California Beach Closure Report 2000

July 2001

DIVISION OF WATER QUALITY
STATE WATER RESOURCES CONTROL BOARD
CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

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INTRODUCTION

California Health and Safety Code Section 115910 requires local health officers to submit to the State Water Resources Control Board (SWRCB) by 15th of each month a survey documenting all beach postings and closures that occurred during the preceding calendar year due to threats to the public health. The law also requires the SWRCB to (1) make available this information to the public by 30th of each month, (2 publish a statewide annual report documenting the beach posting and closure data provided by health officers for the preceding calendar year by July 30, and (3) distribute this report to the Governor, the Legislature, major media organizations, and public within 30 days of publication of the annual report.

The SWRCB staff enters the monthly beach posting and closure data provided by the local health officers on its website (http://www.swrcb.ca.gov) for easy public access. The coastal Regional Water Quality Control Boards (RWQCBs) also post this information on their websites or link to the SWRCB's website.

This annual beach closure report contains beach posting and closure information submitted by local health officers for the year 2000. It also includes a brief description of SWRCB and RWQCBs activities to keep the beaches clean and healthy.

Significance of Beaches

Various statistics have been reported regarding the economic significance of beaches. Nationwide, beaches contribute over $640 billion (85 percent of all tourist revenues) to the United States economy annually. The U.S. Environmental Protection Agency (USEPA) estimates that Americans make a total of 910 million trips to coastal areas each year, spending about $44 billions. According to the U.S. Lifeguard Association, beach usage in California is higher than the other 49 states combined. California's coastline is one of its most important natural features. It extends over 1,000 miles from the rocky cliffs of the north coast to the sandy, sun-drenched beaches in the south. Approximately 80 percent of California's 33 million residents live within a 30-mile drive of its coastline. The coastal areas represent a desirable place to live. Millions of visitors come to see its beauty and play on the shore and in its waters. Southern California beaches attract 175 million visitors each year, who spend more than $1.5 billion during their visits. For instance, according to one estimate Mission Bay in San Diego County is visited each year by approximately three million people and creates over $25 million in revenue for the County. On a typical summer day, some of the more popular beaches attract 75,000 people. On a statewide basis, California beaches generate $17 billion per year in tourism revenue.

Increasingly the public is becoming concerned about beach closures, swimmers' illnesses, and the lack of public confidence due to the up and down nature of posting of warning signs. When a beach is closed due to contamination, the economic effect can be devastating to local business owners. Much attention has been given to the number of beach closures and warnings, especially along the southern California coast, which is a direct result of the very active beach water quality monitoring programs conducted primarily by county health agencies and municipal waste treatment facilities.

Causes of Beach Closures

Beaches are closed due to water contamination by toxic chemicals or pathogens, which can potentially impact the health of the beachgoers when they are exposed to the contaminated water through skin contact (swimming or surfing) or ingestion. Fever, flu-like symptoms, ear infection, respiratory illness, gastroenteritis, cryptosporidiosis, hepatitis, and other illnesses have been associated with waterborne pathogens. Table 1 lists a number of pathogenic bacteria, protozoa, and viruses; their observed effects on exposed population; and the diseases commonly associated with them. A 1996 epidemiological study sponsored by the Santa Monica Bay Restoration Project and partially funded by the SWRCB validated the cause and effect relationship between elevated levels of bacteria in beach water and health problems observed in exposed beachgoers. Beach closures can also result from other events, such as a leaking sewage pipe or an oil spill.

Sources of Beach Pollution

The ocean is the final deposition site for most land-based pollutants entering California's coastal watersheds. Nearshore pollution can result from dumping industrial waste, dredge spoils, agricultural and urban runoff, and municipal sewer discharges. Although this pollution has been controlled to a great extent in recent years, the increases in population and development offer a constant challenge to those agencies responsible for pollution control. As California's coastal population increases, the number and volume of discharges from industrial and municipal facilities into our coastal waters also increase.

Another primary source of coastal water pollution comes from the untreated runoff flowing from the land through storm drains and hundreds of natural stream courses. Runoff from creeks, rivers, and storm drains is a significant source of pollution to the southern California beaches. This runoff may come from roof tops, streets, yards, gardens, open spaces, parking lots, animal yards, construction sites, logging roads, and any other surface exposed to rain or snow. It collects animal waste, oil and rubber residue from cars, asbestos and metals from brake linings, pesticides, silt, and various types of vegetable matter. It may contain high bacterial counts and viruses, may be toxic to marine life, and may carry tons of garbage and silt that litter the ocean and its beaches and kill or injure marine life. Since this runoff does not come from a discrete source, such as a pipe, it is regarded as a "nonpoint source discharge." Some of these types of wastes are collected in urban storm drains. Storm drain discharges are considered "point source" under the federal Clean Water Act's Storm Water Program, and require National Pollutant Discharge Elimination System (NPDES) permits for discharges to surface waters.

SWRCB's Role

One of the SWRCB's primary responsibilities is to protect California's valuable coastal waters by controlling what goes into them. The six RWQCBs bordering the coastline also have primary responsibility for protecting coastal waters. Anyone wishing to discharge waste to the ocean from a pipe or waste facility (a "point source") must obtain an NPDES permit from the RWQCB. The RWQCBs establish monitoring programs to be conducted by the discharger as a way of measuring compliance with permit provisions. The RWQCBs currently issue NPDES permits for

Table 1. Waterborne Pathogens, Diseases they Cause, and their Effects on Exposed Population.

