

eosc | Blue-Cloud2026

## ***Marine Environmental Indicators***

**A Virtual Lab to assess the  
environmental status of marine areas**

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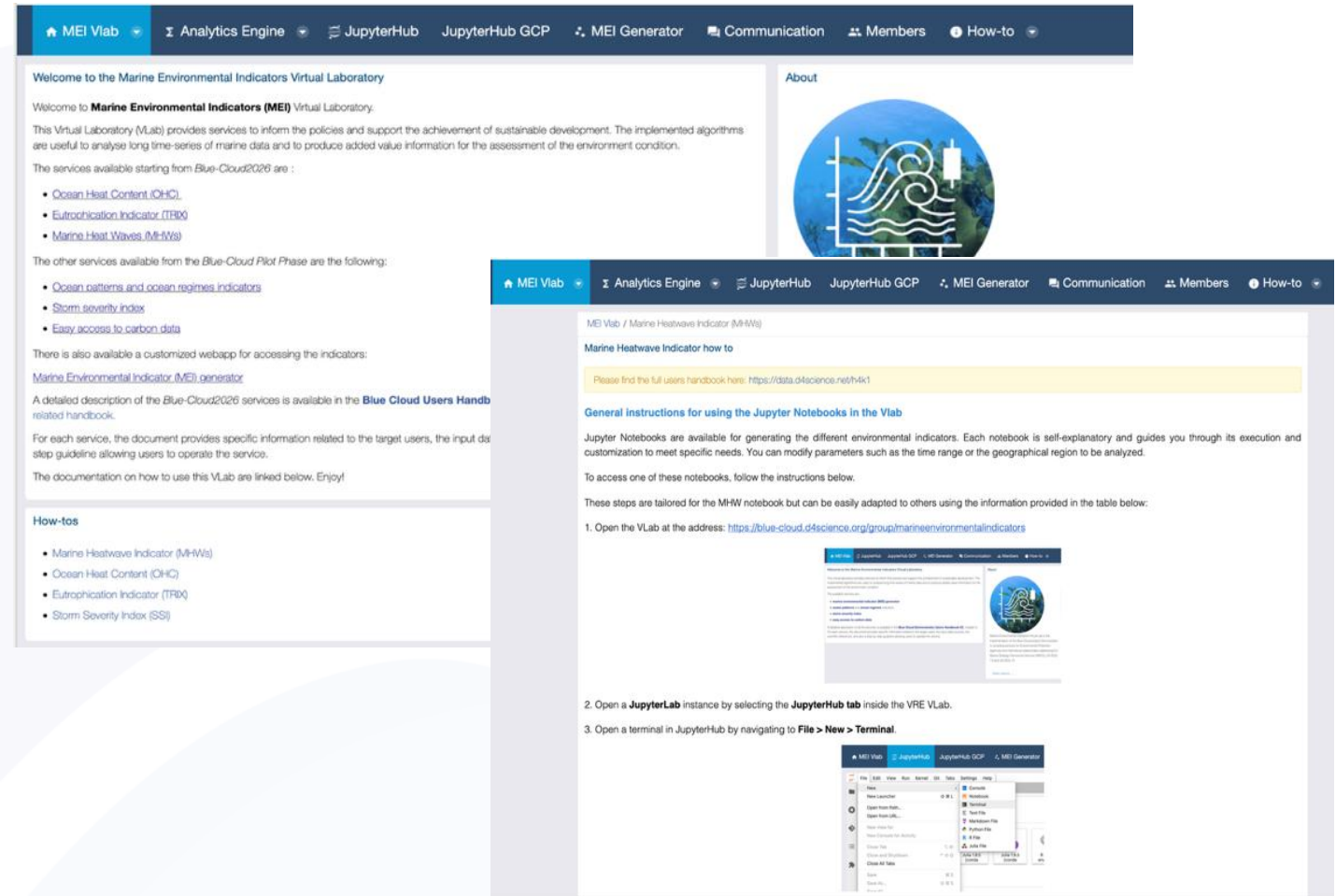
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**5-6 November 2025, Brussels [Belgium]**



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- Access to the web application and the Jupyter notebooks
- Latest indicators included:
  - Ocean Heat Content – OHC
  - TRIX
  - Marine Heat Waves - MHW
- Access to documentation for using the tools and description of the indicators (How-To pages, Handbooks)



How-Tos

Vlab URL: <https://blue-cloud.d4science.org/group/marineenvironmentalindicators>

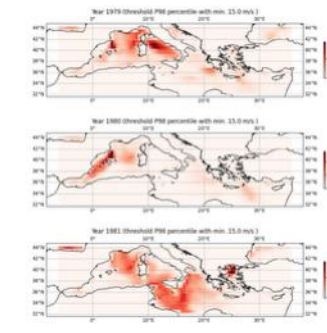
**MEI Generator** is a web application that provides on-demand computation of environmental indicators by sending customized requests to the **cloud-based computing** services of **Blue-Cloud D4Science VRE** platform.

