

Date: March 31, 2006

Project: Final Report for Santa Monica Baykeeper Beachkeeper Citizen Monitoring Program

Watersheds: Santa Monica Bay and Ballona Creek Watersheds

Project Type: Volunteer Water Quality Monitoring

Funding Source: 319h grant funding

Project Cost: \$82,866

Disclosure: Funding for this project has been provided in full or in part through an Agreement with the State Water Resources Control Board (SWRCB) pursuant to the Costa-Machado Water Act of 2000 (Proposition 13) and any amendments hereto for the implementation of California's Nonpoint Source Pollution Control Program. The contents of this document do not necessarily reflect the views and policies of the SWRCB, nor does mention of trade names or commercial products constitute endorsement or recommendation of use.

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III. Executive Summary

The Santa Monica Baykeeper's Beachkeeper Volunteer Water Quality Monitoring Program received a two year 319h grant in the amount of \$82,866 for 2004/2005. The goal of the Beachkeeper Program is to monitor pollution sources and provide baseline data that can be used as source identification information and to measure the effectiveness of future Best Management Practices (BMPs) designed for bacteria, metals, and trash reduction in Santa Monica Bay and Ballona Creek.

The tasks accomplished through this grant were the following: the program developed a comprehensive QAPP for the program and all monitoring efforts that took place under this grant; began to form a TAC to assist with technical aspects of water quality monitoring; conducted extensive outreach to the local community through events and various types of media; recruited and trained over 30 new volunteers; updated photo catalogue and GPS information of all drains and discharges in Santa Monica Bay and the Los Angeles County ASBS to digital format and expanded the photo catalogue to include all of Ballona Creek; focused monitoring efforts on priority monitoring sites identified by the Beachkeeper Program; conducted two dry weather and two wet weather snapshot sampling events that covered all of Santa Monica Bay and the ASBS; presented information about the program at conferences and through local and national media; produced and analyzed microbiological, chemical, and physical data from water samples collected during snapshot sampling events; updated and improved the program's database so it can include observational monitoring data; and updated and added Beachkeeper program information to Baykeeper's new website.

This project and ongoing program is made possible through the many dedicated Beachkeeper volunteers, whose efforts accounted for over \$35,000 of match for this grant. We also partnered with CRG Marine Laboratories, Inc. for metals analysis for all of our water samples.

IV. Problem Statement and Relevant Issues

The need for storm drain monitoring is acute, as the Santa Monica Bay experiences one of the highest levels of stormwater pollution in the nation, with massive amounts of bacteria and trash flowing to the coastal waters. Over three hundred fifty (350) drains (previously identified by the Santa Monica Baykeeper's Beachkeeper Program) flow into Santa Monica Bay. Ballona Creek exhibits alarming levels of contaminants and is one of the primary conduits of runoff pollution from inland sources to the Santa Monica Bay. Approximately eighty percent (80%) of the Ballona Creek Watershed is urbanized resulting in high

levels of urban runoff. High levels of bacteria, metals, and trash have been found at various locations along Ballona Creek, which ultimately impact the coastal waters and the health of the residents and tourists visiting local beaches. Minimal monitoring data currently exists for Ballona Creek yet there is an urgent need for an extensive monitoring program in this area.

V. Project Goals

The general goal of the Beachkeeper Citizen Monitoring Program is to monitor pollution sources and provide baseline data that can be used as source identification information and to measure the effectiveness of future Best Management Practices (BMPs) designed for bacteria, metals, and trash reduction in Santa Monica Bay and Ballona Creek. The Beachkeeper Program monitored throughout the Santa Monica Bay and a small portion of Ballona Creek. This program has been previously funded by a 319h grant and various foundations. Through this current 319h grant, we expanded the monitoring efforts to cover the Area of Special Biological Significance (ASBS) in Los Angeles County and identified all discharges of Ballona Creek. The Beachkeeper Program continues to supply the monitoring results to the Los Angeles Regional Water Quality Control Board (LARWQCB) and a coalition of local stakeholders (Ballona Creek Watershed Task Force [BCWTF]) providing baseline data to determine the need for additional implementation measures. We also conducted extensive community outreach and education in order to increase our volunteer base and the public's awareness of urban runoff and the ways pollution can be reduced.

The main goals of this project are to:

- (1) identify the storms drains and other discharges which are consistently flowing
- (2) track sources and potential sources of pollution
- (3) stop such sources by exposing illegal activities or by working to strengthen water quality regulations set by the EPA and the state.

Along with these goals, the project aimed at raising the community's consciousness about pollution flowing from storm drains, provided a way for individuals to personally impact this problem, and to provide high quality data to agencies and the public about sources and causes of pollution in our coastal and adjacent waterways.

VI. Project Description

A. Project Type

This project is part of the ongoing Beachkeeper Volunteer Water Quality Monitoring Program initiated by the Santa Monica Baykeeper in 1996. This grant funded the expansion of this program.

B. Project Costs and Matching Funds

Task		319(h)	Match Required	Match Obtained
1	Project Admin	\$4,500	\$0	\$0
2	QAPP	\$1,000	\$0	\$0
3	TAC	\$500	\$0	\$0
4	Outreach and Education	\$2,000	\$1,000	\$5,181.00
5	Recruitment and Training	\$5,000	\$2,000	\$2,619.96
6	Expansion and Site Selection	\$14,000	\$2,000	\$4,009.50
7	Implementation	\$16,000	\$22,000	\$23,454.00
8	Water Quality Analysis	\$15,866	\$5,200	\$26,430.50
9	Data Management	\$20,000	\$1,000	\$1,472.50
10	Draft and Final Report	\$4,000	\$0	\$0
	Total	\$82,866	\$33,200	\$63,167.46

The matching funds for this project are from volunteers hours for various aspects of the project, such as obtaining water samples during sampling events, monthly observations conducted by Beachkeeper volunteers, hours spent at community events, hours spent doing laboratory analyzes, and hours spent on helping with training materials updates and website updates.

