



CONNECT

local COastal moNitoriNg sERviCe for PorTugal

Sessão de demonstração serviço CONNECT

Lot 4 - Coastal marine (pre)operational services around the European Atlantic Ocean including the North Sea and the Arctic Ocean
(22050L04-COP-INNO USER-9000) of the tenderer
Copernicus Marine – User – EU Coastal Monitoring Pilot Demonstrations (22050-COP-INNO USER)

Laboratório Nacional de Engenharia Civil (LNEC)

Faculdade de Ciências da Universidade de Lisboa (FCUL) - Associação para a Investigação e Desenvolvimento de Ciências (FCID)

13/03/2024

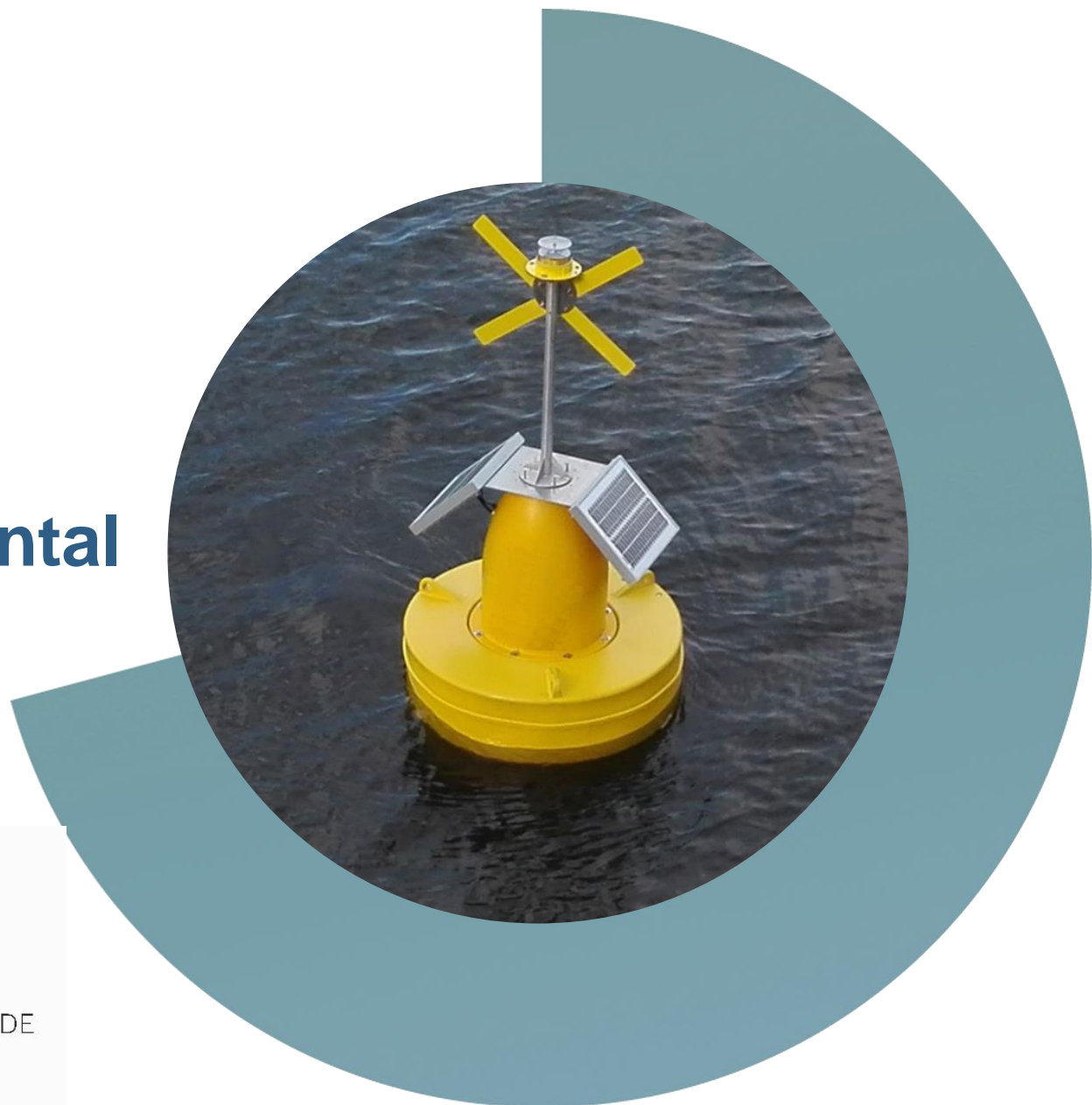


COASTNET

COASTAL MONITORING NETWORK

Rede de Monitorização Ambiental

Ana C. Brito



www.coastnet.pt • coastnet@mare-centre.pt

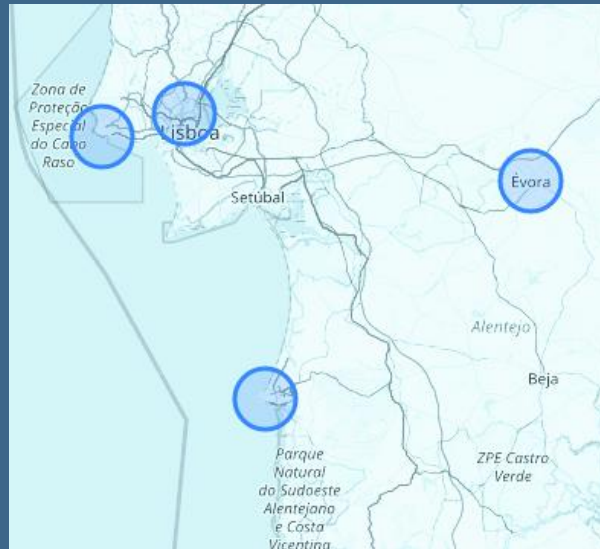




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Promoters



CoastNet is a MARE research infrastructure that results from a partnership between Ciências (MARE-UL) and the University of Évora (MARE-UÉ).



**Ciências
ULisboa**



**UNIVERSIDADE
DE ÉVORA**



Implementation Team



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Susana França
Implementation Team





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Funding, Networks and Associations

FCT Fundação para a Ciência e a Tecnologia



Lisb@20²⁰

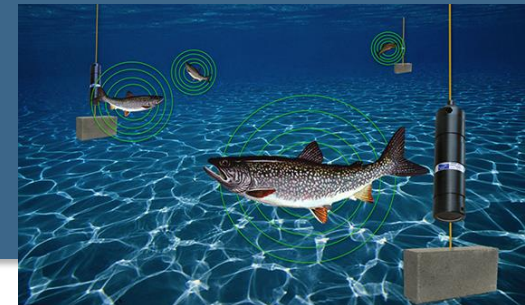
ALENTEJO
2020

Included in the Portuguese Roadmap of Research Infrastructures (RNIE Environmental Sciences)

FCT
Fundação para a Ciência e a Tecnologia
MINISTÉRIO DA CIÊNCIA, TECNOLOGIA E ENSINO SUPERIOR

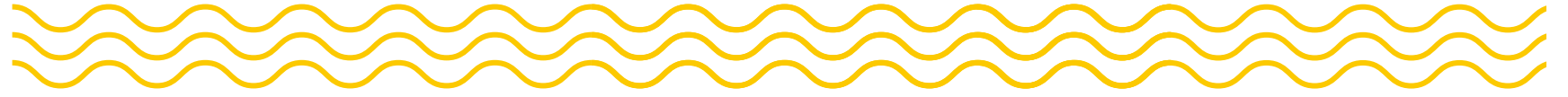
**PORTUGUESE
ROADMAP
OF RESEARCH
INFRASTRUCTURES
– 2020 Update**

FCT – Fundação para a Ciência e a Tecnologia





COASTNET
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Mission



CoastNet is a research infrastructure dedicated to studying the functioning of ecosystems and promoting the sustainable use of the coastal zone.



