



EMODnet



European Marine
Observation and
Data Network

EMODnet Thematic Lot n° V – Biology

CINEA/EMFAF/2022/3.5.2/SI2.895681

Start date of the project: 10/05/2023 (24 months)

Centralisation Phase

Quarterly Progress Report (QR30)

Reporting Period: 01/07/2024 – 30/09/2024



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1. Highlights in this quarter

Task 1: Maintain and improve a common method of access to data held in repositories

During the reporting period, a major data harvest was carried out in celebration of the EurOBIS 20th anniversary, bringing a total of 100 datasets into EMODnet Biology, from which 71 are new and 29 are updated datasets, from both partners and ad-hoc data providers. This data harvest increased the EMODnet Biology occurrence data holdings in more than 750 thousand new records distributed around the Atlantic and Arctic Oceans and the Mediterranean, Baltic, Black and North Seas with a temporal coverage ranging between 1904 and 2024 and covering primarily fish, mammals and zooplankton and, to a lesser extent, benthos, birds, macroalgae, phytoplankton and reptiles.

A list of the published datasets and their details is available in the Annex and the maps with the distribution per functional group and sea region are included in Figure 2 and the geographic distribution of all occurrences published during the reporting period is in Figure 3, also in the Annex.

Work is ongoing to improve INSPIRE conformance of EMODnet Biology metadata records. This work consists in the update of several metadata fields in the metadata records, including version date, lineage, a number of specific thesaurus keywords and URLs to the EMODnet Viewer, among others. The mapping to INSPIRE is a task within WP5 and further updates will align with the metadata review done by the EMODnet Secretariat and the guidance available. More information will be given in subsequent reports.

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

During the reporting period, WP3 held their 6th Quarterly Community Call (Deliverable 3.2.1), in which the progress on ongoing data products was assessed and discussed within the WP. All ongoing work has progressed as planned and is envisioned for timely submission at the end of this calendar year and subsequent publication starting from January 2025.

The Phase IV manuscript by WP3 authors entitled “Realizing the potential of interoperable data products to improve the outlook for marine biodiversity: lessons from the European Marine Data and Observation Network”, that has been submitted to the journal *Marine Policy* in late June, has now received generally positive review comments and the encouragement for resubmission. Currently the authors are finalizing their revision with re-submission schedule for early October.

The EMODnetWFS R package has been submitted to rOpenScience and is [currently under review](#) by external experts. The goal is to have EMODnetWFS published on CRAN for the widest possible visibility and applicability to end-users.

One new external product by *Naval Undersea Warfare* has been [published](#) and integrated to the [EMODnet Map Viewer](#) in September. The product provides information on the abundance and distribution of Loggerhead sea turtles throughout the entire Mediterranean Sea. Such data contributes to more effective conservation and management actions on basin and sub-basin scales.

During this period, WP3 has undergone particular efforts towards progress of Deliverable 3.3.1, focusing on liaising with external entities to target seabird and cetacean migration data. Several seabird experts have been contacted, and initial discussions have been initiated. This deliverable aims to establish collaborations that can provide data on seabird migration routes, including their timing and duration, with particular interest in how these routes may be influenced by coastal and offshore infrastructures. The main feedback received indicates that studying the effects on migrating birds is currently a challenge as it requires radar-based observations. However, due to persistent issues with radar systems, the limited existing data is of restricted usefulness. While there are data available on residing seabirds and insights on their sensitivity to coastal and offshore

infrastructure could be developed, based on the established contacts, this still falls short of the overarching goal of Deliverable 3.3.1, which focuses on impacts on migration routes. As of now, either no suitable data exists for the intended products, or efforts to gather these data are only just beginning among expert groups. Nonetheless, WP3 remains committed to pursuing efforts towards D.3.3.1.

Task 3: Develop a complete and robust machine to machine (M2M) interface to transfer data and products in bulk, which is easily accessible for other machines and initiatives (WP5)

Overview of most important tasks performed during this reporting period:

- Upgrade of the observations layer filter backend (dataportal) to PHP Symfony framework 6.4 LTS
- Upgrade Geoserver to 2.25.1 and later to 2.26 (multiple security issues)
- Upgrade the EMODnet Bio Apache webserver to 4.2.62
- Fixed issue in Geoserver cluster that caused 100% CPU usage and crashed one of the Geoservers instances managed by VLIZ
- Created Geoserver WMS endpoint entry for biology products in the Central Portal, to comply with INSPIRE rules and metadataURL by the secretariat (EM-83)
- Multiple improvements to the EMODnet Biology (data and products) metadata records generated from the IMIS metadata catalogue (which is then harvested by the Central Portal Geonetwork Catalogue). See Task 1 for more details.

