



International Ocean Colour Science
Meeting 2023

Advancing Global
Ocean Colour
Observations

Poster Session 4 Lightning Talks

PML

Plymouth Marine
Laboratory

Poster
#77

Research excellence supporting a sustainable ocean

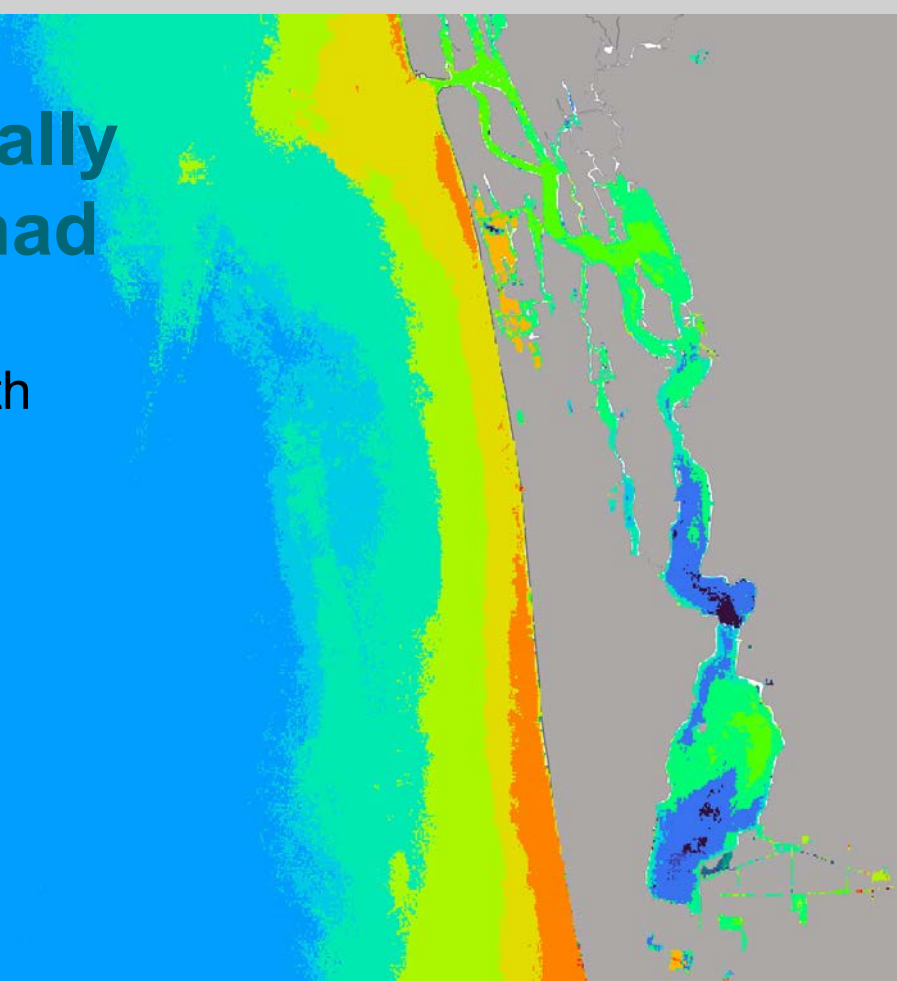
Monitoring long-term changes in the optically complex transition waters of Lake Vembanad

Elizabeth C. Atwood, Thomas Jackson, Shubha Sathyendranath

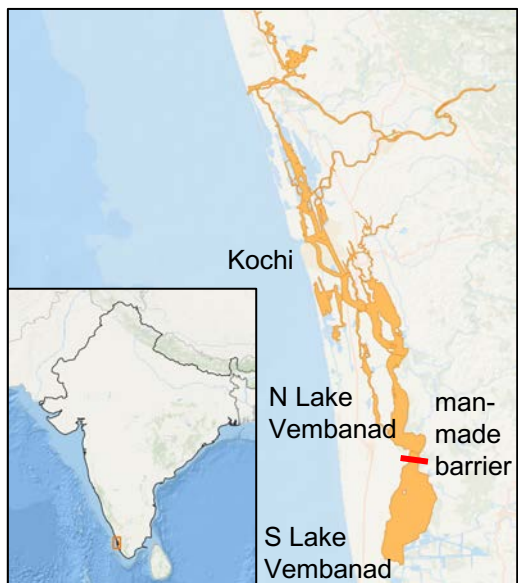


Advancing Global
Ocean Colour
Observations

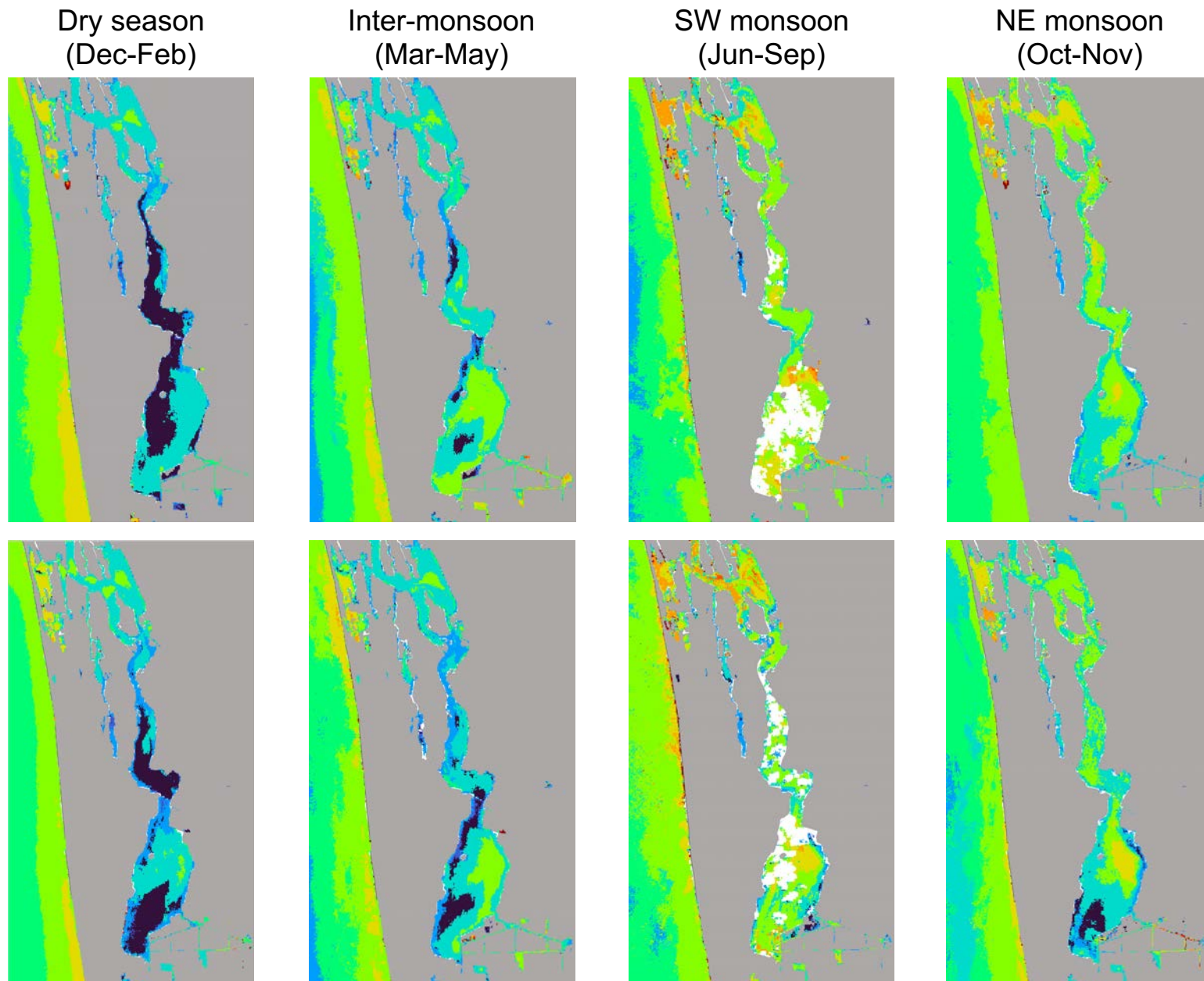
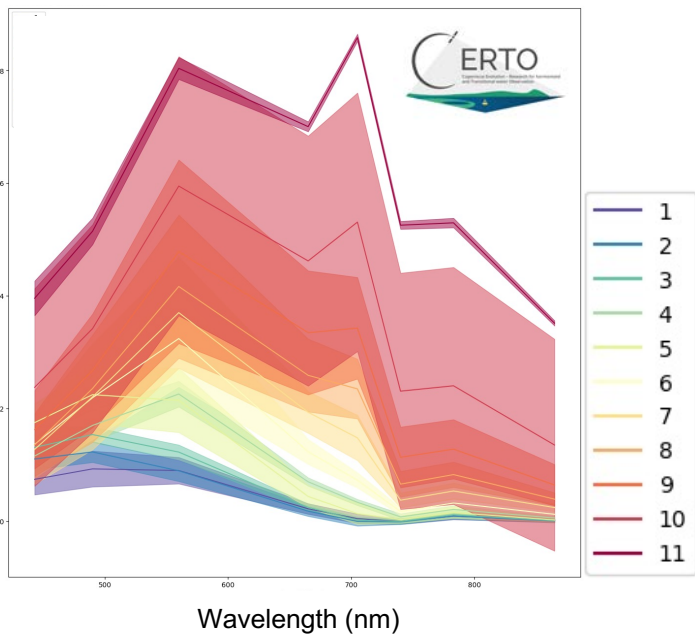
St. Petersburg, FL, USA, 14-17 November 2023



Research excellence supporting a sustainable ocean



MSI transitional water Optical Water Types



2019

2020



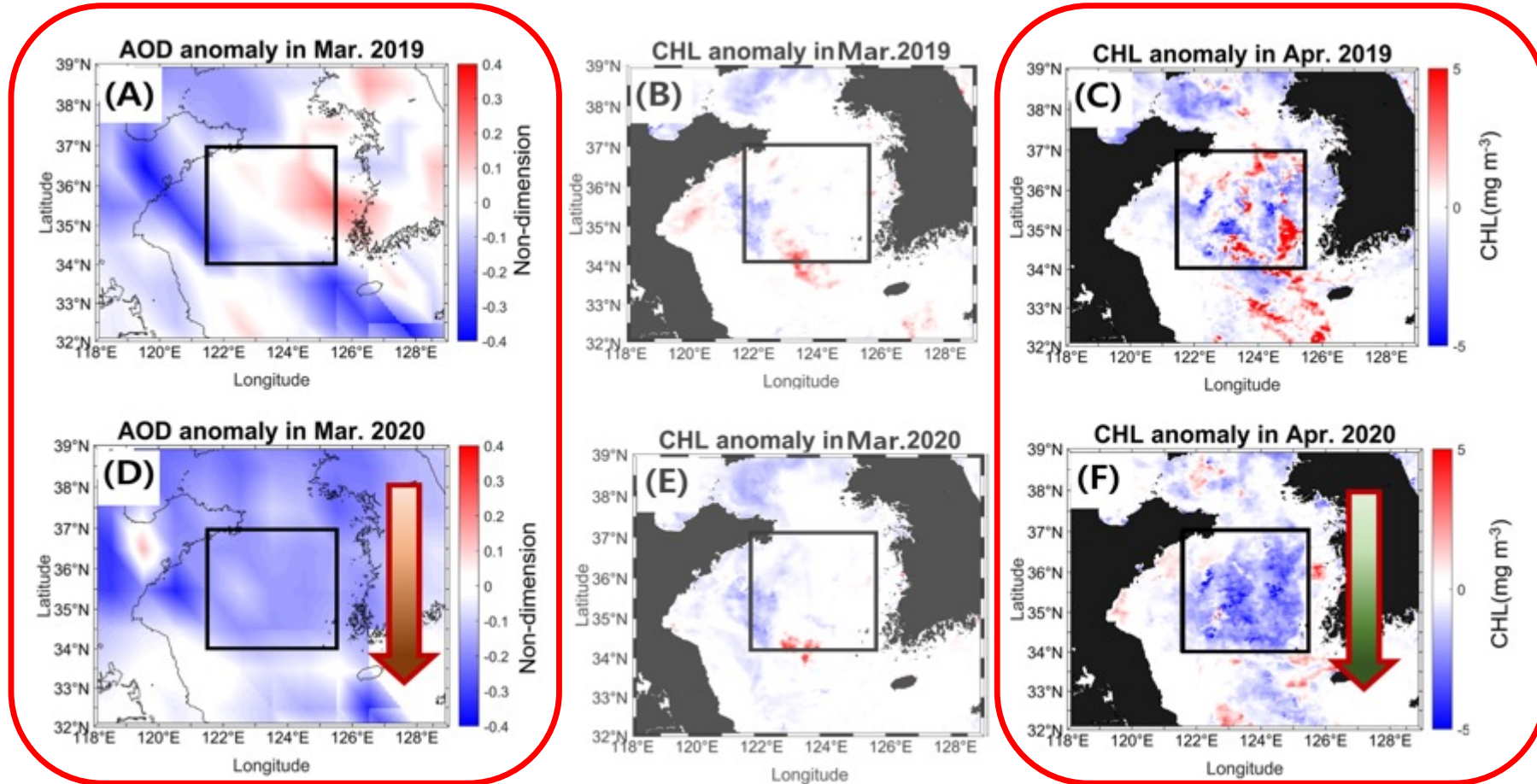
78

**Analysis of biological response time
of environmental variables affecting chlorophyll blooms
in the Central Yellow Sea**

