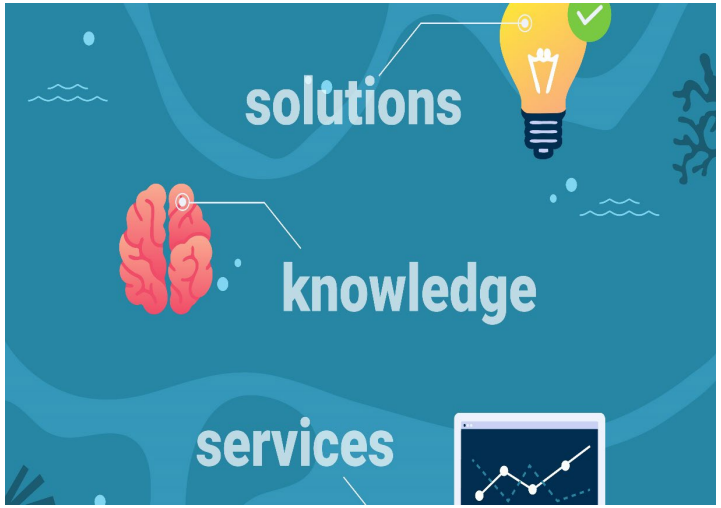
Novedades en la predicción operativa del estado del mar Copernicus Marine IBI MFC

now Systems

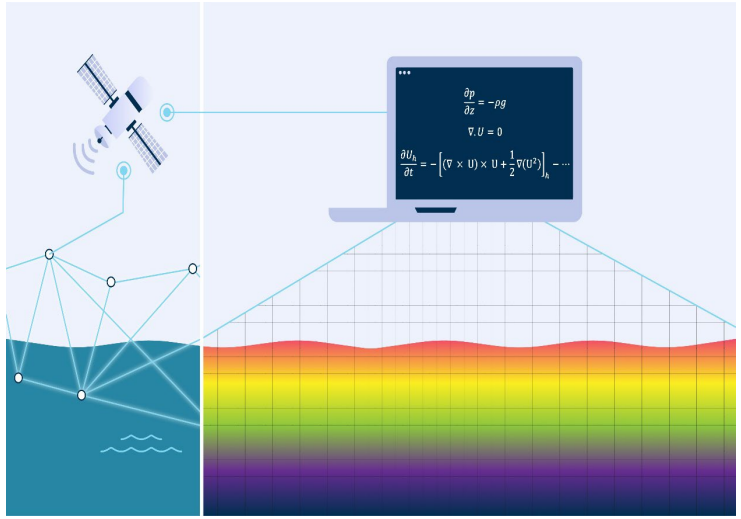
NOW Systems: An Ocean/Coastal Service Provider



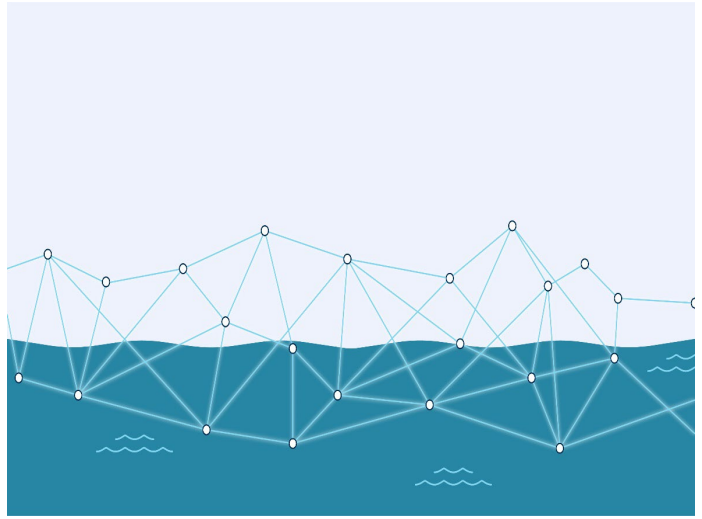
NOW provides solutions, knowledge, and services (continuing Nologin activity for more than a decade)…

for a more sustainable and cost-effective management of activities developed in the marine environment.

