



eosc

Blue-Cloud2026

# Marine Environmental Indicators Vlab in the Pilot Blue-Cloud

VRE and Labs Open Info Day - Webinar

17/03/2023

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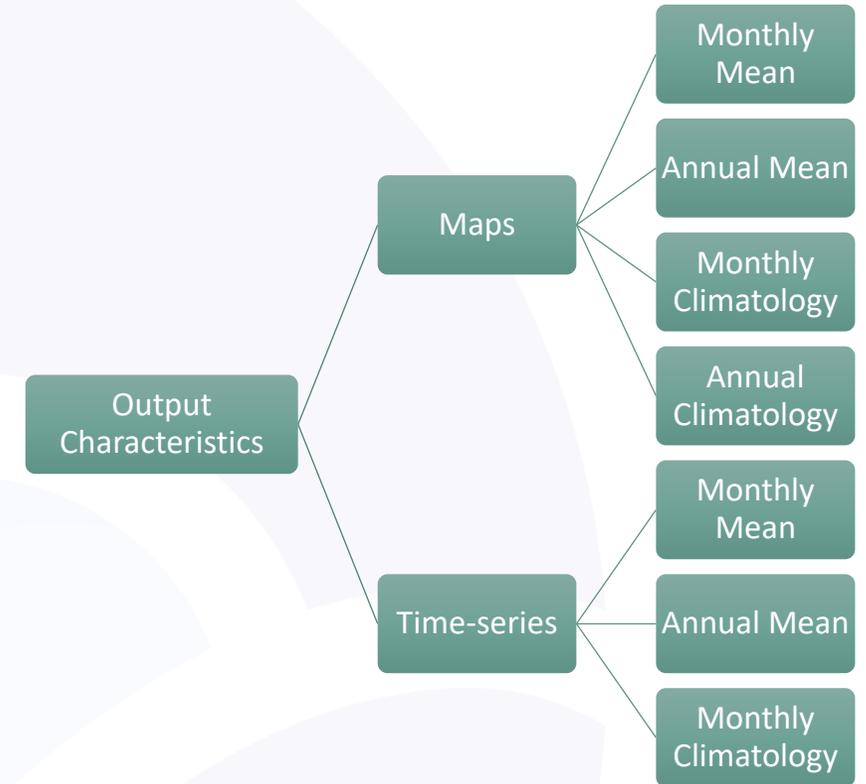
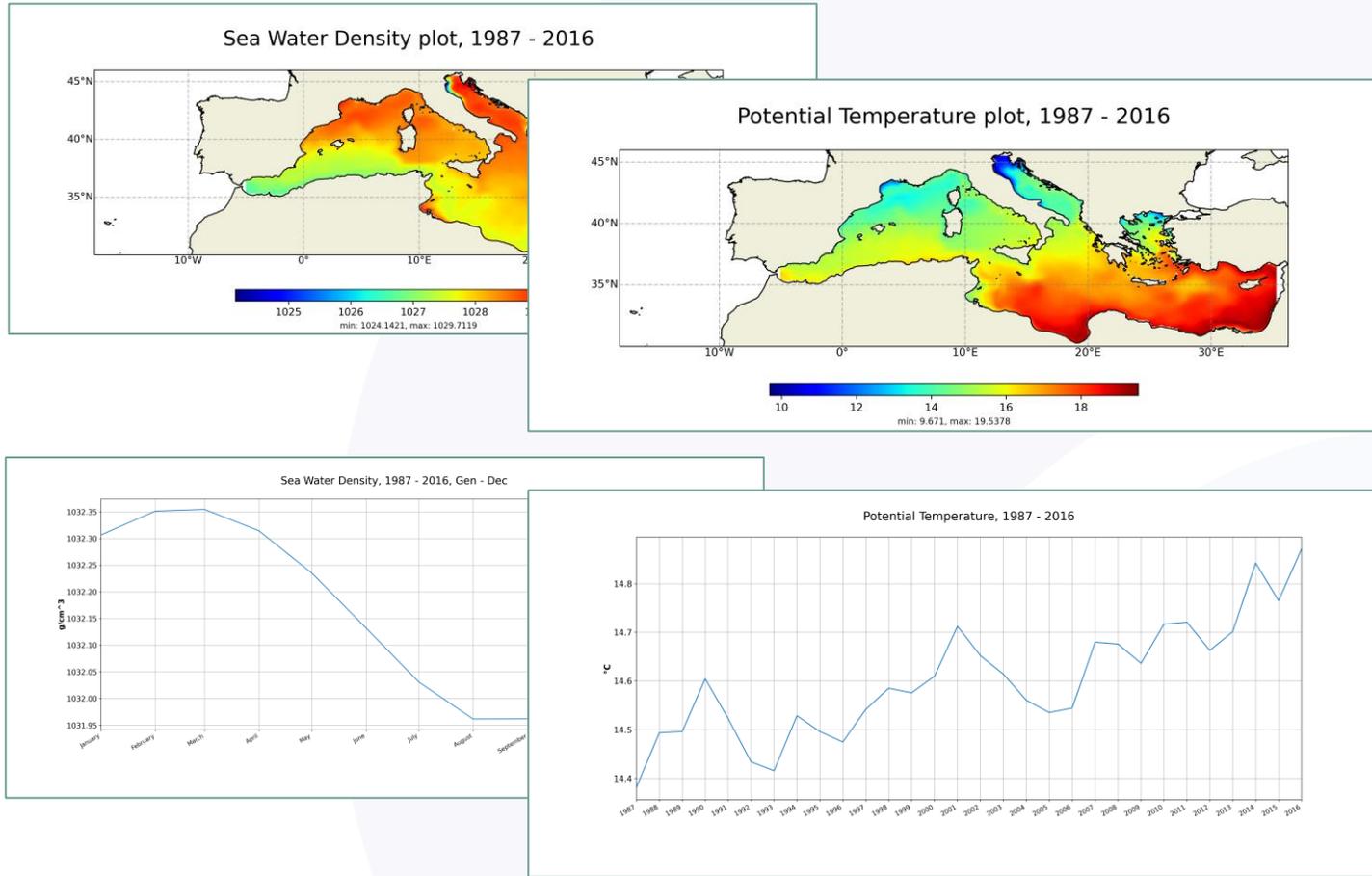
CMCC



