



**MERCATOR
OCEAN**
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Digital Twins of the Ocean for Informed Decision-Making



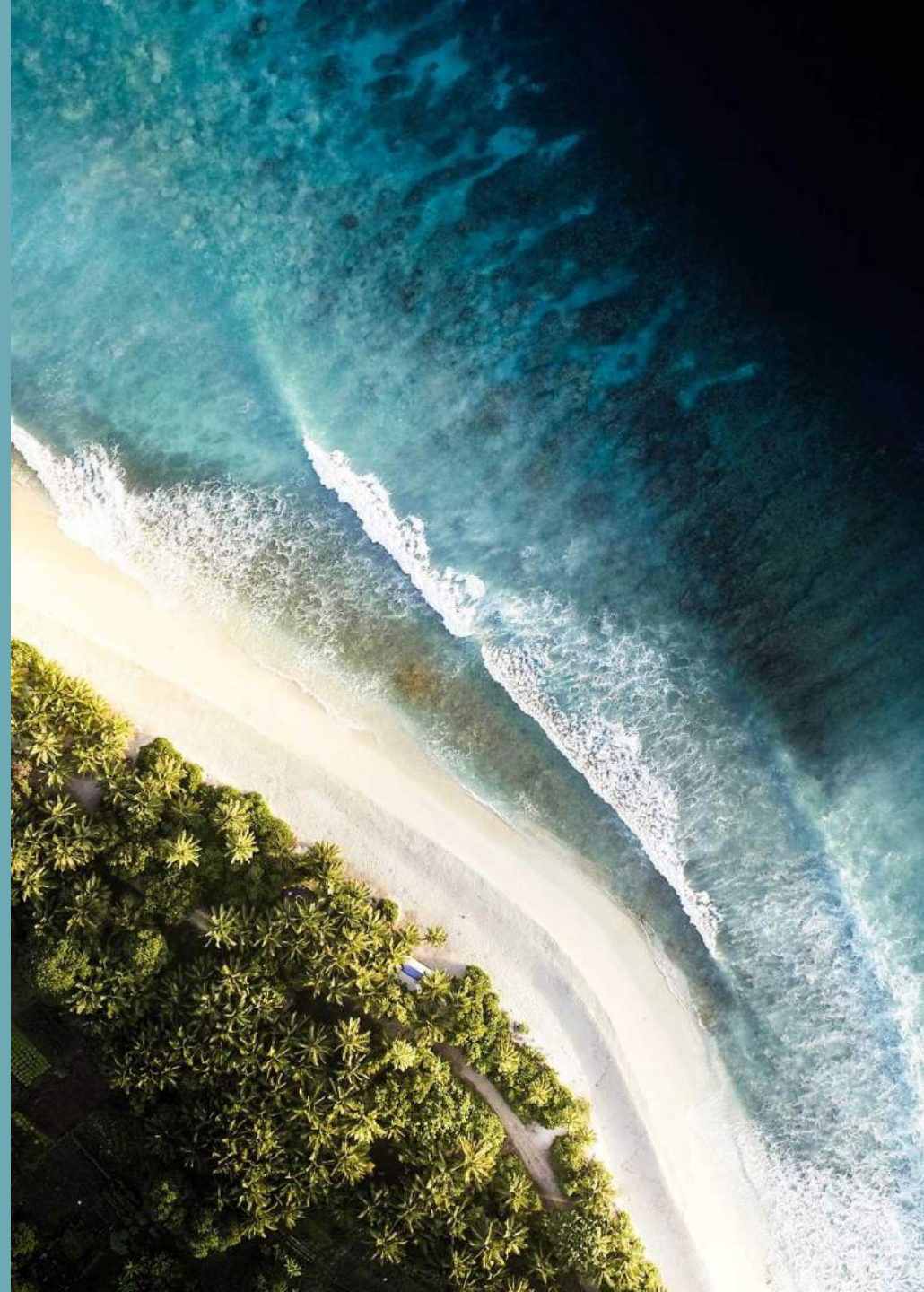
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Mercator Ocean International

13/03/2024



**Bridging the gap
between data and
societal needs
to deliver actionable
information**



Science to Policy Application : Marine Litter

Marine Debris Pollution is a growing transboundary, multi-dimensional problem with environmental, cultural, economic, and human health risks and associated costs, as highlighted by the United Nations Environment Programme (UNEP).