Users can choose:

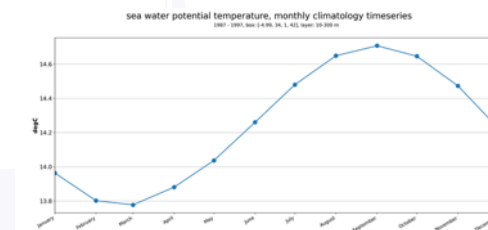
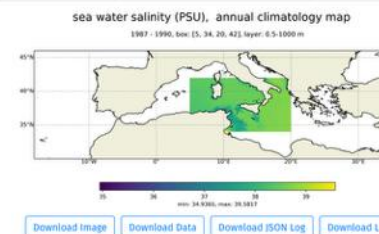
- *Method (algorithm)*
- *Output Type*
- *Data Source*
- *Time Range*
- *Area*
- *Depth ...*
- *Others additional specific parameters*

Method	Creation time	End time	Data source	Output Type	Area [lon,lat]	Depth [m]	Time range
Ocean Climate	2022-05-19T08:57:05Z	2022-05-19T09:00:18Z	MEDSEA_MULTIYEAR_PHY_006_004_BC	annual climatology map - Sea Water Salinity	[5,34]-[20,42]	[0.5, 1000]	1987/1990

## Storm Severity Index



## OceanClimate



Notebook: MHW-Maps

Version: v2.0-alpha

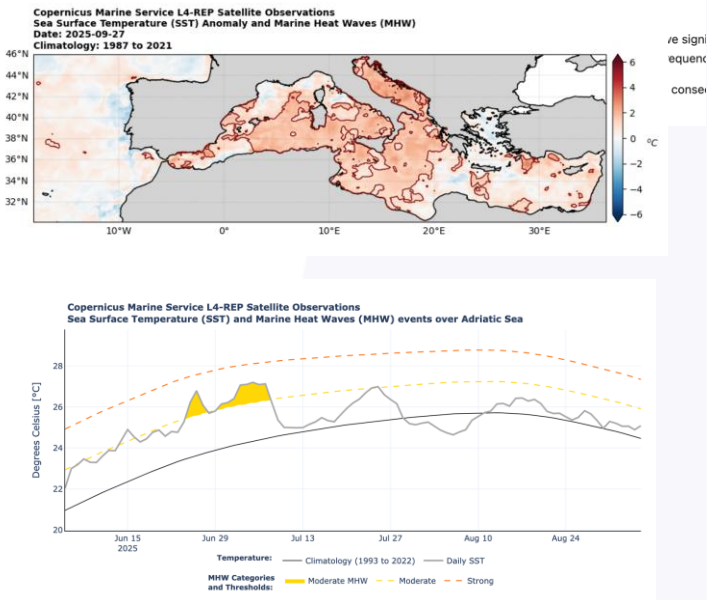
Last update: 2025-08-23

Authors: CMCC

Support: for any questions, suggestions, bugs found, please write to: < bc2026-support [at] cmcc [dot] it >

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Notebook: TRIX

Version: v1.0-beta

Last update: 2025-01-31

Authors: OGS

TROPHIC STATE INDEX - TRIX

The trophic state depends on the availability of nitrogen and phosphorus for primary production, which by total nitrogen and total phosphorus; chlorophyll-a is a substitute parameter for phytoplankton biomass. The trophic state index (TSI) is a parameter that indicates the production intensity of the system. This encompasses both phases of a trophic state index (TSI) and a trophic state index (TSI).

The following notebook should use the DIVAnd outputs from the eutrophication workbook.

- disclaimer: the notebook is in beta version since the datasets from the workbenches are not yet ready.

load the modules, you will probably need to install the following libraries:

TRIX by Season



Notebook: OHC

Version: v1.2-beta

Last update: 2025-09-15

Authors: INGV

Ocean Heat Content (OHC) as an Ocean Monitoring Indicator

The **Ocean Heat Content (OHC)** is considered an important **Ocean Monitoring Indicator** of ocean warming due to climate change. With about **90% of the excess heat** accumulated in the Earth system deposited in the world's ocean, the **Earth Energy Imbalance** is a key indicator of climate change.

OHC in the Mediterranean Sea

The **Mediterranean Sea** is the ocean region that shows the **highest warming** (Fig. 22), thus it is extremely important to have a **robust and reliable OHC indicator** for this region.

The **Copernicus Marine Service** also provides in its **Ocean Monitoring Indicators catalogue** the **Mediterranean OHC Anomaly Reprocessing**, but without a systematic yearly update.

The **Blue Cloud 2026 proposal** of OHC indicator would provide an **operational workflow** that allows rapid Mediterranean OHC monitoring. Moreover, the use of the **Workbench 1 EOVS dataset**, which integrates data from the four main BDIs, would maximize data spatial coverage.

Mathematical Definition of OHC

OHC has been defined within the **Copernicus Marine Service** (von Schuckmann et al., 2016) as the **deviation from a reference layer** (usually from the surface to 700 m or 2000 m depth):

$$OHC = \rho_0 C_p \int_{z_1}^{z_2} (T_l - T_r) dz$$

