UCONN

UNIVERSITY OF CONNECTICUT

Department of Marine Sciences Presents a Seminar by

Hilde Oliver

Woods Hole Oceanographic Institution

Subsurface diatom hotspots driven by Gulf Stream meandering

Satellite altimetry shows that the Gulf Stream south of the northern Middle-Atlantic Bight (MAB) shelf has destabilized in recent decades; vigorous meanders now more frequently directly transport Gulf Stream Water northward into the MAB slope sea. Relative to MAB Shelf and Slope Water, surface Gulf Stream Water is characteristically nutrient poor, so its northward intrusion has been thought to potentially inhibit MAB primary productivity. We present contrasting observations of unexpected intensely productive subsurface diatom hotspots associated with intrusions of upwelled Gulf Stream water in the MAB slope sea in July 2019, which were observed with physical, chemical, and biological measurements from traditional CTD profiling, an autonomous underwater vehicle (REMUS 600), a towed Video Plankton Recorder (VPR), and an Imaging FlowCytobot (IFCB). While satellite ocean color products cannot sense the ~50 m deep subsurface hotspots, satellite sea surface temperature (SST) and sea surface height (SSH) reveal the oceanographic context we hypothesize gave rise to this bloom: a Gulf Stream meander directly intruding towards the shelf to the east of the hotspots. This hypothesis is supported by results of a one-dimensional coupled physical-biogeochemical model, which shows that upwelled nutrients from the Gulf Stream during transport into the MAB slope sea likely drove enhanced subsurface diatom growth. Coupling the subsurface physical and biogeochemical measurements from the Ocean Observatories Initiative (OOI) Pioneer Array moorings and gliders with the large scale physical features captured by satellite SST and SSH will give way to better understanding the temporal and spatial scales of the impact of shifting large-scale circulation on marine primary productivity, below the skin layer.

Host: Jessie Turner
Time & Date: 11:00 am, Friday, October 21, 2022
Place: Lowell Weicker Building, Seminar Room 103 (or WebEx)

Please visit this page to request seminar information:
https://marinesciences.uconn.edu/seminar/seminarform/

If you are an individual with a disability and need accommodations, please contact 860-405-9152 or email marinesciencesseminars@uconn.edu.
For cancellations and additional seminar information see: https://marinesciences.uconn.edu/seminar/seminar1228/.