Core services: Virtual Research environment

An Open Science platform for collaborative marine research, using a wide variety of datasets and analytical tools, complemented by generic services such as sub-setting, pre-processing, harmonising, publishing and visualisation. The VRE hosts different Virtual Labs and is going to include thematic Workbenches, which users can access with existing credentials in EOSC, the European Open Science Cloud. The Blue-Cloud Marine Node implements several core capabilities, as defined by the EOSC Federation Handbook, to ensure effective operation and service deliver such as the Catalogue, AAI, the Gateway and more.

Generic services

• Workspace   • Galaxy
• RStudio   • CCP services
• JupyterHub

Data management facilities

• NoSQL Database   • DD&AS
• Relational Database   • Beacon

Marine Thematic Services

Virtual Labs offer data products and analytical tools within the Virtual Research Environment (VRE). These VLabs serve as real-life demonstrators for web-based open science and are available for testing by research communities within the EOSC federation. The VLabs offer applications for data processing, publishing data results, and managing computation routines. They also provide innovative services in the form of data products and analytical tools, showcasing the added value of web-based open science.

Coastal Ocean observations along Europe

Coastal currents from observations

Carbon-Plankton Dynamics

Marine Environmental Indicators

Global Fisheries Atlas

Physics: temperature & salinity

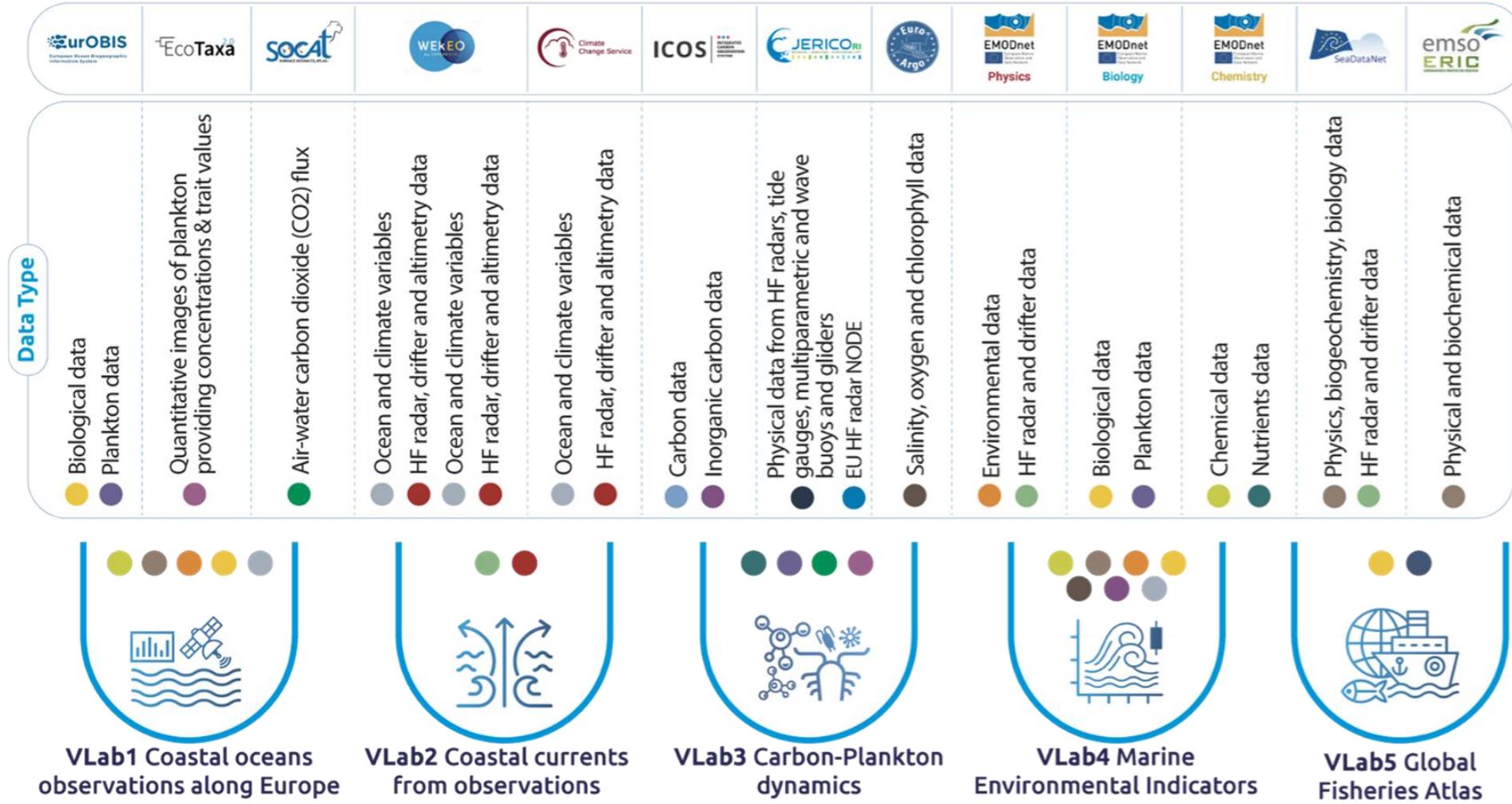Eutrophication: chlorophyll, nutrients, oxygen

