eosc | Blue-Cloud2026

Overview of Blue-Cloud 2026 Virtual Labs & Workbenches

Presented by Cyrielle Delvenne (VLIZ) & Marine Vernet (IFREMER)

5-6 November 2025, Brussels [Belgium]

Funded by the European Union

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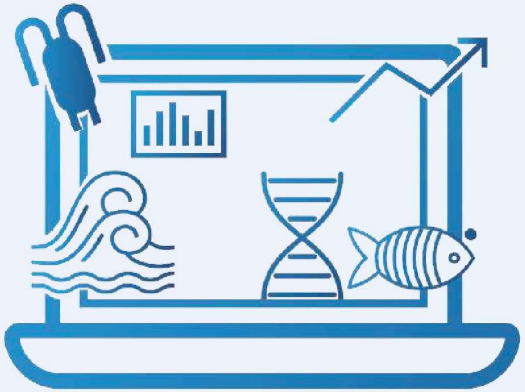
Blue-Cloud 2026 Virtual Labs

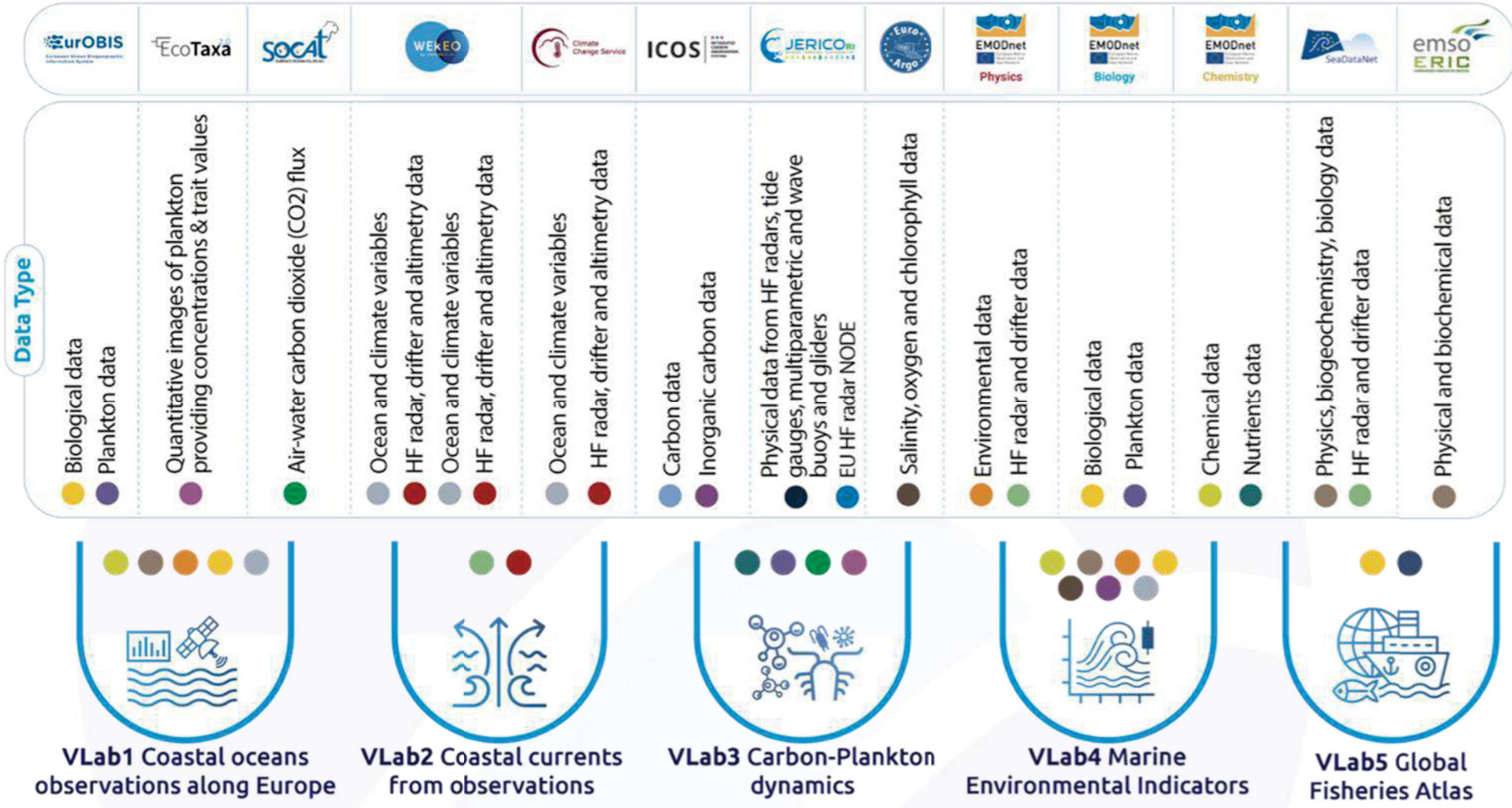


https://blue-cloud.org/virtual-labs

Funded by the European Union

Virtual Labs data types

Blue Data Infrastructures



Coastal Ocean observations along Europe

Integration of European coastal observations in 3 thematic services: **Transboundary Processes and Connectivity**, Extreme Events & Ocean Glider

hidrográfico marinha · portugal

SOCIB Balearic Islands Coastal Observing and Forecasting System

IEEE Advancing Technology for Humanity

JERICO RESEARCH INFRASTRUCTURE

- HF Radar Currents
- Current Profile in MP Buoys
- T in Wave Buoys
- T,S in MP Buoys
- T,S Glider profiles
- SSH at coastal tide gauges

Copernicus Marine Service

- SST fields
- NEMO 3D T,S, SSH, Current
- ERA5 Surface Meteo Params

SeaDataNet

- Physics, BGC, Biology

EMODnet CENTRAL PORTAL

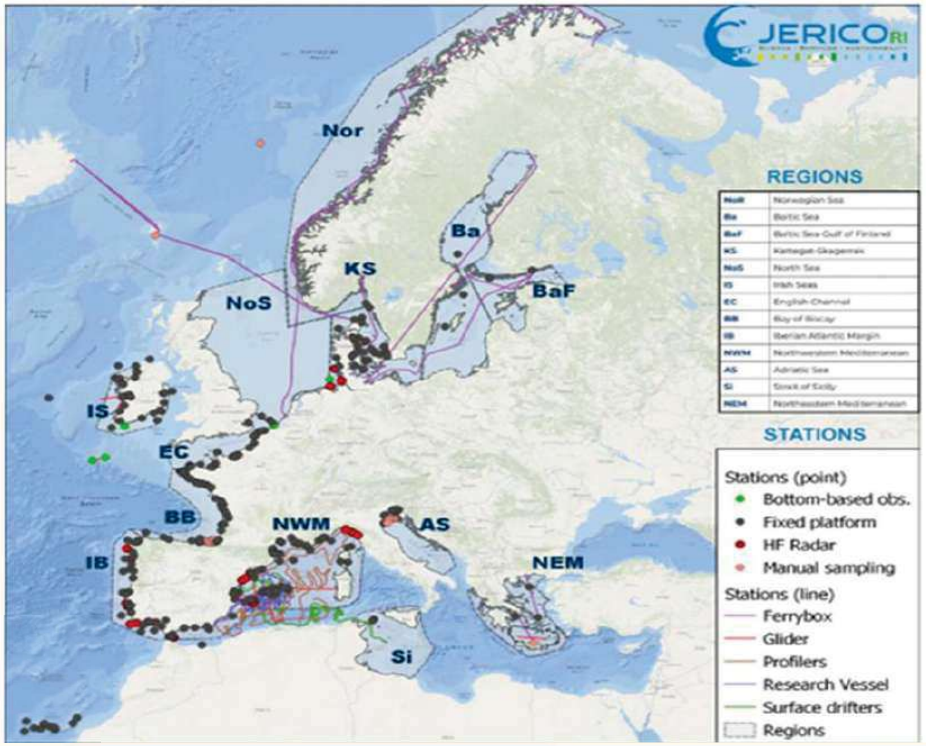
- Physics, Chemistry, Biology, Bathymetry

GEBCO

- Bathymetry

NETCDF

Shiny



Coastal currents from observations

Integration of direct and indirect currents data from different sources, and application to run an oil spill model

Copernicus Marine Service

In Situ - Global Ocean-Delayed Mode Observations of surface (drifters, HFR) and satellite altimetry

EMODnet

GEBCO

Bathymetry

OpenStreetMap

Coastline

ECMWF

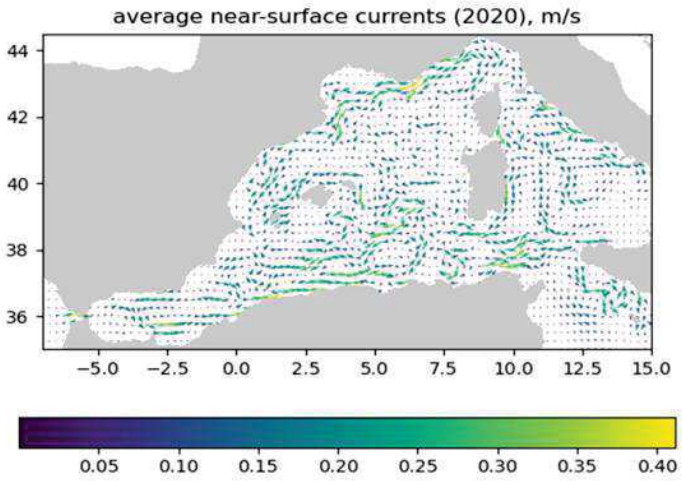
Wind speed

Jupyter notebooks

DIVAnd analysis

Gridded surface currents

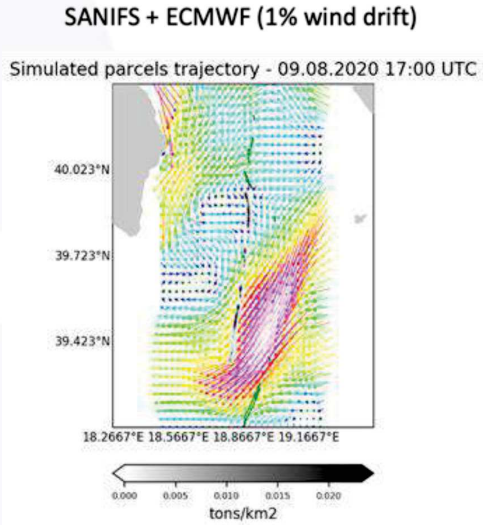
Initialise the oil spill forecasting model (MEDSLIK-II)



jupyter

julia

NETCDF

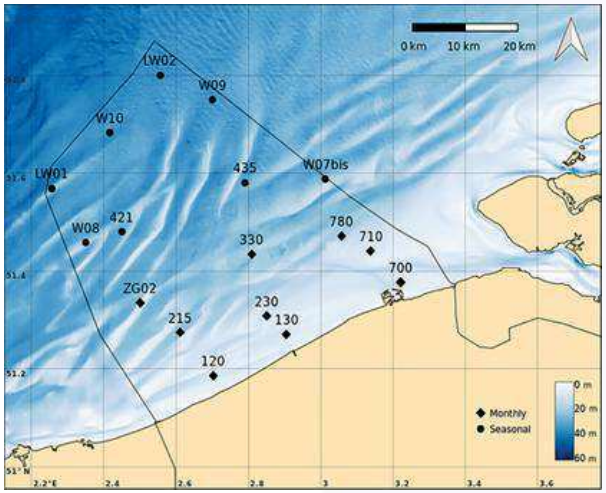


Carbon-Plankton Dynamics

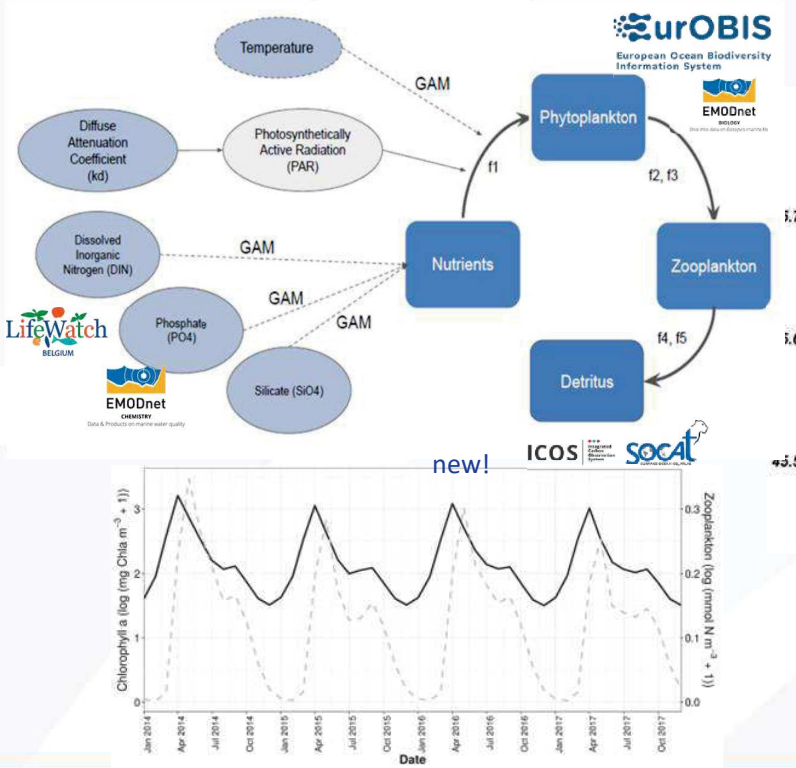
Nutrient-Phytoplankton-Zooplankton-Detritus (NPZD) Model, i.e. a mechanistic model, to identify the contribution of the drivers in phytoplankton dynamics and carbon dynamics.

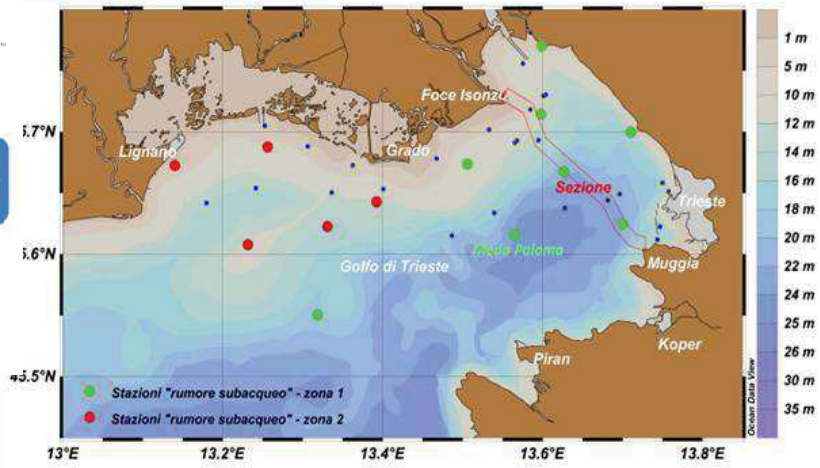
Seasonal and monthly records from 2011-2022

Train and validate the NPZD model for the Adriatic



Mortelmans et al. (2019)





ogs.it

Marine Environmental Indicators

Web app for cloud computation of new added-value data to monitor the environmental status of marine areas.

SERVICES

- Marine Environmental indicator (MEI) generator
- Ocean patterns and ocean regimes indicators
- Storm severity index
- Easy access to carbon data
- Ocean heat content
- Enhance Storm Severity Index (SSI v2)

new!

