

# Virtual Laboratories in the Blue-Cloud VRE

Operational science environments on D4Science for marine observations, modelling, indicators and fisheries knowledge services

## At a glance

All V Labs are running on D4Science in the Blue-Cloud VRE.

- 1 Blue-Cloud Gateway account required (For free!)
- 2 User handbooks (Jan 2025, Jan 2026)
- 5 Virtual Laboratories
- 5 OTGA self-paced training pathways

## Access, training and portfolio overview

The project produced five domain-focused V Labs. Each combines data access, analysis services and reproducible workflows, while the handbooks and Ocean Teacher Global Academy courses support onboarding and re-use.

- Register on the Blue-Cloud 2026 Gateway before accessing services.
- Handbooks document data sources, how-to workflows and options to include additional data.
- Each V Lab is paired with a self-paced OTGA training course.

[V Lab 1 ICOoE](#)
[V Lab 2 Coastal Currents](#)
[V Lab 3 Carbon-Plankton](#)
[V Lab 4 Indicators](#)
[V Lab 5 Fisheries Atlas](#)

## Contributing teams acknowledged in the source text

- V Lab 1:** Instituto Hidrográfico, SOCIB, IEEE
- V Lab 2:** Université de Liège, CMCC Foundation
- V Lab 3:** Flanders Marine Institute, VLIZ, National Institute of Oceanography and Applied Geophysics - OGS
- V Lab 4:** CMCC, INGV, OGS, KNMI, Nubisware
- V Lab 5:** IRD, FORTH, FAO and tuna RFMO / FIRMS data managers

eosc | Blue-Cloud2026 + D4SCIENCE

Five V Labs, two handbooks and a complete training path for marine research communities.

[Reproducible science services](#)
[Gateway onboarding](#)
[Self-paced learning](#)

## How to use the V Labs

### User handbooks

Released in January 2025 (beta) and January 2026 (latest version).

### Gateway access

Users first create an account on the Blue-Cloud 2026 Gateway; the first section of the handbook explains the steps.

### Training

A dedicated OTGA self-paced course has been developed for each V Lab to help users work with the services and outputs.

### Links & QR codes

URLs / QR codes for the Gateway, handbooks, V Lab pages and course pages.

## Conference-ready link panel



D4Science Infrastructure Gateway



D.4.4 V Labs Users Handbook V2



Virtual Labs 2026



V Lab 2 course



V Lab 3 course



V Lab 5 course

## V Lab themes

### Observation integration

ICOOE unifies coastal observations and thematic services for connectivity, storms and gliders.

### Surface current reconstruction

Coastal Currents from Observations merges HF radar, drifters and altimetry using DIVAnd.

### Ecosystem and carbon modelling

Carbon-Plankton Dynamics provides NPZD simulations in carbon units.

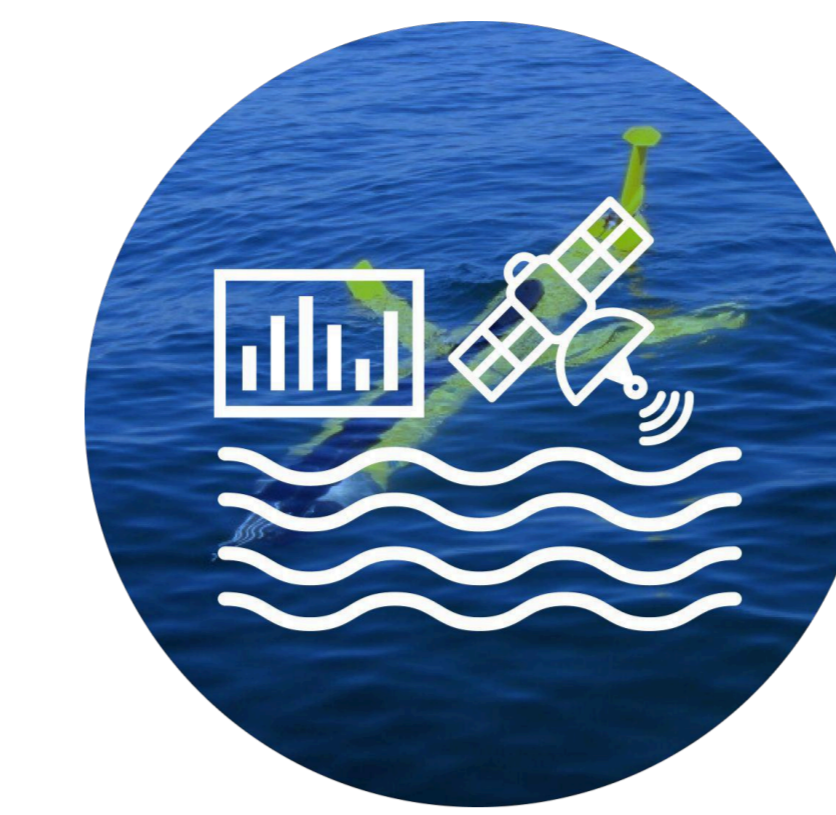
### Environmental indicators + fisheries knowledge

MEI supports ocean management

### Fisheries Global Atlas

GFA harmonises fisheries data and knowledge products.

