

MAKING SENSE OF THE OCEAN: FROM OBSERVATION TO ACTIONABLE KNOWLEDGE



The European Digital Twin of the Ocean (EDITO)

Zoi Konstantinou, Policy Officer on marine knowledge

European Commission, Directorate-General of Maritime Affairs & Fisheries



PROGRAMME OF THE
EUROPEAN UNION



In collaboration with
the UN OD Data
Coordination Office





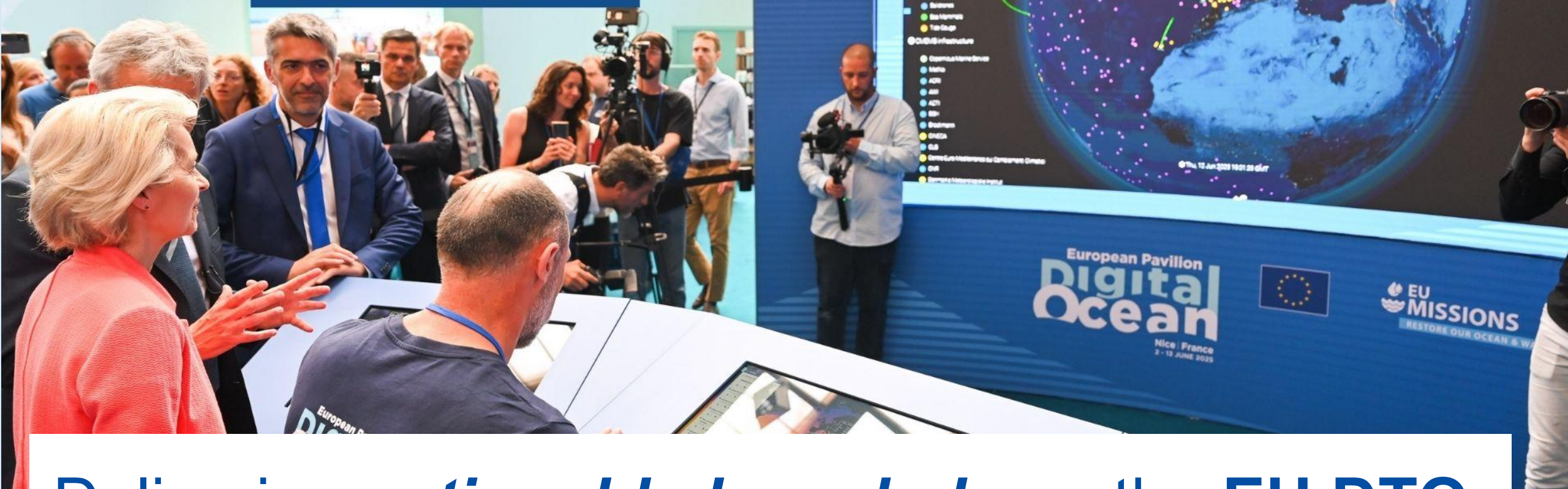
“So, building on the Digital Twin, we launch a new Ocean Observation Initiative. It will give vital data to everyone who relies on the ocean, and it will help to make Europe a global leader in ocean science, technology and security. I call on all countries here today to join Europe in this mission”.

Speech by President von der Leyen at the opening plenary session of the 2025 UN Ocean Conference, 9 June.

EU Ocean Pact - Ocean Observation Initiative

An ambitious and comprehensive plan to deliver user-driven marine knowledge

The EU Ocean Observation Initiative, covering observation campaigns, data processing, infrastructures and the provision of key services, will be the next chapter in the discovery of our planet's inner space and will connect, scale, govern and secure ocean observing capacities.

