



EMODnet



European Marine
Observation and
Data Network

EMODnet
**ANNUAL
REPORT 2024**



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Acknowledgements_____

This Annual report is produced by the EMODnet Secretariat, with input from the EMODnet Central Portal and EMODnet Thematic and Data Ingestion Coordinators.

More information_____

To discover more about EMODnet, visit the EC marine data service EMODnet Portal emodnet.ec.europa.eu or the EC Maritime Forum https://maritime-forum.ec.europa.eu/themes/marine-knowledge/emodnet_en

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Contents



ABOUT EMODNET _____ p. 4



INTRODUCTION _____ p. 6



2024 AT A GLANCE _____ p. 8



EMODNET SERVICES FACTS AND FIGURES _____ p. 12



ONE YEAR OF EMODNET _____ p. 14



EMODNET IN PRACTICE _____ p. 32



EMODNET FOR BUSINESS _____ p. 36



EUROPEAN ATLAS OF THE SEAS _____ p. 48

BUDGET _____ p. 52



EMODNET TEAM _____ p. 54



EMODNET PUBLICATIONS _____ p. 55

About EMODnet

The European Marine Observation and Data Network (EMODnet) is the *in situ* marine data service of the European Commission (EC) Directorate-General Maritime Affairs and Fisheries (EC DG MARE) and funded by the European Maritime Fisheries and Aquaculture Fund. Established in 2009, EMODnet plays a pivotal role as a trusted source of *in situ* marine environmental and human activities data and data products, serving a diverse user base across various sectors.

The EMODnet Portal (emodnet.ec.europa.eu) is a single access point to all EMODnet services, providing easy and free access to a wealth of marine data, metadata, and data products. Covering seven disciplinary themes – bathymetry, geology, physics, chemistry, biology, seabed habitats and human activities – EMODnet spans the entire marine environment from coast to open ocean, surface to the deep seafloor, whilst also offering data and information on the Blue Economy operations, from vessel density and offshore platform sitings, to hosting EU Member State Maritime Spatial Plans.

In collaboration with over 130 partner organisations and stakeholders, EMODnet aggregates data into Findable, Accessible, Interoperable, and Reusable (FAIR) pan-European data layers, with data and accompanying metadata harmonised according to EU e.g., INSPIRE and International e.g., ISO standards. In addition, EMODnet experts produce unique data products such as EUSeaMap, a broad-scale seabed habitat map, the EU Digital Terrain Model for harmonised bathymetry, and the pan-European Marine Litter Database.

EMODnet caters to a broad user community, including the private sector and Blue Economy, national authorities and administrators, research and academia, non-governmental organisations and citizen science initiatives. This dynamic network of experts continuously evolves EMODnet into the operational EU marine data service it is today.

EMODnet aims to enhance its societal relevance. This involves integrating data from citizen science initiatives, expanding data accessibility through platforms like the European Atlas of the Seas, and promoting ocean literacy and sustainable practices across Europe and beyond. The future vision of EMODnet is not just to serve as a data repository but as a catalyst for positive change in marine understanding, conservation, and innovation.

EMODnet is a European regional contributor to the global ocean data ecosystem, providing European-funded Bathymetry data to the Nippon Foundation – GEBCO Seabed 2030 initiative, marine biodiversity/biological data to the Ocean Biodiversity Information System (OBIS) and ensuring that EMODnet is interoperable with – and harvested by – to global ocean data and metadata initiatives such as the Ocean Data and Information System (ODIS) of IODE IOC/UNESCO, the Group on Earth Observations System of Systems (GEOSS) and more. EMODnet also fosters international partnerships with other regional data services worldwide to promote ocean data sharing, data diplomacy and to advance marine data interoperability and open marine knowledge, for all.



THE EUROPEAN MARINE OBSERVATION AND DATA NETWORK - AT A GLANCE

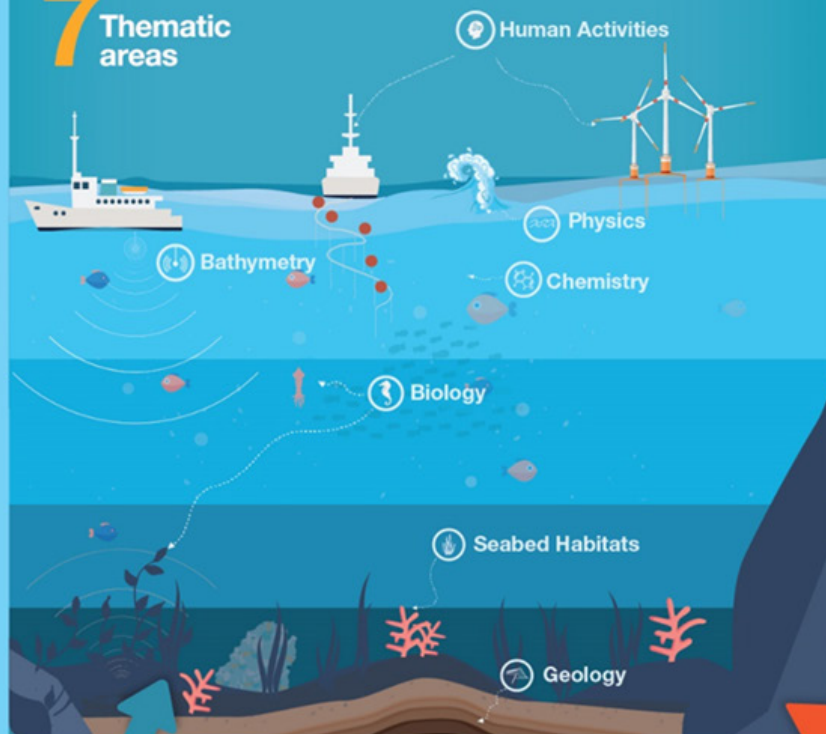
EMODnet



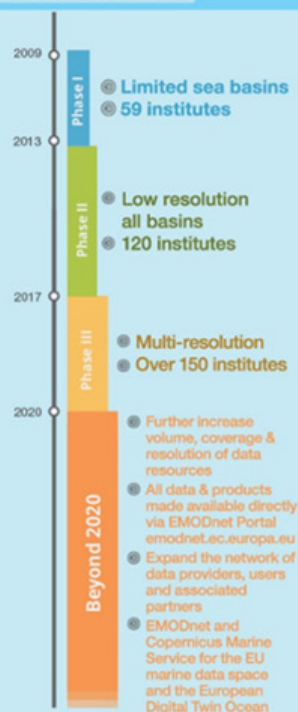
European Marine
Observation and
Data Network

In 2024, EMODnet is an EC *in situ* marine data service of DG MARE, with over **130 organisations** assembling and making available FAIR* pan-European **marine data and data products**.

7 Thematic areas



EMODnet Timeline



1 EMODnet Portal - emodnet.ec.europa.eu

Gateway to all EMODnet data resources and tools allowing users to retrieve data layers from multiple themes

1 Ingestion Portal

facilitating submission of new datasets

EMODnet Secretariat

Why EMODnet?

Every year, the EU & its Member States invest a huge amount in marine observations and data collection.

Most of this data ends up in different databases and systems scattered around Europe and is difficult to find, access, assemble and use. EMODnet produces pan-European integrated data layers and data products, as an open and free public service.



EMODnet is making a difference

From raw data to real-life applications



Who is EMODnet for?

Professionals from: Public Administration Private Sector Society Research/Academia

Benefits

- More productivity:** Avoid costs of repeated collection of data by improving access to already existing data in compatible formats
- More innovation:** Anyone (including SMEs) can build value-added services using data from different sources
- Less uncertainty:** Better access to data improves forecasts of the behaviour of the seas, reducing costs of protecting life and property in coastal areas and offshore
- Adding value to your own data:** Sharing data with EMODnet ensures your data are harmonised and standardised into Findable, Accessible, Interoperable and Reusable (FAIR*) data and metadata, so data can be combined with other data to generate better value-added products and information to support diverse users, contributing to the global ocean data ecosystem



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.ec.europa.eu

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Head of the EMODnet
Secretariat

Introduction from the Head of the EMODnet Secretariat

EMODnet: A Trusted European Asset for Marine Data and Knowledge

January 2024 marked one year since the successful launch of the upgraded, unified EMODnet Portal in January 2023. Building on the success of 2023, the positive stakeholder response to EMODnet's updated centralised service offer continued to grow in 2024, with over 120,000 annual visitors benefitting from streamlined discovery, visualisation, and access to EMODnet's extensive cross-thematic datasets—all available from a single entry point. What sets EMODnet apart is its breadth and depth: it remains the only European Commission marine data service delivering such a comprehensive offer across marine

environmental data and human activities. EMODnet offers over 720 layers on the Map Viewer and many more datasets in the central catalogue that span over 68 parameters, based on *in situ* observations harmonised to FAIR principles and standardised to European INSPIRE geospatial data standards and International ISO and OGC metadata and web service standards. EMODnet provides stakeholders with free, high-quality marine knowledge at pan-European and global scales.

EMODnet's value is reflected not only in its continuous growth and expansion in users but also in over 100 use cases demonstrating practical applications of its data, from supporting EU Policy implementation to providing a trusted marine knowledge baseline for the planning and positioning of Blue Economy coastal and offshore platforms. Behind the scenes, this operational service is made possible thanks to a unique network of over 600 data aggregators and curators and more than 130 partner organisations, working to ensure standardisation and integration of Europe's *in situ* marine data. EMODnet's experts also produce high-impact open-source data products—such as the Digital Terrain Model (DTM) and EUSeaMap—saving users time and resources and fostering innovation.

EMODnet Vision 2035: Co-Designing the Future

Building on the momentum from the 2023 EMODnet Open Conference and Call to Action, in 2024 the EMODnet community kicked off the EMODnet Vision 2035 process to produce a community Vision for EMODnet's service offer over the next decade. The process was spearheaded by a Vision Drafting Group (VDG) co-Chaired by the Head of EMODnet Secretariat and two nominated EMODnet community co-Chairs. The full VDG was composed of representatives from all EMODnet components (seven thematics, data ingestion, Central Portal, Sea-basin Checkpoints and Associated Partners), and included a number of external stakeholders representing key actors in the EMODnet marine knowledge value chain.

In July 2024 the EMODnet VDG launched a public consultation to collect broad input on EMODnet's core pillars for service evolution, contribution to the European Digital Twin Ocean, EU and global partnerships, and more. The inputs received ranged from National marine institutes to Regional initiatives and from European networks to international stakeholders. At the time of writing, the EMODnet Vision 2035 is in its final stages, with a launch planned in 2025 (stay tuned for announcements on the EMODnet Portal, EMODnet news digest and social media).

Cross-Thematic Marine Knowledge at Your Fingertips

In 2024, EMODnet continued to consolidate and grow its unrivalled marine data offer. The seven thematic areas regularly updated services, expanded geographic and temporal coverage, and added new parameters:

Bathymetry: The most popular dataset in 2024 was the Digital Terrain Model (DTM), with thousands of downloads each month. Preparations continued for the major 2025 release covering European seas and the Caribbean;

Biology: Added 1.9 million occurrence records dating from 1753 to 2024, including a unique Loggerhead Turtle density map for the Mediterranean;

Chemistry: Released validated data on eutrophication and acidity, and new maps of contaminants, aligning closely with MSFD and MSPD policy needs;

Geology: Updated layers on geomorphology, Quaternary and pre-Quaternary geology, and enhanced user experience through simplified structure;

Human Activities: Added new datasets on fish quotas and UNESCO World Heritage marine sites, and updated key layers such as Maritime Spatial Plans and vessel density maps.

Physics: Released global climatology for salinity and temperature and continued to deliver data from the EMODnet–SSI–GOF citizen science initiative;

Seabed Habitats: Enhanced EUSeaMap's reach and impact, uploaded Essential Fish Habitat maps and released a new Story Map for user engagement.

Data Ingestion: Expanding the EMODnet offer via data sharing across sectors

Whilst EMODnet thematics have many established data flows directly into the EMODnet service, there remain many data collection efforts that require further support to bring the data into EMODnet e.g., private sector and citizen science. This is where EMODnet Data Ingestion comes in, providing a public service for *in situ* ocean observation, marine monitoring or data collection efforts who would like to submit their data and metadata into EMODnet, for the benefit of all. In 2024, EMODnet Data Ingestion received nearly 300 new dataset submissions, bringing the total to 1,806. Over 1,600 datasets are now publicly visible through the View Submissions tool, including contributions from public research, the private sector, Non-Governmental Organisations (NGOs), and citizen science.

A key highlight of 2024 was an EMODnet webinar for Horizon Europe and Mission Ocean projects, held in February 2024 and co-organised by the EMODnet Secretariat and EMODnet Data Ingestion to provide advice and raise awareness about data and metadata standards and the benefits of sharing data with EMODnet. EMODnet Data Ingestion also produced guidelines together with the public recording of the webinar, to be used as a resource by any European project or indeed wider data collection initiative. Data Ingestion also collaborated with the Central Portal team to move forward the process of centralisation of its service into the EMODnet Portal. This final component of EMODnet's service is on track to be fully centralised into the EMODnet Portal by summer 2025.

Ocean Data for and by Society

EMODnet relies on a vast and diverse community of ocean observers: from operational oceanographic platforms e.g., EuroGOOS to citizen science groups. These observations – collected *in situ* (taken by sensors or samplers in or around the coast and ocean) underpin all EMODnet data services, making it imperative to secure long-term support for both *in situ* ocean observations and marine data management infrastructure and services. EMODnet also supports public outreach and education by making a vast amount of its data available through the **European Atlas of the Seas**, the EC communication and ocean literacy tool. In 2024, the Atlas introduced the “My Locations” tool and launched an educational “Blue Economy Challenge” game. Three workshops were held, and the Atlas was showcased at events such as Science is Wonderful!, European Maritime Day, and Plastic Pirates Summit.

Technical Progress: Powering Innovation

2024 saw the launch of EMODnet's technical blog series to provide stakeholders with regular updates on technical improvements to EMODnet's features, functionalities and services. Among the 2024 highlights was the enhancement of the EMODnet Map Viewer, including the provision of Arctic and Antarctic projections. EMODnet's Technical Working Group with representatives from the EMODnet Secretariat, Central Portal, thematics and data ingestion continue to advance EMODnet's ‘backend’ services to further simplify the user interface, making it easier than ever to discover, visualise and download EMODnet's coastal and marine data and data products.

A growing network, expanding reach

In addition to the 130 partners, EMODnet also has an Associated Partnership Scheme and hundreds more stakeholders providing primary data (ocean observations) to EMODnet and in turn using the EMODnet service for multiple purposes. 2024 saw the development of ten new use cases added to the large and searchable online use case database, and five new Associated Partners (Voice of the Ocean, Oceano Vox, Renewables Grid Initiative, savvy navy and Van Oord). A new data success story section was added to the EMODnet Portal to showcase the diversity of data providers to EMODnet and to recognise their considerable efforts in data collection.

EMODnet's dialogue with the Blue Economy continued in 2024 with an EMODnet for Business workshop on “EMODnet data by and for Ports, Marinas and recreational Boating” taking place as an online event in October 2024, co-organised by EMODnet, the European Boating Industry, TransEurope Marinas and the European Sea Ports Organisation, in collaboration with EC DG MARE. EMODnet also presented at multiple industry-led events including the Geospatial World Forum in Rotterdam, the Netherlands and EMODnet co-organised a session at European Maritime Day in Svendborg, Denmark with the EU Blue Economy Observatory and the European Environment Agency.

Driving Europe's Digital Ocean Future

EMODnet and Copernicus Marine Service continued their long-standing partnership in marine data provision, with a key milestone in 2024 being the continued technical development of the European Digital Twin Ocean (EU DTO) data infrastructure (EDITO-Infra) which led to the launch of the **EDITO** prototype at the **Digital Ocean Forum** in Brussels in June 2024. EMODnet is the *in situ* component of the EU DTO and a key achievement in 2024 was also the common cloud-based data lake of EMODnet and Copernicus Marine Service data, making it directly accessible and usable as high volume, diverse coastal and marine data that can be used with the EU DTOs advanced modelling capabilities and analytical tools. With Phase 1 completed in 2024, Phase 2 of EDITO will start in 2025, bringing new opportunities for user engagement, co-design, and innovation.

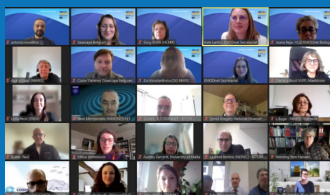
2024 at a glance

EMODnet joins forces with Scuba Schools International and the German Ocean Foundation in the largest citizen science data partnership to date.



Panelists at BOOT 2024, Duesseldorf, Germany showcased a land-mark citizen science initiative bringing scuba diving data to EMODnet, with experts (from left to right): Frank Schweikert, GOF, Germany; Guido Watzig, SSI; Patrick Gorringe, SMHI, Sweden and EMODnet Physics; and Andreea Strachinescu, EC DG MARE. (©EBI)

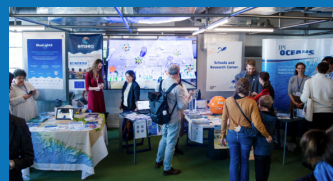
EMODnet hosts webinar for European Research and Innovation (R&I) and EU Mission: restore our Ocean and Waters projects.



Participants from the EMODnet Data Ingestion webinar for European Horizon Europe and Mission: Restore our Ocean and Waters projects, co-organised by the EMODnet Secretariat, Data Ingestion and thematic Coordinators, EC DG MARE and CINEA. (©EMODnet Secretariat)

'EMODnet's Marine Knowledge value chain presented at a Sustainable Blue Economy Partnership (SBEP) ocean observation workshop in Brussels.

EMODnet and the EU Atlas of the Seas exhibited at the Ocean Literacy in Action event.



Ocean Literacy in Action Day 2024. (©EU4Ocean)

EMODnet Secretariat launches a technical blog championed by EMODnet's Technical Coordinator, Conor Delaney.

JANUARY

New EMODnet Chemistry Maps for Marine Contaminants, such as heavy metals, pesticides, hydrocarbons, and PCBs.

EMODnet Biology data used in UNESCO World Heritage Marine Sites for marine biodiversity.

