

# ***Building Services for Sustainable Fishery***

***Session A2 - Natural Resources Management***

***Atlantic from Space Workshop***

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## TECHNOLOGY BRANCH OF THE ELECNR GROUP



SPACE



AERONAUTICS



MARITIME



TRANSPORT



INDUSTRY  
& UTILITIES



TELECOM  
& MEDIA

+500  
High-tech  
projects

15  
Years of  
expertise

4  
Countries

+300  
Highly-  
qualified  
employees

*Excellence, commitment and innovation*



## Services for Sustainable Fishery: CONTEXT

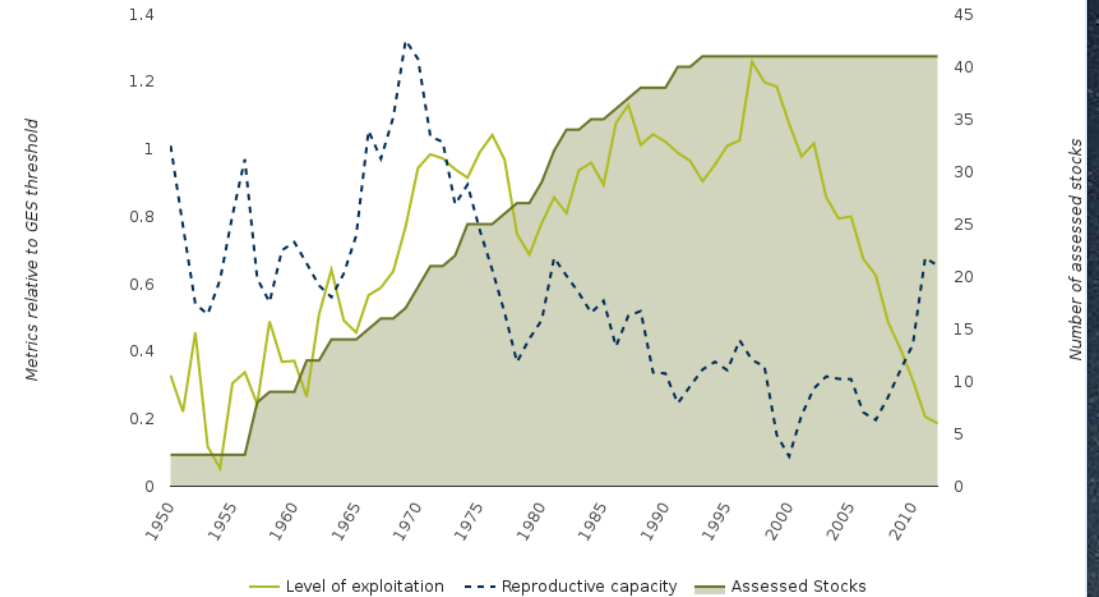
- Fish resources overexploitation



decrease in fish/bycatch populations and reproductive capacity

- Bioeconomy – balance between food security, use of marine resources and their environmental protection
- Translated to policy regulations and objectives
  - UN SDGs – SDG 12 and 14
  - CFP and MSFD

Chart – Average deviation of status compared to policy thresholds for Good Environmental Status (GES) of fish stocks in the North-East Atlantic and Baltic seas



