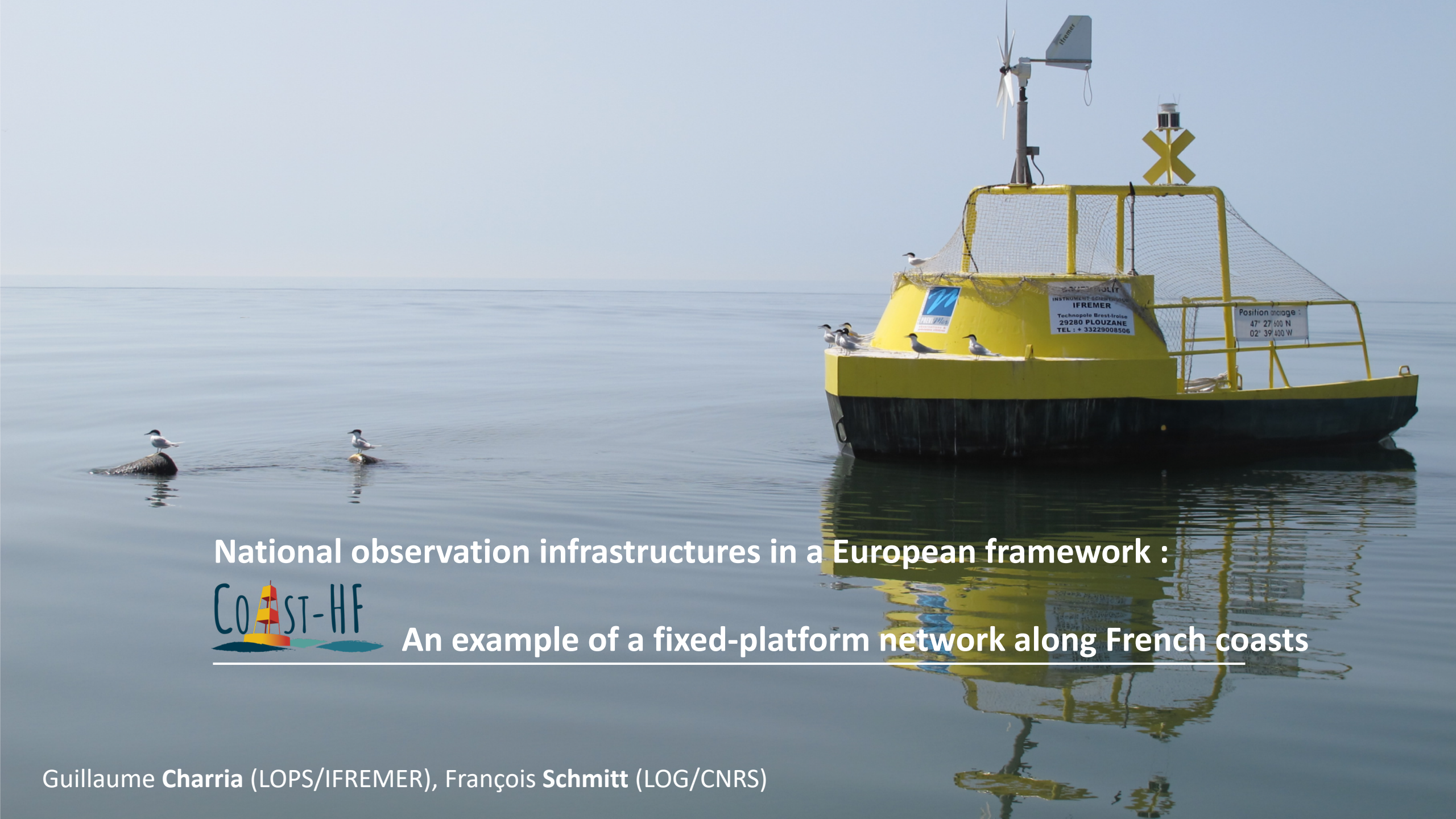


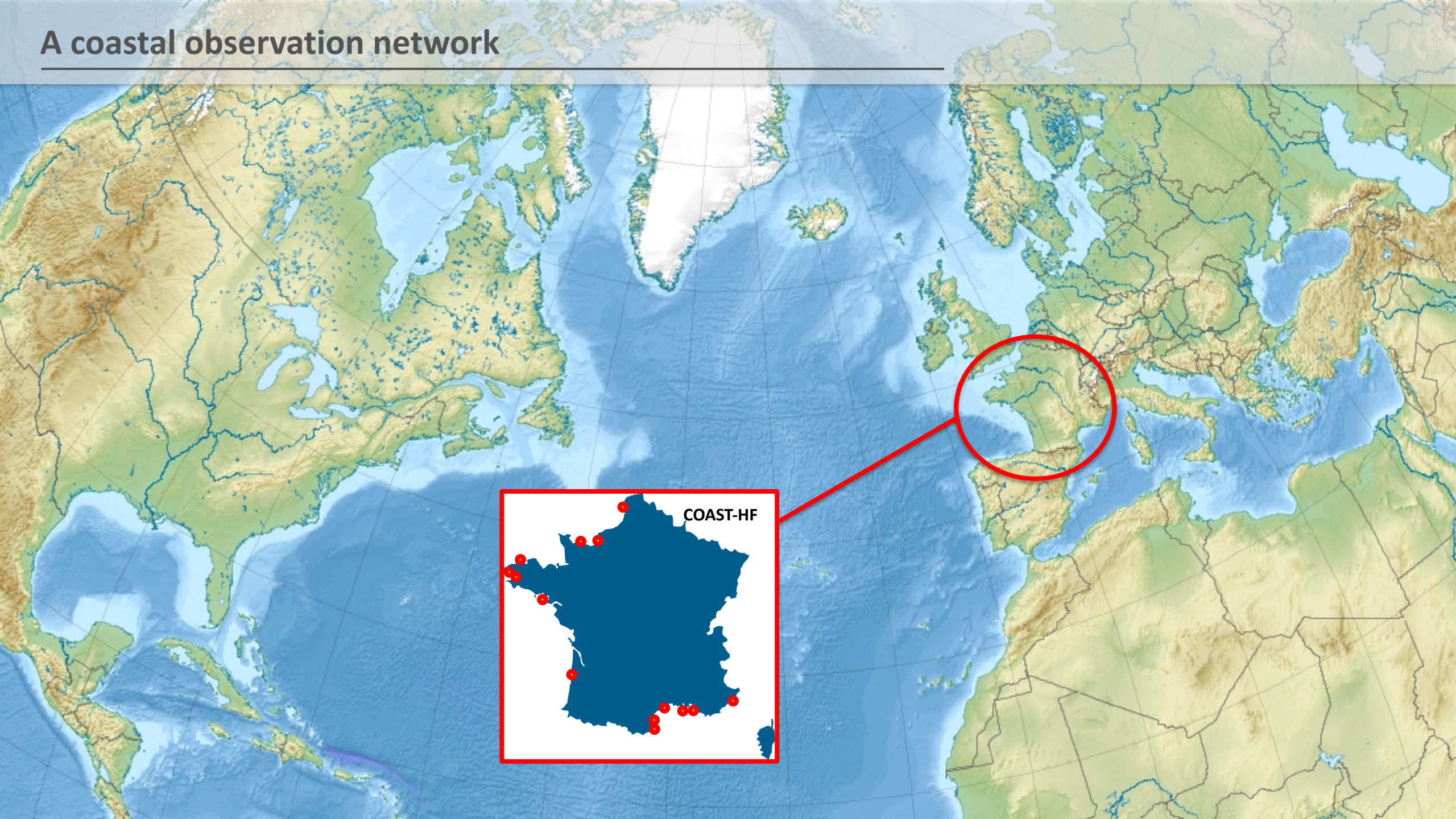
National observation infrastructures in a European framework :

An example of a fixed-platform network along French coasts

Guillaume **Charria** (LOPS/IFREMER), François **Schmitt** (LOG/CNRS)

The COAST-HF network

A coastal observation network



14 fixed-platforms

<u>Variables</u>: temperature, salinity, in situ fluorescence, dissolved O_2 and turbidity

