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Optical Variability and In-Water Algorithms of the Gulf of Thailand

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A study was investigated in the Upper Gulf of Thailand with the aim of developing in-water algorithms for the retrievals of chlorophyll-a (CHLA), total suspended sediment (TSS), coloured dissolved organic matter (CDOM) and diffuse attenuation coefficient for downwelling irradiance at 490 nm (Kd490). Shipboard field observations were made at totally 83 stations during 5 cruises covering early and late southwest and northeast monsoons in the year 2003-2004. The optical data were recorded using the Profiling Reflectance Radiometer (PRR-600) in order to calculate the remote sensing reflectance (Rs) at some reference wavelengths. Results showed that the improved algorithms based on the empirical approach enabled the estimations of the following parameters with acceptable precision. CHLA (mg/m3) = 1.1828(Rrs520/Rrs565)^-4.8367 TSS (g/m3) = 99.355(Rrs670)^0.5746CDOM 412 (m-1) = 0.362(Rrs412/Rrs565)^2 - 0.929(Rrs412/Rrs565) + 0.586Kd 490 (m-1) = 0.2411(Rrs490/Rrs565)^-1.2753The patterns of remote sensing reflectance were related to the distributions of the optically active constituents. Results showed that the optical variability of the Upper Gulf of Thailand is mainly influenced by freshwater inflows and resuspension of bottom sediment as well as sediment composition and characteristics.