Ji-Yeon Baek¹ (jiyeon@pusan.ac.kr), Young-Heon Jo¹

¹Department of Oceanography, BK21 School of Earth and Environmental System, Pusan National University

“Time-lag”





Assimilating multi-platform, multi-band remote-sensing reflectance into a coastal biogeochemical model of the Great Barrier Reef (GBR)

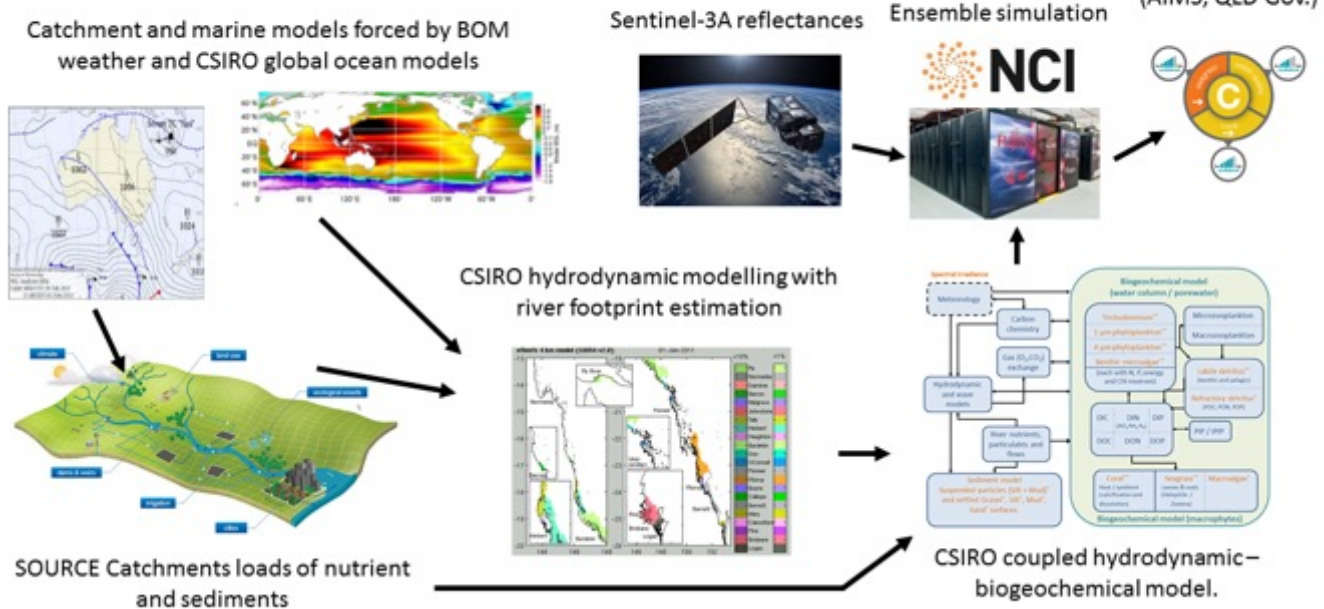
Mark E. Baird^{1,*}, Emlyn M. Jones¹, Roger Scott¹, Mathieu Mongin¹, Thomas Schroeder,¹ David Blondeau-Patissier¹, Tim Malthus¹ + the eReefs team

eReefs is a collaboration between



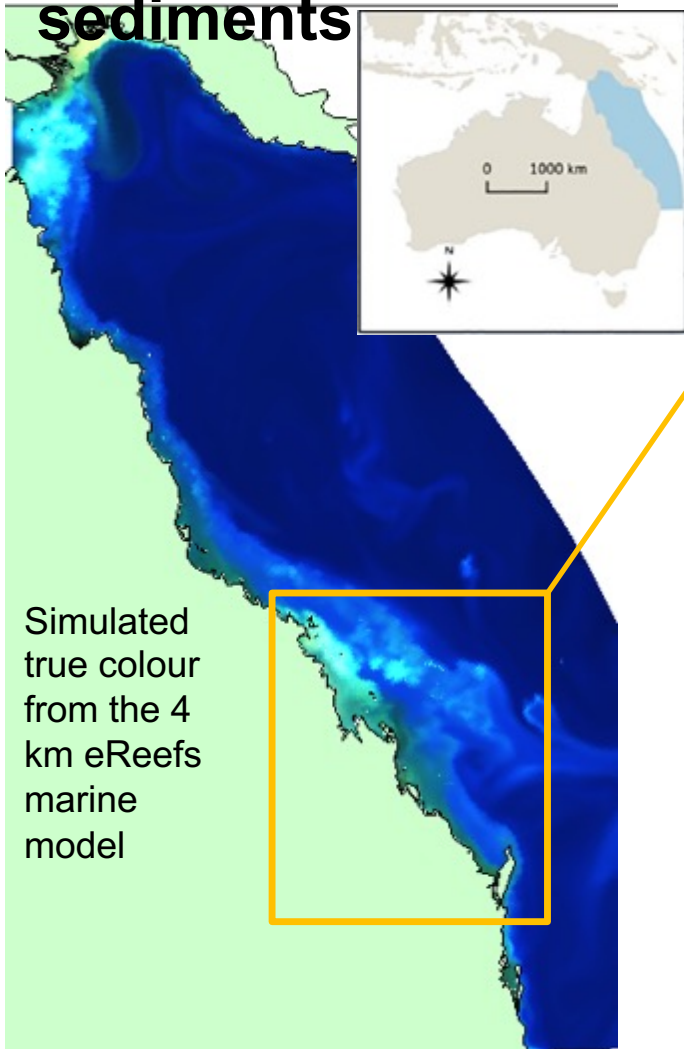
GREAT BARRIER REEF
foundation

eReefs marine biogeochemical data assimilation system

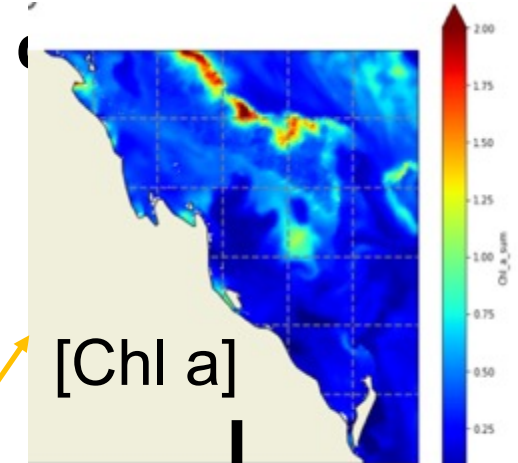


¹CSIRO Environment, Australia
*mark.baird@csiro.au

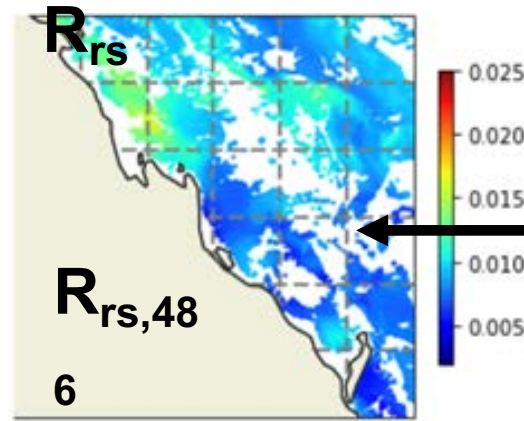
Optically – complex waters containing CDOM, microalgae, suspended sediments



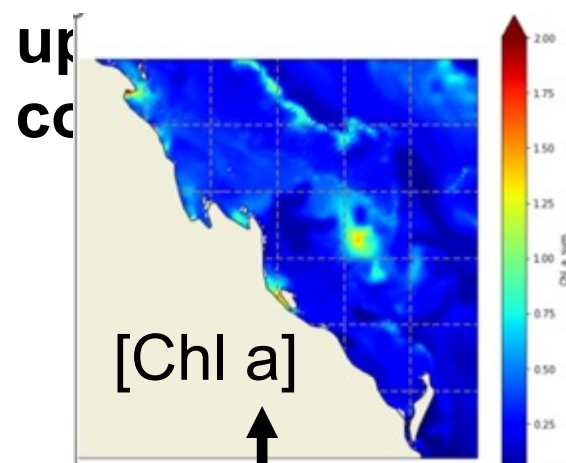
Optical model calculates remote-sensing reflectance from



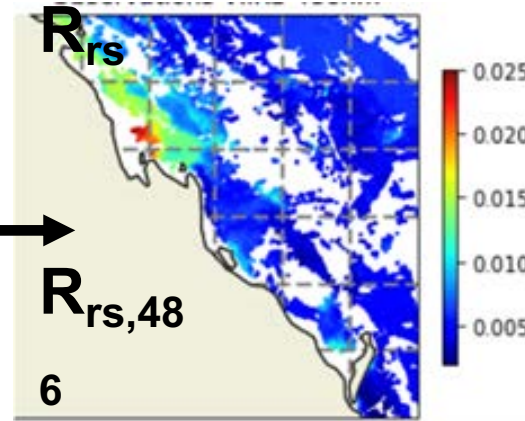
Simulated



Data assimilation uses mismatch of observed and predicted R_{rs} to update



Observed



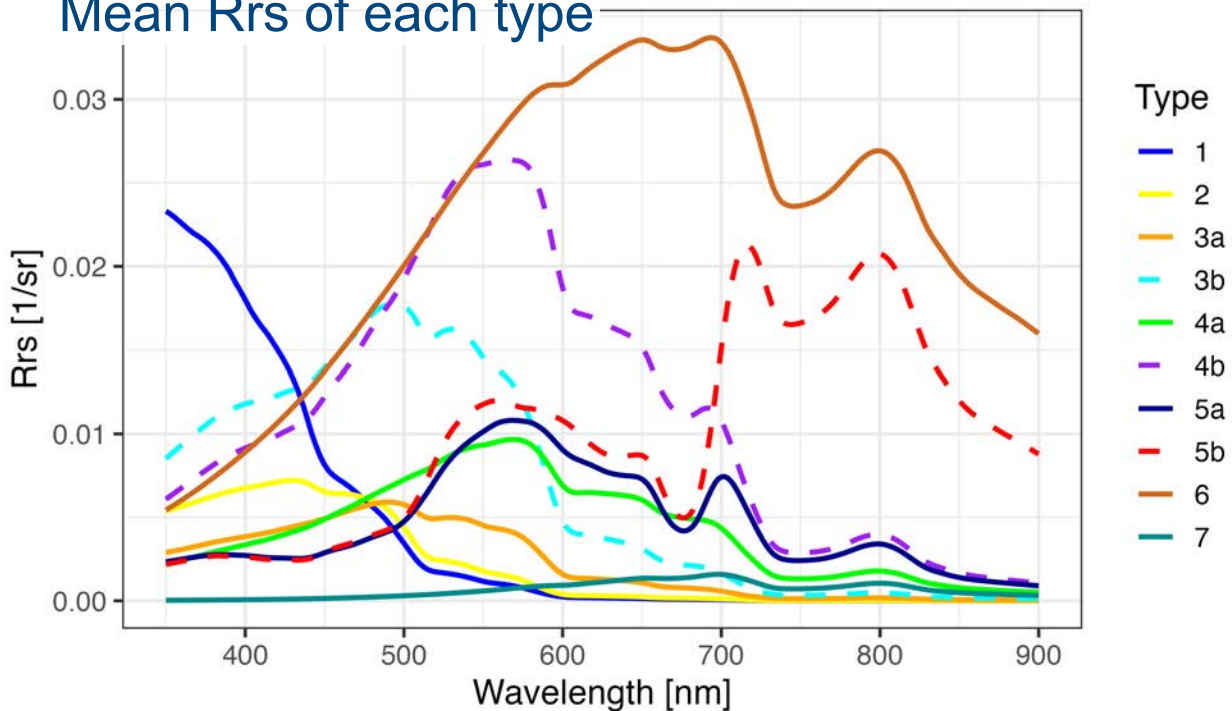
Teaser: Can the multi-platform R_{rs} observations update the different coloured constituents in the appropriate places?

