



1. Projets **HYPERNETS / HYPERNET-POP**  
(Mesures radiométriques hyperspectrales autonomes)

2. Le projet **HyperBOOST**  
(eaux côtières européennes, Tara)

3. Le projet **RIOMar**  
(évolution des eaux côtières françaises)

4. Le CES **ODATIS**  
(produits ODATIS-MR et réunion annuelle)

## H2020-HYPERNETS (R&D), 2018-2023

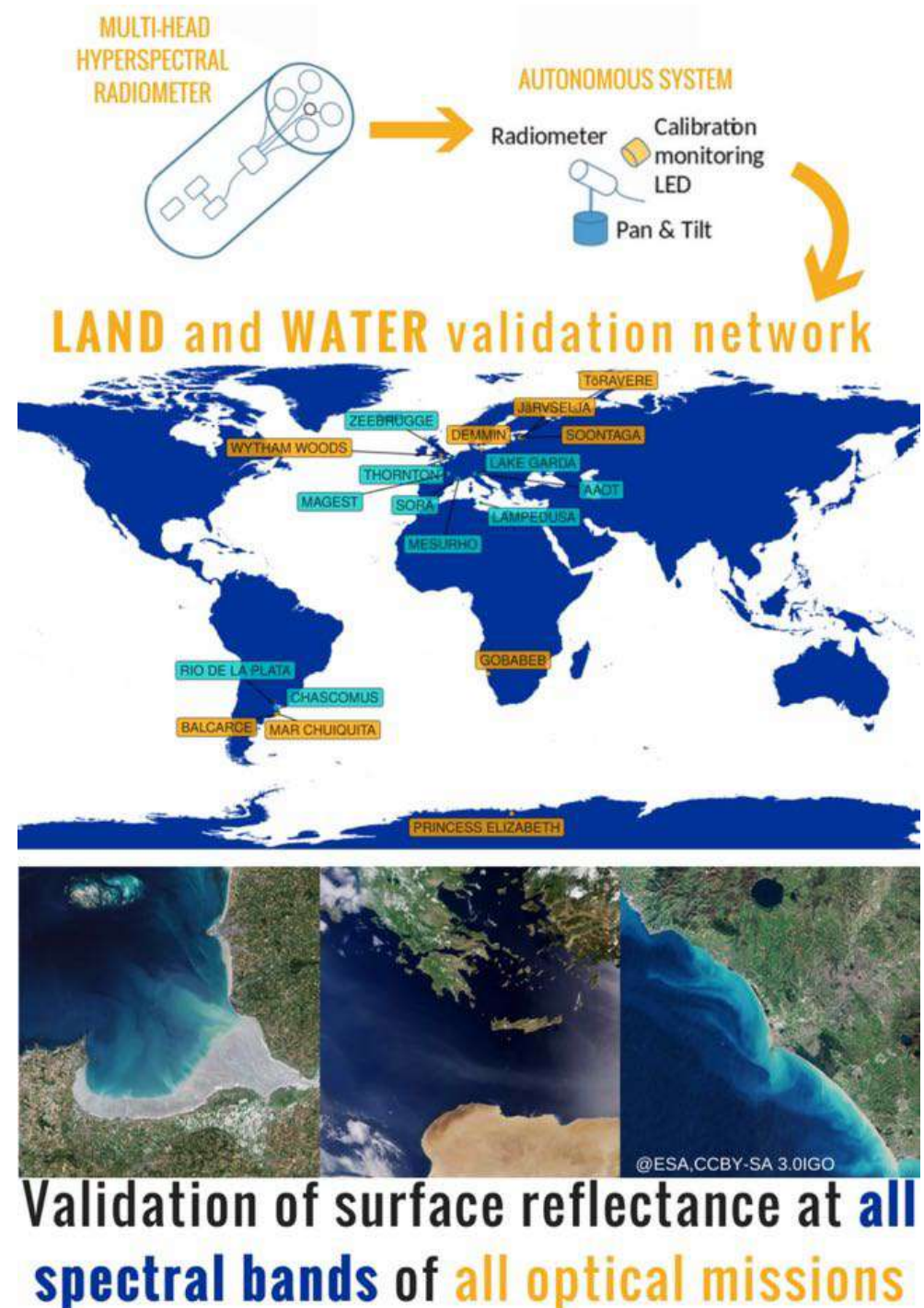
- Un nouveau radiomètre hyperspectral 'low-cost'
- Un système opératoire autonome
- Un réseau international mis en place (surfaces aquatiques et terrestres) pour la validation de la réflectance de surface (toutes missions satellitaires)

## ESA-HYPERNET-POP (operation), 2023-2027

- Maintenance de 1 à 3 sites par partenaire
- Validation des réflectances de surface
- Distribution des données

### Consortium:

RBINS, TARTU, LOV, NPL, CONICET, CNR, GFZ







Commercialisation en 2025 par la société  
RSware : <https://hypstar.eu>

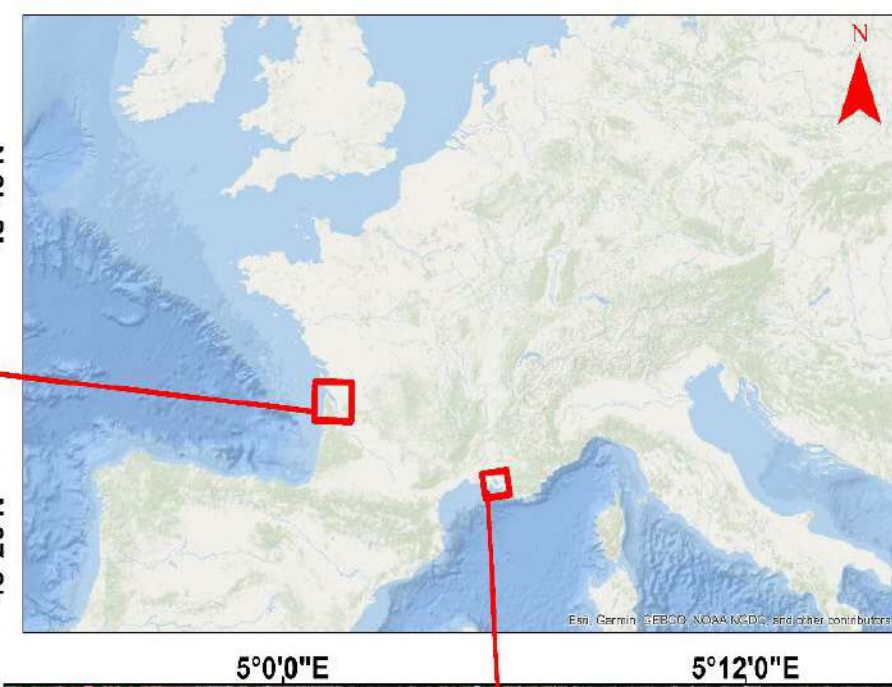
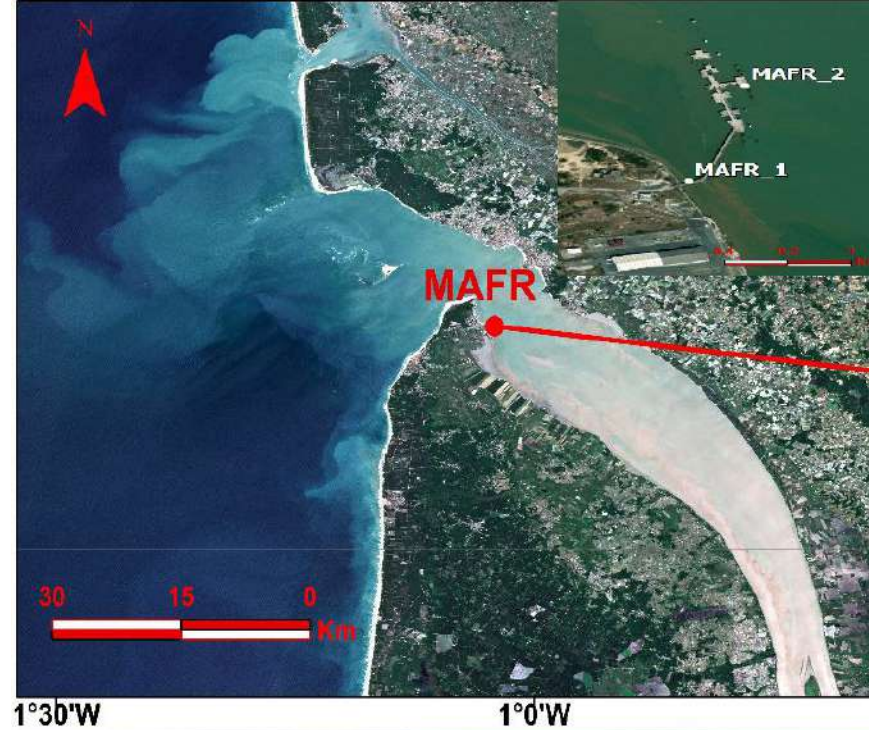


