

OCEAN OPTICS XXIV

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Monday, October 8

Poster Session 1

16:00–18:00

Poster 61

CAN RAYLEIGH-CORRECTED REFLECTANCE BE USED FOR COASTAL AND INLAND WATER APPLICATIONS?

Using Moderate Resolution Imaging Spectroradiometer (MODIS) data covering a large area (almost the entire middle and lower reaches of the Yangtze River Basin and the Yangtze River Estuary) between 2002 and 2016, the uncertainties and applicability of Rrc (Rayleigh-corrected reflectance) in ocean color studies have been investigated. We first examined the correlation between a quality-controlled reflectance product that was generated using a shortwave-infrared (SWIR) based atmospheric correction method (Rrs_swir), and Rrc. Improved relationships between these two products were found for all MODIS bands if a subtraction of the Rrc at 1240-nm was utilized as the aerosol correction for Rrc of other bands. The robust correlations between the two products allow for Rrs_swir to be replaced with Rrc-1240 converted reflectance (denoted as Rrs_rrc-1240) in water applications. In situ validations further demonstrated the accuracy levels between usable Rrs_rrc-1240 and Rrs_swir data are comparable in most MODIS wavelengths. The most striking superiority of Rrs_rrc-1240 over Rrs_swir is the pronounced increase in data coverage (especially in small waters), where the percentage of usable observations (PUOs) of the former are several times or even more than one order of magnitude higher than the latter. The differences in PUOs were mostly due to perturbations of the land adjacency effects (LAEs) on the SWIR-based atmospheric correction, and such effects could also explain the reduced PUOs in smaller water bodies. The use of Rrs_rrc-1240 could enhance the capability of tracking short/long term dynamics and create new possibilities for inland water system monitoring at the basin scale.

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