- The resolution 14 of UNEA-5.2 was endorsed by 175 nations at the United Nations Environment Assembly in March 2022. This resolution aims to forge an **international legally binding instrument on plastic pollution** (“Plastic Treaty”).
- The GPML supports the development of **national marine litter and plastic pollution action plans**
 - engaging with all stakeholders
 - defining a strategic approach to setting targets
 - designing the monitoring and review programme



#breakfreefromplastic

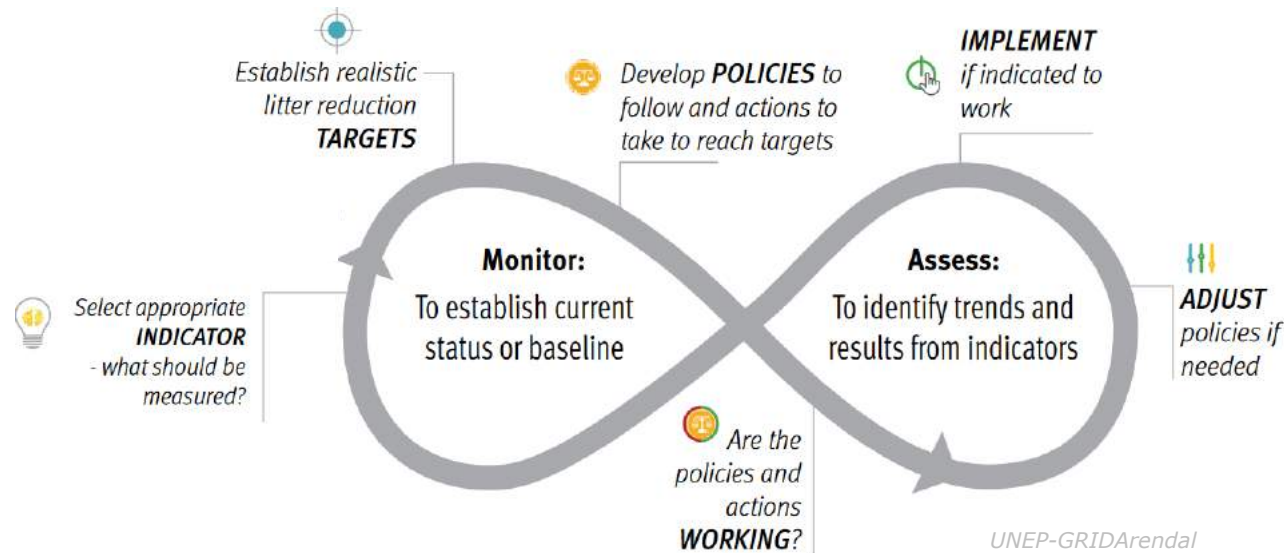


Global Partnership
on Plastic Pollution
and Marine Litter

75 – 199 million tons of plastics are in the oceans, with annual emissions projected to double 2030



Monitoring Marine Litter to support action plans



IMDOS aims to **support and strengthen a network of sustained observations** to enhance marine debris research and to **inform actions** to tackle the growing global plastic pollution problem.



IMDOS was launched in 2022 in support of the scientific community and GPML



The Digital Twins of the Ocean to inform Marine Litter Policy



The European Digital Twin of the Ocean



Integrate data from other European platforms, such as **Copernicus Marine Service** and **EMODnet**.

An exhaustive **reference** to all **ocean data products** available

STAC API supporting **metadata**-based and **semantic search** queries

EDITO is a **European** platform that provides a **single point of entry** to **search**, **explore** and **exploit products** and knowledge to support **digital twins of the ocean**.

User can add new data to the platform either directly (upload) or by deriving existing data to create new data using computational functions.

