



EMODnet



European Marine
Observation and
Data Network

EMODnet Thematic Lot n° V - BIOLOGY

EASME/EMFF/2016/1.3.1.2- Lot 5/SI2.750022 – Biology

Start date of the project: 19/04/2017- (24 months)

EMODnet Phase III – Quarterly Progress Report (8)

Reporting Period: 01/01/2019 – 01/04/2019



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Disclaimer

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Highlights during the reporting period

Provide a short summary of the key achievements and/or events of interest to a wider audience within this reporting period you wish to highlight. **Please make sure that progress in each of the tasks specified in Section 1.4.1 of the Tender Specifications is covered. For those tasks not experiencing significant progress, please state so.** In addition, you can (but not required) also consider the indicators or any other of the reporting sections.

WP1. Project management (Tasks 7 & 8)

Project management during this reporting period has been marked by staff changes. However, project management has not been disrupted because an overlap was planned between the previous and the current EMODnet Biology coordinator. Besides, communication has been regular between the different work package leaders and a Coordination Board meeting was organized to ensure smooth transition and to discuss the work and the organization of the final meeting, to take place on 16th-17th May, in Lisbon. Much of the Project management work has been dedicated to the organization of this meeting, were the progress made during the performance period will be reviewed, and the lessons learned will inform the work plan for the renewal period.

The monitoring indicators that are attached report on web metrics (using Matomo) and usage of the data (data download monitoring). For this reporting period, we observed an average of 21 unique visitors per day (26.4 during weekdays). We noticed an increase of 66% of visitors after the launch of the new version of the download toolbox (14th February), a news which was amplified by the EMODnet Secretariat communication channels.



Evolution of visitors of emodnet-biology.eu during the reporting period, showing a peak in mid-February, after the launch of the new version of the download toolbox.

The help desk stayed online and operational throughout this reporting period.

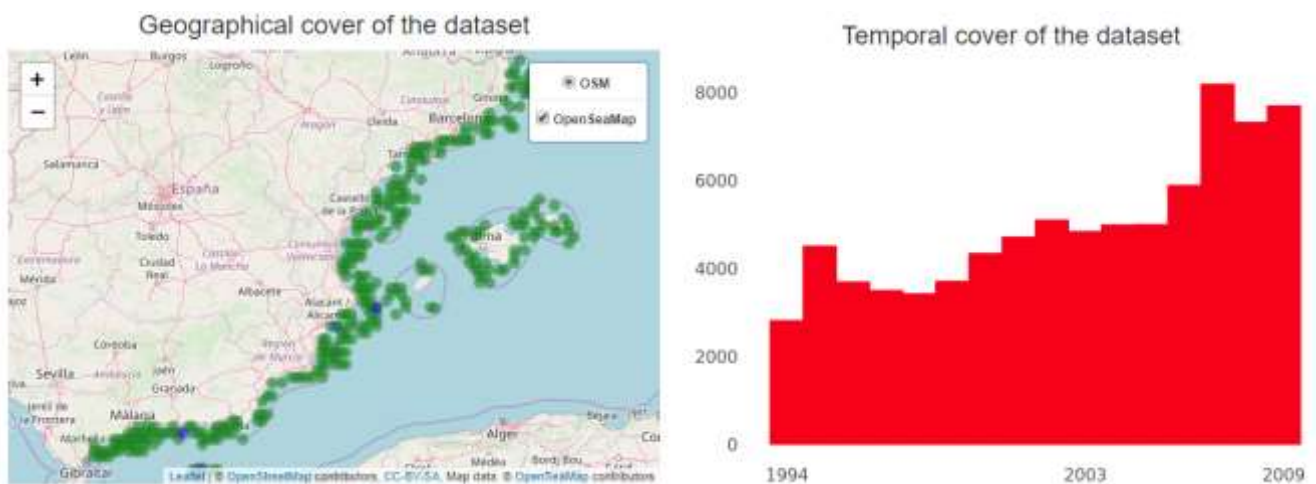
WP2: Data access to marine biological data (Task 1)

The March 2019 data harvest gave access to 12 new datasets and 3 updated dataset(s), representing 800,000 new distribution records. The individual datasets can be accessed via the metadata catalogue, which gives a link to their selection in the download toolbox (links provided below).

New datasets:

- [Phytoplankton composition, biomass and abundance in Estonian territorial waters 1993-2016](#)
- [Zooplankton biomass and abundance in Estonian territorial waters 1993-2016](#)
- [Zooplankton in the coastal waters of Zmiinyi island in the Black Sea \(2003-2006\)](#)
- [Phytoplankton in the Coastal Waters of Zmiinyi Island in the Black Sea \(2004-2015\)](#)
- [MEDITS-Spain: Demersal and mega-benthic species from the MEDITS \(Mediterranean International Trawl Survey\) project on the Spanish continental shelf between 1994 and 2010](#)

- [Dutch long term monitoring of phytoplankton in the Dutch Continental Economical Zone of the North Sea](#)
- [A*MIDEX CHROME: Western Mediterranean automated flow cytometry surface sample from Ships of O/P crossing Tunis-Marseille and Tunis-Genova between October 2016-January 2017](#)
- [Plankton biodiversity data from a North Sea Cruise with R/V Simon Stevin in May 2017](#)
- [Bivalves surveys for the Monitoring and Evaluation Programme of the North Sea OWEZ wind park in 2007](#)
- [WOT-schelpdieren: Dutch national shellfish monitoring in the coastal zone](#) (received via EMODnet Ingestion portal).
- [CETUS: Cetacean monitoring surveys in the Eastern North Atlantic](#)
- [Benthic fauna in Estonian territorial waters 1993-2016](#)



Screen capture of the geographical and temporal cover of the MEDITS-Spain dataset, which has been published in EMODnet Biology during this reporting period.

