



EMODnet



European Marine
Observation and
Data Network

EMODnet Thematic Lot n° VI- Biology

EMFF/2019/1.3.1.9/Lot 6/SI2.837974 -EMODnet -Biology

Start date of the project: 18/04/2021 (24 months)

Centralisation Phase

Final Progress Report

Reporting Period: 18/04/2021 – 19/04/2023



Contents

| | |
|--|----|
| 1. Introduction..... | 3 |
| 2. Update on the Tasks..... | 5 |
| 3. Work Package updates..... | 13 |
| 4. Identified issues: status and actions taken..... | 25 |
| 5. Allocation of project resources | 31 |
| 6. User feedback | 32 |
| 7. Meetings/events held/attended & planned..... | 37 |
| 8. Communication assets..... | 56 |
| 9. Monitoring indicators | 63 |
| 10. Recommendations for follow-up actions by the EU..... | 65 |
| 11. Annex: Other documentation attached | 66 |

Disclaimer

The information and views set out in this report are those of the author(s) and do not necessarily reflect the official opinion of the CINEA or of the European Commission. Neither the CINEA, nor the European Commission, guarantee the accuracy of the data included in this study. Neither the CINEA, the European Commission nor any person acting on the CINEA's or on the European Commission's behalf may be held responsible for the use which may be made of the information.

1. Introduction

EMODnet Biology Phase IV ran for two years, from 2021-04-18 to 2023-04-19. The project builds and expands on the work developed during the previous Phases. The project's tasks as defined in the tender were:

- Task 1: maintain and improve a common method of access to data held in repositories
- 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
- Task 3: Develop procedures for machine-to-machine connections to data and data products
- Task 4: Contribute data, data products and content to a central portal that allows users to find, view and download data and data products
- Task 5: Contributing content to dedicated spaces in Central Portal
- Task 6: Ensure the involvement of regional sea conventions
- Task 7: Contribute to the implementation of EU legislation and broader initiatives for open data
- Task 8: Monitor quality/performance and deal with user feedback
- Task 9: Maintain the existing thematic web portal for a maximum of six months from the start of the projects

For EMODnet Biology, specific requirements related to Task 1 and 3 were also included. Those were:

- Published data shall include information on long-term trends and distribution of the following species groups: phytoplankton, zooplankton, angiosperms, macro-algae, invertebrate bottom fauna, birds (surface observation at sea and coastal nesting), mammals, reptiles, fish (commercial exploited species, sharks, rays)
- Data products shall include: a) digital map layers allowing analysis of changes in species abundance and extent over time and space. The layers shall include those where data from more than one survey have been included and those from where data more than one data source (eg. OBIS and WORMS) have been included; b) species migration routes including timing and duration, particularly those that might be affected by construction or deployment of new coastal or offshore infrastructure. Seabirds and cetaceans are of particular interest.

The consortium was mostly maintained the same as in Phase III, with one partner not remaining and two new partners joining, and included international organisations. National Oceanographic Data Centres (NODC) recognised by IOC-IODE (Intergovernmental Oceanographic Commission - IODE), government agencies, universities and also SMEs (Small and Medium Enterprises), in a total of 22 organisations spread across Europe. Additionally, sub-contracts with different external parties and also a collaboration agreement with an international organisation, were established in order to fulfil the various tasks defined in the proposal. The full list of organisations/parties is available in Table 1 of the Annex.

The overall Phase IV organisation is structured around 5 Work Packages (WP), as represented in the Figure below.

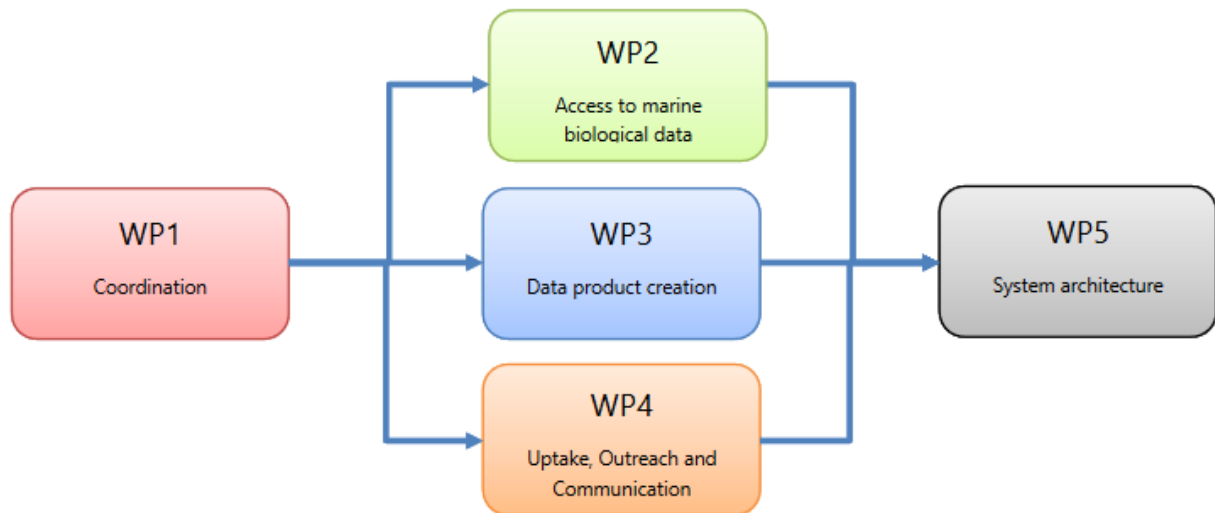


Figure 1. EMODnet Biology Phase IV Work Package organisation

All deliverables were met even if some delays were experienced throughout the Phase. As part of the EMODnet centralisation, the thematic lot's portal was shut down in mid-January 2023 and content as well as data and products can now be accessed via the EMODnet Central Portal, with the Biology landing page being <https://emodnet.ec.europa.eu/en/biology>.

2. Update on the Tasks

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

The main objective for WP2 is covered by Task 1: Maintain and improve a common method of access to data held in repositories. In addition to upgrading the content and quality of existing data and making new data available, the 'FAIRness' (Findability, Accessibility, Interoperability and Reusability) of the metadata for each dataset was assessed and targeted actions were implemented, throughout the Phase, to improve them. As in previous phases, a strong collaboration with the partners was ensured by frequent communication; for new data partners, a setup of data flows was done and for existing partners, the data flows were maintained and improved where applicable. Additional connections with data providers and aggregators outside of the project consortium were explored, which resulted in a significant increase of data for targeted species groups and geographic regions.

Even though some deliverables were delayed, see information included in the various Quarterly Reports, they were all finalised and are published in the EMODnet Central Portal.

Following the experiences and successes of previous Phases, the workplan included not only data publication but also several free training activities for the wider biological community and close collaboration and data exchange with international initiatives like OBIS (Ocean Biodiversity Information System) and GBIF (Global Biodiversity Information System).

The WP2 description, under Section 3 'WP Updates', will include more details on all activities held during this Phase.

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

Five Biology Data Products, that address this task for different taxa and at different spatial and temporal scales, have been published in this Phase. One product was not completed before the end of the Phase due to unexpected events affecting the partner involved. Alongside the distribution maps creation, two R packages were developed and an existing one was improved. The aims proposed for WP3 during this Phase were:

- Develop methodologies to robustly visualise and assess changes in species abundance and extent over time and space
- Increase the linkages between different data sources, providing products which fetch and process data required to address a set of specific user questions
- Expand the geographical scope where possible beyond North Sea and Baltic
- Expand the taxonomic scope to include key taxa of interest

Aim 1 was delivered through the creation of the five Biology Data Products described in the WP3 section. Several of these products also contributed to Aim 3, more specifically, the products Presence/absence data of macrozoobenthos in the European Seas (Herman, 2022), Temporal turnover of macrobenthos in European seas (Webb 2023), and Species Distribution Models for invasive macroalgae (Ramos et al. 2023) which extended their geographical scope to all European seas. These products also delivered **D3.4 Develop method to use Phase III presence-absence maps to display time series of distribution change**, and significant efforts were made to improve the metadata standards in product development, for instance by publishing

all spatio-temporal products in NetCDF format with embedded metadata, thus fulfilling **D3.6 Add/update data product metadata in the EMODnet Biology catalogue.**

All products were published via the EMODnet Central Portal viewer and allow users to filter by taxon name or time and to subset and download the relevant information. The R packages are openly and freely available via the EMODnet GitHub instance.

Detailed information on the specific products and R packages is included in the WP3 section of this document.

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

All work planned within this task was successfully achieved. More specifically through:

- the implementation of a new GeoNetwork instance (v3.8.3) with the DCAT (Data CATalogue vocabulary) plugin (V1.1)
- technical assistance to reformat Phase III and Phase IV products so they could be published via the CP ERDDAP instance
- updates to the relational database system, that is the backbone of the OGC webservices
- setup of a dedicated ERDDAP instance was set up as a Proof of Concept to share Darwin Core compatible CSV files per dataset (<http://erddap.eurobis.org>)
- updates to the data harvesting and publishing procedures to account for new data types

A more detailed overview is given in the WP5 section.

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

Phase IV products were published (See Task 2 and WP3 section) and made available via the EMODnet Central Portal Viewer when applicable. Phase III products were also published via the EMODnet CP viewer/ERDDAP instance, thus allowing users access to the products that had been previously created but not fully implemented in the EMODnet Biology portal.

In late January 2023, centralisation reached a stage where all thematic lots shutdown their portals, this meant that all Biology data/products/tools/content became available via the EMODnet Central Portal.

The publication of data is an invisible process to users, the layer [EurOBIS database observations](#) in the EMODnet CP viewer is updated with every data publication. More details about the publication of data can be found in Tasks 1 and 3 as well as the corresponding WP2 and WP5 sections.

Task 5: Contributing content to dedicated spaces in Central Portal

This task, despite the occasional delays in the deliverable submission, as included in the Table-Status of the Milestones and Deliverables listed in the workplan and reporting in the Quarterly reports, was concluded during Phase IV. Work done towards centralisation was the main focus of this task, as described in the WP1 section.

Along with the publication of the written Phase IV deliverables, various deliverables from the previous Phases were also published in the EMODnet Central Portal.

EMODnet's Biology outreach and communication is done via social media (Twitter) and the publication of news and use cases. The publication of twitter posts on published datasets and Data management related information continued throughout the Phase. News items were published both on the Biology and Central Portal and, upon the shutdown of the Biology portal,

continued on the Central Portal either as individual news items or as items in the EMODnet newsletter. The development of use cases is grouped under **D4.5 Creation of engaging and informative use-cases** for EMODnet Biology to illustrate uptake and utility of data products across a range of stakeholders across the quadruple helix of engagement. More details can be found in the WP4 section.

Due to the EMODnet centralisation, the Biology static content (available via <https://emodnet.ec.europa.eu/en/biology>) was reviewed and small updates were made. A more in-depth overview and updates will take place in Phase V.

Task 6: Ensure the involvement of regional sea convention

All externally focused events organised through WP4 included invitations to and engagement with relevant stakeholders representing the Regional Sea Conventions.

Key linkages to the appropriate interaction points within each Regional Sea Convention structure were identified and mapped in the EMODnet Biology's connectivity to each body (**D4.2**) and empowered EMODnet Biology partners to act as ambassadors for RSC engagement, which hopefully will lead to an increase in visibility for EMODnet Biology within these initiatives. This work will provide the foundation for improved interactions in subsequent phases of work.

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

The EMODnet Biology partnership has a wider-ranging and active involvement in a wide range of open data activities within Europe and globally.

There is representation in a number of UN Decade Projects and Programmes linked to ensuring access to open, standardised data including Marine Life 2030, OBIS and WoRMS (World Register of Marine Species).

In addition, EMODnet Biology is actively involved in Horizon Europe funded activities to improve the availability and flow of marine biodiversity data into the Marine Strategy Framework Directive (MSFD) and the Essential Ocean and Essential Biodiversity Variables (EOV and EBV) to facilitate holistic regional and global ocean assessment. Follow up and extensive collaboration with such projects will be further explored during Phase V.

During the Phase, a questionnaire was made available to various stakeholders for a month and received 24 responses. The questionnaire had 9 questions and the majority of respondents stated they do not use EMODnet Biology's assets in their work, the main reasons being that they do not have access to products or that they require products which are not available (e.g. temporal trend data, coupled molecular biodiversity with climate and environmental data). It is relevant to mention that most biological data users will search and download data through the OBIS portal as it is a more widely known aggregator and it also provides access to other ocean areas not widely covered in EMODnet Biology. To note that all data published in EMODnet Biology are available through OBIS as well due to the data flow established via the European OBIS node, EuroOBIS.

Improved coordination at the EU level was assessed through **D4.4**, illustrating the opportunities for EMODnet Biology to contribute to a European Marine Biodiversity Observation Network (EU MBON). The marine element of the Group on Earth Observations Biodiversity Observation Network (GEO-BON) is being progressed with coordination from EuroMarine. EMODnet Biology is positioned to play a clear role in ensuring the availability of data, promotion and adoption of

biodiversity data standards. D4.4 contains recommendations for the role of EMODnet Biology that can be progressed as the EU MBON initiative matures.

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

Quality and performance was continuously monitored throughout the Phase and found to be compliant with INSPIRE guidance, apart from one instance where the area surrounding the building where our servers are located suffered an energy cut, which affected the portal availability and operationality for some hours, something that has been described in the Quarterly Reports.

User feedback was also dealt with appropriately and timely, with a total of 24 requests/enquiries received and 75% of them being handled within 1 working day. 8.3% handled within 2 working days and the remaining in three or more days. The table on section 6 has a breakdown of all enquiries and the reasons for the delays observed in dealing with user feedback.

Task 9: Maintain the existing thematic web portal for a maximum of six months from the start of the projects

During this Phase the main work was aligned with the EMODnet centralisation efforts, therefore the thematic portal was not subject to developments. The updates performed were related to static content, to reflect the new Phase information (e.g. consortium, workplan) and with the publication of news. By mid-January 2023, the centralisation process was concluded and the portal shutdown.

| 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 |
| D1.1: Help desk operational and contact details published online (M3) | WP1 | QR17 (30 Jun 2021) | Delivered | 30/06/2021 | |
| D1.2 Quarterly progress reports (scheduled defined in the tender) (M3-M24) | WP1 | QR17 (15 Jul 2021) QR18 (15 Oct 2021) QR19 (15 Jan 2022) QR20 (15 Apr 2022) QR21 (15 Jul 2022) QR22 (15 Oct 2022) QR23 (15 Jan 2023) QR24 (15 Apr 2023) | Delivered Delivered Delivered Delivered Delivered Delivered Delayed Delivered | 15/07/2021 15/10/2021 15/01/2022 15/04/2022 15/07/2022 14/10/2022 15/02/2023 15/04/2023 | Due to EMODnet centralisation |
| D1.3 First interim report after phase (M12) | WP1 | 19/04/2022 | Delivered | 17/06/2022 | |
| D1.4 Final report (M24) | WP1 | 19/04/2023 | Delivered | 19/06/2023 | |
| D1.5 Attend Steering Committee and Technical Working Group meetings (M0-M24) | WP1 | Sep 2021 Apr 2022 Sep 2022 Nov 2022 Apr/May 2023 | Delivered Delivered Delivered Delivered Delivered | 08/09/2021 26-28/04/2022 21-22/09/2022 07-08/11/2022 04-05/04/2023 and 23/05/2023 | |
| D2.1 Inventory of possible historical data resources within the consortium (M6) | WP2 | 29/10/2021 | Delivered | 18/11/2021 | |
| D2.2 Technical implementation of data flows for the new project partner (M6) | WP2 | 29/10/2021 | Delivered | 18/11/2021 | |
| D2.3 Report on efforts undertaken in rescuing historical data through citizen science (M18) | WP2 | 15/10/2022 | Delivered | 01/12/2022 | |
| D2.4 At least 3 linkages with initiatives outside of the original Consortium, resulting | WP2 | 31/12/2022 | Delivered | 31/12/2022 | |

| | | | | | |
|---|-----|--|--|--|--|
| in extra data/information available via the Portal (M20) | | | | | |
| D2.5 Feasibility study for recognition of specific ecological traits and/or sampling devices/methodologies in text (M22) | WP2 | 25/02/2023 | Delivered | 20/04/2023 | Due to organisation of Workshop and time required to analyse the outcome and finalise drafting the report |
| D2.6 Report on the standardisation and integration of the proposed new and updated datasets (M24) | WP2 | 19/04/2023 | Delivered | 30/05/2023 | Report was pending the inclusion of the information from the last Phase IV data harvest which finished in May 2023 |
| D3.1 Quarterly WP3 community calls; call leader or other nominated team member to produce summary report of each call for publication on EMODnet website (M3-M24) | WP3 | Call QR17 (30 Jun 2021) Call QR18 (30 Sep 2021) Call QR19 (31 Dec 2021) Call QR20 (31 Mar 2022) Call QR21 (30 Jun 2022) Call QR22 (30 Sep 2022) Call QR23 (31 Dec 2022) Call QR24 (31 Mar 2023) | Delivered Delivered Delivered Delivered Delivered Delayed Delayed Delivered | 18-19/05/2021 22/09/2021 10/12/2021 Week of 28/02/2022 Week of 02/05/2022 + 18/07/2022 20/10/2022 06/02/2023 02/03/2023 | |
| D3.2 Annual intensive workshops, in person with online participation options. Workshops involve collaborative product development on one or more targeted themes derived from WP4 user needs questionnaire (M12-M22) | WP3 | Workshop 1 (19 Apr 2022) Workshop 2 (28 Feb 2023) | Delivered Delivered | Week of 28/02/2022 Changed to a series of community calls to draft D3.5 | |
| D3.3 Publish R package to link EMODnet biology data with data from other EMODnet sources (M12) | WP3 | 19/04/2022 | Delivered | | |

| | | | | | |
|--|-----|------------|-----------|---|--|
| D3.4 Develop method to use Phase III presence-absence maps to display time series of distribution change (M12) | WP3 | 19/04/2022 | Delivered | | |
| D3.5 Produce position paper outlining questions that can be addressed using EMODnet data, together with remaining gaps, and strategies for filling these (M24) | WP3 | 19/04/2023 | Delayed | Paper being drafted and will be ready for submission shortly after Phase IV is finished | |
| D3.6 Add/update data product metadata in the EMODnet Biology catalogue (M24) | WP3 | 19/04/2023 | Delivered | | |
| D4.1: Questionnaire to inform cross-lot product development (M3) | WP4 | 30/07/2021 | Delivered | 06/09/2021 | |
| D4.2: EMODnet Biology connectivity 'map' of projects, institutes, initiatives and networks to inform targeted engagement (M12) | WP4 | 19/04/2022 | Delivered | | |
| D4.3 EMODnet Biology participation in each of the RSCs to inform and advise of available data products and mechanisms to access and influence the development of data, products, tools and services (M12) | WP4 | 19/04/2022 | Delivered | | |
| D4.4 "Launch" of the European MBON node (M24) | WP4 | 19/04/2023 | Delivered | | |

| | | | | | |
|--|-----|--------------------------|-----------|------------|--|
| D4.5 Creation of engaging and informative use-cases for EMODnet Biology to illustrate uptake and utility of data products across a range of stakeholders across the quadruple helix of engagement (M6, M12, M18, M24) | WP4 | Use case 1 (29 Oct 2021) | Delivered | 31/01/2022 | Publication was done after the dataset mentioned in the use case was publicly available Publication will be done during Phase V |
| | | Use case 2 (19 Apr 2022) | Delivered | 01/04/2022 | |
| | | Use case 3 (15 Oct 2022) | Delayed | 14/03/2023 | |
| | | Use case 4 (19 Apr 2023) | Pending | | |
| D5.1 User portal operation and maintenance (M0-M6) | WP5 | 19/10/2021 | Delivered | | |
| D5.2 Webservices operation and maintenance (M0-M24) | WP5 | 19/04/2023 | Delivered | | |
| D5.3 Technology stack upgraded (M12) | WP5 | 19/04/2022 | Delivered | | |
| D5.4 Evaluation and implementation of bulk data transfer technologies (M24) | WP5 | 19/04/2023 | Delivered | | |

3. Work Package updates

WP1 – Coordination

The tasks covered by this WP are Task 5: Contributing content to dedicated spaces in Central Portal and Task 8: Monitor quality/performance and deal with user feedback

WP1 activities are mainly centered in ensuring that all deliverables and objectives are met according to the timelines defined in the tender and also in the Phase IV proposal. The table in section 2 lists all deliverables and their delivery date.

Alongside this work, WP1 is also responsible for the organisation of project meetings, managing the budget and liaise with external organisations on behalf of the consortium. More detailed information is listed in the Table on section 7.

Due to the EMODnet centralisation, WP1 was also directly involved in the discussions with the Central Portal team to ensure that all components were adequately addressed and any issues could be highlighted and resolved in a timely manner. A huge amount work was done to ensure the Biology static content was properly reflected in the Central Portal. This involved mainly the mapping of pages in the Biology website to adequate locations in the CP by the EMODnet secretariat and continuous feedback from WP1. The content itself was adjusted, but not thoroughly updated, a task that will be undertaken during Phase V.

Additionally, news were being shared across both portals, until the shutdown of the Biology portal. Several items were published throughout the Phase either as stand-alone news or included in the EMODnet newsletter. All articles in the CP can be found via the link https://emodnet.ec.europa.eu/en/news?body_value=biology. Outreach via social media (i.e. Twitter) was continued with several tweets published each quarter, a summary can be found in Section 8.

During this Phase, several use cases were published to highlight specific developments now available to data providers/users or also ways in which our data/products can be useful for multiple purposes. The use cases can be found via the link https://emodnet.ec.europa.eu/en/use-cases?field_portal_taxonomy_tid=23&body_value=.

An effort was made to publish all deliverables from the previous Phases before the end of the Phase. Following guidance from the EMODnet Secretariat and small technical updates in the Drupal system, this was achieved and all previous deliverables (since 2014 until the end of Phase III) can now be found via <https://emodnet.ec.europa.eu/en/reports> (select EMODnet component- Biology, Publication type- Deliverables).

Task 8 was partially impacted by centralisation. Prior to the Biology portal being shut down, user feedback was collected directly via the contact form. Post centralisation, this feedback is being collected via the Central Portal and is then triaged by the EMODnet Secretariat before being assigned to the thematic lot. Despite the initial difference in how feedback and/or requests arrive to EMODnet Biology, the remaining procedures are similar, meaning that there is an attempt to provide a first answer, or first email within 2 working days (as per tender) and, if required, further follow up until the user is satisfied with the information provided.

