



A comparison of two N-irradiance interaction models of phytoplankton growth

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ABSTRACT: The N-photoacclimation interaction models of Geider et al. (*G_N*) and Flynn et al. (*F_N*) are compared by tuning them to data from a light-shift experiment for a diatom. Both the original model constructs have failings, *G_N* in its N-assimilation component and *F_N* in its photoacclimation component. However, both of these models can be modified readily to overcome these problems. In addition, hybrid models that use the N-assimilation component of *F_N* and the photoacclimative component of *G_N* work well. For situations where a model is required to simulate the interaction between a single N source and light, the use of the revised *G_N* structure should be considered first. The revised *F_N* is better suited for more complex environmental scenarios—for example where detailed simulations of ammonium-nitrate interactions are required. *G_N* and *F_N* are to be preferred over models that use a fixed Chl : C, because they may both be tuned directly to real chlorophyll a data in ecosystem simulators.

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