<u>Depth</u>: sub-surface (1 to 3m depth) / <u>Frequency</u>: hourly to sub-hourly

Today:
4 common parameters
(T, S, Fluo, Turb)

Tomorrow: To new parameters

(partially implemented or under test phase) ...

Dissolved O_2
Phytoplankton diversity
(*e.g. in situ* flow cytometry)
pCO2 (4 equipped stations or under deployment)

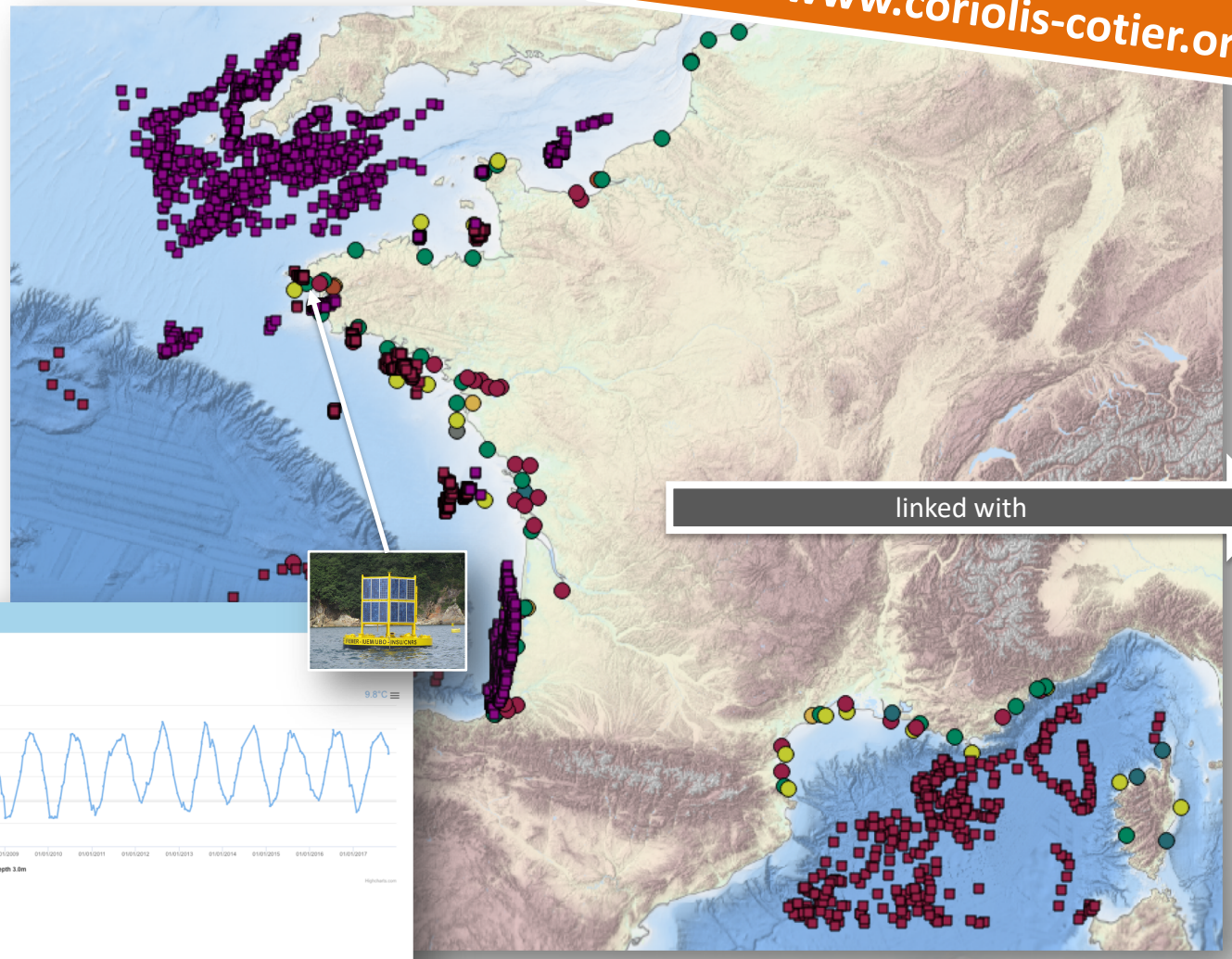
14 fixed-platforms

Variables: temperature, salinity, in situ fluorescence, dissolved O_2 and turbidity