## V Lab 1 | Integration of Coastal Ocean Observations along Europe (ICOOE)



### Coastal observations platform integrating JERICO-RI and other European Blue Data Infrastructures.

- Integrates coastal observations to study connectivity, contaminants, river outflows, extreme events and repeated glider sections.
- Offers dashboards, data reporting, QC/pre-processing, trajectory analyses, current-field statistics and glider processing/viewing tools.

Thematic services address transboundary transport, extreme events and ocean-glider added value.

TS1 Connectivity

TS2 Extreme Events

TS3 Ocean Glider

Partners:

## V Lab 2 | Coastal Currents from Observations



### Integrated surface current maps from HF radar, drifters and satellite altimetry using DIVAnd.

- Produces gridded NetCDF surface-current maps by merging HF radar, drifters and altimetry over coastal regions.
- Uses optimisation and validation against independent drifters, then supports Lagrangian trajectories and oil-spill simulations.

HF radar

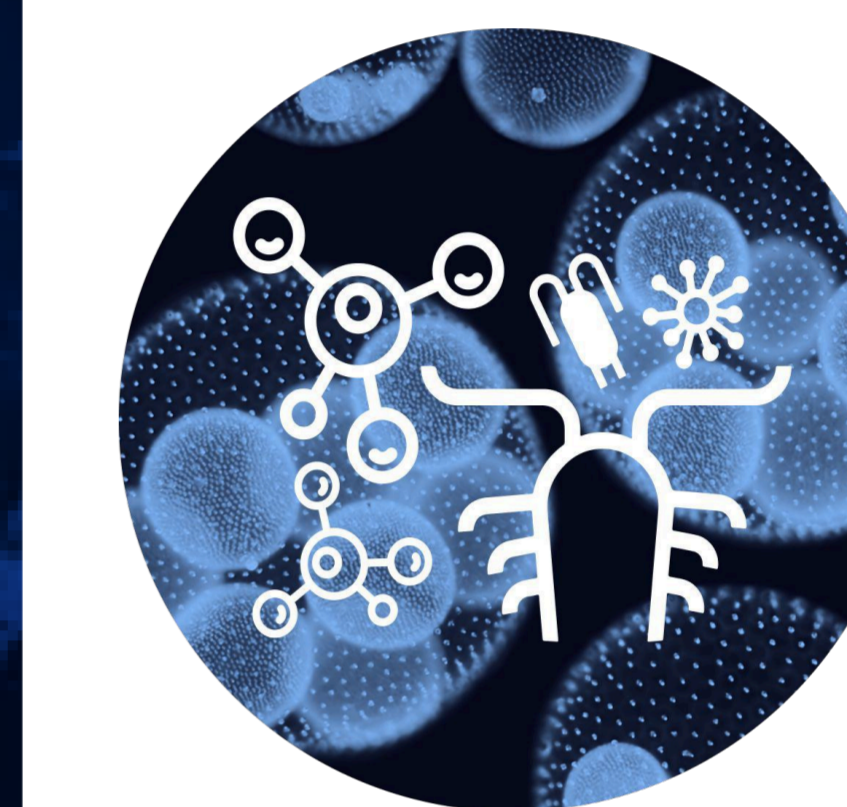
Drifters

Altimetry

DIVAnd

Partners:

## V Lab 3 | Carbon-Plankton Dynamics



### NPZD modelling in carbon units for plankton dynamics and carbon-flow simulations.

- Simulates nutrients, phytoplankton, zooplankton and detritus while tracking carbon flows.
- Provides Jupyter notebooks and an interactive RShiny app using SST, salinity, nutrients, pCO<sub>2</sub>, wind and pH forcing.

