

California Snapshot Day 2007 Report



Produced By
Orange County Coastkeeper
May 31, 2007

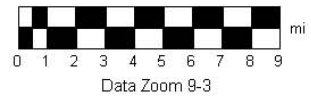
Table of Contents

Site Map	3
Executive Summary	4
Background	5
Project Description	5
Project Participants	6
Water Analysis Parameters	7
Water Analysis Methodology	7
Data Results	7
Data Discussion	7
Wetlands Data Discussion	11
City Parks Lakes Discussion	12
Conclusions	13
Graphs	
<i>E.Coli</i> Bacteria	9
Total Coliform Bacteria	10
Enterococcus	11
Tables	
Bacteria Data	15
Chemical Data	17
Physical Parameters	19

Project Map



Data use subject to license.
 © 2004 DeLorme. Topo USA® 5.0.
 www.delorme.com



Executive Summary

On May 5, 2007, approximately fifty citizens from all over Orange County worked together to collect water samples to create a “Snapshot” of the water quality in our streams lakes and ocean. A snapshot event is characterized by having all of the samples collected during a single day; this provides a “Snapshot” of water quality for that day. During the 24 hours allotted for the sample collection, samples were collected from thirty-one sites on fourteen streams, four estuaries, four lakes and three ocean sites. In addition to conducting the water quality tests, members of the public and participants from local environmental organizations gained firsthand knowledge about water quality issues in their local stream or lake, and what they can do to help improve water quality countywide.

The event began with an intercalibration session at Goldenwest College on Monday April 30, where volunteers from participating environmental groups calibrated their monitoring equipment against certified standards for each of the variables they would be testing on May 5th. Several citizen volunteers also attended and were trained in sample collection and analysis, and given educational level test kits to use and assigned monitoring sites.

The day of the event, a “hub” was set up at the Bolsa Chica Wetlands Interpretive Center. At the hub, volunteers from the participating environmental groups dropped off the samples and data they had collected from their assigned sites earlier in the day. Members of the public could pick up testing equipment, receive training and site assignments, and see displays on water quality issues at booths set up by participating members.

The products of this effort are: quality controlled bacteria data from all thirty-one sites; and quality controlled physical and chemical data, collected by experienced water monitoring volunteers, from twenty seven sites. Also, non-quality controlled chemical data was collected by the general public at four sites including both lakes in Huntington Beach Central Park (Huntington and Talbert Lakes) and the Warner St. Bridge and nesting areas in Bolsa Bay. The testing methodology differed for the two chemical results categories. Quality controlled testing was done using meters, colorimeters and color comparators following state accepted standard methods. At the other four non-quality controlled sites, all tests other than bacteria were run by the citizens at the site using educational testing kits. Before being issued the kits, the citizens were trained in sample collection techniques, testing methods and the reasoning behind each of the test parameters. While the results of the educational level kits can be considered descriptive of the site characteristics, it is not of sufficient quality to use to determine exceedences of water quality standards. After the event, all of the data collected was analyzed to produce this report. The results analysis for the quality controlled data was developed separate from the non-quality controlled data.

The data from this event shows that while our ocean water quality was good, water quality in most of the county’s coastal streams and some city park lakes was poor on May 5th. Most coastal streams suffer from an excess of nutrients and high bacteria counts, the classic indicators of urban runoff. The poor water quality of most of our streams is no surprise to water quality experts; efforts costing millions of dollars have been underway for years to improve water quality. However, the government can only do so much to clean up the problems we all generate. The most effective way to improve water quality is for the general public to reduce or eliminate the trash, chemicals and other human waste that ends up in our waters by changing habits that result in runoff.

By bringing the general public into the process of water monitoring to directly see the results of urban runoff, we hope to make an impact on the amount of pollutants entering our streams. We can reach a much wider audience than just the project participants by creating watershed advocates out of our volunteers. The data from this event will be used to continue the efforts to improve the water quality in our county's streams by raising public awareness and increasing personal involvement by citizens. For more information on water monitoring in Orange County see the Citizen Watershed Monitors of Orange County website at www.cwmoc.org or the Orange County Coastkeeper website at www.coastkeeper.org

Background

California Snapshot Day is the product of a continuing effort by the California State Water Resources Control Board to involve the public in water quality issues. In 2003 the Board funded the first California Snapshot Day event through a grant to the Monterey Bay Sanctuary Foundation. The 2003 event covered the entire state and collected data from over six hundred monitoring sites. Simultaneously the State Water Boards Clean Water Team, a group of State Water Board water monitoring specialists created to support citizen monitoring efforts, facilitated the creation of loose coalitions of organizations involved in water monitoring activities including non-profits, universities and public agencies. Through this effort CWMOC (Citizen Watershed Monitors of Orange County) was formed. With Orange County Coastkeeper leading the organization's activities, CWMOC participated in the 2003 event and has carried on the event through the present. CWMOC has also expanded the program by participating in the annual World Water Monitoring Day events that occur in October of each year to celebrate the anniversary of the creation of the USEPA. As a result, Orange County has benefited through the creation of a group of highly trained and organized volunteer water monitors who educate the public and act as advocates for clean water while collecting valuable water quality data that can be used by the water boards and local agencies in making water quality decisions. California Snapshot Day 2007 is the fifth continuous year that CWMOC has hosted the event during which it has grown from primarily a data collection event by the member groups into a major public outreach event designed to involve the public in water quality through direct participation in water monitoring countywide.