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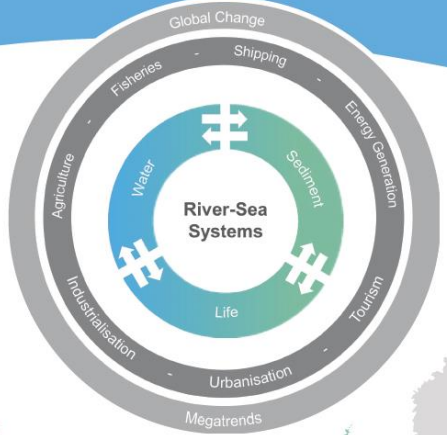
Funding, Networks and Associations

CoastNet is now part of the EU **DANUBIUS** Research Infrastructure (**DANUBIUS-RI**)

Making River-Sea Systems Work



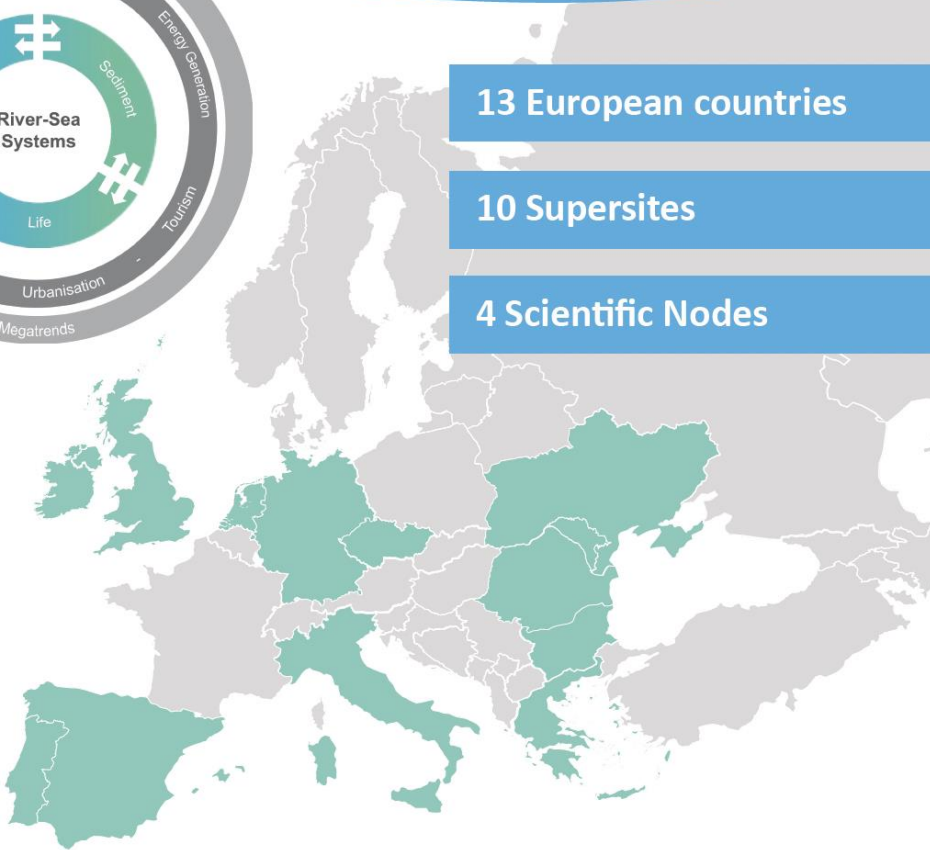
From the river source to sea, DANUBIUS-RI provides state-of-the-art research infrastructure to sustainably manage River-Sea Systems.



13 European countries

10 Supersites

4 Scientific Nodes



DANUBIUS-RI

Mission: facilitate and contribute excellence science to the continuum from river to sea

Vision: achieve healthy River-Sea Systems and sustainable use

Goal: to overcome fragmentation of science, knowledge, data & management



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DANUBIUS-RI

Passionate about River-Sea Systems Research ?

(then apply to access DANUBIUS-RI Services for FREE)

Pilot call for research proposals

Research Theme: 'Water, sediment and biotic variations and their impacts on aquatic ecosystems in river sea systems under extreme events and climate change scenarios.'

- ✓ Free use of DANUBIUS-RI services
- ✓ Aimed at early stage researchers / PhD
- ✓ Up to 2 month duration projects
- ✓ Guidance from experts at host institutions



Funded by the European Union (HORIZON-INFRA-2021-DEV-02)
under grant agreement No 101079778.

www.danubius-ip.eu
Email: danubius.research@geoecomar.ro



Objectives



- ✓ **Promote observations and measurements on the Portuguese coast, either remotely or on the water, predominantly continuously;**
- ✓ **Integrate and allow the visualization of the data obtained;**
- ✓ **Allow free and near real-time access to the data collected, as well as to historical data compiled;**
- ✓ **Develop a set of products and indicators for the coastal zone;**



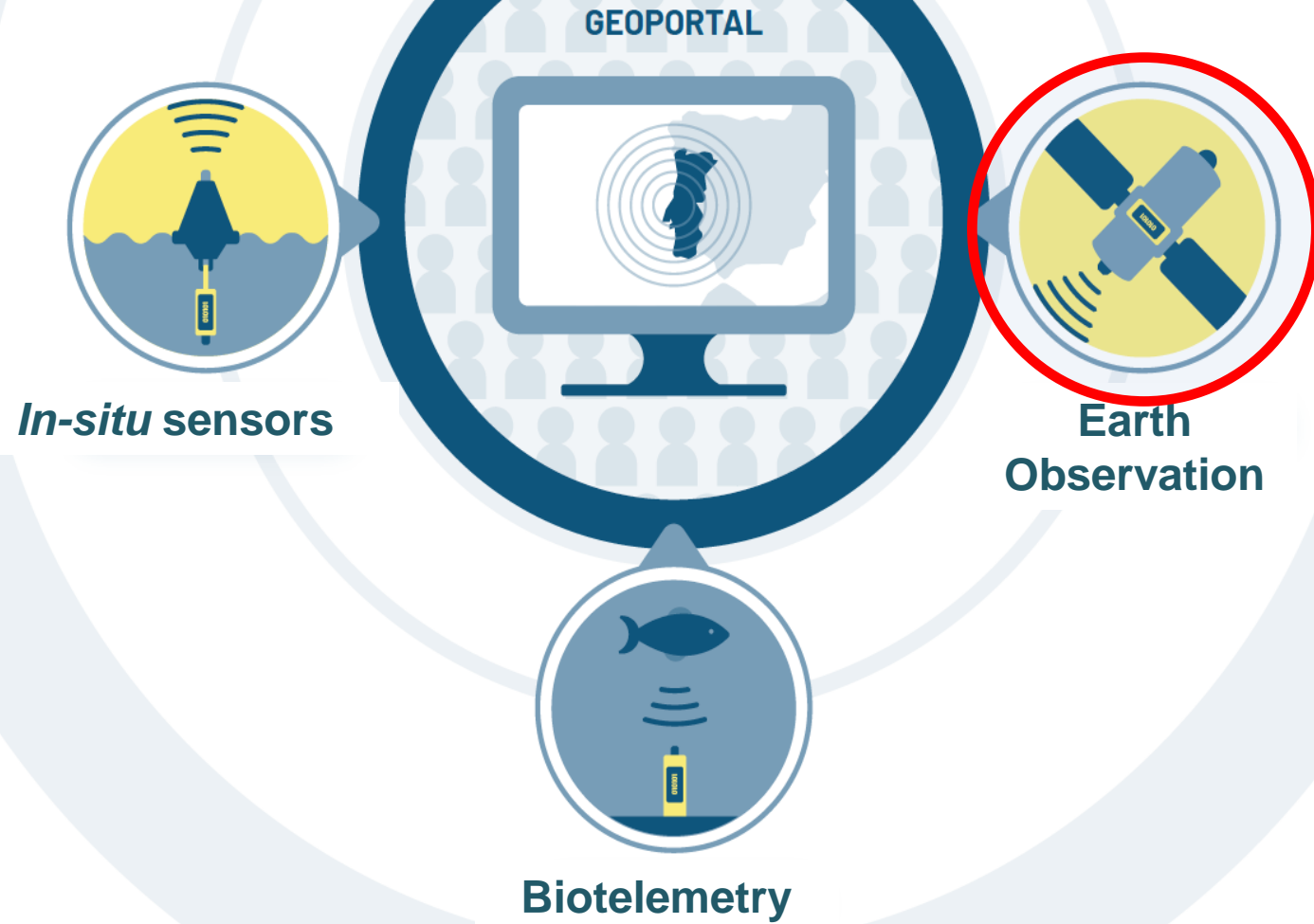
Action Lines



- 1. The Coastal Remote Sensing System (CRSS)**
- 2. The Portuguese Tracking Network (PTN)**
- 3. The Environmental and Biological Monitoring System (EBMS)**
- 4. Web-based CoastNet Platform (WBCP) (Geoportal)**



Lines of Action:





Coastal Remote Sensing System (CRSS)



Objectives

- ✓ Aggregate satellite data for the PT coastal region and make them available – *Standard*
- ✓ Develop new products for our coastal zone (UI), freely available from Geoportal – *indicators*
- ✓ Temporal dataseries (~20/30 years worth of data) vs NRT monitoring

