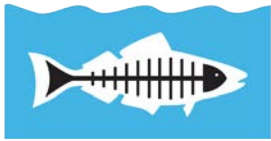


Heal the Bay

HEAL THE BAY'S
2016-17 ANNUAL
**BEACH
REPORT
CARD**



Heal the Bay

HEAL THE BAY'S 2016-17 ANNUAL **BEACH REPORT CARD**

Heal the Bay is an environmental non-profit dedicated to making the coastal waters and watersheds of Greater Los Angeles safe, healthy and clean. To fulfill our mission, we use science, education, community action and advocacy.

The Beach Report Card program is funded by grants from



SWAIN BARBER
FOUNDATION

©2017 Heal the Bay. All Rights Reserved. The fishbones logo is a trademark of Heal the Bay. The Beach Report Card is a service mark of Heal the Bay.

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



| THE BEACH REPORT CARD |

2016-17

SECTION I: INTRODUCTION

EXECUTIVE SUMMARY	4
ABOUT THE BRC	5

SECTION II: WEST COAST SUMMARY

WEST COAST BEACH WATER QUALITY OVERVIEW	8
CALIFORNIA HONOR ROLL.....	14
CALIFORNIA BEACH BUMMERS.....	16
ANALYSIS BY BEACH TYPE.....	22

SECTION III: 2016-17 BEACH NEWS

FUNDING: FEDERAL BEACH ACT	26
FUNDING: CALIFORNIA BEACH PROGRAM	27
SURFER HEALTH STUDY.....	27
NOWCAST PROGRAM.....	28
QUANTITATIVE MICROBIAL RISK ASSESSMENT AT INNER CABRILLO BEACH.....	29
STATE WATER RESOURCES CONTROL BOARD'S BACTERIAL OBJECTIVES	29

SECTION IV: COUNTY SUMMARIES

OVERVIEW OF COASTAL COUNTIES	31
CALIFORNIA COUNTY SUMMARIES.....	32
OREGON/WASHINGTON COUNTY SUMMARIES.....	48

SECTION V: APPENDICES

A // HISTORY OF BEACH BUMMERS	51
B1 // GRADES BY COUNTY - CALIFORNIA.....	52
B2 // GRADES BY COUNTY - WASHINGTON.....	65
C // FREQUENTLY ASKED QUESTIONS.....	70
D // METHODOLOGY.....	72
E // INDEX/BILLS.....	74
F // ACKNOWLEDGEMENTS	75

EXECUTIVE SUMMARY

California has experienced a welcome relief from its years-long drought. However, with the much needed rainfall comes increased amounts of urban runoff that have affected the water quality of its beaches. Heal the Bay is among those at the forefront in guarding this precious resource and faces the upcoming year with both expanding scientific programs and potentially disastrous budget cuts.

For most of the 2016-17 year, California continued the dry weather trend it had been experiencing since 2012. However, the dry, summer period of this reporting year was followed by a remarkably wet winter, particularly for Northern California coastal counties. Rainfall levels over the last year far exceeded the five- and ten-year averages in California (although, in Southern California, rainfall levels were similar to historic values). Beaches throughout the state had excellent grades during the 2016 summer dry weather, but wet weather grades were worse than the five-year average. This marks the first time in three years that Cowell Beach in Santa Cruz did not top the “Beach Bummer” list. This year it ranked in at No. 3, with Clam Beach in Humboldt County claiming the No. 1 spot. There were 32 locations from Central to Southern California that earned a spot on the Honor Roll.

Heal the Bay, in partnership with Stanford University and UCLA, continues to invest in efforts to predict beach water quality. Predictive models, or beach water quality ‘NowCasting’ tools, are designed to predict daily water quality based upon historic data and location specific, environmental information for a defined beach. Last summer Heal the Bay expanded the NowCast project from three to five beaches. The program will add five (5) more beaches to daily predictions this coming summer.

Unfortunately, fiscal funding and regulatory policies at the federal level continue to threaten beach water quality monitoring programs. The U.S. President’s proposed budget for Fiscal Year 2017-18 would eliminate BEACH ACT grant funds. Though the final budget has not yet been set, reducing funds for this important program would compromise the ability for state agencies and municipalities to adequately monitor beach water quality across the country, including California.



REPORT HIGHLIGHTS

WINTER DRY GRADES
in California took a hit last year.
| Page 10 |

RAINFALL LEVELS
far exceeded averages from the last decade in California.
| Page 12 |

WATER QUALITY IMPROVEMENT
involving some of Southern California’s dirtiest beaches.
| Page 13 |

SAN CLEMENTE PIER
and **LA JOLLA COVE**
make their first appearance on the Beach Bummer list.
| Page 16 |

CLAM BEACH COUNTY PARK
in Northern California was #1 on the Beach Bummer list.
| Page 16 |

FEDERAL FUNDING
for the BEACH Act is in danger of being eliminated for 2017-18
| Page 26 |

NOWCAST PREDICTIVE MODELLING
program continues to expand.
| Page 28 |

THE 2016-17 BEACH REPORT CARD

Since its inception over 25 years ago, the Beach Report Card has provided beachgoers with a reliable and easy-to-understand tool in analyzing beach water quality. The better the grade a beach receives, the lower the risk of illness to ocean users. The BRC is the result of an ongoing cooperation between shoreline monitoring agencies in California, Oregon and Washington.

The Annual Beach Report Card is a summary of the past year's water quality at sampling locations along the West Coast for three distinct periods:

- Summer dry weather – April through October 2016
(Under Assembly Bill 411 [AB 411] in California)
- Winter dry weather – November 2016 through March 2017
- Year-round wet weather conditions –
April 2016 through March 2017.

In addition to summarizing ocean water quality, this report includes a brief review of the sewage spills that reached surface waters over the past year.



Introduction (continued)

Beaches in the U.S. accommodate nearly two billion visitors each year¹ and contribute to an estimated \$90 billion coastal tourism economy². However, recreating at polluted beaches can also result in significant economic loss. A study in Los Angeles and Orange Counties found that the regional public health cost of gastrointestinal illnesses caused by recreating in polluted ocean waters was between \$21 and \$51 million each year³.

Beach water quality monitoring helps ensure the health protection of the millions of beachgoers in the U.S. each year by focusing remediation efforts on areas of greatest need and allowing the public to make informed decisions about where to recreate. However, water quality information must be accessible and easy to understand for beachgoers to make informed decisions. Heal the Bay's Annual Beach Report CardSM achieves this goal by using an intuitive A to F grading system to provide water quality information to the millions of people who recreate along West Coast shoreline waters. Grades are based on routine beach water quality sampling conducted by local health agencies and dischargers. Without these monitoring programs, the public health of beachgoers would be seriously jeopardized. As such, federal and state funding are critical in supporting local beach monitoring programs.

Water samples are analyzed for fecal



indicator bacteria (FIB) that indicate pollution from numerous sources, including human and animal waste. Sample results are used to assign each location with an A to F grade based upon FIB concentration, which represents the risk of adverse health effects to beachgoers. The better the grade, the lower the risk of illness to ocean users.

Heal the Bay's first Annual Beach Report Card (BRC) was published in 1991 for Los Angeles County. It has since grown to provide beachgoers throughout Washington, Oregon and California with water quality grades for their local beaches. Updated weekly grades can be found each Friday at www.beachreportcard.org.

Regardless of the BRC grades, which represent an overall seasonal trend,

county health officials and Heal the Bay recommend that beach users never swim or surf within 100 yards of any flowing storm drain. In addition, beachgoers should avoid ocean water contact during a rainstorm, and for a minimum of the three days following the cessation of the storm. 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 visit healthebay.org, or call 1-800-HEAL BAY.

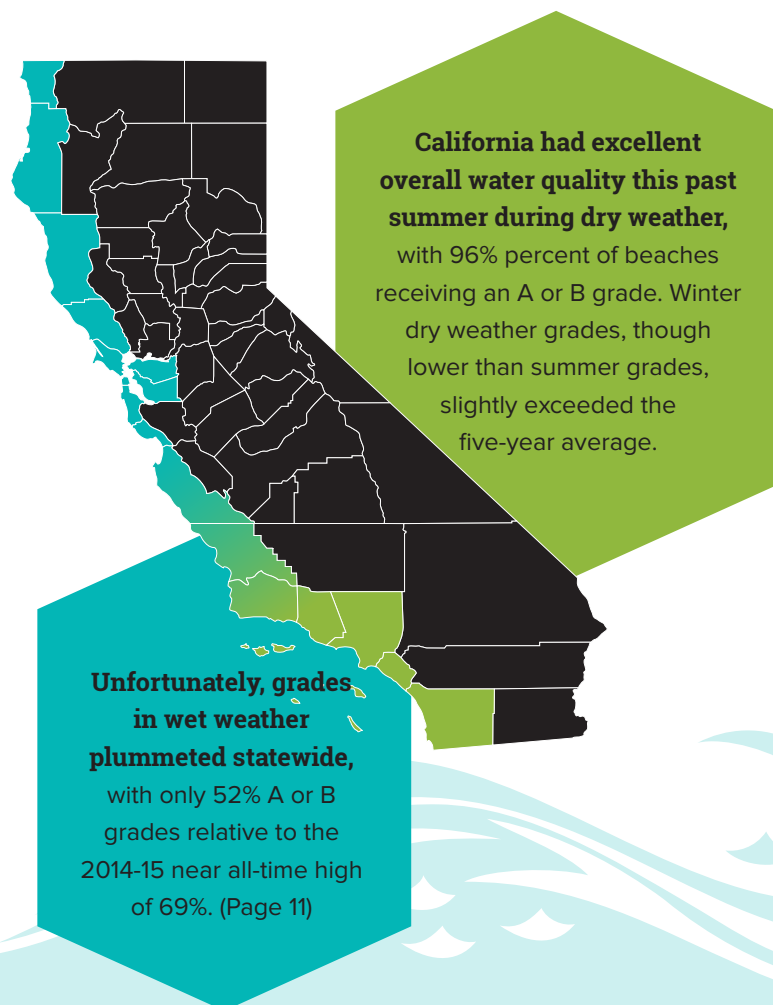


¹ <http://water.epa.gov/type/oceb/beaches/basicinfo.cfm> ² National Ocean Economics Program, 2 National Ocean Economics Program, State of the U.S. Ocean and Coastal Economies, Center for the Blue Economy at the Monterey Institute of International Studies (2014) ³ Given, S. et al, Regional Public Health Cost Estimates of Contaminated Coastal Waters: A Case Study of Gastroenteritis at Southern California Beaches, 40 Environ. Sci. Technol. 4851 (2006)

| WEST COAST SUMMARY |



OVERVIEW OF WEST COAST BEACH WATER QUALITY



CHANGES IN WINTER DRY GRADES	10
CALIFORNIA GRADES.....	11
NORTHERN CALIFORNIA GRADES	11
SOUTHERN CALIFORNIA GRADES	11
COUNTY RAINFALL AND HISTORIC LEVELS.....	12
2016-17 RAINFALL BY SEASON.....	12
SAVING POCHE BEACH.....	13
WATER QUALITY IMPROVEMENT	13
2016-17 HONOR ROLL.....	14
CALIFORNIA'S CLEANEST BEACHES.....	15
2016-17 BEACH BUMMERS	16
BEACH BUMMERS – FIVE YEAR HISTORY	20
CALIFORNIA'S TROUBLED BEACHES.....	21
ALL CALIFORNIA GRADES (APPENDIX B).....	52

Rainfall levels skyrocketed

last year. With all counties exceeding their five and ten-year precipitation averages, rainfall-related water quality, or “wet weather” grades, plummeted. This encompasses any sample data taken throughout the year during or within 72 hours of a rainfall event of 0.1 inches or greater.

California's boom and bust water cycle,

which is a series of dry years followed by extremely wet year in California is only projected to intensify in the face of climate change, with deeper droughts and heavier rains for coastal counties. See California county historic averages from 1981-2010 (Figure 2-4).

The drop in California wet weather grades

demonstrates why wet weather water quality continues to be a public health concern even with increased rainfall events. This illustrates why California coastal Health Departments and Heal the Bay recommend swimmers stay out of the water for a minimum of three days following a rain event of at least 0.1 inches.

The winter 2016-17 season was peppered with rain events

resulting in what is now recognized as the second wettest year on record for the state—dating back to 1895— and the wettest year on record for Northern California. Unsurprisingly, precipitation totals greatly surpassed historic averages across the northern part of the state. However, from San Luis Obispo down to San Diego County, rainfall levels, though much greater than five and ten-year averages, were merely closer to historic levels. (Figure 2-4).

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

NORTHERN CALIFORNIA

At Northern California beaches, there was another year of great summer dry weather water quality with 92% of monitored beaches receiving an A or B grade. Winter dry weather was similar to the summer grades, with 88% of the monitored locations receiving A or B grades. However, many county monitoring programs in Northern California only sample during summer months, making this comparison difficult. Wet weather grades were low with 44% of locations receiving C to F grades. (Figure 2-2)

Given that the past rainy season was the wettest on record for Northern California, rainfall levels were extremely high. In multiple Northern California counties rainfall levels more than doubled five and ten-year averages. (Figure 2-2)

SOUTHERN CALIFORNIA

Southern California had another year of excellent summer dry weather water quality with 97% of monitoring locations receiving A or B grades. Summer 2016 was the sixth summer in a row of drought years in Southern California. Drier conditions, with less rain and drought-era conservation efforts, likely result in less urban runoff, which in turn could lead to the improvement of overall grades. (Figure 2-3)

Wet weather water quality was a different story with beach water quality plummeting during rain events (wet weather), resulting in 49% of beaches receiving C to F grades. This was an 11% increase in C to F grades compared to the five-year average. This extreme water quality difference in wet weather compared to dry weather 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. (Figure 2-3)

Overview (continued)

THE PACIFIC NORTHWEST BEACH WATER QUALITY OVERVIEW



The Pacific Northwest, specifically Washington, had excellent water quality last summer. Of the 166 monitoring locations, 94% received an A grade, with only six shoreline locations (4%) receiving a grade of C or lower. Unfortunately, due to funding constraints for the monitoring program, the frequency of sampling at Oregon beaches was not robust enough for this report to produce a grade. Oregon and Washington monitor beach water quality at most locations from Memorial Day through Labor Day only.

See page 48 for Pacific Northwest Summary



TABLE 2-1: CHANGES IN WINTER DRY GRADES FROM PREVIOUS YEAR

Poor grades are not unusual during rain events but most beaches rebound during dry winter spells. Due to the increased rainfall and subsequent runoff in 2016-17, a number of beaches were adversely affected and received poor grades throughout the winter season, wet or dry.

	 Winter Dry		 Wet Weather	
	2016-17	LAST YEAR	2016-17	LAST YEAR
Imperial Beach, Imperial Beach Pier	C	A+	D	F
Imperial Beach, proj. of Cortez Avenue	F	A+	D	F
Imperial Beach, south end of Seacoast Drive	F	A+	F	F
Tijuana Slough, NWRS North of Tijuana River	F	A+	F	F
Tijuana Slough, NWRS Tijuana River mouth	F	D	F	F
Border Field State Park, proj. Monument Rd	F	D	F	F
Newport Beach, projection of 38th Street	C	A	A	C
Huntington Harbor, Mothers Beach	C	B	F	F
Doheny, at San Juan Creek	F	B	F	n/a
Doheny, 1000' so. of SERRA Outfall	F	A	D	C
San Clemente Pier, drain	F	A	C	n/a
Malibu, Puerco State Beach at creek mouth	C	A	C	A
Topanga State Beach at creek mouth	C	B	F	C
Will Rogers State Beach at S.M. Canyon	C	A	F	F
Long Beach, projection of 5th Place	C	A	F	F
Long Beach, projection of 10th Place	C	A	F	F
Long Beach, projection of 72nd Place	F	D	F	A+
Channel Islands Harbor, Beach Park	D	A	F	C
Santa Barbara, Arroyo Burro Beach	F	A+	F	F
Capitola, west of jetty	F	A	F	F
Baker Beach, at Lobos Creek	F	D	A	C
Candlestick Point, Jackrabbit Beach	F	A+	D	C

II. WEST COAST SUMMARY

OVERVIEW

FIGURE 2-1: CALIFORNIA GRADES (2016-2017)

Key: A B C D F

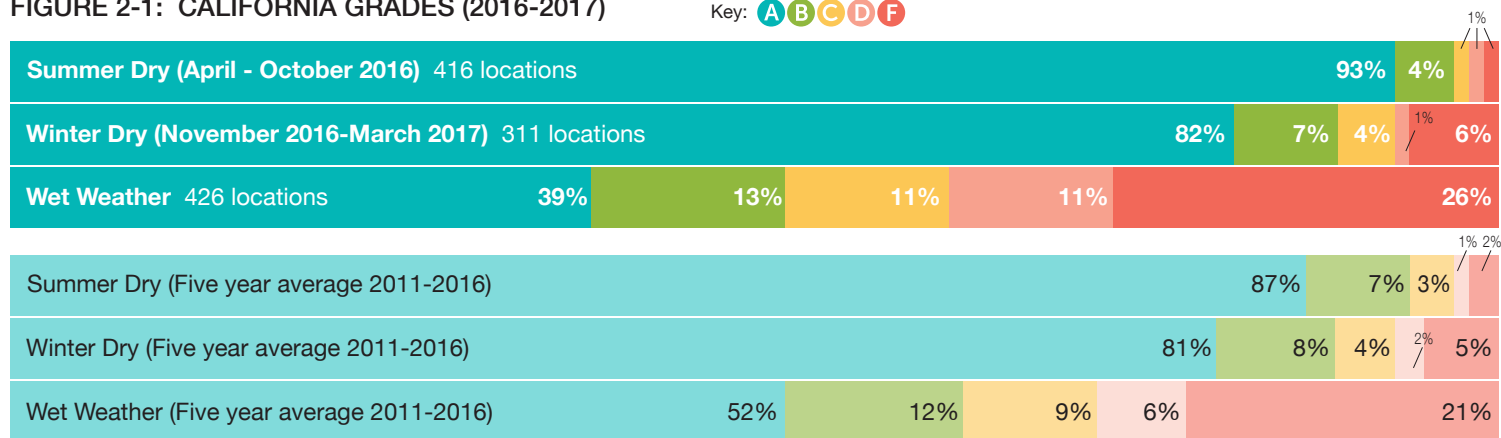


FIGURE 2-2: NORTHERN CALIFORNIA GRADES (2016-2017)

