Tuesday, October 9
Oral Session 4
14:40–15:40

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PERSISTENT UV REFLECTANCE PEAKS IN THE GULF OF MAINE OBSERVED USING ABOVE-WATER, HYPERSPECTRAL RADIOMETRY: NEW OBSERVATIONS FROM THE GULF OF MAINE NORTH ATLANTIC TIME SERIES (GNATS)

The Gulf of Maine North Atlantic Time Series (GNATS)—a ferry-based, ship-of-opportunity program operating aboard a high-speed catamaran ferry—has regularly sampled across the widest part of the Gulf of Maine between Portland, Maine, USA and Yarmouth, Nova Scotia, Canada, for the last 20 years. The GNATS transect crosses four major coastal water masses, each with a different influence of phytoplankton, colored dissolved organic matter and suspended sediments. We also deploy a glider equipped with spectral Lu and Ed sensors (including a UV channel) along the same transect. In 2017, we transitioned our above-water radiometry from spectral-reflectance measurements (7 bands between 412 and 685nm) to hyperspectral- reflectance measurements (137 bands between 350 and 803nm with ~3.3nm resolution). We will present an analysis of these hyperspectral UV reflectance observations from the Case II coastal waters. In particular, we will focus our presentation on 1) the presence of persistent peaks in UV reflectance associated with specific water masses, and 2) relating the UV reflectance peaks to independently-measured hydrographic, optical, biological and chemical variables. One of the more prominent trends that we have observed is a persistent reflectance peak at 380-400 nm that varies as a function of changes in cloud/fog cover. Based on the rapidity of the change and the spectral quality, we hypothesize that we are seeing a reflectance change due to mycosporine-like amino acids (MAAs), UV-absorbing, photoprotective compounds known to be synthesized by various microalgal taxa including dinoflagellates, cyanobacteria, prymnesiophytes and diatoms.

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