- Trophic Index (TRIX)
- Marine heat wave

Copernicus Marine Service

WEkEO

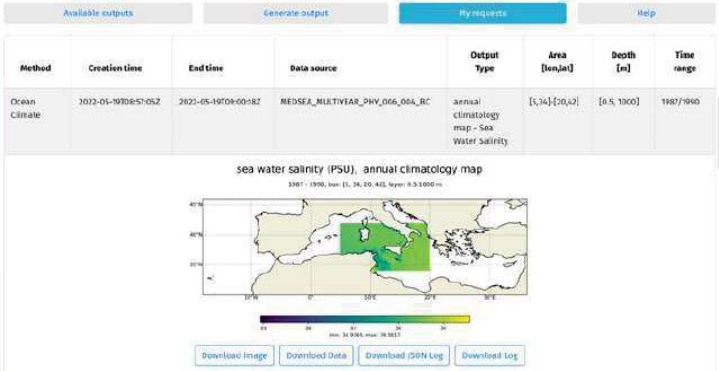
EMODnet CHEMISTRY

Data & Products on marine water quality

- Temperature and salinity Historical Data
- Mediterranean Sea Physics Reanalysis
- Global Ocean Physics Reanalysis
- Wind speed
- Wind (ERA5) reanalysis
- Global in-situ observation
- Other environmental variables

jupyter

Cloud Computing Platform (CCP)



Global Fisheries Atlas

Discovery & Access of Global Record of Stocks and Fisheries, and Fisheries Atlas datasets

GRSF Catalog
(Knowledge level)

Fetch
Transform

RDF Format

GRSF staging KB

Data curation & validation

GRSF
KB & Catalogue

ckan

Data processing: records cleaning, standardization, dissection & merging

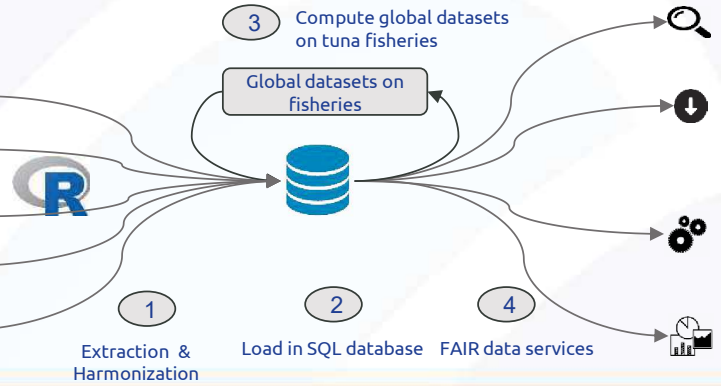
new!

Workflows
merging

Fisheries Atlas
(data level)

(*eg* Tuna) RFMOs

IOTC
ICCAT
IATTC
WCPFC
CCSBT



Discover available data
What datasets exist?
How they were built?

Access the data and code
Different protocols and formats ?

Process the data
How to customize a fisheries atlas?

Visualize the data
How to easily create maps, plots?

GeoNetwork
GeoServer
zenodo
GitHub
RStudio
doi
OpenLayers
Shiny

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Blue-Cloud 2026 EOV Workbenches

https://blue-cloud.org/workbenches-essential-ocean-variables-eovs

Funded by the European Union

Blue-Cloud2026 EOV Workbenches

Cloud-based, analytical pipelines Leveraging EOSC Node Generic Capabilities

To produce highly qualified datasets for chosen Essential Ocean Variables & Essential Biodiversity Variables

From various major ocean research infrastructure data collections

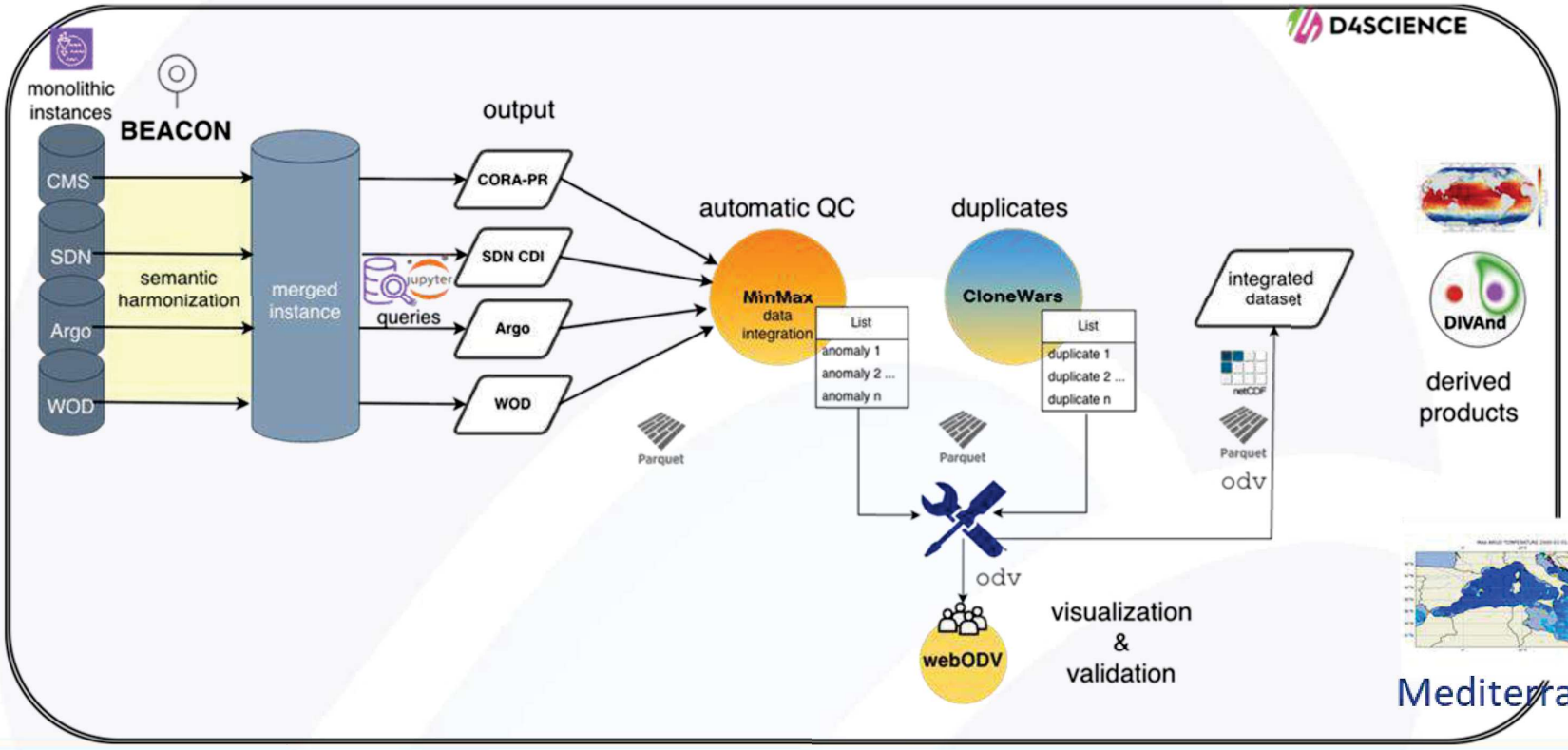
physical workbench for temperature, salinity

chemical workbench, linked to eutrophication: nutrients, chlorophyll, oxygen

ecosystem workbench for plankton biomass and diversity

Blue-Cloud2026 EOV Workbenches

Physical Workbench for Temperature & Salinity EOV



Copernicus Marine Service

SeaDataNet

Euro-Argo

NOAA WOD

BDI

hcmr

ISTITUTO NAZIONALE DI GEOFISICA E VULCANOLOGIA

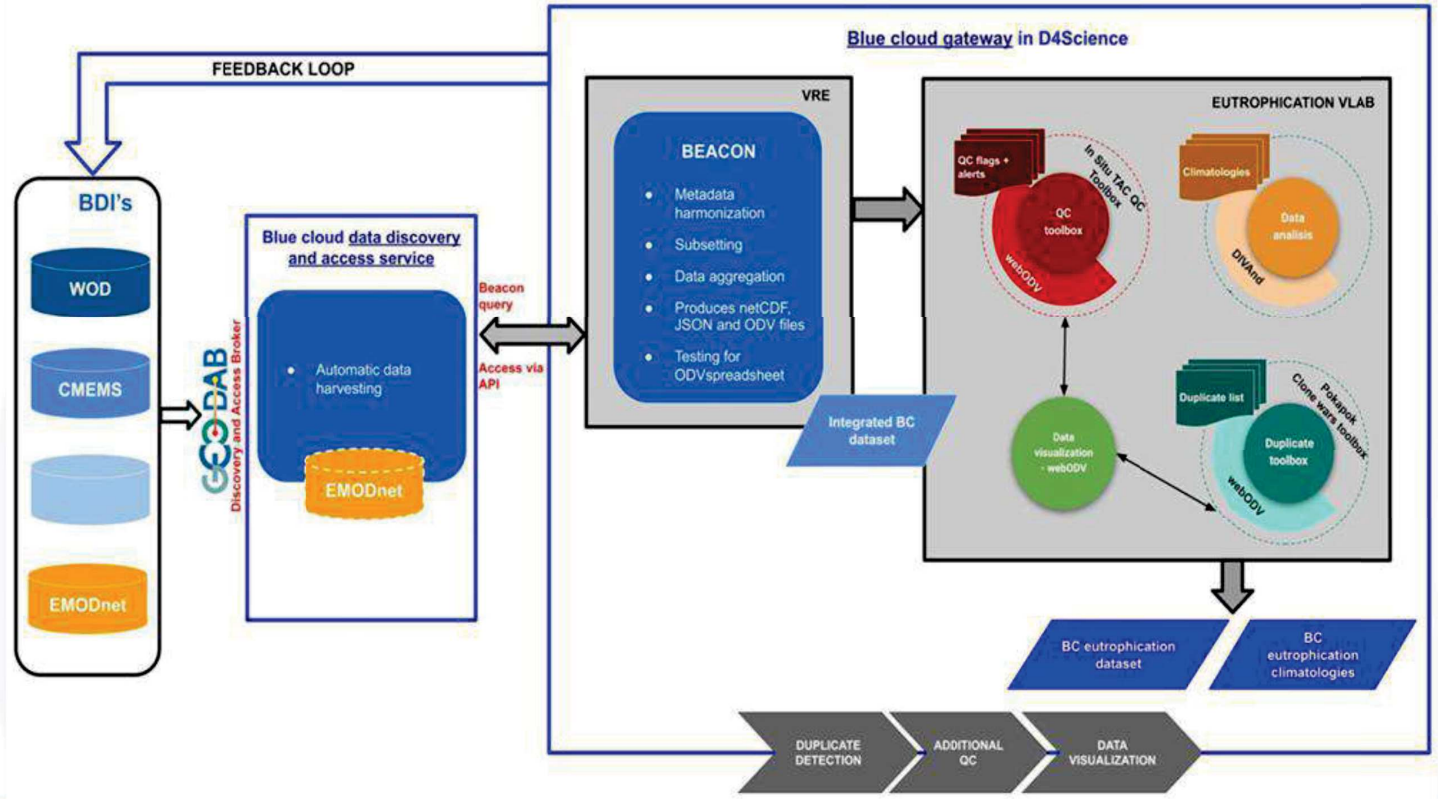
POKaPOK

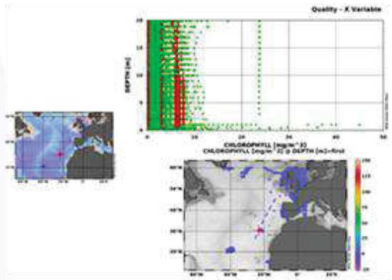
Ifremer

OCEANSCOPE

Blue-Cloud2026 EOV Workbenches

Eutrophication Workbench for nutrients, oxygen and chlorophyll EOV





North East Atlantic

WOD

Copernicus Marine Service

EMODnet CHEMISTRY
Data & Products on marine water quality

BDI

POKaPOK

OGS Istituto Nazionale di Oceanografia e di Geofisica Sperimentale

Ifremer

SMHI

Blue-Cloud2026 EOV Workbenches

Ecosystem Workbench for plankton diversity & biomass EOV & EBV

ETH zürich

SORBONNE UNIVERSITÉ

EMBL

OBIS OCEAN BIODIVERSITY INFORMATION SYSTEM

GBIF Global Biodiversity Information Facility

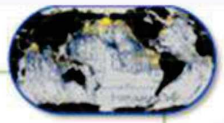
AtlantECO Atlantic Ecosystems Assessment, Forecasting & Sustainability

MGnify

EcoTaxa 2.0

BDI

Plankton data



EurOBIS European Ocean Biodiversity Information System

GBIF

AtlantECO

EcoTaxa 2.0

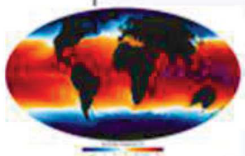
MGnify

Global Environmental data

Temperature, O_2, Chlorophyl, Alkalinity, EKE, HCO_3, PAR, DIC, ...

Copernicus Marine Service

NOAA



Input

Input

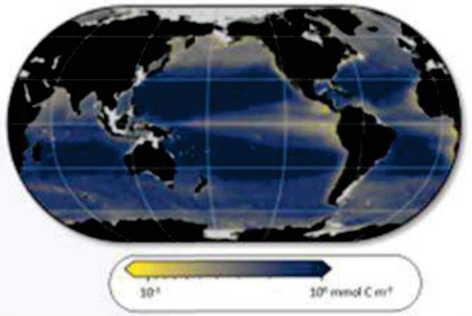
Ecosystem Workbench

EPHALOPOD

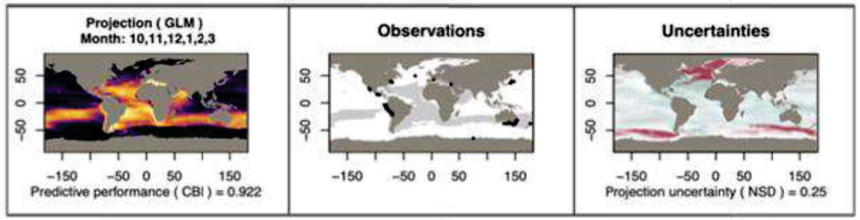
Species distribution modelling pipeline

- Comprehensive suite of methods: (GLM, GAM, SVM, MLP, RF, BRT, MBTR)
- Quality checks, uncertainty estimation

Output



Global plankton EOVs and EBVs
(NetCDF files & Summary PDF)



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Any questions?
5-6 November 2025, Brussels [Belgium]
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Eutrophication: chlorophyll, nutrients, oxygen

Nydia Catalina Reyes Suarez (OGS)

5-6 November 2025, Brussels [Belgium]

Funded by the European Union

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Essential Ocean Variables Workbench: Eutrophication

Partners: OGS (lead), Ifremer, HCMR, SMHI & Pokapok.