Parameter	HYPSTAR-SR radiometer
Measured quantity	Radiance and irradiance (multiplexed)
Field of view	2° (radiance), 180° (irradiance)
Detector array	2048 px Si
Spectral range	380 ... 1020 nm
Spectral sampling interval	0.5 nm
Spectral resolution	3 nm
ADC resolution	16 bit
Integration time	1...65535 ms
Shutter	Internal
Target camera	5 Mpx, RGB
Communication interface	RS485, half duplex, 115.2 ... 8000 kbps
Housing material	Anodised marine grade aluminium
Dimensions (DxL)	ø110.3 x 267 mm
Weight	1.5 kg
Power supply	8 ... 18 V DC, 0.5 A
Environmental protection	IP67
Operating temperature	-25 ... +45 °C
Storage temperature	-35 ... +70 °C

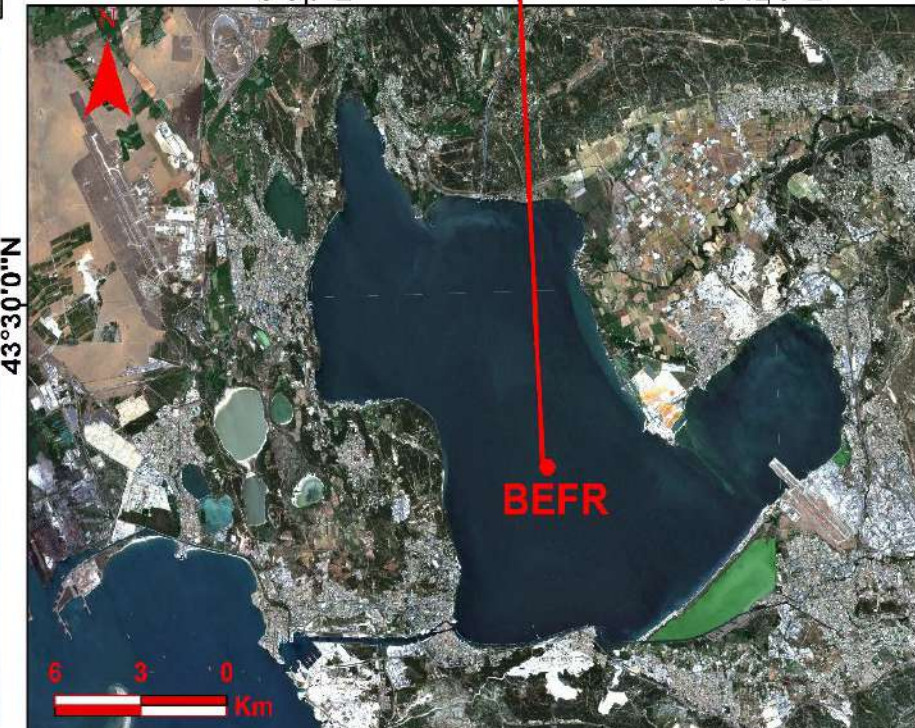


## HYPERNETS data:

- Center of the optically complex **Berre coastal lagoon** (SE France) (phyto. Blooms, river discharge):  
HYPERNETS system v1>v3 in operation (every 30 mn) since February 2021



- Mouth of the highly turbid **Gironde Estuary** (SW France):  
HYPERNETS system v2 in operation (every 15 mn) since November 2021





# En France, 3 sites aquatiques : lagune côtière, estuaire et embouchure de fleuve

## New HYPERNETS data:

- **Mouth of Rhône River** (SE France)  
(river discharge):  
HYPERNETS system v3  
in operation (every 30 mn)  
since December 2023



**Multi-sensor scientific platform  
(IFREMER, LSCE):**  
Wind, rain,  
T, S, Turb, Fluo,  
ADCP,  
sediment traps

**Séquence de mesures standard : 3 E<sub>d</sub>, 3 L<sub>s</sub>, 6 L<sub>u</sub>, 3 E<sub>d</sub> (Mobley 1999) puis transfert et QC → Rw**

# Distribution de jeux de données initiaux (15 sites) : zenodo

[Communities](#)[My dashboard](#)[Log in](#)[Sign up](#)

15 result(s) found

Sort by Best match

## Versions

View all versions

## Access status

Open

## Resource types

Dataset

Lesson

## Subjects

HYPSTAR

hyperspectral

satellite validation

multi-angular

optical properties

environment

June 19, 2023 (1.2) Dataset Open

### Initial Sample of HYPERNETS Hyperspectral Water Reflectance Measurements for Satellite Validation from the LPAR site (Argentina)

Dogliotti, Ana I. ; Piegari, Estefania ; Rubinstein, Lucas ; and 1 other

The HYPERNETS project ([www.hypernets.eu](http://www.hypernets.eu)) has the overall aim to ensure that high quality in situ measurements are available to support the (VNIR/SWIR) optical Copernicus products. Therefore, it established a new autonomous hyperspectral spectroradiometer (HYPSTAR® - [www.hypstar.eu](http://www.hypstar.eu)) dedicated to land and water surface reflectance validation with ...

15

Uploaded on June 19, 2023

46 5

June 19, 2023 (v1.2) Dataset Open

### Initial Sample of HYPERNETS Hyperspectral Water Reflectance Measurements for Satellite Validation at the mouth of the Gironde Estuary, MAFR site (France)

Doxaran, David ; Corizzi, Alexandre

The HYPERNETS project ([www.hypernets.eu](http://www.hypernets.eu)) has the overall aim to ensure that high quality in situ measurements are available to support the (VNIR/SWIR) optical Copernicus products. Therefore, it established a new autonomous hyperspectral spectroradiometer (HYPSTAR® - [www.hypstar.eu](http://www.hypstar.eu)) dedicated to land and water surface reflectance validation with ...

