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)

EMODnet Phase III – Quarterly Progress Report (QR19)

Reporting Period: 01/10/2021 – 31/12/2021

The European Marine Observation and Data Network (EMODnet) is financed by the European Union under Regulation (EU) No 508/2014 of the European Parliament and of the Council of 15 May 2014 on the European Maritime and Fisheries Fund.

Contents

Disclaimer

Highlights in this quarter

Status of the Milestones and Deliverables listed in the workplan				
Milestone/Deliverable	WP	Date due	Status (Delivered/Delayed)	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	
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	
D1.3 First interim report after phase (M12)	WP1	19/04/2022		
D1.4 Final report (M24)	WP1	19/04/2023		
D1.5 Attend Steering Committee and Technical Working Group meetings (M0-M24)	WP1	Sep 2021 TBC 2022	15th SC meeting attended / 10th WG meeting attended	

D2.1 Inventory of possible historical data resources within the consortium (M6)	WP2	29/10/2021	Delivered (see Task 1)	
D2.2 Technical implementation of data flows for the new project partner (M6)	WP2	29/10/2021	Delivered (see Task 1)	
D2.3 Report on efforts undertaken in rescuing historical data through citizen science (M18)	WP2	15/10/2022		
D2.4 At least 3 linkages with initiatives outside of the original Consortium, resulting in extra data/information available via the Portal (M20)	WP2	31/12/2022		
D2.5 Feasibility study for recognition of specific ecological traits and/or sampling devices/methodologies in text (M22)	WP2	25/02/2022		
D2.6 Report on the standardisation and integration of the proposed new and updated datasets (M24)	WP2	19/04/2023		

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 (see QR17 task 2) Delivered (see QR18 task 2) Delivered (see QR19 task 2)	
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)		
D3.3 Publish R package to link EMODnet biology data with data from other EMODnet sources (M12)	WP3	19/04/2022		
D3.4 Develop method to use Phase III presence-absence maps to display time series of distribution change (M12)	WP3	19/04/2022		
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		

D3.6 Add/update data product metadata in the EMODnet Biology catalogue (M24)	WP3	19/04/2023		
D4.1: Questionnaire to inform cross-lot product development (M3)	WP4	30/07/2021	Delivered (see QR18 task 3)	There was a slight delay in making the questionnaire available due to the holiday period. More details in the Task 3 section
D4.2: EMODnet Biology connectivity 'map' of projects, institutes, initiatives and networks to inform targeted engagement (M12)	WP4	19/04/2022		
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		
D4.4 "Launch" of the European MBON node (M24)	WP4	19/04/2023		
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) Use case 2 (19 Apr 2022) Use case 3 (15 Oct 2022) Use case 4 (19 Apr 2023)	Delivered (see task 7)	Submitted to EMODnet Secretariat
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		
D5.3 Technology stack upgraded (M12)	WP5	19/04/2022		

D5.4 Evaluation and implementation of bulk data transfer technologies (M24)	WP5	19/04/2023		

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

The inventory of 'Possible historical data resources within the consortium' was initiated over the 2021 summer (July - September), when all WP2 partners were requested to provide an overview of in-house historical datasets. Within EMODnet Biology and this Work Package (WP), historical data are defined as data collected up to 70 years ago (before 1950). The inventory was also used to identify possible rescue datasets, defined as data published between 1950-2000s, which currently only exist on paper or in text files.

The outcome resulted in the identification of a total of 18 datasets. By using the temporal data coverage as an essential factor to prioritise this list - considering the 'historical data' definition within this project, 13 datasets were identified as Historical Data Resources. A full report on the inventory is available online via the link. Over the next few months several platforms will be tested to assess whether data digitisation, through citizen science efforts is feasible and how it can be implemented. It is worth noting that partners are still be able to identify historically relevant data, which can be added to this inventory during the project's lifetime.

A second deliverable (D2.2) was created, introducing the technical implementation of data flows for new partners (UkrSCES and IH Cantabria) but also updating information for existing partners. The document can be accessed via the link.

An agreement has been made with the Research Institute Nature and Forest (INBO), to establish a regular flow of the European Seabirds at Sea (ESAS) data to the EurOBIS database, so these can become available through EMODnet Biology. A first data transfer will happen early 2023. Conversations with PANGAEA, Data Publisher for Earth & Environmental Science (Germany) are ongoing, with the aim to agree on the best way to establish a continuous data flow to EMODnet Biology.

During October 2021, the third Phase IV data harvest was completed and published 39 new datasets and 1 updated dataset. As in the previous harvest, data did not come exclusively from EMODnet Biology Partners, but also from Phase III data grant holders and ad-hoc submissions. This action brought the total number of available occurrence records to 26.6 million, originating from a total of 1.181 datasets. An overview of the new datasets is available in the Annex alongside with maps with the geographical distribution and functional group overview.

