The +ATLANTIC CoLAB operational Lagrangian Platform

MOHIDing with MOHID-Lagrangian at IST-UL

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CoLAB +ATLANTIC

+ Outline

- Who we are and what we do at +ATLANTIC
  - Main Goals of +ATLANTIC products and services
    - Showcasing the ATLANTIC SENSE geoportal
      - Introducing the Lagrangian Platform – Oil Spill Simulator
        - Main Features and Limitations of the Oil Spill Simulator
          - Next steps to update and upgrade service

WHO is +ATLANTIC CoLAB

ABOUT

WHO IS +ATLANTIC CoLAB

+ATLANTIC aims to turn ocean data and knowledge into value-added information products and services in order to foster the preservation and sustainably harnessing of the Atlantic Ocean using an integrated and multidisciplinary approach.

13 associates: 5 companies, 3 universities, 4 associations & 1 State Lab

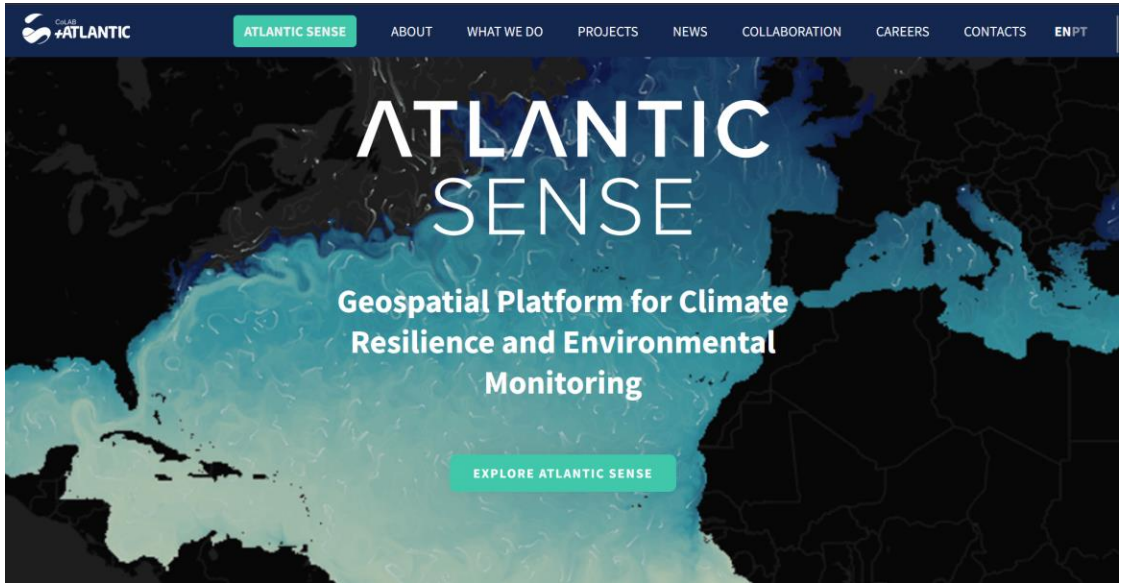
To provide differentiated know-how, +ATLANTIC has different technical groups, including the **Operational METOCEAN Modelling team**

