EMODnet Thematic Lot n° V - BIOLOGY

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

Start date of the project: 19/04/2017 - (48 months)

EMODnet Phase III – Quarterly Progress Report (10)

Reporting Period: 01/07/2019 – 30/09/2019

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

Contents

Disclaimer

1 Highlights during the reporting period

WP1. Project management (Tasks 7 & 8)

Throughout the reporting period we have participated in the EMODnet Steering Committee and Technical Working Group meetings that took place in early September. These events were followed by the OpenSeaLab hackathon which the consortium not only attended but also assisted with organising (see WP5 section for more information).

Following the guidelines provided by the Secretariat, the website menus were harmonised and EMODnet Biology was registered in FAIR sharing, DOI accessible via the link https://fairsharing.org/FAIRsharing.pp1Jtx.

FAIR sharing is used by e.g researchers to identify and cite standards, databases or repositories that exist within their discipline for, e.g. when creating a data management plan, releasing data or submitting a manuscript to a journal. This will hopefully increase the visibility for EMODnet Biology.

A continuous effort is being undertaken to harmonise the reporting from the download tool box, which will make information more easily understandable, cross-checked and cross-referenced.

An analysis of the web metrics and usage data (data download monitoring) using Matomo was conducted. A total number of 1534 visits were made by, on average, 14 visitors per day. The higher number of visitors seen on the graph below is concurrent with the OpenSeaLab dates, with a total of 100 unique visitors during the event period.

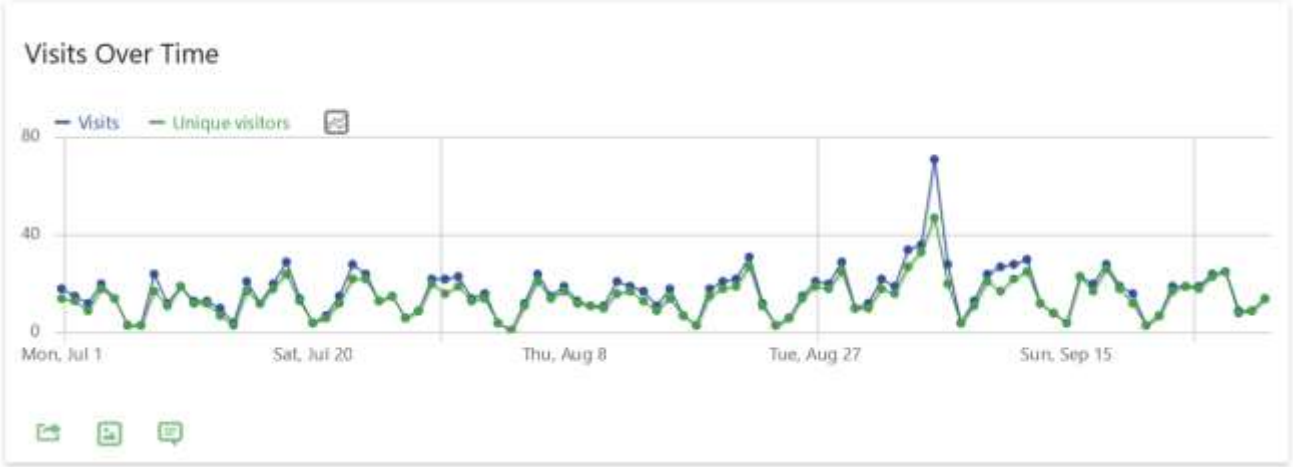

Figure 1.Evolution of visitors of emodnet-biology.eu during the reporting period

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

The August harvest accounted for 22 new datasets, which added 238.846 new occurrence records from 46.590 events and 331.912 Extended Measurements or Facts (eMoF) records.