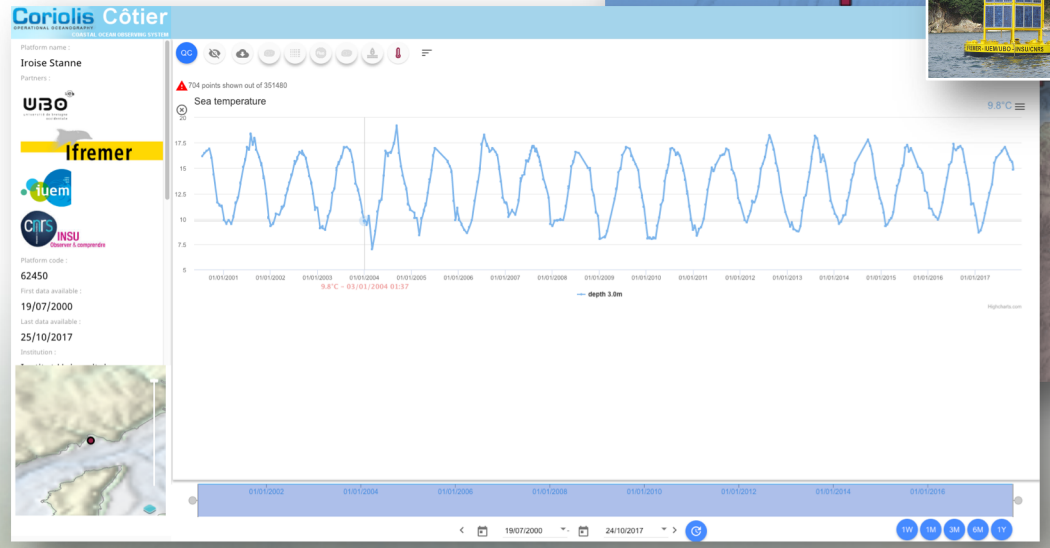
Depth: sub-surface (1 to 3m depth) / Frequency: hourly to sub-hourly

Data access

Data available on
www.coriolis-cotier.org



linked with



Copernicus
Europe's eyes on Earth

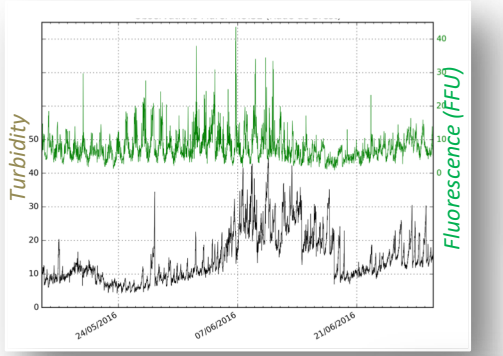
http://marine.copernicus.eu/

European Commission

Key science questions and few examples

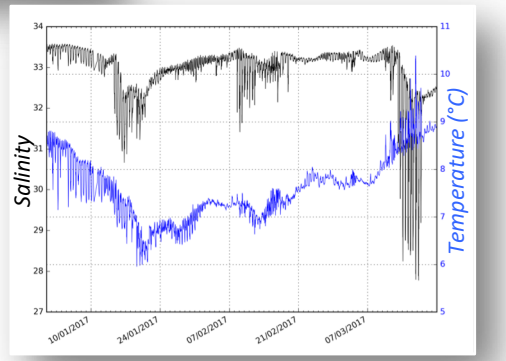
Key science questions

Marel IROISE observations (Bay of Brest)



Marel IROISE buoy

SMILE observations (Bay of Seine)



SMILE buoy

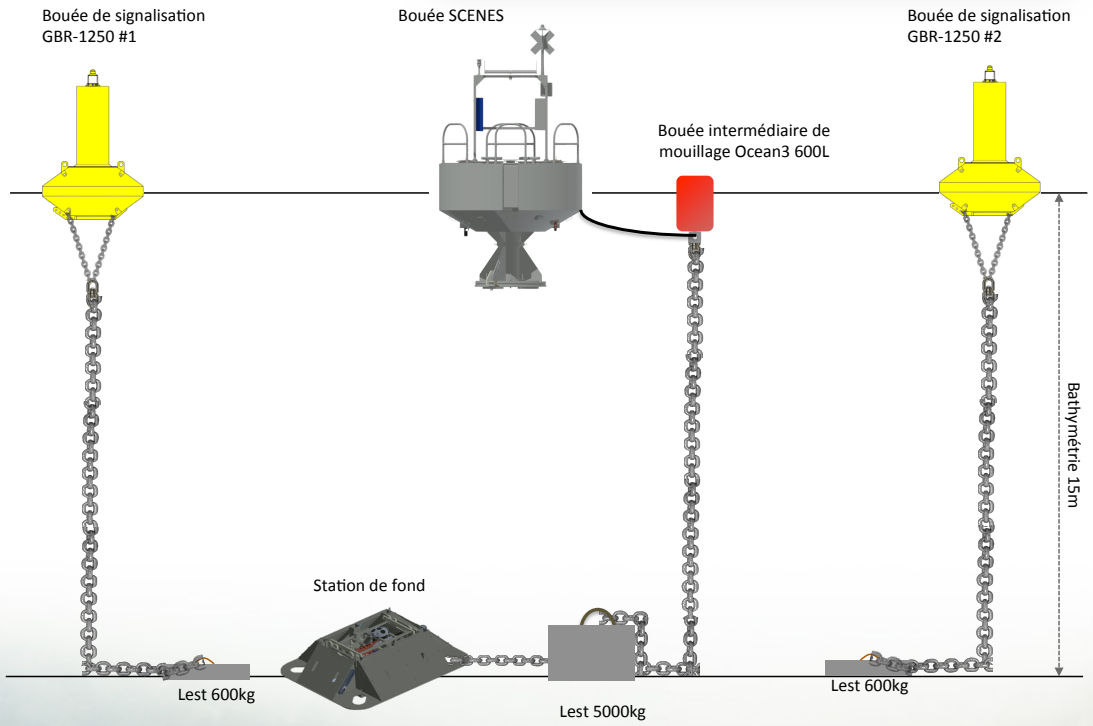
To observe **continuously and at high frequency** the coastal ocean along the french coasts