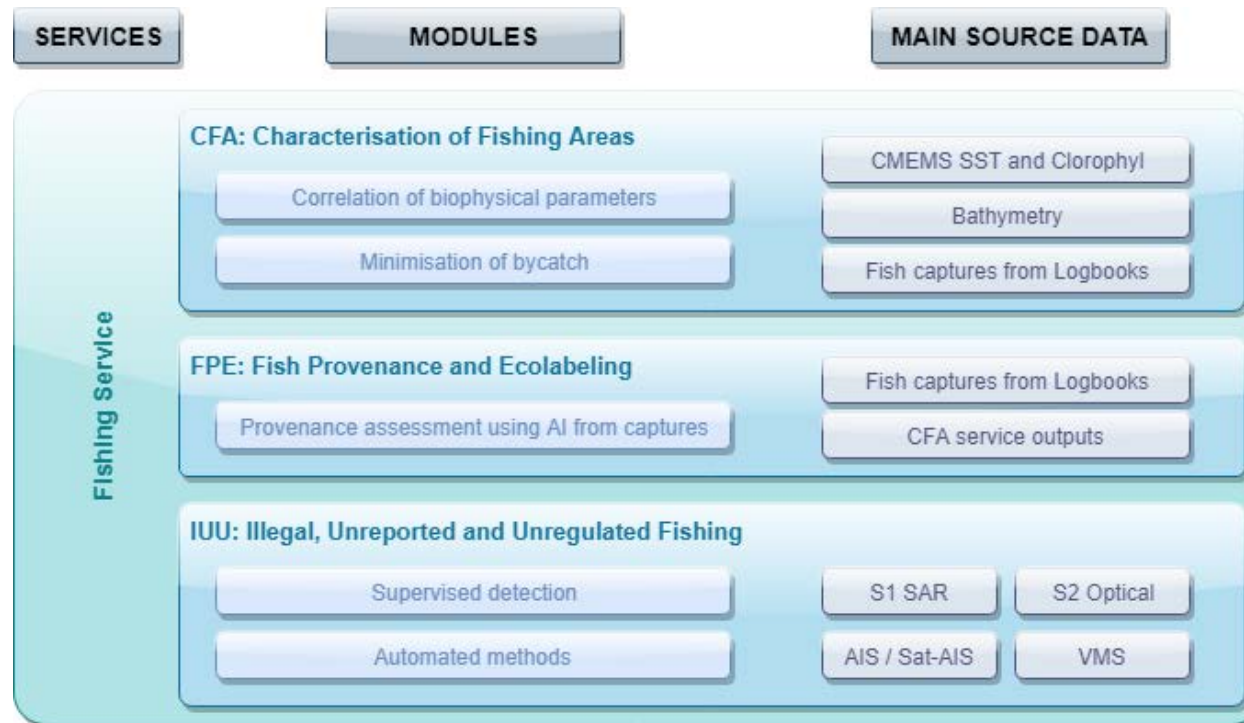
International Council for the Exploration of the Sea (ICES)





## Services for Sustainable Fishery: CONTEXT

- EO based services can help by providing spatialised information on:
  - environmental parameters relevant to species distribution
  - fishing activities (fish vessel detection and movements)





## Services for Sustainable Fishery: OVERVIEW

Collaborative EO ecosystem for sustainable fishery services development

- Engage **Users** and **federate** service needs

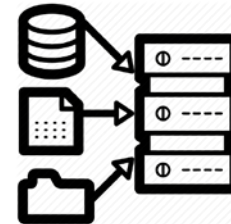
User Groups



- Collaborative and interoperable **R&D** and **operations** environment



- Easy access** to EO and non-EO **datasets**



- Application co-development** for the identified use-cases



- Attract funding and ensure **sustainability**





## Services for Sustainable Fishery: ENGAGE USERS AND FEDERATE USER NEEDS

- Public and Private Institutions (End Users)
  - Directorate General for Maritime Policy (DGPM) – Portugal
  - Directorate General for Marine Resources (DGRM) – Portugal
  - Directorate General of Port Authorities (DGAM) - Portugal
  - Guardia Civil – Spain
  - Hellenic Centre for Marine Research (HCMR) – Greece
  - Norwegian Coastal Administration (NCA) – Norway
  - European Aquaculture Technology and Innovation Platform (EATIP) - EU



## Services for Sustainable Fishery: ENGAGE USERS AND FEDERATE USER NEEDS

- Public R&D entities/initiatives (End Users and Service Developers)
  - Portuguese Sea and Atmosphere Institute (IPMA) - Portugal
  - Portuguese Hydrographic Institute (IH) – Portugal
  - University College Cork (UCC) - Ireland
  - Civil Engineering National Laboratory (LNEC) - Portugal
  - National Oceanography Centre (NOC) - UK
  - EuroGEOSS – EU
  - GEO BluePlanet - INT
  - Air Centre - INT
- Companies (Service Developers)
  - KSAT - Norway
  - PML Space Applications Ltd - UK
  - ARGANS – FR/UK
  - CLS - FR



# Services for Sustainable Fishery: R&D & OPERATIONS ENVIRONMENT



## Research Environment

Data + tools + applic. +  
Orchestrator + process. + support  
Target: researchers

