



EMODnet



European Marine
Observation and
Data Network

EMODnet Thematic Lot n° V - BIOLOGY

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EMODnet Phase III – Interim Report

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Executive summary

As part of the third or multiresolution phase of the European Marine Observation and Data Network (EMODnet), a consortium of 23 institutes responsible for safeguarding and disseminating marine biological data further developed the biological component of this long term marine data initiative. By capitalizing on the investments in the EMODnet Biology preparatory action and EMODnet phase II, the project partners further collaborated to make marine biological observations from the European Regional Seas findable, accessible, interoperable and reusable. At the same time, an open call for grants to become EMODnet Biology associated data partner was launched, in order to ingest additional biological datasets for identified gap areas and groups. Nine proposals were approved and this data will be made available in the next year of the project.

Detailed inventories of the recent and historical European biological datasets are created and published online via the EMODnet biology data catalogue. The catalogue currently contains over 1,200 dataset descriptions with information on the what, who, when, where and why a dataset was collected. These datasets include many large monitoring data collections from different European regional seas representing observations of marine species of phytoplankton, zooplankton, algae, angiosperms, benthos, birds, mammals, reptiles or fish. For several of them a Digital Object Identifier (DOI) is equally available. During this reporting period over 5 million records from more than 130 different datasets were mobilized into the system, providing a significant contribution to the information on the distribution and abundance of life in the European Seas and Ocean.

Today, already 875 marine biological datasets, representing over 23 million occurrence records are freely accessible through the EMODnet Biology data download portal. The portal includes now 1. a toolbox allowing federated selection queries over different datasets, 2. a description on how the API can be accessed (as a WFS service) if a user wants to access machine readable marine biology data and 3. a link to the IPT resources, being the raw data available in Darwin Core Archive. The data are integrated into the European Ocean Biogeographic Information System (EurOBIS) datasystem which contributes to OBIS, an global strategic alliance of people and organizations sharing a vision to make marine biogeographic data, from all over the world, freely available over the World Wide Web.

All marine biological data is transformed to a common data structure and passes taxonomic (using the WoRMS Vocabulary) and geographic (using the MarineRegions Vocabulary) quality control procedures. The common data structure and standards used within EMODnet Biology consists of a DarwinCore (Dwc) Event Core in combination with a Dwc Occurrence and MeasurementOrFact Extension. This new structure enables the linkage of measurements or facts - quantitative and qualitative properties - to both sampling events and species occurrences, and includes additional fields for property standardization (using the NERC Vocabulary). The standard also allows to organize, aggregate, and link ocean observation events (e.a. a sample) using an "event hierarchy".

This data, being provided by a network of 88 different organisations across Europe and beyond, is being used for various research and local or regional assessment purposes by scientists and other stakeholders from over 122 organisations. It is also contributing to OBIS, being used for different global assessments such as the United Nations World Ocean Assessments and the Convention on Biological Diversity for the identification of Ecologically or Biologically Significant Marine Areas (or EBSAs).

A workshop to investigate the scope of data products and applicability to end users took place in October 2017. Representatives from all four regional sea commissions, transatlantic partnerships,

industry, conservation and management organisations met to steer the development of key biological data products to be developed. It was clear that the real value lies in the the development of scalable, information-rich data products They concluded to concentrate and structure the data products on the Essential Ocean Variables for Biodiversity provided through an Atlas of Marine Life. During the reporting period, inventories have been made of (a) data sets that are available as basis for data products in the Atlas (b) work flows and analyses needed for the preparation of data products (c) data product needs by user communities, including regional seas commissions and (d) environmental data layers (D4.1) that can be used as the basis for Species Distribution Models.

Introduction

Marine biodiversity data are essential to measure and study the ecosystem health of maritime basins. These data are often collected with limited spatial and temporal scope and are scattered over different organizations in small datasets for a specific species group or habitat. Therefore, there is a continuous need to assemble these individual datasets, and process them into interoperable biological data products for assessing the environmental state of overall ecosystems and complete sea basins.

The main goals of the this two-year project, running between 19/04/2017 till 19/04/2019 are thus to assemble existing data and metadata from public and private organisations on water column and on the sea-bed surveys of marine species belonging to different trophic groups (phytoplankton, zooplankton, algae, angiosperms, fish, benthos, birds, mammals and reptiles), to process these data into interoperable formats which includes agreed standards, common baselines or reference conditions, to create a set of gridded abundance data products for a range of marine species and to develop and operate a data portal allowing public access and viewing of the available data, metadata and data products.

The specific objectives require developing and maintaining: 1) a common method of access to data held in repositories; 2) products constructed from one or more data sources that provide users with information about the distribution of parameters in time and space; 3) procedures for machine-to-machine connections to data and data products; 4) a web portal allowing users to find, visualise and download data; 5) the coherence with efforts of regional sea conventions; 6) the interoperability with data distributed by non-EU organizations; 7) a process to monitor performance and deal with user feedback; 8) a help desk offering support to users.

For this tender, a consortium of 23 government agencies and research institutes (VLIZ, MBA, HCMR, NIOZ, ILVO, Deltares, Aarhus University, SMHI, University of Sheffield, SYKE, IEO, Ifremer, IPMA, OGS, IMR, MARIS, ULg, SAHFOS, ICES, OBIS, NIMRD, CEFAS, IOF) with national and international expertise in marine biological data monitoring and data management built further upon the work carried out during the biological preparatory action and second phase of EMODnet Biology.

The activities of the EMODnet biology are divided into 6 work packages (WP1: Project Management; WP2: Data access to marine biological data; WP3: Data archaeology and rescue; WP4: Data product creation; WP5: Uptake and outreach; WP6: Data portal). Each work package has a lead partner, a detailed description, objectives, input, output, methodology, activities, deliverables and partners involved. The project has a total of 21 deliverables for the first two years.

The standards and data formats used within this project to integrate the scattered marine biological datasets are based on the World Register of Marine Species (WoRMS), the authoritative and comprehensive list of names of marine organisms worldwide and the Darwin Core Archive, an internationally recognised biodiversity informatics data standard that simplifies the publication of biodiversity data. Through the implementation of the European Ocean Biogeographic Information System (EurOBIS) as marine biological data infrastructure, this project has a strong collaboration, with OBIS, an evolving global strategic alliance of people and organizations sharing a vision to make marine biogeographic data, from all over the world, freely available over the World Wide Web.

Digital map layers to analyse changes in species abundance and extent over time and space will be created. By capitalizing on the investments in EMODnet Biology phase II, we will create gridded maps indicating spatio-temporal distributions of species, groups and indicators using the species observations, the traits database, and the compilation of historic data that may allow reconstructing

long-term evolution of some selected groups. We will intensify the exchange of information across lots and using chemical, habitat, physical and human-use data sets as background landscape layers that can help improving the interpretation/prediction of occurrence of species groups, interpret species (group) sensitivity and relate indicators to human pressures. All digital data products will be made be made available in interoperable geographic data formats, free of charge and free of restrictions of use.

Highlights in this reporting period

- 1. Making Marine Biological Data Findable:** Detailed inventories of recent and historical European biological datasets to be mobilized within EMODnet were created and published online via the EMODnet biology data catalogue.
- 2. Making Marine Biological Data Accessible:** Today, already 37 EMODnet Biology datasets have been delivered by the data partners, of which 3 datasets are major updates of data that was already previously available. These 37 datasets include mainly large monitoring data collections from the different European regional seas representing a little over 5 million distribution records (5.053.908), of which 70% (3.560.466) passes the quality control (QC) procedures. An additional 97 datasets have been made available through EurOBIS – the European Ocean Biogeographic Information System.
- 3. Making Marine Biological Data Interoperable:** All marine biological data passes the taxonomic (using the WoRMS Vocabulary) and geographic quality control procedures. The common data structure and standards used within EMODnet Biology consist of a DarwinCore (Dwc) Event Core in combination with a Dwc Occurrence Extension and a proposed enhancement to the Dwc MeasurementOrFact Extension. This new structure enables the linkage of measurements or facts - quantitative and qualitative properties - to both sampling events and species occurrences, and includes additional fields for property standardization (using the NERC Vocabulary). The standard also allows to organize, aggregate, and link ocean observation events using an “event hierarchy”.
- 4. Making Marine Biological Data Downloadable:** The data portal download section has been restructured in order to have a better and more direct access to the data. The portal includes now a toolbox allowing federated selection queries over different datasets, a description on how the API can be accessed (as a WFS service) if a user wants to access machine readable marine biology data and a link to the IPT resources, being the raw data available in Darwin Core Archive.
- 5. Associated partnership:** An open call for grants to become an EMODnet Biology associated data partner was launched, in order to mobilize additional biological dataset for identified gap areas and groups. Nine out of the ten submissions were approved and data will be made available in the next year of the project.
- 6. Stakeholder consultations:** A workshop to investigate the scope of data products and applicability to end users gathered representatives from the four regional sea commissions, transatlantic partnerships, industry, conservation and management organisations. This international end user board are co-steering the development of key biological data products to be developed.
- 7. Atlas of Marine Life showcasing Essential Ocean Biodiversity Variables:** One of the key deliverables of the data product activities is the creation of the Atlas of Marine Life, providing fit for purpose biological data products. Central within the Atlas of Marine Life, will be the contribution to the Essential Ocean Biodiversity Variables, as defined in the framework of GOOS. During the reporting period, inventories have been made of data sets that are available as basis for data products in the Atlas, work flows and analyses needed for the preparation of data products and environmental data layers (D4.1) that can be used as the basis for Species Distribution Models.
- 8. EMODnet Biology contributing partners:** During the past year, 88 organisations provided data to EMODnet Biology and the EurOBIS database. Data is delivered mainly by scientific

organisations from Universities (40%), Governmental agencies (40%) and foundations, NGO's and companies (20%). 23 different countries provide data, mainly from Italy, the UK, Spain, Belgium, France and Sweden.

9. **Data usage:** 927 download requests were registered from 117 different organisations (this is without counting the web service requests). The organisations downloading the data are from 31 different countries, mainly located in the UK, Spain, France, Belgium, Portugal, Italy, Germany and the Netherlands. Data is mainly used for research, data exploration and testing, species mapping and biodiversity assessments but also more specifically for ecology research, GIS analysis, data research, training, product creation, biogeographic analysis, fisheries research and consultation projects.

10. **EMODnet biology contributing to global assessments:** The Ocean Biogeographic Information System (OBIS), run by IOC-UNESCO, is the world's most comprehensive database on the diversity, distribution, and abundance of life in the ocean in time and space. The European contribution is significant. Not less than 23 million of the 50 million records are from the European Seas, provided to OBIS via EMODnet Biology/EurOBIS and constitute an important contribution of our global knowledge on marine biodiversity. OBIS is now an important contributor to several international processes, such as (i) the United Nations World Ocean Assessments of the Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socio-economic Aspects, (ii) the regional and global assessments of the Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services (IPBES) and the Transboundary Water Assessment of the Global Environment Facility. The Convention on Biological Diversity is also using OBIS as a key source of information for the identification of Ecologically or Biologically Significant Marine Areas (or EBSAs). Being the European component of this global system, EMODnet Biology secures through OBIS Europe's contribution to global processes.

Summary of the work done

Task 1: a common method of access to data held in repositories (WP2, WP3)

In the first year, a detailed inventory of the recent and historical biological datasets to be mobilized to EMODnet was created (D2.1; D3.3). Biological data are 'data and metadata on observations of marine species belonging to the phytoplankton, zooplankton, macro-algae, angiosperms, benthos, birds, mammals, reptiles or fish'. Detailed metadata descriptions of each of these datasets has been published online through the EMODnet biology data catalogue. Today, already 37 EMODnet Biology datasets have been delivered by the data partners, of which 3 datasets are major updates of data that was already previously available. These 37 datasets include mainly large monitoring data collections from the different European regional seas representing a little over 5 million distribution records (5.053.908), of which 70% (3.560.466) passes the quality control (QC) procedures (D2.2). This represents 35% of the original identified datasets among the project partners. An additional 97 datasets have been made available through EuroBIS – the European Ocean Biogeographic Information System -, as part of the daily activities of the EuroBIS Data Management Team. Although these datasets are not delivered through EMODnet Biology partners directly, they are publically available through EMODnet and do make a valuable contribution to the project. It concerns 1.5 million distribution records, of which 87% (1.3 million) passes the taxonomic and geographic quality control procedures (taxon is matched with World Register of Marine Species, taxon is at genus or (sub)species level, latitude & longitude are different from zero, latitude & longitude are within possible boundaries). The common data structure and standard used within EMODnet Biology consists of a DarwinCore (Dwc) Event Core in combination with a Dwc Occurrence Extension and a proposed enhancement to the Dwc MeasurementOrFact Extension. This new structure enables the linkage of measurements or facts - quantitative and qualitative properties - to both sampling events and species occurrences, and includes additional fields for property standardization (using the NERC Vocabulary). The standard also allows to organize, aggregate, and link ocean observation events using "event hierarchy". An open call for grants to become an EMODnet Biology associated data partner was launched, in order to mobilize additional biological dataset for identified gap areas and groups. Nine out of the ten submissions were approved and data will be made available in the next year of the project.

Task 2: products constructed from one or more data sources (WP4)

One of the key deliverables of the activities is the creation of the Atlas of Marine Life, providing fit for purpose biological data products. Central within the Atlas of Marine Life, is the contribution to the documentation of essential ocean biodiversity variables, as defined in the framework of GOOS. During the reporting period, inventories have been made of (a) data sets that are available as basis for data products in the Atlas (b) work flows and analyses needed for the preparation of data products (c) data product needs by user communities, including regional seas commissions and (d) environmental data layers (D4.1) that can be used as the basis for Species Distribution Models.

Task 3: machine-to-machine connections (WP6)

In order to improve the machine to machine connections to the biological data, the data download section has been restructured in order to improve better and more direct access to the data. There are now three subsections under data download: the data download toolbox allowing federated selection queries over different datasets, the EMODnet Biology API, a page describing how the data can be accessed as a WFS service, for example if some user or developer wants to develop an online App and accessing machine readable marine biology data from EMODnet biology and a link to the IPT resources: being the raw data available in Darwin Core Archive through an IPT.

Task 4: Web Portal (WP6)

During this reporting period the EMODnet Biology Portal was kept operational and several new improvements to improve the usability of the portal have been developed, amongst others the implementation of the new EMODnet template, adding a tutorial movie to use the download toolbox, and a dynamic page including near real time data statistics on the number of marine biological dataset descriptions (metadata), number and evolution of datasets integrated and available through the system, the number and evolution of occurrence records, and the number of quality controlled records, the number of available data products and the number of species names per higher taxonomic group linked to the World Register of Marine Species (WoRMS).

Task 5: coherence with efforts of regional sea conventions (WP5)

An initial workshop to investigate the scope of data products and applicability to end users (D5.1) took place in October 2017. Representatives from all four regional sea commissions, transatlantic partnerships, industry, conservation and management organisations met in London on the 10th of October 2017 for an EMODnet Biology meeting to steer the development of key biological data products to be developed. Contacts with both OSPAR and HELCOM showed that, as they want to keep full (political) control on the process of the preparation of crucial data products, e.g. related to the selection of protected areas or the designation of species with special protection status, the most useful contribution from EMODNET is the production of underlying data layers, which are usually covered by the EOVs. The project was also involved in the liaison with EMODnet Seabed Habitats to facilitate closer working and co-development of data products, and the continued engagement and active participation with the OSPAR workshop on the Coordination of Biodiversity Assessment and Monitoring.

Task 6: interoperability with non EU organizations (WP5)

The initial development started of the paper (D5.2) investigating the data formats, standards and guidelines in use in the transatlantic region, how EMODnet Biology data can best support the development of EOVs and EBVs, and how to promote and integrate a global Marine Biodiversity Observation Network. Alongside this an abstract was prepared and accepted for the Ocean Obs 2019 conference to promote the activities and product developed through EMODnet Biology and build strategic links with transatlantic and global data initiatives.

Task 7: monitor performance (WP1)

Detailed monitoring shows the number of datasets contributed, the number of data downloads, the organizations that are downloading the data per country, and for what purpose (indicators). Regular feedback on the newly developed performance indicators has been provided to TrustIT and the EMODnet Biology web instance has been added to the Central EMODnet Piwik/Matomo instance in order to harmonize the monitoring statistics among the different EMODnet portals.

Task 8: help desk (WP1)

In order to monitor user feedback and improve support to the users, the EMODnet Biology help-desk was being activated and published on the EMODnet Biology website. Users can contact the help-desk using different modalities: by email, phone or using the automatic feedback form.

Challenges encountered during the reporting period

Main challenge	Measures taken
<p>We had no permission to make available the MEDITS (international bottom trawl survey in the Mediterranean) data from IOF (Croatia)</p>	<p>The organisation had no permission to exchange them. Among these data, the largest sets were collected through projects funded by EU DG-Mare DCF (MEDITS, DEMON, PELMON, MEDIAS). Unfortunately, contrary expectation, the project partner got no permission for exchange of these data from their Ministry. Explanation was that permission for data exchange collected in the framework of above projects should be requested by VLIZ as the lead partner in the project. We provided this information back to DGMARE but received no feedback for this moment.</p>
<p>Delay deliverables WP3</p>	<p>The initial two deliverables of WP3 had some delay. Various situations explained the delays for the deliverables. New administrative procedures have delayed the hiring of the team in HCMR, which could be effective only mid-June. The MedOBIS IPT had to be reinstalled on a new server, and the new setting up and the transfer of metadata and datasets took unplanned time. However, the access to the published datasets was maintained as much as possible during that period. This delay had no impact on the project as a whole and all planned deliverables are now delivered.</p>
<p>Delays in WP2 data publishing</p>	<p>Most of the partners are now switching to the new data scheme. The data systems are now also being updated to be able to provide data in the new scheme. Although there were delays, we see that the M12 deadline however was met for most of the data providers. This new scheme will also allow for example to store habitat observation data and pool data per sample, a request that has been made by different communities (EEA, DGENV, Sea basin checkpoints).</p>
<p>Data do not pass the QC</p>	<p>Most of the data records that do not pass the QC, are due to taxa that have not (yet) been matched to the World Register of Marine Species (WoRMS), the taxonomic backbone for EurOBIS. The Data Management Team (DMT) is still working with the providers to sort these out, as it mostly concerns 'dubious matches', which means that the scientific name is in use for more than one species and the authorship of the scientific name needs to be added to be able to distinguish between the different species, and to make correct assumptions when mapping these names to WoRMS.</p>
<p>Use of non DarwinCore parameters, which may need more standardization by using BODC vocabularies.</p>	<p>The DMT is committed to helping the providers with this. This task has largely been delayed due to time constraints, as too many datasets being delivered too close to the deadline date. These remaining issues will be picked up in the coming months and the data providers are expected to help the DMT with this.</p>
<p>Lack or insufficient basic</p>	<p>Time-consuming search and contact with originators, check</p>

metadata, such as station coordinates, sampling date, dataset originator, and metadata related to sample analysis, cell counting procedure	of literature
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Allocation of project resources

Categories	Estimated Resource usage (%)
Making data and metadata interoperable and available	52 %
Preparing data products	15 %
Preparing web-pages, viewing or search facilities	6 %
Managing user feedback	3%
Project management	7 %
Outreach and communication activities	17 %

Work package updates

WP1: Project Management (Lead partner VLIZ)

On April 19th, 2017 the EMODnet Biology contract with contract number EASME/EMFF/2016/1.3.1.2 - Lot 5/SI2.750022 was signed between EASME and 22 partners, represented by the Flanders Marine Institute (VLIZ). Following, a Consortium Agreement between VLIZ and the 22 partners has been drafted and was signed by all partners.

An open call for grants to become an EMODnet Biology associated data partner was launched and closed on 15/10/2017. We received 10 submissions from new partners to contribute to the project and fill gaps of the EMODnet biology data system. The submissions were evaluated by the EMODnet Biology Steering Committee. Nine out of the ten submissions were approved and subcontracts with nine new associated data partners were signed. The associated data partners are the Bulgarian Academy of Sciences, the Odessa National I.I. Mechnikov University, the CoNISMA – Local Research Unit of Lecce, the Tallinn University of Technology, the Agri-Food and Biosciences Institute, the Roscoff Marine Station, the Universidad de Cantabria, the Norwegian Institute for Water Research and Royal Belgian Institute of Natural Sciences. The subcontracts started 15/01/2018 and will run for 12 months. The new partners received a grant to participate in the general project meetings and to contribute data to EMODnet biology, using standards and data format used within the project.

All project deliverables are being published on the EMODnet Biology website at <http://www.emodnet-biology.eu/deliverables>. All deliverables planned for the first 12 months, including four quarterly progress reports were delivered and are available online. A kick off meeting was organised and took place in VLIZ, Oostende on the 25 and 26 of April, 2017. 41 partners from 23 organisations attended the kick off meeting. During this two-day event, the consortium discussed the work plan of the project, focussing on the first year deliverables. The second General meeting took place the 3th and 4th May, 2018 in Trieste, Italy. The meeting was hosted by OGS. A workshop report of the kick off meeting was drafted, and made publically available at the EMODnet Biology website at:

http://www.emodnet-biology.eu/sites/emodnet-biology.eu/files/public/documents/EMODnet_Biology_III/kickoff/minutes_KickOff_EMODnetBiology.pdf

Besides the general project meetings, EMODnet Biology participated and contributed to the different EMODnet Steering Committee meetings, the EMODnet technical working groups and other relevant meetings organised DGMARE, the EMODnet Secretariat and TGDATA. The project provided input and feedback on its current activities.

- Participation in the Genoa technical meeting (5-6/07/2017) to discuss performance indicators for Biology and to discuss interoperability of data products across different themes
- Participation in the Rome Steering Committee meeting (13-15/09/2017) to discuss progress, including proposal new indicators
- Participation and co-organisation of the EMODnet Open Sea Lab Hackathon – 15-17 November 2017, Antwerp.
- Participation to the Mallorca Steering Committee meeting (21-23/03/2018) to discuss progress, including proposal new indicators
- Participation in the Mallorca technical meeting (20-21/03/2018) to discuss interoperability of data products across different themes

- Participation to the TGDATA Meeting – 9 and 10 November, 2017 EEA
- Participation to the TGDATA Meeting – 12 and 13 February, 2018 EEA

In order to monitor user feedback and improve support to the users, the EMODnet Biology help-desk was being activated and published in the main menu of the EMODnet Biology website at: <http://www.emodnet-biology.eu/help-desk>. Users can contact the help-desk using different modalities. The help desk contains a direct email to which all queries can be sent

- By email: bio@emodnet.eu
- By telephone: +32-(0)59-34 01 59
- By automatic feedback from
- Furthermore, links to information on data, standards, procedures and functionalities at the EMODnet Biology tutorials page

Regular feedback on the newly developed performance indicators has been provided to TrustIT and the EMODnet Biology web instance has been added to the Central EMODnet Piwik/Matomo instance in order to harmonize the monitoring statistics among the different EMODnet portals.

