

**EDITO**

European Digital Twin Ocean

# EDITO: two innovative projects for an operational European Digital Twin of the Ocean

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## landSeaLot Kickoff

Yann Drillet, MOi team and partners from EDITO projects



# <https://www.edito-modellab.eu/>

DISCOVER TWO EU INTERDEPENDENT PROJECTS BUILDING  
THE EUROPEAN DIGITAL TWIN OF THE OCEAN

PROJECTS

 **EDITO ModelLab**  
European Digital Twin Ocean

A 3-year project aiming to develop the next generation of ocean models, combining artificial intelligence and high-performance computing, to be integrated into the EDITO public infrastructure, providing access to focus applications and simulations of different what-if scenarios

[DISCOVER EDITO-MODEL LAB](#)

 **EDITO Infra**  
European Digital Twin Ocean

A 2-year project that will build the public infrastructure backbone for EDITO by integrating key data service components (among which Copernicus Marine Service and EMODnet), and by sharing cloud processing capabilities and software into a single digital framework

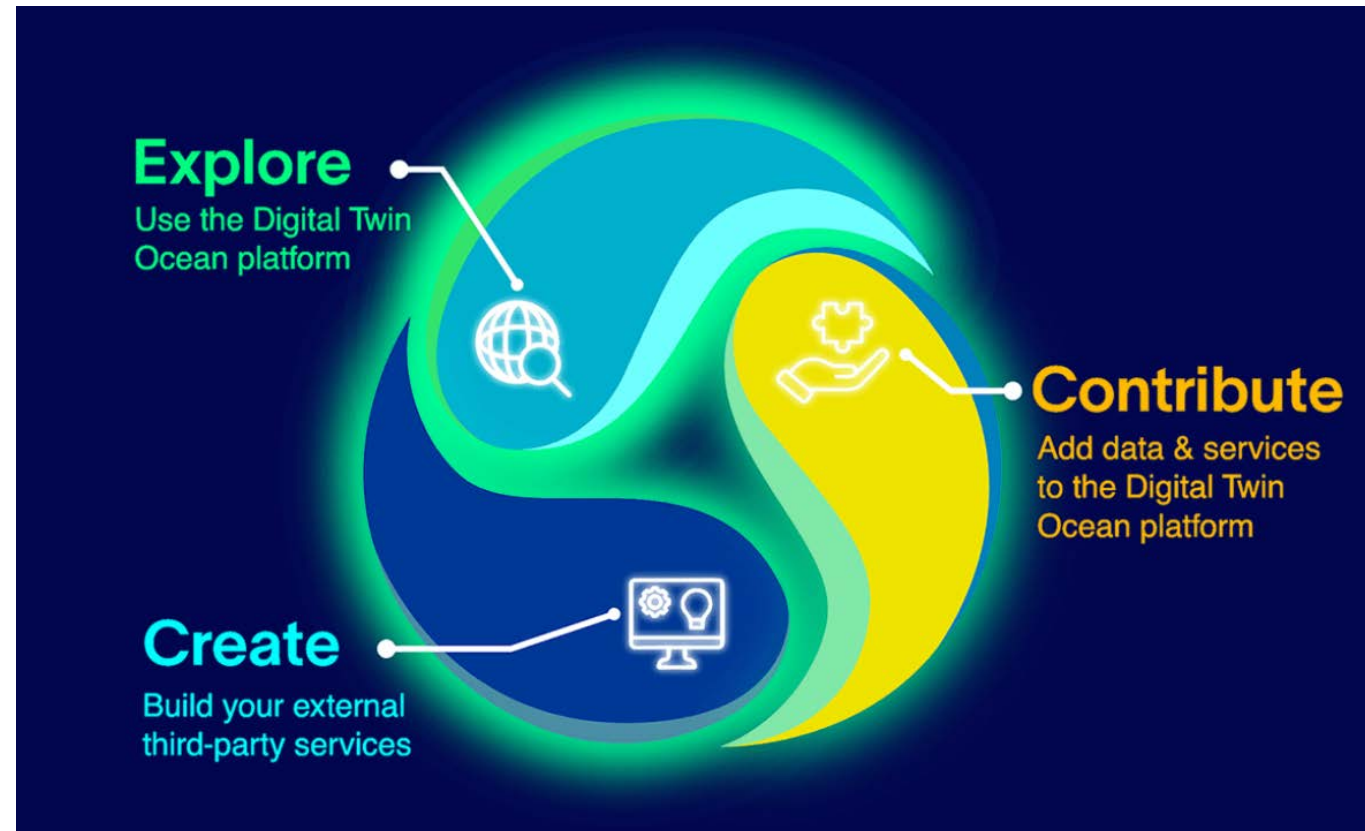
[DISCOVER EDITO-INFRA](#)