The individual datasets can be accessed via the metadata catalogue, which contains a link to their selection in the download toolbox. A list of dataset names and links is provided below:

Breeding avifauna of small Estonian islands and islets, national monitoring 1957-2016

Roscoff inventories: marine fauna and flora since 1800

Abundance and biomass of benthic infauna as part of the North Channel habitat mapping project,

2017

Cover of intertidal macroalgae along the N and NW coast of the Iberian Peninsula in 2011

Long-term monitoring of the phytoplankton at the SOMLIT-Astan Station in the Western English Channel from 2000 to present

Zooplankton counts measured at the West-Hinder in 1902

Jellyfish Sightings along the Italian Coastline from 2009 to 2017

Specific diversity data of macrobenthic communities in the "Pierre Noire" study site in the English Channel from 1977 on

Advanced Modelling & Research on Eutrophication & the Structure of coastal planktonic food-webs: mechanisms & modelling (AMORE)

Benthic flora in Estonian territorial waters 1997-2016

1800-2016 Department for Environment Food & Rural Affairs (Defra), Marine Strategy Framework Directive (MSFD) Collation of invasive non-indigenous species

Total Hydrozoa abundance in the Southern Bight of the North Sea between 1971 and 1972

Spatial variation of the zooplankton community in the Belgian part of the North Sea on 18-19 April 1978

Biomass of Characteristic Intertidal and Subtidal Taxa in the N of Spain from 1992 to 2003

Phytoplankton-BG Black Sea-2007-2016

Abundances of benthic infauna from grab sediment samples as part of the INIS Hyrdo project, Co. Down (Northern Ireland), 2011

Weight of Copepoda in the Southern bight of the North Sea in 1971 and 1974

Aerial counts and breeding success monitoring of grey seal, Estonian national monitoring 2000-2016

Phytoplankton monitoring at the Château du Taureau Station in the Western English Channel, from 2009 to 2011

Specific diversity data of macrobenthic communities in the "Rivière de Morlaix" study site in the English Channel from 1977 to 1996

2012-ongoing UK Offshore Marine Conservation Zone (MCZ) Survey Data

1778-1998 Ivor Rees North Wales Marine Fauna Ad-hoc sightings shore and ship-based surveys

The geographical, temporal and taxonomical distribution of the data added and updated in this reporting period can be seen in the figures below.

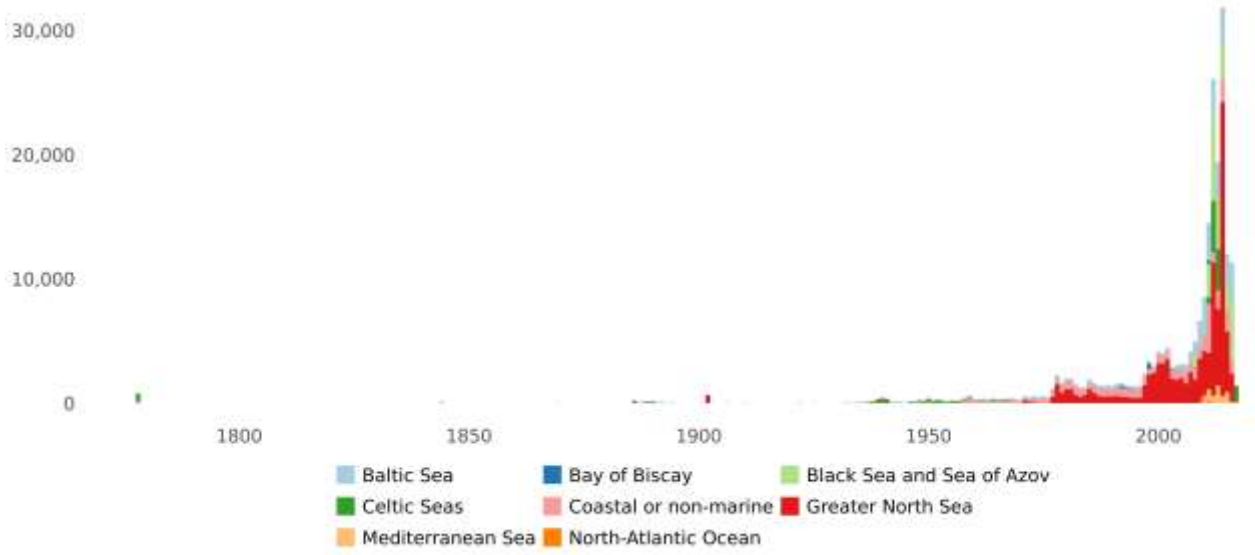

Figure 2. Number of records per occurrence year and marine region that have been harvested during the reporting period.