Task 4: Contribute data, data products and content to a central portal that allows users to find, view and download data and data products

Overview of most important tasks performed during this reporting period:

- Added AlgaeBase data to the EuroBIS & OBIS monthly export script (now allowed by the license)
- Database changes needed to store eDNA data were finished by the end of Sep 2024
- Improved harvesting stored procedures (remove redundant code, made overall process faster)
- Implemented new filter in the EuroBIS staging database, to decide whether data should immediately be exported to EMODnet Biology or should wait until QC is finalised (i.e. some data flows are faster to the EuroBIS IPT without being full manually QC'ed)
 - Fixed script that cleans up the EMODnet (Biology) WMS cache on the Central Portal viewer

Task 5. Contributing static content to dedicated spaces in the Central Portal

The thematic lot contributed with the publication of various news items and deliverables in the EMODnet portal. An exhaustive list is presented below.

Deliverables:

- 2024-07-05: [D4.1.3 RSC Workshop report \(Phase V\)](#)

News items:

- 2024-07-04: [EMODnet Biology latest technical developments](#)
- 2024-07-08: [EMODnet Biology reports on Fisheries survey data publication](#)
- 2024-07-17: [EMODnet Biology new data publication](#)
- 2024-07-17: [EMODnet Biology supports the biodiversity community by republishing products](#)
- 2024-09-04: [EMODnet Biology launches new survey targeting EU funded projects working on biodiversity](#)

- 2024-09-17: [EMODnet Biology congratulates EuroBIS for its 20th anniversary](#)

Events:

- EMODnet Biology survey: Assessment of Data Management Practices in EU-Funded Projects: <https://emodnet.ec.europa.eu/en/events/emodnet-biology-survey-assessment-data-management-practices-eu-funded-projects>

Task 6: Ensure the involvement of Regional Sea Conventions (RSC)

The report based on the workshop dedicated to Regional Sea Conventions has been shared with the workshop participants and published in the EMODnet portal, as mentioned in Task 5. The document can be found via the [link](#).

Task 7: Contribute to the implementation of the EU legislation and broader initiatives for open data

In order to support open and FAIR data initiatives, the partnership has started the organization of the workshop dedicated to EU research projects to provide relevant information for the different project organizations in data management according to consolidated biodiversity standard protocols.

Additionally, the thematic lot joined the TG DATA meeting on 2024-09-27 and presented an overview of the work that has been developed in EMODnet Biology and how we can support member states and EU institutions with the publication of MSFD reporting data.

Task 8: Monitor quality/performance and deal with user feedback

The continuous monitoring of the thematic lot's webservices is done by GeoHealthCheck, a tool maintained by the Central Portal technical team. Webservices were compliant with INSPIRE during the reporting period. Figure 1 covers the period from 2023-10-02 to 2024-10-02 as it is not possible to restrict the information to the reporting period.

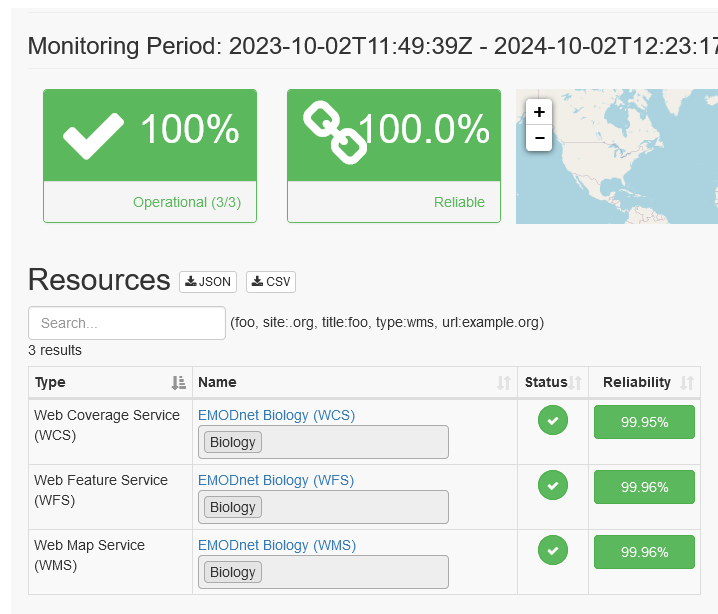


Figure 1. GeoHealthCheck monitoring for EMODnet Biology's webservices. The period covered ranges from 2023-10-02 to 2024-10-02

Two user requests were received during the reporting period and both received a first response within 48 h of being assigned to the thematic lot.

