International Ocean Colour Science Meeting 2025

Advancing Global Ocean Colour Observations

Poster Lightning Session 1B

Poster No. 32

Main pathways transport patterns of plankton communities in the Black Sea

Mainara Biazati Gouveia[1] , Elisaveta Peneva[1] , Emil Stanev[1,2]

[1] Meteorology and Geophysics Department, Faculty of Physics, Sofia University "St. Kliment Ohridski", Sofia, Bulgaria.
[2] Institute of Coastal Systems - Analysis and Modeling, Helmholtz-Zentrum Hereon, 21502, Geesthacht, Germany.

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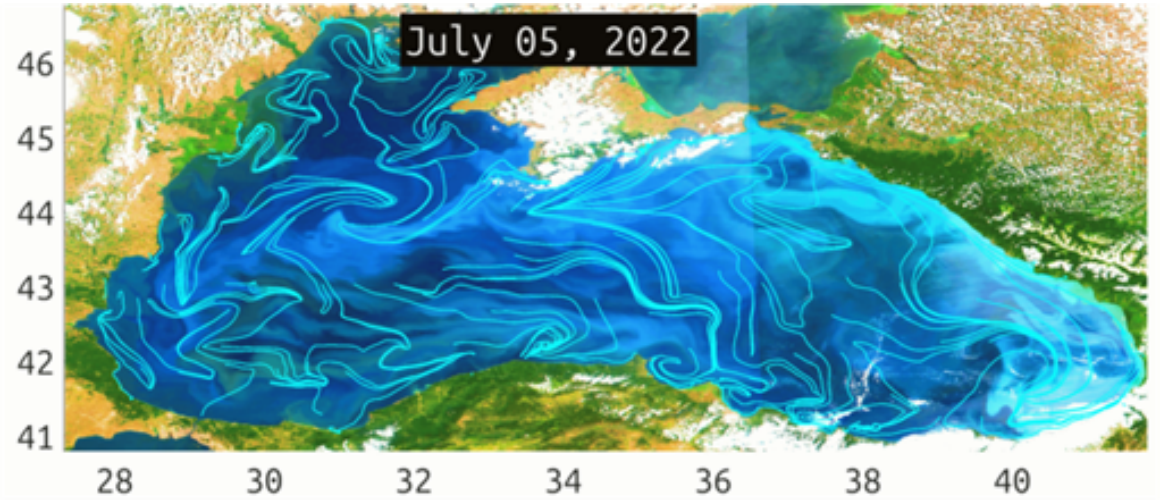
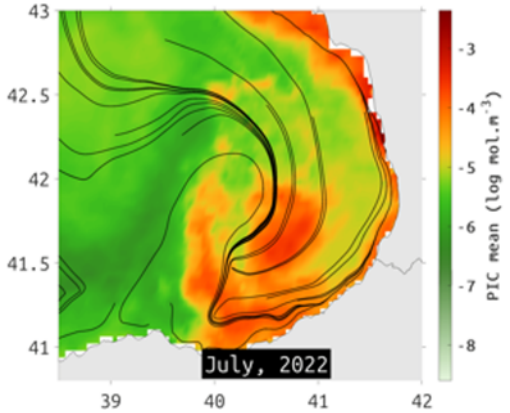
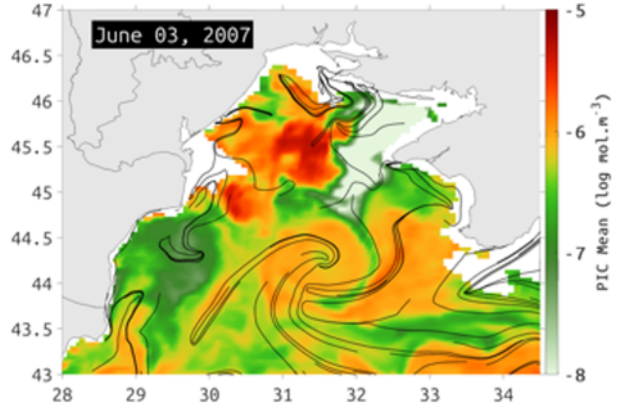
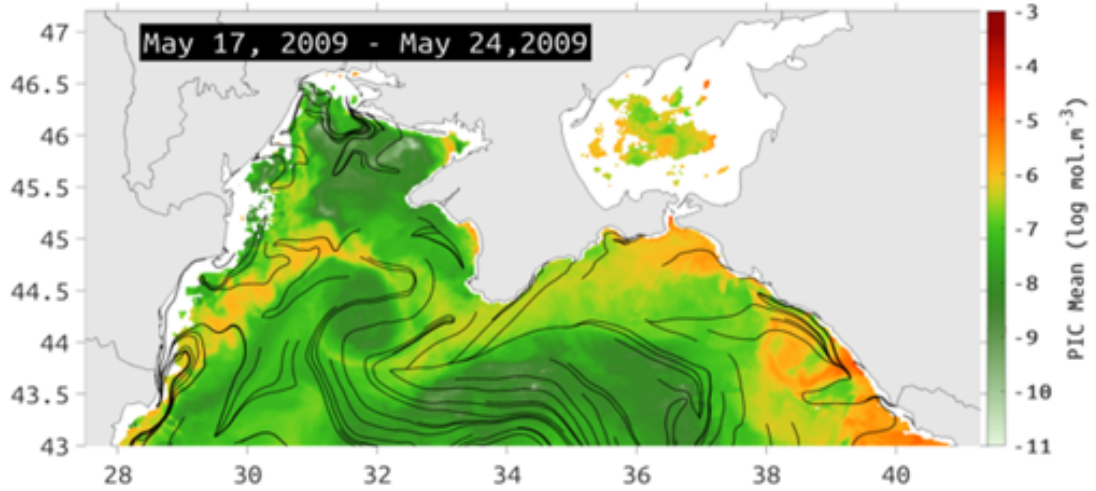
Identify the main pathways of plankton transport in the Black Sea, as extracted from climatological Lagrangian Coherent Structures (cLCS).

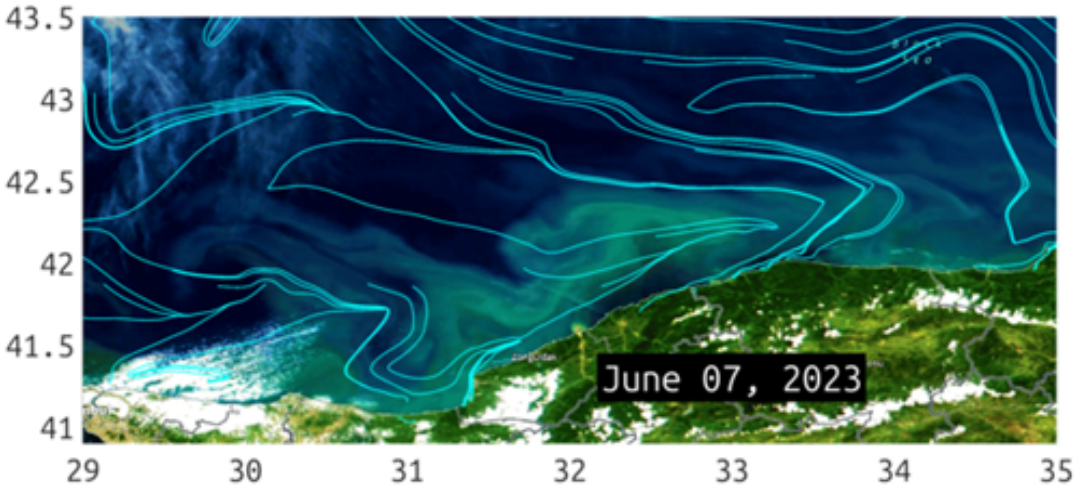






Observations show that four transport barriers and eddy structures attract nearby plankton communities and guide them along their path.





Poster # 34

Enhanced Coral Reefs Classification from Remote Sensing with Spatial Information

Siyuan Hou

MEL, COES, Xiamen University

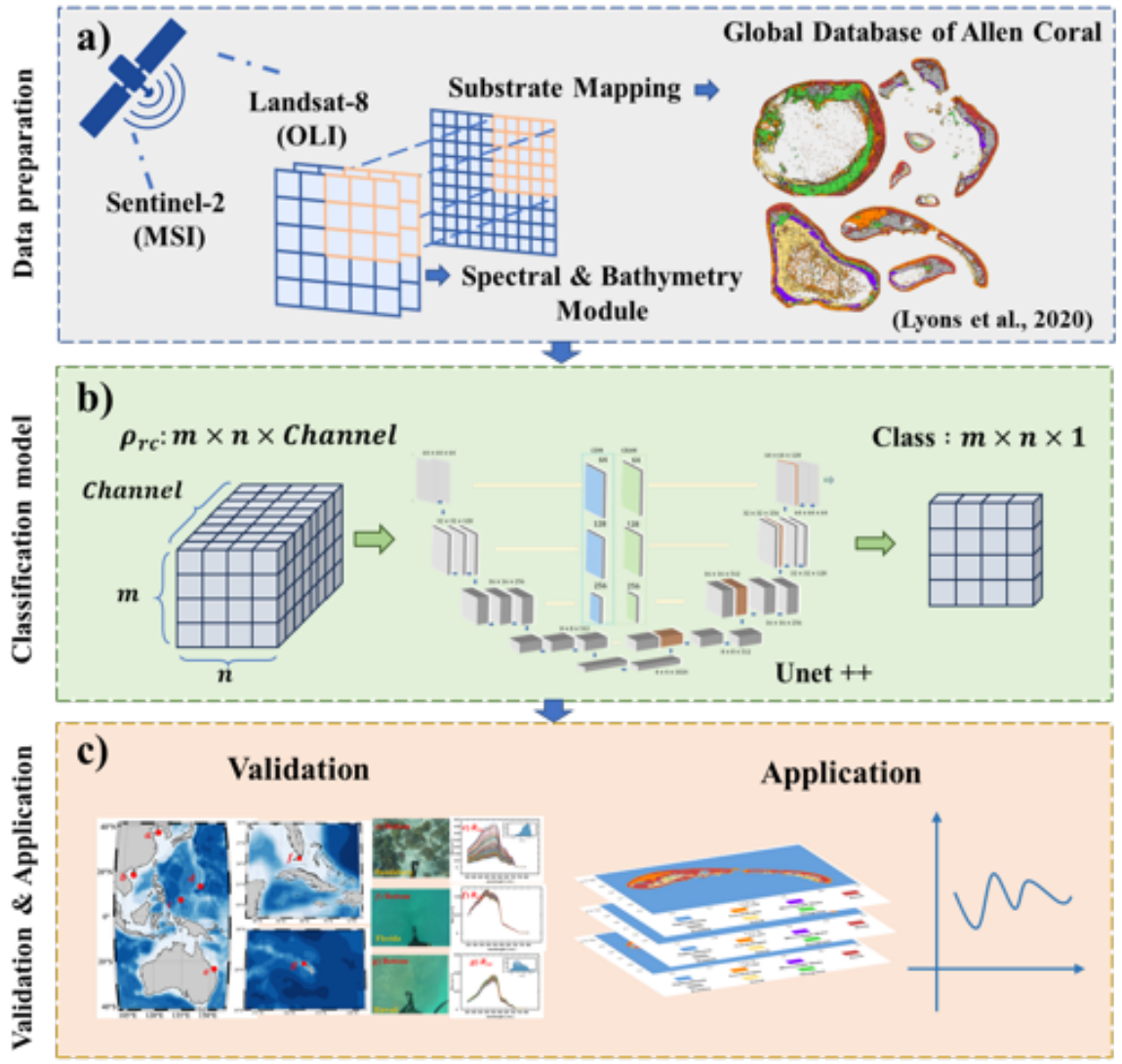
In collaboration with
Xiaolong Yu, Zhongping Lee, Shaoling Shang

IOCS-2025 Darmstadt, 1-4 December

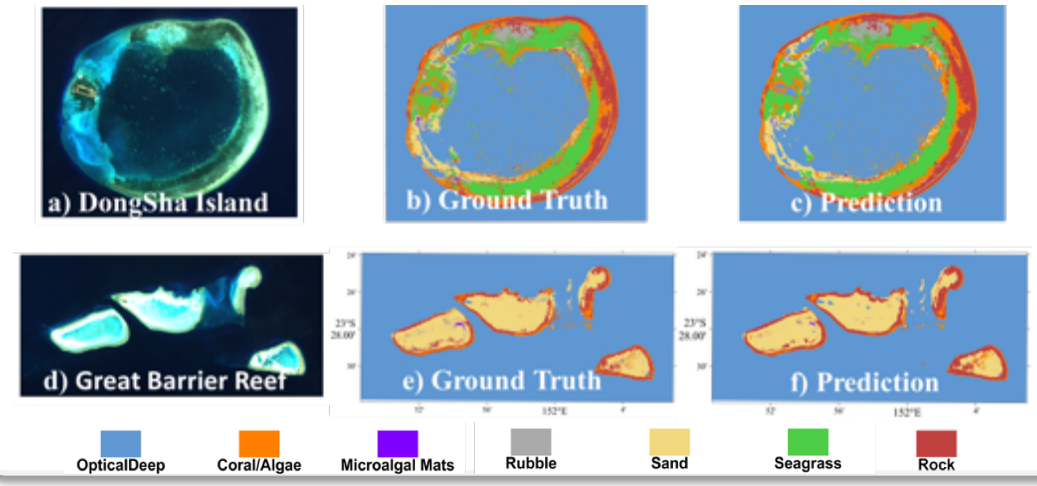
Poster # 34

Enhanced Coral Reefs Classification from Remote Sensing with Spatial Information

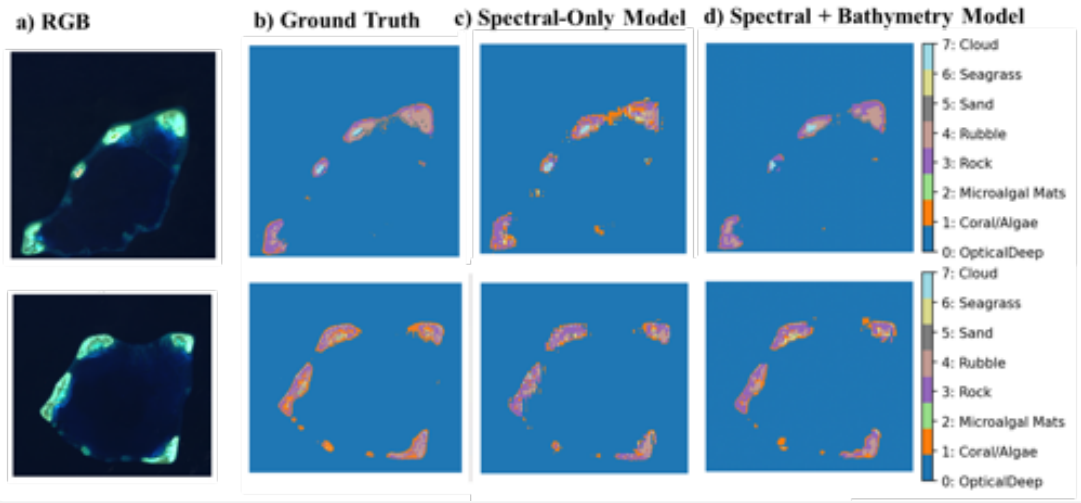
■ ***Substrate Mapping*** *via Spectral–Spatial Fusion with Bathymetry Constraints, validated with the Allen Coral Atlas (ACA)*



■ ***High Consistency*** *Between Ground Truth and Predictions Across Reef Regions*



■ ***Enhanced Generalization and Stability*** *in Substrate Predictions with Bathymetry Constraints*