We collect near-real-time in-situ and satellite observations, ...



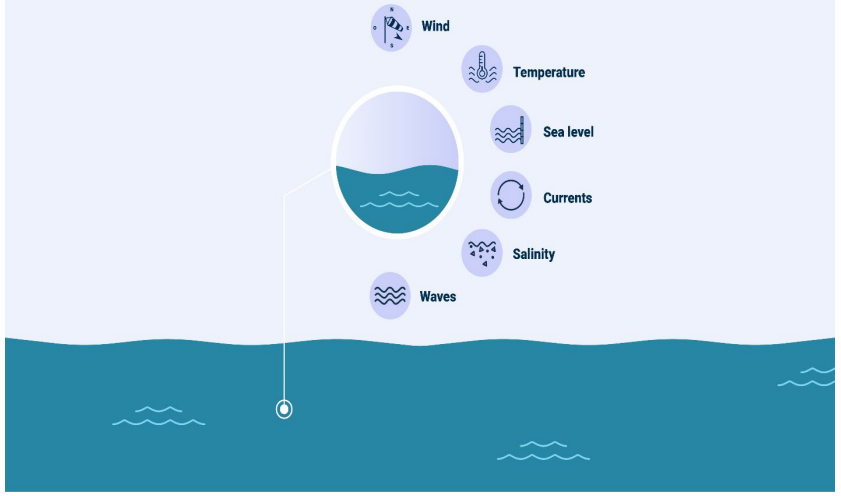
We develop and run state-of-the-art numerical models, …



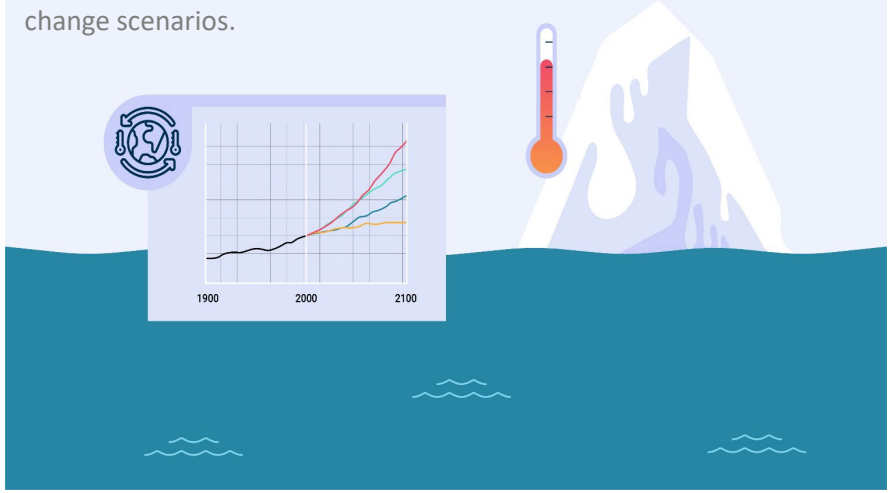
..and we apply combined solutions based on AI

