

eosc | Blue-Cloud2026

EMODnet services in the framework of the EU DTO programme

Conor Delaney, Technical Coordinator &
Deputy Head of EMODnet Secretariat

5-6 November 2025, Brussels [Belgium]



Funded by
the European Union

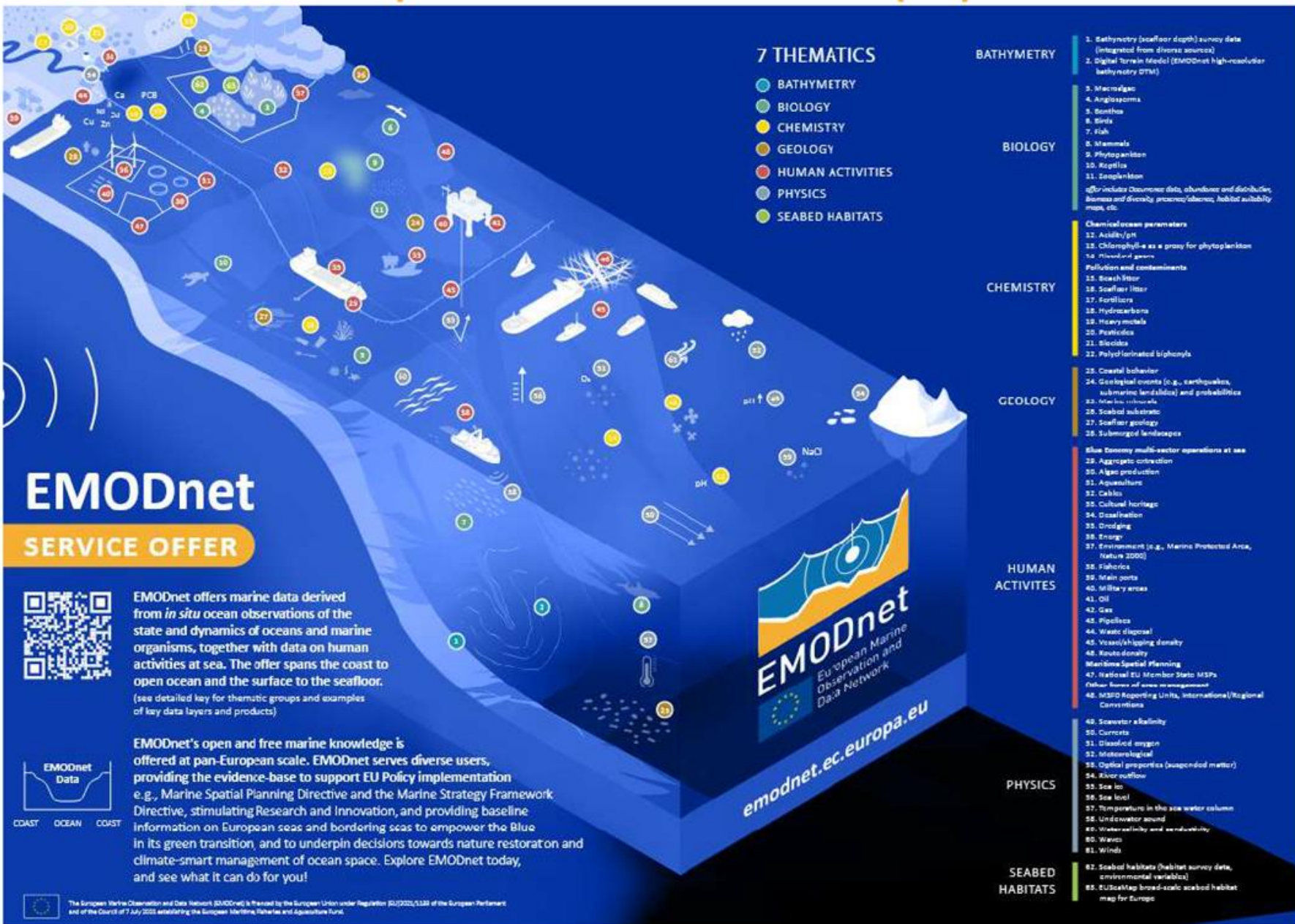
EMODnet services in the framework of the EU DTO program.

Dr. Conor Delaney, EMODnet Technical Coordinator



The European Marine Observation and Data Network (EMODnet) is financed by the European Union under Regulation (EU) 2021/1139 of the European Parliament and of the Council of 7 July 2021 establishing the European Maritime, Fisheries and Aquaculture Fund.

EMODnet: The comprehensive international (EU) marine knowledge service



A unique asset offering data and data products from the marine and coastal environment and human activities at sea at European scale.

Reliant on EU Open Data Directive and the EU INSPIRE Directive.



emodnet.ec.europa.eu

EMODnet partners: an established and unique expert network



More than **130 EMODnet partners**: organisations, institutes and companies from the public and private sector across **21 EU Member States** and **12 associated countries**



Countries with EMODnet partners: Albania, **Belgium**, **Bulgaria**, **Croatia**, **Cyprus**, **Denmark**, **Estonia**, Faroe Islands, Finland, **France**, Georgia, **Germany**, **Greece**, Iceland, **Ireland**, Israel, **Italy**, **Latvia**, **Lithuania**, **Malta**, Monaco, Montenegro, **Netherlands**, Norway, **Poland**, **Portugal**, **Romania**, **Slovenia**, **Spain**, **Sweden**, Turkey, Ukraine, United Kingdom.

*BOLD = EU Member State

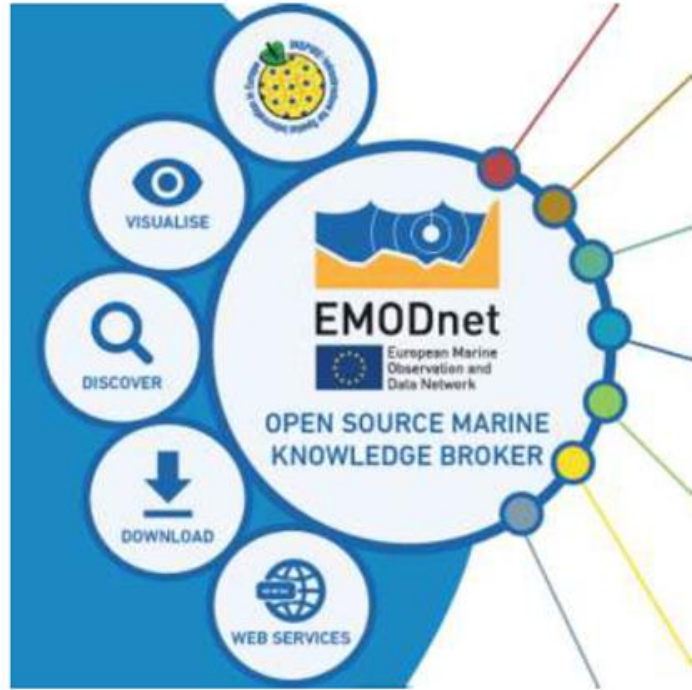
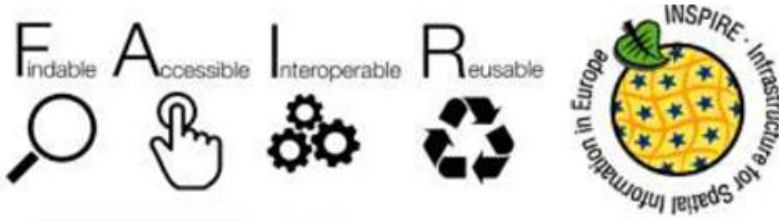
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EMODnet partners: an established and unique expert network

A diverse EU partnership of National Marine Research and Oceanographic Institutes, National Hydrographic Offices, National Geological Surveys and National Oceanographic Data Centres, private sector, non-profits and government agencies.

