

## **Comparison of three chlorophyll-a estimation approaches using ASTER data acquired over Sri Lankan coastal water bodies**

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### **ABSTRACT**

In the present study, we compare the following Chlorophyll-a (Chl-a) estimation algorithms using ASTER data acquired over Sri Lankan coastal water bodies: (1) the simple band-ratio algorithm with simple atmospheric correction using dark object subtraction (DOS); (2) the single band-ratio algorithm with radiative transfer-based atmospheric correction using ENVI's FLAASH software including MODTRAN; and (3) our previously proposed algorithm based on combinations of ASTER and corrected MODIS Ocean Color-3 (OC3) data. First, several ASTER band ratios were regressively analyzed with in-situ Chl-a data acquired from the Negombo estuary and Puttalam lagoon in the west coast of Sri Lanka, and the band ratio with the highest correlation was selected. Then, time-series Chl-a distribution maps with the spatial resolution of ASTER/VNIR (15 m) were generated using the above three methods, and compared with the in-situ Chl-a data. Based on the result obtained, the FLAASH and ASTER/OC3 based methods showed high correlation with the in-situ Chl-a values ( $R^2 = 0.96$  and  $0.92$  respectively), while the DOS based method showed low correlation ( $R^2 = 0.61$ ), which indicates that the ASTER/OC3 based method will give equivalent performance to the FLAASH based method even though it does not need user-based atmospheric correction like the DOS and the FLAASH based methods.

**Keywords:** Chlorophyll-a (Chl-a); ASTER; MODIS OC3; atmospheric correction; coastal water bodies.

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