[www.coresyf.eu](http://www.coresyf.eu)  
<https://geportal.coresyf.eu>

 Oil spill detection	 Vessel detection	 Coastal Altimetry
 Hyper-temporal Time Series	 Water quality & benthic habitat mapping	 Optical & SAR Bathymetry

## R&D Environment

Development of maritime services using open data  
Visualisation of service outputs  
Target: service developers

[www.simocean.pt](http://www.simocean.pt)  
<http://geoportal.simocean.pt/>

	<b>FISHING AREAS CHARACTERIZATION</b> Prediction of fish distributions and potential areas of catch for the main species along the Portuguese coast
	<b>SEA STATE INDEX FOR HARBOUR APPROACHES</b> To provide access to real-time sea state information based on high-resolution forecast models for the port authorities.
	<b>COMPARISON OF METEO-OCEANOGRAPHIC PARAMETERS</b> Integrated web visualization environment of different meteo-oceanographic fields

## R&D & Operations Environ.

Services operational environment  
Data catalogue projects/services  
Projects/services catalogue  
Target: service developers

<https://nextgeoss.eu/>



**More info on tomorrow's presentation on "Big Data Platform for Marine Applications" by Nuno Catarino et al. in Session D1-D2 at 14.30**





## Services for Sustainable Fishery: EASY ACCESS TO EO AND NON-EO DATASETS



Sentinel 1A/B

Sentinel 2A

Sentinel 3A

Jason-1/2/3

ENVISAT

ERS-1/2

SARAL/AltiKa

Landsat 8

Specific scenes from VHR

SAR and Optical

HYCOM sea state data

AROME meteo parameters

SMARTWAVE wave, sea  
floor depth

SWAN wave, sea floor  
depth data

ECMWF wave data

CMEMS Ocean Colour, SST

Coastal radar currents data

Fish Capture Data

Sentinel-1

Sentinel-2

Sentinel-3

Proba-V

CMEMS

GOME-2

MODIS

GDACS



JRC

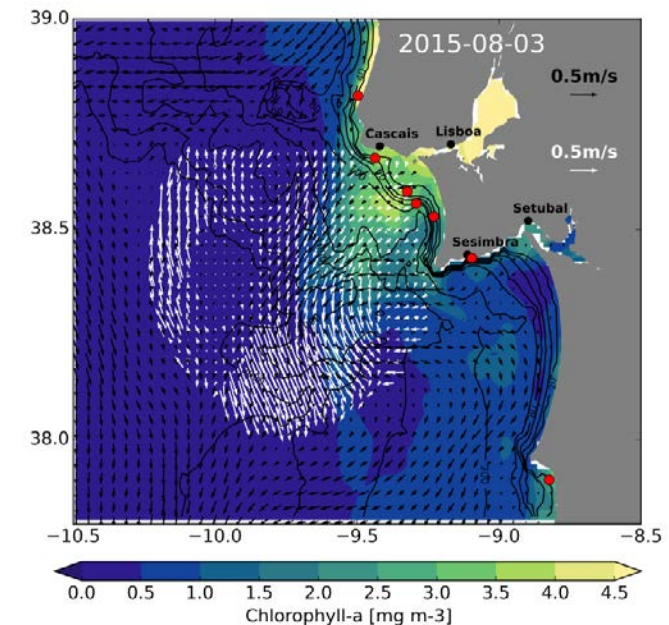
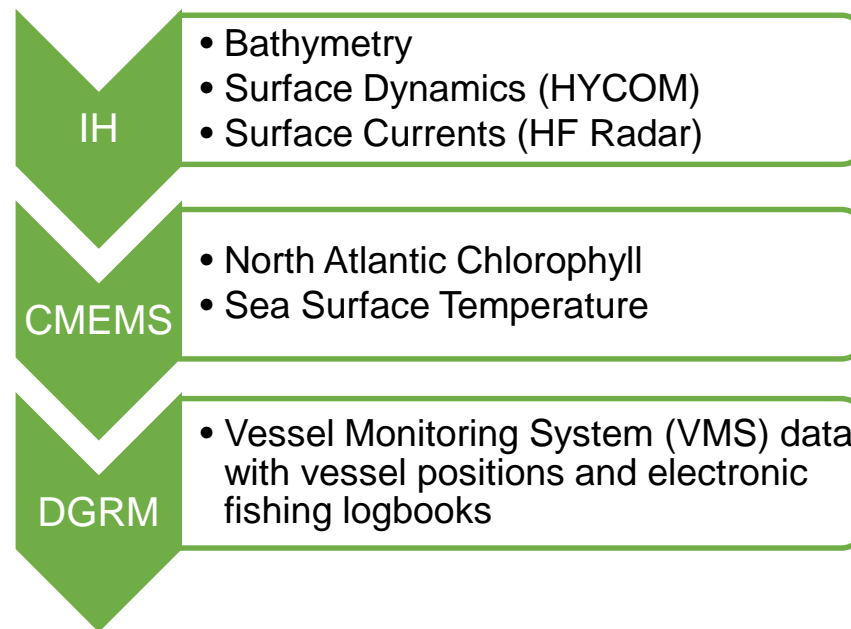
... and growing



