

FPCUP ACTION 2021-2-47:

Coastal Coordination of User Needs and Methodologies

M04: Report on the first cycle of interaction with national users.

Under FPCUP action 2021-2-47, the AD AIR Centre responsibilities include interfacing with national Portuguese coastal users, to discuss needs and showcase Copernicus-related services, and coordinating with the national Copernicus User Forum representatives to form a working group for Coastal applications. Recognizing that an established community of Copernicus coastal users is not yet present in Portugal, our first interaction involved leveraging the results of other actions, in particular, the results of the survey carried for the action Copernicus Uptake for Maritime Sector¹ and the outcomes of a FPCUP event², that showcased Copernicus-related products and services, to address ocean and coastal challenges.

From the analysis of the survey replies (see Annex I for complete analysis) it was possible to provide a first characterization of the national Portuguese coastal users involved in this first interaction (N=34; Annex I: Figure 1), from the point of view of their affiliation and their affinities, with respect to specific coastal activities. The user's affiliation (Annex I: Figure 2) was primarily research-oriented, both from academia and research entities (62%), with a segment of users affiliated with public entities. The private sector was less represented, as only 12% of the respondents worked in private entities. The interaction also provided insight into the main affinities, with specific marine sub-sectors of Portuguese respondents engaged in coastal activities (Annex I: Figure 3). Most of the users were involved in research, protection, and conservation activities. A consistent part of the users was also associated with maritime infrastructure and development (ports, tourism, energy, and transport) followed by those with an affinity for resource management and utilization (fisheries, aquaculture, and raw material extraction).

The assessment of Copernicus products awareness, usage, and satisfaction among the users (Annex I: Figure 4) revealed that nearly all were fully aware of the program, and that three-quarters were familiar with product and service distinctions and used the products. Among users, there was a consistent and proficient utilization pattern, where the majority relied on satellite-derived and model-derived products, indicating a predominant reliance on remote sensing. Satisfaction was high, totaling 84%. The remaining quarter cites a lack of skills as the main obstacle to uptake the data and services in their activities. Despite the high satisfaction rates, the users identified some requirements that would improve the service. The most mentioned downside of Copernicus Services was the spatial resolution, which was claimed to be insufficient. Temporal resolution enhancement was also required by the user, although, no one mentioned the desired periodicity to fulfil their needs. Some users suggested that access to data should be streamlined, and tailored data should be facilitated, alongside tutorials for accessing and downloading them. Lastly, it was suggested that prediction services should provide longer and more stable outputs.

The survey's open-ended questions on uses of the Copernicus data provided limited feedback from national coastal users, regarding the quality and usefulness of existing Copernicus downstream products. However, on a national scale, it should be noted that the availability of downstream products is on the rise. Events such as Copernicus for Business Innovation in Portugal² have served as platforms to bring together service providers and potential end users, and showcase new Portuguese downstream national products, encouraging their adoption and stimulating the development of innovative solutions in ocean and coastal monitoring. In the event (see agenda in

¹ [Action 2021-2-42 Copernicus uptake for the maritime sector](#)

² [Action 2020-3-2 Copernicus for Business Innovation in Portugal](#)



Annex II) Mercator Ocean was invited to participate and introduce relevant Copernicus Marine Services, Data and Tools, and experts from the Azores and mainland Portugal were invited to showcase their success cases of development of downstream products as well as to provide training.

Despite the need for new products, new parameters and/or post-processing emerging in the survey, coastal users often did not explicitly mention a specific new type of product, except for model forcing (atmospheric forcing and mass flows). The users also identified some complementary services unavailable on Copernicus Services and acquired from other sources. Some of this could be integrated into Copernicus Services, complementing the products already provided, eventually establishing interconnection between platforms to avoid product redundancy. The most referred type of datasets was related to in situ variables that are required for validation, calibrations, and correction of their models, in particular ocean current velocity and meteorological data. In terms of imagery, there are people also using imagery from other sources such as MODIS or other higher resolution imagery for water level monitoring. Considering the scope of coastal activities, some users rely on other sources to assess the coastal hazards risk and maritime vessels positions from AIS (Automatic Identification System) and VDES (VHF Data Exchange System) systems. Other parameters, that are sourced elsewhere, consist of wind modelling data, ecosystems health indicators and national monitoring campaigns.

Acknowledgment

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Annex I: Survey on the use of Copernicus data for the Marine sector

Survey on the use of Copernicus data for the Marine sector: insights from the Portuguese respondents engaged in coastal activities (34).