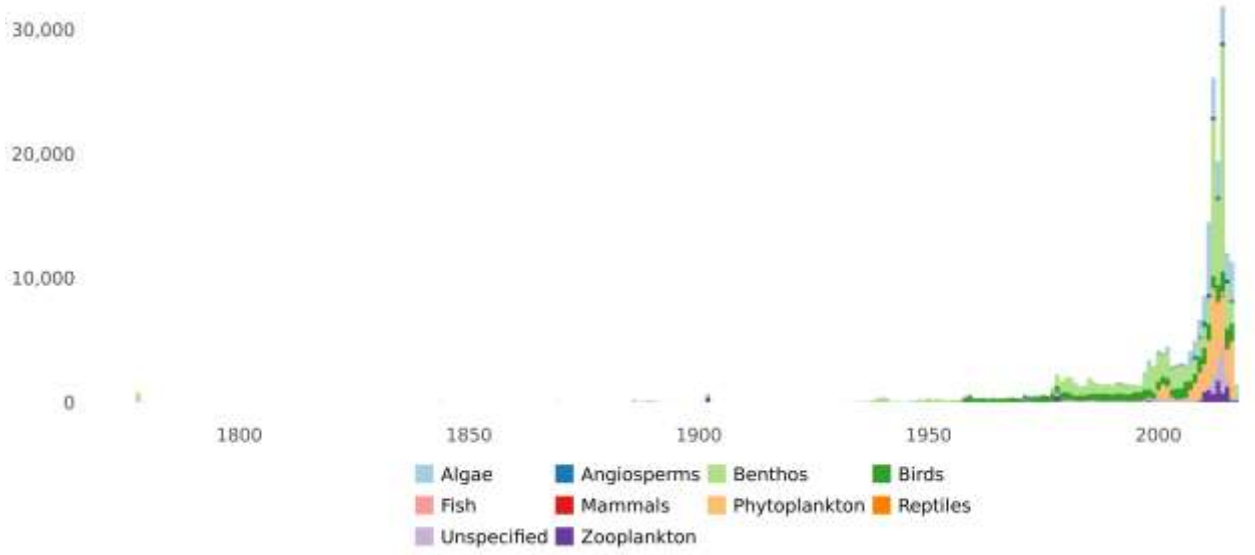

Figure 3. Number of records per occurrence year and functional group that have been harvested during the reporting period.

NB: Unspecified refers to occurrences where no functional group could be identified in WoRMS. This grouping amounts to a total of 416 datasets, comprising 947207 occurrences, from all regions

Figure 4.Map of gridded number of occurrences that have been harvested during the reporting period.

WP3: Data archaeology and rescue (Task 1)

During this quarter, a number of activities were completed, namely the transfer and check of the geoserver, MedOBIS database, viewer and IPT to a new server; upload of 25 biodiversity datasets from the MedOBIS database to the MedOBIS viewer and check and correction of 50 IPT datasets.

A number of activities that took place that haven't been completed and will continue into the next quarter are: the ongoing prioritization exercise of Mediterranean historical datasets; data and metadata digitisation and mobilisation for https://doi.org/10.1007/s12526-019-00968-6 (Albano PG, Stockinger M (2019) *The rhizome layer of Posidonia oceanica: an important habitat for Mediterranean brachiopods*. *Marine Biodiversity*) and dataset http://biotime.st-andrews.ac.uk/getDataDone.php?505 (*Fish and marine invertebrates from the Israeli Eastern Mediterranean sea 1990-4, 2000, 2008-2012*); corrections to dataset http://ipt.medobis.eu/manage/resource?r=transmed (*Phytoplankton in longitudinal east-west transect of the Mediterranean Sea, 1999*).