In kind services for metals analysis from CRG Marine Laboratories, and for donations from companies like West Marine were also used as match funding.

1. Other funding sources during this project period were as follows:

Employees Community Fund of Boeing California
Entertainment Industry Foundation
Environment Now
Patagonia
Oracle
RGK Foundation
Carl and Roberta Deutsch Foundation

C. Project Methodology and Description

The program recruited and mobilized volunteers through community events, internet announcements on volunteer sites, our website, and newsletter notices. We encouraged the community to participate in the hands-on monitoring, data collection, and water sampling needed to assess the damage caused by urban runoff and other contaminants from storm drains. Throughout the term of the

grant, we attended or conducted over 35 events where we were able to outreach and recruit new volunteers to the Beachkeeper program.

Once enough potential volunteers signed up to become a Beachkeeper volunteer, they were invited to an evening training. These trainings include an introduction to the Clean Water Act, current and local water pollution issues, the history of the Beachkeeper program and its volunteers, bird and wildlife habitat identification and, water quality monitoring and sampling protocols. Throughout this project term we conducted 3 trainings (March 23, 2004, February 21, 2006, and February 28, 2006) and recruited over 30 new volunteers.

Upon completion of Beachkeeper training and additional field training to assure quality control and quality assurance procedures for sampling and observations, a volunteer is assigned a section of beach to monitor. Volunteers are encouraged to commit to their section for at least one year. After being out in the field a few times, the volunteer becomes the steward of their stretch of beach and all the discharge points located within it. Observational data collected each month by the Beachkeeper volunteers includes the physical appearance of the beach, amount of flow from drains in their section, the amount of debris at and around storm drains in their section, and wildlife observations, including three species of endangered or threatened birds in Southern California.

Each volunteer then monitors the locations along his or her section for pollution and is responsible for collecting water samples from their drains during our scheduled snapshot sampling events. This is the first and most critical step of sampling. If high quality procedures are followed in the field, samples can be expected to be free from contamination and used with confidence. Volunteers endure rigorous classroom and field training to ensure that sampling locations are consistent and that proper collecting procedures are followed. Throughout the term of this grant, we conducted 4 snapshot sampling events (2 dry weather and 2 wet weather/first flush). The first two sampling events (June 5, 2004 and October 20, 2004) were not billed to this grant because we were still waiting on QAPP approval. We used an already approved QAPP developed for the Southern California Marine Institute (SCMI), where the Beachkeeper Program is listed as a monitoring partner. For the second two events (August 6, 2005 and October 19, 2005), we used our approved QAPP through this project. The QAPP was approved on February 24, 2005. The statistics on the four sampling events conducted are included in the next section under new data.

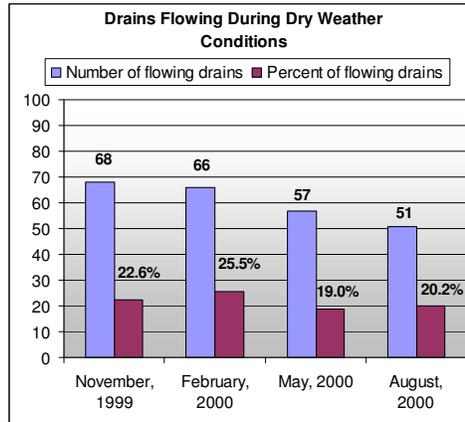
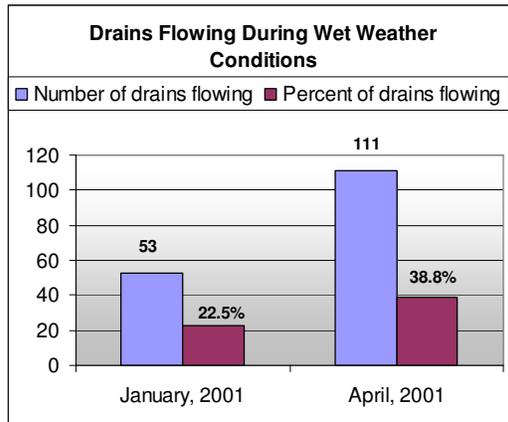
The next step in water quality monitoring is analyzing the samples collected from the drains. Within just a few hours of collection, the samples are brought to the Baykeeper's in-house laboratory and analyzed for seven different water quality parameters. All instruments and lab supplies used are calibrated and checked for quality assurance purposes. After hours of measuring, diluting, mixing and rinsing, the samples are tested and results recorded for data entry into the database. Total coliform, *E.coli*, and enterococci bacteria results are obtained