Project Description

California Snapshot Day consists of four major components; the first is public outreach to solicit public participation in the event. One of the primary goals is to directly involve the public in water quality by recruiting citizen volunteers to conduct water monitoring on the day of the event. This outreach consists of media announcements in local print (O.C.Register), radio (KFI), and television outlets (HBTv); outreach from the CWMOC member organizations including direct mail and email campaigns; along with website announcements on the CWMOC website www.cwmoc.org, Orange County Stormwater website www.ocwatersheds.com and many city websites including the cities of Huntington Beach and Los Alamitos. The idea is to recruit teams of citizen volunteers in advance and train them in water monitoring techniques, issue them test kits, and assign monitoring sites for the event.

The second step is an intercalibration session less than one week before the event where the citizen








volunteers can receive training and their test kits, and the CWMOC member groups calibrate their monitoring equipment in a laboratory setting using certified standards to insure the accuracy of the data they collect for the event. All the calibration activities are documented and records kept at the O.C. Coastkeeper office.

The third step is to organize a “hub”. The hub serves a location for the event participants to drop off the water samples they collect for additional analysis that has not been done in the field such as bacterial and nutrient analysis. Additionally the hub serves as a location for the general public to show up on the day of the event and receive information on water quality issues in their area, meet with water quality professionals, and participate in demonstrations of water quality monitoring activities. CWMOC members and local agencies set up booths at the hub to highlight their projects and provide educational materials to the on how they can make a difference in water quality. While the number of people at the hub has been low, generally less than on hundred individuals, those that do participate leave with an excellent understanding of the water quality in Orange County and what they can do to improve it.

The fourth step is the production of a Snapshot Day report detailing the results of the water monitoring conducted for the event. The report is widely distributed and the results are routinely reported in the media. In the past this has resulted in actions by local and regional agencies, non-profits and educational institutions to respond to the issues reported, resulting in the desired increased focus on water quality in Orange County.

Project Participants

Many thanks to the non-profit organizations and local agencies that participated:

-  D.I.V.E.R.S – Divers Involved Voluntarily Environmental Rehabilitation Safety.
-  Orange County Coastkeeper (OCCK)
-  Bolsa Chica Conservancy
-  Surfrider Foundation
-  Trout Unlimited
-  County of Orange (Resource Development and Management Department)
-  City of Huntington Beach

Special thanks to the County of Orange (Resource Development and Management Department), and the J.D. Powers Company for funding, Orange County Coastkeeper for organizing the event, and Bolsa Chica Conservancy for hosting the California Snapshot Day event at the Bolsa Chica Wetlands Interpretive Center.

Water Analysis Parameters:

Bacteria Tests:

E. Coli (EC)
Total Coliform (TC)
Enterococcus

Physical Tests:

Water temperature
Air temperature
Conductivity
Turbidity/Clarity

Chemical Tests:

Orthophosphate
Ammonia-Nitrogen
Nitrate-Nitrogen
Dissolved Oxygen
pH

Testing Methodology

All Bacteria testing was done using the IDEXX Colilert 18 and Entrolert most probable number method. All bacteria samples were processed at the O.C.Coastkeeper lab in Costa Mesa using USEPA approved methods and holding times. Chemical testing was done in the field for pH and dissolved oxygen at all sites using electronic meters or color comparators. Nutrient testing (orthophosphate, Nitrate-Nitrogen, Ammonia Nitrogen) was done in the field by groups possessing the proper equipment using LaMotte and HACH colorimeters or Chemetrics color comparator kits. Samples that could not be analyzed for nutrients in the field were put on ice and the nutrient tests were run at the O.C. Coastkeeper lab. Physical tests for water and air temperature, conductivity and turbidity/clarity were run in the field. The Educational test kits provided to the general public are produced by the LaMotte Company and include test for all the above chemical and physical tests except for ammonia and conductivity. Due to the variety of equipment and test methods used, a detailed discussion of the specific equipment and test methods used is not included in this report. Equipment and test method questions should be directed to Ray Hiemstra at ray@coastkeeper.org

Data Results Discussion (Quality Controlled data only):

- ✚ Water Temperature – The temperature of water affects aquatic life because most species can only thrive within a certain temperature range. Other factors, such as dissolved oxygen, can be affected by the temperature, which in turn, affects the rate of photosynthesis in aquatic plants. Human interventions can affect temperature by removing canopy cover and building or removing water diversions along the stream or in the stream, causing a rise in water temperature. The temperatures we measured were not at levels that would affect the beneficial uses of these streams.
- ✚ Dissolved Oxygen – Oxygen is needed for respiration, movement, feeding, and growth. Therefore the amount of oxygen in the water affects not only the number of aquatic animals and plants, but also the amount of bacteria in the water. The minimum acceptable level of dissolved oxygen, as stated in the Regional Water Boards Basin Plan is 5mg/L. 75% of the sites that tested for Dissolved Oxygen met the minimum acceptable level. The freshwater sites that did not meet the standard included the Santa Ana River, Delhi Channel, Big Canyon Creek, San Juan Creek and Fishers Gulch. Additionally marine sites in Huntington Harbor and Bolsa Bay had low Dissolved oxygen levels. These low dissolved oxygen levels are reason for concern as they can affect the survival of wildlife.
- ✚ Conductivity/Salinity – By measuring conductivity, we can gauge the amount of dissolved

solids in the water. Dissolved solids include, acids, minerals, salts, and metals. Conductivity varies for many reasons but high conductivity may be a signal of bigger problems. The acceptable limit of conductivity we have chosen to use for this study is 1.0 ms/cm for fresh water based on goals set for Silverado Creek by the Regional Water Board. Ten of the eleven freshwater conductivity measurements exceeded the selected objective. Salinity is primarily used to determine if sites are salt or freshwater. Salinity that is elevated or reduced from normal levels can affect wildlife. Salinity levels were within normal levels at the project sites