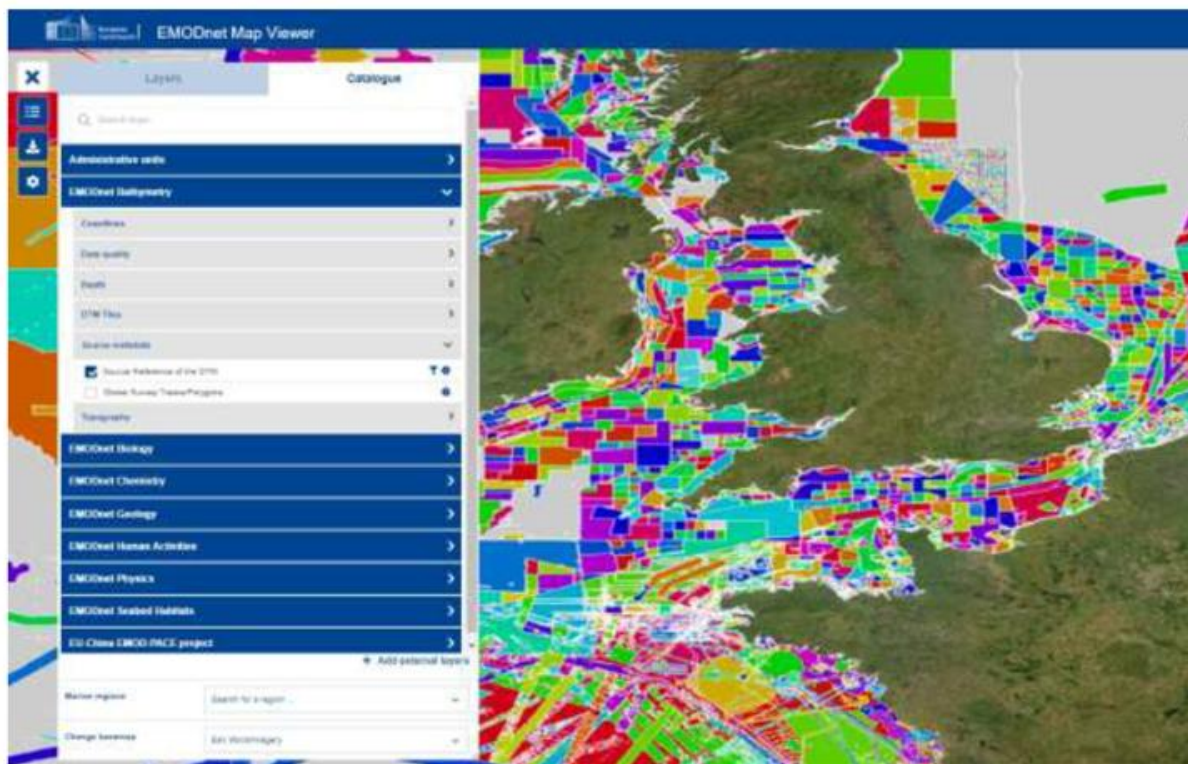


EMODnet: Guiding principles – Cheat Sheet.



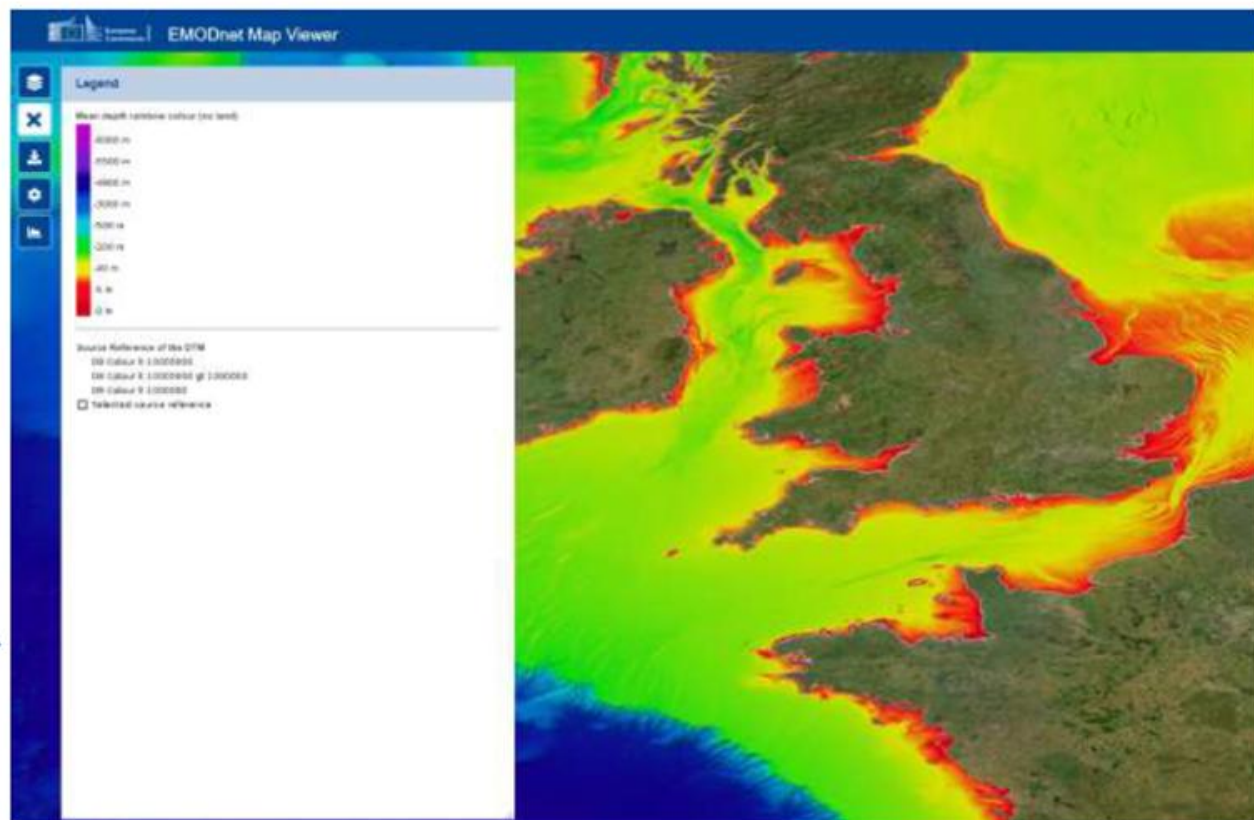
- **European INSPIRE Directive** and embodies the **Findable, Accessible, Interoperable and Reusable (FAIR)** data principles;
- **European data standards (e.g., INSPIRE) and international metadata standards (e.g., ISO)** and is underpinned by a single metadata catalogue (GeoNetwork);
- **EMODnet's data collections are as open as possible** (as closed as necessary) and **EU-funded data products are fully open access** (Creative Commons CC BY 4.0);
- **EMODnet's web services** follow **Open Geospatial Consortium (OGC) standards** WMS, WFS, WebS and OpenDAP, with machine-to-machine readability and Application Programming Interfaces (APIs)