14

1

Uploaded on June 19, 2023

42 7

June 19, 2023 (v1.2) Dataset Open

### Initial Sample of HYPERNETS Hyperspectral Water Reflectance Measurements for Satellite Validation at Lake Garda, GAIT site (Italy)

Brando, Vittorio ; Gonzalez Vilas, Luis ; Bresciani, Mariano ; and 3 others

The HYPERNETS project ([www.hypernets.eu](http://www.hypernets.eu)) has the overall aim to ensure that high quality in situ measurements are available to support the (VNIR/SWIR) optical Copernicus products. Therefore, it established a new autonomous hyperspectral spectroradiometer (HYPSTAR® - [www.hypstar.eu](http://www.hypstar.eu)) dedicated to land and water surface reflectance validation with ...

9

9

6

6

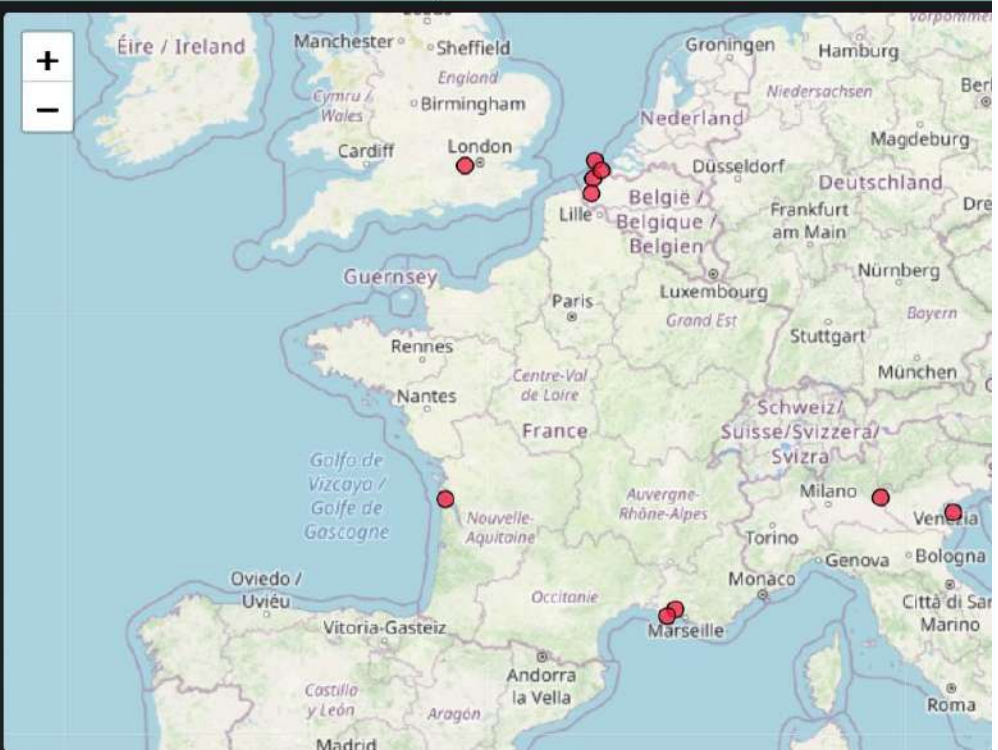
Uploaded on June 19, 2023

56 6





WATERHYPERNET - hyperspectral water reflectance data for satellite validation



2 types de systèmes :  
Le **HYPSTAR** et le **PANTHYR**  
PI : K. Ruddick (RBINS)

Submission  
Submission closed

Sections

S2-MSI  
S3-OLCI  
L8/9-OLI  
MODIS,  
VIIRS  
PRISMA  
ENMAP  
DSIS  
PACE  
CHIME



SUBMISSION CLOSED

### Optical Radiometry and Satellite Validation

Agnieszka Bialek · David Doxaran · Vittorio Ernesto Brando · Clemence Goyens · Kevin Ruddick · Ana Ines Dogliotti

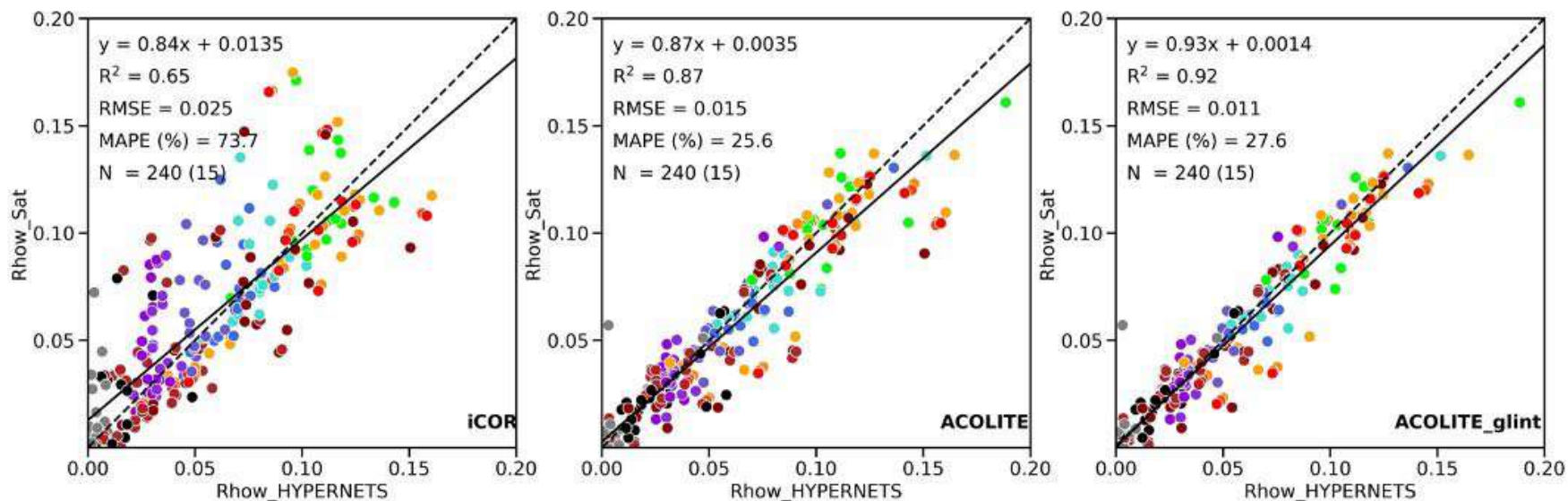
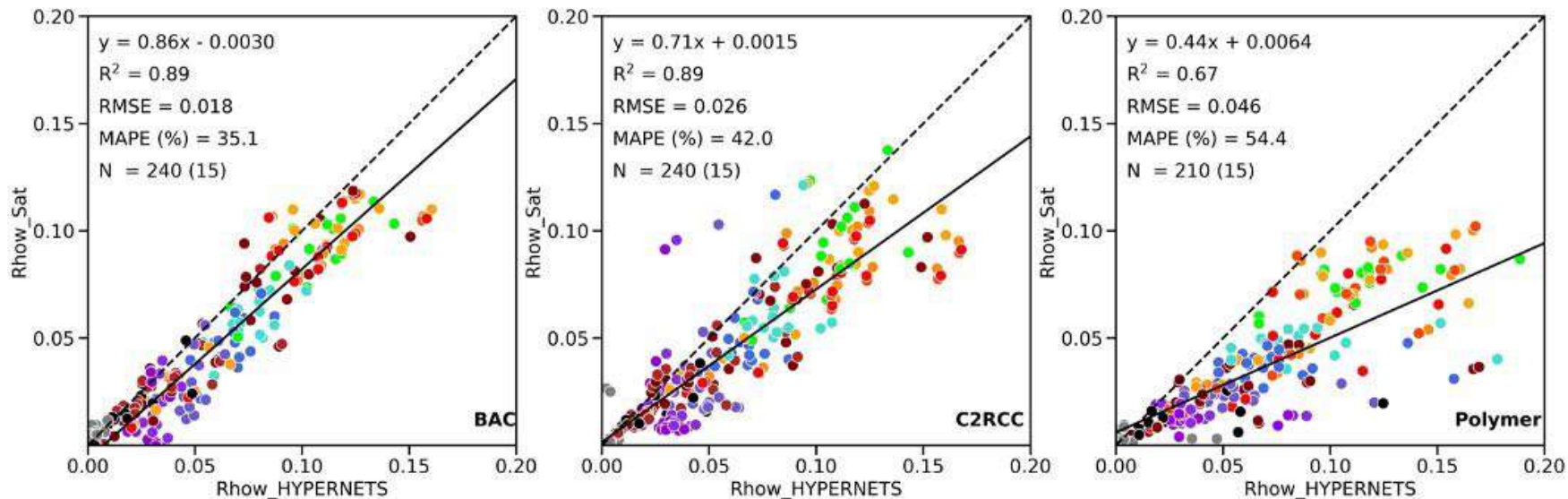
5,632 views 11 articles

