



EMODnet



European Marine
Observation and
Data Network

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

Quarterly Progress Report (6)

Reporting Period: 01/07/2023 – 30/09/2023



Contents

1. Highlights in this quarter	3
2. Identified issues: status and actions taken.....	12
EM-781: Data Flow and Process flow per use case for Data Ingestion	12
3. Communication assets	14
4. Monitoring indicators.....	15
5. Annex 1: List of platforms as ingested as part of EMODnet Ingestion – Physics cooperation.....	17
6. Annex 2: Deliverable D4.6 – Database about availability of license data per country	31

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1. Highlights in this quarter

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; and technical upgrades and improvements.

Early January 2023, the Central Portal has been launched, whereby all thematic portals have been de-activated and migrated to the Central Portal. Since early April 2023, a cooperation has started between EMODnet Ingestion, the Central Portal team and the EU to discuss a feasible migration and following deployment for EMODnet Ingestion. In the third Quarter, two meetings took place between EMODnet Ingestion and EU to provide more information about the architecture of two core services – Submission and Viewing services. As outcome the EU decided not to strive for full deployment of the Submission service at the Europa CP server, but for now to follow the approach as proposed by the CP team, which was discussed at a recent meeting - 9 October 2023 – between all three parties.

The current plan for deployment is given below, including some further analyses:

- The static content of the EMODnet Ingestion website will move to a dedicated section of the Central Portal, comparable to the dedicated sections for each of the Thematic Lots. The CP Team has already prepared a draft version on the CP development site, which EMODnet Ingestion will review and complete in cooperation with CP team;
- For the Submission service it has been decided to go for a deployment whereby a split will be made between the front end (user interface for submission forms) and the back end (database and management functions). Currently, there is a direct connection between these, but the split can be made by expanding the back end with a API which will interact with the front end. The back end, including the contents, and API will stay at the servers of HCMR, while the front end will be hosted at the CP servers at VLIZ. As a first step, EMODnet Ingestion will analyse the target situation and come up with a planning and efforts. The front end, also to be developed by EMODnet Ingestion, will be deployed at the CP test site by EMODnet Ingestion and once well tested and ok, will be migrated by VLIZ to the production CP site;
- For the Submission Viewing service it is planned to integrate its contents (full submission records) into the Central Portal Products Catalogue. Earlier a mapping analysis has been performed by HCMR, comparing the metadata formats of the Viewing service and the Products Catalogue, exploring how the published submission records might fit. The mapping analysis indicates that the Viewing service features multiple metadata fields which are not (yet) supported by the Products Catalogue. Also, the Submission service makes use of several controlled vocabularies and directories (such as EDMO, CSR, EDMERP). As follow up, the CP team will review the mapping analysis and together with EMODnet Ingestion will see how the format of the Products Catalogue might be expanded with extra tags to make it fit. Both catalogues are based on versions of the ISO 19115 model, so this seems to be feasible. The back-end of the Viewing service will continue to be operated and managed by MARIS and for the regular transfer to the CP Products Catalogue, MARIS is in favour of setting up a OAI-PMH service, which can be harvested by CP;
- The current Submission service makes use of SeaDataNet Marine-ID for AAI. In the new situation, this should be replaced with ECAS AAI. The CP Team will look into the technicalities of ECAS

deployment as this has to be done at the front end on the CP server. The EMODnet Ingestion team will then look into the technical connection with the back-end. In addition, an efficient plan will have to be made for migrating the current Marine-ID registered users to an ECAS account, while preserving the relations of each user with the contents in the Submissions database;

- The realtime viewer service, as developed and managed by EMODnet Physics together with EMODnet Ingestion, will continue to be hosted by ETT, and this will interact with the Central Portal Map Viewer by means of an OGC WMS – WFS exchange. EMODnet Physics will have two map folders, one for its mature phase 2 maps of physics stations and access to their metadata and data sets, and another one for the phase 1 maps as part of EMODnet Ingestion. In practice, the functionality for both types will follow a common principle with maps and options for filtering, using ERDDAP and OGC WMS-WFS services. In the coming time, EMODnet Physics will finalise reorganizing its overall set-up, after which a test deployment can be undertaken;
- For internal communication, the Ingestion consortium uses an extranet. This will be continued as before and separately from the Central Portal.

EMODnet Ingestion participated in a brainstorming meeting with DG MARE (18 July 2023) where the achievements of the project were discussed and brainstorming took place for future opportunities and interesting perspectives for the Ingestion network in light of the next EU programme 2028 – 2035.

MEDIN – MDE exchange to the Submission service: A new json file was formatted based on the latest communication, between MARIS, BODC and HCMR (May 2023) on the subject. The new JSON has been tested again for import into the Submission service. Most of the previous issues have been successfully addressed. A small number of issues remain, with the most important one being the licensing schema. Licensing terms' definition is an ongoing task, undertaken by The Crown Estate. Once this is settled, then the focus will be put towards the management functions for the MDE-MEDIN => INGESTION exchange process.

Task 2: Implement pathways for delivering data to final repositories

The total number of received submissions increased from 1466 to 1509, while the number of processed and published data submissions increased from 1334 to 1367, and of which, the number of fully elaborated data submissions went from 606 to 624 data. The KPI excel sheet provides more details.

Task 3: Facilitate machine-to-machine transfers

Activities continued as planned, and several additional operational stations (including river stations, gliders, and surface unmanned vehicles) have been integrated into the system. Specifically, as originally scheduled, we successfully completed the ingestion (phase 1) of iFado unmanned vehicles. Noteworthy among these developments is the inclusion of data from a river data provider: AUGAS DE GALICIA, XUNTA DE GALICIA (SPAIN). We also achieved the integration of more operational data from the IMOS-AODN network (Australia), with special thanks to our participation at the SOOS Symposium. Additionally, we've acquired data from Lyse AS (Norway), a company operating power plants in Norway, which has initiated data sharing with the INS SITU regional node. Notably there are many new buoys from the IABP (international arctic buoy program)



Figure 1. newly integrated platforms, 66 of which are already in INS TAC

Importantly, this M2M exercise has the final goal of setting up a connection between the provider and EMODnet in a way that, once it is in place, new data (from continuously operating platforms) and new platform data (from platforms with a given lifetime period, e.g., gliders, Argo, drifting buoys...) are available as soon as they start collecting/transferring data. For completeness, from now on, we are also reporting on the newly integrated platforms from these sources. Notably, this outcome is the result of joint activities between Ingestion, Physics, MIC TWG, INS TAC, with the support and contribution of many other integrators.

To support the centralization of services, the real-time demonstrator will follow the same approach already applied for EMODnet Physics. Hence, the SWE and other real-time data flows will be organized into an RT_Ingestion_collection on ERDDAP and on GeoServer. GeoServer will provide the Central Portal (CP) with WMS/WFS features (including platform position layers) that also offer HTML features (with metadata and variable plots). ERDDAP will support this feature by populating the charts with data.

Accessing this data may require updates to the CP filtering features, which will be based on a JSON file with layers and features to be used for queries.

