



MARINE & MARITIME

#FISHERIES #AQUACULTURE #MARINE TRANSPORT
#COASTAL MANAGEMENT #OFFSHORE ASSETS MONITORING #MARINE ECOSYSTEMS #WATER QUALITY

*“Oceans support life on Earth,
and we need more Earth Observation
to build our marine knowledge
and act sustainably.”*



WHERE ARE WE NOW?

The current state-of-play in the sector. Maturity of EO and its contribution to addressing the challenges of the sector.



POLICY

- € **Strong political momentum** at the EU and global level.
- € Current policy efforts address the need to **improve our marine knowledge, sustainably manage** this valuable resource and important economic sector, and take into account the **growing global food demand**.

Main relevant policies and initiatives:

- € United Nations Decade of Ocean Science for Sustainable Development
- € EU mission to Restore our Ocean and Waters by 2030 (2021-2027)
- € EU Strategy for a Sustainable Blue Economy (EU Green Deal)



EO MARKET MATURITY

- € Overall, **revenues** from EO services are **expected to double** in the next decade.
- € Earth Observation is **widely used** in marine surveying, mapping, vessel identification, detection and tracking, security at sea, and fishing monitoring and control.
- € The market for EO data for **aquaculture** is in its infancy, but expected to grow substantially.



R&D

- € **Digital Twin of the Ocean** and other R&D efforts aimed at improving our understanding of the marine environment.
- € **Main topics:** marine coastal areas, water quality, marine pollution, (oil spills, accumulation of plastic), sustainable fisheries and aquaculture.
- € Focus on **EO integration with in-situ** and (emerging) technologies and data streams.

WHERE DO WE WANT TO BE?

Guiding aims and priorities for the future as defined through the FIRE consultation process with sectoral users and EO professionals.

EO FOR OCEAN HEALTH

- € **Comprehensive use of EO** for assessing, monitoring, and modelling ocean health.
- € Filling the geographical or thematic **marine knowledge gaps**.
- € Successful creation of an **operational Digital Twin** of the ocean to guide all future marine activities.

MORE EO FOR IUU AND OTHER MARINE & MARITIME APPLICATIONS

- € Excellent data quality, reliability, time-series to **broaden the use cases** of EO-powered solutions.
- € Fully exploiting **SAR imagery** and other technologies.
- € **Full uptake** by all users and actors.

RIGHT EFFICIENCY/ SCALABILITY BALANCE

- € EO solutions for the sector which are **scalable** and **customizable**.
- € **User-centred design**, use of cloud and smart algorithms.

FULL EO COMPETENCE BY SECTOR PROFESSIONALS

- € **Full use of EO data in the workflow** of marine and maritime professionals, both smaller and bigger actors.

EO TO SUPPORT SOCIETAL GOALS AND PRIORITIES

- € Unequivocal role for EO in enhancing **sustainability, food security, environmental goals** and the SDGs related to the marine sector.

HOW TO GET THERE?

Selected actions to be taken by the community of practitioners (both EO and non-EO) to achieve the envisaged future.

01

SUPPORTING INTEGRATED SYSTEMS (OF SYSTEMS)

02

FOSTERING MARINE
DATA AVAILABILITY AND
ACCESSIBILITY

03

INCORPORATION OF EO IN KEY
POLICIES AND STRATEGIES

04

DEMONSTRATING THE VALUE
OF MATURE EO APPLICATIONS

05

SUPPORT FOR
THEMATIC PRIORITIES IN
UNDERDEVELOPED R&D AREAS

06

CAPACITY BUILDING

01 SUPPORTING INTEGRATED SYSTEMS (OF SYSTEMS)

Financial, technical, and advisory support for the development of integrated systems of systems for marine life monitoring and modelling, relying on EO-based solutions and contributing to a better understanding of the marine environment.

WHY

- **Improved understanding** of the marine life for more **sustainable management** of the resource and adaptation for future challenges
- **User-friendly** and actionable tool(s) for observing and analysing the state of the marine life
- Better use of **existing resources** (EO data, achieved progress)
- **More widespread uptake** of EO-enabled solutions

HOW

Comprehensive
evaluation of current
**user needs and technical
developments**

Dedicated European,
national or regional
R&D funds

Advisory support
for commercialisation
and/or upscaling of
the developed applications

WHO


EU institutions


EO service providers


End users


Sector professionals


Copernicus Services



MID-TERM
2-5 years

IMPACT

End users	HIGH
EO service providers	HIGH
Multipliers	MEDIUM
Governance actors	MEDIUM

HOW TO GET THERE?

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02 FOSTERING MARINE DATA AVAILABILITY AND ACCESSIBILITY

R&D actions stimulating creation of open-source data, data sharing and improving in-situ data availability.

WHY

- Marine ecosystems as a shared global resource can best serve both businesses and society, at the local and global level, if marine data is made **available to the largest possible user groups**
- Better **quality** of marine data (both EO and in-situ)
- **New or improved** EO-based solutions
- Improved preparedness for **future challenges**
- Involvement and engagement of **citizens and other actors**

HOW

Support for R&D actions providing **open-source** marine data, **data sharing** systems and/or APIs as part of the project results.