Operational METOCEAN Modelling team

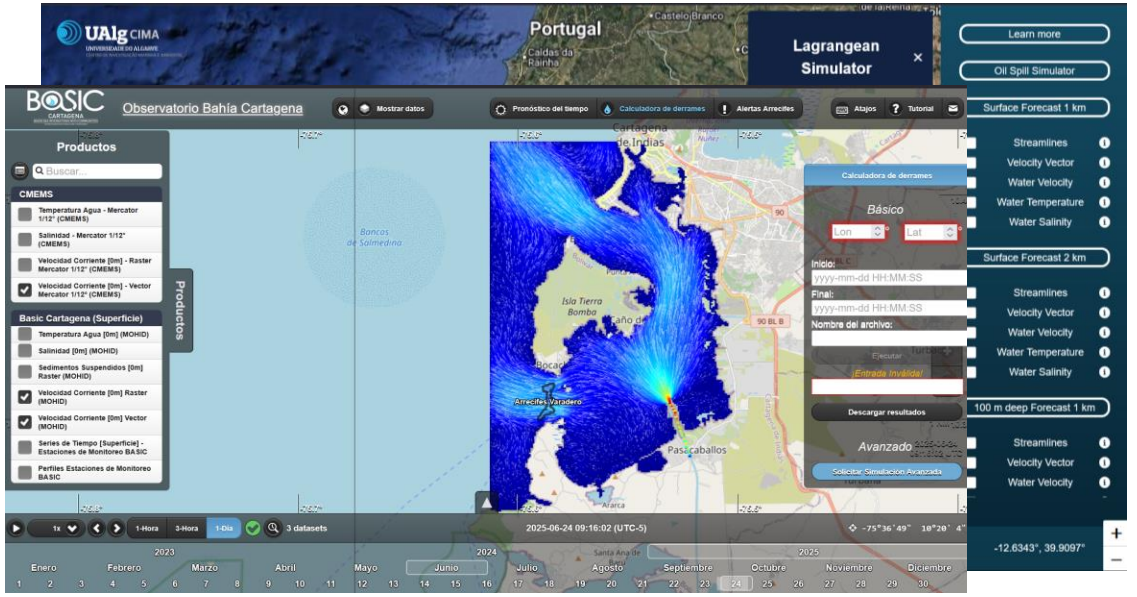
MOHID model, including the **MOHID Lagrangian module**

→ to produce <u>operational physical and biogeochemical predictions</u>

Output is standardized to feed our geoportal