# Results:

## Seawater reflectance retrieval

S3-OLCI

Gironde

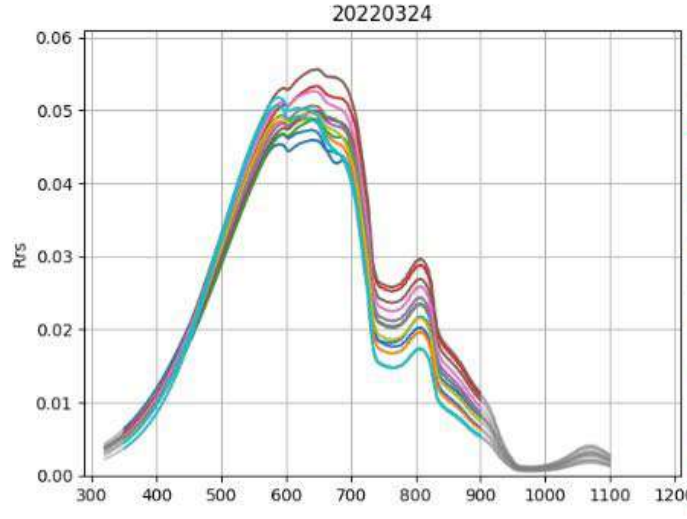
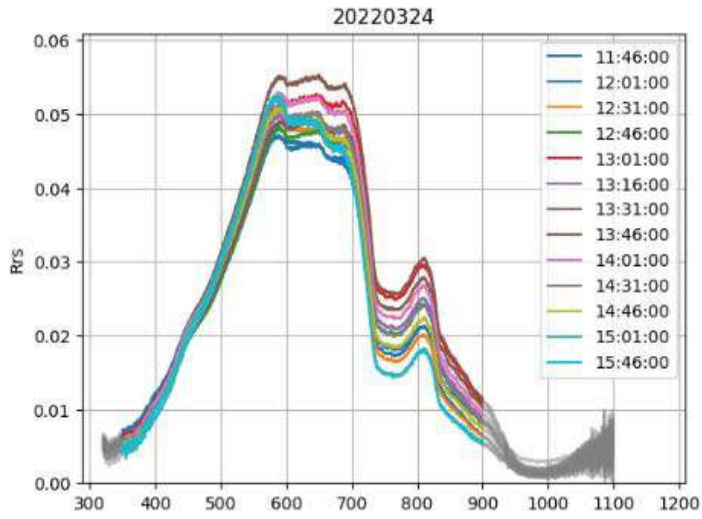


Doxaran et al. (2023)

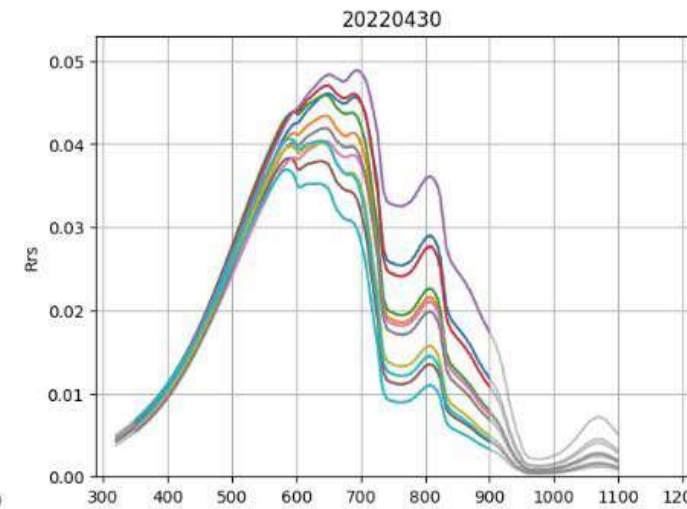
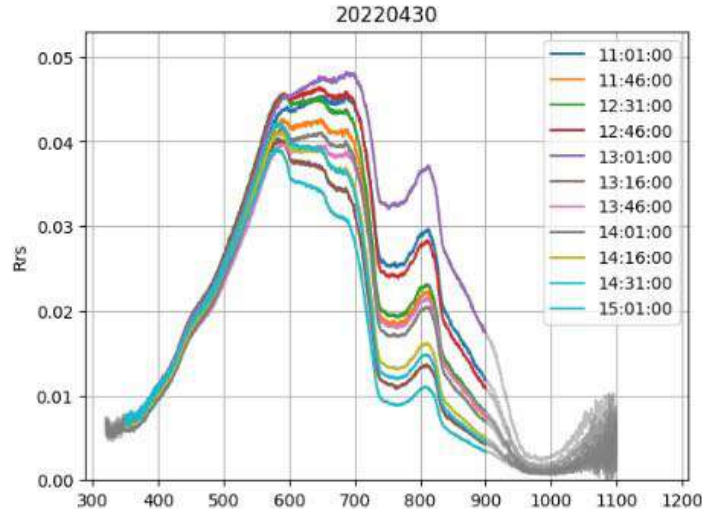


# Modelling the full HYPERNETS spectra (in and out the saturation regime)

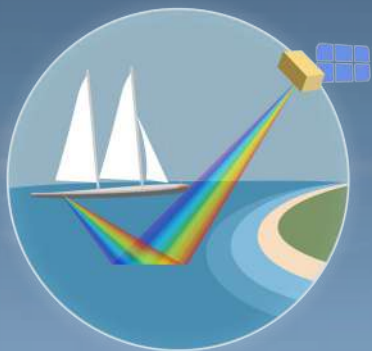
→ 6 unknowns outside saturation:  $X = \left( \frac{a_{p0}^*}{b_{bp0}^*}, \frac{a_{p\infty}^*}{b_{bp\infty}^*}, b_{bp0}, S, \gamma, Chl \right)$