# Services for Sustainable Fishery: APPLICATION CO-DEVELOPMENT **SIMOCEAN**



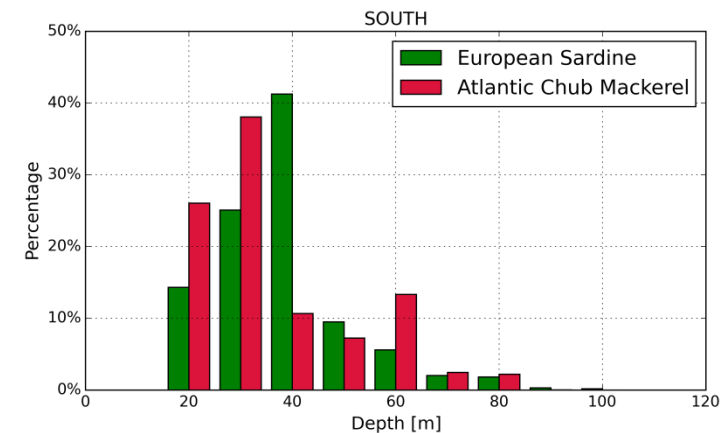
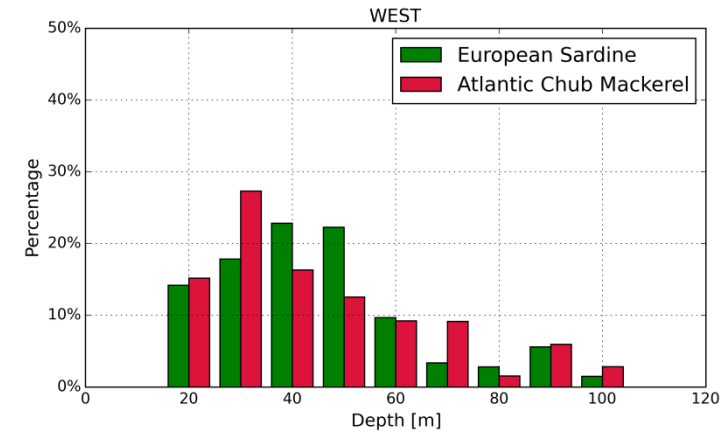
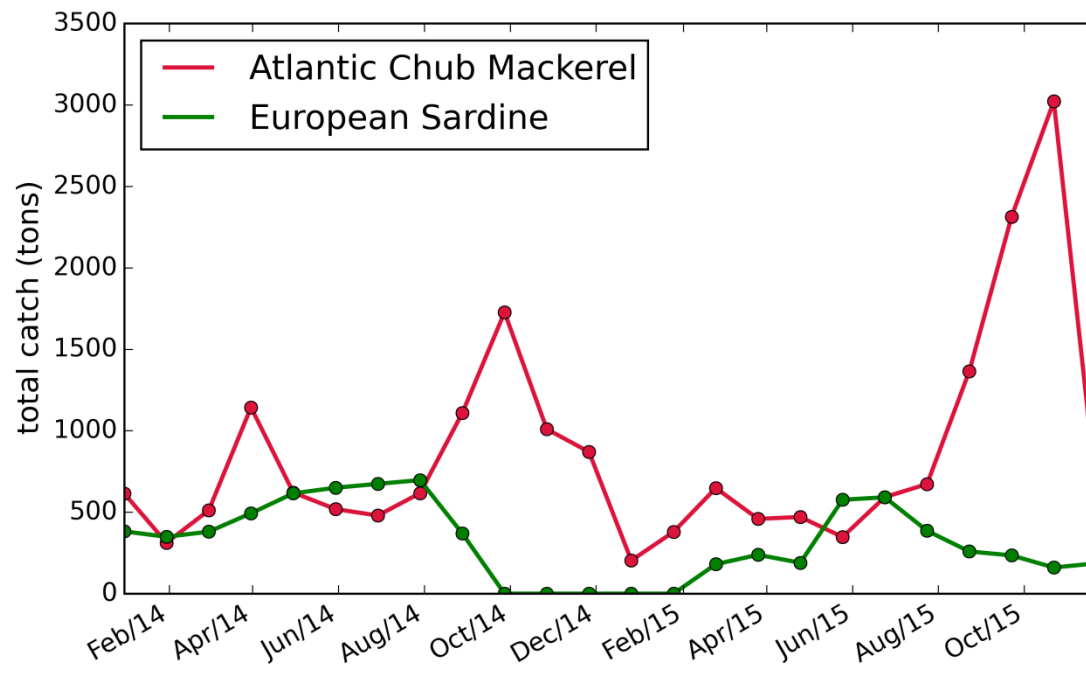
- Co-developed by IH, IPMA and Deimos
- Correlate fishing areas/captures with oceanographic parameters.
- Focused on Sardine and Mackerel  
- More info on 25<sup>th</sup> of February poster session – poster #6 “Fishing areas characterization using satellite and in-situ data” by Luísa Lamas *et al.*