NOW Systems: An Ocean/Coastal Service Provider

to know more about the state of the ocean…

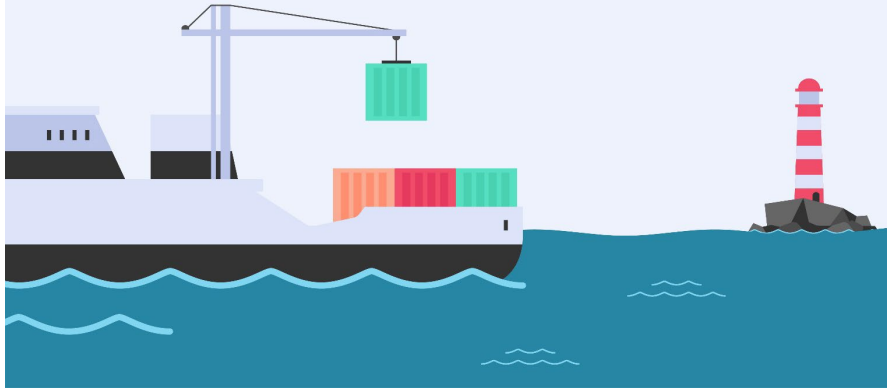


under present and future climate conditions, working with climate change scenarios.



helping our customers in all the operational phases of their maritime activities

NOW Systems: Ocean monitoring and forecasting for decision making



now Systems

The Copernicus Marine Service

Copernicus Marine offers **free and open access** to Ocean Products for Blue/Green/White Ocean
It is a service:

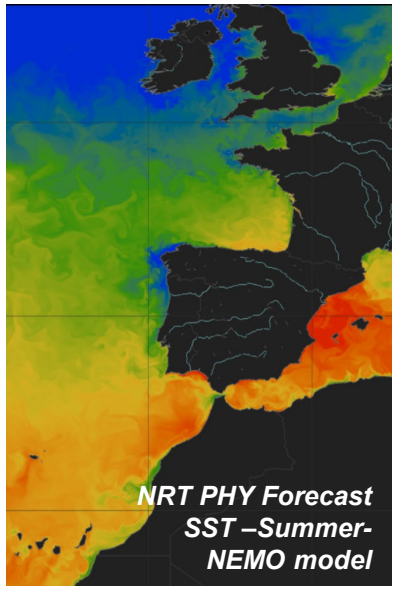
- **user-driven**
- **science-driven**

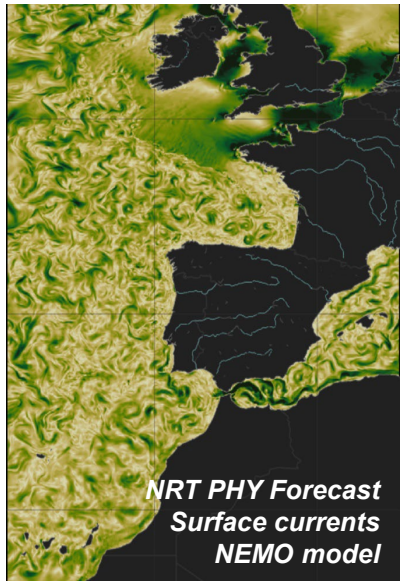
It supports the **transition to sustainable Blue Economy** by

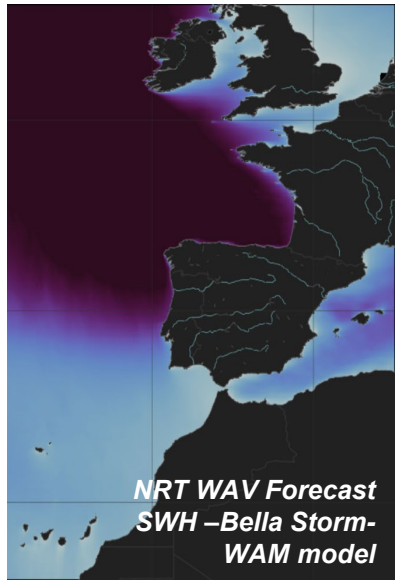
- Supporting collaborative frameworks for the development of new applications
- Promoting existing downstream services