Holistic optical water type classification for ocean, coastal, and inland waters

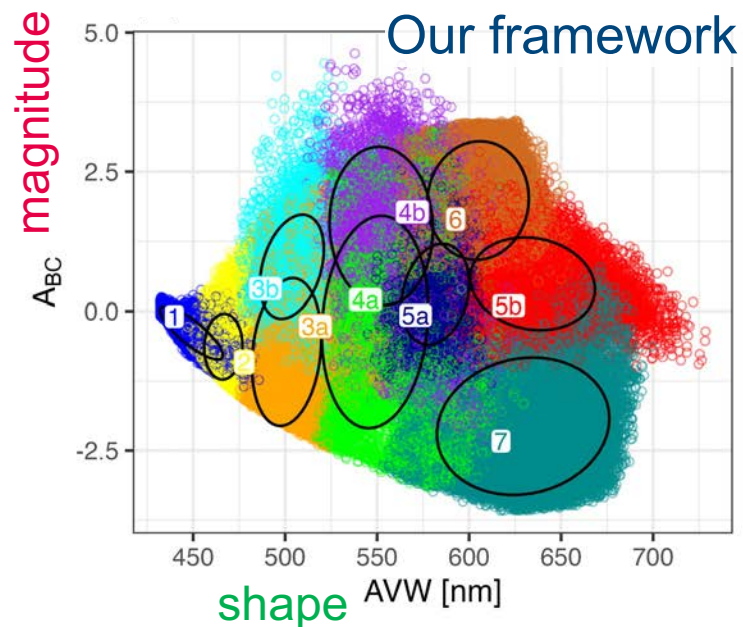
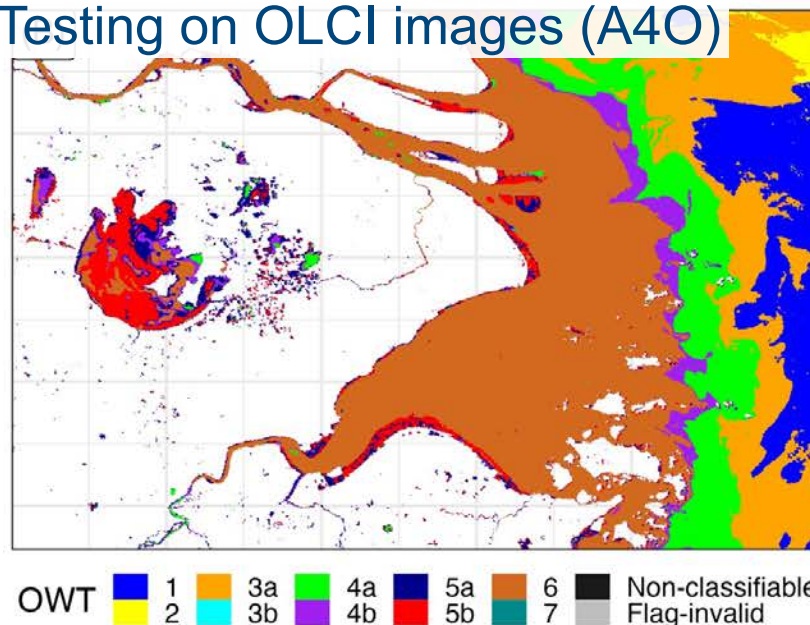
Shun Bi*, Martin Hieronymi, and Rüdiger Röttgers

Institute of Carbon Cycles, Helmholtz-Zentrum Hereon, Geesthacht, Germany

Mean Rrs of each type

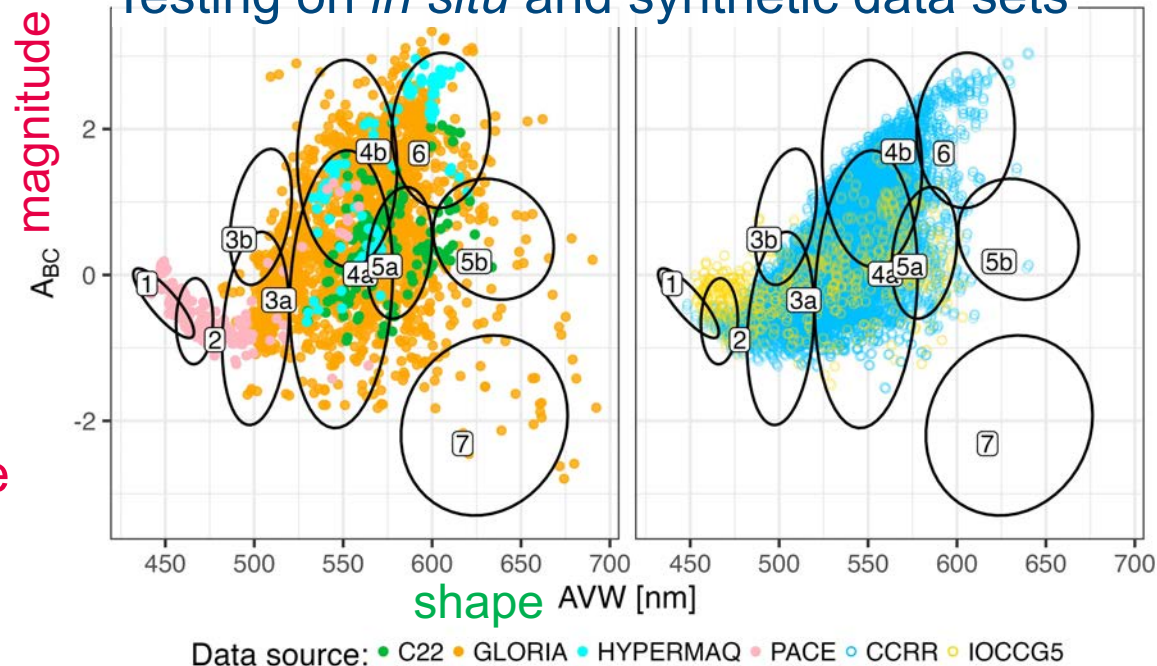


Testing on OLCI images (A40)



The new framework combines spectral **shape** and **magnitude** information.

Testing on *in situ* and synthetic data sets



A Machine Learning Framework to Estimate Diatom Biomass from Space

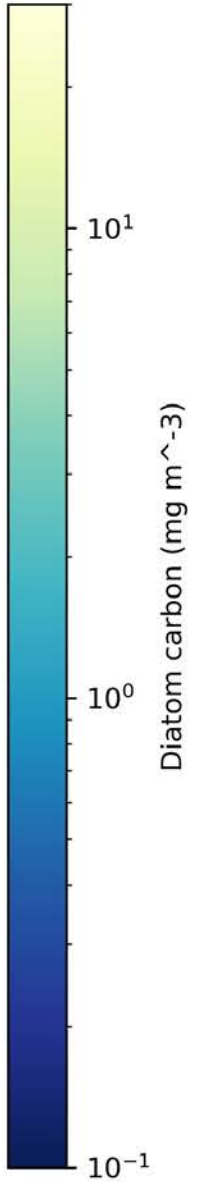
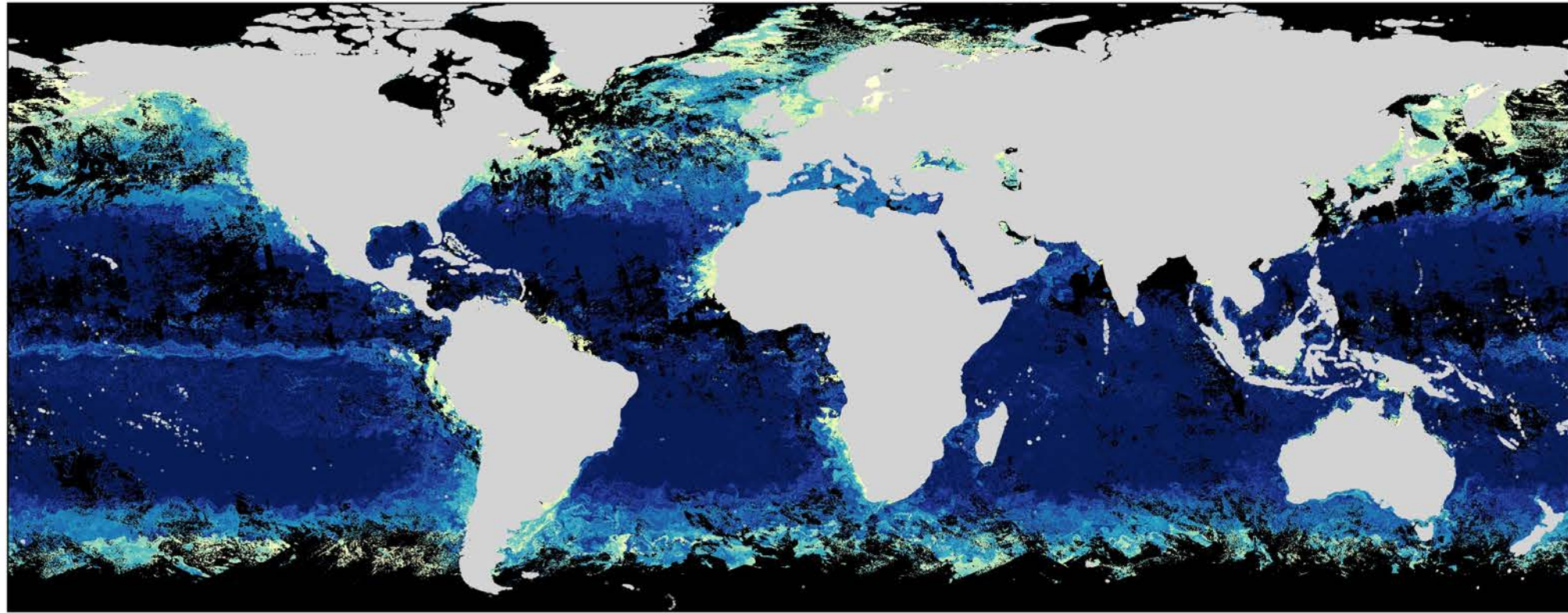
A. Chase¹, P. Gaube¹, V. Staneva², N. Haëntjens³, C. Stern⁴,
E. Boss³, L. Karp-Boss³, G. Bourdin³

¹ Applied Physics Laboratory - University of Washington

² eScience Institute - University of Washington

³ School of Marine Sciences - University of Maine

⁴ Lamont Doherty Earth Observatory - Columbia University



Poster #83 – come chat!