Pathogen		Disease	Effects
Bacteria	Escherichia coli (enteropathogenic)	Gastroenteritis	Vomiting, diarrhea, death in susceptible populations
	Legionella pneumophila	Legionellosis	Acute respiratory illness
	Leptospira	Leptospirosis	Jaundice, fever (Weil's disease)
	Salmonella typhi	Typhoid fever	High fever, diarrhea, ulceration of the small intestine
	Salmonella	Salmonellosis	Diarrhea, dehydration
	Shigella	Shigellosis	Bacillary dysentery
	Vibrio cholerae	Cholera	Extremely heavy diarrhea, dehydration
	Yersinia enterolitica	Yersinosis	Diarrhea
Protozoans	Balantidium coli	Balantidiasis	Diarrhea, dysentery
	Crytosporidium	Cryptosporidiosis	Diarrhea
	Entamoeba histolytica	Amedbiasis (amoebic dysentery)	Prolonged diarrhea with bleeding, abscesses of the liver and small intestine
	Giardia lamblia	Giardiasis	Mild to severe diarrhea, nausea, indigestion
	Naegleria fowleri	Amoebic meningoencephalitis	Fatal disease; inflammation of the brain
Viruses	Adenovirus (31 types)	Respiratory disease	
	Enterovirus (67 types, e.g., polio, echo, and Coxsackie viruses)	Gastroenteritis	Heart anomalies, meningitis
	Hepatitis A	Infectious hepatitis	Jaundice, fever
	Norwalk agent	Gastroenteritis	Vomiting, diarrhea
	Reovirus	Gastroenteritis	Vomiting, diarrhea
	Rotavirus	Gastroenteritis	Vomiting, diarrhea

discharges from municipal storm sewer systems serving a population of 100,000 or more. The SWRCB has also adopted two statewide general storm water permits for industrial and construction activities and a statewide permit to address all road construction activities of the California Department of Transportation. These permits require the storm water dischargers to implement programs to reduce and/or eliminate storm water pollution to the maximum extent possible. If nonpoint source waste causes serious pollution, the RWQCBs may work with the dischargers to require the application of measures to control the waste (known as best management practices or BMPs) and prevent pollution. If those measures are not carried out effectively, the RWQCBs may issue waste discharge permits or take enforcement action.

Beach Closure, Beach Posting (Warning Sign), and Rain Advisory

County health officers can take three discrete actions based on beach water quality monitoring data, sewage spills, and storm events. Beaches, or more precisely the ocean waters adjacent to the beaches, are posted with warning signs or are closed when certain kinds of indicator bacteria are found in the water at levels that are considered a problem. These indicator bacteria imply the potential presence of microscopic disease-causing organisms originating from human and animal wastes. Water samples are collected in the surf zone to determine if recreational waters are contaminated with indicator bacteria (total coliform, fecal coliform, and enterococci). If tests using indicator bacteria show levels above State standards (Table 2), the beach will be posted with warning signs or closure notices to notify the public of the potential health risk. The beach is reopened when further sampling confirms that the density of bacteria in water does not exceed the State standards.

A "Beach (ocean) Closure" occurs as a result of a sewage spill or **repeated** incidences of excedeences of bacterial standards from an unknown source. A closure is a notice to the public that the water is unsafe for contact and that there is a high risk of getting ill from swimming in the water. Closure occurs when health risks are considered greater than those associated with posting that some evidence of monitoring indicates a problem. A beach closure does not result in the closure of the entire beach for recreational activities. In most cases, the ocean is closed to swimming and other water contact recreation while the beach area is open for sunbathing, volleyball, and other activities that do not involve water contact.

A "Beach Warning" sign means that at least one bacterial standard has been exceeded, but there is no known source of human sewage. The posting of warning signs alerts the public of a possible risk of illness associated with water contact. The placement of signs may be short term when a single bacterial indicator standard is exceeded or more permanent where monitoring indicates repeated contamination (e.g., from a storm drain). Warnings may also be posted where sources of contamination are identifiable and can be explained as not of human origin (e.g., resident marine mammals or seabirds).

A "Rain Advisory" is often issued when it rains because it is known from past experience that rainwater carries pollution to the beach. After a rain, indicator bacteria counts usually exceed the State standards for recreational water use. For this reason, county health officials usually recommend that beach users should not swim or surf during rain and three days after a rainstorm. Rain advisories are issued by radio or newspaper during rainstorms to warn people to avoid areas where rainwater flows onto the beach and may not be based on the actual evidence of contamination.

Assembly Bill (AB) 411

Pursuant to AB 411 (Wayne, Chapter 765, Statutes of 1997), DHS adopted procedures that increased consistency in the way county agencies measure beach water quality, post warnings, and close beaches (Sections 115880, 115885, and 115915 of the Health and Safety Code). Beginning in 1999, the law required local health officers to conduct weekly bacterial testing (total coliform, fecal coliform, and enterococci bacteria) between April 1 and October 31 of waters adjacent to public beaches which have more than 50,000 visitors annually and are near storm drains which flow in the summer. If any one of these indicator organisms exceeds the DHS standard (Table 2), the county health officer is required to post warning signs at the beach and make a determination whether to close that beach in the case of extended exceedences. The law also requires the county health officer to establish a telephone hotline to inform the public of all beaches that are closed, posted, or otherwise restricted. Ten coastal counties (San Mateo, Sonoma, Santa Cruz, Monterey, San Luis Obispo, Santa Barbara, Ventura, Orange, Los Angeles, and San Diego) and one city (Long Beach) have reported that they have beaches that meet the AB 411 criteria, i.e., beaches that are near storm drains and are visited by more than 50,000 people annually.

Before AB 411 became law, county health officers had discretion to post or close any beach that violated total coliform standards. Under the new regulations, county health officers are required to post warnings whenever any one of the bacterial standards is violated in areas near storm drains, but they have the discretion to close the beach when appropriate. Many beaches near storm drains (which are covered under the AB 411 regulations) frequently violate at least one of the standards established by the DHS. These violations increase the number of postings regardless of whether there have been changes in water quality from previous years. Information collected under the mandate of AB 411 provides a new baseline against which the number of future beach warning postings and closures could be compared.

