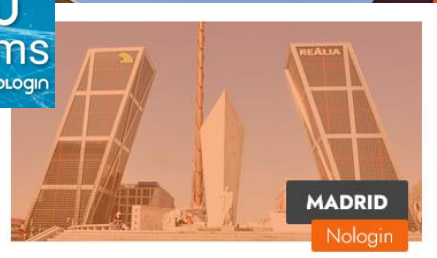
Nologin Oceanic Weather Systems: delivering operational services for the Copernicus Marine and developing coastal downstream applications in the European NorthEast Atlantic.

nologin

NOW

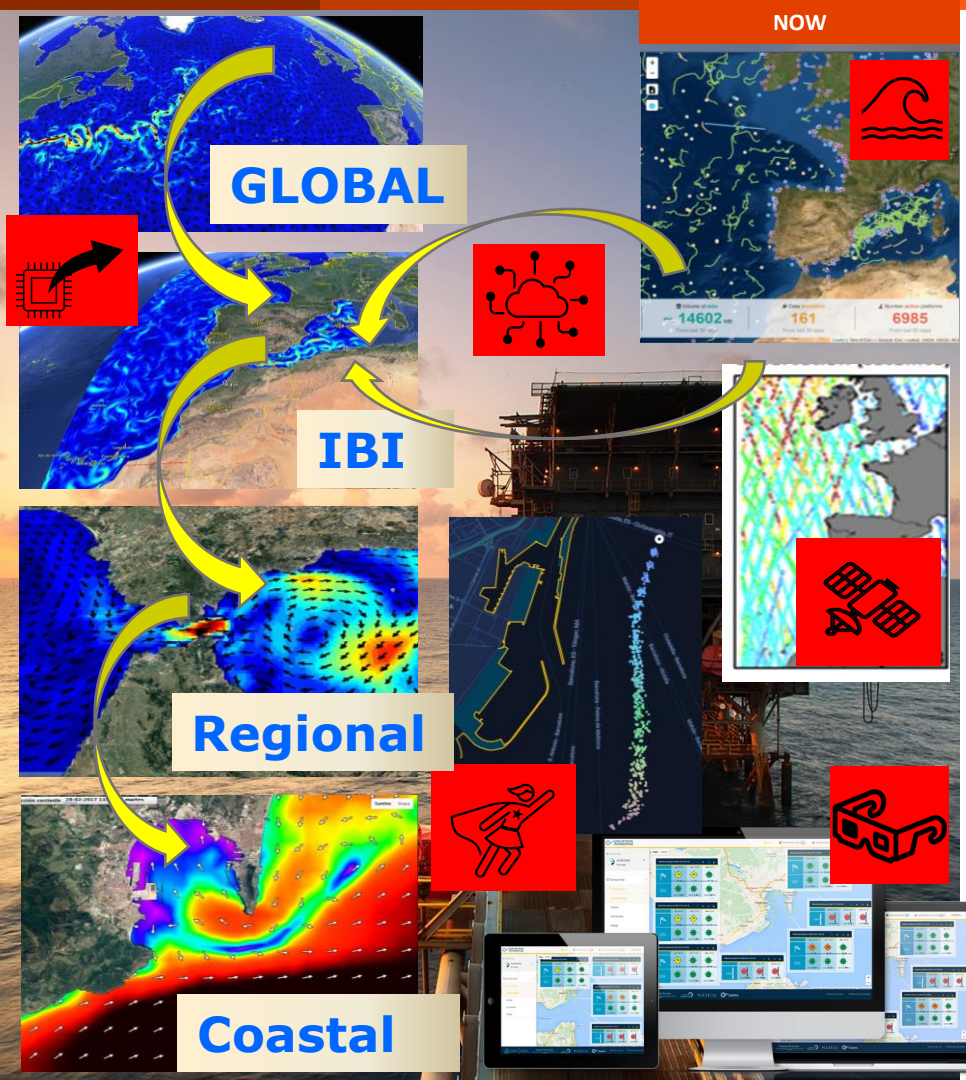
Nologin Oceanic Weather systems



OceanPredict
Advancing the science of ocean prediction

COSS-TT International Coordination Meeting (9).

2-4 May 2023 Montréal, Canada



Who are we? What do we do?