Seagrass extent scenarios near Crisfield, Maryland, USA

David Demaree¹, Blake Schaeffer², Wilson Salls³, John M. Johnston⁴, Richard Zimmerman⁵,
Victoria Hill⁶

¹*Oak Ridge Institute for Science and Education (ORISE), U.S. Environmental Protection Agency, Office of Research and Development. demaree.david@epa.gov*

²*U.S. Environmental Protection Agency, Office of Research and Development. schaeffer.blake@epa.gov*

³*Environmental Protection Agency, Office of Research and Development. salls.wilson@epa.gov*

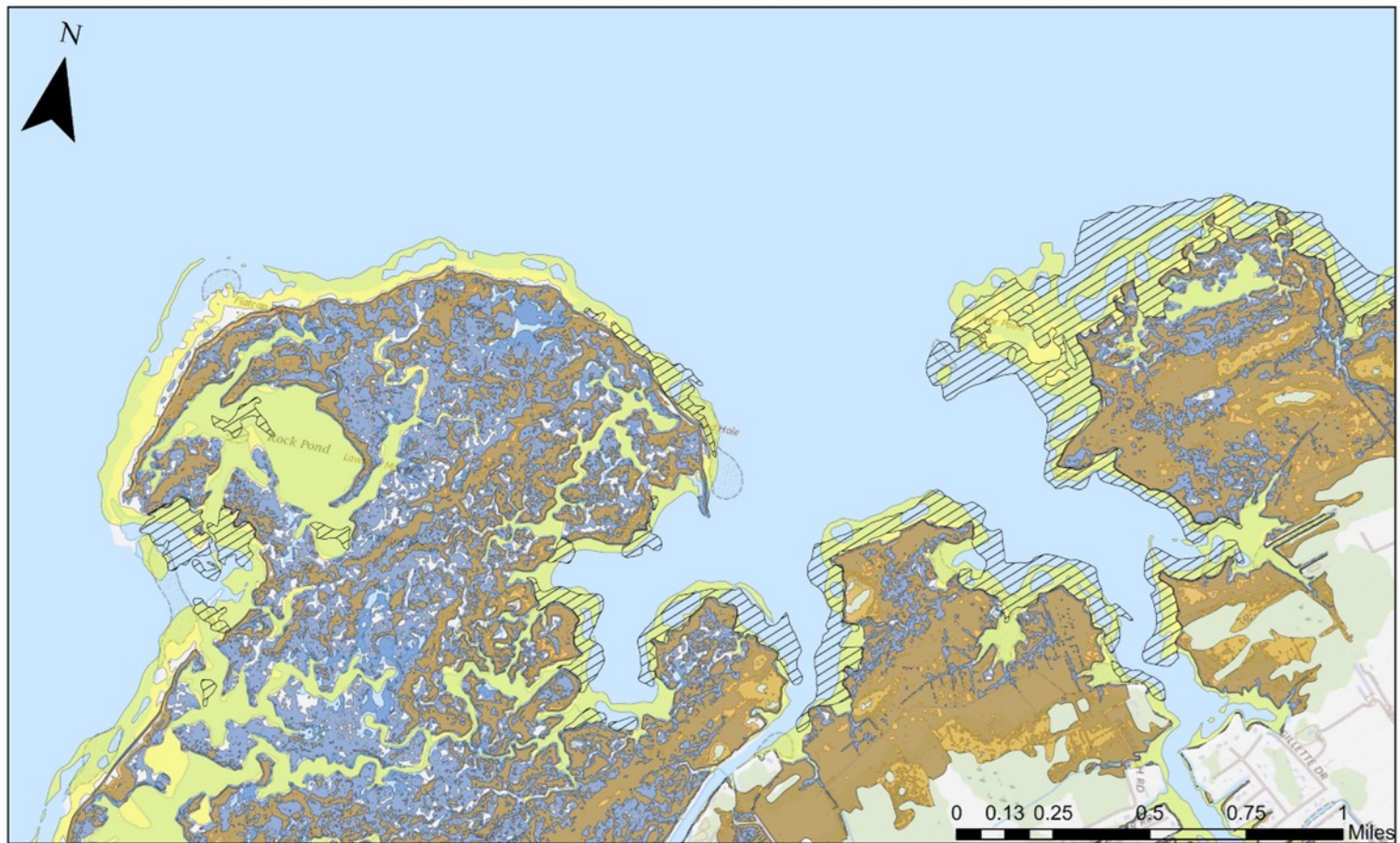
⁴*U.S. Environmental Protection Agency, Office of Research and Development. johnston.johnm@epa.gov*

⁵*Old Dominion University, Ocean, Earth and Atmospheric Sciences Department, Bio-Optical Research Group. rzimmerm@odu.edu*





⁶*Old Dominion University, Ocean, Earth and Atmospheric Sciences. vhill@odu.edu*

For The International Ocean Colour Science Meeting 2023, University of South Florida, St. Petersburg, FL. Poster number 85, Session 4.

Disclaimer: The views expressed in this presentation are those of the authors and do not necessarily represent the views or policies of the U.S. Environmental Protection Agency. Any mention of trade names or commercial products does not constitute EPA endorsement or recommendation for use.



Legend

-  Seagrass 2021
-  2100 Seagrass SSP1
-  2100 Seagrass SSP5
-  Modeled Seagrass 2022



CSIR - Fourth Paradigm Institute

Bengaluru, India

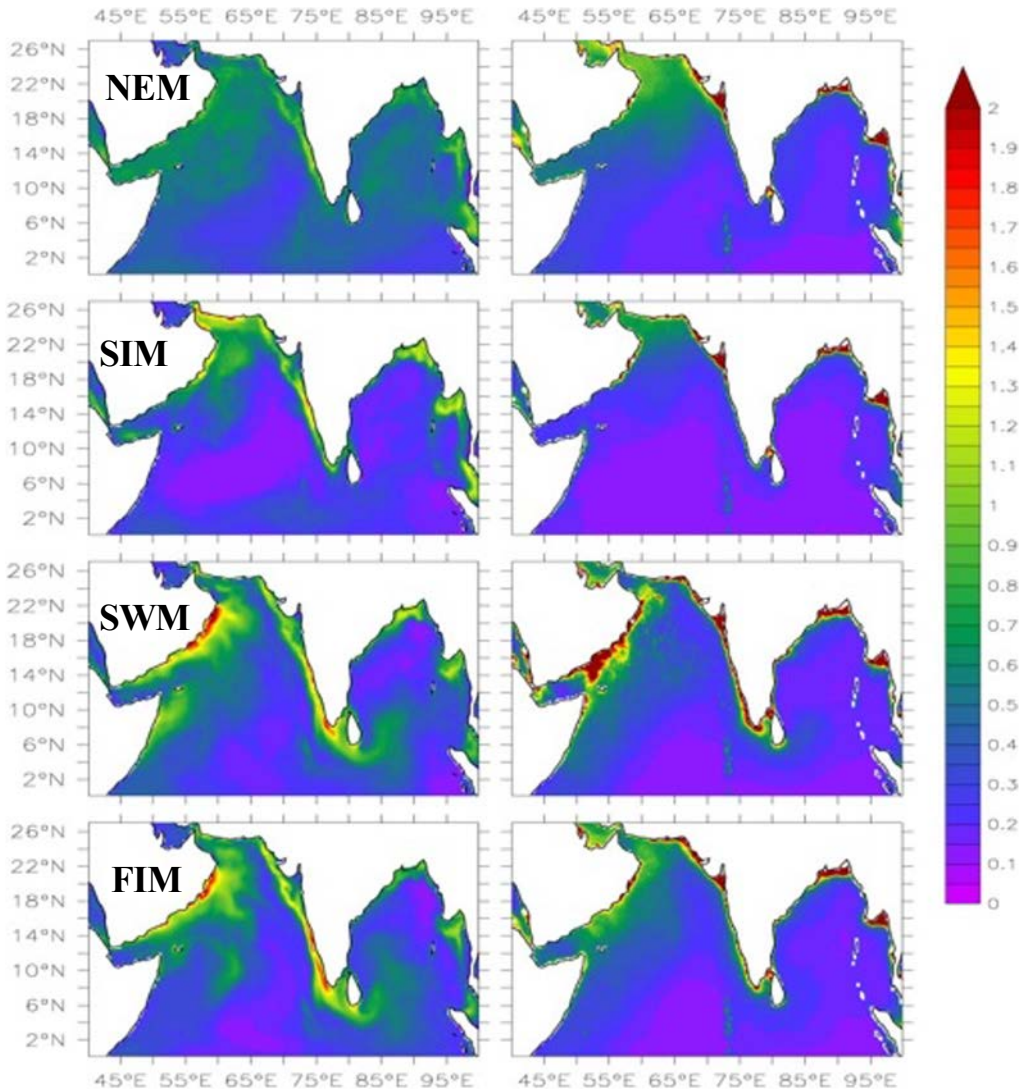


Chlorophyll and Primary Productivity Variations of the Indian Ocean using Model simulations and Observations

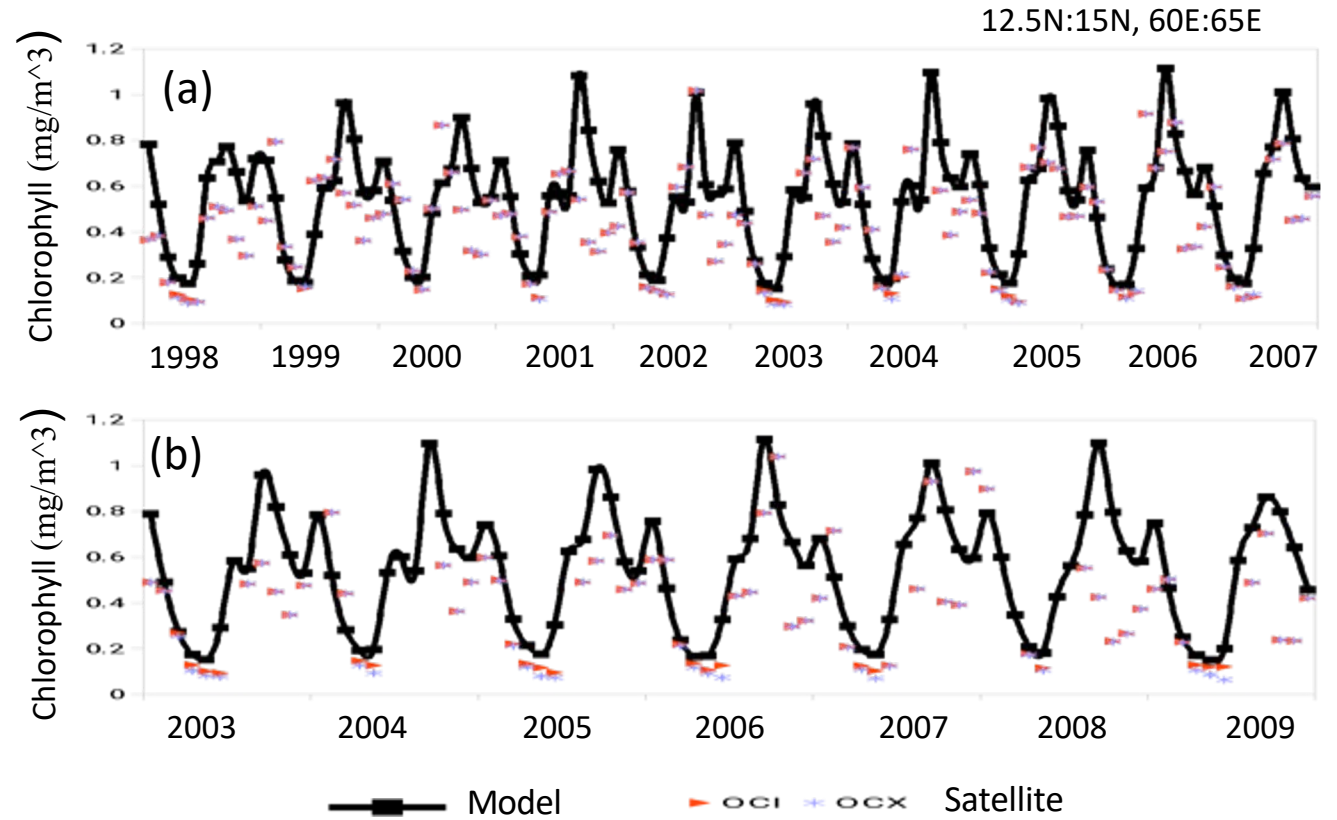
C Kalyani Devasena, M K Sharada, K V Ramesh and Lakshmikanthan P

Email:kalyani@csir4pi.in

Comparison of Chlorophyll (mg/m^3) from model with satellite data



Comparison of Model Simulation results with Satellite Data on Chlorophyll (a) SeaWiFS (b) MODIS



Satellite-Based Primary Production during a *Phaeocystis* sp. Bloom in the Labrador Sea