# What EDITO will deliver ?

## An integrated platform



## New services



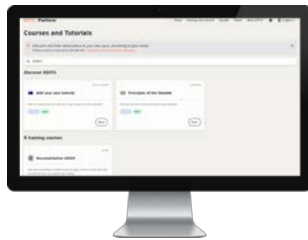
# Get started with EDITO

## Home

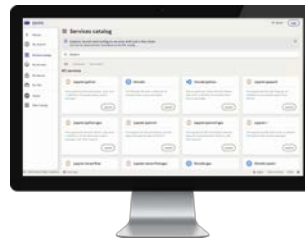
<https://tutorials.digitaltwinocan.edito.eu>



## Tutorials



## Datalab

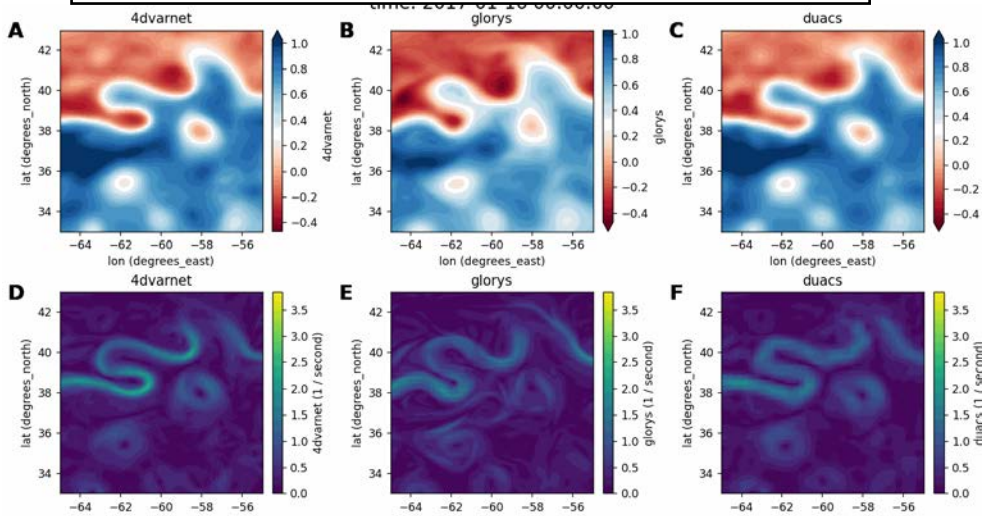


## Viewer

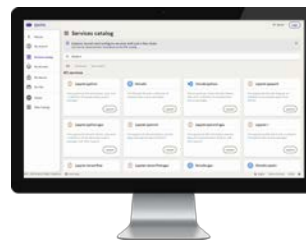


# Get started with EDITO

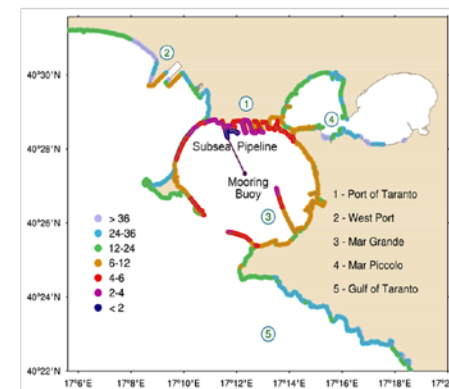
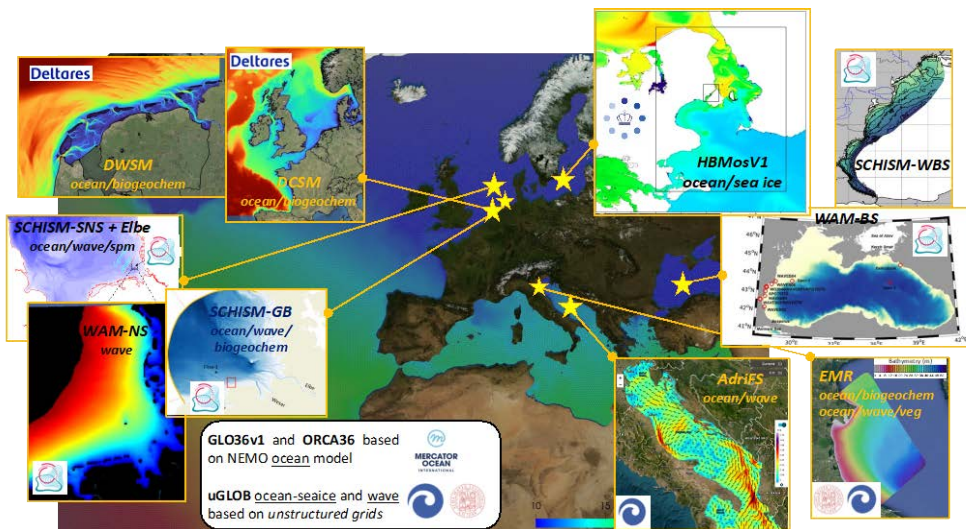
## Models & emulators



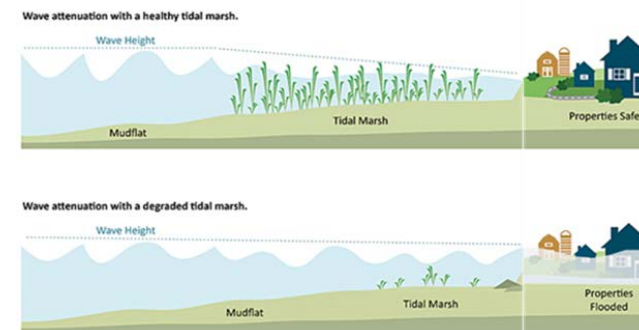
## Datalab



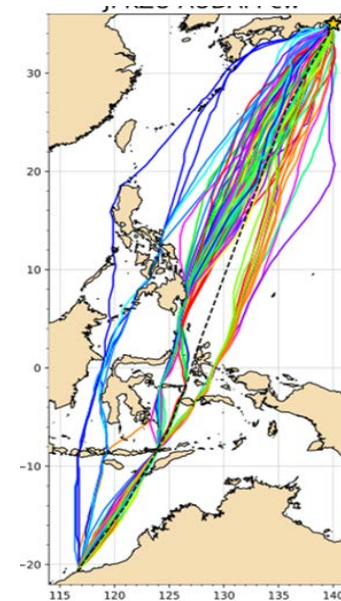
Applications : NBS, hazard mapping, ship routing, pollution



Arrival time (hours) for the beached oil to exceed the socioeconomic threshold of 0.1 g/m



Source: Esri ArcNews, "GIS Helps Integrate Coastal Hazard Risk and Sea Level Rise," 2014



# THANK YOU

# Digital Twin Ocean, The European Perspective

**A core infrastructure, conceived as a public good and service, to support the implementation of the marine Green Deal objectives**

At European level: **hundreds of initiatives**, Regional, National and European marine projects and infrastructures, Private initiatives, Monitoring services, Citizen science campaigns.... are committed to study and protect the marine ecosystem.