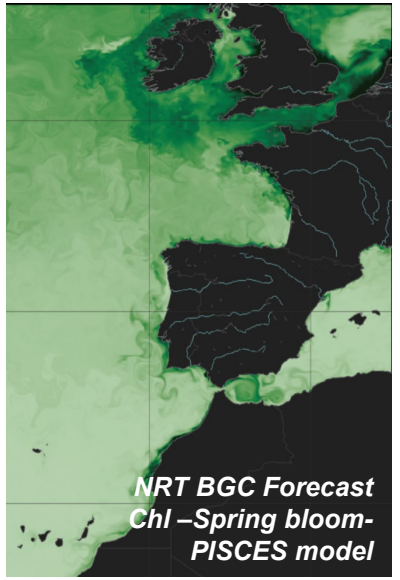
The IBI MFC

- The **IBI Monitoring and Forecasting Centre** provides regional products for the Atlantic European façade.
- Short-term **forecasts, analyses** and **reanalyses** for the **blue (physics and waves)** and **green (biogeochemical)** ocean.
- Using **high resolution models** (& coupling components).
- Integrating observations through **Data Assimilation.**
- IBI **product quality** (reliable science-based) assessment.


NRT PHY Forecast
SST –Summer-
NEMO model


NRT PHY Forecast
Surface currents
NEMO model

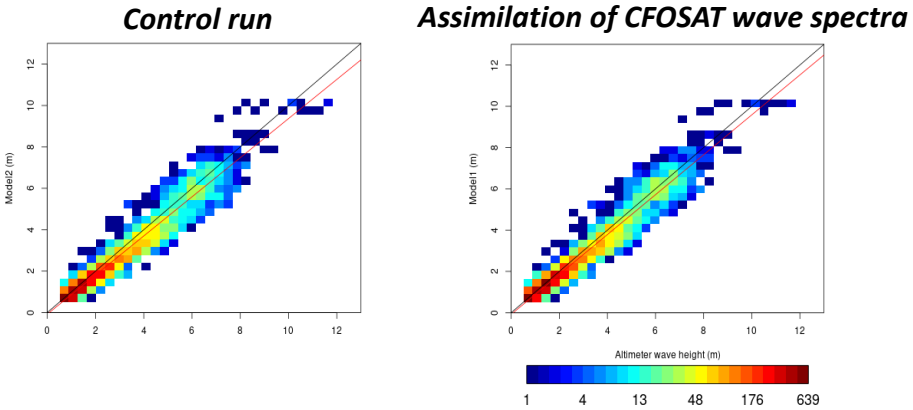

NRT WAV Forecast
SWH –Bella Storm-
WAM model


NRT BGC Forecast
Chl –Spring bloom-
PISCES model

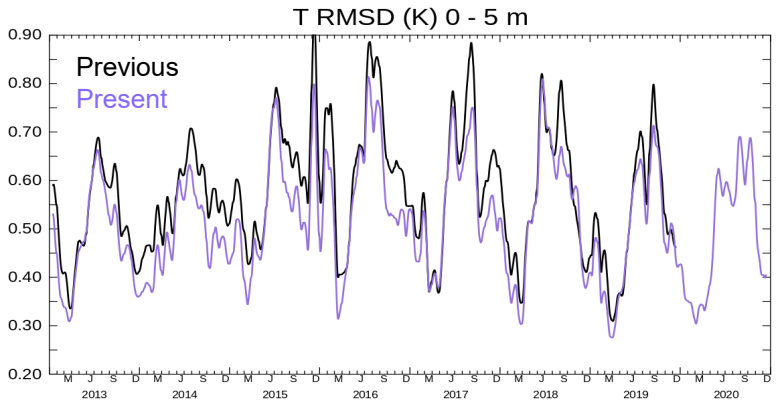
now Systems

The IBI MFC: Major achievements since the beginning of Copernicus 2

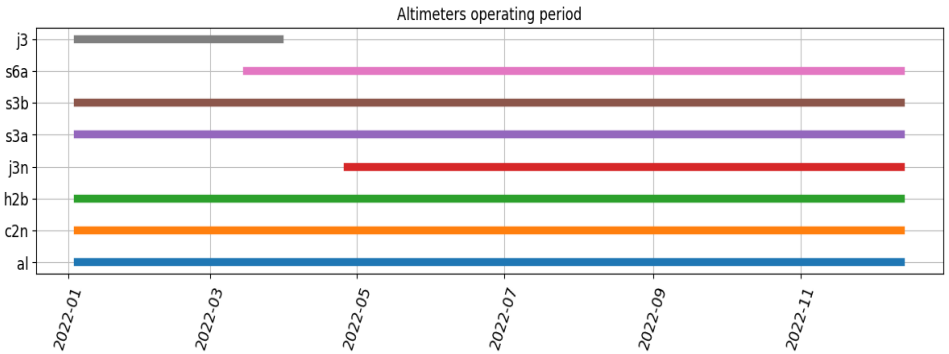
- New Near Real Time physics & waves systems.
  - Improvement of Data Assimilation schemes.
  - Ingestion of more/better observations:
    - Physics: HR Odyssea SST, Sentinel-6A & HaiYang-2B.
    - Waves: New CFOSAT wave spectra.
  - New highest wave variables.
- New Multi Year Wave reanalysis @ 1/36º



Scatter plots of SWH vs. independent altimeters during January 2020.



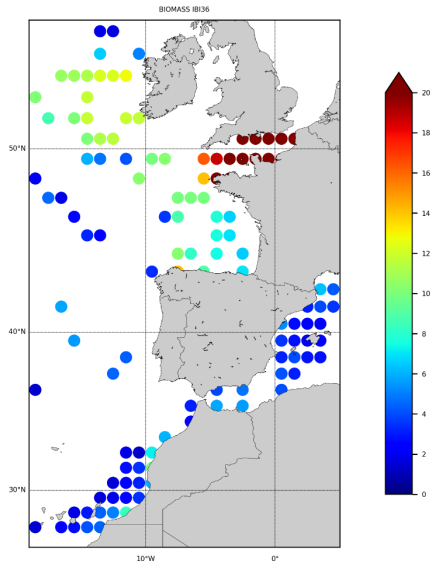
0-5m Temperature Errors (RMSD) for current and previous NRT IBI PHY system.



Altimeters assimilated in IBI-PHY along 2022

The IBI MFC: Major achievements since the beginning of Copernicus 2

- Improvement of NRT IBI biogeochemistry operational service scenario: delivering a best estimate from an IBI BGC hindcast run coupled to IBI physics best analysis.
- Upgrade of products: Delivery of new zooplankton variable & delivery of climatologies (1993-2016 period) for all IBI Multi Year (physics, waves & biogeochemistry) products.



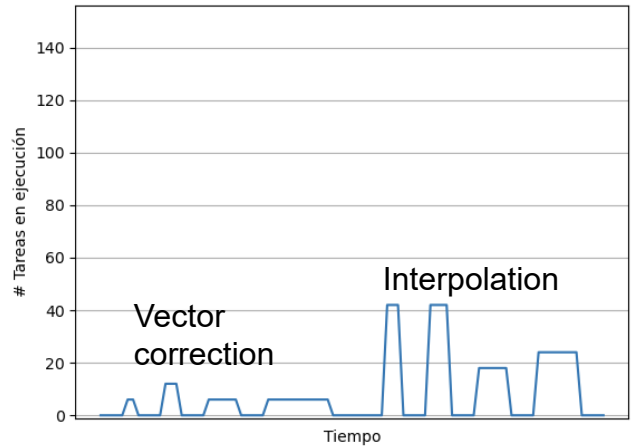
Mean distribution of meso-zooplankton biomass (µg C / L) for IBI36 over the period 2013-2019 (all depth intervals and months are averaged).