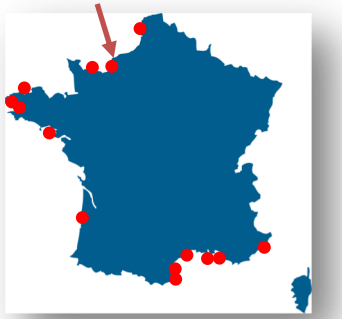
Evolution and variability of hydrological structure: **from extreme events to interannual scales**

Land – coastal ocean exchanges

To understand the **ecosystem** response to those evolutions

SCENES buoy





Surface real time observations (every 15min) :

- Wind (amplitude/direction)
- Humidity (%)
- Atmospheric pressure
- GPS position

- Turbidity (NTU)
- Fluorescence (µg/l)
- Salinity, temperature, O_2

Bottom real time observations :

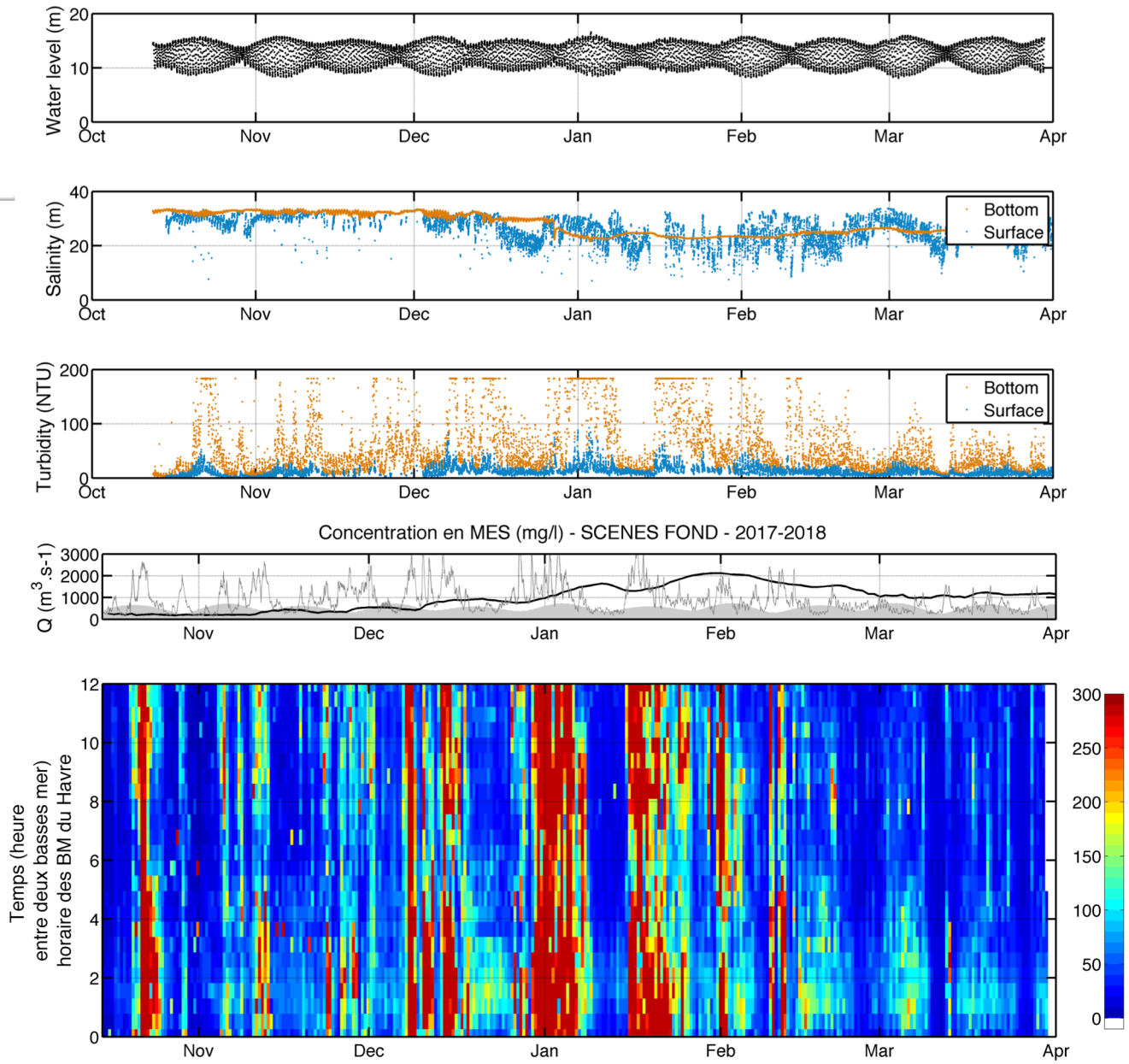
- Turbidity (NTU) / Fluorescence (µg/l)
- AWAC Current / Waves

