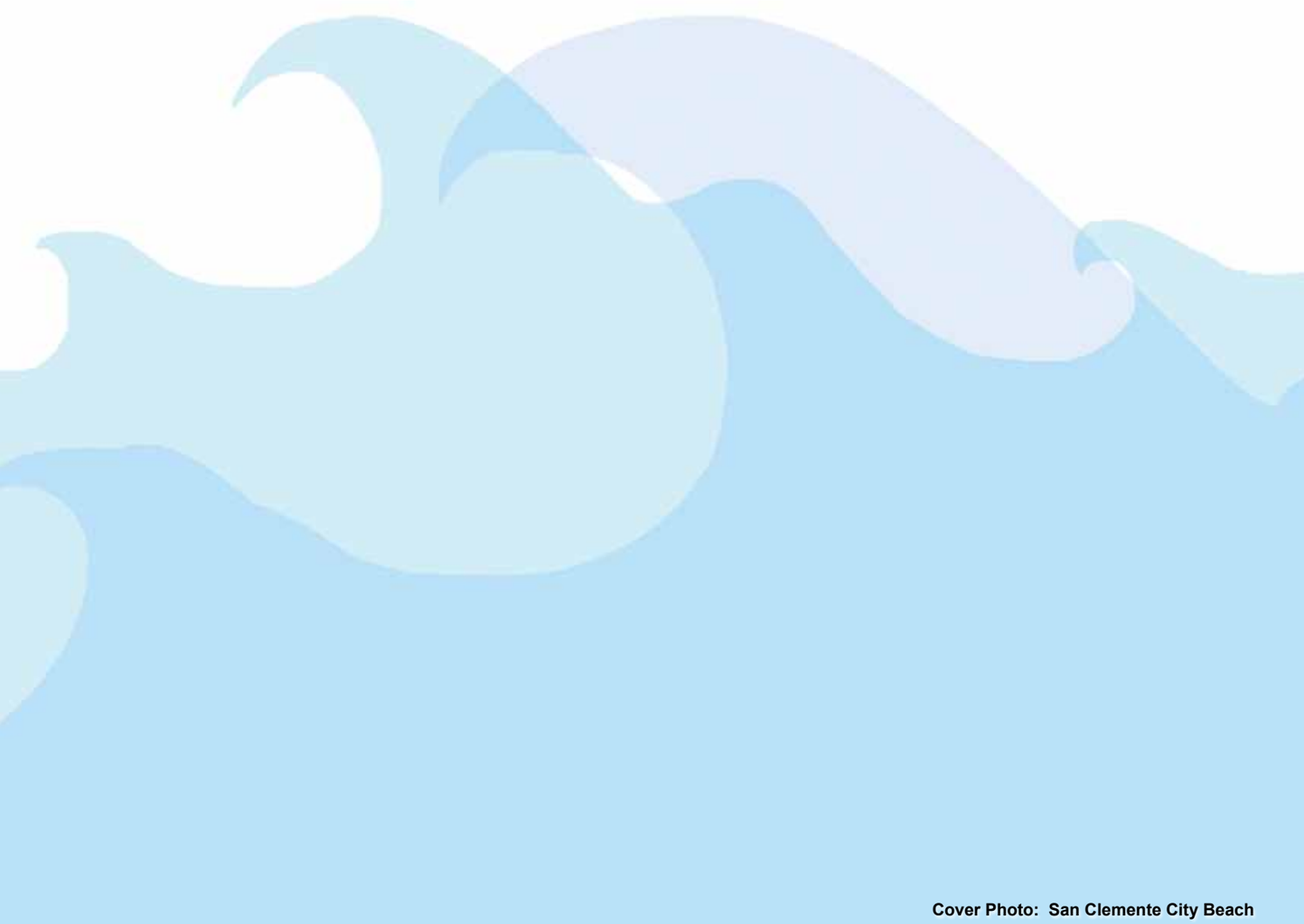
2010 Annual Ocean, Harbor & Bay Water Quality Report

September 2011

HEALTH CARE AGENCY
PUBLIC HEALTH SERVICES
ENVIRONMENTAL HEALTH



Cover Photo: San Clemente City Beach

September 2011

2010 Annual Ocean, Harbor & Bay Water Quality Report

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ACKNOWLEDGMENTS

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In addition, HCA/Environmental Health would like to give special thanks to the following organizations for their dedication, support and assistance to the Ocean Water Protection Program providing public health protection to Orange County residents and visitors: Marine Safety and Lifeguard Divisions of the cities of Seal Beach, Huntington Beach, Newport Beach, Laguna Beach and San Clemente; Monarch Beach Lifeguards; OC Sheriff Harbor Patrol; OC Lifeguards; California State Beach Park Lifeguards; County of Orange Community Resources/OC Parks; and California State Parks.

Blue Whale Migration
Dana Point

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Family Walking on Beach
Laguna Main Beach

Over 12,750 water samples were collected and approximately 38,500 tests performed.

Fire Boat Dive Team at Sunset

EXECUTIVE SUMMARY

The 2010 Annual Ocean, Harbor and Bay Water Quality Report provides an updated analysis of bacteriological water quality data for Orange County's recreational waters and includes data on sewage spills and related ocean, harbor and bay water closures. The annual report also describes year-to-year variability and trends representing the 11-year period that Assembly Bill 411 (AB411) Ocean Water-Contact Sports Standards for bacteriological water quality has been in place from 2000 – 2010. In addition, the annual report incorporates historical sewage spill and associated ocean, harbor and bay water closure information during the most recent 24-year period from 1987 – 2010.

Major findings of the 2010 Annual Ocean, Harbor and Bay Water Quality Report are:

Sewage Spills and Ocean, Harbor and Bay Water Closures

- The total number of sewage spills reported to the Ocean Water Protection Program in 2010 was the lowest number of sewage spills reported since 1998 and represents the eighth consecutive year a decrease in the total number of sewage spills has been reported.
- In December, Orange County experienced intense rainstorm events with record rainfall totals which resulted in three separate storm-related sewage spill closure events on December 22, 2010. Each ocean water closure lasted for nine days and accounted for a total of 43.2 Beach Mile Days which represents 64% of the total number of Beach Mile Days of closure for the year.
- In 2010, the total number of ocean, harbor and bay water closures due to sewage spills (17) increased over the previous year (6) and was the largest year-to-year increase in 10 years.
- Over half (52%) of the ocean, bay and harbor water closure incidents in 2010 were due to sewage spills discharging large volumes of sewage (1000 gallons or more). The percentage of large sewage spills initiating ocean, harbor and bay water closure incidents in 2010 was the highest in over a decade.

Posted Warnings Due to Bacteriological Standards Violations

- In 2010, the total number of Beach Mile Days posted due to bacteriological standards violations (87.6) was the lowest total on record for an AB411 period (April 1 – October 31) since the program was initiated in 2000. The total number of Beach Mile Days posted in Orange County has declined by 75% since 2002.
- From April 1, 2010 to October 31, 2010, a total of 4,740 ocean water samples were collected at open coastal surf zone monitoring locations along Orange County's 42-mile coastline with 97% of the samples meeting compliance with State bacteriological standards. Only 130 of the samples collected exceeded State bacteriological standards.
- During an 8-week demonstration period, a new rapid water quality monitoring method was used to improve public health protection at select Orange County beaches. The new rapid method yields results in about four hours, compared to the more than 24 hours required for currently-used methods. This technology enabled the Ocean Water Protection Program to provide beach water quality warnings and advisories within hours of when samples were collected.
- A total of 15 Rain Advisory Warnings were issued in 2010 which resulted in 98 Rain Advisory Days due to elevated levels of bacteria in local ocean, harbor and bay waters. This was the highest number of Rain Advisory Warnings issued and Rain Advisory Days reported in Orange County since the AB411 program was initiated in 2000.

Mountains and Water Tower
Sunset Beach

Ocean Water Protection Program staff responds on a 24-hour basis to investigate any reports of sewage or other potential contamination incidents …

Orange County Beaches
Monitoring Stations
LOS ALAMITOS
ANAHEIM
ORANGE
GARDEN GROVE
SEAL BEACH
WESTMINSTER
SANTA ANA
SILVERADO
Seal Beach
Huntington Harbour
Surfside
Sunset Beach
HUNTINGTON BEACH
FOUNTAIN VALLEY
FOOTHILL RANCH
TRABUCO CANYON
Bolsa Chica State Beach
IRVINE
COSTA MESA
Huntington City Beach
LAKE FOREST
Huntington State Beach
NEWPORT BEACH
Newport Bay
Newport Slough
LAGUNA HILLS
MISSION VIEJO
CORONA DEL MAR
Newport Beach
ALISO VIEJO
Crystal Cove State Park
LAGUNA BEACH
SAN JUAN CAPISTRANO
Emerald Bay
Laguna Beach
LAGUNA NIGUEL
Aliso County Beach
South Laguna Beach
Monarch Beach
DANA POINT
Dana Point Harbor
Doheny State Beach
Salt Creek County Beach
SAN CLEMENTE
Capistrano County Beach
Capistrano Bay District Beach
Poche Beach
San Clemente City Beach
San Clemente State Beach
HCA Monitoring Stations
OCSD Monitoring Stations
SOCWA Monitoring Stations
N
Miles
0
2.5
5
10

THE OCEAN WATER PROTECTION PROGRAM

As part of the County of Orange Health Care Agency (HCA), Environmental Health's Ocean Water Protection Program is responsible for protecting the public from exposure to ocean and bay waters that may be contaminated with sewage or may cause illness along Orange County's 42 miles of open ocean coastline and 70 miles of harbor and bay frontage. Ocean and bay waters used for body-contact recreational activities such as swimming, surfing and diving must meet specific bacteriological standards to be considered safe for such purposes.

In 2010, the Health Care Agency, two local sanitation agencies (Orange County Sanitation District and South Orange County Wastewater Authority) and OC Public Works cooperatively tested the coastal waters in Orange County for bacteria that indicated the possible presence of disease-causing organisms. Staff from the Ocean Water Protection Program, sanitation agencies and OC Public Works participated in the weekly collection of water samples at approximately 150 ocean, harbor and bay monitoring locations throughout coastal Orange County. Last year, over 12,750 ocean, harbor, and bay water samples were collected and approximately 38,500 analyses were performed to determine the results for three indicator bacteria used for compliance purposes (i.e., total coliform, fecal coliform and enterococcus).

The Ocean Water Protection Program staff review the bacteriological water sample results daily and issue ocean and bay water closures, postings and health advisories under the requirements stipulated by the California Health and Safety Code and Title 17 of the California Code of Regulations. When the results of testing indicate that one or more of the AB411 Ocean Water-Contact Sports Standards have been exceeded, the public is notified (i.e., signs are posted at the beach, hotline and web page are updated), and the monitoring frequency and locations may increase until the sample results meet established standards and/or the source of the problem is eliminated. In addition, the Ocean Water Protection Program staff responds on a 24-hour basis to investigate any reports of sewage or other potential contamination incidents that may affect public health at any of Orange County's ocean, harbor and bay water areas.

The Ocean Water Protection Program maintains an Ocean, Harbor and Bay Water Posting and Closure Telephone Hotline, Web Page and Twitter account which provide current information regarding Orange County beach closures, posted warnings, and advisories. The Telephone Hotline and Web Page are immediately updated and a Twitter message is sent when a change of status occurs at any ocean, harbor or bay water area in Orange County.

Ocean, Harbor and Bay Water Closure & Posting Telephone Hotline: (714) 433-6400

Ocean, Harbor and Bay Water Closure & Posting Web Page: www.ocbeachinfo.com.

Ocean, Harbor and Bay Water Closure & Posting Tweets: http://twitter.com/ocbeachinfo

Surfers
Salt Creek Beach

Ocean Water-Contact Sports Standards – Assembly Bill 411 (AB411)

In 1998, AB411 (Wayne) was chaptered into law and added Sections 115880-115915 to the California Health and Safety Code. The law authorized the creation of bacteriological ocean water quality standards that are considered protective of public health (California Code of Regulations Sections 7956-7962).

The standards are informally called “AB411 standards” and include the following:

- Required testing of the waters adjacent to all ocean and bay public beaches for total coliforms, fecal coliforms and enterococci bacteria that may indicate the presence of possible disease-causing bacteria, viruses or protozoa.
- Required maintenance and updates of the Ocean, Harbor and Bay Posting and Closure Hotline.
- Established single sample standards for total coliforms, fecal coliforms and enterococci bacteria which shall not exceed:
    - Total Coliforms: 10,000 organisms per 100 milliliter sample.
    - Fecal Coliforms: 400 organisms per 100 milliliter sample.
    - Enterococci: 104 organisms per 100 milliliter sample.
    - Fecal Coliform to Total Coliform ratio: >1,000 total coliforms if ratio exceeds 0.1.
- Established 30-day geometric mean standards (of five weekly samples) for total coliforms, fecal coliforms and enterococci bacteria which shall not exceed:
    - Total Coliforms: 1,000 organisms per 100 milliliter sample.
    - Fecal Coliforms: 200 organisms per 100 milliliter sample.
    - Enterococci: 35 organisms per 100 milliliter sample.
- When any waters adjacent to a public beach fail to meet any of the standards described above, the local health officer shall post signs on the beach to restrict access to the affected waters.
- Weekly testing is required from April 1 to October 31 if the following applies:
    - The beach is visited by more than 50,000 people annually.
    - The beach is located in an area adjacent to a storm drain that flows in the summer.
- In the case of a known release of sewage into ocean or bay waters adjacent to a public beach, the local health officer is required to:
    - Immediately close the affected ocean or bay waters until the source of the sewage is eliminated.
    - Collect bacterial samples from the affected waters.
    - Continue the closure until testing results of water samples meet the established standards.

Dolphins
Dana Point Harbor

Disease-Causing Microorganisms

Contaminated runoff and untreated sewage released into ocean and bay waters may result in swimmer exposure to pathogenic bacteria, viruses or protozoa. These disease-causing microorganisms may be present at or near the sites where discharges enter the water.

The following table lists the types of microorganisms and the diseases (or symptoms) they may cause.

PATHOGENIC AGENT	DISEASE
Bacteria	
Escherichia coli (E. coli)	Gastroenteritis
Salmonella (not typhi)	Gastroenteritis, usually with fever; less commonly septicemia (generalized infection - organisms multiply in the bloodstream)
Some strains of *Shigella*	Gastroenteritis, usually with fever
Protozoa (Intestinal Parasites)	
Cryptosporidium	Diarrhea – Cryptosporidiosis
Giardia lamblia	Diarrhea – Giardiasis
Viruses	
Rotavirus	Gastroenteritis
Enteroviruses	Respiratory infection, rash, fever, meningitis
Norwalk and Norwalk-like viruses	Gastroenteritis
Adenovirus	Respiratory infection and gastroenteritis
Hepatitis A (outbreaks associated with eating shellfish from sewage-contaminated water)	Infectious hepatitis (liver malfunction)

The levels of bacteria, viruses and protozoa typically decrease in ocean and bay waters over time due to the following reasons:

- Die off due to sun (ultraviolet exposure), salt water or age.
- Predation by other organisms.
- Dispersion and dilution.

Aliso County Beach, Laguna Beach

Indicator Bacteria Testing Methods

The detection and enumeration of disease-causing organisms (pathogens) identified with waterborne illness is difficult, time-consuming and costly. Thus, most water quality laboratories are required to test for fecal indicator bacteria (i.e., total coliforms, fecal coliforms and enterococci) as a means to ascertain the likelihood that human pathogens may be present in recreational waters. Fecal indicator bacteria normally occur in the intestines of all warm-blooded animals, are excreted in high numbers in feces, but can also be found in soil and decaying vegetation. Since there is no ideal indicator group, testing is done for more than one indicator. Total coliforms are a broad group of organisms that include fecal coliform bacteria as well as E. coli. The enterococci group has been determined to be a good indicator of water-contact associated gastroenteritis. The methods most commonly used to detect fecal indicator bacteria in water include:

- Membrane Filtration (MF)
- Multiple-Tube Fermentation (MTF)
- Colilert®
- Enterolert®

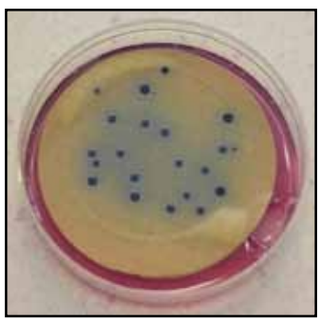
All of the methods are culture based, which means that the indicator bacteria present in water must be allowed to grow in order to be detected. Differences between the methods include how the bacteria are detected and counted, how soon the results become known, and cost. Each method has its advantages and disadvantages. Most of the limitations depend on factors such as the other types of constituents in the water and density of bacteria present, and all require at least an 18-hour incubation period. The following is a brief summary of the Membrane Filtration method, the method used by the County of Orange Health Care Agency/ Public Health Laboratory, the South Orange County Wastewater Authority Laboratory and the Orange County Sanitation District Laboratory for the analyses of total coliforms, fecal coliforms and enterococci in ocean and bay waters. Detailed descriptions for the Membrane Filtration (MF), Multiple-Tube Fermentation (MTF), Colilert® and Enterolert® methods are available in the latest edition of Standard Methods for the Examination of Water and Wastewater.

Membrane Filtration (MF)

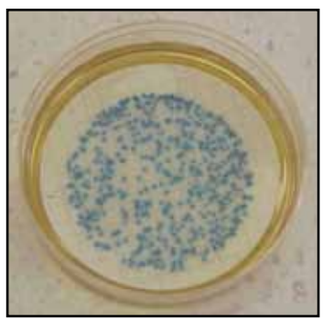
The membrane filtration method involves filtering water through a porous membrane to concentrate or trap bacteria from the water sample on the filter surface. The membrane filter is placed onto a culture medium designed to encourage the growth of the target indicator. The filter is incubated for 22–24 hours to allow the bacterial cells to multiply into visible colonies. Theoretically, each bacterial cell (or clump of cells) produces a single colony on the membrane.

The colonies are viewed under a 10X magnifying lens and distinguished from non-target bacteria based on the type, size and color of the colonies. Target bacteria are indicated by pigment production resulting from bacterial enzymatic reactions to specific substrates. The number of colonies present in 100 milliliters of water, also known as “Colony Forming Units” (CFUs), is counted and the concentration of organisms in the original sample is calculated.

Total Coliform Colonies



Fecal Coliform Colonies



Enterococcus Colonies

Public Notification and Risk Communication

Public notification and risk communication is a critical component of the Ocean Water Protection Program. Public awareness and enhancing the capacity for informed personal choice are important factors in ensuring public health protections are provided to recreational water users. The Ocean Water Protection Program has established and maintains an integrated management system to inform the public of the potential health risks associated with water contact activities in coastal recreational waters that do not meet applicable water quality standards. Multiple communication measures are promptly taken to notify the public when ocean, harbor or bay water areas do not meet or are expected not to meet AB411 Ocean Water-Contact Sports Standards. The Ocean Water Protection Program implements the following types of public notification measures to communicate information regarding beach water quality and to protect the health of beach users:

- **Beach Signs** – Signs are posted to notify beach users of the current status of the ocean, harbor or bay water area. Posted beach signs are located where they are most likely to be noticed by beach users and provide a visual notice at the point of ocean water access.
- **Telephone Hotline** – The Ocean, Harbor and Bay Water Closure & Posting Telephone Hotline has been established to inform the public about all beaches that are currently closed, posted with a health warning, or when a rain advisory has been issued. The telephone hotline message is immediately updated when a change in the status of beach closures, postings or advisories occur. The Ocean, Harbor and Bay Water Closure & Posting Telephone Hotline is (714) 433-6400.
- **Web Page** – The Ocean, Harbor and Bay Water Closure & Posting Web Page has been developed and is used to report beach closures, postings and rain advisories. The web page is updated immediately when the status of the closure, posting or advisory changes. The Ocean, Harbor and Bay Water Closure & Posting Web Page internet address is www.ocbeachinfo.com.
- **Social Media** – Public notification of ocean water quality status changes are being communicated to the public through the social media network of Twitter. For the latest information and instant ocean water quality updates when they occur, follow us on Twitter at http://twitter.com/ocbeachinfo.
- **Press Releases** – Public notification of a beach closure or rain advisory is provided in a press release issued by the Health Care Agency. The press release will indicate whether a closure or advisory is being issued, the reason for the closure or advisory, the area affected, and the anticipated duration of the closure or advisory.
- **Annual Reports** – To assess the health of the ocean, harbor and bay waters being monitored, the Ocean Water Protection Program compiles an annual report of the beach closures, postings and advisories after the year has ended. The Annual Ocean, Harbor and Bay Water Quality Report provides an updated analysis of bacteriological water quality, describes year-to-year variability and trends for Orange County's recreational waters and includes data on sewage spills and beach closures. Annual Reports from 2002 to present can be viewed and downloaded from the Ocean, Harbor and Bay Water Closure & Posting Web Page at www.ocbeachinfo.com.

Current information about OC water conditions is available at www.ocbeachinfo.com, Twitter and the Closure Telephone Hotline.

Closure and Warning Signs

The yellow closure sign is posted when a sewage spill affects ocean or bay waters adjacent to a public beach. This sign is also available in Spanish.

The warning sign with the red and black border is posted when a violation of the AB 411 Ocean Water-Contact Sports Standards occurs.

The warning sign with the yellow and black border is permanently posted near storm drains, creeks and rivers to advise the public of the risks associated with possible contamination from urban runoff.

Beach Mile Days (BMD)

The term “Beach Mile Days” is used to represent the measurement of the number of days and the linear area of ocean, harbor or bay front waters that are closed due to a sewage spill or posted for a violation of the AB411 Ocean Water-Contact Sports Standards.

Beach Mile Days (BMD) are calculated by multiplying the number of days of a closure or posting by the number of miles of beach closed or posted:

(Number of Days) x (Miles of Beach Closed/Posted) = Beach Mile Days

For example, if a sewage spill resulted in the closure of ½ mile of beach for 7 days then:

(7 days) x (0.5 miles of beach closed) = 3.5 Beach Mile Days of closure

Another example, if 300 feet of beach is posted for a violation of the AB411 Ocean Water-Contact Sports Standards for 5 consecutive days, then:

(5 days) x (0.06 miles of beach posted) = 0.3 Beach Mile Days of posting

Using BMD as a measurement of ocean and bay water availability is more meaningful than using the number of incidences or the number of days since BMD take into account both the length of beach and time of a closure or posting. The State of California Water Resources Control Board and all California coastal counties use BMD for reporting closures and postings which provides a standardized measurement that allows comparison of different areas (beach to beach or county to county) and the assessment of closure and posting trends over time.

Ocean Fest
San Clemente City Beach

2010 RAPID INDICATORS DEMONSTRATION PROJECT

During the summer of 2010, the County of Orange Health Care Agency, in collaboration with the Southern California Coastal Water Quality Research Project, Orange County Sanitation District, South Orange County Wastewater Authority, City of Newport Beach, California State Parks, and Miocean, participated in the Rapid Indicators Demonstration Project.

