

Blue-Cloud 2026 in a nutshell

NTNU EOSC workshop
February 2024

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Funded by
the European Union¹

A federated European FAIR and Open Research Ecosystem for oceans, seas, coastal and inland waters

Blue-Cloud 2026 **builds upon the pilot Blue-Cloud project** to further evolve its **pilot ecosystem into a Federated European Ecosystem to deliver FAIR & Open data, analytical services, instrumental for deepening research of oceans, EU seas, coastal & inland waters.**

It develops a **thematic marine extension to EOSC** for open web-based science, & serves needs of the EU Blue Economy, Marine Environment and Marine Knowledge agendas.

Budget: € 8 845 420,00

Funding: [HORIZON-INFRA-2022-EOSC-01](https://cordis.europa.eu/project/id/101094227) | RIA - Research and Innovation action
<https://cordis.europa.eu/project/id/101094227>

Length: 42 months

Starting date: 1 January 2023

Consortium: 40 partners from 14 countries

Project Information

Blue-Cloud 2026

Grant agreement ID: 101094227

DOI

[10.3030/101094227](https://doi.org/10.3030/101094227) 

Start date

1 January 2023

End date

30 June 2026

Funded under

Research infrastructures

Total cost

€ 8 845 420

EU contribution

€ 8 845 420



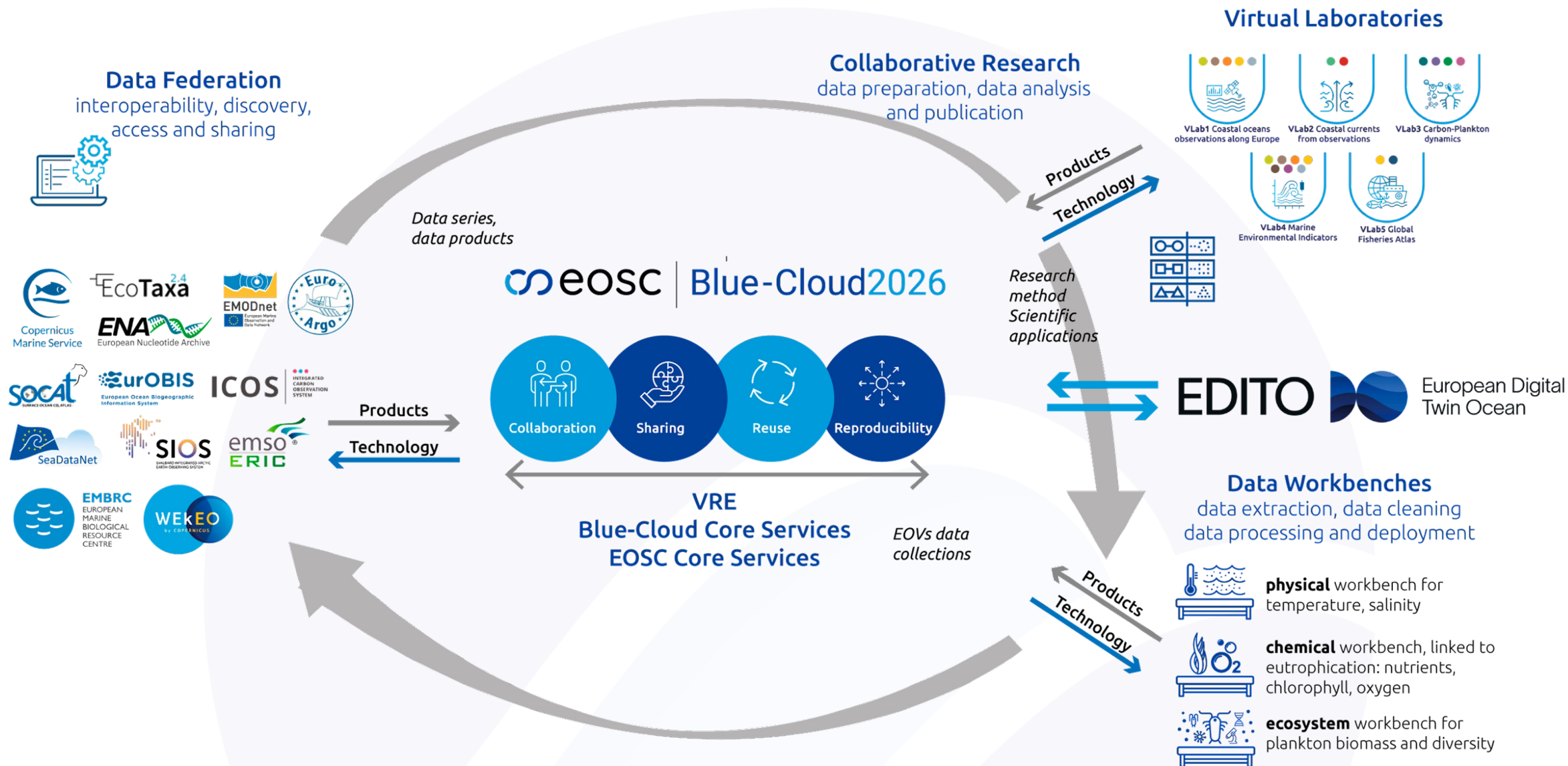
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CONSIGLIO NAZIONALE DELLE RICERCHE

