

Further information in the coastal areas from 250-m resolution multiple bands of GCOM-C “SHIKISAI”

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Generally, since the optical characteristics of a coastal area is more complicated than an open ocean, it is necessary to take into consideration the regionality of the in-water optical properties (absorption and scattering, and their spectral characteristics) in order to estimate biological variables like a chlorophyll-a concentration from satellite observations. On the other hand, the optical properties may be useful as new environment information if they can be derived correctly.

The Second-generation Global Imager (SGLI) boarded on Global Change Observation Mission - Climate (GCOM-C) has launched in Dec. 2017. Since SGLI has 19 observation channels with 250-m spatial resolution in the visible - infrared wavelengths, applications near the coastal areas are expected to be improved. The SGLI channels (380, 412, 443, 490, 530, 565, 672, and 867 nm) include a near-ultraviolet band (380 nm) and a pair of an absorption and a baseline in comparatively longer wavelengths (530 nm and 565 nm) which can improve estimate of high chlorophyll-a concentration since the absorption is not saturated with the high concentration in the wavelengths.

GCOM-C captured patches where water-leaving reflectance (r_w) of 565-nm, which is derived by the atmospheric radiative transfer code, Pstar-4 (Ota et al., 2010), were especially higher compared with r_w at 530 nm in the central part of the Seto Inland Sea on August 1, 5, and 13 2018. High $a_{ph}/(a_{ph}+a_{dg})$ ratio areas were captured (Fig. 1) through the in-water optical property model (Lyon and Hoge, 2006; Murakami, 2018) using average spectra of a_{ph} or a_{dg} in NOMAD dataset (Werdell, and Bailey, 2005). Generally, difference between absorption coefficients of phytoplankton at 530 nm and 565 nm ($a_{ph}(530nm) - a_{ph}(565nm)$) is larger than difference between absorption coefficient of CDOM + detritus at 530 nm and 565 nm ($a_{dg}(530nm) - a_{dg}(565nm)$). It may correspond to the redtide which has been reported around the area by Fisheries Agency (Fisheries Agency, 2018).

We will continue to make more precise water-leaving spectra to be used for useful information of coastal environment through improvement of correction aerosol absorption and so on.

Reference

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Keywords: GCOM-C, SHIKISAI, SGLI , ocean color, remote sensing

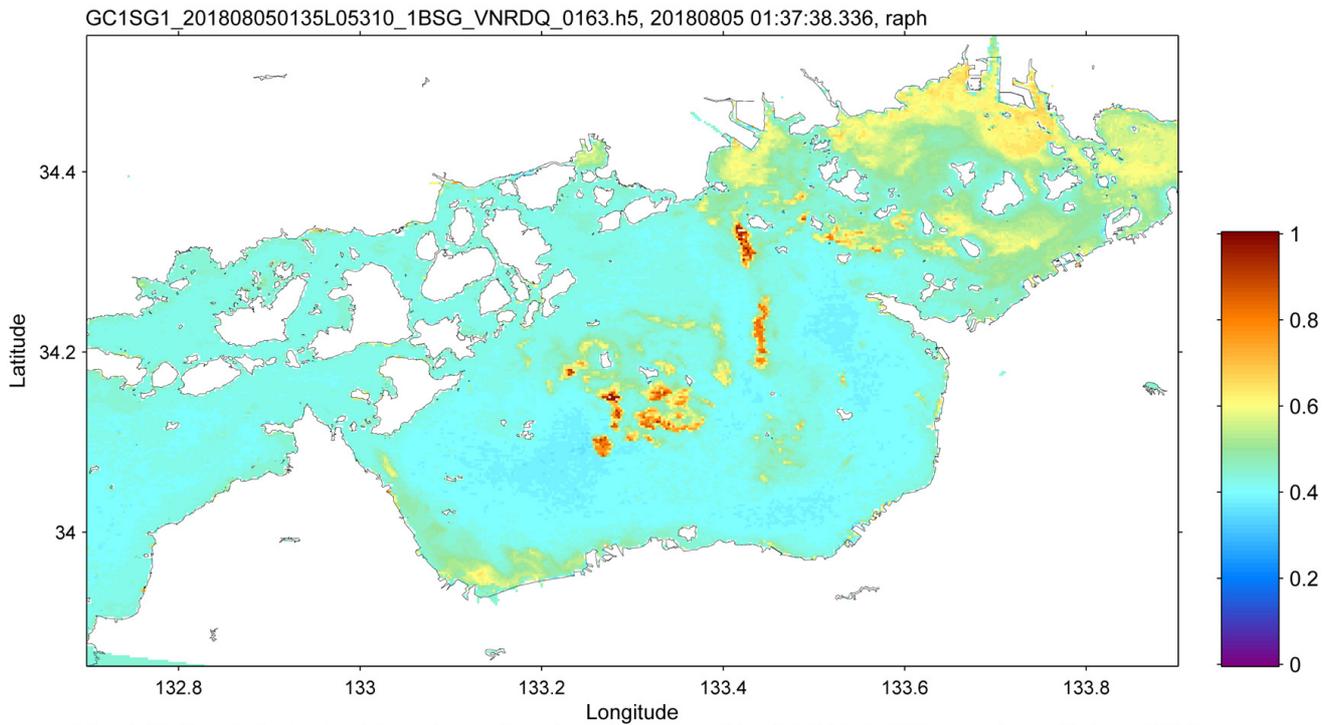


Fig. 1 Ratio of phytoplankton absorption ($a_{ph} / a_{ph} + a_{dg}$) by GCOM-C 250-m data on 5 Aug. 2018