

morro bay
volunteer monitoring

Morro Bay Volunteer Monitoring Program

Bacteria Monitoring Update

Fall 2007

Background

The Morro Bay Volunteer Monitoring Program (VMP) has been monitoring bacteria in local creeks and in the bay on a monthly basis since the summer of 2002.

Volunteers collect samples and then use IDEXX's Colilert-18 test kits to measure *E. coli* and total coliform levels from creek samples and *E. coli* from bay samples. Volunteers use IDEXX's Enterolert to monitor enterococcus, an indicator bacteria that is less sensitive to salt water. The lab work is conducted at the Morro Bay-Cayucos Wastewater Treatment Plant lab.

Each month the results are shared with various organizations and agencies including the Central Coast Regional Water Quality Control Board (CCRWQCB), the County Public Health Department, the City of Morro Bay, the California Department of Public Health and others.

What do the data mean?

Our bacteria results are compared to EPA's recommended standards for safe recreational contact. For freshwater, the total coliform level of concern is 10,000 MPN/100 mL. We do not collect total coliform data for marine samples. For *E. coli* in freshwater, the level of concern is 235 MPN/100 mL. Although a standard does not exist for *E. coli* in marine waters, we use the same 235 MPN/100 mL value, which is the approach taken by the Water Board. For enterococcus monitoring, which we conduct only in marine waters, the recommended level of concern is 104 MPN/100 mL for enterococcus. If bacteria levels exceed these standards, there is a higher likelihood that contact with these waters could lead to illness.

Program Updates

We are continually striving to improve the quality of the data from our bacteria monitoring. Part of this includes updating our equipment. Our laboratory incubators were outdated, donated units. Earlier this year we were able to purchase two larger, self-regulating units with built in thermostats that better hold the incubator temperatures at a constant level.

Additionally, some new sites have been added within the last year to assist with pinpointing potential bacterial sources. Due to elevated bacteria levels at our Pennington Creek site, a new site was added upstream on Cal Poly's property. In anticipation of extensive restoration work at Chorro Creek Ecological Reserve, a bacteria site was added directly upstream of the reserve. This new site, along with data from a site within the reserve and a site directly below the reserve, will help us understand the effect of the reserve on creek bacteria levels.

A Special Thanks to Our Volunteers

We'd like to thank the dedicated volunteers who have contributed to our bacteria monitoring effort throughout 2007:

Melinda Elster
Jane Fielder
Mimi Kimball
B.K. Richard
Karen Watts
George Wright

Also, a special thanks to the staff at the Morro Bay-Cayucos Wastewater Treatment Plant whose generous donation of lab space make our monitoring effort possible.

VMP Monitoring of Morro Bay

Monitoring Sites

The following bay sites are monitored on a monthly basis: Coleman Beach (COL), State Park Marina (SPM), Tidelands Park (TID), Windy Cove (WIN), Baywood Park (BAY), Cuesta Inlet (CIN), and Pasadena Point (PAS). The bay sites were chosen for their high potential for recreational contact, as these are areas commonly used by kayakers, windsurfers, surfers and others.

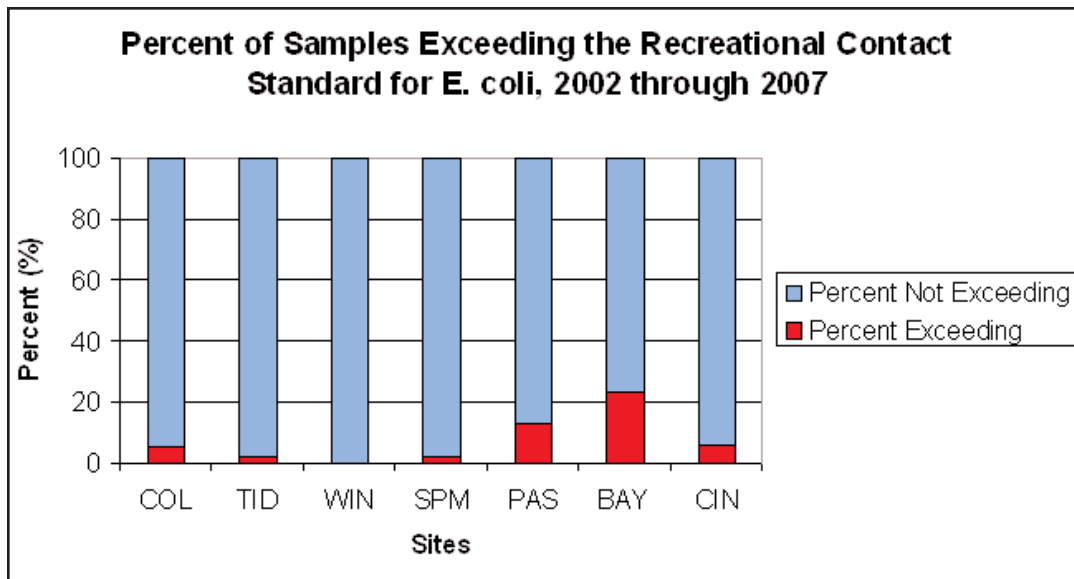
Volunteers sample from the shoreline on an outgoing tide. Samples are collected in sterile containers, stored on ice and then immediately transported to the lab. Volunteers typically analyze the samples within six hours of collection to maintain sample integrity. The IDEXX Colilert-18 test kits generate results for *E. coli* and Enterolert generates results for enterococcus.



Monitoring Results

Due to its high level of variability, bacteria data can be challenging to analyze.