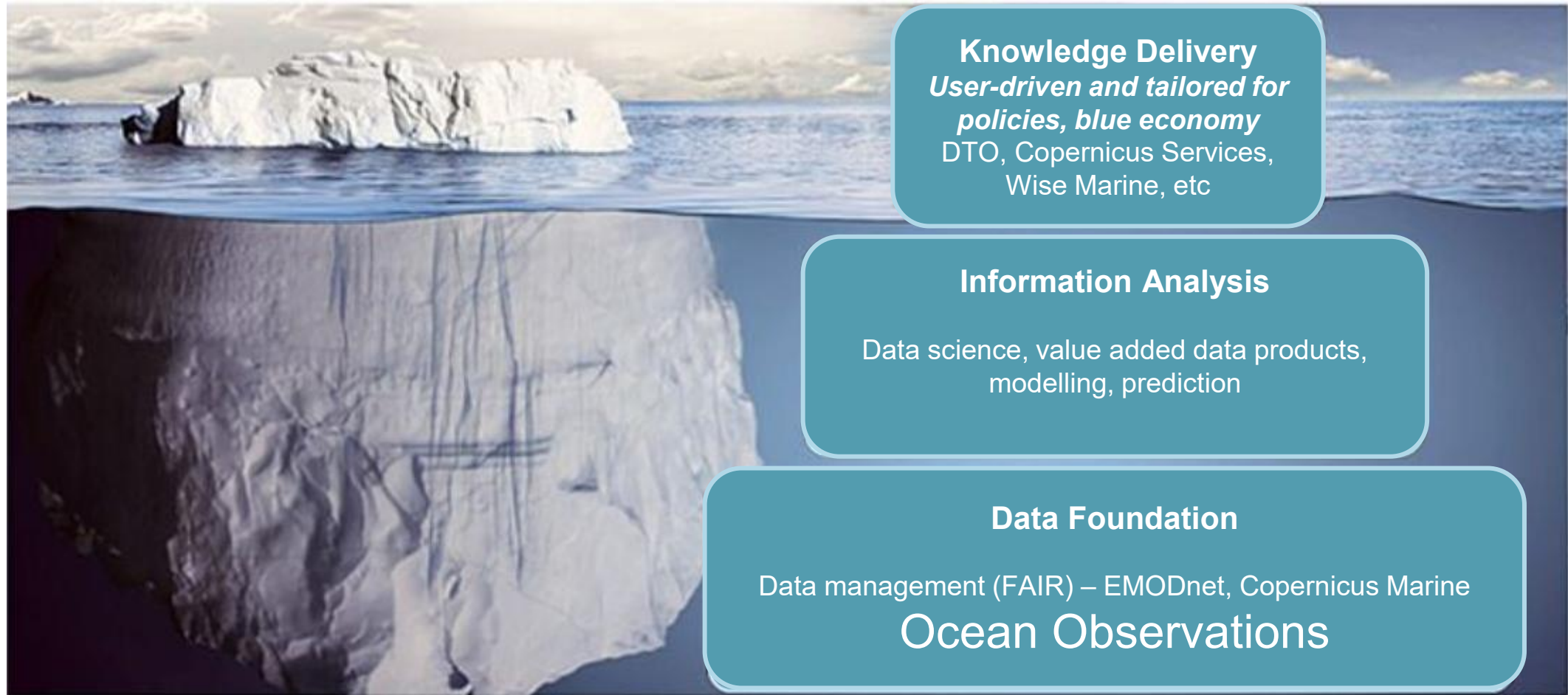


Delivering *actionable knowledge* – the EU DTO

For R&I, climate forecasts, early warning, security and defence, marine conservation, blue economy (fisheries, shipping, renewable energy, tourism, aquaculture, etc)...

For legislative implementation, *digitalisation and simplification*: Marine Spatial Planning (Ocean Act), Marine Strategy Framework Directive, Common Fisheries Policy, ...

