Name(s)

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Project Number

J1332

Project Title

Nutrient or Pollutant: How Do Changes in Nutrient Loading Affect Algae Growth and Water Quality?

Abstract

Objectives/Goals
My objective is to determine how changes in nutrient loading affect algae growth and water quality, and its link to pollution. My hypothesis is that a small amount of nutrient input will yield a normal algae growth rate, but too much will inhibit growth.

Methods/Materials
250 mLs of red micro algae were placed in (3) 2000 mL Erlenmeyer flasks, each containing 1800 mL salt water, identified as Flasks A, B, C, with 2, 5, and 7 mL of fertilizer introduced to each flask, respectively. I observed for two weeks changes in algae growth in each flask, measuring changes in dissolved oxygen, pH, ammonia levels, and Secchi depth.

Results
The results indicated that changes in nutrient loading can affect algae growth and water quality. Flask A, which contained the least amount of nutrients, yielded the greatest amount of algae growth, with the highest levels of D.O. and ammonia, shallower Secchi depths and lower pH. Flasks B/C contained the highest nutrient inputs, but yielded lower levels of growth, with lower D.O. and ammonia levels, deeper Secchi depths, and higher pH.

Conclusions/Discussion
My experiment illustrated how lower nutrient levels yielded a more normal result, one that parallels what occurs in nature when it is not disturbed. The higher nutrient levels were not, in fact, beneficial to the environment, but instead inhibited normal growth and reduced water quality. The experiment demonstrated how a normal factor can become abnormal when man interferes.

Summary Statement

My objective is to illustrate the relationship between nutrient input and algae growth, and ultimately their link to pollution.

Help Received

Andres Carillo, senior instructor at Cabrillo Aquarium, provided guidance and helped establish test procedure.