Sea Future 2025
1 October 2025
La Spezia Naval Base

Harmonisation and coordination to support MSP implementation

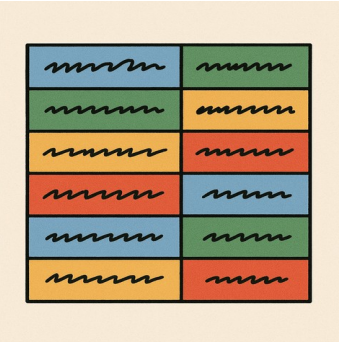
The experience of the Technical Expert Group MSP Data

Alessandro Sarretta
CNR – IRPI Research Institute for Geo-Hydrological Protection

Maritime Spatial Planning (MSP)

- MSP is a **data-intensive process** that requires the integration of **diverse** and **heterogeneous** datasets, from environmental to socio-economic information.
- Both integrating these datasets as input for building the plans (***input data***) and visualizing them in plans (***output data***) represent key challenges in the process.
- Code lists, vocabularies and semantics of terms used for data may differ between countries

DIRECTIVE 2014/89/EU
Article 10
Data use and sharing
Member States shall organise the use of the best available data, and decide how to organise the sharing of information, necessary for maritime spatial plans.



Technical Expert Group (TEG) on Data for Maritime Spatial Planning (MSP)

- **Objective**: to support EU MSP process dealing with data management issues related to the MSP;
- Coordinated by EU Commission (DG MARE, CINEA), Assistance Mechanism and 2 co-chairs;

Directorate-General for Maritime Affairs and Fisheries

European Climate, Infrastructure & Environment Executive Agency

- More than 50 members, voluntary participation;
- So far: 12 meetings, 3 workshops, 1 thematic session…and applied results
  - https://maritime-spatial-planning.ec.europa.eu/msp-resources/technical-expert-group-teg-data-msp

Goals of the TEG on Data4MSP

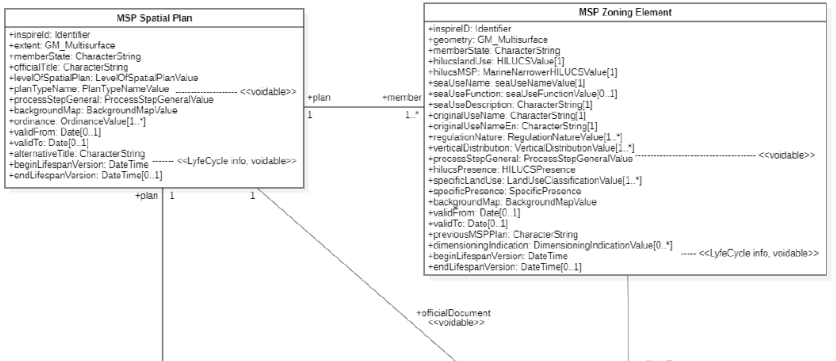
- Promote **cross-border data exchange**: facilitate the availability and sharing of data and information on MS between EU Member States.
- Ensure **coherence with environmental data**: support access to data on the state of the marine environment in relation to maritime spatial plans
- Prevent overlaps and redundant work by **coordinating activities across different projects and regions**.
- Develop **common standards**: establish standards for sharing maritime spatial plans and finalize a unified MSP data framework.

Activities and sub-groups

- 1st phase (2020)
  - Mapping of existing and available MSP data
  - Harmonization of terminology and nomenclature for MSP output data
- 2nd phase (2023)
  - Metadata Standard for Marine Plans
  - MSFD & MSP Data Management
  - MSP Data Framework
  - Network Services and MSP
  - Socioeconomic Impact of MSP
- 3rd phase (2024)
  - EU Data Spaces
  - MSP Data Standard Maintenance
  - MSFD & MSP Data Management
  - Digital Twins in MSP