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

Progress from all partners was discussed at the quarterly call held on 2021-12-10. Significant progress has been made on the development of the EMDOnetWFS package, for accessing data across EMODnet lots, which is foundational to ongoing development of products. The scope of this work will be expanded considerably through the involvement of Emmanuel Blondel (contract in final stages of preparation) who will develop Web Coverage Service (WCS) capability within R, allowing a more straightforward access to data stored in raster (i.e., gridded) format. Another independent consultant, Maëlle Salmon, has been contracted to help improve the reproducibility and documentation of our products, thus providing users with clearer information about the quality of parameters mapped in time and space. This work has commenced and more progress will be reported in the next QR.

A new collaborative relationship between our machine learning team at U Liege and our zooplankton expert at the MBA has commenced the process of improving the quality of our maps of zooplankton distributions in time and space.

The WP3 workshop is being planned for early March 2022 with a focus on advancing product development over a concentrated period, covering all aspects of this task.

Direct links between our products and the user community have been made or are in development. These include a use case prepared for the Dutch government using the EMODnet product on abundance of benthic organisms, which will be fully developed into an EMODnet use case study. The team are also in discussion with the UK State of Nature Partnership with the aim of using the same benthic product to vastly expand the taxonomic and geographical scope of the marine indicator to be developed for the forthcoming 2023 State of Nature report.

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

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 IMIS metadata catalogue (it was not replicating what was in the original data provider field in IPT). This was caused by an incomplete mapping of these fields in the script that transfers IMIS metadata to the EML output. The mapping logic was revised and fixed.

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

During the reporting period two WP2 deliverables were published and when centralisation is complete, they will be found in the Central Portal (CP). More details can be found in Task 1.

EMODnet Biology uses Twitter as the main vehicle of outreach and, in some instances, the news items published in the thematic lot's portal are also used to disseminate project related information. It is expected that both the news as well as the Twitter posts will continue when centralisation occurs.

Due to the changes expected within the context of the migration to the Central Portal, no major updates were made to the Biology portal, other than those reflecting the publication of new data and other deliverables (see Task 1).

A joint EMODnet Biology and Seabed Habitats use case was drafted and submitted to the EMODnet Secretariat and is pending publication (more details in Task 7).

Task 5: Contributing content to dedicated spaces in Central Portal

The main activity within this task was done in collaboration with the EMODnet Secretariat, in light of the future centralisation of the Biology thematic lot. The mapping of the Biology site was done by the Secretariat and reviewed by the Biology coordinator in the previous quarter, and during the quarter reported in this document, a meeting took place to agree on which content would be relevant to include in the CP and which content was already accessible via other means, therefore not requiring a specific page in the CP (e.g. the information given in https://www.emodnet-biology.eu/blog is also available via the EMODnet GitHub. The links to this repository are also included in the data products' metadata, which can be accessed via the catalogue). This meeting with the Central Portal technical team took place on 2021-11-10 and no major constraints to progress were identified. A review of the latest CP viewer was made available to the team and was shared with Bilbomatica. Some functionalities, like the layer animation, required for Biology, were not fully implemented in the version available at the time of the meeting. This was updated with the last version but, due to the holiday season, was only checked and tested in QR20.

In addition, to the above, the thematic lot has supported the EMODnet Secretariat in the following activities:

- Contribution with information for the October and November newsletters
- Review of the EMODnet Technical Working Group meeting minutes

Task 6: Ensure the involvement of regional sea convention

No specific, direct engagement with the RSC's has taken place in this reporting period, however work has continued on key deliverables within WP4, to better understand and illustrate the interactions the EMODnet Biology partnership has, in order to ensure that subsequent targeted engagement is streamlined.

Additionally, EMODnet Biology was represented in a number of workshops, events and fora alongside RSC's to ensure continued awareness of EMODnet Biology data, tools and services. These including the Future of our Seas event. More details are given in the Meetings and events attended section of this document.

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

EMODnet Biology continues to promote open data and the provision of products, tools and services to support the implementation of EU legislation through targeted and ad-hoc engagements. The partnership has been represented on several international events. Details can be found in the Meetings and events attended section of this document.

As briefly mentioned in Task 4, a use case was submitted to the EMODnet Secretariat, illustrating improvement in the availability of point-based habitat data and linking it to EMODnet Seabed Habitats, and with WP3 there is a continuous approach to develop examples of the uptake of EMODnet Biology products.

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

Technical monitoring is an ongoing task and done via various tools, Matomo for user monitoring and GeoHealthCheck for webservices.

The website had 2.630 visits, with an average of ~30 visits per day during the reporting period. No evident connection with communication outreach activities can be inferred from the graphs in Figures 4 and 5 of the Annex.

Webservices monitoring have been in place since March 2021 and, as it is not possible to select a date range applicable to the reporting period, Figure 6 of the Annex, includes information since the tool was made operational. Biology services have a 100% operationality with a 99.5% reliability, which is compliant with INSPIRE guidance.