Blue cloud 2026 General Assembly

5-7 Nov 2025

Funded by the European Union

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Marine Environmental Indicators

Francesco Palermo (CMCC)

5-6 November 2025, Brussels [Belgium]

Funded by the European Union

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Physics: temperature & salinity

Simona Simoncelli (INGV)

5-6 November 2025, Brussels [Belgium]

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EOV Workbench for Physics

Simona Simoncelli

INGV

simona.simoncelli@ingv.it
ORCID 0000-0003-1283-2798

and the **PWB team**

Ifremer POKaPOK OCEANSCOPE hcmr ΕΛΚΕΘΕ

MARIS National Oceanography Centre British Oceanographic Data Centre AWI ALFRED WEGENER INSTITUT

Funded by the European Union

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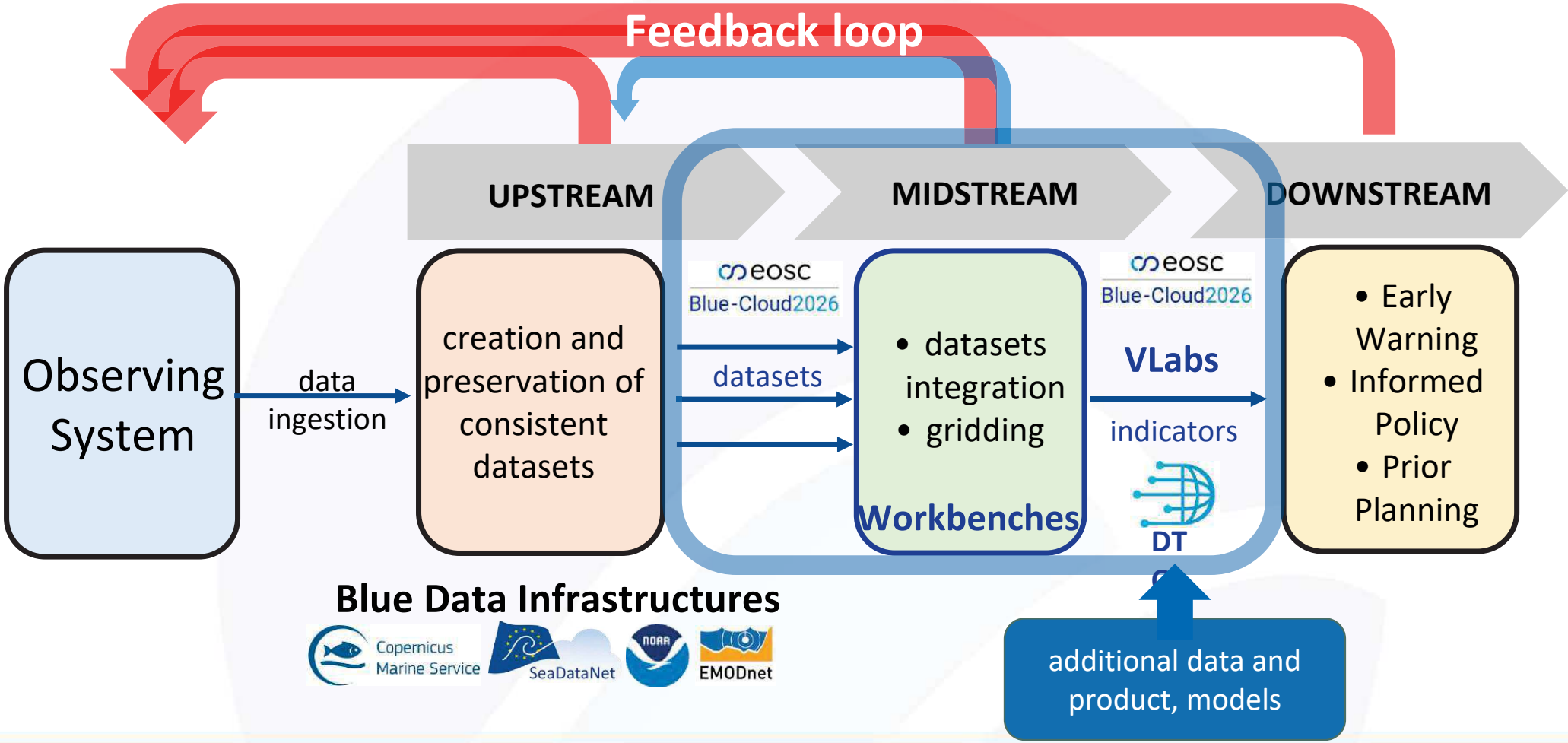
Speeding up the data value chain



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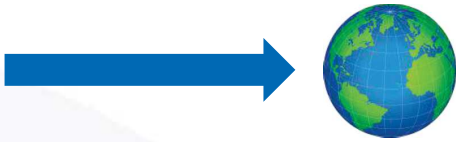
WORKBENCH Design



Data Discovery & Access Service

WOD

Copernicus Marine Service

EMODnet

SeaDataNet

Euro Argo

metadata

dataset 1

metadata

dataset 2

metadata

dataset n

data lake

Interactive data exploration & visualization

webODV

Virtual Research Environment

added value EOVs datasets

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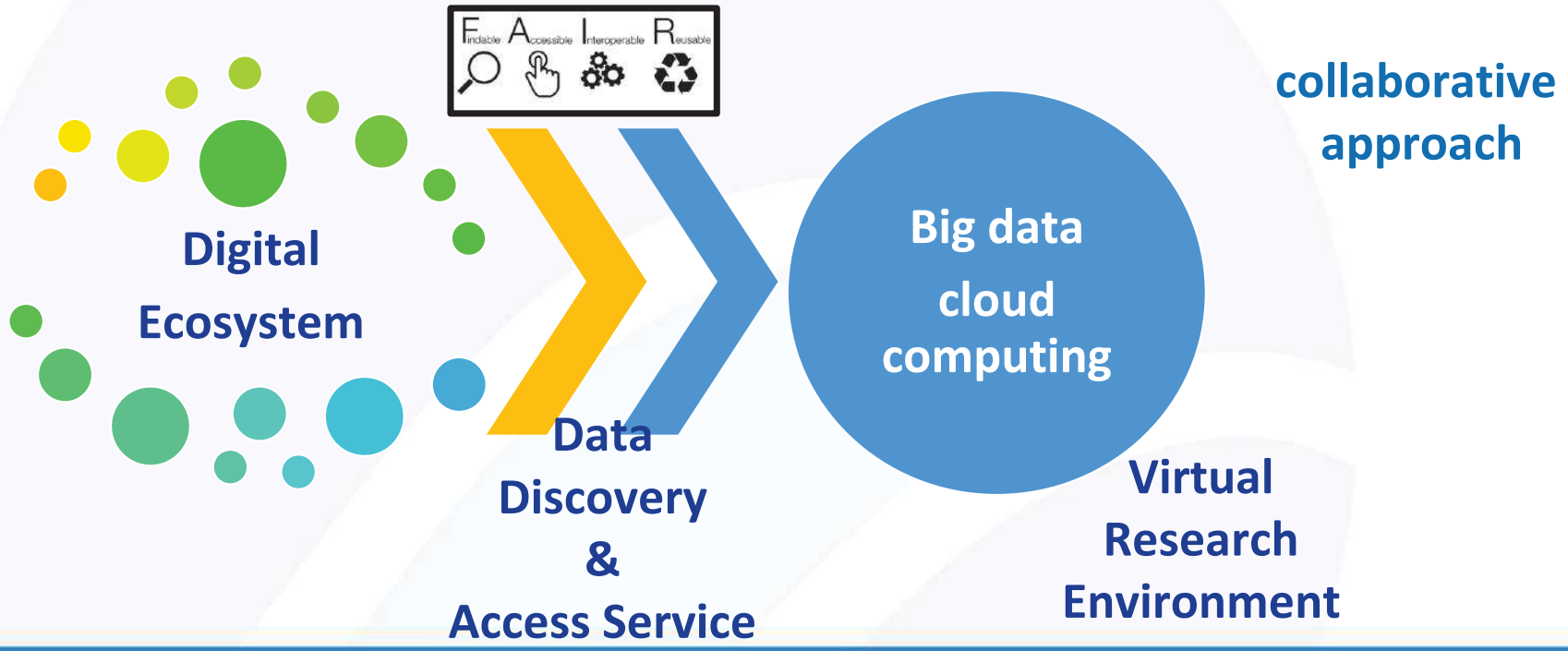
Cloud-based Workflow

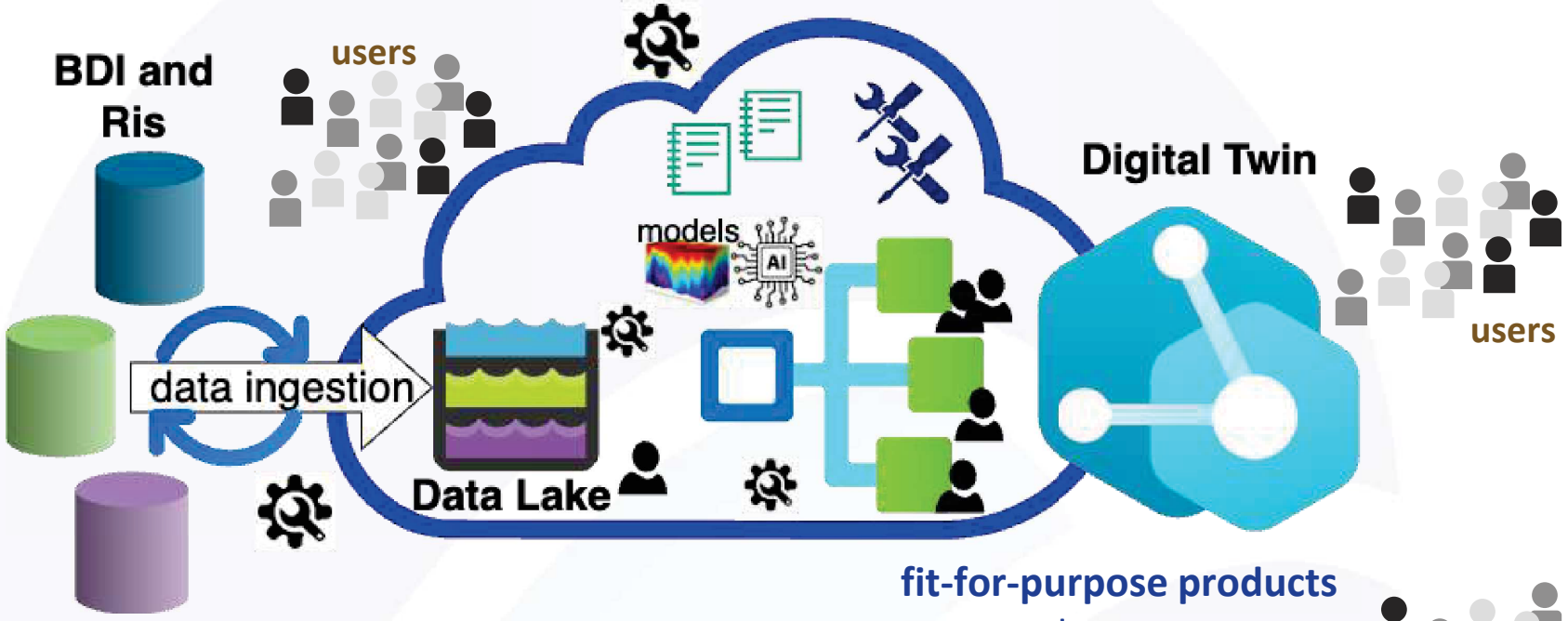
Deployment and orchestration of analytical tools on a Virtual Research Environment

- **automation** increases efficiency and replicability, optimizing the the results
- **FAIR principles** and **advanced services** for data access, web apps for software development and interactive computing



Digital Twin

Innovative applications can be built thanks to cloud-based environments implementing operational workflows and exploiting data lake solutions



ARCO format conversion

performant data access and sub-setting capabilities

fit-for-purpose products

datasets

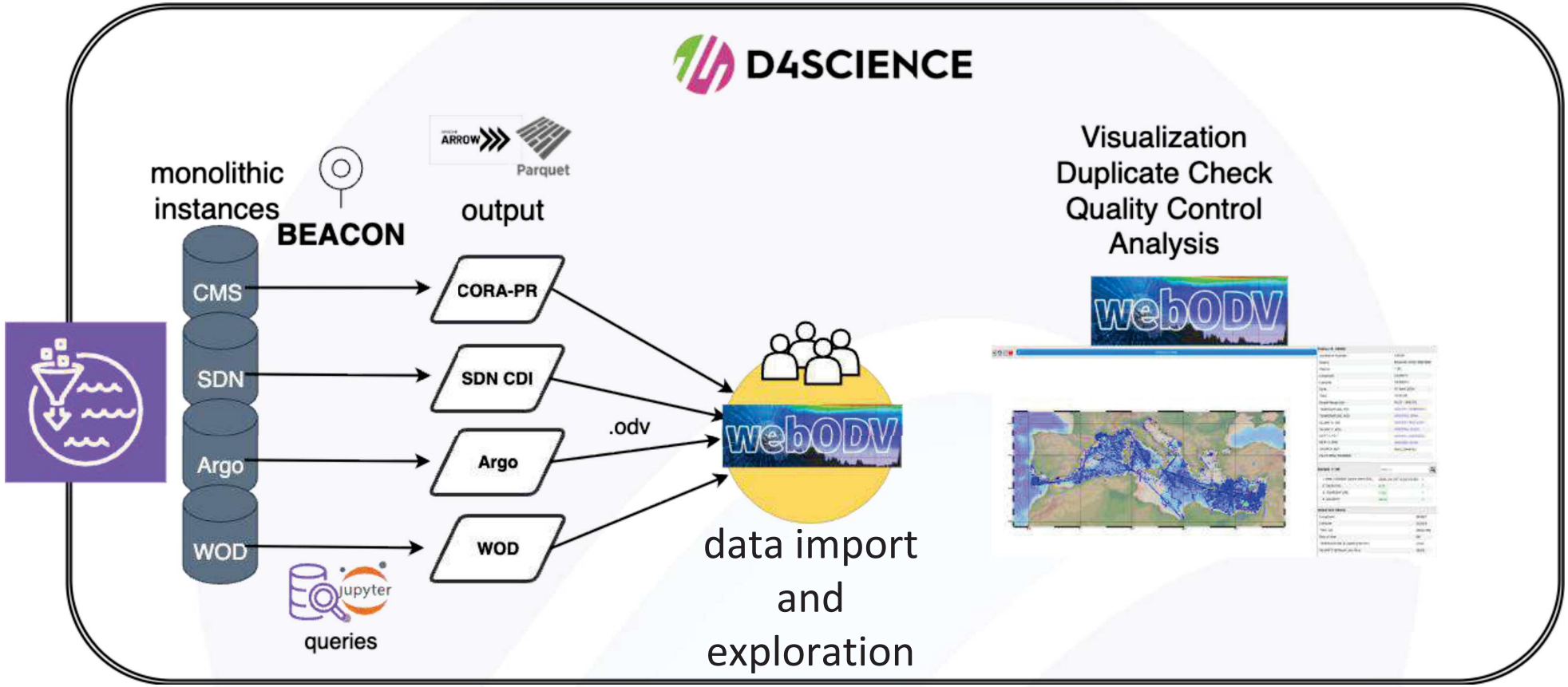
model outputs

what if scenarios

users

Physic Workbench: Hackathon 2025

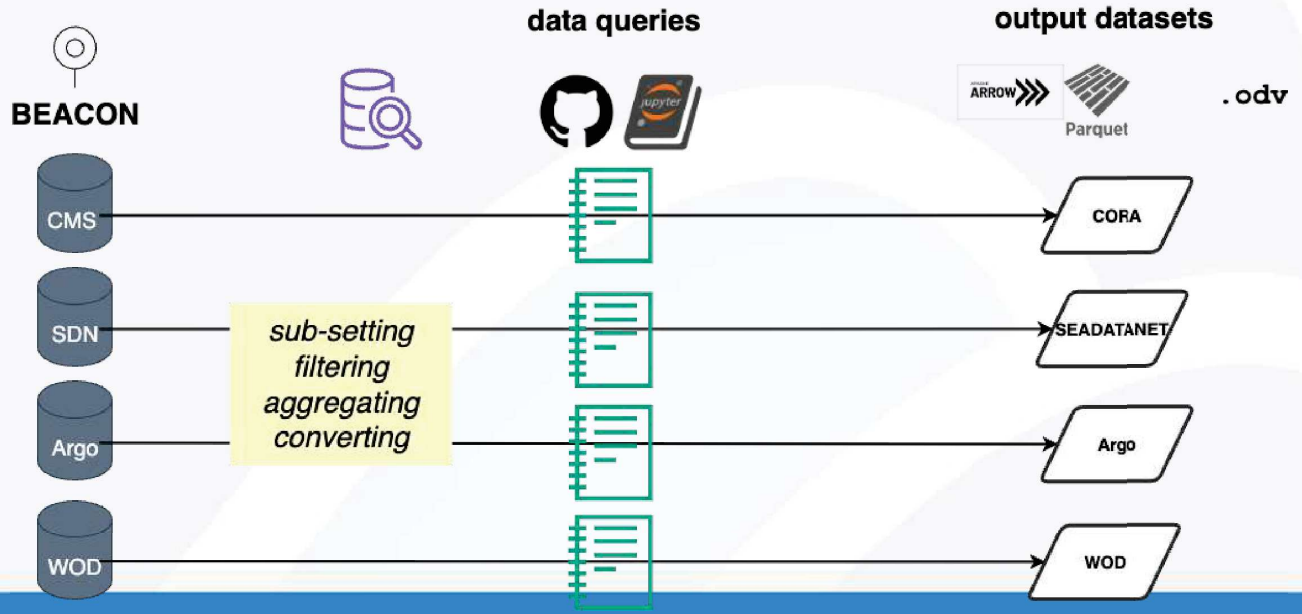
Beacon monolithic instances have been tested and Jupyter notebooks to query them have been set up