- ✚ pH – This is a measure of hydrogen ions that controls the acidity and the alkalinity of the water. Most aquatic life can only survive within a narrow range of pH, thus it is important to monitor. The acceptable level for pH is between 6.5/7.0(freshwater/marine) and 8.6. Only two of the sites exceeded the objective, Chris Carr Park Lake and Greer Park Lake, both in Huntington Beach. Since these lakes are stocked with fish by the California Department of Fish and Game the high pH could be a problem for the fish.
- ✚ Orthophosphate –Phosphates most commonly enter waterbodies through lawn and garden fertilizer with run-off or soil erosion. Increased phosphate concentrations can lead to increased growth of algae and plants, which then depletes dissolved oxygen in the water. The U.S. EPA has recommended that phosphate should not exceed the levels of 0.1mg/L in arid regions, so that is the level we have selected for this report. 78% of the sites that were tested for Phosphate exceeded the limit of 0.1mg/L.
- ✚ Nitrate-Nitrogen – Similar to phosphate, nitrate is a plant nutrient that usually enters waterbodies through overuse of fertilizer. Thus, it also promotes algae blooms and excessive aquatic plant growth that can suffocate other life. Excess levels of nitrates in drinking water can cause methemoglobinemia or “blue baby” disease. All of the sampled sites are within the Regional Board’s Basin Plan objective of 10mg/L.
- ✚ Ammonia-Nitrogen – Ammonia is another plant nutrient, the primary sources are fertilizer and animal waste. Ammonia is an important chemical to monitor because it can accumulate to toxic levels and affect metabolism. This toxic affect can also organisms higher up in the food chain. The acceptable limit of Ammonia- Nitrogen as detailed in the Regional Water Boards Basin Plan varies depending on site conditions. The acceptable freshwater limit can be calculated using a formula, dependent on the temperature and pH. The marine standard used by the Los Angeles Regional Water Board is .233 mg/l and is used as the saltwater standard for this report. 66 % of the freshwater sites that were sampled for Ammonia-Nitrogen exceeded the standards, only one saltwater site (at the Edison Plant) exceeded the Los Angeles Water Board standard.
- ✚ Turbidity/Transparency – Turbidity and Transparency are measurements of the clarity of water. Turbidity measurements are made using special meters and is reported as NTU’s, transparency is measured as the distance in centimeters that an object can be seen underwater. High turbidity and low transparency levels indicate a large amount of suspended particles in the water. These suspended particles can block our sunlight and impede respiration, and this can have a major effect on organisms. Additionally high levels of turbidity create concern since suspended particles are often carry pollutants. Natural turbidity varies from site to site

but is generally below 100 NTU. If turbidity is above average, this may indicate erosion, nutrient loading, or excessive algae growth. Levels exceeding 100 FAU in fresh water would be considered unusual and would be a level of concern. None of the sampled sites exceeded the limit for turbidity.



Bacteria- *E. coli*, Total Coliform and Enterococcus – High levels of these indicator bacteria imply a high probability of pathogens in the water. Total Coliform comes from a broad range of environmental sources including plants and animals. The presence of *E.coli* is an indicator of fecal contamination from warm blooded animals and in some cases can cause severe illness. Enterococcus is considered the best indicator of human sources of bacteria contamination. The accepted single sample limit for *E. coli* is 235MPN/100ml (as recommended by the U.S. EPA) and the limit of Total Coliform is 10,000 mpn/100ml. 29% of the sampled sites exceeded the limit for *E. coli*. Total Coliform levels which exceeded 10,000MPN/100ml (most probable number) were found at 35% of the sites sampled. The single sample limit for Enterococcus is 104 mpn/100ml. Enterococcus concentrations exceeded the single sample limit at 66% of all the project sites and 95% of the freshwater sites. The salt Creek site had an extremely high concentration. The acceptable level of Total Coliform and Enterococcus is derived from the California standard for ocean water and recreational use, AB 411. While all of the sites were sampled for all three bacteria types, the test results for *E.coli* and Total Coliform at twelve sites were discarded due to excess incubation time.

Figure 1 – Concentration of *E. coli* present at Snapshot Day May 5th 2007 sample sites. Orange indicates exceedence of USEPA recommended single sample standard 235 mpn/100ml.