During an 8-week demonstration period, a new rapid water quality monitoring method was used to improve public health protection at select Orange County beaches. The new rapid method yields results in about four hours, compared to the more than 24 hours required for currently-used methods. This technology enabled the Ocean Water Protection Program to provide beach water quality warnings and advisories on the same day that samples were collected.

The demonstration project ran from July 6 to August 31, 2010. Samples were collected at 7:00 AM, Monday through Friday at nine sampling sites along five beaches: Doheny State Beach, Huntington State Beach, Newport Beach Pier, Corona Del Mar State Beach and Newport Dunes. By 8:30 AM, the samples were delivered to the three laboratories that currently test beach water quality in Orange County: Orange County Sanitation District, Orange County Public Health Laboratory, and South Orange County Wastewater Authority.

The samples were processed using a quantitative polymerase chain reaction (qPCR) rapid method. This is a genetic method that measures the presence and amount of DNA from enterococcus bacteria and has been in use at public health laboratories for more than a decade in medical applications like HIV testing. This is the first application of its type used for ocean water quality analysis.

The sample results were submitted to the Ocean Water Protection Program at 11:00 AM and the data was reviewed and compared to state health standards for ocean recreational water body-contact. If the sample results were above state health standards, the Ocean Water Protection Program posted the beach location with health warning signs by 12:00 noon.

Over the course of the study, the Ocean Water Protection Program continued to closely monitor and compare the effectiveness of the rapid method versus current methods at protecting beachgoer's health. In addition to traditional public notification methods using beach signs, web site and telephone hotline updates, the Ocean Water Protection Program used the demonstration project to unveil two new approaches to quickly inform people about current beach water quality.

One new approach was issuing the results through a Twitter feed (www.Twitter.com/ocbeachinfo) providing instant notifications to email inboxes and cell phones when there was a change in status in ocean water quality. Due to the positive public response, the Ocean Water Protection Program is continuing to utilize the social media network Twitter for this purpose. Secondly, in a partnership with the Miocean Foundation, five large electronic display monitors were installed at heavily frequented beach locations showing current ocean water quality at sites where the rapid method samples were collected.

The US Environmental Protection Agency is currently working to develop rapid microbial monitoring methods nationally and is using the information and lessons learned during the Rapid Indicators Demonstration Project to develop a national rapid method implementation strategy.

One new approach was issuing the results through a Twitter feed providing instant notifications to email inboxes and cell phones.

SEWAGE WASTE DISCHARGES

Sewage waste discharges commonly known as sewage spills occur when wastewater being transported via underground pipes overflows through a manhole, clean-out drain or broken pipe. Sewage spills can cause health hazards, damage to homes and businesses and threaten the environment, local waterways and beaches. Untreated sewage has high levels of disease-causing bacteria and viruses. Orange County Health Care Agency/Environmental Health is responsible for protecting public health by closing ocean, harbor and bay water areas affected by sewage spills and will close food-service establishments if a sewage spill poses a threat to public health.

Common Causes of Sewage Spills:

Grease builds up inside and eventually blocks sewer pipes. Grease gets into the sewer from food establishments, household drains, as well as from poorly maintained commercial grease traps and interceptors.

Infrastructure problems caused by tree roots in the lines, broken/cracked pipes, missing or broken cleanout caps, or undersized sewers can cause blockages.

Infiltration and inflow impacts pipe capacity and is caused when groundwater or rainwater enters the sewer system through pipe defects and illegal connections.

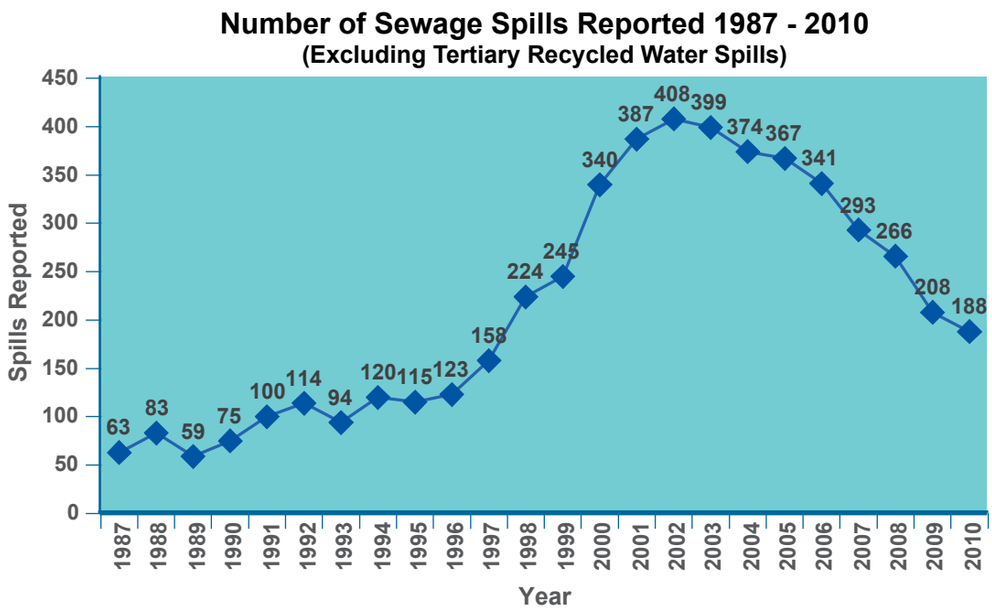
Local and state agencies have legal jurisdiction and enforcement authority to ensure sewage spills are remediated. Allowing sewage to discharge from a home, business or public property may subject the responsible party to penalties and/or out-of-pocket costs to reimburse local and state agencies for clean-up efforts and for not reporting the sewage spill. As mandated by the California Health and Safety Code, any person who causes or permits a sewage discharge to any state waters must ***immediately*** notify the local health agency of the discharge.

If you see a sewage spill occurring, immediately notify your City Sewer/Public Works Department or Public Sewer District.

Harbor Sunset

Number of Sewage Waste Discharges Reported 1987 - 2010

The number of sewage spills reported to the Orange County Ocean Water Protection Program by sanitation districts, cities that operate sewage collection systems and private property owners from 1987 - 2010 is detailed in the following graph. The total number of sewage spills reported in 2010 represents the eighth consecutive year a decrease in the total number of sewage spills has been reported.

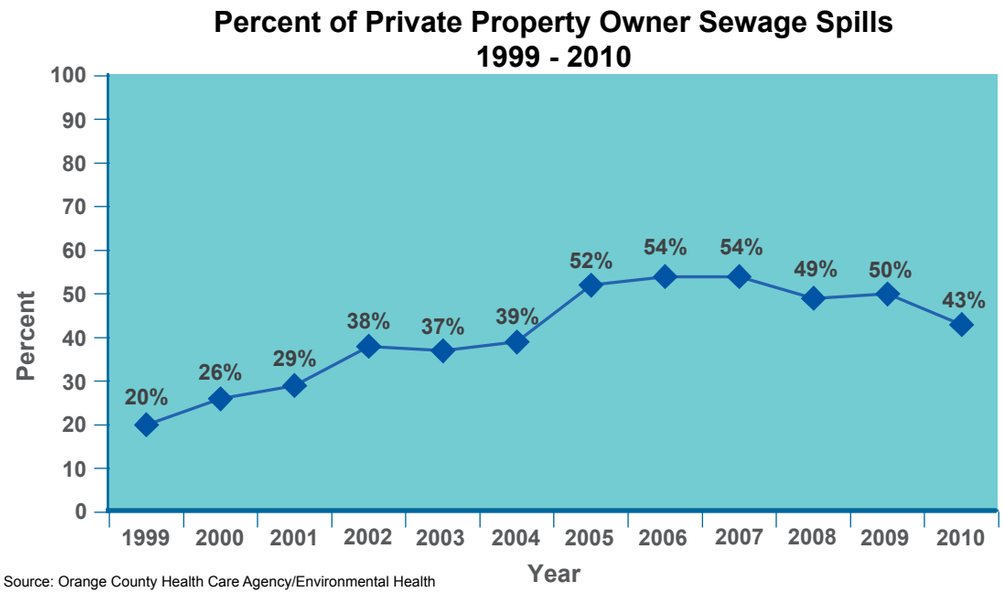


Source: Orange County Health Care Agency/Environmental Health

Skim Boarders Waiting
"The Wedge," Newport Beach

Private Property Owner Sewage Spills 1999 - 2010

The following chart depicts the percentage of sewage spills due to overflows from privately owned sewage systems (e.g., residential homes, apartment/condominium complexes, strip malls, etc.) reported each year from 1999 - 2010. In 2010, privately owned sewage systems were responsible for 43% of all sewage spills reported in Orange County.

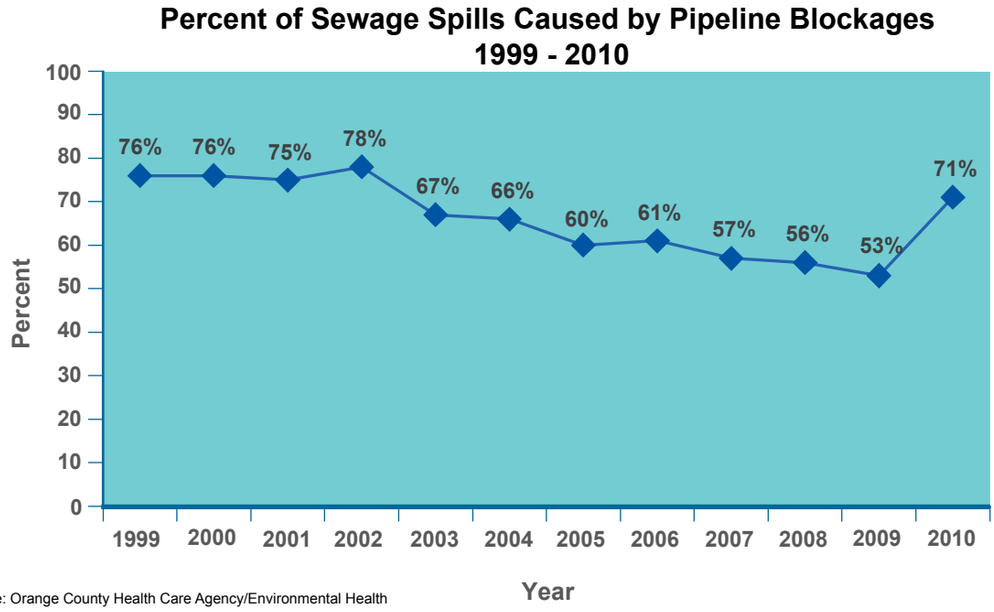


Source: Orange County Health Care Agency/Environmental Health

Sunset over Balboa Fun Zone
Newport Beach

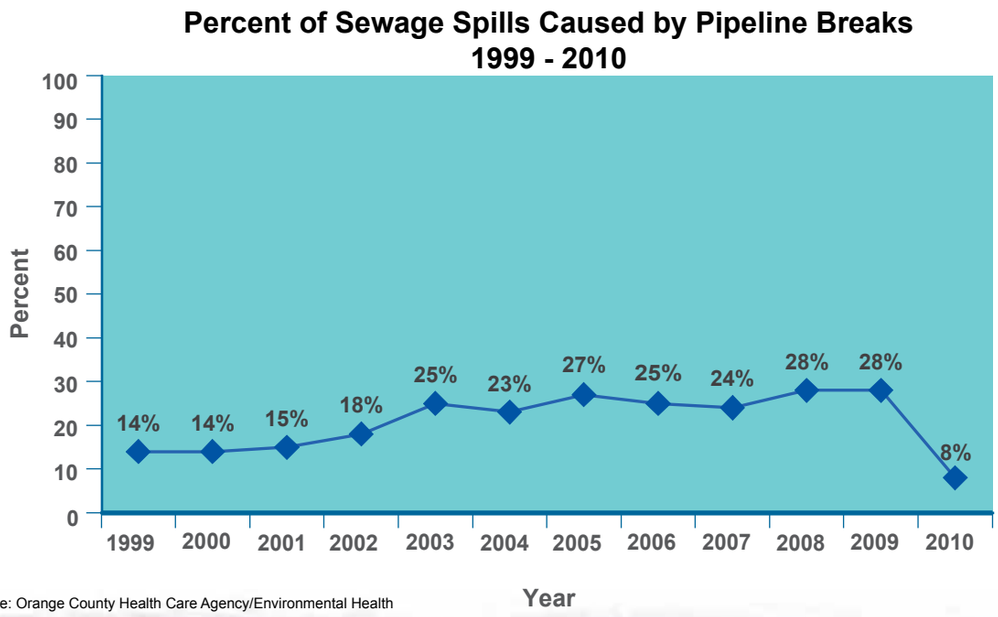
Sewage Waste Discharge Causes 1999 - 2010

The percentage of sewage spills caused by pipeline blockages from 1999 – 2010 is detailed in the following graph. The total number of sewage spills caused by pipeline blockages increased 18% from 2009 to 2010.



Source: Orange County Health Care Agency/Environmental Health

The following graph depicts the percentage of sewage spills caused by pipeline breaks from 1999 – 2009. There has been a 20% decrease in the total number of sewage spills caused by pipeline breaks from 2009 to 2010.

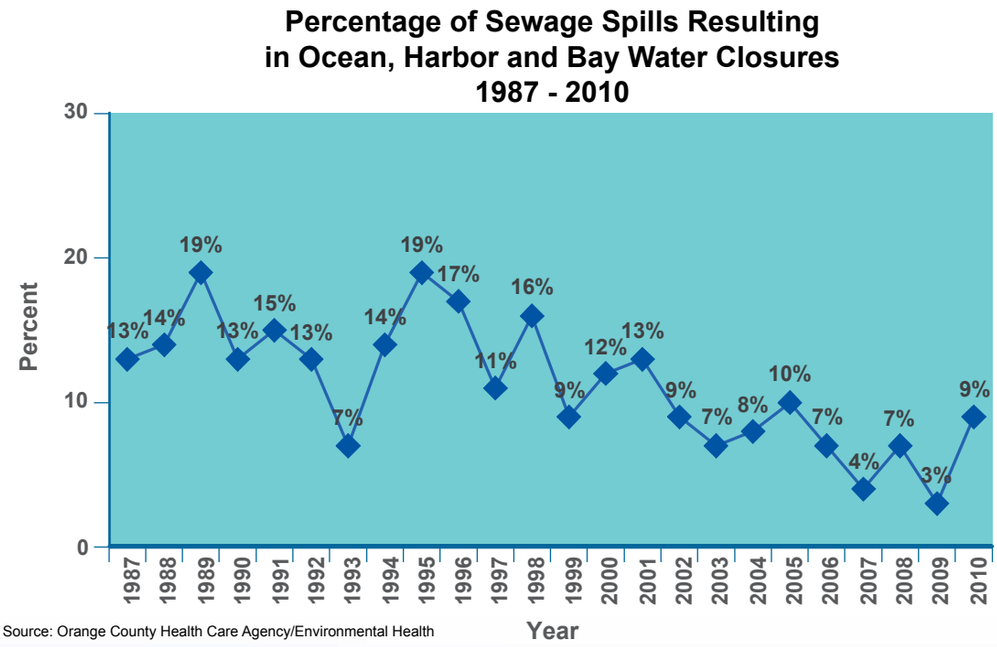


Source: Orange County Health Care Agency/Environmental Health

Surfers and Dolphins
Huntington Beach

Percent of Sewage Waste Discharges Resulting in Closures 1987 - 2010

The percentage of sewage spills reported that resulted in an ocean, harbor, and bay water closure from 1987 – 2010 is shown in the following graph. The 6% increase from 2009 to 2010 represents the largest 1-year increase in the percentage of closures per total number of sewage spills reported in 17 years.



Source: Orange County Health Care Agency/Environmental Health

OCEAN, HARBOR AND BAY WATER CLOSURES DUE TO SEWAGE SPILLS

When a known release of sewage is reported to the Ocean Water Protection Program, the ocean or bay water areas that may be affected by the sewage discharge are immediately closed to water-contact recreational activities. The closure area is based on many factors including type of sewage (e.g., untreated, secondary treated, etc.), volume of spill, location of spill, ocean currents and tides, historical sewage spills in the area, and other pertinent information. After the initial closure area is established, the appropriate agencies are notified, the area is posted with closure signs, a press release is issued, the Ocean, Harbor and Bay Water Closure & Posting Telephone Hotline and web page are updated with the beach closure information, and daily bacterial sampling of the affected area is initiated.

The closed ocean or bay water area will be reopened or reduced in size when the contamination source has been eliminated and after two daily consecutive sampling results indicate the affected area meets the AB411 Ocean Water-Contact Sports Standards.

The Ocean, Harbor and Bay Water Closure and Posting Telephone Hotline, web page and Twitter account provide the current status information for beach closures and are immediately updated when a change of status occurs. In addition, detailed information regarding Orange County beach closure events from 1999 – 2010 can be viewed and downloaded from the web page.

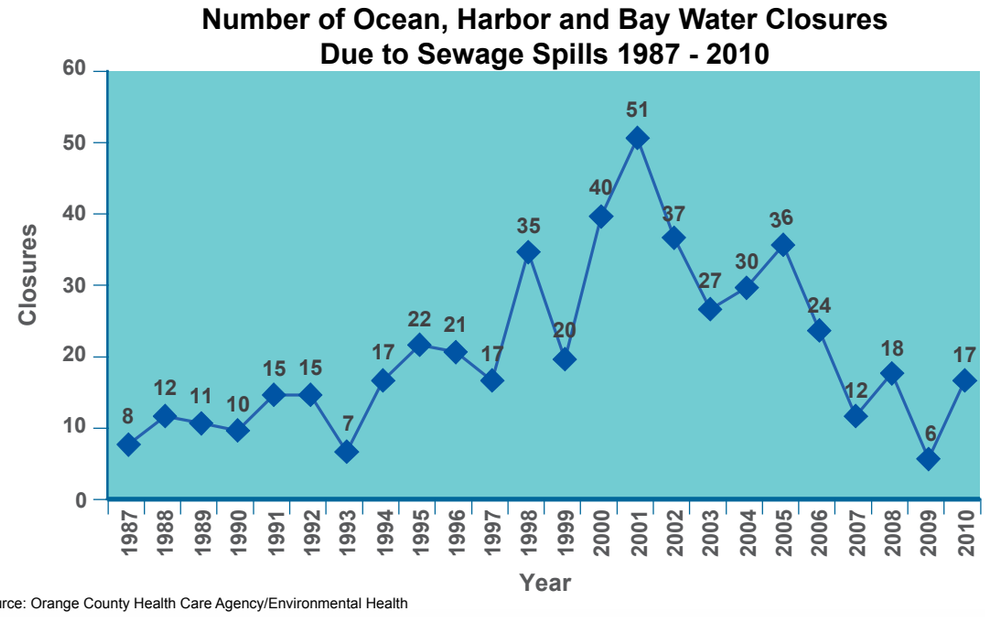
Ocean, Harbor and Bay Water Closure & Posting Telephone Hotline: (714) 433-6400

Ocean, Harbor and Bay Water Closure & Posting Web Page: www.ocbeachinfo.com.

Twitter: http://twitter.com/ocbeachinfo

Total Number of Closures Due to Sewage Spills 1987 - 2010

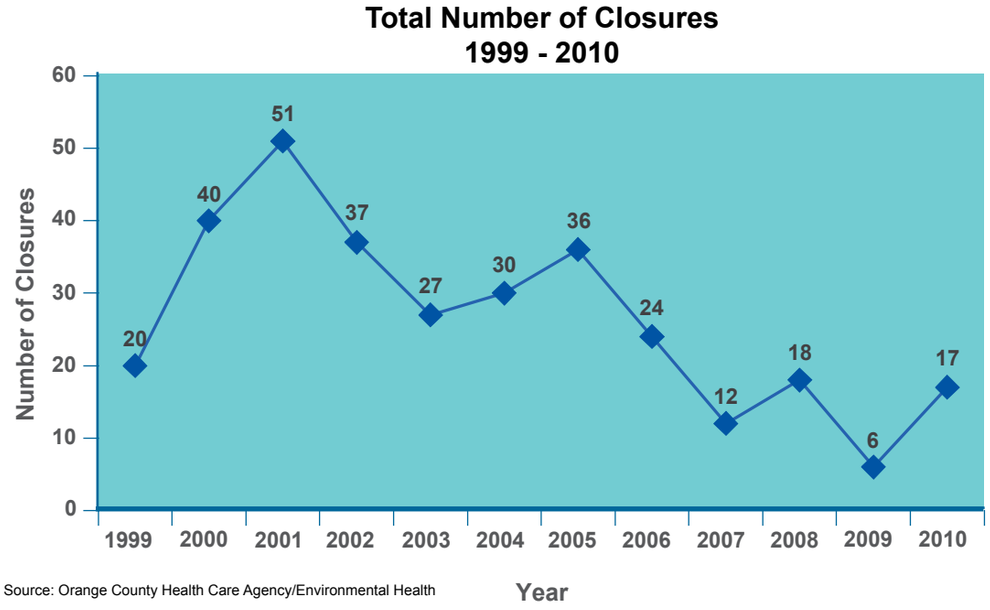
The total number of ocean, harbor and bay water closures in Orange County due to sewage spills from 1987 - 2010 is summarized in the following graph. In 2010, the number of sewage spill closures increased over the previous year and was the largest 1-year increase in 10 years.



