# SPRING 2017 SEMINAR SERIES

DEPARTMENT OF OCEAN, EARTH, AND ATMOSPHERIC SCIENCES
3:00PM – ROOM 200 IN THE OCEANOGRAPHY/PHYSICS BUILDING
THURSDAY March 30th, 2017

## *"Patterns of Chlorophyll, Phytoplankton Community Structure, and "Food Quality" in Monterey Bay and San Francisco Bay, CA using Imaging Spectroscopy Data from the California HyspIRI Airborne Campaign."*

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### ABSTRACT

There is a need in the ocean color community to discriminate among phytoplankton groups within the bulk chlorophyll pool to understand ocean biodiversity, track energy flow through ecosystems, and identify and monitor for harmful algal blooms. The Monterey Bay (MB) and San Francisco Bay (SFB) support nurseries of ecologically and commercially important fisheries, including some threatened species. Phytoplankton community structure influences food web dynamics, and the taxonomy of the phytoplankton may be more important in determining primary "food quality" than environmental factors. As such, estimating food quality from phytoplankton community composition can be a robust tool to understand trophic transfer of energy. Recent work explores a phytoplankton "food quality index" in SFB through the use of microscopy and phytoplankton chemotaxonomy to evaluate how changes in phytoplankton composition may have influenced the recent trophic collapse of pelagic fishes in the northern part of the SFB. As a part of the Hyperspectral Infrared Imager (HyspIRI) Airborne Preparatory Campaign we evaluated the use of hyperspectral imagery to discriminate algal taxa in MB and SFB and then to infer "food quality" in SFB using an empirical food quality index. The HyspIRI-California Airborne Campaign used the Airborne Visible/Infrared Imaging Spectrometer- Classic (AVIRIS-C) sensor to image coastal targets and derive chlorophyll and phytoplankton biodiversity using the algorithms OC3 and PHYDOTax. These algorithms rely on the fine scale, subtle spectral shape of the atmospherically corrected hyperspectral remote sensing reflectance ($R_{rs}$) spectrum of the ocean surface. Phytoplankton community structure for MB and SFB and "food quality" for SFB will be presented and limitations in these ocean color algorithms will be discussed.