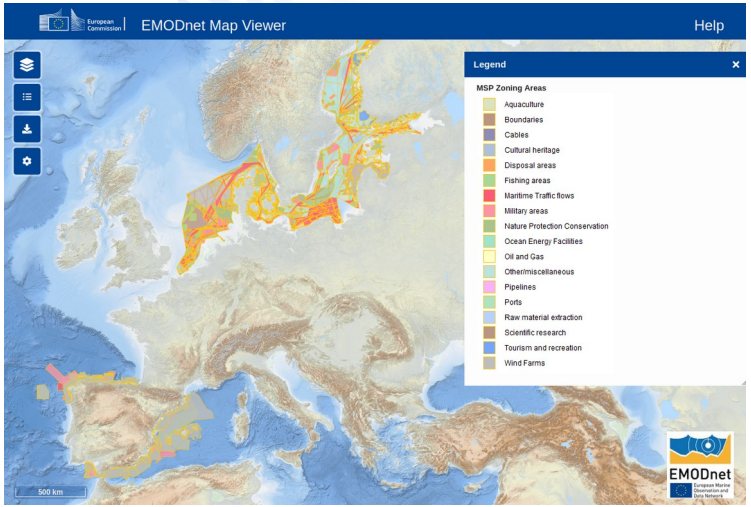
Harmonization of MSP plan data

- Discussion starting from 3 data models: Helcom-Vasab / Basemap; MSP INSPIRE data model (delivered by MarSP project); MSP EMODnet model.
- European Marine Observation and Data Network (EMODnet) https://emodnet.ec.europa.eu



Proposal for making harmonized MSP plan data available across Europe

Results of the work of the Technical Expert Group (TEG) on MSP data



Maritime Spatial Planning Data Framework (MSPdF)

https://cinea.ec.europa.eu/publications/maritime-spatial-planning-data-framework-mspdf_en

- Guides data collection with **seven cluster checklists**
  - what type of information should be considered for specific MSP process

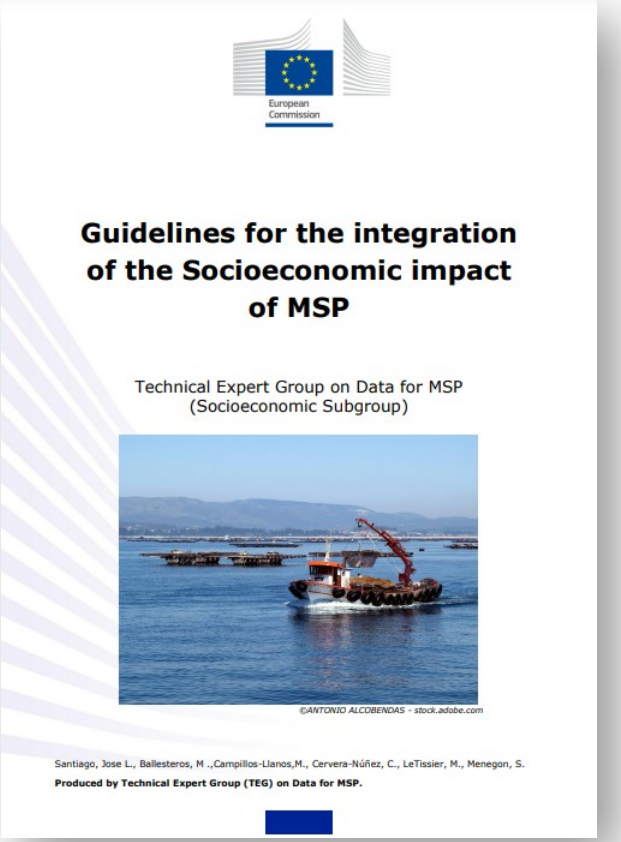
Data cluster 1	Marine & Coastal Environment
Data cluster 2	Marine & Coastal Conservation and Designated sites
Data cluster 3	Oceanographic characteristics and Climate
Data cluster 4	Coastal *Land use* and Planning
Data cluster 5	Operative maritime activities and Planning
Data cluster 6	Socio-economic information
Data cluster 7	Governance information

- First milestone for MSP input data harmonisation - improves **interoperability** (proposed harmonisation data models and semantic code lists);
- Improves **comparability** of applied data collections;
- Supports design for **monitoring and evaluation**