11:46:00	$a_p^*/b_{bp0}^*=3.05$	$S=0.014$	$\gamma=0.544$	$a_p^*/b_{bp}^*inf=0.44$	$b_{bp0}=1.484$	$chl=0.00$
12:01:00	$a_p^*/b_{bp0}^*=4.13$	$S=0.016$	$\gamma=1.427$	$a_p^*/b_{bp}^*inf=0.32$	$b_{bp0}=1.857$	$chl=9.70$
12:31:00	$a_p^*/b_{bp0}^*=3.75$	$S=0.015$	$\gamma=1.211$	$a_p^*/b_{bp}^*inf=0.29$	$b_{bp0}=1.594$	$chl=2.89$
12:46:00	$a_p^*/b_{bp0}^*=3.97$	$S=0.015$	$\gamma=1.201$	$a_p^*/b_{bp}^*inf=0.31$	$b_{bp0}=2.061$	$chl=4.97$
13:01:00	$a_p^*/b_{bp0}^*=3.56$	$S=0.015$	$\gamma=1.095$	$a_p^*/b_{bp}^*inf=0.28$	$b_{bp0}=2.579$	$chl=3.29$
13:16:00	$a_p^*/b_{bp0}^*=3.76$	$S=0.015$	$\gamma=1.144$	$a_p^*/b_{bp}^*inf=0.32$	$b_{bp0}=2.127$	$chl=2.97$
13:31:00	$a_p^*/b_{bp0}^*=3.84$	$S=0.015$	$\gamma=1.072$	$a_p^*/b_{bp}^*inf=0.35$	$b_{bp0}=2.475$	$chl=2.30$
13:46:00	$a_p^*/b_{bp0}^*=3.44$	$S=0.015$	$\gamma=0.991$	$a_p^*/b_{bp}^*inf=0.26$	$b_{bp0}=2.517$	$chl=0.17$
14:01:00	$a_p^*/b_{bp0}^*=3.57$	$S=0.016$	$\gamma=1.075$	$a_p^*/b_{bp}^*inf=0.31$	$b_{bp0}=2.212$	$chl=2.11$
14:31:00	$a_p^*/b_{bp0}^*=3.81$	$S=0.016$	$\gamma=1.089$	$a_p^*/b_{bp}^*inf=0.33$	$b_{bp0}=1.971$	$chl=0.00$
14:46:00	$a_p^*/b_{bp0}^*=3.86$	$S=0.016$	$\gamma=1.103$	$a_p^*/b_{bp}^*inf=0.35$	$b_{bp0}=1.801$	$chl=0.43$
15:01:00	$a_p^*/b_{bp0}^*=3.87$	$S=0.018$	$\gamma=1.352$	$a_p^*/b_{bp}^*inf=0.28$	$b_{bp0}=1.430$	$chl=5.81$
15:46:00	$a_p^*/b_{bp0}^*=4.06$	$S=0.018$	$\gamma=1.164$	$a_p^*/b_{bp}^*inf=0.35$	$b_{bp0}=1.382$	$chl=1.29$



11:01:00	$a_p^*/b_{bp0}^*=3.97$	$S=0.013$	$\gamma=0.945$	$a_p^*/b_{bp}^*inf=0.36$	$b_{bp0}=2.686$	$chl=9.06$
11:46:00	$a_p^*/b_{bp0}^*=4.07$	$S=0.013$	$\gamma=1.101$	$a_p^*/b_{bp}^*inf=0.37$	$b_{bp0}=1.837$	$chl=7.73$
12:31:00	$a_p^*/b_{bp0}^*=3.79$	$S=0.014$	$\gamma=1.062$	$a_p^*/b_{bp}^*inf=0.34$	$b_{bp0}=1.882$	$chl=5.65$
12:46:00	$a_p^*/b_{bp0}^*=3.69$	$S=0.013$	$\gamma=0.958$	$a_p^*/b_{bp}^*inf=0.34$	$b_{bp0}=2.442$	$chl=7.87$
13:01:00	$a_p^*/b_{bp0}^*=3.65$	$S=0.013$	$\gamma=0.899$	$a_p^*/b_{bp}^*inf=0.35$	$b_{bp0}=4.061$	$chl=13.77$
13:16:00	$a_p^*/b_{bp0}^*=3.97$	$S=0.013$	$\gamma=0.920$	$a_p^*/b_{bp}^*inf=0.42$	$b_{bp0}=0.965$	$chl=3.85$
13:46:00	$a_p^*/b_{bp0}^*=4.22$	$S=0.013$	$\gamma=1.006$	$a_p^*/b_{bp}^*inf=0.47$	$b_{bp0}=1.837$	$chl=6.80$
14:01:00	$a_p^*/b_{bp0}^*=4.35$	$S=0.014$	$\gamma=1.103$	$a_p^*/b_{bp}^*inf=0.41$	$b_{bp0}=1.698$	$chl=5.78$
14:16:00	$a_p^*/b_{bp0}^*=4.15$	$S=0.014$	$\gamma=1.177$	$a_p^*/b_{bp}^*inf=0.39$	$b_{bp0}=1.272$	$chl=6.56$
14:31:00	$a_p^*/b_{bp0}^*=3.96$	$S=0.014$	$\gamma=1.131$	$a_p^*/b_{bp}^*inf=0.37$	$b_{bp0}=1.120$	$chl=5.13$
15:01:00	$a_p^*/b_{bp0}^*=3.71$	$S=0.012$	$\gamma=0.911$	$a_p^*/b_{bp}^*inf=0.43$	$b_{bp0}=0.766$	$chl=4.24$