Poster # 37

Perturbing effects on above-water radiometry: the AAOT case study

Tamito Kajiyama[1], Davide D'Alimonte[1], Barbara Bulgarelli[2], Giuseppe Zibordi[3,4]

1) AEQUORA, PT; 2) EC-JRC, IT; 3) NASA Goddard Space Flight Center, USA; 4) Southeastern Universities Research Association, Washington DC, USA

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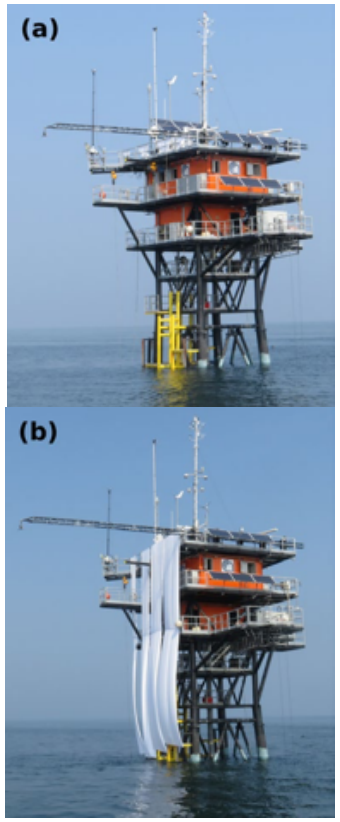
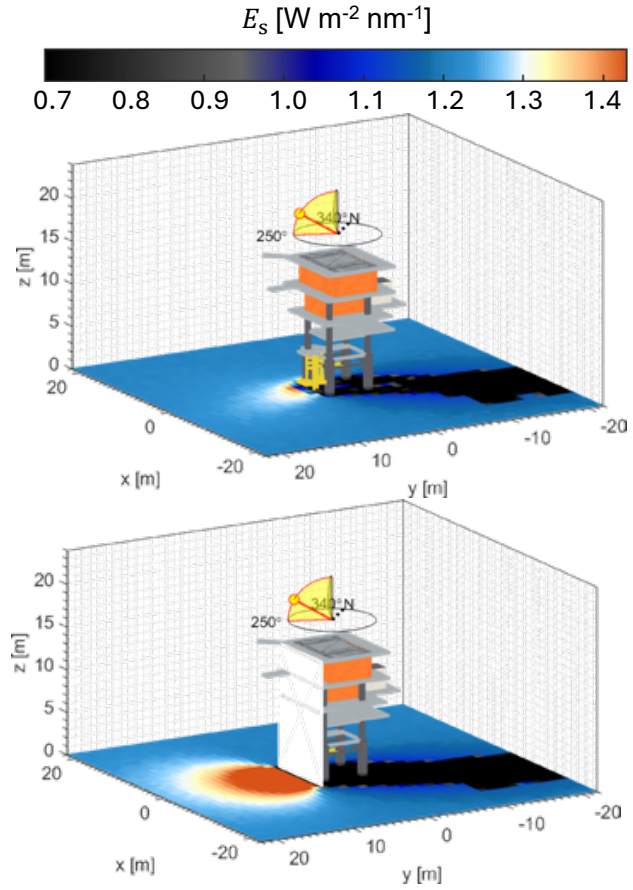
Poster # 37

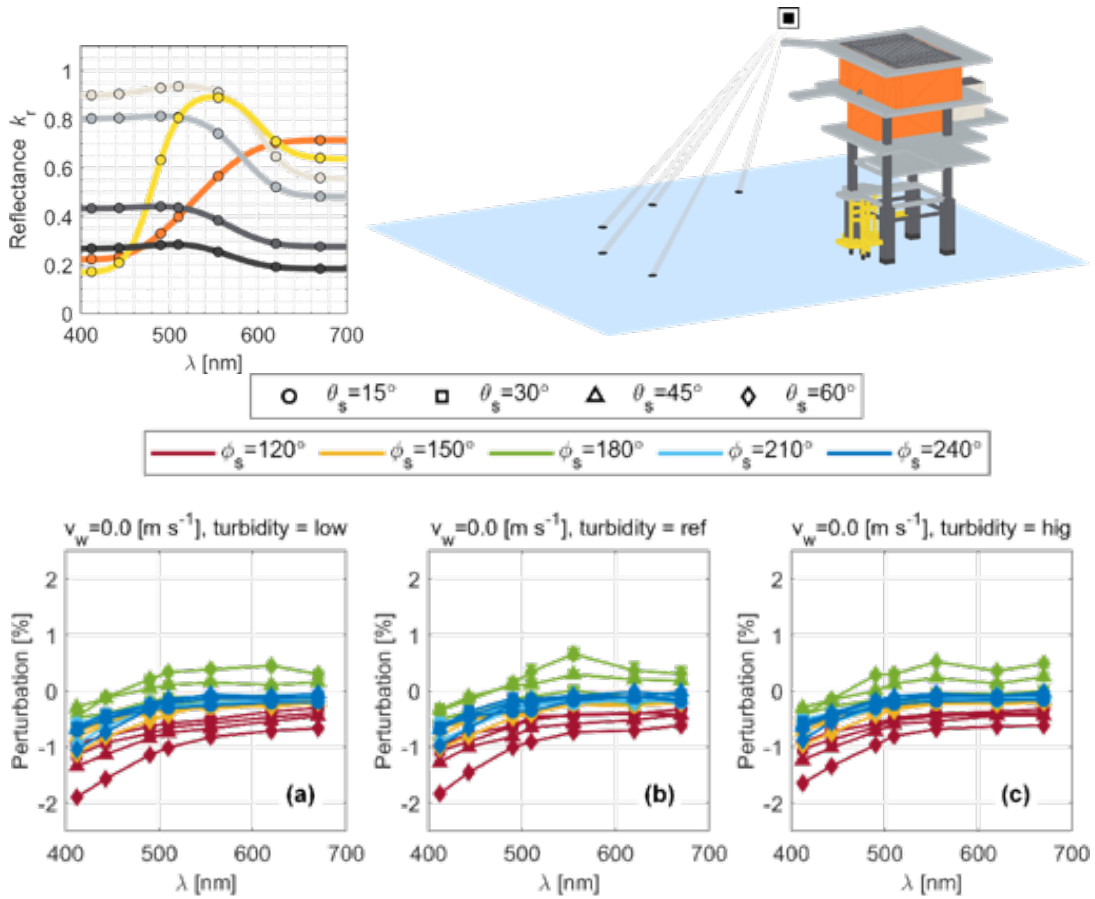
Case study: analysis of structure perturbations (SP) at the Acqua Alta Oceanographic (AAOT) Tower

A) Comparison with experimental results





B) Simulations of SP on AERONET-OC measurements



1. Substantial agreement between simulations and experimental results.
2. Minimal SPs on AERONET-OC measurements at the AAOT when applying basic QC.
3. Importance of SP analyses to support above-water radiometry (oceanographic towers and vessels).

Poster # 38

A major cyanobacteria bloom in the Baltic Sea region in summer 2025 observed using multiple methods

Bengt Karlson, Lars Arneborg, , Mikael Hedblom, , Inga Koszalka and Anders Torstensson

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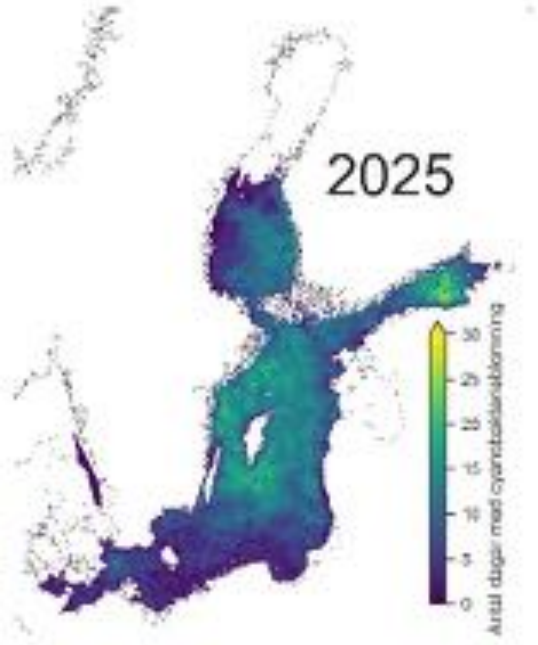
Poster # 38

Baltic Sea

- Baltic Algae Watch System
- Major cyanobacteria bloom in the Baltic Proper Summer 2025
- Bloom observed also in the Gulf of Botnia
- Cyanotoxins in mussels and oysters in the Skagerrak, Swedish west coast

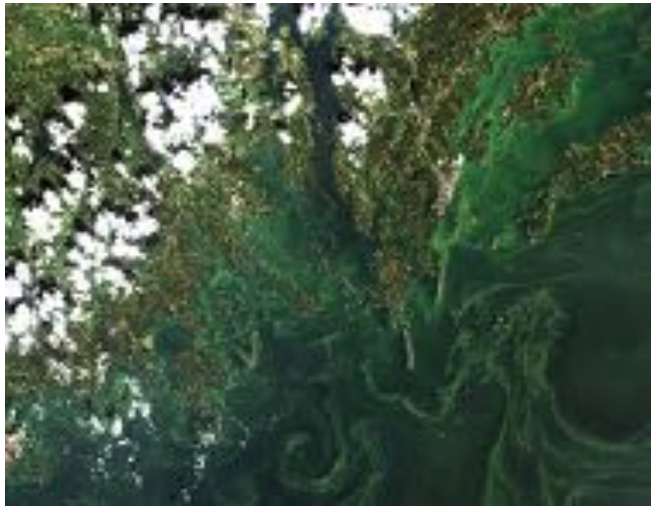
- Ocean colour
  - Sentinel 2 + 3
  - PACE-OCI

- *In situ* sea truth data from automated microscopy Imaging FlowCytoBot



Number of days with cyanobacteria surface accumulations

Imaging FlowCytobot on R/V Svea



Stockholm archipelago 20 July 2025 Sentinel 2 RGB

Eastern Gotland 20 July 2025 Sentinel 2 RGB

Dolichospermum sp., *Nodularia spumigena, Aphanizomenon flosaquae*

SMHI

Stockholms universitet

Poster NO 41

Phytoplankton Phenology and Physical Forcing in the Pemba Channel: Disentangling Their Roles in Small Pelagic Fish Dynamics

Hellen J. Kizenga[1,3(*)], Emmanuel Devred[2], Margaret Kyewalyanga[3]

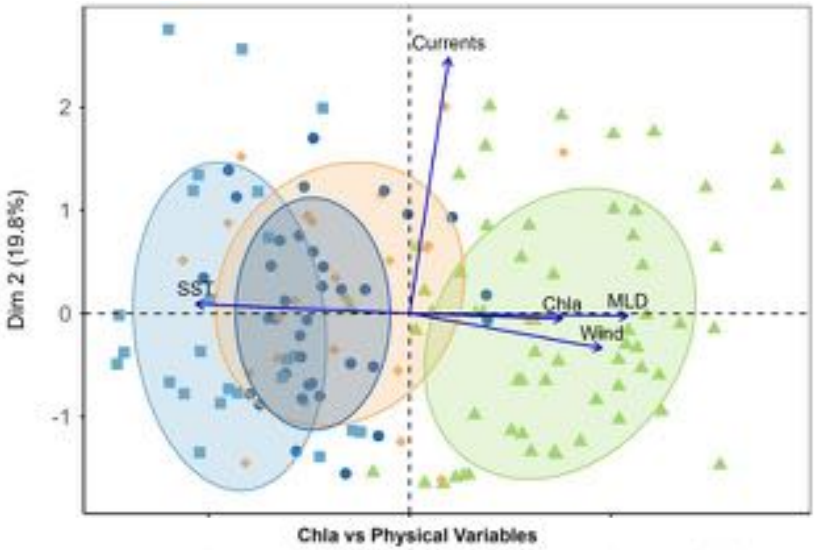
[1] *University of Bologna, Italy.*
[2] *Bedford Institute of Oceanography, Dartmouth, Nova Scotia, Canada.*
[3] *Institute of Marine Sciences, Zanzibar, Tanzania.*

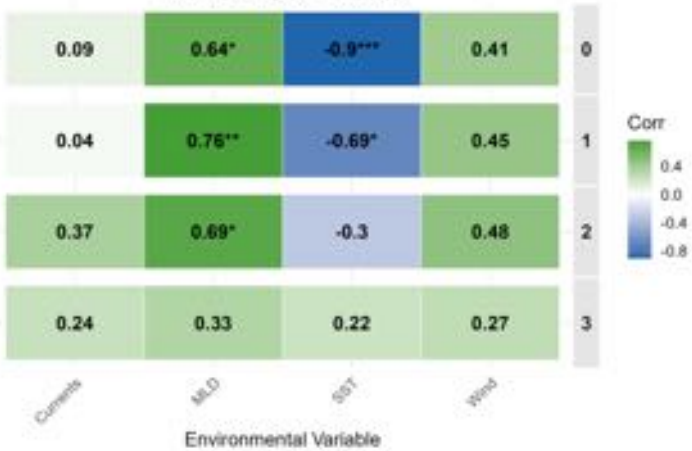
IOCS-2025 Darmstadt, 1-4 December

Email: *hellenjoseph.kizeng2@unibo.it*

Poster NO 41

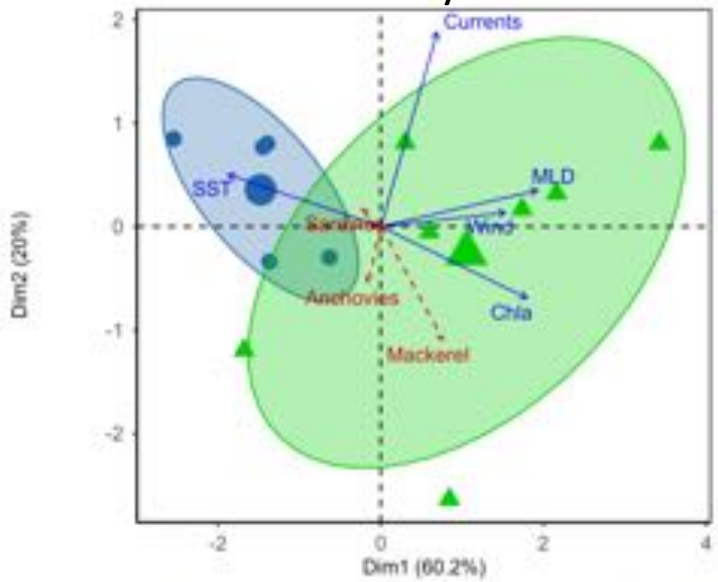
Seasonal physical drivers shape phytoplankton productivity