- Salinity, temperature, O_2

R. Verney *et al.*

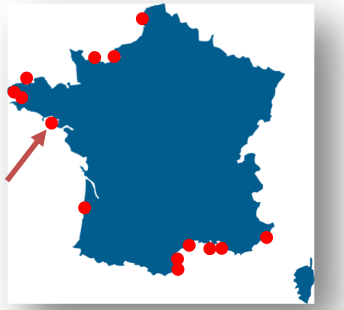
October 2017 – June 2018

Observations synthesis



R. Verney *et al.*

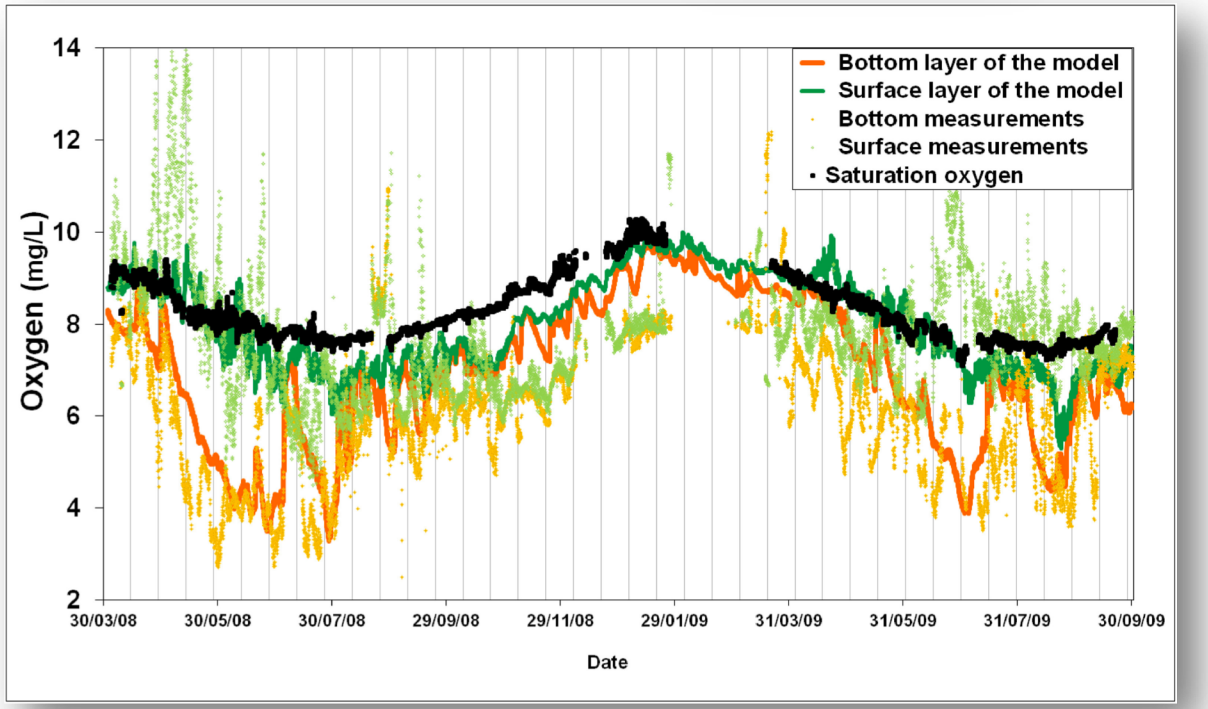
MOLIT Buoy in bay of Vilaine



Possible hypoxia at depth

↳ Sludge of *Lepidodinium chlorophorum*
Mortality of fishes (south of Loire river)

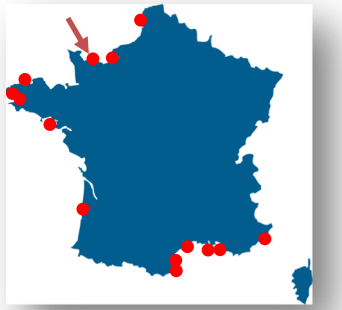
Aurousseau et al., 2017



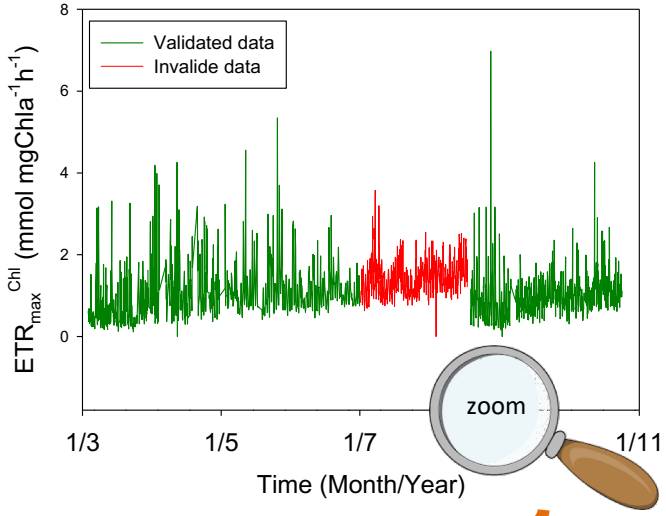
Menesguen *et al.*, OM, 2019

Estimation of primary production

Fast Repetition Rate Fluorometer Act 2 (Chelsea Technologies Group UK)

