



International
Ocean Colour Science
Meeting 2025

Advancing Global Ocean Colour Observations

Poster Lightning Session 3B



Calling Session 3B presenters to
the front in Poster Number order

Poster Lightning Session 3B

STARTS IN

Poster # 153

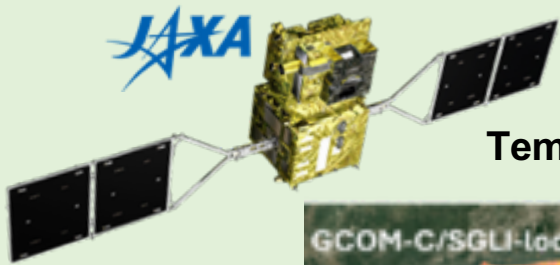
Cross-Regional Detection of Harmful Algal Blooms Using GCOM-C/SGLI Ocean Color Data in Eutrophic coastal Waters of Japan and Thailand

Jutarak Luang-on, Eko Siswanto, Kazunori Ogata,
Mitsuhiro Toratani, Anukul Buranapratheprat,
Joji Ishizaka, Hiroto Higa, Lael Wakamatsu,
Sherwood Lan Smith



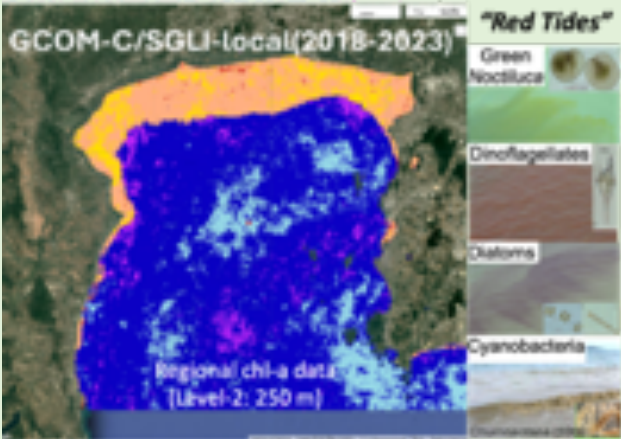
Poster # 153

GCOM-C/SGLI

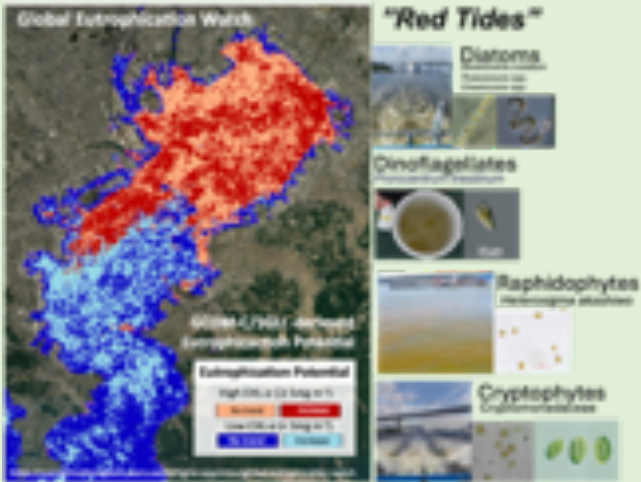


Spatial res.: 250 m
Temporal res.: 2.5 days

1) The upper Gulf of Thailand

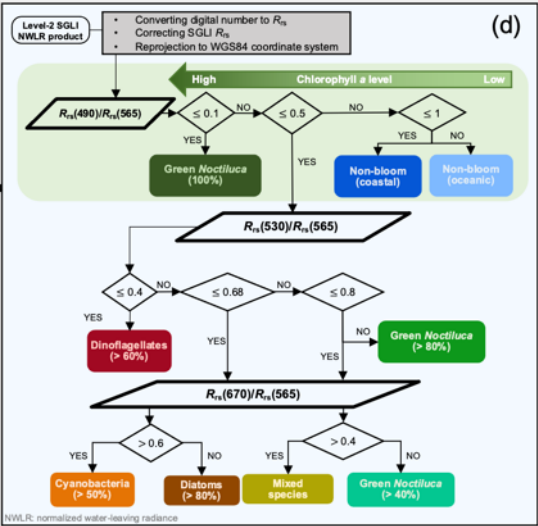
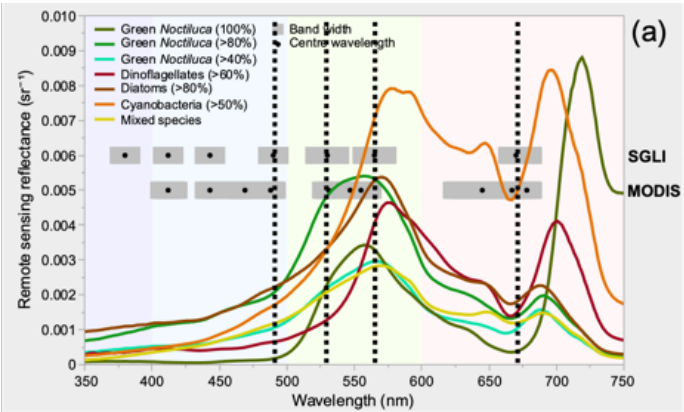


2) Tokyo Bay



Algal-bloom classification algorithm

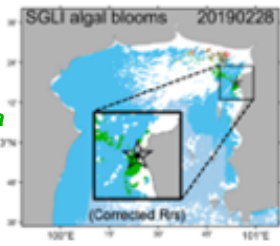
Averaged in-situ hyperspectral Rrs of red tide waters in the upper Gulf of Thailand



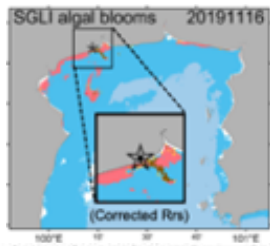
Key Findings

Green Noctiluca (100%)	Green Noctiluca (>80%)	Green Noctiluca (>40%)	Diatoms (>80%)	Dinoflagellates (>60%)	Cyanobacteria (>40%)	Mixed species	Non-bloom (coastal)	Non-bloom (oceanic)
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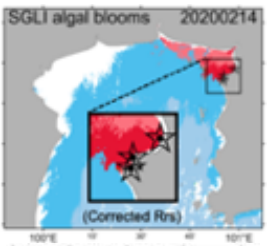
Green Noctiluca bloom



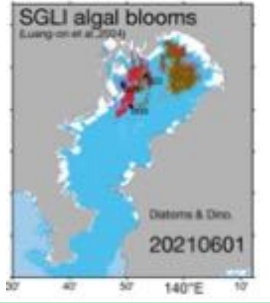
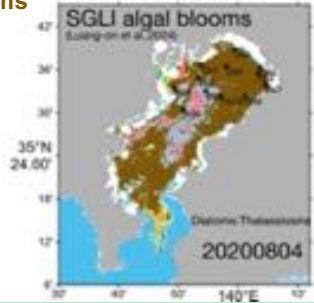
Diatom blooms