EMODnet | Bathymetry DTM European wide marine product

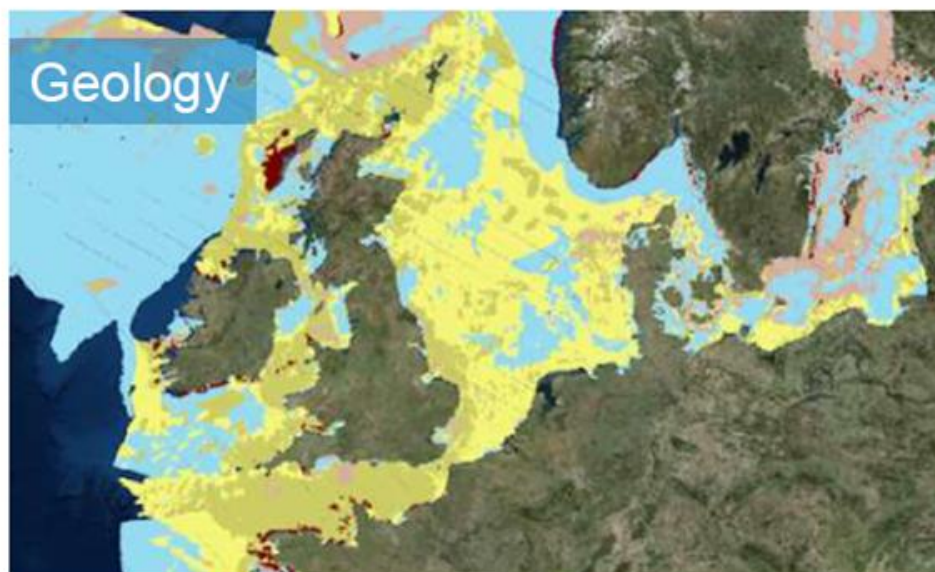
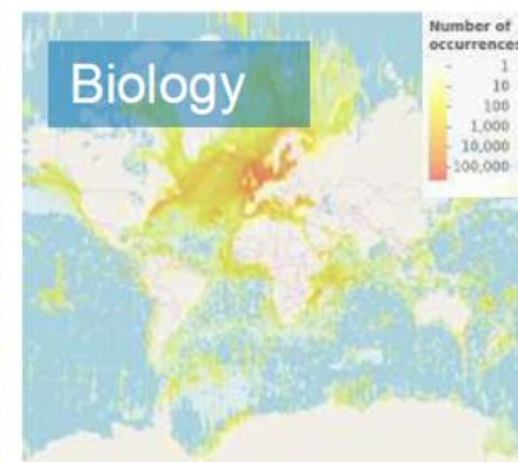
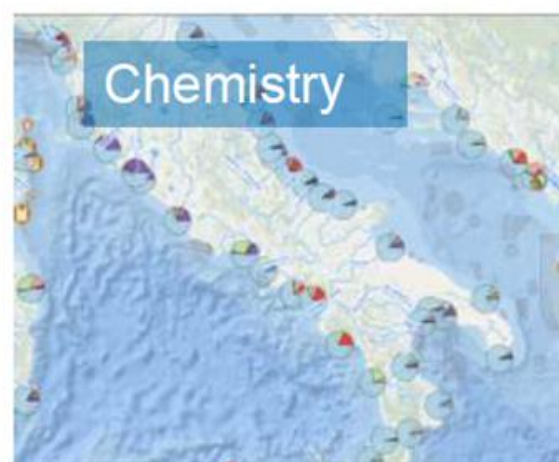


Soundings data collected from member states (and others)

Turned into a European Digital Terrain Model of the seabed.



EMODnet: the power of Open Data



January 2023, we switched to one map viewer



One central map viewer

to visualise all EMODnet data



BATHYMETRY



HUMAN ACTIVITIES

120
partners

1 OCEAN 1 EMODnet

One single portal

One central metadata catalogue

to enhance data search and discovery

+100
use cases



CHEMISTRY



BIOLOGY

Discover, visualise and
download marine data and products
across 7 thematics and hundreds of parameters



PHYSICS



GEOLOGY



SEABED HABITATS

EMODNET.EC.EUROPA.EU



The European Marine Observation and Data Network (EMODnet) is financed by the European Union under Regulation 2012/2013/13 of the European Parliament and of the Council of 7 July 2012 establishing the European Maritime, Fisheries and Aquaculture Fund.

YOUR GATEWAY TO *IN SITU* MARINE DATA IN EUROPE AND BEYOND

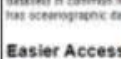


EMODnet | One central ERDDAP

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English

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English

ERDDAP > List of All Datasets

154 matching datasets, listed in alphabetical order.

Grid Data	Sub- set	Table Data	Make A Graph	W M	Source Data File	Title	Sum- mary	FGDC, ISO, Metadata	Back- ground Info	RSS	E mail	Institution	Dataset ID
						The List of All Active Datasets in this ERDDAP		F M	background			VLIZ	allDatabases
data			graph	M		Arctic Ocean, DIVA-4D 6-year analysis of Water body dissolved oxygen concentration 1965/2017 v2021 [time][lat][lon], 0.1deg, 1967-2014		F M	background			Inst	
data			graph	M		Arctic Ocean, DIVA-4D 6-year analysis of Water body dissolved oxygen concentration 1965/2017 v2021 [time][lat][lon], 0.1deg, 1967-2014		F M	background			Inst	
data			graph	M		Arctic Ocean, DIVA-4D 6-year analysis of Water body phosphate 1965/2017 v2021 [time][depth][lat][lon], 0.1deg, 1967-2014		F M	background			Inst	
data			graph	M		Arctic Ocean, DIVA-4D 6-year analysis of Water body phosphate 1965/2017 v2021 [time][lat][lon], 0.1deg, 1967-2014		F M	background			Inst	
data			graph	M		Arctic Ocean, DIVA-4D 6-year analysis of Water body silicate 1965/2017 v2021 [time][depth][lat][lon], 0.1deg, 1967-2014		F M	background			Inst	
data			graph	M		Arctic Ocean, DIVA-4D 6-year analysis of Water body silicate 1965/2017 v2021 [time][lat][lon], 0.1deg, 1967-2014		F M	background			Inst	
data			graph	M		Baltic Sea, DIVA-4D 6-year seasonal analysis of Water body chlorophyll-a 1965/2018 v2021 [time][depth][lat][lon], 0.1deg, 1962-2015		F M	background			Sw	
data			graph	M		Baltic Sea, DIVA-4D 6-year seasonal analysis of Water body chlorophyll-a 1965/2018 v2021 [time][lat][lon], 0.1deg, 1962-2015		F M	background			Sw	
data			graph	M		Baltic Sea, DIVA-4D 6-year seasonal analysis of Water body dissolved inorganic nitrogen (DIN) 1965/2018 v2021 [time][depth][lat][lon], 0.1deg, 1962-2015		F M	background			Sw	
data			graph	M		Baltic Sea, DIVA-4D 6-year seasonal analysis of Water body dissolved inorganic nitrogen (DIN) 1965/2018 v2021 [time][lat][lon], 0.1deg, 1962-2015		F M	background			Sw	
data			graph	M		Baltic Sea, DIVA-4D 6-year seasonal analysis of Water body dissolved oxygen concentration 1965/2018 v2021 [time][depth][lat][lon], 0.1deg, 1962-2015		F M	background			Sw	
data			graph	M		Baltic Sea, DIVA-4D 6-year seasonal analysis of Water body dissolved oxygen concentration 1965/2018 v2021 [time][lat][lon], 0.1deg, 1962-2015		F M	background			Sw	
data			graph	M		Baltic Sea, DIVA-4D 6-year seasonal analysis of Water body phosphate 1965/2018 v2021 [time][depth][lat][lon], 0.1deg, 1962-2015		F M	background			Sw	
data			graph	M		Baltic Sea, DIVA-4D 6-year seasonal analysis of Water body phosphate 1965/2018 v2021 [time][lat][lon], 0.1deg, 1962-2015		F M	background			Sw	