Five new datasets have already been identified to be processed and ready for ingestion:

1) Phytoplankton of coastal waters in the Aegean Sea, Eastern Mediterranean, 2002-2003
2) Molluscs from two rocky shores of the North coast of Crete (NaGISA project)

3) Otto Steinbock.(1937) The Fishery Grounds near Alexandria. 14. Turbellaria. Notes and memoirs No.25.
4) El Saby M.K. (1937). A chemical study of the Egyptian Sardinella. 1 – Variation in the fat content of whole fish, flesh and gonads. Hydrobiology and Fisheries directorate. Notes and Memoirs. No 29. Cairo, Egypt.
5) Forbes E (1844) Mollusca and Radiata of the Aegean Sea.

This WP is also working on the preparation of a paper on MedOBIS. More details will be given once this work advances into the publication stages.

Work was carried out to determine whether there were any MedOBIS and OBIS datasets that could be relevant to the programme and had not yet been harvested. A total of 37 datasets were identified and quality checks are being done before they can be incorporated into the catalogue. Further updates on this work will be provided in subsequent reports.

WP4. Data product creation (Task 2)

WP4 has been developing a critical assessment of the EMODnet Biology metadata and database, to identify missing metadata and data gaps that hamper the creation of data products in alignment with the Essential Ocean Variables (EOVs). Starting from an exercise to map (i) diversity of macrobenthos and (ii) the distribution of a single macrobenthos species in the Southern part of the North Sea, several issues were highlighted and recommendations were made to enrich the information linked to datasets, sampling methods, species and EOVs. This draft document was subsequently discussed in a WP4 meeting with the World Register of Marine Species (WoRMS - VLIZ) and the database managers of the EMODnet Biology database (WP2 & WP6 - VLIZ). WoRMS, the taxonomic backbone for EMODnet Biology, are currently performing a large data mining exercise to add additional species traits information to WoRMS, which can address some of the data gaps identified in this exercise. From the meeting it was also clear that it is technically possible to add more information to the EMODnet Biology database (WP6) thanks to the new Darwin Core (DwC) OBIS-ENV schema that EMODnet Biology implemented in the performance period of EMODnet phase III. The draft document of recommendations will be further elaborated with iterations between WP2, WP4, WP6 and WoRMS, and will result in a recommendations report that will identify priorities for the next months for several WPs.

The data products created in the previous period have been archived in the Marine Data Archive for long-term storage. The products have been published with DOI, which links to the EMODnet Biology Data Catalog. The downloads include the original datasets, procedures to create a harmonized dataset and the methodology and code to create the products:

Beauchard, O.; Troupin, C.; (2018): Distribution of benthic macroinvertebrate living modes in European seas. Marine Data Archive. https://doi.org/10.14284/373

Beauchard, O.; Troupin, C.; (2018): Distribution of fish living modes in European seas. Marine Data Archive. https://doi.org/10.14284/374

Herman, P.M.J.; (2018): Use of EMODNET Biology Data for invasive species policies. What can we learn? Marine Data Archive. https://doi.org/10.14284/375

Herman, P.M.J.; (2018): Phytoplankton community analysis in the Middle Adriatic. Marine Data Archive. https://doi.org/10.14284/376

Herman, P.M.J.; (2018): Phytoplankton community analysis in the Northern Adriatic. Marine Data Archive. https://doi.org/10.14284/377

Webb, T.J.; Lines, A.; (2018): Thermal affinities for European marine species. Marine Data Archive. https://doi.org/10.14284/378

Herman, P.M.J.; (2018): Long term zooplankton time series analysis from Villefranche, Western Mediterranean. Marine Data Archive. https://doi.org/10.14284/379

Barth, A.; Herman, P.M.J.; (2018): Neural network modelling of Baltic zooplankton abundances. Marine Data Archive. https://doi.org/10.14284/381

ILVO, an EMODnet Biology partner, requested the use of the harmonized EMODnet Biology benthic dataset within the framework of the ICES working group on Fisheries Benthic Impact and Trade-offs (WGFBIT). WGFBIT is using the dataset to ground truth their fishery assessment FBIT framework. According to ILVO it is the ideal benthic dataset to work with as it has the widest geographical scope and is already harmonized to certain level. Updates on this use-case will be given in subsequent reports.

