EMODnet - Ingestion and safe-keeping of marine data

CINEA/EMFAF/2021/3.4.10/02/SI2.868290

Start date of the project: 30/03/2022 (24 months)

Centralisation Phase

Interim Progress Report

Reporting Period: 30/03/2022 – 29/03/2023

The European Marine Observation and Data Network (EMODnet) is financed by the European Union under Regulation (EU) 2021/1139 of the European Parliament and of the Council of 7 July 2021 establishing the European Maritime, Fisheries and Aquaculture Fund and its predecessor, Regulation (EU) No. 508/2014 of the European Parliament and of the Council of 15 May 2014 on the European Maritime and Fisheries Fund.

Contents

1. Introduction

Many data collected by public authorities, researchers and private operators of coastal or offshore facilities still do not arrive to national or regional repositories and are thus unavailable to potential users. This creates additional costs for those working on marine issues who will have the choice of accepting lower confidence in their analysis than would otherwise be the case, or being compelled to needlessly repeat observations. There is therefore the need to streamline the data ingestion process so that data holders from public and private sectors can easily release their data for safekeeping and subsequent distribution through EMODnet or other means.

In 2016 a first contract was concluded for developing a service for ingestion and safe-keeping of marine data. In that context, a Data Ingestion Portal has been developed, which facilitates data managers to ingest their marine datasets for further processing and publishing as open data. In 2019, a second contract was agreed with the same consortium for continuing the Ingestion service for another two years. This has been succeeded by a third contract, starting 30st March 2022, concluded between EU CINEA and almost the same consortium for a 2 years duration with an option for a seamless continuation with another 2 years. The general objective is to facilitate and streamline the process whereby marine data from whatever source (including national monitoring programmes, research projects and private companies) is delivered on a voluntary basis for safekeeping to data repositories from where it can be freely disseminated.

The EMODnet Ingestion no 3 consortium brings together a European consortium of overall 43 organisations (marine research institutes, governmental agencies, and SME's) from 27 coastal countries. Together they continue the EMODnet Ingestion service by means of technical operation and maintenance of the technical components and by marketing and processing of ingested submissions for publication and wider distribution via national, regional, European and EMODnet portals. Geographically the overall network has nodes in the countries around all European marine basins and it covers also all EMODnet data themes. Most members are data centres and are qualified as National Oceanographic Data Centres (NODC) recognised by the International Oceanographic Data and Information Exchange (IODE) of the Intergovernmental Oceanographic Commission (IOC) of UNESCO or as National Geological Surveys or as National Hydrographic Agencies. Moreover, all EMODnet thematic projects are represented by their coordinators.

This interim progress report will describe the activities and results achieved during the first year of the EMODnet Ingestion and safe-keeping of marine data no 3 contract, which ran from 30th March 2022 to and including 29th March 2023.

2. Update on the Tasks

Task 1: Maintain, further develop and migrate a web-portal

During the reporting period the EMODnet Ingestion portal and its services were maintained and care was taken to ensure that all services continued to operate as required. Maintenance involves: content updates; adding new data centres contacts; manual work on submitted metadata mapping and missing values, automatic updating of Submission service vocabularies on a regular basis; exchange (JSON) of Submission service with Summary service; users support. Furthermore, a number of technical upgrades and improvements were developed and deployed.

Early January 2023, the Central Portal has been launched, bringing and publishing together the output of all EMODnet thematic groups through one shop-window. Migration of EMODnet Ingestion is next on the list and will be worked out in the second year of the contract.

Task 2: Implement pathways for delivering data to final repositories

EMODnet Ingestion 3 has a network of 50 data centres which act as 'assigned data centres' for processing received data submissions. The submission process has been refined with additional rules following experiences. HCMR as scientific coordinator has interacted with several data centres to progress with the processing and publishing process. There is a close cooperation with IFREMER as publisher of the SEANOE entries for further streamlining the ingestion flow. Progress has been made with setting up an exchange with the Marine Data Exchange of The Crown Estate (UK). In the reporting period, the number of submissions received has increased from **1137** to **1419**. Processing these submissions, the number of published '*as is'* records went up from **1002** to **1262,** whereby the number of elaborated submissions, ingested into European portals, was increased from **448** to **564**.

Task 3: Facilitate machine-to-machine transfers

This concerns identifying and supporting new operational oceanography stations and operators in becoming contributors to the European operational oceanography data exchange. This task is undertaken in a cooperation between EMODnet Ingestion and EMODnet Physics. In order to get engaged with potential providers, numerous events were joined and/or organized to make providers aware and interested to become data contributors. The approach of Task 3 is comparable to the Ingestion process for delayed mode data sets. Namely, after identifying and convincing new stations and/or providers, they are supported to get connected on short term, using a number of connector technologies, and to publish their Near Real Time data streams '*as-is'*. For this purpose, several connector packages including supporting documentation were and are being prepared, which facilitate an easy and effective connection. Also, the existing online viewer has been upgraded, allowing to oversee and query all stations, their providers, and data streams, which were connected so far as phase 1 as a result of Task 3 activities.

The next stage in the approach is to encourage and again give support to providers in becoming contributors to the structured European operational oceanography data exchange, which implies getting connected to EuroGOOS with its ROOSs, CMEMS INSTAC, and SeaDataNet (for delayed mode data). Making this step, requires adopting common standards for making data and metadata FAIR, which can be laboursome and costly, and reason for providers to stay at phase 1. However, if upgraded to phase 2, providers are also included in the structural offer of EMODnet Physics, which since January 2023 is integrated in the EMODnet Central Portal. Deliverable D3.2 documents the efforts and success with engaging new stations and providers

and is included as an Annex 2, together with Deliverable D3.1 which specifies how to achieve FAIRness for Near Real Time data streams.

Task 4: Operate a help-service for users to provide their data in the most appropriate format

The portal has a service-desk, which is operated on working days. Users can either email their questions or ask for a call back. Emails are sent to a generic service desk mailbox. All queries are saved and tracked in the Open-source Ticket Request System (OTRS), allowing providing statistics on the questions received. Recorded queries are analysed in order to elaborate a Frequently Asked Questions (FAQ) page at the portal. In the reporting period only 7 questions were received and answered through the online help-service, while more than 80 direct support requests were received by HCMR from users of the Submissions service.

Task 5: Allow providers of data to track the progress of their data from submission through to their storage in a repository

Data providers can follow the processing of their data submissions in the Submission Service, which is done in several steps each indicated by a status field. Data providers are contacted by assigned data centres, in case there are additional questions about the ingested data sets.

Task 6: Participate in discussions with EMODnet partners in order to improve the efficiency of the whole collection, assembly and dissemination process

Representatives of the EMODnet Ingestion Coordination team participated in the EMODnet Steering Group and Technical Working Group meetings. All coordinators of EMODnet Thematic projects are partners in EMODnet Ingestion which guarantees a mutual tuning with EMODnet Ingestion. An Ingestion plenary project meeting was organized with all consortium members to inform and discuss about the approaches for EMODnet Ingestion and the best ways to achieve results. Moreover, the Ingestion Coordination team, participated in several events organized by EMODnet Thematics and EMODnet Secretariat to present EMODnet Ingestion.

Task 7: Maintain a summary record of data delivered

This function is offered by the View Submissions service. Each completed submission is migrated to that service for publishing as part of a discovery and access service. Distinction is made in phase I and II which is one of the search facets. Editing activities take place aimed at replacing so-called orphan data for organisations from free text into controlled EDMO terms, orphan data for projects into controlled EDMERP terms, and orphan terms for Cruises into controlled Cruise Summary Reports (CSR) terms in order to improve the integrity and richness of the metadata.

Task 8: Engage in outreach activities towards significant holders of marine data whose data are not yet available.

During the reporting period, RBINS undertook promotion of the project in social media and supported several partners to increase the visibility of their communication activities. RBINS updated and developed additional promotional material such as leaflets, posters, news items, video, web conf backgrounds, and others, aimed at supporting promotional activities. Moreover, EMODnet Ingestion was presented and actively promoted by members at several Conferences, Workshops, and other events.

Task 9: Improve and document the availability of data provided for coastal and offshore licensing.

A new challenge is to engage with public authorities in Member States who receive data from licensing procedures for coastal or offshore activities, with particular emphasis on aquaculture and offshore energy. An

inventory was compiled of relevant stakeholders; in total 128 stakeholders from 27 countries could be identified. More than half (52%) of the identified stakeholders were national governments from different ministries, followed by agencies (19%), and education such as universities and scientific institutes (9%). These results have been summarised in Deliverable D4.4 which is included as Annex 4 to this report. As follow-up activities are now well underway for compiling Deliverable 4.5 - Inventory of current license data practices in each country –. This inventory aims at establishing a baseline assessment of data collection and licensing processes in each country.

Task 10: Service continuity during operation and for transition

Coordination of the consortium is undertaken by MARIS and HCMR to ensure the continuity of the EMODnet Ingestion portal and its array of services.

Status of the Milestones and Deliverables listed in the workplan					
Milestone/Deliverable in numerical order	WP	Date due	Status (To do/ Delivered/ Delayed)	Date delivered	If Delayed: reason for delay and expected delivery date
D0.1: Quarterly concise progress reports	0.1	M4, M7, M10, M13, M16, M19, M22, M24	D0.1-a,b,c,d delivered; others to do	M4, M7, M10, M13	
D0.2: Interim report	0.1	M12	Delivered	M13	
D0.3: Final report	0.1	M24	To do		
D0.4: Transition and hand over protocol	0.1	M24	To do		
D0.5i: Agreement and subcontracts	0.1	M1	All done		
D0.6i: Short minutes - action lists of internal coordination meetings	0.1	Regularly	Ongoing		
D1.1: Web portal operational, incl extranet	1.1	M1 – M24	Delivered	Operational since M0	
D1.2: Guidelines, manuals, handbooks on portal	1.1	M1 – M24	Delivered	Operational since M0	
D1.3: User Management service operational (Marine-ID /EU Login)	1.2	M1 – M24	Delivered	Operational since M0	
D1.4: Data Submission Service operational	1.3	M1 – M24	Delivered	Operational since M0	

D1.5: Data Submission Service upgraded	1.3	M1 – M8	Delivered	Operational since M6	
D1.6: Data tracking service operational	1.4	M1 – M24	Delivered	Operational since M0	
D1.7: View Submissions service operational	1.5	M1 – M24	Delivered	Operational since M0	
D1.7: Portal and services moved to Central Portal	1.1 – 1.5	M1 – M12[1]	Delayed to M13 – M24 period		
D2.1: Pathways operational	2.1	M1 – M24	Delivered	Operational since M0	
D2.2: Many submissions processed and published 'as is' (phase 1) and at EMODnet thematic services (phase 2)	2.1	M12, M24	Underway	M12	See WP2 report
D2.3: Help service operational	2.2	M1 – M24	Delivered	Operational since M0	
D3.1: Updated documentation, standards and procedure for NRT and RT data published	3.1	M12, M24	Delivered	M12	See Annex 1
D3.2: Connections with new NRT and RT monitoring stations operational	3.1	M12, M24	Delivered	M12	See Annex 2
D3.3: ERDDAP installation package	3.1	M12	Delivered.	M6	See WP3 report about Github
D3.4: DAB installation package	3.1	M12	Delivered; now under testing	M12	See WP3 report about WHOS activity

[1] Migration process in practice has started in M15 in agreement with Contracting Authority, so should be arranged before M24

D3.5: SWE to ERDDAP software module	3.2	M22	Underway		
D3.6: Upgraded Viewing service for NRT and RT stations	3.2	M12	Delivered	M12	See WP3 report about NRT viewer
D4.1: Inventory updated of potential data sources and providers in European countries and priorities	4.1	M8	Delivered	M8	See Annex 3
D4.2: Updated promotion material	4.4	M12, M24	Regularly	M12	
D4.3: Results of marketing and outreach activities	4.2	M12, M20	Delivered	M12	See WP4 report
D4.4: Inventory of identified stakeholders for licensing data	4.3	M6	Delivered in 2 versions	M6, M8	See Annex 4 for final version
D4.5: Inventory of current license data practices	4.3	M14	Underway		
D4.6: Database about availability of license data per country	4.3	M18	To do		
D4.7: Reporting on license data Workshop	4.3	M22	To do		

3. Work Package updates

To achieve the objectives of the EMODnet Data Ingestion 3 project, the 10 Tasks are divided over 5 Work Packages as follows:

Work Package No.	Work Package title	Covering tasks	WP leader
WP0	Project Management	Task 6 – EMODnet tuning Task 10 – service continuity (transfer strategy part)	MARIS
WP1	Construct and operate central Data Ingestion portal with services	Task 1 - web-portal Task 5 – tracking service Task 7 – summary service Task 10 – service continuity (technical configuration part)	HCMR
WP2	Implement and operate pathways	Task 2 – pathways Task 4 – help service	IFREMER
WP3	Facilitate machine-to-machine transfers	Task 3 – machine-to-machine	ETT
WP4	Marketing and outreach	Task 8 – outreach Task 9 – coastal and offshore license data	RBINS

WP0 – Project Management

Covering Tasks 6 and 10

The project management and the coordination of EMODnet Ingestion in the first year of the new contract have aimed at ensuring timely delivery of outcomes and high quality of documentation, tools, results and products. Project management includes the collaboration with the other EMODnet thematic portals, with the Central portal group and larger EMODnet organisation. The consortium is coordinated by MARIS (project coordinator and HCMR (scientific coordinator).

On 17th March 2022 message was received from the EU CINEA that the bid and evidence documents provided for EMODnet Ingestion 3 had been successful. As a follow-up, MARIS signed the contract on behalf of the consortium at 22nd Martch 2022, which triggered countersigning of the new EMODnet Ingestion 3 contract by CINEA on 30th March 2022. Since then, further contractual activities were undertaken by the coordinator for drafting and getting agreement and signatures for the partner contract with HCMR and bilateral subcontracts with the 41 other members of the EMODnet Ingestion 3 consortium. All subcontractors have signed.

The project activities were started by e-mail communication and short web conferences with core members. A full project meeting took place on 16-17 June 2022 in Athens, Greece, hosted by HCMR. This meeting brought onsite 40 representatives of consortium members, while another 24 joined online. At the meeting the

objectives for all the project activities were presented and discussed to inform all members of the targets and the best ways forward to achieve these. Overall, participants were very happy to meet again onsite as that made quite a difference in acting and solving challenges as a team.

Further coordination mostly took place by e-mail and short web conferences. The EMODnet Ingestion 3 consortium also comprises the coordinators of each of the thematic lots, which allows for tuning with their thematic project activities.

Recently, a second EMODnet Ingestion 3 plenary project meeting took place, 12 – 13 April 2023, in Larnaca – Cyprus, hosted by ORION. This meeting was used to gather input for the interim progress report and to set the clocks for the activities in the second year of the current contract.

MARIS and HCMR participated to several other EMODnet meetings, representing EMODnet Ingestion and maintaining relations with other lots. They had a ''meet and greet'' with the new Deputy-Head of EU DG MARE to introduce him to the EMODnet Ingestion goals and activities. They had a kick-off meeting with CINEA and DG MARE to discuss the new contract and its priorities. They participated and presented the project progress in the EMODnet Steering Committee and Technical Working Group meetings which took place in the period of 26 – 28 May 2022, 20-21 September 2022 (only TWG), and 7-8 November 2022 (only SC). And they joined the EMODnet Centralisation webinar at 16th February 2023.

MARIS participated to the EU-Canada Ocean Partnership meeting that was organized by the EU in Brussels, 3 – 4 October 2022. At the meeting, brainstorming took place about possible subjects for cooperation between EU and Canada, whereby the EU topics had a focus on EMODnet and Copernicus Marine. During the brainstorming, several thematic EMODnet topics were highlighted, while also the Ingestion service was mentioned. The EU will prepare an official report from the meeting which will give a list of priority subjects which might become part of further development in an EU -Canada cooperation.

MARIS and HCMR contributed to the 2 Marine Data for and from the Offshore Renewable Energy (ORE) sector workshops, one for the Northeast Atlantic, North Sea & Baltic Sea seas, and one for the Mediterranean Sea and Black Sea ORE. These workshops were initiated by EU DG MARE and organised by the EMODnet secretariat at 20 – 21 September 2022 and 20 – 21 October 2022. MARIS and HCMR presented EMODnet Ingestion and in particular how industry partners could use Ingestion for sharing their marine data sets.

Contributions were given for the EMODnet 2021 and 2022 Annual reports upon request of the EMODnet Secretariat.

An extranet is maintained to manage all project documents concerning contractual affairs, project activities and presentations of project meetings. The extranet can be reached through the EMODnet Ingestion portal and all consortium members have received logon details for their account.

Furthermore, a mailing list is used to support internal communication for all consortium members. In particular the consortium mailing list has been used regularly by the Coordination team to give guidance and suggestions to consortium partners about the ongoing and planned activities and to clear up any questions.

MARIS prepared and submitted quarterly progress reports for the four quarters in the first year of the EMODnet Ingestion 3 contract, using contributions from WP leaders. Finally, MARIS prepared and submitted the Interim Progress report, again with the help of WP leaders.

WP1 – Construct and operate central Data Ingestion portal with services

Covering Tasks 1,5,7, and 10

Maintenance of portal and its services

The maintenance of the portal and its services is an everyday job to ensure the smooth operation of all components of the Ingestion system. It includes:

- Content updates of:
    - web site with new promotion material, presentations, news, etc.. For instance, recently the operational oceanography pages have been reviewed and updated;
    - the metadata of the submissions when it is requested by the data providers or the data centres such as deletion of duplicates or wrong submissions, changes at narrative summaries, dates correction, typos, fixing unsuccessful data packages uploads, change of observation types or themes, replacement of uploaded files, changes of data download URLs, rejections cancellation, etc.
- Addition of new Data Centres (DC) contacts into the submission service workflow when it is requested by the DCs.
- Fixing/correction of DCs assignments when it is requested by the DCs mainly in cases of a cross cutting data discipline between the DCs.
- Facilitation of the ingestion of big data sets (>1 Gb EMODnet Ingestion threshold) mainly for geophysical data sets from collaborating projects like EuroFleets+ (EF+) where Ingestion has been adopted as the instrument for populating the EF+ project data repositories.
- Manual mapping of submitted metadata with controlled vocabularies (such as EDMERP, EDMO, CSR) when this is not done by the Data Submitter (DS) or the DCs.
- Automatic updating of the Submission service vocabularies on a regular basis (every day).
- Exchange on a regular basis of the completed Phase I and phase II submissions between the Submission and the Summary service on a standard text-based format (JSON).
- Give users support on how to handle marine litter, on wrong usage of dashboard when partner has dual role (DS and DC), on the usage of the service, on adding missing countries or emails of contact persons, on uploading of big data sets (EF+ cruise data).

More than 85 user requests were sent to the Submission service Masters (MARIS, HCMR) during the first year of the project concerning the maintenance of the service and it usage. These requests have been sent by email directly to the Masters, and are different from the ones of the Help Desk and are summarized at the figure below. The majority of the requests are related with the users support and the content updates.

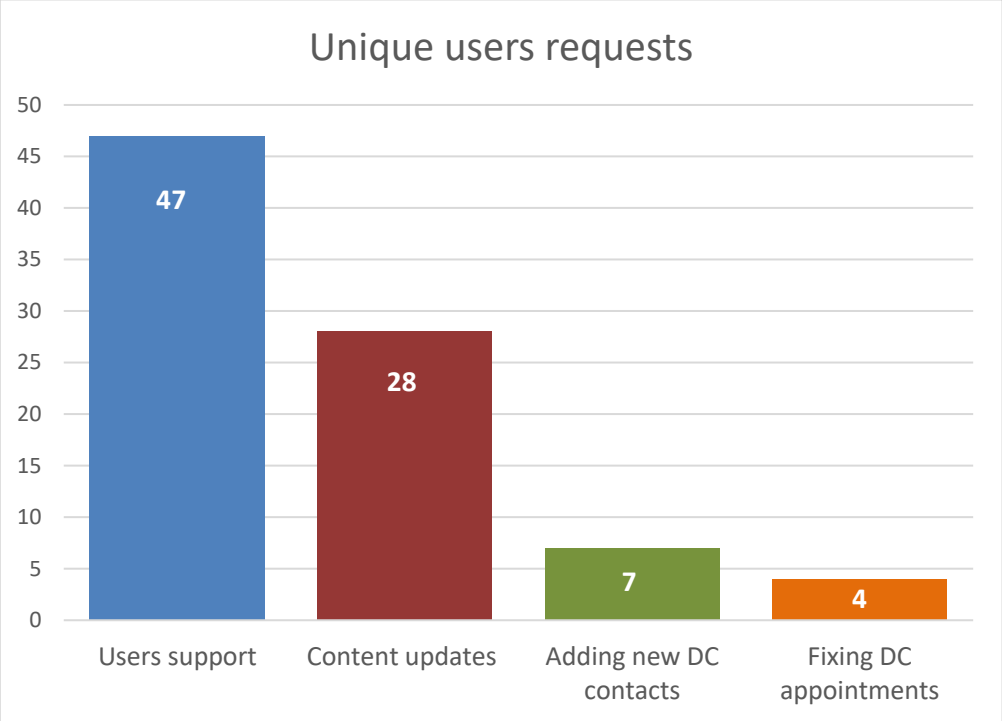


Figure: maintenance of the Submission service - main users unique requests

Improvements

In parallel, several improvements were implemented during the reporting period:

- The Submission service Cruise Summary Report (CSR) lookup has been updated and is now pointing to the SeaDataNet CSR (and no longer to BSH CSR) since Ifremer is now managing the CSR catalogue.
- A new module developed (similar to Key Indicators) that provides access to the processing time required for submissions to reach individual statuses. It is available for the Masters only (currently under the test service) aiming to assist the Masters on following up the timely finalization of the submissions forms and on interfering with the DS and/or the DCs when appropriate.
- In Seanoe, authors' metadata follow the publications approach and are stored in free text fields (similar to the publications "affiliations") which in some cases may not contain the same fields when authors for example do not wish their personal data such as email to be displayed freely. This ends to empty mandatory fields in Ingestion, which makes difficult the further processing of the harvested SeaNoe records. As Ingestion does not publish personal data at its Summary service, it was agreed between the managers of the two services that Ingestion will harvest the necessary information from Seanoe for internal use only within the Ingestion service processing workflow.

Further development & technical upgrades

Several technical upgrades were implemented during this reporting period to maintain and further improve the operation of the service:

- The function "Re-Assignment" is now available at the production service besides the test service. It allows the DC contact persons to change by themselves the responsible person for the submission

processing without the intervention of the administrators or without requiring status changes. The corresponding manual for the DCs was updated and made available to the web portal and in the Submission service.

- The Seanoe field "How to cite" has been transferred to the Summary service providing higher visibility and acknowledgments to the authors of the scientific data publications.
- The Marine-ID web services were updated by Ifremer and the new Marine-Id endpoint was adopted in the Ingestion portal. Currently it is available under the test service and will be transferred to the production by end of May.

The next upgrades of the submission service include:

- Development of an endpoint for access on demand to statistics for downloading of 'as-is' data packages in support of the quarterly and other project progress reports.
- Improvement of the notification system to trigger data submitters and data centres to move on with the processing steps and reduce the elapsed time between submission and publication of the data packages and their metadata.
- Enrichment of the Seanoe metadata by adding information for the Data Originator. Currently, the Ingestion service provides information for the Publisher and the Data Holding Organization. As authors in Seanoe are not always the same as the Originators of the data sets, this additional field will provide more visibility to the data providers.

Migration to central portal

A preliminary meeting between the technical managers of the EMODnet central portal and Ingestion managers MARIS and HCMR took place beginning of April 2023 to discuss options for the migration of the Ingestion portal and services to the central portal. At the meeting, MARIS and HCMR proposed a possible migration approach. The meeting will be repeated in the nearest future to make further steps towards a feasible and effective migration plan.

WP2 – Implement and operate pathways

Covering Task(s) 2 and 4

The success of EMODnet Ingestion depends (among other factors) on the implementation, maintenance and operation of pathways by partners to identify, submit new datasets, publish and integrate those into the appropriate data repositories and the EMODnet central portal. For that purpose, several key indicators are maintained to monitor the progress of submissions and their publishing (Phase I, II), as they are described below.

Number and status of submissions

Since the end of the second contract (DIP2) there were about 350 new submissions (last column in the table below), an increase in totals about 32%. The total number of new Phase I and Phase II submissions since DIP2 is 326, an increase of 35%, from which 139 have been finalized and elaborated in Phase II.

	end DIP1 (May'19)	end DIP2 (Oct'21) [increase]	end 1st year DIP3	New submissions since DIP2 [% increase]
Totals	619	1071 [73%]	**1419**	**348 [32%]**
Published	506	936 [85%]	**1262**	**326 [35%]**

Phase II	205	425 [107%]	**564**	**139 [33%]**

Table: Submission service population over the 3 contracts

Focusing only on the activities in the 1st year of the new contract, then the following table gives the numbers.

	Begin DIP3 (30 March 2022)	**end 1st year DIP3**	**New submissions [% increase]**
Totals	1137	1419	**282 [25%]**
Published	1002	1262	**260 [26%]**
Phase II	448	564	**116 [26%]**

Table: Submission service population over the 1st year of DIP3

The submissions evolution in time is shown at the figure below. Vertical lines denote the end of the first (DIP1) and second (DIP2) contracts. We can easily visualize the continuous increase in time and between the 3 phases of the project. We also see that the steepness of the curves are different: the total submissions (in blue) as well as those reach Phase I (in red) are increasing twice more quickly than the ones that reach Phase II (in green). It is an expected result taking into account the different level of difficulty of the two Phases. Phase I is finalized by the DCs relatively fast compared to the time (and effort) needed for the further process of the data packages (re-formatting, standardization, homogenization, quality control, etc.) before their integration into the final data repositories and EMODnet products.

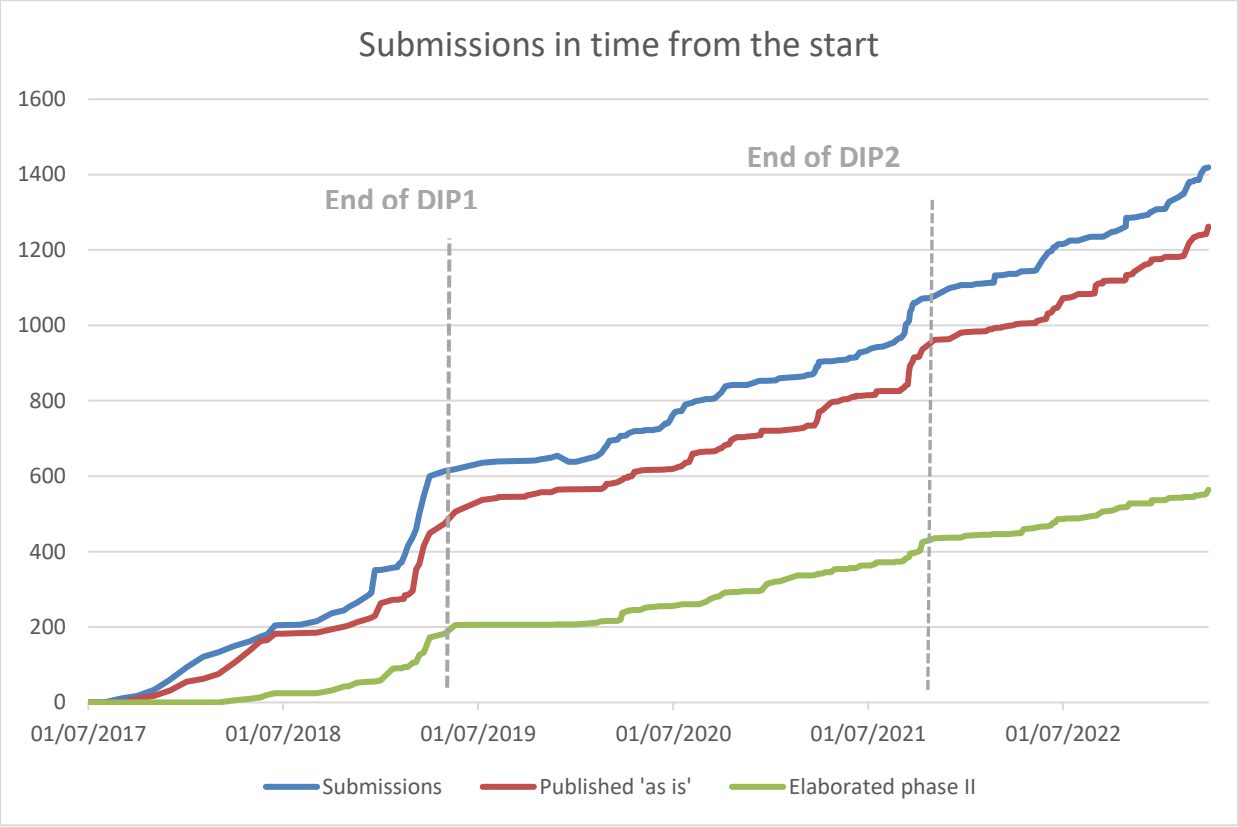
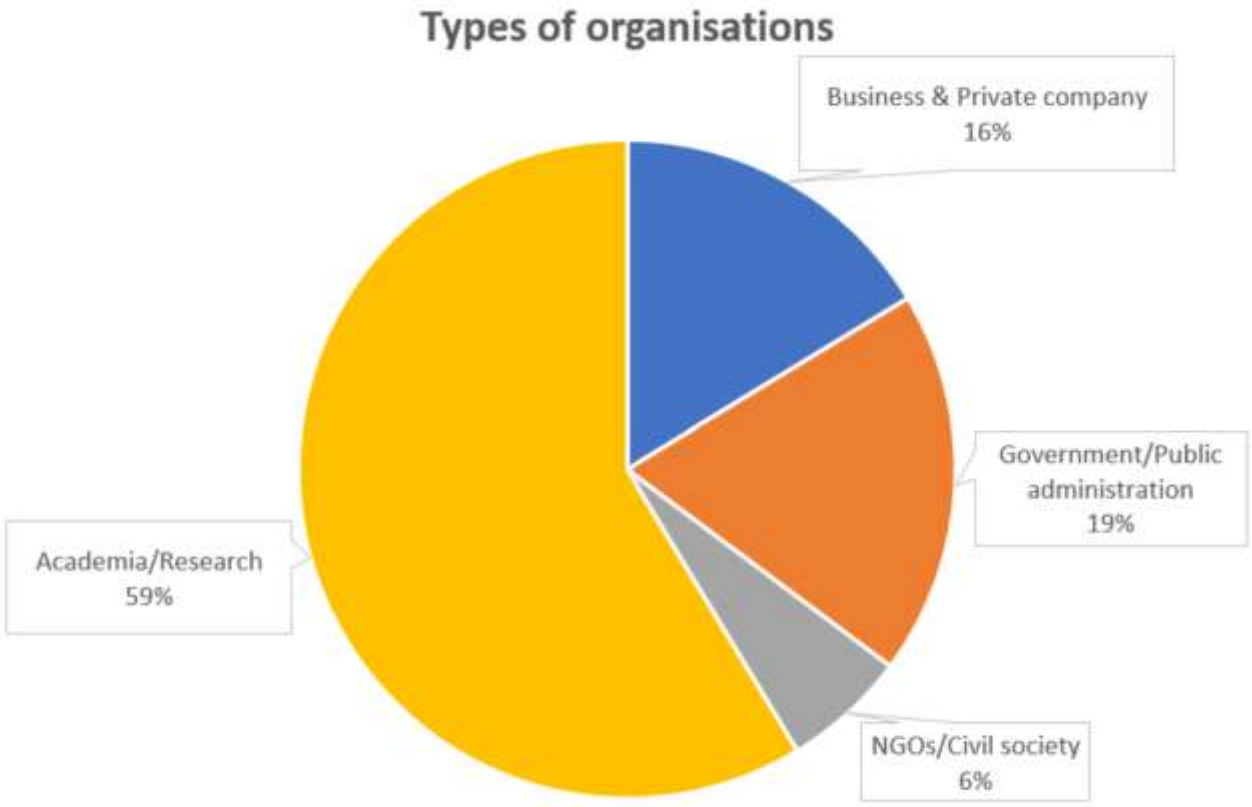


Figure: number of submissions and Phase I and Phase II publications over the 3 contracts

The above mentioned submissions come from 196 Organizations (originators and holding centres) from Academic & Research Sector, Governmental & Public Sector, Business & Private companies, and NGOs & Civil societies. The majority of submissions (59% of the totals) is from the Academic and Research Institutes with a total of 999 submissions while there is great potential for growth from the NGOs through the collaboration of Ingestion with these communities (such as for marine litter) which hold a large amount of data.



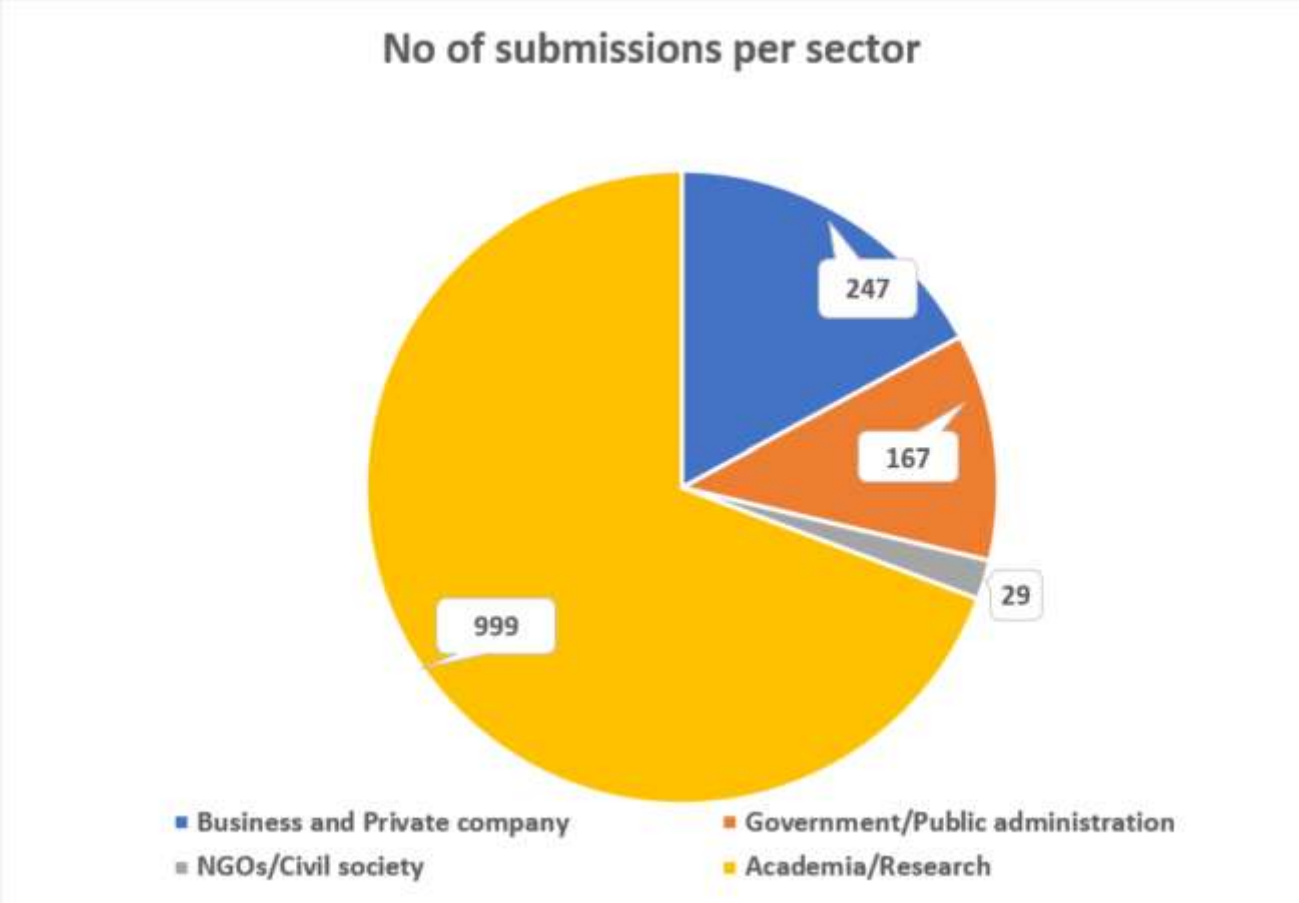


Figure: Published Submissions by sector

The division of the completed submissions per theme (published at Phase I and II) is illustrated at the left figure below. Physical data is the majority at a percentage of 39% and Chemistry at 26%. The figure at the right distinguishes the percentages of each theme that are published at Phase I and II. In physics, there is a balance, in chemistry there are more data in Phase II than in Phase I, but for the rest of the themes the status is reversed, the Phase II is behind Phase I. As it was mentioned this is due to the higher difficulty for integrating these into EMODnet as most of them are less standardized and homogenized than physical or chemical data.

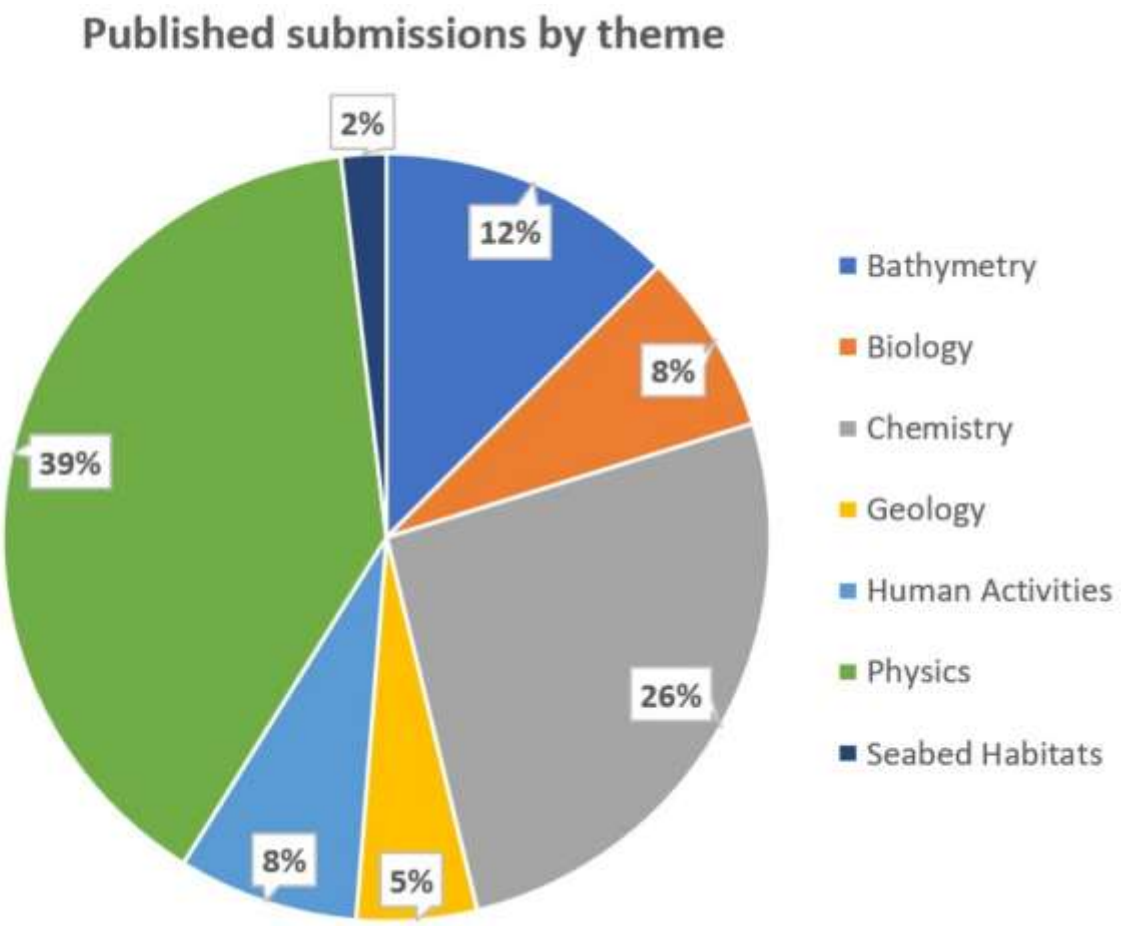


Figure: Published (Phase I +Phase II) submissions per theme

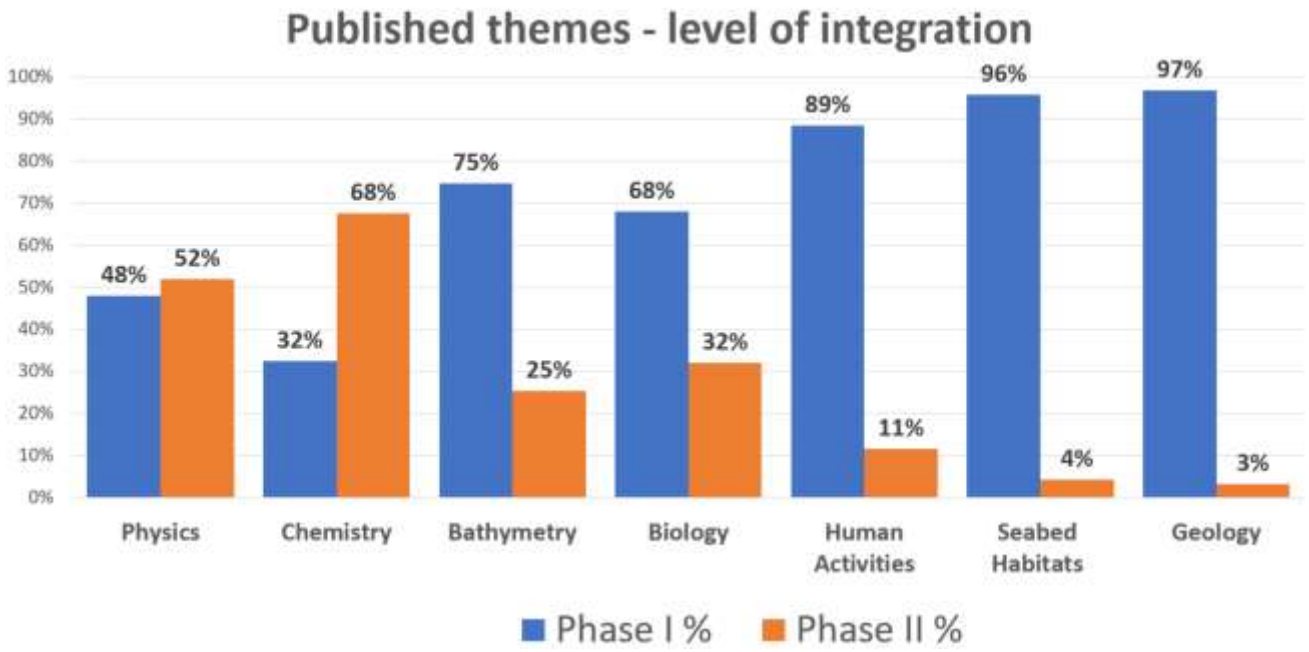


Figure: Published submissions per theme and level of integration at Phase I, II

Coupling with SEANOE data citing service

EMODnet Ingestion encourages researchers and data originators to submit their data to Seanoe and get a DOI that helps to increase their citation indices and obtain wider recognition. Seanoe has become a major contributor of EMODnet ingestion with more than 250 total entries since the start of the dynamic (M2M) exchange with Ingestion, early of 2020. Of them, 53% are in Phase I and 16% in Phase II. Since the end of the previous contract (DIP2 -10 Oct. 2021), more than 110 new Seanoe entries were added to the Submission service, of which 53 published 'as-is' (Phase I) and 27 in Phase II.

The majority of Seanoe submissions is assigned to Ifremer, an expected situation as Seanoe started as a French service and later was adopted as SeaDataNet service, opening the way for researchers from other countries to get a DOI for their data sets. The number of DCs responsible to process and publish Seanoe submissions has increased from 12 centres at the start of DIP3 to 19 after one year of DIP3.

Coupling with the Marine Data Exchange (MDE)

Important steps were done towards finalizing the dynamic exchange between Ingestion and the MDE of the Crown Estate (TCE). TCE collects all marine environmental data from the offshore wind industry in UK and leases sites for renewable energy, cables, pipelines and marine aggregates within the EEZ. TCE holds the MDE database with more than 250 Tb of marine industry data. A selection of the MDE metadata records, namely those concerning marine data sets, are harvested and made available via the MEDIN Discovery portal (managed by NOC-BODC and technically operated by Maris). An initial conceptual mapping between MDE and Ingestion metadata standards was successful and a JSON export file with selected MEDIN metadata fields was produced making use of JSON elements as already in use by Ingestion. During import to the Ingestion service, some issues raised that are currently being reviewed by the corresponding teams.

