100) A or B grades. This was slightly below the 5-year average of 91%. Winter dry weather was a bit lower than the summer grades, with 40 of 50 (80%) of the monitored locations receiving A or B grades. When the AB411—the law that requires summer time monitoring—season ends in October, so do a number of county monitoring programs. Wet weather A and B grades were 57% (57 of 101), with over 21% F grades. These grades were based on an average of 10 samples collected.

In the San Francisco Bay area (Marin County through San Mateo County) specifically, summer dry weather grades were excellent for ocean-side beaches—beach locations west of the Golden Gate Bridge, with 95% (38 of 40) receiving A or B grades. For beachgoers who visit the bay-side (beaches within the San Francisco Bay), water quality grades were very good, with 85% (24 of 28) of the monitored locations receiving A or B grades. Winter dry weather water quality dipped slightly compared to the summer, with 18 of the 22 (82%) ocean-side locations receiving A or B grades. Unfortunately, bay-side swimmers had slightly poorer water quality during winter dry weather with only 45% (5 of 11) A or B grades. Wet weather water quality between the ocean-side and bay-side mirrors statewide grades by beach type (see "Analysis by Beach Type" below). Approximately 71% (28 of 40) of ocean-side locations received an A or B grade compared to 39% (11 of 28) bay-side locations.

Southern California had excellent summer dry weather water quality with 97% A or B grades (Figure 2-3). This was the fifth year in a row of below average rainfall in Southern California and as a result its beaches experienced less urban runoff, which likely led to the improvement of overall grades.

As with every year, beach water quality plummeted when it rained (wet weather), with only 55% (167 of 301) of the monitoring locations receiving very good-to-excellent grades (A or B). In particular, 29% of the beaches monitored earned F grades (Figure 2-1), which was up two percentage points from last year. 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 recreational waters during, and for at least three days after a rainstorm.

CALIFORNIA HONOR ROLL

A select few (34) monitoring locations in California exhibited excellent water quality (A+ grades) during all three monitoring time

Photo 2-1: Abalone Cove on the Palos Verdes Peninsula has been on the Beach Report Card's Honor Roll for the past seven years.

FIGURE 2-4

2015-16 BEACH BUMMERS

1.	**Cowell Beach**, west of the Wharf	Santa Cruz County
2.	**Clam Beach**, near Strawberry Creek	Humboldt County
3.	**Shoreline Beach Park, Shelter Island**	San Diego County
4.	**Monarch Beach**, north at Salt Creek	Orange County
5.	**Santa Monica Pier**	Los Angeles County
6.	**Mother's Beach, Marina Del Rey**	Los Angeles County
7.	**Redondo Municipal Pier**, 100 yards south	Los Angeles County
8.	**Candlestick Point-Sunnydale Cove**	San Francisco County
9.	**Pillar Point**, end of West Point Ave. #7	San Mateo County
10.	**Pismo Beach Pier**, 40 feet south	San Luis Obispo County

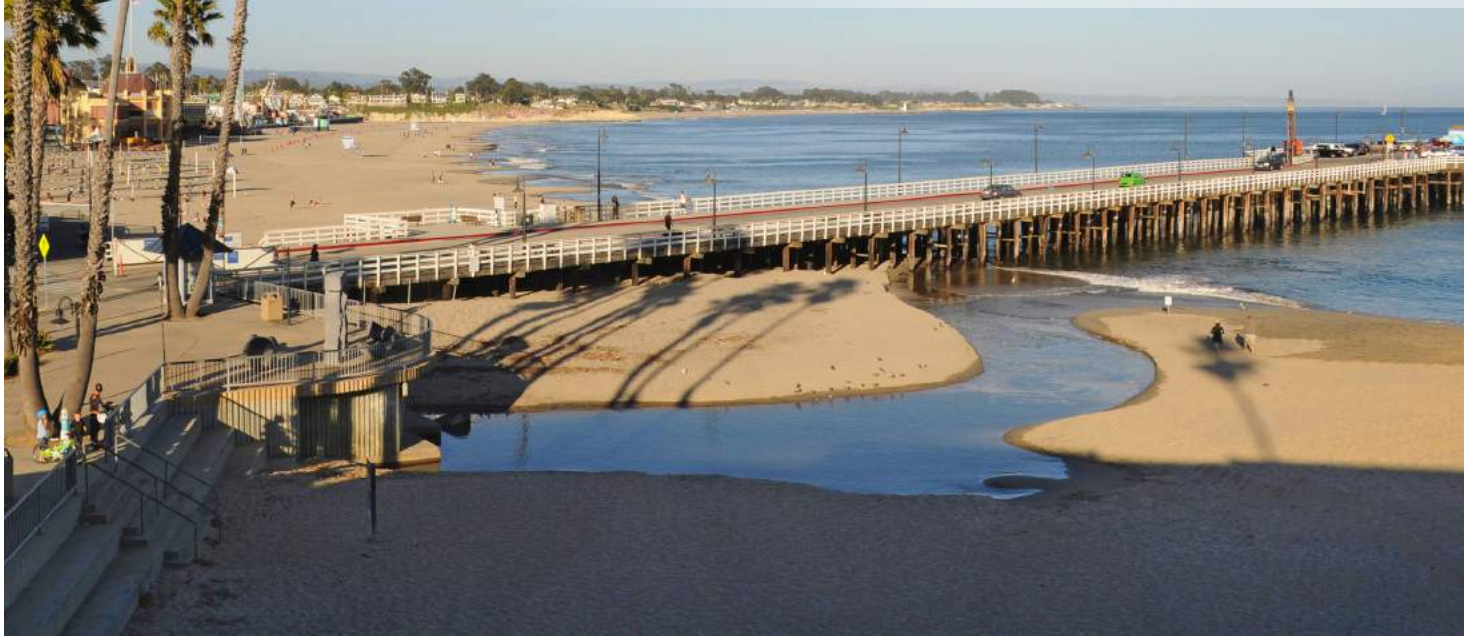


Photo 2-2: Cowell Beach in Santa Cruz received the poorest water quality grades in California for the third consecutive year. It has appeared at the No.1 or No. 2 spot since 2009.

periods in this report and have earned spots on Heal the Bay's Honor Roll this year. A list of all Honor Roll recipients can be found in Appendix B.

CALIFORNIA BEACH BUMMERS

Heal the Bay designates the monitoring locations with the poorest dry weather water quality in California over the past year as annual "Beach Bummers." (Figure 2-4). The top ten Beach Bummers are:

1. COWELL BEACH, SANTA CRUZ // AT THE WHARF

For the third year in a row, Cowell Beach claims the infamous No. 1 Beach Bummer spot this year. For the last seven years, Cowell Beach has been ranked either No.1 or No.2 on the Beach Bummer list. 62% of samples taken during the 2015 summer dry period exceeded at least one state bacterial standard at this location. Work is currently underway to install steel bird fencing under the pier to prevent roosting and is projected to be finished within the next two months. The Cowell Beach Working Group and City of Santa Cruz officials hope that this installment will help reduce at least one of the sources of bacterial contamination impacting this location.

2. CLAM BEACH COUNTY PARK // NEAR STRAWBERRY CREEK

With 42% (14) of the 33 dry weather samples collected during the summer dry period exceeding at least one state bacterial standard, Clam Beach County Park made the Beach Bummer List for the third year in a row, moving up to the No. 2 spot this year. This site is fed by two creeks, Patrick Creek and Strawberry Creek. Officials report that the nature of the outlet of Strawberry Creek to Clam Beach has changed from a sandy, seasonally braded and

shallow flow to a more constant steady flow that is almost riparian in nature. One possible cause of this change is the now absent beaver dam upstream that once dammed portions of Strawberry Creek. This change has likely altered the retention time and flow of the creek before it reaches the beach. Potential upstream bacterial sources include onsite sewage treatment systems, wildlife, and domestic animals.

3. SHELTER ISLAND, SHORELINE BEACH PARK

Water quality issues at Shelter Island, Shoreline Beach Park in San Diego date back to the year 2000. In fact, in the 2001-2002 Annual BRC report, Shelter Island made the Beach Bummer list at the number nine spot. However, subsequent to 2003, Shelter Island, Shoreline Beach Park never received lower than a B grade—for 12 straight years. We were surprised to see it back on the Beach Bummer list this year. With 45% (14) of the 31 dry weather summer samples exceeding a state bacterial standard, what changed here to make this site so problematic for beachgoers and bay-users? Circulation issues tend to plague enclosed waterbodies like San Diego Harbor, however since grades at this beach have been historically good for more than a decade, the concern is that there is another unidentified source causing these exceedances.

4. MONARCH BEACH, DANA POINT // NORTH AT SALT CREEK

Monarch Beach joins the list this year at the No. 4 spot, with 27% of samples collected during summer dry weather exceeding at least one state bacterial standard. It has been nearly 10 years of great water quality on our annual reports—seven A and two B grades—since Monarch Beach last received a D grade (2005-06 Annual Report). What happened here? This site was likely impacted simply by the relocation of the monitoring station to point zero—where a river, creek, or storm drain flow meets the ocean water. Historically, water quality samples at this site were collected at a set distance away from the storm drain—typically 25, 50, or 83 yards away. From a public health protection perspective, Heal the Bay has advocated for point zero sampling for more than 10 years. Heal the Bay believes that monitoring closest to a potential pollution source or outlet (point zero) gives the most accurate picture of water quality at these types of beaches and is also the most protective of public health.

The City of Dana Point has invested a considerable amount of resources ensuring that runoff from areas surrounding Monarch Beach is treated prior to discharging any flow into this waterbody. For example, they have an Ozone Treatment Facility that treats dry weather runoff from May through November. The treated runoff is then returned to Salt Creek just prior to reaching the ocean. Unfortunately, like most natural creek systems flowing to the ocean, creeks often meander, rather than flowing in a straight path to the sea.

The local agencies have argued that the meandering portion of Salt Creek has facilitated a greater bird population, and in turn increased the amount of bird feces at this location—ultimately leading to the poor water quality. We recommend further investigation to identify the cause of the decline in water quality at Monarch Beach.

5. SANTA MONICA PIER

Despite past successes in improving beach water quality, the Santa Monica Pier unfortunately continues to stay on the Beach Bummer list, ranking at No. 5 this year. From 2011 to 2012, Heal the Bay partnered with the City of Santa Monica and the University of California at Los Angeles to conduct a Bacterial Source study. The study results indicated that (1) conditions under the pier (moisture and lack of sunlight) promote bacterial persistence, (2) bird specific bacteria were detected, and (3) human specific bacteria were undetected. The City continues to implement best management practices to improve beach water quality.

Following past efforts to keep the beach water around Santa Monica Pier safe for swimming, the City was approved for a Clean Beaches Initiative (CBI) grant to build a regional, multi-benefit project that will capture the wet weather runoff from the sub-watershed

Photo 2-3: Shoreline Beach Park on Shelter Island, San Diego reappears on the Top Ten Beach Bummer list for the first time since 2001-02.

FIGURE 2-5: MOTHER'S BEACH, MARINA DEL REY

	2014-2015			2015-2016		
	Summer Dry	Winter Dry	Wet Weather	Summer Dry	Winter Dry	Wet Weather
Playground Area	F	F	F	C	F	F
Lifeguard Tower	F	F	F	B	D	F
Between Tower/ Boat Dock	F	F	F	F	F	F

Photo 2-4: Marina del Rey's Mother's Beach has received poor grades in all weather.

that drains to the Santa Monica Pier storm drain. The runoff will be stored in a tank to supply water to the nearby Santa Monica Urban Runoff Recycling Facility (SMURRF) during dry weather periods when there is greater capacity. Any runoff overflow will be directed to the sanitary sewer system. Once implemented, the project will treat both dry and wet weather runoff flows, which will greatly reduce the amount of stormwater that enters Santa Monica Bay from city streets and hopefully improve water quality at the pier.

6. MOTHER'S BEACH, MARINA DEL REY

With another year of very poor water quality, Mother's Beach in Marina del Rey has once again landed itself a place on the Beach Bummer list. Mother's Beach at the Playground area had grades of C, F, and F for summer, winter, and wet weather time periods. Mother's Beach at the lifeguard tower had grades of B, D, and F respectively for the same time periods. Mother's Beach between the Lifeguard tower and boating dock had grades of F, F, and F for summer, winter, and wet weather time periods. Unfortunately, the water quality improvement measures that have been implemented at Mother's Beach have not resulted in noticeable changes. This includes a circulation device, which was supposed to improve water flow thereby reducing bacteria concentrations, and bird wires, which are designed to deter birds from the area. Signage has also been installed to notify beachgoers about the poor water quality. As with most enclosed waterbodies throughout the state, poor water quality is exacerbated in areas with poor water circulation.

7. REDONDO MUNICIPAL PIER
// 100 YARDS SOUTH

A new addition to this year's Beach Bummer list, Redondo Municipal Pier has earned itself the No. 7 spot on the list. Interestingly, summer (April through October) exceedances at this location did not begin to occur until the Hyperion Treatment Plant began its planned diversion on September 21st. The planned diversion involved discharging effluent out the one-mile pipe located off Dockweiler Beach instead of the regularly used 5-mile discharge pipe, so that work to repair an es-

sential pump header on the 5-mile pipe could take place. There were no rainfall events within 72 hours prior to any of these exceedances. While this site has had historically poor wet weather water quality - likely due to storm drain impacts - there has never been an F summer dry weather grade at this location. We will keep an eye on Redondo Pier this summer to determine if this is an ongoing trend. See "Hyperion 1-mile Diversion project and MOSO event" in the Beach News section for more information.

8. CANDLESTICK POINT-SUNNYDALE COVE, SAN FRANCISCO COUNTY

For the past three years, the Candlestick Point area has had a shoreline monitoring location on the Top 10 Beach Bummer list—Windsurfer Circle (2013—Ranked 9th; 2014—Ranked 10th). The trend continued this year for Candlestick Point, with Sunnydale Cove lingering on the Bummer list at No. 8. As with most enclosed waterbodies throughout the state, poor water quality is exacerbated in areas with poor water circulation. While no definitive sources of fecal pollution have been identified within the area, the local monitoring agency should conduct a source identification study to determine what is causing the poor water quality.

9. PILLAR POINT, SAN MATEO // END OF WESTPOINT AVE. #7

Pillar Point rejoins the Beach Bummer list this year ranking at the No. 9 spot. The sampling location is within an enclosed harbor, and as with most enclosed water bodies throughout the state, there is a higher level of uncertainty about the quality of water when swimming here. For example, from 2004 through 2006, Pillar Point harbor was on the Beach Bummer list (#5, #8, and #6). Then water quality improved to B and A grades from 2007 through 2009. The trend reverted back to poor water quality during the summer months with three straight D's from 2010 through 2012, only to reverse itself to great water quality with an A grade in 2013. The summer grades at this location for the last three years have been C, B, and D.

The site is also adjacent to a lagoon, which may be great for tide pooling, but is a likely contributor to the high bacterial counts in the area, and compounded by reduced circulation.

10. PISMO BEACH PIER // 40 FEET SOUTH OF THE PIER

Over the past few years, this location appeared to be on the upturn after historic poor water quality. Despite water quality improvements in recent years during the summer swimming season (2012-B; '13-A; '14-C; and '15-A), water quality at Pismo Beach south of the pier declined in 2015, ranking it at No. 10 on our Beach Bummer list. The 'lost decade' for this location spanned from 2002 to 2011 when water quality during the summer was regularly problematic (2-Bs; 2-Cs; 2-Ds; and 3-Fs) relative to other San Luis Obispo beaches. As water quality improved elsewhere throughout the State, this location had enough exceedances to warrant making the Beach Bummer list.

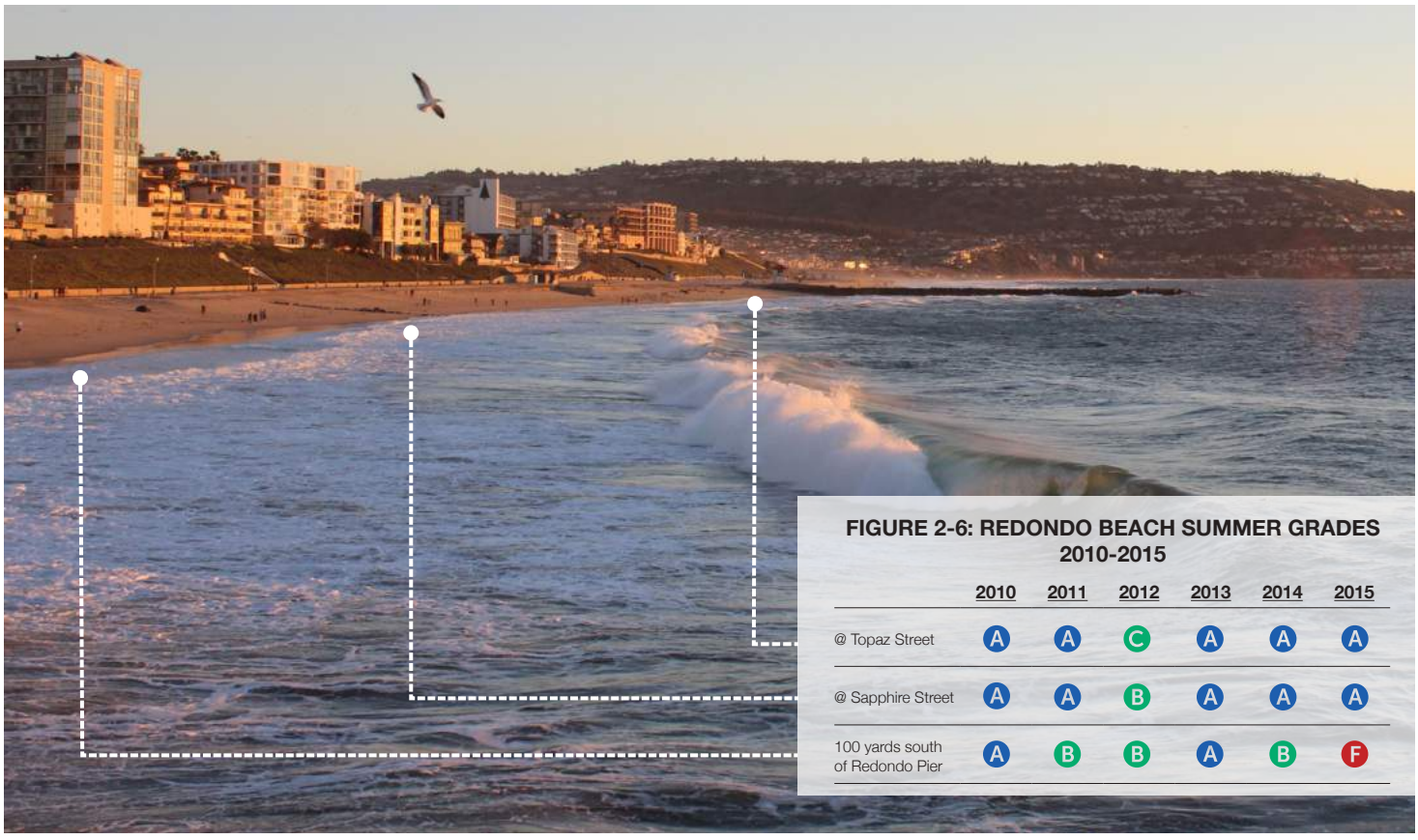


FIGURE 2-6: REDONDO BEACH SUMMER GRADES 2010-2015

	2010	2011	2012	2013	2014	2015
@ Topaz Street	A	A	C	A	A	A
@ Sapphire Street	A	A	B	A	A	A
100 yards south of Redondo Pier	A	B	B	A	B	F

Photo 2-5: Despite historically poor wet weather quality, summer dry grades just south of the Redondo Beach Pier are typically good – until this year.

ANALYSIS BY BEACH TYPE

California's beach grades were separated and compared by beach type to determine if differences existed in water quality at various beaches. Beaches were divided into three categories: 1) open ocean beaches; 2) beaches adjacent to a creek, river, or storm drain (natural or concrete); and 3) beaches located within enclosed water bodies.

The grades were separated for all three time periods: summer dry season (April through October), winter dry weather (November through March) and year-round wet weather conditions. Figure 2-7 illustrates the grades by percent during each time period.

OPEN OCEAN BEACHES

In general, open ocean beaches with no known pollution sources exhibit excellent summer dry weather beach water grades. The past year was no exception, as nearly all open ocean beaches (71 of 73 or 97%) earned A grades for the summer dry weather time period. Redondo Beach Pier, south in Los Angeles County was the only location not to receive an A or B grade during summer dry weather. However, the water quality at Redondo Pier Beach may have been impacted by the City of Los Angeles' Hyperion Wastewater Treatment Plant diversion project—see Beach Bummer #7 and "Hyperion 1-mile Diversion project and MOSO event" in the Beach News section for more information. Winter dry weather grades at open ocean beaches were also excellent with 97% A or B grades (66 of 68), which was on a par with the five-year average (96% A or B grades). As for wet weather grades, this year's marks reverted to the 2013 levels, with 77% A and B grades, which was slightly below the five-year average (79% A or B grades).

