



# EMODnet



European Marine  
Observation and  
Data Network

## EMODnet Thematic Lot n° 4 - Chemistry

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Start date of the project: 03/10/2019 - (24 months)

**EMODnet Phase IV –Final Report**

**Reporting Period: 03/10/2019 – 02/10/2021**



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## Executive summary

*[Provide a short summary of the key achievements and/or events of interest to a wider audience since the start of the project phase (provide the date) you wish to highlight. You can also consider the indicators or any other of the reporting sections. Provide a bullet list of maximum 10 main points with short explanations. Max 2 pages.]*

This report describes the activities and results achieved by EMODnet Chemistry during its IV contract phase, which lasted two years starting on 3<sup>rd</sup> October 2019. All achievements, results, latest news, and events are published in the portal: <http://www.emodnet-chemistry.eu>.

EMODnet Chemistry phase IV has the overall objective of providing access to marine chemistry data sets and derived data products concerning **eutrophication, ocean acidification, contaminants, and marine litter** from 3 matrices: water, biota, and sediment. Focus is given to marine litter collected on beaches, in fishermen's nets, or in specific surveys. **All major European sea regions are covered:** Norwegian Sea, Barents Sea, Baltic Sea, N.E. Atlantic Ocean (Celtic Seas, Iberian coast and Bay of Biscay and Macaronesia), Greater North Sea, Mediterranean Sea and Black Sea, adopting the geographical definitions of MSFD.

Phase IV aims at a continuation and improvement of services, assembling, processing, and making accessible more measurements and deriving products of chemical substances for eutrophication and contaminants. The scope was extended with micro-litter, while the feasibility and implication in managing floating macrolitter, and seafloor macro-litter by ROV/AUV multimedia was deeply analysed. This is taking advantage of the increasing engagement and cooperation with the MSFD process and Copernicus services. Phase IV marks a major step in the implementation of the activities, given the adoption of EMODnet Chemistry as the European data platform in support of the assessment of Descriptor 10 (Marine Litter), thus increasing confidence, and having achieved acceptance in the databases, and in the derived data products and data services by the MSFD community, including EU services, Regional Sea Conventions, and Member States.

EMODnet Chemistry Phase IV advanced on the following activities:

- **Consolidation** of the process to create regional standardised, harmonized, validated data collections for all European seas, harvesting from the data sets gathered and managed in the EMODnet Chemistry CDI service and the European databases for beach respectively seafloor litter. Eutrophication and Ocean Acidification, Contaminants, Beach and Seafloor Litter were completed with floating Micro-litter, showing a rather extended coverage;
- **Expansion** of the number of data sets in the EMODnet Chemistry CDI service from circa 1.000.000 to 1.127.111 CDI entries of which currently circa 900.000 in the European seas, whereby major activities have taken place for checking and improving the quality of the metadata and data, both for syntax as for content. The metadata have been expanded with additional fields, updated by the network of EMODnet Chemistry partners and, where possible, derived automatically from linked directories. The aim is making data more fit for MSFD and CMEMS communities (see customisation below).
- **Expansion** of the pan-European marine litter databases for beach litter, for seafloor litter and for floating micro-litter. In total, they contain data on 9726 beach surveys, 6304 seafloor trawls and 352 floating micro-litter surveys, and 32 surveys of micro-litter in sediments. Beach litter data collection was undertaken in cooperation with Member States contributing with MSFD official monitoring data. **Consolidation** of the online tools for beach litter and seafloor litter data formatting, to the unified data model, and data validation.

- **Customisation** of EMODnet Chemistry portal, to improve users' friendliness, in particular on its viewing and downloading functionalities. A simplified layout, giving direct access to the data services, and new contents were implemented increasing the focus on data and data products for the three chemical themes. This includes regular updating of the portal content and posting of latest news and events, presenting marine litter, contaminants, ocean acidification and eutrophication in dedicated sections, extension of CDI interface to allow additional search criteria, extension in data and metadata format to show information requested by EEA and Copernicus (as data quality, instrument, and platform information).
- **Innovation** of the user interface with the development of a new service to facilitate exploring, sub-setting, visualizing, and extracting data sets in multiple formats from the harmonized, standardized, validated data collections that EMODnet Chemistry is regularly producing and publishing for all European sea basins for eutrophication and contaminants. For this new service an adaptation is being made of the **webODV service** as developed in the EU SeaDataCloud project. The source code is available on GitHub.

During Phase IV, EMODnet Chemistry consolidated several important milestones, improving EMODnet Chemistry visibility and consideration:

- **EEA** followed-up on the use of EMODnet Chemistry data for its three indicators (i.e. 'Hazardous substances in marine organisms', 'Nutrients in TCM waters' and 'Chlorophyll in TCM waters') and started an extensive use of marine litter data. This confirmed EMODnet Chemistry as a source of qualified data and updated information, complementing OSPAR and HELCOM data available at ICES, and representing an alternative data resource for the Mediterranean Sea and Black Sea.
- **UNEP-MAP** started to use EMODnet Chemistry data (on Eutrophication and Contaminants) as a reliable external data source, to complement data available in IMAP Pilot Info System and MEDPOL Database in order to prepare the Mediterranean Quality Status Report 2023 (UNEP/MED WG.492/12).
- **MSFD TG-ML** endorsed EMODnet Chemistry marine litter database system for gathering beach litter data on a European scale, looking forward to micro-litter. As main results:
  - A subset of the EMODnet Chemistry pan-European Marine Litter database including the official monitoring data on beach litter 2012-2016 has been used to compute both the EU Marine Litter quantitative Baselines and Threshold values,
  - EMODnet updated the collection of monitoring data by all EU Member States covering 2016 to 2020,
  - the approach used for beach litter has been extended to marine micro – litter. Starting with the overview of available data in surface water, sediment and biota, the extensive collection of floating micro-litter from all MS was undertaken, involving the related EMODnet national data centres.
- EMODnet Chemistry implemented its close cooperation with **Copernicus** by sharing oxygen, chlorophyll-a, and nutrients aggregated, validated, and harmonized data collections and validation methods. EMODnet-Chemistry oxygen data product was used to generate the new version of the CMEMS-INSTAC REP-BGC (O<sub>2</sub> dataset) product, to be delivered in December 2021.

# 1. Introduction

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*[Provide a short (max 2 pages) introduction to set the stage (start date, main goals, background, consortium, key components and characteristics of the lot). Max 2 pages.]*

EMODnet Chemistry IV contract first objective is to expand and further improve the products and services developed in the previous phases, working towards interoperability with services developed by other thematic groups and with the INSPIRE Directive, and being open to receive data provided through EMODnet data ingestion facility. The approach is focused on seeking engagement with and direct involvement of the Regional Sea Conventions (RSCs) and Marine Strategy Framework Directive (MSFD) experts, customised following the mandate to contribute to MSFD implementation.

EMODnet Chemistry Phase IV requires developing and maintaining:

- a common method of access to data held in repositories,
- products constructed from one or more data sources that provide users with information about the distribution of parameters in time and space,
- procedures for machine-to-machine connections to data and data products,
- a web portal allowing users to find, visualise and download data,
- coherence with efforts of Regional Sea Conventions,
- interoperability with data distributed by non-EU organisations,
- a process to monitor performance and deal with user feedback,
- a help desk offering support to users.

EMODnet Chemistry Phase IV consortium brings together **13 partners** and **3 subcontractors** from **11 countries** along European seas, mostly national marine monitoring agencies and major marine research institutes. The partners combine long-standing expertise and experiences of collecting, processing, quality controlling and managing marine chemistry data and data products together with expertise in distributed data infrastructure development and operation, provision of discovery, access and viewing services following INSPIRE implementation rules and international standards (ISO, OGC). Furthermore, the consortium mobilised a group of **28 institutes** willing to provide support to the initiative, to give advice on planned activities and to contribute with chemical observation data sets. For this reason, it was decided to set up an open **Advisory Forum** that combines a wealth of national and regional expertise and knowledge about the chemistry data and their possible use for contributing to GES indicators and the MSFD implementation.

EMODnet Chemistry makes available measurements of concentrations of chemical parameters in seawater, sediment, and biota, particularly those relevant to the Marine Strategy Framework Directive or to global climate change as identified in the following:

- pesticides and biocides (such as DDT, HCB)
- antifoulants (such as TBT, TPT)
- pharmaceuticals (such as oxytetracycline)
- heavy metals (such as mercury, cadmium, lead)
- hydrocarbons (such as anthracene, fluoranthene)

- radionuclides (such as  $^{137}\text{Cs}$ ,  $^{239}\text{Pu}$ )
- fertilisers (such as nitrogen (DIN, TN), phosphorus (DIP, TP))
- organic matter e.g. from sewers or mariculture (such as total carbon (TOC))
- chlorophyll
- silicates
- partial pressures of dissolved gases (such as oxygen, carbon dioxide)
- acidity (from pH,  $\text{pCO}_2$ , Total Inorganic Carbon, alkalinity)
- marine litter (collected on beaches, in fishermen's nets, or in specific surveys). This shall include macro-objects (nets, bottles etc.) as well as fragments and microparticles, mainly plastic, in the water column, sediments and beaches
- nutrient loads (nitrogen and phosphorus) to regional seas by major rivers

The geographical scope covers metadata, data, and data products over:

- 1)** Water column and seabed for the complete coverage of the Baltic, Barents, Black, Mediterranean, and North Seas, for the coverage of jurisdictional waters (including continental shelf and claimed extended continental shelf) of Member States and Norway for the North-East Atlantic (Celtic Seas, Iberian Coast and Bay of Biscay, Macaronesia and Norwegian Sea);
- 2)** Coastline for EU Member States plus Norway and all Baltic countries.

High resolution digital map layers of chemicals concentration on beaches (in the case of litter), in the open water, sediments and on the coast allowing users to analyse changes over time and space, including higher resolution efforts at selected river mouths are produced.

All data, metadata and data products can be found, viewed, and downloaded free of charge and free of restrictions of use through EMODnet Chemistry web portal, synchronised in its products catalogue with the Central Portal.

## 2. Update on the Tasks

*[Please make sure that progress in each of the **tasks specified in the relevant Tender Specifications** since the start of the project phase (provide the date) is listed. For those tasks not experiencing progress, please provide an explanation. Max 2 pages.]*

The progress in each task detailed in the Tender Specifications under Section 1.4.1 in this project phase (from 3<sup>rd</sup> October 2019 to 2<sup>nd</sup> October 2021) is listed below:

### **Task 1: Develop a common method of access to data held in repositories:**

- EMODnet Chemistry gathers measurement datasets on seawater quality from many data sources and makes them findable, accessible, interoperable, and reusable. This is achieved by making use of the SeaDataNet Common Data Index (CDI) data discovery and access service. During the two years of the contract, the number of data sets in the EMODnet Chemistry CDI service has increased from circa 1.000.000 to 1.1271.111 CDI entries of which currently circa 970.000 in the European seas. Also, major activities have taken place for checking and improving the quality of the metadata and data, both for syntax as for content. The CDI service allows users to browse data sets in more detail, to narrow down their query and to download a selection of data sets.

In addition, marine litter data for beach litter and seafloor litter, also coming from different sources, are managed in two central databases, involving considerable efforts for validation, classification, and metadata documenting. In consultation with relevant EU stakeholders (EC-JRC, TG-ML, RSCs, etc.), a proposal was finalised and published for expanding the marine litter data management portfolio of EMODnet Chemistry with Floating Marine Macro Litter. This expansion underpins the increasing role of EMODnet Chemistry as European data management hub for many kinds of marine litter data, which is accepted by the MSFD community of EU services, Regional Sea Conventions, and Member States. At the end of the contract, the Marine Litter databases contain data on 9726 beach surveys, 6704 seafloor trawls and 352 floating micro-litter surveys, and 32 surveys of micro-litter in sediment.

### **Task 2: Construct products from one or more data sources that provide users with information about the distribution of parameters in time and space:**

- Measurement data are harmonized, standardized, validated, and made available as regional and global data collections for eutrophication (nutrients, chlorophyll, and oxygen) and ocean acidification (alkalinity and pH) in seawater, for contaminants in seawater, biota and sediment and for marine litter in seawater and sediment.

Map products are computed and published for 5 eutrophication variables: Dissolved inorganic nitrogen (DIN), Phosphate, Silicate, Chlorophyll - a, and Dissolved oxygen concentration. Maps concern pan-European climatological maps created over all data with monthly basis, 6-year analyses interpolated on a regular grid at basin scale, while high resolution analyses are performed on selected coastal areas. Spatial distributions of sampling stations for ten selected contaminant substances show data below and above Limit of Quantification (LOQ), data with LOQ above or below 30 percent of EQSD threshold values, and sampled matrix. Updated maps for beach litter and seafloor litter at measurement points were also made available.

### **Task 3: Develop procedures for machine-to-machine connections to data and data products:**

- Machine-to-machine connections to data and data products are upgraded following the [Technical Guidance for the implementation of INSPIRE View Services](#). EMODnet Chemistry product catalogue provides INSPIRE metadata fields, including a data URL and a metadata URL and this metadata description links users to OGC services available on the product, as WMS and WFS services. There is an OGC CSW service for the products catalogue itself. EMODnet Chemistry data sets are publicly



discovered and accessed through the CDI Data Discovery & Access service, that has a versatile user interface, is INSPIRE compliant, and an API is under development as part of ENVRI-FAIR and Blue-Cloud projects.

**Task 4: Maintain and further develop a thematic web portal allowing users to find, visualise and download data and promote the data and data products of the portal:**

- The EMODnet Chemistry portal has been reviewed and restyled following the observations received from the EU DG MARE and the EMODnet Secretariat. For instance, the section ABOUT is completely rewritten and is continuously updated with new Guidelines, Reports and documents from Project Meetings. The section DATA ACCESS provides quick and easy access to the new harmonized and validated data collections, while measurement data, as delivered by the data providers, are made available through the CDI Data Discovery and Access service. The section DATA PRODUCTS, enriched with clear descriptions of all available results, allows the user to browse, visualise and download data products. In the second contract year, the new webODV Data Explorer and Extractor service was successfully configured and deployed. It provides a low threshold for MSFD users and research community to browse, to visualise, and to make subsets in different export formats of the data collections and prepare graphics, like ocean sections of specific parameters. These can include interpolations using the integrated DIVA tool. The thematic hexagons 'Eutrophication', 'Ocean acidification', 'Contaminants' and 'Marine litter' have been rewritten with clear descriptions of the new data products. In the case of marine litter, it links to a set of data management tools used to format (from a syntactic and semantic point of view) and validate beach and seafloor litter data. News and events, Posters and Presentations are continuously updated and distributed with all promotion materials, including the new video **EMODnet Chemistry, a value for marine strategies**.

**Task 5: Ensure the involvement of Regional Sea Conventions:**

- Dialogue with four Regional Sea Conventions has been maintained through participation in the MSFD Technical Groups (on Contaminants and Marine Litter), where a regular dialogue is established, and through the MSFD Board of experts, consulted prior to the release of new products. During the contract, **3 meetings with the board of experts of MSFD** were organised: the first one on Marine litter maps; the second one on Eutrophication maps; the third one on Contaminant maps. Thanks to the high quality of data collections and the increased knowledge of EMODnet from the experts, the maps were well received and discussed in a constructive way. The meetings demonstrate a significant increase of cooperation and trust for mutual benefits. In addition, EMODnet Chemistry was invited to several meetings of the Ecosystem Approach Correspondence Group on Pollution Monitoring and of MED POL Focal Points, organized by UNEP-MAP to illustrate its possible contribution to Med QSR 2023. More information on the meetings is available on the EMODnet Chemistry Portal.

**Task 6: Install a process to monitor performance and deal with user feedback:**

- Procedures are up and running. COVID-19 emergency did not affect the functionality. The new web service developed by OGS has collected download metrics for the map viewer, DOI landing pages, the data products catalogue and webODV Data Explorer and Extractor. Unfortunately, user activities are not recorded for EMODnet Chemistry products described and made available through the Central Portal.

**Task 7: Operate a help desk offering support to users:**

- The helpdesk is kept operational in the reporting period. COVID-19 emergency did not affect the functionality. All support requests received via the Help desk are listed in Section 6.

### 3. Work Package updates

*[Provide in the table a list of all Milestones and Deliverables as from the technical workplan, the date due and status. Then, using the Work Package as a header, list the activities that occurred since the start of the project phase. When describing each Work Package, please also refer to the corresponding Tender task(s) (specified in the relevant Tender Specifications). Max 2 pages per work package.]*

All Milestones and Deliverables listed in the work plan were delivered within the contract duration. Any reason for delayed delivery was described in the quarterly reports and was resolved within the contract phase.

To make the execution of the contract easier and more effective, a Work Plan is implemented that groups Tender task(s) under the Work Packages (WP):

WP No.	Work Package Title	Covering tasks
WP1	Project Management	Task 8: Coordination
WP2	Data access	Task 1: Develop a common method of access to data held in repositories
WP3	Generation of data products, including collections	Task 2: Construct products from one or more data sources that provide users with information about the distribution of parameters in time and space
WP4	Technical development and operation of portal, services and tools	Task 3: Develop procedures for machine-to-machine connections to data and data products Task 4: Maintain and further develop a thematic web portal Task 6: Install a process to monitor performance and deal with user feedback
WP5	MSFD, Regional and European uptake and interaction	Task 5: Ensure the involvement of regional sea conventions Task 7: Operate a help desk offering support to users
WP6	Outreach and promotion	Task 6: Monitor performance and deal with user feedback Task 9: Promotion and dissemination

Details on the WP activities and tasks are presented below.

## WP1 – Project Management (OGS)

The project management and the coordination of EMODnet Chemistry consortium aims at ensuring timely delivery of outcomes, setting up remedial plans in case of delayed activities, and high quality of documentation, tools, and any other result. To this end, the project management group, supported by the Project Office for daily stewardship, organizes internal and external meetings, and publishes the outputs on the Portal, which is also used to promote the multiple activities related to the project. The project management includes the collaboration with the other EMODnet thematic portals, with the Central portal group and larger EMODnet organisation. Lastly, this WP is committed to the overall legal, financial, administrative, contractual management.

To keep communication, the Project Office defined several new mailing lists:

- [info@emodnet-chemistry.eu](mailto:info@emodnet-chemistry.eu)
- [partners@emodnet-chemistry.eu](mailto:partners@emodnet-chemistry.eu)
- [subcontractors@emodnet-chemistry.eu](mailto:subcontractors@emodnet-chemistry.eu)
- [advisory@emodnet-chemistry.eu](mailto:advisory@emodnet-chemistry.eu) (open Advisory Forum)
- [all@emodnet-chemistry.eu](mailto:all@emodnet-chemistry.eu) (merging the three lists' partners + subcontractors + advisory)
- [board-msfd@emodnet-chemistry.eu](mailto:board-msfd@emodnet-chemistry.eu) (board of MSFD experts)

As soon as the positive evaluation of the procurement procedure was received on 30/07/2019, the coordination activity started. The contract was counter-signed on 03/10/2019 marking the official start of the contract. The Consortium Agreement (CA) was finalised on 11/11/2019 and is on the Extranet since 19/2/2020 as well as the three bilateral Subcontracts. In addition, an official agreement was countersigned by the members of the Advisory Forum.

The 1st Steering Committee meeting, foreseen for month 1, was held in Rome (Italy) on 29-30/10/2019. As communicated to DG MARE/EASME in the quarterly report, the first Full Group meeting (originally planned for M6=March 2020) was shifted to 21-25/9/2020 (M12) to have it back-to-back with the EMODnet Jamboree. Instead, a Steering Committee meeting was organised in Trieste in M6. Due to COVID-19 pandemic, the March 2020 (M6) Steering Committee meeting was organised online back-to-back with the first Technical Group Meeting. The first Full Group meeting was rescheduled as a series of regional meetings, in June 2020, to motivate data providers for their essential role in EMODnet Chemistry and inform them on feedback from Regional Leaders after the data harvesting.

Other two Full Group meetings were held on 2 February and 17 June 2021; the latter organized back-to-back with the EMODnet Conference, and it was followed, in the afternoon, by a Steering Committee meeting.

From October 2020 to February 2021, remote meetings with the six Regional Leaders were held on a monthly basis to coordinate the first and second data harvest.

From April to July 2020 and from February to May 2021, monthly remote meetings with Regional Leaders were held to smooth the production of eutrophication and contaminant maps.

The first meeting between CMEMS and EMODnet Chemistry (following the MoU signed on June 2019) was organised in Brussels on 12-13/2/2020, to work on a common methodology for processing oxygen and chlorophyll data sets, and to formulate metadata richness as required by CMEMS. In January 2021, EMODnet participated in the Copernicus General Assembly.

From December 2020 to June 2021 the project management group took part in regular meetings with Mercator Ocean International to set out the first MSFD-targeted joint portfolio of CMEMS and EMODnet data products. The document was released in June 2021.

Since October 2020, several meetings were organized to discuss development of the webODV Explorer and Extractor tool, technical expansion to include contaminants, the promotion video, and its launch.

Since February 2021, the project management group has participated in weekly meetings to produce the promotion movie released in June 2021.

Formal and informal online meetings with experts (e.g. in pollutants, vocabularies and formats, APIs, Marine Strategy Framework Directive, Regional Sea Conventions, etc.) were regularly organized to improve data quality and accessibility according to end-users' feedback. Furthermore, these meetings aimed at discussing the management of different kinds of data and developing further data products also through new interactions at EU and global level.

On 31 May 2021, a webinar on micro-litter data management was organized for all the EMODnet Chemistry network. This information was also shared with representatives of the Member States and the MSFD TG ML during a webinar held on 27 May 2021.

The coordinator and the technical coordinator actively engaged in EMODnet Steering Committee meetings, to Technical Working Groups meetings, to Communication meetings and to bilateral ad hoc meetings organised by the Secretariat upon need. They participated in the MSFD Technical Group on Marine Litter (TG ML) and on Contaminants (D8 and D9).

Quarterly progress reports were regularly submitted by email and approved by EU EASME.

## **WP2 – Data access, including marine litter (MARIS)**

EMODnet Chemistry makes use of a large pan-European network of data centres from marine research institutes and governmental monitoring agencies for gathering measurement datasets on seawater quality from many data sources and making these findable, accessible, interoperable and reusable (FAIR). This is achieved by making use of the SeaDataNet Common Data Index (CDI) data discovery and access service. From the start of the new EMODnet Chemistry IV contract, all data providers were encouraged by MARIS as WP2 leader to be active in checking the formats of existing CDI - data sets using the SeaDataNet OCTOPUS software and to give a follow up to issues as identified earlier by Regional Leaders and the overall SeaDataNet checks for existing CDI - data sets.

Moreover, all data providers were encouraged and supported during the project to proceed with new data submissions and thereby to make use of the latest SeaDataNet tools, MIKADO for CDI metadata entries, NEMO for converting local data files to ODV formats, Vocabularies for mapping local terms to common terms, OCTOPUS for checking formats of data files before submission, and to install and configure the latest version of the new Replication Manager for arranging automatic connectivity between Data Centres and the CDI service.