WP2: Data access to marine biological data (Lead partner VLIZ)

The overall objective of WP2 is the development of a common method of access to biological data held in repositories by the organization collecting them and make the data interoperable such that all data of a particular type collected within a defined time and space window can be found, visualized and downloaded. Biological data are defined as 'data and metadata on observations of marine species', whereas 'marine species' belong to the phytoplankton, zooplankton, macro-algae, angiosperms, benthos, birds, mammals, reptiles or fish'.

All objectives can be translated into two distinct tasks: i) Analyze and assess in-depth the usability and fitness for purpose of the different data. In other words, determine

- available data types (e.g. abundance, absence, or biomass)
- taxonomic, spatial or temporal cover
- if supporting functional trait information can be made available
- if supporting environmental information can be made available
- whether the dataset is fitted to contribute to specific data products
- specific model of linking with the EMODnet data portal

and ii) Format the data and perform data standardizations

- Match data with Darwin Core data scheme
- Perform quality checks & standardization:
 - taxonomic QC through WoRMS
 - all required fields are completed
 - all given values are possible (cfr. lat-lon, date ...)
 - check for duplicate records
 - check provided codes

- match traits with different vocab

List of the deliverables

- D2.1: Assessment of data and databases, including list of datasets that will be used for creation of products (M3 => 19 July 2017)
- D2.2: Data standardization and formatting of a subset of the data that is needed for the data products (M12 => 19 April 2018)
- D2.3: Data standardization and formatting of all datasets mentioned under data coverage section of proposal for linking with EMODnet biology (M24 => 19 April 2019)

D2.1: Assessment of data and databases, including list of datasets that will be used for creation of products

http://www.emodnet-biology.eu/sites/emodnet-biology.eu/files/public/documents/EMODnet_Biology_III/Deliverables/D2.1.docx

The data management team created an ISO 19115-compliant metadata record for all the datasets that were promised to be delivered through WP2. For some of these metadata records, the last details will be fixed when the data is actually delivered. All datasets can now be discovered through the EMODnet Biology Data Catalogue (<http://www.emodnet-biology.eu/data-catalog>).

Based on the original inventory, 77 new datasets will be delivered within the framework of EMODnet Biology 3, and 29 existing datasets will receive an update. To ensure a smooth submission of all the datasets to EMODnet Biology, a prioritization has been made, based on the content of the datasets. As WP4 – Data product creation – is dependent on the work of WP2, priority was given to the processing of benthic datasets, as these have been indicated by WP4 as the most important ones in the creation of the first data products.

Based on the inventory, we have subdivided all the datasets into 4 categories:

- (1) Only benthic data
- (2) Benthic data in combination with non-benthic data
- (3) Non-benthic data
- (4) Datasets that are already in the system, but need an update

Since September 2017, the Data Management Team (DMT) has focused on the first and the second group, aiming to fully integrate these by Month 12 (=April 2018), so WP4 can start on the creation of benthic-related data products. Due to the large amount of data, the processing of priority 1 and priority 2 datasets was spread over several months, allowing both the providers and the data management team enough time for the processing. An overview of all the datasets, their level of priority and the status of their progress can be found at https://docs.google.com/spreadsheets/d/1iK-b7s0j0F-3ULeKG0in0TWedj_1f7p7ADlvG7agfE/edit#gid=2028958388

Since the original inventory, more datasets have been identified or larger datasets have been split up into their subsets for clarity and convenience of the EMODnet Biology users. The proposed deadline for the delivery of the priority 1 datasets was set for the end of January 2018. The deadline for the priority 2 datasets was set to April 2018.

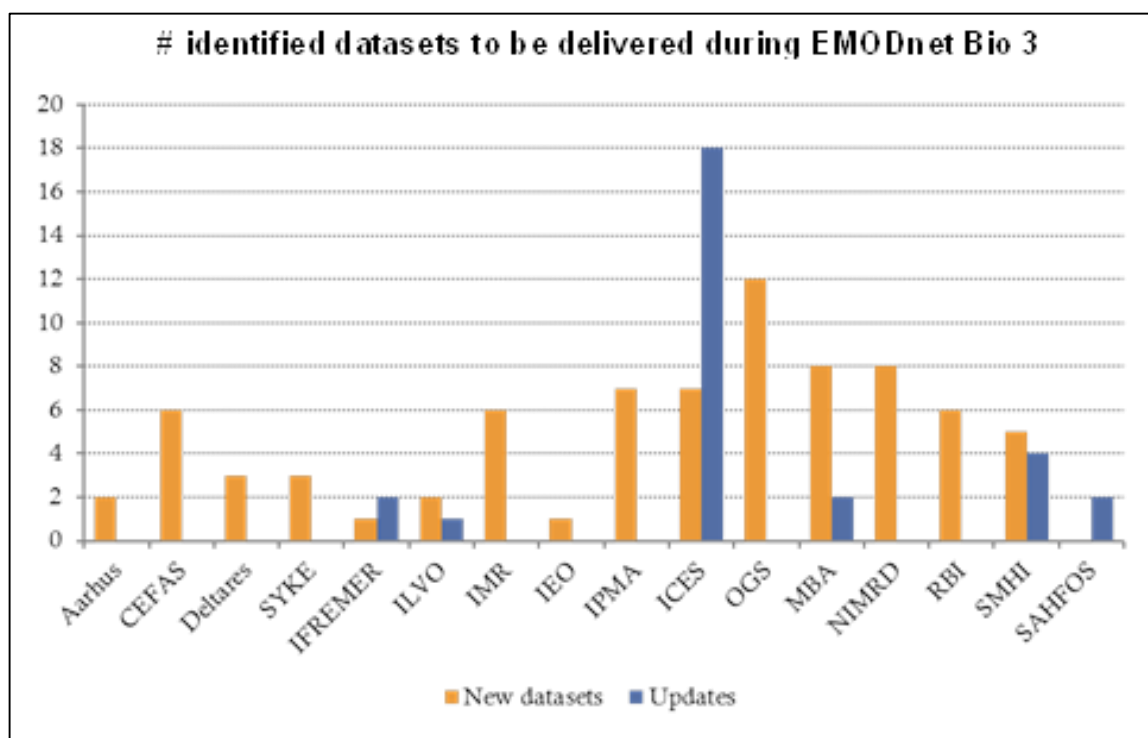


Fig 1: Number of new datasets and updated datasets per EMODnet biology WP2 partner

D2.2: Data standardization and formatting of a subset of the data that is needed for the data products

http://www.emodnet-biology.eu/sites/emodnet-biology.eu/files/public/documents/EMODnet_Biology_III/Deliverables/D2.2.docx

Today, already 37 EMODnet Biology datasets have been delivered by the data partners, of which 3 datasets are updates of data that was already previously available in EurOBIS. These 37 datasets represent a little over 5 million distribution records (5.059.726), of which 70% (3.560.466) passes the quality control (QC) procedures.

The QC procedures are the following:

1. taxon is matched with World Register of Marine Species (www.marinespecies.org)
2. taxon is at genus or (sub)species level
3. latitude & longitude are different from zero
4. latitude & longitude are within possible boundaries ($-90 < \text{lat.} < +90$ & $-180 < \text{long.} < +180$)

A record needs to comply to all these QC-steps to pass the quality control procedure.

Most of the records that do not pass the QC, are due to taxa that have not (yet) been matched to the World Register of Marine Species (WoRMS), the taxonomic backbone for EurOBIS. The Data Management Team (DMT) is still working with the providers to sort these out, as it mostly concerns 'dubious matches', which means that the scientific name is in use for more than one species and the authorship of the scientific name needs to be added to be able to distinguish between the different species, and to make correct assumptions when mapping these names to WoRMS.

Other issues with the data are linked to the use of non DarwinCore parameters, which may need more standardization by using BODC vocabularies. The DMT is committed to helping the providers

with this. This task has largely been delayed due to time constraints, as too many datasets being delivered too close to the deadline date. These remaining issues will be picked up in the coming months and the data providers are expected to help the DMT with this.

In some cases, there are structural issues with the data, which still need to be resolved. In these datasets, the data format does not yet fully comply with the OBIS format guidelines. This will also be dealt with in the coming months, and the data providers are expected to assist in this and to fully comply with the needed data format for EuroBIS and EMODnet Biology.

The majority of the datasets (35) have been delivered through IPT, the preferred way of data delivery to EuroBIS.

In the past year, an additional 97 datasets have been made available through EuroBIS, as part of the daily activities of the EuroBIS Data Management Team. Although these datasets are not delivered through EMODnet Biology, they do make a valuable contribution to the project. It concerns 1.5 million distribution records, of which 87% (1.3 million) passes the QC procedures.

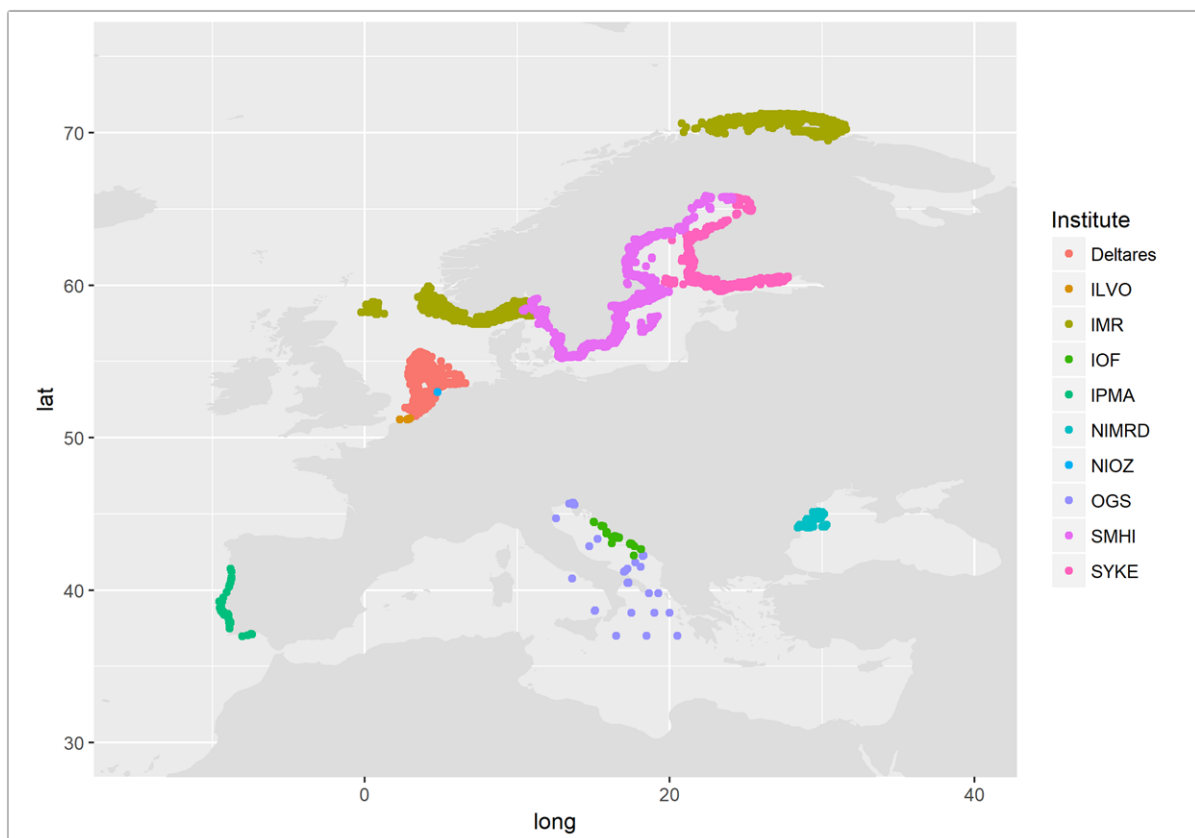


Fig 2: Map showing the location of the distribution records that have been provided by the EMODnet data partners – through 37 datasets - and that are already available through EuroBIS and the EMODnet Biology Data Portal.

rescue and a long-term strategy to ensure the continuous flow of such data in the EMODnet platform. The specific objectives are:

- To review the strategy, activities and best practices implemented in EMODnet2
- To develop a productive workflow to maximize efficiency
- To continue identification of historical data (archaeology) that are at risk and plan for their digitization (rescue)
- To run a framework of small grants for their digitization, standardization and quality control
- To implement a mechanism for the networking of the supporting community to ensure continuous inflow of datasets in the future

List of the deliverables

- D3.1: Scientific document presenting the data archeology and rescue strategy of the project (M03).
- D3.2: Report on the digitization of 3 datasets under the modified procedure (M06).
- D3.3: Update of the list of the 76 datasets along with a list of selected datasets for digitization (M08)
- D3.4: General report on data entry list of data papers in preparation, submitted, and published (M24). Individual report for each dataset (D3.4.1, etc.) as available.
- D3.5: Policy report on biodiversity data management sent to research organizations (M14).

D3.1: Scientific document presenting the data archeology and rescue strategy of the project

http://www.emodnet-biology.eu/sites/emodnet-biology.eu/files/public/documents/EMODnet_Biology_III/Deliverables/D3.1.docx

During the previous phase of EMODNET (EMN2), data were entered directly in the Darwin Core format (DwC). Data managers were trained through workshops and teleconferences.

Two documents were produced during EMN2 related to this activity (some complements to these two documents were inserted herein):

- A technical document with indications on metadata creation, and quality control (Mavraki, 2014).
- An article based on the report of a workshop conducted jointly between EMODNET and LifeWatchGreece, held in the Hellenic Centre for Marine Research in 2014 (Faulwetter et al., 2016).

Two main difficulties were recognized (final report of EMN2 WP4):

- During the data entry: data providers have difficulty to stick to the standards when, 1) analyzing the data in the original document to fit them in the DwC standard, and 2) managing data that are not in the typical original format of the document (which are frequent in the expedition reports).
- During the data control by MedOBIS: the DwC is a flat format that lead to a great amount of repetition of data. The MedOBIS last step of quality control had necessarily to check all this repeated fields through all records to ensure that the values were the actually same, adding significant quality control working time.

One solution to address the two issues was presented: customizing the templates for data entry as close as possible to the format of the original source. It helps the data provider to control the data entry, and it minimizes the final quality control step: in both cases, quality control is performed all along the data workflow, and not only when the dataset is complete.

The key ideas formulated in D3.1 are:

- to enter data in an electronic format that mimics the layout of the document as much as it is possible: it facilitates data cleaning and data entry quality control (comparison of the data as in the original document and the digitized data).
- to customize data entry templates through a cooperative work between the data provider and MedOBIS.
- to transform/copy the digitized data in a pseudo-relational data schema represented by the customized templates. In other words, data are separated in several tables (e.g., localities, stations, ...) that may be controlled much faster.
- to match the customized templates with the DwC through a cooperative work between the data provider and MedOBIS.
- to leave the final production of the DwC file under the MedOBIS IPT from a clean, standardized, and quality-controlled dataset (whatever the starting format is).

D3.2: Report on the digitization of 3 datasets under the modified procedure

http://www.emodnet-biology.eu/sites/emodnet-biology.eu/files/public/documents/EMODnet_Biology_III/Deliverables/D3.2.docx

Three datasets were chosen to test internally the modifications of the data entry procedure.

Two were chosen for "archaeology" purposes. They are from the same expedition. However, the reports from this expedition are not standardized. The third one was chosen for "rescue" purpose (and may be more relevant to the WP2), but it was convenient in the MedOBIS schedule to integrate that dataset.

Details of the datasets are given in the D3.2.

- Steuer A. 1939. The fishery grounds near Alexandria. XIX Mollusca. Notes and Memoirs No 33: 207 species, 145 Events, 882 records, 6 measurements (<http://ipt.medobis.eu/resource?r=egyptexpeditionmollusca>)
- The Fishery Grounds near Alexandria. VII. Decapoda. By Heinrich Balss (1936). Notes and memoirs No. 15: 67 species, 107 Events, 310 records, 166 measurements (<http://ipt.medobis.eu/resource?r=egyptexpeditiondecapoda>)
- Benthic communities and environmental parameters in three Mediterranean ports (Sardinia, Crete, Tunisia): 272 species, 540 Events, 4067 records, 2608 measurements (: http://ipt.medobis.eu/resource?r=mapmed_ports).

In general, the procedure was followed, even if due to the internal nature of the test, some cooperative work could not be tested. Some improvements were made during these tests (integrated in the procedure already). The continuous quality control along the procedure is a key point to decrease the final one. And must be reinforced. The test with bigger datasets from external data providers will allow to produce a final version at the end of the project. Especially, we expect to test it with the granted datasets.

D3.3: Update of the list of the 76 datasets along with a list of selected datasets for digitization

http://www.emodnet-biology.eu/sites/emodnet-biology.eu/files/public/documents/EMODnet_Biology_III/Deliverables/D3.3.docx

In the second phase of EMODNET (EMN2), a search in the literature delivered 220 publications with a potential dataset, 76 were retained as more appropriate to EMODNET. The search was more oriented to the Mediterranean Sea for MedOBIS. Fifty new publications with potential datasets were found,

including in the grey literature. Search have targeted the north-eastern Atlantic as the Mediterranean was covered exhaustively during EMN2, and we realize it was difficult to spot new ones (among those already recorded).

Geographic repartition: North-East Atlantic (32), Bay of Biscay (8), Mediterranean (4), North Atlantic (4), Channel sea (2). The list is given in D3.3 and integrated in the previous list.

Type of ecosystems: plankton and a few on pelagos (21); shallow benthos (17), deep-sea (almost all benthos) (12). Year range spans over 100 years from 1880 to 1980, but half of them are posterior to 1970.

Interestingly, some patterns in the results lead us to several considerations.

Grey literature

Grey literature especially technical reports should be reviewed extensively (as it is done by NIMRD and OGS partners in their respective institutes). But language is a barrier to search in such documentary catalogs, and national partners should be involved.

Generally, these technical reports contain raw data, which are the data targeted by EMODNET and OBIS in general, while scientific publications list the average or other synthesized indicators.

FP-funded European projects and European agencies

From supplementary searches, 60 additional sources of potential datasets were collated from FP-funded European Projects and from the European Environment Agency (not only species occurrences for the latter). However, we have not searched yet if the data for the European projects are completely available despite the INSPIRE directive. A systematic review of other potential sources in European Agencies should be conducted in collaboration with WP2.

With the development of the web indexing facilities, the question is not anymore to find opportunistically datasets to be digitized (those already found are enough for several person-years of digitization work), but rather to develop digitization programmes that would systematically exhaust the catalogues already assembled by institutes and initiatives, in collaboration with libraries, museums, fisheries institutes, marine stations, and European agencies.

Potential partners could be:

- Institute and agencies related to fisheries through DG-MARE (e.g.: FAO and the Regional Fisheries Bodies – ICES, GFCM). See for instance historical datasets in the ICES catalogue: http://gis.ices.dk/geonetwork/srv/eng/catalog.search#/search?facet.q=type%2Fhistorical&resultType=details&fast=index&content_type=json&from=1&to=20&sortBy=relevance
- Marine stations: MARS network - the European Marine Research Institutes and Stations (<http://www.marinstations.org/>)
- BHL (through BHL Europe)
- Natural history museums: CETAF - Consortium of European Taxonomic Facilities (<https://www.cetaf.org/>)
- European agencies: DG-ENV, EEA and the topic centers, JRC, ...

WP4: Data product creation (Lead: Deltares)

During the reporting period, inventories have been made of (a) data sets that are available as basis for data products in the Atlas (b) work flows and analyses needed for the preparation of data products (c) data product needs by user communities, including regional seas commissions and (d) environmental data layers that can be used as the basis for Species Distribution Models.

As far as WP4 is concerned, the main result of the workshop on data needs with end users (London, October 2017, organized by WP5) was twofold: on the one hand a concentration and structuring of the data products based on Essential Ocean Variables for biodiversity, on the other hand concentration on variables that can be of interest for the Regional Seas Commissions. Contacts with

both OSPAR and HELCOM showed that they are not interested in 'ready-made' data products from EMODNET, as they want to keep full (political) control on the process of the preparation of crucial data products, e.g. related to the selection of protected areas or the designation of species with special protection status. The most useful contribution from EMODNET is the production of underlying data layers, which are usually covered by the EOVs. We will therefore not concentrate on special products for the Commissions, unless explicitly asked to do so and given a precise methodology.

The GOOS EOVs are listed in Annex I. It is apparent that especially the subvariables provide a major challenge. As an example, mapping diversity and taxonomic composition of phytoplankton seems quite challenging for most seas (maybe except for Baltic), but we do have reliable data for time series at single stations. Based on the product developed for the LTER Trieste site, we will develop similar products for other Mediterranean sites, if data are available and sufficiently reliable.

in Annex II, the EOVs are summarized in a slightly more practical and symmetric way. For the different seas the data availability is indicated. However, not all possible analyses will be attainable in practice. In general, it may be anticipated that few areas are sufficiently covered by data sets to provide reliable interpolation maps only based on data. As an example, there are few or no samples of benthos in the anoxic deep bottoms of the Baltic, and simple interpolation across that area will yield wrong results. In such cases we will provide maps based on a minimal SDM that takes into account factors like oxygen availability, salinity, sediment texture (at least hard vs. soft), depth. The environmental layers for such elementary SDMs exist from physics, habitats, chemistry, at least for the Baltic and North Sea, and have already been downloaded and incorporated into work flows.