STORM DRAIN IMPACTED BEACHES

Historically, Los Angeles County was one of a few counties in the entire state (along with Humboldt County, San Francisco County and portions of San Diego and Santa Cruz counties) to have a monitoring program that collected samples at a point directly in front of flowing storm drains and creeks, known as "point-zero." However, this was the first year that all monitoring agencies participating in the California Beach Program were required to sample at point-zero. Heal the Bay has long advocated for such action and believes that monitoring closest to a potential pollution source or outlet (point zero) gives the most accurate picture of freshwater impact to coastal water quality and is also the most protective of public health. As such, beachgoers can now be sure that County monitoring programs are much more alike, offering the same level of public health protection, than in previous years. This is a major step in achieving monitoring consistency from county to county, and meeting the intent of AB411—that all swimmers, waders, divers, and surfers have a fundamental 'right to know' about the quality of the water.

Despite this sampling change, water quality at storm drain impacted beaches still earned excellent summer dry weather grades with 96% A or B grades (190 of 199)—this was slightly lower than last year's

FIGURE 2-7: GOOD / POOR GRADES BY TIME PERIOD & BEACH TYPE

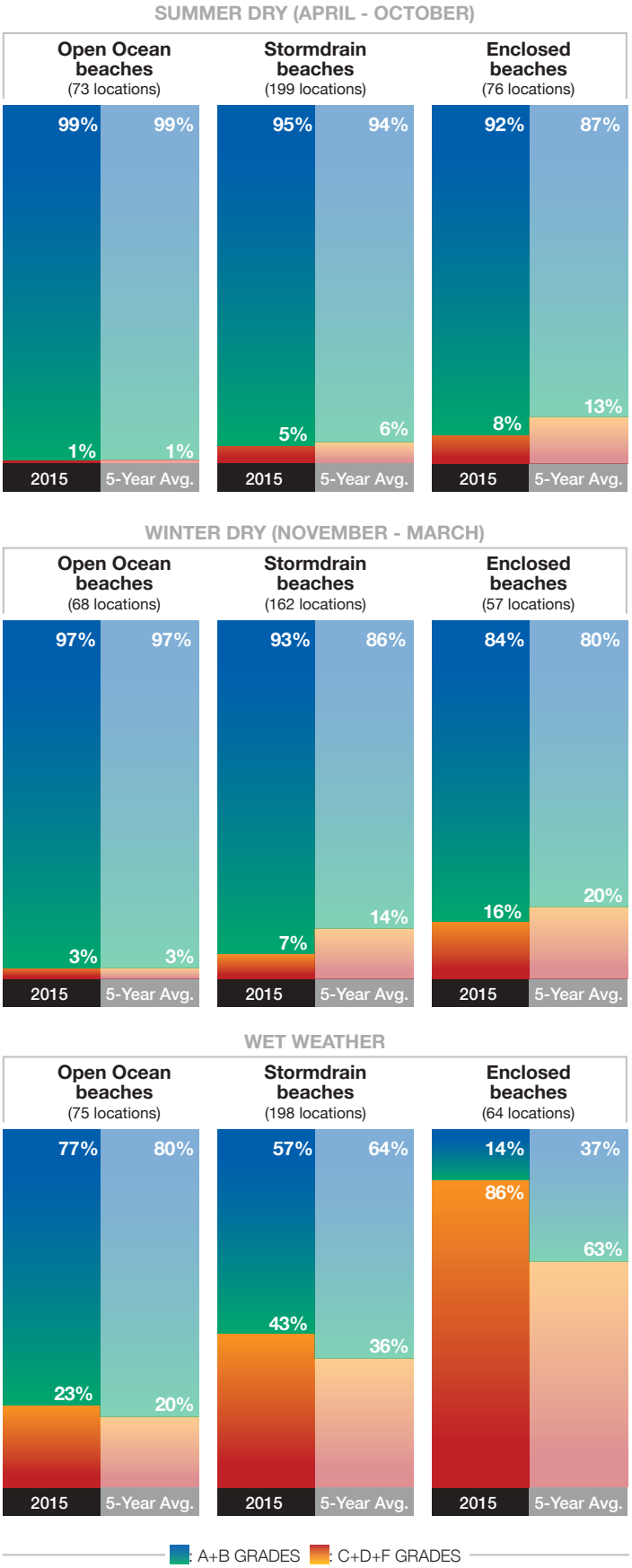


Photo 2-6: Cabrillo Beach (harbor side) has had historic poor water quality in contrast to Cabrillo's ocean side, which usually gets excellent water quality grades.

mark of 99%, but still above the five-year average percent of 94%. Winter dry weather grades at storm drain beaches reversed last year's downward slip and improved with 92% A or B grades. This year's 92% percentage mark was higher than the five-year average of 86%. As for wet weather grades, the downward trend seen the past few years continued, by further dropping another two percentage points to 57% (112 of 198) A or B grades.

ENCLOSED BEACHES

Summer dry weather grades at enclosed beaches reached another new high this year, with 93% A or B grades this year, which bested the 5-year percentage average of 88%. While water quality has significantly improved over time at enclosed beaches, swimming at these beaches can still be a cause for concern for beachgoers frequenting these areas. The main issue is the extended 'residence' times that exist within enclosed waterbodies as a result of poor circulation. Poor circulation and high residence times can mean that it takes longer for potentially polluted water to mix with cleaner water which allows bacterial levels to remain elevated for extended period of time. Note: four of the top ten beach bummers in California are enclosed beaches. Winter dry weather grades continue to hold steady with 85% A or B grades. This is very comparable to the two previous years' percentages, and was slightly better than the five-year average of 80%.

As for wet weather, there is no worse place to swim by beach type than at an enclosed beach. Wet weather grades continue to be extremely poor at enclosed beaches this past year, with only 15% (9 of 64) A or B grades.

This comparison by beach type continues to demonstrate that water quality at open ocean beaches is generally superior to water quality at enclosed and storm drain impacted beaches, particularly during wet weather. During summer dry weather, probably the time when there is least likely to be flow in storm drains, storm drain impacted beaches were very comparable to open ocean beaches, with marked divergence during wet weather, again demonstrating the serious impact that urban runoff can have on water quality.

Section III: 2015-16 Beach News

Point Zero Monitoring
Hyperion Diversion Project and MOSO Event
Refugio Oil Spill and related closures
Predictive Modeling Project
Quantitative Microbial Risk Assessment at Cabrillo Beach

Photo: "Point Zero" during a rain event at Torrance Beach, Los Angeles County

2015-16 BEACH NEWS

The Beach News section discusses some of the major issues that impacted beach water quality over the past year. 2015-2016 was a very busy year for coastal water quality in California, with policy, research developments, infrastructure issues and programmatic changes throughout the state.

POINT ZERO MONITORING

The State Water Resources Control Board (SWRCB) has administered the California Beach Program for the past four years. For the first time in the history of the Annual Report, Los Angeles County, portions of Orange, San Diego, and Humboldt Counties will not be alone in sampling directly at the outfall, also known as 'point zero' – where the discharge meets the ocean. Last summer, the SWRCB required all coastal counties receiving state funds to monitor their beaches at point zero. Heal the Bay believes that monitoring closest to a potential pollution source or outlet (point zero) gives the most accurate picture of water quality at these types of beaches and is also the most protective of public health. Heal the Bay has long advocated for point zero monitoring to be required throughout California, and the SWRCB requirement that counties monitor at point zero if they receive state funding is a result, in part, of our advocacy.

HYPERION DIVERSION PROJECT AND MOSO EVENT

This past fall, the City of Los Angeles diverted the effluent from the Hyperion Wastewater Treatment Plant from its standard 5-mile outfall pipe to its back-up 1-mile outfall pipe. The diversion took place from September 21 to November 2 in order to allow time for essential repairs to be completed on the 5-mile outfall pump header.

On average, Hyperion discharges 250 million gallons of effluent per day (mgd). One of the major stories that occurred within days of the diversion commencement was the discovery of large quantities of Materials of Sewage Origin (MOSO) washing ashore along long stretches of Dockweiler Beach. On September 23, beachgoers in the area started finding large numbers of tampon applicators, condoms, and needles on the beach. Dockweiler Beaches to the border of El Segundo and Manhattan Beach were closed from September 23-26. Subsequent to this event, the City of Los Angeles conducted daily sweeps of the beaches to remove all MOSO debris. In addition, the City conducted a thorough investigation of its plant operations to determine the cause of the MOSO event by convening a Technical Advisory Committee, which was chaired by a third party. Ulti-

Photo 3-1: Materials of sewage origin washed up on South Bay beaches within days of a diversion event at the Hyperion Treatment Plant

Photo 3-2: Refugio State Beach was the site of a 100,000 gallion crude oil spill in May 2015. Photo: AP Photo/Jae C. Hong, File

mately, the TAC produced a report detailing their findings, which was required by the Los Angeles Regional Water Quality Control Board (LARWQCB), and concluded that the origin of the MOSO event stemmed from a past sewage spill event over ten years ago, in 2005. The report found that the spill likely flowed into an internal drainage system within the Hyperion Wastewater Treatment Plant that drains to the one-mile outfall pipe. However, that pipe is rarely used by the City, so the contents from that spill were trapped in a segment of the 1-mile outfall pipe since the spill occurred. This debris was 1) not seen by standard operations and maintenance practices, 2) never properly flushed at the time of the incident, and 3) entrained with the flow from the 2015 diversion.

Beyond the MOSO event, other actions associated with this diversion occurred. During the diversion, plans included disinfection of the effluent via a 3 parts per million (ppm) dosage of sodium hypochlorite. Two days after the start of the diversion project, the dosage was increased to 4 ppm to more effectively reduce bacterial pollution. At several stages throughout the diversion project, these dosages were not met. For example, on October 6, 8 and 14 – 22, samples were measured at less than 0.1 ppm. The average dosage measured during the diversion was only 1.94 ppm. These disinfection issues may be related to the unusual quantity and magnitude of bacterial exceedances seen at a handful of locations near Hyperion Wastewater Treatment Plant during this time period.

Extensive monitoring was performed by the City of Los Angeles before, during, and after the diversion project, including testing for organics and metals, toxicity in sediments, surface mapping of currents, nutrients, phytoplankton, and benthic macrofauna. The final report summarizing the monitoring results is due to be submitted to the LARWCB by April 26, 2017. Heal the Bay will comment on this matter, asking for assurances in future project permitting that such impacts to receiving waters and aquatic habitat are better protected.

THE REFUGIO OIL SPILL IN SANTA BARBARA

On May 19, 2015 a ruptured inland pipeline in Santa Barbara County, owned by Plains All American Pipeline, spilled over 100,000 gallons of crude oil into a nearby culvert, and from there directly onto the beach and into the ocean near Refugio State Beach. The oil spread to the ocean before the oil company reported it to authorities and before cleanup crews could quickly respond.

Ultimately, authorities closed Refugio State Beach from May 19 -July 17, 2015. El Capitan State Beach was closed from May 20 -June 26, and Sands at Coal Oil Point from May 24-26, 2015. Public access was closed to beaches and fishing from Gaviota State Beach to Coal Oil Point in Isla Vista for weeks following the spill. In the days following the spill, the oil spread as far south as Crystal Cove in Orange County as well as to multiple beaches in Los Angeles and Ventura Counties, including Long Beach, Manhattan, Santa Monica, Oxnard, and Zuma Beach in Malibu. Several beaches in the South Bay and Long Beach regions of Los Angeles County were closed while crews cleaned up the oil that washed ashore.

Response efforts collected 270 birds (204 dead, 65 live) and 168 marine mammals (106 dead, 62 live) along with countless fish and other marine animals. While oil doesn't influence the fecal indicator bacteria (FIB) that our beach grades are based on, it has a serious impact to beach and marine ecology, and kept gorgeous, normally healthy beaches closed to the public for a long stretch of time. The impacts to local ecology, recreation, and local business are currently being evaluated through the Natural Resource Damage Assessment (NRDA) process currently being conducted by the state and federal agencies.

PREDICTIVE BEACH MODELING

Last summer, Heal the Bay, Stanford University, and UCLA implemented a real-time pilot predictive modeling program at three Southern California beaches from July through October. Predictive models, or beach water quality 'Nowcasting' tools, are designed to predict expected water quality results based upon historic data and location specific information for a defined beach. The models can be used to inform the public about what water quality might be for any given day at a particular beach. These 'Nowcasts' can be conducted much faster than the current public notification pro-

Photo 3-3: Arroyo Burro Beach was part of a real-time pilot predictive modeling program in 2015 and will be again in 2016.

tocol, which rely on analytical methods that can take 18-24 hours to produce results. This delay in the existing system can lead to inadvertent beach openings, which may put public health at risk, or alternatively inappropriate advisories that may keep people away from enjoying a clean beach.

Three beaches were piloted for Nowcasting in 2015: Arroyo Burro (Santa Barbara County), Santa Monica Pier (Los Angeles County), and Doheny (Orange County). The pilot project demonstrated that predictive models can outperform current methods at both protecting public health and keeping the beach un-posted on days when it is clean. Most importantly it showed that 'Nowcasting' programs can be easily integrated into current beach management programs. Results from Phase II were extremely promising, motivating Heal the Bay to pursue 'Nowcasting' as a permanent part of the Beach Report Card over the years to come.

After last summer's successful pilot project, Heal the Bay received a Clean Beach Initiative (CBI) grant to partner with Stanford University and UCLA to expand and build predictive models through a third phase of this 'Nowcast' project. The next phase will predict beach grades at 20 beaches throughout California over the next three years. 'Nowcast' models will primarily be developed for summertime, but we will include winter months in areas with winter surfing use. The project will begin in the summer of 2016 with 5 locations from Santa Barbara through Orange County: Arroyo Burro and East Beach in Santa Barbara, Santa Monica Pier in Los Angeles, Belmont Pier in Long Beach, and Doheny Beach in Orange County. The models will be run daily providing a "Nowcast" result which indicates whether the beach is likely or unlikely to have a bacterial exceedance that day. Predictive models can help beach managers make more informed decisions about whether a beach should be posted or open for public use. Being able to run the model rapidly and daily helps close the notification gap regarding water quality, thus helping to protect public health every day in a more robust manner than the current testing methods.

QUANTITATIVE MICROBIAL RISK ASSESSMENT AT INNER CABRILLO BEACH

When USEPA published the 2012 Recreational Water Quality Guidance, it authorized alternative methods to standard (i.e., culture based) water quality for determining health risks associated with swimming in fecal indicator bacteria (FIB) contaminated recreational waters, so long as those methods afforded the same health protections as the existing standards. These alternative tools included predictive modeling, epidemiological studies, and quantitative microbial risk assessment (QMRA).

QMRA is a tool for quantifying swimming risk by setting site-specific numeric objectives for FIB that are different from existing standards. The main caveat to this approach is that the FIB sources must be predominantly characterized as non-human and non-fecal. To date, no QMRAs have been implemented for a marine beach in the United States, much less California. In 2012, the Los Angeles Regional Water Quality Control Board (LARWQCB), the Southern California Coastal Water Research Project (SCCWRP), and Channel Islands Harbor (Ventura County) attempted such an effort for Hobie Beach and Beach Park in Oxnard. The effort was ultimately abandoned due to the consistent exceedances of FIB standards and the presence of human fecal markers found at those beaches.

There are currently three QMRA efforts taking place in California: Baby Beach in Dana Point Harbor—Orange County, Tecolote Creek in Mission Bay—San Diego County, and Inner Cabrillo Beach in San Pedro Bay (aka Port of Los Angeles)—Los Angeles County. For the Inner Cabrillo Beach effort, the State Water Resources Control Board has funded SCCWRP, in partnership with the LARWQCB and the City of Los Angeles, to attempt a QMRA study at that site. SCCWRP plans to commence the sampling component of the program this summer, and complete this effort by the fall. Once the data is collected and analyzed, the decision to proceed with this process will be made.

Photo 3-4: Santa Monica was part of a real-time pilot predictive modeling program in 2015 and will be again in 2016.

Section IV: Policy Updates and Recommendations

Funding: Federal BEACH Act
Funding: California Beach Program
Smart Water Management
State Water Resources Control Board's Bacterial Objectives
Dog Beaches

Photo: Long Beach at dawn, south of Belmont Pier, Los Angeles County

Photo 4-1: Beach visitors contribute to an estimated $90 billion coastal tourism economy, yet recreating at polluted beaches can also result in significant economic loss.

FUNDING: FEDERAL BEACH ACT

As has happened for the past several years, the President's FY 2016 budget proposed to eliminate funding (approximately $10 million/annually) for EPA's BEACH Act grant program. Since 2012, this program's budget has been on the proverbial 'chopping block'. Fortunately, this fiscal year was no different in terms of saving the program, with the Senate Appropriations Committee's reinstating the budgetary line item for 2016. The EPA's stance on the matter has been that after 10 years of funding, many non-federal agencies should now have the ability to run their beach programs without federal support. This is extremely concerning for two reasons: many state beach programs are run completely on federal funds (such as Oregon) and states are only legally required to implement beach programs when federal funding is provided.

The BEACH Act is crucial to protecting the public health of beachgoers across all coastal and Great Lakes bordering states. Many state beach programs run solely on federal funds, with states mandated to implement beach monitoring programs only when federal funding is provided. With more than 90 million annual beachgoers nationwide, the loss of this funding results directly in public health protection being seriously jeopardized. The federal Beach Program provides approximately $500,000/annually to California, which is critical in maintaining the state's current level of coastal monitoring. As has been stated earlier in this report, beach tourism and the coastal recreational economy are valued at close to $90 billion, so investing $10 million a year nationally to ensure that coastal resources continue to produce a utility and maintain functionality makes fiscal and public health sense.

FUNDING: CALIFORNIA'S BEACH PROGRAM

The State Water Resources Control Board (SWRCB) has administered the California Beach Program for the past four years. The California Beach Program is the implementing tool for the state requirement that ocean or bay water at swimming beaches be routinely tested for Fecal Indicator Bacteria (FIB), so long as State Funds are available. Historically, the Beach Program was managed by the California Department of Public Health (CDPH). However, CDPH had little power to enforce or incentive to modify the water quality monitoring programs throughout the State. With no mechanism to raise funds for the program — funding for the Beach Program had been stagnant since its inception in 1998 and no programmatic guidance to provide contracting monitoring agencies. As such, CDPH could do little to shape county water quality monitoring programs. Numerous inconsistencies among these programs continued making it impossible for beachgoers to know if it was safe to swim. Historic inconsistencies among County agencies throughout the State included: 1) where samples were collected relative to the potential pollution source, 2) the frequency of monitoring, and 3) the public notification protocols used to notify the public and when to notify.

Happily, this year marked the first year that the SWRCB required beach water quality samples to be collected directly from areas of highest expected bacteria levels (outfalls of stormdrains, creeks, and rivers - "point zero") and highest recreational use. In previous years, sample locations varied across monitoring agencies (e.g. 25, 50 or 83 yards away from an outfall), with few agencies monitoring at point zero. Heal the Bay has long advocated—10 years—for point zero monitoring to be required throughout California. Other funding eligibility

criteria that Heal the Bay will continue to advocate for include:

- Monitoring agencies must continue to monitor at least 80% of the locations monitored prior to the 2008 state budget cuts.
- Sampling frequency should increase with beach use and/or public health risk. For example, high risk beaches (high beach use and close proximity to a potential pollution source) should be sampled three to five times per week.
- Public notification of water quality should occur immediately after sampling results are available.
- Monitoring agencies and dischargers should be required to work together to streamline and enhance coastal monitoring for year-round public health protection.
- Chronically polluted or high-risk beaches with continuous bacteria exceedances should be permanently posted.

SMART WATER MANAGEMENT

With Californians, especially in Southern California, continuing to face an uncertain water future, we must once again focus on the importance of using water wisely. The days of using water only once—as is the case for most wastewater and stormwater—before disposing of it into the ocean should be an article of our past replaced by smarter and more sustainable practices. As Steve Lopez once wrote about plastic bags in 2007 that is equally applicable to our historic behavior towards water, it is "...an indictment of our slovenly, junk-food, single-use, throwaway society."

In Los Angeles, we import nearly 90% of our water supply as a metropolitan city, which is neither sustainable nor justifiable with so much freshwater being flushed out to sea each day. In fact, it is frankly dangerous to continue with such a massive reliance on imported water especially with climate change threatening to disrupt the system that we rely on so heavily. Strangely enough, each day we let roughly 10 million gallons of urban runoff flow through our rivers, creeks, streams and stormdrains. This number escalates to the billions on wet weather days. Not only are we allowing this resource to drain away, we pollute it with contaminants that make the water undrinkable and unhealthy prior to discharging it to the ocean. It's why many of our beaches, rivers and creeks remain chronically polluted. Continuing with our wasteful water ways, we discharge a minimum of 20 million gallons per day of highly treated wastewater from the Donald Tillman Treatment Plant into the Los Angeles River. We need to change this type of behavior, and better utilize this precious resource. Our region needs to be smarter about maximizing the water that we already have and the water that we receive from rain.