The quality and performance monitoring continued to be done via the GeoHealthCheck tool implemented by VLIZ on behalf of the Central Portal. Throughout the Phase, EMODnet Biology

was always compliant with the operationality and reliability INSPIRE guidance with the exception of an instance where there was a power failure due to external reasons, which affected the Biology portal. This was addressed in the corresponding Quarterly Report. The GeoHealthCheck tool allows for the monitoring for a 1-year period, which cannot be modified, so Figure 1 in the Annex includes the overview for the period from 2022-04-26 to 2023-04-27. The Quarterly Reports, published in the Central Portal, have a report on this monitoring as well as a similar analysis and visual representation covering the reporting period to which they apply.

As a conclusion, even though some constraints were had during Phase IV, all deliverables were submitted and made available on the EMODnet Central Portal, with publication of roughly 21% being slightly delayed when compared to the planned dates. In terms of data there was a 24% increase of available records published through the thematic lot, even though some delays in submission by consortium partners were experienced. There were also various efforts to investigate other means of making more data available, be it through digitisation efforts through citizen science platforms or the tools that allow for the capture of information included in documents, i.e. text mining.

Five data products (species maps) were published, two R packages published and maintenance and improvement to an existing R package was done. The resource investment in developing and maintaining these R packages is thought to be beneficial as it allows users to use theirs or other data to create their own analysis and distribution maps, which they can then use for their work. Several outreach activities were also planned with the aim to increase the visibility and uptake of EMODnet Biology's assets. These activities included not only participation in several meetings and conferences, but also in the reinforcement of the collaboration with other international initiatives. Centralisation was a challenging line of work as the systems set in place aren't always fit for Biological data, this forced the team to have a trial and error approach in order to publish data products. Even though centralisation was completed in early January 2023, several lines of work are still ongoing to facilitate the discoverability and download of the thematic lots' data, products and tools.

WP2 – Access to marine biological data

In parallel with previous phases, the main and only task and goal of WP2 within Phase IV was to maintain and improve a common method of access to data held in repositories. The work performed in the previous EMODnet phases has allowed the consortium to establish a solid foundation of European marine data and a network of data providers spread across countries. In Phase IV, WP2 aims to continue to expand and consolidate the network in order to make more data available. An equal focus was kept on the ingestion of new datasets and the update of existing datasets. Updates could entail (1) uptake of data for recently sampled year(s), (2) addition of (extra) Measurement or Facts data, (3) addition of true absence data (if available), (3) the implementation of the DarwinCore EventCore format and (4) the enhancement of the implementation and link with the followed standards, formats and vocabularies. Where possible, further automatisation of the data flows was pursued. A full report on the technical implementation of data flows for new project partners was made available in the early stages of Phase IV as [Deliverable 2.2](#), and the standardisation and integration of the proposed new and updated datasets was made available as **Deliverable 2.6**. A list of the datasets published during Phase IV is available in the Annex, under the WP2 section.

During Phase IV, WP2 also looked beyond the existing partnership, aiming to engage and work with other (European) organisations and scientists, as described under **Deliverable 2.4**, where at least three linkages with databases and/or initiatives outside of the original Consortium needed to be made, resulting in extra data and information available via the Portal. The underlying goal was two-fold: (1) expand the data content, with a geographical focus on the North—East Atlantic marine waters, and also including the Caribbean Sea and Macaronesia and (2) where possible expand the species traits information within the World Register of Marine Species (WoRMS) for the targeted groups within EMODnet Biology: phyto-, zooplankton, macro-algae, benthos, birds, mammals, reptiles and fish. Several successes were made at this level. Through a collaboration with INBO (Research Institute Nature & Forrest), a continuous data flow of the European Seabirds at Sea (ESAS) database has been made possible. Active data exchanges were also set up with the Oceans Past Initiative (OPI), a thematic node within the Ocean Biodiversity Information System (OBIS) network, focusing on historical data. Also from within the OBIS network, several mammal, turtle and birds datasets were retrieved from OBIS-SeaMap, and a small number of datasets from the Caribbean OBIS node, to adhere to the request of making available data from the Caribbean Sea, with a first focus on datasets that have a connection with Europe, either collected by European researchers, or from Caribbean countries and regions that have a connection with a European country (eg. Overseas territories). Initial contacts with two other organisations – the Global Biodiversity Information Facility (GBIF) and Data Publisher for Earth & Environmental Science (PANGAEA), explored data exchange options, which will be further expanded during Phase V. On the level of trait data, a Macro-algal traits portal was launched late 2022 (<https://www.algaetraits.org/>) and active collaboration between WoRMS and FishBase which is leading to the inclusion of fish trait information such as the FAO-ASFIS codes (the Food And Agriculture list of Species for Fishery Statistics purposes), functional group information and detailed body size data. This information is available in EMODnet Biology due to the use of WoRMS as the taxonomic backbone.

Deliverables 2.1 (Inventory of possible historical data resources within the consortium) and **2.3** (Report on efforts undertaken in rescuing historical data through citizen science) were closely related. The ultimate target of these Deliverables was to reach out and inform citizen scientists about the EMODnet Biology project and at the same time to mobilise paper-based historical data to digital form to be published. In this framework, several citizen science platforms were explored according to pre-defined criteria relevant both to the citizen scientist's and the data manager's perspective. The assessment allowed for the selection of the Zooniverse and DoeDat platforms. Both HCMR and VLIZ teams tested these platforms. Even though it was a successful trial, with two datasets swiftly being quickly digitised by the citizen scientists and published via EMODnet Biology, future activities need to be carefully considered and planned as the setup of the projects in both platforms was, as expected, quite time-consuming. After careful consideration, future digitisation efforts will be pursued only through Zooniverse, mainly due to the fact that the guidelines can be published in only one language, thus decreasing the effort of the Data Management Team in setting up a project.

Dataset curation process is quite difficult and time consuming, especially when dealing with historical datasets. Text mining tools can assist in curating and discovering knowledge from multiple documents, but the training and evaluation of these tools rely on curated and annotated documents and dictionaries (e.g., controlled vocabularies, ontological terms and/or database entry names and synonyms). Several text mining tools exist and are considered successful in the recognition of species names or environments in text, but further research is needed when it comes to extracting species traits from text. In order to overcome this constraint and establish procedures that can be used by providers working with historical data, a feasibility study was done by an external organisation. The outcome of this collaboration was the **Deliverable 2.5** and an open and free training that took place as an online session on 2023-03-20, the report is available via the [link](#).

Overall, Phase IV has added 174 new datasets and 48 updates of datasets to the EurOBIS database, covering all functional groups and all geographical regions. At the end of Phase IV, EMODnet Biology provides access (Via the EMODnet Central Portal viewer) to 1,280 datasets, representing roughly 35,68 million occurrence records and 92 million Measurements or Facts. The table below summarises the relevant information for the Phase.

| | April 2021 | April 2023 |
|-----------------------------------|--------------|---------------|
| Datasets | 1,077 | 1,280 |
| # occurrence records | 25.5 million | 35.68 million |
| Quality controlled records | 86% | 86% |
| eMoF records | 30.7 million | 92.1 |
| Species names | 98,024 | 103,613 |
| Accepted species names | 75,658 | 73,029 |

The majority of the data available through EMODnet Biology are shared with the international initiatives OBIS and GBIF (Global Biodiversity information Facility). To avoid dataset and effort duplication, not all data available via EMODnet Biology are shared via the EurOBIS node with

these initiatives, the data flow for these instances is done via other pathways, e.g via dedicated partner flows implemented for other OBIS nodes that are part of the Biology consortium. The figures in the WP2 section of the Annexes summarise the increase in data availability during the various Phases, in terms of occurrences, datasets, geographical distribution of records and functional group.

WP3 – Data product creation

The work developed in WP3 is covered by 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.

Below is a summary of the various products created during this Phase:

- *Presence/absence data of macrozoobenthos in the European Seas* (Herman 2022 <https://www.vliz.be/imis?dasid=8216>). This product has combined presence data from EurOBIS with reconstructed absence data for 10.830 benthic taxa at 292.332 sampling stations throughout European seas. The significant advance was to deduce absence from metadata: only datasets looking for the entire benthic community, or well-defined subset of the community, were included. This means that the absence of a species from sites within the dataset can be interpreted as implying that it was looked for but not found. The addition of absence data greatly expands the scope for modelling species distributions as a function of environmental or human impact variables.
- *Temporal turnover of macrobenthos in European seas* (Webb 2023, <https://www.vliz.be/imis?dasid=8229>) builds on the *Presence/absence data of macrozoobenthos in the European Seas* product described above, to derive estimates of temporal turnover in benthic communities on a spatial grid across European seas. This product uses only species-level records, and sampling events where the full macrobenthic community was surveyed (i.e. where there are no 'NA' values in the presence/absence dataset for any species). Six time periods were considered, based on data availability: before 1990, 1990-1999, 2000-2004, 2005-2009, 2010-2014, and 2015 and after. A 1° grid was used to obtain reasonable numbers of repeat samples per grid cell. In total the product considered 8149 macrobenthic species across 414-1° grid cells throughout European seas, and documents temporal change at the community level in terms of species turnover and beta diversity statistics.
- *Phytoplankton alpha diversity in the greater Baltic Sea area* (Torstensson, Sundqvist, & Lindh 2023, <https://www.vliz.be/imis?dasid=8221>) presents an assessment of change in phytoplankton alpha diversity over time in the greater Baltic sea area. Abundance data from the Swedish national phytoplankton monitoring were downloaded from GBIF (data originating from SHARKweb). In this product, only Swedish data were included as abundance was required for the calculations. The period between 2000-2021 was the only one considered, as that's when the sampling effort was more consistent (especially from 2007-2021). Samples were rarefied and the Shannon diversity index and species richness (n taxa) were calculated for each monthly sample, resulting in spatial data points being clustered together. Rarefied monthly gamma diversity values were also calculated for the entire region, yet these values were highly biased by sampling effort (e.g. as there are less samples from the Gulf of Bothnia in winter time).
- *Species Distribution Models for invasive macroalgae* (Ramos et al. 2023, <https://www.vliz.be/en/imis?dasid=8209>) provides the historical and projected distribution of four invasive macroalgae (*Asparagopsis armata*, *Caulerpa taxifolia*, *Sargassum muticum* and *Undaria pinnatifida*) along the European coasts. It uses a Species Distribution Modelling approach using historical distribution records and future climate

projections under the RCP8.5 emissions scenario and shows the estimated change in the potential distribution of these species historically and up to 2100.

- *Spatial interpolation of Calanus finmarchicus and Calanus helgolandicus observations in the North Sea* (Troupin 2023, <https://www.vliz.be/imis?dasid=8220>). This product presents a spatial interpolation of the distributions of two key zooplankton species, *Calanus finmarchicus* and *Calanus helgolandicus*. It uses observations from the Continuous Plankton Recorder survey in the North Sea and the DIVAnd software tool to create continuous spatial fields from the sparse spatial coverage of the raw data. Creation of the product required development of a multivariate approach to incorporate environmental variables in the interpolation method, and the output is a series of gridded maps showing distribution of the target species through space and time.

The requirement to produce species migration routes maps for seabirds and cetaceans proved to be a challenging task. At a first instance because there wasn't enough data available for these two groups but also because there was no expertise within the consortium. Throughout the Phase, various discussions with the partners highlighted the difficulties in setting up an external collaboration with the bird and cetacean communities, both in terms of data sharing and product creation. A positive outcome was achieved through the contact with an established researcher and an agreement that his products could be re-published via EMODnet Biology was granted, however due to lack of time this will only happen during the first few months of Phase V.

Another significant achievement of WP3 was the creation, development, and/or publication of three R packages, which together deliver D3.3 Publish R package to link EMODnet data. All R packages are available via the EMODnet GitHub:

- BTrait (<https://github.com/EMODnet/Btrait>) provides an example of how data can be linked to address specific issues of management concern - in this case, linking data on the distribution of benthic species with information on their biological traits, and then with data on environmental conditions and human pressures (specifically fishing) to enable an assessment of fishing impacts on benthic communities.
- EMODnet WFS (<https://github.com/EMODnet/EMODnetWFS>) provides programmatic access in R to all EMODnet data (across all lots) that is served via WFS, and it has been substantially developed during this Phase. The eurobis package now uses EMODnetWFS as a backbone to access EurOBIS occurrence data.
- EMODnet WCS (<https://github.com/EMODnet/EMODnetWCS>) extends access to EMODnet raster data that is served via WCS - a significant amount of data across all EMODnet Lots. This development has involved EMODnet Biology partners but has also demonstrated the value of contracting external consultants to aid with specific research software development issues

Various efforts were made to address Aim 4. For instance, the WP lead devised and supervised a masters project to compare spatial and temporal trends in seabird abundance and diversity derived directly from EMODnet Biology data with those obtained from more detailed quality-controlled maps available from third parties (Waggitt et al. 2019 <https://doi.org/10.1111/1365-2664.13525>). The conclusion of this project was that while very broad scale patterns could be derived from the data, accurate quantification of seabird (and cetacean) distributions in space

and time require significantly more data processing, standardisation, and analysis. An outcome of this has been work within EMODnet to host the distribution maps of Waggitt et al. (2019) as an external product. The publication of the products via the Central Portal viewer will be done during the first months of Phase V.

There has also been significant work in WP3 in community building, through our quarterly community calls (D3.1) and annual workshops (D3.2) which facilitated sharing of good practice, expert tutorials, and collaborative product development. These have all built towards the drafting of a position paper *Realising the potential of interoperable data products to improve the future outlook for marine biodiversity: lessons from the European Marine Data and Observation Network* (D3.5), aimed at synthesising and summarising the lessons learned from biological product development over EMODnet Biology Phase IV, in particular emphasising the value of biological data products to marine research and management. Data product publication took priority over finalising the manuscript, but the expectation is to submit to *Marine Policy* or a similar journal by the end of 2023.

WP4 – Uptake, Outreach and Communication

WP4 work covers Task 6: Ensure the involvement of regional sea conventions and Task 7: Contribute to the implementation of EU legislation and broader initiatives for open data

The adoption of data, products and services and their operational integration represents a significant measure of success for the EMODnet Biology project. As such this dedicated WP is committed to understanding the reach, level and engagement and proactively work to ensure uptake by the wider community and key stakeholders. Below is a brief summary of the outputs and conclusions from this phase of work.

D4.1: Questionnaire to inform cross-lot product development (M3)

Using the Alchemer tool, an online questionnaire management service, and in collaboration with EMODnet Seabed Habitats, we sought to capture key stakeholder requirements and drivers. The resulting questionnaire was shared throughout our network of stakeholders and the wider marine biological community. The questionnaire remained open for four weeks and we received 24 responses.

The results of the questionnaire have been shared with the wider partnership and specifically with WP3 to inform future product development and also with EMODnet Seabed Habitats to help drive greater cross-lot collaboration.

D4.2: EMODnet Biology connectivity ‘map’ of projects, institutes, initiatives and networks to inform targeted engagement (M12)

In order to better understand the landscape within which EMODnet Biology sits and the complexity of the range of project, initiatives and institutes, a further questionnaire was prepared using the Alchemer application. This instance, targeted EMODnet Biology partners, and specifically the staff that form the EMODnet Biology consortium and their interactions with other areas. The full extent of the partnerships interactions would result in an overly complex network map, so the decision was taken to simplify and focus on key, strategic engagements including ICES Working Groups, Regional Sea Conventions, UN Ocean Decade Programmes and the other EMODnet thematic lots. Future iterations delivered through the next phase of work will further develop the map to highlight the nature and directionality of the engagement activity.

D4.3: EMODnet Biology participation in each of the RSC’s to inform and advise of available data products and mechanisms to access and influence the development of data, products, tools and services (M12)

Leveraging the outputs of D4.2 we have identified relevant EMODnet Biology partners to engage with each of the Regional Sea Conventions, in order to better understand their requirements. It is recognised that each of the RSC’s have differing requirements, a range of technical support available to them and that the relevant point of contact will vary, from specific working groups to the main RSC secretariat. Following initial engagement, the EMODnet Biology partnership will then be well positioned to ensure operational adoption of key data products and services to support RSC activities in the coming phases of activity.

D.4.4: “Launch” of the European MBON node (M24)

Due to the shifting landscape of EU initiatives and activities, this deliverable was repositioned to support the emerging EU MBON coordination activities resourced through EuroMarine. D.4.4 therefore became a review and recommendations report highlighting the position and strengths

of the EMODnet Biology partnership and how the existing investment, infrastructure and expertise can provide benefits to the EU MBON. There is clearly significant opportunity for this thematic lot to play a pivotal and significant role in the EU MBON, both through its existing connectivity and interactions with their initiatives and partnerships, the operational, proven data infrastructure and in the training and capacity building resources to aid the adoption of standards and best practices for data, metadata and data products.

D4.5: Creation of engaging and informative use-cases for EMODnet Biology to illustrate uptake and utility of data products across a range of stakeholders across the quadruple helix of engagement (M6, M12, M18, M24)

Four use cases were planned for Phase IV. The published use cases are based on the collaboration with the EMODnet Seabed Habitats team to produce guidelines to submit habitat data to EMODnet Biology (Holistic, standards-based access and interoperability for marine biodiversity data) and the second one on a specific work done by one of our partners on mapping the Distribution of reef-building benthos in the North Sea to support Dutch Ministry of Infrastructure and Transport.

The next published use case outlines the standards-based methodology for the publication of EMODnet Biology datasets with associated media information, enhancing 'traditional' occurrence data with contextual imagery.

The final use case is awaiting publication but will focus on the publication of eDNA derived occurrence data in the standardised OBIS-ENV format and the linkages with data available to the EMODnet Biology partnership from a peer reviewed manuscript on fungal DNA.

WP5 – System Architecture

The work covers the following Tasks:

- 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,
- Task 4- Contribute data, data products and content to a central portal that allows users to find, view and download data and data products and
- Task 9- Maintain the existing thematic web portal for a maximum of six months from the start of the projects

The EMODnet centralisation involved several technical changes to the way EMODnet Biology publishes and publishes the data and data products. The portal shutdown and redirect to the EMODnet Central Portal was achieved in early 2023, a number of HTTP 301 redirect lines were added to the Apache webserver configuration, with the aim to redirect incoming emonet-biology.eu links to their Central Portal counterpart.

Regarding the data and data products accessibility via the EMODnet CP, there was a need to implement a basic functionality to filter the data and products for species names, therefore a customised filter was developed for Biology layers (both data and products), allowing users to search, in the first instance, for specific taxon names. This filter uses the EMODnet Biology download toolbox API for the data and a combination of the ERDDAP API and Aphia/WoRMS database queries for the products (in order to match the AphiaID included in the products to the taxon name). Further API development will be required to ensure that other relevant filters, e.g species traits, data precision, parameters, etc, can also be searchable in the EMODnet CP viewer, thus taking advantage of the interoperability work that is routinely done by the Data management team and extended partnership. The first filter implementation (allowing the search of taxon names) was finished in time for centralisation and the switch off of the thematic portal. Further expansion of the filter options will be done in Phase V.

Effort was also put into improving the M2M interfaces, with a focus on aligning with the EMODnet centralisation work, more specifically: (1) final technical modifications on the customised GeoNetwork installation were applied, making it ready to be deployed in a production environment (mainly CSS, layout and templating issues). (2) Technical assistance to properly reformat several Phase III and Phase IV data products was provided, in order for them to be included in the Central Portal's ERDDAP instance and Central Portal viewer and (3) allow for the delivery of occurrence (real) absence data

A dedicated ERDDAP instance was set up as a Proof of Concept to share Darwin Core compatible CSV files per dataset (<http://erddap.eurobis.org>). This work was developed within the context of a different project, but its outcomes will be explored by EMODnet Biology in terms of whether the data can be made available to the Central Portal as one NetCDF dataset (in addition to the existing OGC standards) that users will be able to query and filter for the information they are looking for.

Various updates to the relational database system, that is the backbone of the OGC webservices, begun, with the new version being PostgreSQL 14 with a PostGIS (3.2.2) extension. In order to harvest and publish new data types (i.e species identification through images), new fields were introduced in the EurOBIS harvesting table, so that compatibility with the data formats was ensured. This resulted in the addition of 16 new fields in the data harvest system, all

intermediate databases, the production systems. The DarwinCore data files containing these new fields are now available to the users.

Following user feedback, the thematic lot became aware that some of the dataset's metadata fields (contact, metadata author, ...) were not being assigned properly on the EML output of the in house developed IMIS metadata catalogue. Upon investigation, it was found that this was caused by an incomplete mapping of the fields in the script that transfers IMIS metadata to the EML output. The mapping logic was revised and fixed.

The implementation of a new GeoNetwork version (3.8.3) with the DCAT (Data CATalogue vocabulary) plugin (1.1) was completed. The DCAT Application profile for data portals in Europe (DCAT-AP) is a specification based on W3C's (World Wide Web Consortium) DCAT for describing public sector datasets in Europe. Its basic use case is to enable a cross-data portal search for datasets and make public sector data better searchable across borders and sectors. This is achieved by the exchange of descriptions of datasets among data portals. Due to it being a version from gim.be, some customisations (mainly Dutch hard-coded displays) were removed and standardised to fit EMODnet's needs. This version was installed as a Docker container so multiple identical instances could be launched (i.e. for the EMODnet Central Portal as well as EMODnet Biology), but with different content and layout/templates.

The Geo stack was upgraded to their latest versions: Geoserver 2.23 and PostGreSQL 14. A Geoserver cluster was also created, decreasing the downtime to a minimum. Proper monitoring of these components was put in place, via an internal Grafana dashboard. The software upgrades were followed by an intensive testing and verification process of about one month. During testing, a number of issues were fixed, which resulted in a much more stable and robust system. The EuroBIS & EMODnet IPT instance (<https://ipt.vliz.be/eurobis/>) were also upgraded to the latest version (2.7.2).

The first implementation of the internal semi-automated procedures to query, request, download and reformat data from SeaDataNet's API was completed and made operational. This means that the Data Management team will be able to more quickly publish biological data available through this aggregator, while spending less time with the reformatting. Constraints are still in place when it comes to vocabulary mapping which cannot rely on a fully automated process, but require manual intervention by a data manager.

Finally, the implementation of the fitness for use label on published data was revisited with the aim to be finalised in 2023.