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

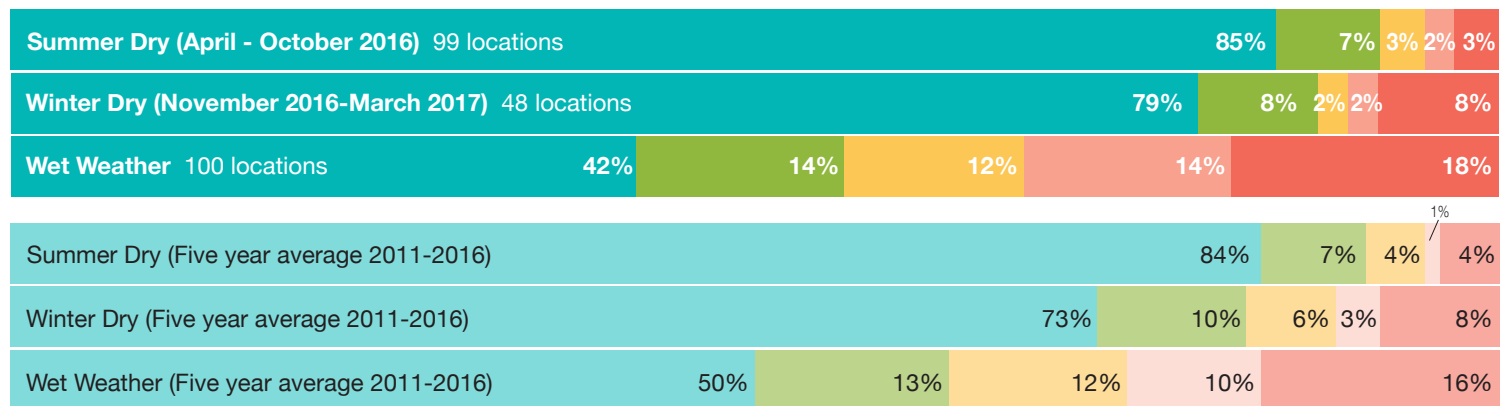


FIGURE 2-3: SOUTHERN CALIFORNIA GRADES (2016-2017)

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

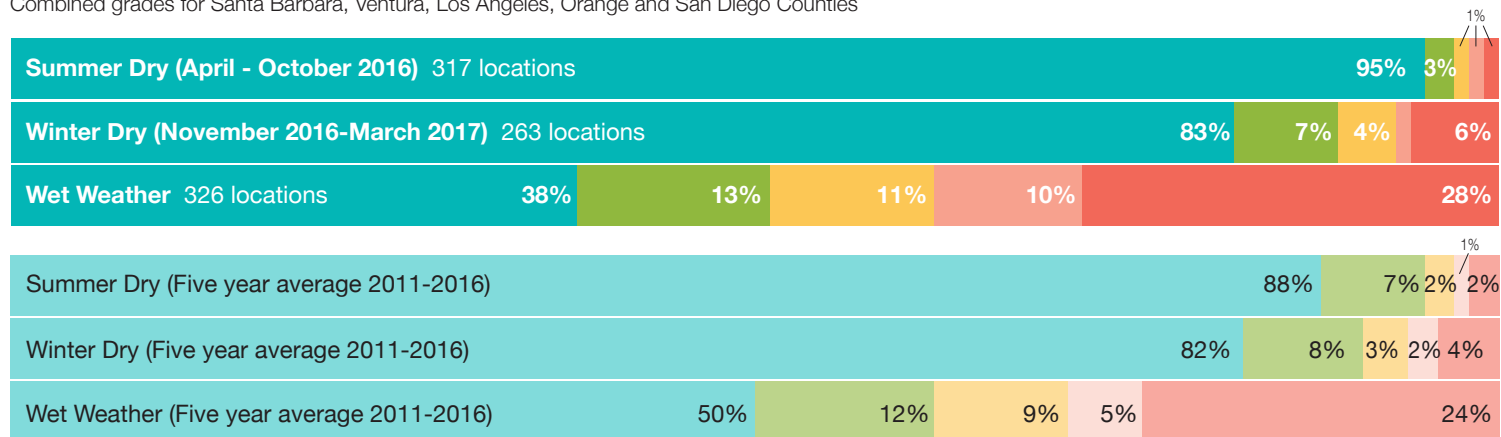


FIGURE 2-4: 2016-17 COUNTY RAINFALL AND HISTORIC LEVELS

*Historic Levels reflect average rainfall measured 1981-2010.

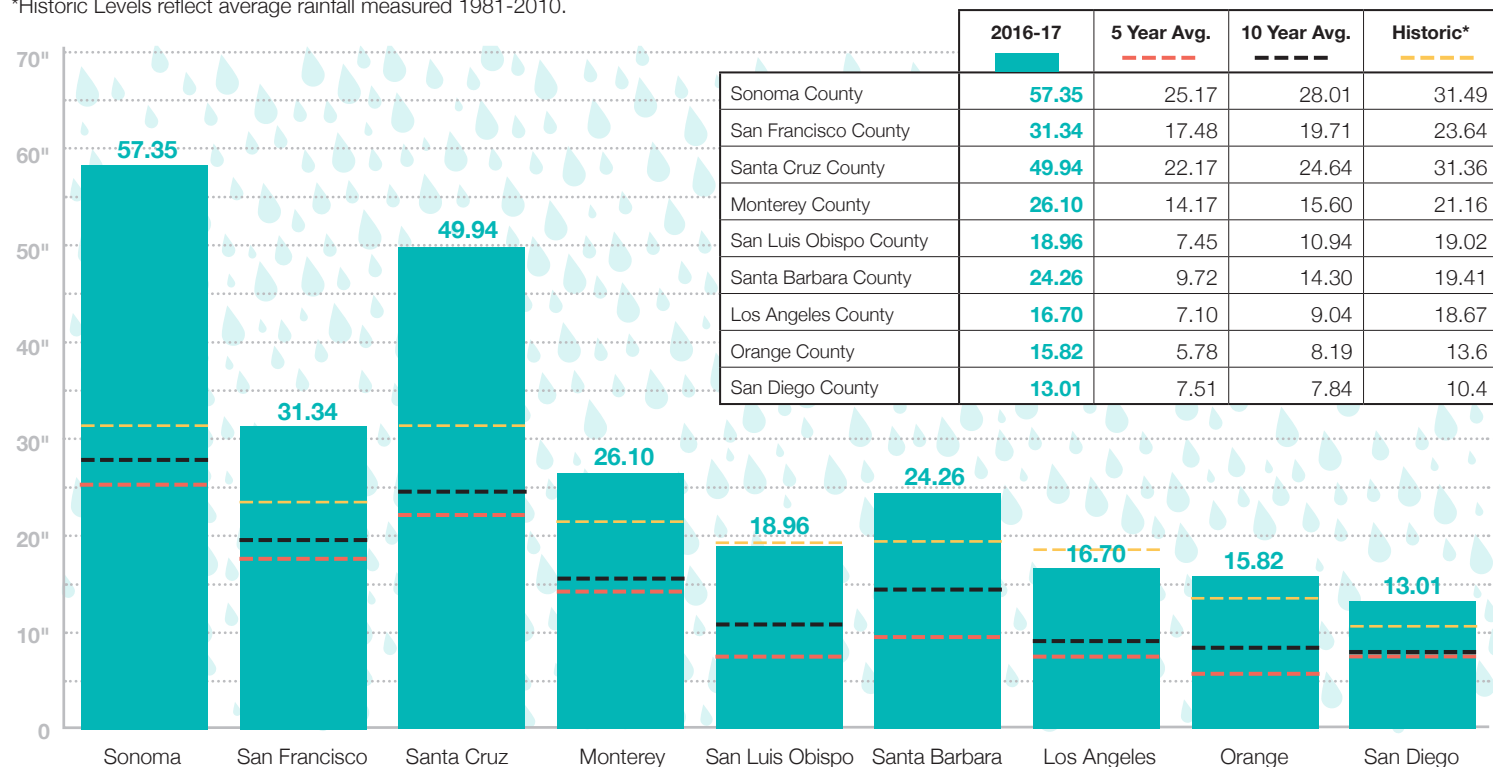


FIGURE 2-5: 2016-17 COUNTY RAINFALL BY SEASON

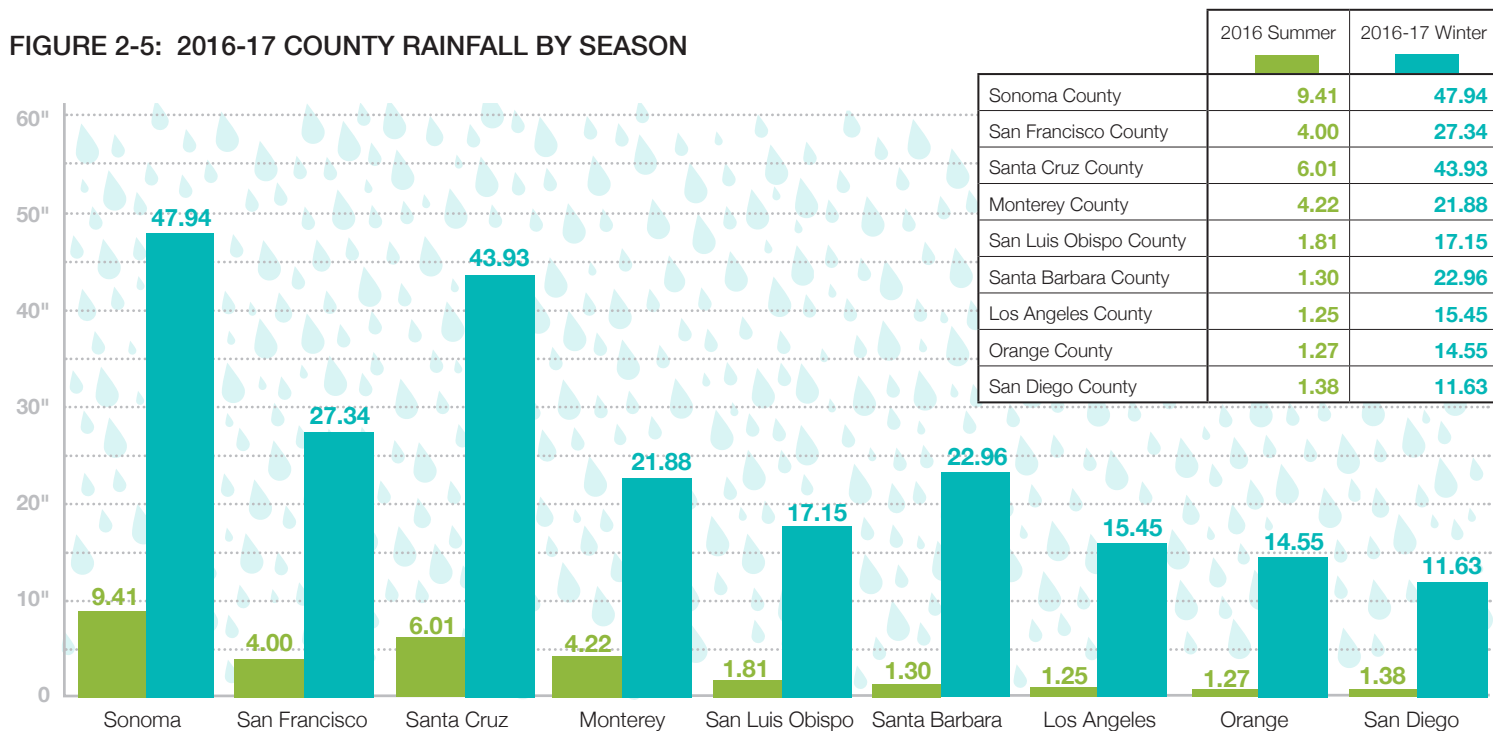


FIGURE 2-6: SAVING POCHE BEACH

Poche Beach in San Clemente/Dana Point has gone from being a perennial Beach Bummers to Honor Roll recipient.



TABLE 2-2: WATER QUALITY IMPROVEMENT

Other locations besides Poche Beach have bettered their grades. These beaches below have all made frequent appearances on our Top Ten Beach Bummers list since 2004 and have shown improvement in water quality during all three monitoring periods since 2012.

Former Beach Bummers	Years	2016-17			2015-16			2014-15			2013-14			2012-13		
		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
Cabrillo Beach, at restrooms (2004–2015)	12	B	B	F	A	A	D	D	B	F	F	D	F	F	F	F
Avalon, midpoint, Catalina Island (2004–2013)	10	A	n/a	A+	B	n/a	C	C	n/a	A+	B	n/a	n/a	F	n/a	n/a
Poche Beach (2008–2013)	5	A+	A+	A+	A	A	A	A	A	F	B	A	B	F	D	D
Redondo Beach Pier (2005, 2013, 2016)	3	A	B	A	F	D	A	B	F	F	A	C	C	C	F	F

2016-2017 HONOR ROLL



To earn a spot on the Honor Roll, a beach must be monitored weekly year-round, and have received only exceptional (A+) grades during all seasons and weather conditions.

HONOR ROLL NOTES

POCHE BEACH in San Clemente has landed on the Heal the Bay's Honor Roll after being a Top Ten Beach Bummer 2008-2013.

The beach at **LAGUNA LIDO APTS** has landed on the Honor Roll every year since Heal the Bay started tracking grades in 1990.

Wet weather generally leads to lower grades in Malibu, but **EL MATADOR BEACH** has once again landed on the Honor Roll.

ABALONE COVE in Rancho Palos Verdes and Oceanside's **ST. MALO BEACH** received poor wet weather grades, knocking them off the Honor Roll after many years of exceptional water quality.

LAGUNA BEACH (between Aliso Point and Mussell Cove) and **CARLSBAD** (between Cerezo Drive and Pointsettia Lane) offers some of the consistently best beach water quality in California.

Lack of winter dry data has left most of **VENTURA COUNTY**'s normally excellent beaches off the Honor Roll.

FIGURE 2-7:
2016-17 HONOR ROLL BEACHES

SAN LUIS OBISPO COUNTY

San Simeon	Pico Avenue
Morro Bay	Morro Bay City Beach



VENTURA COUNTY

Oxnard	Silver Strand @ Sawtelle Ave.
--------	-------------------------------



LOS ANGELES COUNTY

Malibu	El Matador State Beach
Malibu	Malibu Point
Palos Verdes Est.	Bluff Cove
Rancho Palos Verdes	Portuguese Bend Cove



ORANGE COUNTY

Newport Beach	Balboa Beach @ 15th/16th St.
Newport Beach	Balboa Beach Pier
Newport Beach	Crystal Cove, Pelican Point Beach
Newport Beach	Crystal Cove
Laguna Beach	Treasure Island Beach
Laguna Beach	North Aliso County Beach
Laguna Beach	Camel Point
Laguna Beach	West Street
Laguna Beach	Table Rock
Laguna Beach	Laguna Lido Apt.
Laguna Beach	Three Arch Bay
Dana Point	Projection of Camino Estrella
Dana Point	S. Capistrano Bay Community Beach
San Clemente	Poche Beach



SAN DIEGO COUNTY

Carlsbad	projection of Cerezo Drive
Carlsbad	projection of Palomar Airport Rd.
Carlsbad	Encina Creek outlet
Carlsbad	projection of Ponto Drive
Carlsbad	projection of Poinsettia Lane
Encinitas	San Elijo Park, Pipes surf break
Encinitas	San Elijo Park, north end of stairs
Encinitas	Cardiff State Beach, Lagoon outlet
Encinitas	Cardiff State Beach, Las Olas
Solana Beach	Fletcher Cove
Point Loma	Point Loma Lighthouse



II. WEST COAST SUMMARY

HONOR ROLL BEACHES



TABLE 2-3: CALIFORNIA'S CLEANEST BEACHES FOR WATER QUALITY

★ = Honor Roll ■ = Year 'Round good or excellent grades ■ = Year 'Round mixed or poor grades

County/Beach	2016-17	2015-16	2014-15	2013-14	2012-13	2011-12	2010-11	2009-10	2008-09
San Luis Obispo Morro Bay City Beach, 75' north of main parking lot	★	■	★	■	■	■	■	★	★
Los Angeles Malibu – El Matador State Beach	★	★	■	■	■	★	■	■	★
Los Angeles Palos Verdes Peninsula – Bluff Cove	★	■	★	★	★	★	★	■	★
Los Angeles Palos Verdes Peninsula – Abalone Cove	■	★	★	★	★	★	★	★	■
Los Angeles Palos Verdes Peninsula – Portuguese Bend Cove	★	★	★	★	■	■	■	■	★
Orange Balboa Beach –The Wedge	■	■	★	★	★	★	★	■	■
Orange Laguna Beach – Treasure Island Beach	★	■	★	■	■	★	■	★	■
Orange Laguna Beach – North Aliso County Beach	★	■	■	■	■	★	★	★	■
Orange Laguna Beach – Camel Point	★	★	■	■	★	■	■	■	■
Orange Laguna Beach – Table Rock	★	■	■	★	■	★	■	■	★
Orange Laguna Beach – Laguna Lido Apt.	★	★	★	★	★	★	★	★	★
Orange Laguna Beach – Three Arch Bay	★	★	■	■	■	■	■	■	■
Orange Laguna Beach – 9th Street, 1000 Steps Beach	■	■	■	★	★	★	★	★	■
San Diego Oceanside – St. Malo Beach	■	★	■	★	★	★	★	★	★
San Diego Carlsbad, projection of Cerezo Drive	★	★	n/a	★	★	★	★	★	★
San Diego Carlsbad, projection of Palomar Airport Rd.	★	★	n/a	■	★	★	★	★	★
San Diego Carlsbad, Encina Creek outlet	★	★	n/a	★	★	■	■	★	★
San Diego Carlsbad, projection of Ponto Drive	★	★	n/a	★	■	★	■	★	★
San Diego Carlsbad, projection of Poinsettia Lane	★	★	n/a	★	■	★	■	★	★
San Diego Encinitas –San Elijo State Park Pipes, surf break	★	★	n/a	■	■	★	★	★	n/a
San Diego Encinitas – San Elijo State Park, north end of stairs	★	★	★	■	■	★	★	★	n/a
San Diego Cardiff – San Elijo Lagoon outlet	★	★	■	■	■	★	■	★	n/a
San Diego Cardiff – Las Olas, 100 yds. south of Charthouse	★	★	★	■	★	★	★	★	n/a
San Diego Solana Beach – Fletcher Cove	★	★	■	■	■	■	■	★	n/a
San Diego Point Loma Lighthouse	★	■	★	★	■	★	★	■	■

2016-2017 BEACH BUMMERS



Heal the Bay designates the monitoring locations with the poorest dry weather water quality in California during the past summer as annual “Beach Bummer.”

BEACH BUMMER NOTES

Two Southern California locations have made their first ever appearance on the Beach Bummer list: **SAN CLEMENTE PIER** and **LA JOLLA COVE**.

This year’s Beach Bummer has four beaches with F summer grades. Last year, all Beach Bummer received F summer grades.

COWELL BEACH drops to No. 3 after having been ranked No. 1 or No. 2 since 2010.

After being the No. 1 or 2 ranked Beach Bummer for six consecutive years, Catalina Island’s **AVALON BEACH** has received excellent grades since 2013.

Two of **HUMBOLDT COUNTY’S** five monitored beaches have made the Beach Bummer list.

San Mateo’s Marina Lagoon has two locations that have made multiple Bummer appearances. Only **LAKESHORE PARK** has made the Top Ten this year.