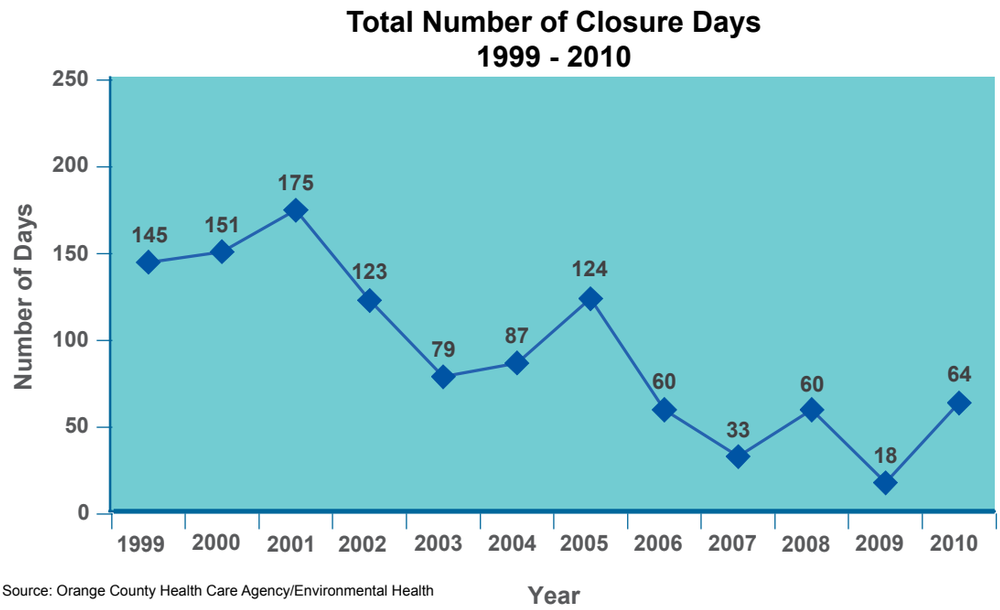
Source: Orange County Health Care Agency/Environmental Health

Total Number of Closures, Closure Days and Beach Mile Days 1999 - 2010

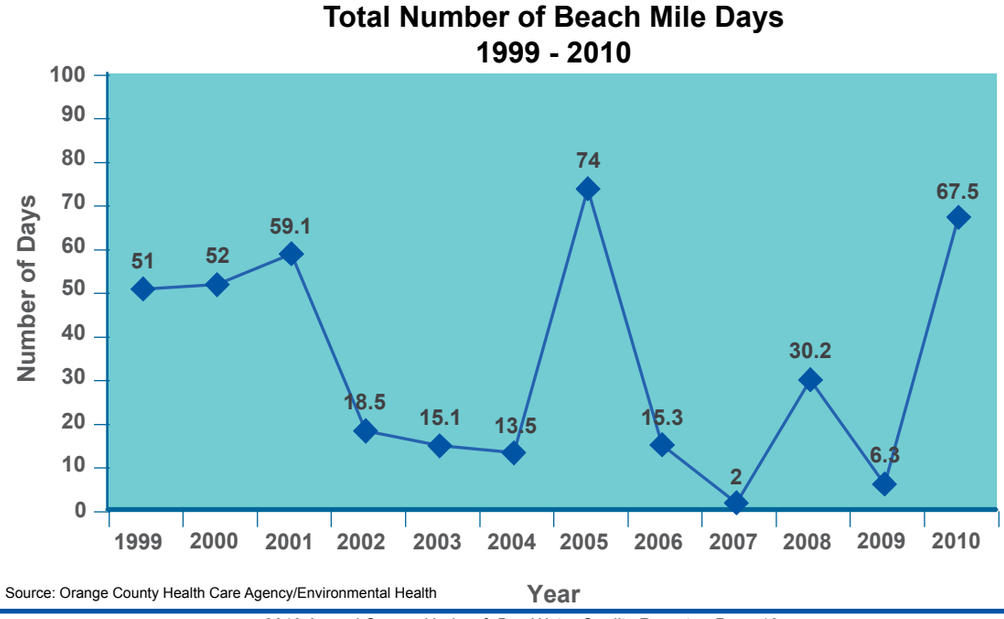
The following graphs depict the total number of closures, total number of closure days and total number of Beach Mile Days of closure due to sewage spills in Orange County from 1999 – 2010. In 2010, the total number of closure days (54) and total number of Beach Mile Days (67.5) significantly increased over the previous year and was the highest number of ocean and bay water closures days and Beach Mile Days on record since 2005.



Source: Orange County Health Care Agency/Environmental Health



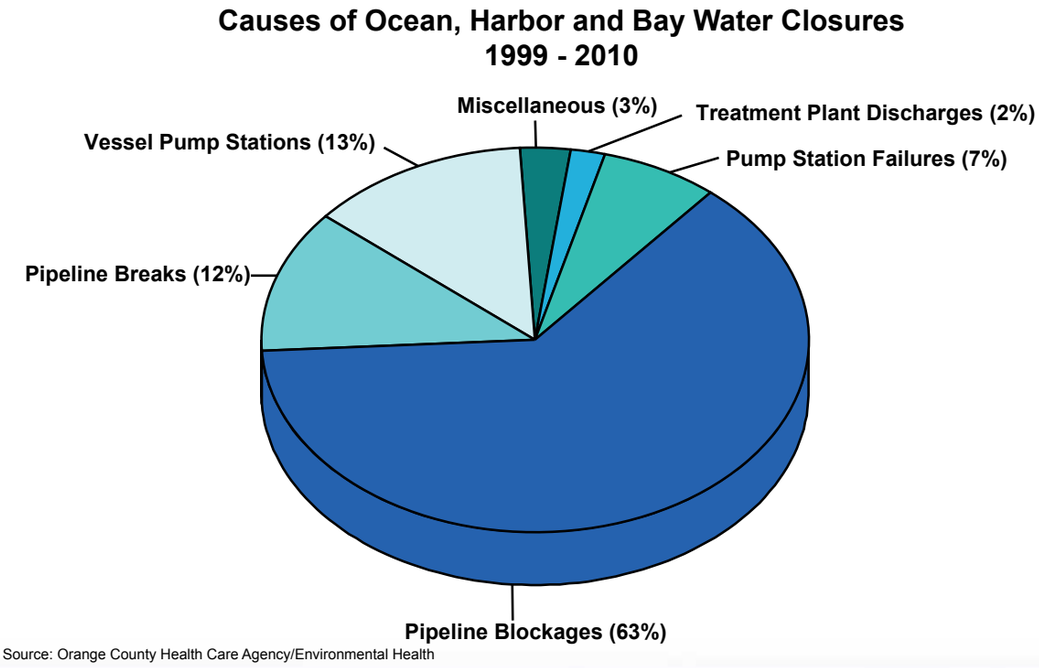
Source: Orange County Health Care Agency/Environmental Health



Source: Orange County Health Care Agency/Environmental Health

Sewage Spill Closure Causes 1999 - 2010

The following chart illustrates that sewage system pipeline blockages caused the majority (63%) of all ocean, harbor and bay water closures in Orange County for the 12-year period from 1999 - 2010.

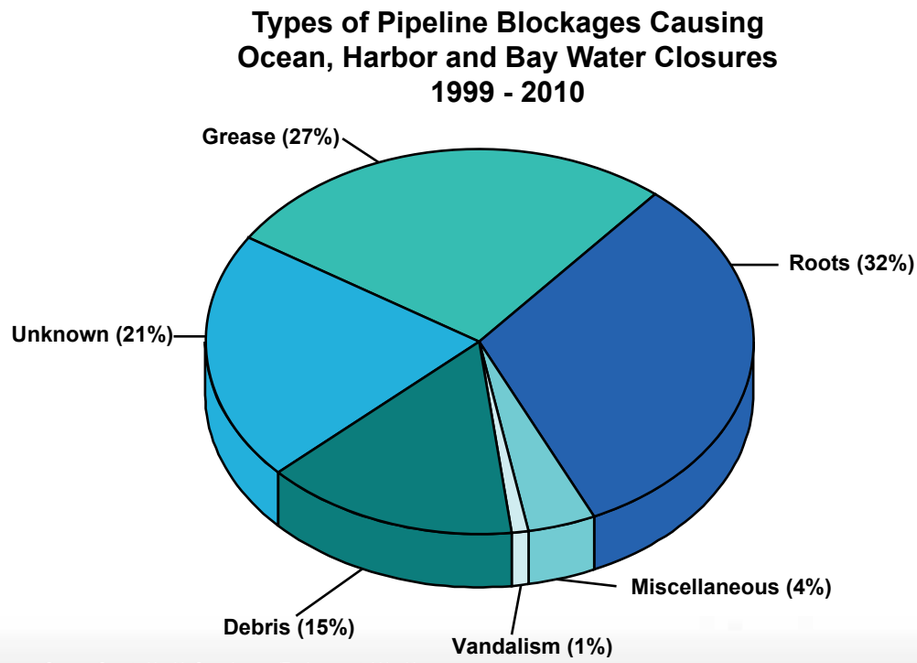


Source: Orange County Health Care Agency/Environmental Health

Big Wave Shore Break
"The Wedge," Newport Beach

Types of Pipeline Blockages Causing Closures 1999 - 2010

The infiltration of roots and deposition of grease into sewer pipes accounted for a majority (59%) of the pipeline blockages that resulted in ocean, harbor and bay water closures in Orange County for the 12-year period from 1999 – 2010.

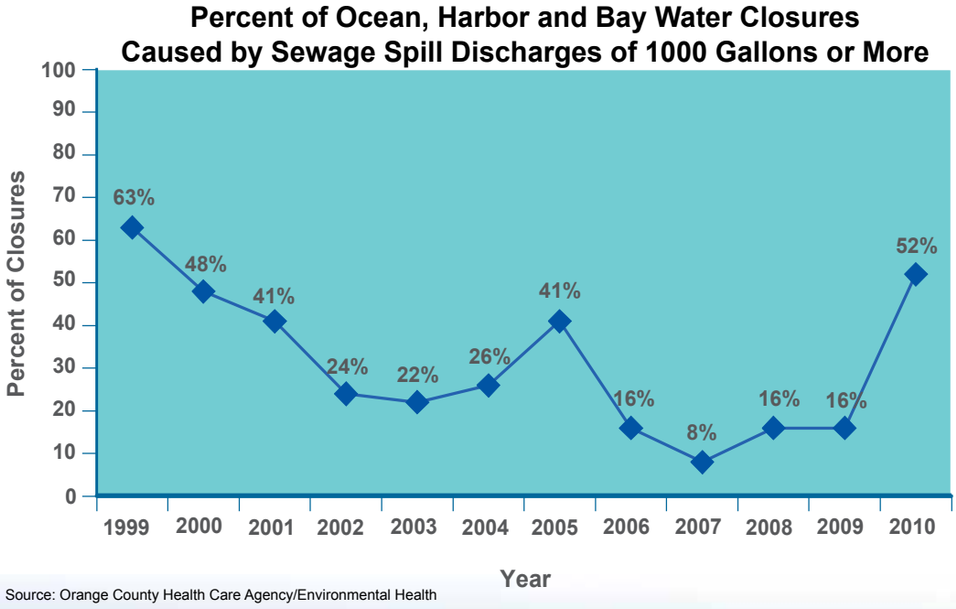


Source: Orange County Health Care Agency/Environmental Health

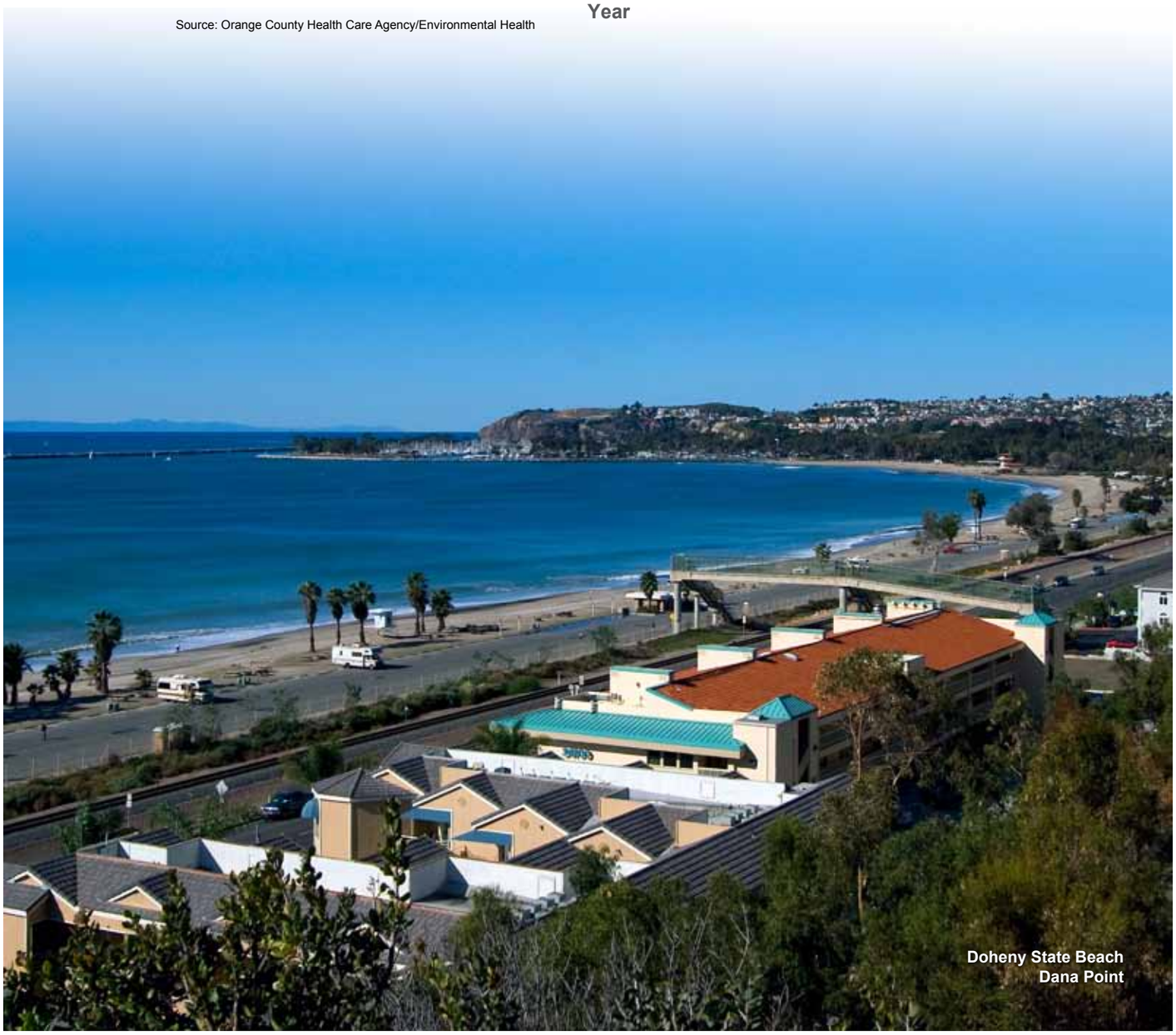
Young Surfer
San Clemente Beach

Percent of Closures Due to Large Sewage Spills 1999 - 2010

The following graph depicts the percent of sewage spill closures where the volume of sewage discharged into ocean, harbor or bay water was at least 1000 gallons or more. In 2010, over half (52%) of the ocean, harbor and bay water closure events were due to sewage spills discharging large volumes (1000 gallons or more) of sewage which represents the highest percentage since 2000.



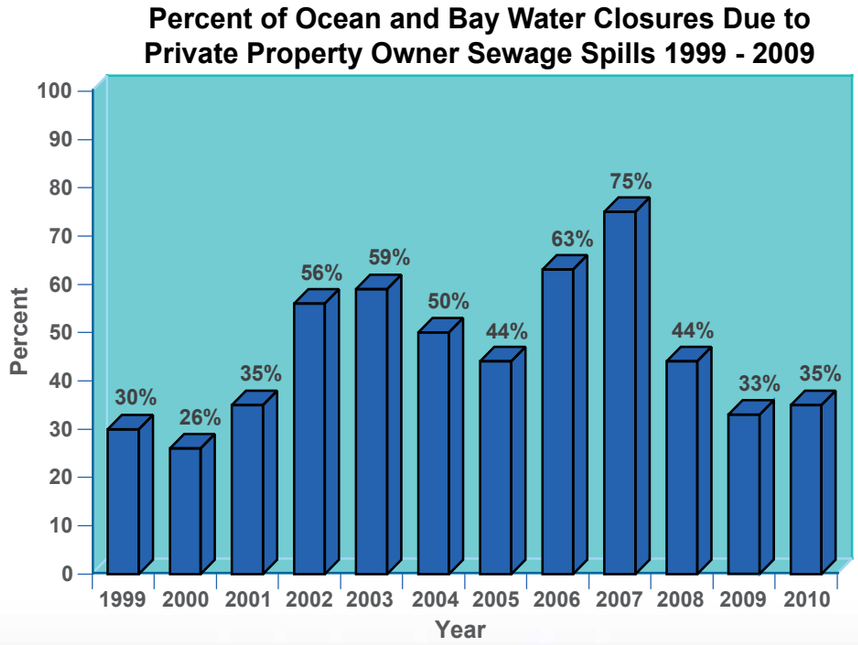
Source: Orange County Health Care Agency/Environmental Health



Doheny State Beach
Dana Point

Closures Due to Private Property Owner Sewage Spills 1999 - 2010

The percentage of ocean, harbor and bay water closures that were due to private property owner sewage system spills for the 12-year period from 1999 – 2010 is shown in the following chart. In 2010, six ocean and bay water closures due to private property owner sewage spills accounted for 35% of all ocean and bay water closures for the year.



Source: Orange County Health Care Agency/Environmental Health

Sailboat Race

In 2010, the total number of Beach Mile Days posted due to bacteriological standards violations (87.6) was the lowest total on record.

Newport Harbor

OCEAN, HARBOR AND BAY WATER POSTINGS DUE TO BACTERIOLOGICAL STANDARDS VIOLATIONS

Upon implementation of the AB411 Ocean Water-Contact Sports Standards in July of 1999, the Ocean Water Protection Program began posting the required health warning signs at public beaches where the ocean, harbor or bay waters failed to meet state mandated recreational water quality standards.

From April 1 to October 31 bacteriological water samples are collected a minimum of once a week at approximately 125 ocean, harbor and bay locations throughout Orange County. Sample results are reviewed daily by the Ocean Water Protection Program to determine compliance with the seven AB411 bacteriological standards established by the State of California. Each year the Ocean Water Protection Program will review bacteriological results of approximately 7,000 ocean, harbor and bay water samples collected from April 1 to October 31.

When a bacteriological water sample fails to meet an AB411 Ocean Water-Contact Sports Standard, the following actions are taken:

- Warning signs are posted at the affected ocean, harbor or bay water area indicating that bacteria levels have exceeded health standards and ocean water contact may cause illness.
- The information regarding the posted area is updated on the Ocean, Harbor and Bay Water Closure and Posting Hotline at (714) 433-6400, Web Page at www.ocbeachinfo.com, and by Twitter at http://twitter.com/ocbeachinfo.
- Follow-up bacteriological water samples are collected at the posted location and the results are evaluated daily to determine if the posted area should be increased, reduced, shifted or removed.

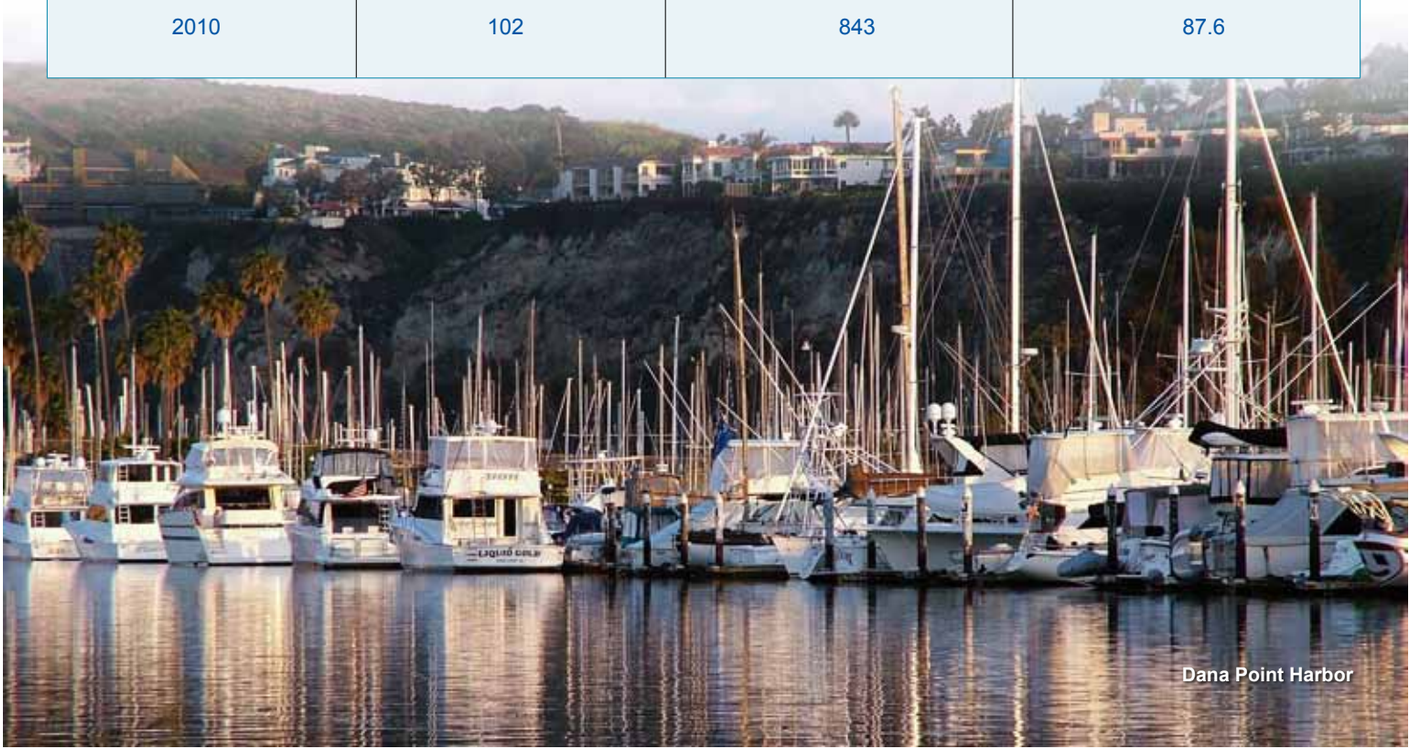
Because ocean, harbor or bay water areas that violate the AB411 Ocean Water-Contact Sports Standards may cause illness to recreational water users, the Ocean Water Protection Program staff recommends staying out of the water at all beach areas that are posted with the health warning sign shown below.

Total Number of Posted Warnings, Posting Days and Beach Mile Days 2000 - 2010

As required by the California Health and Safety Code Section 115910, violations of the AB411 Ocean Water-Contact Sports Standards between April 1 and October 31 must be reported to the California State Water Resources Control Board by all California coastal counties on a monthly basis. The information provided in this section is the data reported to the California State Water Resources Control Board beginning with the year 2000, the first calendar year that the AB411 Ocean Water-Contact Sports Standards were in place.