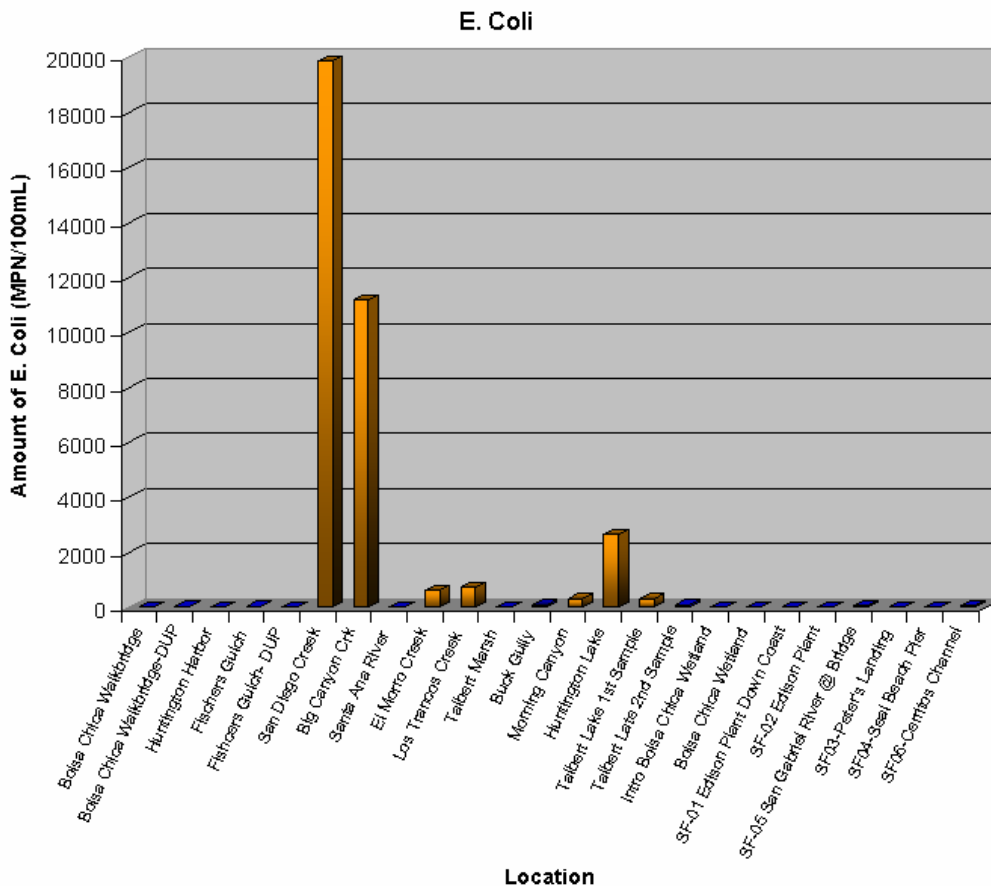


Figure 2 – Concentration of Total Coliform present at Snapshot Day May 5th 2007 sample sites. Orange indicates exceedence of California AB411 recommended single sample standard 10,000 mpn/100ml.