Physic Workbench: Hackathon 2025

Retrieval of ready to use datasets for scientific applications

- **notebooks for the rapid/easy access to 4 data sources: Argo, World Ocean Database, SeaDataNet, Copernicus CORA**
- blending the data experts knowledge with code optimization by the software developers
- the notebooks are managed through github and soon published

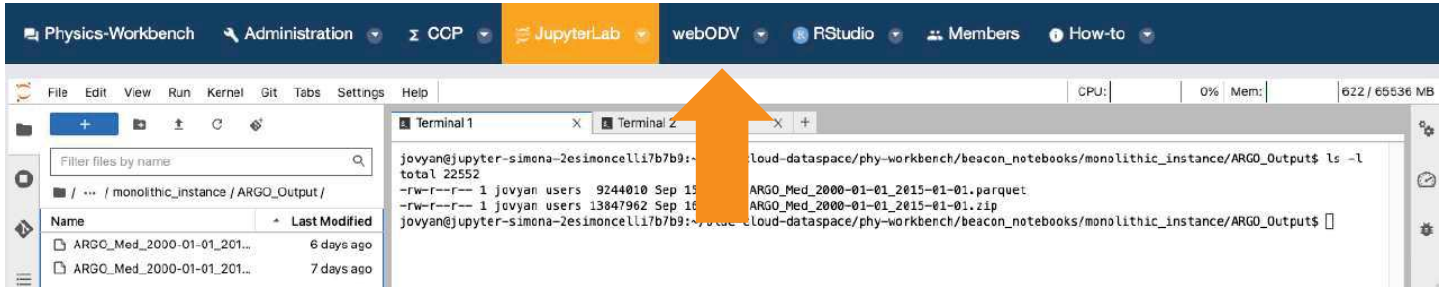


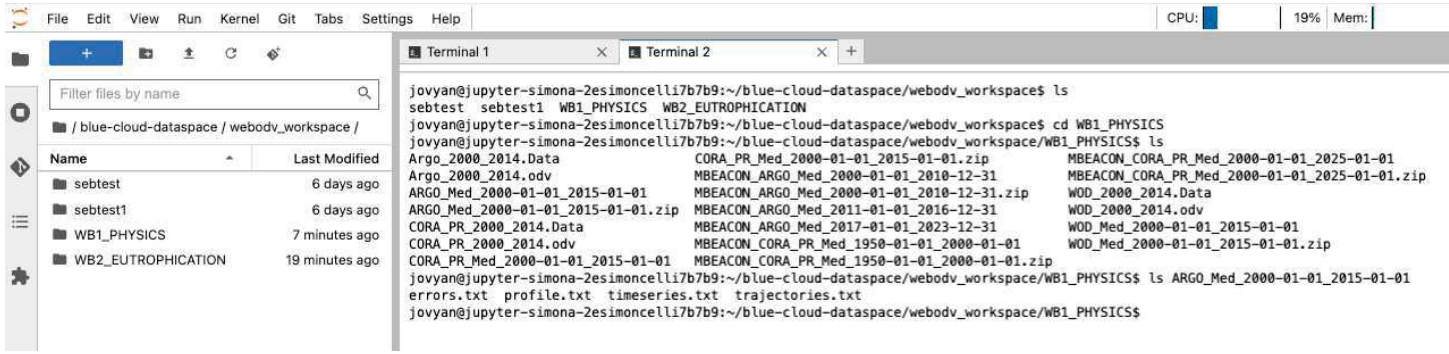
EXAMPLE

Retrieve Argo T and S values in the Mediterranean Sea between 0-150m in the time period 2000-2014, filtering only GOOD data and obtain an output.zip (odv spreadsheet format) file

- diagnostics available in the notebook
- copy output.zip in webODV_workspace
- unzip
- launch webODV and import the profile.txt file

.parquet, .nc, .arrow,. pandas, .geopandas, .zarr, .geoparquet, .odv, .csv formats are also available options to speed up you workflow!





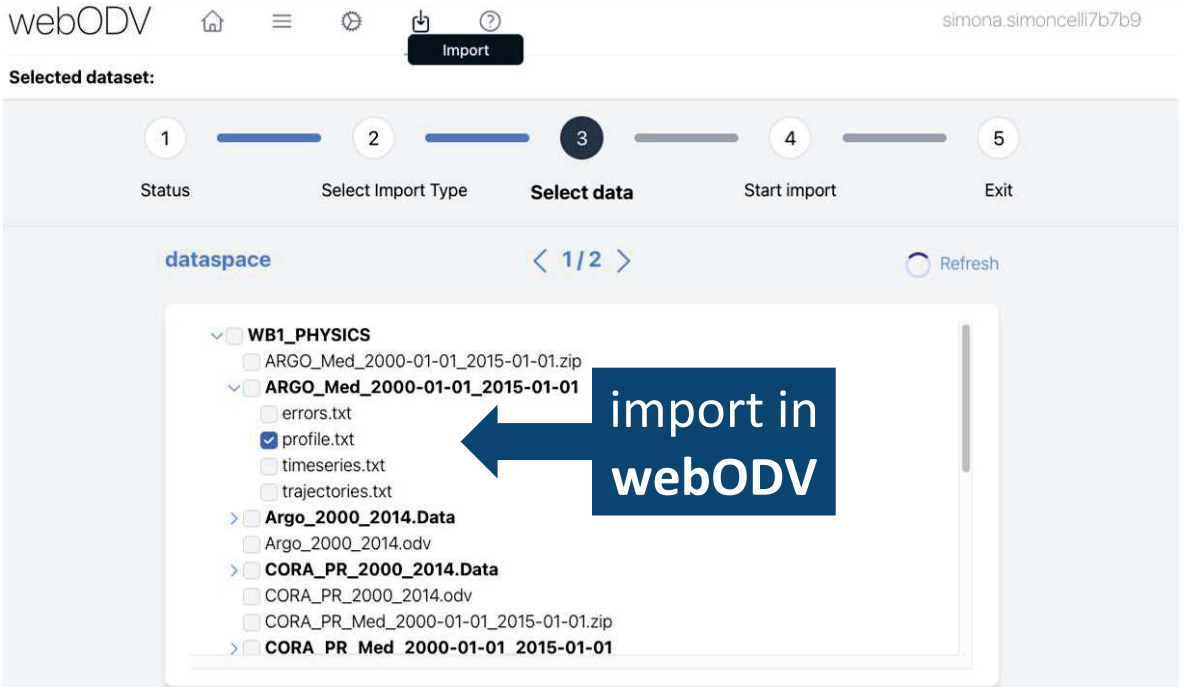
Uncompress

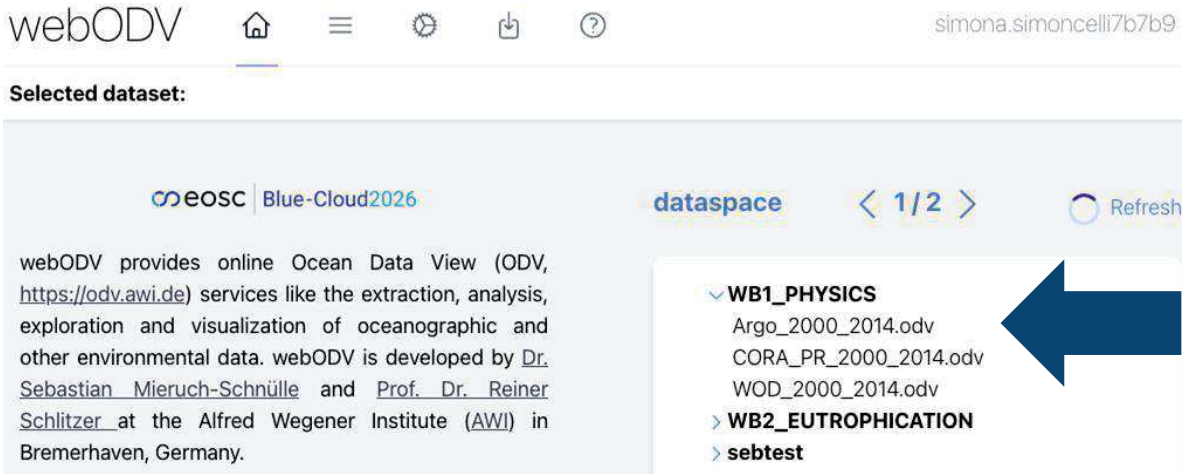
```
$ls ARGO_Med_2000-01-01_2015-01-01*
ARGO_Med_2000-01-01_2015-01-01.zip
ARGO_Med_2000-01-01_2015-01-01:
errors.txt
profile.txt
timeseries.txt
trajectories.txt
```

import in webODV

EXAMPLE

Retrieve Argo Temperature and Salinity values in the Mediterranean Sea between 0-150m in the time period 2000-2014, filtering only GOOD data and obtain an output.zip (odv spreadsheet format) file





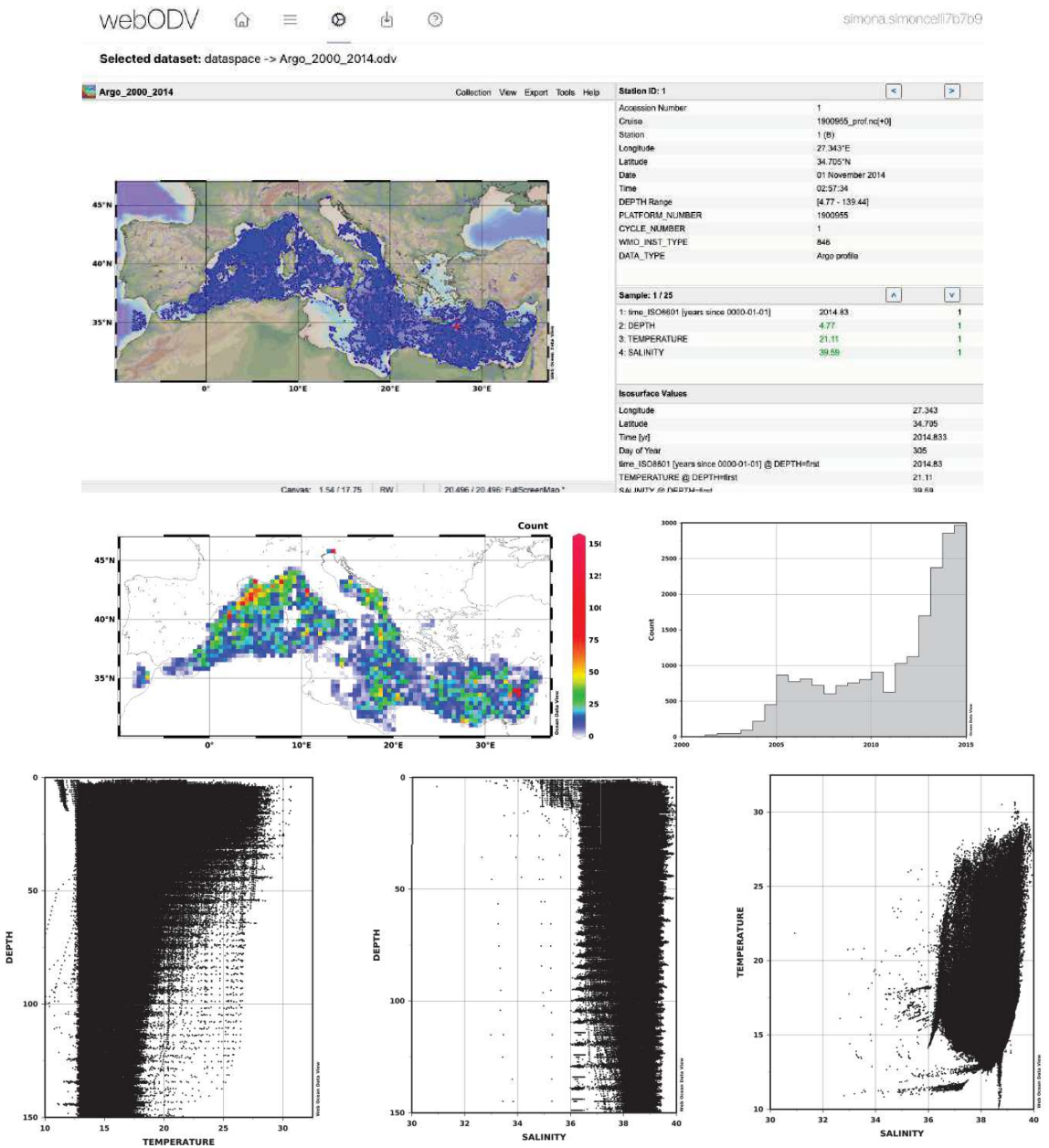
EXAMPLE

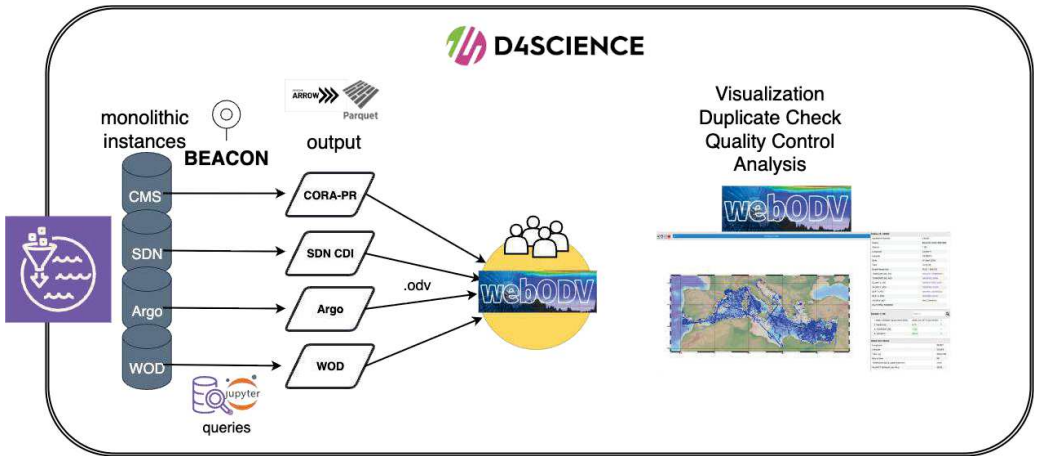
Retrieve Argo Temperature and Salinity values in the Mediterranean Sea between
0-150m in the time period 2000-2014, filtering only GOOD data and obtain an output.zip (odv spreadsheet format) file

diagnostics obtained in **webODV**

- distribution map
- time histograms
- scatter plots
- TS diagrams

webODV for data QC and duplicates detection

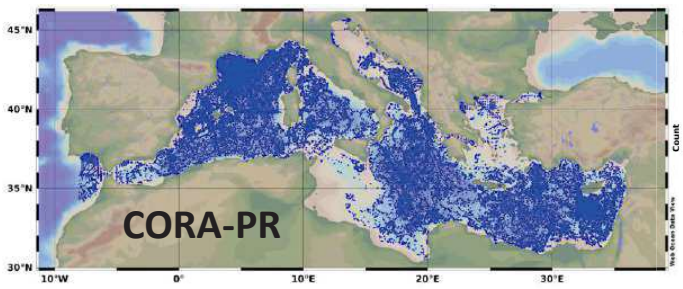


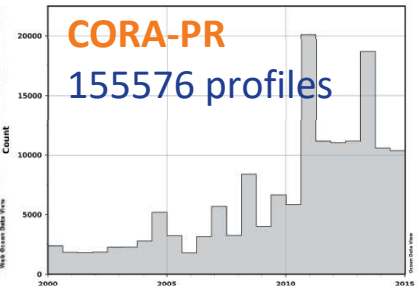


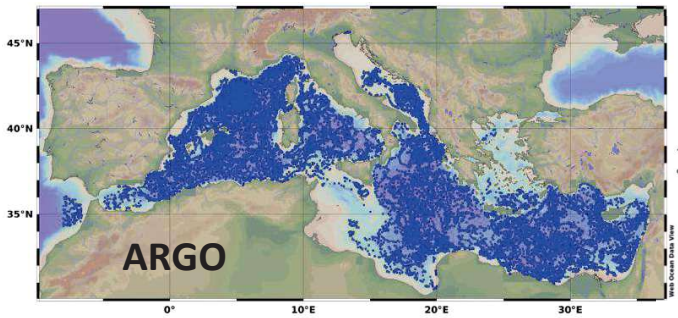
You can query **4 Beacon Monoliths** to sub-set T and/or S in a specific domain, layer and time period, filtering GOOD data and obtain an output in many formats

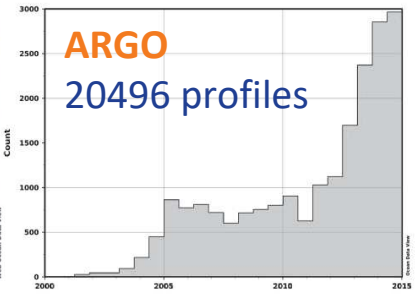
Is there a dataset fitting your needs in terms of coverage, quality,...?