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
1.1.1 Quarterly Progress reports	WP1	2023-07-15	Delivered	2023-07-14	
		2023-10-15	Delivered	2023-10-13	
		2024-01-15	Delivered	2023-01-15	
		2024-04-15	Delivered	2024-04-15	
		2024-07-15	Delivered	2024-07-15	
		2024-10-15	Delivered	2024-10-15	
		2024-01-15			
		2025-01-15			
		2025-04-15			
		2025-07-15			
1.1.2 Interim report	WP1	2024-05-10	Delivered	2024-06-28	
1.1.3 Final Report	WP1	2025-05-09			
1.2.1 Update of EMODnet Biology data products via the EMODnet CP catalogue	WP1	2024-05-10 and 2025-05-09	Ongoing		
1.3.1 Monitoring user feedback via EMODnet JIRA	WP1	2023-05-10 to 2025-05-09	Ongoing		
1.3.2 Operation of the EMODnet CP helpdesk	WP1	2023-05-10 to 2025-05-09	Ongoing		
1.4.1 Minutes from the three project meetings (kick off, annual and final)	WP1	2023-06-10	Delivered	2023-06-30	
		2024-05-10	Delivered	2024-05-09	
		2025-05-09			
1.5.1 Participation in the EMODnet Steering Committee meetings	WP1	2023-05-10 to 2025-05-09	Delivered Delivered	2023-12-01 2024-04-29/30 2024-10-07 and 2024-11-13	Other dates to be confirmed
1.5.2 Participation in the EMODnet Open Conference	WP1	2023-05-10 to 2025-05-09	Delivered	2023-11-29/30	
1.6.1 Appropriate mechanisms and guidelines for handover	WP1	2025-05-09			
2.1.1 Maintenance of adequate mechanisms to ensure data are interoperable	WP2	2023-05-10 to 2025-05-09	Ongoing		
2.1.2 Report on the standardisation and integration of datasets published during the Phase	WP2	2025-05-09			
2.2.1 Summary on consortium data flows	WP2	2023-11-10	Delivered	2023-11-10	
2.3.1 Plan to optimise procedures to make	WP2	2023-05-10 to 2025-05-09			

restricted data available to users					
2.4.1 Workshop on use of Zooniverse for data digitisation through citizen science	WP2	2023-11-10	Delivered	2023-11-15	
2.4.2 Data training workshop for Mediterranean organisations	WP2	2023-11-10	Delivered	2023-11-13/14	
2.4.3 Report on the availability of data following the workshops	WP2	2025-03-10			
2.5.1 Guidance for data management practices applied to omics data	WP2	2023-05-10 to 2025-05-09			
3.1.1 Internal WP3 and WP4 Workshop	WP3	2023-09-10	Delivered	2023-09-11	
3.2.1 Quarterly community calls	WP3	2023-08-10	Delivered Delivered	2023-06-08 2023-09-14	
		2023-12-10	Delivered	2023-12-04	
		2024-03-10	Delivered	2024-03-04	
		2024-05-10	Delivered	2024-04-16	
		2024-08-10	Delivered	2024-07-17	
2024-12-10					
2025-03-10					
3.3.1 Liaison with external entities targeting seabird and cetacean migration outputs	WP3	2023-05-10 to 2025-05-09	Ongoing		
3.3.2 Data product creation	WP3	2023-05-10 to 2025-05-09	Ongoing		
4.1.1 Update connectivity maps and identification of stakeholder community	WP4	2023-09-10	Delivered	2023-09-28	
4.1.2 Informative material based 4.2.2 published in the EMODnet CP	WP4	2024-05-10	Delivered		
4.1.3 Informative material based on the 4.2.3 outcomes	WP4	2024-07-10	Delivered	2024-07-05	See Task 5
4.1.4 Informative material based on the 4.3.1 outcomes	WP4	2025-05-09			
4.1.5 Publication of four Use Cases	WP4	2023-11-10 2024-05-10 2024-11-10 2025-05-10	Delivered Delivered	2023-11-27 2024-05-28	
4.1.6 Publication of written documents	WP4	2023-05-10 to	Ongoing		