Dinoflagellates blooms



Algal Bloom Detection by GCOM-C/SGLI

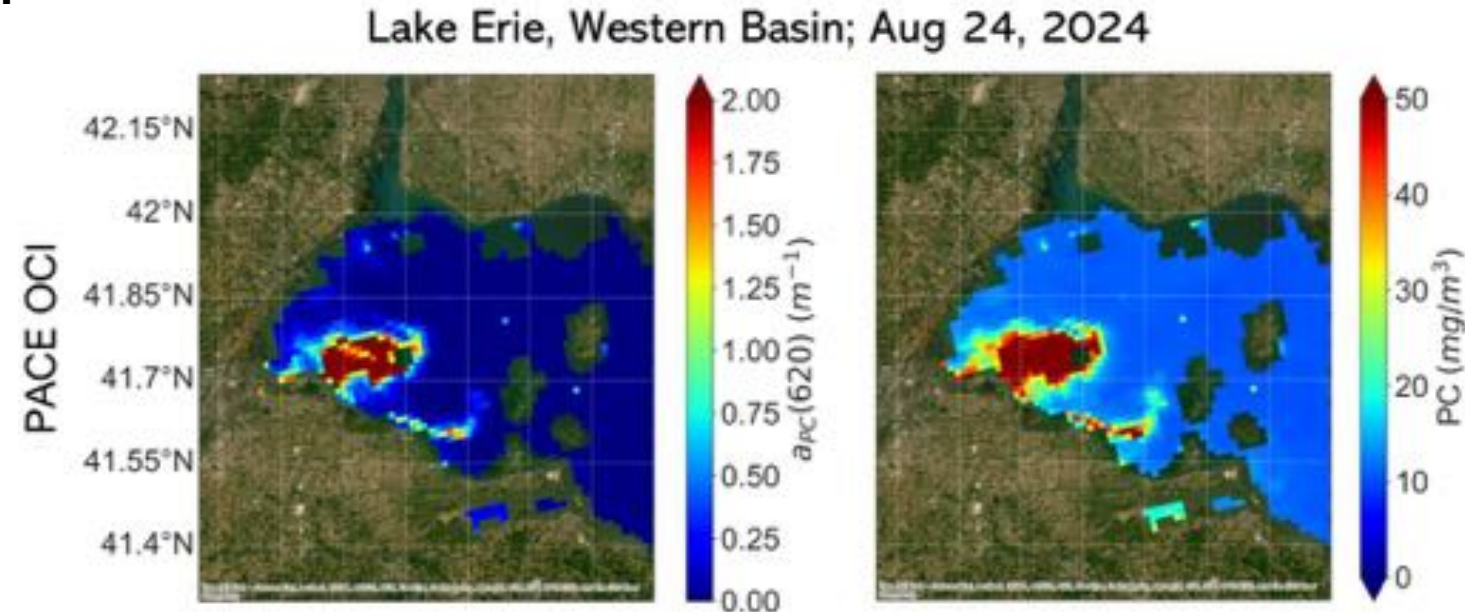
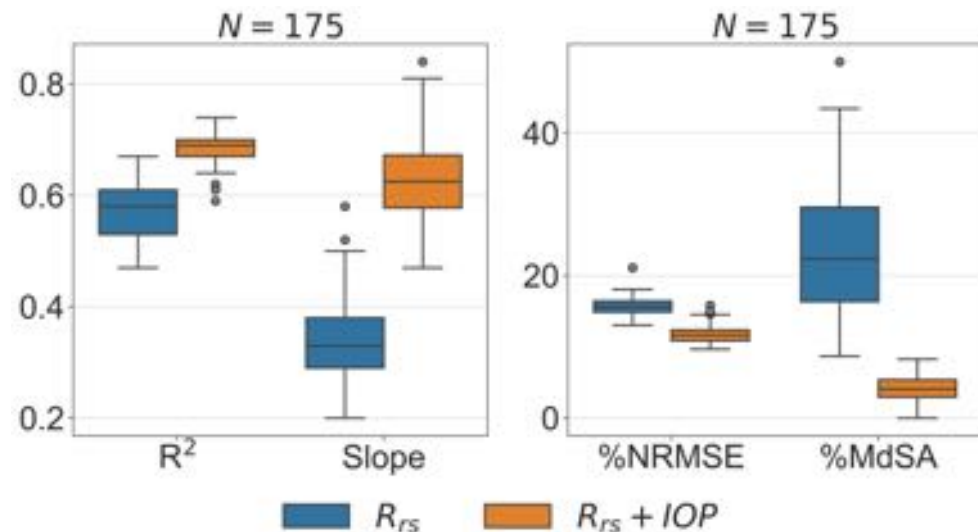
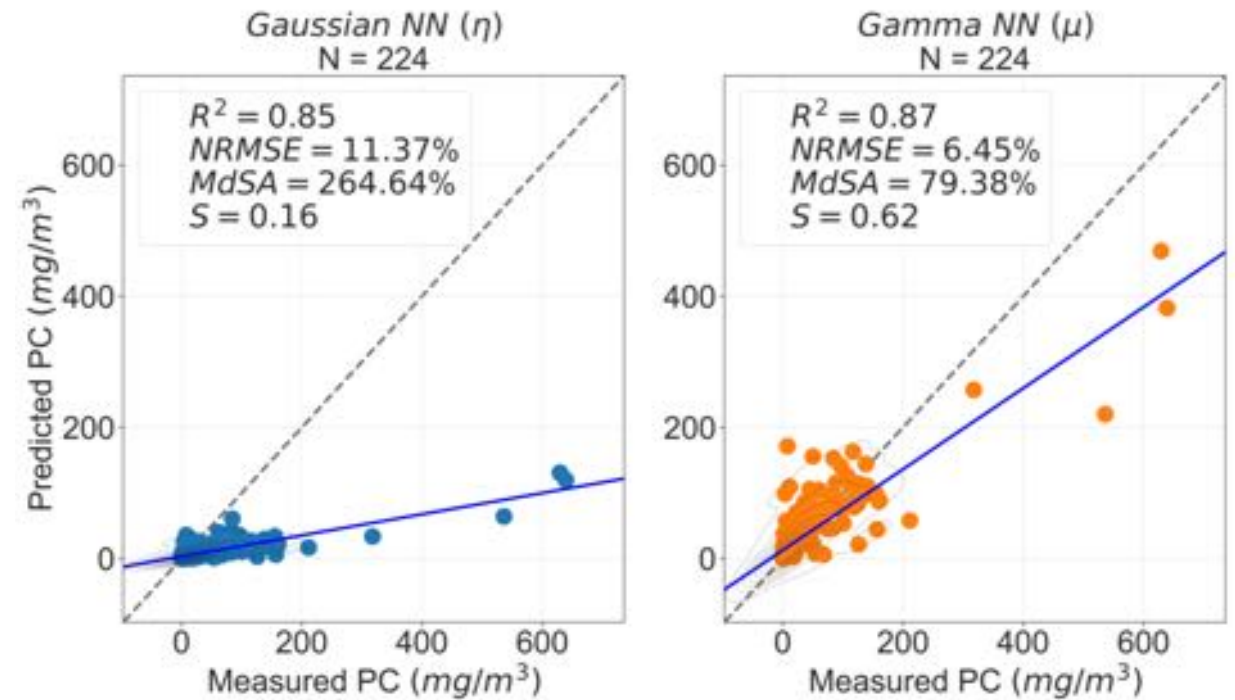


First Phycocyanin Retrievals from NASA PACE: A Physics-Informed AI Approach for Cyanobacteria Biomass Estimation

Chintan B. Maniyar, Weiming Hu, Abhishek Kumar,
Gengchen Mai, Ryan O'Shea, Arun Saranathan,
Akash Ashapure, Nima Pahlevan, Deepak R. Mishra

Poster # 155

- **Problem**: No one model that works well for wide range of Phycocyanin concentration
- **Solution**: An approach that encounters for physical reality and nature of PC
- **Low-PC**: Hybrid-QAA features help
- **High-PC**: Gamma-aware NN helps
- **First demonstration** of PACE OCI data for producing aPC and PC concentration maps!



Poster # 157

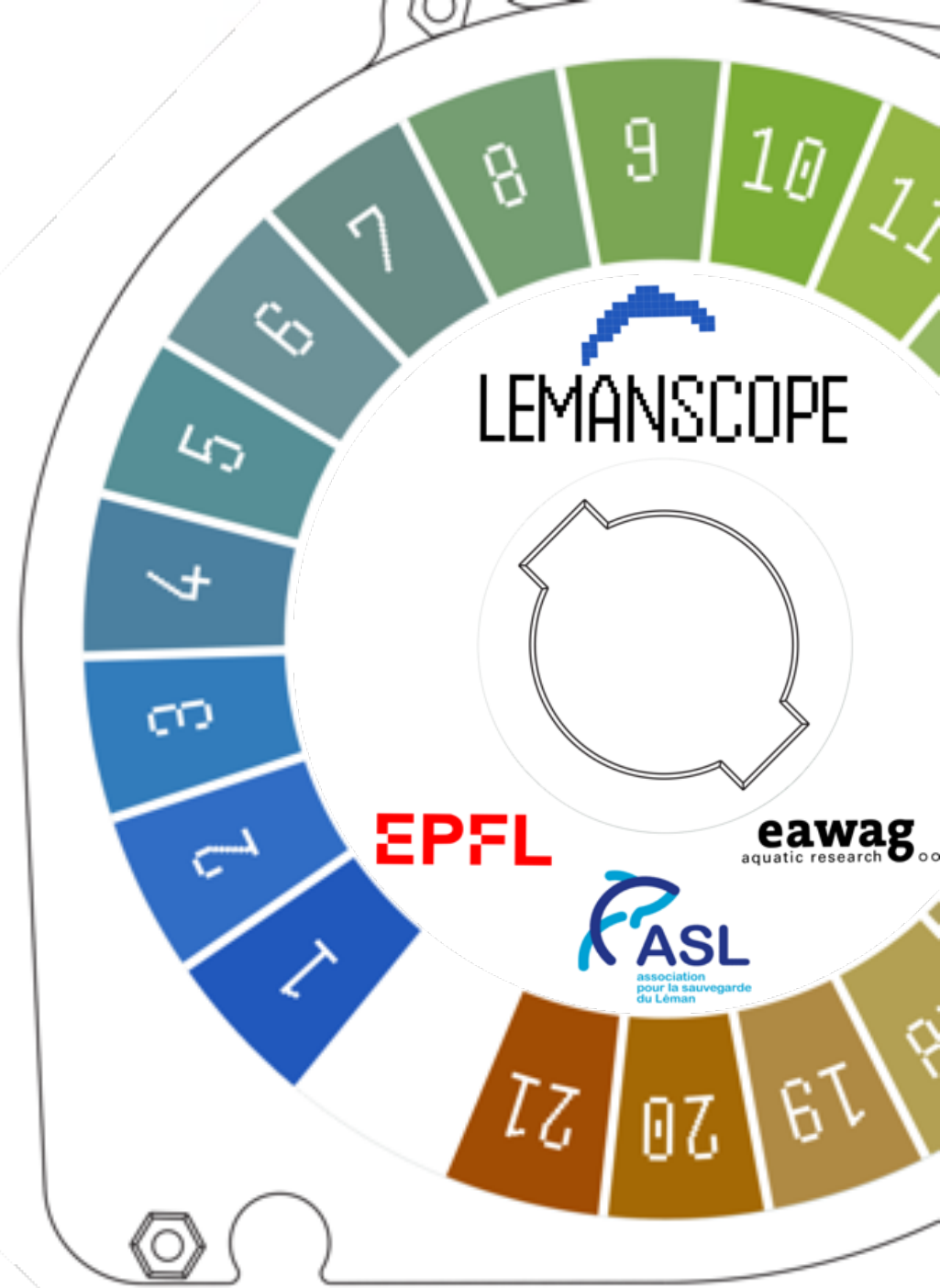
On the use of citizen science measurements for validating EO products near the shore

Daniel Odermatt^{1,2}, Yasmin Ghadyani¹,
Mortimer Werther¹, Abolfazl Irani Rahaghi^{1,2},
Laurence Haller³, Natacha Pasche³