The total number of posted warnings, total number of posting days, and total number of Beach Mile Days that were posted due to AB411 standards violations between April 1 and October 31 for all Orange County ocean, harbor and bay water areas are shown in the following table:

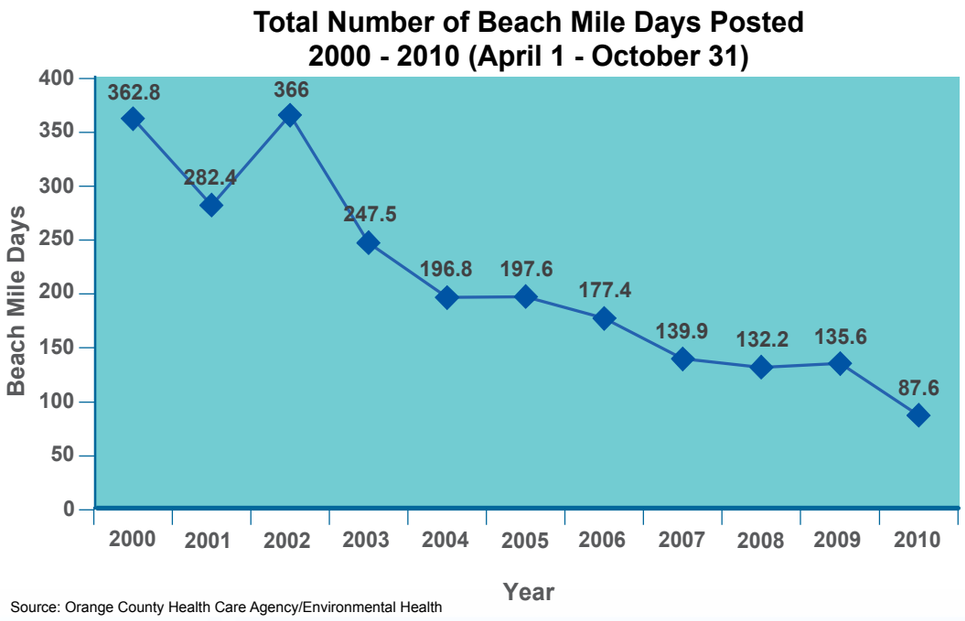
YEAR	POSTED WARNINGS	POSTING DAYS	BEACH MILE DAYS
2000	199	2,123	362.8
2001	208	2,454	282.4
2002	308	2,456	366.0
2003	160	1,732	247.5
2004	141	1,877	196.8
2005	102	1,512	197.6
2006	183	1,381	177.4
2007	116	1,037	139.0
2008	121	857	132.2
2009	109	791	135.6
2010	102	843	87.6



Dana Point Harbor

Total Number of Beach Mile Days Posted 2000 – 2010

The total number of Beach Mile Days that were posted due to AB 411 standards violations between April 1 and October 31 from 2000 – 2010 is detailed in the following graph. The total number of Beach Mile Days posted in 2010 (87.6) was the lowest total on record for the 11-year period from 2000 – 2010. In addition, the total number of Beach Mile Days posted in Orange County between April 1 and October 31 has declined by 75% since 2002.



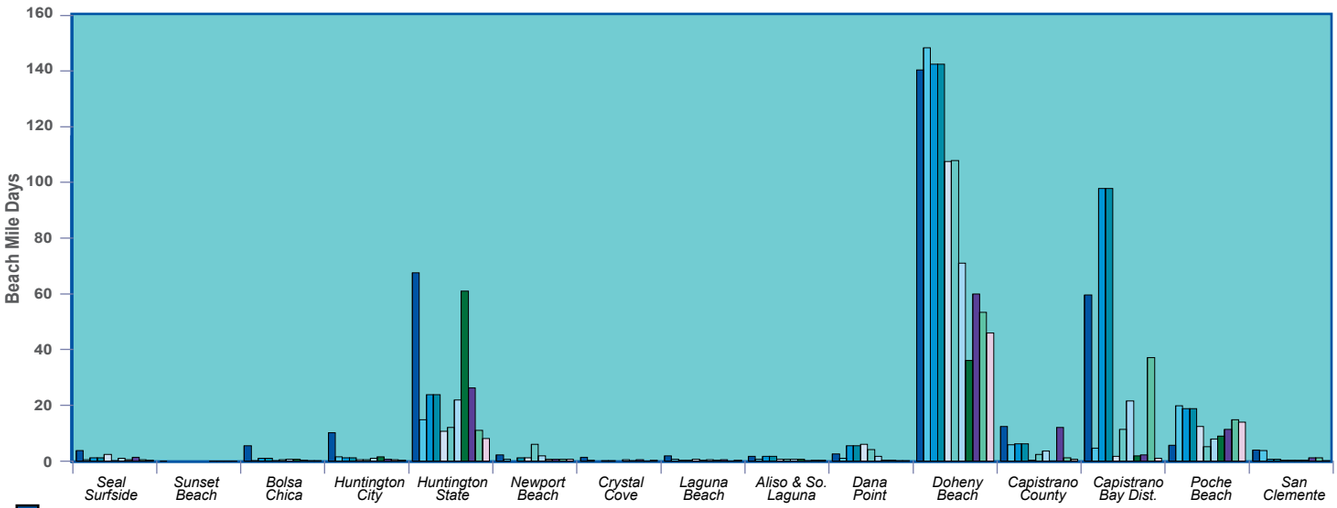
Source: Orange County Health Care Agency/Environmental Health

Dolphin Breach Offshore
Laguna Beach

Beach Mile Days Posted for Open Coastal Ocean Water Areas 2000 – 2010

The total number of Beach Mile Days posted due to AB411 standards violations between April 1 and October 31 for each Orange County open coastal ocean water area from 2000 – 2010 is depicted in the following graph. The open coastal ocean water areas of Doheny State Beach, Huntington State Beach and Capistrano Bay District Beach have the highest total number of Beach Mile Days posted from 2000 – 2010.

Total Number of Beach Mile Days Posted for Open Coastal Ocean Water Areas 2000 - 2010 (April 1 - October 31)



	Seal Surfside	Sunset Beach	Bolsa Chica	Huntington City	Huntington State	Newport Beach	Crystal Cove	Laguna Beach	Aliso & So. Laguna	Dana Point	Doheny Beach	Capistrano County	Capistrano Bay Dist.	Poche Beach	San Clemente
2000	3.7	0	5.4	10.1	67.6	2.2	1.3	1.9	1.6	2.5	140.3	12.4	59.6	5.7	3.9
2001	0.4	0	0.1	1.4	14.8	0.7	0.3	0.6	0.7	0.9	148.4	5.8	4.6	19.8	3.8
2002	1.2	0	0.9	1.2	23.8	1.2	0.1	0.2	1.7	5.5	142.5	6.2	97.9	18.8	0.6
2003	0.3	0	0.8	0.8	41.9	1.4	0.2	0.2	0.5	2.3	116.5	2.6	18.4	11.0	0.6
2004	2.4	0	0.1	0.5	10.6	1.2	0.1	0.6	0.6	6.0	107.6	0.3	1.7	12.4	0.3
2005	0.1	0	0.4	0.4	12.1	6.0	0	0.3	0.6	4.0	107.9	2.4	11.3	5.1	0.2
2006	0.9	0	0.7	0.9	21.9	1.9	0.4	0.4	0.6	1.6	71.0	3.6	21.5	7.8	0.3
2007	0.5	0	0.6	1.4	61.0	0.6	0.1	0.3	0.6	0.2	36.1	0	1.9	9.0	0.3
2008	1.3	0	0.2	0.7	26.2	0.6	0.4	0.5	0.1	0.3	60.0	12.0	2.2	11.4	1.1
2009	0.5	0	0.1	0.5	11.0	0.6	0	0	0.3	0.1	53.3	1.1	37.1	14.8	1.1
2010	0.3	0	0.1	0.2	8.1	0.7	0.2	0.2	0.3	0.4	46	0.6	0.9	14	0.1

Source: Orange County Health Care Agency/Environmental Health

San Clemente Pier

Seals on Buoy
Laguna Beach

OCEAN, HARBOR AND BAY WATER RAIN ADVISORIES

During and after a significant rainstorm event, storm drains, creeks and rivers carry floodwaters with urban runoff into local ocean, harbor and bay waters. Urban runoff may include fertilizers, road oils, litter and large amounts of bacteria from a variety of sources such as animal waste and decomposing vegetation.

The levels of bacteria can rise significantly in ocean and bay waters close to discharging storm drains and outlets of creeks, rivers and streams during and after rainstorms. To ensure that public health and safety is protected, the Ocean Water Protection Program staff advises against body-contact recreational use of ocean, harbor or bay waters where there may be contamination due to storm water carrying urban runoff. The elevated bacterial levels in ocean, harbor and bay waters may continue for a period of at least three days depending on the intensity of the rain and the volume of runoff.

Swimmers, surfers and divers should avoid body-contact recreation with Orange County's ocean, harbor and bay waters during and after a rainstorm event and all beach users should avoid contact with any storm drain or creek runoff on the beach during dry or wet weather conditions.

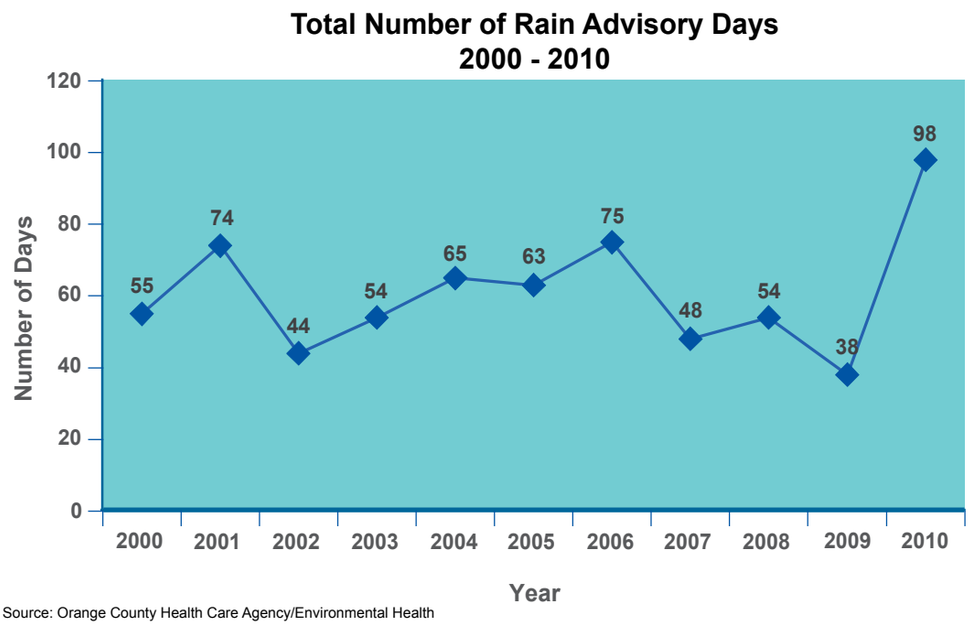
The Ocean Water Protection Program issues a Rain Advisory during or immediately after a rainstorm event that results in measured rainfall greater than or equal to two-tenths of an inch (0.20"). If multiple rainstorm events occur during the 72-hour window of the previous rainstorm, the existing rain advisory continues for an additional 72 hours. Rain advisory information is provided by issuing a Rain Advisory Press Release to media outlets and on the Ocean, Harbor and Bay Water Closure and Posting Hotline at (714) 433-6400, web page at www.ocbeachinfo.com, and by Twitter at http://twitter.com/ocbeachinfo.

OC experienced the highest number of rain advisory days on record.

"The Wedge"
Newport Beach

Total Number of Rain Advisory Days 2000 - 2010

The following graph depicts the total number of rain advisory days issued for ocean, harbor and bay waters from 2000 - 2010. In 2010, Orange County experienced the highest number of rain advisory days on record.

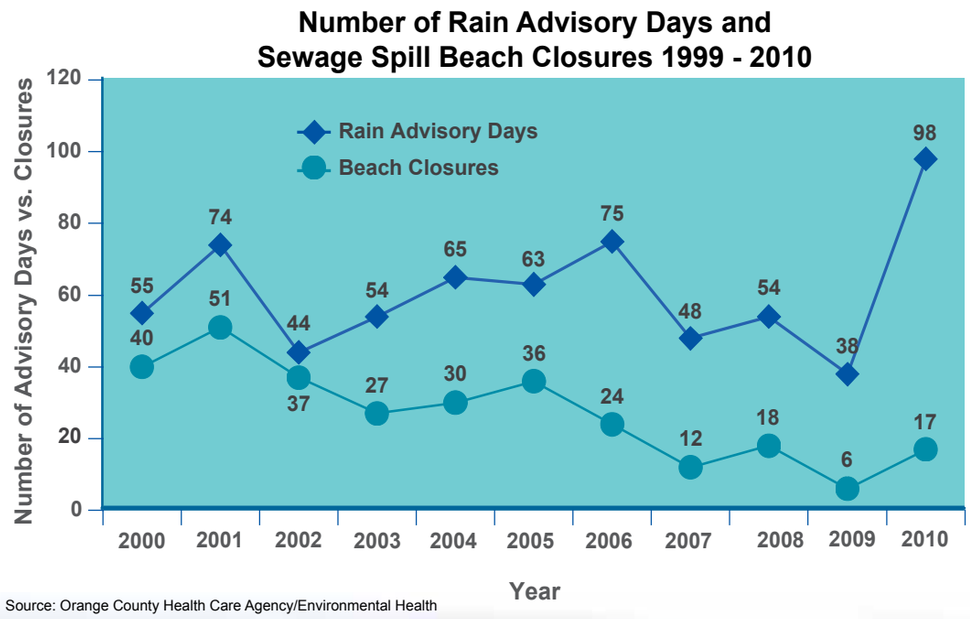


Source: Orange County Health Care Agency/Environmental Health

Dana Harbor Sunrise

Number of Rain Advisory Days and Sewage Spill Beach Closures 2000 - 2010

The following graph depicts the total number of rain advisory days issued for ocean, harbor and bay waters and the total number of sewage spill beach closures from 2000 - 2010. Although Orange County experienced its highest number of storm related rain advisory days in 2010, the total number of sewage spill beach closures for the year was the third lowest on record from 2000 – 2010.



Source: Orange County Health Care Agency/Environmental Health

Ocean, Harbor and Bay Rain Advisories 2000 - 2010

Listed below are the total number of rain advisory days for each year and the dates that the ocean, harbor and bay water rain advisories were in effect for Orange County from 2000 - 2010.

YEAR 2000 (55 Total Rain Advisory Days)
January 25 – February 2
February 10 – February 16
February 17 – February 27
February 28 – March 13
April 17 – April 23
September 23 – September 25
October 11 – October 15
October 27 – November 22

YEAR 2001 (74 Total Rain Advisory Days)
January 8 – January 16
January 24 – January 31
February 10 – February 16
February 20 – March 13
April 7 – April 13
April 21 – April 24
November 12 – November 16
November 24 – November 27
November 29 – December 6
December 14 – December 18
December 21 – December 25
December 30 – December 31

YEAR 2002 (44 Total Rain Advisory Days)
January 1 – January 3
January 28 – February 1
February 17 – February 21
March 7 – March 11
March 18 – March 21
March 23 – March 27
November 8 – November 13
November 30 – December 3
December 16 – December 31

YEAR 2003 (54 Total Rain Advisory Days)
January 1 – January 2
January 8 – January 12
February 11 – February 17
February 25 – March 2
March 15 – March 19
April 14 – April 18
May 3 – May 7
July 30 – August 3
November 1 – November 7
November 13 – November 19
December 8 – December 11
December 15 – December 18
December 25 – December 28

YEAR 2004 (65 Total Rain Advisory Days)
January 2 – January 6
February 3 – February 6
February 18 – March 6
April 2 – April 5
April 17 – April 20
October 17 – October 24
October 26 – November 1
November 8 – November 12
November 21 – November 25
November 27 – December 1
December 5 – December 12
December 28 – December 31

YEAR 2005 (63 Total Rain Advisory Days)
January 1 – January 18
January 28 – January 31
February 11 – February 28
March 5 – March 8
March 19 – March 26
April 22 – May 1
May 6 – May 10
September 20 – September 24
October 17 – October 21
November 10 – November 14
December 31

YEAR 2006 (75 Total Rain Advisory Days)
January 1 – January 6
February 18 – February 23
February 27 – March 24
March 28 – April 9
April 14 – April 18
April 23 – April 26
May 22 – May 25
October 14 – October 17
December 10 – December 14
December 17 – December 21
December 22 – December 25
December 27 – December 31

YEAR 2007 (48 Total Rain Advisory Days)
January 31 – February 6
February 11 – February 16
February 19 – February 26
February 27 – March 2
March 21 – March 23
April 20 – April 25
September 22 – September 25
October 13 – October 16
November 30 – December 4
December 7 – December 12
December 19 – December 24

Ocean, Harbor and Bay Rain Advisories 2000 - 2010

YEAR 2008 (54 Total Rain Advisory Days)
January 4 – January 10
January 22 – February 1
February 3 – February 6
February 14 – February 17
February 21 – February 27
May 22 – May 27
November 4 – November 7
November 26 – December 1
December 15 – December 28

YEAR 2009 (38 Total Rain Advisory Days)
January 23 – January 27
February 5 – February 21
March 5 – March 8
October 14 – October 17
December 7 – December 16
December 22 – December 25

YEAR 2010 (98 Total Rain Advisory Days)
January 18 – January 30
February 5 – February 13
February 20 - March 10
April 5 – April 8
April 12 – April 15
April 22 – April 25
April 28 – May 1
October 5 – October 10
October 19 – October 24
October 25 – November 2
November 8 – November 11
November 20 – November 27
November 28 – December 1
December 6 – December 9
December 17 – December 31

From April 1, 2010 to October 31, 2010, a total of 4,740 ocean water samples were collected … Only 130 of the samples collected exceeded State bacteriological standards.

Airborne Body Surfer
Newport Beach

APPENDIX 1

Postings by Open Coastal Ocean Water Areas 2000 – 2010

The following tables and graphs provide monitoring information from April 1 to October 31 for each of Orange County's open coastal ocean water areas and is arranged in geographical order from north to south. The appendix information provided for each open coastal ocean water area includes:

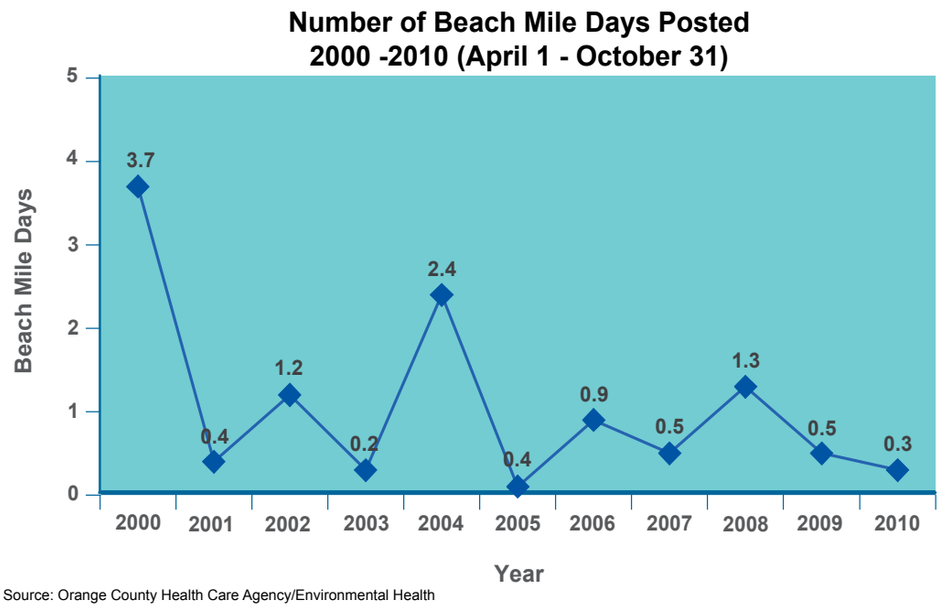
- Sampling agency, sampling frequency, sampling locations and number of beach miles;
- Total number of posted warnings, total number of posted warning days and total number of Beach Mile Days that were posted due to AB411 standards violations;
- A trend graph depicting the total number of Beach Mile Days that the open coastal water area was posted from 2000 – 2010; and
- The dry weather AB411 single sample standard compliance rate at each open coastal ocean water sampling location for the 6-year period from 2005 – 2010.