E. Devred, S. Clay, K. Wilson and T. Perry

Ocean and Ecosystem Science Division

Bedford Institute of Oceanography

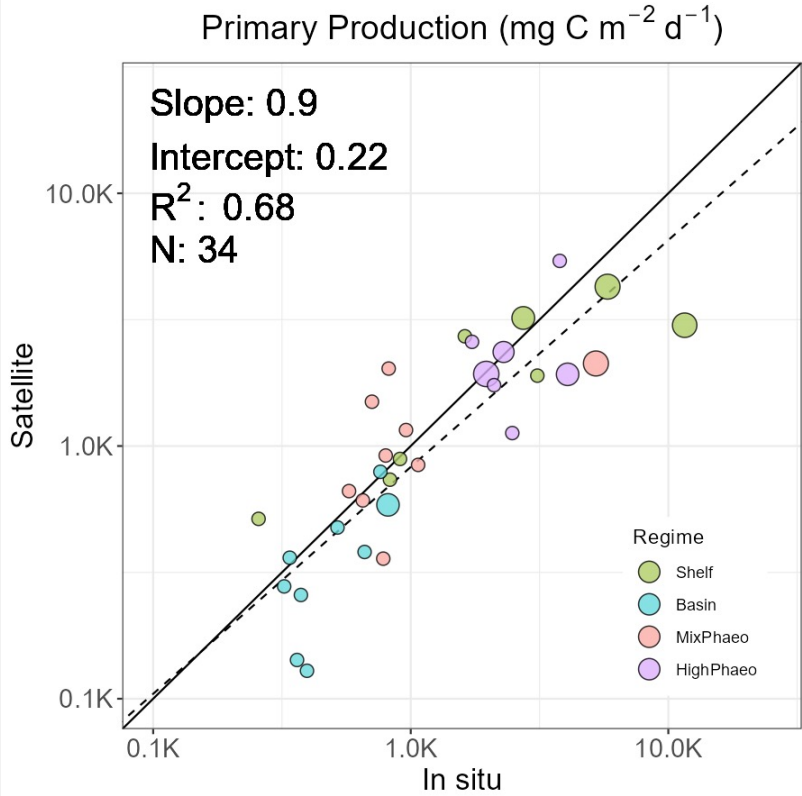
Dartmouth, NS, B2Y 4A2, Canada



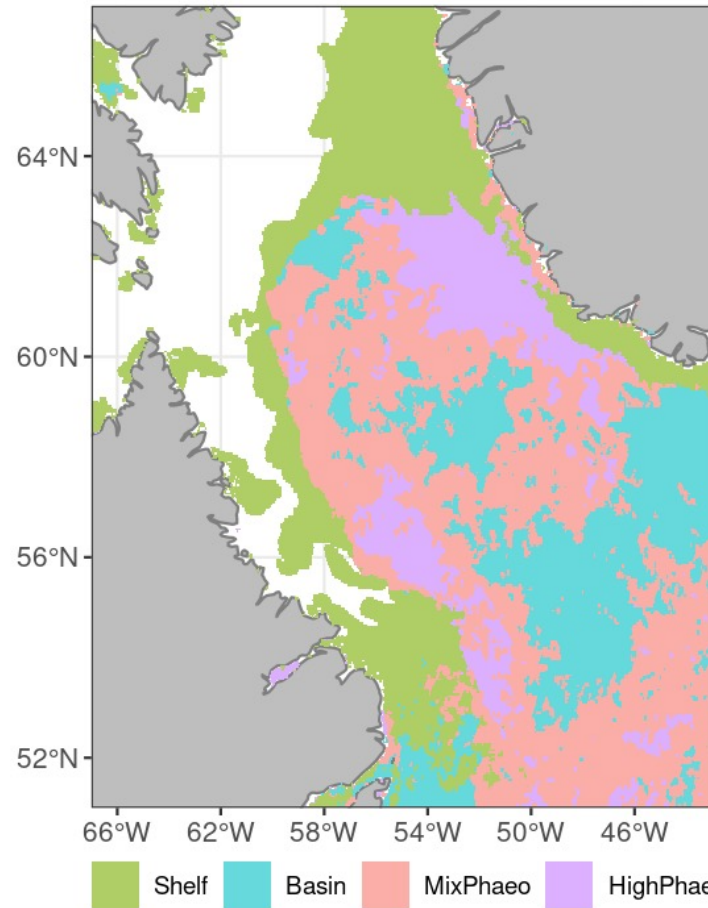
Fisheries and Oceans
Canada

Pêches et Océans
Canada

Model Validation

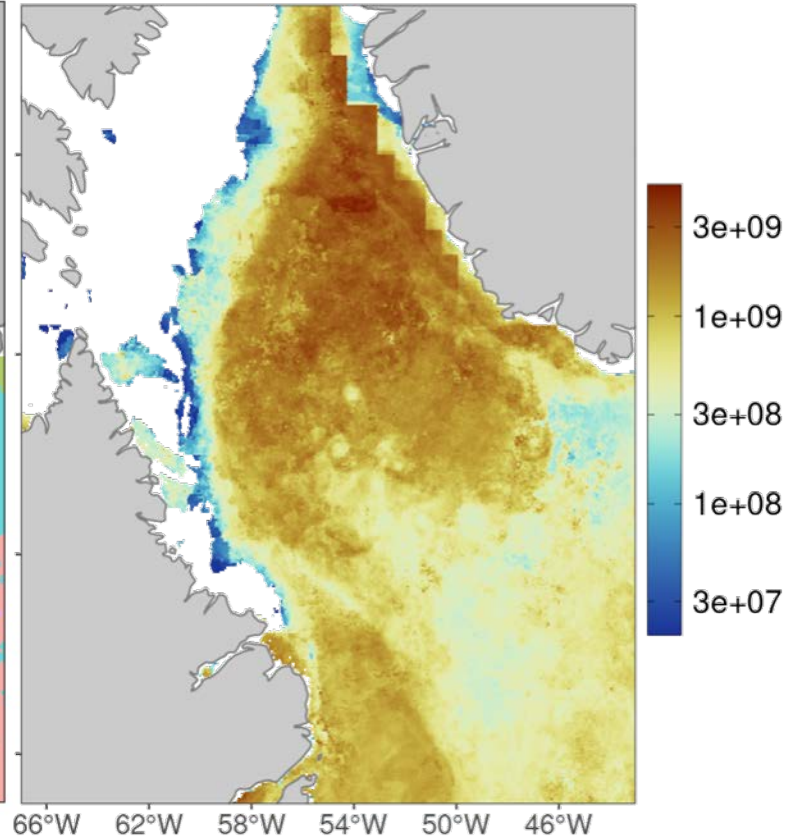


Regime-based PI parameters assignment



May 2022

Total Primary Production (g Carbon)

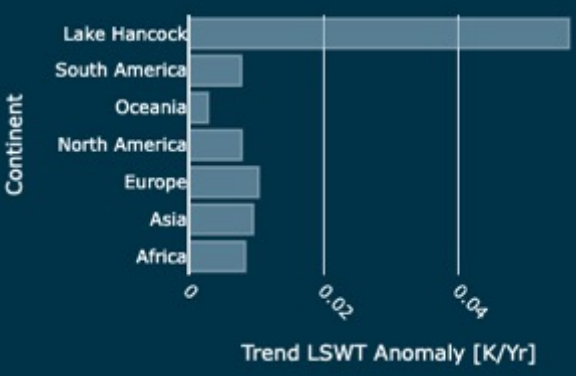


High Phaeocystis Oceanographic regime accounted for ~44% of Carbon production in May 2022

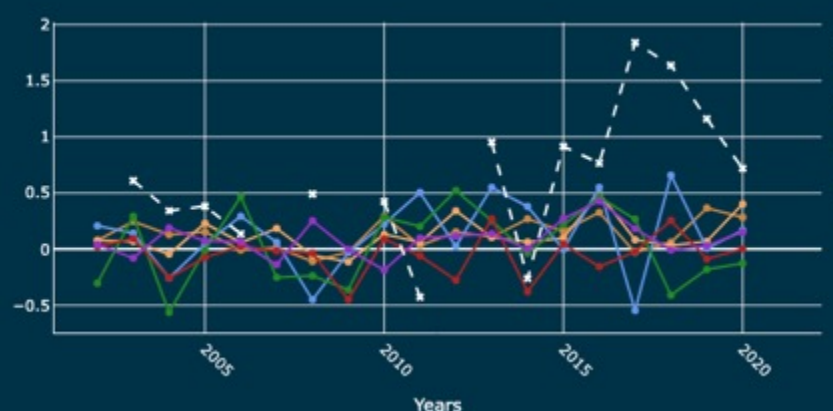
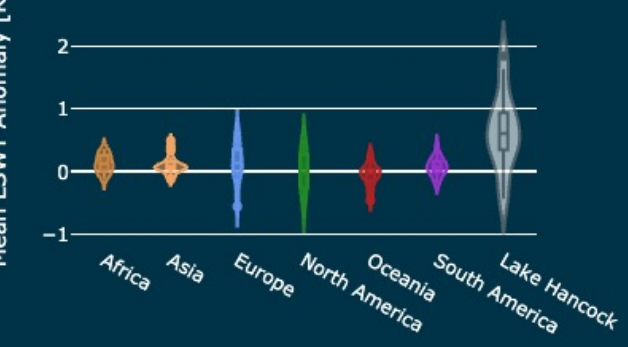
Exploring the satellite-derived lakes variables for climate studies

Claudia Giardino, M. Bresciani, M. Pinardi, D. Stroppiana, R. Caroni, L. Parigi, G. Tellina, A. J. Greife, S. Simis, J.-F. Crétau, L. Carrea, K. Stelzer, H. Yesou, C. Duguay, C. Fatras, D. Jiang, J. Scholze, A. Mangilli, C. Albergel, A. Andral

Indicator Trend



Indicator Distribution

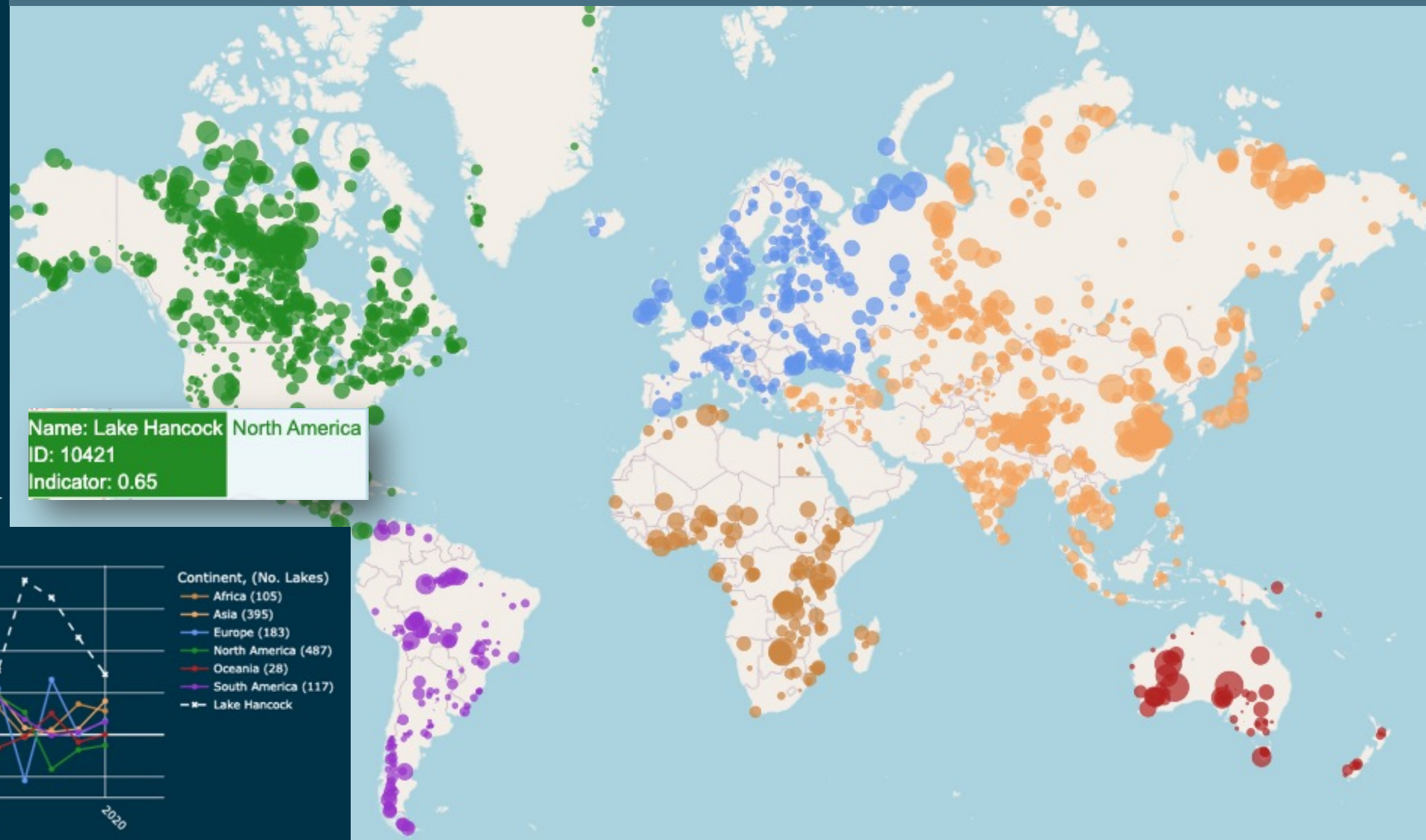


- Continent, (No. Lakes)
- Africa (105)
- Asia (395)
- Europe (183)
- North America (487)
- Oceania (28)
- South America (117)
- Lake Hancock