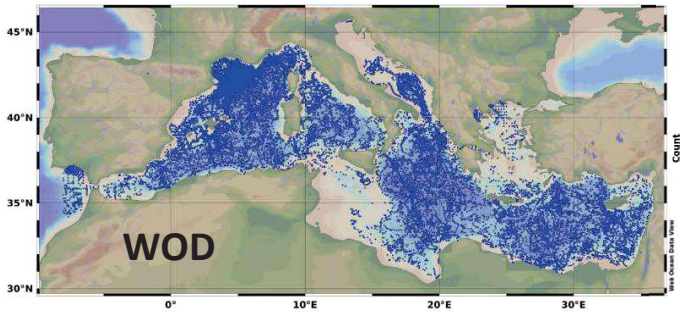
Data integration is the next step!

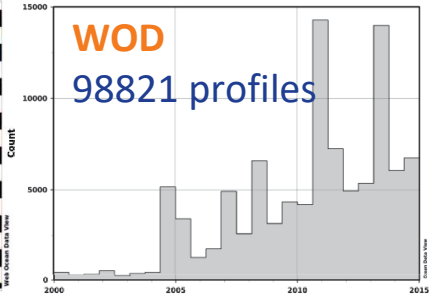


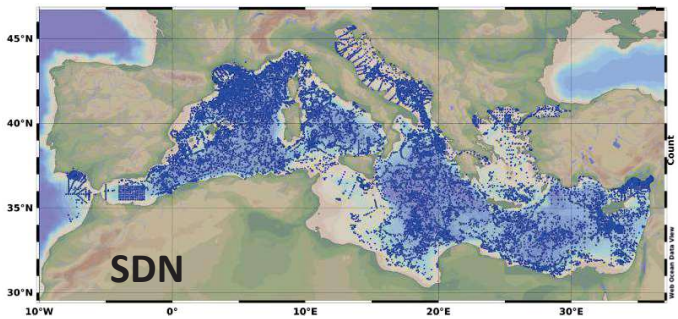


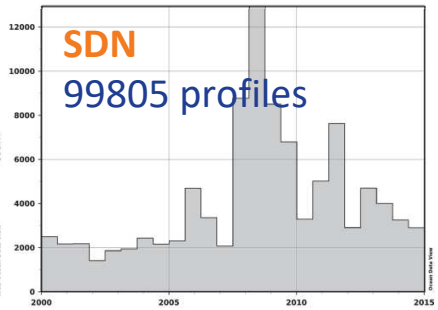












Preparation to Phase2

Essential metadata retrieval:
- BDI ID
- platform
- instrument
- data provider

Sub-setting capabilities:
- time period
- box domain and polygon selection
- depth layer
- variable

Pressure to depth conversion

Aggregation of parameters and variables (i.e. Argo ADJUSTED variables)

Filtering capabilities:
- datasets (platforms, instrument, data provider)
- quality flags (i.e. GOOD data)

Multi output: pandas, geopandas, netcdf, zarr, parquet, geoparquet, odv, arrow, csv

✓ Consistency of the monoliths with the data source
✓ Correctness of the ingestion and harmonization process from monoliths to merged instance
✓ Set up of the merged beacon query and refinement of harmonization

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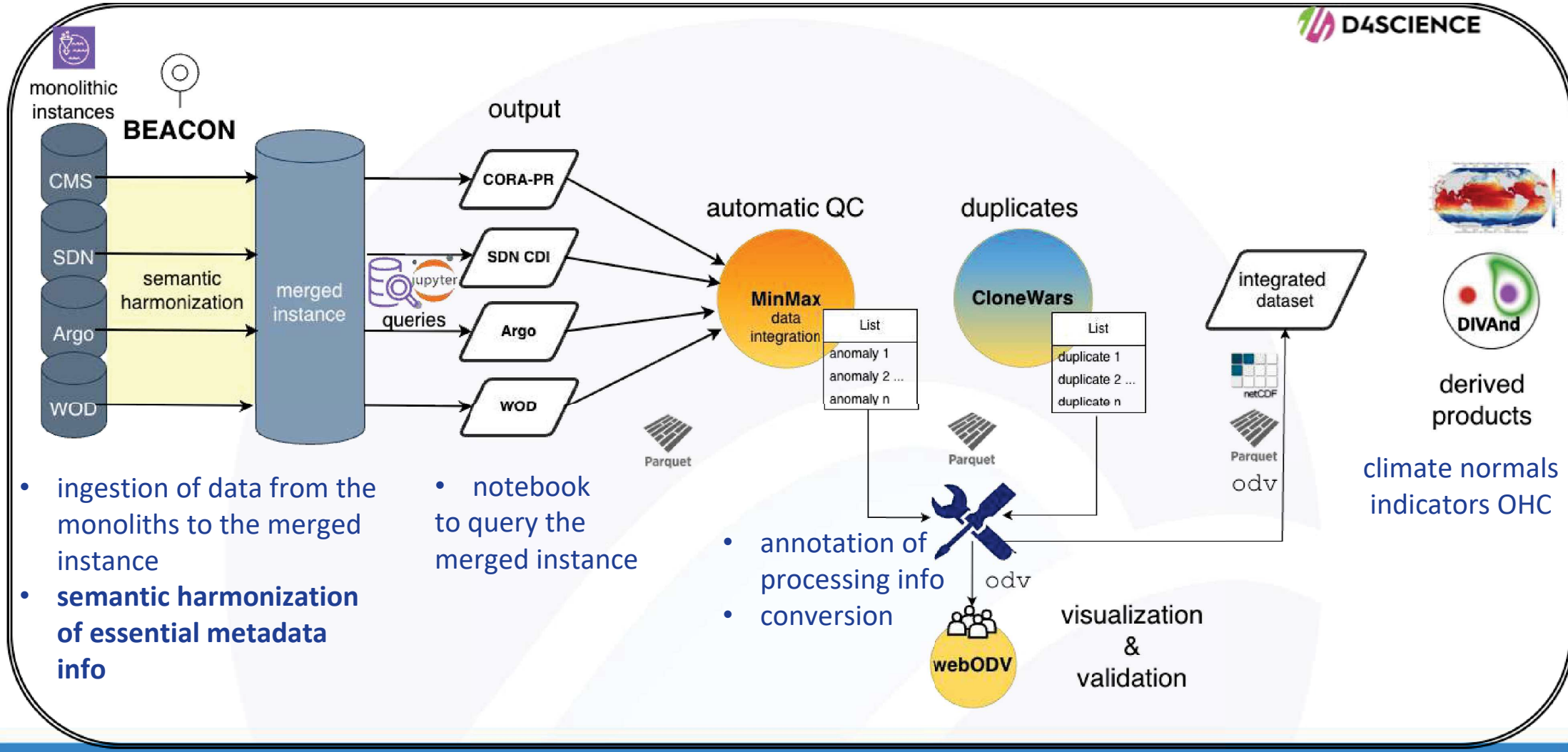
Physics Workbench: phase 2



- ingestion of data from the monoliths to the merged instance
- **semantic harmonization of essential metadata info**

- notebook to query the merged instance

- annotation of processing info
- conversion

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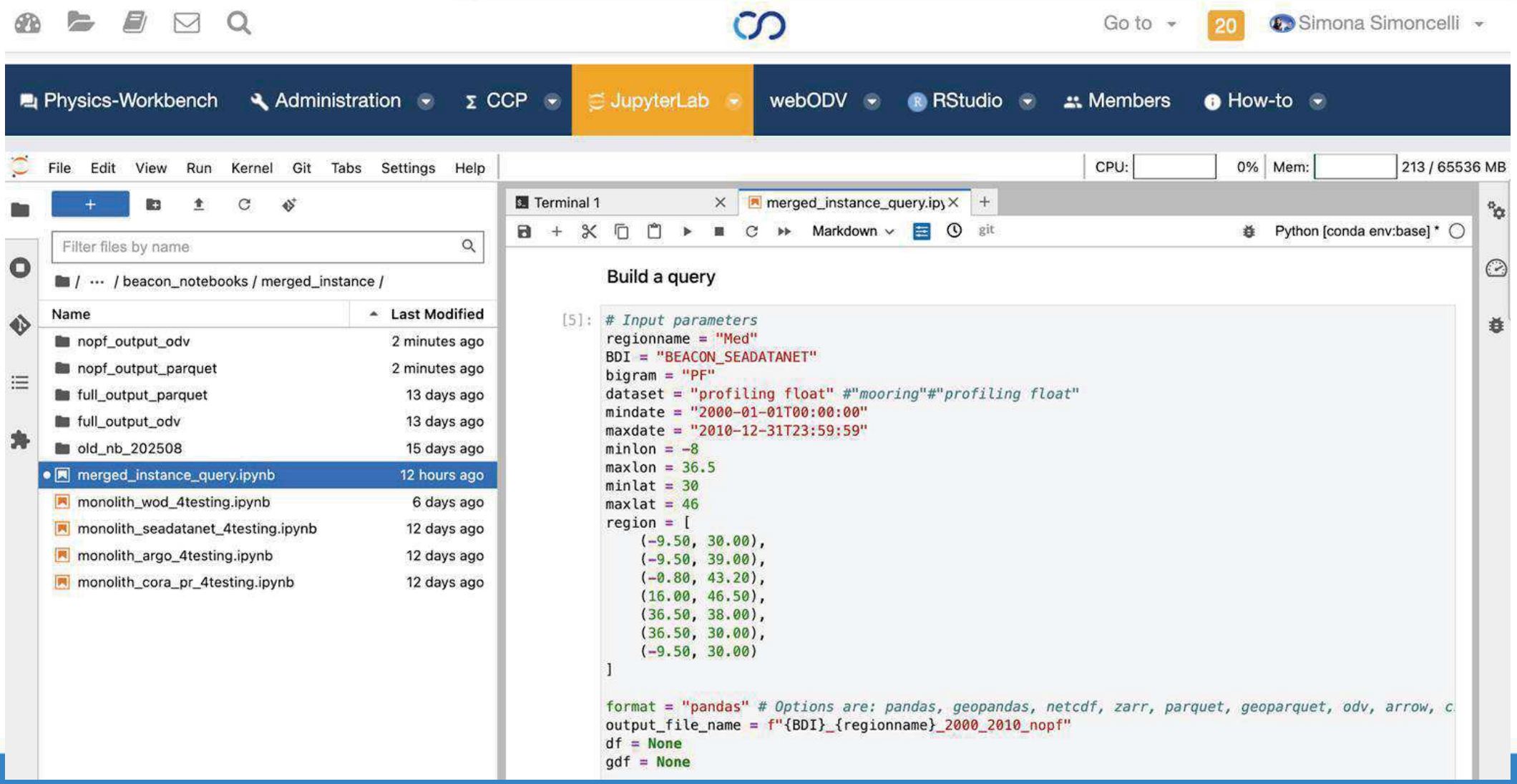
Physics Workbench: phase 2



Physics Workbench: phase 2

list of variables

```
['SOURCE_BDI',
'SOURCE_BDI_DATASET_ID',
'EDMO_CODE',
'EDMERP_CODE',
'CSR',
'PLATFORM_L06',
'PLATFORM_C17',
'FEATURE_TYPE',
'BIGRAM',
'DATASET',
'SDN_PLATFORM_TYPE',
'COMMON_ODV_TAG',
'TIME',
'TIME_QC',
'LONGITUDE',
'LATITUDE',
'POSITION_QC',
'DEPTH',
'DEPTH_P01',
'DEPTH_P06',
'DEPTH_UNITS',
'DEPTH_QC',
'TEMPERATURE',
'TEMPERATURE_P01
'TEMPERATURE_P06
'TEMPERATURE_UNI
'TEMPERATURE_QC'
'TEMPERATURE_L05
'TEMPERATURE_L22
'TEMPERATURE_L33
'SALINITY',
'SALINITY_P01',
'SALINITY_P06',
'SALINITY_UNITS',
'SALINITY_QC',
'SALINITY_L05',
'SALINITY_L22',
'SALINITY_L33']
```

Filters for optimized integration

```
## FILTERS
#query_builder.add_not_equals_filter("SOURCE_BDI", "BEACON_CORA_TS") # Avoid time series
query_builder.add_equals_filter("SOURCE_BDI", BDI)

# Avoid Profiling Floats
if BDI == "BEACON_CORA_PR":
    query_builder.add_not_equals_filter("BIGRAM", bigram) # CORA-PR
if BDI == "BEACON_WOD":
    query_builder.add_not_equals_filter("DATASET", "profiling float") # WOD
    query_builder.add_not_equals_filter("DATASET", "moored buoy") # WOD
    query_builder.add_not_equals_filter("DATASET", "drifting buoy") # WOD
if BDI == "BEACON_SEADATANET":
    query_builder.add_not_equals_filter("PLATFORM_L06", "SDN:L06::46")# SDN profiling float
    query_builder.add_not_equals_filter("PLATFORM_L06", "SDN:L06::48")# SDN mooring
    query_builder.add_not_equals_filter("PLATFORM_L06", "SDN:L06::43")# SDN moored surface buoy
    query_builder.add_not_equals_filter("PLATFORM_L06", "SDN:L06::41")# SDN subsurface mooring
    query_builder.add_not_equals_filter("PLATFORM_L06", "SDN:L06::18")# SDN river station
    query_builder.add_not_equals_filter("PLATFORM_L06", "SDN:L06::17")# SDN coastal station


query_builder.add_range_filter("TIME", mindate, maxdate)  # You can adjust the date range as needed. Th
query_builder.add_range_filter("LATITUDE", minlat, maxlat)  # Latitude range from -90 to 90 (you can ad
query_builder.add_range_filter("LONGITUDE", minlon, maxlon)  # Longitude range
query_builder.add_polygon_filter("LONGITUDE","LATITUDE", region)  # Define a polygon area (you can adju

query_builder.add_is_not_null_filter("DEPTH")
# Ensure at least Temperature or Salinity is not null
query_builder.add_filter(OrFilter([IsNotNullFilter("TEMPERATURE"),
                                   IsNotNullFilter("SALINITY")]))
```

