Key ingredients for marine and maritime Digital Twins in the frame of ILIAD project

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DUTH, SINTIG, BLB, INTRA

ILIAD IN A SEASHELL

Enabling an ecosystem of interoperable digital twins for the ocean trough:

- Connecting to *existing* ocean data infrastructures
- Enhancing ocean data infrastructures with *additional* observation technologies and citizen science

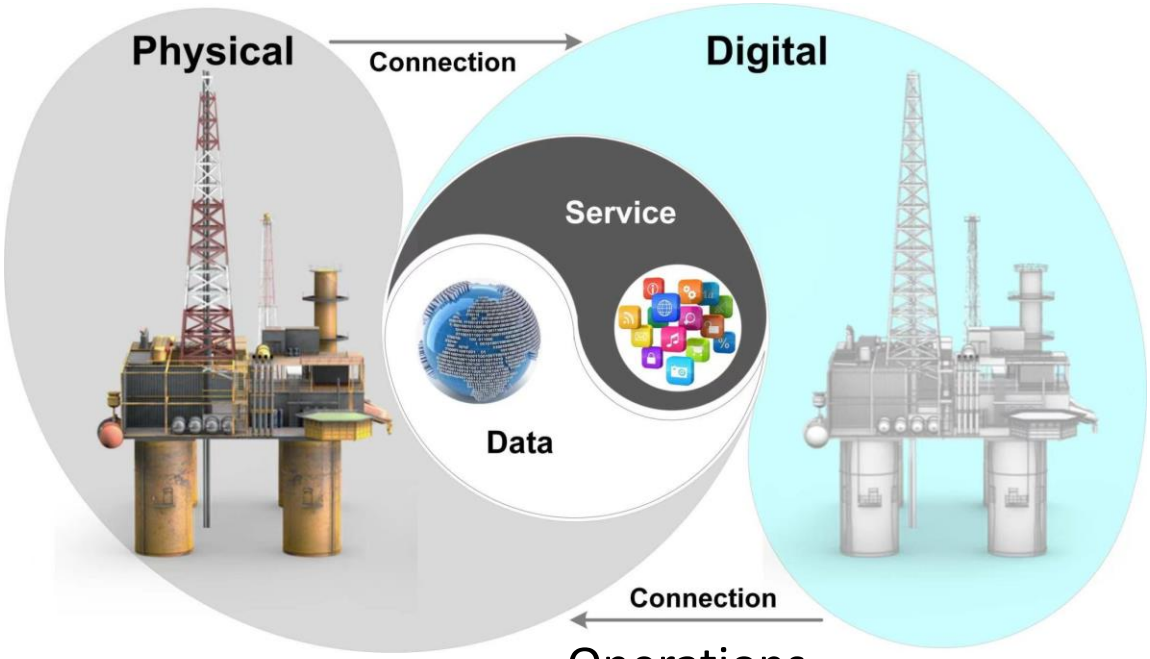
Create an open marketplace accessible for all providers and users by:

- Developing *innovative methods* in open frameworks and platforms
- Enabling model *evaluations & comparisons* for many Earth science applications from weather, energy, aquaculture to climate and more

Provide solutions to address future societal challenges by:

- Assembling a broad and diverse *user community* of existing and new users,
- Supporting the communities in testing and using the project's *innovative technological solutions*