The following actions with respect to the EOVs are ongoing or completed:

- Chl-a and primary production products as environmental layers are not available from direct measurements, but will be provided from remote sensing (for chlorophyll) and modelling (for primary production), primarily through COPERNICUS services.
- A DIVA workflow taking into account co-variables (corresponding with the Baltic zooplankton example in Fig. 5) is under development and will be tested in the coming year.
- A workflow and working example for the analysis of single-station long term time series has been provided (Fig. 6) and will, where possible, be extended to include more stations.
- Phytoplankton data of the Baltic are currently being collected and streamlined, including taxonomic control. They will be used to produce products comparable for what is already available for the Dutch EEZ and the French coast.
- Current products for Baltic zooplankton (Fig. 5) will be extended with Finnish, Polish and Danish data. The work on compiling these more complete datasets is ongoing; the workflow will, in principle, remain comparable to the one used as a basis for the analysis in Fig. 2.
- Zooplankton products for the NE-Atlantic will be based on the already available operational products (OOPS) for ICES, for which a workflow exists. Currently, a products update with zooplankton observations till 2016 and including the whole Atlantic basin is being prepared.
- With respect to trait-based analysis, most of the preparatory work has been finished for both fish, benthos, mammals and birds. A workflow for preparing gridded maps based on trait-based classifications has been tested on a limited dataset of benthos for the Dutch EEZ, and will be extended to the complete North Sea, Celtic Seas and Baltic Sea.
- In addition, gridded distribution maps per species will be produced for benthos and fish in the North Sea, Celtic Sea and Baltic Sea. This will be based on the same dataset as the trait-based maps, and will use existing DIVA work flow.

- a further trait-based analysis of fish data, incorporating temperature tolerance of fish, is being prepared. The aim of this analysis is to use existing distribution data to derive thermal tolerances, and based on this extrapolate possible changes with climate change.
- it has been decided to take no additional action concerning sea mammals and sea reptiles, as other (international) activities already extensively cover these groups.

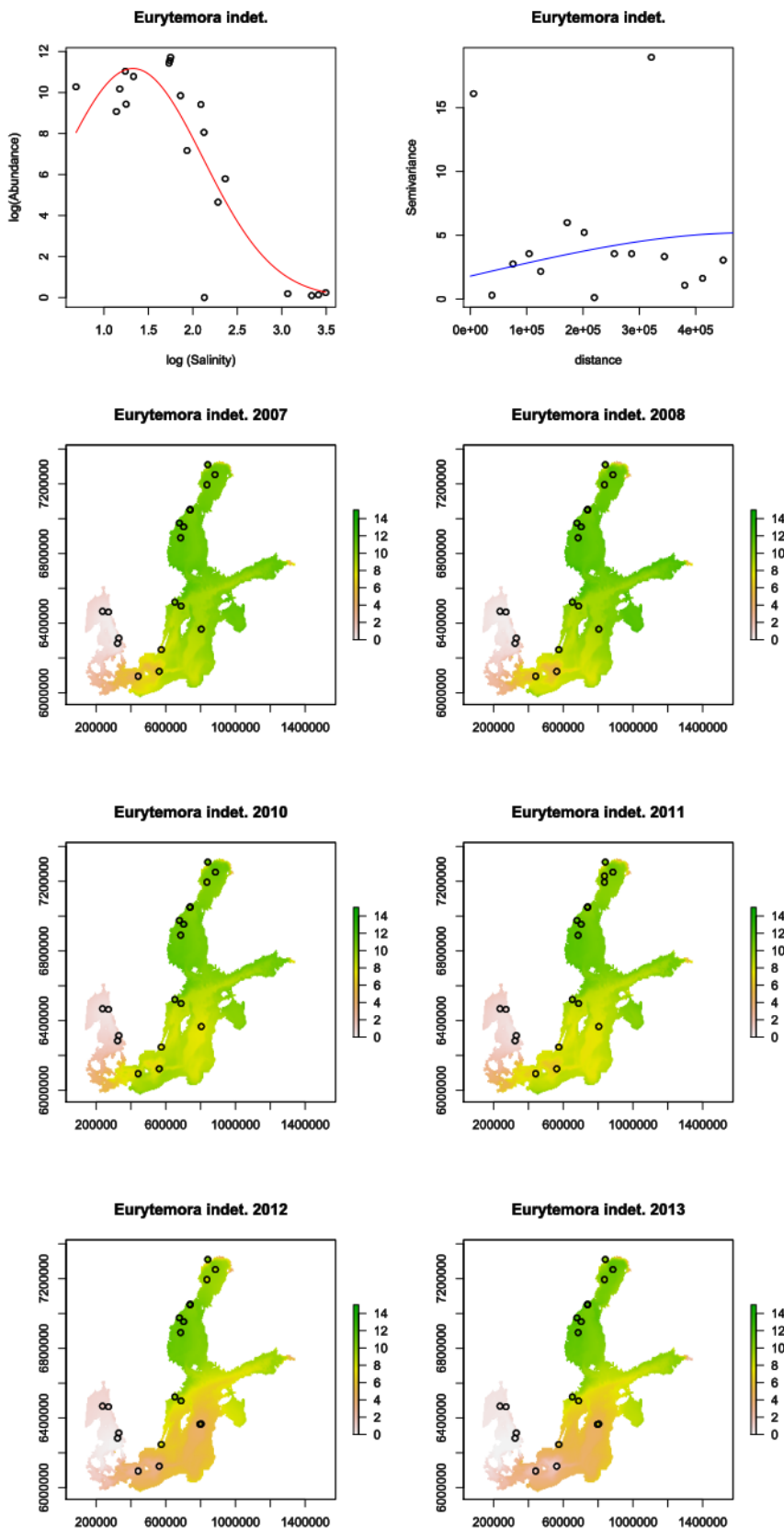


Fig. 5. Example of the gridding map of the brackish-water copepod species *Eurytemora affinis* in the Baltic Sea, based on the Swedish SHARK dataset. The upper left panel shows the response curve of the species abundance on salinity (both variables are log-transformed). The upper right panel shows the semivariogram of the dataset, used as a basis for the kriging with salinity as co-factor. The other panels show the gridded abundance plots for 6 different years after interpolation with kriging using salinity fields as co-factors. These are all years in the dataset for which a coherent sampling was present.

Actual sampling points are indicated on the plots by circles. The species' response to salinity can be seen as a basic determinant of the gridded plots, but year-to-year variation is also visible, e.g. in the lower abundance of the species in the southern part of the Baltic during 2012 and 2013.

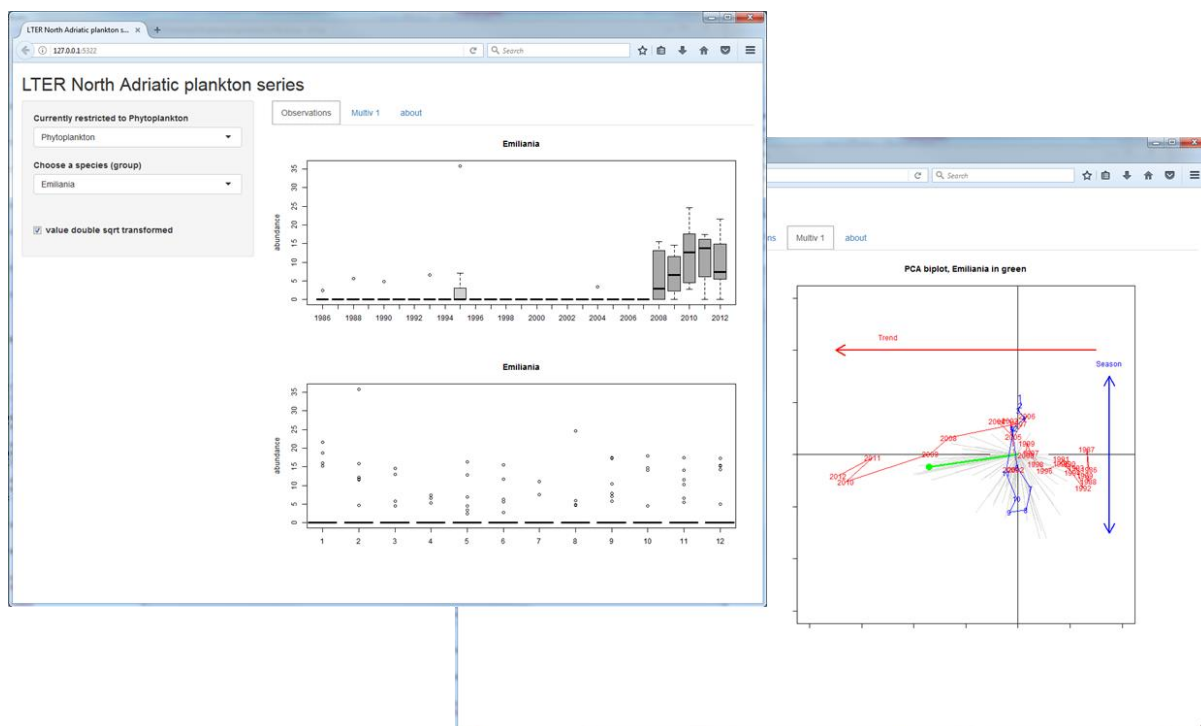


Fig. 6. Screenshots of the interactive web application analyzing the LTER series of phytoplankton at Trieste. The first screen shows the temporal evolution of the species over the years, as well as the distribution over the months in an average year. The second screen shows (with the green arrow) how the species is projected into the multivariate space that has two clear components: the long term trend (indicated in red) and the seasonal pattern (in blue). The species chosen here (*Emiliana*) contributes significantly to the trend (it is almost restricted to the last post-eutrophication years), but has no clear seasonal preference.

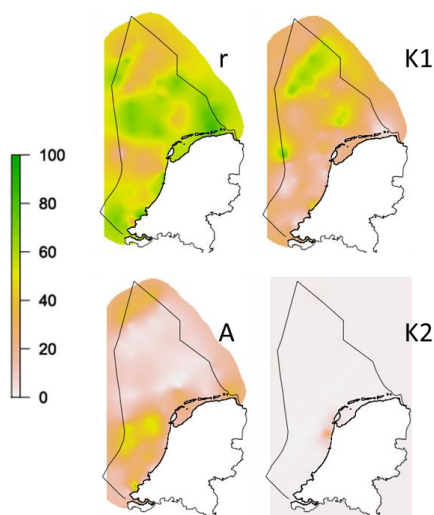


Fig. 7. Spatial distribution of four distinct macrozoobenthos species groups as four distinct life history strategies derived from a biological trait analysis in the Dutch EEZ. *r*-strategists are pioneer/opportunistic with short lifespan and high growth rate. *A*-strategist that are stress-resistant, adapted to harsh environments characterised by adverse waves and currents; they early mature after a direct development and allocate large reproductive efforts. *K*-strategists (*K1* and *K2*) are climax species mainly characterised by slow growth, late maturity and long life span (longer in *K2*); both are encountered in stable habitats or deep sediment layers.

Regional Sea Commissions

In general, we will not duplicate efforts already executed within the regional sea commissions, but provide additional or underlying data layers. For HELCOM there is a clear demand for better maps of benthic species. This coincides with an already identified task for EOV's.

In addition, we will try and produce underlying data layers that can be useful for the analysis of Marine Protected Areas. The regional seas commissions were very clear that they prefer to keep this -

politically sensitive - subject mainly in their own hands. The contribution of EMODNET biology will be mainly gridded data products on zooplankton, phytoplankton, benthos, fish, as well as the trait-based analyses mentioned earlier.

Special protection status of species has been added to the EMODNET taxonomic databases. However, EMODNET will not go any further than producing maps of relevant groups based on these traits, as the commissions do not want interference with the process of choosing species and designating status of protection.

For Mediterranean and Black Sea, data availability may be the prime problem. We will try to extend the approach of LTERTrieste to other sites. Action has been started.

Priorities for the coming period

The priorities for the coming period are:

- executing the trait-based gridding products for benthos, fish, mammals and birds in the North Sea, Celtic Sea and Baltic Sea
- extending the zooplankton and phytoplankton data sets to the Baltic, including information from diverse sources
- develop DIVA-based workflow incorporating co-factors in Species Distribution Models
- develop and present the trait-based analysis of fish thermal tolerance, including predictions for the effects of climate change
- include maps of sensitive species and species with special protection status into the maps produced in the framework of trait-based analyses
- extend the single-station long term analysis to several stations along European coasts; use existing work flow but investigate extension to include station comparison
- discuss with ICES on the production of data products concerning fish, without overlap with existing initiatives
- add additional environmental layers to the species (or group) distribution models where appropriate; availability of suitable layers from habitats, chemistry and physics has been confirmed and for the most part tested in workflows.

WP 5: Outreach & Uptake (Lead partner MBA)

The activities of WP5 began during the successful and well-attended Kick-off meeting in April 2017. Following plenary presentations outlining the deliverables and overall approach, the core participants in WP5 met in a highly productive breakout session to refine the next steps.

Deliverable 5.1: Workshop to investigate scope of data products and applicability to end users

http://www.emodnet-biology.eu/sites/emodnet-biology.eu/files/public/documents/EMODnet_Biology_III/Data%20product%20workshop_London_2017/WP5WorkshopReport_Final.pdf

The initial focus for WP5 was the planning, organisation and delivery of an international workshop to define the requirements for data products being developed in WP4. The workshop was initially scheduled to take place in M3 of the project, however this would fall during the summer holiday

period for many countries. In order to maximise attendance and align with other meetings planned for ICES and OSPAR the decision was made to move the workshop to early October 2017.

At the Kick-off meeting and through subsequent teleconferences the WP5 group developed the list of workshop participants to provide a list of critical invitees and an agenda that will stimulate and inform.

In addition, work was begun to form collaborations and partnerships with complimentary projects and initiatives including AtlantOS, GEOBON and GLOBIS-B to minimise duplication and ensure support for the developing Essential Ocean and Biodiversity Variables (EOV & EBVs) and that the outputs from EMODnet Biology Phase 3 are as relevant, accessible and essential as is possible.

The workshop to investigate the scope of data products and applicability to end users (D5.1) took place in October 2017. Representatives from all four regional sea commissions, transatlantic partnerships, industry, conservation and management organisations met in London on the 10th October 2017 for an EMODnet Biology meeting to steer the development of key biological data products to be developed in WP4. The full workshop report can be found on the EMODnet Biology website:

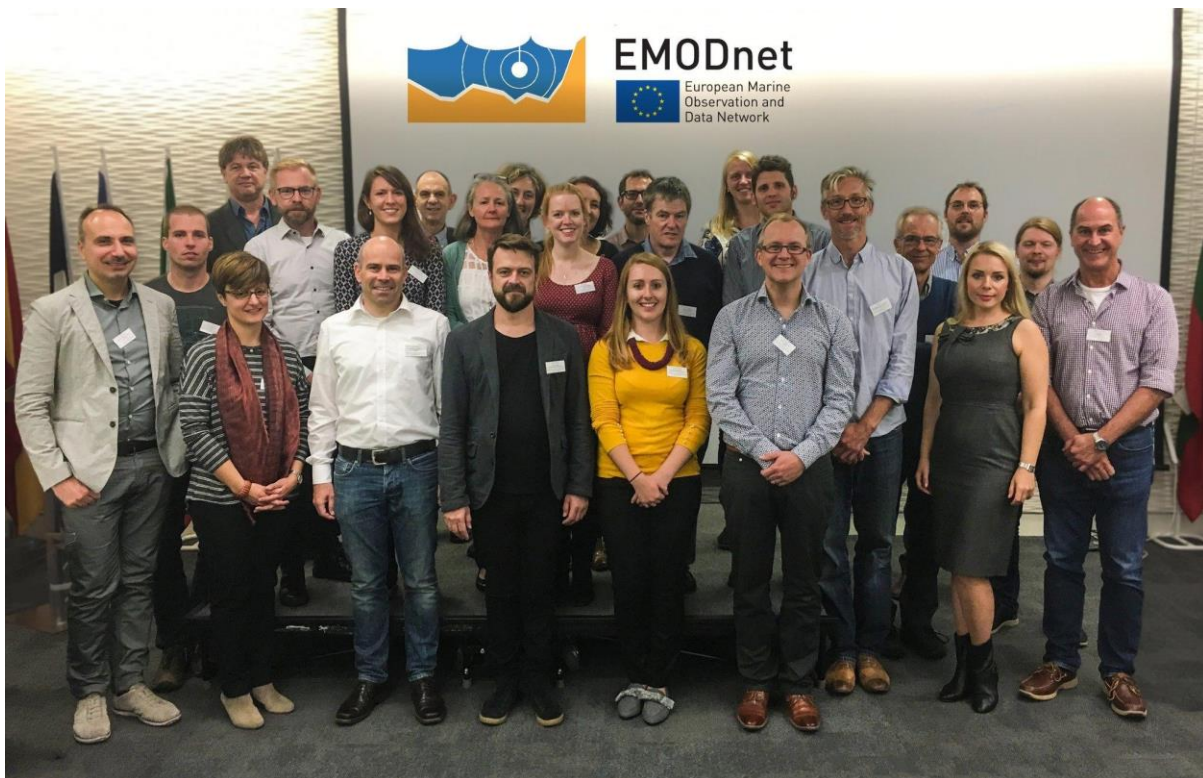


Fig 8: International workshop to investigate scope of data products and applicability to end users

Prior to the workshop all participants were invited to submit responses to a series of questions relating to the current use and requirements for biological data products, to inform the discussion on the day. Following an initial set of presentations from EMODnet Biology partners to provide context and explain the current infrastructure and product provision, key stakeholders gave short presentations outlining the approaches to biological data use in their organisations, and the gaps and requirements that EMODnet Biology could possibly address. The sessions were broadly structured around three areas; Regional Sea Commissions, Global & Transatlantic Initiatives and Conservation & Management. The issues that were identified shared many common elements, including the lack of interoperability, the degree of patchiness and heterogeneity across the data holdings and a lack of products to support key reporting requirements.

All participants recognised the value of such a workshop and expressed a desire to remain engaged and informed in the development of data products that is being delivered by WP4. This continued engagement will be realised through the next stage of WP5, and D5.2 - A report and peer-reviewed publication on comparison of data formats, standards and guidelines in the transatlantic area. Following the workshop WP5 partners met with the WP4 lead and the EMODnet Biology co-ordinator to summarise the workshop discussions and discuss how the requirements of stakeholders could be implemented.

In December 2017 WP5 was also involved in the liaison with EMODnet Seabed Habitats to facilitate closer working and co-development of data products, and the continued engagement and active participation with the OSPAR workshop on the Coordination of Biodiversity Assessment and Monitoring.

The first quarter of 2018 saw the initial development of the paper (D5.2) investigating the data formats, standards and guidelines in use in the transatlantic region, how EMODnet Biology data can best support the development of EOVs and EBVs, and how to promote and integrate a global Marine Biodiversity Observation Network.

Alongside this an abstract was prepared and submitted for the Ocean Obs 2019 conference to promote the activities and product developed through EMODnet Biology and build strategic links with transatlantic and global data initiatives.

WP 6: Technical update EMODnet biological portal & machine to machine connections (Lead VLIZ)

The objectives of WP6 is to further develop and maintain the EMODnet biological portal and portal services and to make the data, metadata and data products that are created and mobilized during the project available through the biological portal. The metadata and data products available from the portal will also be made available through the EMODnet central entry-point portal.

During this reporting period the plans for portal development were presented at the April kick-off meeting in Oostende. The EMODnet Biology Portal was already operational before the start of phase III project but several new improvements to improve the usability of the portal and to improve the machine to machine connections have been developed, amongst others:

Front-end developments

- The new website template, developed by TrustIT and the EMODnet Secretariat has been implemented on the EMODnet Biology website, in order to increase the harmonization of the different EMODnet portals. The EMODnet pay-off became 'Dive into data on Europe's Marine Life'.
- A new tutorial movie to use the download toolbox has been created and is available at: <http://www.emodnet-biology.eu/tutorials>
- A clear description of the EMODnet Biology API and how to access its web services has been published at: <http://www.emodnet-biology.eu/emodnet-biology-api>. There is now a description available on how to retrieve occurrence data and measurement data through WFS, how to query WoRMS using the AphiaID, how to query IMIS, using the datasetID and how to retrieve data from the gridded abundance data products using WMS/WFS.

EMODnet | **BIOLOGY**
Dive into data on Europe's marine life

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Unlocking European Marine Biodiversity Data

The EMODnet biology data portal provides free access to data on temporal and spatial distribution of marine species and species traits from all European regional seas. EMODnet Biology is part of the EU funded European Marine Observation and Data Network and is built upon the World Register of Marine Species and the European Ocean Biogeographic Information System.

Major EurOBIS and EMODnet Biology update

Thanks to a huge effort of the EMODnet biology consortium, 39 new and updated datasets representing more than six million distribution records are made available as open marine biodiversity data.

General Meeting coming up

Next EMODnet Biology general meeting to take place in Trieste, 3-4 May 2018

[more news]

Gridded abundance map of cod (*Gadus morhua*) using geospatial modelling. An animation of this data product shows the temporal evolution of cod abundances, illustrating the dramatic decrease of the stock in the North Sea

The data portal provides a gateway to marine biodiversity data. It includes a **search, selection, mapping and download function** and is fully OGC compliant.

[Read more](#)

You can access metadata descriptions of **almost 1000 thematic biological databases** through the data catalogue, including national marine biological monitoring datasets, scientific field surveys and experiments and data collection studies. Datasets cover marine species of phytoplankton, zooplankton, angiosperms, macro-algae, invertebrate bottom fauna, birds, mammals and fish.

[Read more](#)

EMODnet
European Marine Observation and Data Network

EMODnet is a long term marine data initiative spanning seven broad disciplinary themes: bathymetry, geology, physics, chemistry, biology, seafloor habitats and human activities. The **EMODnet Central Portal** allows users to access data products from each of these lots under one single interface.

[Read more](#)

Fig 9: Homepage EMODnet-Biology website

- A new dynamic page including data statistics: <http://www.emodnet-biology.eu/statistics> has been embedded into the EMODnet Biology website. This page contains in real time the number of:
 - o The number of marine biological dataset descriptions (metadata)
 - o The number and evolution of datasets integrated and available through the system
 - o The number and evolution of occurrence records, and the number of quality controlled records
 - o Number of available data products
 - o Number of species names per higher taxonomic group linked to the World Register of Marine Species (WoRMS)

- The data download section of the EMODnet Biology website has been restructured in order to improve direct access to the data. There are now three subsections under data download:
 - Data Download toolbox: the toolbox allows to easily subselect and download data by performing metadata and data queries. The user can select by keyword, spatial, temporal and taxonomic search. A datafile will be generated that can be downloaded as a csv-file or can be accessed via a webservice. The query itself can also be stored as a JSON-file.
 - EMODnet Biology API: this page describes how the data can be accessed as a WFS service, for example if some user or developer wants to develop an online App using marine biology data from EMODnet biology. The page is intended for users that know how to work with webservices and can access data using the OGC protocols.
 - IPT resources: this points to the datasets of EMODnet biology as available in Darwin Core Archive through a IPT. The Integrated Publishing Toolkit (IPT) is a free open source software tool written in Java that is used to publish and share biodiversity datasets through the GBIF, EurOBIS and OBIS network. The IPT can also be configured with either a DataCite or EZID account in order to assign DOIs to datasets transforming it into a data repository.