Updated datasets:

- [Phyto- and microzooplankton in mussel farms - North Adriatic Sea \(SosteMiTS Project\) 2008-2009](#)
- [Subtidal epibenthos and demersal fish monitoring in function of a foreshore suppletion at the Belgian coast, period 2013-2016](#)
- [Subtidal hyperbenthos monitoring in function of a foreshore suppletion at the Belgian coast, period 2013-2016](#)

As this project phase is nearing its end, all partners were requested to provide updates on the status of their work to deliver the indicated data to EMODnet Biology, so they can be harvested in EurOBIS. Within the EMODnet Biology project, 93 new datasets would be delivered, and an additional 44 would be updated. On March 1st, the situation was as follows: 42 new datasets provided and 11 datasets updated.

We requested each partner to give an update to indicate estimated time of delivery, together with challenges or unforeseen obstacles encountered during the performance period. In addition, if the data were already delivered, the partners were asked for potential improvements on the data for the next phase, e.g. more abiotic data available but not delivered, more (detailed) information on sampling – e.g. eMoF format – available, updates already available, etc.

SYKE - Last dataset (Phytoplankton) will be delivered in April.

- Update the current datasets (benthos, zooplankton, phytoplankton) to include data up to 2020 and also with some older data. Additional data on coastal zooplankton dataset and a qualitative/semiquantitative phytoplankton (ferrybox) dataset could be delivered. Discussions are ongoing with the Finnish underwater habitat mapping program (VELMU) to share their data.

OGS

- Largest part of the commitments has been delivered. There are a few deviations, which were compensated with additional datasets not in the inventory, and some datasets are still being checked. OGS has submitted more records than committed. Two of the suggested datasets have been submitted as WP3 contribution (historical data).
- Possible improvements:
 - More metadata on sampling and analytical protocols.
 - Abiotic data could become available for most of the datasets submitted.
 - More data have been acquired and some updates of time series have been done but access restrictions need to be double-checked.

ILVO

- All datasets according to plan. Last datasets delivered are pending action from the Data Management Team.

AARHUS

- Update of the delivered data will be done by the end of 2019, including the 2019 data.
- Older data are available, but will need to be thoroughly quality checked before they can be released.

ICES

- All the datasets have been delivered.
- Improvements could be made on the way the data are being updated within EMODnet Biology.

MBA

- Not all data delivered yet, but work with the Data Management Team is in progress to get the MBA IPT DwC-A formatted data to the best format and quality. Delivery by the end of April should be possible, but can depend on external factors.
- As MBA has become the UK OBIS node, a continuous flow of data to the MDA IPT will happen from several data providing institutes, and this will result in an increase of potential data that can also flow to EMODnet Biology.

CEFAS

- An agreement has been made between CEFAS and MBA and the CEFAS datasets will flow to MBA (UK OBIS node) and, from there, to EMODnet Biology.
- CEFAS still needs to transfer its datasets to MBA, from where they can flow to EMODnet Biology. Their data system has recently changed, with a consequence that quality control and upload is still ongoing.
- Staff restrictions has led to a slow-down on the data delivery process.

Ifremer

- Data will be delivered in the coming weeks.

IPMA

- All datasets will be delivered by the end of April.
- Additional measurements or facts that go along with the current datasets are available, and could be shared with EMODnet Biology.

NIMRD

- All promised datasets will be delivered by the end of April for the final check.
- Additional datasets have already been identified for phytoplankton, zooplankton and macrozoobenthos for the period 1890-1990/2000.

IEO

- A first version of the dataset was delivered a processed and it's available in EMODnet Biology.
- IEO is working on solving some discrepancies in their export procedure and will provide an update of the data in the coming weeks.