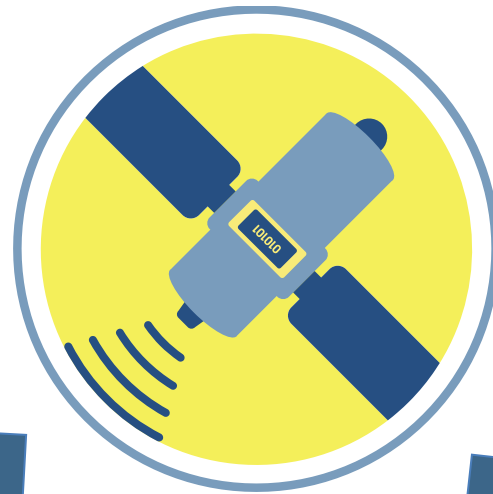


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Coastal Remote Sensing System (CRSS)

Data Providers



Sentinel
Data Hub



Copernicus Marine Environment
Monitoring Service (CMEMS)

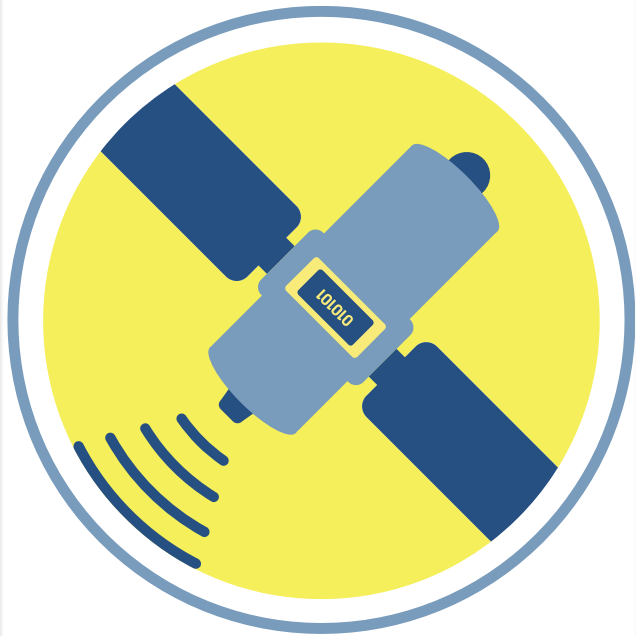


SMOS data



Coastal Remote Sensing System (CRSS)

Products available (*standard*)

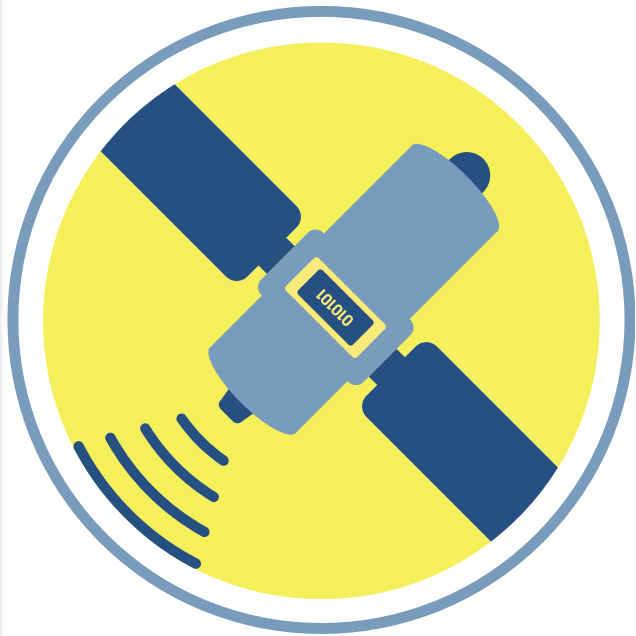


- **Temperature (SST)**
- **Chlorophyll *a***
- **Sea Surface Height**
- **Wind Speed/Stress**
- **Sea water velocity**
- **Salinity**



Coastal Remote Sensing System (CRSS)

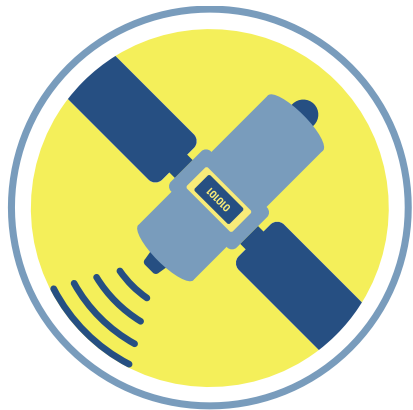
New products (*indicators*)



- **Upwelling Index**
- **Fronts**
- ***Phytoplankton size class***
- **Water Quality Index**



Coastal Remote Sensing System (CRSS)



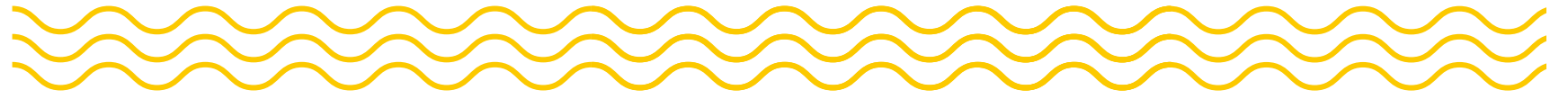
Satellite Data



Access to data, download and processing using:
INCD Cluster (National Distributed Computing Infrastructure)

