

THE OCCURRENCE OF DISSOLVED AND PARTICULATE
ADENOSINE-5'-TRIPHOSPHATE IN ANTARCTIC COASTAL ECOSYSTEMS

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By

Michele Paulette Nawrocki

Thesis Committee

David M. Karl, Chairperson
Stephen V. Smith
Gordon T. Taylor

Abstract

This study has two components: the optimization of a method for measuring dissolved ATP over a wide range of concentrations and its field application. A method was developed with a detection limit of 4 ng D-ATP. The Antarctic Peninsula coastal marine ecosystem was the field site. This ecosystem represents a complex physical environment, ranging from a nearshore embayment of extremely high productivity to the oligotrophic Drake Passage. High resolution sampling was carried out through most of the course of the productive season, from December through March. Dissolved ATP was positively correlated with biomass as measured by particulate ATP. Dissolved ATP peak values of $>1000 \text{ ng l}^{-1}$ were observed at the height of the austral spring phytoplankton bloom, and dissolved ATP concentrations equalled those of particulate ATP at the most productive stations. Dissolved ATP declined as the bloom subsided, presumably due to microheterotrophic uptake. Nucleotide measurements suggested that dissolved ATP was produced as a result of exudation or release during grazing activity rather than as a result of cell death and autolysis.