In addition, following requests from EEA and Copernicus CMEMS for additional metadata, a plan was made for enriching the CDI metadata with fields for PlatformCode (L06), and Shipcode (C17), where applicable, using the relation with the Cruise Summary Reports (CSR) directory, for Type of Project (monitoring versus research), using the relation with the Projects (EDMERP) directory, and for various regional codes. The latter concern region codes for OSPAR, HELCOM, and MSDFD areas, which can be derived automatically by means of the given coordinates in the CDI records. Moreover, local water depths for CDIs for point data with empty values fields could be derived automatically, using the REST service from the EMODnet

Bathymetry DTM service, although within the European limits of the EMODnet DTM. Finally, measures were taken for improving the coherence between the P01 parameters as used in the ODV data files and the P02 parameter groups as used in the CDIs. The P01s, in particular those with measurement values, can be extracted from the ODV files in the new central data cache and from internal buffers with restricted data sets (see WP4 for more information) and then used for establishing the correct P02s in the CDIs following the P01-P02 thesaurus relations. These enrichments are now done automatically during the import of new and updated CDIs. However, all data providers were informed and requested to add, where possible and applicable, relations to Cruise Summary Reports (CSR) and Projects (EDMERP) and where needed to populate first extra entries to those SeaDataNet directories too. Moreover, data providers were asked to complete as much as possible the existing CDI field on instruments with terms from the L05 Vocabulary as well detailed information on QA-QC procedures and methodologies that had been applied on the samples for deriving the parameters (P01) and their values. Finally, data providers were asked to reconsider their possible data restrictions and to strive for more open data, where possible and in dialogue with their data originators and institutes.

Two guidance manuals 'EMODnet Phase IV - How to include information in the CDIs – guidelines' and 'EMODnet Phase IV - Updated guidelines for SeaDataNet ODV production' were produced and published at the EMODNet Chemistry portal, while MARIS set-up the automatic procedures as part of the CDI – data import process, and IFREMER made several upgrades to the MIKADO and OCTOPUS software.

In addition, a series of meetings were organised between the Regional Leaders (RLs) and the data providers for the relevant regions, to discuss the findings of RCs in harvested data collections, to discuss the required corrections and to refine their data population activities.

Over the whole contract period of two years, the number of data sets in the EMODnet Chemistry CDI service has increased from circa 1.000.000 to 1.127.111 CDI entries of which currently circa 970.000 in the European seas. That is a considerable increase of nearly 12%, while also the overall quality of the metadata and data has considerably been improved, both for syntax as for content.

In order to collect marine litter data from relevant EMODnet Chemistry consortium members and others, the earlier Guidelines and Forms for gathering beach litter (nets, bottles etc) and seafloor litter (i.e. litter collected by fish trawl surveys) were upgraded and published at the EMODnet Chemistry portal. This concerns the 'Seafloor data format template' and 'Beach data format template' which were published at the start of the new contract, and which were promoted to potential data providers within the EMODnet Chemistry consortium, but also to the members of TG-ML and beyond. Later on, additional guidelines and formats were formulated and published such as: a) Micro-litter data format template; b) Guidelines for gathering Micro-litter datasets; c) Guidelines and forms for gathering marine litter data; d) Proposal for Floating Marine Macro litter data management at European level. Most recently, a proposal was finalised and published for expanding the Marine Litter data management portfolio of EMODnet Chemistry with Seafloor litter images and videos. These forms and guidelines were developed and published in cooperation with the TG-ML, since the TG-ML and DG Environment have adopted EMODnet Chemistry as the European facility for gathering and compiling databases for Marine Litter. For that purpose, there is also an intense cooperation between OGS as manager and validator of the ML databases and EC-JRC as co-chair of TG-ML. This gives great support for gathering ML submissions from Member States and other sources, coordinated through TG-ML. Considerable efforts are required and have been spent in both contract years for validation, classification, and metadata documenting of the incoming ML submissions. OGS also makes CDI entries for all accepted submissions. This way, users can browse data sets in more detail, narrow down their query and download a selection of data sets. At the end of the contract, the central Marine Litter databases at OGS contain data on 9726 beach surveys, 6704 seafloor trawls, 352 floating micro-litter surveys, and 32 surveys of micro-litter in sediment. OGS is exploring options for also

handling other types of ML data. In that framework, a new data management proposal for handling seafloor litter images and videos has been produced and is under revision for taking into production.

## WP3 – Generation of data products, including collections (AU-DCE, SMHI, IMR, IFREMER, HCMR, NIMRD)

After consultation with EEA, the scheduling of WP3 was slightly revised, planning to close the first (interim) data harvesting at the end of November 2019 (M2) and shifting the consolidated project output to November 2020 (M12). In this way, data providers were not able to give their contribution to improve the first harvest but would contribute to the second harvest. In practice, the first harvests were made by MARIS from the CDI service in January – February 2020 for eutrophication and in May 2020 for contaminants and handed over to the six Regional Leaders who were engaged to generate harmonised, aggregated, and validated data collections for eutrophication and contaminants. As a result, EMODnet Chemistry released to EEA the aggregated and validated collection for eutrophication and contaminants at the end of June 2020 and July 2020 respectively

Following the activities by Regional Leaders, new updated aggregated data collections were released in March 2021 for all groups of parameters covering eutrophication, contaminants, and marine litter. Each regional collection for eutrophication and contaminants covers one of the following sea regions: Arctic Ocean, Baltic Sea, Greater North Sea, North East Atlantic Ocean, Mediterranean Sea, and Black Sea.

The types of data available are:

1. Vertical profiles for data that have been collected roughly at the same time and location for several consecutive vertical depths
2. Time series for data collected at the same location and depth but repeated in time.

For eutrophication the time series are from the water column, whilst for contaminants they come from three different matrices: water, sediment and biota.

The table below reports in numbers the work coordinated by the Regional leaders in strict cooperation with the data originators to generate the whole collections (restricted and unrestricted).

### DATA COLLECTIONS FOR EUTROPHICATION

Sea region	EMODnet partners (Tot. N.)	Originators (Tot. N.)	Countries (Tot. N.)	Time series (Tot. Stations)	Vertical profiles (Tot. Stations)
Arctic Ocean	8	42	6	NONE	115,672
Baltic Sea	12	40	9	56	178,268
NE Atlantic	13	104	15	554	389,985
Greater North Sea	12	67	12	3312	568 731
Black Sea	21	38	7	NONE	70,972
Mediterranean Sea	24	97	18	10,885	230,251

### DATA COLLECTIONS FOR CONTAMINANTS

Sea region	EMODnet partners (Tot. N.)	Originators (Tot. N.)	Countries (Tot. N.)	Time series (Tot. Stations)	Vertical profiles (Tot. Stations)
Arctic Ocean	5	13	3	NONE	1558
Baltic Sea	11	24	10	524	4,860
NE Atlantic	8	21	9	531	2,684
Greater North Sea	22	88	16	932	15,927
Black Sea	13	21	7	NONE	32,134
Mediterranean Sea	17	40	14	6,443	6,740



The table below reports the DOIs of the unrestricted collections published on the Data Product Catalogue.

<b>Contaminants aggregated datasets v2021</b>	
Arctic Ocean	<a href="https://doi.org/10.6092/BZ0Y-NA72">https://doi.org/10.6092/BZ0Y-NA72</a>
Baltic Sea	<a href="https://doi.org/10.6092/28Y3-TH08">https://doi.org/10.6092/28Y3-TH08</a>
NE Atlantic	<a href="https://doi.org/10.6092/BYAC-H177">https://doi.org/10.6092/BYAC-H177</a>
Greater North Sea	<a href="https://doi.org/10.6092/42T8-ZY38">https://doi.org/10.6092/42T8-ZY38</a>
Black Sea	<a href="https://doi.org/10.6092/JBGE-HY83">https://doi.org/10.6092/JBGE-HY83</a>
Mediterranean Sea	<a href="https://doi.org/10.6092/VYVD-OG91">https://doi.org/10.6092/VYVD-OG91</a>
<b>Eutrophication and Acidity aggregated datasets v2021</b>	
Arctic Ocean	<a href="https://doi.org/10.6092/XE56-Z804">https://doi.org/10.6092/XE56-Z804</a>
Baltic Sea	<a href="https://doi.org/10.6092/W67J-4P80">https://doi.org/10.6092/W67J-4P80</a>
NE Atlantic	<a href="https://doi.org/10.6092/HMH8-X461">https://doi.org/10.6092/HMH8-X461</a>
Greater North Sea	<a href="https://doi.org/10.6092/64H8-3Q06">https://doi.org/10.6092/64H8-3Q06</a>
Black Sea	<a href="https://doi.org/10.6092/E9JP-RA41">https://doi.org/10.6092/E9JP-RA41</a>
Mediterranean Sea	<a href="https://doi.org/10.6092/EP6N-TP63">https://doi.org/10.6092/EP6N-TP63</a>

The data collections for eutrophication provide information on nutrients, chlorophyll and oxygen; whilst the collections for contaminants concern the following group of variables: antifoulants, hydrocarbons, heavy metals, polychlorinated biphenyls, pesticides and biocides, radionuclides.

Data were aggregated, harmonised and validated as synthetically described hereafter:

1. EMODnet Chemistry brings together and harmonises a large amount of in-situ observations, both from 66 monitoring agencies and scientific institutes, namely the Originators.
2. Data entering EMODnet Chemistry are managed by a network of 48 data centers (scientific institutes & data management experts) from 32 countries and 5 International organizations (the International Council for the Exploration of the Sea and the Regional Sea Conventions) following the same standard protocols developed in the framework of the European SeaDataNet infrastructure and undergoing a validation process.
3. An automatic Robot Harvester is adopted to retrieve specific datasets from the distributed network of data centers (DCs) to obtain data collections per sea region. DCs manage the data gathering from the multiple organizations that originate datasets.
4. Data aggregation, harmonization and validation are led by regional experts, following methodology agreed with the wider international community.

All details are reported in the documents:

Quality Control steps for EMODnet Chemistry Eutrophication aggregated datasets - v2021

Quality Control steps and dataset formats for EMODnet Chemistry Contaminant aggregated datasets

Concerning the collection of marine litter on a European scale, quality control and harmonization of data, performed during the first quarter of the first year, revealed several errors in both beach and seafloor litter as delivered by OSPAR (MCS) and ICES (DATRAS). Therefore, the providers undertook a major revision of the data that required to remove the entire delivery and to correct inconsistencies. In September 2020 and October 2020 OSPAR and ICES released the corrected datasets, complementing beach litter data from

2016 to 2020 submitted by EU Member States (as part of the EC-JRC data call), and marine litter and micro-litter harvested by EMODnet Chemistry network. This activity was undertaken in synergy with MSFD TG ML as part of the MSFD monitoring data collection. At the start of the second year, the coverage was extended to include marine micro-litter originating from official monitoring data on beaches, in surface water, water column, sediment and biota.

Concerning the global beach litter data collections, they are loaded in a central database after a semi-automated validation phase. Once loaded, a data assessment is performed in order to check data consistency and potential errors are corrected thanks to a feedback loop with data originators.

The harmonized datasets include 12390 CDI records, in which 11152 refer to monitoring data, 1208 to data from cleaning surveys and 29 to data from research. A relevant part of the monitoring data has been considered for assessment purposes by the European institutions and therefore is tagged as 'MSFD\_monitoring'.

Data are formatted following guidelines and forms for gathering marine litter data, which are regularly revised and updated. Some of them are reported below; the full list is available in the Guidelines section of the EMODnet Chemistry Portal:

1. Marine litter data flow
2. Guidelines and forms for gathering marine litter data: beach and seafloor trawling. Version 6
3. Guidelines and formats for gathering and management of micro-litter data sets on a European scale (floating and sediment micro-litter). Version 0.2
4. Seafloor data format template

The new data collections have been used as input for preparing new maps.

Concerning Eutrophication, different climatologies, spatially interpolated concentration maps, have been produced with the DIVAnd (Data-Interpolating Variational Analysis in n dimensions) software. The maps display the depth-time variability of Dissolved inorganic nitrogen (DIN), Phosphate, Silicate, Chlorophyll, and Dissolved oxygen concentration.

In particular, Map viewer service allows users to visualize three main typologies of products, that are characterized by different spatial and temporal resolutions:

1. Monthly climatologies for all European Seas combining data ranging from 1960 to 2020;
2. Seasonal climatologies by sea region built as 6-years running averages covering the time period from 1997 to 2017,
3. Seasonal climatologies of specific coastal areas that combine data ranging from 1980-90 to 2018-19, depending on the area. Currently the maps of the Gulf of Riga (Baltic Sea), Danube Delta (Black Sea) and Po river (Mediterranean Sea) are available.

Horizontal sections of the 4-dimensional fields (longitude, latitude, depth and time) can be visualized at a selected depth and time. The climatological fields can also be interpolated and visualized on arbitrary vertical sections. An animation of the evolution over time of the parameters is also available. All data products are also accessible through the Catalogue Service where users can also retrieve the full set of metadata, originators and distributors.

All details on the climatologies are reported in the document [EMODnet Chemistry Regional climatologies produced with Data Interpolating Variational Analysis \(DIVA\). Release 2021](#)



Spatial distributions of sampling stations for ten selected contaminant substances visualize data below and above Limit of Quantification (LOQ), data with LOQ above or below 30 percent of EQSD threshold values, and sampled matrix.

Concerning marine litter, updated maps for beach litter and seafloor litter at measurement points were also made available in June and August 2021. The EMODnet Marine Litter Visualization Products have been designed to consistently represent data within the limits of compatibility of the data sampling methodologies. During the period the guidelines [EMODnet Visualization products for Sea Floor Litter data](#) were published. This document describes the data management and computation methods used to produce the EMODnet Chemistry seafloor litter visualization products.

All data products were tuned based on feedback received from the meetings with the board of experts of MSFD. All data products were mapped to BODC vocabularies for offering better search filters in the data products catalogue: Matrix Categories - L04 and Themes - P36. All new data products have been published using the services as provided at the EMODnet Chemistry portal and described in more detail in WP4 below.

## WP4 – Technical development and operation of portal, services and tools (MARIS, ULg, AWI)

In February 2020 DG MARE and Secretariat requested for improvement of the website and easier access to data and data products. As part of this reshuffling, it was decided to place the CDI Data Discovery and Access service somewhat at a lower place, giving more focus to the data products, including the validated data collections per MSFD region, and to the four topics 'eutrophication, acidification, contaminants, and marine litter'. Furthermore, developments were initiated for a Data Collection discovery and extractor service, adopting and adapting from the WebODV development of AWI in the SeaDataCloud project (see more details in Annex).

### Upgrading of CDI Data Discovery and Access service:

Since November 2019, EMODnet Chemistry has been using the upgraded SeaDataNet CDI service, developed under the EU H2020 SeaDataCloud project. Details of the architecture of the upgraded CDI service are provided in the Annex.

The CDI user interface for EMODnet Chemistry is regularly updated and includes criteria for searching on matrix (water column, sediment, biota), chemistry substances (P36 vocabulary with terms such as 'heavy metals', 'fertilisers', 'Pesticides and biocides', and others), ICES areas, HELCOM areas, OSPAR areas, and MSFD regions. The latest version of **MSFD regions boundaries** is used for tagging all CDI entries and for filtering the relevant data collections.

### INSPIRE WMS-WFS services:

Upon request of the EMODnet Secretariat a number of activities were undertaken for the OGC services of EMODnet Chemistry to make them INSPIRE compliant, i.e. by including metadata for data URLs and metadata URLs for each map layer of the multiple WMS servers.

EMODnet Chemistry metadata and product services are now fully compliant with the current INSPIRE requirements. In the end of 2020, EMODnet Chemistry, as a member of the Marine Strategy Framework Directive (MSFD) Common Implementation Strategy (CIS) Technical Group on Marine Data (TG DATA), presented the progress with developing an INSPIRE Transformation service for SeaDataNet – EMODnet Chemistry as part of the CDI Data Discovery & Access service.

### Web forms harmonisation:

There are several ways for downloading products, namely directly from the new products matrix, Product catalogue, and Map Viewer. The web order forms were harmonised and all support handling registered users via Marine-ID or free text with mandatory email address.

### Marine Litter database system and products generation and publishing:

Currently, EMODnet Chemistry has procedures and protocols for gathering and processing of three types of Marine Litter, namely beach litter, seafloor litter from trawling, and micro litter (floating and in sediment). For formats, classifications, and gathering procedures, cooperation and tuning took place with TG-ML and EC-JRC. For the first two ML types, two central databases have been set-up at OGS, while for floating micro litter use is made of CDI and adapted ODV formats. For access, use is made of the CDI service for all three ML types, whereby OGS generates the CDIs from the two central databases, acknowledging the data curators in the CDI metadata. While, in addition mapping products are generated and published as map layers.

- For **Beach Litter** there was no structured QC loop towards data providers as already in place for other kinds of data, such as eutrophication and contaminants. A strong quality check process has been developed and progressively upgraded by OGS before db ingestion; afterwards CDI and ODV files are made, and populated, and data products are generated. Data products creation is an important post-ingestion quality control step, together with specific queries and GIS geoprocessing. Some of the main quality issues pointed out are: wrong beaches/surveys coordinates (on land), missing EDMOs (originator)/ beach country (excluding MLW), missing EDMERP, and duplicate data received from different collators. This gives delays in data publication, updates and/or deactivation of CDIs which is resources consuming and not meeting project deadlines. To prevent it, the pre-ingestion validation phase was successfully put in place and upgraded to streamline the data management workflow.
- For **Seafloor Litter** there is a comparable situation and process as for Beach Litter. Quality issues concern exists for ICES and DeFishGear data: doubtful/wrong hauls lengths/coordinates/ trawling distance (zero or too long, on land); tracks on land. These give again delays in data publication, updates and/or deactivation of CDIs which are resource consuming and not meeting project deadlines. To overcome it, a pre-ingestion validation phase was successfully implemented to streamline the data management workflow and prevent the ingestion of bad quality data.

Actions were undertaken for solving these issues. Formats were updated, where needed, and QA-QC of beach and seafloor litter input was improved, among others by keeping more contact with data providers, further structuring of the organisation of data gathering and reporting, in cooperation with TG-ML, EC-JRC, and involved data aggregators such as MCS, ICES, MEDITS, UNEP-MAP, and others. And with ICES the procedure for harvesting of Datas Seafloor Litter data was discussed and improved. As part of this process, many initial CDI entries were de-activated and later upgraded with the correct entries.

Most recently, a proposal was finalised and published for expanding the Marine Litter data management portfolio of EMODnet Chemistry with **Floating Marine Macro Litter (FMML)**. Again, this was prepared in cooperation with the TG-ML and EC-JRC. FMML only seems to be relevant for the Mediterranean Sea as OSPAR and HELCOM do not consider FMML as an indicator. Items should be > 2,5 cm. The process towards handling FMML data was started in February 2019 with a EC-JRC - FMML-Workshop where active communities were identified. There were two slightly different reporting forms in use, one for coastal areas (Italian form), and one for open seas (English form). As an outcome of the Workshop, activities were undertaken by OGS, in discussion and cooperation with TG-ML, and EC-JRC, for a new approach, adopting and adapting the CDI and ODV format as done already for Floating Micro Litter. However, the conclusion

of the analysis suggested that it is better to wait for an improvement in the standardisation of the sampling protocols and reporting units

- Another new ML data type are **Seafloor Litter Images and Videos**. These are collected by a few institutes such as IFREMER in its RAMOGE cruise and ISPRA. Interactions were undertaken with JAMSTEC (Japanese environmental agency) who set up a data management system for such data, and Oceanobs'19 community. Additionally, EC-JRC organized a workshop for brainstorming and a research paper ('Seafloor litter quest') was published. There are challenges for setting up such a system, linked to the possible volumes and required bandwidth. OGS made a proposal with a list of relevant metadata and data, but further clarifications are needed before starting the data management.

Marine Litter data are used to produce **Aggregated Collections**: for **beach** respectively **seafloor** litter, in EMODnet Beach litter data format Version 1.0 (spreadsheet file composed of 4 sheets: beach metadata, survey metadata, animals and litter) respectively in EMODnet Sea-floor litter data format Version 1.0 (csv format, tab separated values). These products are included in the EMODnet Chemistry Products catalogue with metadata and DOI. **ML maps** are generated at intervals for beach litter and seafloor litter data collections, and these are published through the Map Viewer while documented in the Products Catalogue. Papers were written and published on this: [https://www.emodnet-chemistry.eu/repository/20210610\\_EMODnet\\_Beach\\_ML\\_Products.pdf](https://www.emodnet-chemistry.eu/repository/20210610_EMODnet_Beach_ML_Products.pdf) and [https://www.emodnet-chemistry.eu/repository/20210823\\_EMODnet\\_Seafloor\\_ML\\_Products.pdf](https://www.emodnet-chemistry.eu/repository/20210823_EMODnet_Seafloor_ML_Products.pdf). Further steps were taken for fully streamlining the process: 1) input data collections are delivered from OGS to IFREMER; 2) IFREMER loads these files into a local GIS for a number of analytics and statistics, resulting in the EMODnet maps; 3) integration in the Map Viewer is done by OGC WMS – WFS, and as Shape files and PNGs for downloading.

### **Streamlining the process for generation and publishing of Contaminants maps:**

Contaminant maps are based on the harmonised contaminants data collections produced by the Regional Leaders. Additional central validation and harmonization is needed between the regional data collections. For instance, new P01 registrations should be moderated to keep more balance in use of P01s and for educating somewhat different data providers. For that purpose, OGS prepared and shared a document with extra instructions to Regional Leaders and OGS cooperated with ISPRA to optimize the input for the maps process. For the latter, ISPRA has designed and deployed a workflow for producing the different contaminant maps after receiving the data collections. For this purpose, ISPRA has set up a GeoDB for loading the data sets and then performing analytical processing for the maps. Also, ISPRA has set up a spatial infrastructure for publishing the resulting maps in WMS, WFS, and sharing as images, for integration into the Map Viewer.

### **Making use of SDC VRE developments for extraction of regional data collections:**

During the second contract year, **webODV Data Explorer and Extractor**, prototyped by AWI as part of the H2020 SeaDataCloud project, was successfully configured and deployed, first with a trial version and later fully operational. It enables users to explore, subset, visualize, and extract data from the EMODnet Chemistry aggregated and validated data collections for eutrophication and contaminants. Expanding the interfaces for handling the contaminants data collections was very challenging due to the complexity of many different contaminants variables and how to make meaningful extractions and graphics. The online webODV service now provides a low threshold for MSFD users and research community to make full use of the EMODnet Chemistry data products, e.g. for use in environmental assessments. WebODV offers scientists easy options for exploring these data collections as a 'treasure box', allowing them to do fundamental science and prepare graphics, like ocean sections of specific parameters. These can include interpolations using the integrated DIVA tool, which adds to making graphics, ready for scientific abstracts and papers.

## WP5 – MSFD, Regional and European uptake and interaction (ICES)

### Helpdesk

The help service consists of a helpdesk and help information published at the portal. The help desk is easily accessible by: a) online contact form, b) email, c) telephone. The online chat was removed as requested by the Secretariat due to privacy constraints. No allowed alternative was found, so we've agreed to remove the chat option. The telephone service operates during European working hours, while e-mails get answered within two working days. All queries are tracked, and a record is kept of all queries received. The helpdesk is operated by OGS. The questions have different grades, like answer immediately, forward to internal experts for answering, and forward to consortium experts for answering.

### Interaction and regular dialogue with MSFD stakeholders

The focus in the first year was on specific discussion and interactions related to quality control of data and data products that have potential for use in the regional sea and MSFD setting. ICES has been active as an intermediary for tuning with OSPAR, HELCOM, and EEA system developments, and OGS has performed a similar function for the EC-JRC (see next section).

