Building Services for Sustainable Fishery and Aquaculture

Workshop - Linking Earth Observation data and Sustainable Development across the Atlantic

3rd Marine Technologies Workshop

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Services for Sustainable Fishery: CONTEXT

- EO based services can help by providing spatialised information on:
 - oceanographic and environmental parameters relevant to species distribution
 - fishing activities (fish vessel detection and movements)
- Combined with other data sources provide higher level fishery support services





Services for Sustainable Fishery: OVERVIEW

Collaborative EO ecosystem for sustainable fishery services development

User Groups

- Engage **Users** and **federate** service needs
- Collaborative and interoperable R&D and operations environment
- Integrated access to EO and non-EO datasets
- Application co-design between service providers and users
- Attract funding, operationalise 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
 - Food and Agriculture Organization of the United Nations INT
 - Direção Regional das Pescas dos Açores PT
 - Scottish Salmon Producers Organisation UK
 - Integrated Information System (private company service provider to fishers)
 - International Council for the Exploration of the Sea (ICES) INT
 - UK Department for Environment, Food & Rural Affairs (Defra) UK
 - Wales Welsh Government UK



Services for Sustainable Fishery: ENGAGE USERS AND FEDERATE USER NEEDS

End Users needs

- Public Institutions
 - Monitor fishing activities
 - Compliance with regulations (e.g., Common Fisheries Policy, Marine Strategy Framework and Marine Spatial Planning Directives)
 - Ensure sustainability of resources
 - Environmental Impact of Fishing and Aquaculture Resources
- Private companies (fishing and aquaculture)
 - Reduce operational costs & improve rentability
 - Risk assessment and mitigation
 - Sustainability as a marketing strategy (e.g eco-labels)





Services for Sustainable Fishery: R&D & OPERATIONS ENVIRONMENT



Research Environment Data + tools + applic. + Orchestrator + process. + support Target: researchers www.coresyf.eu

https://geportal.coresyf.eu



Vessel detection

Hyper-temporal Time Series



Water quality & benthic Optical & SAR Bathymetry

Coastal Altimetry





R&D Enviroment

Development of maritime services using open data Visualisation of service outputs Target: service developers <u>www.simocean.pt</u> <u>http://geoportal.simocean.pt/</u>



FISHING AREAS CHARACTERIZATION diction of fish distributions and potential areas of catch for the mai species along the Portuguese coast

SEA STATE INDEX FOR HABOUR APPROACHES To provide access to real-time sea state information based on highresolution forecast models for the port authorities.

COMPARISON OF METEO-OCEANOGRAPHIC PARAMETERS ntegrated web visualization environment of different meteo-oceanographic fields



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R&D & Operations Environ.

Services operational environment Data catalogue projects/services Projects/services catalogue Target: service developers https://nextgeoss.eu/





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 **Sentinel-1 AROME** meteo parameters **Sentinel-2** SMARTWAVE wave, sea **Sentinel-3** floor depth **Proba-V** SWAN wave, sea CMEMS floor depth data GOME-2 **ECMWF** wave data MODIS CMEMS Ocean Colour, SST **GDACS** Coastal radar currents data JRC **Fish Capture Data**

... and growing



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OCEAN

Services for Sustainable Fishery: APPLICATION CO-DEVELOPMENT



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Services for Sustainable Fishery: APPLICATION CO-DEVELOPMENT

- Fish Activity Monitoring service to be developed in E-SHAPE project for DGRM
 - extend monitoring to deep water pelagic fishes: tuna and swordfish
 - characterize/quantify human pressure related to fishing activities
 - relate activities with environmental data relevant to species distribution
- Based on work developed by IPMA in previous projects:
 - BIOMETORE Fisheries-related activities in seamounts of the Madeira-Tore and Great Meteor
 - SeaBioData Good Environmental State of European marine and coastal waters





Analysis of fishing intensity using VMS data and E-logbooks



Identification and characterization of spatial patterns of fishing activity for PT fleets in Atlantic seamounts by fishing gear type and target species: *In:* Campos et.al., 2019, Marine Policy 99, 50-57 and Campos et al., 2018 – Symposium on the Iberian Atlantic Margin



e-shape







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 current sustainable fishery support services portfolio
 - Expand current fishery support services to other regions/species
- Scale up and operationalise services for engaged public institutions
- Extend commercial services for fishing and aquaculture private sector



Services for Sustainable Fishery: MAJOR CHALLENGES

- Lack of operational services
- Awareness and capacity building on EO capabilities
- Building confidence in EO-based services
- Willingness to Pay hard to define
- Need for data integration in one single access point
- Need of NRT information
- Access to in-situ test and validation data (e.g. fish captures logbooks, AIS and VMS)





Services for Sustainable Fishery: Collaboration with AIR Centre - 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: <u>http://atlanticgeoss.org/</u>



Thank you!

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