Figure 1 shows a suggested protocol for posting and closure based on the results of bacterial monitoring or reported sewage spill. This protocol was developed by the Monitoring and Reporting Subcommittee of the Beach Water Quality Workgroup, an ad-hoc committee of State, federal, and local agency representatives and environmental groups that have a stake in beach water quality programs. The decision tree provides guidance to the county health staff on whether a beach should be posted or closed. AB 411 specifies when to post or close a beach which has input from storm drains. However, there is discretion for posting or closure of beaches in areas away from the influence of storm drains. The key to this discretionary action is whether the county health staff is confident that high levels of bacterial indicators will be detected on a repeated basis (leading to beach closure) or not (leading to beach posting).

Indicator Organisms

Since identification and enumeration of pathogens, such as viruses in water, are difficult, time consuming, and expensive laboratory methods have been developed to measure the presence and density of “indicator” organisms. The indicator organisms may not cause human health impacts, but their presence indicates the potential for water contamination with other pathogens that are harmful, such as bacteria, viruses and protozoa. Indicator bacteria are carried to coastal waters in

a variety of ways. Bacteria typically enter coastal waters from sewage spills; overflows of sewage-treatment plants and sanitary sewers; and storm water runoff from urban, suburban, and rural areas. An ideal indicator would be found only when disease-causing agents were present at densities that could cause problems. Since the coliform bacteria group (total, fecal, E. coli and enterococci) is found in the intestines and feces of warm-blooded animals, their presence indicates that pathogens from untreated or partially treated sewage or contaminated runoff may be present in water. Other advantages of using coliform bacteria group as indicator organisms include: (1) they are easily detected by simple laboratory methods; (2) they are not usually present in unpolluted waters; (3) their concentration in water can be correlated with the extent of contamination; and (4) they are safe to work with in the laboratory.

In 1967, USEPA recommended a fecal coliform water quality criterion for protection of human health. The criterion recommended that the maximum density of fecal coliform not exceed the geometric mean of 200 organisms per 100 milliliter (ml) in recreational waters. Again in 1986, USEPA issued more criteria for bathing (full body contact) in recreational waters based on E. coli and enterococci. In fresh waters, the geometric mean of bacterial densities should not exceed 126 per 100 ml for E. coli, **or** 33 per 100 ml for enterococci. For marine waters, the geometric mean of enterococci should not exceed 35 per 100 ml.

Table 2 presents the California Department of Health Services (DHS) bacterial standards for water-contact sports. The standards are for total coliform, fecal coliform, and enterococci for a single sample or for a 30-day log mean basis. Further, the ratio of total to fecal coliform should not exceed 10 ml when the total coliform density is more than 1,000 ml.

The current indicators are not very precise to assess human health impacts. Rather, these bacteria are produced by many types of animals, and they represent a range of potential risks of disease. For example, birds using wetland areas can excrete indicator bacteria in densities that would suggest a potential risk to human health. However, birds do not carry the same types of pathogens as people. The risk of illness to people is assumed to be lower when the indicator bacteria come from animals instead of humans. Further research is needed in this area.

Beach Mile-Day (BMD)

The BMD is a measure of beach availability for recreation per year. It is a product of the number of miles of coastline and 365 days (the number of days the beach may be available for recreation in California). For instance, if a county has 50 miles of open coast, bay, and harbor beaches, it has 18,250 BMDs available (50 X 365). However, if 15 miles of the beach are closed or posted for 10 days, then 150 BMDs are not available for recreation resulting in 0.8 percent beach impairment (150/18250 X 100). In other words, 99.2 percent of beach usage met the standards.

The BMD is a useful measure for comparing the health of beaches from year to year. The comparison is how much of the year's BMDs has been impaired in a particular county. It is a more meaningful measure of comparison than the number of incidences or the number of days of postings or closures.

Table 2. California Department of Health Services Bacterial Standards for Water-- Contact Sports		
Sample Type	**Bacteria**	**Standard**
		(Organism or Colony forming unit per 100 ml of water)
Single		
	Total Coliform	10,000
	Fecal Coliform	400
	Enterococci	104
	Total to fecal Coliform ratio (when total is 1,000)	10
30-day log mean		
	Total Coliform	1,000
	Fecal Coliform	200
	Enterococci	35

YEAR 2000 BEACH CLOSURE AND POSTING INFORMATION

The information presented in this report is derived from SWRCB's Beach Closure/Posted Warning Database which identifies the beach name and the extent of closures and posted warnings in miles (or yards). This database makes it possible to report beach postings and closures by BMDs. Detailed county reports on individual posted warnings, beach closures, and rain advisories for year 2000 are included in the Appendix of this report in geographical order of counties starting from the north of the State to the south. At the end of each individual county report, the total sum of the incidences of posted warnings/beach closures/rain advisories, days (duration), and BMDs are specified. Each time a portion of a beach was posted or closed, the event was counted as a day. The number of days of posted warnings or closures are mentioned to indicate the magnitude of the posting/closure events.

Beach Warning Postings

Table 3 presents the data on beach warnings posted during year 2000 from the City of Long Beach and 11 counties, ten of which (Sonoma, San Mateo, Santa Cruz, Monterey, San Luis Obispo, Santa Barbara, Ventura, Los Angeles, Orange, and San Diego) meet the reporting AB 411 requirement criteria as mentioned previously. San Francisco County also reported these data although the County is not required to do so pursuant to AB 411. The coastal counties of Del Norte, Humboldt, Marin, Contra Costa, and Alameda did not have a monitoring program since these counties do not have beaches that meet the AB 411 criteria. Mendocino County on the other hand reported no posting of beach warnings during year 2000. On a statewide basis, 1,285 beach warnings were posted lasting for a total of 8,133 days. This resulted in approximately 1,100 BMDs of posting. Los Angeles County had the maximum number of incidences (325), and San Diego County had the maximum number of days of postings (2,450). Orange County had the maximum number of BMDs posted (about 596). These three counties along with the County of Santa Barbara and the City of Long Beach accounted for over 85 percent of the posting data. The primary cause of the bacterial contamination leading to postings was either unknown or rainfall resulting in storm events.

