Name(s)	Project Number
Joshua J. Kim	**S0909**

Project Title

Water Quality Impairment of Upper Newport Bay: What Impact Water Quality at the Santa Ana Delhi Channel?

Abstract

Objectives/Goals

Upper Newport Bay is an important natural reserve but unfortunately the Bay is threatened by numerous sources of pollutant loading by tributaries of its watershed. Santa Ana Delhi Channel is a main input of urban runoff into Bay, so that fecal indicator bacteria (FIB) concentrations in the Bay are thought to be forced by dry weather and storm water runoff from the Channel. Three investigative questions were identified. What are the dominant seasonal variations of water quality? What are the environmental factors contributing to water quality? What are the possible major sources of water pollution?

Methods/Materials

To get scientific answers for the questions, two hypotheses were made, one is fecal pollution in the Bay could be forced by dry weather and storm water runoff from the Channel and the other one is sediment would be a source of fecal pollution to the Bay in addition to runoff input. Materials and equipments used are sampling bottles, ropes, ice chest, temperature gun, UV lamp, bacteria incubator, pH meter, salinity meter, Colilert, Enterolert, quanti tray 100, and phosphate buffer solution. Field grab samples were collected at the Channel for total 19 times, 10 samples during dry season and 9 samples during wet season. Samples were analyzed for escherichia coli (EC) and enterococci bacteria (ENT).

Results

For the surface water samples, FIB concentration was higher in the dry season than in the wet season. Also, FIB concentration was higher in the dry season than in the wet season for the sediments samples. EC bacteria concentrations measured in the surface water samples exhibit high correlation with salinity but low correlation with sediment. ENT bacteria concentrations measured in the surface water samples exhibit high correlation with ENT bacteria in the sediment samples.

Conclusions/Discussion

Based on the data analyses and discussions with year-long data, the following conclusions were made. EC in the water has bigger impact by Salinity and smaller impact by sediment and rainfall. EC in the water is more sensitive by sea water intrusion. ENT in the water has higher impact by sediment but less impact by Salinity and rainfall. ENT in the water is more sensitive by sediment suspension. EC in the water gets bigger impact by sea water intrusion and ENT in the water gets bigger impact by sediment. The conclusions agree with my basic hypotheses and proved that my initial hypotheses were correct.

Summary Statement

To find out what are dominant variations, environmental factors, and major sources of pollution for water quality at the Santa Ana Delhi Channel which leads to Upper Newport Bay.

Help Received

Dr. Ahn guided me for sampling and laboratory analysis work and Dad helped me for data discussion and make conclusion.