FIGURE 2-8:
2016-17 TOP TEN BEACH BUMMERS

1	Clam Beach County Park, McKinleyville HUMBOLDT COUNTY	F
2	San Clemente Pier, San Clemente ORANGE COUNTY	F
3	Cowell Beach, West of Wharf, Santa Cruz SANTA CRUZ COUNTY	F
4	Lakeshore Park, Marina Lagoon, San Mateo SAN MATEO COUNTY	F
5	La Jolla Cove, La Jolla SAN DIEGO COUNTY	D
6	Santa Monica Pier, Santa Monica LOS ANGELES COUNTY	D
7	Capitola Beach, Capitola SANTA CRUZ COUNTY	D
8	Luffenholtz Beach, Trinidad HUMBOLDT COUNTY	D
9	Mother’s Beach, Marina del Rey LOS ANGELES COUNTY	D
10	Monarch Beach, N. of Salt Creek, Dana Point ORANGE COUNTY	D

2015 was the first year that all California BEACH Program agencies were required to sample at “point-zero”, which gives the most accurate picture of coastal water quality.

CABRILLO BEACH has not made the list for the second year in a row, after being a Beach Bummer every year from 2004 to 2015.

CLAM BEACH COUNTY PARK, MOTHER’S BEACH, MARINA DEL REY and **SANTA MONICA PIER** have been Bummer for the past four years.

Humboldt County**#1 CLAM BEACH COUNTY PARK****#8 LUFFENHOLTZ BEACH**

This is Clam Beach County Park's fourth year on the Beach Bummer list, this year moving up to the No. 1 spot. This site is fed by two creeks, Patricia Creek and Strawberry Creek. Potential upstream bacterial sources include multiple private septic systems. The Humboldt Public Health lab is developing Bacteroides testing to help pinpoint the issue via source tracking. Luffenholtz Beach is a new addition this year, making the list at the No. 8 spot.

San Mateo County**#4 LAKESHORE PARK, MARINA LAGOON**

Marina Lagoon returns to the Beach Bummer list this year after a brief reprieve in the 2015 summer season, when it earned a C grade. Like many enclosed beaches (see Analysis by Beach Type section on page 22), poor water circulation continues to be an issue for the Marina Lagoon where Lakeshore Park is located.

Santa Cruz County**#3 COWELL BEACH at the Wharf****#7 CAPITOLA BEACH**

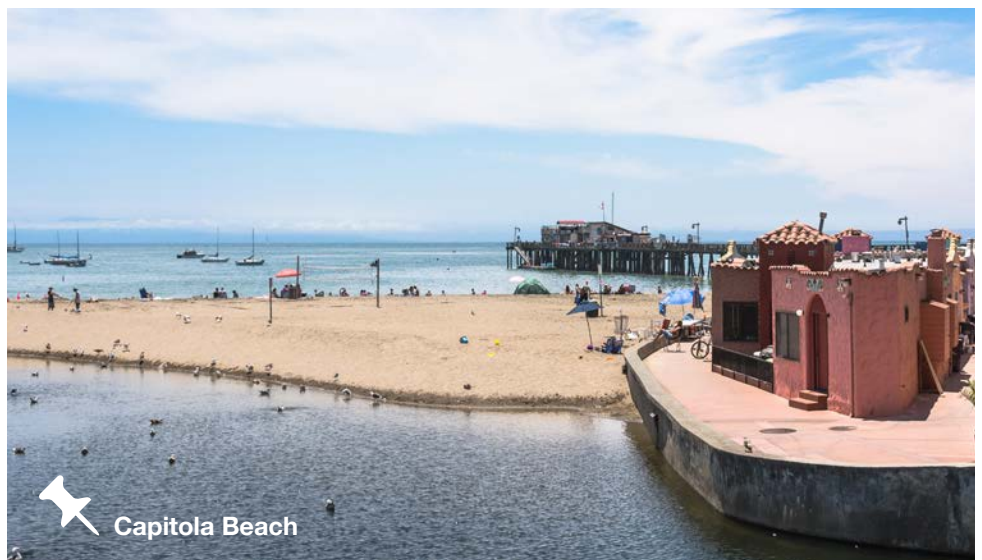
Cowell Beach ranked in at No. 3 on the Beach Bummer list this year. For the last eight years, Cowell Beach had been ranked either No. 1 or No. 2 on the Beach Bummer list, staying in the No. 1 spot for the last three years. Steel bird fencing was installed under

the pier during the 2016 summer season to prevent bird roosting. While Cowell scored better on average last summer compared to years past – bumping it out of the No. 1 spot – exceedances were still an issue. If high FIB levels persist, additional source tracking is recommended. This site will be included in the 2017 NowCast program, where it will receive daily predictions of water quality. Capitola Beach returns to the Beach

Bummer list this year after a three-year hiatus. Capitola has jumped on and off the list repeatedly over the history of the Beach Report Card. This beach sits at the mouth of Soquel Creek, south of the Capitola wharf. Beach locations at the mouth of storm drains, creeks or rivers pose a public health threat to the beach going public when flowing because of bacteria exposure, even during dry weather (see Analysis by Beach Type section).



Luffenholtz Beach



Capitola Beach

Beach Bumpers (continued)

Los Angeles County

#6 SANTA MONICA PIER

#9 MOTHER'S BEACH, MARINA DEL REY



Despite many projects to improve beach water quality, the Santa Monica Pier continues to stay on the

Beach Bummer list, ranking in at No. 6 this year. A 2011 to 2012 study from Heal the Bay, City of Santa Monica and UCLA found 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. Through a Clean Beaches Initiative (CBI) grant, the city will start construction in 2017 on a 1.6 million gallon underground storage stormwater tank that will capture wet weather runoff that drains to the Santa Monica Pier storm drain. The stored runoff will supply water to the Santa Monica Urban Runoff Recycling

Facility (SMURRF) during dry weather. When completed, the project is expected to greatly reduce the amount of stormwater that enters Santa Monica Bay from city streets and therefore improve water quality at the pier. The SMURRF can process up to 500,000 gallons a day of runoff at this time, which is equal to five percent (5%) of the city's daily use.

With another year of poor water quality, Mother's Beach (between the tower and dock) in Marina del Rey has once again landed a place on the Beach Bummer list, though the D that it earned in summer 2016 was better than the straight F's the site had seen for the previous three years. As with most enclosed waterbodies throughout the state (see Analysis by Beach Type section), poor water quality is exacerbated in areas with poor water circulation. Unfortunately, the projects to improve water quality at Mother's Beach have not fully resolved the water quality issues. Such projects include a circulation device to improve water flow, bird

deterrent wires and signage to discourage the public from feeding birds or bringing their dogs to the beach.

Orange County

#2 SAN CLEMENTE PIER

#10 MONARCH BEACH, DANA POINT

The two Orange County bumper sites are combination of a new and an old addition to this year's list. The San Clemente Pier site was a new "point zero"—



meaning the point on the beach where the stream, creek, river, or storm drain discharge meets the ocean

water—addition to Orange County monitoring program in 2015. Because of the numerous exceedances at the Pier, the County implemented an adaptive sampling program for this location, adding monitoring stations 25 feet and 75 feet both upcoast and downcoast of the pier. Results at the point zero sample site at the pier have generally been below standards, but the upcoast and downcoast locations meet standards the majority of the time. In addition, the County has conducted genetic marker testing for canine and human sources, finding none to date. Although additional studies are planned to identify the source of contamination, it should be noted that swimming, surfing, and diving are already prohibited below the pier.

As for Monarch Beach, water quality still remains problematic at this site. There was a slight improvement in summer water quality compared to last year—ranking No. 4 on the 2016 Beach Bummer list, but not enough to move this site off the list completely. The City of Dana Point has invested in an Ozone Treatment Fa-



Mother's Beach, Marina del Rey

Beach Bumpers (continued)

cility that treats dry weather runoff from May through November. Local agencies still remain concerned about the meandering portion of Salt Creek. 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. In addition, a falconry program was implemented to reduce bird-related FIB counts at the mouth of the creek. The program remained active until the end of the AB411 season. Due to its potential harm to federally threatened snowy plovers during their nesting season, Heal the Bay supported the decision to end the program at its scheduled completion date.

San Diego County

#5 LA JOLLA COVE



San Diego's La Jolla Cove was also a new addition to the Bummer list this year.

Agency staff who monitor water quality in the area noted anecdotally an increase in seal and sea lion activity at the site. Whether or not the seals and sea lions are a contributing factor to these high counts—additional studies would need to confirm, it is likely that the cove-like conditions exacerbate poor water quality, much like at an enclosed waterbody site.



Monarch Beach at Salt Creek



La Jolla Cove

Other Beach Bumpers/ Places Of Concern:

- Newport Bay at Abalone Avenue
 - Long Beach, proj. of Coronado Ave.
 - Arroyo Burro Beach, Santa Barbara*
 - Linda Mar Beach, Pacifica
 - Keller Beach, Richmond*
- (*full year's data incomplete)

Updates From Last Year:

Last year's Beach Bumpers that have not repeated are:

- Shelter Island, San Diego (#3)
- Redondo Beach Pier (#7)
 - Candlestick Point (#8)
- Pillar Point Harbor (#9)
- Pismo Beach Pier (#10)

II. WEST COAST SUMMARY

BEACH BUMMERS



TABLE 2-4: 2016-17 BEACH BUMMERS – FIVE YEAR HISTORY

Most of 2016-17's Beach Bummers have a history of water quality problems.

2016-17 Beach Bummers	County	2016-17			2015-16			2014-15			2013-14			2012-13		
		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
1 Clam Beach County Park	Humboldt	F	n/a	F	F	n/a	F	F	n/a	n/a	D	n/a	n/a	A	n/a	n/a
2 San Clemente Pier	San Diego	F	F	C	B	A	n/a	A	A	A	A	A	A+	A	A+	A+
3 Cowell Beach, Santa Cruz	Santa Cruz	F	A	F	F	A+	D	F	F	C	F	n/a	A+	F	n/a	n/a
4 Lakeshore Park, Marina Lagoon	San Mateo	F	B	F	C	B	F	F	C	F	F	F	F	D	F	F
5 La Jolla Cove	San Diego	D	n/a	D	B	B	A+	A	n/a	A+	A	A+	A+	n/a	n/a	n/a
6 Santa Monica Pier	Los Angeles	D	F	F	F	F	F	F	F	F	D	F	F	B	F	F
7 Capitola Beach (west of jetty)	Santa Cruz	D	F	F	C	A	D	C	F	F	C	A	F	C	D	F
8 Luffenholz Beach	Humboldt	D	n/a	C	C	n/a	D	A	n/a	n/a	A	n/a	n/a	A	n/a	n/a
9 Mother's Beach, Marina del Rey	Los Angeles	D	F	F	F	F	F	F	F	F	F	F	F	A	F	F
10 Monarch Beach, Dana Point	Orange	D	F	F	F	F	F	B	A	B	A+	B	A+	A	B	A+
... Newport Bay @ Abalone Ave.	Orange	F	A	C	A	A+	F	A	A+	D	A	A+	A+	A	A	A
... Long Beach @ Coronado Ave.	Los Angeles	C	B	F	A	A	F	A	A	F	B	A	F	C	A	B
... Linda Mar Beach, Pacifica	San Mateo	C	A	F	A	C	F	B	C	F	A	A+	D	A	A	D
... Keller Beach, North	Contra Costa	C	n/a	D	B	n/a	A	A	n/a	A	A	n/a	A	A	n/a	A

PLEASE NOTE: ▼ Starting in 2015, the SWRCB required all coastal counties receiving state funds to monitor their beaches at point zero – where the discharge meets the ocean. Prior to monitoring year 2015-16, only Los Angeles County (and portions of Orange, San Diego, and Humboldt Counties) sampled directly at the outfall, which gives the most accurate picture of water quality.


TABLE 2-5: CALIFORNIA'S TROUBLED BEACHES (SUMMER GRADES, 2008-2017)

These beaches that have turned up more than once on Beach Bummer lists since 2008 due to poor summer grades.

Bold denotes current 2016-17 Beach Bummer.







*See Table 2-2 on page 13 for "Water Quality Improvement".

Beach/County		2016-17	2015-16	2014-15	2013-14	2012-13	2011-12	2010-11	2009-10	2008-09
Clam Beach County Park	Humboldt	F	F	F	D	A	B	A	A	A
Candlestick Point, Windsufers Circle	San Francisco	B	C	C	C	C	B	D	A	A
Candlestick Point, Sunnydale Cove	San Francisco	A	D	F	B	A	A	D	B	A
Baker Beach @ Lobo Creek	San Francisco	B	B	C	C	C	B	F	F	F
Keller Beach North	Contra Costa	C	B	A	A	A	B	F	D	F
Pillar Point Harbor	San Mateo	B	D	B	C	A	D	D	A	A
Marina Lagoon, Lakeshore Park	San Mateo	B	C	F	F	F	F	D	F	B
Marina Lagoon, Aquatic Park	San Mateo	F	C	F	F	D	F	D	D	D
Cowell Beach	Santa Cruz	F	F	F	F	F	F	F	F	C
Capitola Beach, west of Jetty	Santa Cruz	D	C	C	C	C	F	F	F	C
Stillwater Cove, Monterey Bay	Monterey	A	A	D	D	C	D	C	A	A
Pismo Beach Pier	San Luis Obispo	B	D	A	C	A	B	F	C	F
Malibu Pier	Los Angeles	n/a	n/a	A	C	F	F	B	B	B
Santa Monica Pier	Los Angeles	D	F	F	D	B	A	A	F	F
Mother's Beach, Marina del Rey	Los Angeles	D	F	F	F	A	A	A	B	A
Redondo Beach Pier *	Los Angeles	A	F	B	A	C	B	B	B	B
Cabrillo Beach, at restrooms *	Los Angeles	B	A	D	F	F	F	F	F	F
Avalon, midpoint, Catalina Island *	Los Angeles	A	B	C	C	F	F	F	F	F
Monarch Beach, Dana Point	Orange	D	F	B	A+	A	A	A	A	A
Doheny State Beach, north	Orange	B	B	A	A	D	B	F	B	A

 PLEASE NOTE: ▼ Starting in 2015, the SWRCB required all coastal counties receiving state funds to monitor their beaches at point zero – where the discharge meets the ocean. Prior to monitoring year 2015-16, only Los Angeles County (and portions of Orange, San Diego, and Humboldt Counties) sampled directly at the outfall, which gives the most accurate picture of water quality.



OPEN OCEAN VS. STORM DRAIN VS. ENCLOSED BEACHES

2016-17 Beaches with Good (A or B) Grades	 Open Ocean Beaches	 Storm Drain Impacted	 Enclosed Waterbodies
 Summer Dry	100%	95%	95%
 Winter Dry	93%	88%	88%
 Wet Weather	66%	52%	28%

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) Storm Drain-impacted beaches
- 3) Enclosed Beaches

Grades were separated for all three time periods:

- 1) Summer Dry season (April through October)
- 2) Winter Dry weather (November through March)
- 3) Year-round Wet Weather conditions



Open Ocean:
Cassidy Beach



Storm Drain Impacted:
Redondo Beach



Enclosed:
Marina del Rey

OPEN OCEAN BEACHES

Open ocean beaches with no known pollution sources most often exhibit excellent summer dry weather grades.

2016-17 Findings

- 100% of open ocean beaches earned A grades for summer dry weather.
- Winter dry weather grades at open ocean beaches were also excellent, with 93% A or B grades.
- As for wet weather grades, marks this year dipped at open ocean beaches to only 66% A and B grades, well below the five-year average of 82% A or B grades.

STORM DRAIN IMPACTED BEACHES

Storm drain impacted beaches are those adjacent to a creek, river or storm drain (natural or concrete). Monitoring programs collect samples where that storm

drain or waterbody meets the ocean, also known as “point-zero”. After years of Heal the Bay’s advocacy, California began to require that all monitoring agencies in the California Beach Program sample at point-zero in summer of 2015. Monitoring at point-zero provides the most accurate picture of coastal water quality based upon storm drain inputs. *(Note: seven of the top ten beach bums in California are storm drain, creek or river impacted beaches.)*

2016-17 Findings

- Storm drain impacted beaches had great water quality in summer dry weather, with 95% A or B grades.
- Winter dry weather grades at storm drain impacted beaches performed on par with the five-year average, with 88% A or B grades.
- Wet weather grades at storm drain impacted beaches dropped significantly, with only 52% A or B grades.

BEACH TYPE ANALYSIS SUMMARY

SUMMER DRY GRADES

last year were great across the board. This was likely influenced by the on-going drought conditions from previous years that carried through summer 2016.

WINTER DRY GRADES

continued to perform well on average, though not as quite as well as during summer months.

WET WEATHER

conditions plummeted this last year resulting in worse grades across all three beach types in comparison to the five-year averages.

Beach Types (continued)

ENCLOSED BEACHES

Enclosed beaches are those waterbodies with poor circulation and flushing mechanics- typically lagoons, marinas, family-oriented beaches (aka "baby beach", mother's beach" or "kiddie beach") and harbors. Swimming at these locations can be a cause for concern, especially for the young children that frequent them. Poor circulation and high residence times means that it takes longer for polluted water to mix with cleaner water, which then allows bacteria levels to remain elevated for extended periods of time. As for wet weather, there is no worse place to swim by beach type than at an enclosed beach. *(Note: three of the top ten beach bums in California are enclosed beaches.)*

2016-17 Findings

- Summer dry weather at enclosed beaches reached another new high this year, with 95% A or B grades, which bested the five-year average of 88%.
- Enclosed beaches also scored well during winter dry weather, with 88% A or B grades.
- Wet weather grades were extremely poor this year, with only 28% of enclosed beaches receiving A or B grades.

