Blue-Cloud2026

Blue-Cloud is now officially recognized as the **EOSC Node | European Digital Twin Ocean**. It is championing a vision where major EU marine knowledge assets (i.e. EMODnet, Copernicus Marine, EDITO), environmental and marine Research Infrastructures (from ESFRI and beyond) are combined to establish an EOSC Node that will drive marine data provision and open science developments in EOSC.

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blue-cloud.org


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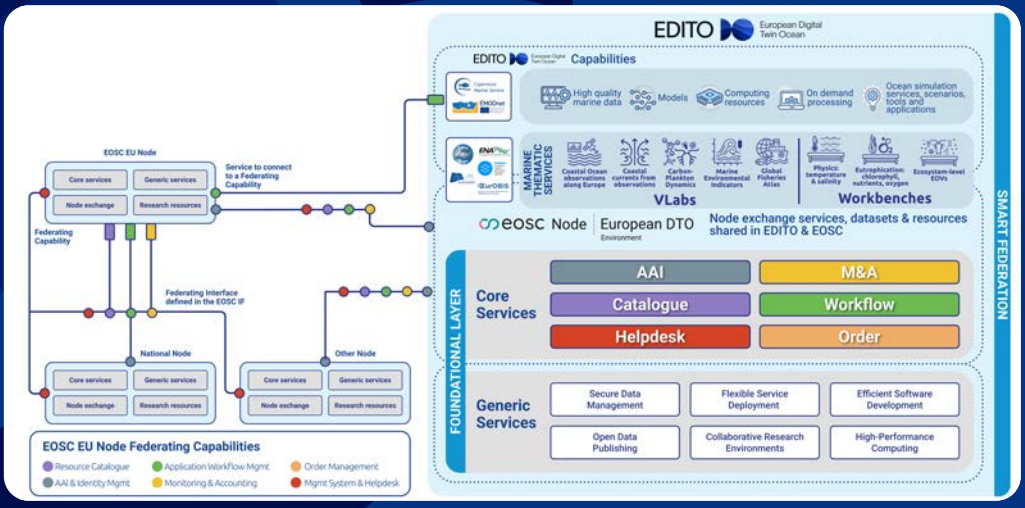
EOSC Node | European DTO

Environment

Between 2019 and 2026 the Blue-Cloud project piloted a marine thematic node within the European Open Science Cloud (EOSC) for quality marine science in support of the European Digital Twin of the Ocean programme and its implementing facilities.

Following the success of this pilot phase, this proven infrastructure and community have evolved.

The objective of the EOSC Node | European Digital Twin Ocean is to consolidate a marine thematic node in EOSC, establishing the technical and governance conditions that will guide the transition towards becoming a core component of the EDITO core infrastructure platform of the European Digital Twin Ocean.



Learn more about how Blue-Cloud is contributing to the EOSC

Core services

Core services

Core capabilities that enable the operation of the Node, such as the Gateway, the Catalogue, AAI, Helpdesk and more.

These services start with TRL8 and ensure compliance with EOSC minimal node requirements and provide the essential technical capabilities for a trusted and secure federated system in the entire research data lifecycle, from discovery and access to analysis and publication.

- **Gateway**
- **Resource Catalogue**
- **AAI & Identity Mgmt**
- **Service Monitoring & accounting**
- **Application Workflow Mgmt**
- **Order Management**
- **Helpdesk**

Generic services

A set of ready-to-use digital environments, permitting users to move comfortably from raw data to scientific insight. They integrate cloud computing, workflow management, and collaborative functionalities, making it possible to design, test, and publish research directly within the Virtual Research Environment (VRE).

- **File Sync & Share (Workspace)**
- **RStudio**
- **JupyterHub**
- **Galaxy**
- **Collaborative Computing Platform (CCP) services**

Spatial Data Infrastructure (SDI) Facilities

Suite of tools for managing and sharing large volumes of unstructured and semi-structured data with flexible data models, to efficiently access, subset, and analyze data within data lakes, making large datasets more manageable and interoperable.

- **NoSQL Database**
- **Relational Database**
- **DD&AS**
- **Beacon**

Essential Ocean Variables Workbenches

A number of data-intensive Workbenches for selected Essential Ocean Variables (EOVs) are being developed and tested in Blue-Cloud 2026. Ocean and data scientists will implement efficient workflows that allow them to harmonise, validate and qualify large and various in situ data sources, exploiting the blue analytical services available in the Blue-Cloud Virtual Research Environment.

Physics: temperature & salinity

This Workbench will implement a cloud-based workflow to generate harmonised, validated and customisable EOV data collections for temperature and salinity, integrating datasets released from different EU and non-EU data infrastructures for the test region of the Mediterranean Sea. The optimised workflow will allow users and big data infrastructures to rapidly/systematically derive and upgrade integrated data collections and generate different datasets as e.g. gridded climatologies.

Eutrophication: chlorophyll, nutrients, oxygen

This Workbench will define and implement an efficient production workflow to merge, aggregate and harmonise multi-source datasets managed by Copernicus Marine Service, EMODnet Chemistry and the World Ocean Database, together with key EU RIs and build highly qualified EOV datasets for eutrophication variables: chlorophyll, nutrients, oxygen. Tested for the North East Atlantic, the aim is to further extend it to the global ocean during the last year of the project.

Ecosystem-level EOVs

This Workbench will improve the availability, quality and interoperability of large collections of plankton observations based on traditional counts, quantitative imaging and genomic methods available from the EMODnet/EurOBIS and ELIXIR data infrastructures. It will develop a generic modelling workflow to generate high-quality interpolated maps of the global distribution of these plankton entities. It will generate ecosystem-level EOVs following clear QA/QC steps and according to best practices in habitat modelling.