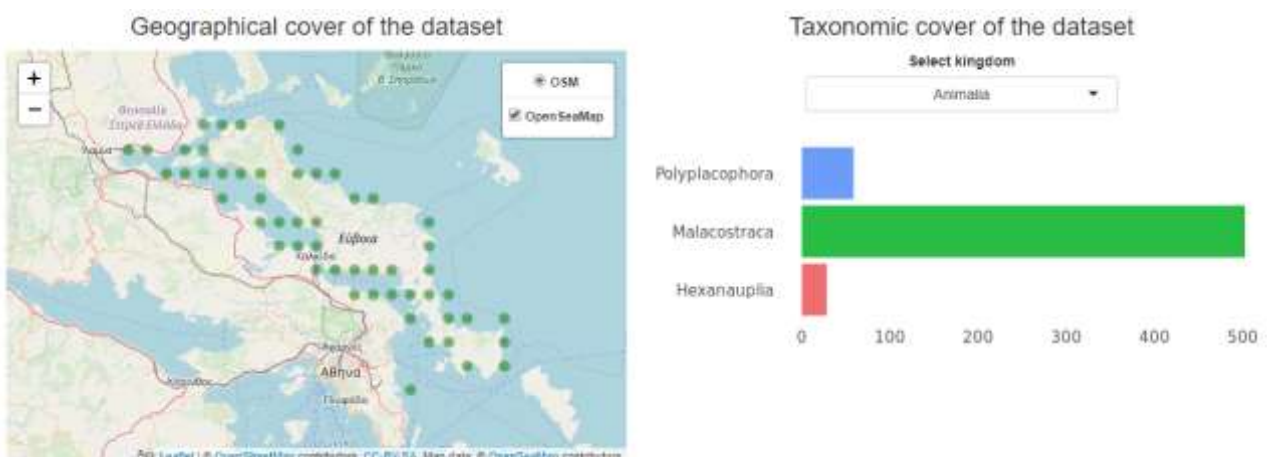
No direct feedback to our specific communication was received from a number of partners, but the data delivery status is derived from previous communication:

- SMHI: data delivery process ongoing
- Deltares: data delivery process ongoing
- NIOZ: status and delivery process unclear

WP3: Data archaeology and rescue (Task 1)

Significant progress has been made for the historical data that is managed within WP3. A list of fully processed datasets that are ready to be harvested can be seen below:

- Hall-Spencer J., Grall J., Gerovasileiou V., Mavraki D., Paranou P., Baily N., Nikolopoulou S. (2018): [BIOMAERL. Maerl Biodiversity. Functional Structure And Anthropogenic Impacts \(1996-1998\)](#). Hellenic Center for Marine Research.
- F.M Ghazzawi. [The Phytoplankton. A study of the Suez Canal Plankton. Preliminary Report. Notes and Memoirs No 24](#). Hydrobiology and Fisheries Directorate, Egypt.
- Maurice Burton (1936). [The Fishery grounds near Alexandria. IX – Sponges. Cairo Government Press, Bulaq](#). Department of Zoology, British Museum. Fisheries Research Directorate.
- F.M. Ghazzawi (1938). [Plankton of the Egyptian waters. Two Cladocera from the plankton Notes and Memories of the Hydrobiology and Fisheries Directorate of Egypt, Notes and Memories No 31](#).
- H. Bachmann (Cairo 1936). [Phytoplankton From The Nile. The fishery grounds near Alexandria, Fisheries Research Directorate, Egypt. Notes and Memories No 22](#).
- Pavludi C., Christodoulou M., Mavidis M. (2016). [Comparative study of the organismic assemblages associated with the demosponge *Sarcotragus foetidus* Schmidt, 1862 in the coasts of Cyprus and Greece](#).
- Kattoulas ME. Koukouras A. (1972 - 1975). [Benthic Fauna of the Evvoia Coast and Evvoia Gulf. I. Barnacles, II. Polyplacophora, III. Natantia, IV. Macrura Reptantia, V. Anomura, VI. Brachyoura. Scientific Annales of the School of Physics and Mathematics, University of Thessaloniki](#)
- Dimitris Poursanidis & Drosos Koutsoubas (2015). [Mollusca fauna from the Mediterranean reef ecosystem \(1170\) – the zone of the photophilic algae](#).
- Ignatiades, L., N. Moschopoulou, M. Karydis and A. Vassiliou, 1983. [Phytoplankton Ecology of the Saronic Gulf, Aegean Sea](#). Greek Atomic Energy Commission, Nuclear Research Center 'Democritus', Athens.



Screen capture of the geographic and taxonomic coverage of the historical dataset "Benthic Fauna of the Evvoia Coast and Evvoia Gulf" as given by the EMODnet Biology online QC tool for IPT based resources.

Additional datasets in final stage of preparation are:

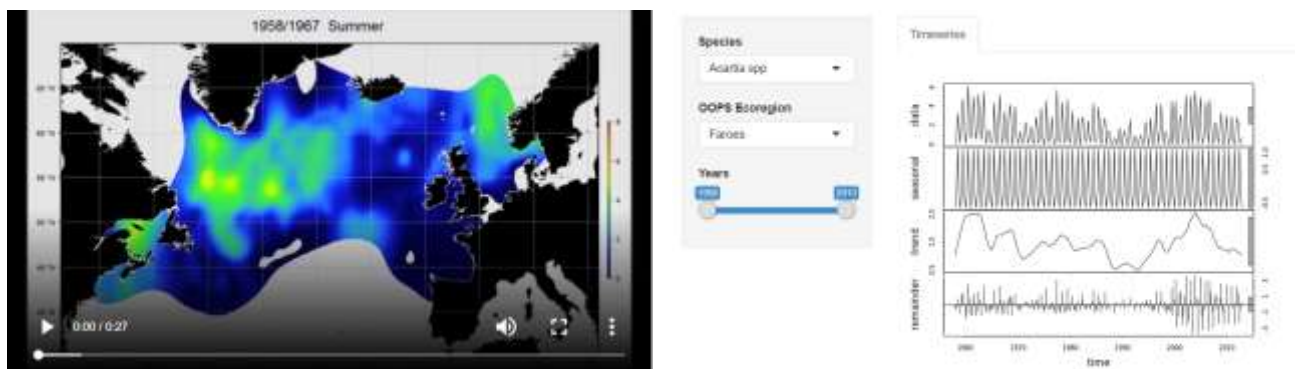
- Lakkis, S., (2011). [Le Zooplancton Marin du Liban \(Méditerranée orientale\): Biologie, Biodiversité, Biogéographie](#). Publ.Université Libanaise, Beirut, Lebanon, No 23:566p.
- Lakkis, S., (2011). [Phytoplankton Marin du Liban \(Méditerranée Orientale\): Biologie, Biodiversité, Biogéographie](#). Aracne Editrice, Rome, Italy, 296 p.