Funded by  
the European Union

- Study of sea condition and trend for annual, seasonal and monthly periods
- Data source : Copernicus Marine Service MED and GLO Reanalysis products (model data)

→ OFFLINE COMPUTED



MEI is a web application that provides **cloud based online computation** of new added-value data through the submission to the *D4Science “Data Miner”* of customized requests.

The user can choose:

- *Method*
- *Output Type*
- *Data Source*
- *Time Range*
- *Area*
- *Depth*
- ...
- additional specific parameters

Available outputs | Generate output | My requests | Help

Method: Ocean Climate

Output type: annual climatology map

Data source: MEDSEA\_MULTIYEAR\_PHY\_006\_00

Output Field: Sea Water Salinity

Time range: 1987 to 1990  
Extension from 1987 to 2015

Area: Lat: 34 to 42, Lon: 5 to 20  
Extension from 30.17 to 46.00  
Extension from -6.021 to 36.31

Depth: From: 0.5, To: 1000  
Extension from 0 to 5808

Execute process

Leaflet | Tiles © Esri — Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, UPR-EGP, and the GIS User Community

- Presentation of the Vlab with the links to the different customized products developed using the VRE Services
- Header buttons to access the different available VRE services in this Vlab



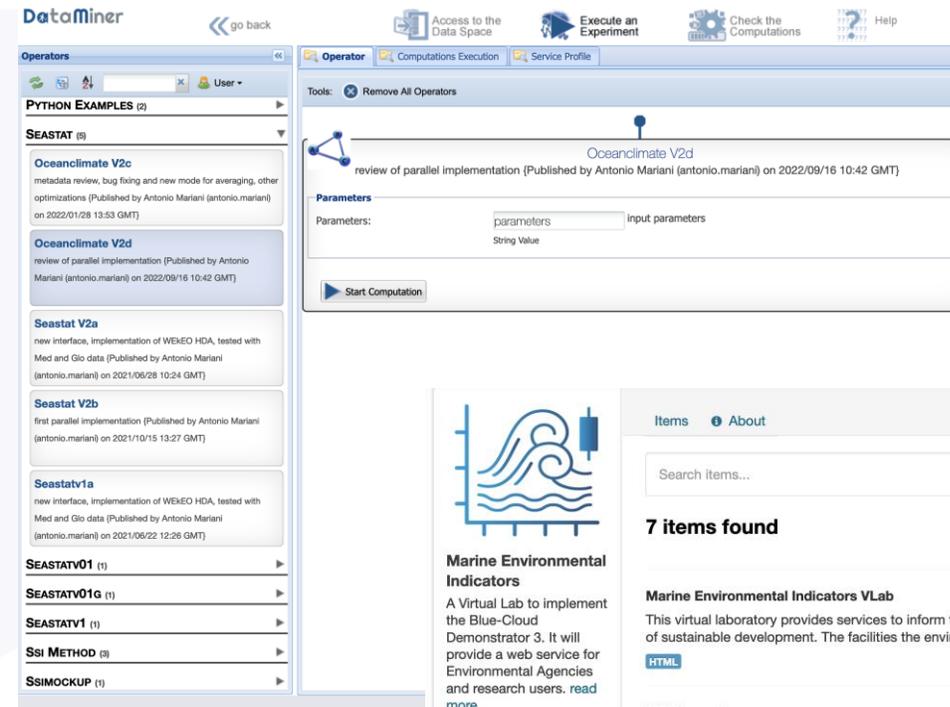
The screenshot shows the VLAB Home page with a dark blue header containing navigation links: Marine Environmental Indicators Home, Software Importer, Analytics Engine, JupyterHub, GeoNetwork, Catalogue, and MEI Generator. Below the header are buttons for Communication and Members. The main content area is titled 'Welcome to the Marine Environmental Indicators Virtual Laboratory' and includes a paragraph about the lab's purpose, a list of services (MEI generator, ocean patterns/regimes, storm severity index, and carbon data access), and a reference to a handbook. A right-hand sidebar titled 'About' features a line graph icon and text describing the lab as an implementation of the Blue-Cloud project Demonstrator 3. The footer contains legal links and a European Union funding acknowledgment.

