Name(s)

Kaylah M. Clement

Project Number

J0906

Project Title

Correlating Total Coliform and Heterotrophic Plate Counts Using Labile Carbon

Abstract

Objectives/Goals

The purpose of my project is to determine if there is a correlation between Total Coliform (TC), Heterotrophic Plate Counts (HPC) and Biochemical Oxygen Demand (BOD) in the Kern River watershed. I feel that there will be a correlation between TC, HPC, and BOD because BOD provides food for the various groups of bacteria.

Methods/Materials

The experimental methods used to determine the correlation include Multiple Tube Fermentation using Lauryl Tryptose Lactose Broth and Brilliant Green Bile to confirm Total Coliform and Ecoli. The MPN results are determined using the charts in Standard Methods for the Examination of Water and Waste Water. Another test performed is the Heterotrophic Plate Count. This test involves transferring samples and agar into petri dishes and incubating the plates for 48 hours. Using a colony counter I counted the colonies in each dish and averaged the results. The final test was the Biochemical Oxygen Demand. This test involved taking 300ml of sample water and transferring phosphate buffer solution, alkali solution and sodium sulfite solution. This inoculation was mixed with sulfuric acid and results were determined using the formula in Standard Methods for Water and Waste Water. Other tests performed, though not necessary to determined a correlation were Ph tests, H_2O temperature, outside temperature and turbidity for each sample site.

Results

My results confirmed that there is a correlation between BOD5, Total Coliform and Heterotrophic Plate Counts. Samples #1-5 showed a consistent pattern. My hypothesis was correct, showing a correlation between TC, BOD5 and HPC with results of R = 0.98. According to Pearson Correlation Coefficient, 1 is a perfect positive correlation, 0 is no correlation, and -1 is a perfect negative correlation.

Conclusions/Discussion

The testing that I have completed is beneficial to provide an indication of the type and extent of contaminants that threaten the Kern River as a source water. This study is a way to anticipate future source water problems. I plan to continue this study in 2006 - 07, comparing the correlation found this year to a possible correlation found the following year. The correlation should be translatable to sea water, and I intend to confirm this next year as well.

Summary Statement

Determining a correlation between TC, HPC and BOD5 in the Kern River water shed is beneficial to providing an indication of the type and extent of contaminants that threaten the source water and should be translatable to sea water.

Help Received

Used equipment at McRay Laboratory under the supervision of Gary Hill. My mom provided transportation, as well as videotaping and taking pictures.

Ap2/06