Provider of technical solutions, services & know-how **in support of** more efficient and sustained activities in the **marine coastal environment**. Focused on:

- ✓ ***Monitoring*** ; Integration of observational data;
- ✓ ***Forecasting*** ; Dynamical Models (short-term & climate)
- ✓ ***Combined solutions*** ; model-obs ; based on AI solutions
- ✓ ***Added Value Services ;*** i.e. oil spill, warning systems, …
- ✓ ***Operations;*** for General Core /Targeted Applications.
- ✓ ***Digital Twins*** ; Integrated interactive services + inspired viewing capabilities

Contributing to a better know of the past, present and future state of the blue and green ocean.

Who are we? The Team

NOW Systems integrated by highly skilled experts in the **STEM** area.





Arancha Amo
RESPONSIBLE OF OPERATIONAL OCEAN FORECAST SERVICES

Cristina Toledano
WAVE MODELLER (AND RESPONSIBLE OF OPERATIONAL WAVE FORECASTING SERVICES)

Jose María Gracía-Valcecasas
COASTAL SERVICES MANAGER



LLuis Castrillo
JUNIOR OCEAN SCIENTIST

Manuel García-León
COASTAL MET-OCEAN SENIOR EXPERT

Marcos Sotillo
NOW TECNICAL MANAGER



Raul Alonso
DATA ANALYST / JUNIOR SOFTWARE DEVELOPER

Roland Aznar
OCEAN MODELLING MANAGER

Stefania Ciliberti
SENIOR RESEARCH SCIENTIST (AND PRODUCT QUALITY RESPONSIBLE)

Integrated & Supported by:

•**Zaragoza**
Avda. de Ranillas 1D, 50018

•**Madrid** Torres Kio
Paseo de la Castellana, 216, 28046

nologin

Technological IT Company

22+
Años de experiencia

90+
Empleados

$8M+
Facturación 2021

Core Services

Copernicus Marine Service

Nologin –NOW-·

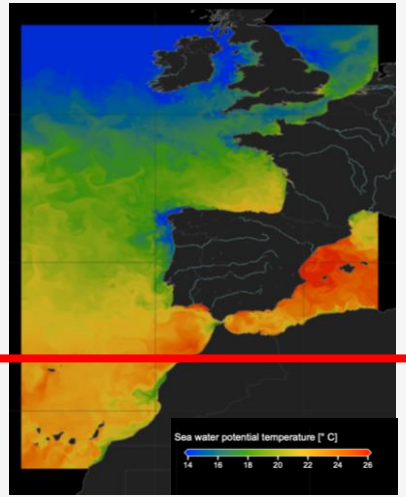
EC Copernicus Marine Service Provider

Forecasting

IBI-MFC (Iberia-Biscay-Ireland Monitoring & Forecasting Centre)

Nologin co-leads with Mercator Ocean International the IBI-MFC since 2018 (responsible of operations; with MF and CESGA)

IBI-MFC Consortium



Observation

INS-TAC (In-Situ Obs. Thematic Assembly Centre)

Nologin in the InS-TAC partnership, responsibility (shared with PdE) in operations, validation and service evolution for the IBI area.

INS-TAC Consortium

Other Services

PQ-Dashboard (Developing Copernicus Marine Web services)

e-Training (Managing the Copernicus Marine e-Training Platform & generating training materials)

Ocean Prediction DCC (supporting MOI in the development of its Co-design Team)

Ocean Prediction — UN Decade Collaborative Center

Downstream Services

NOW: Developing targeted coastal services…

OSPAC (Oceanographic Services for Ports and Cities)
(Co-developed with PdE in H2020 EuroSea Project)

Nologin

End-user Applications to ease use of environmental information & added value services (eg.**warning systems**).

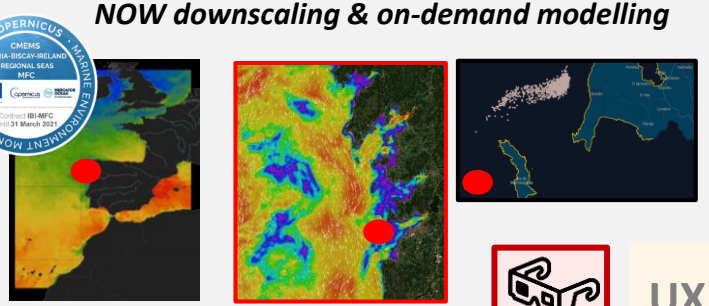
Better **coastal model solutions** for short-term forecasting and climate monitoring/prediction (impacts).