Figure 1. Occupational engagement on marine, coastal, and inland activities: Insights from the Portuguese users

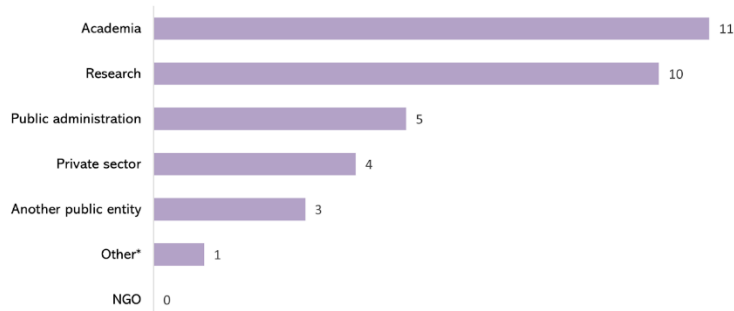


Figure 2. Affiliation profiles of Portuguese respondents involved in coastal activities.

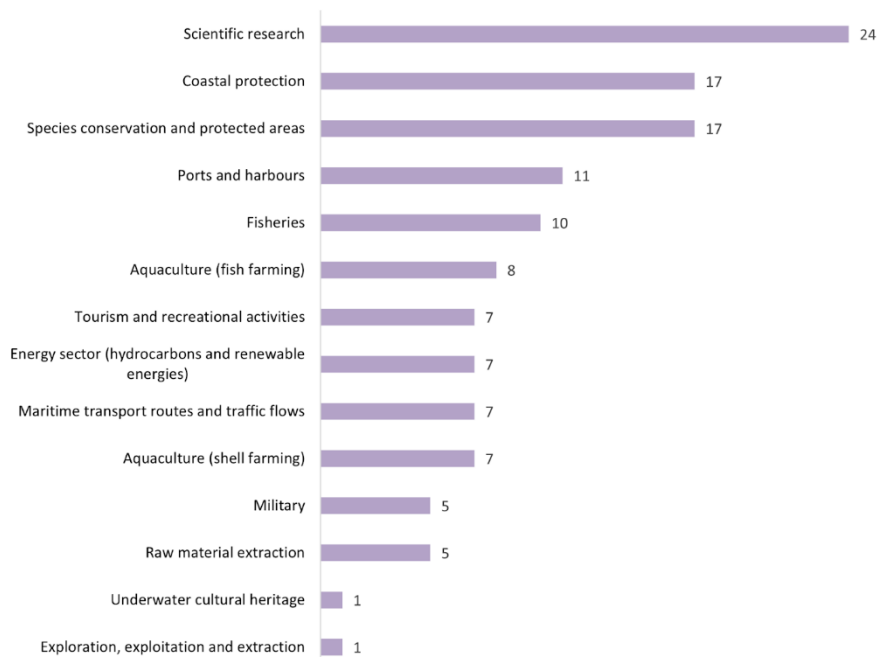


Figure 3. Marine sector affinities of Portuguese respondents involved in coastal activities.