One way to assess the data is to track the number of samples that exceed a level established to protect human health. In this chart, the red portion of the bar represents the percent of the samples that exceeded the safe recreational contact standard of 235 MPN/100 mL. This standard was determined to be the level at which illness is more likely for those swimming in the water. The blue portion of the bar shows the percent of samples that did not exceed this standard.



The Water Board becomes concerned when 10% or more of the samples exceed the protective standard. The data shows that this was case at both Baywood Pier and Pasadena Point.

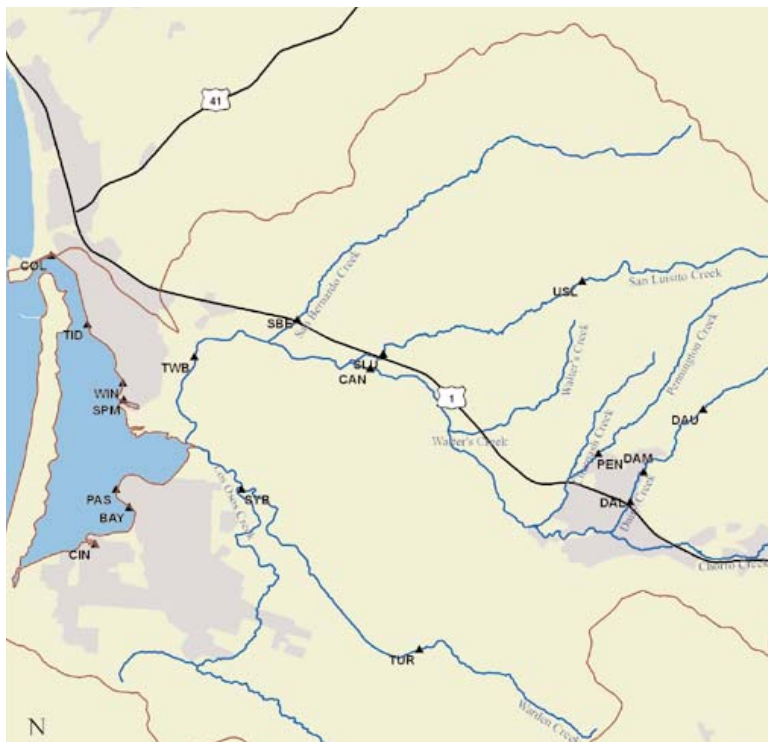
VMP Monitoring of the Morro Bay Watershed

Monitoring Sites

The following creek sites are monitored on a monthly basis: Chorro Creek at Canet Rd. (CAN), Chorro Creek at Chorro Ecological Reserve (CER), San Luisito Creek (SLU), San Bernardo Creek (SBE), Pennington Creek (PEN), Dairy Creek (DAL, DAM), Los Osos Creek (SYB), Warden Creek (TUR) and Chumash Creek (CHU).

The VMP's bacteria monitoring volunteers collect monthly data on total coliform and *E. coli* levels for 10 creek sites throughout the watershed.

The sites were chosen for their broad distribution throughout the watershed and to build on historic sampling data.

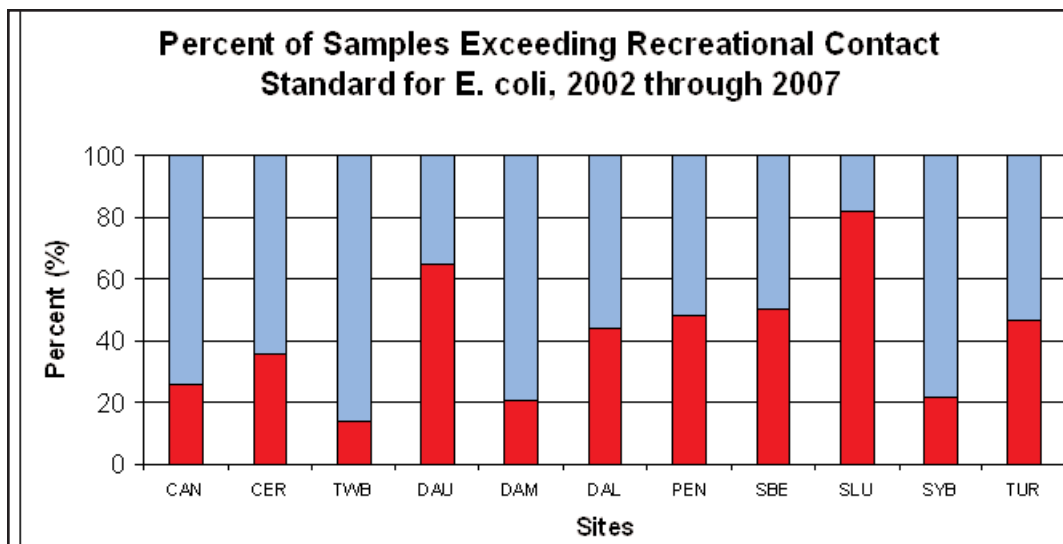


Monitoring Results

Although bacterial indicators are monitored, the exact source of the bacteria is not determined by this method. Only a DNA study can pinpoint the sources of the bacteria.

The red portion of the bar chart show the percent of the samples for each site that exceeded the safe recreational contact standard of 235 MPN/100 mL for *E. coli*. The blue portion of the bar chart show the percent of samples that did not exceed.

Due to the minimal amount of data collected to date, upper Pennington Creek (above the current site), on Chorro Creek just above the Ecological Reserve, and on upper San Luisito Creek have not been included in this analysis.



Many of the exceedances are at sites with a potential for recreational contact. Chorro, Dairy, San Luisito, San Bernardo and Los Osos Creeks all have recreational contact listed as one of their beneficial uses by the Water Board. In order to protect these uses, the bacteria levels need to remain below 235 MPN/100 mL for *E. coli*.