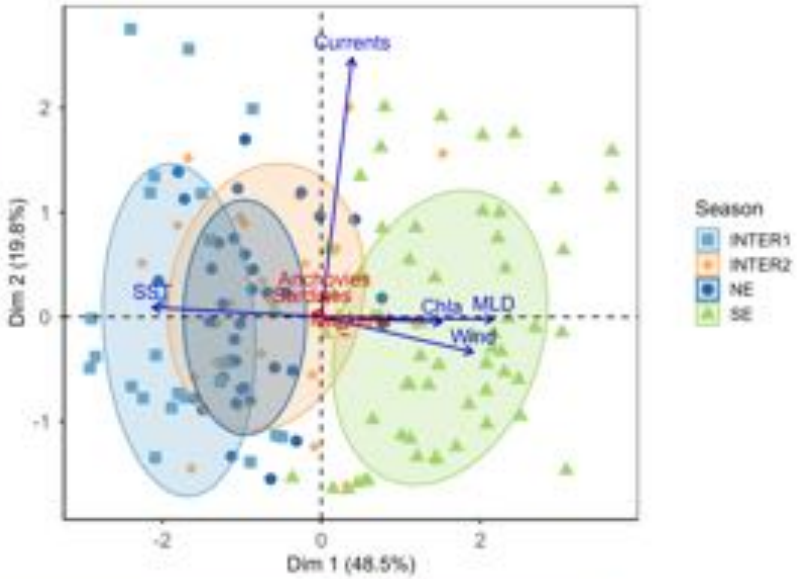


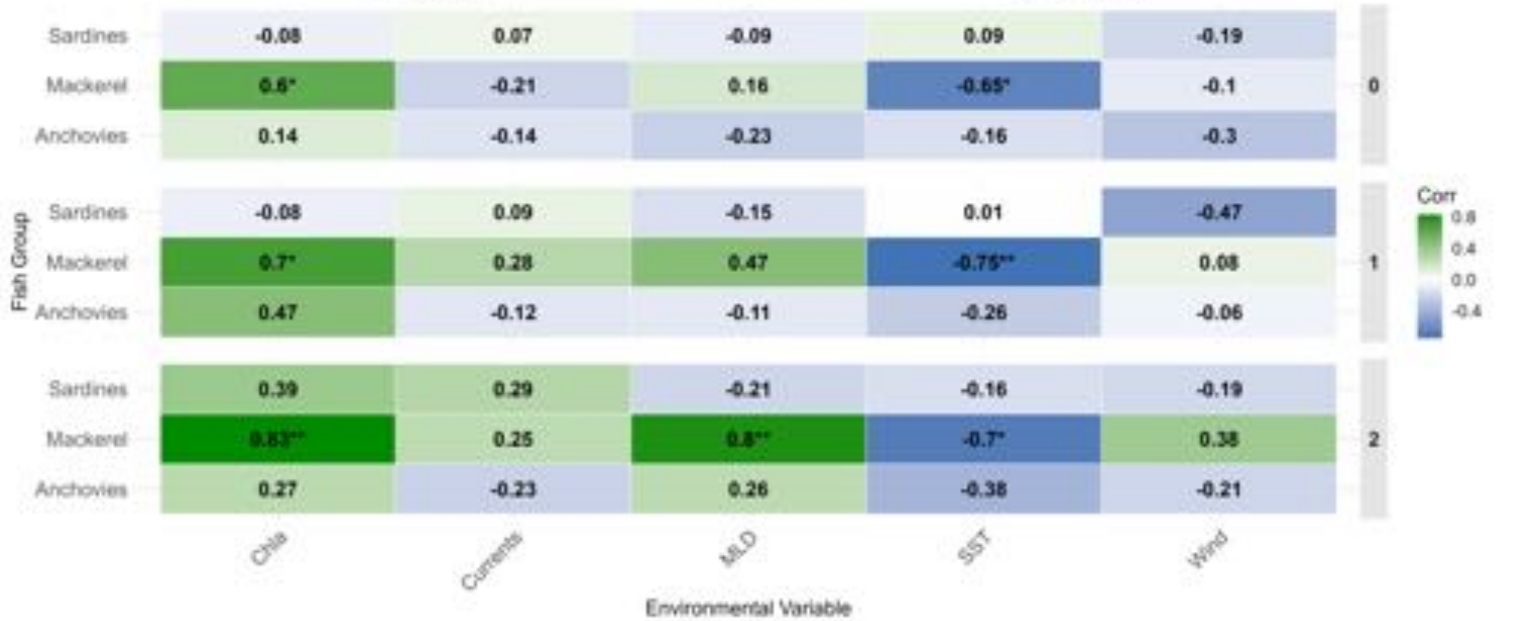


Chla

Fish dynamics largely driven by cumulative lagged bio-physical ocean variability







Poster # 42

Unveiling the Relationship between Phytoplankton and Particulate Organic Carbon in the Global Ocean via Satellite Data

Rimi Kobeysi, Hubert Loisel, Daniel Jorge, Christophe Guinet, Roy El Hourany and Lucile Dufforet-Guarier

Laboratoire d'océanologie et de géosciences (LOG)

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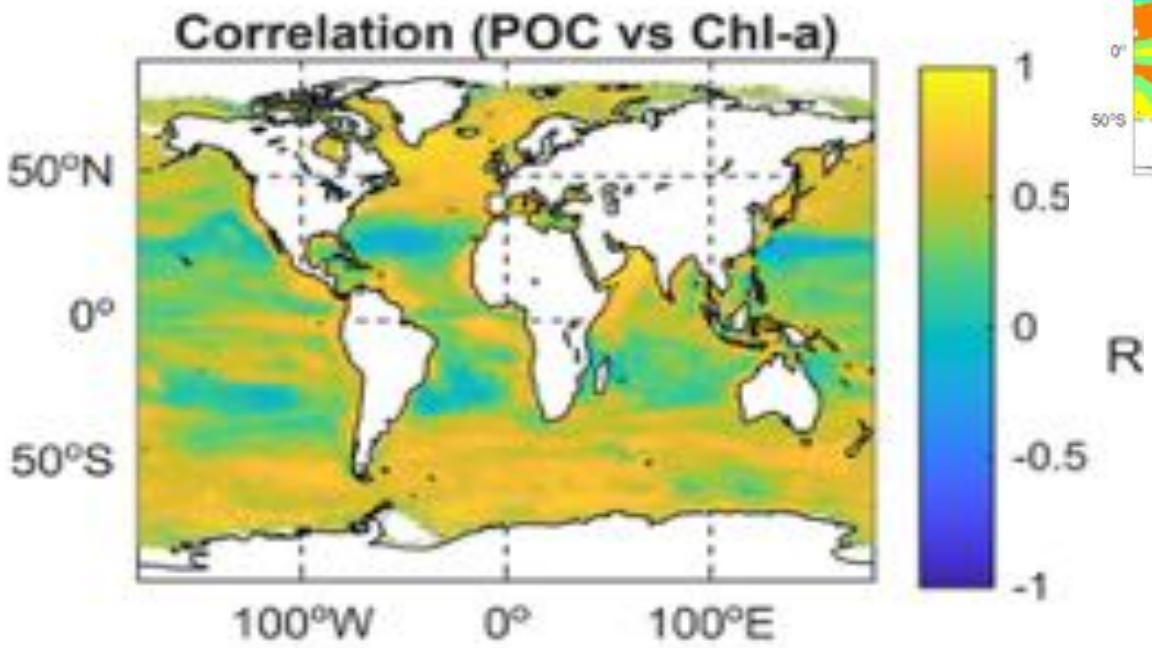
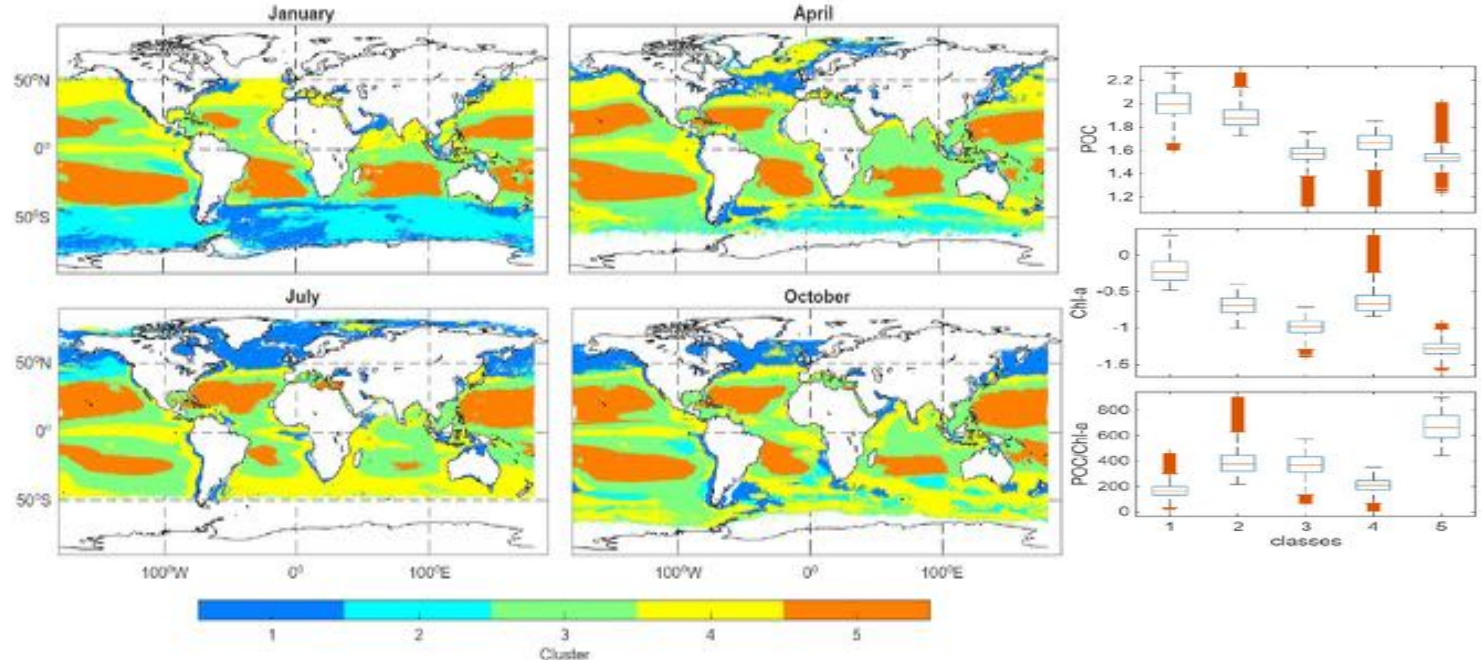
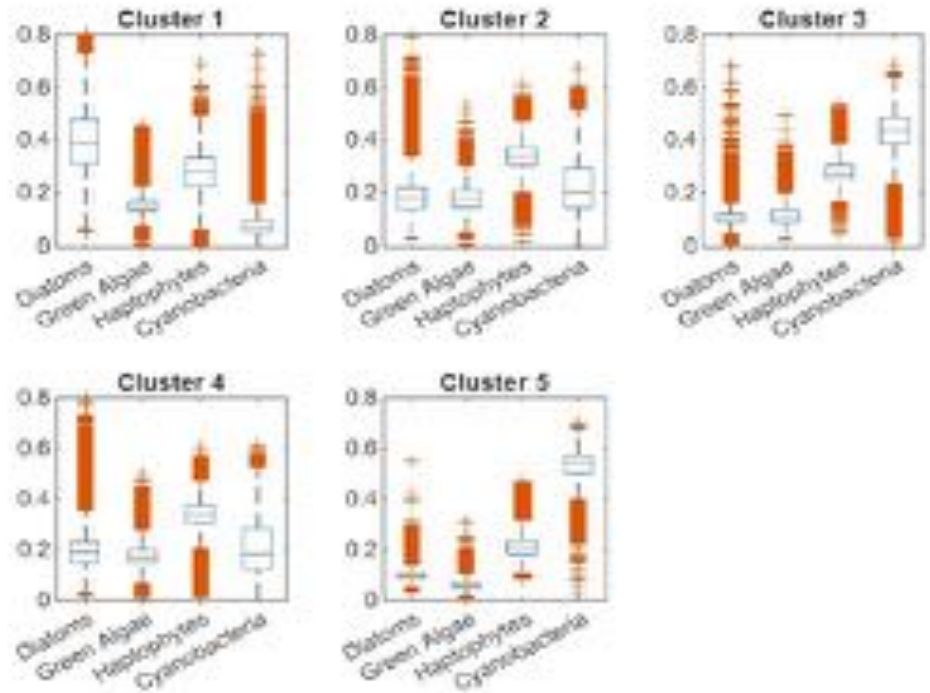
Poster # 42

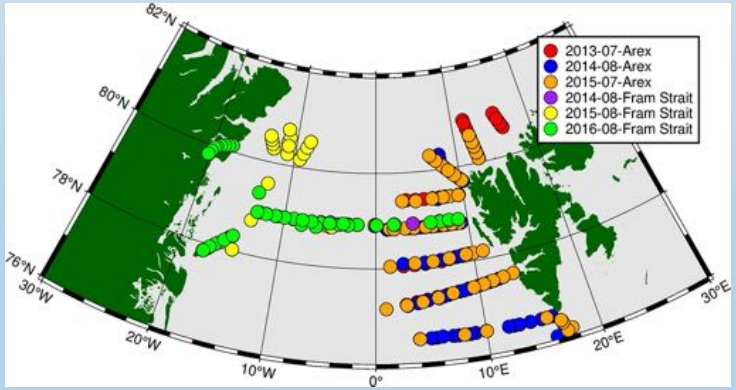

Correlation (POC vs Chl-a)
50°N
0°
50°S
100°W
0°
100°E
1
0.5
0
-0.5
-1
R


January
April
July
October
50°N
0°
50°S
100°W
0°
100°E
Cluster
POC
Chl-a
POC/Chl-a
clases

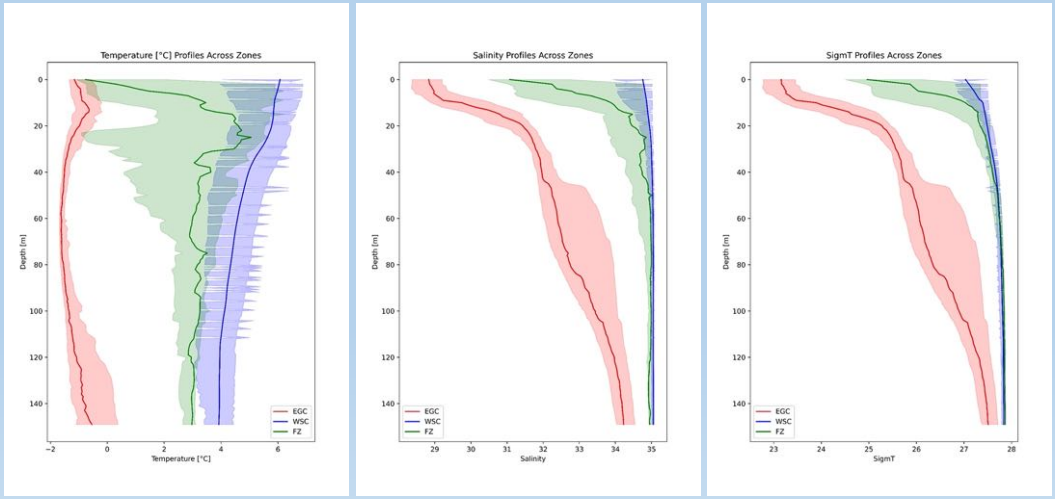

Cluster 1
Cluster 2
Cluster 3
Cluster 4
Cluster 5
Diatoms
Green Algae
Haptophytes
Cyanobacteria

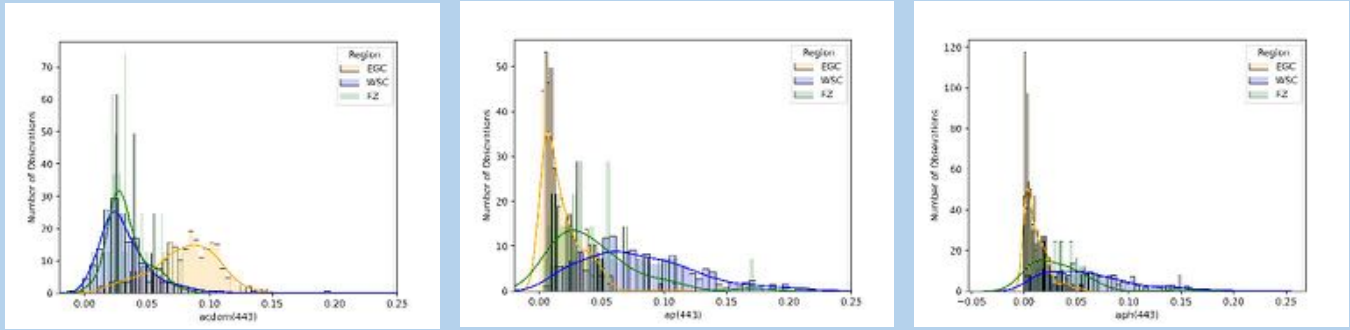
In-situ multispectral inherent and apparent optical properties data set for bio-optical modelling and ocean color remote sensing products validation in European Arctic

Piotr Kowalczuk, Midhun Shah Hussain, Mirosław Darecki, Marta Konik, Monika Zabłocka, Justyna Meler, Dominik Lis, Sławomir Sagan, Mats A. Granskog, Colin A. Stedmon



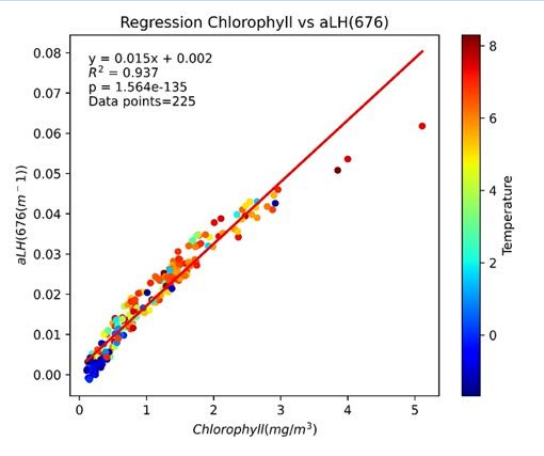
- Optical properties of saline and warm Atlantic Water carried by West Spitsbergen Current (WSC) are controlled by optical properties of phytoplankton and its dynamics.
- Optical properties of fresher and cold Polar Water carried by East Greenland Current (EGC) are controlled by CDOM.