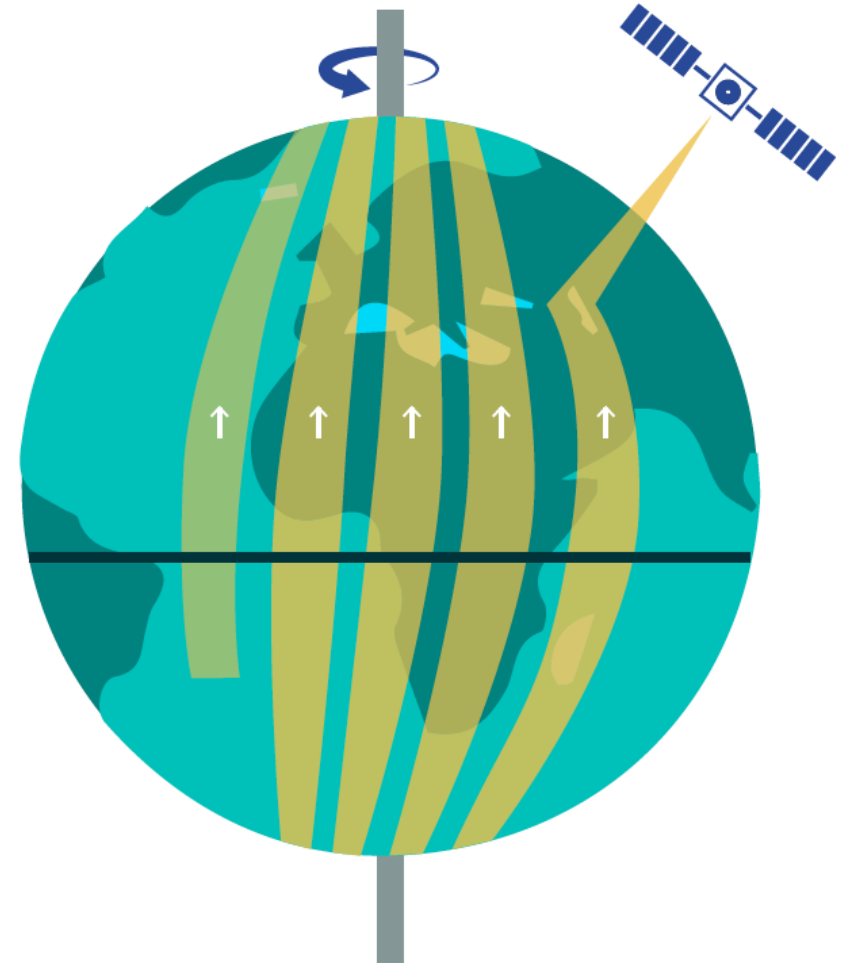


All data available in the
CoastNet's Geoportal



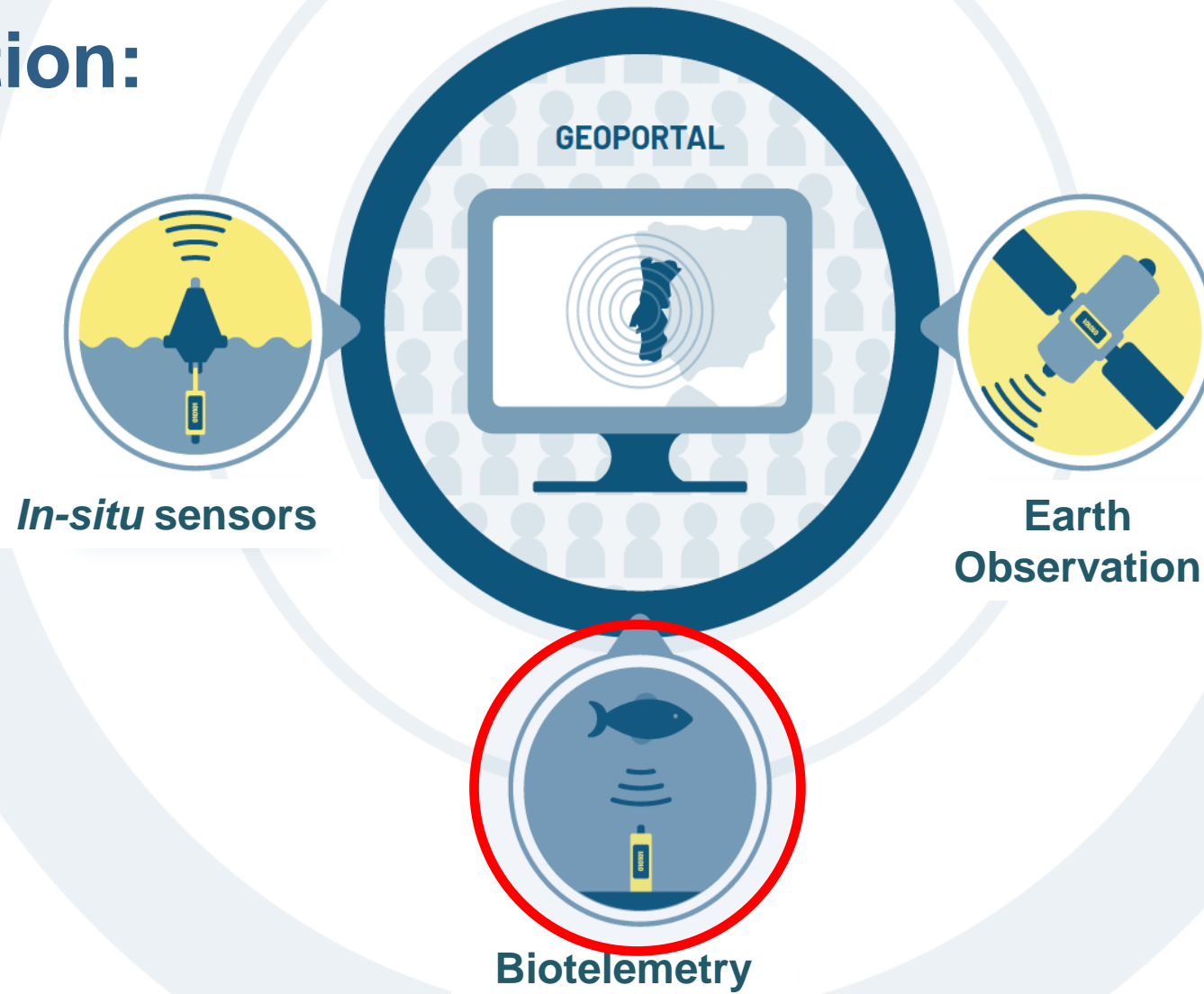
Importance of RS data in Coastnet

- Time-series & NRT data
- Development of new products to comply with EU Directives (e.g. WFD, MSFD)
- Integration of different data sources: **i)** satellite; **ii)** in-situ sensors; **iii)** biotelemetry receivers; **iv)** historical data





Lines of Action:

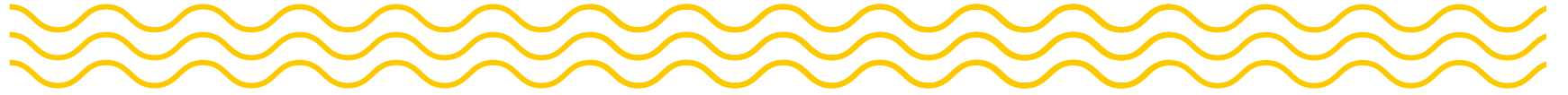




Portuguese Tracking Network

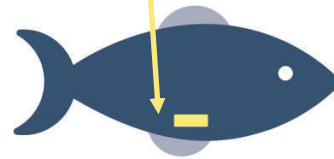
- **For what?** Monitoring movement of aquatic organisms;
- **Where?** Coastal zone, estuaries and rivers;
- **How?** Record of acoustic signal transmitted by animal tags





How does

Acoustic Transmitter

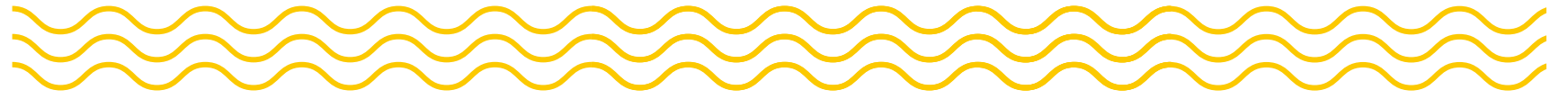


Acoustic Receiver

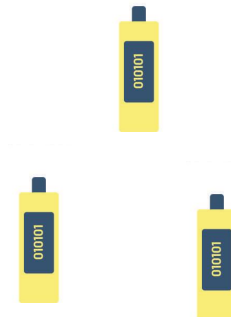
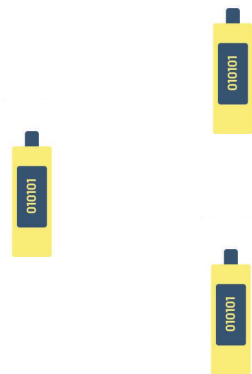
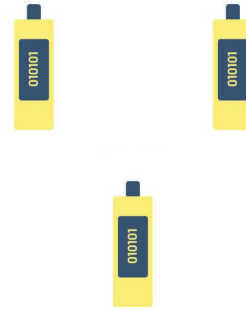
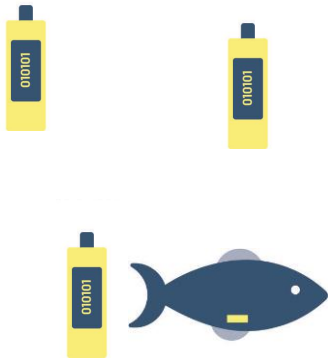




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How does it work?

