**BIOGEOCHEMICAL CHARACTERIZATION OF OPTICALLY COMPLEX COASTAL WATERS USING UNDERWAY AND IN SITU HYPERSPECTRAL OBSERVATIONS**

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Optically complex coastal waters present a challenge for ocean color remote sensing because of the high degree of spatial heterogeneity and limitations in the performance of algorithms. Ship-based underway hyperspectral observations of remote sensing reflectance provide a means for improved spatial resolution and greater degrees of freedom for semi-analytical algorithms. Here, we describe a series of complementary observations of surface hyperspectral radiance and irradiance and in situ measurements of apparent and inherent optical properties and key constituents in coastal waters of the northern Gulf of Mexico. The Satlantic HyerSAS-UV system was used to provide above-water measurements of radiance and irradiance, as well as extended spectral range into the UV-B, thereby yielding broad spatial and temporal coverage and higher frequency sampling. The extensive coverage facilitated comparisons to satellite-derived remote sensing reflectance, but also extended observations into regions not accessible by satellite. In addition to radiometry measurements, discrete profiles of spectral absorption and backscattering were determined using a WETLabs, Inc. ac-s absorption/attenuation meter and bb9 backscattering meter, respectively. Spectrophotometric measurements of particulate and dissolved absorption were also made using conventional methods. These in situ measurements were compared to inherent optical properties estimated by inversion of the HyperSAS reflectance using the quasi-analytical algorithm (QAA v6). In general, the QAA products provided a good representation of the in situ observations over a wide range of conditions. Results illustrate the utility of remote sensing reflectance as means of characterizing distributions of biogeochemical properties in an optically complex coastal regime, the Mississippi River outflow region.

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