Lifeguard Tryouts
Newport Beach

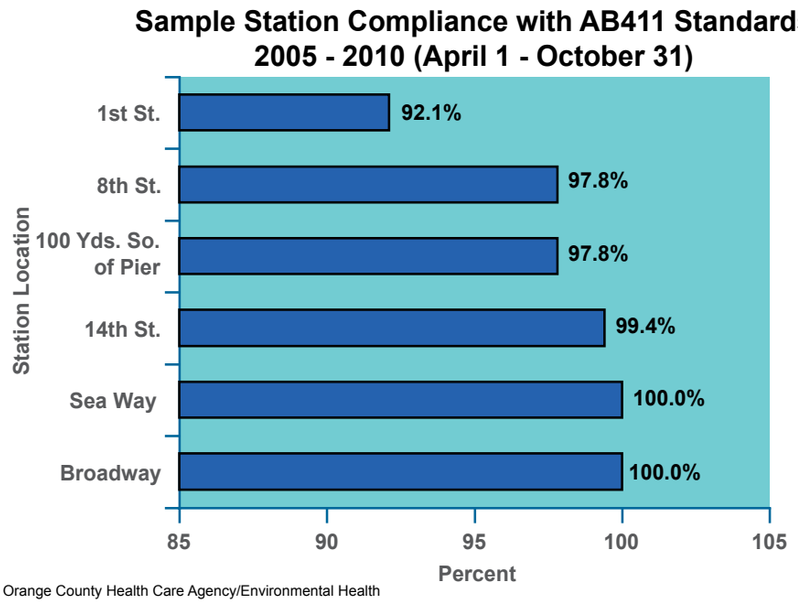
• SEAL BEACH / SURFSIDE / SUNSET BEACH

Sampling Agency: HCA Environmental Health
Sampling Frequency: 1 sample per week
Sampling Locations: 1st Street, 8th Street, 100 yards south of Pier, 14th Street, Sea Way, Broadway
Beach Miles: 3.0 miles of open coastal beach

Number of Posted Warnings, Posting Days and Beach Mile Days (April 1 – October 31)			
Year	Posted Warnings	Posting Days	Beach Mile Days
2000	6	47	3.7
2001	3	6	0.4
2002	5	22	1.2
2003	3	5	0.3
2004	3	18	2.4
2005	1	2	0.1
2006	8	15	0.9
2007	2	8	0.5
2008	4	8	1.3
2009	4	8	0.5
2010	2	5	0.3



Source: Orange County Health Care Agency/Environmental Health

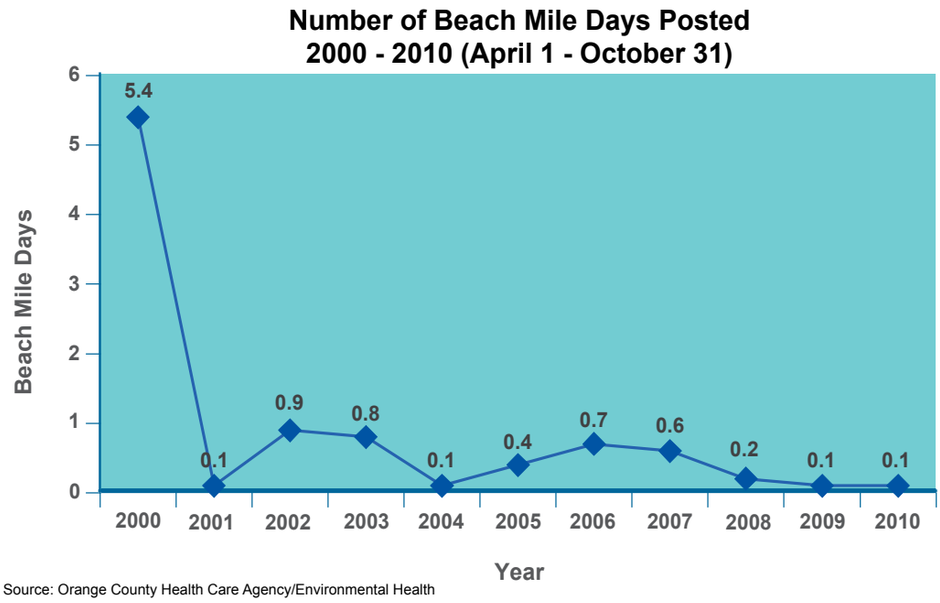


Source: Orange County Health Care Agency/Environmental Health

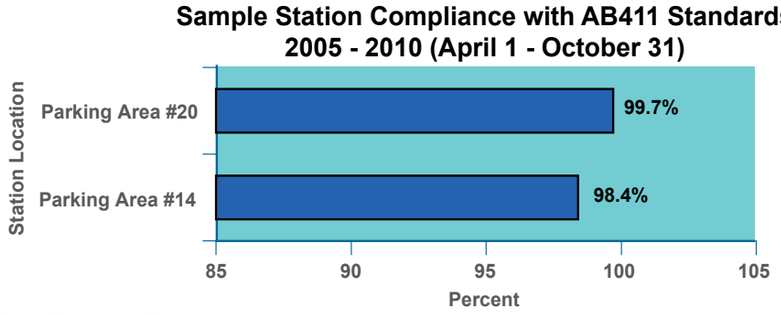
• BOLSA CHICA STATE BEACH

Sampling Agency: Orange County Sanitation District
Sampling Frequency: 5 samples per week
Sampling Locations: Parking Area #20, Parking Area #14
Beach Miles: 2.8 miles of open coastal beach

Number of Posted Warnings, Posting Days and Beach Mile Days (April 1 – October 31)			
Year	Posted Warnings	Posting Days	Beach Mile Days
2000	6	12	5.4
2001	1	1	0.1
2002	7	11	0.9
2003	8	14	0.8
2004	1	1	0.1
2005	4	7	0.4
2006	7	13	0.7
2007	3	6	0.6
2008	2	2	0.2
2009	1	1	0.1
2010	1	1	0.1



Source: Orange County Health Care Agency/Environmental Health



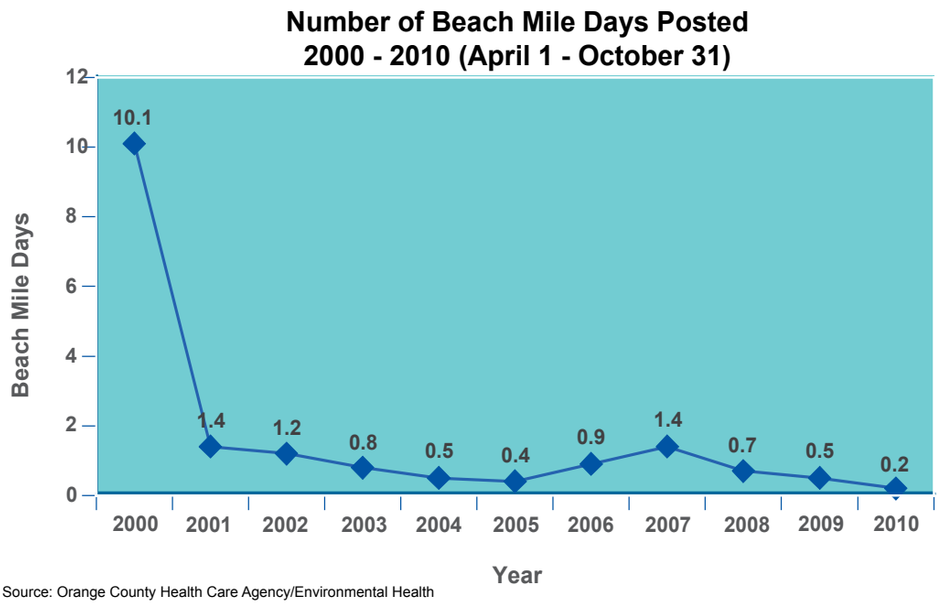
Source: Orange County Health Care Agency/Environmental Health

Bolsa Chica State Beach, Huntington Beach

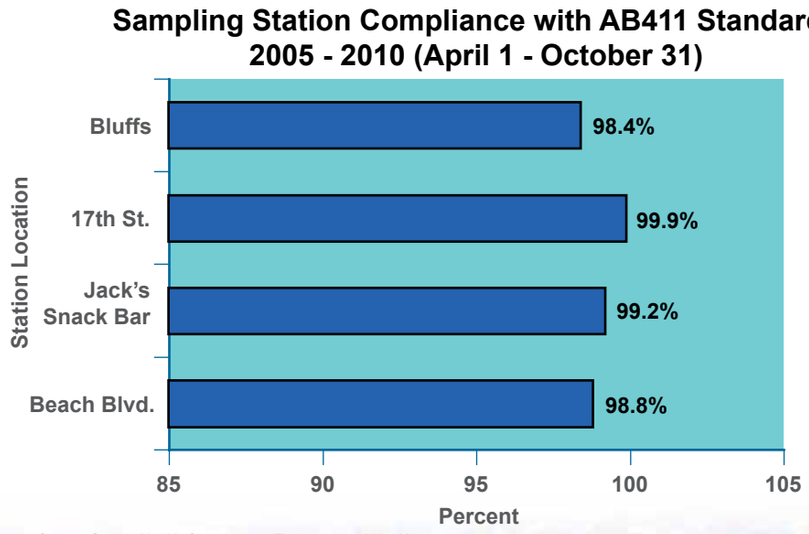
• HUNTINGTON CITY BEACH

Sampling Agency: Orange County Sanitation District
Sampling Frequency: 5 samples per week
Sampling Locations: Bluffs (Dog Beach), 17th Street, Jack's Snack Bar (Huntington Street), Beach Blvd.
Beach Miles: 3.5 miles of open coastal beach

Number of Posted Warnings, Posting Days and Beach Mile Days (April 1 – October 31)			
Year	Posted Warnings	Posting Days	Beach Mile Days
2000	6	10	10.1
2001	10	16	1.4
2002	7	14	1.2
2003	7	12	0.8
2004	4	8	0.5
2005	3	7	0.4
2006	4	6	0.9
2007	10	18	1.4
2008	7	9	0.7
2009	5	7	0.5
2010	3	3	0.2



Source: Orange County Health Care Agency/Environmental Health



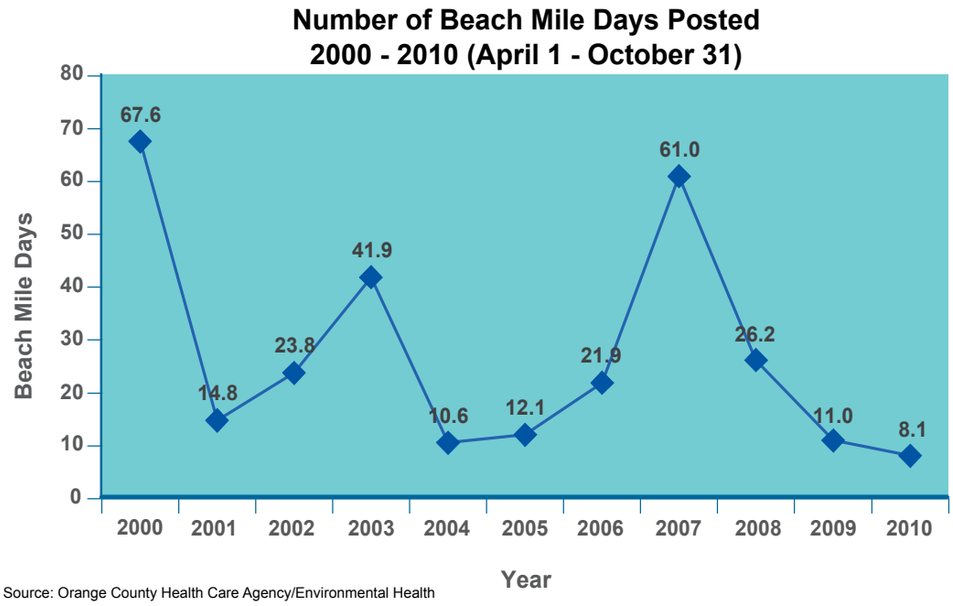
Source: Orange County Health Care Agency/Environmental Health

Huntington City Beach

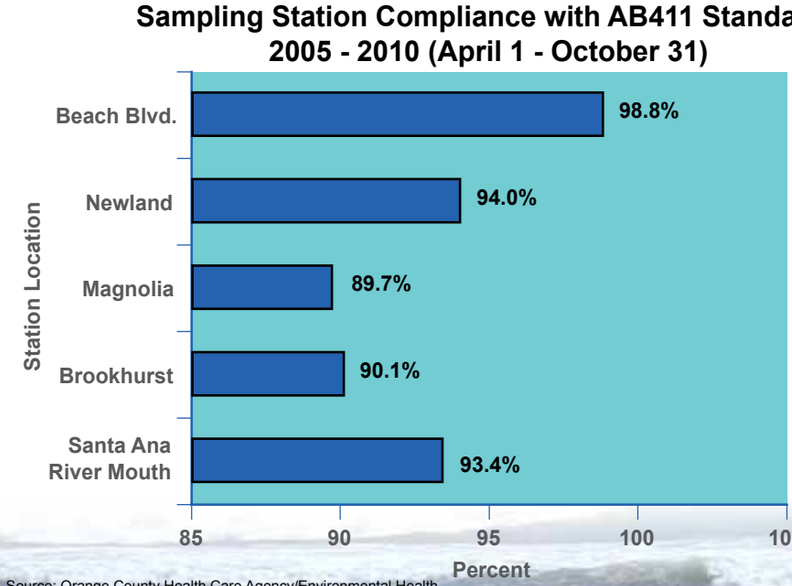
• HUNTINGTON STATE BEACH

Sampling Agency: Orange County Sanitation District
Sampling Frequency: 5 samples per week
Sampling Locations: Beach Blvd., Newland Street, Magnolia Street, Brookhurst Street, Santa Ana River Mouth Beach
Beach Miles: 2.5 miles of open coastal beach

Number of Posted Warnings, Posting Days and Beach Mile Days (April 1 – October 31)			
Year	Posted Warnings	Posting Days	Beach Mile Days
2000	28	223	67.6
2001	29	70	14.8
2002	31	89	23.8
2003	21	72	41.9
2004	23	55	10.6
2005	14	55	12.1
2006	34	92	21.9
2007	27	112	61.0
2008	28	78	26.2
2009	23	32	11.0
2010	11	27	8.1



Source: Orange County Health Care Agency/Environmental Health

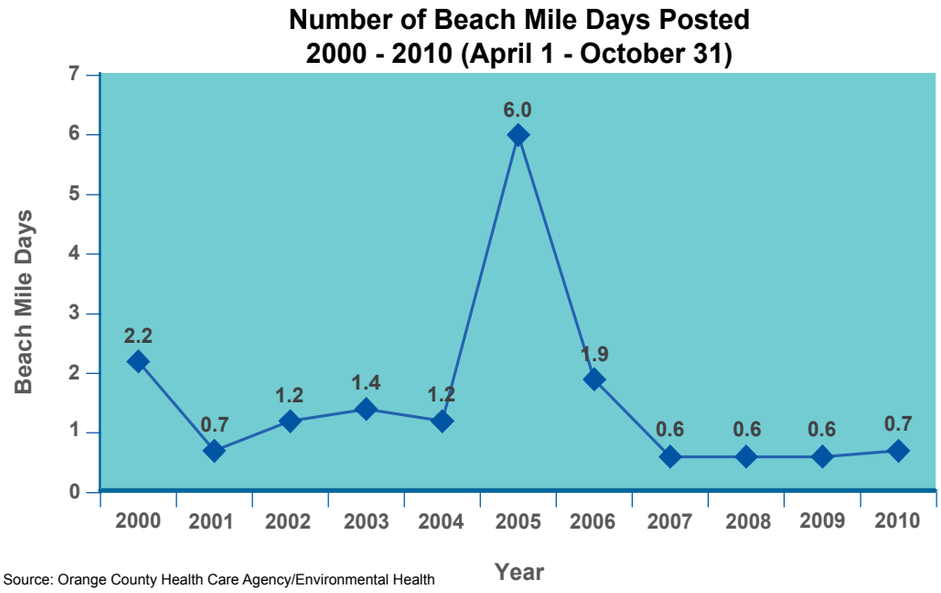


Source: Orange County Health Care Agency/Environmental Health

• NEWPORT BEACH

Sampling Agency: Orange County Sanitation District
Sampling Frequency: 5 samples per week
Sampling Locations: Orange St., 52nd/53rd St., 38th St., 15th/16th St. Balboa Pier, The Wedge, Corona Del Mar State Beach, Little Corona
Beach Miles: 7.0 miles of open coastal beach

Number of Posted Warnings, Posting Days and Beach Mile Days (April 1 – October 31)			
Year	Posted Warnings	Posting Days	Beach Mile Days
2000	8	18	2.2
2001	8	13	0.7
2002	10	17	1.2
2003	14	23	1.4
2004	12	18	1.2
2005	6	21	6.0
2006	6	10	1.9
2007	8	10	0.6
2008	6	11	0.6
2009	3	10	0.6
2010	11	11	0.7



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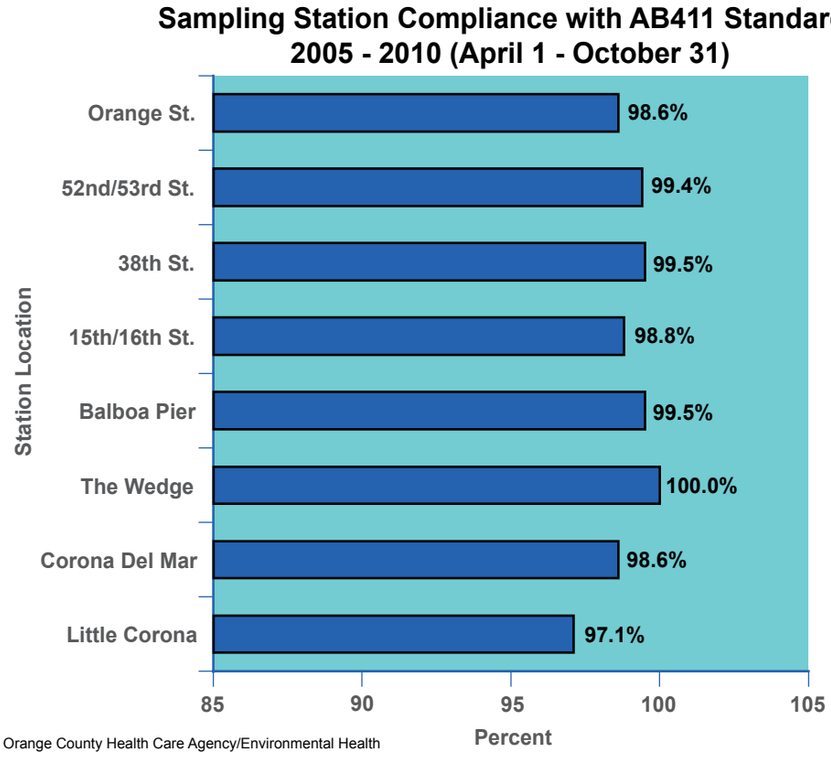
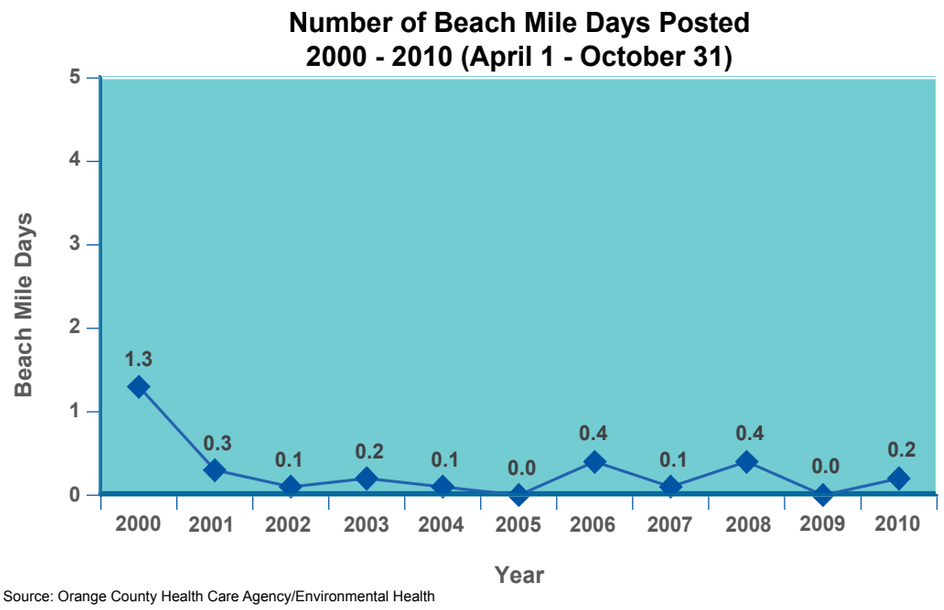


Source: Orange County Health Care Agency/Environmental Health

• CRYSTAL COVE STATE BEACH

Sampling Agency: HCA Environmental Health, Orange County Sanitation District
Sampling Frequency: 1 or 5 samples per week
Sampling Locations: Pelican Point Beach, Crystal Cove Beach, Muddy Beach (Reef Point), El Moro Beach
Beach Miles: 3.2 miles of open coastal beach

Number of Posted Warnings, Posting Days and Beach Mile Days (April 1 – October 31)			
Year	Posted Warnings	Posting Days	Beach Mile Days
2000	9	21	1.3
2001	3	5	0.3
2002	1	1	0.1
2003	1	4	0.2
2004	1	2	0.1
2005	0	0	0.0
2006	1	2	0.4
2007	1	1	0.1
2008	1	2	0.4
2009	0	0	0.0
2010	2	3	0.2



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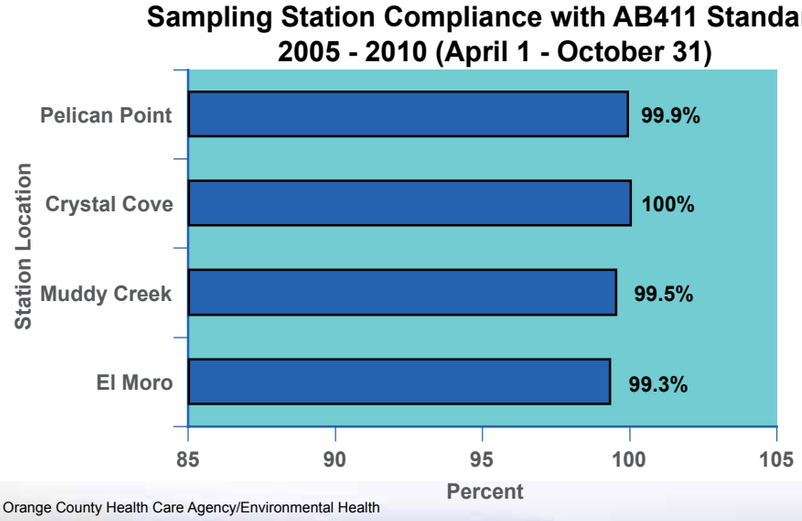


Source: Orange County Health Care Agency/Environmental Health

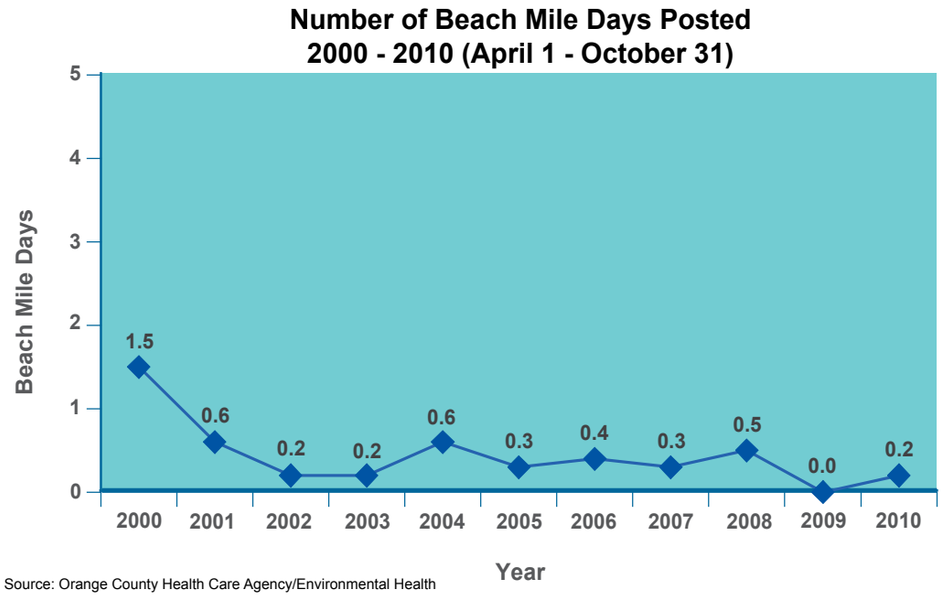
Crystal Cove State Beach

• LAGUNA BEACH

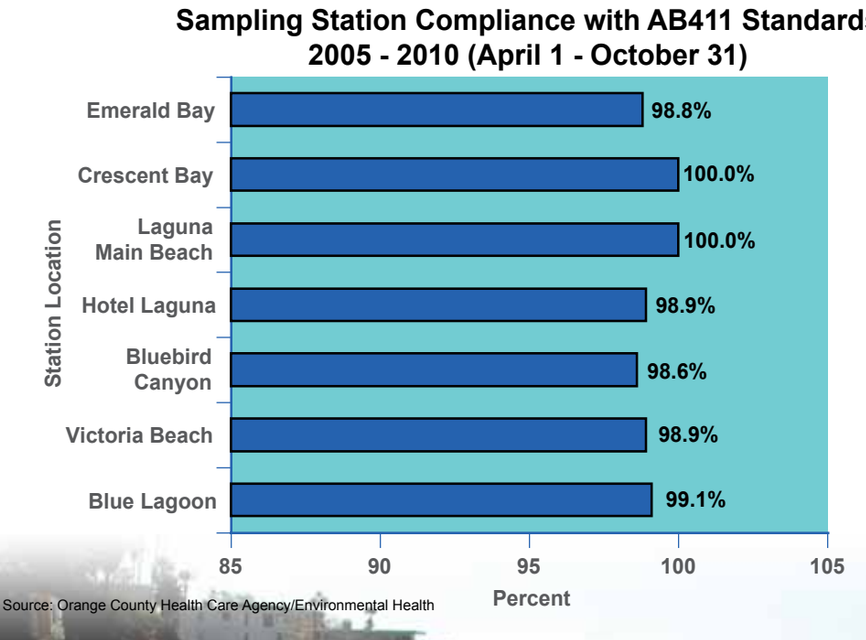
Sampling Agency: HCA Environmental Health, South Orange County Wastewater Authority
Sampling Frequency: 1 or 2 samples per week
Sampling Locations: Emerald Bay, Crescent Bay, Laguna Main Beach, Hotel Laguna, Bluebird Canyon, Victoria Beach, Blue Lagoon
Beach Miles: 4.4 miles of open coastal beach