 Italy

Develop a Federated European Ecosystem to deliver FAIR & Open data and analytical services, instrumental for deepening research of oceans, EU seas, coastal & inland waters. It also aims to develop a thematic marine extension to EOSC for open web-based science, serving the needs of the EU Blue Economy, Marine Environment and Marine Knowledge agendas.

All in all, Blue-Cloud 2026 will expand the federated approach of the previous Blue-Cloud, involving more aquatic data stakeholders, and interacting with EOSC developments, in support of the EU Green Deal, UN SDG, EU Destination Earth, and the EU Mission Starfish on healthy oceans, seas, coastal and inland waters, ultimately to provide a core data service for the Digital Twin of the Ocean.





Consiglio Nazionale
delle Ricerche

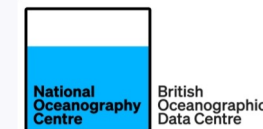
**Scientific and
Administrative Coordinator**



Project Coordinator



Technical Coordinator





NERSC is partner in SIOS, the **Svalbard Integrated Arctic Earth Observing System (SIOS)**. Metadata from both the Norwegian Data Infrastructures (NMDC, NorDataNet) are harvested into SIOS data infrastructure, which is being connected to the Blue-Cloud DD&AS.

NERSC is therefore contributing to both the **horizontal expansion** of the Blue-Cloud federation (with new data) as well as the **vertical expansion**, improving semantic interoperability of metadata and adding functionality for sub-setting and extracting specific data slices from the BDI repositories at data level, also to facilitate the population of 'Data Lakes'

Blue-Cloud 2026 core services

VRE & Data Discovery & Access
Services - status today



Facilitates users:

Federated search for discovering interesting data sets (currently more than 10 million) in a two step approach

Federated retrieval of identified data sets using a shopping basket mechanism

Download of data sets or push to Blue-Cloud VRE

Facilitates managers of Blue Data Infrastructures:

Wider outreach to potential users

Stay informed about data requests and users for their repository

Periodic reporting of downloads from their repository



Expanding and Optimising the Blue-Cloud Data Discovery & Access service (DD&AS) and its FAIRness by:

- harmonising and expanding functionality of web services as operated by each BDI for discovery and access of managed data resources, and as used in DD&AS, following FAIRness review
- developing and deploying semantic brokering as part of DD&AS interface
- federating additional BDIs into the DD&AS (**EMSO, SIOS, EMODnet Physics, ELIXIR MGnify**)
- Reviewing and deploying data sub-setting and extracting services, operated by each BDI, for feeding Blue-Cloud 'raw data' Data Lakes,
- developing and deploying Blue-Cloud Data Lakes for storing and maintaining 1) 'raw data' extracted from BDIs and 2) harmonised and validated data collections for selected data types, as resulting from the WP3 EOVS Work Benches



Support researchers and scientists in doing science

Without

- forcing specific approaches and technologies
- asking to focus on matters other than their science

By

- enriching their activities with the information that enables sharing and reuse of their scientific workflows
- making their research objects ready for publication