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

No further work required for this task. The thematic portal has been operational since the start of the contract and will continue until it is agreed that it can be shut down, with users being redirected to the CP for Biology (meta)data, products, tools, services and other information.

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	Pending	More information from the Secretariat is needed on what the expected end result should be		
Implementing Marine-ID	Resolved	~~Review of potential alternatives (QR10 report feedback)~~ 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		
Including data and metadata URL in web services of data products	Ongoing	No changes since the last QR	QR18	
Assessment of performance				
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	
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		

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
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&dasid=5076 as an example	QR19	11/11/2021
Updates to EMODnet reporting regions polygons	Ongoing	Update will include: • 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: • 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

User feedback (Contact Us form, online chat & other communication means)

Overview of user feedback and/or requests received in this quarter							
Date	Organisation	Type of user feedback (e.g. technical, case study, etc.) and short description of the feedback received	Means of contact	Response time	Status of user query: resolved/pending	Measures taken to resolve the query	Status: if not (yet) resolved/pending, explain reason why and expected timeline
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	
2021-12-09	UDG	Academia	email	1 day	Resolved	Directed user to Seabed Habitats as query was not within Biology's remit	

Meetings/events held/attended & planned

A. Meetings/events organised and attended					
Date	Location	Type event (internal or external meeting, training/workshop)	Indicate if a ppt was given (yes/no + short description)	Meeting attended (A) / organised (O)	Short description and main results (# participants, agreements made, etc.)
07/10/2021	Online	External Webinar	No	A	Best Practice Webinar & Study Launch: Offshore Biodiversity Data and Monitoring - What have we yet to learn?
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.
12/10/2021	Online	External Webinar	No	A	Webinar 1: IBAT and ENCORE: 2 key biodiversity data sources for screening purposes
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.
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 heterogenous in terms of knowledge as some participants were at university entry level whereas others were at Post-Doc level.

26/10/2021	Online	External Webinar	No	A	Webinar 3: Innovative developments in the field of biodiversity data collection
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.
03/11/2021	Online	External meeting	No	A	ODYSSEA conference: 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. The conference has been arranged into 6 specific areas of focus: 1. Capacity-building around the Mediterranean (with emphasis in North Africa) 2. Marinomica – the data visualisation platform 3. Development of Marinomica products and services.

					4. Observatories – the new Med observatories. 5. End user services and contribution to policy processes 6. Impacts and the future 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 hind, now and forecasts; fishery and aquaculture; biodiversity; oil and gas exploitation; tourism; and marine traffic and harbours. 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.
12/11/2021	Online	External	No	A	Networking Fridays - MarineLife 2030 & OKAN. Live participants + delayed views: 272 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
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
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.
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.
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.
SUM				**O**	**Total # of meetings organised = 0**
SUM				**A**	**Total # of meetings attended = 14**

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
Feb 2022	Poland/online	Conference	A	International Ocean Data Conference
March 2022	Online	Workshop	O	WP3 data product workshop

Communication assets

A. Communication products				
Date	Communication material	Short description (of the material, title, ...) of the asset	Main results	Name of event at which material was disseminated (if applicable)
October	Tweets	25 tweets	Increase visibility Outreach Follower engagement	NA
November	Tweets	19 tweets	Increase visibility Outreach Follower engagement	NA
December	Tweets	24 tweets	Increase visibility Outreach Follower engagement	NA
October	News	https://www.emodnet-biology.eu/news?p=show&id=8886	New Data harvest announcement	NA
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

In Figures 7 and 8 in the Annex it is possible to see the impressions and engagements resulting from the Tweets published during the reporting period.

B. Planned communication products			
Date	Communication material	Short description (of the material, title, ...) and/or link to the asset	Main results expected
QR20	Tweets	Tweets on published datasets, project information, participation in meetings/events	Increase visibility Outreach Follower engagement
QR20	News articles	Published deliverables Project information	Increase visibility Outreach

List of known publications using EMODnet data or data products				
Date	Type and name of journal, conference, …	Publication title including DOI (if known)	Author(s)	Organisation(s)
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
02/10/2021	Book	Ocean Science Data (Paperback ISBN: 9780128234273)	Chapter 2: Joana Beja[1], Leen Vandepitte[1], Abigail Benson[12], Anton Van de Putte[2,3], Dan Lear[4], Daphnis De Pooter[5], Gwenaëlle Moncoiffé[6], John Nicholls[7], Nina Wambiji[8], Patricia Miloslavich[9,10], Vasilis Gerovasileiou[11]	1 Flanders Marine Institute (VLIZ), Oostende, Belgium 2 Royal Belgian Institute for Natural Sciences, Brussels, Belgium 3 UniversitØ 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