Neural Networks and **AI-based solutions** to improve coastal monitoring and predicion.

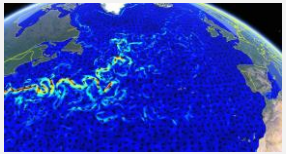
The NOW Coastal Service

Dealing with all the elements needed for a comprenhensive customized coastal service...

NOW downscaling & on-demand modelling



Expert use of Core services and products (Copernicus, EMODNET, …)



Global Model

Ocean Monitoring

QC / Reprocessing

Services input

Regional service

Coastal service

Artificial Intelligence

UserInterface App
Added value tools

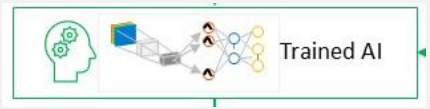
UX Continuos evolution

NRT Forecasting & MY climate monit.
PHY & BGC EOVs InSitu+Sat OBS
Surf & 3D Customized services

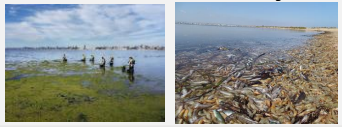
Aiming TRL-9

Customer's Observations

NOW SOFIA Tool
+ R&D (KAILANI, ECCLIPSE)



Extreme event analysis

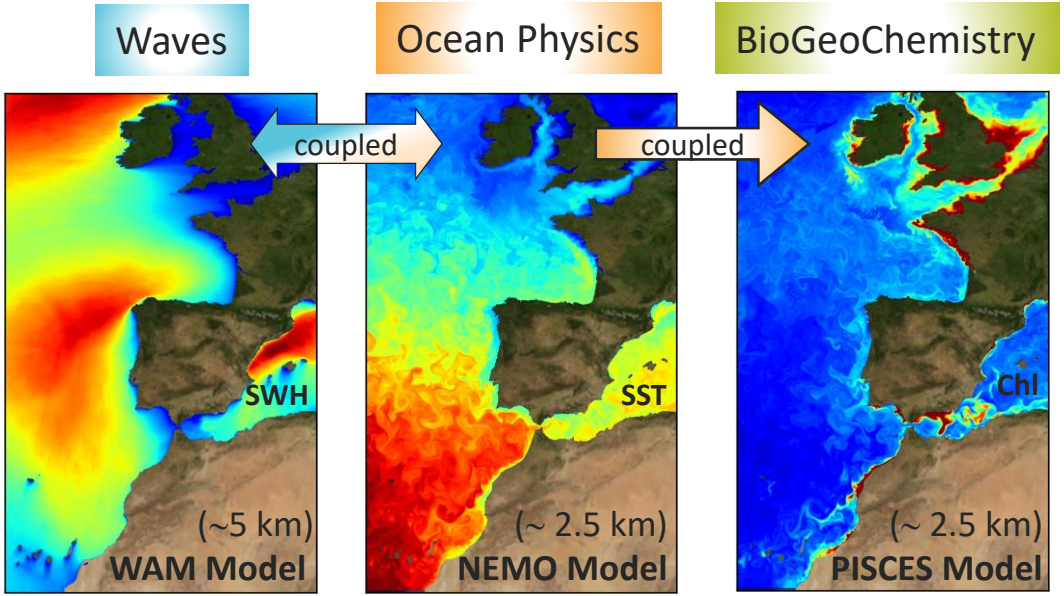


Climate Change Impacts

The IBI Mission!

To provide regional short-term ocean NRT **forecasts and MY reanalysis** products for the Atlantic European façade (**IBI area**).

