OFFICIAL ABSTRACT and CERTIFICATION

Calculating the Concentrations of Nonmetals in Water Samples Leading to Harmful Algal Blooms in Previously-Fertilized Areas

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A key industry in Michigan is agriculture. In order to achieve maximum outputs, farmers use different fertilizers containing necessary elements such as nitrogen and phosphorus. Although these elements are vital in certain quantities, they can cause harm when too concentrated. For example, harmful algal blooms (HABs) are generally a direct effect of their presence. The purpose of the experiment is to determine the concentrates of specific nonmetals [nitrogen and phosphorus] in water samples at Forest Hills Nature Area in order to see if the levels correlate with soil sample results of previous experimentation or if the water samples have statistically different values than the soil. If water samples are collected from Forest Hills Nature Area and tested for their concentrations of phosphate and nitrate, then the water levels will have similar ppm values to the soil samples collected around the lakes.

In order to begin the experimentation, 15 water samples were collected from different parts of Forest Hills Nature Area in Alma, Michigan along with one control of distilled water. These samples were then tested using a series of specific reagents such as nitrate reductase and HI-717-25 Phosphate Reagents A and B. The elements were measured for the parts per million value using a NECi color slider for nitrate and Hanna instrumentation for phosphates. In addition, the average was calculated after three trials of each sample were conducted. After experimentation, the hypothesis was not supported in that the levels of phosphorus and nitrogen were greater than the average quantity found in the soil sample of previous experimentation, indicating the soil may not be the culprit of the HABs or the soil had leeched the elements into the water. However, the ANOVA One Way Variable Test shows that with 95% confidence the results are not statistically significant to one another.

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