Monitoring indicators

Comments on the progress indicators in the excel template		
Progress indicator	Means of collecting figures	Comment
1. Current status and coverage of total available thematic data A) Volume and coverage of available data	In house systems	There were no significative changes in the numbers of birds, fish and reptile data since the last quarter. The biggest increase in data was for mammals, mainly due to the submission of the Phase III data grants. There was a small decrease in the number of records for macroalgae, phyto and zooplankton most likely related with changes resulting from dataset updates. Data made available during the quarter originated from 4 regions: Atlantic, Black Sea, Mediterranean Sea and North Sea. The biggest additions were for Benthos in the Atlantic and Mammals in the North Sea. Note that absence of records added during the reporting period is shown as an empty cell and all 0% values mean that records are available but their overal contribution to the data added during this quarter is quite small.
B) Usage of data in this quarter	In house systems	There was a significant increase in data usage during the reporting period. That is also reflected in the downloaded volume, which increased more than 30%
2. Current status and coverage of total number of data products A) Volume and coverage of available data products	In house systems	Two external products, submitted via EMODnet Ingestion, were added to the catalogue. No new internal products were published during the reporting period. Added details for products per theme and also per product.
B) Usage of data products in this quarter	Matomo	There was no change on the number of downloaded products when compared to the previous quarter.
3. Organisations supplying/approached to supply data and data products within this quarter	In house systems	Most organisations submitted their data as part of their commitments with the project, with the exception of two that volunteered it. One NGO submitted data, the remaining were either governmental or academia/research. Data submitted are not restricted.
4. Online 'Web' interfaces to access or view data		There was no change to the services available since the last reporting period

5. Statistics on information volunteered through download forms	Thematic lot download form	The big majority of users are affiliated to academia and/or work in research organisations. In terms of data usage, roughly half will be for research purposes followed by a much smaller % for education & workshops, GIS analysis and Mapping, visualisation & communication. During the reporting period, the big majority of our users originate from a European country.
6. Published use cases	Matomo	There were no changes in the number of published cases during the reporting period. A mistake was found in the number of views reporting in the previous quarter, the correct numbers, in the order of the table presented above are 8/7/2/4. Upon inspection it is clear that there was minor increase in the number views since the previous reporting period, for all use cases except the first two, where a decrease in views was identified.
8.1. Technical monitoring	Matomo	The average response time is below the allowed threshold and the portal's uptime remains at 100%, which complies with requirements
8.2. Portal user-friendliness (Visual harmonization score)	Trust-IT evaluation	The portal fully complies with the visual guidelines
9. Visibility & Analytics for web pages	Matomo	No significant changes when compared with the previous quarter
10. Visibility & Analytics for web sections	Matomo	Increase in the number of pageviews for two pages, whereas others remained roughly with the same pageviews as in the previous quarter. It's not clear if an event has triggered this increase in the Geoviewer and portal pages, but could have been partly due to the thematic lot's involvement in the Hack4Oceans event
11. Average visit duration for web pages	Matomo	Slight increase in visit duration for most pages, when compared with the previous reporting period

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

Annex: Other documentation attached

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

Below is included a table with a list of all datasets harvested during the reporting period, including information on their Marine Region(s), functional group(s) and temporal coverage.

Dataset	Marine Region	Functional Group	Temporal Coverage	Organisation (e.g. partner, external)	Phase III or IV
Mesozooplankton, National Pilot Monitoring Studies 2017, EMBLAS-II	Black Sea	zooplankton	2017	partner	Phase IV
Macrozoobenthos, National Pilot Monitoring Studies 2017, EMBLAS-II	Black Sea	benthos	2017	partner	Phase IV
Data on cetacean occurrence collected during the project "EMBLAS-Plus, Improving Environmental Monitoring in the Black Sea – Selected Measures", 2019	Black Sea	mammals	2017	partner	Phase IV
Mesozooplankton, National Pilot Monitoring Studies Phyllophora July 2017, EMBLAS-II	Black Sea	zooplankton	2017	partner	Phase IV
Mesozooplankton, National Pilot Monitoring Studies 2016, EMBLAS-II	Black Sea	zooplankton	2016	partner	Phase IV
Mesozooplankton, Joint Open Sea Surveys 2016, EMBLAS-II	Black Sea	zooplankton	2016	partner	Phase IV
Macrozooplankton, National Pilot Monitoring Studies 2016, EMBLAS-II	Black Sea	zooplankton	2016	partner	Phase IV
Macrozoobenthos, National Pilot Monitoring Studies Phyllophora July 2017, EMBLAS-II	Black Sea	benthos	2017	partner	Phase IV
Macrozoobenthos, National Pilot Monitoring Studies Phyllophora August 2017, EMBLAS-II	Black Sea	benthos	2017	partner	Phase IV