# Services for Sustainable Fishery: APPLICATION CO-DEVELOPMENT **SIMOCEAN**

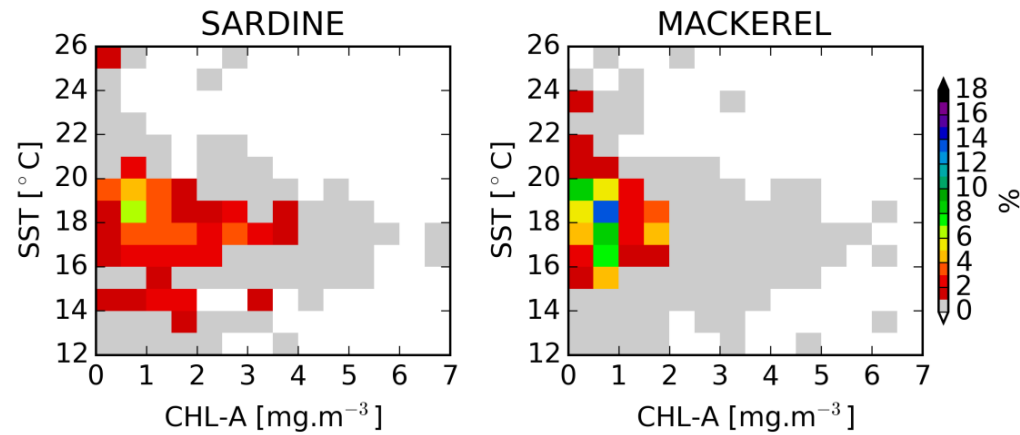
## Distribution and characterization of the fishing areas (temporal and depth)