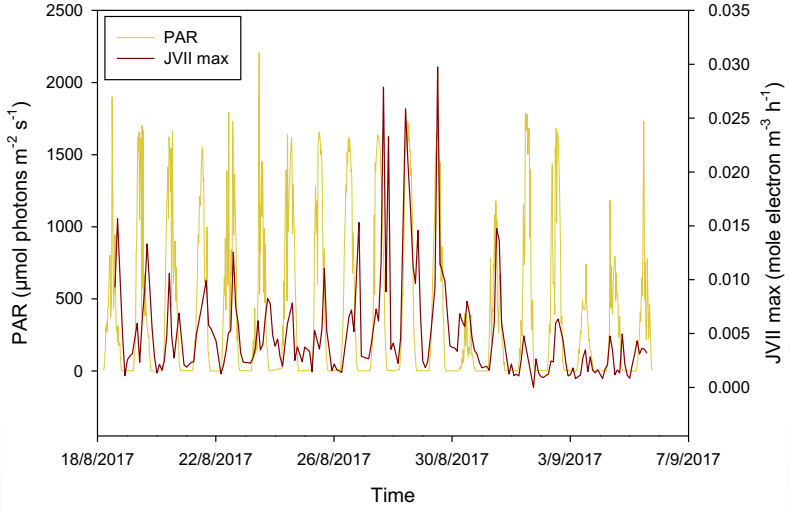


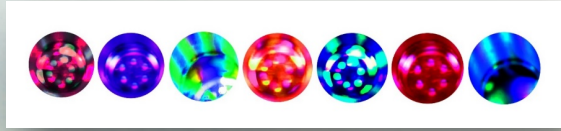
Observed photosynthetic maximal capacity in 2017



Maximal production

(absorption method – Oxborough et al., 2012)

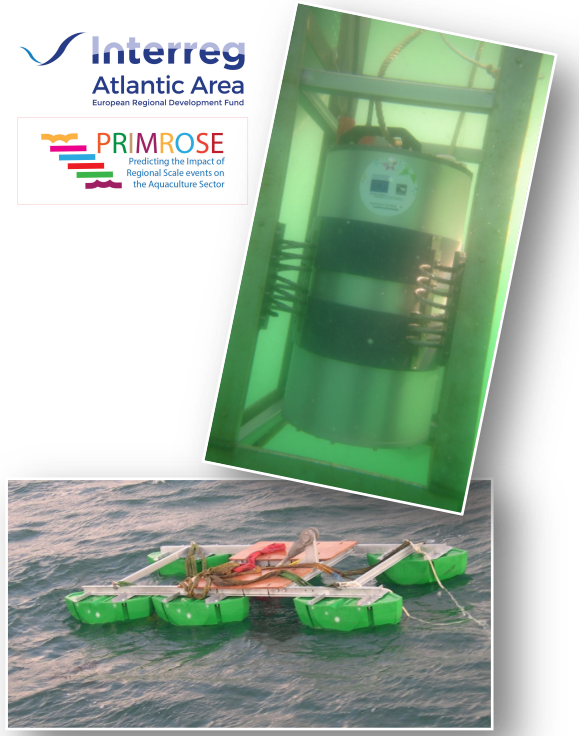




P. Claquin, F. Jacqueline, M. Navon, M. Repecaud, G. Izabel, L. Quemener, D. Lemeille, JP Lehodey, O. Jolly, P Riou.

Technological developments

Near future technological improvements – few examples



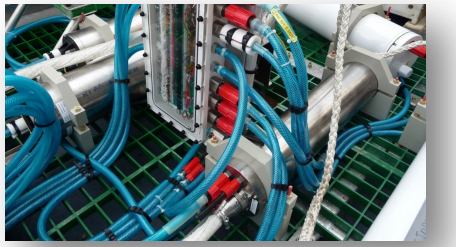
In situ continuous flow cytometry

Near future technological improvements – few examples

In situ continuous flow cytometry

Evolution of communication and storage units

COSTOF2 driver development and implementation for COAST-HF network



UNION EUROPÉENNE
UNANIEZH EUROPA

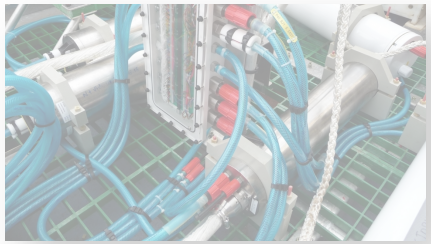
ROEC
RÉSEAU D'OBSERVATION HAUTE-FRÉQUENCE POUR L'ENVIRONNEMENT CÔTIER

Near future technological improvements – few examples

In situ continuous flow cytometry

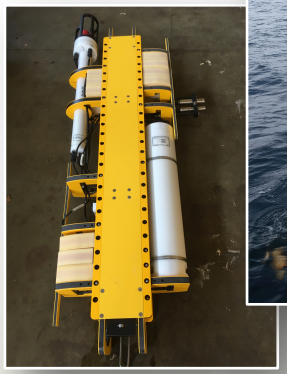
Evolution of communication and storage units