Ecosystem-level EOVs

VLabs

Workbenches

EuroGOOS
European Global Ocean Observing System

eosc | Blue-Cloud2026

hidrográfico marinha-portugal

VLIZ

JERICORI

AQUARIUS

amrit

Virtual Laboratories Data Types

Data Type

Source	Data Types
EurOBIS	Biological data; Plankton data
EcoTaxa	Quantitative images of plankton providing concentrations & trait values
SOCAT	Air-water carbon dioxide (CO2) flux
WEkEO	Ocean and climate variables; HF radar, drifter and altimetry data
Climate Change Service	Ocean and climate variables; HF radar, drifter and altimetry data
ICOS	Ocean and climate variables; HF radar, drifter and altimetry data
JERICO RI	Carbon data; Inorganic carbon data
Euro Argo	Physical data from HF radars, tide gauges, multiparametric and wave buoys and gliders; EU HF radar NODE
EMODnet Physics	Salinity, oxygen and chlorophyll data
EMODnet Biology	Environmental data; HF radar and drifter data
EMODnet Chemistry	Biological data; Plankton data
SeaDataNet	Chemical data; Nutrients data
emso ERIC	Physics, biogeochemistry, biology data; HF radar and drifter data; Physical and biochemical data

VLab1 Coastal oceans observations along Europe

VLab2 Coastal currents from observations

VLab3 Carbon-Plankton dynamics

VLab4 Marine Environmental Indicators

VLab5 Global Fisheries Atlas

EuroGOOS
European Global Ocean Observing System

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Integration of Coastal observations along Europe

This Virtual Lab implements an environment that is specifically designed to widely expand user's ability to access, integrate and exploit observations collected along the European coastal ocean areas, with particular focus to the observations provided by the partners of the Joint European Research Infrastructure for Coastal Observatories (JERICO-RI).

Partners Involved

hidrográfico marinha-portugal

SOCIB
Balearic Islands
Coastal Observing
and Forecasting System

IEEE
France Section

Data Sources

CMEMS, EMODnet Physics, Geology, Biology, Bathymetry and Human Activities, SOCIB Data Repository, IH, PdE, PLOCAN.

Coastal Currents from Observations

This Virtual Lab provides a service to generate integrate ocean surface current maps from direct and indirect current measurements derived from different sources, High Frequency (HF) radar.