		2025-05-09			
4.2.1 Engagement plan for each RSC	WP4	2023-11-10	Delivered	2023-10-03	
4.2.2 Questionnaire to inform about what data & products EMODnet Biology offers and to collect stakeholder needs	WP4	2023-11-10	Delivered	2023-10-04	
4.2.3 Workshop with RSCs to understand major needs	WP4	2024-05-10	Delivered		
4.2.4 Report on progress for the publication of fisheries survey data	WP4	2025-05-09	Delivered		
4.3.1 Workshop with representatives of major recent and current European Research Projects and initiatives to share experience and knowledge in biodiversity monitoring and assessment and in data, tools and services	WP4	2024-11-10			
4.3.2 Participation in TG DATA meetings	WP4	2023-05-10 to 2025-05-09	Ongoing	2024-05-14 2024-09-27 2024-10-08	Other dates to be confirmed
4.4.1 Ensure compatibility with INSPIRE Directive (data, metadata, data products)	WP4	2023-05-10 to 2025-05-09	Ongoing		
4.4.2 Report on the activities to support EU Member States regarding their reporting obligations	WP4	2025-05-10	Ongoing		
5.1.1 Streamlining semantic interoperability	WP5	2023-05-10 to 2025-01-10			
5.1.2 Integration of omics data into the data model	WP5	2024-09-10	Ongoing		See Task 4
5.1.3 Roadmap for marine biodiversity data	WP5	2025-05-09			
5.2.1 M2M communication plan and solutions	WP5	2023-05-10 to 2025-05-09	Ongoing		
5.3.1 Operational web services	WP5	2023-05-10 to 2025-05-09	Ongoing		
5.3.2 Technology stack upgrades	WP5	2025-05-09	Ongoing		See Task 3
5.3.3 Technical maintenance of procedures	WP5	2023-05-10 to 2025-05-09	Ongoing		See Task 4

for ingestion of data from the data providers					
5.3.4 Development and implementation of procedures to publish omics data	WP5	2025-05-09			
5.4.1 Synchronisation of all data and data products metadata to the EMODnet CP catalogue (GeoNetwork)	WP5	2023-05-10 to 2025-05-09	Delivered		
5.4.2 All data and products available through the EMODnet CP	WP5	2023-07-10 to 2025-05-09	Ongoing		See Task 2
5.4.3 Participation in the EMODnet TWG meetings	WP5	2023-05-10 to 2025-05-09	Ongoing	2023-10-18 2024-03-12	Other dates to be confirmed
5.4.4 Maintenance and development of API used to query EMODnet Biology layers available via the EMODnet CP viewer	WP5	2023-05-10 to 2025-05-09	Ongoing		

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
Task 2: Phase V position paper	Pending	Paper submitted to the Marine Policy journal and reviewers comments received. Further updates will be given in future reports		
Observations in view of Section 1.7 of the Tender Specifications on Performance and Quality Requirements				
Progress solving identified issues				
EM-83 - Biology - Web Services MetadataUrl and DataUrl	Resolved	Pending confirmation by the EMODnet Secretariat		
EM523: EMODnet Biology Phase IV layers for European Atlas of the Sea	Pending	Ticket created by Coordinator, was considered low priority due to centralisation work and subsequently the end of Phase IV and start of Phase V		End of Phase V
EM524: IUCN red list Near Threatened category layer	Pending	Ticket created by Coordinator, was considered low priority due to centralisation work and subsequently the end of Phase IV and start of Phase V		End of Phase V
EM577: Update of zooplankton layers in the European Atlas (if available)	Pending	Ticket created by the EMODnet Secretariat, was considered low priority due to centralisation work and subsequently the end of Phase IV and start of Phase V		End of Phase V

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
Users do not have access to absence occurrences	Ongoing	Species' absence in surveys can provide invaluable information for data product creation and overall ecosystem knowledge. Within the thematic lot, there are several datasets where data providers have reported true absences (species were looked for but not found) or derived absences (i.e a list of species was defined for the project and systematically used throughout. When a species is absent from the data submitted, we know that this is because such individuals were absent from the samples). Work is underway to allow for these data to be available to users	QR22	
Users do not have access to genomics data	Ongoing	In the Phase IV workplan it was stated that the thematic lot would endeavour efforts to implement procedures to handle and publish genomics data. This work is not meant to be done	Phase V	

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
		in isolation with the international community therefore most actions have been limited to accompanying the situation and internally assessing what changes need to occur in the DB so that these data can be properly managed.		
Delays due to situation in the Ukraine	Ongoing	UkrSCES is slowly picking up the work and interacting again with the planned activities, including those related with data provision. Further updates will be given in subsequent reports		