4. Identified issues: status and actions taken

| A. Priority issue(s) identified and communicated by CINEA/ DG MARE/ SECRETARIAT | | | | |
|---|----------------------------------|--|-------------|------------------|
| Priority issue | Status (Pending/ Resolved) | Action(s) taken/ remaining actions planned | Date due | Date resolved |
| Including in metadata records online resources (This will be provided as part of the comprehensive metadata review, planned for end 2022. This will however require a CSW service that provided access to the Portal's metadata records) | Pending | No changes since the last QR | QR24 | |
| Including data and metadata URL in web services of data products | Ongoing | No changes since the last QR | QR18 | |
| Implementing Marine-ID | Resolved | With the ongoing work towards the centralisation of all thematic lots in the Central Portal, it has been established that Marine-ID cannot be used as an authentication means. If any is required in the Central Portal, it will be the EU login | | |
| Assessment of performance | | | | |
| Task 6: Ensure the involvement of regional sea convention: it could be useful to share insights on the high-level messages shared with the RSCs and outcomes of discussions/meetings with each of the RSCs | Resolved | High level summary of is provided in the meetings attended section | | |
| The Secretariat is wondering if those tutorials will be made available online on the Biology/Central Portal website as it could be of interest for other thematic lots but also data providers. | Resolved | It is not envisaged that these tutorials will be shared publicly as they were designed for internal use and using the guidance and documentation the thematic lot has in place when creating products. | QR21 | QR21 |
| In the previous reporting period, a survey was done and it was reported that a brief summary would be included in this quarterly report. However, no details on the survey results were provided | Resolved | There was no mention of a survey done in the previous report (QR19). An internal survey was done to capture all partner's involvement with different RSC's, international initiatives, EU Working Groups, the outcome of which will be made | QR20 | QR20 |

| | | | | |
|---|----------|--|------|------|
| | | available via a connectivity map of the network, included in D4.2 | | |
| Indicator 2: Status/Volume and coverage of total number of products. | Resolved | The indicator units is correct as we monitor the products that are downloaded, each download equates to one request | QR20 | QR20 |
| Indicator 3: The thematic lots should not provide an exhaustive list of their contributing partners | Resolved | This indicator only includes the partners that have in fact contributed with data during the reporting period. Data providers (internal or external) have always been listed in the QR when their data were published within the period in consideration | QR20 | QR20 |
| A recent questionnaire (D4.1) used a commercial survey tool called Alchemer. The Secretariat is looking forward to the results, and recommends that in future surveys should be run via the EU Survey tool (https://ec.europa.eu/eusurvey/home/welcome) | Resolved | The Alchemer tool is used by MBA and complies with GDPR regulation, while also allowing for a simple way to create a results report. Future EMODnet Biology surveys will use the EU survey tool instead | QR19 | |
| Status of the archaeological data part | Resolved | Archaeological data (phase III WP3) is now included in WP2. Whenever archaeological data are harvested they will be highlighted in the quarterly report. For QR17, 4 NIMRD datasets fit this category | | |
| The use of the term "archaeological data" is incorrect | Resolved | This term is not incorrect, as it is also used for old data that are not available in digital format. The term was also used in Phase III and Phase IV proposals, therefore, for consistency's sake, will continue to be used throughout this phase. | | |
| European Marine Regions shapefile | Resolved | Shapefile is fully implemented and will continue to be used throughout Phase IV unless new requirements are published | | |

| | | | | |
|--|----------|---|------|--|
| Portal specifies the schedule for publication of the products | Resolved | Provisional dates will be agreed for the publication of Phase IV products and will be shared with the EMODnet Secretariat in order to agree on the communication strategy for each product. Similar procedure to what was done for Phase III products | | |
| It is recommended that the new delivery dates for the 'delayed datasets' would be listed in the Biology Final Report, so that these can be known as they are part of Phase III (and the Biology lot is now in Phase IV), so as to ensure delivery in the near future | Resolved | All Phase III data will be referred to as such in future reports | QR17 | |
| There was no update provided on this task in the report. As indicated in the previous assessment report, Secretariat recommends to have a discussion between CINEA/DG MARE and all thematic coordinators at the next Steering Committee meeting in September 2021 to formulate guidance and to understand the objectives of the collaboration (per RSC if possible and per thematic node), and so gain a priority perspective and targeted way forward. | Resolved | This refers to Phase III Task 5 and Phase IV Task 6. An update was provided in the final report and will always be included in future reports under the appropriate task. | QR17 | |
| Progress solving identified issues | | | | |
| EM-83 - Biology - Web Services MetadataUrl and DataUrl | Pending | Resolution is planned to take place in the second half of 2021 or early 2022 | | |
| EM-78 - Biology to report on status or plans to support INSPIRE Compliant CSW | Ongoing | Customised GeoNetwork (DCAT and INSPIRE compliant) upgrade in progress. Fixing and debugging is almost complete, however the Log4j bug that was identified worldwide at the end of 2021 also needs to be addressed for this piece of software | | |
| EM-143 - Biology Quality of Service Monitoring | Resolved | Upon investigation, it is believed that the cause of the issue was the VLIZ firewall migration | | |
| Observations in view of Section 1.7 of the Tender Specifications on Performance and Quality Requirements | | | | |
| What is the portal's plan regarding data collection from the Caribbean Sea? | Ongoing | Partners have been requested to assess if they have any data in the region and if possible to submit it | QR24 | |

| | | | | |
|---|----------|--|------|--|
| | | Ongoing communication with Caribbean OBIS to incorporate their data our holdings. | | |
| Observations in view of Section 1.7 of the Tender Specifications on Performance and Quality Requirements | | | | |
| Indicator 5: The Secretariat noted some data entry errors in the excel table, i.e., 206 users giving information, vs. 23 total users for quarterly period. It was therefore not possible to interpret the results and perhaps clarify this in the final report which is still due. | Resolved | This was most likely a typo and should read 206 total users for the quarterly period | | |
| Summary of the data and data products available should be included in the portal | Resolved | The portal was updated with the publication of all Phase III products (e.g. https://www.emodnet-biology.eu/blog). Summary of data and products can be done within the context of the centralisation | QR17 | |

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 absent 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 image data associated with occurrence records | Ongoing | As part of Phase IV proposed work, changes to the Database and data publishing procedures are necessary to allow users to obtain images associated to the taxa occurrence records. | QR24 | QR24 |

| | | | | |
|---|----------|--|------|------------|
| 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 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 | The partner in questions, UkrSCES is based in Odessa and contributes to WP2. Situation is being followed up within the project. The ongoing conflict might mean that the partner is unable to supply the data within the project's deadlines, as initially agreed | | |
| Thematic lot metadata records not in the EMODnet catalogue | Ongoing | Due to centralisation, the lot will lose its catalogue, where users can search and download data. Work is ongoing to allow for a sync between the lots' catalogue (hosted by VLIZ) and the EMODnet GeoNetwork instance to ensure all metadata remain FAIR | QR24 | |
| EMODnet Biology products added to CP viewer | Resolved | Biology products are being made available to the CP either via ERDDAP or GeoServer. The NetCDF structure complies with CF guidance for Biological data | QR24 | QR22 |
| Updates to Webservices to allow users to download habitat data that are not linked to biological occurrences | Resolved | The inclusion of ingestion of habitats data, that resulted from a collaboration between Seabed Habitats and Biology, was successful. A constraint in accessing the data was identified for those records that are not linked to biological records. Changes to data publication procedures have been implemented and it is confirmed that habitat data linked to species occurrences can now be downloaded via the EMODnet Biology toolbox and webservices. | QR22 | QR21 |
| EML metadata mapping between IMIS (metadata catalogue) and IPT had some transformation issues | Resolved | Improved the mapping and made the contact/author fall back mechanisms work as intended | QR19 | 30/11/2021 |

| | | | | |
|--|----------|--|------|------------|
| Inclusion of dataset bounding box in metadata records. This need was identified by a different project but also affects EMODnet Biology's metadata records as they are being harvested by this third project | Resolved | For all the datasets, the geographical bounding box is being calculated based on the occurrence records in the dataset. This information is stored in the IPT metadata as the 'EurOBIS calculated BBOX'. See https://www.emodnet-biology.eu/data-catalog?module=dataset&david=5076 as an example | QR19 | 11/11/2021 |
| Updates to EMODnet reporting regions polygons | Ongoing | Update will include: <ul style="list-style-type: none"> ● a coastal buffer of 3km inland in the Other Seas region so that all coastal records are correctly captured (small gaps due to different coastlines were identified) ● Inclusion of the Caribbean Seas in the Atlantic region ● Minor gaps between the different polygons closed and mapped to the appropriate regions | QR20 | |
| QC tool updates | Resolved | Updates included: <ul style="list-style-type: none"> ● Documentation added to About tab (error messages explanation and tutorials) ● Debugging (account for non resolving BODC terms, non-numerical coordinates, dependencies management) ● Addition of BODC S09 collection to the checks and harvest of new BODC terms | QR19 | QR19 |
| Change of staff at HCMR | Resolved | Handover was done so that co-lead responsibilities and overall workplan were shared with the HCMR team. No delays or constraints occurred | QR18 | QR18 |
| Re-definition of Phase IV Marine Regions as specified in the tender | Resolved | EEA shapefile was adapted for Biology purposes. More details can be found in Task 8 | QR17 | QR17 |
| GeoNetwork update | Pending | New version has been updated and is being tested before being made operational | QR18 | |

5. Allocation of project resources

| Information on the allocation of project resources | |
|--|--------------------|
| Categories | Resource usage (%) |
| Making data and metadata interoperable and available | 52% |
| Preparing data products | 15% |
| Preparing web-pages, viewing or search facilities | 1% |
| Managing user feedback | 3% |
| Project management | 7% |
| Outreach and communication activities | 19% |
| Others | NA |

6. User feedback

| Overview of user feedback and/or requests received in this project phase | | | | | | | |
|--|--------------------|---|------------------|--|--|---|--|
| Date | Organisation | Type of user feedback (e.g. technical, case study, etc.) and short description of the feedback received | Means of contact | Response time | Status of user query (Resolved/ Pending) | Measures taken to resolve the query | Status: if not (yet) resolved/ pending, explain reason why and expected timeline |
| 29/03/2023 | RBINS-BMDC | Question about biological data standardisation for the CDI service | email | Within 1 day | resolved | Explanation provided on how to search for parameters in BODC-NVS P01 collection. Suggestions for specific parameter codes, for the identified variables, sent to user | |
| 20/03/2023 | Private individual | Request for support with Mediterranean shapefile | EMODnet JIRA | Within 1 day (ticket was assigned on 2023-03-20) | Resolved | Directed the user to the Marine Regions portal where more detailed information and contact details for the team could be found | |
| 07/03/2023 | Undersee | Enquiry about the use of Physico-chemical parameters in EurOBIS | email | Within 1 day | Resolved | This enquiry was suited for the Physics team and a JIRA ticket was created in the EMODnet instance so it could be followed up | |
| 23/02/2023 | DTU | Invitation to participate in a biodiversity indicator co-creation process | EMODnet JIRA | Within 1 day (ticket was assigned) | Resolved | Requested more information about the activities and provisionally accepted based on availability for the event dates | |

| | | | | | | | |
|-------------------|----------------------------------|--|---------------------------|-----------------------|----------|--|--|
| | | | | on 2023-03-02) | | | |
| 24/09/2022 | Commercial company (undisclosed) | Enquiry on whether advertisements could be posted/linked to the portal | Portal contact form+email | Within 2 working days | Resolved | Advised user that none of the VLIZ maintained/hosted websites allow for links or any type of advertisements | |
| 27/07/2022 | Deep Wind Offshore | Access to bird data in the Baltic Sea, north of Upsala | EMODnet helpdesk | Within 1 working day | Resolved | Informed user that holdings for that specific group and area is very scarce but that we should have more data within the coming months. Directed user to other possible sources of data. | |
| 17-06-2022 | Wavec | Download data (polygon made by the user) | Website form | Within 1 working day | Resolved | Directed user to EMODnet Biology download toolbox and clarified how a bounding box could be drawn to select an area of interest | |
| 17-06-2022 | University of Edinburgh | OSPAR Workshop - NACES - Sponge Datasets | email | Within 2 working days | Resolved | Provided additional information as shared during the workshop. Directed user to the SponGES metadata record and SponGIS website | |
| 27-04-2022 | University of Lagos | Request for a host supervisor (POGO SCOR fellowship 2022 programme) | email | Within 5 working days | Resolved | Directed user to general jobs email at VLIZ as any internship request is processed via that route, rather than directly by the thematic lot | |
| 15-04-2022 | NA/Private | Data Request: Phosphorus/Nitrate/Chlorophyll-a/Silicate | email | Within 3 working days | Resolved | Directed user to EMODnet Chemistry for the chemical data and to the Biology | |

| | | | | | | | |
|-------------------|---|--|-------|----------------------|----------|---|--|
| | | Mediterranean/Adriatic/Ionian Sea | | | | download toolbox to search for specific taxa | |
| 05-04-2022 | SLIIT (Sri Lanka Institute of Information Technology) | Requesting Information for University Research Project (Nematode images) | email | Within 1 working day | Resolved | Directed user to Nemys, the world database of Nematodes and to WoRMS (World Register of Marine Species) where some Nematode images can also be found | |
| 17/02/2022 | DFMR | Government Information on how to share data | email | 1 working day | Resolved | User asked about registration to share data. All information provided, no response received | |
| 14/02/2022 | MNCN-CSIC | Government Access to Mediseh Posidonie shapefile | email | 1 working day | Resolved | Directed user to the downloadable files | |
| 11/02/2022 | RWS | Government Request to provide a presentation at the NCK open day | email | 1 working day | Resolved | Invitation received on March 2 nd , presentation will be given on QR21 | |
| 11/03/2022 | UGent | Academia/Research EMODnet Biology aanleveren datalayers- bivalve reefs | email | 1 working day | Resolved | Request forwarded by EMODnet Secretariat. Data Products seem to be a better fit for Seabed Habitats, however the user was encourage to submit the data behind the maps to Biology as well | |
| 23/03/2022 | CSIC | Government IPT credentials – associatedMedia field missing | email | 1 working day | Resolved | Informed user that this is a known issue with missing fields in files available to users. This is part of our | |

| | | | | | | | |
|-------------------|-----------------------------|---|--|--|----------|---|--|
| | | | | | | infrastructure updates for Phase IV | |
| 2021-12-09 | UDG | Academia | email | 1 day | Resolved | Directed user to Seabed Habitats as query was not within Biology's remit | |
| 2021-11-25 | UCC | Academia | CP helpdesk form | 1 day | Resolved | Email sent to user requesting more information on the problem experienced. User did not reply | |
| 2021-08-18 | Sustainable Digital Finance | Making Oceans Count in the Nordic financial system - initiative | email (forwarded by the EMODnet secretariat) | 1 day | Resolved | Provided information on how user can query our holdings (catalogue and data) | |
| 2021-08-04 | IMBRSEA | EMODNET Data Access | email | 2 weeks (email received during the holiday period and send to an individual, not the team's email) | Resolved | Directed user to the WFS R package GitHub and the EMODnet Biology WebServices documentation | |
| 2021-08-04 | UCSD | Pulling metadata from VLIZ | email | 5 days (email received during the holiday period and send to an | Resolved | Directed user to the EMODnet Biology API documentation | |

| | | | | | | | |
|-------------------|-----------------|---|-----------------|--|----------|--|--|
| | | | | individual, not the team's email) | | | |
| 2021-07-14 | IPMA | Request for Dead planktonic foraminifera faunal data from NE Atlantic multinet hauls dataset to be added to EMODnet Biology | Submission form | 1 day | Resolved | Emailed user to inform that data would be added to the database in due time | |
| 09/06/2021 | Ifremer | Enquiry about JERICO datasets data downloads | email | 1 working day | Resolved | EMODnet Biology does not collate this information at dataset/data provider level. Pointed to OBIS stats as a proxy of EMODnet Biology downloads. Also noted that EMODnet Biology downloads are approximately 1% of those observed in OBIS (for datasets that flow via EuroBIS) | |
| 07/05/2021 | SeaBed Habitats | Enquiry about data grants | email | 1 working day | Resolved | Reply informing the user that no data grants are expected during Phase IV | |

7. Meetings/events held/attended & planned

| A. Meetings/events organised and attended in this project phase | | | | | |
|---|------------------------|---|--|--------------------------------------|--|
| Date | Location | Type event (internal or external meeting; training/ workshop) | Was a presentation given? (yes/no + short description) | Meeting attended (A) / organised (O) | Short description and main results (# participants, agreements made, etc.) |
| 2023-04-12 to 2023-04-13 | Larnaka, Cyprus Hybrid | Meeting | Yes EMODnet Biology updates for Ingestion | O | EMODnet Ingestion annual meeting |
| 2023-02-04 to 2023-04-05 | Brussels, hybrid | Meeting | Yes EMODnet Biology status update | A | EMODnet Technical Working Group meeting |
| 2023-03-27 to 2023-03-30 | online | Hackathon | No | A/O | Open Sea Lab Hackathon Several EMODnet Biology members participated as mentors and coaches in the event and as organisers |
| 2023-03-22/ 2023-03-24 | Paris, France | Meeting | No | A | Participation in the 27th Session of the IODE Committee |
| 2023-03-21 | Paris, France | Conference | Online poster | A | Participation in the International Ocean Data Conference-II |
| 2023-03-20 | Online | Training Session | Yes | O | A training session organised in the framework of EMODnet Biology, specifically focusing on the ongoing Feasibility Study on Ecological Traits and sampling devices/ methodologies identification with text mining. |
| 2023-03-14 to 2023-03-15 | Hybrid | Meeting | No | A | Marco Bolo project kick off Details in Task 7 |

| | | | | | |
|--------------------------|--------|---------------------|-----|---|--|
| 2023-01-23 | Online | Meeting | No | A | EMODnet: achievements & way forward Participants: EMODnet coordinators, CINEA and DG MARE |
| 2023-01-18 | Online | Meeting | No | A | Kick off meeting on updating EMODnet portal content Participants: EMODnet thematic lots and EMODnet Secretariat Meeting focused on sharing information on static content, news, use cases and reports and new products |
| 2022-11-08 | Hybrid | External Conference | | A | 2022 EuropaBON Conference in collaboration with Biodiversa+ |
| 2022-11-07 to 2022-11-08 | Online | External Meeting | Yes | A | EMODnet Steering Committee meeting Agenda and meeting notes available via https://webgate.ec.europa.eu/maritimeforum/en/node/7500 |
| 2022-11-02 to 2022-11-04 | Online | External workshop | | A | Mediterranean Biodiversity Protection Community (MBPC) project Final Event, entitled "The Mediterranean leading the way - a cooperative framework to strengthen area-based nature conservation actions The talks on the first day of the online event (3rd of November), were policy oriented. They discussed for the need of regional cooperation especially regarding the aspects of plastic free islands (the Network of Islands) and climate change mitigation. In addition, they referred to other actions such as the Charter of Commitment for Mediterranean Posidonia Beaches (touristic sector) and the Wetland and Forest Contract. In this framework, Carole |

| | | | | | |
|---------------|--------|-------------------|-----|---|--|
| | | | | | <p>Martinez (MedPAN, https://medpan.org/about/), made a brief reference to the Marine Protected Areas.</p> <p>On the 4th of November discussions were focused on marine policy (SESSION 1: Area-based nature conservation actions and the review of marine and maritime EU policies). From the DG ENV the talk referred to the importance of fisheries resources and the Review of the Marine Strategy. Special mention made to the habitat types and the Marine Protected Areas (target of 30%), as well as the need of improving data collection. Mr Eduardo Carqueijeiro, Policy Officer, DG R&I, referred to the European Green Deal and the necessity of synergies between the Horizon Projects and the Regional Development Fund Programmes. He also referred to the mission Ocean and Wastes (pesticides, microplastics, noise pollution) and the mission Implementation Charter. Finally, Mrs Celine Frank from DG MARE, emphasized on Maritime Spatial Planning and nature conservation with mentions to Examples of MSP plans in EMODnet- Human Activities.</p> <p>Another mention to EMODnet was by Mrs Dania Abdul Malak (reference to habitat change and shipping lanes).</p> <p>Event details can be found via https://biodiversity.uma.es/mbpctoolscatalogue/the-mediterranean-leading-the-way/#program</p> |
| 2022-10-20/21 | Online | External workshop | Yes | A | <p>EMODnet for Business Workshops: Marine data for and from the Offshore energy sector- Mediterranean and Black Sea (https://emodnet.ec.europa.eu/en/emodnet-</p> |

| | | | | | |
|--------------------------|-------------------|-------------------|--|---|--|
| | | | | | business-workshop-marine-data-and-offshore-energy-sector-mediterranean-sea-and-black-sea and https://webgate.ec.europa.eu/maritimeforum/en/node/7383 > 80 participants Main objectives were: facilitate cross-sectoral dialogue and share experiences from key offshore energy stakeholders regarding their in-situ data needs, the potential for developing targeted data products, tools and methodological approaches that can support the sector |
| 2022-10-17 | Online | External Workshop | No | A | DASSH user requirements workshop Small workshop targeting specific organisations/initiatives to contribute to DASSH's future developments. DASSH is the Archive for Marine Species and Habitats Data, hosted by the Marine Biological association |
| 2022-10-11 | Online | External Workshop | Yes Shared presentation with EMODnet Seabed Habitats where the topics covered were: <ul style="list-style-type: none"> • EMODnet • EMODnet Biology (data, products, services and tools) • EMODnet Seabed Habitats (data, products, services/tools) | A | Copernicus workshop on Biodiversity and coastal ecosystems (https://www.copernicus.eu/en/events/events/copernicus-biodiversity-coastal-ecosystems-workshop) 150 participants Showcase Copernicus outputs in relation to biodiversity and coastal ecosystems and address knowledge gaps, EBVs and new 2030 policy requirements |
| 2022-10-03 to 2022-10-04 | Brussels, Belgium | External Forum | No | A | EU-Canada Ocean Partnership Forum (https://oceans-and-fisheries.ec.europa.eu/news/1st-eu-canada-ocean-partnership-forum-experts-cooperate-ocean-observation-2022-10-10_en) |

| | | | | | |
|---------------|----------|--------------------|-----|---|--|
| | | | | | 40 participants Main objective was to identify opportunities for collaboration, including closing existing knowledge gaps and ensuring availability of ocean observation data |
| Various dates | Online | Hackathon planning | No | A | Open sea Lab 3 Hackathon planning Core team composed of EMODnet Biology and EMODnet Secretariat colleagues to define the OSL3 overall structure |
| 22/09/2022 | Brussels | External meeting | Yes | A | 2 nd EMODnet-Copernicus Marine Service coastal workshop Details of this event, including a provisional agenda can be found in https://webgate.ec.europa.eu/maritimeforum/en/node/7390 The event was focused on dialogue between the two EU marine data services EMODnet and Copernicus Marine Service with a specific focus on the coastal area |
| 21-22/09/2022 | Brussels | External meeting | Yes | A | EMODnet Technical Working Group Hybrid meeting where each thematic lot presented the work since the last meeting and an update of the centralisation process was given by the Central Portal Technical Team |
| 20-21/09/2022 | Online | External workshop | No | A | EMODnet for Business Workshops – Marine Data for and from the Offshore energy sector in the Northeast Atlantic, North Sea and Baltic Sea areas Event details, including an agenda are found in https://webgate.ec.europa.eu/maritimeforum/en/node/7382 More than 65 participants joined the two-half day event |

| | | | | | |
|-------------------|--------|-------------------|-----|---|--|
| 19-23/09/2022 | Gdansk | Conference | yes | A | Presentation on EuroBIS & EMODnet Biology on the European Marine Biology Symposium (EMBS), reaching several potential data providers and explaining the need of FAIR data and sharing data with initiatives such as EMODnet Biology. |
| 15/09/2022 | Online | External meeting | No | A | The Historical Data Project Team, which was established at the 10th OBIS Steering group meeting in 2022, was presented in the joint meeting of OBIS Historical Data & Data Quality Control Project Teams. Communication between MedOBIS and OPI is ongoing for future activities. |
| 07/07/2022 | Online | External workshop | No | A | How to expand the GROOM RI data management capacity to the “new” data type collected by Gliders in Europe? Organised by EuroSea and EuroGOOS the workshop aimed at discussing new data types, assessing the possible data flows, constraints, existing infrastructures. One such data type is imaging data from instrumentation installed on gliders, for which EMODnet Biology has some experience. More details about the workshop can be found via https://www.groom-ri.eu/european-glider-data-management-workshop-agenda-2/ |
| 22-06-2022 | Online | External Meeting | No | A | EMODnet Vision for the future, governance and business model Meeting organised by the EMODnet Secretariat to gather feedback from the various thematic lots on how the centralisation changes can help shape the future of EMODnet |
| 21-06-2022 | Online | External Meeting | No | A | EMANEDS Meeting with TransEuropeMarinas and European Boating Industry as well as other EMODnet thematic |

| | | | | | |
|-------------------------|---------------|-------------------|--|---|---|
| | | | | | lots to discuss possible ways of engaging marina users through data collection activities. First expected output is a concept paper of the relevance of this line of work and a high-level overview of how it could be implemented |
| 20-06-2022 | Online | External training | No | A | Infosession "How to make a site compliant" Training session organised by DG COMM for EMODnet thematic lots covering the requirements pertaining to the repatriation to the Europa domain |
| 14 to 16-06-2022 | | External Meeting | Yes EMODnet & regional sea conventions: strengthen co-operation | A | OSPAR ICG-COBAM meeting Overview of EMODnet and how can EMODnet Biology support OSPAR's activities, more specifically: <ul style="list-style-type: none"> • What can EMODnet mean for the OSPAR groups and vice-versa? • Which EMODnet data/services used for current QSR2023? • QSR 2023: knowledge gap section! Any topics wherefore EMODnet can give support? |
| 13-06-2022 | Online | External Workshop | No | A | NACES workshop This was an expert workshop on the Roadmap for further work on the North Atlantic Current and Evlanov Sea basin MPA. EMODnet Biology participated and highlighted that the data included in the report (made available ahead of the event) was in fact published by EMODnet Biology (data were retrieved via OBIS). It was also noted some datasets that are not yet published could be relevant for this work. |
| 06 to 10-06-2022 | New York, USA | External Meeting | Yes | A | 22 nd meeting of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea |

| | | | | | |
|-------------------------|------------------|---------------------|-----|---|---|
| | | | | | <p>EMODnet Biology was invited to present the European perspective on “Strengthening ocean observation value chain through regional cooperation: lessons from EMODnet Biology”</p> <p>A slide with the data flow (including EMODnet Ingestion was presented)</p> <p>The session video is available via https://media.un.org/en/asset/k1o/k1oa2bkb5t</p> |
| 19 to 20-05-2022 | Ravenna, Italy | External Conference | No | A | <p>European Maritime Day</p> <p>EMODnet Biology attended as an invited panellist to the session EMD WS n°9 - Ocean observations, marine data and services for the European Green Deal. The video recording is available via the link https://vimeo.com/714099133</p> |
| 09 to 13-05-2022 | Sardinia, Italy | External | No | O | <p>ICES Benthos Ecology Working Group</p> <p>Discussion on Benthic work (e.g. invasives) and benthic time series applications</p> |
| 04 to 05-05-2022 | Hybrid /Oostende | Internal Meeting | Yes | O | <p>Annual project meeting</p> <p># Participants: ~40</p> <p>Status of the project given via WP leaders presentations and partners pitch presentations. WP2, WP3 and WP4 had breakout sessions where specific topics related to the workplan could be discussed and further progressed</p> <p>Partner and WP presentations can be found via https://www.emodnet-biology.eu/documents (under EMODnet_Biology_IV/Meetings folder)</p> |
| 26 to 28-04-2022 | Hybrid /Oostende | External Meeting | Yes | A | <p>EMODnet Steering Committee and Technical Working Group Meetings</p> <p>EMODnet thematic lots’ status updates, centralisation overview and progress so far.</p> |

| | | | | | |
|--------------------------|---------------|---------------------|---|---|---|
| | | | | | Minutes: https://webgate.ec.europa.eu/maritimeforum/en/node/7141 and https://webgate.ec.europa.eu/maritimeforum/en/node/7266 |
| 20 to 21-04-2022 | Hybrid /Paris | External Conference | No | A | Digital Ocean Forum High level event organised by Copernicus as a response to the EU Mission “Restore our Oceans and Seas by 2030” and to the call made at the One Ocean Summit on 11 February 2022 in Brest (France) towards the construction of the European Digital Twin Ocean (DTO) based on European Assets such as Copernicus and EMODnet Agenda: https://www.mercator-ocean.eu/wp-content/uploads/2022/04/DOF-21.04.pdf |
| 11 and 22-04-2022 | online | External workshop | No | A | Workshops on data management for new Dutch North Sea Research program. Represented EMODnet, agreements on standards to facilitate transfer to EMODnet Biology and other lots. |
| 11-04-2022 | Online | External Webinar | Yes Presentation: https://www.nck-web.org/content/documents/2022/Theme_Day_Measurements/pitch9_EMODnet_Biology_JoanaBeja_VLIZ.pdf High level overview about EMODnet Biology's activities and services | A | NCK Data Day: https://www.nck-web.org/upcoming-events/108-the-value-of-measurements-and-monitoring # Participants: ~50 Recording: https://www.nck-web.org/past-events/all-events/108-the-value-of-measurements-and-monitoring Session dedicated to the topic “The value of measurements and monitoring” |
| 05-04-2022 | Online | External Workshop | No | A | EATIP-OBPS Best Practises in Aquaculture workshop Report published in Best Practices in Aquaculture, EATIP-OBPS Workshop, Tuesday, 05 April 2022, 11.00 - 14.30 UTC (Online), Proceedings. |

| | | | | | |
|-------------------------|--------|-------------------|---------|---|--|
| | | | | | oceanbestpractices.org and workshop presentations are available via Basecamp.com Best Practice in Aquaculture - 5 April 2022: Presentations |
| 11/03/2022 | Online | External Meeting | No | A | Marine Biodiversity Networking Fridays Ocean Observation: strengthening collaboration among the marine biodiversity Ocean Decade Actions Range of presentations highlighting UN Decade actions |
| 02/03/2022 | Online | External Meeting | No | A | MarineLife2030 Capacity Building and Citizen Science Volunteers Introductory meeting to develop the MarineLife2030 UN Decade programme activities related to Citizen Science and associated data flows. |
| 28/02-03/03/2022 | Online | Internal workshop | WP3 Yes | O | WP3 data product workshop Internal workshop to discuss, organise Phase IV Biological data product creation |
| 28/02/2022 | Online | External Meeting | No | A | Meeting with Central Portal Technical Team Discuss centralisation workplan and work required by thematic lot to comply with CP requirements |
| 26/01/2022 | Online | External Meeting | No | A | JERICO Image data management follow up Aim was to share JERICO updates and discuss the best way forward in implementing a solution for image data management that fits not only JERICO's but also EMODnet Biology's objectives |
| 17/02/2022 | Online | External Meeting | No | A | Meeting with Trans Europe Marinas and European Boating Industry Follow up of a request forwarded by the EMODnet Secretariat. Discussion on how these organisations can foster ocean outreach within its members but also contribute with data and use EMODnet's |

| | | | | | |
|----------------------|--------------------------|---------------------|-----|---|--|
| | | | | | data/products. Colleagues from EMODnet Ingestion and Physics were also present |
| 14-16/02/2022 | Hybrid (Sopot , Poland) | External Conference | Yes | A | Ocean Data Conference > 200 participants Oral presentation titled 'EMODnet Biology: A European initiative with global influence' and partner poster titled 'Dive into MedOBIS: an Open and FAIR Biogeographic Information System for the Mediterranean Sea' |
| 11/02/2022 | Online | Internal meeting | No | O | EMODnet Biology Coordination Board meeting Progress updates, project information exchanged within all WPs through their leads |
| 09-11/02/2022 | Online | External Conference | No | A | One Ocean Summit Commission initiative to promote a cleaner, healthier and safer ocean |
| 04/02/2022 | Online | External Meeting | No | A | MarineLife2030 Co-design and Stakeholder Engagement Meeting Initial meeting to discuss previous activities and potential roles in developing engagement activities around the MarineLife2030 UN Decade programme. |
| 02/02/2022 | Online | External Workshop | No | A | Black Sea CONNECT Innovation Workshop Aim was feature successful stories and best practices from different blue economy sectors, allowing the meeting of nascent maritime and innovation clusters in the Black Sea with more developed European counterparts and driving their collaborative development of blue innovations for the region |
| 14/01/2022 | Online | External Webinar | No | A | Marine Biodiversity Networking Fridays: Marine indicators for the Convention on Biological Diversity Permanent link: https://www.aircentre.org/netfridays-marine-biodiversity-02/ |

| | | | | | |
|-------------------|--------|-------------------|-----|---|---|
| 14/01/2022 | Online | External Meeting | No | A | Meeting with Central Portal Technical team Discuss centralisation workplan and work required by thematic lot to comply with CP requirements |
| 17/12/2021 | Online | External Workshop | No | A | A virtual Marine Stakeholder Conference entitled "Future of our Seas". Highlighting the current state of EU waters in the context of MSFD. Breakout sessions included attended included: A Coherent Framework - looking at the interaction between MSFD and other EU legislation Implementing the Directive - Working Together. This session looked at how, through engagement and interaction we can improve coordination and implementation of the directive. |
| 13/12/2021 | Online | External Workshop | Yes | A | Scientific Workshop on White Sea Benthic Datasets. Exploring the availability and utility of data in the White Sea region, including the opportunities for EMODnet Biology supporting data digitisation and rescue. |
| 07/12/2021 | Online | External Workshop | No | A | iNaturalist Steering Group. This global Citizen Science initiative collects biodiversity data and images via an app and website. Work is underway to investigate the development of workflows and process to capture iNaturalist data and integrate it into EMODnet Biology. |
| 23/11/2021 | Online | External Workshop | Yes | A | Macroalgae Workshop 50 participants Eurosea organised workshop where EMODnet Biology was invited to present not only our holdings and products with respect to macroalgae, the data flow and connections with global initiatives like OBIS |

| | | | | | |
|-------------------|--------|------------------|----|---|---|
| | | | | | and GBIF, but also provided a brief overview of EMODnet Seabed Habitats and Human Activities as other sources of information that could be relevant to this community |
| 12/11/2021 | Online | External | No | A | <p>Networking Fridays - MarineLife 2030 & OKAN. Live participants + delayed views: 272</p> <p>The AIR (Atlantic International Research) Centre, organises 'networking Fridays': short webinars on several topics, aiming for an international collaborative framework to address global challenges and local priorities in the Atlantic Ocean. The webinar of Friday 12 November was aimed at introducing the Ocean Decade Programme MarineLife 2030 and the Ocean Knowledge Action Network (OKAN). Full webinar available through YouTube: https://www.youtube.com/watch?v=j8-V9t11-OY</p> |
| 03/11/2021 | Online | External meeting | No | A | <p>ODYSSEA conference:</p> <p>The purpose of this conference was to present the results of the ODYSSEA project to key target audiences: partners, the scientific community, marine-based industry (including SMEs), policymakers, public authorities, media, consumer organisations and the public. The conference had around 120 participants.</p> <p>The conference has been arranged into 6 specific areas of focus:</p> <ol style="list-style-type: none"> 1. Capacity-building around the Mediterranean (with emphasis in North Africa) 2. Marinomica – the data visualisation platform |

| | | | | | |
|-------------------|--------|------------------|----|---|--|
| | | | | | <p>3. Development of Marinomica products and services.</p> <p>4. Observatories – the new Med observatories.</p> <p>5. End user services and contribution to policy processes</p> <p>6. Impacts and the future</p> <p>Most interesting was the presentation of Marinomica platform, which is an application focused on decision making in the marine environment. Marinomica platform provides state of the art on-demand data services and forecasts to a wide range of users managing and mitigating challenges arising from changes in the water. The Marinomica Platform vision is to provide a single portal by applying advanced algorithms to organise, homogenise and fuse the large quantities of data in common standard type. It is foreseen as an ideal tool for all parties that are engaged in mitigating pollution hazards and untreated waste; offshore maritime renewable energy (currents, wind, waves, solar); MetOcean hindcasts, nowcasts and forecasts; fishery and aquaculture; biodiversity; oil and gas exploitation; tourism; and marine traffic and harbours.</p> <p>Answering my question what the source of the data is, they replied: Present Datasets: CMEMS, HYCOM, AVISO+, CLS models, Sentinels, ECMWF, NOAA, EMODnet habitats and Upcoming Datasets: OneGeology, Fishbase, UNEP-WCMC, CORDEX CC, e-Hype.</p> |
| 28/10/2021 | Online | External Webinar | No | A | Webinar 4: Looking ahead: Future developments in the biodiversity data landscape |

| | | | | | |
|----------------------|-------------------|--------------------|----|---|--|
| 28/10/2021 | Online | External Webinar | No | A | OBIS Genetic Data Webinar Organised to inform the wider community of the recent developments and implementation for genetic data. |
| 26/10/2021 | Online | External Webinar | No | A | Webinar 3: Innovative developments in the field of biodiversity data collection |
| 20-21/10/2021 | Brussels, Belgium | External Hackathon | No | A | Hack4Oceans Hackathon EMODnet Biology was present to provide support to the student participants in the development of their ideas. The overall group was quite heterogeneous in terms of knowledge as some participants were at university entry level whereas others were at Post-Doc level. |
| 19/10/2021 | Online | External Webinar | No | A | EU Biodiversity: The use of remote sensing as a specific source of biodiversity data. The webinar series "Biodiversity data for corporate biodiversity measurement" organised by the EU Business @Biodiversity platform aims to integrate the concept of biodiversity conservation into business policies, with one of the main topics being the "use of remote sensing as a specific source of biodiversity data". With the aim of monitoring the environment, i.e. ecosystems and populations among others, for the prevention or mitigation of the human impact on them, remote sensing applications based on satellites, radar and artificial intelligence technologies were presented. The main interest focused on natural forests deforestation and degradation as well as animal population decline, while tools such as large scale - real time land use maps of high resolution and accuracy and hi-tech smart collars respectively were suggested as |

| | | | | | |
|---------------------|--------|---|-----|---|--|
| | | | | | monitoring solutions. Marine (protected) areas were also mentioned, though not analysed, as possible fields of monitoring. |
| 12/10/2021 | Online | External Webinar | No | A | Webinar 1: IBAT and ENCORE: 2 key biodiversity data sources for screening purposes |
| 08/10/2021 | Online | External Workshop | No | A | 4OCeans Project Workshop. Exploring the availability and use of historic data, with a focus on fisheries and whaling records. |
| 07/10/2021 | Online | External Webinar | No | A | Best Practice Webinar & Study Launch: Offshore Biodiversity Data and Monitoring - What have we yet to learn? |
| 13/09/2021 | Online | External training | No | A | Interview for the micro-credential course based on MOOC (Innovative methods for assessment of marine ecosystems distribution) ran by University of Cantabria, University of Bologna, University of Coimbra and the Spanish Co Telefonica Educacion Digital |
| 9-10/09/2021 | Hybrid | EMODnet Technical Working Group meeting | Yes | A | Meeting held to discuss technical details related with the different thematic lots, EMDOnet Ingestion and EMODnet Central Portal |
| 8-9/09/2021 | Hybrid | EMODnet Steering Committee meeting | Yes | A | Meeting held to discuss progress within EMODnet, with the presence of the MKEG group, DG MARE and CINEA |
| 02/09/2021 | Online | Meeting | No | A | UNEP/MAP on the 2023 Mediterranean Quality Status Report (QSR) Attended by a partner, where the interest to strengthen dialogue between EMODnet Biology and various stakeholders was highlighted. |
| 14/07/2021 | Online | Meeting | Yes | A | ODIN Black Sea (IODE) SG IX Attended by a partner |

| | | | | | |
|----------------------------------|--------|---------------------|--|---|--|
| 12/07/2021 | Online | Meeting | No | A | BRIDGES-BS kick off meeting. Project title “Advancing Black Sea Research and Innovation to Co-Develop Blue Growth within Resilient Ecosystems” >150 participants Assess where/how EMODnet Biology (who is not a partner) can provide support to data management |
| 02/07/2021 | Online | External/Conference | No | A | All-Atlantic2021-MBON Side Event Descriptions and use-cases of how MBON has brought together communities of practice in support of an all-Atlantic solution, aligned with the aims and actions within the UN Ocean Decade. Examples from the Caribbean, Western Atlantic and African coast were given, and particular mention given to how EMODnet Biology represents a successful mechanism for the promotion of standards and engagement with stakeholders. |
| 18/06/2021 | Online | External | No | A | EC European Ocean Observation event 98 participants |
| 17-18/06/2021 | Online | External/Workshop | No | A | EMODnet Jamboree Ocean Best Practices and Citizen Science Sessions |
| 14-6/06/2021 | Online | External/Conference | Yes (EMODnet Biology presentation and poster titled: A decade of EMODnet Biology- What the future entails) | A | EMODnet Open Conference |
| 31/05/2021 and 03/06/2021 | Online | External/Conference | No | A | All-Atlantic DATA & POLICY Forum |
| 26-28/05/2021 | Online | External/Workshop | No | A | EuropaBON First Stakeholder Workshop: Biodiversity Data User, Provider & Policy Needs Initiative is mainly terrestrial focused and there was an acknowledgement that the marine environment was not as well addressed. Several working groups met and discussed various topics. EMODnet Biology |

| | | | | | |
|---------------|--------|---------------------|---|-----|---|
| | | | | | highlighted the need for better collaboration with existing marine initiatives and clarified several aspects related not only with the marine topic (e.g. EU directives) but also the role of the EMODnet network and how we (especially the Biology lot) could better support/collaborate with EuropaBON |
| 19/05/2021 | Online | Internal/Meeting | No | O | Meeting with EMODnet Central Portal technical team |
| 18-21/05/2021 | Online | Internal/Meeting | Yes | O | EMODnet Biology Phase IV kick off meeting |
| 18/05/2021 | Online | Internal/Meeting | No | A/O | Meeting with EMODnet Seabed Habitats lot Discussed the recent ingestion of habitat data to EMODnet Biology and future steps, including collaboration in drafting guidance to data providers, in drafting a use case and showcasing this work to the wider network |
| 17/05/2021 | Online | Internal/Meeting | Yes | O | EMODnet Biology end of Phase III meeting |
| 20-21/04/2021 | Online | Internal/Meeting | Yes | A | EMODnet Technical Working Group meeting |
| 19/04/2021 | Online | Internal/Meeting | Yes | A | EMODnet Steering Committee meeting |
| 12-14/04/2021 | Online | External/Conference | Yes (poster titled 10 Years of EMODnet Biology: Past, Present and Future) | A | IMDIS |
| SUM | | | | O | Total # of meetings organised = 12 |
| SUM | | | | A | Total # of meetings attended = 74 |

B. Meetings/events planned in the future

| Date | Location | Type event (meeting, training (workshop), etc.) | Meeting to be attended (A) / organised (O) | Short description and main expected outcomes |
|--------------------------|------------------|---|--|--|
| 2023-05-23 | Brest, France | Meeting | A | EMODnet Steering Committee meeting |
| 2023-05-24 to 2023-05-25 | Brest, France | Event | A | European Maritime Day 2023 |
| 2023-06-07 to 2023-06-08 | Heraklion, Crete | Meeting | O | EMODnet Biology Phase IV final meeting |

8. Communication assets

| A. Communication products developed | | | | |
|-------------------------------------|--|--|---|--|
| Date | Communication material | Short description (of the material, title, ...) of the asset | Main results | Name of event at which material was disseminated (if applicable) |
| QR24 | Tweets | 25 tweets on published datasets, data management tips and activities by the EMODnet Biology team | Increase exposure to activities and outputs, Outreach | NA |
| QR24 | News | Articles published in the EMODnet Central Portal, see Task 5 | Increase exposure to activities and outputs, Outreach | NA |
| QR24 | Use case | See Task 5 | Increase exposure to activities and outputs, Outreach | NA |
| QR22 | News on the Biology portal 2022-07-13 2022-07-14 2022-08-25 2022-09-24 | Support the rescue of historical marine biological data from the Mercator expeditions through the DoeDat Platform EMODnet Biology Quarterly Report 20 is now published Digging up the oceans' past How do you use marine data hosted in Flanders? | Increase exposure to activities and outputs Outreach | NA |
| QR21 | Tweets | 42 tweets on published datasets and activities by the EMODnet Biology team | Increase exposure to activities and outputs Outreach | NA |
| QR21 | News 06-04-2022 28-04-2022 | https://www.emodnet-biology.eu/news?p=show&id=9006 https://www.emodnet-biology.eu/news?p=show&id=9017 | Increase exposure to activities and outputs Outreach | NA |
| QR21 | Event page | https://emodnet.ec.europa.eu/en/emodnet-biology-panelist-22nd-un-open-ended-informal-consultative-process-oceans-and-law-sea | Increase exposure to activities | NA |
| QR20: January | Tweets | 18 tweets | Increase visibility Outreach Follower engagement | NA |
| QR20: January | Use case | Holistic, standards-based access and interoperability for marine biodiversity data https://emodnet.ec.europa.eu/en/use-case/holistic-standards-based-access- | Increase visibility Outreach | NA |

| | | | | |
|-----------------------|--------------------------------------|--|--|---|
| | | and-interoperability-marine-biodiversity-data) | | |
| QR20: February | Tweets | 24 tweets | Increase visibility Outreach Follower engagement | NA |
| QR20: February | News | New Use case- combining species and habitats data | | NA |
| QR20: March | Tweets | 16 Tweets | Increase visibility Outreach Follower engagement | NA |
| QR20: March | News | WP3 Data Product Workshop complete | | |
| QR19: October | Tweets | 25 tweets | Increase visibility Outreach Follower engagement | NA |
| QR19: November | Tweets | 19 tweets | Increase visibility Outreach Follower engagement | NA |
| QR19: December | Tweets | 24 tweets | Increase visibility Outreach Follower engagement | NA |
| QR19: October | News | https://www.emodnet-biology.eu/news?p=show&id=8886 | New Data harvest announcement | NA |
| QR19: November | News | https://www.emodnet-biology.eu/news?p=show&id=8918 https://www.emodnet-biology.eu/news?p=show&id=8921 | Deliverables published | NA |
| | | | | |
| Sep 2021 | Video | Interview on the topic: Challenges in sharing marine ecosystem information | Awareness/Outreach/Education | The video is part of the MOOC “Sustainable Marine Ecosystems” delivered by the Universities of Bologna, Coimbra, Cantabria and the Spanish Co Telefonica Educacion Digital. All content and materials will be open source |
| QR18 | Tweets | 49 tweets about published datasets and project related information | Awareness/Outreach/Education | |
| QR18 | News 16/07/2021 02/09/2021 | https://www.emodnet-biology.eu/news?p=show&id=8833 https://www.emodnet-biology.eu/news?p=show&id=8857 | Awareness/Outreach/Education | EMODnet Biology Website |

| | | | | |
|-------------|--------------------------|--|--------------------------------------|----|
| | 06/09/2021 10/09/2021 | https://www.emodnet-biology.eu/news?p=show&id=8862 https://www.emodnet-biology.eu/news?p=show&id=8866 | | |
| QR17 | Tweets | Online dataset, Product publication, Events attended, etc | 79 tweets Increase in # followers | NA |
| QR17 | News | Data harvest results, meetings, deliverables published, etc | 10 items | NA |