¹ Eawag, Swiss Federal Institute of Aquatic Science and Technology

² Department of Geography, University of Zurich

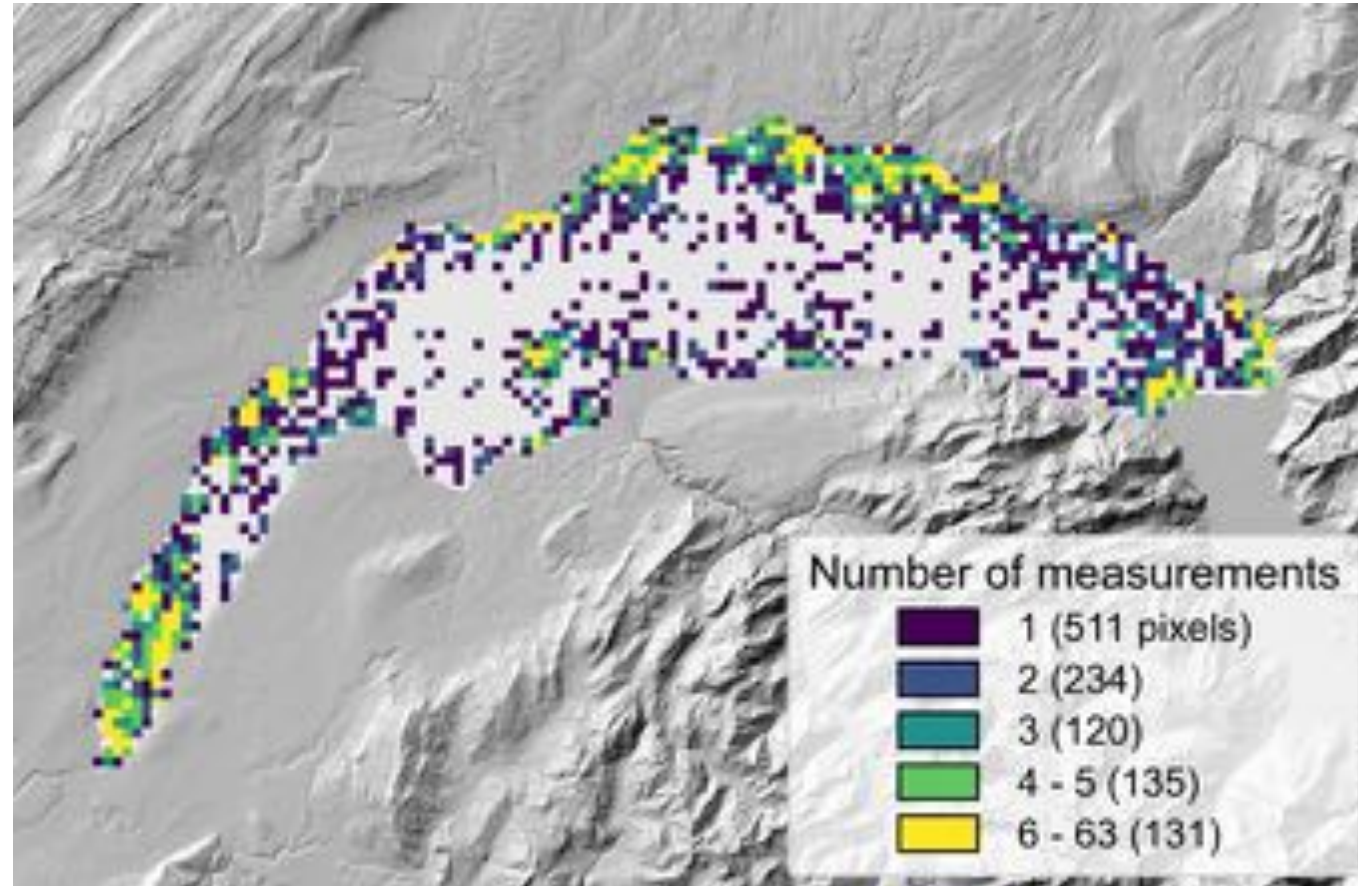
³ Limnology Center, École Polytechnique Fédérale de Lausanne (EPFL)



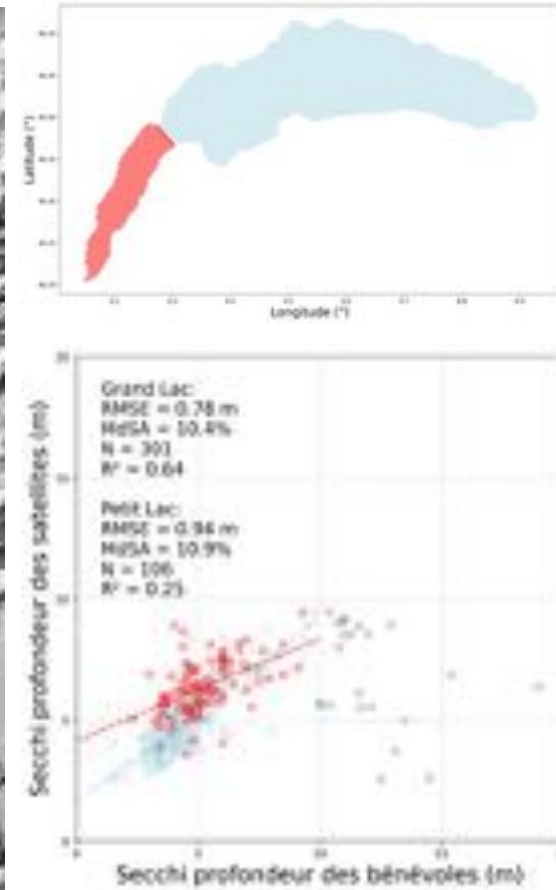
Poster # 157 LEMANSCOPE



300 citizen scientists



2600 Secchi depth measurements since May 2024



lots of S-3 matchups

A New AI Approach to Retrieving Ocean Color Products from Unoccupied Aircraft Systems (UAS)

Román A.^{1*}, Windle A.E.², Tovar-Sánchez A.¹, Navarro G.¹, Silsbe G.³

¹ Institute of Marine Sciences of Andalusia (ICMAN), Spanish National Research Council (CSIC), Puerto Real, 11510, Spain. * a.roman@csic.es

² NASA Goddard Space Flight Center/Science Systems and Applications Inc., Greenbelt, 20771, Maryland, United States.

³ Horn Point Laboratory, University of Maryland Center for Environmental Science (UMCES), Cambridge, 21613, Maryland, United States.



Poster # 162



This study highlights the potential of using **UAS equipped with multispectral sensors** to observe aquatic systems and help bridge the existing **observational gap** in coastal ocean-color remote sensing.

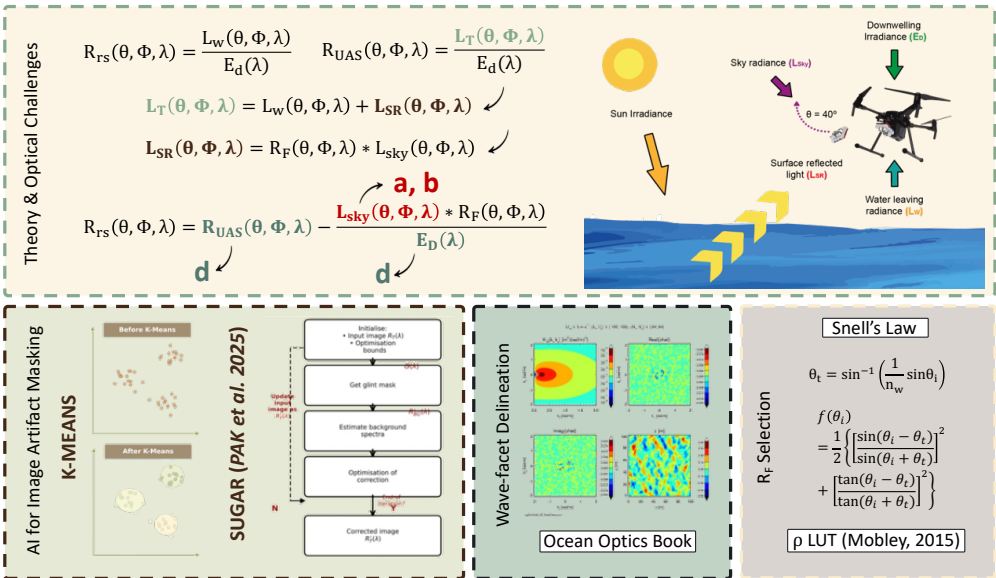
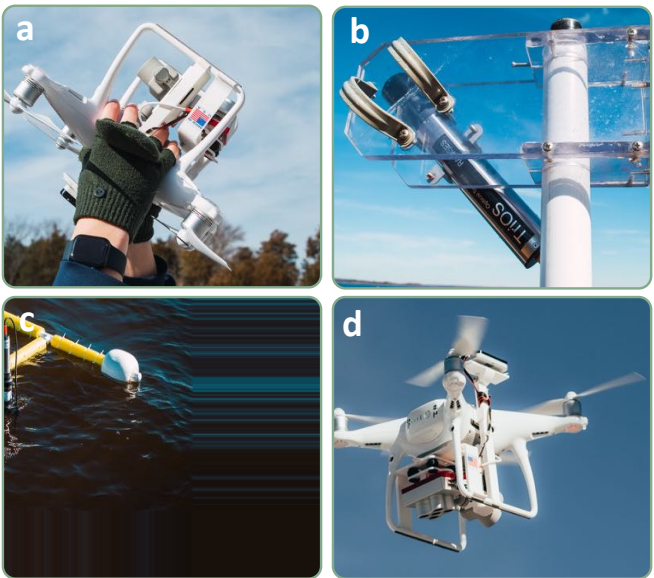


Future improvements to the method could focus on leveraging **deep learning** to optimize alignment, positioning, artifact masking (*i.e.* sun glint), and R_{rs} retrieval.

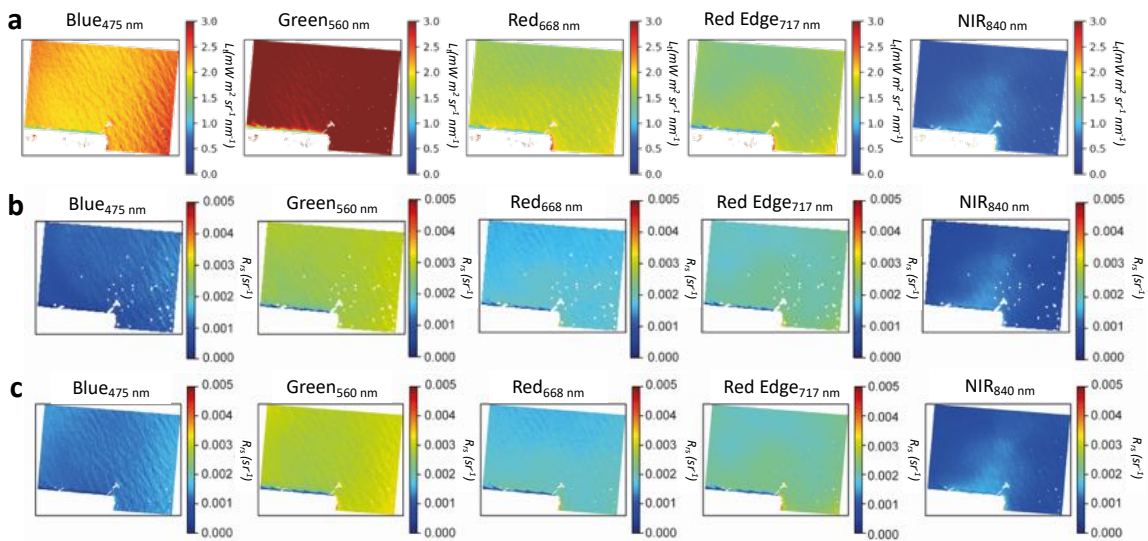
GOALS

- 1 To use **AI** to remove glint effects, whitecaps, and artifacts that could affect R_{rs} retrievals.
- 2 To address the optical challenge of removing L_{SR} when retrieving R_{rs} under **varying sky conditions**.
- 3 To evaluate a method for retrieving **ocean color** from **UAS** measurements using a 5-band **multispectral sensor**.
- 4 To compare and validate ocean-color products against **in-situ measurements**.