Request Support

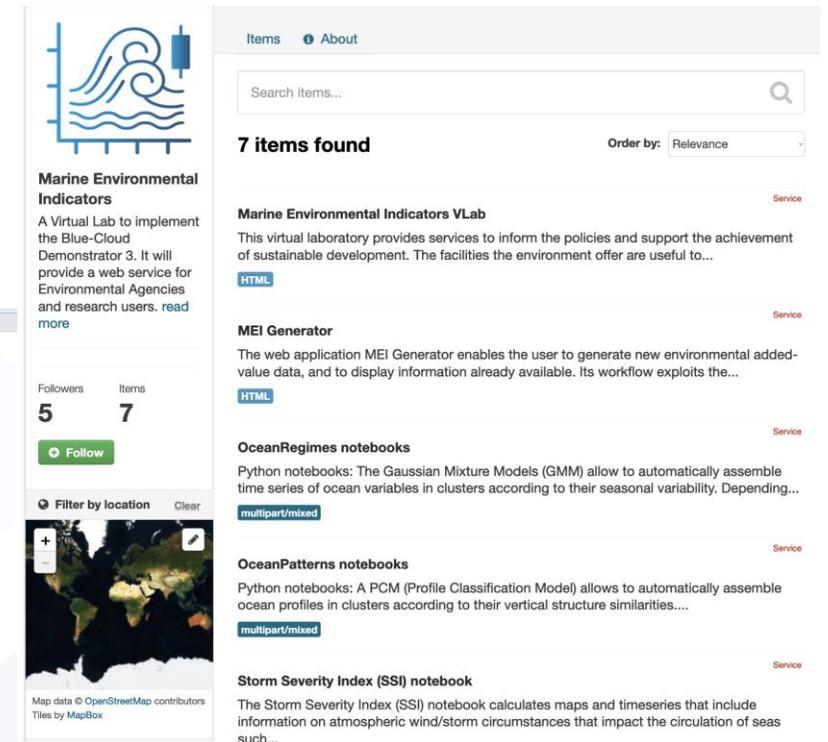


## MEI uses many VRE services:

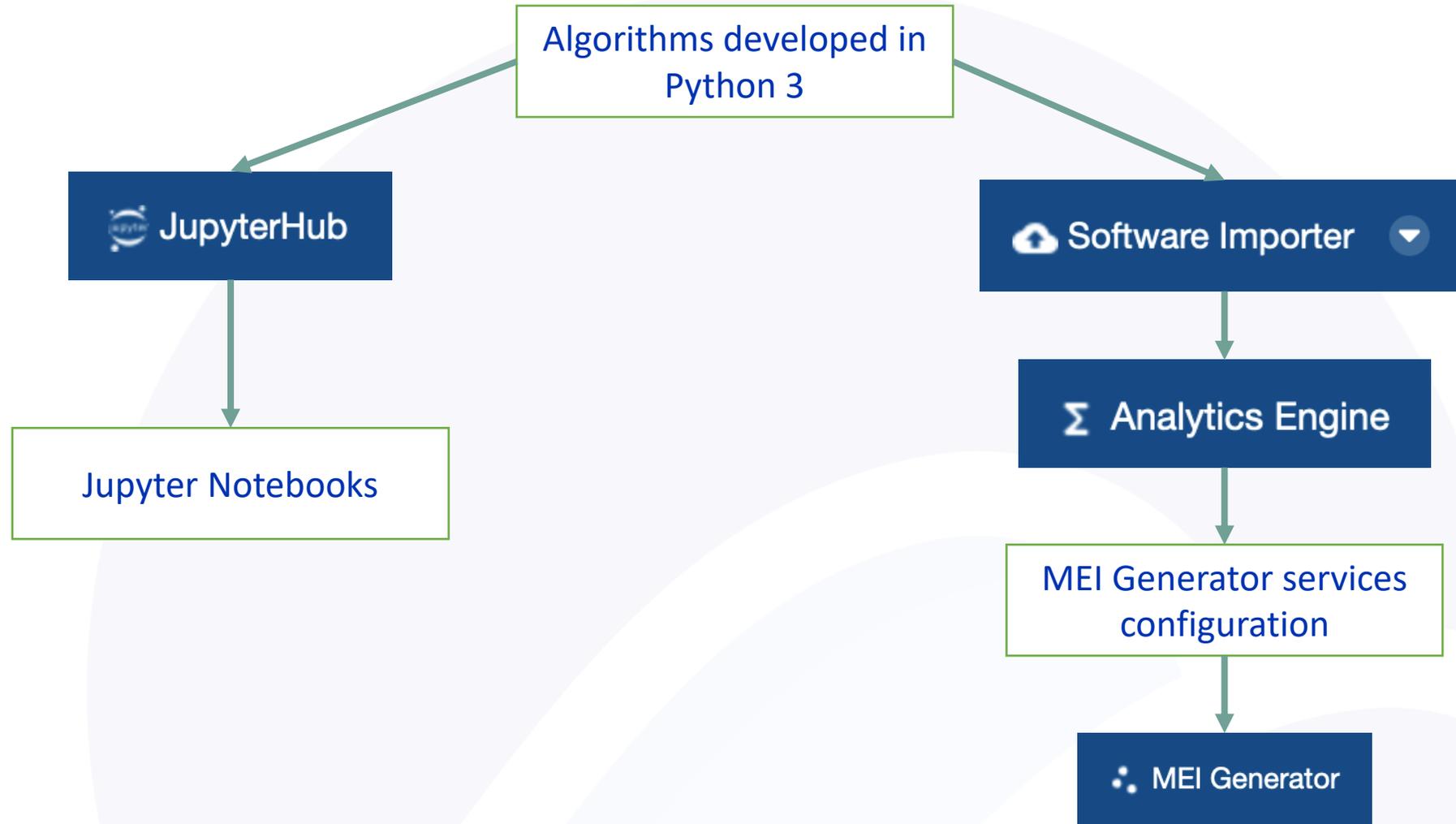
-  Software Importer
-  Analytics Engine (Data Miner)
-  JupyterHub
-  Catalogue
- (Silver) Authentication REST API
- WPS [OpenGIS® Web Processing Service](#)
- Storage Hub
- Docker containers



The screenshot shows the DataMiner web interface. On the left, there is a sidebar with a list of operators under the heading 'Operators'. The operators listed include 'PYTHON EXAMPLES (2)', 'SEASTAT (8)', 'Oceancimate V2c', 'Oceancimate V2d', 'Seastat V2a', 'Seastat V2b', 'Seastatv1a', 'SEASTATV01 (1)', 'SEASTATV01G (1)', 'SEASTATV1 (1)', 'SSI METHOD (3)', and 'SSIMOCKUP (1)'. The main area on the right shows the details for the 'Oceancimate V2d' operator. It includes a title 'Oceancimate V2d', a description 'review of parallel implementation (Published by Antonio Mariani (antonio.mariani) on 2022/09/16 10:42 GMT)', and a 'Parameters' section with a 'parameters' input field and a 'String Value' label. There is a 'Start Computation' button at the bottom of the operator view.



The screenshot shows a search results page for 'Marine Environmental Indicators'. At the top, there is a search bar with the text 'Search items...' and a magnifying glass icon. Below the search bar, it says '7 items found' and 'Order by: Relevance'. The first item is 'Marine Environmental Indicators VLab', described as 'This virtual laboratory provides services to inform the policies and support the achievement of sustainable development. The facilities the environment offer are useful to...'. Below this, there are several other items, each with a 'Service' tag and a 'HTML' link. At the bottom of the page, there is a 'Follow' button and a 'Filter by location' section with a 'Clear' button. The page also features a small map of the world and a 'Map data © OpenStreetMap contributors Tiles by MapBox' footer.



Available methods appear in the first dropdown menu [a] (now *Ocean Climate*, *Ocean Pattern* and *Storm Severity Index*)

Several Output Types are selectable in [b], while [c] presents the applicable Data Sources

(For O.C.) The user can chose the type among the several possible mean maps, time-series and climatologies, and the field of interest