The integration steps between MDE and Ingestion are listed in more details below:

- September 2021: Preliminary mapping between MEDIN (MDE) metadata format and EMODnet Ingestion format completed by NOC-BODC and sent to HCMR for review.
- February 2022: Meeting between NOC-BODC and TCE to discuss the proposed coupling and to highlight some known metadata content issues, particularly around access constraints.
- December 2022: Meeting between NOC-BODC, MARIS and HCMR to finalise the mapping (syntactic) between the MEDIN (MDE) and EMODnet Data Ingestion metadata formats and set up an Implementation Plan for the exchange between MEDIN (MDE) and EMODnet Data Ingestion.
- February 2023: MARIS produced JSON file with selected MEDIN metadata fields, making use of JSON elements as already in use by Ingestion and sent to HCMR for review and import into the submission test service.
- March 2023: HCMR finalized the semantic checks and sent to MARIS and NOC-BODC a report with the (potential) issues found.
- Currently, BODC, MARIS, and HCMR are working to finalize the identified issues related to the mapping and JSON export.

In parallel, NOC-BODC is in contact with the TCE concerning the updating of the TCE data policy to clearly reflect that the ingested data should have no restrictions.

Next steps include:

- MARIS will establish the MEDIN JSON export service, while HCMR will finalize the MEDIN JSON import service and together with NOC-BODC will test the exchange.
- MARIS will establish a simple service to facilitate NOC-BODC to select MDE-MEDIN records for inclusion in the MEDIN export list and provide associated instructions to NOC-BODC.
- NOC-BODC will discuss further with Crown Estate to encourage open access practices and to keep informed about possible updating of MDE formats and practices.
- Finally, the exchange will be taken into production and will arrange a regular exchange of selected data records from MDE to MEDIN and then to Ingestion

The Help-desk

The service-desk of EMODnet ingestion is available from the portal at the following address: https://www.emodnet-ingestion.eu/help and it is operated on working days by IFREMER and MARIS. Users can either email their questions or ask for a call back. Emails are sent to a generic service desk mailbox managed by IFREMER and MARIS. All queries are saved and tracked in the Open-source Ticket Request System (OTRS) managed by IFREMER, allowing providing statistics on the questions received. Recorded queries are analysed in order to elaborate a Frequently Asked Questions (FAQ) page, available on the EMODnet ingestion website at https://www.emodnet-ingestion.eu/help/faq.

The statistics about the usage of the helpdesk during the 1st year of DIP3 show that 7 questions were received by the EMODnet ingestion helpdesk. A detailed overview of these requests is given in chapter 6. None of them asked for a call-back. This small number has to be put into perspective with the fact that many EMODnet ingestion users make direct contacts with their assigned data centre which directly answers to their questions. They bypass the EMODnet ingestion helpdesk, because they already have direct contacts. Also, there are many contacts with the ''masters'' (HCMR and MARIS) of the submission service, as already explained under WP1.

WP3 – Facilitate machine-to-machine transfers

Covering Task 3

EMODnet Ingestion supports two main types of ingestions: the first one concerns delayed mode data for which the Data Ingestion service has been established an approach which forwards ingested data to an expert data centre selected from a network of 50 assigned data centres based upon data theme and country of submitter as well as EMODnet specific thematic data centers. The second type concerns the real time (RT) and near real time (NRT) data flow from operational oceanographic platforms whose operators would like and include their data and streams in EMODnet Physics offer. Analogously to the delayed mode ingestion process, the real time operational data flow ingestion can be described into 2 distinct phases:

- Phase 1: is the publishing in EMODnet Physics/ EMODnet Ingestion realtime dashboard of the submitted/identified operational data source "as is"
- Phase 2: is once this data is fully digested by partner infrastructures (either national, European or International assembly center), implicating more metadata included and adopting prevailing format standards.

The task 3 dealing with operational oceanography data is done in a cooperation between EMODnet Physics and EMODnet Ingestion, whereby it is a major aim to bring new stations and providers to phase 2, as that will make the stations and providers ready for inclusion in the structured European operational oceanography data exchange which is organised between EuroGOOS, CMEMS INSTAC, and SeaDataNet, and which also includes structured uptake in the offerings of EMODnet Physics.

Phase 1 is completed when the submitted/identified operational data source is included and made available "as is" in the EMODnet Physics - EMODnet Ingestion realtime dashboard, which recently has been upgraded. The new viewer (See: https://realtime.emodnet-physics.eu) serves as a quick shop-window to show the connected stations (see also WP3.2.2). While in phase 2, data flows are elaborated together with their operators and stations become part of the structured European operational oceanography exchange with EMODnet Physics, CMEMS INSTAC and EuroGOOS.

For the phase 1 connection from source to EMODnet a number of machine-to-machine technologies can be used. Once a new operational data source is ingested (connected) into the data layer and a data-collection is added to the master ERDDAP data server, managed by EMODnet Physics, then phase 1 is completed. While for phase 2, data flows are elaborated together with their operators and stations become part of the structured European operational oceanography exchange with EMODnet Physics, CMEMS INSTAC and EuroGOOS.

For the purpose of making it easy for new stations and their operators to connect, ETT together with SMHI, CNR and 52North are focusing on developing easy-to-configure connector packages. Developments for connectors focus on: 1) ERDDAP, 2) DAB, 3) SWE services, and 4) OGC OM-JSON based timeseries API.

WP3.1: Connecting more operators and monitoring platforms to the European oceanography data exchange

In line with the developed actions during the previous contracts, in collaboration with EMODnet Physics, this task is aimed at identifying, convincing and supporting more oceanography operators to get connected to the European oceanography data exchange. In practice it implicates two sub-taks: 1) approaching operators of

operational oceanography platforms and networks that are not yet participating in the exchange, and 2) making available (open) tools for facilitating and enabling data sharing.

WP3.1.1 – approaching operators – led by ETT and SMHI

Although the project only started end March 2022, the activities to facilitate interoperability and support new providers to interoperate with EMODnet were not stopped after the end of the previous contract. A large number of events were organized and/or attended to present EMODnet and how Ingestion tools can support providers to join EMODnet and the European operational oceanography exchange. An overview is given in Deliverable D3.2 which is included as Annex 2 and the list is also integrated in the events table of Chapter 7.

A few highlighted events:

- EuroGOOS Tide Gauge Task Team is preparing a community workshop (4-5 May 2023, Madrid) to discuss the development of a REProcessed product to support Copernicus Marine Service and EMODnet Physics stakeholders. This product will make available long term timeseries (hour time granularity) of qualified sea level data, preferably with a unified inventory and aiming to include more GNSS stations.
- At 16 November 2022 a Guest Lecture was given during the International Training program on ocean regional governance – University of Malta.
- At 17-18 October 2022 the team participated in the Sea Level Rise Conference in Venice, Italy, where EMODnet was presented and endorsed as the European Hub for In Situ Data.
- The event “low-cost technologies and citizen science in ocean data collection” was hosted in Cape Town, in the Genova Pavillion, of the Ocean Race Village.

Figure: Poster on the Ocean Race: from science to citizen science

- A dialogue was started with the WHOS about data exchange, making use of the DAB service (see next paragraph). Currently 19 web services from 15 countries contribute to the WHOS data, with both

hydrological and meteorological observations including water level, discharge, temperature, precipitation that is of interest also for the marine users, especially in case of stations nearby river estuaries. The on-going interaction between EMODnet Ingestion and WMO is to get the formal approval to implement the interoperability as well to identify technical means to give attributions to the original hydrology data providers in the EMODnet portal.

Since November 2021 there is also the Marine Insitu Collaboration Technical Working Group (MIC TWG), that joins together key actors from EMODnet Ingestion, Physics, Chemistry, Copernicus Marine Service In Situ TAC, EuroGOOS office and EuroGOOS Task Teams, and SeaDataNet, for working together on the further harmonization of standards, procedures and workflow for ingesting and sharing operational data. The main scope is to be one single voice towards newcomers. The group set up periodic meetings (full team 6 months, tech on demand) to share progresses and define next actions.

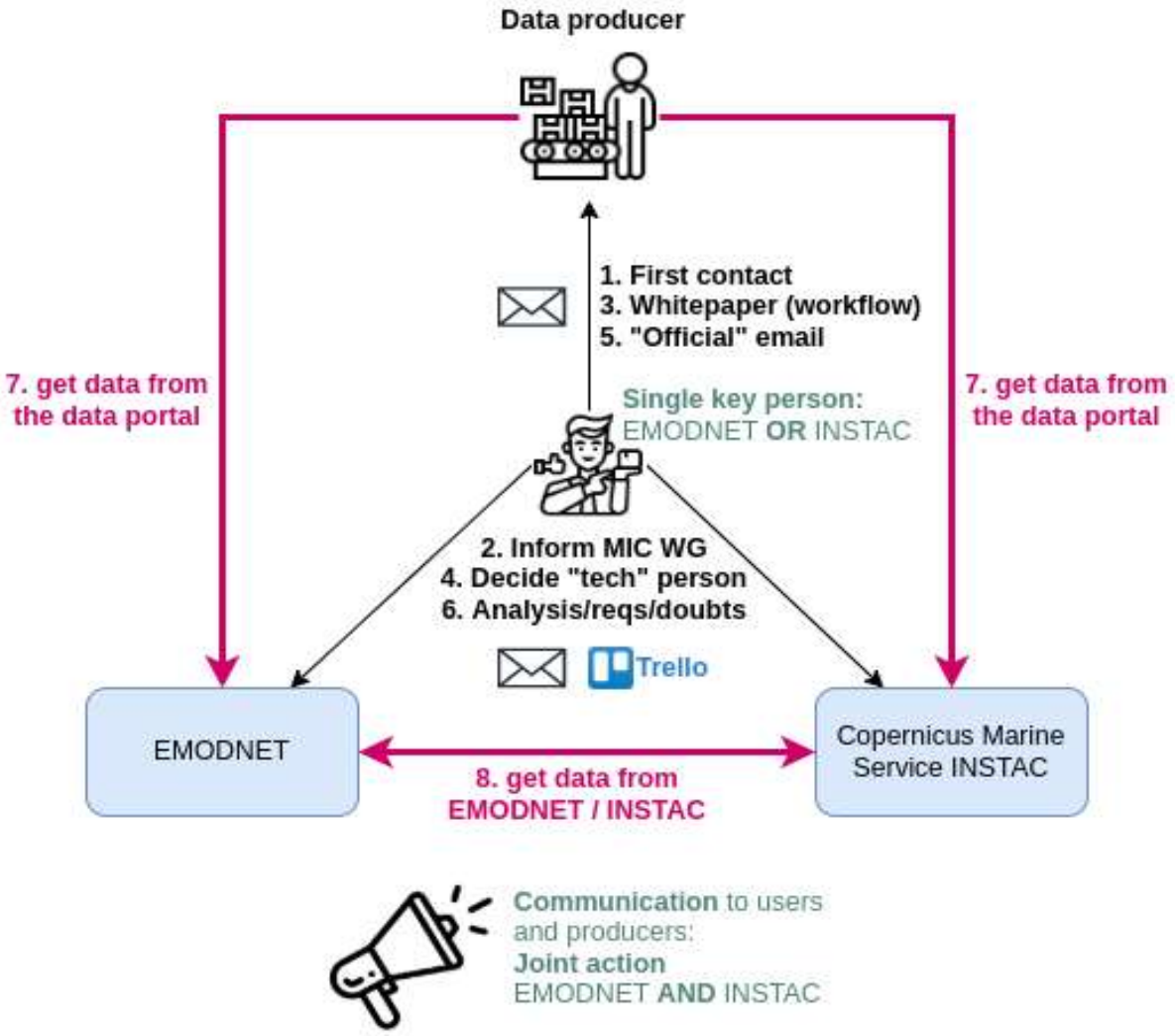


Figure: MIC WG approach and working workflow

New data sources are being approached, whereby the focus is now also on Citizen Science projects collecting ocean physics parameters by means of low cost, but accurate, tools such as Deepod, CCTBON, and others.

Citizen Science engagement:

As part of EMODnet Ingestion and in cooperation mainly with EMODnet Physics and EMODnet Chemistry, a number of activities have been initiated in the field of Citizen Science, of which some highlights are given below:

Cooperation has started with TransEurope Marinas, a network of marinas working on pan-European scale, and which comprises the most extensive marina group in Europe, spanning twelve countries, https://www.transeuropemarinas.com. The *European marina network of environmental data stations*, EMANEDS together with EMODnet Physics, has the ambition to create a pilot programme of harmonised and community-rich environmental data stations around Europe based in a selection of marinas from the TransEurope Marinas association. Centred around a digital dashboard, data from oceanographic and atmospheric sensors, biomonitoring activities and ocean-related citizen science projects might be collated, displayed and interpreted, encouraging engagement with a wide body of participants. It has been agreed with TransEurope partners to use well-developed marinas to generate relevant data that can be shared with EMODnet. TransEurope is now seeking funding opportunities to further explore the huge potential this collaboration can offer, whereby EMODnet partners are giving advice and support.

EMODnet Ingestion in collaboration with EMODnet Physics and various initiatives, projects and programs such as AtlantOS, JERICO S3, Ocean Race, EuroSea and Blue-Cloud 2026 has organized a number of workshops to showcase the potential of data collected from low-cost ocean sensors. Low-cost is often, but not necessarily, connected to citizen science initiatives. These workshops have been very appreciated and in some cases follow-up workshops have been organised after demand from the participants. The list of existing low-cost sensor initiatives is constantly increasing and discussions are ongoing with many of them to guide, advice, and set up data flows via EMODnet Ingestion. The Citizen Science actions are highly profiled thanks to the collaboration with the Ocean Race which gives the action a very wide resonance effect. This is possible thanks to the fact that ETT is supporter of Genova that is going to host the Grand Finale of the Ocean Race in June 2023. The data as collected during the ongoing Ocean Race are already made available via EMODnet Physics.

Many more examples are on the way. This is clearly a community who have been waiting for the opportunity to share their knowledge and data to a wider community.

EMODnet Ingestion and Physics is also working closely with the Decade project Sailing4Science, S4S. S4S are building a global network of sailors who volunteer to observe and collect vital data from our ocean and coastlines onboard their sailboats. S4S together with EMODnet Ingestion and EMODnet Physics are engaging with relevant sailing groups to join S4S with the goal to set up dataflows towards EMODnet Ingestion.

There are ongoing discussions to integrate these activities under the Ocean Decade Program CoastPredict. Discussions have also taken place with the Decade Program Observing Together.

With support from the JERICO-S3 project, a low-cost sensor, Ocean Best Practices and data workshop will be organised in Brest in September 2023, gathering initiatives from around the world. A session proposal on low-cost ocean sensors and data has also been submitted to Ocean Sciences 2024 , https://www.agu.org/Ocean-Sciences-Meeting, together with a session proposal at Oceanology International 2024, https://www.oceanologyinternational.com/london/en-gb.html.

Other examples of Citizen Science projects are the MedFever and SeaCleaner projects, from which data sets have been submitted through ENEA and which are now in phase 1, the GreenPeace Floating Micro-Litter project on floating microlitter, which is now in phase 2 with support of HCMR (see also:

https://www.frontiersin.org/articles/10.3389/fmars.2021.699000/full), and the T-MEDnet which is an initiative of professional divers that are collecting bottom water micro-logger data. Periodically they dive into scientific relevant sites to take the logged data and restart the measurement.

eMOLT - Environmental Monitors on Lobster Traps and Large Trawlers is another very nice example: lobster catchers were interested in understanding which were the most favorable conditions to catch lobster and so they decided to install water temperature sensors on the traps. They got in contact with NOAA to run this exercise and now they are operationally delivering data to the scientific community. A similar story is applicable to the smart sensors that can be sticked to fishing gears and nets. The Ocean Data Collective (a SME) is now organizing the data collection for many fishermen and suppling EMODnet and other marine data integrators with these near real time data.
Two further and very promising examples are the Educational Passages and Student Drifters Program initiatives. The first is developing and deploying small boats equipped with some sea surface and meteorological sensors, the second is developing and deploying drifters. These data are going to be available to EMODnet (the iFADO are on the way).

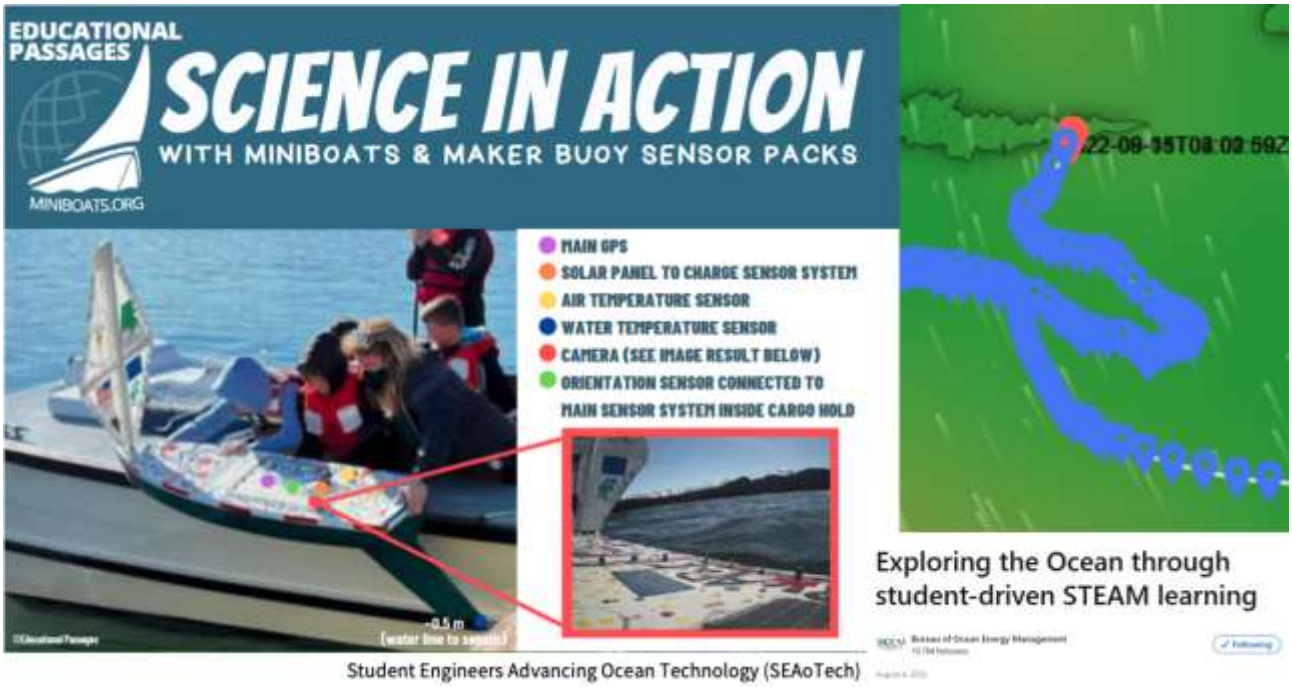


Figure: Educational Passages illustration

Figure: Educational Passages illustration

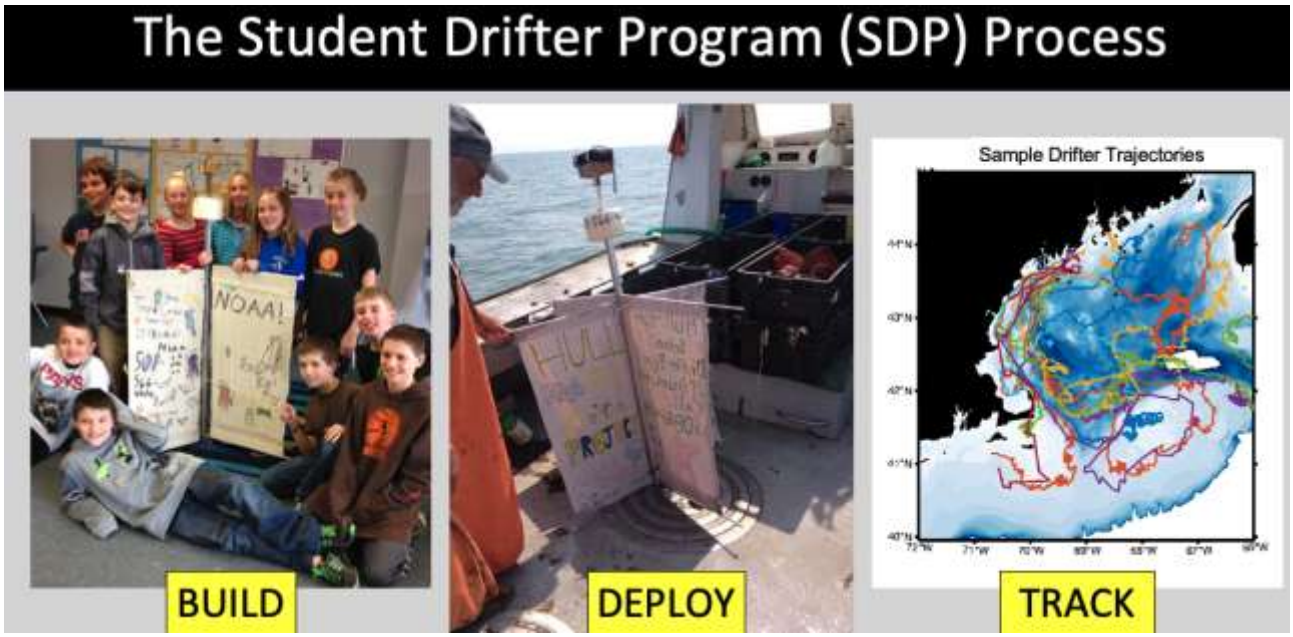


Figure: Student Drifter Program illustration

One can conclude that the momentum in Citizen Science data projects is increasing and some examples are already ingested into EMODnet, while more will follow, encouraged and supported by EMODnet Ingestion and Physics.

Progress in RT and NRT data connections:

Overall, the engagement activities towards the ocean community have been very successful and generated a lot of impact, as it has resulted in many new operational oceanography data providers, not only from Europe, but also on a global scale, getting connected, at least for phase 1.

At the end of the previous contract already very good figures were reported, namely 400 river stations, 70 sea level stations and 1550 sensors. As already anticipated, different sources adopted different approaches to share data towards ingestion. Some decided to be connected by expert node (e.g. river data providers), some decided to offer direct interoperability (e.g. EMSO), and some to implement SOS-SWE connections, etc

The following table presents a summary of the progress towards the ingested sources, more specifically indicating which provider has been consolidated (and which technology was and is in use to implement the interoperability)

Description	Status	Parameters	notes	Status now
20 tide gauge from the Sweden Maritime Administration	Phase 2	Sea Level	This data collection was then included into the CMEMS INSITU TAC Baltic product	These platforms are fully integrated in the operational data flow and are keeping providing data
4 wave buoys in Liguria [2 DISTAV.ARPAL] [2 OSIS.DLTM]	Phase 1	Wave		ARPAL – have changed their service and should be reconnect OSIS – the system is not operated any longer
Berring Data Collective - Fish vessel data [>500K measurements]	Phase 2	Temperature, Salinity	This data collection was then included into the CMEMS INSITU TAC Global product	BDC is fully integrated in the operational data flow and it is keeping providing data. We have now more than 20114 measurements[2]
Saildrone [> 20K measurements]	Phase 1	Temperature, Atm pressure		Saildrone data are not flowing operationally, the available data were (are) made available by projects
Antarctic Circumnavigation Expedition (ACE)	Phase 1	Temperature, Biogeochemistry	the NRT connection is towards the ACE data dissemination system – i.e. zenodo – as soon as a new dataset is available it is harvested and made available in the EMODnet Physics catalogue.	The collection has not increased as there wasn't any new expedition
HFR Lisbon	Phase 2	Surface Currents	This data collection is also included into the EU HFR node and CMEMS INSITU TAC Global product	These platforms are fully integrated in the operational data flow and are keeping providing data

[2] https://www.fishydata.com/erddap/tabledap/ODN_Binned_FV.htmlTable?tow_id&time%3E=2000-03-31T15%3A00%3A00Z&time%3C=2023-06-20T18%3A06%3A00Z&distinct()&orderByCount(%22%22)

HFR Cornwall	Phase 2	Surface Currents	(the stream is temporary suspended)	Interoperability towards European node has not re-covered yet
HFR Finnmark – Norway	Phase 2	Surface Currents	This data collection is also included into the EU HFR node and CMEMS INSITU TAC Global product	These platforms are fully integrated in the operational data flow and are keeping providing data
JRC TAD (tzunamy alert device)	Phase 1	Sea Level		These platforms are fully integrated in the operational data flow and are keeping providing data. The network is expanding and we have now 350 platforms connected (notably we also see some stations out of sea – location control has to be applied yet)
Sea Level Center University of Hawaii	Phase 2	Sea Level	This data collection is part of GLOSS partnership	These platforms are fully integrated in the operational data flow and are keeping providing data UHSLC is delivering fast data (usually within one month from the collection) and research quality data (2-3 years from the collection). The interoperability is implemented by ERDDAP, hence as soon new data are in UHSLC they are in EMODnet
NMDIS sea level stations	Phase 1	Sea Level		6 stations are keeping offering operational data. To note that after the EMOD-PACE exercise, NMDIS has further improved and updated their services and tools. Some new operational data are now available in NMDIS portal but have not offered (yet) via the interoperability tools developed with EMOD-PACE
EMSO stations (OBSEA, SmartBay,…)	Phase 1	Temperature, Salinity, Noise,		These platforms are fully integrated in the operational data flow and are keeping providing data. The interoperability is implemented by ERDDAP, hence as soon new data are in EMSO they are in EMODnet.
Centro Tecnologico Naval	Phase 1	Noise		These data were delayed mode data. CTN is keeping delivering data periodically. Notably the underwater noise monitoring framework has lately been updated and Ingestion (and Physics) are

				working on updating the workflow for linking metadata as indicated by the new TG NOISE deliverables *
T-MEDNET	Phase 2	Temperature, Salinity	This data collection was then included into the CMEMS INSITU TAC Global product	T-MEDnet is delivering delayed mode data this data is harvested periodically. Last harvest includes 2021 data. Tools to have more frequent synch between T-MEDnet and EMODnet shoud be implemented. At the moment EMODnet is linked to 5 of the 19 T-MEDnet sites.

* see:

https://publications.jrc.ec.europa.eu/repository/handle/JRC133477

https://publications.jrc.ec.europa.eu/repository/handle/JRC133476

One of the most important results is the enlargement of the river data sources: we have now more than 650 river stations delivering data operationally (more than 200 new stations in this contract period), the number of the Arctic Icebreakers (from 2 to 7 and for each icebreaker more and more data are flowing into EMODnet Ingestion/Physics), the JRC TAD network has largely expanded (more than 350 stations) and, notably, as soon as JRC-TAD includes or activates a new station it is immediately active in EMODnet too. Another very important recent outcome is a result from the ingestion activities done for linking the VOTO (Voice Of The Ocean) data: VOTO is working extensively on glider data and the collaboration is supporting the updating of the glider data model and the policy to ingest/link these data: glider data are made available on the VOTO ERDDAP as soon as the glider start transmitting and the delayed mode is available as soon as the glider is recovered. At the time of writing more than 250 glider missions are already visible. This has triggered an action in EMODnet Physics to reorganize the glider data according the same model.

Also, the collaboration with the earlier mentioned "The Ocean Race" is producing good outcomes as 2 IMOCA are delivering surface temperature operationally, another 2 are analyzing microplastics in the water and 1 IMOCA is equipped with a TORA system. Both the microplastics and the biodiversity data are going to be provided to expert data centers (IFREMER, GEOMAR, etc) and from there to EMODnet.

As indicated, the Deliverable D3.2 - Report on "new user engagement and ingestion workshops" -, made available as Annex 2 to this report, documents all the engagement activities and gives a detailed list of all the newly connected data providers, both for marine and riverine areas.

As part of the engagement activities, also a new documentation has been drafted in the form of Deliverable D3.1 – NRT Data exchange in Europe: standards and procedures – which explains how to achieve FAIRness in metadata and data formats, supported by controlled vocabularies, of importance for structural connecting of observation stations and their data streams to the European operational oceanography data exchange. This Deliverable D3.1 is made available as Annex 1 to this report.

WP3.1.2 – developing tools for facilitating M2M exchange – Led by ETT, CNR-IIA, and MI

This task consists in organizing and making available software connector tools for implementing operational data exchange.

One technology is **ERDDAP**: ERDDAP is an Apache based data server that offers an easy and consistent way to download subsets of gridded and tabular scientific datasets in common file formats and make graphs and maps. The peculiarity of ERDDAP is that it unifies the different types of data servers so you have a consistent way to get the data you want, in the format you want. In particular, ERDDAP reformats the request into the format required (.html table, ESRI .asc and .csv, Google Earth .kml, OPeNDAP binary, .mat, .nc, ODV .txt, .csv, .tsv, .json, and .xhtml) by the remote server, sends the request to the remote server, gets the data, reformats the data into the format that you requested, and sends the data to requester. During its last contract, EMODnet Physics adopted ERDDAP as a central technology in its data management infrastructure. Lately the EMODnet Central portal also deployed an ERDDAP instance to facilitate data interoperability hence one main goal of this task is to develop a fully documented docker-ERDDAP installation package for the EMODnet stakeholders. This Deliverable D3.3 has been made available at: https://github.com/EMODnet-Physics

In addition, the team also released a preliminary version of a light and easy installable mapviewer that consumes data from the ERDDAP docker. In other words, if the provider installs the docker following the provided examples/templates, he can also install this light mapviewer[3] and see its data from a local interface that can easily adapted and expanded for internal purpose. This way the provider can deploy its own mapviewer and at the same time is adopting standards that facilitate immediate interoperability towards EMODnet Ingestion.

A second technology is the **Discovery Access Broker (DAB)**: The DAB, developed by CNR-IIA, is a set of coordinated software components in charge of geospatial resource brokering with the aim of enabling interoperability amongst distributed heterogeneous data sharing systems. The end goal of DAB is to lower the entry barriers for both the two classes of System of Systems (SoS) i.e. providers and consumers (clients). The DAB technology, successfully demonstrated in the context of international initiatives such as the Global Earth Observation System of Systems (GEOSS)[4], the WMO Hydrological Observing System (WHOS)[5], the Ocean Data Interoperability Platform (ODIP)[6] and SeaDataNet[7], implements a metadata brokering approach, acting as a middleware software framework able to mediate and convert different web service protocols and data models to the required ones, this way enabling a data flow from data provider services to data user tools and applications as shown in the following image.

The DAB relies on a central harmonized data model composed of metadata elements from ISO 19115. Extensions are available to accommodate community defined additional elements. Heterogeneous data models can thus be mapped against the harmonized model to enable uniform harmonized discovery and access of heterogeneous data resources. Different data source types can be accessed by the DAB, having developed and plugged in the DAB framework specific accessor components to provide support for correspondent web service types, including but not limited to ERDDAP, HydroServer, OpenAPI based REST APIs, OGC SOS, and others. New protocols, that are being explored in the context of DAB as part of EMODnet Ingestion, is to leverage the OGC OM-JSON based timeseries API and the (now under definition) OGC Sensor API.

[3] https://github.com/ettspa/ingestion-vanillajs-mapviewer

[4] GEOSS: https://www.earthobservations.org/geoss.php

[5] WHOS: https://public.wmo.int/en/our-mandate/water/whos

[6] ODIP: http://www.odip.org/

[7] SeaDataNet: https://www.seadatanet.org/Data-Access/Discover-international-data

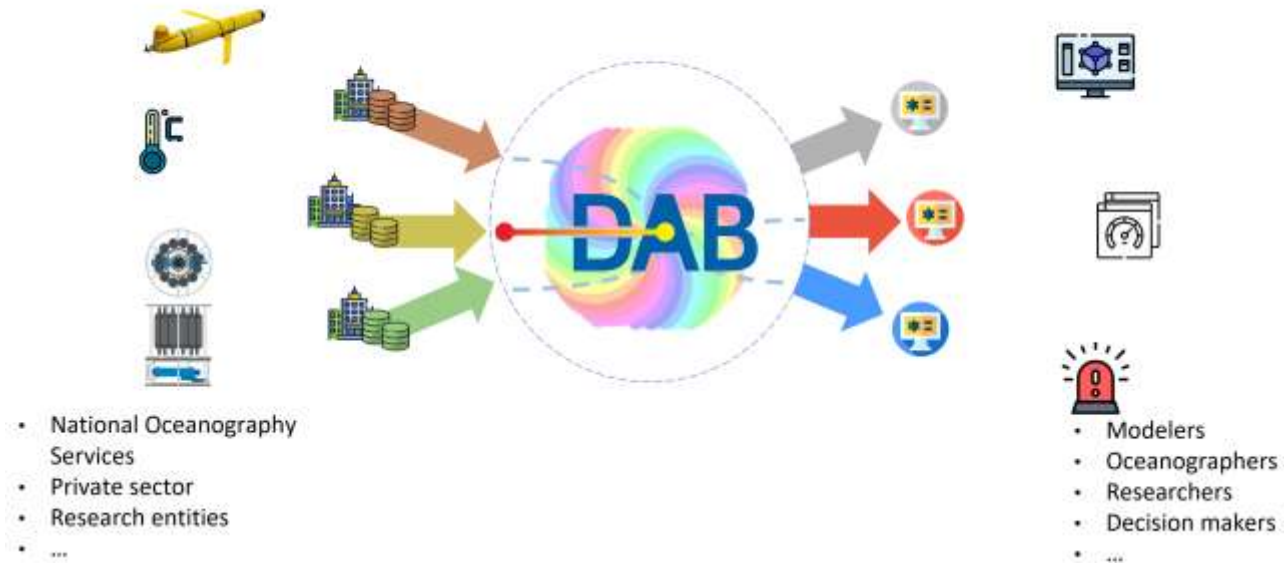


Figure: Discovery and Access Broker (DAB) technology to realize a system of systems implementing a brokering approach

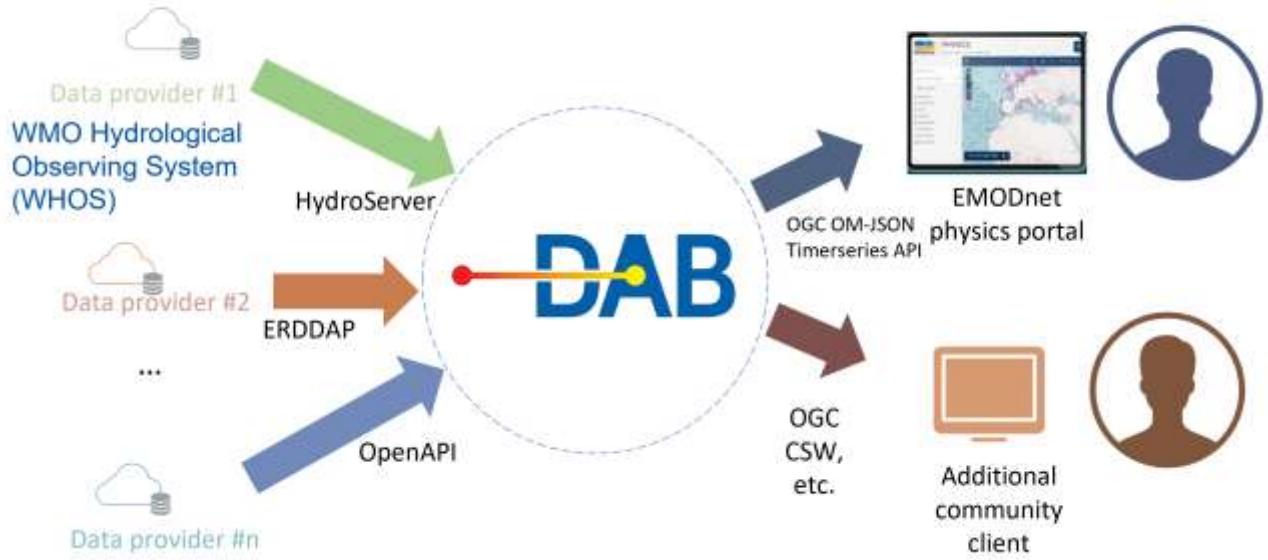


Figure: DAB deployment for EMODnet data ingestion showing the main protocol that are being implemented by the DAB for machine-to-machine data transfers, as well as the WHOS potential data source.

Interoperability tests are proceeding fine between CNR-IIA and ETT to assure near real time data flow is optimized using the implemented OGC OM-JSON based timeseries API and the provided content meets the metadata quality requirements. Technical discussion is also proceeding fine between CNR-IIA and 52North to support the implementation of the now under definition OGC Sensor API in the DAB. The DAB installation package is made available as Deliverable D3.6 and is currently under testing as part of the WHOS engagement activities (see D3.2).

WP3.2: Upgrading and expanding the Sensor Web Enablement (SWE) Demonstrator – led by ETT and 52North

The Sensor Web Enablement (SWE) demonstrator, started in the previous contract, is continued and more operators of oceanography platforms will be approached for trying out this new approach for making their data streams available in Real Time (RT). The EMODnet Ingestion adopted the 52North SOS SWE implementation which is open source and fully documented.

Concerning the SOS-SWE exercise, at the end of the previous phase there were a number of stations providing data by implementing SOS-SWE interoperability. As already reported, most of these stations were participating to research projects that, among the other goals, they were proofing this technology. Now that most of these projects ended and other technologies (e.g. ERDDAP) took over, in this phase Ingestion is focusing on improving the use of SOS-SWE for immediate metadata sharing with a focus on ship based observations in collaboration with the EuroFleet+ initiative.

provider	Sensors	Types	Datasets	Status Now
NEXOS	12	Mobile Platforms	14	Project ended. Stations are not operational. Research data have been submitted to PANGAEA or SEANOE[8]. Oceanographic data are included in EMODnet (AdriFOOS, OBSEA)
IRCEL - CELINE	111	Time series	598	These data are about Belgium inland air quality. There is an interest in the wind data that have to be reorganized into a wind data collection (yet). At the moment they are not visible.
OBSEA	2	Time series	17	OBSEA has moved to ERDDAP and is operationally connected to EMODnet
PIM	5	Time series	15	System was shut down.
CNR + ARPA ER	669	Time series	4	ARPA ER was contributing with river runoff data from the Po River basin, now this data flow is up-taken by the EMODnet Physics River node.
HZG – FerryBox	569	Time series	327585	Heron is operationally delivering Ferrybox data to INSTAC and from there they are synch to EMODnet
SMHI	2825	Time series	4591	SMHI is operationally sharing these data with the Copernicus Marine Service INSTAC and EMODnet
INOGS	15	Time Series	64	INOGS has moved to ERDDAP and is operationally connected to EMODnet
MONALISA prj	31	Time Series	353	These data are about inland atmospheric parameters and have been disconnected. During phase one they were used as an example to show the easiness of the implementation of the concept to engage other providers.

[8] https://beopen.openaire.eu/search/project?projectId=corda_____::4c98fd13173bf17d8f622f6870dcc8fe

52N FLUGGS server	83	Time Series	212	These data are about inland atmospheric parameters and have been disconnected. During phase one they were used as an example to show the easiness of the implementation of the concept to engage other providers.

Table: Updates on the SOS-SWE sources from previous contract

WP3.2.1 – expanding the Sensor Web Enablement (SWE) Demonstrator – led by 52N

The SWE is applied as part of the collaboration between EMODnet Ingestion and EuroFleets+[9]. EuroFleets+ is implementing open free of charge access to research vessels fleet and produced data. It is demonstrated that the SWE approach supports operators in navigation, meteo, salinometer delayed mode data exchange. According to this approach the Eurofleets Automatic Reporting System (EARS) and European Virtual Infrastructure in Ocean Research (EVIOR) manage the full set of sensors and platforms metadata and links to data publishing services which can then be easily linked into any collection and service.

The approach also considers event data encoded in SensorML. A new O&M observation type was defined to hold a SensorML encoded event as its result. The event data are ingested into the SensorThings API via MQTT and the "Dynamic Vessel Tracking & Events System", a visualization dashboard, can display them in near real-time. This task will be completed in the next months, so that events will also be displayed as the Eurofleets+ dashboard (http://eurofleets.utm.csic.es/dashboard) next to the underway data from the research vessels during the TA cruises. The latest work on the system also involves analyzing and solving performance issues due to the sheer volume of the observational data. This includes updating of software deployed three years ago and the migration of existing databases. The deployment of the new version and restoration of initial performance will be done soon.

In practice operators have to start by describing their platforms and sensors using the SWE editor (SMLE) following pre-defined SWE instrument profiles and SDN vocabularies. The data streams of the deployed platforms and sensors are then ingested in (near) real-time into a database system at the shore which facilitates SOS and SensorThings API services for wider distribution of metadata and data to users, also including connecting to CDI entries for archived data.

The initial idea of using a Sensor Observation Service for storing rich SensorML based metadata and linking to an ERDDAP dataset for observational data has been slightly revised. The Sensor Observation Service, as a XML-RPC based OGC service can be considered a legacy standard by now. Many institutions and data provider instead rely on the newer OGC SensorThings API, which uses an OData -like JSON/REST interface. Unfortunately, coming from the IoT world, this standard is lacking ways to encode complex sensor descriptions. Though it can link to externally hosted SensorML descriptions, these are still XML based and the access patterns to the descriptions (e.g. search for specific sensors) are not standardized.

At the same time the OGC is in the process of defining a new generation of service the standards, the OGC API family of standards. These services are OpenAPI based JSON/REST services and will in future replace established standards like the OGC Web Map Service (WMS) or OGC Web Feature Service (WFS).

This family of standards is currently lacking a true successor to the Sensor Observation Service, offering means of accessing rich sensor metadata descriptions and easy access to the observational streams. To overcome

[9] https://www.eurofleets.eu/

this, the OGC Connected Systems Standards Working Group (SWG) was recently established to develop the next iteration of SensorML and SWE Commons (including an official JSON encoding) and to define a modular API definition that is a successor to the OGC Sensor Observation Service as well as the OGC Sensor Planning Service. 52°North is actively participating in this SWG.

The service will easily allow to only host sensor metadata descriptions and linking to external datasets for the actual observation data, although direct provision of observations will be an optional part of the service, including provision in near-real time via MQTT. As such the newly defined service is an ideal candidate for the presented use case of providing rich, SensorML-based metadata and linking to an ERDDAP instance for the actual data. The standard is currently under intense development and a first draft version is planned to be presented at the 126th OGC Member Meeting in June 2023. By then 52°North also plans to have a first prototypical implementation. This reporting is considered as Deliverable D3.7 – Report on SOS SWE implementation progress -.

WP3.2.2 – SWE to ERDDAP – led by ETT

As anticipated, one outcome of the previous contract was the development of a simple point of access (i.e. EMODnet Real Time page) as a proof that the new provider's implementation of the SOS SWE standard for RT data distribution is fully working. This activity is updating the realtime dashboard at both front-end level (Helgoland interface was dismissed to move towards a lighter technology more in line with the centralization process) and at back-end level by working on the development of a SOS SWE to ERDDAP module. The use of the SOS SWE approach for metadata management combined with the use of ERDDAP for RT data exchange may represent an interesting and easily adoptable methodology to facilitate fully documented RT data exchange.

The upgraded viewer is now up and running at: https://realtime.emodnet-physics.eu

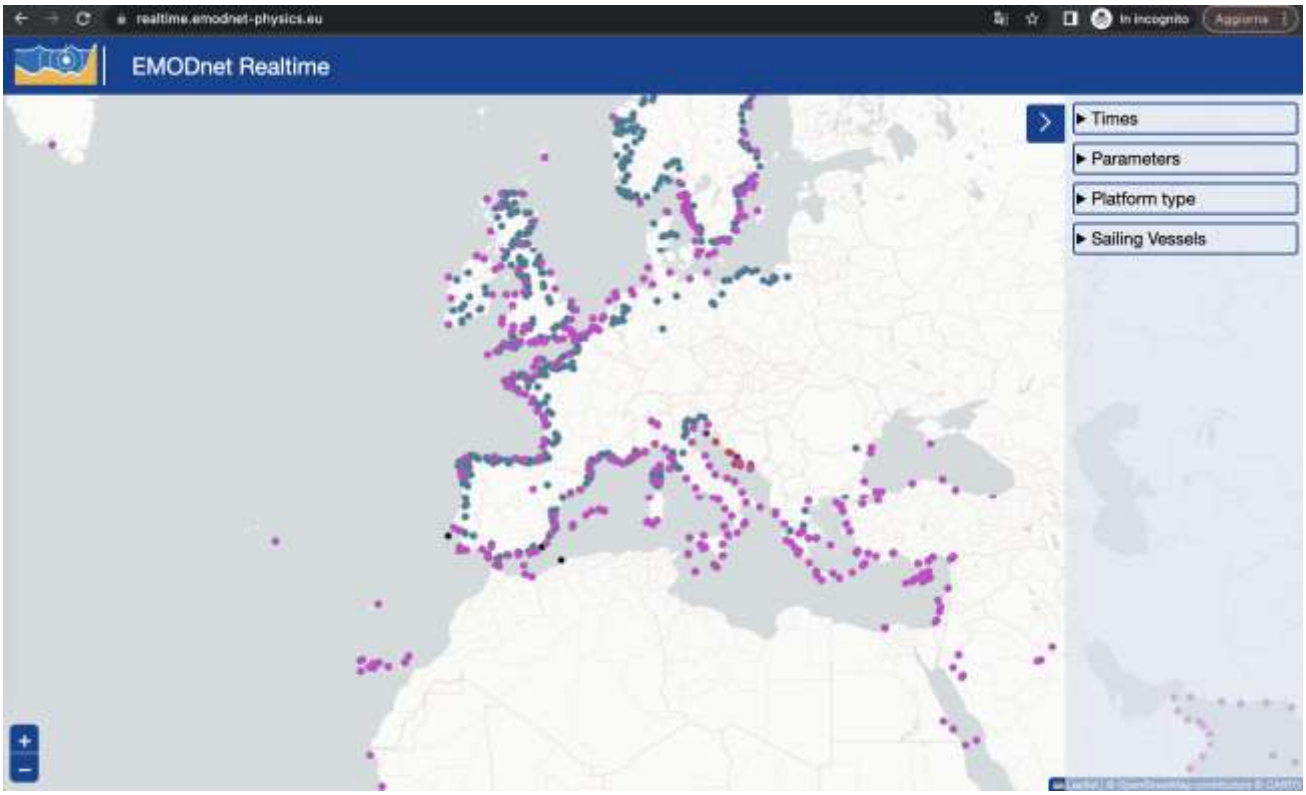


Image: upgraded viewer for phase 1 connected observing stations and operators

Image: plots of time series of operational observing stations

Notably the interface was updated to match providers expectation and have an easy way to find themselves. The system is now grouping the linked parameters/platforms together with the providers. This new viewer, built upon SWE to ERDDAP represents Deliverable D3.9 – SWE to ERDDAP module.

