CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY

Name(s)

Annemarie R. Kelleghan

Project Number

S0704

Project Title

Breathing Ballona: An Analysis of Dissolved Oxygen and Density in Ballona Creek

Abstract

Objectives/Goals

The purpose of my project was to measure the dissolved oxygen at various test sites throughout Ballona Creek. I compared the dissolved oxygen to the salinity of the creek water. I also evaluated the salinity levels from previous years and compared those results to the salinity levels from this year.

Methods/Materials

Water samples taken at various points along Ballona Creek were tested for non-volatile residue (NVR) and density. I kayaked throughout the creek in order to get dissolved oxygen readings and water samples from the center of the creek. I also tested the dissolved oxygen, took water samples at the edge of the creek, and compared them to the water properties measured at the center of the creek. Dissolved oxygen readings were obtained using a Milwaukee SM600 Dissolved Oxygen Meter. All of the results were graphed in order to determine if there was any correlation between the various properties I tested.

Results

The dissolved oxygen in the creek increases the further inland traveled. Although there was a slight increase in the dissolved oxygen at the edge of the creek, there was only a minimal difference between the dissolved oxygen in the center of the creek and that at the edge of the creek at the same distance inland. The density and NVR tests indicated that the salinity in the creek decreased he further inland traveled. My density and NVR tests are precise, as shown by the standard deviation calculations. My density and non-volatile residue results from this year show the same trend that was found in the salinity tests from previous years.

Conclusions/Discussion

The dissolved oxygen tests and the nomographs prepared from the data show that Ballona Creek has a sufficient amount of dissolved oxygen to sustain aquatic life. It has been shown that aquatic life must have a dissolved oxygen saturation well above thirty percent, and all of my results measured more than forty-nine percent saturation. Through my research, I found that dissolved oxygen is inversely related to salinity; as the salinity in the creek decreased, the dissolved oxygen increased.

Summary Statement

The focus of this research was to determine the dissolved oxygen levels of Ballona Creek and to compare the data to my past three years' measurements of temperature, density, non-volatile residue, and other water properties.

Help Received

My father provided transportation to and from the creek. He also took photos of me working in the field.