CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY

Name(s)

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Project Number

J1111

Project Title

How Do Nitrate Levels Along the Salinas River Compare to Non-Farm Tributary Water?

Abstract

Objectives/Goals

My objectives were to compare nitrate levels from agricultural runoff at various points along the Salinas River in Monterey County, and to compare them to a non-farm tributary, the Arroyo Seco. My goal was to determine if the California Regional Water Quality Control Board should adopt regulations to prevent fertilizer nitrates from polluting the water supply.

Methods/Materials

I tested the Salinas River water at 7 different points, and the Arroyo Seco tributary as a baseline point. I took the samples in two different conditions: before the first-flush rainfall of the winter and on the day after the first-flush rain. The Monterey Bay Analytical Services tested for the nitrates and I helped perform the electrical conductivity tests.

Results

Salinas River nitrate levels were high before and after rainfall. Baseline nitrate levels in the tributary were nearly undetectable. These results are due to the different land uses associated with each river. Lands bordering the Salinas River are intensively farmed, while the tributary area is not farmed. The first winter rain did not flush more fertilizer nitrates out of the farm fields and into the river, but rather had a diluting effect as confirmed by the electrical conductivity tests.

Conclusions/Discussion

In conclusion, my data and results prove the first part of my hypothesis as correct because the Salinas River (experimental group) recorded excessive levels of nitrates, and the non-farm Arroyo Seco River (control group) had almost undetectable levels. Also, my data and results did not support the second part of my hypothesis because rainfall actually diluted the fertilizer runoff into the Salinas River, rather than showing higher concentrations of nitrates. Overall, my study supports the position of the Regional Water Quality Control Board that it needs to regulate the intensive use of fertilizer by farms adjacent to the Salinas River.

Summary Statement

My project studied nitrate levels from agricultural runoff in the Salinas River, compared those levels to a non-farm tributary, and determined that public regulations are needed to reduce the pollution from fertilizer used in agriculture.

Help Received

Monterey Bay Analytical Services Laboratory helped perform the nitrate tests and I used their equipment, Father drove me to and from the Salinas River bridges, My parents read over my reports.