All processes provided by the platform are **exposed** through **OGC API processes** standard for a **seamless third-party integration**

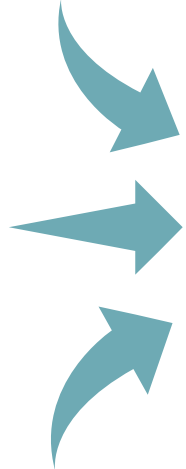
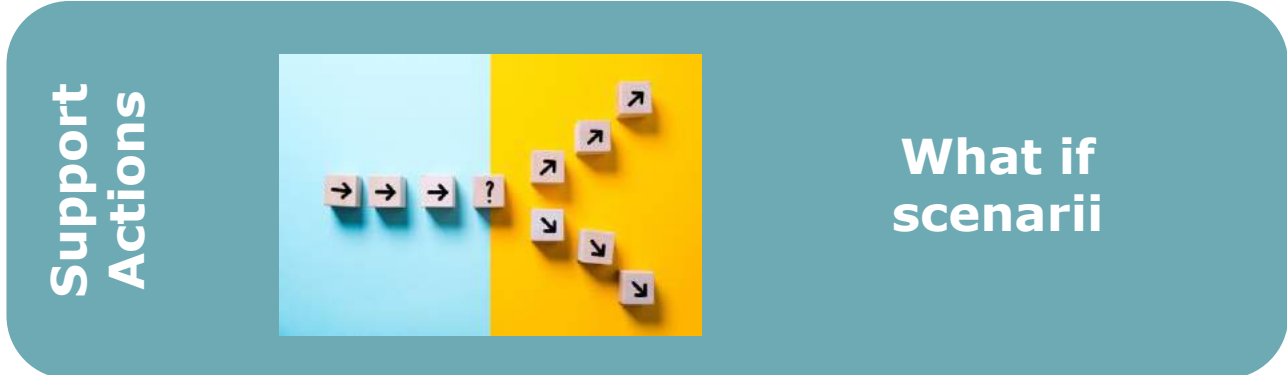
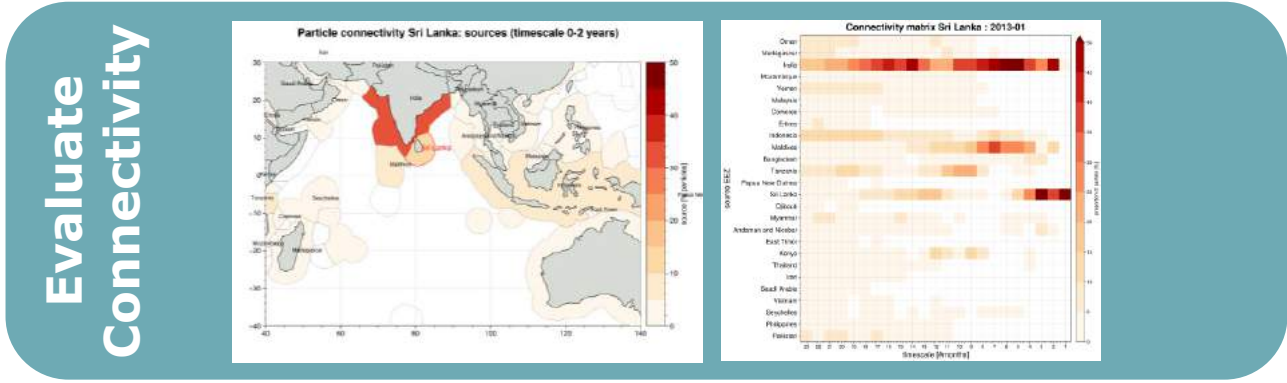
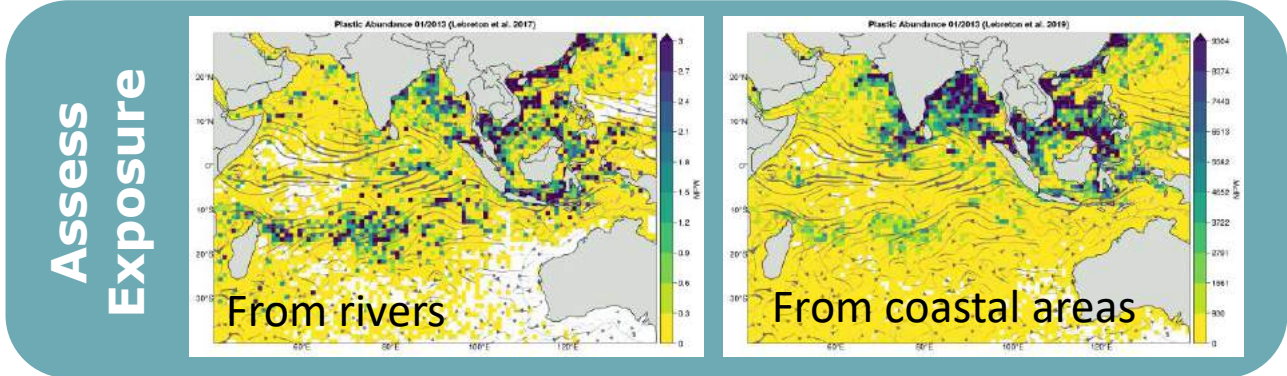
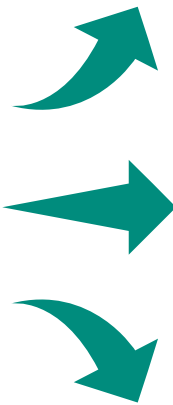
The European Digital Twin of the Ocean