Back-end developments

- A major update of the geospatial infrastructure of EMODnet Biology has been made. The hardware set-up where the EMODnet-biology Toolbox database was running on was examined, after which various optimizations were implemented: the database moved to another server, one which is better suited for dealing with resource intensive queries (SSDs are now used for locale storage, lots of RAM to allocate, ...). Besides those hardware improvements, we made sure that our server ran the latest version of Geoserver (2.11) and PostgreSQL (9.6) in order to be sure we are taking advantage of all latest improvements.
- Based on requirements from the growing EMODnet and EurOBIS community to manage data deriving from novel biological sensors and datasets that combine biological, physical and chemical measurement, an extended data scheme and new standard has been proposed. The new scheme builds on the Darwin Core Archive (DwC-A) standard and on practices adopted by the Global Biodiversity Information Facility (GBIF). It consists of a DwC Event Core in combination with a DwC Occurrence Extension and a proposed enhancement to the DwC MeasurementOrFact Extension. This new structure enables the linkage of measurements or facts - quantitative and qualitative properties - to both sampling events and species occurrences, and includes additional fields for property standardization. We also embrace the use of the new parentEventID DwC term, which enables the creation of a sampling event hierarchy. Therefore, a major update on the data scheme of the geospatial infrastructure of EMODnet Biology has been made. Now, we are in the process of developing a new user interface, through the data download toolbox, which will allow to easily query and retrieve the different data types including habitat observations, different biotic quantifications and descriptors, sediment characteristics and other environmental parameters, collected during biological observations. The new interface will also allow to download the data as a flat file, to pool data per sample and to include absence data.

User Feedback

Date	Name	Organization	Type of user feedback (e.g. technical, case study etc.)	Response
31/01/2017	/	Scientific	Technical request to get access to the emodnet biological dataset through WFS (I'd tried to toggle on the WFS in map viewer but I don't see the "address"). The purpose is to include it in a webgis for marine conservation.	We created a clear description and overview of the EMODnet API & web services at http://www.emodnet-biology.eu/emodnet-biology-api
01/02/2017	/	Scientific	Technical: On the Data Download page I wanted to download all records of a species from my country's EEZ (UK). In the 'select geographic area' section there is an option to search by EEZ but many EEZs are missing, e.g. the UK, France, Germany, Belgium, etc. I think many people would find it useful to be able to search by their country's EEZ.	A bug, took 6 days to solve.
23/06/2017	/	Scientific	Invited to workshop to explore opportunities between Aquanis, MSFD, EASIN, EMODnet and WRIMS	Workshop attended in September at IEO, WRIMS was picked up by OSPAR for the Intermediate Assessment Report on NIS
07/07/2017	/	U.S. Geological Survey	Calculation SDG14 product for the GEO BON meeting using EurOBIS data from Norway	Provide feedback on integration of Norwegian abundance data
24/07/2017	/	JNCC	Use EurOBIS datascheme to store habitat data	We organized a workshop in July to discuss how EurOBIS datascheme can be used to store habitat data, next to species occurrences. We worked out a proposal and the OBIS Env scheme will be used by EMODnet habitats
16/08/2017	/	ICES	Request to launch news on OOPS Zooplankton products through ICES communication channels	News released on http://www.ices.dk/news-and-events/news-archive/news/Pages/Zoom-in-on-zooplankton-data.aspx
23/09/2017		ETT	With EMODnet Physics we discussed the Sea Mammals data (MEOP Database) and how the mammal observation	We linked this with the global network of MEOP through the ODIP project. We will further develop a use case within ODIP on how to link physical-

			should be integrated into EurOBIS/OBIS.	biological observations from MEOP
28/09/2017		IMDC	Information request on data licenses of EMODnet biological data	We made an analysis on what percentage of the EMODnet data is CC-BY and CC-BY-NC
05/10/2017	/	DMARE	EMODnet biology was invited to provide input on the Blue Cloud Initiative	The email was forwarded to the project consortium and around 10 partners participated in the survey
18/10/2017	/	HELCOM	Communications with HELCOM on zooplankton data products and how it could be used in the HELCOM process	Provide example Baltic products to HELCOM to highlight what kind of data EMODnet biology can produce
19/10/2017	/	HELCOM	Request to integrate the HELCOM Red list species into EMODnet biology	The list was added as a 'trait' to the WoRMS database
25/10/2017	/	CEFAS	Integrating long term UK Benthic data collected by Oil and Gas industry	Dataset integrated in EurOBIS and available through EMODnet Biology
9-10/11/2017		EEA	Invitation to participate on TGDATA Meeting	Attending TGDATA Meeting
09/11/2017		JNCC	Request on trait data to develop BH1 Indicator on benthic organisms in the UK	Communications on data exchange and approach
05/12/2017		OSPAR	Invitation from OSPAR to attend the ICG-COBAM Meeting	We participated in the benthic and the NIS working group. Methodologies to calculate benthic indicators were exchanged, from the NIS working group we learned they are using WRIMS as a data source and we discussed the possibility that national reporting data on NIS could flow back to WRIMS
10/01/2018	Sophie Johnston	University of St Andrews	Data request: a project that aims to collect biodiversity data and build a global time series database. The project is called BioTIME.	We provided links to relevant information, took 2 days
23/02/2018	--	NOI	Data request: I am looking for data about zooplankton abundance and I bumped into the "OOPS - Copepods: ICES Operational Oceanographic Products and Services - Gridded Copepod abundance data" which might be exactly what I am looking for - Purpose of my work is to use copepod data to assess fish stocks status in	We provided links to relevant information, took 1 day

			space and time, as part of my PhD.	
14/03/2018		Birdlife	Request to Birdlife to share their seabird tracking data with EMODnet Biology	Pending at the moment
23/03/2018	--	University Lisbon	Data request: In the context of thesis work, I would like to access all Azores biological data available at EMODnet. The main goal is to integrate species and environmental data so that distribution models can be automatically executed and the corresponding results can be updated when new data arrives.	We provided links to relevant information, 1 day
12/04/2018	--	JNCC	Request to share ESAS bird data with EMODnet Biology	Pending: UK data will be delivered, other data is pending.
18/04/2018	--	Villefranche Observatory, CNRS	Request to create a time series product, based on a dataset that has been submitted to EMODnet Biology in previous phase	Is currently being analysed under the data product WP

Meetings held/attended since last report

Date	Location	Title	Internal/External + Short Description
25-26/04/2017	Oostende, BE	Kick off meeting project	The Kick-off meeting took place in Oostende on the 25 and 26 of April. 41 participants, all partners represented
16/05/2017	Brussels, BE	EuroGOOS-VLIZ	Meeting to exchange information between EMODnet Biology and EuroGOOS
7-8/06/2017	Copenhagen, DK	TGDATA meeting	Meeting on technicalities of DIKE, MSFD.
7-8/06/2017	Brussels, BE	AtlantOS Transatlantic Ocean Data Harmonization Workshop	Meeting to discuss transatlantic Ocean Data Harmonization
13/06/2017	Brussels, BE	Blue Cloud workshop	Meeting to take stock of existing initiatives (including EMODnet) and discussion of way forward
4-6/07/2017	Genoa, IT	EMODnet technical meeting	Meeting to discuss technical progress of different EMODnet lots
24-25/07/2017	Oostende, BE	EMODnet Biology-seabed habitat	Meeting to discuss links between EMODnet biology and seabed habitats
5-6/09/2017	Madrid, SP	Marine NIS species	Meeting to discuss link between EMODnet NIS data and other initiatives (Aquanis, EASIN)
13-15/09/2017	Rome, IT	EMODnet steering com. meeting	Steering Committee meeting EMODnet
10/10/2017	London, UK	Data product workshop	The workshop to investigate the scope of data products and applicability to end users
11/10/2017	London, UK	Project meeting on data product creation	Meeting to discuss the creation and implementation of data products as identified by the users
15-17/10/2017	Antwerp, BE	Opensealab	Attending and provide coaching during OpenSeaLab Hackathon
25-26/01/2018	Oostende, BE	Lifewatch User meeting	EMODnet Biology presented at the LifeWatch.be Users & Stakeholders meeting
12-13/02/2018	Brussels, BE	TGDATA Meeting	Attending TGDATA meeting with presentation on how EMODnet biology deals with data on species distributions and where EMODnet biology and INSPIRE uses the same vs. different standards
08/03/2018	Brussels, BE	EOOS Forum	Participating in EOOS Forum
20-23/03/2018	Mallorca, Spain	EMODnet Steering Com	Steering Committee and technical meeting EMODnet
3-6/04/2018	Liege, BE	DIVA data product workshop	Participation in DIVA workshop, creation of gridded abundance data products.
14/03/2018	London	JericoNext	Jerico Next Biological data management and link with

		Data management meeting	EMODnet Biology
28/03/2018	Brussels	EMODnet biology data management, RBINS	Meeting on ingestion biological data RBINS into EMODnet Biology
13/04/2018	Skype	Teleconference on INSPIRE-EMODnet	Discuss compatibility of EMODnet data with INSPIRE. We discussed the possibility if INSPIRE could adopt the standards used by EMODnet Biology (Darwin Core data scheme, WoRMS, OBIS Env)

Outreach and communication activities

Date	Media	Title	Short description and/or link to the activity
25-26/04/2017	Presentations, tweets, newsletter, reports	Kick off meeting project	Presentations, tweets, newsletter, reports
7-8/06/2017	Presentations	AtlantOS Transatlantic Ocean Data Harmonization Workshop	Presentation OBIS, EurOBIS, EMODnet Bio
5-6/09/2017	Presentations	Marine NIS species	Meeting to discuss link between EMODnet NIS data and other initiatives (Aquanis, EASIN)
16/08/2017	News	Zoom in on zooplankton data	ICES news: Time-series and spatial data on zooplankton can be viewed through a new online product. http://www.ices.dk/news-and-events/news-archive/news/Pages/Zoom-in-on-zooplankton-data.aspx
11/09/2017	Newsletter, tweet	The call for grants	The call for grants was published at http://www.emodnet-biology.eu/call-grant-associated-data-partner and was tweeted through the EMODnet tweet. It was retweeted 40 times
10/10/2017	Presentations, tweets, newsletter, report	Data product workshop	The workshop to investigate the scope of data products and applicability to end users

15-17/10/2017	Presentations, tweets, newsletter, reports	Opensealab	Attending and provide coaching during OpenSeaLab Hackathon
25-26/01/2018	Presentation on EMODnet Biology and links with the Lifewatch taxonomic backbone infrastructure	Lifewatch User meeting	EMODnet Biology presented at the LifeWatch.be Users & Stakeholders meeting
12-13/02/2018	Presentation on EMODnet biology	TGDATA Meeting	Attending TGDATA meeting with presentation on how EMODnet biology deals with data on species distributions and where EMODnet biology and INSPIRE uses the same vs. different standards
21/03/2018	VLIZ Marine Science Day	EMODnet	EMODnet was presented at the VMSD The VLIZ Marine Science Day has become an established event for all marine and coastal scientists in Flanders and its neighbouring regions.
6/03/2018	Presentations	EMODnet	EMODnet and EMODnet biology data infrastructure was presented at the meeting between JPI, Marine Board, EMODnet and VLIZ
08/03/2018	Online tutorial	EMODnet biology data management tutorial	An online tutorial on how to quality control and update biological data into EMODnet Biology is under construction in the Oceanteacher, global Academy training course from IODE.

Updates on Progress Indicators

Indicator 1 - Volume of data made available through the portal

Date	Records	Name Datasets (n=252)	Status	Acronym	Top organisation	Institute	Country
2017-04-20 till 2018-04-20	5,257,306 New records 4,065,867 Updated records	252 datasets					
2017-04-22 21:02:54.220	16861	Type locality distributions from the World Register of Marine Species	Update	SC	NULL	WoRMS Steering Committee	NULL
2017-04-25 10:00:24.257	1068	Trawl-survey data from the Pipeta programme in the Northern Adriatic Sea (Mediterranean) collected in 1988 and 1991	new	ISPRA	Italian National Institute for Environmental Protection and Research	Branch office Chioggia	ITA
2017-04-25 10:00:24.257	1068	Trawl-survey data from the Pipeta programme in the Northern Adriatic Sea (Mediterranean) collected in 1988 and 1991	new	OGS	NULL	National Institute of Oceanography and Experimental Geophysics	ITA
2017-04-25 10:00:24.257	556	Trawl-survey data in the Adriatic Sea (Mediterranean) collected in 1972, 1975 and 1981	new	OGS	NULL	National Institute of Oceanography and Experimental Geophysics	ITA
2017-04-25 10:00:24.257	556	Trawl-survey data in the Adriatic Sea (Mediterranean) collected in 1972, 1975 and 1981	new	ISPRA	Italian National Institute for Environmental Protection and Research	Branch office Chioggia	ITA
2017-04-25 10:00:24.257	1976	Trawl-survey data from the Pipeta Expedition in the Adriatic Sea (Mediterranean) collected in 1982	new	OGS	NULL	National Institute of Oceanography and Experimental Geophysics	ITA
2017-04-25 10:00:24.257	1976	Trawl-survey data from the Pipeta Expedition in the Adriatic Sea (Mediterranean) collected in 1982	new	ISPRA	Italian National Institute for Environmental Protection and Research	Branch office Chioggia	ITA
2017-04-25 10:00:24.257	3139	Trawl-survey data in the central-eastern Adriatic	new	OGS	NULL	National Institute of Oceanography and Experimental	ITA

		Sea (Mediterranean) collected in 1957 and 1958				Geophysics	
2017-04-25 10:00:24.257	3139	Trawl-survey data in the central-eastern Adriatic Sea (Mediterranean) collected in 1957 and 1958	new	ISPRA	Italian National Institute for Environmental Protection and Research	Branch office Chioggia	ITA
2017-04-25 10:00:24.257	3275	Trawl-survey data from the "expedition Hvar" in the Adriatic Sea (Mediterranean) collected in 1948-1949	new	OGS	NULL	National Institute of Oceanography and Experimental Geophysics	ITA
2017-04-25 10:00:24.257	3275	Trawl-survey data from the "expedition Hvar" in the Adriatic Sea (Mediterranean) collected in 1948-1949	new	ISPRA	Italian National Institute for Environmental Protection and Research	Branch office Chioggia	ITA
2017-04-25 10:00:24.257	9723	Trawl survey data from the Jabuka Pit area (central-eastern Adriatic Sea, Mediterranean) collected between 1956 and 1971	new	OGS	NULL	National Institute of Oceanography and Experimental Geophysics	ITA
2017-04-25 10:00:24.257	9723	Trawl survey data from the Jabuka Pit area (central-eastern Adriatic Sea, Mediterranean) collected between 1956 and 1971	new	ISPRA	Italian National Institute for Environmental Protection and Research	Branch office Chioggia	ITA
2017-05-22 21:03:18.800	16961	Type locality distributions from the World Register of Marine Species	Update	SC	NULL	WoRMS Steering Committee	NULL
2017-06-12 13:48:16.007	496	Community structure and seasonal fluctuation of macrobenthos in a <i>Ceriops tagal</i> mangrove sediment at Gazi Bay in 1992 and 1993	new	VUB	Vrije Universiteit Brussel	Fundamental and Applied Marine Ecology Post Graduate Program	BEL
2017-06-12 13:48:16.007	496	Community structure and seasonal fluctuation of macrobenthos in a <i>Ceriops tagal</i>	new	UGent	Universiteit Gent	Onderzoeksgroep Mariene Biologie	BEL

		mangrove sediment at Gazi Bay in 1992 and 1993					
2017-06-12 13:48:16.007	865	Epibenthic and fish community in Gazi Bay sampled from 12-15 October 1994	new	UGent	Universiteit Gent	Onderzoeksgroep Mariene Biologie	BEL
2017-06-12 13:48:16.007	42	Mangrove crabs and their relationship with the environment in mangrove forests of Dabaso and Gazi (Kenya) sampled in 1998 and 1999	new	NULL	NULL	University of Florence	ITA
2017-06-12 13:48:16.007	42	Mangrove crabs and their relationship with the environment in mangrove forests of Dabaso and Gazi (Kenya) sampled in 1998 and 1999	new	VUB	NULL	Vrije Universiteit Brussel	BEL
2017-06-12 13:48:16.007	42	Mangrove crabs and their relationship with the environment in mangrove forests of Dabaso and Gazi (Kenya) sampled in 1998 and 1999	new	UA	NULL	Universiteit Antwerpen	BEL
2017-06-12 13:48:16.007	380	Seagrasses and associated macroalgae at West Gazi bay during July and August 1987 and abiotic data of the corresponding sampling locations	new	UGent	Universiteit Gent	Laboratorium Plantkunde	BEL
2017-06-12 13:51:41.830	4228	Mesozooplankton North Adriatic-Gulf of Trieste LTER time-series	Update	OGS	NULL	National Institute of Oceanography and Experimental Geophysics	ITA
2017-06-12 13:51:41.830	1236	Phytoplankton Adriatic-SESAME Project	Update	OGS	NULL	National Institute of Oceanography and Experimental Geophysics	ITA
2017-06-12 14:05:57.880	1976	Trawl-survey data from the Pipeta Expedition in the Adriatic Sea (Mediterranean) collected in 1982	Update	OGS	NULL	National Institute of Oceanography and Experimental Geophysics	ITA
2017-06-12 14:05:57.880	1976	Trawl-survey data from the Pipeta Expedition in the Adriatic Sea	Update	ISPRA	Italian National Institute for Environmental Protection and	Branch office Chioggia	ITA

		(Mediterranean) collected in 1982				Research		
2017-06-22 21:03:16.387	17141	Type locality distributions from the World Register of Marine Species	Update	SC	NULL		WoRMS Steering Committee	NULL
2017-07-22 21:03:23.210	17309	Type locality distributions from the World Register of Marine Species	Update	SC	NULL		WoRMS Steering Committee	NULL
2017-08-18 10:00:02.117	201	Phytoplankton monitoring in the Trieste harbour, North Adriatic Sea (Port Authority), March 2015	new	OGS	NULL		National Institute of Oceanography and Experimental Geophysics	ITA
2017-08-18 10:00:02.117	3944	Phytoplankton monitoring in the Trieste harbour - North Adriatic Sea (FERRIERA), 2008-2014	new	OGS	NULL		National Institute of Oceanography and Experimental Geophysics	ITA
2017-08-18 10:00:02.117	605	Polychaeta distribution data from: Deep-sea fauna of European seas - an annotated species check-list of benthic invertebrates living deeper than 2000 m in the seas bordering Europe	new	MSU		Lomonosov Moscow State University	Department of Hydrobiology	RUS
2017-08-18 10:00:02.117	605	Polychaeta distribution data from: Deep-sea fauna of European seas - an annotated species check-list of benthic invertebrates living deeper than 2000 m in the seas bordering Europe	new	RAS		Russian Academy of Sciences	P. P. Shirshov Institute of Oceanology	RUS
2017-08-18 10:00:02.117	605	Polychaeta distribution data from: Deep-sea fauna of European seas - an annotated species check-list of benthic invertebrates living deeper than 2000 m in the seas bordering Europe	new	NHM	NULL		Natural History Museum	GRB
2017-08-18 10:00:02.117	9265	Microzooplankton South Adriatic-	Update	OGS	NULL		National Institute of Oceanography	ITA

		PRISMA1-Flussi Project				and Experimental Geophysics	
2017-08-18 10:00:02.117	9967	MAREANO - Baseline mapping of hyperbenthic crustacea fauna obtained with RP-sledge	Update	IMR	NULL	Institute of Marine Research	NOR
2017-08-18 10:00:02.117	27015	MAREANO - Baseline mapping of fauna obtained with grab	Update	IMR	NULL	Institute of Marine Research	NOR
2017-08-18 10:00:02.117	15733	MAREANO - Baseline mapping of epifauna obtained with Beamtrawl	Update	IMR	NULL	Institute of Marine Research	NOR
2017-08-18 10:00:02.117	1006	Phytoplankton collected in the Mediterranean Sea in 1959 on board the R/V Akademik S. Vavilov	Update	NASU	National Academy of Sciences of Ukraine	Institute of Biology of the Southern Seas	UKR
2017-08-18 10:00:02.117	1829	Benthos collected in the Azov Sea in 1935 on board the R/V N. Danilevskiy	Update	NASU	National Academy of Sciences of Ukraine	Institute of Biology of the Southern Seas	UKR
2017-08-18 10:00:02.117	1258	Benthos collected in the Azov Sea during several expeditions in 1934-1935	Update	NASU	National Academy of Sciences of Ukraine	Institute of Biology of the Southern Seas	UKR
2017-08-18 10:00:02.117	1230	Zooplankton collected in the Black Sea along the Yalta-Batumi transect in February 1951	Update	NASU	National Academy of Sciences of Ukraine	Institute of Biology of the Southern Seas	UKR
2017-08-18 10:00:02.117	957	Zooplankton collected in the Black Sea during Cruise 5 in February 1957	Update	NASU	National Academy of Sciences of Ukraine	Institute of Biology of the Southern Seas	UKR
2017-08-18 10:00:02.117	716	Phytoplankton data collected during R/V Issledovatel cruise in October 1948	Update	NASU	National Academy of Sciences of Ukraine	Institute of Biology of the Southern Seas	UKR
2017-08-18 10:00:02.117	418	Phytoplankton data from the Sukhumi region, Black Sea, collected in November 1948	Update	NASU	National Academy of Sciences of Ukraine	Institute of Biology of the Southern Seas	UKR
2017-08-18 10:00:02.117	808	Phytoplankton data collected in deep waters of the halistatic region of the Black Sea in September 1948	Update	NASU	National Academy of Sciences of Ukraine	Institute of Biology of the Southern Seas	UKR
2017-08-18 10:00:02.117	1132	Phytoplankton data collected during cruises on the R/V Knipovich	Update	NASU	National Academy of Sciences of Ukraine	Institute of Biology of the Southern Seas	UKR

		in 1948 and 1950					
2017-08-18 10:00:02.117	989	Phytoplankton data collected near Yalta, Black Sea, in June 1950	Update	NASU	National Academy of Sciences of Ukraine	Institute of Biology of the Southern Seas	UKR
2017-08-18 10:00:02.117	774	Zooplankton data collected during cruises on the R/V Knipovich in April 1950	Update	NASU	National Academy of Sciences of Ukraine	Institute of Biology of the Southern Seas	UKR
2017-08-18 10:00:02.117	787	Phytoplankton data collected during First Ukrainian Antarctic Expedition (March 1997) on board of R/V Krenkel in Bransfield strait and region of Ukrainian Antarctic Station	Update	UkrSCES	NULL	Ukrainian scientific center of Ecology of Sea	UKR
2017-08-18 10:00:02.117	3072	Phytoplankton data collected during cruise 22 of R/V Fiolent (December 1987 – April 1988) in the Indian sector of the Southern Ocean	Update	UkrSCES	NULL	Ukrainian scientific center of Ecology of Sea	UKR
2017-08-18 10:00:02.117	3049	Phytoplankton data collected during cruise 37 (second joint Soviet-American expedition) of R/V Akademik Korolev (July 1984) in the Bering Sea	Update	NASU	National Academy of Sciences of Ukraine	Department of plankton	NULL
2017-08-18 10:00:02.117	526	Microzooplankton data (Tintinnida) collected during 7-th Ukrainian Antarctic Expedition (March, 2002) on board of R/V Horizont (Bransfield Strait)	Update	NASU	National Academy of Sciences of Ukraine	Department of plankton	NULL
2017-08-18 10:00:02.117	165	Microzooplankton data (Tintinnida) collected during First Ukrainian Antarctic Expedition (March-April 1997) on board of R/V Krenkel	Update	NASU	National Academy of Sciences of Ukraine	Department of plankton	NULL
2017-08-18 10:00:02.117	2345	Phytoplankton data collected during Second Ukrainian Antarctic Expedition (March-	Update	UkrSCES	NULL	Ukrainian scientific center of Ecology of Sea	UKR