- <https://erddap.emodnet.eu/erddap/index.html>
- An API to Gridded datasets

**ERDDAP server @ EMODnet**
Easier access to scientific data

English

ERDDAP > griddap > Make A Graph

Baltic Sea, DIVA-4D 6-year seasonal analysis of Water body phosphate 1980/2018
v2021 [time][lat][lon], 0.1deg, 1982-2015

Dataset Title: v2021 [time][lat][lon], 0.1deg, 1982-2015

Institution: Swedish Meteorological and Hydrological Institute (Dataset ID: Baltic_Sea_PO_3D_800f_49af_274c)

Information: Summary | License | FGDC | ISO 19115 | Metadata | Background | Data Access Form

Graph Type: surface

X Axis: longitude

Y Axis: latitude

Color: Water_body_phosphate_deepest

Dimensions: time (UTC) specify just 1 value -- Start: 2015-10-16T00:00:00Z Stop: 2015-10-16T00:00:00Z

latitude (degrees_north): 53.0 65.9

longitude (degrees_east): 9.4 30.9

Graph Settings: Color Bar: Minimum Maximum Continuity: N Sections: Scale: Ascending

Redraw the Graph (Please be patient, it may take a while to get the data.)

Optional: Then set the File Type: .htmlTable (File Type information) and Download the Data or an image or view the URL: https://erddap.emodnet.eu/erddap/griddap/Baltic_Sea_PO_3D_800f_49af_274c (Documentation / Bypass this form)

Click on the map to specify a new center point.

Zoom: 2000 4000 8000 16000 32000 64000 128000 256000 512000 1024000 2048000 4096000 8192000 16384000 32768000 65536000 131072000 262144000 524288000 1048576000 2097152000 4194304000 8388608000 16777216000 33554432000 67108864000 134217728000 268435456000 536870912000 1073741824000 2147483648000 4294967296000 8589934592000 17179869184000 34359738368000 68719476736000 137438953472000 274877906944000 549755813888000 1099511627776000 2199023255552000 4398046511104000 8796093022208000 17592186044416000 35184372088832000 70368744177664000 140737488355328000 281474976710656000 562949953421312000 1125899906842624000 2251799813685248000 4503599627370496000 9007199254740992000 18014398509481984000 36028797018963968000 72057594037927936000 144115188075855872000 288230376151711744000 576460752303423488000 1152921504606846976000 2305843009213693952000 4611686018427387904000 9223372036854775808000 18446744073709551616000 36893488147419103232000 73786976294838206464000 147573952589676412928000 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YEARS

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FORMATS

Categories

North East Atlantic Ocean - Contaminants aggregated datasets 1970/2017 v2018

EMODnet Chemistry aims to provide access to marine chemistry data sets and derived data products concerning eutrophication, ocean acidification and contaminants. The chemicals chosen reflect importance to the Marine Strategy Framework Directive (MSFD). This regional aggregated dataset contains all unrestricted

Black Sea - Contaminants aggregated datasets 1974/2017 v2018

EMODnet Chemistry aims to provide access to marine chemistry data sets and derived data products concerning eutrophication, ocean acidification and contaminants. The chemicals chosen reflect importance to the Marine Strategy Framework Directive (MSFD). This regional aggregated dataset contains all unrestricted

Baltic Sea - Contaminants aggregated datasets 1972/2017 v2018

EMODnet Chemistry aims to provide access to marine chemistry data sets and derived data products concerning eutrophication, ocean acidification and contaminants. The chemicals chosen reflect importance to the Marine Strategy Framework Directive (MSFD). This regional aggregated dataset contains all unrestricted

Mediterranean Sea - Contaminants aggregated datasets 1974/2017 v2018

EMODnet Chemistry aims to provide access to marine chemistry data sets and derived data products concerning eutrophication, ocean acidification and contaminants. The chemicals chosen reflect importance to the Marine Strategy Framework Directive (MSFD). This regional aggregated dataset contains all unrestricted

Habitat Map of "Capo Milazzo" marine protected area

Data were collected in the framework for the establishment of the Capo Milazzo ANP. The study was founded by NATM. The map was constructed by using acoustic data, direct observations by ROV and satellite images.

EMODnet Product Catalogue

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Download Display mode

North Sea - Contaminants aggregated datasets 1959/2019 v2021

EMODnet Chemistry aims to provide access to marine chemistry data sets and derived data products concerning eutrophication, ocean acidification and contaminants. The chemicals chosen reflect importance to the Marine Strategy Framework Directive (MSFD). This regional aggregated dataset contains all unrestricted EMODnet Chemistry data on contaminants, and covers the North Sea with 34975 CDI records divided per parameter: 1450 biota, 34740 water profiles, 8045 sediment profiles and 281 sediment time series. For water, the temporal range is from 1959-10-03 to 2019-12-30. For sediment, the temporal range is from 1970-01-11 to 2018-12-18 for profile data and from 1980-06-10 to 2015-06-10 for the time series. For biota, the temporal range is from 1979-02-26 to 2018-02-03. Data were aggregated and quality controlled by Aarhus University, Department of Bioscience, Marine Ecology Research from Denmark. Regional datasets concerning contaminants are automatically harvested. Parameter names in these datasets are based on P01, 8000 Parameter Usage Vocabulary, which is available at: <http://readthedocs.org/docs/emodnet/vocabulary/en/latest/>. Each measurement value has a quality flag indicator. The resulting data collections for each Sea Basin are harmonised, and the collections are quality controlled by EMODnet Chemistry Regional Leaders using ODV Software and following a common methodology for all Sea Regions. Harmonisation means that: (1) unit conversion is carried out to express contaminant concentrations with a limited set of measurement units (according to EU directives 2013/39/EU, Comm. Dec. EU 2017/548) and (2) merging of variables described by different "local names", but corresponding exactly to the same concepts in 8000 P01 vocabulary. Detailed documentation is available at: <https://emodnet-chemistry.readthedocs.io/en/latest/contaminants/32NorthSea/>. Explore and extract data at: <https://emodnet-chemistry.readthedocs.io/en/latest/contaminants/32NorthSea/>. The harmonised dataset can also be downloaded as ODV spreadsheet (TXT file), which is composed of metadata header followed by tab separated values. This worksheet can be imported to ODV Software for visualisation (More information can be found at: <https://www.seaobservatory.org/Software/ODV/>). The same dataset is offered also as XLSX file in a longitudinal format, in which each P01 measurement is a record line. Additionally there are a series of columns that split P01 terms in subcomponents (measure, substance, CAS number, matrix...). This transposed format is more adapted to worksheet applications users (e.g. LibreOffice Calc). The original datasets can be searched and downloaded from EMODnet Chemistry Download Service: <https://emodnet-chemistry.readthedocs.io/en/latest/>

Overview

Water

Sediment thickness

Sediment profiles

Soils

Identification Comment ReferenceSystem Quality DomainConsistency

Distribution format Open for ODV spreadsheet and transposed spreadsheet (Format 1.0)