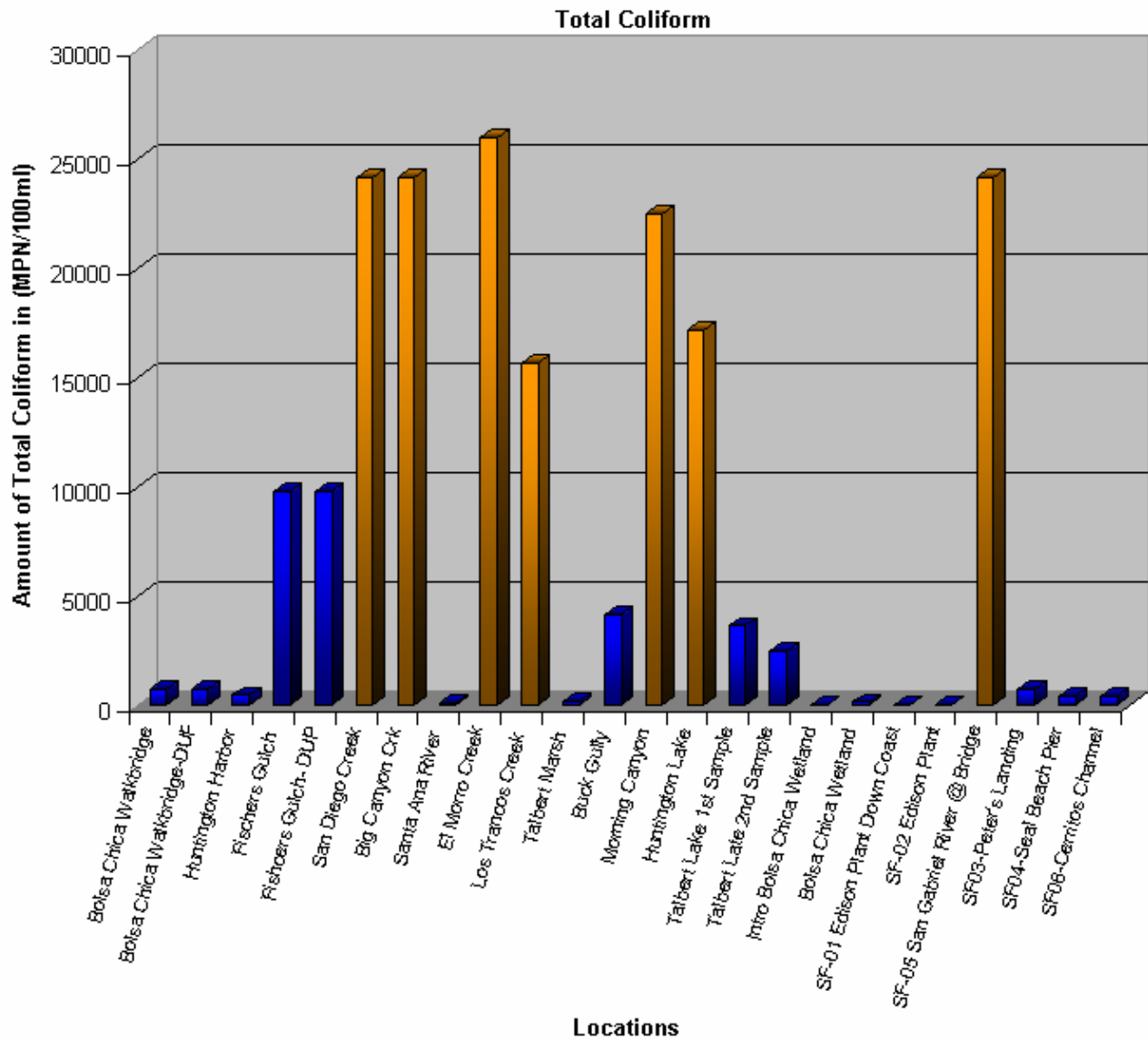
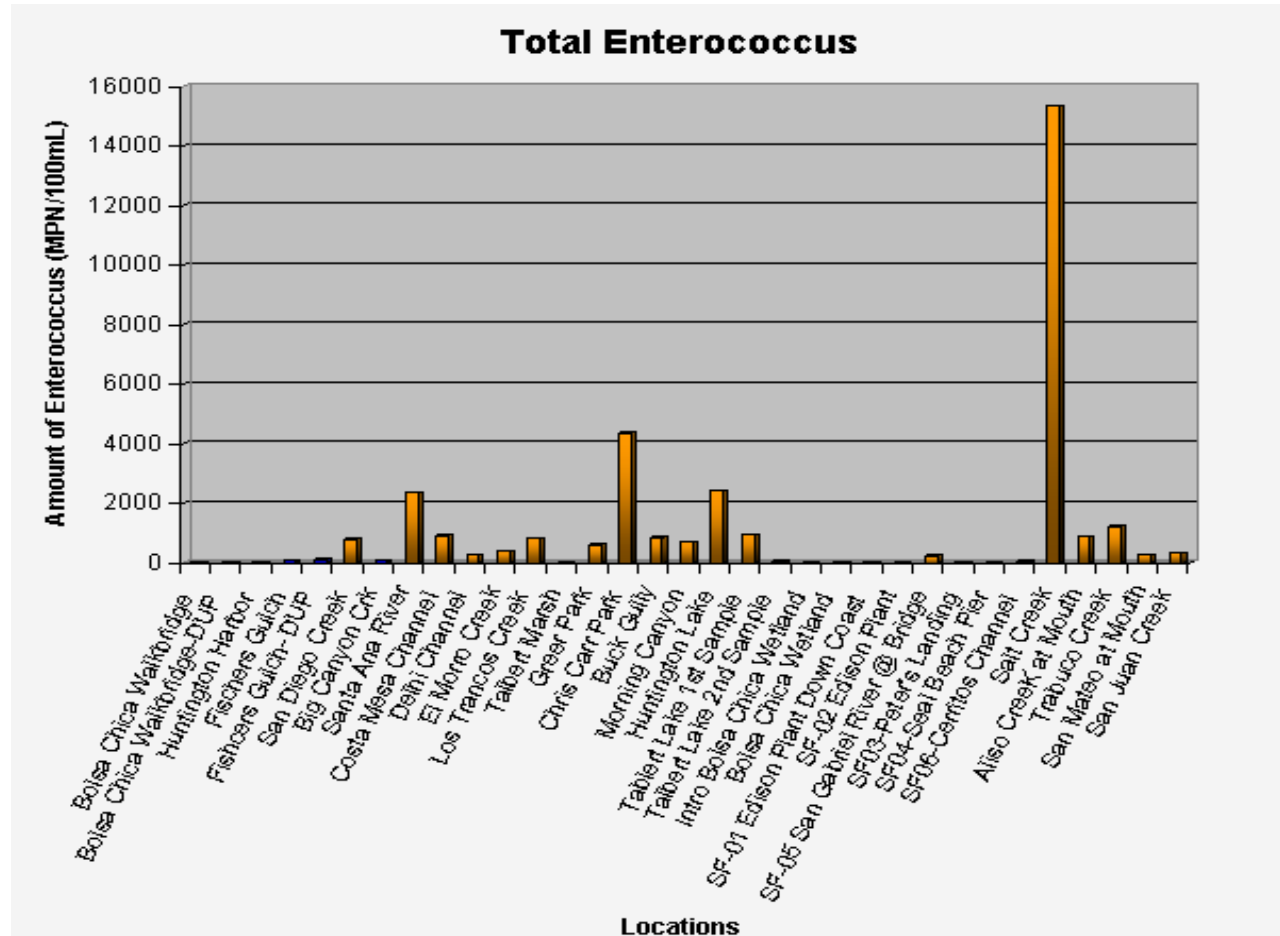


Figure 3 – Concentration of Enterococcus present at Snapshot Day May 5th 2007 sample sites. Orange indicates exceedence of California AB411 recommended single sample standard 104 mpn/100ml.



Orange County Wetlands Analysis

One of the most important waterbody types from an ecological standpoint are wetlands. Orange County has five marine wetlands, San Mateo Creek Mouth, Upper Newport Bay, Huntington Beach, Bolsa Chica, and Seal Beach. Samples were collected from four of these wetlands for this project. In recognition of this we decided to compare the data we collected from four of the five marine wetland areas of Orange County to see if there are significant differences in the water quality parameters we measured. The four wetland areas we are comparing are the San Mateo Creek Estuary (San Mateo Creek Site), Upper Newport Bay (Delhi Channel Site), Huntington Beach Wetlands (Talbert Marsh site) and the Bolsa Chica Wetlands (Bolsa Chica Walkbridge site).

