



Do we need complex mechanistic photoacclimation models for phytoplankton?

Flynn, Kevin J.

Limnol. Oceanogr., 48(6), 2003, 2243-2249 | DOI: 10.4319/lo.2003.48.6.2243

ABSTRACT: The outputs of simple models relating phytoplankton growth and chlorophyll *a* (Chl *a*) to irradiance and nutrient (nitrogen [N] and/or iron [Fe]) availability are compared with those of complex mechanistic models. Mechanistic models, which are significantly more expensive in computational terms, are required for a proper description of high-resolution dynamics of light acclimation with or without changes in nutrient status (for example, with diurnal light-dark periodicity or Fe fertilization). However, for instances in which such detailed descriptions of growth and Chl : carbon (C) are not required, there appears to be no justification for using mechanistic models to simulate nutrient-light interaction. Multinutrient models based on modified quota-type models, coupled with a simple photosynthesis-irradiance growth rate equation and an empirically derived Chl *a* :C relationship linking irradiance to growth rate, should be adequate for most oceanographic modeling scenarios.

Article Links

[Download Full-text PDF](#)

[Return to Table of Contents](#)

Please Note

Articles in L&O appear in PDF format. Open access articles may be freely downloaded by anyone. Other articles are available for download to subscribers only, or may be purchased for \$10 per article. All L&O articles are moved into Open Access after three years.