Distributor

Organisation name	National Institute of Oceanography and Applied Geophysics - OGS, Division of Oceanography
Delivery point	Borgo Grotta Gigante 42/c
City	Sgonico (Trieste)
Postal code	34010
Country	Italy
Electronic mail address	nodc@ogs.trieste.it
Linkage	http://www.ogs.trieste.it/
Role	Distributor: Party who distributes the resource

Search and filter INSPIRE metadata of all EMODnet products emodnet.ec.europa.eu/geonetwork

Web Service Standards for Data Downloads – Common Features

Open Geospatial Consortium Web Feature Service (via OSGeo Projects)
&
OPeNDAP (via ERDDAP)

1. **Access data remotely.** Many EMODnet data servers are hosted remotely, so the ability to stream data is crucial to our operations.
2. **Stream only the data you need** – Downloading entire datasets is wasteful. EMODnet users can subset from larger datasets by requesting just the data they need.
3. **Use any analysis tool** -The last thing that most people want to do is learn a new analysis tool just to work with a dataset. With OPeNDAP and OGC WFS, people use tools that they are already familiar with, including Python, R, and QGIS.
4. **No need to re-format data** - valuable time is spent re-organizing and re-formatting data OGC-WFS & OPeNDAP helps avoid this work by allowing the user to select from a number of file formats when downloading data..

EMODnet | One map viewer – subset and download



EMODnet Map Viewer

EN English

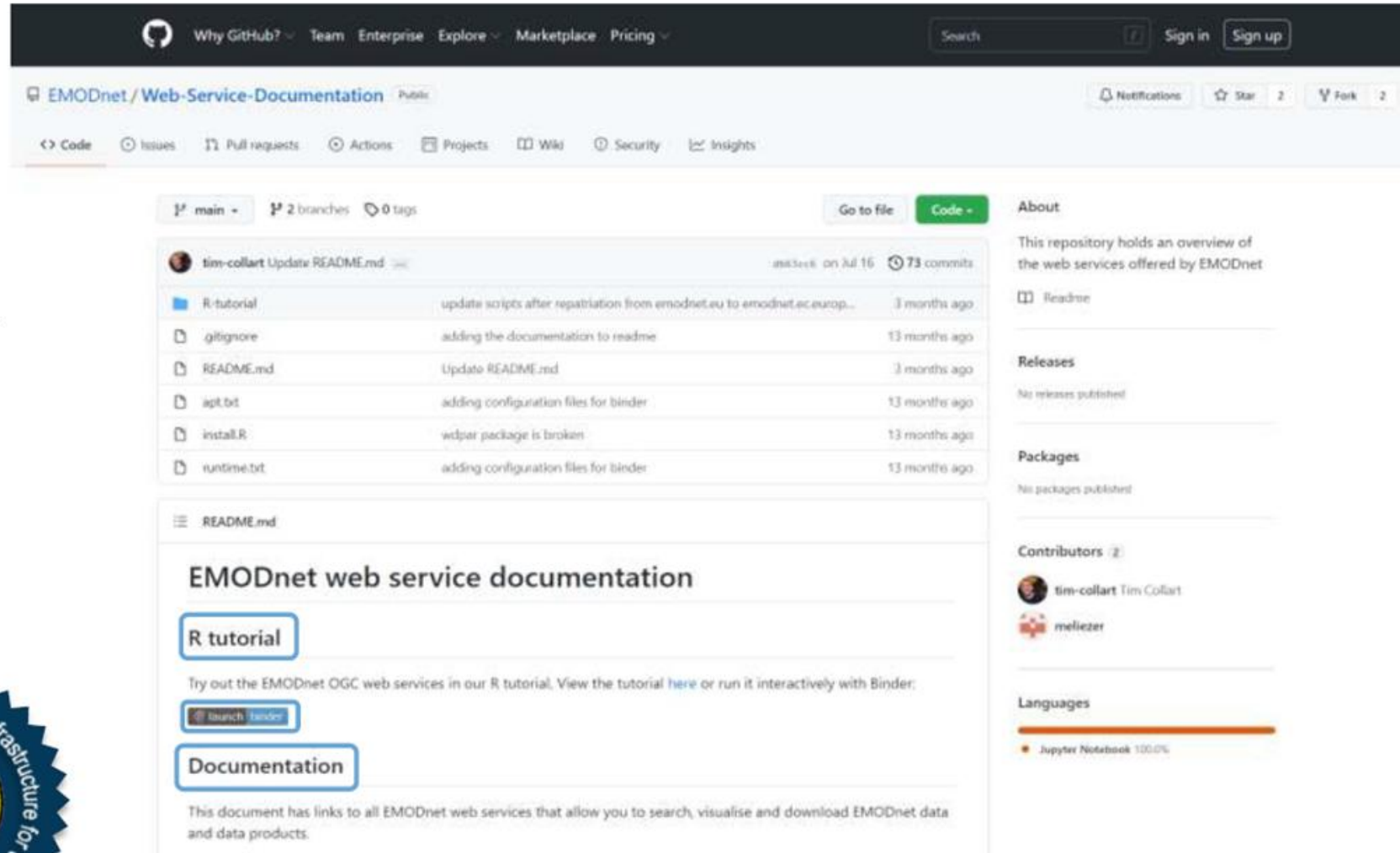
EMODnet web services

Access EMODnet data, products and metadata through INSPIRE-compliant OGC web services and other API's