At the HELCOM STATE and CONSERVATION meeting (5-9 October 2020) a discussion on the use of Beach litter data for the Baltic holistic assessment (HOLAS III) resulted in the conclusion that HELCOM would support the use of the EMODNET database (EMODnet Chemistry) for HOLAS III in the short term, but agreed to explore the use of the ICES database for the longer term. At the ICES Expert Group meeting on Marine Litter (WGML) which met online in October 2020, there is a draft recommendation that was elaborated after a brainstorming where it was suggested that WGML could liaise with EMODnet Chemistry to perform a quality control check report, with recommendations that EMODnet Chemistry could use to improve the overall quality of micro-plastics data that are made available through the EMODnet portal. This cooperation will be similar in design to the existing model used for the EEA indicators dataflow, where ICES performs QC reports that are fed back to EMODnet Chemistry to increase the quality of eutrophication and hazardous substances dataflows. The follow-up meeting between EMODnet Chemistry and ICES WGML experts is planned for the 25<sup>th</sup> October, 2021.

Within EMODnet Chemistry 4 the dedicated 'Board of MSFD experts' was maintained to give advice on products and to monitor development of thematic products and services from the MSFD perspective, the board membership comprises over 50 thematic experts covering hazardous substances, eutrophication and marine litter, as well as regional sea convention Secretariat officers. Three board sessions dedicated to marine litter, eutrophication and hazardous substances were convened remotely during the project to both inform the Board of new developments, but also to get critical input to improve the products for the MSFD/Regional Sea use cases that the experts envisage. All three sessions were well attended, and the experts were given products to review before the meeting, and also time in the meeting to ask questions. The meetings came in the latter part of EMODnet Chemistry 4, as the data products that we required their input to, were released only after 12 months from the inception of phase 4.

Besides meetings organized within the tender, EMODnet Chemistry was invited to several meetings of the Ecosystem Approach Correspondence Group on Pollution Monitoring of UNEP-MAP, to illustrate its activity and possible contribution to the Mediterranean Quality Status Report 2023. As a result of the interaction, EMODnet Chemistry data are now regarded as a reliable external data source, to complement data available in IMAP Pilot Info System and MEDPOL Database.

**Meeting with the MSFD experts on new contaminant maps: 1 June 2021**

17 participants covering all regions met to understand and discuss the process for producing the datasets used for the contaminants' maps, and a Q and A session on the decisions that were taken that related to the EU MSFD revision of the decision on criteria for Good Environmental Status (2017). This marked a change in approach from the previous phase, and a challenge in ensuring the board of experts understood and could endorse the approach. There were a few discussions concerning the representation of data below the limit of quantification (LOQ), and the use of European environmental quality standards (EQS's) on the maps. The map products have needed some adjustment based on the board of experts' feedback, and the new release is under publication on the website.

Summary information and report [here](#).

**Meeting with MSFD experts on new DIVA maps for Eutrophication: 27 May 2021**

27 participants covering all European regional seas to walk-through the process for producing the datasets used for the eutrophication maps, and a Q and A session on the maps themselves. Overall, the maps were well received, and discussions centred on clarifications, or recollecting previous board meeting dialogues on decisions of how the products should be formulated spatially and temporally. The [new map layers](#) were released a few days after the meeting.

Summary information and report [here](#).

**Meeting with MSFD board of experts on new Marine Litter maps: 30 March 2021**

25 participants covering all European regional seas reviewed data flow activities for marine litter (all segments) and discussed the new versions of data products (map layers). The meeting highlighted a number of challenges in appropriate representation of the data on maps, and how to counter for variations in regional reporting and present harmonized products. Following the meeting, discussions continued by correspondence and after a number of updates to the map products, the map layers were released on [EMODnet Chemistry](#).

Summary information and report [here](#).

**Meeting with UNEP-MAP Barcelona Convention regarding the 2023 Mediterranean Quality Status Report delivery: 2 September 2021**

Most contracting parties of the Barcelona Convention, from both EU and non-EU countries, participated in the consultation meeting to share views and contribute to the document 2023 MED QSR approach and structure, presented by the UNEP/MAP Secretariat. In 2021 the document was finalized by the Secretariat under the leadership of the Ecosystem Approach Correspondence Group, who was also involved in identifying and mapping available complementary sources to address the data and knowledge gaps. In this regard, during the open discussion the participants were asked to explain their potential contribution to specific Ecological Objectives, Common Indicators, or chapters/sections of the Report.

Summary information and report [here](#).

**Maintain international cooperation and interoperability**

During the last phase of EMODnet Chemistry, the EEA put a greater focus on using data from EMODnet for both its State of the Environment report, and the core indicators for Eutrophication and Contaminants. In addition, a greater uptake of marine litter data between the EEA and EMODnet was desired by both entities. OGS supported by ICES have had a number of dialogues with the EEA and also participated in the Marine Litter Watch workshops hosted by the EEA. At this stage, although there is willingness to cooperate,



there is no clear description from the EEA on what indicator it proposed for marine litter, and it is therefore not possible to elaborate a suitable data product until this is concluded through their Marine Litter Watch network. Within this project phase, the EEA marine litter contact person has changed, and the new contact has not elaborated on the discussion.

As outlined in WP3, there is a continued synergy and technical support being given to TG-Marine Litter, and the continuous interaction with this group, and the EC-JRC, beyond just the technical issues is needed to ensure recognition of the role of EMODnet, but also to keep a European coordination of the harmonization of these data.

The EU MSFD meetings, WGDike and TGDData were much reduced in 2020 and 2021 due to COVID 19 and other personnel issues. The last meeting of TGDData in October 2019 focussed on the then pressing issues of Directive reporting, there was however a presentation by Giordano Giorgi (ISPRA, Italy) related to EcAp Pilot System data management for IMAP (Mediterranean) common indicators, which highlighted the use of EMODnet Chemistry to provide data management services. The meeting of TGDData in November 2020 featured a presentation by EMODnet Chemistry on the INSPIRE transformation services that are developed through SeaDataNet and applied to chemical contaminants data in EMODnet Chemistry. There have been no meetings of TG DATA in 2021, and the two WGDike meetings focussed almost entirely on reporting of articles under the MSFD, and there was no discussion on specifics related to data provision.

Concerning the interaction with the RSCs, the EMODnet Chemistry involvement in implementing the Ecosystem Approach Roadmap, agreed by the Contracting Parties to the Barcelona Convention, was confirmed during the latest consultation regarding the 2023 UNEP/MAP Mediterranean Quality Status Report delivery. In this occasion EMODnet Chemistry explained its crucial contribution to the specific Ecological Objectives EO5 (eutrophication), EO9 (contaminants) and EO10 (marine litter). EMODnet Chemistry agreed to act as the data platform for marine litter data management within HELCOM. EMODnet Chemistry interacted with OSPAR experts to agree on micro-litter vocabulary terms.

EMODnet Chemistry gave its contribution to the 5th Community Workshop of the IOC-UNESCO Ocean Best Practices System, entitled 'An Ocean of Values'. Further contacts were established to evaluate how EMODnet can contribute to the UN Global Partnership on Marine Litter Digital Platform.

EMODnet Chemistry participated in activities for transparent and accessible seas and oceans, linked to the UN Ocean Decade, also joining groups of experts engaged in the implementation of global data platforms that support the sea-related objectives of the UN 2030 Agenda for Sustainable Development.

## WP6 – Outreach and promotion (RBINS, OGS)

The aim of WP6 has been to promote and disseminate EMODnet Chemistry activities (services and functions) to a wide range of audiences (researchers, policy makers, public stakeholders, private and public environmental research organizations, governments and governmental agencies, and marine environmental organisations) with adapted messages and media. The general goal was to make these audiences aware of the EMODnet Chemistry portal, products, and services, in the context of the whole EMODnet initiative.

All promotional activities and communications were performed in close coordination with the EMODnet Secretariat, to guarantee the consistency of the message and to avoid overlapping initiatives. All new designs respect the 2017 EMODnet Visual Identity Guidelines. Hereafter main actions are synthesized:

- Improving the coordination to reply to the Secretariat requests;
- Monitoring the functionality of the web portal and its services on a regular basis;

- Publication and promotion of the movie 'EMODnet Chemistry: a value for marine strategies' and the webODV tutorial;
- Regular publication and dissemination of latest achievements in the news and other specific sections on the portal, in the monthly News Digest (central portal), and dissemination in the social media and by email.

### 6.1 Engagement with the industry

EMODnet Chemistry has initiated contacts with the industry to solicit win-win opportunities.

The annual event of the World Ocean Council (online event, Sustainable Ocean Summit, 9-11 December 2020, <https://www.sustainableoceansummit.org/>) was an opportunity to strengthen links with EMODnet via a general presentation targeting the private sector.

### 6.2 Widening the international scientific cooperation

During the fourth phase, the relationship with the Copernicus Marine Services has been enhanced and made fully operational. A joint EMODnet Chemistry - CMEMS INSTAC meeting was held in February 2020, to share expertise and biogeochemical data, and to plan joint products and solve metadata issues. The first joint EMODnet – CMEMS MSFD portfolio was approved and is promoted on YouTube in the [new video](#) at min 4'50", on [LinkedIn](#) and [Twitter](#).

Participation to the UN Ocean Decade: The EMODnet Secretariat and EMODnet Chemistry participated as experts in a dedicated Working Group of the global SDG14 education project with Mercator Ocean International, to position EMODnet as a significant EU contribution to the upcoming UN Decade of Ocean Science for Sustainable Development. The official launch of the Sulitest took place on 9 July 2021 during the SDG14 High Level Political Forum. It was promoted on the Chemistry Portal and on [Twitter](#) & [LinkedIn](#). The UN Ocean Decade is also advertised in the new promotion [video](#) at min 5'05".

### 6.3 Global promotion activities

The persistence of the COVID-19 pandemic from March 2020 until the end of the project prevented the holding of physical meetings. Therefore, almost all communication and promotion were done remotely, and the focus was on online digital products and activities designed and produced by the RBINS partner, in partnership with OGS, MARIS and the EMODnet Secretariat. Among the key activities, there was the update of the Chemistry portal, presentations at online events, the launch of webODV with a video tutorial, the release of the new promotion movie 'EMODnet Chemistry: a value for marine strategies', the production of regular digital news on the advancement of the project for publication on the Chemistry portal and participation to the monthly EMODnet News Digest, and the active (social) media dissemination of these information in partnership with the EMODnet Secretariat. All product designs followed the 2017 EMODnet Visual Identity Guidelines. Thanks to the very good coordination with the EMODnet Secretariat, RBINS has been able to catch up on delay on WP6 activities due to the change of the responsible person at RBINS in June 2020. This helped a lot to speed up the learning curve.

- **Launch of WebODV**

The webODV Data Explorer and Extractor was launched with a [press-release](#), followed by a NewsFlash by the Secretariat, an email to stakeholder network, and news on the Chemistry portal, in November 2020. The communication was prepared jointly by AWI, RBINS, OGS and the EMODnet Secretariat. The [Video tutorial](#) and the [user Manual](#) dedicated to this new webODV online tool provide user-friendly instructions. The former consists in an attractive screencast of Sebastian Mieruch (AWI) showing how webODV can be used and the potential of the tool for eutrophication data.

- **Release of the new promotion movie**

The new EMODnet Chemistry presentation and promotional film was produced by RBINS and designed with OGS, Maris and the EMODnet partners (AWI, ULiège). It was published on the EMODnet YouTube channel and launched on the first day of the Open Conference on 14 June. This launch was supported by a [news](#) on the portal, a [poster](#) in the virtual exhibition, chats in Slido, on [Twitter](#) and on LinkedIn ([first](#) and [second](#) announcement). Thanks to the enthusiastic and spontaneous contribution of EMODnet Chemistry partners and data ambassadors, subtitles in 8 languages were added by October 2021 (simplified Chinese, Spanish, English, Russian, French, German, Dutch, and Italian).

- **Pro-active social media presence**

As of April 2021, a proactive publication in the social media (Twitter and LinkedIn) was organised between RBINS, OGS and EMODnet secretariat. The news published on the portal or in the monthly News Digest were supported by posts on those social media. During project meetings, the network was reminded that the visibility of this type of activity needs their support, likes, thumbs-up, repost, comments. Report on statistics were included in the quarterly reports of the project. It is noted that thanks to an active presence in the social media and community building, the visibility of the more recent publications was higher.

- **Publications and press releases**

Partners have been encouraged to publish their activities and results in *technical and professional journals* and to mention EMODnet in their communications. The inventory of publications is **listed in Chapter 8**.

We can remember that OGS won the competition for the [best poster at the EMODnet Open Conference](#) – virtual exhibition with the title ‘Combining multidisciplinary interoperable EMODnet data products to support conservation and management of Mediterranean Sensitive Habitats: example of the North Adriatic maërl beds’.

A *list of press contacts* from different magazines has been initiated and shared with the Secretariat and could still be refined with the purpose to attract the interest of new potential users. Direct contacts remain to be established with the edition of those magazines to secure the visibility of future press-releases and increase the impact of the dissemination of news.

Two *new mailing lists* were set up with the help of the network: one list assembling communicators of partner organisations and one list with extra experts:

- MAILING LIST EMODNET4 - Extra Experts (experts likely to use the EMODnet data and products but not involved in the project)
- MAILING LIST EMODNET4 - Extra Outreach& Promotion contacts (people likely to publish Chemistry info on their institute websites, twitter, LinkedIn, newsletter, magazine)

For these lists, a specific footer with extra information was prepared.

A draft publication in the form of Q&A with Alessandra Giorgetti has been shared with Horizon-Magazine.EU. It is under review by the editor (not yet published).



## 4. Identified issues: status and actions taken

[Provide an overview of the issues identified by CINEA (Table A), if any, since the start of the project phase (provide date), the status of those issues and actions taken to address them and/or roadmap with remaining actions planned to resolve the issues. in Table B, provide information about issues and challenges identified by yourself, if any.]

A. Priority issue(s) identified and communicated by CINEA/ DG MARE/ SECRETARIAT				
Priority issue	Status (Pending/ Resolved)	Action(s) taken / remaining actions planned	Date due	Date resolved
Make data easier to access, with interfaces, also fit for non-professionals, to visualise data	Resolved	webODV facilitates the discovery, sub-setting, visualisation and extraction of subsets in multiple formats, all in an easy way and fast	7/2020	11/2020
EMODnet - EU/USA privacy shield - live chat function	Resolved	Live chat eliminated from Chemistry portal	26/10/2020	3/11/2020
Matomo is no longer tracking pages of emodnet-chemistry.eu domain (JIRA EM-183)	Resolved	Trust-IT discovered (06/04/21) that Matomo has no Q1 stats for the Chemistry's Portal, but only from other web domains belonging to the Portal, e.g. the Map Viewer. Tim Collart created (07/04/21) a Jira issue stating that this issue starts on 17/12/2020, which means it also affected the stats of 2020-Q4. OGS and VLIZ analysed and resolved this issue within one day	08/04/2021	08/04/2021 (But Matomo metrics for Q1 is lost)
Constant monitoring of Matomo's traffic. Not urgent but a better coordination is needed	Pending	To be discussed and agreed at the TWG	20-21/4/2021 & Sept 2021	

<b>B. Issues / challenges identified by the thematic assembly group itself</b>				
Priority issue / challenge	Status (Pending/Resolved)	Action(s) taken / remaining actions planned	Date due	Date resolved
<b>EMODnet Chemistry website metrics improvement</b>	Resolved	Better definition of web sections and web pages to be monitored	11/2020	12/2020
<b>Grafana graphics are not significant nor updated promptly (JIRA EM-119)</b>	Resolved	Trust-IT script should sum multiple Matomo entries as single number saved in the database used by Grafana	12/2020	04/2021
<b>Metrics from Grafana</b>	Resolved	Indicator 6 is not updated	1st week of quarter	n/a
<b>Missing statistic and download form from Central portal (JIRA EM-209)</b>	Resolved	Based on a discussion we'll continue to provide metrics for indicator 5 only for web interfaces in which download form is presented. No action is required	09/2021	09/2021
<b>Harmonisation of items (Types, Topics, Keywords, Formats, Resolution, Progress code) in the Products catalogue of the Central Portal</b>	Pending	Discussed at the TWG. Need of shared guidelines		
<b>Request to the Central Portal to extend the list of keywords to all terms as it is now for CONTACTS</b>	Pending	Discussed at the TWG		

## 5. Allocation of project resources

*[Provide information about the efforts spent since the start of the project phase (provide the date) on achieving the main objectives and tasks of the project. Provide an overview of resource usage (percentage of project resources) divided into the following categories (if no precise information is available, provide estimate indication instead).]*

Information on the allocation of project resources	
Categories	Resource usage <sup>1</sup> (%)
Making data and metadata interoperable and available (WP2)	20 %
Preparing data products (WP3)	12.5 %
Preparing web-pages, viewing or search facilities (WP4)	10 %
Interaction with MSFD community (WP5)	2.5 %
Project management (WP1)	7.5 %
Outreach and communication activities (WP6)	5 %

<sup>1</sup> Provide the workings of your calculations, i.e. percentage allocation of the total amount awarded.

## 6. User feedback (Contact us form, online chat & other communication means)

*[Provide a list of all user feedback received on your portal in chronological order since the start of the project (provide date). Indicate the type of the feedback received, a clear description of the query, and the actions undertaken to resolve the issue (e.g. update of metadata, fixing a particular issue with the map viewer). Indicate the status of the query (i.e. has the query been resolved or not yet), and if not provide an explanation why. List any feedback you received on the portal that can be used to build EMODnet use cases.]*

Overview of user feedback and/or requests received in this quarter							
Date	Organisation	Type of user feedback (e.g. technical, case study, etc.) and short description of the feedback received	Means of contact	Response time	Status of user query: resolved/pending	Measures taken to resolve the query	Status: if not (yet) resolved/pending, explain reason why and expected timeline
02/11/2020	Ministry of Agriculture, Rural Development and Environment, Nicosia	question	contact form	1 day	resolved	Information provided	n/a
8/10/2020	Sebastian Ehrhart, SYKE	Request to be included in the mailing list	Central Portal - Contact Form	1 day	resolved	Action in the mailing list	n/a
05/11/2020	Student from Cardiff University, UK	question	contact form	2 hours	resolved	Information provided	n/a
26/11/2020	MARE-EXT	Carlos asked for help in composing the GDPR/IDPR assessment.	e-mail	1 day	resolved	Information provided	n/a

<b>28/12/2020</b>	Lennert Eskens, KU Leuven	Question on plastic bag	Central Portal - Contact Form	3 days	resolved	Information provided	n/a
<b>05/01/2021</b>	CEFAS, UK	Request for participation to the OSPAR microplastic expert group	Web form	1.5 h	resolved	Agreed on participation	n/a
<b>18/01/2021</b>	SOCIB	Ask details on how to connect to the data platform	Web form	7 h	resolved	Information provided	n/a
<b>17/3/2021</b>	Leuven University	Plastic bags extremely heavy	e-mail	1 hour	resolved	Information provided	n/a
<b>6/4/2021</b>	Tejo Energia, Pego Electricity Production Center	Request physical-chemical data in the Atlantic Ocean.	Web form	8 days	resolved	Information provided	
<b>3/5/2021</b>	UNEP/MAP	Use of EMODnet Chemistry data	e-mail	10 hours	resolved	Data provided	
<b>2/7/2021</b>	MEDPOL - UNEP/MAP	Regarding case study of use of EMODnet Chemistry data (eutrophication): request of information on metadata	e-mail	Less than 1 day	resolved	Personal contact	resolved
<b>14/07/2021</b>	European Commission - Joint Research Centre	EC DG MARE informed OGS that EC-JRC expressed interest to work with EMODnet regarding Descriptor 8 (Contaminants) of the MSFD and more specifically acute pollution events (oil and other contaminant spills)	email	1 day	resolved	During a dedicated meeting and via email, OGS communicated its availability to work with EC-JRC also regarding acute pollution events.	

<b>8/8/2021</b>	MEDPOL UNEP/MAP	- Regarding case study of use of EMODnet Chemistry data (contaminants): request of data quality check verification	e-mail	1 day	resolved	Personal contact with user which required consequent extensive interaction with data originator	resolved
<b>23/8/2021</b>	EC - JRC	Regarding case study of use of EMODnet Chemistry data (contaminants): request of information on data and metadata	e-mail	Less than 2 hours	Resolved	Personal contact, dedicated meeting	Resolved, but dialogue to consolidate interactions and collaboration is ongoing
<b>24/08/2021</b>	The Italian Institute for Environmental Protection and Research (ISPRA)	Invitation to sign the declaration of intent on joining the Plastic Busters Network for tackling marine plastic pollution in the Mediterranean, with special emphasis on Marine Protected Areas	email	2 days	resolved	OGS sent the signed declaration to ISPRA	
<b>14/09/2021</b>	EU UNITED project and the NORA workgroup	Brecht Stechele asked whether EMODnet provides a service to extract spatial data series for the North Sea (total coverage) for the following parameters for a 10 years series: chlorophyll A, SPM (or POM/POC), SST and SSS.	email	3 days	resolved	Clear instructions were provided to access the proper EMODnet Chemistry Service	
<b>16/09/2021</b>	National Institute of Geophysics and Volcanology (INGV)	Request to discuss in what way data of chemical oceanography from the fixed station "Pegaso", located in Panarea Island (Sicily), could be ingested into the EMODnet Chemistry portal	email	2 days	pending	OGS notified via mail its availability to discuss the data ingestion	INGV notified OGS that the data owners are still discussing the feasibility internally. As soon as they come to an agreement, they are

							going to contact OGS again.
<b>21/09/2021</b>	EC-JRC	Provide overview about incoming floating micro-litter data. Table with progress update	e-mail	1 week	Resolved	Extract information from the database in the given format	
<b>22/09/2021</b>	Clean coast Bonaire	Carolyn Caporusso, involved in defining a strategy for harmonization of beach litter monitoring within the Wider Caribbean Region, contacted OGS to discuss potential collaboration with EMODnet Chemistry concerning the data management system.	email	3 days	resolved	A dedicated meeting has been set for the first days of October	22/09/2021
<b>15/9/2021</b>	Interreg Med SHAREMED	Regarding case study of use of EMODnet Chemistry data (contaminants): request of information on data and metadata	e-mail	1 day	Resolved	Personal contact, dedicated meeting	Resolved
<b>05/10/2021</b>	EC-JRC	Provide progress report on litter data collection	e-mail	20 min. & 1 day	Resolved	Extract information from the database in the given format	

## 7. Meetings/events held/attended & planned

*[Organisational meetings/events held/participated (incl. presentations, lectures, trainings, demonstrations, workshops, etc.) by the contractor since the start of the project phase (provide date) and planned in the future. Please add a short description on the meeting as well as the nature and volume of the audience.*

*When listing a meeting, please indicate whether it was an internal (i.e. within your partnership/lot) or external meeting (i.e. outside your partnership/lot).]*

A. Meetings/events organised and attended					
Date	Location	Type event (internal or external meeting, training/workshop)	Indicate if a ppt was given (yes/no + short description)	Attended / organised	Short description and main results (# participants, agreements made, etc.)
<b>9/10/2020</b>	Online (headquarter Naples, SZN)	Workshop	The EMODnet initiative was brought as a key example to explain the importance of HQ data to support European policies and global environmental assessment.	A	<p>Title: The Italian HUB for the BLUEMED initiative Pilot "Towards a Healthy plastic-free Mediterranean Sea"</p> <p>Organizers: the BLUEMED GSO and CSA.</p> <p>Participants: Universities, CNR, ENEA, CONISMA, INGV, Bioplastic Association, NGO, OGS, ISPRA, SZN, CIHEAM.</p> <p>The R&amp;I BlueMed Initiative fosters integration of knowledge and efforts of Mediterranean Countries to create new sustainable blue growth in the area</p>
<b>12/10/2020</b>	Online	Workshop	No	A	<p>Title: International Data Sharing Workshop for Non-UN IGOs, Global and Regional Organisations and Projects, NGOs and Private Sector.</p> <p>Organizers: the UNESCO Intergovernmental Oceanographic Commission (IOC) Project Office for the International Oceanographic Data and Information Exchange (IODE)</p> <p>Participants: NIOZ, UN/IOC (IWG-SODIS group, Ocean InfoHub (OIH) group, ODISCat group</p>