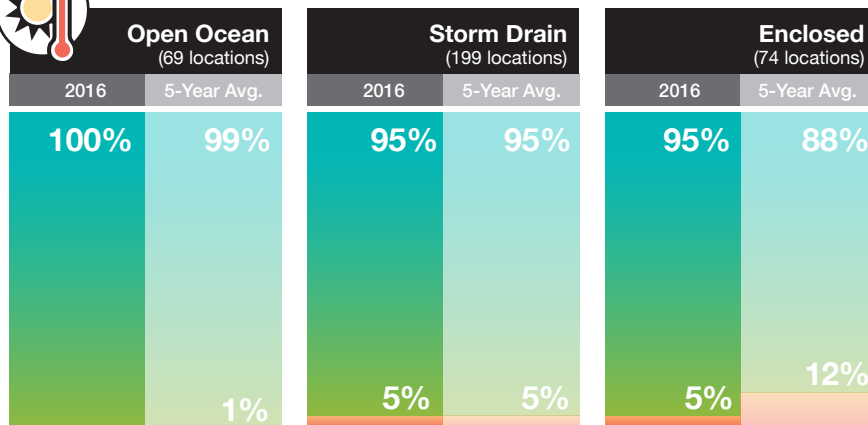


FIGURE 2-9: GRADES BY TIME PERIOD & BEACH TYPE

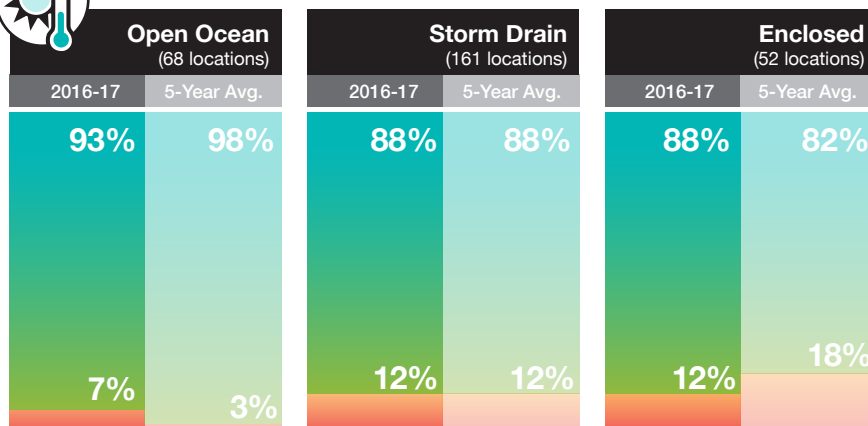
■ : A+B GRADES ■ : C+D+F GRADES



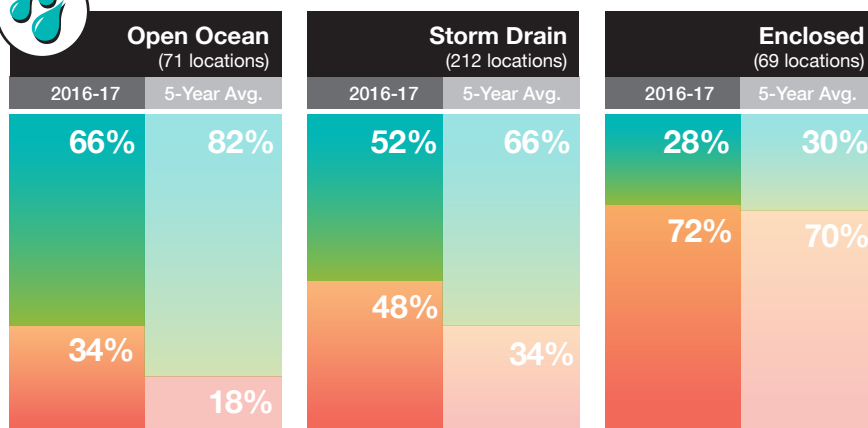
SUMMER DRY GRADES (APRIL - OCTOBER 2016)



WINTER DRY GRADES (NOVEMBER 2016 - MARCH 2017)



WET WEATHER GRADES (APRIL 2016 - MARCH 2017)



A photograph of a coastal scene. In the foreground, there's a rocky shore covered with seaweed and three starfish: one large orange one, one smaller red one, and one smaller orange one. A tide pool is visible in the background, reflecting the sky. The text '| BEACH NEWS |' is overlaid on the right side of the image.

| BEACH NEWS |



NEWS UPDATE: WEST COAST BEACHES

The Beach News section discusses some of the major issues that impacted beach water quality over the past year.

FUNDING:	
FEDERAL BEACH ACT	26
FUNDING:	
CALIFORNIA BEACH PROGRAM	27
SURFER HEALTH STUDY	27
NOWCAST PROGRAM	28
QUANTITATIVE MICROBIAL RISK ASSESSMENT AT INNER CABRILLO BEACH	29
STATE WATER RESOURCES CONTROL BOARD'S BACTERIAL OBJECTIVES	29

FUNDING: FEDERAL BEACH ACT

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 required to implement beach monitoring programs only when federal funding is provided. With more than 90 million annual beachgoers nationwide, the loss of this funding jeopardizes public health protection. Each year, the federal Beach Program provides approximately \$365,000 to California to support the state’s beach water quality monitoring. Beach tourism and coastal recreation in California are valued at close to \$90 billion, so it makes fiscal and public health sense to invest \$10 million per year through the BEACH Act grant program for beach monitoring throughout the U.S. to ensure that coastal resources continue to produce a utility and maintain functionality.

However, moving forward, future funding remains a concern, particularly when President Trump proposed a 31% reduction for the USEPA budget. This action will certainly end the BEACH Act grant program. Since 2012, the BEACH Act programmatic budget has been eliminated from Presidential budgets (approximately \$10 million/annually) even when the EPA’s overall budget was fairly stable. Fortunately, in past years, the Senate Appropriations Committee has reinstated the program’s funds back into the budget. However, with the current make-up of Congress, the BEACH Act funding is particularly vulnerable.

This is extremely concerning for two reasons: 1) many state beach programs are run completely on federal funds (such as Oregon) and 2) states are only legally required to implement beach programs when federal funding is provided. As such, the beach-going public is likely to be uninformed about local water quality conditions due to the lack of monitoring programs.

...with the current make-up of Congress, the BEACH Act funding will not likely be reinstated.

III. BEACH NEWS

FUNDING: CALIFORNIA'S BEACH PROGRAM

The State Water Resources Control Board (SWRCB) has administered the California Beach Program for the past six 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. This year, the SWRCB will provide \$1.8 million dollars to seventeen California counties, who sampled over 420 monitoring stations annually across 291 beaches, collecting over 28,000 samples.

Heal the Bay continues to advocate to the SWRCB for the California Beach Program to include the following elements as part of county monitoring plans:

- Agencies must continue to monitor at least 80% of the locations that were 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.



THE SURFER HEALTH STUDY

The Southern California Coastal Water Research Project (SCCWRP) released a “Surfer Health Study” in 2016. From 2013-15, during winter seasons, SCCWRP partnered with UC Berkeley School of Public Health, Surfrider Foundation and Soller Environmental to study whether surfing was related to a higher rate of illness and how those rates changed in dry or wet weather. The study looked at two beaches in San Diego: Ocean Beach at the mouth of the San Diego River and Tourmaline Surfing Park at the mouth of Tourmaline Creek.

We do not recommend citing the study as a reason to create less health protective objectives for these two locations. For one, the population (only surfers over the age of 18 who were English speaking) examined in this study should be considered too narrow to influence public health standards that are in place to protect all potential beach users. Furthermore, samples of stormwater discharged from both sites identified the presence of human pathogens, a serious water quality concern for ocean users at those locations, and a clear indication of upstream issues in both locations that have not yet been resolved.

Most concerning however, were the contradictions within the report regarding recommendations on whether these results should be compared to USEPA guidelines in order to determine potential new standards. The report states both that the study, “provides the technical foundation for policy makers to discuss new, wet-weather-specific water quality standards,” and then later states, “Surfers also spend most of their time offshore in large waves and spend relatively little time in shallow water near the beach. Due to these differences, we recommend caution in the direct comparison of risk estimates from this study with USEPA guidelines.” Heal the Bay agrees that due to the narrow population in the study, extreme caution needs to be used with study results and does not recommend comparison of study results with the USEPA bacterial objectives in order to reduce objectives set to protect the public health of all types of beach goers.

III. BEACH NEWS

NOWCAST PROGRAM

Last summer, Heal the Bay, Stanford University and UCLA expanded the predictive modeling program from three to five Southern California beaches from July through October. The five beaches modeled in 2016:

- Arroyo Burro
(Santa Barbara County)
- East Beach (Santa Barbara County)
- Santa Monica Pier
(Los Angeles County)
- Belmont Pier (Long Beach City)
- Doheny State Beach
(Orange County)

Predictive models, or beach water quality 'Nowcasting' tools, are designed to predict daily water quality based upon historic data and location specific information for a defined beach.

The models can be used to inform the public about water quality conditions on a given day for a particular beach. These 'NowCasts' can be produced much faster than the current public notification methods, which rely on analytical methods that can take 18-24 hours to produce results. This delay in the existing system can lead to inadvertently not posting a beach advisory, which may put public health at risk, or alternatively, inappropriate advisories that may keep people away from enjoying a clean beach.

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.



After Heal the Bay's successful pilot project in 2015, the organization was fortunate enough to receive another Clean Beach Initiative (CBI) grant to again partner with Stanford University and UCLA through a third phase.

The NowCast program will continue to expand, with the goal of becoming a permanent part of the Beach Report Card program over the next two years. The program will grow to 20-25 locations in the next two years with a handful of surf beaches modeled during the winter season for additional public health protection.

During the summer 2017 season, ten beaches will have predictive models running daily from April through October. (Figure 3-1)

**FIGURE 3-1:
2017 SUMMER
NOWCAST LOCATIONS**

- **Moonlight Beach, Encinitas**
SAN DIEGO COUNTY
- **Doheny State Beach**
ORANGE COUNTY
- **Huntington State Beach**
ORANGE COUNTY
- **Belmont Pier, Long Beach**
LOS ANGELES COUNTY
- **Long Beach City Beach at 5th Pl.**
LOS ANGELES COUNTY
- **Redondo Pier (100 yards south)**
LOS ANGELES COUNTY
- **Santa Monica Pier**
LOS ANGELES COUNTY
- **Arroyo Burro**
SANTA BARBARA COUNTY
- **East Beach**
SANTA BARBARA COUNTY
- **Cowell Beach**
SANTA CRUZ COUNTY

III. BEACH NEWS

QUANTITATIVE MICROBIAL RISK ASSESSMENT AT INNER CABRILLO BEACH

Last summer saw the kick-off of the Inner Cabrillo Beach (ICB) Quantitative Microbial Risk Assessment (QMRA) study led by Southern California Coastal Water Research Project (SCCWRP). The goal of QMRA studies in general is to assess the risk of gastrointestinal illness for people recreating at a specific location based on measurements of bacteria and pathogens at the site and, according to USEPA guidelines, is designed for use in places where bacterial contamination is not human in origin. By comparing the risk of illness calculated for the site to USEPA-determined acceptable risk limits, water quality standards for bacteria may be altered for that site. The ICB QMRA, if completed, would be the first QMRA study at a beach in the state. Heal the Bay is taking part in the Technical Advisory Committee along with other ICB stakeholders. The first phase of the study was completed last summer and indicated high levels of fecal indicator bacteria, as well as the presence of bacteria specifically from human sources. As a result, focus of the study has shifted to identifying potential sources of this bacteria and addressing them.



STATE WATER RESOURCES CONTROL BOARD'S BACTERIAL OBJECTIVES

For the past three years, the State Water Resources Control Board (SWRCB) has indicated that they plan to amend the state's bacterial objectives in the California Ocean Plan and the Inland Surface Water, Enclosed Bays and Estuaries Plan. A draft of the staff report was supposed to be released last summer for public review and comment. However, the State delayed the release and revised the timeframe. The draft objectives were released in June 2017, with a hearing scheduled for July 2017, and the goal of policy adoption by November 2017. Heal the Bay staff have been tracking the issue and are reviewing the draft objectives to make recommendations to the SWRCB to ensure the strongest public

health protection possible.

The goal of this process is to update two statewide policies that protect recreational users from the risks of swimming in fecal contaminated waterbodies. There are 11 elements to the SWRCB proposed update that have major impacts to protecting beachgoer health. Three of the 11 elements are of serious concern to Heal the Bay: 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 three elements has

implications for reducing public health protection for swimmers in 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.



| COUNTY SUMMARIES |





OVERVIEW OF
COASTAL COUNTIES

Heal the Bay provides Beach Report Card grades for all coastal counties in California from Del Norte down to San Diego. The following section 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 waterbody and the number of beach closures due to sewage spills.

Heal the Bay provides an AB411 (summer) dry grade for a beach if the public agency collected samples for at least 75% of the monitoring time-period. Given that there were about 30 weeks between April 1st and October 31st, then there had to be at least 23 weekly samples collected to be provided a grade. The same threshold of 75% is used for winter grades. Wet weather grades are based on any samples taken during either summer or winter seasons within 72 hours of a rain event of at least 0.1 inches.

For rain events across the state, the difference in frequency of events between counties makes it impossible to determine a minimum sampling threshold for grade generation. Thus, Heal the Bay generates a grade for wet weather regardless of the sample size. This enables beachgoers to see differences in dry versus wet weather water quality.



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

CALIFORNIA COUNTY SUMMARIES.....	32
OREGON COUNTY SUMMARIES.....	48
WASHINGTON COUNTY SUMMARIES.....	48

San Diego County

SUMMARY:

- Summer dry weather grades were excellent with 97% of sites receiving A and B grades.
- Beaches performed well on average during the winter dry period with 83% scoring A and B grades. However, the 83% A and B grades marked a dip in water quality to the five-year average of 95%.
- Wet weather grades took a hit and dropped from the five-year average of 81% to only 68% of locations receiving A and B grades.
- San Diego had one Beach Bummer during the summer 2016 season:
 - La Jolla Cove in the No. 5 spot.

For more on the 2016-17 Beach Bumpers see page 16.

FURTHER INSIGHT:

- Winter dry weather grades can reflect poor water quality longer than the 72-hour period that is recommended to avoid water contact following a significant rain event.
- Heal the Bay recommends that the 72-hour rule be used by the public as a *minimum* timeframe to stay out of the water for health protection.
- Moonlight Beach in the City of Encinitas will be included in the 2017 NowCasting program, receiving daily water quality predictions from June through October.
- Moving off last summer's beach bumper list, water quality improved at Shoreline Beach Park, Shelter Island this past summer season with a B grade.

RAINFALL

- This was a heavy rain year in San Diego in comparison to the 7-8" average rainfall for the county over the last 5-10 years.
- Rainfall volumes across San Diego spanned from 12.73" to 17.93" depending on the rain gauge used for analysis (DEMX, SAN and NFG). Depending on the gauge, this was either in line with or quite a few inches over the 10.4" average for the county from 1981-2010.

SEWAGE SPILL NOTES

- There were 28 reported sewage spills for the county, totaling about 1.6 million gallons. Of these spills, eight were "major," ten were "minor" and the final ten were "small." From these sewage spills about 1.2 million gallons reached a surface waterbody.
- This year, contaminated runoff from the Tijuana River resulted in 21 separate closure events with different distances and durations.

San Diego County Grades												
	2016-2017						5-Year Avg. (2011-2016)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A	71	95%	33	79%	37	56%	67	93%	40	92%	38	72%
B	2	3%	2	5%	8	12%	3	4%	1	3%	5	9%
C	1	1%	1	2%	6	9%	1	1%	0	0%	2	5%
D	1	1%	0	0%	7	11%	0	0%	1	2%	2	3%
F	0	0%	6	14%	8	12%	0	0%	1	2%	6	12%
Total	75		42		66		72		44		53	

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

Sewage Spills Summary			
28 SEWAGE SPILLS were reported to have reached a waterbody in San Diego County	8 Major Spills (10,000+ gallons)	1,200,361 GALLONS OF SEWAGE Total Volume reported to have reached waterbody in San Diego County	5 health warnings
	10 Minor Spills (1-10,000 gallons)		6 beach closures
	10 Small Spills (<1,000 gallons)		

Honor Roll			
	Summer Dry	Winter Dry	Wet Weather
Carlsbad (five monitored locations)	A+	A+	A+
Encinitas, San Elijo State Park (two locations)	A+	A+	A+
Cardiff State Beach (two locations)	A+	A+	A+
Solana Beach, Fletcher Cove, Lomas Santa Fe Dr.	A+	A+	A+
Point Loma Lighthouse	A+	A+	A+

Beach Bumpers			
	Summer Dry	Winter Dry	Wet Weather
La Jolla Cove	D	n/a	D

REFERENCES: A complete list of grades for the county's beach monitoring locations can be found in Appendix B1. Samples were collected throughout the year along open coastal and bay beaches.

MONITORING AGENCIES: The City of Oceanside, The City of San Diego, Encina Wastewater Authority, San Elijo Joint Powers Authority, Port of San Diego, The County of San Diego Department of Environmental Health (DEH).

FOR ADDITIONAL WATER QUALITY INFORMATION:
County of San Diego Department of Environmental Health www.sdbeachinfo.com

Orange County

SUMMARY

- Orange County had another great year of summer dry weather grades with 97% of sites scoring A and B grades.
- Beaches also performed well overall in the county during winter dry weather, with 93% of locations receiving A and B grades.
- Wet weather grades took a large hit in Orange County over the last year with only 44% of beaches earning A or B grades.
- Two beach bummers were on the list this year in Orange County:
 - San Clemente Pier in the No. 2 spot
 - Monarch Beach, North Salt Creek in the No. 10 spot

FURTHER INSIGHT:

- Orange County had one location that scored an F grade for the summer season: Abalone Ave. Beach on Balboa Island in Newport Bay.
- Local agency officials believe the exceedances are related to 1) an abandoned small craft just offshore last year that was a roosting spot for birds and 2) waste from pets frequenting the beach.
- Very poor wet weather grades illustrate why California coastal health departments recommend swimmers stay out of the water for a minimum of three days following a rain event of at least 0.1 inches.

RAINFALL

- Rainfall in Orange County totaled 15.82" from April 2016 – March 2017.
- Given that the average rainfall over the past 5-10 years was between 5-8", this past rainy season felt like a deluge.
- However, total rainfall volume over the last year was not that different than the 13.6" average for the county (1981-2010).

SEWAGE SPILL NOTES:

- There were 18 reported sewage spills in Orange County last year totaling 115,723 gallons.
- From these sewage spills about 109,000 gallons reached a surface waterbody.
- Of these spills, two were "major," four were "minor" and 12 were "small."
- These spills resulted in three individual beach closures.

REFERENCES: A complete list of grades for the county's beach monitoring locations can be found in Appendix B1. Samples were collected throughout the year along open coastal and bay beaches.

MONITORING AGENCIES: Orange County Environmental Health, South Orange County Wastewater Authority, Orange County Sanitation District (OCSD).

FOR ADDITIONAL WATER QUALITY INFORMATION:

County of Orange Environmental Health Division www.ocbeachinfo.com

Orange County Grades												
	2016-2017						5-Year Avg. (2011-2016)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A	111	95%	93	85%	38	32%	95	91%	76	82%	46	49%
B	3	3%	7	7%	14	12%	6	6%	9	10%	10	11%
C	0	0%	2	2%	15	13%	2	2%	3	3%	9	10%
D	1	1%	0	0%	17	14%	1	1%	1	1%	6	6%
F	2	2%	6	6%	34	29%	1	1%	4	4%	23	24%
Total	117		109		118		104		93		94	

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

Sewage Spills Summary			
18 SEWAGE SPILLS were reported to have reached a waterbody in Orange County	2 Major Spills (10,000+ gallons)	109,287 GALLONS OF SEWAGE Total Volume reported to have reached waterbody in Orange County	3 health warnings
	4 Minor Spills (1-10,000 gallons)		3 beach closures
	12 Small Spills (<1,000 gallons)		

Honor Roll			
	Summer Dry	Winter Dry	Wet Weather
Balboa Pier	A+	A+	A+
The Wedge	A+	A+	A+
Crystal Cove State Park (two monitored locations)	A+	A+	A+
Laguna Beach (seven monitored locations)	A+	A+	A+
Dana Point, projection of Camino Estrella	A+	A+	A+
Dana Point, South Capistrano Bay Comm. Beach	A+	A+	A+
San Clemente, Poche Beach	A+	A+	A+

Beach Bummers			
	Summer Dry	Winter Dry	Wet Weather
Newport Bay, Abalone Avenue Beach	F	A	C
Dana Point, Monarch Beach North	D	F	F
San Clemente Pier	F	F	C

Los Angeles County

SUMMARY

- Los Angeles County had another banner year of summer dry weather grades with 96% of sites receiving A and B grades.
- Winter dry weather grades were on par with the five-year average, with 87% of locations scoring A and B grades.
- Wet weather grades continue to be an issue in Los Angeles, with only 39% of beaches managing to earn an A or B grade.
- Two bummer in Los Angeles that have been of historic concern made the list again this year (though lower on the list than in years past):
 - Santa Monica Pier at the No. 6 spot
 - Mother's Beach (between the tower and dock), Marina del Rey at No. 9

FURTHER INSIGHT:

- Los Angeles had one beach bumper drop off the list from last year: Redondo Pier (100 yards south). This site has been added to the NowCast program for summer 2017 and will receive daily water quality predictions from May through October.
- More beaches (41) earned an F in wet weather in Los Angeles than any other county.
- Very poor wet weather grades illustrate why California coastal health departments recommend swimmers stay out of the water for a minimum of three days following a rain event of at least 0.1 inches.