The IBI MFC: Major achievements since the beginning of Copernicus 2

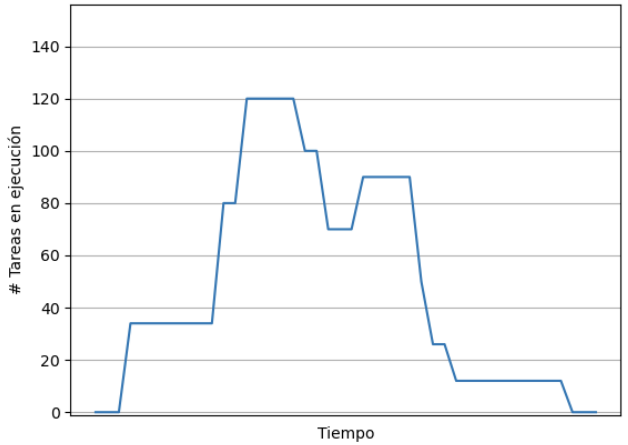
- New operational production for North-West-Shelf region: Delivery of new products derived from IBI native system. Implementation of whole new operational suites.

- Continuous enhancement & bug corrections of operational chains.
  - Migration to specific LUSTRE filesystems in North-West-Shelf chains: postprocessing tasks reduced from 80 min to 30 min.
  - Implementation of LINDA processes sync/communication model in North-West-Shelf chain. Better use of resources. Time decreased by 50%.