<b>14/10/2020</b>	Online	External meeting	No	A	<p>Second webinar of the Sulitest Specialized Module on SDG 14 project</p> <p>Organizers: Sulitest NGO, Mercator Ocean International and UN DESA</p> <p>Participants: Sulitest, Mercator Ocean International, UN DESA, Kedge Business School, EMODnet Chemistry</p> <p>The working group passes through the questions of the theme 1: why is the ocean important? For Web3 Sulitest and Mercator Ocean International will propose a limited number of questions per theme strictly related to SDG 14 targets</p>
<b>19/10/2020</b>	Online	Internal meeting	Yes, Second chemistry data harvesting for eutrophication and contaminants and present status of data and metadata population	O	<p>4th Phase 1st regional leaders video conference on the 2nd harvest for eutrophication and contaminants</p> <p>Organizers: OGS/MARIS</p> <p>Participants: EMODnet Chemistry Regional Leaders and Partners.</p>
<b>20-21/10/2020</b>	Online	External meeting	Yes, EMODnet Presentation "EMODnet: your gateway to marine data in Europe, and beyond "	A	<p>Title: EATIP-Copernicus Marine-EMODnet workshop on Marine data to support aquaculture in the North Atlantic</p> <p>Organizers: DG MARE, DG DEFIS, EATiP, Mercator Ocean International</p> <p>Participants: DG MARE, DG DEFIS, EATiP, Mercator Ocean International, EMODnet</p> <p>This event explored opportunities and applications for marine environmental Open Access Data to support the aquaculture sector in the North Atlantic region.</p>
<b>22/10/2020</b>	Online	Internal meeting	No	O	<p>Discussing technical progress and launch of WebODV extractor and later integration with the viewer service</p> <p>Participants: OGS, MARIS, AWI, and ULg</p>

<b>29/10/2020</b>	online, host by NIMRD, Constanta	External meeting	Yes, EMODnet Chemistry portal was presented, along with SeaDataCloud and EMODnet Ingestion, as one of the main European Initiatives where RoNODC is participating.	A	Celebration Of 50 Years of NIMRD Establishment and International Black Sea Day
<b>5-6/11/2020</b>	Online	External meeting	Yes, EMODnet – a network of NODCs	A	Title: Implementing the roadmap towards the ocean oxygen data platform  Organizers: LEGOS, Uliege  Participants: National Oceanographic Data Centers (NODCs), Regional hubs and Government Data Analytics Centers (GDACs)
<b>9-10 &amp; 12-13/11/2020</b>	Online	Internal meeting	Yes, progress activities	A	EMODnet Steering Committee and Technical Working Group
<b>12/11/2020</b>	Online	External meeting	Yes, Progress with developing an INSPIRE Transformation service for SeaDataNet – EMODnet Chemistry	A	9th MSFD TG DATA meeting  Organizers: MSFD TG DATA  Participants: EEA, DG ENV, ISPRA, EU MSP TG, HELCOM, DG MARE, Biblomantica, MARIS, INFO/RAC, ICES, OSPAR.  Presented relevant initiatives for the group, analysis of the reported information on MSFD Article 19(3), and discussed the tasks about data standards.
<b>24-25/11/2020</b>	Online	Workshop	Yes, EMODnet Chemistry Online Data Extraction, Visualization and Analysis with webODV	A	9th MonGOOS workshop  Title: New ocean observation approaches for a blue Mediterranean Sea: physical and biogeochemical systems, data and model assimilation  Organizers: MonGOOS partnership  Participants: CNR, Hassan II University (NIRF), IEO, PdE, NKUA, DUTH, ISPRA, SOCIB, CMCC, OGS, INSTM, LOV

					<p>(Sorbonne University), IOLR, IMEDEA, INRH, FORTH, NIB, Thessaloniki University, ODYSSEA</p> <p>Presented the EMODnet Chemistry webODV data Explorer and Extractor service</p>
<b>27/11/2020</b>	Trieste, Italy	Interview for a dissemination event targeted to the general public	Yes, Marine pollution 101: knowing, preventing, reducing	A	<p>European Researchers' Night 2020</p> <p>Organizers: Science Centre Immaginario Scientifico, the scientific and interactive museum of Trieste (Italy)</p> <p>Participants: Alessandra Giorgetti, Chiara Altobelli</p> <p>SHARPER, SHARing Researchers' Passions for Evidences, is one of the 7 Italian projects aimed at realizing the European Researchers' Night 2020 to raise awareness on the relevance of research to make decisions in many different fields.</p>
<b>30/11/2020</b>	online	Internal meeting	No	O	<p>4th Phase 2nd regional leaders video conference on 2nd harvest for eutrophication and contaminants</p> <p>Organizers: OGS/MARIS</p> <p>Participants: EMODnet Chemistry Regional Leaders and Partners.</p>
<b>1/12/2020</b>	online	External meeting	Yes, one slide showing that the selected 24 questions cover all SDG targets and most of the key topics	A	<p>Title: third webinar of the Sulitest Specialized Module on SDG 14 project</p> <p>Organizers: Sulitest NGO, Mercator Ocean International and UN DESA</p> <p>Participants: Sulitest, Mercator Ocean International, UN DESA, Kedge Business School, EMODnet Chemistry</p> <p>The working group past through the 24 questions selected by Sulitest and Mercator Ocean International to discuss whether: some key topics are still missing in each theme; some questions are not relevant or incorrect</p>

<b>3/12/2020</b>	online	Internal meeting	No	O	Discussing technical expansion of WebODV Extractor service with contaminants Participants: OGS, MARIS, and AWI
<b>8, 10/12/2020</b>	online	Conference	No	A	Sustainable Ocean Meeting conference Title: Ocean Vision 2030: the Decade for Ocean Action
<b>14/12/2020</b>	online	External meeting	No	A	MSFD Technical Group on Marine Litter Organizers: DG ENV, EEA Participants: EU Member States, Invited experts
<b>14/12/2020</b>	online	External meeting	Yes, MSFD portfolio containing CMEMS & EMODnet products - Current proposal	A	EMODnet Chemistry, Mercator Ocean International meeting on the MSFD data products portfolio Organizers: Mercator Ocean International Participants: EMODnet Chemistry, Mercator Ocean International, EEA and DG ENV
<b>21/12/2020</b>	online	Internal meeting	No	O	Discussing progress with technical expansion of WebODV Extractor service with contaminants, considering graphics, search criteria, and export formats Participants: OGS, MARIS, and AWI
<b>06/01/2021</b>	Web	External	Yes, big picture EMODnet	A	Possible collaboration with the Centre for the Fourth Industrial Revolution and the Ocean (C4IR Ocean)
<b>08/01/2021</b>	Web	Internal	No	O	Tuning developments in webODV, for eutrophication and contaminants Participants: AWI, MARIS and OGS
<b>11/01/2021</b>	Web	Internal	No	O	RLs meeting on 2nd data harvesting for eutrophication and contaminants

					Participants: MARIS, OGS, AWI, IMR, SMHI, NIMRD, HCMR, AU-DCE, IFREMER
<b>14/01/2021</b>	Web	Workshop	Yes, EMODnet Chemistry management of ML data	A	OSPAR microplastic expert group meeting Participants: OSPAR microplastic expert group (MPEG), OGS, and other ML experts
<b>15/01/2021</b>	Web	External	Yes, EMODnet General	A	Baltic SC meeting
<b>19/01/2021</b>	Web	Internal	No	O	Marine Litter products discussion Participants: OGS, IFREMER
<b>20/01/2021</b>	Web	External	No	A	Sulitest SDG14 module 4th meeting Participants: Sulitest NGO, OGS, EMODnet Secretariat, UNDESA, Mercator Ocean International and other experts on the UN Agenda 2030 for SD and marine scientists.
<b>26-28/01/2021</b>	Web	Workshop	No	A	CMEMS GA Participants: Copernicus community
<b>01/02/2021</b>	Web	Internal	No	O	RLs meeting on 2nd data harvesting for eutrophication and contaminants Participants: MARIS, OGS, AWI, IMR, SMHI, NIMRD, HCMR, AU-DCE, IFREMER
<b>02/02/2021</b>	Web	Internal	Yes, WP1,WP2,WP3,WP4,WP5,WP6	O	EMODnet Chemistry Project Meeting Participants: EMODnet Chemistry partners, subcontractors, and members of the advisory forum
<b>03/02/2021</b>	Web	External	No	O	Synergies between Plastic busters interreg MED project and EMODnet Chemistry Participants: OGS, ISPRA
<b>08/02/2021</b>	Web	Internal	No	O	Seafloor marine litter data

					Participants: ICES, OGS
<b>11/02/2021</b>	Web	External	No	O	EMODnet-CMEMS joint portfolio of data products fit for the MSFD purposes Participants: EMODnet Chemistry, Mercator Ocean International
<b>16/02/2021</b>	Web	External	Yes, Intro EMODnet and Arctic portal	A	Arctic ROOS AM Participants: SMHI, Arctic ROOS member institutes
<b>18/02/2021</b>	Web	Internal	No	O	EMODnet Chemistry promotional movie Participants: OGS, MARIS, RBINS, AWI
<b>18/02/2021</b>	Web	Internal	No	O	EMODnet Chemistry meeting on DIVA maps Participants: OGS, AWI ,ULiege, IMR, SMHI, NIMRD, HCMR, AU-DCE, IFREMER
<b>23/02/2021</b>	Web	Internal	No	O	webODV tool for contaminants Participants: AWI, MARIS and OGS
<b>23/02/2021</b>	Web	External	No	O	Meeting to discuss Data Ingestion from Nord Stream Participants: SMHI and Nord Stream representatives
<b>24/02/2021</b>	Web	External	No	A	EMODnet Chemistry at the International Expert Meeting on Marine Plastic Litter Monitoring Data Sharing Project Participants: OGS, Ministry of the Environment-Government of Japan, ML experts
<b>25/02/2021</b>	Web	Internal	No	O	APIs for EMODnet Chemistry Participants: OGS, MARIS, MI, BODC, ULG
<b>03/03/2021</b>	Web	Internal	No	O	EMODnet Chemistry promotional movie Participants: OGS, MARIS, RBINS, AWI

<b>11/03/2021</b>	Web	External	No	O	EMODnet-CMEMS joint portfolio of data products fit for the MSFD purposes  Participants: EMODnet Chemistry, Mercator Ocean International
<b>12/03/2021</b>	Web	Internal	No	O	EMODnet Chemistry promotional movie  Participants: OGS, MARIS, RBINS
<b>12/03/2021</b>	Web	External	No	O	How to use ERDDAP data server and benefits for EMODnet Chemistry  Participants: OGS, MARIS, ETT
<b>16/03/2021</b>	Web	Internal	No	O	EMODnet Chemistry meeting on DIVA maps  Participants: OGS, AWI, ULiege, IMR, SMHI, NIMRD, HCMR, AU-DCE, IFREMER
<b>18/03/2021</b>	Web	Internal	No	O	EMODnet Chemistry promotional movie  Participants: OGS, MARIS, RBINS
<b>23/03/2021</b>	Web	External	No	A	Sulitest sdg14 module 5th meeting  Participants: Sulitest NGO, OGS, EMODnet Secretariat, UNDESA, Mercator Ocean International and other experts on the UN Agenda 2030 for SD and marine scientists.
<b>24-25/03/2021</b>	Web	External	No	A	Marine Data to support Aquaculture in the Mediterranean and Black Sea  Participants: EMODnet, CMEMS, EATIP, DG MARE, Copernicus / EMODnet users, data providers, coastal managers and aquaculture data end users
<b>25/03/2021</b>	Web	Internal	No	O	EMODnet Chemistry promotional movie  Participants: OGS, MARIS, RBINS, AWI, ULiege

<b>29/03/2021</b>	Web	External	No	O	EMODnet-CMEMS joint portfolio of data products fit for the MSFD purposes  Participants: EMODnet Chemistry, Mercator Ocean International
<b>30/03/2021</b>	Web	Internal	No	O	EMODnet Chemistry meeting on DIVA maps  Participants: OGS, AWI, ULiege, IMR, SMHI, NIMRD, HCMR, AU-DCE, IFREMER
<b>30/03/2021</b>	Web	Workshop	Ye, Marine Litter products	O	EMODnet Chemistry MSFD board of experts meeting on new marine litter products.  Participants: 24 marine litter experts from Europe
<b>30/03/2021</b>	Video conference	External	YES,  1. EMODnet Chemistry now and in the next phase (OGS) 2. EMODnet Chemistry marine litter: planning maps for marine litter (IFREMER)	O	Meeting with MSFD experts on new marine litter data products  Participants: ICES, OGS, IFREMER, many other EMODnet Chemistry partners, international experts on marine litter, members of the board of experts of MSFD.
<b>31/3/2021</b>	Lesson at Master diploma	Master lesson	YES  From good data .... To good decisions From data to knowledge for sustainable blue growth	A	Lesson at the Advanced Master on Blue Growth, organized by OGS and University of Trieste (Italy)  Participants: 20 participants from several Mediterranean countries.
<b>07-22/04/2021</b>	Video conference	Internal	NO	O	Meeting to discuss the script and the storyboard of the new promotional and tutorial EMODnet Chemistry video and EMODnet4policy video  Participants: RBINS, OGS, MARIS, Uliege, AWI
<b>02/04/2021</b>	Video conference	Internal	NO	O	Meeting to inform EMODnet Human Activities on how to provide EMODnet Chemistry with information for the CMEMS-EMODnet data catalogue



					Participants: OGS and COGEA
<b>13/04/2021</b>	Video conference	Internal	NO, minutes available	O	DIVA maps for eutrophication  Participants: OGS, MARIS, ULiege, AWI, EMODnet Chemistry Regional Coordinators (AU-DCE, HCMR, IFREMER, IMR, NIMRD, SMHI)
<b>from 12 to 14/04/2021</b>	Video conference	International Conference	YES, EMODnet Chemistry: progresses and challenges along the path to the European marine litter data management	A	International Conference on Marine Data and Information Systems (IMDIS)
<b>15/04/2021</b>	Video conference	External	NO, minutes available	O	EMODnet and CMEMS shared data products meeting Participants: OGS, Mercator Ocean International
<b>from 19 to 21/04/2021</b>	Video conference	Internal	YES, Key achievements and outputs, collaborations and upcoming plans	A	EMODnet Steering Committee and TWG meetings Participants: restricted to members of the EMODnet SC and TWG.
<b>30/04/2021</b>	Video conference	General Assembly	YES, New and consolidated large scale cooperation actions of 2020 and beyond	A	European Geosciences Union: General Assembly Participants: scientists, especially early career researchers, and experts in all fields of geoscience.
<b>12/05/2021</b>	Video conference	External	NO	O	Presentation and discussion of UNEP/MAP needs Participants: OGS, UNEP/MAP, 2 Experts from MED-POL
<b>06-20-25/05/2021</b>	Video conference	Internal	NO, minutes available	O	DIVA maps for eutrophication  Participants: OGS, MARIS, ULiege, AWI, EMODnet Chemistry Regional Coordinators (AU-DCE, HCMR, IFREMER, IMR, NIMRD, SMHI)

<b>06-25/05/2021</b>	Video conference	External	NO, minutes available	O	EMODnet and CMEMS shared data products meeting Participants: OGS, Mercator Ocean International
<b>20/05/2021</b>	Video conference	Workshop	NO	A	European Technical Commission CEN/TC 444 workshop on microplastics
<b>26/05/2021</b>	Video conference	Internal	No	A	Meeting on contaminant maps Participants: OGS, IFREMER, ISPRA, ULiege.
<b>27/05/2021</b>	Video conference	External	YES, 1. EMODnet Chemistry The pan-European network for data and products on marine water quality (OGS) 2. EMODnet Chemistry: Eutrophication map products review (ULiege) 3. EMODnet Chemistry 4 Eutrophication map products review – Regional DIVA/DIVAnd 6-year seasonal analysis (SMHI) 4. EMODnet Chemistry 4 Eutrophication map products review - Coastal areas DIVAnd maps Po River, Gulf of Riga, Danube Delta (NIMRD)	O	Meeting with MSFD experts on new DIVA maps concerning eutrophication.  Participants: ICES, OGS, Uliege, EMODnet Chemistry Regional Coordinators (AU-DCE, HCMR, IFREMER, IMR, NIMRD, SMHI), many other EMODnet Chemistry partners, international experts of eutrophication, members of the board of experts of MSFD.
<b>27/05/2021</b>	Video conference	Training workshop	YES, 1. Micro-litter data collection with EMODnet 2. EMODnet Chemistry: micro-litter data management, formats, and relevant information	O	Webinar on micro-litter data management Participants: Members States and the MSFD TG ML
<b>31/05/2021</b>		Training workshop	YES,	O	Webinar on micro-litter data management

			1. Micro-litter data collection with EMODnet 2. EMODnet Chemistry: micro-litter data management, formats, and relevant information		Participants: EMODnet Chemistry network
<b>01/06/2021</b>	Video conference	External	YES, 1. Board of MSFD Experts: Contaminants (ICES) 2. EMODnet Chemistry: the pan-European network for data and products on marine water quality 3. Dataset collection for contaminants, and the map products	O	Meeting with the MSFD experts on new contaminant maps  Participants: ICES, OGS, ISPRA, many other EMODnet Chemistry partners, international experts of contaminants, members of the board of experts of MSFD.
<b>11/06/2021</b>	Trieste (Italy)	Festival	YES, Let's get marine data free	O	Festival of the Sea: let's get marine data free Participants: general public
<b>14/06/2021</b>	Video conference	External	NO	O	Discussion of UNEP/MAP needs Participants: OGS, UNEP/MAP, 2 Experts from MED-POL
<b>14/06/2021</b>	Video conference	kick-off meeting external	NO	A	EOSC Future project: kick-off meeting Participants: the Partners of EOSC Future project
<b>from 14 to 16/06/2021</b>	Video conference	Open conference	YES, PPT - EMODnet Achievements and forward look (OGS) PPT - EMODnet Chemistry and Copernicus work together (OGS) PPT - EMODnet Chemistry - OBPS use case (OGS)	A	EMODnet Open Conference: Connecting Open Data, Delivering Marine Knowledge: A Vision for 2030 Participants: EMODnet partners, international data providers and users

			<p>Poster and pitch - EMODnet Chemistry: a value for marine strategies (RBINS)</p> <p>Poster and pitch - Combining multidisciplinary interoperable EMODnet data products to support conservation and management of Mediterranean Sensitive Habitats: example of the North Adriatic maërl beds. (OGS)</p> <p>Poster and pitch - Marine Litter Database and associated products (IFREMER)</p> <p>Poster and pitch - EMODnet Ingestion Success stories fFour cases related to EMODnet CHEMISTRY)</p> <p>Final notes - EMODnet for Global (OGS)</p> <p>Oral contribution - EMODnet for EU Green Deal (OGS)</p>		
<b>16/06/2021</b>	Trieste (Italy)	Festival "MareDireFare" for the UN Decade of the Ocean	YES, Marine litter data: Collection and Management (OGS)	O	"Alternative plastic" event: examples of new and consolidated virtuous initiatives.  Participants: general public
<b>17/06/2021</b>	Video conference	Internal	YES,  1. WP1 – Project management, progress on deliverables, including interaction with EC-	O	EMODnet Chemistry  - Project meeting  Participants: <a href="#">EMODnet Chemistry consortium</a>  Steering Committee meeting

			<p>JRC, CMEMS and EEA. Preparation to phase 5 (OGS)</p> <ol style="list-style-type: none"> <li>2. WP2 – Status of metadata and data population, including increase over time, and harvesting for products (MARIS)</li> <li>3. WP2 – Micro-litter data collection and link to Member States (OGS)</li> <li>4. WP3 – Generation of products: aggregated datasets. Data quality and quantity gaps (HCMR)</li> <li>5. WP3 – New DIVA maps on Map viewer (SMHI)</li> <li>6. WP3 – Generation of maps on contaminants (ISPRA)</li> <li>7. WP3 – New maps for marine litter on Map viewer (IFREMER)</li> <li>8. WP4 – Technical developments, services and tools: information about centralization process (MARIS)</li> <li>9. WP4 – Improving of the SDC VRE and webODV (AWI)</li> <li>10. WP5 – Report of the meetings with the MSFD board of experts and of EMODnet/ICES data integration for EEA indicators (ICES)</li> <li>11. WP6 - Outreach &amp; Promotion activities (RBINS)</li> </ol>		<p>Participants: EMODnet Chemistry partners and NOC-BODC subcontractor</p>
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<b>18/06/2021</b>	Video conference	Internal	NO, oral contribution (OGS)	A	EMODnet Jamboree: Citizen Science Workshop Participants: EMODnet partners
<b>25/06/2021</b>	virtual	internal meeting	Yes (current chemical groupings and the reason for a revision)	O	Experts meeting to revise the chemical groupings Participants: international chemical experts
<b>01/07/2021</b>	virtual	external meeting	Yes (EMODnet Chemistry contribution to provide FAIR data)	A	HarmoNIA Network meeting Participants: HarmoNIA Network
<b>09/07/2021</b>	virtual	meeting	NO	O	Informal meeting with OSPAR experts to agree on micro-litter vocabulary terms
<b>09/07/2021</b>	virtual	external meeting upon invitation entitled "We Are All Ocean Citizens", a side-event of the high-level political forum on sustainable development.	NO	A	The event launched the Sulitest SDG 14 module in partnership with UN Department of Economic and Social Affairs (DESA) and Mercator Ocean International. EMODnet EMODnet Chemistry took part to the development of the module and promoted it's launch. Participants: Sulitest SDG14 Working group and ambassadors
<b>15/07/2021</b>	virtual	meeting	NO	A	Informal meeting with DG MARE and Human Activities to share views on Oil Spill data
<b>20 – 22/07/2021</b>	Tbilisi (Georgia, Caucaso)	external meeting	Yes (The presentation introduced by TSU was dedicated to the modelling of the distribution of the Marine litter in the Georgian Black Sea coastal area, where the EMODnet data on ML was used.)	O	The meeting was organised within the EU BSB programme ( project BSB552 RedMarLitter). Participants: EU BSB programme network
<b>02/09/2021</b>	virtual	consultation	Yes (EMODnet Chemistry contribution to EO5, EO9; EO10)	A	Consultation on the 2023 UNEP/MAP MED QSR Participants: international marine experts and data managers
<b>07/09/2021</b>	virtual	workshop	NO, input sent prior the meeting to drive discussion	A	SDG 14.3.1 Data Portal and federated data system workshop
<b>07/09/2021</b>	virtual	training workshop	NO	A	"Value chains in public marine data, a UK Study". The webinar was aimed at disseminating the inspiring results of an original survey of UK marine data users, conducted by GOOS, OECD and MEDIN

