EU MISSION

‘Restore our Ocean and Waters by 2030’

Digital Ocean and Waters Knowledge system

2022

#MissionOcean #Eumissions #HorizonEU

Why a European Digital Twin Ocean?

Support the Mission

PROTECT AND RESTORE MARINE AND FRESHWATERS ECOSYSTEMS AND BIODIVERSITY

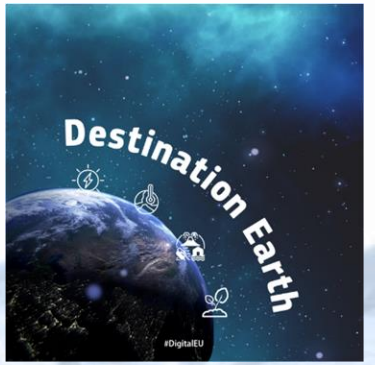
PREVENT AND ELIMINATE POLLUTION OF OUR OCEANS, SEAS AND WATERS

MAKE THE BLUE ECONOMY CARBON-NEUTRAL AND CIRCULAR

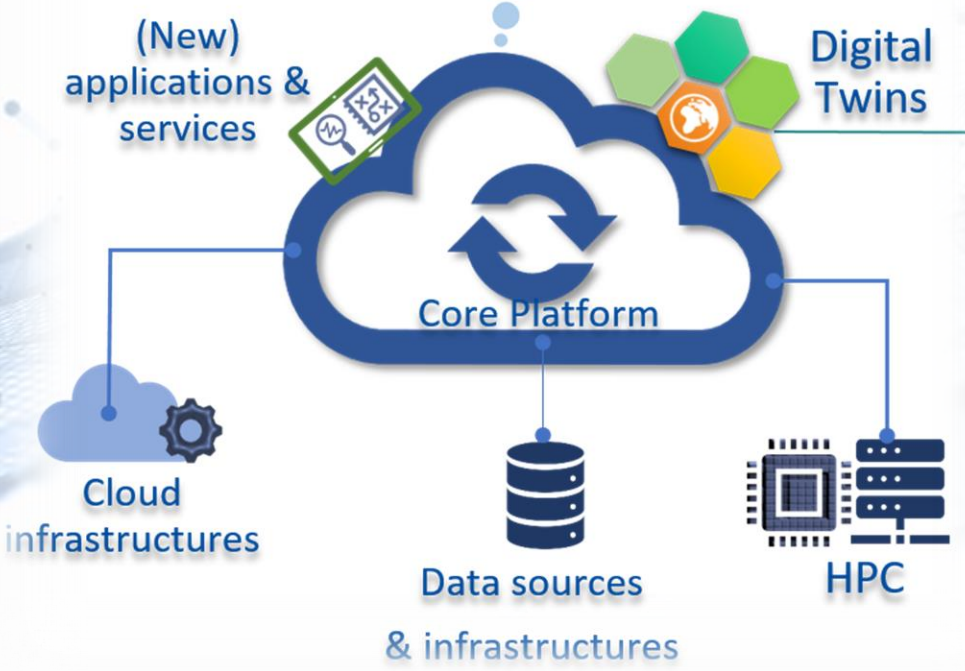
Cross-cutting enablers for the mission:

- Digital Ocean and Water knowledge system
- Public mobilisation and engagement

Part of DestinE



Climate adaptation, extrêmes and geohazards
Ocean, biodiversity, urban



The EU DTO, an international commitment from the von der Leyen Commission

"Today, we know the ocean is vulnerable and is threatened by our misdeeds. Pollution, chemicals and the overexploitation of marine resources. The ocean is too large for any one of us, and yet so fragile that our individual actions matter. …

… Every problem is an opportunity for innovation. But we need a clear and ambitious objective. We need a mission, like the European Green Deal. ***That is why we have launched the 'Mission to restore our ocean and waters by 2030'***

… Finally, the ocean is still largely a great mystery for humankind.