3. Communication assets

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	
	Paper	Dos Santos A, Pires RTF, Ribeiro F, Dias IM, De Sousa LF, Bartilotti C, Freitas M, First record of the fried egg jellyfish <i>Phacellophora camtschatica</i> Brandt, 1835 (Cnidaria: Scyphozoa) in mainland Portugal, with notes on occurrences for the Madeira and Azores archipelagos, northeastern Atlantic Ocean. Cah. Biol. Mar (2024). https://cbm.sb-roscoff.fr/cbm/article.htm?id=59131		10.21411/CBM.A.DCC83AA4	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 comprehensive 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
<p>1. Current status and coverage of total available thematic data</p> <p>A) Volume and coverage of available data</p>	<i>Internal systems</i>	An exceptional big harvest, including 100 datasets was held during the reporting period. The data publication included not just new datasets but updates to existing ones. Available data increased for all functional groups except benthos. This is likely due to datasets being updated and some records being removed as better information was available to describe the biological occurrences. The biggest increase was for fish data, followed closely by mammal data. Data covered all European seas, with the biggest increase in the North Sea, followed by the Atlantic and lowest increase in the Black Sea and Arctic regions. Note that data from the Caribbean region is included in the Atlantic information, the total number of records for the Caribbean region ascends to almost 99 thousand, a number that will continue to steadily increase due to the republication of data already made available via other OBIS nodes.
<p>What is your opinion on the data coverage within EMODnet for your thematic?</p>	<i>Expert knowledge</i>	Data coverage trend remains similar to what was included in previous reports. The thematic lot is in communication with Caribbean providers through the OBIS and GBIF networks but data (re)publication is slow as not all data available through these aggregators comply with the EMODnet Biology quality criteria. The Data management team provides input for identified issues to be resolved, but this work needs to be done by the providers themselves. Additionally, various contacts have been established to encourage data submission from Mediterranean providers but they have mostly been unsuccessful and the consortium remains the main source of data for this area.
<p>B) Usage of data in this quarter</p>	<i>NA</i>	There are currently no systems in place to obtain this information
<p>2. Current status and coverage of total number of data products</p>	<i>Internal systems</i>	Coverage updated for the products published in QR29 and QR30. Note that the calculations for the % coverage takes into account the coverage for each individual product against the regions as defined by the tender and implemented by EMODnet

Comments on the progress indicators in the indicators spreadsheet		
Progress indicator	Means of collecting figures	Comment
A) Volume and coverage of available data products		Biology (see https://marineregions.org/gazetteer.php?p=details&id=63392). The value included in the table is the sum of all products for the specific sub-them/area.
B) Usage of data products in this quarter	NA	There are currently no mechanisms in place to obtain this information
3. Internal and external organisations supplying/approached to supply data and data products within this quarter	<i>Internal systems</i>	The majority of datasets in this exceptional data publication were gathered from OBIS SEAMAP, this is part of our ongoing effort to synchronise the data available in OBIS/GBIF that fits within the remit of EMODnet Biology and could be useful for our users. Note that some datasets fall outside the European seas and cover other regions of the world.
5.1 Daily number of page views of EMODnet Thematic entry page	Europa Analytics	There is no identifiable trend that can be extracted from the graphs
5.2 Quarterly total number of visitors, page views, unique page views and percentage of returning visitors	Europa Analytics	There was a slight decrease in the number of visitors and unique pageviews. This negative trend was also detected in the pageviews and returning visitors. A possible explanation for this decrease could be due to the summer period, with a slow down of activities that required EMODnet Biology data, products and /or information

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

Annex: Ancillary information

Task 1: Maintain and improve a common method of access to data held in repositories