EMODnet Physics and the MOANA project expand EMODnet's data offer in the Pacific Ocean.

Expanding EMODnet Seabed Habitats in the Caribbean with SAERI: New Data and Capacity Building Efforts.

MARCH

EMODnet kicks off its Vision 2035 Drafting Group with nominated representatives across all EMODnet components spanning the Secretariat, Central Portal, seven Thematics, Data Ingestion, Sea-basin Checkpoint Coordinators, Associated Partners and key actors in EMODnet's value chain.

FEBRUARY

20

The first EMODnet Vision Drafting Group (VDG) meeting took place.

The EMODnet 20th Steering Committee took place online, discussing EMODnet for EU Policy, thematic updates to data and data products, stakeholder engagements, user uptake, and EMODnet's data sharing and data ingestion activities.

EMODnet Geology and Chemistry participated in the EU Geosciences Union (EGU) 2024 General Assembly, presenting the latest EMODnet thematic offer and recognising international partnerships with UNESCO and National / regional data services on particular topics e.g., ocean acidification.

The EMODnet Secretariat presented EMODnet's diverse marine data service at the Hydrospatial Infrastructure and Blue Economy Summit, part of the Geospatial World Forum 2024 in Rotterdam, the Netherlands.

EMODnet data ingestion, thematics, Central Portal and Secretariat participated at the International Conference on Marine Data and Information Systems (IMDIS) in Bergen, Norway.

EMODnet showcased its contribution to the EU DTO at the Digital Ocean Forum 2024 in Brussels, Belgium.

The EMODnet Secretariat and Copernicus Marine Service also co-organised a DOF Scientific and Technical workshop.



Breakout Sessions during DOF 2024 Scientific and Technical workshop. (©EDITO)

22

APRIL

MAY

JUNE

EMODnet exhibited with Copernicus Marine Service at the UN Ocean Decade Conference held in Barcelona, Spain in April 2024.

EMODnet for the UN Ocean Decade



2021 United Nations Decade
of Ocean Science
2030 for Sustainable Development

EMODnet collaborated with the EU Blue Economy Observatory and the European Environment Agency for a joint workshop on 'Data for Blue Economy' at European Maritime Day 2024 in Svendborg, Denmark.



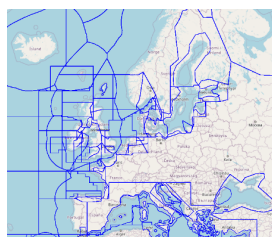
Participants of the European Maritime Day 2024 in Svendborg, Denmark. (©European Commission)

EMODnet, Copernicus Marine Service, EUMETSAT and ECOPs initiated a joint webinar series on European Marine Data for the UN Ocean Decade, in collaboration with the UN OD Ocean data sharing office.

EMODnet for the UN Ocean Decade. (©UNOD)

The EMODnet Vision 2035 public survey was launched for a two-month consultation period, open to all stakeholders with responses from experts in Europe and worldwide.

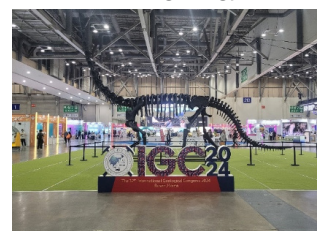
New EMODnet Human Activities datasets on fish quotas and UNESCO World Heritage Convention Sites were launched and made available in the EMODnet Map Viewer for public use.



EMODnet Map Viewer showing the EMODnet Human Activities dataset on fishing quotas by Fishery Management Zones (FMZs) (right). (©EMODnet Secretariat)

EMODnet Biology's ongoing contribution of marine data for EU Policy was presented at the **11th Technical Group (TG) Data meeting** of the Marine Strategy Framework Directive (MSFD).

EMODnet Geology presented a poster at the 37th International Geological Congress (IGC), titled 'EMODnet Geology's new standards revealing Earth's seabed geology'.



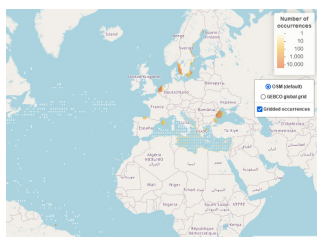
The 37th International Geological Congress 2024 held in Busan, Republic of Korea. (©Dr Susanna Kihlman/ EMODnet Geology & GTK)

JULY

SEPTEMBER

20

AUGUST



EMODnet Biology July_Harvest.png. © CC-BY-MODnet Biology new data publication

The publication of data, which was completed in late June, increased the EMODnet Biology holdings by more than 300K new occurrence records. The data originates from 28 datasets, including 16 new and 12 updated, covering the period from 1981 to 2023.

EMODnet Seabed Habitats produced a map library of its benthic habitat maps.

EMODnet Geology engaged with global stakeholders at the 37th International Geological Congress (IGC) in Busan, Republic of Korea, where project delegates presented the initiative during a dedicated session.

EMODnet showcased its latest services to the International Council for the Exploration of the Sea (ICES) Annual Science Conference 2024 in Newcastle, UK, with the Secretariat hosting an exhibition booth, co-Chairing a scientific session and presenting at an early career event.

2024 at a glance

EMODnet hosted an online stakeholder workshop 'Marine data for Ports, Marinas and the recreational Boating sector.'

EMODnet participated at the Ocean Best Practices Workshop VIII, presenting best practices for enhancing data and service interoperability within the EU DTO.

EMODnet Human Activities spoke at roundtable during the Ecomondo Green Technology Expo, on Innovations in Coastal Monitoring and Forecasting for early warning systems, in Rimini, Italy.

EMODnet services were represented by the EMODnet Secretariat and some thematics during the Marine User Days 2024 in Lisbon, Portugal.

EMODnet Biology increased its biodiversity data holdings by over 1.2 million new occurrence records, spanning a historical time period of over 100 years for a broad range of taxonomic groups from algae to marine mammals and more.

23

OCTOBER

NOVEMBER

DECEMBER

EMODnet Chemistry participated at the International Workshop on Monitoring, Assessment and Prevention of Marine Litter on the seafloor in Shanghai, China, focusing on data collection and best practices.



EMODnet Chemistry at the International Workshop on Monitoring, Assessment and Prevention of Marine Litter on the Seafloor in Shanghai, China. (©EMODnet Chemistry)

EMODnet Geology updated the data products on Seafloor geology and submerged Landscapes.



EMODnet Geology WP8 – Submerged Landscapes – Data Structure/Layers. These submerged landscapes map layers show the different data types included in the work package. (©EMODnet Secretariat)

EMODnet service: facts and figures

Over
EMODnet
Partner
Organisations

130



EMODnet
Associated
Partners
by end 2024

35



120 Use cases
by end 2024



Data & data product offer

6,389 entries in the EMODnet product Catalogue
722 layers in the EMODnet map viewer
Data offered for over **68** (parameters e.g., temperature, vessel density) across 7 thematic areas across the coastal and marine environment and human activities at sea.



Social media reach 2024

In 2024, EMODnet's social media presence continued to evolve across platforms. **X** (formerly Twitter) recorded **6,147** followers, a 1.6% decrease compared to 2023, reflecting a broader trend of platform diversification. In contrast, **LinkedIn** showed strong growth, with followers increasing by 44.8% to **2,762**, highlighting a rise in professional engagement. **YouTube** subscribers also grew by 14.3% to **296**. Notably, YouTube watch time increased by 13.3% to **121.2** hours, suggesting that although fewer videos were viewed overall, audience engagement with the content deepened.



EMODnet Portal Web traffic



144,688 visitors*

222,618 sessions**

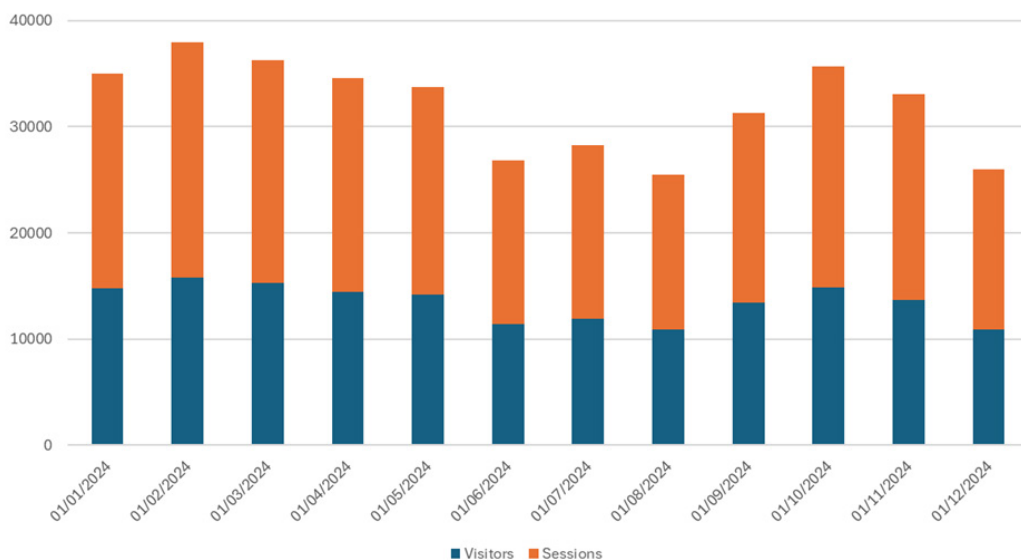
413,770 page views

16,83% of returning visitors

* The number of unique visitors. Every visitor is counted once, even if they visit the website many times during the day.

** A session starts with the first event and ends 30 minutes after the last event (after the session is over).

EMODnet Portal visitors and sessions



EMODnet Secretariat

The European Marine Observation and Data Network (EMODnet) is supported by a Secretariat that provides strategic and technical advice and facilitation together with coordination across all areas of EMODnet's activities, including the coordination of EMODnet governance meetings, and a focal point for cross-thematic partnership activities, including at European scale e.g., Copernicus Marine Service, to presenting EMODnet to policymakers to demonstrate the concrete way EMODnet is supporting EU Policy e.g., MSFD and MSP, and at a Global level e.g., IODE of IOC-UNESCO and ODIS global ocean data/metadata initiative. The Secretariat is a key contributor to the Central Portal Technical Team and Technical Working Group, guiding the development of the EMODnet Central Portal. The Secretariat also monitors the progress of the seven thematics and data ingestion and leads EMODnet's organisation of flagship events and pan-EMODnet communication resources (e.g., videos, infographics), actively promoting EMODnet at events and regularly disseminating updates online via the Portal, social media, News Digest and more. In addition, the Secretariat team fosters strong coherence, interaction and collaboration across the EMODnet partnership, conducts targeted activities to connect EMODnet with Europe's Ocean Observation community (e.g., EMODnet representation on the European Ocean Observing System Steering Group) and targeted studies which together provide advice to EC DG MARE for the EC Ocean Observation Initiative. The Secretariat also manages the technical and communication aspects of the European Atlas of the Seas, an EC web-based communication tool utilising open data from EMODnet and wider sources.

Since 2013, the EMODnet Secretariat has been administered by Seascope Belgium and hosted at the InnovOcean Campus in Oostende, Belgium, with the support of the Flemish Government. In its current phase, the core secretariat staff from Seascope Belgium is supported by three other organisations: Trust-IT for communication, website design and targeted technical activities, the European Marine Board to support European Ocean Observation stakeholder interactions, and Bilbomática for technical and development support for the European Atlas of the Seas and the Central Portal Map Viewer.



2024 EMODnet Secretariat contributions to key events

EMODnet Secretariat actively attends, presents, and/or co-organises many EMODnet and external events, highlights of which are presented below for the year 2024. You can find more information on the events page of the EMODnet website: <https://emodnet.ec.europa.eu/en/>

- » EMODnet for Horizon Europe and EU Mission: Restore our Ocean and Waters projects," 28 February, Online webinar (co-organiser, host and moderator)
- » 22nd EOOS Steering Group meeting, 18 April 2024, Brussels, Belgium (speaker)
- » VLIZ InnovOcean Campus Seminar, 3 May 2024, Ostend, Belgium (speaker)
- » UN Ocean Decade Conference, April 2024, Barcelona, Spain (exhibitor)
- » Geospatial World Forum 2024 – Hydrosatial Infrastructure and Blue Economy Summit, 14–16 May 2024 (speaker)
- » International Conference on Marine Data and Information Systems (IMDIS), 27–29 May 2024, Bergen, Norway (presenter)
- » European Maritime Day (EMD) 2024, 30–31 May 2024, Svendborg, Denmark (workshop co-organiser, Chair, speaker and exhibitor)
- » Ecopath 40 Years – The Ecosystem Continuum, 3–8 June 2024, Ostend, Belgium (presenter)
- » Copernicus Marine General Assembly, 4–5 June 2024, Online
- » JPI Oceans Strategic Navigation Forum, 11 June 2024, Brussels, Belgium
- » Digital Ocean Forum 2024, 12–13 June 2024, Brussels, Belgium (co-organiser and panellist)
- » ICES Annual Science Conference, 9–12 September 2024, Gateshead, UK (exhibitor, co-Chair and speaker)
- » Water4All Data Sharing Meeting, 18 September 2024, Online
- » PREP4BLUE Knowledge Output Workshop, 19 September 2024, Online
- » Marine Strategy Framework Directive TG DATA Meeting, 27 September 2024, Brussels, Belgium (observer)
- » Ocean Knowledge 2030, 21 October 2024, Dublin, Ireland (speaker)
- » OBPS 8th Annual Workshop, 14–18 October 2024, Online (presenter)
- » EMODnet for Business Workshop – Marine Data for Ports, Marinas and Boating, 22 October 2024, Online (lead organiser, host, moderator, reporter)
- » 23rd EOOS Steering Group Meeting, 24 October 2024, Brussels, Belgium (speaker)
- » European Maritime Spatial Planning (MSP) Week, 22–24 October 2024, Marseille, France (speaker)
- » Marine User Days, 5–6 November 2024, Lisbon Portugal (exhibitor)



One year of EMODnet



Thematic node: EMODnet Bathymetry

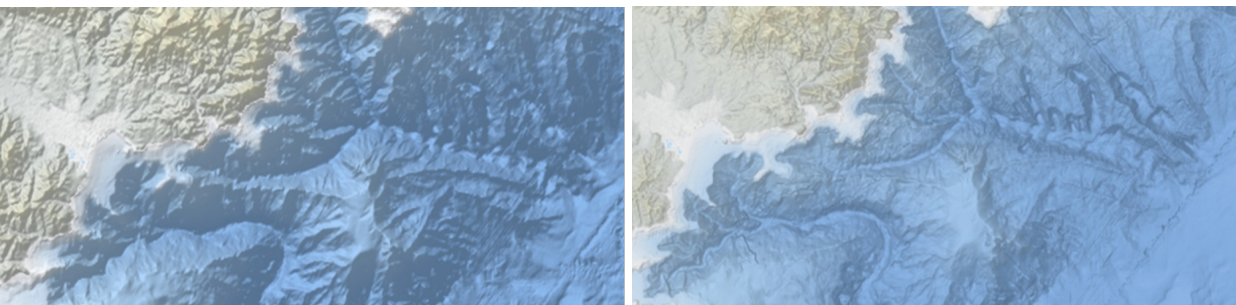
BATHYMETRY

Bathymetry describes the topography of the seabed, by measuring the distance from the sea surface to the seafloor. It provides essential information to understand the dynamics of the marine environment: the shape of the seabed can influence Ocean circulation and currents, local fauna and seafloor habitats. It is also very important for hydraulic models to calculate tides and waves and other derived parameters. The EMODnet Bathymetry theme provides access to data and data products on bathymetry (water depth), such as the EMODnet Digital Terrain Model (DTM) for all European seas and the Caribbean Sea, depth contours, survey tracks, best estimate satellite-derived coastlines, national baselines, and various options to view, query, and download.

2024 Key Facts

Activities in 2024 were mostly dedicated to generating the new EMODnet 2024 DTM. This has been prepared using a common methodology by an experienced team of bathymetry experts as a composite of more than 22,000 data sets, selected from the EMODnet Bathymetry catalogues and processed to common standards and grid. The latest DTM has a grid resolution of 1/16 arc minutes * 1/16 arc minutes and can be viewed with several layers as part of the Bathymetry folder in the Map Viewer of the EMODnet Portal. The 2024 DTM includes a selection of the latest data sets and efforts were undertaken to improve anomalies and artefacts identified in the earlier 2022 version. As part of this, data providers in 2023-2024 brought together another 1,800 bathymetric data sets, bringing the total collections of EMODnet Bathymetry to 43,092 survey data sets and 299 composite Digital Terrain Models (DTMs) and Satellite Derived Bathymetry products. These are available in the EMODnet Bathymetry catalogue services, based upon SeaDataNet, and ultimately in the central EMODnet metadata catalogue. The latest GEBCO 2024 was used to fill gaps in data coverage. The DTM for the Caribbean Sea region has also been updated, adding new survey data sets for coastal waters of several Caribbean islands. New rendering has been applied for the OGC web services of the 2024 EMODnet DTMs resulting in doubling the render resolution and application of advanced hill shading algorithms. The sky model illumination model was applied providing the most accurate representation of the terrain, preserving important details that are obscured in other techniques.

Publication of the highly successful EMODnet World Base Layer Service (EBWBL) continued as OGC WMTS service. It provides fast and easy access to worldwide bathymetric and topographic information as a composite of EMODnet DTM, General Bathymetric Chart of the Oceans (GEBCO), and a satellite-derived DTM for land cover with a common grid and colour palette, while the coastline is based upon OpenStreetMap. A new 2024 set of satellite-derived coastlines for Europe and the Caribbean has been prepared for Lowest Astronomical Tide (LAT), Mean Sea Level (MSL) and Mean High Water (MHW). The coastlines are included as extra layers in the central EMODnet Map Viewer, allowing users to view and download these in shape format. The layers are also included in the WMS-WFS service. Processing of satellite images at large spatial and temporal scales concerns large volumes of satellite data. Use was made of the Google Earth Engine platform, allowing parallel processing of huge volumes of satellite data in reasonable time and harmonising satellite data acquired by different satellite missions performed by ESA and



Rendering of a coastal area in the 2022 release of the DTM (upper) vs. in the 2024 DTM release (lower). (©EMODnet Bathymetry)

NASA. A mixture was used of top-of-atmosphere reflectance satellite images from NASA/USGS Landsat 8 and ESA Sentinel-2 satellite missions, acquired during 2013-2020.