Sensors
Models
Big Data
Cloud storage
ML and AI algorithms



Operations
Controls
Optimization
Diagnosis
Decision Systems

ILIAD DIGITAL TWINS OF THE OCEAN

Existing Wind Farm Capacity

Ocean Energy Potential

Coastal Sediment Transport

Plastic Pollution Monitoring

Oils Spill Simulation

Insurance For Marine & Maritime Activities

Jellyfish Swarm Forecast

Harbour Safety

Met Ocean Hind, Now & Forecast

Fisheries Productivity & Sustainable Aquaculture

Ballast Water Monitoing

Aquaculture & Harmful Algae, Water Quality & Ship Traffic

The Fisheries DT

Iliad

Copernicus Marine Service

VISTOOLS analytics

Iliad platform

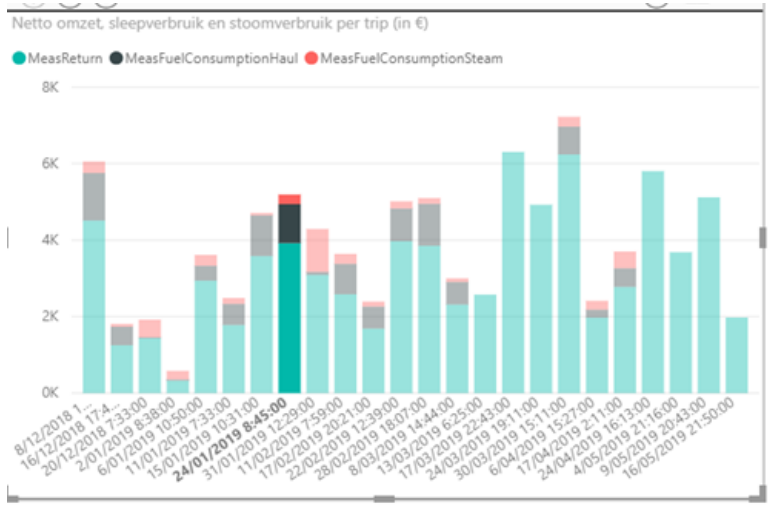
data delivery for other model validation

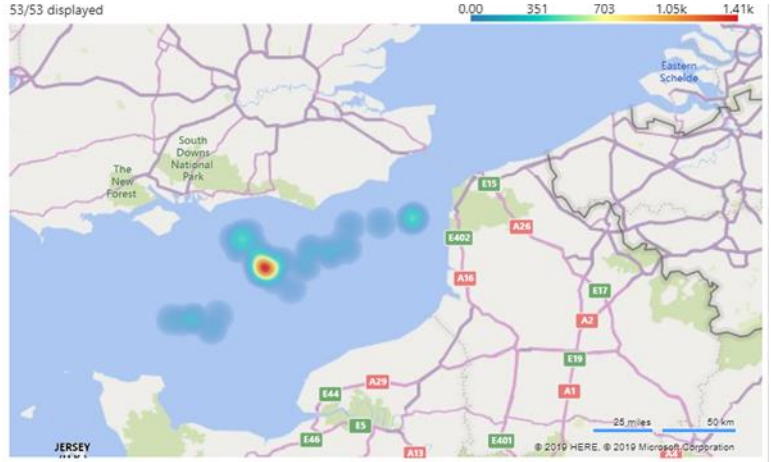
catch probabilities

fuel efficiency

ecosystem model

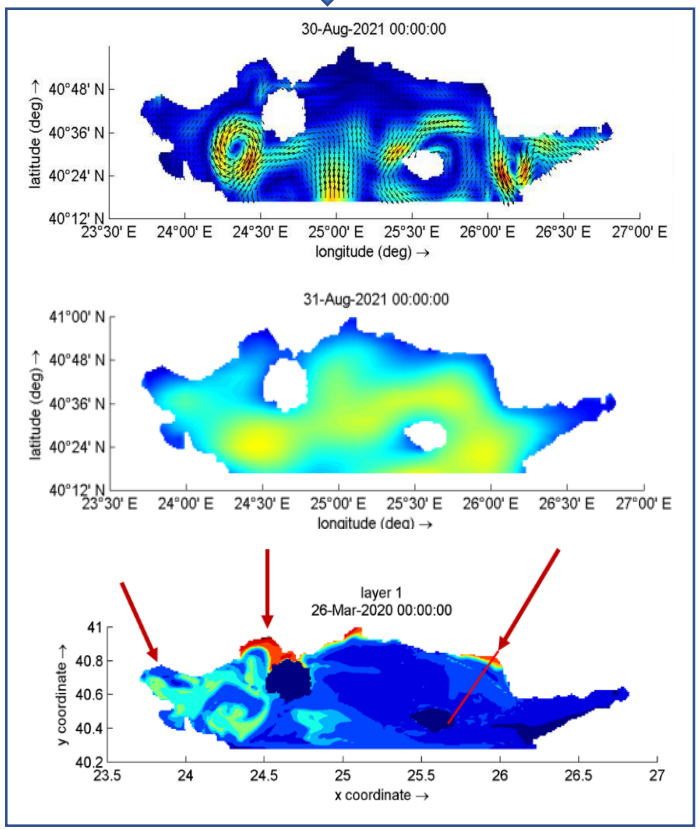
fishing activity monitoring (e.g. seabed disturbance)