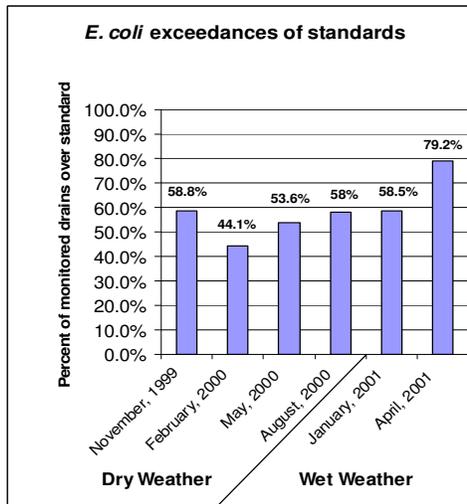
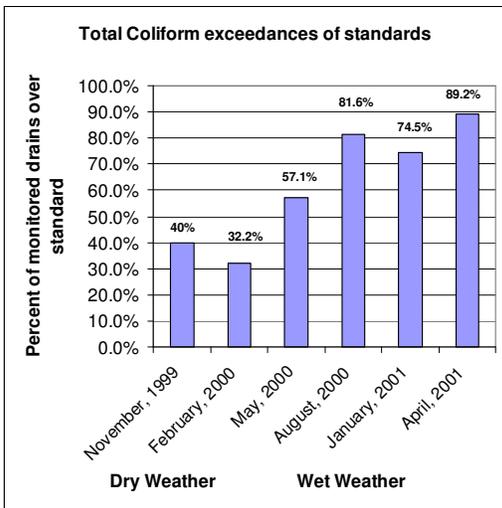
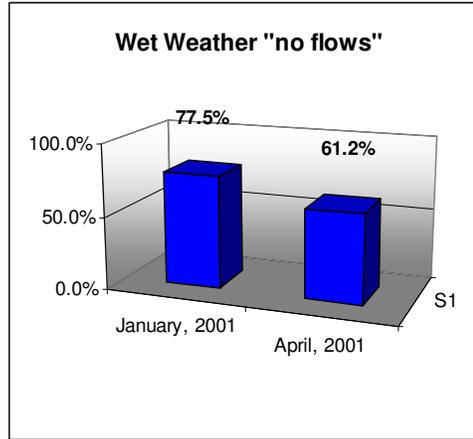
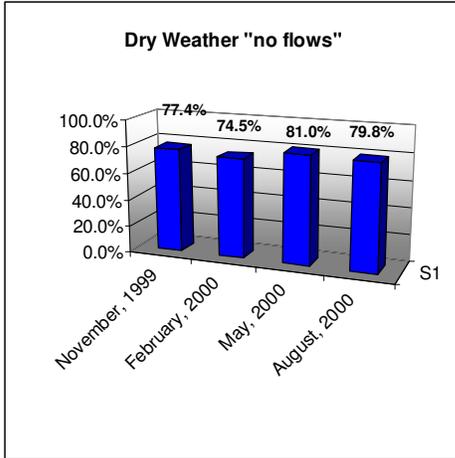
after the samples have been incubated with a reagent and the bacteria have been given time to grow. These bacteria numbers are recorded along with results from the pH, salinity, and total dissolved solids tests. Samples are also prepared in our lab for metals testing, and sent to a state certified lab, with results of the levels of 21 metals returned to the Baykeeper within a few weeks.

This data is then entered into a customized Access database created by the Beachkeeper Program. This database contains a microbiology and chemistry data entry component, and throughout the term of this grant we were able to create and begin to populate a new observational data component. All of the program snapshot sampling event data is housed in this database. The data and database functions were initially used to produce our 2001 Beachkeeper program report. Many of the sampling events and activities that lead up to this report were funded by a previous 319h grant. Since then we have conducted an additional 9 sampling events (4 during this grant term) and have inputted the data into the database.