WP3 is also conducting efforts to mobilise further data from other institutions (e.g. OGS) and with the academia. However, staff limitations are slowing down the process. WP3 is also working on a brief report about data management status from a questionnaire send to different institutions.

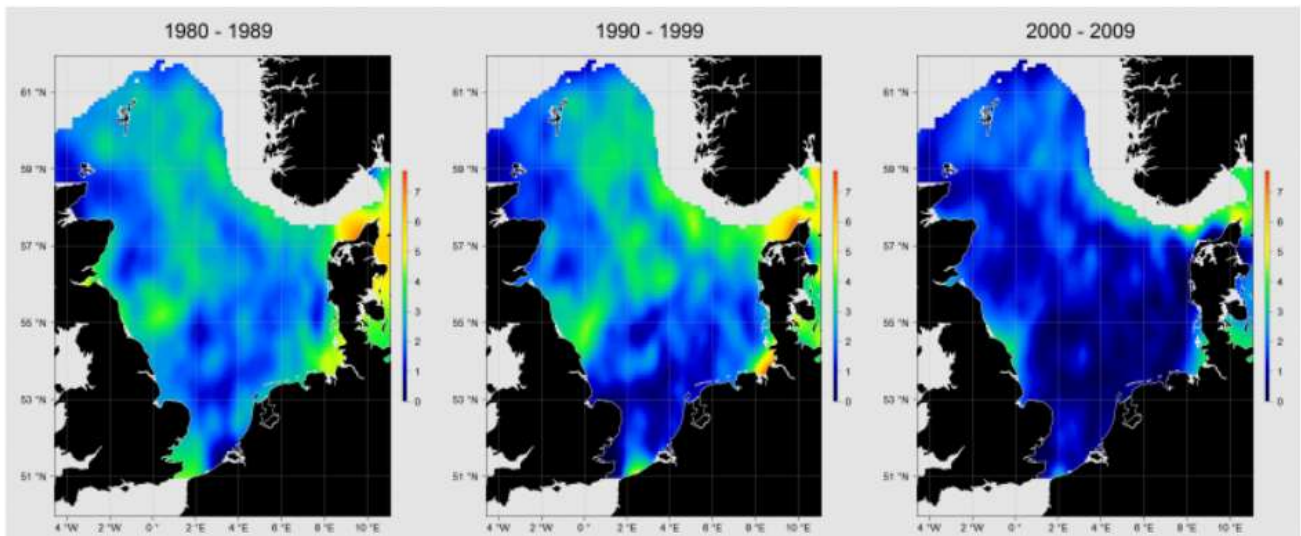
WP4. Data product creation (Task 2)

In December 2019, EMODnet Biology launched the European Atlas of Marine Life to display the data products that have been built upon the EMODnet Biology data. The Atlas provides a combination of tools, models and dynamic maps that allow to visualise marine biological data products that are structured around the Essential Ocean Variables (EOVs) for Biology and Ecosystems. The specification sheets for these EOVs are still under revision, so these data products can be also seen as work in progress.

During the last reporting period, EMODnet Biology has worked to increase the FAIRness of the data products in the European Atlas of Marine Life. For each product, a story has been published where the scientific background of the product is explained. The stories have been updated to document and provide links to the workflows and the code used to create the products, so they can be reproducible. The underlying datasets that have been used for each product are listed and a link to the data and the metadata is provided. Both the products and the data are published using OGC web services, ensuring interoperability. We are also working towards assigning a DOI to the data products. Examples of data product stories are listed below (full list available at: <http://www.emodnet-biology.eu/blog>):