Dataset	Marine Region	Functional Group	Temporal Coverage	Organisation (e.g. partner, external)	Phase III or IV
Macrozoobenthos, Joint Open Sea Surveys August 2017, EMBLAS-II	Black Sea	benthos	2017	partner	Phase IV
Phytoplankton, National Pilot Monitoring Studies Phyllophora August 2017, EMBLAS II Project	Black Sea	phytoplankton	2017	partner	Phase IV
Phytoplankton, Joint Open Sea Surveys 2016, EMBLAS II Project	Black Sea	phytoplankton	2016	partner	Phase IV
Macrozoobenthos, National Pilot Monitoring Studies 2016, EMBLAS-II	Black Sea	benthos	2016	partner	Phase IV
Mesozooplankton, National Pilot Monitoring Studies Phyllophora August 2017, EMBLAS-II	Black Sea	zooplankton	2017	partner	Phase IV
Mesozooplankton, National Pilot Monitoring Studies Phyllophora April 2017, EMBLAS-II	Black Sea	zooplankton	2017	partner	Phase IV
Mesozooplankton, Joint Open Sea Surveys 2017, EMBLAS-II	Black Sea	zooplankton	2017	partner	Phase IV
Macrozooplankton, Joint Open Sea Surveys 2016, EMBLAS-II	Black Sea	zooplankton	2016	partner	Phase IV
Macrozoobenthos, National Pilot Monitoring Studies Phyllophora April 2017, EMBLAS-II	Black Sea	benthos	2017	partner	Phase IV
Phytoplankton, National Pilot Monitoring Studies Phyllophora April 2017, EMBLAS II Project	Black Sea	phytoplankton	2017	partner	Phase IV
Phytoplankton, National Pilot Monitoring Studies 2016, EMBLAS II Project	Black Sea	phytoplankton	2016	partner	Phase IV

Dataset	Marine Region	Functional Group	Temporal Coverage	Organisation (e.g. partner, external)	Phase III or IV
Phytoplankton, Joint Open Sea Surveys 2017, EMBLAS II Project	Black Sea	phytoplankton	2017	partner	Phase IV
Meiobenthos, National Pilot Monitoring Studies 2016, EMBLAS-II	Black Sea	benthos	2016	partner	Phase IV
Soft-bottom macrozoobenthos from the littoral zone of the Natura 2000 MPA "Ropotamo", Southern Bulgarian Black Sea (2013)	Black Sea	benthos	2013	external (ad hoc)	
Infauna from seagrass meadows in the coastal Bulgarian Black Sea (2013-2014)	Black Sea	angiosperms	2013-2014	external (ad hoc)	
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.	Aegean Sea	benthos	1841-1843	partner	Phase IV
LifeWatch observatory data: Permanent Cetacean passive acoustic sensor network in the Belgian Part of the North Sea	North Sea	mammals	2014 onwards	partner	Phase IV
Global Marine biodiversity data from Seawatchers Marine Citizen Science Platform 1980-2020	Mediterranean Sea, Biscay Bay, Canary Islands	Algae, benthos, birds, angiosperms	1980-2020	data grant	Phase III
Contaminant and isotopic data in European hake and their parasites Anisakis sp.	Celtic Sea	fish	2018	EMODnet Ingestion	
MME-T-MEDNet: Mass mortality events in Mediterranean marine coastal ecosystems	Mediterranean Sea	Benthos, algae	1979-2019	data grant	Phase III

Dataset	Marine Region	Functional Group	Temporal Coverage	Organisation (e.g. partner, external)	Phase III or IV
Phytoplankton abundance in the coastal and open waters of the Adriatic Sea (2013-2014)	Adriatic Sea	phytoplankton	2013-2014	partner	Phase III
Zooplankton studies in the Southern Bight of the North Sea between 1971 and 1974	North Sea	zooplankton	1971-1974	partner	Phase IV
Presence of cetacean species collected through Fixed-Line-Transect monitoring across the Western Mediterranean Sea (Civitavecchia-Barcelona route) between 2014 and 2018	Mediterranean Sea	mammals	2014-2018	data grant	Phase III
Catalogue of algae collected in the Mediterranean Sea during the cruises of Cutter Violante in 1876 and 1877	Mediterranean Sea	algae	1876-1877	partner	Phase IV
Phytoplankton in front of River Po Delta (PRISMA2-SP1 project) 1996-1998	Adriatic Sea	phytoplankton	1996-1998	partner	Phase IV
Phytoplankton North Adriatic-Gulf of Trieste C1 – LTER time-series 1986-2005	Adriatic Sea	phytoplankton	1986-2005	partner	Phase IV
Phytoplankton North Adriatic-Gulf of Trieste C1 – LTER time-series from 2010 onwards	Adriatic Sea	phytoplankton	2010 onwards	partner	Phase IV
Phytoplankton North Adriatic-Gulf of Trieste C1 – LTER time-series 2006-2009	Adriatic Sea	phytoplankton	2006-2009	partner	Phase IV
Irish Benthos monitoring as part of the Water framework directive since 2012	Irish Sea	benthos	2012 onwards	data grant	Phase III
Phytoplankton abundance data from the Gibraltar coastline 2009-2019	Gibraltar Strait	phytoplankton	2009-2019	partner	Phase III