Assess Exposure and Connectivity

User input:
 Source of plastic: riverine, coastal, all
 Zone of interest (e.g. EEZ)
 Max. age of plastic

Scenario:
 River cut: XX%
 Source EEZ: Country
 Coastal cut : XX%



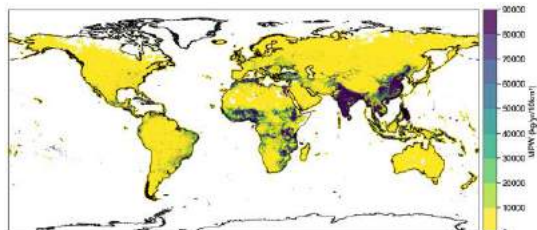
Inform Policy Design, Assess and Adjust

EDITO "What if" Scenarii to Design Policy

e.g. What's the impact of potential plastic removal action plans on local exposure ?

1. Plastic waste input

Continental waste



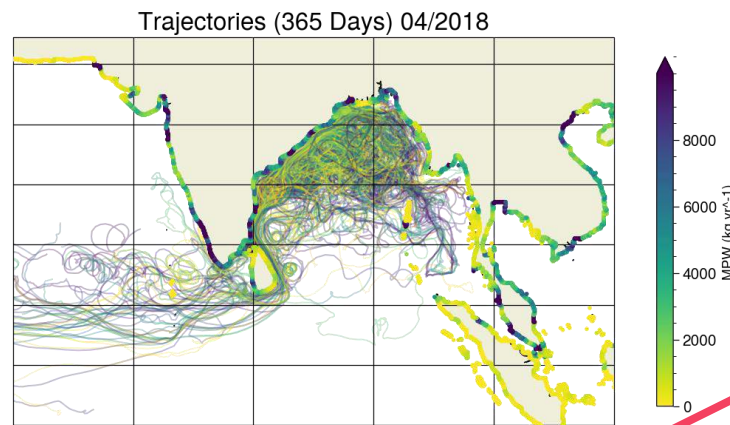
Lebreton 2019

Riverine waste

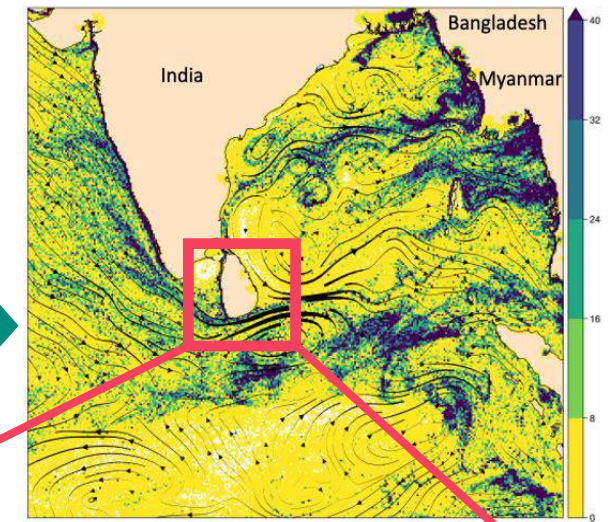


Lebreton 2017

2. Transport in the ocean Lagrangian modeling

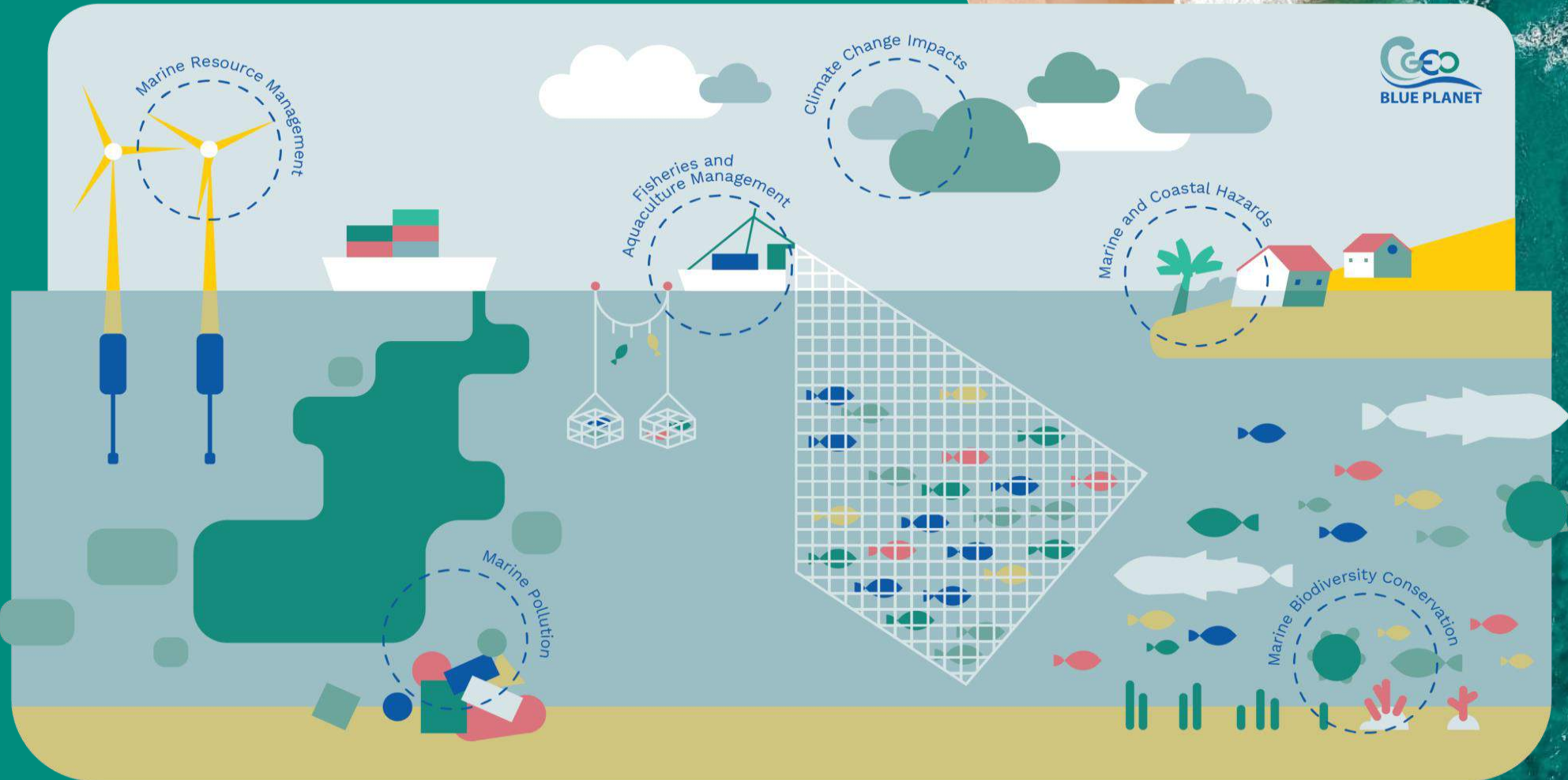


3. Monitoring plastic, and quantifying exposure



Identify priority regions of action for mitigation and adaptation
Support compensation scheme

What would be your application ?