WP5: Uptake and outreach (Tasks 5 & 6)

The majority of work has been in the response to reviewers' comments from the submission of D5.2, a peer-reviewed publication to the journal Marine Policy. Titled "Supporting the Essential - Recommendations for the development of accessible and interoperable marine biological data products", the manuscript outlines the stakeholder-led approaches in the development of the biological data products of WP4 to support effective conservation, management and policy development. Highlighting how WP5 captured the requirements of a broad range of stakeholders and the iterative, structured processes that framed the development of tools, models and maps supporting the FAIR (Findable, Accessible, Interoperable, Reusable) data principles (Wilkinson et al, 2016).

In addition to the product development work of EMODnet Biology the manuscript promoted and further enhanced the definitions of data products produced by the EMODnet Secretariat and originally published in the EMODnet Data and Data Product Portfolio. The comments received from reviewers have resulted in a much improved manuscript, and the extended time period to work on the paper has provided opportunity to include a critical review of the initial suite of EMODnet Biology Data products, including link to the European Atlas of Marine Life and Github pages where they are hosted. The manuscript has been resubmitted to the journal Marine Policy where we now anticipate it will be published in due course.

At the Lisbon meeting, a number of recommendations were given and they are included in the report found through in the Deliverables section of the website (D5.4.pdf).

As part of the OpenSeaLab hackathon organisation in September 2019, we developed the OpenSeaLab data access page (http://www.opensealab.eu/data2019) in collaboration with the EMODnet Secretariat. On the data access webpage we give a clear overview of all the possible ways to access EMODnet data and products. We have also listed all data download portals, web service catalogues and web service documentation. Additionally, we have created easy to use examples in R and Python. All tutorials and code are available on the EMODnet github: https://github.com/EMODnet/OpenSeaLab2/.

During the OpenSeaLab hackathon, four EMODnet Biology coaches assisted the 16 teams (a total number of 72 participants) with information and help to access and use the EMODnet Biology data and products.

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

Work was undertaken in the Darwin Core harvester to improve error messages' information. It is now possible to identify where the problems are, thus not relying so often on IT colleague's expertise. Work is also

undergoing to allow for an easy removal of datasets from the harvester. Once implemented, this will avoid dataset duplication in other databases (e.g. EurOBIS).

2 Challenges encountered during the reporting period

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

[Please, provide information in the table.]

Main challenge	Measures taken
Three marine regions missing from the dataset used in the reporting tool	- Datasets included in the reporting spreadsheet are up to date - Investigation by IT colleagues to determine which part of the procedures allowed for this error to happen - Procedures will be set in place to prevent these issues from arising in future reports
New staff	With a senior staff member leaving, a new team member was recruited to handle the harvest tasks. This had as a consequence a slight increase in the ingestion time due to knowledge acquisition

3 Identified issues: status and actions taken

Provide an overview of the issues identified, if any, during the reporting period, the status of those issues, and actions taken to address them.

[Please, provide information in the table.]

Issue identified	Status (Pending/Resolved)	Action taken	Date due
All EMODnet data products should start with the acronym "EMODnet"	Resolved	Updates to all (41) biology layers visible in the main EMODnet portal (EMODnet Biology layers)	QR10
Including machine-readable MetadataURL and dataURL in web services of data products	Ongoing	MetadatURL implemented (e.g. http://geo.vliz.be/geoserver/Emodnetbio/wms?&request=getcapabilities) More information needed before implementing the changes for the DataURL	QR10 QR11
Including in metadata records online resources	Pending	More information is needed on what the expected end result should be	-
Implementing https and Marine-ID	Pending	A new developer will be hired and will address this task	QR12
Giving access to all OBIS data through EMODnet	Ongoing	Initial discussion was held at the Steering Committee meeting and main obstacles to pursue this are: - Request permission from OBIS (not an obstacle *per se* but something that needs to be done before proceeding) - Possible data quality issues (OBIS and EMODnet Biology have different levels of quality control, so this shouldn't be a "simple" important of all OBIS data, as it would have to be quality controlled following the established procedures for EMODnet Biology project) - Checks on controlled vocabularies needs to be done to make sure the OBIS datasets conform with what has been implemented for EMODnet Biology.	-