# HyperBOOST

Hyperspectral Bio-Optical  
Observations Sailing on *Tara*

## WP2 in-situ data collection and processing



Project partners

Collaborating with

**PML** | Plymouth Marine  
Laboratory

**LOV** — LABORATOIRE  
D'Océanographie  
DE VILLEFRANCHE

1865 THE UNIVERSITY OF  
**MAINE**

**CNR ISMAR**  
ISTITUTO NAZIONALE  
PER LO STUDIO  
E LE RICERCHE  
MAREMARE

**ibf**  
CNR - Istituto di Biofisica

**EMBL**



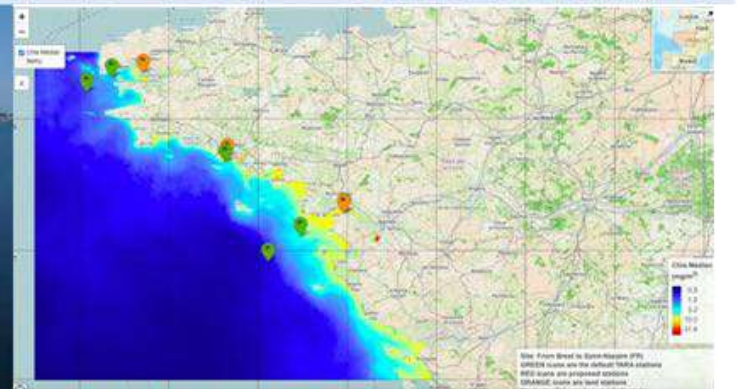
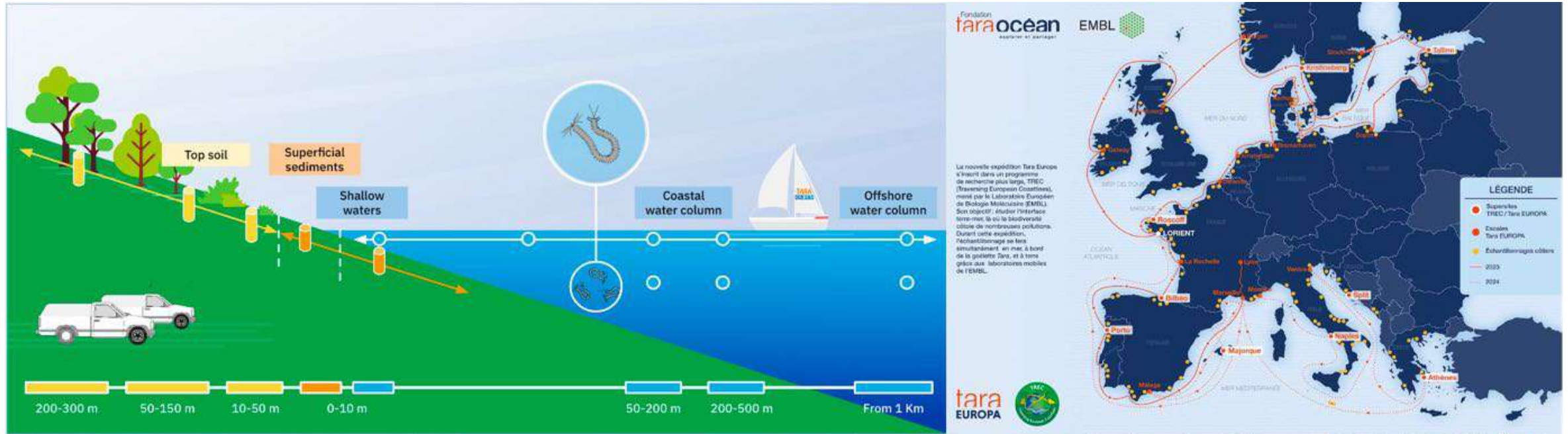
The HyperBOOST project is funded by the European Space Agency (ESA)

[www.hyperboost.info](http://www.hyperboost.info)



# Calibration & validation of satellite products in Europe

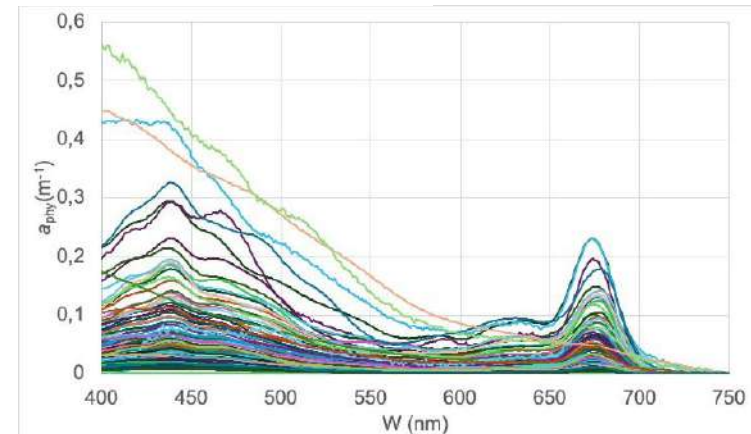
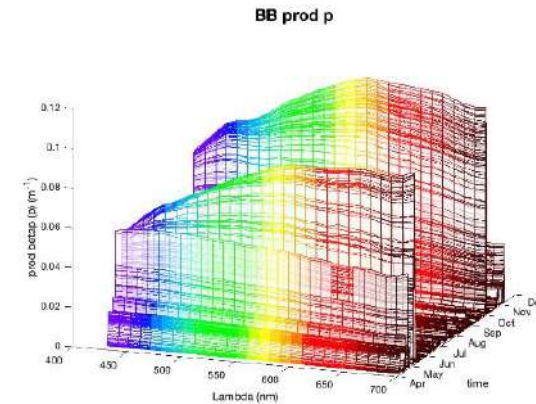
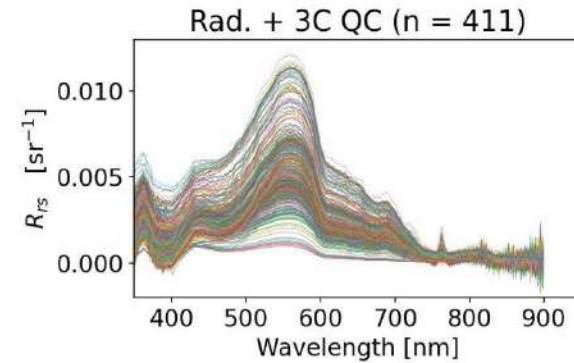
## TARA-Europa / HyperBOOST (2023 > 2024)





- ✓ **SoRad, Tom (PML)**
  - Continuous **hyperspectral** above-water radiometry:  $R_{rs}$
- ✓ **acs,bb3,Hyper-bb, Emmanuel (Umaine)**
  - Continuous  $a$ ,  $c$ ,  $b$ ,  $b_b$  **hyperspectral** data
- ✓ **SPM, POM, POC, CHL, David (LOV)**
  - SPM, Chla, POM, POCon discrete samples
  - **Hyperspectral** particulate absorption ( $a_p$ ,  $a_{nap}$ ,  $a_{phy}$ )
- ✓ **CDOM, FDOM, TOC, DOC, Chiara (CNR-P)**
  - Hyperspectral CDOM absorption
  - DOC