Dataset title	New/Update	Phase	Organisations	License
Acoustic telemetry data for Atlantic cod (<i>Gadus morhua</i>) in the C-Power wind farm in the southern North Sea (Belgium)	New	V	Partner(VLIZ)	Attribution (CC BY)
Acoustic telemetry data for Atlantic cod (<i>Gadus morhua</i>) in the Scheldt estuary and southern North Sea (Belgium)	New	V	Partner(VLIZ)	CC 0 (No Rights Reserved)
Acoustic telemetry data for European eel (<i>Anguilla anguilla</i>) in the Scheldt estuary and southern North Sea (Belgium)	New	V	Partner(VLIZ)	CC 0 (No Rights Reserved)
Canary Islands	Update	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
CeNoBS: Birds sightings in the Black Sea recorded by CeNoBS Aerial Expedition in 2019	New	NA	Ad-hoc(Mare Nostrum)	Attribution-ShareAlike (CC BY-SA)
Cetacean sightings in North Sea	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Conservacion y preservacion de tortugas marinas	Update	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Cyprus 2018 (aggregated per 1-degree cell)	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Dolphins validated sightings reported in the Mediterranean Sea from 2019 onwards by avvistAPP users	Update	V	Partner(OGS)	Attribution-NonCommercial (CC BY-NC)
Fondazione Cetacea	Update	NA		Attribution-NonCommercial (CC BY-NC)
Gelatinous zooplankton validated sightings reported in the Mediterranean Sea from 2019 onwards by avvistAPP users	Update	V	Partner(OGS)	Attribution-NonCommercial (CC BY-NC)
Green Balkans cetacean strandings on the Bulgarian Black Sea coast	Update	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Green turtles in the Canary Islands	Update	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Atlantic gray seal in North Atlantic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)

Happywhale - Atlantic spotted dolphin in North Atlantic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Atlantic white-sided dolphin in North Atlantic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Bearded seal in Arctic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Bearded seal in North Atlantic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Beluga in Arctic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Blue whale in Arctic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Bowhead in Arctic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Bowhead in North Atlantic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Common bottlenose dolphin in Arctic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Common bottlenose dolphin in North Atlantic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Common minke whale in Arctic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Common minke whale in North Atlantic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Cuvier's beaked whale in North Atlantic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - False killer whale in North Atlantic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Fin whale in Arctic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Fin whale in North Atlantic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Harbor porpoise in Arctic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)

Happywhale - Harbor porpoise in North Atlantic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Harbor seal in Arctic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Harbor seal in North Atlantic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Humpback whale in Arctic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Indian humpback dolphin in Indian Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Killer whale in North Atlantic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Long-finned pilot whale in Arctic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Long-finned pilot whale in North Atlantic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Northern bottlenose whale in Arctic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Northern bottlenose whale in North Atlantic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Polar bear in Arctic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Polar bear in North Atlantic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Pygmy killer whale in North Atlantic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Ringed Seal in Arctic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Ringed Seal in North Atlantic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Risso's dolphin in North Atlantic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Rough-toothed dolphin in North Atlantic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)

Happywhale - Sea otter in North Atlantic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Sei whale in Arctic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Sei whale in North Atlantic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Short-beaked common dolphin in North Atlantic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Short-finned pilot whale in North Atlantic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Sowerby's beaked whale in North Atlantic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Sperm whale in Arctic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Striped dolphin in North Atlantic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Walrus in Arctic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - Walrus in North Atlantic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - White-beaked dolphin in Arctic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Happywhale - White-beaked dolphin in North Atlantic Ocean	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
HELCOM/OSPAR Sweden ports water sampling	New	NA	Ad-hoc(EMODnet Ingestion)	CC 0 (No Rights Reserved)
HELCOM/OSPAR UK ports water sampling	New	NA	Ad-hoc(EMODnet Ingestion)	CC 0 (No Rights Reserved)
Historical occurrence of whales in Scottish Waters inferred from whaling records	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
ICES Biodiversity - Cetaceans (JCDP)	New	V	Partner(ICES)	Attribution (CC BY)
ICES Fish predator/prey data	Update	V	Partner(ICES)	Attribution (CC BY)
IMR Occurrences of fish from research and rental vessels 2000-2023	New	V	Partner(IMR)	Attribution (CC BY)

