Wednesday, October 10
Poster Session 3
16:00–18:00

Poster 19

SPATIAL PATTERNS AND OPTICAL ANALYSIS OF WILDFIRE-DERIVED ASH IN THE SANTA BARBARA CHANNEL

In December 2017, the Thomas Fire became the largest wildfire in California history, burning nearly 300,000 acres of primarily forested land. The fire, coupled with unusually strong Santa Ana winds, produced a plume of smoke, ash, and soot that extended more than 1000 km offshore, inundating the Santa Barbara Channel (SBC) with ash for 6 weeks. Here we describe the distribution of Thomas Fire ash in the SBC using an optical approach. This work was made possible by adapting a previously planned cruise aboard R/V Sally Ride on December 15-22. We highlight image analyses from water samples acquired in the surface ocean and at the chlorophyll maximum 4 times daily using an Imaging FlowCytobot (IFCB) that imaged ash particles. We supplement these observations with depth profiles of inherent optical properties to determine the extent to which the dissolution of ash in seawater affects absorption and scattering. We then describe how our image analysis determined properties of ash across depth, space, and time. We use a semi-quantitative approach to link ash observations to biogeochemically and ecologically relevant covariates: euphotic depth (determined using a profiling radiometer), phytoplankton taxonomy (determined through image and pigment analysis), and phytoplankton physiology (chl/carbon as derived from inherent optical properties). We assess the spatiotemporal variability of these parameters. Finally, we compare our findings to a typical December month in the SBC using a twenty-year HPLC pigment and optics dataset, and we discuss the implications of predicted increases in forest fire on microbial life in the SBC.

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