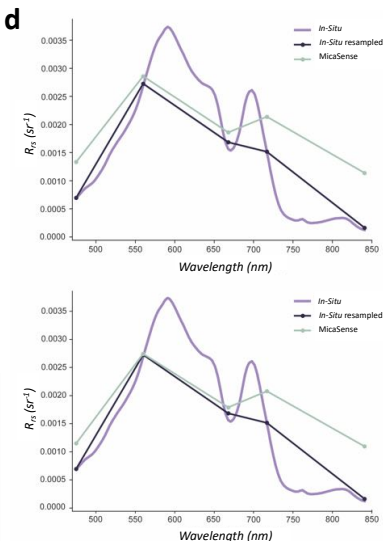
METHODS



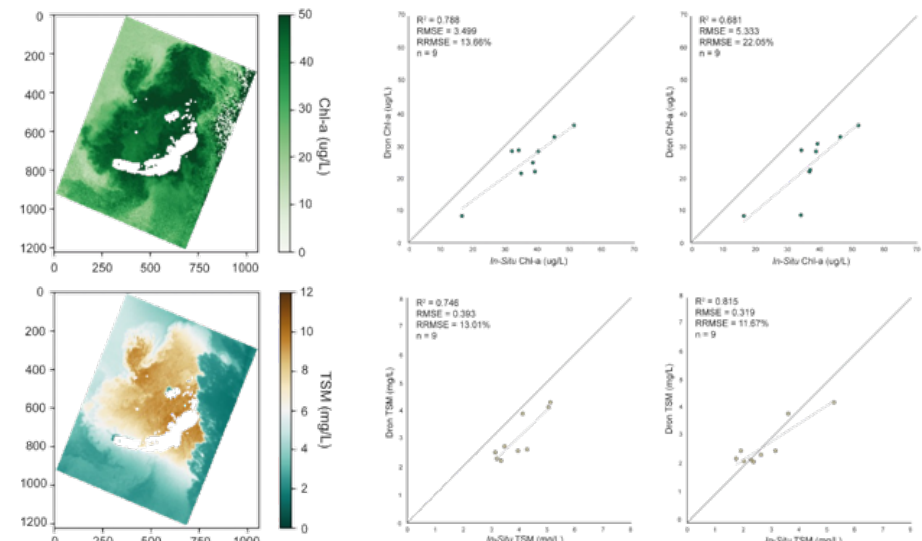
RESULTS



DATA COLLECTION



DATA PROCESSING



Poster # 165

Can Optical Water Types be used as ecological indicators?

Insights from a temperate estuary

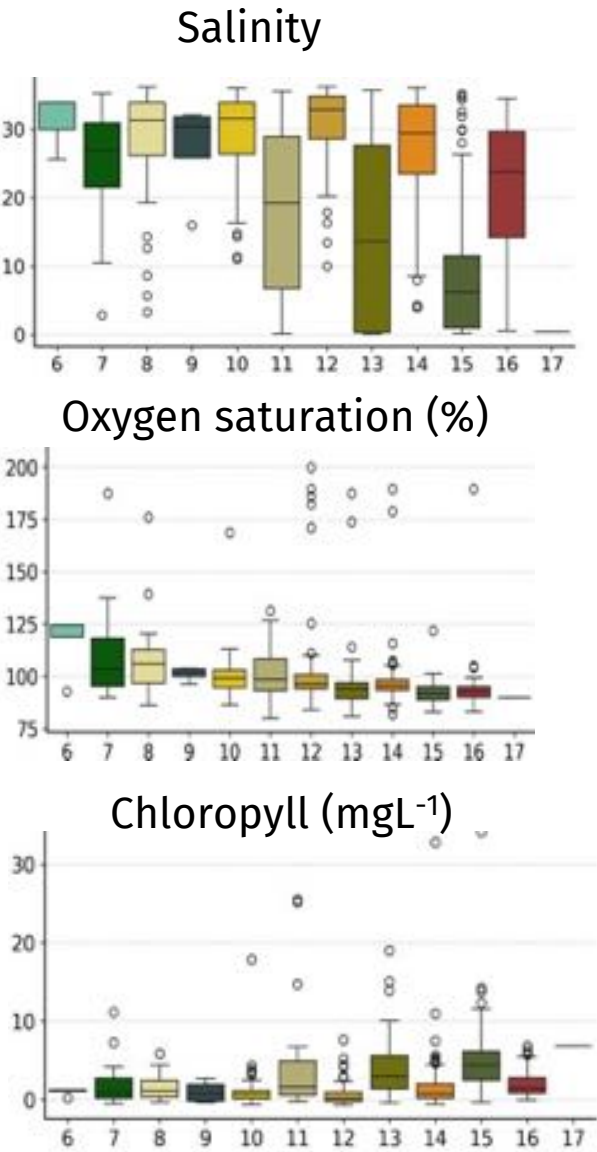
Sent, G., Spyrakos, E., Jackson T., Atwood E., Brotas V.,
Groom S., Brito A. C.



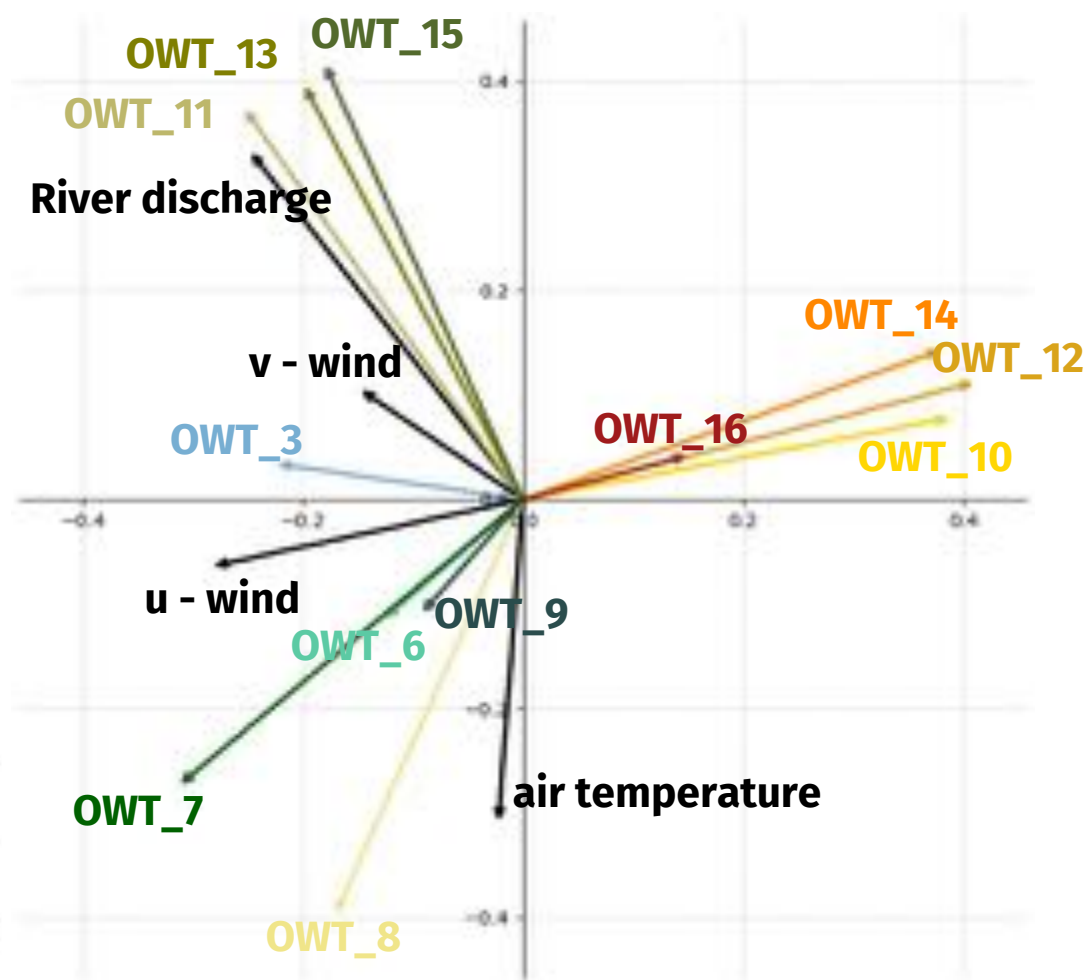
IOCS-2025 Darmstadt, 1-4 December

Poster # 165 Can Optical Water Types be used as ecological indicators?