4 User Feedback

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

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

Date	Organisation	Type of user feedback (e.g. technical, case study, etc.)	Response time
09/08/2019	Marine Geospatial Ecology Lab Nicholas School of the Environment (Duke University)	downloading gridded abundance maps on EMODnet?	Within 1 day
02/09/2019	ILVO	EMODNET Benthic dataset for ICES WGFBIT purpose	Within 1 day (more information included in the WP4 section)
27/09/2019	EMODnet Seabed Habitats	Request for environmental temperature and salinity data.	Within 1 day

5 Meetings held/attended since last report

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

[Please, provide information in the table.]

Table: Meetings organised and attended.

Date	Location	Type event (meeting, training (workshop), etc.)	Attended (A) / Organised (O)	Short description and main results (# participants, agreements made, etc.)
01/07/2019 to 05/07/2019	Lecce, Italy	LifeWatch & ENVRIplus International Summer School - Data FAIRness for Environmental & Earth Science Infrastructures	Attended	Course focussed on the specific Data FAIRness phase in the Environmental and Earth sciences URL: https://www.lifewatch.eu/web/guest/iss-data-fairness
02/07/2019 to 05/07/2019	Brest, Fance	JERICO-Next final meeting	Attended	Presented results on integration of biological data generated by the project URL: http://www.jerico-ri.eu/events/jerico-next-final-general-assembly/
02/09/2019 to 03/09/2019	Ghent, Belgium	EMODnet Steering Committee	Attended	20 participants Progress since last SC meeting
04/09/2019	Ghent, Belgium	EMODnet Technical Working Group	Attended	Ongoing technical bottle necks were discussed and suggestions to move forward
04/09/2019 to 06/09/2019	Ghent, Belgium	EMODnet Open Sea Lab II	Attended/Organised	70 participants Hackathon in Ghent, coaching to teams and data and services used were from EMODnet Biology
18/09/2019	Oostende, Belgium	Meeting with partner (ILVO)	Attended/Organised	Three main items were discussed, two of them of a technical nature (IPT and DwC related) and one related with datasets for next harvest. 7 dataset updates and one new dataset will be included in the next harvest.

16/09/2019 to 20/09/2019	Honolulu, Hawai'I, USA	OceanOBS19	Attended	1368 participants Participation in breakout sessions and networking activities, contribution to EMODnet white paper URL: http://www.oceanobs19.net/
24/09/2019	Online call	WP4 meeting with WoRMS, WP2, WP6	Organised	Discussion on (meta)data recommendations from WP5, WoRMS traits work and EMODnet database work (WP2, WP6).
SUM			**O**	**Total # of meetings organised = 2**
SUM			**A**	**Total # of meetings attended = 7**

* All URLs were accessed on 01OCT2019

6 Outreach and communication activities

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

[Please, provide information in the table.]

Table: Communication activities.

Date	Communication action/material	Short description (of the material, title, ...) and/or link to the activity	Main results (# participants, # views, # press clippings, etc.)
04/07/2019	Tweet		https://twitter.com/EMODnet/status/1146697818230407168?s=20 # Likes = 6 # Retweets= 4
17/07/2019	Tweet		https://twitter.com/EMODnet/status/1146699595864510464 # Likes = 12 # Retweets= 11

05/08/2019	FB		# Likes= 2 # Shares= 3
06/08/2019	Tweet		https://twitter.com/DanLear/status/1158726450763239424?s=20 # Likes = 1 # Retweets= 1
06/08/2019	FB		# Likes= 1 # Shares= 1
26/08/2019 to 30/08/2019	Poster	"Where did all the cod go?" presented at FOSS4G conference	> 1000 participants URL: https://2019.foss4g.org/
27/08/2019	Tweet		https://twitter.com/EMODnet/status/1166331924937355264 # Likes = 5 # Retweets= 0