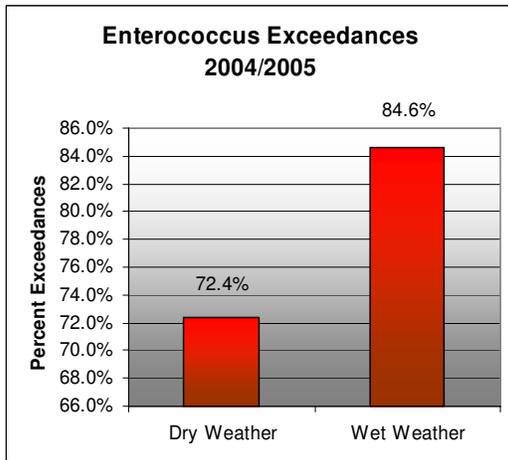
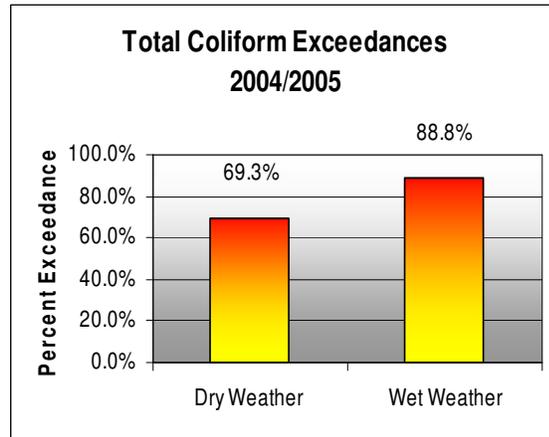
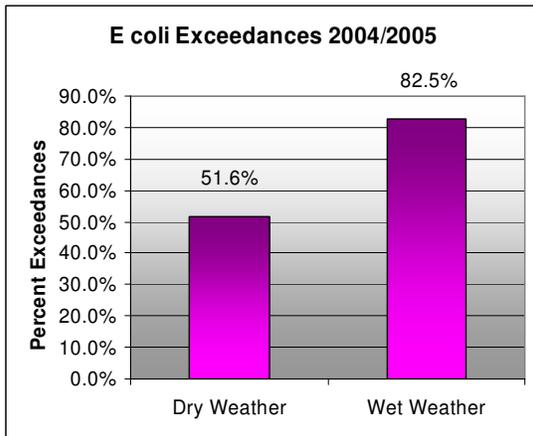
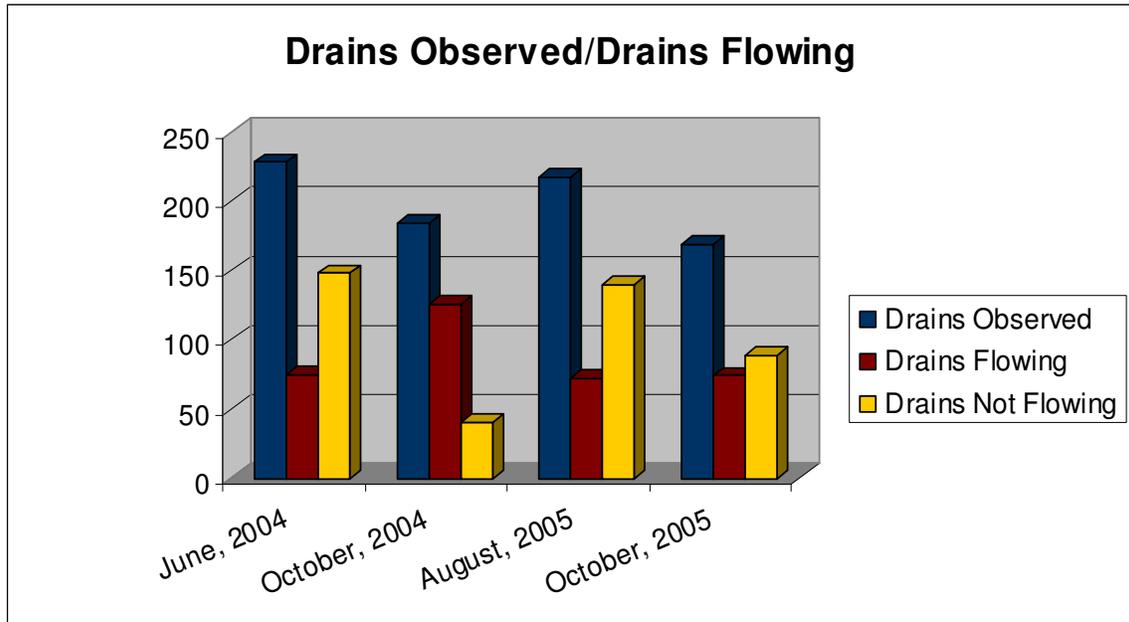
D. Existing and New Data

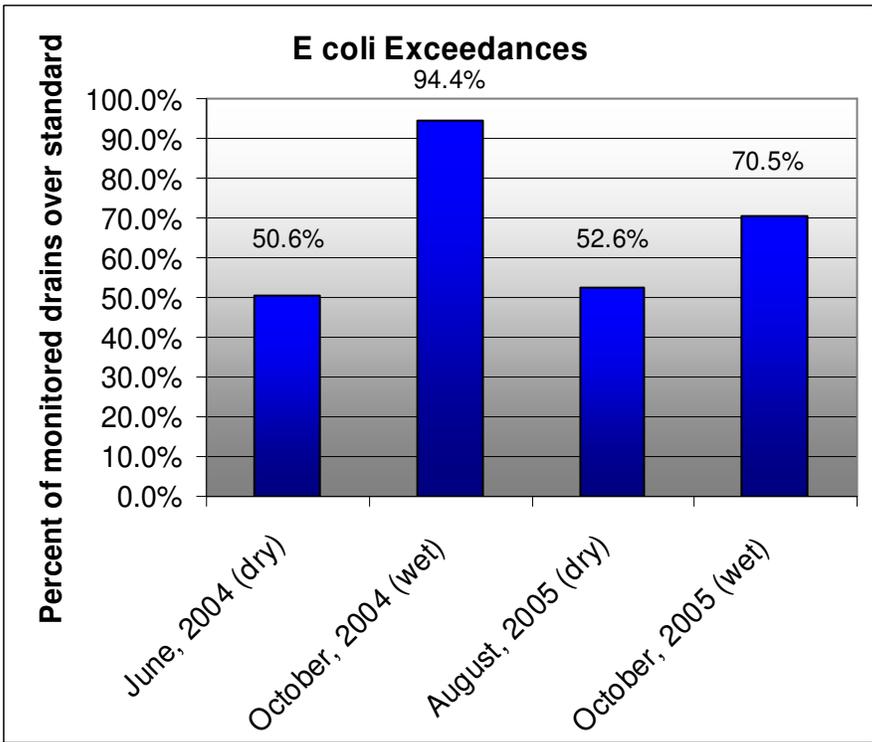
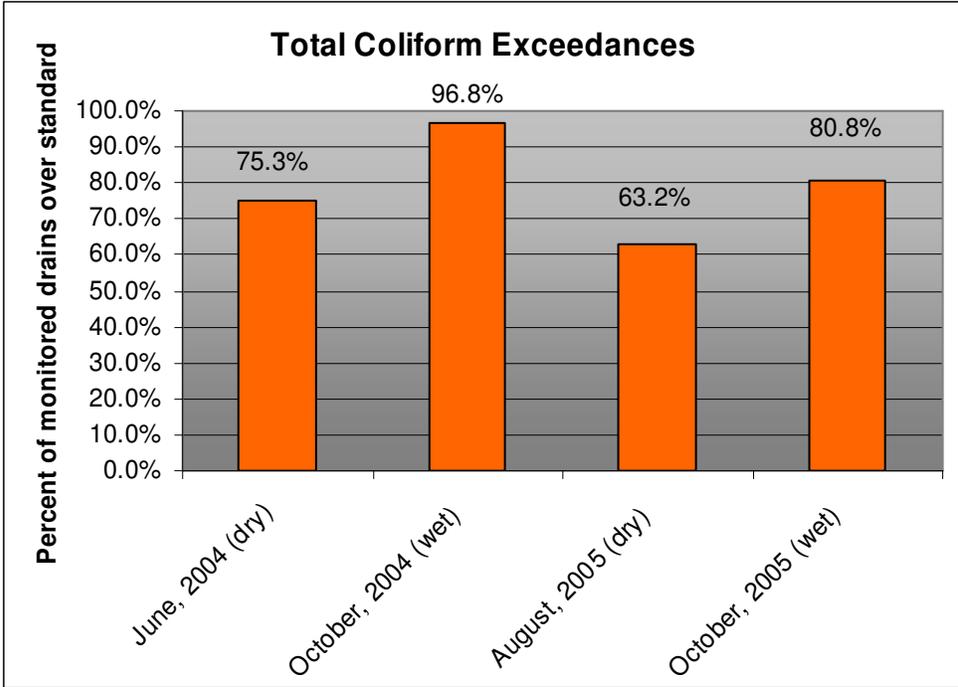
Existing Summarized Data (1999-2001) from previous 319h grant:

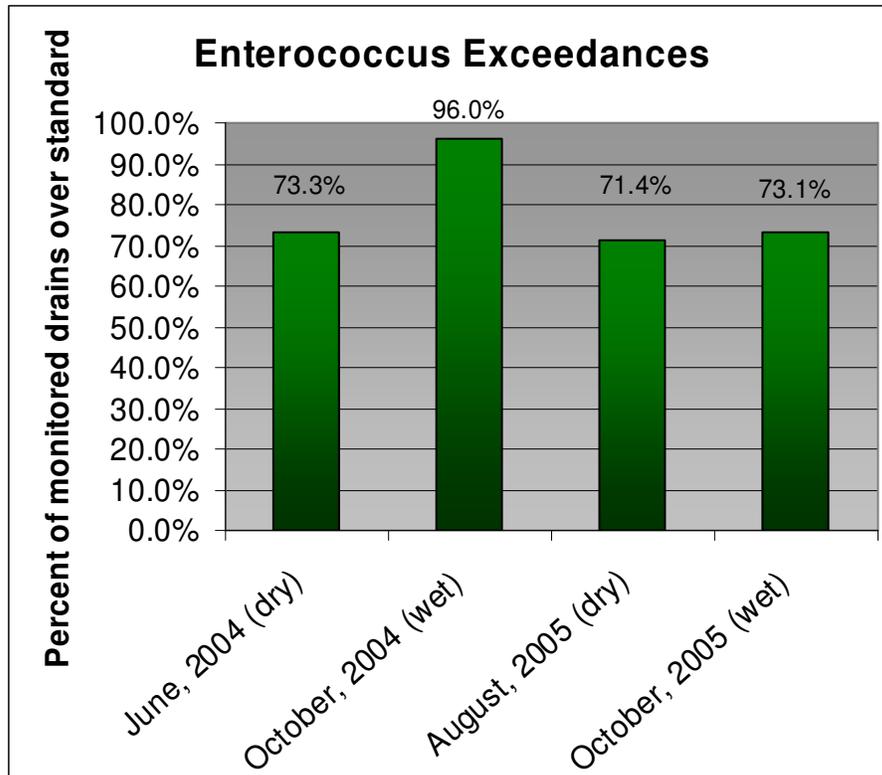




New Summarized Data (2004-2005) from this 319h grant:







In addition to the summarized data above we have included tables of all the data in electronic form on CD. The entire digital photo catalogues and gps coordinates of all the drains is also included on the CD due to the size of these documents. An example of the photo catalogue is included in the appendices of this report.

E. Data Evaluation/Pollutant Reduction

Overall, the dry weather sampling events had less exceedances for all three indicator bacteria. Enterococci exceedances for dry and wet weather events were fairly high and similar, but exceedances for total coliform and E coli showed approximately 20% difference during dry vs. wet weather snapshots.

The number of drains monitored was higher during both dry weather events because of the amount of time available to plan these snapshots sampling events. Wet weather drains monitored was lower because they are based on first flush rain events and volunteers are given 24 hours notice to help us with the event. Considering that wet weather snapshots can also fall on a weekday, we had pretty good coverage of our monitoring areas and a fairly high number of water samples.

More drains were not flowing during the dry weather events, which is to be expected. But many of the drains that were flowing during these dry conditions exceeded state water quality objectives for indicator bacteria.

Since 2001, many drains in the Santa Monica Bay have dry weather diversions or have had BMPs installed to help reduce bacteria numbers. We noticed that our data showed that although a diversion or BMP was installed and supposedly functioning, we identified flow and high bacteria numbers from these drains. The dry weather exceedance percentages seem to be higher since 2001 as well.