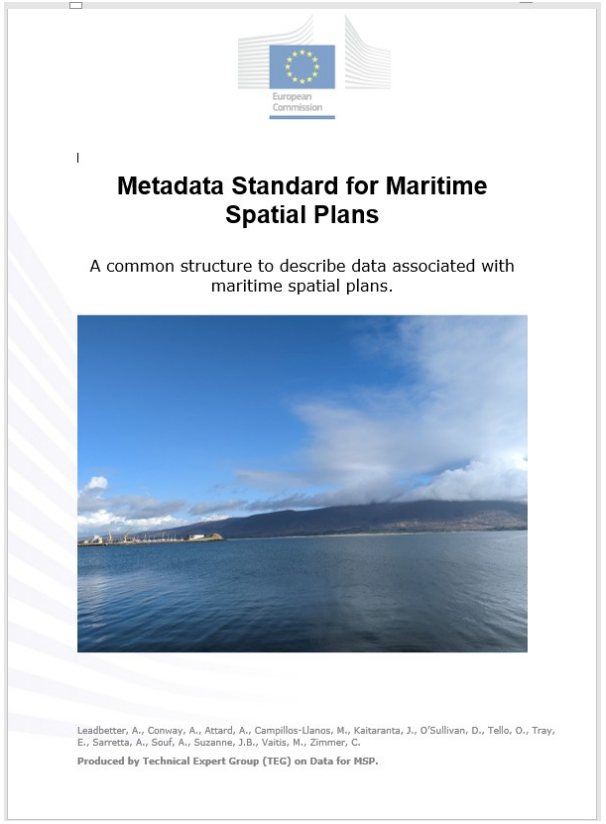
Recommendations on integrating the socioeconomic dimension into MSP processes

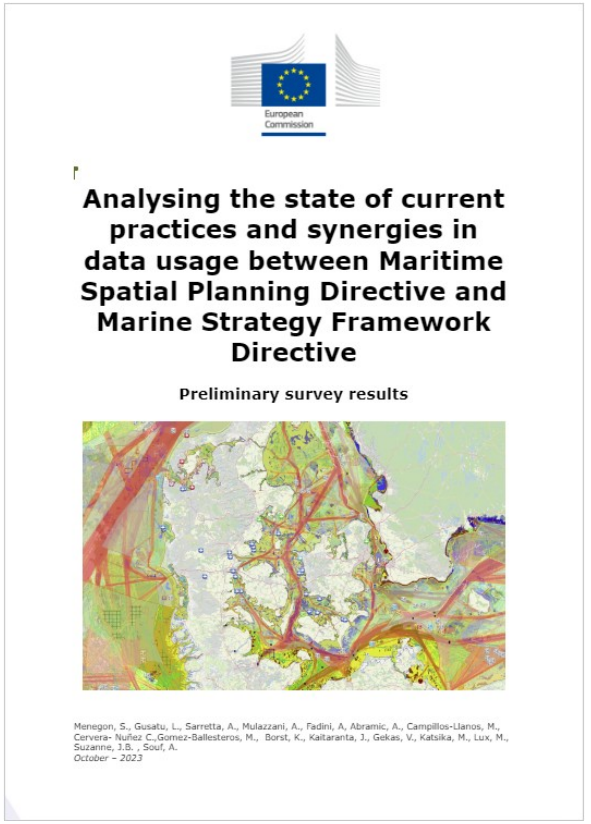
https://cinea.ec.europa.eu/publications/guidelines-integration-socioeconomic-impact-msp_en

- Understand state-of-the-art;
- Optimize use of available socioeconomic datasets;
- Explore alternatives for socioeconomic data collection, data integration and data analysis;
- Address or set the baseline to respond to critical questions: what are the economic and/or social benefits stemming from the implementation of MSP.