The complexity is to help them to **work together** and with other international initiatives.

Need for user-driven **powerful tools**, fit for digital age, to strengthen ocean knowledge and ocean management: by integrating and connecting wide range of data and models (from physics to socio-economics) with cloud infrastructures, HPC, AI and services.

# Get started with EDITO

The screenshot shows the homepage of the EDITO Platform. At the top left, the logo reads "EDITO Platform". The navigation menu at the top right includes "Home", "Trainings and tutorials", "Datalab", "Viewer", "About EDITO", "Support", a settings gear icon, and "English" with a dropdown arrow. The main heading is "EDITO platform for Digital Twins of the Ocean". Below this, a sub-heading says "Let's find and share resources on oceanographic models and data". To the right is a large graphic of two overlapping circles with a blue-to-purple gradient. Below the main content are three white boxes with icons and text:

- Tutorials to learn about the platform**: Accompanied by a book icon. Below the text is "the tutorials that you can access" and a button labeled "Consult our tutorials".
- The Datalab to design your digital twin ocean application**: Accompanied by a server rack icon. Below the text is "access services and personal space to work from the cloud" and a button labeled "Discover the Datalab".
- The viewer to explore the oceanographic data**: Accompanied by a globe icon. Below the text is "see for yourself your data representation" and a button labeled "Access the viewer".

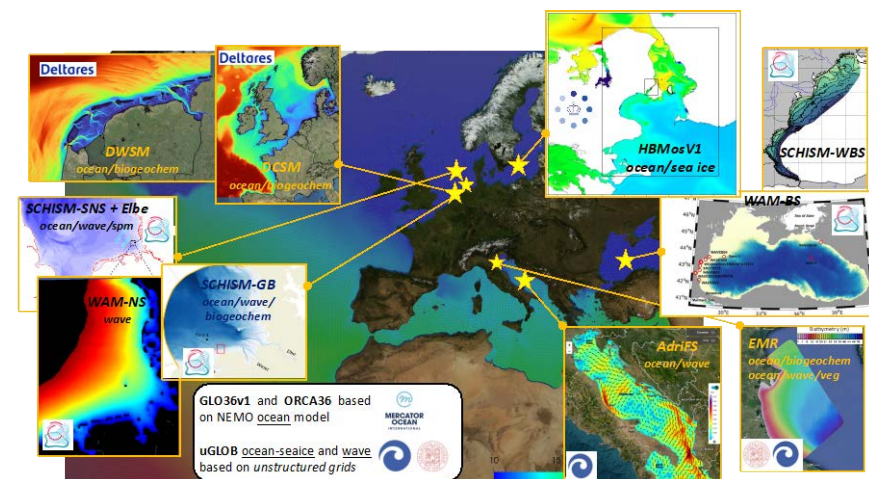
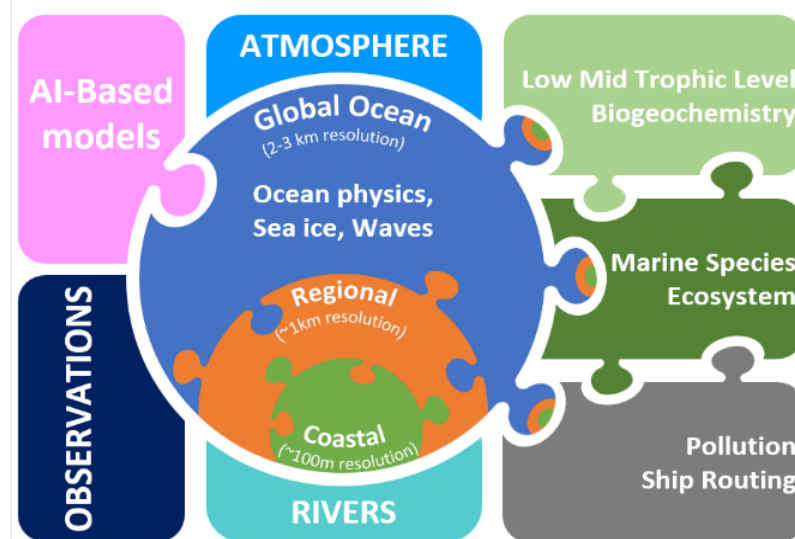
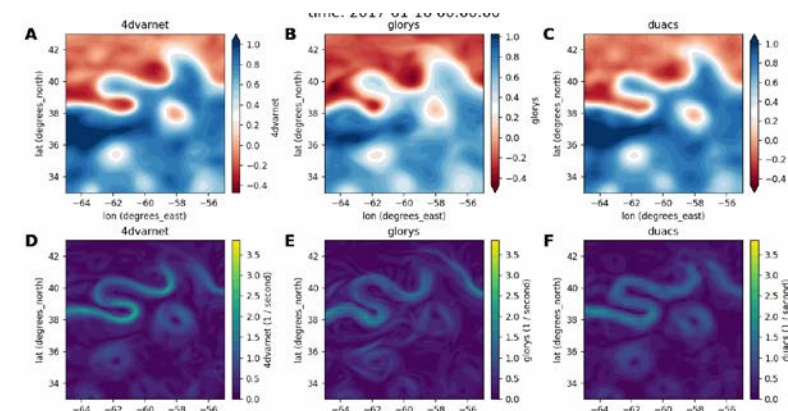
At the bottom left of the page, a URL is displayed: <https://tutorials.staging.edito.eu>



