**Sign of the times: the lipid signature of a collapsing phytoplankton bloom**

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Phytoplankton play vital roles in carbon capture and sequestration, much of which occurs during large bloom events. These blooms collapse when population controls such as grazing pressure, viral infection and lysis, and nutrient stress are re-established. We use UPLC-HRAM mass-spectrometry methods to analyze membrane lipids extracted from particulate matter off the coast of California during the collapse of a diatom-dominated phytoplankton bloom. We measure membrane lipid ratios and find that in eutrophic environments, classic oligotrophic biomarkers for nutrient stress such as SQDG:PG serve as biomarkers for phytoplankton biomass instead of measuring phosphorus or nitrogen stress. This environmental lipidomic method shows promise for future analysis of bloom decline mechanisms.

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Sessions:

**SS011 ANATOMY OF A BLOOM: UNRAVELING DRIVERS OF BIOMASS CHANGE AND CARBON DYNAMICS OVER THE ANNUAL CYCLE**

A comprehensive understanding of bloom dynamics and their climate sensitivities requires understanding the processes driving annual cycles in biomass and organic carbon at appropriate temporal and spatial scales. Seasonally resolved field programs (e.g. NASA NAAMES) and technological advancements (e.g. profiling floats, flow cytometry applications, genomics) are providing new insights on growth and loss processes of both photoautotrophic and heterotrophic communities that are challenging traditional views. Mechanistic controls and their effects (e.g. stochastic decoupling of growth and loss rates, phytoplankton stress, and species diversity) must be explored in the context of net accumulation rates in biomass and organic carbon. This session will examine mechanisms and interactions, ranging in scale from viruses to meso- and basin-scale physics, which regulate annual cycles in plankton biomass and inform predictions of future change. Our focus will be on the classic bloom-forming subarctic Atlantic, with a particular interest in the western reaches of the basin. The session will highlight results from in-situ, remote sensing, or modeling efforts providing new insights on plankton annual cycles and organic carbon dynamics

**SS018 - METABOLIC DIVERSITY IN MARINE BIOGEOCHEMICAL CYCLES IN PRESENT AND FUTURE OCEAN**

Recent advances in analytical methods opened new avenues to shed light onto the diversity of organic molecules in the oceanic environment. Similarly, the application of metagenomics, -transcriptomics and –proteomics allow obtaining insights into the metabolic diversity within microbial communities from the sunlit surface waters to the deep ocean realm. Gene or protein abundance do not provide information, however, on turnover rates of specific DOM compounds. Hence, a combination of approaches is required to fully understand the transformation of DOM by microbial communities combining recently developed approaches to characterize DOM with methods targeting the functional diversity of microbial communities and linking this to bulk measurements of microbial activity such as microbial biomass production and respiration to mechanistically understand the role of microbial communities in biogeochemical cycles of the present and future ocean. This session should bring together scientists from the fields of marine biogeochemistry and biological and microbial oceanography.