Metadata and interaction with MSFD



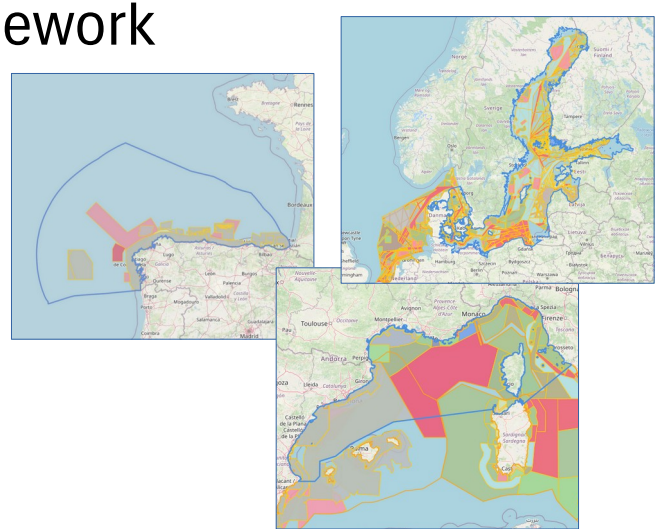


ReMAP project

(http://www.geoportal.ulpgc.es/remap/)

Reviewing and Evaluating the Monitoring and Assessment of Maritime Spatial Planning

- support of the European MSP process Monitoring & Evaluation of MSP plans
- (10+1) modular simplified analytics
- Building blocks results of TEG: MSP data model and MSP data Framework
- 3 use cases:
  - Baltic Sea
  - Galicia
  - North West Med Sea



- Input Data
- Output Data
- MSP & MSFD Links
- Cumulative Impact Assessment
- Conservation (in)compatibility
- Socioeconomic Assessment
- Governance Assessment
- Navigation Safety
- Ecosystem Services
- Land-Sea Interactions

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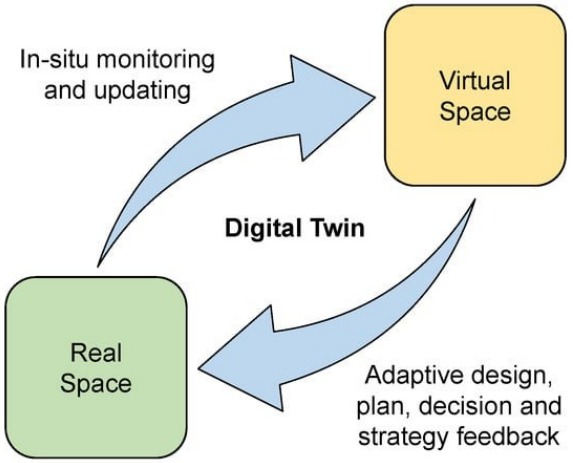
Definitions: Digital Twins

Digital Twins are a **virtual replica** of the physical world. Changes in the real system are reflected in the digital twin and the twin can be used to modify the real system (**feedback**).

Brönner et al., 2023



Inamdar et al., 2024

Applications:

- Manufacturing
- Transportation and logistics
- Urban planning
- Supply chain optimization
- ...

Virtual Singapore

Wired, 2017

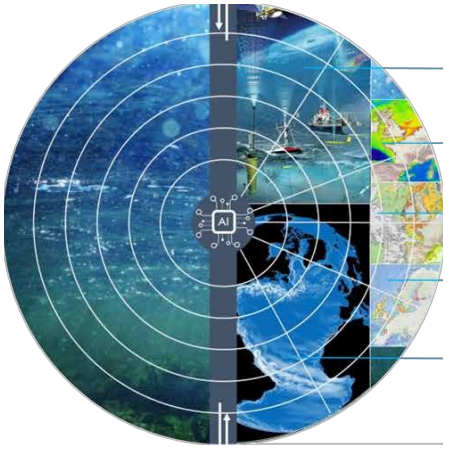
DTO – Digital Twins of the Ocean

- virtual representations of the ocean with its **physical**, **chemical** and **biological properties**, based on **ocean observations** and **ocean models** with the purpose of **what-if scenarios for decision making**. The feedback of DTO is the implementation of decisions based on the DTO