					Participants: international marine experts and data managers
<b>08-09-10/09/2021</b>	virtual	project meeting	Yes, presentations on Key updates and forward look + Discussion on the Product Catalogue	A	EMODnet SC + MKEG + TWG
<b>14/09/2021</b>	virtual	workshop	Yes (EMODnet Chemistry expertise in marine litter data management was presented)	A	"Healthy Mediterranean Sea - Unlocking the potential of Ports and Harbours in preventing and reducing the effects of Marine LitterBlueMed workshop". BlueMed workshop. EMODnet was invited to participate in the workshop to share its expertise in marine litter data management.
<b>23/09/2021</b>	virtual	workshop	NO	A	"Global Partnership on Marine Litter: New platform release & interoperability with the OBPS" the 5 <sup>th</sup> Community Workshop of the IOC-UNESCO Ocean Best Practices System. Participants: BlueMed network
<b>23/09/2021</b>	virtual	workshop	Yes (EMODnet Chemistry expertise in marine litter data management was presented)	A	"An Ocean of Values", the 5 <sup>th</sup> Community Workshop of the IOC-UNESCO Ocean Best Practices System. It is aimed at exchanging ideas and discussing topical issues with the OBP community and disseminate the outputs. Participants: OBP community
<b>24/09/2021</b>	Trieste and virtual	festival	NO	O	During the event "Open science: because knowing is good for the environment", at the Trieste Next Festival, Alessandra Giorgetti was interviewed to explain what open science is about. EMODnet Chemistry was brought as an example. Participants: general public
<b>1/10/2021</b>	virtual	meeting	Yes (EMODnet Chemistry services for contaminants were presented)	A	Meeting EC-JRC and EMODnet on Contaminants data
<b>SUM</b>				<b>O</b>	<b>Total # of meetings organised =48</b>
<b>SUM</b>				<b>A</b>	<b>Total # of meetings attended = 42</b>



## B. Meetings/events planned in the future

Date	Location	Type event (meeting, training (workshop), etc.)	Meeting to be attended (A) / organised (O)	Short description and main expected outcomes
<b>October 2021</b>	Piran (Slovenia)	Workshop	A	Workshop organized by Institute for water of the Republic of Slovenia and Ministry of the Environment and Spatial Planning dedicated to Action plan to establish National Platform for Marine Environment Management". EMODnet was presented as an example of transnational cooperation towards shared data for Marine Environmental Management
<b>October-November 2021</b>	Batumi, Georgia	Science picnic with TSU	O	Science picnic – science popularisation country-wide event (TSU will have its own facility, where results of all ongoing marine projects (including EMODnet Ingestion, EMODnet Chemistry ) will be introduced.
<b>05/10/2021</b>	virtual	meeting	O	Harmonization of Caribbean beach litter monitoring data
<b>14/10/2021</b>	virtual	meeting	O	EMODnet Chemistry and GPML Digital Platform collaboration
<b>19/10/2021</b>	virtual	meeting	A	TG ML sea floor litter core group
<b>25-29/10/2021</b>	virtual	training course	A	"Implementing the Ocean Data and Information System (ODIS) architecture". During this course, participants will be trained in how to link their systems into ODIS and to make them a more visible and actionable part of the ocean's digital ecosystem.
<b>25/10/2021</b>	virtual	meeting	A	EMODnet/ICES WG Marine litter meeting
<b>26-28/10/2021</b>	virtual	workshop	A	"Annual MONGOOS General Assembly and Workshop". It is aimed at integrating science-based knowledge and promoting solution-oriented research in the Mediterranean Sea. (EMODnet cited in the SHAREMED WS report)
<b>26-27/10/2021</b>	virtual	workshop	A	MSFD microliter workshop organised by EC-JRC
<b>12/11/2021</b>	virtual	Project meeting	O	EMODnet Chemistry Steering Committee
<b>TBD</b>	virtual	workshop	A	Marine Litter and Plastic Pollution Ontology peer review process
<b>TBD</b>	virtual	meeting	A	PANGEA meeting
<b>January or February 2022</b>	TBD	meeting	A	ICES WG Marine litter
<b>14-16/02/2022</b>	hybrid	conference	A	International Ocean Data Conference

## 8. Communication assets

*[List all the relevant communication and dissemination products and assets you have developed since the start of the project phase (provide date) (e.g. brochures, videos, press releases, newsletters, blogs) and are planning to do. At the bottom of the table, provide a total number for every type of communication product you have developed (e.g. total # of press releases, etc.) or provide a summary from the actions on Twitter from (e.g. Twitter Analytics: number of Tweets and followers of Twitter account).]*

A. Communication assets				
Date	Communication material	Short description (of the material, title, ...) and/or link to the asset	Main results	Name of event at which material was disseminated (if applicable)
1/10/2020	Online Communication Portal - News section	The Italian HUB for the BLUEMED initiative Pilot "Towards a Healthy plastic-free Mediterranean Sea"	Let users and visitors aware on EMODnet Chemistry participation in the BLUEMED Workshop	
6/10/2020	Online Communication Portal - News section	International Data Sharing Workshop for Non-UN IGOs, Global and Regional Organisations and Projects, NGOs and Private Sector	Let users and visitors aware on EMODnet Chemistry involvement in global data sharing projects	
9/10/2020	PPT	EMODnet Chemistry platform - HQ data to support european policies and global assessment	Share EMODnet Chemistry expertise on marine plastic issue	BLUEMED Workshop "Towards a Healthy plastic-free Mediterranean Sea"
12/10/2020	Online Communication Portal - Events section	BlueMed web meeting focused on marine plastic litter	Let users and visitors aware on BLUEMED project and the role played by EMODnet Chemistry	
20/10/2020	Online Communication Portal - Events section	Sulitest Specialized Module on SDG 14 project: second meeting	Keep users informed on the progress of the Sulitest sdg14 module project	
21/10/2020	Online Communication Portal - News section	Marine data to support aquaculture in the North Atlantic	Let users and visitors aware on the relevance of EMODnet Chemistry data to support aquaculture	
21/10/2020	PPT	Marine data to support aquaculture in the North Atlantic. EMODnet, your	Share EMODnet Chemistry data management expertise	External meeting: Marine data to support aquaculture in the North Atlantic

		gateway to marine data in Europe, and beyond		
26/10/2020	Online Communication Portal – project meetings section	4th Phase Regional Leaders videoconference: 19 October 2020	Keep users and visitors up to date with the initiative progress	
26/10/2020	PPT	Second chemistry data harvesting for eutrophication and contaminants and present status of data and metadata population	Discuss and coordinate the 2nd harvest for eutrophication and contaminants	4th Phase 1st regional leaders video conference on the 2nd harvest for eutrophication and contaminants
28/10/2020	Online Communication Portal – Use case section	EMODnet Chemistry infrastructure: the pillar of the HarmoNIA visualization tools	Keep users and visitors up to date with the initiative progress	
29/10/2020	Online Communication Portal – Reports to EU section	4th Phase: 2020Q3 Trimonthly Report, July-September	Share with EMODnet Chemistry members and all users the most relevant outcomes of the past 3 months	
29/10/2020	PPT	EMODnet Chemistry portal was presented, along with SeaDataCloud and EMODnet Ingestion, as some of the main European Initiatives to which RoNODC is participating.		Celebration Of 50 Years of NIMRD Establishment and International Black Sea Day
30/10/2020	Online Communication Portal – Use case section	The first EU ML quantitative Threshold value by using EMODnet Chemistry data	Keep users and visitors of the Portal up to date with the initiative progress	
5/11/2020	Online Communication Portal – Reports to EU section	4th Phase: Interim Report, October 2019 - October 2020	Share with EMODnet Chemistry members and all users the most relevant outcomes of the 1 <sup>st</sup> year of the 4 <sup>th</sup> phase	
6/11/2020	Online Communication Portal - News section	Implementing the roadmap towards the ocean oxygen data platform	Keep users and visitors informed on the next events	
9/11/2020	Online Communication Portal - News section	EMODnet Steering Committee and Technical Working Group	Keep users and visitors informed on the upcoming events	

9/11/2020	Online Communication Portal - News section	EMOD-PACE project and upcoming meetings	Keep users and visitors informed on the next events	
9/11/2020	Online Communication Portal - Events section	Implementing the roadmap towards the ocean oxygen data platform	Let users and visitors aware on the EMODnet Chemistry contribution to the ocean oxygen data platform	
9/11/2020	PPT	EMODnet – a network of NODCs	Share EMODnet Chemistry data management expertise	External meeting: Implementing the roadmap towards the ocean oxygen data platform
10/11/2020	Online Communication Portal – Guidelines section	Marine Litter Data-Flow	Explain users how to easily collect and harmonize marine litter data following the EMODnet Chemistry methodology and tools	
10/11/2020	Online Communication Portal - News section	9th MSFD TG DATA meeting	Keep users and visitors informed on the upcoming events	
10/11/2020	PPT	Progress with developing an INSPIRE Transformation service for SeaDataNet – EMODnet Chemistry	Contribute to the MSFD monitorings	9th MSFD TG DATA meeting
10/11/2020	Online Communication Portal - News section	How to submit marine litter data?	Disseminate the new guidelines on the marine litter data flow	
13/11/2020	Online Communication Portal – Events section	The first step of the Horizon 2020 EUROqCHARM project	Let users and visitors aware on the EMODnet Chemistry contribution to the EUROqCHARM project and its relevance	
16/11/2020	Online Communication Portal – Events section	EMODnet: November 2020 Steering Committee and Technical Working Group	Keep users and visitors up to date with the initiative progress	

19/11/2020	Online Communication Portal - News section	EMOD-PACE WP2 Chemistry group meeting	Keep users and visitors informed on the upcoming events	
19/11/2020	PPT	EU-China Data harmonization	Share EMODnet Chemistry data management expertise	EMOD-PACE WP2 Chemistry group meeting
23/11/2020	Online Communication Portal - News section	4th Phase 2 <sup>nd</sup> regional leaders video conference on 2nd harvest for eutrophication and contaminants	Keep users and visitors informed on the upcoming events	
23/11/2020	Online Communication Portal - News section	Third webinar of the Sulitest Specialized Module on SDG 14 project	Keep users and visitors informed on the upcoming events	
23/11/2020	PPT	one slide showing that the selected 24 questions cover all SDG targets and most of the key topics	Contribute to the realization of the sulitest sdg14 module	Third webinar of the Sulitest Specialized Module on SDG 14 project
23/11/2020	PPT	Presented the EMODnet Chemistry webODV data Explorer and Extractor service	Show the new ODV tool to the scientific community attending the meeting	9th MonGOOS workshop
24/11/2020	Online Communication Portal - News section	Explore and extract data with the new webODV tool	Keep users up to date with the latest tool available	
24/11/2020	Video	Explore and extract data with the new webODV tool	Explain users how the new ODV tool works	EMODnet central portal, mail to data experts and scientific community
24/11/2020	Manual	Explore and extract data with the new webODV tool	Explain users how the new ODV tool works	EMODnet central portal, mail to data experts and scientific community
24/11/2020	Press release	Explore and extract data with the new webODV tool	Inform the scientific community about the new ODV tool	EMODnet central portal, mail to data experts and scientific community
24/11/2020	EMODnet newsdigest	Explore and extract data with the new webODV tool	Inform EMODnet users about the new ODV tool	
24/11/2020	Online Communication Portal - News section	European Researchers' Night 2020	Raise awareness and disseminate information	

24/11/2020	Online Communication Portal – Video section	webODV tool for online data Exploration and Extraction	Keep users and visitors informed on the next events	
24/11/2020	Online Communication Portal – Guidelines section	User Manual for the aggregated data Explorer and Extractor	Make available the hot to document that explains the the new ODV tool	
26/11/2020	Online Communication Portal – Events section	The webODV data Explorer and Extractor tool presented at the MonGOOS workshop	Let users and visitors informed on MonGOOS workshop outcomes	
2/12/2020	Online Communication Portal – Events section	EMOD-PACE on line meeting on water quality: 23 November 2020	Provide users with details on WP2 EMOD-PACE meeting	
3/12/2020	Online Communication Portal – Events section	Sulitest Module on SDG 14 project: third meeting	Provide users with details on the third meeting devoted to the Sulitest Module on SDG 14 project	
3/12/2020	Online Communication Portal – Media section	Science Centre Immaginario Scientifico: European Researchers' Night 2020	Raise people awareness and disseminate information	
3/12/2020	Online Communication Portal - News section	Synergies between EMODnet Chemistry and EUROqCHARM project. Kick off meeting of EUROqCHARM project (EUROpean quality Controlled Harmonization Assuring Reproducible Monitoring and assessment of plastic pollution)	Keep users and visitors informed on the next events	
4/12/2020	Online Communication Portal - News section	Sustainable Ocean Meeting conference Title: Ocean Vision 2030: the Decade for Ocean Action	Keep users and visitors informed on the next events	
9/12/2020	Online Communication Portal - News section	SHAREMED: first capitalization workshop	Keep users and visitors informed on the next events	
11/12/2020	Online Communication Portal – project meetings section	4th Phase 2 <sup>nd</sup> Regional Leaders videoconference: 30 November 2020	Keep users and visitors up to date with the initiative	

11/12/2020	Online Communication Portal - Events section	EMOD-PACE WP 2 plenary meeting and WP2 Leaders and EU meeting	Provide users with details on WP 2 plenary meeting and WP2 Leaders and EU meeting	
11/12/2020	PPT	EMOD-PACE aims, work plan and 2 December WP2 meeting follow up	Share EMODnet Chemistry data management expertise	EMOD-PACE WP 2 Leaders and EU meeting
11/12/2020	Online Communication Portal - News section	MSFD Technical Group on Marine Litter	Keep users and visitors informed on the next events	
11/12/2020	Online Communication Portal - News section	The latest scientific article about EMODnet Chemistry	Keep users and visitors informed on the latest publications	
14/12/2020	Online Communication Portal - News section	EMODnet Chemistry, Mercator Ocean International meeting on the MSFD data products portfolio	Keep users and visitors informed on the next events	
14/12/2020	PPT	MSFD portfolio containing CMEMS & EMODnet products - Current proposal	Show the EMODnet Chemistry proposal for the MSFD data products portfolio	EMODnet Chemistry, Mercator Ocean International meeting on the MSFD data products portfolio
15/12/2020	Online Communication Portal - News section	EUROqCHARM project: the first General Assembly	Keep users and visitors informed on the next events	
15/12/2020	Online Communication Portal - Publications section	Frontiers: Aggregated and Validated Datasets for the European Seas: The Contribution of EMODnet Chemistry	Make available the latest publications	
04/01/2021		New Year Newsletter	Inform on key success of previous year and on new partnerships under development	Dissemination to EMODnet Chemistry (on 27/12) and to SDC all + IMDIS (on 4/1)
	Article on website + emails	Monthly contribution to EMODnet NewsDigest	Inform on key progress and releases	
08/01/2021	Online Communication Portal - News section	4th Phase regional leaders videoconference: 11th January 2021	Keep users informed on the progress of the project	



08/01/2021	Online Communication Portal - News section	Happy new year from EMODnet Chemistry: 2020 Top 5	Keep users informed on the 2020 outcomes of the project	
12/01/2021	Online Communication Portal - Guidelines section	Seafloor data format template	Provide users with the template developed for seafloor data	
12/01/2021	Online Communication Portal - Guidelines section	Guidelines and forms for gathering marine litter data: beach and seafloor trawlings	Explain users how to easily collect and harmonize specific marine litter data following the EMODnet Chemistry methodology	
18/01/2021	Online Communication Portal - Reports to EU section	4th Phase 2020Q4 Trimonthly Report: October-December	Share with EMODnet Chemistry members and all users the outcomes of the latest 3 months of 2020	
20/01/2021	Online Communication Portal - Publications section	Environ.Res.Lett.: The quest for seafloor macrolitter: a critical review of background knowledge, current methods and future prospects	Make available the latest publications	
20/01/2021	Online Communication Portal - News section	Read the latest publication on seafloor macro-litter	make it easier to find the latest publications	
20/01/2021	Online Communication Portal - project meetings section	4th Phase Regional Leaders videoconference: 11 January 2021	Provide users with details on internal meetings	
25/01/2021	Online Communication Portal - Events section	EMODnet Chemistry at the OSPAR microplastic expert group meeting	Keep users and visitors informed on the upcoming events	
25/01/2021	Online Communication Portal - News section	3rd EMODnet Chemistry Project Group meeting in one week	Keep users and visitors informed on the upcoming events	
26/01/2021	Online Communication Portal - News section	4th Phase Regional Leaders meeting: 1 February 2021	Keep users and visitors informed on the upcoming events	
28/01/2021	Online Communication Portal - Media section	EU Science Hub: The quest for hidden marine litter	Raise people awareness and disseminate information	

28/01/2021	Online Communication Portal – Media section	GARR News: an ocean of data for a healthy planet (IT)	Raise people awareness and disseminate information	
29/01/2021	Online Communication Portal – Guidelines section	Proposal for Floating Marine Macro litter data management at European level	Keep users and visitors informed on the latest contribution of EMODnet Chemistry to EU ML data management	
03/02/2021	Online Communication Portal – project meetings section	4th Phase Project Coordination Group meeting: 2 February 2021	Provide users with details on internal meetings	
4/2/2021	EMODnet Chemistry Virtual backgrounds	Custom background to help branding the work of our community while also giving a more professional look to our participation in remote meetings	Tool for branding EMODnet Chemistry at on line events	Was sent to all people involved in EMODnet Chemistry + published among the promotion material available on the web portal (12/2)
	New mailing list with stakeholders outside main people involved in EMODnet	At last PG meeting, all participants and partners were invited to share new contacts to enlarge our diffusion mailing list for news and press-releases.	New mailing list created and slowly growing for outreach and awareness raising	SMHI & RBINS has provided a list of new contacts
09/02/2021	Online Communication Portal – project meetings section	4th Phase RLs Leaders meetings on 2nd data harvest for eutrophication and contaminants: 19Oct20-30Nov20-11Jan21-1Feb21	Provide users with details on internal meetings	
12/02/2021	Online Communication Portal – Poster and flyers section	EMODnet Chemistry virtual backgrounds for remote meetings	To promote sense of belonging in EMODnet Chemistry partnership	
12/02/2021	Online Communication Portal – News section	EMODnet cited as a pillar for HQ open-access data	Keep users and visitors informed on the role played by EMODnet Chemistry as EU gateway to HQ open-access marine data	
12/02/2021	Online Communication Portal – News section	EMODnet Chemistry on SEMED digital platform	Keep users and visitors informed on the role played by EMODnet Chemistry at Mediterranean scale	

24/02/2021	Online Communication Portal - News section	EMODnet Chemistry at the International Expert Meeting on Marine Plastic Litter Monitoring Data Sharing Project	Keep users and visitors informed on the upcoming events	
24/02/2021	Online Communication Portal - project meetings section	4th Phase meeting on DIVA maps for eutrophication: 18 February 2021	Provide users with details on internal meetings	
28/02/2021	Online Communication Portal - Media section	Linkiesta: Abbissi affollati (Crowded abysses)	Raise people awareness and disseminate information	
28/02/2021	Online Communication Portal - Video tutorial section (help desk)	Viewing and downloading products, 2019 (Phase 3)	Make it easy to use the viewing and downloading services	
22/03/2021	Online Communication Portal - News section	New HQ marine litter data for new HQ products	Keep users informed on the progress of the project	
22/03/2021	Online Communication Portal - Guidelines section	Quality Control steps for EMODnet Chemistry Eutrophication aggregated datasets - v2021	Keep users informed on the harmonization and validation process	
23/03/2021	Online Communication Portal - project meetings section	4th Phase meeting on DIVA maps for eutrophication: 16 March 2021	Provide users with details on internal meetings	
25/3/2021	Twitter post	Release of new maps on beach litter and seafloor litter in Europe		Published on account of Atlantic Strategy in Ireland (15 retweets, 2 citations, 17 like) including a retweet by National Hub France with a comment in French
26/03/2021	Online Communication Portal - News section	EMODnet Chemistry at the workshop Marine Data to support Aquaculture in the Mediterranean and Black Sea	Keep users and visitors informed on the upcoming events	

26/03/2021	Online Communication Portal - News section	The new marine litter products under the magnifying lens of the MSFD experts	Keep users and visitors informed on the upcoming events	
30/03/2021	Online Communication Portal - Publications section	RC Technical report: A Joint List of Litter Categories for Marine Macrolitter Monitoring	Keep users informed on relevant publications	
31/03/2021	Online Communication Portal - project meetings section	4th Phase MSFD board of experts meeting on new ML maps: 30 March 2021	Provide users with details on the most relevant meetings	
March 2021	LinkedIn post	Announcement of EMODnet Open Conference with a top message mentioning  "RBINS / BMDC is a partner of EMODnet-Chemistry and EMODnet-Data Ingestion. Join us for the Open Conference and Jamboree 2021 (hybrid event). Call for posters by 6 April #event #open #marine #data #chemistry #conference #EMODnetConference"	95 views	LinkedIn
April 2021	EMODnet Central Portal use case section	EMODnet Chemistry use case: A joint list of litter categories	Provide EMODnet partnership and users with detailed information on why and how EMODnet Chemistry contributed to the joint list of litter categories	
April 2021	EMODnet Central Portal news digest section	EMODnet Chemistry use case: A joint list of litter categories	Briefly inform EMODnet partnership and users on main EMODnet Chemistry monthly achievements	
06/04/2021	EMODnet Chemistry portal <a href="#">news section</a>	EMODnet Open Conference and Jamboree 2021: a vision for 2030	Briefly inform EMODnet Chemistry partnership and users on the main objectives of the EMODnet Open Conference and Jamboree 2021	
07/04/2021	EMODnet Chemistry portal <a href="#">project meeting section</a>	4th Phase meeting on DIVA maps for eutrophication: 30 March 2021	inform the partnership and users on the main topic discussed during a specific meeting and the resulting agreements and actions.	