- Covering Blue (ocean physic and waves) & Green (biogeochemical) ocean components
- Using high resolution models (& coupling components!)
- Integrating observations through Data Assimilation schemes (analysis & re-analysis production)
- IBI product quality assessed (reliable science-based products)



The IBI-MFC: An evolving service

	C-1 start (2015)	C-1 Phase 2 (2018)	@ end of 2021
IBI-PHY-NRT	- 1/36º NEMO3.4 App. - Sequential Periodic restart - ATM: ECMWF-1/8º (3-h)	- NEMO3.6 - DA (SST, SSH, InSitu TS) - ATM: 1-h ECMWF.	- IBI Wave coupling (in FCs) - Updated tidal forcing
IBI-BIO-NRT	✘	- 1/36º PISCES3.6 - No permanent burial - Improved carbon cycle - Carbon vars distributed	- Revised inputs from rivers - Permanent burial - Improved OBC (CMEMS GLO)
IBI-WAV-NRT	✘	- 1/10º MFWAM App	- 1/20º MFWAM + DA - IBI Currents inputs
IBI-PHY-MY	- 1/12º NEMO3.2 (ERA-Int) - DA (SST, SSH, InSitu TS) - Coverage: 2002-2011	- 1/12º NEMO 3.6 - Coverage: back to 1993	- ATM: ECMWF ERA5 - improved DA - New OBS (OSTIA SST)
IBI-BIO-MY	- 1/12º PISCES 3.2 - Non-assimilative hindcast - Coverage: 2002-2011	- 1/12º PISCES 3.6 - No permanent burial - Improved carbon cycle - Carbon vars distributed - Coverage: back to 1993	- Revised inputs from rivers - Permanent burial - Improved OBC/IC (CMEMS GLO)
IBI-WAV-MY	✘	- 1/10º MF-WAM - Winds: ERA-int - OBC: ECMWF	- 1/20º MFWAM + DA (SWH) - Winds: ERA5 - OBC: CMEMS GLO - IBI Currents inputs

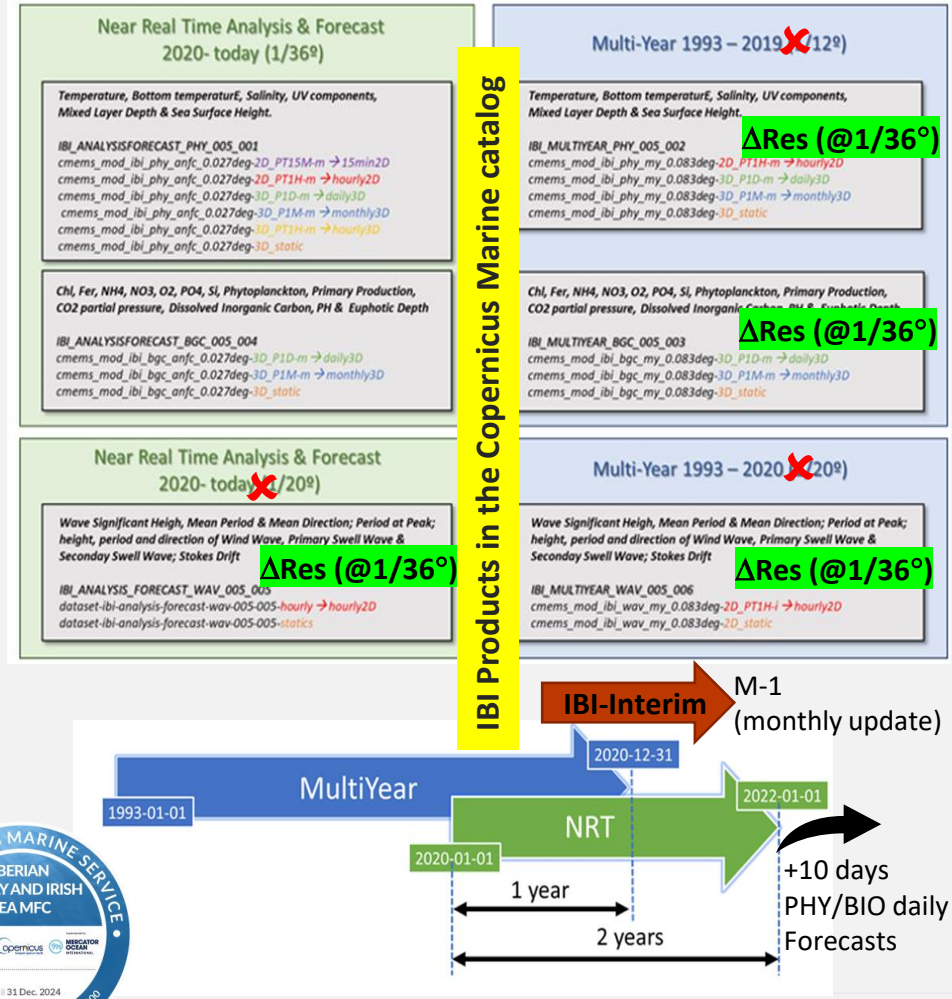
IBI-MFC Improvement lines along Copernicus-1 (2015-2021):

