

AN EMPIRICAL OCEAN COLOUR ALGORITHM FOR ESTIMATING COLOURED DISSOLVED ORGANIC MATTER (CDOM) IN EAST COAST MALAYSIA WATER.

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ABSTRACT

Using a bio-optical dataset collected on a series of cruises in east coast Malaysia water, we examined the empirical approach for estimating coloured dissolved organic matter (CDOM) from satellite ocean colour data. Surface water samples and optical measurements were conducted in a wide range of water types from coastal to offshore waters during different monsoon seasons in 2009. The analysis of data is based on a direct empirical relationship between CDOM absorption at different wavelengths and the blue-to-green band ratio of reflectance. The algorithm was tested using an independent dataset and applied to MODIS satellite data for east coast of Malaysia water for the derivation of CDOM. Our results indicated that CDOM absorption in the UV wavelengths (350 and 380 nm) were better correlated with the reflectance ratio $R_{rs}(412/547)$ ($R^2 = 0.87$) than in the blue wavelengths (400, 412 and 443 nm) ($R^2 = 0.85-0.72$). These resulting empirical relationships allow CDOM absorption in the study area to be estimated from satellite ocean colour data. Validation against an independent dataset showed that the algorithms for CDOM absorption (350 and 380 nm) performed relatively well with the r.m.s difference between the observed and predicted values are 0.02 and 0.01 m^{-1} , respectively. The ability of the algorithms to predict CDOM absorption as those presented in this study can be further improved using more independent tests with in-situ and satellite bio-optical measurements.

Keywords: CDOM, ocean colour, remote sensing, Malaysia water,