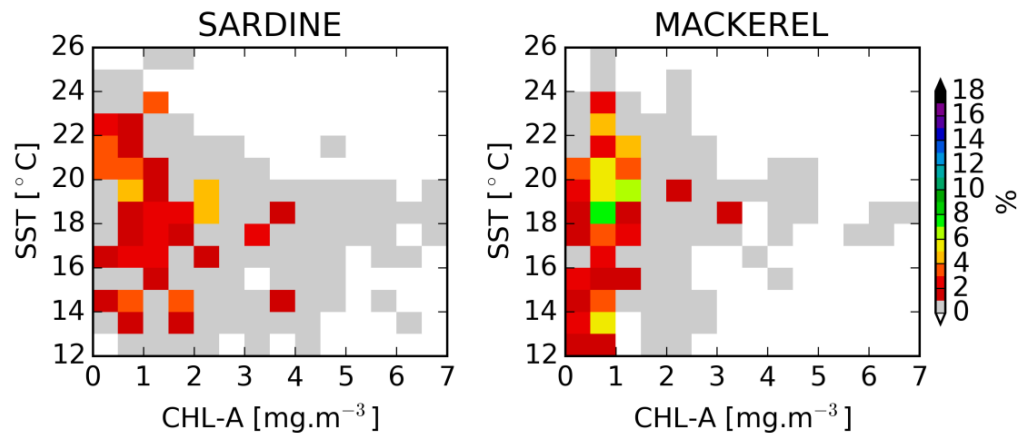


# Services for Sustainable Fishery: APPLICATION CO-DEVELOPMENT **SIMOCEAN**

## Distribution and characterization of the fishing areas (Chl and SST)



	CHL[ $\text{mg.m}^{-3}$ ]	SST[ $^{\circ}\text{C}$ ]
Sardine	0 – 4.0	16 – 20
Mackerel	0 – 2.0	15 – 21

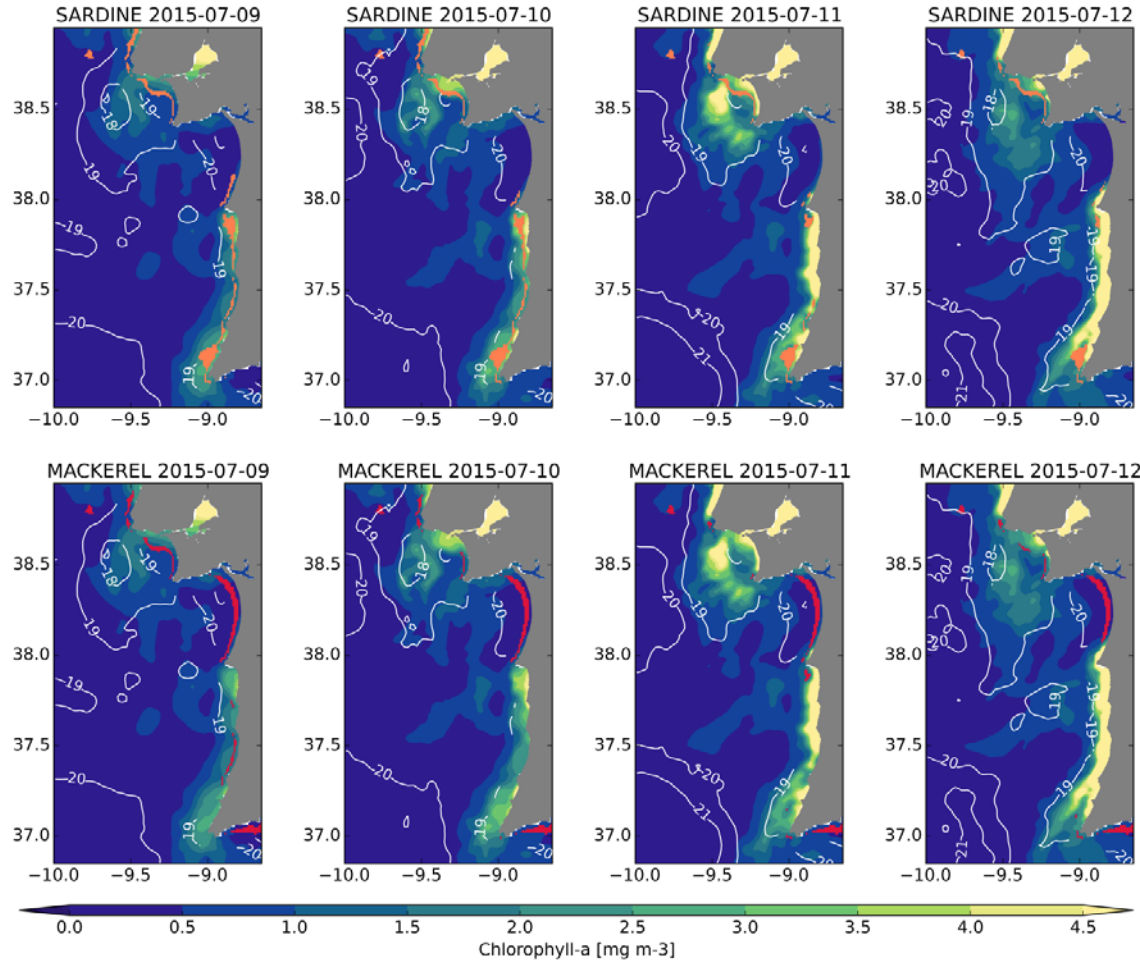


	CHL[ $\text{mg.m}^{-3}$ ]	SST[ $^{\circ}\text{C}$ ]
Sardine	0 – 3.0	14 – 22
Mackerel	0 – 1.5	12 – 24