NPZD

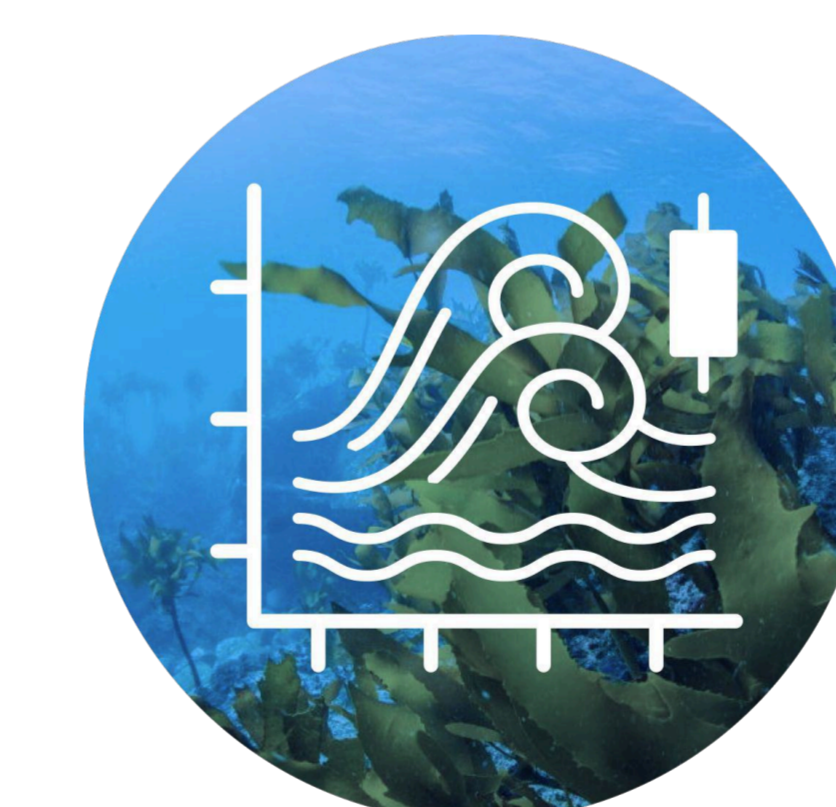
Jupyter Notebook

EDITO

RShiny

Partners:

## V Lab 4 | Marine Environmental Indicators



### Unified indicator workflows for marine environmental assessment and decision support.

- Computes Marine Heatwaves, Ocean Heat Content, TRIX eutrophication and Storm Severity Index v2 via notebooks and a dedicated web application.
- Produces maps, time series and downloadable outputs, with job handling through the VRE Analytics Engine and Cloud Computing Platform.

MHW

OHC

TRIX

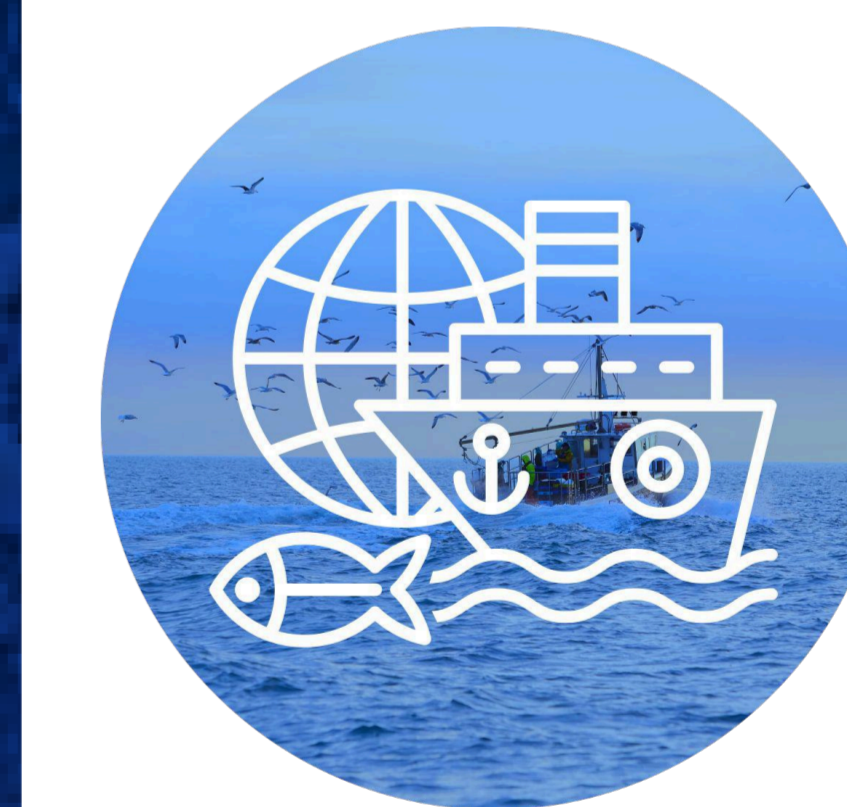
SSI v2

Web app

A video tutorial is available on the Blue-Cloud YouTube channel.

Partners:

## V Lab 5 | Global Fisheries Atlas



### Global fisheries knowledge and data services built from authoritative sources.

- Harmonises fisheries data and knowledge sources for graphical interfaces and programmatic access.
- Combines GRSF knowledge services with Global Tuna Atlas workflows, dashboards and web mapping, supported by GitHub, Zenodo DOIs and RStudio/CI environments.

GRSF KB

Tuna Atlas

RStudio

Zenodo DOIs

Partners:

