

EU Coastal Use Cases Workshop

September 16, 2024

PIPELINE-DITO Pilot Portuguese coastal operational model for the Digital Twin of the Ocean



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IPMA, +Atlantic Colab, Hidromod, Fciências.ID



PROGRAMME OF
THE EUROPEAN UNION



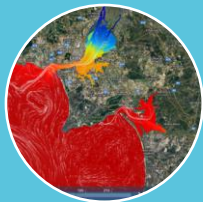
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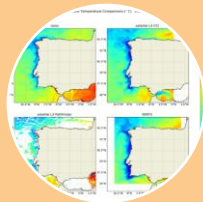
MAIN OBJECTIVE

Design and coordinate the consolidation of a consortium to build a robust national coastal modelling system for Portugal including relevant key players.



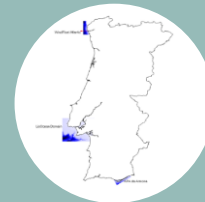
Use Case 1

- Tagus/Sado Area
- WFD/MSFD



Use Case 2

- Mainland Portugal Coast
- MSFD/CFP



Use Case 3

- 3 Hi-res areas
- MSP/Green Deal

PROPOSAL TO CONSOLIDATE A PORTUGUESE COASTAL DOWNSCALLING MODELING SERVICE

Target EU Directives

- **Water Framework Directive (WFD)**
- **Marine Strategy Framework Directive (MSFD)**
- **Bathing Water Directive (BWD)**
- **Flood Directive (FD)**
- **Common Fisheries Policy (CFP)**
- **Marine Spatial Planning Directive (MSP)**
- **Integrated Coastal Zone Management in Europe (ICZM)**



Copernicus
Marine Service

Consortium



IPMA



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Francisco
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PIPELINE - DITO

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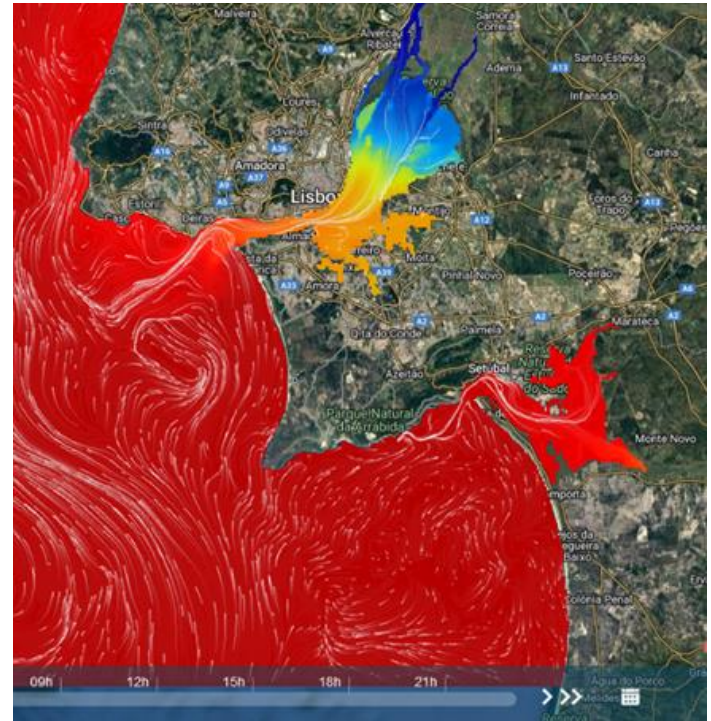
- **Copernicus Marine Products and Coastal models**

3 Use Cases



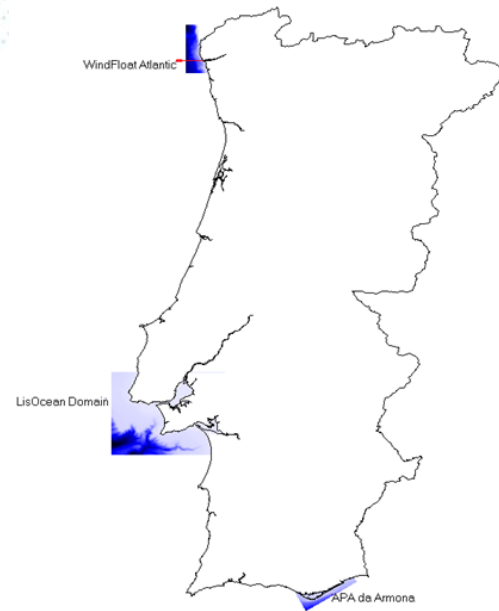
Produce operational results in an estuarine system with many competing uses such as big ports and marine protected areas (Tagus/Sado estuaries)