Other geoportals relying upon MOHID simulations for Algarve (PT), Colombia, Cádis (ES), …



ATLANTIC SENSE

atlanticsense.com

ATLANTIC
SENSE

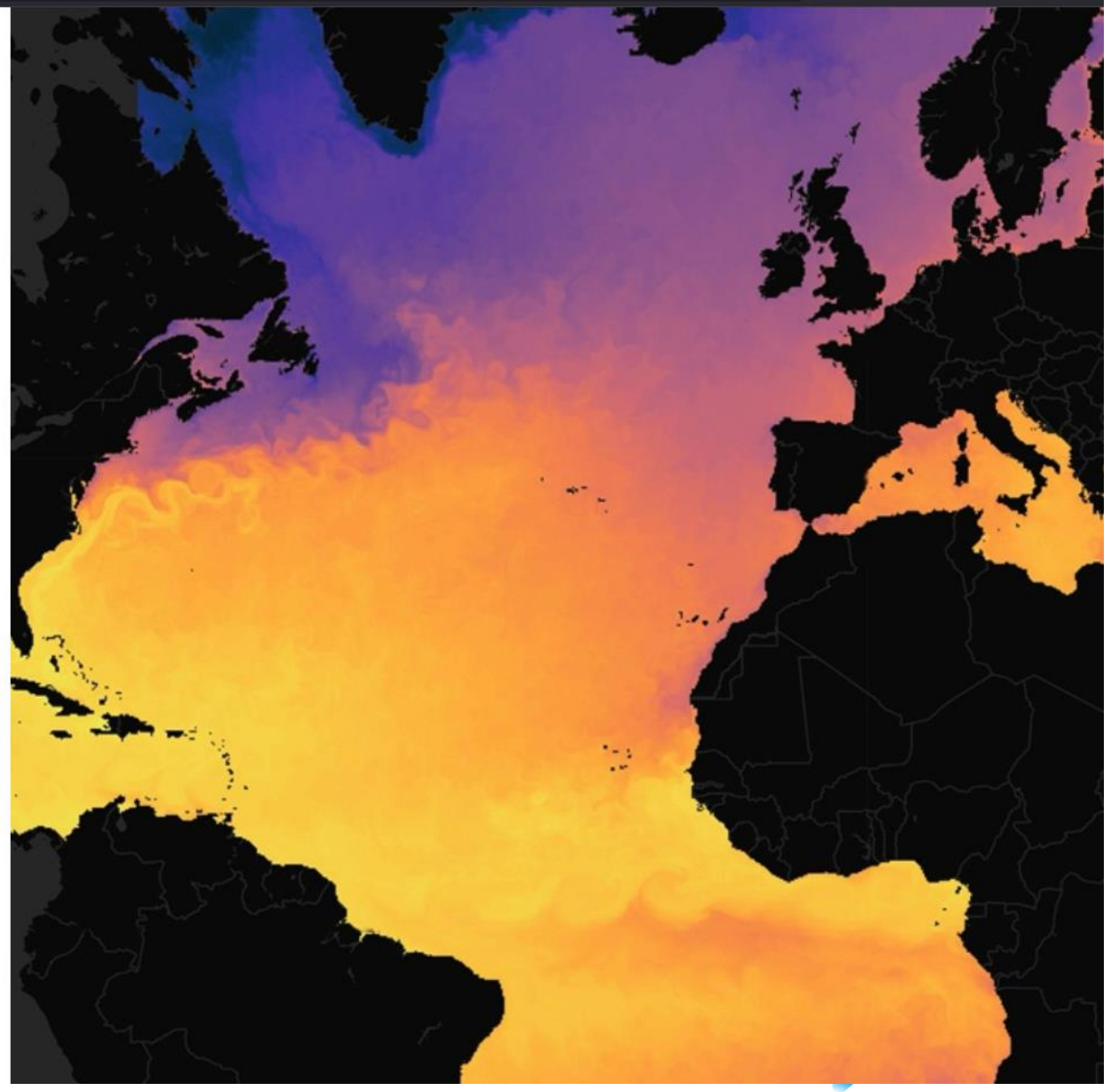
Geospatial Tool for Climate Resilience and Environmental Monitoring