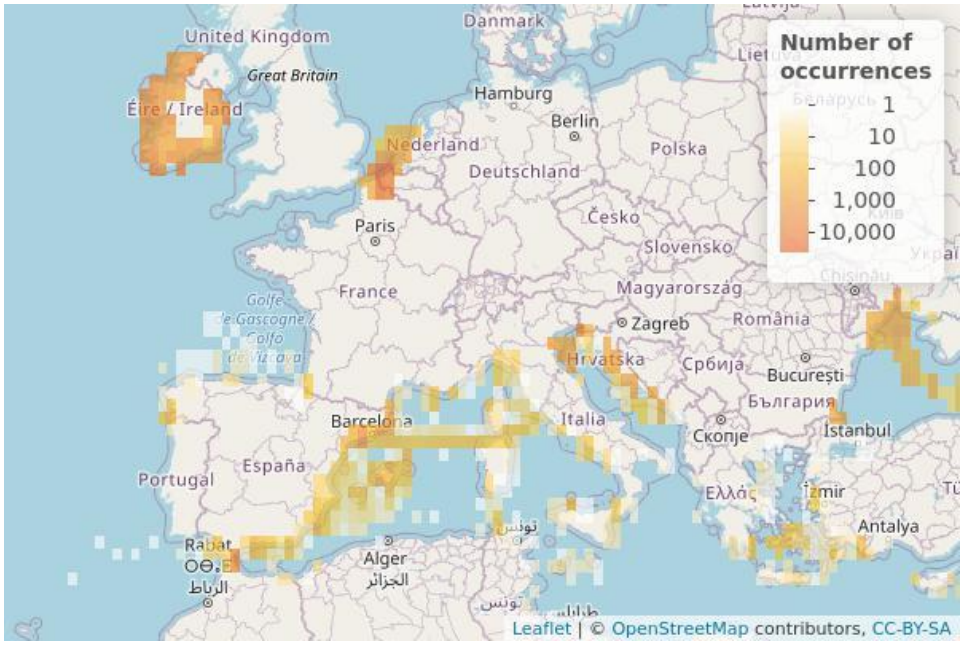

Figure 1. Map of gridded occurrences published by EMODnet Biology during the reporting period

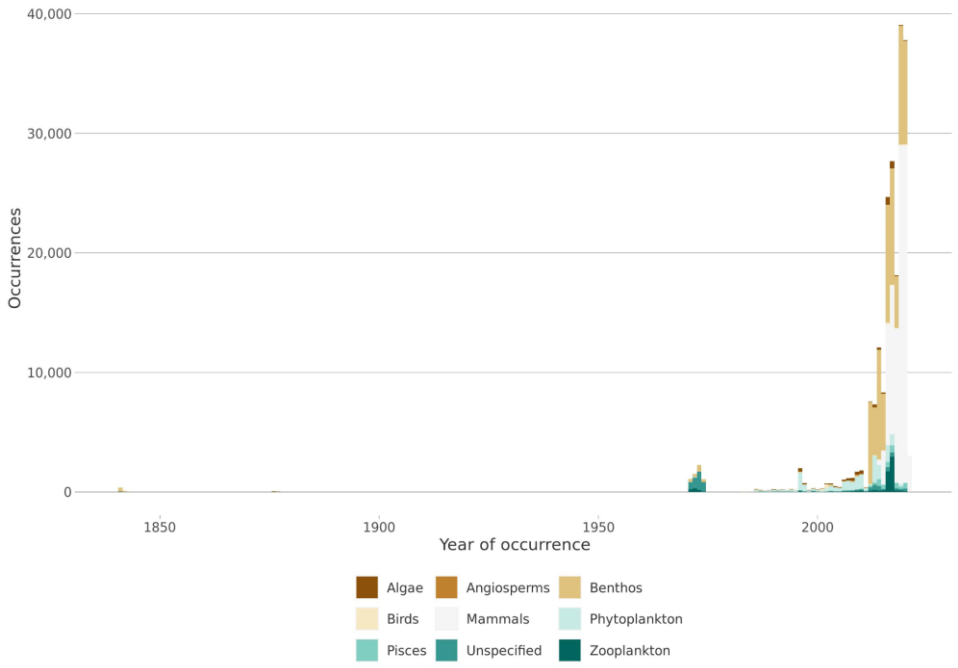

Figure 2. Number of occurrences, per year of sample and sub-theme, published by EMODnet Biology during the reporting period