When comparing the following sites: Bolsa Chica Walkbridge (BC), Delhi Channel (DC), Talbert Marsh(TM), and San Mateo at Mouth (SM)

✚ Enterococcus (MPN/100mL):

Newport Bay and San Mateo were in exceedence of acceptable, with San Mateo having the greatest level of exceedence at 265mpn/100mL. Huntington Beach and Bolsa Chica were not in exceedence.

✚ Phosphate (PO4):

Bolsa Chica was the only wetland to exceed the recommended phosphorus level. Its result of 0.24 was over twice the readings at the other wetlands.

✚ Nitrate average (N03):

None of the Wetlands exceeded the freshwater standard of 10mg/l but the San Mateo Wetlands were substantially higher than the others at 7.9 mg/l. Upper Newport Bay was second at 5.4 mg/l the Talbert and Bolsa Chica Wetlands were much better at 2.2 and 1.1 respectively.

✚ Ammonia average (NH3):

None of the sites tested exceeded the marine ammonia standard used for this report. No data was collected for BC for NH3.

✚ pH level:

None of the wetlands exceeded the acceptable pH level. However the Bolsa Chica Wetlands were at the very high end of the acceptable range at 8.51.

✚ Average DO (dissolved oxygen):

Upper Newport bay at the Delhi channel had a very low DO reading of 2.02, this is serious enough to call for further investigation of the DO levels in this area. The two other sites tested were above the minimum of 5mg/L. The Talbert channel was not tested for DO due to equipment problems.

To summarize the above findings, only the Huntington Beach wetlands at Talbert Marsh had no exceedences(recognizing that no pH or DO reading were taken there) of the water quality standards. The Bolsa Chica wetlands have the highest level of phosphates and are relatively high in pH. The San Mateo and Upper Newport Bay wetlands have high bacteria counts and much higher nitrate levels than the other wetlands with Upper Newport Bay having the additional problem of very low DO at the site tested.

City Parks Lake Analysis

One of the new things we are doing this year is to take a look at the water quality in lakes located in city parks. Because of their close proximity to the event location, four city park lakes in Huntington Beach were selected for testing; Greer Park Lake and Chris Carr Park Lake, along with Huntington and Talbert lakes in Huntington Beach Central Park.

When comparing the data between Greer Park, Chris Carr Park, Huntington Lake, and Talbert Lake:

✚ Bacteria:

For Enterococcus all of the lakes except Talbert were above the standard with Huntington Lake the highest at a reading of greater than 2,419. This is over four times the next highest lake at Greer Park. For *E.Coli* and Total Coliform, Huntington Lake was substantially higher than Talbert lake although both of them were above the standard. *E.Coli* and Total Coliform results were thrown out for Chris Carr and Greer Parks due to incubation error.

✚ Phosphate (PO₄)

It was also found that Greer Park, Chris Carr Park, Huntington Lake, and Talbert Lake were all above the level for Phosphates found in the water with 0.9 (mg/L), 3.5 (mg/L), 1.5 (mg/L), and 1 (mg/L) respectively.

✚ pH

The pH levels at two of the park lakes were above the acceptable limit with a pH of 9.11 at Greer Park, and a pH of 9.17 at Chris Carr Park.

✚ Dissolved Oxygen (DO)

The average DO at Talbert Lake was also above the recommended levels with a DO reading of 2.667 (mg/L).

Summarizing the city parks lakes analysis, we found that bacteria counts for indicator bacteria were well above recommended levels at all the lakes. Additionally phosphate and pH levels are high. At the lakes tested for these variables. These results are not surprising considering city park lakes are often the direct recipients of large volumes of urban runoff. On the good side the lake have good levels of dissolved oxygen; this is probably due to aeration systems installed in most of the lakes.

Overall Conclusions:

California Snapshot Day 2007 was a big success. A small army of citizen volunteers managed to monitor water quality at thirty one project sites covering most of the streams draining to the coast, four of the counties five marine wetlands, and four city park lakes. This monitoring resulted in a comprehensive look at water quality countywide on May 5th. The CWMOC member organizations hosted a “hub” at the Bolsa Chica Wetlands interpretative center that served its purpose as a gathering point for the public to browse booths by environmental groups, state, regional, and local agencies promoting water quality. The data from all the project sites was analyzed against accepted federal, state and local water quality objectives to determine if exceedences existed. The vast majority of the data was generated by highly trained citizen monitors using state approved methods. The data generated by the general public using educational test kits is included in the database but was analyzed separately from the quality controlled data to assure accurate conclusions.

The results of the data show that bacteria levels are high in most Orange County streams, our two rivers; the Santa Ana and San Gabriel, and at the four city park lakes we tested. This is a continuing problem that will only be cured through changes in the habits of all of us. There is a huge amount of

information available to the public on how to solve this problem; it is up to us all to act on it to see change. The ocean sites tested did not exceed bacterial standards, this is the normal situation for Orange County ocean waters during dry weather and we can be proud of that.

Plant nutrients are also an issue of concern with the majority of the freshwater sites tested showing excessive amounts of phosphate and ammonia. Phosphate levels are naturally high in Orange County so little can be done to change that, but with the naturally high levels of phosphate that occur in Orange County waters even levels of nitrate below the regional board standard can result in algal blooms and other problems for our freshwater streams. We all need to make the effort to reduce our use of plant nutrients to reduce the levels of ammonia and nitrates in our waters. Of particular concern are high nutrient readings for phosphate at the Bolsa Chica Wetlands and nitrate at the San Mateo wetlands. These sensitive areas need extra protection to safeguard their critical environmental functions as nurseries for fish and home to other wildlife.