		April 1998) on board of R/V Krenkel					
2017-08-18 10:00:02.117	2414	Phytoplankton data collected during cruise 24 of R/V Skif (February - March 1989) in the Indian sector of the Southern Ocean	Update	UkrSCES	NULL	Ukrainian scientific center of Ecology of Sea	UKR
2017-08-18 10:00:02.117	488	Phytoplankton data collected during cruise 25 of R/V Skif (January 1990) in the Indian sector of the Southern Ocean	Update	UkrSCES	NULL	Ukrainian scientific center of Ecology of Sea	UKR
2017-08-18 10:00:02.117	677	Phytoplankton data collected during a cruise in the Black Sea in May 1957	Update	NASU	National Academy of Sciences of Ukraine	Institute of Biology of the Southern Seas	UKR
2017-08-18 10:00:02.117	550	Phytoplankton data collected in the Black Sea in February 1957	Update	NASU	National Academy of Sciences of Ukraine	Institute of Biology of the Southern Seas	UKR
2017-08-18 10:00:02.117	771	Phytoplankton data collected in the Black Sea along the Tuapse transect in August 1951	Update	NASU	National Academy of Sciences of Ukraine	Institute of Biology of the Southern Seas	UKR
2017-08-18 10:00:02.117	3906	Phytoplankton data of Sevastopol Bay of the Black Sea during 1972	Update	NASU	National Academy of Sciences of Ukraine	Institute of Biology of the Southern Seas	UKR
2017-08-18 10:00:02.117	2034	Phytoplankton samples collected near Sochi, Black Sea, in 1974-1975 (sochi_1974-1975)	Update	NASU	National Academy of Sciences of Ukraine	Institute of Biology of the Southern Seas	UKR
2017-08-18 10:00:02.117	2063	Phytoplankton monitoring data from Sevastopol Bay (Black Sea) from 1952 to 1963	Update	NASU	National Academy of Sciences of Ukraine	Institute of Biology of the Southern Seas	UKR
2017-08-18 10:00:02.117	4758	Phytoplankton monitoring data from a polygon near Belbek River (Black Sea) from 1987 to 1990	Update	NASU	National Academy of Sciences of Ukraine	Institute of Biology of the Southern Seas	UKR
2017-08-18 10:00:02.117	2831	Phytoplankton data collected in the Black Sea during the 33rd cruise of the R/V "Professor Kolesnikov" in 1995	Update	NASU	National Academy of Sciences of Ukraine	Institute of Biology of the Southern Seas	UKR

2017-08-18 10:00:02.117	263	Phytoplankton data collected in the Black Sea and Bosphorus area during a cruise of the R/V "Mgla", year 1968	Update	NASU	National Academy of Sciences of Ukraine	Institute of Biology of the Southern Seas	UKR
2017-08-18 10:00:02.117	146	Phytoplankton data collected in the Black Sea and Bosphorus area during a cruise of the R/V "Mgla", year 1969	Update	NASU	National Academy of Sciences of Ukraine	Institute of Biology of the Southern Seas	UKR
2017-08-18 10:00:02.117	421	Phytoplankton data collected in the Black Sea during the 4th cruise of the R/V "Kiev" in 1995	Update	NASU	National Academy of Sciences of Ukraine	Institute of Biology of the Southern Seas	UKR
2017-08-18 10:00:02.117	176	Phytoplankton data collected in the Black Sea in 1958	Update	NASU	National Academy of Sciences of Ukraine	Institute of Biology of the Southern Seas	UKR
2017-08-18 10:00:02.117	2837	Phytoplankton data collected in the Black Sea during the 117th cruise of the R/V "Kovalevskiy" in 1990	Update	NASU	National Academy of Sciences of Ukraine	Institute of Biology of the Southern Seas	UKR
2017-08-18 10:00:02.117	4156	Phytoplankton data collected in the Black Sea, Bosphorus area, Marmara Sea, Aegean Sea, Ionian Sea, Tunisian Strait, and Mediterranean Sea during the 65th cruise of the R/V "Kovalevskiy" in 1969-1970	Update	NASU	National Academy of Sciences of Ukraine	Institute of Biology of the Southern Seas	UKR
2017-08-18 10:00:02.117	15224	Mesozooplankton abundance and biomass in Sevastopol Bay and inshore waters off the Crimean Coasts of the Black Sea	Update	NASU	National Academy of Sciences of Ukraine	Institute of Biology of the Southern Seas	UKR
2017-08-18 10:00:02.117	2500	Gelatinous macrozooplankton abundance and biomass in Sevastopol Bay and inshore waters off the Crimean Coasts of the Black Sea	Update	NASU	National Academy of Sciences of Ukraine	Institute of Biology of the Southern Seas	UKR
2017-08-18 10:00:02.117	9630	Zooplankton from the north-eastern	Update	RAS	Russian Academy of	P. P. Shirshov Institute of	RUS

		Black Sea			Sciences	Oceanology	
2017-08-18 10:00:02.117	214	Benthic data from Sevastopol (Black Sea)	Update	NASU	National Academy of Sciences of Ukraine	Institute of Biology of the Southern Seas	UKR
2017-08-18 10:00:02.117	8692	YugNIRO-1 - Macrozoobenthos data and accompanied environmental data from the Black Sea	Update	YugNIRO	Southern Scientific Research Institute of Marine Fisheries and Oceanography	World Ocean Fisheries Resources Department	UKR
2017-08-18 10:00:02.117	2742	Phytoplankton data collected in the Black Sea during 33 cruise of the R/V "Professor Vodyanitskiy"	Update	NASU	National Academy of Sciences of Ukraine	Institute of Biology of the Southern Seas	UKR
2017-08-18 10:00:02.117	2670	Phytoplankton data collected in the Black Sea during 37 cruise of the R/V "Professor Vodyanitskiy"	Update	NASU	National Academy of Sciences of Ukraine	Institute of Biology of the Southern Seas	UKR
2017-08-18 10:00:02.117	737	Phytoplankton data collected in the Black Sea during a cruise of the R/V "Experiment"	Update	NASU	National Academy of Sciences of Ukraine	Institute of Biology of the Southern Seas	UKR
2017-08-18 10:00:02.117	14036	Phytoplankton of the northern part of the Black Sea 1992-1993	Update	UkrSCES	NULL	Ukrainian scientific center of Ecology of Sea	UKR
2017-08-18 10:00:02.117	1527	Phytoplankton data collected in the Black Sea during the 5th cruise of the R/V "Kiev"	Update	NASU	National Academy of Sciences of Ukraine	Institute of Biology of the Southern Seas	UKR
2017-08-18 10:00:02.117	2627	Phytoplankton data collected in the Black Sea during 107 cruise of the R/V "Kovalevskiy"	Update	NASU	National Academy of Sciences of Ukraine	Institute of Biology of the Southern Seas	UKR
2017-08-18 10:00:02.117	26357	Zooplankton in the Ukraine Black Sea shelf (1989-2005)	Update	UkrSCES	NULL	Ukrainian scientific center of Ecology of Sea	UKR
2017-08-18 10:00:02.117	879	Cetacean sightings in the Black Sea, Sea of Azov and Kerch Strait	Update	NULL	NULL	Brema Laboratory	UKR
2017-08-22 21:03:42.040	17599	Type locality distributions from the World Register of Marine Species	Update	SC	NULL	WoRMS Steering Committee	NULL
2017-09-22 21:03:08.380	17861	Type locality distributions from the World Register of Marine Species	Update	SC	NULL	WoRMS Steering Committee	NULL
2017-09-29	1610	Diversity of	new	UGent	Universiteit	Onderzoeksgroep	BEL

10:54:48.110		meiobenthos in tropical seagrass beds of Gazi Bay (Kenya) sampled from 16 to 19 July 1996			Gent	Mariene Biologie	
2017-09-29 10:54:48.110	2038	Semi-quantitative microplankton analysis (Sylt Roads Time Series) in the Wadden Sea off List, Sylt, North Sea in 2012	new	AWI	Alfred Wegener Institute for Polar- and Marine Research	Wadden Sea Station Sylt	DEU
2017-09-29 10:54:48.110	2333	Semi-quantitative microplankton analysis (Sylt Roads Time Series) in the Wadden Sea off List, Sylt, North Sea in 2011	new	AWI	Alfred Wegener Institute for Polar- and Marine Research	Wadden Sea Station Sylt	DEU
2017-09-29 10:54:48.110	2121	Semi-quantitative microplankton analysis (Sylt Roads Time Series) in the Wadden Sea off List, Sylt, North Sea in 2010	new	AWI	Alfred Wegener Institute for Polar- and Marine Research	Wadden Sea Station Sylt	DEU
2017-09-29 10:54:48.110	2376	Semi-quantitative microplankton analysis (Sylt Roads Time Series) in the Wadden Sea off List, Sylt, North Sea in 2009	new	AWI	Alfred Wegener Institute for Polar- and Marine Research	Wadden Sea Station Sylt	DEU
2017-09-29 10:54:48.110	1949	Semi-quantitative microplankton analysis (Sylt Roads Time Series) in the Wadden Sea off List, Sylt, North Sea in 1996	new	AWI	Alfred Wegener Institute for Polar- and Marine Research	Wadden Sea Station Sylt	DEU
2017-09-29 10:54:48.110	2899	Semi-quantitative microplankton analysis (Sylt Roads Time Series) in the Wadden Sea off List, Sylt, North Sea in 1995	new	AWI	Alfred Wegener Institute for Polar- and Marine Research	Wadden Sea Station Sylt	DEU
2017-09-29 10:54:48.110	2962	Semi-quantitative microplankton analysis (Sylt Roads Time Series) in the Wadden Sea off List, Sylt, North Sea in 1994	new	AWI	Alfred Wegener Institute for Polar- and Marine Research	Wadden Sea Station Sylt	DEU

2017-09-29 10:54:48.110	2542	Semi-quantitative microplankton analysis (Sylt Roads Time Series) in the Wadden Sea off List, Sylt, North Sea in 1993	new	AWI	Alfred Wegener Institute for Polar- and Marine Research	Wadden Sea Station Sylt	DEU
2017-09-29 10:54:48.110	3127	Semi-quantitative microplankton analysis (Sylt Roads Time Series) in the Wadden Sea off List, Sylt, North Sea in 1992	new	AWI	Alfred Wegener Institute for Polar- and Marine Research	Wadden Sea Station Sylt	DEU
2017-09-29 10:54:48.110	319	Seasonal variation of the zooplankton community at Gazi, Lamu and Malindi (Kenya) sampled between 1990 and 1992	new	VUB	Vrije Universiteit Brussel	Laboratorium voor Ecologie en Systematiek	BEL
2017-09-29 10:54:48.110	319	Seasonal variation of the zooplankton community at Gazi, Lamu and Malindi (Kenya) sampled between 1990 and 1992	new	VUB	Vrije Universiteit Brussel	Fundamental and Applied Marine Ecology Post Graduate Program	BEL
2017-09-29 10:54:48.110	2485	Study of epifauna and meiobenthos by means of cage experiments in a <i>Cerriops tagal</i> and <i>Avicennia marina</i> mangrove at Gazi Bay (Kenya) in August and September 1992	new	UGent	Universiteit Gent	Onderzoeksgroep Mariene Biologie	BEL
2017-09-29 10:54:48.110	2485	Study of epifauna and meiobenthos by means of cage experiments in a <i>Cerriops tagal</i> and <i>Avicennia marina</i> mangrove at Gazi Bay (Kenya) in August and September 1992	new	UGent	Universiteit Gent	Vakgroep Biologie	BEL
2017-09-29 10:54:48.110	2183	Study of epifauna and meiobenthos using field exclusion experiments in a <i>Cerriops tagal</i> and <i>Avicennia marina</i>	new	UGent	Universiteit Gent	Onderzoeksgroep Mariene Biologie	BEL

		mangrove at Gazi Bay (Kenya) in August and September 1992					
2017-09-29 10:54:48.110	2183	Study of epifauna and meiobenthos using field exclusion experiments in a <i>Ceriops tagal</i> and <i>Avicennia marina</i> mangrove at Gazi Bay (Kenya) in August and September 1992	new	UGent	Universiteit Gent	Vakgroep Biologie	BEL
2017-09-29 10:54:48.110	8	Summary of benthos at Gazi Bay, Kenya (EC-project 1989-1992)	new	UGent	Universiteit Gent	Vakgroep Biologie	BEL
2017-09-29 10:54:48.110	28598	Personal library collection of Martin Angel of published and unpublished Halocyprid (Ostracoda) occurrences	new	NHM	NULL	Natural History Museum	GRB
2017-09-29 10:54:48.110	2818	Semi-quantitative microplankton analysis (Sylt Roads Time Series) in the Wadden Sea off List, Sylt, North Sea in 2004	new	AWI	Alfred Wegener Institute for Polar- and Marine Research	Wadden Sea Station Sylt	DEU
2017-09-29 10:54:48.110	2766	Semi-quantitative microplankton analysis (Sylt Roads Time Series) in the Wadden Sea off List, Sylt, North Sea in 2003	new	AWI	Alfred Wegener Institute for Polar- and Marine Research	Wadden Sea Station Sylt	DEU
2017-09-29 10:54:48.110	2942	Semi-quantitative microplankton analysis (Sylt Roads Time Series) in the Wadden Sea off List, Sylt, North Sea in 2002	new	AWI	Alfred Wegener Institute for Polar- and Marine Research	Wadden Sea Station Sylt	DEU
2017-09-29 10:54:48.110	2673	Semi-quantitative microplankton analysis (Sylt Roads Time Series) in the Wadden Sea off List, Sylt, North Sea in 2001	new	AWI	Alfred Wegener Institute for Polar- and Marine Research	Wadden Sea Station Sylt	DEU

2017-09-29 10:54:48.110	1774	Semi-quantitative microplankton analysis (Sylt Roads Time Series) in the Wadden Sea off List, Sylt, North Sea in 1987	new	AWI	Alfred Wegener Institute for Polar- and Marine Research	Wadden Sea Station Sylt	DEU
2017-09-29 10:54:48.110	139	Macrobenthos of the mangroves of Gazi Bay (Kenya) sampled in September 1990	new	KMFRI	NULL	Kenya Marine and Fisheries Research Institute Mombasa Centre	KEN
2017-09-29 10:54:48.110	139	Macrobenthos of the mangroves of Gazi Bay (Kenya) sampled in September 1990	new	UGent	Universiteit Gent	Onderzoeksgroep Mariene Biologie	BEL
2017-09-29 10:54:48.110	2139	Mesozooplankton South Adriatic-PRISMA1-Flussi Project	Update	NULL	University of Trieste	Marine Biology Laboratory	ITA
2017-09-29 10:54:48.110	2068	Semi-quantitative microplankton analysis (Sylt Roads Time Series) in the Wadden Sea off List, Sylt, North Sea in 2013	new	AWI	Alfred Wegener Institute for Polar- and Marine Research	Wadden Sea Station Sylt	DEU
2017-09-29 10:54:48.110	2323	Semi-quantitative microplankton analysis (Sylt Roads Time Series) in the Wadden Sea off List, Sylt, North Sea in 2008	new	AWI	Alfred Wegener Institute for Polar- and Marine Research	Wadden Sea Station Sylt	DEU
2017-09-29 10:54:48.110	2606	Semi-quantitative microplankton analysis (Sylt Roads Time Series) in the Wadden Sea off List, Sylt, North Sea in 2006	new	AWI	Alfred Wegener Institute for Polar- and Marine Research	Wadden Sea Station Sylt	DEU
2017-09-29 10:54:48.110	3122	Semi-quantitative microplankton analysis (Sylt Roads Time Series) in the Wadden Sea off List, Sylt, North Sea in 1999	new	AWI	Alfred Wegener Institute for Polar- and Marine Research	Wadden Sea Station Sylt	DEU
2017-09-29 10:54:48.110	2775	Semi-quantitative microplankton analysis (Sylt Roads Time Series) in the Wadden Sea off List, Sylt, North Sea in 1997	new	AWI	Alfred Wegener Institute for Polar- and Marine Research	Wadden Sea Station Sylt	DEU

2017-09-29 10:54:48.110	2855	Semi-quantitative microplankton analysis (Sylt Roads Time Series) in the Wadden Sea off List, Sylt, North Sea in 1990	new	AWI	Alfred Wegener Institute for Polar- and Marine Research	Wadden Sea Station Sylt	DEU
2017-09-29 10:54:48.110	2320	Semi-quantitative microplankton analysis (Sylt Roads Time Series) in the Wadden Sea off List, Sylt, North Sea in 1988	new	AWI	Alfred Wegener Institute for Polar- and Marine Research	Wadden Sea Station Sylt	DEU
2017-09-29 10:54:48.110	690	Faunistic factors in the regeneration of mangroves of Gazi Bay and Mida Creek (Kenya)	new	VUB	Vrije Universiteit Brussel	Laboratorium voor Algemene Plantkunde en Natuurbeheer	BEL
2017-09-29 10:54:48.110	1289	Phytoplankton monitoring in the South Adriatic (Adricosm-STAR project), 2008-2009	new	OGS	NULL	National Institute of Oceanography and Experimental Geophysics	ITA
2017-09-29 10:54:48.110	3137	Phytoplankton South Adriatic-PRISMA1-Flussi Project	Update	OGS	NULL	National Institute of Oceanography and Experimental Geophysics	ITA
2017-09-29 10:54:48.110	2711	Semi-quantitative microplankton analysis (Sylt Roads Time Series) in the Wadden Sea off List, Sylt, North Sea in 2007	new	AWI	Alfred Wegener Institute for Polar- and Marine Research	Wadden Sea Station Sylt	DEU
2017-09-29 10:54:48.110	2637	Semi-quantitative microplankton analysis (Sylt Roads Time Series) in the Wadden Sea off List, Sylt, North Sea in 2005	new	AWI	Alfred Wegener Institute for Polar- and Marine Research	Wadden Sea Station Sylt	DEU
2017-09-29 10:54:48.110	2587	Semi-quantitative microplankton analysis (Sylt Roads Time Series) in the Wadden Sea off List, Sylt, North Sea in 2000	new	AWI	Alfred Wegener Institute for Polar- and Marine Research	Wadden Sea Station Sylt	DEU
2017-09-29 10:54:48.110	3066	Semi-quantitative microplankton analysis (Sylt Roads Time Series) in the Wadden Sea off List, Sylt, North Sea in 1998	new	AWI	Alfred Wegener Institute for Polar- and Marine Research	Wadden Sea Station Sylt	DEU

2017-09-29 10:54:48.110	2725	Semi-quantitative microplankton analysis (Sylt Roads Time Series) in the Wadden Sea off List, Sylt, North Sea in 1991	new	AWI	Alfred Wegener Institute for Polar- and Marine Research	Wadden Sea Station Sylt	DEU
2017-09-29 10:54:48.110	2914	Semi-quantitative microplankton analysis (Sylt Roads Time Series) in the Wadden Sea off List, Sylt, North Sea in 1989	new	AWI	Alfred Wegener Institute for Polar- and Marine Research	Wadden Sea Station Sylt	DEU
2017-10-23 09:12:07.180	18074	Type locality distributions from the World Register of Marine Species	Update	SC	NULL	WoRMS Steering Committee	NULL
2017-11-22 21:03:06.197	18277	Type locality distributions from the World Register of Marine Species	Update	SC	NULL	WoRMS Steering Committee	NULL
2017-12-15 09:39:23.903	9024	Norman and Florence Hammond records. Seawatch and coastal survey records	Update	NULL	NULL	Cumbria Biodiversity Data Centre	GRB
2017-12-15 09:39:23.903	23071	Echinoderm specimens of Museum d'Histoire Naturelle, France	Update	MNHN	NULL	National Natural History Museum Paris	FRA
2017-12-15 09:39:23.903	9274	Ecoscope Balbaya Database	new	IRD	NULL	Institut de Recherche pour le Développement	FRA
2017-12-15 09:39:23.903	374	Coastal and marine species	new	NULL	NULL	National Biodiversity Data Centre	EIR
2017-12-15 09:39:23.903	7721	Chondrichthyans Of Ireland	new	NULL	NULL	National Biodiversity Data Centre	EIR
2017-12-15 09:39:23.903	10534	Biological Reference Collections ICM CSIC	new	CSIC	Spanish Council for Scientific Research	Institute of Marine Sciences	ESP
2017-12-15 09:39:23.903	6215	Zariquiey Collection. Biological Reference Collections ICM CSIC	new	CSIC	Spanish Council for Scientific Research	Institute of Marine Sciences	ESP
2017-12-15 09:39:23.903	2839	Rocky Shore Macroalgae	new	NULL	NULL	National Biodiversity Data Centre	EIR
2017-12-15 09:39:23.903	122	Microphytobenthos monitoring in the Trieste harbour, North Adriatic Sea (Port Authority) in 2015	new	OGS	NULL	National Institute of Oceanography and Experimental Geophysics	ITA