Key data providers and users in 2024

The key data providers of EMODnet Bathymetry continue to include national hydrographic services, marine research institutes, governmental departments, and companies, bringing the total number of data providers to 78 organisations. A new data provider, for instance, was the Marine and Freshwater Research Institute (MFRI) from Iceland, which contributed a large composite DTM for the Atlantic and Arctic waters around Iceland. Another noticeable contribution came from the Portuguese Continental Shelf Mapping Project, which is part of the SEAMAP 2030 program and led by the Hydrographic Institute of Portugal. Its goal is to map the nation's maritime territories comprehensively by 2030, aligning with global efforts like the Seabed 2030 project. Data collection began in 2005, involving over 900 survey days until 2009. As of recent updates, around 56% of Portugal's maritime areas have been mapped. To complete this by 2030, 100 to 150 survey days are planned annually. The Portuguese data contribution has greatly enhanced data coverage in the Atlantic region of the EMODnet DTM.

Currently, most hydrographic survey institutes and major marine research institutes from Europe are involved in EMODnet Bathymetry. Key users of EMODnet Bathymetry are academia and research – including from the international community, governmental departments, Non-Governmental Organisations (NGOs) – and a wide range of marine and offshore companies, as bathymetry is a key input and base layer for many operations and projects at sea and along the coasts. In 2024, circa 32,000 DTM tiles and 8,000 High-Resolution DTM files were downloaded. In addition, the OGC web services (machine-to-machine) continued to be very popular with circa 30 million OGC service requests in 2024. The variety of uses can also be derived from the numerous EMODnet Bathymetry references in research papers, journals and books.

Ever since the start of the EMODnet Bathymetry project, there has been a strong relationship between various global bathymetric initiatives. EMODnet Bathymetry continues to be the main data source for Europe for the GEBCO digital grid, produced yearly by the Seabed 2030 project. The EMODnet Bathymetry grid is fully incorporated in the GEBCO grid releases. There is a strong representation of EMODnet Bathymetry as experts in the GEBCO community. GGSgc is elected Chair of the GEBCO Technical Subcommittee for Ocean Mapping (TSCOM) with CNR-ISMAR acting as Vice Chair, and Shom as member. Moreover, the Vice Chair for the GEBCO Guiding Committee is performed by CNR-ISMAR. This way, EMODnet Bathymetry was presented in 2024 at various Seabed 2030 and GEBCO meetings around the world. There is also a close collaboration with IHO, which has led to data contributions by several other national hydrographic services beyond the consortium, such as from Finland, Poland, and Iceland.

BATHYMETRY 2024 EVENTS

Commission internationale pour l'exploration scientifique de la Méditerranée (CIESM), 20 March 2024, Monaco

North Sea Hydrographic Commission, 8-10 April 2024, Malmö, Sweden

UN Ocean Decade, 10-12 April 2024, Barcelona, Spain

Geospatial World Forum, 15 May 2024, Rotterdam, The Netherlands

EMODnet Bathymetry Basin coordinators meeting 15-18 May 2024, Lormes, France

IHO-Europe Networking Group (IENWG), 29 May 2024, Svendborg, Denmark

European Maritime Day (EMD 2024), 30-31 May 2024, Svendborg, Denmark

International Conference on Marine Data and Information Systems, 27-29 May 2024, Bergen, Norway

Canadian Hydrographic Conference, 30-31 May 2024, St Johns' NL, Canada

Mediterranean and Black Seas Hydrographic Commission, 2-4 July 2024, Constanța, Romania

Baltic Sea Hydrographic Commission-29, 17-19 September 2024, Tallinn, Estonia

Ocean Data Action Day, 10 October 2024, Oslo, Norway

GEBCO Guiding Committee and the 6th Nippon Foundation GEBCO Seabed 2030 Pacific Ocean Mapping Meeting, 4-8 November 2024, Nadi, Fiji

GeoBuiz Summit Europe, 14 November 2024, Amsterdam, The Netherlands

Meso-American – Caribbean Sea Hydrographic Commission, 2-6 December 2024, Panama City, Panama





Thematic node: EMODnet Biology

BIOLOGY

Marine biology (including biodiversity) is the understanding of species distributions through time and space and is essential to assess the state of the marine environment. EMODnet Biology provides access to marine biodiversity data and products, including species occurrences, biotic and abiotic parameters.

The biodiversity data originates from various sources, from citizen science to tracking, imagery to visual observations and genomics. The data published were collected in short- and long-term projects, monitoring or ad-hoc surveys, citizen science activities and literature reviews and covers not only recent but also historical data.

2024 Key Facts

The year 2024 was a year of intense activity for EMODnet Biology. On the data side, the thematic published almost 2 million occurrence records from 122 new datasets and updated 121 existing datasets. This brought the total of published occurrence records to almost 40 million records. Three genomics datasets were published in the last data harvest of the year, following months of technical changes and discussions on how



to expose the data whilst aligning with the guidelines from other important biodiversity initiatives.

Four external data products were published in the EMODnet Map Viewer throughout 2024, with most being made available directly to the thematic lot and one resulting from direct contact with the product creators.

EMODnet Biology also organised and hosted two workshops, one focused on the Regional Sea Conventions and the other for the EU Mission Ocean funded projects.

Of the written deliverables published during the year, [D4.2.4. Report on progress for the publication of fisheries survey data](#) is highlighted, which provides an overview of the various fisheries data, the existing data availability and recommendations to improve access and publication of these data via EMODnet Biology. A total of 20 map layers were available in the EMODnet Map Viewer by the end of 2024.

As in previous years, continuous technical updates and development have taken place. Aside from improvements to the data publication procedures, to improve efficiency and speed, a major development took place to accommodate for the management and hosting of genomics data.

Key data providers and users in 2024

Aside from the data provision by the consortium organisations, EMODnet Biology published seafloor (benthic) marine biodiversity data from the EMODnet Seabed Habitats consortium, from various OBIS and GBIF nodes, and from *ad hoc* providers that submitted their data. Support was also given to various EU Mission Ocean funded projects, to assist not only with data submission but also specific enquiries on data standards and quality control.

BIOLOGY 2024 EVENTS

The following list includes some of the many events in which EMODnet Biology was involved,:

EMODnet webinar for EU Mission: Restore our Ocean and Waters and Horizon, 28 February, Online

VLIZ Marine Science Day, 6 March, Oostende, Belgium

Iliad Webinar: Digital Twins of the Ocean and Biodiversity, 13 March, Online

NECCOTON project meeting, 21 March, Liège, Belgium

EMODnet Biology annual meeting, 16-17 April, Constanta, Romania

EMODnet Biology workshop with RSC, 18 April, Constanta, Romania

TG DATA meeting, 14 May, Online

IMDIS Conference, 27-31 May, Bergen, Norway

State of Marine Biodiversity Monitoring in Europe workshop, 4-6 June, Online

Digital Ocean Forum, 12-13 June, Brussels, Belgium

Marine Biodiversity Monitoring Harmonisation meeting, 17-18 September, Ispra, Italy

TG DATA meeting, 27 September, Online

MARBLUE Conference, 23-25 October, Constanta, Romania

Marine Biodiversity Monitoring Harmonisation Workshop, 4-7 November, Sitges, Spain

EMODnet Biology workshop for EU Mission Ocean funded projects, 19-20 November, Online

Enhancing EMODnet user-friendliness: Ocean data for policy support under EU marine directives, online



BIOLOGY





Thematic node: EMODnet Chemistry

CHEMISTRY

EMODnet Chemistry facilitates the findability, accessibility and usability of marine chemical datasets and derived data products in all major European marine regions. In particular, the offer includes datasets related to eutrophication and ocean acidification in water, contaminants in water, sediment and biota, and marine litter on beaches, the seafloor and the sea surface.

To this end, EMODnet Chemistry first collects and validates data and makes them freely available and interoperable. Secondly, EMODnet Chemistry creates and publishes standardised, harmonised and quality-controlled data collections and reliably derived products. Some of these tools allow users to visualise the distribution and density of sampling stations, as well as the concentration of certain chemicals over space and time. In

addition, a dedicated online tool facilitates subsetting and downloading data sets in various formats, enabling their analysis and the creation of customised visualisations such as time series, trajectories, plots and maps. In this way, EMODnet Chemistry plays a key role in the implementation of European Union marine policies such as the Marine Strategy Framework Directive (MSFD), the Water Framework Directive and the Maritime Spatial Planning Directive. Although EMODnet Chemistry focuses on European Union data sources, it provides important support for the implementation of the blue data infrastructures at a global level.

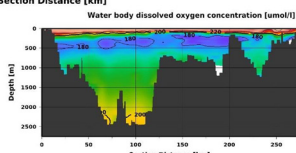
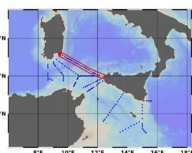
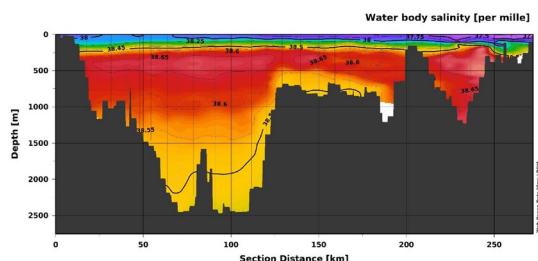
2024 Key Facts

The partnership expanded the amount of data. In particular, the number of row datasets increased from approximately 1,271,000 to approximately 1,296,000. This was also made possible thanks to the inclusion of a new partner: the Federal Maritime and Hydrographic Agency as the National Oceanographic Data Centre of the Federal Republic of Germany. For the first year, EMODnet Chemistry used these data to create data collections for eutrophication (nutrients, chlorophyll and oxygen), ocean acidification (alkalinity and pH) and contaminants (heavy metals, hydrocarbons, antifoulants, polychlorinated biphenyls, pesticides & biocides and radionuclides) not only for each European sea basin but also at European level.

In addition, quality controls were strengthened and further simplified. This was also possible thanks to the implementation of new functions in the Ocean Data View (ODV) software, developed by Alfred Wegener Institute (AWI), a project partner in partnership with EMODnet Chemistry regional coordinator who are responsible for ensuring data quality in close collaboration with the data providers.

In terms of data products, new maps were created for contaminants in water, biota and sediment. Specifically, in addition to the existing maps published in 2023, the new category “Contaminants in marine organisms” was created in the EMODnet Map Viewer to contain layers showing the sampling locations for all available years combined. The percentage of data availability for a given contaminant sampled in different animal groups is indicated. Finally, under the new subcategory “Eutrophication (depth and density layers),” the maps show some visualisations that users can easily create with the EMODnet Chemistry webODV Explorer and Extractor Service.

Map type
“Contaminants
in marine
organisms”
for cadmium
included in the
variable group
“Heavy metals.”
(©EMODnet
Chemistry)



Participants at the invitation-only meeting on data close to river mouths organised by multiple EMODnet thematics (including Chemistry, Physics) in Lisbon on 8 November 2024.

(©EMODnet Chemistry)

The partnership remains committed to pursuing the principles of open science by providing data for various EU-funded projects. In 2024 this included Blue-Cloud 2026 and FAIR-EASE, which aim to improve the FAIRness of European data and facilitate the development of digital twin applications. EMODnet Chemistry's additionally contributes to the European Digital Twin Ocean platform (EU DTO) though the data lake created by the EDITO-Infra project.

The Consortium continued to provide tireless support for environmental policy in Europe. EMODnet Chemistry was confirmed as a major data manager for descriptors 5 (eutrophication), 8 (chemical pollution) and 10 (marine litter) of the Marine Strategy Framework Directive (MSFD). This was achieved by the steady engagement with the European Environment Agency (EEA), the Regional Sea Conventions, the International Council for the Exploration of the Sea (ICES), the EU Member States (MS) and the EMODnet Chemistry board of experts on the MSFD. Involvement in the implementation of the MSFD, a global reference point in the fight against marine pollution, resulted in EMODnet Chemistry being increasingly called upon to share expertise and data beyond European borders. In particular, the partnership provided interoperability with data disseminated using non-EU initiatives. These are the Japanese Ministry of Environment's international project on harmonisation of microliter data, the CoP Chemicals Dimension of the UN Global Partnership on Plastic Pollution and Marine Litter and the UN Federated Data System for Ocean Acidification as part of the Agenda 2030 Sustainable Development Goal 14.3.1.

Key data providers and users in 2024

EMODnet Chemistry fostered a win-win interaction with data providers to improve the quantity and quality of data. Data providers include marine research institutes, environmental agencies, government marine managers from EU Member States (MS) dedicated to marine monitoring and/or marine science, ICES, the Copernicus Marine Service and citizen scientists. The following two events are examples of the variety of measures implemented during the reporting year: (i) [an on-site training for all data providers](#) to explain how to feed data into the EMODnet Chemistry data discovery and access service of the SeaDataNet infrastructure; (ii) [a meeting in Portugal](#) to support national entities in sharing water quality data close to major river mouths.

The **European Environment Agency, the EC Joint Research Centre and most of the Regional Sea Conventions are consolidated data users**, while the partners of the Horizon Europe Blue-Cloud 2026 project have recently used EMODnet Chemistry data together with data from Copernicus Marine and the World Ocean Database to contribute to the implementation of the European Open Science Cloud (EOSC). The aim is to develop a toolbox to create customisable, validated datasets on key ocean variables of eutrophication and to assess the consistency of the information. Finally, EMODnet together with Copernicus Marine provides the data backbone for the European Digital Twin Ocean, which will facilitate the development of applications for the digital twin.

Read the [use cases 2024 for EMODnet Chemistry](#).

CHEMISTRY 2024 EVENTS

EMODnet Chemistry training on data submission from data providers, 30-31 January 2024, Trieste, Italy
Ocean Science meeting of the American Geophysical Union (AGU), 18-24 February 2024, New Orleans, USA and Online

General Assembly of the Baltic Operational Oceanographic System, 6-8 May 2024, Copenhagen, Denmark
Workshop on the standardisation of ocean acidification data at a global scale, 7-8 May 2024, Venice, Italy
Meeting of the MSFD Working Group on data, information and knowledge exchange (WG DIKE) and the Technical group on data (TG Data), 14 May and 27 September 2024, Online

International Conference on Marine Data and Information Systems (IMDIS) 2024, 27-29 May 2024, Bergen, Norway

ONE BLUE project webinar, which was held in conjunction with the European Green Week 2024, 6 June 2024, Online

International workshop on Ocean and Coastal nutrients, 16 September 2024, Brest, France

Copernicus Marine Workshop dedicated to OSPAR Eutrophication Groups, 1 October 2024, Toulouse, France and Online

International workshop "AOMI (Atlas of Ocean Microplastics) Database: Enhancing Ocean Microplastics Monitoring, 8 October 2024, Online

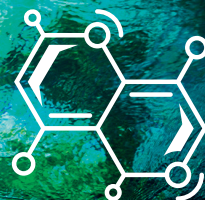
International Workshop on Monitoring Assessment, and Prevention of Marine Litter on Seafloor, 9-11 October 2024, Shanghai, China

43rd Congress of the Mediterranean Science Commission (CIESM), 14-18 October 2024, Palermo, Italy

3rd scientific/educational event organised under the auspices of the Ministry of Science and Education of Georgia, 18 October 2024, Batumi, Georgia

MARBLUE 2 International Conference, 23-25 October 2024, Constanta, Romania

Meeting on data pathways from Portuguese major river mouths, 8 November 2024, Lisbon, Portugal





GEOLOGY

The geology of Europe’s seafloor is diverse, ranging from hard rock outcrops to glacial sediments that can be hundreds of metres in thickness. The geological picture is further complicated by structural faults, complex geomorphological structures on the seafloor surface, and episodic events such as earthquakes, submarine landslides and volcanic activity. Geological data is essential to support maritime spatial planning, coastline prediction, geohazard assessment, offshore installation design and environmental conservation.

A variety of marine landscapes, submarine processes and relics of ancient environments evident throughout our Oceans have resulted in different types of mineral accumulations on and beneath Europe’s seafloor from coastal areas to deep abyssal plains. The importance of submarine mineralisation systems is related to the abundance and exploitation potential of many strategic aggregates, energy, metals, and Critical Raw Materials (CRM), necessary for modern society development, especially green transition.

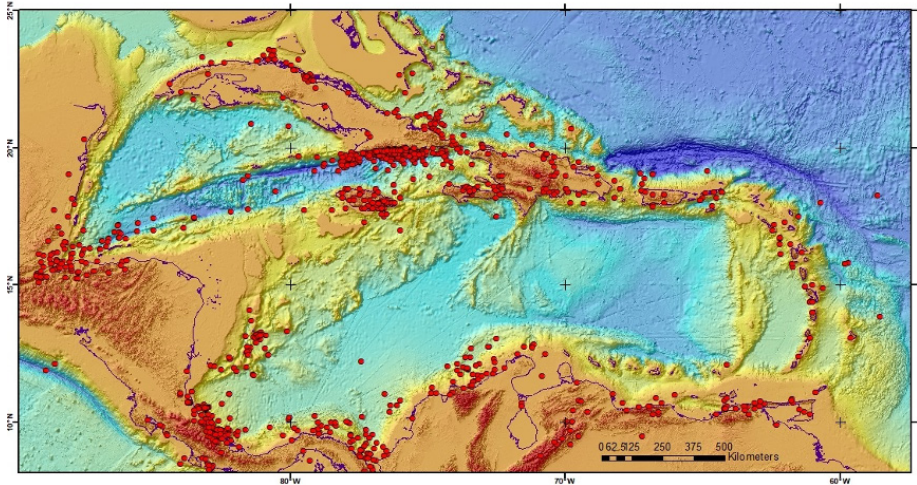
The EMODnet Geology thematic offers key information on marine geological features by providing access to data and data products covering seabed substrate, seafloor geology, coastal behaviour, sediment accumulation rates, geological events and probabilities, and mineral occurrences, as well as submerged landscapes. The data products span not only the European Seas but extend to the Caspian and the Caribbean Seas.