Number of Posted Warnings, Posting Days and Beach Mile Days (April 1 – October 31)

Year	Posted Warnings	Posting Days	Beach Mile Days
2000	15	34	1.9
2001	5	10	0.6
2002	3	4	0.2
2003	2	4	0.2
2004	4	7	0.6
2005	3	6	0.3
2006	4	7	0.4
2007	4	5	0.3
2008	3	8	0.5
2009	0	0	0.0
2010	3	3	0.2



Source: Orange County Health Care Agency/Environmental Health



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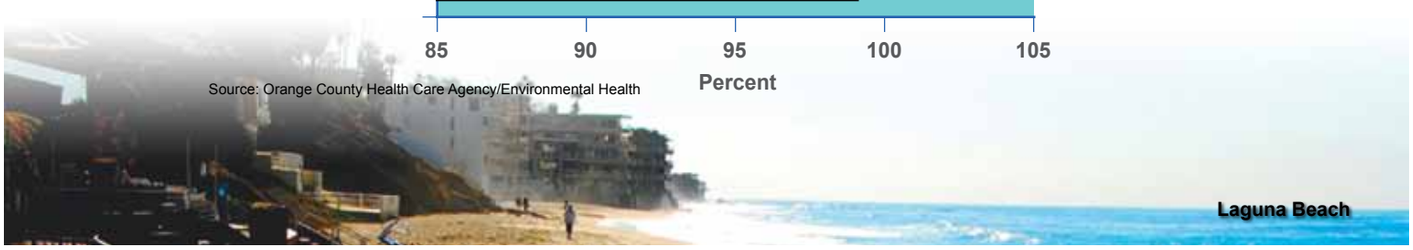


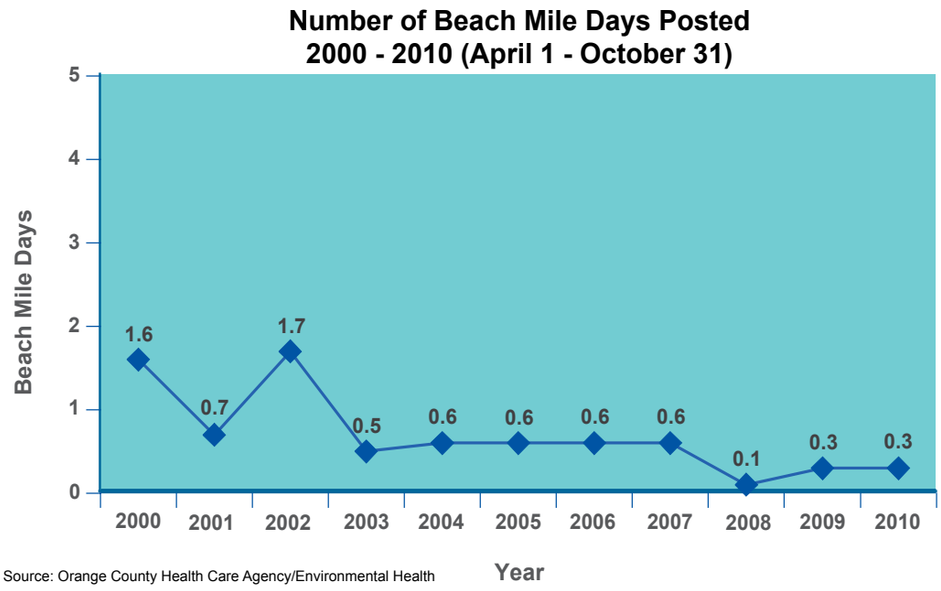
Laguna Beach

• ALISO COUNTY BEACH & SOUTH LAGUNA BEACH

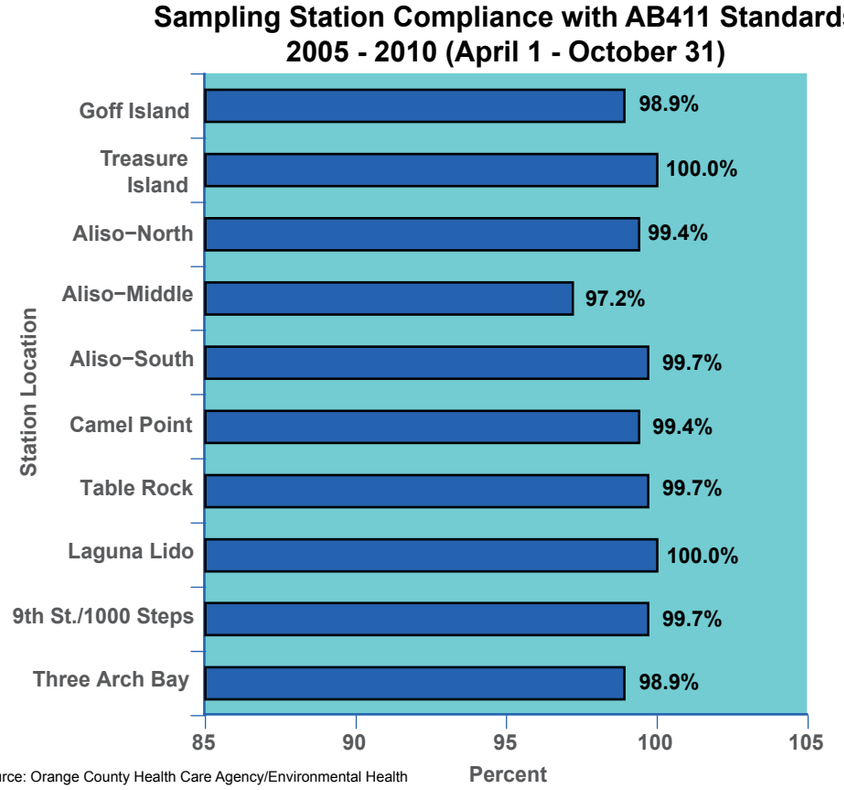
Sampling Agency: South Orange County Wastewater Authority
Sampling Frequency: 2 samples per week
Sampling Locations: Goff Island Beach, Treasure Island Beach, Aliso Beach – North, Aliso Beach – Middle, Aliso Beach – South, Camel Point, Table Rock, Laguna Lido, 9th Street/1000 Steps Beach, Three Arch Bay
Beach Miles: 2.0 miles of open coastal beach

Number of Posted Warnings, Posting Days and Beach Mile Days (April 1 – October 31)

Year	Posted Warnings	Posting Days	Beach Mile Days
2000	12	22	1.6
2001	4	5	0.7
2002	4	9	1.7
2003	5	9	0.5
2004	4	6	0.6
2005	6	11	0.6
2006	7	11	0.6
2007	3	11	0.6
2008	1	1	0.1
2009	5	5	0.3
2010	3	6	0.3



Source: Orange County Health Care Agency/Environmental Health

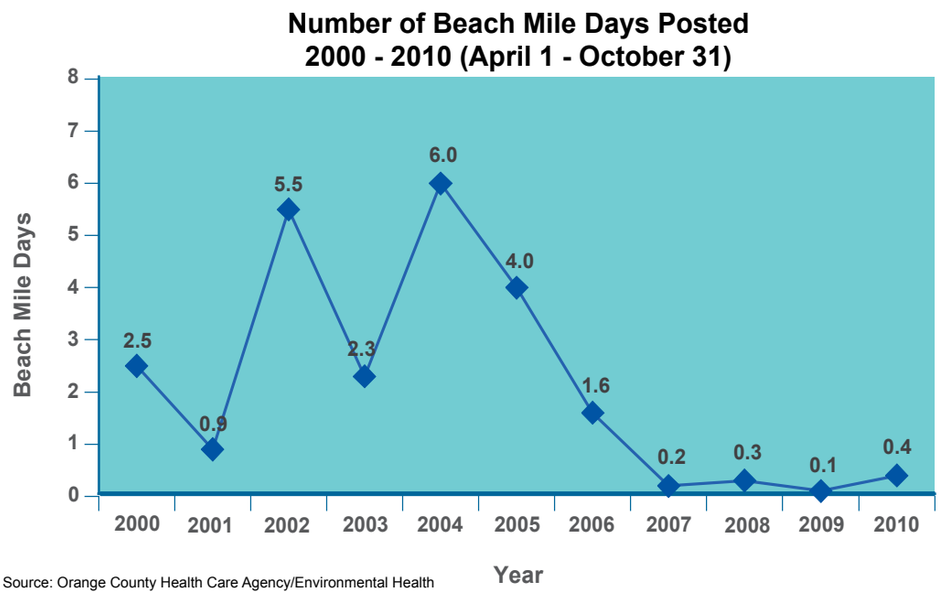


Source: Orange County Health Care Agency/Environmental Health

• DANA POINT

Sampling Agency: HCA Environmental Health, South Orange County Wastewater Authority
Sampling Frequency: 1 or 2 samples per week (season dependent)
Sampling Locations: Monarch Beach, Salt Creek County Beach, Dana Strands, Ocean Institute Beach
Beach Miles: 3.0 miles of open coastal beach

Number of Posted Warnings, Posting Days and Beach Mile Days (April 1 – October 31)			
Year	Posted Warnings	Posting Days	Beach Mile Days
2000	4	42	2.5
2001	7	13	0.9
2002	10	95	5.5
2003	6	39	2.3
2004	13	108	6.0
2005	5	63	4.0
2006	8	23	1.6
2007	2	3	0.2
2008	1	5	0.3
2009	1	7	0.1
2010	4	7	0.4



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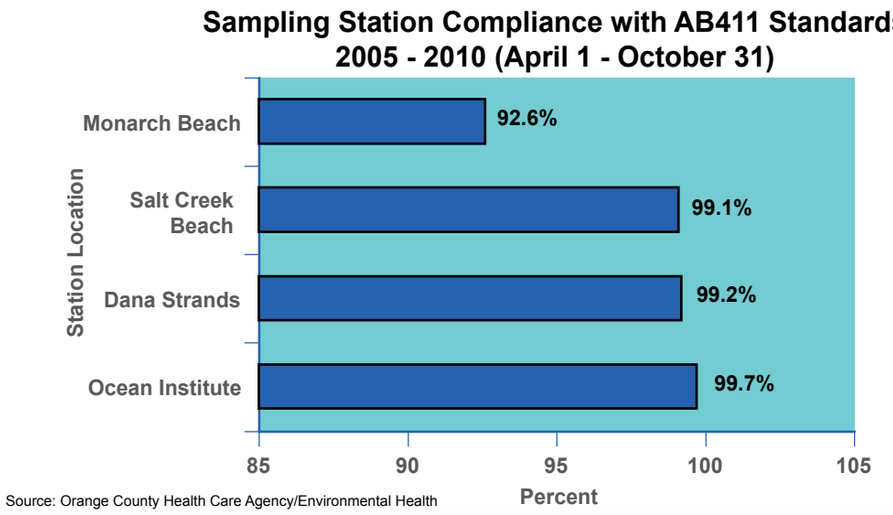


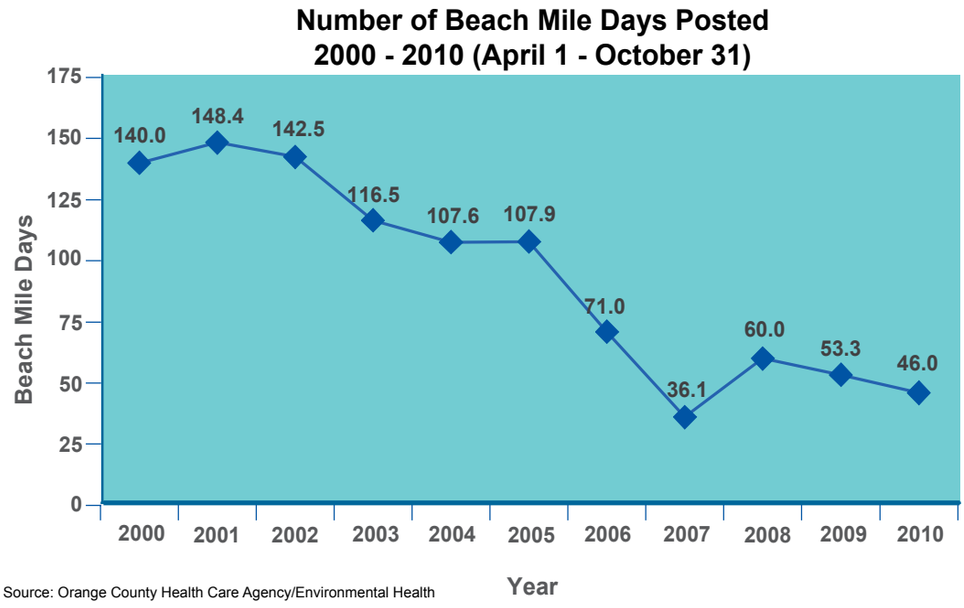
Source: Orange County Health Care Agency/Environmental Health

• DOHENY STATE BEACH

Sampling Agency: South Orange County Wastewater Authority, HCA Environmental Health
Sampling Frequency: 1 or 2 samples per week (season dependent)
Sampling Locations: North Beach, 500' North of San Juan Creek, San Juan Creek/Ocean Interface, Lifeguard Tower #9, Between Lifeguard Tower #9 & #8, Lifeguard Tower #7, Lifeguard Tower #6
Beach Miles: 1.1 miles of open coastal beach

Number of Posted Warnings, Posting Days and Beach Mile Days (April 1 – October 31)

Year	Posted Warnings	Posting Days	Beach Mile Days
2000	9	165	140.0
2001	5	191	148.4
2002	7	216	142.5
2003	6	207	116.5
2004	12	226	107.6
2005	3	123	107.9
2006	11	130	71.0
2007	13	180	36.1
2008	10	183	60.0
2009	11	117	53.3
2010	19	184	46.0



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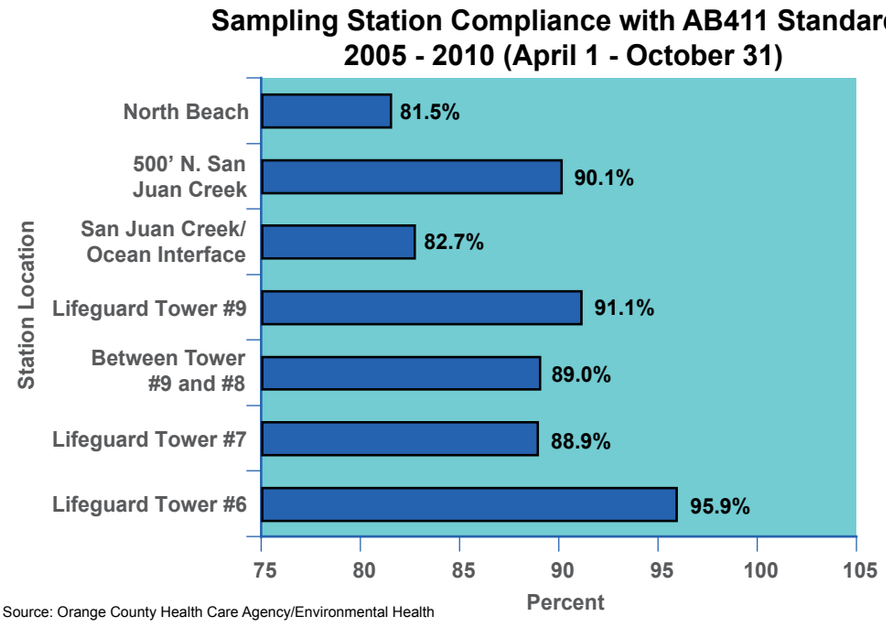
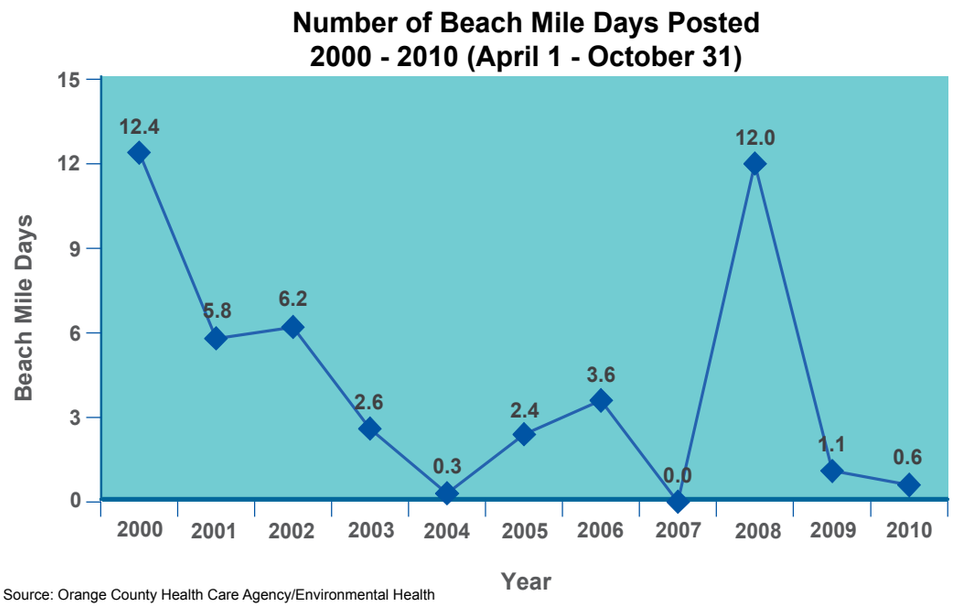


Source: Orange County Health Care Agency/Environmental Health

• CAPISTRANO COUNTY BEACH

Sampling Agency: South Orange County Wastewater Authority
Sampling Frequency: 1 or 2 samples per week (season dependent)
Sampling Locations: Capistrano County Beach
Beach Miles: 0.25 miles of open coastal beach

Number of Posted Warnings, Posting Days and Beach Mile Days (April 1 – October 31)			
Year	Posted Warnings	Posting Days	Beach Mile Days
2000	4	128	12.4
2001	5	98	5.8
2002	7	104	6.2
2003	2	11	2.6
2004	1	2	0.3
2005	4	12	2.4
2006	4	15	3.6
2007	0	0	0.0
2008	3	48	12.0
2009	3	33	1.1
2010	2	3	0.6



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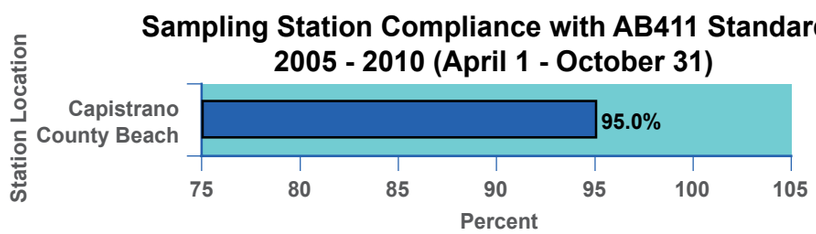


Source: Orange County Health Care Agency/Environmental Health

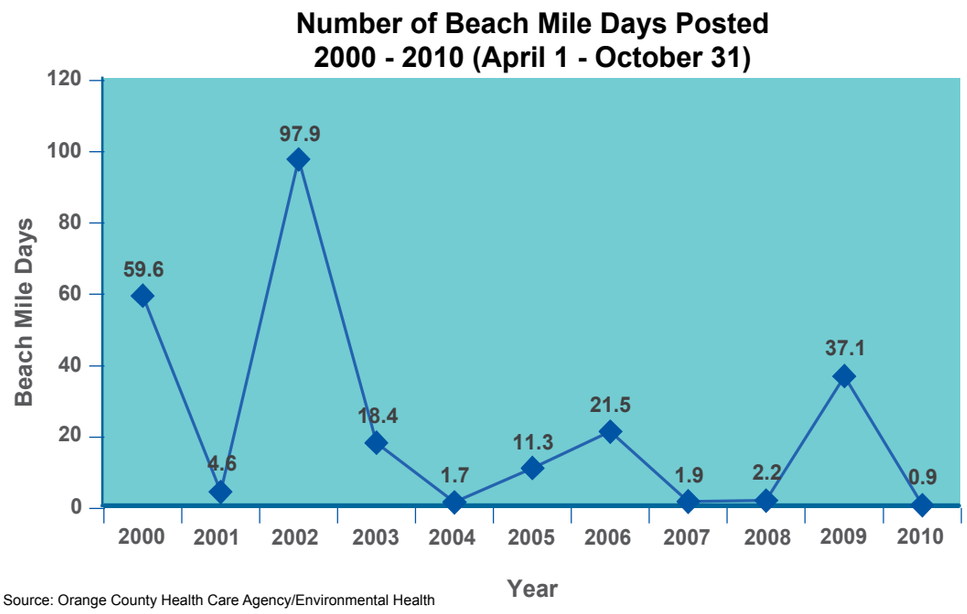
Capistrano County Beach, Dana Point

• CAPISTRANO BAY DISTRICT BEACH

Sampling Agency: South Orange County Wastewater Authority
Sampling Frequency: 1 or 2 samples per week (season dependent)
Sampling Locations: 35195 Beach Rd., 35535 Beach Rd.
Beach Miles: 1.6 miles of open coastal beach

2Number of Posted Warnings, Posting Days and Beach Mile Days (April 1 – October 31)

Year	Posted Warnings	Posting Days	Beach Mile Days
2000	2	53	59.6
2001	5	31	4.6
2002	6	77	97.9
2003	5	25	18.4
2004	3	4	1.7
2005	2	9	11.3
2006	6	20	21.5
2007	2	7	1.9
2008	6	38	2.2
2009	6	29	37.1
2010	2	16	0.9