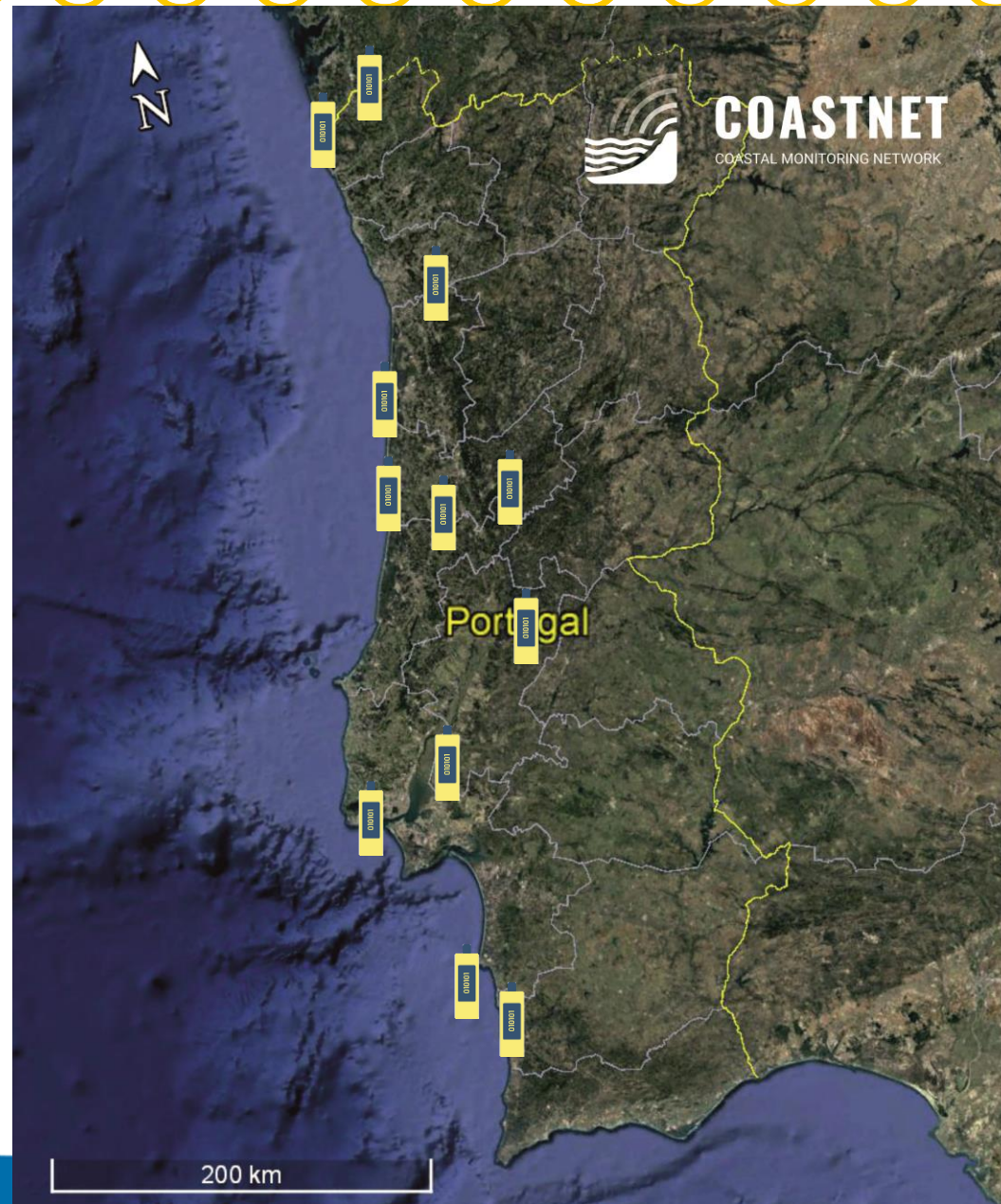




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Portuguese Tracking Network





Tejo estuary - Local Network

← → ↻ ⓘ Inseguro | geoportal.coastnet.pt/#

Lat: 38.746 Lon: -9.254

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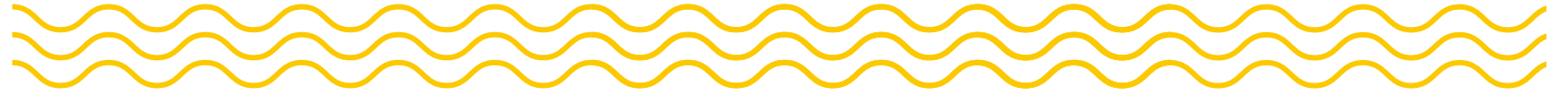
Master layer

Biotelemetry

- TEJO_#072
- TEJO_#071
- TEJO_#070
- TEJO_#069
- TEJO_#068
- TEJO_#067
- TEJO_#066
- TEJO_#065
- TEJO_#064

Corvina-legítima

Leaflet | Powered by Esri | Earthstar Geographics

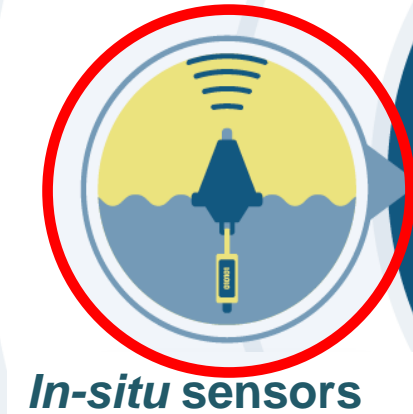


Data sharing Platform

The screenshot shows a web browser window with the URL lifewatch.be/ptn/. The page header includes the COASTNET logo and the title "PTN - Portugal Tracking Network". A text indicator states "Data platform, featuring 91024467 detections". The main content is a map of Europe and the Mediterranean region, overlaid with numerous red and blue circular markers representing data points. A legend in the bottom right corner features the "EUROPEAN TRACKING NETWORK ETN" logo, which consists of a blue hexagonal grid pattern.

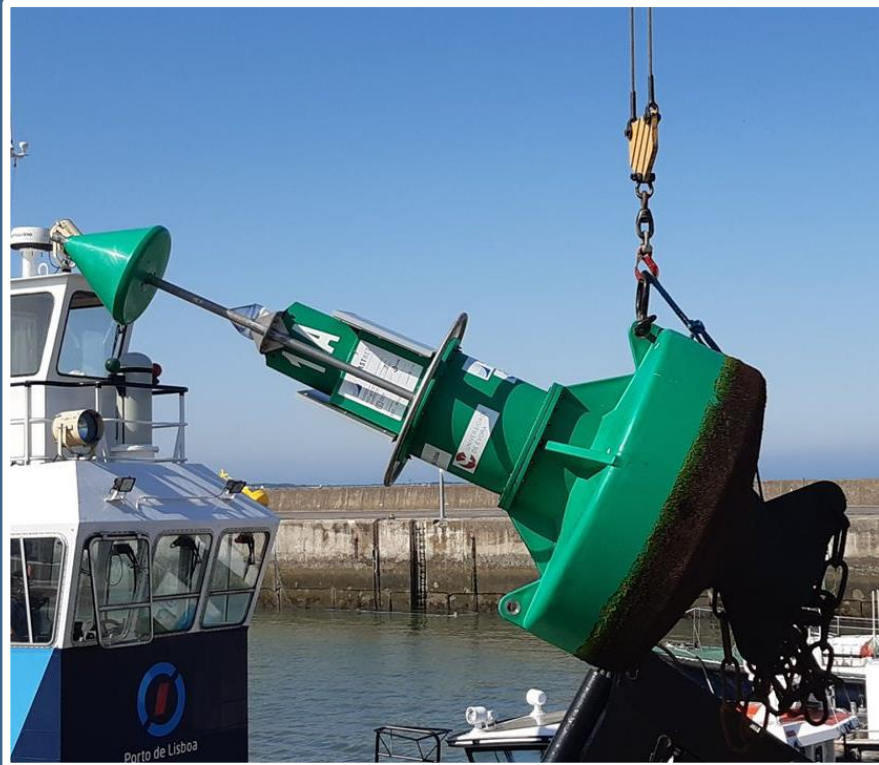


Lines of Action:





Environmental and Biological Monitoring System (EBMS)



Objectives

- ✓ Continuous and autonomous measurement of environm. parameters
- ✓ Key parameters for studying the structure of aquatic biological communities
- ✓ 3 estuarine systems
- ✓ 3 buoys in each system that cover the salinity gradient



Mira Estuary – Location and Deployment



June 2019





2500

Super Silent

COASTREY
MADE IN JAPAN

COASTREY
MADE IN JAPAN

COASTREY
MADE IN JAPAN



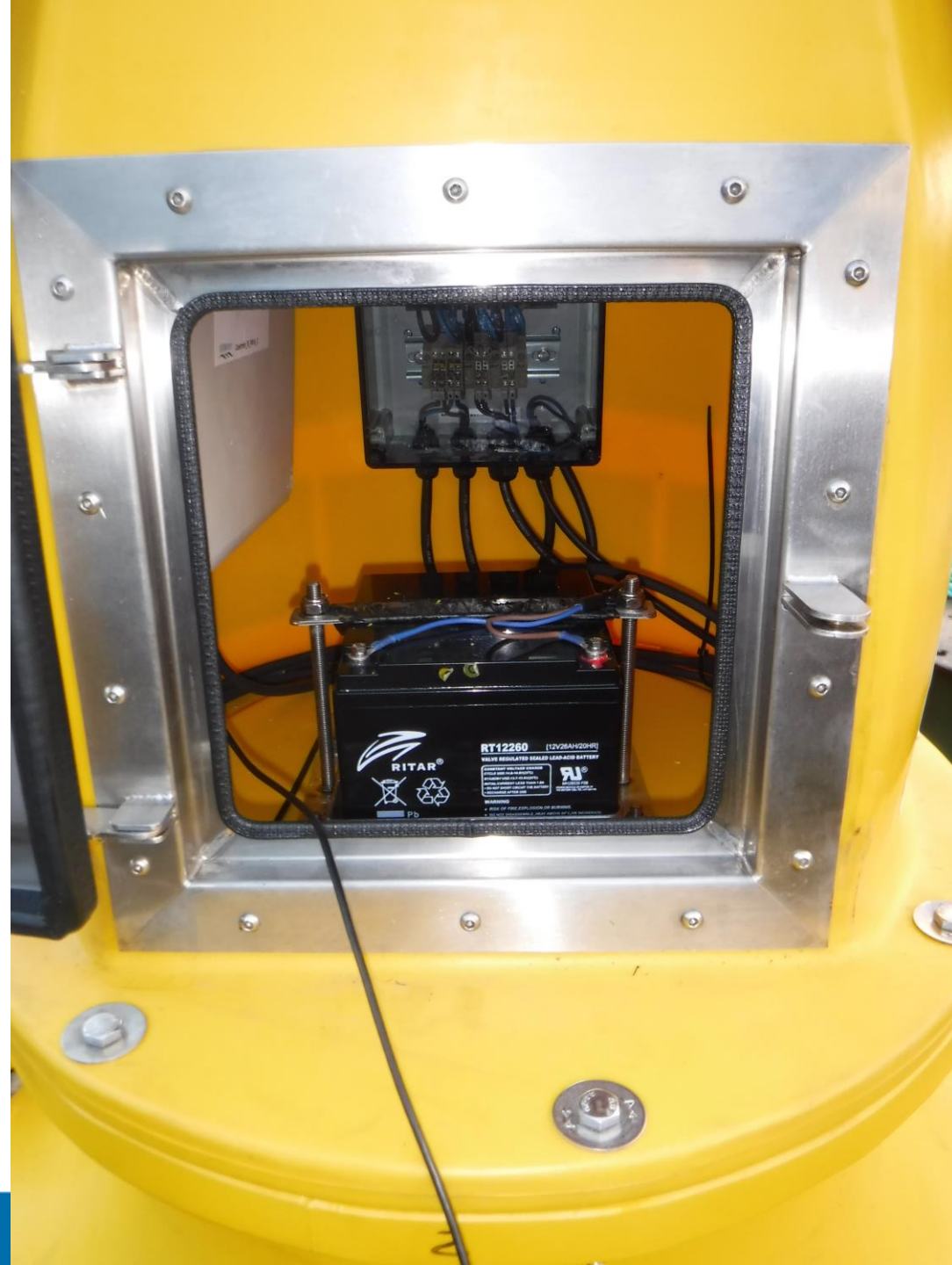
Deployment of the EBMS-Mira in June 2019