VII. Public Outreach

We have had consistent interest for the Beachkeeper program throughout the term of this grant and have recruited over 30 new volunteers. Most of the interest and new volunteers come from our local events, our newsletter, website volunteer opportunities section, and other online volunteer services like volunteermatch.com. These types of activities occurred throughout the term of this entire grant.

Early 2004, we updated our Beachkeeper program field guide for our volunteers and provided them with new kits with our logo that were donated in kind to our program. We also received a corporate sponsorship that helped the program obtain Beachkeeper program shirts for all volunteers, funders, and supporters. The field guides, kits, and t-shirts serve as constant outreach tools for the program.

We created a simple but useful Beachkeeper program brochure that was used throughout this grant. It is small and laminated so that current volunteers can carry them in their kits along with their pollution hotline cards and other sampling equipment. Many of our current volunteers get approached by beachgoers while observing or sampling their sections and this is a great way for our volunteers to reach out to the community.

In May 2004, the Beachkeeper program was invited to do a presentation at the National River Rally in May. The program was used as example of a successful water monitoring program and how we take data and turn it into information for the public. We were able to do extensive outreach during this conference and created a specific powerpoint presentation for the conference.

In May 2004, we conducted an outreach and education appeal for one of our priority monitoring sites for the Beachkeeper program at our annual fundraiser dinner. We had two volunteers donate their time and expertise in media outreach and design to create this appeal. Also, the two volunteers continued to work with the program and project.

We distributed a Baykeeper newsletter in Spring and Fall 2004 and 2005, which included a Beachkeeper program section that highlighted program projects, accomplishments, informed current volunteers and served as an outreach tool for recruiting new volunteers.

We have established the beginnings of a comprehensive community based monitoring program in Ballona Creek. Since 2001, the Beachkeeper Program Director serves as the monitoring subcommittee chair for the Ballona Creek Watershed Task Force and through this task force has been working on ways to establish a monitoring program that meets the various needs of the Ballona Creek watershed. We provide updates at all task force meetings have conducted various forms of outreach during these meetings that have positively affected this grant.

The Clean Water Act Owner's Manual 2nd Edition has just been released and it features the Beachkeeper Program and how our water quality data has helped to develop TMDLs in the Los Angeles Region. Over the past five years, 5000 copies of the first edition of Clean Water Act Owner's Manual have hit the streets. This information has helped countless citizens and organizations improve the implementation and enforcement of the Clean Water Act at the state level.

VIII. Conclusions

A. Project Evaluation and Effectiveness

This program has been very effective throughout it's existence and throughout the term of this 319h grant. The program continues to improve and expand all of it's water quality monitoring efforts and continues to be fluid and dynamic to address timely needs for water quality data in the Los Angeles region.

During the term of this grant, the program almost doubled the number of water quality monitoring volunteers, updated pictures, descriptions, and gps coordinates for over 700 drains in the Los Angeles region, consistently monitored a priority site in Santa Monica Bay where we played a lead role in installing a bacteria reducing BMP, conducted four extensive snapshot sampling events that covered over 65 miles of coastline in less then three hours and produced thousands of records of bacteria and heavy metals data, and improved our database to not only hold more data, but to be compatible with many water quality monitoring databases in the region.

This program's data is one of the few in the Los Angeles region to be used in helping to shape water quality regulations. The program has a strong presence in the local community and environmental community. Many Los Angeles region TMDLs and BMP projects have resulted from our photo catalogue and data from drains and discharges in Santa Monica Bay, the Los Angeles County ASBS, and Ballona Creek. We applied for this 319h grant in 2001 and received

project selection notification on January 9, 2002. The Beachkeeper Program is an ongoing volunteer water monitoring effort since 1996, so a few TMDL and BMP projects that the program had in mind for the term of this grant were conducted before the official start date. In addition, many projects also took place and expanded as a direct result of this grant.

B. Individual Goals and Performance measures

Goal: *Identify storms drains and other discharges which are consistently flowing.*

Performance measures:

At the start of this grant term process, Baykeeper staff and volunteers had identified approximately 350 drian and discharges that flowed into Santa Monica Bay. To date, over 700 storm drains and discharges that flow directly into the Santa Monica Bay, Los Angeles County ASBS, and adjacent creeks have been identified. Prior to this grant, all pictures were in film format and descriptions typed on paper and copies could be provided to volunteers and agencies through photocopies. Throughout the billable term of this grant, the Beachkeeper program has updated the entire photo catalogue to digital format. Digital format will help us distribute out the drain and discharge information in a more convenient and timely format and will help us with future dissemination of program information. This was a key deliverable for this grant.

Throughout the term of this grant, Beachkeeper volunteers have consistently conducted monthly observations on many sections of beach and drains along Santa Monica Bay. One of their observational focuses is to track flowing drains. This information was useful in developing the Santa Monica Bay beaches bacteria TMDL and the regional board put in a clause in the monitoring plan for this TMDL that all Beachkeeper program drain data be used during any revisiting periods for this TMDL.

Goal: *Track sources and potential sources of pollution.*

Performance Measures:

Data collected by Baykeeper volunteers had found that since 1996, a majority of drains in Santa Monica Bay regularly exceeded state and regional water quality objectives for bacteria. In 2002, the Regional Board used location information collected through the Baykeeper to set limits during dry and wet weather for the Santa Monica Bay Beaches Bacteria TMDL. Numerous other agencies and municipalities including Los Angeles County, CalTrans, and several cities including Malibu, Los Angeles, Santa Monica, El Segundo, Manhattan Beach, Hermosa Beach, Redondo Beach, Torrance, and Palos Verdes Estates are currently using our photographs and GPS information regarding storm drain locations in order to determine ownership of these drains for TMDLs.

