**Preliminary Assessment of Satellite Spatial Resolution Required to Capture Spatial Dynamics of Phytoplankton and CDOM across Estuaries and Adjacent Coastal Ocean**

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The goal of this effort is to study the spatial distribution of phytoplankton and CDOM (chromophoric dissolved organic matter) within several river mouths and plume regions for the purpose of determining spatial resolution requirements necessary to capture the intrinsic variability from remote sensing measurements. Our approach utilizes full-resolution data from MERIS (300 m), HICO (90 m), and Landsat (30 m) in the Chesapeake Bay estuary, Mississippi Delta, and adjacent coastal oceans (estuary plumes), which was processed to remote-sensing reflectance (Rrs) and used as input to algorithms of chlorophyll (Chl) and CDOM absorption coefficient at 412 nm (ag412). In this preliminary study we used satellite sensors with different resolutions and simple statistical methods to identify some initial thresholds and sensitivities related to the behavior of estuarine plumes. Further analysis are planned using more sophisticated statistical approaches applied to multiple regions and larger image collections. Uncertainties for algorithm retrievals were computed based on the expected Rrs noise and in situ algorithm error estimates. The Rrs noise was derived from the sensor signal-to-noise model, propagated through the atmospheric correction process. Sensor noise has a significant impact on the retrieved property variance. Analysis of the variance within boxes with increasing pixel sizes around a set of test stations showed that the normalized standard deviation (NSTD, coefficient of variation; %) changes with increasing pixel size. For Landsat NSTD is larger in regions having the lowest property concentrations, while the opposite behavior is observed for MERIS (mainly due to the sensor’s noise characteristics).

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