Fostering **innovative data production**, storage (cloud), mining, or gathering strategies such as crowdsourcing or data crawling, machine learning, deep learning.

Standardisation of initiatives to achieve the highest level of **interoperability** of pre-processed data.

WHO



EU institutions



Researchers, academia



Sector professionals



Copernicus Services

SHORT-TERM
1-2 years

IMPACT

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Multipliers	MEDIUM
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03 INCORPORATION OF EO IN KEY POLICIES AND STRATEGIES

Incorporation of EO solutions in key marine and maritime policies and strategies would create a regulatory framework that dictates EO use and allows the realisation of associated benefits across multiple applications.

WHY

- Amendments to **EU, national or regional policies** to incorporate (or update the references to) EO solutions
- **Increased uptake of EO data** in policy making and implementation/monitoring of regulation
- **Economic, environmental and other benefits** for governmental authorities responsible for implementing policies at EU, national and regional level

HOW

Review of **current provisions** for EO use in relevant policies.

Expert consultation (with researchers and industry sharing their voice), a **concerted effort** to incorporate EO solutions in relevant policies and strategies at national, regional, European or global level should be undertaken.

Advocate for the **use of EO in regional and national planning and policy** documents (e.g. through innovation procurement schemes, Horizon Europe or national funds).

WHO



SHORT-TERM
1-2 years

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Multipliers	HIGH
Governance actors	HIGH

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- 02 FOSTERING MARINE DATA AVAILABILITY AND ACCESSIBILITY
- 03 **INCORPORATION OF EO IN KEY POLICIES AND STRATEGIES**
- 04 DEMONSTRATING THE VALUE OF MATURE EO APPLICATIONS
- 05 SUPPORT FOR THEMATIC PRIORITIES IN UNDERDEVELOPED R&D AREAS
- 06 CAPACITY BUILDING

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04 DEMONSTRATING THE VALUE OF MATURE EO APPLICATIONS

To further demonstrate the value of mature EO solutions, the generated benefits must be clearly highlighted (in a quantifiable manner). This, together with the **promotion of champions and success stories**, can serve as an essential **push for widespread adoption** among marine and maritime professionals, especially when coupled with R&D developments that take into account evolving needs and realities.

WHY

- **Increased uptake** of EO in mature application areas, documented by quantifiable market growth
- Improved EO services **targeted to user needs** and delivered both by established actors and by start-ups and SMEs

HOW

Awareness raising activities such as dedicated studies showcasing the benefits generated; campaigns for success stories and champion users; **meeting marine professionals** at their events or organisation of targeted workshops and matchmaking **events**.

Innovation support actions such as **hackathons** or **acceleration programmes**; actions improving specific existing service applications or user uptake of mature EO applications.

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MID-TERM
2-5 years

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SUPPORT FOR THEMATIC PRIORITIES IN UNDERDEVELOPED R&D AREAS

Support is necessary for the development of scalable tools for targeted underrepresented sub-sectors or problems. This would result in **financial, technical and advisory support** for actors developing applications which **bridge the gap in the current offer**. For instance, applications targeting **particular complex topics or areas** such as coastal waters or underrepresented user groups such as smallholder fishermen, or both when targeting marine spatial planning and authorities.

WHY

- New EO solutions supporting **underrepresented communities**
- Scientific and technological advancements **tackling identified gaps**
- Improved marine **governance** and **resource use** efficiency

HOW

Analysis of the current application evolution and **gaps** in terms of groups of users not yet targeted and/or technological advancements impact and/or thematical priority areas

Potential **current priorities**: dedicated applications (technological support, incentive package) for smaller fisheries, applications in marine coastal waters, and marine spatial planning assistance for regional or local authorities.

WHO



SHORT-TERM

1-2 years

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06

CAPACITY BUILDING

All actions for the Marine Sector can benefit from targeted capacity building activities. These should be focused on **training marine professionals, authorities and other non-expert groups** in the use of EO-based solutions in their operational workflows.

WHY	<ul style="list-style-type: none"> — Stimulating a shift towards user-driven design of EO solutions — Facilitating the integration of EO solutions in the workflow of the marine industry — Growing awareness and understanding of the EO potential 	
HOW	<p>Launching a comprehensive capacity building programme that leverages best practices and successful training tools to enable practitioners in making the most of EO-based solutions.</p>	<p>It could include thematic workshops and trainings targeted to a particular group (e.g. public authority or marine professional) and develop collaborative spaces where partnerships between the industry, universities and users can be forged.</p>
WHO	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  EU institutions </div> <div style="text-align: center;">  EO service providers </div> <div style="text-align: center;">  Researchers, academia </div> <div style="text-align: center;">  Copernicus Services </div> <div style="text-align: center;">  Regional/national authorities </div> <div style="text-align: center;">  Sector professionals </div> </div>	

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2–5 years

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... to know more ...