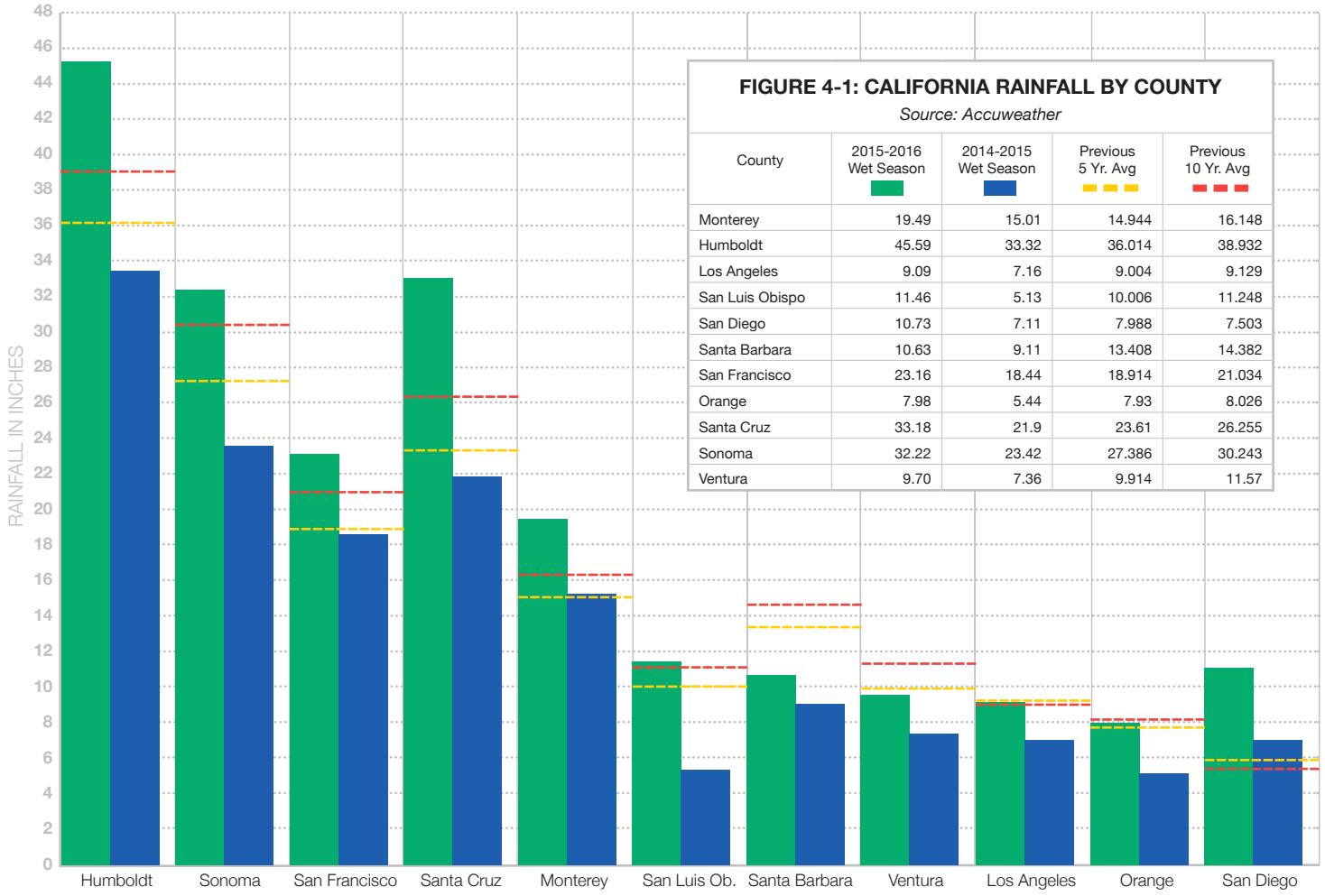


FIGURE 4-1: CALIFORNIA RAINFALL BY COUNTY

Source: Accuweather

County	2015-2016 Wet Season	2014-2015 Wet Season	Previous 5 Yr. Avg	Previous 10 Yr. Avg
Monterey	19.49	15.01	14.944	16.148
Humboldt	45.59	33.32	36.014	38.932
Los Angeles	9.09	7.16	9.004	9.129
San Luis Obispo	11.46	5.13	10.006	11.248
San Diego	10.73	7.11	7.988	7.503
Santa Barbara	10.63	9.11	13.408	14.382
San Francisco	23.16	18.44	18.914	21.034
Orange	7.98	5.44	7.93	8.026
Santa Cruz	33.18	21.9	23.61	26.255
Sonoma	32.22	23.42	27.386	30.243
Ventura	9.70	7.36	9.914	11.57

Heal the Bay is actively engaged in determining L.A.'s water future. Here is what we believe the region needs to start doing today to sustain our water needs in the future:

- Modifying our landscaping is a good first step in fighting drought. For example, irrigation for landscaping still accounts for more than 50% of urban water use.
- Capturing runoff, cleaning it, and using it to augment regional water supplies. For example, after a storm as much as 10 billion gallons of water is lost, simply flowing as urban runoff through our cemented rivers into the sea with little to no ecological benefits.
- Increasing our use of reclaimed water to offset potable water demand and replenish our regional groundwater basins. Each day the Hyperion Treatment Plant discharges more than 250 million gallons of wastewater into Santa Monica Bay, and Tillman Treatment Plant discharges more than 50 million gallons of highly treated wastewater into the LA River.
- Teach water literacy! We should not be waiting for kids to go to college before we teach them a water resource class. Water, like reading and writing, needs to be taught in primary school.

It will take significant resolve and funding to achieve these goals, but watershed management plans that prioritize natural infrastructure and multi-benefit stormwater capture projects, as well as increasing greywater usage and infiltrating recycled water must be embraced for a more sustainable water future.

STATE WATER RESOURCES CONTROL BOARD'S BACTERIAL OBJECTIVES

In the summer of 2014, the State Water Resources Control Board (SWRCB) embarked on a process to amend the bacterial objectives in the California Ocean Plan and the Inland Surface Water, Enclosed Bays and Estuaries Plan. The goal of this process is to develop a statewide program to protect recreational users from the effects of swimming in water bodies with pathogens. There are 11 elements to this proposed amendment the SWRCB will consider that can have major impacts to protecting beachgoer health. Three elements are of serious concern: 1) the recommendation to use a single fecal indicator, enterococcus, to determine risk; 2) the suspension of Recreational 1-uses (Rec-1)—swimming or wading in the water—during high flow suspension within rivers and creeks; and 3) the allowance for a variance, seasonal suspension or Limited Rec-1 water contact. Each of these has implications for reducing public health protection for swimmers at recreational waters. For example, California currently uses seven FIB criteria that are associated with different health outcomes (upper respiratory, skin rash, flu-like symptoms, and intestinal ailments) compared to USEPA's two criteria, which are associated with mostly intestinal ailments.

A draft staff report was scheduled to be released spring 2016 for public review and comments, with SWRCB adoption anticipated for summer 2016. However, the process has been delayed until the summer and likely will not come to the SWRCB until the fall. Heal the Bay staff will review the draft objectives upon release and make recommendations to the SWRCB to ensure the strongest public health protection possible.

DOG BEACHES

Heal the Bay recognizes the need for dog parks in the highly urbanized environment of Southern California. However, we believe there is a potential for increased illnesses associated with swimming at "dog beaches" or beaches that allow dogs to run and play in the surf-zone or on the beach area subject to tide. Thus, Heal the Bay does not support dog beaches that allow dogs in the water or on any part of the beach that is subject to the tide.

Even if dog owners diligently remove dog feces, small amounts of fecal matter will remain on the sand and contaminate the water. Animal feces can carry viruses and other pathogens that may cause illness to exposed humans. The potential for increased illnesses is greater for small children: children tend to play in the swash zone where fecal contamination is greatest; they tend to ingest more water than the average swimmer; and epidemiological studies indicate that they are more susceptible to illnesses associated with swimming in water contaminated with fecal bacteria. People with comprised immune systems including the elderly are also more susceptible to water-borne diseases.

If a municipality is considering locating a dog park at a beach, Heal the Bay has the following recommendations:

HEAL THE BAY'S RECOMMENDATIONS FOR DOG PARKS AT PUBLIC BEACHES

- The dog park must be located above the highest high tide line.
- The dog park should be fully enclosed by fencing or other means to ensure dogs stay within the designated area.
- The area should be clearly marked as a dog park in such a manner that tourists and other visitors unfamiliar with the beach will understand the area is a dog park.
- Rules requiring the immediate clean-up of dog feces should be strictly enforced.
- A routine maintenance program should be implemented to keep the designated area clean of dog feces and trash.

Section V: California Coastal Counties

Photo: El Matador State Beach, 2015-16 Honor Roll

Photo 5-1: Surfers at Manhattan Beach.

CALIFORNIA COASTAL COUNTIES

Heal the Bay offers beach report card grades for all coastal counties in California from San Diego in the south to Del Norte in the North. Following is a brief summary of each county's monitoring program over the past year, water quality grades, the number of sewage spills to reach a receiving water body, and the number of beach closures due to sewage spills.

For the first time in reporting history, all coastal counties that received funds from the State Water Resources Control Board for their shoreline water quality monitoring program were required to collect samples directly at the outfall—point zero, where the discharge meets the ocean. Heal the Bay has long advocated for such action and believes that monitoring closest to a potential pollution source or outlet (point zero) gives the most accurate picture of freshwater impact to coastal water quality and is also the most protective of public health. As such, beachgoers can now be sure that county monitoring programs are much more alike, offering the same level of public health protection than in previous years.

Also new to a number of county assessments is the wet weather water quality grade. For those coastal counties that only monitor during AB 411—from April through October, Heal the Bay rarely produced winter dry weather or wet weather grades due to the insufficient amount of monitoring data collected from November through March. For example, during the summer and winter dry weather time-periods, historically Heal the Bay only generated a grade for a beach if the public agency sampled at least 75% of the monitoring time-period—if there are about 15 weeks between Memorial Day and Labor Day, then there should be at least 11 weekly samples collected. Unfortunately, for rain events across the state, the difference in frequency of events between counties has made it impossible to determine a minimum sampling threshold for grade generation during wet weather. This year, Heal the Bay has decided to generate a grade for wet weather regardless of the sample size. This enables beachgoers to see differences in dry versus wet weather water quality. In addition, Heal the Bay will state the sample size for this time-period so that beachgoers can determine their level of certainty with the information provided.

SAN DIEGO COUNTY

Table 5-1: San Diego County Grades

	2015-2016						5-Year Average (2010-2015)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A		86%		85%		72%		95%		94%		68%
B		11%		6%		5%		3%		1%		12%
C		0%		0%		7%		1%		1%		4%
D		1%		4%		0%		0%		1%		5%
F		1%		6%		16%		0%		2%		12%
Locations		72		52		57		72		41		51

*State AB411 monitoring April thru October. Percentages may not add up to 100 due to rounding.

There are five agencies within San Diego County that provided monitoring information for Heal the Bay's Beach Report Card:

- The City of Oceanside
- The City of San Diego
- Encina Wastewater Authority
- San Elijo Joint Powers Authority
- The County of San Diego Dept of Environmental Health (DEH)

Samples were collected throughout the year along open coastal and bay beaches.

Once again, beach water quality during summer dry weather at the 72 monitoring locations in San Diego County was excellent. There were 62 A grades and eight (8) B grades that represented 97% of the monitored beaches. Only two locations did not make the A or B threshold. They were: Mission Bay, Comfort Station (D) and San Diego Bay at Shelter Island (F). Unfortunately, San Diego Bay, Shelter Island exceeded water quality standards enough to make the Beach Bummer list at the #3 spot.

The County's water quality during winter dry weather was also excellent with 47 of 52 (91%) monitoring locations receiving A or B grades—44 As and 3 Bs. Unfortunately, non-summer dry weather ocean sampling decreases at a number of beach locations that are routinely sampled in the summer. Both Mission Bay (three locations) and Tijuana Slough/Border Field (three locations) were the two areas with the six locations that received a grade of C or lower. Overall wet weather water quality this past year was on par with the county's five-year average, with 77% A and B grades compared to 80%.

Figure 5-1 compares San Diego County's water quality grades for this past year to the five-year average.

A complete list of grades for San Diego County's beach monitoring locations can be found in Appendix C1 on Page 52.

Photo 5-2: Mission Bay, Comfort Station was one of two San Diego County locations that did not make the A or B threshold.

SEWAGE SPILL SUMMARY[1]

In San Diego County, sewage spills are generally separated into two categories, 1) those caused by the Tijuana River, and 2) all others. This year the Tijuana River resulted in about 21 separate closure events with different distances—the international border fence through Imperial Beach to Silver Strand—and durations—a couple of days to a month. As for the "others," there were six beach closures due to sewage spills. Three in the Coronado area, two in Mission Bay (one of the two spills discharged over 108,000 gallons of sewage), and one at Point Loma.

Overall, there were approximately 22 more reported sewage spills from April 2015 through March 2016 that reached a surface waterbody, prompting 7 additional non-beach related health warnings. Of the 22 sewage spills that reached a surface waterbody, four (4) were "major" sewage spills—more than 10,000 gallons, four were "minor" spills —more than 1,000 gallons but less than 10,000 gallons, and 14 were "small" spills—less than 1,000 gallons. In total, about 6.9 million gallons of sewage reached a surface waterbody (dry or wet) from these spills.

For additional water quality information:
County of San Diego
Department of Environmental Health
www.sdbeachinfo.com

ORANGE COUNTY

Table 5-2: Orange County Grades

	2015-2016						5-Year Average (2010-2015)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A		94%		88%		34%		91%		81%		50%
B		5%		8%		11%		6%		9%		14%
C		0%		2%		10%		2%		4%		11%
D		0%		0%		5%		1%		2%		6%
F		1%		2%		40%		1%		4%		19%
Locations	114		112		100		101		87		91	

*State AB411 monitoring April thru October. Percentages may not add up to 100 due to rounding.

There are three agencies within Orange County that provide monitoring information to Heal the Bay's Beach Report Card:

- Orange County Environmental Health
- South Orange County Wastewater Authority
- Orange County Sanitation District (OCSD)

Samples were collected throughout the year along open coastal, harbor, and bay beaches, as well as near flowing storm drains, creeks or rivers.

Orange County grades for summer dry weather this past year were excellent – 113 of 114 locations (99%) scored A or B grades – with only one location scoring below a B grade: Monarch Beach (F grade). Monarch Beach water quality was problematic enough to make the Bummer list at #4. For more information on this location please read the Beach Bummer section on page 11.

During winter dry weather, 96% of year round monitored beaches (112 locations) received A or B grades, with 99 sites (88%) receiving A grades. There were only four locations that earned a C or lower grade: Newport Bay at Sapphire Ave. (C), Aliso Creek outlet (C), Monarch Beach (F), and Doheny State Beach North Beach (F).

With almost three more inches of rain this year (7.98") compared to last year (5.09"), wet weather water quality this past year in Orange County dipped to another new low with only 45% of the monitored locations receiving an A or B grade compared to 49% last year. In fact, there were more F grades (40) than there were A grades (34) confronting surfers and divers who braved the waters during wet weather. These results illustrate why coastal Health Departments throughout California recommend swimmers to stay out of the water during rain events and for a minimum of three days following the end of them.

Figure 5-2 illustrates an assessment of this past year's grade percentages at Orange County beaches compared to the five-year average. A complete list of grades for Orange County's beach monitoring locations can be found in Appendix C1 on Page 54.

SEWAGE SPILL SUMMARY

There were nine reported sewage spills in Orange County that led to beach or ocean water closures this past year. Five of the nine closures were located in the inner Newport waterbody (Bay, Harbor, and Slough) and two were in Huntington Harbour. In addition, there were another 26 spills from April 2015 through March 2016 that reached a surface waterbody. These other 26 spills prompted 5 non-beach health warnings. Of all 35 spills that reached a surface waterbody, two (2) were "major" sewage spills—more than 10,000 gallons, nine were "minor" spills—more than 1,000 gallons but less than 10,000 gallons, and 24 were "small" spills—less than 1,000 gallons. Overall, the approximate sewage volume spilled into a surface waterbody (dry or wet) was 50,033 gallons.

For additional water quality information:
County of Orange Environmental Health Division
www.ocbeachinfo.com

1 All California Sewage Summary data came from the California State Water Resource Control Board and/or the respective Health Departments.

Photo 5-3: Monarch Beach @ Salt Creek joins the Beach Bummer list this year at the No. 4 spot.

LOS ANGELES COUNTY

Table 5-3: Los Angeles County Grades

	2015-2016						5-Year Average (2010-2015)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A		86%		84%		30%		72%		69%		29%
B		6%		4%		10%		14%		11%		13%
C		3%		4%		16%		6%		6%		9%
D		1%		4%		6%		2%		4%		8%
F		3%		5%		39%		6%		11%		41%
Locations		88		83		88		91		85		87

*State AB411 monitoring April thru October. Percentages may not add up to 100 due to rounding.

Table 5-4: Long Beach City Grades

	2015-2016						5-Year Average (2010-2015)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A		80%		73%		13%		42%		72%		1%
B		13%		7%		0%		38%		13%		7%
C		7%		13%		7%		19%		5%		4%
D		0%		7%		0%		0%		0%		1%
F		0%		0%		80%		0%		9%		86%
Locations		15		15		15		15		15		15

*State AB411 monitoring April thru October. Percentages may not add up to 100 due to rounding.

FIGURE 5-1: LOS ANGELES COUNTY BEACHES WITH POOR GRADES DURING DRY WEATHER

Beaches that received "C" grade or lower during Summer Dry or Winter Dry monitoring periods. *Denotes a 2015-16 Top Ten Beach Bummer

	Summer Dry	Winter Dry	Wet Weather
Surfrider Beach, Malibu	A	F	F
Will Rogers State Beach @ Sunset Boulevard	D	C	F
Santa Monica Municipal Pier*	F	F	F
Venice Beach @ Windward Avenue drain	C	A	F
Marina del Rey, Mother's Beach @ playground area	C	F	F
Marina del Rey, Mother's Beach @ lifeguard tower	B	D	F
Marina del Rey, Mother's Beach between tower and boat dock*	F	F	F
Redondo Beach Pier, 100 yards south*	F	D	A
Long Beach @ Granada Avenue (Rosie's Dog Beach)	B	C	F
Long Beach @ 72nd Place	C	D	A+

There are five agencies within the County of Los Angeles that contributed monitoring data to Heal the Bay's Beach Report Card:

- City of Los Angeles' Environmental Monitoring Division (EMD) at the Hyperion Sewage Treatment Plant provided daily or weekly beach data for 33 locations
- The Los Angeles County Department of Public Health Environmental Health program monitored 29 locations on a weekly basis
- Los Angeles County Sanitation District monitored eight locations weekly
- City of Long Beach, Environmental Health Division, monitored 15 (down from 25 historically) locations on a weekly basis
- The City of Redondo Beach monitored seven locations in the South Bay

For the first time in the Annual Report, Los Angeles County will not be alone in sampling directly at the outfall—point zero, where the discharge meets the ocean. Last summer, the State Water Resources Control Board required all coastal counties receiving state funds to monitor their beaches must sample at 'point zero.' As mentioned earlier, Heal the Bay believes that monitoring closest to a potential pollution source or outlet (point zero) gives the most accurate picture of water quality at these types of beaches and is also the most protective of public health.

Summer dry weather water quality in Los Angeles was excellent with 92% A or B grades. This percentage mark for A and B grades was slightly less than last year's 93%. There were seven beaches that received a grade of C or lower. They were: Sunset Blvd. Beach (D), Venice Beach at Windward Ave. (C), and Long Beach City Beach at 72nd Place (C). The other problem beaches within the County made it to the Beach Bummer list. Once again, Los Angeles County was host to three of the 10 beaches on the statewide Beach Bummer list this year—more than any other county. The bummers include: Redondo Municipal Pier (No. 7), Marina del Rey Mother's Beach (No. 6), and Santa Monica Municipal Pier (No. 5), all of which have been on the Bummer list within the last three years. One beach location that stands out is Inner Cabrillo in the Port of Los Angeles. Notorious for historic poor water quality, this year was the first time in 14 years that it was not on the Bummer list. In fact, the location received A grades in both summer and winter dry weather. It is only one year, but hopefully a trend that holds up.

Winter dry weather water quality in Los Angeles County was also very good, with 88% A or B grades. However, wet weather water quality continues to pose a problem for surfers and divers who braved the waters. Wet weather grades in Los Angeles were no exception, with only 40% A or B grades. This is lower than last year's 42%, and continues the downward wet weather beach grade trend started two years ago. Los Angeles County's percentage of wet weather A or B grades continues to be consistently lower than the statewide average of A or B grades.

FIGURE 5-2: AVALON BEACH, CATALINA ISLAND SUMMER GRADES 2006-2015

	2007	2008	2009	2010	2011	2012	2013	2014	2015
East of Casino Arch	F	F	F	F	F	F	C	A	A
100 feet west of Pier	F	F	F	F	F	F	B	B	A
50 feet west of Pier	F	F	F	F	F	F	B	C	B
50 feet east of Pier	F	F	F	F	F	F	C	A	A
100 feet east of Pier	F	F	D	D	D	D	A	A	A

Photo 5-4: Avalon Bay on Catalina Island has shown tremendous improvement in water quality during the summer dry season.