Virtual Laboratories

Data sharing

- Workspace
- Dataspace
- Repositories

Data analytics

- High Throughput Computing
- Notebook
- RStudio

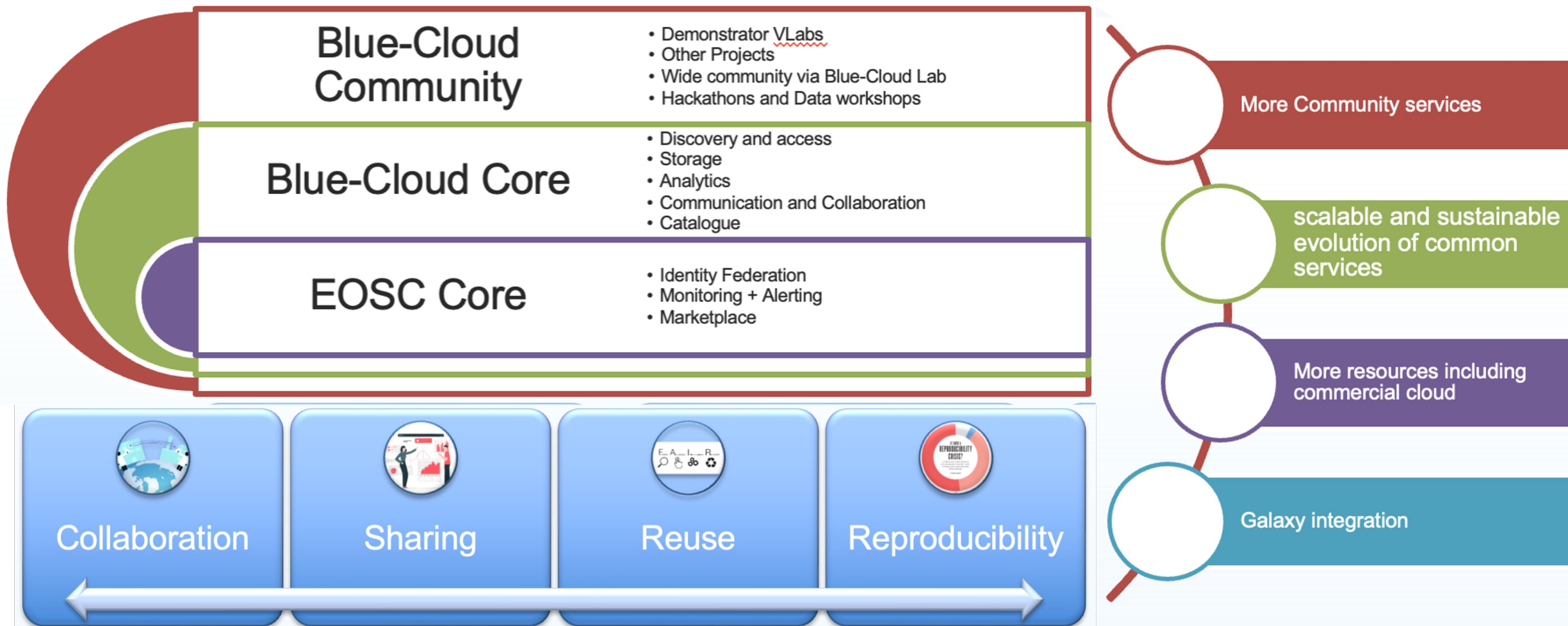
Social networking

- Messages
- Posts and replies
- User profiling

Research Object Publishing

- Catalogue
- Thredds
- GeoNetwork

It is implemented as a System of Systems promoting Open Science



Blue-Cloud 2026 Virtual Labs and WorkBenches

Example of real life applications



 Coastal Ocean observations along Europe

 new!
Coastal currents from observations

 Carbon-Plankton Dynamics

 Marine Environmental Indicators

 Global Fisheries Atlas

Blue Data Infrastructures

 EurOBIS
European Ocean Biodiversity Information System

 Copernicus Marine Service

 SeaDataNet

 EMODnet
CENTRAL PORTAL
Your gateway to marine data in Europe

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 EcoTaxa 2.5

 MGnify

 ENA
European Nucleotide Archive

 Euro-Argo

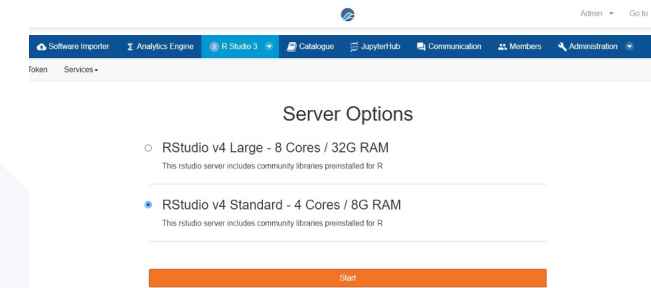
 JERICO RESEARCH
INFRASTRUCTURE

 emso ERIC
EUROPEAN RESEARCH INFRASTRUCTURE CONSORTIUM

 ICOS
Integrated Carbon Observation System

 SIOS

Blue Cloud VRE



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Data Catalogue

eosc

zenodo

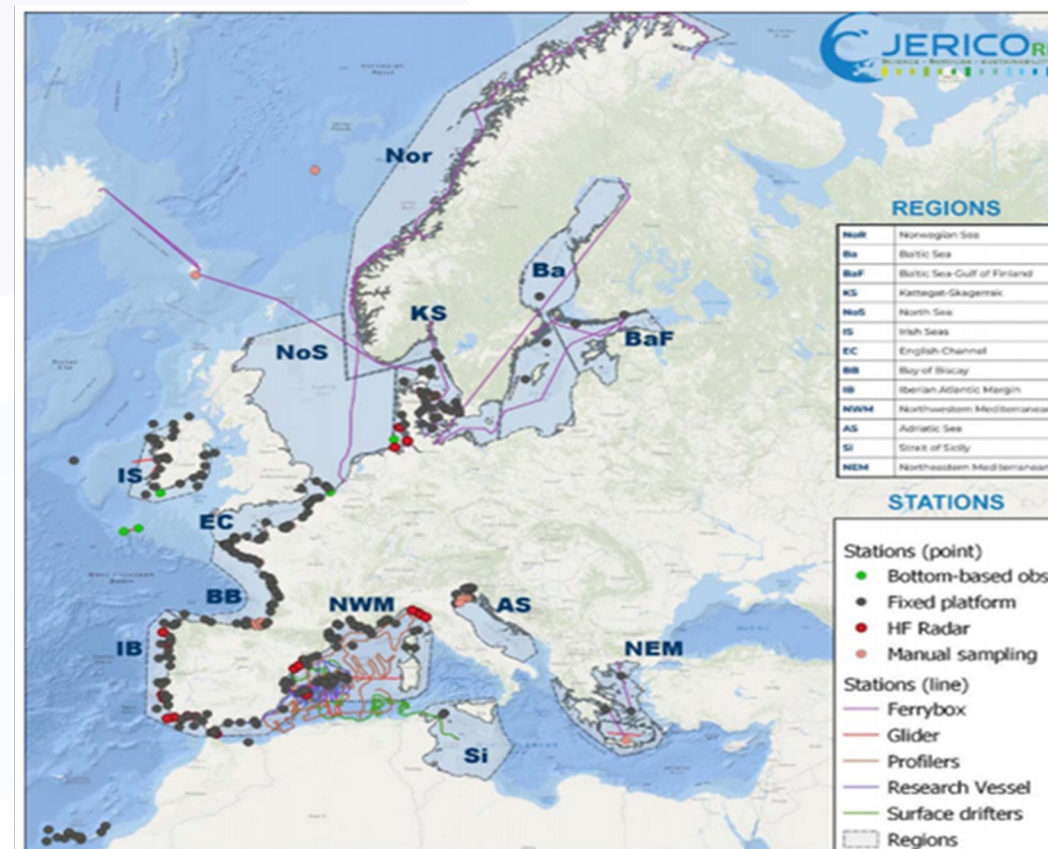




Integration of European coastal observations in 3 thematic services: **Transboundary Processes and Connectivity (i.e. contaminants spread), Extreme Events & Ocean Glider**



- 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
- SST fields
- NEMO 3D T,S, SSH, Current
- ERA5 Surface Meteo Params
- Physics, BGC, Biology
- Physics, Chemistry, Biology, Bathymetry
- Bathymetry





physical workbench for
temperature, salinity



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



ecosystem workbench
for plankton biomass
and diversity

The objective is to obtain **highly qualified datasets** for some chosen Essential Ocean Variables (EOVs) combining different and various sources as inputs.

→ The results will be 1 highly qualified dataset per EOv

