

## A phytoplankton model with dynamic stoichiometry based on a new instant acclimation scheme: good reproduction of the subsurface chlorophyll maximum and primary production

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Oceanic phytoplankton adjust to a change in surrounding environment, where the chlorophyll/carbon and nitrogen/carbon ratios are changed. Based on Smith et al. (2015), we introduced new phytoplankton acclimation scheme into a biogeochemical model combined with an OGCM. The scheme is based on the assumption of instant acclimation; that is, phytoplankton stoichiometry (chl:C:N:Fe) is uniquely determined by a surrounding environmental condition. Therefore, it can represent dynamic stoichiometry with low computational costs. The model well reproduces the latitudinal distribution of the subsurface chlorophyll maximum. The simulated net primary production is similar to the observed, and it is underpinned by the good reproduction of chlorophyll distribution and variable nitrogen/carbon ratio.

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