Indicators

Aggregation method

Country



Name: Lake Hancock
 ID: 10421
 Indicator: 0.65

Assessing submerged aquatic vegetation blue carbon in the Chesapeake Bay from high resolution satellite imagery

Victoria Hill (vhill@odu.edu). Richard Zimmerman
Department of Ocean and Earth Sciences, Old
Dominion University, Norfolk, VA

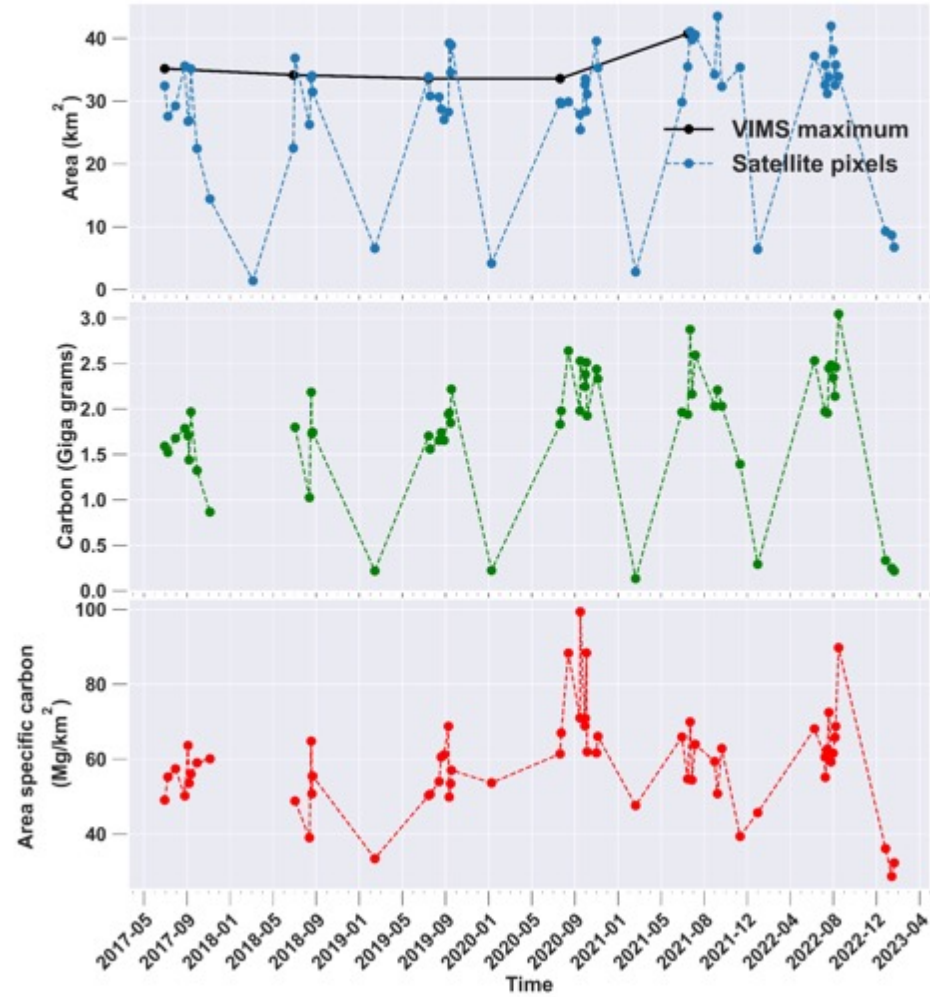


Study sites span marine to freshwater grasses



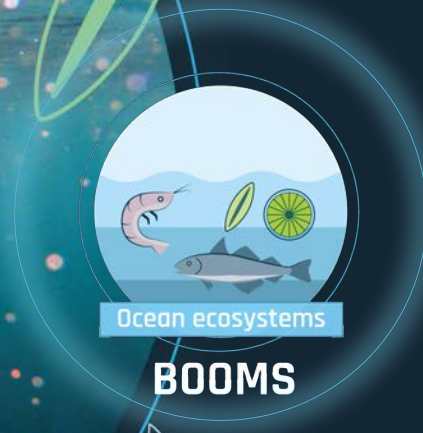
Susquehanna flats

Cloud free imagery

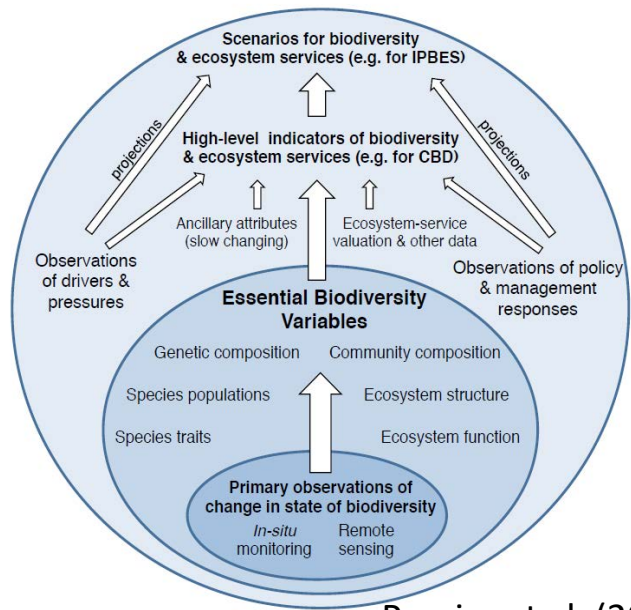


Satellite Earth observation products to inform ocean Essential Biodiversity Variables in the context of climate change

V. Martinez-Vicente, T. Jackson, D. Clewley, D. Raitzos, S. Darmaraki, J. Fernandes, L. Barille, P. Gernez, B. Davies, D. Traganos, S. Sathyendranath

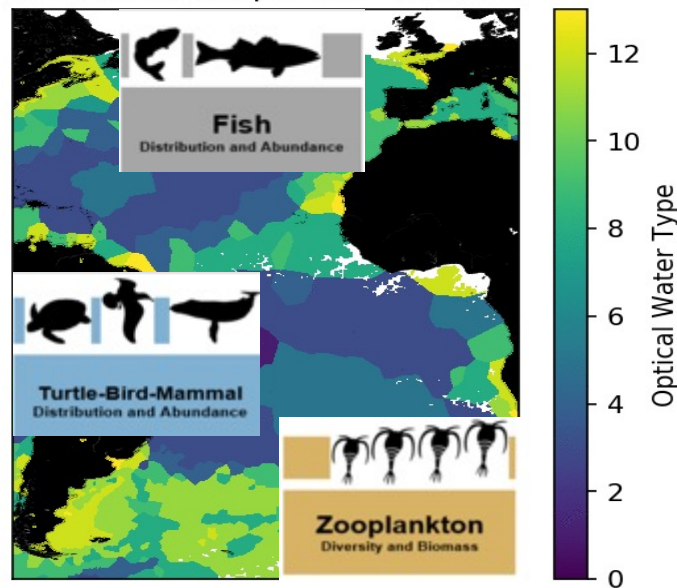


Can remote sensing be used to map biodiversity? POSTER 93 Session 4



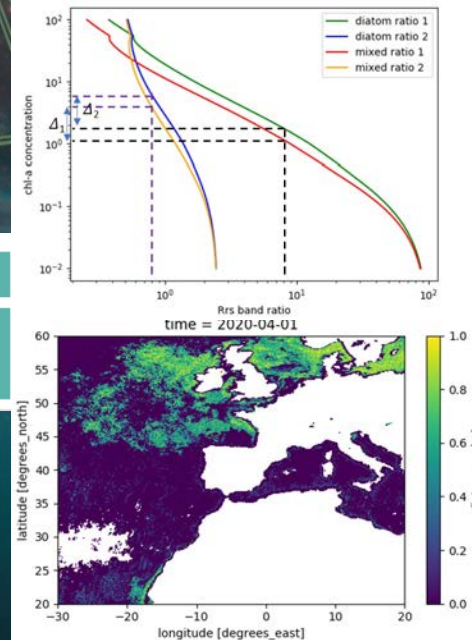
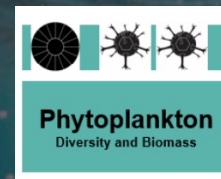
Pereira et al. (2013)

BOOMS Seascapes v1 - 01/1998



Seascapes related to pelagic ecosystem structure

Diatom community mapping



Taxonomic class mapping and their phenology in coastal habitats

How can Space Agencies support further research?

Priority list of marine biodiversity metrics to observe from space
Thursday, 16 November 2023, 2:30 – 5:00 pm



Testing a hyperspectral, bio-optical approach to identify phytoplankton groups in the Chesapeake Bay

Morgaine McKibben^{1,2}, Stephanie Schollaert-Uz¹,
Sherry L. Palacios³

¹NASA Goddard Space Flight Center, Greenbelt, Maryland

²Earth System Science Interdisciplinary Center/University of Maryland

³Department of Marine Science, California State University Monterey Bay

Poster #94

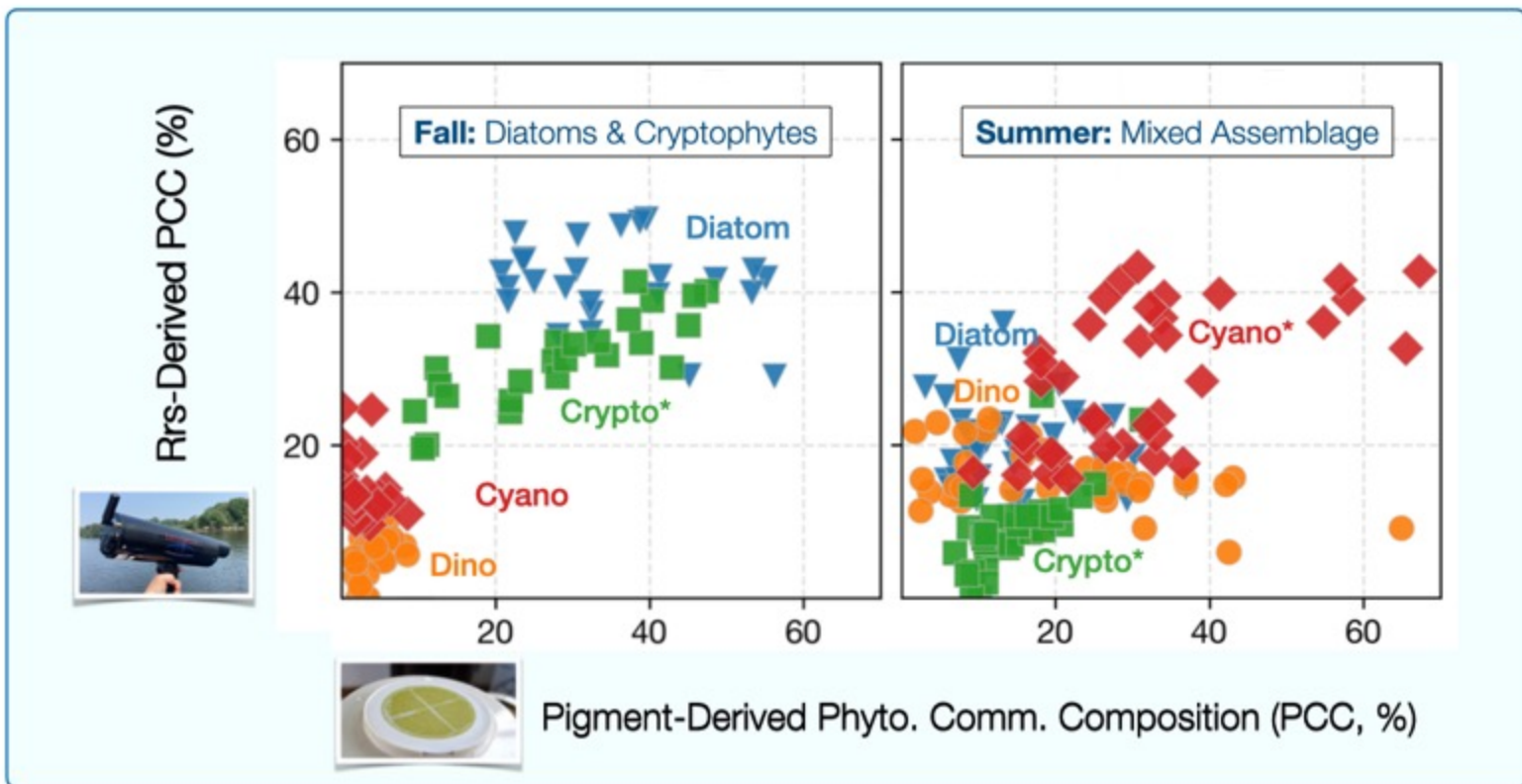
International Ocean Colour Science Meeting