Partners Involved

SOCIB
Balearic Islands
Coastal Observing
and Forecasting System

LIÈGE université

cmcc
Centro Euro-Mediterraneo
sui Cambiamenti Climatici

Data Sources

CMEMS, GEBCO, EMODnet Bathymetry, NOAA, Open Street Map, ECMWF.
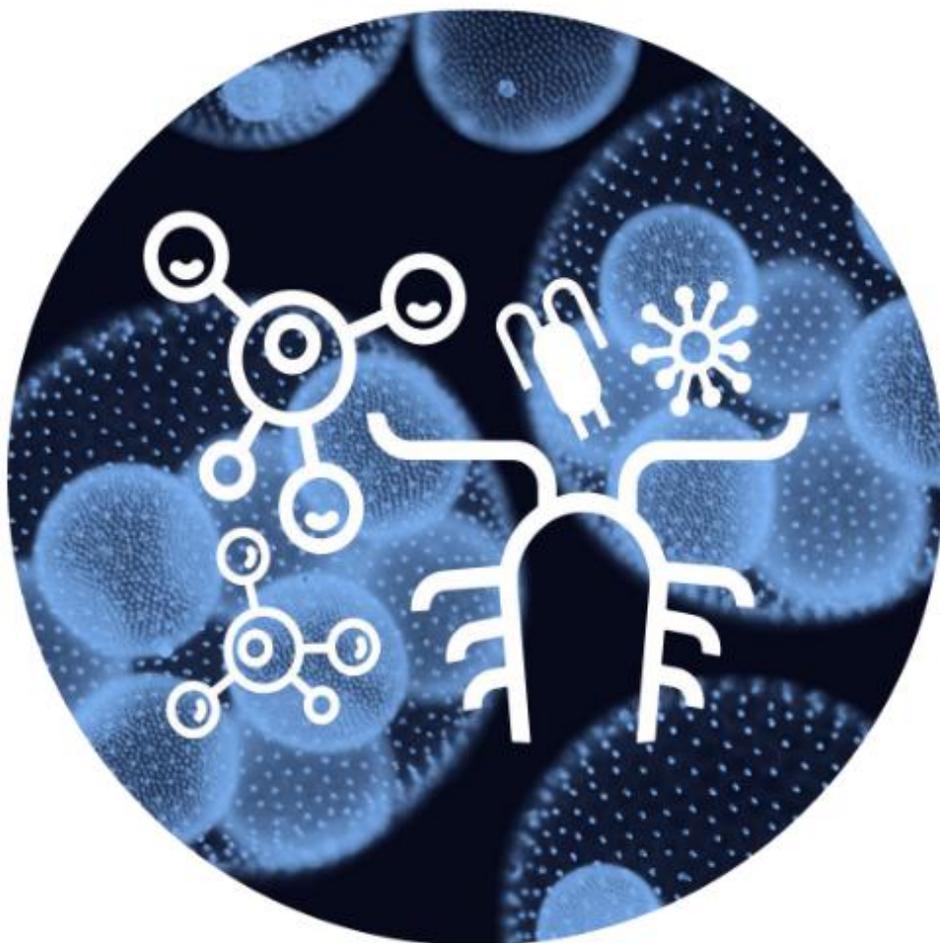
Carbon Plankton Dynamics

This Virtual Lab provides a service to analyse the relative contribution of the drivers in phytoplankton dynamics in the Belgium part of the North Sea and the northern Adriatic Sea.