... Needs a comprehensive & coherent ***marine knowledge value chain***



Ocean Observation Initiative – HL objectives

High-Level Objective 1

Establishing a fit-for-purpose European Ocean Observing System

“Developing an integrated, high-tech, cost effective, reliable and secure observation system”

Strategic Autonomy & Leadership Opportunity

- ✓ securing *European autonomy* in ocean observation
- ✓ fostering *international scientific collaboration* with like-minded partners
- ✓ securing historical data & safeguarding data flows
- ✓ build observing capacity at the *Global South*

Research & Innovation, Market Development

- ✓ development of *innovative & disruptive* ocean observing technologies
- ✓ establishing a *European market of OO technologies*
- ✓ design the *European Ocean Observing System*, including *marine Research Infrastructures*

Ocean Observation Governance & Coordination through the Ocean Act

- ✓ MS Coordination, *assuring planning optimisation, digitalisation & simplification, reduction of burden, identification of gaps, etc*
- ✓ Ensure links between OOI and OA → marine knowledge assets

“Creating a coherent and standardised approach to planning and conducting ocean observation campaigns by 2027”

Ocean Observation Initiative – HL objectives

High-Level Objective 2

Optimise the European Marine Knowledge value chain

Internal (European Commission) Governance of Marine Knowledge

- ✓ Establishing a robust governance framework and ***potentially integrating EU marine knowledge assets*** such as EMODnet, Copernicus Marine Environment Monitoring Service (CMEMS), WISE-Marine, and the European Digital Twin of the Ocean (DTO)
- ✓ Ensuring *the evolution of these assets* to support autonomy and varying needs
- ✓ *Aiming to enhance efficiency and mitigate existing fragmentation*

High-Level Objective 3

Deliver the operational Digital Twin Ocean

Digital developments and AI capacities

- ✓ Developing DTO application pipelines, establish quality control and feedback mechanisms, establish service protocols
- ✓ Ensuring research and operational activities can tap in European resources and infrastructures like EuroHPC, AI factories and national facilities

EU DTO service governance

- ✓ Establishing internal governance structure of the EU DTO and securing an operational funding line
- ✓ Establishing co-governance with the Member States
- ✓ Establishing framework of operations for proprietary development

3 challenges for the future



Information

Reliable, relevant,
scalable:

Scientific challenge



Infrastructure

Robust, efficient,
performant:

Technological challenge



Impact

Demand-led, inclusive,
sustainable:

Cooperation challenge

EU Digital Twin Ocean as a consolidator of Marine Knowledge



EDITO

European Digital
Twin Ocean

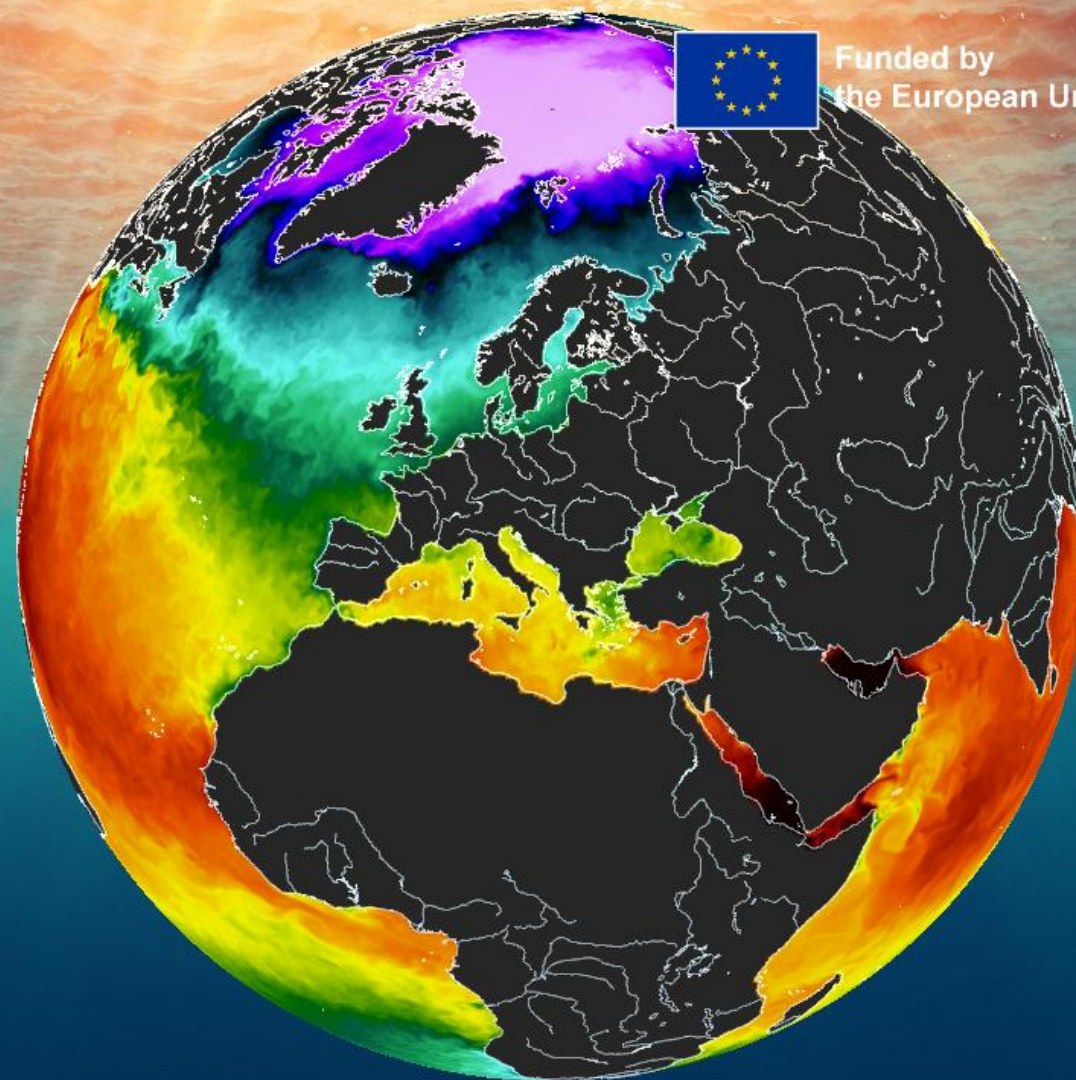
European Digital Twin Ocean

A leap in ocean knowledge and sustainable action empowering citizens to make informed decisions backed by science and data to restore marine and coastal environments, support a sustainable blue economy and mitigate and adapt to climate change.

DISCOVER ►



Funded by
the European Union



The European DTO Offer



Explore

Create



Contribute

Each Project
brings its:
Data
Tools
Front-Office







Opportunity for the creation of a mosaic of innovative actions



EU DTO application

to combat marine plastic pollution and safeguard marine environments

Monitoring marine plastic, predicting its movement to support informed decisions and actions to curb marine plastic.

<https://youtu.be/BnvXpqNJliU>

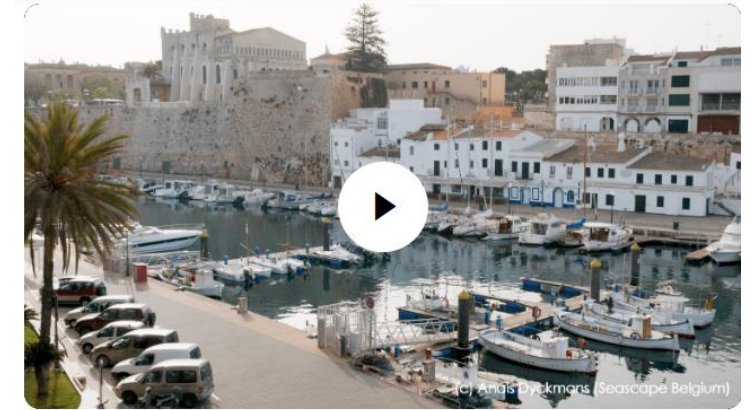


EU DTO application

to support nature-based solutions against coastal hazards

Exploring the best way to use coastal vegetation such as seagrass to reduce coastal risks.

