Tuesday, October 9
Poster Session 2
10:30–12:30

Poster 134

SEASONAL VARIABILITY OF THE DIFFUSE LIGHT FIELD IN RELATION TO THE MIXED-LAYER DEPTH AND THE SUCCESSION OF PHYTOPLANKTON ASSEMBLAGES

Seasonal attenuation patterns of downwelling irradiance and upwelling radiance in temperate coastal waters are dependent on dynamic changes in the physical, chemical and biological conditions of the water column. High-quality in situ observations of the diffuse light field coupled with bio-optical properties are particularly important for ocean color remote sensing validation and evaluation of biogeochemical processes in a column of water. The objective of this study is to characterize the seasonal variability of the diffuse light field in relation to the mixed layer depth (MLD) and succession of phytoplankton assemblages. Monthly field measurements of physical and biological parameters were conducted in the coastal waters of Sagami Bay from May 2016 to May 2018. Two transitional optical conditions were observed throughout the study: MLD > Zeu (1% euphotic depth) during winter, and MLD < Zeu from spring to fall. Phytoplankton biomass was highest (Avg: >3.0 mgChl-a m^{-3}) during the spring-summer season following the shoaling of the MLD (Avg: ~12 m). Analysis of multi-excitation fluorescence and pigments suggest the high phytoplankton biomass during the spring-summer season was dominated by brown algae, followed by cyanobacteria during the late-summer when the MLD < Zeu. Green algae and cryptophytes relatively dominated the water column when the MLD > Zeu. Preliminary results suggests the seasonal succession of phytoplankton assemblages in the water column are dependent on the spectral quality of the diffuse light field, which simultaneously alters the attenuation characteristics of downwelling irradiance and upwelling radiance.

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