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

Poster 179

TOWARDS IMPROVED SATELLITE ALGORITHM VALIDATION TOOLS: A REVISED PIGMENT-BASED APPROACH FOR DISCRIMINATING PHYTOPLANKTON TYPES

Phytoplankton traits, such as morphology, nutrient acquisition, and life cycle strategies, influence a phytoplankton group's role within an ecosystem. These traits are used to categorize phytoplankton groups according to their biogeochemical function, namely phytoplankton functional types (PFTs). Defining PFTs requires knowledge of how these traits influence oceanic biogeochemical cycles, the food web and the biological carbon pump. PFT algorithms use Rrs-derived products, such as phytoplankton absorption, to model PFT community composition in the ocean. Coincident in situ observations of phytoplankton taxonomy with satellite-based observations are vital for ground-truthing the products of these algorithms. The CHEMTAX method is widely used to differentiate PFTs with in situ pigment data and provides both relative and absolute abundance of taxonomic groups.Limitations exist with this approach:it relies on accurate diagnostic pigment-to-Chlaratios for a region of interest, and Chlais sensitive to light regime and nutrient availability, reducing the accuracy of this method. Phytoplankton carbon (Cphyto) remains a better measure of biomass because it is not as sensitive to these environmental pressures. Through a series of controlled experiments conducted at the National Center for Marine Algae and Microbiota, we aimed to develop a set of refined pigment-to-Chlaand pigment-to-Cphyto ratios specific to phytoplankton species and physiological state. During this study we quantified changes in pigment content, pigment-to-Chlaratios and pigment-to-Cphyto ratios of 41 phytoplankton species. From this study, we will present preliminary results comparing the implementation of CHEMTAX using pigment-to-Cphyto ratios and revised pigment-to-Chla ratios to model phytoplankton community composition in the ocean.

Aimee Neeley, NASA GSFC, aimee.neeley@nasa.gov, https://orcid.org/0000-0001-5701-0953
Michael Lomas, Bigelow Laboratory for Ocean Sciences, mlomas@bigelow.org
Antonio Mannino, NASA GSFC, antonio.mannino-1@nasa.gov
Ryan Vandermeulen, NASA GSFC, ryan.a.vandermeulen@nasa.gov