27/08/2019	Tweet		https://twitter.com/EurOBIS_VLIZ/status/1166307516491468802?s=20 # Likes = 10 # Retweets= 3
29/08/2019	Tweet		https://twitter.com/BrittLonneville/status/1166953615069798400?s=20 # Likes = 6 # Retweets= 0
	News	"2nd Open Sea Lab Hackathon"	https://www.eu-atlas.org/news/project-news/131-2nd-open-sea-lab-hackathon
05/09/2019	Tweet		https://twitter.com/PieterPrvst/status/1169688443389132800?s=20 # Likes = 14 # Retweets= 2

05/09/2019	Tweet		https://twitter.com/EurOBIS_VLIZ/status/1169538121798750209?s=20 # Likes = 2 # Retweets= 0
05/09/2019	News	"Tweede prijs voor Digitwin Noordzee op de EMODNET Hackathon!"	https://www.informatiehuismarien.nl/nieuws/alle-nieuwsberichten/2019/tweede-prijs-digitwin-noordzee-emodnet-hackathon/
	News	"Having Fun With Marine Data – OpenSeaLab 2"	https://www.eu-atlas.org/news/project-news/131-2nd-open-sea-lab-hackathon
17/09/2019	Tweet		https://twitter.com/EMODnet/status/1174038749941911553?s=20 # Likes = 26 # Retweets= 9
18/09/2019	Tweet		https://twitter.com/EMODnet/status/1174394378753715 20?s=20 # Likes = 20 # Retweets= 6

18/09/2019	Tweet		https://twitter.com/thembauk/status/1174251152071942145?s=20 # Likes = 38 # Retweets= 27
19/09/2019	Tweet		https://twitter.com/EMODnet/status/1174448834342080513?s=20 # Likes = 6 # Retweets= 0
20/09/2019	FB		# Likes= 20 # Shares= 1

21/09/2019	Tweet		https://twitter.com/EMODnet/status/1175187454027976704?s=20 # Likes = 10 # Retweets= 7
21/09/2019	Tweet		https://twitter.com/stracma/status/1175180780856848384?s=20 # Likes = 10 # Retweets= 7
23/09/2019	Tweet		https://twitter.com/EurOBIS_VLIZ/status/1176118803849261061?s=20 # Likes = 4 # Retweets= 1
25/09/2019	News	"Open Sea Lab II boosting new data product ideas"	http://www.vliz.be/en/news?p=show&id=8004

25/09/2019	FB		# Likes= 25 # Shares= 1
Under revision (not published yet)	Marine Policy	Supporting the Essential - Recommendations for the development of accessible and interoperable marine biological data products	More information given on the WP5 highlight section
In preparation		MedOBIS paper drafting	More information given in WP3 highlight section
SUM of New tweets			**Total # of 15**
SUM of presentations			**Total # of 1**
SUM of information on booths			**…**

* All URLs were accessed on 01OCT2019

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

[Please, provide information in the table.]

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

Date	Name of journal, conference, …	Publication title	Authors	Organisation(s)
17/07/2019	Frontiers in marine Science (https://doi.org/10.3389/fmars.2019.00395)	A Response to Scientific and Societal Needs for Marine Biological Observations	Nicholas J. Bax1,2*, Patricia Miloslavich2,3*, Frank Edgar Muller-Karger4, Valerie Allain5, Ward Appeltans6, Sonia Dawn Batten7, Lisandro Benedetti-Cecchi8, Pier Luigi Buttigieg9, Sanae Chiba10,11, Daniel Paul Costa12, J. Emmett Duffy13, Daniel C. Dunn14, Craig Richard Johnson2, Raphael M. Kudela15, David Obura16,17, Lisa-Maria Rebelo18, Yunne-Jai Shin19,20, Samantha Elisabeth Simmons21 and Peter Lloyd Tyack22	1 Oceans and Atmosphere, CSIRO, Hobart, TAS, Australia 2 Institute for Marine and Antarctic Studies, University of Tasmania, Hobart, TAS, Australia 3 Departamento de Estudios Ambientales, Universidad Simón Bolívar, Caracas, Venezuela 4 Institute for Marine Remote Sensing, College of Marine Science, University of South Florida, St. Petersburg, St. Petersburg, FL, United States 5 Secretariat of the Pacific Community, Noumea, France 6 Intergovernmental Oceanographic Commission of UNESCO, IOC Project Office for IODE, Ostend, Belgium 7 The CPR Survey-MBA, Nanaimo, BC, Canada 8 Department of Biology, University