- **A complete IBI Portfolio.**
- **System interactions (Coupling).**
- **New/Update Data Assimilation**
- **Product Improvement: New vars, ⇑ Resolution, ⇑ Coverage.**
- **Model Configuration improv. (inc. Forcing).**

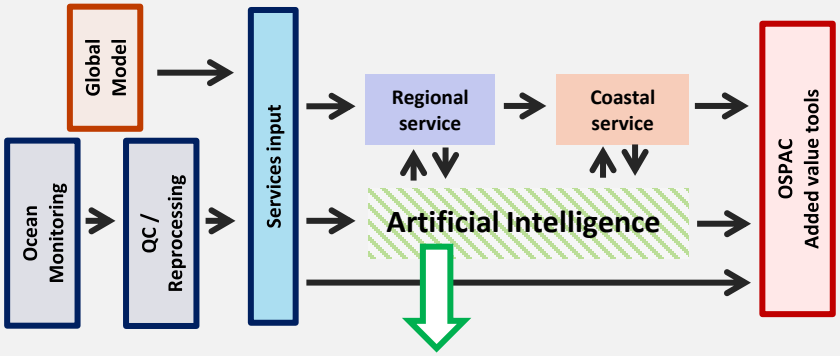
28 Sci papers on IBI products & service evolution.
IBI-MFC, SE & H2020 Projects.

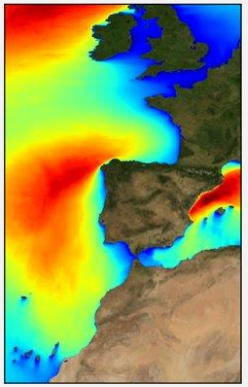
IBI-MFC Service: Roadmap for Copernicus-2 (2022-2024)

- *Enhance IBI Product homogenity*
  - All IBI products in a **common single grid**
  - **MY & NRT @ same resolution (1/36º)**
- *Ensure IBI Service Continuity*
  - Get MY products update closer to present (**New MY Interim Streams**)
  - Ocean physical forecast till **+10 Days**.
  - Daily update of BIO forecasts, etc.…
- *Make IBI products more coastal oriented*
  - Improving models/DA/forcing
  - Enhancing coupling (i.e. with atmosphere, river hidrology, etc.)



NOW Coastal Services' Components





KAILANI Objective: ***Enhance coastal wave IBI-WAV forecast****, by* ***improving its forcing (using AI).***

Copernicus Marine Service

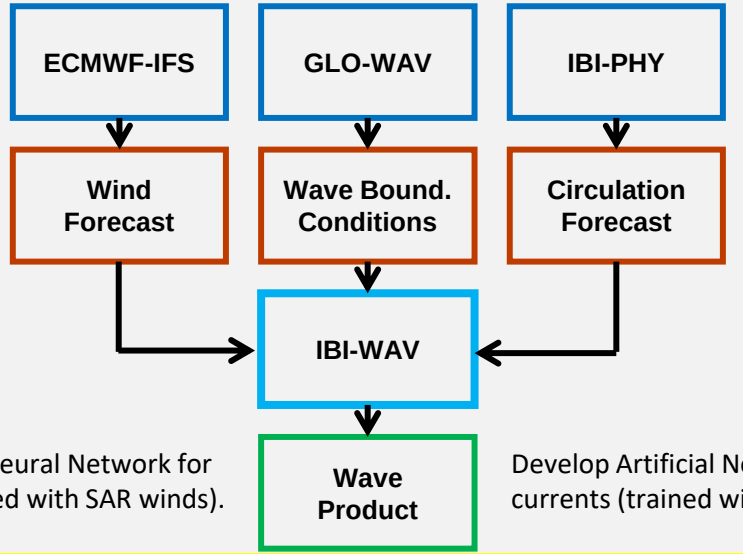
Service Evolution (2022-2024)