Current sequential postprocessing procedure

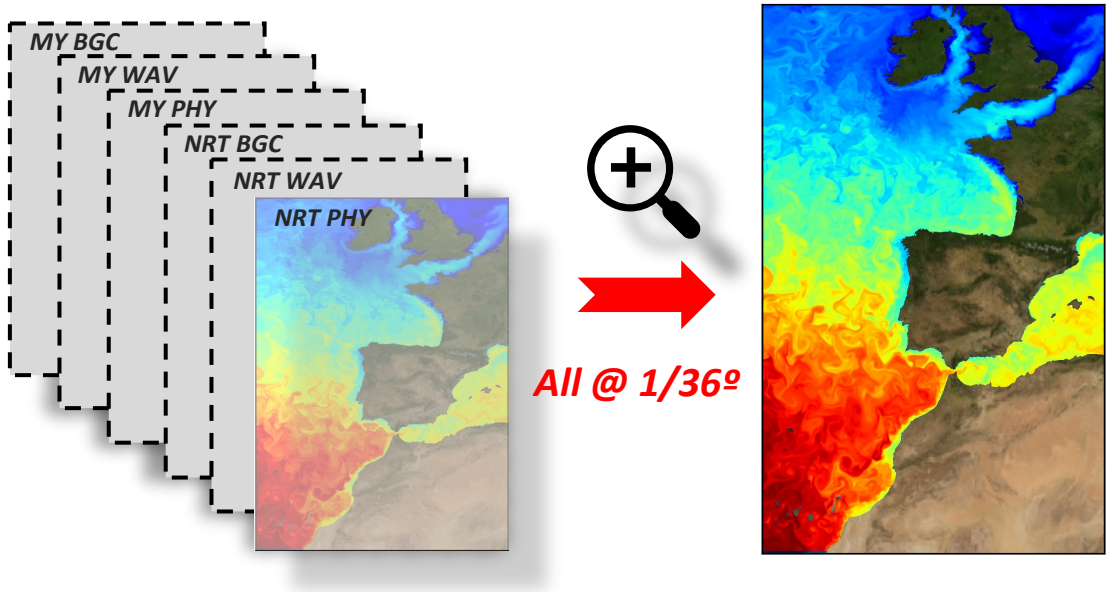


With LINDA

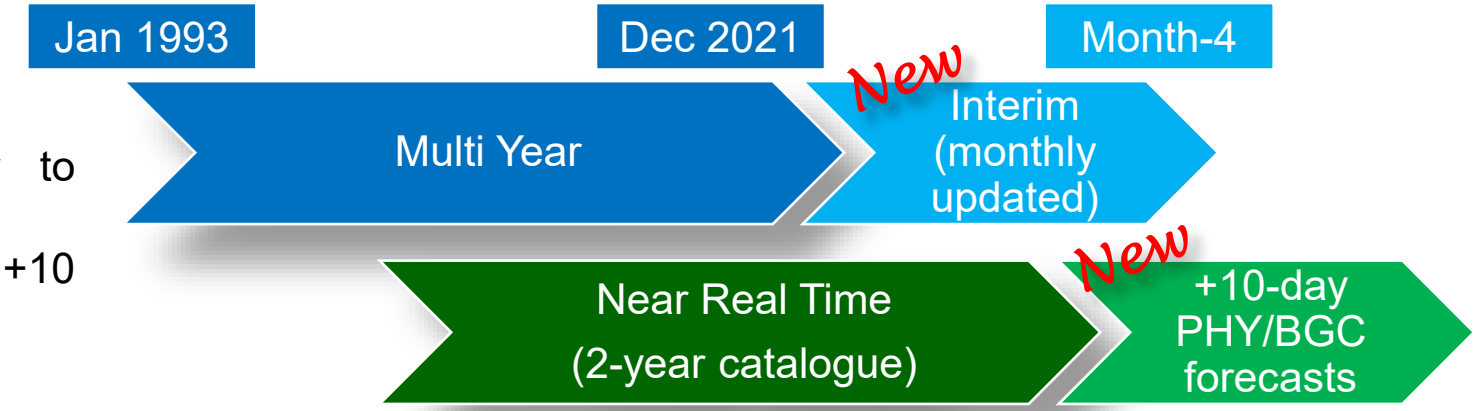


The IBI MFC: Major evolutions planned by the end of 2024

- Major IBI-MFC goal: Enhancement of IBI products homogeneity.
  - Delivery of all IBI products (Near Real Time forecasts and Multi-Year reanalyses) in a common single grid @ 1/36º (~3km).
  - Significant resolution increase in Multi-Year physics (x3), biogeochemistry (x3) and wave products (x2).



- Ensuring of service continuity.
  - Multi-Year products updated closer to present time: new Interim datasets.
  - Near Real Time Physics forecast up to +10 days.

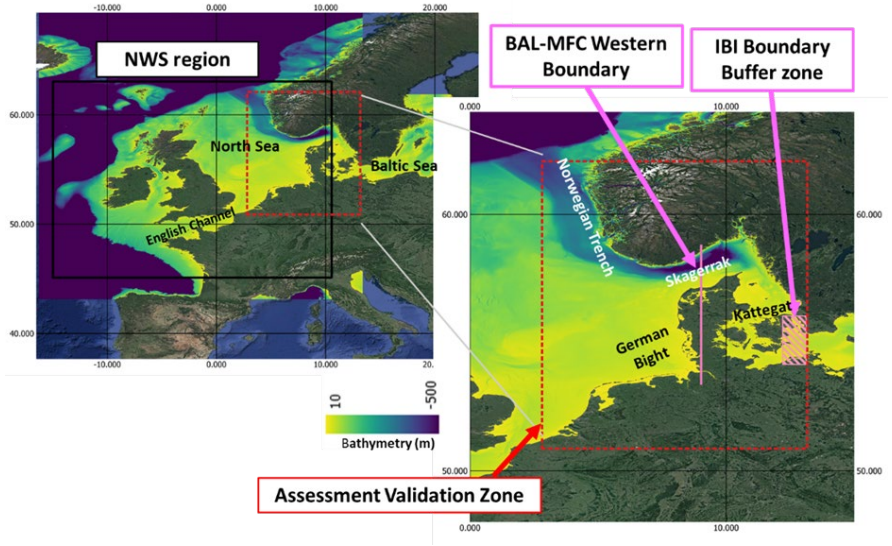


now Systems

The IBI MFC: Major evolutions planned by the end of 2024

- New physics vertical velocities variable.
- New biogeochemical light attenuation variable.
- New Mean Sea Level variable detided with Doodson filter methodology.
- Extension of wave reanalysis back to 1980.
- Delivery of air-sea fluxes for Multi-Year products.