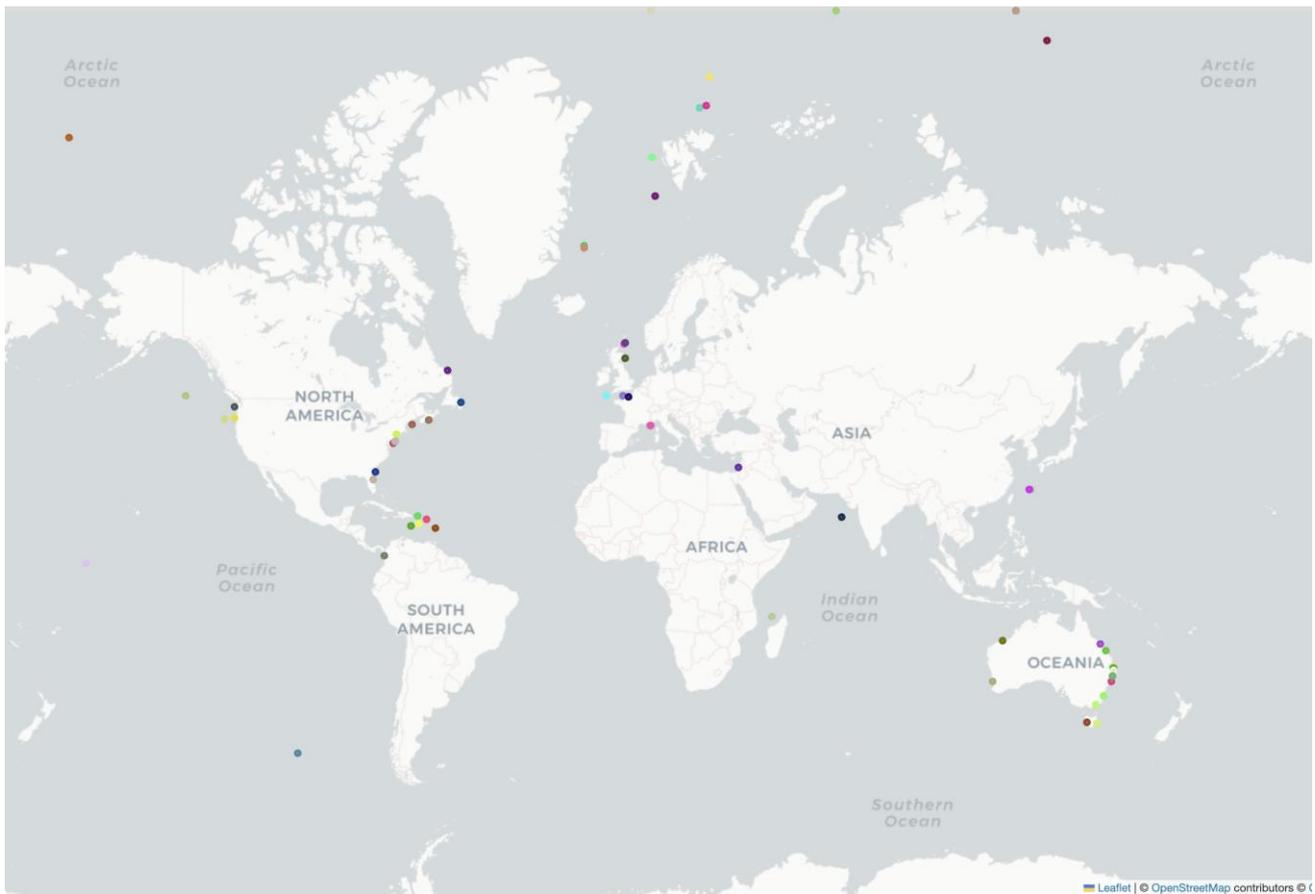


Figure 2. operational data in INS TAC (Ingestion phase 2 level 1)

See Annex 1 for a table listing all the platforms integrated during the reporting period.

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 four questions were received and answered. Three of those came in through the existing helpdesk system. As part of the migration, also use is made of the Central Portal Help Desk which runs through JIRA. This way, one additional question was received this quarter, which has been dealt with.

The Fisheries Research Institute, Greece, through the Ingestion Helpdesk expressed interest to share its data with EMODnet. The FRI is responsible for the MSFD implementation in the N. Aegean Sea MRU. As such it holds the data collected for all descriptors for that region. HCMR came in contact with FRI and discussed available options for such exchange. FRI is interested to join and become part of EMODnet Network. As next, HCMR will provide technical details on how to become a node at the SeaDataNet infrastructure and as such to contribute to EMODnet.

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

All coordinators of EMODnet Thematic projects are partners in EMODnet Ingestion which guarantees a mutual tuning with EMODnet Ingestion. Moreover, EMODnet Ingestion coordinators are involved in the communication of the EMODnet Steering Committee and Technical Working Group.

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.

Two poster abstracts have been submitted for the open EMODnet Jamboree conference, planned 29-30 November 2023 in Brussels – Belgium. One poster “All hands on deck to put your data to work” on the success stories of EMODnet DIP 3 compiling 12 country cases. The other one "Wake Up Your Data" used to communicate on EMODnet data ingestion process.

Furthermore, the promotion of the project through social and other media is being continued, for example, on 29 September, a news item has been published in Emodnet 2023 News Digest on “webODV - Online Analysis and Visualization of EMODnet Chemistry Data” (<https://ec.europa.eu/newsroom/emodnet/newsletter-archives/48035>)

At the same time, the promotion of data sharing is being proceeded through presentations on workshops and conferences, like during the EMODnet marine data for the coastal tourism sector workshop on 26-27 September 2023 which had the aim to connect the Coastal Tourism sector in Europe, from private to public sector, with EMODnet services, thus promoting data sharing by the coastal tourism sector of relevant marine environmental and human activities data.

EMODnet Ingestion participated in a follow-up meeting (8 September 2023) between EMODnet and Erasmus Maris about exchange of marine litter data. Data collection efforts by Erasmus Maris (including citizen science), metadata protocols exchange and subsequent data flow/data submission to EMODnet (Data Ingestion/Chemistry) were discussed and next actions were formulated.

A central document was prepared compiling all outreach activities and events in one large file as a google document. The file is shared with anyone with the link for collaboration and input for updating the outreach and events tables, like meetings or events, communication assets and scientific publications. The partners are being encouraged to continuously update the document with their latest outreach activities.

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

In this quarter, a first draft of deliverable D4.6 was delivered. This concerns establishing a user-friendly database that tracks the availability of license data in each participating country. This database is primarily oriented towards parameters relevant to coastal and offshore activities, particularly in the domains of

aquaculture and offshore energy. Its primary objective is to provide in-depth specifications and insights into the accessibility of data from all participating countries. The database is set up as an online spreadsheet, which allows EMODnet Ingestion partners to provide further entries and updates throughout the project's lifecycle, ensuring the most up-to-date information. The launch of the database comes with a short D4.6 document, which is added as Annex 2 to this quarterly report. When currently matching the available data to the different EMODnet themes, the focus was on Human Activities (19%), Biology (18%), and Chemistry (18%), while Geology accounts for only 3% of the collected data. Given the extensive list of over 80 parameters and topics provided, they have been consolidated for clarity and ease of reference, resulting in a total of 11 distinct sub-themes. The majority of the data pertains to Environmental and Impact Monitoring, with 446 parameters gathered across 20 countries.

Deliverable D4.6 and its findings are integral components for the ongoing roadmap development (scheduled for M12-M22). As key step in crafting the roadmap aimed at achieving a more harmonised approach, preparations for a workshop are already in progress, with the event itself expected to convene in January 2024. In the meantime, EMODnet Ingestion partners are encouraged to review and complement the contents of the database in order to get an extensive overview by the end of 2023 and before the Workshop.

See Annex 2 with Deliverable D4.6 with further information about the database.

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. The Q2 report has been prepared and submitted which was accepted by the EU.

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,e, f delivered; two others to do	M4, M7, M10, M13, M16, M19	
D0.2: Interim report	0.1	M12	Delivered and accepted	27 April 2023; amended 29 June 2023	
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	Underway		Delayed to M24 as agreed with EU
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		
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; integrated as Annex in Interim Report		

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

D3.2: Connections with new NRT and RT monitoring stations operational	3.1	M12, M24	Delivered; integrated as Annex in Interim Report		
D3.3: ERDDAP installation package	3.1	M12	Delivered.	M6	See Interim Report
D3.4: DAB installation package	3.1	M12	Under testing (see WHOS activity)		
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		See Interim Report
D4.1: Inventory updated of potential data sources and providers in European countries and priorities	4.1	M8	Delivered	M8	
D4.2: Updated promotion material	4.4	M12, M24	Regularly		
D4.3: Results of marketing and outreach activities	4.2	M12, M20	M12 integrated in Interim Report; M20 to be integrated in Final Report		
D4.4: Inventory of identified stakeholders for licensing data	4.3	M6	2 nd and largely improved version Delivered	M6, M8	
D4.5: Inventory of current license data practices	4.3	M14	Delivered	M15	Delivered with Q2-2023 report
D4.6: Database about availability of license data per country	4.3	M18	Delivered as first release with further action underway	M18	See Annex 2

D4.7: Reporting on license data Workshop	4.3	M22	To do		
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2. 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
EM-781: Data Flow and Process flow per use case for Data Ingestion	Resolved	Analysis done and reported on JIRA		5 Oct 2023
EM-782: Mapping of MetaData from DI to GeoNetwork	Pending	Ingestion made mapping which has to be reviewed by CP team how to make a fit	End Nov 2023	
EM-785: DI to provide information about the Physics SWE demonstrator	Pending	ETT busy with re-organisation of EMODnet Physics ERDDAP and OGC WMS-WFS services. Once set up ok, then discussion with CP team	End Oct 2023	
EM-768: An epic to collect together JIRA for the DIP centralisation	Pending	Folder to follow all DIP migration activities	End March 2024	
EM-783 Risk Analysis on using ECAS for whole DIP system	Pending	CP Team to analyse; results also relevant for DIP Submission service	End Nov 2023	
EM-305/322 Content Inventory Data Ingestion	Pending	CP team has made a narrative compilation and composed a first Ingestion narrative at CP test site for check and completion by DIP	End Feb 2024	

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

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3. Communication assets

[In Table A, list peer reviewed publications directly (co-)authored by consortium and project partners in the reporting period. In Table B, list all non-peer reviewed publications (co-)authored. In all cases, indicate the type of publication, provide the full reference incl. title, volume and issue etc., and whether the publication is open or closed access.]

A. (Co-)Authored peer-reviewed publications in the quarter					
Date of publication	Type of publication	Full reference	ISBN	DOI	Is it open access? Yes/No

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

For a compressive overview of publications referring to/making use of EMODnet data and/or data products, please consult Google Scholar.