B. Planned communication products

| Date | Communication material | Short description (of the material, title, ...) and/or link to the asset | Main results expected |
|-------------|------------------------|--|-----------------------|
| Not planned | | | |

| A. (Co-)Authored peer-reviewed publications in this project phase | | | | | |
|---|---------------------|---|------------------------|---|---------------------------|
| Date of publication | Type of publication | Full reference | ISBN | DOI | Is it open access? Yes/No |
| 14/10/2022 | Paper (Pre-print) | Sofie Vranken, Marine Robuchon, Stefanie Dekeyzer, Ignacio Bárbara, Inka Bartsch, Aurélie Blanfuné, Charles-François Boudouresque, Wim Decock, Christophe Destombe, Bruno de Reviers, Pilar Díaz-Tapia, Anne Herbst, Romain Julliard, Rolf Karez, Priit Kersen, Stacy A. Krueger-Hadfield, Ralph Kuhlenkamp, Akira F. Peters, Viviana Peña, Cristina Piñeiro-Corbeira, Fabio Rindi, Florence Rousseau, Jan Rueness, Hendrik Schubert, Kjersti Sjøtun, Marta Sansón, Dan Smale, Thierry Thibaut, Myriam Valero, Leen Vandepitte, Bart Vanhoorne, Alba Vergés, Marc Verlaque, Christophe Vieira, Line Le Gall, Frederik Leliaert, Olivier De Clerck. AlgaeTraits: a trait database for (European) seaweeds. (15) (PDF) AlgaeTraits: a trait database for (European) seaweeds. Earth System Science Data | NA | https://doi.org/10.5194/essd-2022-329 | Yes |
| 22/10/2022 | Journal | B L Townhill, Y Artioli, J K Pinnegar, S N R Birchenough, Exposure of commercially exploited shellfish to changing pH levels: how to scale-up experimental evidence to regional impacts, ICES Journal of Marine Science, Volume 79, Issue 9, November 2022, Pages 2362–2372 | NA | DOI: 10.1093/icesjms/fsac177 | Yes |
| 22/07/2022 | Journal | Automating the Curation Process of Historical Literature on Marine Biodiversity using text mining: The DECO Workflow | NA | https://doi.org/10.3389/fmars.2022.94084 | YES |
| 20/01/2022 | Paper | Beauchard O, Mestdagh S, Koop L, Ysebaert T, Herman PMJ (2022) Benthic synecology in a soft sediment shelf: habitat contrasts and assembly rules of life strategies. Mar Ecol Prog Ser 682:31-50. | Online ISSN: 1616-1599 | https://doi.org/10.3354/meps13928 | No |

| | | | | |
|------------|------|---|--|---|
| 02/10/2021 | Book | <p>Ocean Science Data (Paperback ISBN: 9780128234273)</p> | <p>Chapter 2: Joana Beja¹, Leen Vandepitte¹, Abigail Benson¹², Anton Van de Putte^{2,3}, Dan Lear⁴, Daphnis De Pooter⁵, Gwenaëlle Moncoiffé⁶, John Nicholls⁷, Nina Wambiji⁸, Patricia Miloslavich^{9,10}, Vasilis Gerovasileiou¹¹</p> | <p>1 Flanders Marine Institute (VLIZ), Oostende, Belgium 2 Royal Belgian Institute for Natural Sciences, Brussels, Belgium 3 Université Libre de Bruxelles, Brussels, Belgium 4 Marine Biological Association, Plymouth, United Kingdom 5 Commission for the Conservation of Antarctic Marine Living Resources, (CCAMLR), Hobart, TAS, Australia 6 British Oceanographic Data Centre, National Oceanography Centre, Liverpool, United Kingdom 7 Norfish Project, Centre for Environmental Humanities, Trinity College Dublin, Dublin, Ireland 8 Kenya Marine and Fisheries Research Institute, Mombasa, Kenya 9 Scientific Committee on Oceanic Research (SCOR), University of Delaware, College of Earth, Ocean and Environment, Newark, DE, United States 10 Departamento de Estudios Ambientales, Universidad Simon Bolívar, Caracas, Miranda, Venezuela 11 Hellenic Centre for Marine Research (HCMR), Institute of Marine Biology, Biotechnology and Aquaculture (IMBBC), Heraklion, Greece 12 U.S. Geological Survey, Lakewood, CO, United States</p> |
|------------|------|---|--|---|

| B. Other/non-peer reviewed types of publications (co-)authored in this project phase | | | | | |
|--|---------------------|--|--|---|---------------------------|
| Date of publication | Type of publication | Full reference | ISBN | DOI | Is it open access? Yes/No |
| 07/09/2022 | Conference abstract | Martin-Cabrera P, Perez Perez R, Irrison J-O, Lombard F, Ove Möller K, Rühl S, Creach V, Lindh M, Stemmann L, Schepers L (2022) Establishing Plankton Imagery Dataflows Towards International Biodiversity Data Aggregators. Biodiversity Information Science and Standards 6: e94196 | | https://doi.org/10.3897/biss.6.94196 | Yes |
| 19/09/2022 | Conference abstract | Perez-Perez R, Vandepitte L., Beja J., Vanhoorne B., Leclercq F., Tyberghein L. (2022) The European Ocean Biodiversity Information System (EurOBIS): your gateway to quality controlled marine biodiversity data (https://embs55.ug.edu.pl/wp-content/uploads/2022/09/Book_of_abstract.pdf) | | | Yes |
| 2022 | | Pierucci A et al (2022) Working Group on Fisheries Benthic Impact and Trade-Offs (WGFBIT; outputs from 2021 meeting). | | http://doi.org/10.17895/ices.pub.10042 | Yes |
| Oct 2021 | Report | A Review of Biodiversity Data Needs and Monitoring Protocols for the Offshore Wind Energy Sector in the Baltic Sea and North Sea | PJ Stephenson | Consultant for Renewables Grid Initiative | - |
| QR17 | IMDIS 2021 | Wake up, safeguard & share your marine data with EMODnet-Ingestion.EU | Schlesse Marianne ¹ , Strobbe Francis ² , Schaap Dick ³ , Iona Sissy ⁴ and Beja Joana ⁵ | 1. Belgian Marine Data Center, OD Nature, Royal Belgian Institute of Natural Sciences, Vautierstraat 29, 1000 Brussel, Belgium 2.EMODnet Secretariat, InnovOcean site, Wandelaarkaai 7, 8400 Oostende, Belgium | - |

| | | | | | |
|------|-----------|---|--|--|---|
| | | | | 3. MARIS, Gildeweg 7 A, 2632 BD Nootdorp, Netherlands 4. Hellenic Centre for Marine Research-HCMR, Institute of Oceanography, P.O. Box 712, 190 13 Anavyssos, Greece 5. Flanders Marine Institute (VLIZ), InnovOcean site, Wandelaarkaai 7, 8400 Oostende, Belgium | |
| QR17 | IMDIS2021 | 10 years of EMODnet Biology: past, present & future | Joana Beja ¹ , Leen Vandepitte ¹ , Ruben Perez Perez ¹ , Gizem Poffyn ¹ , Dan Lear ² , Vasilis Gerovasileiou ³ , Peter Herman ⁴ , Bart Vanhoorne ¹ , Lennert Tyberghein ¹ , EMODnet Biology consortia | 1. Flanders Marine Institute (Belgium) 2. Marine Biological Association (UK) 3. Hellenic Centre for Marine Research (Greece) 4. Deltares (The Netherlands) | - |

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

9. Monitoring indicators

| Comments on the progress indicators in the indicators spreadsheet | | |
|---|-----------------------------|---|
| Progress indicator | Means of collecting figures | Comment |
| 1. Current status and coverage of total available thematic data A) Volume and coverage of available data | In house system | |
| What is your opinion on the data coverage within EMODnet for your thematic? | | Efforts were done during this Phase to address some of the data gaps (in terms of functional groups as well as geographic coverage). This meant the inclusion (and subsequent updates of the ESAS dataset (covering birds) and the republication of datasets from OBIS Caribbean and SeaMap nodes, the latter focusing on mammals and reptiles. This Phase we also reached a data milestone, with more than 30 million occurrences published. Note that datasets collected in the Caribbean Sea and republished via the thematic lot, are included in the Atlantic Ocean reporting. |
| B) Usage of data since the start of the project phase | In house system | The table represents the information collected until centralisation occurred, this means that the last 3 months until the end of the Phase are not covered. The gap in information might explain the negative trend |
| 2. Current status and coverage of total number of data products A) Volume and coverage of available data products | In house system | Since the last QR, three internally created products were published. Phase IV ends with 38 internal products and 3 external available to users. From these 11 are available through the CP viewer. Note that coverages above 100% mean that the areas in question are included in multiple products, not just one |
| B) Usage of data products since the start of the project phase | Matomo | The usage of products covers only the period until the Biology portal was shutdown, in mid-January, after which we don't have metrics for the first quarter of 2023 as all products are being served either by geoServer or ERDDAP and no systems were in place to compile the information in time for this report |
| 3. Internal and external organisations supplying/approached to supply data and data products since start of the project phase | In house system | Outside the consortium, data were published from organisations that volunteered it, those submitting via EMODnet Ingestion and a few that were approached. Note that the table includes not only new datasets but also updates to existing data, which refers to new or better quality data. |

| | | |
|---|-------------------------|---|
| 4. Online 'Web' interfaces to access or view data | | Due to centralisation several changes occurred. Data and products are now available via the EMODnet viewer. OGC services for data are hosted by the VLIZ geoserver instance and the main data catalogue is available via the EurOBIS website. OGC webservices for data products are available from both the VLIZ and EMODnet Geoserver instances. Products are also available via the EMODnet ERDDAP instance. The Data Products metadata is available via the VLIZ catalogue. Products code, input and outputs are also available via the EMODnet GitHub |
| 6. Statistics on information volunteered through download forms | In house system | Note that the information is only available for the pre centralisation period. After which, users can directly download data without having to provide any details |
| 7. Published use cases | Matomo/Europa Analytics | The information is split in two tables, the top one reflects the information since the start of Phase IV until centralisation and the bottom covers the period from Jan 2023 to the end of Phase. |
| 9. Technical monitoring | Matomo | The information included represents the period from the start of the phase until centralisation. During the period covered, the portal was 100% operational and with the response times within INSPIRE guidance |
| 10. Visibility & Analytics for web pages | Matomo | The graphs represent the period from the start of the Phase until centralisation, the overall change during this period is negligible |
| 11. Visibility & Analytics for web sections | Matomo | The graphs represent the period from the start of the Phase until centralisation. There was a sharp increase in the pageviews for specific pages, especially those where data could be retrieved |
| 12. Average visit duration for web pages | Matomo | The graphs represent the period from the start of the Phase until centralisation. There was no significant change in the visit duration throughout this period |

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

10. Recommendations for follow-up actions by the EU

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

11. Annex: Other documentation attached

Consortium list

| Nr | Partner | Full name | Country |
|-------------------------|------------------|--|---------------|
| 1 | VLIZ | Flanders Marine Institute | BE |
| 2 | HCMR | Hellenic Centre for Marine Research | GR |
| 3 | U. Sheffield | University of Sheffield | UK |
| 4 | MBA | Marine Biological Association | UK |
| 5 | SMHI | Swedish Meteorological and Hydrological Institute | SV |
| 6 | IEO | Spanish Institute of Oceanography | SP |
| 7 | IMR | Institute of Marine Research | NO |
| 8 | Aarhus U | Aarhus University- Danish Centre for Environment And Energy | DK |
| 9 | UkrSCES | Ukrainian Scientific Center of Ecology of Sea | Ukr |
| 10 | SYKE | Finnish Environment Institute | FI |
| 11 | MARIS-SDN | Marine Information Service | NL |
| 12 | OGS | National Institute of Oceanography and Applied Geophysics | IT |
| 13 | ILVO | Institute for agricultural and fisheries research | BE |
| 14 | ICES | International Council for the Exploration of the Sea | DK |
| 15 | NIMRD | National Institute for Marine Research and Development "Grigore Antipa" | RO |
| 16 | IH Cantabria | Hydraulic Institute- University of Cantabria | ES |
| 17 | U Liege | Liège University | BE |
| 18 | CEFAS | Centre for Environment, Fisheries and Aquaculture Science | UK |
| 19 | Deltares | Stitching Deltares | NL |
| 20 | IFREMER | French Research Institute for Exploitation of the Sea | FR |
| 21 | IPMA | Portuguese Institute of Ocean and Atmosphere | PT |
| 22 | NIOZ | Royal Netherlands Institute for Sea Research | NL |
| External parties | | | |
| | UNESCO-OBIS | Ocean Biodiversity Information System | International |
| | Anna Krystalli | Research Software Engineer for WP3 | GR |
| | Maëlle Salmon | Software Engineer for WP3 | FR |
| | Emmanuel Blondel | Software Engineer for WP3 | FR |
| | INBO | Research Institute Nature and Forest Data provider for WP2 | BE |
| | Advance Services | Technological company | GR |

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

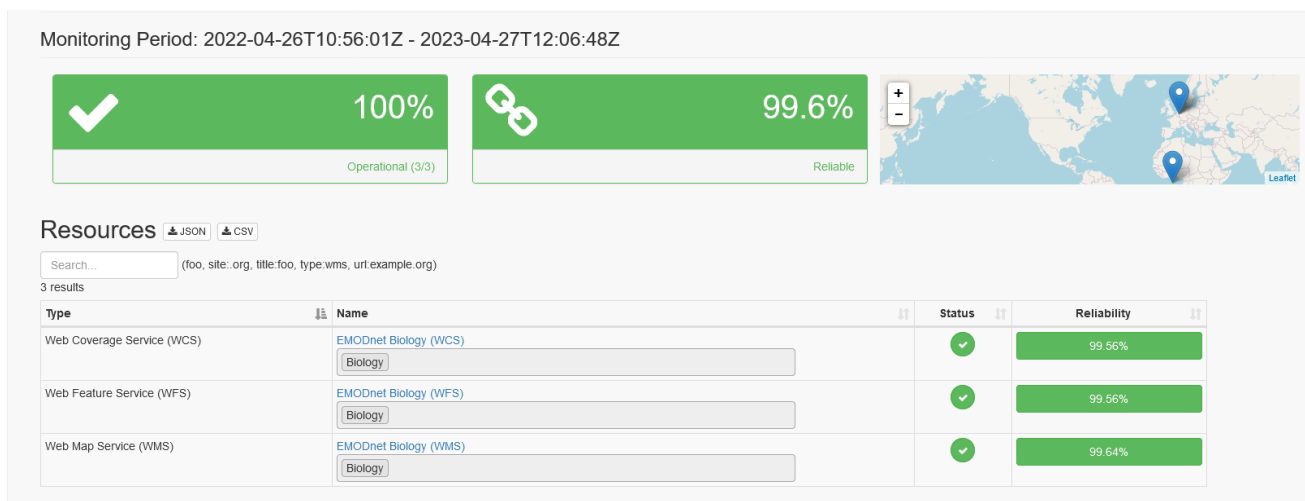


Figure 1. EMODnet Biology OGC monitoring for the period between 202-04-26 to 2023-04-27

WP2: Access to marine biological data

The table below includes a summary of all Phase IV datasets published via EMODnet Biology, including the dataset title, URL, publication date= Harvest date, whether it was a new or an update to an existing dataset, the Phase it belongs to (due to COVID constraints some data grant holders had difficulty in keeping with the stipulated deadlines, therefore, a few Phase III datasets were only published during Phase IV) and additional comments.

| Dataset | Url | Harvest Date | Type | Phase | Comments |
|---|---|--------------|------|----------|----------|
| 2009 University of Plymouth Wave Hub, Cornwall towed underwater video baseline benthic survey | http://www.emodnet-biology.eu/data-catalog?dasid=6430 | 2021-05-10 | New | Phase IV | |
| 2010 University of Plymouth Guernsey towed underwater video benthic survey | http://www.emodnet-biology.eu/data-catalog?dasid=6421 | 2021-05-10 | New | Phase IV | |
| 2011 University of Plymouth Falmouth towed underwater video maerl and associated epifauna survey | http://www.emodnet-biology.eu/data-catalog?dasid=6693 | 2021-05-10 | New | Phase IV | |
| 2012 University of Plymouth Falmouth towed underwater video maerl and associated epifauna survey | http://www.emodnet-biology.eu/data-catalog?dasid=6692 | 2021-05-10 | New | Phase IV | |
| 2012 University of Plymouth Jersey towed underwater video Epifauna survey | http://www.emodnet-biology.eu/data-catalog?dasid=6420 | 2021-05-10 | New | Phase IV | |
| 2012-2013 University of Plymouth Falmouth maerl bed infauna and sediment survey using diver cores | http://www.emodnet-biology.eu/data-catalog?dasid=6691 | 2021-05-10 | New | Phase IV | |

| Dataset | Url | Harvest Date | Type | Phase | Comments |
|--|---|--------------|--------|----------|----------|
| 2013 University of Plymouth Flamborough Head (UK) Special Area of Conservation (SAC) towed underwater video condition assessment of epibenthic communities and biotopes | http://www.emodnet-biology.eu/data-catalog?dasid=6424 | 2021-05-10 | New | Phase IV | |
| 2013 University of Plymouth Thanet Coast (UK) Special Area of Conservation (SAC) towed underwater video condition assessment of epibenthic communities and biotopes | http://www.emodnet-biology.eu/data-catalog?dasid=6426 | 2021-05-10 | New | Phase IV | |
| Amrum Bank and inner German Bight Benthos | http://www.emodnet-biology.eu/data-catalog?dasid=1677 | 2021-05-10 | Update | | |
| Biological dataset for Pagrus pagrus fished along Southern Brazil | http://www.emodnet-biology.eu/data-catalog?dasid=6574 | 2021-05-10 | Update | | |
| Data collected during the expeditions of the e-learning projects Expeditie Zeeleeuw and Planeet Zee | http://www.emodnet-biology.eu/data-catalog?dasid=4355 | 2021-05-10 | Update | | |
| Eastern Channel dataset | http://www.emodnet-biology.eu/data-catalog?dasid=1779 | 2021-05-10 | Update | | |
| Fish larvae from May to June '95 of the "Capricórnio" campaign in the Republic of Guinea Bissau | http://www.emodnet-biology.eu/data-catalog?dasid=6697 | 2021-05-10 | New | Phase IV | |
| GAIA_ADRION_FLT Network-ANPA_2014-2018: Adriatic and Ionian Sea mega-fauna monitoring employing ferry as platform of observation along the Ancona-Igoumenitsa-Patras lane, from December 2014 to December 2018 | http://www.emodnet-biology.eu/data-catalog?dasid=6546 | 2021-05-10 | New | Phase IV | |
| GAIA_IONIAN_2008-2018: Ionian Sea mega-fauna monitoring employing a sailing vessel along random tracks from 2008 to 2018 | http://www.emodnet-biology.eu/data-catalog?dasid=6547 | 2021-05-10 | New | Phase IV | |
| Macrobenthos data from the Norwegian Skagerrak coast | http://www.emodnet-biology.eu/data-catalog?dasid=1801 | 2021-05-10 | Update | | |

| Dataset | Url | Harvest Date | Type | Phase | Comments |
|--|---|--------------|--------|----------|----------|
| Macrobenthos from the eastern English Channel in 1999 and 2001 | http://www.emodnet-biology.eu/data-catalog?dasid=1684 | 2021-05-10 | Update | | |
| Macrobenthos samples collected in the Scottish waters in 2001 | http://www.emodnet-biology.eu/data-catalog?dasid=1853 | 2021-05-10 | Update | | |
| Microzooplankton, National Pilot Monitoring Studies August 2017, EMBLAS-II | http://www.emodnet-biology.eu/data-catalog?dasid=6497 | 2021-05-10 | New | Phase IV | |
| Microzooplankton, National Pilot Monitoring Studies Phyllophora April 2017, EMBLAS-II | http://www.emodnet-biology.eu/data-catalog?dasid=6498 | 2021-05-10 | New | Phase IV | |
| Microzooplankton, National Pilot Monitoring Studies Phyllophora August 2017, EMBLAS-II | http://www.emodnet-biology.eu/data-catalog?dasid=6499 | 2021-05-10 | New | Phase IV | |
| Microzooplankton, National Pilot Monitoring Studies Phyllophora July 2017, EMBLAS-II | http://www.emodnet-biology.eu/data-catalog?dasid=6500 | 2021-05-10 | New | Phase IV | |
| Occurrence of Eukaryotes in the size fraction >200 micrometres, collected worldwide during the Tara Oceans expedition (2009-2013) using a WP11 net and analysed on a ZooScan imaging platform. | http://www.emodnet-biology.eu/data-catalog?dasid=6515 | 2021-05-10 | New | Phase IV | |
| Occurrence of Eukaryotes in the size fraction >680 micrometres, collected worldwide during the Tara Oceans expedition (2009-2013) using a R&G net and analysed on a ZooScan imaging platform. | http://www.emodnet-biology.eu/data-catalog?dasid=6514 | 2021-05-10 | New | Phase IV | |
| Phytoplankton, National Pilot Monitoring Studies August 2017, EMBLAS II Project | http://www.emodnet-biology.eu/data-catalog?dasid=6467 | 2021-05-10 | New | Phase IV | |
| Plankton community in Bongo net (300µm), Tara Oceans cruise | http://www.emodnet-biology.eu/data-catalog?dasid=6512 | 2021-05-10 | Update | | |
| Plankton community in Bongo net, MOOSE-GE cruises, North-Western Mediterranean Sea | http://www.emodnet-biology.eu/data-catalog?dasid=6510 | 2021-05-10 | New | Phase IV | |