2024 Key Facts

During 2024, the EMODnet Geology consortium has focused on collecting available new data and metadata. These datasets are being harmonised with most data products set for updates by the phase’s end in September 2025. In 2024, all map layers in the EMODnet Map Viewer under the themes, Submerged Landscapes and Sea-Floor Geology, were successfully updated based on new data, as well as map layer groups reconstructed. Significant progress was made in the Caribbean Sea area, with Geological Events and Minerals datasets and maps completed. The subcontractor responsible for the Caspian Sea subtask has been upgrading data elements, aiming for higher resolution data products by the end of the phase with the first delivery provided for quality check in 2024. Additionally, EMODnet Geology has been developing new data products related to the geotechnical properties of the seabed, which include information about the ground conditions and the physical properties of soil, as well as coastal vulnerability.

One of EMODnet Geology’s major efforts was hosting a scientific session titled “EMODnet Geology’s new standards revealing Earth’s seabed geology” at the International Geological Congress (IGC) in Busan, Republic of Korea held in August 2024. This valued event gathered around 5,000 participants from around the world and thus provided a forum for presenting EMODnet worldwide. EMODnet Geology representatives delivered seven oral presentations and four posters with additional presentations from Japan and Brazil. EMODnet Geology was also featured in other sessions at IGC 2024.

In 2024, EMODnet Geology’s Caribbean Sea group completed Minerals and Geological Events maps and datasets, of which the Map of Earthquakes in the Caribbean Sea serves as an example. (©EMODnet Geology)



In June 2024, there were changes in the coordination team of EMODnet Geology. Dr Vallius, who has excellently led the thematic for many years, and Dr Kaskela, the deputy coordinator, switched roles. The coordination team actively participated in key events, including the 20th EMODnet Steering Committee Meeting and the Digital Ocean Forum (DOF) 2024. Collaboration with other thematic lots and regional tasks in the Caribbean and Caspian Seas was active, ensuring that progress remained on schedule.

EMODnet Geology held two project meetings in 2024, each attended by approximately 50 project representatives. The meetings took place in Espoo, Finland, in May and in Trondheim, Norway, in November. Key topics for discussion included updates on Geology's activities in producing harmonised marine geological data products, as well as plans for the coming months.

Collaboration with other EMODnet thematics and initiatives, including the European Digital Twin of the Ocean (EDITO), remained strong, ensuring continued progress and innovation in marine geological data products.

Key data providers and users in 2024

The primary data providers for EMODnet Geology include marine geology departments and teams of the national geological surveys, as well as research institutes from European maritime countries, participating in the project as project partners or subcontractors. Some additional data are collected nationally by the project partners and incorporated into our various data products. These data products are widely used in maritime spatial planning, coastal zone management and environmental impact assessments, particularly among the rapidly growing community of actors in the offshore renewable energy sector.

Data products provided by EMODnet Geology have been in active use by other project and initiatives. For instance, several EMODnet Geology partners are also involved in the HORIZON 2.5 - Climate, Energy and Mobility project Geological Service for Europe (GSEU), facilitating synergy and direct feedback between the two projects. The GSEU project utilises EMODnet Geology both as an information source and as a platform for disseminating new data and information generated by GSEU. For example, GSEU has been querying EMODnet Geology attributes and translating them into applied attributes needed to build a geo-assessment matrix for determining seabed suitability for the construction of offshore windfarms. In addition, the former project coordinator is on the Advisory Board of two Horizon Europe (HE) projects (HE TRIDENT and HE S34I) and thus acting as a link between these HE projects and EMODnet.

GEOLOGY 2024 EVENTS

EMODnet Geology was presented at several events, including:

NATO - Science for Peace and Security - Advanced Training Course G6116, 15-20 January 2024, Agadir, Morocco

Baltic Stakeholder Conference 2024 – PROTECT BALTIC, 29 February 2024, Espoo Finland

Netherlands Centre for Coastal Research NCK Days 2024, 13-15 March 2024, Amersfoort, Netherlands

XXIX General Assembly of the Association of Iberoamerican Geological and Mining Surveys (ASGMI), 8-12 April 2024, Hidalgo, Mexico

EGU General Assembly 2024, 15-19 April 2024, Vienna, Austria

GeoHab 2024, 6-10 May 2024, Arendal, Norway

EMODnet Geology project meeting, 14-16 May 2024, Espoo, Finland

EMODnet Geology Caribbean group workshop, from 28 May to 1 June 2024, Cotuí, Dominican Republic

Digital Ocean Forum 2024, 12-13 June 2024, Brussels, Belgium

Workshop on Progress in Measuring and Reporting Blue Carbon, 26 June 2024, Online

37th International Geological Congress (IGC 2024), 25-31 August 2024, Busan, Republic of Korea

20th Seminario Nacional de Ciencias y Tecnologías del Mar (SENALMAR), 11-14 September 2024, Santa Marta, Columbia

JFÍ (Geoscience Society of Iceland) Fall meeting 2024, 4 October 2024, Reykjavik, Iceland

EMODnet Geology project meeting, 4-8 November 2024, Trondheim, Norway

A Geological Service for Europe (GSEU) Workshop, 20-22 November 2024, Athens, Greece

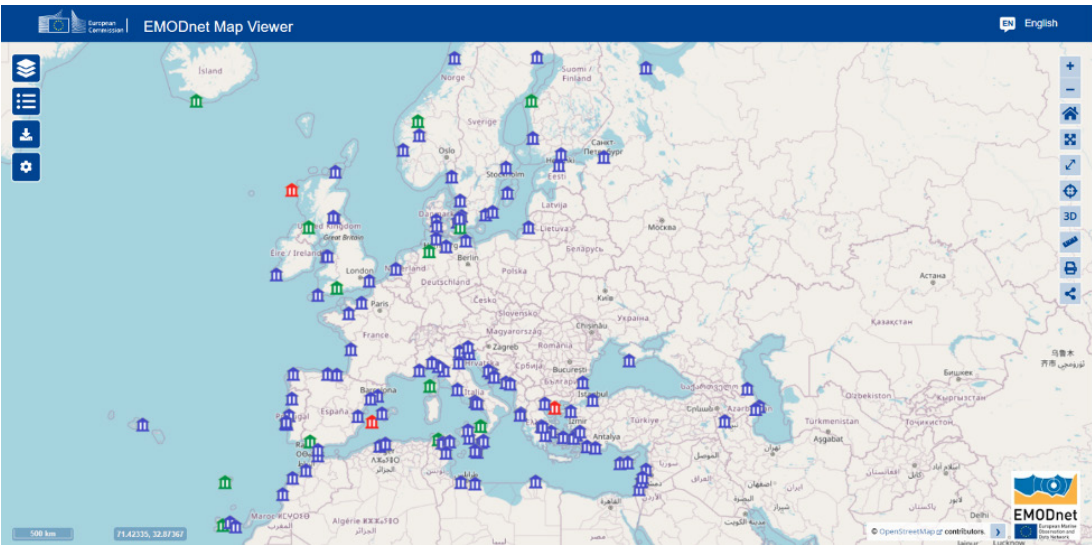




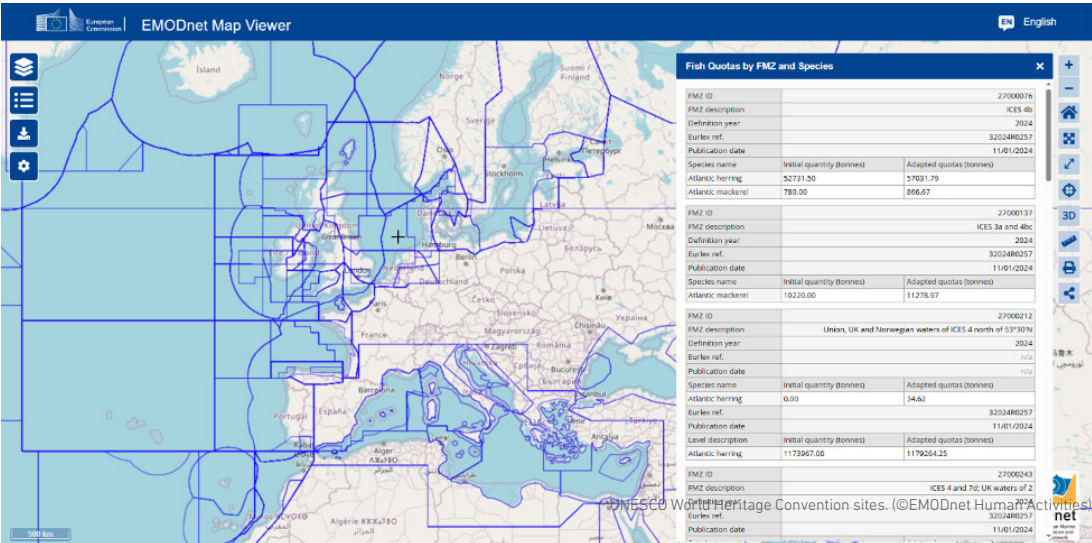
Thematic node:
EMODnet Human Activities

Pressure on Europe's marine space and resources is high and continuous demand for resources such as oil and gas, marine minerals and seafood must be managed alongside the need to use marine space for renewable energy installations, communications cables, waste disposal sites and shipping. Additionally, societal demand for marine tourism and leisure activities, and the need to conserve marine ecosystems and habitats is leading to increased competition and conflict between different marine sectors. The EMODnet Human Activities thematic provides access to data and data products on the spatial extent and intensity of human activities at sea with the benefit of having these information available on the EMODnet Map Viewer and Catalogue together with other EMODnet thematic coastal and marine environmental data and data products, enabling more integrated and holistic studies of ocean dynamics and health together with assessing human impact and informing more sustainable Blue Economy operations, area based management e.g., Marine Protected Areas and ocean governance.

UNESCO World
Heritage
Convention sites.
(©EMODnet
Human
Activities)



Fish quotas.
(©EMODnet
Human
Activities)



2024 Key Facts

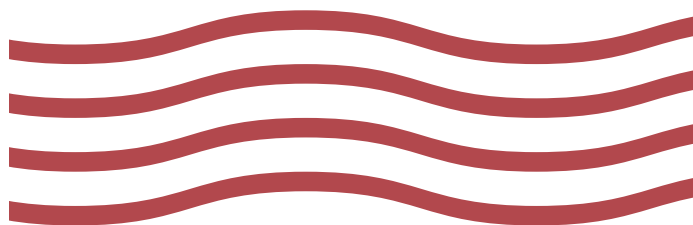
2024 was mainly a year of consolidation for the Human Activities thematic group. A special effort was made to update all existing data sets and continue expanding their coverage.

At the same time, entirely new data sets were made available. The “cultural heritage” theme was enriched by a data set covering UNESCO’s World Heritage Convention sites. In addition, a much-awaited data set on fish quotas also made its debut. It is based on EC DG MARE’s data and provides information on Total Allowable Catches (TACs), which are catch limits provided for certain vulnerable fish stocks for a given year. The series spans from 2012 up to the present day.

Last but not least, the Maritime Spatial Planning (MSP) data set continued its expansion, with the ingestion of new plans and update of old ones. Over time, the ambition is to cover all spatial plans of EU Member States, as data is made available.

Key data providers and users in 2024

Human Activities that take place in the ocean are diverse and heterogeneous, and so are data providers and users, who range across several disciplines and sectors. Member States’ governments, agencies and research institutes remain the backbone of Human Activities data providers, along with EU institutions, international organisations and industry stakeholders. The same can be said about users. For the better or the worse, the ocean bustles with human activity, and so a wide range of users leverage EMODnet’s data. Among these are governments and policy makers, academic and research institutions, industry and private sector - companies and consultancies in sectors like offshore renewable energy, aquaculture, shipping, dredging, and telecommunication use the data to plan and execute projects, assess risks, and explore business opportunities - maritime spatial planners, and the list goes on.



HUMAN ACTIVITIES

HUMAN ACTIVITIES 2024 EVENTS

Ocean Observation for MSP, 14 January 2024, Online

MSP Data Tools and Guidance Workshop: Technical Expert Group on Data for MSP, 13 March 2024, Brussels, Belgium

European Maritime Day, 30-31 May 2024, Svendborg, Denmark

Workshop for the European Marinas Network Scoping Action - Empowering Marinas for Sea Science & Community Unity, 4-5 July, Venice, Italy





Thematic node:
EMODnet Physics

PHYSICS

Ensuring continual and immediate access to the physical characteristics of the ocean, such as its circulation, heat and salt distribution, and other water properties, is essential for providing accurate ocean forecasts, early warnings, climate projections, and assessments. And, whilst satellites can monitor the surface skin of the ocean, *in situ* make it possible to provide deeper depth profiles and data on many more ocean physical parameters e.g., underwater noise. A comprehensive understanding of these properties is essential for informed climate predictions and assessments, contributing to the preservation of ocean health and the responsible utilisation of its abundant advantages.

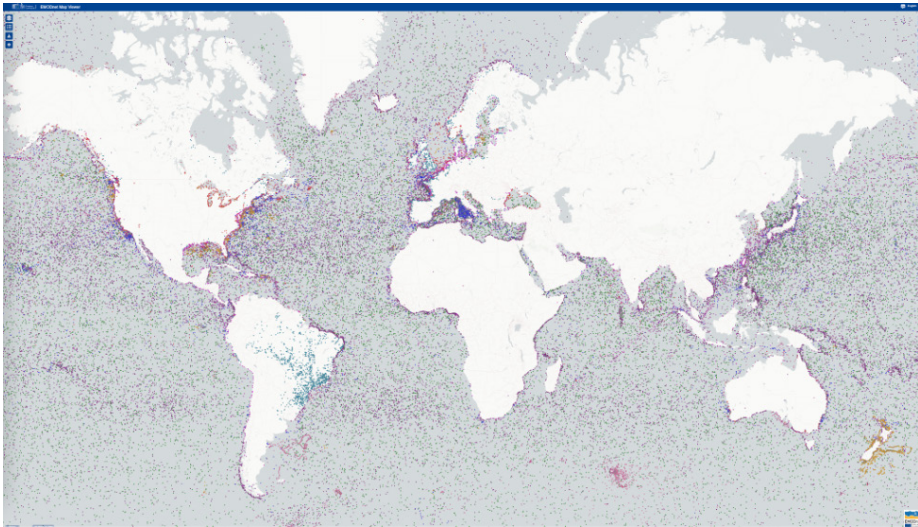
EMODnet Physics serves as a centralised platform for collecting and publicly disseminating ocean physics data and data products, adhering to common standards. It integrates data from key European oceanographic repositories and marine infrastructures, offering a wide range of parameters, including temperature, salinity, current profiles, sea level trends, wave characteristics, wind speed and direction, water turbidity, underwater noise, river flow, and sea-ice coverage. The available data products consist of *in situ* data, *in situ* data collections, reanalysis and trend analyses for various parameters, as well as space-time aggregated *in situ* data products.

2024 Key Facts

EMODnet Physics has established a comprehensive data network by building gateways to national, regional, and thematic data repositories. Over the years, the project has grown significantly, now involving around 400 institutes and providers from across Europe and beyond. In 2024 EMODnet Physics reached a new milestone with more than 100,000 datasets linked and accessible.

New datasets and observation platforms have been incorporated, further expanding the data available through EMODnet Physics. Key operational platforms such as ARGO floats, drifting buoys, moorings, tide gauges, and river stations regularly deliver data. Some of these platforms focus on collecting single parameters for specific thematic collections, while others contribute to multiple collections by recording diverse parameters. The EMODnet Portal now provides access to approximately 19,000 ARGO floats, 27,800 drifting buoys, 4,800 tagged sea mammals, 3,300 tide gauges, 2,000 river gauge stations, 2,700 unmanned

Global platforms that have collected dataset in the last year... an ocean of data! (©Antonio Novellino/ EMODnet Physics)



vehicles missions—including gliders and sailing drones— 10.000 datasets from vessels such as fishing boats and ferry boxes, and over three million CTD profiles under the Physics theme.

In addition to integrating traditional data sources, EMODnet Physics is also advancing the inclusion of citizen science data, with operational ingestion and integration nearly complete. The initiative actively supports international efforts related to data interoperability and the ocean data value chain. It is involved in global committees such as the Ocean Prediction DCC - Ocean Forecasting Co-design Team and the Global Ocean Observing System (GOOS) Observations Coordination Group, which focuses on developing low-cost ocean data collection technologies. EMODnet Physics also plays a crucial role in supporting global scientific communities, including the Southern Ocean Observing System (SOOS), and contributes to climate change studies and assessments by the Intergovernmental Panel on Climate Change (IPCC). In 2024 EMODnet Physics participated in over 50 events, including European Maritime Day 2024, and IMDIS 2024, with some sessions focusing on cost-effective technologies and citizen science. These events have proven valuable in expanding marine data collection efforts, helping to fill data gaps, and improving the temporal and spatial resolution of coastal area monitoring. Through these developments, EMODnet Physics continues to strengthen its role in ocean monitoring, ensuring better data accessibility, enhanced interoperability, and increased collaboration within the global scientific community.

Key data providers and users in 2024

EMODnet Physics in 2024 brings together an exceptionally diverse community of data providers and users, spanning scientific institutions, government agencies, citizen science initiatives, and international organizations. The integration of the WMO Hydrological Observing System (WHOS) has expanded access to crucial hydrological data, linking global meteorological and hydrological networks with EMODnet's marine datasets. At the same time, EMODnet has embraced citizen science contributions, notably through a dialogue with stakeholders like Scuba Schools International, the German Foundation for Marine Conservation, OceanoVox, Swan Hellenics, SGD4MED, etc. enabling participatory activities to contribute valuable observations on ocean conditions (data have been integrated in collaboration with Ingestion).

A significant achievement has also come from collaboration with the MOANA Project, which has helped improve oceanographic data coverage in the South Pacific—an area where observations have historically been sparse—enhancing understanding of ocean currents and climate variability in the region.