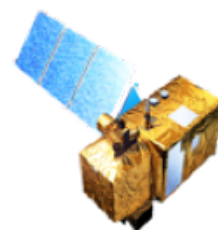
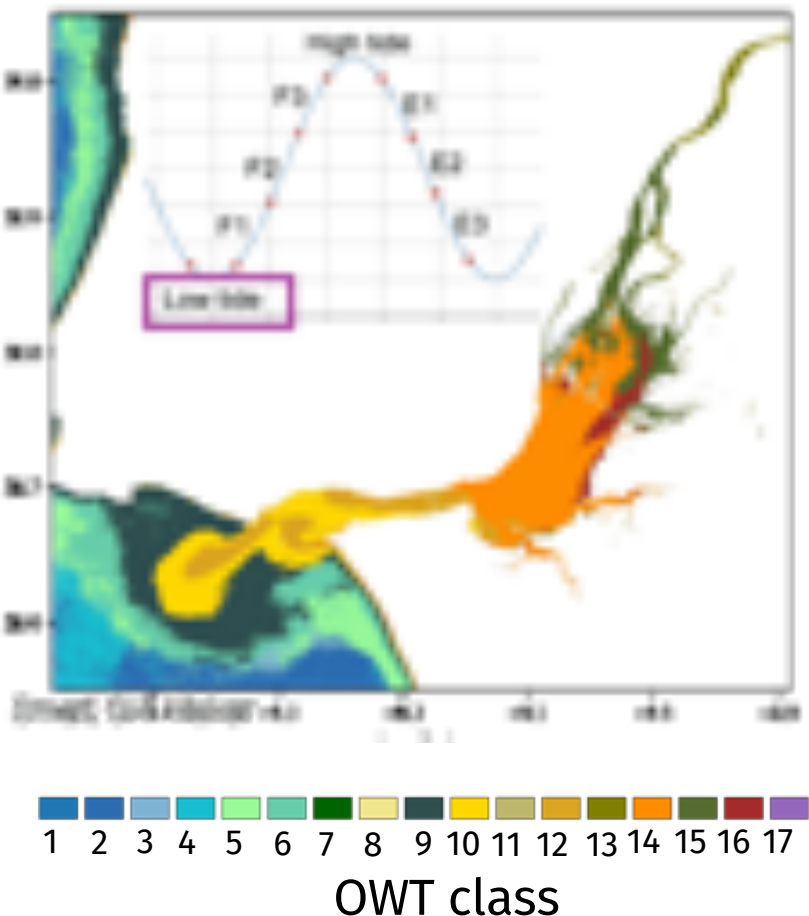
In situ data



Environmental forcings



Tidal variability





Sentinel 2 user-relevant water quality monitoring in small southern African water bodies

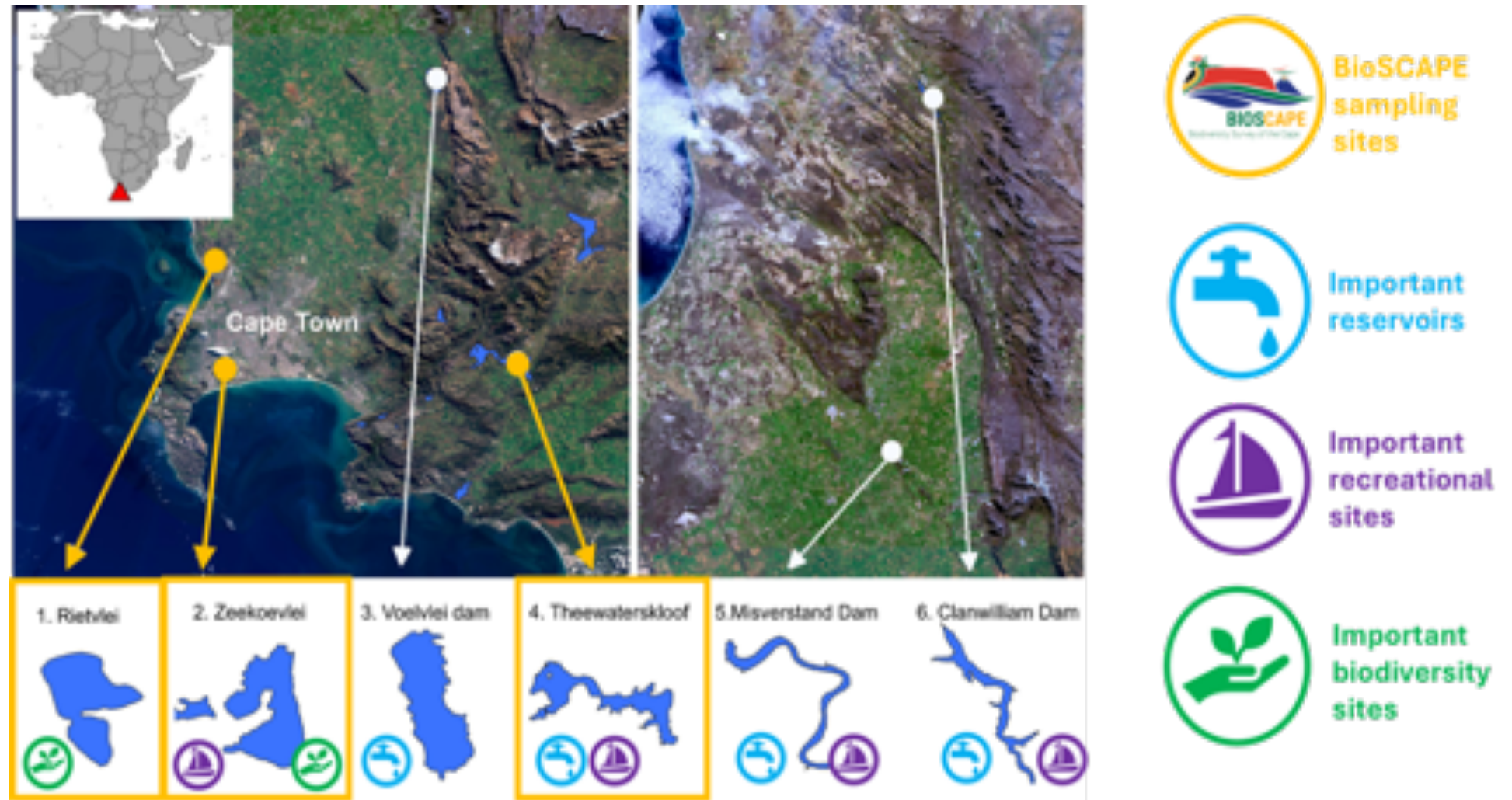
Marié E. Smith, Dalin Jiang, Evangelos Spyrakos, Humeshni Pillay



**UNIVERSITY of
STIRLING**



Poster # 167



- ✓ Recommendations for atmospheric correction & Chl-a retrieval algorithms
- ✓ Reusable cloud-based data processing workflows

Poster # 169

Intercomparison of EnMAP water-leaving reflectance from five atmospheric correction methods using global hyperspectral and multispectral in situ data

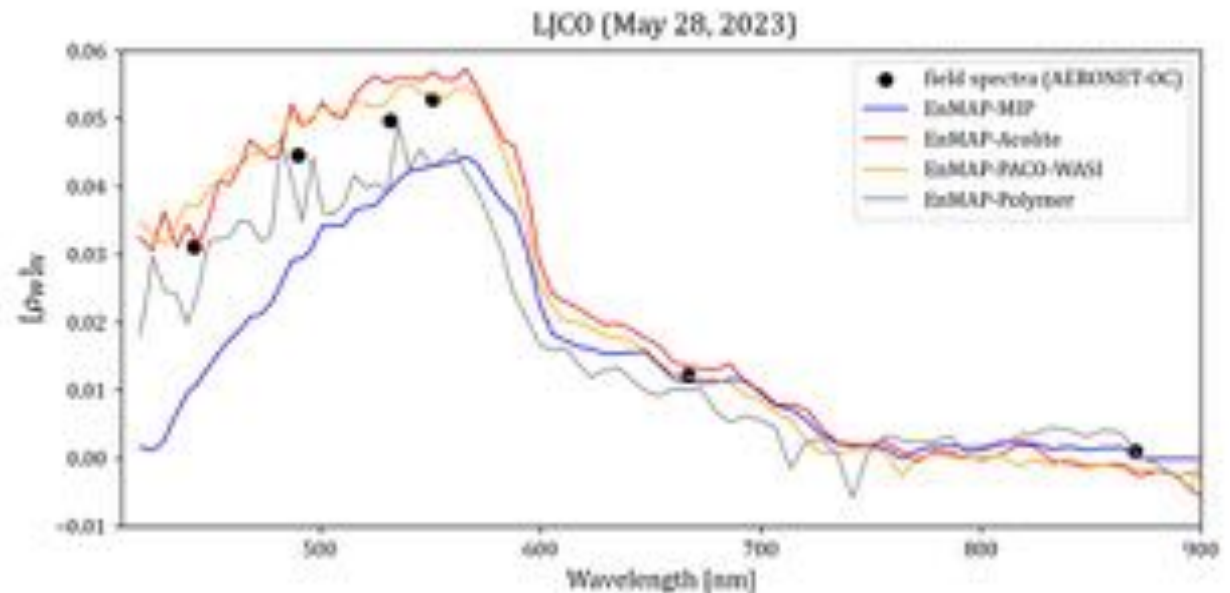
Mariana A. Soppa, Avotramalala N. Randrianalisoa, Sabine Chabrillat, Daniel Scheffler, Peter Gege, Tristan Harmel, Francois Steinmetz, Quinten Vanhellemont, Vittorio Brando, Mariano Bresciani, Simone Colella, Ana Dogliotti, David Doxaran, Claudia Giardino, Francesca Ortenzio, Nicole Pinnel, Kevin Ruddick, Thomas Schroeder, Ian Somlai, Dieter Vansteenwegen, Maximillian Langheinrich, Emiliano Carmona, Michael Bachmann, Miguel Pato, Astrid Bracher

Poster # 169

- EnMAP validation after 3 years in orbit.
- Worldwide collaborations with institutions acquiring in-situ data, essential for successful validation.
- Also key for atmospheric correction intercomparison performance: MIP, POLYMER, ACOLITE, hGRS and PACO-WASI.



EnMAP image acquired at the Lucinda Jetty Coastal Observatory.