Islas Canarias (Proyecto Aegina): juvenile loggerheads	Update	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Isle of Lewis Benthic Ecology Drop-down Video Survey - Envision (2011)	New	NA	Ad-hoc(EMODnet Seabed Habitats)	Attribution (CC BY)
Israel Sea Turtle Tracking Project 2008: Loggerhead & Green Turtles (aggregated per 1-degree cell)	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
KYMA boat-based surveys in Thyrrenian Sea and Ionian Sea	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Macrozoobenthos-North Adriatic-Gulf of Trieste, C1-LTER time-series 2014-2018	New	V	Partner(OGS)	Attribution-NonCommercial (CC BY-NC)
Microzooplankton-North Adriatic-Gulf of Trieste, C1-LTER time-series 1986-1990	New	V	Partner(OGS)	Attribution-NonCommercial (CC BY-NC)
Microzooplankton-North Adriatic-Gulf of Trieste, C1-LTER time-series 1998-2010	New	V	Partner(OGS)	Attribution-NonCommercial (CC BY-NC)
NICO 10 campaign 2018	New	V	Partner(NIOZ)	CC 0 (No Rights Reserved)
North Cyprus 2015 - Green Turtles	Update	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Northern Elephant Seals Post-Breeding 2016	Update	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Observatoire Pelagis - Reseau National Echouage (French stranding network) strandings 1934-2015	Update	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Phytoplankton North Adriatic-Gulf of Trieste C1 “LTER time-series from 2010 onwards	Update	V	Partner(OGS)	Attribution-NonCommercial (CC BY-NC)
Plankton community in WP2 net (200µm), Point B, Villefranche-sur-Mer, France	Update	NA	Ad-hoc(LOV)	Attribution (CC BY)
PONTUS-BIOFAC Black sea bottlenose dolphin sightings	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution (CC BY)
Population estimate and distribution pattern of Indian Ocean humpback dolphin in northwestern Persian Gulf	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Relative abundance of potentially pathogenic bacteria in treated wastewater and coastal water, Adriatic Sea time-series 2019-2020	New	V	Partner(OGS)	Attribution-NonCommercial (CC BY-NC)
Sea Turtles of Dominica	Update	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)

Sea Turtles of Dominica	Update	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Sea turtles validated sightings reported in the Mediterranean Sea from 2019 onwards by avvistAPP users	Update	V	Partner(OGS)	Attribution-NonCommercial (CC BY-NC)
Seguimiento de 10 crías de tortuga boba nacidas en 2016 en el litoral valenciano, en el marco del Proyecto LIFE 15 IPE ES 012 (aggregated per 1-degree cell)	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
SHARK - National and regional marine environmental monitoring of Picoplankton in Sweden since 2002	Update	V	Partner(VLIZ)	CC 0 (No Rights Reserved)
SHARK - National environmental monitoring of Grey seal in Sweden since 1989	Update	V	Partner(VLIZ)	CC 0 (No Rights Reserved)
SHARK - National Epibenthos monitoring in Sweden since 1992	Update	V	Partner(VLIZ)	Attribution (CC BY)
SHARK - National marine bacterioplankton monitoring in Sweden since 1989	Update	V	Partner(VLIZ)	CC 0 (No Rights Reserved)
SHARK - National marine environmental monitoring of jellyfish in Sweden since 2007	Update	V	Partner(VLIZ)	CC 0 (No Rights Reserved)
SHARK - National marine environmental monitoring of zooplankton in Sweden since 1979	Update	V	Partner(VLIZ)	CC 0 (No Rights Reserved)
SHARK - National phytoplankton monitoring in Sweden since 1983	Update	V	Partner(VLIZ)	CC 0 (No Rights Reserved)
SHARK - Regional monitoring and monitoring projects of Epibenthos in Sweden since 1994	Update	V	Partner(VLIZ)	Attribution (CC BY)
SHARK - Regional monitoring, recipient control and monitoring projects of phytoplankton in Sweden since 1985	Update	V	Partner(VLIZ)	CC 0 (No Rights Reserved)
Spain-Balearic Is. 2015 Loggerhead Turtles	Update	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Spatial distribution of plankton in the Cabo Frio Upwelling System in the South Brazilian Shelf	New	V	Partner(VLIZ)	Attribution (CC BY)
Stellwagen Shearwater Tagging 2018 (aggregated per 1-degree cell)	New	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Tracking of Arctic tern migrations 2007-2008	Update	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)
Tracking small loggerheads from spanish nests	Update	NA	Ad-hoc(OBIS SEAMAP)	Attribution-NonCommercial (CC BY-NC)