| Dataset | Url | Harvest Date | Type | Phase | Comments |
|---|---|--------------|--------|----------|----------|
| Plankton community in Juday-Bogorov (330Åµm) net, Point B, Villefranche-sur-Mer, France | http://www.emodnet-biology.eu/data-catalog?dasid=6507 | 2021-05-10 | New | Phase IV | |
| Plankton community in Multinet (300Åµm), Tara Oceans cruise | http://www.emodnet-biology.eu/data-catalog?dasid=6513 | 2021-05-10 | Update | | |
| Plankton community in RÅ©gent (680Åµm) net, Point B, Villefranche-sur-Mer, France | http://www.emodnet-biology.eu/data-catalog?dasid=6506 | 2021-05-10 | New | Phase IV | |
| Plankton community in WP2 net (200Åµm), DYFAMED point, Ligurian Sea, France | http://www.emodnet-biology.eu/data-catalog?dasid=6508 | 2021-05-10 | New | Phase IV | |
| Plankton community in WP2 net (200Åµm), PNMR cruises, Parc Naturel Marin d'Iroise, France | http://www.emodnet-biology.eu/data-catalog?dasid=6511 | 2021-05-10 | New | Phase IV | |
| Plankton community in WP2 net (200Åµm), Point B, Villefranche-sur-Mer, France | http://www.emodnet-biology.eu/data-catalog?dasid=6505 | 2021-05-10 | New | Phase IV | |
| Presence of sea turtles collected through Fixed-Line-Transect monitoring across the Western Mediterranean Sea (Civitavecchia-Barcelona route) between 2013 and 2017 | http://www.emodnet-biology.eu/data-catalog?dasid=6403 | 2021-05-10 | New | Phase IV | |
| Romanian Black Sea Phytoplankton data from 1961 to 1970 | http://www.emodnet-biology.eu/data-catalog?dasid=5651 | 2021-05-10 | New | Phase IV | |
| Romanian Black Sea Phytoplankton data from 1975 to 1980 | http://www.emodnet-biology.eu/data-catalog?dasid=5773 | 2021-05-10 | New | Phase IV | |
| Romanian Black Sea Phytoplankton data from 1981 to 1990 | http://www.emodnet-biology.eu/data-catalog?dasid=6694 | 2021-05-10 | New | Phase IV | |
| 70 samples data of Kiel Bay | http://www.emodnet-biology.eu/data-catalog?dasid=618 | 2021-07-14 | Update | | |
| Arctic soft-sediment macrobenthos | http://www.emodnet-biology.eu/data-catalog?dasid=533 | 2021-07-14 | Update | | |
| Bay of Puck dataset | http://www.emodnet-biology.eu/data-catalog?dasid=611 | 2021-07-14 | Update | | |
| Benthic Fauna of the Evvoia Coast and Evvoia Gulf. | http://www.emodnet-biology.eu/data-catalog?dasid=6705 | 2021-07-14 | New | Phase IV | |

| Dataset | Url | Harvest Date | Type | Phase | Comments |
|---|---|--------------|--------|----------|----------|
| Benthos Gironde Estuary | http://www.emodnet-biology.eu/data-catalog?dasid=597 | 2021-07-14 | Update | | |
| BIOMAERL.Maerl Biodiversity.Functional Structure And Antropogenic Impacts (1996-1998). | http://www.emodnet-biology.eu/data-catalog?dasid=6703 | 2021-07-14 | New | Phase IV | |
| BiomÅ´r 1 dataset. Benthic data from the Southern Irish Sea from 1989-1991 | http://www.emodnet-biology.eu/data-catalog?dasid=1600 | 2021-07-14 | Update | | |
| Cetacean monitoring data collected along fixed transect using ferries as platforms in the Strait of Gibraltar, 2018, FLT Med Network. | http://www.emodnet-biology.eu/data-catalog?dasid=6443 | 2021-07-14 | New | Phase IV | |
| Comparative study of the organismic assemblages associated with the demosponge <i>Sarcotragus foetidus</i> Schmidt, 1862 in the coasts of Cyprus and Greece | http://www.emodnet-biology.eu/data-catalog?dasid=6702 | 2021-07-14 | New | Phase IV | |
| Danish Kattegat herring fishery, 1520-1899 | http://www.emodnet-biology.eu/data-catalog?dasid=7761 | 2021-07-14 | New | Phase IV | |
| Danish Limfjord herring fishery, 1518-1835 | http://www.emodnet-biology.eu/data-catalog?dasid=7762 | 2021-07-14 | New | Phase IV | |
| Danish Sound herring fishery, 1368-1790 | http://www.emodnet-biology.eu/data-catalog?dasid=7763 | 2021-07-14 | New | Phase IV | |
| Dolphins and sea turtle monitoring in the Pelagie Archipelago (Italy) from 2004 to 2006 | http://www.emodnet-biology.eu/data-catalog?dasid=6548 | 2021-07-14 | New | Phase IV | |
| Dutch herring fishery, 1512-1790 | http://www.emodnet-biology.eu/data-catalog?dasid=7764 | 2021-07-14 | New | Phase IV | |
| Dutch-Icelandic cod fishery, 1520-1852 | http://www.emodnet-biology.eu/data-catalog?dasid=7765 | 2021-07-14 | New | Phase IV | |
| English herring fishery, 1520-1790 | http://www.emodnet-biology.eu/data-catalog?dasid=7766 | 2021-07-14 | New | Phase IV | |
| English North-East Atlantic cod fishery, 1520-1790 | http://www.emodnet-biology.eu/data-catalog?dasid=7767 | 2021-07-14 | New | Phase IV | |
| Faroes cod fishery, 1520-1807 | http://www.emodnet-biology.eu/data-catalog?dasid=7768 | 2021-07-14 | New | Phase IV | |

| Dataset | Url | Harvest Date | Type | Phase | Comments |
|--|---|--------------|--------|----------|-------------------------------|
| Fauna Bentonica | http://www.emodnet-biology.eu/data-catalog?dasid=596 | 2021-07-14 | Update | | |
| Flemish herring fishery, 1386-1790 | http://www.emodnet-biology.eu/data-catalog?dasid=7769 | 2021-07-14 | New | Phase IV | |
| French herring fishery, 1520-1790 | http://www.emodnet-biology.eu/data-catalog?dasid=7770 | 2021-07-14 | New | Phase IV | |
| French North East Atlantic Cod Fishery 1520-1829 | http://www.emodnet-biology.eu/data-catalog?dasid=7771 | 2021-07-14 | New | Phase IV | |
| Garfish morphology in Adriatic Sea 2003-2007 | http://www.emodnet-biology.eu/data-catalog?dasid=6690 | 2021-07-14 | Update | Phase IV | First published on 2021-05-10 |
| German Herring Fishery 1520-1790 | http://www.emodnet-biology.eu/data-catalog?dasid=7772 | 2021-07-14 | New | Phase IV | |
| Groundfish Survey Invertebrate Data | http://www.emodnet-biology.eu/data-catalog?dasid=6449 | 2021-07-14 | New | Phase IV | |
| Helfer H. 1936. The fishery grounds near Alexandria. VIII Pantopoda. Notes et memoires No 16 | http://www.emodnet-biology.eu/data-catalog?dasid=5516 | 2021-07-14 | New | Phase IV | |
| Iceland Cod Landings 1520-1871 | http://www.emodnet-biology.eu/data-catalog?dasid=7773 | 2021-07-14 | New | Phase IV | |
| IOW Macrozoobenthos monitoring Baltic Sea (1980-2005) | http://www.emodnet-biology.eu/data-catalog?dasid=601 | 2021-07-14 | Update | | |
| Irish Herring Fishery 1520-1790 | http://www.emodnet-biology.eu/data-catalog?dasid=7774 | 2021-07-14 | New | Phase IV | |
| Jalta-Black Sea | http://www.emodnet-biology.eu/data-catalog?dasid=628 | 2021-07-14 | Update | | |
| Kalamitsi | http://www.emodnet-biology.eu/data-catalog?dasid=623 | 2021-07-14 | Update | | |
| Kelp occurrences in the Azores (northeast Atlantic) | http://www.emodnet-biology.eu/data-catalog?dasid=6556 | 2021-07-14 | New | Phase IV | |
| Kongsfjorden/Spitsbergen - soft bottom fauna | http://www.emodnet-biology.eu/data-catalog?dasid=614 | 2021-07-14 | Update | | |
| Laspibay-Black Sea | http://www.emodnet-biology.eu/data-catalog?dasid=629 | 2021-07-14 | Update | | |

| Dataset | Url | Harvest Date | Type | Phase | Comments |
|--|---|--------------|--------|----------|----------|
| LBMRev | http://www.emodnet-biology.eu/data-catalog?dasid=602 | 2021-07-14 | Update | | |
| Macrobenthos of the Western Scheldt (Ossenissee, Valkenisse, Terneuzen and Vlissingen) on 27 and 28 September 1978 | http://www.emodnet-biology.eu/data-catalog?dasid=4221 | 2021-07-14 | Update | | |
| MegFeod-Black Sea | http://www.emodnet-biology.eu/data-catalog?dasid=626 | 2021-07-14 | Update | | |
| Mollusca fauna from the Mediterranean reef ecosystem (1170 habitat) | http://www.emodnet-biology.eu/data-catalog?dasid=6701 | 2021-07-14 | New | Phase IV | |
| Mytilini | http://www.emodnet-biology.eu/data-catalog?dasid=622 | 2021-07-14 | Update | | |
| National Marine Monitoring Programme data set | http://www.emodnet-biology.eu/data-catalog?dasid=615 | 2021-07-14 | Update | | |
| National Monitoring Programme for Phytoplankton Species occurrence in Aquaculture Production Areas | http://www.emodnet-biology.eu/data-catalog?dasid=6452 | 2021-07-14 | New | Phase IV | |
| North Atlantic and Arctic Cumacea sampled during the IceAGE (2011) and PASCAL (2017) project | http://www.emodnet-biology.eu/data-catalog?dasid=6710 | 2021-07-14 | New | Phase IV | |
| Norway Cod Fishery 1520-1850 | http://www.emodnet-biology.eu/data-catalog?dasid=7775 | 2021-07-14 | New | Phase IV | |
| Norway West Coast Herring Fishery 1520-1850 | http://www.emodnet-biology.eu/data-catalog?dasid=7776 | 2021-07-14 | New | Phase IV | |
| Norwegian/Swedish Bohuslän Herring Landings 1520-1808 | http://www.emodnet-biology.eu/data-catalog?dasid=7777 | 2021-07-14 | New | Phase IV | |
| Occhipinti dataset | http://www.emodnet-biology.eu/data-catalog?dasid=600 | 2021-07-14 | Update | | |
| Painted Comber morphology in Adriatic Sea 2001-2002 | http://www.emodnet-biology.eu/data-catalog?dasid=6700 | 2021-07-14 | New | Phase IV | |
| Plymouth sound dataset. Soft sediment macrobenthos from the Plymouth Sound from 1995 | http://www.emodnet-biology.eu/data-catalog?dasid=534 | 2021-07-14 | Update | | |

| Dataset | Url | Harvest Date | Type | Phase | Comments |
|---|---|--------------|--------|----------|----------|
| Polish Arctic Marine Programme | http://www.emodnet-biology.eu/data-catalog?dasid=243 | 2021-07-14 | Update | | |
| REDIT 1 | http://www.emodnet-biology.eu/data-catalog?dasid=213 | 2021-07-14 | Update | | |
| SARONIKOS | http://www.emodnet-biology.eu/data-catalog?dasid=289 | 2021-07-14 | Update | | |
| Scottish Herring Fishery 1466-1790 | http://www.emodnet-biology.eu/data-catalog?dasid=7778 | 2021-07-14 | New | Phase IV | |
| Shetland Cod Fishery 1520-1796 | http://www.emodnet-biology.eu/data-catalog?dasid=7779 | 2021-07-14 | New | Phase IV | |
| Steinbock (1937) Turbellaria XIV. The fishery grounds near Alexandria. Notes and Memories of the Fisheries Directorate of Egypt, No. 25 | http://www.emodnet-biology.eu/data-catalog?dasid=6020 | 2021-07-14 | New | Phase IV | |
| Strelbay | http://www.emodnet-biology.eu/data-catalog?dasid=627 | 2021-07-14 | Update | | |
| Zooplankton studies at a fixed station (West-Hinder) in the North Sea between 1977 and 1979 | http://www.emodnet-biology.eu/data-catalog?dasid=4696 | 2021-07-14 | New | Phase IV | |
| Catalogue of algae collected in the Mediterranean Sea during the cruises of Cutter Violante in 1876 and 1877 | http://www.emodnet-biology.eu/data-catalog?dasid=7888 | 2021-10-26 | New | Phase IV | |
| Contaminant and isotopic data in European hake and their parasites Anisakis sp. | http://www.emodnet-biology.eu/data-catalog?dasid=6575 | 2021-10-26 | New | Phase IV | |
| Data on cetacean occurrence collected during the project “EMBLAS-Plus, Improving Environmental Monitoring in the Black Sea” Selected Measures, 2019 | http://www.emodnet-biology.eu/data-catalog?dasid=6502 | 2021-10-26 | New | Phase IV | |
| Global Marine biodiversity data from Seawatchers Marine Citizen Science Platform 1980-2020 | http://www.emodnet-biology.eu/data-catalog?dasid=6526 | 2021-10-26 | New | Phase IV | |
| Infauna from seagrass meadows in the coastal Bulgarian Black Sea (2013-2014) | http://www.emodnet-biology.eu/data-catalog?dasid=7865 | 2021-10-26 | New | Phase IV | |

| Dataset | Url | Harvest Date | Type | Phase | Comments |
|---|---|--------------|------|----------|----------|
| Irish Benthos monitoring as part of the Water framework directive since 2012 | http://www.emodnet-biology.eu/data-catalog?dasid=6386 | 2021-10-26 | New | Phase IV | |
| LifeWatch observatory data: Permanent Cetacean passive acoustic sensor network in the Belgian Part of the North Sea | http://www.emodnet-biology.eu/data-catalog?dasid=5531 | 2021-10-26 | New | Phase IV | |
| Macrozoobenthos, Joint Open Sea Surveys August 2017, EMBLAS-II | http://www.emodnet-biology.eu/data-catalog?dasid=6470 | 2021-10-26 | New | Phase IV | |
| Macrozoobenthos, National Pilot Monitoring Studies 2016, EMBLAS-II | http://www.emodnet-biology.eu/data-catalog?dasid=6469 | 2021-10-26 | New | Phase IV | |
| Macrozoobenthos, National Pilot Monitoring Studies 2017, EMBLAS-II | http://www.emodnet-biology.eu/data-catalog?dasid=6471 | 2021-10-26 | New | Phase IV | |
| Macrozoobenthos, National Pilot Monitoring Studies Phyllophora April 2017, EMBLAS-II | http://www.emodnet-biology.eu/data-catalog?dasid=6472 | 2021-10-26 | New | Phase IV | |
| Macrozoobenthos, National Pilot Monitoring Studies Phyllophora August 2017, EMBLAS-II | http://www.emodnet-biology.eu/data-catalog?dasid=6483 | 2021-10-26 | New | Phase IV | |
| Macrozoobenthos, National Pilot Monitoring Studies Phyllophora July 2017, EMBLAS-II | http://www.emodnet-biology.eu/data-catalog?dasid=6473 | 2021-10-26 | New | Phase IV | |
| Macrozooplankton, Joint Open Sea Surveys 2016, EMBLAS-II | http://www.emodnet-biology.eu/data-catalog?dasid=6496 | 2021-10-26 | New | Phase IV | |
| Macrozooplankton, National Pilot Monitoring Studies 2016, EMBLAS-II | http://www.emodnet-biology.eu/data-catalog?dasid=6495 | 2021-10-26 | New | Phase IV | |
| Meiobenthos, National Pilot Monitoring Studies 2016, EMBLAS-II | http://www.emodnet-biology.eu/data-catalog?dasid=6501 | 2021-10-26 | New | Phase IV | |
| Mesozooplankton, Joint Open Sea Surveys 2016, EMBLAS-II | http://www.emodnet-biology.eu/data-catalog?dasid=6486 | 2021-10-26 | New | Phase IV | |
| Mesozooplankton, Joint Open Sea Surveys 2017, EMBLAS-II | http://www.emodnet-biology.eu/data-catalog?dasid=6487 | 2021-10-26 | New | Phase IV | |
| Mesozooplankton, National Pilot Monitoring Studies 2016, EMBLAS-II | http://www.emodnet-biology.eu/data-catalog?dasid=6485 | 2021-10-26 | New | Phase IV | |

| Dataset | Url | Harvest Date | Type | Phase | Comments |
|---|---|--------------|------|----------|----------|
| Mesozooplankton, National Pilot Monitoring Studies Phyllophora April 2017, EMBLAS-II | http://www.emodnet-biology.eu/data-catalog?dasid=6488 | 2021-10-26 | New | Phase IV | |
| Mesozooplankton, National Pilot Monitoring Studies Phyllophora August 2017, EMBLAS-II | http://www.emodnet-biology.eu/data-catalog?dasid=6490 | 2021-10-26 | New | Phase IV | |
| Mesozooplankton, National Pilot Monitoring Studies Phyllophora July 2017, EMBLAS-II | http://www.emodnet-biology.eu/data-catalog?dasid=6489 | 2021-10-26 | New | Phase IV | |
| MME-T-MEDNet: Mass mortality events in Mediterranean marine coastal ecosystems | http://www.emodnet-biology.eu/data-catalog?dasid=6527 | 2021-10-26 | New | Phase IV | |
| Phytoplankton abundance data from the Gibraltar coastline 2009-2019 | http://www.emodnet-biology.eu/data-catalog?dasid=7885 | 2021-10-26 | New | Phase IV | |
| Phytoplankton abundance in the coastal and open waters of the Adriatic Sea (2013-2014) | http://www.emodnet-biology.eu/data-catalog?dasid=7893 | 2021-10-26 | New | Phase IV | |
| Phytoplankton in front of River Po Delta (PRISMA2-SP1 project) 1996-1998 | http://www.emodnet-biology.eu/data-catalog?dasid=7887 | 2021-10-26 | New | Phase IV | |
| Phytoplankton North Adriatic-Gulf of Trieste C1 â€” LTER time-series 1986-2005 | http://www.emodnet-biology.eu/data-catalog?dasid=7891 | 2021-10-26 | New | Phase IV | |
| Phytoplankton North Adriatic-Gulf of Trieste C1 â€” LTER time-series 2006-2009 | http://www.emodnet-biology.eu/data-catalog?dasid=7889 | 2021-10-26 | New | Phase IV | |
| Phytoplankton, Joint Open Sea Surveys 2016, EMBLAS II Project | http://www.emodnet-biology.eu/data-catalog?dasid=6463 | 2021-10-26 | New | Phase IV | |
| Phytoplankton, Joint Open Sea Surveys 2017, EMBLAS II Project | http://www.emodnet-biology.eu/data-catalog?dasid=6464 | 2021-10-26 | New | Phase IV | |
| Phytoplankton, National Pilot Monitoring Studies 2016, EMBLAS II Project | http://www.emodnet-biology.eu/data-catalog?dasid=6453 | 2021-10-26 | New | Phase IV | |
| Phytoplankton, National Pilot Monitoring Studies Phyllophora April 2017, EMBLAS II Project | http://www.emodnet-biology.eu/data-catalog?dasid=6465 | 2021-10-26 | New | Phase IV | |
| Phytoplankton, National Pilot Monitoring Studies Phyllophora August 2017, EMBLAS II Project | http://www.emodnet-biology.eu/data-catalog?dasid=6468 | 2021-10-26 | New | Phase IV | |

| Dataset | Url | Harvest Date | Type | Phase | Comments |
|--|---|--------------|--------|----------|-------------------------------|
| Presence of cetacean species collected through Fixed-Line-Transect monitoring across the Western Mediterranean Sea (Civitavecchia-Barcelona route) between 2014 and 2018 | http://www.emodnet-biology.eu/data-catalog?dasid=6402 | 2021-10-26 | New | Phase IV | |
| Soft-bottom macrozoobenthos from the littoral zone of the Natura 2000 MPA "Ropotamo", Southern Bulgarian Black Sea (2013) | http://www.emodnet-biology.eu/data-catalog?dasid=7866 | 2021-10-26 | New | Phase IV | |
| Spanish and Basque Newfoundland Cod Fishery 1520-1790 | http://www.emodnet-biology.eu/data-catalog?dasid=7780 | 2021-10-26 | Update | Phase IV | First published on 2021-07-14 |
| Zooplankton studies in the Southern Bight of the North Sea between 1971 and 1974 | http://www.emodnet-biology.eu/data-catalog?dasid=4668 | 2021-10-26 | New | Phase IV | |
| Assessment of zooplankton at the site of the sinking of the N.R.P. "S. Miguel" | http://www.emodnet-biology.eu/data-catalog?dasid=7969 | 2022-01-20 | New | Phase IV | |
| Benthic Haploniscidae (Isopoda) collected around Iceland during the BIOICE, IceAGE, IceAGE2, IceAGE_RR and IceAGE3 expeditions in 1992-2020 | http://www.emodnet-biology.eu/data-catalog?dasid=7868 | 2022-01-20 | New | Phase IV | |
| Biocean | http://www.emodnet-biology.eu/data-catalog?dasid=490 | 2022-01-20 | Update | | |
| Biometric measurements of the seagrass <i>Zostera noltii</i> in the Mira channel of the Ria de Aveiro throughout the year 2020 | http://www.emodnet-biology.eu/data-catalog?dasid=7905 | 2022-01-20 | New | Phase IV | |
| Dolphins validated sightings reported in the Mediterranean Sea from 2019 onwards by avvistAPP users | http://www.emodnet-biology.eu/data-catalog?dasid=7971 | 2022-01-20 | New | Phase IV | |
| Gelatinous zooplankton validated sightings reported in the Mediterranean Sea from 2019 onwards by avvistAPP users | http://www.emodnet-biology.eu/data-catalog?dasid=7972 | 2022-01-20 | New | Phase IV | |
| HELCOM/OSPAR Ballast water observations | http://www.emodnet-biology.eu/data-catalog?dasid=7927 | 2022-01-20 | New | Phase IV | |