RAINFALL

- Rainfall in Los Angeles (at LAX) totaled 16.7" from April 2016 – March 2017, while rainfall in Long Beach totaled 19.47" during that same time period.
- This was a heavy rain year for Los Angeles County in comparison to the 7-9" average for the county over the last 5-10 years.
- Yet, the total rain volume in Los Angeles County did not exceed the 18.67" average from 1981-2010.

SEWAGE SPILL NOTES:

- Los Angeles had the largest number of reported sewage spills at 108 individual events.
- These reported spills totaled about 3.3 million gallons.
- From these sewage spills, about 2.3 million gallons reached a surface waterbody.
- These spills resulted in three individual health warnings.
- Of these spills, 16 were "major," 41 were "minor" and 51 were "small."

(Long Beach continued on page 35)

Los Angeles County Grades

	2016-2017						5-Year Avg. (2011-2016)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A	79	93%	62	76%	20	23%	68	76%	63	74%	27	31%
B	3	4%	9	11%	14	16%	11	13%	8	10%	11	13%
C	1	1%	7	9%	9	10%	4	4%	4	5%	9	11%
D	2	2%	1	1%	4	5%	1	2%	3	4%	5	6%
F	0	0%	3	4%	40	46%	5	6%	6	7%	34	39%
Total	85		82		87		90		85		87	

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

Sewage Spills Summary

108 SEWAGE SPILLS were reported to have reached a waterbody in Los Angeles County	16 Major Spills (10,000+ gallons)	2,301,780 GALLONS OF SEWAGE Total Volume reported to have reached waterbody in Los Angeles County	3 health warnings
	41 Minor Spills (1-10,000 gallons)		
	51 Small Spills (<1,000 gallons)		8 beach closures

Honor Roll

	Summer Dry	Winter Dry	Wet Weather
Malibu, El Matador State Beach	A+	A+	A+
Malibu Point	A+	A+	A+
Palos Verdes Peninsula, Bluff Cove	A+	A+	A+
Palos Verdes Peninsula, Portugese Bend	A+	A+	A+

Beach Bumpers

	Summer Dry	Winter Dry	Wet Weather
Santa Monica Pier	D	F	F
Marina del Rey, Mother's Beach, bet Tower/Dock	D	F	F
Long Beach, projection of Coronado Avenue	C	B	F

Los Angeles County // Long Beach

SUMMARY:

- Long Beach had great summer dry weather water quality again last year, with 92% of the sites having A or B marks.
- Winter dry weather grades dipped to only 62% of sites receiving A or B marks.
- Wet weather resulted in F grades across the board in Long Beach.

FURTHER INSIGHT:

- Long Beach is situated between two of the largest rivers in Los Angeles County (the Los Angeles and San Gabriel Rivers), which likely contributes heavily to its poor wet weather grades.
- Sampling at Colorado Lagoon ceased in September 2016 due to dredging activities associated with a new restoration project.

REFERENCES: A complete list of grades for the county's beach monitoring locations can be found in Appendix B1. Samples were collected throughout the year along open coastal and bay beaches.

MONITORING AGENCIES: 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 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

Long Beach Grades												
	2016-2017						5-Year Avg. (2011-2016)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A	11	85%	3	23%	0	0%	8	54%	12	86%	1	7%
B	1	8%	5	38%	0	0%	5	36%	1	7%	1	7%
C	1	8%	4	31%	0	0%	1	7%	1	7%	1	7%
D	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
F	0	0%	1	8%	13	100%	0	0%	0	0%	12	80%
Total	13		13		13		14		14		15	

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



FIGURE 4-1: LONG BEACH GRADES AND RAINFALL COMPARISON

2010-2017 Rainfall and Water Quality Grades at Long Beach monitoring locations between Rosie's Dog Beach and 5th Place.

	2016-17			2015-16			2014-15			2013-14			2012-13			2011-12			2010-11		
	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	Summer Dry	Winter Dry	Wet Weather
Granada Avenue (Rosie's Dog Beach)	B	C	F	B	C	F	A	A	F	C	A	F	B	A	A	A	A	F	A	B	F
Prospect Avenue	A	B	F	A	A	F	A	A	F	B	A	F	B	A	B	B	C	F	C	A	F
Belmont Pier (west side)	A	B	F	A	A	F	A	B	F	B	A	F	C	A	B	B	A	F	C	B	F
Coronado Avenue	C	B	F	A	A	F	A	A	F	B	A	F	C	A	B	B	B	F	C	F	F
Molino Avenue	A	C	F	A	C	F	A	A	F	B	A	F	A	A	C	B	F	F	D	A	F
10th Place	A	C	F	A	A	F	A	A	F	B	A	F	B	A	C	B	F	F	C	A	F
5th Place	A	C	F	A	A	F	A	B	F	B	B	F	A	A	C	B	C	F	C	A	F
Rainfall	19.47"			7.31"			6.67"			4.81"			7.54"			6.74"			18.88"		

Ventura County

SUMMARY:

- Ventura earned 100% A grades during summer dry weather for the 9th consecutive year.
- Ventura beaches also earned great grades during winter dry weather with only one beach not earning an A or B grade - Harbor Beach Park at the South end of Victoria Avenue earned a D grade.
- Wet weather water quality was again well above average, with 80% of the 40 sites earning A or B grades.

FURTHER INSIGHT

- 40 locations were monitored weekly from April - October 2016 and 19 locations year-round.
- Ventura County's online sample data and lab reports regularly had value discrepancies. These were related to quality control issues.

RAINFALL

- Rainfall volumes in Ventura County spanned from 19.81" to 20.70" depending on the rain gauge used for analysis (OXR and VTU respectively).
- A small portion of this volume fell during summer months, but most of the rainfall (about 18") occurred during the winter season.

SEWAGE SPILL NOTES:

- Ventura County only had one reported sewage spill according to SWRCB records, totaling about 17,000 gallons.
- About 16,000 gallons from this spill reached a surface waterbody, resulting in a health warning. This event ranked as a "major" spill.

REFERENCES: A complete list of grades for the county's beach monitoring locations can be found in Appendix B1. Samples were collected throughout the year along open coastal and bay beaches.

FOR ADDITIONAL WATER QUALITY INFORMATION:

Ventura County's Environmental Health Division www.vcrma.org/envhealth

Ventura County Grades

	2016-2017						5-Year Avg. (2011-2016)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A	40	100%	15	94%	28	70%	40	100%	16	100%	19	77%
B	0	0%	0	0%	4	10%	0	0%	0	0%	3	12%
C	0	0%	0	0%	5	13%	0	0%	0	0%	1	5%
D	0	0%	1	6%	1	3%	0	0%	0	0%	1	2%
F	0	0%	0	0%	2	5%	0	0%	0	0%	1	3%
Total	40		16		40		40		16		24	

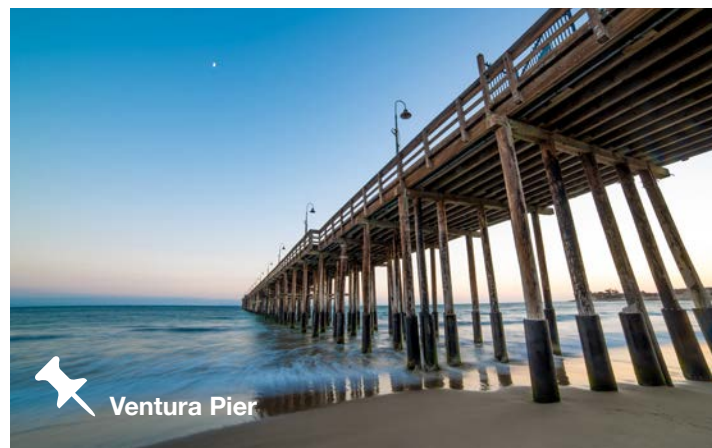
*State AB411 monitoring April thru October. Percentages may not add up to 100 due to rounding.

Sewage Spills Summary

1 SEWAGE SPILL was reported to have reached a waterbody in Ventura County	1 Major Spill (10,000+ gallons)	16,275 GALLONS OF SEWAGE Total Volume reported to have reached waterbody in Ventura County	1 health warning
	0 Minor Spills (1-10,000 gallons)		0 beach closures
	0 Small Spills (<1,000 gallons)		

Honor Roll Grades

	Summer Dry	Winter Dry	Wet Weather
Silverstrand, Sawtelle Avenue, south of drain	A+	A+	A+



Santa Barbara County

SUMMARY:

- Unfortunately, lab errors for a large portion of the summer season resulted in too few reliable samples for beaches in Santa Barbara County to receive summer dry grades.
- Winter dry weather grades were excellent with 93% of locations scoring A and B marks.
- Wet weather grades were extremely poor with 80% of locations (12 sites) receiving C – F grades.

FURTHER INSIGHT:

- Santa Barbara has two beaches that are a part of the NowCast program, which receive daily predictions from April through October:
 - Arroyo Burro Beach
 - East Beach

RAINFALL

- Rainfall volumes in Santa Barbara County ranged from 17.68” to 24.26” depending on the rain gauge used for analysis (SMX and SBA respectively).
- This was a heavy rain year for the county in comparison to the 10-14” average over the last 5-10 years.
- Although rainfall was higher at the SBA rain gauge this year, the total of both rain stations was within range of the 19.41” average for the county from 1981-2010.

SEWAGE SPILL NOTES:

- There were seven reported sewage spills in Santa Barbara County, totaling about 5,000 gallons.
- About half of the volume spilled reached a surface waterbody.
- These spills resulted in no individual health warnings.
- Of these spills, two were “minor” and five were “small.”
- To compare, last year there were three reported spills with approximately 85,880 gallons reaching a surface waterbody.

REFERENCES: A complete list of grades for the county's beach monitoring locations can be found in Appendix B1. Samples were collected throughout the year along open coastal and bay beaches.

FOR ADDITIONAL WATER QUALITY INFORMATION:

Santa Barbara County's Environmental Health Agency www.sbcphd.org

Santa Barbara County Grades

	2016-2017						5-Year Avg. (2011-2016)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A	n/a		14	93%	1	7%	14	87%	12	77%	8	53%
B	n/a		0	0%	2	13%	2	11%	2	15%	3	20%
C	n/a		0	0%	1	7%	0	0%	1	5%	2	15%
D	n/a		0	0%	3	20%	0	0%	0	0%	0	0%
F	n/a		1	7%	8	53%	0	0%	0	0%	1	9%
Total			15		15		16		15		14	

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

Sewage Spills Summary

7 SEWAGE SPILLS were reported to have reached a waterbody in Santa Barbara County	0 Major Spills (10,000+ gallons) 2 Minor Spills (1-10,000 gallons) 5 Small Spills (<1,000 gallons)	2,620 GALLONS OF SEWAGE Total Volume reported to have reached waterbody in Santa Barbara County	0 health warnings 0 beach closures
---	---	---	---

Beach Bummers

	Summer Dry	Winter Dry	Wet Weather
Arroyo Burro Beach*	n/a	F	F

*Arroyo Burro Beach is not an official 2016-17 Beach Bummer because of incomplete reports during the AB411 monitoring season. However, it remains an area of concern because of its previous appearances on our Top Ten Beach Bummers list.



Arroyo Burro Beach

San Luis Obispo County

SUMMARY:

- Summer dry weather grades were excellent in San Luis Obispo with 100% of sampling locations earning an A or B grade.
- Winter dry weather results were also excellent with 100% of beaches receiving A grades.
- Wet weather grades, though lower on average than dry weather, were much higher than the average for the State and were on-par with the five-year average for the County.

NOTES:

- San Luis Obispo had one beach bumper drop off the list from last year: Pismo Beach Pier, scored a B grade for the 2016 summer dry season.
- Construction is currently underway at Pismo Pier to rehabilitate and repair the 1924 structure.

RAINFALL

- Rainfall volumes in San Luis Obispo County ranged from 18.96" to 27.48" depending on the rain gauge used for analysis (MQO and CAPS respectively).
- This was a very heavy year of rain in comparison to the 7-11" average for the county over the last 5-10 years.
- Although rainfall was higher at the CAPS rain gauge this year, the total of both rain stations was within range of the 19.41" average for the county from 1981-2010.

SEWAGE SPILL NOTES:

- There were 10 reported sewage spills totaling about 105,000 gallons.
- Almost the whole volume spilled reached a surface waterbody.
- These spills resulted in two individual health warnings.
- Three of these spills were "major," four were "minor" and three were "small."
- To compare, last year there were seven reported spills with approximately 8,000 gallons reaching a surface waterbody.

REFERENCES: A complete list of grades for the county's beach monitoring locations can be found in Appendix B1. Samples were collected throughout the year along open coastal and bay beaches.

MONITORING AGENCIES: 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).

FOR ADDITIONAL WATER QUALITY INFORMATION:

San Luis Obispo County Environmental Health Department www.slocounty.ca.gov/health/publichealth/ehs/beach.htm

San Luis Obispo County Grades

	2016-2017						5-Year Avg. (2011-2016)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A	15	94%	19	100%	9	47%	17	88%	16	88%	14	73%
B	1	6%	0	0%	8	42%	1	7%	1	6%	3	16%
C	0	0%	0	0%	0	0%	1	3%	1	3%	1	5%
D	0	0%	0	0%	0	0%	0	0%	0	0%	1	3%
F	0	0%	0	0%	2	11%	0	0%	0	0%	0	0%
Total	16		19		19		19		19		19	

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

Sewage Spills Summary

10 SEWAGE SPILLS were reported to have reached a waterbody in San Luis Obispo County	3 Major Spills (10,000+ gallons)	103,200 GALLONS OF SEWAGE Total Volume reported to have reached waterbody in Santa Luis Obispo County	2 health warnings
	4 Minor Spills (1-10,000 gallons)		0 beach closures
	3 Small Spills (<1,000 gallons)		

Honor Roll Grades

	Summer Dry	Winter Dry	Wet Weather
San Simeon, Pico Avenue	A+	A+	A+



Monterey County

SUMMARY

- Monterey County samples regularly during the summer (AB411 season) and only once per month during the winter dry season.
- Of the eight sites monitored, 100% of them received an A grade in summer dry weather.
- All sites also technically received an A grade for summer wet weather, however those A grades are only based on one wet weather sample per location.
- Both summer dry and wet weather grades were above their respective five-year averages.

RAINFALL

- Rainfall totaled 26.10" from April 2016 – March 2017.
- This was a very heavy year of rain in comparison to the 14-16" rainfall average for the county over the last 5-10 years.
- The total rainfall this year was notably even higher than the 21.16" average for the county from 1981-2010.

SEWAGE SPILL NOTES:

- There were 16 reported sewage spills totaling about 820,000 gallons.
- From these spills, approximately 516,000 gallons reached a surface waterbody.
- These spills resulted in four individual health warnings.
- Three of these spills were "major," five were "minor" and eight were "small."
- To compare, last year there were seven reported spills with approximately 221,000 gallons reaching a surface waterbody.

REFERENCES: A complete list of grades for the county's beach monitoring locations can be found in Appendix B1. Samples were collected throughout the year along open coastal and bay beaches.

MONITORING AGENCIES: 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).

FOR ADDITIONAL WATER QUALITY INFORMATION:
Monterey County Environmental Health Bureau
www.mtyhd.org/index.php/beach-water-quality

Monterey County Grades

	2016-2017						5-Year Avg. (2011-2016)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A	8	100%	n/a		8	100%	6	67%	n/a		6	75%
B	0	0%	n/a		0	0%	1	11%	n/a		0	0%
C	0	0%	n/a		0	0%	1	11%	n/a		1	13%
D	0	0%	n/a		0	0%	1	11%	n/a		0	0%
F	0	0%	n/a		0	0%	0	0%	n/a		1	13%
Total	8				8		9				8	

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

Sewage Spills Summary

16 SEWAGE SPILLS were reported to have reached a waterbody in Monterey County	3 Major Spills (10,000+ gallons)	515,696 GALLONS OF SEWAGE Total Volume reported to have reached waterbody in Monterey County	4 health warnings
	5 Minor Spills (1-10,000 gallons)		5 beach closures
	8 Small Spills (<1,000 gallons)		



Santa Cruz County

SUMMARY

- Beaches in Santa Cruz County performed well during summer dry weather with 85% receiving A or B grades.
- Winter dry weather grades performed better than those in summer, with 92% of beaches receiving A or B grades— as is standard for Santa Cruz, but unique in California.
- Wet weather grades were poor with 54% of sites receiving C to F grades.
- Santa Cruz had two locations on the “Beach Bummer” list:
 - Cowell Beach, West of the Wharf at No. 3
 - Capitola Beach at No. 7

FURTHER INSIGHT:

- Santa Cruz County will be partnering with Heal the Bay this summer season by participating in our predictive modeling program. Heal the Bay’s NowCast system will provide daily water quality public notifications for Cowell Beach.

RAINFALL

- Rainfall totaled a whopping 49.94” from April 2016 – March 2017.
- This was an incredibly heavy year of rain, doubling county averages from the last 5-10 years.
- The total also far surpassed the 31.36” average for the county from 1981-2010.

SEWAGE SPILL NOTES:

- There were seven reported sewage spills totaling about 37,000 gallons.
- Almost the whole volume that was spilled reached a surface waterbody.
- These spills resulted in only one individual health warning.
- One of these spills was “major,” one was “minor” and five were “small.”
- For comparison, last year there were 11 reported spills with approximately 5,000 gallons reaching a surface waterbody.

REFERENCES: A complete list of grades for the county’s beach monitoring locations can be found in Appendix B1. Samples were collected throughout the year along open coastal and bay beaches.