2017-12-15 09:39:23.903	120	Fucus virsoides distribution in 1992-1993. Gulf of Trieste, North Adriatic	new	OGS	NULL	National Institute of Oceanography and Experimental Geophysics	ITA
2017-12-15 09:39:23.903	3086	Microphytobenthos in mussel farms - North Adriatic Sea (SosteMiTS Project) 2008-2009	new	OGS	NULL	National Institute of Oceanography and Experimental Geophysics	ITA
2017-12-22 21:02:49.597	18375	Type locality distributions from the World Register of Marine Species	Update	SC	NULL	WoRMS Steering Committee	NULL
2018-01-22 21:02:36.720	18618	Type locality distributions from the World Register of Marine Species	Update	SC	NULL	WoRMS Steering Committee	NULL
2018-02-22 21:03:03.230	18787	Type locality distributions from the World Register of Marine Species	Update	SC	NULL	WoRMS Steering Committee	NULL
2018-02-28 14:09:12.213	18805	Type locality distributions from the World Register of Marine Species	Update	SC	NULL	WoRMS Steering Committee	NULL
2018-03-12 10:22:38.797	525	Strandings along Romanian Black Sea coasts 2010-2016	Update	NIMRD	NULL	National Institute for Marine Research and Development "Grigore Antipa" Constanta	ROM
2018-03-12 10:22:38.797	525	Strandings along Romanian Black Sea coasts 2010-2016	Update	NULL	NULL	Mare Nostrum NGO	ROM
2018-03-12 10:22:38.797	28604	Phytoplankton North Adriatic-Gulf of Trieste LTER time-series	Update	OGS	NULL	National Institute of Oceanography and Experimental Geophysics	ITA
2018-03-12 10:22:38.797	3928	Allied Humpback Whale Catalogue, 1976 - 2003	Update	NULL	College of the Atlantic	Allied Whale	USA
2018-03-12 10:22:38.797	4871	Alnitak Cetaceans and sea turtles surveys off Southern Spain	Update	ALNITAK	NULL	ALNITAK Marine Research Centre	ESP
2018-03-12 10:22:38.797	1408	UK Royal Navy Marine Mammal Observations	Update	NULL	NULL	United Kingdom Hydrographic Office	GRB
2018-03-12 10:22:38.797	4215	YoNAH Encounter: The Years of the North Atlantic Humpback Whale	Update	USM	University of Southern Maine	Bioscience Research Institute	USA
2018-03-12 10:22:38.797	105	IMMRAC Marine mammal sightings from the Mediterranean's Levantine Basin	Update	IMMRAC	University of Haifa	Israel Marine Mammal Research and Assistance Center	ISR
2018-03-12 10:22:38.797	2060	Tracking of Arctic tern migrations 2007-2008	Update	GINR	NULL	Greenland Institute of Natural Resources	GRL

2018-03-12 10:22:38.797	155	Jonian Dolphin Conservation di Taranto marine mammal sightings 2009-2012	Update	NULL	NULL	Jonian Dolphin Conservation	ITA
2018-03-12 10:22:38.797	99	Cetaceans sightings by boat 2010-2016	Update	NIMRD	NULL	National Institute for Marine Research and Development "Grigore Antipa" Constanta	ROM
2018-03-12 10:22:38.797	99	Cetaceans sightings by boat 2010-2016	Update	NULL	NULL	Mare Nostrum NGO	ROM
2018-03-12 10:22:38.797	62	Cetaceans sightings from shore 2010-2016	Update	NULL	NULL	Mare Nostrum NGO	ROM
2018-03-12 10:22:38.797	62	Cetaceans sightings from shore 2010-2016	Update	NIMRD	NULL	National Institute for Marine Research and Development "Grigore Antipa" Constanta	ROM
2018-03-12 10:22:38.797	209039	PIROP Northwest Atlantic 1965-1992	Update	CWS	Canadian Federal Government	Canadian Wildlife Service	CAN
2018-03-12 10:22:38.797	2558	SCANS I cetacean sightings 1994	Update	USTAN	University of St Andrews	Sea Mammal Research Unit	GRB
2018-03-12 10:22:38.797	492	OceanCare cetacean sightings 2001-2014	Update	NULL	NULL	OceanCare	SCH
2018-03-12 10:22:38.797	1142	Tethys Research Institute aerial survey cetacean sightings 2009-2011	Update	NULL	NULL	Tethys Research Institute	ITA
2018-03-12 10:22:38.797	8469	Tethys Research Institute shipboard survey cetacean sightings 1986-2012	Update	NULL	NULL	Tethys Research Institute	ITA
2018-03-12 10:22:38.797	37	Fondazione Cetacea	new	NULL	NULL	Fondazione Cetacea	ITA
2018-03-12 10:22:38.797	321	Canary Islands - OAG	new	OAG	NULL	Granadilla Environmental Observatory	ESP
2018-03-12 10:22:38.797	35	Study of young rehabilitated harbour seal in the north of France	new	CHENE	NULL	Association Chene	FRA
2018-03-12 10:22:38.797	51	Loggerheads in the Adriatic Sea	new	NULL	University of Pisa	Islameta Group	ITA
2018-03-12 10:22:38.797	93	AdriaWatch project	new	NULL	University of Pisa	Islameta Group	ITA
2018-03-12 10:22:38.797	21	Juvenile loggerheads from Lampedusa Island, Italy	new	NULL	University of Pisa	Islameta Group	ITA
2018-03-12 10:22:38.797	20	First satellite tracking of sea turtles in Albania	new	MEDASSET	NULL	Mediterranean Association to save the sea turtles	HEL
2018-03-12	169	Islas Canarias	new	ICCM	NULL	Instituto Canario	ESP

10:22:38.797		(Proyecto Aegina): juvenile loggerheads				de Ciencias Marinas	
2018-03-12 10:22:38.797	539	IFREMER/Kélonia satellite tracked late juvenile loggerhead sea turtles from Réunion Island 2008-2012	new	IFREMER	NULL	Institut Français de Recherche pour l'Exploitation de la Mer	FRA
2018-03-12 10:22:38.797	539	IFREMER/Kélonia satellite tracked late juvenile loggerhead sea turtles from Réunion Island 2008-2012	new	NULL	NULL	Kélonia	FRA
2018-03-12 10:22:38.797	1011	SCANS II cetacean sightings on primary platform of vessel surveys 2005	new	USTAN	University of St Andrews	Sea Mammal Research Unit	GRB
2018-03-12 10:22:38.797	27	Acoustic detections of sperm whales from research cruises in the Med sea, 1994-2001	new	CIBRA	Università degli Studi di Pavia	Interdisciplinary Centre for Bioacoustics	ITA
2018-03-12 10:22:38.797	244	Microphytobenthos monitoring in the Mar Piccolo of Taranto. 2013- 2014	new	OGS	NULL	National Institute of Oceanography and Experimental Geophysics	ITA
2018-03-12 10:22:38.797	220	Adult female elephant seals Post-Breeding 2015	new	NULL	University of California, Santa Cruz	Costa Lab	USA
2018-03-12 10:22:38.797	13	North Cyprus 2015 - Green Turtles	new	NULL	NULL	Marine Turtle Research Group	GRB
2018-03-12 10:22:38.797	78	Spain-Balearic Is. 2015 Loggerhead Turtles	new	NULL	NULL	Fisheries Bycatch Research Group	NULL
2018-03-12 10:22:38.797	298	Giant Devil Rays in the North-Western Mediterranean Sea	new	NULL	NULL	Tethys Research Institute	ITA
2018-03-12 10:22:38.797	65	Andalusia, Spain. Small loggerheads from a nest at Pulpí (Almería)	new	DCAN	Technical University of Valencia	Departamento de Ciencia Animal	ESP
2018-03-12 10:22:38.797	509	Observatoire Pelagis sightings from fishery surveys 2004- 2009	new	NULL	Université de La Rochelle	Observatoire Pelagis (UMS 3462)	FRA
2018-03-12 10:22:38.797	111453	Observatoire Pelagis aerial surveys 2002- 2015	new	NULL	Université de La Rochelle	Observatoire Pelagis (UMS 3462)	FRA
2018-03-12 10:22:38.797	49327	Observatoire Pelagis boat surveys 2003- 2016	new	NULL	Université de La Rochelle	Observatoire Pelagis (UMS 3462)	FRA

2018-03-12 10:22:38.797	100	Canary Islands	new	NULL	NULL	Proyecto Aegina	ESP
2018-03-12 10:22:38.797	4	Green turtles in the Canary Islands	new	NULL	NULL	ADS Biodiversidad	ESP
2018-03-12 10:22:38.797	7027	Visual sightings from Song of the Whale 1993-2013	new	IFAW	NULL	International Fund for Animal Welfare	USA
2018-03-12 10:22:38.797	63	Cetacean coordinated transborder monitoring using ferries as platforms of observation off Tunisia 2013-2014 - Atutax	new	ATUTAX	NULL	L'Association Tunisienne de Taxonomie	NULL
2018-03-12 10:22:38.797	82	Cetacean coordinated transborder monitoring using ferries as platforms of observation off Tunisia 2013-2014 - Ketos	new	KETOS	NULL	Associazione Culturale Scientifica Ketos	ITA
2018-03-12 10:22:38.797	3355	Atlantic grey seal breeding colonies in Hay and Saddle Islands, Nova Scotia	new	NULL	Duke University	Marine Geospatial Ecology Lab	USA
2018-03-12 10:22:38.797	17	Russian Barnacle Geese	new	RUG	NULL	Rijksuniversiteit Groningen	NED
2018-03-12 10:22:38.797	111	Conservación y preservación de tortugas marinas	new	CRAM	NULL	Fundación para la Conservación y Recuperation de Animals Marinos	ESP
2018-03-12 10:22:38.797	73	Spain Tags merged	new	SEFSC	Federal Government of the United States of America	Southeast Fisheries Science Center	USA
2018-03-12 10:22:38.797	56	Israel's sea turtle monitoring program	new	NULL	Israel Nature and Parks Authority	Sea Turtle Rescue Center	ISR
2018-03-12 10:22:38.797	838	SCANS II cetacean sightings from aerial surveys 2005	new	USTAN	University of St Andrews	Sea Mammal Research Unit	GRB
2018-03-12 10:22:38.797	967	SCANS II cetacean sightings on tracker platform of vessel surveys 2005	new	USTAN	University of St Andrews	Sea Mammal Research Unit	GRB
2018-03-12 10:22:38.797	90	Visual contacts from research cruises in the Med sea, 1994-2001	new	CIBRA	Università degli Studi di Pavia	Interdisciplinary Centre for Bioacoustics	ITA
2018-03-12 10:22:38.797	56	University of Liverpool seabird tracking in Anguilla 2012-2015	new	NULL	NULL	University of Liverpool	GRB

2018-03-12 10:22:38.797	17	Tracking small loggerheads from spanish nests	new	DCAN	Technical University of Valencia	Departamento de Ciencia Animal	ESP
2018-03-12 10:22:38.797	312	Northern Elephant Seals Post-Breeding 2016	new	NULL	University of California, Santa Cruz	Costa Lab	USA
2018-03-12 10:22:38.797	288	Sea Turtles of Dominica	new	DomSeTCO	NULL	Dominica's Sea Turtle Conservation Organization Inc.	NULL
2018-03-12 10:22:38.797	137	Sea Turtles of Dominica	new	DomSeTCO	NULL	Dominica's Sea Turtle Conservation Organization Inc.	NULL
2018-03-12 10:22:38.797	824	Northern Elephant Seals Post-Molting 2016	new	NULL	Duke University	Marine Geospatial Ecology Lab	USA
2018-03-12 10:22:38.797	24053	Observatoire Pelagis - Reseau National Echouage (French stranding network) strandings 1934-2015	new	NULL	Université de La Rochelle	Observatoire Pelagis (UMS 3462)	FRA
2018-03-12 10:22:38.797	1251	Phytoplankton collected in the Po River Delta - North Adriatic Sea (RITMARE Project) 2013-2014	new	OGS	NULL	National Institute of Oceanography and Experimental Geophysics	ITA
2018-03-22 21:03:03.273	18997	Type locality distributions from the World Register of Marine Species	Update	SC	NULL	WoRMS Steering Committee	NULL
2018-04-16 09:29:36.350	1008420	Continuous Plankton Recorder Dataset (SAHFOS) - Phytoplankton	Update	SAHFOS	NULL	The Sir Alister Hardy Foundation for Ocean Science	GRB
2018-04-16 09:29:37.350	2146112	Continuous Plankton Recorder Dataset (SAHFOS) - Zooplankton	Update	SAHFOS	NULL	The Sir Alister Hardy Foundation for Ocean Science	GRB
2018-04-16 09:30:12.350	2318	Ongoing UK MarLIN Shore Thing timed search results	Update	MBA	NULL	Marine Biological Association of the UK	GRB
2018-04-16 09:46:12.350	111453	Observatoire Pelagis aerial surveys 2002-2015	Update	NULL	Université de La Rochelle	Observatoire Pelagis (UMS 3462)	FRA
2018-04-16 09:46:14.350	49327	Observatoire Pelagis boat surveys 2003-2016	Update	NULL	Université de La Rochelle	Observatoire Pelagis (UMS 3462)	FRA
2018-04-16 09:46:22.350	99235	ICES Phytobenthos community dataset	new	ICES	NULL	International Council for the Exploration of the Sea	DMK
2018-04-16 09:46:23.350	452549	ICES Phytoplankton Community dataset	new	ICES	NULL	International Council for the Exploration of the Sea	DMK

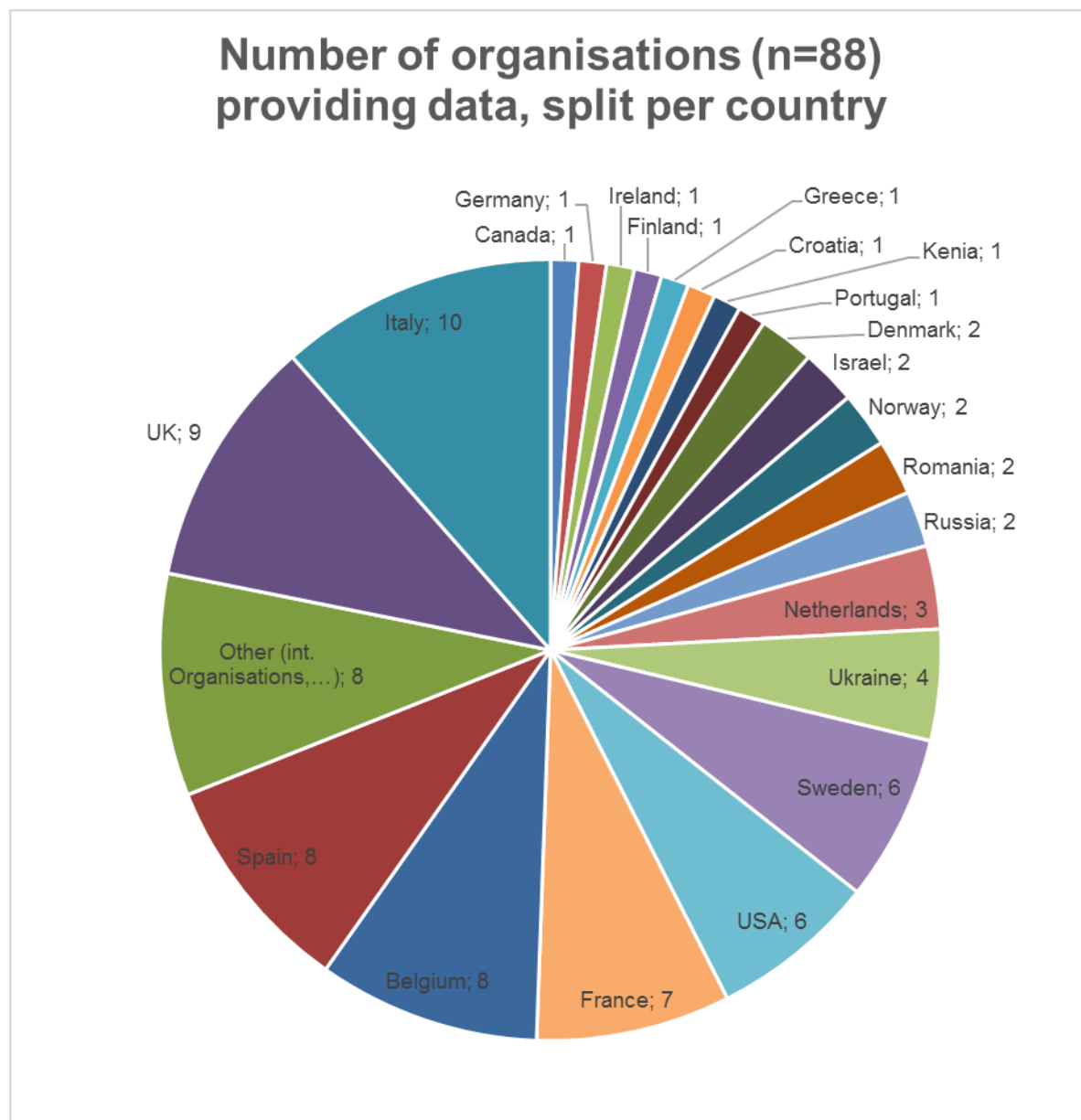
2018-04-16 09:46:24.350	210683	ICES Zooplankton Community dataset	new	ICES	NULL	International Council for the Exploration of the Sea	DMK
2018-04-16 09:46:26.350	407	Megafaunal data from the 2009 BIOFUN trans- Mediterranean deep-sea cruise	new	CSIC	Spanish Council for Scientific Research	Institute of Marine Sciences	ESP
2018-04-16 09:46:26.350	407	Megafaunal data from the 2009 BIOFUN trans- Mediterranean deep-sea cruise	new	NIVA	NULL	Norwegian Institute for Water Research	NOR
2018-04-16 09:46:28.350	2070	Macrozoobenthos data collected in the East Constanta sector of the Romanian marine waters between 1977 and 1999	new	NIMRD	NULL	National Institute for Marine Research and Development "Grigore Antipa" Constanta	ROM
2018-04-16 09:46:29.350	2467	Macrozoobenthos data collected in the Northern part of the Romanian littoral (Danube mouths) between 1977 and 1999	new	NIMRD	NULL	National Institute for Marine Research and Development "Grigore Antipa" Constanta	ROM
2018-04-16 09:46:30.350	436	Macrozoobenthos collected from the longitudinal profiles in the Romanian marine waters between 1986-1990	new	NIMRD	NULL	National Institute for Marine Research and Development "Grigore Antipa" Constanta	ROM
2018-04-16 09:46:31.350	2633	Northern shrimp (Pandalus borealis) in the Norwegian Deep and Skagerrak, 1984-2017	new	IMR	NULL	Institute of Marine Research	NOR
2018-04-16 09:46:32.350	3039	Red king crab survey data from Finnmark Northern Norway in the period 1994 -2016	new	IMR	NULL	Institute of Marine Research	NOR
2018-04-16 09:46:33.350	58386	Dutch long term monitoring of macrobenthos in the Dutch Continental Economical Zone of the North Sea	new	RWS	Ministerie van Infrastructuur en Milieu	Rijkswaterstaat	NED
2018-04-16 09:46:34.350	1767	Phyto- and microzooplankton in mussel farms - North Adriatic Sea (SosteMiTS Project) 2008- 2009	new	OGS	NULL	National Institute of Oceanography and Experimental Geophysics	ITA
2018-04-16 09:46:35.350	762	Microzooplankton monitoring in the Mar Piccolo of	new	OGS	NULL	National Institute of Oceanography and Experimental	ITA

		Taranto. 2013-2014				Geophysics	
2018-04-16 09:46:36.350	608	Microphytobenthos in Panarea Island. ECO2 Project	new	OGS	NULL	National Institute of Oceanography and Experimental Geophysics	ITA
2018-04-16 09:46:37.350	1391	Phytoplankton in the South Adriatic Sea (MEDGES Experiment) 2013	new	OGS	NULL	National Institute of Oceanography and Experimental Geophysics	ITA
2018-04-16 09:46:38.350	139	Phytoplankton monitoring in Grado, GO - North Adriatic Sea. 2016	new	OGS	NULL	National Institute of Oceanography and Experimental Geophysics	ITA
2018-04-16 09:46:39.350	1413	Phytoplankton in the South Adriatic Sea (ADREX Experiment) 2014	new	OGS	NULL	National Institute of Oceanography and Experimental Geophysics	ITA
2018-04-16 09:46:40.350	85786	Finnish Baltic Sea benthic monitoring, POHJE database	new	FEI/SYKE	NULL	Finnish Environment Institute	FIN
2018-04-16 09:46:41.350	265066	SHARK - National Epibenthos monitoring in Sweden since 1992	new	NULL	NULL	Linnaeus University	SVE
2018-04-16 09:46:41.350	265066	SHARK - National Epibenthos monitoring in Sweden since 1992	new	SMHI	NULL	Swedish Meteorological and Hydrological Institute	SVE
2018-04-16 09:46:41.350	265066	SHARK - National Epibenthos monitoring in Sweden since 1992	new	SU	NULL	Stockholm University	SVE
2018-04-16 09:46:41.350	265066	SHARK - National Epibenthos monitoring in Sweden since 1992	new	SEPA	NULL	Swedish Environmental Protection Agency	SVE
2018-04-16 09:46:41.350	265066	SHARK - National Epibenthos monitoring in Sweden since 1992	new	NULL	NULL	University of Gothenburg	SVE
2018-04-16 09:46:41.350	265066	SHARK - National Epibenthos monitoring in Sweden since 1992	new	NULL	NULL	Swedish Agency for Marine and Water Management	SVE
2018-04-16 09:46:42.350	4084	Subtidal macrobenthos monitoring in function of a foreshore suppletion at the Belgian coast, period 2013-2016	new	ILVO	Vlaamse overheid	Instituut voor landbouw- , visserij en voedingsonderzoek	BEL
2018-04-16 09:46:43.350	162235	ICES Zoobenthos Community dataset	new	ICES	NULL	International Council for the Exploration of the	DMK