Figure 2 shows that statewide the source of 35 percent of all BMDs with warnings posted was contamination carried to the beach through creeks/rivers, and 18 percent was through storm drains and urban runoff. The source was unknown for 42 percent of the BMDs with posted warnings.

Six counties (San Mateo, Santa Cruz, Ventura, Los Angeles, Orange, and San Diego) reported permanent beach postings at certain beaches (Table 4). The majority of these permanent postings are due to storm drains or creeks/rivermouths that enter the ocean. Some counties do not opt for permanent postings at beaches near storm drains if the drains are seasonal. Since there is no uniform reporting system of permanent beach postings among the counties, these data are not included in the beach posting data. SWRCB staff is working with county health staff to improve the reporting system for this category. This is the first time the permanent beach postings are presented in the Beach Closure Report.

As a precautionary measure, people should never swim or surf within 100 yards of any posted storm drain or creek/rivermouth.

Table 3. Beach Warnings Posted in California By County--2000				
County	**Number of Incidences**	**Number of Days**	**Beach Mile-Day Posted**	**Primary Cause(s)**
Del Norte	NM*			
Humboldt	NM			
Mendocino	NP**			
Sonoma	12	29	2.7	Rain, Unknown
Marin	NM			
San Francisco	13	31	49	Rain
Contra Costa	NM			
Alameda	NM			
San Mateo	17	387	21.5	Unknown
Santa Cruz	7	44	19.8	Unknown
Monterey	16	42	13.8	Unknown
San Luis Obispo	6	16	2.2	Rain
Santa Barbara	152	1,296	73.5	Rain, Unknown
Ventura	72	237	13.4	Unknown
Los Angeles	325	1,150	126.1	Unknown
Long Beach (City)	99	161	4.6	Unknown
Orange	290	2,055	595.8	Unknown
San Diego	274	2,450	168.9	Bacteria Levels Exceed Standards
TOTAL	1,283	7,898	1,091.3	

*** No monitoring**

**** No postings**

Figure 2. Sources of Contamination Resulting in Warnings Posted--2000
(Based on Beach Mile-Days)