WP4 – Marketing and outreach

Covering Task 8 and 9

WP4.1: Promotion and Outreach activities

During the EMODnet Ingestion 3 kick-off meeting, the activity schedule for promotion and outreach activities was presented by RBINS. Partners were also invited to publish their work in scientific social networks. A booklet with the first ten use cases was printed and distributed at at the kick-off meeting of the project and two events in June 2022 in Portugal. RBINS also disseminated outreach material sent by classic mail priori to the meeting (stickers, bookmarks, flyers, Ingestion pins, the remaining A0 posters “Wake up your marine data” printed on polyester), along with EMODnet reports provided by the Secretariat and notebooks.

Work took place for compiling more Ingestion use cases to complement the earlier use cases and to create a series. The use cases are actively promoted in social networks, on the web and in newsletters. Multiple tweets and publications on LinkedIn took place, as well as the publication of news items in the EMODnet News Digest, which has now become a regular target for the dissemination of the project activities. In December 2022 this resulted in an updated and expanded presentation of the existing 9 + 3 use cases, which has been published on the home page of the Ingestion portal under “Join our success stories” and also on the Central portal. Also, a compilation of 6 Chemistry success stories was prepared and sent to EMODnet Chemistry for further promotion.

One "success story" was drafted with partner NIMRD entitled "Mare Nostrum NGO contribution to the European Marine Litter database". This is promoted on the website and in the social media, and included in one of the two poster contributions that were presented at the MARBLUE conference (http://www.marblue.ro/), organized by NIMRD in Romania in October 2022. The theme of the conference was "Blue Growth: Challenges and opportunities for the Black Sea". The first poster explains how EMODnet Ingestion functions and is entitled "Wake up, safeguard and share your marine data with EMODnet-Ingestion.eu". The second poster showcases key achievement of the project so far and focuses on three success stories collected from Romania, Bulgaria and Georgia; it is entitled "Your data work at EMODnet-Ingestion.eu". At the MARBLUE conference also oral presentations have been given about EMODnet Ingestion by the coordinator (MARIS), while IFREMER presented SeaDataNet and its relation with EMODnet.

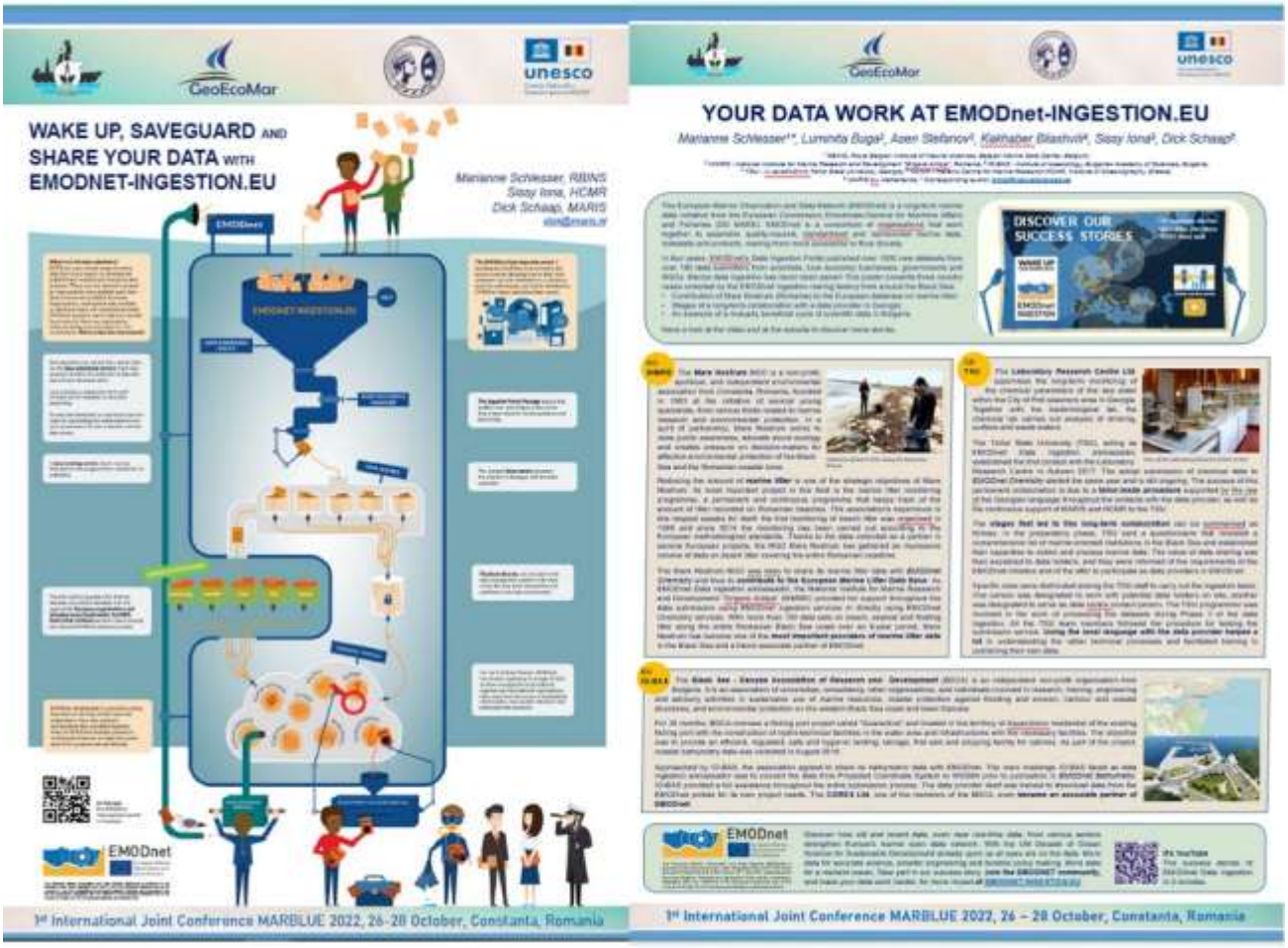


Figure: 2 posters at MARBLUE conference

Partner ENEA has posted a number of EMODnet videos and promotion texts on the Marina Platform website, by which it is shared with a large community of people interested in blue biotechnology of the Mediterranean Sea, as part of the training material of the B-Blue project. See: https://www.marina-platform.eu/registeredarea/labs/viewLab/127

MARIS participated to the EU-Canada Ocean Partnership meeting that was organized by the EU in Brussels, 3 – 4 October 2022, brainstorming about possible subjects for cooperation between EU and Canada. Several thematic EMODnet topics were highlighted, while also the Ingestion service was mentioned.

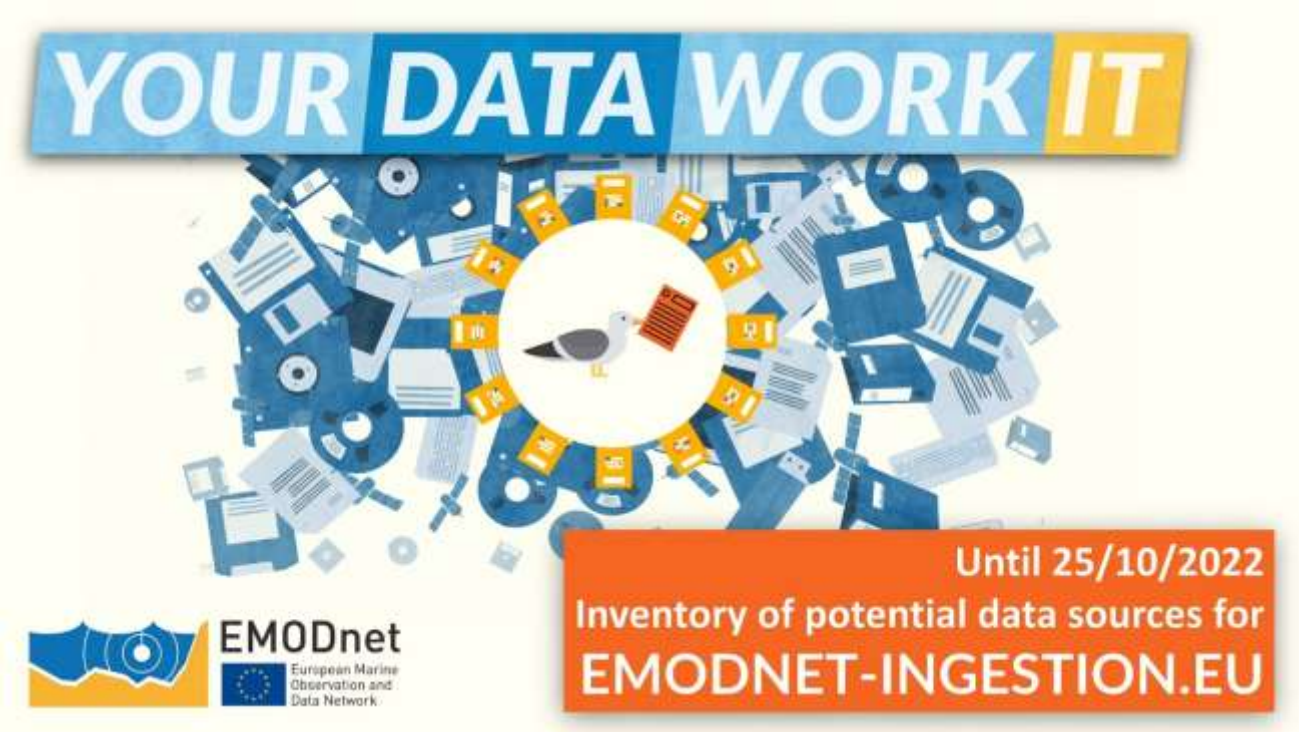
MARIS and HCMR contributed to 2 Marine Data for and from the Offshore Renewable Energy (ORE) sector workshops, initiated by EU DG MARE at 20 – 21 September 2022 and 20 – 21 October 2022, presenting EMODnet Ingestion and in particular how industry partners could use Ingestion for sharing their marine data sets.

RBINS is underway with preparing a briefing for data ambassadors to record a video presentation of their use case, using the Belgian case as an example. The video will be prepared in the coming months. In the meantime, in the first quarter of 2023, a new R/V leaflet with two flagship case studies was printed in 4000 copies and shared with all consortium members, in particular to support the objective of mobilising coastal and offshore licensing data.

All partners undertook various outreach activities at conferences, workshops, and bilateral meetings, partly onsite, mostly remote, which are listed in Chapter 7. Several of these activities have resulted in actual data submissions, which then have been followed-up for publishing. The table in Chapter 8 gives more details about the promotional assets.

WP4.2: Inventory of potential data sources

Work was undertaken for an updated inventory of potential data sources. An initial version of this inventory was made in the previous contract and served as a guidance for partners to identify and mobilise new data providers and new data submissions. In the new contract, this exercise for building an inventory with contributions from all EMODnet ''ambassadors'' has been repeated, thereby making use of the lessons learned so far. RBINS provided a guidelines document, including lessons learned and instructions, and a reporting template for the inventory. In November 2022, RBINS closed the compilation and the Deliverable D4.1 - I**nventory of potential data sources – was released.** The inventory contains 230 data sources from 25 countries and 35 institutes as potential data sources to follow-up. The Deliverable D4.1 is included as Annex 3 to this report.



WP4.3: Improve and document the availability of data provided for coastal and offshore licensing.

The overall objective of task 9 is to engage with authorities in Member States who receive data from licensing procedures for coastal or offshore activities. Specific attention is given to aquaculture and offshore energy. The Work Package is structured based on the following steps:

- Identification of potential stakeholders
- Inventory of data collection and licensing processes in each country
- Set up of a database
- Initiation development of a roadmap towards a more harmonised approach

Identification of potential stakeholders

As part of this activity, a stakeholder mapping process was set up. The purpose was to identify relevant stakeholders, specify their interests and determine their roles and mandates and their desired involvement in the different phases of the project. In total 128 stakeholders were identified in 27 countries. An additional four countries have indicated that they are in contact with potential stakeholders, but were not able to fill in the provided survey at the time of submission. The survey will be kept open, so as soon as other stakeholders are identified, they can be added to the list and included in all relevant activities.

More than half (52%) of the identified stakeholders were national governments from different ministries such as the Ministry of Energy, Ministry of Renewable Energy, Ministry of Environment and Water and the Ministry of Agriculture. This is followed by agencies (19%) and education such as universities and scientific institutes (9%).

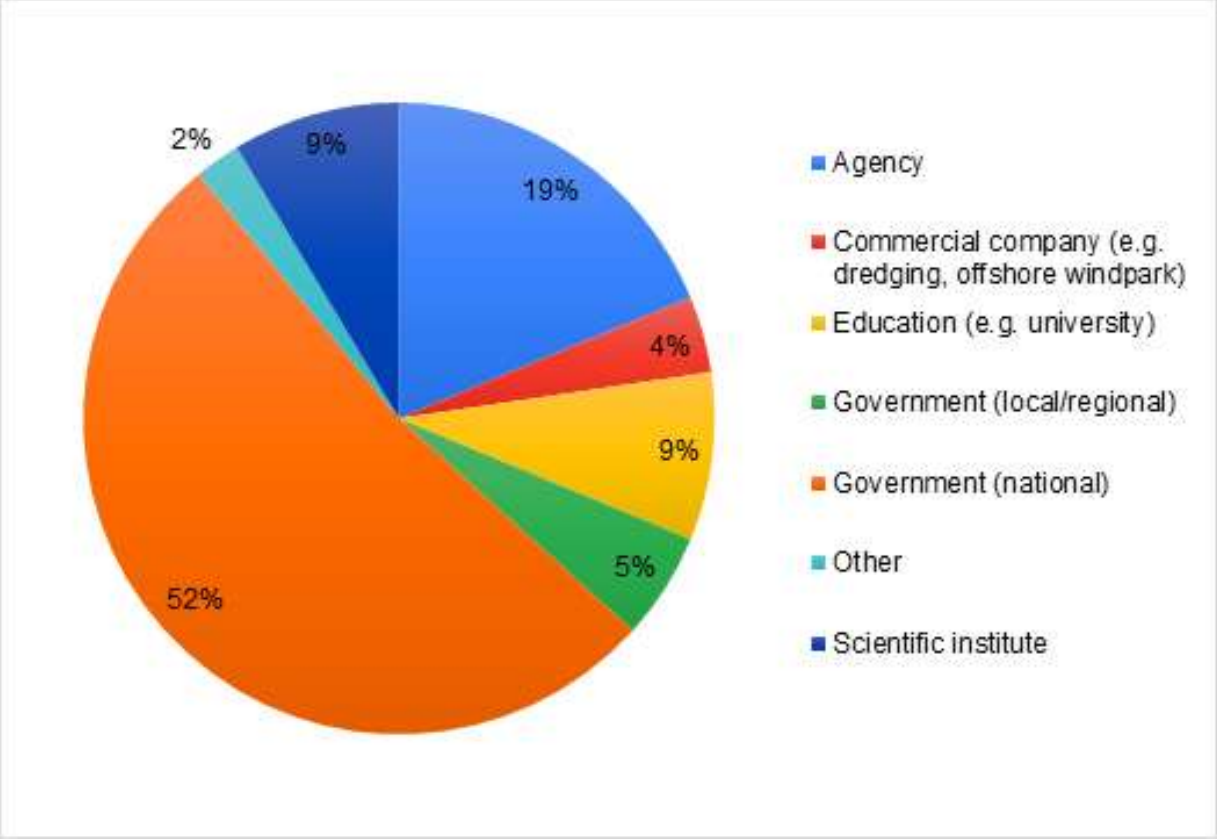


Figure: Different types of stakeholders responsible or involved in the offshore licensing process

The full results of this activity can be found in Deliverable D4.4 **-** Inventory of identified stakeholders for licensing data - which is made available as Annex 4 to this Report.

Inventory of data collection and licensing processes in each country

The results of Deliverable 4.4 serve as input for preparing Deliverable 4.5, which aims at establishing a baseline assessment or inventory of data collection and licensing processes in each country. This activity is led by Deltares and is currently still ongoing. The objective of this activity is twofold:

- Identify practices on data collection and licensing processes;
- Examine relevant previous EU-funded projects to identify common methodologies, roadmaps and synergies which would support the proposed approach of this project.

The activities that will be carried out for this task are divided into several steps:

- Step 1: Deltares will draft a general template that contains questions on licensing procedures for each member state. These questions will include amongst others:
    - Which institution or organization is responsible for issuing licenses for offshore energy/aquaculture in your country?
    - Who can apply for an offshore license or permit?
    - What is the procedure for obtaining a permit for offshore energy/aquaculture in your country?
    - Which information is needed?
    - How long does it take?
- Step 2: The partners from the consortium are requested to complete the template for their country. If they are familiar with the requested information, they can provide it themselves, but if this is not the case it is required to reach out to the stakeholders in order to obtain the relevant information.
- Step 3: The gathered data will be analysed by Deltares in collaboration with consortium partners. The first aim is to provide a comprehensive overview of methods and procedures for licensing in each country. In addition, the results are studied in more detail in order to make cross-country and cross-basin comparisons.
- Step 4: A desk study will be conducted to find any relevant previous EU-funded projects in order to identify possible methodologies, roadmaps or synergies which could be of value for the objectives of this project.

Currently the project team is focusing on the completion of steps 2 and 3. In this regard it should be noted that the collection of information from consortium partners is a lengthy process and depending on the speed at which their national and local contact respond to the information requests of EMODnet partners. At the moment the project team has been able to collect initial information for the countries indicated in the following figure.

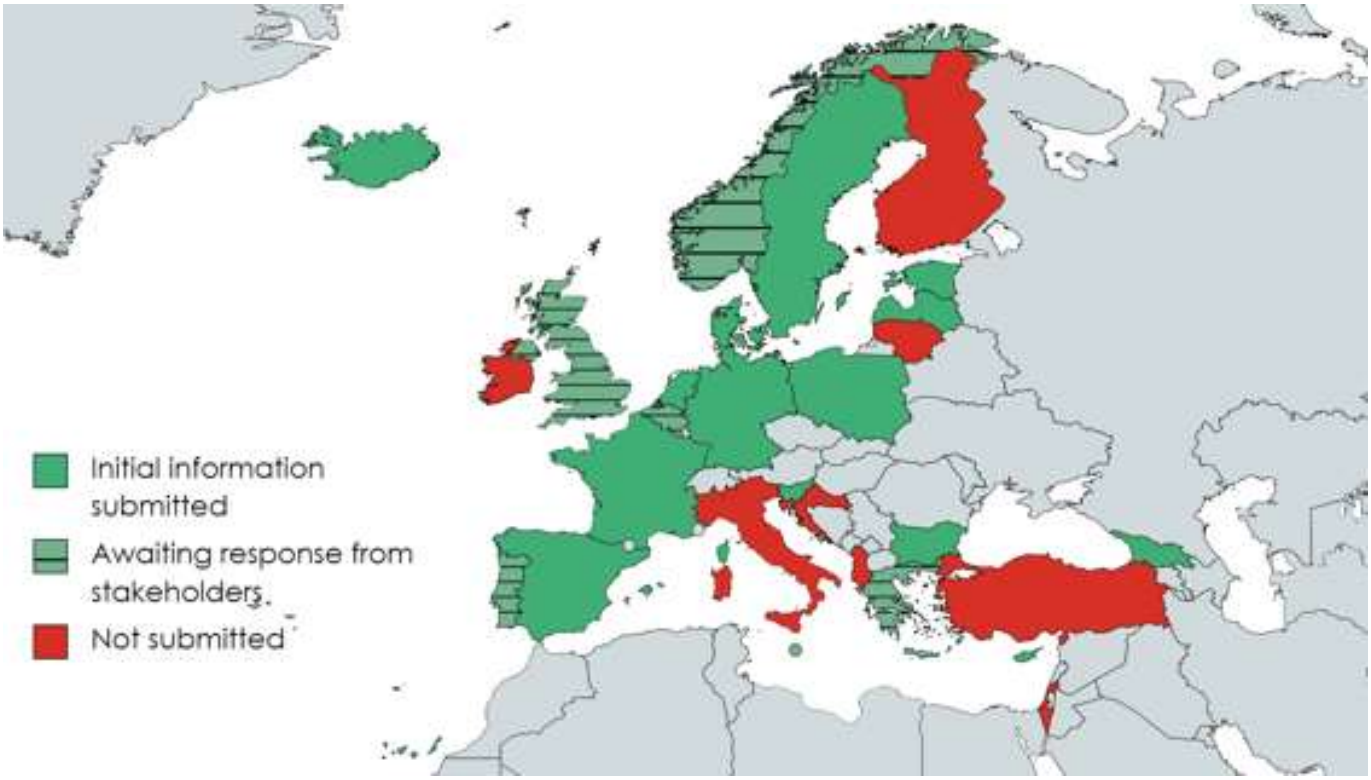


Figure: Overview of current responses

Once ready, the final results of this activity will be presented in Deliverable D4.5 - Inventory of current license data practices -.

Set up of a database

As part of this activity, a simple database will be set up documenting the parameters relevant for coastal or offshore activities with particular focus on aquaculture and offshore energy, and specifications and accessibility of the data from each country. Deltares is again in the lead for this task and has developed an initial database for this activity. The data collected as part of Deliverable D4.5 will be incorporated in this database. The final results of this activity will then be presented in Deliverable D4.6 **-** Database about availability of license data per country -.

Initiation development of a roadmap towards a more harmonised approach

The aim of this activity is to provide an incentive to countries to move towards a more harmonized approach between and also within Member States. This could lay the basis for support from stakeholders for initiating development of a roadmap for a more harmonised approach. Although this workshop is not scheduled until later in the project, Deltares is already collecting the contact details of stakeholders who might be interested in participating. Specifically, the results of Deliverable D4.4 and D4.5 are useful in this regard. The workshop is labelled as Deliverable D4.7 **-** Workshop: Reporting on license data -, which will be implemented near the last months of the contract.

4. Identified issues: status and actions taken

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
Improving the 1st release of D4.4	Resolved	All consortium requested to improve and complete the survey for all countries. 2nd release of D4.4 is now available.		M8

B. Issues / challenges identified by the thematic assembly group itself				
Priority issue / challenge	Status (Pending/ Resolved)	Action(s) taken / remaining actions planned	Date due	Date resolved

5. Allocation of project resources

Information on the allocation of project resources	
Categories	Resource usage[10] (%)
Project Management (WP0)	4
Construct and operate central Data Ingestion portal with services (WP1)	7
Implement pathways to forward submitted data to the appropriate repository (WP2)	15
Facilitate machine-to-machine transfers (WP3)	6
Marketing and outreach activities (WP4)	19
TOTALS	**51%**

[10] Provide the workings of your calculations, *i.e.* percentage allocation of the total amount awarded.

6. User feedback

Overview of user feedback and/or requests received in this 1st year							
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
27 Sep 2022	IRTA/Spain	Asked how to participate in IODE OceanTeacher as usder had interest in EMODnet Biology	Online Feedback form	Same day	Resolved	Request forwarded to IODE who answered	
29 Nov 2022	BugBounty/India	Reported a vulnerability in the Ingestion portal	Online Feedback form	Same day	Resolved	Issue solved and thanked	
30 Jan 2023	MFRI, Iceland	Partner question about moving record to Phase II	Feedback form and e-mail	Same day	Resolved	Explanation given by Master	
17 Jan 2023	SINTEF, Norway	Several question about EMODnet ingestion: safeguard? Checks?	Feedback form and e-mail	3 days	Resolved	Contact established between IMR, Ingestion partner and SINTEF	

01 March 2023	University of Edinburg, United Kingdom	Marine -ID connection problem	Feedback form and e-mail	1 day	Resolved	Problem was on Marine-ID side, solved	
21 March 2023	IMS-METU, Turkey	Pb of wrong assignment of a dataset	Feedback form and e-mail	1 day	Resolved	Correction done per Master	
04 April 2023	IOF, Croatia	How to reject a dataset	Feedback form and e-mail	Same day	Resolved	Explanation given per Master	

7. Meetings/events held/attended & planned

A. Meetings/events organised and attended in the 1st year					
Date	Location	Type event (internal or external meeting; training/ workshop)	Was a presentation given? (yes/no + short description)	Meeting attended (A) / organised (O)	Short description and main results (# participants, agreements made, etc.)
05 Apr 2022	web	external	no	A	ETT: Joining webinar on Best Practice in Aquaculture
08 April 2022	Sweden	external	yes	A	SMHI: Meeting of Swedish National Committee for Ocean Decade with attention to EMODnet and Ingestion.
11 Apr - 2022	Online	External Webinar	Yes	A	VLIZ: NCK Data Day: https://www.nck-web.org/upcoming-events/108-the-value-of-measurements-and-monitoring . Given presentation: https://www.nck-web.org/content/documents/2022/Theme_Day_Measurements/pitch9_EMODnet_Biology_JoanaBeja_VLIZ.pdf High level overview about EMODnet Biology's activities and services. Recording: https://www.nck-web.org/past-events/all-events/108-the-value-of-measurements-and-monitoring Session dedicated to the topic "The value of measurements and monitoring" A slide with the data flow (including EMODnet Ingestion was presented)
12 Apr 2022	Online	Meeting – MARE A1 Deputy Head of Unit with MARIS, HCMR	yes	A	MARIS + HCMR: To introduce the project to the new MARE Deputy head

12-13 Apr 2022	Genova, Italy	Meeting	yes	O	ETT: Marine Insitu Collaboration - MIC TWG - to streamline data flow between main EU marine data operators and integrators
14 Apr 2021	Split, Croatia	Soundscape project internal meeting, Interreg programme CBC Italy – Croatia	no	A	IOF: Discussion on the publishing of collected data on underwater noise in the Soundscape project The decision was to publish 20 seconds averaged sound pressure data sets from all stations in the North part of the Adriatic Sea from March 2020 – June 2021. Proposed is using EMODNET Data Ingestion and SeaDataNet service SEANOE for data publishing with DOI.
Apr 2022	Online/La Spezia	Internal meeting with the DLTM working team for the LabMare initiative	no	A	ENEA: The Ligurian DLTM Consortium (CNR, ENEA, IIM, INGV, etc.) has installed a coastal-cabled monitoring station, in the Eastern Ligurian Sea in the S. Teresa Bay (La Spezia)). ENEA published on behalf of the DLTM consortium in the SeaNOE system a time series of about 2 years about temperature, pressure, water conductivity and salinity. Data published in the SeaNOE system in April 2022.
25 Apr 2022	Online	Meeting – Kick off CINEA/EMFAF with MARIS, HCMR	no	A	MARIS + HCMR: To discuss with EU CINEA and DG MARE the new contact
26-27 Apr 2022	Online	Hybrid meeting: EMODnet 11th TWG	no	A	MARIS + HCMR: To discuss the EMODnet centralization and its progress
Apr 2022	e-mail contacts & phone calls	Dissemination activitiy in the B-Blue project in which ENEA is responsible	Yes	A	ENEA: Agreed to present the EMODnet Data Ingestion portal by means of videos and a short document in a web site used by a huge Mediterranean community of the Blue Biotechnologies (BBt).
May 9, 2022	Constanta, Romania	External Meeting: EMD in My Country 2022, Science Fair on Blue Economy in the Black Sea Region, organized	Yes.	A	NIMRD: EMODnet Ingestion and the workflow process from data to EMODnet Portal were presented to the audience. By means of poster and EMODnet Ingestion promotion materials

		by Black Sea Universities Network			
09-10 May 2022	Sweden, Malmö	External	yes	O	SMHI: International Ocean Literacy Conference organised in Sweden, One Ocean – One Planet: Ocean Literacy Action 2022. Organised a parallel session on Citizen Science and Ocean Literacy. ~25 attendees
11 May 2022	Online	webinar - EU Marine Data Services EMODnet and COPERNICUS Marine in the context of An All Atlantic Ocean Data Space 2030 and global ocean data ecosystem	no	A	HCMR: Panelist on behalf of EMODnet data Ingestion at the discussion for the data sharing
11 May 2022	Sweden, Malmö	External	no	O	SMHI: National marine infrastructure and data mapping workshop. ~45 attendees
9-13 May 2022	web + Cadiz, Spain	workshop	yes	A	ETT: participating in EuroSEA workshops week + GA
16 May 2022	Bizkaia (Spain)	Conference. Training	Yes.	(A)	CSIC: conference for universitary students in the framework of a conference cycle about: ROVs, offshore eolica and geology. Focus on morphosedimentary features and sedimentary systems making up the continental margins. EMODnet was introduced to show how a rapid access to relieable and accurate information is possible. Title: The seafloor geomorphology and sedimentation on continental margins. The colleagues at the meeting have no information to ingest because they are not data originators. A general conference will be arranged after summer to explain with more detail EMODnet.
May 17, 2022	Zagreb, Croatia	Internal meeting Croatian Marine referral centre	Yes	A	IOF: Short presentation on EMONnet and discussion on declassification of data collected in the framework of MSFD (MESD) and WFD (HV) monitoring

		(RMC) with the Ministry of the economy and sustainable developt (MESD) and Croatian waters (HV)			.The conclusion was that RMC sent an official letter to MESD and HV with a request to join all data collected in the framework of MSFD and WFD in two mirroring databases (located in RMC and HV) and their declassification.
19 May 2022	Online	MEDIN Data Archive Centres Meeting	No	A	BGS: MEDIN DAC meeting including BGS, BODC and other DACs
19-20 May 2022	Ravenna, Italy	conference	yes	A	MARIS + ETT: Participating in European Maritime Days - https://ec.europa.eu/maritimeaffairs/maritimeday/conference_en . MARIS chaired a panel on European marine data management. EU4Ocean @ EMD - https://european-maritime-day-2022.b2match.io/agenda?session=c2Vzc2lvbjoxMTI1OTA%3D&track_id=19933
19 May 2022	Sweden, Gothenburg	External	yes	A	SMHI: National marine Citizen Science workshop. ~25 attendees. Presenting on national CS initiatives, cooperation and data flows
19-20 May 2022	Constanta, Romania	External Meeting: The 8th International Scientific Conference SEA-CONF 2022, "Sailing to the future" Fair, organized by "Mircea cel Batran" Naval Academy	Yes	A	NIMRD: EMODnet Ingestion was presented to the audience using poster and EMODnet Ingestion promotion materials.
26 May 2022	Online	Meeting – Trans Europe Marinas with ETT, SHMI, HCMR	no	A	HCMR+ETT+SMHI: To discuss on new sensors installed to the Trans Europe Marinas network and later data ingestion into EMODnet
30 May 2022	Online	Preparatory meeting-EMODnet Vision 2030	no	O	HCMR: To discuss the EMODnet Vision for the future, government and business model

30 May 2022	Genova, Italy	meeting	yes	O	ETT: meeting with CIMA foundation (https://www.cimafoundation.org/) - to discuss about synergies
May 2022	Hafnarfjörður	Internal meeting at MFRI	No	A/O	FMRI: A meeting on releasing CTD data from fisheries cruises
06-10 Jun 2022	New York, USA	External Meeting	Yes	A	VLIZ: Participated to 22nd meeting of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea. EMODnet Biology was invited to present the European perspective on "Strengthening ocean observation value chain through regional cooperation: lessons from EMODnet Biology". It included a slide with the data flow including EMODnet Ingestion.
6-7 Jun 2022	Vieira de Leiria, Portugal	Symposia organised by APOCEAN – Portuguese association of Oceanography	Yes	A	IHPT: Encontro de Oceanografia 2022 (https://apocean.wordpress.com/inscricoes/); Poster "Wake up your data" was presented + stand with promotion material as received from RBINS.
10 Jun 2022	Online	Meeting – EMODnet Ocean Decade coordination group	no	A	HCMR: To discuss EMODnet involvement and contribution in Ocean decade activities
07 Jun 2022	Sweden, Norrköping	External	yes	A	SMHI: RV Svea open day for SMHI employees. General EMODnet presentation given
16 Jun 2022	Genova, Italy	workshop	no	A	ETT: GESmartCity - Blue District - workshop to discuss about synergies between projects to support the municipality blue and smart projects - about 30 attenders
16-17 Jun 2022	Glyfada, Athens, Greece	Kick-Off Meeting EMODnet Data Ingestion 3	Yes	O	Kick-Off Meeting EMODnet Data Ingestion 3 with 40 in-situ and 24 remote participants, to discuss the new phase goals and activities

17 Jun 2022	Online	Meeting	No	A	COGEA: Meeting in the framework of iAtlantic industry data exchange. The meeting aimed at exchanging offshore oil and gas data with Brazil. It was recommended to submit the layers through the EMODnet Data Ingestion portal.
21 Jun 2022	Online	Meeting – Trans Europe Marinas/EMANEDS project	no	A	HCMR+ETT+SMHI: To discuss concept paper an sensors characterization and prioritisation for including into EMANEDs project
21 Jun 2022	Online	Meeting	No	A	COGEA: Meeting to discuss the final report of contract: CINEA/EMFF/2020/3.1.16/Lot2/SI2.850940 - Vessel Density. EMODnet Human Activities is the steering committee. The contract has produced a method and map layers to account for loss of SAT-AIS messages due to collisions. The layers will be uploaded on the EMODnet Data Ingestion portal.
21 Jun 2022	web	external	no	O	ETT: CCMALR - to discuss about interoperability
21 Jun 2022	Brest, France	Internal meeting	Yes	O	Shom: meeting for sharing experience on European Projects. 17 participants. Presentation of EMODNet Data Ingestion given.
22 Jun 2022	Brest, France	External meeting	No	O	Shom : JIST « Journée d'information scientifique et technique » - 150 participants. Data Ingestion promotional material distributed.
22 Jun 2022	Online	EMODnet Vision 2030	no	A	MARIS + HCMR: Internal consultation & planning meeting for EMODnet Vision 2030
21-23 Jun 2022	Lisbon, Portugal	Symposia co-organised by Hydrographic Institute, Navy Authority and State Laboratory, and the Hydrographic Institute of the Spanish Navy	Yes	O	IHPT : 7as Jornadas de Engenharia Hidrográfica/ 2as Jornadas Luso-Espanholas de Hidrografia (https://jornadas.hidrografico.pt/index/pt) Poster "Wake up your data" presented + stand with promotion material sent by RBINS.

27 Jun – 01 Jul 2022	Portugal, Lisbon	Conference	no	A	SMHI: Participating in UN Ocean Conference
27-28 Jun 2022	Online	Hybrid meeting: EMODnet 16th SC	no	A	MARIS + HCMR: Periodic meeting of the EMODnet Steering committee - To discuss the EMODnet Ingestion update and the centralization
28 Jun 2022	Online	Meeting	Yes:	A	COGEA: It was an internal meeting organized by DG MARE to understand to what extent EMODnet can support the offshore energy sector and Maritime Spatial Planning. As specifically regards MSP, it was highlighted that some Member States have already submitted their spatial plans via EMODnet Data Ingestion, and these plans have ended up on EMODnet Human Activities. It was added that EMODnet Data Ingestion has potential for filling a gap (without passing new legislation) in the MSP Directive, which does not set out rules, standards and formats for data transmission. Full availability was given to assist Member States in submitting their plans via EMODnet Data Ingestion. MARE and the EU MSP Platform will follow up with MSs. presentation of EMODnet Human Activities for offshore energy and MSP. It was highlighted that the Data Ingestion facility should become the preferred vehicle for Member States to transmit their spatial plans to the Commission
5 Jul 2022	Batumi, Georgia	National event	Yes	O	TSU: presented and exhibited visual and video material for promotion of the goals and results of EMODnet Ingestion and EMODnet Chemistry projects. The national event was organized under the auspice of government of Georgia dedicated to the Black Sea affairs, problems, achievements etc. TSU was one of the organizers. The computer accessories made from the plastic waste with the logos of the projects were presented and distributed among attendees during the sessions.
5 Jul 2022	web	workshop	yes	A	ETT: European Glider Data Management Workshop - https://www.groom-ri.eu/european-glider-data-management-workshop-agenda-2/ -

					https://docs.google.com/document/d/1hQSNbznH6sm5Eo1KjrkK1og1vQDOjRtwGa0xryANe54/edit# Highlighted EMODnet status and activities for glider network
7 Jul 2022	Bilbao, Spain	Symposium of the Iberian Atlantic Margin	Yes	A	CSIC : Oral presentation + abstract « EMODnet: Nodo de información geoespacial para el análisis y modelización de distintos procesos en el medio marino Javier Valencia Mtz. De Antoñana1*,Gemma Ercilla Zárraga2 »
9 Jul 2022	Liepaja, Latvia	external	No	A	LHEI: The Day of the Sea. Poster presentation on site, discussion with potential data holders (mostly scientific data) about data sharing and FAIR principles. Discussion about sandy beach pollution with plastic and available information.
11 Jul 2022	web	Summer school	yes	A	ETT: EMODnet program, goals, projects and actions were introduced before digging into in situ data management and sharing (with EMODnet provided tools such ERDDAP docker)
21 Jul 2022	Online	MEDIN Standards Meeting	No	A	BGS: MEDIN Standards Meeting including BGS, BODC and other DACs
25-29 Jul 2022	Lisbon, Portugal	the Oceanographic Department from IH organized the 2022 Summer School to Bachelor's and Master's students from the Geophysical Sciences of Lisbon University.	Yes	A	IHPT : Publicize EMODnet and particularly, EMODnet Ingestion and we made students aware of the usefulness of data sharing.

4 Aug 2022	web	Conference	Yes	A	ETT: O*pen Science Conference* - SCAR OSC data session: Sharing science data FAIRly to support interdisciplinary research collaborations. About 70 attenders. Highlighted role of EMODnet as open and free data hub
13 Aug 2022	Saulkrasti, Latvia	external	No	A	LHEI: Harbour festival. Poster presentation on site, discussion about scientific data sharing and FAIR principles.
15-30 Aug 2022	Copenhagen, Denmark	Several meetings with the Ministry of Environment, Environmental Protection Agency	Yes	A	AU-DCE: The result of the meetings was a new dataset.
19 Aug 2022	Barranquilla-Colombia, Spain	Technical Week of Geology, Engineering and Geosciences of the Universidad Del Norte	Yes	A	IHPT: Presentation 'Scientific challenges in Marine Geology and links to EMODnet'
9-11 Sep 2022	Lerici, Italy	The Mytiliade biennial festival	yes	A	ENEA: EMODnet has been promoted by using a video, a poster and promotional material during the 3 days event: Mythiliade organized by the Municipality of Lerici and dedicated to aquaculture.
13-15 Sep 2022	Rotterdam	External/workshop	yes	A	SMHI + ETT: NOOS Annual Meeting, approximately 25 participants. General EMODnet presentation including Data Ingestion
13-14 Sep 2022	Qawra, Malta	SHAREMED International Workshop	No	O	UM: An international workshop was organised by UM together with OGS within the project SHAREMED. EMODnet poster was exhibited and the concept of EMODnet was discussed especially with the Non-EU participants.
14-15 Sep 2022	Gijon (Spain)	Meeting	yes	A	IEO-CSIC: Internal meeting in the framework of Marine Strategy Directive for Spain. Data Ingestion tools and SEANOE portal were presented.

15 Sep 2022	Risø, near Roskilde, Denmark	Meeting	Yes	O	AU-DCE: Meeting with scientists from Aarhus University regarding the uploading of several Marine Beach Litter datasets: "National monitoring data for beach litter from two Baltic Sea beaches in Denmark, 2020-21"
16-19 Sep 2022	Porto Heli, Argolida, Greece	Marine & Inland Waters Research Symposium		A	HCMR: presented the EMODnet data Ingestion with a focus on the data sharing and its benefits
20-21 Sep 2022	Online	EMODnet for Business Workshops – Marine Data for and from the Offshore energy sector in the Northeast Atlantic, North Sea and Baltic Sea areas		A	HCMR: presented the EMODnet Data Ingestion, service as the public EMODnet service in support of the Blue Economy towards FAIR marine data sharing.
21-22 Sep 2022	Brussels, Belgium	EMODnet TWG12 meeting		A	HCMR: discussed the centralization and presented the EMODnet Ingestion technical updates and improvements.
22 Sep 2022	Brussels, Belgium	EMODnet-Copernicus Marine Service coastal workshop		A.	HCMR: participated on the discussion for the cooperation of EMODnet, Copernicus and data integration.
19-23 Sep 2022	Gdansk, Poland	Conference	Yes	A	VLIZ: European Marine Biodiversity Symposium 55th (https://embs55.ug.edu.pl/). A presentation was given representing EurOBIS/EMODnet Biology. EMODnet Ingestion was introduced as a way to reach EurOBIS/EMODnet Biology during the conference meals and coffee breaks
22 Sep 2022	On-line	external	Yes	O	ORION: Presentation about MUSAN Ayia Napa underwater park wave climate condition based upon use of EMODnet bathymetry with Lidar observations for simulating the extreme wave induced forces and the estimation of the extreme wave pressure at sea surface and at water depth

					below for December 2021 to April 2022. Also promotion made for EMODnet Ingestion.
25 Sep 2022	Genova, Italy	Workshop	Yes	A	ETT: Salone Nautico 2022 – International Boat Show – The sustainability comes from the sea: living experiences according to the One Health Approach Workshop. The theatre of the sea, at the hearth of the event, hosted the workshop to discuss about sustainability and oceans. The event was attended by more than 150 people on site. The event had a big hype on local newspapers and social channels[11]. Overview given of EMODnet program, EMODnet Physics and Ingestion to enable new services and sustainable developments.
27-29 Sep 2022	Brest	External	no	A	SMHI + ETT: joined Copernicus INSTAC GA together with MIC working group meeting. Periodic meeting of the Marine In situ Collaboration team to review achievements and plan new actions to unlock and include more in situ data on EOVs for the benefit of EMODnet, Copernicus Marine Service, EuroGOOS and related initiatives.
29 Sep 2022	web	Workshop	Yes	A	ETT: EuroGOOS FerryBox Annual Workshop[12]. Coordination with the FB TT is important for both Physics, Chemistry and Ingestion themes. The importance to work on a clear data licence (CC-BY) was largely discussed. Updates given on EMODnet and available features

[11] E.g. https://www.visitgenoa.it/it/evento/ocean-race-al-salone-nautico-genova-grand-finale

[12] https://eurogoos.eu/events/8th-ferrybox-workshop-eurogoos-task-team-meeting/

26-30 Sep 2022	Brest, France	SeaTechWeek 2022. Conference	no	O	Shom: workshop on S-100 and e-Navigation organized during the conference. No specific presentation on EMODnet, but contacts made.
29 Sep 2022	Brussels, Belgium	Internal RBINS meeting	yes	A/O	RBINS : finalise the inventory of datasets to be submitted in EMODnet Ingestion 3, update the status of those ingested in last three months and identify opportunities for the mobilisation of extra datasets.
30 Sep 2022	Riga, Latvia	external	no	O	LHEI: European Researcher's Night 2022. Poster presentation on site, discussion about scientific data sharing and FAIR principles. Discussion about sandy beach pollution with plastic, mercury in biota and available information.
30 Sep 2022	St. Elmo, Valletta	Science in the City / Researchers Night	yes.	A	UM: UM participated in the Science in the City street festival with a stand dedicated to Open Science. During this event, a presentation was made about EMODnet and how Open Science benefits the public with special reference to the Atlas of the Seas and the Teachers Corner.
30 Sep 2022	St. Elmo, Valletta	Science in the City / Researchers Night	No	A	UM: THE Oceanography Malta Research Group from UM had a stand in the Science in the City street festival called "An ocean of possibilities" where we had the opportunity to dialogue with visitors to the stand about the activities of EMODnet.
30 Sep 2022	Varna Bulgaria	European Night of Scientists	Yes.	A	IO-BAS: At the IO-BAS stand for marine science the Emodnet Ingestion project was presented with poster and flyers. Organised by IO-BAS, Varna Municipality, Medical University, Maritime School, Institute of Fish Resources, and Higher School of Management. http://io-bas.bg/2022/08/25/
4 Oct 2022	Helsinki, Finland	Lecture, University of Helsinki, Faculty of Biological and Environmental Sciences	Yes	A	GTK: EMODnet, EMODnet Geology and EMODnet Ingestion were introduced to students during the lecture, 20 students

03 – 04 Oct 2022	Brussels, Belgium	Workshop EU-Canada – Ocean partnership	Yes	A	MARIS, SMHI, JNCC, VLIZ, and others: participated in brainstorming workshop about topics for cooperation. Included lot of attention for data management and exchange.
03-05 Oct. 2022	Milazzo, Italy	Metrology of the Seas conference: workshop	yes	O	ETT+SMHI: Organising session: https://www.metrosea.org/special-sessions Including EMODnet presentations
5-6 Oct 2022	Taunton, UK/Online	UK Centre for Seabed Mapping meetings	No	A	BGS: Meeting for management group, Standards, National Coordination and International Coordination. https://www.admiralty.co.uk/uk-centre-for-seabed-mapping
10-11 Oct 2022	Taranto, Italy	Workshop	no	A	ETT: GreenBlueDays
14 Oct 2022	Online	Meeting		A	ETT: EuroGOOS DATAMEQ
19-20 Oct 2022	Online	Workshop	yes	A	EMODnet for Business Workshops – Marine Data for and from the Offshore energy sector in the Mediterranean and Black Seas. ETT + MARIS: organised by DG-MARE. Presentations on EMODnet included.
20 – 21 Oct 2022	Varna, Bulgaria + Online	Conference Black Sea 2022	yes	A	IO-BAS: Promotional Emodnet Ingestion materials will be provided to the participants from potential data sources. https://nts.varna-bg.org/bg/52794
22 Oct 2022	Online	Workshop		A	ETT: MSFD TG NOISE (D11)
24-28 Oct 2022	Copenhagen, Denmark	Meeting	yes	A	Meeting with potential data providers at the Ministry of Environment and Aarhus University. AU-DCE: A presentation was given and further potential data sets discussed.