That is why Europe is building a digital twin of the ocean*.*

We are connecting our assets – like the Copernicus satellites, marine infrastructure like icebreakers, buoys and underwater drones, and high performance computing. We will gather the raw data and turn it into real-time knowledge and longer-term predictions.

We are putting the power of the digital revolution at the service of our climate*. …"*

Structuring & integrating the ocean knowledge value chain FOR ocean actors

TO:

- Support science-driven approaches to policies implementations by users: ecosystem-based management of marine habitats/green infrastructure, planning and management of marine areas, safeguard productivity and biodiversity of marine ecosystems, etc.
- Support industry to develop new business models, sustainable green services, and opportunities in ocean data and related services
- Increase citizen engagement & empowering citizens in innovative co-designed services and projects, enable the infusion of 'non-scientific data streams'

HOW:

- By Integrating and connecting wide range of data and models (from physics to socio-economics) with cloud infrastructures, HPC, AI
- by providing development kits, interfaces and visualization tools for "what-if" scenarios and decision support

« A core infrastructure, conceived as a public good »

European Commission

An EU endeavour already ongoing

EU French presidency event
Co-organised wth DG MARE, RTD, DEFIS, CNECT, JRC

70 experts - 20 countries

To align ambitions for a EU DTO with:

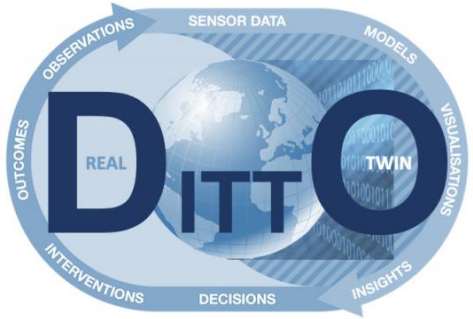
- A 2024 milestone
- A service portfolio and architecture
- 8 additional shared recommendations

EU contribution to UN decade

4 to 5 May 2022

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

DITTO - Digital Twins of the Ocean



International Digital Twins of the Ocean Summit

Mission:

- develop and share a common understanding of digital twins of the ocean
- establish best practices in the development of DTOs
- advance a digital framework for DTOs for professionals to create their own digital twins

