OCEAN & EARTH SCIENCES

OLD DOMINION UNIVERSITY

Fall Seminar Series

Thursday, October 23rd @ 3 pm

Room 200, Oceanography & Physics Building

Or Via Zoom

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Boston University

Title

Predicting Carbon Export Flux from Ocean Color-Based Phytoplankton Community Composition

ABSTRACT

Characterizing phytoplankton diversity across spatiotemporal scales is essential for a complete understanding of various Earth system processes, from biogeochemical cycling to carbon sequestration. Understanding the distribution of different phytoplankton groups in time and space is particularly relevant as phytoplankton communities and the oceans they reside in are under threat from human activity, including anthropogenic climate change. Despite the urgency and importance of resolving phytoplankton community composition, current observations of the global ocean fail to capture phytoplankton composition at high taxonomic resolution and on scales relevant to the broader Earth system. To address this fundamental challenge, my work merges ocean color remote sensing measurements with in-water molecular and optical data to enable accurate observations of phytoplankton on global to regional scales, across depths, and at high temporal resolution. In this talk, I will first describe my work to compare high resolution in situ measurements of phytoplankton community composition with remotely-sensible variables, including phytoplankton pigment concentrations derived from a novel bio-optical computational model. This model is currently being implemented for NASA's new Plankton Aerosol Cloud and ocean Ecosystem (PACE) sensor and will extend our understanding of surface ocean phytoplankton community composition in space and time. I will then link these remotely-sensible estimates the deep sea by investigating how these surface ocean phytoplankton communities are transformed and transported into the mesopelagic ocean using DNA sequencing. This approach aims to quantify otherwise cryptic links between surface ocean phytoplankton, sinking marine particles, and carbon export flux. By combining methods and scales of inquiry, we developed predictive relationships between ocean color-based surface ocean phytoplankton taxa and carbon export flux magnitude at depth.

Zoom: Contact OES Admin- OESadmin@odu.edu