FIGURE 5-3: SANTA MONICA – GRADES 2011-2016

	2011-2012			2012-2013			2013-2014			2014-2015			2015-2016		
	Summer Dry	Winter Dry	Wet Weather	Summer Dry	Winter Dry	Wet Weather	Summer Dry	Winter Dry	Wet Weather	Summer Dry	Winter Dry	Wet Weather	Summer Dry	Winter Dry	Wet Weather
Montana Avenue drain	A+	A+	F	A	A	C	A	A	D	A	A	F	A	A+	C
Wilshire Blvd. drain	B	A	F	A	A	C	A	C	F	B	F	F	A	A	C
Santa Monica Pier	A	D	F	B	F	F	D	F	F	F	F	F	F	F	F
Pico/Kenter storm drain	A	D	F	A	D	F	A	A	F	A	C	F	A	B	F
Strand Street, in front of the restrooms	A	A+	C	A+	A+	C	A+	B	B	A	B	C	A	A+	C
Ocean Park Beach at Ashland Avenue drain	A	A	D	A	A	F	A	A	D	A	B	F	A	A	F

LONG BEACH

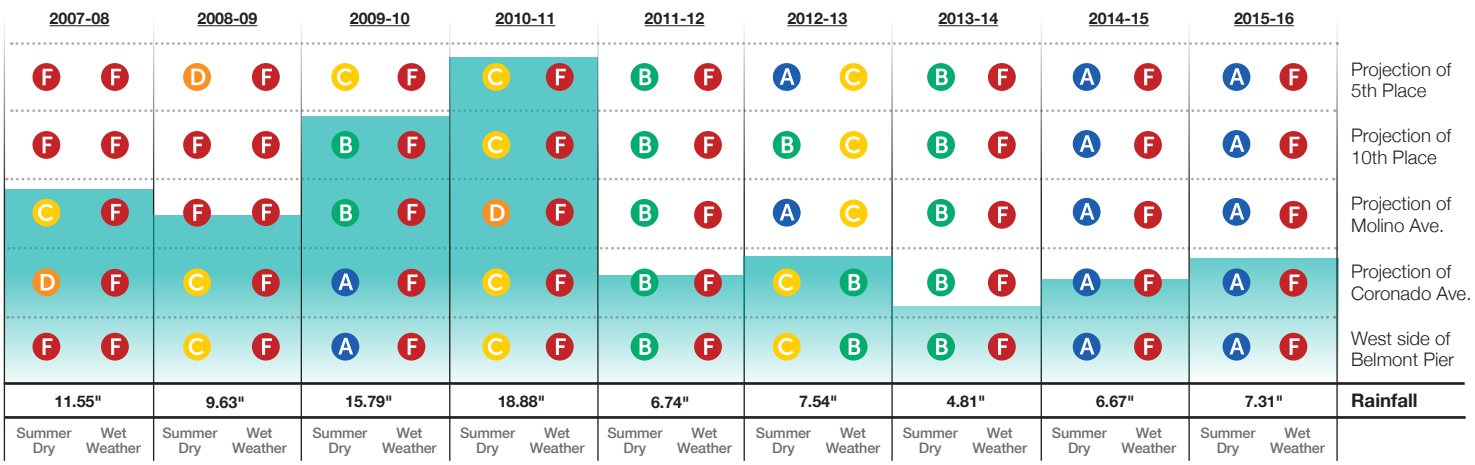
Because there are two health agencies in Los Angeles County that participate in a shoreline monitoring program, we have called out the City of Long Beach beach water quality monitoring program as a matter of consistency. During dry weather, the City of Long Beach continues to show improved beach water quality. This past year, summer dry weather grades were excellent, with 14 of 15 sites (93%) receiving A or B grades. As stated earlier, Long Beach City Beach at 72nd Place (C) was the only location in Long Beach to not get an A or B.

Winter dry weather grades were very good with 80% of locations earning A or B grades – 11 As and one B (see Figure 5-4). Once again, no other geographic location presented such a stark dichotomy between dry weather and wet weather grades than in Long Beach. Whereas 80% of the monitored locations received A grades in summer dry weather, the opposite was true for wet weather, with 80% of them receiving F grades. Only two monitored locations were safe for swimming when there was a storm event. Coincidentally, one of the beach locations that received an A grade in wet weather was Long Beach City Beach at 72nd Place. The other beach was at Long Beach City Beach, projection of 55th Place. The location of Long Beach, situated between two of the largest rivers (Los Angeles and San Gabriel River) in Los Angeles County, likely contributes greatly to these problematic wet weather grades. These results illus-

Photo 5-5: No other geographic location presented such a stark dichotomy between dry weather and wet weather grades than Long Beach.

FIGURE 5-4: LONG BEACH GRADES AND RAINFALL COMPARISON

2007-2016 Summer and Wet Weather Grades at Long Beach monitoring locations between 5th Street and Belmont Pier



trate why coastal Health Departments throughout California recommend swimmers to stay out of the water during rain events and for a minimum of three days following the end of them.

A complete list of grades for Los Angeles County's beach monitoring locations can be found in Appendix C1 on Page 57.

SEWAGE SPILL SUMMARY

There were three reported sewage spills in Los Angeles County that led to beach closures this past year.

The largest spill was 440,000 gallons into the Los Angeles River that ultimately impacted Long Beach City beaches. The other two spills were smaller in volume, 500 and 225 gallons, and impacted Lechuza Point in Malibu and Redondo Beach Pier, respectively. In addition to these three spills, there were a number of sewage spills that reached receiving waterbodies (creeks, rivers, streams, sloughs, and bays), which can discharge into the ocean. In Los Angeles County, there were approximately 104 other spills from April 2015 through March 2016 that reached a surface waterbody and prompted 6 non-beach health warnings (four ocean and six non-ocean water). Though a beach closure may not be issued for every spill, the volume spilled can still impact receiving waterbodies (creeks, rivers, streams, sloughs, and bays), and affect ocean water quality at a later time. Of the 108 spills that reached a surface waterbody, 11 were "major" sewage spills—more than 10,000 gallons, 37 were "minor" spills—more than 1,000 gallons but less than 10,000 gallons, and 60 were "small" spills—less than 1,000 gallons. Overall, the approximate sewage volume spilled into a surface waterbody (dry or wet) was 949,656 gallons.

For additional water quality information:
County of Los Angeles Department of Public Health Environmental Health
http://publichealth.lacounty.gov/eh
City of Long Beach
www.longbeach.gov/health/eh/water/water_samples.asp

VENTURA COUNTY

Table 5-5: Ventura County Grades

	2015-2016						5-Year Average (2010-2015)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A	100%		100%		70%		100%		98%		72%	
B	0%		0%		13%		0%		1%		14%	
C	0%		0%		10%		0%		0%		5%	
D	0%		0%		3%		0%		0%		7%	
F	0%		0%		5%		0%		1%		2%	
Locations	40		18		40		40		16		20	

*State AB411 monitoring April thru October. Percentages may not add up to 100 due to rounding.

The County of Ventura Environmental Health Division monitored 40 locations weekly from April through October 2015, and 18 locations year-round. The County monitored beaches from Rincon Beach (south of Rincon Creek near the Santa Barbara County line) to Staircase Beach.

Once again, summer dry water quality grades in Ventura County were excellent this past year, with 100% of locations receiving A-grades. In addition, winter dry grades were also excellent with 100% receiving an A. Ventura County had three locations on the Honor roll, including Hollywood Beach at Los Robles St. (South of drain), Port Hueneme Beach Park (50 yards South of the Drain), and Ormond Beach (Oxnard Industrial drain, 50 yards South). These Honor Roll beaches had no exceedances for the year.

As for wet weather, overall water quality was very good (83%) based on the five samples collected. Thirty-three of the 40 monitored locations in Ventura County received an A or B grade. Seven locations received a C or lower grade: Faria County Park (C), Surfer's Point (F), Promenade Park at Figueroa St. (C), San Buenaventura at San Jon (F), Channel Islands Harbor-Hobie Beach (D), Channel Islands Harbor-Beach Park (C), and Ormond Beach-J Street Drain (C). This year Ventura County matched its five-year average during summer dry weather and fell just short of the wet weather average.

A complete list of grades for Ventura County's beach monitoring locations can be found in Appendix C1 on Page 59.

SEWAGE SPILL SUMMARY

There was one reported sewage spill in Ventura County. The spill occurred in Mandalay Bay, and led to the closure of water contact within the bay. There were no other reported sewage spills that led to beach closures, yet there were a number of sewage spills that reached receiving waterbodies (creeks, rivers, streams, sloughs, and bays) that can discharge into the ocean. In Ventura County, there were approximately 7 other spills from April 2015 through March 2016 that reached a surface waterbody, resulting in 1 health warning (one beach and one non-beach). Of these eight spills, there were zero (0) "major" sewage spill—more than 10,000 gallons, three "minor" spills—more than 1,000 gallons but less than 10,000 gallons, and five (5) "small" spills—less than 1,000 gallons. The approximate sewage volume spilled into a surface waterbody (dry or wet) was 4,688 gallons.

For additional water quality information:
Ventura County's Environmental Health Division
www.ventura.org

SANTA BARBARA COUNTY

Table 5-6: Santa Barbara County Grades

	2015-2016						5-Year Average (2010-2015)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A		88%		88%		44%		85%		74%		46%
B		13%		6%		19%		13%		17%		19%
C		0%		6%		25%		1%		5%		22%
D		0%		0%		0%		0%		3%		3%
F		0%		0%		13%		0%		1%		10%
Locations		16		16		16		16		15		16

*State AB411 monitoring April thru October. Percentages may not add up to 100 due to rounding.

The County of Santa Barbara Environmental Health Agency monitored 16 locations on a weekly basis year-round, from as far upcoast as Guadalupe Dunes to the furthest downcoast location at Carpinteria State Beach.

Beaches were more impacted from the Plains All American Pipeline spill this summer than fecal indicator bacteria. Both Refugio State Beach and El Capitan State Beach were closed to the public for large stretches of time last summer. As such, water quality samples were not collected at either of these sites for 4 to 8 weeks. Nevertheless, Santa Barbara still displayed excellent water quality grades last summer, with all locations (100%) getting A or B grades during summer dry weather.

The great water quality pattern held for the winter dry weather, with 14 of the 16 locations receiving A grades. Hammond's Beach (C) was the only location not to get an A or B. As for wet weather water quality, divers and surfers needed to exercise a bit of caution when entering the water this year, since only 10 of the 16 (63%) of the monitored locations received an A or B grade. Six locations received fair to poor marks for wet weather: Hope Ranch (C), Arroyo Burro (F), East Beach at Mission Creek (F) and Sycamore Creek (C), Hammond's Beach (C), and Carpinteria State Beach (C). These results illustrate why coastal Health Departments throughout California recommend swimmers to stay out of the water during rain events and for a minimum of three days following the end of them.

A complete list of grades for the county can be found in Appendix C1 on Page 60.

SEWAGE SPILL SUMMARY

While there were no reported sewage spills in Santa Barbara County that led to beach closures this past year, there were a number of sewage spills that reached receiving waterbodies (creeks, rivers, streams, sloughs, and bays) that can discharge into the ocean. In Santa Barbara County, there were approximately 3 spills from April 2015 through March 2016 that reached a surface waterbody, which generated one non-beach related health warning. Of the three spills, there was one (1) "major" sewage spill—more than 10,000 gallons, two "minor" spills—more than 1,000 gallons but less than 10,000 gallons, and zero "small" spills—less than 1,000 gallons. The approximate sewage volume spilled into a surface waterbody (dry or wet) was 85,880 gallons.

For additional water quality information:
Santa Barbara County's Environmental Health Agency
www.sbcphd.org

Photo 5-6: East Beach at Mission Creek received poor marks over the past year.

SAN LUIS OBISPO COUNTY

Table 5-7: San Luis Obispo County Grades

	2015-2016						5-Year Average (2010-2015)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A		83%		94%		56%		91%		86%		71%
B		11%		6%		22%		5%		7%		17%
C		0%		0%		11%		3%		3%		5%
D		6%		0%		6%		1%		1%		5%
F		0%		0%		6%		0%		2%		2%
Locations		18		18		18		19		19		19

*State AB411 monitoring April thru October. Percentages may not add up to 100 due to rounding.

The County of San Luis Obispo Environmental Health Services monitored 18 locations on a weekly basis throughout the year from Pico Avenue in San Simeon downcoast to Pismo State Beach (at the end of Strand Way).

Summer dry weather water quality grades in San Luis Obispo County were excellent this past year with 94% A or B grades—15 As and 2 Bs. Unfortunately, one location had poor beach water quality during this time-period: Pismo Beach, just south of the pier. While Pismo Beach, at Wadsworth Street and at Ocean View—two sampling locations that bookend the pier—received A grades, the pier site got a D. As water quality improved elsewhere in the County and State, Pismo Beach, south of the pier, had enough exceedances to warrant a Beach Bummer listing at #10.

As for the winter dry weather, water quality was excellent. All 18 locations (100%) received A or B grades—17 As and 1 B. This was a marked improvement compared to last year's 79% receiving A or B grades. The El Niño season had a slight impact on wet weather grades with 14 of the 18 (78%) of the locations receiving an A or B grade. There were 10 samples collected during wet weather this reporting year. The four beaches that received fair to poor grades were Cayucos State Beach between the Creek and the Pier (C); Morro Bay City Beach, near Atascadero (D); and Avila Beach at San Juan St. (F) and San Luis St. (C).

A complete list of grades for San Luis Obispo County's beach monitoring locations can be found in Appendix C1 on Page 60.

SEWAGE SPILL SUMMARY

While there were no reported sewage spills in San Luis Obispo County that led to beach closures this past year, there were a number of sewage spills that reached receiving waterbodies (creeks, rivers, streams, sloughs, and bays) that can discharge into the ocean. In San Luis Obispo County, there were approximately seven spills from April 2015 through March 2016 that reached a surface waterbody without generating a health warning. Of these seven (7) spills, there was one (1) "major" sewage spills—more than 10,000 gallons, zero (0) "minor" spill—more than 1,000 gallons but less than 10,000 gallons, and six (6) "small" spills—less than 1,000 gallons. The approximate sewage volume spilled into a surface waterbody (dry or wet) was 7,970 gallons.

For additional water quality information:
San Luis Obispo County
Environmental Health Department
www.slocounty.ca.gov/health/publichealth/ehs/beach.htm

MONTEREY COUNTY

Table 5-8: Monterey County Grades

	2015-2016						5-Year Average (2010-2015)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A		100%		N/A		88%		63%		N/A		76%
B		0%		N/A		0%		13%		N/A		10%
C		0%		N/A		13%		15%		N/A		3%
D		0%		N/A		0%		10%		N/A		3%
F		0%		N/A		0%		0%		N/A		7%
Locations		8				8		8				7

*State AB411 monitoring April thru October. Percentages may not add up to 100 due to rounding.

The County of Monterey Environmental Health Bureau monitored eight locations on a weekly basis from April through October 2015, from as far upcoast as the Monterey Beach Hotel at Roberts Lake in Seaside to a downcoast location of Carmel City Beach. With no water quality monitoring after October, winter dry grades are not provided for this time-frame. Historically, Heal the Bay has elected not to produce wet weather grades for the Annual Report due to insufficient monitoring data collected during this period. This year, Heal the Bay has decided to generate a grade for wet weather along with the sample size.

Monterey County's summer dry weather grades were excellent, with all eight locations receiving A grades. One of the best on record for Monterey County, the summer of 2015's 100% A grades was significantly better than the five-year average of 63%. The greatest improvement in water quality was at Stillwater Cove. For the previous two years, Stillwater Cove was on the Beach Bummer list (2014-#5 and 2015-#7).

For surfers and divers venturing into the water during wet weather scenarios, there was equally good news. Seven of eight (88%) of the beach locations received excellent marks during rain events. There were eight samples collected during this scenario. The only location not to get an A grade in wet weather was Monterey State Beach (C).

A complete list of grades for Monterey County's beach monitoring locations can be found in Appendix C1 on Page 61.

SEWAGE SPILL SUMMARY

There was one reported sewage spill in Monterey County that led to beach closure this past year. The sewage spill took place in Pa-

cific Grove and closed Lovers Point Beach, discharging 219,205 gallons. There were no other reported sewage spills that led to beach closures, yet there were a number of sewage spills that reached receiving waterbodies (creeks, rivers, streams, sloughs, and bays), which can discharge into the ocean. In Monterey County, there were approximately six other spills from April 2015 through March 2016 that reached a surface waterbody, which prompted two health warnings (one beach and one non-beach). Of the seven spills, there was one (1) "major" sewage spills—more than 10,000 gallons, one "minor" spills—more than 1,000 gallons but less than 10,000 gallons, and five (5) "small" spills—less than 1,000 gallons. The approximate sewage volume spilled into a surface waterbody (dry or wet) was 221,025 gallons.

For additional water quality information:
Monterey County Environmental Health Bureau
www.mtyhd.org/index.php/beach-water-quality

SANTA CRUZ COUNTY

Table 5-9: Santa Cruz County Grades

	2015-2016						5-Year Average (2010-2015)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A	69%		92%		0%		74%		75%		37%	
B	15%		8%		15%		5%		15%		20%	
C	8%		0%		38%		6%		3%		21%	
D	0%		0%		15%		2%		2%		7%	
F	8%		0%		31%		14%		5%		15%	
Locations	13		13		13		13		12		15	

*State AB411 monitoring April thru October. Percentages may not add up to 100 due to rounding.

The County of Santa Cruz Environmental Health Services monitored 13 shoreline locations frequently enough (at least weekly) to be included in this report, spanning the area from Natural Bridges State Beach downcoast to Rio del Mar Beach.

Summer dry weather grades were up generally very good to excellent, with 11 of 13 (84%) monitored locations receiving an A (9) or B (2) grade. These results were on par with the five-year county average for A and B grades. There were two locations that received fair to poor marks during the peak beach going season time period: Cowell Beach, west of the Wharf (F), and Capitola Beach, west of the jetty (C). While water quality improved at Cowell Beach, near the Lifeguard Tower from an F grade in 2014 to an A grade in 2015, the same could not be said for the "west of the wharf" location. For the second year in a row, the Cowell Beach, west of the Wharf site was ranked #1 on the Beach Bummer list.

Unique to Santa Cruz, winter dry grades were better than summer dry grades. All locations monitored received very good to excellent marks, with 12 of 13 (92%) receiving A grades.

As for Santa Cruz County's wet weather grades, the marks were awful with only two of the 13 locations receiving B grades. For kayakers, divers, and surfers who brave the colder water temperatures during the rainy season, this information is bleak. Six of the 13 locations received D or F grades (Cowell Beach, west of Wharf; Capitola Beach, west and east of Jetty; New Brighton Beach; and Rio Del Mar Beach). These results illustrate why coastal Health Departments throughout California recommend swimmers to stay out of the water during rain events and for a minimum of three days following the end of them.

A complete list of grades for Santa Cruz County's beach monitoring locations can be found in Appendix C1 on Page 61.

SEWAGE SPILL SUMMARY

While there were no reported sewage spills in Santa Cruz County that led to beach closures this past reporting year, there were a number of sewage spills that reached receiving waterbodies (creeks, rivers, streams, sloughs, and bays) which can discharge into the ocean. In Santa Cruz County, there were approximately 11 spills from April 2015 through March 2016 that reached a surface waterbody. Of these 11 spills, there were zero (0) "major" sewage spills—more than 10,000 gallons, two (2) "minor" spills—more than 1,000 gallons but less than 10,000 gallons, and nine (9) "small" spills—less than 1,000 gallons. The approximate sewage volume spilled into a surface waterbody (dry or wet) was 4,828 gallons.

For additional water quality information:
Santa Cruz County's
Department of Environmental Health Services
http://gis.co.santa-cruz.ca.us/PublicWaterQuality

FIGURE 5-5: COWELL BEACH – GRADES 2010-2016

	2010-2011			2011-2012			2012-2013			2013-2014			2014-2015			2015-2016		
	Summer Dry	Winter Dry	Wet Weather	Summer Dry	Winter Dry	Wet Weather	Summer Dry	Winter Dry	Wet Weather	Summer Dry	Winter Dry	Wet Weather	Summer Dry	Winter Dry	Wet Weather	Summer Dry	Winter Dry	Wet Weather
at Stairs	A+	A+	B	A	A+	A	A	A	B	A	A	A+	A+	A	B	A	A	C
Lifeguard Tower 1	D	D	B	F	A	C	F	B	C	A	A+	C	F	B	C	A	A+	C
at Wharf	F	N/A	N/A	F	N/A	N/A	F	N/A	N/A	F	N/A	A+	F	F	C	F	A+	D

SAN MATEO COUNTY

Table 5-10: San Mateo County Grades

	2015-2016						5-Year Average (2010-2015)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A		82%		71%		18%		82%		76%		42%
B		5%		10%		18%		6%		10%		14%
C		9%		14%		18%		3%		3%		6%
D		5%		0%		9%		3%		1%		16%
F		0%		5%		36%		6%		9%		21%
Locations		22		21		22		22		18		19

*State AB411 monitoring April thru October. Percentages may not add up to 100 due to rounding.

The County of San Mateo Environmental Health Department monitored 22 ocean and bayside locations on a weekly basis year round, from as far upcoast as Sharp Park Beach to a downcoast location at Gazos Creek. (See Figures 5-12 and 5-13 on page 38 for combined grades of the Bay Area).