Oct 2022	Lisbon, Portugal	Historical data recovery		O	IHPT: intends to start working with Inst. Oceanography from the University of Lisbon to recover data from historical cruises.
21 Oct 2022	Riga, Latvia	external University of Latvia, Faculty of Chemistry, lectures	yes	A	LHEI: a short presentation on a couple of slides throughout the lecture about oceanology, sample handling, processing, data processing and data open access (examples from EMODnet).
24 Oct 2022	On-line	Meeting with Trans Europe Marinas/EMANEDS project	no	A	ETT+SMHI+HCMR: To discuss EMANEDs project activities implementation and evaluation
24 Oct 2022 – 2 Dec 2022	Online – University of Cadiz, Spain	SEA-EU Marine Data Literacy Course	yes	O	UM: The SEA-EU Marine Data Literacy Course is a course organised by the European University of the Seas. Students were introduced to EMODnet both during the lectures that were held online and the practical sessions held in person in Cadiz.
25-27 Oct 2022	Delft, Netherlands	GA-Jerico-DS meeting at Deltares	no	A	RWS joined this GA Jerico meeting - promotion of EMODNET in Jerico-RI / DS/S3 projects/program.
26 Oct 2022	Online meeting	The Danish Environmental Agency	Yes	A	AU-DCE: Decision making meeting resulting with the preparation of the dataset “Microplastic particles in sediments from Danish waters 2018-2021” published to the EMODnet Ingestion on the 21-12-2022
26-28 Oct. 2022	Constanta, Romania	International MARBLUE Conference	yes (poster)	A	TSU has a Poster Presentation – Session IV in the frame of the 1st Joint International Conference - MARBLUE 2022;The aim of the International Conference is to contribute to the protection of the Black Sea by supporting the sustainable development in a multi-disciplinary way.
26-28 Oct. 2022	Constanta, Romania and online	International MARBLUE Conference “Blue Growth: Challenges and opportunities for the Black Sea”.	yes (poster)	A	RBINS with MARIS, HCMR had a Poster Presentation at MARBLUE– Session IV: Observing the Black Sea. The first poster explains how EMODnet Ingestion functions and is entitled “Wake up, safeguard and share your marine data with EMODnet-Ingestion.eu”. Have a look at the posters in PDF: poster1.

26-28 Oct. 2022	Constanta, Romania and online	International MARBLUE Conference "Blue Growth: Challenges and opportunities for the Black Sea".	yes (poster)	A	RBINS with NIMRD, IO-BAS, TSU and MARIS had a Poster Presentation at MARBLUE – Session IV: Observing the Black Sea. This second poster showcases key achievements of the project so far and focuses on three success stories collected from Romania, Bulgaria and Georgia. It is entitled "Your data work at EMODnet-Ingestion.eu". Have a look at the poster in PDF: poster2.
26-28 Oct. 2022	Constanta, Romania and online	International MARBLUE Conference .	yes (oral)	A	IFREMER presented "SeaDataNet - Delivering marine and ocean data from the Cloud" and its relationship with EMODnet .
26-28 Oct 2022	Constanta, Romania and online	International MARBLUE Conference .	yes (oral)	A	MARIS (EMODnet Ingestion Coordinator) gave an oral presentation about Blue-Cloud, also mentioning EMODnet Ingestion.
28 Oct 2022	Online; Neth.	NODC-NL meeting	Yes	O	RWS, Deltares and NIOZ: NODC-NL discussion on future plans and role of Emodnet-portals etc.
Oct – Dec 2022	Deltares, Delft, Neth. / Online	Workshops, webinar and/or symposia	yes	O	Deltares: During the Deltares Software Days (DSD), attended by different stakeholders from Europe and beyond, it is planned to further promote the activities of EMODnet Ingestion.
Oct 2022		International Conference	yes	A	TSU: submitted a paper and presentation on Marine Litter and EMODnet for the proceedings of the conference (using inter alia data from EMODnet databases). International Scientific-Practical Conference "The development of mining and geology is the precondition for the revival of economy"
Oct 2022	Online meetings	Online meetings	yes	O	ENEA: Contacts with colleagues involved in the Blue Lakes project that collected microplastics data in the main Italian lakes.

3-4 Nov 2022	Wageningen, The Netherlands	External meeting: North Sea Days	yes (poster)	A	Deltares presented a poster on the EMODnet data ingestion and EMODnet Biology data products work done in the last years, stressing the importance of combining routine monitoring and project-based monitoring for the completion of distribution maps for Benthos and Plankton.
3-4 Nov 2022	Wageningen, Neth.	Dutch North Sea days with 350 people	Yes	A	RWS and Deltares attend the yearly North Sea days; promoting of european data centres and added value of Emodnet, especially for North Sea activities
7 Nov -7 Dec 2022	Msida, Malta	IOI course	Yes	O	UM: Training programme on regional ocean governance for the Mediterranean, Black, Baltic, and Caspian seas. Includes a unit about tools and processes to manage the oceans and regional seas, in which EMODnet is presented to the participants.
7-8 Nov 2022	Physical meeting in Brussels & online	EMODnet SC17 meeting	Yes	A	Periodic meeting of the EMODnet Steering committee - To discuss the EMODnet Ingestion update and the centralization
7-11 Nov	Varna, Bulgaria	EMODnet Geology project meeting	Yes	A	GTK: Discussions related to the progress of the EMODnet Geology project and the EMODnet collaboration
8 Nov 2022	Online meeting	Meeting for the LabMare activity	No	A	ENEA promoted the use of EMODnet Data Ingestion during the meeting related to the LabMare observatory activity including the data management.
9 Nov 2022	Online	EOOS-OC meeting	No	A	RWS: Attending EOOS-OC meeting; promoting the use of EMODNET-ingestion for additional oceanographic and ecological data
9-10 Nov 2022	Online	Workshop	yes	A	SMHI: Presenting at Arctic data workshop “Opportunities and challenges for in situ ocean observing in the Arctic”
10 Nov 2022	Varna, Bulgaria	EuroGeoSurveys Marine Geology Expert Group meeting	Yes	A	GTK: EMODnet Geology and EMODnet Ingestion projects were advertised in the presentation (by Kotilainen A.)

10 Nov 2022	Split, Croatia	Presentation about Data Management	yes	O	EmodNET Ingestion project, tools and main principles (including general SeaDataCloud infrastructure) to students of "Marine biology and technology", university of Split
11 Nov 2022	Online	MEDIN OGC API Workshop	Yes	A	BGS: Improving access to marine environmental data using an Application Programming Interface (API) standard (https://ogcapi.bgs.ac.uk/)
14 Nov 2022	Lisbon, Portugal	Meeting with MARE, University of Lisbon	Yes	O	Organised with researchers that coordinates, during the last decades, several projects that collect oceanographic data from the North Atlantic Ocean. Data Ingestion tools and the SEANOE portal were presented.
14-15 Nov 2022	İstanbul / Türkiye	International Forum	yes (poster)	O	METU-IMS: Marine Litter Action Forum was organised by EU H2020 Black Sea CONNECT CSA that METU-IMS leads.
14-15 Nov 2022	Istanbul, Turkiye	International Marine Litter Forum	no	A	TSU participated in Marine Litter Action Forum organised by EU H2020 Black Sea CONNECT CSA that METU-IMS leads.
17-18 Nov 2022	Puerto Montt, Chile	Workshop	yes	A/O	ULiège gave a data analysis workshop (with DIVAnd). 10 participants.
21-25 Nov 2022	Puerto Montt, Chile	Conference	yes	A	Keynote presentation about in situ data analysis methods (about 150 participants)
20-21 Nov 2022	Florence, Italy	Workshop	Yes	O	ETT: HFR TT – MONGOOS WS and GA
21 Nov 2022	Online	MEDIN Standards Meeting	No	A	BGS: MEDIN Standards Meeting including BGS, BODC and other DACs

22 Nov 2022	Stellendam, Netherlands	Offshore Expertise Centre - Visit of former minister of Foreign Affairs	Yes	O	RWS: Presentation of the complete Marine European Landscape, inclusive EMODNET for former minister of Foreign Affairs by visiting the Offshore Expertise Centre in Stellendam. Promoting the Dutch Digital North Sea Initiative
22 Nov 2022	online	Blue Cluster annual bathymetric consultation	Yes	A	VLIZ: Event organised for actors involved in collecting and exploring bathymetric data in the Belgian part of the North Sea. More details in Dutch can be found in (https://www.blauwecluster.be/nieuws/eerste-jaarlijks-overleg-rond-bathymetrische-data-zit-erop) Presentation can be found via https://www.blauwecluster.be/presentaties-van-het-eerste-jaarlijkse-overleg-bathymetrie-22-november-2022 . Presentation 4.1 focuses on submitting bathymetry data via EMODnet Ingestion
22-24 Nov 2022	Florence, Italy	AM	Yes	A	SMHI: MONGOOS AM
23 Nov 2022	online	Conference/Master Class Title: Infraestructuras de Datos Espaciales: EMODnet, ejemplo de IDE continental.	Yes	O	EMODnet at the University of Granada (Spain) by Javier Valencia.. Forum: Master's Degree in Geology applied to mineral and energy resources (GEOREC). https://canal.ugr.es/evento/video-presentacion-de-la-infraestructura-de-datos-espaciales-marinos-de-europa/
25 Nov 2022	Online	Internal meeting MARIS and Deltares	No	O	To discuss how to improve and complete Deliverable D4.4 – Inventory of offshore license stakeholders
Dec 2022	Online	Meetings with the DLTM partners involved in the Levante Canyon	No	A	ENEA promoted the EMODnet Data Ingestion as well as SeaNOE during meetings held in the framework of the DLTM activity related with the measurements sampled in a stand-alone mooring, at about 600 m depth

		measurements in the Ligurian Sea			along the Levante Canyon of the Eastern Ligurian Sea. The data sets have been published in SeaNOE.
2 Dec 2022	Riga, Latvia	LHEI internal scientific/administrative meeting	yes	O	LHEI: Overview of scientific and administrative activities of LHEI project leaders, presentation of projects . EMODnet DI (as well as SEANOE) was presented for all level scientists in LHEI.
6 Dec 2022	Online	Meeting in the framework of the MedFever project	Yes	A	ENEA promoted the EMODnet Data Ingestion activity as well as SeaNOE with colleagues involved in the MedFever project.
6-8 Dec 2022	Monaco	HYDRO2022 Conference	yes	A	SHOM attended a conference organized by the International Federation of Hydrographic Societies (IFHS). Shom made a presentation : *EMODnet Bathymetry: current status of the European bathymetric Digital Terrain Model*
6-9 Dec 2022	Antalya, Türkiye	National Marine Monitoring and Assessment Symposium	yes (poster)	A	The Symposium is organised in "Turkish National Integrated Marine Pollution Monitoring Program" implemented by the Ministry of Environment, Urbanization and Climate Change
13 Dec 2022	On-line	Internal meeting	no	O	HCMR+MARIS+BODC: to finalise metadata mapping and set up the implementation plan for the metadata exchange between EMODnet Data Ingestion - Marine Data Exchange (MDE) archive
14 Dec 2022	Madrid, Spain	Univ. Complutense Madrid. Master's class at "Master en Meteorologia y Geofisica".	yes	A	IEO: "El Sistema para la Observación del Océano (IEOOS) del Instituto Español de Oceanografía y las iniciativas europeas de gestión de datos".
16 Dec 2022	Lisbon, Portugal	Workshop about Data Management	yes	O	IHPT: EMODnet Ingestion presented with a focus on the data sharing and its benefits
20 Dec 2022	Brussels, Belgium	Internal meeting with the communication department	no	O	Guidelines for the self production of videos presenting the 12 Ingestion use cases

10 Jan 2023	web	internal - tech meeting	no	A	ETT: Technical Innovation Board Meeting - NAUTILOS project. EMODnet is a primary NAUTILOS stakeholders and these meetings are good occasion to be synch on approach, methods, news, needs etc.
11 Jan 2023	web	workshop	no	A	ETT: OceanPrediction will be, first and foremost, a global, transversal, and cross-sectorial community built around ocean forecasting. Working in close collaboration with other Decade coordination bodies and actions, OceanPrediction DCC will promote the co-creation and development of ocean forecasting capacities worldwide. Serving the United Nations Decade of Ocean Science for Sustainable Development objectives, the centre will raise ocean literacy and public engagement, while inspiring standards, best-practices and tools to build an ocean science-to-service global framework centred on the principles of accessibility, interoperability and integration - https://oceanpredict.org/events/oceanprediction-un-decade-collaborative-centre-kick-off/#event-overview
13 Jan 2023	Alicante, Spain	workshop	yes - The role of data and data process for ocean and environment understanding and sustainable exploitation	A	ETT: OCEANRACE - Genova Pavillion and Italian Day. ETT was awarded to join the roadshow during the race legs to have a presentation covering ocean data management, processing, interoperability, etc. EMODnet, Copernicus Marine Service, EuroSEA, SO-CHIC, NAUTILOS and many other European projects, as well as Italian projects are explained to the public
16 Jan 2023	Southampton, UK / Online	Meeting	MEDIN Data Archive Centres Meeting	A	BGS, BODC: MEDIN Data Archive Centres Meeting including BGS, BODC and other DACs

17 Jan 2023	Southampton, UK / Online	Meeting	MEDIN Standards Meeting	A	BGS, BODC: MEDIN Standards Meeting including BGS, BODC and other DACs
17 Jan 2023	Southampton, UK / Online	Meeting	MEDIN Joint Working Group meeting	A	BGS: MEDIN Joint Working Group Meeting including BGS, BODC and other DACs
19 Jan 2023	University of Cadiz, Cadiz, Spain	Lecture-Training	Short introduction to EMODnet portals	A	This talk was carried out in the master teaching classes by Gemma Ercilla, from ICM-CSIC, in the in the framework of the Master of Oceanography of the Marine science Faculty of the University of Cadiz
19 Jan 2023	Gothenburg, Sweden	workshop	no	A	ETT: Voice of the Ocean - ERDDAP lectures and workshops in Gothenburg. VOTO will present outcomes from the collaboration with EMODnet
20 Jan 2023	Gothenburg, Sweden	workshop	yes - Ocean data managment and EMODnet	A	SMHI - workshop to present on latest updates on ocean data management and EMODnet
23 Jan 2023	web	internal - meeting	no	A	ETT: EMODnet achievements & way forward - an internal meeting to collect views on past achievements and perspectives for the years to come.
26 Jan 2023	web	workshop	no	A	ETT: EMODnet Sea-basin Checkpoints event
27 Jan 2023	Savona, Italy	meeting	yes	O	ETT: CIMA Foundation - new provider candidate - meeting to present on EMODnet
7 Feb 2023	Lisbon, Portugal	external meeting		O	Cooperation between IH and IPMA to support new entries at EMODnet (Physics and Biology)

08 Feb 2023	web	internal - tech meeting	no	A	ETT: EuroGOOS Tide Gauge Task Team
17 Feb 2023	Varna , Bulgaria	Workshop		A	Living Labs Workshop in the framework of BRIDGE-BS project. A total number of 22 stakeholders and 6 facilitators participated actively in the workshop. The Emodnet Ingestion was presented to the stakeholders' audience.
17 Feb – 18 Feb 2023	Bologna, Italy	internal - tech meeting	yes	O	ETT: CNR ISP - new provider candidate - meeting to present on EMODnet - discussion on cryosphere data
21 Feb 2023	Murica, Spain (web)	workshop	yes	A	ETT: MAR MENOR - Public workshop (on the 21st of February) to show their observational monitoring capabilities
23 Feb 2023	capetown, Sud Africa	workshop	yes	O	ETT: Ocean data hour - low cost tech and citizen science
24 Feb 2023	capetown, Sud Africa	workshop	yes	A	ETT: Presentation on ocean data management in Europe with an overview on the major European Marine data integrators
28 Feb 2023	Genova, Italy	seminar	yes	A	ETT: Accademia Marina Mercantile - ITS ... how to find and process ocean data
28 Feb 2023	Constant, Romania	Second round of BRIDGE-BS Living Lab	Yes, display promotional materials	A	NIMRD: During the RIDGE - BS Living Lab workshop, attended by 34 representatives of 22 institutions from all sectors, respectively politics/administrative, economy/business, civil society/NGO, and education/research, the EMODnet Data Ingestion and EMODnet Chemistry promotion materials were displayed.
02 Mar 2023	web	workshop	no	A	ETT: Advancing EOOS - the foundation of European ocean knowledge - online launch event, the new EOOS Strategy and Roadmap for

					Implementation 2023-2027 will be presented and discussed by esteemed members of the European ocean community.
06 Mar 2023	web	internal - tech meeting	no	A	ETT: EMODnet Central Portal team meeting with Physics
6-30 Mar 2023	Online + Ostende, Belgium	Many EMODnet Ingestion partners participated and served as coach before and during the Open Sea Lab 3.0 Hackathon		A	All partners: https://opensealab.eu
7 Mar 2023	London, UK	UK CSM Showcase Event	Yes - display stands with video for all partners	A	BGS, BODC, JNCC: UK Centre for Seabed Mapping Showcase event - all attended and presented display stands with video loops, along with other marine stakeholders
7 Mar 2023	London, UK	Meeting		A	BGS, BODC, JNCC: UK Centre for Seabed Mapping meetings (Management and National Coordination) All attended along with various other partners including government agencies involved with seabed mapping
8 Mar 2023	London, UK	Meeting	Y - presentation	A	Civil Hydrography Annual Seminar 2023. BGS presented
09 Mar 2023	Paris, France	Science-Industry Workshop - Data Sharing for Improved Ocean-Climate modelling (external meeting)	Yes - overview of EMODnet Data Ingestion presented by EMODnet Secretariat	A	Workshop organised by HUB-Ocean in the context of UN Decade (https://oceandecade.org/news/fugro-and-ioc-unesco-launch-working-group-to-unlock-private-sector-ocean-data/). EMODnet Ingestion presented to raise awareness of its potential as a means of mobilising marine datasets into European network/infrastructure.
09 Mar - 10 Mar 2023	Trieste, Italy	general assembly	yes	A	ETT: EMODnet Chemistry Assembly and stakeholder meetings - Presentation on River data management

13 Mar 2023	web	internal - tech meeting	no		ETT: SOOS DMSC – Discussion on data flow and how to facilitate the ingestion
14 Mar 2023	Lisbon, Portugal	external meeting		O	Historical data recovery follow-up meeting with MARE, University of Lisbon
15 Mar – 16 Mar 2023	Murica, Spain	workshop	yes	A	ETT: QuiteSEA - stakeholders workshop – Presentation on EMODnet and need for underwater noise data
20th Mar 2023	Madeira, Portugal	Lecture	Yes	O	Lecture about EMODnet Bathymetry delivered to UM students while on fieldwork in Madeira after a whale watching tour.
20 Mar - 21 Mar 2023	Paris, France	conference	no	A	Many partners: IODE – II conference
21-22 Mar 2023	University of Cadiz, Cadiz, Spain	Open Science Staff Week, SEA-EU	No	A	This meeting forms part of the activities within reSEArch-EU's WP promoting Open Science, intended to promote the direct interaction of the Open Science Ambassadors (OSAs) and the Open Research Data Officers (ORDOs). EMODnet Ingestion was introduced by UM OSAs to other OSAs and ORDOs during the practical sessions held on the second day.
27 Mar – 28 Mar 2023	web	hackaton	no	A	Many partners: EMODnet Hackaton
28 Mar 2023	web	internal - tech meeting	no	A	ETT: CMEMS INSTAC Stakeholder + MIC coordiantion

30 Mar 2023	Gothenburg, Sweden	seminar	yes	A	ETT: Coastal Data Gap Challenge with Chalmers
30 Mar 2023	web	internal - tech meeting	yes	O	ETT: River runoff data management
31 Mar 2023	Genova, Italy	tv talk	no	A	The Ocean Race Genova The Grand Finale - Verso l'arrivo a Itajaì e la sostenibilità - During the talk we discussed about ocean data management in Europe and how EMODnet is dealing with data
2022-2023	The Netherlands/Online	Meetings		A	Deltares: Regular meetings with the Directorate-General for Public Works and Water Management (Rijskwaterstaat) which is part of the Ministry of Infrastructure and Water Management of the Netherlands are planned. These meetings are intended to discuss making data available.
SUM				**172**	**Total # of meetings organised = 44**
SUM					**Total # of meetings attended = 128**

A. Meetings/events planned in the near future				
Date	Location	Type event (meeting, training (workshop), etc.)	Meeting to be attended (A) / organised (O)	Short description and main expected outcomes
1 Apr 2023	Online	Meeting	O	ENEA: Online meeting with colleagues involved in the Blue Lakes project who collected microplastics data in some Italian lakes.
4 Apr 2023	Online	External meeting	O	UoM: Meeting with data providers to discuss issues with data preparation for Seabed Litter data to be submitted on EMODnet.

12-13 Apr 2023	Larnaka, Cyprus	DIP3 Internal plenary meeting	A/O	Annual plenary meeting of EMODnet Ingestion consortium
26 Apr 2023	Southampton/ Online	Open Meeting	A	BGS/BODC: MEDIN open meeting - Enhancing the national framework for UK marine data
End of Apr 2023	Online	Meeting	O	ENEA: Meeting with colleagues involved in a marine monitoring activity in Sicily.
8-12 May 2023	Liège, Belgium	Conference	A/O	GHER / ULiège: 54th International Liège Colloquium on Ocean Dynamics - Machine Learning and data analysis in Oceanography. A stand will promote the work of EMODnet INgestion (poster, flyers, leaflets, stickers). Contact: Ch. Troupin
8-12 May 2023	Malta	Oceanography bootcamp	O	UoM: https://www.um.edu.mt/courses/studyunit/GSC5508 This study unit involves the students going out in the field to collect data and put into practice the theory learnt throughout the course. The collected data is supplemented with data derived from existing databases (EMODnet) for a comprehensive analysis of the task assigned. Also, students will be instructed how to prepare the data for assimilation into EMODnet.
9 May 2023	Online	Meeting	O	RBINS: Meeting with one potential data provider about sharing beach litter data collected during a Citizen beach cleaning survey national program.
10 May 2023	Online	Meeting	A	BGS/BODC: MEDIN Standards Working Group meeting.
11 May 2023	Online	Meeting	A	BGS/BODC: MEDIN Data Archive Centres Working Group meeting.
17 May 2023	Online	Lecture	A	UoM : Infraestructura de Datos Espaciales Marinos de Europa-EMODnet. This lecture is planned in the framework for the master of the University of Jaen, Jaen (Spain) whose title is: Geodesia por satélites y Geofísica aplicadas a la Ingeniería y Geología

May 2023	Ocean Data hour – Newport, US			ETT: : https://theoceanracegenova.com/
Jun 2023	Ocean Data hour – Aarhus, Denmark			ETT: https://theoceanracegenova.com/
Jun 2023	Ocean Data hour – the Hague, Netherlands			ETT: : https://theoceanracegenova.com/
Jun 2023	Ocean Data week – Genova, Italy			ETT: https://theoceanracegenova.com/
2022-2023	The Netherlands/Online	Meeting	A	Deltares: Regular meetings with the Directorate-General for Public Works and Water Management (Rijskwaterstaat) which is part of the Ministry of Infrastructure and Water Management of the Netherlands are planned. These meetings are intended to discuss making data available.
TBD	TBD	Workshop on data management for offshore license related data collection in EU member states	O	Deltares: A workshop will be organised together with representatives of stakeholders and EMODnet Ingestion members to present and discuss the findings on current practices and approaches in different Member State countries. This will help to refine the understanding of EMODnet Ingestion and stakeholders about data acquisition and management in the framework of governmental license procedures in their countries. This should drive a discussion whether a more harmonised approach between and possibly also within Member States might be desirable and feasible. This could lay the basis for support from stakeholders for initiating development of a roadmap for a more harmonised approach.
TBD	Online	Online meetings	O	ENEA: Contacts with a team of a racing boat that is going to collect oceanographic data.
TBD	Riga, Latvia	Lecture	O	LHEI: University of Latvia: lectures to students about marine sample preparation and analysis, as well as data processing, FAIR principles, data depositories, SEANOE and EMODnet DI

8. Communication assets

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

A. Communication products developed				
Date	Communication material	Short description (of the material, title, …) of the asset	Main results	Name of event at which material was disseminated (if applicable)
28 Apr 2022	LinkedIn Post	Easter bells brought us #EMODnet Data Ingestion III project.	Promotion DIP III project start	Account Marianne Schlesser Impressions: 315 Reactions: 5
28 Apr 2022	Twitter Post	Easter bells brought us #EMODnet Data Ingestion III project. This confirms the unwavering support of the team work of 43 organizations for streamlining the #MarineData ingestion process and release them for subsequent distribution as #OpenData https://tinyurl.com/2p934d7p	Promotion DIP III project start	Account @MarianneBMDC Impressions: **603** Engagement: 19 Likes: 9 Retweet: 4
28 Apr 2022	Web page	Announcement of the objectives of DIP3 project as a science news on RBINS intranet	Internal RBINS promotion	
29 Apr 2022	Web page	News on the EMODnet website and in the NewsDigest on the start of DIP3	Promotion DIP III project start	
13 May 2022	Twitter Post	See how easy it is to share your data with @EMODnet #Ingestion https://youtube.com/watch?v=p3vwngxyXuo	Quote from Sissy Iona + promotion of	Account @MarianneBMDC Impressions: 318 Engagement: 10

		Want to become our next success story? ➡️ https://youtube.com/watch?v=EEjoSgFBOOA #EMODnet #MakeEUBlue #UNOceanDecade	the two animation movies	Likes: 3 Retweet: 2
1 Jun 2022	Web page on CSIC website	Also, the EMODnet ingestion -3 has been updated in the Organisation website. The link is: https://www.icm.csic.es/ca/emodnet	Promotion DIP3 to CSIC network	
16 Jun 2022	Twitter post	Our colleagues @MarianneBMDC & @rubenperper presenting the contributions & future plans of @RBINSmuseum & @VLIZnews to @EMODnet #Ingestion during the Phase 3 kickoff meeting #today #WakeUpYourData #FAIRdata #OpenScience #MarineScience		**@EurOBIS** Followers : 793 Impressions: 364 Engagements: 38 Details: 5 Likes: 13 Retweets: 6
16 Jun 2022	Twitter post	Today and tomorrow @EMODnet #Ingestion kicks off the third phase of the project. About 40 partners and #MarineData ambassadors are welcomed by @HcmrInOcean in Glyfada, another 15 are participating remotely @IFREMER @SeaDataNet @EuroBIS @METU_IMS @GHER @VLIZnews @bodc colleagues!	Information on DIP3 start	Account @MarianneBMDC Impressions: **820** Engagement: 95 Likes: 22 Retweet: 7 Details: 16
16 Jun 2022	Twitter post	Group pictures (remote and on-site!) of the @EMODnet Data Ingestion 3 kickoff meeting, organised by our @HcmrInOcean colleagues! @SeaDataNet @bodc @MarianneBMDC @Ifremer_fr @VLIZnews @METU_IMS		**@GHER_ULiege** Followers: 658 Impressions: **1,276** Engagements: 84 Detail expands: 19 Profile visits: 4

17 Jun 2022	Twitter post	We are all set for a second day of hybrid @EMODnet #Ingestion kick-off meeting and presentation of national progress report of partners on local marketing activities & potential #marine #dataset mobilisation in this third phase of the project	Information on DIP3 start	Account @MarianneBMDC Impressions: 158 Engagement: 95 Likes: 5 Retweet: 2 Details: 7
29 Jun 2022	EMODnet News	Setting sail for EMODnet Data Ingestion III	Information on DIP3 to the EMODnet network	Taken up in the NewsDigest disseminated by mail on 5/7/22
29 Jun 2022	LinkedIn post	All sails set for #EMODnet Data #Ingestion III project Get a flavor of the kick-off meeting we had last week in Athens with #MarineData ambassadors from 43 institutions in 26 countries, led by Dick M.A. Schaap (MARIS) & Sissy Iona (HCMR). https://lnkd.in/ea5teCPC	Information on DIP3 start	Account Marianne Schlesser Followers 967 Impressions **356** Likes 3
29 Jun 2022	Web page	https://www.emodnet-ingestion.eu/promotion/news/all-sails-set-for-emodnet-data-ingestion-iii/38	News for the Ingestion network	
29 Jun 2022	Twitter post	All sails set for @EMODnet Data #Ingestion III project with #MarineData ambassadors from 43 institutions in 26 countries, led by MARIS & @HcmrInOcean 👉 Get a flavour of the kick-off meeting https://tinyurl.com/52txdtz8	Promotion of article on the Ingestion portal	Account @MarianneBMDC Impressions: **449** Engagement: 56 Likes:11 Retweet: 4 Details: 8
Jun 2022		Promotion material sent by RBINS to IHPT for two events		

Jun 2022	Booklet	Collection of the first 10 use cases published in the form of an A5 booklet	Visibility of Ingestion use cases	Two conferences in Portugal + DIP3 kickoff meeting
6 Jul2022	Twitter post	Our colleague **Sara Almeida** from **Instituto Hidrográfico** (PT) promoting @EMODnet #DataIngestion at the 7th Hydro Engineering Conference / 2nd Luso-Spanish Hydrographic Conference in Lisbon PT on 21-23 June 2022 tinyurl.com/3jpcftn7 @shom_fr @TheBelgianNavy @SeaDataNet	Visibility of partner's promotion	@MarianneBMDC Followers: 195 Impressions: 50 Engagement: 8
6 Jul 2022	TwItter post	The 3rd phase of @EMODnet Data Ingestion Project, which #METUIMS is involved as a partner, has been kicked off! In the meeting, our researcher Volodymyr Myroshnychenko presented #METUIMS activities within #EMODnet and @BRIDGE_BlackSea research as a source of new datasets.		@METU_IMS Followers: **1960** Retweets: 4 Likes: 10
8 Jul2022	Twitter post	🔭 Nuestra compañera Gemma Ercilla nos manda esta foto del Simposio del Márgen Ibérico Atlántico, donde ha presentado @EMODnet, un nodo de información geoespacial para el análisis y modelización de distintos procesos en el medio marino. 🎉 ¡Felicidades por la presentación, Gemma!		@ICM-CSIC
13 Jul2022	Twitter post	Our colleagues from CSIC, **Gemma Ercilla** & **Javier Valencia**, presenting #EMODnet #DataIngestion at the Symposium of the Iberian Atlantic Margin, Bilbao (Spain), 7-9 July 2022. 🔗 https://emodnet-ingestion.eu		@MarianneBMDC Followers: 195 Impressions: 121 Engagement: 8

		@ICMCSIC @EMODnet @SeaDataNet #GemmaErcilla		
1 Sep2022	LinkedIn post	The #EMODnet-INGESTION III #MarineData inventory campaign runs until 25th October 2022.	Visibility of the two videos and inventory campaign	@MarianneSchlesser Followers: 1012 Impressions: 568 Engagements: 13 Likes: 13 Repost: 4
1 Sep2022	Twitter post	📣The #EMODnet-INGESTION III #MarineData inventory campaign runs until 25th October 🚢**Collect once** and **use many times**. Get back to your national @EMODnet data ambassador. Check how => https://youtube.com/watch?v=p3vwngxyXuo #BlueGrowth @EU_MARE @SeaDataNet @HcmrInOcean		@MarianneBMDC Followers: 195 Impressions: **831** Engagement: 56 Retweet: 11 Likes: 20
1 Sep2022	Twitter post	🗓️Last day to submit an **abstract** for the #MARBLUE conference on 26-28th October 2022 ⚓ Registration until 15th September to participate in **#BlueGrowth: Challenges and opportunities for the BLACK SEA Sea** @EU_BlackSeaAM@GeoEcoMar @ConnectBlackSea + With #EMODnetIngestion colleagues, we submitted a poster on ingestion success stories collected from around the Black Sea 😊 Stay tuned		@MarianneBMDC Followers: 195 Impressions: 104 Engagements: 10 Likes: 5
14 Sep2022	Twitter post	Guess who's here? EurOBIS harvest update!! 🌱🐬🐢🐤🦀🪼🦠🐟 1 Updated and 12 #NewDataset !!		@EuroBIS_VLIZ Followers : 793 Likes: 11

		145K+ new occurrence records @EMODnet @VLIZnews @Marecamp_CT #NIMRD @ipma_pt @SBRoscoff #FAIRdata #Ingestion @unitartu @SYKEint #marinescience @LifeWatchVLIZ @OBISNetwork		Retweets: 5
30 Sep 2022	Use Case #12	Case 12. Mare Nostrum NGO contribution to the European Marine Litter database (prepared with NIMRD)		To be presented at MARBLUE conference in Oct.22
15 Oct2022	LINKEDIN post	#EMODnet keeps your data future proof #BlueEconomy. Get inspired by stories of (sleeping) #marine_data openly shared for safekeeping, further distribution & analysis. - Watch this 2 min #video on three of our success stories https://lnkd.in/d6K85Q58 - Find out more about our collaborations with companies, governments, research institutes and NGOs through this collection of cases: https://lnkd.in/dfadY92X - Join us at EMODnet-Ingestion.EU - Browse through our available data at emodnet.ec.europa.eu #OceanDecade #EMODnet #SeaDataNet #marine #data #research #future #innovation		Account Marianne Schlesser Impressions: 526 Reactions: 15 Shares : 6
19 Oct 2022	Twitter post	When data publishing to @EMODnet #Ingestion leads to a joint publication **Aarno Kotilainen** & **STUK** (**Finland**)	Promotion use case 11	Account @MarianneBMDC Impressions: 204 Engagement: 14 Likes: 2 Retweet: 1

		Case 1: ^{137}Caesium peak in the sedimentary records of the Baltic Sea is used to define recent rates of sedimentation in #EMODnet #Geology		
22 Oct 2022	Twitter post	#MarineLitter data from 8 research surveys, monitoring & cleaning initiatives of NGO's are accessible via #EMODnet #Chemistry EELTBGROSIHRTRCY Case 11: Marine litter #data shared with @EMODnet #Ingestion and fit for #MSFD reporting @OGS @TalTech @lheilv @tudavtudav	Promotion use case 10	Account @MarianneBMDC Impressions: **1780** Engagement: 79 Likes: 18 Retweet: 8
17 Oct 2022	Tweet	Reminder of the ongoing inventory of datasets for inclusion in EMODnet-INGESTION III.		@MarianneBMDC
18 Oct 2022	Tweet	Announcement of the two posters on EMODnet Ingestion finalised for the MARBLUE conference		@MarianneBMDC
20 Oct 2022	Web page on the portal	Presentation of the full package of contributions on EMODnet Ingestion during the MARBLUE Conference (posters and oral presentations)		
25 Oct 2022	Tweet	Reminder deadline registration for the MARBLUE conference (on site and online)		@MarianneBMDC
28 Oct 2022	Use Case #12	Case 12. Mare Nostrum NGO contribution to the European Marine Litter database (prepared with NIMRD)		Twitter, inclusion in compilation of success stories, publication on Chemistry portal
28 Oct 2022	Poster	Poster entitled "Your data work at EMODnet-Ingestion.eu" showcasing the MARBLUE conference participants key achievements of the project so far and focus on three success stories collected from around the Black Sea (Romania, Bulgaria and Georgia).		MARBLUE conference + Ingestion website + Chemistry website (TBC) + Twitter

28 Oct 2022	Poster	Poster entitled "Wake up, safeguard and share your marine data with EMODnet-Ingestion.eu" to Inform the MARBLUE conference participants of the practice in EMODnet-Ingestion.		MARBLUE conference + Ingestion website + + Twitter
01 Oct to 31 st Dec 2022	Tweets	Various tweets about published datasets that were submitted via EMODnet Ingestion		@EuroBIS_VLIZ
23 Nov. 22	Twitter post	#GeoINT #IDEs #geomatica #intelligence #inteligencia Hoy me toca participar en un evento que me hace mucha ilusión: Videoconferencia en el Máster en Geología aplicada a los Recursos Minerales y Energéticos de la UGR. De la mano de Claudio Marchesi y de Jesús Galindo, vamos a hacer una presentación de la Infraestructura de Datos Espaciales Marinos de Europa. Esta base de datos se ha convertido en un importante repositorio de consulta y descarga de información con componente geográfica sobre el ambiente marino para cualquier rama del conocimiento. En particular, EMODnet da acceso a datos de Batimetría, Biología, Química, Geología y Geofísica, Actividades humanas, Física, Hábitats de los fondos marinos. Su acceso es abierto y está perfectamente estandarizado para poder trabajar con sus datos en cualquier formato, tanto Web como GIS. E intentaremos hacer soñar a los alumnos con sus posibilidades de futuro... https://lnkd.in/dfqDR4iR	Visibility of the EMODnet dataset inventory and potential data providers	Javier Valencia @LYRAingeneria

December 2022	Tweets	**Series of 12 tweets** to advertise the 12 EMODnet Ingestion success stories already available.		@MarianneBMDC
Dec/Jan 2022	PDF document	Updated and expanded compilation of 12 Ingestion success stories		Ingestion portal "Join our success stories"
11 Jan 2023	Tweet	#NewDataset > 10K occurrences from #Mediterranean > 10K #actinopteri #taxa 🐡 🐡 🐡 - abundance #FAIRdata available via https://emodnet-biology.eu/data-catalog?module=dataset&dasid=8121 @jmeesvliz @VLIZnews @EMODnet #Biology #Ingestion @LifeWatchVLIZ @OBISNetwork #marinescience #OpenScience	> 500 views	Account: @EurOBIS_VLIZ
25 Jan 23	LinkedIn post	Have a look at key updates on EMODnet Data Ingestion phase III in my article "The awakening of the marine data".		Account: Marianne C. Schlesser
25 Jan 23	LinkedIn article	The awakening of marine data continues: Updates on EMODnet Data Ingestion phase III		Account: Marianne C. Schlesser
25 Jan 2023	PDF document on Central portal	Presentation of the updated and expanded compilation of 12 ingestion success stories		Ingestion portal "Join our success stories"
25 Jan 2023	News and PDF on Ingestion portal	"Check out our steadily increasing number of success stories for EMODnet Ingestion" Presentation of the updated and expanded compilation of 12 ingestion success stories on the Ingestion Portal	Info sharing	News on Ingestion portal + home page "Join our success stories"

26 Jan 2023	Internal doc.	Communication plan for the promotion of the centralisation phase of EMODnet from the perspective of EMODnet Ingestion (internal use)		
27 Jan 23	Central Portal News	The awakening of marine data continues: Updates on EMODnet Data Ingestion phase III	Included in News Digest	
27 Jan 23	Tweet	New year updates on EMODnet Data Ingestion PHASE III. " The awakening of marine data continues".		Account: @MarianneBMDC
30 Jan 23	Tweet	One EMODnet, One Portal		Account: @MarianneBMDC
2 Feb 23	RBINS Intranet	News on RBINS intranet to promote One Ocean, One EMODnet (UNIFIED MARINE DATA), to invite colleagues to attend the webinar on 16/2 and invite them to contact BMDC as Data ambassadors in EMODnet Data Ingestion.	RBINS Internal information sharing	
1 Feb 23	Tweet	EMODnet Data Ingestion Portal is next on the list to join this unified marine data service		Account: @MarianneBMDC
2 Feb 23	News on Ingestion portal	News on Ingestion portal on "**EMODnet and European defence**"		
2 Feb 23	News	News on Ingestion portal announcing "**One Ocean, One EMODnet**"		
2 Feb 23	Tweet	Have a look at how your chemical and marine litter data work at EMODnet		Account: @MarianneBMDC
3 Feb 23	Tweet	European defence and EMODnet – article from our EMODnet data ambassador in Cyprus + Case study of marine data ingestion with the Belgian Navy		Account: @MarianneBMDC

3 Feb. 23	LinkedIn post	Hope for win-win cooperation between EMODnet and European Defence Agency. Have a look at this article from Mrs. Claudia Coman, EMODnet Data Ingestion ambassador in Cyprus, who attended the conference "Battlefield redefined" on 23-24 January 2023 in Limassol.		Account: Marianne C. Schlesser
Feb.	LinkedIn post	EMODnet reaches a landmark achievement, as it launches its fully centralised #marinedata services, integrating all its themes into one Central Portal @EU_MARE Know more here 👉 https://europa.eu/!VpT33f and article below		Account: Marianne C. Schlesser
9 Feb 23	Tweet	THE UPGRADED EMODnet CATALOGUE IS READY FOR YOUR QUERIES! Want to join EMODnet? Wake up your data ! Set them free for blue society and you will get a strong net in return @EMODnet #DataIngestion		Account: @MarianneBMDC Views: 888 Engagements: 37
13 Feb 23	Central Portal News	News on "EMODnet and European defence"	Included in News Digest	
14 Feb 23	Tweet	IDEAL FOR BUSINESS - Your marine data, work it! 📽️https://bit.ly/3RajPUm Sharing your marine data with @EMODnet #DataIngestion has never been easier! 🤝You may even become an #EMODnet #AssociatedPartner to make #FAIR #MarineData open to all in the #EUGreenDeal #UNOceanDecade and more!		Account: @MarianneBMDC Views: 448 Engagements: 23

15 Feb 23	Tweet	The Public #Webinar on #EMODnet #CentralPortal is tomorrow at 15:30 👉Direct link to the webinar platform https://bit.ly/3K5AFT7 All #ThematicPortals now redirect to http://emodnet.ec.europa.eu with new features and a simplified user experience! Demo tomorrow #MarineData #FAIRdata		Account: @MarianneBMDC
27 Mar 23	Flyer	New flyer A4 R/V with new success cases in support of the objectives of WP4.2 and 4.3. (4000 copies printed).	Communication tool for data ambassadors	printed version disseminated to partners at the plenary meeting (12-13 April 2023)
27 Mar 23	News	News on Ingestion portal to inform on availability of the **new flyer** (for order or download) – It is also added to the Ingestion extranet.		
30 Mar 23	News	MEDIN Marine Data News March 2023. 'One ocean, one EMODnet'. News story to highlight the new EMODnet Central Portal and update on UK contributions to EMODnet Data Ingestion project.	Raised awareness of EMODnet Central and Data Ingestion Portals	MEDIN Marine Data News - sent to subscribers over email and is available under https://medin.org.uk/marine-data-news
31 Mar 23	Tweet	Announcement of the new EMODnet Ingestion flyer		Account: @MarianneBMDC
	LinkedIn, Twitter & Facebook	Many Reposts / retweets / reshares of publications from EMODnet Secretariat by the EMODnet Data Ambassadors!		

A. Planned communication products			
Date	Communication material	Short description (of the material, title, …) and/or link to the asset	Main results expected
Apr. 23	News for Central & Ingestion portals + LinkedIN + Twitter	D4.4 Inventory of identified stakeholders for licensing data – Progress of EMODnet Data Ingestion phase III	Visibility of the project
Apr. 23	News for Central & Ingestion portals + LinkedIN + Twitter	Results Annual Plenary	Visibility of the project
Apr. 23	Printed A0 posters	Two paper copies A0 of the Wake up your data poster. Available for lending from RBINS.	
2023-2024	Tweets & Posts on LinkedIn	IMPORTANT FOR ALL PARTNERS Upcoming tweets will be shared from @RBINSmuseum account on twitter and @Royal Belgian Institute of Natural Sciences on LinkedIn. Please give a notification to those accounts when you communicate on EMODnet Ingestion in those social networks!	Reaching stakeholders throughout Europe
May 23	Video	The series of success stories presented in one video published on EMODnet YouTube channel	Reaching stakeholders throughout Europe
June 23	News Digest	Promotion of the use of WebODV. Contact **S. Mieruch, AWI**	
21-25 Aug 2023	Baltic Sea Science Congress 2023	EMODnet Ingestion poster(s) and other publications	AU-DCE: Presentation of the EMODnet Ingestion for potential users and stakeholders.