St. Petersburg, FL

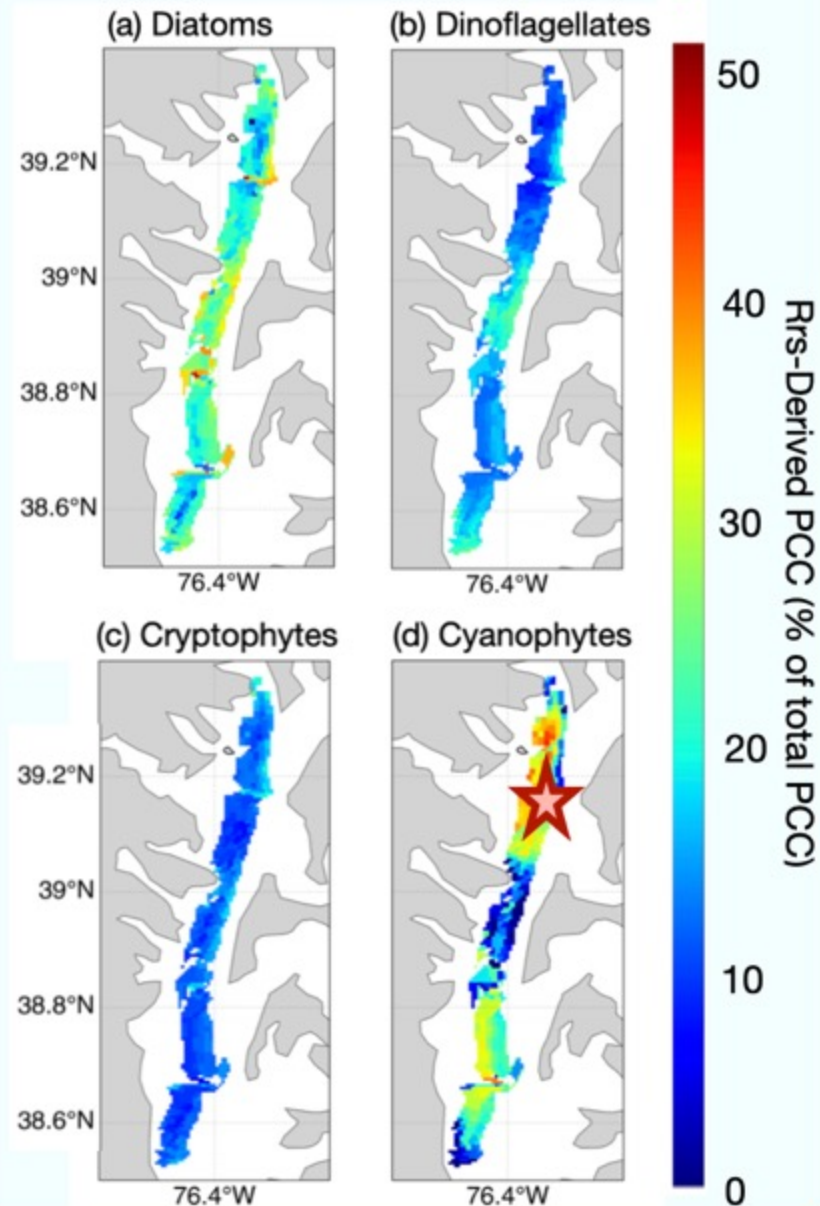
November 16, 2023

The Phytoplankton Detection with Optics (PHYDOTax) approach was regionally parameterized & identified cyanophytes and/or cryptophytes using *shipboard remote sensing reflectance (Rrs)* in the turbid Chesapeake Bay. Performance using synthetic mixtures was overall robust. Low sensitivity to runs at 3 hyperspectral resolutions: 1, 5 & 10nm.

Poster #94



Airborne PCC, N. Chesapeake Bay



Bigelow | Laboratory for
Ocean Sciences



Evaluation of ocean color remote sensing as a tool to investigate ocean biogeochemistry response to aerosol deposition events

What can satellites tell us about the impact of volcanoes & wildfires on the ocean ecosystem?

Catherine Mitchell, Karen Stamieszkin, Ben S. Twining

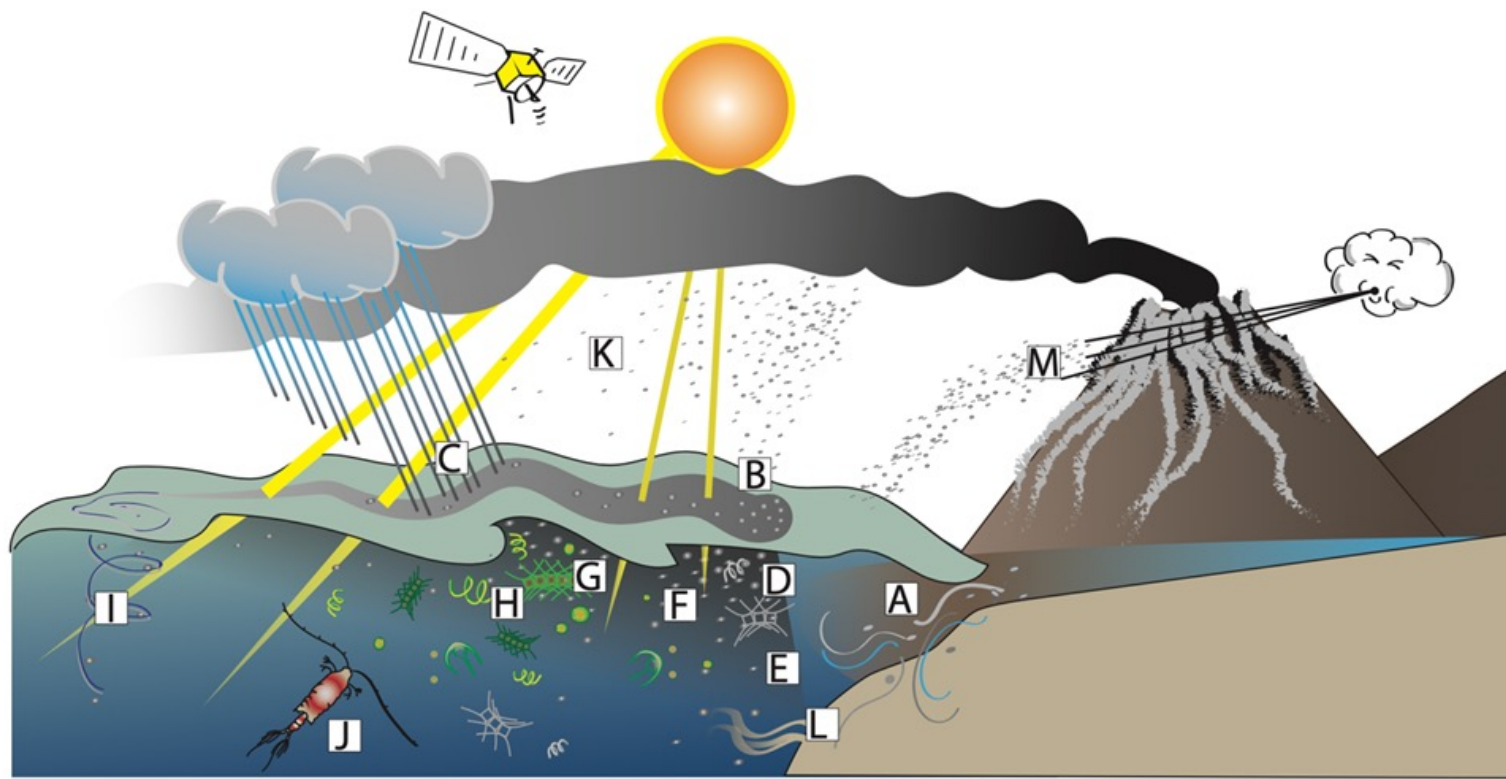
Kelsey M. Bisson, Oregon State University & OBB Program, NASA HQ

Bess G. Koffman, Colby College

Sasha J. Kramer, Monterey Bay Aquarium Research Institute

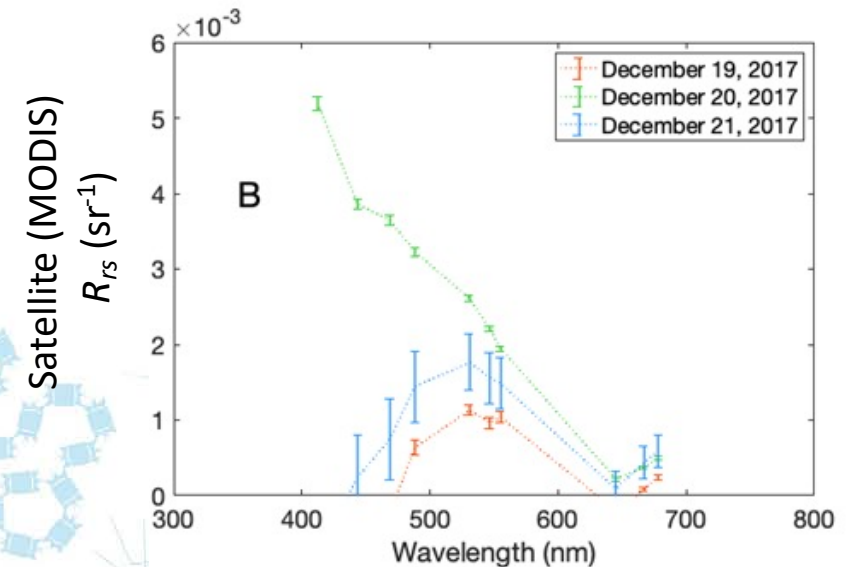
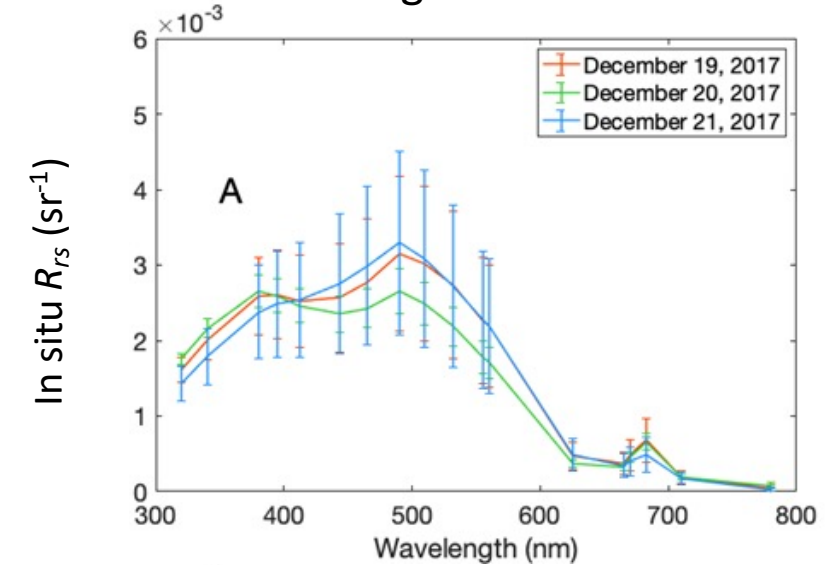


What can satellites tell us about the impact of volcanoes & wildfires on the ocean ecosystem?



Bisson et al (2023), RSE

Remote sensing reflectance during a wildfire



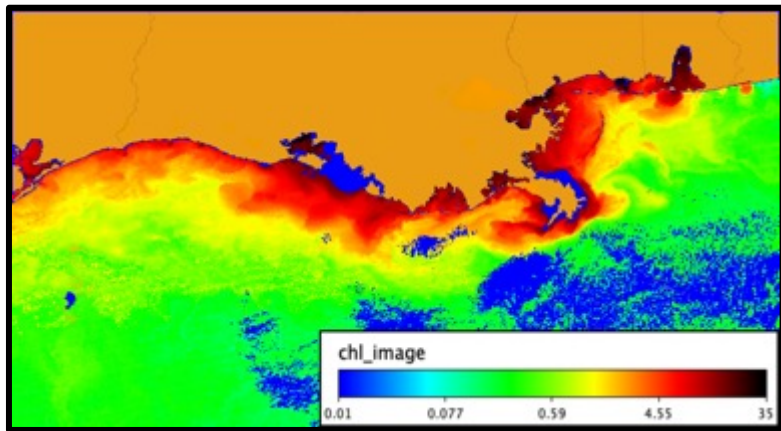
Kramer et al (2023), Front. Mar. Sci.