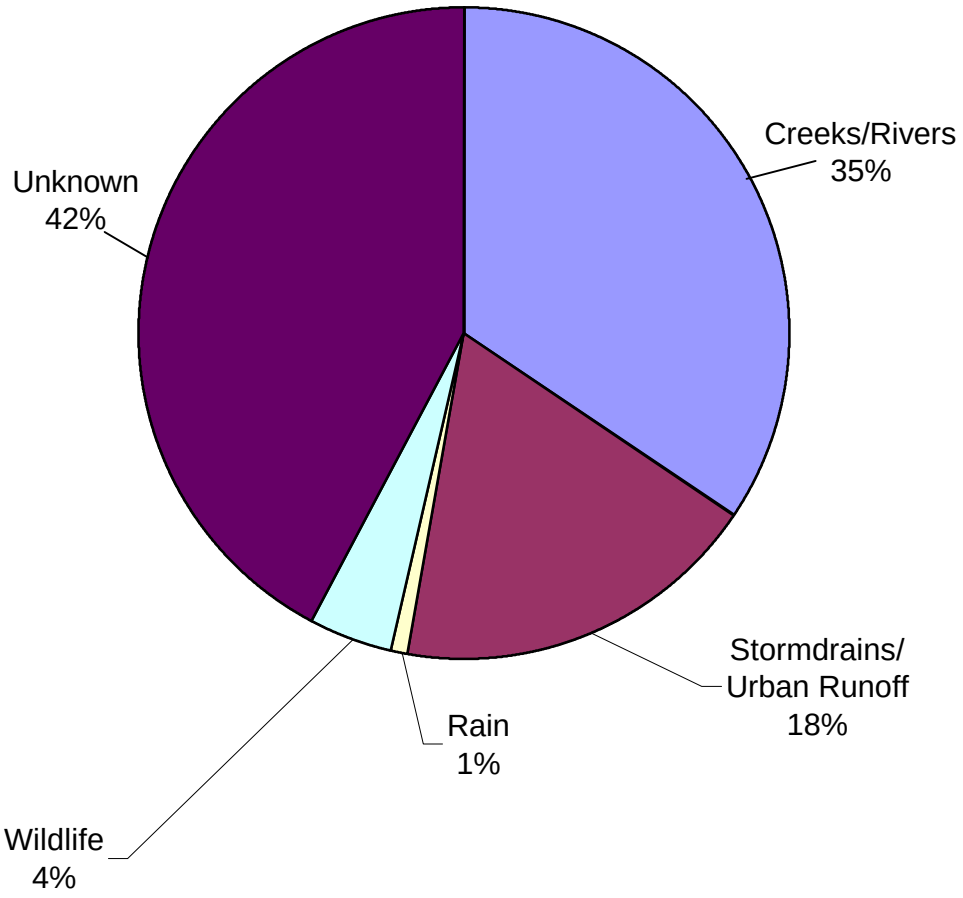

Table 4. Permanent Beach Postings By County--2000

County	Permanent Postings
San Mateo	Half Moon Bay @ San Pedro Creek
	Half Moon Bay @ San Vicinidi Creek
Santa Cruz	Monterey Bay @ San Lorenzo Rivermouth
	Twin Lakes Beach @ Schwan Lagoon
	Capitola Beach @ Soquel Creek
	Rio Del Marr Beach @ Aptos Creek
	Cowell Beach @ Neary Lagoon
Ventura	Rincon Parkway North
	Faria County Park
	Solimar Beach (Cypress Tree)
	Surfer's Point (Mouth of Ventura River)
	Promenade Park @ Figueroa St., Redwood Apts., Oak St., & California St.
	San Buenaventura State Beach @ Karlorama St.San Jon St.,Dover Lane, Weymouth Lane
	McGrath State Beach @ McGrath Lake Drain
	Oxnard State Beach @ Falkirk Ave
	Channel Islands Harbor Beach Park @ Kiddie Beach
	Ormond Beach @ Oxnard Industrial Drain
	Sycamore Cove Beach
	County Line Beach
Los Angeles	Santa Monica Canyon Creek
Orange	Dana Point Harbor @ North side of the East Basin at K-O Docks
	Newport Bay @ Harbor Marina, 33rd St. Channel, & 43rd St. Beach
	Sea Beach/Surfside @ San Gabriel River
	Huntington City Beach @ Storm Drains 1rst St., 7th St., 13th. St., and 23rd St.
	Huntington State Beach @ Talbert Channel and Santa Ana River
	Newport Beach @ Santa Ana River and Buck Gully
	Crystal Cove State Park @ Pelican Point Creek, Waterfall Creek, Los Trancos Creek, Muddy Creek, & El Moro Creek
	Emerald Bay @ Emerald Bay Drain
	Laguna Beach @ Broadway Creek
	Laguna Beach @ Storm Drains at Heisler Park, Cleo St., Bluebird Canyon, Dumond St., Lagunita/Blue Lagoon, South Coast Highway at Hospital, Thalia St., Oak St., Irvine Cove, Crescent Bay, Laguna Ave., Ocean Way, West St., & Table Rock Circle
	Aliso Beach @ Aliso Creek
	1000 Steps County Beach @ 1000 Steps Drain
	Monarch Beach @ Salt Creek
	Salt Creek Beach @ Dana Strand and Salt Creek Service Rd.
	Doheny State Beach Park @ North Beach and San Juan Creek
	Capistrano County Beach @ Capo Beach Storm Drain
	Poche Beach @ Poche Drain
	San Clemente City Beach @ Storm Drains at Pico, Lifeguard Headquarters, under pier, El Portal stairs, Mariposa Linda Lane, South Linda Lane, Trafalgar Canyon, La Ladrea, Riveria Beach, Salem Tressel, & Cypress Shores
San Diego	La Jolla Community Beach @ Casa Beach Children's Pool

Beach Closures

Table 5 presents the calendar year 2000 beach closure data from nine coastal counties. The Counties of Del Norte, Humboldt, Marin, Contra Costa, and Alameda had no monitoring programs. The counties of San Francisco, Santa Cruz, and Santa Barbara along with the City of Long Beach reported no beach closures. There was a total of 117 incidences of beach closures which lasted for 772 days statewide. Approximately 324 BMDs were closed in the State in 2000. San Diego County had the maximum number of closures reported--47 beach closures, 310 beach closure days, and 187 BMDs closed. This County accounted for over 40 percent of the total number of beach closure incidences and days and over 50 percent of BMDs closed statewide. The primary causes of the beach closures were sewer line overflow, breakage, and blockage.

Figure 3 shows that statewide creeks/rivers and sewer lines accounted for almost all the BMDs of closures. It should be noted that counties are not specific and consistent in their reporting of the sources and causes of beach closures. Some counties may report sewer lines as source of beach closures while others may report them as the cause of beach closures. In either case, problems with sewer lines, such as line breaks, blockages due to grease, roots, or rocks, and pump failure, have led to a significant number of beach closures.

Figure 4 shows the contribution of pollution sources when beach postings and closures are combined. Creeks/rivers account for 37 percent, sewer lines and storm drains/urban runoff account for 12 percent each, and the cause for beach posting or closure is unknown for a little over one-third of the cases (37 percent).

Rain Advisories

Six counties (Monterey, Santa Barbara, Ventura, Los Angeles, Orange, and San Diego) reported issuing a total of 129 rain advisories during year 2000 lasting for a total of 737 days (Table 6). Ventura County has the highest number of rain advisories (103) and the duration (571 days). This is a result of different reporting methods used by counties. Ventura County reported a separate rain advisory for each beach in the County, while the other counties reported the number of rain advisories that are issued for all beaches in the counties.

Data Evaluation

California beaches have the most stringent set of public health standards, and they are monitored more than anywhere in the nation. For these reasons, there are more beaches posted or closed in California than anywhere else. The year 2000 beach posting and closure data are not comparable with the year 1999 data set. Since the AB 411 regulations were not officially adopted until July 1999, the beach posting and closure data included in the SWRCB's year 1999 Beach Closure Report did not cover the entire testing period required by law. Consequently, there were only over 5,000 days of postings and closures during 1999 compared to over 8,000 days in year 2000. This should not be interpreted as a worsening trend in beach water quality. As the monitoring baseline is improved, the data will be comparable and will be able to demonstrate the trend.