4. 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 quarter is 33 and of this 18 were elaborated to phase 2. The overall number of published submissions went from 1334 to 1367.
What is your opinion on the data coverage within EMODnet for your thematic? B) Usage of data in this quarter	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.
	Cloud storage of Submission Viewing service	The total number of download transactions and volume decreased with ca 28% compared to the previous quarter, but is still considerable.
3. Internal and external organisations supplying/approached to supply data and data products within this quarter	Submission Viewing service	New data submissions were received from 8 organisations, mostly academic and research.
9) Visibility & analytics for web pages	Grafana	The visits to the Homepage, Submission service and Viewing service are quite stable in time.
10) Visibility & analytics for web sections	Grafana	The Viewing Service which publishes the completed submissions generates most traffic and this is quite stable over time. 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 daily visit duration for the Viewing service section went down from 50 sec to only 20 seconds, while the homepage went somewhat up.

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

5. Annex 1: List of platforms as ingested as part of EMODnet Ingestion – Physics cooperation

The following table lists the platforms integrated.

Name	Lat	Lon	Last value	Provider	Country	Integration date
Lakes entrance	-37,90	147,97	03/08/23	IMOS - AODN	AUS	24/07/23
Cape sorell	-42,20	145,05	03/08/23	IMOS - AODN	AUS	24/07/23
Maria island	-42,52	148,35	03/08/23	IMOS - AODN	AUS	03/08/23
Emu park	-23,30	151,07	03/08/23	IMOS - AODN	AUS	24/07/23
Gold coast	-27,97	153,45	03/08/23	IMOS - AODN	AUS	24/07/23
Palm beach	-28,10	153,48	03/08/23	IMOS - AODN	AUS	24/07/23
Tweed heads	-28,18	153,58	03/08/23	IMOS - AODN	AUS	24/07/23
Tweed offshore	-28,22	153,68	03/08/23	IMOS - AODN	AUS	24/07/23
Batemans bay	-35,75	150,32	03/08/23	IMOS - AODN	AUS	24/07/23
Crowdy head	-31,82	152,85	03/08/23	IMOS - AODN	AUS	24/07/23
Byron bay	-28,87	153,68	03/08/23	IMOS - AODN	AUS	24/07/23
Coffs harbour	-30,37	153,28	02/08/23	IMOS - AODN	AUS	24/07/23
Rottnest island	-32,10	115,40	02/08/23	IMOS - AODN	AUS	25/07/23
Hay point	-21,27	149,32	29/07/23	IMOS - AODN	AUS	24/07/23
Port-hedland	-20,17	118,51	26/07/23	IMOS - AODN	AUS	24/07/23
DendermondeDender	51,04	4,08	05/07/23	WATERINFO, BELGIUM	BEL	06/07/23
300234066891240	73,23	-130,58	04/10/23	Environment Canada	CAN	17/07/23
Drifting Buoy	54,59	-57,14	09/08/23	FISHERIES AND OCEANS CANADA	CAN	18/07/23
sama2	11,24	-74,22	04/10/23	DIRECCI\u00d3N GENERAL MAR\u00cdTIMA (COLOMBIA)	COL	28/09/23

leme	34,67	33,04	24/09/23	CYPRUS UNIVERSITY OF TECHNOLOGY	CYP	07/07/23
300534060151880	85,53	119,16	08/10/23	ALFRED WEGENER INSTITUTE HELMHOLTZ CENTRE FOR POLAR AND MARINE RESEARCH	DEU	25/08/23
300534064368480	88,27	61,65	05/10/23	ALFRED WEGENER INSTITUTE HELMHOLTZ CENTRE FOR POLAR AND MARINE RESEARCH	DEU	04/09/23
300234068164710	85,53	121,66	05/10/23	ALFRED WEGENER INSTITUTE HELMHOLTZ CENTRE FOR POLAR AND MARINE RESEARCH	DEU	07/08/23
300534060057710	85,55	121,92	05/10/23	ALFRED WEGENER INSTITUTE HELMHOLTZ CENTRE FOR POLAR AND MARINE RESEARCH	DEU	02/09/23
300534064364470	85,31	122,84	05/10/23	ALFRED WEGENER INSTITUTE HELMHOLTZ CENTRE FOR POLAR AND MARINE RESEARCH	DEU	04/09/23
300234068514740	84,17	132,13	05/10/23	ALFRED WEGENER INSTITUTE HELMHOLTZ CENTRE FOR POLAR AND MARINE RESEARCH	DEU	07/08/23
300434064564590	82,75	25,03	05/10/23	ALFRED WEGENER INSTITUTE HELMHOLTZ CENTRE FOR POLAR AND MARINE RESEARCH	DEU	22/09/23
300234060729780	85,45	122,66	04/10/23	ALFRED WEGENER INSTITUTE HELMHOLTZ CENTRE FOR POLAR AND MARINE RESEARCH	DEU	20/08/23
300234060727760	85,27	123,22	04/10/23	ALFRED WEGENER INSTITUTE HELMHOLTZ CENTRE FOR POLAR AND MARINE RESEARCH	DEU	20/08/23
300234060726880	85,48	122,16	04/10/23	ALFRED WEGENER INSTITUTE HELMHOLTZ CENTRE FOR POLAR AND MARINE RESEARCH	DEU	20/08/23
300234068166760	82,88	25,75	04/10/23	ALFRED WEGENER INSTITUTE HELMHOLTZ	DEU	07/08/23

				CENTRE FOR POLAR AND MARINE RESEARCH		
300534064364400	88,84	112,57	06/09/23	ALFRED WEGENER INSTITUTE HELMHOLTZ CENTRE FOR POLAR AND MARINE RESEARCH	DEU	04/09/23
SVP_BRST	78,87	7,31	03/10/23	EUROPEAN ORGANIZATION FOR THE EXPLOITATION OF METEOROLOGICAL SATELLITES	DEU	05/10/23
SVP_BRST	76,18	8,36	03/10/23	EUROPEAN ORGANIZATION FOR THE EXPLOITATION OF METEOROLOGICAL SATELLITES	DEU	05/10/23
BDC Vessel 28	40,93	-71,25	03/10/23	BERRING DATA COLLECTIVE	DNK	22/09/23
uper	72,79	-56,15	18/09/23	DANISH NATIONAL SPACE CENTRE, TECHNICAL UNIVERSITY OF DENMARK (DENMARK)	DNK	07/08/23
Grande_de_Camari nas	43,14	-9,11	02/10/23	AUGAS DE GALICIA, XUNTA DE GALICIA, SPAIN	ESP	03/08/23
Grova	42,11	-8,82	02/10/23	AUGAS DE GALICIA, XUNTA DE GALICIA, SPAIN	ESP	03/08/23
Minor	42,11	-8,77	02/10/23	AUGAS DE GALICIA, XUNTA DE GALICIA, SPAIN	ESP	03/08/23
BaixoUmia	42,52	-8,77	02/10/23	AUGAS DE GALICIA, XUNTA DE GALICIA, SPAIN	ESP	03/08/23
Lagares	42,22	-8,70	02/10/23	AUGAS DE GALICIA, XUNTA DE GALICIA, SPAIN	ESP	03/08/23
Anllons-Carballo	43,21	-8,69	02/10/23	AUGAS DE GALICIA, XUNTA DE GALICIA, SPAIN	ESP	03/08/23
Umia	42,60	-8,64	02/10/23	AUGAS DE GALICIA, XUNTA DE GALICIA, SPAIN	ESP	03/08/23
Barces	43,23	-8,32	02/10/23	AUGAS DE GALICIA, XUNTA DE GALICIA, SPAIN	ESP	03/08/23
Eume-Fragas	43,41	-8,06	02/10/23	AUGAS DE GALICIA, XUNTA DE GALICIA, SPAIN	ESP	03/08/23
Sor	43,62	-7,73	02/10/23	AUGAS DE GALICIA, XUNTA DE GALICIA, SPAIN	ESP	03/08/23