An EU endeavour already ongoing

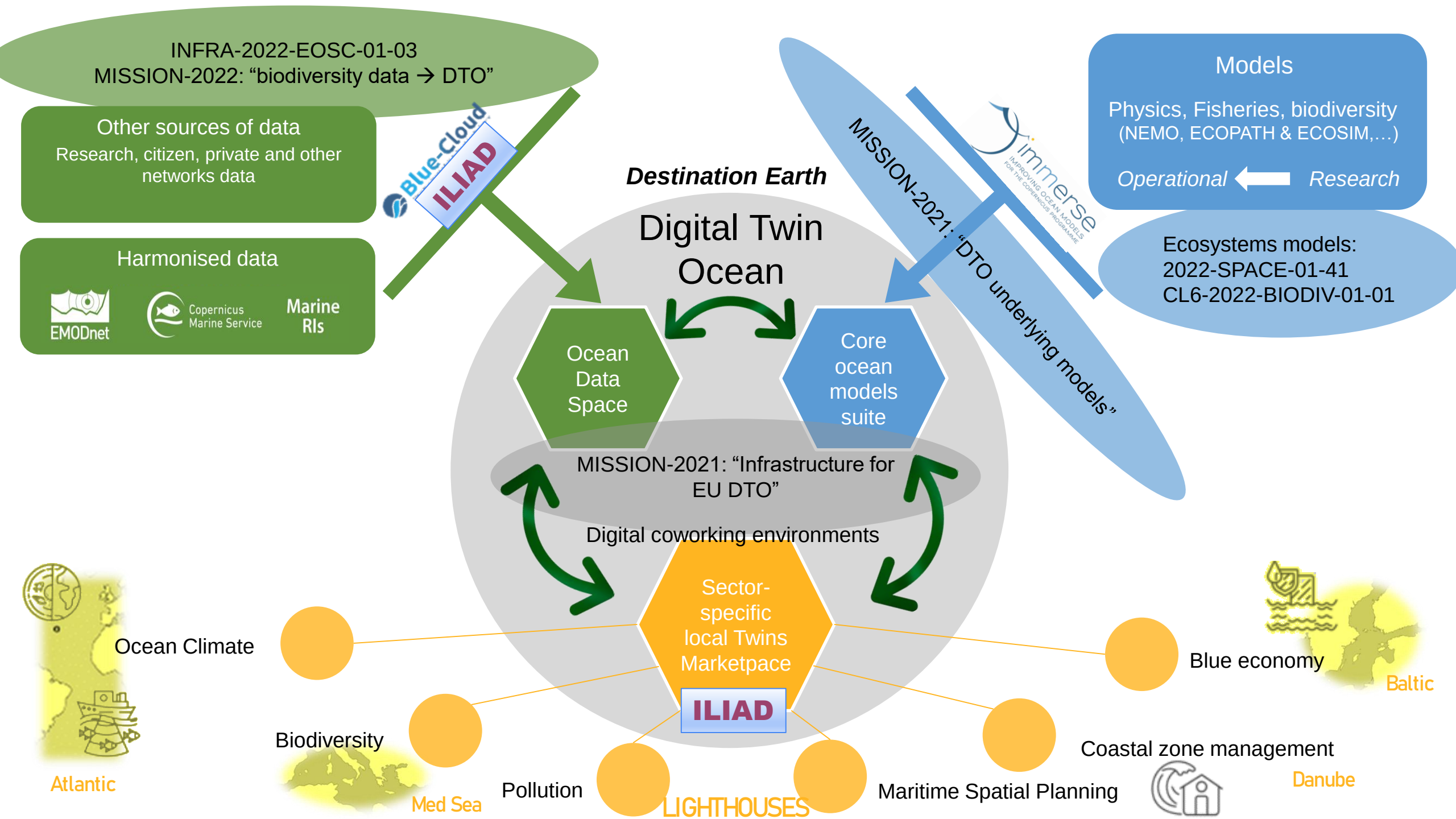
Science-base

- Horizon Europe:
  - Projects: Blue Cloud, Immerse (Adv Nemo models), Obama-Next, MarcoBolo, Biocean5D, Marbefes (marine and coastal biodiversity and ecosystems)
  - Calls: HORIZON-INFRA-2022-EOSC-01-03: FAIR and open data sharing in support of healthy oceans, seas, coastal and inland waters; HORIZON-CL4-2022-SPACE-01-41: operational ecosystem models from space, HORIZON-CL6-2022-CLIMATE-01-02: Understanding the oceanic carbon cycle
- Sustainable Blue Economy Partnership: Member States DTO initiatives

EU Core Digital Twin Ocean

- Infrastructure for EU DTO:
  - EDITO (Mercator Ocean, Flanders Marine Institute), 3M€
- Data:
  - Integration of biodiversity monitoring data into the Digital Twin Ocean, 10M€
- Models:
  - Underlying models for the European Digital Twin Ocean, 7M€
- Services & Interfaces:

ILIAD, 19M€


INFRA-2022-EOSC-01-03
MISSION-2022: “biodiversity data → DTO”
Other sources of data
Research, citizen, private and other networks data
Harmonised data
EMODnet
Copernicus Marine Service
Marine RIs
Blue-Cloud
ILIAD
Destination Earth
Digital Twin Ocean
Ocean Data Space
Core ocean models suite
MISSION-2021: “Infrastructure for EU DTO”
Digital coworking environments
Sector-specific local Twins Marketpace
ILIAD
MISSION-2021: “DTO underlying models”
Models
Physics, Fisheries, biodiversity
(NEMO, ECOPATH & ECOSIM,…)
Operational
Research
immerse
Ecosystems models:
2022-SPACE-01-41
CL6-2022-BIODIV-01-01
Ocean Climate
Atlantic
Biodiversity
Med Sea
Pollution
LIGHTHOUSES
Maritime Spatial Planning
Coastal zone management
Danube
Blue economy
Baltic