						Sea	
2018-04-16 09:46:44.350	2257	Subtidal hyperbenthos monitoring in function of a foreshore suppletion at the Belgian coast, period 2013-2016	new	ILVO	Vlaamse overheid	Instituut voor landbouw- , visserij en voedingsonderzoek	BEL
2018-04-16 09:46:45.350	1396	Subtidal epibenthos and demersal fish monitoring in function of a foreshore suppletion at the Belgian coast, period 2013-2016	new	ILVO	Vlaamse overheid	Instituut voor landbouw- , visserij en voedingsonderzoek	BEL
2018-04-16 09:46:46.350	2014	Benthic fauna collected in the Arrábida Marine Protected Area (SW Portugal) from 2007 to 2009	new	IPMA	NULL	Instituto Português do Mar e da Atmosfera	POR
2018-04-16 09:46:47.350	256	Benthic macrofauna of the Ericeira coast (central Portugal) collected in May 2001	new	IPMA	NULL	Instituto Português do Mar e da Atmosfera	POR
2018-04-16 09:46:48.350	627	Benthic fauna of the Southwest Alentejo and Vicentine Coast Natural Park (SW Portugal) collected in August 2011	new	IPMA	NULL	Instituto Português do Mar e da Atmosfera	POR
2018-04-16 09:46:49.350	1156	Macrozoobenthos of marine waters in mainland Portugal collected in March and September 2010	new	IPMA	NULL	Instituto Português do Mar e da Atmosfera	POR
2018-04-16 09:46:51.350	5993	Phytoplankton composition, primary production and chlorophyll a from 1966-2017 in the Middle Adriatic	new	IZOR	NULL	Institute of Oceanography and Fisheries	HRV
2018-04-16 09:46:52.350	246760	SHARK - Regional monitoring and monitoring projects of Epibenthos in Sweden since 1994	new	NULL	NULL	Swedish county administration boards	NULL
2018-04-16 09:46:52.350	246760	SHARK - Regional monitoring and monitoring projects of Epibenthos in Sweden since	new	NULL	NULL	Swedish municipalities	NULL

		1994					
2018-04-16 09:46:52.350	246760	SHARK - Regional monitoring and monitoring projects of Epibenthos in Sweden since 1994	new	SMHI	NULL	Swedish Meteorological and Hydrological Institute	SVE
2018-04-16 09:46:53.350	4149	Temporal evolution of zooplankton by WP2 net in the Northwestern Mediterranean Sea, Villefranche-sur-mer 2004-2010	new	CNRS	The National Center for Scientific Research	Observatoire Océanologique de Villefranche sur Mer	FRA
2018-04-16 09:46:54.350	5629	Temporal evolution of zooplankton by Regent net in the Northwestern Mediterranean Sea, Villefranche-sur-mer, 1959-2010	new	CNRS	The National Center for Scientific Research	Observatoire Océanologique de Villefranche sur Mer	FRA
2018-04-16 09:46:55.350	3606	Temporal evolution of zooplankton, surface observations, in the Northwestern Mediterranean Sea, Villefranche-sur-mer 1898-1917	new	CNRS	The National Center for Scientific Research	Observatoire Océanologique de Villefranche sur Mer	FRA
2018-04-16 09:46:56.350	7099	Temporal evolution of zooplankton by Juday-Bogorov net in the Northwestern Mediterranean Sea. Villefranche-sur-mer, 1966-1999	new	CNRS	The National Center for Scientific Research	Observatoire Océanologique de Villefranche sur Mer	FRA
2018-04-16 09:46:57.350	1123600	RSMP Baseline Dataset	new	CEFAS	NULL	Centre for Environment, Fisheries and Aquaculture Science	GRB
2018-04-16 09:46:58.350	273002	Royal Netherlands Institute for Sea Research (NIOZ) - Kom Fyke Mokbaai	new	NIOZ	NULL	Koninklijk Nederlands Instituut voor Onderzoek der Zee	NED

Indicator 2 - Organisations supplying each type of data broken down into country and organisation type (e.g. government, industry, science)



<i>Institute (n=88)</i>	<i>Top organisation</i>	<i>Acronym</i>	<i>Country</i>	<i>Category</i>
Fundamental and Applied Marine Ecology Post Graduate Program	Vrije Universiteit Brussel	VUB	BEL	University
Instituut voor landbouw- , visserij en voedingsonderzoek	Vlaamse overheid	ILVO	BEL	Governmental organisations

Laboratorium Plantkunde	Universiteit Gent	UGent	BEL	University
Laboratorium voor Algemene Plantkunde en Natuurbeheer	Vrije Universiteit Brussel	VUB	BEL	University
Laboratorium voor Ecologie en Systematiek	Vrije Universiteit Brussel	VUB	BEL	University
Onderzoeksgroep Mariene Biologie	Universiteit Gent	UGent	BEL	University
Universiteit Antwerpen	NULL	UA	BEL	University
Vakgroep Biologie	Universiteit Gent	UGent	BEL	University
Vrije Universiteit Brussel	NULL	VUB	BEL	University
Canadian Wildlife Service	Canadian Federal Governmental organisations	CWS	CAN	Science
Wadden Sea Station Sylt	Alfred Wegener Institute for Polar- and Marine Research	AWI	DEU	Governmental organisations
International Council for the Exploration of the Sea	NULL	ICES	DMK	Science
National Biodiversity Data Centre	NULL	NULL	EIR	Science
ADS Biodiversidad	NULL	NULL	ESP	Company, civil society, NGO
ALNITAK Marine Research Centre	NULL	ALNITAK	ESP	University
Departamento de Ciencia Animal	Technical University of Valencia	DCAN	ESP	University
Fundación para la Conservación y Recuperación de Animales Marinos	NULL	CRAM	ESP	Company, civil society, NGO
Granadilla Environmental Observatory	NULL	OAG	ESP	Science
Institute of Marine Sciences	Spanish Council for Scientific Research	CSIC	ESP	Governmental organisations
Instituto Canario de Ciencias Marinas	NULL	ICCM	ESP	Science
Proyecto Aegina	NULL	NULL	ESP	Science
Finnish Environment Institute	NULL	FEI/SYKE	FIN	Governmental organisations
Association Chene	NULL	CHENE	FRA	Company, civil society, NGO
Institut de Recherche pour le Développement	NULL	IRD	FRA	Science
Institut Français de Recherche pour l'Exploitation de la Mer	NULL	IFREMER	FRA	Governmental organisations
Kélonia	NULL	NULL	FRA	Company, civil society, NGO
National Natural History Museum Paris	NULL	MNHN	FRA	Science
Observatoire Océanologique de Villefranche sur Mer	The National Center for Scientific Research	CNRS	FRA	Science
Observatoire Pelagis (UMS 3462)	Université de La Rochelle	NULL	FRA	Science
Centre for Environment, Fisheries and Aquaculture Science	NULL	CEFAS	GRB	Governmental organisations
Cumbria Biodiversity Data Centre	NULL	NULL	GRB	Science
Marine Biological Association of the UK	NULL	MBA	GRB	Science

Marine Turtle Research Group	NULL	NULL	GRB	Science
Natural History Museum	NULL	NHM	GRB	Science
Sea Mammal Research Unit	University of St Andrews	USTAN	GRB	University
The Sir Alister Hardy Foundation for Ocean Science	NULL	SAHFOS	GRB	Science
United Kingdom Hydrographic Office	NULL	NULL	GRB	Governmental organisations
University of Liverpool	NULL	NULL	GRB	University
Greenland Institute of Natural Resources	NULL	GINR	GRL	Science
Mediterranean Association to save the sea turtles	NULL	MEDASSET	HEL	Company, civil society, NGO
Institute of Oceanography and Fisheries	NULL	IZOR	HRV	Governmental organisations
Israel Marine Mammal Research and Assistance Center	University of Haifa	IMMRAC	ISR	Science
Sea Turtle Rescue Center	Israel Nature and Parks Authority	NULL	ISR	Science
Associazione Culturale Scientifica Ketos	NULL	KETOS	ITA	Company, civil society, NGO
Branch office Chioggia	Italian National Institute for Environmental Protection and Research	ISPRA	ITA	Governmental organisations
Fondazione Cetacea	NULL	NULL	ITA	Company, civil society, NGO
Interdisciplinary Centre for Bioacoustics	Università degli Studi di Pavia	CIBRA	ITA	University
Islameta Group	University of Pisa	NULL	ITA	University
Jonian Dolphin Conservation	NULL	NULL	ITA	Company, civil society, NGO
Marine Biology Laboratory	University of Trieste	NULL	ITA	University
National Institute of Oceanography and Experimental Geophysics	NULL	OGS	ITA	Science
Tethys Research Institute	NULL	NULL	ITA	Science
University of Florence	NULL	NULL	ITA	University
Kenya Marine and Fisheries Research Institute Mombasa Centre	NULL	KMFRI	KEN	Governmental organisations
Koninklijk Nederlands Instituut voor Onderzoek der Zee	NULL	NIOZ	NED	Science
Rijksuniversiteit Groningen	NULL	RUG	NED	University
Rijkswaterstaat	Ministerie van Infrastructuur en Milieu	RWS	NED	Governmental organisations
Institute of Marine Research	NULL	IMR	NOR	Governmental organisations
Norwegian Institute for Water Research	NULL	NIVA	NOR	Science
Department of plankton	National Academy of Sciences of Ukraine	NASU	NULL	Governmental organisations
Dominica's Sea Turtle Conservation	NULL	DomSeTCO	NULL	Company,

Organization Inc.				civil society, NGO
Fisheries Bycatch Research Group	NULL	NULL	NULL	Science
L'Association Tunisienne de Taxonomie	NULL	ATUTAX	NULL	Science
Swedish county administration boards	NULL	NULL	NULL	Governmental organisations
Swedish municipalities	NULL	NULL	NULL	Governmental organisations
WoRMS Steering Committee	NULL	SC	NULL	Science
Instituto Português do Mar e da Atmosfera	NULL	IPMA	POR	Governmental organisations
Mare Nostrum NGO	NULL	NULL	ROM	Company, civil society, NGO
National Institute for Marine Research and Development "Grigore Antipa" Constanta	NULL	NIMRD	ROM	Science
Department of Hydrobiology	Lomonosov Moscow State University	MSU	RUS	University
P. P. Shirshov Institute of Oceanology	Russian Academy of Sciences	RAS	RUS	Governmental organisations
OceanCare	NULL	NULL	SCH	Company, civil society, NGO
Linnaeus University	NULL	NULL	SVE	University
Stockholm University	NULL	SU	SVE	University
Swedish Agency for Marine and Water Management	NULL	NULL	SVE	Governmental organisations
Swedish Environmental Protection Agency	NULL	SEPA	SVE	Governmental organisations
Swedish Meteorological and Hydrological Institute	NULL	SMHI	SVE	Governmental organisations
University of Gothenburg	NULL	NULL	SVE	University
Brema Laboratory	NULL	NULL	UKR	Science
Institute of Biology of the Southern Seas	National Academy of Sciences of Ukraine	NASU	UKR	Governmental organisations
Ukrainian scientific center of Ecology of Sea	NULL	UkrSCES	UKR	Governmental organisations
World Ocean Fisheries Resources Department	Southern Scientific Research Institute of Marine Fisheries and Oceanography	YugNIRO	UKR	Science
Allied Whale	College of the Atlantic	NULL	USA	University
Bioscience Research Institute	University of Southern Maine	USM	USA	University
Costa Lab	University of California, Santa Cruz	NULL	USA	Science
International Fund for Animal Welfare	NULL	IFAW	USA	Company, civil society, NGO
Marine Geospatial Ecology Lab	Duke University	NULL	USA	University
Southeast Fisheries Science Center	Federal Governmental organisations of the United States of America	SEFSC	USA	Governmental organisations

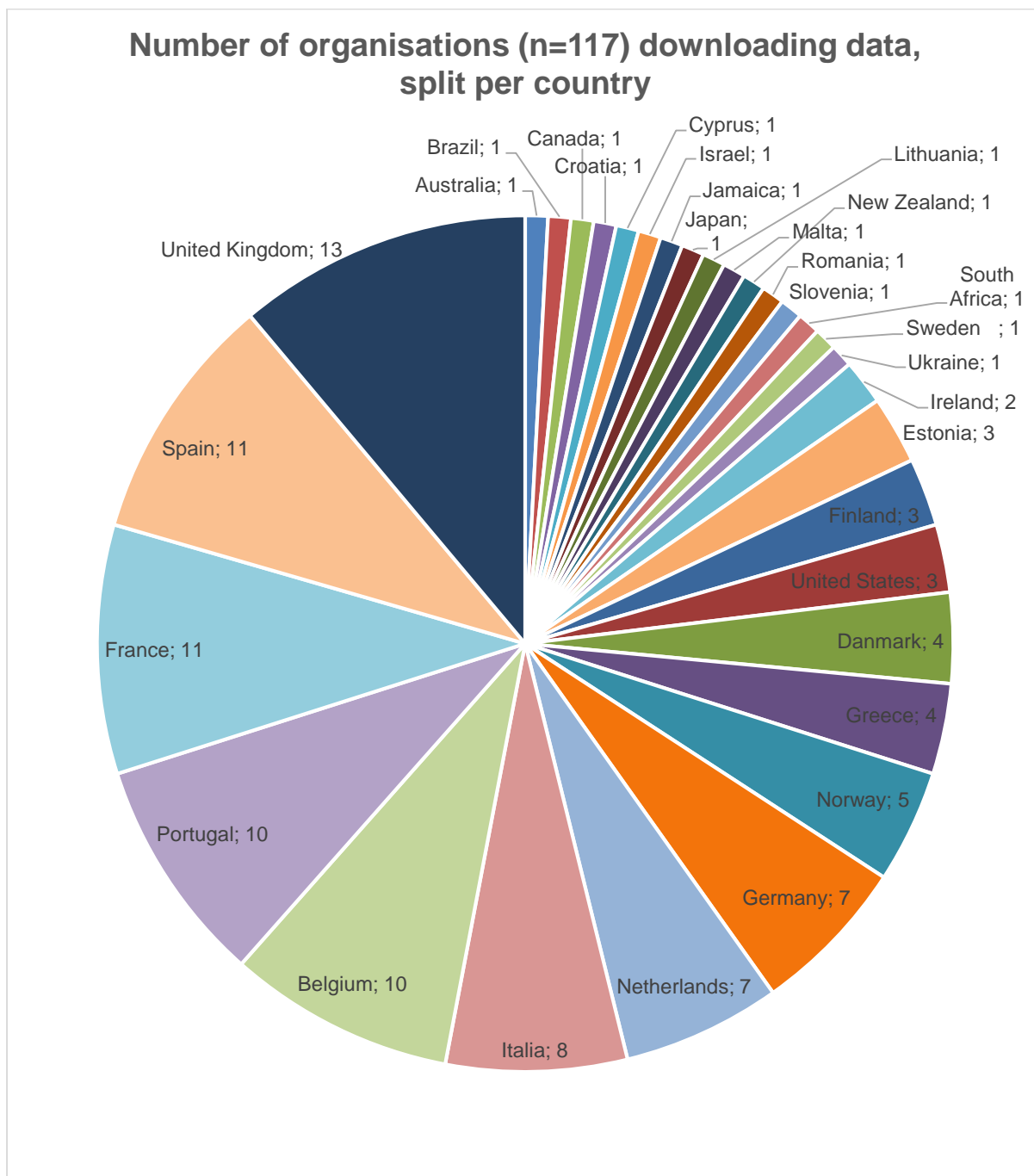
Indicator 3 - Organisations that have been approached to supply data with no result

We contacted Birdlife to check if they are willing to contribute their Seabird tracking database to EMODnet biology. The request was re-iterated by DMARE. At the moment we are waiting for their response. They mentioned it might be difficult as it is not an open database. One reason mentioned was that the data is collected by different people across the BirdLife partnership and a lot of this research might not be published yet.

Indicator 4 - Volume of each type of data and of each data product downloaded from the portal

Date	Number of downloads
20/04/2017– 20/07/2017	310 downloads
21/07/2017– 20/10/2017	165 downloads
21/10/2017– 20/01/2018	217 downloads
21/01/2018– 20/04/2018	234 downloads
20/04/2017– 20/04/2018	926 downloads

Indicator 5 - Organisations that have downloaded each data type



Organization (n=117)	country	Category
University of Tasmania	Australia	University
Merkator	Belgium	Governmental organisations

ULg	Belgium	University
UNESCO	Belgium	Science
IOC	Belgium	Science
Colruyt Group	Belgium	Company, civil society, NGO
EMODnet	Belgium	Science
EMODnet Secretariat	Belgium	Science
Flanders Marine Institute (VLIZ)	Belgium	Science
Ghent University	Belgium	University
VLIZ	Belgium	Science
UFRN	Brazil	Science
University of Alberta	Canada	University
enveco	Greece	Company, civil society, NGO
IOR Split	Croatia	University
Enalia Physis Environmental Research Centre	Cyprus	University
DTU-Aqua	Danmark	University
Geodatastyrelsen	Danmark	Science
DTU-Aqua	Danmark	University
ICES	Denmark	Science
Estonian Marine Institute	Estonia	Governmental organisations
Tallinn University of Technology	Estonia	Governmental organisations
Estonian Marine Institute	Estonia	Governmental organisations
Åbo Akademi	Finland	University
Finnish Environment Institute	Finland	Governmental organisations
Syke	Finland	Governmental organisations
AGROCAMPUS OUEST	France	Company, civil society, NGO
BRL ingenierie	France	Science
Cerema	France	Company, civil society, NGO
EurAka Modélisation	France	Company, civil society, NGO
IFREMER	France	Governmental organisations
SINAY	France	Company, civil society, NGO
Thales Research	France	Company, civil society, NGO
BRL ingenierie	France	Governmental organisations
SINAY	France	Company, civil society, NGO
Thales Research	France	Company, civil society, NGO

Freelance	France	Company, civil society, NGO
Alfred-Wegener-Institut, Helmholtz-Zentrum für Polar- und Meeresforschung	Germany	Science
Geomar	Germany	Science
Helmholtz-Zentrum Geesthacht	Germany	Science
Institute for Hydrobiology and Fisheries Science	Germany	Science
PANGAEA, Data Publisher for Earth and Environmental Science	Germany	Science
Helmholtz-Zentrum Geesthacht	Germany	Science
BioConsult SH	Germany	Company, civil society, NGO
Democritus University of Thrace	Greece	University
Hellenic Center for Marine Research - Institute of Marine Biology Biotechnology and Aquaculture	Greece	Science
University of Piraeus	Greece	University
Marine Institute Ireland	Ireland	Science
UCC	Ireland	Science
Hebrew University	Israel	University
Università del Salento	Italia	University
Circolo 1554	Italia	Company, civil society, NGO
INGV	Italy	Science
unive	italy	University
University	Italy	University
University of Padova	Italy	University
University of Salento	Italy	University
OGS	Italy	Science
International Seabed authority	Jamaica	
Tokyo University of Marine Science and Technology	Japan	University
Klaipeda University	Lithuania	University
AquaBioTech	Malta	Science
informatiehuis marien	Nederland	Governmental organisations
IHE-Delft	Netherlands	Company, civil society, NGO
NIOZ	Netherlands	Science
Hydrography	Netherlands	Science
Deltares	Netherlands	Governmental organisations
UN-IHE Delft	Netherlands	Company, civil society, NGO
University of Auckland	New Zealand	University
AHO	Norway	Science
OCLAB	Norway	Science
The Oslo School of Architecture and Design	Norway	University

University of Bergen	Norway	University
University of Oslo	Norway	University
CCMAR	Portugal	Science
CIIMAR	Portugal	Science
FCT-UNL	Portugal	Science
HIDROMOD	Portugal	Science
IMAR	Portugal	Science
Instituto Hidrográfico	Portugal	Science
IST	Portugal	Science
Universidade do Algarve - CCMAR	Portugal	University
University of Algarve	Portugal	University
University of the Azores	Portugal	University
NIMRD "Grigore Antipa"	Romania	Governmental organisations
national Institute of Biology	Slovenia	Governmental organisations
South African National Biodiversity Institute	South Africa	Science
Observatorio Ambiental Granadilla	Spain	Science
Heraspace startup candidate ESA BIC	Spain	Company, civil society, NGO
IRTA	Spain	Science
Santiago de Compostela University	Spain	University
SOCIB	Spain	Science
Spanish Research Council	Spain	Governmental organisations
Santiago de Compostela University	Spain	University
UCA	Spain	University
University of Malaga	Spain	University
UPV	Spain	Governmental organisations
AZTI	Spain	Governmental organisations
SMHI	sweden	Governmental organisations
Wageningen University & Research	The Netherlands	University
Odessa National I.I.Mechnikov University	Ukraine	University
Cefas	United Kingdom	Governmental organisations
Imperial	United Kingdom	
JNCC	United Kingdom	Governmental organisations
Ramboll environ	United Kingdom	Company, civil society, NGO
Sheffield University	United Kingdom	University
MSC	United Kingdom	Company, civil society, NGO
Heriot Watt University	United Kingdom	University
Plymouth University	United Kingdom	University

Portsmouth University	United Kingdom	University
QMUL	United Kingdom	Company, civil society, NGO
University of Bristol	United Kingdom	University
University of Cambridge, Department of Earth Sciences	United Kingdom	University
University of Bristol	United Kingdom	University
Duke University	United States	University
OSU	United States	University
University of Florida	United States	University

