Improvement of absorption-based primary production model for SGLI/GCOM-C

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Net primary production (NPP) of phytoplankton is important to understand the global carbon cycle and marine ecosystem. While the majority of satellite NPP models use chlorophyll *a*(chl-*a*) concentration as a proxy of phytoplankton biomass, several NPP models use absorption coefficient of phytoplankton. An NPP models for Japanese new ocean color sensor, Second-generation GLobal Imager (SGLI), was developed based on the phytoplankton absorption to reduce estimation errors of chl-*a*due to pigment packaging and turbid water. However, sufficient validation in the open ocean has not been carried out. In this study, we obtained NPP data in the Pacific Ocean and compared with satellite-derived NPP applying the SGLI NPP model to MODIS data. The model overestimated the lower values of NPP less than 1000 mg m^{2}d^{-1}. Newly developed model considering response to daily averaged photosynthetically available radiation (PAR) showed better performance than previous one. However, bias and errors were still detected for a part of data. We will also discuss possibility of temperature dependency on this NPP model.

Keywords: ocean color remote sensing, primary production, phytoplankton