

OCEAN OPTICS XXIV

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Tuesday, October 9

Oral Session 5

16:20–17:40

16:40–17:00

EFFECT OF LIGHT ON THE CHLOROPHYLL-TO-CARBON RATIO IN NATURAL POPULATIONS OF PHYTOPLANKTON

The photo-acclimation model of Geider et al. (1996) and the analytic solution to the model provided by Jackson et al. (2017) show how the chlorophyll-to-carbon ratio of phytoplankton depends uniquely on the ratio of available light to the photoadaptation parameter, which can be estimated from photosynthesis-irradiance experiments. However, the model also contains an unknown parameter: the maximum carbon-to-chlorophyll ratio. We have some evidence from culture measurements that it depends on phytoplankton type (Geider et al. 1997). However, we have very limited information on its variability under natural oceanic conditions. In this presentation, we use direct field observations of phytoplankton carbon and chlorophyll to infer values of maximum chlorophyll-to-carbon ratio in natural populations. We also explore whether this parameter can be estimated indirectly from field measurements of primary production. We analyse how the results can be extended to calculate phytoplankton carbon from satellite data.

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