

OCEAN OPTICS XXIV

Valamar Lacroma Dubrovnik Hotel | Dubrovnik, Croatia | October 7–12, 2018

<https://oceanopticsconference.org>

Monday, October 8

Poster Session 1

16:00–18:00

Poster 117

MULTISPECTRAL CLASSIFICATION OF GULF OF MAINE SURFACE WATERS: SEASONAL AND INTERANNUAL VARIABILITY

Bio-optically, Gulf of Maine (GOM) surface waters are strongly heterogeneous, exhibiting highly variable distributions in both time and space of suspended sediment, colored dissolved organic matter (CDOM), and phytoplankton. The concentration of non-algal components strongly impacts water optical properties in the GOM, rendering the standard NASA chlorophyll algorithm suspect. However, spectral signatures of the water are well quantified by satellite-based multispectral reflectance measurements. Here, we identify the spectral signatures of dominant water types present in the GOM using monthly composite SeaWiFS and MODIS data from 1998-2016. A merged multivariate clustering approach, including Self-Organizing Maps and hierarchical clustering, is used to group dominant spectral signatures across time and space. Remapped results provide a climatological view of bio-optical water types and the interannual variability of their distribution. Results indicate the same 2-3 spectral water types dominate the central GOM interannually. Several less spatially predominant water types are present mainly along the coast and over George's Bank, varying in location seasonally. Spectral signatures of the water types suggest they range from relatively clear waters, mixed waters dominated by suspended sediments, and waters dominated by CDOM and phytoplankton. Water type interannual variability and quantified trends suggest that in recent years, the central GOM experienced a shift in the dominant water type in September and November. This shift appears to be from clearer water, to water dominated by CDOM and phytoplankton. These results provide new satellite ocean color views of GOM variability over seasonal and interannual time scales.

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