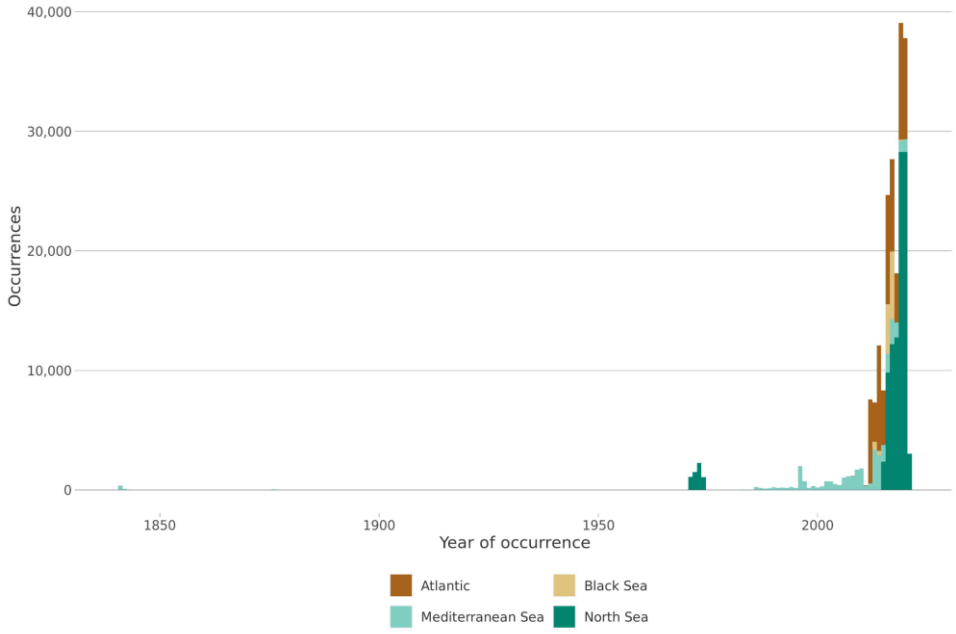

Figure 3. Number of occurrences, per sample year and marine region, published by EMODnet Biology during the reporting period

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

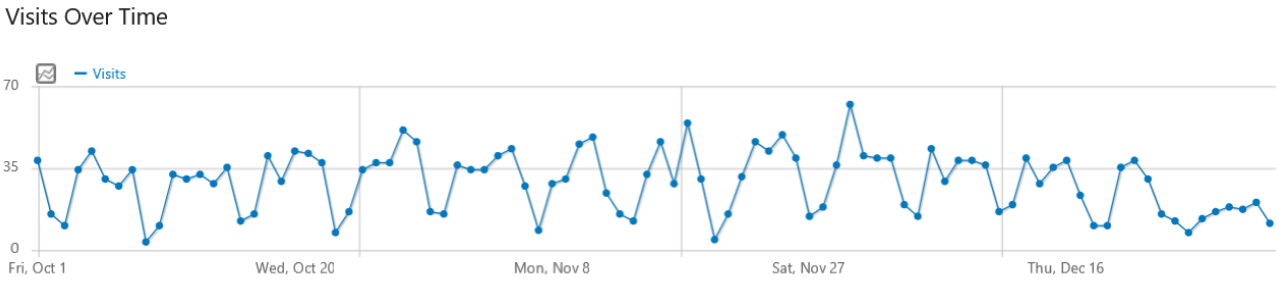

Figure 4. Visits over time for the reporting period (Collected via Matomo)

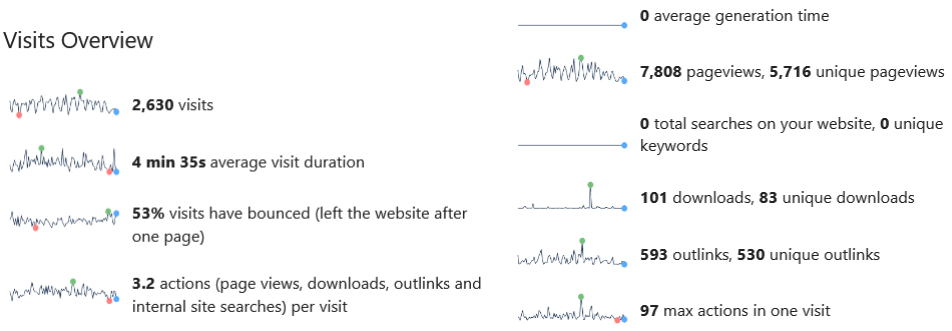

Figure 5. Visits Overview for the reporting period (Collected via Matomo)