➔ **99 stations et 65 'parfaits' matchups en 2023**



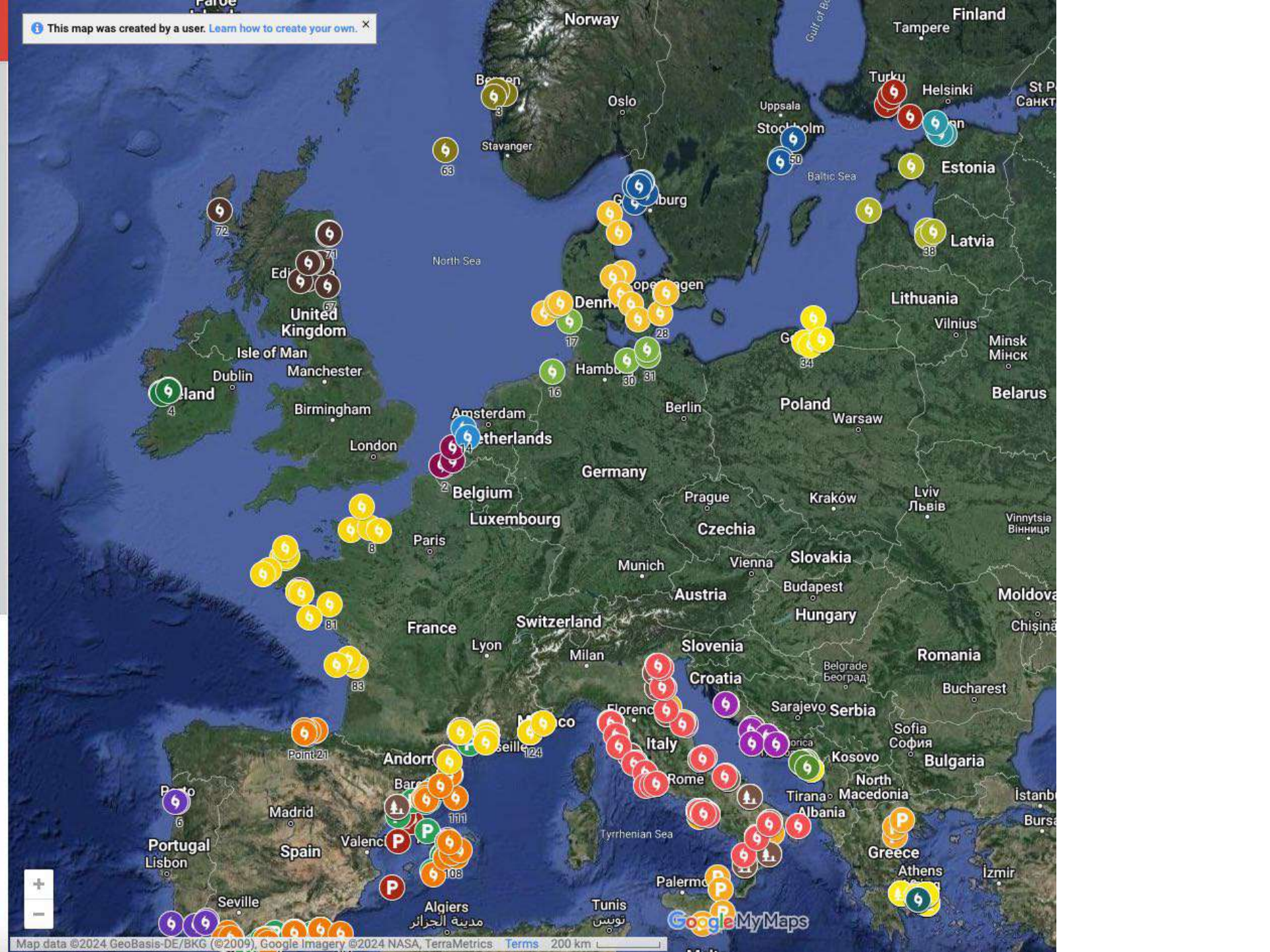


**Map\_TaraEuropa**  
Douglas Couet

6,473 views  
Published 5 days ago

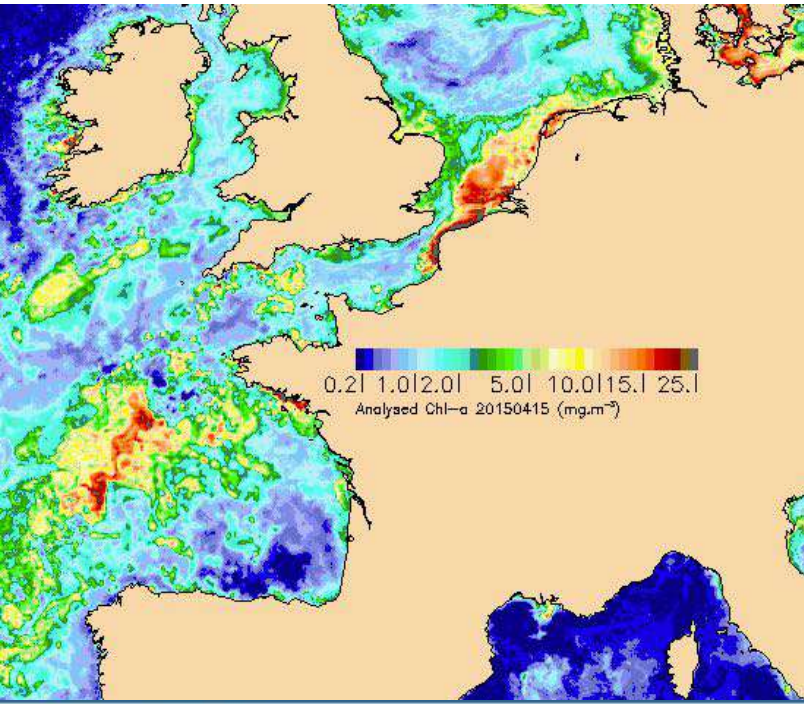
SHARE

- Aliens in port
  - All items
- TaraEuropa\_PerformedStations
- treclsi2023
- MapTaraEuropa\_PERMITS\_GPS coordina...
  - pending
  - Authorized
  - Forbidden
- TREC Isi sites - 2024
  - yes
  - Other / No data
- TaraEuropa\_StationGPS\_Map
  - Spain
  - Italy
  - France
  - Danemark
  - Suede
  - UK

