Estimation of Primary Productivity in the Case 2 waters of North-Eastern Bay of Bengal

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Abstract

Remote sensing (RS) has proved to be an important tool for ocean colour mapping and interpretation over the years. Ocean colour parameters such as chlorophyll, suspended Particulate matter (SPM) and yellow substance can be appropriately quantified using RS techniques. Chlorophyll is one of the most important parameters as it is significantly related to Primary Productivity (PP) and biomass estimations. Several empirical and semi-analytical bio-optical algorithms have been developed to quantify chlorophyll pigment concentration in oceanic waters. However, coastal waters are much more complex than open ocean in terms of spectral signatures due to a much higher complexity of the component substances. Hence most chlorophyll algorithms fare poorly in coastal waters in comparison to open oceans and several spatio-temporal adjustments have to be incorporate before these algorithms can give acceptable results. The present study aims to estimate the surface chlorophyll concentration in the coastal waters of north eastern Bay of Bengal from remotely sensed ocean colour data. Towards this aim, several chlorophyll algorithms have been tested against satellite synchronous sea-truth data and the best suited algorithm has been selected for further processing. PP of the study area has been estimated from the resultant chlorophyll values using two different models, one depth integrated and the other considering the Mixed Layer Depth. The results of the study indicate that in presence of high suspended and dissolved organic matter chlorophyll signature are masked. The chlor-a2 algorithm gives best result for this area and season due to the modification incorporated for SPM and yellow substance corrections. For pp estimation, depth integrated model gives better results than the mixed layer depth model for given conditions.