PHYSICS 2024 EVENTS

BOOT 2024, January 2024, Duesseldorf, Germany

Ocean Science Meeting 2024 Conference, 18 February 2024, New Orleans, USA

EMODnet Webinar for European Research & Innovation projects, 28 February 2024, Online

EMODnet Technical Working Group Meeting, 12 March 2024, Online

Oceanology International Conference, 12 March 2024, London, UK

EMODnet Ingestion Plenary Meeting, 03 April 2024, Malta

Beyond Climate Change: Sustained Ocean Observation, 08 April 2024, Barcelona, Spain

Horizon Europe POLARIN project Kick-off meeting, 17 April 2024, Bremerhaven, Germany

BlueCloud2026 Webinar: Making Marine Data FAIR, 23 April 2024, Online

IMDIS (International Conference on Marine Data & Information Systems), 27 May 2024, Bergen, Norway

Data Management Seminar (University of Genova), 02 May 2024, Genova, Italy

"Glocal Comunicazioni" Conference, 09 May 2024, Genova, Italy

SOOS Scientific Committee Meeting, 11 June 2024, Online

Digital Ocean Forum 2024, 12 June 2024, Brussels, Belgium

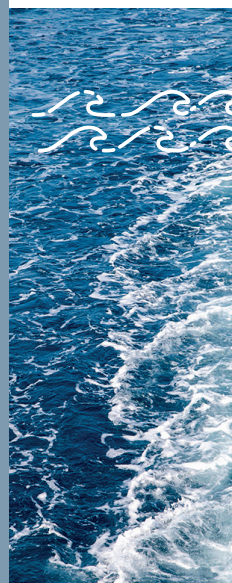
Workshop with Maritime Academy of Panama Cadets, 21 June 2024, Genova, Italy

#OceanHackathonUE, 7 July 2024, Online

ERASMUS MARIS week, 9 September 2024, Valencia, Spain

IQuOD/SOOP/GTSP/XT Science meeting, 11 November 2024, Bologna, Italy

AIVP Conference – International Conference of Port Cities, 27 November 2024, Lisbon, Portugal





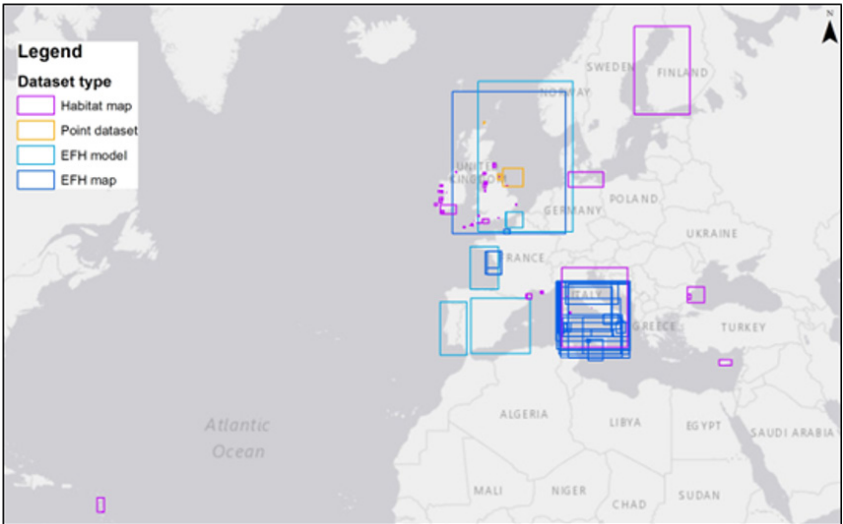
SEABED HABITATS

EMODnet Seabed Habitats (ESH) deliverables, datasets, and models can be used to inform monitoring of environmental change effects on the ecosystem and biodiversity of European seas and adjacent regions. Understanding the occurrence and distribution of different seafloor habitats is important for effective planning, conservation and sustainable development of the marine environment. EMODnet Seabed Habitats facilitates access to the EUSeaMap product (broad-scale seabed habitat map for Europe) and is the one-stop shop for accessing seabed habitat data. The largest European collection of habitat maps from individual surveys and survey-based sample points, with detailed metadata, can be accessed alongside composite data products, environmental variables data and seabed habitat models.

2024 Key Facts

Throughout the year, the compilation of spatial data and products from around Europe on European seabed habitats has continued to grow. In 2024, 56 new habitat maps from surveys, 60 Essential Fish Habitat (EFH) maps and models, and three new point datasets of habitats from surveys were made available online and via web services.

For other ESH products, 2024 was a building year, during which the groundwork for the coming year’s updates was laid. In Composite Products the focus was on creating a methodology for combined and harmonised Essential Fish Habitats (EFH) maps and models as well as potential Vulnerable Marine Ecosystems (VMEs). In the EUSeaMap modelling, the main efforts were on knowledge transfer to the new modelling team and discussing issues and potential improvements of background layers.



Map showing the bounding boxes representing the distribution of the datasets submitted to EMODnet by Seabed Habitats in 2024. (©OpenStreetMap contributors and the GIS user community)

Key data providers and users in 2024

In 2024 EMODnet Seabed Habitats sourced marine habitat datasets from 24 different data providers, which included national research institutes and other government organisations, universities, NGOs, private companies and the (British) Crown Estate.

The European Marine Board (EMB) published the Future Science Brief on Marine Habitat Mapping in June 2024, underscoring the critical need for accurate and comprehensive marine habitat maps to inform decision-making and achieve EU policy goals, including biodiversity protection, habitat restoration, sustainable Blue Economy development, and climate actions. The Future Science Brief highlights significant knowledge gaps, especially regarding biological habitats and deep-sea environments, and emphasises the importance of increasing resolution and coverage in both spatial and biological terms. The EMB Habitat Mapping Working Group used EMODnet marine data in the analysis and collation of high-quality marine habitat maps necessary for a variety of marine policies.



SEABED HABITATS 2024 EVENTS

EMODnet Seabed Habitats was presented at several events, including:

MPA Europe Annual Meeting, 16-18 January 2024, Faro, Portugal

15th EMODnet Technical Working Group, 12 March 2024, Online

JNCC All-Hands Meeting, 13th March 2024, Online

GEOHAB 2024, 6 –10th May 2024, Arendal, Norway

HELCOM IC HABMAP Workshop, 15–16th May 2024, Online

OSPAR Benthic Regional Action Plan Workshop, 22nd –23rd May 2024, Online

Progress in Measuring and Reporting Blue Carbon Workshop, 26th June 2024, Online

ICES SCICOM/Annual Science Meeting, 13 –14th September 2024, Gateshead, UK

57th European Marine Biology Symposium, 16 –20th September 2024, Naples, Italy

MPA Monitoring & Habitat Mapping Workshop, 19 –20th September 2024, Cork, Ireland

16th EMODnet Technical Working Group, 8 –10th October 2024, Brussels, Belgium

EMODnet Workshop – Ports, Marinas, Boating, 22nd October 2024, Online

Barbados Government Delegation Visit, 04th November 2024, Galway, Ireland

Ocean Knowledge 2030 Conference, 20th – 21st November 2024, Dublin, Ireland

INFOMAR Annual Seminar, 28th November 2024, Dublin, Ireland





Portal:

EMODnet Data Ingestion
emodnet-data-ingestion.eu

DATA INGESTION

Many data collected by public authorities, researchers and private operators of coastal or offshore facilities still do not arrive to national or regional repositories and are thus unavailable to potential users. This limited data access creates costly redundant work for those who collect marine observations and reduces the reliability of marine research. There is therefore the need to streamline the data ingestion process so that data holders from public and private sectors can easily release their data for safekeeping and subsequent distribution through EMODnet or other means.

EMODnet's Data Ingestion, involving and serving all EMODnet thematic groups, tackles these problems by reaching out to data holders, explaining the benefits of data sharing and offering a support service to assist them in releasing their data for subsequent processing and quality control.

2024 Key Facts

During 2024 the Data Submissions service achieved a steady increase of submissions from 1548 to 1806. The number of completed submissions went from 1411 to 1643, with submissions being published for discovery and downloading by users via the EMODnet Products Catalogue service. The number of further elaborated data sets went up from 639 to 740. These datasets have been curated by assigned data centres from the EMODnet Ingestion network to common formats and are made available in the European data management infrastructures such as SeaDataNet, EurOBIS, and others that feed into EMODnet and its Thematic Groups as input for EMODnet data products.

EMODnet Data Ingestion in 2024 still operated with its own portal, but great progress has been made on the migration from EMODnet Ingestion towards the EMODnet portal. This includes the integration of several services operated by EMODnet Ingestion, which gave some technical challenges. In the meantime, the Submission Viewing service has been integrated into the EMODnet Products Catalogue service, while the progress and success of EMODnet Ingestion with connecting operational oceanography data providers and their NRT station data can now be followed via the EMODnet Map Viewer service. Finalisation and launch of the full migration are planned soon in 2025. This will include the migration of the Submission service and having a dedicated section for Ingestion on the EMODnet portal.

In February 2024 a successful Workshop was held with invited stakeholders aiming to promote common management and sharing practices for data sets collected as part of national license procedures. Stakeholders from 18 countries together examined the practices and approaches in offshore licensing data management, with a focus on renewable energy and aquaculture. EMODnet was recognised as a potential key player in promoting a harmonised strategy for data management within licensing procedures by facilitating capacity



building, providing best practice guidelines, and promoting dialogue among member states. As follow-up, four pilot cases with stakeholder interviews are being selected to develop a roadmap for such a harmonisation. In parallel, a literature review was undertaken. An inventory of current license data practices in the offshore renewable energy sector revealed that out of 27 countries analysed, 17 have established licensing procedures. While 23 countries have established procedures for offshore aquaculture licensing. Licensing procedures vary among countries, which is due to different national regulations. A difference can also be found in data sharing. Some countries provide licenses where sharing data via public access is included, while other countries also provide licenses where commercial confidentiality is included. This means not all data is shared. Many countries indicate that they require environmental impact assessment data for the licensing and planning phase of offshore aquaculture. Some countries also indicate to use environmental impact assessment data for the offshore renewables. Considering all aspects, EMODnet Data Ingestion has prepared an outline for the pilot cases and the roadmap, which will also include an additional Workshop with stakeholders in 2025 to present the outcomes of the pilot cases and to brainstorm on the roadmap.

Key data providers and users in 2024

EMODnet Data Ingestion not only targets delayed mode data sets, but together with EMODnet Physics reaches out to operators of Near Real Time (NRT) and Real Time (RT) oceanographic monitoring sites, including all kinds of fixed or moving platforms. In 2024, again many oceanography operators and platforms, such as river stations, gliders, surface unmanned vehicles, sea mammals-based, and fishing vessels, were motivated and given guidance for connecting and sharing their data streams with the European oceanography data exchange as managed by EuroGOOS, Copernicus Marine Service, and SeaDataNet, which are major pillars under EMODnet Physics. For this purpose, the MIC -Marine *In situ* Collaboration has been set up. There is global coverage, including many international networks and programs. This activity is supported by dissemination and engagement efforts in collaboration with other projects and initiatives (e.g., LandSeaLot, JERICO-S3, Blue-Cloud 2026) and with actions during workshops and conferences. The connected stations and data sets can be discovered and accessed via two EMODnet Ingestion map layers ('as-is' and 'integrated') in the EMODnet Map Viewer service.

Together with the EMODnet Secretariat a Webinar was held on 28 February 2024, entitled "EMODnet for Horizon Europe and EU Mission: restore our Ocean and Waters" for representatives of European Horizon Europe and EU Mission Ocean projects that are and will be collecting *in situ* marine data. The webinar was attended by over 95 participants representing at least 45 EU RTD projects. They were advised to adopt community standards, particularly those used by EMODnet and its supporting infrastructures such as SeaDataNet, EurOBIS, EGD, and others, when developing and deploying their Data Management Plans (DMPs). This way, projects can ensure that their data becomes FAIR and machine-readable, enhancing its usability and impact, and its uptake in EMODnet. An EMODnet guidance document has been published on the EMODnet portal primarily aiming at European Research and Innovation projects that seek advice and guidelines on preparing and submitting data to EMODnet.

DATA INGESTION 2024 EVENTS

OLAMUR project annual meeting, 8-9 January 2024, Bergen, Norway
 MIC - Marine *In situ* Collaboration meeting, 21 February 2024, Online
 EMODnet for Horizon Europe and EU Mission: restore our Ocean and Waters, 28 February 2024, Webinar
 Data Management in Offshore Licensing Procedures, 29 February 2024, Online Workshop
 VLIZ Marine Science Day, 6 March 2024, Oostende, Belgium
 Oceanology International 2024, 12-14 March 2024, London, United Kingdom
 OBSSEA4CLIM project kick-off meeting, 13-14 March 2024, Copenhagen, Denmark
 LandSeaLot project kick off meeting, 26-28 March 2024, Delft, The Netherlands
 UN Ocean Decade, 10-12 April 2024, Barcelona, Spain
 EGU General Assembly 2024, 15-19 April 2024, Vienna, Austria
 POLARIN project kick-off meeting, 17-18 April 2024, Bremerhaven, Germany
 NAUTILUS-H2020 project meeting, 15-19 April 2024, Heraklion, Greece
 European Maritime Day (EMD 2024), 30-31 May 2024, Svendborg, Denmark
 International conference on Marine Data and Information Systems, 27-29 May 2024, Bergen, Norway
 Ocean Data Action Day, 10 October 2024, Oslo, Norway



EMODnet in practice

Use cases

Users are at the centre of EMODnet’s strategy. EMODnet’s pan-European data and data products across all seven thematics (which collectively offer more than 68 parameters) are widely used across sectors including research and academia, policy and administration, the private sector including the blue economy, non-governmental organisations (NGOs), and society. EMODnet’s Findable, Accessible, Reusable and Interoperable (FAIR) data- and web services are crucial to the discovery and access of such data, data products and marine knowledge by diverse communities from Europe and beyond, to enable marine and maritime stakeholders to find, use and generate the information necessary to improve our knowledge of the seas; support the Blue Economy and its sustainable management and diversification; and to provide citizens, businesses, NGOs and policymakers alike with the information to help meet the ambitious targets of the European Union’s Green Deal, and to support evidence-based decision making and policy assessments at European and global levels.

EMODnet, the Secretariat and its network of more than 130 partners proactively engage with EMODnet’s diverse user community to produce use cases to exemplify the value and benefits of EMODnet for applications in the ocean, coastal and land-sea interface. If you have developed an application using EMODnet data and/or data products, please share it with us by contacting helpdesk@emodnet.ec.europa.eu.

In this section, examples of concrete uses of EMODnet published in the course of 2024 are presented (below). The full portfolio of use cases can be consulted on the EMODnet Portal at <https://emodnet.ec.europa.eu/en/use-cases>. This searchable database enables users to filter use cases by EMODnet theme and stakeholder type—namely Business/Private Sector, Government/Public Administration, Research/Academia, and Society. A free-text search function allows for more specific queries. Each entry highlights the thematic data used and identifies the user group involved, aligned with the four main stakeholder categories.

EMODnet Use Cases website section. (©EMODnet)

European Marine Observation and Data Network (EMODnet)

About

Data Services

Solutions

Themes

Community

Atlas of the Seas

News & Events

FAQ Downloads

Home > Solutions > Use Cases

Use Cases

EMODnet component

Select

Case Type

Select

Text search:

Bathymetry

Biology

Human Activities

Seabed Habitats

25 Feb 2025

EMODnet data supporting the MSP Challenge, a tool to help stakeholders manage the blue economy and marine environment

The Maritime Spatial Planning (MSP) Challenge is an open-source platform developed by Breda University of Applied Sciences. It helps users manage the blue economy and marine environment by simulating the impact of decisions on energy, shipping, and marine life. The simulations encourage users to utilize the best available data for assessing the current status



PHYSICS



CHEMISTRY

SEABED
HABITATS

BATHYMETRY

HUMAN
ACTIVITIES

THEMATIC

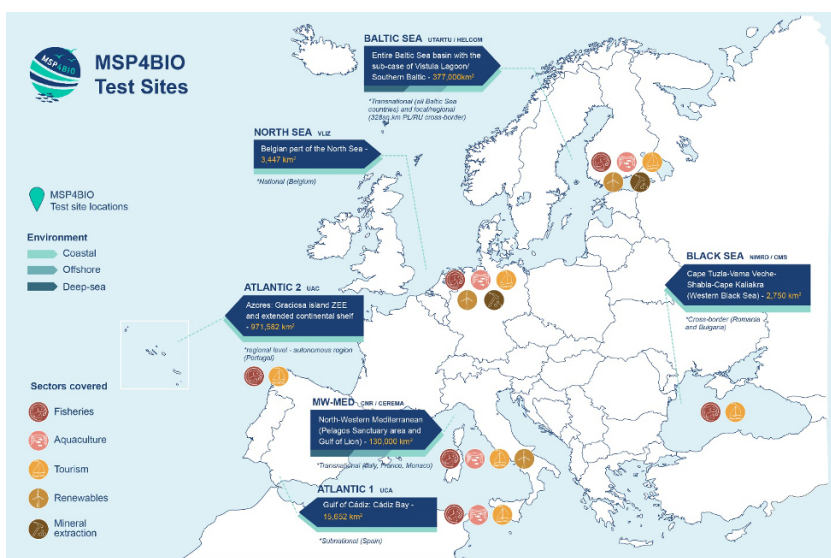
USE CASE SECTOR

Business/Private and
Research/Academia

1. EMODnet Services underpin science-based, data-driven Maritime Spatial Planning & Marine Protected Area networks

The Improved Science-Based Maritime Spatial Planning to Safeguard and Restore Biodiversity in a coherent European MPA network (MSP4BIO) is a Horizon Europe project involving 17 partners across Europe. The initiative aims to use knowledge-based, data-driven Maritime Spatial Planning (MSP) to protect and recover marine ecosystems, supporting the EU Biodiversity Strategy 2030, the Convention on Biological Diversity Post-2020 Global Biodiversity Framework, and the EU Green Deal. By engaging MSP planners and Marine Protected Area (MPA) managers, integrated flexible socio-ecological management is developed and its concrete applicability in various pilot sites of European Sea Basins is validated. MSP4BIO's final output will be an integrated and modular Ecological-Socio-Economic (ESE) management framework for the protection and restoration of marine ecosystems, within its general objectives of promoting sustainable blue growth and integrating maritime policies.