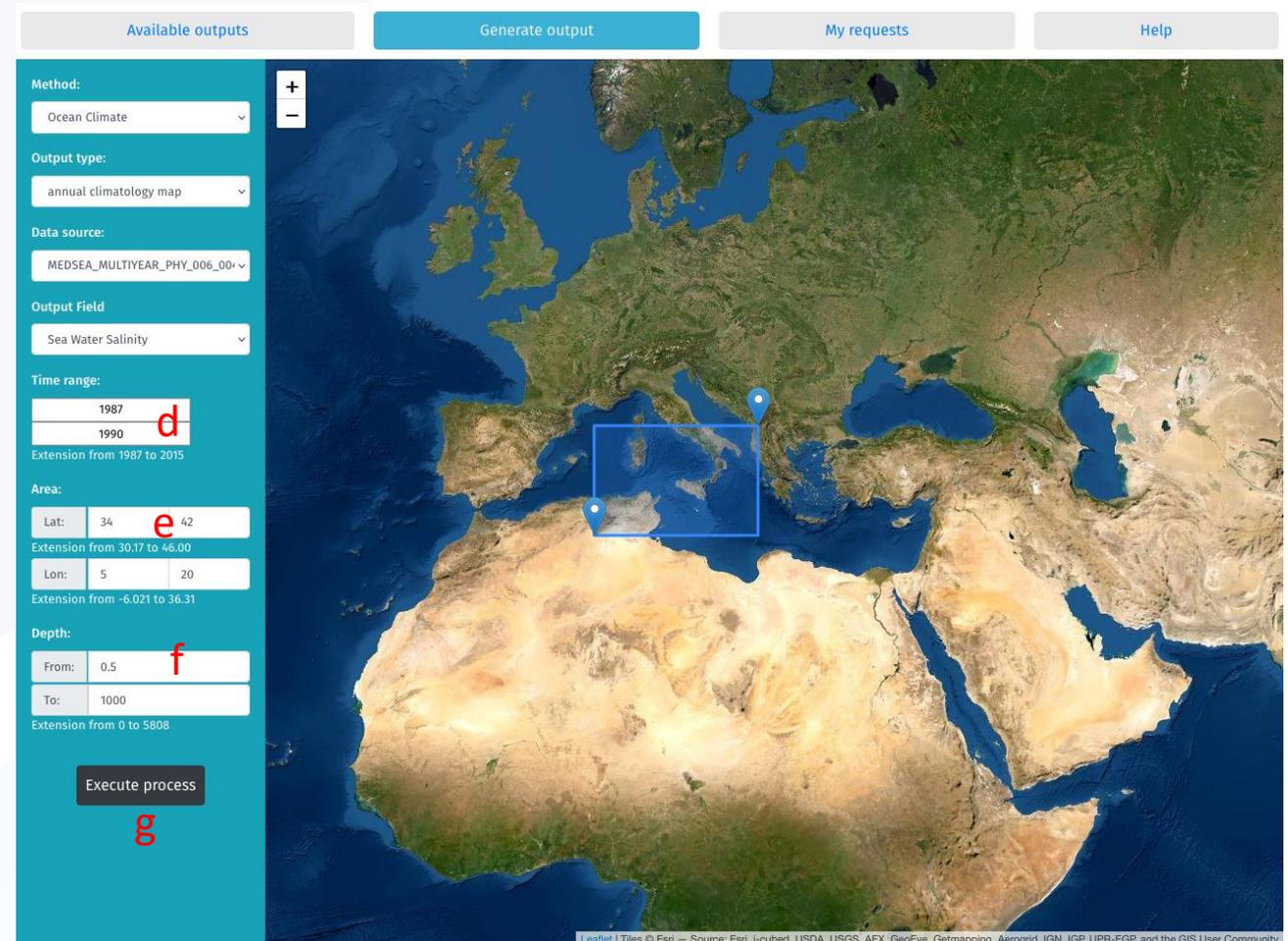
The image displays two screenshots of a web interface for selecting climate data. The top screenshot shows a dropdown menu for 'Method' with a red 'a' next to it. The bottom screenshot shows three dropdown menus: 'Method' (with 'Ocean Climate' selected), 'Output type' (with a red 'b' next to it), and 'Data source' (with a red 'c' next to it). Both screenshots feature a satellite map of Europe and the Mediterranean region in the background.

Depending on the selected *Output Type* and *Data Source*, the interface will require the insertion of specific information to define

- the *Time Range* in [d],
- the *Area* in [e],
- the *Depth* in [f]
- other specific parameters

The selected Area is visible on the map

After all selections, the user can submit the request [g]



The screenshot displays the eOSC interface for generating an output. The sidebar on the left contains the following configuration options:

- Method:** Ocean Climate
- Output type:** annual climatology map
- Data source:** MEDSEA\_MULTIYEAR\_PHY\_006\_00+
- Output Field:** Sea Water Salinity
- Time range:** 1987 to 1990 (labeled [d])  
Extension from 1987 to 2015
- Area:** Lat: 34 to 42 (labeled [e])  
Extension from 30.17 to 46.00  
Lon: 5 to 20  
Extension from -6.021 to 36.31
- Depth:** From: 0.5 (labeled [f])  
To: 1000  
Extension from 0 to 5808

At the bottom of the sidebar is an "Execute process" button (labeled [g]). The main map area shows a satellite view of the Mediterranean region with a blue rectangular selection box over the sea.