COSTOF2 driver development and implementation for COAST-HF network



New profiling facilities

Wirewalker platform for high-frequency water column sampling



Links between national and European infrastructures

A program patchwork …

… where a coastal local observation network can feed the global system

… where a coastal local observation network can feed the global system

National Research Infrastructure & an operational oceanography programme

Data

ODATIS

Network

ILICO
INFRASTRUCTURE DE RECHERCHE LITTORALE & CÔTIÈRE

COAST-HF
COASTAL OCEAN OBSERVING SYSTEM – HIGH FREQUENCY

Coriolis

… where a coastal local observation network can feed the global system

National Research Infrastructure & an operational oceanography programme

To a European Research Infrastructure

Data

ODATIS

Network

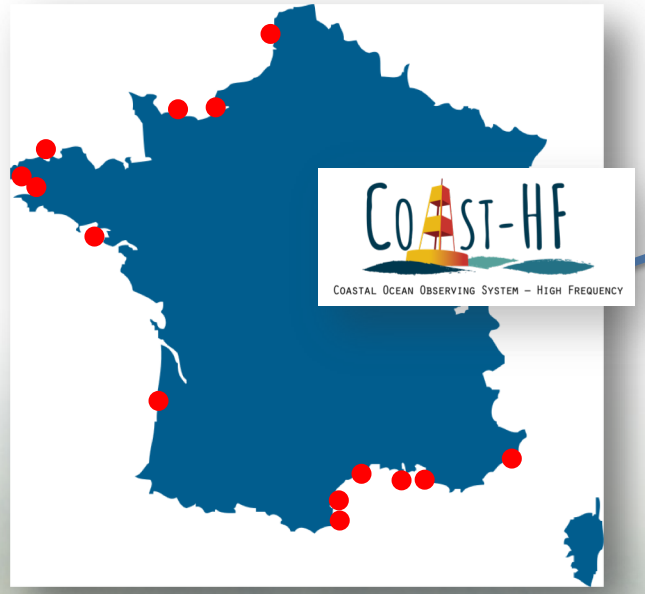
ILICO
INFRASTRUCTURE DE RECHERCHE LITTORALE & COTIÈRE

JERICO next

Interreg Atlantic Area
European Regional Development Fund

MyCoast

Coriolis



Towards Best Practices at European level
for coastal observation infrastructures

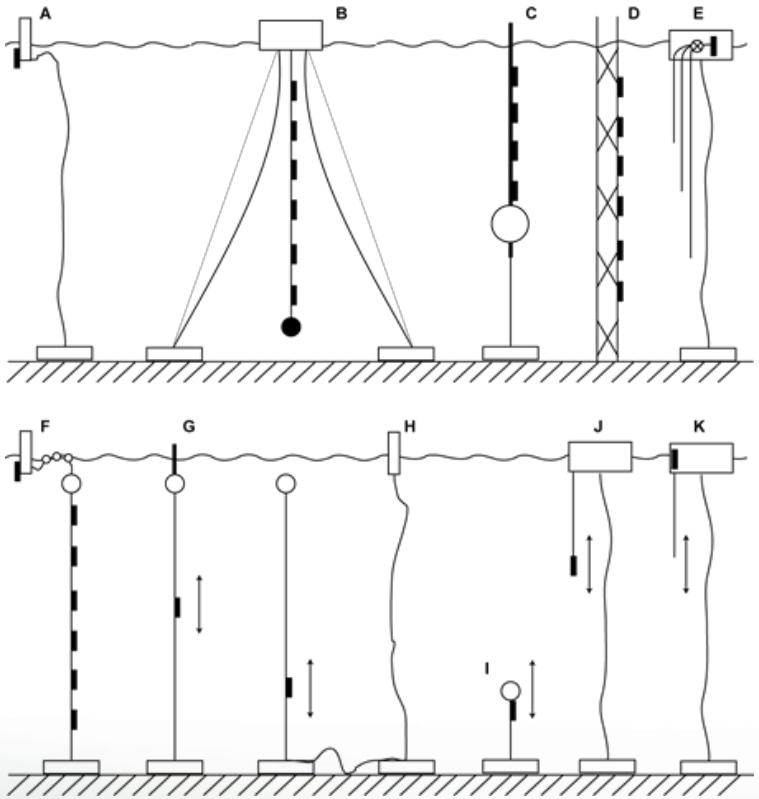


Figure 5.2.3. Mooring designs

5. FIXED PLATFORMS

5.1. Fixed platform definition and types

5.2. Platform design

5.3. Sensors

5.4. Telemetry

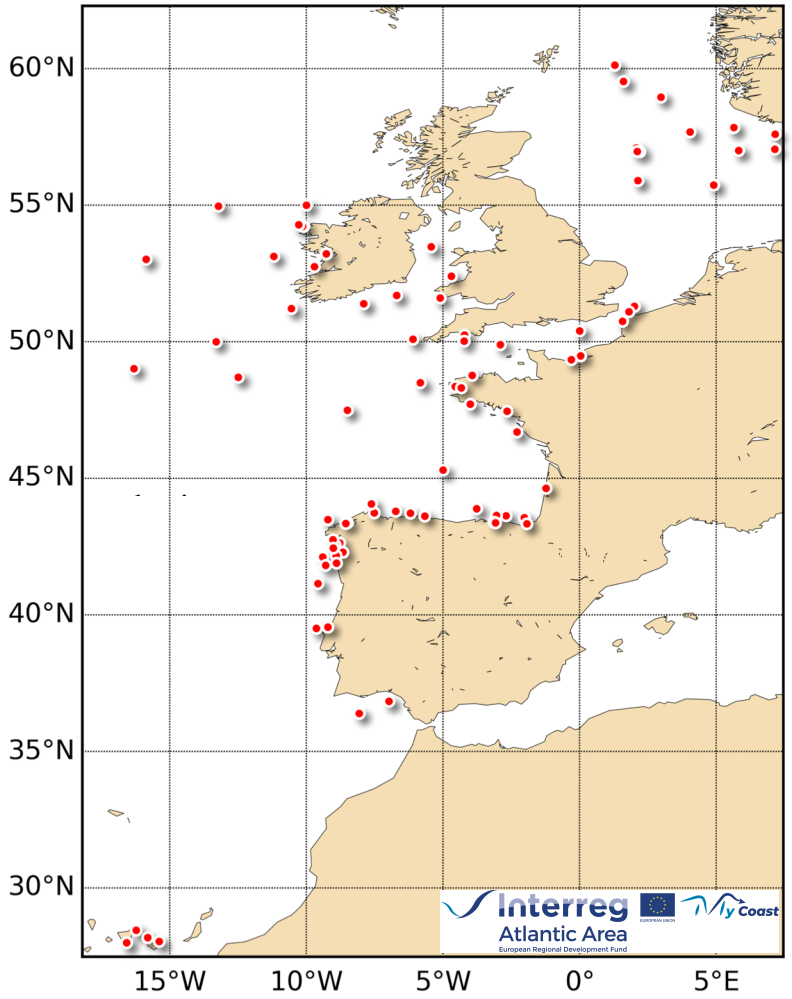
5.5. Power systems

5.6. Platform operation
- 5.6.1. Biofouling
- 5.6.2. Corrosion
- 5.6.3. Vandalism on fixed stations

5.7. Deployment-Installation procedures
- 5.7.1. Pre-deployment
- 5.7.2. Deployment
- 5.7.3. Recovery

5.8. Maintenance

93 MyCOAST in situ stations
(without Tide Gauges and cruises)



http://www.jerico-ri.eu/previous-project/deliverables/d4-4-report-on-best-practice-in-conducting-operations-and-maintaining/