MSP4BIO requires extensive data on marine ecology, physics, socioeconomics, anthropogenic impacts, and climate, which are often scattered, inaccessible, or non-existent, making data-driven MSP an especially complex task. EMODnet, a major provider of European and sea basin-scale data, has been invaluable to the project. MSP4BIO assessed data availability at the test sites and compiled relevant data, finding EMODnet often provided the only available data, reducing data gaps. The project uses data from nearly all EMODnet's thematic lots, as well as national data infrastructures, and Copernicus. Europe-wide layers like bathymetrical, physical, and chemical data have provided useful background knowledge for the ESE management framework. Stakeholder interactions at test sites have extensively used EMODnet data products, such as habitat maps and spatial data on anthropogenic activities, to collect data on trade-off scenarios, optimising the ESE framework and improving MPA management.



MSP4BIO Test Sites. (©MSP4BIO)

THEMATIC



PHYSICS

USE CASE SECTOR

Government/Public administration

2. EMODnet's harmonised, standardised and validated data collections on eutrophication and chemical pollution used for the EU Marine Strategy Framework Directive

The Joint Research Centre (JRC), the EC's science and knowledge service, is part of the Common Implementation Strategy (CIS) and plays a key role in the implementation of the Marine Strategy Framework Directive (MSFD). JRC's mission is to anticipate challenges related to EU policy development, integrate science and knowledge into legislation to design new policies and monitor their implementation and impact. The JRC works to facilitate the exchange of harmonised marine policy and scientific information and to provide the CIS of the MSFD and other EU policies with up-to-date scientific knowledge. To best address the individual MSFD descriptors, technical groups were established within the CIS for marine litter, underwater noise, seabed integrity and data, and MSFD expert networks for other descriptors.

After the 2023 EC assessment of the marine environment monitoring programmes, data accessibility gaps were identified. The JRC recommended efforts to improve the findability and accessibility of original data and metadata, such as collecting MSFD data through a single data portal. EMODnet Chemistry thematic was utilised by the JRC as the single repository for MSFD data for the Descriptors 5 (Eutrophication), 8 (Contaminants) and 9 (Contaminants in Seafood).

The in-depth analysis of EMODnet system availability, standardisation, harmonisation, storage and accessibility led to the improvement of the data structure and the creation of the data collections on contaminants and eutrophication, fed by data from EU Member States under the MSFD monitoring programme. In particular, the analysis led to an improvement of MSFD reporting on Descriptors 5, 8, and 9. EMODnet Chemistry has been recognised by the JRC and the whole MSFD CIS as a consolidated and trusted data manager and unique access point to contaminant and eutrophication data.

Four of the eleven descriptors of the EU Marine Strategy Framework Directive (MSFD), for which EMODnet Chemistry provides a key data service. The MSFD descriptors are used to describe the state of the marine environment. (©EMODnet Chemistry taking inspiration from the MSFD stock images)



Eutrophication

5.



Marine litter

10.



Concentrations of contaminants

8.



Contaminants in fish/seafood for human consumption

9.



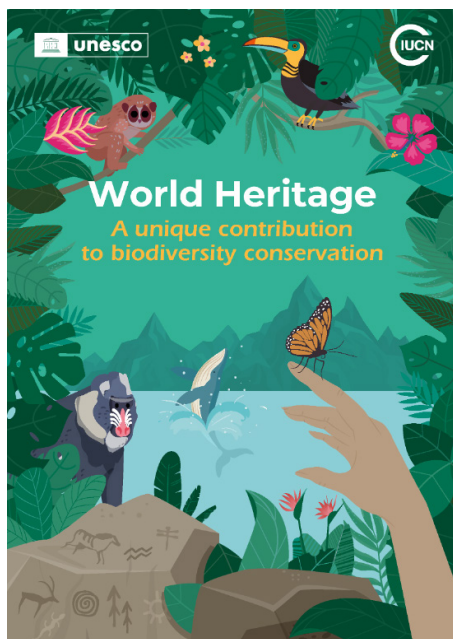


3. EMODnet optimises data flow for facts and figures on the importance of UNESCO World Heritage Marine Sites for marine biodiversity

United Nations Educational, Scientific and Cultural Organisation (UNESCO) and the International Union for Conservation of Nature (IUCN) have conducted a pioneering assessment of the status and trends of species within UNESCO World Heritage sites, protected areas of universal value, providing unique insights into the species richness of these sites.

The collaboration between the World Heritage Marine Programme, Flanders Marine Institute (VLIZ), and the Ocean Biodiversity Information System (OBIS) secretariat facilitated access to essential data and information, enabling accurate insights into the species richness of the marine sites under the UNESCO World Heritage. Some of these sites are located within European marine waters, and the data retrieved from OBIS includes information made available via EMODnet Biology through the European regional OBIS node, EurOBIS. This global effort allowed for a comprehensive view of the current diversity in these Marine Heritage Sites, with European data playing an essential role in completing the picture.

Given the global scope of the approach, data from OBIS was utilised at an international level. The data flow from EMODnet Biology to OBIS streamlined the data collection process, making it more efficient. Accessing all available data through a single system that adheres to international standards, significantly improved the workflow and expedited the data processing.



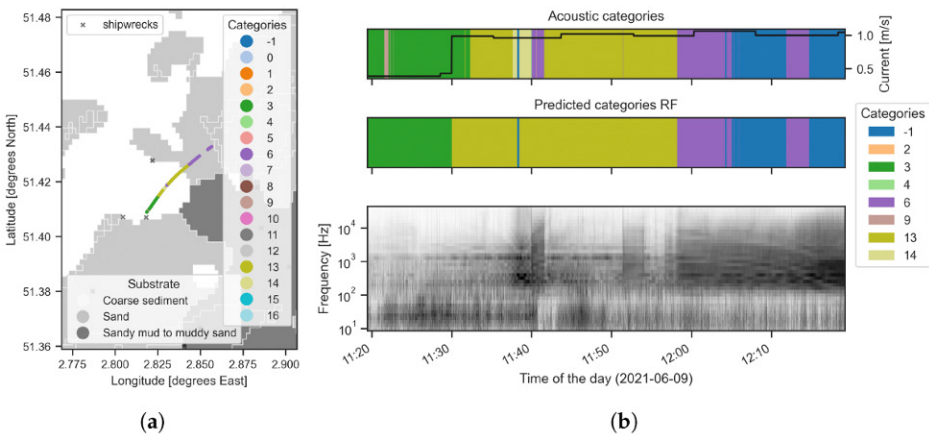
World Heritage: A unique contribution to biodiversity conservation.
(©UNESCO, 2023. CC-BY-SA 3.0 IGO)

4. Using EMODnet marine data to correlate underwater sound with other environmental parameters

The Flanders Marine Institute (VLIZ) is an autonomous Belgian non-profit organisation that conducts interdisciplinary research on the ocean, seas, coast and estuaries. Its mission is to enhance and disseminate science-based knowledge as broadly as possible, leveraging new technologies and focusing on innovation and valorisation.

Data from the EMODnet Human Activities, Bathymetry, and Seabed Habitats thematics were utilised to determine whether underwater sound in the Belgian part of the North Sea correlates with environmental parameters such as bathymetry, seabed habitat and shipping density. The cross-thematic data from EMODnet helped identify when and where certain soundscapes, i.e., a collection of sounds at certain locations, occur and whether they can be correlated with other environmental factors. It was found that the soundscapes indeed correlate with these environmental parameters, and by combining certain parameters, it is possible to predict which soundscape could be heard at specific locations and times.

EMODnet's free and open access service helped the researchers to overcome the challenge of access to standardised and interoperable data, leading to two publications. The centralised open access to EMODnet data had a positive impact, enabling the retrieval of environmental information from the Belgian part of the North Sea, which would have been difficult or time-consuming, and makes this research reproducible.



THEMATIC



CHEMISTRY

DATA
INGESTION

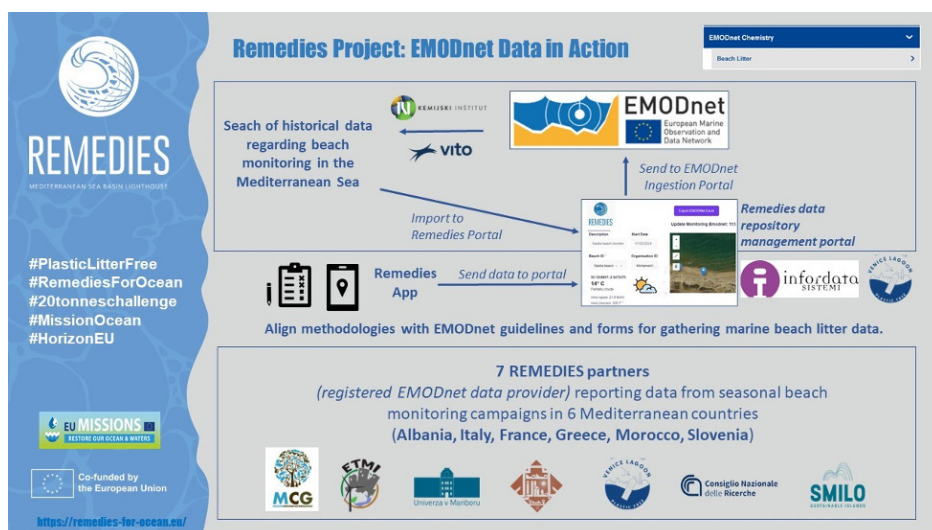
USE CASE SECTOR

Society

5. EMODnet Data in Action: Beach Litter Monitoring App and Venice Lagoon Plastic Free

The non-profit organisation, Venice Lagoon Plastic Free (VLPF), is listed on the National Single Third Sector Registry (RUNTS), is a supporter of the WWF Plastic Smart City Initiative, a signatory of the EU Charter Restore our Ocean and Water mission and is an EMODnet data provider. VLPF functions as a catalyst of social and technological innovation against marine litter and plastics pollution using the World Heritage site of Venice and its Lagoon as a living laboratory. The organisation is dedicated to developing local, national and international projects/networks for the facilitation of resources and expertise for plastic pollution prevention and remediation measures, within a circular economy approach.

VLPF used EMODnet Chemistry data in the context of the EU-funded REMEDIES Mediterranean Sea-basin lighthouse project, specifically using EMODnet's historical marine litter data from the pan-European marine litter database. This provided standardised and homogenised data, as well as identified data gaps, and the development of the Beach Litter Monitoring App. EMODnet also offered valuable services like the beach litter format validator, which helped generate correct datasets that were then submitted back to the EMODnet Ingestion Portal. VLPF will continue to use EMODnet web services for automatic data exchange, further enhancing our ability to manage and analyse marine litter data effectively. By developing the Beach Litter Monitoring App that acquires, stores, and aggregates data on marine litter pollution, VLPF, as a lighthouse test site and REMEDIES demo sites, can leverage citizen science. This allows members of the public involved in beach clean-ups to actively engage in scientific research.



EMODnet for Business

With its harmonised open data resources, the EMODnet Portal and its data services are central to the EU's efforts to support the Blue Economy with trusted and high-quality marine data and knowledge. With the combined effort of over 130 partners, the EMODnet service provides open and free access to pan-European marine data, data products and information that offshore and coastal businesses and operators use as an evidence-base to inform platform sitings, de-risk their platforms, reduce their costs in data collection, and enables climate-smart decision making based upon the combination of marine environmental and human activities data, including national Maritime Spatial Plans (MSP). The EMODnet service also provides opportunities for small and medium-sized enterprises (SMEs) and consultancies to build on top of EMODnet's baseline FAIR data layers and products, promoting the innovation of new applications and services that the private sector and public-private partnerships develop for targeted stakeholders, thereby driving forward research and innovation in the Blue Economy.

22 October 2024

ONLINE EVENT

EMODnet for Business
Marine data for ports, marinas and boating

#MarineData4PortsMarinasBoating



EMODnet
 European Marine
 Observation Data
 Infrastructure



European
 Commission



EMODnet for Business 2024 banner. (©EMODnet Secretariat)



EMODnet for Business is an important component of EMODnet's partnership engagement, with many private sector organisations using EMODnet services as intermediate and end-users and increasingly submitting data to EMODnet. For this reason, EMODnet conducts dialogues, demonstrations and events specifically aimed at the Blue Economy and businesses. Building on the success of previous events for Aquaculture (2020-2021), Offshore Renewable Energy (2022), and Coastal Tourism (2023), the 2024 event was dedicated to Marine Data for Ports, Marinas, and Boating.

On October 22nd, EMODnet and the European Commission Directorate-General for Maritime Affairs and Fisheries (EC DG MARE) hosted over 70 key actors across the ports, marinas and boating sector in a pan-European online workshop titled "EMODnet Marine Data for Ports, Marinas and Boating." The European Boating Industry, TransEurope Marinas, and the European Sea Port Organization were among the key stakeholders from the target Blue Economy sectors that co-designed the event. A wide variety of stakeholder sectors were represented, including port authorities, research, policy, marine data services, non-governmental organisations, sectoral associations, and thematic networks and projects.

The workshop aimed to increase awareness of the EMODnet EC marine data services and of its data and data products relevance in the Blue Economy, as well as enable discussions on data sharing opportunities that promoted data collection and submission to EMODnet. The workshop was broken into two sessions, the first focusing on the value of open data, EMODnet's services, existing and potential applications of EMODnet data, and interactive cross-sectoral discussion of requirements of *in situ* marine environmental and human activities data. The second session centred on data sharing, specifically how the ports, marinas and boating industry can contribute marine environmental and human activities data to EMODnet, with interactive dialogue on the data sharing opportunities and challenges of EMODnet's Data Ingestion public service.

The workshop highlighted the growing necessity for stakeholders in the ports, marinas and boating industry to access marine environmental and human activities data. This data is becoming critical for their operations, including supporting the green transition and addressing the data requirements for the ongoing transformations of city ports from solely transport hubs to also data hubs. Additionally, the workshop revealed that many stakeholders have already been collecting, or planning to collect, marine data relevant to EMODnet, and a motivation to help fill gaps in key data layers, with a request for EMODnet to develop a similar data layer for ports in Europe. Lastly, it was suggested that targeted resources for the marinas, ports and boating industries be developed, with the potential for co-development. Examples of these resources include data sharing guidelines and further information on the EMODnet offer. EMODnet will continue developing these recommendations and insights and aims to further promote the EMODnet offer at upcoming events.

For further information, the workshop agenda, presentations, and can be found and downloaded on the EC Maritime Forum (https://maritime-forum.ec.europa.eu/index_en) and EMODnet Portal (<https://emodnet.ec.europa.eu/en/reports>), together with reports from other workshops in the EMODnet for Business workshop series.



The EMODnet Associated Partnership (AP) Scheme is a free and flexible network for stakeholders who are not funded by EMODnet to join the EMODnet community for closer dialogue with EMODnet experts and to develop win-win collaboration in the domain of marine data. The EMODnet AP Scheme is open to both the private and public sectors, including public-private partnerships. In 2024, the EMODnet AP Scheme was strengthened to 35 members with four new EMODnet Aps namely Voice of the Ocean (VOTO), Oceano Vox, the Renewable Grid Initiative (RGI), savvy navy, and Van Oord.



Who can become an Associated Partner?

- » If you are a stakeholder that would like closer dialogue with EMODnet experts, but you prefer a light and flexible status without contractual obligations or complicated application/exit procedures, then the EMODnet AP Scheme is for you;
- » An EMODnet Associated Partner is formally recognised as a member of the EMOD-network without any associated contractual obligations i.e., without receiving funding and without the need to be a contractual partner in one of the projects;
- » In dialogue with the EMODnet Secretariat and wider partners, each AP needs to show both motivation and concrete activity that is win-win for EMODnet e.g., use case development, data sharing, best practice exchange.

What are the benefits of joining the EMODnet Associated Partnership Scheme?

- » EMODnet APs receive regular updates from EMODnet on service updates, wider marine data landscape developments in Europe and beyond and invitations to speak at EMODnet events, including information not publicly shared in the EMODnet monthly newsletter;
- » EMODnet APs can have a closer dialogue with EMODnet experts to see how EMODnet can serve your organisation's needs, opportunities for data sharing, sharing of best practices, EMODnet's service evolution;
- » EMODnet works with APs to explore win-win collaboration opportunities that are tailored to an APs needs, whether it is raising visibility of the EMODnet APs data sharing achievements and the company's impact for the European and Global Ocean Data Ecosystem, to exchanging on the European data space and digital twin ocean developments, solving technical queries on how to optimise the use of EMODnet for Blue Economy planning and operations, or being invited to speak at flagship high visibility EMODnet events e.g., EMODnet Open Conference series to present use cases and company perspectives and more;
- » EMODnet APs can explore future funding possibilities, and some evolve to become funded partners of EMODnet, in dialogue with EMODnet thematic and Data Ingestion.



Further information on EMODnet for Business, its Associated Partnership Scheme and more:

- » Explore EMODnet's wealth of marine data services for the Blue Economy and beyond: <https://emodnet.ec.europa.eu/en>
- » Explore how EMODnet can support you to ingest your data for high impact: <https://www.emodnet-ingestion.eu/>
- » Apply to become an EMODnet Associated Partner: <http://www.emodnet.eu/emodnet-associated-partners>
- » Share a use case: <http://www.emodnet.eu/use-cases>
- » EMODnet for Maritime Spatial Planning (MSP) video (see also EMODnet for Blue Economy sectors in the EMODnet video gallery): <https://emodnet.ec.europa.eu/en/emodnet-maritime-spatial-planning>
- » Follow EMODnet on social media @EMODnet on LinkedIn, Twitter/X
- » Contact the EMODnet Helpdesk with your questions: secretariat@emodnet.ec.europa.eu

European Ocean Observing

In 2020, EC DG MARE launched a consultation on the 'EC Ocean Observation – sharing responsibility' initiative with a key objective of stimulating European Member States to increase their levels of coordination and efficiency in Ocean observation, marine monitoring, and data collection. To support these endeavours, EMODnet conducts activities to strengthen the connection and dialogue with the European Ocean Observation community and stakeholders across the marine knowledge value chain and is a member of the European Ocean Observing System (EOOS) governance boards and dialogues. Since 2019, the EMODnet Secretariat has conducted a series of activities related to strengthening EMODnet's connection with the European Ocean Observing community. These efforts aim to assess and provide recommendations on improving and optimising the flow of *in situ* ocean observations from National and Regional level to EMODnet and to provide key information on ocean observation coordination and data pipelines to support the EC Ocean Observation Initiative. In 2024, EMODnet delivered a targeted assessment of regional ocean observation coordination and data pipelines, consulting with European Regional Sea Conventions (RSCs), International Council for the Exploration of the Sea (ICES), and Arctic stakeholders, including Arctic ROOS and Arctic Passion. This [report](#) is publicly accessible on the EMODnet Portal and provides recommendations on enhancing EMODnet's data harvesting and provision from RSCs.