KAILANI

nologin

METEO FRANCE

ORITIA & BOREAS Wind Engineering



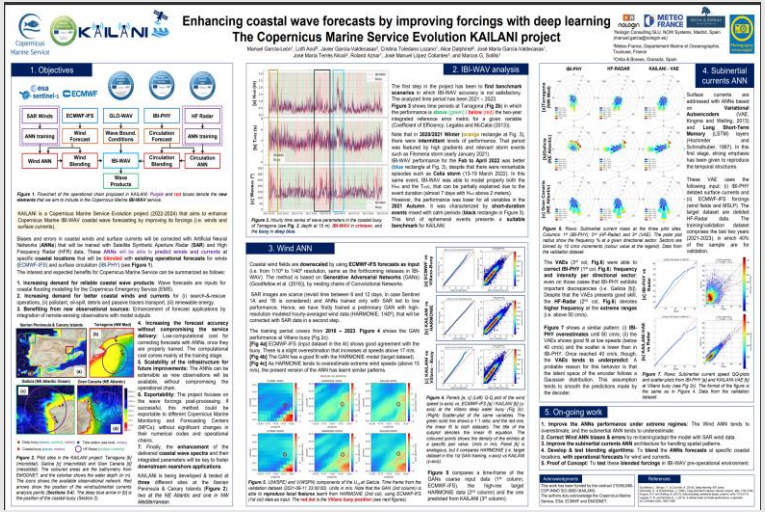
Develop Artificial Neural Network for wind forcing (trained with SAR winds).

Develop Artificial Neural Network for currents (trained with HF-Radar obs).

AI-Improved service/products (using OBS & MOD) being developed …

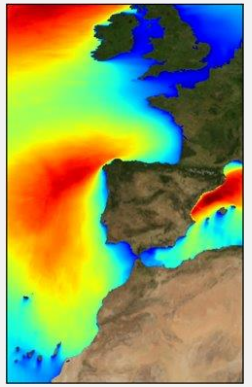
KAILANI preliminary results @ EGU-2023

https://doi.org/10.5194/egusphere-egu23-7632



Ocean

NOW Coastal Services' Components



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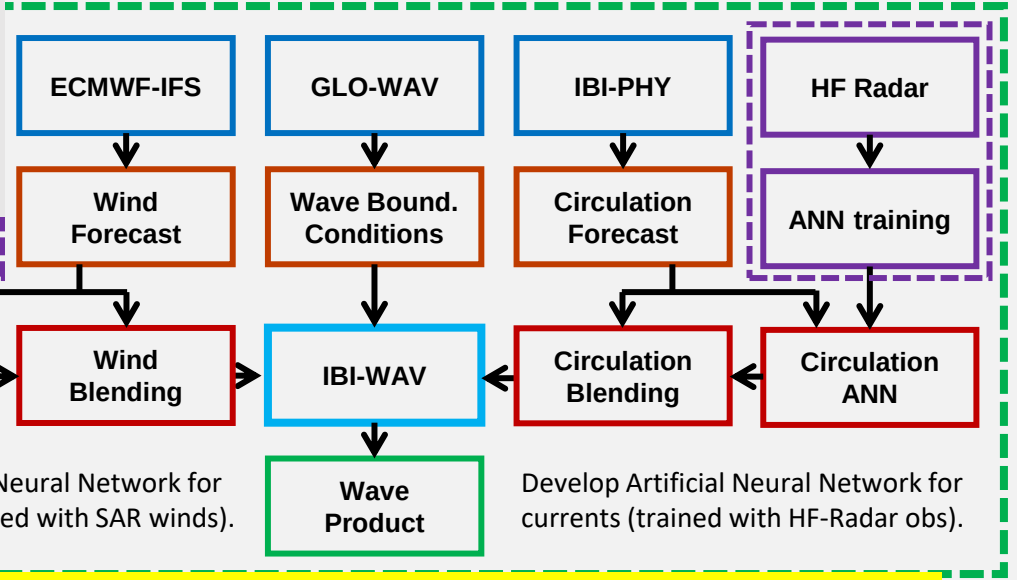