GrandeRibadeo	43,50	-7,08	02/10/23	AUGAS DE GALICIA, XUNTA DE GALICIA, SPAIN	ESP	03/08/23
larn2	34,93	33,64	05/10/23	BALEARIC ISLANDS UNIVERSITY, FACULTY SCIENCES	ESP	07/09/23
alex3	31,21	29,89	29/09/23	BALEARIC ISLANDS UNIVERSITY, FACULTY SCIENCES	ESP	07/09/23
elja1	33,26	-8,50	27/09/23	BALEARIC ISLANDS UNIVERSITY, FACULTY SCIENCES	ESP	07/09/23
tst2	41,60	2,62	19/09/23	BALEARIC ISLANDS UNIVERSITY, FACULTY SCIENCES	ESP	16/08/23
BenalupAlamo	36,36	-5,79	21/08/23	DIRECCION GENERAL DE INFRAESTRUCTURAS DEL AGUA, JUNTA DE ANDALUCIA, SPAIN	ESP	23/08/23
Other Ice Buoy	88,38	7,20	02/10/23	Alfred-Wegener-Institute for Polar- and Marine Research (AWI)	FRA	06/10/23
Other Ice Buoy	85,39	122,56	02/10/23	Alfred-Wegener-Institute for Polar- and Marine Research (AWI)	FRA	06/10/23
Sea030	43,09	6,51	20/07/23	Alseamar-Alcen	FRA	06/10/23
Sea037	42,98	7,12	12/07/23	Alseamar-Alcen	FRA	06/10/23
ptbc2	43,40	4,98	05/10/23	NAVY HYDROGRAPHIC AND OCEANOGRAPHIC SERVICE, MILITARY OCEANOGRAPHY CENTRE	FRA	03/10/23
Thio2	-21,61	166,24	04/10/23	NAVY HYDROGRAPHIC AND OCEANOGRAPHIC SERVICE, MILITARY OCEANOGRAPHY CENTRE	FRA	28/08/23
Le Precheur	14,81	-61,23	22/07/23	NAVY HYDROGRAPHIC AND OCEANOGRAPHIC SERVICE, MILITARY OCEANOGRAPHY CENTRE	FRA	24/07/23
Clarinbridge29004Clarinarin	53,23	-8,87	06/10/23	OPW HYDROMETRIC SECTION	IRL	22/08/23
kaso	35,42	26,92	07/10/23	ISRAEL ELECTRIC COMPANY	ISR	02/10/23

zkth	37,78	20,91	07/10/23	ISRAEL ELECTRIC COMPANY	ISR	29/09/23
smth	40,47	25,47	07/10/23	ISRAEL ELECTRIC COMPANY	ISR	25/09/23
efjm	18,18	-76,45	13/09/23	JAMAICAN METEOROLOGICAL SERVICE (JAMAICA)	JAM	21/08/23
kisr	29,35	48,09	04/10/23	KUWAIT INSTITUTE FOR SCIENTIFIC RESEARCH (KUWAIT)	KWT	07/08/23
masi2	20,68	58,87	07/10/23	DIRECTORATE GENERAL METEOROLOGY AND AIR NAVIGATION (OMAN)	OMN	10/08/23
300234061162580	84,19	56,71	20/09/23	ARCTIC AND ANTARCTIC RESEARCH INSTITUTE, ROSHYDROMET (SAINT- PETERSBURG)	RUS	16/08/23
SEA077_M25	58,45	19,82	09/10/23	Voice of the Ocean Foundation	SWE	07/10/23
SEA078_M15	58,45	18,81	09/10/23	Voice of the Ocean Foundation	SWE	07/10/23
SEA063_M65	55,33	16,07	09/10/23	VOICE OF THE OCEAN FOUNDATION	SWE	27/09/23
SEA079_M14	58,14	19,94	06/10/23	VOICE OF THE OCEAN FOUNDATION	SWE	07/09/23
SEA056_M64	55,57	16,35	27/09/23	VOICE OF THE OCEAN FOUNDATION	SWE	07/09/23
SEA044_M86	58,25	11,05	26/09/23	VOICE OF THE OCEAN FOUNDATION	SWE	15/09/23
SEA076_M19	58,52	18,47	15/09/23	VOICE OF THE OCEAN FOUNDATION	SWE	07/09/23
SEA044_M85	57,81	11,33	12/09/23	VOICE OF THE OCEAN FOUNDATION	SWE	23/08/23
SEA077_M24	58,15	19,98	06/09/23	VOICE OF THE OCEAN FOUNDATION	SWE	29/07/23
SEA078_M14	58,33	18,94	06/09/23	VOICE OF THE OCEAN FOUNDATION	SWE	28/07/23
SEA063_M63	55,61	16,31	06/09/23	VOICE OF THE OCEAN FOUNDATION	SWE	14/08/23

SEA044_M84	57,94	11,18	22/08/23	VOICE OF THE OCEAN FOUNDATION	SWE	04/08/23
SEA067_M46	55,57	16,35	11/08/23	VOICE OF THE OCEAN FOUNDATION	SWE	26/07/23
SEA069_M15	55,57	16,35	11/08/23	VOICE OF THE OCEAN FOUNDATION	SWE	26/07/23
SEA044_M83	57,80	11,31	03/08/23	VOICE OF THE OCEAN FOUNDATION	SWE	11/07/23
SEA063_M62	55,57	16,35	26/07/23	VOICE OF THE OCEAN FOUNDATION	SWE	10/07/23
Sea019	44,45	-63,36	28/09/23	Bedford Institute of Oceanography (BIO)	CAN	06/10/23
Sea024	48,16	-53,22	14/07/23	Bedford Institute of Oceanography (BIO)	CAN	06/10/23
SVP B MetOcean	71,81	-14,21	05/10/23	EIG EUMETNET	FRA	05/10/23
SVP B MetOcean	71,61	-14,10	05/10/23	EIG EUMETNET	FRA	05/10/23
Rosie	49,67	-140,42	19/09/23	Fisheries and Oceans Canada Marine Environmental Data Section (MEDS)	CAN	06/10/23
Sea083	-12,87	45,36	30/09/23	IFREMER Institut Francais de Recherche pour l'Exploitation de la Mer	FRA	06/10/23
SO FAR	26,58	127,24	13/08/23	KYOTO UNIVERSITY	JPN	01/08/23
SO FAR	26,37	127,15	31/07/23	KYOTO UNIVERSITY	JPN	01/08/23
SO FAR	26,35	126,85	31/07/23	KYOTO UNIVERSITY	JPN	01/08/23
Slocum G2	49,54	-7,07	02/07/23	National Oceanography Centre (Liverpool)	GBR	06/10/23
Coprolite	59,40	-0,92	02/10/23	National Oceanography Centre Southampton (NOC)	GBR	06/10/23
Slocum	56,76	-0,92	10/08/23	NATIONAL OCEANOGRAPHY CENTRE SOUTHAMPTON (NOC)	GBR	28/07/23
Cabot	59,22	-1,44	04/08/23	NATIONAL OCEANOGRAPHY CENTRE SOUTHAMPTON (NOC)	GBR	28/07/23

Slocum G2	59,41	-1,23	01/08/23	NATIONAL OCEANOGRAPHY CENTRE SOUTHAMPTON (NOC)	GBR	28/07/23
ng665	15,51	-68,97	28/09/23	NAVAL OCEANOGRAPHIC OFFICE (NAVO)	USA	18/07/23
ce_311	44,74	-124,65	14/09/23	OREGON STATE UNIVERSITY (OSU)	USA	29/07/23
ce_384	44,66	-127,98	06/08/23	OREGON STATE UNIVERSITY (OSU)	USA	29/07/23
osu551	47,18	-124,79	21/09/23	OREGON STATE UNIVERSITY COLLEGE OF EARTH OCEAN AND ATMOSPHERIC SCIENCES (CEOAS)	USA	22/09/23
iFADO_El_Hierro_Mar_Salitre_y_Lava	7,75	-41,67	07/10/23	PLATAFORMA OCEANICA DE CANARIAS (PLOCAN), EDUCATIONAL PASSAGES	ESP	18/07/23
iFADO_Buche_Salado_II	16,14	-22,72	24/07/23	PLATAFORMA OCEANICA DE CANARIAS (PLOCAN), EDUCATIONAL PASSAGES	ESP	18/07/23
300125061832760	78,96	-133,79	29/09/23	POLAR SCIENCE CENTER	UNKNOWN	03/10/23
ru40	39,22	-74,29	20/09/23	RUTGERS THE STATE UNIVERSITY OF NEW JERSEY INSTITUTE OF MARINE AND COASTAL SCIENCES	USA	05/07/23
franklin	31,45	-80,11	30/08/23	SKIDAWAY INSTITUTE OF OCEANOGRAPHY	USA	10/08/23
Sdeep01	38,98	0,60	05/09/23	SOCIB (Spain)	ESP	06/10/23
sbu01	39,34	-73,90	01/08/23	STONY BROOK UNIVERSITY	USA	08/07/23
bill	40,92	-73,63	09/09/23	UNIVERSITY OF CONNECTICUT (U.CONN)	USA	05/08/23
ud_476	38,70	-74,70	20/09/23	UNIVERSITY OF DELAWARE COLLEGE OF EARTH OCEAN AND ENVIRONMENT (CEOE)	USA	25/08/23
um_242	43,31	-68,55	21/08/23	UNIVERSITY OF MAINE	USA	07/08/23