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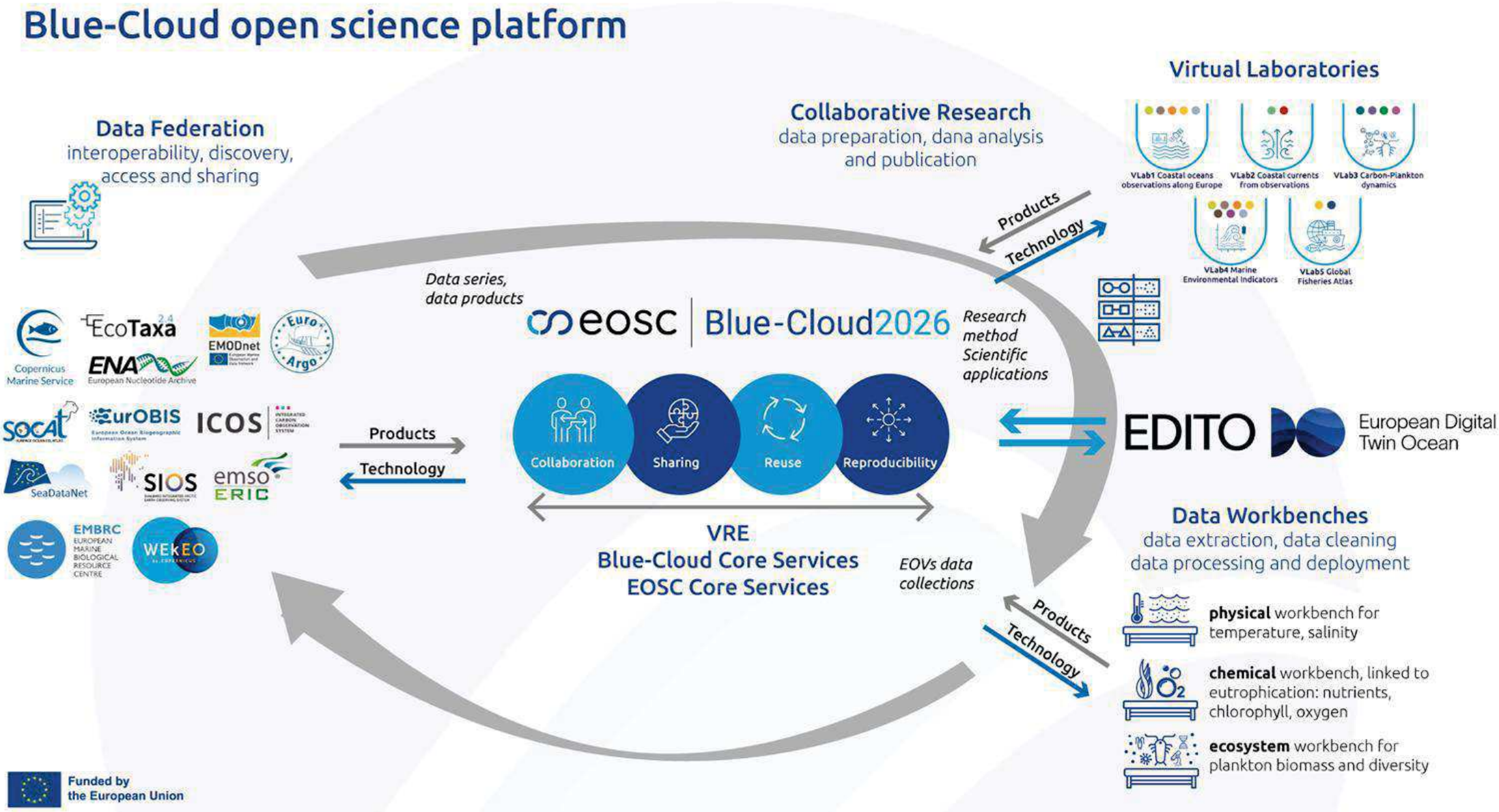
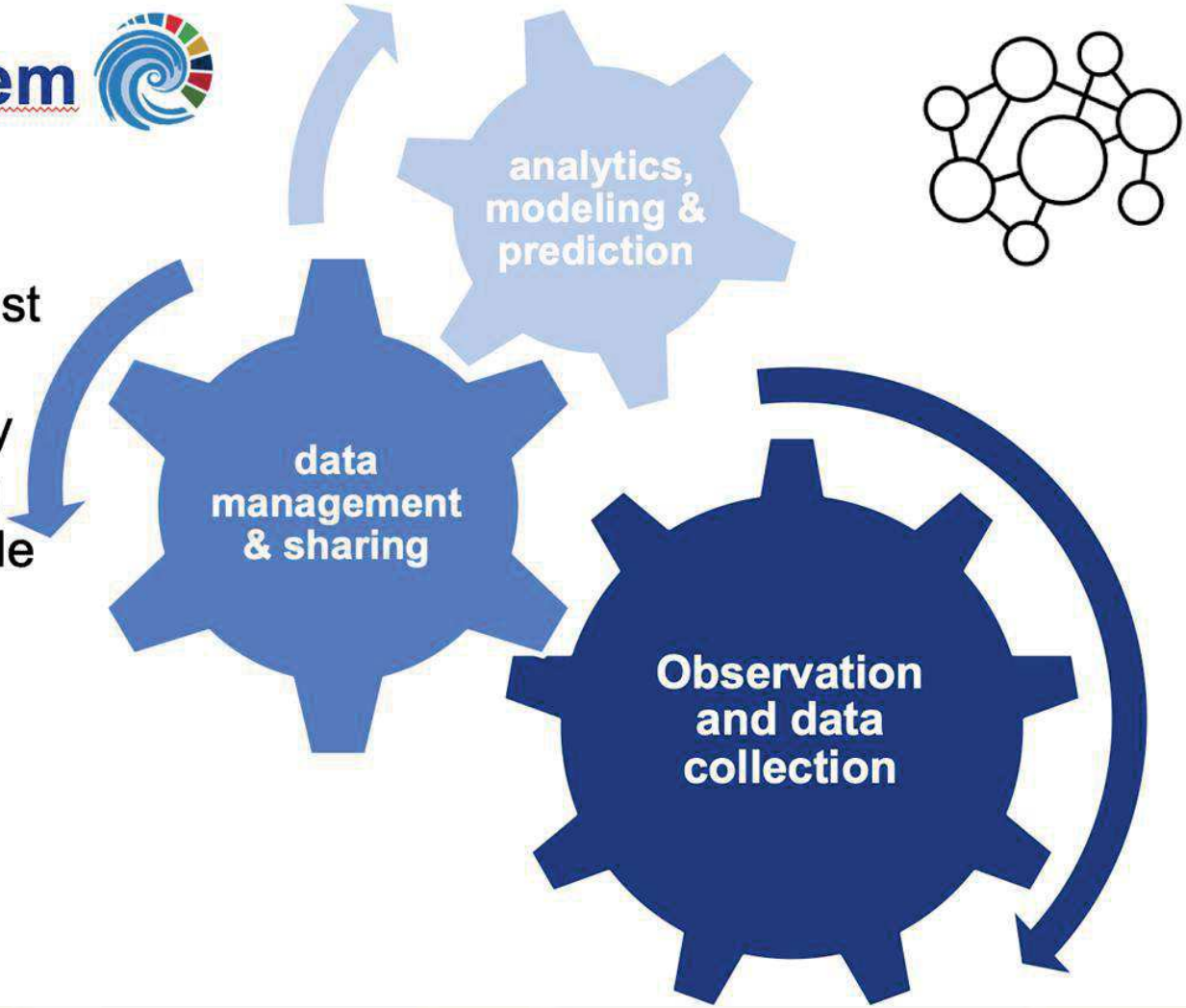
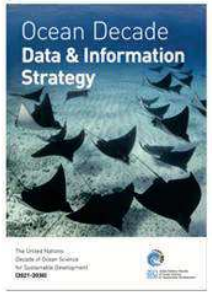


Digital Ecosystem

Data systems (BDIs) co-create a distributed, robust and collaborative **digital ecosystem** to be actively used for decision making and to support sustainable ocean management





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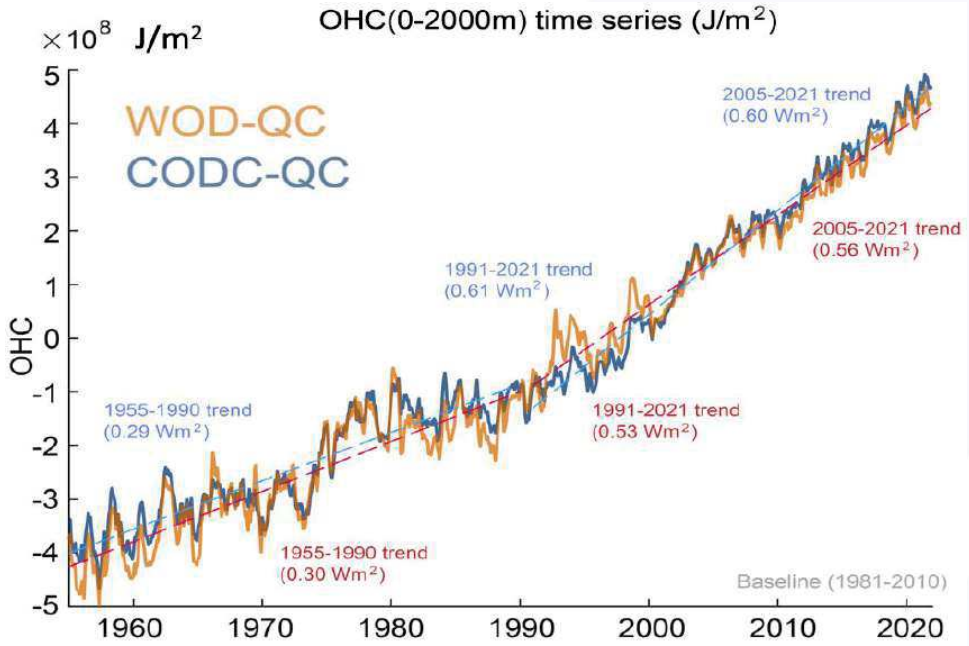
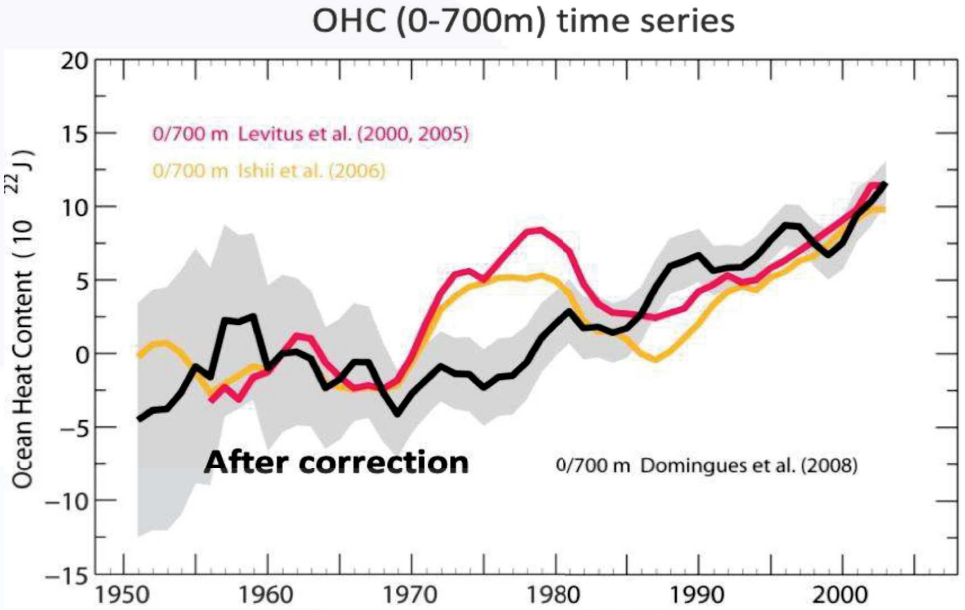
‘Climate quality’ ocean data

Ocean Heat Content indicator





Impact of QC on OHC 0-2000 m

~8% trend difference from 2005-2021

Impact of instrumental bias on OHC 0-700 m

~50% trend difference from 1970-2000

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Integration of coastal ocean observations along Europe

Joao Paulo do Nascimento Vitorino (IH)

5-6 November 2025, Brussels [Belgium]

Funded by the European Union

eosc | Blue-Cloud2026

WP4 T4.2 Vlab 1:

Unlocking the potential for integration of Coastal Ocean Observations along Europe (ICOOE)

IH – João Vitorino, Vânia Lima, Paulo Nunes, Telmo Geraldes Dias

SOCIB - Juan Gabriel Fernández, Melanie Juza, Emma Reyes, Nikolaos Zarokanellos, Miguel Charcos, Enrique Castrillo

IEEE France - Jay Pearlman, Rene Garello

Funded by the European Union

To support coastal ocean researchers and general users in the

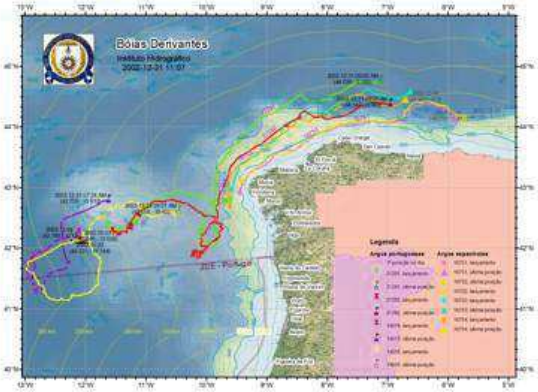
IDENTIFICATION, ACCESS, PROCESSING,

ANALYSIS, INTEGRATION AND VISUALIZATION

of Coastal Ocean Observations and Complementary Information

3 THEMATIC SERVICES OFFERED:

TS#1: Transboundary Processes & Connectivity



TS#2: Extreme Events

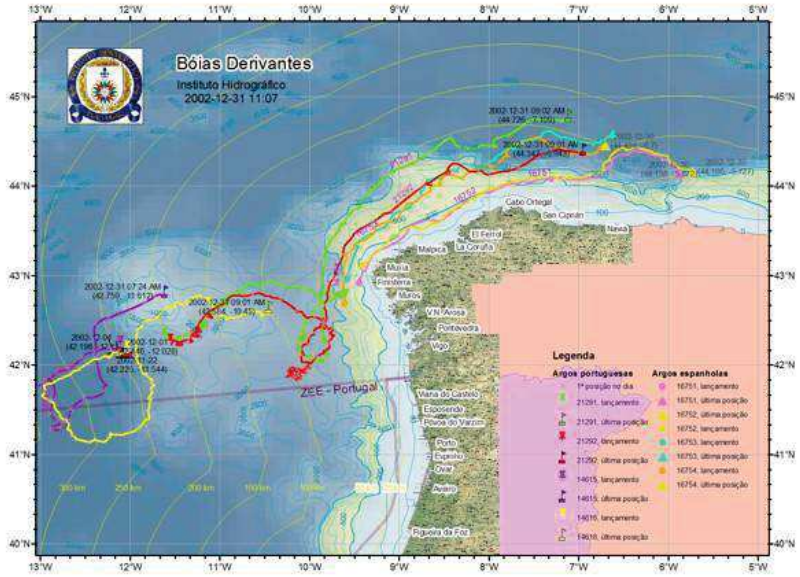
TS#3: Ocean Glider

BACKGROUND

The coastal ocean hosts a broad range of mechanisms promoting the long distance transport of disturbances, water properties, contaminants and biological species.