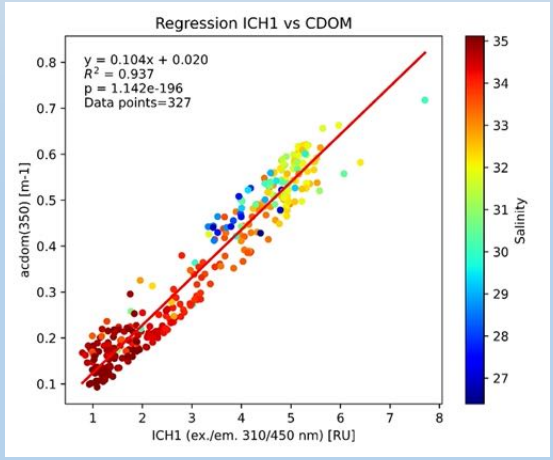


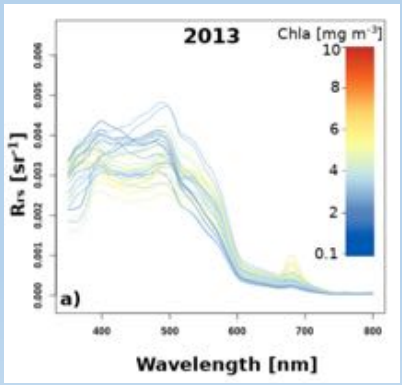


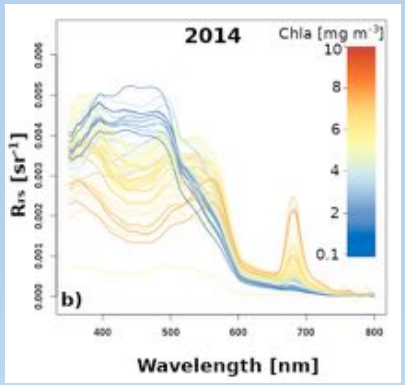
- Chlorophyll-a concentration in EGC is ca. order of magnitude lower and its maximum is located deeper compared to WSC and Polar Front.

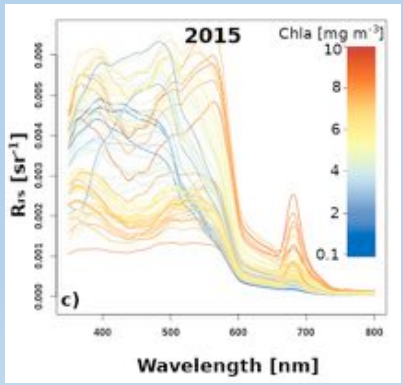
- The phytoplankton pigments line height absorption $a_{LH}(676)$ is very good proxy for chlorophyll-a concentration and the fluorescence intensity of the humic-like DOM fraction is a strong predictor of CDOM absorption coefficient.
- Chlorophyll-a concentration is to large extent controlled by water temperature while the CDOM absorption is controlled by the salinity in the Fram Strait.



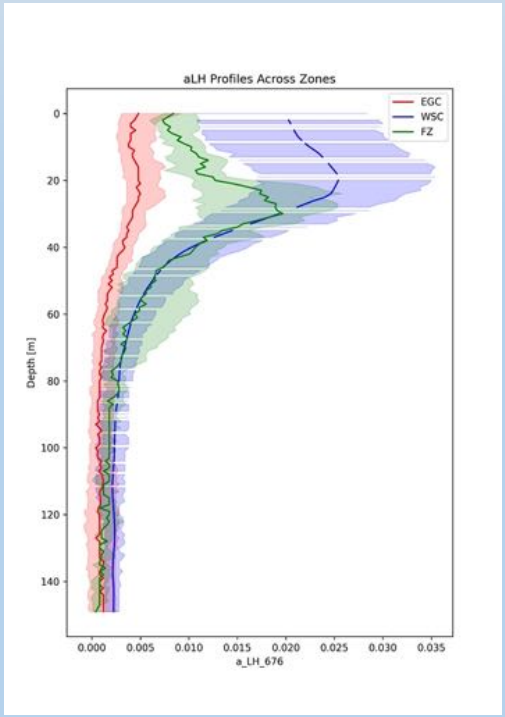


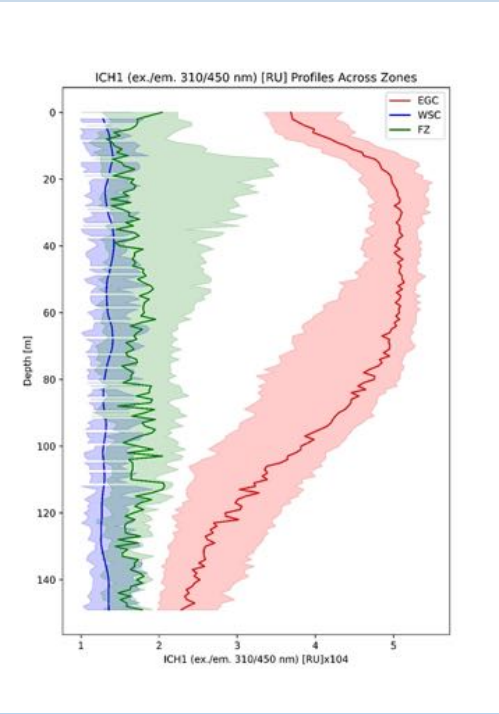






- $R_{rs}(\lambda)$ spectra reflect the phytoplankton functional diversity at chlorophyll-a concentrations > 5 mg m^3





Acknowledgements: This study was funded by the Polish National Science Centre (NCN) OPUS26 project OptiCal-Green (2023/51/B/ST10/01344) granted to PK. Field work was conducted in summer 2013-2016 in the framework of the research project funded by the Polish-Norwegian Research Programme operated by the National Centre for Research and Development under the Norwegian Financial Mechanism 2009–2014, contract Pol–Nor/197511/40/2013, CDOM-HEAT, awarded to PK. The ship time on board of r/v Lance was provided by the Norwegian Polar Institute, Tromsø, Norway. The ship time on board of r/v Oceania was provided by Institute of Oceanology Polish Academy of Sciences, Sopot, Poland.

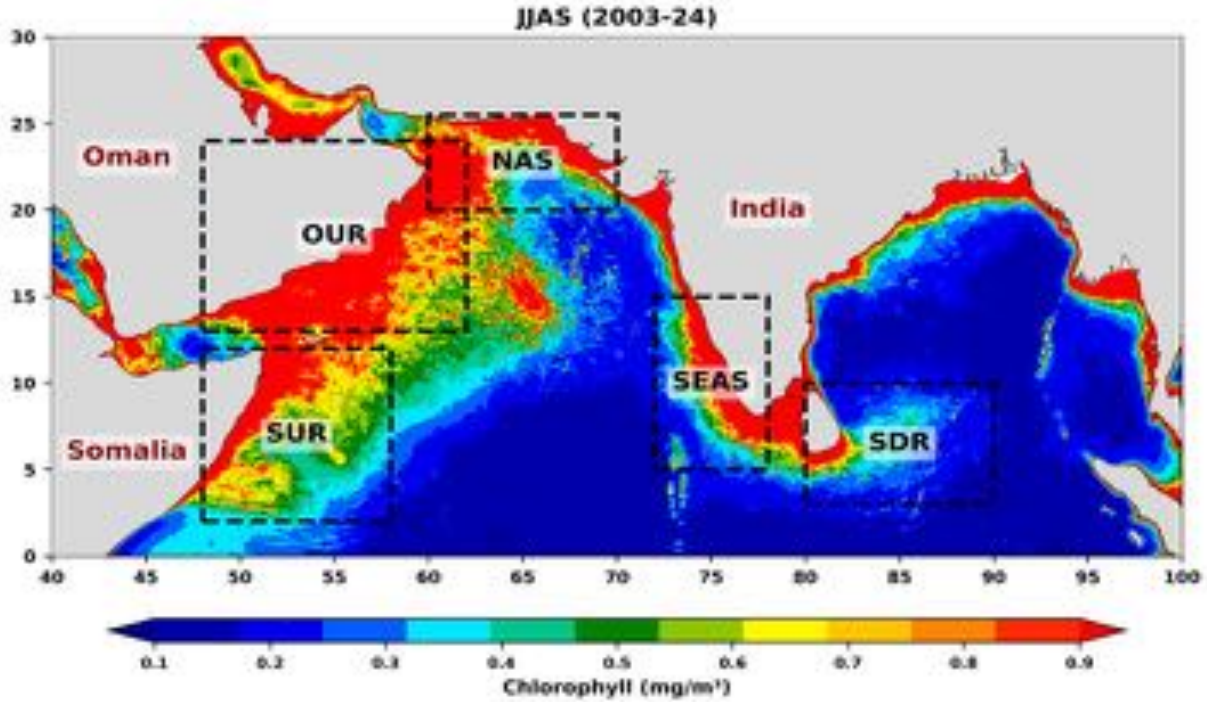
Poster No. 44

Long-Term Variability of surface Chlorophyll in the North Indian Ocean: Role of Ocean-Atmosphere Forcings

Pavas kumar[1,2,a] Mangesh Gauns[1,2,b], Jayu Narvekar[1,2,c]

[1] *CSIR-National Institute of Oceanography, Dona-Paula-Goa, India 403004*

[2] *Academy of Scientific and Innovative Research (AcSIR), Ghaziabad-201002, India*



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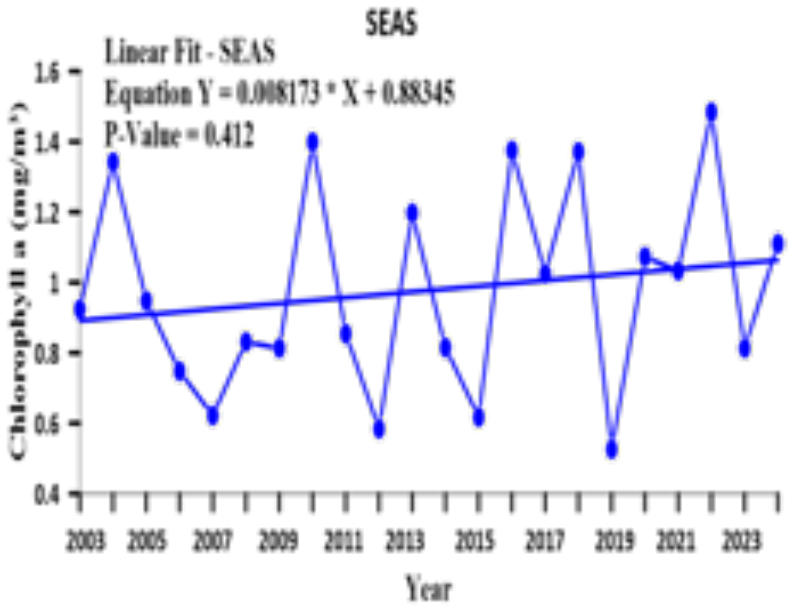
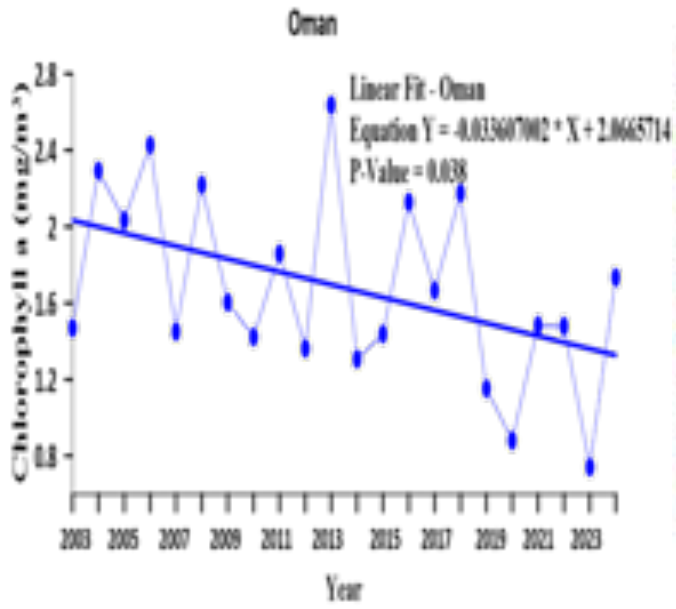
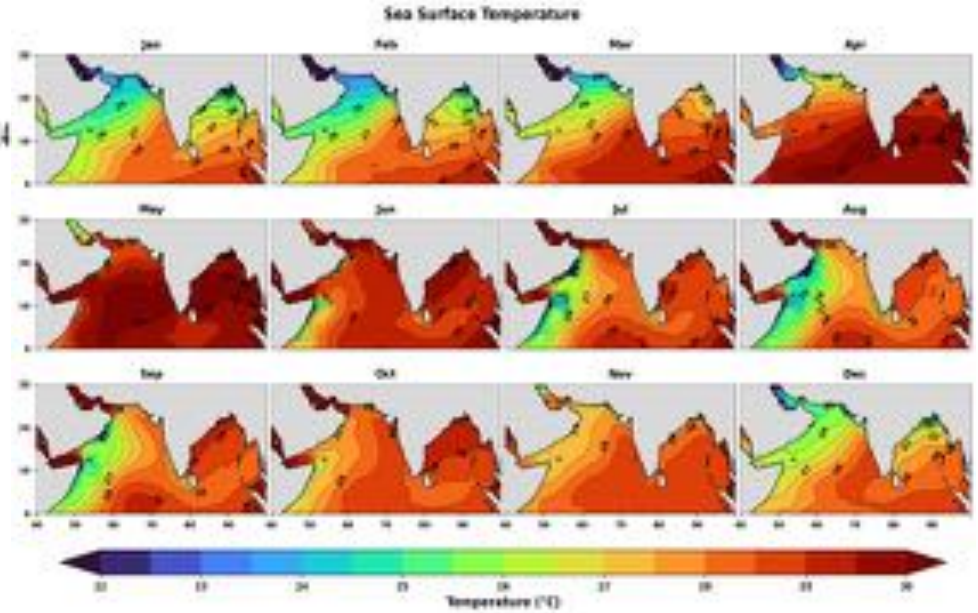
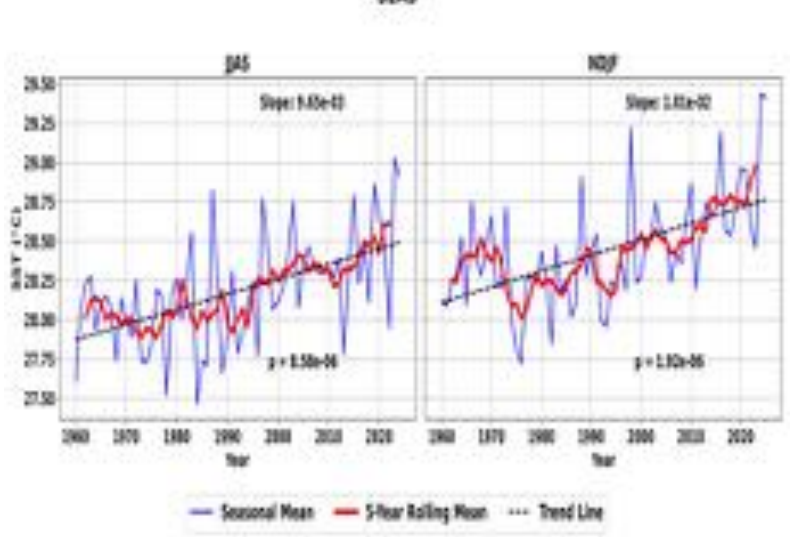
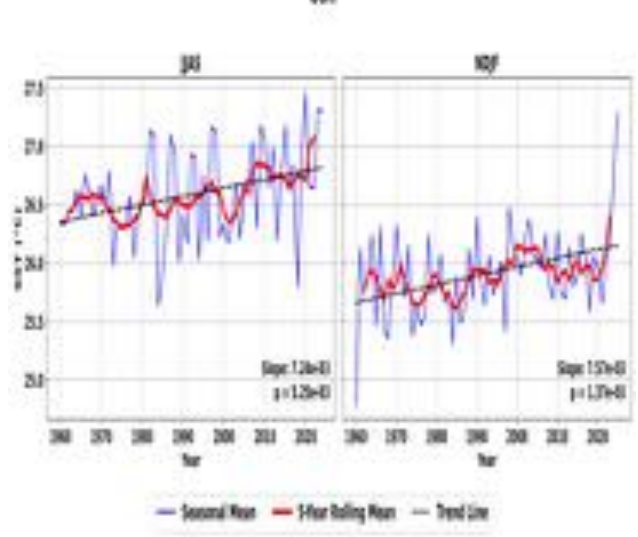
Poster no. 44