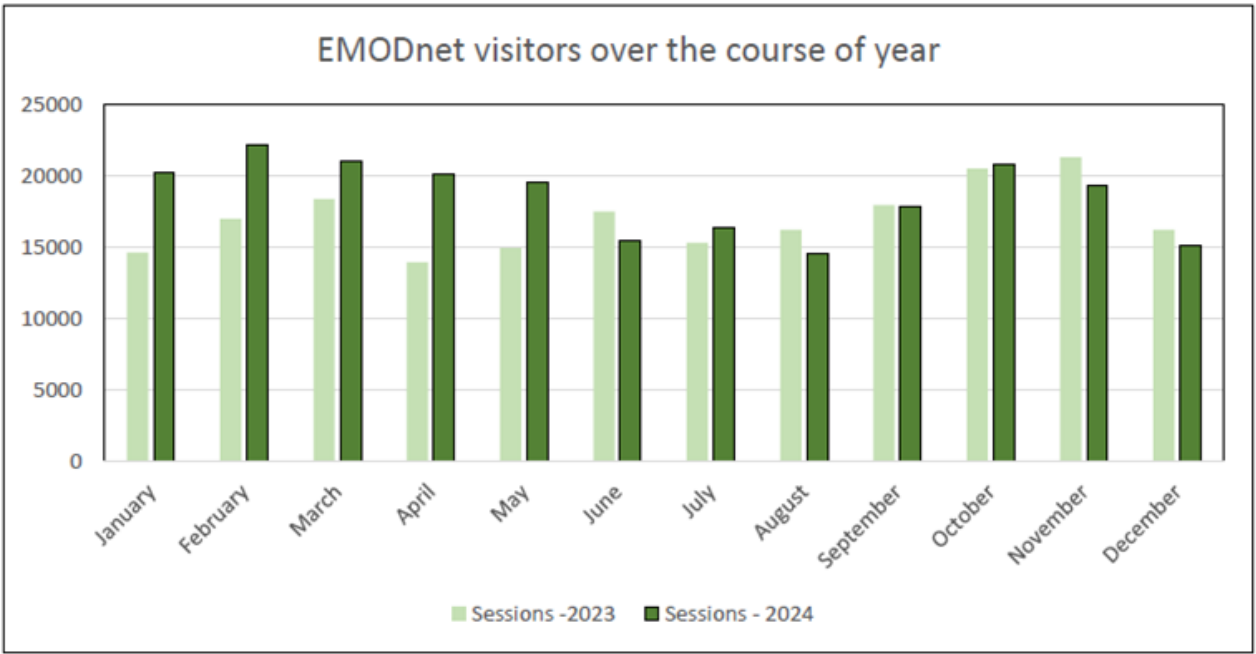
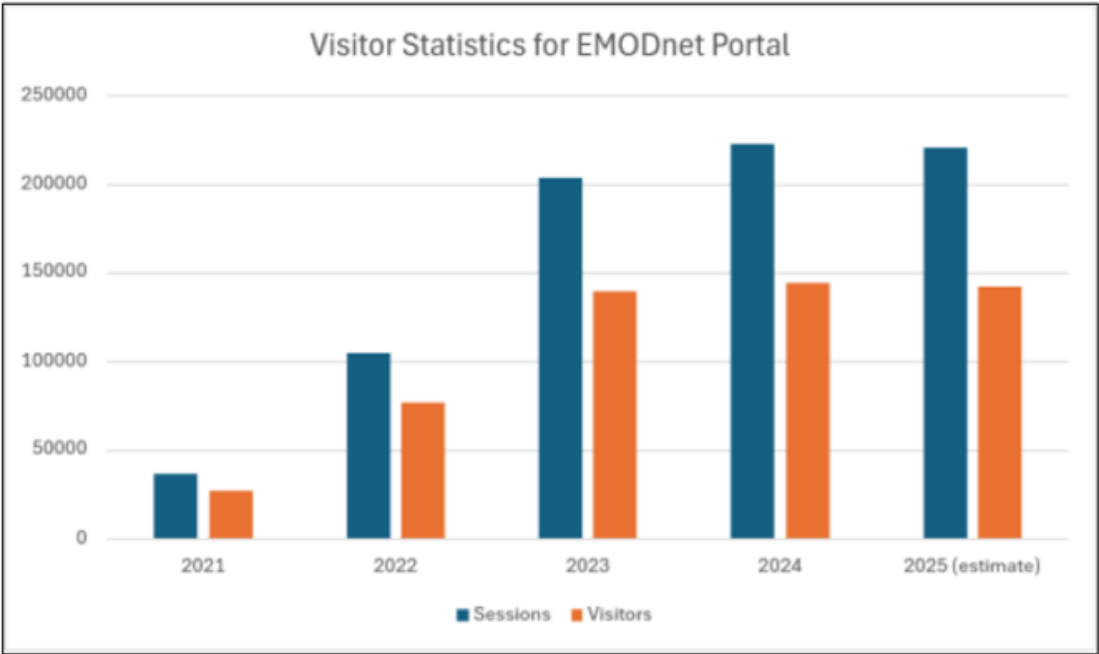
Web service documentation and R code examples available on GitHub:

github.com/EMODnet/Web-Service-Documentation

Find additional code examples on the EMODnet Github



The benefit of the centralization of EMODnet



	Progress Report (December - 2020 to December - 2022)	Progress Report (December - 2022 to December - 2023)	Growth
Digital Terrain Model (DTM)	25772	46349	80%
High Resolution-DTM (HR-DTM)	2160	16424	660%
Satellite Derived Coastlines	114	1308	1047%



A leap in ocean knowledge and sustainable action



European Digital Twin Ocean Core Infrastructure

The European platform for discovering, visualizing, and leveraging products and knowledge to power digital twins of the ocean



Discover EDITO applications



Marine Plastic Tracker

SnapPlanet

This application provide a What If Scenario for the Marine Plastic Tracker

[Access](#)

Projection of the dynamics of unexploited skipjack biomass

Mercator Ocean

Projection without taking fishing into account in response to a high greenhouse gas emissions scenario (IPCC RCP8.5 scenario). A study conducted by the Pacific Community (SPC) in collaboration with Mercator Ocean International

[Access](#)

EDITO ecosystem

Mercator Ocean

Visualize the EDITO ecosystem in the frame of the ocean monitoring and forecasting.

[Access](#)

Sargassum Forecast

Mercator Ocean

Sargassum forecast - North Atlantic seasonal distribution of sargassum.

[Access](#)

OceanICU simulator

Bolding & Bruggeman ApS

Simulate a water column anywhere around the world and explore its response to pressures.

[Access](#)

GLONET

Mercator Ocean

Learn about GLONET, Mercator Ocean's AI-based forecast model

[Access](#)

The Ocean Bulletin

Amphitrite

The cutting-edge technology developed by Amphitrite fuses multiple satellite observations harnessing artificial intelligence, to provide a new generation of highly reliable and accurate ocean data, enabling fine-scale voyage optimization.

[Access](#)