Workbenches or pipelines will be built to obtain the highly qualified datasets that can use other data sources or be adjusted depending on expert needs

The challenge is to deal with large in situ datasets, i.e. to both access the relevant data and make developments on it. Blue Cloud 2026 will allow this thanks to the high level performance D4science VRE based on cloud computing associated with big data technology, a large datasets repository (datalake) and an expert data management.

Blue-Cloud 2026 Training Academy & Outreach





The **Training Academy** offers lessons and materials that guide users and marine researchers in utilising Blue-Cloud services.

A dedicated series of webinars focuses on FAIR data management for marine science.

Also thanks to new international partners, our content is reaching specialist audiences in extra-EU countries more than in the previous project.

**Upcoming Training webinar:
March 2024**

blue-cloud.org/training-academy



Training materials & user guides

Optimising FAIRness of federated Blue Data Infrastructures. Blue-Cloud Training Academy, Webinar #2

📅 Uploaded on: 06 December 2023

👤 Dick Schaap; Thierry Carval; Raul Bardaji

The webinar gave information about the Blue-Cloud initiative and more details about the architecture and approach for the Blue-Cloud Federated Data Discovery & Access Service (DD&AS).... [Read more](#)

👁 120 views 📄 111 downloads

FAIR Data Principles 1: Foundational components, best practices and standards. Blue-Cloud Training Academy, Webinar #1

📅 Uploaded on: 26 September 2023

👤 SIMONCELLI, Simona; GARELLO, René; GIORGETTI, Alessandra; Pittonet Gaiarin, Sara; Kokkinaki, Alexandra; Rettberg, Najla; Thijssen, Peter

This webinar is the first in a series of three Blue-Cloud 2026 Training Academy webinars on FAIR Data Principles, to be held from September 2023 to March 2024.... [Read more](#)

👁 155 views 📄 254 downloads



IMDIS 2024 - Bergen (Norway), 27-29 May 2024

International Conference on Marine Data and Information Systems



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