

## **Coupling In Situ and Satellite Data to Validate Satellite Optical Properties**

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We have improved methods for validating satellite algorithms in coastal waters. Optical properties in coastal waters change rapidly on very fine temporal and spatial scales. It is therefore inappropriate to validate satellite optical algorithms at large spatial scales using in situ point measurements. The variation within the satellite region (1km) must be accounted for in the comparison with the point measurement. Inherent Optical Properties (absorption and scattering coefficients) were derived and validated from SeaWiFS and MODIS imagery covering a variety of regions and water types including coastal and open-ocean waters. We examine optical variability over small spatial scales (meters) using continuous underway measurements averaged and over large scales (kilometers) using remote sensing imagery. We determined the mean to variance relationship at various spatial scales over bin ranges from 30 meters to 20 kilometers. We define how the spatial correlation scales (for each binned spatial resolution) are coupled to the mean optical property. These relationships between the mean and variance enabled us to improve and more accurately validate in situ point measurements and the 1 kilometer SeaWiFS and MODIS optical algorithms especially in coastal waters.