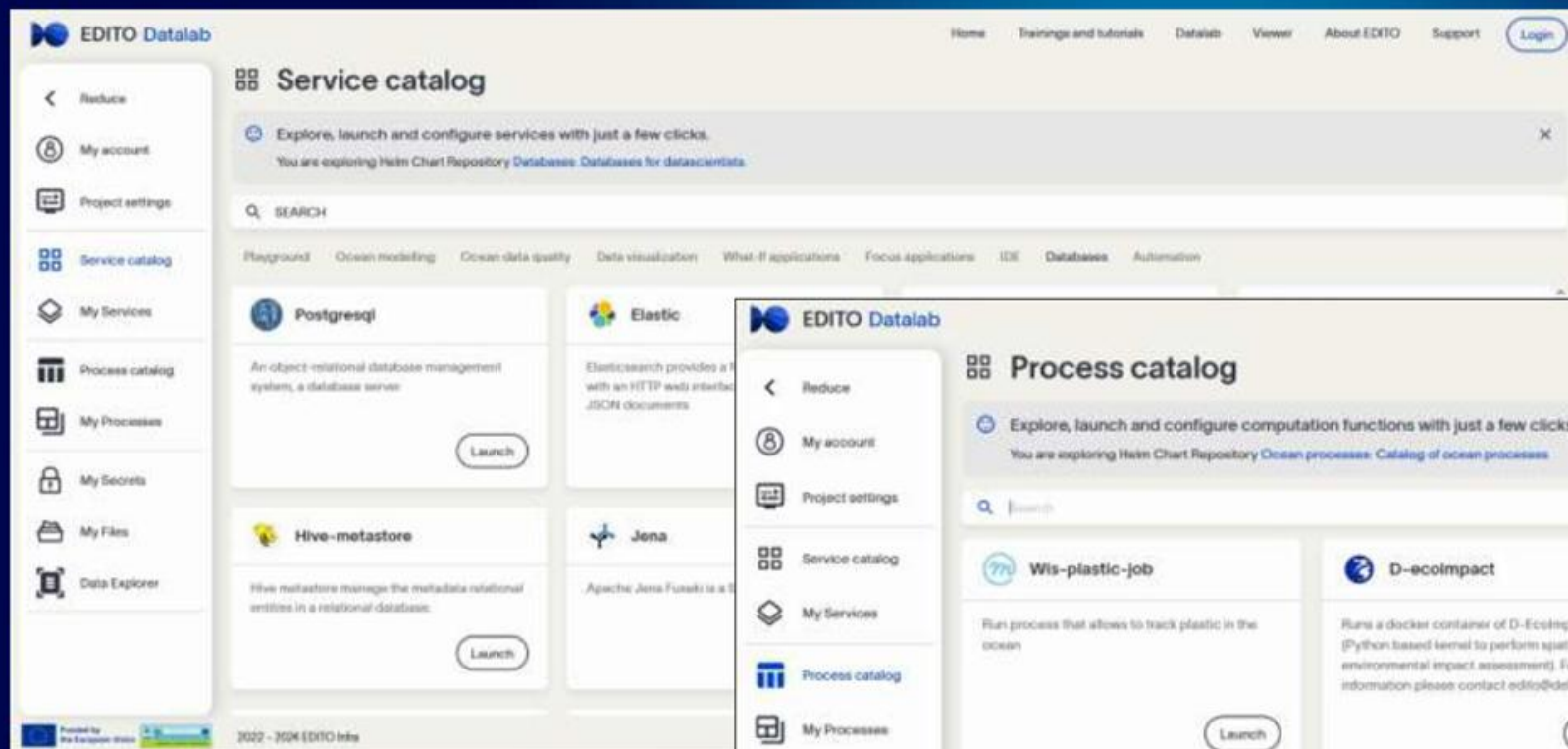
OceanBench

Mercator Ocean

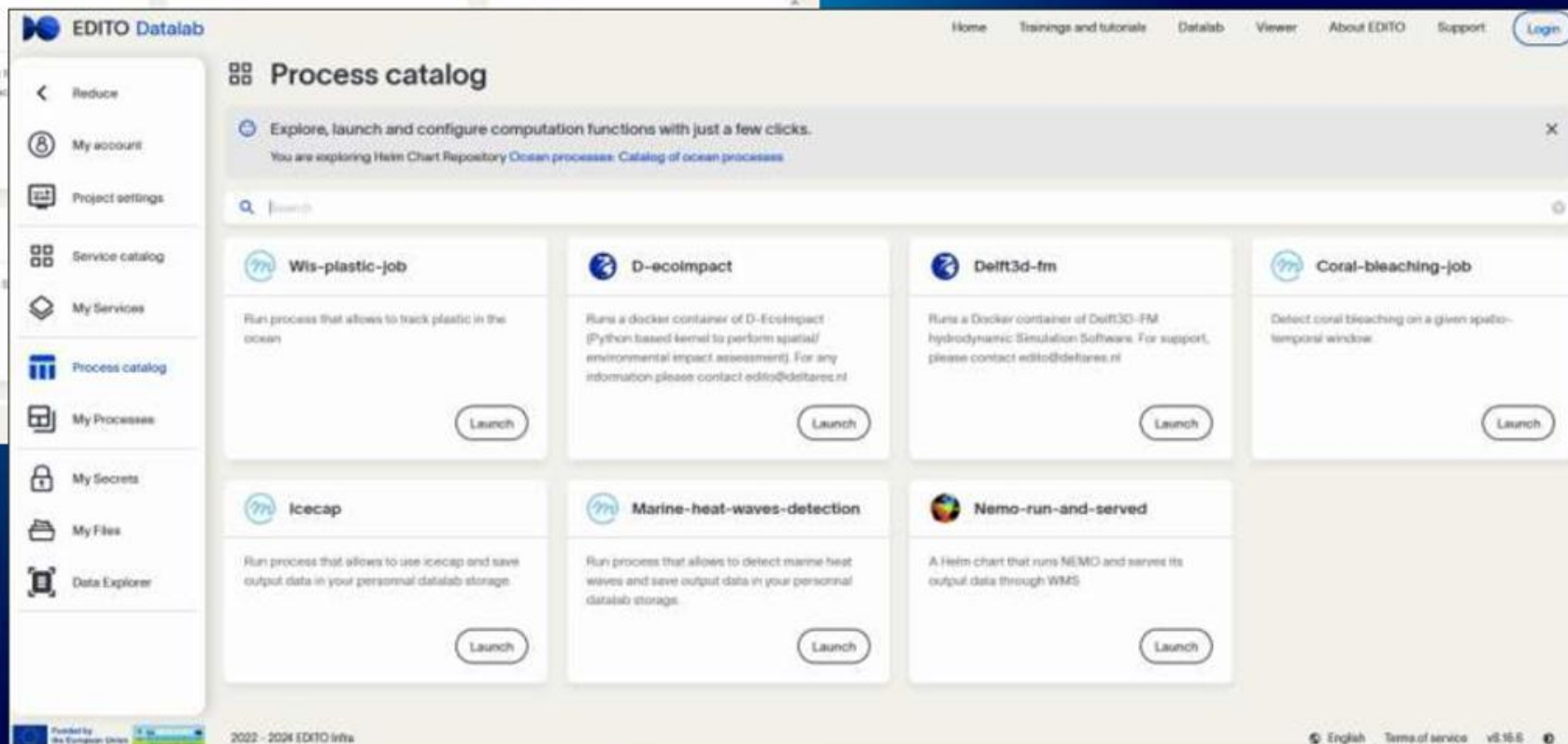
OceanBench is a benchmarking tool to evaluate ocean forecasting systems against reference ocean datasets and observations.

[Access](#)

EDITO Service Catalogue



The screenshot shows the 'Service catalog' page of the EDITO Datalab. The top navigation bar includes links for Home, Trainings and tutorials, Datalab, Viewer, About EDITO, Support, and a Login button. The left sidebar contains a 'Reduce' button and links to My account, Project settings, Service catalog (active), My Services, Process catalog, My Processes, My Secrets, My Files, and Data Explorer. The main content area features a search bar and a list of services: PostgreSQL, Elastic, Hive-metastore, and Jena. Each service card includes a brief description and a 'Launch' button. A notification banner at the top of the main area reads: 'Explore, launch and configure services with just a few clicks. You are exploring Helm Chart Repository Databases: Databases for data scientists.'



The screenshot shows the 'Process catalog' page of the EDITO Datalab. The top navigation bar is identical to the previous screenshot. The left sidebar is also identical. The main content area features a search bar and a grid of process cards: Wis-plastic-job, D-ecotmpact, Delft3d-fm, Coral-bleaching-job, Icecap, Marine-heat-waves-detection, and Nemo-run-and-served. Each process card includes a brief description and a 'Launch' button. A notification banner at the top of the main area reads: 'Explore, launch and configure computation functions with just a few clicks. You are exploring Helm Chart Repository Ocean processes: Catalog of ocean processes.'



Spatial Temporal Asset Catalogue (STAC)

EDITO Datalab

HomeTrainings and tutorialsDatalabExplore dataIntegrate dataAbout EDITODocumentationSupportLogout

My Services

Access your running services
Services are supposed to be shut down as soon as you stop using them actively.

RefreshNew serviceDelete allEvents

Running services

Stac-browser

Service: Stac-browser
Quoted: 14 minutes ago

Open

Resource usage quotas

Your current resource usage is reasonable.