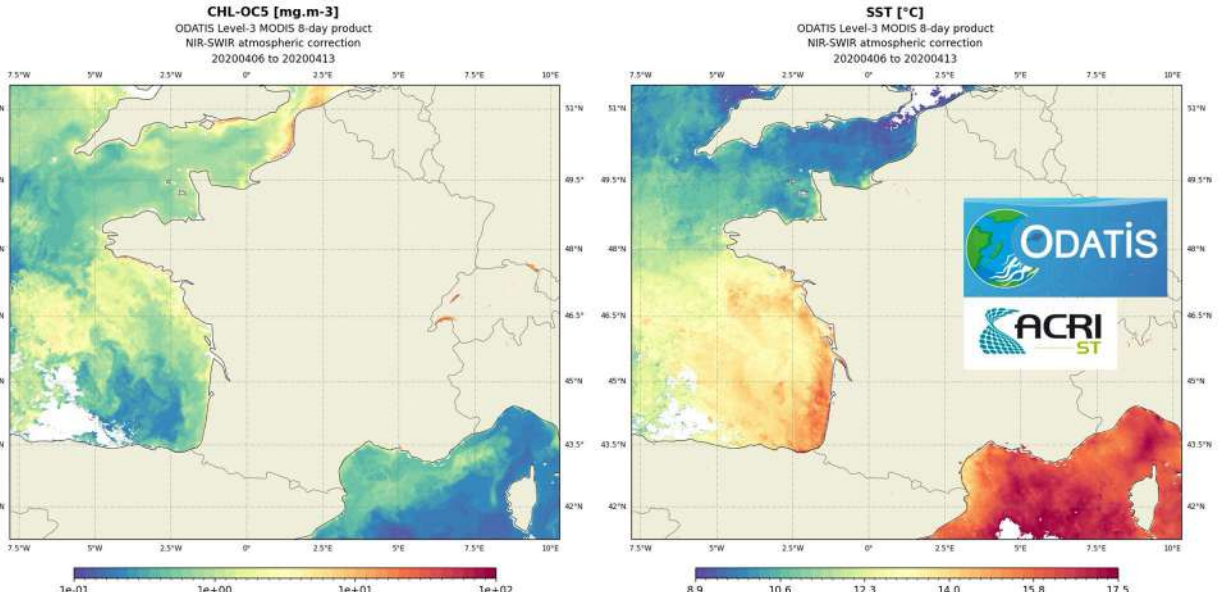




# 3. RIOMar : évolution récente (25ans) en cours et à venir des eaux côtières françaises



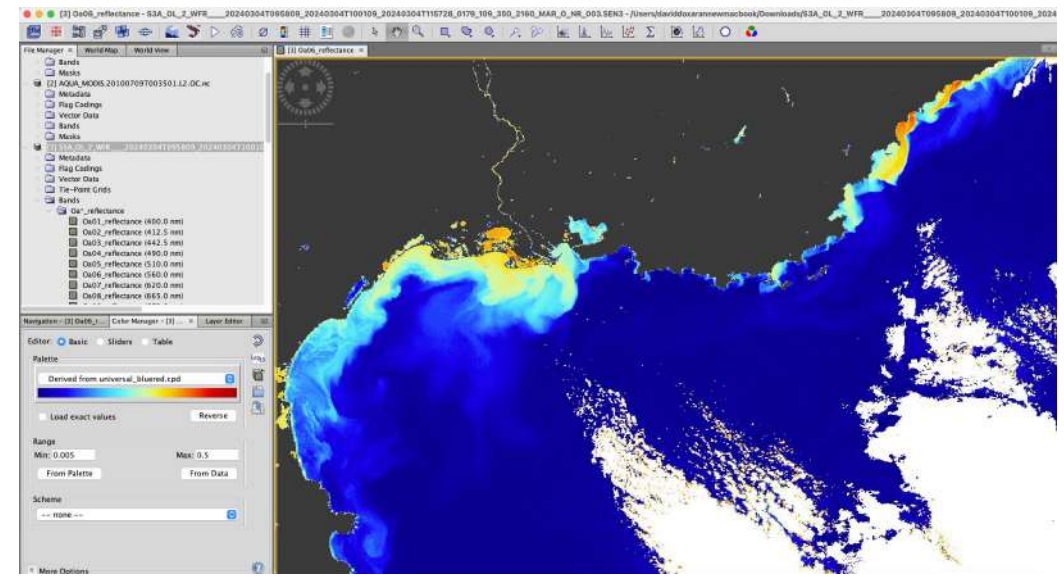
SST, Réflectance, IOPs, Turbidité, MES, Chla, CDOM, POC, DOC  
Algorithmes développés en France et validés (e.g., stations SOMLIT)



25 dernières années

OCEANCOLOUR - New full-region HR Products BAL, BLS, MED, BLK, NWS, IBI

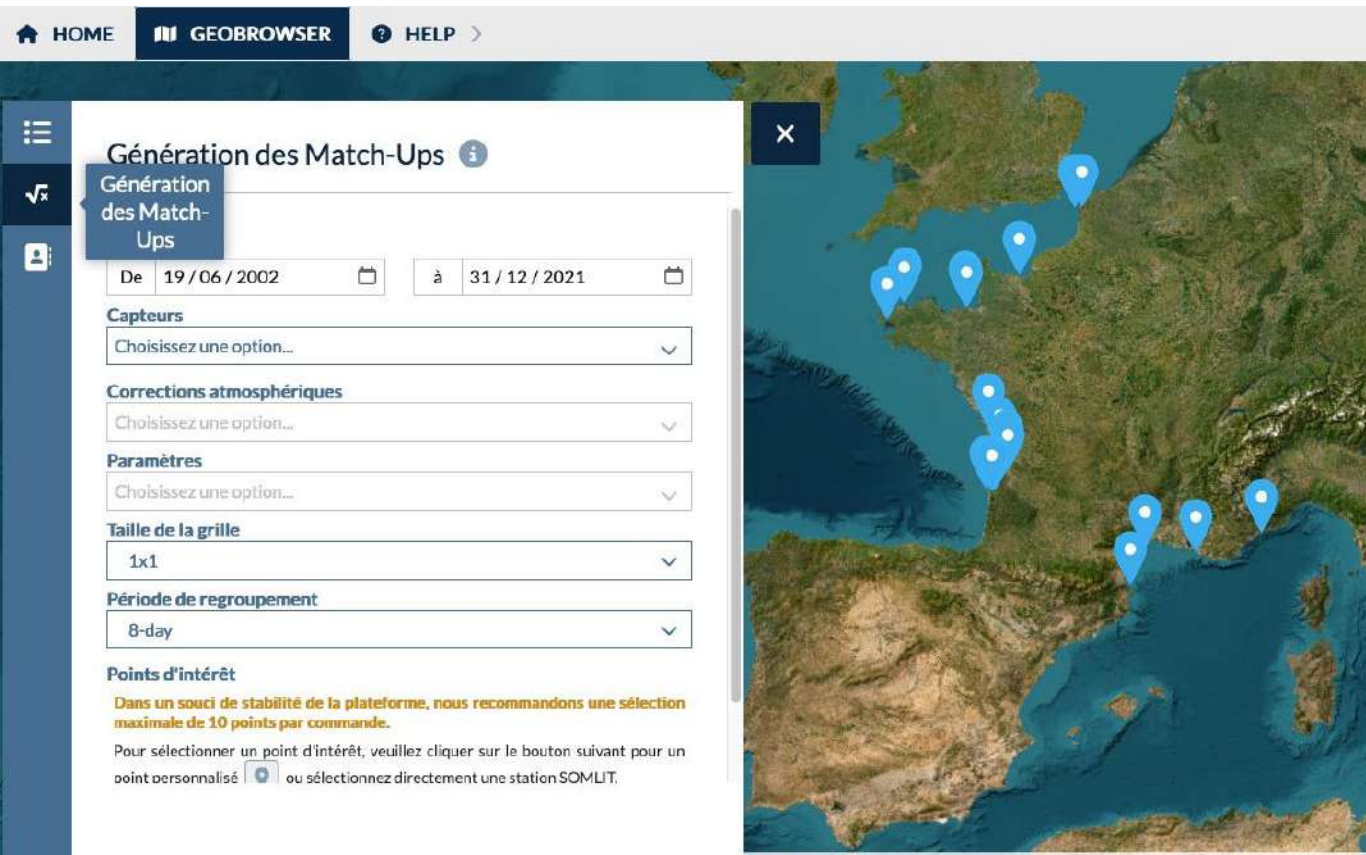
Date: 22 July 2021  
Until mid July, the Ocean Colour High Resolution (100m) products were available in tiles for each region and provided via FileTransferProtocol only.



Temps réel (accompagnements missions)



## 4. Le CES **ODATIS** (produits ODATIS-MR et réunion annuelle)



HOME | GEOBROWSER | HELP >

### Génération des Match-Ups i

Génération des Match-Ups

De 19 / 06 / 2002 à 31 / 12 / 2021

**Capteurs**  
Choisissez une option...

**Corrections atmosphériques**  
Choisissez une option...

**Paramètres**  
Choisissez une option...

**Taille de la grille**  
1x1

**Période de regroupement**  
8-day

**Points d'intérêt**  
Dans un souci de stabilité de la plateforme, nous recommandons une sélection maximale de 10 points par commande.  
Pour sélectionner un point d'intérêt, veuillez cliquer sur le bouton suivant pour un point personnalisé ou sélectionnez directement une station SOMLIT.

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### Jour 1 13/03

11h-12h : actualités CNES / ODATIS

12h-12h30 : nouveaux projets / Produits 1/2

14h00-16h30 : nouveaux projets / Produits 2/2

16h30-19h : jeunes chercheurs (doctorants et postdocs)

### Jour 2 14/03

9h-12h : retour produits ODATIS-MR et suite ?

12h-12h30 : discussion avec ACRI-ST

14h-15h : Groupe de travail 1

15h-16h : Groupe de travail 2

16h : nouveau(x) groupe(s) ?

16h-16h30 : Interactions ODATIS / THEIA

16h30 - 17h30 : Conclusions et planning 2024

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