Partners Involved

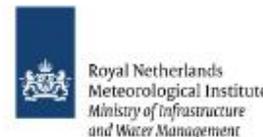VLIZ   OGS

Data Sources

EMODnet Biology/EurOBIS, EMODnet Chemistry, SOCAT, ICOS-Carbon portal.
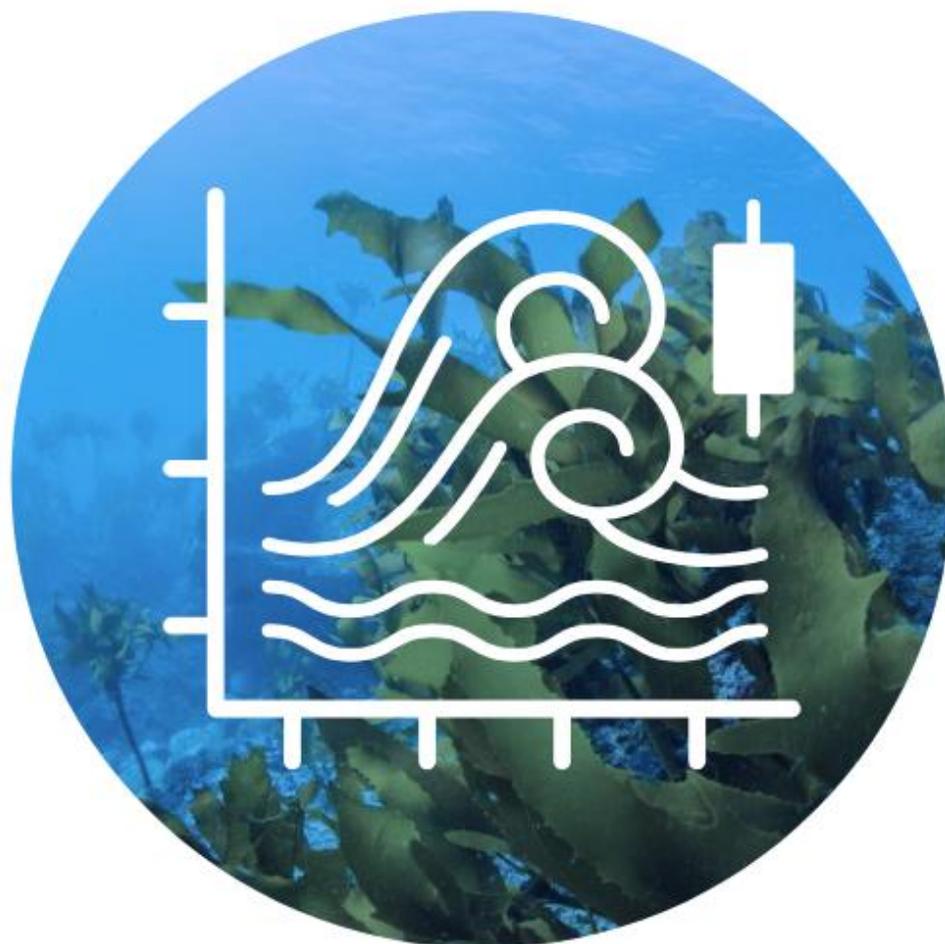
Marine Environmental Indicators

The VLab aims to develop a web application that allows users to monitor and assess the environmental status of marine areas, by performing online spatio-temporal analysis with the implemented algorithms, for selected environmental variables.

Partners Involved

cmcc
Centro Euro-Mediterraneo
sul Cambiamenti Climatici

Royal Netherlands
Meteorological Institute
*Ministry of Infrastructure
and Water Management*

ISTITUTO NAZIONALE
DI GEOFISICA E VULCANOLOGIA

OGS

Data Sources

Copernicus Marine Service, Copernicus Climate SeaDataNet, World Ocean Database, EMODnet.

Global Fisheries Atlas

This Virtual Lab's mission is to help making fisheries data FAIR and, by doing so, to provide a more comprehensive view of global fisheries to support informed decision-making and management of fisheries resources.

Partners Involved

IRD Institut de Recherche pour le Développement FRANCE

FORTH

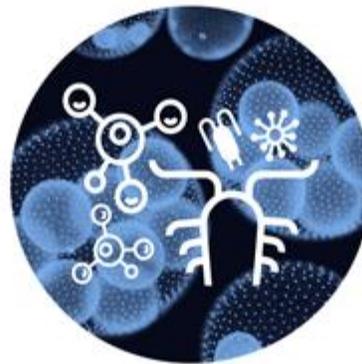FAO Food and Agriculture Organization of the United Nations

Data Sources

FIRMS (RFMOs), FishSource (Sustainable Fisheries Partnership), RAM, and FAO SDG14-4-1 Questionnaire.

OceanTeacher Global Academy

Coastal currents from observations

Carbon-Plankton Dynamics

Global Fisheries Atlas

A set of 4 hour **courses** designed to **empower ocean scientists** by providing a comprehensive understanding and **practical skills** in using some of the **Virtual Laboratories (VLabs)** running in the Blue-Cloud Virtual Research Environment (VRE).

EuroGOOS
European Global Ocean Observing System

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