The summer dry grades for San Mateo County were very good overall, with 87% of the 22 locations receiving an A (18) or B (1) grade. There were three locations that received a C, D, or F grade this past summer season, and all were located within an enclosed area: Marina Lagoon or Pillar Point Harbor. Water quality was much improved at the Aquatic Park and Lakeshore Park in Marina Lagoon last summer compared to the previous three years at these two sites celebrated with fair, C grade, water quality. This was the first time in the last few years that Marina Lagoon was not on the Beach Bummer list. Unfortunately, as Marina Lagoon fell off the list, Pillar Point Harbor near Westpoint Ave. was placed on the list at the #9 spot. Pillar Point Harbor near Westpoint Ave. received a D grade. As water quality improved elsewhere in the County and State, this location had enough exceedances to warrant making the Beach Bummer list.

Similar to 2014, this past winter dry weather grades were very good, with 81% of beaches receiving A (15) or B (2) grades. As rainfall amounts increase during the winter months, runoff and flow volumes in local rivers and creeks also increase, which impacts water quality at beaches surrounding these waterbodies even when there is no actual rain. Linda Mar Beach and Oyster Point were two such beaches. Both sites had A grades during the summer dry-weather season, but C grades during the winter dry-weather. Much like the rest of the state during wet weather, water quality plummeted, with only eight (8) of 22 locations (36%) receiving A or B grades. This was considerably lower than last year's 52% by 16 percent. These results illustrate why coastal Health Departments throughout California recommend swimmers to stay out of the water during rain events and for a minimum of three days following the end of them.

SEWAGE SPILL SUMMARY

There were six (6) reported sewage spills in San Mateo County that led to beach closures this past year. Four of those six spills occurred at Pacifica State Beach and discharged 194,100 gallons. The other two sewage spills were at Parkside Aquatic Beach. Overall, there were approximately 46 spills from April 2015 through March 2016 that reached a surface waterbody, which prompted 14 health warnings—six of which were beach closures—in San Mateo County. Of these 46 spills, 10 were "major" sewage spills—more than 10,000 gallons, 22 were "minor" spills—more than 1,000 gallons but less than 10,000 gallons, and 14 were "small" spills—less than 1,000 gallons. The approximate sewage volume spilled into a surface waterbody (dry or wet) was 425,307 gallons.

For additional water quality information:
San Mateo County http://smchealth.org/environ/beaches

Photo 5-7: During the past year, Pacifica State Beach was the site of four spills involving almost 200,000 gallons of sewage. Photo: Wikicommons

SAN FRANCISCO COUNTY

Table 5-11: San Francisco County Grades

	2015-2016						5-Year Average (2010-2015)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A		79%		60%		13%		77%		69%		40%
B		7%		0%		27%		9%		10%		21%
C		7%		7%		33%		9%		7%		11%
D		7%		7%		7%		3%		7%		8%
F		0%		27%		20%		3%		7%		21%
Locations	14		15		15		14		14		15	

*State AB411 monitoring April thru October. Percentages may not add up to 100 due to rounding.

Table 5-12: San Francisco Bay Area† (Bay Side only)

	2015-2016						5-Year Average (2010-2015)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A		71%		36%		32%		74%		37%		41%
B		14%		9%		7%		14%		16%		13%
C		11%		9%		21%		3%		11%		13%
D		4%		0%		4%		3%		10%		10%
F		0%		45%		36%		6%		26%		24%
Locations	28		11		28		26		12		21	

*State AB411 monitoring April thru October. Percentages may not add up to 100 due to rounding.
†Combined grades for San Francisco, Marin, Alameda, Contra Costa and San Mateo counties.

Table 5-13: San Francisco Bay Area† (Ocean Side only)

	2015-2016						5-Year Average (2010-2015)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A		85%		77%		53%		94%		90%		50%
B		10%		5%		18%		3%		6%		20%
C		3%		14%		10%		2%		2%		8%
D		3%		5%		10%		0%		2%		14%
F		0%		0%		10%		0%		0%		8%
Locations	40		22		40		43		21		22	

*State AB411 monitoring April thru October. Percentages may not add up to 100 due to rounding.
†Combined grades for San Francisco, Marin, Alameda, Contra Costa and San Mateo counties.

The County of San Francisco, in partnership with the San Francisco Public Utilities Commission, maintained its weekly monitoring program for ocean and bay shoreline locations this past year. 14 locations were monitored on a weekly basis year-round.

Like last year, this year San Francisco County earned very good water quality grades during summer dry weather with 86% (12 of 14) of locations receiving A or B grades. The Candlestick Point area had the only two monitoring locations that received fair to poor grades during the summer peak beach going season: Windsurfer Circle (C) and Sunnydale Cove (D). For the second straight year, Candlestick Point at Sunnydale Cove made the Bummer list at the #8 spot. As water quality improved elsewhere throughout the County and State, this location had enough exceedances to warrant making the Beach Bummer list.

Regrettably, winter dry weather grades did not fare as well as the summer dry grades, with only 60% (9 of 15) beaches receiving A or B grades. This was 20 percentage points lower than last year. Once again, wet weather grades hovered at 40%, with only six of the 15 sites receiving A or B grades. These results illustrate why coastal Health Departments throughout California recommend swimmers to stay out of the water during rain events and for a minimum of three days following the end of them.

BACKGROUND INFORMATION FROM THE SAN FRANCISCO PUBLIC UTILITIES COMMISSION

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

However, during heavy rain events, the CSS can occasionally discharge combined treated urban runoff and sewage wastewater, which is typically comprised of 94% treated stormwater and 6% primary treated sanitary flow. In an effort to reduce the number of combined sewer discharges (CSDs), San Francisco 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.

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 AB 411 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.

COMBINED SEWER DISCHARGE SUMMARY

This past year, San Francisco had 31 CSDs, which led to a total of 56 beach advisories.

For additional water quality information:
San Francisco Public Utilities Commission
http://beaches.sfwater.org

EAST BAY: CONTRA COSTA & ALAMEDA COUNTIES

Table 5-14: East Bay County Grades

	2015-2016						5-Year Average (2010-2015)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A		60%		N/A		60%		86%		N/A		60%
B		40%		N/A		10%		14%		N/A		13%
C		0%		N/A		10%		0%		N/A		17%
D		0%		N/A		10%		0%		N/A		6%
F		0%		N/A		10%		0%		N/A		4%
Locations		10				10		10				9

*State AB411 monitoring April thru October. Percentages may not add up to 100 due to rounding.

The East Bay Regional Park District consistently monitored 10 shoreline locations again this year, including two in Contra Costa County (Keller Beach) and eight in Alameda County (Alameda Point and Crown Beach). Samples were collected weekly during the summer dry weather time period and about twice a month throughout the winter – generally not frequent enough for most locations to receive a winter dry weather grade in this report.

Water quality grades were very good to excellent during summer dry weather, with all 10 locations receiving A (6) or B (4) grades. While last summer's water quality received high marks of 60% A and 40% B grades, these fell short of the five-year trends of 86% A and 14% B grades. As for wet weather water quality this past year, six (6) locations earned A grades. Three locations that did not receive an A or B grade this wet season were all at Crown Beach: Crab Cove (D), Shoreline Drive (C), and Bird Sanctuary (F). A complete list of grades can be found in Appendix C1 on pages 62-63.

SEWAGE SPILL SUMMARY

There were no reported sewage spills in Contra Costa or Alameda County that led to beach closures, yet there were a number of sewage spills that reached receiving waterbodies (creeks, rivers, streams, sloughs, and bays) that can discharge into the San Francisco Bay.

In Alameda County, there were approximately 12 spills through April 2015–March 2016 that reached a surface waterbody, prompting five (5) non-beach related health warnings. Of these 12 spills, there were zero (0) "major" sewage spills (more than 10,000 gallons), five (5) "minor" spills (1,000-10,000 gallons), and seven (7) "small" spills (< 1,000 gallons). The approximate sewage volume spilled into a surface waterbody (dry or wet) was 20,948 gallons.

In Contra Costa County, there were approximately 45 spills from April 2015 through March 2016 that reached a surface waterbody, prompting 20 non-beach related health warnings. Of the 45 spills, 13 were "major" sewage spills (more than 10,000 gallons), 20 were "minor" spills (1,000-10,000 gallons), and 12 were "small" spills (< 1,000 gallons). The approximate sewage volume spilled into a surface waterbody (dry or wet) was 385,083 gallons.

For additional information: East Bay Regional Park District www.ebparks.org

MARIN COUNTY

Table 5-15: Marin County Grades

	2015-2016						5-Year Average (2010-2015)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A		86%		N/A		82%		97%		N/A		100%
B		9%		N/A		0%		3%		N/A		0%
C		5%		N/A		0%		0%		N/A		0%
D		0%		N/A		5%		0%		N/A		0%
F		0%		N/A		14%		0%		N/A		0%
Locations		22				22		23				23

*State AB411 monitoring April thru October. Percentages may not add up to 100 due to rounding.

Marin County's water quality monitoring program gathered data during the summer from 22 bayside and oceanside monitoring locations. Ocean locations included Dillon Beach, Bolinas Beach (Wharf Road), Stinson Beach, Muir Beach, and Rodeo Beach. Bayside locations include Baker Beach, Schoonmaker Beach, China Camp, and McNears Beach. These locations were monitored on a weekly basis from April through October 2015. With no water quality monitoring after October, winter dry grades are not provided for this timeframe. Historically, Heal the Bay has elected not to produce wet weather grades for the Annual Report due to insufficient monitoring data collected during this period. This year, Heal the Bay has decided to generate a grade for wet weather along with the sample size.

During the summer dry-weather season, water quality grades were very good to excellent in Marin County this year, with all 21 of 22 (95%) of the monitored locations receiving A (19) or B (2) grades. These marks are consistent with the five-year trend of 100% A (23) or B (1) grades (See figures 5-12 and 5-13 on page 38 for combined grades of the Bay Area). Muir Beach-Central was the only location that received a lower grade, which was a C. In fact, the three sampling sites at Muir Beach (North, Central, and South) were the only ones not to receive A marks during the summer season, respectively getting grades of B, C, and B.

As for wet weather this reporting year, there were approximately two samples collected during this time-period. Water quality during wet weather conditions was very good, with 18 of the 22 (82%) beach locations receiving an A grade. There were four locations that received poor to failing marks. They were Stinson Beach (D), Baker Beach Horseshoe Cove NW and NE (Fs), and China Camp (F).

A complete list of grades for Marin County's beach monitoring locations can be found in Appendix C1 on Page 63.

SEWAGE SPILL SUMMARY

There were three reported sewage spills in Marin County—specifically Richardson Bay/Sausalito area that led to a beach closure this past year. Unfortunately, there were 16 other sewage spills that reached receiving waterbodies (creeks, rivers, streams, sloughs, and bays) that prompted nine (9) non-beach related health warnings.

There were 19 total spills from April 2015 through March 2016 that reached a surface waterbody. Of these 19 spills, two (2) were "major" sewage spill (more than 10,000 gallons), two (2) were "minor" spills (1,000-10,000 gallons), and 15 were "small" spills (< 1,000 gallons). The approximate sewage volume spilled into a surface waterbody (dry or wet) was 102,342 gallons.

For additional water quality information:
Marin County's Department of Environmental Health
www.marincounty.org/ehs

SONOMA COUNTY

Table 5-16: Sonoma County Grades

	2015-2016						5-Year Average (2010-2015)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A		100%		N/A		100%		100%		N/A		100%
B		0%		N/A		0%		0%		N/A		0%
C		0%		N/A		0%		0%		N/A		0%
D		0%		N/A		0%		0%		N/A		0%
F		0%		N/A		0%		0%		N/A		0%
Locations	7				7		6				4	

*State AB411 monitoring April thru October. Percentages may not add up to 100 due to rounding.

The Sonoma County Environmental Health Department monitored seven (7) locations from Gualala Regional Park Beach to Doran Regional Park Beach on a weekly basis from April through October 2015. With no water quality monitoring after October, winter dry grades are not provided for this timeframe. Historically, Heal the Bay has elected not to produce wet weather grades for the Annual Report due to insufficient monitoring data collected during this period. This year, Heal the Bay has decided to generate a grade for wet weather along with the sample size.

Sonoma County again earned excellent summer dry weather water quality grades this year with all A grades. This trend of excellent water quality is also illustrated in the county's 5-year trends analysis, showing all A grades. As for wet weather, there were only two samples collected during this time-period and water quality at the seven beach locations during those two rain events was excellent.

A complete list of grades for Sonoma County's beach monitoring locations can be found in Appendix C1 on Page 64.

SEWAGE SPILL SUMMARY

While there were no reported sewage spills in Sonoma County that led to beach closures this past year, there were a number of sewage spills that reached receiving waterbodies (creeks, rivers, streams, sloughs, and bays) that can discharge into the ocean. In Sonoma County, there were approximately 5 spills from April 2015 through March 2016 that reached a surface waterbody, with four of those prompting health warnings. Of the 5 spills that reached a waterbody, two (2) were "major" sewage spills (more than 10,000 gallons), one was a "minor" spills (1,000-10,000 gallons), and two (2) "small" spills (< 1,000 gallons). The approximate sewage volume spilled into a surface waterbody (dry or wet) was 199,079 gallons.

For additional water quality information:
Sonoma County's Department of Environmental Health
www.sonoma-county.org/health/services/ocean.asp

MENDOCINO COUNTY

Table 5-17: Mendocino County Grades

	2015-2016						5-Year Average (2010-2015)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A		100%		N/A		100%		92%		N/A		50%
B		0%		N/A		0%		4%		N/A		0%
C		0%		N/A		0%		4%		N/A		50%
D		0%		N/A		0%		0%		N/A		0%
F		0%		N/A		0%		0%		N/A		0%
Locations	6				6		5				6	

*State AB411 monitoring April thru October. Percentages may not add up to 100 due to rounding.

The Mendocino County Environmental Health Department monitored six (6) locations from Mackerricher State Park at Virgin Creek to Van Damme State Park Beach at the Little River on a weekly basis from April through October 2015. With no water quality monitoring after October, winter dry grades are not provided for this time-frame. Historically, Heal the Bay has elected not to produce wet weather grades for the Annual Report due to insufficient monitoring data collected during this period. This year, Heal the Bay has decided to generate a grade for wet weather time-period along with the sample size.

During the summer dry weather period in Mendocino County, water quality at all six monitoring locations were excellent, with 100% receiving A grades. This result was better than last year, particularly for a beach like Hare Creek, which improved from a C to an A grade. As for wet weather, there were only two samples collected during this time-period to analyze, but water quality at the six beach locations during those two rain events was excellent.

A complete list of grades for Mendocino County's beach monitoring locations can be found in Appendix C1 on Page 64.

SEWAGE SPILL SUMMARY

While there were no reported sewage spills in Mendocino County that led to beach closures this past year, there was one sewage spill that reached a receiving waterbody (creeks, rivers, streams, sloughs, and bays) from April 2015 through March 2016. The approximate sewage volume spilled into a surface waterbody (dry or wet) was 200 gallons.

For additional water quality information:
www.co.mendocino.ca.us/hhsa/chs/eh/index.htm

HUMBOLDT COUNTY

Table 5-18: Humboldt County Grades

	2015-2016						5-Year Average (2010-2015)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A		40%		N/A		20%		73%		N/A		40%
B		0%		N/A		20%		15%		N/A		20%
C		40%		N/A		0%		4%		N/A		0%
D		0%		N/A		20%		4%		N/A		40%
F		20%		N/A		40%		4%		N/A		0%
Locations		5				5		5				3

*State AB411 monitoring April thru October. Percentages may not add up to 100 due to rounding.

The Humboldt County Environmental Health Department monitored five (5) locations from Trinidad State Beach near Mill Creek to Mad River on a weekly basis from April 2015 through October 2015. With no water quality monitoring after October, winter dry grades are not provided for this timeframe. Historically, Heal the Bay has elected not to produce wet weather grades for the Annual Report due to insufficient monitoring data collected during this period. This year, Heal the Bay has decided to generate a grade for wet weather time-period along with the sample size.

Unfortunately this was not a banner year for beach water quality in Humboldt County as compared to past years. Whereas last year, four of the five beaches received A grades, this year only two maintained that level of excellency during the Summer swimming season. Both Trinidad State Beach and Luffenholtz Beach had fair (C) water quality compared to A's last year. Once again, Clam Beach County Park near Strawberry Creek continued to demonstrate poor water quality, receiving an F grade this summer. This beach moved up another spot on the Beach Bummer list to earn the No. 2 place on the Bummer list. This is Clam Beach's third straight appearance on the Beach Bummer list. Potential bacteria sources include onsite sewage treatment systems, wildlife, domestic animals, and vegetation.

There were six samples collected during wet weather conditions this reporting year. Water quality at beaches was poor during wet weather, with three of the five (60%) beach locations receiving a D or F grade. These results illustrate why coastal Health Departments throughout California recommend swimmers to stay out of the water during rain events and for a minimum of three days following the end of them.

A complete list of grades for Humboldt County's beach monitoring locations can be found in Appendix C1 on Page 64.

SEWAGE SPILL SUMMARY

While there were no reported sewage spills in Humboldt County that led to beach closures this past year, there were a number of sewage spills that reached receiving waterbodies (creeks, rivers, streams, sloughs, and bays) that discharge into the ocean. In Humboldt County, there were approximately eight total spills from April 2015 through March 2016, which reached a surface waterbody. Of these eight spills, there were zero (0) "major" sewage spills (more than 10,000 gallons), two (2) "minor" spills (1,000-10,000 gallons), and six (6) "small" spills (< 1,000 gallons). The approximate sewage volume spilled into a surface waterbody (dry or wet) and not recovered was 3,355 gallons.

For additional water quality information:
Humboldt County's Department of Health & Human Services
www.co.humboldt.ca.us/health/envhealth/beachinfo

DEL NORTE COUNTY

Table 5-19: Del Norte County Grades

	2015-2016						3-Year Average (2012-2015)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A		100%		100%		100%		100%		100%		100%
B		0%		0%		0%		0%		0%		0%
C		0%		0%		0%		0%		0%		0%
D		0%		0%		0%		0%		0%		0%
F		0%		0%		0%		0%		0%		0%
Locations		1		1		1		1		1		1

*State AB411 monitoring April thru October. Percentages may not add up to 100 due to rounding.

The only beach regularly monitored in Del Norte County, Battery Point Lighthouse in Crescent City, received an A grade for the entire monitoring season (Summer Dry, Winter Dry, and Wet). There are no other locations in Del Norte County sampled frequently enough (at least weekly) to receive grades in this report.

SEWAGE SPILL SUMMARY

There was only one sewage spill in Del Norte County over the BRC reporting timeframe (April 2015 through March 2016) that reached a receiving water body discharging about 135 gallons of wastewater.

For additional water quality information:
County of Del Norte Environmental Health Division
www.co.del-norte.ca.us/departments/community-development-department/environmental-health-division

Section VI: Oregon & Washington

2015-2016 BEACH REPORT CARD: OREGON

Oregon's Department of Human Services and Department of Environmental Quality collectively monitored 42 locations throughout the state from May 18th 2015 through September 1st 2015. Unlike California, which uses three indicator bacteria for its monitoring programs, Oregon monitors water quality using only the indicator bacteria Enterococcus. Oregon's program is funded entirely from the federal Beaches Environmental Assessment and Coastal Health Act (BEACH Act). See Funding—Federal BEACH Act under Policy updates and recommendations on page 22.

Sadly, the Oregon Beach Monitoring Program (OBMP) reduced their sampling frequency last summer due to resource constraints. Because of the minimal number of samples—monitored beaches sampled at least 75% of the season—taken by OBMP, none of the Oregon beach locations qualified to receive a grade in this report. The monitoring that occurred varied from one beach area to the next. For example, Curry County (Mill Beach, North Harris, and Hubbard) and Coos County (Sunset Bay and Bastendorff) were monitored once in July and August—two total samples for the entire swimming season. Compare those counties to Lincoln County (D River), Tillamook County (Rockaway, Short Sand, and Twin Rocks), and Clatsop County (Seaside, Cannon, and Tolovana), which were monitored once a month starting in May or bi-weekly starting in June—on average five total samples. For those swimming at Tolovana Beach on the north side of Chisana Creek in June 2015, water quality was exceptionally poor. Finally, there were three beach areas in Lincoln County that came close to meeting the 75% threshold. They were: Nye Beach, Agate Beach, and Seal Rock. All beach areas were monitored bi-weekly for the entire season—for an average of 10 samples.

If funding constraints for the OBMP continue in 2016, we encourage the public agencies to refine their monitoring program, and consider consolidating their culture-based sampling to the highest use or more popular beaches, and increase the sampling frequency to weekly.

SEWAGE SPILLS

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

For additional water quality information:
Oregon Health Authority
http://public.health.oregon.gov/HealthyEnvironments/Recreation/BeachWaterQuality/Pages/index.aspx

2015-2016 BEACH REPORT CARD: WASHINGTON STATE

Washington's BEACH program is a state-administered and locally implemented program. There were a total of 64 beaches with 164 individual sample locations regularly monitored from Memorial Day 2015 through Labor Day 2015. Washington State has one of the most robust beach monitoring programs in the country based on the number of sample sites per mile of beach.