08/04/2021	EMODnet Chemistry portal <a href="#">guidelines section</a>	Quality Control steps and dataset formats for EMODnet Chemistry contaminant aggregated datasets	provide detailed technical information on dataset formats and Quality Control checks made to get the regional data collections for contaminants	
April 2021	Poster abstract &	General poster (that could also serve as a printed leaflet as a leaflet when physical conferences will be held again). Title: <i>EMODnet Chemistry, a treasure for Marine Strategies</i>	Advertisement on the Chemistry website, shown at conference	Poster session - Shown in the Virtual Exhibition room of EMODnet Open Conference in June
April 2021	Creation of two mailing lists	New mailing lists were created with the help of the Chemistry Partners to grow the dissemination of the project and reach out to potential users and data submitters.	List 1 - Extra Outreach & Promotion contacts (people likely to publish our info on their institute websites, twitter, LinkedIn, newsletter, magazine)  List 2 - Extra Experts (likely to use the EMODnet data and products but not involved in the project)	Ongoing increase of contacts thanks to EMODnet Chemistry partners
12/04/2021	EMODnet Chemistry portal <a href="#">news section</a>	New marine litter data products: next meeting today	inform the partnership and users on coming meetings	
12/04/2021	EMODnet Chemistry portal <a href="#">news section</a>	EMODnet-CMEMS shared catalogue of products: next meeting on 15 April	inform the partnership and users on the coming meetings	
15/04/2021	EMODnet Chemistry portal <a href="#">event section</a>	International Conference on Marine Data and Information Systems: 12-14 April 2021	inform the partnership and users on the main events attended and/or organized by EMODnet Chemistry	
16/04/2021	EMODnet Chemistry portal <a href="#">use case section</a>	EMODnet Chemistry contributed to the Joint List of Litter Categories for Marine Macrolitter Monitoring	Provide EMODnet Chemistry partnership and users with detailed information on why and how EMODnet Chemistry contributed to the Joint List of Litter Categories for Marine Macrolitter Monitoring	
20/04/2021	Tweet on the Joint List of Litter Categories	EMODnet Chemistry contributed to the Joint List of Litter Categories for Marine Macrolitter Monitoring	Views 323 Total engagements 16 Like 4 Retweets 2	Published on the account of MarianneBiodiv

21/04/2021	EMODnet Chemistry portal <a href="#">event section</a>	EMODnet Steering Committee and TWG meetings: 19-21 April 2021	inform the partnership and users on the main events attended and/or organized by EMODnet Chemistry	
30/04/2021	EMODnet Chemistry portal <a href="#">guidelines section</a>	Guidelines and formats for gathering and management of micro-litter data sets on a European scale (floating and sediment micro-litter). Version 0 <a href="https://doi.org/10.6092/d3e239ec-f790-4ee4-9bb4-c32ef39b426d">https://doi.org/10.6092/d3e239ec-f790-4ee4-9bb4-c32ef39b426d</a>	provide detailed technical guidelines and formats for gathering and managing EU micro-litter data	
30/04/2021	EMODnet Chemistry portal <a href="#">event section</a>	European Geosciences Union: General Assembly, 19-30 April 2021	inform the partnership and users on the main events attended and/or organized by EMODnet Chemistry	
May 2021	EMODnet Central Portal news digest	Online the EMODnet Chemistry data collections 2021 EMODnet Chemistry: released a new beach litter data product	Briefly inform EMODnet partnership and users on main EMODnet Chemistry monthly achievements	
05/05/2021	EMODnet Chemistry portal <a href="#">report to EU section</a>	4th Phase: 2021Q1 Trimonthly Report, Jan-March	inform the partnership and users on the past 3 months achievements reported to the EC	
06/05/2021	EMODnet Chemistry portal <a href="#">project meeting section</a>	4th Phase meeting on DIVA maps for eutrophication: 13 April 2021	inform the partnership and users on the main topic discussed during a specific meeting and the resulting agreements and actions.	
07/05/2021	EMODnet Chemistry portal <a href="#">guidelines section</a>	Sediment micro-litter data format template <a href="https://doi.org/10.6092/a306cc44-b463-48e7-9540-cb9992ba30d9">https://doi.org/10.6092/a306cc44-b463-48e7-9540-cb9992ba30d9</a>	inform on and provide the template to be used to deliver data of micro-litter in sediment	
13/05/2021	EMODnet Chemistry portal <a href="#">project meeting section</a>	4th Phase meeting on DIVA maps for eutrophication: 6 May 2021	inform the partnership and users on the main topic discussed during a specific meeting and the resulting agreements and actions.	
13/05/2021	EMODnet Chemistry portal <a href="#">project meeting section</a>	4th Phase EMODnet and CMEMS shared data products meetings: Dec2020-May 2021	inform the partnership and users on the main topic discussed during a specific meeting and the resulting agreements and actions.	

19/05/2021	EMODnet Chemistry portal <a href="#">news section</a>	View and download the new data collections	Briefly inform EMODnet partnership and users on the new aggregated data sets available	
19/05/2021	EMODnet Chemistry portal <a href="#">news section</a>	Beach litter: the new maps are now available	Briefly inform the partnership and users on the new visualizations available for coastal litter	
21/05/2021	Promotional Video	Participation in the EMODnet4Policy video	inform on EMODnet Chemistry contribution to the MSFD implementation	Published on EMODnet YouTube channel
26/05/2021	EMODnet Chemistry portal <a href="#">project meeting section</a>	4th Phase meeting on DIVA maps for eutrophication: 18Feb-25 May 2021	inform the partnership and users on the main topic discussed during a specific meeting and the resulting agreements and actions.	
31/05/2021	EMODnet Chemistry portal <a href="#">event section</a>	Watch the webinar on micro-litter data management	inform the partnership and users on the main events attended and/or organized by EMODnet Chemistry	
31/05/2021	EMODnet Chemistry portal <a href="#">project meeting section</a>	4th Phase meeting with MSFD experts on new DIVA maps: 27 May 2021	inform the partnership and users on the main topic discussed during a specific meeting and the resulting agreements and actions.	
June/2021	EMODnet Central Portal use case section	Copernicus Marine and EMODnet joint data catalogue	Provide EMODnet partnership and users with detailed information on why and how Copernicus Marine and EMODnet collaborated to create a joint data catalogue	
June 2021	EMODnet Central Portal <a href="#">news digest section</a>	Copernicus Marine and EMODnet joint data catalogue	Briefly inform EMODnet partnership and users on the latest achievement brought about the collaboration between Copernicus Marine and EMODnet	
01/06/2021	EMODnet Chemistry portal <a href="#">news section</a>	Eutrophication: view and download the new maps	Briefly inform the partnership and users on the new visualizations available for eutrophication	
03/06/2021	EMODnet Chemistry portal <a href="#">project meeting section</a>	4th Phase meeting with the MSFD experts on new contaminant maps: 1 June 2021	inform the partnership and users on the main topic discussed during a specific meeting and the resulting agreements and actions.	



7/6/2021	Tweet Importance of EMODnet Chemistry for Marine Strategies	Promotion of the new video EMODnet for Policy	Views 345 Total engagements 14 Like 3 Retweets 1 With one comment in English.	Published on the account of MarianneBiodiv
7/6/2021	LinkedIn post on the Importance of EMODnet Chemistry for Marine Strategies	Promotion of the new video EMODnet for Policy	Views 326 Interactions 6	
08/06/2021	EMODnet Chemistry portal <a href="#">news section</a>	EMODnet Chemistry Project and SC meetings: 17 June 2021	inform the partnership and users on coming meetings	
08/06/2021	EMODnet Chemistry portal <a href="#">news section</a>	Watch the video EMODnet for Policy!	Promote the new EMODnet video, which EMODnet Chemistry participated in as it is an essential support for the MSFD implementation	
09/06/2021	EMODnet Chemistry portal <a href="#">news section</a>	A new catalogue to support the Marine Strategy Framework Directive: a joint Copernicus Marine and EMODnet initiative	Promote the new joint Copernicus Marine and EMODnet initiative	
9/06/2021	Tweets on Joint Portfolio with CMEMS	A new catalogue to support the Marine Strategy Framework Directive: a joint Copernicus Marine and EMODnet initiative	Views 377 Total engagements 11 Like 2 Retweets 2	Published on the account of MarianneBiodiv
9/06/2021	LinkedIn post on Joint Portfolio with CMEMS	A new catalogue to support the Marine Strategy Framework Directive: a joint Copernicus Marine and EMODnet initiative	Views 204	Published on the account of Marianne Schlessler
10/06/2021	Facebook (OGS account) message	A new catalogue to support the Marine Strategy Framework Directive: a joint Copernicus Marine and EMODnet initiative	Promote the new joint Copernicus Marine and EMODnet initiative	Facebook on the OGS account
11/06/2021	EMODnet Chemistry portal <a href="#">guidelines section</a>	EMODnet Visualization products for Beach Litter data <a href="https://www.emodnet-chemistry.eu/about/documents/EMODnet_Visualization_p">https://www.emodnet-chemistry.eu/about/documents/EMODnet_Visualization_p</a>	provide detailed technical information on how visualizations for Beach Litter data were generated	


		<a href="#">roducts for Beach Litter data</a>		
14/06/2021	EMODnet Chemistry portal <a href="#">event section</a>	EOSC Future project: kick-off meeting	inform the partnership and users on the main events attended and/or organized by EMODnet Chemistry	
14/06/2021	EMODnet Chemistry portal <a href="#">event section</a>	Festival of the Sea: let's get marine data free	inform the partnership and users on the main events attended and/or organized by EMODnet Chemistry	
14/06/2021	NODC/OGS portal <a href="#">Highlights section</a>	Festival of the Sea: let's get marine data free	Promote EMODnet Chemistry via other websites	
14/06/2021	Release on of the new promotion video "EMODnet Chemistry, a value for marine strategies" with subtitles in English and French (https://www.youtube.com/watch?v=4NobECD4k18)	Presentation of EMODnet-Chemistry portfolio (data, products and services), how you can make the most of it, and appreciate the strength of our network.	Inform on EMODnet Chemistry activities, structure and goals. Above 300 views in three days.	EMODnet Open Conference, published on EMODnet youtube channel
14/06/2021	<a href="#">EMODnet Central Portal video gallery</a>	New EMODnet Chemistry promotional and tutorial video included in the EMODnet Central Portal video Gallery.	Promote EMODnet Chemistry via other websites	
14/06/2021	EMODnet Chemistry portal <a href="#">news section</a>	News on EMODnet Chemistry promotional and tutorial video	Advertise the new EMODnet Chemistry video	
14/06/2021	EMODnet Chemistry Portal <a href="#">video gallery</a> (/videos/Emodnet_Chemistry_Youtube.mp4)	New EMODnet Chemistry promotional and tutorial video included in the EMODnet Chemistry video Gallery.	Increase the visibility of the new EMODnet Chemistry video	
14/06/2021	EMODnet Chemistry Portal <a href="#">Poster and</a>	Publication of the poster dedicated to the new EMODnet Chemistry promotional and tutorial video	Increase the visibility of the communication material dedicated to the new EMODnet Chemistry video	

	<a href="#">presentation section</a>			
14/06/2021	Email to all EMODnet Chemistry Consortium	News on the just released EMODnet Chemistry promotional and tutorial video	Inform all EMODnet Chemistry partners and members of the Advisory forum on the new video release	
14/06/2021	SeaDataNet website <a href="https://www.seadatanet.org/">https://www.seadatanet.org/</a>	New EMODnet Chemistry promotional and tutorial video included in different sections of the SeaDataNet website	Promote the new video via other websites	
15/06/2021	EMODnet Chemistry portal <a href="#">event section</a>	EMODnet Open Conference and Jamboree: Chemistry contribution, 14-18 June 2021	inform the partnership and users on the main events attended and/or organized by EMODnet Chemistry	
15/06/2021	EMODnet Chemistry portal <a href="#">news section</a>	What do stakeholders say about EMODnet Chemistry? Some answers from the EMODnet Open Conference	inform the partnership and users on some stakeholders' opinion on EMODnet Chemistry, that were collected during the EMODnet Open conference 2021	
16/06/2021	Poster + pitch presentation	Poster entitled "Combining multidisciplinary interoperable data products to support conservation and management of Mediterranean Sensitive Habitats: example of the North Adriatic maërl beds"	Communicate the importance of data interoperability among EMODnet lots	EMODnet Open Conference
16/06/2021	EMODnet Chemistry Portal <a href="#">Poster and presentation section</a>	Poster entitled "Combining multidisciplinary interoperable data products to support conservation and management of Mediterranean Sensitive Habitats: example of the North Adriatic maërl beds"	Increase the visibility of the Poster that won 1 <sup>st</sup> prize of the Poster session Visibility during virtual exhibition of posters and in plenary during the EMODnet Open Conference	
16/06/2021	EMODnet Chemistry portal <a href="#">news section</a>	Look at the best poster of the EMODnet Open Conference 2021 "Combining multidisciplinary interoperable data products to support conservation and management of Mediterranean Sensitive Habitats: example of the North Adriatic maërl beds"	inform the partnership and users that the best poster of the EMODnet Open Conference 2021 was designed by OGS, scientific coordinator of EMODnet Chemistry	


16/06/2021	Tweet on key messages from the discussion on EMODnet for Global with A. Giorgetti	EMODnet Open Conference 2021: Discussion on EMODnet for Global	Retweets 2 Like 10	
17/06/2021	EMODnet Chemistry portal <a href="#">event section</a>	"Alternative plastic" event: what examples of new and consolidated virtuous initiatives?	inform the partnership and users on the main events attended and/or organized by EMODnet Chemistry	
17/06/2021	NODC/OGS portal <a href="#">Highlights section</a>	"Alternative plastic" event: what examples of new and consolidated virtuous initiatives?	Promote EMODnet Chemistry via other websites	
17/6/2021	New promotion video "EMODnet Chemistry, a value for marine strategies"	Full visioning of the new EMODnet Chemistry promotional and tutorial video with the 65 participants of the EMODnet Chemistry Group Meeting.	Present EMODnet-Chemistry portfolio and appreciate the strength of our network.	EMODnet Chemistry Project Meeting
18/06/2021	EMODnet Chemistry portal <a href="#">project meeting section</a>	4th Phase Project and SC meetings: 17 June 2021	inform the partnership and users on the main topic discussed during a specific meeting and the resulting agreements and actions.	
18/06/2021	EMODnet Chemistry Portal <a href="#">Poster and presentation section</a>	Marine Litter Database and associated products	Increase the visibility of the IFREMER posterMarine Litter Database and associated products presented at the EMODnet Open conference 2021	
23/06/2021	EMODnet Chemistry portal <a href="#">use case section</a>	Joint Copernicus Marine & EMODnet catalogue: Chemistry contribution	Provide EMODnet Chemistry partnership and users with detailed information on how EMODnet Chemistry contribute to the Joint Copernicus Marine & EMODnet catalogue	
28/06/2021	EMODnet Chemistry portal <a href="#">news section</a>	EMODnet Chemistry Q&A: How EMODnet Chemistry supports marine strategies.	inform the partnership and users on how EMODnet Chemistry supports marine strategies and other topics through short monthly interviews	
28/06/2021	Tweet on 1 <sup>st</sup> Q&A with A. Giorgetti	EMODnet Chemistry Q&A: How EMODnet Chemistry supports marine strategies.	Views 521 Total engagements 20 Like 6	Published on the account of MarianneBiodiv

			Ouvertures des détails 6 Retweets 2	
28/06/2021	LinkedIn post on 1 <sup>st</sup> Q&A with A. Giorgetti	EMODnet Chemistry Q&A: How EMODnet Chemistry supports marine strategies.	Views 232 Reactions 5	Published on the account of Marianne Schlessler
July 2021	web news / central portal	2 EMODnet <u>news digest</u> - EMODnet Chemistry reaches one million datasets  EMODnet Chemistry, new maps!	Briefly inform EMODnet partnership and users on main EMODnet Chemistry monthly achievements	
01/07/2021	presentation	4th Phase: Experts meeting to revise the chemical groupings	Revise the chemical groupings with chemical experts	Meeting on chemical groupings with chemical experts
01/07/2021	web news	4th Phase: Experts meeting to revise the chemical groupings  EMODnet Chemistry portal <a href="#">project meeting section</a>	Inform the partnership and users on the main topic discussed during a specific meeting and the resulting agreements and actions.	
02/07/2021	presentation	HarmonIA Network meeting: 1 July 2021  EMODnet Chemistry portal <a href="#">event section</a>	Stress the key role played by EMODnet Chemistry in the HarMONIA project	HarmonIA Network meeting
02/07/2021	web news	HarmonIA Network meeting: 1 July 2021  EMODnet Chemistry portal <a href="#">event section</a>	Inform the partnership and users on the main events attended and/or organized by EMODnet Chemistry	
09/07/2021	LinkedIn post  Account Marianne Schlessler  #Followers 946	#WeAreAllOceanCitizens  <a href="#">Post</a> to promote the release of the Sulitest:  #WeAreAllOceanCitizens  Test your #OceanLiteracy skills with #SulitestSDG14 <a href="http://sulitest.org">http://sulitest.org</a>  See below how participants to the HLPF on Sustainable Development performed today during the launch of the Sulitest module on #SDG14 => We can all improve our knowledge of the #ocean	Increase visibility of the Sulitest to the network of colleagues  # likes / support 8  # views 301	

		#SDG14 #Youth4Ocean #OceanDecade #EU4Ocean #EMODnet #environment #sustainabledevelopment @Children4Oceans @TheBlueLeaders @SophieMirgaux @UNBiodiversity @Sulitest @EU_Mare @CMEMS_EU @OGS_IT		
09/07/2021	<a href="#">Twitter post</a>	#WeAreAllOceanCitizensVague Test your #OceanLiteracy skills with #SulitestSDG14 <a href="http://sulitest.org">http://sulitest.org</a> See below how participants to the launch of the module on #SDG14 performed today We can all improve our knowledge of the #ocean #SDG14 #Youth4Ocean #OceanDecade #EU4Ocean	Increase visibility of the Sulitest to the network of colleagues #Impression 174 #Engagements 18 #Reshare 1 #Likes 3	
16/07/2021	web publication UE report	4th Phase: 2021Q2 Trimonthly Report, Apr-June EMODnet Chemistry portal <a href="#">report to EU section</a>	Inform the partnership and users on the past 3 months achievements reported to the EC	
16/07/2021	web news	Q&A: How does EMODnet Chemistry contribute to address marine litter pollution? EMODnet Chemistry portal <a href="#">news section</a>	Keep partnership and users updated on the main EMODnet Chemistry objectives and achievements	
August 2021	web news / central portal	1 EMODnet <a href="#">news digest</a>	Briefly inform EMODnet partnership and users on main EMODnet Chemistry monthly achievements	
04/08/2021	<a href="#">LinkedIn post</a> Account Marianne Schlessler #Followers 946	Q&A: How does EMODnet-Chemistry contribute to address marine litter pollution? Read the points of view of two experts, from EC JRC and IFREMER <a href="https://lnkd.in/dPXFf3Pq">https://lnkd.in/dPXFf3Pq</a> #OurOcean #MarineData #OpenData #FAIRdata	Increase visibility of web news and the two videos "EMODnet for Policy" and "EMODnet Chemistry, a value for marine strategies" # Likes / support 2 # Views 247	

04/08/2021	<a href="#">Twitter post</a>	<p>Fighting oil spills: #EMODnetChemistry and #EMODnetHumanActivities were called in by EC JRC to provide their expertise in #MarineData management for data of acute #pollution events</p> <p>Discover how Flèche vers la droite <a href="https://emodnet-chemistry.eu/promotion/news/EMODnet_Chemistry_and_Human_Activities_against_contaminant_spills">https://emodnet-chemistry.eu/promotion/news/EMODnet_Chemistry_and_Human_Activities_against_contaminant_spills</a></p> <p>@EU_Mare @OGS_IT @EMODnet</p> <p>Photo by V.Kharlashkin</p>	<p>Increase visibility of web news and the</p> <p>#Impression 508</p> <p>#Engagements 14</p> <p>#Reshare 2</p> <p>#Likes 4</p>	
20/08/2021	web news	<p>The new EMODnet Chemistry phase: confirmed the Consortium.</p> <p>EMODnet Chemistry portal <a href="#">news section</a></p>	<p>Keep partnership and users updated on the main EMODnet Chemistry objectives and achievements</p>	
23/08/2021	web publication	<p>EMODnet Visualization products for Sea Floor Litter data</p> <p>EMODnet Chemistry portal <a href="#">guidelines section</a></p>	<p>Provide detailed technical information on visualization products for Sea Floor Litter data</p>	
23/08/2021	web news	<p>EMODnet Chemistry and Human Activities against contaminant spills.</p> <p>EMODnet Chemistry portal <a href="#">news section</a></p>	<p>Keep partnership and users updated on the main EMODnet Chemistry objectives and achievements</p>	
25/08/2021	<p><a href="#">LinkedIn post</a></p> <p>Account Marianne Schlessler</p> <p>#Followers 946</p>	<p><a href="#">Fighting oil spills</a>: #EMODnetChemistry and #EMODnetHumanActivities were called in by EC JRC to provide their expertise in #MarineData management for data of acute #pollution events</p> <p>Discover how  <a href="https://lnkd.in/diC-Rsvr">https://lnkd.in/diC-Rsvr</a></p> <p>@EU_Mare @OGS_IT @EMODnet</p> <p>Photo by V.Kharlashkin</p>	<p>Increase visibility of web news</p> <p># Reactions 3</p> <p># Views 187</p>	



04/08/2021	<a href="#">Twitter post</a>	<p>Q&amp;A: How does #EMODnet #Chemistry contribute to address marine litter pollution? #OurOcean #MarineData</p> <p>Read the points of view of two experts, from EC JRC and IFREMER <a href="https://emodnet-chemistry.eu/promotion/news/Q&amp;A_How_does_EMODnet_Chemistry_contribute_to%20address_marine_litter_pollution">https://emodnet-chemistry.eu/promotion/news/Q&amp;A_How_does_EMODnet_Chemistry_contribute_to%20address_marine_litter_pollution</a></p> <p>Watch the video =&gt;<a href="https://youtube.com/watch?v=QRkWe6Uy9Vg&amp;t=12s">https://youtube.com/watch?v=QRkWe6Uy9Vg&amp;t=12s</a> =&gt;<a href="https://youtube.com/watch?v=4NobECD4k18">https://youtube.com/watch?v=4NobECD4k18</a> @EU_Mare @OGS_IT</p>	<p>Increase visibility of web news and the two videos "EMODnet for Policy " and "EMODnet Chemistry, a value for marine strategies".</p> <p>#Impression 136 #Engagements 6 #Reshare 1 #Likes 3</p>	
25/08/2021	web news	<p>Q&amp;A: Why is standardization so crucial for unlocking science? And what has EMODnet Chemistry been doing for?</p> <p>EMODnet Chemistry portal <a href="#">news section</a></p>	Keep partnership and users updated on the main EMODnet Chemistry objectives and achievements	
03/09/2021	presentation	<p>Consultation on the 2023 UNEP/MAP MED QSR, 2 September 2021</p> <p>EMODnet Chemistry portal <a href="#">event section</a></p>	Show possible contribution of EMODnet Chemistry to the 2023 UNEP/MAP MED QSR	Consultation on the 2023 UNEP/MAP MED QSR
03/09/2021	web news	<p>Consultation on the 2023 UNEP/MAP MED QSR, 2 September 2021</p> <p>EMODnet Chemistry portal <a href="#">event section</a></p>	Inform the partnership and users on the main events attended and/or organized by EMODnet Chemistry	
06/09/2021	News (SOCIB institutional website)	<p>New SOCIB "CANALES" cruises BGC datasets available in SeaDataNet and Emodnet chemistry</p> <p><a href="https://www.socib.es/index.php?seccion=detalle_noticia&amp;id_noticia=488&amp;language=en_GB">https://www.socib.es/index.php?seccion=detalle_noticia&amp;id_noticia=488&amp;language=en_GB</a></p>	42 page views, 00:01:39 average time on page	
06/09/2021	News (SOCIB institutional account)	<p> New #SOCIB #CANALES Cruises BGC #Datasets available in @SeaDataNet and</p>	779 impressions, 31 interactions	

		@EMODnet chemistry Know more <a href="https://cutt.ly/rWTDRIh">https://cutt.ly/rWTDRIh</a> #ICTSNews #OceanData #OpenAccess <a href="https://twitter.com/socib_icts/status/1434825619217567744">https://twitter.com/socib_icts/status/1434825619217567744</a>		
08/09/2021	web news	Webinar on public marine data, 7 September 2021 EMODnet Chemistry portal <a href="#">event section</a>	Inform the partnership and users on the main events attended and/or organized by EMODnet Chemistry	Webinar on public marine data
September 2021	web news / central portal	2 EMODnet <a href="#">news digest</a>	Briefly inform EMODnet partnership and users on main EMODnet Chemistry monthly achievements	
14/09/2021	web news	The EMODnet 15th Steering Committee Meeting: Autumn 2021 EMODnet Chemistry portal <a href="#">event section</a>	Inform the partnership and users on the main events attended and/or organized by EMODnet Chemistry	
15/09/2021	presentation	Unlocking the potential of Ports and Harbours against Marine Litter: BlueMed workshop, 14 September 2021 EMODnet Chemistry portal <a href="#">event section</a>	Stress the key role played by EMODnet Chemistry in the ML data management and its openness to new collaborations and fields of application	BlueMed workshop
15/09/2021	web news	Unlocking the potential of Ports and Harbours against Marine Litter: BlueMed workshop, 14 September 2021 EMODnet Chemistry portal <a href="#">event section</a>	Inform the partnership and users on the main events attended and/or organized by EMODnet Chemistry	
24/09/2021	Abstract presentation +	IOC-UNESCO Ocean Best Practices Workshop 2021: 20-24 September EMODnet Chemistry portal <a href="#">event section</a>	Stress the key role played by EMODnet Chemistry in the ML data management and the latest best practices developed	IOC-UNESCO Ocean Best Practices Workshop
24/09/2021	web news	IOC-UNESCO Ocean Best Practices Workshop 2021: 20-24 September EMODnet Chemistry portal <a href="#">event section</a>	Inform the partnership and users on the main events attended and/or organized by EMODnet Chemistry	