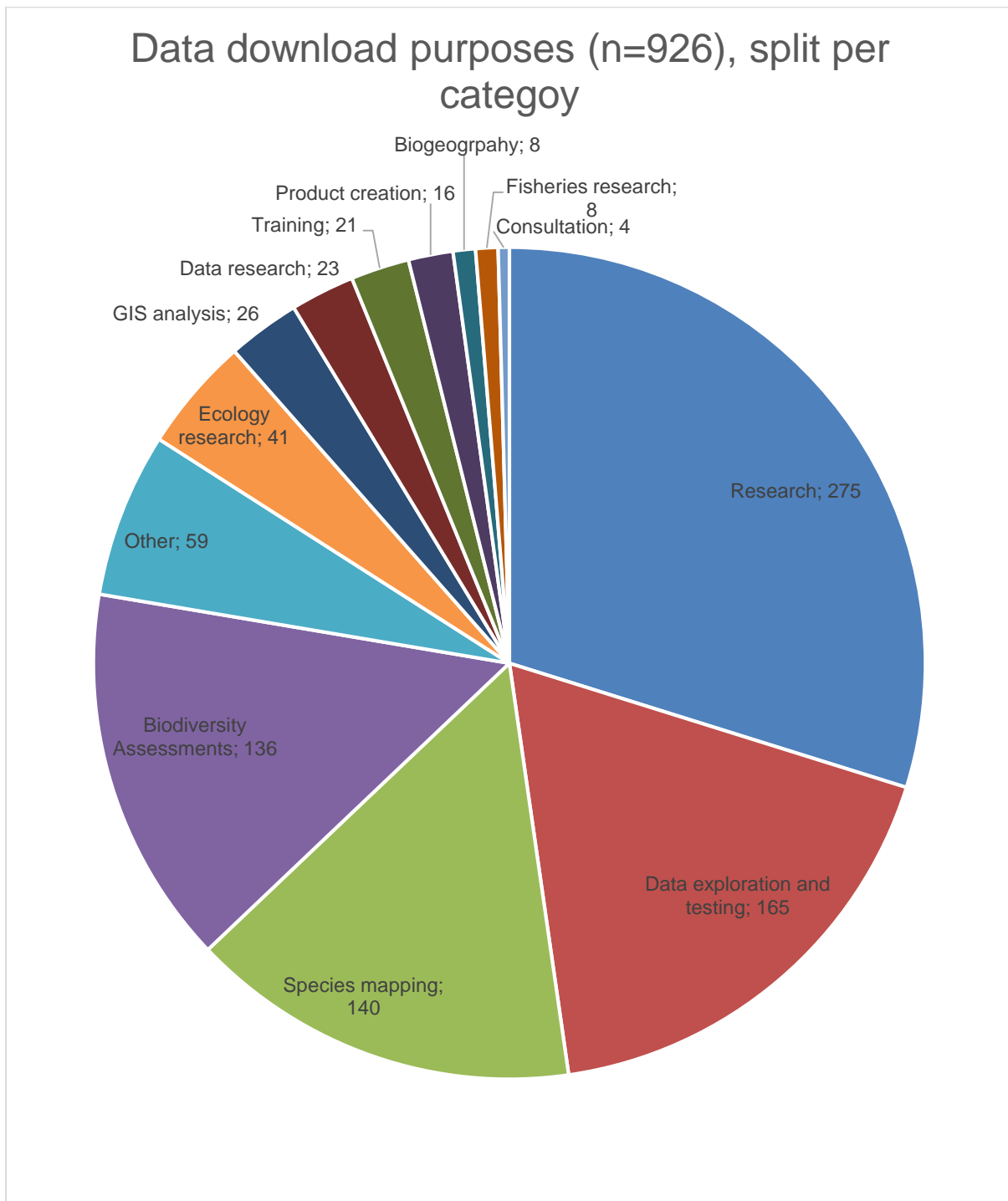
Indicator 6 - User statistics to determine the main pages utilised and identify user navigation routes



Month	Unique visitors	Visits	Pages	Hits	Bytes
jan. 2017	12.160	13.967	34.040	60.675	77.02 GB
febr. 2017	8.590	10.185	25.107	54.461	73.38 GB
mrt. 2017	11.792	13.818	38.941	73.689	104.37 GB
april 2017	11.201	13.255	33.669	75.280	74.58 GB
mei 2017	9.704	11.896	37.543	73.930	97.66 GB
juni 2017	9.264	11.223	77.365	110.955	110.74 GB
juli 2017	9.999	11.816	81.866	110.548	49.59 GB
aug. 2017	11.360	13.883	79.654	106.429	28.17 GB
sept. 2017	11.884	14.660	75.554	113.748	151.05 GB
okt. 2017	13.878	17.004	91.637	146.623	52.79 GB
nov. 2017	15.571	17.527	107.520	151.386	41.46 GB
dec. 2017	14.039	15.882	129.195	166.678	42.47 GB
Totaal	139.442	165.116	812.091	1.244.402	903.28 GB

Month	Unique visitors	Visits	Pages	Hits	Bytes
jan. 2018	14.123	16.149	108.745	154.797	40.69 GB
febr. 2018	11.784	13.197	78.560	114.283	40.30 GB
mrt. 2018	13.248	15.005	105.377	163.124	71.05 GB
april 2018	12.215	13.551	73.583	125.579	39.04 GB
Totaal	53.547	60.341	380.824	581.406	198.73 GB

Indicator 7 - List of what the downloaded data has been used for



Indicator 8 - List of web-services made available and organisations connected through these

The EMODnet Biology data are available as Web Services:

1. Occurrence data (species observations) as Web Feature Service (WFS)

All biological occurrence data from EMODnet biology data is available as WFS services from the EurOBIS database. The different attributes of these occurrences on which you can select can be retrieved here:

<http://geo.vliz.be/geoserver/Dataportal/ows?service=wfs&version=2.0.0&request=DescribeFeatureType&typeName=Dataportal:eurobis&outputFormat=application/json>

For example, you can retrieve occurrence data from dataset 'Monitoring of birds in the Voordelta' (4569):

`geo.vliz.be/geoserver/Dataportal/ows?service=WFS&version=1.0.0&request=GetFeature&typeName=Dataportal:eurobis&&viewParams=where:datasetid=4659&maxFeatures=50&outputFormat=csv`

For example, you can retrieve occurrence data from dataset 'Birds from the Voordelta' 4569 where taxon is 'Larus argentatus' (Herring gull) 137138

`geo.vliz.be/geoserver/Dataportal/ows?service=WFS&version=1.0.0&request=GetFeature&typeName=Dataportal:eurobis&&viewParams=where:datasetid=4659ANDaphiaidaccepted=137138&outputformat=csv`

Retrieve occurrence data from 'Larus argentatus' (Herring gull) 137138:(1 million records!)

`geo.vliz.be/geoserver/Dataportal/ows?service=WFS&version=1.0.0&request=GetFeature&typeName=Dataportal:eurobis&viewParams=where:aphiaidaccepted=137138&outputformat=csv`

Retrieve occurrence data from 'Abra alba' (White furrow shell) 141433 and retrieve the occurrences from 'Ensis ensis' (Common razor shell) 140733

`geo.vliz.be/geoserver/Dataportal/ows?service=WFS&version=1.0.0&request=GetFeature&typeName=Dataportal:eurobis&viewParams=where:aphiaidaccepted=141433ORaphiaidaccepted=140733&outputformat=csv`

2. Additional measurements, linked to the occurrence data as Web Feature Service (WFS)

All additional measurements (Biotic Quantifications, Biota Descriptors, Rock and sediment physical properties, Water column temperature and salinity, Rock and sediment chemistry...) are available in the Measurement of Fact (MoF) Extension of EurOBIS (the MoF is linked with

the Occurrence data through both 'dataprowiderid' and 'occurrenceid'). The different attributes of these MoFon which you can select can be retrieved here:

http://geo.vliz.be/geoserver/Dataportal/ows?service=wfs&version=2.0.0&request=DescribeFeatureType&typeName=Dataportal:euobis_measurementorfacts&outputFormat=application/javascript

Retrieve all MoF from dataprowider '748' (IMR)

http://geo.vliz.be/geoserver/Dataportal/ows?service=WFS&version=1.0.0&request=GetFeature&typeName=Dataportal:euobis_measurementorfacts&&viewParams=where:dataprowiderid=748&maxFeatures=50&outputformat=csv

3. Using the AphiaID to query by (biological) taxonomy

Description how to retrieve the AphiaID i.e. *Larus argentatus*

http://www.marinespecies.org/rest/AphiaIDByName/Larus%20argentatus?marine_only=true

General WoRMS webservice description

<http://www.marinespecies.org/aphia.php?p=webservice>

4. Using the IMISDasID to query by metadata dataset

How to retrieve the datasetid (IMIS DasID) i.e. searching on "birds" & "Voordelta"

<http://www.emodnet-biology.eu/data-catalog?module=dataset&show=jsonportal&searchField=birds+Voordelta>

General IMIS (metadatalogue) webservice description

<http://www.emodnet-biology.eu/data-catalog?page=webservices>

5. Retrieve data of the gridded abundance dataproducts as WFS/WMS

OOPS Copepod gridded abundances 10-year bin

http://geo.vliz.be/geoserver/Emodnetbio/wms?service=WMS&version=1.1.0&request=GetMap&layers=Emodnetbio:OOPS_products&styles=&bbox=-4.95,48.05,12.25,60.75&width=512&height=378&srs=EPSG:4326&format=application/openlayers&viewparams=scientificName:Large%20copepods;season:1;AphiaID:1080;startYearCollection:1958;endYearCollection:1967

OOPS Copepod gridded abundances 1-year bin

http://geo.vliz.be/geoserver/Emodnetbio/wms?service=WMS&version=1.1.0&request=GetMap&layers=Emodnetbio:OOPS_products&styles=&bbox=-4.95,48.05,12.25,60.75&width=512&height=378&srs=EPSG:4326&format=application/openlayers&viewparams=scientificName:Large%20copepods;season:1;AphiaID:1080;startYearCollection:1958;endYearCollection:1958

6. Examples of EMODnet Biology Data applications written in R are available at:

<http://rshiny.emodnet-biology.eu/OOPS/>

<http://rshiny.emodnet-biology.eu/SHARKshiny/>

7. Description of webservices are available at:

<http://www.emodnet-biology.eu/emodnet-biology-api>

Recommendations for follow-up actions by the EU

1. Recommendation to improve data gaps for the creation of biological data products.

Although theoretical developments from local study cases have highlighted the essential components of marine ecosystems, critical obstacles to data product development over the main extents of European seas remain. Benthos, as a key component of the marine ecosystem, is exemplary in this respect: most of the samples that enable mapping of biological variables occur from the Channel to the Arctic. Only a few sampling stations are monitored along the French coast and other isolated locations, but their density do not enable mapping over the shelf. Even within what is available, sampling periods do not overlap among most areas, inducing potentially biases when comparing spatial units. Other biases stem from sampling protocols that differ among surveys/monitoring. Grab and box-corer, even from a same surface area within a same habitat, do not operate similarly so that densities of organisms lying at different sediment depths (and differently vulnerable to human pressures) are not equally estimated (Heip et al., 1992). This restricts the conception of data products only to presence/absence at the expense of the functional reality (Rice et al., 2012).

Globally, this is not a simple problem of data accessibility, but clearly a problem of data gaps and sampling coordination at the very large scale. Besides, an important European commitment as part of the Marine Strategy Framework Directive (MSFD) is to achieve good environmental status of the EU's marine waters by 2020 (European Community, 2008). Given the current absence of benthic data for more than half of the European shelves, this commitment will be difficult to achieve. The problem is exacerbated as many areas have been exploited (e.g. beam trawling) for a long time whereas no inventory of benthic composition has been done (Eigaard et al., 2017).

In the present situation, it is a challenge to adequately support European demands (especially concerning MSFD Descriptor 1 and Descriptor 6) as it cannot provide benthic data products with the spatial coverage expected by the EU demands and scientifically required. We believe, a coordinated pan-European survey is the only solution to get more reliable benthic data products with minimal spatial and temporal sampling biases.

2. Recommendation to improve data accessibility: engage a massive plan of data digitization and proper data and dataset management.

With emerging European initiatives like EOOS and EOSC, it is important that DG-MARE engages into a massive effort of rescue, management and digitization of the past datasets targeted by the Data Archaeology and Rescue activities of EMODnet. This effort is to be linked to the improvement of data and dataset management in marine institutions both at staff and institution levels. DG-MARE could and should play a major role by promoting this aspect in these initiatives.

DG-MARE cannot implement this digitization programme alone, but can develop a large network of partnership. First, EU member states should be involved at high level to promote the programme: integration in research programmes and calls, national directives, recognition of that work at institution and staff levels, not only by increasing the resources but also in-kind incentives. Second, relevant partners for different data topic were spotted, with existing digitization initiatives for some. This list not exhaustive:

All agencies and institutions related to fisheries, national or intergovernmental (IFREMER, IEO, ...; GFCM, ICES, FAO, ...): catalogue of fishery surveys and related studies

Targeting ecological studies in the framework of fisheries, excluding sensitive fishery data that still largely remain protected by states.

All relevant European institutions and bodies (EEA and European Topic Centres for Biodiversity for Inland, Coastal and Marine Waters, JRC, ...; DG-ENV, DG-RTD, DG-CONNECT, DG-DIGIT; ...)

Relevant ERICs: EMBRC, LifeWatch, Using the momentum of the new DISSCO project

- Marine stations (network MARS): catalogue of publications, project, local ecosystem studies over decades
- BHL (BHL Europe): make old reports available in scan-OCR text format
- Natural history museums (CETAF): catalogue of expeditions and collections
- OBIS, EMODNET, NODC, EuroMarine, European Marine Board

To boost the implementation of that programme, a Task Force could be created. It would help marine institutions to implement a proper data and dataset management framework. The Task Force would assist institutions to set up a data policy, a central repository, a data management team, train researchers to data and dataset management issues and initiate systematic and exhaustive digitization programme (methodology, tools, priorities, connection to aggregators such as EMODnet, ...). This set up should be compliant with local and national policies if they exist, and emerging European directives. This Task Force could train national ones.

Annex: Other documentation attached

ANNEX I. GOOS EOVs

Phytoplankton biomass and diversity

Subvariables:

- Presence/Absence/Relative Abundance
- Diversity/Taxonomy ,
- Genomic information
- In vitro/in vivo pigment fluorescence
- Pigment concentration by spectrophotometry (chlorophyll a, b, HPLC pigments)
- Spectral reflectance (ocean color/remote sensing methods)
- Primary productivity (different methods)

Derived products:

- Phytoplankton Functional Types
- Diversity indices : Species richness ; Species evenness ; other
- Harmful or beneficial algal bloom indices, including Harmful Algal Events
- Global biogeography / spatial distribution
- Primary production and carbon and nutrient cycling, storage, and export

Zooplankton biomass and diversity

Subvariables:

- Biomass overall
- biomass or abundance (or presence/absence) by taxon
- biomass or abundance or presence/absence by functional group
- biomass or abundance or presence/absence by size class

Derived products:

- geographical distributions by taxon or functional group
- life history timing
- community size structure

Fish abundance and distribution

Subvariables:

- Number, biomass or abundance index of fish of different taxa per unit volume or area of water in a specific region, stock or population, and measured by a standard or known protocol
- Numbers or biomass of fish by size/age/stage

Derived products:

- Fish abundance indices
- Fish diversity indices
- Size-based indicators of fish assemblages, including mean fish size, size spectra, and large fish indicators

- Food web indicators, including proportion of predatory fish
- Fish production
- Fish habitat

Marine turtles, birds, mammals abundance and distribution

Sub-Variables:

- Species presence/absence
- Age
- Sex
- Count data
- Repeated individual presence (tracking/resights)

Derived products:

- Density
- Hotspots
- Home range
- Utilization distribution (relative occupation of home range)
- Movement patterns
- Migration pathways
- Habitat maps
- Population status (increasing, decreasing stable)

Live coral

Sub-Variables:

- Live coral cover and areal extent
- Coral diversity (species, genera and functional type; and alpha, beta or gamma)
- Coral condition (diseases, bleaching, mortality (partial and full), predated, silted, other conditions/syndromes)
- Total habitable substrate (less sand/silt substrates, structural complexity)
- Coral size classes (recruits/small corals, size class distribution)

Derived products:

- Maps of coral cover and areal extent
- Inventories of coral diversity
- Coral condition
- Coral recruitment and size class distributions
- Coral reef habitat classifications, mapped layers
- Coral reef system health (with key fish, urchins, macroalgae EOVs)
- Convention indicators – Aichi Target 10, SDG 14.2/5, IPBES

Seagrass cover

Sub-Variables:

- Shoot density/cover
- Canopy height
- Seagrass diversity (species)
- Areal extent of seagrass meadows

- Photosynthetic efficiency (measured with PAM)

Derived products:

- Primary and secondary production
- Global and regional seagrass distribution
- Contributions to blue" carbon storage
- Essential fish habitat extent
- Seagrass habitat fragmentation

Macroalgal canopy

Sub-Variables:

- Canopy species diversity
- Canopy height
- Stem density (kelps)
- Plant condition (qualitative: signs of necrosis and potential drivers, fouling and grazing)
- Plant size classes (including recruits)
- Photosynthetic efficiency
- Photosynthetic biomass
- Areal extent

Derived products:

- Habitat extent
- Canopy health indices
- Global geographical distribution
- Primary production
- Essential fish habitat extent

Mangrove cover

Sub-Variables:

- Mangrove fringe width and area
- Mangrove tree species composition and zonation
- Tree, algae, and phytoplankton primary production
- Canopy height and trunk girth
- Trunk and seedling density by species
- Soil profile, carbon/nutrient content, and 14 C age
- Sediment and water column respiration
- Intertidal fish and invertebrate densities

Derived products:

- Above- and below-ground biomass
- Ecosystem gross and net primary production
- Carbon sequestration rate
- Fish and invertebrate productivity

Benthic invertebrate abundance and distribution (*emerging)

ANNEX II EOVS and data availability overview

	Phytoplankton			Zooplankton			Fish			Benthos		
	Biomass production	/ species and diversity	functional groups	Biomass production	/ Species and diversity	functional groups	Biomass production	/ Species and diversity	Functional groups	Biomass production	/ Species and diversity	Functional groups
Baltic	1	2	7	11	12	18	19	19	19			20
North Sea	1	3	8	11	13	18	19	19	19			21
Wider NE Atlantic	1		8	11	14	18	19	19	19			
Atlantic coasts	1	4	9	11	15	18	19	19	19			22
Med Sea West	1	5	10	11	16	18	19	19	19			23
Med Sea East	1		10	11			19	19	19			24
Black Sea	1	6	10	11	17	18	19	19	19			25

	Turtles	Mammals	Birds	Special habitats	Seagrass	Mangrove	corals
	Species and diversity	Species and diversity	Species and diversity				
Baltic	26	27	27		28	28	28
North Sea	26	27	27		28	28	28
Wider NE Atlantic	26	27	27		28	28	28
Atlantic coasts	26	27	27		28	28	28
Med Sea West	26	27	27		28	28	28
Med Sea East	26	27	27		28	28	28
Black Sea	26	27	27		28	28	28

- 1 Biomass as chl-a, and probably as pigment composition, can be derived from EMODNET-chemistry; Primary Production may come from Copernicus (model-based)
- 2 No full overview yet, but at least for Danish waters quite a number of stations available; also Swedish and Finnish data; German data not open.
- 3 Dutch EEZ data; NIOZ time series since 1974 (not open yet); Danish, Swedish and German data
- 4 French coastal data + data products; Spanish Radiales data; Portuguese monitoring data

- 5 Spanish Radiales data; long-term data series in Trieste, Naples, Croatia, France (others?)
- 6 Several historic data bases available. Requires further scrutiny
- 7 To be derived from species data; group indicators may be available from additional stations
- 8 CPR data and data products
- 9 French coastal data, maybe Spanish and Portuguese and UK
- 10 To be checked. Older data sets may be available. CPR
- 11 COPEPODS shows prediction fields derived from Stromberg et al.
- 12 data available since 1900; Finnish, Swedish, Danish, German, Polish, Estonian data in data base. Not all data sets have abundance
- 13 CPR data and data products; IMR data base; Danish, German and Swedish data
- 14 CPR data and data products
- 15 French coastal data; Spanish data Radiales; Portuguese data?
- 16 Time series in Villefranche, Trieste and probably a number of other stations
- 17 Several historic data bases available. Requires further scrutiny
- 18 Derive from species data or CPR
- 19 This will need to be worked out together with ICES
- 20 Danish, Swedish, Finnish, Estonian data in data base. There are German, Polish, Lithuanian data sets (needs checking)
- 21 Variety of data sets available in data base
- 22 French and Spanish data sets available. Needs further checking
- 23 Only French monitoring data sets, and some occasional observations
- 24 few meiobenthos datasets, almost nil
- 25 some historic (limited) data sets and some project-related data
- 26 SWOT website collects turtle data worldwide and seems to be the best resource to refer to; OBIS SEAMAP is linked to this but seems not to be maintained
- 27 EMODNET can add little to existing overviews and initiatives
- 28 refer to 'habitats' lot

ANNEX III: References

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List of abbreviations and acronyms

API: Application programming interface, is a set of subroutine definitions, protocols, and tools for building application software

CORESET: Operationalization of HELCOM core indicators

DIVA: Data-Interpolating Variational Analysis, allows the spatial interpolation of data (analysis) in an optimal way, comparable to optimal interpolation

DwC: The Darwin Core is body of standards. It includes a glossary of terms (in other contexts these might be called properties, elements, fields, columns, attributes, or concepts) intended to facilitate the sharing of information about biological diversity by providing reference definitions, examples, and commentaries. The Darwin Core is primarily based on taxa, their occurrence in nature as documented by observations, specimens, samples, and related information

EEA: European Environment Agency

EBSA: Convention on Biological Diversity for the identification of Ecologically or Biologically Significant Marine Areas

EBV: Essential Biodiversity Variables as defined by GEOBON

EMODnet: European Marine Observation and Data Network

ESFRI: European Strategy Forum on Research Infrastructures

EurOBIS: European Ocean Biogeographic Information System, a distributed system that allows to search multiple datasets simultaneously for biogeographic information on marine organisms in European waters

EOV: Essential Ocean Variables as defined by GOOS

EUBON: European Biodiversity Observation Network

FAO: Food and Agriculture Organization of the United Nations

GOOS: Global Ocean Observing System, a permanent global system for observations, modeling, and analysis of marine and ocean data.

HELCOM: Baltic Marine Environment Protection Commission - Helsinki Commission

ICES: International Council for the Exploration of the Sea

ICGCOBAM: Intersessional Correspondence Group on the Coordination of Biodiversity Assessment and Monitoring, OSPAR expert group

IPBES: Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services

IPT: Integrated Publishing Toolkit (IPT), a free open source software tool written in Java that is used to publish and share biodiversity datasets

IUCN: International Union for Conservation of Nature

MedOBIS: Mediterranean node of Ocean Biogeographic Information System

MoF: Measurement Or Facts, an element from the data scheme to Support generic measurements or facts as defined in Darwin Core.

MSFD: Marine Strategy Framework Directive, a European instrument aiming at Good Environmental Status (GES) of the EU's marine waters by 2020

NODC: National Oceanographic Data Centre

OBIS: Ocean Biogeographic Information System: OBIS strives to document the ocean's diversity, distribution and abundance of life. Created by the Census of Marine Life, OBIS is now part of the Intergovernmental Oceanographic Commission (IOC) of UNESCO, under its International Oceanographic Data and Information Exchange (IODE) programme

OGC: Open Geospatial Consortium

OSPAR: Convention for the Protection of the Marine Environment of the North-East Atlantic

OOPS: Operational Oceanographic Products and Services, proposal formulated by ICES to assist in the ICES advisory process

SDN: SeaDataNet, an infrastructure linking 45 national oceanographic data centres and marine data centres

WoRMS: World Register of Marine Species, an authoritative and comprehensive list of names of marine organisms, including information on synonymy. ERMS is the European component of WoRMS

WRIMS: World Register of Introduced Marine Species,