Each User has a private *My Requests* Section in which the submitted requests are displayed.

When a job execution is complete, clicking on [i] presents the new generated data

Available outputs		Generate output		My requests		Help		
Method	Creation time	Status	Outputs	Data source	Output Type	Area [lon,lat]	Depth [m]	Time range
Ocean Climate	2022-05-19T10:12:22Z	Process Succeeded	<a href="#">Show</a> 	MEDSEA_MULTIYEAR_PHY_006_004_BC	monthly map - Sea Water Salinity	[-4.99,34]-[1,42]	[0.5, 1000]	1990 - March
Ocean Climate	2022-05-19T10:12:04Z	Process Started	Process in progress: 30%	MEDSEA_MULTIYEAR_PHY_006_004_BC	monthly mean timeseries - Sea Water Potential Temperature	[-4.99,34]-[1,42]	[0.5, 1000]	1990-01/2000-12
Ocean Climate	2022-05-19T10:11:57Z	Process Started	Process in progress: 29%	MEDSEA_MULTIYEAR_PHY_006_004_BC	monthly mean timeseries - Sea Water Potential Temperature	[-4.99,34]-[1,42]	[0.5, 1000]	1990-01/2000-12
Ocean Climate	2022-05-19T08:57:05Z	Process Succeeded	<a href="#">Show</a>	MEDSEA_MULTIYEAR_PHY_006_004_BC	annual climatology map - Sea Water Salinity	[5,34]-[20,42]	[0.5, 1000]	1987/1990
Ocean Climate	2022-05-16T15:18:20Z	Process Failed	<a href="#">Log</a>	MEDSEA_MULTIYEAR_PHY_006_004_BC	annual map - Sea Water Salinity	[-4.99,34]-[1,42]	[0.5, 1000]	1987

Information related to the Request

- Method
- Creation time
- Status
- Outputs

Information related to the Output Data

- Data Source
- Output Type
- Area and Depth
- Time Range

When the execution is successful completed, it is possible to (it depends on the method, here O.C.):

- See a static plot [a] of a map or a time-series
- Download the data as file in NetCDF format [b]
- Download the log information related the execution [c]