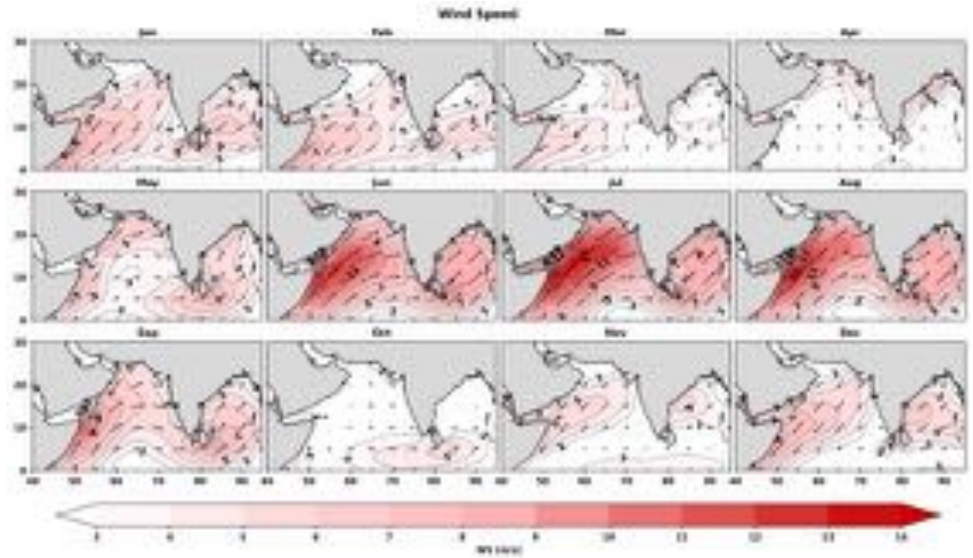

SEAS
Linear Fit - SEAS
Equation Y = 0.008173 * X + 0.88345
P-Value = 0.412
Chlorophyll a (mg/m³)
Year


Oman
Linear Fit - Oman
Equation Y = -0.033607002 * X + 2.0665714
P-Value = 0.038
Chlorophyll a (mg/m³)
Year


Sea Surface Temperature
Temperature (°C)


SEAS
JAS
NDJF
Seasonal Mean
5-Year Rolling Mean
Trend Line


OUR
JAS
NDJF
Seasonal Mean
5-Year Rolling Mean
Trend Line


Wind Speed

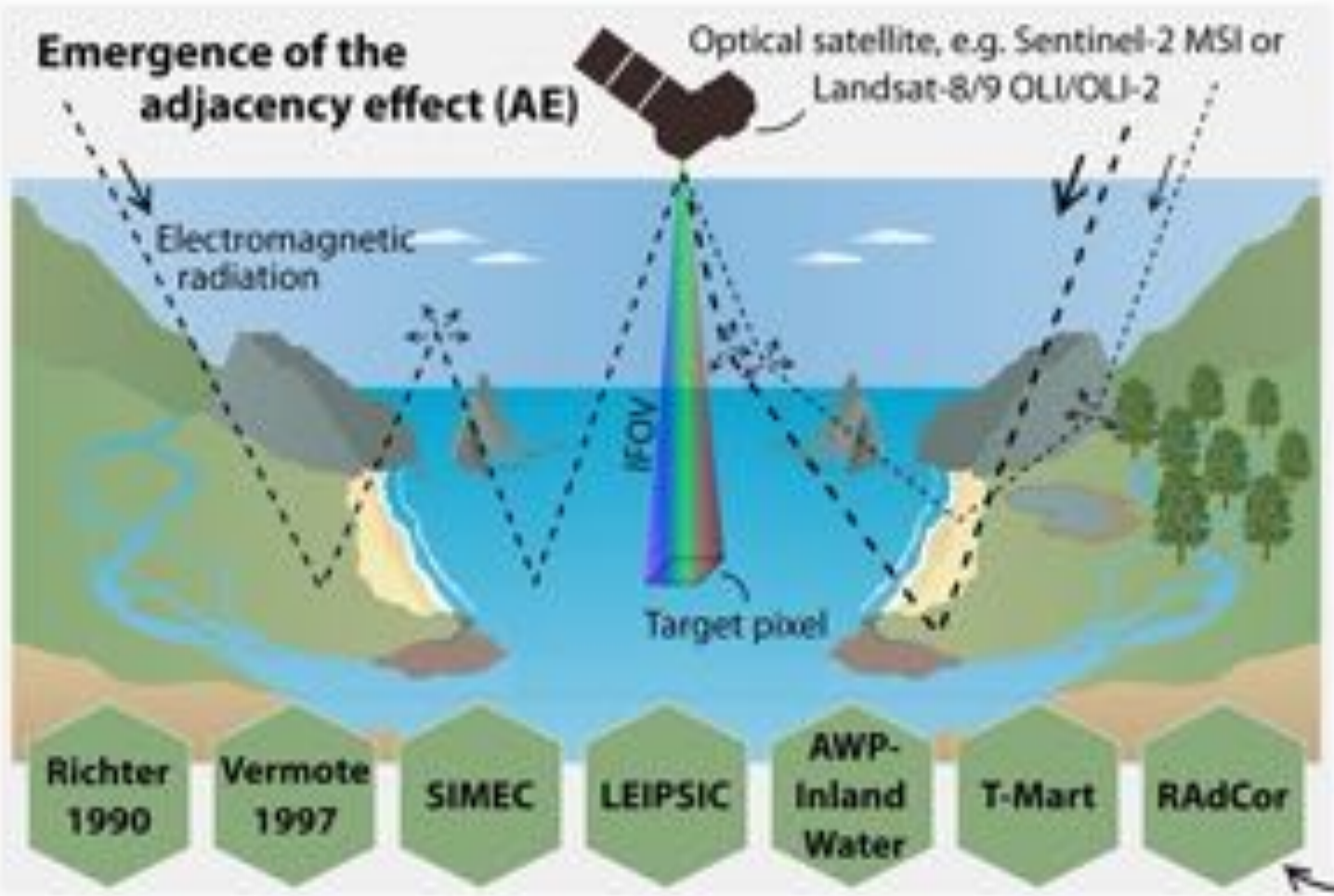
Poster # 50

When Land Meets Water: A Review of the Adjacency Effect in Aquatic High-Contrast Environments

Victor Lion, Bastian Robran, Frederike Kroth & Natascha Oppelt

IOCS-2025 Darmstadt, 1-4 December

Poster # 50



Implications

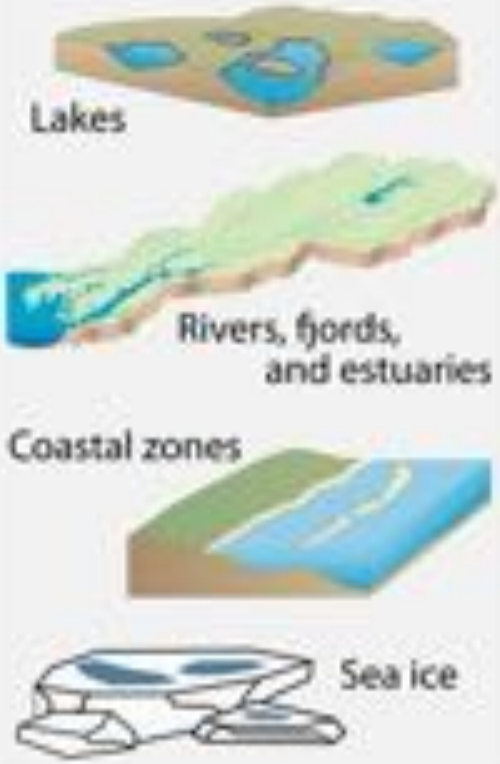
Over **aquatic high-contrast environments**, the AE causes **significant biases in quantitative retrievals**, extending over several kilometers from shore.

Correction tools

AE correction issues in pre-processed products and large atmospheric correction processors.

Open source correction tools still leave room for improvements.

Aquatic high-contrast environments



Poster # 51

Ocean colour products as tracers for surface currents reconstruction: An approach using a neural network

Authors

Juan Manuel López-Contreras (Ulg-UPV/EHU)* - Alexander Barth (ULg) Aida Alvera-Azcárate(ULg) - Ganix Esnaola (UPV/EHU)

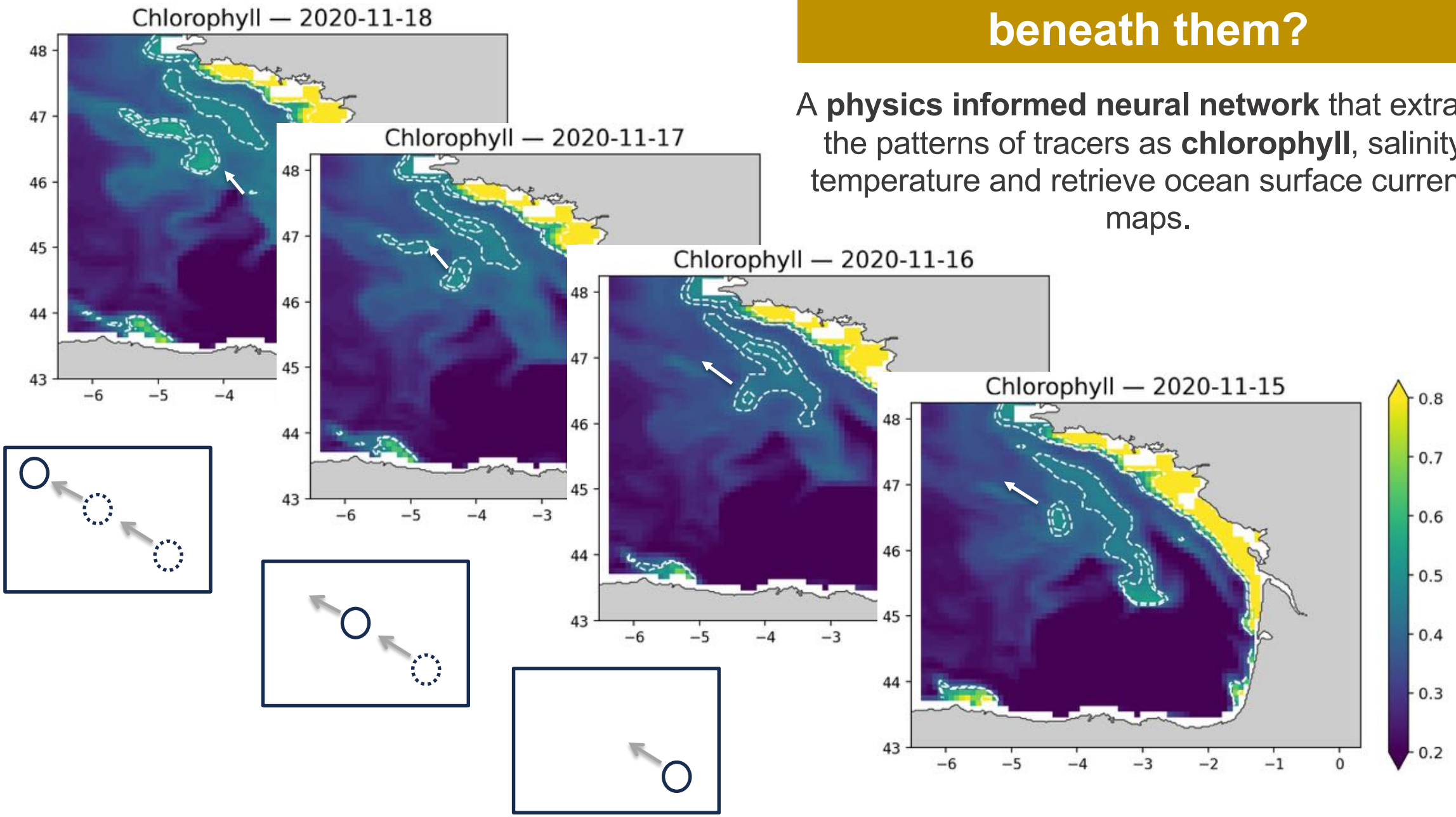
IOCS-2025 Darmstadt, 1-4 December

* j.lopezcontreras@uliege.be

Poster # 51

Can tracers reveal the currents beneath them?

A **physics informed neural network** that extracts the patterns of tracers as **chlorophyll**, salinity, temperature and retrieve ocean surface currents maps.