4804109 drifting buoy	DBCP	81,52	22,37	26/08/23	UNIVERSITY OF WESTERN BRITTANY (UBO)	USA	24/08/23
7801712 drifting buoy	DBCP	81,63	24,45	26/08/23	UNIVERSITY OF WESTERN BRITTANY (UBO)	USA	24/08/23
300534063806270		88,28	21,06	08/10/23	UNKNOWN	UNKNOW N	25/08/23
300534063804120		79,11	125,22	08/10/23	UNKNOWN	UNKNOW N	22/09/23
300434066157890		79,92	-177,36	08/10/23	UNKNOWN	UNKNOW N	19/09/23
300434066254600		85,55	118,95	08/10/23	UNKNOWN	UNKNOW N	19/09/23
300434066151920		84,27	127,83	08/10/23	UNKNOWN	UNKNOW N	19/09/23
300534063054440		85,63	118,98	07/10/23	UNKNOWN	UNKNOW N	24/09/23
300534062891690		75,55	-160,21	07/10/23	UNKNOWN	UNKNOW N	30/07/23
300534062895700		76,58	-154,94	07/10/23	UNKNOWN	UNKNOW N	30/07/23
300534061784850		85,61	119,48	07/10/23	UNKNOWN	UNKNOW N	24/09/23
300534061780910		87,80	-0,02	06/10/23	UNKNOWN	UNKNOW N	24/09/23
300234066088170		87,81	0,21	05/10/23	UNKNOWN	UNKNOW N	03/09/23
300234068527600		82,68	24,43	05/10/23	UNKNOWN	UNKNOW N	28/08/23
300234060543140		84,19	131,82	05/10/23	UNKNOWN	UNKNOW N	25/08/23
300534061345540		84,19	131,82	05/10/23	UNKNOWN	UNKNOW N	24/09/23
300534063050430		88,27	60,38	05/10/23	UNKNOWN	UNKNOW N	24/09/23
300534063056460		85,50	121,89	05/10/23	UNKNOWN	UNKNOW N	24/09/23

300534061348580	87,11	34,31	05/10/23	UNKNOWN	UNKNOW N	24/09/23
300025060513230	88,27	62,07	05/10/23	UNKNOWN	UNKNOW N	24/09/23
300234066797650	87,18	36,84	04/10/23	UNKNOWN	UNKNOW N	03/09/23
300534063449630	70,73	-142,92	04/10/23	UNKNOWN	UNKNOW N	18/09/23
300534061808320	77,89	-128,01	04/10/23	UNKNOWN	UNKNOW N	06/08/23
300534064260620	85,04	45,86	04/10/23	UNKNOWN	UNKNOW N	23/08/23
300534063058450	88,14	16,59	03/10/23	UNKNOWN	UNKNOW N	28/08/23
300534061785890	88,13	13,55	03/10/23	UNKNOWN	UNKNOW N	28/08/23
300234061152630	88,33	7,24	03/10/23	UNKNOWN	UNKNOW N	02/09/23
300234060728940	88,16	16,83	03/10/23	UNKNOWN	UNKNOW N	25/08/23
300534063489680	84,48	82,25	03/10/23	UNKNOWN	UNKNOW N	07/08/23
300234060330560	85,47	122,33	03/10/23	UNKNOWN	UNKNOW N	15/08/23
300434066159880	88,27	68,24	03/10/23	UNKNOWN	UNKNOW N	19/09/23
300534061783870	86,49	33,30	02/10/23	UNKNOWN	UNKNOW N	28/08/23
300534062721510	85,40	122,38	02/10/23	UNKNOWN	UNKNOW N	20/08/23
300534063804280	88,08	0,66	02/10/23	UNKNOWN	UNKNOW N	25/08/23
300234066896250	83,18	28,37	02/10/23	UNKNOWN	UNKNOW N	15/08/23
300534063488700	86,56	49,48	02/10/23	UNKNOWN	UNKNOW N	02/09/23

300234066893230	88,27	68,79	02/10/23	UNKNOWN	UNKNOW N	03/09/23
300534063487700	87,82	94,64	02/10/23	UNKNOWN	UNKNOW N	02/09/23
300534063486690	83,85	111,21	02/10/23	UNKNOWN	UNKNOW N	07/08/23
300534063708990	81,19	155,84	02/10/23	UNKNOWN	UNKNOW N	12/07/23
300534063486700	84,36	95,23	01/10/23	UNKNOWN	UNKNOW N	07/08/23
300534063482680	86,31	115,37	01/10/23	UNKNOWN	UNKNOW N	25/08/23
300534063488690	84,26	121,13	01/10/23	UNKNOWN	UNKNOW N	25/08/23
300234068760760	83,17	-52,94	29/09/23	UNKNOWN	UNKNOW N	08/09/23
300534063485680	88,66	51,04	28/09/23	UNKNOWN	UNKNOW N	02/09/23
300534062897690	57,74	-152,50	15/08/23	UNKNOWN	UNKNOW N	17/08/23
300534062893740	73,78	-156,30	05/08/23	UNKNOWN	UNKNOW N	30/07/23
noat	37,97	23,72	05/10/23	UNKNOWN	UNKNOW N	05/07/23
plop	-1,56	-80,82	04/10/23	UNKNOWN	UNKNOW N	08/08/23
dni7	14,43	89,33	04/10/23	UNKNOWN	UNKNOW N	28/09/23
dcld	-26,74	-73,98	04/10/23	UNKNOWN	UNKNOW N	14/09/23
tst1	41,60	2,62	16/09/23	UNKNOWN	UNKNOW N	21/07/23
Drifting Buoy	3,71	-171,78	05/10/23	UNKNOWN INSTITUTION	UNKNOW N	04/10/23
4701564	79,99	-177,13	04/10/23	UNKNOWN INSTITUTION	UNKNOW N	06/10/23

4701562	82,87	25,64	04/10/23	UNKNOWN INSTITUTION	UNKNOW N	06/10/23
4701565	88,27	65,59	04/10/23	UNKNOWN INSTITUTION	UNKNOW N	06/10/23
4701563	84,15	132,38	04/10/23	UNKNOWN INSTITUTION	UNKNOW N	06/10/23
4701566	85,40	122,61	03/10/23	UNKNOWN INSTITUTION	UNKNOW N	06/10/23
SG683	18,78	-66,81	06/09/23	UNKNOWN INSTITUTION	UNKNOW N	18/07/23
ng267	17,62	-64,13	04/09/23	UNKNOWN INSTITUTION	UNKNOW N	27/08/23
41070 NDBC DAC wave moored buoy	29,29	-80,80	04/10/23	UNKNOWN INSTITUTION	UNKNOW N	06/10/23
MOORED BUOY	18,32	67,36	21/08/23	UNKNOWN INSTITUTION	UNKNOW N	28/07/23
300534063804290	81,09	141,97	08/10/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	21/09/23
300534063805140	79,70	167,45	08/10/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	14/09/23
300534063016440	59,29	-171,17	07/10/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	26/08/23
300534063016430	59,16	-167,68	07/10/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	31/08/23
300534062196230	87,57	16,62	07/10/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	04/08/23
300534061985530	80,89	132,85	07/10/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	21/09/23
300534062021930	81,60	161,20	07/10/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	15/07/23
300534061984520	87,58	-117,75	07/10/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	13/07/23
300234066691600	75,59	-154,34	05/10/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	23/08/23
300234066690590	75,17	-145,43	05/10/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	05/08/23

300534063014500	73,91	-179,14	04/10/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	14/07/23
300534063015410	72,36	-175,19	04/10/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	14/07/23
300534063013420	75,10	-171,14	04/10/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	14/07/23
300534062126820	78,61	-169,16	04/10/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	13/07/23
300534062129810	79,65	-162,65	04/10/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	14/07/23
300534061986530	76,33	-150,42	04/10/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	15/07/23
300534062124450	84,44	131,58	04/10/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	24/08/23
300534063803110	80,44	143,36	04/10/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	21/09/23
300534063803130	80,95	155,38	04/10/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	21/09/23
300534062129820	82,33	163,71	04/10/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	13/07/23
300534063016400	57,35	-171,59	03/10/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	02/09/23
300534063016420	56,70	-166,74	03/10/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	31/08/23
300534062029650	80,32	-153,64	03/10/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	30/08/23
300534062129440	81,58	-176,88	02/10/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	13/07/23
300534063015400	83,61	-173,93	02/10/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	14/07/23
300534062192260	88,40	7,14	02/10/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	09/09/23
300534062125830	84,55	124,58	02/10/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	24/08/23
300534063012420	83,50	168,19	02/10/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	14/07/23

300534063909060	57,29	-167,71	01/10/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	25/08/23
300434065784440	75,72	-174,64	27/09/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	30/06/23
300534061512090	77,11	-154,74	23/09/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	15/07/23
300234062735030	80,52	-168,50	23/09/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	17/07/23
300534061801260	71,32	-156,61	22/09/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	22/08/23
300534062128440	80,93	151,02	13/09/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	13/07/23
300534061614250	77,19	-159,64	09/09/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	15/07/23
300534063018420	78,60	176,32	05/09/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	13/07/23
300534062722770	89,81	88,41	21/08/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	19/08/23
300534061094020	57,74	-152,50	16/08/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	17/08/23
300434065788560	77,17	-168,17	13/07/23	US INTERNATIONAL ARCTIC BUOY PROGRAM	USA	14/07/23
dgum2	12,99	132,17	04/10/23	NATIONAL OCEAN SERVICE-NOAA (USA)	USA	26/07/23
dgum	12,99	132,17	04/10/23	NATIONAL OCEAN SERVICE-NOAA (USA)	USA	26/07/23
dtok	30,53	152,07	04/10/23	NATIONAL OCEAN SERVICE-NOAA (USA)	USA	12/07/23
dphi2	20,69	132,16	26/07/23	NATIONAL OCEAN SERVICE-NOAA (USA)	USA	24/07/23
dtok2	30,53	152,07	12/07/23	NATIONAL OCEAN SERVICE-NOAA (USA)	USA	12/07/23
vsfb	34,56	-120,61	04/10/23	UNIVERSITY OF HAWAII SEA LEVEL CENTER (USA)	USA	30/08/23
300234066439220	-47,20	-169,72	14/09/23	ATLANTIC OCEANOGRAPHIC AND METEOROLOGICAL LABORATORY , NATIONAL OCEANIC AND	USA	05/09/23

