

ALL HANDS ON DECK TO PUT YOUR DATA TO WORK

The European Marine Observation and Data Network (EMODnet) is a long-term marine data initiative from the European Commission Directorate-General for Maritime Affairs and Fisheries (DG MARE). EMODnet is a consortium of organisations that work together to assemble quality-insured, standardised and harmonized marine data, metadata and products, making them more accessible to Blue Society. In six years, EMODnet's Data Ingestion Portal published over 1360 new datasets from over 200 data submitters from scientists, blue economy businesses, governments and NGOs. Marine data ingestion has never been easier!

This poster presents country cases collected by the EMODnet Ingestion roaring factory from around the European Seas:

UK – Marine Scotland Science – A champion in the provision of numerous datasets;
 IT – Joint Research Centre & EMODnet Human Activities – The algae production business now on the map;
 SE – The Berring Data Collective – Fishing for data: Collaborative ocean data where it is needed most;
 BE – Belgian Navy – Fourteen years of archived data shared and saved forever;
 BU – The Black Sea – Danube Coastal Association – An example of a mutually beneficial cycle of scientific data;
 DK – Danish Centre for Environment and Energy – Microplastic-like particles in sediments fit for reporting;
 GE – Poti Laboratory Research Centre Ltd. – Stages of a long-term collaboration with a data provider in Georgia;
 NL – Dutch Ministry of Infrastructure and Water Management – Dutch long term macrobenthos monitoring data 1991-2015;
 ES – ESGEMAR company – The SME sourcing to the Data Ingestion Portal and partnership;
 FI – Radiation and Nuclear Safety Authority of Finland – ¹³⁷Caesium activity contents in seabed sediments in the Baltic Sea;
 IT – Four NGO's and five European monitoring and research centres – Marine litter data fit for reporting to EU marine strategies;
 RO – Mare Nostrum Association – Marine litter data fit for reporting to EU marine strategies.



12+ success stories
 200+ data providers
 1350+ data sets



UK
 BODC

Marine Scotland Science (MSS), the scientific division of Marine Scotland, plays an integral part in supporting the Scottish Government's vision of marine and coastal environments that are clean, healthy, safe, productive, biologically diverse and are managed to meet the long-term needs of both nature and people.



In the context of EMODnet Ingestion, the British Oceanographic Data Centre (BODC) has been able to re-establish contact with MSS organisation which had been a regular data supplier in the past, but where contact had been lost through staff changes and lack of funding. The data are CTD casts, measuring temperature, salinity, dissolved oxygen, fluorescence and turbidity.

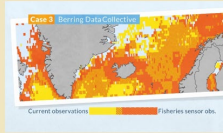
The BODC was able to catch up on a backlog of data. This covers about 10 cruises per year over the last 4 years. For 2016-17, it has delivered to Phase II 1038 CTD casts (21 cruises) with a similar amount to follow for the period 2018-19. The data are available from SeaDataNet and EMODnet Chemistry. Some of the data are time series, which is important for analysis in the context of EMODnet Physics.

The BODC is proud of this achievement thanks to EMODnet Ingestion because it has helped mobilise a substantial amount of data from Marine Scotland Science. **Now that contact has been re-established, data have flowed smoothly and will hopefully lead to regular submissions in the future.**

SE

SMHI

The collaborative integration of sensors with fishing can fill some of the most pressing gaps in the sustained ocean monitoring. Fishing vessels operate exactly where autonomous platforms cannot, leading to a surprising lack of data for fishermen close to shore compared with the open ocean. The mission of the Berring Data Collective (BDC) is to collect high-quality, cost-effective ocean data and connect traditionally divergent users of the ocean space.



The BDC is currently collecting data from an emerging global network of vessels, 81 of which are fishing for data, also in the Arctic. The use of sensors on fishing nets provides high-quality, low-cost subsurface oceanographic data in coastal ocean regions. The data is used for weather forecasting and climate monitoring, predicting ocean changes, improving fisheries science, and avoiding by-catches by understanding the ocean conditions preferred by different species.

The Swedish Meteorological and Hydrological Institute's collaboration with the BDC has led to the ingestion of about eighteen thousand data profiles into the EMODnet Physics databases with the support of EMODnet Ingestion. **By now, the data collected by the BDC from European waters and ranging as far as Alaska are already flowing to EMODnet in near-real time!**

BU

IO-BAS

The Black Sea - Danube Association of Research Development (BDCA) is an independent non-profit organisation. It is an association of universities, consultancy, other organisations, and individuals involved in research, training, engineering and advisory activities in sustainable use of marine resources, coastal protection against flooding and erosion, harbour and coastal structures, environmental protection on the western Black sea coast and lower Danube.