Poster # 52

Characterizing oil spills using deep learning and spectral-spatial-geometrical features of optical satellite images

Yingcheng Lu[1], Junnan Jiao[2], and Chuanmin Hu[2]

1. *International Institute for Earth System Science, Nanjing University, 210046, China. E-mail: luyc@nju.edu.cn*
2. *College of Marine Science, University of South Florida, St. Petersburg, FL 33701, USA.*

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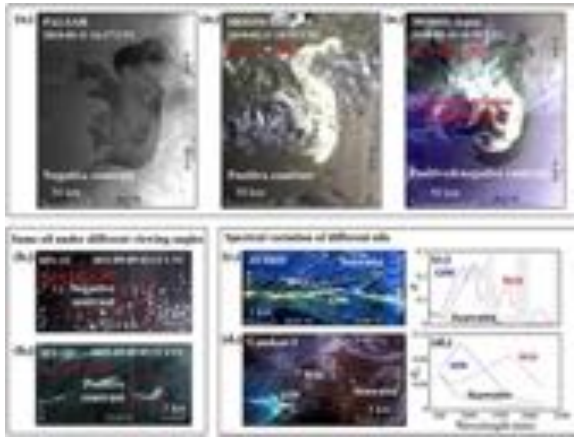
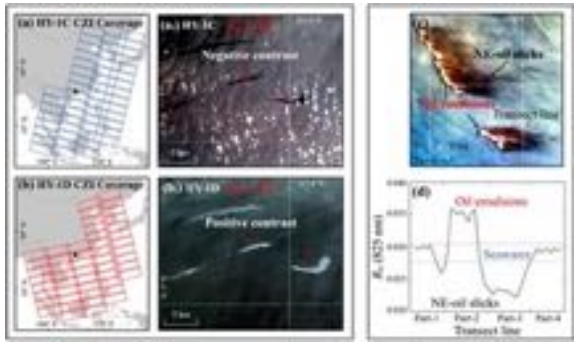
Optical classification and quantification of oil spills

① Optical Remote Sensing Theory

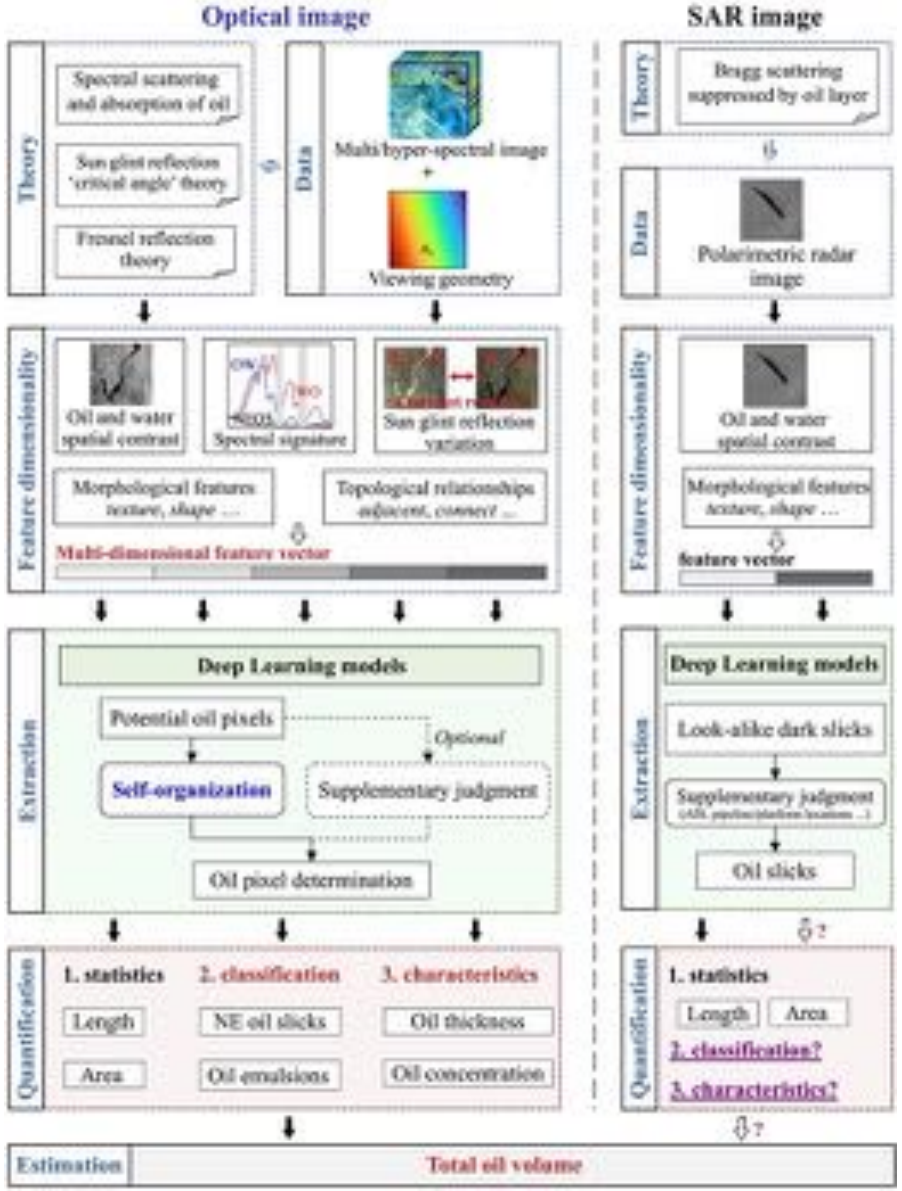


② China HY-1C/D imagery

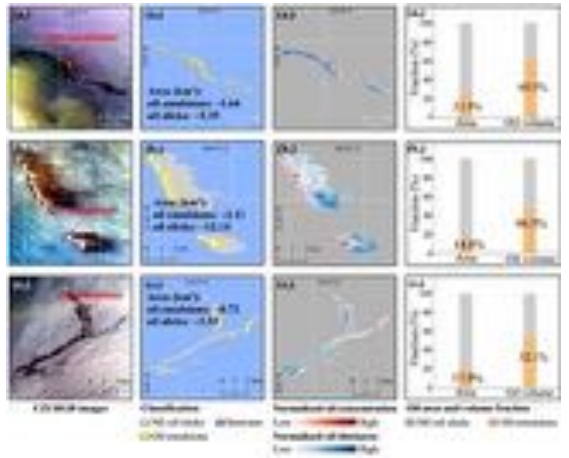


③ Unet

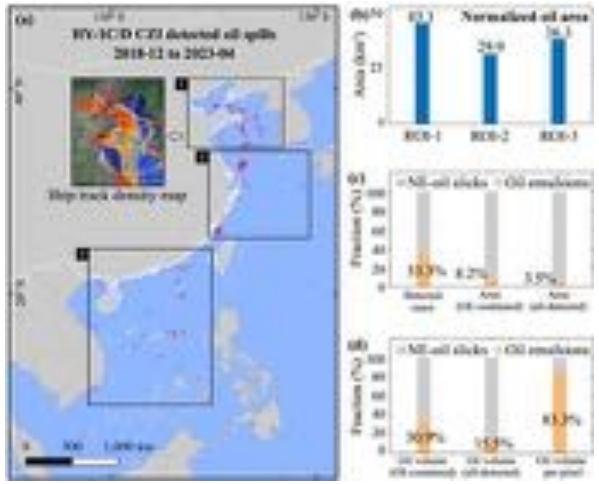
④ Framework of characterizing oil spills using optical and SAR



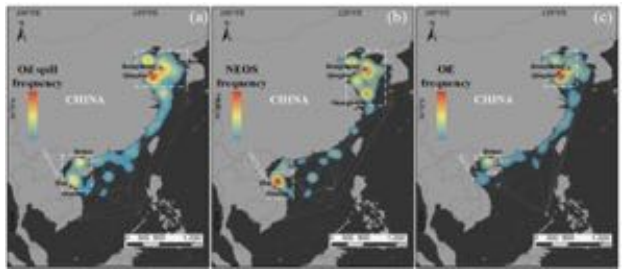
④ Optical classification and quantification



⑤ Oil spill characteristics



⑥ Oil spill frequency heat map in China Seas



Poster # 53

Ensemble Bathymetry Product (EBP): A satellite-derived shallow water mapping system using Sentinel-2

Amihan Yson Manuel, Ryan Tan,
Rakesh Kumar Singh, Soo Chin Liew

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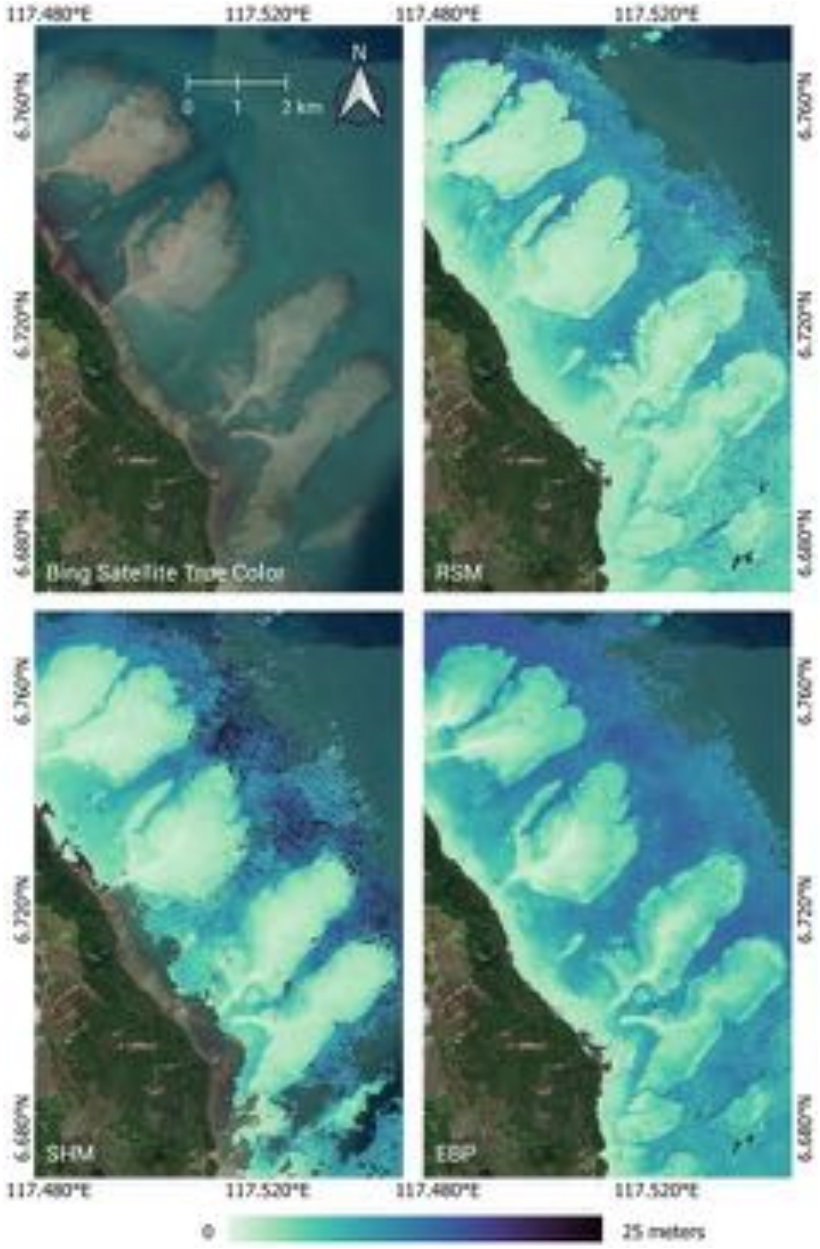
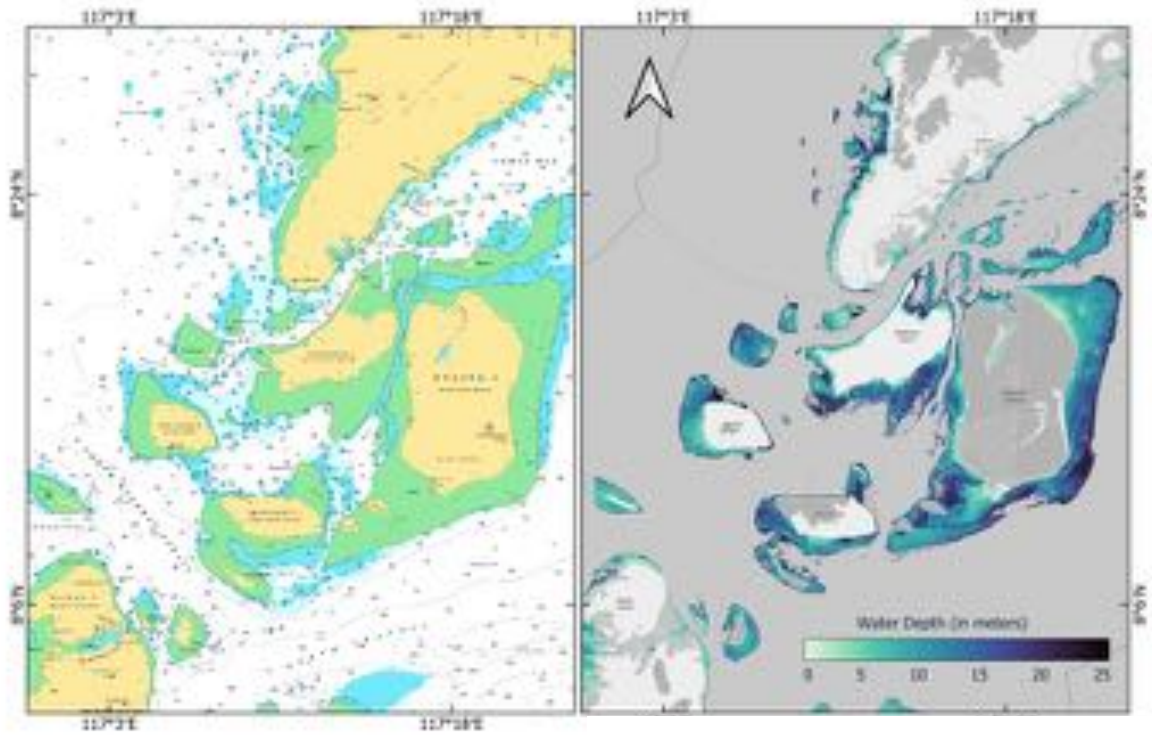
Poster # 53

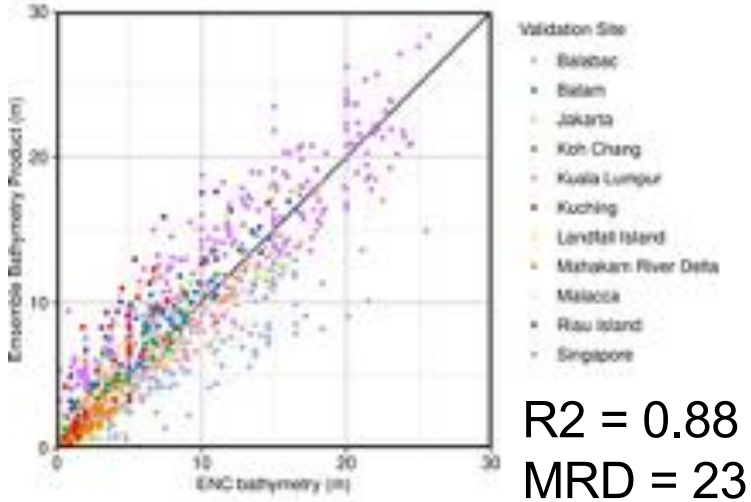


Electronic Navigation Chart

Ensemble Bathymetry Product (EBP)