In the summer of 2003, The Los Angeles Regional Water Quality Control Board (LARWQCB) worked closely with us to implement an effective monitoring program in Ballona Creek that assists in pollutant source identification, and determination of water quality impairments by various pollutants. This information was used in crafting monitoring and implementation plans for upcoming Total Maximum Daily Load for Ballona Creek.

Through the collaboration of the BCWTF, we successfully coordinated and completed three dry weather snapshot sampling events on Ballona Creek (May 17th, July 16th, and September 24th) and worked in collaboration with the Regional Board, City of Los Angeles, Los Angeles County and Southern California Coastal Water Research Project to collect data that will be used for upcoming Total Maximum Daily Load (TMDL) implementation. The Beachkeeper Program was also recognized by the California EPA Department of Toxic Substance Control for coordinating this effort on Ballona Creek.

The Beachkeeper Program served on the Technical Advisory Committee (TAC) put together by SCCWRP for a project that assisted with implementing Coliform TMDLs for Santa Monica Bay beaches using standard methods and rapid indicator detection technologies. The results and manuscript for this study was recently accepted for publication in Applied and Environmental Microbiology, with Beachkeeper Program Director and Baykeeper as a co-author. A copy is included in electronic form on the CD.

Goal: Stop such sources by exposing illegal activities or by working to strengthen water quality regulations set by the EPA and the state. Help to fill gaps in agency data collection and enforcement.

Performance Measures:

Over the term of the grant and prior, Beachkeeper volunteers have been keeping an eye on specific drains that have been identified as diverted. Beachkeeper volunteers are monitor beaches on a monthly basis and serve as pollution watch dogs for the community. Many of these diversions are being built to meet TMDL pollution limits that will be strictly enforced by the Regional Water Quality Control Board in the near future. Our volunteers collect information to ensure compliance and enforcement of these diversions during these months.

Prior to the billable term of this grant, one of our South Bay Beachkeeper volunteers, Dean Francois, has been regularly monitoring one the first diverted drains in the South Bay, the Herondo Avenue drain in Hermosa Beach. This drain has been diverted by Los Angeles County during the summer months since April 2000. Yet during the summer of 2002, large quantities of excess flow and occasional high bacteria counts were regularly observed at this drain. After months of inquiry, we were finally able to get answers and results. The County performed its own investigation and acknowledged that the source of the excess

flow was a water desalinization plant in Torrance and as a result was required to obtain the proper discharge permits. Diversions are a step forward in the efforts to clean up our waters, but they are only effective if they are functioning properly.

On August 18, 2005 the Baykeeper received a hotline call concerning a drain breach and polluted water flowing from the same drain, the Herondo Avenue drain in the South Bay. Beachkeeper Program immediately contacted Beachkeeper volunteers David Henesler and Dean Francois, who regularly monitor the area, to keep an eye on the drain. They reported that the flow was heavy and continued over the next few weeks. Meanwhile, we informed City of Hermosa Beach and the Los Angeles County Department of Public Works to let them know about the problem while we started our own investigation. The amount of flow that we were seeing would be atypical for summer months even if the drain were not diverted, so we knew there had to be a source causing this flow.

We discovered that the same incident from 2002 had occurred. The Water Replenishment District (WRD) of Southern California's de-salination plant in the Torrance was flushing water from their well. The water they flush was supposed to flow to the Dominguez Channel, but the valve redirecting all flows may not have been switched back at the beginning of the summer season. This caused the excess flow to disrupt the diversion at Herondo Avenue. Because of our Beachkeeper volunteer's efforts and observations, the illegal discharge is no longer flowing from the drain. In addition, LA County DPW has informed us that WRD and City of Torrance are working to improve the coordination efforts to ensure that the system is properly adjusted for future discharges.

Goal: Help to plan, implement, and monitor a Best Management Plan (BMP) device, that cleans up polluted water and helps meet TMDL pollution limits.

Performance measures and outcome:

Ramirez Creek runs through a part of the Malibu Creek Watershed and empties out in front of the Paradise Cove property in Malibu. For years, Beachkeeper volunteers have monitored this creek and it has consistently shown bacteria results that exceed standards set by the state. Many families visit this beach throughout the year and children consistently play in and nearby this creek. The owners of the property and local restaurant worked with the Beachkeeper Program over several months in 2003 to find a solution to the problem. After thorough research, monitoring throughout the property and an investigation, a bacteria reducing device was installed on the property. This Clear Creek Systems Inc. device uses UV radiation to kill bacteria as the water flows through the system.

We have been monitoring a priority site in Santa Monica Bay since 2003. We have collected very useful data on the effectiveness of this device and the site.

Beachkeeper volunteers monitor the creek and the effectiveness of the system on a weekly basis and have seen a dramatic drop in bacteria numbers. There are signs up about the device and the weekly results are posted so beachgoers are aware of the bacteria levels for that week. This project has served as a pilot project for many of the upcoming BMPs in the Los Angeles region.

Our ongoing effort over the past few years has led to attention from the City of Malibu. They received a Clean Beach Initiative grant to increase the capacity of the existing device and build upon Baykeeper's efforts. This is great news for the water quality in Paradise Cove. The plan is to improve the device so that it can handle not only dry weather flows, but also certain levels of winter weather flows. Baykeeper will be a part of this effort and plans to continue to monitor when the new and improved device is installed.