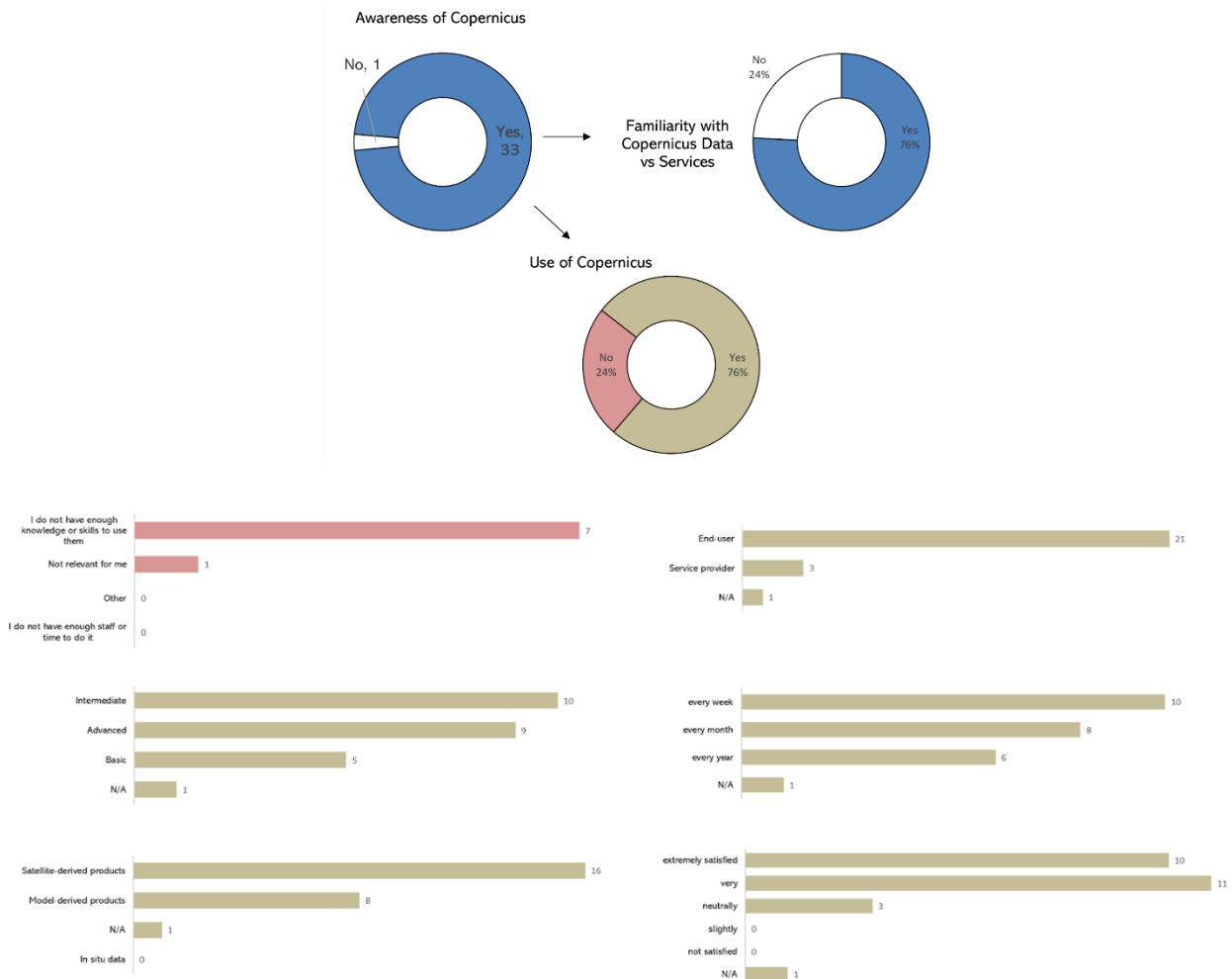


Figure 4. Awareness and Use Copernicus Products & Services: Insights from the Portuguese users.

Annex II: Action 2020-3-2 Copernicus for Business Innovation in Portugal - Agenda

OCEAN MONITORING – March 15th

Presentation of the benefits and opportunities from Copernicus data and tools and presentation of success cases:

- **Muriel Lux** - Copernicus Services, Data and Tools for Ocean Monitoring - Mercator Ocean International (Remote)
- **Issah Nazif Suleiman** - Harmful Algae Blooms Monitoring – Eyecon
- **Monica Silva** - SEAPODYM offers new insights into the behavior of large whales and informs conservation efforts - OKEANOS - Universidade dos Açores
- **Ana Martins** - Ocean mesoscale eddies identification and tracking using Ocean Colour: Relevance of these hydrodynamic structures on ocean production, human health and biodiversity conservation - OKEANOS - Universidade dos Açores (Remote)
- **Renato Mendes** - How is Copernicus data essential for the future of ocean observation with autonomous systems? - Colab +Atlantic & LSTS, FEUP (Remote)
- **Ana Oliveira** - Marine Heat Waves - Colab+Atlantic (Remote)

Training on data usage and tools (1h30) relevant for Ocean Monitoring using Copernicus with parallel workshops:

- **Ana C. Brito** - On the use of Ocean Colour in the Western Iberia Coast - MARE – FCUL
- **Emanuel Castanho** - Introduction to Marine Litter Detection using Python - AIR Centre

COASTAL COMMUNITIES – March 16th

Presentation of the benefits and opportunities from Copernicus data and tools and presentation of success cases (15 min each) (1h30) (6 x 15 min):

- **Muriel Lux** - Copernicus Services, Data and Tools for Ocean Monitoring - Mercator Ocean International (Remote)
- **Anabela Oliveira** - OPENCoastS: on-demand marine data forecast service for Coastal Management - National Laboratory for Civil Engineering – LNEC
- **José Chambel Leitão** – AQUASAFE: Operational Service to Support Port Management - Hidromod
- **Marcos Mateus** - Aplicações de Detecção Remota para Aquacultura - MARETEC
- **Pedro Almeida** - Coastline Evolution Using CASSIE - Colab+Atlantic
- **Claudio Sousa** - Copernicus Master Azores Prize: Bathymetry derivation from multispectral imagery - LS Engenharia (Remote)

Training on data usage and tools (1h30) relevant for Ocean Monitoring using Copernicus with parallel workshops (15 min theoretical concepts + 1:15 exercises):

- **Pedro Almeida** - CASSIE: monitoring shoreline evolution from space using Google Earth Engine - COLAB+Atlantic
- **Anabela Oliveira** - OPENCoast +: Platform for on-demand forecast of circulation and water quality in coastal regions - LNEC



Figure 5. Ocean Monitoring and Coastal Communities Event – March 15th & 16th.