South-East Asia



R2 = 0.88

MRD = 23.4%

Poster # 54

Wavelet-based Analysis of the Hyperspectral Signatures of Marine Plastic Litter

José Maravalhas-Silva[1]
Nuno A. Cruz[1,2]

1 – INESC TEC – Institute for Systems and Computer Engineering, Technology and Science
2 – FEUP DEEC – Faculty of Engineering, University of Porto; Dept. of Electrical and Computer Engineering

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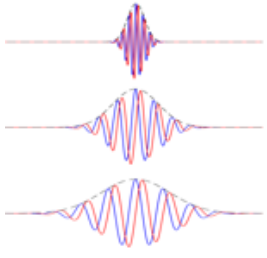
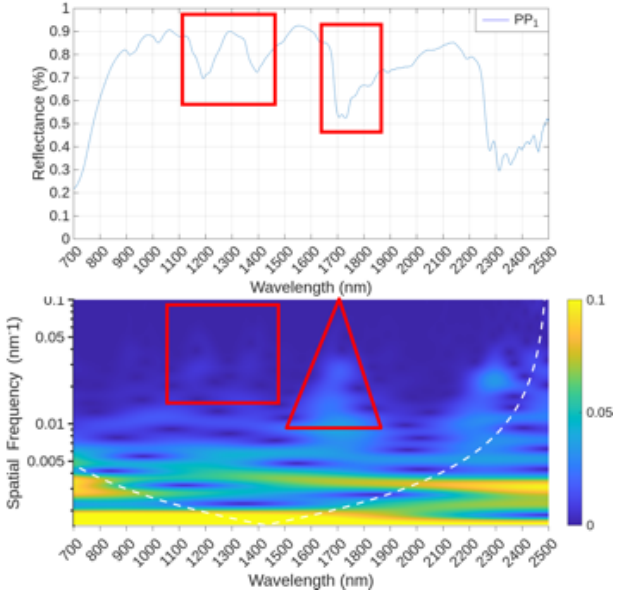
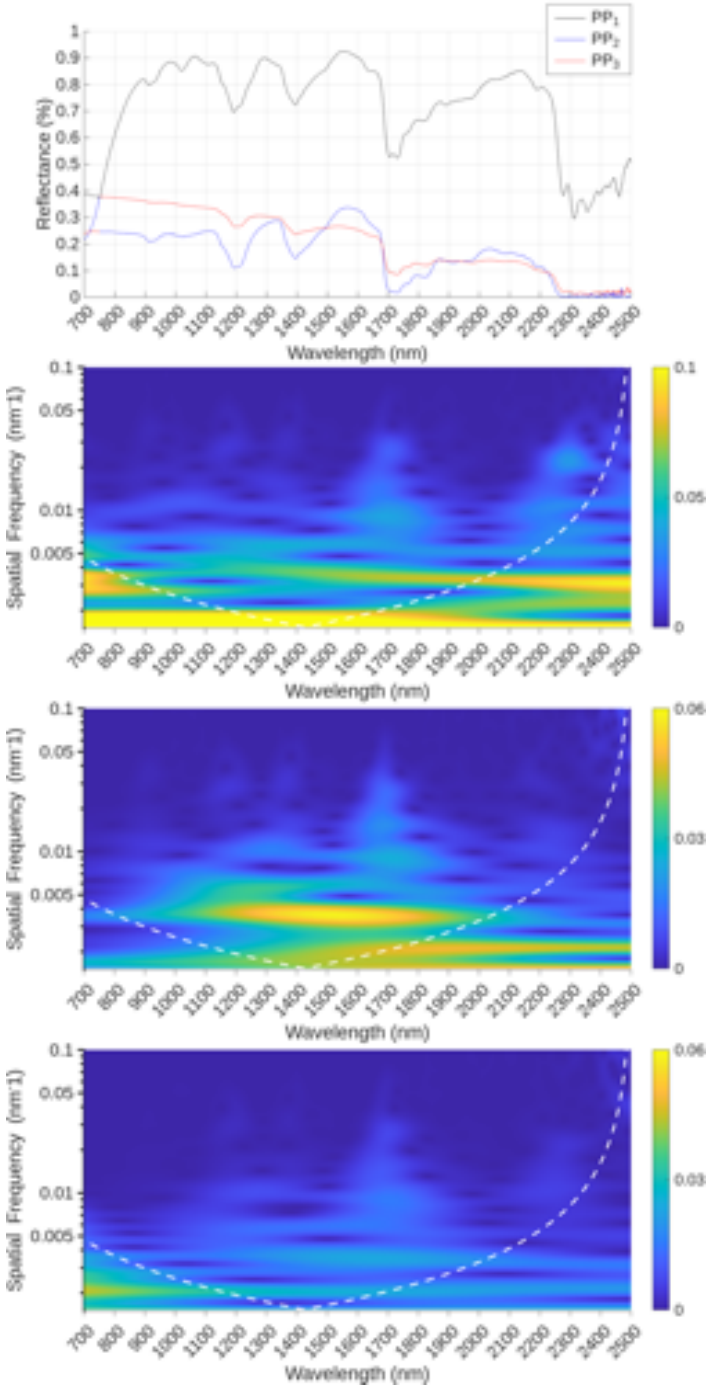
Poster # 54

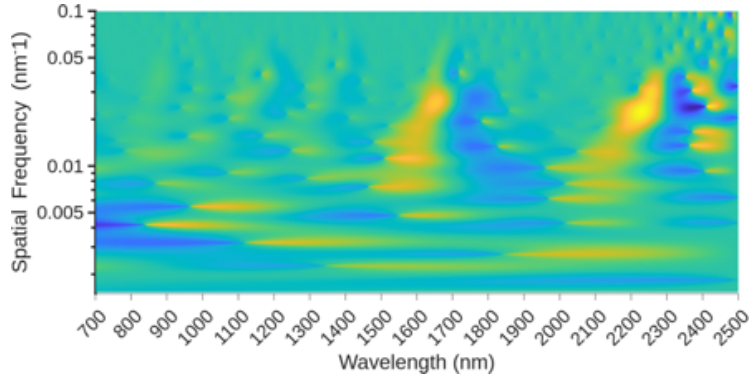
Continuous Wavelet Transform (CWT)



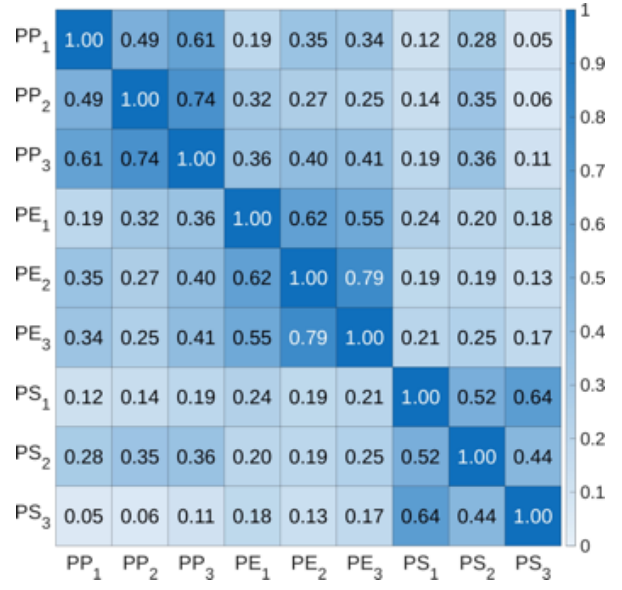




CWT Gradient Matching (CWTGM)



$$CWTGM_{s1}^{s2} = \frac{\mathbf{G}_x^{s1} \cdot \mathbf{G}_x^{s2}}{||\mathbf{G}_x^{s1}||\ ||\mathbf{G}_x^{s2}||}$$



Poster # 55

Tailoring Copernicus Operational Products for Coastal Ocean Applications: The Case of Internal Island-Trapped Waves in the Adriatic Sea

Antonija Matek[1], Mirko Orlić[2], Hrvoje Mihanović[3], Zrinka Ljubešić[1], Simone Colella[4], Vittorio E. Brando[4]

[1]*University of Zagreb, Faculty of Science, Department of Biology, Horvatovac 102A, 10000, Zagreb, Croatia*

[2]*University of Zagreb, Faculty of Science, Department of Geophysics, Horvatovac 95, 10000, Zagreb, Croatia*

[3]*Institute of Oceanography and Fisheries, Šetalište I. Meštrovića 63, 21000, Split, Croatia*

[4]*National Research Council of Italy (CNR), Institute of Marine Science (ISMAR), 30122, Rome, Italy*

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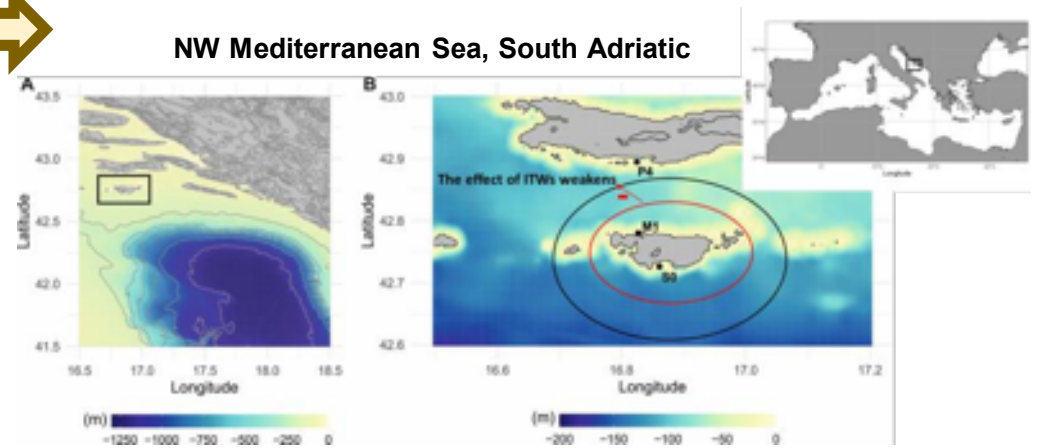
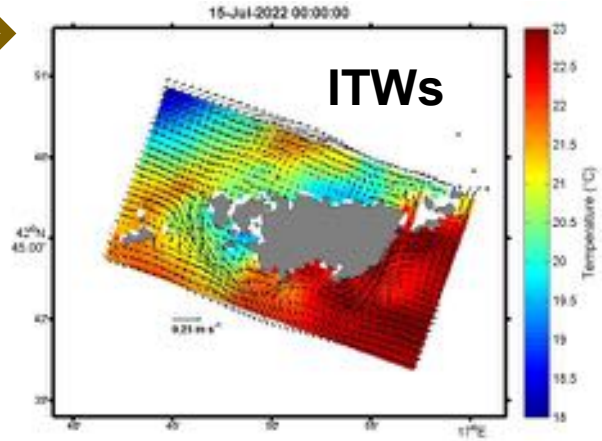
Poster # 55

IN SITU DATA

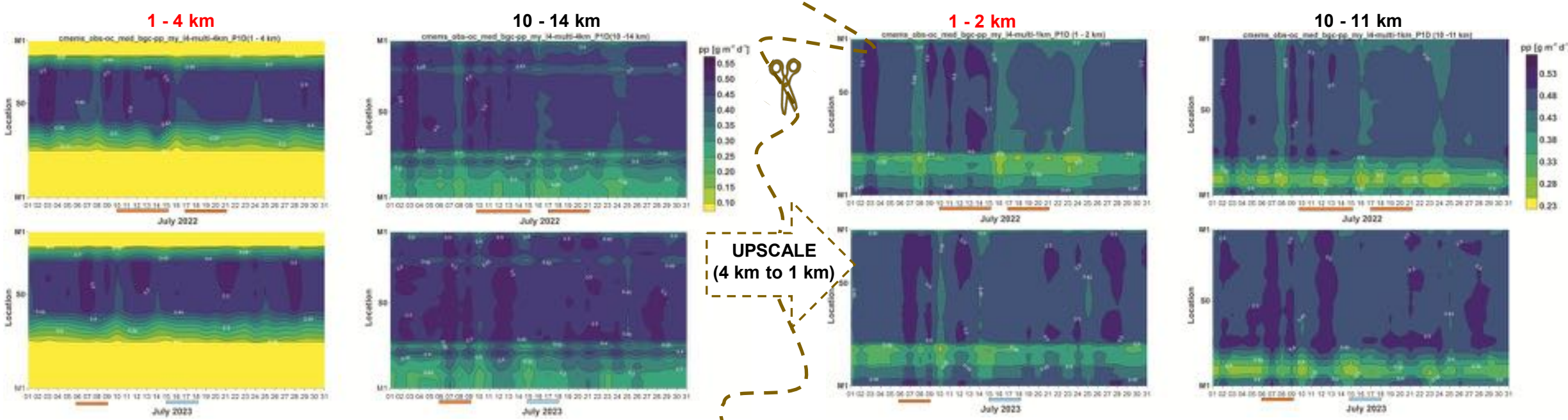




Thermocline movements up to 30 m (supporting mechanisms to facilitate NPP increase)

INTERNAL ISLAND-TRAPPED WAVES INCREASE NPP AT LASTOVO ISLAND?

REMOTE SENSING



Mediterranean Sea, Bio-Geo-Chemical, L4, monthly means, daily gapfree and climatology Satellite Observations (1997-ongoing) (CMEMS) https://doi.org/10.48670/moi-00300. *Berthon & Zibordi (2004), Volpe et al. (2018, 2019)*

Poster # 56

SWIR-band AC & S3NGO Requirements for OLCI-SLSTR Synergy

C. Mazeran, C. Brockmann, F. Steinmetz, R. Preusker,
D. Dessailly, E. Kwiatkowska,
P. Cipollini, S. Proud, S. Dransfeld

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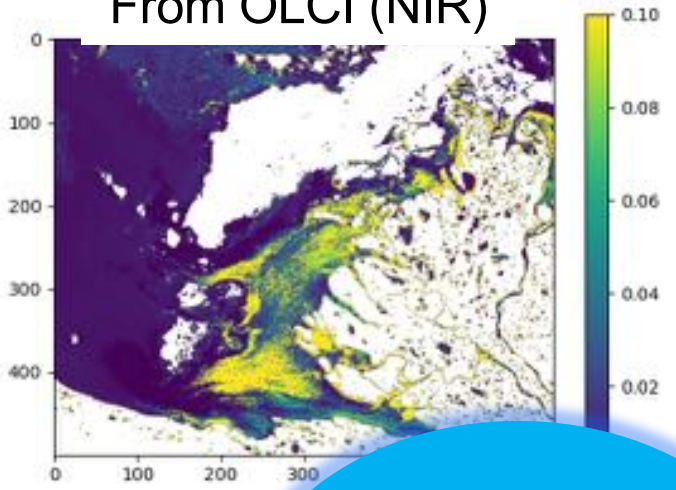
Poster # 56

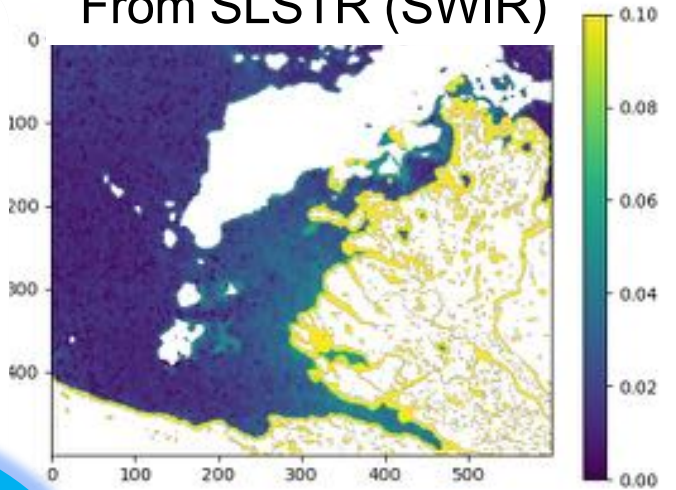
Opportunities of synergy between AOLCI & ASLSTR …