Poster # 170

A Water Quality Service for the Coastal Zone - the Copernicus Marine High- Resolution Coastal Service

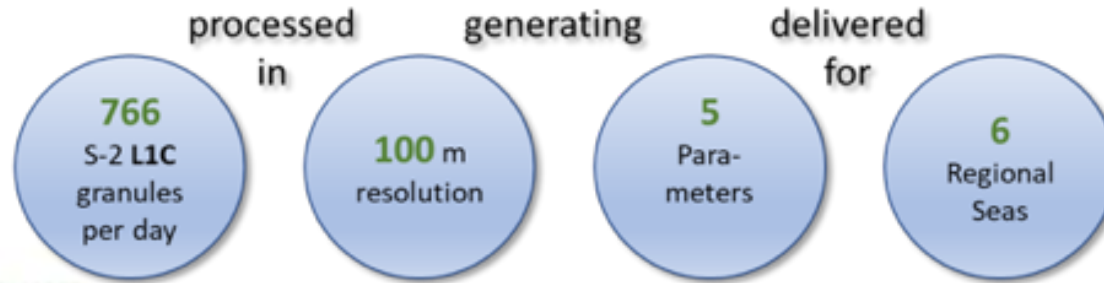
Kerstin Stelzer¹, Dimitry Van der Zande², Martin Böttcher¹, Carole
Lebreton¹, Quinten Vanhellemont²

¹ *Brockmann Consult*

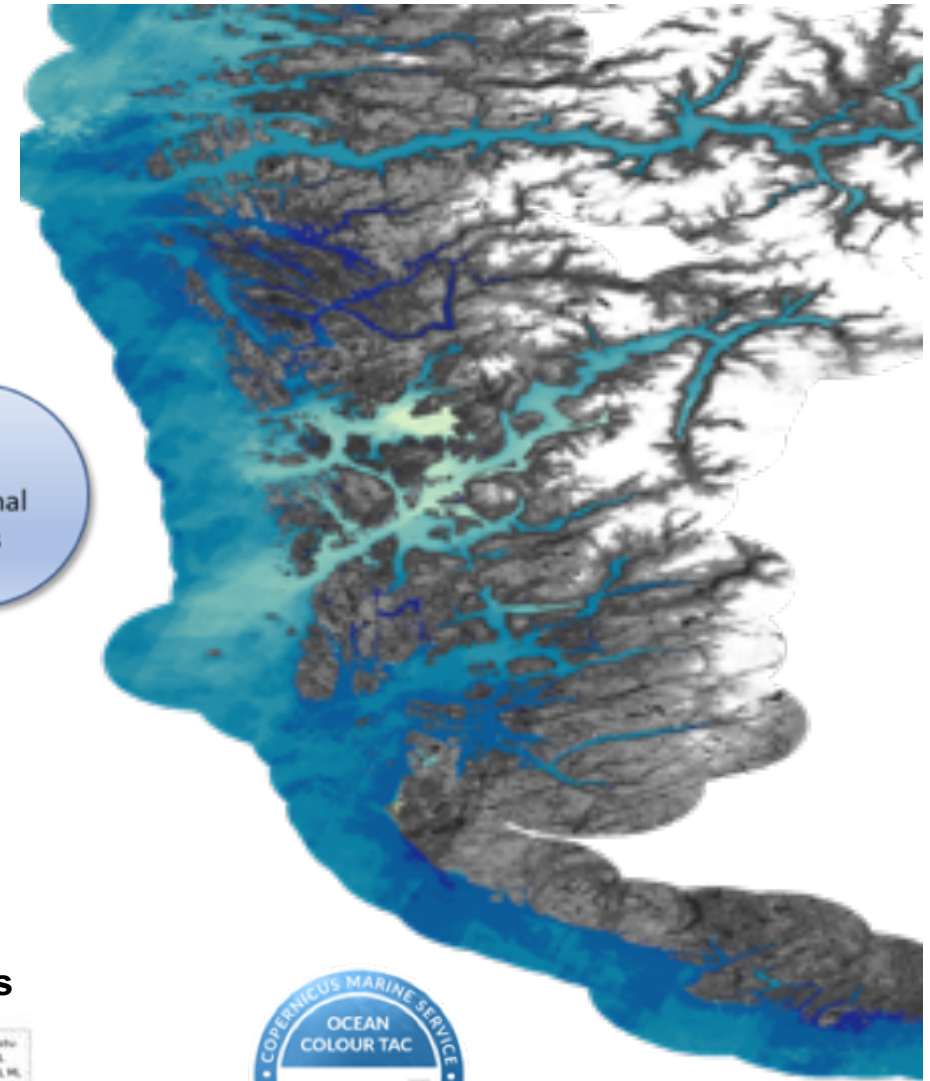
² *Royal Belgian Institute of Natural Sciences (RBINS)*

Poster # 170

The Copernicus Marine High-Resolution Coastal Service offers



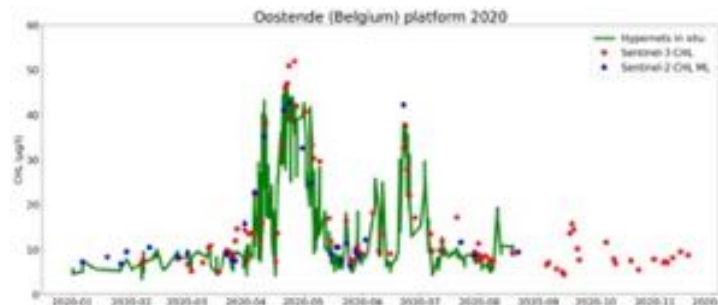
and is undergoing regular
evolutions and validation



Latest Evolution - Destriping



Validation of multi-sensor products



Poster # 171

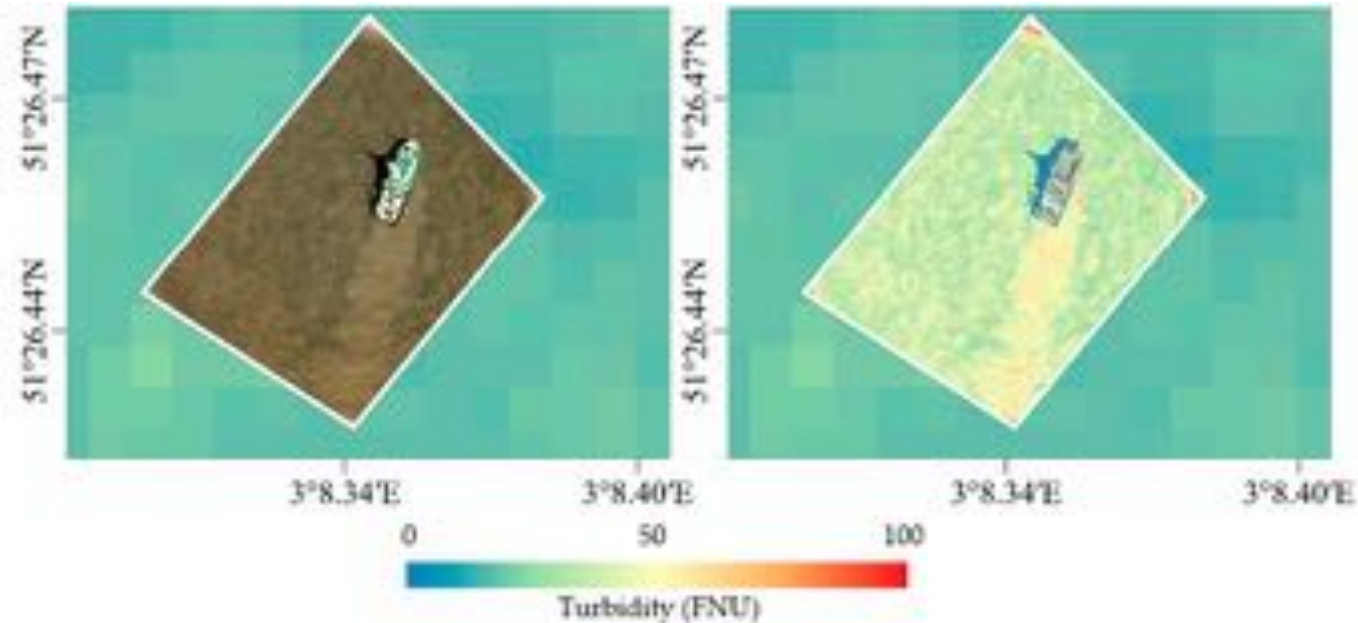
FRM4Drones-AQUA: Building a Framework for Fiducial Reference Measurements in Aquatic Remote Sensing with UAVs

Sindy Sterckx, Liesbeth De Keukelaere,
Agnieszka Bialek, Morven Sinclair

Poster # 171

FRM4DRONES-AQUATIC

Advancing Drone-Based Measurements
for Satellite Calibration and Validation of
Aquatic Reflectance



Poster # 172

Mapping floating macrophyte cover dynamics in Lake Vembanad, India

Emma Sullivan^{1,2}, Anas Abdulaziz³, Jasmin, C⁴, Grinson George⁵, Thomas Jackson⁶, Gemma Kulk^{1,2}, Nandini Menon⁴, R Ranith⁴, Dhritiraj Sengupta⁷, Varunan Theenathayalan⁸, Shubha Sathyendranath^{1,2}, Victor Martinez Vicente¹