FOR ADDITIONAL WATER QUALITY INFORMATION:
Department of Environmental Health Services
<http://gis.co.santa-cruz.ca.us/PublicWaterQuality>

Santa Cruz County Grades												
	2016-2017						5-Year Avg. (2011-2016)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A	11	85%	12	92%	1	8%	10	74%	10	83%	5	34%
B	0	0%	0	0%	5	38%	1	6%	2	17%	3	17%
C	0	0%	0	0%	4	31%	1	6%	0	0%	3	21%
D	1	8%	0	0%	0	0%	0	0%	0	0%	1	9%
F	1	8%	1	8%	3	23%	2	14%	0	0%	3	18%
Total	13		13		13		13		12		15	

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

Sewage Spills Summary			
7 SEWAGE SPILLS were reported to have reached a waterbody in Santa Cruz County	1 Major Spill (10,000+ gallons)	37,140 GALLONS OF SEWAGE Total Volume reported to have reached waterbody in Santa Cruz County	1 health warning
	1 Minor Spill (1-10,000 gallons)		0 beach closures
	5 Small Spills (<1,000 gallons)		

Beach Bummer			
	Summer Dry	Winter Dry	Wet Weather
Santa Cruz, Cowell Beach, west of wharf	F	A	F
Capitola, west of Jetty	D	F	F



San Mateo County

SUMMARY

- Summer dry weather grades were great last year, with 90% of beaches earning A or B grades.
- San Mateo beaches also received high marks during winter dry weather, with 95% scoring A or B grades.
- Wet weather grades were a different story, with 73% of sampling locations earning a C to F grade.
- San Mateo earned one spot on the “Beach Bummers” list this year:
 - Lakeshore Park, Marina Lagoon at No. 4

FURTHER INSIGHT:

- Wet weather grades dipped below last year’s and well below the five-year average.
- Very poor wet weather grades illustrate why California coastal health departments recommend swimmers stay out of the water for a minimum of three days following a rain event of at least 0.1 inches.

RAINFALL

- Rainfall totaled a whopping 49.94” from April 2016 – March 2017.
- This was an incredibly heavy year of rain, doubling county averages from the last 5-10 years.
- The total also far surpassed the 31.36” average for the county from 1981-2010.

SEWAGE SPILL NOTES:

- There were 52 reported sewage spills totaling about 2.3 million gallons.
- Of this, about 1.8 million gallons reached a surface waterbody.
- These spills resulted in 17 individual health warnings.
- Of these spills, 19 were “major,” 18 were “minor” and 15 were “small.”
- San Mateo had some of the highest reported sewage spills by both number and volume.

REFERENCES: A complete list of grades for the county’s beach monitoring locations can be found in Appendix B1. Samples were collected throughout the year along open coastal and bay beaches.

FOR ADDITIONAL WATER QUALITY INFORMATION:
San Mateo County <http://smchealth.org/envirom/beaches>

San Mateo County Grades												
	2016-2017						5-Year Avg. (2011-2016)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A	17	81%	15	75%	6	27%	18	83%	15	74%	7	35%
B	2	10%	4	20%	0	0%	1	4%	2	10%	4	18%
C	1	5%	1	5%	3	14%	1	4%	1	6%	2	8%
D	0	0%	0	0%	5	23%	1	4%	0	0%	3	15%
F	1	5%	0	0%	8	36%	1	6%	2	9%	5	25%
Total	21		20		22		22		20		20	

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

Sewage Spills Summary			
52 SEWAGE SPILLS were reported to have reached a waterbody in San Mateo County	19 Major Spills (10,000+ gallons)	1,843,900 GALLONS OF SEWAGE Total Volume reported to have reached waterbody in San Mateo County	17 health warnings
	18 Minor Spills (1-10,000 gallons)		13 beach closures
	15 Small Spills (<1,000 gallons)		

Beach Bummers			
	Summer Dry	Winter Dry	Wet Weather
Linda Mar Beach, at San Pedro Creek	C	A	F
Lakeshore Park, behind Rec Center	F	B	F



Kiteboard Beach

Alameda & Contra Costa Counties

SUMMARY:

- The East Bay Regional Park District monitored eight locations, two in Contra Costa County (Keller Beach) and six in Alameda County (Crown Beach).
- Samples were collected weekly during the summer and about twice a month throughout the winter – unfortunately not frequent enough to receive a winter grade.
- East Bay grades took a dip this year with 75% receiving A or B grades during summer dry weather.
- Wet weather grades took a serious hit with a 75% of locations scoring C to F grades, more than double that of the five-year average.

FURTHER INSIGHT:

- Contra Costa County (Keller Beach) earned C's at both sampling locations during summer dry weather. These two locations dipped to D grades during wet weather.
- The six Alameda County sites were split between A and B grades during summer dry weather.
- They were also split during wet weather, with two B's, two C's and two F grades.

RAINFALL

- Rainfall totaled a whopping 49.94" from April 2016 – March 2017.
- This was an incredibly heavy year of rain, doubling county averages from the last 5-10 years.
- The total rainfall also far surpassed the 31.36" average for the county from 1981-2010.

SEWAGE SPILL NOTES:

- Between Alameda and Contra Costa counties, there were 110 reported sewage spills totaling about 9.6 million gallons.
- Almost the entire volume that was spilled reached a surface waterbody.
- These spills caused 56 individual health warnings, which presents a stark contrast from the previous year where there were no reported health warnings related to a sewage spill in Alameda County and 20 in Contra Costa County.
- Over the last year, both counties had an incredibly high number and volume of sewage spills, with Alameda County topping the volume spilled category statewide.

REFERENCES: A complete list of grades for the county's beach monitoring locations can be found in Appendix B1. Samples were collected throughout the year along open coastal and bay beaches.

FOR ADDITIONAL WATER QUALITY INFORMATION:
East Bay Regional Park District www.ebparks.org

East Bay (Combined) Grades												
	2016-2017						5-Year Avg. (2011-2016)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A	3	38%	n/a		0	0%	8	84%	n/a		6	64%
B	3	38%	n/a		2	25%	2	16%	n/a		1	6%
C	2	25%	n/a		2	25%	0	0%	n/a		1	15%
D	0	0%	n/a		2	25%	0	0%	n/a		1	9%
F	0	0%	n/a		2	25%	0	0%	n/a		1	6%
Total	8				8		10				9	

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

	Contra Costa County						Alameda County					
	2016-2017						2016-2017					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A	0	0%	n/a		0	0%	3	50%	n/a		0	0%
B	0	0%	n/a		0	0%	3	50%	n/a		2	33%
C	2	100%	n/a		0	0%	0	0%	n/a		2	33%
D	0	0%	n/a		2	100%	0	0%	n/a		0	0%
F	0	0%	n/a		0	0%	0	0%	n/a		2	33%
Total	2				2		6				6	

Sewage Spills Summary				
29 SEWAGE SPILLS were reported to have reached a waterbody in Alameda County	8 Major Spills (10,000+ gallons)	6,892,682 GALLONS OF SEWAGE Total Volume reported to have reached waterbody in ALAMEDA COUNTY	13 health warnings	
	13 Minor Spills (1-10,000 gallons)		1 beach closure	
	8 Small Spills (<1,000 gallons)			
81 SEWAGE SPILLS were reported to have reached a waterbody in Contra Costa County	34 Major Spills (10,000+ gallons)	2,673,414 GALLONS OF SEWAGE Total Volume reported to have reached waterbody in CONTRA COSTA CO.	43 health warnings	
	24 Minor Spills (1-10,000 gallons)		0 beach closures	
	23 Small Spills (<1,000 gallons)			

Beach Bums			
	Summer Dry	Winter Dry	Wet Weather
Richmond, Keller Beach, north	C	n/a	D
Richmond, Keller Beach, south	C	n/a	D

San Francisco County

SUMMARY

- Through partnership with the San Francisco Public Utilities Commission, San Francisco maintains year-round sampling at 15 locations regularly.
- Beaches earned amazing grades during summer dry weather, with 100% earning A or B grades, a 13% increase from the five-year average.
- Winter dry weather grades were on par with the five-year average at 73% of locations scoring A or B grades.
- Wet weather grades in San Francisco could improve with 60% of beaches receiving A or B grades.
- San Francisco had one location drop off the “Beach Bummer” list from last year: Candlestick Point at Sunnyside Cove received an A summer dry grade

FURTHER INSIGHT:

- Winter dry weather grades improved from last year’s scores of 60% A or B grades to 73%.
- Wet weather grades also saw an improvement from last year, up from 40% A or B grades to 60% this year.

RAINFALL

- Rainfall totaled 31.34” from April 2016 – March 2017.
- This far surpassed county averages of 17-20” over the last 5-10 years.
- Rainfall this year was also notably higher than the 23.64” average for the county from 1981-2010.

COMBINED SEWER DISCHARGE NOTES:

- 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).
- As a result, the shoreline has no flowing storm drains in dry weather, but during heavy rain events, the CSS occasionally discharges combined wastewater, which is typically comprised of 94% treated stormwater and 6% primary treated sanitary flow.
- This past year, San Francisco had 31 combined sewer discharges, which led to a total of 56 beach advisories.

REFERENCES: A complete list of grades for the county’s beach monitoring locations can be found in Appendix B1. Samples were collected throughout the year along open coastal and bay beaches.

FOR ADDITIONAL WATER QUALITY INFORMATION:

San Francisco Public Utilities Commission <http://beaches.sfwater.org>

San Francisco County Grades

	2016-2017						5-Year Avg. (2011-2016)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A	13	87%	11	73%	6	40%	11	74%	10	71%	5	35%
B	2	13%	0	0%	3	20%	1	10%	1	7%	3	18%
C	0	0%	0	0%	1	7%	1	10%	1	7%	2	16%
D	0	0%	1	7%	2	13%	0	0%	1	7%	1	9%
F	0	0%	3	20%	3	20%	0	0%	1	7%	3	22%
Total	15		15		15		14		14		15	

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

Sewage Spills Summary

3 SEWAGE SPILLS were reported to have reached a waterbody in San Francisco County	0 Major Spills (10,000+ gallons)	587 GALLONS OF SEWAGE Total Volume reported to have reached waterbody in San Francisco County	0 health warnings
	0 Minor Spills (1-10,000 gallons)		1 beach closure
	3 Small Spills (<1,000 gallons)		



Marin County

SUMMARY

- Marin County only samples during the summer (AB411 season).
- Summer dry weather grades were perfect with 100% of locations scoring A grades.
- Wet weather samples taken during those summer months did not fare as well, dipping to 74% of locations receiving A or B grades compared to 91% on average over the last five years.

SEWAGE SPILL NOTES:

- There were 36 reported sewage spills totaling about 175,000 gallons.
- Almost the whole volume that was spilled reached a surface waterbody.
- These spills caused 11 individual health warnings.
- Over the past year Marin had the 5th highest number of reported sewage spills among the coastal counties.
- To compare, there were 19 spills from 2015-16, with approximately 102,342 gallons reaching a surface waterbody.

REFERENCES: A complete list of grades for the county's beach monitoring locations can be found in Appendix B1. Samples were collected throughout the year along open coastal and bay beaches.

MONITORING AGENCIES: 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).

FOR ADDITIONAL WATER QUALITY INFORMATION:
Marin County's Department of Environmental Health
www.marincounty.org/ehs

Marin County Grades												
	2016-2017						5-Year Avg. (2011-2016)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A	23	100%	n/a		15	65%	22	95%	n/a		21	91%
B	0	0%	n/a		2	9%	1	5%	n/a		0	0%
C	0	0%	n/a		0	0%	0	0%	n/a		0	0%
D	0	0%	n/a		5	22%	0	0%	n/a		1	2%
F	0	0%	n/a		1	4%	0	0%	n/a		2	7%
Total	23				23		23				5	

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

Sewage Spills Summary			
36 SEWAGE SPILLS were reported to have reached a waterbody in Marin County	5 Major Spills (10,000+ gallons)	163,279 GALLONS OF SEWAGE Total Volume reported to have reached waterbody in Marin County	11 health warnings
	10 Minor Spills (1-10,000 gallons)		1 beach closure
	21 Small Spills (<1,000 gallons)		



Sonoma County

SUMMARY

- Summer dry weather grades were perfect with 100% of locations receiving A grades.
- Wet weather samples taken during those summer months also earned great marks with 100% of sites scoring A or B grades.

FURTHER INSIGHT:

- Sonoma County only samples during the summer (AB411 season).
- There were seven wet weather samples collected at each site last summer, a larger summer wet weather pool of data than most other summer-only counties.

RAINFALL

- Rainfall totaled a massive 57.35" from April 2016 – March 2017.
- This doubles county averages from the last 5-10 years.
- This volume of rain was also notably higher than the 31.49" average for the county from 1961-1990.

SEWAGE SPILL NOTES:

- There were 64 reported sewage spills totaling about 2.7 million gallons.
- Almost the whole volume that was spilled reached a surface waterbody.
- These spills caused 50 individual health warnings.
- Sonoma ranks 3rd in terms of number of reported sewage spills among the coastal counties over the last year.
- For a remarkable comparison, there were only five reported spills from 2015-16 in Sonoma County, with approximately 200,000 gallons reaching a surface waterbody.

REFERENCES: A complete list of grades for the county's beach monitoring locations can be found in Appendix B1. Samples were collected throughout the year along open coastal and bay beaches.

FOR ADDITIONAL WATER QUALITY INFORMATION:
Sonoma County's Department of Environmental Health
www.sonoma-county.org/health/services/ocean.asp

Sonoma County Grades												
	2016-2017						5-Year Avg. (2011-2016)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A	7	100%	n/a		6	86%	7	100%	n/a		5	100%
B	0	0%	n/a		1	14%	0	0%	n/a		0	0%
C	0	0%	n/a		0	0%	0	0%	n/a		0	0%
D	0	0%	n/a		0	0%	0	0%	n/a		0	0%
F	0	0%	n/a		0	0%	0	0%	n/a		0	0%
Total	7				7		7				5	

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

Sewage Spills Summary			
64 SEWAGE SPILLS were reported to have reached a waterbody in Sonoma County	21 Major Spills (10,000+ gallons)	2,657,671 GALLONS OF SEWAGE Total Volume reported to have reached waterbody in Sonoma County	50 health warnings
	29 Minor Spills (1-10,000 gallons)		0 beach closures
	14 Small Spills (<1,000 gallons)		



Mendocino County

SUMMARY

- Summer dry weather grades were perfect with all six of the sites sampled earning A grades.
- Wet weather grades were based on about 6 wet weather samples per location, only one site earned less than an A grade which was Caspar Beach at Caspar Creek.

NOTES

- Mendocino County only samples during the summer (AB411 season).
- These summer dry and wet weather grades mark an improvement over the five-year average.
- The county received an incredibly large amount of rain from April 2016 – March 2017, totaling 60.24 inches.

SEWAGE SPILL NOTES:

- There was one reported sewage spill in Mendocino County, totaling about 258 gallons.
- Only 50 of those gallons reached a surface waterbody, resulting in no health warnings.
- Very similarly, there was also only one reported sewage spill in 2015-16, of which approximately 200 gallons reaching a surface waterbody.

REFERENCES: A complete list of grades for the county's beach monitoring locations can be found in Appendix B1. Samples were collected throughout the year along open coastal and bay beaches.

MONITORING AGENCIES: 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).

FOR ADDITIONAL WATER QUALITY INFORMATION:
www.co.mendocino.ca.us/hhsa/chs/eh/index.htm

Mendocino County Grades

	2016-2017						5-Year Avg. (2011-2016)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A	6	100%	n/a		5	83%	5	100%	n/a		5	71%
B	0	0%	n/a		0	0%	0	4%	n/a		0	0%
C	0	0%	n/a		1	17%	0	4%	n/a		2	29%
D	0	0%	n/a		0	0%	0	0%	n/a		0	0%
F	0	0%	n/a		0	0%	0	0%	n/a		0	0%
Total	6				6		5				7	

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

Sewage Spills Summary

1 SEWAGE SPILL were reported to have reached a waterbody in Mendocino County	0 Major Spills (10,000+ gallons)	50 GALLONS OF SEWAGE Total Volume reported to have reached waterbody in Mendocino County	0 health warnings
	0 Minor Spills (1-10,000 gallons)		0 beach closures
	1 Small Spill (<1,000 gallons)		



Fort Bragg @ Pudding Creek

Humboldt & Del Norte Counties

HUMBOLDT COUNTY SUMMARY

- Summer dry weather grades were mixed with three of five sites receiving A grades, while two sites netted D and F grades, earning them each a spot on the “Beach Bummer” list.
 - Clam Beach moved up to the #1 spot on the “Beach Bummer” list this year.
 - Luffenholtz Beach also earned a “bummer” title, ranking in at the #8 spot.
- Summer wet weather grades also varied by location, with 60% of sites (three locations) earning A or B grades.

NOTES:

- Humboldt County only samples during the summer (AB411 season).
- This is Clam Beach’s fourth year on the “Beach Bummer” list.
- The county saw a large amount of rain from April 2016 – March 2017, totaling 58.46 inches.

SEWAGE SPILL NOTES:

- There were 15 reported sewage spills totaling about 110,000 gallons in Humboldt County. Almost the entire volume that was spilled reached a surface waterbody.
- These spills resulted in one health warning.
- For comparison, there were eight reported spills in 2015-16, with only approximately 3,000 gallons reaching a surface waterbody.

DEL NORTE COUNTY SUMMARY

- There is only one beach regularly monitored in Del Norte County: Battery Point Lighthouse in Crescent City.
- Consistent with years past, this site received A grades for both dry and wet weather.
- Del Norte County received the most rain from April 2016 – March 2017 of all California coastal counties, totaling 86.55 inches.

SEWAGE SPILL NOTES:

- There was only one reported sewage spill in Del Norte County, totaling 2,700 gallons. That full volume of sewage reached a surface waterbody, but resulted in no health warnings.
- Very similarly, there was also only one reported spill from 2015-16.

REFERENCES: A complete list of grades for the county’s beach monitoring locations can be found in Appendix B1. Samples were collected throughout the year along open coastal and bay beaches.

FOR ADDITIONAL WATER QUALITY INFORMATION:
Humboldt County’s Department of Health & Human Services
www.co.humboldt.ca.us/health/envhealth/beachinfo

County of Del Norte Environmental Health Division
www.co.del-norte.ca.us/departments/community-development-department/environmental-health-division

Humboldt County Grades												
	2016-2017						5-Year Avg. (2011-2016)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A	3	60%	n/a		2	40%	3	60%	n/a		2	30%
B	0	0%	n/a		1	20%	1	16%	n/a		1	20%
C	0	0%	n/a		1	20%	1	12%	n/a		0	0%
D	1	20%	n/a		0	0%	0	0%	n/a		2	30%
F	1	20%	n/a		1	20%	0	0%	n/a		1	20%
Total	5				5		5				5	

Del Norte County Grades												
	2016-2017						5-Year Avg. (2011-2016)					
	Summer Dry*		Winter Dry		Wet Weather		Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%	#	%	#	%	#	%
A	1	100%	n/a		1	100%	1	100%	1	100%	1	100%
B	0	0%	n/a		0	0%	0	0%	0	0%	0	0%
C	0	0%	n/a		0	0%	0	0%	0	0%	0	0%
D	0	0%	n/a		0	0%	0	0%	0	0%	0	0%
F	0	0%	n/a		0	0%	0	0%	0	0%	0	0%
Total	1				1		1		1		1	

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

Sewage Spills Summary			
15 SEWAGE SPILLS were reported to have reached a waterbody in Humboldt County	1 Major Spill (10,000+ gallons) 7 Minor Spills (1-10,000 gallons) 7 Small Spills (<1,000 gallons)	106,651 GALLONS OF SEWAGE Total Volume reported to have reached waterbody in HUMBOLDT COUNTY	1 health warning 1 beach closure
1 SEWAGE SPILL were reported to have reached a waterbody in Del Norte County	0 Major Spills (10,000+ gallons) 1 Minor Spill (1-10,000 gallons) 0 Small Spills (<1,000 gallons)	2,700 GALLONS OF SEWAGE Total Volume reported to have reached waterbody in DEL NORTE COUNTY	0 health warnings 0 beach closures

Beach Bumpers			
	Summer Dry	Winter Dry	Wet Weather
Luffenholz Beach	D	n/a	C
Clam Beach County Park	F	n/a	F

IV. PACIFIC NORTHWEST COUNTY SUMMARIES



Oregon

Oregon's Department of Human Services and the Department of Environmental Quality collectively monitored select beach locations throughout the state from Memorial Day through Labor Day. 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 26.