Aerosol optical thickness at 865 nm

From OLCI (NIR)



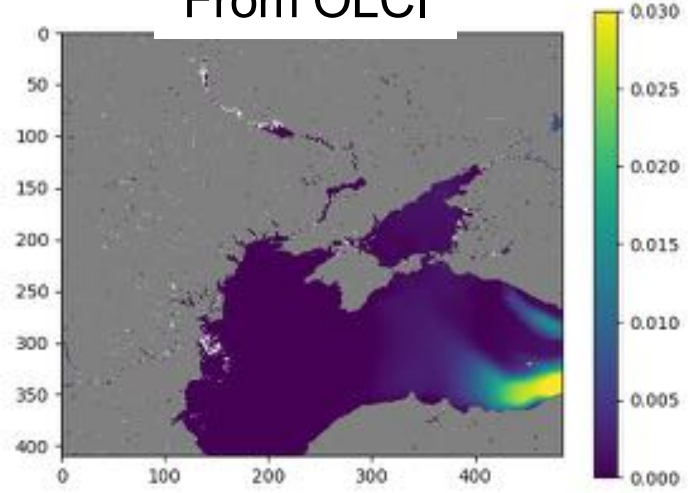
From SLSTR (SWIR)



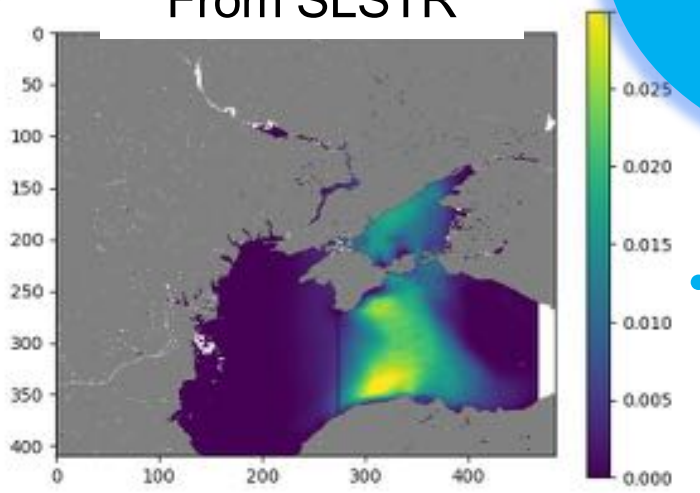
EUM L1C products + SYN-SWIR-AC processor

Sun glint reflectance

From OLCI



From SLSTR



… but challenges → S3NGO requirements

Poster # 61

Planetary Diagnosis of Phytoplankton Iron Stress

Amy G. Nuno[1], Toby K. Westberry[2], Jun Yu[1], J. Keith Moore[1], Michael J. Behrenfeld[2], Adam Martiny[1]

[1]University of California, Irvine, Earth System Science

[2]Oregon State University, Botany and Plant Pathology

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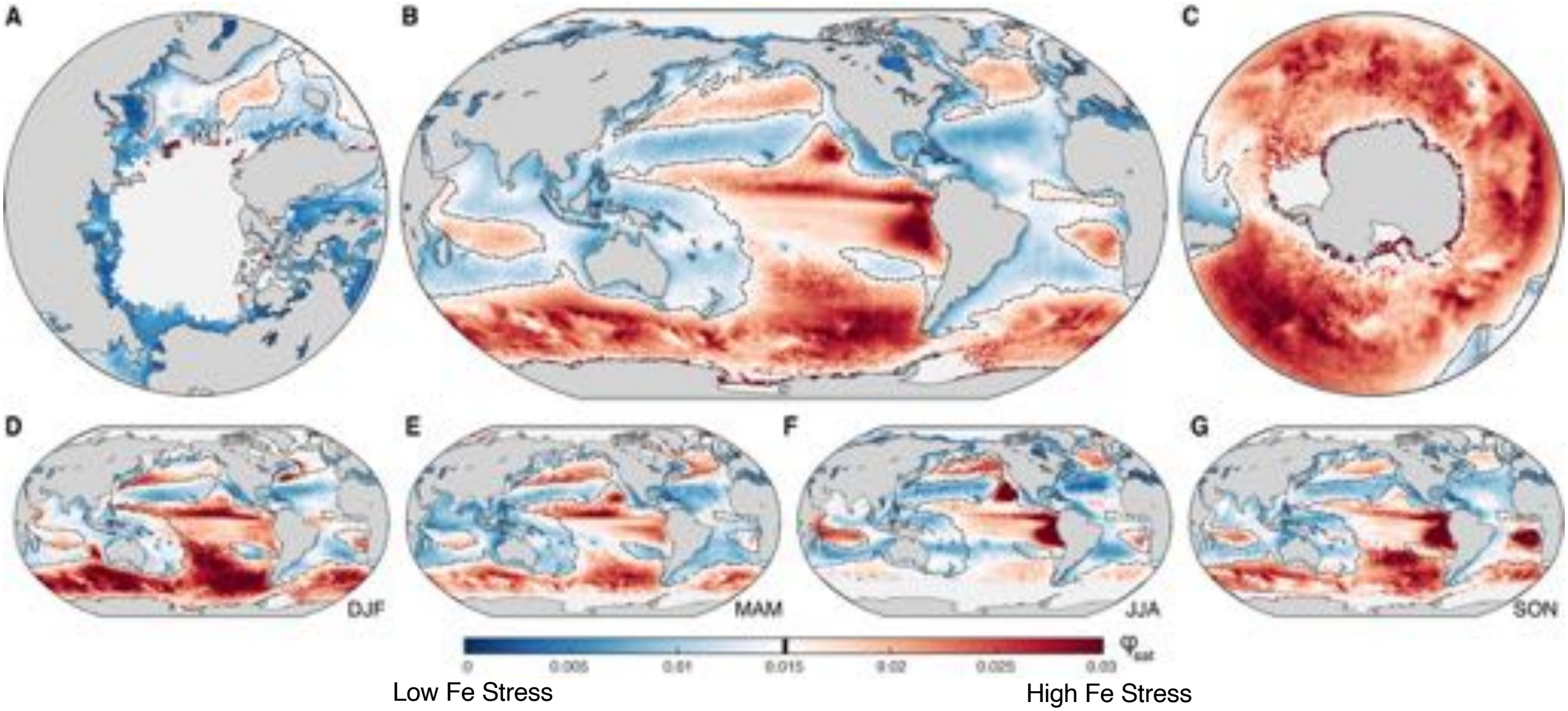
Poster # 61



Low Fe Stress

High Fe Stress

Poster # 64

Satellite observations of phytoplankton blooms in the Western part of the Black Sea

Elitza Pandourska[1], Elisaveta Peneva[2]
[1] Faculty of Physics, Sofia University “St. Kliment Ohridski”, Bulgaria
[2] Faculty of Physics, Sofia University “St. Kliment Ohridski”, Bulgaria

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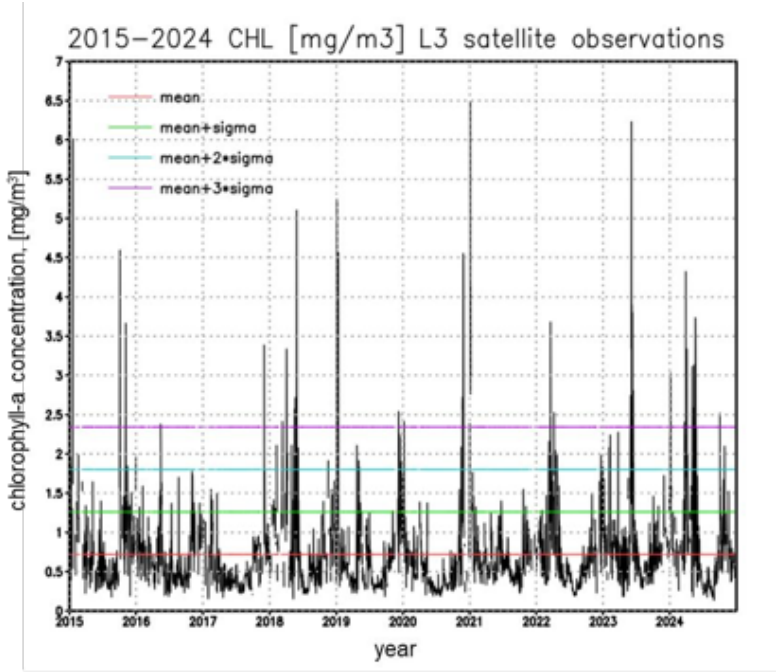
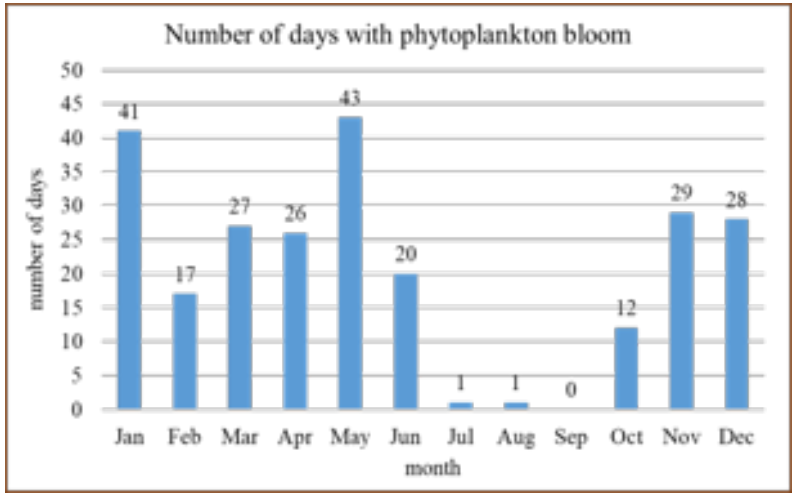
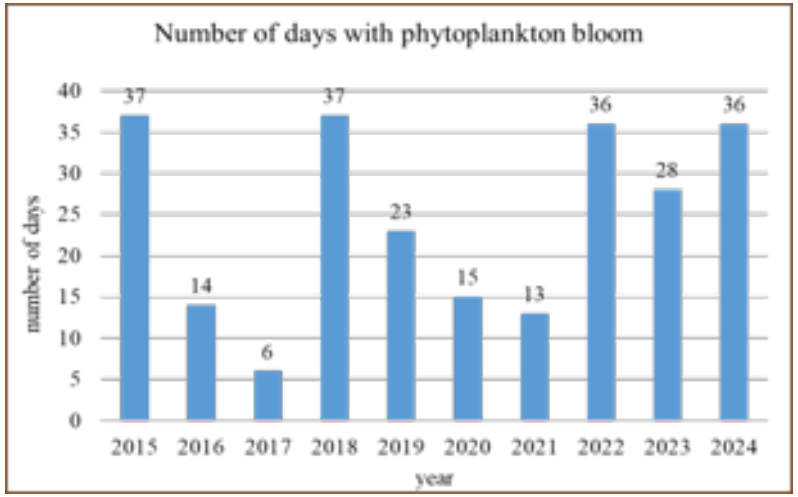
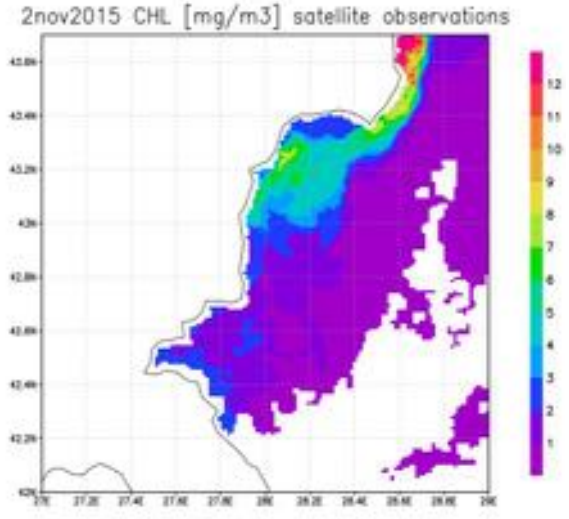
Poster # 64

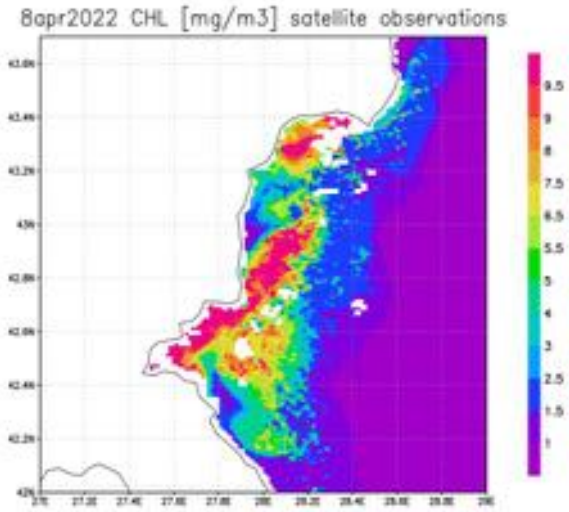
- CMS chl-a satellite data validation for the western part of the Black Sea
- Defining a threshold value for identifying blooms: CHL > 1,3 mg/m^3
- Monthly and yearly distribution of days with blooms
- Classification of phytoplankton blooms – 4 main types

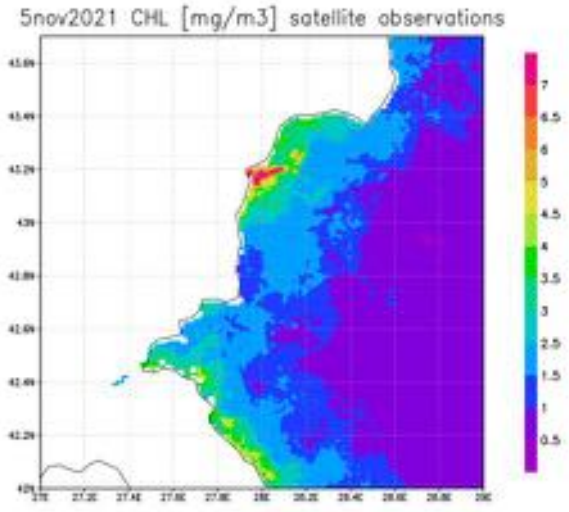


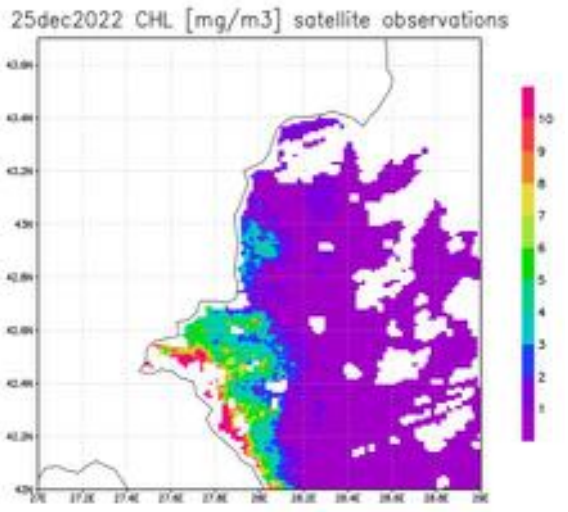












International Ocean Colour Science Meeting 2025

Advancing Global Ocean Colour Observations

Poster Lightning Session 1B

END OF LIGHTNING TALKS