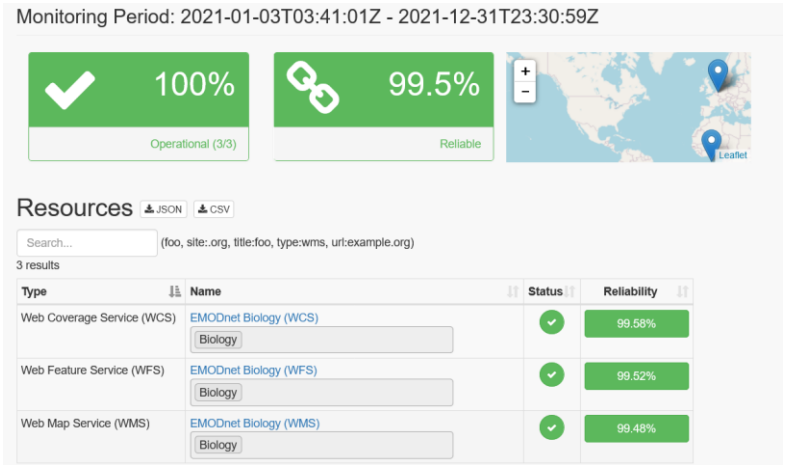

Figure 6. Webservices monitoring from March 2021 until end of 2021 (Collected via GeoHealthCheck)

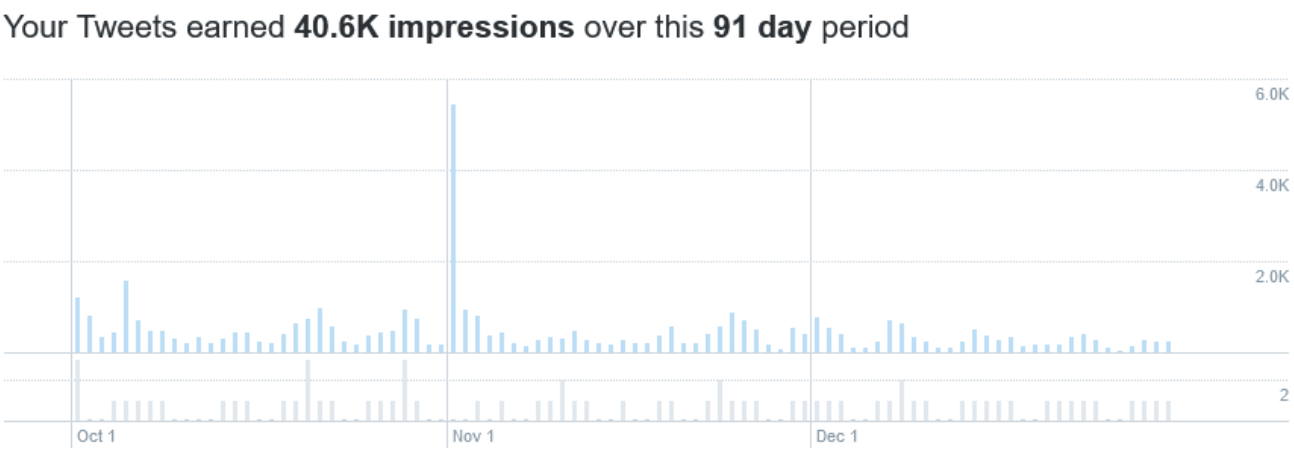

Figure 7. Twitter impressions during the reporting period (collated via Twitter analytics)

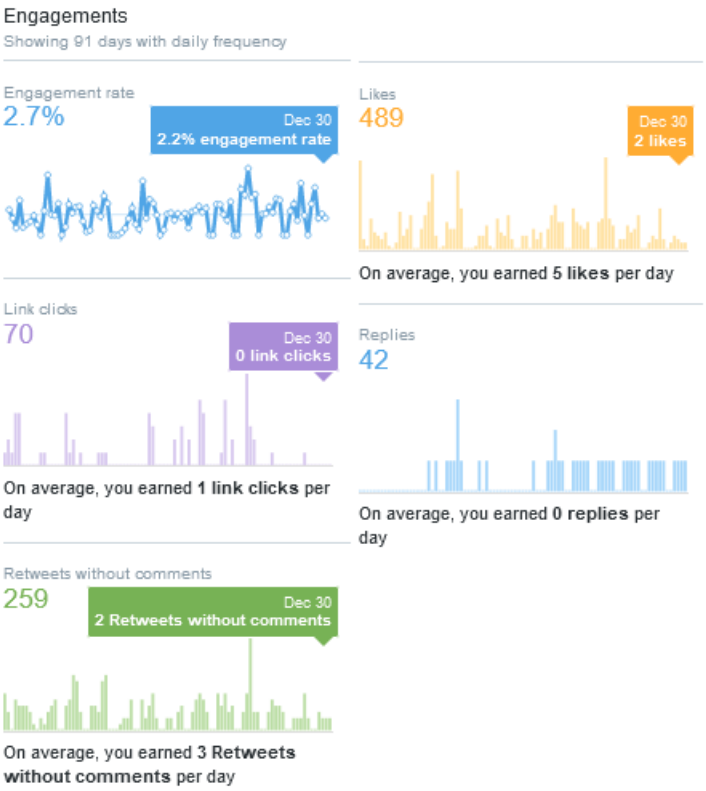

Figure 8. Twitter engagements during the reporting period (collated via Twitter analytics)