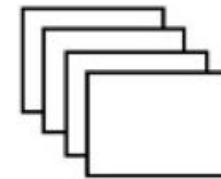
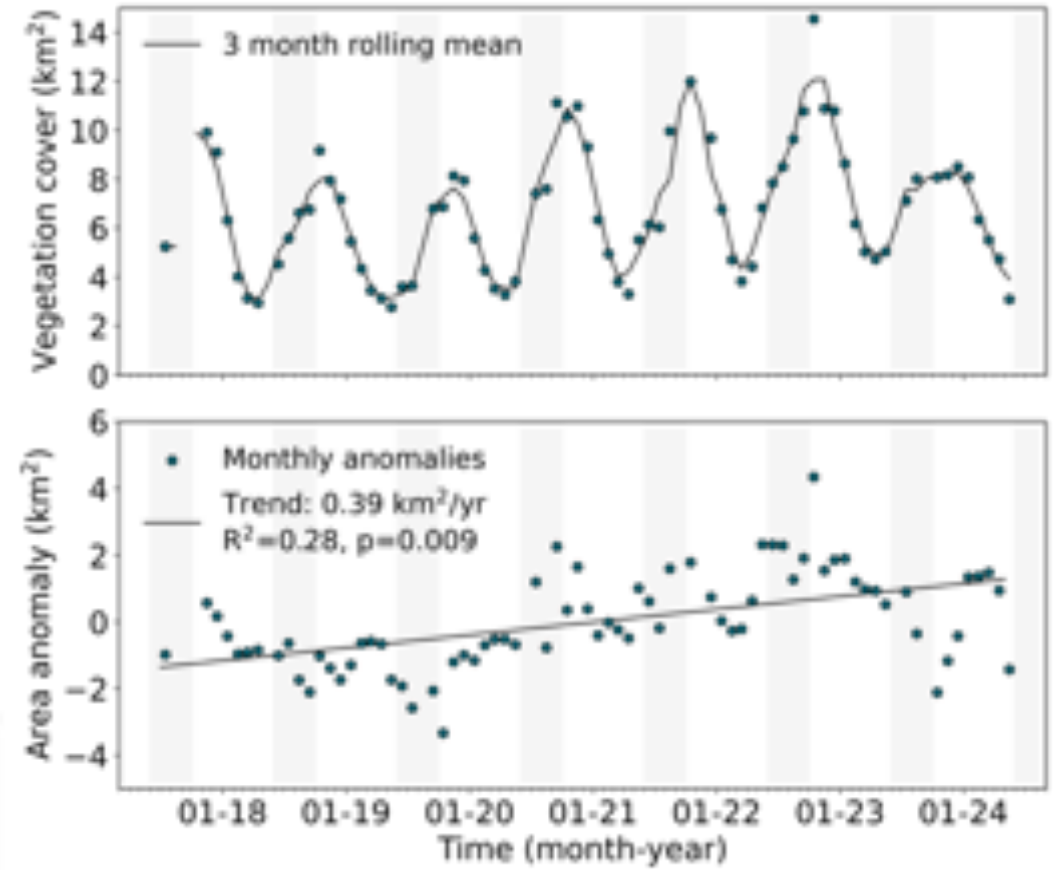
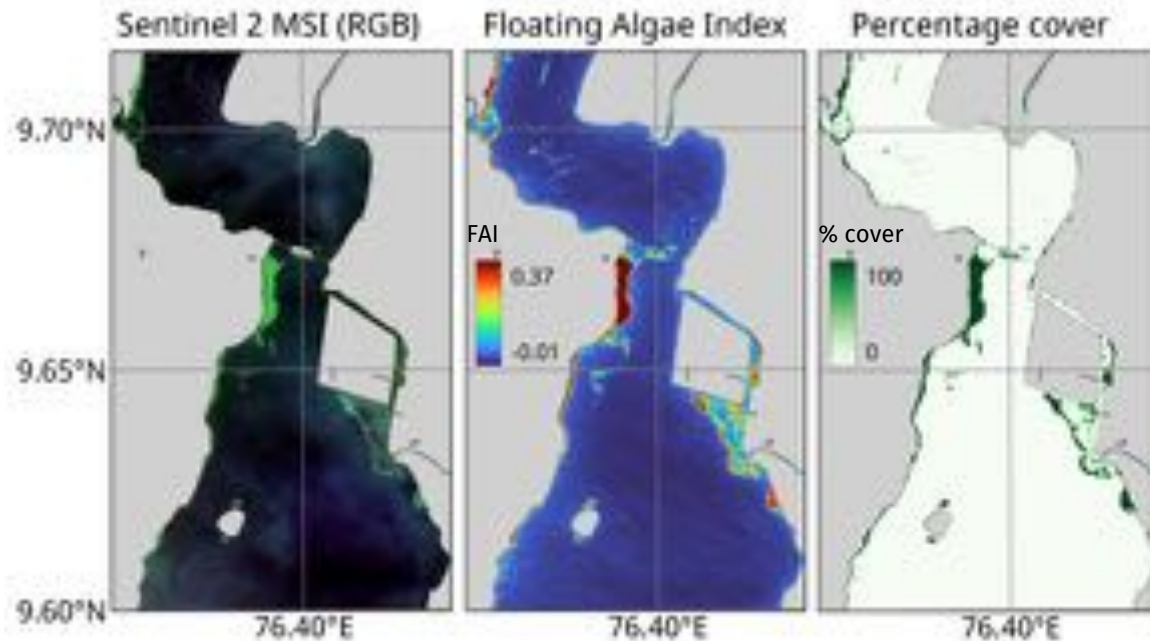
¹Plymouth Marine Laboratory, UK, ²National Centre for Earth Observation, UK, ³CSIR - National Institute of Oceanography, India, ⁴Nansen Environmental Research Centre, India, ⁵Central Marine Fisheries Research Institute (CMFRI), India, ⁶EUMETSAT Climate Services Group, Germany, ⁷GMV, UK, ⁸Environment and Climate Change Canada, Canada Centre for Inland Waters, Canada



Poster # 172



Sentinel 2



2017 - 2024

Poster No. 174

Retrieving chlorophyll-a across diverse optical waters using HY-3A CZI: The integrated and machine learning approaches

Liqiao Tian¹, Lan Zhang², Xiaomin Ye³, **Jingyi Tian^{4*}**

1. State Key Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing, Wuhan University, 430079, China. E-mail: tianliqiao@whu.edu.cn

2. State Key Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing, Wuhan University, 430079, China. E-mail: zhanglan2318@whu.edu.cn

3. National Satellite Ocean Application Service, 100081, China. E-mail: yxm@mail.nsoas.org.cn

4. Office of Science and Technology Development, Wuhan University, 430072, China.

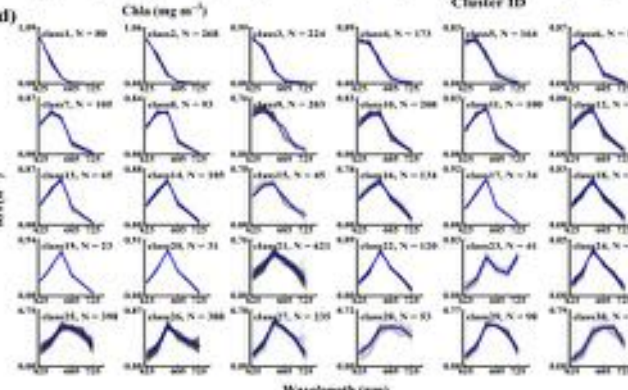
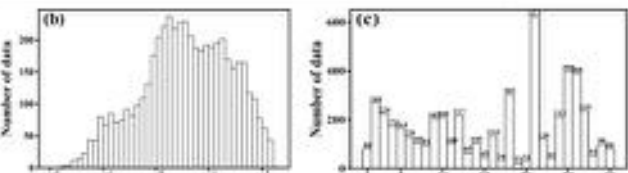
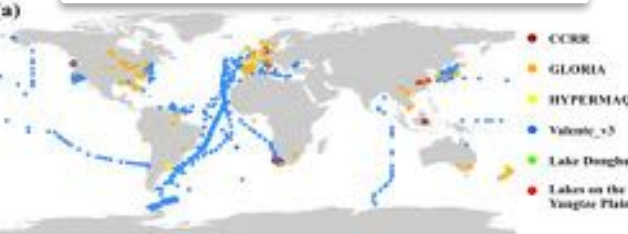
E-mail: tianjingyi@whu.edu.cn

Poster No. 174



HY-3A CZI

1. In-situ Data Collection

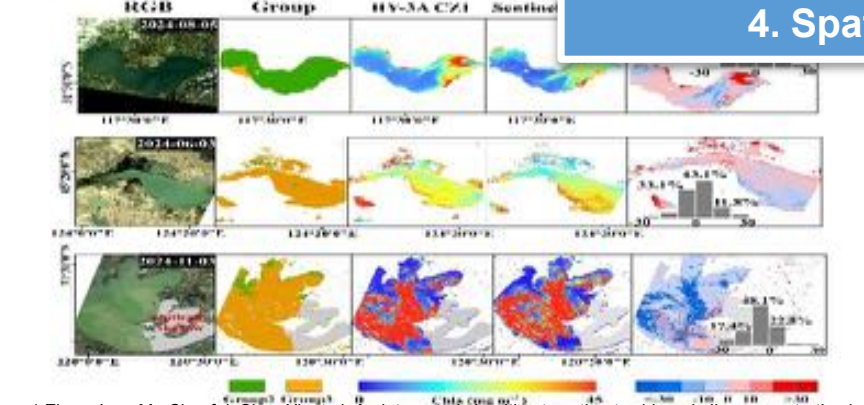
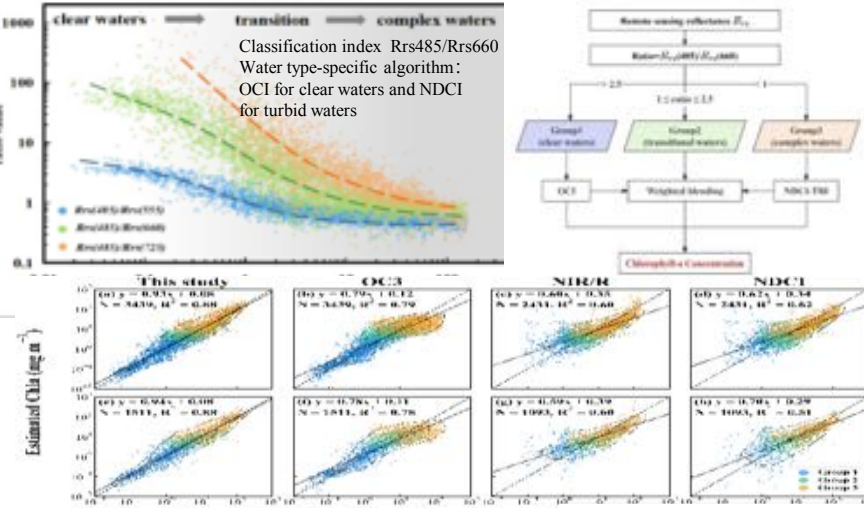