25/09/2021	web news	UNESCO Ocean Best Practices Workshop 2021: 20-24 September OGS-NODC website <a href="#">news section</a>	Inform OGS-NODC website users on the main events that are also dealing with EMODnet Chemistry initiative	
27/09/2021	web news	Q&A: How are citizens contributing to EMODnet Chemistry? EMODnet Chemistry portal <a href="#">news section</a>	Keep partnership and users updated on the main EMODnet Chemistry objectives and achievements	
27/09/2021	web news	Trieste next 2021: open science at OGS OGS-NODC website <a href="#">news section</a>	Inform OGS-NODC website users on the main events that are also dealing with EMODnet Chemistry initiative	
27/09/2021	web news	Trieste next 2021: EMODnet Chemistry, an example of open science EMODnet Chemistry portal <a href="#">event section</a>	Inform the partnership and users on the main events attended and/or organized by EMODnet Chemistry	
30/09/2021	web publication	Frontiers e-book: The Environmental Hazards of Toxic Metals Pollution. EMODnet Chemistry portal <a href="#">publication section</a>	Promote the latest scientific articles based on EMODnet chemistry data	
30/09/2021	web news	EMODnet Chemistry on the Frontiers e-book: The Environmental Hazards of Toxic Metals Pollution. EMODnet Chemistry portal <a href="#">news section</a>	Promote the latest scientific articles based on EMODnet chemistry data	
July-September/2021	Promotion Video on YouTube	With the help of EMODnet Chemistry partners, subtitles in EN/FR have been added to the promotional video	Facilitate access to the work done by EMODnet Chemistry in U.N. languages (EN / FR)	

<b>B. Planned communication assets</b>			
Date	Communication material	Short description (of the material, title, ...) and/or link to the asset	Main results expected
October 2021	Promotion Video on YouTube	With the help of EMODnet Chemistry partners, subtitles in other UN languages RU/ ES + Chinese and further European languages (IT / DE / NL) will be added.	Facilitated access to the work done by EMODnet Chemistry in five U.N. languages (EN / FR / RU / ES + Chinese) and additional European languages (IT / DE / NL).
October /2021	Publication of an article	Q&A with A. Giorgetti in Horizon Magazine	Promotion through media in collaboration with Secretariat
Oct_Dec /2021	Web promotional material	OGS: EMODnet Chemistry ML data success story in EMODnet Ingestion. <a href="#">EMODnet Ingestion</a>	Promote EMODnet Chemistry by means of other EMODnet promotion channels
Oct_Dec /2021	Web promotional material	EMODnet Chemistry ML extended use case. <a href="#">EMODnet Ingestion</a>	Promote EMODnet Chemistry by means of other EMODnet promotion channels
Oct_Dec /2021	Video	Updated movie on webODV with a tutorial dedicated to contaminants	Step-by-step tutorial
Oct_Dec /2021	Web news + Socialmedia posts media + Email	Additional Chemistry use cases and key achievements in EMODnet monthly News Digest / on the Chemistry portal / in social media + Email	Routinely outreach and communication activities

*[Publications (e.g. peer-reviewed journals, book chapters, conference papers, etc.) that you are aware of using/referring to EMODnet data or data products within since the start of the project phase.]*

List of known publications using EMODnet data or data products				
Date	Type and name of journal, conference, ...	Publication title	Author(s)	Organisation(s)
11/12/2020	Frontiers	Aggregated and Validated Datasets for the European Seas: The Contribution of EMODnet Chemistry (doi.org/10.3389/fmars.2020.583657)	Alessandra Giorgetti, Marina Lipizer, Maria Eugenia Molina Jack, Neil Holdsworth, Hans Mose Jensen, Luminita Buga, George Sarbu, Athanasia Iona, Julie Gatti, Martin Larsen, Lotta Fyrberg, Ann Kristin Østrem and Reiner Schlitzer	Istituto Nazionale di Oceanografia e di Geofisica Sperimentale (OGS), Trieste, Italy International Council for the Exploration of the Sea (ICES), Copenhagen, Denmark National Institute for Marine Research and Development "Grigore Antipa", Constanța, Romania Hellenic Centre for Marine Research, Anavyssos, Greece French Research Institute for Exploitation of the Sea (IFREMER), Nantes, France Aarhus University, Aarhus, Denmark Swedish Meteorological and Hydrological Institute, Norrköping, Sweden Institute of Marine Research, Bergen, Norway Alfred-Wegener-Institute, Bremerhaven, Germany

19/01/2021	Environmental Research Letters	Environ.Res.Lett.: The quest for seafloor macrolitter: a critical review of background knowledge, current methods and future prospects (doi: 10.1088/1748-9326/abc6d4)	Miquel Canals, Christopher K Pham, Melanie Bergmann, Lars Gutow, Georg Hanke, Erik van Sebille, Michela Angiolillo, Lene Buhl-Mortensen, Alessandro Cau, Christos Ioakeimidis, Ulrike Kammann, Lonny Lundsten, George Papatheodorou, Autun Purser, Anna Sanchez-Vidal, Marcus Schulz, Matteo Vinci, Sanae Chiba, François Galgani, Daniel Langenkämper, Tiia Möller, Tim W Nattkemper, Marta Ruiz, Sanna Suikkanen, Lucy Woodall, Elias Fakiris, Maria Eugenia Molina Jack and Alessandra Giorgetti	Universitat de Barcelona, Universidade dos Açores, Alfred-Wegener-Institut, European Commission - Joint Research Centre (EC-JRC), Utrecht University, Istituto Superiore per la Protezione e Ricerca Ambientale (ISPRA), Stazione Zoologica Anton Dohrn (SZN), Institute of Marine Research, Università di Cagliari, Barcelona Convention Secretariat, Thünen Institute of Fisheries Ecology, Monterey Bay Aquarium Research Institute, University of Patras, Universität Osnabrück, Istituto Nazionale di Oceanografia e di Geofisica Sperimentale (OGS), Japan Agency for Marine-Earth Science and Technology (JAMSTEC), IFREMER, Bielefeld University, University of Tartu, Baltic Marine Environment Protection Commission, Finnish Environment Institute (SYKE), Marine Research Centre, University of Oxford
25/03/2021	EC-JRC technical report	Joint List of Litter Categories Manual (doi: 10.2760/127473)	David Fleet , Thomais Vlachogianni), Georg Hanke	LKN-SH/DE, MIO-ECSDE/G, EU Joint Research Centre, MSFD Technical Group on Marine Litter
23/08/2021	Methodology document describing the data management and calculation methods used to produce the EMODnet Chemistry	Visualization products for Seafloor Litter data – DOI: <a href="https://doi.org/10.13120/c622d045-94ed-4b6a-9c78-404e86b8b9a3">https://doi.org/10.13120/c622d045-94ed-4b6a-9c78-404e86b8b9a3</a>	Thomas A., Le Moigne M., Quimbert E., Molina Jack M. E., Vinci M., Cociancich A., Barth A., Holdworth N., Giorgetti A., Galgani F.	Ifremer, OGS, ICES, University of Liège

	seafloor litter visualization products.			
09/2021	Frontiers	The Environmental Hazards of Toxic Metals Pollution <a href="https://doi.org/10.3389/978-2-88971-343-1">https://doi.org/10.3389/978-2-88971-343-1</a>	Dragana S. Đorđević, Bernardo Duarte, Senthil Kumar Ponnusamy	University of Belgrade, Center for Marine and Environmental Sciences; SSN College of Engineering
25/09/2021	Marine Pollution Bulletin	Data quality and FAIR principles applied to marine litter data in Europe <a href="https://doi.org/10.1016/j.marpolbul.2021.112965">https://doi.org/10.1016/j.marpolbul.2021.112965</a>	Partescano E., Molina Jack M.E., Vinci M., Cociancich A., Altenburger A., Giorgetti A., Galgani F.	Istituto Nazionale di Oceanografia e di Geofisica Sperimentale (OGS); Institut Français de Recherche pour l'Exploitation de la Mer (Ifremer).
15/09/2021	Marine Pollution Bulletin	Marine debris database development using international best practices: A case study in Vietnam <a href="https://doi.org/10.1016/j.marpolbul.2021.112948">https://doi.org/10.1016/j.marpolbul.2021.112948</a>	Walker T.R., McGuinty E., Hickman D.	School for Resource and Environmental Studies, Dalhousie University, Halifax, Canada PHA Consulting Associates, Canning, Nova Scotia, Canada

## 9. Monitoring indicators

[Please refer to the standardised monitoring tool i.e. Matomo to complete the designated excel template on monitoring and progress indicators in annex, and provide a comment or short explanation on numbers and trends in the table below for each indicator when possible/applicable. **If monitoring was carried out using tools other than Matomo, please indicate clearly.**]

Comments on the progress indicators in the excel template		
Progress indicator	Means of collecting figures	Comment
1. Current status and coverage of total available thematic data  A) Volume and coverage of available data  <b>If you don't use the provided sea-basin figures, please indicate why you do not use them, as from when, and what do you use instead and why?</b>	CDI RSM service	For CDIs, a lot of quality control activities have been ongoing in this contract by Regional Coordinators validating regional data collections for eutrophication and contaminants and providing feedback to data providers for corrections. Moreover, a lot of new data sets have been entered. Due to this, multiple data sets have been deprecated which leads to some decreases in the matrix. However, following new submissions, overall there has been a major increase in data of circa 12%.
B) Usage of data since the start of the project phase	CDI RSM service	The total numbers for the previous contract and the new contract have been calculated and compared. For the downloads this gives a major increase of circa 170%.
2. Current status and coverage of total number of data products  A) Volume and coverage of available data products  <b>If you don't use the provided sea-basin figures, please indicate why you do not use them, as from when, and what do you use instead and why?</b>	Sextant Catalogue and Database queries done by OGS	Many new and updated data products. Mainly Eutrophication DIVA products.
B) Usage of data products since the start of the project phase	Matomo + Database queries done by	"There is a big increase in manual downloads, especially for Acidity.



	OGS based on metrics sent to the new web service (Analytics) by the different clients (Different download interfaces).	<p>As for 'map visualisations', marine litter and chlorophyll data products are the most popular. These values are missing from the previous Final report, so the trend is not available.</p> <p>Please note that we were able to supply 'Total Volume downloaded in GigaBytes' only from 2021-Q1 onwards, and not from October 2019. Hence, the real numbers are actually higher."</p>
3. Organisations supplying/ approached to supply data and data products since the start of the project phase	CDI RSM service	Overall a major increase has been achieved in number of CDI entries, while the group of data providers has increased from 64 to 66 with new connections of SOCIB (Spain) and CNR-IRBIM (Italy).
4. Online 'Web' interfaces to access or view data	Simple information collating.	No changes in this period.
6. Statistics on information volunteered through download forms	Data: CDI RSM service; Data products: Database queries done by OGS based on metrics sent to the new web service (Analytics) by the different clients (Different download interfaces)	<p>"The organisation type distribution for 'Data products (Aggregated Datasets) – webODV Data Explorer and Extractor' is quite different: more NGOs/Civil society and Other, and less for the other categories. We also see more European users via this interface which is dedicated to data collections.</p> <p>Please note that the interface 'Data products (Aggregated Datasets) – webODV Data Explorer and Extractor' is active only from the second half of the reporting period (from Q4 of 2020)"</p>

7. Published use cases	Grafana, based on data from Matomo.	<p>"Highest number of views both on Chemistry: 'EMODnet Chemistry infrastructure: the pillar of the HarmoNIA visualization tools'. On Central the most popular use case is 'EMODnet &amp; CMEMS together to build a framework for improving land boundary conditions in CMEMS regional products'.</p> <p>Matomo metrics starts only on 01/01/2020, while this report's period starts on 03/10/2019"</p>
9.1. Technical monitoring	Grafana, based on monitoring script launched by TRUST-IT	Excellent.
9.2. Visual Harmonisation score	Report by email from TRUST-IT.	Good Visual Harmonisation score.
10. Visibility & analytics for web pages	Grafana, based on data from Matomo.	<p>"Due to Portal's complexity, monitoring specific web pages is not representative. We recommend to focus on the web sections indicator since it summarises traffic of pages inside web sections, and not of individual pages.</p> <p>Naturally, Home page has the highest value. Below it we see Data and Products pages which have similar values.</p> <p>Values comparison for 'Total quarterly unique pageviews' in the beginning and in the end of the reporting period:</p> <p>Products,Data,Help,Home,Promotion,About</p> <p>429,603,73,2107,9,184</p> <p>377,487,39,2398,122,304</p> <p>Increases: Home,Promotion,About. Decreases: Products,Data,Help.</p> <p>Matomo metrics in all graphs starts only on 01/01/2020, while this report's period starts on 03/10/2019. Upon comparison to other nodes, metrics should be normalised."</p>

11. Visibility & analytics for web sections	Grafana, based on data from Matomo.	<p>"Naturally, Home web section has the highest value. Below it we see Products and Promotions sections.</p> <p>Values comparison for 'Total quarterly unique pageviews' in the beginning and in the end of the reporting period:</p> <p>Products,About,Data,Help,Home,Promotions,Marine Litter</p> <p>1777,367,685,1044,3036,8,105</p> <p>1382,1779,1791,1049,5116,1060,581</p> <p>Big increases for all web sections, except for Products (-22%). Biggest increase trends: Promotions ND Marine Litter. Help: a minor increase.</p> <p>Matomo metrics in all graphs starts only on 01/01/2020, while this report's period starts on 03/10/2019. Upon comparison to other nodes, metrics should be normalised."</p>
12. Average visit duration for web pages	Grafana, based on data from Matomo.	<p>"As expected, Data, Products and Home web pages have the highest values. There are big decreases in the visit durations, probably due to a change in the Portal's design. In this case we cannot refer to web sections graphs which could be more representative.</p> <p>Matomo metrics in all graphs starts only on 01/01/2020, while this report's period starts on 03/10/2019. Upon comparison to other nodes, metrics should be normalised."</p>

*The monitoring numbers reported as part of the progress monitoring of EMODnet performance are collected through Matomo. In some cases, numbers from other monitoring systems may also be reported (e.g. Awstats, Google Analytics). Each system uses different technical approaches and therefore has its strengths and shortcomings. Therefore, results are indicative and care should be taken with interpreting absolute numbers or comparing results from different tools. It is often more sensible to consider trends over time collected by the same monitoring tool.*

## 10. Recommendations for follow-up actions by the EU

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*[Give a list of recommendations and suggestions for the EU to consider and take action. Max 1 page.]*

EMODnet Chemistry decided, since its pilot phase, to adopt the SeaDataNet infrastructure, standards, tools and services as a basis, taking advantage of all developments undertaken by SeaDataNet with its core network of National Oceanographic Data Centres (NODCs) since the 1980s with the support of a range of EU RTD projects. SeaDataCloud, the EU H2020 project currently driving the further development of the SeaDataNet infrastructure, is officially ending per end October 2020, while it is essential to sustain with appropriate RTD funding its further developments. This for state-of-the-art FAIR standards and services and as an essential link between data observing programmes and networks, both from scientific and governmental monitoring departments, and overarching infrastructures like EMODnet, CMEMS, Blue-Cloud and European Open Science Cloud, being a major aggregator service in the European marine data management landscape.

Extend the scope of the project to neighbouring countries: EMODnet Chemistry already covers some non-EU countries on a voluntary basis. However, in certain areas (e.g. in the Mediterranean) it is of paramount importance to also include neighbouring countries to give a better coverage of the southern areas and strengthen the collaboration with the RSC (UNEP/MAP). Data might not be easily available, and additional financial resources might thus be required.

Organise a meeting with various DGs and agencies of the EU Commission potentially interested in MSFD monitoring data reporting (e.g. DG MARE, DG ENV, EC-JRC) to foster synergies and potentially extend the approach set up for beach litter data collection at EU scale to contaminants and eutrophication. Despite the efforts and the discussion within the EU technical groups, MSFD data flow is not always straightforward causing double reporting by EU member states, waste of resources, frustration and, paradoxically, less data availability. Therefore, it might be useful to explore the *modus operandi* promoted by EC-JRC and by the MSFD TG ML and the collaboration strategy between the consolidated systems (RSCs, ICES, EEA).

Request the introduction of the obligation to share data with EMODnet, to safeguard and make available new data to the scientific community. The example of the EU Eurofleets and EU Eurofleets+ projects, where the initiative is implemented at national scale by research vessel operators and making use of EMODnet and SeaDataNet services and mobilising the network of National Oceanographic Data Centres (NODCs) for handling underway and delayed mode scientific data sets as collected during research cruises.

## 11. Annex: EMODnet Chemistry Technical infrastructure

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*[List in Annex if you wish to provide any additional information.]*

The technical infrastructure for EMODnet Chemistry comprises a number of components, which are developed, maintained, and operated by a number of technical partners. These partners are members of the Technical Working Group which had progress / coordination meetings in March 2020 and February 2021. Technical activities have taken place on the following topics.

### **Checking present status and upgrading of basis functionality of portal and services:**

DG MARE and Secretariat made an assessment of the EMODnet Chemistry portal in February 2020, which resulted in a request for improvement of the website and making access to data and data products easier. As follow-up, a document was prepared with an amended layout and navigation of the EMODnet Chemistry portal, simplifying the homepage, and improving focus and access to services and to aggregated collections. As next step, the changes to the portal were deployed. As part of this reshuffling, also it was decided to place the CDI Data Discovery and Access service somewhat at a lower place, as the focus should be more on the data products and the three topics 'eutrophication, contaminants, and marine litter'. Furthermore, a matrix of downloadable validated data collections per MSFD region has been implemented prominently, while simplifying and lowering the presentation of the CDI matrix user interface. The MapViewer (new name for OceanBrowser) and the Product Catalogue (new name for Sextant catalogue) were maintained for publishing and giving access to all the products. Furthermore, developments were initiated for a Data Collection discovery and extractor service, adopting and adapting from the WebODV development of AWI in the SeaDataCloud project (see more details below).

### **Upgrading of CDI Data Discovery and Access service:**

As indicated earlier in WP2, EMODnet Chemistry makes use of the SeaDataNet Common Data Index (CDI) Data Discovery and Access service for gathering the chemistry observation data sets from in-situ observations and samples, and their successive laboratory analyses, by means of a large network of data centres. The CDI service also provides a central catalogue and shopping mechanism for finding and retrieving the gathered 'raw' data sets at granule level, which regularly are harvested for providing input to the Regional Coordinators as part of WP3 activities.

The CDI metadata format is based on the the ISO 19115 – 19139 standards for metadata, and is INSPIRE compliant (more explanation later) and made fit for describing marine data in a FAIR (Findable, Accessible, Interoperable, and Reusable) way. For the CDI data discovery and access service a major upgrading had taken place in the EU H2020 SeaDataCloud project and this upgrade was adopted and adapted for EMODnet Chemistry. The upgraded SeaDataNet CDI service was launched in October 2019, and the derived EMODnet Chemistry version was released early November 2019. The upgrade has been achieved by joint developments of the SeaDataNet network of NODCs and EUDAT, a leading European network of academic computing centres. The new architecture makes a distinction between the front-end with discovery, shopping and downloading of data sets by users, and the back-end for importing new and updated CDI metadata and related data entries (including versioning) by data centres. The separation is achieved by introducing a central data cloud, which holds copies of all unrestricted data sets by replication from the connected data centres, and which serves as a central data cache for efficiently executing user shopping requests. While restricted data sets still are stored only at the connected data centres and transferred through the new system to users for downloading, once the data provider has agreed with providing access.



The new CDI User Interface gives users powerful search options by combining free search, facet search and geographic search options, powered by Elastic Search, SQL search, and Geo Server. The data access function comprises a simple and effective data shopping, tracking and download service mechanism. All functions for both users and data providers can be reached from a new MySeaDataNet dashboard, depending on the Marine-ID credentials of users, and associated registered functions and roles. Searching and browsing can be done anonymously, while shopping by users and import by data providers require authorisation and authentication by means of the Marine-ID AAI service, which is operated by SeaDataNet. Login is required for logistic reasons, and because many data providers require justification of the use of their data. Through the MySeaDataNet dashboard, the shopping process now has an integrated dialogue instead of having to go to separate applications and URLs, for example for searching, registering, checking shopping progress, and retrieving data sets. This makes the dialogues for users and providers much more efficient, and easy to understand and perform. Furthermore, several processes and functionalities have been reviewed and optimised, including performances, which again is in favour of the users and data providers.

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quality procedures, and by supporting data providers in the adoption and configuration of the new services for import and format checking.

The user interface for EMODnet Chemistry is different from the overall user interface for SeaDataNet as it has several search criteria which are purely focused and relevant for the Chemistry data collection and its users. This includes criteria for searching on matrix (water column, sediments, biota), chemistry substances (P36 vocabulary with terms such as 'heavy metals', 'fertilisers', 'Pesticides and biocides', and others), ICES areas, HELCOM areas, OSPAR areas, and MSFD regions as special terms next to the regular where, when, who, and how search criteria in order to satisfy MSFD user requirements.