# Models developed in EDITO

**Deep Differentiable Emulators (DDEs)** for ocean modelling and forecasting that will provide **native AI building blocks** for the hybrid digital twins of the ocean

**Numerical models** for hydrodynamics and waves and develop the **next generation** of ocean model configurations optimised for European HPC hardware and the Digital Twin usage.



# Demonstration based on FA and WiS

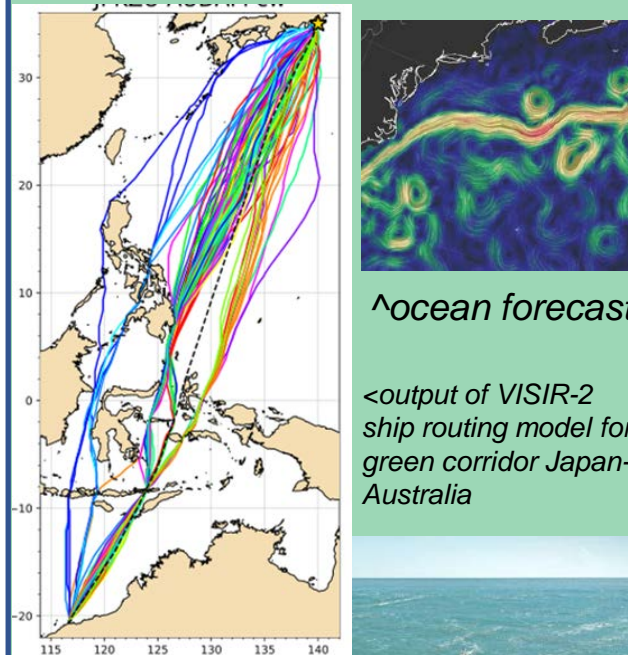
## 1. Marine Protected Areas & biodiversity