EOOS

In situ ocean observations are the foundation of the EMODnet marine knowledge value chain and EMODnet has long-standing partnerships and collaborations with key actors across the ocean observation marine monitoring and data collection stakeholder community, ranging from public sector operational oceanographic and research-driven time-series to hydrographic offices, geological surveys, government and administration monitoring efforts, citizen science and the private sector. In 2024, EMODnet also continued its representation – via the EMODnet Secretariat, Physics, Chemistry and Data Ingestion in the Marine *In situ* Collaboration (MIC) Group, set up in 2022 between Copernicus Marine Service, EMODnet and EuroGOOS. This continues to leverage further data flow interoperability and alignment from the operational oceanographic community to – and between – the two EC marine data services. Dialogue with European Research Infrastructures was also increased, aided by European projects including AMRIT, EuroGO-SHIP, AQUARIUS and others.

The EMODnet Secretariat and wider EMOD-network also proactively engage with the community-driven European Ocean Observation System (EOOS) initiative, having been a founding member (EMODnet Secretariat) of the EOOS Steering Group and with wider EMODnet representation and presentations of EMODnet activities in other EOOS governance boards e.g., Operations Committee and the Resource Forum. EMODnet also contributes to strengthening links with EOOS through EMODnet flagship events and by co-organising and speaking at other EOOS events, bringing the message of the need for a more sustained and coordinated *in situ* ocean observing system for Europe to related marine and maritime community events. In 2024, these included an EOOS session at Oceanology International 2024 in London, UK, and targeted meetings with the European Marine Board, EuroGOOS, JPI Oceans and other stakeholders.

This enhances the connection between the ocean observation and data provision with data services and facilitates feedback from users on data needs and requirements for ocean observing design, also supporting the EC Ocean Observation initiative.



Infographic showcasing the data flow from Ocean Observation to EMODnet. (©EMODnet Secretariat)

Sea-basin Checkpoints

EMODnet maintains engagement with the EMODnet Sea-basin Checkpoint (SBCP) Coordinators who each led regional sea-basin studies for EMODnet and bring additional expertise to EMODnet's continued evolution. In 2024, the EMODnet Secretariat convened a meeting for SBCP Coordinators as part of the EMODnet Vision 2035 stakeholder consultation held from July to September 2024. Three SBCP representatives also sit on the EMODnet Vision 2035 Drafting Group together with other EMODnet and wider stakeholder representatives.

EMODnet and Copernicus Marine Service

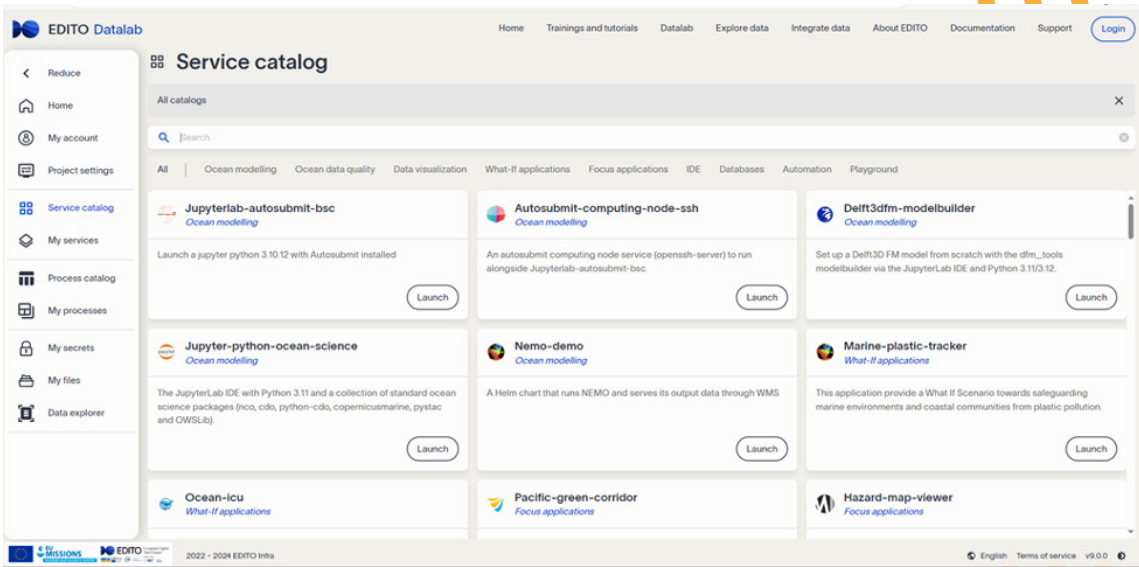
In 2024, EMODnet and the Copernicus Marine Service further consolidated their long-standing partnership as the two core marine data services of the European Commission, which together serve marine data and knowledge to the European Digital Twin Ocean (EU DTO). This key collaboration is presented in more detail in a [dedicated section](#) on the EMODnet Portal and a [joint communication on the European In Situ Marine Data Service landscape](#), released in November 2023.

EMODnet and Copernicus Marine Service have a bi-directional data flow for a small number of marine environmental parameters (some physical and biogeochemical) used in Copernicus Marine Service to validate satellite-derived data and/or as input to computer models. To optimise these specific data flows which are largely from operational oceanographic platforms, a Marine *in situ* Coordination Inter-Service Working Group was formed in 2022, jointly led by EMODnet, Copernicus Marine Service, and EuroGOOS, which aims to optimise data flows, reduce duplication, and enhance interoperability. In 2024, synergies between the two services became even more visible: EMODnet Physics continued to incorporate a core set of Copernicus *in situ* products, while EMODnet Chemistry provided essential datasets for validating Copernicus biogeochemical models. It is noted that EMODnet's service offer of *in situ* data is far more diverse since it includes over 65 marine environmental parameters across seven diverse themes, and uniquely also includes data and information on human activities at sea.

In 2024, EMODnet and Copernicus Marine Service further strengthened their collaboration for the EU DTO, notably on delivering the pilot EU DTO and its cloud-based common data lake of EMODnet and Copernicus Marine Service data and data products via the infrastructure project EDITO-Infra. This was showcased at the Digital Ocean Forum (DOF) 2024 held in June in Brussels, Belgium, co-organised by EMODnet partners VLIZ and Seascope Belgium, together

with Mercator Ocean International, and involving hundreds of stakeholders from across Europe and beyond.

As mature, operational EC services, EMODnet and Copernicus Marine Service now form the backbone of the EU's interoperable marine data space and its public EU DTO, which is a key component of the Mission: Restore our Ocean and Waters digital ocean and water knowledge system. This system is set to offer a step-change in marine knowledge to support policy implementation, to power research and innovation, and to support the blue economy in a green transition.



The European Digital Twin Ocean platform with data lake populated with EMODnet and Copernicus Marine Service data through the EDITO-Infra project. (©EDITO)

EMODnet for the European Digital Twin Ocean

As a core part of Europe's marine data infrastructure, EMODnet plays a vital role in building the European Digital Twin Ocean (EU DTO)—a next-generation framework to revolutionise how Europe monitors, models, and manages its ocean and coastal environments. Drawing on its expertise in aggregating, harmonising, and delivering multidisciplinary *in situ* data, EMODnet provides quality-controlled datasets—spanning physical, chemical, biological, geological, and human activities at sea—to power the EU DTO. Through the EDITO-Infra project, EMODnet contributes to the creation of a shared, cloud-based data lake and the development of interoperable, FAIR (Findable, Accessible, Interoperable, Reusable) data services for next-generation applications.

Beyond data provision, EMODnet bridges fragmented national and regional sources, delivering pan-European marine knowledge essential for accurate, scalable digital ocean models. By enhancing real-time access to high-resolution, multi-thematic data, EMODnet supports dynamic ocean management, the EU Green Deal, the EU Mission Restore our Ocean and Waters, and the broader blue digital transition. Looking ahead, EMODnet will continue to synchronise data products across its Central Portal and the EDITO platform, develop new cloud-ready services, and expand technical cooperation to meet evolving user needs.

At the third Digital Ocean Forum (DOF 2024) held in 12-13 June, organised by the European Commission, Mercator Ocean International, and partners, EMODnet contributed to discussions on data interoperability, modelling, and societal applications. EMODnet Technical Coordinator Conor Delaney presented on the role of FAIR, interoperable data in the EDITO Data Lake and Modelling Engine, while Kate Larkin, Head of the EMODnet Secretariat, highlighted EMODnet's key contribution to the EU DTO through harmonised, multidisciplinary marine data alongside Copernicus Marine Service. DOF 2024 reaffirmed the need for collaboration to advance Europe's digital ocean and support sustainable ocean governance. Re-watch the DOF 2024 high-level session and view the programme [here](#).

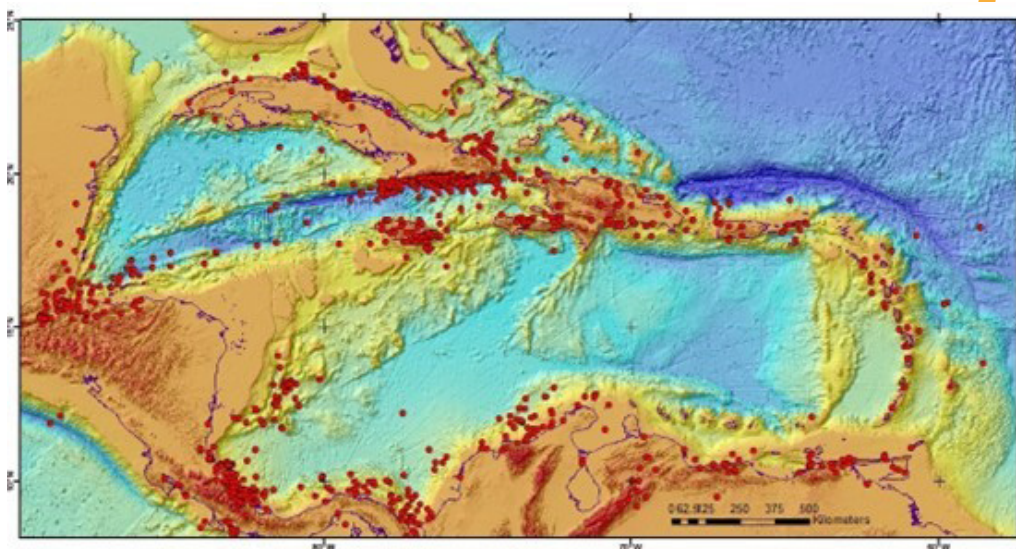


Digital Ocean Forum 2024 panel on "Digital Twin Ocean: A Game Changer for Ocean Knowledge and Action" with Kate Larkin, Head of EMODnet Secretariat. (©EMODnet Secretariat)

EMODnet partnerships: Global

Whilst EMODnet has a core European mandate, EMODnet is expanding its international partnerships, enhancing data sharing in regions such as the Caribbean Sea, Caspian Sea, and the Arctic and Southern Oceans also offers global data and other regional data of European interest. In this regard, EMODnet Geology-Caribbean Workshop held from 28 May to 1 June 2024 in Cotuí, Dominican Republic. Organised by the Geological and Mining Institute of Spain (IGME, CSIC), ASGMI, and the National Geological Service of the Dominican Republic, the workshop brought together representatives from eight geological services—Colombia, Costa Rica, Cuba, Spain, Guatemala, Honduras, Mexico, and the Dominican Republic—as well as students from the Technological University of Cibao Oriental (UTECO).

This technical workshop, part of the activities of the newly established EMODnet Geology Caribbean Group coordinated by IGME, aims to produce a series of thematic seabed maps (geological, tectonic, geomorphological, seabed sediments, mineral and energy resources, geological events, and coastal behaviour) using EMODnet methodologies. The event strengthened links between EMODnet and Caribbean geological services, paving the way for new regional initiatives and promoting the dissemination and use of EMODnet standards.



Map of Earthquakes in the Caribbean Sea, completed in 2024. (©EMODnet Geology Caribbean Sea Group)

In addition, EMODnet's international collaboration enables thematic areas such as EMODnet Physics and Biology to provide globally relevant datasets, increasingly used by international researchers and Blue Economy stakeholders. In 2024, EMODnet reinforced its role as a key regional contributor to the global ocean data ecosystem by providing FAIR Bathymetry data and the Digital Terrain Model (DTM) to the Nippon Foundation-GEBCO Seabed 2030 Project, engaging with GEO Blue Planet, GOOS, and collaborating with regional data services worldwide.

EMODnet also contributes to major global frameworks, supporting the UN 2030 Agenda for Sustainable Development (notably SDG 14), as well as EU efforts towards the EU Biodiversity Strategy 2030, the Nature Restoration Law, and the future UN Convention on Marine Biodiversity Beyond National Jurisdiction (BBNJ). By offering open, FAIR, and interoperable marine data and services assembled from hundreds of sources, EMODnet is already accessible at a global level, supporting international science, sustainable ocean governance, and the global Blue Economy, reinforcing its position as a trusted data service for Europe and beyond.

EMODnet for the UN Ocean Decade

Since its launch in 2021, EMODnet has been an active contributor to the UN Decade of Ocean Science for Sustainable Development (UN Ocean Decade) and, since 2023, an official Implementing Partner. The EMODnet for the Ocean Decade Coordination and Implementation Group (E4OD CIG), established in 2023, continues to map and strengthen EMODnet's contributions, identifying new opportunities aligned with Decade goals.

In 2024, EMODnet maintained its key advisory role in shaping the Ocean Data 2030 Strategy and Implementation Plan, contributing to Challenge 8: Digital Representation of the Ocean, and supporting initiatives such as the DITTO programme and COASTPredict. EMODnet's FAIR metadata catalogue enables direct harvesting into the Ocean Data and Information System (ODIS), making its data visible through platforms like The Global Earth Observation System of Systems (GEOSS) and the UN Decade's data infrastructure. EMODnet also actively supports the Decade Coordination Office for Ocean Data Sharing (DCO-ODS) by providing integrated, standardised, and openly available *in situ* marine data and products.

In April 2024, EMODnet experts participated in the UN Ocean Decade Conference in Barcelona, Spain, contributing to stakeholder workshops and discussions on Europe's Digital Ocean, Blue-Cloud, and Challenge 8, and engaging in a joint exhibition on ocean data sharing and prediction with Mercator Ocean International and Copernicus Marine Service.



EMODnet, Copernicus Marine Service and VLIZ colleagues attending the UN Ocean Decade Conference 2024 in Barcelona, Spain. (@EMODnet Secretariat)

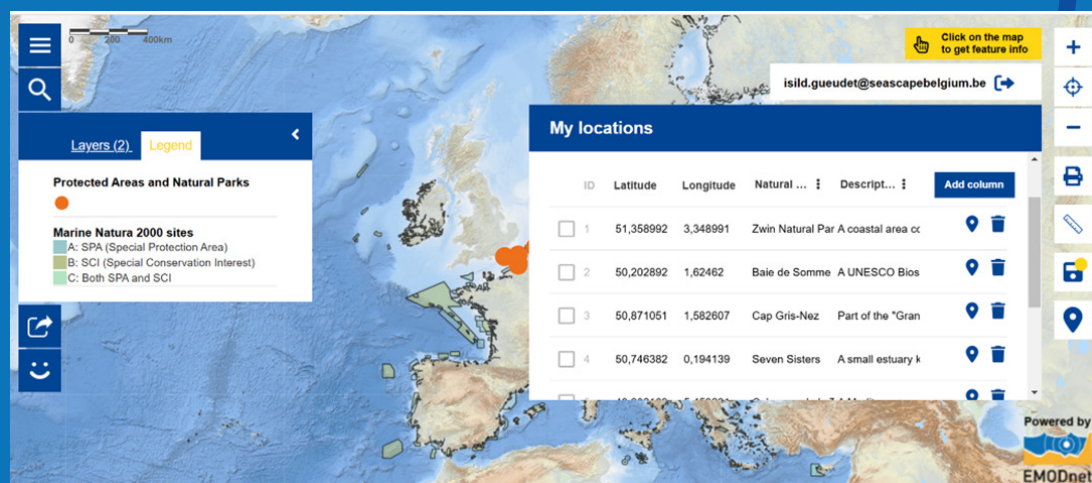
Additionally, in 2024, EMODnet joined forces with key European and global stakeholders to co-organise the Ocean Data Webinar Series, in partnership with EUMETSAT, Copernicus Marine Service, and the Early Career Ocean Professionals programme, in collaboration with the UN Decade Coordination Office for Ocean Data Sharing. The series conducted two webinars in 2024 with two more planned for 2025, aiming to increase awareness of the wealth of ocean data available through European data services including EMODnet, while promoting user-driven approaches to ocean monitoring and data use in support of the UN Decade's ten Challenges. Through this collaboration, EMODnet reinforced its role not only as a trusted European marine data service but also as a capacity-building actor empowering users worldwide to access, use and contribute to FAIR ocean data.

