The Effects of Iron Seeding on Phytoplankton and Zooplankton Populations, and on Water Chemistry

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The purpose of this experiment is to determine the effects of iron (II) sulfate (FeSO4) fertilization on pH, salinity, and ammonia, and observe its affect on phytoplankton and zooplankton populations. The experiment utilized two aquariums filled with seawater collected from local estuaries and plankton collected separately using a plankton net. 1 gram (117 ppm concentration) of FeSO4 was then added to one aquarium. The pH, salinity, and ammonia levels were measured daily, and water samples were also examined under a microscope in both aquariums each day for 15 days. The pH of the water dropped due to a reaction between H2O and FeSO4, which produces H2SO4and eventually rebounded. Salinity gradually rose in both tanks, indicative of minor evaporation. The salinity in the tank that received FeSO4 rose more slowly than the other. There was never traceable ammonia in either tank, meaning no large-scale mortality occurred. During microscope observations, zooplankton and phytoplankton populations in the test tank increased in size, and individual phytoplankton were generally larger than individuals in the control tank, meaning that FeSO4 was facilitating growth and reproduction. FeSO4 has an affect on water chemistry, lowering pH, and decreasing evaporation, but also increasing plankton populations, further altering water chemistry. This experiment, in conjunction with other research, suggests that iron seeding is not systemically beneficial for these reasons.

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