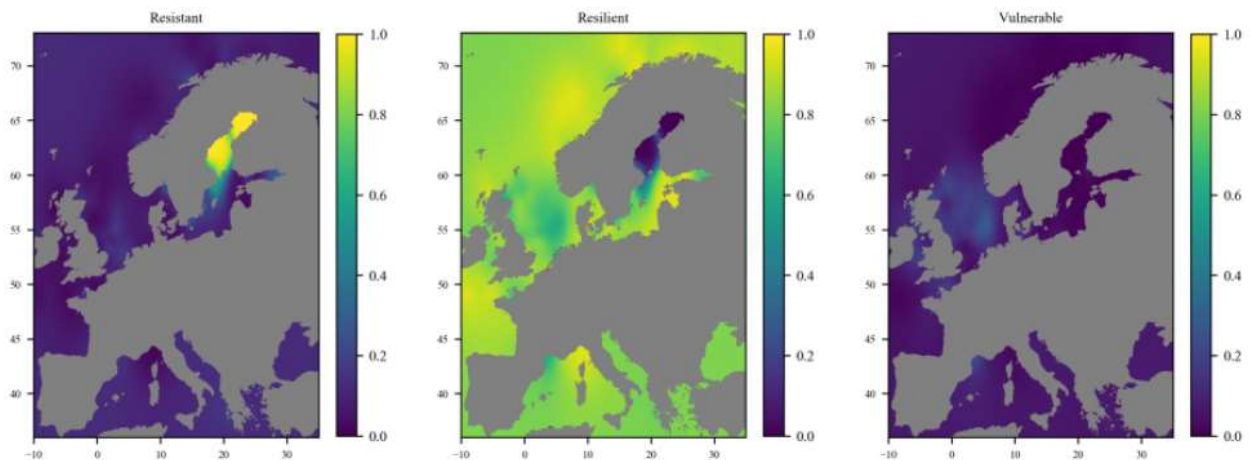


[An operational zooplankton data service](#): a set of gridded map layers showing the average abundance of the 6 most abundant copepods species in the North Atlantic Ocean (image: *Calanus finmarchicus*), using the data from the Continuous Plankton Recorder. The gridded abundance values were summarized per OOPS region and converted to a timeseries so they can be interactively display on an R Shiny application.



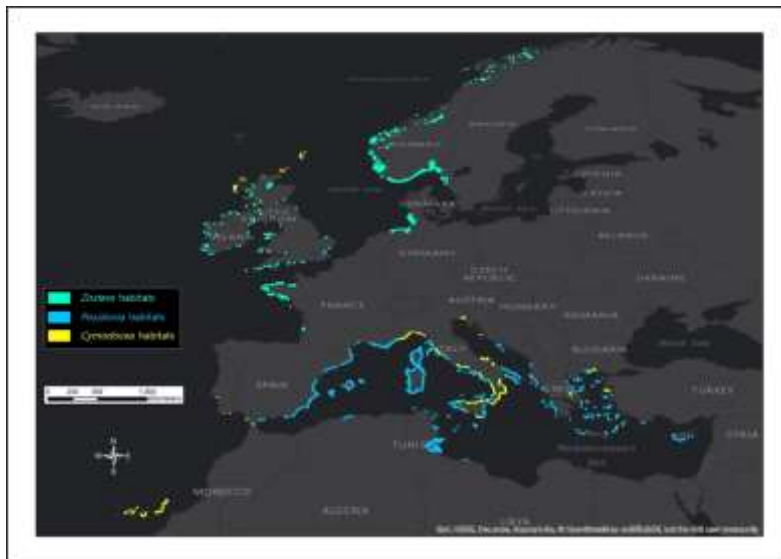
[Trends in abundance of fish species in the North Sea](#) (cod, plaice, herring, anchovy, sand eel, mackerel, sprot) using data from the ICES International Bottom Trawl Survey (IBTS) that has been running since the seventies. The image represents the stock depletion of *Gadus morhua* over time.

Map showing the relative distribution of the three living modes



[Distribution of benthic macroinvertebrate living modes in European seas](#): series of products displays the main functional types of benthic macroinvertebrates derived from a multivariate analysis of 13 life history traits.

EMODnet Biology is also working towards creating similar stories for three new external data products developed by EMODnet Seabed Habitats. These products are also organized around the EOVs that deal with coral, seagrass and macroalgal cover and composition, which contain sub-variables that can be directly informed by habitat maps. The layers have already been added to the product mapper of the European Atlas of Marine Life.



Collated seagrass polygon data from EMODnet Seabed habitats used in the generation of the Seagrass EOY layer, included in the European Atlas of Marine Life.

WP5: Uptake and outreach (Tasks 3 & 4)

This quarter saw the submission of Deliverable 5.2, a peer-reviewed publication to the journal *Marine Policy*. Titled "Supporting the Essential - Recommendations for the development of accessible and interoperable marine biological data products", the manuscript outlines the stakeholder-led approaches in the development of the biological data products of WP4 to support effective conservation, management and policy development. Highlighting how WP5 captured the requirements of a broad range of stakeholders and the iterative, structured processes that framed the development of tools, models and maps supporting the FAIR (Findable, Accessible, Interoperable, Reusable) data principles (Wilkinson et al, 2016).

In addition to the product development work of EMODnet Biology the manuscript promoted and further defined the definitions of data products produced by the EMODnet Secretariat and original published in the EMODnet Data and Data Product Portfolio (<http://www.emodnet.eu/data-portfolio>). The manuscript is currently under peer-review and we await feedback. Besides, EMODnet Biology has contributed to the White Paper submitted for the OceanObs19 conference, to take place in September. This paper explains how the European Marine Observation and Data network (EMODnet) has evolved over the last decade improving access to marine data, metadata and data products for a wider range of users, and it has a dedicated section for the biological lot. The paper received feedback and a reviewed manuscript was recently submitted.