European Atlas of the Seas

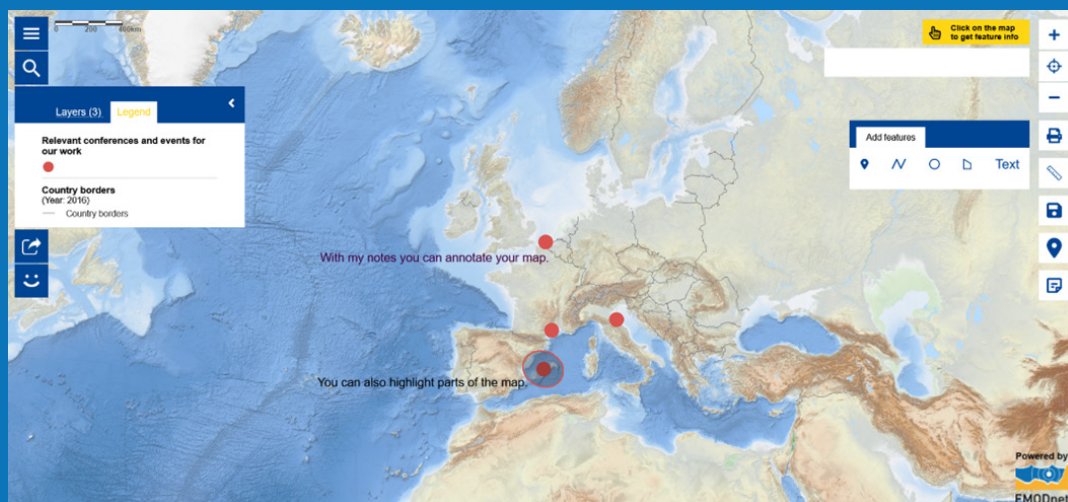
The European Atlas of the Seas is a user-friendly, interactive web map viewer aimed at the general public, educators, students, professionals from different sectors, policy-makers, communication experts and media. First launched in 2010 by the European Commission Directorate-General for Maritime Affairs and Fisheries (DG MARE), it presents marine information comprehensively and visually, making it a great tool for ocean literacy, formal and non-formal education, marine policy, and the Blue Economy.

With its constantly evolving catalogue of more than 270 map layers, the Atlas hosts a wealth of information about Europe's marine environment and related human activities, covering topics such as nature, tourism, security, energy, transport, sea bottom, sea level rise, fisheries, aquaculture, and much more. This information is provided by a wide range of authoritative marine data sources including notably the European Commission and its agencies, EMODnet, Copernicus (Marine and Land Services), Eurostat, the European Environment Agency and the Joint Research Centre. The Map Layers in the Atlas, over half provided by EMODnet, are regularly updated with new data and new map layers are added to the Atlas.

The Atlas provides several functionalities that enable users to find and understand natural and socio economic information on the marine and coastal regions of Europe and make use of interactive maps in teaching resources and online media. The Atlas allows one to search for and combine map layers on different topics, navigate and interact with maps to find more information, print, share and embed maps on websites, find geographical coordinates of any location as well as calculate distances and areas. In 2024, the Atlas Team developed two new tools - 'My Locations' and 'My Notes' – which allow users to create their own maps, adding locations with custom information and annotating maps with symbols and text to customise them for their use case.

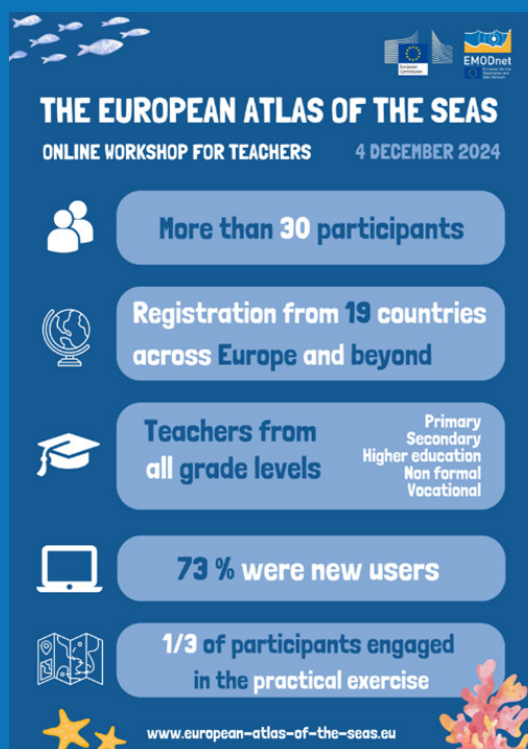


Development of a map layer with the new 'My Locations' tool. (©European Atlas of the Seas)



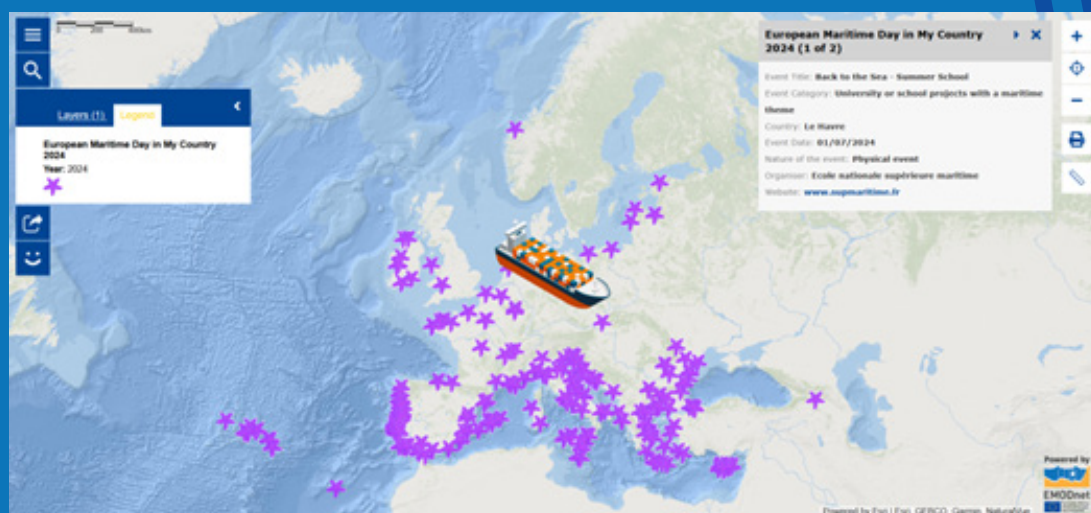
Map annotations created with the new 'My Notes' tool. (©European Atlas of the Seas)

For example, teachers can use these tools to create maps related to educational projects, field trips or case studies. Users can save the maps they have created in their own working space in the Atlas with the 'My Maps' tool that was developed in 2023 and share these maps with others. This series of new tools further increases the range of activities for which the Atlas can be used in classrooms across Europe. To help users learn how to use these tools, the Atlas Team organised an online workshop for teachers in December 2024 which included a presentation of the new tools and an optional exercise that allowed teachers to gain experience with the tools and to ask questions. A video tutorial was also developed which demonstrates the use of the 'My Locations' tool.



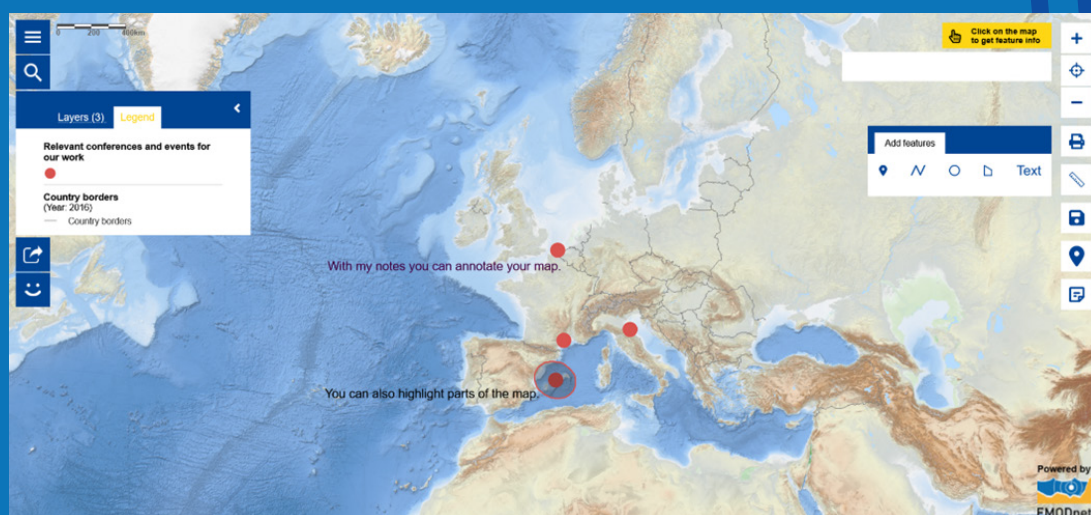
Key figures related to the online workshop for teachers organised on 4 December 2024 (left) and infographic of the Atlas shared in the online article published after the workshop (right). (©European Atlas of the Seas)

A new educational game was added to the Teachers Corner: the Blue Economy Challenge game. Students have to find five images hidden by the Atlas Team in the map layer 'European Maritime Day in My Country 2024' map layer using the given geographical coordinates. This activity enables students to learn how to use geographical coordinates to find any specific location on a map and to gain knowledge about economic activities related to the ocean, seas and coasts. A Teachers guide was developed which includes the solutions to the game and further explanation on how to use the Atlas to find the images on the map and the answers to the questions.



One of the hidden images in the European Maritime Day in My Country 2024 map layer as part of the Blue Economy Challenge game. (©European Atlas of the Seas)

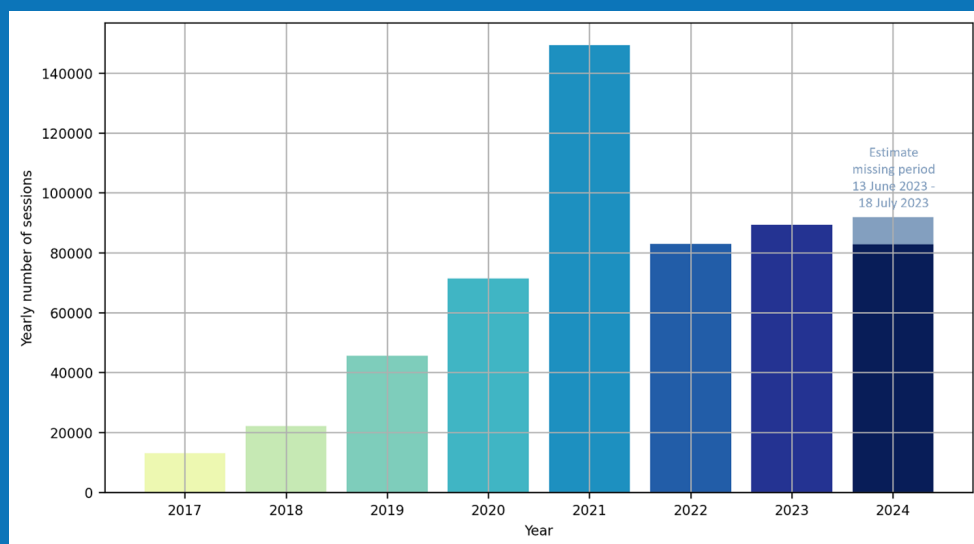
Synergies between the Atlas and the EU4Ocean Coalition for ocean literacy were further strengthened notably through the update of the EU4Ocean map in the Atlas, communication via the Map of the Week and EU4Ocean communication channels and contribution to several events.



The three map layers that constitute the EU4Ocean Coalition map in the Atlas were updated in 2024. (©European Atlas of the Seas)

Key achievements in 2024

- » In 2024, 43 map layers were updated and two new map layers were added, the map layers on the 'European Maritime Day in My Country Events 2024' and 'Fisheries Local Action Groups';
- » Twelve new map stories were added to the Atlas;
- » The 'My Locations' and 'My Notes' tools were developed, allowing users to create their own maps;
- » Promotion efforts have strengthened the visibility of the Atlas for audiences across Europe. This included the organisation of three workshops: two in-person workshops with primary school students in Belgium and an online workshop for teachers. The Atlas was promoted at five in-person events: European Ocean Days - 'Ocean Literacy in Action', European Youth Week Kick-off Event, Science is Wonderful!, European Maritime Day and the Plastic Pirates Summit. The Atlas poster was featured at the European Ocean Days - 'Where next for Europe's Seas?' event and VLIZ Marine Science Day. The Atlas was also presented at the online EU4OCEAN Science Projects Online Workshops (SPOW) - Plastic Pollution and Working with Ocean Technology. Promotion further included online publication of the Maps of the Week every Friday on the Maritime Forum and the EMODnet Portal, inclusion of the 'Monthly dive into the European Atlas of the Seas' in the EMODnet newsletter, contribution to the Maritime Forum newsletter, maps of the month in the DG MARE newsletter and regular activity on the Atlas' social media account;
- » The Atlas Team developed two video tutorials, respectively on the Atlas measure tool (published on the EMODnet YouTube channel in 2024) and on the 'My Locations tool' (developed in 2024 and published in early 2025);
- » New content was added to the Teachers Corner including the Blue Economy Challenge game, a quiz on marine litter and three presentations;
- » The new developments accompanied by structured promotion and outreach activities have led to an estimated total of up to 92,000 visits to the Atlas in 2024, further exposing EMODnet data and products to a growing audience across Europe and the World.



Yearly visits to the European Atlas of the Seas in the past eight years. Please note that due to an issue with Europa Analytics, no information was collected in the period of 13 June 2023 – 18 July 2024. The number of visits during this period was estimated based on that of the same period in 2023 (as indicated in grey in the graph). (©Europa Analytics)

Atlas: www.european-atlas-of-the-seas.eu

Teachers' Corner: <http://Learn.european-atlas-of-the-seas.eu>

X: [@EuropeAtlasSeas](https://twitter.com/EuropeAtlasSeas)

Budget

The figures below represent the budget committed in thousands of Euro.

More information on the EMODnet budget can be found at: <https://emodnet.ec.europa.eu/en/emodnet-budget>

Theme & Project	Preparatory Actions ¹	Maritime Policy Fund ²	European Maritime and Fisheries Fund ³		
	2008-2010 (k€)	2011-2013 (k€)	2014 (k€)	2015 (k€)	2016 (k€)
Central services		520		4.565	155
EMODnet Secretariat		520		520	155
Data Ingestion				4.045	
Thematic Groups	6.350	16.350	1.194	4.917	13.483
Bathymetry & Coastal mapping	2.175	2.000	1.194	4.917	
Biology	750	1.700			1.770
Chemistry	700	4.000			2.805
Geology	925	4.200			4.500
Human Activities		2.060			1.608
Physics	1.000	1.000			1.400
Seabed Habitats	800	1390			1400
Sea-basin Checkpoints		1.695	4.175		
Arctic			906		
Atlantic			1.590		
Baltic Sea			784		
Black Sea			895		
Mediterranean		1.095			
North Sea		600			
Observation				4.000	
Argo				4.000	
Grand Total (K€)	6.350	18.565	5.369	13.482	13.638

¹ As defined in article 54 of Regulation (EU, Euratom) No 966/2012 of the European Parliament and of the Council of 25 October 2012 on the financial rules applicable to the general budget of the Union

² Regulation (EU) No 1255/2011 of the European Parliament and of the Council of 30 November 2011 establishing a Programme to support the further development of an Integrated Maritime Policy

³ Regulation (EU) No 508/2014 of the European Parliament and of the Council of 15 May 2014 on the European Maritime and Fisheries Fund

⁴ Regulation (EU) 2021/1139 of the European Parliament and of the Council of 7 July 2021 establishing the European Maritime, Fisheries and Aquaculture Fund

				European Maritime, Fisheries and Aquaculture Fund ⁴				Grand Total (k€)
2017 (k€)	2018 (k€)	2019(k€)	2020 (k€)	2021 (k€)	2022 (k€)	2023 (k€)	2024 (k€)	
1.420	1.000	1.420	138	2.665		2.665		14.548
1.420		1.420	138	1.325		1.325		6.823
	1.000			1.340		1.340		7.725
7.098	4.671	5.737	7.074	4.237	6.810	4.896	7.362	90.179
3.720		2.800		2.800		2.662		22.268
1.770		1.500			2.000			9.490
	1.399		2.234			2.234	2.450	15.822
	1.770		2.420		2.420		2.400	18.635
1.608		1.437		1.437			1.392	9.542
	950		1.050		1.020		1.120	7.540
	552		1.370		1.370			6.882
								5.870
								906
								1.590
								784
								895
								1.095
								600
								4.000
								4.000
8.518	5.671	7.157	7.212	6.902	6.810	7.561	7.362	114.597



EMODnet Team

Head of EMODnet
Secretariat



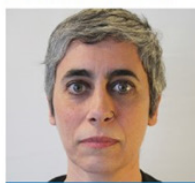
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EMODnet Biology



Joana Beja

EMODnet
Bathymetry



Thierry Schmitt

EMODnet
Chemistry



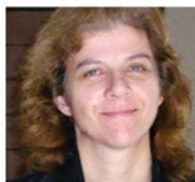
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EMODnet
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Anu kaskela

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Alessandro Pititto

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Physics



Antonio Novellino

EMODnet
Seabed Habitats



Ville Karvinen

Coordinators of the EMODnet Partnership in 2024.

EMODnet Publications

A list of peer reviewed and non-peer reviewed publications, (co-)authored by the EMODnet thematic lots and Data Ingestion, can be consulted at: <https://emodnet.ec.europa.eu/en/publications-list-2024>.

For a more comprehensive overview of publications referring to/making use of EMODnet data and/or data products, please consult online reference services e.g., Google Scholar, Web of Science.

European Commission

Energy, Climate change, Environment

European Marine Observation and Data Network (EMODnet)

About Data Services Solutions Themes Community Atlas of the Seas News & Events FAQ Downloads

Home > About > Reports > Publications List 2024

Publications List 2024

PAGE CONTENTS

- Bathymetry
- Biology
- Chemistry
- Data Ingestion
- Geology
- Human Activities
- Physics
- Seabed Habitats

Bathymetry

A. (Co-)Authored peer-reviewed publications in the quarter

Date of publication	Type of publication	Full reference	ISBN	DOI	Is it open access? Yes/No
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B. Other/non-peer reviewed types of publications (co-)authored in the quarter

Date of publication	Type of publication	Full reference	ISBN	DOI	Is it open access? Yes/No
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Biology

A. (Co-)Authored peer-reviewed publications in the quarter

Date of publication	Type of publication	Full reference	ISBN	DOI	Is it open access? Yes/No
		Maioli, Federico,			



EMODnet

European Marine
Observation and
Data Network

 emodnet.ec.europa.eu

 [@EMODnet](https://twitter.com/EMODnet)

 [/company/emodnet/](https://www.linkedin.com/company/emodnet/)



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.