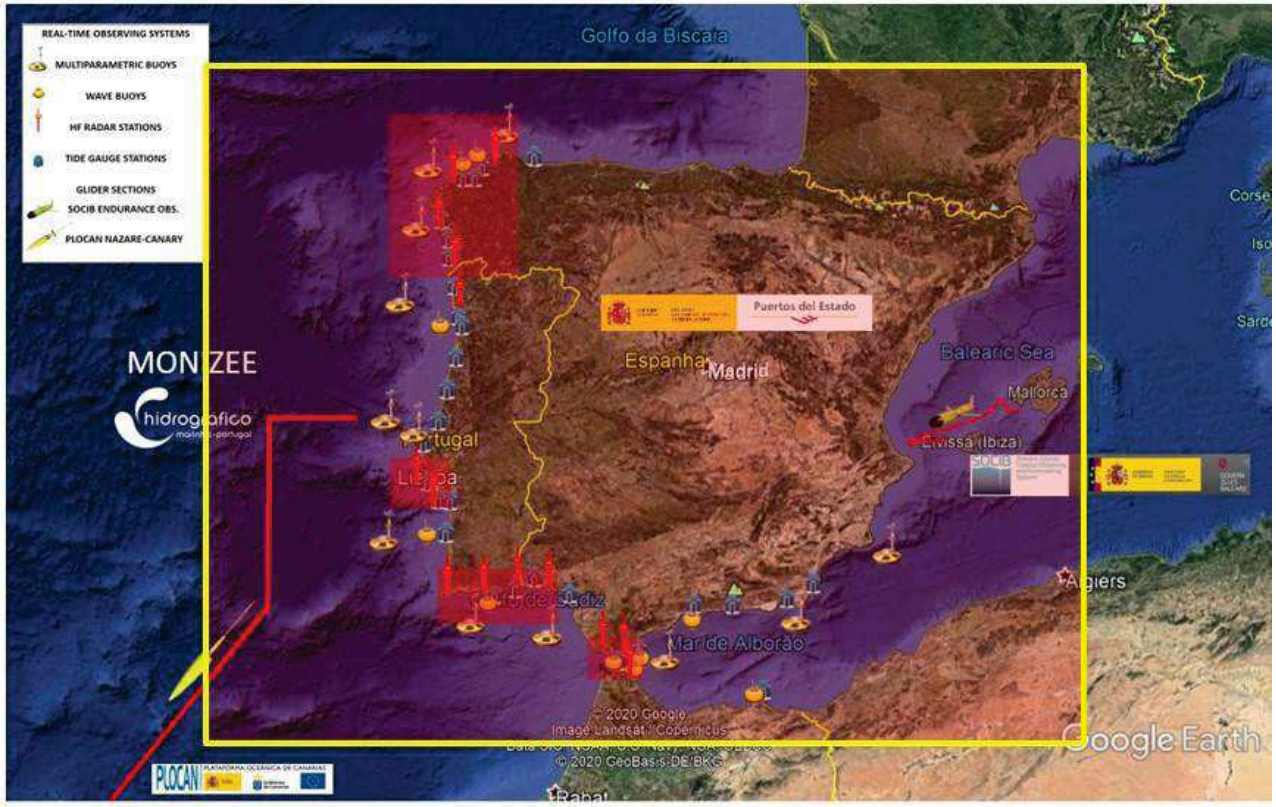
STRATEGY

Allowing users to identify and access the relevant observations and complementary information provided by aggregators and available for analysis and integration.



The pilot demonstrator focus:

- **The Iberian coastal ocean**, in which monitoring infrastructures are operated by partners in Portugal (IH) and Spain (SOCIB, Puertos del Estado, PLOCAN).
- **Surface currents,** either:
  - measured by HF radars, provided by the European HF Radar Node
  - simulated by numerical models and provided by CMEMS



blue-cloud.d4science.org/group/icooe/thematic-service-1

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Coastal oceans observations al… | Administration | Thematic Service 1 | Thematic Service 2 | Thematic Service 3 | Analytics | JupyterHub | RStudio | Communication

Catalogue | Members | How-to

USER OPTIONS

User selection of area of interest, time range and parameters.

Coordinates

Select area

Latitude

Min | Max

Longitude

Min | Max

Time range

Start Date → 2025-11-04

Select parameters

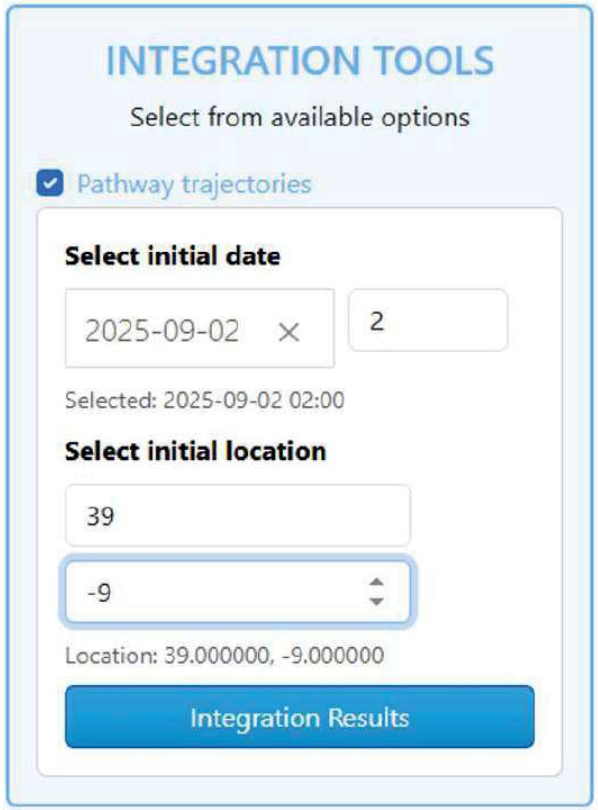
surface currents

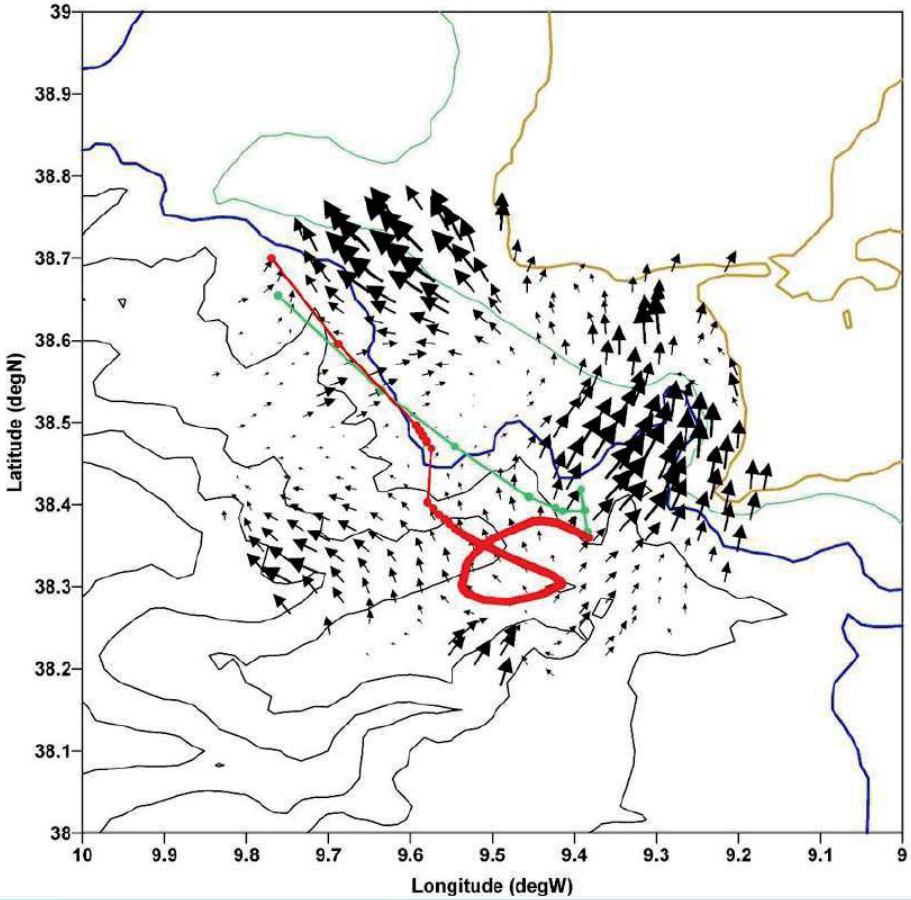
AVAILABLE DATA

Check the Overlap Area (OA) and Overlap Time (OT)

INTEGRATION OF DATASETS

➢ TRANSPORT PATHWAYS OF A PASSIVE TRACER





Trajectories calculated using:

NEMO (daily)

Combining NEMO (daily) & HF radar (hourly)

EXPLORATION OF INDIVIDUAL DATASETS

- **BASIC STATISTICS FOR SELECTED DATASETS**

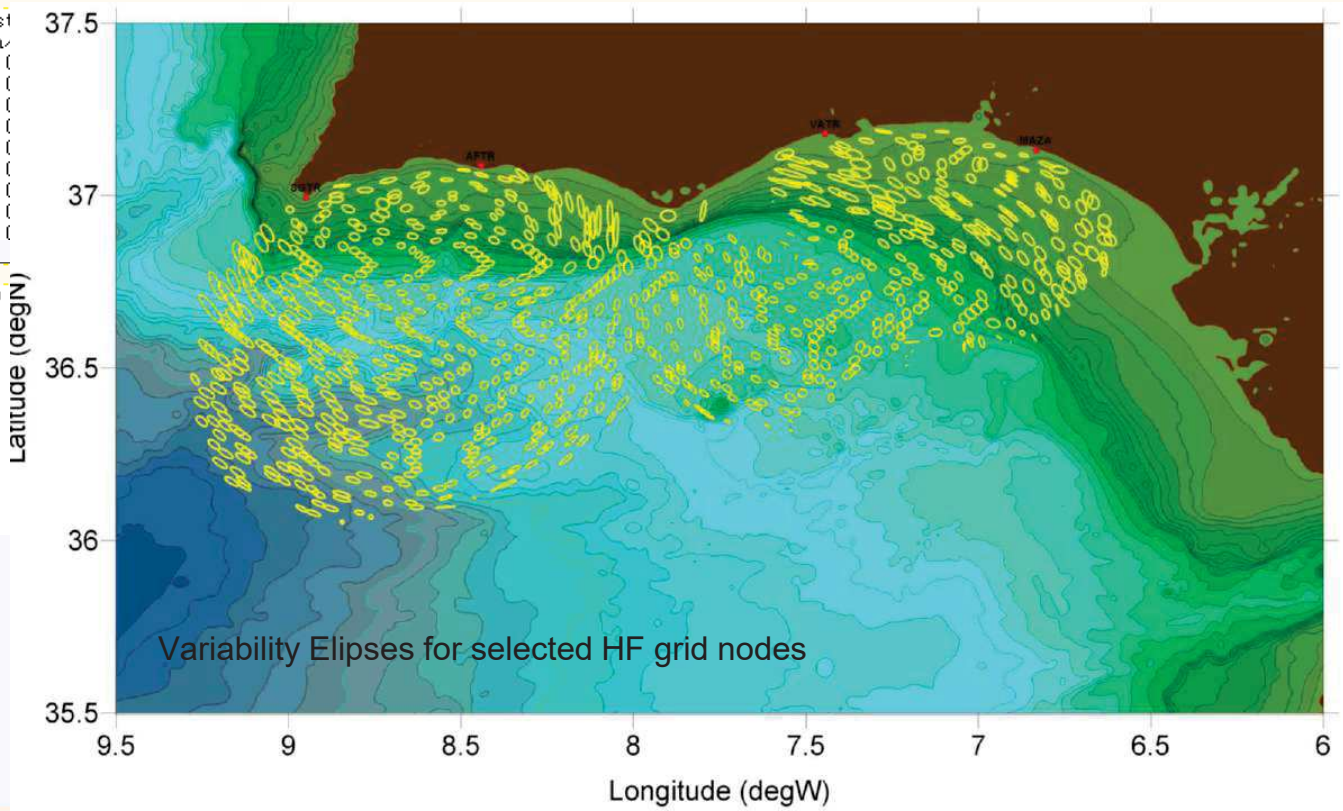
SCALAR STATISTICS

LONGITUDE (degE)	LATITUDE (degN)	Umin (m/s)	Umean (m/s)	Umax (m/s)	Uvar (m2/s2)	Ust (m/
-9.48973	38.17931	-0.086	0.089	0.217	0.006	0.(
-9.53781	38.19192	0.003	0.115	0.214	0.002	0.(
-9.48973	38.19192	-0.088	0.080	0.184	0.003	0.(
-9.47370	38.19192	-0.115	0.048	0.150	0.004	0.(
-9.42562	38.19192	-0.217	-0.019	0.084	0.004	0.(
-9.60192	38.20453	0.017	0.088	0.146	0.001	0.(
-9.58589	38.20453	0.041	0.108	0.164	0.001	0.(
-9.53781	38.20453	-0.011	0.117	0.201	0.002	0.(
-9.52178	38.20453	-0.034	0.107	0.192	0.002	0.(

VECTORIAL STATISTICS

LONGITUDE (degE)	LATITUDE (degN)	VMean (m/s)	MVDir (deg)	MVVar (m2/s2)	MVStD (m/s)
-9.48973	38.17931	0.107	123.340	0.005	0.069
-9.53781	38.19192	0.162	134.869	0.003	0.050
-9.48973	38.19192	0.100	126.556	0.003	0.059
-9.47370	38.19192	0.056	120.425	0.004	0.060
-9.42562	38.19192	0.037	329.536	0.004	0.061
-9.60192	38.20453	0.157	145.911	0.002	0.040
-9.58589	38.20453	0.175	141.819	0.002	0.041
-9.53781	38.20453	0.170	136.573	0.002	0.048
-9.52178	38.20453	0.152	135.297	0.003	0.051
-9.50576	38.20453	0.136	132.210	0.003	0.055

r (2)	Cstd (m/s)	Csem (m/s)
5	0.071	0.004
3	0.058	0.004
3	0.056	0.003
2	0.047	0.003
3	0.053	0.003
1	0.037	0.002
2	0.041	0.003
3	0.052	0.003
3	0.052	0.003



TS#2 - EXTREME EVENTS

BACKGROUND

Extreme events promote severe impacts in the coastal ocean, changing dramatically the conditions of the water column, shelf and slope floor and coastal boundary.

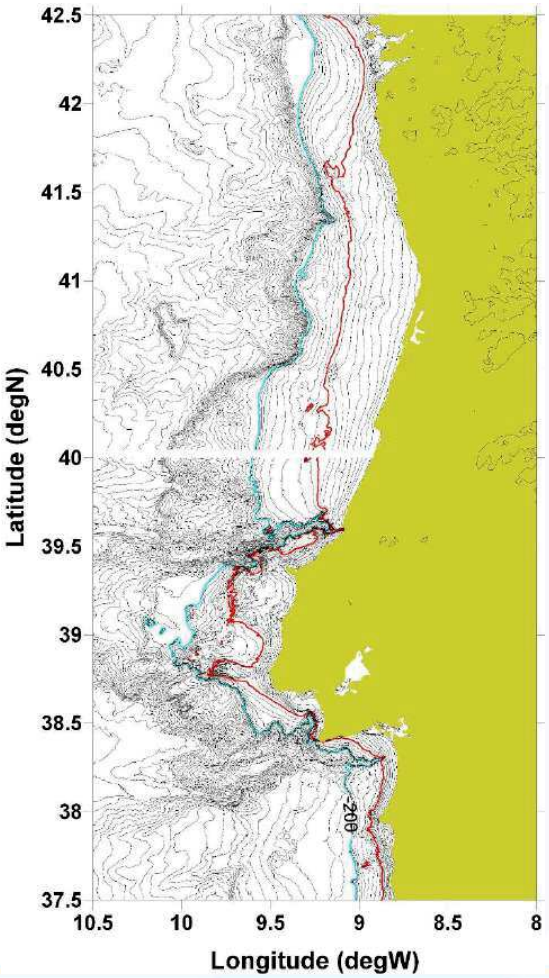
STRATEGY

The Thematic Service explores 3 major storm events that impacted the Iberian coastal ocean area, providing, for each, the relevant datasets for analysis and integration.