<https://youtu.be/PXt44Wj-SWw>

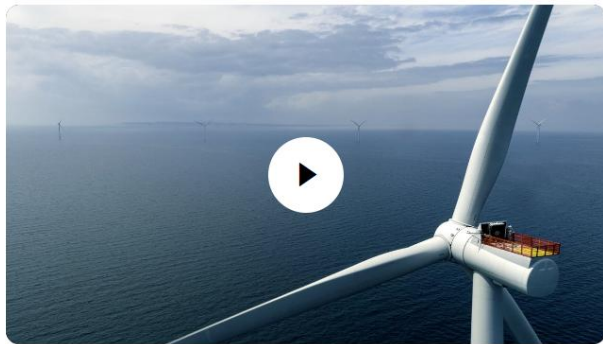


EU DTO - SOCIB application

Early warning system for extreme events

Predicting meteo-tsunamis in the western Mediterranean for managing risk and adaptation to a changing climate.

<https://youtu.be/yZL5SEOWB6o>



EU DTO - OLAMUR application

Supporting sustainable multi-use of marine environment

Unveiling the potential of Multi-Use offshore wind energy and low trophic level aquaculture in the Baltic Sea.

<https://youtu.be/EAur0zZGDoQ>

A wide range of applications
showcased, integrated (or soon to be)
into the EU DTO

<https://events.edito.eu/2024-digital-ocean-forum/content/use-cases>



EU DTO - NOCOS DT application

Improving ship navigability in the Arctic and Baltic Ocean

Digital twin tools for monitoring sea ice and assessing the risk for maritime transport.

<https://youtu.be/Kz3acp2Ntww>

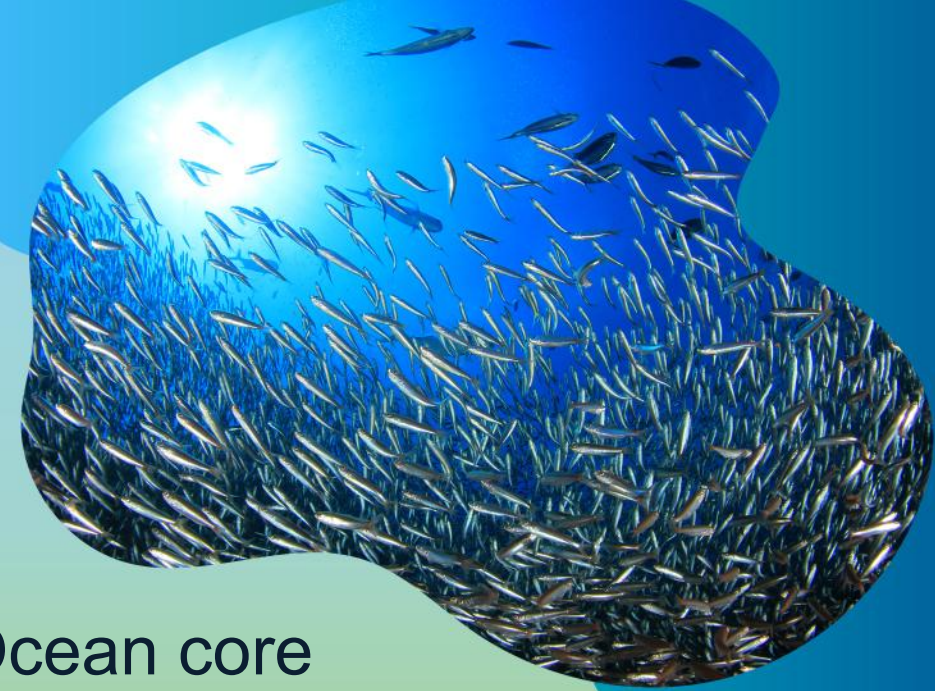


EUROPEAN UNION



EU
MISSIONS

RESTORE OUR OCEAN AND WATERS



Learn more for the EU Digital Twin Ocean core infrastructure [here!](#)



TwinPolitics Ocean Seminar Series, 25/09/2025

A satellite with solar panels is shown orbiting a vibrant blue ocean with white-capped waves. The satellite is positioned in the upper left quadrant of the frame.

THANK YOU

#EUdata4OceanDecade

DATA FOR THE
UN OCEAN DECADE
A EUROPEAN FOCUS