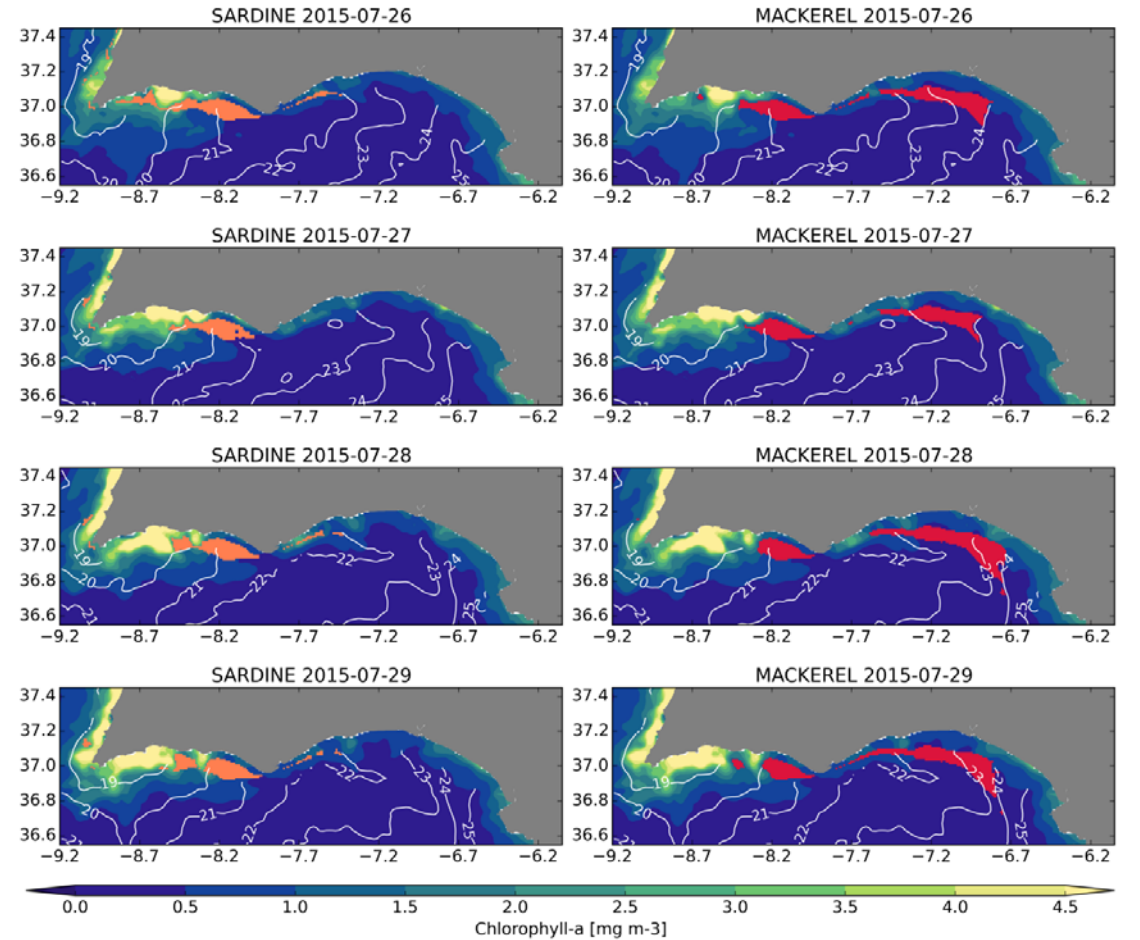


# Services for Sustainable Fishery: APPLICATION CO-DEVELOPMENT **SIMOCEAN**

## Potential Areas Identified (West)



## Potential Areas Identified (South)





## Services for Sustainable Fishery: Application co-development



### Fish Activity Monitoring service

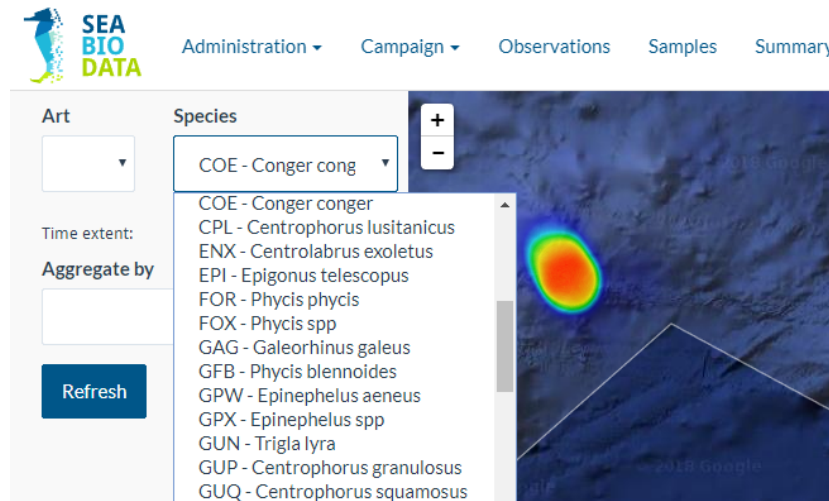
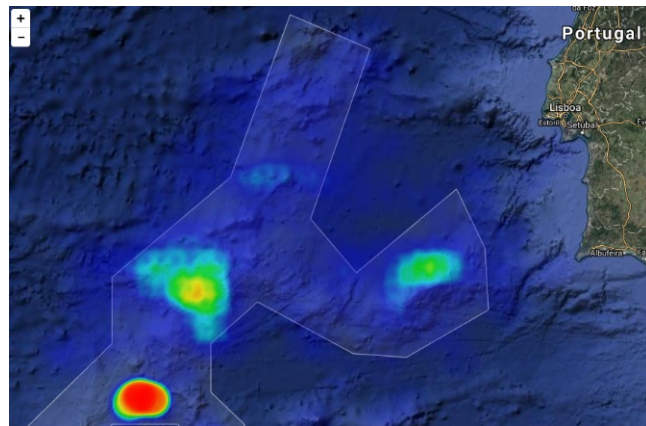
- extend monitoring to deep water pelagic fishes: **tuna and swordfish**
- **characterize/quantify human pressure**
- **relate activities with environmental data**
- strengthen **monitoring on the fishery in the Northeast Atlantic**
- **raise users awareness** of human footprint in marine ecosystems





## Services for Sustainable Fishery: Application co-development

- Web based service to provide maps for deep sea fishing areas on:
  - fishing effort, landings, catch rates and environmental characterization
- Based on work developed in previous projects:
  - BIOMETORE
  - SeaBioData



Analysis of fishing intensity using VMS data and E-logbooks

First step towards development of fishing intensity indicators for MSFD D3 and D6

Identification and characterization of spatial patterns of fishing activity  
*In:* Campos et.al., 2019, Marine Policy 99, 50-57 and Campos et al., 2018 – Symposium on the Iberian Atlantic Margin



## Services for Sustainable Fishery: Attract funding and ensure sustainability



- Assure future funding from R&D European and National calls to:
  - Extend service portofolio to aquaculture
  - Extend sustainable fishery portfolio
  - Expand to other regions/species
- Scale up and operationalise services for public institutions
- Commercial services for fishing and aquaculture private sector





## Services for Sustainable Fishery: Recommendations

- Create regional knowledge clusters
- Dedicated calls to promote and scale up adoption of EO services
- Establishment of European Level open access datasets key to improvement of EO services:
  - Higher resolution regional sea state and meteorological datasets
  - Fish capture data
  - AIS NRT data
- Improve quality of E-logbooks data
- Improve spatial resolution of EO based environmental parameters products (e.g. ocean colour)



## Services for Sustainable Fishery: AtlanticGEOSS

**Vision:** The Atlantic GEOSS' vision is to **enhance the role of Earth Observation** information and services serving the **Atlantic Region** societal needs, with strong focus on the *Sustainable Development Goals* and the *Belém Statement*, while promoting collaboration and growth.

**Mission:** The mission of the Atlantic GEOSS is to **mobilize and coordinate** complementary resources of Atlantic countries to create a **sustainable EO data ecosystem** for the Atlantic region, supporting the use of Earth Observation information in *decision-making processes*.

Go to: <http://atlanticgeoss.org/>



Thank you!

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