

# OCEAN OPTICS XXIV

Valamar Lacroma Dubrovnik Hotel | Dubrovnik, Croatia | October 7–12, 2018

<https://oceanopticsconference.org>

Thursday, October 11

Poster Session 4

10:30–12:00

## Poster 199

### **EMBRACING VARIABILITY: HOW CAN WE USE PATCHY DATA TO ACCOUNT FOR SUBMESOSCALE PROCESSES?**

The ocean is a highly dynamic system, a confluence of biological, chemical and physical process. These processes happen at different spatial and temporal scales and their interaction often results in non-linear dynamics. The common practice is to average results across a meaningful spatial or temporal resolution and compare the means. Our hypothesis is that understanding the fine scale variability (rather than solely the broad mean) might provide better insight and predictive ability. One of the biggest challenges is obtaining high spatial and temporal resolution global data. Here we use satellite, modeling, Bio-ARGO floats and in situ data to investigate the role of fine scale temperature variability on phytoplankton community dynamics. To our knowledge, no study has focused on the variability aspect or studied all 4 components simultaneously. Using pigment ratio variability as a proxy for variability in phytoplankton community composition, we compiled a quality-controlled dataset of HPLC pigment records (MAREDAT, NASA, HOT, BATS, PALMER) combined with BIO-ARGO profile data, focusing on surface samples (<20m, ~ 84,000 and ~275,000 data points, respectively). We then selected forty 5x5 degree bins from environmentally different locations with abundant HPLC or ARGO data and matched those with MODIS SST. Ideally, we could bridge the limited HPLC and Bio-ARGO observations using global satellite data. Some of our initial findings suggest that 1) the open-ocean oligotrophic regions are more dynamic than we previously expected, 2) ARGO and MODIS show similar ranges of temperature variability, 3) temperature variability could serve as a predictor of variability in community composition.

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