For 30 months, BDCA was in charge of a fishing port project called "Quarantine" and located in the territory of Asparuhovo residential area, Varna municipality. The project covered the modernisation and reconstruction of the existing fishing port with the construction of hydro-technical facilities in the water area and infrastructures with the necessary facilities. The aim was to provide an efficient, regulated, safe and hygienic landing, storage, first sale and shipping facility for catches. As part of the project, coastal bathymetry data was collected in August 2019.

The main challenge faced by IO-BAS as data ingestion ambassador was converting the data from Projected Coordinate System to WGS84 before publication to EMODnet Bathymetry. IO-BAS provided a full assistance throughout the entire submission process. The provider was trained how to download data from EMODnet sites for the needs of his own projects and consultations. One member of the provider association, CORES Ltd., even became EMODnet Associated Partner.



IT

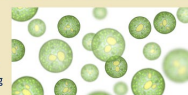
COGEE

The Joint Research Centre (JRC) is the European Commission's science and knowledge service. It employs scientists to carry out research in order to provide independent scientific advice and support to EU policy. The JRC is data collector on algae and spirulina aquaculture farms. It gathers the data on algae production facilities directly from the European farmers.



During the last 2 years, JRC made an effort to increase the quality of the mapping of the algae production facilities which included the launch of a survey with the industry and a consultation with experts. Resulting from this work the number of algae companies in the database almost duplicated, including now more than 200 macro- and microalgae companies spread between 17 countries. The updated database also includes some new categories of data such as the species and volumes produced by each company which adds interesting information to the global understanding of the sector in Europe. Besides algae-based products, the aquaculture farms deliver also valuable data for the blue bio-economy.

Algae and spirulina are farmed all around Europe. Spirulina (Arthrospira) has even become one of the most popular food supplement in western human nutrition since the 1970s. **You can now visualise where they are produced in Europe** by accessing the dataset on the various algae and spirulina production facilities on the EMODnet Human Activities portal.



BE

RBINS

Since 2006, the Belgian Navy operates 5 Hydroid REMUS 100 Autonomous underwater vehicles (AUVs). Four more were acquired in 2012 and 2016. Till 2019, 880 missions have been undertaken in Europe for port protection and mine hunting operations, for which side scan sonar images are used.



From the first contact of the data ambassador with the Research Centre of the Belgian Navy, it was quite willing to share some of the data gathered by the AUVs. The data that matters to the Belgian Navy, the side-scan sonar images, have not been shared and remain classified. The Navy data manager did a lot of work in extracting the data from the files. This process actually improved the data accountability of the data owner: reorganising and renaming the proprietary files from the AUVs, and extracting the data in a human readable format (txt) also serves their own interest in the long term.

Collaboration with RBINS in this processes raised the point of data quality and recalibration after maintenance of some AUVs. Further follow-up with the manufacturer of the AUVs is foreseen to get an idea of the sensor models included in the AUVs and of calibration curves. The data were published 'as is' to EMODnet Chemistry and EMODnet Physics. **This experience opens perspectives for other national navies to join the EMODnet family!**



DK

AU-BIOS

The Danish Ministry of Environment and Energy initiated the national monitoring programme using the environmental indicator "microplastic" so that it can be used for the national implementation of EU's Marine Strategy Framework Directive (MSFD) in relation to Descriptor 10 for assessments of characteristics, state, impact and trends of litter in the marine environment.



The data provider, the Danish Centre for Environment and Energy (DCE), is Aarhus University's central unit for knowledge exchange within the areas of nature, environment, climate and energy. Under the scientific assessment Report No. 178, the DCE describes the results of the national monitoring programme on microplastic contents and composition in sediments collected in the inner Danish waters in 2015.

The ingestion team supported the data provider all the way during the process including data and metadata submission and the organisation of data in a relational structure. The main challenges were to convince the data provider to allocate the necessary time for the data preparation and submission, and to database the dataset according to the EMODnet guidelines. **The efforts for the data publication were largely outweighed by the fact that the DCE can use EMODnet Ingestion structures and services:** (i) as a repository for stocking data and metadata, (ii) as an add-on to the national monitoring programme on microplastic, (iii) for organising and presenting the data in a relational, databased format, (iv) for generating data products on a European scale, and publishing the data and data products for Marine litter to EMODnet Chemistry.