Atlantic SENSE by +ATLANTIC is a geospatial platform designed to support climate resilience and environmental monitoring across the Atlantic Basin. It offers access to data from four key Earth domains: **ocean**, **land**, **air**, and **coastal areas**.

By transforming complex data into actionable insights, Atlantic SENSE helps various types of users understand and address the **impacts of climate change and environmental risks**, with a **focus on protecting vulnerable ecosystems and communities.**

EXPLORE OUR PLATFORM

colabatlantic.com



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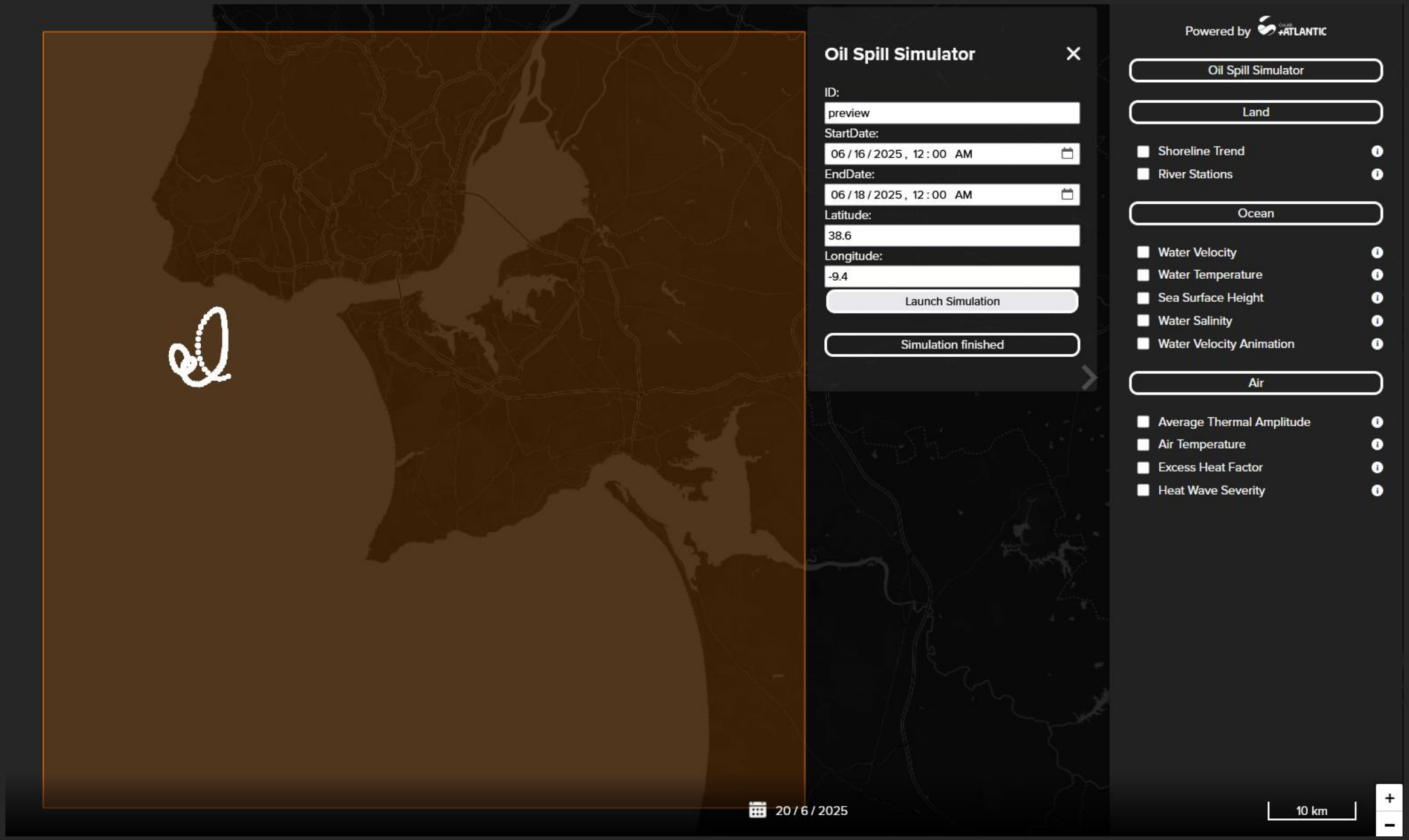
Introducing: operational Lagrangian Platform

Introducing our operational Lagrangian Platform

WHAT is it? **Online Oil Spill Simulator**

WHAT is the Main Goal of it? Simple **hindcast/forecast** for less than 4 days of particle trajectories within **LisOcean** Operacional Model domain.

HOW does it work? User selects the starting coordinates of a particle & the time range for the simulation.
Our Backend System will establish the communication between the MOHID Lagrangian Module at +ATL and the end-user.
Backend System returns a *.kml file with the simulated trajectory and plots the trajectory on the Lagrangian Platform


Oil Spill Simulator
ID:
preview
StartDate:
06 / 16 / 2025 , 12 : 00 AM
EndDate:
06 / 18 / 2025 , 12 : 00 AM
Latitude:
38.6
Longitude:
-9.4
Launch Simulation
Simulation finished
Powered by
Oil Spill Simulator
Land
Shoreline Trend
River Stations
Ocean
Water Velocity
Water Temperature
Sea Surface Height
Water Salinity
Water Velocity Animation
Air
Average Thermal Amplitude
Air Temperature
Excess Heat Factor
Heat Wave Severity
20 / 6 / 2025
10 km

Operational Lagrangian Platform

Main Features

- Interactive
- 2D simulation
- Tracers – no material properties
- Built upon our operational LisOcean model, where it takes its hydrodynamical input parameters from.
- Uses Meteorological input parameters from both GFS (provided by NOAA) and AROME model (provided by IPMA).