N	Min	Max	Mean	Med	Stdev
4950	0.017	159.07	14.64	3.79	24.83

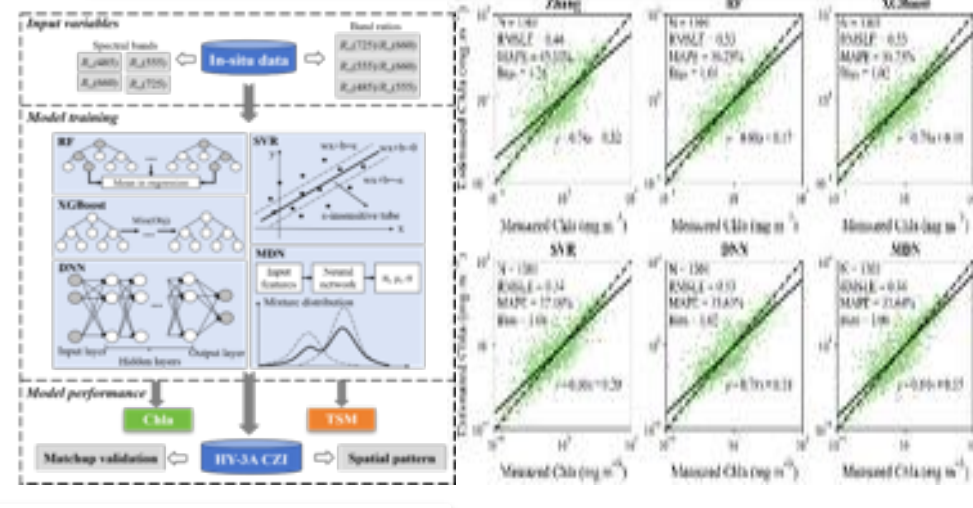
Achieving accurate Chl-a retrieval across optically diverse waters (clear / transitional / turbid)

- **Global in-situ Chla dataset:** N ≈ 5,000, covering inland, coastal, and marine waters with wide optical variability.
- **HY-3A CZI data:** 8 programmable VIS–NIR bands (425–950 nm) with 20 m spatial resolution.
- **Integrated algorithm:** water-type classification/OCI for clear waters / blended TBI/NDCI for turbid waters/weighted scheme for transitions.
- **Machine learning framework:** RF, SVR, XGBoost, DNN, and MDN models trained and validated on the global dataset.
- **The integrated method achieved $R^2 = 0.88$ (log scale) and strong spatial consistency with Sentinel-2 MSI.**
- **MDN was the best ML model (MAPE = 33.6%), capturing complex spatial gradients.**
- **Both approaches successfully applied to CZI Chl-a mapping and operationally deployed for large-scale monitoring.**

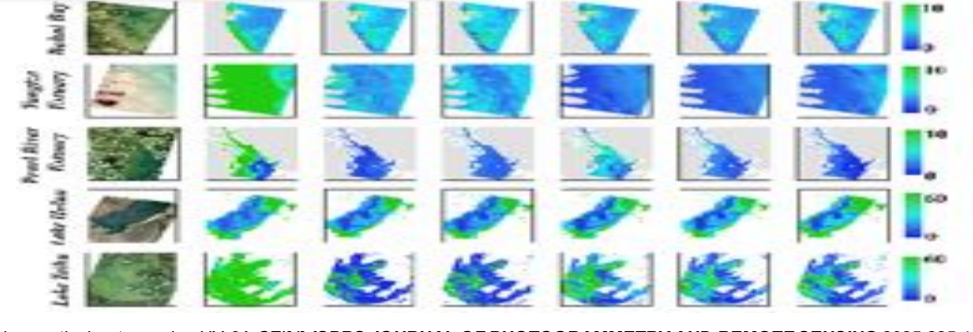
2. The Integrated Algorithm



3. Machine Learning Algorithm



4. Spatial Distribution



1. Zhang Lan, Ma Chaofei, Chen Xi, et al. An integrated algorithm to estimate chlorophyll-a concentration in various optical waters using HY-3A CZI[J]. *ISPRS JOURNAL OF PHOTOGRAMMETRY AND REMOTE SENSING*, 2025, 225: 402-422.

2. Zhang Lan, Zhang Chen, Ma Chaofei, et al. Machine learning-based retrieval of chlorophyll-a and total suspended matter from HY-3A CZI: Model development, validation, and application[J]. *ISPRS JOURNAL OF PHOTOGRAMMETRY AND REMOTE SENSING*, 2025, 227: 613-631.

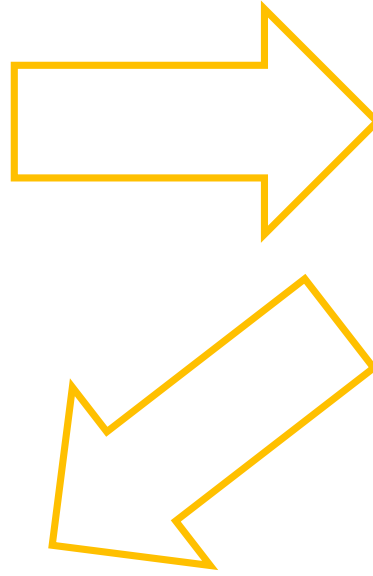
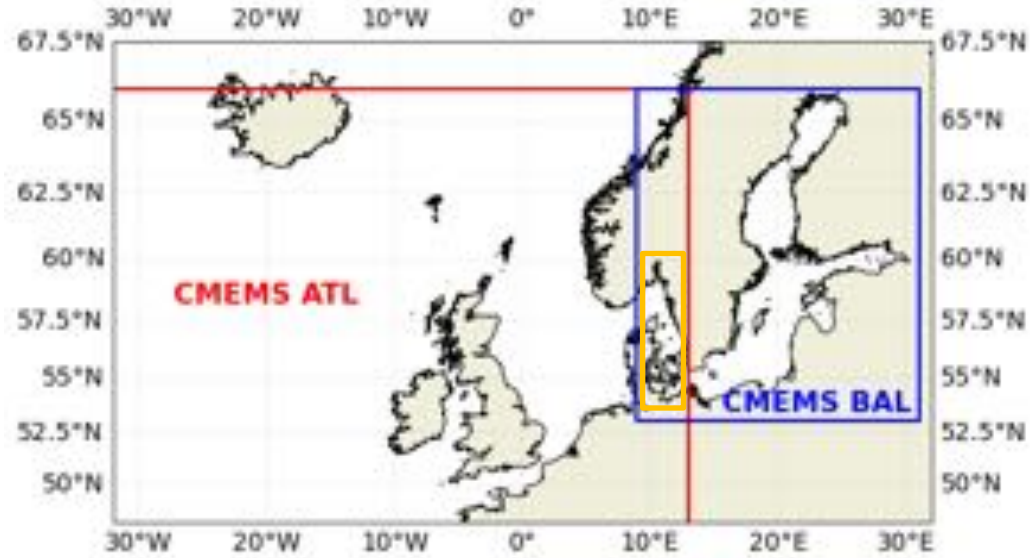
Poster # 175

Evaluation of Copernicus Ocean-Colour with in-situ data

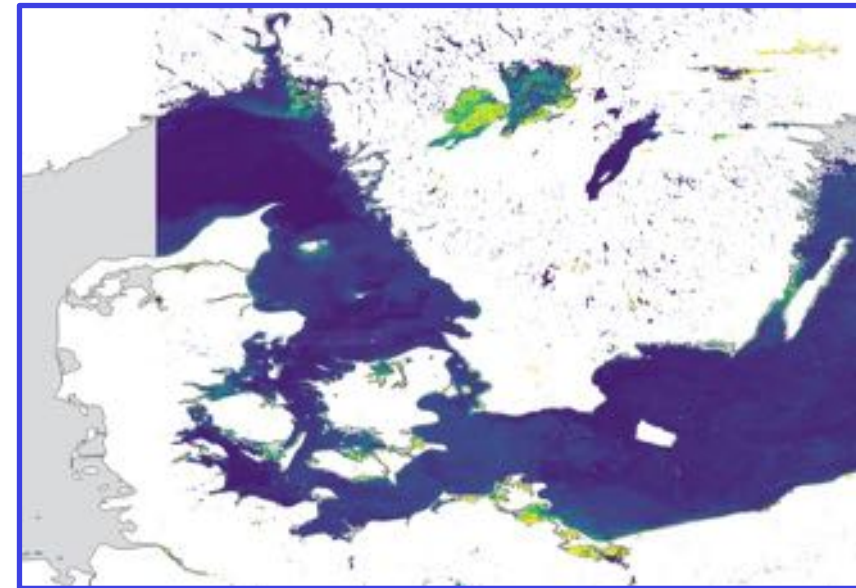
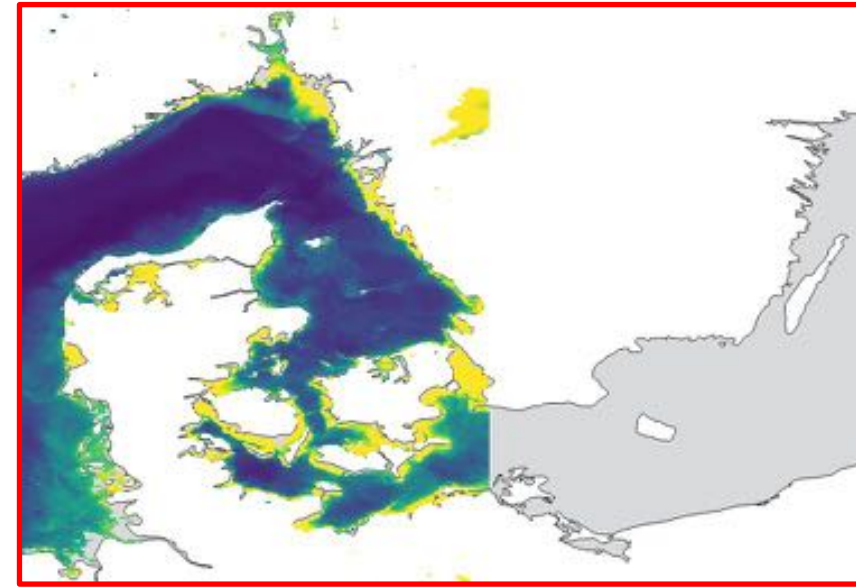
E.M. van der Lee, B. Cahill,
K. Heyer, A. Grage, L. Walden,
U. Gräwe, T. Brüning



Poster # 175



CMEMS ATL v. CMEMS BAL



Applications of Ocean Colour Data to Aid in Forecasting Harmful Algal Blooms

Lael Wakamatsu¹, Gregory Britten^{2,3}, Andy Fischer⁴, Christopher Bolch⁴, Jutarak Luang-on¹, Sherwood Lan Smith¹



Harmful Algal Blooms

1

Remote
sensing
applications

2

In situ data
collection

3

Statistical
modeling &
prediction
potential





International
Ocean Colour Science
Meeting 2025

Advancing Global Ocean Colour Observations

Poster Lightning Session 3B

END OF LIGHTNING TALKS