

## The importance of nutrients to phytoplankton production in New York harbor

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### ABSTRACT

A four-year study was conducted to identify the importance of nutrients in regulating phytoplankton growth and productivity in New York harbor.

While nitrogen (occurring primarily as ammonia in yearly concentrations of 25-88  $\mu\text{g-at/liter}$ ) and phosphorous appear to be present well in excess of concentrations capable of limiting phytoplankton growth, silicon delivery to the estuary and New York Bight apex decreases sharply in May and June. The phytoplankton community at this time changes from diatom-dominated to chlorophyte- and dinoflagellate-dominated. Primary productivity reflects this change, initially decreasing between April and May, then increasing towards summer as the chlorophytes become dominant. Data from laboratory experiments suggest that diatom growth during the late spring could be restored by the addition of silicon, trace elements, and vitamins.

During peak photosynthesis periods (February-March, May-July), productivity seems to be regulated by light intensity, but during the fall, when productivity is low, unidentified constituents in the water appear to inhibit photosynthesis.

Water quality management strategies for the harbor must address all aspects of the system (planktonic, benthic, pelagic regimes) and consider the influence of the bight apex and Long Island Sound as sources of biomass.

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