For a second year, the Oregon Beach Monitoring Program (OBMP) was unable to maintain a weekly sampling frequency 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 (monitored beaches must be sampled at least weekly to receive a grade).

If funding constraints for the OBMP continue or worsen in 2018, we encourage these public agencies to refine their monitoring program, consider consolidating their culture-based sampling to the highest use beaches and to increase the sampling frequency of those locations to weekly testing.

FOR ADDITIONAL WATER QUALITY INFORMATION:
Oregon Health Authority <http://public.health.oregon.gov/HealthyEnvironments/Recreation/BeachWaterQuality/Pages/index.aspx>

Washington

Washington's BEACH program is a state-administered and locally implemented program. Like Oregon, Washington monitors only *Enterococcus* bacteria, which differs from California's three indicator bacteria monitoring protocol. Approximately 80% of the program has historically been 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 Makah Tribe also contributes beach monitoring to the state program through separate BEACH Program Tribal funding. 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.

SUMMARY:

- There were 166 individual sample locations regularly monitored from Memorial Day 2016 through Labor Day 2016.
- Water quality during summer dry weather was excellent with 94% of sites earning A grades.
- Compared with 12 sites in 2015, only 6 sites earned C to F grades in the summer 2016 season.
- The poor grades were comprised of three C's and three F's split between Clallam, Island, King and Snohomish Counties.
- Water quality during wet weather improved in Washington last year with 93% of sites earning A or B grades.
- This is a large improvement from last year where 71% of locations received A and B grades during summer wet weather.

REFERENCES: Wet weather grades in Washington are based on a significant rainfall event of 0.2 inches or more and the 72 hours following the rain event. Washington's grading methodology can be found in Appendix D on page 72. A complete list of grades for Washington State's beach monitoring locations can be found in Appendix B2.

MONITORING AGENCIES: 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>

TABLE 4-2: WASHINGTON STATE GRADES BY COUNTY AND NO. OF LOCATIONS

Clallum County						
	Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%
A	21	91%	15	100%	21	91%
B	1	4%	0	0%	1	4%
C	1	4%	0	0%	1	4%
D	0	0%	0	0%	0	0%
F	0	0%	0	0%	0	0%
Total	23		15		23	

King County						
	Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%
A	26	90%	n/a		23	79%
B	2	7%	n/a		4	14%
C	0	0%	n/a		1	3%
D	0	0%	n/a		1	3%
F	1	3%	n/a		0	0%
Total	29				29	

Skagit County						
	Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%
A	4	100%	n/a		3	75%
B	0	0%	n/a		0	0%
C	0	0%	n/a		0	0%
D	0	0%	n/a		1	25%
F	0	0%	n/a		0	0%
Total	4				0	

Gray's Harbor County						
	Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%
A	9	100%	n/a		9	100%
B	0	0%	n/a		0	0%
C	0	0%	n/a		0	0%
D	0	0%	n/a		0	0%
F	0	0%	n/a		0	0%
Total	9				9	

Kitsap County						
	Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%
A	35	97%	n/a		35	97%
B	1	3%	n/a		1	3%
C	0	0%	n/a		0	0%
D	0	0%	n/a		0	0%
F	0	0%	n/a		0	0%
Total	36				36	

Snohomish County						
	Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%
A	14	93%	n/a		10	67%
B	0	0%	n/a		2	13%
C	1	7%	n/a		2	13%
D	0	0%	n/a		0	0%
F	0	0%	n/a		1	7%
Total	15				15	

Island County						
	Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%
A	3	50%	n/a		4	67%
B	0	0%	n/a		0	0%
C	1	17%	n/a		0	0%
D	0	0%	n/a		0	0%
F	2	33%	n/a		2	33%
Total	6				6	

Mason County						
	Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%
A	9	100%	n/a		4	100%
B	0	0%	n/a		0	0%
C	0	0%	n/a		0	0%
D	0	0%	n/a		0	0%
F	0	0%	n/a		0	0%
Total	9				4	

Thurston County						
	Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%
A	3	100%	n/a		3	100%
B	0	0%	n/a		0	0%
C	0	0%	n/a		0	0%
D	0	0%	n/a		0	0%
F	0	0%	n/a		0	0%
Total	3				3	

Jefferson County						
	Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%
A	3	100%	n/a		3	100%
B	0	0%	n/a		0	0%
C	0	0%	n/a		0	0%
D	0	0%	n/a		0	0%
F	0	0%	n/a		0	0%
Total	3				3	

Pierce County						
	Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%
A	23	100%	n/a		17	89%
B	0	0%	n/a		1	5%
C	0	0%	n/a		1	5%
D	0	0%	n/a		0	0%
F	0	0%	n/a		0	0%
Total	23				0	

Whatcom County						
	Summer Dry*		Winter Dry		Wet Weather	
	#	%	#	%	#	%
A	6	100%	n/a		5	83%
B	0	0%	n/a		0	0%
C	0	0%	n/a		0	0%
D	0	0%	n/a		0	0%
F	0	0%	n/a		1	17%
Total	6				6	

A photograph of a man from behind, sitting on a surfboard. He has a large, colorful tattoo on his upper back. He is looking out at the ocean, where waves are breaking. The scene is set on a sandy beach.

| APPENDICES |

Beach Bummers

Grades by County - California

Grades by County - Pacific Northwest

Frequently Asked Questions

Methodology

Index/Bills

Acknowledgements

BEACH BUMMERS TOP TEN HISTORY: 2010-2017 ● First appearance

2017	2016	▼	2015	2014
Clam Beach County Park HUMBOLDT COUNTY	Cowell Beach SANTA CRUZ COUNTY		Cowell Beach SANTA CRUZ COUNTY	Cowell Beach SANTA CRUZ COUNTY
San Clemente Pier ● ORANGE COUNTY	Clam Beach County Park HUMBOLDT COUNTY		Mother's Beach, MDR LOS ANGELES COUNTY	Marina Lagoon (2 locations) 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
Marina Lagoon, Lakeshore Park SAN MATEO COUNTY	Monarch Beach (North) ORANGE COUNTY		Marina Lagoon (2 locations) SAN MATEO COUNTY	Cabrillo Beach, harborside LOS ANGELES COUNTY
La Jolla Cove ● SAN DIEGO COUNTY	Santa Monica Pier LOS ANGELES COUNTY		Mission Bay SAN DIEGO COUNTY	Stillwater Cove MONTEREY COUNTY
Santa Monica Pier LOS ANGELES COUNTY	Mother's Beach, MDR LOS ANGELES COUNTY		Santa Monica Pier LOS ANGELES COUNTY	Clam Beach County Park HUMBOLDT COUNTY
Capitola Beach SANTA CRUZ COUNTY	Redondo Beach Pier LOS ANGELES COUNTY		Candlestick Point SAN FRANCISCO COUNTY	Santa Monica Pier LOS ANGELES COUNTY
Luffenholz Beach ● HUMBOLDT COUNTY	Candlestick Point SAN FRANCISCO COUNTY		Stillwater Cove MONTEREY COUNTY	Pillar Point Harbor SAN MATEO COUNTY
Mother's Beach, MDR LOS ANGELES COUNTY	Pillar Point Harbor SAN MATEO COUNTY		Cabrillo Beach, harborside LOS ANGELES COUNTY	Capitola Beach SANTA CRUZ COUNTY
Monarch Beach, Dana Point ORANGE COUNTY	Pismo Beach Pier SAN LUIS OBISPO COUNTY		Huntington Beach (Brookhurst) ORANGE COUNTY	Windsurfer Circle SAN FRANCISCO COUNTY
2013	2012		2011	2010
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	Cowell Beach SANTA CRUZ COUNTY		Avalon, Catalina Island LOS ANGELES COUNTY	Cowell Beach SANTA CRUZ COUNTY
Poche Beach ORANGE COUNTY	Marie Canyon, Malibu LOS ANGELES COUNTY		Cabrillo Beach, harborside LOS ANGELES COUNTY	Cabrillo Beach, harborside LOS ANGELES COUNTY
Cabrillo Beach, harborside LOS ANGELES COUNTY	Surfrider Beach, Malibu LOS ANGELES COUNTY		Topanga State Beach LOS ANGELES COUNTY	Poche Beach ORANGE COUNTY
Malibu Pier LOS ANGELES COUNTY	Solstice Canyon, Malibu LOS ANGELES COUNTY		Poche Beach ORANGE COUNTY	Santa Monica Pier LOS ANGELES COUNTY
Marina Lagoon (2 locations) SAN MATEO COUNTY	Cabrillo Beach, harborside LOS ANGELES COUNTY		Doheny State Beach ORANGE COUNTY	Colorado Lagoon, Long Beach LOS ANGELES COUNTY
Doheny State Beach ORANGE COUNTY	Doheny State Beach ORANGE COUNTY		Arroyo Burro (Hendry's Beach) SANTA BARBARA COUNTY	Baker Beach SAN FRANCISCO COUNTY
Redondo Beach Pier LOS ANGELES COUNTY	Poche Beach ORANGE COUNTY		Baker Beach SAN FRANCISCO COUNTY	Capitola Beach SANTA CRUZ COUNTY
Windsurfer Circle SAN FRANCISCO COUNTY	Escondido State Beach, Malibu LOS ANGELES COUNTY		Colorado Lagoon, Long Beach LOS ANGELES COUNTY	Mission Bay SAN DIEGO COUNTY
Tijuana River Mouth SAN DIEGO COUNTY	Topanga State Beach Malibu LOS ANGELES COUNTY		Capitola Beach SANTA CRUZ COUNTY	Will Rogers State Beach LOS ANGELES COUNTY



PLEASE NOTE: ▼ Starting in 2015, the SWRCB required all coastal counties receiving state funds to monitor their beaches at point zero – where the discharge meets the ocean. Prior to monitoring year 2015-16, only Los Angeles County (and portions of Orange, San Diego, and Humboldt Counties) sampled directly at the outfall, which gives the most accurate picture of water quality.

San Diego County		Summer Dry (Apr-Oct)	Winter Dry (Nov-Mar)	Wet Weather Year-Round
Oceanside	San Luis Rey River outlet	A	A	D
	projection of Tyson Street	A+	A+	B
	projection of Forster Street	A+	A+	B
	500' north of Loma Alta Creek outlet	A+	A+	B
	projection of Cassidy Street	A+	A+	C
	St. Malo Beach (downcoast from St. Malo Road)	A+	A+	C
Carlsbad	projection of Tamarack Avenue	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+
Encinitas	Moonlight Beach (Cottonwood Creek outlet)	A	A	D
	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 of Liverpool Drive	A+	A+	B
Cardiff State Beach	San Elijo Lagoon outlet	A+	A+	A+
	Charthouse parking, slightly south of Kilkeny	A+	A+	A
	Las Olas, 100 yds. south of Chighthouse	A+	A+	A+
	Seaside State Park	A+	A	A+
Solana Beach	Tide Beach Park, projection of Solana Vista Drive	A+	A	A+
	Fletcher Cove, projection of Lomas Santa Fe Drive	A+	A+	A+
	Seascape Surf Beach Park	A+		
Del Mar	San Dieguito River Beach	A	A	A+
	projection of 15th Street	A+		A+
Torrey Pines	Los Penasquitos Lagoon outlet	A	A+	A+
La Jolla Shores	El Paseo Grande, near Scripps	A		
	projection of Ave De La Playa	A		A+
La Jolla	La Jolla Cove	D		D
	South Casa Beach	A		A+
	Ravina, south of Nicholson Point	A+		A+
Windansea Beach	projection of Playa Del Norte	A		A+
Pacific Beach	Pacific Beach Point, downcoast of Linda Way	A		A+
	Tourmaline Surf Park, projection of Tourmaline Street	A		A+
	projection of Grand Avenue	A+		
Mission Beach	Belmont Park	A+	A+	A

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

Orange County

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

ORANGE COUNTY (CONTINUED)		Summer Dry (Apr-Oct)	Winter Dry (Nov-Mar)	Wet Weather Year-Round
Newport Bay (continued)	Onyx Avenue Beach	A+	B	F
	Ruby Avenue Beach	A+	A	D
	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
	Alvarado / Bay Isle Beach	A	A	F
	N Street Beach	A+	A+	A
	Harbor Patrol Beach at Bayside Drive	B	A	D
	Rocky Point Beach	A	A+	B
Corona Del Mar	Corona Del Mar Beach	A	A	C
	Little Corona Beach	A+	A	A
Crystal Cove	Pelican Point Beach	A+	A+	A+
	Crystal Cove	A+	A+	A+
	Crystal Cove (weekly)	A	A+	A+
	Muddy Creek Beach	A+	A+	A
	El Moro Beach	A+	A+	A
Laguna Beach	Emerald Bay Beach	A+	A+	D
	Diver's Cove	A+	A+	B
	Crescent Bay Beach	A+	A+	A
	Laguna Main Beach	A	B	F
	Laguna Hotel	A+	A	D
	Cleo Street	A	A	F
	projection of Bluebird Canyon	A	B	B
	between Pearl and Agate Street	A	A+	B
	Victoria Beach	A	A+	A+
	Blue Lagoon		A	A
	Goff Island Beach	A+	A+	A
	Treasure Island Beach	A+	A+	A+
	North Aliso County Beach	A+	A+	A+
	Aliso Creek - Ocean Interface	A+	A	F
	Aliso Creek - outlet	A	A	C
	Aliso Creek - 1000' south	A+	A	A
	Camel Point	A+	A+	A+
	West Street	A+	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+

ORANGE COUNTY (CONTINUED)		Summer Dry (Apr-Oct)	Winter Dry (Nov-Mar)	Wet Weather Year-Round
Dana Point	Monarch Beach North	D	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	F
	Doheny State Beach, Mid-Beach, north of San Juan Creek	A	B	F
	Doheny State Beach, San Juan Creek Ocean Interface	A	F	F
	Doheny State Beach, San Juan Creek Interface	A+	F	F
	Doheny State Beach, 1000' so. of SERRA Outfall (last campground)	A	F	D
	Doheny State Beach, 2000' so. of SERRA Outfall	A	A	D
	Doheny State Beach, South Day Use Area drain	A+	A	F
	Doheny State Beach, 3000' so. of SERRA Outfall (pedestrian bridge)	A+	A	D
	Doheny State Beach, End of the park	A+	A	D
	Capistrano County Beach, 5000' so. of SERRA Outfall	A	A+	A+
	Capistrano County Beach, drain	A+	A	C
	Capistrano Bay Community Beach	A	A+	A+
	Capistrano, proj. of Camino Estrella, 7500' so. of SERRA Outfall	A+	A+	A+
	So. Capistrano Bay Comm. Beach, 10000' so. of SERRA Outfall	A+	A+	A+
San Clemente	Poche Beach	A+	A+	A+
	Poche Creek ocean interface	A	A	F
	Capistrano Shores north	A+		F
	Pico drain at North Beach	A		D
	North beach at Avenida Pico (20000' south of Outfall)	A+		B
	Mariposa Beach	A+		F
	Linda Lane Beach	A+		C
	San Clemente Pier, Lifeguard Building north	A+	A+	B
	San Clemente Pier, drain	F	F	C
	Trafalgar Canyon	A	A	F
	Boca del Canon Beach	A+		A
	Riviera Beach	A+		A+
	at Avenida Calafia	A+	A	A
	at Avenida Las Palmeras	A+		A
Dana Point Harbor	Baby Beach - West End	A	A	B
	Baby Beach - Buoy Line	A	A+	C
	Baby Beach - Swim Area	B	A	C
	Baby Beach - East End	A+	A+	C
	Guest Dock	A+	A+	B
	Youth Dock	A+	A+	A

Los Angeles County

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

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

LOS ANGELES COUNTY (CONTINUED)		Summer Dry (Apr-Oct)	Winter Dry (Nov-Mar)	Wet Weather Year-Round
Long Beach (continued)	Mother's Beach, north end	A	B	F
	Alamitos Bay, 56th Place on bayside	A+	A	F
	projection of 55th Place	A	A	F
	projection of 72nd Place	A+	F	F
Catalina Island	Avalon Beach, east of the Casino Arch, at the steps	A		A
	Avalon Beach, 100 feet west of the Green Pleasure Pier	A		A+
	Avalon Beach, 50 feet west of the Green Pleasure Pier	A		A+
	Avalon Beach, 50 feet east of the Green Pleasure Pier	A		A+
	Avalon Beach, 100 feet east of the Green Pleasure Pier	A		A+
Ventura County				
Ventura	Rincon Beach, 25 yards south of the creek mouth	A+	A	B
	Rincon Beach, at end of the footpath	A+		A+
La Conchita	La Conchita Beach, Ocean View Road	A+		A+
Ventura	Oil Piers Beach, south of drain	A		A+
	Hobson County Park, base of stairs to the beach	A+		A+
	Faria County Park, stairs	A+	A	C
	Mandos Cove, point zero	A+		A+
	Solimar Beach south, end of east gate access road	A	A	B
	Emma Wood State Beach, 50 yards south of first drain	A+	A	B
	Surfer's Point at Seaside, end of access path via wooden gate	A	A+	C
	Promenade Park, Figueroa Street	A+	A+	C
	Promenade Park, Redwood Apts.	A+		A+
	Promenade Park, Holiday Inn south of drain at California Street	A		A+
	San Buenaventura Beach, south of drain at Kalorama Street	A		A+
	San Buenaventura Beach, south of drain at San Jon Road	A	A+	D
	San Buenaventura Beach, south of drain at Dover Lane	A+		A+
	San Buenaventura Beach, south of drain at Weymouth Lane	A+		A+
Ventura Harbour area	Marina Park, beach at north end of playground	A+		A+
	Peninsula Beach, beach area north of South Jetty	A		A+
	Surfer's Knoll, beach adjacent to parking lot	A	A+	A
Channel Islands Harbor	Hollywood Beach, Los Robles Street, south of drain	A	A+	A
	Hobie Beach Lakshore Drive	A+		C
	Beach Park at south end of Victoria Avenue	A	D	F
	Silverstrand Beach, San Nicholas Avenue, south of jetty	A	A	A
	Silverstrand Beach, Santa Paula Drive, south of drain	A+	A+	A
	Silverstrand Beach, Sawtelle Avenue, south of drain	A+	A+	A+
Port Hueneme	Beach Park, 50 yards north of the Pier	A	A	C