Storm Ophelia
9 – 18 Oct 2017

Storm Emma
28 Feb – 10 Mar 2018

Hurricane Leslie
10-20 Oct 2018

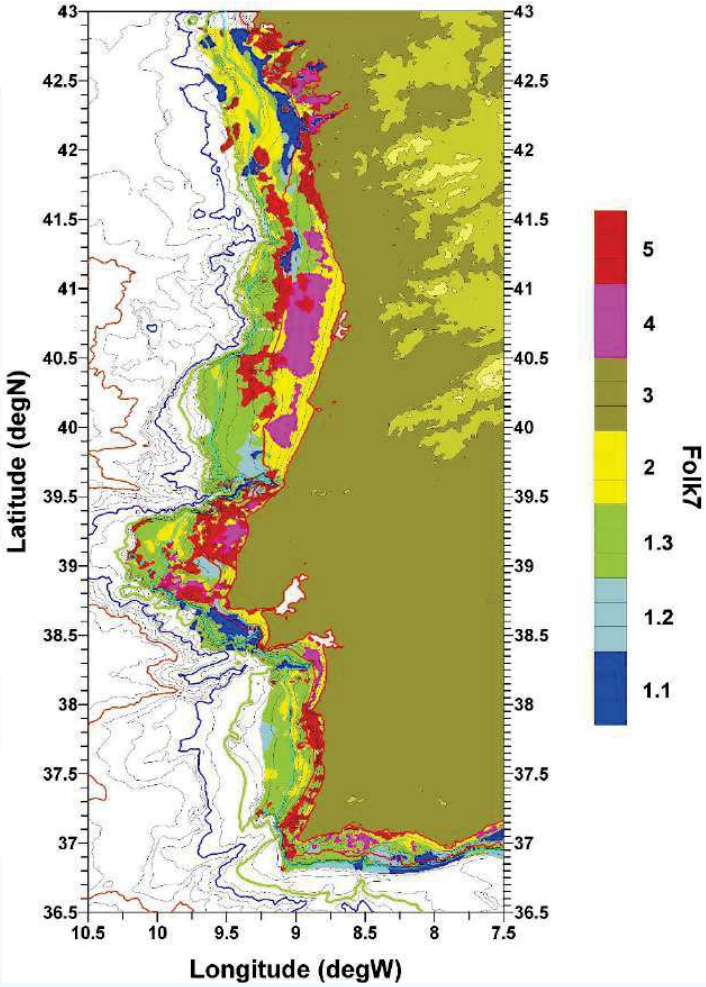


DATASETS

Bottom Characterization

EMODNET
DTM2024
Bathymetry
(res.115m)

EMODNET
Bottom Sedimentary Cover
(Seabed Substate Folk7)



DATASETS

Environmental Conditions

CMEMS MFWAM Wave Model

Hourly fields of the main wave parameters

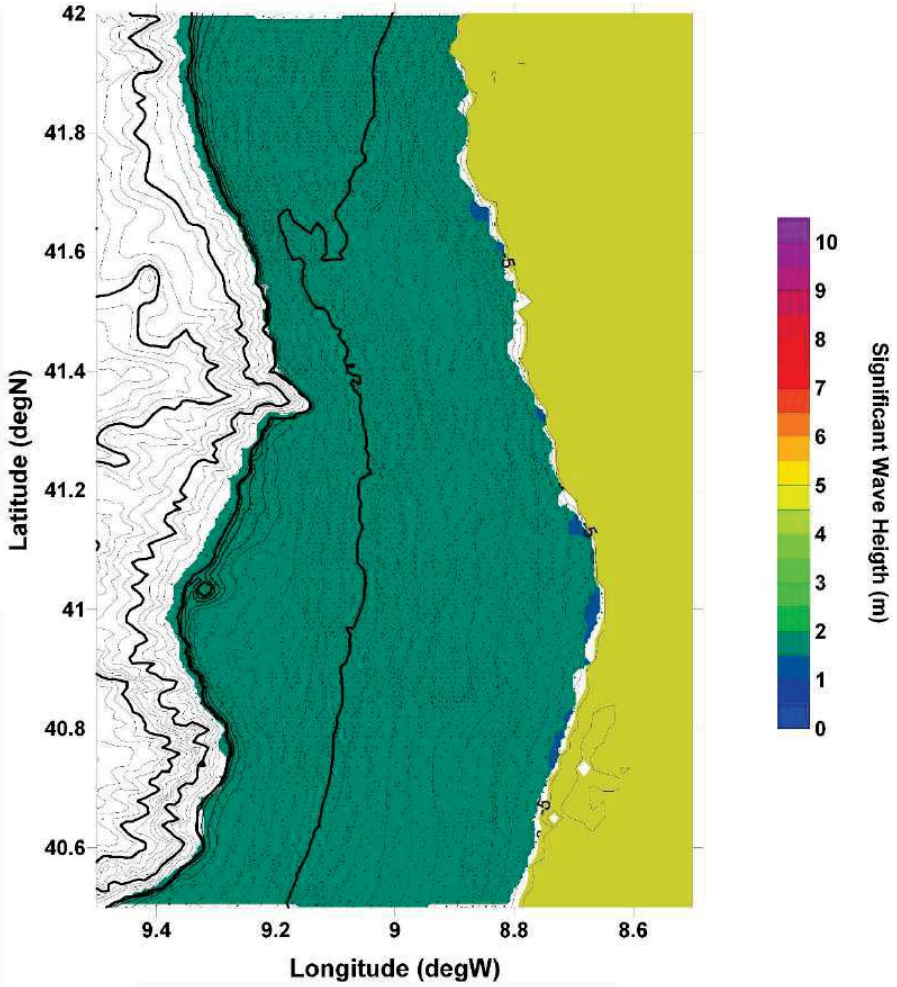
cmems_mod_ibi_wav_my_0.027deg_PT1H-i

CMEMS NEMO Model

Hourly fields of barotropic current

Focus on how these conditions affect the shelf-upper slope areas during the periods of

Highest Waves ***and*** ***Lowest Waves***



USER OPTIONS

User selection of 1 area of interest and 1 extreme event episode.

Coordinates

Select area

Latitude

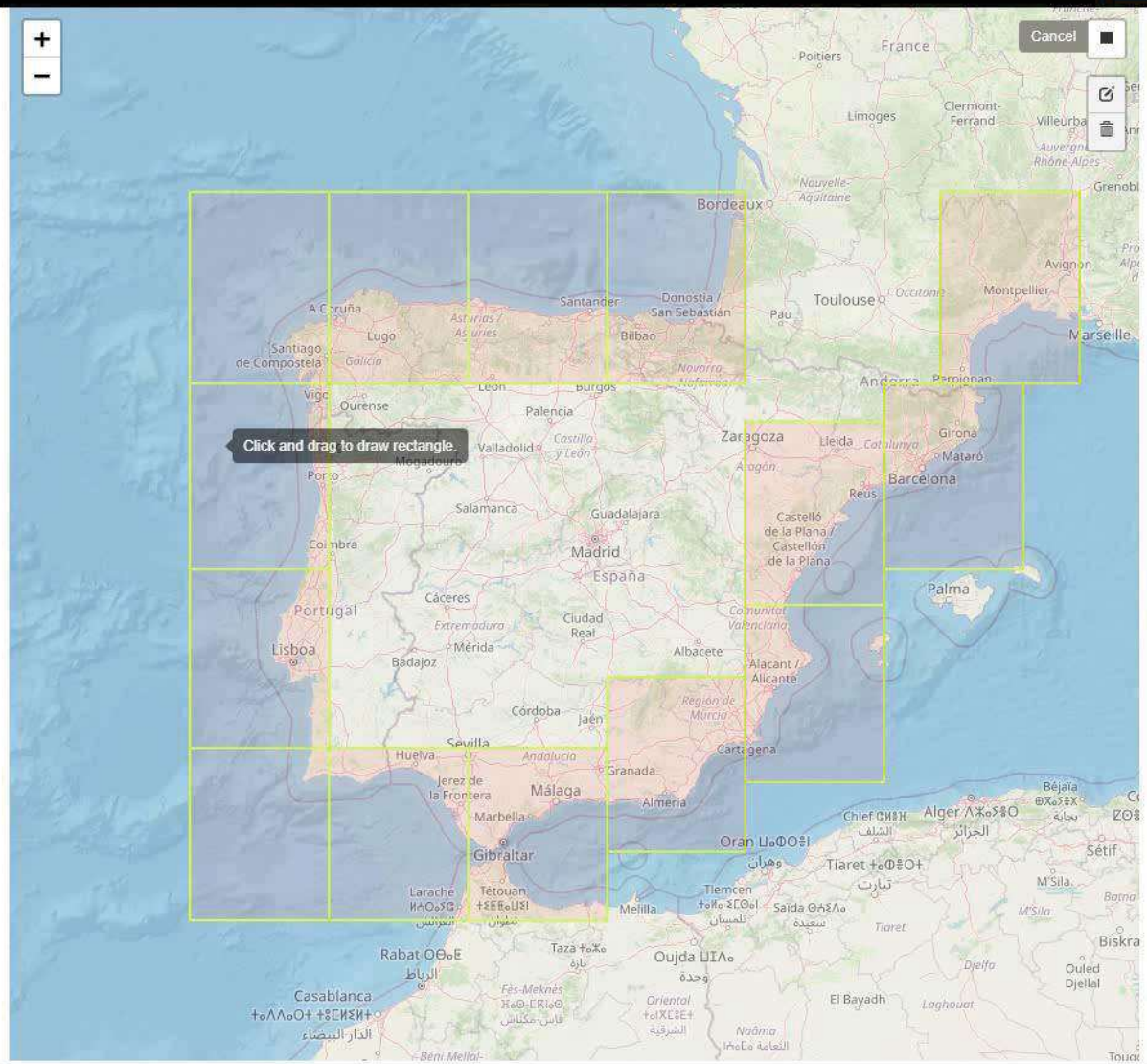
Min Max

Longitude

Min Max

Select Extreme Event

Storm Emma (March 2018)



Rain warning
Just issued

Search

POR

INTEGRATION OPTION 1:

Impacts on Bottom Sedimentary Cover

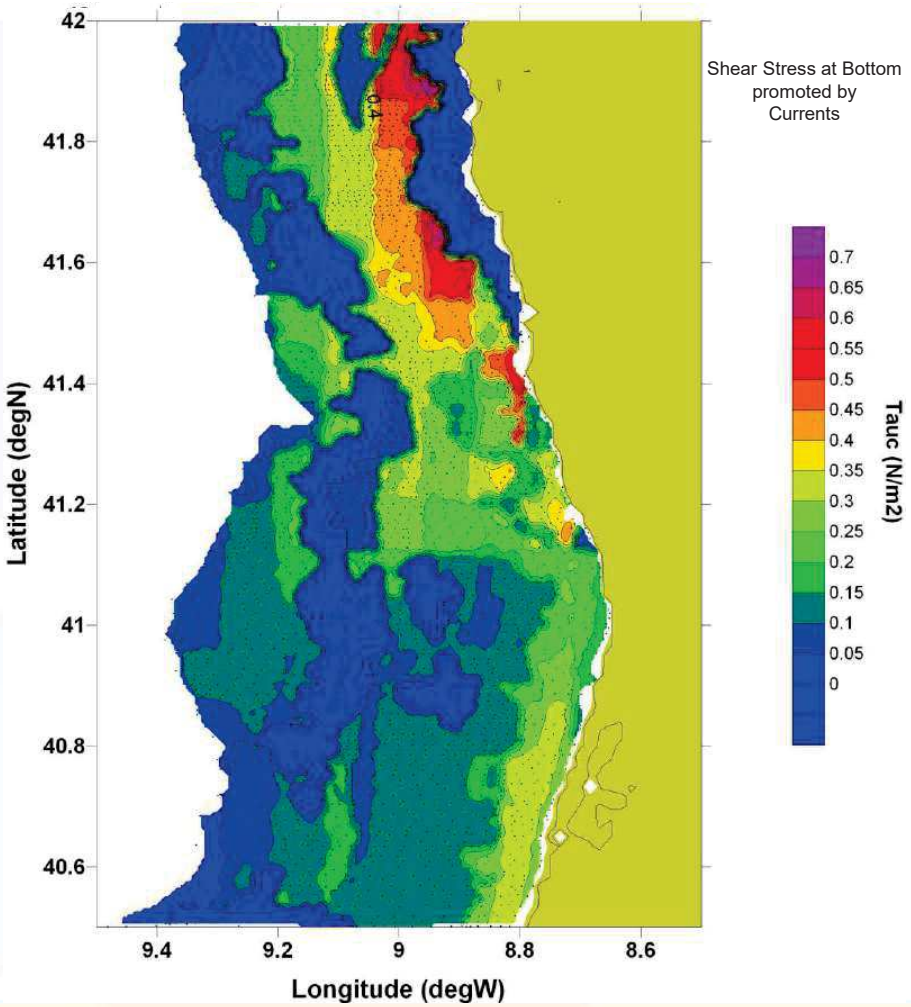
Products offered

Characterization of waves parameters & barotropic currents at each node of the bottom sedimentary cover

Characterization of bottom shear stresses associated with waves, currents, combined effect of currents & waves and critical shear stresses for remobilization

Characterization of bedform features promoted by currents & waves forcing

Characterization of bedload and suspended transport promoted by currents & waves forcing



QuickTime Player Archivo Edición Visualización Ventana Ayuda Mar 4 nov 12:37

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Coastal oceans observations al... Administration Thematic Service 1 Thematic Service 2 Thematic Service 3 Analytics JupyterHub RStudio

Communication Catalogue Members How-to

Welcome to the Coastal oceans observations along Europe Virtual Laboratory

Welcome to the **Coastal oceans observations along Europe** Virtual Laboratory.

This Virtual Laboratory (VLab) provides you with an environment that is specifically designed to support you in your explorations of the available coastal ocean information, developing and implementing tools to facilitate the access to different types of data, to data processing and quality control when needed, to exploitation of individual datasets and to integrated analysis of different types of data. It brings together observations collected by partners of the Joint European Research Infrastructure for Coastal Observatories (JERICO-RI) with other available data from international data repositories.

VLab 1 will support the coastal ocean users through three Thematic Services:

- **Thematic Service 1,** addressing **"Transboundary processes and connectivity along the European margins",** aims to support user interest in processes such as biological connectivity, contaminants spread, and impacts of river outflows along margins.
- **Thematic Service 2, "Extreme Events"**, focusing on impacts of major storms on the coastal ocean environment.
- **Thematic Service 3, "Ocean glider"** will show the added value of repeated glider sections.

The documentation for them are linked below. Enjoy!

How-tos

- Thematic Service 1
- Thematic Service 2
- Thematic Service 3
- Future improvements

jupyter

JupyterHub

JupyterHub enables the exploitation of computational environments and resources without burdening users with installation and maintenance tasks.
This JupyterHub environment is *(i)* preconfigured with libraries and packages to ease the execution of common data analytics tasks, and *(ii)* provides access to the Workspace enabling sharing of resources much easier

About ICOOE VLab

This VLAB will implement 3 Thematic Services (Transboundary Processes and Connectivity, Extreme Events, Ocean Glider) that will widely expand users' ability to access and integrate observations collected along Europe's coastal ocean, building new knowledge on key scientific and societal questions and challenges, supporting researchers, Blue Economy actors, environmental managers and crisis respons ...

See more Edit this text

Other options ...

VRE Managers and Groups

View Managers

Workspace view

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Name Owner Last modified

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Sebastian Mieruch (AWI)

5-6 November 2025, Brussels [Belgium]

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The Global Fisheries Atlas

Julien Barde (IRD)

5-6 November 2025, Brussels [Belgium]

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