27 Nov.-1 Dec.23	Posters and talks	All Partners: Participation to the **third EMODnet Open Conference and Jamboree** taking place from 27 November to 1 December 2023 in Brussels (Belgium)	
27 Nov.-1 Dec.23	Poster	New poster with overview of 12 success stories presented at the EMODnet Jamboree	Promotion of success stories
2023	New Use Cases	All EMODnet Ingestion Partners are invited to enlarge the number of Use Cases of the project using the template provided by the EMODnet Secretariat; Please send your text and illustration to Nathalie Tonne	Example: "EMODnet Physics & Data ingestion supporting outdoor activity planning and eco-friendly tourism" is a published use case of Data Ingestion + Physics from 2020:
2023	ResearchGate	Publication of EMODnet Ingestion posters and related papers (by ALL Partners)	Visibility of the project in Science Social Media (several EMODnet publications available)
2023	Academia.edu	Publication of EMODnet Ingestion posters and related papers (by ALL Partners)	Visibility of the project in Science Social Media (several EMODnet publications available)

A. (Co-)Authored peer-reviewed publications in the 1st year					
Date of publication	Type of publication	Full reference	ISBN	DOI	Is it open access? Yes/No
6 Dec 2021	Collective positioning paper	Cappelletto M., Santoleri R., Evangelista L., ..., A. Giorgetti,..., M. Fichaut, ..., Simoncelli S. et al. (2021). The Mediterranean Sea we want. Ocean Coast. Res. 69 (suppl 1)		http://dx.doi.org/10.1590/2675-2824069.21019mc	Yes
11 Oct 2021	book chapter	S. Simoncelli, G.M.R. Manzella, A. Storto, A. Pisano, M. Lipizer, A. Barth, V. Myroshnychenko, T. Boyer, C. Troupin, C. Coatanoan, A. Pititto, R. Schlitzer, D.M.A. Schaap, S. Diggs (2022) "A collaborative framework among data producers, managers, and users". Book Chapter in "Ocean Science Data". Ed. Manzella, G.M.R. and Novellino A., Elsevier.	978-0-12-823427-3	http://dx.doi.org/10.1016/B978-0-12-823427-3.00001-3	No
2022	Paper	D.Demetrashvili, K.Bilashvili, N.Machintadze, N.Tsintsadze, V.Gvakharia, N.Gelashvili, V.Trapapaidze, I.Kuzanova “Numerical modelling of Marine Litter distribution in Georgian coastal waters of the Black Sea, Journal of Environmental Protection and Ecology, Vol. 23, No 2 (2022), p.p. 531-542.	ISSN 1311-5065		Yes
2022	Paper	D. González-Fernández1, G. Hanke, M. Pogojeva, N. Machitadze, Y. Kotelnikova6 , I. Tretiak, O. Savenko, K. Bilashvili, N. Gelashvili, A. Fedorov, D. Kulagin, A. Terentiev, J. Slobodnik. Floating marine macro litter		https://www.sciencedirect.com/journal/environmental-pollution	no

		in the Black Sea: toward baselines for large scale assessment, Journ. Of Environmental Pollution, ELSEVIER, Volume 309, 15 September 2022, 119816			

B. Other/non-peer reviewed types of publications (co-)authored in the 1st year					
Date of publication	Type of publication	Full reference	ISBN	DOI	Is it open access? Yes/No
May 2022	Abstract Volume	Kotilainen, A.T., Kotilainen, M.M., Jokinen, S., Virtasalo, J.J., Kaskela, A.M, 2022. Coastal estuaries – Baltic Sea habitat types under threat. In: The GeoHab 2022 Conference: marine geological and biological habitat mapping, 16-20 May, 2022, Venice, Italy: Abstracts, 65. https://geohab.org/wp-content/uploads/2022/05/Abstract_Volume_GEOHAB2022.pdf			Yes
8 June 2022	The Prime Minister's Office's publication (Finland)	Prime Minister's Office, 2022. National Implementation Plan for the UN Decade of Ocean Science (in Finnish). 25 pages. https://urn.fi/URN:ISBN:978-952-383-122-3 The Actions include developing uniformity and usability of marine data flows, where key areas include e.g. cooperation between EMODnet	978-952-383-122-3		Yes
14 Oct 2022	paper	Zodiatis, G., Brenner, S., Gertman, I., Ozer, T., Simoncelli, S., Ioannou, M., and Savva, S., (2022) Twenty years of in-situ monitoring in the south-eastern Mediterranean Levantine basin: basic elements of the			yes

		thermohaline structure and of the mesoscale circulation during 1995-2015. Frontier Marine Science, topic: Climate Change impacts on Mediterranean Coastal and Transitional Areas: Assessment, Projection, and Adaptation.			
26-28 Oct 2022	1st Joint International Conference MARBLUE 2022	Marianne Schlesser, Luminita Buga, Asen Stefanov, Kakhaber Bilashvili, Sissy Iona, Dick Schaap, · YOUR DATA WORK AT EMODnet-INGESTION.EU, Abstract, Poster session at International Joint Conference MARBLUE 2022 / 26-28 October 2022, Constanta, Romania			Yes
26-28 Oct 2022	1st Joint International Conference MARBLUE 2022	Marianne Schlesser, Sissy Iona, Dick Schaap; WAKE UP, SAVEGUARD AND SHARE YOUR DATA WITH EMODnet-INGESTION.EU, Abstract, Poster session at International Joint Conference MARBLUE 2022 / 26-28 October 2022, Constanta, Romania			Yes

9. Monitoring indicators

Comments on the progress indicators in the indicators spreadsheet		
Progress indicator	Means of collecting figures	Comment
1. Current status and coverage of total available thematic data A) Volume and coverage of available data	Submission Viewing service	The total number of new phase 1 + phase 2 submissions in the current year is 250 and of this 106 were elaborated to phase 2. The overall number of published submissions went from 1012 to 1262. .
What is your opinion on the data coverage within EMODnet for your thematic?	Submission Viewing service	The submissions are well divided over the EMODnet thematics. They follow more or less the division of ocean observation activities for different data types.
B) Usage of data in this quarter	Cloud storage of Submission Viewing service	There is a considerable decrease in number of downloads by 50% compared to the previous year. However, the volume of downloads is twice as large this year with 213 GB.
3. Internal and external organisations supplying/approached to supply data and data products within this quarter	Submission Viewing service	There is a good mix in organisation types and countries. The total number of data providers has increased in the year with 27 to 196.
9) Visibility & analytics for web pages	Grafana	The visits to the Homepage and Submission service are quite stable in time while the visits to Data Wanted service go down to zero as it was disabled. The stats for the Viewing Service only availble since end March 2023 and are comparable to the Submission Service.
10) Visibility & analytics for web sections	Grafana	The Viewing Service which publishes the completed submissions generates most traffic and this is quite stable over the full year. Overall, there is no high traffic on the site, but is also not to be expected considering the function of EMODnet Ingestion in the EMODnet framework.
11) Average visit duration for web pages	Grafana	The average visit duration for the Viewing service section is about 30 seconds, while this is a little bit lower for the Submission service section.

The monitoring numbers reported as part of the progress monitoring of EMODnet performance are collected through Matomo and/or Europa Analytics, unless reported otherwise.

10. Recommendations for follow-up actions by the EU

From the experiences with EMODnet Ingestion it can be concluded that there are still many data providers that are not aware of the European and international standards and infrastructures for making their data interoperable and reuseable for other applications. This strengthens the need for continuing the EMODnet Ingestion mission and operation. The mission should be aimed at making more stakeholders in the marine data community, both users and providers, aware and informed about European marine data management and the larger benefits of sharing data. This can partly be implemented by EMODnet Ingestion by continuing its marketing and outreach campaign activities. However, there should also be sufficient resources kept available for elaborating submitted data sets as these can have many formats, lacking quality indications or quality control, and having limited metadata. For that reason, the promotion of open data principles should be complemented by the EU, wherever it can.

Exploring, finding and implementing ways for connecting more providers by means of direct exchanges with their portals and systems becomes increasingly important and relevant. This includes an evolution of the Ingestion portal with more machine-to-machine exchanges. Although it should be realised that setting up such exchanges largely will depend on the question in how far data providers already are using standards, both for IT services and for the formatting and documenting of their data sets. The technical coupling can be quite challenging in practice and represent considerable efforts. For that reason, EU should stimulate more adoption of standards for data management as well as promote development of machine-to-machine exchanges.

11. Annex: Other documentation attached

Annex 1: D3.1 - Updated documentation, standards and procedure for NRT and RT data published – April 2023

Annex 2: D3.2 - Connections with new NRT and RT monitoring stations operational – April 2023

Annex 3: D4.1 - Inventory updated of potential data sources and providers in European countries and priorities – November 2022

Annex 4: D4.4 - Inventory of identified stakeholders for licensing data - February 2023

Annex 1: D3.1 - Updated documentation, standards and procedure for NRT and RT data published – April 2023

EMODnet Ingestion and safe keeping

CINEA/EMFAF/2021/3.4.10/02/SI2.868290

Start date of the project: 30/03/2022 (24 months)

Centralisation Phase

D3.1: Updated documentation, standards and procedure for NRT and RT data published

The European Marine Observation and Data Network (EMODnet) is financed by the European Union under Regulation (EU) 2021/1139 of the European Parliament and of the Council of 7 July 2021 establishing the European Maritime, Fisheries and Aquaculture Fund and its predecessor, Regulation (EU) No. 508/2014 of the European Parliament and of the Council of 15 May 2014 on the European Maritime and Fisheries Fund.

Disclaimer

Document info

Title (and reference)	Updated documentation, standards and procedure for NRT and RT data published [D3.1]
WP title (and reference number)	WP3 - Facilitate machine-to-machine transfers
Task (and reference number)	WP3.1 - Connecting more operators and monitoring platforms to the European oceanography data exchange WP3.1.1 - approaching operators
Authors [affiliation]	Novellino A [ETT]
Dissemination level	Public (CC-BY)
Submission date	31/03/2023
Deliverable due date	31/03/2023

Contents

1 NRT Data Exchange

1.1 EMODnet Ingestion

EMODnet Ingestion and safe-keeping of marine data is a trans-thematic platform that seeks to identify and reach out to organisations from research, public, and private sectors who are holding marine datasets and who are not yet connected and contributing to the existing marine data management infrastructures which are driving EMODnet. Those potential data providers should be motivated and supported to release their datasets for safekeeping and subsequent free distribution and publication through EMODnet.

EMODnet Ingestion supports two main types of ingestions: the first one concerns delayed mode data for which the Data Ingestion Submission service has been established which forwards ingested data to an expert data center selected from a network of 50 assigned data centers based upon data theme and country of submitter as well as EMODnet specific thematic data centers.

A low threshold is offered by splitting the completion of the submission form in 2 parts, whereby a data submitter only completes a part of the metadata together with the uploading of a data package. Each data submission is then assigned to a competent data centre for completing the metadata of the submission. Thereafter, those completed submissions are published with their data packages “as is” at the portal in the View Submissions service, where users can search, browse and download the data packages.

As a next step, assigned data centres elaborate selected submissions further to make (subsets of) the data fit for population into national, regional, European and EMODnet thematic portals. This depends on data centres assessing the added-value of the submitted data and the efforts needed for elaborating the data to common formats, if anyhow possible. Elaboration includes activities like review, validation, conversions to standard formats, and further population to the relevant European infrastructures such as SeaDataNet, EurOBIS, EGDI, CMEMS, and others, depending of the theme, which then feed into EMODnet data portals.

The second type concerns the real time (RT) and near real time (NRT) data flow from operational oceanographic platforms whose operators would like and include their data and streams in EMODnet Physics offer. Near real time operational ocean data management and exchange processes within this activity are intended to reduce duplication of effort among agencies, to improve quality and reduce costs related to geographic information, thus making oceanographic data more accessible to the public and helping to establish key partnerships to increase data availability.

The major EU marine data infrastructures for operational oceanography data exchange are the Copernicus Marine Environmental Monitoring Service (CMEMS), the SeaDataNet (SDN) network of National Oceanographic Data Centres, and EuroGOOS with its ROOSs. EMODnet Physics and EMODnet Data Ingestion work closely together with these 3 leading European infrastructures, and are sharing efforts with them to facilitate the access to operational data streams. In particular, EMODet is very active in the identification of new operators and/or new stations, providing the necessary support providers to establish Near Real Time (NRT) connectivity towards the European Infrastructures, and promoting common standards forv structured exchange.

The document is aiming at being a simple user guide to data providers about NRT data sharing standards and procedures.

1.2 EMODnet Ingestion approach for NRT time

Sources of data are making metadata and data available according to different data transport formats, different metadata standards, and different data publication services.

As general examples: CMEMS-INSTAC is offering data via the CMEMS Dissemination Unit (CMEMS DU) and more specifically it implements a dedicated FTP folder for IN SITU data; Coriolis is making data available on a public IFREMER ftp folder; IOC offers html page with latest 30 days of sea level data from IOC-Tide Gauges, etc. New providers may apply one of these strategies as well as others. EMODnet Ingestion and EMODnet Physics are working together to identify new operational data providers and give them support to get connected in an efficient way. For this, EMODnet Ingestion is also working on machine-to-machine procedures and tools to implement connections from source-to-EMODnet (Physics via Ingestion). Whenever possible, the EMODnet Ingestion action is to streamline the new data flow towards one of the major near real time pathways that EMODnet Physics uses to connect sources, and in general, there are three main near real time (NRT) pathways to EMODnet Physics.

The first one is via the EuroGOOS ROOSs and the CMEMS INSTAC. This combined infrastructure is based on regional nodes, i.e. Regional Data Assembly Centre (RDAC), which guarantee the same quality of the products delivered to the end-user. The RDAC are collecting data from a network of production units (PUs). A PU is responsible for its observing system, which collects controls and distributes data according to its own rules. Routinely (e.g.: every hour), each RDAC distributes all its new data on a regional FTP portal, CMEMS-INSTAC makes this data harmonised and available on the CMEMS-DU infrastructure and EMODnet can update its database by accessing the CMEMS-DU FTP.

The second pathway is via the Global Data Assembly Centre (GDAC) that collects and distributes data from international monitoring programmes such as ARGO, GOSHIP, DBCP, etc. This data flow is totally automated and so data quality is automatically checked according internationally agreed methods. Some of these data are included in the CMEMS-INSTAC redistribution packages, and when necessary, EMODnet Physics collects these datasets from the CMEMS-DU FTP. If it is not the case, EMODnet collects these datasets directly from the GDAC FTP.

The third pathway is via Thematic Assembly Centers (TACs)[1] that are in charge for the collection and dissemination of these “new/emerging” network platforms and parameters (e.g. sea surface currents fields recorded by HF Radars, acoustic noise recorded in terms of sound pressure level, etc.). In addition, TACs are connected to PUs and each PU is responsible for its observing system, which collects, controls and distributes data according to its own rules. This is the case where the collaboration between EMODnet Ingestion and EMODnet Physics play the most important and crucial role and the development of specific tools may be necessary.

Analogously to the delayed mode ingestion process, the real time operational data flow ingestion as deployed by EMODnet Ingestion – EMODnet Physics can be described into 2 distinct phases:

- Phase 1: is the publishing in EMODnet Physics/ EMODnet Ingestion realtime dashboard of the submitted/identified operational data source “as is”

[1] EMODnet Physics is acting as TAC for some “emerging” networks (e.g. in situ river inflow).

- Phase 2: is once this data is fully digested by partner infrastructures (either national, European or International assembly center).

Phase 1 is completed when the submitted/identified operational data source is included and available "as is" in the EMODnet Physics/EMODnet Ingestion realtime dashboard. This dashboard has recently been upgraded and is available at: https://realtime.emodnet-physics.eu

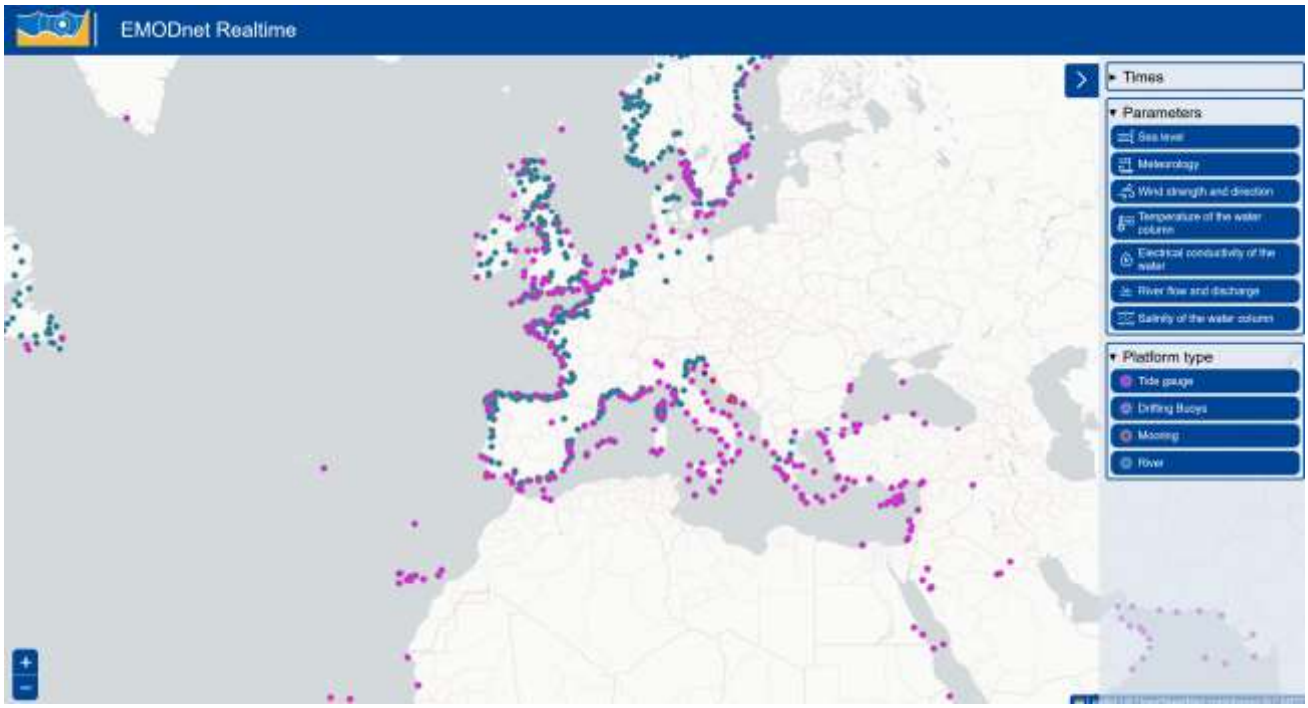


Image: upgraded viewer for observing stations newly connected through EMODnet Ingestion – Physics cooperation as result of phase 1.

The connection from source to EMODnet includes and exploits machine-to-machine technologies ranging from the adoption of Sensor Observation Service (SOS) - Sensor Web Enablement (SWE) for RT exchange to the adoption of the Data Access Broker (DAB) service, to the adoption ERDDAP. Once a new operational data source is ingested into the data layer and a data-collection is added to the ERDDAP data server, phase 1 is completed.

This link is then used to continue the process towards the completition of the ingestion phase 2, that is achieved when this new data source is included into existing EuroGOOS – Copernicus INSTAC Near Real Time (NRT) exchange progress. This phase 1 to phase 2 promotion requires further elaboration (e.g. adoption of common QC/QF at source, adoption of standardized metadata, etc.) and may not always be possible. For instance, it might require quite an effort from the data provider, which is not acceptable for their management. While establishing phase 1 connectivity is much easier and requires less efforts.

2. Standard and procedures

Timely, free and unrestricted exchange of oceanographic observational data is essential for understanding the oceans' complex role in the weather and the climate, for empowering decision makers with evidence-based information for sustainable management of the ocean and environment etc. Open and free data policy is widely encouraged by the European Commission and Member States for a wide range of environmental data services targeted to a wide range of user communities. Interoperability of data systems has become a priority with the development of FAIR principles (2014)[2], a set of guiding principles (2016) to make data **Findable, Accessible, Interoperable, and Re-usable**.

Furthermore, in 2021, OECD, with the Recommendation on Enhancing Access to and Sharing of Data, set principles and policy guidance to help governments to maximise the cross-sectoral benefits of all types of data – personal, non-personal, open, proprietary, public and private – while protecting the rights of individuals and organizations. The availability and accessibility of these data is not always easy and often the sources are lacking compliance to international standards, and many challenges (still) exist associated with good management of ocean data, such as using different formats, wide diversity of datasets, and disparate data management structures, among others (Tanhua et al., 2019). Anyhow the basic milestones are set and can be easily adopted and adapted to the purpose. This comprises, open science practices covering the entire workflow of the ocean data production and dissemination, including data processing, validation and dissemination infrastructure(s).

2.1 Data FAIRness

Since 1960, the IODE has been publishing manuals and guides[3,] that dealt with operational procedures for data collection, quality assessment and quality control, standards and reference materials, data formats, etc. Harmonisation of marine in situ data is necessary for scientists of different disciplines and experts in various fields to share information and tackle together a specific marine phenomenon or threat.

Marine observations generate raw data which can be stored in repositories commonly known as data archive centres (DACs). DACs give access to datasets, metadata and sometimes data-products. With dozens of expert DACs, the NRT marine data landscape is diverse and complex. Public marine data are accessed via many different routes.

Over the last three decades great progress was made at European level in terms of advancing these standards and facilitating machine-to-machine data processing, and programs and projects such as Copernicus, EMODnet, SeaDataNet, H2020 EuroSea etc are continuously updating these recommendations (see Tanhua et al. 2019 for an exhaustive review). These recommendations are made according to the FAIR principles broken down into the 15 characteristics laid down by the FORCE11[4] collective and clearly described in Quimbert et al. (2022).

Table 1. FAIR principles proposed by the FORCE11 community

Findable	

[2] https://www.force11.org/group/fairgroup/fairprinciples
[3] https://www.iode.org/index.php?option=com_oe&task=viewDoclistRecord&doclistID=9
[4] https://force11.org/info/the-fair-data-principles/
FORCE11 is a community of scholars, librarians, archivists, publishers and research funders that has arisen organically to help facilitate the change toward improved knowledge creation and sharing.

F1	(meta)data are assigned a globally unique and eternally persistent identifier.
F2	data are described with rich metadata.
F3	(meta)data are registered or indexed in a searchable resource.
F4	metadata specify the data identifier.
Accessible	
A1	(meta)data are retrievable by their identifier using a standardized communications protocol.
A1.1	the protocol is open, free, and universally implementable.
A1.2	the protocol allows for an authentication and authorization procedure, where necessary.
A2	metadata are accessible, even when the data are no longer available.
Interoperable	
I1	(meta)data use a formal, accessible, shared, and broadly applicable language for knowledge representation.
I2	(meta)data use vocabularies that follow FAIR principles.
I3	(meta)data include qualified references to other (meta)data.
Re-usable	
R1	(meta)data have a plurality of accurate and relevant attributes.
R1.1	(meta)data are released with a clear and accessible data usage license.
R1.2	(meta)data are associated with their provenance.
R1.3	(meta)data meet domain-relevant community standards.

Notably, these recommendations are always including three main elements for implementing the interoperability, namely metadata (including data quality), data format and data services. More specifically, metadata of deposited publications must be open under a Creative Common Public Domain Dedication (CC 0) or equivalent, in line with the FAIR principles (in particular machine-actionable) and provide information at least about the following:

- publication
- author(s),
- title,
- date of publication,
- publication venue;
- Horizon Europe or Euratom funding;
- grant project name, acronym and number; licensing terms;
- persistent identifiers for the publication, the authors involved in the action and, if possible, for their organisations and the grant.

Where applicable, the metadata must include persistent identifiers for any research output or any other tools and instruments needed to validate the conclusions of the publication. Nevertheless, data usability strongly depends on the data policy license and in such regard, there is an increasing push for adopting the Common Creative framework and in particular the CC-BY license (the only limitation is that credit must be given to creator). Embargo of data and other CC-license can also be applied wherever the policy is 'As open as possible as closed as necessary'. Providers can avoid offering open access in case OA be against the beneficiary's legitimate interests, including regarding commercial exploitation.

2.2 Making data FAIR

2.2.1 Data Quality Principles

The principles aim to encourage all involved in research to maintain, and to respond adequately to possible threats or violations of research integrity. Researchers should be guided by these principles at each stage of the project work and in particular they have to ensure:

- Academic Excellence - Researchers have to apply sound methodology, suitable methods, standard procedures and documented protocols where appropriate, to ensure the highest quality of work, its dissemination and replicability.
- Honesty - Researchers must acknowledge the direct and indirect contributions of colleagues, collaborators and others. The basic principle of any scientific activity is the need for researchers to be honest in respect of their own actions and in their responses to the actions of other scientists.
- Accountability - Researchers should recognise their responsibility to the general public, and should take all reasonable measures to ensure that their research complies with any agreement, related policies and professional bodies' guidance; and allows for proper governance and transparency.
- Care and Respect - Researchers should avoid any unreasonable risk or harm to research subjects and researchers themselves.

2.2.2 Data Format

Transport format is one of the key elements for implementing data interoperability and having a common transport format is an open community issue. The European operational oceanography data infrastructures are based on the format of the files that are used to distribute OceanSITES data model (with some extensions to provide the user with more information). Typically, the transport format for operational data is NetCDF (CF Convention). The NetCDF CF (v1.6 or greater) file format should be preferred as it is commonly used by the marine community and by the data integrators for in situ data as well as for satellite and modelling ones. It is a self-describing format, which eases the understanding of the file content. Another widely used scientific data file format is HDF[5]. Both NetCDF and HDF provide compact, binary formats optimised for efficient storage and access of large, complex datasets and support features such as internal compression, and support hierarchical structuring of data within files.

2.2.3 Metadata

The adoption of ISO standards and the use of shared controlled vocabularies are a key prerequisite towards consistency and this data integrator and data mediator role. ISO 19115 Standard[6] requires a basic minimum number of metadata elements that are essential for the data presentation:

- Dataset or dataset series on specific challenges ('what'),
- Geographic bounding box ('where'),
- Temporal extent ('when'),
- Contact point to learn more about or order the dataset ('who').

[5] https://www.hdfgroup.org/solutions/hdf5/
[6] https://www.iso.org/standard/53798.html

The key references for cataloguing the information in NRT are:

- ISO 8601 Representation of date and time,
- SeaDataNet NVS P0x description of parameters,
- Climate and Forecasting conventions for parameters standard names,
- WGS84 for Datum.
- links to the processing history of the observations (i.e., source, version, quality assessment and control, sensors).

Table 2. Metadata Vocabularies

Metadata field	Vocabulary exists	Link to vocabulary	Vocabulary governance	Mandatory/ Suggested
Platform id		https://www.ocean-ops.org/	OCEANOPS – WMO	M
Platform type	Yes	http://vocab.nerc.ac.uk/collection/L06/current/	BODC	M
sensor_model	Yes	http://vocab.nerc.ac.uk/collection/L22/current/	BODC -NVS	S
contributors_role				
naming_authority	Yes	https://edmo.seadatanet.org/	SeaDataNet	M
Institution	Yes	https://edmo.seadatanet.org/	SeaDataNet	M
qc_method	*	doi		M
data_mode	Yes	NRT/DM/REP	EuroGOOS DATAMEQ	S
variable names	Yes	http://vocab.nerc.ac.uk/collection/P02/current/ http://vocab.nerc.ac.uk/collection/P01/current/ http://vocab.nerc.ac.uk/collection/P07/current/ https://cfconventions.org /Data/cf-standard-names/79/build/cf-standard-name-table.html	BODC – NVS CF	M S S M
unit	yes	https://vocab.nerc.ac.uk/collection/P06/current/	SeaDataNet	M
Qualy Flag Scheme	yes	https://vocab.seadatanet.org/v_bodc_vocab_v2/search.asp?lib=L20	SeaDataNet	M
Time	yes	ISO8601	ISO	M
Datum	Yes	WGS84	ISO	M
Country	yes	ISO3166	ISO	M
Licence	Yes	https://creativecommons.org/	CC	M
INSPIRE	Yes	ISO 19115	ISO/INSPIRE	M
PI	yes	https://orcid.org/	ORCID	S

To note that this is a continously evolving table and will be updated continuously as soon as needed.

2.2.4 Use of uncommon or unavailable ontologies or vocabularies

The NVS offers both NVS RESTful, SOAP and SPARQL services. A GitHub repository for key NVS vocabularies[7] tracks the discussion on new terms adoption. NAUTILOS partners are already using these services and are collaborating with SeaDataNet and linked projects (e.g., EMODnet, ARGO, Copernicus Marine Service).

The NVS service is also open to map and manage new terms and ontologies, therefore the primary approach of OCEAN:ICE will be to interact with the service (and the people managing the vocabulary) to have a community definition, acceptance and hence adoption of new proposed terms.

[7] github.com/nvs-vocabs

2.2.5 Observational platform

Each in situ platform/station should be identified by a unique ID. A WMO code is assigned (OceanOPS, https://www.ocean-ops.org/) to ARGO, drifting buoy, mooring buoy, fixed ocean platform (e.g. SAMBA array), autonomous vehicle.

2.2.6 Institution

The institution responsible (operating) for the marine in situ data should be displayed. This should be done through an EDMO code that references marine institutions all over the world. The information and any organisation's code can be found on SeaDataNet website[8].

2.2.7 Principal Investigator and Research Team

Actors associated with the data should be referenced by a persistent digital identifier as for example an ORCID identifier[9].

2.2.8 Project Identifier

When data is acquired during a project, this last one needs to be associated with the data and identified by its EDMERP code. The code (5 digits) of a project can be found or obtained for a new project on SeaDataNet website[10].

2.2.9 Dataset Identifier

The datasets should be identified by a DOI, persistent identifier for object and ISO standard. The two main reference DOI publishers in Europe are ZENODO[11] for any research fields (and including data, papers, software …) and SEANOE[12] for marine research data. The granularity of the dataset, to which a DOI should be assigned, is not homogeneous and not yet consolidated. An important point is that each DOI including the reference to the same dataset (only this one or among others) should be linked together (e.g. a DOI assigned to a platform and a DOI assigned to the network of all the platforms) to allow complete traceability of the initial platform. One major problem when seeking to uniquely identify the data digital objects is the fragmentation of the data acquisition process. If we consider the ARGO as an example, data from each profiler are reviewed and checked against climatological data and nearby Argo data from different profiler. But ARGO are continuously uploading new data (same ARGO with new profiles, new ARGOs) and updates to existing data when delayed mode quality control is done. To overcome this issue, it's important to Include and refer to a timestamp and identify the "version" (identify time relative to changes to the dataset)

[8] https://edmo.seadatanet.org/results
[9] Information and registration: https://orcid.org/
[10] https://www.seadatanet.org/Metadata/EDMERP-Projects
[11] https://help.zenodo.org/
[12] https://www.seanoe.org/html/doi-complementarity-with-databases.htm

2.2.10 Data Services

To facilitate the data harmonisation and operate as integrator and data translator for facilitating the data use and interoperability it is important to use common open tools to query for and view data collections and data products. The GOOS Observation Coordination Group (OCG), coordinating the activities of the global ocean observing networks, is working to improve data interoperability between and within the various observing networks. The OCG is actively promoting the use of ERDDAP[13] as a key tool towards interoperability of global ocean datasets. ERDDAP data server is open-source software written in Java that builds upon the open-source ideals of the OPeNDAP, WCS, SOS and OBIS standards.

ERDDAP data server supports several common data file formats (html table, netcdf, csv, txt, mat, json, etc.) and output files are created on-the-fly in any of this format. ERDDAP implements FGDC Web Accessible Folder (WAF) with FGDC-STD-001-1998 and ISO 19115 WAF with ISO 19115-2/19139.

Another tool that is increasing in popularity and use is GeoNetwork. GeoNetwork, based on an open source (GNOS) project, is a free and open source (FOSS) cataloguing application for spatially referenced resources. GeoNetwork provides a web interface to search geospatial data across multiple catalogues. The search provides full-text search as well as faceted search on keywords, resource types, organisations, scale, etc.

The catalogue is able to describe geospatial layers, services, maps and also non geographic datasets. GeoNetwork implements WxS, OGC, ISO 19115/119/110 standards used for spatial resources and also the Dublin Core format usually used for open data portals.

Another tool is SEANOE. SEANOE (SEA scieNtific Open data Edition) is an open scientific data repository in the marine sciences field. Currently operated by the SISMER marine data center within the ODATIS Ocean Cluster framework and funded by IFREMER. Publication of datasets in SEANOE data is free of charge, with a limitation of 100GB of size per record. Each dataset published on SEANOE will get a unique DOI which allow it to be published and cited in the most reliable and sustainable way. Data published on SEANOE are freely available. They can be used in accordance with the terms of the Creative Commons license selected by the data's author. By contributing to the Open Access / Open Science movement, SEANOE offers a free access to all scientific data financed by public funds for the benefits of research.It is possible to set a maximum of 2 years embargo on a dataset, the goal is for example to restrict access to a publication data under scientific review.With a fast responding service, SEANOE will attribute a DOI within 24 hours to well described datasets. Each dataset is checked before being published. SEANOE is entitled to refuse any publication that does not match its criteria quality or field (marine sciences). EMODnet Ingestion network marine data centers will be informed of datasets published in SEANOE thanks to automatic duplication in the EMODnet Data Ingestion portal. Datasets of interest will then be submitted by EMODnet data center to their national data centers, and published in internationnal data portals such as SeaDataNet, EurOBIS, and EMODnet thematic portals. These services allow metadata to be harvested and indexed.

2.2.11 Data License

As already described ocean data have to be freely available to the community at no cost and limitation. Simply ensuring that data are freely and openly available is not enough to effectively improve data interoperability,

[13] https://coastwatch.pfeg.noaa.gov/erddap/index.html

though of course this is necessary. As anticipated, data license is key element for interoperability and it should consider the following:

- When possible, to give open and free access to the data. Note that this access can be done through authorisation or authentication if needed.
- To provide to the data actor (creator) a standardised way to grant permission to use his/her work done under copyright law.
- To be clear and accessible to the user or data actor and readable by a machine

The licence "Creative Commons" (CC[14]) gathers these characteristics. It lists 6 different licence types from most to least permissive with the common point that credits must be given to the creator. The most permissive: CC-BY (with the only limitation that credit must be given to creator)[15] should be preferred, following the principle 'as open as possible as closed as necessary'.

An Embargo period may also be applied. The Embargo is the period during which access to the dataset is temporarily restricted. Usually, embargoes are applied while researchers are awaiting publication or pursuing a patent. Typical embargo periods range from 6 to 24 months from the data collection time. In any case metadata will be open under CC 0 or equivalent (to the extent legitimate interests or constraints are safeguarded), in line with the FAIR principles and provide information about the licensing terms and persistent identifiers, amongst others.

[14] Refer to https://creativecommons.org/about/cclicenses/ for all detailed information on CC licences.
[15] CC BY-NC/CC BY-ND are allowed for long-text formats

3. Links and Readings

3.1 References

- The European Marine Observation and Data Network (EMODnet): Visions and Roles of the Gateway to Marine Data in Europe. Front. Mar. Sci., 12 July 2019. https://doi.org/10.3389/fmars.2019.00313
- Quimbert E. *et al.* (2022) Guide principes FAIR. Principes FAIR dans le contexte du pôle ODATIS doi.org/10.13155/87107
- Révelard A. *et al.* (2022). Ocean integration : the needs and challenges of effective coordination within the ocean observing system. Frontiers in Marine Science 8:737671. doi:10.3389/fmars.2021.737671
- Tanhua T. *et al*. (2019) ocean FAIR data services. Frontiers in Marine Science, 6:440. doi:10.3389/fmars.2019.00440
- Thijsse P., Schaap D. (2019). Marine subdomain FAIRness roadmap. ENVRI-FAIR project. EU Horizon 2020 research and innovation programme under grant agreement No 824068
- Wilkinson, M.D. *et al.* (2016). The FAIR Guiding Principles for scientific data management and stewardship. Scientific Data, 3, 160018. doi.org/10.1038/sdata.2016.18
- EuroSEA D.3.7 - Network harmonisation recommendations (www.eurosea.eu)
- Obaton et al. (2022). Proceedings at MetroSea 2022.

Annex 2: D3.2 - Connections with new NRT and RT monitoring stations operational – April 2023

EMODnet Ingestion and safe keeping

CINEA/EMFAF/2021/3.4.10/02/SI2.868290

Start date of the project: 30/03/2022 (24 months)

Centralisation Phase

D3.2: Connections with new NRT and RT monitoring stations operational

The European Marine Observation and Data Network (EMODnet) is financed by the European Union under Regulation (EU) 2021/1139 of the European Parliament and of the Council of 7 July 2021 establishing the European Maritime, Fisheries and Aquaculture Fund and its predecessor, Regulation (EU) No. 508/2014 of the European Parliament and of the Council of 15 May 2014 on the European Maritime and Fisheries Fund.

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Document info

Title (and reference)	Connections with new NRT and RT monitoring stations operational [D3.2]
WP title (and reference number)	WP3 - Facilitate machine-to-machine transfers
Task (and reference number)	WP3.1 - Connecting more operators and monitoring platforms to the European oceanography data exchange WP3.1.1 - approaching operators
Authors [affiliation]	Novellino A [ETT]
Dissemination level	Public (CC-BY)
Submission date	31/03/2023; revised 27/06/2023
Deliverable due date	31/03/2023

Contents

1. EMODnet Ingestion

EMODnet Ingestion and safe-keeping of marine data is a trans-thematic platform that seeks to identify and reach out to organisations from research, public, and private sectors who are holding marine datasets and who are not yet connected and contributing to the existing marine data management infrastructures which are driving EMODnet. Those potential data providers should be motivated and supported to release their datasets for safekeeping and subsequent free distribution and publication through EMODnet.

EMODnet Ingestion supports two main types of ingestions: the first one concerns delayed mode data for which the Data Ingestion Submission service has been established which forwards ingested data to an expert data center selected from a network of 50 assigned data centers based upon data theme and country of submitter as well as EMODnet specific thematic data centers. A low threshold is offered by splitting the completion of the submission form in 2 parts, whereby a data submitter only completes a part of the metadata together with the uploading of a data package. Each data submission is then assigned to a competent data centre for completing the metadata of the submission. Thereafter, those completed submissions are published with their data packages “as is” at the portal in the View Submissions service, where users can search, browse and download the data packages. As a next step, assigned data centres elaborate selected submissions further to make (subsets of) the data fit for population into national, regional, European and EMODnet thematic portals. This depends on data centres assessing the added-value of the submitted data and the efforts needed for elaborating the data to common formats, if anyhow possible. Elaboration includes activities like review, validation, conversions to standard formats, and further population to the relevant European infrastructures such as SeaDataNet, EurOBIS, EGDI, CMEMS, and others, depending of the theme, which then feed into EMODnet data portals.

The second type concerns the real time (RT) and near real time (NRT) data flow from operational oceanographic platforms whose operators would like and include their data and streams in the EMODnet offerings. Near real time operational ocean data management and exchange processes within this activity are intended to reduce duplication of effort among agencies, to improve quality and reduce costs related to geographic information, thus making oceanographic data more accessible to the public and helping to establish key partnerships to increase data availability. Analogously to the delayed mode ingestion process, the real time operational data flow ingestion can be described into 2 distinct phases:

- Phase 1: is the publishing in EMODnet Physics/ EMODnet Ingestion realtime dashboard of the submitted/identified operational data source “as is”
- Phase 2: is once this data is fully digested by partner infrastructures (either national, European or International assembly center), implicating more metadata included and adopting previaling format standards.

The task dealing with operational oceanography data is done in a cooperation between EMODnet Physics and EMODnet Ingestion, whereby it is a major aim to bring new stations and providers to phase 2, as that will make the stations and providers ready for inclusion in the structured European operational oceanography data exchange which is organised between EuroGOOS, CMEMS INSTAC, and SeaDataNet, and which also includes structured uptake in the offerings of EMODnet Physics.

As part of this task for ingesting operational data streams, there is also proactive searching and identification of new operators and/or new stations, followed by supporting identified providers to establish Near Real

Time (NRT) connectivity towards European Marine Infrastructures as well as the promotion of common standards and metadata. To do so, meetings and workshops are continously organized to engage potential EMODnet Stakeholders.

This document lists the (user engagement related) attended events during the first 12 months of the EMODnet Ingestion 3 contract and decribes the main collected feedback.

2. User Engagement

The team proactively participated to a series of events and workshops (e.g. EuroGOOS FerryBox Annual Scientific Workshop, EuroGOOS Tide Gauge Task Team, European HFR Annual Assembly, MONGOOS workshop and assembly, TG NOISE, EuroGOOS DATAMEQ, Copernicus Marine Service INSTAC Stakeholders meeting, SOOS DMSC, etc.) promoting open data and refining and adoption of common standards (P01-P02, ISO 8601, WGS84, EDMO, EDMERP, ORCID, doi, CC). The following table gives an overview of these events and workshops in the 1st year.

Date	Location	Short description and main results (# participants, agreements made, etc.)
12-13/04/2022	Genova, Italy	Marine Insitu Collaboration - MIC TWG - to streamline data flow between main EU marine data operators and integrators
09-10/05/2022	Malmo, Sweden	Ocean Literacy - Ocena Decade Sweden - https://malmo.se/Welcome-to-Malmo/Sustainable-Malmo/One-Ocean---One-Planet-Ocean-Literacy-Action-2022.html.
20/05/2022	Ravenna, Italy	EU4Ocean @ EMD - https://european-maritime-day-2022.b2match.io/agenda?session=c2Vzc2lvbjoxMTI1OTA%3D&track_id=19933
26/05/2022	web	EMANEDS – European Marina Networks of Environmental Data Stations – to discuss about interoperability and data flow towards EMODnet
30/05/2022	Genova, Italy	meeting with CIMA foundation (https://www.cimafoundation.org/) - to discuss about synergies
16/06/2022	Genova, Italy	GESmartCity - Blue District - workshop to discuss about synergies between projects to support the municipality blue and smart projects - about 30 attenders
21/06/2022	web	EMANEDS – European Marina Networks of Environmental Data Stations – to discuss about interoperability and data flow towards EMODnet
21/06/2022	web	CCMALR - to discuss about interoperability
11/07/2022	web	EMODnet program, goals, projects and actions were introduced before digging into in situ data management and sharing (with EMODnet provided tools such ERDDAP docker)
05/07/2022	web	European Glider Data Management Workshop - https://www.groom-ri.eu/european-glider-data-management-workshop-agenda-2/ - https://docs.google.com/document/d/1hQSNbznH6sm5Eo1KjrkK1og1vQDOjRtwGa0xryANe54/edit#
04/08/2022	web	*Open Science Conference* - SCAR OSC data session: Sharing science data FAIRly to support interdisciplinary research collaborations. About 70 attenders.
14-15/09/2022	Rotterdam, Netherlands	The NOOS annual meeting 2022
25/09/2022	Genova, Italy	Salone Nautico 2022 – International Boat Show – The sustainability comes from the sea: living experiences according to the One Health Approach Workshop. The theatre of the sea, at the hearth of the event, hosted the workshop to discuss about sustainability and oceans.