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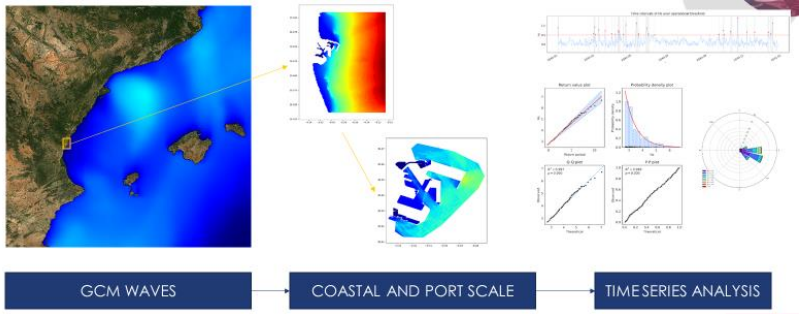
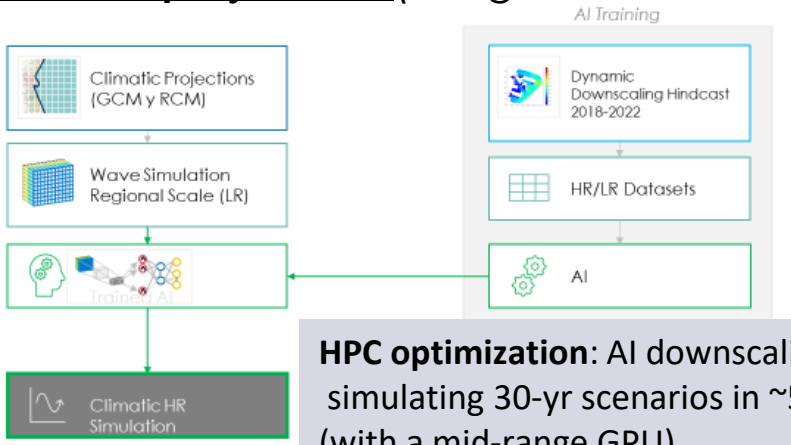


Mar Menor:
Saltwater lagoon
@ SE Spain.

Región de Murcia
Instituto Murciano de Investigación y Desarrollo Agrario y Medioambiental
imida

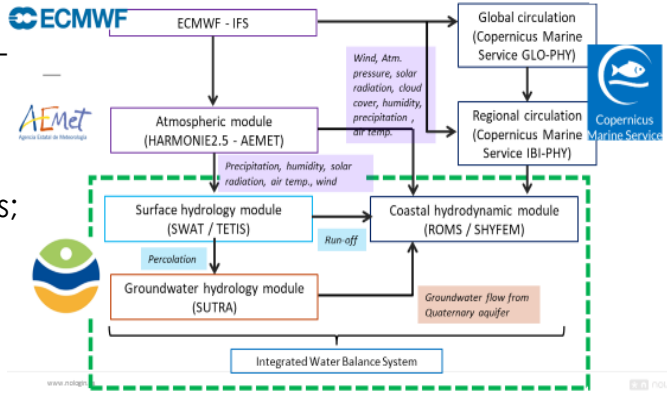
@ECCLIPSE: Deliver at ports ***H-R wave climate projections*** (using **AI-methodology**)



HPC optimization: AI downscaling simulating 30-yr scenarios in ~5' (with a mid-range GPU).

Contributing to ***IMIDA Mar Menor Observatory***.

Ensuring inter-operability of ATM-OCE-HYD (surface & underground waters) models (different providers; univ, companies, Agencies) to build an **Integrated forecast service.**



Building Digital Twin approaches

Nologin building UX interfaces & Added value service tools

OSPAC Operational Services for Ports And Cities

A one-stop shop Service Aggregator

EuroSea

- A new **coastal management product**
- **Integrating observations** and downscaled **forecasts**, to supply operational oceanographic services for ports & cities.
- Improving environmental management and hazard warning
- Driving forward the concept of **smart maritime cities**.

EuroSea Tasks 5.2.x

Demonstrator selected by the ECs Innovation Radar (2022). (TRL7)