Thematic Virtual Labs

Carbon-Plankton Dynamics

This model will use carbon units to study nutrient availability, productivity, organic matter, and interactions in marine regions beyond MIRAMARE.

Global Fisheries Atlas

Expanding operational fisheries VLabs in Blue-Cloud, enabling global access to fisheries data. Experience enhanced knowledge management and spatial data interoperability for impactful research and insights.

Coastal currents from observations

Improve integration and accuracy of ocean surface current data with Blue-Cloud 2026. Generate integrated maps using HF radar, drifter, and satellite altimetry data.

Integration of coastal ocean observations along Europe

Integrate diverse ocean data for enhanced knowledge base. Blue-Cloud 2026 combines JERICO-RI data, advanced visualisations, and expanded functionalities for valuable coastal insights.

Plankton Genomics

Enabling scientific exploration of plankton, including its distributions, dynamics and fine-grained diversity to molecular resolution, through genomics analysis.

Thematic Virtual Labs

Marine Environmental Indicators

This VLab enables monitoring, assessment, and decision-making for marine areas. Exploit diverse data sources in a unique analysis service for online computation of indicators.

Aquaculture Monitor

Delivering a tool to produce national aquaculture sector overviews for monitoring aquaculture in marine cages and in coastal areas.

Fish, a matter of scales

Improving data management and analytic capabilities for fisheries by expanding the Virtual Lab for the Fisheries Atlas and the Global Record of Stocks and Fisheries.

Zoo and Phytoplankton EOV products

Processing several data resources available under different European marine networks to produce unique zoo and phytoplankton EOV products.

Become familiar with Blue-Cloud 2026 Virtual Labs

Blue-Cloud as a research founding pillar of the Digital Twin of the Ocean

Digital Twins of the Ocean (DTO) will improve ocean knowledge and support science decisions based on the next generation of digital ocean models and marine information systems. Europe is building its own DTO with European data sets, which will be fed into the global Digital Twins of the Ocean (DITTO) initiative.
Blue-Cloud provides data services and analytical virtual labs that are essential for European and global twins for marine environments. Within the European Digital TwinOcean, the Blue-Cloud digital ecosystem could be considered as a research component, offering e-infrastructure services (computing, storage, analytics, Single sign-on (SSO), Authentication and Authorization Infrastructure (AAI) and generic services, orchestrated with a large variety of data resources), a federated data service (10M+ datasets and products from leading European marine data management infrastructures), and research intensive virtual labs, embedded in a powerful VRE, federating multiple e-infrastructures.

Learn more about how Blue-Cloud is contributing to the DTO

From Blue-Cloud to the EOSC Node
European Digital Twin Ocean
Blue-Cloud 2026 Conference

When **28 May 2026**

Where **Brussels** (Belgium)
at "Comet Louise, Pl. Stéphanie 20, 1050"

Audience Marine Researchers, Data Providers, Industry and Policy Makers

Over the past years, Blue-Cloud has played a foundational role in federating marine and environmental data, services, and analytical tools across Europe. Through close alignment with the EOSC, Blue-Cloud has demonstrated how cloud-based, open science environments can support ocean research, innovation, and policy making.

This work directly contributes to the objectives of the EU Mission: Restore our Ocean and Waters, the EU Digital Twin of the Ocean (including EDITO, its core public infrastructure), and the UN Ocean Decade, by enabling data-driven solutions for ocean sustainability.

Now, the project hands over a mature, policy-aligned digital legacy: the EOSC Node | European Digital Twin Ocean, is progressing towards operational integration within the EOSC Federation.

Join us at the event and get first-hand experience of the EOSC Node | European Digital Twin Ocean, and a clear view of Europe's path toward a federated, policy-aligned digital ocean ecosystem

Register to join us!

Submit your Poster

Blue-Cloud Training Academy

Unlock the potential of Open Science and FAIR data principles for marine research

Blue-Cloud Training Academy

Comprehensive lessons and materials that guide you in utilising Blue-Cloud services for Open Science in marine research. The Academy also hosts dedicated courses to foster the uptake of Open Science practices and explore the challenges and solutions in applying the FAIR foundational components, standard and practices towards data interoperability to achieve FAIRification in the marine data community.

Discover how to harness the power of our platform and embrace Open Science practices in the ocean science domain. Join us on this educational journey - check the Academy and sign up for the upcoming training opportunity.

In partnership with

GOOS

IODE International Oceanographic Data and Information Exchange

EuroGOOS European Global Ocean Observing System

unesco Intergovernmental Oceanographic Commission

IEEE

OTG@ OceanTeacher Global Academy

Ocean best practices

Blue-Cloud Training Academy

Three just-launched online courses to empower ocean scientists by providing a comprehensive understanding and practical skills in using Vlabs running in the Blue-Cloud 2026 VRE.

Blue-Cloud Training Academy

The online courses, available on the IOC OceanTeacher Global Academy (OTGA), offer video lessons and supporting material organised in different modules, according to the topic of each course. The estimated time to complete each self-paced course is approximately 4 hours. The courses are available until 31 July 2026 and are all free of charge. Audience: Researchers, data scientists, academic professionals involved in ocean science and related fields who are interested in enhancing their research capabilities through advanced digital tools and collaborative platforms.

Access the courses now

Coastal currents from observations

Learn how to use a multi-source approach framework to study and reconstruct surface currents through a variational inverse method.

Carbon-Plankton Dynamics

Utilise models to study carbon plankton and apply them to make decisions related to the carbon pump mechanism based on data products and modelling output.

Global Fisheries Atlas

Increase knowledge and skills to effectively navigate, utilize and customize the Global Fisheries Atlas Virtual Lab for accessing, analyzing, and contributing to global fisheries data and research.

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