concrete anchors - 3 Tons



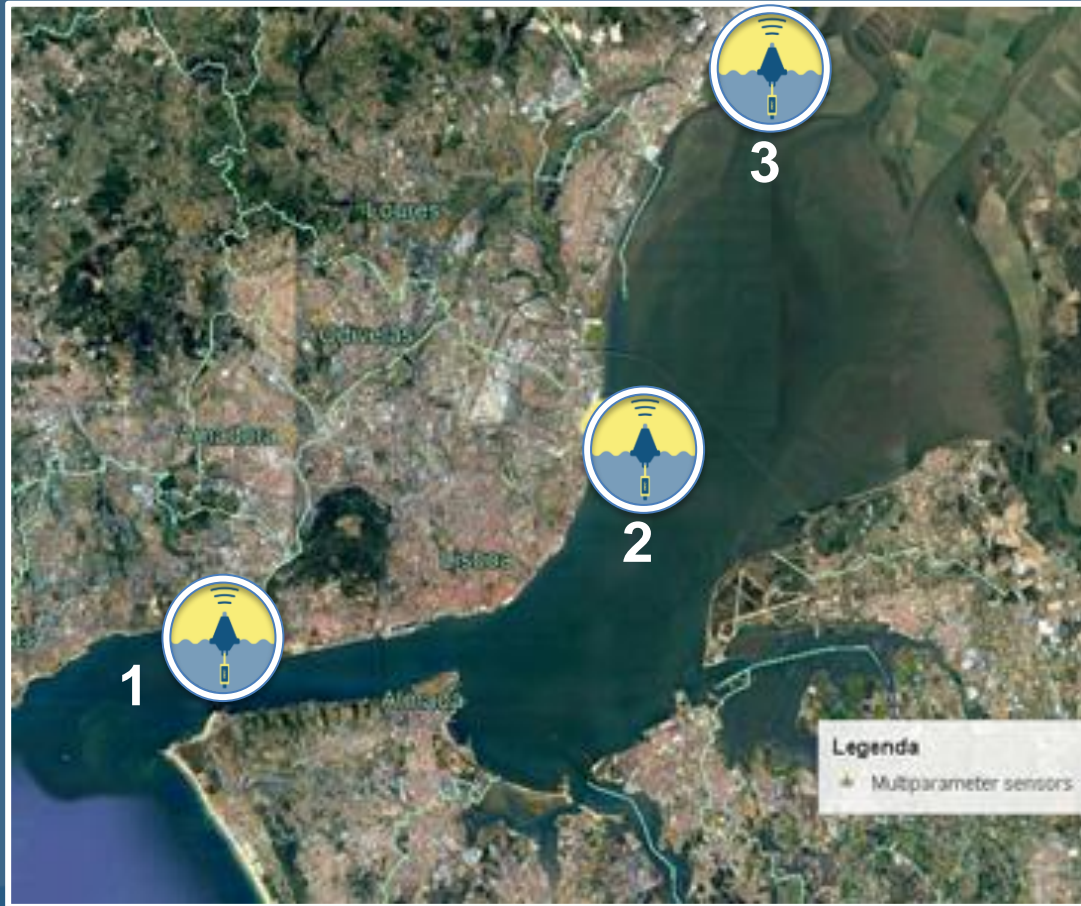




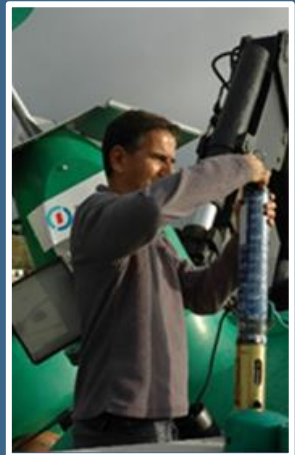




Tejo Estuary – Location and Deployment



Sept-Oct
2019





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Porto de Lisboa

Deployment of the EBMS-Tejo in September 2019



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Porto de Lisboa



Mondego Estuary – Location and deployment

Oct-Nov 2019





Environmental Parameters and System characteristics



- **Salinity**
- **Temperature**
- **Dis. Oxygen**
- **pH**
- **Chlorophyll *a***

- **Solar Panels**
- **GPS**
- **Off Station Alarm**
- **Always at surface
(~0.5m)**



Measurement and Data transmission



Measurements
every 15 min



Data storage at
logger



Data transmitted
(GPRS) 4 times per
day



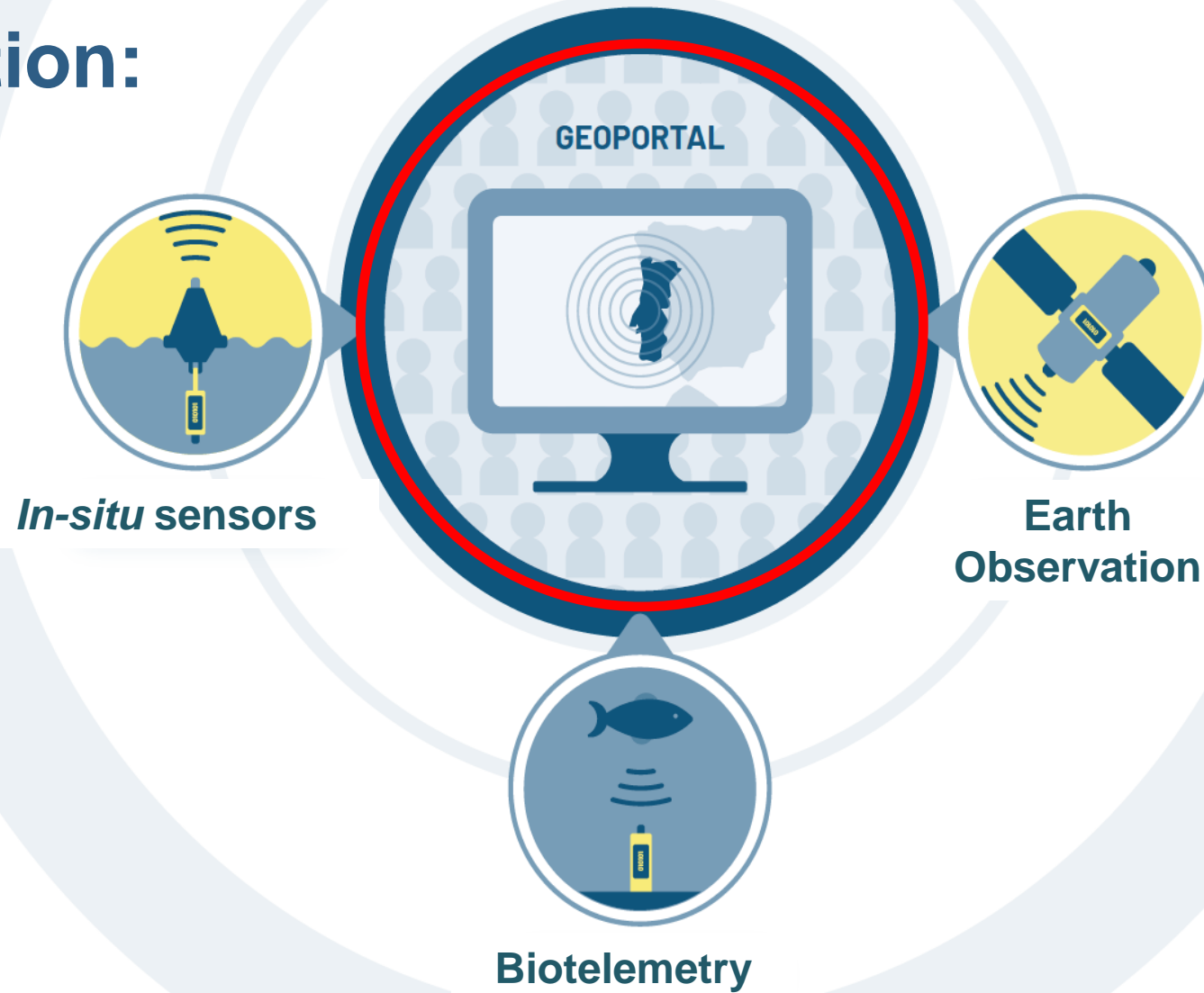
Data available in the
Geoportal



- ✓ NRT (NRT)
- ✓ Time Series



Lines of Action:





Lat: 37.858 Lon: 10.811



Chlorophyll-a concentration 4...