Also during this reporting period significant work has been taking place in the preparation and planning for deliverable 5.3 – the workshop to present EMODnet Biology data products to end users. This event has been planned to run ahead of the EMODnet Biology General Meeting in Lisbon in May 2019. The event has attracted an excellent variety of speakers covering the range of biological Essential Ocean Variables and promotion of the European Atlas of Marine Life. In order to promote the event further it is being run as a side meeting of the European Maritime Day Conference, which also takes place in Lisbon on the 16th-17th May 2019.

The WP5 team have developed an engaging and informative agenda that will not only highlight the significant achievements of EMODnet Biology over the last two years but provide opportunity for focussed discussion and break-out groups to help inform the next stage of the project to ensure the outputs are focussed on meeting user needs and the emerging challenges facing the worlds oceans, including those of the UN SDG 14, the relevant Aichi targets and the goals of the upcoming UN Ocean Decade

Besides, EMODnet Biology has held regular meeting with OBIS in order to explore how the data in EMODnet Biology and the trait information from the taxonomic backbone of EurOBIS can contribute to the UN World Ocean Assessment (WOA) Report. Additionally, EMODnet Biology attended the Scientific Committee of the WWF Living Planet Index (LPI) report for Belgium. EMODnet Biology data and data products were showcased and initial discussions took place to scope the possibility of EMODnet Biology data to contribute to the marine part of the Belgian LPI. The collaboration of EMODnet Biology with OBIS-WOA and WWF-LPI are ongoing, and are a clear demonstration of the value of EMODnet data to serve the wider community and to support global biodiversity challenges.

Finally, EMODnet Biology attended the First International AtlantOS Symposium that took place in the UNESCO Headquarters in Paris at the end of March. The meeting highlighted the lack of good, long-term series of biological and biogeochemical data to inform better management of the oceans. A task was performed under the Data management work package, to increase interoperability of metadata between SDN and EurOBIS systems at the institute level. The outcomes of this work package were presented at the meeting and at the poster session.

WP6: Technical update EMODnet Biology portal & machine to machine connections (Task 3 & 4)

A new version of the download toolbox has been published in this reporting period. The new features are:



Select by data precision: taxonomic rank, date precision and/or coordinate uncertainty.



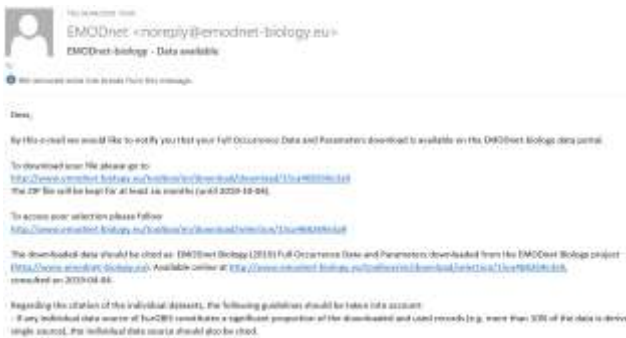
Additional parameter filters: users can now choose whether they want to select datasets with extra measurements on biota descriptors & quantifications, currents, sea level and waves, dissolved gases, flow cytometry, bathymetry, meteorology, optical properties, sediment properties, sampling descriptors or water column temperature and salinity.



The users can now choose between different download types: Basic Occurrence Data, Full Occurrence Data, or Full Occurrence Data and Parameters (include all available measurements).



Users can visualize their final selection on the geoviewer and the data is made available as one flattened table where additional measurements are added as extra columns.



The download is offered as an asynchronous process: users receive an email with a link to the location where the dataset is available for download.

During this reporting period, the R package "[REMOBIO](#)" was published in the EMODnet Github. This package allows users to download data using the EMODnet Biology Web Feature Service (WFS). The user can download the data applying multiple filters, e.g.: using the species unique identifier (aphiaID), the dataset unique identifier (dasID), or by providing a geoserverURL that can be obtained through the EMODnet Biology download toolbox.

REMOBIO

An R package to get download from the EMODnet Biology WFS. This function allows you to download data using `aphid`, `dasid` or an `geoserverURL` you obtain through the EMODnet Biology toolbox <http://www.emodnet-biology.eu/toolbox>.

Installation

Installing `REMOBIO` requires the `devtools` and `'imis'` packages:

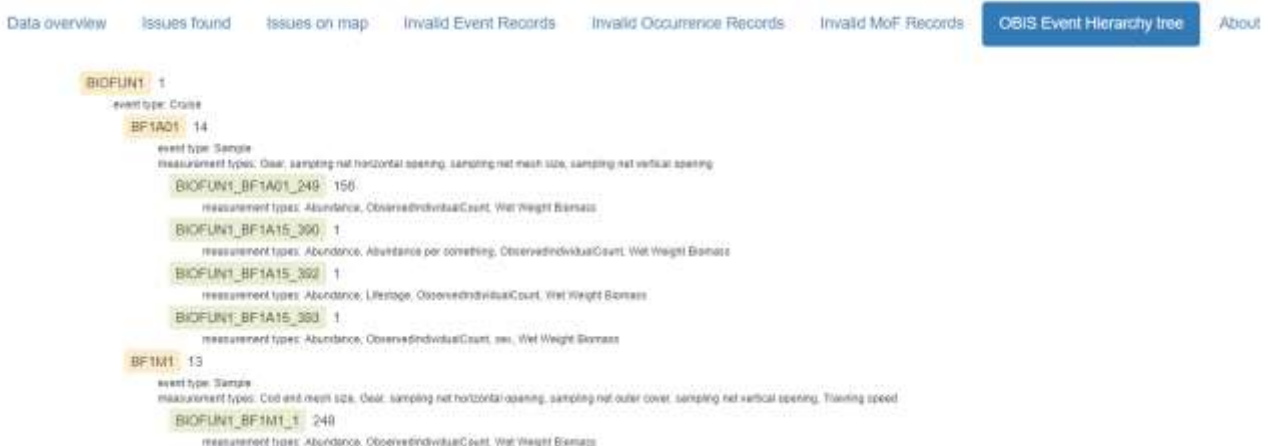
```
install.packages("devtools")
devtools::install_github("EMODnet/imis")
devtools::install_github("DaphneLsd/REMOBIO")
library("REMOBIO")
```

Usage:

- `getemobiodata(dasid = "4662")` - download data from a single dataset. Use the `dasid` obtained through the <http://www.emodnet-biology.eu/data-catalog> (the id from the url) or use the function `listemodnetdatasets()` to get an overview
- `getemobiodata(aphid = "141433")` - download data from a single taxon (the child taxa will be included also). Use the id obtained through www.marinespecies.org
- `getemobiodata(dasid = "1884", type = "basic")` - download data only for 8 essential columns (see <http://www.emodnet-biology.eu/node/172#Basic>)
- `getemobiodata(rgid=c("5670", "3315"))` - download data from a specific region using the `rgid` from `marineregions`, or type `View(IHOareas)`, `View(EEZs)`, `View(FAOareas)` to get an overview.

Screen capture of the REDMOBIO package in Github, a package published by EMODnet Biology to download data using the WFS services.

The content of the Biology lot in the EMODnet github is continuously updated. The R-based quality control tool (<https://github.com/EMODnet/EMODnetBiocheck>) has been recently upgraded and now includes a DwC sampling event hierarchy tree, an improved duplicates check and an Open Seamap background layer to visualize the geographic extent of the data. Besides, the tool now uses the BODC interoperable services to check the compliance with the controlled vocabularies.



Screen capture showing the DwC Event hierarchy tree for a dataset being checked with the EMODnet Biology online QC tool.

Challenges encountered during the reporting period

Provide an overview of the main challenges encountered during the reporting period and the measures taken to address them, including those related to technical and data provision issues.

[Please, provide information in the table.]

Main challenge	Measures taken
Change of staff (project leader)	Ensure overlap between former and current project coordinator, document work and procedures, maintain solid communication channels with work package leaders, organize coordination board meeting.

User Feedback

List any useful feedback you received on your portal, your activities or those of other EMODnet projects/activities. Also provide any suggestions you have received for EMODnet case studies and/or future products/activities/events.

[Please, provide information in the table. If you wish to include the full user feedback in the report you can attach it in Annex.]

Date	Organisation	Type of user feedback (e.g. technical, case study, etc.)	Response time
21/01/2019	Individual	I am an artist in the process of organising an invasive species research & art project. I am working with <i>Sargassum muticum</i> as it is growing in various sites around the UK. I would like to know if there is anywhere on the Somerset coast that I might find it?	1 day
14/02/2019	Individual (PhD)	In reply to EMODnet Biology tweet about the new version of the download toolbox : 😊 So much interesting data! potentially an invaluable tool for studying spatial/temporal dynamics of #MarineEcosystems Let's explore! 🗺️🔍	

Meetings held/attended since last report

List here the internal and external meetings held/participated by the contractant (e.g. meeting, conference, training (workshop), etc.) since the last quarterly report. Please add a short description on the meeting as well as the nature and volume of the audience. At the bottom of the table, provide the total number of events organised and events participated.

Table: Meetings organised and attended.

Date	Location	Type event (meeting, training (workshop), etc.)	Attended (A) / Organised (O)	Short description and main results (# participants, agreements made, etc.)
17/1/2019	Remote meeting	Meeting with EMODnet Seabed Habitats	Organised	Continuation on joint efforts for EOv data products and DwC format for habitats data.
8/2/2019	UGent Ghent (Belgium)	YES-SETAC training course	Attended	In a course on data and data management, EMODnet is presented from the perspective of data management (harmonization, FAIR). A specific session is given on how to access EMODnet Biology data with R and web services.
29/2/2019	Remote meeting	Communication meeting with EMODnet Secretariat	Attended	Communication strategy is discussed: promo video, press releases for new data products, annual report, etc.
1/3/2019	WWF Belgium, Brussels	Progress meeting and Scientific Committee of the WWF Living Planet Index Report	Attended	Explore potential contribution of EMODnet data to the marine part of WWF Belgium Living Planet Index report. Scientists from the project and VLIZ are following up.
8/3/2019	Remote meeting	Coordination board meeting	Organised	Discuss the progress and actions of the renewal period, organization of the EMODnet Biology final meeting in May.
13/3/2019	Bredene, Belgium	VMSD	Attended	Established event for all marine and coastal scientists in Flanders/Belgium and its neighbouring regions. EMODnet and EMODnet data is presented at the info booth for the scientists. Promo material displayed.
25-28/3/2019	UNESCO, Paris (France)	AtlantOS Final meeting	Attended	Networking with MBON and GOOS-EOVs. Lack of good, long-term series of biological and biogeochemical data was highlighted.
SUM			O	Total # of meetings organised = 2
SUM			A	Total # of meetings attended = 5