Map of 11 sediment sampling stations in Danish waters in 2015.

GE

TSU

The Laboratory Research Centre Ltd. is in charge of the long term monitoring of the chemical parameters of the sea water within the City of Poti seashore area in Georgia. Together with the bacteriological lab, the chemical lab carries out analysis of drinking, surface and waste waters.



As EMODnet Data Ingestion ambassador, the Tbilisi State University (TSU) established the first contact with the Laboratory Research Centre in Autumn 2017. The actual submission of chemical data to EMODnet started the same year and is still ongoing. **The success of this permanent collaboration is due to a tailor-made procedure supported using the Georgian language throughout the contacts with the data provider, and to the continuous support of MARIS and HCMR to the TSU.** The use of the local language with the data provider helped a lot in understanding the rather technical processes and facilitated the training in publishing their own data.

In the preparatory phase, a questionnaire was sent to reveal a comprehensive list of marine-oriented institutions in the Black Sea, and to establish their capacities to obtain and process marine data. The value of data sharing was then explained to data holders; they were informed of the requirements of the EMODnet project and offer to participate as data providers. Specific roles were distributed among the TSU staff to carry out the ingestion tasks. One person was designated to work with potential data holders on site, another was designated to serve as data centre contact person. The TSU programmer was involved in the work of processing the datasets during Phase II. All the TSU team members followed the procedure for testing the submission service.

ES

CSIC

ESGEMAR is a Spanish technical consultancy company which operates in a diverse range of areas and sectors from marine technical assistance, support, training and research. It has a vast experience in marine geophysical exploration, marine geology, submarine resources, submarine hazards cartography, seafloor mapping and charting, fisheries studies support and control, sea-weeds resources exploration, underground hazards mapping for fishing, biodiversity studies, marine environment and underwater environmental impact reports.



Challenges encountered by the CSIC as data ambassador were the lack of knowledge of the EMODnet website on the side of the data provider and the confidentiality of much of the data as they belong to private companies. The difficulties were solved with the interplay of several actions, such as showing other cases of data providers of the nearby community and whose data have been already ingested. ESGEMAR was also invited to visit the EMODnet website to download data, maps, etc., from the area where it usually works, as this information **may be useful for the company's future work.** This action raised awareness of the importance of open database and open data access.

After the agreement with ESGEMAR, the CSIC supported the creation of the metadata, and the data were ingested. The data provider was also convinced that EMODnet is a good showcase for the company and its activities, so much so that ESGEMAR became an Associated Partner of EMODnet.

IT

OGS

Since October 2019, EMODnet Chemistry has been collecting, harmonizing and validating marine litter data. Five European monitoring and research centres, and four NGOs submitted their datasets through the EMODnet Ingestion Portal. Once elaborated, the data are included in the database maintained by the National Oceanographic Data Centre (NODC) at the National Institute of Oceanography and Applied Geophysics (OGS).



Picture: Joint List of Litter Categories for marine macro-litter Monitoring

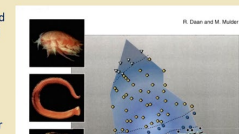
Time range of the different datasets stretches from one to five years and covers the period 2013-2020. The datasets come from 8 countries bordering the Baltic Sea, the Black Sea and the Mediterranean Sea: Estonia (TalTech), Latvia (LHEI), Bulgaria (BGODC), Romania (Mare Nostrum), Slovenia (NIB), Croatia (IZOR), Turkey (TUDAV) and Cyprus (ORION). Marine litter composition and abundance were defined in sediments, mostly coastal deposits, well known as beach litter, by means of visual census methodologies. A Croatian dataset comes from seafloor samples collected by trawling.

The main challenge achieved via the work of EMODnet Chemistry in collaboration with the EC Joint Research Centre and the MSFD Technical Group on Marine Litter was to develop agreed European standard formats, based on existing best practices set up by consolidated communities. Standardization enables to compare marine litter data collected with many different methodologies by numbers of data sources. EMODnet Chemistry works in strict cooperation with the NODCs and the Member States to produce validated data collections on a European scale. Besides MSFD monitoring data, EMODnet Chemistry also manages, stores and gives access to marine litter data from both research surveys and monitoring or cleaning initiatives of citizen science.