				ATMOSPHERIC ADMINISTRATION		
300234063792990	-32,21	-136,23	01/09/23	ATLANTIC OCEANOGRAPHIC AND METEOROLOGICAL LABORATORY , NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	USA	31/07/23
SG666	16,44	-66,49	25/09/23	ATLANTIC OCEANOGRAPHIC AND METEOROLOGICAL LABORATORY , NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	USA	14/07/23
BDC Vessel 28	40,93	-71,25	03/10/23	GULF OF MAINE LOBSTER FOUNDATION, NOAA FISHERIES	USA	19/09/23
Drifting Buoy	-49,22	-104,82	04/10/23	Scripps Institution of Oceanography La Jolla (SIO)	USA	06/10/23
Drifting Buoy	6,27	-77,45	16/09/23	SCRIPPS INSTITUTION OF OCEANOGRAPHY LA JOLLA (SIO)	USA	16/09/23

6. Annex 2: Deliverable D4.6 – Database about availability of license data per country



EMODnet Ingestion and Safe-Keeping of Marine Data - Phase III

D4.6 Database about availability of license data per country

Technical Report

September 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.



EMODnet Ingestion III Project Information	
Project full title	EMODnet Ingestion and Safe-Keeping of Marine Data - Phase III
Grant agreement number	CINEA/EMFAF/2021/3.4.10/02/SI2.868290
Project coordinator	Dick Schaap (MARIS)
Project start date and duration	01-04-2022 (24 months)
Project website	https://www.emodnet-ingestion.eu/

Deliverable Information	
Work package number	4
Work package title	Marketing and Outreach
Deliverable number	4.6
Deliverable title	Database about availability of license data per country
Description	The objective of Deliverable 4.6 was to create an easily searchable database centred on coastal and offshore activities, particularly aquaculture and offshore energy. This database includes vital parameters for these sectors and offers extensive data from different countries. It will be regularly updated for continued relevance. This deliverable offers foundational information and further clarification.
Lead beneficiary	Deltares
Lead Author(s)	David Geurts, Sonja Wanke
Contributor(s)	EMODnet Ingestion consortium members
Revision number	0.2
Revision Date	29 September 2023
Status	Final
Dissemination level	Public

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Table of Contents

1	Introduction.....	1
2	The Importance of Standardisation and Definitions	2
3	Database Structure and Glossary.....	3
4	Conclusion and Next Steps	10

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, research organisations, industry, and civil society.

However, many data collected by public authorities, researchers and private operators of coastal and/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 voluntarily for safekeeping to data repositories from where it can be freely disseminated.

Task 9, a part of Work Package 4 (WP4) - Marketing and Outreach Activities, is dedicated to improving and documenting the availability of data for coastal and offshore licensing procedures. This task aims to address the challenges associated with licensing processes for coastal and offshore activities, ensuring that relevant and comprehensive data is accessible to support informed decision-making.

The two previous tasks focused on identifying stakeholders that give out licences/permits for coastal and offshore activities, monitoring or collecting data (D4.4), and identifying licensing procedures for European countries (D4.5). This task aimed to establish a user-friendly searchable database focusing on coastal and offshore activities, with a specific emphasis on aquaculture and offshore energy sectors. The database documents crucial parameters essential for these activities, ensuring comprehensive coverage and accessibility of data from various countries. This [database](#) will continuously evolve, updating with new information for ongoing relevance and usefulness. This deliverable serves as foundational context and provides additional clarification.

2 The Importance of Standardisation and Definitions

In the realms of offshore aquaculture and renewable energy, navigating through licensing procedures can be a daunting task. One of the prime challenges is ensuring that all stakeholders, from energy companies to marine farmers, have a consistent and clear understanding of the licensing requirements. Establishing a well-structured database is a step forward in ensuring that misunderstandings and inconsistencies, which can impede or even derail licensing processes, are kept at bay. This centralized system acts as a repository of accurate and timely information, thus streamlining the often convoluted licensing procedures.

As more countries tap into the potential of offshore aquaculture and renewable energy, there is an increasing need for cross-country data comparison and analysis. Licensing norms, while rooted in local regulatory environments, can gain significantly from global benchmarks. A standardized database, which could encapsulate best practices and procedures from various countries, can be a cornerstone in optimizing and refining licensing norms. Such a framework ensures that nations while adhering to their local contexts, are also informed by global best practices.

The importance of standardized parameters cannot be stressed enough, especially in industries as critical and dynamic as offshore renewable energy and aquaculture. Given the intricate interplay of environmental, economic, and technological considerations in these sectors, licensing must be underpinned by a robust set of standards. A centralized database ensures that these standards are not just documented but are also accessible and universally applied, fostering consistency across projects.

Given the jargon-heavy nature of these sectors, it is vital to establish a common glossary for key terms and parameters related to licensing. Misinterpretation or misapplication of specific terms can have significant repercussions, ranging from legal disputes to environmental concerns. A standardized database that houses a comprehensive glossary ensures that all stakeholders, be they regulators, applicants, or consultants, have a unified reference point. Such clarity is indispensable in ensuring that licensing procedures run smoothly and effectively.

Finally, considering the pivotal role of data sharing and comparative analysis in refining and optimizing licensing procedures, the merits of standardization become even more pronounced. A database tailored for this purpose not only aids stakeholders in accessing and sharing vital information but also paves the way for comparative analysis. Such insights can be instrumental in enhancing the efficacy, transparency, and robustness of licensing procedures for offshore aquaculture and renewable energy, ensuring that they are both industry-friendly and environmentally sound.

3 Database Structure and Glossary

A database is a structured collection of organized and interconnected data that is designed to be easily accessed, managed, and updated. It serves as a central repository for storing information systematically and efficiently. Databases are used to store various types of data, such as text, numbers, images, and more, and they allow users to perform operations like querying, adding, updating, and deleting data. Based on the information that was provided by the consortium members and stakeholders during the previous task, a simple database structure could be set up.

The database structure is designed to efficiently organize and manage information using a series of key parameters. It is primarily organized around the following fields:

- Country: denoting the geographic location
- Activity: indicating the specific type of activity (renewable energy or aquaculture)
- Phase: categorizing the stage of the activity (site selection, licensing and planning, construction and installation, and operation and maintenance)
- Data collected: detailing if information is collected in a certain country and phase
- Data publicly available: specifying whether the data is accessible to the public
- Theme: highlighting the overarching topic based on the EMODnet Portals (Bathymetry, Chemistry, Biology, Geology, Physics, Human Activities and Seabed Habitats)
- Sub-theme: grouping of the different parameters
- Specifications: providing further granularity within the thematic context
- Link: offering a reference or hyperlink to the data source
- Last updated: recording the date of the most recent data update.

Glossary

Term	Definition
Ammunition	Ammunition refers to the physical materials, such as bullets, shells, or cartridges, used in firearms and other weapons to propel projectiles.
Anthropogenic Elements	Anthropogenic elements are chemical elements or compounds that result from human activities, such as industrial pollution, and can have environmental and health impacts.
Archaeology	Archaeological data includes artifacts, fossils, structures, and other physical evidence from past human civilizations, providing insights into historical cultures and societies.
Bathymetry	Bathymetry is the measurement and mapping of underwater depths and topography, usually of ocean floors, lakes, or rivers.
Benthic Ecology	Benthic ecology is the study of organisms and ecosystems that inhabit the bottom of aquatic environments, including ocean floors, lakes, and rivers.
Benthos	Benthos refers to the community of organisms living on or near the seabed, lakebed, or riverbed, including plants, animals, and microorganisms.
Biodiversity	Biodiversity includes information about the variety of species and ecosystems in a specific area, helping to assess and monitor the health of ecosystems.