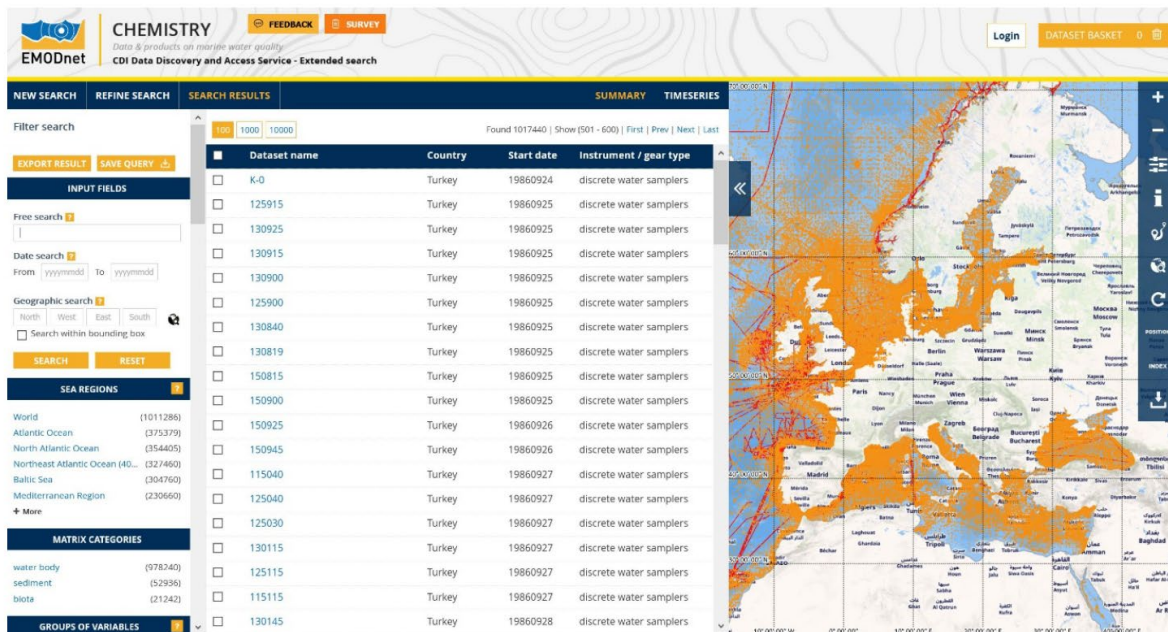
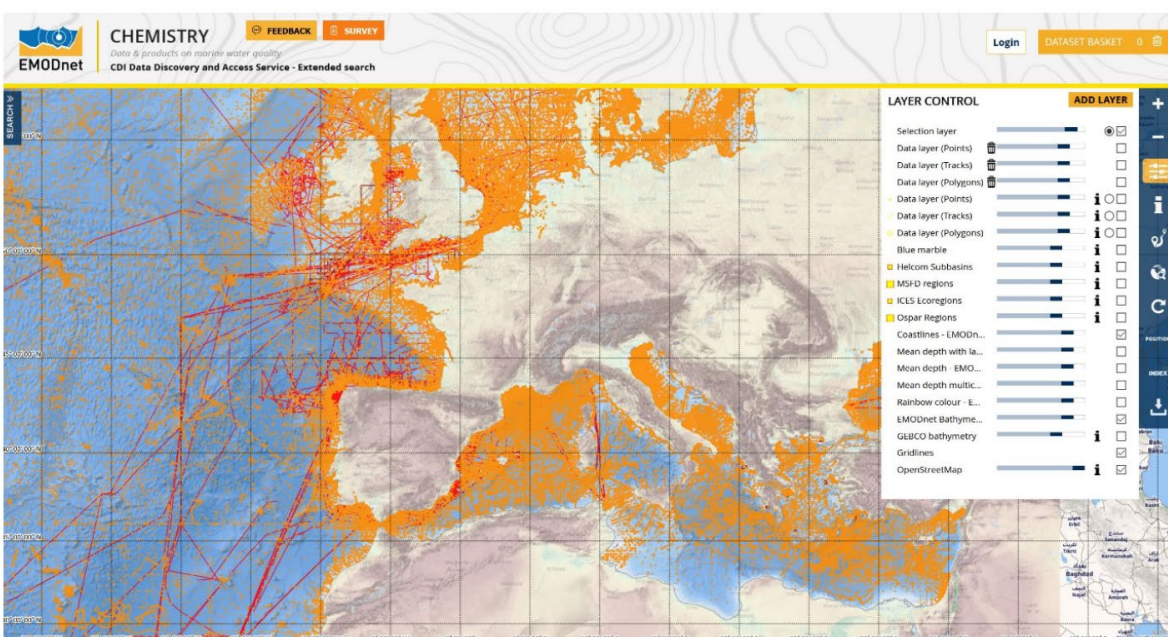


Figure: User Interface of upgraded CDI service



*Figure: Large mapping interface as part of the User Interface of upgraded CDI service*

### **MSFD regions:**

The MSFD regions are used for tagging CDI records and for harvesting data sets, which then are provided as 'raw' data collections to the Regional Coordinators for their validation, aggregation, and harmonisation activities. The first version of boundaries of MSFD regions was given by EEA to the project during the previous project. However, overtime a new formulation became available which consists of four main regions (Black Sea, Mediterranean, Baltic Sea, and North-West Atlantic Ocean (including Greater North Sea)). Due to this change, a new tagging had to be prepared for all CDI entries and for amending the filters for the buffers which are used for regularly harvesting the relevant data collections. The new MSFD region coverage is included as a map layer in the CDI service interface.

### **INSPIRE WMS-WFS services:**

Upon request of the EMODnet Secretariat a number of activities were undertaken for the OGC WMS – WFS services of EMODnet Chemistry to make them INSPIRE compliant by including metadata for data URLs and metadata URLs for each map layer using the GeoServer CMS and by extra entries in the Sextant catalogue service.

### **Web forms harmonisation:**

There are several ways for downloading products, namely directly from the new products matrix, Sextant catalogue, and Map Viewer. The web order forms were harmonised and all support handling registered users via Marine-ID or free text with mandatory email address.

### **Marine Litter database system and products generation and publishing:**

Currently, EMODnet Chemistry has procedures and protocols for gathering and processing of three types of Marine Litter, namely beach litter, seafloor litter, and micro litter (floating and in sediment). For formats, classifications, and gathering procedures, cooperation and tuning took place with TG-ML and EU-JRC. For the first two ML types, two central databases have been set-up at OGS, while for floating micro litter use is made of CDI and adapted ODV formats. For access, use is made of the CDI service for all three ML types, whereby OGS generates the CDIs from the two central databases, acknowledging the data curators in the CDI metadata. While, in addition mapping products are generated and published as map layers.

- For **Beach Litter** there was no structured QC loop towards data providers as already in place for other kinds of data (such as eutrophication and contaminants). A strong quality check process has been developed and progressively upgraded by OGS before db ingestion; afterwards CDI and ODV files are made, and populated, and data products are generated. Data products creation is an important post-ingestion quality control step, together with specific queries and GIS geoprocessing. Some of the main quality issues pointed out are: wrong beaches/surveys coordinates (on land), missing EDMOs (originator)/ beach country (excluding MLW), missing EDMERP, and duplicate data received from different collators. This gives delays in data publication, updates and/or deactivation of CDIs which is resources consuming and not meeting project deadlines. To prevent it, the pre-ingestion validation phase was successfully put in place and upgraded to streamline the data management workflow
- For **Seafloor Litter** there is a comparable situation and process as for Beach Litter. Quality issues concern exists for ICES and DeFishGear data: doubtful/wrong hauls lengths/coordinates/ trawling distance (zero or too long, on land); tracks on land. These give again delays in data publication, updates and/or deactivation of CDIs which is resources consuming and not meeting project deadlines. To overcome it, a pre-ingestion validation phase was successfully implemented to streamline the data management workflow and prevent the ingestion of bad quality data.



Actions were undertaken for solving these issues. Formats were updated, where needed, and QA-QC of beach and seafloor litter input was improved, among others by keeping more contact with data providers, further structuring of the organisation of data gathering and reporting, in cooperation with TG-ML, EC-JRC, and involved data aggregators such as MCS, ICES, MEDITS, UNEP-MAP, and others. And with ICES the procedure for harvesting of Datras Seafloor Litter data was discussed and improved. As part of this process, many initial CDI entries were de-activated and later upgraded with the correct entries.

Most recently, a proposal was finalised and published for expanding the Marine Litter data management portfolio of EMODnet Chemistry with **Floating Marine Macro Litter (FMML)**. Again, this was prepared in cooperation with the TG-ML and EC-JRC. FMML only seems to be relevant for the Mediterranean Sea as OSPAR and HELCOM do not consider FMML as an indicator. Items should be > 2,5 cm. The process towards handling FMML data was started in February 2019 with a EC-JRC- FMML-Workshop where active communities were identified. There were two slightly different reporting forms in use, one for coastal areas (Italian form), and one for open seas (English form). As an outcome of the Workshop, activities were undertaken by OGS, in discussion and cooperation with TG-ML, and EC-JRC, for a new approach, adopting and adapting the CDI and ODV format as done already for Floating Micro Litter. However, the conclusion of the analysis suggested that it is better to wait for an improvement in the standardisation of the sampling protocols and reporting units.

Another new ML data type are **Seafloor Litter Images and Videos**. These are collected by a few institutes such as IFREMER in its RAMOGE cruise and ISPRA. Interactions were undertaken with JAMSTEC (Japanese environmental agency) who set up a data management system for such data, and Oceanobs'19 community. Additionally, EC-JRC organized a workshop for brainstorming and a research paper ('Seafloor litter quest') was published. There are challenges for setting up such a system, linked to the possible volumes and required bandwidth. OGS made a proposal with a list of relevant metadata and data, but further clarifications are needed before starting the data management

Marine Litter data are used to produce **Aggregated Collections**: for **beach** respectively **seafloor** litter, in EMODnet Beach litter data format Version 1.0 (spreadsheet file composed of 4 sheets: beach metadata, survey metadata, animals and litter) respectively in EMODnet Sea-floor litter data format Version 1.0 (csv format, tab separated values). These products are included in the EMODnet Chemistry Products catalogue with metadata and DOI. While **ML maps** are generated at intervals for beach litter and seafloor litter data collections, and these are published through the Map Viewer while documented in the Products Catalogue. A paper was written and published on this: <https://doi.org/10.6092/ef4901d2-642a-4881-ba81-6b2607f5485e>. Further steps were taken for fully streamlining the process: 1) input data collections are delivered from OGS to IFREMER; 2) IFREMER loads these files into a local GIS for a number of analytics and statistics, resulting in the EMODnet maps; 3) integration in the Map Viewer is done by OGC WMS – WFS, and as Shape files and PNGs for downloading.

### **Streamlining the process for generation and publishing of Contaminants maps:**

Contaminant maps are produced on the basis of the harmonised contaminants data collections as produced by the Regional Leaders. Additional central validation and harmonization is needed between the regional data collections. For instance, new P01 registrations should be moderated to keep more balance in use of P01s and for educating somewhat different data providers. For that purpose, OGS prepared and shared a document with extra instructions to Regional Leaders and OGS cooperated with ISPRA to optimize the input for the maps process. For the latter, ISPRA has designed and deployed a workflow for producing the different contaminant maps after receiving the data collections. For this purpose, ISPRA has set up a GeoDB for loading the data sets and then performing analytical processing

for the maps. Also, ISPRA has set up a spatial infrastructure for publishing the resulting maps in WMS, WFS, and sharing as images, for integration into the Map Viewer.

### Making use of SDC VRE developments for extraction of regional data collections:

As part of the H2020 SeaDataCloud project a prototype VRE has been developed, which was launched around September 2020 at: <https://www.seadatanet.org/Software/VRE>. It includes a prototype of the WebODV application as developed by AWI, which is an online version of the highly successful ODV software. Derived from this WebODV prototype, AWI undertook steps towards a WebODV Explorer and Extractor which allows to browse through and make subsets from ODV data collections. Considering the earlier discussion with EU and EMODnet Secretariat for making the finding and extracting of data sets easier for all kinds of users, it was decided to adopt and adapt the WebODV Extractor for facilitating to explore, subset, visualize, and extract data sets in multiple formats from the harmonized, standardized, validated data collections that EMODnet Chemistry is regularly producing and publishing for all European sea basins for **eutrophication** and **contaminants**. During the second contract year, **webODV Data Explorer and Extractor** was successfully configured and deployed, first with a trial version and later fully operational. It enables users to explore, subset, visualize, and extract data from the EMODnet Chemistry aggregated and validated data collections. Initially only for eutrophication, which was announced with a press release, accompanied by an online tutorial and a complete set of operative explanatory manuals. This was followed by including also access and extraction of the contaminants data collection. Expanding the interfaces for handling the contaminants data collections was very challenging due to the complexity of many different contaminants variables and how to make meaningful extractions and graphics. The online webODV service now provides a low threshold for MSFD users and research community to make full use of the EMODnet Chemistry data products, e.g. for use in environmental assessments. WebODV offers scientists easy options for exploring these data collections as a 'treasure box', allowing them to do fundamental science and prepare graphics, like ocean sections of specific parameters. These can include interpolations using the integrated DIVA tool, which adds to making graphics, ready for scientific abstracts and papers.

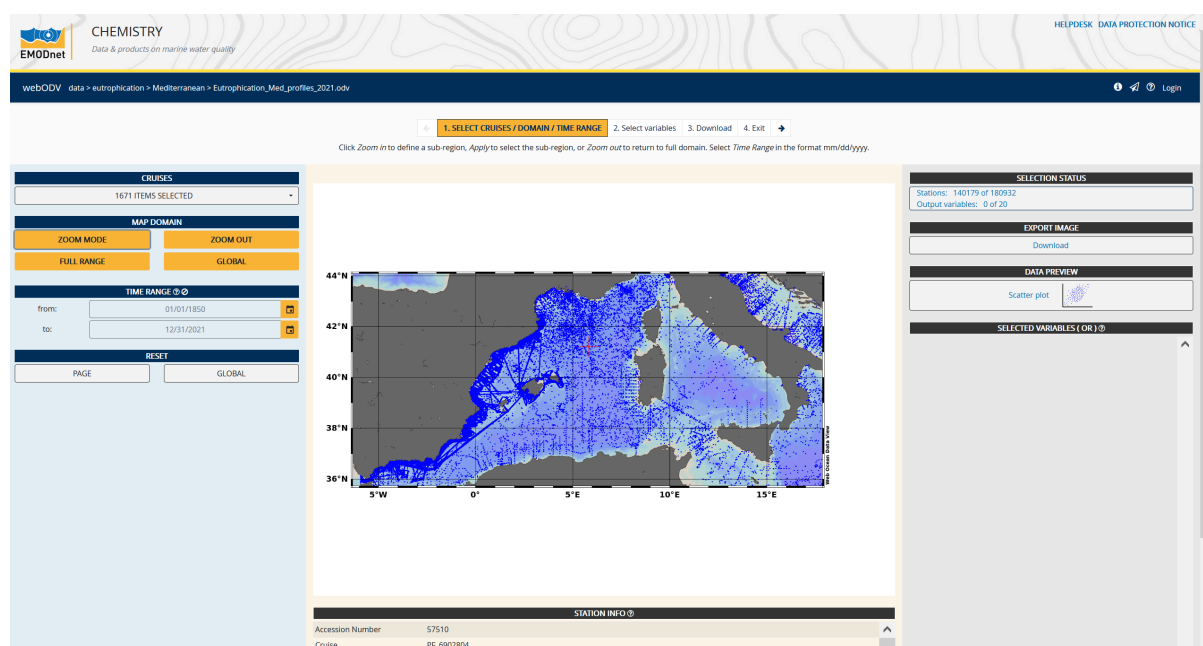


Figure: Screenshot of the new WebODV Extractor service for harmonised data collections for eutrophication and contaminants

### INSPIRE Compliance:

The SeaDataNet CDI metadata schema is based upon the ISO 19115 content standard, while for XML encoding it is based upon the ISO 19139 Schemas, which are also the basis for the INSPIRE metadata standards. Through earlier contacts with the INSPIRE team of the EC-Joint Research Centre (EC-JRC) it was ensured that the CDI schema is INSPIRE compliant since 2013. However, around 2018, the INSPIRE ISO 19139 metadata schema (V11) has been updated, but also the INSPIRE metadata validator was replaced. Again, tests were undertaken with the INSPIRE Executable Test Framework (ETF) metadata validation reporter. It appeared, that the validator was not able to accept CDI XML documents any more, which were earlier ok. From this moment, a constructive discussion took place between the SeaDataNet/EMODnet community and the INSPIRE EC-JRC team to help solving the different issues, such as **'XML encoding test', 'Metadata for discovery test', and 'Metadata for interoperability'**. As a consequence, an updated version of the SeaDataNet CDI XML schema (Version 12.1.0) was released in December 2019 which included several changes. Likewise, the release of an upgraded version of the ETF INSPIRE metadata validator service (<http://inspire.ec.europa.eu/validator/>) was made by the INSPIRE team. Tests were undertaken, which highlighted the conformance of the updated SeaDataNet CDI XML schema (Version 12.1.0) with the current INSPIRE metadata validator. As a result, all XML outputs of the CDI services at SeaDataNet, EMODnet Bathymetry, EMODnet Chemistry and EMODnet Physics portals are now fully INSPIRE compliant again, which makes all the contributors of these portals also fully compliant with INSPIRE. End 2020, EMODnet Chemistry, as a member of the Marine Strategy Framework Directive (MSFD), Common Implementation Strategy (CIS) Technical Group on Marine Data (TG DATA), presented the progress with developing an INSPIRE Transformation service for SeaDataNet – EMODnet Chemistry as part of the CDI Data Discovery & Access service. Finally, in the last quarter of 2020, further INSPIRE optimization took place for the EMODnet Chemistry products catalogue, following the Technical Guidance for the implementation of INSPIRE View Services, and also tuning with the EMODnet Technical Working Group. As a result, the EMODnet Chemistry products catalogue now provides INSPIRE metadata fields, including a data URL and a metadata URL and this metadata description links users to OGC services available on the product, as WMS and WFS services. There is also an OGC CSW service for the products catalogue itself.

INSPIRE standards are not stable, and there is an ongoing discussion at INSPIRE with proponents and opponents of accepting community profiles. This implicates, that monitoring these developments stays necessary and we should be prepared to make new amendments, if needed in the near future.

## 12. List of abbreviations and acronyms

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**AU-DCE**, Danish Centre for Environment and Energy

**AWI**, Alfred Wegener Institute

**BODC**, British Oceanographic Data Centre

**137Cs, Caesium-137 CDI, Common Data Index**, provides a highly detailed description of the data, answering to the questions: where, when, how and who collected the data, and how to get them. One CDI describes a data series which can be a vertical profile on a fixed location, a time series or a trajectory data set.

**CMEMS**, the Copernicus Marine Environment Monitoring Service (led by Mercator-Océan).

**CSR**, Cruise Summary Report is a metadata service of SeaDataNet

**DCs**, Data Centres

**D8** and **D9**, Descriptor 8 (Contaminants) and Descriptor 9 (Contaminants in seafood) of the Marine Strategy Framework Directive

**DDT**, para-diclorodifeniltricloroetano

**DeFishGear**, Derelict Fishing Gear Management System in the Adriatic Region is the 3-year long project implemented within the framework of the IPA Adriatic Cross-border Cooperation Programme, co-funded by the European Union.

**DIN** is Dissolved Inorganic Nitrogen.

**DIP** is Dissolved Inorganic Phosphorus.

**DIVA, Data-Interpolating Variational Analysis**, is a software tool that allows to spatially interpolate (or analyse) observations on a regular grid in an optimal way.

**DIVAnd** (Data-Interpolating Variational Analysis in n dimensions) software.

**DOI**, Digital Object Identifier

**DTM**, Digital Terrain Models

**EC -JRC**, European Commission Joint research Centre

**EDMERP**, European Directory of Marine Environmental Research Projects is a metadata service of SeaDataNet

**EDMO** is the European Directory fo Marine Environmental Data.

**EEA**, European Environment Agency

**EQS**, Environmental Quality Standards.

**EQSD**, Environmental Quality Standards Directive (Legislative instrument).

**EU EASME**, Executive Agency for Small and Medium-sized Enterprises

**GES** is Good Environmental Status.

**HCB**, Hexachlorobenzene

**HCMR**, Hellenic Centre for Marine Research

**HELCOM** Convention = Baltic Marine Environment Protection Commission is the governing body of the Convention on the Protection of the Marine Environment of the Baltic Sea Area, known as the Helsinki Convention.

**ICES**, International Council for the Exploration of the Sea

**IFREMER**, French Research Institute for Exploitation of the Sea

**IMR**, Norwegian Institute of Marine Research

**INSTAC** is the In Situ Thematic Assembling Centre of CMEMS in charge of in-situ data delivery.

**LOD**, Limit Of Detection, means the output signal or concentration value above which it can be affirmed, with a stated level of confidence that a sample is different from a blank sample containing no determinand of interest.

**LOQ**, Limit Of Quantification, means a stated multiple of the limit of detection at a concentration of the determinand that can reasonably be determined with an acceptable level of accuracy and precision. The limit of quantification can be calculated using an appropriate standard or sample, and may be obtained from the lowest calibration point on the calibration curve, excluding the blank.

**MEDITS** is the International bottom trawl survey programme in the Mediterranean.

**MED POL**, Programme for the Assessment and Control of Marine Pollution in the Mediterranean, the first Mediterranean Action Plan operational programme

**Med QSR 2023**, UNEP/MAP Mediterranean Quality Status report that will be released in 2023

**MSFD** is the Marine Strategy Framework Directive.

**NIMRD**, National Institute for Marine Research and Development “Grigore Antipa”

**NODC**, National Oceanographic Data Centre defined within the International Oceanographic Data Exchange (IODE) System of the UNESCO Intergovernmental Oceanographic Commission (IOC).

**Ocean Browser** is the EMODnet Chemistry data products viewing and downloading service that allows users to visualize gridded fields on-line. It is based on open standards from the Open Geospatial Consortium (OGC), in particular Web Map Service (WMS) and Web Feature Service (WFS).

**ODV, Ocean Data View**, is a freely available software package that provides interactive exploration, analysis and visualization of oceanographic and other geo-referenced profiles or sequence data. ODV and NetCDF data file formats are used as mandatory data exchange formats in SeaDataNet/EMODnet Chemistry.

**OGC-CSW**, Open Geospatial Consortium Catalog Service for the Web

**OGC-MCS**, Open Geospatial Consortium metadata catalogue service

**OGC- WFS**, Open Geospatial Consortium Web Feature Service

**OGC WMS**, Open Geospatial Consortium Web Map Service

**OSPAR** Convention is the Convention for the Protection of the Marine Environment of the North-East Atlantic.

**P01** = British Oceanographic Data Centre (BODC) Parameter Usage Vocabulary, is one of SeaDataNet Common Vocabularies based upon a semantic model that is the simple

concatenation of three ‘themes’ (what, where/matrix and how/methods) and used to describe individual measured phenomena in ODV data transport format. P01 are narrower terms of P02. At present P01 already contains more than 30.000 concepts.

**P02** = SeaDataNet Parameter Discovery Vocabulary, is one of SeaDataNet Common Vocabularies describing fine-grained related groups of measurement phenomena designed to be used in dataset discovery interfaces (namely CDI metadata records).

**P36** = EMODnet chemistry lot aggregated parameter names, is one of SeaDataNet Common Vocabularies used to facilitate data aggregation and data labelling (as in products description).

**239Pu**, Plutonium-239

**QA/QC** = Quality Assurance/Quality Control.

**RL** = EMODnet Chemistry Regional Leaders as identified in the Technical Proposal (WP3.1).

**Robot Harvester** is the system used for discovery and gather data from SDN infrastructure of distributed NODCs via the CDI Discovery and Shopping mechanism with an almost full automatic method. It is configured to harvest data on selected sea areas (or MSFD regions) and for specific chemical parameters.

**ROV/AUV**, Remote Operative Vehicle and Autonomous Underwater Vehicle

**RSC** are Regional Sea Conventions.

**SC** = Steering Committee.

**SDN**, SeaDataNet is the pan-European infrastructure for ocean & marine data management sponsored within FP7 (grant agreement 283607, 1/10/2011-30/9/2015) linking more than 100 national oceanographic data centres and marine data centres from 35 countries riparian to all European seas.

**Sextant** products metadata catalogue is the EMODnet Chemistry data products discovery service used for searching Chemistry data products and linking to the viewing service.

**SMHI**, Swedish Meteorological and Hydrographical Institute

**TBT**, Tributyltin

**TG DATA** is the MSFD Common Implementation Strategy Technical Group on Marine Data.

**TG ML** is the MSFD Common Implementation Strategy Technical Group on Marine Litter.

**TN** is Total Nitrogen.

**TP** is Total Phosphorus.

**TPT**, triphenyltin chloride

**TOC** is Total Organic Carbon.

**ULg**, University of Liège

**UNEP/MAP** is the United Nations Environment Programme, Mediterranean Action Plan for the Barcelona Convention adopted by 16 Mediterranean countries and the European Community.

**VRE**, Virtual Research Environment.

**WPS**, Web Processing Services.