Geophysical Research Abstracts
Vol. 19, EGU2017-2183-1, 2017
EGU General Assembly 2017

Phytoplankton Productivity numerical model: calibration via laboratory cultures

Marco Zavatarelli (1,2), Emanuela fiori (1), and Amadio Carolina (1)

(1) Bologna University, Physics and Astronomy, bologna, Italy (marco.zavatarelli@unibo.it), (2) Consorzio nazionale interuniversitario sulle scienze del mare, Roma, Italy

The primary production module of the "Biogeochemical Flux Model" (BFM) has been used to replicate results from laboratory phytoplankton cultures of diatoms, dinoflagellates and picophytoplankton.
The model explicitly solve for the phytoplankton, chlorophyll, carbon, phosphorus, nitrogen and (diatoms only) silicon content. Simulations of the temporal evolution of the cultured phytoplankton biomass, have been carried out in order to provide a correct parameterization of the temperature role in modulating the growth dynamics, and to gain insight in the process of chlorophyll turnover, with particular reference to the phytoplankton biomass decay in condition of nutrient stress.
Results highligthed some limitation of the Q10 approach in defining the temperature constraints on the primary production (particularly at relatively high temperature) This required a modification of such approach. Moreover, the decay of the chlorophyll concentration under nutrient stress, appeared (as expected) significantly decoupled from the evolution of the carbon content. The implementation of a specific procedure (based on the laboratory culture results) adressing such decoupling, allowed for the achievement of better agreement between model and observations.