		The event was attended by more than 150 people on site. The event had a big hype on local newspapers and social channels[1]
29/09/2022	Brest, France	MIC working group meeting. Periodic meeting of the Marine In situ Collaboration team to review achievements and plan new actions to unlock and include more in situ data on EOVs for the benefit of EMODnet, Copernicus Marine Service, EuroGOOS and related initiatives.
29/09/2022	web	EuroGOOS FerryBox Annual Workshop[2]. Coordination with the FB TT is important for both Physics, Chemistry and Ingestion themes. The importance to work on a clear data licence (CC-BY) was largely discussed.
28-29/09/2022	web	Annual scientific workshop of the European FB community. the focus of EMODnet presentation was on FAIR, open data (CC-BY) and adoption of tools like ERDDAP.
04/10/2022	Milazzo	MetroSea 2022. International IEEE event on Marine technologies and services. Event was attendend by about 100 people. EMODnet Physics organized the special session on data networking and interoperability. https://www.metrosea.org/special-session-1. https://www.metrosea.org/files/MetroSea2022_FinalProgram.pdf
05/10/2022	Genova	GENOA SEA SUSTAINABLE CITY - EMODnet (program and focus on Physics, Chemistry, Ingestion) was presented and discussed during the event. https://www.genovabluedistrict.com/eventi/genoa-sea-sustainable-city/ Event was hybrid (about 50 in presence)
11/11/2022	Taranto	GREENBLUEDAYS - A innovative forum on sustainable development in Southern Italy - EMODnet (program and focus on Physics, Chemistry, Ingestion) was presented and discussed during the session "new economy of the sea: compatibility and sustainability" - https://greenbluedays.it/tavola-rotonda-la-nuova-economia-del-mare-a-taranto-compatibilita-e-sostenibilita/ more than 300 attenders in presence during the event
14/10/2022	web	DATAMEQ - EuroGOOS Data Management, Exchange, and Quality Working Group (DATAMEQ WG) helps improving harmonization and integration of European marine data. EMODnet is one core stakeholder for the community
17-18/10/2022	Venice	Knowledge Hub - Sea Level Rise Conference 2022 - https://knowledgehubsealevelrise.org/ - International Conference on Sea Level Rise. EMODnet representatives actively participated to panels discussion. Hybrid event with about 100 attenders in presence
26/10/2022	FARO	NAUTILOS - The flagship H2020 project will develop a new generation of cost-effective sensors and samplers and integrate observation technologies and platforms into large-scale demonstrations across European seas making a significant contribution towards the democratisation of marine environment monitoring. EMODnet is one key stakeholder for new data that the project is going to generate.
28/10/2022	web	MIC - sea level data - GLOSS
16/11/2022	web	International ocean governance course - offered by the IOI and the University of Malta - about 30 students
21-22/11/2022	Florence	HFR Task Team periodic meeting to review the general progress of the Task Team work plan, in order to progress in the joint roadmap. https://www.lamma.toscana.it/sites/default/files/doc/news/HFRadarTT_2022_annual%20meeting_agenda_draft.pdf
22-23/11/2022	Florence	MONGOOS workshop - http://www.lamma.rete.toscana.it/news/dal-21-al-24-firenze-sara-la-capitale-delloceanografia-europea https://eurogoos.eu/current/mongoos-annual-meeting-workshop-on-the-importance-of-scales-and-uncertainties-in-ocean-transport-and-the-general-assembly/
24/11/2022	Florence	MONGOOS General Assembly. During the meeting updates about EMODnet program and centralization process were presented and discussed. http://www.lamma.rete.toscana.it/sites/default/files/doc/news/MonGOOS_General%20Assembly_Agenda_Florence22.pdf
24/11/2022	web	AIVP general assembly - AIVP is an NGO that has been bringing together urban and port stakeholders. Novellino joined as a partner and presented on EMODnet program and themes
25/11/2022	web	EuroSEA - WP3 internal meeting to finalize deliverables on "network harmonization recommendations" where recommendations comes from internal and external stakeholders, hence EMODnet, SeaDataNet NODCs, and Copernicus Marine Service
14/12/2022	Rome	ONTM Genaral Assembly, ONTM is National Observatory for the Protection of the Sea, during the General assembly (about 50 attenders), EMODnet was indicated as a primary stakeholder for the observatory
13/01/2023	Alicante, Spain	OCEANRACE - Genova Pavillion and Italian Day. ETT was awarded to join the roadshow during the race legs to have a presentation covering ocean data management, processing, interoperability, etc. EMODnet, Copernicus Marine Service, EuroSEA, SO-CHIC, NAUTILOS and many other European projects, as well as Italian projects are explained to the public
19/01/2023	Gothenburg, Sweden	Voice of the Ocean - ERDDAP lectures and workshops in Gothenburg. VOTO will present outcomes from the collaboration with EMODnet
20/01/2023	Gothenburg, Sweden	SMHI - workshop to present on latest updates on ocean data management and EMODnet

27/01/2023	Savona, Italy	CIMA Foundation - new provider candidate - meeting to present on EMODnet
08/02/2023	web	EuroGOOS Tide Gauge Task Team
17/02/2023 - 18/02/2023	Bologna, Italy	CNR ISP - new provider candidate - meeting to present on EMODnet - discussion on cryosphere data
21/02/2023	Murica, Spain (web)	MAR MENOR - Public workshop (on the 21st of February) to show their observational monitoring capabilities
23/02/2023	capetown, Sud Africa	Ocean data hour - low cost tech and citizen science
24/02/2023	capetown, Sud Africa	Presentation on ocean data management in Europe with an overview on the major European Marine data integrators
28/02/2023	Genova, Italy	Accademia Marina Mercantile - ITS ... how to find and process ocean data
02/03/2023	web	Advancing EOOS - the foundation of European ocean knowledge - online launch event, the new EOOS Strategy and Roadmap for Implementation 2023-2027 will be presented and discussed by esteemed members of the European ocean community.
13/03/2023	web	SOOS DMSC – Discussion on data flow and how to facilitate the ingestion
28/03/2023	web	CMEMS INSTAC Stakeholder + MIC coordiantion
30/03/2023	Gothenburg, Sweden	Coastal Data Gap Challenge with Chalmers
30/03/2023	web	River runoff data management
31/03/2023	Genova, Italy	The Ocean Race Genova - The Grand Finale - Verso l'arrivo a Itajaì e la sostenibilità - During the talk we discussed about ocean data management in Europe and how EMODnet is dealing with data

Joining these events and workshops has resulted in creating interest and giving support to many oceanography station operators for getting connected and joining the near real time and/or real time data exchange. These results are described in the following chapter.

A key outcome is also the formulation of the new EuroGOOS data policy draft (which will be discussed during the next EuroGOOS general assembly) which is going to adopt and promote the CC schema as part of the EuroGOOS data policy:

Data license

A EuroGOOS data policy is to promote the well-known and unambiguous CC-BY or CC-0 data licenses, ideally as soon as the data is available.

Any other kind of specific license from a group of lawyers will probably be subject to various interpretations; the risk is to get swamped or worse to vague.

There may be some exceptions; the priority to publication is in my view not one of thesethis exceptions: a dataset can-should be published with proper credits and traceability (the quality may improve in time) to the observation team.

3. New providers

The engagement activities as described in the previous chapter have had a lot of impact, as it has resulted in many new operational oceanography data providers, not only from Europe, but also on a global scale. The following lists the newly connected data providers, both for marine and riverine areas.

Institute	Nature	Country	Type of data	**notes**	**Type**
Instituto Nacional del Agua (INA) - Ministerio de Obras Públicas – Argentina	public	Argentina	river	3 river stations delivering data in NRT	Public/ Government
Executive Agency "Exploration and Maintenance of the Danube River" (IAPPD)	public	Bulgaria	river	1 station delivering data in NRT	Public/ Government
Institute of Meteorology and Water Management National Research Institute, Poland (IMGW-NRI)	public	Poland	river	15 stations delivering data in NRT	Academic/ Research
Norwegian Water Resources and Energy Directorate (NVE), Norway	public	Norway	river	9 stations delivering data in NRT	Public/ Government
APA, Agencia Portuguesa do Ambiente, Portugal	public	Portugal	river	The first river provider to be linked, now it is linking all the Portuguese rivers	Public/ Government
Agencia Catalana de l'Aigua - ACA, Generalitat de Catalunya	public	Spain	river	Operational since previous contract	Public/ Government
Agenzia regionale per la prevenzione, l'ambiente e l'energia dell' Emilia-Romagna (ArpaER)	public	Italy	river	Already in with Po river, now extended to 5 stations delivering data in NRT	Public/ Government
Augas de Galicia, Xunta de Galicia	public	Spain	river	Operational since previous contract	Public/ Government
BIZKAIKO FORU ALDUNDIA - DIPUTACION FORAL DE BIZKAIA	public	Spain	river	Operational since previous contract	Public/ Government
Centro Funzionale della Regione Toscana	public	Italy	river	7 stations delivering data in NRT	Public/ Government
Confederacion Hidrografica del Cantabrico, CH Cantabrico	public	Spain	river	Operational since previous contract	Public/ Government
Confederacion Hidrografica del Ebro	public	Spain	river	Operational since previous contract	Public/ Government

Confederacion Hidrografica del Guadalquivir	public	Spain	river	Operational since previous contract	Public/ Government
Confederacion Hidrografica del Jucar, Spain	public	Spain	river	Operational since previous contract	Public/ Government
Confederacion Hidrografica del Mino-Sil	public	Spain	river	Operational since previous contract	Public/ Government
Confederacion Hidrografica del Segura, OA	public	Spain	river	Operational since previous contract	Public/ Government
Dipartimento Regionale per la Sicurezza del Territorio - ARPAV	public	Italy	river	Operational since previous contract	Public/ Government
Direccion General de Infraestructuras del Agua, Junta de Andalucia	public	Spain	river	Operational since previous contract	Public/ Government
Direction generale opeationnelle de la Mobilite et des Voies hydrauliques	public	Spain	river	Operational since previous contract	Public/ Government
ESB, Ireland	private	Ireland	river	13 stations delivering data in NRT	Public/ Government
Environment Agency Head Office (EA Head Office) + Department for Environment Food & Rural Affairs + MST	public	United Kingdom	river	Operational since previous contract	Public/ Government
Federal Waterways and Shipping Administration + Wasser- und Schifffahrtsamt Eberswalde	public	Germany	river	5 stations delivering data in NRT	Public/ Government
GIPUZKOAKO FORU ALDUNDIA - DIPUTACION FORAL DE GIPUZKOA	public	Spain	river	Operational since previous contract	Public/ Government
Institute of Marine Biological Resources and Inland Waters (ITHAVIPEY), Greece	public	Greece	river	5 stations delivering data in NRT	Academic/ Research
Ministere de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs (MELCCFP), Quebec, Canada **+** Environment Canada, Government of Canada	public	Canada	river	More than 50 stations delivering data in NRT	Public/ Government
Norddjurs Kommune + Randers Kommune + Vejle Kommune + Viborg Kommune	public	Denmark	river	9 stations delivering data in NRT	Public/ Government
OPW, The Office of Public Works, Ireland	public	Ireland	river	Operational since previous contract	Public/ Government
Protezione Civile della Regione Autonoma Friuli Venezia Giulia	public	Italy	river	2 stations delivering data in NRT	Public/ Government

Rijkswaterstaat	public	Netherland	river	9 stations delivering data in NRT	Public/ Government
SERVICE HYDROGRAPHIQUE ET OCEANOGRAPHIQUE DE LA MARINE + Schapi - Service central d'hydrometeorologie et d'appui a la prevision des inondations + Eaufrance - Service public d'information sur l'eau	public	France	river	Operational since previous contract	Public/ Government
Scottish Environment Protection Agency, SEPA	public	United Kingdom	river	More than 50 stations delivering data in NRT	Public/ Government
Sveriges meteorologiska och hydrologiska institut, SMHI	public	Sweden	river	Operational since previous contract	Government / Research
U.S. Geological Survey	public	United State of America	river	More than 50 stations delivering data in NRT	Public/ Government
Uraren Euskal Agentzia - Agencia Vasca del Agua (URA), Spain	public	Spain	river	Operational since previous contract	Public/ Government
H2020 ARICE – Polarstern (AWI), Arctic Net, Amundsen	public	Germany	Meteorological	Now there are data from the following Ice breaker: FENNICA, KRONPRINS, AKON, LAURA_BASSI, ODEN, POLARSTERN, SIKULIAQ	Academia/ Research
MELOA data project - UPC	public	Spain	Wave	the MELOA deployed 2 stations that are not continuously delivering data. Periodically they send updates.	Academia/ Research
VOTO – Voice of the ocean foundation	NGO	Sweden	Glider data (Temperature, Salinity, Dissolved Oxigen, Chl…)	More than 250 glider missions have been linked. NRT are operationally flowing and DM mode are available soon after the mission is closed.	NGO
JRC	public	Italy	Sea Level	JRC is extending the TAD service, now more than	Academia/ Research

				350 stations are available in the service and are linked to EMODnet	
eMOLT - Berring Data Collective	private	Denmark	Temperature, Salinity	The collection includes both historical data and operational data from about 10 systems (on monthly base)	Private
IZOR	Public	Croatia	Sea level	7 Stations operationally delivering data to EMODnet	Government / Research
NDBC - NOAA	public	United State of America	38 meteorological buoys	Operationally delivering data	Government / Research
HFR EU NODE – CNR ISMAR	public	-	New HFR	Northern Med (extendend network)	Academia/ Research

Table: Overview of newly connected operational oceanography data providers, both for marine and riverine areas

One of the most important result is the enlargement of the river data sources: we have now more than 650 river stations delivering data operationally (more than 200 new stations in this contract period), the number of the Arctic Icebreakers (from 2 to 7 and for each icebreaker more and more data are flowing into EMODnet Ingestion/Physics), the JRC TAD network has largely expanded (more than 350 stations) and, notably, as soon as JRC-TAD includes or activates a new station it is immediately active in EMODnet too. Another very important recent outcome is a result from the ingestion activities done for linking the VOTO (Voice Of The Ocean) data: VOTO is working extensively on glider data and the collaboration is supporting the updating of the glider data model and the policy to ingest/link these data: glider data are made available on the VOTO ERDDAP as soon as the glider start transmitting and the delayed mode is available as soon as the glider is recovered. At the time of writing more than 250 glider missions are already visible. This has triggered an action in EMODnet Physics to reorganize the glider data according the same model.

Concerning the interoperability with the EuroFleet the first 2 ships (Sarmiento and Hesperides operated by CISC are already exchanging data). Moreover, there are already 3 sites delivering underwater sound data operationally[1].

Also the collaboration with “The Ocean Race” is producing good outcomes 2 IMOCA are delivering surface temperature operationally, other 2 are analyzing microplastics in the water and 1 IMOCA is equipped with a TORA system. Both the microplastics and the biodiversity data are going to be provided to expert data centers (IFREMER, GEOMAR, etc) and from there to EMODnet.

[1] https://erddap.emodnet-physics.eu/erddap/search/index.html?page=1&itemsPerPage=1000&searchFor=hydrophone

4. Feedback

Generally, the very first outcome and result is an increased level of collaboration among the different actors of the data collection, validation, and integration. EMODnet (Ingestion and Physics) helped to shift a cultural attitude of considering “my data” to “our data”.

This mental shift together with the adoption of tools (standards and tools) to facilitate and enable interoperability, contributed to make FAIRness a real concept.

The strong and daily collaboration with the Copernicus Marine Service IN SITU Thematic Assembly Center represents one of the most important achievements: the extended team (recently named MIC – marine in situ collaboration) is prouder and prouder of the joint results. Acting as a unique backbone team, this is facilitating interaction with all the European and International actors with a unique voice for the benefit of the two major European Marine related programs (EMODnet and Copernicus Marine).

EMODnet acts as the catalyst to bring communities together in order to address and solve various data issues and hence increase the amount of data shared and made available.

By setting up stakeholders’ engagement events, any possible data-sharing issues are discussed, and active solutions are proposed. This was the case for HFR operators, gliders operators, Fishermen, and now EMODnet is approaching and engaging new important communities: citizen science projects and cryosphere researchers.

In the operational data management and flow there is a need to work on enhancing the spatial resolution of its collections, where spatial resolution means increasing the number of sources, closing gaps in coastal areas, connect new providers that are running operational (continuous/operational) marine data programs.

The priority should be given to parameters and communities that are unique in physics and that are not findable and consumable easily elsewhere. The list includes: river data (complementing runoff with other physical and meteorological data), ice data (from smart cameras), wind, cryosphere data at the sea.

To this end it’s important to keep developing collaborations and memorandum of understanding with key community players (Arctic Ice Breaker consortium, SIOS, EuroFleet, IMO, WOD).

Annex 3: D4.1 - Inventory updated of potential data sources and providers in European countries and priorities – November 2022

EMODnet - Ingestion and safe-keeping of marine data

CINEA/EMFAF/2021/3.4.10/02/SI2.868290

Start date of the project: 30/03/2022 (24 months)

Centralisation Phase

D4.1 Inventory updated of potential data sources and providers in European countries and priorities" (M8)

November 2022

The European Marine Observation and Data Network (EMODnet) is financed by the European Union under Regulation (EU) 2021/1139 of the European Parliament and of the Council of 7 July 2021 establishing the European Maritime, Fisheries and Aquaculture Fund and its predecessor, Regulation (EU) No. 508/2014 of the European Parliament and of the Council of 15 May 2014 on the European Maritime and Fisheries Fund.

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Document info

Title	D4.1 Inventory updated of potential data sources and providers in European countries and priorities
Work Package	WP4 – Marketing and Outreach
Task (and reference number)	WP4.1: Identification of potential data sources
Authors [Affiliation]	Marianne Schlesser [RBINS], Ruth Lagring [RBINS], Hong Mingh Le [RBINS], Nicolas de Ville de Goyet [RBINS]
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Contents

1. Introduction

To stimulate all partners and countries to stay on the same line, the WP4.1 coordinated action that was done at the start of the EMODnet Ingestion 1 and 2 projects was repeated during the summer 2022. Instructions and way forward were presented by RBINS during the kick-off meeting of the project on June, 16th. During the kick-off meting, each partner was also invited to report on national progress about potential data sources, progress on ingestion of datasets and local marketing activities undertaken since the closing plenary of DIP2 (21-22/09/2022). Like other tasks, also this task had not really halted end of September 2021 but continued.

For the preparation of Deliverable 4.1 of the third phase of EMODnet Data Ingestion, each data centre was invited by partner RBINS to analyse and update its national situation and identify potential data sources of possible interest to EMODnet which could then be used as a list for follow-up under WP4.2. For that purpose each EMODnet "Data ambassador" was sent on August, 24th an excel survey form and an updated guidance note with lessons learnt, useful hints and reminder on thematic data priorities. There were also announcements made as reminder on LinkedIn and Twitter with a visual was created on this occasion. The deadline to compile this national overview was set to October, 25th.

Image: visual designed by RBINS to announce the survey on social networks.

Regarding the information requested in the survey, the national overviews had to be concise and at the same time provide sufficient information to allow for the prioritising per theme and thereafter for the follow-up actions as part of WP4.2. As a trade-off the following items were gathered in the reporting spreadsheet:

- Record number: the collection of each EMODnet Ingestion contact should start with 1;
- Country: indicating your country by ISO 3166 code;
- Reporting consortium member: indicate your centre by its EDMO code;
- EMODnet Theme: indicating Bathymetry, Geology, Chemistry, Physics, Biology, Human Activities, or Seabed Habitats;
- Potential data provider contact;
- Potential data sets in DIP3: indicating data types, possible volume of data sets and possibly further descriptive information on geographical and temporal coverage;
- Opportunity: indicating your initial judgement how the data provider might be motivated to cooperate and release its data sets for EMODnet;

- Comments: any relevant supplementary information;
- Sea area: geographical information on the location where the data was collected ;
- Estimated size: indicate the estimated size of the dataset (small, medium, large, huge) and give estimate and type (points, line, polygons).

Like in 2020, this exercise could build upon the earlier achievements, insights and lessons learned during the preceding years. In completing the survey, partners were invited to pay attention to two main lessons learned from phases I and II:

1) As contacting and convincing external potential data providers turns out to be time consuming with often limited benefits, partners were encouraged to look for data sources from other departments within their own Institute which has proved to give more satisfying results. Therefore, to seek for potential data sources inside and outside their organization, the consortium members were invited to firstly exploit their own organization network to find holders that are not yet involved in European data sharing and secondly concentrate efforts on building upon already existing relationships.

2) Many national authorities/data providers do not give a high priority to share data in international context, and many data providers are busy with other activities. To lower the threshold of effort for data providers, it was recommended that consortium members act as 'EMODnet ambassadors' to help data providers undertaking the submission. It even can be that the consortium members make the submissions themselves on behalf of the data providers as originator and/or data holding organisation.

By the deadline of October 25th, about half of the consortium members had completed the survey. The deadline had to be extended to November, 15th and again to November 25th for few who had not yet completed the survey or had further questions .

The national submissions were compiled by RBINS and an overview is presented below. In consultation with the project coordinators, it was decided not to make any prioritisation effort as this had been done as a group in an on-site meeting during phase 1 and 2 of the project and it was impossible for RBINS to do this remotely. It was also considered that this prioritisation was hardly used in the two previous phases of the project. Instead, the consortium members made a self-assessment, indicating the level of opportunity from low to high.

An analysis of the submissions shows a slight discrepancy between themes and opportunity. It is advised that data centres try to focus their efforts on datasets that are underrepresented on the whole but that have a lower opportunity level. On the other hand, 'low hanging fruit' datasets should not be put aside, especially if they are large or come from an underrepresented marine area.

2. Summary of survey results and inventory of potential data sets

This survey resulted in 230 data sources from 25 countries and 35 institutes. All members responded to the survey. A similar survey was launched in the phase 1 and 2 of the project. In March 2017, the survey resulted in 117 data sources and 2020 it resulted in 342 data sources. Assuming members reported every data set they had in 2017 and 2020 and that the same dataset doesn't appear in the 2022 survey, we can therefore deduce that the recent survey has a closer-to-reality coverage of nationally available datasets that can reasonably be ingested in the project. We can then expect the number of future Phase I submissions to be more in step with the numbers reported in this survey. Like in 2020, the results of the survey show that the strategy to let members look at more local and internal (and less commercial/external) datasets did work out positively and that their networks have continued to matured their approach to sharing data.

Country	Nb Submissions	Country	Nb Submissions
BE	19	**IS**	10
BG	8	**IT**	26
CY	3	**LV**	4
DK	9	**MT**	6
EST	2	**NL**	5
FI	8	**NO**	15
FR	9	**PT**	4
GB	40	**RO**	4
GE	1	**SE**	14
GR	8	**SI**	4
HR	9	**SP**	8
IE	6	**TR**	5
IL	3		

Table 1.: Number of expected submissions per country

The number of submissions per country shows that having multiple members per country helps in reaching higher numbers. This is the case for the Great Britain and for Italy. Norway and Sweden have the most submissions in absolute terms (15 from the Public Roads Administration of Norway; 14 from various providers).

Themes	Number of expected submissions (update Nov. 2022)	Number of expected submissions (update Oct. 2020)
Bathymetry	17	19
Chemistry	62	111
Physics	92	145
Biology	43	91
Geology	32	40
Human activities	19	22
Seabed habitats	19	25
Marine litter	2	4
Total	286	457

Table 2.: Repartition of themes over the expected submissions

Table 2 shows the repartition of themes over the submissions. Compared to 2020, the numbers have decreased, perhaps to what can be a realistic effort of ingestion by the partners, also including less datasets with low opportunity? A fair amount of submissions (39/230) belongs to more than one theme. Physics, Chemistry are the most common (>25%), followed by Biology (17%) and Geology (14%). There are two datasets dealing with Marine Litter but formally they would be considered Chemistry datasets.

'Opportunity' expresses the availability of the data (how easy it is to get, through willingness, leverage, good contacts,...) and the effort willing to be given related to the data size, quality and resolution itself. Inherent data qualities cannot be improved, but it might be possible to increase the likelyhood of receiving the data, via more extensive contacts, if the data is really interesting or rare over the whole project. Based on all submissions, there are 151/230 datasets with high (medium to high) opportunity (66%), 51/230 with medium (medium to low) opportunity (22%) and 28/230 with low opportunity (12%).

The current inventory is shared as a collaborative Google spreadsheet to provide a dynamic survey follow-up. Partners will use the inventory to give a follow-up in their countries. The latest inventory at the end of November 2022 is included in this Deliverable. The following pages give the inventory as collated at the end of November 2022.

Record	Country	Reporting con-sortium mbr (EDMO code)	EMODnet Theme	Potential data provider contacts	Potential data sets in DIP3	Opportunity	Sea area
1	**BE**	1578, BMDC, Hong Minh LE	Chemistry	ILVO - Flemish Institute for Agriculture, Fisheries and Food – 1478	PAHs, PCBs, heavy metals, TOC, grain size in sludge (harbours and dredging disposal sites)	high	North Sea
2	**BE**	1578, BMDC, Hong Minh LE	Chemistry	ILVO - Flemish Institute for Agriculture, Fisheries and Food – 1478	Oxygenated PAHs in mussels	high	North Sea
3	**BE**	1578, BMDC, Hong Minh LE	Biology, Chemistry	RBINS – MARECO – 3327	Biomass and abundance (Belgian Part of the North Sea - Epi-, hyper- and macrobenthos, fish, ...), Experiments data (nutrients concentrations, DIC, oxygen, alkalinity, ...), stable isotopes data	high (partly, only in situ part)	North Sea
4	**BE**	1578, BMDC, Hong Minh LE	Physics	RBINS – SUMO – 3327	MOMO Tripod data (Part 2)	high	North Sea
1	**BE**	422, VLIZ, Joana Beja	Biology, Seabed habitats	EEA	EU species and habitats data (Article 17 of the Habitats Directive)	High	North Sea
2	**BE**	422, VLIZ, Joana Beja	Biology, Geology	EEA	Time series for invertebrates and sediments	High	North Sea
3	**BE**	422, VLIZ, Joana Beja	Biology	ILVO	Evaluation of by-catch in the Belgian brown shrimp (Crangon crangon L.) fishery since 1996		North Sea
4	**BE**	422, VLIZ, Joana Beja	Biology	VUB (ESA)	Phytoplankton of the Belgian Continental shelf gathered by the ULB	Low	North Sea
5	**BE**	422, VLIZ, Joana Beja	Biology	Green Balkans NGO, Bulgaria and TUDAV Foundation, Turkey	Flora and fauna inhabiting the Black Sea	Low	Black Sea
6	**BE**	422, VLIZ, Joana Beja	Biology	INBO	Bird countings on the Belgian Continental Shelf	Low	North Sea
7	**BE**	422, VLIZ, Joana Beja	Biology	INBO	Distribution of seabirds on the Belgian Continental Shelf	Low	North Sea

8	**BE**	422, VLIZ, Joana Beja	Biology	INBO	Flemish waterbird counts	Low	North Sea
9	**BE**	422, VLIZ, Joana Beja	Biology	IRScNB/KBIN, INBO	Crgulls: Observations of Belgian color ring-marked gulls from 1999 until 2010	Low	North Sea
10	**BE**	422, VLIZ, Joana Beja	Biology	MARBIOL	Meiobenthos of the Southern Bight of the North Sea, Western Scheldt and also Greenland, Antarctica and the Kenyan mangroves	Low	North Sea
11	**BE**	422, VLIZ, Joana Beja	Biology	VLIZ	LifeWatch observatory data: long term collections of macrobenthos in the Belgian Part of the North Sea	Low	CC-BY
12	**BE**	422, VLIZ, Joana Beja	Biology	VLIZ	Baseline inventory of echinoderms and decapod crustaceans of rocky shores in the Arrabida Marine Park (Portugal)	Medium	Coastal Atlantic, off Portugal
13	**BE**	422, VLIZ, Joana Beja	Chemistry	VLIZ	Beach litter data collected by iSea Greece	High	Aegea, Cretan and Ionian Seas
14	**BE**	422, VLIZ, Joana Beja	Chemistry	MareNostrum	Marine litter from aerial surveys	Medium	
15	**BE**	422, VLIZ, Joana Beja	Human Activities	VLIZ	Belgian recreational fisheries	Medium	Belgian part of the North sea
1	**BG**	692, IO-BAS, Asen Stefanov	Human activities, Chemistry	Black Sea Basin Directorate, bdvarna@bsbd.org ,https://www.bsbd.org	T,S, Silicate, Phosphate, Nitrite, Nitrate, Ammonium, DO	High. There is existing cooperation which will facilitate further data provition	Black Sea
2	**BG**	692, IO-BAS, Asen Stefanov	Physics	IO-BAS, http://io-bas.bg	Buoy data (Varna , Burgas)	High. The data are iavailble in IO-BAS	Black Sea
3	**BG**	692, IO-BAS, Asen Stefanov	Human activities	NAFA Bulgaria ; http://iara.government.bg/	Aquaculture	Low. they are not willing to share data but now we have new contacts	Black Sea
4	**BG**	692, IO-BAS, Asen Stefanov	Physics	National Institute of Geophysics Geodesy and Geography - BAS	Sea-Level	High	Black Sea

5	**BG**	692, IO-BAS, Asen Stefanov	Chemistry, Human activities	MARINE ANTIPOLLUTION ENTERPRISE JSCO, http://www.pchmv-bg.com/	Oil spils - since 1972; New history after 1992	Low. Previous experience indicated that they are not willing to share data	Black Sea
6	**BG**	692, IO-BAS, Asen Stefanov	Chemistry, Physics	Pudos - Enterprise for the management of environmental protection activities ,https://pudoos.bg/	T,S, Silicate, Phosphate, Nitrite, Nitrate, Ammonium, DO	High. There is existing cooperation	Black Sea
7	**BG**	692, IO-BAS, Asen Stefanov	Physics	Executive Agency "Maritime administration"	Meteo stations, T/S	High	Black Sea
8	**BG**	692, IO-BAS, Asen Stefanov	Physics	**Institute of Biodiversity and Ecosystem-BAS**	T,S, Silicate, Phosphate, Nitrite, Nitrate, Ammonium, DO	High	Black Sea
1	**CY**	4537, ORION, George Zodiatis	Physics	ORION	time series for sea temperatures	High	East MedSea-Levantine basin
2	**CY**	4537, ORION, George Zodiatis	Physics	ORION	time series for sea level	High	East MedSea-Levantine basin
3	**CY**	4537, ORION, George Zodiatis	Chemistry	MEYDAN SOLUTIONS Ltd	sediments: Naphthalene, acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benzo(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene	High	East MedSea-Levantine basin
1	**DK**	729, AU-DCE, Mihail-Constantin Carausu	Chemistry	The Danish Environmental Protection Agency	National monitoring data for beach litter	High	North Sea, Baltic Sea
2	**DK**	729, AU-DCE, Mihail-Constantin Carausu	Chemistry	The Danish Environmental Protection Agency	National monitoring data for microlitter particles in water surface	High	Danish waters, North Sea, Baltic Sea
3	**DK**	729, AU-DCE, Mihail-Constantin Carausu	Chemistry	Danish Centre for Environment and Energy	Microplastic-like particles in sediments from Danish waters	High	North Sea, Baltic Sea
4	**DK**	729, AU-DCE, Mihail-Constantin Carausu	Biology, Chemistry	Aarhus University, Department of Ecoscience	Data from North-West Greenland	Medium	Artic Sea
5	**DK**	729, AU-DCE, Mihail-Constantin Carausu	Biology, Chemistry	Femern A/S	Data from the Femern Belt EEA	Low	Baltic Sea

6	**DK**	729, AU-DCE, Mihail-Constantin Carausu	Biology, Chemistry	Rambøll	Data from the North Stream project	Low	Baltic Sea
7	**DK**	729, AU-DCE, Mihail-Constantin Carausu	Biology	Aarhus University, Department of Ecoscience	Stone reef data from the monitoring program	Medium	North Sea, Baltic Sea
8	**DK**	729, AU-DCE, Mihail-Constantin Carausu	Biology	Aarhus University, Department of Ecoscience	Coastal vegetation data from the Danish monitoring program	Low	North Sea, Baltic Sea
9	**DK**	729, AU-DCE, Mihail-Constantin Carausu	Biology	University of Copenhagen	Galathea III Expedition data	Low	Atlantic Ocean, Pacific Ocean, Arctic Ocean
1	**EST**	713, TalTech, Villu Kikas	Chemistry	Estonian Environment Agency	Beach litter	Medium	Baltic Sea
2	**EST**	713, TalTech, Villu Kikas	Chemistry	MSI TalTech	Nutrients; hazardous substances	Medium	Baltic Sea
1	**FI**	1544, GTK, Aarno Kotilainen	Bathymetry	Nord Stream 2 AG	DTM: XYZ format	High	Baltic Sea
2	**FI**	1544, GTK, Aarno Kotilainen	Geology	Nord Stream 2 AG	SBP (Sub-bottom profile): SEGY; Side-Scan Sonar Mosaics: tif files; Geotechnical reports: pdf	High	Baltic Sea
1	**FI**	1725, FMI, Kimmo Tikka	Physics	University of Helsinki, Tvärminne Zoological Station	CTD	Medium to High	Baltic Sea
2	**FI**	1725, FMI, Kimmo Tikka	Physics	FMI, Utö station	T,S,CO2, currents, waves	Medium to High	Baltic Sea
3	**FI**	1725, FMI, Kimmo Tikka	Physics	FMI	CTD	High	Baltic Sea
4	**FI**	1725, FMI, Kimmo Tikka	Biology, Chemistry	FMI	O2, Chl-a, Backscattering, C/FDOM	High	Baltic Sea

5	**FI**	1725, FMI, Kimmo Tikka	Physics	Traficom	Temperature profiles	low	Baltic Sea
6	**FI**	1725, FMI, Kimmo Tikka	Physics	Navy	Temperature profiles	low	Baltic Sea
1	**FR**	540, SHOM, Ronan Pronost	Bathymetry, Physics	National Institute for Universe Sciences (INSU, CNRS) https://www.insu.cnrs.fr/ http://charon.dt.insu.cnrs.fr/daufin/ Céline Laus Heyndickx: celine.heyndrickx@cnrs.fr	Raw data ASCII files: Singlebeam data (coastal bathymetry) Pressure, air temperature and humidity, wind direction and speed, water conductivity, salinity and temperature, fluorescence	High	
2	**FR**	540, SHOM, Ronan Pronost	Bathymetry, Human activities, Geology	"Grands Ports Maritimes", French autonomous harbours, (Le Havre, Marseille, Bordeaux,…)	Multibeam, singlebeam, sidescan, wrecks, obstructions, sediments	Medium to High	French Coastal waters
3	**FR**	540, SHOM, Ronan Pronost	Bathymetry, Human activities, Geology	Regional councils Departmental Directorate of Territories (DDT)	Multibeam, singlebeam, sidescan, wrecks, obstructions, sediments	Medium to High	French Coastal waters
4	**FR**	540, SHOM, Ronan Pronost	Bathymetry	ENSTA Bretagne http://www.ensta-bretagne.fr/ Roderick Moitié: roderick.moitie@ensta-bretagne.fr	Multibeam, Singlebeam, sidescan	High	Coastal Waters of Brittany
5	**FR**	540, SHOM, Ronan Pronost	Bathymetry, Geology	INTECHMER http://www.intechmer.cnam.fr/l-institut/presentation/ Emmanuel Poizot: emmanuel.poizot@lecnam.net	Multibeam, grain size	Medium	English Channel
6	**FR**	540, SHOM, Ronan Pronost	Bathymetry	Institut Paul-Emile Victor https://www.institut-polaire.fr/language/en/ Héléne Leau: helene.leau@ipev.fr	Multibeam	High	South Indian Ocean, Arctic
7	**FR**	540, SHOM, Ronan Pronost	Bathymetry	Local industries and every kind of private organizations	Multibeam, singlebeam, etc.	Low to medium	French EEZ
9	**FR**	540, SHOM, Ronan Pronost	Bathymetry, Geology, Seabed habitats, Chemistry, Biology, Physics, Human activities	ETR-Every Foreign data collector in French waters	Various	High	French EEZ

10	**FR**	540, SHOM, Ronan Pronost	Bathymetry, Geology, Seabed habitats, Chemistry, Biology, Physics, Human activities	US-National Centers for Environmental Information (NCEI, NOAA) https://www.ncei.noaa.gov/ Jennifer Jenks: jennifer.jencks@noaa.gov	Wide range of raw data in climate, coastal, oceanographic and geophysical (variety of formats)	Medium	
1	**GB**	2746, JNCC, Helen Lillis	Biology, Seabed Habitats, Geology	Scottish Association for Marine Science (SAMS), EDMO id. 44	Deep Sea Benthic Biodiversity (Arctic, North Atlantic & Rockall Trough, Off Barra, Portuguese coast) - Habitat extent, zoobenthos counts and abundance, sediment grain-size - Several datasets since 1973. EDIOS programme ID 10239	Medium	Arctic, North Atlantic & Rockall Trough, Off Barra, Portuguese coast
2	**GB**	2746, JNCC, Helen Lillis	Biology, Seabed Habitats	Scottish Association for Marine Science (SAMS), EDMO id. 44	Outputs of MARPAMM project	Medium	Celtic Seas
3	**GB**	2746, JNCC, Helen Lillis	Bathymetry, Biology, Seabed Habitats, Geology	NAFC Marine centre, University of the Highlands and Islands, EDMO Id. 2485	Habitat mapping for the Shetland Islands' Marine Spatial Plan (SIMSP) - multibeam surveys, dropdown video surveys and priority marine feature data	Medium	Greater North Sea
4	**GB**	2746, JNCC, Helen Lillis	Seabed Habitats	Marine Scotland Science, EDMO Id. 2135	Habitat maps classified in National habitat classification or Annex I from 2000-present Scottish waters inshore and offshore, from research activities	Medium	Scotland inshore and offshore
5	**GB**	2746, JNCC, Helen Lillis	Biology, Seabed Habitats	University of Ghent, EDMO Id 2376	Bivalve reefs in Belgium	Small	Greater North Sea
6	**GB**	2746, JNCC, Helen Lillis	Seabed Habitats	National Oceanography Centre So, Marine Geoscience group, EDMO Id. 17	Marine habitat maps from recent NOCs cruises (e.g. CODEMAP project)	Medium	
7	**GB**	2746, JNCC, Helen Lillis	Seabed Habitats	EU ATLAS project	Unpublished outputs of EU ATLAS project (2016-2020)	Small	North Atlantic
8	**GB**	2746, JNCC, Helen Lillis	Seabed Habitats	Mission Atlantic project	Outputs of Mission Atlantic project (2020-2025)	Small	North Atlantic
9	**GB**	2746, JNCC, Helen Lillis	Seabed Habitats	Various	Individual datasets from the OSPAR threatened and/or declining habitats database	High	Northeast Atlantic
10	**GB**	2746, JNCC, Helen Lillis	Seabed Habitats	Various	England national seagrass layer	Medium	English inshore waters

11	**GB**	2746, JNCC, Helen Lillis	Seabed Habitats	ESRI	Ecological Coastal Units	Medium	Global
12	**GB**	2746, JNCC, Helen Lillis	Seabed Habitats	NatureScot; EDMO Id. 5368	Potential suitable habitat for spawning herring; maybe other essential fish habitat maps too?	Medium	Scotland
13	**GB**	2746, JNCC, Helen Lillis	Seabed Habitats	Swansea University; EDMO Id. 4053	Habitat suitability model of Zostera marina in Wales	Medium	Wales
1	**GB**	42, BGS, Mary Mowat	Geology	University of Plymouth; EDMO Id. 47	Particle Size Analysis data and carbonate data from NERC BLUECoast project	Medium	
2	**GB**	42, BGS, Mary Mowat	Geology	Wessex Archaeology; EDMO Id. 5120	Geophysics	Medium	
3	**GB**	42, BGS, Mary Mowat	Geology	Marine Scotland Science (MSS); EDMO Id. 2135	Geology, geophysics	Medium	
4	**GB**	42, BGS, Mary Mowat	Geology	Scottish Association for Marine Science (SAMS); EDMO Id. 44	Geology, geophysics	Medium	
5	**GB**	42, BGS, Mary Mowat	Geology	Agri-Food and Biosciences Institute (AFBI), EDMO Id. 1385	Geology, geophysics	Medium	
6	**GB**	42, BGS, Mary Mowat	Geology	The Crown Estate (Marine Data Exchange); EDMO Id. 1604	Celtic Arrray Geotechnical data and other geotechnical data from Marine Data Exchange	Medium	
7	**GB**	42, BGS, Mary Mowat	Geology	The Crown Estate (Marine Data Exchange); EDMO Id. 1604	Geotechnical data from Marine Data Exchange	Medium	
8	**GB**	42, BGS, Mary Mowat	Geology	The Crown Estate (Marine Data Exchange); EDMO Id. 1604	Geophysical data from Marine Data Exchange	Medium	
9	**GB**	42, BGS, Mary Mowat	Geology, Biology	Hartley Anderson (on behalf of BEIS); EDMO Id. 2280	Strategic Environment Assessment data	Low	

10	**GB**	42, BGS, Mary Mowat	Geology	University of St Andrews; EDMO Id. 2770	Seabed Sample analysis data	Low	
15	**GB**	42, BGS, Mary Mowat	Geology	Cefas; EDMO Id. 28	Backscatter data	Medium	
16	**GB**	42, BGS, Mary Mowat	Geology	Cefas; EDMO Id. 28	Seabed samples	Medium	
16	**GB**	42, BGS, Mary Mowat	Geology	Scottish Environment Protection Agency (SEPA), EMOD id. 4554	Backscatter data	Medium	
17	**GB**	42, BGS, Mary Mowat	Geology	Welsh Goverment; EDMO Id. 5181	Sidescan sonar	Low	
18	**GB**	42, BGS, Mary Mowat	Geology	IMARDIS/Bangor University; EMOD Id. 1468	Geophysics, backscatter, grab samples	Medium	
19	**GB**	42, BGS, Mary Mowat	Geology	EMEC (European Marine Energy Centre); EDMO Id. 2758	Geology, geophysics	Low	
20	**GB**	42, BGS, Mary Mowat	Geology	National Oceanography Centre (Southampton) (NOC); EDMO Id. 17	Geophysics	Medium	
21	**GB**	42, BGS, Mary Mowat	Geology	National Oceanography Centre (Southampton) (NOC); EDMO Id. 17	Geological core data	Medium	
21	**GB**	42, BGS, Mary Mowat	Geology	University of Sheffield	Geological core data	Medium	
1	**GB**	43, BODC, Mark Hebden / Lesley Rickards	Physics	Plymouth Marine Laboratory; EDMO Id. 47	Western Channel Observatory, Stations E1 and L4 (near real time data as delayed mode already at BODC). Temperature, Salinity and possibly other variables.	Medium	English Channel
2	**GB**	43, BODC, Mark Hebden / Lesley Rickards	Physics, Chemistry	AFBI, Northern Ireland; EDMO Id. 1385	North of Ireland Joint Agency Coastal Monitoring Programme (NIJACMP) - 11 coastal stations (temperature, salinity, fluoresence. Some moorings also measure turbidity and DO) – BODC has test data from have one station; need further metadata.	Medium/High	Irish Sea and St Georges Channel

3	**GB**	43, BODC, Mark Hebden / Lesley Rickards	Physics, Chemistry	Marine Scotland Science; EDMO Id. 2135	Offshore Standard Oceanographic Sections (3 sections); profiles of temperature, salinity and nutrients. 2020 and/or 2021 data.	High	Inner Seas off the West Coast of Scotland, North East Atlantic, North Sea.
4	**GB**	43, BODC, Mark Hebden / Lesley Rickards	Physics	The European Marine Energy Centre Limited (EMEC), EDMO Id. 2758	Two data sets FoW-SMADCP-3, Seabed Mounted ADCP survey at EMEC tidal test site at Fall of Warness, Orkney, UK, and BC-DWR-E-2017, EMEC Datawell Waverider data at full scale wave test site at Billia Croo, Orkney, UK.	High	North Sea, North East Atlantic
5	**GB**	43, BODC, Mark Hebden / Lesley Rickards	Physics	Data from Environment Agency, but held by BODC, EDMO Id. 43	UK tide gauge data from last 10 years, initially data from 2 sites but further sites are available.	High	North Sea, North East Atlantic, Inner Seas off the West Coast of Scotland, Irish Sea and St Georges Channel, Bristol Channel, English Channel, Celtic Sea
6	**GB**	43, BODC, Mark Hebden / Lesley Rickards	Bathymetry	The Crown Estate (Marine Data Exchange); EDMO Id. 1604	Bathymetry dataset collected by GEMS Survey Limited contracted by Forewind Limited to undertake bathymetric and geophysical surveys.	HIgh	North Sea
7	**GB**	43, BODC, Mark Hebden / Lesley Rickards	Physics, Chemistry	Isle of Man Government Laboratory; EDMO Id. 1371	Isle of Man Marine Water Monitoring Programme	Low/medium	Irish Sea and St Georges Channel
8	**GB**	43, BODC, Mark Hebden / Lesley Rickards	Biology	BODC, EDMO Id. 43	Biodiversity/biological data held at BODC from various UK sources.	High	Various
1	**GE**	693, TSU, Kakhaber Bilashvili	Geology	Institute of Geography	Bathymetric survey datasets	High	Black Sea coastal zone, Georgia
1	**GR**	269, HCMR, Sissy Iona	Chemistry	Hellenic Centre for Marine Research, Institute of Oceanography (HCMR / IO) 164	CO2, alkalinity	High	East Mediter.
2	**GR**	269, HCMR, Sissy Iona	Chemistry	Hellenic Centre for Marine Research, Institute of Oceanography (HCMR / IO) 164	CO2, alkalinity	High	Ionian, Aegean Sea.
3	**GR**	269, HCMR, Sissy Iona	Chemistry, Biology	Hellenic Centre for Marine Research, Institute of Oceanography (HCMR / IO) 164	Plastics in fish, mussel	High	Ionian, Aegean Sea

4	**GR**	269, HCMR, Sissy Iona	Physics, Chemistry	Hellenic Centre for Marine Research, Institute of Oceanography (HCMR / IO) 164	Nutrients, Cs137, optic data	high	Aegean Sea
5	**GR**	269, HCMR, Sissy Iona	Physics, Chemistry, Biology	Hellenic Centre for Marine Research, Institute of Oceanography (HCMR / IO) 164	CTD data, zooplankton, Chl, nutrients, Dissolved ocygen, Beach Litter, Hydrocarbons	high	Aegean Sea, Ionian Sea
6	**GR**	269, HCMR, Sissy Iona	Physics	HCMR/Institute of Oceanography	Optic data	medium to high	Eastern Med.
7	**GR**	269, HCMR, Sissy Iona	Physics	Univ. of Aegean	CTD data, drifters, moorings	medium	Aegean Sea
8	**GR**	269, HCMR, Sissy Iona	Physics	HCMR/Institute of Oceanography	current meters	high	Aegean Sea, Ionian Sea
1	**HR**	700, IOF, Vlado Dadic	Physics	IOF	Sea level data time series	medium	Adriatic Sea
2	**HR**	700, IOF, Vlado Dadic	Physics	IOF	Current data series	high	Adriatic Sea
3	**HR**	700, IOF, Vlado Dadic	Physics	IOF	Current profiles data series	high	Adriatic Sea
4	**HR**	700, IOF, Vlado Dadic	Physics, chemistry, biology	Ministry of economy and sustainable develpment	Classical oceanographic cruise data (temperature, salinity, nutrients, phyto and zooplankton)	high	Adriatic Sea
5	**HR**	700, IOF, Vlado Dadic	Physics, chemistry, biology	IOF	Classical oceanographic cruise data (temperature, salinity, nutrients, phyto and zooplankton)	high	Adriatic Sea
6	**HR**	700, IOF, Vlado Dadic	Physics, Chemistry, biology	Croatian waters	Classical oceanographic cruise data (temperature, salinity, nutrients, phyto and zooplankton)	high	Adriatic Sea
7	**HR**	700, IOF, Vlado Dadic	Physics	IOF	Currents profiles from moving vessel - MSFD monitoring	high	Adriatic Sea
8	**HR**	700, IOF, Vlado Dadic	Physics	IOF	Underwater noise data	high	Adriatic Sea