| Dataset | Url | Harvest Date | Type | Phase | Comments |
|---|---|--------------|--------|----------|----------|
| HELCOM/OSPAR Lithuania ports water sampling | http://www.emodnet-biology.eu/data-catalog?dasid=7946 | 2022-01-20 | New | Phase IV | |
| HELCOM/OSPAR Netherlands ports water sampling | http://www.emodnet-biology.eu/data-catalog?dasid=7961 | 2022-01-20 | New | Phase IV | |
| HELCOM/OSPAR Spain ports water sampling | http://www.emodnet-biology.eu/data-catalog?dasid=7962 | 2022-01-20 | New | Phase IV | |
| LifeWatch observatory data: phytoplankton observations by imaging flow cytometry (FlowCam) in the Belgian Part of the North Sea | http://www.emodnet-biology.eu/data-catalog?dasid=4688 | 2022-01-20 | Update | | |
| Living and Quaternary mollusca collected along the coast of Libya (Tripolitania) in spring 1913 | http://www.emodnet-biology.eu/data-catalog?dasid=7974 | 2022-01-20 | New | Phase IV | |
| Marine alien species in Eastern Sicily (year 2019) | http://www.emodnet-biology.eu/data-catalog?dasid=6530 | 2022-01-20 | New | Phase IV | |
| Marine Recorder Snapshot extract of surveys entered by JNCC | http://www.emodnet-biology.eu/data-catalog?dasid=8015 | 2022-01-20 | New | Phase IV | |
| Marine Recorder Snapshot extract of surveys entered by Kent Wildlife Trust | http://www.emodnet-biology.eu/data-catalog?dasid=8023 | 2022-01-20 | New | Phase IV | |
| Marine Recorder Snapshot extract of surveys entered by National Museums Northern Ireland (NMNI) | http://www.emodnet-biology.eu/data-catalog?dasid=8016 | 2022-01-20 | New | Phase IV | |
| Marine Recorder Snapshot extract of surveys entered by Natural England | http://www.emodnet-biology.eu/data-catalog?dasid=8020 | 2022-01-20 | New | Phase IV | |
| Marine Recorder Snapshot extract of surveys entered by NatureScot | http://www.emodnet-biology.eu/data-catalog?dasid=8019 | 2022-01-20 | New | Phase IV | |
| Marine Recorder Snapshot extract of surveys entered by NRW | http://www.emodnet-biology.eu/data-catalog?dasid=8017 | 2022-01-20 | New | Phase IV | |
| Marine Recorder Snapshot extract of surveys entered by SeaSearch | http://www.emodnet-biology.eu/data-catalog?dasid=8018 | 2022-01-20 | New | Phase IV | |
| Marine Recorder Snapshot extract of surveys entered by Sussex Wildlife Trust | http://www.emodnet-biology.eu/data-catalog?dasid=8024 | 2022-01-20 | New | Phase IV | |
| Marine Recorder Snapshot extract of surveys entered by The archive for marine | http://www.emodnet-biology.eu/data-catalog?dasid=8021 | 2022-01-20 | New | Phase IV | |

| Dataset | Url | Harvest Date | Type | Phase | Comments |
|---|---|--------------|--------|----------|-------------------------------|
| species and habitats data (DASSH) | | | | | |
| Marine Recorder Snapshot extract of surveys entered by Wildlife Trusts | http://www.emodnet-biology.eu/data-catalog?dasid=8022 | 2022-01-20 | New | Phase IV | |
| Mesozooplankton, National Pilot Monitoring Studies 2017, EMBLAS-II | http://www.emodnet-biology.eu/data-catalog?dasid=6494 | 2022-01-20 | Update | Phase IV | First published on 2021-10-26 |
| Phytoplankton North Adriatic-Gulf of Trieste C1 “LTER time-series from 2010 onwards | http://www.emodnet-biology.eu/data-catalog?dasid=7890 | 2022-01-20 | Update | Phase IV | First published on 2021-10-26 |
| Sea turtles validated sightings reported in the Mediterranean Sea from 2019 onwards by avvistAPP users | http://www.emodnet-biology.eu/data-catalog?dasid=7973 | 2022-01-20 | New | Phase IV | |
| Stable isotope ratios of C and N in benthic macrofauna from Mediterranean seagrass litter accumulations from Calvi Bay in 2011-2012 | http://www.emodnet-biology.eu/data-catalog?dasid=6658 | 2022-01-20 | New | Phase IV | |
| Zooplankton data collected in the Romanian Black Sea waters between 1956 and 1960 | http://www.emodnet-biology.eu/data-catalog?dasid=5774 | 2022-01-20 | New | Phase IV | |
| Biometric measurements of the seagrass <i>Zostera marina</i> in the Mira channel of the Ria de Aveiro from December 2019 to August 2020 | http://www.emodnet-biology.eu/data-catalog?dasid=8045 | 2022-03-28 | New | Phase IV | |
| Black coral occurrences on the Azores shelves (central north Atlantic) from 1991 to 2019 | http://www.emodnet-biology.eu/data-catalog?dasid=8042 | 2022-03-28 | New | Phase IV | |
| Cirralittoral faunal turf occurrences on the Azores shelves (central north Atlantic) from 2005 to 2018 | http://www.emodnet-biology.eu/data-catalog?dasid=8041 | 2022-03-28 | New | Phase IV | |
| HELCOM/OSPAR Estonia ports water sampling | http://www.emodnet-biology.eu/data-catalog?dasid=8037 | 2022-03-28 | New | Phase IV | |
| Marine fauna in underwater monitoring (years 2015-2016) | http://www.emodnet-biology.eu/data-catalog?dasid=6531 | 2022-03-28 | New | Phase IV | |
| Rhodolith occurrences in the Azores (central north Atlantic) between 1998 and 2018 | http://www.emodnet-biology.eu/data-catalog?dasid=8043 | 2022-03-28 | New | Phase IV | |

| Dataset | Url | Harvest Date | Type | Phase | Comments |
|---|---|--------------|--------|----------|----------|
| The marine algae of Alexandria. I. A report on some marine algae collected from the vicinity of Alexandria by A. H. Nasr (1940). Notes and Memoirs No. 36 | http://www.emodnet-biology.eu/data-catalog?dasid=8040 | 2022-03-28 | New | Phase IV | |
| Zooplankton data collected in the Romanian Black Sea waters between 1961 and 1969 | http://www.emodnet-biology.eu/data-catalog?dasid=5649 | 2022-03-28 | New | Phase IV | |
| Annual wrack biomass of the northern Portugal sandy beaches | http://www.emodnet-biology.eu/data-catalog?dasid=8049 | 2022-05-16 | New | Phase IV | |
| CETUS: Cetacean monitoring surveys in the Eastern North Atlantic | http://www.emodnet-biology.eu/data-catalog?dasid=6202 | 2022-05-16 | Update | | |
| Littoral Monitoring Network of Cantabria (Invertebrates) | http://www.emodnet-biology.eu/data-catalog?dasid=8059 | 2022-05-16 | New | Phase IV | |
| Littoral Monitoring Network of Cantabria (Phytoplankton) | http://www.emodnet-biology.eu/data-catalog?dasid=8060 | 2022-05-16 | New | Phase IV | |
| Natura 2000 Network (Saltmarshes vegetation) | http://www.emodnet-biology.eu/data-catalog?dasid=8061 | 2022-05-16 | New | Phase IV | |
| SHARK - National environmental monitoring of Grey seal in Sweden since 1989 | http://www.emodnet-biology.eu/data-catalog?dasid=2457 | 2022-05-16 | Update | | |
| SHARK - National environmental monitoring of Harbour seal in Sweden since 1988 | http://www.emodnet-biology.eu/data-catalog?dasid=2459 | 2022-05-16 | Update | | |
| SHARK - National marine environmental monitoring of zooplankton in Sweden since 1979 | http://www.emodnet-biology.eu/data-catalog?dasid=2452 | 2022-05-16 | Update | | |
| Zooplankton data collected in the Romanian Black Sea waters between 1973 and 1980 | http://www.emodnet-biology.eu/data-catalog?dasid=5775 | 2022-05-16 | New | Phase IV | |
| Danube Mouths Zoobenthos data from 2011 to 2015 | http://www.emodnet-biology.eu/data-catalog?dasid=8084 | 2022-09-05 | New | Phase IV | |
| Data from the 1935-1936 cruises of the Belgian training ship Mercator 3 Pisces collection | http://www.emodnet-biology.eu/data-catalog?dasid=8107 | 2022-09-05 | New | Phase IV | |

| Dataset | Url | Harvest Date | Type | Phase | Comments |
|--|---|--------------|--------|----------|----------|
| Data from: Rehabilitating the cyanobacteria "niche" partitioning, resource use efficiency, and phytoplankton community structure during diazotrophic cyanobacterial blooms | http://www.emodnet-biology.eu/data-catalog?dasid=8086 | 2022-09-05 | New | Phase IV | |
| Distribution of deep-sea sponges in the North Atlantic | http://www.emodnet-biology.eu/data-catalog?dasid=6707 | 2022-09-05 | New | Phase IV | |
| Larvae of decapods off Portuguese coast from 1986 to 1994 | http://www.emodnet-biology.eu/data-catalog?dasid=8109 | 2022-09-05 | New | Phase IV | |
| Macrozoobenthos from the Belgian Continental Shelf, collected in 2000 | http://www.emodnet-biology.eu/data-catalog?dasid=1855 | 2022-09-05 | Update | | |
| Observation of marine vulnerable mobile species in Sicilian waters, Ionian Sea (surveys 2015-2019) | http://www.emodnet-biology.eu/data-catalog?dasid=6529 | 2022-09-05 | New | Phase IV | |
| Occurrence of Eukaryotes in the size fraction 20-180 micrometres, collected worldwide during the Tara Oceans expedition (2009-2013) using a ring net and analysed by environmental High Content Fluorescence Microscopy (e-HCFM) | http://www.emodnet-biology.eu/data-catalog?dasid=6520 | 2022-09-05 | New | Phase IV | |
| Occurrence of Eukaryotes in the size fraction 5-20 micrometres, collected worldwide during the Tara Oceans expedition (2009-2013) using a ring net and analysed by environmental High Content Fluorescence Microscopy (e-HCFM) | http://www.emodnet-biology.eu/data-catalog?dasid=6519 | 2022-09-05 | New | Phase IV | |
| Plankton Production season off Portuguese coast from 1986 to 1987 | http://www.emodnet-biology.eu/data-catalog?dasid=8108 | 2022-09-05 | New | Phase IV | |
| Presence of cetaceans and sea turtles in the Gulf of Catania, Eastern Sicily, Ionian Sea (surveys 2015-2019) | http://www.emodnet-biology.eu/data-catalog?dasid=6524 | 2022-09-05 | New | Phase IV | |
| Romanian Black Sea Phytoplankton data from 1991 to 2000 | http://www.emodnet-biology.eu/data-catalog?dasid=8083 | 2022-09-05 | New | Phase IV | |

| Dataset | Url | Harvest Date | Type | Phase | Comments |
|--|---|--------------|--------|----------|----------|
| Zooplankton of the South and South-Western Portuguese Coast in Winter 2006-07 | http://www.emodnet-biology.eu/data-catalog?dasid=8085 | 2022-09-05 | New | Phase IV | |
| Abundance of <i>Diadema antillarum</i> (Echinodermata: Echinoidea) on the coast of Venezuela: 1975-2003 | http://www.emodnet-biology.eu/data-catalog?dasid=8133 | 2022-12-09 | New | Phase IV | |
| Assessment of Zooplankton in the area of Prestige oil tanker accident | http://www.emodnet-biology.eu/data-catalog?dasid=8129 | 2022-12-09 | New | Phase IV | |
| Benthic Isopoda of the Aegir Ridge (Norwegian Sea) collected during the IceAGE3 (SO276 MerMet17-06) expedition in summer 2020 | http://www.emodnet-biology.eu/data-catalog?dasid=6708 | 2022-12-09 | New | Phase IV | |
| Characterization of sound scattering layers in the Bay of Biscay using broadband acoustics, nets and video acoustics and biological data | http://www.emodnet-biology.eu/data-catalog?dasid=8130 | 2022-12-09 | New | Phase IV | |
| ClimateFish: A database to track the abundance of selected coastal fish species as candidate indicators of climate change | http://www.emodnet-biology.eu/data-catalog?dasid=8121 | 2022-12-09 | New | Phase IV | |
| Dutch coast monitoring - Natuurlijk Veilig: Spisula survey | http://www.emodnet-biology.eu/data-catalog?dasid=8156 | 2022-12-09 | New | Phase IV | |
| Dutch coast monitoring - Natuurlijk Veilig: Texel (J. van Dalfsen) | http://www.emodnet-biology.eu/data-catalog?dasid=8157 | 2022-12-09 | New | Phase IV | |
| Dutch long-term monitoring of microzooplankton in the Dutch Continental Economical Zone of the North Sea (2000-2010) | http://www.emodnet-biology.eu/data-catalog?dasid=8155 | 2022-12-09 | New | Phase IV | |
| HELCOM/OSPAR Germany ports water sampling | http://www.emodnet-biology.eu/data-catalog?dasid=8094 | 2022-12-09 | New | Phase IV | |
| HELCOM/OSPAR Latvia ports water sampling | http://www.emodnet-biology.eu/data-catalog?dasid=8104 | 2022-12-09 | New | Phase IV | |
| North Atlantic and Arctic Amphipoda sampled during the IceAGE project | http://www.emodnet-biology.eu/data-catalog?dasid=6209 | 2022-12-09 | New | Phase IV | |
| North Sea Benthos Survey | http://www.emodnet-biology.eu/data-catalog?dasid=67 | 2022-12-09 | Update | | |

| Dataset | Url | Harvest Date | Type | Phase | Comments |
|--|---|--------------|--------|----------|-------------------------------|
| Planktonic Production Cycles and their Relationship with Fishing Resources on the Portuguese Coast | http://www.emodnet-biology.eu/data-catalog?dasid=8127 | 2022-12-09 | New | Phase IV | |
| Polychaetes from major ports in Greece in 2020-2021 | http://www.emodnet-biology.eu/data-catalog?dasid=8076 | 2022-12-09 | New | Phase IV | |
| Presence of cetaceans in Sicilian waters, Ionian and Tyrrhenian Sea (records 2008-2019) | http://www.emodnet-biology.eu/data-catalog?dasid=6525 | 2022-12-09 | New | Phase IV | |
| Satellite-tracking of loggerhead sea turtles tracked from western Mediterranean | http://www.emodnet-biology.eu/data-catalog?dasid=8128 | 2022-12-09 | New | Phase IV | |
| Stranded cetaceans and sea turtles along the Sicilian coasts and waters (years 2014-2018) | http://www.emodnet-biology.eu/data-catalog?dasid=6528 | 2022-12-09 | New | Phase IV | |
| The marine algae of Alexandria. II. A study of the occurrence of some marine algae on the Egyptian Mediterranean Coast (with 6 figures) by A. H. Nasr (1940). Notes and Memoirs No. 37 | http://www.emodnet-biology.eu/data-catalog?dasid=8077 | 2022-12-09 | New | Phase IV | |
| Type locality distributions from the World Register of Marine Species | http://www.emodnet-biology.eu/data-catalog?dasid=5184 | 2023-04-22 | Update | | |
| Abundance and Distribution of Temora turbinata and Temora stylifera in Mochima National Park, Venezuela | http://www.emodnet-biology.eu/data-catalog?dasid=8136 | 2023-05-16 | Update | Phase IV | First published on 2022-12-09 |
| Abundance of young mullet Mugil liza Valenciennes, 1836 in the surf zone along the southern coast of Brazil | http://www.emodnet-biology.eu/data-catalog?dasid=8250 | 2023-05-16 | New | Phase IV | |
| Acoustic detections from research cruises in the Med sea, 1994-2001 | http://www.emodnet-biology.eu/data-catalog?dasid=8203 | 2023-05-16 | New | Phase IV | |
| Amphipod distribution data from the North Atlantic and Arctic waters compiled from literature records published in 1931-2018 | http://www.emodnet-biology.eu/data-catalog?dasid=8070 | 2023-05-16 | New | Phase IV | |
| Atlantic Anguilla surveys (1862-2007) | http://www.emodnet-biology.eu/data-catalog?dasid=4420 | 2023-05-16 | Update | | |

| Dataset | Url | Harvest Date | Type | Phase | Comments |
|---|---|--------------|--------|----------|-------------------------------|
| Baltic international trawl surveys | http://www.emodnet-biology.eu/data-catalog?dasid=2760 | 2023-05-16 | Update | | |
| Belgian recreational fisheries monitoring | http://www.emodnet-biology.eu/data-catalog?dasid=8165 | 2023-05-16 | New | Phase IV | |
| Benthos Oosterschelde 1959-2015 | http://www.emodnet-biology.eu/data-catalog?dasid=8253 | 2023-05-16 | New | Phase IV | |
| Benthos Westerschelde 1963-2012 | http://www.emodnet-biology.eu/data-catalog?dasid=8252 | 2023-05-16 | New | Phase IV | |
| BLM CETAP OPP Sightings | http://www.emodnet-biology.eu/data-catalog?dasid=3438 | 2023-05-16 | New | Phase IV | |
| CARESAT (aggregated per 1-degree cell) | http://www.emodnet-biology.eu/data-catalog?dasid=8204 | 2023-05-16 | New | Phase IV | |
| CODA cetacean sightings on primary platform of vessel surveys 2007 | http://www.emodnet-biology.eu/data-catalog?dasid=5336 | 2023-05-16 | New | Phase IV | |
| CODA cetacean sightings on tracker platform of vessel surveys 2007 | http://www.emodnet-biology.eu/data-catalog?dasid=5337 | 2023-05-16 | New | Phase IV | |
| CURLEW_VLAANDEREN - Eurasian curlews (Numenius arquata, Scolopacidae) breeding in Flanders (Belgium) [subsampled representation] | http://www.emodnet-biology.eu/data-catalog?dasid=7932 | 2023-05-16 | New | Phase IV | |
| Dataset from Zostera noltei stationary monitoring in French coastal waters (Atlantic) since 2011 | http://www.emodnet-biology.eu/data-catalog?dasid=6663 | 2023-05-16 | New | Phase IV | |
| DATRAS: ICES Database of trawl surveys, survey: DWS | http://www.emodnet-biology.eu/data-catalog?dasid=4530 | 2023-05-16 | New | Phase IV | |
| DATRAS: ICES Database of trawl surveys, survey: SP-PORC | http://www.emodnet-biology.eu/data-catalog?dasid=4416 | 2023-05-16 | New | Phase IV | |
| Edward Forbes. Report on the Mollusca and Radiata of the Aegean Sea, and on their distribution, considered as bearing on Geology. 13th Meeting of the British Association for the Advancement of Science, London, 1844. | http://www.emodnet-biology.eu/data-catalog?dasid=7886 | 2023-05-16 | Update | Phase IV | First published on 2022-10-26 |

| Dataset | Url | Harvest Date | Type | Phase | Comments |
|--|---|--------------|--------|----------|-------------------------------|
| Epibenthos and demersal fish monitoring at long-term monitoring stations in the Belgian part of the North Sea | http://www.emodnet-biology.eu/data-catalog?dasid=4450 | 2023-05-16 | Update | | |
| Epibenthos and demersal fish monitoring in function of aggregate extraction in the Belgian part of the North Sea | http://www.emodnet-biology.eu/data-catalog?dasid=4447 | 2023-05-16 | Update | | |
| Epibenthos and demersal fish monitoring in function of dredge disposal monitoring in the Belgian part of the North Sea | http://www.emodnet-biology.eu/data-catalog?dasid=4448 | 2023-05-16 | Update | | |
| Epibenthos and demersal fish monitoring in function of wind energy development | http://www.emodnet-biology.eu/data-catalog?dasid=4449 | 2023-05-16 | Update | | |
| European Seabirds At Sea (ESAS) | http://www.emodnet-biology.eu/data-catalog?dasid=3117 | 2023-05-16 | New | Phase IV | |
| Explore Your Shore | http://www.emodnet-biology.eu/data-catalog?dasid=8046 | 2023-05-16 | Update | Phase IV | First published on 2022-05-16 |
| Finnish Baltic Sea benthic monitoring, POHJE database | http://www.emodnet-biology.eu/data-catalog?dasid=5725 | 2023-05-16 | Update | | |
| Finnish Baltic Sea phytoplankton monitoring, KPLANK database | http://www.emodnet-biology.eu/data-catalog?dasid=5724 | 2023-05-16 | Update | | |
| Finnish Baltic Sea zooplankton monitoring | http://www.emodnet-biology.eu/data-catalog?dasid=5726 | 2023-05-16 | Update | | |
| Finnish macrophyte monitoring data | http://www.emodnet-biology.eu/data-catalog?dasid=8080 | 2023-05-16 | New | Phase IV | |
| Georgia Aquarium/DomSeTCO Leatherback's of Dominica (aggregated per 1-degree cell) | http://www.emodnet-biology.eu/data-catalog?dasid=8206 | 2023-05-16 | New | Phase IV | |
| Grey seals ARGOS telemetry in Molene Archipelago | http://www.emodnet-biology.eu/data-catalog?dasid=8211 | 2023-05-16 | New | Phase IV | |
| Grey seals GPS telemetry in Baie de Somme | http://www.emodnet-biology.eu/data-catalog?dasid=8212 | 2023-05-16 | New | Phase IV | |
| Gulf of Riga Larval Fish Survey | http://www.emodnet-biology.eu/data-catalog?dasid=5049 | 2023-05-16 | Update | | |