VENTURA COUNTY (CONTINUED)		Summer Dry (Apr-Oct)	Winter Dry (Nov-Mar)	Wet Weather Year-Round
Oxnard	Ormond Beach, J Street drain	A+	A+	F
	Ormond Beach, Oxnard Industrial drain 50 yards north of the drain	A+		A+
	Ormond Beach, Arnold Road	A+	A+	B
County Line Beach point zero		A+		A+

Santa Barbara County

Lompoc	Jalama Beach		A	B
Goleta	Gaviota State Beach		A	A
	Refugio State Beach		A	F
	El Capitan State Beach		A	F
Isla Vista	Sands at Coal Oil Point		A+	B
Goleta	Goleta Beach		A	F
Hope Ranch	Hope Ranch Beach		A+	F
Santa Barbara	Arroyo Burro Beach		F	F
	Leadbetter Beach		A	F
Santa Barbara (continued)	East Beach at Mission Creek		A	F
	East Beach at Sycamore Creek		A+	F
Montecito	Butterfly Beach		A	C
	Hammond's Beach		A	D
Summerland	Summerland Beach		A+	D
Carpinteria	Carpinteria State Beach		A+	D

San Luis Obispo County

San Simeon	Hearst Memorial State Beach, 100 yards west of pier at creek outfall		A+	A
	Pico Avenue	A+	A+	A+
Cayucos State Beach	North of pier at outfall		A+	A
	downcoast of the pier	A	A	B
	Studio Drive, parking lot near Old Creek	A+	A+	B
Morro Strand State Beach	projection of Beachcomber Drive	A+	A+	B
Morro Bay City Beach	projection of Atascadero	A	A+	B
	Morro Creek, south side	A	A+	B
	75 feet north of main parking lot	A+	A+	A+
Avila Beach	Olde Port Beach, Harford Beach, north	A	A	F
	350 yards west of pier at creek outfall		A+	F
	projection of San Luis Street	A	A+	B
Pismo Beach	Sewers at Silver Shoals Drive	A	A	A
	projection of Wadsworth Street	A+	A+	B
	Pismo Beach Pier, 40 feet south of the pier	B	A	B

SAN LUIS OBISPO COUNTY (CONTINUED)		Summer Dry (Apr-Oct)	Winter Dry (Nov-Mar)	Wet Weather Year-Round
Pismo Beach (continued)	projection of Ocean View	A+	A+	A
	Pier Avenue, 330 yards north	A+	A+	A
	Pier Avenue	A	A+	A+
	Pier Avenue, 571 yards south, end of Strand Way	A+	A+	A
Monterey County				
Monterey Bay	Monterey State Beach	A		A+
	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	Carmel City Beach, projection of Ocean Avenue, west end	A+		A+
Santa Cruz County				
Santa Cruz	Natural Bridges State Beach	A+	A+	B
	Cowell Beach, at the Stairs	A+	A+	B
	Cowell Beach, Lifeguard Tower 1	A	A	B
	Cowell Beach, west of the wharf	F	A	F
	Santa Cruz Main Beach at the Boardwalk	A	A	C
	Santa Cruz Main Beach at the San Lorenzo River	A	A	C
	Seabright Beach	A+	A+	A
	Twin Lakes Beach	A	A+	B
Capitola	west of jetty	D	F	F
	east of jetty	A	A	F
	New Brighton Beach	A	A+	C
Aptos	Seacliff State Beach	A+	A+	B
	Rio Del Mar Beach	A	A+	C
San Mateo County				
Pacifica	Sharp Park Beach, projection of San Jose Avenue	A+		A+
	Sharp Park Beach, projection of Birch Lane	A+		A
	Rockaway Beach at Calera Creek	A	A+	A
	Linda Mar Beach at San Pedro Creek	C	A	F
Montara State Beach	at Martini Creek	A	A	F

SAN MATEO COUNTY (CONTINUED)		Summer Dry (Apr-Oct)	Winter Dry (Nov-Mar)	Wet Weather Year-Round
Fitzgerald Marine Reserve	at San Vicente Creek	A	B	F
Pillar Point	#8 Mavericks Beach Westpoint Avenue	A	A	F
	Harbor end of Westpoint Avenue (# 7)	B	C	F
Half Moon Bay	Surfer's Beach, south end of riprap	A	A	C
	Roosevelt Beach, south end of parking lot	A	A	D
	Dunes Beach	A	A	C
	Venice Beach at Frenchman's Creek	A	B	D
	Francis Beach at the foot of the steps	A	A	A
Pomponio State Beach	at Pomponio Creek	A+	A+	D
Pescadero	Pescadero State Beach at Pescadero Creek	A	A+	C
	Bean Hollow State Beach	A	A	A
	Gazos Beach at Gazos Creek	A	A	A+
San Mateo	Oyster Point	A	A	D
	Coyote Point	A+	A+	D
	Marina Lagoon, Parkside Aquatic Park	B	B	F
	Marina Lagoon, Lakeshore Park - behind Rec Center	F	B	F
	Kiteboard Beach		A	F

East Bay - Alameda / Contra Costa Counties

Richmond	Keller Beach, North Beach	C		D
	Keller Beach, South Beach	C		D
Alameda	Crown Beach, Crab Cove	B		F
	Crown Beach, Bath House	A		C
	Crown Beach, Windsurfer Corner	A		B
	Crown Beach, at Sunset Road	A		B
	Crown Beach, at 2001 Shoreline Drive	B		C
	Crown Beach, at Bird Sanctuary	B		F

San Francisco County

Aquatic Park District	Aquatic Park Beach, Hyde Street Pier, projection of Larkin Street	A+	A+	B
	Aquatic Park Beach, 211 Station	A	A	B
Presidio	Crissy Field Beach, East 202.4 Station	A	A	C
	Crissy Field Beach, West 202.5 station	A+	A	A
	Baker Beach, East Ocean #15 East	A+	A+	A
	Baker Beach, at Lobos Creek	B	F	A
	Baker Beach, West Ocean #16	A+	A+	A

SAN FRANCISCO COUNTY (CONTINUED)		Summer Dry (Apr-Oct)	Winter Dry (Nov-Mar)	Wet Weather Year-Round
Seacliff	China Beach, end of Sea Cliff Avenue	A	A+	A
Sunset District	Ocean Beach, projection of Balboa Avenue	A+	A+	B
	Ocean Beach, projection of Lincoln Way	A+	A+	D
	Ocean Beach, projection of Sloat Boulevard	A	A+	A
Islais Channel	Islais Landing	A	A+	F
Candlestick Point	Jackrabbit Beach	A	F	D
	Windsurfer Circle	B	F	F
	Sunnydale Cove	A	D	F

Marin County

Tomaes 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
	Millerton Point	A		A+
Bollinas Bay	Bollinas Beach, Wharf Road	A		A+
	Stinson Beach, North	A		D
	Stinson Beach, Central	A		D
	Stinson Beach, South	A+		D
Muir Beach	North	A		D
	Central	A+		F
	South	A		D
Rodeo Cove	Rodeo Beach, North	A+		A+
	Rodeo Beach, Central	A+		A+
	Rodeo Beach, South	A+		A+
Fort Baker	Horseshoe Bay SW	A		A
	Horseshoe Bay NW	A		A+
	Horseshoe Bay NE	A		B
Sausalito	Schoonmaker Beach	A		B
San Rafael	China Camp	A		A+
	McNears Beach	A		A+

Sonoma County

		Summer Dry (Apr-Oct)	Winter Dry (Nov-Mar)	Wet Weather Year-Round
Gualala	Gualala Regional Park Beach	A+		A+
Sea Ranch	Black Point Beach	A+		A+
Jenner	Stillwater Cove Regional Park Beach	A+		A+
	Goat Rock State Park Beach	A+		A+
Bodega Bay	Salmon Creek State Park Beach	A		A+
	Campbell Cove State Park Beach	A		B
	Doran Regional Park Beach	A		A

Mendocino County

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

Humboldt / Del Norte Counties

Crescent City	Battery Point Lighthouse	A+		A+
Trinidad	Trinidad State Beach near Mill Creek	A		A
	Luffenholtz Beach near Luffenholtz Creek	D		C
	Moonstone County Park, Little River State Beach	A		B
McKinleyville	Clam Beach County Park near Strawberry Creek	F		F
	Mad River Mouth, north	A		A

Clallam County

		Summer Dry (Apr-Oct)	Winter Dry (Nov-Mar)	Wet Weather Year-Round
Neah Bay	Third Beach - east	A+	A+	A+
	Third Beach - mid	A+	A+	A+
	Third Beach - west	A+	A+	A
	Front Street Beach East at Kal Chate St.	A+	A+	A+
	Front Street Beach East at Pine Street	A	A+	A
	Front Street Beach East - mid	A+	A+	A+
	Dakwas Park Beach - west	A+	A+	A
	Dakwas Park Beach - mid	A+	A+	A+
	Dakwas Park Beach - east	A	A+	A
Makah Bay	Hobuck Beach - north	A+	A+	A+
	Hobuck Beach - south	A+	A+	A+
	Sooes Beach - north	A	A+	A
	Sooes Beach - mid	A+	A+	A+
	Sooes Beach - south	A+	A+	A+
Juan de Fuca Strait/ Port Angeles	Salt Creek Recreation Area - north	A	A+	A+
	Salt Creek Recreation Area - south	A+	A+	A+
	Cline Spit County Park - north	B	A+	A+
	Cline Spit County Park - mid	C	A+	A+
	Cline Spit County Park - south	A	A+	A+
	Hollywood Beach - west	A+	A+	A+
	Hollywood Beach - mid	A	A+	A+
	Hollywood Beach - east	A+	A+	A+
	Hollywood Beach - mid south	A+	A+	A+

Grays Harbor

Westport	The Groins - east	A+		A+
	The Groins - mid	A		A+
	The Groins - west	A		A+
	Half Moon Bay - north	A		A+
	Half Moon Bay - mid	A		A+
	Half Moon Bay - south	A		A+
	Westhaven State Park, South Jetty - north	A+		A+
	Westhaven State Park, South Jetty - mid	A+		A+
	Westhaven State Park, South Jetty - south	A+		A+

		Summer Dry (Apr-Oct)	Winter Dry (Nov-Mar)	Wet Weather Year-Round
Island County				
Whidbey Island	Oak Harbor Lagoon - mid	A		A+
	Oak Harbor Lagoon - north west	A		A+
	Oak Harbor Lagoon - south east	A		A+
	Freeland County Park, Holmes Harbor - west	C		A+
	Freeland County Park, Holmes Harbor - mid	F		F
	Freeland County Park, Holmes Harbor - east	F		F
Jefferson County				
Port Townsend	Fort Worden State Park - north	A		A+
	Fort Worden State Park - mid	A+		A+
	Fort Worden State Park - south	A+		A+
King County				
Shoreline	Richmond Beach, Saltwater Park - north	A+		A+
	Richmond Beach, Saltwater Park - mid	A+		A+
	Richmond Beach, Saltwater Park - south	A		A+
Seattle	Carkeek Park - north	A+		A+
	Carkeek Park - mid	A+		A+
	Carkeek Park - south	A+		A+
	Golden Gardens - north	A		A+
	Golden Gardens - mid	A		B
	Golden Gardens - south	F		B
	Alki Beach Park - north	A+		A+
	Alki Beach Park - mid	A+		A+
	Alki Beach Park - south	A+		B
	Richey Viewpoint - north	A+		A+
	Richey Viewpoint - mid	A		A
	Richey Viewpoint - south	B		A+
	Lincoln Park - north	A+		B
	Lincoln Park - mid	A+		A+
	Lincoln Park - south	A		C
Burien	Seahurst (Ed Munro) Park - north	A		A+
	Seahurst (Ed Munro) Park - mid	A+		A+
	Seahurst (Ed Munro) Park - south	A+		A+
Des Moines	Saltwater State Park - north	A		A+
	Saltwater State Park - mid	B		D
	Saltwater State Park - south	A		A+
	Redondo County Park - north	A		A+
	Redondo County Park - mid	A		A+

KING COUNTY (CONTINUED)		Summer Dry (Apr-Oct)	Winter Dry (Nov-Mar)	Wet Weather Year-Round
Federal Way	Dash Point State Park - east	A		A+
	Dash Point State Park - west	A+		A+
	Dash Point State Park - mid	A+		A
Kitsap County				
Kingston	Arness County Park - north	A		A+
	Arness County Park - mid	A+		A+
	Arness County Park - south	A		A+
Indianola	Indianola Dock - west	A+		A+
	Indianola Dock - mid	A		A+
	Indianola Dock - east	A		B
Bainbridge Island	Fay Bainbridge State Park - north	A+		A+
	Fay Bainbridge State Park - mid	B		A+
	Fay Bainbridge State Park - south	A+		A+
	Eagle Harbor Waterfront Park - east	A		A+
	Eagle Harbor Waterfront Park - west	A+		A+
	Eagle Harbor Waterfront Park - mid	A+		A+
	Joel Pritchard Park - east	A+		A+
	Joel Pritchard Park - west	A+		A+
Silverdale	Silverdale County Park - east	A+		A+
	Silverdale County Park - mid	A+		A+
	Silverdale County Park - west	A+		A+
Port Orchard Bay	Illahee State Park - north	A+		A+
	Illahee State Park - mid	A+		A+
	Illahee State Park - south	A		A+
Bremerton	Lions Park - north	A+		A+
	Lions Park - mid	A+		A+
	Lions Park - south	A+		A+
	Evergreen Park - north	A+		A+
	Evergreen Park - mid	A+		A+
	Evergreen Park - south	A+		A+
Port Orchard	Pomeroy Park - Manchester Beach - north	A		A+
	Pomeroy Park - Manchester Beach - mid	A		A+
	Pomeroy Park - Manchester Beach - south	A+		A+
Hood Canal	Scenic Beach State Park - west	A+		A+
	Scenic Beach State Park - mid	A+		A+
	Scenic Beach State Park - east	A+		A+
Hansville	Point No Point Lighthouse Park - north	A+		A+
	Point No Point Lighthouse Park - mid	A		A+
	Point No Point Lighthouse Park - south	A		A+

Mason County

		Summer Dry (Apr-Oct)	Winter Dry (Nov-Mar)	Wet Weather Year-Round
Hood Canal	Twanoh State Park - point	A		A+
	Twanoh State Park - west of point	A+		
	Twanoh State Park - west of dock	A+		
	Potlatch State Park - north	A+		
	Potlatch State Park - mid	A+		
	Potlatch State Park - south	A		
North Bay	Allyn Waterfront Park north	A+		A+
	Allyn Waterfront Park mid	A+		A+
	Allyn Waterfront Park south	A+		A+

Pierce County

Henderson Bay	Purdy Sandspit County Park - east	A		A+
	Purdy Sandspit County Park - mid	A		A+
	Purdy Sandspit County Park - west	A		A+
Tacoma	Dash Point County Park - west of pier	A+		A+
	Dash Point County Park - east of pier	A+		A+
	Dash Point County Park - east	A+		A+
	Owens Beach - Point Defiance Park - north	A+		A+
	Owens Beach - Point Defiance Park - mid	A+		A+
	Owens Beach - Point Defiance Park - south	A		A+
	Ruston Way north - projection of Warner St	A+		A+
	Titlow Park - north	A+		A+
	Titlow Park - mid	A		C
	Titlow Park - south	A		B
	Browns Point Lighthouse Park east	A+		A
	Browns Point Lighthouse Park	A+		A
	Browns Point Lighthouse Park south	A+		A
	Waterfront Dock/ Ruston Way - south	A+		
	Waterfront Dock/ Ruston Way - north	A+		
	Jack Hyde Park - west	A		
	Jack Hyde Park - east	A+		
Steilacoom	Sunnyside Beach Park - north	A		A+
	Sunnyside Beach Park - mid	A		A+
	Sunnyside Beach Park - south	A+		A+

Skagit County

Padilla Bay	Bayview State Park - north	A		A+
	Bayview State Park - mid	A		A+
	Bayview State Park - south	A		A+
	Bayview Boat Launch - dock	A+		D

Snohomish County

		Summer Dry (Apr-Oct)	Winter Dry (Nov-Mar)	Wet Weather Year-Round
Stanwood	Kayak Point County Park - north	A+		A+
	Kayak Point County Park - mid	A+		A+
	Kayak Point County Park - south	A+		A+
Edmonds	Picnic Point County Park - north	A+		C
	Picnic Point County Park - mid	A+		C
	Picnic Point County Park - south	A+		A+
	Edmonds Underwater Park - north	A		B
	Edmonds Underwater Park - mid	C		F
	Edmonds Underwater Park - south	A+		A+
	Marina Beach (No Dogs) - north	A+		A+
	Marina Beach (No Dogs) - mid	A+		A
	Marina Beach (No Dogs) - south	A+		B
Mukilteo	Mukilteo Lighthouse Park south	A+		A+
	Mukilteo Lighthouse Park mid	A+		A+
	Mukilteo Lighthouse Park north	A+		A+

Thurston County

Olympia	Burfoot County Park - north	A		A+
	Burfoot County Park - mid	A+		A+
	Burfoot County Park - south	A+		A+

Whatcom County

Bellingham	Larrabee State Park Wildcat Cove - mid	A+		A+
	Larrabee State Park Wildcat Cove - west	A		A+
	Larrabee State Park Wildcat Cove - south	A+		A+
	Little Squalicum Park east	A		F
	Little Squalicum Park at creek outlet	A+		A+
	Little Squalicum Park far west of pier	A		A+

About 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 rain-storm, 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 D.

*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 confirmed 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 "Analysis of Beach Types" on page 22.

Are beaches monitored year-round?

This is the Beach Report Card's fifth year of grading water quality along the entire U.S. Pacific Coastline. A total of 580 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. President Trump's proposed budget for FY 2017 '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.

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.



Beach Report Card Grading and Methodology

The Beach Report Card Grading Methodology translates complex shoreline bacteria data into a grade format that is meaningful and useable by all California beachgoers.

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 5-1 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 5-2.

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 us-

ing the rolling 30-day geometric mean values calculated for each sample day (see Table 5-3).

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 5-4).

'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 5-4.

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 5-2, 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 5-2. 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 5-6.

'Percentage of points lost' is allocated depending upon the threshold exceeded. The penalties for threshold exceedances are presented in Table 5-7. 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 5-1: GRADING SYSTEM

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

TABLE 5-2: TOTAL POINTS AVAILABLE BY COMPONENT

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

TABLE 5-3: 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 5-4: 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 5-5: 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 5-6: 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 5-7: 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

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 Criteria – 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 Threshold Values (STV) and Beach Action Values (BAV) into the beach water quality lexicon.

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 unwavering 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:



SWAIN BARBER
FOUNDATION

2016-17 Annual Beach Report Card

Report Research and Copy: Leslie Griffin, James Alamillo and Karen Vu

Data Compilation and Analysis: Leslie Griffin and Karen Vu

Copy Editors: Sarah Abramson Sikich, Rita Kampalath Karen Vu, and Nick Payne

Printed on recycled paper.



Heal the Bay

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