#97

MODIS-Aqua chlorophyll and phytoplankton size class distribution in the northern Gulf of Mexico

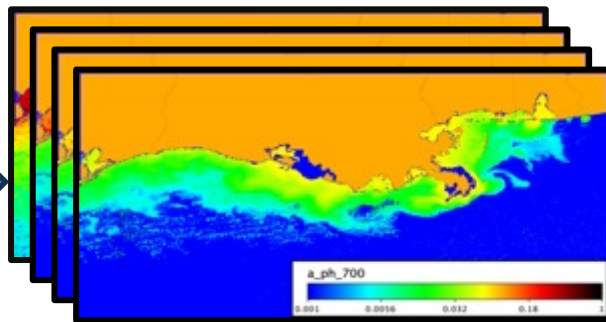
Arnab Paul, Louisiana State University,
Bingqing Liu, University of Louisiana,
Eurico D'Sa, Louisiana State University



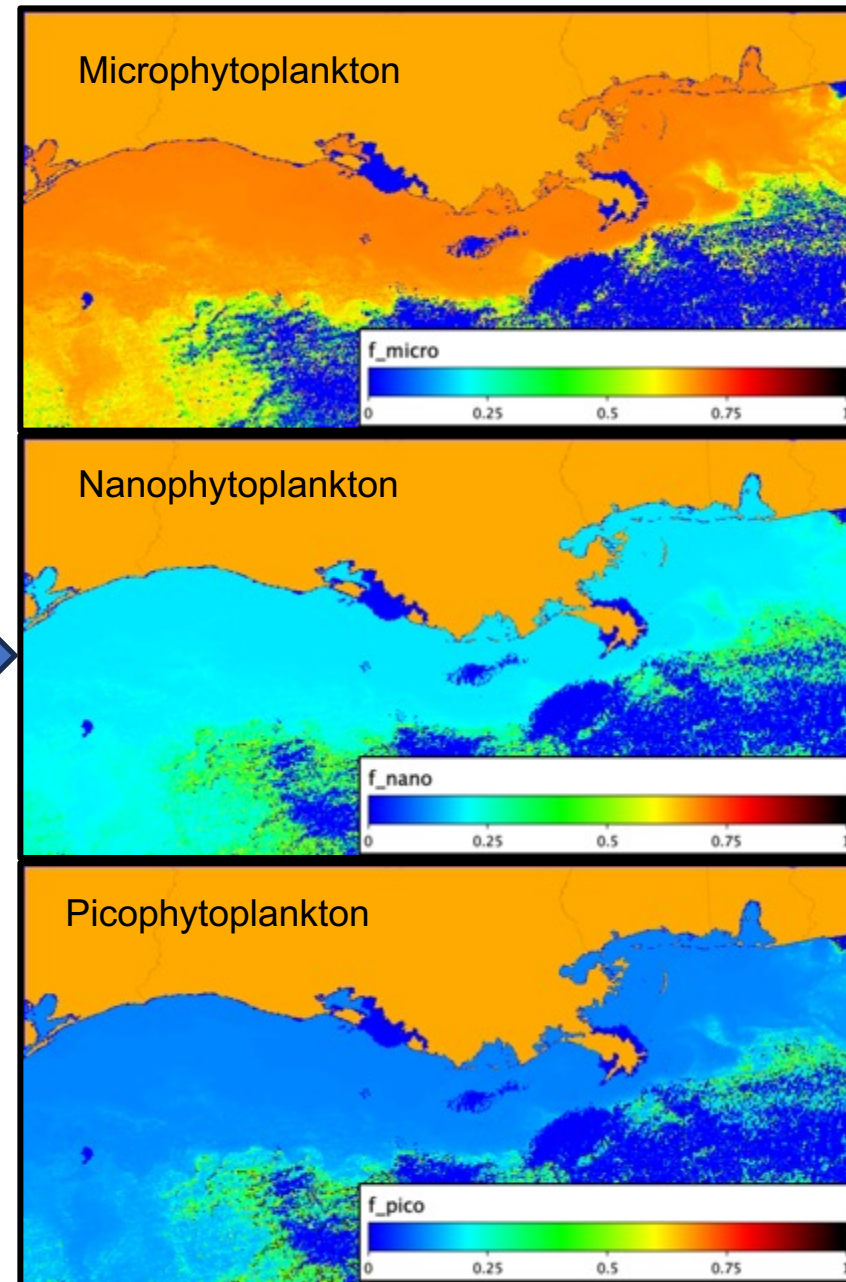


Chlorophyll map based on empirical band ratio of atmospherically-corrected Rrs (MODIS)

301 phytoplankton absorption maps based on 3rd order polynomial regression model



Three dominant phytoplankton size structure based on inversion model



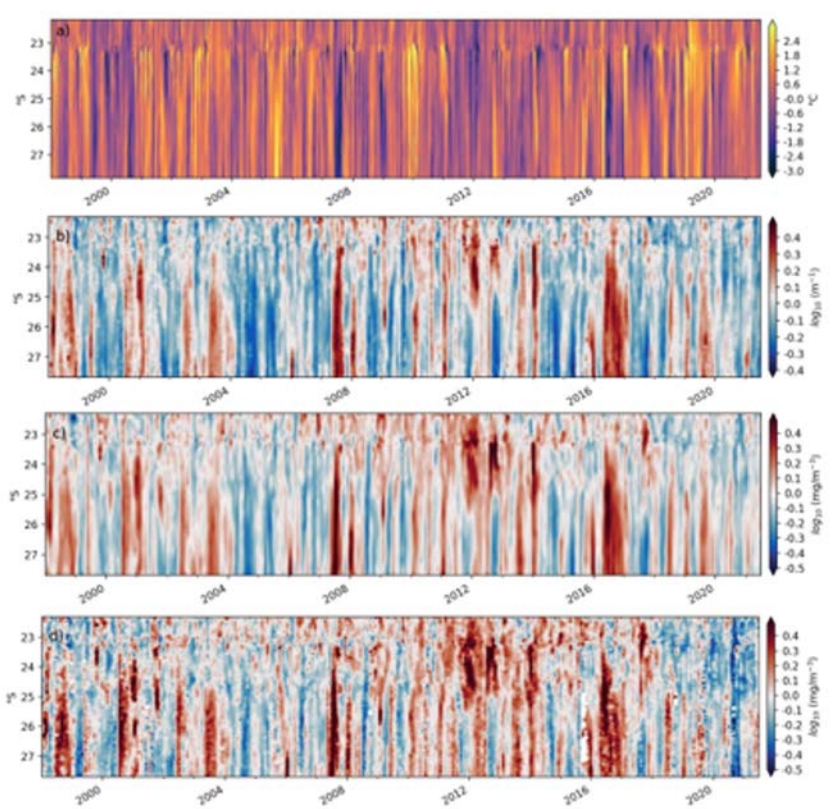
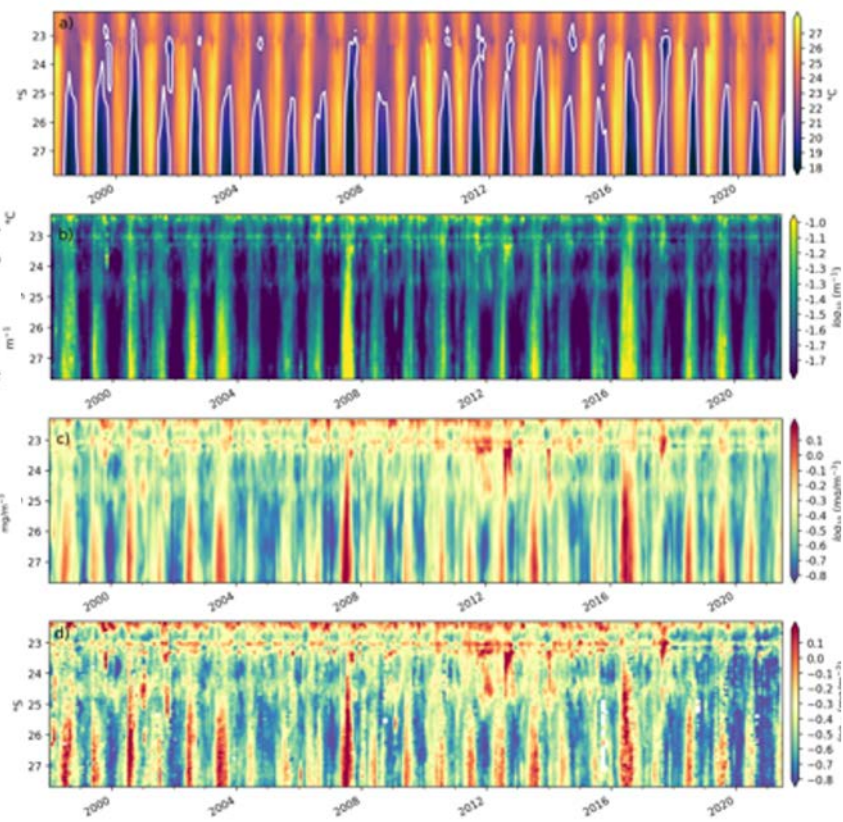
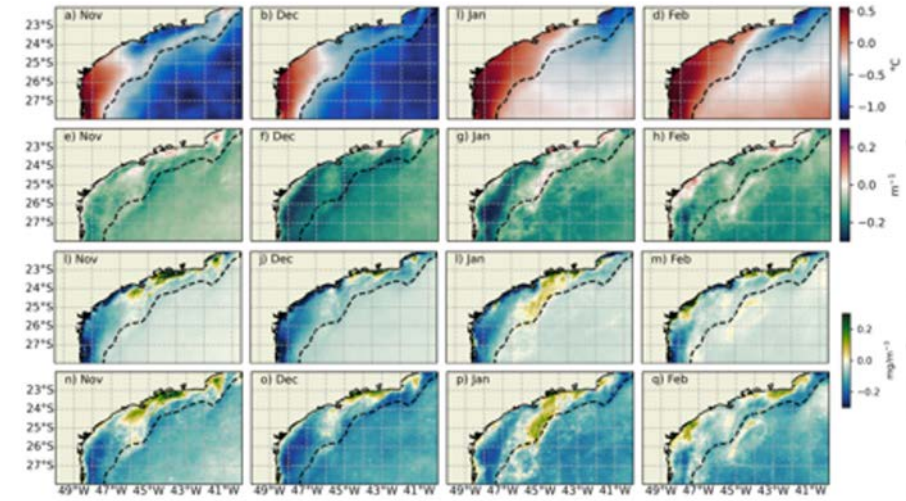
Seasonality and correlations of Colored Detrital Matter to Chlorophyll-a and Sea Surface Temperature on the Southeast Brazilian Continental Shelf

Bruno Gonçalves Pereira¹, Paulo Simmionato Polito and Áurea Maria Ciotti²

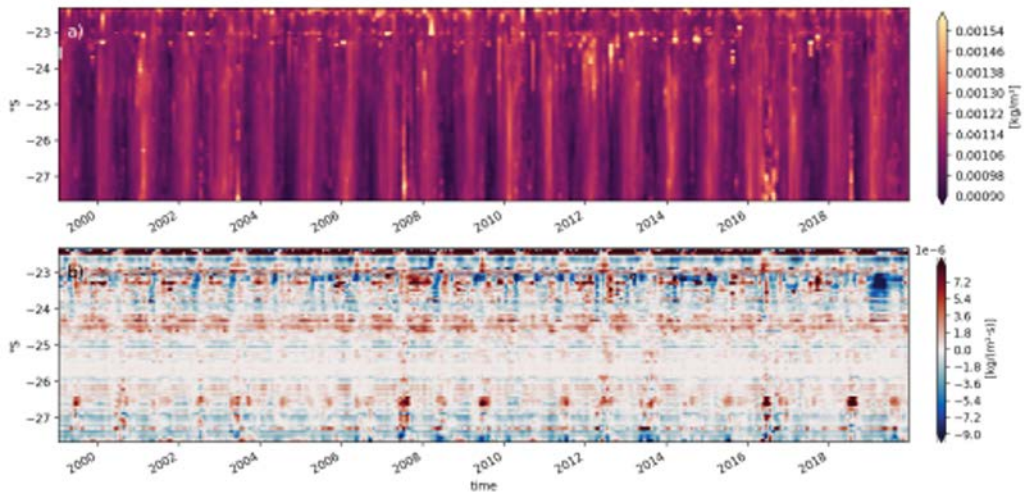
¹Oceanographic Institute, University of Sao Paulo, IOUSP, Brazil

²Center for Marine Biology, University of Sao Paulo, - CEBIMar, Brazil

Maps and time-series



DOC transport



Correlations