- Model MOHID
- Horizontal resolution 280m - Period 2024-3 day forecast
- Atmospheric forcing: IPMA high-resolution meteorological models
- Downscaled from
 - GLOBAL_ANALYSIS_FORECAST_PHYS_001_024 (~7km)
 - GLOBAL_ANALYSIS_FORECAST_BIO_001_028
 - IBI_ANALYSISFORECAST_PHY_005_001 (~2.4km)
 - IBI_ANALYSISFORECAST_BGC_005_004
- Actual state:
- currently operational (LEVEL 2) and results are published in NetCDF CF through a THREDDS server



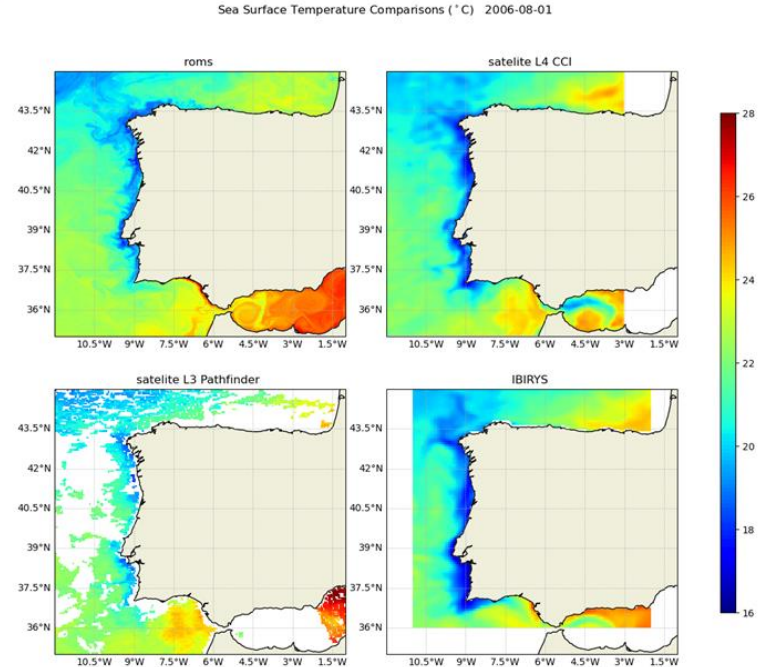
Produce operational results in 2 other areas:

- a marine renewable energy (MRE) site (Viana do Castelo)
 - an aquaculture production area (Algarve)
-
- Model MOHID Horiz res $\leq 280\text{m}$ Period 2024-3 day forecast. Downscaled from:
 - IBI_ANALYSISFORECAST_PHY_005_001
 - IBI_ANALYSISFORECAST_BGC_005_004
 - Actual state: more adequate domains will be selected from the inventory in Activity 1



Pilot sites for Portugal coastal application (Minho and Lima estuaries along with marine renewable energies), Tagus and Sado estuarine system and Ria Formosa along with aquaculture facilities.

- High-resolution reanalysis for Iberia
 - Model CROCO
 - Horiz res 1/48^o (~1.7km) Period 2002-2020
 - Atmospheric forcing: ERA5
 - Downscaled from
 - GLORYS2V12 (2002-2020) (~7km res)
 - GLOBAL_ANALYSIS_FORECAST_PHYS_001_024 (from 2021)
- Currently available from 2002 to 2020 (extended to 2020 during this service and it will be extended till the present date)



Comparison of SST snapshots from ROMS IBv2.0, satellite SST from ESA-CCI, Pathfinder and IBIRYS (1/8/2006)

Project Website:

<https://www.pipeline-dito.colabatlantic.com/>

Content: project description, objectives, case studies, data visualization and contacts.