The Offshore Operations DT

Copernicus Marine Service



Marinomica Package

The Oil Spill DT

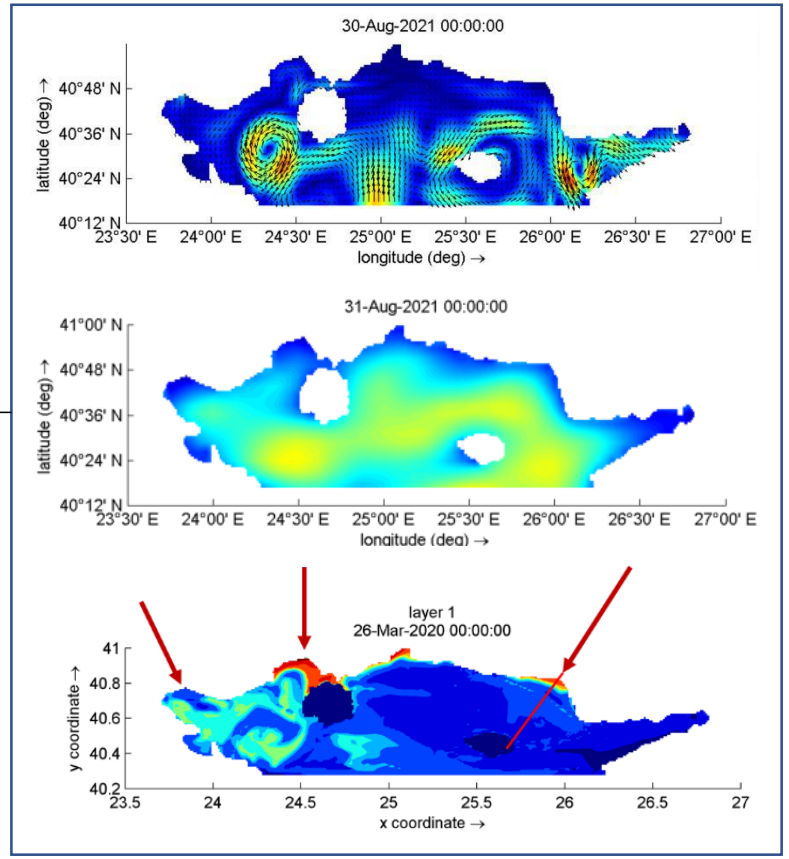
Scan Satellite Images For Oil Spills

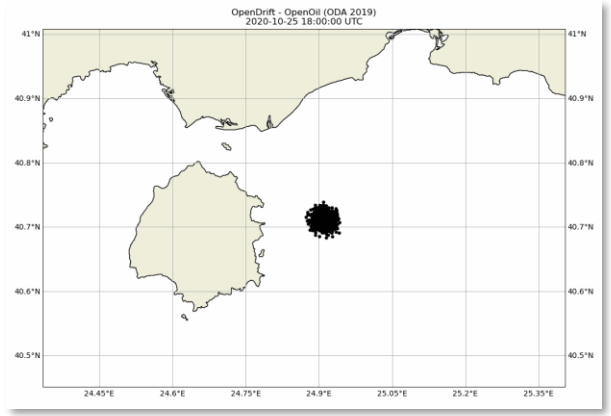
Scan Social Media Posts For Oil Spills References

Use Citizen Science Apps For Oil Spills Records

Event Identification Pack

Marinomica Package





Alarm and Aid Authorities' Response

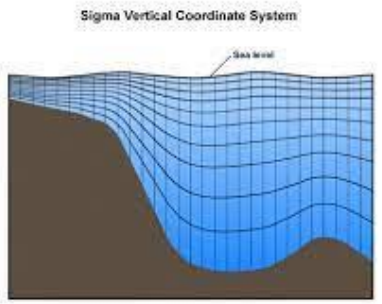
Use Sensors, Citizen Science Apps & SM posts to Evaluate Clean up

ILIAD Digital Twin Ingredients and Novelties

Sensors
Gliders
Drones
MPS
Drifters
Ecosounders
LiDAR
Low-cost Sensors

AI Algorithms
Data Fusion
Data Analytics
Data-driven Models
Machine Learning
Pattern Recognition
Event Detection

DTO Platform
Federated
Interoperable
Data Collector
Simulator
Control Room



Models
Coupled,
Downscaled
Hydrodynamic
Wave
Biogeochemical
Ecosystem
Oil Spill
Fish & Mussel
GFD to CFD