Available outputs
Generate output
My requests
Help

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

sea water salinity (PSU), annual climatology map

1987 - 1990, box: [5, 34, 20, 42], layer: 0.5-1000 m

Download Image
Download Data
Download JSON Log
Download Log

a

b

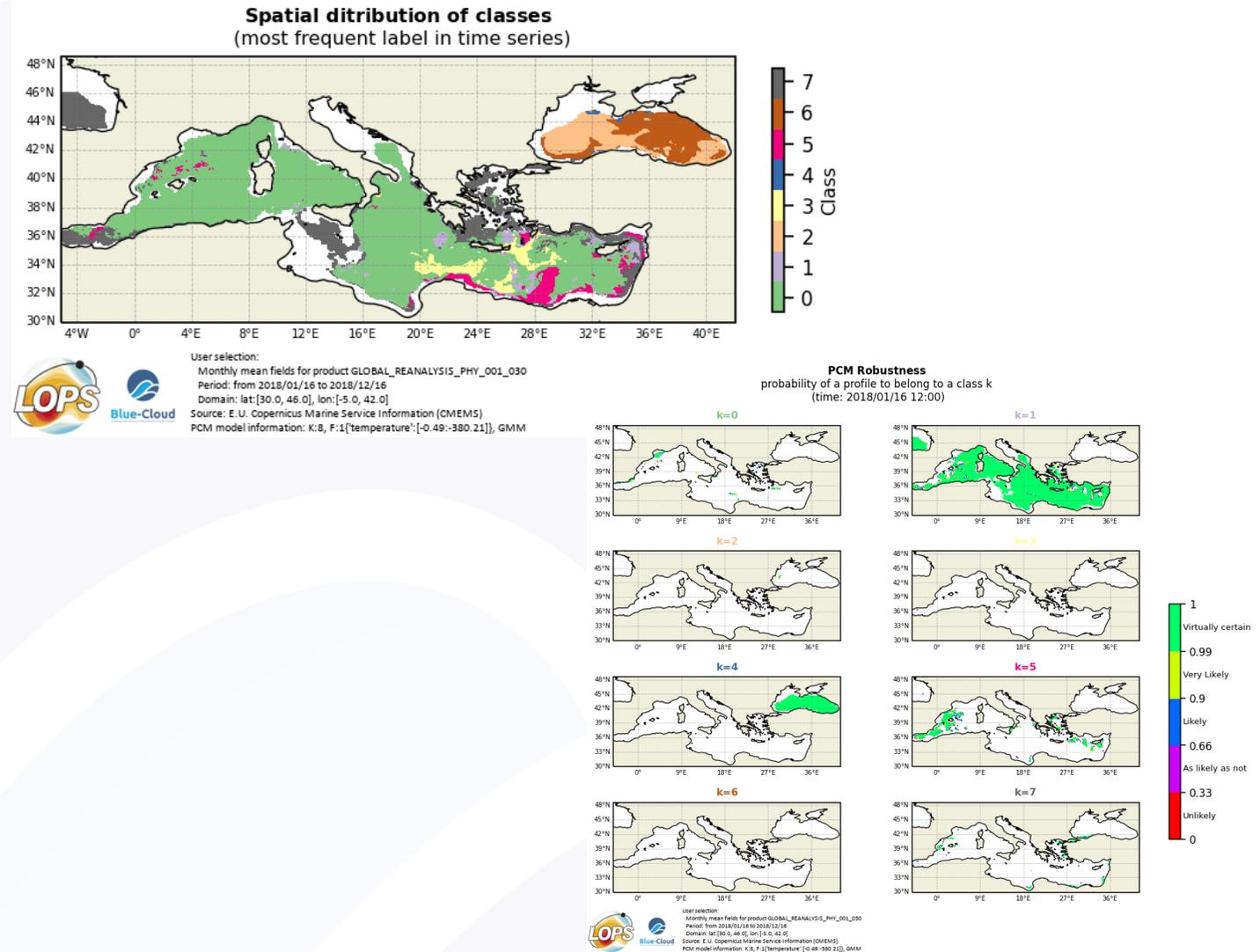
c

Example of outputs taken from the method:

*Ocean Patterns*

by Ifremer

- Spatial distribution of classes
- PCM Robustness

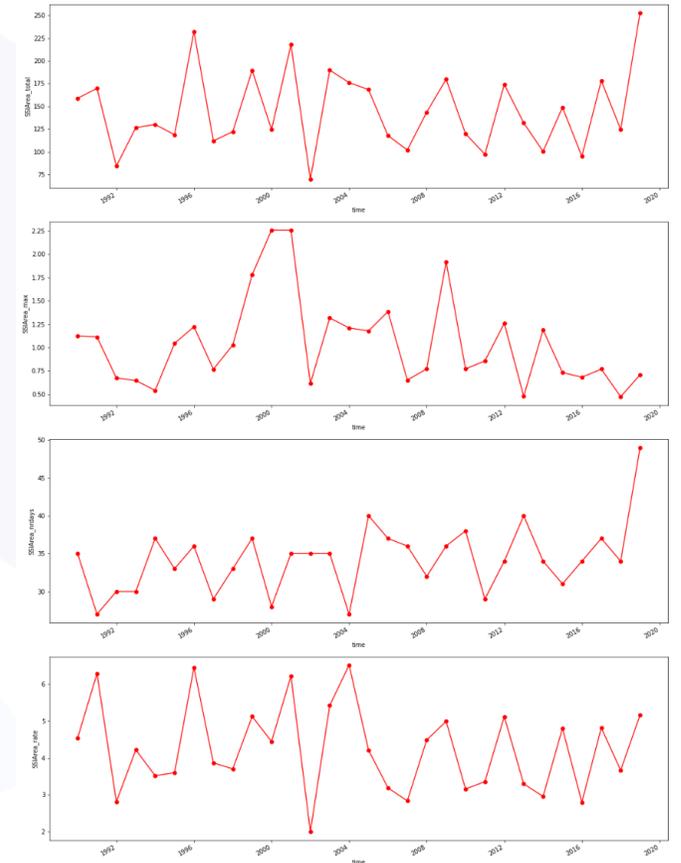
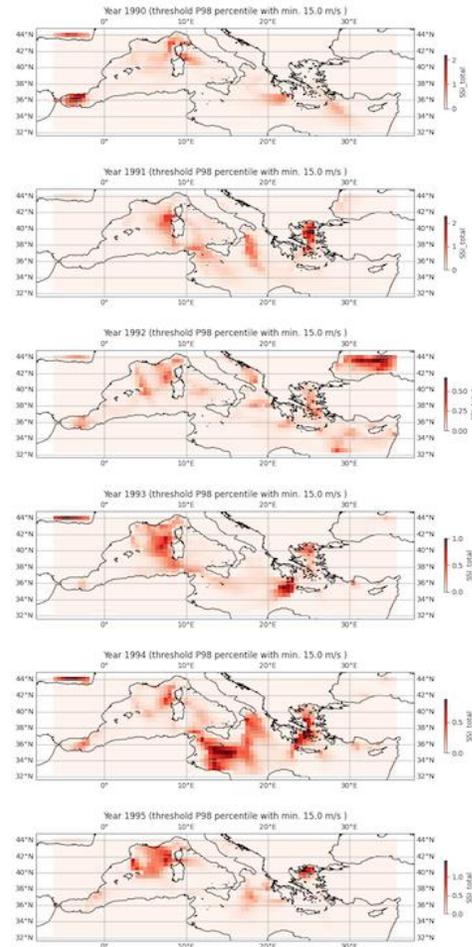