Table 5. Beach Closures in California By County--2000

County	Number of Incidences	Number of Days	Beach Mile- Day Closed	Primary Cause(s)
Del Norte	NM*			
Humboldt	NM			
Mendocino	1	15	2.6	Sewer Main Break
Sonoma	2	4	0.4	Unknown, Other
Marin	NM			
San Francisco	NC**			
Contra Costa	NM			
Alameda	NM			
San Mateo	9	217	41.9	Rain
Santa Cruz	NC			
Monterey	6	16	3.9	Line Break, Sewer Manhole Overflow
San Luis Obispo	1	1	0.1	Sewer Overflow at Residence
Santa Barbara	NM			
Ventura	4	12	0.7	Blockage
Los Angeles	7	45	33.6	Sewer Main Break, Blockage due to different sources
Long Beach (City)	NM			
Orange	40	152	53.4	Blockage due to different causes
San Diego	47	310	187	Sewage
TOTAL	117	772	323.6	

*** No monitoring**

**** No closures**

Figure 3. Sources of Contamination Resulting in Beach Closures--2000.
(Based on Beach Mile Days)

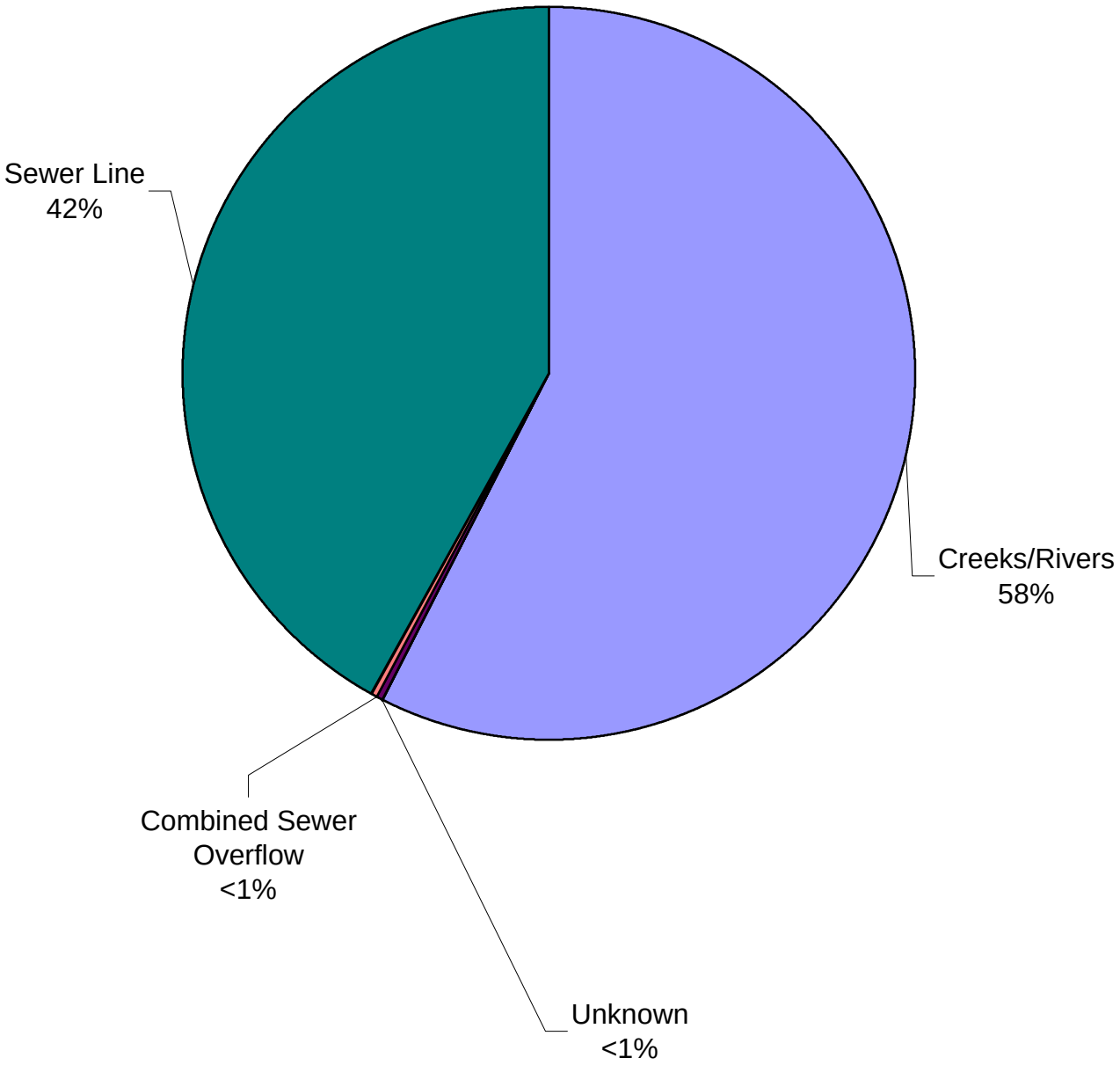

Figure 4. Sources of Contamination Resulting in Warnigs Posted and Closures Statewide--2000. (Based on Beach Mile Days)

