

OCEAN OPTICS XXIV

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Wednesday, October 10

Poster Session 3

16:00–18:00

Poster 67

PHYTOPLANKTON DYNAMICS AND PARTICLE DISTRIBUTIONS IN A COASTAL NORWEGIAN BIOLOGICAL HOTSPOT

The size structure and the photophysiological status of a phytoplankton community has assumed to directly impact the size and the nature of a particle as well as the energy transfer to upper trophic levels. Yet, little is known regarding the relationship of phytoplankton size and particle size distributions in marine systems. Here, we present data from a novel combination of in-situ optical instruments, including: particle imaging (Silhouette Camera, SilCam), inherent optical properties (Laser In situ Scattering Transmissometry-100, LISST-100) and fluorescence-based photophysiology (Pulse Amplitude Modulation and Fast Repetition Rate Fluorometers) collected from several sites along the coast of Norway. Pigment chemotaxonomy (High Performance Liquid Chromatography, HPLC) was also investigated to give information about phytoplankton community structure and their light harvesting versus photoprotective properties. We hypothesized that sites with intense mixing resulted in a greater proportion of large phytoplankton, such as diatoms. Large proportion of diatoms resulted in the dominance of mesozooplankton taxa (copepods, including aggregates or fecal pellets) due to intense grazing compared to sites with less abundance of diatoms. The slopes of power-law fitted particle size distributions from distinct optical measurements (HPLC, SilCam and LISST) were used to understand the impact of phytoplankton size structure to the total particles in the water. Understanding the fate of phytoplankton on the nature, size and shape of particles in the water column will help to improve our knowledge of pelagic processes and carbon flux occurring in coastal marine ecosystems.

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