| Dataset | Url | Harvest Date | Type | Phase | Comments |
|---|---|--------------|--------|----------|-------------------------------|
| HG_OOSTENDE - Herring gulls (<i>Larus argentatus</i> , Laridae) breeding at the southern North Sea coast (Belgium) [subsampling representation] | http://www.emodnet-biology.eu/data-catalog?dasid=7921 | 2023-05-16 | New | Phase IV | |
| ICES Fish predator/prey data | http://www.emodnet-biology.eu/data-catalog?dasid=2144 | 2023-05-16 | Update | | |
| ICES historical plankton dataset | http://www.emodnet-biology.eu/data-catalog?dasid=2817 | 2023-05-16 | Update | | |
| ICES Vulnerable Marine Ecosystems | http://www.emodnet-biology.eu/data-catalog?dasid=5757 | 2023-05-16 | New | Phase IV | |
| IFCB Utö 2021 JERICO-RI Gulf of Finland Pilot Supersite | http://www.emodnet-biology.eu/data-catalog?dasid=8218 | 2023-05-16 | New | Phase IV | |
| Irish ground fish survey | http://www.emodnet-biology.eu/data-catalog?dasid=2762 | 2023-05-16 | Update | | |
| Kenya Marine and Fisheries Research Institute - Marine Species | http://www.emodnet-biology.eu/data-catalog?dasid=3765 | 2023-05-16 | New | Phase IV | |
| KMFRI literature records | http://www.emodnet-biology.eu/data-catalog?dasid=8187 | 2023-05-16 | New | Phase IV | |
| LBBG_JUVENILE - Juvenile lesser black-backed gulls (<i>Larus fuscus</i> , Laridae) hatched in Zeebrugge (Belgium) [subsampling representation] | http://www.emodnet-biology.eu/data-catalog?dasid=7937 | 2023-05-16 | New | Phase IV | |
| LBBG_ZEEBRUGGE - Lesser black-backed gulls (<i>Larus fuscus</i> , Laridae) breeding at the southern North Sea coast (Belgium and the Netherlands) [subsampling representation] | http://www.emodnet-biology.eu/data-catalog?dasid=7919 | 2023-05-16 | New | Phase IV | |
| LifeWatch observatory data: zooplankton observations in the Belgian Part of the North Sea | http://www.emodnet-biology.eu/data-catalog?dasid=4687 | 2023-05-16 | Update | | |
| Long-term cetacean monitoring in the Azores based on whale watching observations (2009-2020) | http://www.emodnet-biology.eu/data-catalog?dasid=7948 | 2023-05-16 | Update | Phase IV | First published on 2022-01-20 |

| Dataset | Url | Harvest Date | Type | Phase | Comments |
|--|---|--------------|--------|----------|----------|
| Mackerel and horse mackerel eggs | http://www.emodnet-biology.eu/data-catalog?dasid=2470 | 2023-05-16 | Update | | |
| Macrobenthos monitoring at long-term monitoring stations in the Belgian part of the North Sea from 2001 on | http://www.emodnet-biology.eu/data-catalog?dasid=5394 | 2023-05-16 | Update | | |
| Macrobenthos monitoring in function of aggregate extraction activities in the Belgian part of the North Sea | http://www.emodnet-biology.eu/data-catalog?dasid=4451 | 2023-05-16 | Update | | |
| Macrobenthos monitoring in function of dredge disposal monitoring in the Belgian part of the North Sea | http://www.emodnet-biology.eu/data-catalog?dasid=4452 | 2023-05-16 | Update | | |
| Macrophytes occurrence data within French Mediterranean Lagoon since 2006 | http://www.emodnet-biology.eu/data-catalog?dasid=8244 | 2023-05-16 | New | Phase IV | |
| Marine benthic-pelagic fauna and flora of Blue Flag coasts in northern Crete - Version 1.1 | http://www.emodnet-biology.eu/data-catalog?dasid=8210 | 2023-05-16 | New | Phase IV | |
| MEDGULL_ANTWERPEN - Mediterranean gulls (Ichthyophaga melanocephalus, Laridae) breeding near Antwerp (Belgium) [subsampling representation] | http://www.emodnet-biology.eu/data-catalog?dasid=7938 | 2023-05-16 | New | Phase IV | |
| Monitoring data of Posidonia oceanica meadows along the French Mediterranean coasts since 2007 | http://www.emodnet-biology.eu/data-catalog?dasid=6667 | 2023-05-16 | New | Phase IV | |
| Network Monitoring phytoplankton | http://www.emodnet-biology.eu/data-catalog?dasid=2451 | 2023-05-16 | Update | | |
| North Sea cod and plaice egg surveys (2004, 2009) | http://www.emodnet-biology.eu/data-catalog?dasid=4418 | 2023-05-16 | Update | | |
| O_AMELAND - Eurasian oystercatchers (Haematopus ostralegus, Haematopodidae) breeding on Ameland (the Netherlands) [subsampling representation] | http://www.emodnet-biology.eu/data-catalog?dasid=7940 | 2023-05-16 | New | Phase IV | |

| Dataset | Url | Harvest Date | Type | Phase | Comments |
|---|---|--------------|------|----------|----------|
| O_ASSEN - Eurasian oystercatchers (<i>Haematopus ostralegus</i> , <i>Haematopodidae</i>) breeding in Assen (the Netherlands) [subsamped representation] | http://www.emodnet-biology.eu/data-catalog?dasid=7941 | 2023-05-16 | New | Phase IV | |
| O_BALGZAND - Eurasian oystercatchers (<i>Haematopus ostralegus</i> , <i>Haematopodidae</i>) wintering on Balgzand (the Netherlands) [subsamped representation] | http://www.emodnet-biology.eu/data-catalog?dasid=7942 | 2023-05-16 | New | Phase IV | |
| O_SCHIERMONNIKOOG - Eurasian oystercatchers (<i>Haematopus ostralegus</i> , <i>Haematopodidae</i>) breeding on Schiermonnikoog (the Netherlands) [subsamped representation] | http://www.emodnet-biology.eu/data-catalog?dasid=7943 | 2023-05-16 | New | Phase IV | |
| O_VLIELAND - Eurasian oystercatchers (<i>Haematopus ostralegus</i> , <i>Haematopodidae</i>) breeding and wintering on Vlieland (the Netherlands) [subsamped representation] | http://www.emodnet-biology.eu/data-catalog?dasid=7944 | 2023-05-16 | New | Phase IV | |
| O_WESTERSCHELDE - Eurasian oystercatchers (<i>Haematopus ostralegus</i> , <i>Haematopodidae</i>) breeding in East Flanders (Belgium) [subsamped representation] | http://www.emodnet-biology.eu/data-catalog?dasid=7918 | 2023-05-16 | New | Phase IV | |
| On the Radiata of the Eastern Mediterranean. Part I. Ophiuridae, by Edward Forbes | http://www.emodnet-biology.eu/data-catalog?dasid=8200 | 2023-05-16 | New | Phase IV | |
| Opportunistic macroalgae blooms (green tides) monitoring along the North and Atlantic French coasts since 2008 | http://www.emodnet-biology.eu/data-catalog?dasid=8242 | 2023-05-16 | New | Phase IV | |
| Phytoplankton abundance and composition and physico-chemical parameters in the Ebro delta embayments (Alfacs Bay and Fangar Bay, North Western Mediterranean) during 1990-2019. | http://www.emodnet-biology.eu/data-catalog?dasid=6456 | 2023-05-16 | New | Phase IV | |

| Dataset | Url | Harvest Date | Type | Phase | Comments |
|---|---|--------------|--------|----------|-------------------------------|
| Phytoplankton, National Pilot Monitoring Studies Phyllophora July 2017, EMBLAS II Project | http://www.emodnet-biology.eu/data-catalog?dasid=6466 | 2023-05-16 | Update | Phase IV | First published on 2021-05-10 |
| Progetto Egadi (aggregated per 1-degree cell) | http://www.emodnet-biology.eu/data-catalog?dasid=8205 | 2023-05-16 | New | Phase IV | |
| RADIALES NW Spain Phytoplankton | http://www.emodnet-biology.eu/data-catalog?dasid=8192 | 2023-05-16 | New | Phase IV | |
| RADIALES NW Spain Zooplankton | http://www.emodnet-biology.eu/data-catalog?dasid=8193 | 2023-05-16 | New | Phase IV | |
| Rehabilitated loggerhead from southern Italy - 2 (aggregated per 1-degree cell) | http://www.emodnet-biology.eu/data-catalog?dasid=8208 | 2023-05-16 | New | Phase IV | |
| Report on the Danish Oceanographical expeditions 1908-1910 to the Mediterranean and adjacent seas. Vol II Biology. A.8 Lepadogaster By Frederic Guitel (1919) | http://www.emodnet-biology.eu/data-catalog?dasid=8201 | 2023-05-16 | New | Phase IV | |
| Rockall survey ICES Vib | http://www.emodnet-biology.eu/data-catalog?dasid=2767 | 2023-05-16 | Update | | |
| Romanian Black Sea Zooplankton data from 2001 to 2010 | http://www.emodnet-biology.eu/data-catalog?dasid=8198 | 2023-05-16 | New | Phase IV | |
| RÅgen Herring Larvae Survey | http://www.emodnet-biology.eu/data-catalog?dasid=5756 | 2023-05-16 | Update | | |
| SHARK - National and regional marine environmental monitoring of Picoplankton in Sweden since 2002 | http://www.emodnet-biology.eu/data-catalog?dasid=8188 | 2023-05-16 | New | Phase IV | |
| SHARK - National Epibenthos monitoring in Sweden since 1992 | http://www.emodnet-biology.eu/data-catalog?dasid=2455 | 2023-05-16 | Update | | |
| SHARK - Regional monitoring and monitoring projects of Epibenthos in Sweden since 1994 | http://www.emodnet-biology.eu/data-catalog?dasid=5727 | 2023-05-16 | Update | | |
| SHARK - Regional monitoring, recipient control and monitoring projects of | http://www.emodnet-biology.eu/data-catalog?dasid=6698 | 2023-05-16 | Update | Phase IV | First published on 2021-07-14 |

| Dataset | Url | Harvest Date | Type | Phase | Comments |
|---|---|--------------|--------|----------|-------------------------------|
| phytoplankton in Sweden since 1985 | | | | | |
| Status and occurrence of the non-indigenous <i>Mulinia lateralis</i> (Say, 1822) in the central Wadden Sea (southern North Sea) | http://www.emodnet-biology.eu/data-catalog?dasid=8259 | 2023-05-16 | New | Phase IV | |
| The International Herring Larvae Surveys | http://www.emodnet-biology.eu/data-catalog?dasid=4423 | 2023-05-16 | Update | | |
| MAREANO - Base-line mapping of epifauna obtained with Beamtrawl | http://www.emodnet-biology.eu/data-catalog?dasid=4540 | 2023-03-06 | Update | | |
| MAREANO - Base-line mapping of fauna obtained with grab | http://www.emodnet-biology.eu/data-catalog?dasid=4539 | 2023-03-06 | Update | | |
| MAREANO - Base-line mapping of hyperbenthic crustacea fauna obtained with RP-sledge | http://www.emodnet-biology.eu/data-catalog?dasid=4541 | 2023-03-06 | Update | | |
| SHARK - National marine bacterioplankton monitoring in Sweden since 1989 | http://www.emodnet-biology.eu/data-catalog?dasid=5018 | 2023-03-06 | Update | | |
| SHARK - National marine environmental monitoring of Ringed seal in Sweden since 1995 | http://www.emodnet-biology.eu/data-catalog?dasid=2458 | 2023-03-06 | Update | | |
| SHARK - National phytoplankton monitoring in Sweden since 1983 | http://www.emodnet-biology.eu/data-catalog?dasid=2453 | 2023-03-06 | Update | | |
| SHARK - National zoobenthos monitoring in Sweden since 1971 | http://www.emodnet-biology.eu/data-catalog?dasid=2454 | 2023-03-06 | Update | | |
| SHARK - Regional monitoring, recipient control and monitoring projects of zoobenthos in Sweden since 1972 | http://www.emodnet-biology.eu/data-catalog?dasid=6699 | 2023-03-06 | Update | Phase IV | First published on 2021-07-14 |

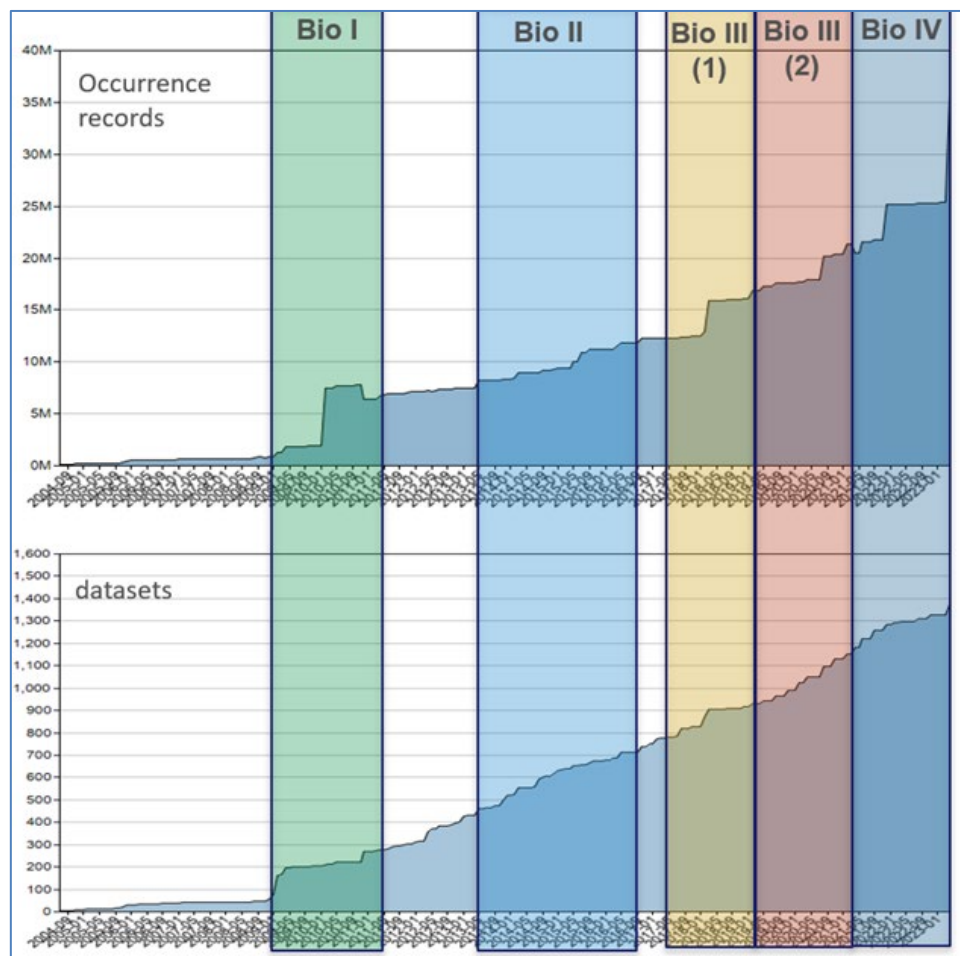


Figure 2: Overview of growth in number of occurrence records (top) and number of datasets (bottom) since the setup of the EuroBIS database, with indication of the different EMODnet Biology Phases.

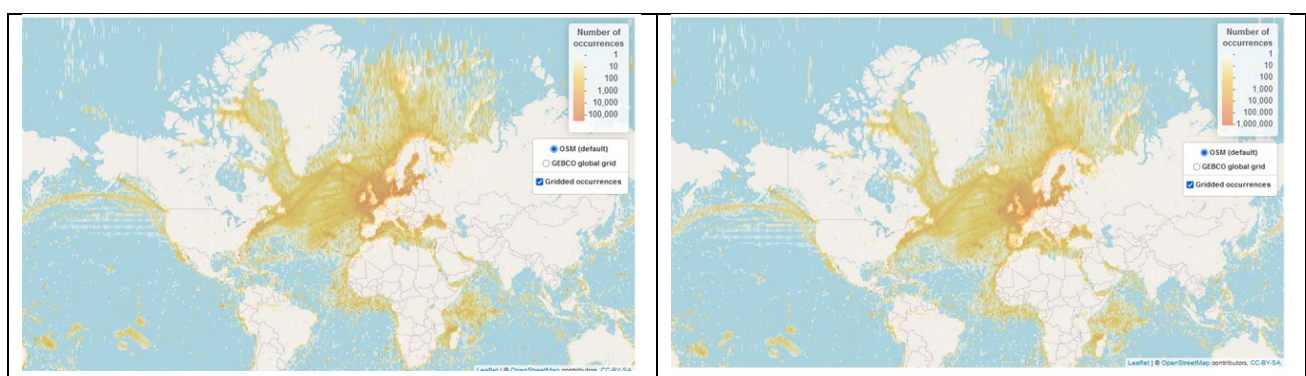


Figure 3: Comparison in available occurrence records from a geographical perspective. Situation April 2021 (left) versus situation April 2023 (right).

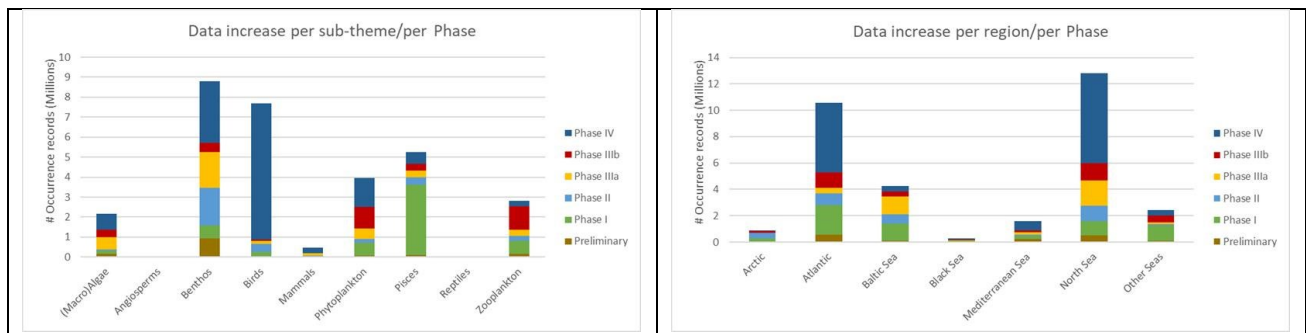


Figure 4: Data increase per Phase. Left: increase per functional group; Right: increase per geographic region (Phase IV data increase is in dark blue)

WP5 Technical infrastructure

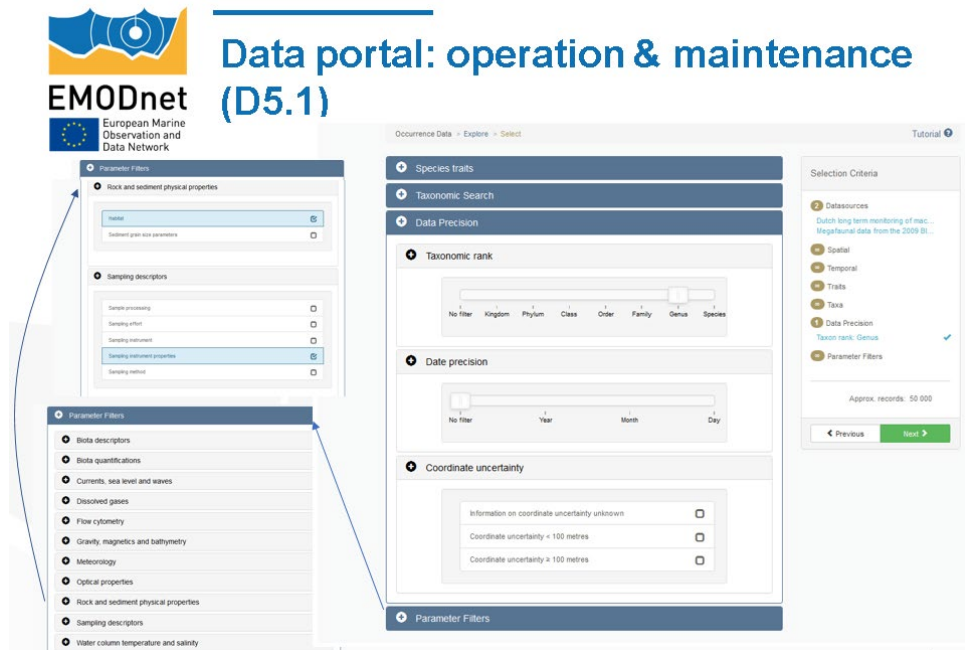


Figure 5: Filter options included in the download toolbox of the EMODnet Biology portal (available until late 2022)

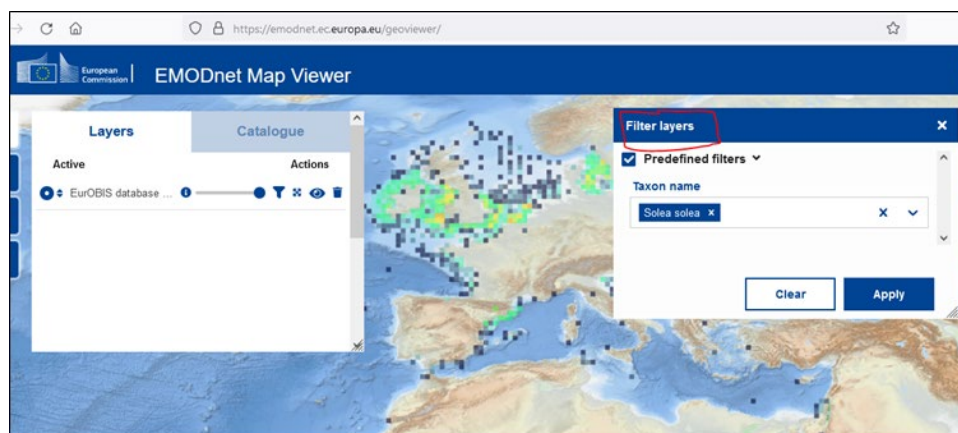


Figure 6: Filter options included in the EMODnet Biology data layer (EurOBIS database observations) available in the EMODnet Central Portal Viewer post centralisation

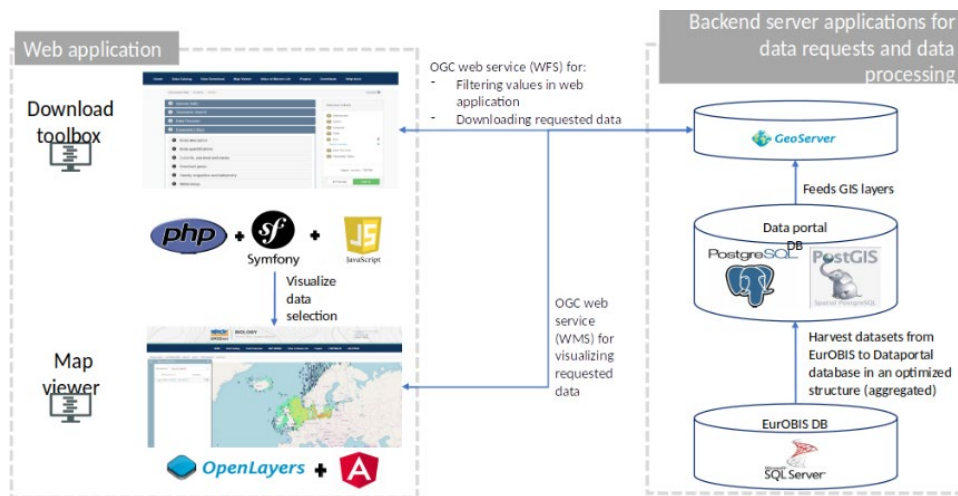


Figure 7: EMODnet Biology Data infrastructure