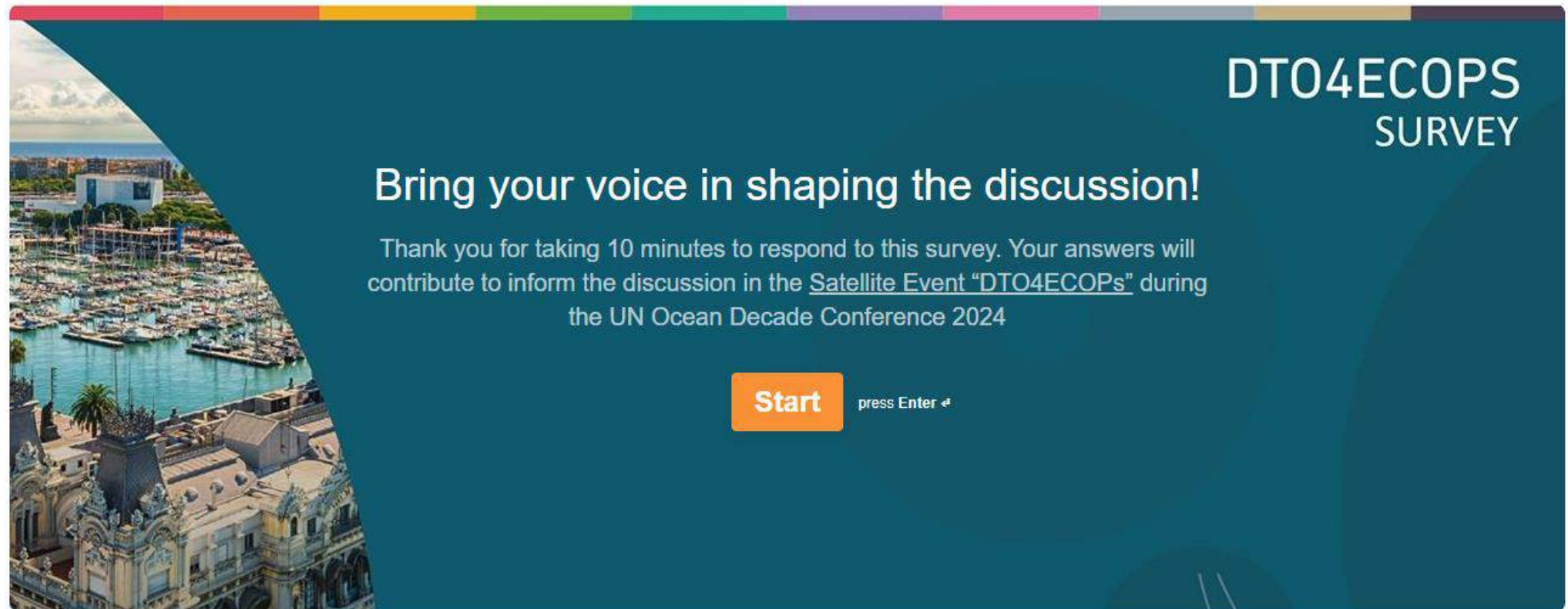


YOUR VISION FOR DIGITAL TWIN OCEANS (DTOs)

"Digital Twins" of the Ocean (DTOs) bring together wide varieties of data combined with online computation resources can be harnessed to address societal challenges in the marine domain, facilitating the deployment and analyses of "what-if" scenarios (e.g., what if we build this dike ?). They can also be harnessed for other purposes, such as creating capacity in ocean sciences or supporting STEM education.

Different initiatives around the world are deploying public infrastructure (e.g., in Europe, **EMODnet** and **Copernicus Marine** are building **EDITO** to improve access to data and computing resources), as well as developing DTOs and applications (e.g., **ILIAD**, **DITTO**) to address ocean-related challenges.

As an ECOP, how should these initiatives be set up to respond to your needs? What challenges should they contribute to solve? What is your vision for Digital Twins of the Ocean?



**DT04ECOPS
SURVEY**

Bring your voice in shaping the discussion!

Thank you for taking 10 minutes to respond to this survey. Your answers will contribute to inform the discussion in the [Satellite Event "DT04ECOPS"](#) during the UN Ocean Decade Conference 2024

Start press Enter ↵



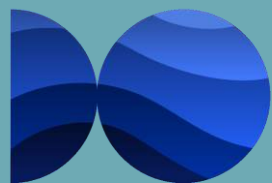
THANK YOU!



Implemented by



European Digital Twin Ocean



EDITO
Modellab



ECOP
Early Career
Ocean Professionals



2021
2030 United Nations Decade
of Ocean Science
for Sustainable Development

ocean
BRIDGES