Approximately 80% of the program is funded under the federal BEACH Act, with the remaining 20% funded by the United States Environmental Protection Agency's (USEPA) National Estuary Program's Pathogen Prevention, Reduction and Control Grant. 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. The Makah Tribe also contributes beach monitoring to the state program through separate BEACH Program Tribal funding. Like Oregon, Washington monitors only Enterococcus bacteria, which differs from California's three indicator bacteria monitoring protocol. Washington's grading methodology can be found in Appendix A on page 45.

Washington's water quality during dry weather in the summer season was excellent. 90% of the monitored locations (147 sites) had A grades, and scored on par with the three year average from 2012-2014 (93% A or B grades). Only twelve of the 161 monitoring locations (7%) received fair to poor water quality grades during summer dry weather throughout the state (four C grades, three D grades and five F grades). This was also on par with the three year average for fair to poor water quality during dry summer weather. For the third year in a row, Island County's Freeland County Park in Holmes Harbor (three F grades) earned a spot as one of the three beach areas with the poorest summer dry weather grades in Washington State. Whatcom County's Larrabee State Park, Wildcat Cove (one F, one D, and one A+) and Pierce County's Browns Point Lighthouse Park (two D grades, one A) earned the remaining two spots of the three worst beach locations for bacteria in Washington during summer dry weather.

There are many Washington counties with great summer dry weather (100% A and B grades) including Grays Harbor, Jefferson, King, Kitsap, Mason, Snohomish, and Thurston Counties. Counties with great wet weather (≥0.2 inch rain events and the following three days) however, were much harder to find, including only Jefferson and Pierce Counties. As a state, Washington averages only 71% A and B grades during summer wet weather.

A complete list of grades for Washington State's beach monitoring locations can be found in Appendix C2 on page 65.

SEWAGE SPILL SUMMARY

This past year, Washington experienced 21 sewage spills that resulted in health warnings—15 of which were beach closures and 6 of which were no contact advisories. Five of the 21 sewage spills were

Clallam County Grades

2015-2016	Summer Dry		Wet Weather	
	#	%	#	%
A		83%		63%
B		8%		4%
C		8%		0%
D		0%		25%
F		0%		8%
Locations	24		24	

Jefferson County Grades

2015-2016	Summer Dry		Wet Weather	
	#	%	#	%
A		75%		100%
B		25%		0%
C		0%		0%
D		0%		0%
F		0%		0%
Locations	4		4	

Mason County Grades

2015-2016	Summer Dry		Wet Weather	
	#	%	#	%
A		89%		67%
B		11%		0%
C		0%		0%
D		0%		22%
F		0%		11%
Locations	9		9	

Snohomish County Grades

2015-2016	Summer Dry		Wet Weather	
	#	%	#	%
A		100%		93%
B		0%		0%
C		0%		0%
D		0%		0%
F		0%		7%
Locations	15		15	

Gray's Harbor County Grades

2015-2016	Summer Dry		Wet Weather	
	#	%	#	%
A		100%		89%
B		0%		0%
C		0%		0%
D		0%		11%
F		0%		0%
Locations	9		9	

King County Grades

2015-2016	Summer Dry		Wet Weather	
	#	%	#	%
A		30%		60%
B		0%		1%
C		0%		7%
D		0%		20%
F		0%		10%
Locations	30		30	

Pierce County Grades

2015-2016	Summer Dry		Wet Weather	
	#	%	#	%
A		77%		95%
B		5%		0%
C		5%		0%
D		9%		0%
F		5%		5%
Locations	22		22	

Thurston County Grades

2015-2016	Summer Dry		Wet Weather	
	#	%	#	%
A		100%		0%
B		0%		0%
C		0%		67%
D		0%		0%
F		0%		33%
Locations	3		3	

Island County Grades

2015-2016	Summer Dry		Wet Weather	
	#	%	#	%
A		50%		83%
B		0%		0%
C		0%		0%
D		0%		0%
F		50%		17%
Locations	6		6	

Kitsap County Grades

2015-2016	Summer Dry		Wet Weather	
	#	%	#	%
A		100%		60%
B		0%		3%
C		0%		7%
D		0%		20%
F		0%		10%
Locations	33		30	

Skagit County Grades

2015-2016	Summer Dry		Wet Weather	
	#	%	#	%
A		67%		0%
B		0%		0%
C		33%		0%
D		0%		0%
F		0%		100%
Locations	3		3	

Whatcom County Grades

2015-2016	Summer Dry		Wet Weather	
	#	%	#	%
A		67%		50%
B		0%		0%
C		0%		0%
D		17%		0%
F		17%		50%
Locations	6		6	

known as a combined sewer overflow (CSO). Four of these five CSOs resulted in beach closures, lasting a total of 14 days. The reported volume of two of these CSOs was estimated to be seven million and eight million gallons respectively.

COMBINED SEWER OVERFLOWS

Combined sewer and stormwater (CSS) systems are located in older communities throughout the Puget Sound. CSSs carry both wastewater and stormwater to a treatment plant, and when heavy rains fill the pipes, excess stormwater and sewage flow directly into local waterbodies. These Combined Sewer Overflows (CSOs) are a concern for beach managers because untreated wastewater and stormwater may discharge near swimming beaches and pose risks to public health. In particular, CSO discharges in King County and in Clallam County outlet near BEACH Program-monitored swimming beaches are cause for concern. King County provides a real-time map notifying the public about CSO discharges at www.kingcounty.gov/environment/wastewater/CSOstatus/Overview.aspx.

In Clallam County, Port Angeles Harbor is lined with CSSs managed by the city and regulated by the Department of Ecology. Both Sail and Paddle Park Beach and Hollywood Beach are located in Port Angeles Harbor. Over the past few years, steps have been taken to reduce the volume of CSOs discharged to the Harbor.

Information and photos generously provided by the
Washington Department of Health and Department of Ecology.

For additional water quality information:
State of Washington's Department of Ecology
www.ecy.wa.gov/programs/eap/beach/index.html
Current beach closure and advisory information can be found at:
http://ecologywa.blogspot.com/search/label/Fecal%20matters

Section VII: Appendices

Photo: Mission Bay Visitor's Center @ Clairemont Drive, San Diego County

Frequently Asked Questions (FAQs)

HEAL THE BAY'S ANNUAL BEACH REPORT CARD

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 science, education, community action and advocacy to pursue our mission.

What is the Beach Report Card?

Ocean water quality testing is vital to the health of the millions of people who recreate in coastal waters. Heal the Bay's Beach Report Card (BRC) is a vital public health protection tool based on the monitoring of beaches conducted by local health agencies and dischargers.

Since the BRC was first published more than 25 years ago, beachgoers throughout California have come to rely on the annual and weekly grades to better protect their health and the health of their families. The BRC grades over 600 locations along the West Coast for summer dry weather and over 300 locations year-round on an A-to-F scale based on the risk of adverse health effects to beachgoers. Grades are based on fecal bacteria pollution concentrations in the wave-wash. 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 BRC 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. Heal the Bay urges coastal beachgoers to use this information before they visit beaches on the West Coast.

The Beach Report Card would not be possible without the cooperation of all of the shoreline monitoring agencies in California, Oregon and Washington.

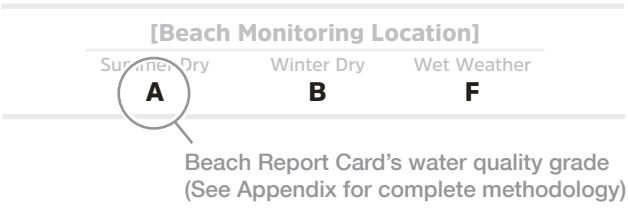
What is the history of the BRC?

Heal the Bay's first Beach Report Card was published in 1991 and covered about 60 monitoring locations in Los Angeles County from Leo Carrillo Beach (near the Ventura County line) 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 known public issue only when a substantial sewage spill occurred. Although beaches were routinely monitored, the data were either inaccessible or incomprehensible to the general public.

Since then, an immense amount of work has been completed and resources invested to reduce urban runoff pollution and sewage spills at our local beaches. All the while, Heal the Bay's Beach Report Card expanded its coverage from Los Angeles County to the entire western United States coastline.

What do the grades mean to the beach user?

Recreating in waters with increased bacteria concentrations has been associated with increased risks to human health. The higher the grade a beach receives, the better the water quality at that beach. The lower the grade, the greater the health risks. Potential illnesses include stomach flu, eye/ear infections, 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.



How are grades calculated?

Heal the Bay's grading system takes into consideration the magnitude and frequency of exceedances above allowed bacterial levels over the course of the specified time period. Each BRC year contains three time/weather periods:

- Summer Dry = Samples taken during dry weather between April 1 and October 31
- Winter Dry = Samples taken during dry weather between November 1 and March 31
- Wet Weather = Samples taken during or within 72 hours of a rain event*

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 grade, and to provide better understanding of statewide beach water quality impacts. For complete methodology, see Appendix A.

NOTE: *Heal the Bay utilizes a definition of a 'rain event' in California as precipitation greater than or equal to one tenth of an inch (>= 0.1"). Oregon and Washington criteria for a rain event is >=0.2" precipitation.

How current are the grades?

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. Faster methods are currently being developed but presently remain too costly to implement. Heal the Bay releases grades every Friday throughout the year based on the most recent available sample data for the entire West Coast. Weekly grades and more can be found at www.beachreportcard.org

What type of 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 amounts of indicator bacteria present in runoff, and consequently in the wave-wash, is currently the best indication of whether or not a beach is safe for recreational water contact. The link between swimming in waters containing elevated levels of indicator bacteria and health risk was con-

firmed in the ground breaking 1995 epidemiological study conducted by the University of Southern California, Orange County Sanitation District, the City of Los Angeles and Heal the Bay, under the auspices of the Santa Monica Bay Restoration Project.

Indicator bacteria do not usually cause bather illness. Instead, their presence indicates the potential for water contamination with other pathogenic microorganisms such as bacteria, viruses and protozoa that do pose a health risk to humans. The BRC 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 report card contains no information on toxins or trash in the water or on the beach.

ABOUT INDICATOR BACTERIA

The most common types of indicator bacteria include:

- **Total coliform**
- **Fecal coliform (or E. coli)**
- **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 bacteria 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.

Why is storm drain pollution so significant?

Health officials and Heal the Bay recommend that beach users never swim within 100 yards on either side of a flowing storm drain, creek, or river in any coastal waters during a rainstorm, and to stay out of the water 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.

Children often 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 all swimmers are minimized. This Heal the Bay recommendation was finally adopted by the State Water Resources Control Board (SWRCB) for the 2015 swimming season. In fact, the SWRCB made point zero monitoring a criterion for receiving beach water quality monitoring funds. This was great news for beachgoers and families going to the beach last summer.

For more on storm drain beaches, see "Beach Types" on page 14.

Are beaches monitored year-round?

This is the Beach Report Card's fourth year of grading water quality along the entire U.S. Pacific Coastline. A total of 637 shoreline monitoring locations were analyzed from Whatcom County in Washington to San Diego County at the Mexican border. Most sample locations are selected by monitoring, health, and regulatory agencies to specifically target popular beaches or those beaches frequently affected by a pollution source like runoff. In the case of the Pacific Northwest, some locations are selected for being popular shell fishing beaches.

According to the EPA BEACH Act of 2000, each state having 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. Once again, President Obama's proposed budget for FY 2016 'red-lined' the entire BEACH Act monitoring program (approximately $10 million). States are only required to monitor recreational waters when federal funding is available, meaning the proposed budget cuts could ultimately relinquish states of their monitoring responsibilities. Without such funds, water quality monitoring programs like Oregon's would vanish. Fortunately for beachgoers across the country, Congress restored these appropriated funds for the 2016 swimming season.

In California, water quality samples are collected by the appropriate health agency at a minimum of once a week from April through October as required under the California Beach Bathing Water Quality Standards (AB 411) and recommended by 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. Starting April 2015, all monitoring agencies participating in the California Beach Program were required to sample at point-zero—where flows from rivers, creeks, or storm drains meet the ocean. This was a major step in achieving monitoring consistency from county to county, and meeting the intent of AB411.

The majority of Oregon and Washington water quality monitoring occurs during the summer swimming season (Memorial Day through Labor Day).

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, which include a component to identify and quantify viral pathogens, began five and a half years ago. These large scale epidemiology studies (using over 30 microbial indicators) were led by SCCWRP, UC Berkeley, Orange County Sanitation Districts, the USEPA, and Heal the Bay. The studies took place at Doheny State Beach, Avalon Beach and Surfrider Beach in Malibu.

In January 2012, the article "Using Rapid Indicators for Enterococcus to Assess the Risk of Illness after Exposure to Urban Runoff Contaminated Marine Water" (www.ncbi.nlm.nih.gov/pmc/articles/PMC3354759) to assess the risk of illness after exposure to urban runoff contaminated marine water was published in Water Research, based on the epidemiology study performed at Doheny State Beach between 2007-2008. In March 2014, an article summarizing Avalon's epidemiological was published in Water Research.

Methodology

METHODOLOGY: CALIFORNIA

Heal the Bay's Beach Report Card grading system is endorsed by the SWRCB and the Beach Water Quality Workgroup as an effective way to communicate beach water quality to the public

Past amendments to the grading methodology have included:

- The inclusion of the geometric mean into the calculation
- A firm zero-to-100 point scale
- Greater weight for Enterococcus and the total to fecal ratio relative to total coliform and fecal coliform

The 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 Table 7-1 the methodology uses a standard A through F grading system, and grades are based on the following formula:

$$\%\ \text{Grade} = \frac{\text{'TOTAL POINTS AVAILABLE'} - \text{'TOTAL POINTS LOST'}}{\text{'TOTAL POINTS AVAILABLE'}}$$

[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 7-2.

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). Wet weather data is graded separately from dry weather data, and does not currently 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 the rolling 30-day geometric mean values calculated for each sample day (see Table 7-3).

Each geometric mean criterion exceeded is assigned a specific percentage of points lost. Non-exceedances are given 0%. The percentage of points lost from each of the three criteria divided by the number of sample days are multiplied by the 'Total Available Points' (any sum of percentages exceeding 100% automatically loses all 50 points available in 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 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 7-4).

'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 7-4.

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

$$\%\ \text{Grade} = \frac{\text{'TOTAL POINTS AVAILABLE'} - \text{'TOTAL POINTS LOST'}}{\text{'TOTAL POINTS AVAILABLE'}}$$

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.

METHODOLOGY: OREGON AND WASHINGTON

The Oregon and Washington state grade methodology (using Enterococcus standards) was adapted from the seven standard California methodology (see Appendix A1).

Total Points Available

As seen in Table 7-2, the methodology uses a standard A through F grading system, and grades are based on the following formula:

$$\%\ \text{Grade} = \frac{\text{'TOTAL POINTS AVAILABLE'} - \text{'TOTAL POINTS LOST'}}{\text{'TOTAL POINTS AVAILABLE'}}$$

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.)

Wet weather data (>=0.2 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 7-2. In order for the points in each component to become available certain criteria must be met. Oregon and Washington 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 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 7-6.

'Percentage of points lost' is allocated depending upon the threshold exceeded. The penalties for threshold exceedances are presented in Table 7-7. 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

$$\text{\% Grade} = \frac{\text{'TOTAL POINTS AVAILABLE'} - \text{'TOTAL POINTS LOST'}}{\text{'TOTAL POINTS AVAILABLE'}}$$

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.

TABLE 7-1: GRADING SYSTEM

A	B	C	D	F
100%-90%	89%-80%	79%-70%	69%-60%	<60%

TABLE 7-2: TOTAL POINTS AVAILABLE BY COMPONENT

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

TABLE 7-3: CALCULATING THE TOTAL POINTS LOST FOR THE GEOMETRIC MEAN COMPONENT

Indicator Exceeded	Calif. Beach Bathing Water Standard	% of Total Available Points Lost** Due to Exceedance	Total Avail. Points
Enterococcus	35	80%	50
Fecal Coliform	200	40%	
Total Coliform	1000	20%	

** Colony forming units per 100 milliliters of ocean water*

TABLE 7-4: 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. N/A = Not applicable*
*SD = Standard Deviation. **Bold** = California State Health Department standards for a single sample*

TABLE 7-5: CALCULATING THE TOTAL POINTS LOST 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	50
Fecal Coliform	10%	30%	40%	N/A	
Enterococcus	20%	40%	60%	N/A	
Ratio (when total > 1,000)	25%	50%	75%	100%	

TABLE 7-6: SINGLE SAMPLE GRADIENT THRESHOLDS IN CFU/100ML*

Indicator Bacteria	SLIGHT T – 1 SD	MODERATE T + 1 SD	HIGH > T + 1 S
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 7-7: 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

Beach Bummers History

2016	2015	2014	2013
Cowell Beach SANTA CRUZ COUNTY	**Cowell Beach** SANTA CRUZ COUNTY	**Cowell Beach** SANTA CRUZ COUNTY	**Avalon, Catalina Island** LOS ANGELES COUNTY
Clam Beach County Park HUMBOLDT COUNTY	**Mother's Beach, MDR** LOS ANGELES COUNTY	**Marina Lagoon** SAN MATEO COUNTY	**Cowell Beach** SANTA CRUZ COUNTY
Shelter Island (Shoreline Park) SAN DIEGO COUNTY	**Clam Beach County Park** HUMBOLDT COUNTY	**Mother's Beach, MDR** LOS ANGELES COUNTY	**Poche Beach** ORANGE COUNTY
Monarch Beach (North) ORANGE COUNTY	**Aquatic Park** SAN MATEO COUNTY	**Cabrillo Beach, harborside** LOS ANGELES COUNTY	**Cabrillo Beach, harborside** LOS ANGELES COUNTY
Santa Monica Pier LOS ANGELES COUNTY	**Mission Bay** SAN DIEGO COUNTY	**Stillwater Cove** MONTEREY COUNTY	**Malibu Pier** LOS ANGELES COUNTY
Mother's Beach, MDR LOS ANGELES COUNTY	**Santa Monica Municipal Pier** LOS ANGELES COUNTY	**Clam Beach County Park** HUMBOLDT COUNTY	**Marina Lagoon** SAN MATEO COUNTY
Redondo Beach Pier LOS ANGELES COUNTY	**Candlestick Point** SAN FRANCISCO COUNTY	**Santa Monica Pier** LOS ANGELES COUNTY	**Doheny State Beach** ORANGE COUNTY
Candlestick Point SAN FRANCISCO COUNTY	**Stillwater Cove** MONTEREY COUNTY	**Pillar Point Harbor** SAN MATEO COUNTY	**Redondo Beach Pier** LOS ANGELES COUNTY
Pillar Point Harbor SAN MATEO COUNTY	**Cabrillo Beach, harborside** LOS ANGELES COUNTY	**Capitola Beach** SANTA CRUZ COUNTY	**Windsurfer Circle** SAN FRANCISCO COUNTY
Pismo Beach Pier SAN LUIS OBISPO COUNTY	**Huntington Beach (Brookhurst)** ORANGE COUNTY	**Windsurfer Circle** SAN FRANCISCO COUNTY	**Tijuana River Mouth** SAN DIEGO COUNTY

2012	2011	2010	2009
Avalon, Catalina Island LOS ANGELES COUNTY	**Cowell Beach** SANTA CRUZ COUNTY	**Avalon, Catalina Island** LOS ANGELES COUNTY	**Avalon, Catalina Island** LOS ANGELES COUNTY
Cowell Beach SANTA CRUZ COUNTY	**Avalon, Catalina Island** LOS ANGELES COUNTY	**Cowell Beach** SANTA CRUZ COUNTY	**Cabrillo Beach, harborside** LOS ANGELES COUNTY
Marie Canyon, Malibu LOS ANGELES COUNTY	**Cabrillo Beach, harborside** LOS ANGELES COUNTY	**Cabrillo Beach, harborside** LOS ANGELES COUNTY	**Pismo Beach Pier** SAN LUIS OBISPO COUNTY
Surfrider Beach, Malibu LOS ANGELES COUNTY	**Topanga State Beach Malibu** LOS ANGELES COUNTY	**Poche Beach** ORANGE COUNTY	**Colorado Lagoon, Long Beach** LOS ANGELES COUNTY
Solstice Canyon, Malibu LOS ANGELES COUNTY	**Poche Beach** ORANGE COUNTY	**Santa Monica Pier** LOS ANGELES COUNTY	**Santa Monica Pier** LOS ANGELES COUNTY
Cabrillo Beach, harborside LOS ANGELES COUNTY	**Doheny State Beach** ORANGE COUNTY	**Colorado Lagoon, Long Beach** LOS ANGELES COUNTY	**Long Beach (multiple locations)** LOS ANGELES COUNTY
Doheny State Beach ORANGE COUNTY	**Arroyo Burro (Hendry's Beach)** SANTA BARBARA COUNTY	**Baker Beach** SAN FRANCISCO COUNTY	**Poche Beach** ORANGE COUNTY
Poche Beach ORANGE COUNTY	**Baker Beach** SAN FRANCISCO COUNTY	**Capitola Beach** SANTA CRUZ COUNTY	**Surfrider Beach, Malibu** LOS ANGELES COUNTY
Escondido State Beach, Malibu LOS ANGELES COUNTY	**Colorado Lagoon, Long Beach** LOS ANGELES COUNTY	**Mission Bay** SAN DIEGO COUNTY	**Campbell Cove** SONOMA COUNTY
Topanga State Beach Malibu LOS ANGELES COUNTY	**Capitola Beach** SANTA CRUZ COUNTY	**Will Rogers State Beach** LOS ANGELES COUNTY	**Doheny State Beach** ORANGE COUNTY

2015-16 Honor Roll Southern California

Ventura County	Los Angeles County	Orange County	San Diego County
Hollywood Beach @ Los Robles St. (south of drain)	**El Matador State Beach** @ Encinal Canyon	**El Moro Beach (point zero)** (Beginning March 2015)	**Oceanside** San Luis Rey River outlet
Port Hueneme Beach Park 50 yds. no. of the Pier	**Escondido State Beach** Just east of Escondido Creek	**Crescent Bay Beach**	**Oceanside** Projection of Forster Street
Ormond Beach Oxnard Industrial drain 50 yds. no. of the drain	**Long Point** Rancho Palos Verdes	**Victoria Beach (point zero)** (Beginning March 2015)	**Oceanside** St. Malo Beach (downcoast from St. Malo Road)
	Abalone Cove Shoreline Park Rancho Palos Verdes	**Camel Point**	**Carlsbad** Projection of Cerezo Drive
	Portuguese Bend Cove Rancho Palos Verdes	**Laguna Lido Apt.**	**Carlsbad** Projection of Palomar Airport Road
		Three Arch Bay	**Carlsbad** Encina Creek outlet
		Marine Science Institute Beach (SERRA)	**Carlsbad** Projection of Ponto Drive
		Dana Point Projection of Camino Estrella (7500' South Outfall)	**Carlsbad** Projection of Poinsettia Lane
		Dana Point So. Capistrano Bay Comm. Beach (10000' so. of SERRA Outfall)	**Encinitas San Elijo State Park** Projection of Liverpool Drive
		San Clemente @ Avenida Calafia	**Cardiff State Beach** Seaside State Park
		San Clemente @ Avenida Las Palmeras	**Solana Beach Tide Beach Park** Projection Solana Vista Drive
		Dana Point Harbor Youth Dock	**Solana Beach Fletcher Cove** Projection Lomas Santa Fe Drive
			Ocean Beach Ocean Pier Projection of Narragansett Avenue
			Point Loma Lighthouse

California's year-round monitored beaches with excellent water quality all year.