Show more

Catalogs 443

TilesListAscendingDescending

Filter catalogs by title

3d habitat suitability maps of the 30 main commercial fish species from the atlantic ocean

A collection of 3D habitat suitability maps of the 30 main commercial fish species from the Atlantic Ocean data

1/1/1981, 12:00:00 AM UTC - 10/24/2025, 12:00:00 AM UTC

Additional information coastal vulnerability index

A collection of additional_information_coastal_vulnerability_index data

1/1/2000, 12:00:00 AM UTC - 12/31/2025, 12:00:00 AM UTC

Additional information coastal vulnerability index of closest coastline

A collection of additional_information_coastal_vulnerability_index_of_closest_coastline data

11/7/2024, 12:00:00 AM UTC - 12/31/2025, 12:00:00 AM UTC

Age of sea ice (Climate Forecast convention)

"Age of sea ice" means the length of time elapsed since the ice

1/1/1981, 12:00:00 AM UTC - 10/24/2025, 12:00:00 AM UTC

Mean of annual 90th percentile kinetic energy values between 2016 and 2018 n s m2

A collection of mean_of_annual_90th_percentile_kinetic_energy_values_between_n_2016_and_2018_n_s_m2 data

1/1/2016, 12:00:00 AM UTC - 1/31/2018, 12:00:00 AM UTC

Mean of annual 90th percentile kinetic energy values due to waves

A collection of mean_of_annual_90th_percentile_kinetic_energy_values_due_to_waves data

1/1/2016, 12:00:00 AM UTC - 3/31/2018, 12:00:00 AM UTC

Mean of annual 90th percentile kinetic energy values n s m2

A collection of mean_of_annual_90th_percentile_kinetic_energy_values_n_s_m2 data

1/1/1900, 12:00:00 AM UTC - 12/31/2025, 12:00:00 AM UTC

Sea surface wave directional spread at variance spectral density maximum (Climate Forecast convention)

The quantity with standard name sea_surface_wave_directional_spread_at_variance_spectral_density_maximum is the directional spread of the most energetic...

3/21/1841, 12:00:00 AM UTC - 6/10/2025, 12:00:00 AM UTC

Sea surface wave energy at variance spectral density maximum (Climate Forecast convention)

The wave directional spectrum can be written as a five dimensional function S(t,x,y,f,theta) where t is time, x and y are horizontal coordinates (such as longitude and latitude), f is...

3/21/1841, 12:00:00 AM UTC - 6/10/2025, 12:00:00 AM UTC

Sea surface wave from direction (Climate Forecast convention)

The phrase "from_direction" is used in the construction X_from_direction and indicates the direction from which the velocity vector of X is coming. The direction is a bearing in th...

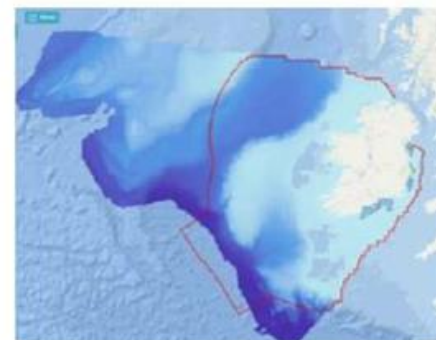
3/21/1841, 12:00:00 AM UTC - 7/15/2025, 1:00:00 AM UTC

Example : EDITO Model Lab Hackathon

Identify suitable offshore windfarm sites using the latest data, considering physical and socioeconomic constraints

Project Workflow

1. Identify our National Planning Framework Area.
2. For our baseline layer, latest bathymetry data was clip to 150m for floating wind and 80m for fixed offshore wind.
3. Identify constraints according to our National Marine Planning policy:
 - Ferry Routes (with 5km buffer)
 - Shipwrecks (with 500m buffer)
 - Special Areas of Conservation
 - Special Protected Areas
 - Defence Restriction Zones
 - EMODnet Vessel Density
4. Clip baseline by constraints.
5. Visualise in Terria.

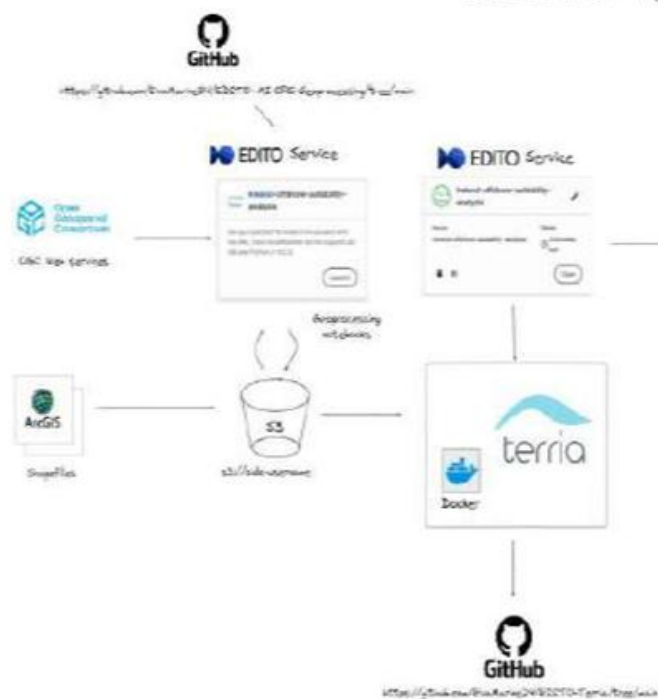


Example : EDITO Model Lab Hackathon

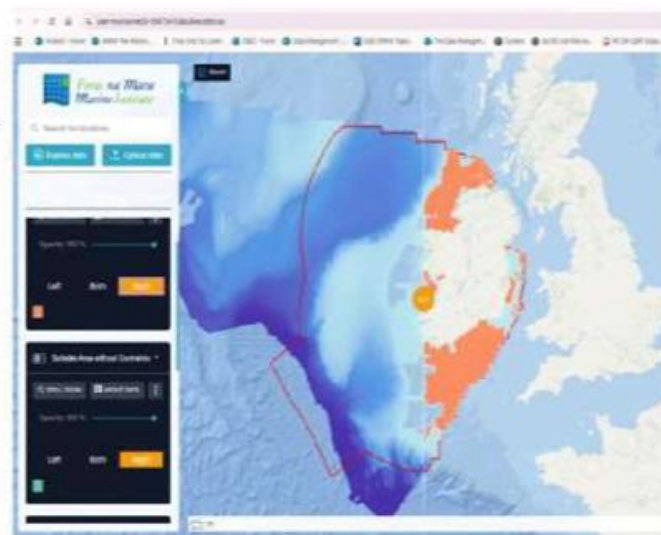
The MI team quickly built a useful and deployable app, to tackle a 'what if' scenario

Technical Workflow

EDITO Hackathon



Marine Institute TerriaMap



EMODnet
Human Activity Web Map Services

Foras na Mara
Marine Institute
ArcGIS REST Services

Team Members



Eva Linehan, Marine Institute



Gerald Lyons, Marine Institute



Eoghan Cunningham, Marine Institute



Diego Pereiro, Marine Institute

EMODnet – EDITO next steps.

- Copy all of EMODnet Products to the data lake, there are thousands.
- When needed, make some EMODnet products available in Cloud Optimised Formats.
- Automate the data product flow from EMODnet to EDITO.
- Automate the meta-data flow from the EMODnet CSW to the EDITO STAC
- Improve the harmonisation of meta-data across EMODnet thematics.
- Provide support to users who want to work with EMODnet data on EDITO.
- Leverage EDITO to try tackle some of the Big Data problems that we have in EMODnet.
- Encourage a sense of ownership of EDITO for the EMODnet Community



EMODnet



European Marine
Observation and
Data Network



emodnet.ec.europa.eu

Stay up-to-date with
the latest news



eoOSC | Blue-Cloud2026

Thank you!

5-6 November 2025, Brussels [Belgium]



Funded by
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