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Mapping of Total Suspended Matter based on Sentinel-2 data on the Hooghly River, India

R. Premkumar, R. Venkatachalapathy and S. Visweswaran

Department of Physics, Annamalai University, Annamalai Nagar-608 002, India
E-mail: premkumar140994@gmail.com

Abstract: This study aims to develop a regional algorithm for monitoring and retrieval of total suspended matter concentration (C_{TSM}) using in-situ C_{TSM} data, in-situ remote sensing reflectance (R_{rs}) data and Sentinel 2 MSI data on Hooghly River. The field measurements were carried for 20 stations using Satlantic Hyperspectral Ocean Colour Radiometer (HyperOCR) and water samples were also collected at a depth of 0.5m from April to May 2018. The concentration of total suspended matter varies from 132 to 540 mg L^{-1}. The calibration was done for 70% of the data between in-situ C_{TSM} and in-situ remote sensing reflectance and the remaining 30% of the data is used for in-situ validation. The in-situ validation result shows the band combination of B7/B2 has higher fitting. For satellite validation, Sentinel 2 Multispectral Instrument (MSI) satellite data applies to the in-situ validation models to the retrieval of C_{TSM}, which also confirms the band ratio of B7/B2 gives a good correlation with R^2=0.75. The study shows, the applicability of Sentinel 2 MSI data for retrieval of C_{TSM} in Hooghly River, Kolkata. The Sentinel 2 MSI B7/B2 is highly recommended for mapping a higher concentration of suspended matter in the study area, respectively.

Keywords: Total suspended matter, Hyperspectral radiometer, Regional algorithm, Sentinel 2 MSI data, Hooghly river