California 2015-2016 Grades by County

San Diego County		Summer Dry (Apr-Oct)	Winter Dry (Nov-Mar)	Wet Weather Year-Round
Oceanside	San Luis Rey River outlet	A+	A+	A+
	projection of Tyson Street	A	A+	B
	projection of Forster Street	A+	A+	A+
	500' N. of Loma Alta Creek outlet	A+	A+	B
	projection of Cassidy Street	A+	A	A+
	St. Malo Beach (downcoast from St. Malo Road)	A+	A+	A+
Carlsbad	projection of Tamarack Avenue	A	A+	A+
	warm water jetty	A		A+
	projection of Cerezo Drive	A+	A+	A+
	projection of Palomar Airport Road	A+	A+	A+
	Encina Creek outlet	A+	A+	A+
	projection of Ponto Drive	A+	A+	A+
	projection of Poinsettia Lane	A+	A+	A+
	Batiquitos Lagoon outlet	A	A+	A+
Encinitas	Moonlight Beach (Cottonwood Creek outlet)	B	A	C
	Swami's Beach (Seacliff Park)	A		A+
	San Elijo State Park - Pipes surf break	A+	A	A+
	San Elijo State Park - North end of State Park stairs	A+	A	A+
	San Elijo State Park - projection Liverpool Drive	A+	A+	A+
Cardiff State Beach	San Elijo Lagoon outlet	A	A	A+
	Charthouse parking (slight S. of Kilkeny)	A	A+	A+
	Las Olas (100 yds. South of Charthouse)	A+	A	A+
	Seaside State Park	A+	A+	A+
Solana Beach	Tide Beach Park - projection Solana Vista Drive	A+	A+	A+
	Fletcher Cove - projection Lomas Santa Fe Drive	A+	A+	A+
	Seascape Surf Beach Park	A+		A+
Del Mar	San Dieguito River Beach	A	A	A
	projection of 15th Street	A	A	A+
Torrey Pines	Los Penasquitos Lagoon outlet	A+	A+	B
La Jolla	Shores projection of Ave De La Playa	A	A	A+
	La Jolla Cove	B	B	A+
	Ravina - South of Nicholson Pt.	A		A+
Windansea Beach	projection of Playa Del Norte	A+	A	A+
Pacific Beach	P.B. Point (downcoast of Linda Way)	B		
	Tourmaline Surf Park - projection of Tourmaline Street	A	A	A+

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

SAN DIEGO COUNTY		**Summer Dry** (Apr-Oct)	**Winter Dry** (Nov-Mar)	**Wet Weather** Year-Round
Mission Beach	Belmont Park	A	A	A
Mission Bay	Bonita Cove (east cove)	A+		
	Bahia Point - northside (apex of Gleason Road)	A		
	Fanuel Park - projection of Fanuel Street	B		
	Crown Point Shores	A		
	Wildlife Refuge near fence - projection of Lamont Street	A		
	Campland (west of Rose Creek)	A		
	DeAnza Cove (mid - cove)	B		
	Visitor's Center - projection of Clairemont Drive	B	F	F
	Comfort Station - north of Leisure Lagoon	**D**	**F**	
	Leisure Lagoon (swim area)	A		
	Tecolote Playground (watercraft area)	A		
	Tecolote Shores (swim area)	A	F	A+
	Vacation Isle Ski Beach	A		
	Vacation Isle North Cove Beach	B		C
Ocean Beach	San Diego River outlet (Dog Beach)	A	A	A+
	Stub Jetty	A	A	A
	Pier northside at Newport Avenue	A	A	A+
	Ocean Pier - projection of Narragansett Avenue	A+	A+	A+
	projection of Bermuda Avenue	A	B	A
Sunset Cliffs	projection of Ladera Street	A+	A	A+
Point Loma	Point Loma Treatment Plant	A	A	A+
	Lighthouse	A+	A+	A+
San Diego Bay	**Shelter Island (Shoreline Beach Park)**	**F**		**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		
Coronado	projection of Ave del Sol	A+	A	C
	Silver Strand	A+	A+	C
Imperial Beach	projection of Carnation Avenue	A+	A+	F
	Imperial Beach Pier	A	A+	F
	projection of Cortez Avenue		A+	F
	south end of Seacoast Drive	A	A+	F
Tijuana Slough	NWRS 3/4 mi. N of TJ River	A	A+	F
	NWRS Tijuana Rivermouth	B	D	F
Border Field State Park	projection of Monument Road	A	D	F
	Border Fence (northside)	A	B	F

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

Orange County

		Summer Dry (Apr-Oct)	Winter Dry (Nov-Mar)	Wet Weather Year-Round
Seal Beach	projection of 1st Street	B	A	F
	projection of 8th Street	B	A+	F
	100 yards south of pier	A	A	C
	projection of 14th Street	A	A+	B
Surfside Beach	projection of Sea Way	A	A+	A+
	projection of Broadway	A+	A+	A
Bolsa Chica	Bolsa Chica Beach across from the Reserve Flood Gates	A	A+	D
	Bolsa Chica Reserve at the downcoast end of State Beach	A	A+	C
Huntington Beach	Bluffs	A	A	D
	projection of 17th Street	A	A+	D
	Jack's Snack Bar at Street	A	A	D
	projection of Beach Boulevard	A+	A	F
	projection of Newland Street (SCE Plant)	A	A	F
	projection of Magnolia Street	A	A	F
	projection of Brookhurst Street	A	A	F
	Santa Ana River Mouth	A	A	F
Newport Beach	projection of Orange Street	A	A	F
	projection of 52nd/53rd Street	A+	A+	C
	projection of 38th Street	A+	A	C
Balboa Beach	projection of 15th/16th Street	A	A	C
	Pier	A+	A+	B
	The Wedge	A	A+	B
Huntington Harbor	Mothers Beach - Orange County	A	B	F
	Trinidad Lane Beach	B	A	F
	Seagate Lagoon	A	A+	B
	Humboldt Beach	A	A	C
	Davenport Beach	A	A+	D
	Coral Cay Beach	A	B	F
	11th Street Beach	A	A	F
Newport Bay	Newport Dunes - North	A	A	F
	Newport Dunes - East	A	B	F
	Newport Dunes - Middle	A	A+	F
	Newport Dunes - West	A	A	F
	Bayshore Beach	A+	A+	F
	Via Genoa Beach	A	A	F
	Lido Yacht Club Beach	A	A	F
	Garnet Avenue Beach	A	A	F
	Sapphire Avenue Beach		C	F
	Abalone Avenue Beach	A	A+	F

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

ORANGE COUNTY		**Summer Dry** (Apr-Oct)	**Winter Dry** (Nov-Mar)	**Wet Weather** Year-Round
Newport Bay (cont.'d)	Park Avenue Beach	A+	A+	F
	Onyx Avenue Beach	A+	A	F
	Ruby Avenue Beach	A	A+	F
	Grand Canal	A	A	F
	43rd Street Beach	A	A	F
	38th Street Beach	A	A	F
	19th Street Beach	A	A	F
	15th Street Beach	A+	A	F
	10th Street Beach	A	A+	F
	Newport Bay N Street Beach	A+	A	F
	Newport Bay Harbor Patrol Beach at Bayside Drive	A	A+	F
	Newport Bay Rocky Point Beach	A+	A+	F
Corona Del Mar	Corona Del Mar (CSDOC)	A+	A	B
	Little Corona Beach	B	A	C
Pelican Point Beach	Pelican Point Beach	A+	A	B
Crystal Cove State Park	Crystal Cove (CSDOC)	A+	A+	C
	Crystal Cove (weekly)	A	A+	C
	Muddy Creek Beach	A+	A+	B
	El Moro Beach	A+	A+	A+
Laguna Beach	Emerald Bay Beach	A	A	A+
	Diver's Cove	A+	A	
	Crescent Bay Beach	A+	A+	A+
	Laguna Main Beach	A	B	B
	Laguna Hotel	A	A	A+
	Cleo Street	A+	A	
	projection of Bluebird Canyon	A	A	A+
	Victoria Beach	A+	A+	A+
	Laguna Beach - Goff Island Beach	A	A+	A+
	Treasure Island Beach	A+	A	A
	North Aliso County Beach	A+	A	A+
	Aliso Creek Ocean Interface	A	B	
	Aliso Creek - outlet	A	C	B
	Aliso Creek - 1000' south	A+	A	A+
	Camel Point	A+	A+	A+
	West Street	A+	A	
	Table Rock	A	A+	A
	Laguna Lido Apt.	A+	A+	A+
	9th Street 1000 Steps Beach	A	A+	A+
	Three Arch Bay	A+	A+	A+

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

ORANGE COUNTY		**Summer Dry** (Apr-Oct)	**Winter Dry** (Nov-Mar)	**Wet Weather** Year-Round
Dana Point	**Monarch Beach (North)**	**F**	**F**	**F**
	Salt Creek Beach	A	A+	A
	Dana Strands Beach (AWMA)	A	A+	A+
	Marine Science Institute Beach (SERRA)	A+	A+	A+
Doheny State Beach	North Beach	B	F	
	Mid Beach north of San Juan Creek	A	A	F
	San Juan Creek Ocean Interface	A	B	
	San Juan Creek Interface	A	B	F
	Last Campground (1000' south of SERRA Outfall)	A	A	C
	2000' south of SERRA Outfall	A	A	F
	Doheny Beach - South Day Use Area drain	A	A	
	Pedestrian Bridge (3000' south of SERRA Outfall)	A	A	F
	End of the Park	A+	A	B
	Capistrano County Beach (5000' south of SERRA Outfall)	A		B
	Capistrano County Beach drain	A		
	Capistano Bay Community Beach	A+		
	projection of Camino Estrella (7500' so. Outfall)	A+	A+	A+
	So. Capistrano Bay Comm. Beach (10000' so. SERRA Outfall)	A+	A+	A+
San Clemente	Poche Beach	A	A	A
	Poche Creek Ocean Interface	A	B	
	Capistrano Shores North		A+	
	Pico drain at North Beach	A	A	
	North beach at Avenida Pico (20000' South Outfall)	A+	A	A+
	Mariposa Beach	A+	A	
	Linda Lane Beach	A+	B	
	Pier Lifeguard Building north	A+	A	A
	Pier drain	B	A	
	Trafalgar Canyon	A+	A	A+
	Boca del Canon Beach	A+	A+	
	Riviera Beach	A+		
	at Avenida Calafia	A+	A+	A+
	at Avenida Las Palmeras	A+	A+	A+
Dana Point Harbor	Baby Beach - West End	A	A+	A+
	Baby Beach - Buoy Line	A	A+	A+
	Baby Beach - Swim Area	A	A	A+
	Baby Beach - East End	A	A	A+
	Guest Dock	A+	A	A+
	Youth Dock	A+	A+	A+

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

Los Angeles County

		Summer Dry (Apr-Oct)	Winter Dry (Nov-Mar)	Wet Weather Year-Round
Malibu	Leo Carrillo Beach at Arroyo Sequit Creek	A	A	B
	Nicholas Beach at San Nicholas Canyon Creek	A+	A+	A
	El Matador State Beach at Encinal Canyon	A+	A+	A+
	Broad Beach at Trancas Creek mouth	A	A	A+
	Zuma Beach at Zuma Creek mouth	A+	A+	A
	Walnut Creek outlet projection of Wildlife Road	A+	A	F
	Unnamed Creek projection of Zumirez Drive (Little Dume)	A	A	A
	Paradise Cove Pier at Ramirez Canyon Creek	A	A	A
	Escondido State Beach just east of Escondido Creek	A+	A+	A+
	Latigo Canyon Creek mouth	A	A+	A
	Dan Blocker County Beach at Solstice Canyon	A+	A+	F
	Unnamed Creek adj. to public stairway at 24822 Malibu Rd	A	A	A
	Puerco State Beach at creek mouth	A+	A	A
	Marie Canyon drain at Puerco Beach at 24572 Malibu Rd	A	A	F
	Malibu Point	A+	A	A
	Surfrider Beach (breach point)	A	F	F
	Carbon Beach at Sweetwater Canyon	A+	A+	A
	Las Flores State Beach at Las Flores Creek	A+	A	D
	Big Rock Beach at 19948 PCH stairs	A	A	B
	Las Tunas County Beach at Pena Creek	A		A+
Topanga State Beach	Topanga Beach at creek mouth	A	B	C
Castle Rock Beach	Castlerock storm drain	A	A	C
Will Rogers State Beach	**Santa Ynez drain at Sunset Boulevard**	**D**	**C**	**F**
	17200 PCH (1/4 mile east of Sunset drain)		A+	A
	Bel Air Bay Club drain near fence	A	A	B
	Pulga Canyon storm drain	A	A+	F
	Temescal Canyon drain	A+	A+	B
	Santa Monica Canyon drain	A	A	F
Santa Monica	Montana Avenue drain	A	A+	C
	Wilshire Boulevard drain	A	A	C
	Santa Monica Municipal Pier	**F**	**F**	**F**
	Pico/Kenter storm drain	A	B	F
	Strand Street (in front of the restrooms)	A	A+	C
	Ocean Park Beach at Ashland Avenue drain	A	A	F
Venice Beach	Rose Avenue storm drain	A	A	F
	Brooks Avenue drain	A	A+	C
	Windward Avenue drain	**C**	**A**	**F**
	Venice Fishing Pier - 50 yards south	A	A+	F
	Venice City Beach at Topsail Street	A	A+	D

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

LOS ANGELES COUNTY		Summer Dry (Apr-Oct)	Winter Dry (Nov-Mar)	Wet Weather Year-Round
Marina del Rey	**Mothers' Beach - Playground area**	**C**	**F**	**F**
	Mothers' Beach - lifeguard tower	**B**	**D**	**F**
	Mothers' Beach - between Tower and Boat dock	**F**	**F**	**F**
Dockweiler State Beach	Culver Boulevard drain	A	A	F
	North Westchester Storm Drain	A+	A+	F
	World Way (south of D&W jetty)	A	A+	F
	Imperial Hwy drain	A	A	C
	Hyperion Treatment Plant One Mile Outfall	A	A+	C
	at Grand Avenue drain	A+	A	D
Manhattan Beach	at 40th Street	A	A+	B
	at 28th Street drain	A	A	F
	Manhattan Beach Pier at drain	A	A+	C
Hermosa Beach	at 26th Street	A	A	B
	Hermosa Beach Pier - 50 yards south	A	A+	B
	at Herondo Street storm drain - (in front of the drain)	A	A	F
Redondo Beach	**Redondo Beach Pier - 100 yards south**	**F**	**D**	**A**
	at Sapphire Street	A	A+	C
	at Topaz Street - north of jetty	A	A+	B
Torrance Beach	at Avenue I drain	A	A	B
Palos Verdes Peninsula	Malaga Cove at trail outlet	B	A	A+
	Malaga Cove at rocks	A+	A	A+
	Palos Verdes (Bluff) Cove	A+	A	A+
	Long Point	A+	A+	A+
	Abalone Cove Shoreline Park	A+	A+	A+
	Portuguese Bend Cove	A+	A+	A+
San Pedro	Royal Palms State Beach	A	A+	A+
	Wilder Annex San Pedro	A	A+	A
Cabrillo Beach	Cabrillo Beach - ocean side	A	A+	A+
	Cabrillo Beach - harborside at restrooms	A	A	D
	Cabrillo Beach - harborside at boat launch	A	A	D
Long Beach	projection of 5th Place	A	A	F
	projection of 10th Place	A	A	F
	projection of Molino Avenue	A	C	F
	projection of Coronado Avenue	A	A	F
	Belmont Pier - westside	A	A+	F
	projection of Prospect Avenue	A	A	F
	projection of Granada Avenue	B	C	F
	Alamitos Bay - 2nd Street Bridge & Bayshore	A	A	F
	Alamitos Bay - shore float	A	A	F
	Mother's Beach - Long Beach - north end	B	B	F

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

LOS ANGELES COUNTY		**Summer Dry** (Apr-Oct)	**Winter Dry** (Nov-Mar)	**Wet Weather** Year-Round
Long Beach (cont.'d)	Alamitos Bay - 56th Place - on bayside	A	A	C
	projection of 55th Place	A	A	A
	projection of 72nd Place	**C**	**D**	**A+**
	Colorado Lagoon - north	A	A	F
	Colorado Lagoon - south	A	A+	F
Catalina Island	Avalon Beach - east of the Casino Arch at the steps	A		F
	Avalon Beach - 100 feet west of the Green Pleasure Pier	A		C
	Avalon Beach - 50 feet west of the Green Pleasure Pier	B		C
	Avalon Beach - 50 feet east of the Green Pleasure Pier	A		F
	Avalon Beach - 100 feet east of the Green Pleasure Pier	A		C

Ventura County

Rincon Beach	25 yds. so. of the creek mouth	A	A+	B
	at the end of the footpath	A+		A+
La Conchita Beach	Ocean View Road	A+		A+
Oil Piers Beach	south of drain	A		A+
Hobson County Park	base of stairs to the beach	A		A+
Faria County Park	at the stairs	A+	A+	C
Mandos Cove	point zero	A+		A+
Solimar Beach	at south end of east gate access road	A+	A+	B
Emma Wood State Beach	50 yards S. of first drain	A	A+	A+
Surfer's Point at Seaside	End of access path via wooden gate	A	A+	F
Promenade Park	Figueroa Street	A	A+	C
	Redwood Apts.	A+		A+
	Holiday Inn south of drain at California Street	A+		A+
San Buenaventura Beach	south of drain at Kalorama Street	A		A+
	south of drain at San Jon Road	A+	A	F
	outh of drain at Dover Ln.	A+		A+
	south of drain at Weymouth Ln.	A+		A+
Ventura Harbour outlet	Marina Park (Beach at N. end of playground)	A		A+
	Peninsula Beach (Beach area N. of South Jetty)	A+		A+
	Surfer's Knoll (Beach adjacent to parking lot)	A	A+	B
Oxnard Beach	5th Street (south of drain)	A+		B
	Outrigger Way (south of drain)	A+		A+
	Falkirk Avenue (south of drain)	A+		A+
	Starfish Drive (south of drain)	A+		A+
Hollywood Beach	La Crescenta Street (south of drain)	A+		A+
	Los Robles Street (south of drain)	A+	A+	A+