9	**HR**	700, IOF, Vlado Dadic	Physics	IOF	CTD data	high	Adriatic Sea
1	**IE**	396, MI, Andrew Conway	Physics	BIM - Ireland's Seafood Development Agency	ADCP and drifter deployments	Medium	NE Atlantic
2	**IE**	396, MI, Andrew Conway	Physics	Marine Institute	Surface drifters	High	NE Atlantic
3	**IE**	396, MI, Andrew Conway	Physics	Marine Institute	Mace Head COMPASS buoy	High	NE Atlantic
4	**IE**	396, MI, Andrew Conway	Physics	University College Cork	Seal tag data from the SeaMonitor project	High	NE Atlantic
5	**IE**	396, MI, Andrew Conway	Biology	Atlantic Technical University	Invasive Species eDNA EMFF Project data	High	NE Atlantic
6	**IE**	396, MI, Andrew Conway	Human Activities	Department of Housing, Local Government and Heritage	MSP related datasets to inform decision making	High	NE Atlantic
1	**IL**	963, IOLR, Isaac Gertman	Physics, Chemistry, biology	Haifa University	Classical oceanographic cruise data (temperature, salinity, oxygen, fluorescence, turbidity)	High	
2	**IL**	963, IOLR, Isaac Gertman	Physics, Chemistry, biology	Ruppin Maritime College	Classical oceanographic cruise data (temperature, salinity, oxygen, fluorescence, turbidity)	High	
3	**IL**	963, IOLR, Isaac Gertman	Physics, Meteo	Nobel Energy Tamar Platform	Waves, Currents, Water temperature, Wind, Air Temperature, Atm. Pressure	Low	
1	**IS**	583, MFRI, Sólveig Rósa Ólafsdóttir and Eygló Ólafsdóttir	Chemistry, Physics	MFRI - Marine and Freshwater Research Institute	T,S, Silicate, Phosphate, Nitrite, Nitrate, Ammonium, DO, Phytoplakton (biomass, abundance) - Icelandic Waters, 1950-present	High	Arctic, North Atlantic
2	**IS**	583, MFRI, Sólveig Rósa Ólafsdóttir and Eygló Ólafsdóttir	Physics	MFRI - Marine and Freshwater Research Institute	CTD from pelagic fisheries	High	Arctic, North Atlantic
3	**IS**	583, MFRI, Sólveig Rósa Ólafsdóttir and Eygló Ólafsdóttir	Physics	The Icelandic Road and Coastal Administration - IRCA	Real time surface T data on wave bouys	High	North Atlantic

4	**IS**	583, MFRI, Sólveig Rósa Ólafsdóttir and Eygló Ólafsdóttir	Physics	MFRI - Marine and Freshwater Research Institute.	2 new sites for continous real time sea surface T data	High	Icelandic coast
5	**IS**	583, MFRI, Sólveig Rósa Ólafsdóttir and Eygló Ólafsdóttir	Bathymetry	MFRI - Marine and Freshwater Research Institute	Seabed mapping	Medium	North Atlantic
6	**IS**	583, MFRI, Sólveig Rósa Ólafsdóttir and Eygló Ólafsdóttir	Chemistry	Umhverfisstofnun - The Environment Agency of Iceland.	OSPAR and WFD monitoring data, including heavy metals and priority substances	High	North Atlantic
7	**IS**	583, MFRI, Sólveig Rósa Ólafsdóttir and Eygló Ólafsdóttir	Marine Litter	BioPol, Marine Biotechnology Science Hotel in Skagaströnd.	Marine litter, marine biotechnology and microplastic	Small	North Atlantic
8	**IS**	583, MFRI, Sólveig Rósa Ólafsdóttir and Eygló Ólafsdóttir	Chemistry	Háskólasetur Suðurnesja - The University of Iceland's Research Center in Sudurnes	Contaminants	Medium	North Atlantic
9	**IS**	583, MFRI, Sólveig Rósa Ólafsdóttir and Eygló Ólafsdóttir	Biology	MFRI - Marine and Freshwater Research Institute.	Data sets of zooplankton biomass and species composition.	Medium	North Atlantic
10	**IS**	583, MFRI, Sólveig Rósa Ólafsdóttir and Eygló Ólafsdóttir	Human activities	MAST - Icelandic Food and Veterinary Authority.	Locations and metadata for aquaculture sites and production in sea water and freshwater aquaculture farms	Medium	North Atlantic
1	**IT**	120, OGS, Alessandra Giorgetti	Chemistry	OSPAR Commission	Beach Litter Dataset	Medium to High	
2	**IT**	120, OGS, Alessandra Giorgetti	Chemistry	ICES	Marine litter data from DATRAS trawl surveys	Medium to High	
3	**IT**	120, OGS, Alessandra Giorgetti	Chemistry	COISPA – Tecnologia & Ricerca (M.T. SPEDICATO)	MEDITS - International bottom litter trawl survey	Medium to High	
4	**IT**	120, OGS, Alessandra Giorgetti	Chemistry	Department of Chemical Sciences, University of Trieste, Via Giorgieri 1, Trieste, Italy;Gianpiero Adami;gadami@units.it	Contaminants	Medium to High	

5	**IT**	120, OGS, Alessandra Giorgetti	Chemistry	Department of Geological, Environmental and Marine Sciences, University of Trieste, Trieste, Italy;Stefano Covelli;covelli@units.it	Contaminants	Medium to High	
6	**IT**	120, OGS, Alessandra Giorgetti	Chemistry	PANGAEA® Data Publisher	Italian Chemical Dataset	Medium to High	
7	**IT**	120, OGS, Alessandra Giorgetti	Chemistry	EU Member States	Beach, seafloor and micro-litter data	Medium to High	
8	**IT**	120, OGS, Alessandra Giorgetti	Chemistry	EU Member States	Contaminants	Medium to High	
1	**IT**	136, ENEA, Leda Pecci / Andrea Bordone	Physics	MedFever project team	Time series of temperature sampled during 2022	High	Tyrrenian Sea
2	**IT**	136, ENEA, Leda Pecci / Andrea Bordone	Chemistry	Blue Lakes project team	microplastics data in the main Italian lakes	High	Some Italian Lakes
3	**IT**	136, ENEA, Leda Pecci / Andrea Bordone	Physics	The Ligurian DLTM Consortium (CNR, ENEA, IIM, INGV, etc.)	Time series of temperature, pressure, water conductivity and salinity	High	the Eastern Ligurian Sea in the S. Teresa Bay (La Spezia)
4	**IT**	136, ENEA, Leda Pecci / Andrea Bordone	Biology	Some CNR colleagues	biodiversity data	High	Mediterranean Sea
1	**IT**	2276, OGS, Paolo Diviacco / Mihai Burca	Physics	National Institute of Oceanography and Applied Geophysics - OGS, Section of Geophysics	Underwater noise	High	Gulf of Trieste (Northern Adriatic Sea)
1	**IT**	251, INGV, Simona Simoncelli	Physics	INGV	reprocessed dataset of XBTs	High	Ligurian and Tyrrhenian Sea
1	**IT**	251, INGV, Simona Simoncelli	Physics	INGV	EMSO delay mode time series	High	Western Ionian node
1	**IT**	251, INGV, Simona Simoncelli	Chemistry	INGV	BGC data at Panarea geothermal observatory	High	Panarea (Tyrrhenian Sea)

1	**IT**	251, INGV, Simona Simoncelli	Physics	INGV	Sea Level data at Thule station (Arctic)	High	Thule
1	**IT**	4530, Cogea, Alessandro Pititto	Human Activities	Hellenic Hydrocarbons and Energy Resources Management Company S.A. (HEREMA S.A.), Greece	Oil and gas wells (points), licences (polygons), platforms (points)	High	Ionian Sea and the Central Mediterranean Sea, Aegean-Levantine Sea
2	**IT**	4530, Cogea, Alessandro Pititto	Human Activities	**Geodata.gov.gr, Greece**	Oil and gas wells (points), licences (polygons), platforms (points)	High	Ionian Sea and the Central Mediterranean Sea, Aegean-Levantine Sea
3	**IT**	4530, Cogea, Alessandro Pititto	Human Activities	Ministry of Environment and Energy - GENERAL DIRECTORATE OF ELECTRONIC GOVERNANCE & GEOGRAPHIC INFORMATION, Greece	Oil and gas wells (points), licences (polygons), platforms (points)	High	Ionian Sea and the Central Mediterranean Sea, Aegean-Levantine Sea
4	**IT**	4530, Cogea, Alessandro Pititto	Human Activities	Black Sea Oil & Gas	Oil and gas wells (points), licences (polygons), platforms (points)	High	Black Sea
5	**IT**	4530, Cogea, Alessandro Pititto	Human Activities	Agentia Nationala pentru Resurse Minerale, Romania	Oil and gas wells (points), licences (polygons), platforms (points)	High	Black Sea
6	**IT**	4530, Cogea, Alessandro Pititto	Human Activities	BRGM (Bureau de Recherches Géologiques et Minières), France	Oil and gas wells (points), licences (polygons), platforms (points)	Medium to High	Western Mediterranean Sea, Bay of Biscay and the Iberian Coast
7	**IT**	4530, Cogea, Alessandro Pititto	Human Activities	Ministère de la transition écologique et solidaire/Ministère de l'économie et des finances - DGEC (Direction Générale de l'Énergie et du Climat) - Bureau Ressources Énergétiques du Sous-Sol (BRESS), France	Oil and gas wells (points), licences (polygons), platforms (points)	Medium to High	Western Mediterranean Sea, Bay of Biscay and the Iberian Coast
8	**IT**	4530, Cogea, Alessandro Pititto	Human Activities	Hydrographic institutes (in general)	Cables (Lines)	High	All European seas
9	**IT**	4530, Cogea, Alessandro Pititto	Human Activities	Hydrographic institutes (in general)	Pipelines (Lines)	High	All European seas

1	**LV**	698, LHEI, Rita Poikane	Seabed Habitat	**Nature Conservation Agency (DAP)**	Habitats data	high	Baltic Propper
2	**LV**	698, LHEI, Rita Poikane	Physics	**Ministry of Environmental Protection and Regional Development (VARAM)**	- physical oceanography data	high	Gulf of Riga
3	**LV**	698, LHEI, Rita Poikane	Chemistry	**Ministry of Environmental Protection and Regional Development (VARAM)**	- chemical oceanography data	high	Gulf of Riga
4	**LV**	698, LHEI, Rita Poikane	Chemistry	SELGA / Master thesys	Data collection of micro-/mezo- plastic in beach sediments	high	Coastline of Latvia of the Baltic Sea and Gulf of Riga
1	**MT**	708, UoM, Audrey Zammit	Physics	University of Malta	Drifter trajectories	High	Mediterranean Sea, mostly central
2	**MT**	708, UoM, Audrey Zammit	Chemistry	University of Malta	Beached Marine Litter	High	Maltese Islands coastal waters
3	**MT**	708, UoM, Audrey Zammit	Chemistry	MEPA (now known as ERA)	Physico-Chemical data for bathing water	High	Maltese Islands coastal waters
4	**MT**	708, UoM, Audrey Zammit	Chemistry	MEPA (now known as ERA)	Physico-Chemical data and trophic status for selected coastal areas	High	Maltese Islands coastal waters
5	**MT**	708, UoM, Audrey Zammit	Seabed Habitats?	MEPA (now known as ERA)	Macroalgal assemblages in Maltese coastal waters	High	Maltese Islands coastal waters
6	**MT**	708, UoM, Audrey Zammit	Physics / Chemistry	MEPA (now known as ERA)	Physico-Chemical data for coastal area close to landfill	High	Maltese Islands coastal waters
1	**NL**	1528, Deltares, Willem Stolte	Biology	Rijkswaterstaat	Macrobenthos and phytoplankton long term monitoring	every year (phytoplankton) and every third year (macrobenthos), new monitoring data come available. Very valuable for emodnet biology. Open data	North Sea, Wadden Sea

2	**NL**	1528, Deltares, Willem Stolte	Biology	Wageningen Marine Research	Macrobenthos, birds, fish from project monitoring	irregular flow of e.g. offshore wind research monitoring data. Usually open data	North Sea, Wadden Sea
3	**NL**	1528, Deltares, Willem Stolte	Chemistry	Rijkswaterstaat	Water quality including contaminants and metals dissolved and particulate fractions	Long term series. Right now only metadata in SeaDataNet. Open data	North Sea, Wadden Sea
4	**NL**	1528, Deltares, Willem Stolte	Chemistry	Rijkswaterstaat	CTD observations, Ferry boxes, Scan fish	unclear how much there is, and unclear what is already in EMODnet via e.g. GOOS.	North Sea.
1	**NL**	630, NIOZ, Taco de Bruin	Physics/Chemistry	NIOZ	CTD observations, including bottle files with nutrients	High	North Sea, NW Atlantic Ocean, Caribean Sea
1	**NO**	612, IMR, Øyvind Angelskår	Physics	Statens vegvesen (Public Roads Administration)	Wave: Station BFA1, 2015 - 2020	High	North Sea: Bjørnafjorden
2	**NO**	612, IMR, Øyvind Angelskår	Physics	Statens vegvesen (Public Roads Administration)	Current: Station BFA1, 2015 - 2020	High	North Sea: Bjørnafjorden
3	**NO**	612, IMR, Øyvind Angelskår	Physics	Statens vegvesen (Public Roads Administration)	Wave: Station BFA2, 2015 - 2020	High	North Sea: Bjørnafjorden
4	**NO**	612, IMR, Øyvind Angelskår	Physics	Statens vegvesen (Public Roads Administration)	Current: Station BFA2, 2015 - 2020	High	North Sea: Bjørnafjorden
5	**NO**	612, IMR, Øyvind Angelskår	Physics	Statens vegvesen (Public Roads Administration)	Wave: Station BFA3, 2015 - 2020	High	North Sea: Bjørnafjorden
6	**NO**	612, IMR, Øyvind Angelskår	Physics	Statens vegvesen (Public Roads Administration)	Current: Station BFA3, 2015 - 2020	High	North Sea: Bjørnafjorden
7	**NO**	612, IMR, Øyvind Angelskår	Physics	Statens vegvesen (Public Roads Administration)	Wave: Station BFA4, 2015 - 2020	High	North Sea: Bjørnafjorden
8	**NO**	612, IMR, Øyvind Angelskår	Physics	Statens vegvesen (Public Roads Administration)	Current: Station BFA4, 2015 - 2020	High	North Sea: Bjørnafjorden

9	**NO**	612, IMR, Øyvind Angelskår	Physics	Statens vegvesen (Public Roads Administration)	Wave: Station BFA5, 2015 - 2020	High	North Sea: Bjørnafjorden
10	**NO**	612, IMR, Øyvind Angelskår	Physics	Statens vegvesen (Public Roads Administration)	Current: Station BFA5, 2015 - 2020	High	North Sea: Bjørnafjorden
11	**NO**	612, IMR, Øyvind Angelskår	Physics	Statens vegvesen (Public Roads Administration)	Current: Station 1, 2020 - 2021	High	North Sea: Sørfjorden - Tetteneset
12	**NO**	612, IMR, Øyvind Angelskår	Physics	Statens vegvesen (Public Roads Administration)	Current: Station 2, 2020 - 2021	High	North Sea: Sørfjorden - Slåtteskallen
13	**NO**	612, IMR, Øyvind Angelskår	Physics	Statens vegvesen (Public Roads Administration)	Current: Station 3, 2020 - 2021	High	North Sea: Sørfjorden - Fossmark
14	**NO**	612, IMR, Øyvind Angelskår	Physics	Statens vegvesen (Public Roads Administration)	Current: Station 4, 2020 - 2021	High	North Sea: Sørfjorden - Langhelle
15	**NO**	612, IMR, Øyvind Angelskår	Physics	Statens vegvesen (Public Roads Administration)	Current: Station 5, 2020 - 2021	High	North Sea: Sørfjorden - Herlander
1	**PT**	590, IHPT, Sara Almeida	Physics	CESAM - UA	Data collected from scientific projects	Medium	North of Portugal
2	**PT**	590, IHPT, Sara Almeida	Physics and Chemistry	FC - UL	Historical data collected since 1980	High	IBI area
3	**PT**	590, IHPT, Sara Almeida	Physics	IPMA	Data collected from scientific projects	Medium	North Atlantic ocean
4	**PT**	590, IHPT, Sara Almeida	Physics	LNEC	Data from project CONPRAR	Medium	Algarve
1	**RO**	697, NIMRD, Luminita Buga	Bathymetry	NIMRD	Bathymetric surveys	High	Black Sea

2	**RO**	697, NIMRD, Luminita Buga	Chemistry	Mare Nostrum NGO	Beach litter	High	Black Sea
3	**RO**	697, NIMRD, Luminita Buga	Physics	RONODC/NIMRD	Sea level data 1984 - 2021	High	Black Sea
4	**RO**	697, NIMRD, Luminita Buga	Chemistry	NIMRD	Seafloor litter 2020 -2021	High	Black Sea
1	**SE**	752, SMHI, Lotta Fyrberg	Physics	Bohusläns vattenvårdsförbund . Www.bvvf.se	Sond data	High	Kattegat
2	**SE**	752, SMHI, Lotta Fyrberg	Physics	SMHI	MVP (Moving vessel profiler) - 2021	High	Skagerrak, Kattegat, The Gulf of Bothnia and the Baltic Sea.
3	**SE**	752, SMHI, Lotta Fyrberg	Physics/chemistry	Waters project (2012-2013)	CDOM, SPM, SPIM = Suspended Inorganic Particulate matter.	Medium	Fjords in Skagerrak & Kattegat
4	**SE**	752, SMHI, Lotta Fyrberg	Chemistry	Transpaper (2011-2015)	CDOM	Medium	Kattegat, the Baltic Sea and the Gulf of Bothnia
5	**SE**	752, SMHI, Lotta Fyrberg	Biology	Jerico - Tångesund	IFCB - pictures - 2021	Low	Skagerrak
6	**SE**	752, SMHI, Lotta Fyrberg	Biology	DNA -Barcoding	Phytoplankton species - 2021	Low	Skagerrak, Kattegat, The Gulf of Bothnia and the Baltic Sea.
7	**SE**	752, SMHI, Lotta Fyrberg	Chemistry	Ferrybox - R/V Svea	pH, pCO2, CDOM, Turbidity - 2021	High	Skagerrak, Kattegat, The Gulf of Bothnia and the Baltic Sea.
8	**SE**	752, SMHI, Lotta Fyrberg	Physics	Umea University, 2021-	CTD	High	The Gulf of Bothnia
9	**SE**	752, SMHI, Lotta Fyrberg	Physics	Stockholm Universit, 2021-	CTD	High	The Baltic Sea
10	**SE**	752, SMHI, Lotta Fyrberg	Physics/chemistry	SMHI	CTD - Oxygen & Flourescence	High	Skagerrak, Kattegat, The Gulf of Bothnia and the Baltic Sea.

11	**SE**	752, SMHI, Lotta Fyrberg	Physics	VOTO, Voice of the Ocean, http://voiceoftheocean.org/sv/ -2021?	T, S, waves and more	High	The Baltic Sea
12	**SE**	752, SMHI, Lotta Fyrberg	Physics	SMHI	River data/flow	High	Skagerrak, Kattegat, The Gulf of Bothnia and the Baltic Sea.
13	**SE**	752, SMHI, Lotta Fyrberg	Physics/Chemistry/Biology/Bathymetry/Human activities	Nord Stream	Bathymetry, currents, fish, algae, marine mammals, noice, plankton, sediment,..	High	The Baltic Sea
14	**SE**	752, SMHI, Lotta Fyrberg	Physics	COINS/COPERNICUS	CTD	High	ARCTIC
1	**SI**	1229, NIB, Branko Cermelj	Chemistry	ARSO	Nutrients,Contaminants, Monitoring 2021 results	High	Mediterranean, Adriatic
2	**SI**	1229, NIB, Branko Cermelj	Physics	NIB	Currents profiles from moving vessel	High	Mediterranean, Adriatic
3	**SI**	1229, NIB, Branko Cermelj	Physics	NIB	Currents measurement time series from different campaigns-MSFD	High	Mediterranean, Adriatic
4	**SI**	1229, NIB, Branko Cermelj	Biology	NIb	Soft bottom Benthic Invertebrates along the Slovenian Coast (2005 - 2012)	High	Mediterranean, Adriatic
1	**SP**	26, CSIC, Gemma Ercilla	Bathymetry	Ingeconsul.sl	Bathymetries	High	Spanish waters
2	**SP**	26, CSIC, Gemma Ercilla	Geology	CSIC, University of Vigo, IGME	Seismic profiles	High	NE Atlantic
3	**SP**	26, CSIC, Gemma Ercilla	Geology	University of Granada	Seismic profiles	High	SW Mediterranean
4	**SP**	26, CSIC, Gemma Ercilla	Geology	CSIC (Continental Margins Group)	Seafloor-geology (geomorphology)	High	SW Mediterranean and Atlantic
5	**SP**	26, CSIC, Gemma Ercilla	Marine litter	CSIC (Functioning and Vulnerability of Marine Ecosystems Group & Continental Margins Group)	Seasfloor marine litter from ROVs	High	SW Mediterranean and Atlantic
1	**SP**	353, IEO, Elena Tel	bathymetry	SGP + IEO	underway singlebeam bathymetry data	High	
2	**SP**	353, IEO, Elena Tel	Physics	SGP + IEO	underway meteo data	High	

3	**SP**	353, IEO, Elena Tel	Physics	IEO	underway data (TSG, meteo)	High	
1	**TR**	696, METU, Devrim Tezcan	Physics	Mersin Metropolitan Municipality	CTD	High	NE Mediterranean
2	**TR**	696, METU, Devrim Tezcan	Chemistry	Mersin Metropolitan Municipality	Temp, Sal, Nutrients	Medium	NE Mediterranean
3	**TR**	696, METU, Devrim Tezcan	Geology	Erdemli Municipality	Grain Size	High	NE Mediterranean
4	**TR**	696, METU, Devrim Tezcan	Physics	Mersin Soda Industry Inc	CTD	Medium	NE Mediterranean
5	**TR**	696, METU, Devrim Tezcan	Habitat	Kyrenia University	Sonar map, seafloor photos	Medium	Northern Cyprus coast

Annex 4: D4.4 - Inventory of identified stakeholders for licensing data - February 2023

CINEA/EMFAF/2021/3.4.10/02/SI2.868290
Start date of the project: 30/03/2022 (24 months)

Centralisation Phase

D4.4: Inventory of identified stakeholders for licensing data

February 2023

The European Marine Observation and Data Network (EMODnet) is financed by the European Union under Regulation (EU) 2021/1139 of the European Parliament and of the Council of 7 July 2021 establishing the European Maritime, Fisheries and Aquaculture Fund and its predecessor, Regulation (EU) No. 508/2014 of the European Parliament and of the Council of 15 May 2014 on the European Maritime and Fisheries Fund.

Disclaimer

Document info

Title (and reference)	D4.4: Inventory of identified stakeholders for licensing data
WP title (and reference number)	WP4: Marketing and Outreach
Task (and reference number)	WP4.3: Improve and document the availability of data provided for coastal and offshore licensing
Authors [affiliation]	Sonja Wanke (Deltares)
Dissemination level	Public
Submission date	February 2023
Deliverable due date	February 2023

Table of Contents

1 Introduction

A partnership of over a hundred and twenty European organisations work together under EMODnet in seven thematic groups to assemble marine data from diverse sources and resources in order to make them more accessible and more interoperable. Part of their work involves building gateways to national, regional or thematic repositories and creating products based on marine and maritime data held by public bodies.

However, many data collected by public authorities, researchers and private operators of coastal or offshore facilities still do not arrive to these national or regional repositories and are thus unavailable to potential users. This creates additional costs for those working on marine issues who will have the choice of accepting lower confidence in their analysis than would otherwise be the case, or being compelled to needlessly repeat observations. There is therefore the need to streamline the data ingestion process so that data holders from public and private sectors can easily release their data for safekeeping and subsequent distribution through EMODnet or other means.

The general objective of EMODnet Ingestion III is to facilitate and streamline the process whereby marine data from whatever source (including national monitoring programmes, research projects, licensing data and private companies) be delivered on a voluntary basis for safekeeping to data repositories from where it can be freely disseminated.

Task 9 (Improve and document the availability of data provided for coastal and offshore licensing) which falls under WP4 – Marketing and outreach activities will tackle the challenge of licensing procedures for coastal and offshore activities. The aim is to identify and engage with public authorities who receive data from licensing procedures for coastal or offshore activities with particular emphasis on aquaculture and offshore energy, in order to get more insights in related monitoring data management, to promote use of common standards, and start a path towards a more harmonised approach, by means of a workshop. The first task deals with **identifying stakeholders that give out licences/permits for coastal and offshore activities, do monitoring or collect data**. Later on, these stakeholders will be asked about their processes.

An example of how marine data flows in the Netherlands is given below. The project data that is collected and/or maintained by different institutes are channelled to a national portal for open data access. Then suitable data are transposed to a format suitable for uptake in EMODnet (Figure 1.1).

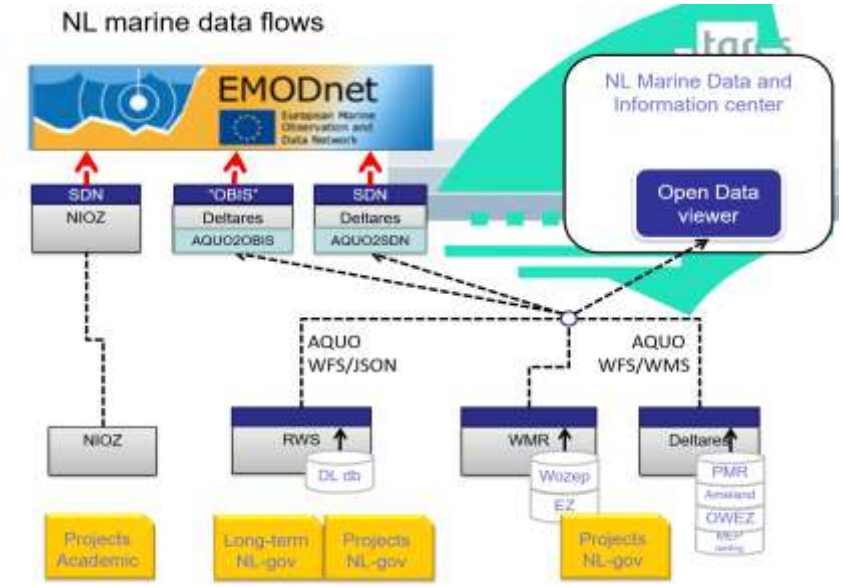

Figure 1.1: Example of marine data flows in the Netherlands

2 Approach

Besides national monitoring programs, marine data are collected for other purposes, e.g. to determine ecological effects of offshore activities like wind farms, aquaculture, sand mining etc. These collected data may come available publicly, but more often, they are kept at organisations responsible for data collection or licensing processes. In EMODnet Ingestion III the aim is to get a better picture of each country's procedures around such data collection. The first step is to identify all relevant stakeholders (e.g. public authorities). Therefore, a stakeholder mapping process has been set up. The purpose is to identify relevant stakeholders, specify their interests and determine their roles and mandates and their desired involvement in the different phases of the project.

Deltares will lead this process, but each local EMODnet Ingestion partner will be closely involved in this process as they have local connections. The purpose is to identify relevant stakeholders, specify the interests and determine their roles and mandates as well as their desired involvement in the different phases of the project. A stakeholder analysis table will facilitate this process.

It should be noted that not all stakeholders need, want and/or can participate in the same degree and should be involved in the same intensity throughout the project. This very much depends on the stakeholders' interest, their role and influence, their capacity to participate and the specific purpose of the different stages.

3 Stakeholders per Country

In total 128 stakeholders were identified by 27 countries (an overview can be found in Appendix II). An additional four countries have indicated that they are in contact with potential stakeholders, but were not able to fill in the provided survey at the time of submission. The survey will be kept open, so as soon as other stakeholders are identified, they can be added to the list and included in all relevant activities. More than half (52%) of the identified stakeholders are national governments from different ministries such as the Ministry of Energy, Ministry of Renewable Energy, Ministry of Environment and Water and the Ministry of Agriculture. This is followed by agencies (19%) and education such as universities and scientific institutes (9%) (Figure 3.1).

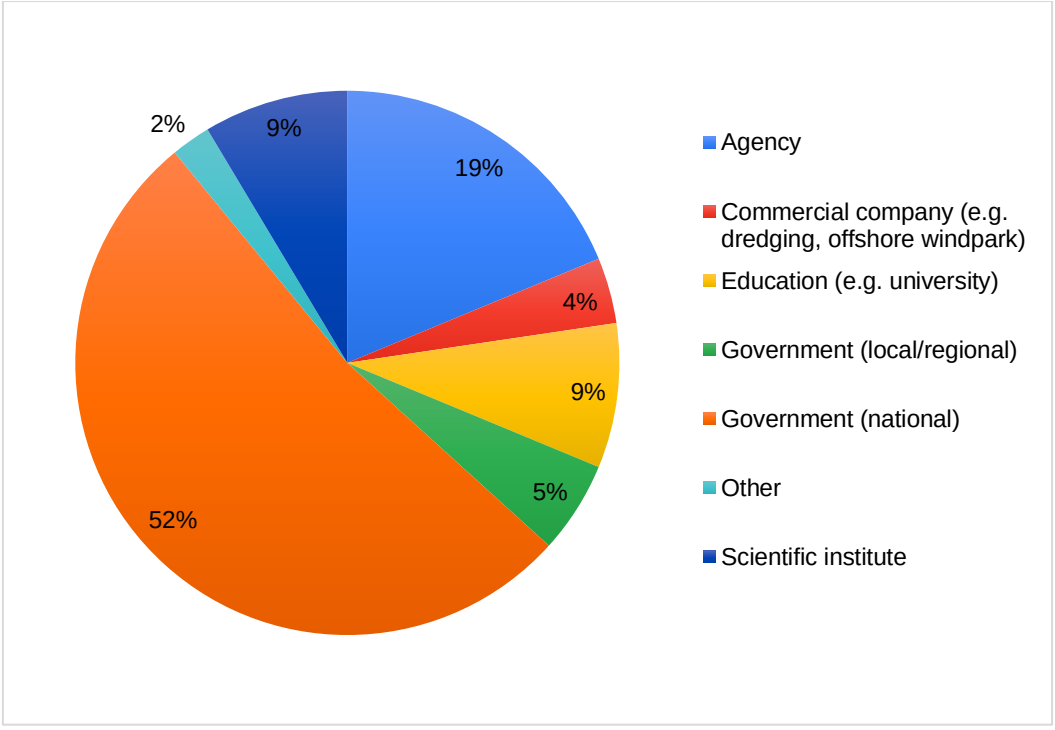

Figure 3.1: Different types of stakeholders responsible or involved in the offshore licensing process

When asked about their role concerning data, the majority of stakeholders had three roles: data producers, data owners and data holders (52%), followed by data owners (15%) and data owners and data holders (9%) (Figure 3.2).

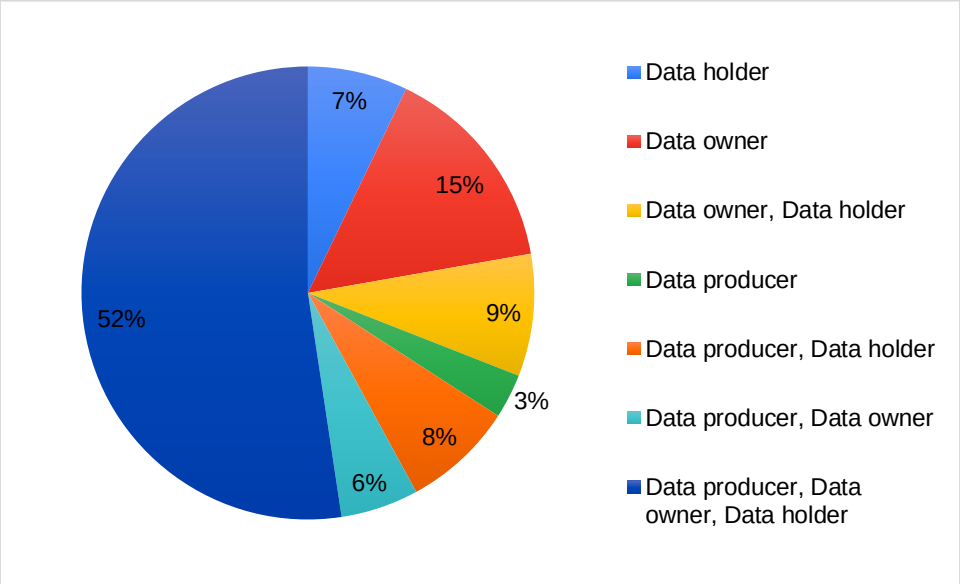

Figure 3.2: Stakeholders according to their current role concerning data (i.e. data holder, data owner, data producer)

Additionally, some specific EMODnet Ingestion questions were asked to check whether potential stakeholders already know about the project or would like to be involved more which is important information for the following phase. Many of the asked stakeholders already know about EMODnet Ingestion, while there is only a few that are not yet aware of it. On the other hand, when asked about wanting to collaborate with EMODnet Ingestion, only 25% said yes, while the majority did not know yet (Figure 3.3).

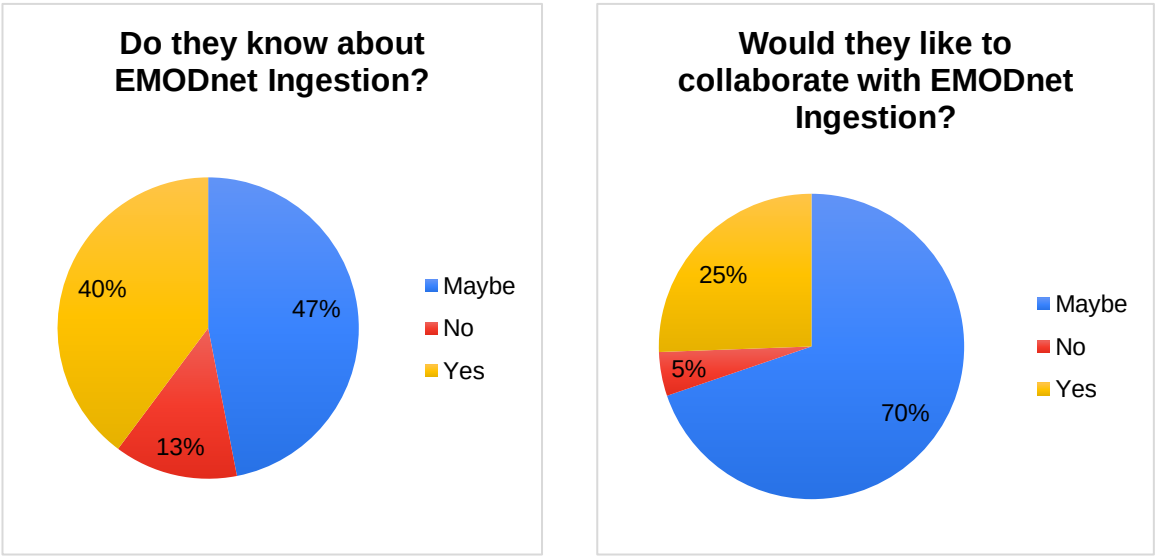

Figure 3.3: Stakeholders' knowledge on (a) and potential to collaborate (b) with EMODnet Ingestion

The following sections provide a detailed breakdown of all stakeholders per country. Seven different types of stakeholders were identified as follows:

Type	Code
Agency	
Commercial company	
Education	
Government (local/regional)	
Government (national)	
Other	
Scientific institute	

3.1 Belgium

1	**Federal Public Service Economy / General Directorate Energy / Offshore cel**			
	Responsibilities Give out licenses, do the monitoring, collect data			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		
2	**MUMM-RBINS (Scientific Service Management Unit of the Mathematical Model of the North Sea of the Royal Belgian Institute of Natural Sciences)**			
	Responsibilities Do the monitoring, collect data, and environmental impact assessment			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		
3	**ILVO - Flanders Research Institute for Agriculture, Fisheries and Food**			
	Responsibilities Do the monitoring, collect data, and environmental impact assessment			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		
4	**Colruyt / Project Value@Sea**			
	Responsibilities and activities R&D tests of mussel aquaculture in the offshore windfarms			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		
5	**UGent, Faculty of Bioscience Engineering**			
	Responsibilities and activities Offshore aquaculture			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		

3.2 Bulgaria

6	**Ministry of Environment and Water**			
	Responsibilities Responsible for integrated water management in order to achieve their good environmental status in the Black Sea region for basin water aquaculture. They give permissions for building or installing "installations" in, on, up, below or over the bottom of the Bulgarian part of Black Sea. Examples are constructions for fish breeding or the entrance of mussel seed, the installation of windmills and other large constructions, or the excavation of pipelines and cables. Used Legislation - Water Law, Environmental protection Law			
	Role	✓ Data producer	✓ Data owner	Data holder
	Data policy in place	Yes		
7	**Ministry of Regional Development and Public Works**			
	Responsibilities and activities Responsible for Coastal and offshore licenses. Responsible for Maritime Spatial Planning for Black Sea – Bulgaria. Maritime Spatial Planning (MSP) is a public process for the analysis and planning of human activities in marine areas to achieve ecological, economic, and social objectives. The goal is to develop spatial plans which define the effective use of marine areas for different marine activities and the sustainable use of marine and coastal resources. Used Legislation - Water Law, Law on the development of the Black Sea Coast, Environmental protection Law			
	Role	✓ Data producer	✓ Data owner	Data holder
	Data policy in place	Yes		
8	**Ministry of Energy**			
	Responsibilities and activities Responsible for oil and gas production licenses. Permits for search and exploration or for exploration of underground resources on the territory of the Republic of Bulgaria, including in the continental shelf and in the exclusive economic zone in the Black Sea, issued by the Council of Ministers and the Minister of Energy. Used Legislation - Underground wealth law			
	Role	Data producer	✓ Data owner	Data holder
	Data policy in place	Yes		
9	**Ministry of Agriculture (Executive Agency for Fisheries and Aquaculture)**			
	Responsibilities and activities Fisheries are bound by the Common Fisheries Policy of the EU and therefore to strict measures and rules. These relate to areas, catches (quotas), seasons and sea days, engine power and regulations for the fishing gear. Used Legislation- Fisheries and Aquaculture Law			
	Role	✓ Data producer	✓ Data owner	✓ Data holder

	Data policy in place	Yes

3.3 Croatia

10	**Hrvatske Vode (Croatian Waters)**			
	Responsibilities and activities Legal entity for water management, giving out specific licences, monitoring, collecting data, responsible for WFD performed by consultant institutes. Some activities: Preparation of planning documents for water management, water regulation and protection from adverse effects of water, Amelioration drainage, Water use, Water protection, Irrigation, Expert supervision, Management of special projects.			
	Role	✓ Data producer	Data owner	Date holder
	Data policy in place	Yes		
11	**OIKON Ltd. – Institute of Applied Ecology**			
	Responsibilities and activities Monitoring, data collection; licensed and accredited consulting company / research institute in the field of applied ecology in Croatia among other activities provides services in the fields of nature and environmental protection. Contracted by the Ministry of economy and sustainable development for some specific projects on temporary base.			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		
12	**Ministry for Economy and Sustainable Development**			
	Responsibilities and activities Give out licenses: Energy approvals, Environmental permit, Environmental impact assessment, Strategic environmental impact assessment, Assessment of the need for an environmental impact assessment, Ecological network Natura 2000...). Responsible for implementation of MSFD Directive in Croatia through nominated consultants (Institute of oceanography and fisheries and Institute Ruđer Boskovic). Owner of MSFD data. Gives permission for publishing data for wide users.			
	Role	Data producer	✓ Data owner	Data holder
	Data policy in place	No		
13	**Ministry of Agriculture - Directorate for Fisheries and Aquaculture**			
	Responsibilities and activities Give out licenses related fisheries and aquaculture. Require collection of fisheries and food web related data though subcontracts.			
	Role	Data producer	✓ Data owner	Data holder
	Data policy in place	Yes		
14	**Institute Ruđer Bošković, Zagreb**			

	Responsibilities and activities Research, monitoring, assessment of marine environment, data collecting physical oceanography, chemistry and biology to collect data for the licenses for assessment of marine environment. Contracted by the Ministry of Science and Education, Ministry of Economy and Sustainable Development.			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		
15	**Hydrographic Institute of the Republic of Croatia**			
	Responsibilities and activities Monitoring, data collection (i.e. bathymetry, seabed, physical oceanography and chemistry). Contracted by the Ministry of the Sea, Transport and Infrastructure, Ministry of Economy and Sustainable Development.			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		
16	**Institute for Marine and Coastal Research, University of Dubrovnik**			
	Responsibilities and activities Marine research and monitoring, assessment of the marine environment, and data collection. Contracted by the Ministry of Science and Education, Ministry of Economy and Sustainable Development.			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		
17	**The Blue World Institute of Marine Research and Conservation, Mali Lošinj**			
	Responsibilities and activities Collection of the marine sensitive species (dolphins and sea turtles). Contracted by the Ministry of economy and sustainable development on temporary base.			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		
18	**Institute of Oceanography and Fisheries**			
	Responsibilities and activities Research, monitoring, assessment of marine environment, data collecting of physical oceanography, chemistry, biology, fisheries and aquaculture to collect data for the licenses. Contracted by the Ministry of Science and Education, Ministry of Economy and Sustainable Development (MSFD implementation).			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		

3.4 Cyprus

19	**Hydrography Section, Department of Lands and Surveys, Nicosia**			
	Responsibilities and activities Collect and manage data (i.e. bathymetry and sea level)			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes, https://eservices.dls.moi.gov.cy/#/national/inspiregeoportalmapviewer		
20	**Department of Fisheries and Marine Research**			
	Responsibilities and activities Give out licenses, do monitoring, collect data			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		
21	**Mer- Marine and Environmental Research Lab ltd**			
	Responsibilities and activities Do monitoring			
	Role	✓ Data producer	Data owner	✓ Data holder
	Data policy in place	Unknown		
22	**AKTI Project and Research Centre**			
	Responsibilities and activities Monitoring			
	Role	✓ Data producer	Data owner	Data holder
	Data policy in place	Unknown		
23	**Marine and Carbon Lab, University of Nicosia**			
	Responsibilities and activities Education and research, collect data			
	Role	✓ Data producer	Data owner	Data holder
	Data policy in place	Yes		

3.5 Denmark

24	**The Danish Environmental Protection Agency**			
	Responsibilities and activities Give out licenses, do the monitoring and to some extent collect data			
	Role	✓ Data producer	✓ Data owner	Data holder

	Data policy in place	Yes, https://eng.mst.dk/about-us/the-personal-data-policy-of-the-environmental-protection-agency/		
25	**Aarhus University, Department of Ecoscience**			
	Responsibilities and activities Do the monitoring, collect the data, analyses the data			
	Role	✓ Data producer	Data owner	✓ Data holder
	Data policy in place	Yes, https://international.au.dk/about/profile/privacy-policy		

3.6 Estonia

26	**Environmental Agency**			
	Responsibilities and activities Field of activity is the fulfilment of the national environmental monitoring programme, the preparation of national and international reports in the field of environment, evaluating environmental status, ensuring vital services, including weather forecasts, and the maintenance and renewal of monitoring stations and equipment. Information that can be downloaded from the Estonian Environment Agency's webpage is for public use. The source must be referred to. Belongs under Ministry of Environment.			
	Role	Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		
27	**Ministry of Environment**			
	Responsibilities and activities Issuer of a marine scientific research permit to foreign research bodies for investigations in Estonian territorial sea or exclusive economic zone and associated entry clearances for research vessels.			
	Role	Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		
28	**Ministry of Economic Affairs and Communications**			
	Responsibilities and activities Gives out all permissions to operate or build related to harbours, sea traffic and hydrography service (Transport Administration), sea cables deployed, energy (wind parks) etc.			
	Role	Data producer	✓ Data owner	Data holder
	Data policy in place	Yes		
29	**Tallinn University of Technology - Department of Marine Systems**			
	Responsibilities and activities Marine monitoring, collecting data and analysing collected data.			
	Role	✓ Data producer	✓ Data owner	✓ Data holder

	Data policy in place	Yes		
30	**Estonian Marine Institute**			
	Responsibilities and activities Marine monitoring, collecting data and analysing collected data.			
	Role	✓Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		

3.7 Finland

31	**Defence Command, The Finnish Defence Forces**			
	Responsibilities and activities They give out of the licenses to execute seabed surveys including acoustic-seismic surveys and seabed sampling in territorial sea areas and in internal waters. In the EEZ area, permission for seabed survey is granted by the Finnish Government on the presentation of the Ministry of Economic Affairs and Employment (TEM), but those permits are actually sought from TEM.			
	Role	✓ Data producer	✓ Data owner	Data holder
	Data policy in place	Yes, https://puolustusvoimat.fi/merenmittaus1		
32	**The Ministry of Economic Affairs and Employment of Finland**			
	Responsibilities and activities In the EEZ, the right to explore, exploit, preserve and manage abiotic and biotic natural resources, as well as other activities aimed at the economic exploitation and exploration of the zone, belongs to the Finnish State. The permission applications to use the Finnish Economic Zone should be sent to the Ministry of Economic Affairs and Employment of Finland. The permit requires the approval of the Government.			
	Role	Data producer	Data owner	✓ Data holder
	Data policy in place	Yes		
33	**The Regional State Administrative Agency (Aluehallintovirasto in Finnish)**			
	Responsibilities and activities The protection of the Baltic Sea marine ecosystem is based on international agreements, EU Community law and national legislation. The reconciliation of human activities and natural values is regulated by permitting processes based on these laws. Along with water and marine management, the most essential laws for environmental impact assessment of projects in marine areas in Finland are the Water Act, the Environmental Protection Act and the Land Use and Construction Act. The Water Act guides the use and construction of water bodies. The Water Act regulates permitting matters for projects related to, for example, piers, land extraction, sea cables, extension of the environmental permit for offshore wind farm, water pipes and pressure sewer systems, the construction of floating dwellings, marine refills, edge embedding/boundary bank for constructions, waterway maintenance, and dredging and dumping. Dredging and dumping activities exceeding 500 m^3 of volume are authorised and instructed. However, the absolute need for permits does not apply to waterway maintenance dredging, but a permit must be applied for if dredging can change, among other things, the aquatic environment. Smaller dredging is carried out by a notification procedure.			