… where a coastal local observation network can feed the global system

National Research Infrastructure & an operational oceanography programme

To a European Research Infrastructure

Linked with European programmes

Data

ODATIS

Network

ILICO

INFRASTRUCTURE DE RECHERCHE LITTORALE & COTIÈRE

JERICO next

Interreg Atlantic Area

European Regional Development Fund

MyCoast

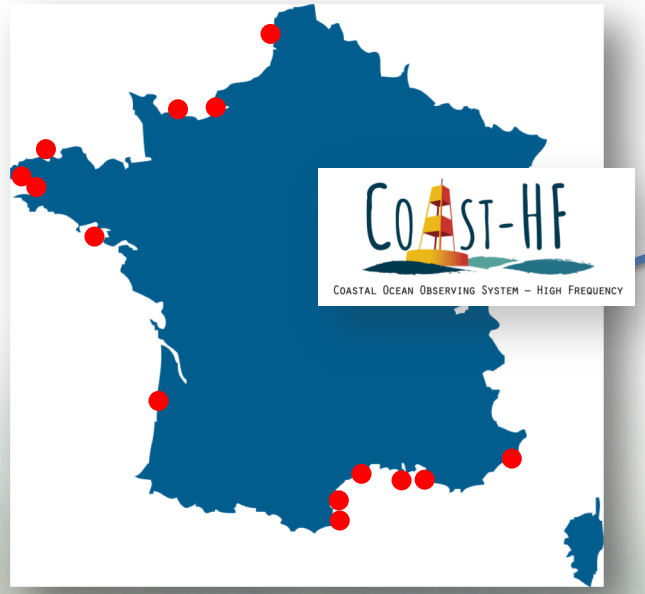
EuroGOOS

European Global Ocean Observing System

EOOS

Copernicus

The European Earth Observation Programme



COAST-HF

COASTAL OCEAN OBSERVING SYSTEM – HIGH FREQUENCY

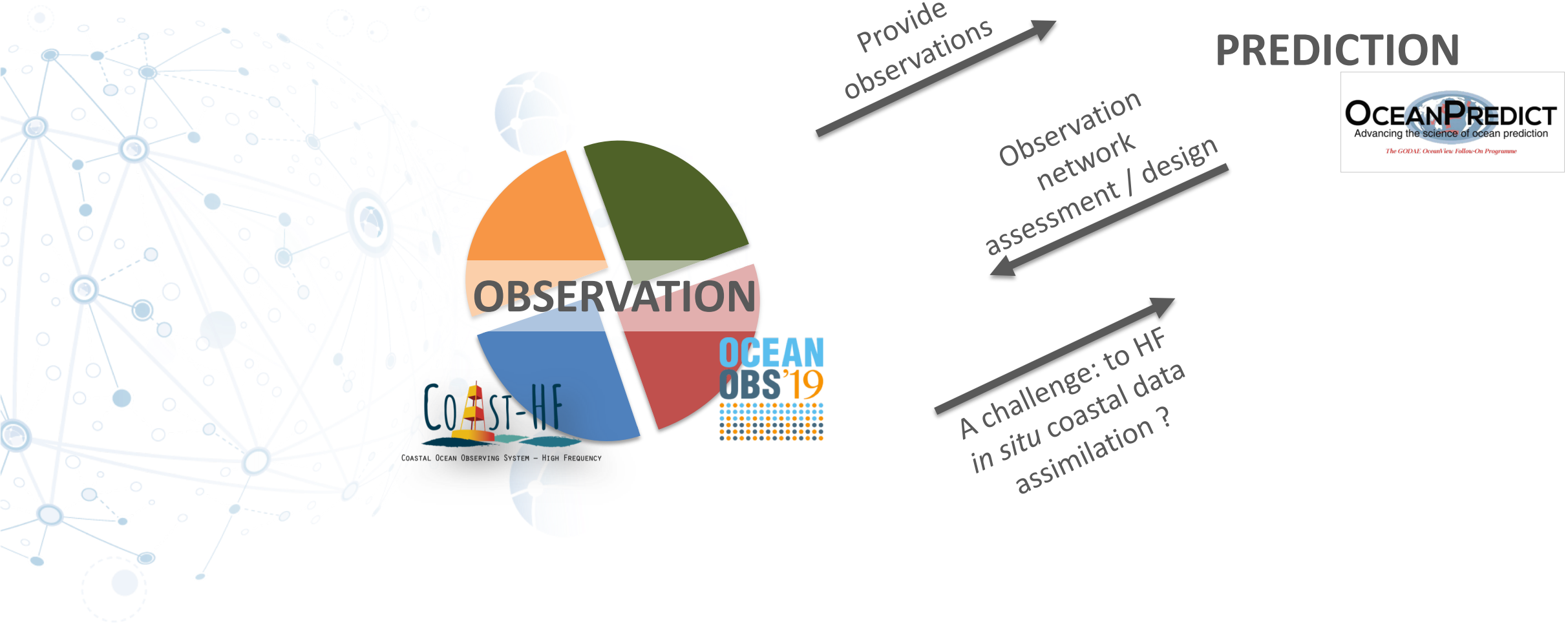
Coriolis

The Global Ocean Observing System

GOOS

To global

Observations & predictions



Thanks for your attention !