Citizen Science
Networks
Reporting Apps
Social Networks
Semantics
Humans as Sensors

Dashboards
Geo-Visualization
User XP, VR

Existing Resources
Satellites
Sensor Networks
Databases
Large-scale Models

IoT
Data Transfer
Cloud Storage
HPCs

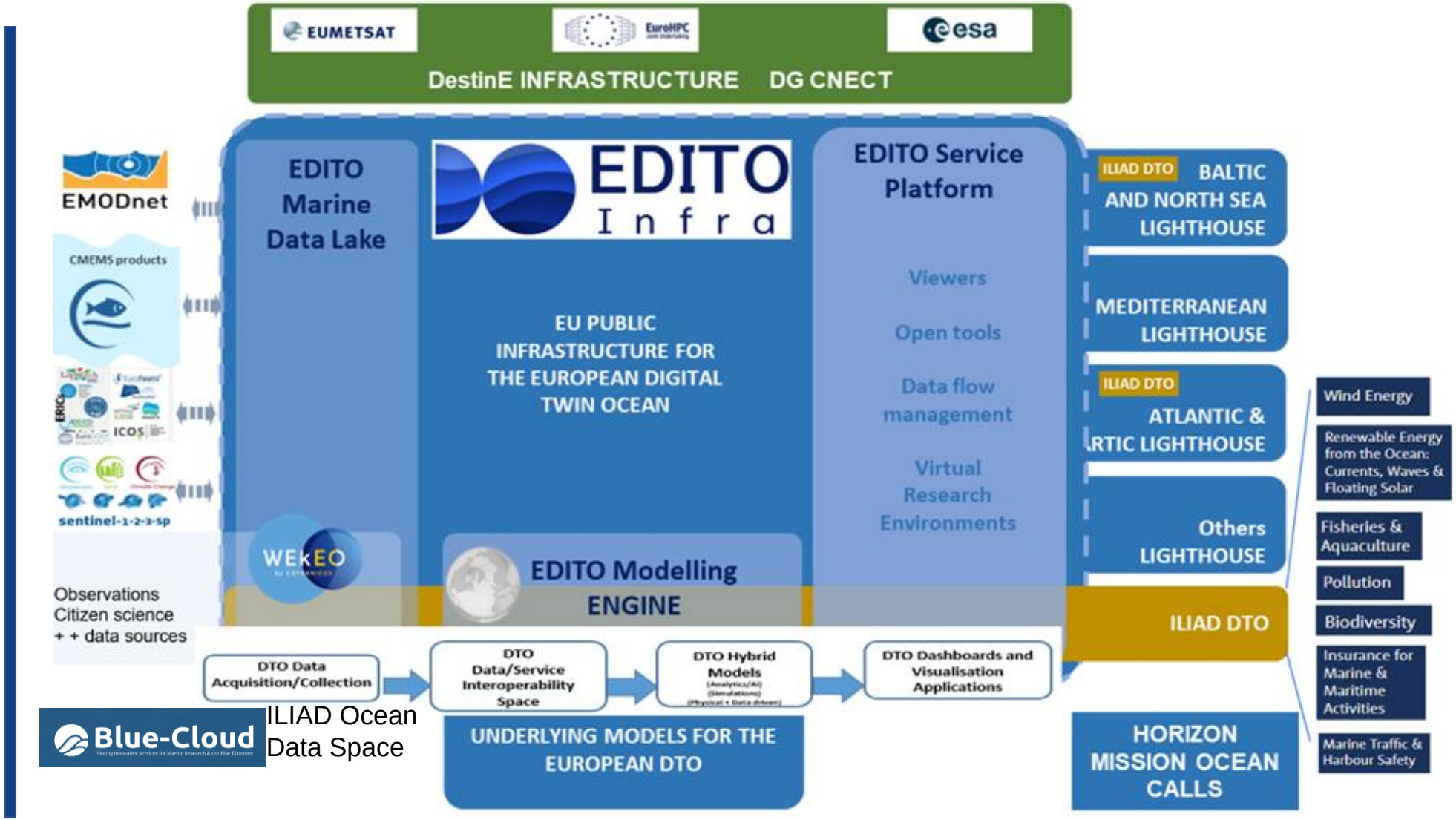
Policy

Technology Transfer

Dissemination

CAPACITY BUILDING

ILIAD Contribution to the EU DTO Future Infrastructure



Thank You

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