Biology	Biological data encompasses information about living organisms, including their behavior, genetics, population dynamics, and ecological interactions.
Bird Survey	A bird survey is a systematic collection of data on bird species, populations, and behaviors in a particular geographic area, aiding conservation and ecological research.
Birds:	Birds are warm-blooded, feathered vertebrates belonging to the class Aves, characterized by beaks, wings, and the ability to fly in most species.
Bird Migration	Bird migration refers to the seasonal movement of birds between breeding and non-breeding areas, often covering vast distances.
Bottom Mapping	Bottom mapping involves the creation of maps or charts that display the characteristics and contours of the seafloor, lakebed, or riverbed.
Carrying Capacity:	Carrying capacity is the maximum population size an ecosystem can sustain over a given period without degrading its environment or resources.
Chemical Conditions	Chemical conditions refer to the composition and concentration of chemical substances, such as pollutants or nutrients, in an environment.
Chlorophyll a	Chlorophyll a is a green pigment found in photosynthetic organisms, crucial for capturing light energy during photosynthesis.
Coastal Processes	Coastal processes are natural phenomena and human activities that shape and influence the dynamic environments where land meets the sea.
Construction	Construction data includes information related to the building and development of structures, infrastructure, and facilities.
Currents	Currents are the continuous, directional movements of water or air in the Earth's oceans and atmosphere, affecting climate and navigation.
Dissolved Oxygen	Dissolved oxygen is the amount of oxygen present in a liquid, such as water, and is vital for the survival of aquatic organisms.
Ecology	Ecological data encompasses information about the interactions between organisms and their environments, including factors like population dynamics and species relationships.
Ecological Survey	An ecological survey is a systematic collection of data aimed at understanding the structure and function of ecosystems and their components.
Economy	Economic data comprises information related to financial activities, such as production, consumption, trade, and economic indicators.
EIA (Environmental Impact Assessment)	EIA is a process that evaluates the potential environmental effects of proposed projects, policies, or activities to inform decision-making and mitigate negative impacts.
Emissions	Emissions refer to the release of substances, often pollutants or greenhouse gases, into the atmosphere. These can originate from various

	sources, including industrial processes, vehicles, power plants, and natural phenomena.
Energy Generation	Energy generation refers to the production of electrical or mechanical energy from various sources, such as fossil fuels, renewables, or nuclear power.
Energy Production	Energy production is the process of generating usable energy from different sources, meeting the demands of society.
Environmental Data	Environmental data encompasses information about the natural world, including factors like climate, ecosystems, pollution, and weather patterns.
Environmental Monitoring	Environmental monitoring involves the systematic collection and analysis of data to track changes in environmental conditions and assess the impact of human activities.
Environmental Studies	Environmental studies is an interdisciplinary field that explores the relationship between humans and their environment, addressing environmental issues and sustainability.
Epifauna	Epifauna are organisms that live on the surface of substrates, such as rocks or the seabed, in aquatic environments.
Feed Utilization	Feed utilization involves assessing how efficiently animals, such as fish or livestock, convert their food into growth or energy.
Fish	Fish are aquatic vertebrates with gills, fins, and scales, belonging to the class Pisces, and are an essential food source worldwide.
Fish Health	Fish health refers to the physical and physiological well-being of fish species, including disease resistance, growth, and overall condition.
Flora and Fauna	Flora encompasses the plant life of a particular region, while fauna refers to the animal life, collectively describing the biological diversity of an area.
Geology	Geological data comprises information about Earth's composition, structure, and history, often used in geological research and exploration.
Geomorphology	Geomorphology is the study of landforms, their origins, development, and evolution, often related to geological processes.
Geophysical	Geophysical relates to the branch of Earth science that studies physical properties and processes of the Earth, such as seismic activity or magnetic fields.
Geophysical and Geotechnical Survey	A survey that collects data on Earth's physical properties and geological characteristics, useful for construction and environmental assessments.
Geospatial	Geospatial data comprises information tied to specific geographic locations, often used in mapping, navigation, and spatial analysis.

Geotechnical	Geotechnical data provides insights into the mechanical and thermal properties of the Earth's subsurface, crucial for construction and infrastructure projects.
Hydrobiological	Hydrobiological data includes information on aquatic life, particularly organisms living in freshwater or marine environments.
Hydrochemical	Hydrochemical data consists of information about the chemical composition of water bodies, including rivers, lakes, and oceans.
Hydrodynamic	Hydrodynamic data encompasses measurements of the movement and flow of fluids, such as water or air, often used in fluid dynamics studies.
Hydrography	Hydrography data involves the mapping and charting of bodies of water, detailing their depth, shoreline, and underwater features.
Hydrology	Hydrology is the scientific study of water, focusing on its occurrence, distribution, movement, and properties in various forms.
Ichthyofauna	Ichthyofauna refers to the fish species present in a specific region or ecosystem.
Intertidal Ecology	Intertidal ecology examines the organisms and ecological processes in the areas that are periodically submerged and exposed by tides.
Level of Uneaten Feed Accumulating on Seabed	This phrase relates to the assessment of the amount of unconsumed food settling on the seabed, which can impact the marine environment.
Marine Biodiversity	Marine biodiversity encompasses the variety of species and ecosystems present in the world's oceans and coastal areas.
Marine Litter	Marine litter refers to the accumulation of human-made waste materials in marine environments, including plastics and debris.
Marine Mammals	Marine mammals are warm-blooded animals that live in aquatic environments, such as whales, dolphins, seals, and sea lions.
Marine Megafauna	Marine megafauna includes large marine organisms like whales, sharks, and sea turtles, which play essential ecological roles.
Meteorological Data	Meteorological data includes information about weather patterns, atmospheric conditions, and climatic phenomena.
Metocean Data	Metocean data encompasses data related to meteorology and oceanography, often used in offshore operations and planning.
Monitoring Data	Monitoring data consists of ongoing observations and measurements used to assess and track changes in specific parameters or conditions.
Monitoring Program	A monitoring program is a systematic plan for collecting data over time to assess and manage environmental, ecological, or industrial processes.
Noise	Noise refers to unwanted or disruptive sound that can affect ecosystems, human health, and wildlife.

Nutrient Levels	Nutrient levels indicate the concentrations of essential substances, like nitrogen and phosphorus, in an ecosystem, which can influence plant and animal growth.
Oceanographic	Oceanographic data includes information about the physical and chemical properties of the ocean, helping scientists understand marine environments.
Onshore	Onshore refers to activities or locations that are situated on or near the land, as opposed to offshore activities or those conducted in bodies of water.
Oxygen	Oxygen is a chemical element essential for respiration and the survival of most organisms on Earth.
Performance Data	Performance data includes information about how well a system, process, or organism functions or operates.
Physical	Physical data encompasses measurements and observations related to the physical properties of materials, substances, or environments.
Production	Production is the process of creating goods or services, often referring to manufacturing or the generation of energy.
Salinity	Salinity refers to the salt concentration in water, which can vary in different aquatic environments.
Sand/Gravel Resources	Sand and gravel resources are naturally occurring materials used in construction and various industrial applications.
Seabed	The seabed is the bottom surface of an ocean, sea, or other large bodies of water.
Seabed Composition	Seabed composition describes the makeup and characteristics of materials that form the seafloor.
Seabed Conditions	Seabed conditions refer to the physical and chemical characteristics of the ocean or sea floor, influencing marine ecosystems.
Seabirds	Seabirds are birds that primarily inhabit marine environments, often nesting on coastal cliffs and islands.
Sediment Quality	Sediment quality refers to the condition and composition of particles and materials that settle on the seabed or riverbed.
Sediment Type	Sediment type data describes the characteristics and classification of particles or materials in sedimentary environments.
Sedimentology	Sedimentology is the scientific study of sedimentary rocks, including their formation, composition, and environmental history.
Shipping and Navigation	Shipping and navigation involve the movement of vessels, ships, and boats on waterways, oceans, and seas for transportation and commerce.
Socio-economic	Socio-economic data includes information about the social and economic conditions, activities, and impacts within a specific region or community.

Socio-economic Impact	Socio-economic impact refers to the consequences of a project, policy, or activity on the social and economic well-being of a community or region.
Soil Composition	Soil composition refers to the arrangement and types of mineral and organic materials in the Earth's top layer, influencing plant growth and land use.
Species	A species is a fundamental unit of biological classification, consisting of individuals capable of interbreeding and producing fertile offspring.
Species Diversity and Abundance of Megafauna	This phrase relates to the variety and population levels of large marine animals (megafauna) in a specific area or ecosystem.
Surveillance Fauna Types	Surveillance fauna types likely refer to the monitoring and observation of specific animal species for research or conservation purposes.
Swell	Swell refers to long-period ocean waves that have traveled a significant distance from their source and are characterized by a regular, rhythmic pattern.
Technical Parameters	Technical parameters are specific and measurable factors or characteristics used to describe or assess the performance of a system or process.
Temperature	Temperature is a measure of the warmth or coldness of a substance or environment and has a significant impact on biological and physical processes.
Tides	Tides are the periodic rising and falling of sea levels caused by gravitational interactions between the Earth, Moon, and Sun.
Total Nitrogen	Total Nitrogen (TN) is a measurement that includes all forms of nitrogen compounds present in a sample, often used to assess water quality.
Total Organic Carbon	Total Organic Carbon (TOC) refers to the sum of all carbon-containing compounds in a sample, commonly used in environmental and water quality assessments.
Total Phosphorous	Total Phosphorous (TP) is a measurement that includes all forms of phosphorus compounds present in a sample, often used in water quality analysis.
Total Suspended Solids	Total Suspended Solids (TSS) refer to the particles and materials suspended in a liquid, typically measured in water quality assessments.
Turbidity	Turbidity is a measure of the cloudiness or haziness of a liquid, caused by the presence of suspended particles, which can affect water quality.
Underwater Noise	Underwater noise consists of sound emissions and disturbances that occur in aquatic environments, potentially impacting marine life.
Water Column Profile	A water column profile is a graphical representation of water properties, such as temperature and salinity, at various depths within a body of water.