Dissolved Oxygen and pH were not found to be major water quality issues in this study but there were a few sites of concern. Exceptionally low DO readings at the Delhi Channel mouth in Upper Newport Bay is a bad sign that should be followed up on, pH levels measured at the Bolsa Chica Wetlands were at the high end of the range and should continue to be monitored. Additionally the very high pH at Chris Carr and Greer parks should be investigated further.

The physical parameters were also generally good with the exception of conductivity. High levels of conductivity were common, and high conductivity can make life difficult for plant and animal organisms living in the stream.

It should be noted this is only a snapshot of the water quality in Orange County, thus the results may not represent long term conditions. However, exceedences should be noted for future analysis.

This was the fifth annual snapshot day event, and a comparison with previous Snapshot Day events shows that the water quality problems found the past still remain. This is despite costly efforts by local and state agencies to improve water quality through treatment processes and regulatory efforts. This demonstrates that waiting for “someone else” to improve our water quality is an ineffective strategy. The only way we will see significant improvement in the water quality of our streams is if all Orange County citizens change their habits to reduce the human sources of bacteria and nutrients that pollute our streams. As outlined in the summary above and presented in detail in the tables on the following pages, the water quality in Orange County’s creeks has a long way to go before we can achieve the maximum beneficial uses we expect and deserve from our local waterways. This report is intended to inform the public at large of the problems we face as a community in regards to water quality

This event has helped in raising awareness of the water quality issues in Orange County and directly demonstrating to the public the effects of pollutants on our waters. This report also provides data to the public and local agencies that can be used in planning actions to improve water quality. A digital copy of this data along with data from past years is available at www.cwmoc.org and www.coastkeeper.org.

**Table 1: Bacteria Results for Snapshot Day May 5, 2007 Marine Sites.
Values in Red exceed State or USEPA recommended levels.**

Site	Group	Total Coliform: (MPN/100ml)	Total E. Coli: (MPN/100ml)	Total Enterococcus (MPN/100mL)
Bolsa Chica Walkbridge	BCC	759	10	10
Bolsa Chica Walkbridge-DUP	BCC	771	31	<10
Huntington Harbor	BCC	464	<10	<10
Santa Ana River	Divers	74	<10	2,359
Delhi Channel	OCCK			262
Talbert Marsh	OCCK	185	<10	10
Intro Bolsa Chica Wetland	Public	30	10	<10
Bolsa Chica Wetland	Public	146	10	<10
SF-01 Edison Plant Down Coast	Surfrider	<10	<10	<10
SF-02 Edison Plant	Surfrider	10	<10	<10
SF-05 San Gabriel River @ Bridge	Surfrider	24,192	74	218
SF03-Peter's Landing	Surfrider	712	<10	<10
SF04-Seal Beach Pier	Surfrider	448	30	<10
SF06-Cerritos Channel	Surfrider	399	63	31
San Mateo at Mouth	TU			265

**Table 2: Bacteria Results for Snapshot Day May 5, 2007 Freshwater Sites.
Values in Red exceed State or USEPA recommended levels.**

Site	Group	Total Coliform: (MPN/100ml)	Total E. Coli: (MPN/100ml)	Total Enterococcus (MPN/100mL)
Wintersburg Channel-DUP	BCC			
Wintersburg Channel @ Gothard	BCC			
Fischers Gulch	BCC	9804	31	74
Fishcers Gulch- DUP	BCC	9804	20	98
San Diego Creek	Divers	>24,192	19,863	798
Big Canyon Crk	Divers	>24,192	11,199	81.5
Costa Mesa Channel	OCCK			904
El Morro Creek	OCCK	26,020	630	373
Los Trancos Creek	OCCK	15,650	740	805
Greer Park	OCCK			617
Chris Carr Park	OCCK			4,352
Buck Gully	OCCK	4,190	<100	830
Morning Canyon	OCCK	22,470	310	691
Huntington Lake	Public	17,220	2,650	>2,419.2
Tablet Lake	Public	3640 (2nd Sample 2460)	310 (2nd Sample <100)	933 (2nd Sample 50.5)
Salt Creek	TU			15,310
Aliso Creek at Mouth	TU			876
Trabuco Creek	TU			1198
San Juan Creek	TU			327

**Table 3: Chemical Results for Snapshot Day May 5, 2007 Marine Sites.
Values in Red exceed State or USEPA recommended levels.**

Site	Group	PO4 average (mg/L)	NO3 Average (mg/L)	NH3 average (mg/l)	NH3 objective (mg/L)	pH	Average DO (mg/l)
Bolsa Chica Walkbridge	BCC	0.28	1.1			8.51	5.95
Bolsa Chica Walkbridge-DUP	BCC						
Huntington Harbor	BCC	0.16	7.7			8.0	4.55
Santa Ana River	Divers	0.2	0	0.27	0.045	7.9	4.5
Delhi Channel	OCCK	0.09	5.3	0.13	0.011	7.2	2.02
Talbert Marsh	OCCK	0.07	2.2	0.17			
Intro Bolsa Chica Wetland	OCCK	0.1	1.6			7	2
Bolsa Chica Wetland	OCCK	0.34	6.7	6.6	0.024	7.5	2
SF-01 Edison Plant Down Coast	Surfrider	0.013	0.8	0.05		7.9	6.4
SF-02 Edison Plant	Surfrider	0.06	1.5	0.28		7.8	6.6
SF-05 San Gabriel River @ Bridge	Surfrider	0.29	1.9	0.19		7.9	5.6
SF03-Peter's Landing	Surfrider	0.18	2.35	0.12		7.8	4.9
SF04-Seal Beach Pier	Surfrider	0.075	1.3	0.02		8.1	6
SF06-Cerritos Channel	Surfrider	0.17	1.35	0.11		7.8	2.6
San Mateo at Mouth	TU	0.23	7.9	0.06	0.029	7.63	82.9