Outreach and communication activities

Please list all the relevant communication/outreach activities or products you have developed/executed during this period (including presentations, lectures, trainings, demonstrations, workshops, etc., and development of communication materials such as brochures, videos, press releases, newsletters, etc.). At the bottom of the table, provide a total number for every type of communication activity you have developed/executed (e.g. total # of press releases, total # of presentations given, etc.).

[Please, provide information in the table.]

Table: Communication activities.

Date	Communication action / material	Short description (of the material, title, ...) and/or link to the activity	Main results (# participants, # views, # press clippings, etc.)
14/02/2019	News item	New version of the EMODnet Biology download toolbox http://www.emodnet-biology.eu/news?p=show&id=6720	
14/02/2019	Main Tweet	Need #marine #biodiversity #data? Check what's new on #EMODnet #Biology! 1) Go to https://bit.ly/2TVKhCI 2) Select when & where 📅🌐 3) Choose the species 🧑‍🔬 4) Add parameter & precision filters <input type="checkbox"/> 🔍 5) Visualise your selection <input type="checkbox"/> 🗺️ 6) Pick download type <input type="checkbox"/> <input checked="" type="checkbox"/> 7) Download! ⬇️ https://twitter.com/EMODnet/status/1096027817857421317	28 retweets, 32 likes
13/03/2019	Conference information booth	EMODnet Booth at the VLIZ Marine Scientist Day.	Over 300 participants
01/03/2019	Presentation	Presentation of EMODnet Biology at the WWF Belgium offices, for the Scientific Committee of the WWF Living Planet Index Report for Belgium.	
SUM of News/ tweets			Total # of 2
SUM of presentations			Total # of 1
SUM of information booths			Total # of 1



Siguiendo

Need [#marine](#) [#biodiversity](#) [#data](#)? Check what's new on [#EMODnet](#) [#Biology](#)!

- 1) Go to bit.ly/2TVKhCl
- 2) Select when & where  
- 3) Choose the species 
- 4) Add parameter & precision filters  
- 5) Visualise your selection  
- 6) Pick download type  
- 7) Download! 

Traducir Tweet



14:46 · 14 Feb, 2019

28 Retweets · 32 Me gusta

Jan Mees, 331 Maritime & Tech, WolFM5 y 8 más

🗨️ 28 🍷 32 📧

Relevant scientific and/or popular publications (scientific papers, book chapters, conference papers, ...) you published or of which you know they have been published using/referring to EMODnet data or data products during this reporting period must also be reported here.

Table: List of known publications using EMODnet data or data products.

Date	Name of journal, conference, ...	Publication title	Authors	Organisation(s)
Under revision (not published yet)	Marine Policy	Supporting the Essential - Recommendations for the development of accessible and interoperable marine biological data products	Dan Lear (DL), Silvana Birchenough (SB), Klaas Deneudt (KD), Martin Edwards (ME), Lennert Tyberghein (LT), Amy Ridgeway (AR), Gert Van Hoey (GvH), Marina Lipizer (ML), Neil Holdsworth (NH), Ward Appeltans (WA), George Graham (GG), Simon Claus (SC), Peter Herman (PH), Frank Muller-Karger (FM), Gabrielle Canonico (GC), Daniel Kissling (DK), Henrik Nygård (HN), Nathalie Tonne (NT), Paula Oset Garcia (POG)	
Under revision (not published yet)	OceanObs	The European Marine Observation and Data Network (EMODnet): Visions and Roles of the gateway to marine data in Europe	Belén Martín Míguez, Antonio Novellino, Matteo Vinci, Jan-Bart Calewaert, Henry Vallius, Thierry Schmitt, Alessandro Pititto, Alessandra Giorgetti, Natalie Askew, Sissy Iona, Dick M.A. Schaap, Nadia Pinardi, Quillon Harpham, Belinda Kater, Jacques Populus, Jun She, Oonagh McMeel, Dan Lear, Giuseppe Manzella, Gorringe Patrick, Simona Simoncelli, Kate Larkin, Neil Holdsworth, Christos Arvanitidis, Maria Eugenia Molina Jack, Maria Montero, Peter Herman, Francisco	

			Hernandez, Simon Claus, Nathalie Tonne, Atanas Palazov	
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Annex: Other documentation attached

No annexes

New monitoring indicators

Please consult and fill in the designated excel template.

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). Each system uses different technical approaches and therefore has its strengths and shortcomings. Therefore, results are indicative and care should be taken with 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.