Habitat suitability and biodiversity indicators



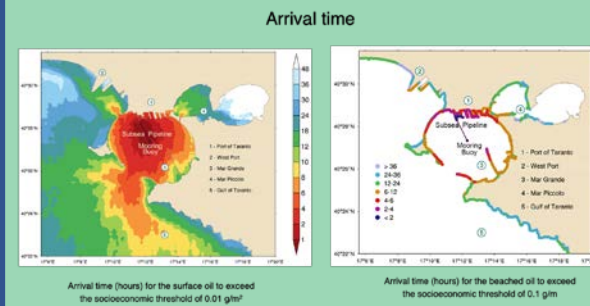
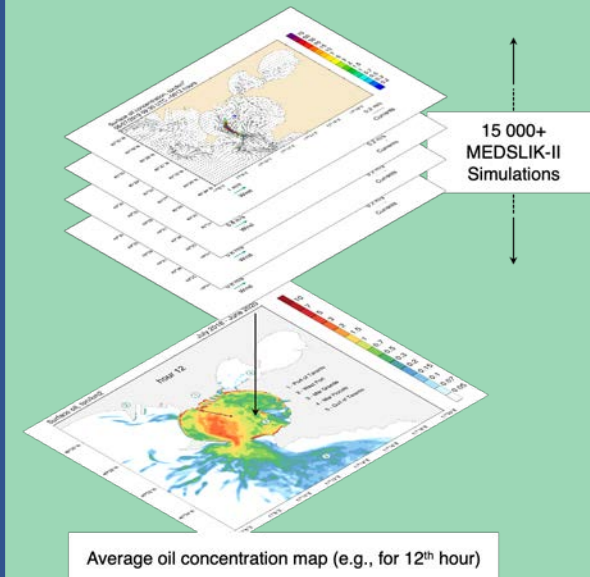
## 2. Ship routing for zero carbon

Using forecasts of ocean waves and currents to reduce CO2 emissions



## 3. Zero pollution

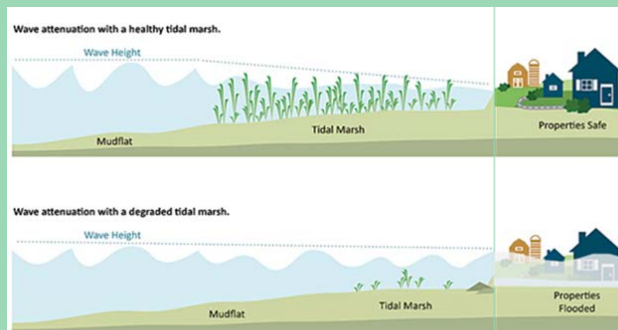
Simulating release of oil from ships and plastics from land



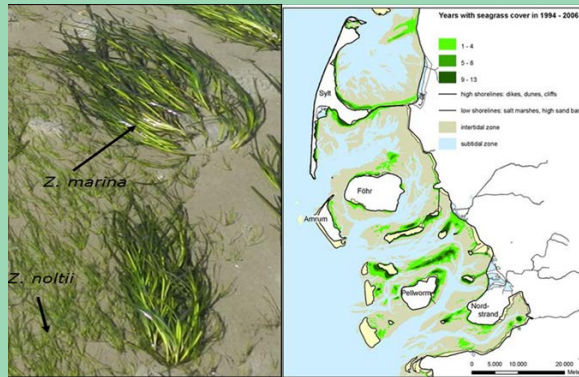
# Demonstration based on FA and WiS

## 1. Nature Based Solutions for biodiversity and coastal hazards

Impact of extreme events on ecosystems protection and mitigation

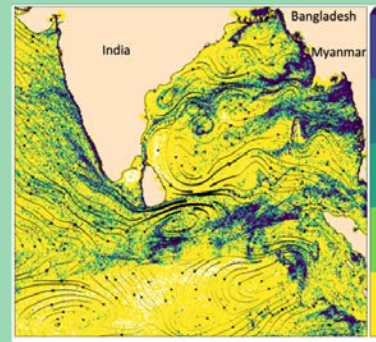


Source: Esri ArcNews, "GIS Helps Integrate Coastal Hazard Risk and Sea Level Rise," 2014



## 2. Marine plastic for Zero pollution

Effects of plastic pollution levels reductions in LOC in the marine environment



## 3. Aquaculture for Zero carbon

Marine aquaculture offers opportunities for emissions reduction and the potential for carbon sequestration. .