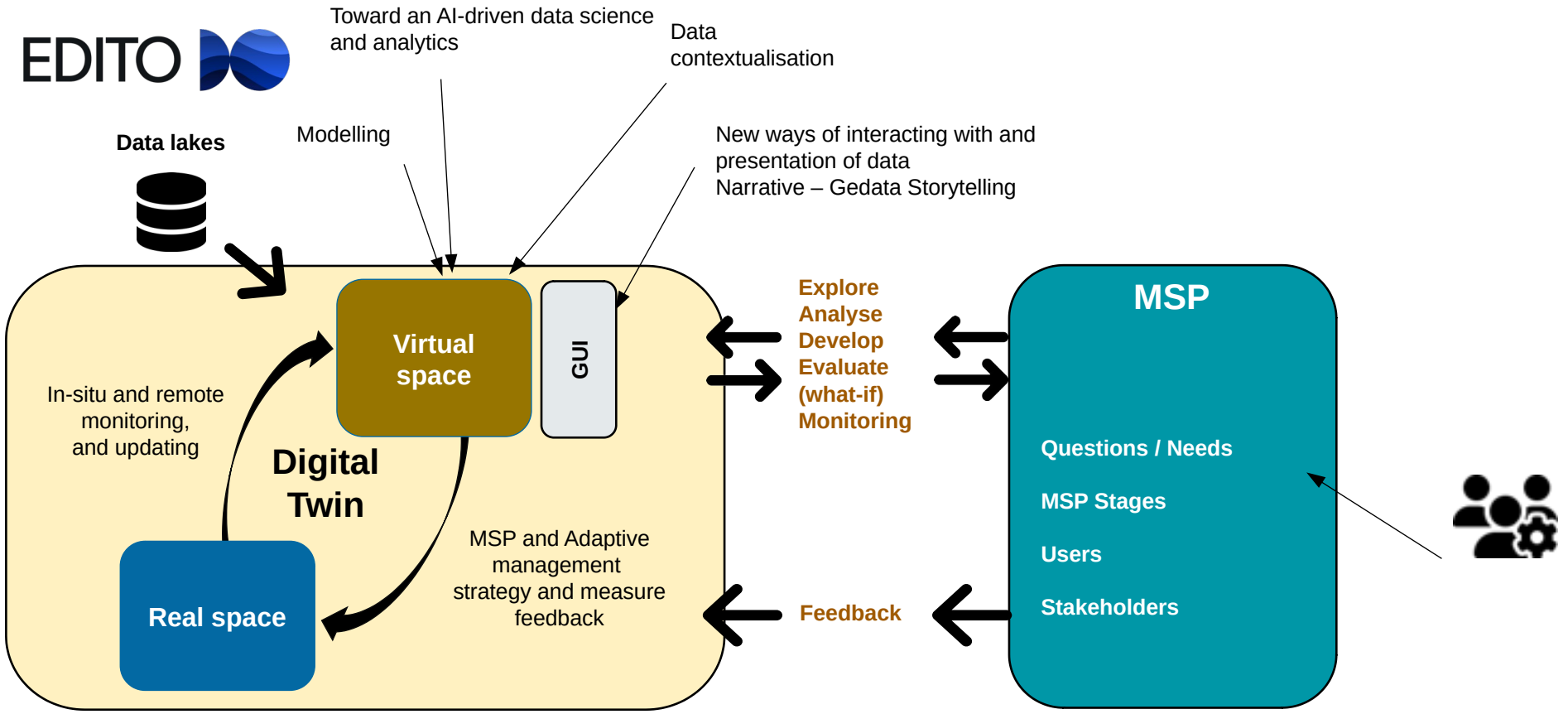
Digital Twins Local domain

↓ Geospatial & temporal Gradient

DTO, DOT Geospatial domain



DTO for MSP


EDITO
Toward an AI-driven data science and analytics
Data contextualisation
Copernicus Marine Service
Data lakes
Modelling
New ways of interacting with and presentation of data
Narrative – Gedata Storytelling
Virtual space
GUI
In-situ and remote monitoring, and updating
Digital Twin
Real space
MSP and Adaptive management strategy and measure feedback
Explore
Analyse
Develop
Evaluate
(what-if)
Monitoring
Feedback
MSP
Questions / Needs
MSP Stages
Users
Stakeholders
Interoperability, Semantic, Standards, Web services

Thank you for your attention

Alessandro Sarretta
alessandro.sarretta@cnr.it
CNR – IRPI Research Institute for Geo-Hydrological Protection

Technical Expert Group on Data for MSP
https://maritime-spatial-planning.ec.europa.eu/msp-resources/technical-expert-group-teg-data-msp

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