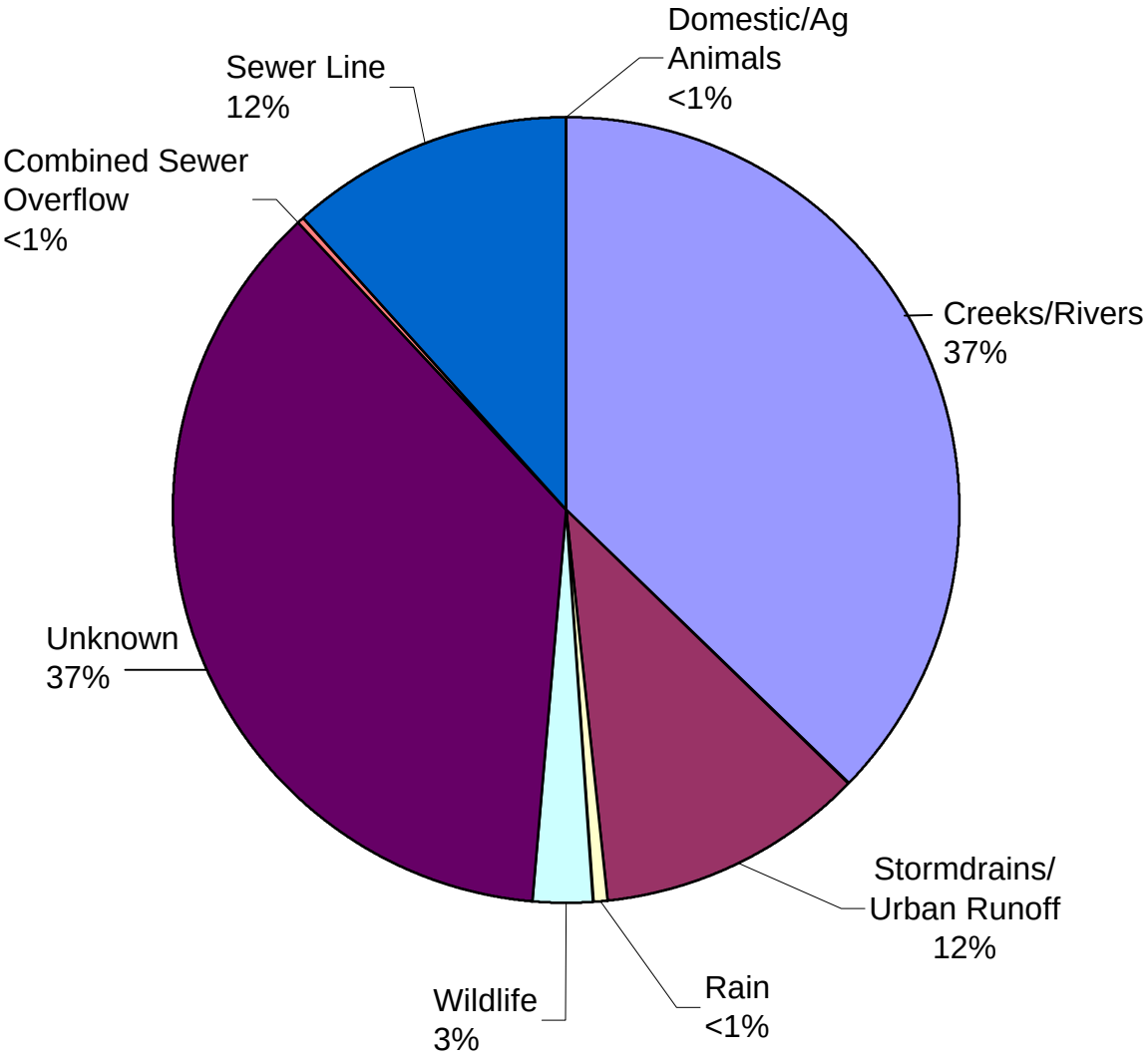

Table 6. Beach Rain Advisories by County--2000		
County	**Rain Advisories**	**Duration of Advisory (Days)**
Monterey	2	11
Santa Barbara	3	10
Ventura	103	571
Los Angeles	9	49
Orange	6	58
San Diego	6	38
TOTAL	129	737

According to the extensive research of Heal the Bay, an environmental advocacy group, the majority of California beaches are clean and safe during dry weather. Heal the Bay's 2000-2001 Beach Report Card evaluated 375 Southern California beaches from Point Conception in Santa Barbara County to the Mexican Border and assigned A-F grades based on daily and weekly bacterial pollution levels in the surf zone in correlation to the risk of adverse health effects to humans. Some of their findings are:

- Over 60 percent of southern California beaches (234 of 375) received an "A" grade during dry weather.
- Over 80 percent of open beaches (i.e., locations not within an enclosed bay, harbor, or marina and not impacted by a storm drain) received an "A" grade.
- Over 90 percent of the 21,100 beach sample days during dry weather met State bathing water standards for all bacterial indicators.

Heal the Bay's report documents the disparity in the beach water quality during the dry and wet seasons. Southern California beaches are impacted by rain events through untreated storm drain runoff, which carries bacteria, motor oil, animal wastes, pesticides, yard waste, and trash to the beaches. Close to 70 percent of monitored beaches received an "F" grade during inclement weather conditions as compared to a little over 11 percent during dry weather. The complete report can be accessed at Heal the Bay's website (http://www.healthebay.org).

In July 2000 the USEPA released the results of its third annual National Health Protection Survey of Beaches. State and local environmental and public health officials voluntarily returned information on 1,891 beaches. The survey showed that 459 beaches (24 percent of the reported beaches) were affected by at least one posting or closure. Complete results of this survey are available at the USEPA's Beaches Environmental Assessment, Closure and Health (BEACH) Watch website (http://www.epa.gov/OST/beaches).

It is difficult to conduct an inter-county comparison of beach posting and closure data even with the implementation of AB 411. The reason for this is that some counties have year round monitoring, which is not required by AB 411. Counties may have different sampling

locations with respect to storm drains. For instance, Los Angeles County has monitoring stations 50 yards from a flowing storm drain whereas San Diego County monitors at the point of discharge. In general, open ocean beaches are cleaner than beaches adjacent to storm drains and beaches located within enclosed bays which have poor water circulation.

It should be noted that beach posting and closure data collected under the requirement of AB 411 may not be an accurate measurement of beach water quality for the following reasons:

1. As mentioned earlier, the indicator bacteria may not be the right indicator of pathogens in shoreline waters.

2. The indicator bacteria assay takes 18 to 36 hours or longer to complete. During this time, the beachgoers may be exposed to harmful pathogens. By the time a beach is posted based on monitoring data, the indicator bacteria may not be present in the shoreline waters. Thus a beach may be open when it is contaminated and posted when it is clean. There is a need for rapid, simple, and inexpensive assays of beach water quality to mitigate this problem.

