



Fall 2017 SEMINAR SERIES

DEPARTMENT OF OCEAN, EARTH, AND ATMOSPHERIC SCIENCES
3:00 PM – ROOM 200 IN THE OCEANOGRAPHY/PHYSICS BUILDING
THURSDAY, SEPTEMBER 7, 2017

“(Sub)mesoscale fronts structure phytoplankton communities and enhance diversity”

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ABSTRACT

To date, the net effect of (sub)mesoscale ocean fronts on phytoplankton community structure and biodiversity has been difficult to determine due in part to a paucity of data collected at appropriate spatial scales and taxonomic resolution. In this study, I analyzed continuous measurements of picophytoplankton community composition in surface waters during 13 cruises conducted in the North Pacific and South Atlantic. My aim was to uncover how phytoplankton assemblages and biodiversity are modulated by (sub)mesoscale fronts. This extensive dataset is made up of highly spatially resolved (~ 1 km) sea surface cytometric counts of *Prochlorococcus*, *Synechococcus* and picoeukaryotes, with concurrent measurements of temperature and salinity. I investigated how the abundance of the different phytoplankton populations varies across frontal features, defined by temperature and density gradient criteria. There was a significant increase in the Shannon diversity index at fronts, however none of the phytoplankton functional groups enumerated showed any difference in their distributions at fronts compared to background conditions. The dominant impact of fronts on phytoplankton community structure, therefore, is to create more even assemblages by mixing communities from adjacent water masses. Thus, (sub)mesoscale fronts act as ephemeral oceanic ecotones where distinct phytoplankton communities are mixed, and may play a key role in sustaining larger scale patterns in phytoplankton diversity.

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