Example of outputs taken from the method:

*Storm Severity Index (SSI)*

by KNMI

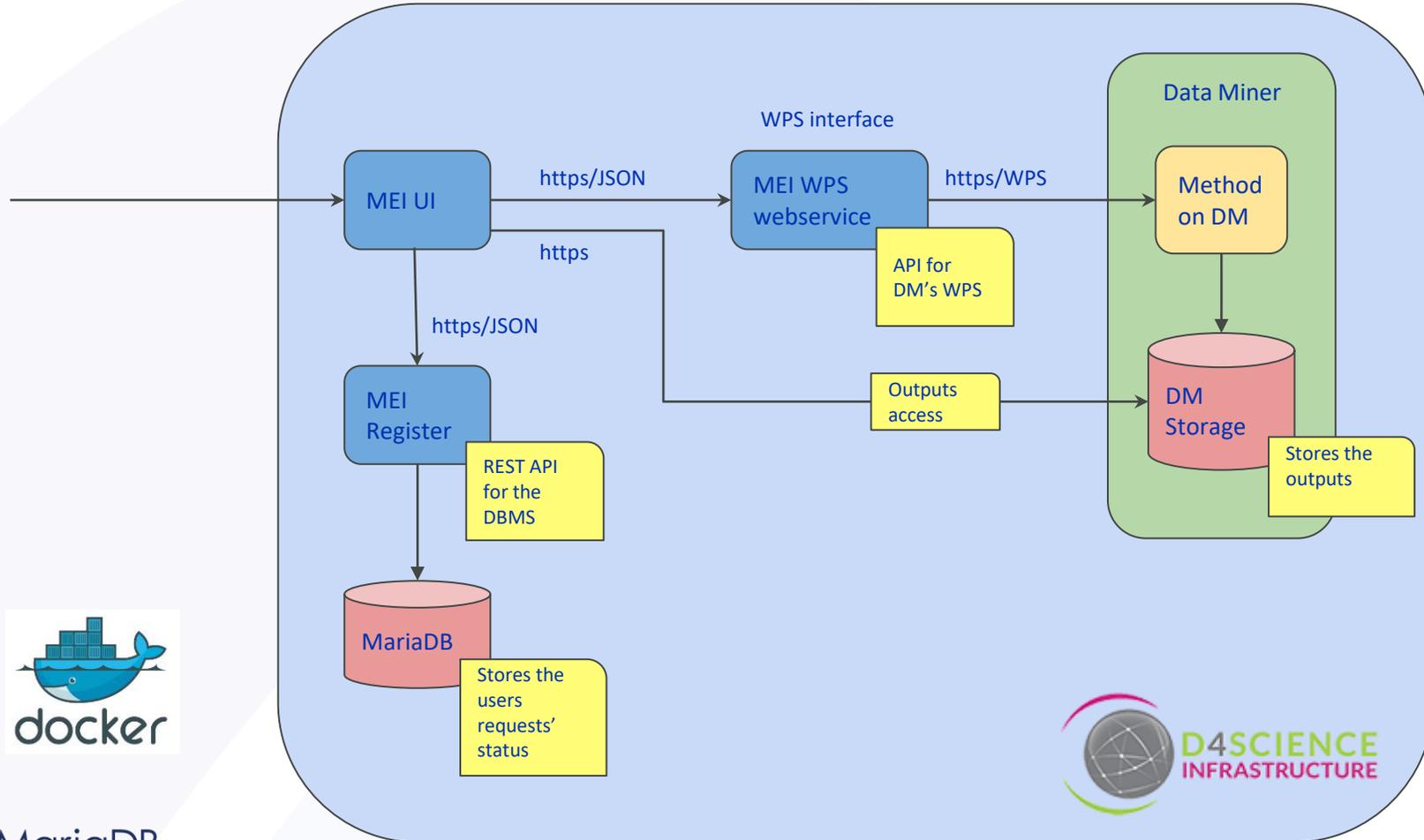
- Maps
- Timeseries



MEI Typical User:



Technologies:



- We have developed an “interface definition language” (*IDL*) for the definition of the input parameters that a WPS method expects to start a new processing
- Any WPS method which is compliant with such IDL, can receive a processing request from *MEI UI*
- A compliant method becomes available on *MEI UI* when its IDL specification is loaded inside the *MEI Register*

Many thanks!

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