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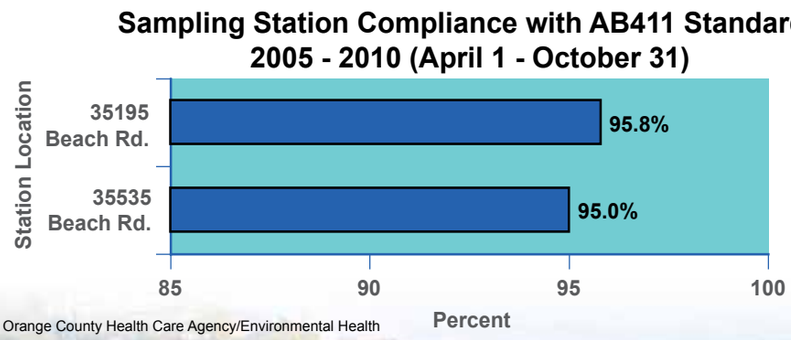


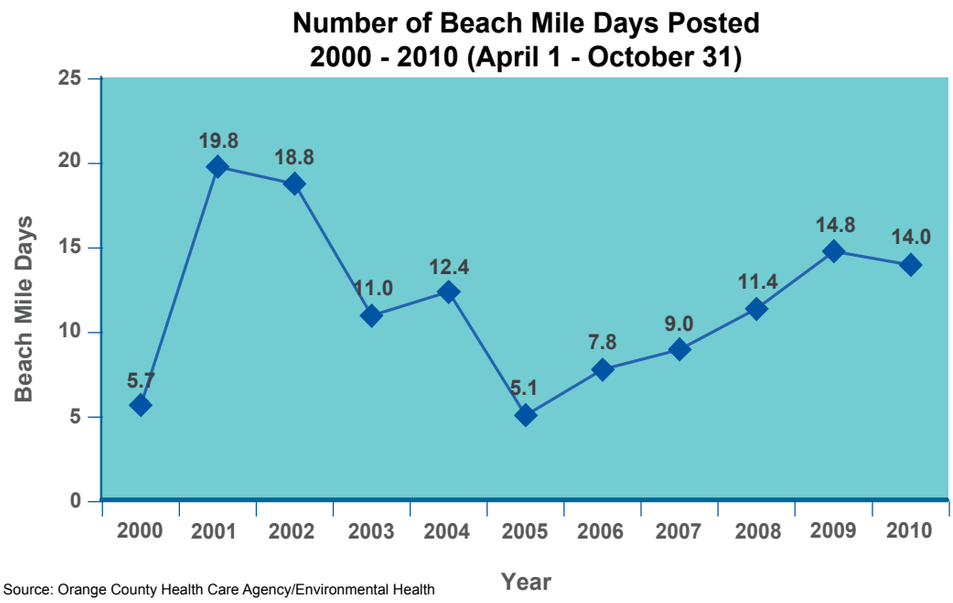
Source: Orange County Health Care Agency/Environmental Health

Capistrano Bay District Beach, Dana Point

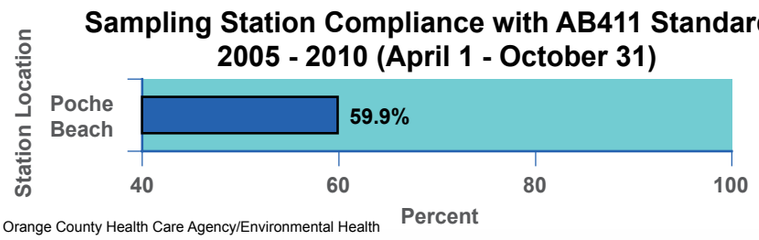
• POCHE BEACH

Sampling Agency: South Orange County Wastewater Authority
Sampling Frequency: 1 or 2 samples per week (season dependent)
Sampling Locations: Poche Beach
Beach Miles: 0.2 miles of open coastal beach

Number of Posted Warnings, Posting Days and Beach Mile Days (April 1 – October 31)			
Year	Posted Warnings	Posting Days	Beach Mile Days
2000	3	104	5.7
2001	3	145	19.8
2002	4	153	18.8
2003	7	88	11.0
2004	7	160	12.4
2005	5	68	5.1
2006	4	104	7.8
2007	2	154	9.0
2008	6	147	11.4
2009	2	184	14.8
2010	2	179	14.0



Source: Orange County Health Care Agency/Environmental Health



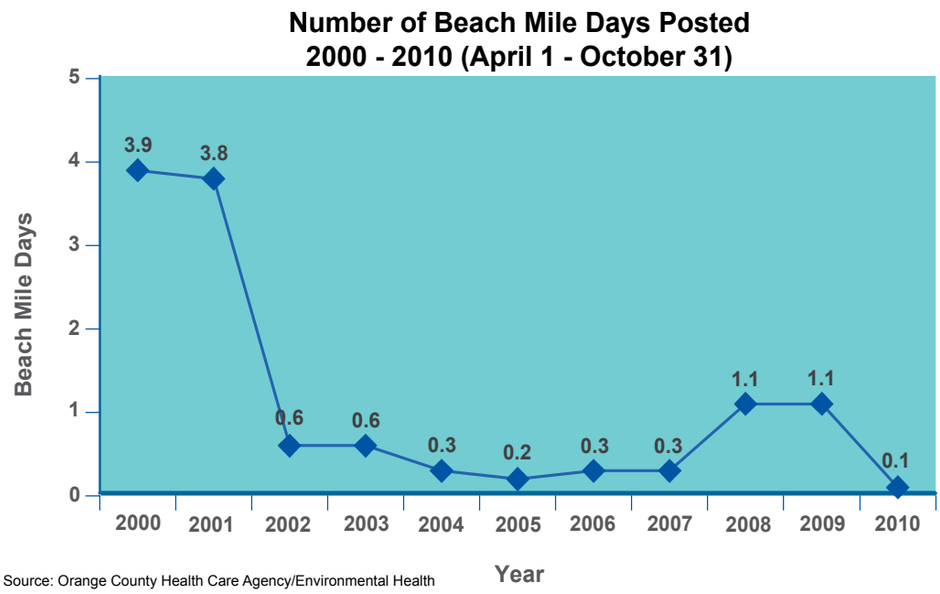
Source: Orange County Health Care Agency/Environmental Health

Poche County Beach, San Clemente

• SAN CLEMENTE CITY & STATE BEACH

Sampling Agency: South Orange County Wastewater Authority / HCA Environmental Health
Sampling Frequency: 1 or 2 samples per week (season dependent)
Sampling Locations: North Beach, 450 feet north of Pier, Trafalgar Street (“T” Street), Avenida Califia, Avenida de las Palmeras
Beach Miles: 3.2 miles of open coastal beach

Number of Posted Warnings, Posting Days and Beach Mile Days (April 1 – October 31)			
Year	Posted Warnings	Posting Days	Beach Mile Days
2000	5	13	3.9
2001	4	13	3.8
2002	6	10	0.6
2003	4	7	0.6
2004	2	5	0.3
2005	2	4	0.2
2006	4	6	0.3
2007	3	6	0.3
2008	6	10	1.1
2009	8	20	1.1
2010	1	2	0.1



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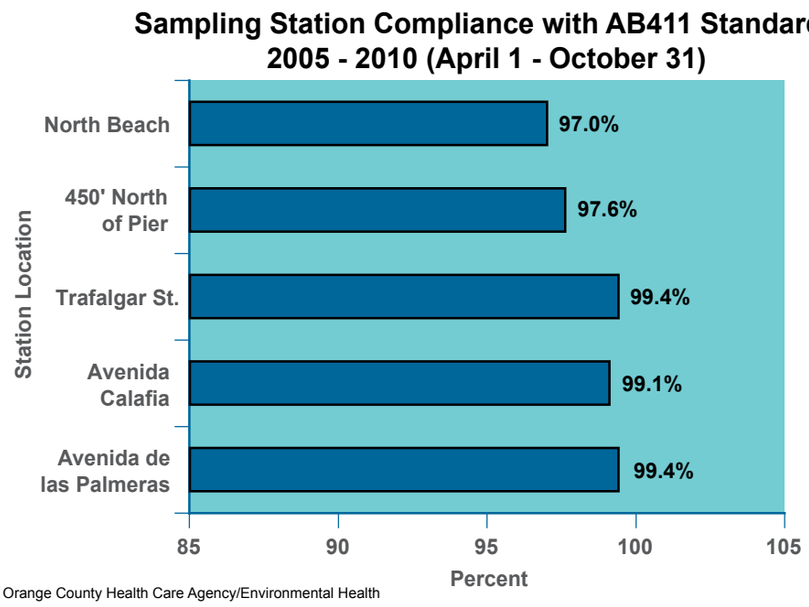


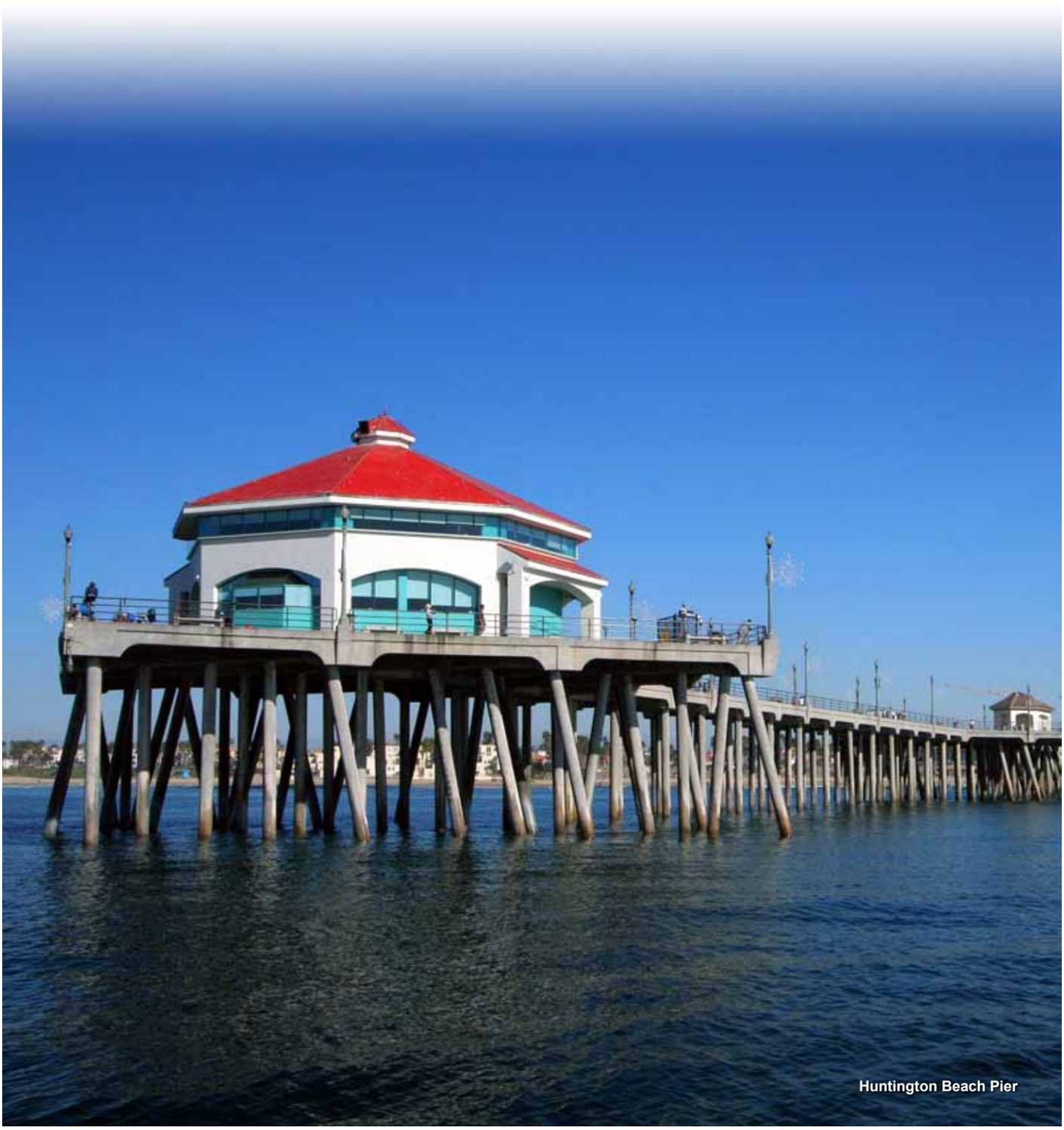
Source: Orange County Health Care Agency/Environmental Health

APPENDIX 2

Postings by Harbor and Bay Water Areas 2000 – 2010

The following tables and graphs provide monitoring information between April 1 and October 31 for each of Orange County's harbor, bay and slough water areas and is arranged in geographical order from north to south. The appendix information provided for harbor, bay and slough water area includes:

- Sampling agency, sampling frequency, sampling locations and number of beach miles;
- Total number of posted warnings, total number of warning days and total number of Beach Mile Days that were posted due to AB411 standards violations; and
- A trend graph depicting the total number of Beach Mile Days the open coastal water area was posted from 2000 – 2010.

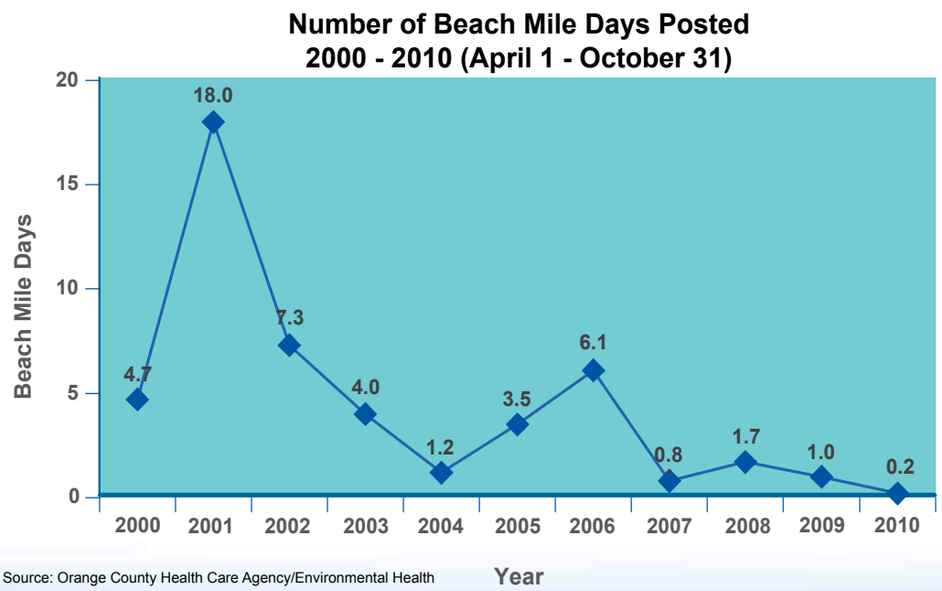


Huntington Beach Pier

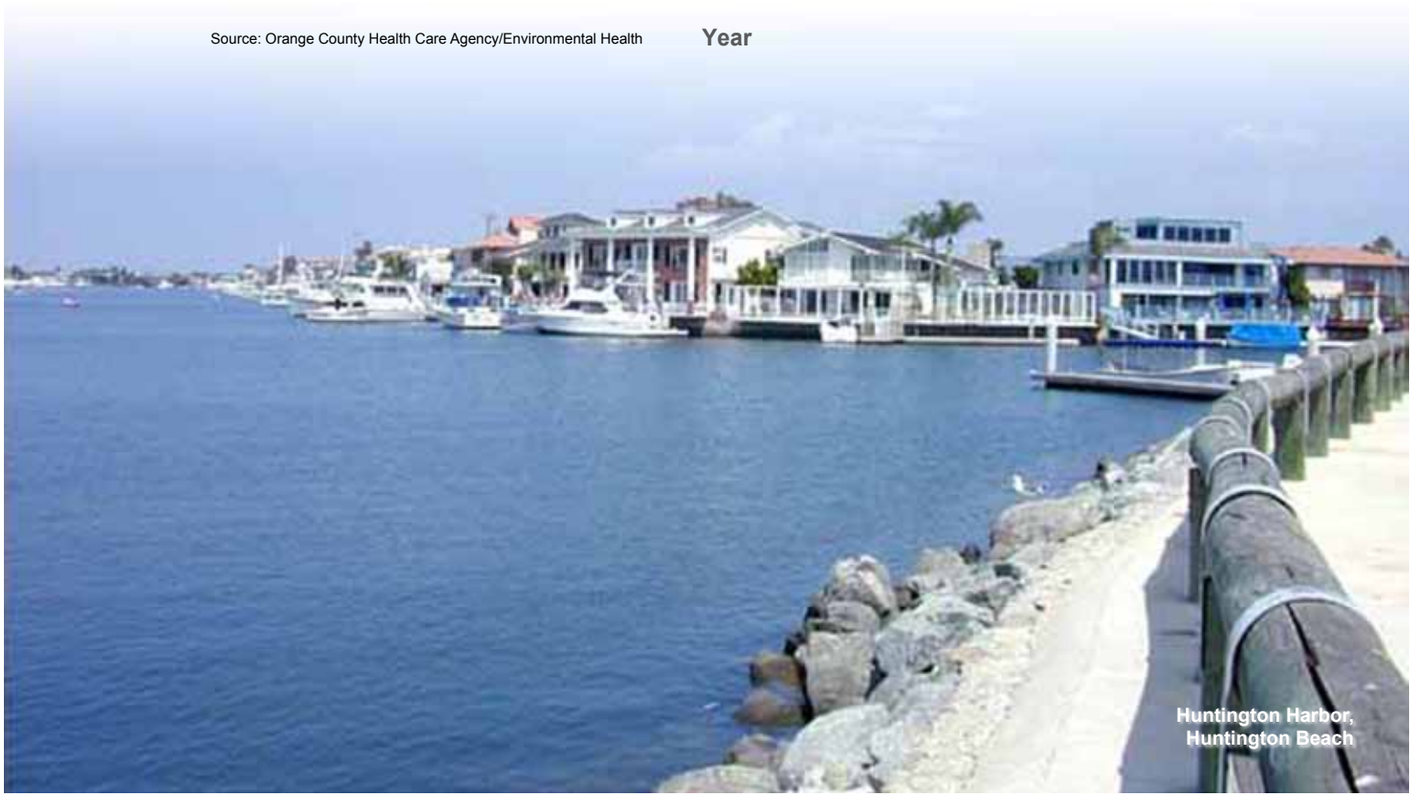
• HUNTINGTON HARBOUR

Sampling Agency: HCA Environmental Health
Sampling Frequency: 1 sample per week
Sampling Locations: Sunset Aquatic Marina, Mother's Beach, Trinidad Lane Beach, Sea Gate Lagoon, Humboldt Beach, Davenport Beach, Huntington Harbour Marina, Harbour Channel at Coral Cay, 11th Street Beach, Admiralty Drive Channel, Peter's Landing Marina, Anaheim Bay Shell Gas Dock at Mariner's Point, Coral Cay Beach, Bolsa Bay
Beach Miles: 31.1 miles of harbor frontage

Number of Posted Warnings, Posting Days and Beach Mile Days (April 1 – October 31)			
Year	Posted Warnings	Posting Days	Beach Mile Days
2000	16	100	4.7
2001	34	182	18.0
2002	24	134	7.3
2003	15	73	4.0
2004	8	31	1.2
2005	15	68	3.5
2006	21	110	6.1
2007	8	16	0.8
2008	12	34	1.7
2009	5	18	1.0
2010	4	6	0.2



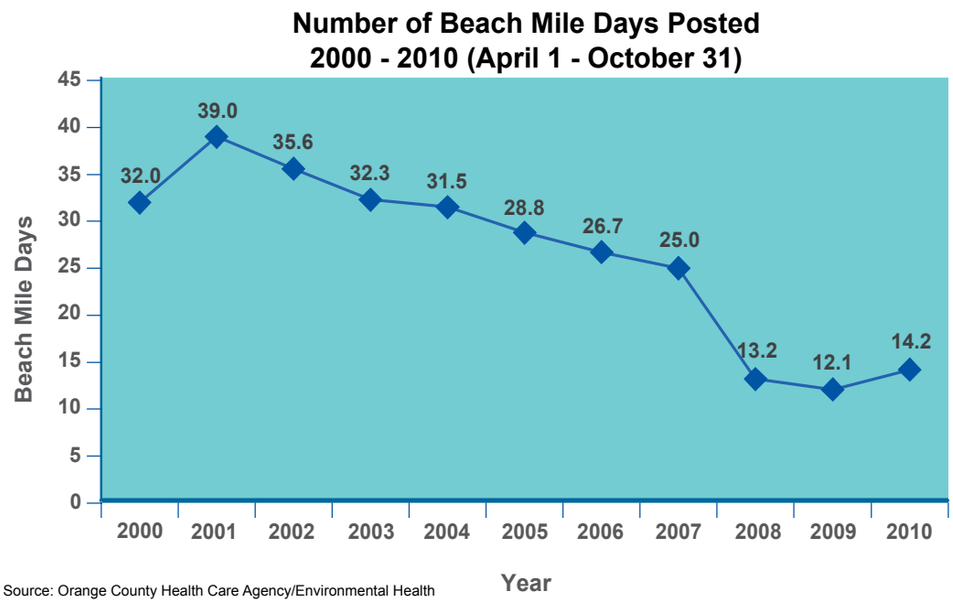
Source: Orange County Health Care Agency/Environmental Health


Huntington Harbor, Huntington Beach

• NEWPORT BAY

Sampling Agency: HCA Environmental Health
Sampling Frequency: 1 sample per week
Sampling Locations: Newport Dunes Beach (east, middle, west, north), Vaughn's Launch, Ski Zone, North Star Beach, Bayshore Beach, De Anza Launch (Pearson's Port), 43rd Street Beach, 38th Street Beach, 33rd Street Channel, Newport Blvd. Bridge Marina (Harbor Tower Marina), Lido Isle Yacht Club Beach, Via Genoa Beach, Rhine Channel,19th Street Beach, 15th Street Beach, 10th Street Beach, Alvarado/Bay Isle Beach, "N" Street Beach, Garnet Avenue Beach, Ruby Avenue Beach, Sapphire Avenue Beach, Grand Canal, Abalone Avenue Beach, Park Avenue Beach, Onyx Avenue Beach, Promontory Point Channel, Bayside Drive Beach (Harbor Patrol Beach).
Beach Miles: 39.5 miles of bay frontage

Number of Posted Warnings, Posting Days and Beach Mile Days (April 1 – October 31)			
Year	Posted Warnings	Posting Days	Beach Mile Days
2000	56	929	32.0
2001	68	931	39.0
2002	43	905	35.6
2003	40	730	32.3
2004	31	768	31.5
2005	21	719	28.8
2006	30	492	26.7
2007	18	471	25.0
2008	15	246	13.2
2009	19	213	12.1
2010	18	307	14.2