Satellite In-situ Sensor

NRT vs Time Series

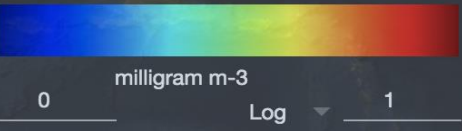
Near Real Time

Time Series

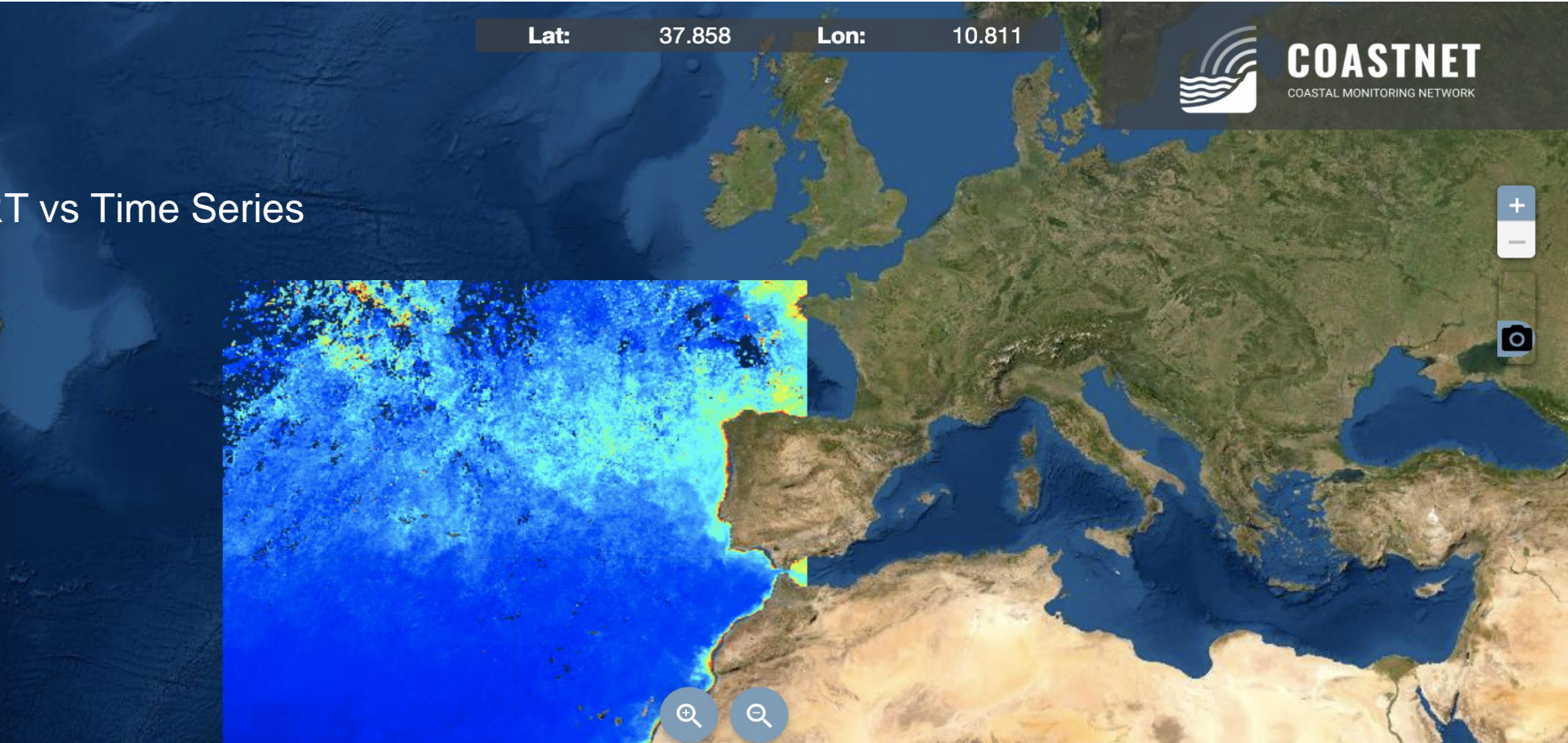
- Ocean Colour
- Chlorophyll-a con...
- Chlorophyll-a con...
- Std deviation Chl...
- Std deviation Chl...

- Sea Level
- Sea Surface Salinity
- Sea Surface Temp...

HELP



RESET



Animation

Frame Rate
10

START

Start Date End Date
11/1/1997 12/1/2016

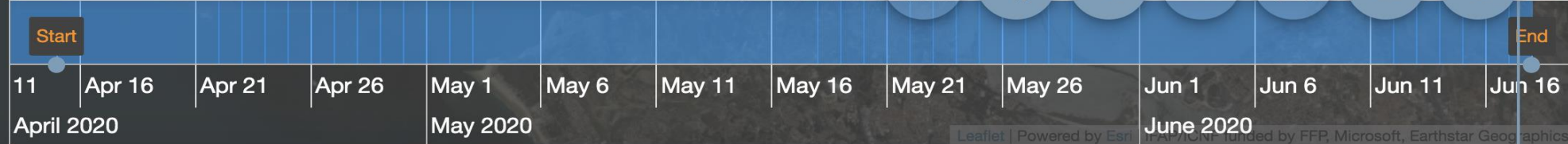
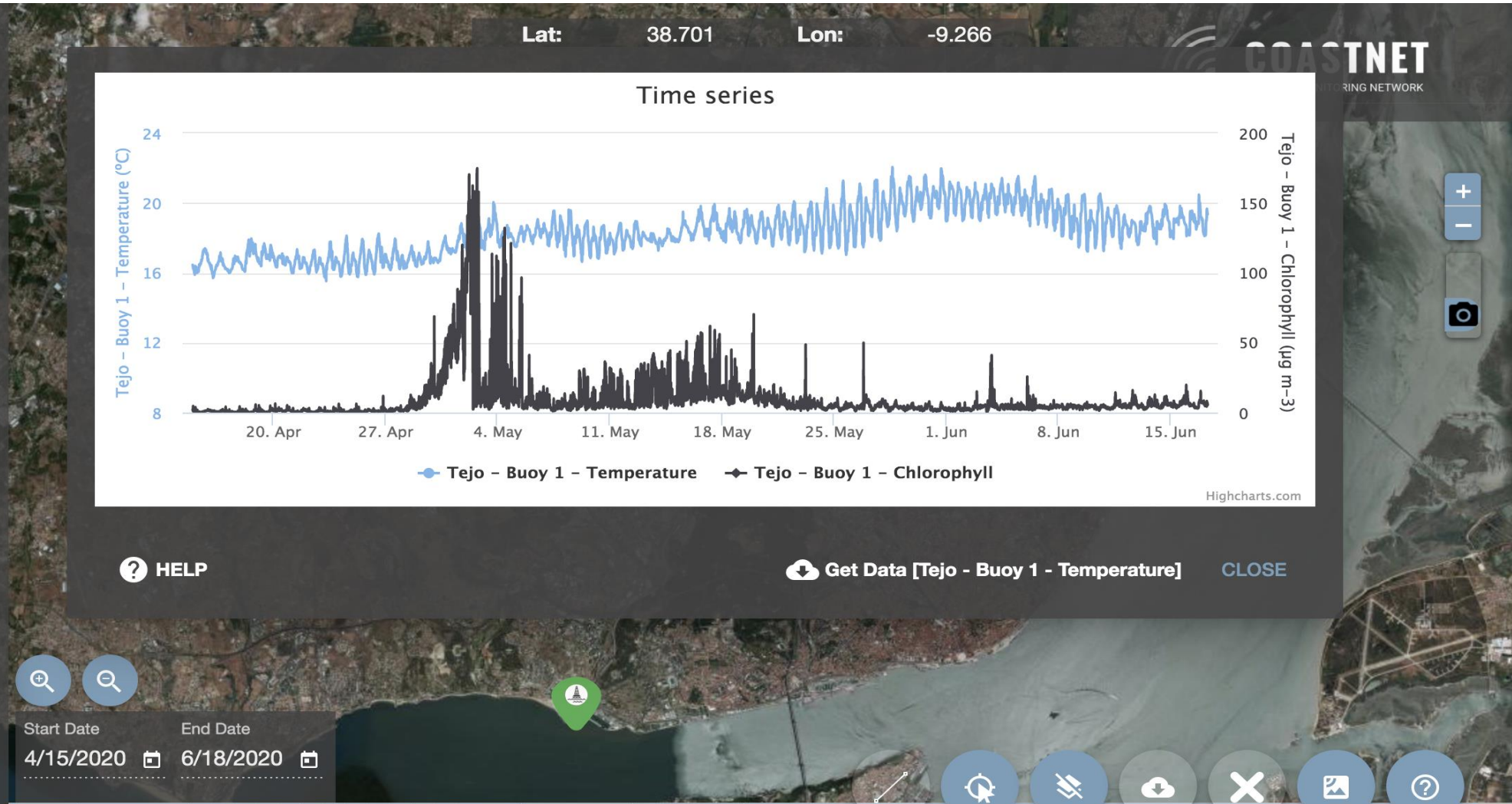




