

Effect of *Nannochloropsis oceanica* in Carbonic Acid Acidification

Temstrom, Gunnar (School: Hilton Head Preparatory School)

Scientists had long praised the ocean as being a great carbon dioxide “sink” and for good reason, a study published in a Science journal found that the ocean absorbed 30% percent of the emissions produced from the beginning of the industrial revolution to the mid- 1990s (Gerber). However, over the past decade, scientists have come to realize that this reduction in atmospheric carbon dioxide does have a cost: it alters the pH composition of the ocean. In this experiment, I sought to find a way to control ocean acidification through the introduction of a biological remediation species of algae. In this experiment, *Nannochloropsis Oceanica* was identified as a possible remediation species due to its rapid-reproductive rate, long suspension / non-symbiotic self-dependence, and its potential in biofuel and waste disposal research. The *Nannochloropsis* in this experiment was cultured in synthesized seawater and later CO₂ was introduced at a rate of 0.114g per minute over a five-hour testing period. Of the varying concentrations of Secchi millimeters - 140mm, 100mm, and 60mm - the 60mm absorbed the most - CO₂ 8.94 x 10⁻⁵ percent of grams total- vs. the control absorption of 3.73 x 10⁻⁴ percent of grams total. Similarly, this highest concentration limited pH changes the most - ending average pH of 6.51 versus control ending average of 5.98. Thus the results supported the initial hypothesis that as the concentration of *Nannochloropsis* increased, the rate of pH change and absorption of CO₂ would decrease.