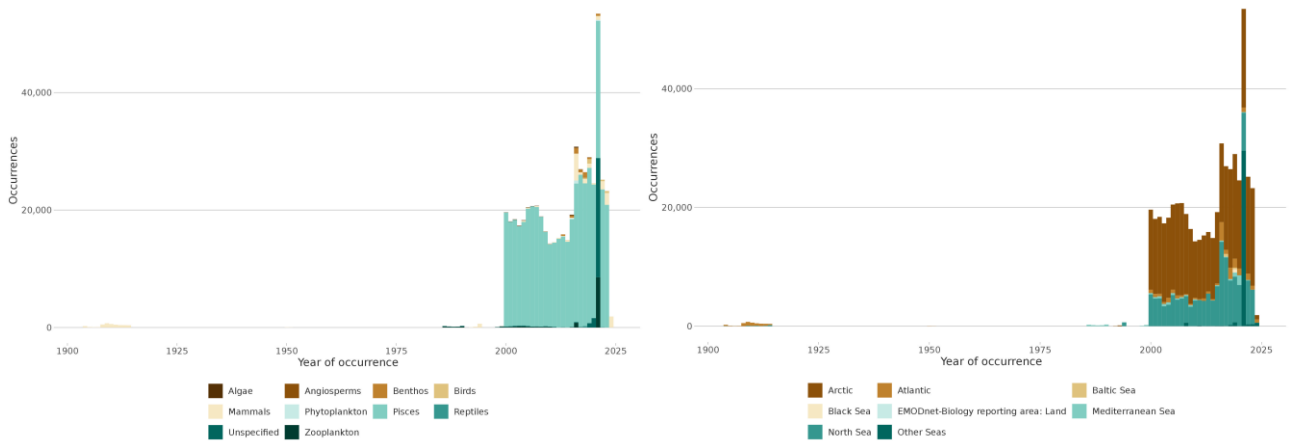


Figure 2. Occurrence distributions, for data published during the reporting period, per year of occurrence of the Functional group (left) and Sea region (right).

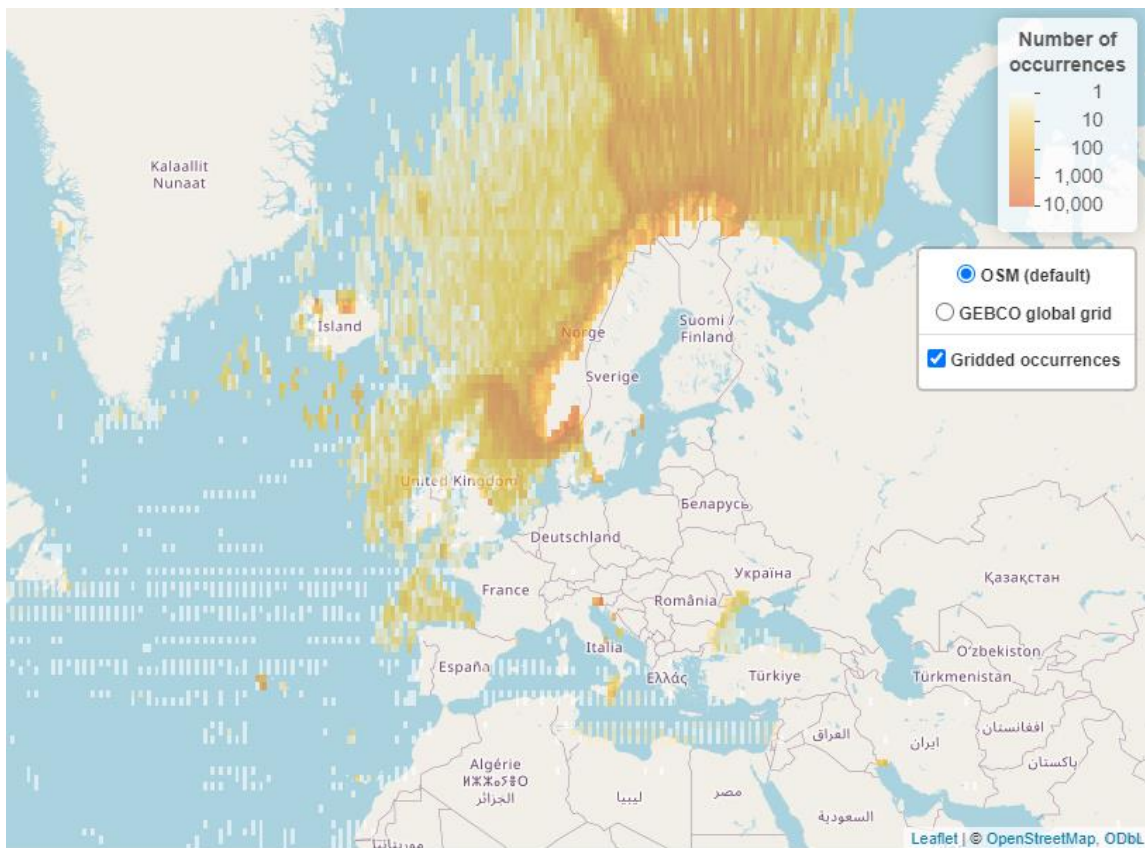


Figure 3. Occurrences distribution for data published during the reporting period. Image is centered in Europe even though published data covers other sea regions.