Tejo - Buoy 1 - Temperature

lite In-situ Sensor Biotek

- Mondego
- Tejo
- Buoy 1
- pH
- Temperature
- Salinity
- Dissolved oxygen
- Chlorophyll
- Buoy 2
- Buoy 3



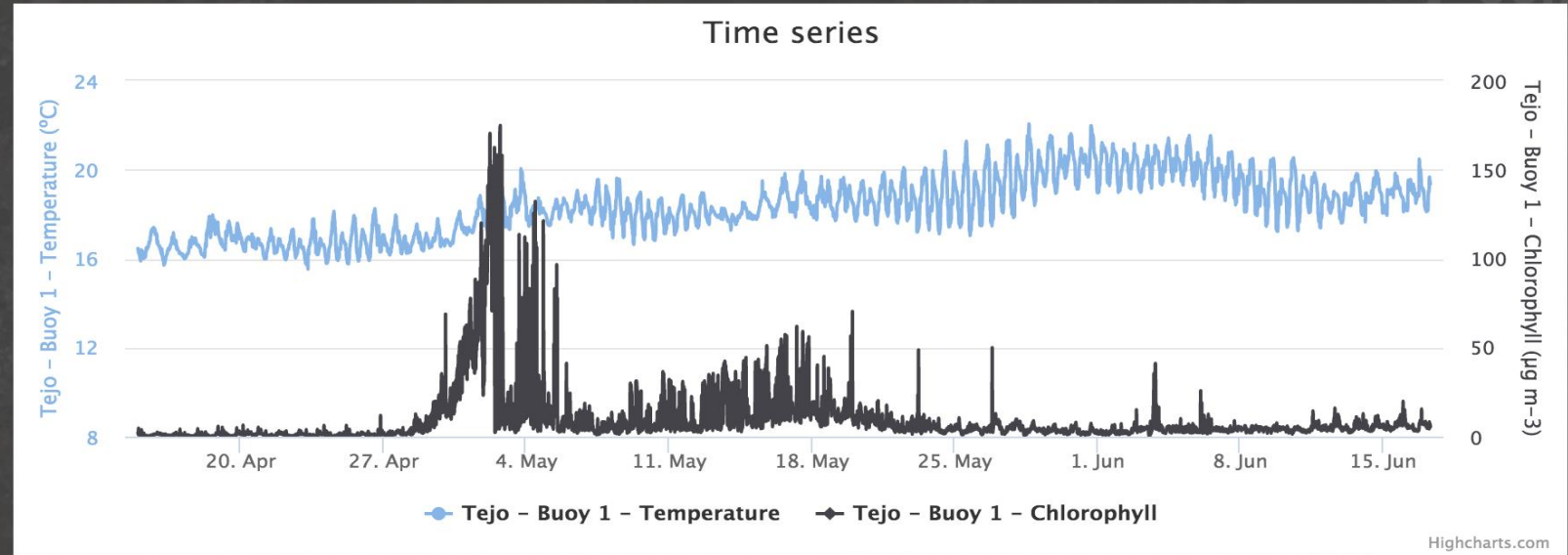


Tejo - Buoy 1 - Temperature

lite In-situ Sensor Biotek

- Mondego
- Tejo
- Buoy 1
- pH
- Temperature
- Salinity
- Dissolved oxygen
- Chlorophyll
- Buoy 2
- Buoy 3

Lat: 38.701 Lon: -9.266



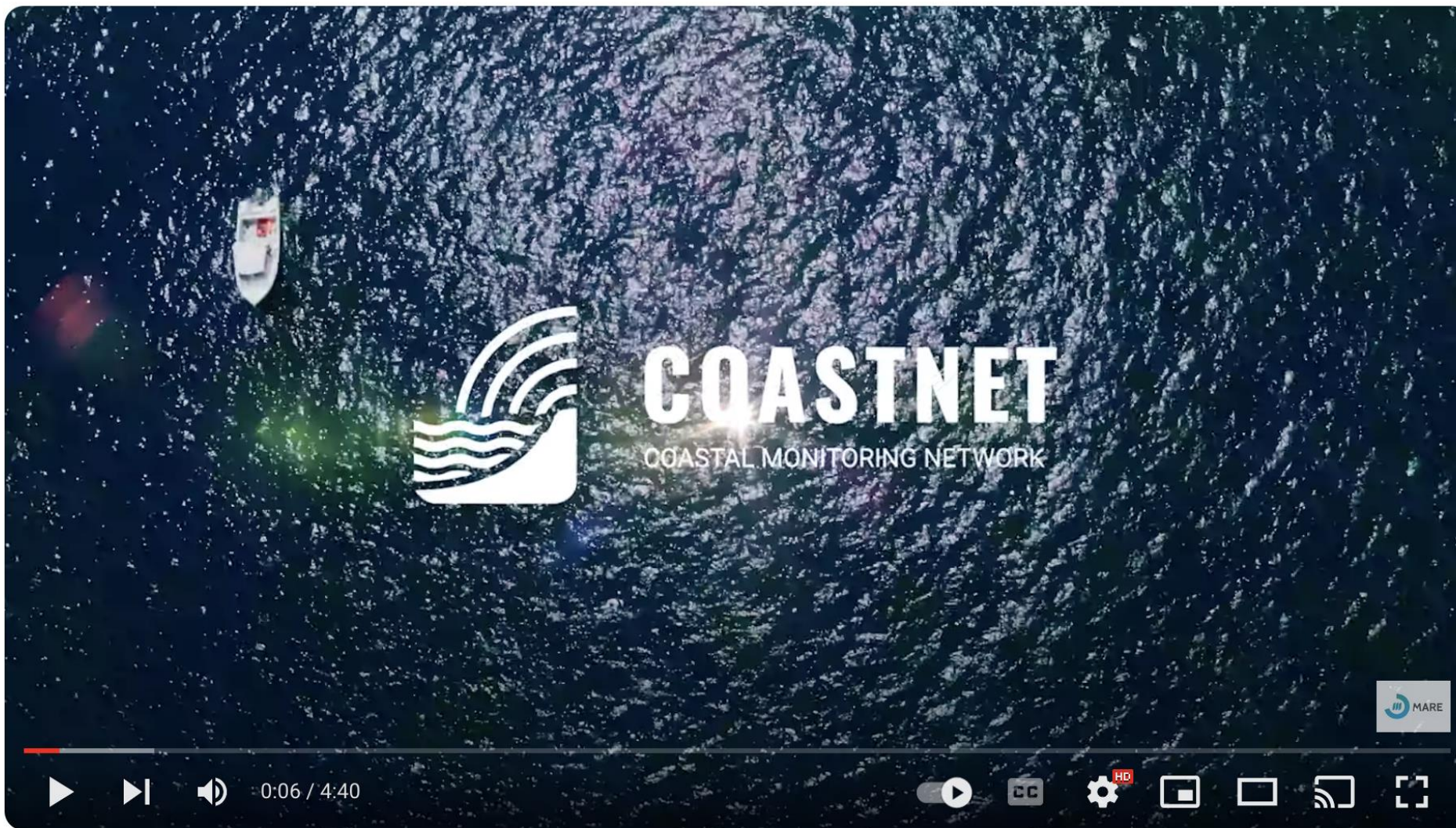
HELP

Get Data [Tejo - Buoy 1 - Temperature] CLOSE

Start Date: 4/15/2020

End Date: 6/18/2020





Conheça a Coastnet

<https://www.youtube.com/watch?v=Zu22kCPUTxM>



MARE - Centro de Ciências do Mar e do
364 subscribers

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4

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MARE



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Financiamento

Cofinanciado por:



UNIÃO EUROPEIA
Fundo Europeu
de Desenvolvimento Regional





Muito obrigada !

acbritto@fc.ul.pt