CALIFORNIA SCIENCE & ENGINEERING FAIR
2019 PROJECT SUMMARY

Name(s)

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Project Number

J1511

Project Title

How Mid-Winter Storms Affect Bacteria Levels in Major Waterways of Northern California

Abstract

Objectives

The objective of this project was to test the levels of bacteria in water samples collected before and after a storm in mid-winter from major waterways of Northern California.

Methods

Materials: Petri dishes, Water samples, Pipette, Incubator, Two kinds of plastic bags- gallon and quart size, Water thermometer, Cooler, Candle, Tape, Metal rod, Rubbing alcohol.
Water samples were collected, plated on petri dishes and incubated to grow out bacteria in the sample. The number of bacterial colonies were counted. The levels were compared between the sites and repeated. Once before a storm and again after a storm had started.

Results

I learned that the Mad River had the most bacteria before the rain and that Redwood Creek had the second most bacteria before the rain. The Klamath River, the Little River and the Eel River all had the least amount of bacteria before the rain, besides the control. In the results from the second round of sample collecting, after the rain, Redwood Creek had the most bacteria, then the Little River, next was the Klamath River, the Eel River, and last was the Mad River, besides the control. All the samples collected after the rain had less bacteria than the samples collected before the rain. While both collections had lots of bacteria in them, some of the ones I could count, like the control and the Mad River, in the after it rained samples, but all the other samples I had to estimate.

Conclusions

For my project I wanted to find out if there was going to be more bacteria in the water before it rained or after it rained from major waterways in northern California. I collected samples from the Klamath River, Redwood Creek, Little River, Mad River, Eel River and my tap water as the control. My hypothesis was that if bacteria levels become more concentrated in drier months, when water flow is low and runoff is limited from lack of rain, then when the rainy seasons starts bacteria levels at the mouth of a river should be lower before a rainstorm and higher right after a rainstorm. The runoff would be adding more bacteria into the water. Had I done my water sample collections at the beginning of the rainy season, I may have found my hypothesis to be true. I did my sampling in December after we had already had several rainstorms to flush concentrated bacteria levels from pooled areas in waterways and from runoff from areas that drain into rivers. My results showed that bacteria levels were actually less concentrated after a storm and that the rain acted as a dilluter of bacteria.

Summary Statement

This experiment was about how bacteria levels change in waterways during a storm.

Help Received

I conducted my experiment independently this year. Last year, I was taught how to conduct my procedure by Briggitte Blackman, a biology professor at HSU. My science teacher, Nick Dedini, was helpful in making sure my experiment was thorough and clearly presented.