NL

Deltares

The Dutch Ministry of Infrastructure and Water Management is responsible for all ecological monitoring in the Dutch part of the North Sea. The Ministry applies an open data policy, according to which all monitoring data can be shared.



The main difficulty of Deltares, as data ambassador in the project, was that data are gathered by different parties. Therefore, some harmonization (mostly done by the provider) was necessary to publish the best data possible. Conveniently, the ingestion portal guides the addition of relevant metadata, which is necessary for continued use of this kind of project-wise collected monitoring data. Taxonomical names were matched to WoRMS by the data ambassador. The data provider published to EMODnet Biology the long term ecological monitoring data of the benthos collected in the period 1991-2015.

The Dutch Ministry of Infrastructure and Water Management has interest in the EMODnet data for analyses that require cross-border observations. Therefore, in the future, EMODnet data may be used by the Ministry for assessments.

FI

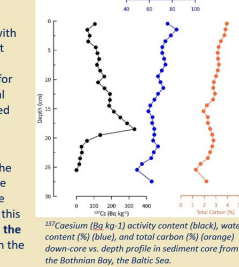
GTK

Fallout from the 1986 Chernobyl nuclear power plant accident has rendered the Baltic Sea as the most polluted marine body in the world with respect to ¹³⁷Caesium. Radioactivity from ¹³⁷Cs in sediments has generally declined due to decay of ¹³⁷Cs over the last decades. However, ¹³⁷Cs contents in subsurface sediments remain at elevated levels compared to pre-Chernobyl levels, especially in the northern Baltic Sea sediment and it is considered that Chernobyl fallout created a clear chronostratigraphic marker.



The Radiation and Nuclear Safety Authority (STUK) supervises radiation and nuclear safety in Finland with the purpose to protect people and the environment from the detrimental effects of radiation. STUK measures ¹³⁷Cs data in the sediments of Baltic Sea for environmental monitoring purposes. The Geological Survey of Finland (GTK) contacted STUK and received the data in April 2021 after a few encouragements.

Acting as data ambassador, GTK submitted the standardized data on behalf of the data owner, to the EMODnet Geology portal. It was considered that the ¹³⁷Caesium peak in the sedimentary record could be used to define recent rates of sedimentation. After this fruitful collaboration, **a joint article about ¹³⁷Cs in the Baltic Sea sediments** was published in Sept. 2021 in the Marine Pollution Bulletin.



Ro

NIMRD

The Mare Nostrum NGO is a non-profit, apolitical, independent environmental association from Constanta, Romania, founded in 1993 at the initiative of several young specialists, from various fields related to marine research and environmental protection. In a spirit of partnership, Mare Nostrum works to raise public awareness, educate about ecology and create pressure on decision-makers for effective environmental protection of the Black Sea and the Romanian coastal zone.



Reducing the amount of **marine litter** is one of the strategic objectives of Mare Nostrum. Its most important project in this field is the marine litter monitoring programme, a permanent and continuous programme that keeps track of the amount of litter recorded on Romanian beaches. The association's experience in this respect speaks for itself: the first monitoring of beach litter was organised in 1999 and since 2014 the monitoring has been carried out according to the European methodological standards. Thanks to the data collected as a partner in several European projects, the NGO Mare Nostrum has gathered an impressive volume of data on beach litter.

The Mare Nostrum NGO was eager to share its beach litter data with EMODnet Chemistry and thus to contribute to the European Marine Litter Data Base. As EMODnet Data Ingestion ambassador, the National Institute for Marine Research and Development "Grigore Antipa" (NIMRD) provided full support throughout the data submission using EMODnet Ingestion services or directly using EMODnet Chemistry services. With more than 130 data sets on beach, seabed and floating litter along the entire Romanian Black Sea coastline over a period of eight years, Mare Nostrum has become one of the most important providers of marine litter data in the Black Sea and a future Associate Partner of EMODnet.

Discover how old and recent data, even near real-time data, from various sectors strengthen Europe's marine open data network. With the UN Decade of Ocean Science for Sustainable Development already upon us all eyes are on the data. More data for accurate science, smarter engineering and durable policy making. More data for a resilient ocean. Take part in our success story. **Join the EMODNET community**, and make your data work harder, for more impact at EMODNET-INGESTION.EU.



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