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

VENTURA COUNTY		**Summer Dry** (Apr-Oct)	**Winter Dry** (Nov-Mar)	**Wet Weather** Year-Round
Chanel Islands Harbor	Hobie Beach Lakshore Drive	A+	A	D
	Beach Park at S. end of Victoria Avenue	A	A	C
Silverstrand	San Nicholas Avenue (south of jetty)	A	A	A+
	Santa Paula Drive (south of drain)	A+	A+	A
	Sawtelle Avenue (south of drain)	A	A+	A+
Port Hueneme Beach Park	50 yds. no.of the Pier	A+	A+	A+
Ormond Beach	J Street drain	A+	A+	C
	Oxnard Industrial drain 50 yds. no. of the drain	A+	A+	A+
	Arnold Road	A+	A+	B
Point Mugu	adjacent to parking lot entry	A+		A+
	Thornhill Broome Beach adjacent to parking lot entry	A		A+
Sycamore Cove Beach	50 yds. so. of the creek mouth	A+		A+
County Line Beach	point zero	A		A+
Staircase Beach	bottom of staircase	A		A+

Santa Barbara County

Guadalupe Dunes		A	A+	A+
Jalama Beach		A+	A+	B
Gaviota State Beach		A	A+	A+
Refugio State Beach		A	A	B
El Capitan State Beach		A+	A+	A
Sands	at Coal Oil Point	A+	A+	A
Goleta Beach		A	A+	A
Hope Ranch Beach		A	A	C
Arroyo Burro Beach		A	A+	F
Leadbetter Beach		B	B	B
East Beach	at Mission Creek	B	A	F
	at Sycamore Creek	A	A+	C
Butterfly Beach		A	A+	A
Hammond's Beach		A	C	C
Summerland Beach		A	A+	A
Carpinteria State Beach		A	A+	C

San Luis Obispo County

San Simeon	Pico Avenue	A	A+	A+
Cayucos State Beach	halfway between Cayucos Creek and the Pier	A	A	C
	downcoast of the pier	A	A+	B
	Studio Drive parking lot near Old Creek	A	A	A

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

SAN LUIS OBISPO COUNTY		**Summer Dry** (Apr-Oct)	**Winter Dry** (Nov-Mar)	**Wet Weather** Year-Round
Morro Strand State Beach	projection of Beachcomber Drive	A	A+	A+
Morro Bay City Beach	projection of Atascadero	A+	A+	D
	Morro Creek (south side)	A+	A+	B
	75 feet north of main parking lot	A	A+	B
Olde Port Beach	Harford Beach, north	B	B	B
Avila Beach	projection of San Juan Street	B	A	F
	projection of San Luis Street	A	A	C
Pismo Beach	Sewers at Silver Shoals Drive	A	A+	A+
	projection of Wadsworth Street	A	A	A+
	Pier 40 feet south of the pier	**D**	**A**	**A**
	projection of Ocean View	A	A	A+
	330 yards no. of Pier Avenue	A	A	A+
	projection of Pier Avenue	A	A	A+
	571 yards south of Pier Avenue end of Strand Way	A+	A	A+

Monterey County

Monterey Bay	Monterey State Beach	A		C
	Monterey Municipal Beach (at the commercial wharf)	A		A
	San Carlos Beach at San Carlos Beach Park	A		A
	Lover's Point Park projection of 16th Street	A		A
	Asilomar State Beach projection of Arena Avenue	A+		A
	Spanish Bay (Moss Beach) end of 17 mile drive	A		A
	Stillwater Cove at Beach and Tennis Club	A		A+
Carmel	projection of Ocean Avenue (west end)	A+		A+

Santa Cruz County

Santa Cruz	Natural Bridges State Beach	A+	B	B
	Cowell Beach at the Stairs	A	A	C
	Cowell Beach Lifeguard Tower 1	A	A+	C
	Cowell Beach west of the wharf	**F**	**A+**	**D**
	Santa Cruz Main Beach at the Boardwalk	B	A	C
	Santa Cruz Main Beach at the San Lorenzo River	A	A+	F
	Seabright Beach	A	A+	C
	Twin Lakes Beach	A	A+	C
Capitola Beach	**Capitola Beach west of jetty**	**C**	**A**	**F**
	Capitola Beach east of jetty	B	A	F
	New Brighton Beach	A+	A	F

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

SANTA CRUZ COUNTY		Summer Dry (Apr-Oct)	Winter Dry (Nov-Mar)	Wet Weather Year-Round
Aptos	Seacliff State Beach	A	A+	B
	Rio Del Mar Beach	A	A+	D

San Mateo County

Pacifica	Sharp Park Beach projection of San Jose Avenue	A+	A+	A
	Sharp Park Beach projection of Birch Ln.	A	A	B
	Rockaway Beach at Calera Creek	A	A+	B
	Linda Mar Beach at San Pedro Creek	A	C	F
Montara State Beach	at Martini Creek	A+	A	A
Fitzgerald Marine Reserve	at San Vicente Creek	B	A	F
Pillar Point	Pillar Point #8 Mavericks Beach Westpoint Avenue	A	B	C
	Pillar Point Harbor end of Westpoint Avenue #7	**D**	**C**	**F**
Half Moon Bay	Surfer's Beach southend of riprap	A		A+
	Roosevelt Beach south end of parking lot	A	A+	D
	Dunes Beach	A+	A+	B
	Venice Beach at Frenchman's Creek	A	A	F
	Francis Beach at the foot of the steps	A+	A+	B
Pomponio State Beach	at Pomponio Creek	A+	A+	D
Pescadero State Beach	at Pescadero Creek	A	A+	C
South Coast	Bean Hollow State Beach	A+	A+	A
	Gazos Beach at Gazos Creek	A	A+	C
Bayside	Oyster Point	A	C	F
	Coyote Point	A	A+	C
	Aquatic Park	**C**	**F**	**F**
	Lakeshore Park - behind Rec Center	**C**	**B**	**F**
	Kiteboard Beach	A+	A	F

Alameda County

Alameda Point	Alameda Point North	A+		A+
	Alameda Point South	A		A+
Crown Beach	Crab Cove	B		D
	Bath House	A		A
	Windsurfer Corner	A		A+
	Sunset Road	A		B
	2001 Shoreline Drive	A+		C
	Bird Sanctuary	B		F

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

San Francisco County

		Summer Dry (Apr-Oct)	Winter Dry (Nov-Mar)	Wet Weather Year-Round
Aquatic Park Beach	Hyde Street Pier - projection of Larkin Street	A+	A+	B
	Aquatic Park Beach 211 Station	A	F	C
Crissy Field Beach	East 202.4 Station	A	F	C
	West 202.5 station	A	A+	C
Baker Beach	East Ocean #15 East	A	A	A
	Lobos Creek	B	D	C
	West Ocean #16	A	C	A
China Beach	end of Sea Cliff Avenue	A+	A+	B
Ocean Beach	projection of Balboa Avenue	A	A	B
	projection of Lincoln Way	A	A	D
	Islais Landing at Islais Creek		A	F
	projection of Sloat Boulevard	A+	A+	B
Candlestick Point	Jackrabbit Beach	A	A+	C
	Windsurfer Circle	**C**	**F**	**F**
	Sunnydale Cove	**D**	**F**	**F**

Contra Costa County

Keller Beach	North Beach	B		A
	South Beach	B		A

Marin County

Tomales Bay	Dillon Beach	A+		A+
	Lawson's Landing	A		A+
	Miller Park	A+		A+
	Heart's Desire	A		A+
	Shell Beach	A+		A+
	Chicken Ranch Beach at Creek	A		A+
Bolinas Bay	Bolinas Beach (Wharf Rd)	A		A+
	Stinson Beach North	A		A
	Stinson Beach Central	A		D
	Stinson Beach South	A+		A+
Muir Beach	North	B		A+
	Central	**C**		**A+**
	South	B		A+
Rodeo Beach	North	A+		A+
	Central	A+		A+
	South	A+		A+

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

MARIN COUNTY		Summer Dry (Apr-Oct)	Winter Dry (Nov-Mar)	Wet Weather Year-Round
Baker Beach	Horseshoe Cove SW	A+		A+
	Horseshoe Cove NW	A		F
	Horseshoe Cove NE	A		F
Schoonmaker Beach		A		A
China Camp		A		F
McNears Beach		A		A+

Sonoma County

Gualala Regional Park Beach	A+		A+
Black Point Beach	A+		A+
Stillwater Cove Regional Park Beach	A+		A+
Goat Rock State Park Beach	A+		A+
Salmon Creek State Park Beach	A+		A+
Campbell Cove State Park Beach	A		A+
Doran Regional Park Beach	A+		A+

Mendocino County

MacKerricher State Park at Virgin Creek	A+		
Pudding Creek Ocean Outlet	A+		
Hare Creek	A		
Caspar Beach at Caspar Creek	A+		
Big River near PCH	A+		
Van Damme State Park at the Little River	A+		

Humboldt County

Trinidad State Beach near Mill Creek	C		A+
Luffenholtz Beach near Luffenholtz Creek	C		D
Moonstone County Park (Little River State Beach)	A		F
Clam Beach County Park near Strawberry Creek	**F**		**F**
Mad River Mouth (north)	A+		B

Del Norte County

Crescent City - Battery Point Lighthouse	A	A+	A

County “Beach Bummer” names appear in **bold**.

Washington 2015-16 Grades by County

Whatcom County

		Summer Dry	Wet Weather
Little Squalicum Park	far west of pier	A	F
	at creek outlet	A	F
	east	A	F
Larrabee State Park Wildcat Cove	south	A+	A+
	west	D	A+
	mid	F	A+

Thurston County

Burfoot County Park	south	A+	F
	mid	A+	C
	north	A+	C

Snohomish County

Mukilteo Lighthouse Park	north	A	A+
	mid	A+	A+
	south	A+	A+
Marina Beach Edmonds (No Dogs)	south	A	A+
	mid	A	A+
	north	A	A+
Edmonds Underwater Park	south	A	F
	mid	A	A+
	north	A	A+
Picnic Point County Park	south	A	A+
	mid	A+	A+
	north	A+	A+
Kayak Point County Park	south	A	A+
	mid	A	A+
	north	A	A+

Skagit County

Bayview State Park	south	A	F
	mid	A	F
	north	C	F

Pierce County

		Summer Dry	Wet Weather
Browns Point Lighthouse Park	south	D	A+
		D	A+
	east	A	A+
Solo Point Boat Launch	north	A+	A+
	mid	A	A+
	south	A	A+
Sunnyside Beach Park	south	A+	A+
	mid	A+	A+
	north	A+	A+
Titlow Park	south	A	A+
	mid	F	A+
	north	A+	A+
Ruston Way north	at Warner St	C	A+
Owens Beach Point Defiance Park	south	A+	F
	mid	A	A+
	north	A	A+
Dash Point County Park	east	A+	A+
	east of pier	A+	A+
	west of pier	A+	A+
Purdy Sandspit County Park	west	A+	A+
	mid	A	A+
	east	B	A+

Mason County

Allyn Waterfront Park	south	B	F
	mid	A	D
	north	A	D
Twanoh State Park	west of dock	A+	A+
Potlatch State Park	south	A	A+
	mid	A	A+
	north	A	A+
Twanoh State Park	west of point	A	A+
	point	A	A+

Kitsap County

		Summer Dry	Wet Weather
Joel Pritchard Park	mid	A+	A+
	west	A+	A+
	east	A+	A+
Point No Point Lighthouse Park	south	A+	A+
	mid	A+	A+
	north	A	A+
Scenic Beach State Park	east	A+	A+
	mid	A+	A+
	west	A+	A+
Evergreen Park	south	A+	A+
	mid	A+	A+
	north	A+	B
Lions Park	south	A	A+
	mid	A	A+
	north	A	A+
Illahee State Park	south	A+	C
	mid	A+	D
	north	A+	C
Eagle Harbor Waterfront Park	mid	A+	D
	west	A	C
	east	A+	D
Silverdale County Park	west	A	A+
	mid	A	A+
	east	A+	A+
Fay Bainbridge State Park	south	A+	A+
	mid	A+	A+
	north	A	A+
Indianola Dock	east	A+	A+
	mid	A	A+
	west	A+	A+
Arness County Park	south	A+	B
	mid	A+	A+
	north	A+	F

King County

		Summer Dry	Wet Weather
Dash Point State Park	mid	A	C
	west	A+	A+
	east	A+	D
Redondo County Park	south	A+	B
	mid	A	A+
	north	A	D
Saltwater State Park	south	A	A
	mid	A	D
	north	A	D
Seahurst (Ed Munro) Park	south	A	F
	mid	A	F
	north	A	F
Lincoln Park	south	A+	A+
	mid	A+	A+
	north	A+	A+
Richey Viewpoint	south	A	D
	mid	A+	C
	north	A+	D
Alki Beach Park	south	A+	A+
	mid	A	A+
	north	A+	A+
Golden Gardens	south	A+	A+
	mid	A	A+
	north	A	A+
Carkeek Park	south	A+	A+
	mid	A+	A+
	north	A+	A+
Richmond Beach Saltwater Park	south	A+	A+
	mid	A+	A+
	north	A+	A+

Jefferson County

Mystery Bay State Park	east end of dock	A+	A+
Fort Worden State Park	south	A+	A+
	mid	B	A+
	north	A+	A+

Island County

		Summer Dry	Wet Weather
Freeland County Park Holmes Harbor	east	F	A+
	mid	F	F
	west	F	A+
Oak Harbor Lagoon	south east	A+	A+
	north west	A+	A+
	mid	A+	A+

Gray's Harbor County

Westhaven State Park South Jetty	south	A+	A+
	mid	A+	A+
	north	A	A+
Westhaven State Park Half Moon Bay	south	A+	A+
	mid	A	A+
	north	A	A+
Westport The Groynes	west	A+	A+
	mid	A	D
	east	A	A+

Clallam County

		Summer Dry	Wet Weather
Dakwas Park Beach Neah Bay	east	A+	A+
	mid	A+	A+
	west	A+	A
Hobuck Beach	mid south	A+	A+
Hollywood Beach	east	C	F
	mid	A	D
	west	A	D
Cline Spit County Park	south	B	D
	mid	B	D
	north	A	D
Salt Creek Recreation Area	south	C	F
	mid	A+	A+
	north	A+	A+
Sooes Beach	south	A+	A+
	mid	A+	B
	north	A	D
Hobuck Beach	south	A+	A+
	north	A+	A+
Third Beach Neah Bay	west	A+	A+
	mid	A+	A+
	east	A+	A+
Front Street Beach East	mid	A+	A+
	at Pine Street	A+	A+
	at Kal Chate St.	A+	A+

Oregon 2015-16 Grades by County

The Oregon Beach Monitoring Program (OBMP) reduced their sampling frequency last summer due to resource constraints. Because of the minimal number of samples taken by OBMP, none of the Oregon beach locations qualified to receive a grade in this report. See page 43 for more details.

Indices

GLOSSARY

ARRA ..... American Recovery and Reinvestment Act
BAV ..... Beach Action Value
BEACH Act ..... National Beach Guidance and Performance Criteria for Recreational Waters
BMP ..... best management practices
BRC ..... Beach Report Card
CDPH ..... California Department of Public Health
CBI ..... Clean Beach Initiative
CDO ..... Cease and Desist Order
CSS ..... combined sewer and storm drain system
CSD ..... combined sewer discharges
CSO ..... combined sewer overflows
CWA ..... Clean Water Act
DEH ..... Division of Environmental Health
DPH ..... Department of Public Health
dPCR ..... Digital Polymerase Chain Reaction E. coli Escherichia coli
EMD ..... Environmental Monitoring Division (L.A.)
EPA ..... Environmental Protection Agency
FIB ..... fecal indicator bacteria
GI illness ..... Gastrointestinal Illness
LFD ..... Low Flow Diversion
LID ..... Low Impact Development
MLR ..... Multiple Linear Regression
MOU ..... Memorandum of Understanding
MS4 ..... Municipal Separate Storm Sewer System
Nowcast ..... same day predictive modeling tool
NOV ..... Notice of Violation
NGO ..... Non-Government Agency
NSE ..... Natural Source Exclusion
OWTS ..... Onsite Wastewater Treatment System
point zero ..... location where outfall meets the ocean
QMRA ..... Quantitative Microbial Risk Assessment
qPCR ..... Quantitative Polymerase Chain Reaction
Regional Board ..... Regional Water Quality Control Board
SEP ..... Supplemental Environmental Projects (L.A.)
SIPP ..... Source Identification Protocol Project
SCCWRP ..... Southern California Coastal Water Resources Project
SMURRF ..... Santa Monica Urban Runoff Recycling Facility
SPF ..... Sun Protection Factor
State Board ..... State Water Resources Control Board
SSO ..... Sanitary Sewer Overflows
TMDL ..... Total Maximum Daily Load
UCLA ..... University of California, Los Angeles
UCB ..... University of California, Berkeley
USEPA ..... United States Environmental Protection Agency
VB ..... Virtual Beach—USEPA predictive model
wave wash ..... monitored location where runoff meets surf

SIGNIFICANT BILLS AND ACTS

Clean Water Act- Federal (1972)
Establishes the basic structure for regulating discharges of pollutants into the waters of the United States.

Ambient Water Quality Criteria for Bacteria – Federal (1986)
USEPA develops water quality criteria/standards to protect people swimming in recreational waters (e.g., lakes, rivers, beaches) from microbial organisms such as bacteria and viruses.

AB 411 - California (1997)
Beach Bathing Water Quality Standards. Requires all waters along California's coast to meet certain minimum standards. Coastal waters will be tested weekly during the period of April through October.

AB 538 - California (1999)
Requires the state board to develop source investigation protocols for use in conducting source investigations of storm drains that produce exceedances of specified bacteriological standards.

BEACH Act - Federal (2000)
Beaches Environmental Assessment and Coastal Health Act. Amends the Clean Water Act and authorizes the EPA to award grants to reduce the risk of illness to users of the nation's recreational waters.

CBI - California (2001)
California's Clean Beach Initiative. Grant program provides funding for projects that will improve California's coastal water quality and swimmers' safety. Funding priority is given to projects that reduce bacterial contamination on busy California beaches.

Proposition O (Prop O) - Los Angeles (2004)
Authorized the City of Los Angeles to issue a series of general obligation bonds for up to $500 million for projects to protect public health by cleaning up pollution, including bacteria and trash, in the city's watercourses, beaches and the ocean, in order to meet Federal Clean Water Act requirement

ARRA - Federal (2009)
American Recovery and Reinvestment Act. Stimulus package, from which $18 billion is allocated for relief and investment in environment, public health and 'green' alternatives.

SB 482 - California (2011)
Public Beach Contamination, Standards, Testing, Closing. Allows the State Board to direct permit fees up to $1.8 million towards California's Beach Program and requires the drafting of regulations relating to testing of waters adjacent to public beaches.

Recreational Water Quality Critera – Federal (2012)
After 25 years, USEPA updates water quality standards/criteria to protect people swimming in recreational waters (e.g., lakes, rivers, beaches) from microbial organisms such as bacteria and viruses. Introduces Statistical Thresold Values (STV) and Beach Action Values (BAV) into the beach water quality lexicon.

Acknowledgement and Credits

ACKNOWLEDGEMENTS

Heal the Bay would like to give special thanks to Washington's Department of Health and Department of Ecology, who jointly manage Washington's beach program, for generously providing local, current information on Washington's beach water quality. We would also like to thank Oregon's Department of Human Services and Oregon's Department of Environmental Quality for providing water quality data. All agencies provided valuable advice and information, making the Beach Report Card possible in Oregon and Washington.

Additionally, this report and the entire Beach Report Card program would not be possible without the cooperation of the many monitoring and public agencies throughout California. These agencies include:

Humboldt County Environmental Health Division

Mendocino County Environmental Health Department

Sonoma County Environmental Health Division

Marin County Environmental Health Services

San Francisco Public Utilities Commission

East Bay Regional Park District

San Mateo County Environmental Health Division

Santa Cruz County Environmental Health Services

Monterey County Environmental Health Bureau

San Luis Obispo County Environmental Health Services

Santa Barbara County Environmental Health Services

Ventura County Environmental Health Division

City of Los Angeles Environmental Monitoring Division

Los Angeles County Sanitation Districts

County of Los Angeles Department of Public Health Environmental Health

City of Redondo Beach

City of Long Beach Department of Health and Human Services Environmental Health Division

South Orange County Wastewater Authority

County of Orange Environmental Health

Orange County Sanitation District

San Diego County Department of Environmental Health

San Elijo Joint Powers Authority

City of San Diego

City of Oceanside

Encina Wastewater Authority

State Water Resources Control Board

The Beach Report Card's original concept and methodology were created in-part by Heal the Bay's former President, Dr. Mark Gold. This report would not be possible without his vision and unwavered dedication to improving beach water quality and strengthening public health protection.

A special thank you to our funders for their continued support of the Beach Report Card program and the publication of this report:

SIMA SURF INDUSTRY MANUFACTURERS ASSOCIATION

SWAIN BARBER FOUNDATION

Heal the Bay

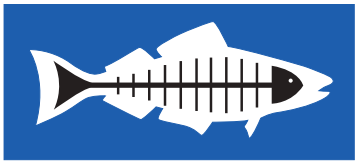
2015-16 ANNUAL BEACH REPORT CARD

Report Research and Copy: Leslie Griffin and James Alamillo

Data Compilation and Analysis: Leslie Griffin

Copy Editors: Sarah Abramson Sikich and Rita Kampalath

Printed on recycled paper.



Heal the Bay

1444 9th Street, Santa Monica, CA 90401
800.HEAL.BAY 310.451.1500
healthebay.org