

Assessing the potential of satellite and ground spectral data for Chlorophyll-a monitoring in Lake Kasumigaura, Japan

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Abstract

The suitability of a handheld spectrometer and ASTER satellite data for monitoring Chlorophyll-a (Chl-a) in Lake Kasumigaura, Japan was tested in July 2010 to December 2013. ASTER based Chl-a retrieval algorithms were developed support with in-situ Chl-a, MODIS OC3 Chl-a and Kakemaoki and Koshin automated water quality monitoring stations Chl-a. ASTER VNIR band ratio were regressively analyzed with the corrected MODIS Chl-a and automated station values obtained for each ASTER date on a day by day basis. The regression equation of the ASTER band ratio (B1/B2), with highest correlation was used to generate high-resolution Chl-a distribution maps. Significant correlation between the ratio of the reflectance peak at 705 nm and the Chl-a absorption at 678 nm and the in-situ Chl-a content was observed and these reflectance ratios were used to establish spectrometric Chl-a estimation algorithms. Proposed algorithms can be successfully adopted to determine localized environmental effects in the Lake.

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