- North-West-Shelf R&D: sensitivity studies to nest into BAL MFC solution in north-eastern boundary (instead of GLO MFC solution).



- Continuous enhancement & bug corrections of operational chains:
  - Implementation of ecFlow workflow manager.
  - Migration to specific LUSTRE filesystems in IBI chains.
  - Application of LINDA processes sync/communication model in IBI chains.
- Improved product quality assessment with optimized validation modules and new metrics.

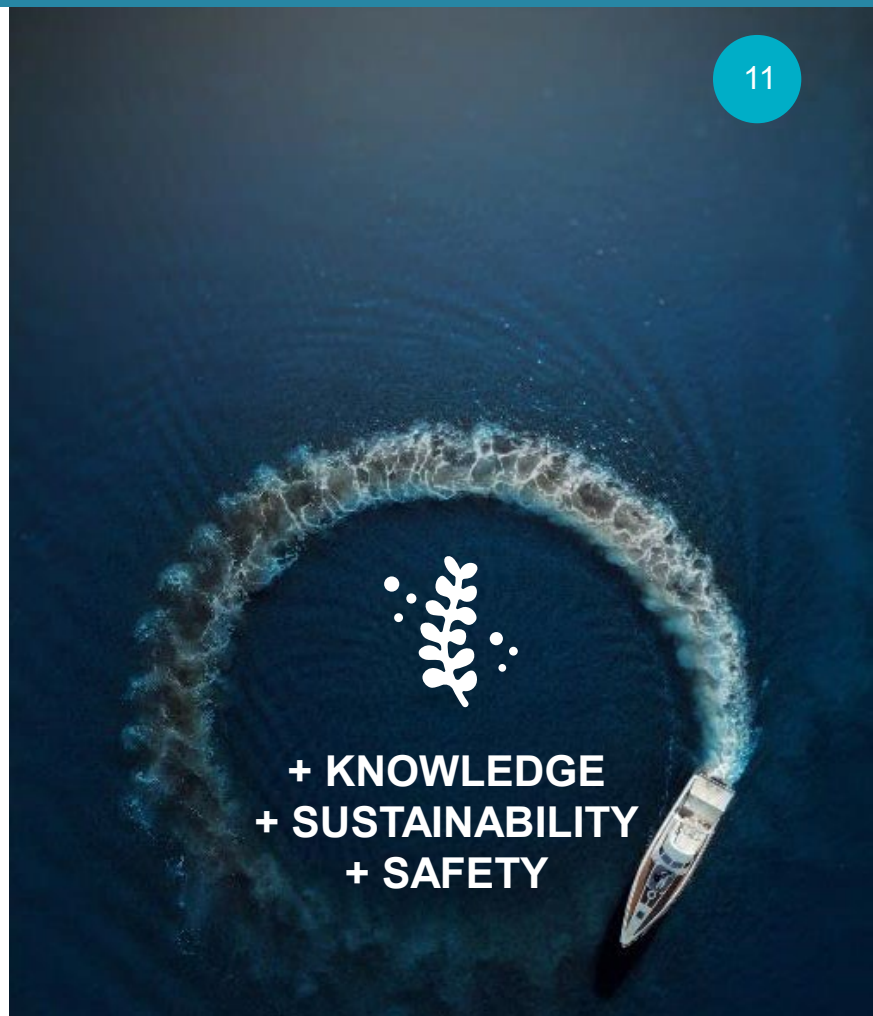
COLLABORATION NOW + CESGA:

- **Maintain** Oceanographic Operational Services within an HPC environment, working in the fine tunning and optimization in collaboration with CESGA
- **Development** of Sustainable Coastal Operational Services (in a DTO context) to support all blue economy related activities.

Beach status and water quality monitoring.
Sustainable tourism.

Aquaculture exploitation

Management of **Protected marine areas.**



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COASTAL SERVICES MANAGER

now Systems