	Also, extraction of marine sand and seabed mineral requires always a permit under the Water Act. Treatment and further processing of resources, for example the processing of sand and gravel into concrete gravel, may also require an environmental permit. An environmental permit is needed if there is a risk that planned activities may pollute the environment. An environmental permit is needed for activities such as fish farming, mining of ores and minerals, wastewater treatment, disposal of waste, utilization of waste material for marine refilling, shipyards, and ports and harbours. Depending on the activity, the authorization process may require permits under both — or more — laws. The Land Use and Construction Act applies to issues related to coastal or marine zoning, construction, or having landscape altering effects. The Nature Conservation Act has been of limited importance so far in relation to the permit processes carried out along the coast and at sea, as the Act has not included a sufficient number of marine habitats and species. To check whether the planned marine and coastal activities need, for example, an environmental permit or a permit under the Water Act, permit needs are assessed by the Centre for Economic Development, Transport and the Environment (ELY- keskus in Finnish). Permit applications should be sent to the Regional State Administrative Agency (Aluehallintovirasto in Finnish) for the region where the project is located, well in advance of the planned start date of the project. Permit applications under the Water Act are processed by the Regional State Administrative Agencies for Southern Finland, Eastern Finland, Western and Inland Finland and Northern Finland. If the planned project is in the region of Southwestern Finland, application will be processed by the Regional State Administrative Agency for Southern Finland. If the planned project is in Lapland, the application will be processed by the Regional State Administrative Agency for Northern Finland. The Regional Administrative Agency usually informs about the application by means of public notice. Authorities will issue a statement on the application. Participants will be allowed to make reminders and residents within the catchment area of the project will be able to give their opinion. After consulting the applicant on opinions and reminders, the Regional Administrative Agency shall take a decision in the case. The decision can be appealed to the Administrative Court of Vaasa and its decision further to the Supreme Administrative Court (KHO). You can only appeal to the Supreme Administrative Court if you have obtained leave to appeal. A fee is charged to the applicant for processing the licence application In the case of minor environmental impacts (e.g., small dredging), only notification to the supervisory authority may be sufficient to initiate operations. *Note* They are supervisory authority, rather than data producer, owner or holder.*			
	Role	Data producer	Data owner	✓ Data holder
	Data policy in place	Yes		

3.8 France

34	**BRGM - Bureau de recherches géologiques et minières** **(French National Geological Service)**			
	Responsibilities and activities Even though their activities are mainly conducted inland, they have some activities in the Marine environment. They may conduct survey for their own research (e.g. risk assessments, core samplings, etc.). BRGM is consulted before any permit is granted for mining activities in French territory and they usually have access to data collected during such activities (prospection and exploitation).			
	Role	✓ Data producer	✓ Data owner	✓ Data holder

	Data policy in place	Yes, https://www.brgm.fr/en/activities/knowledge-dissemination-open-science		
35	**CEREMA - Centre d'études et d'expertise sur les risques, l'environnement, la mobilité et l'aménagement**			
	Responsibilities and activities CEREMA has a dedicated mission on Environmental risks and another in the Sea and Littoral areas. They are one of the main institutions providing expertise to the French Ministry for the Environment (for instance on the attribution of wind farms permits) and to local administrations. They also operate a network of coastal Swell buoys (CANDHIS).			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		
36	**OFB - Office français pour la biodiversité (French Biodiversity Agency)**			
	Responsibilities and activities OFB coordinates national information systems on biodiversity, water and both aquatic and marine habitats. It manages French protected areas (both marine and inland). It is consulted before the attribution of permits for most activities on French territory: wind farms, fisheries, marine mining activities.			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		
37	**Météo-France (French meteorological office)**			
	Responsibilities and activities Météo-France collects and disseminates meteorological data (observations, predictions, climatology, etc.), including at sea. They are consulted before the attribution of permits for most activities at sea, and data collected by the permit-owner must be transmitted to Météo-France.			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes, https://donneespubliques.meteofrance.fr/		
38	**Shom - Service hydrographique et océanographique de la marine (French Hydrographic Office)**			
	Responsibilities and activities Shom is consulted prior to the attribution of authorization for Marine Research activities.			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes, https://data.shom.fr, https://diffusion.shom.fr		
39	**Ifremer - Institut français de recherche pour l'exploitation de la mer**			
	Responsibilities and activities Acts as a scientific and technical advisor for the attribution of permits for exploration or exploitation of marine material (mineral or living resource).			
	Role	✓ Data producer	✓ Data owner	✓ Data holder

	Data policy in place	Yes		
40	**DGEC - Direction générale de l'énergie et du climat (Directorate General for Energy and Climate)**			
	Responsibilities and activities Marine Wind farms: definition of areas and permits attribution.			
	Role	Data producer	✓ Data owner	Data holder
	Data policy in place	Yes		
41	**DGAMPA - Direction générale des affaires maritimes, de la pêche et de l'aquaculture (Directorate General for Maritime Affairs, Fisheries and Aquaculture)**			
	Responsibilities and activities Issuing of permits			
	Role	Data producer	✓ Data owner	Data holder
	Data policy in place	Yes		
42	**Préfectures Maritimes (Channel & North Sea, Atlantic, Mediterranean Sea)**			
	Responsibilities and activities Authorization for Marine research and other activities in French waters			
	Role	Data producer	✓ Data owner	Data holder
	Data policy in place	Yes		
43	**DDTM - Direction départementale des territoires et de la mer (a total of 26 directions in the coastal "Départements")**			
	Responsibilities and activities Issuing of authorizations to occupy the Maritime Public Domain (Territorial Sea)			
	Role	Data producer	✓ Data owner	Data holder
	Data policy in place	Yes		

3.9 Georgia

44	**The National Environment Agency (NEA)**
	Responsibilities and activities The National Environment Agency is a legal entity of public law within the system of the Ministry of Environmental Protection and Agriculture of Georgia. The following activities are carrying out by Agency: Plan and project marine infrastructure facilities and conduct researches needed for these works; developing sea and river bank-protection projects; conducting monitoring and ichthyological, hydrobiological, microbiological studies and study of marine mammals in Georgia's Black Sea continental shelf, territorial waters and special economic zone; Authorization of vessels sailing under the flag of Georgia engaged in fishing or fishing activities in territorial seas and exclusive economic zones (EEZ) of foreign country, also in

	high seas; At the request of the applicant, verification of catch certificates for vessels sailing under the flag of Georgia for the export of fishing products; Validation of notification on catch certificates issued by foreign countries and keeping records of the states and their competent authorities from which the relevant notification was received; Assess fish stocks at the Black Sea coast and inland waters of Georgia and establish quotas. The Agency is guided by the Constitution of Georgia, international treaties of Georgia, decrees of the President of Georgia, resolutions and directives of the Government of Georgia, orders of the Minister of Environmental Protection and Agriculture of Georgia, its Statutes, other legislative and by-law normative acts and individual administrative-legal acts of the head of the Agency.			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	No		
45	**Iv.Javakhishvili Tbilisi State University (TSU)**			
	Responsibilities and activities ADU of IODE/IOC/UNESCO, collator ADU of IODE/IOC/UNESCO is not contracted by the governmental authorities. It is a unit within the IODE system and network and designated as National Coordinator for oceanographic data management.			
	Role	Data producer	Data owner	✓ Data holder
	Data policy in place	Yes		
46	**Laboratory Research Centre, Poti**			
	Responsibilities and activities Monitoring			
	Role	✓ Data producer	Data owner	Data holder
	Data policy in place	Yes		
47	**State Hydrographical Service of Georgia**			
	Responsibilities and activities Do the monitoring, collect data They are legal entity of public law within the system of Ministry of Economy and Sustainable Development of Georgia. The corresponding screenshot of the website will be sent.			
	Role	✓ Data producer	Data owner	Data holder
	Data policy in place	No		
48	**Ministry of Economy and Sustainable Development of Georgia**			
	Responsibilities and activities leads facilitation of issuance of licenses and permits and reform of the system of technical regulation; Law of Georgia on Licenses and Permits regulates spheres of licenses and permits and determines the comprehensive list of licenses and permits, including types of import and export products. Also defines rules on issuance of licenses and permits, making changes and revoking them. There are no restrictions of licensing requirements or other			

	non-tariff barriers, except for necessity to protect public health, national security and environment. There are number of state regulation acts, as follow: The Law of Georgia on Environmental Protection regulates legal relations in the field of environmental protection and the use of natural resources between state bodies and natural and legal persons in the field of environmental protection and nature use throughout Georgia, including its territorial waters, airspace, continental shelf and exclusive economic zone. The Law on the Regulation and Engineering Protection of the Banks of the Sea, Ponds and Rivers of Georgia establishes the status of comprehensive and rational use of the sea coasts, waterbodies and rivers of Georgia and ensures sustainability of coastal engineering protection zones; it establishes forms of state control and liability for activities resulting in erosion and abrasion processes in the coastal engineering protection zone. The Maritime Code of Georgia regulates relations with maritime navigation. 'Maritime navigation' means the use of ships for carrying passengers, cargo, luggage, and mail for fishing and other offshore operations; for exploring and extracting minerals for towage and rescue operations, and for other economic, scientific and cultural purposes. Law on Water regulating the protection of water bodies (including the Black Sea of Georgia) and the rational use of water resources, taking into account the interests of present and future generations and the principles of sustainable development. Law on Licenses and Permits, which regulates the procedure for issuing licenses for mining and fishing in Georgia's territorial sea and inland waters. The Law on Wildlife refers to the basic legal relations on protection, reproduction and conservation of wild animals and wildlife objects permanently or temporarily inhabiting the land, soil, water, atmosphere, territorial waters, continental shelf and special economic zone, in naturally free, semi-free or artificially created environmental conditions in the field of protection, reproduction and/or use of wildlife objects. This Law also regulates fishing issues. On the establishment and management of Kolkheti Protected Areas. Kolkheti Protected Area includes both terrestrial territory and sea water with an area of 15,276 hectares. The Law provides for the care, protection, restoration and rational use of land, water, fauna, flora and other natural resources within the Kolkheti Protected Areas; protection of sea water with a width of 5 nautical miles to maintain ecological balance on the adjacent coastline; create favourable conditions for education and scientific research; The environmental Assessment Code regulates matters related to strategic documents and public or private activities, which may have significant effects on the environment, human life and/or health. The procedures for environmental impact assessment, strategic environmental assessment, transboundary environmental impact assessment, and public participation in decision-making, as well as the conduct of expert examinations, fall within the scope of this Code.			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		

3.10 Germany

49	**Federal Maritime and Hydrographic Agency (BSH)**	
	Responsibilities and activities	

	The BSH is a higher federal authority within the portfolio of the Federal Ministry for Digital and Transport (BMDV). It is the public institution for maritime tasks. This concerns tasks such as averting dangers at sea, issuing official nautical charts and surveying tasks in the North Sea and Baltic Sea, as well as forecasting tides, water levels and storm surges. In addition, the BSH is responsible for the surveying of ships, flag law, the testing and approval of navigation and radio equipment and the issue of certificates for seafarers. With regard to construction projects in the North and Baltic Seas, the BSH is responsible for spatial planning and for the testing and approval of power generation systems (offshore wind turbines), cables and other systems within the scope of federal responsibility.			
	Role	Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes, www.govdata.de/dl-de/by-2-0		
50	**LKN.SH**			
	Responsibilities and activities NLWKN is an Agency of the local Government of Niedersachsen and responsible for coastal protection and conservation of nature.			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Unknown		
51	**NLWKN**			
	Responsibilities and activities NLWKN is an Agency of the local Government of Niedersachsen and responsible for coastal protection and conservation of nature.			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Unknown		
52	**Federal Waterways and shipping administration (WSV)**			
	Responsibilities and activities To enable economical shipping traffic, WSV operates and maintains the federal waterways and the associated facilities (locks, weirs, ship lifts, bridges, etc.) and expands them as required.			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes, www.govdata.de/dl-de/by-2-0		
53	**Alfred Wegener Institute (AWI)**			
	Responsibilities and activities AWI conducts research on climate change in all forms and across the globe.			
	Role	Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Unknown		
54	**Baltic Sea Research Warnemünde (IOW)**			
	Responsibilities and activities The Leibniz Institute for Baltic Sea Research Warnemünde (IOW) is a non-university marine research institute. In its four departments, the basic disciplines of marine research are represented. Its research programme is directed towards coastal and marginal seas with a special focus on the Baltic Sea ecosystem. In addition to its research activities, the IOW pursues a transfer concept and operates research infrastructures for the scientific community. The IOW is a member of the Leibniz Association (WGL). Its institutional budget is jointly funded by the Federal Government and the Länder. The IOW			

	is a foundation under public law. (https://www.io-warnemuende.de/kurzvorstellung-lageplan.html, 12.01.23)			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Unknown		

3.11 Greece

55	**Hellenic Hydrocarbons and Energy Resources Management Company S.A. (HEREMA S.A.)**			
	Responsibilities and activities HEREMA S.A is a state-owned company with the Hellenic State being the sole stakeholder (100%), however it operates independently as a private-sector economic entity. It gives out licenses, do monitoring, collect data (https://www.greekhydrocarbons.gr/gr/CompanyOverview_gr.html). The company besides the hydrocarbon projects is broadening its scope to new energy technologies that can support the country's energy transition to renewable sources. Since May 2022 the company has signed a memorandum of Cooperation with HCMR (https://www.greekhydrocarbons.gr/news_en/PR_REL_120522_EN.html).			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		
56	**Ministry of Rural Development and Food, Directorate General of Fisheries**			
	Responsibilities and activities The Directorate General of Fisheries is the administrative sector of the Ministry of Rural Development and Food, which manages the sectors of fisheries, aquaculture and marketing-processing of fisheries products. The Directorate General of Fisheries aim is to promote the primary sector through the development of fishery and aquaculture, with the objectives of optimum management of fishery resources, implementation of activity control and promotion of issues within the EU and international organisations. The Directorate is contracting: - **HCMR** (Research Organization) to collect fisheries data in the framework of EU data Collection Framework - **Fisheries Research Institute (FRI) (Research Organization)** to collect aquaculture data (mainly capacity, economics) including environmental data			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		
57	**Hellenic Statistical Authority, Agriculture, Livestock, Fishery and Environment Statistics Division**			
	Responsibilities and activities			

	The Agriculture, Livestock, Fishery and Environment Statistics Division of the Hellenic Statistical Authority collects data (through surveys) for assessments of fishery production, values of catches, professional employments (https://www.statistics.gr/en/statistics/agr).			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		
58	**Ministry Environment & Energy**			
	Responsibilities and activities Responsible among others for the water resources management, WFD, MSFD. It cooperates with consulting companies and contracts privates or research institutes (like HCMR) to collect marine data incl. data related to aquacultures.			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		
59	**Independent Power Transmission Operator (IPTO)**			
	Responsibilities and activities Get licenses from the state for underwater cable root surveys. It cooperates with privates or research institutes (like HCMR) to collect marine data.			
	Role	✓ Data producer	Data owner	✓ Data holder
	Data policy in place	Yes		
60	**Hellenic Telecommunications Organisation S.A. (OTE Group)**			
	Responsibilities and activities Get licenses from the state for underwater cable root surveys. It cooperates with privates or research institutes (like HCMR) to collect marine data.			
	Role	✓ Data producer	Data owner	✓ Data holder
	Data policy in place	Yes		

3.12 Iceland

61	**The Environment Agency of Iceland**			
	Responsibilities and activities The Environment Agency operates under the direction of the Ministry for the Environment and Natural Resources. Its role is to promote the protection as well as sustainable use of Iceland's natural resources, as well as public welfare by helping to ensure a healthy environment, and safe consumer goods.			
	Role	Data producer	Data owner	✓ Data holder
	Data policy in place	Unknown		

3.13 Ireland

62	**Socio-Economic Marine Research Unit**			
	Responsibilities and activities Generate marine economic related data used in the monitoring of marine planning and development			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Unknown		
63	**National Biodiversity Data Centre**			
	Responsibilities and activities Generate and hold data on marine species and habitats			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Unknown		
64	**DHLGH - Foreshore Licensing Team**			
	Responsibilities and activities License foreshore activity, collect data through application and statory legislative processes			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Unknown		
65	**DHLGH - Marine Area Regulation Authority**			
	Responsibilities and activities License offshore activity, monitor compliance, hold related data			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Unknown		
66	**DECC - Petroleum Affairs Division**			
	Responsibilities and activities Hold data, monitor compliance with offshore development license terms			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Unknown		
67	**DHLGH - National Monuments Service**			
	Responsibilities and activities Maintain data related to marine archaeological sites (e.g. shipwrecks)			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Unknown		
68	**Geological Service Ireland**			
	Responsibilities and activities			

	Generate and hold data on marine geological environment data			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Unknown		
69	**DHLGH - National Parks and Wildlife Service**			
	Responsibilities and activities Generate and hold data on marine species and habitats			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Unknown		

3.14 Israel

70	**Ministry of Energy**			
	Responsibilities and activities Give out licenses, define the data necessity, collect selected data			
	Role	Data producer	✓ Data owner	Data holder
	Data policy in place	Yes		
71	**Ministry of Environmental Protection**			
	Responsibilities and activities Give out licenses, define monitoring of water quality in Israel EEZ, define data to be observed, define observations periodicity, define oil spill forecasting necessity			
	Role	Data producer	✓ Data owner	Data holder
	Data policy in place	Yes		
72	**Israel Oceanographic & Limnological Research**			
	Responsibilities and activities Give out licenses, define monitoring of water quality in Israel EEZ, define data to be observed, define observations periodicity, define oil spill forecasting necessity			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		

3.15 Italy

73	**Coast Guard that depends on the Ministry of Infrastructure and Transport**			
	Responsibilities and activities To give out specific permission for offshore installation.			
	Role	Data producer	Data owner	✓ Data holder
	Data policy in place	Unknown		

3.16 Latvia

74	**Latvian Environmental, Geology and Meteorological Centre**			
	Responsibilities and activities Collect data, did the monitoring Can provide data for EIAs when developer is applying for license (in case of OWF). Do not participate in decision making.			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	No		
75	**Institute of Food Safety, Animal Health and Environment (BIOR)/Fish Resource Research Department**			
	Responsibilities and activities collect data, do the monitoring and research Can provide data for EIAs when developer is applying for license (in case of OWF). Provide evidence for decision (data, scientific justification) if license is fisheries related.			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	No		

*Note: *Licenses for exploration and exploitation of offshore energies and aqua farming in Latvia are the responsibility of the Ministry of Economics and Ministry of Agriculture. But a new ministry has been created since 1st January 2023- the Ministry of Climate and Energy. According to the law, it seems that this ministry will take over some responsibilities.*

3.17 Malta

76	**Continental Shelf Department**			
	Responsibilities and activities CSD is responsible for regulating activities on Malta's continental shelf. It also acts as the Geological Survey of Malta. It is the entity that issues licences for oil exploration, marine scientific research, laying of cables and pipelines and the construction of artificial structures on the continental shelf.			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Unknown		
77	**Department of Fisheries and Aquaculture**			
	Responsibilities and activities DFA is responsible for regulating fishing and aquaculture activities in Malta. It gathers biological and economic information which it uses in decision making related to sustainable fishing. The Aquaculture Directorate is a branch of the DFA, which is responsible for the			

	implementation of the Aquaculture Strategy for the Maltese Islands. All fishers are licenced by the MFA.			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Unknown		
78	**Environment Resources Authority**			
	Responsibilities and activities ERA is the national regulator on the environment. The authority is responsible for the issuing of environmental permits which are required for a number of activities, such as industrial and waste management activities, quarries and combustion plants. It has a robust data gathering structure which is important in its role as advisor to the Government on environment-related policy making. ERA is also responsible for the implementation of assessments required by the MSFD.			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Unknown		

3.18 Netherlands

79	**Ministry of Infrastructure and Water Management** **Rijkswaterstaat - Directorate Sea and Delta**			
	Responsibilities and activities On behalf of the Ministry of Infrastructure and Water Management, Rijkswaterstaat - **Directorate Sea and Delta** gives out (parts) of the offshore sea bottom licenses related to dredging, sand extractions, cables, wrecks etc. They ask for that two "types" of monitoring data and reporting of the initiator a) during the operation itself (for safety reasons, noise and environment limits etc) and b) environmental/ecological impact monitoring (local and far distance) during and after the activity. Besides that, Directorate Sea Delta has its own (WOZEP)Team for ecological impact studies for "spatial policy planning choices of Windmills areas". They define ecological research studies and specify requirements for Open marine Data.			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		
80	**Ministry of Agriculture, Nature and Food Quality (LNV)**			
	Responsibilities and activities The Ministry of Agriculture, Nature and Food Quality issues permits licenses under the Nature Conservation Law. The handling of license applications, enforcement requests and the question of the presence of a possible license obligation in relation to marine activities falls under the authority of LNV. These are, for example, gas and salt extraction, aquaculture Fish- and Defence activities.			
	Role	Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		

3.19 Norway

81	**Fiskeridirektoratet (Directorate of Fisheries)**			
	Responsibilities and activities The Directorate of Fisheries' shall promote profitable economic activity through sustainable and user-oriented management of marine resources and the marine environment.			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		

3.20 Poland

82	**Department of Maritime Economy, Ministry of Infrastructure**			
	Responsibilities and activities Supervising activities carried out in offshore areas, also in the field of wind farms, granting licenses.			
	Role	Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		

3.21 Portugal

83	**DGRM (Direção-Geral de Recursos Naturais, Segurança e Serviços Marítimos)[1]**			
	Responsibilities and activities Develop maritime safety and services, including the maritime-port sector, the implementation of policies on fisheries, aquaculture, the processing industry and related activities, the preservation and knowledge of marine resources, as well as to ensure the regulation and control of activities in these areas.			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes, https://www.dgrm.mm.gov.pt		
84	**APA (Agência Portuguesa do Ambiente)[2]**			
	Responsibilities and activities APA is a state agency whose mission is the integrated management of environmental and sustainability policies. Is responsible for monitoring, planning and evaluation, licensing and inspection, and is therefore the main environmental regulator in Portugal			
	Role	Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes, https://apambiente.pt/		

[1] depends on Minister of Economy and the Sea, together with the Minister of Infrastructure and Housing and the Minister of Agriculture and Food

[2] depends on Minister of Environment and Climate Action

85	**DGEG (Direção-Geral de Energia e Geologia)[3]**			
	Responsibilities and activities DGEG, state administration body, which pursues the definition, implementation and evaluation of public policies related to energy and geological resources.			
	Role	✓ Data producer	✓ Data owner	Data holder
	Data policy in place	Yes, https://www.dgeg.gov.pt/pt/servicos-online/informacao-geografica/		
86	**AMN (Autoridade Maritima Nacional)[4]**			
	Responsibilities and activities Coordinate the activities in public and maritime domain spaces under national sovereignty and jurisdiction.			
	Role	Data producer	Data owner	Data holder
	Data policy in place	Yes, https://www.amn.pt/		

3.22 Romania

87	**Ministry of Environment Waters and Forests**			
	Responsibilities Responsible, through subordinated institutions (Department of Water management, National Environment Protection Agency, Romanian Waters National Administration, regional authorities), for implementation of MSFD, WFD directives and for the National Monitoring programme for Romanian Black Sea waters. It issues environmental permits or licenses for on/offshore developments. It is responsible for the implementation of the Coastal Protection works. Used Legislation - Water Law, Environmental protection Law, ICZM Law			
	Role	✓ Data producer	✓ Data owner	Data holder
	Data policy in place	Yes		
88	**Ministry of Development, Public Works and Administration**			
	Responsibilities and activities Responsible (together with the MSP Committee) for the implementation of MSP Directive, elaboration, and monitoring of national MSP. Used Legislation - Water Law, ICZM Law, Environmental protection Law			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		
89	**Ministry of Energy**			
	Responsibilities and activities			

[3] depends on Minister of Environment and Climate Action

[4] depends on Minister of Defence

	Issues the authorization act regarding offshore works for the holders of oil / gas agreements related to offshore perimeters. Used Legislation – Law regarding relating to offshore petroleum perimeters, Environmental protection Law			
	Role	Data producer	✓ Data owner	Data holder
	Data policy in place	Yes		
90	**National Agency for Mineral Resources**			
	Responsibilities and activities Negotiates and establish together with the other conceding authorities of the state public domain, the clauses, and conditions for exploration/exploitation of offshore oil and gas agreements and concludes such agreements. It regulates the oil and gas operations and mining activities and monitors the application of the measures established for environmental protection, during and after oil and gas operations and mining activities. Used Legislation - Mining law, Petroleum law			
	Role	Data producer	✓ Data owner	Data holder
	Data policy in place	Yes		
91	**Ministry of Agriculture and Rural Development (National Agency for Fisheries and Aquaculture)**			
	Responsibilities and activities Elaborates and implements the Romanian Operational Programme for Fisheries. Elaborates regulations regarding access to living aquatic resources for commercial and recreational/sports fishing; technical characteristics and conditions of use of fishing gear, as well as commercial fishing methods in natural fish habitats; annual establishment of the total allowable catch (TAC), fishing quotas and fishing effort; prohibition periods; biological recovery areas/resource as well as the preventive measures; fishing of protected species; minimum individual sizes per species that can be captured; Fleet Adaptation Plan and the Fishing Effort Adjustment Plan. Used Legislation- Law regarding Fishery and aquaculture, Water Law, Environmental protection Law			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		

3.23 Slovenia

92	**Ministry of the Environment and Spatial Planning**			
	Responsibilities and activities The Ministry of the Environment and Spatial Planning helps provide a healthy living environment for all inhabitants of the Republic of Slovenia and promotes and coordinates efforts towards sustainable development based on the efficient and economical use of natural resources and ensuring social wellbeing.			

	Give out licenses: Energy approvals, Environmental permit, Environmental impact assessment, Strategic environmental impact assessment, Assessment of the need for an environmental impact assessment, Ecological network Natura 2000...). Responsible for implementation of WFD and MSFD Directive in Slovenia. Owner of WFD and MSFD data. Gives permission for publishing data for wide users.			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Unknown		
93	**Slovenian Environment Agency (ARSO)**			
	Responsibilities and activities Slovenian Environment Agency performs expert, analytical, regulatory and administrative tasks related to the environment at the national level. Our primary objective is to become a leading, effective and trustworthy environmental institution, capable of disseminating knowledge to other related institutions around the world. The Environment Agency is a body of the Ministry of the Environment and Spatial Planning. Monitor public policies for the environment and sustainable development.			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		
94	**Ministry of Agriculture, Forestry and Food**			
	The Ministry of Agriculture, forestry and Food is in charge for the Effective fisheries policies and measures help ensure sustainable and competitive fisheries that will sustain the balance between available resources and the environment and increase the competitiveness of Slovenian aquaculture on national and European markets. Responsibilities and activities Fisheries is bound by the Common Fisheries Policy of the EU and therefore to strict measures and rules. These relate to areas, catches (quotas), seasons and sea days, engine power and regulations for the fishing gear. Used Legislation- Marine Fisheries Act (ZMR-2) Owner of Fishery data.			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		
95	**Institute for Water of the Republic of Slovenia (IZVRS)**			
	Within IZVRS the Sector for Marine Waters covers the regulation, use and protection of the sea, prepares expert bases for the Sea Management Plan pursuant to the Decree on Detailed Content of Marine Environment Management Plan as well as development tasks and expert bases for marine environment impact assessments. *Responsibilities and activities* In the area of protection IZVRS determines the impact of pressures on the individual elements of the environmental state pursuant to the requirements of the Marine Strategy Framework Directive and prepare expert bases for assessing the hydromorphological pressures (for coastal waters and lakes). IZVRS also prepares expert bases and methodologies for waste pollution management, for assessing the individual elements of			

	the environmental state with regard to coastal waste and micro-plastics pollution in water and for content linked to managing the impact of underwater noise on the marine environment Monitor public policies for the environment and sustainable development			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Unknown		
96	**National Institute of Biology (NIB)**			
	Responsibilities and activities The Marine Biological Station (MBS) of NIB in Piran was established in 1969 in response to growing public interest in the sea. Although initially focused on the study of local flora and fauna, it has gradually evolved into a larger research centre focusing on ecological and pollution issues. As part of its research activities, MBS develops studies on the oceanography of coastal waters and operates a research vessel (12 m), an oceanographic buoy, field instruments (e.g., ADCP, CTD with fluorescence and PAR sensors) and a HF radar, and has established the National Oceanographic Data Centre (NODC) for Slovenia.			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		

3.24 Spain

97	**Ministry for the Ecological Transition and the Demographic Challenge. General Director of the Coast and the Sea**			
	Responsibilities and activities The proposal for the granting and processing of authorizations, permits and concessions their monitoring and control for: the exploitation of hydrocarbons; the actions in terms of research and use of mineral deposits and other geological and hydrogeological resources, within the framework of the powers of the General Administration of the State; the execution of works or installations in marine waters, its bed or its sub bottom, or the placement or deposit of materials on the seabed, as well as the discharges.			
	Role	Data producer	✓ Data owner	Data holder
	Data policy in place	Yes		

3.25 Sweden

98	**Swedish Agency for Marine and Water Management**			
	Responsibilities and activities The responsible Government agency tasked to protect, restore and ensure sustainable use of freshwater resources and seas including fisheries management Collect data, licensing fishing permits in Swedish EEZ.			

	Role	Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		
99	**Swedish University of Agricultural Sciences**			
	Responsibilities and activities Monitor and collect data. Contracted by SWAM to perform the national fish monitoring. Not involved in licensing procedures.			
	Role	✓ Data producer	Data owner	✓ Data holder
	Data policy in place	Yes		
100	**Stockholm University, Department of Ecology, Environment and Plant Sciences**			
	Responsibilities and activities Monitor national data and collect regional data. Contracted by SWAM to perform parts of the national monitoring. Not involved in licensing procedures.			
	Role	✓ Data producer	Data owner	✓ Data holder
	Data policy in place	Yes		
101	**Tjärnö Marine Laboratory, Gothenburg University**			
	Responsibilities and activities Monitor and collect data. Contracted by SWAM to perform parts of the national monitoring. Not involved in licensing procedures.			
	Role	✓ Data producer	Data owner	✓ Data holder
	Data policy in place	Yes		
102	**Department of Biological and Environmental Sciences, Gothenburg University**			
	Responsibilities and activities Monitor and collect data. Contracted by SWAM to perform parts of the national monitoring. Not involved in licensing procedures.			
	Role	✓ Data producer	Data owner	✓ Data holder
	Data policy in place	Yes		
103	**Umea Marine Sciences Centre, Umea University**			
	Responsibilities and activities National and regional monitoring. Contracted by SWAM to perform parts of the national monitoring.			

	Not involved in licensing procedures.			
	Role	✓ Data producer	Data owner	✓ Data holder
	Data policy in place	Yes		
104	**Geological Survey of Sweden**			
	Responsibilities and activities Monitor, collect data and give out licences Give permission for sand, gravel or stone quarrying within a general water area in the sea, is normally granted by SGU. Monitor hazard substances. Permission to explore the continental shelf is normally issued by the Geological Survey of Sweden (SGU), but sometimes by the government (valid from 1 July 2022). Contracted by SWAM to perform parts of the national monitoring.			
	Role	✓ Data producer	Data owner	✓ Data holder
	Data policy in place	Yes		
105	**Swedish Coast Guard**			
	Responsibilities and activities The Coast Guard is a civilian government agency that belongs to the Ministry of Defence's area of activity. The overall goals for the authority's activities are decided by the parliament and the government decides on the more detailed governance. The Coast Guard's task is to conduct maritime surveillance and rescue services at sea. The coast guard must also coordinate civilian needs for maritime surveillance and convey civilian maritime information to relevant authorities. Not involved in licensing procedures.			
	Role	Data producer	Data owner	X Data holder
	Data policy in place	Unknown		
106	**Swedish Land and Environmental court**			
	Responsibilities and activities Permit examinations for installations at sea After evaluations by the Swedish County administration boards they are often the authority that examine the Natura 2000 permits. In order to build wind turbines in Sweden's sea territory, a permit for environmentally hazardous activities and water activities is required according to the Environmental Code. A permit is also required on the continental shelf (continental shelf law) as well as the municipality's approval and notification according to the Planning and Building Act. Permits for the establishment of wind power in water are normally reviewed by the Land and Environmental Court.			
	Role	Data producer	✓ Data owner	Data holder
	Data policy in place	Yes		
107	**Swedish Government**			
	Responsibilities and activities			

	Licencing wind farms in Swedish EEZ. Permission to lay out cables and wires on the seabed or to build offshore wind farms is issued by the government. Give permission to extract natural resources from the continental shelf. Permissions for Wrecks before 1850 are handled by the Department of Culture.			
	Role	Data producer	✓ Data owner	Data holder
	Data policy in place	Yes		

3.26 Turkey

108	**Ministry of Environment, Urbanisation and Climate Change**			
	Responsibilities and activities The ministry is responsible to implement the Turkish National Integrated Marine Pollution Monitoring Program covering the Turkish coastal areas that is designed according to the Regional Marine Conventions such as Barcelona and Bucharest Conventions, related EU directives (MSFD and WFD) and according to the national legislation. The other responsibility of the ministry is to prepare and update Integrated Coastal Zone Plans in Turkey.			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		
109	**Mersin Metropolitan Municipality**			
	Responsibilities and activities They are monitoring the Mersin coastal areas for water quality in collaboration with the METU.			
	Role	Data producer	✓ Data owner	Data holder
	Data policy in place	No		
110	**University of Kyrenia**			
	Responsibilities and activities They have a monthly time series dataset off the Kyrenia between 2014-2016. They will start another time series monitoring in 2023.			
	Role	✓ Data producer	✓ Data owner	Data holder
	Data policy in place	No		

3.27 United Kingdom

111	**Environment Agency**			
	Responsibilities and activities England only. The Environment Agency work to create better places for people and wildlife, and support sustainable development. EA is an executive non-departmental public body,			

	sponsored by the Department for Environment, Food & Rural Affairs. The Environment Agency licenses industry, business and individuals to carry out certain activities that have the potential to pollute the environment.			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		
112	**Maritime and Coastguard Agency (MCA)**			
	Responsibilities and activities The Maritime & Coastguard Agency (MCA) has overall responsibility for the UK's hydrographic obligations under the Safety of Life at Sea Convention (SOLAS). The MCA manages a multi-million-pound budget to systematically survey the waters around the UK. This programme is known as the "UK Civil Hydrography Programme" (UK CHP). Under the UK CHP, commercial contracts are let to ensure accurate hydrographic information is gathered for updating the nation's nautical charts and publications.			
	Role	Data producer	✓ Data owner	Data holder
	Data policy in place	Yes		
113	**Scottish Environmental Protection Agency (SEPA)**			
	Responsibilities and activities Scotland only. As Scotland's principal environmental regulator, SEPA issue a range of authorisations designed to control activities that could lead to pollution or environmental damage. e.g. Aquaculture. Although remit in the marine environment extends to three miles offshore, have no direct regulatory role in marine renewable generation. However, they act as a designated consultation authority for Marine Scotland, a Directorate of Scottish Government, and work closely with partners in marine licensing and monitoring.			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		
114	**Harbour Authorities**			
	Responsibilities and activities Manage harbours. MMO issue the Harbour Orders in England, so not exactly sure the role they play in licencing.			
	Role	Data producer	Data owner	✓ Data holder
	Data policy in place	No		
115	**Crown Estate Scotland**			
	Responsibilities and activities Crown Estate Scotland's purpose is investing in property, natural resources and people to generate lasting value for Scotland. This includes maintaining and seeking to enhance income from, and the value of, the Scottish Crown Estate while supporting delivery of the Scottish Government's purpose.			
	Role	Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		

116	**United Kingdom Hydrographic Office**			
	Responsibilities and activities Hydrographic data from renewables licence applications required to be sent here. (also data collected as part of the Civil Hydrography Programme)			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	No		
117	**Department for Business, Energy and Industrial Strategy**			
	Responsibilities and activities They are involved in renewables licensing.			
	Role	Data producer	Data owner	✓ Data holder
	Data policy in place	No		
118	**Offshore Petroleum Regulator for Environment and Decommissioning (OPRED)**			
	Responsibilities and activities All UK. The part of BEIS to deal with oil and gas, regulated under the Energy Act. Issue licences for oil and gas operations. Publish all the paperwork related to Nationally Significant Infrastructure Projects (licences, consent orders, environmental statements (includes EIA - contain processed data such as sediment types, species and habitats), not raw data)) on their website. Licence conditions. For monitoring and enforcement, they get sent information on returns from marine mammal observers, pipeline survey data, where rock has been laid to stabilise pipelines, etc. as part of 'Close Out Reports'.			
	Role	Data producer	✓ Data owner	Data holder
	Data policy in place	No		
119	**Cefas**			
	Responsibilities and activities Don't issue licences but might receive returns as part of licence conditions, e.g. contaminants.			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		
120	**North Sea Transition Authority (NSTA)**			
	Responsibilities and activities The NSTA regulates the licensing of exploration and development of the UK's offshore and onshore (England) oil and gas resources, carbon storage, gas storage and unloading activities.			
	Role	Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		
121	**Marine Management Organisation**			
	Responsibilities and activities			

	Supports Planning Inspectorate (advising on licence conditions, depending on type of licence) but also have a regulatory role issuing licences for smaller projects, such as building harbours, aggregate extraction, cable laying. Monitoring and enforcement of Marine Licences.			
	Role	Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		
122	**Planning Inspectorate**			
	Responsibilities and activities Reviews and gives out Deemed Marine Licence. Publishes all the paperwork related to Nationally Significant Infrastructure Projects (licences, consent orders, environmental statements (includes EIA - contain processed data such as sediment types, species and habitats), not raw data)) on their website. Probably don't get sent any raw data.			
	Role	Data producer	Data owner	✓ Data holder
	Data policy in place	No		
123	**Department for Agriculture, Environment and Rural Affairs**			
	Responsibilities and activities Like MMO for England, have a regulatory role issuing licences for smaller projects, such as building a harbour, aggregate extraction, cable laying. Monitoring and enforcement of Marine Licences.			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	No		
124	**Natural Resources Wales**			
	Responsibilities and activities Like MMO for England, they have a regulatory role issuing licences for smaller projects, such as building a harbour, aggregate extraction, cable laying. Monitoring and enforcement of Marine Licences. Might be sent raw data along with paperwork, but not sure.			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	No		
125	**Marine Scotland**			
	Responsibilities and activities Marine Scotland is responsible for the integrated management of Scotland's seas, working closely with delivery partners Scottish Natural Heritage (SNH) and the Scottish Environment Protection Agency (SEPA). This covers: • marine renewable, fishing vessel, freshwater fisheries and seal licensing • ensuring compliance with fisheries regulations • promoting sustainable, profitable and well-managed fisheries and aquaculture industries • ensuring a sound scientific evidence base exists to inform our marine policies • the sustainable management of freshwater fish and fisheries resources			

	• promoting sustainable economic growth from the marine renewables industry Marine Scotland is similar to the Planning Inspectorate and MMO but just covers Scotland. They publish all the paperwork related to Nationally Significant Infrastructure Projects (licences, consent orders, environmental statements (including EIA - containing processed data such as sediment types, species and habitats, but not raw data) on their website.			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		
126	**Marine Scotland Science**			
	Responsibilities and activities Marine Scotland Science (MSS), the scientific division of the Marine Scotland Directorate, plays an integral part in supporting the Scottish Government's vision of marine and coastal environments that are clean, healthy, safe, productive, biologically diverse and are managed to meet the long-term needs of both nature and people.			
	Role	✓ Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		
127	**The Crown Estate including Marine Data Exchange**			
	Responsibilities and activities The Crown Estate has a property portfolio encompassing many of the UK's cityscapes, ancient forests, farms, parkland, coastline and communities, The Crown Estate's role as employer, influencer, manager, guardian, facilitator and revenue creator is unique. It has two main objectives: to benefit the taxpayer by paying the revenue from our assets directly to the Exchequer; and to enhance the value of the estate and the income it generates. The estate extends throughout Britain and includes extensive marine assets throughout the UK, including 55% of the foreshore and all of the seabed out to the 12 nautical miles limit. Since 2018 Crown Estate Scotland was established as a separate organisation including responsibility for the seabed out to the 12 nautical mile limit. Seabed Survey Licence -Within the 12 nautical mile limit, all survey activity that interacts with the seabed requires a Seabed Survey Licence, unless the works fall within the public rights of navigation or fishing. Outside of 12 nautical mile (i.e. beyond the territorial limit) survey activity only requires a licence if it relates to an activity over which The Crown Estate holds rights, such as offshore renewable energy, marine mineral extraction, or gas and carbon storage. Non-commercial research activity outside 12 nautical miles does not require a licence. Coastal Survey licences provide permission to undertake a range of small scale commercial survey activities, interfering with the foreshore or seabed, usually for a period of up to 12 months. Marine Data Exchange, part of The Crown Estate, established in 2013, provides access to survey data and reports collected by offshore renewable and marine aggregates customers.			
	Role	Data producer	✓ Data owner	✓ Data holder
	Data policy in place	Yes		
128	**Marine Environmental Data and Information Network (MEDIN)**			
	Responsibilities and activities			

	MEDIN is a partnership of UK organisations committed to improving access to marine data. Partners are both public and private sector. MEDIN reports through the UK Marine Monitoring and Assessment Strategy to the UK Marine Science Coordination Committee (MSCC). MEDIN does not hold produce, own or hold any data directly but its discovery metadata portal provides information about 15,000 marine datasets. MEDIN delivers data through a network of accredited Data Archive Centres. It is responsible for the United Kingdom Directory of Marine Observing Systems (UKDMOS), a unique internet-based searchable database of marine monitoring conducted by UK organisations. In addition, MEDIN promotes the use of standardised field names and controlled vocabularies so that datasets are described in a consistent way for every type of marine data. NOTE: in the next question "What is their current role?", since a response is required, I have put "Data holder" as the MEDIN Data Archive Centres hold data. Coastal Survey licences provide permission to undertake a range of small scale commercial survey activities, interfering with the foreshore or seabed, usually for a period of up to 12 months. Marine Data Exchange, part of The Crown Estate, established in 2013, provides access to survey data and reports collected by offshore renewable and marine aggregates customers.			
	Role	Data producer	Data owner	✓ Data holder
	Data policy in place	Yes		

A. Appendix I Stakeholder Questionnaire

Country

What is the name of the stakeholder/organisation/institute?

What type are they?

What are the main responsibilities of the stakeholder in relation to marine monitoring and research data (e.g. give out licenses, do the monitoring, collect data, etc.)?

What is their current role?

- Data producer
- Data owner
- Date holder

Do they have a data policy (if yes, please insert a link to the document if available)?

Do they know about EMODnet Ingestion?

Would they like to collaborate with EMODnet Ingestion?

Do they have the capacity to participate?

Should they be invited to the final workshop?

B. Appendix II Overview of Identified Stakeholders per Country

Country	Questionnaire filled in	Number of stakeholders identified
Belgium	✓	4
Bulgaria	✓	4
Croatia	✓	9
Cyprus	✓	5
Denmark	✓	2
Estonia	✓	5
Finland	✓	3
France	✓	10
Georgia	✓	5
Germany	✓	6
Greece	✓	6
Iceland	✓	1
Ireland	✓	8
Israel	✓	3
Italy	✓	1
Latvia	✓	2
Malta	✓	3
Netherlands	✓	2
Norway	✓	1
Poland	✓	1
Portugal	✓	4
Romania	✓	5
Slovenia	✓	5
Spain	✓	1
Sweden	✓	16
Turkey	✓	3
UK	✓	18
Total		**128**