Water Quality	Water quality refers to the condition and characteristics of water, often assessed based on factors like clarity, purity, and the presence of contaminants.
Weather Conditions	Weather conditions encompass the current atmospheric state, including factors like temperature, humidity, wind, and precipitation.
Wind Resources	Wind resources refer to the availability and energy potential of wind for purposes such as electricity generation through wind turbines.
Wind Speed and Direction	Wind speed and direction are measurements of the velocity and compass orientation of wind, crucial for understanding atmospheric dynamics.
Wrecks	Wrecks are the remains of sunken ships, aircraft, or other objects, often of historical or archaeological interest.

4 Conclusion and Next Steps

This deliverable focused on the development of a straightforward database that chronicles license data availability for each country. This database primarily centres on parameters relevant to coastal and offshore activities, especially aquaculture and offshore energy. It aims to provide detailed specifications and insights regarding data accessibility from every participating country.

The database will remain consistently accessible to project collaborators and interested parties, guaranteeing real-time updates and enabling the continual incorporation of data throughout the project's lifecycle and into the future. This ensures that the database provides the most comprehensive and up-to-date picture possible. A brief summary of some of the different data that is being collected per EMODnet theme can be found in Figure 1. Most of the data is collected for Human Activities (19%), Biology (18%) and Chemistry (18%). While only 3% are collected for Geology.

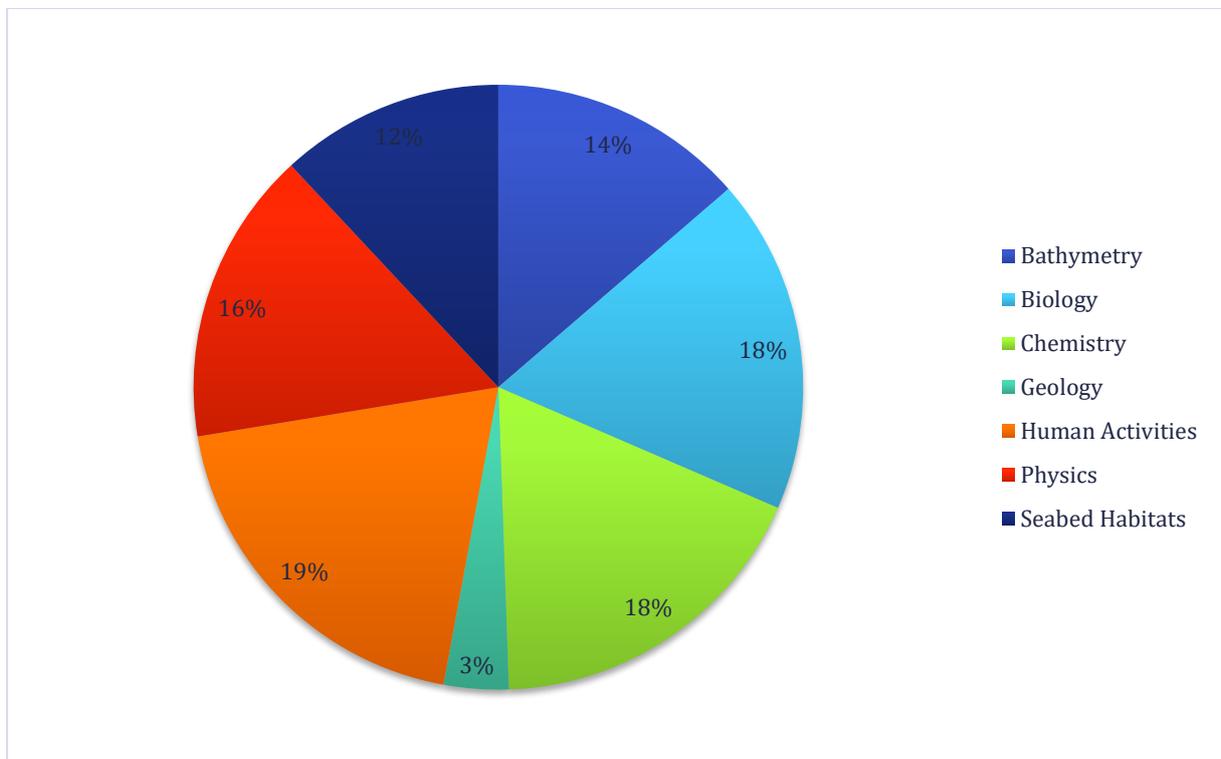


Figure 1: Overview of database data per theme for offshore aquaculture and renewable energy

Given the extensive list of over 80 parameters and topics provided, they have been consolidated for clarity and ease of reference, resulting in a total of 11 distinct sub-themes. The majority of the data pertains to Environmental and Impact Monitoring, with 446 parameters gathered across 20 countries (Figure 2).

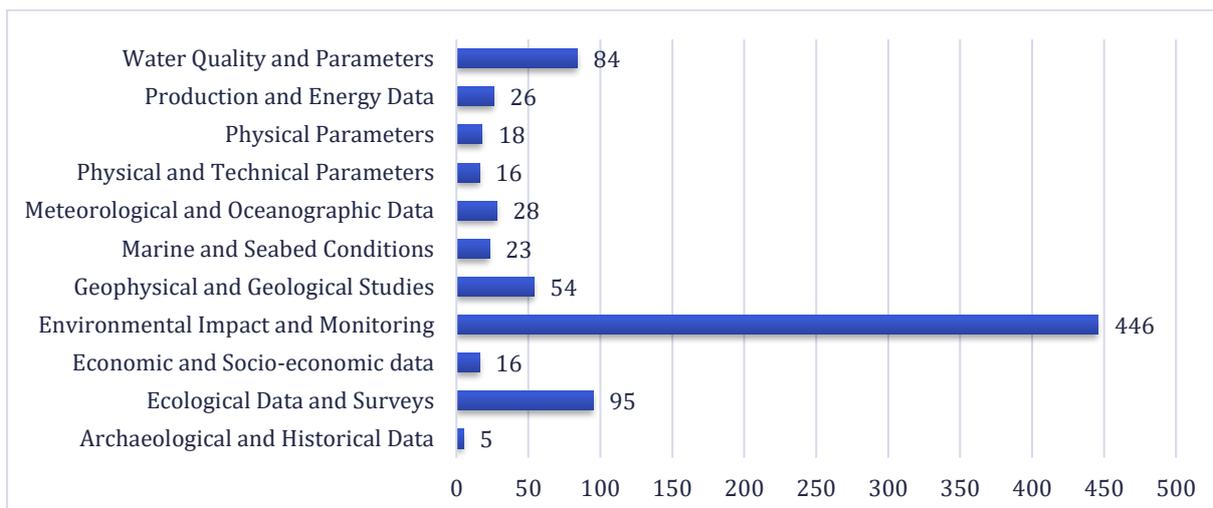


Figure 2: Overview of data entries per sub-theme for offshore aquaculture and renewable energy

In a comparative analysis, offshore aquaculture activities account for 59% of the data collected, while offshore renewable energy contributes to the remaining 41%. Notably, there are variations in data collection across the four phases pertinent to offshore licensing, as illustrated in Figure 3 and Figure 4. For aquaculture, the bulk of the data, 34%, is gathered during the *Licensing and Planning* phase. In contrast, renewable energy sees its highest data collection, at 35%, during the *Operation and Maintenance* phase.

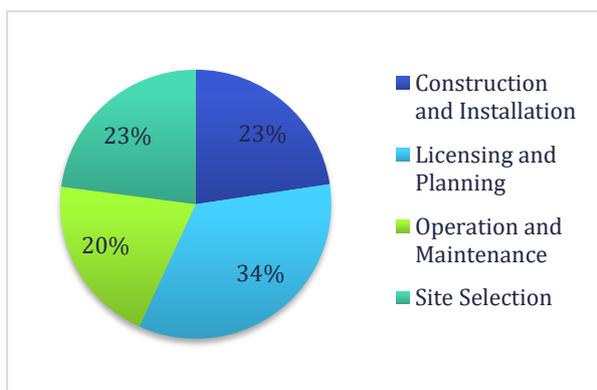


Figure 3: Overview of data entries in the database per phase for offshore aquaculture



Figure 3: Overview of data entries in the database per phase for offshore renewable energy

Transitioning to the next phase, Deliverable 4.7 plans to organize a workshop to present findings on license data. The overarching goal of this workshop is to encourage countries to adopt a more standardized approach to license data, fostering consistency both between and within Member States. While the workshop's date is set for the future, proactive measures are already in place to gather contact details of potential stakeholders. Insights from Deliverables 4.4 and 4.5 play a crucial role in identifying these participants. In the upcoming period, the specific goals and content of the workshop will be determined in collaboration with consortium partners.