Operational Lagrangian Platform

Main Features

Advantages

- Fast (under 1 minute)
- No modelling know-how, no registration nor login needed
- Trajectory output automatically saved as *.kml

Limitations

- Cannot run simulations spanning a period longer than 4 days → limitation set by number of forecasted days for local region
- Limited geographical region
- User cannot define particle material type

Next Steps

Update & Upgrade

Update – MOHID-Lagrangian

Official release of new stable version of MOHID-Lagrangian

Update dependencies as well (python, libs, etc.)

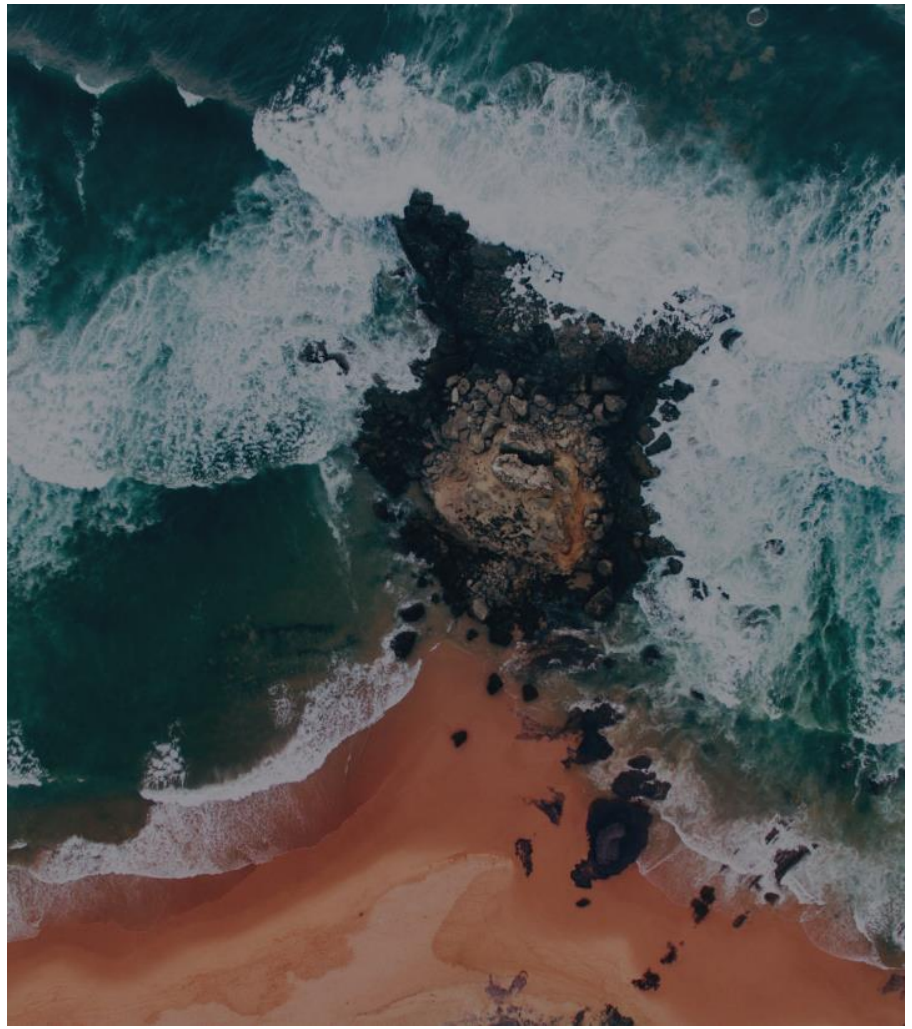
Upgrade Online Simulator

Extend horizontal domain to whole mainland Portugal and Portuguese EEZ.

Redundancy of input datasets, i.e., extend Meteorology forecasts to MeteoGalicia as well.

Extend number of simulated days if running in hindcast mode.

Define other particle material properties.



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PRR Plano de Recuperação e Resiliência

REPÚBLICA PORTUGUESA

Financiado pela União Europeia NextGenerationEU

MI MISSÃO INTERFACE

ANI AGÊNCIA NACIONAL DE INOVAÇÃO