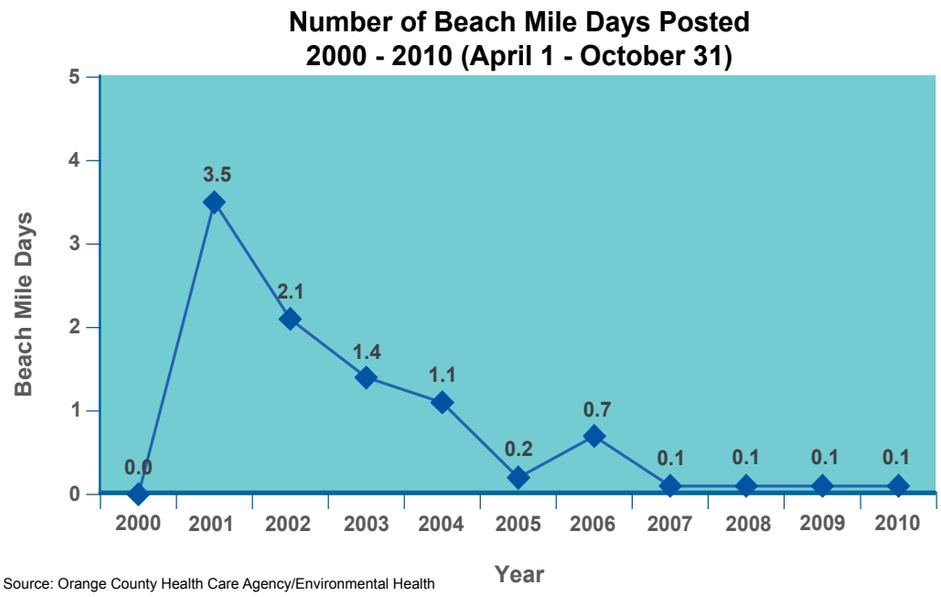


Source: Orange County Health Care Agency/Environmental Health

• NEWPORT SLOUGH

Sampling Agency: HCA Environmental Health
Sampling Frequency: 1 sample per week
Sampling Locations: Lancaster Street at 61st Street, Lancaster Street at Canal Street
Beach Miles: 0.1 miles of channel beach

Number of Posted Warnings, Posting Days and Beach Mile Days (April 1 – October 31)			
Year	**Posted Warnings**	**Posting Days**	**Beach Mile Days**
2000	N/A	N/A	N/A
2001	6	324	3.5
2002	5	181	2.1
2003	6	111	1.4
2004	3	96	1.1
2005	2	15	0.2
2006	10	61	0.7
2007	1	2	0.1
2008	4	13	0.1
2009	3	6	0.1
2010	2	6	0.1



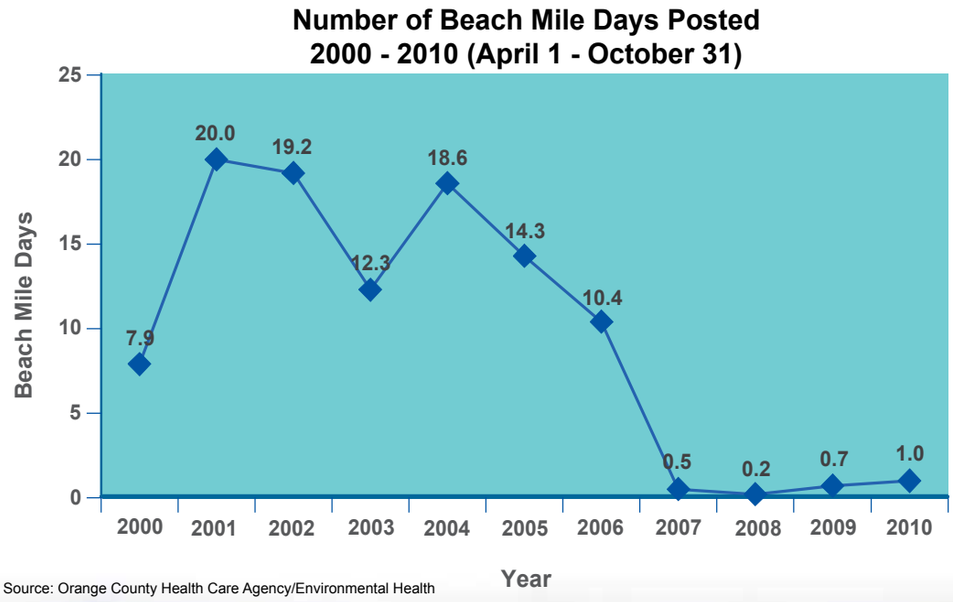
Source: Orange County Health Care Agency/Environmental Health

• DANA POINT HARBOR

Sampling Agency: HCA Environmental Health, South Orange County Wastewater Authority
Sampling Frequency: 1 sample per week
Sampling Locations: Fuel Dock, Baby Beach (west end, buoy line, swim area, east end), Pier, Pilgrim Dock, Youth Dock, Harbor Entrance, Guest Dock, Harbor Patrol Dock, "M" Dock
Beach Miles: 3.3 miles of harbor frontage

Number of Posted Warnings, Posting Days and Beach Mile Days (April 1 – October 31)

Year	Posted Warnings	Posting Days	Beach Mile Days
2000	10	206	7.9
2001	8	420	20.0
2002	9	410	19.2
2003	8	298	12.3
2004	9	362	18.6
2005	6	322	14.3
2006	14	264	10.4
2007	9	27	0.5
2008	6	13	0.2
2009	5	53	0.7
2010	12	74	1.0



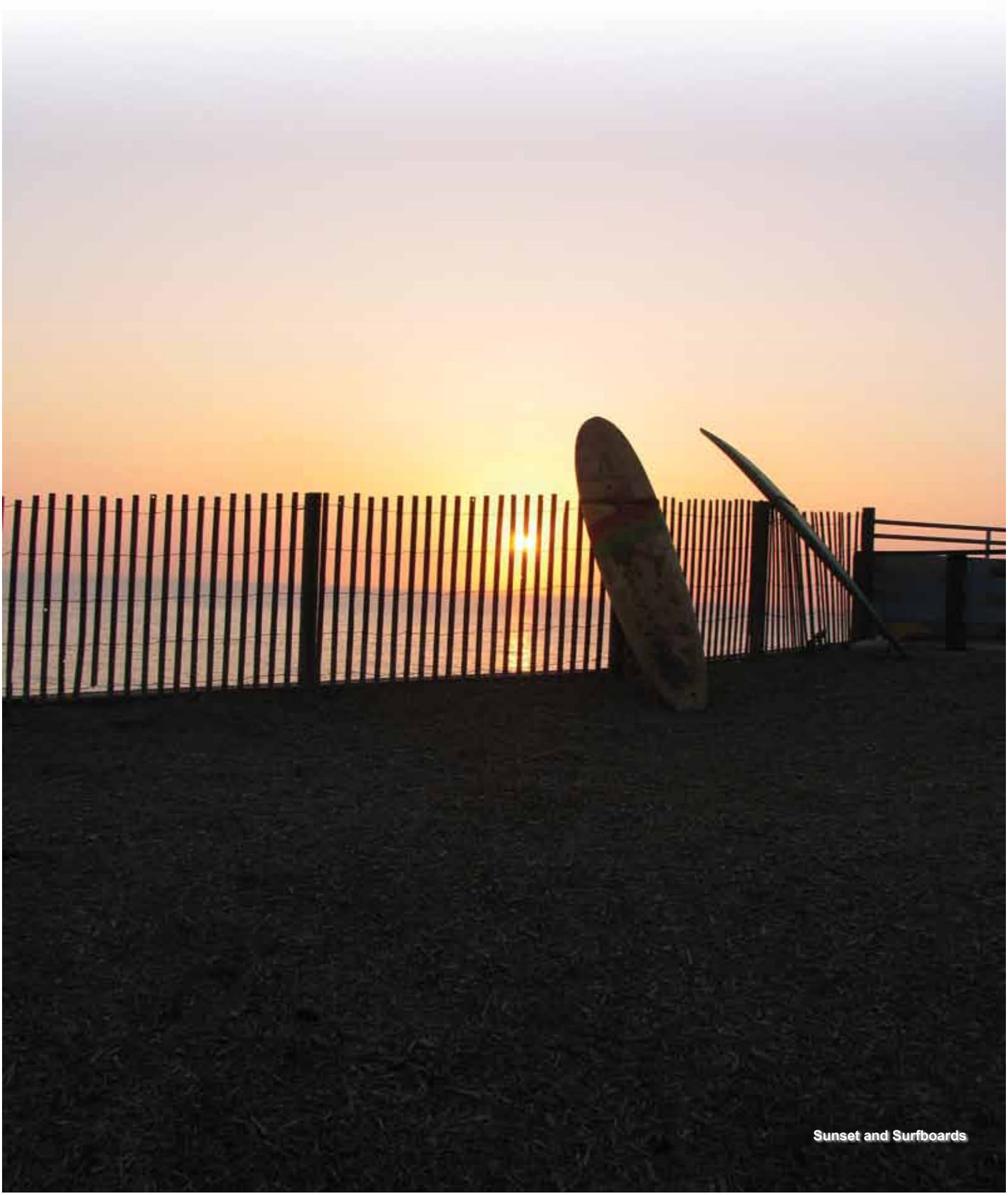
Source: Orange County Health Care Agency/Environmental Health

Dana Point Harbor, Dana Point

APPENDIX 3

Unauthorized Discharge of Waste and Ocean/Harbor/Bay Closures 1987 - 2010

The following chart, arranged by year, details the total number of unauthorized discharges of waste reported to the Health Care Agency as well as the total number of ocean, harbor and bay water closures for 1987 – 2010. The total number of unauthorized discharges of waste reported is categorized by sewage type and by waste discharge causes for each year. The total number of ocean, harbor and bay water closures is categorized by waste type and closure causes. In addition, the total number of Beach Mile Days for ocean, harbor and bay water closures from sewage spills and miscellaneous causes is shown for 1999 – 2010.



Sunset and Surfboards

Number of Unauthorized Discharges of Waste / Ocean and Bay Water Closures in Orange County 1987 – 2010

	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
WASTE DISCHARGES																								
Total Number of Discharges	63	83	59	76	101	118	97	125	120	170	226	252	276	377	412	522	534	496	480	454	394	387	321	290
By Waste Type																								
Raw Sewage	60	83	58	70	96	108	91	112	111	117	142	205	236	331	378	404	392	362	358	333	287	257	199	180
Primary Treated Effluent	0	0	1	0	0	0	1	1	0	1	1	0	0	1	0	0	0	2	0	0	0	1	2	3
Secondary Treated Effluent	0	0	0	3	3	5	0	2	3	1	10	12	2	6	9	3	6	10	9	7	6	4	6	3
Tertiary Treated Effluent	0	0	0	1	1	4	3	5	5	47	68	28	31	37	25	114	135	122	112	113	101	121	113	102
Miscellaneous	3	0	0	2	1	1	2	5	1	4	5	7	7	2	0	1	1	0	1	1	0	4	1	2
Waste Discharge Causes																								
Pipeline Breaks	16	12	13	25	11	17	21	18	20	57	61	60	38	51	60	92	133	114	128	113	94	108	90	118
Pipeline Blockages	26	42	32	34	72	86	61	89	72	65	118	139	210	288	308	409	358	329	289	277	225	215	170	135
Pump Station Failures	14	26	13	12	12	6	9	9	8	24	15	16	14	8	15	11	17	12	7	15	10	13	4	8
Treatment Plant Discharges	0	1	0	2	2	3	0	2	3	1	1	2	0	0	4	2	4	9	4	6	4	9	11	6
Stormwater Surcharges	0	0	0	0	0	1	2	0	10	0	4	14	0	1	0	3	6	2	7	3	3	3	1	11
Vessel Pump Station Failures	0	0	0	0	0	0	1	0	0	1	0	0	0	4	9	3	6	9	4	1	3	1	1	0
Miscellaneous	7	2	1	3	4	5	3	7	7	22	27	21	14	25	16	2	10	21	41	39	55	38	44	12
OCEAN AND BAY WATER CLOSURES																								
Total Number of Closures	8	12	11	10	15	15	7	17	22	21	17	35	22	40	51	38	27	30	36	24	12	18	6	17
By Waste Type																								
Raw Sewage	8	12	11	10	14	13	7	13	21	20	16	30	19	38	49	37	27	29	35	23	12	18	6	16
Primary Treated Effluent	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0
Secondary Treated Effluent	0	0	0	0	0	2	0	0	0	0	0	1	1	2	2	0	0	0	1	0	0	0	0	0
Tertiary Treated Effluent	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
Miscellaneous	0	0	0	0	1	0	0	2	1	1	0	2	2	0	0	1	0	0	0	1	0	0	0	1
Ocean and Bay Water Closure Causes																								
Pipeline Breaks	2	2	5	3	2	5	2	7	6	2	4	18	2	4	6	2	2	3	9	4	0	2	0	4
Pipeline Blockages	3	3	1	5	9	7	2	8	10	8	8	4	11	30	29	31	17	13	18	16	9	11	6	9
Pump Station Failures	3	6	5	1	3	1	1	0	3	7	4	3	5	2	6	1	1	0	2	2	0	3	0	1
Treatment Plant Discharges	0	1	0	0	0	0	0	2	0	0	0	0	1	0	1	0	0	1	1	0	0	1	0	1
Stormwater Surcharges	0	0	0	0	0	1	1	0	2	1	1	5	0	0	0	0	0	0	1	0	0	0	0	1
Vessel Pump Station Failures	0	0	0	0	0	0	1	0	0	1	0	0	0	4	9	3	6	9	4	1	3	1	0	0
Miscellaneous	0	0	0	1	1	1	0	0	1	2	0	5	3	0	0	0	1	4	1	1	0	0	0	1
Beach Mile Days of Closures																								
Due to Sewage Spills	~	~	~	~	~	~	~	~	~	~	~	~	51.0	52.0	59.1	18.5	15.1	13.5	74.0	15.3	2.0	30.2	6.3	67.5
Due to Miscellaneous Causes	~	~	~	~	~	~	~	~	~	~	~	~	105.1	0.0	0.0	11.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

~ = Data Not Available

APPENDIX 4

2010 Sewage Spill Closures for Ocean, Harbor and Bay Water Areas

The following table provides a summary of each sewage spill that resulted in an ocean, harbor or bay water closure in 2010. The table shows the closure dates, number of days closed, number of Beach Mile Days of the closure, the ocean, harbor or bay water area that was closed, the responsible agency or a private property owner (PPO) responsible for the closure, the cause of the sewage spill closure and the estimated volume of sewage spilled, recovered and released to the ocean, harbor or bay water area.

2010 Sewage Spill Closures for Ocean, Harbor and Bay Water Areas in Orange County

	Date Closed	Date Opened	Number of Days Closed	Beach Mile Days	Ocean, Harbor or Bay Area Closed	Agency/Reason	Amount Spilled*
1	1/11/10	1/13/10	2	0.11	Sunset Aquatic Marina and Portofino Cove in Huntington Harbour	PPO / line blockage (unknown)	~6,400 gallons/sewage ~4,400 gallons recovered ~2,000 gallons released
2	2/2/10	2/4/10	2	0.06	Bayside Coves in Newport Bay, Newport Beach	PPO / line blockage (grease)	~150 gallons/sewage ~100 gallons recovered ~50 gallons released
3	2/6/10	2/9/10	3	1.14	1000 feet upcoast and 1000 feet downcoast of Bluebird Canyon, Laguna Beach	City of Laguna Beach / line blockage (debris)	~400 gallons/sewage 0 gallons recovered ~400 gallons released
4	3/23/10	3/29/10	6	17.70	All of Doheny State Beach, Capistrano County Beach and Capistrano Bay Community Beach	Santa Margarita Water District / line break	~1,000,000 gallons/sewage ~400,000 gallons recovered ~600,000 gallons released
5	6/25/10	6/28/10	3	0.34	300 feet upcoast and 300 feet downcoast of Aliso Creek at Aliso County Beach in Laguna Beach	PPO / line blockage (grease)	~2400 gallons/sewage ~1200 gallons recovered ~1200 gallons released
6	7/2/10	7/5/10	3	0.17	All of Little Corona Beach, Newport Beach	Irvine Ranch Water District / line break	~26725 gallons/sewage ~5850 gallons recovered ~20875 gallons released
7	7/21/10	7/24/10	3	0.17	150 feet upcoast and 150 feet downcoast of Aliso Creek at Aliso County Beach, Laguna Beach	PPO / sewer cross connected to storm drain	~unknown gallons/sewage ~0 gallons recovered ~unknown gallons released
8	8/7/10	8/10/10	3	0.17	From the mouth of the San Gabriel River to 300 feet downcoast of the San Gabriel River, Seal Beach	City of La Habra / line blockage (rags and roots)	~1125 gallons/sewage ~0 gallons recovered ~1125 gallons released
9	9/7/10	9/9/10/	2	0.23	“F” Street downbay to “H” Street in Newport Bay, Newport Beach	City of Newport Beach / line blockage (paper)	~25 gallons/sewage ~15 gallons recovered ~10 gallons released
10	9/19/10	9/22/10	3	1.42	From the projection of Point Place downcoast to the projection of Vista Del Sol at Three Arch Bay, Laguna Beach	South Coast Water District / line blockage (unknown)	~525 gallons/sewage ~50 gallons recovered ~475 gallons released
11	9/20/10	9/22/10	2	1.00	¼ mile upcoast and ¼ mile downcoast of Salt Creek at Monarch Beach and Salt Creek County Beach, Dana Point	Moulton Niguel Water District / sewage system surcharge	~1,500 gallons/sewage ~0 gallons recovered ~1,500 gallons released
12	9/24/10	9/27/10	3	1.42	Admiralty Drive Channel from Grimaud Lane downchannel to Broadway Street, Huntington Harbour	PPO / line blockage (unknown)	~200 gallons/sewage ~0 gallons recovered ~200 gallons released
13	11/22/10	11/24/10	2	0.11	150 feet upcoast and 150 feet downcoast of Broadway Creek, Laguna Beach	PPO / line blockage (unknown)	~200 gallons/sewage ~100 gallons recovered ~100 gallons released
14	12/1/10	12/4/10	3	0.34	300 feet upcoast and 300 feet downcoast of Aliso Creek at Aliso County Beach in Laguna Beach	South Orange County Wastewater Authority / line break	~300 gallons/ sewage sludge ~0 gallons recovered ~300 gallons released
15	12/22/10	12/30/10	8	16.37	4.0 miles of ocean water area from Crescent Bay to Aliso County Beach, Laguna Beach	City of Laguna Beach / storm damage	~64,200 gallons/sewage ~0 gallons recovered ~64,200 gallons released
16	12/22/10	12/30/10	8	12.19	4.0 miles of ocean water area from Aliso County Beach to Dana Point	South Orange County Wastewater Authority / storm damage	~12,000 gallons/sewage ~0 gallons recovered ~12,000 gallons released
17	12/22/10	12/30/10	8	14.60	4.0 miles of ocean water area from Dana Point to San Clemente	Moulton Niguel Water District / storm damage	~50,000 gallons/sewage ~0 gallons recovered ~50,000 gallons released

PPO = Private Property Owner
* Amount Spilled: gallons of sewage spilled – gallons of sewage recovered = gallons of sewage released into ocean, bay or harbor.
~ All volumes are estimations based on responding sanitation district/city field staff observations and calculations.

APPENDIX 5

Single Sample Standard Exceedance Rates for Open Coastal Monitoring Locations

The following table, arranged in geographical order from north to south, provides the dry weather AB411 single sample standard exceedance rate at each Orange County open coastal monitoring location from April 1 to October 31 during the six-year period from 2005 – 2010.

Station #	Monitoring Location	% Exceed Standards	Station #	Monitoring Location	% Exceed Standards	Station #	Monitoring Location	% Exceed Standards
Seal Beach / Surfside / Sunset			**Laguna Beach**			**Capistrano Beach**		
OSB02	1st Street	7.9%	OLB10	Emerald Bay	1.2%	S-9	Capistrano County Beach	5.0%
OSB03	8th Street	2.2%	OLB05	Crescent Bay Beach	0.0%	S-11	Capistrano Bay Dist.–North	4.2%
OSB05	100 Yds South of Pier	2.2%	OLB00	Laguna Main Beach	0.0%	S-13	Capistrano Bay Dist.–South	5.0%
OSB04	14th Street	0.6%	S16	Hotel Laguna	1.1%	**San Clemente City & State Beach**		
OSB01	Sea Way	0.0%	S15	Bluebird Canyon	1.4%	S-15	Poche Beach	40.1%
OSUB1	Broadway	0.0%	S14	Victoria Beach	1.1%	S-17	North Beach	3.0%
Bolsa Chica State Beach			S13	Blue Lagoon	0.9%	S-19	450 Feet North of Pier	2.4%
39N	Parking Area #20	0.3%	S12	Goff Island Beach	1.1%	OSC01	Trafalgar “T” Street	0.6%
33N	Parking Area #14	1.6%	S11	Treasure Island Beach	0.0%	S-21	Avenida Califia	0.9%
Huntington City & State Beach			S10	Aliso Beach–North	0.6%	S-23	Las Palmeras	0.6%
27N	Bluffs	1.6%	S9	Aliso Beach–Middle	2.8%			
21N	17th Street	0.1%	S8	Aliso Beach–South	0.3%			
15N	Jacks Snack Bar	0.9%	S7	Camel Point	0.6%			
12N	Beach Blvd.	1.2%	S6	Table Rock	0.3%			
9N	Newland Street	6.0%	S5	Laguna Lido	0.0%			
6N	Magnolia Street	10.3%	S4	9th Street / 1000 Steps	0.3%			
3N	Brookhurst Street	9.9%	S3	Three Arch Bay	1.1%			
0	Santa Ana River Mouth	6.6%	**Dana Point**					
Newport Beach			OSL2	Monarch Beach	7.4%			
3S	Orange Street	1.4%	S2	Salt Creek Beach	0.9%			
6S	52nd / 53rd Street	0.6%	S1	Dana Strands	0.8%			
9S	38th Street	0.5%	S-6	Ocean Institute Beach	0.3%			
15S	15th / 16th Street	1.3%	**Doheny State Beach**					
21S	Balboa Pier	0.5%	ODB02	North Beach	18.5%			
27S	The Wedge	0.0%	S-2	500’ N. of San Juan Ck.	9.9%			
29S	Corona Del Mar Beach	1.4%	S-0	SJC / Ocean Interface	17.3%			
ONB3	Little Corona Beach	2.9%	S-1	Lifeguard Tower #9	8.9%			
Crystal Cove State Park			S-3	Between Tower #9 & #8	11.0%			
ONB35	Pelican Point	0.0%	S-5	Lifeguard Tower #7	11.1%			
39S	Pelican Point Beach	0.2%	S-7	Lifeguard Tower #6	4.1%			
ONB39	Crystal Cove Beach	0.0%						
ONB43	Muddy Creek Beach	0.5%						
ONB45	El Moro Beach	0.7%						

School of Dolphins

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Newport Beach Pier