**Table 4: Chemical Results for Snapshot Day May 5, 2007 Freshwater Sites.
Values in Red exceed State or USEPA recommended levels.**

Site	Group	PO4 average (mg/L)	NO3 Average (mg/L)	NH3 average (mg/l)	NH3 objective (mg/L)	pH	Average DO (mg/l)
Wintersburg Channel-DUP	BCC						
Wintersburg Channel @ Gothard	BCC	0.45	4.1	OR		8.5	12
Fischers Gulch	BCC	1.195	1			7.945	3.32
Fishcers Gulch- DUP	BCC						
San Diego Creek	Divers	0.1	2	0.49	0.05	8.5	6.4
Big Canyon Crk	Divers	0.77	0	0.29	0.02	7.5	4.5
Costa Mesa Channel	OCCK	0.67	2.65	0	0.05	8.5	14.85
El Morro Creek	OCCK	0.2	0.2			7.665	5.25
Los Trancos Creek	OCCK	2.5	0.6			8.10	10
Greer Park	OCCK	0.9				9.11	12
Chris Carr Park	OCCK	3.5				9.17	9
Buck Gully	OCCK	0.15		0	0.02	7.61	9
Morning Canyon	OCCK	0.35				7.25	11
Salt Creek	TU	2.47	2.8	0.6	0.019	7.54	78.2
Aliso CreeK at Mouth	TU	0.6	0.95	0.02	0.037	7.73	84.6
Trabuco Creek	TU	0.33	0.3	0.01	0.033	7.71	91.5
San Juan Creek	TU	0.53	0.75	0.53	0.015	7.41	69.9

Table 5: Chemical Results for Snapshot Day May 5, 2007 Public Sites.
Values in Red exceed State or USEPA recommended levels.

Site	Group	PO4 average (mg/L)	NO3 Average (mg/L)	pH	Average DO (mg/l)
Huntington Lake	Public	1.5		7.5	8
Talbert Lake	Public	1	4	7.83	2.667

Table 6: Physical Results for Snapshot Day May 5, 2007 Marine Sites.
Values in Red exceed State or USEPA recommended levels.

Site	Group	Water Temp. (celcius)	Air Temp. (celcius)	Average EC (mS)	Turbidity	Transparency	Salinity (ppt)
Bolsa Chica Walkbridge	BCC	20.1	18.1	44.5			32.15
Bolsa Chica Walkbridge-DUP	BCC						
Huntington Harbor	BCC	19.7	23.7				30
Santa Ana River	Divers	18.5	17.5	Exceeds Range		3	34
Delhi Channel	OCCK	19.4		9.86	5	14	
Talbert Marsh	OCCK						
SF-01 Edison Plant Down Coast	Surfrider	15.5	18.0	53.2	7.0 (NTU)		34
SF-02 Edison Plant	Surfrider	15.0	18.0	54.5	3.5 (NTU)		34
SF-05 San Gabriel River @ Bridge	Surfrider	17.0	21.5	38.5	1.5 (NTU)		24
SF03-Peter's Landing	Surfrider	19.0	23.5	54.6	3.5 (NTU)		34
SF04-Seal Beach Pier	Surfrider	17.0	16.0	53.3	2.6 (NTU)		35
SF06-Cerritos Channel	Surfrider	17.5	17.5	55.1	0.9 (NTU)		34
San Mateo at Mouth	TU	19.04					

Table 7: Physical Results for Snapshot Day May 5, 2007 Freshwater Sites.
Values in Red exceed State or USEPA recommended levels.

Site	Group	Water Temp. (celcius)	Air Temp. (celcius)	Average EC (mS)	Turbidity	Transparency	Salinity (ppt)
Wintersburg Channel-DUP	BCC						
Wintersburg Channel @ Gothard	BCC	18.7	22.4				
Fischers Gulch	BCC	18.35	19.45	0.853			0.5
Fishcers Gulch- DUP	BCC						
San Diego Creek	Divers	19.5	14.5	12.75		31	9
Big Canyon Crk	Divers	18.0	17.0	4.7		110	4
Costa Mesa Channel	OCCK	21.3		2.225	5		
El Morro Creek	OCCK	15.2	17.6				
Los Trancos Creek	OCCK	16.25	18.2				
Greer Park	OCCK	20.65	17.7	1.02			
Chris Carr Park	OCCK	21.3	19.6	1.1			
Buck Gully	OCCK	15.5	18.5				
Morning Canyon	OCCK	18.6	18.85				
Salt Creek	TU	15.61					
Aliso CreeK at Mouth	TU	16.98					
Trabuco Creek	TU	15.56					
San Juan Creek	TU	16.12					

Table 8: Physical Results for Snapshot Day May 5, 2007 Public Sites.
Values in Red exceed State or USEPA recommended levels.

Site	Group	Water Temp. (celcius)	Air Temp. (celcius)	Average EC (mS)	Turbidity	Transparency	Salinity (ppt)
Huntington Lake	Public	23.5				50	
Tablert Lake	Public	24				40	
Intro Bolsa Chica Wetland	Public	18				0	
Bolsa Chica Wetland	Public	22				40	