Goal: Recreate the Beachkeeper program portion of our website to help recruit more volunteers and easily disseminate information to the community.

Performance Measures:

We have started the design phase of the Beachkeeper program portion of our new website. We created a volunteer corner to highlight volunteer's efforts and provide current volunteers with program information, such as our field handbook, through our website. We have also posted information for community members who are interested in volunteering as well. We also use the blog on our website to keep volunteers and community members posted on the latest news about water quality and the program.

This is the starting block to help us integrate our database and make data and information from our program available on our website, in order to facilitate distribution of this information to the public and agencies. This will also be used as an outreach tool to educate and involve the community and keep volunteers updated on their section of beach or creek.

Challenges of the project and program:

One of the constant challenges is managing the program and its growth on the limited budget and limited staff time available. The program has grown to monitor over 700 sites, analyze over 200 samples for every snapshot for various parameters in our in-house laboratory. Although we have been fortunate to find some ongoing sources of foundation funding to date, the increasing size and scope of the program definitely present a financial challenge for the future.

Another constant challenge is to minimize volunteer turnover and to keep pace with the level of interest that we have had for the Beachkeeper Program. The program has expanded to being one of the main resources for storm drain and

flow information for the Santa Monica Bay and Ballona Creek. The key lesson that we have learned is that no task is too large if you have the support of the community and the help of dedicated volunteers. The Beachkeeper program and the organization continues to grow and because of interest from the community and recognition of the value of this program.

C. Next Steps

The next steps for this program is to get consistent full coverage of all Santa Monica Bay and ASBS drains. Even with over 60 volunteers, the monitoring area is large and additional volunteers are needed. We will continue to work with the Ballona Creek Watershed Task Force to expand our efforts to Ballona Creek and plan to share the information on drains collected through this grant with the group to assist in this expansion.

We will continue to be involved in all TMDL efforts in the region to assure that our data is useful in creating effective water quality regulations. We also plan on reaching out to more of the community through efforts used in the term of this grant and through new programs that were created as a result of this program.

The Beachkeeper program conducted many outreach efforts as a result of specific concerns that community groups have had about water quality during and prior to the term of this grant. The program is the first to respond to educate these community members on what they as citizens can do to help. Because of these efforts, the Beachkeeper Program Director developed the vision and initial plans for a new outreach program at the Santa Monica Baykeeper. This program educates community groups and residents about the Clean Water Act and how they as citizens can understand and use it to protect waterways in their local areas. Thus empowering the community to have a more direct involvement with water quality issues in their neighborhoods and on their local waterways. The Clean Water Act-Empower the People Program is a direct result of the work that the Beachkeeper Program has conducted for many years. We hope that this type of focused outreach will help reach more people and educate them to be stronger environmental stewards.

IX. Appendices

A. Grant Summary Form

Included in electronic form on the CD.

B. List of Deliverables

Task 1

Nine Quarterly Progress Reports

Contract Summary Form

MBE/WBE Documentation

Contractor Documentation/ Solicitation Documentation

Project Survey Form

Task 2

Approved and Signed QAPP with Monitoring Plan

Task 3

TAC Member List

Draft of Participation Confirmation Letters

Task 4

Sign up sheets from local events and communication materials

Lists of potential new volunteers

Sample solicitations

Task 5

Updated Handbook and Field Materials

Training Presentation Materials

Recruitment Flyers

List of New Volunteers

Record of training sessions and attendance sheet

Task 6

Meeting notes and suggested methods for expanding existing program

List of priority monitoring sites and testing parameters

List of priority drains, "wave wash" sites

List of existing and planned diversions and BMPs

Photograph catalogue of sites and GPS coordinates (on CD)

GIS maps (on CD)

Task 7

List of volunteers by location

Schedule of sampling events

Correspondence with the Clean Water Team

Record and summary of observational data

Notes of field check dates, times, and volunteer performance and ability
Flyers, notices, sign-up sheets, and informational packets from
meetings/presentations

Task 8

Data from Biannual Water sampling events

List of priority storm drains in Santa Monica Bay

List of priority storm drains in Ballona Creek and the ASBS

Record of samples preserved for metals analysis, list of sites sampled, and
spreadsheet of metals results.

Physical Habitat assessment results

Task 9

Printout of Data

Process Summary

Trends Analysis

Beachkeeper program website page layout, printout of website additions and
updates.

Task 10

Draft Project Report

Final Project Report

C. List of Subcontractors/MBE/WBE

CRG Marine Laboratories

Network Giant

D. Tables of summarized numerical data

Included in electronic form on the CD.

E. Photos

Example of photo catalogue shown here and the entire inventory of drain pictures
and descriptions included in electronic form on the CD.

Example: Section Three Photos

Directions: Section Three starts at Malibu Pier and ends at Las Flores Beach. Parking is available on PCH near the Malibu Pier or just north of the pier at the Malibu Lagoon and Museum entrance. There is beach access from the parking lot. Head south towards the pier to get to the first drain.

S3 Drain #10

Located east of the Malibu Pier and just east of the Malibu Beach Inn (pink building on the left); this drain is a large, twin box concrete outlet.



GIS Map Location

GPS Coordinate

Photo from a Beachkeeper Program training session.



F. Copies of articles about Beachkeeper Program

All articles were included in the progress reports throughout this grant.

G. Copies of peer reviewed articles

Included in electronic form on the CD.