3. There are many sources of variablity in shoreline bacteria monitoring. According to research conducted by the Southern California Coastal Water Research Project, different laboratories reported different bacterial counts for the same sample (inter-laboratory variability). Water samples collected from very close locations in the surf zone had different bacterial counts (spatial variability). Further, water samples collected from the same location but at different times of the day had different bacterial counts (temporal variability).

However, with all these shortcomings, a monitoring program for indicator bacteria remains the best available choice for assessing beach water quality and making posting or closure decisions.

GOVERNOR'S CLEAN BEACH INITIATIVE AND SWRCB'S IMPLEMENTATION PLAN

In January 2001 Governor Gray Davis proposed a "Clean Beach Initiative" to combat the problem of contaminated ocean water and beach postings/closures. The initiative will enable State and local agencies to address this contamination, making California beaches safer and ensuring the economic vitality of coastal areas.

The proposed activities of the initiative include assistance to local agencies in areas that have chronic beach contamination problems and high beach usage, leveraging ongoing strong support from local communities. Measures to curb urban runoff include the diversion of dry weather flows from storm drains, construction of infiltration basins, catch basin inserts, as well as isolating controllable sources of pollution. Construction and restoration of wetlands should decrease the amount of pathogens reaching beaches. The initiative will also provide funding for research to develop rapid, inexpensive methods for detecting and analyzing bacteria and pathogens. This will result in timely beach postings or closures and also will assist in source identification which will allow regulators to more quickly track pollution sources and mitigate the problem.

One of the key projects in the SWRCB's 2001 draft Strategic Plan deals with the implementation of the Governor's Clean Beach Initiative. The SWRCB's Clean Beach Project will develop and implement a comprehensive plan incorporating a watershed approach and involving all SWRCB and RWQCB pertinent water quality programs. A detailed road map will be developed to coordinate the efforts of the SWRCB's regulatory and local assistance functions with the efforts of local, State and federal agencies. The project will have detailed specific actions and milestones. The goal of the project is to significantly and steadily decrease beach closures and postings over the next ten years. The SWRCB has designated a Clean Beaches Coordinator to oversee the development and implementation of the Clean Beach Project and to track and report its progress.

SWRCB staff has taken the lead in scheduling and organizing the meetings of the ad-hoc Beach Water Quality Workgroup. The Workgroup includes representatives from organizations responsible for the protection and reporting of beach water quality including SWRCB, coastal RWQCBs, county environmental health departments, DHS, California Coastal Commission, USEPA (Region 9), sewage treatment plants, Heal the Bay, and other environmental groups. The Workgroup provided valuable input to the SWRCB staff in the development of the beach water quality database. One of the objectives of the SWRCB's Clean Beach Project is to develop capability to share beach closure information through the geographical information system.

As part of the Governor's Clean Beach Initiative, funds will be made available for beach water quality improvement projects. A number of loans and grant programs, such as the SWRCB's Cleanup and Abatement Account (CAA), federal Clean Water Act Sections 205(j) and 319(h) allocations, and Propositions 12 and 13 resources will be tapped for this activity.

For instance, in July 2001, the SWRCB allocated approximately $1 million to the San Diego RWQCB from the CAA to fund the identification of the presence and source(s) of pathogenic viruses and bacteria in the recreational waters of Mission Bay and associated threats to human health.

On March 7, 2000, California voters passed Proposition 12 (Safe Neighborhood Parks, Clean Water, Clean Air, and Coastal Protection Bond Act) and Proposition 13 (Safe Drinking Water, Clean Water, Watershed Protection, and Flood Protection Bond Act). Proposition 12 provides funding to the State Coastal Conservancy for coastal protection programs. This includes an allocation of $25 million to the Santa Monica Bay Restoration Project to fund grants to public entities and nonprofit organizations to implement storm water and urban runoff pollution prevention programs, habitat restoration, and other priority activities specified in the Santa Monica Bay Restoration Plan.

Proposition 13 provides funding for coastal nonpoint source programs to improve water quality and environment of coastal waters, estuaries, bay and nearshore waters, and groundwater. Grants of up to $5 million per project are available for projects to improve water quality at public beaches and to make improvements for the purposes of ensuring that coastal waters adjacent to public beaches meet the State's indicator bacteria standards for water recreation; improvements to existing sewer collection systems and septic systems for restoration and protection of coastal water quality; storm water and runoff pollution reduction and prevention programs for restoration and protection of coastal water quality; and comprehensive capability for monitoring, collecting and analyzing ambient water quality, including maintenance technology that can be entered into a statewide information base with standardized protocols;, and sampling, collection, storage and retrieval procedures.

SWRCB will also apply for federal funding that became available this year exclusively for beaches pursuant to the Beaches Environmental and Coastal Health (BEACH) Act of 2000 (Public Law 106-284, October 10, 2000). During this first year, $2 million in development grants will be made available to coastal and Great Lakes states to improve monitoring and public notification of human health risks at beaches. It is anticipated that in the future this grant program will have a full authorization of $30 million per year to fund states' clean beach implementation programs.

SWRCB staff has been actively working on other beach related projects. In January 2001, staff submitted a report to the Legislature on a comprehensive coastal water quality monitoring program pursuant to AB 1429 (Chapter 899, Statutes of 1997). Staff is working with the University of California to develop protocols for use in source investigations of storm drains that produce chronic exceedences of bacterial standards in adjacent beach waters, cost to implement these investigations, and a timeline for completion. A report of this information will be submitted to the Legislature by December 1, 2001 as required by Water Code Section 13178.

APPENDIX

County Closure, Posted Warnings, and Rain Advisory Reports
In Geographical Order from North to South