				of Pisa, CoNISMa, Pisa, Italy 9 Helmholtz Zentrum für Polar- und Meeresforschung, Alfred Wegener Institut, Bremerhaven, Germany 10 JAMSTEC, Yokohama, Japan 11 UNEP-WCMC, Cambridge, United Kingdom 12 Department of Ecology and Evolutionary Biology, University of California, Santa Cruz, Santa Cruz, CA, United States 13 Smithsonian, Washington, DC, United States 14 Nicholas School of the Environment, Duke University, Durham, NC, United States 15 Ocean Sciences Department, University of California, Santa Cruz, Santa Cruz, CA, United States 16 Coastal Oceans Research and Development in the Indian Ocean (CORDIO East Africa), Mombasa, Kenya 17 Global Change Institute, The University of Queensland, Brisbane, QLD, Australia 18 International

				Water Management Institute, Regional Office for SE Asia and The Mekong, Vientiane, Laos 19 MARBEC (IRD, Univ. Montpellier, IFREMER, CNRS), Montpellier, France 20 Department of Biological Sciences, Ma-Re Institute, University of Cape Town, Cape Town, South Africa 21 Marine Mammal Commission, Bethesda, MD, United States 22 Marine Biological Association, Nanaimo, BC, Canada
07/08/2019	Frontiers in Marine Science (https://doi.org/10.3389/fmars.2019.00440)	Ocean FAIR Data Services	Toste Tanhua1*, Sylvie Pouliquen2, Jessica Hausman3, Kevin O'Brien4, Pip Bricher5, Taco de Bruin6, Justin J. H. Buck7, Eugene F. Burger8, Thierry Carval2, Kenneth S. Casey9, Steve Diggs10, Alessandra Giorgetti11, Helen Glaves12, Valerie Harscoat2, Danie Kinkade13, Jose H. Muelbert14, Antonio Novellino15, Benjamin Pfeil16, Peter L. Pulsifer17, Anton Van de Putte18, Erin Robinson19,	1 GEOMAR Helmholtz Centre for Ocean Research Kiel, Kiel, Germany 2 IFREMER, Plouzané, France 3 Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, United States 4 Joint Institute for the Study of the Atmosphere and Ocean, University of Washington, Seattle, WA, United States 5 Southern Ocean Observing System, University of Tasmania, Hobart, TAS, Australia 6 NIOZ Royal

			Dick Schaap20, Alexander Smirnov21, Neville Smith22, Derrick Snowden23, Tobias Spears24, Shelley Stall25, Marten Tacoma6, Peter Thijsse20, Stein Tronstad26, Thomas Vandenberghe18, Micah Wengren23, Lesley Wyborn27 and Zhiming Zhao28	Netherlands Institute for Sea Research, and Utrecht University, Texel, Netherlands 7 National Oceanography Centre–British Oceanographic Data Centre, Liverpool, United Kingdom 8 NOAA Pacific Marine Environmental Laboratory, Seattle, WA, United States 9 NOAA National Centers for Environmental Information, Silver Spring, MD, United States 10 Scripps Institution of Oceanography, University of California, San Diego, La Jolla, CA, United States 11 Istituto Nazionale di Oceanografia e di Geofisica Sperimentale, Sgonico, Italy 12 British Geological Survey, Nottingham, United Kingdom 13 Woods Hole Oceanographic Institution, Woods Hole, MA, United States 14 Instituto de Oceanografia, Universidade Federal do Rio Grande, Rio Grande, Brazil

				15 ETT, Genova, Italy 16 Bjerknes Centre for Climate Research, University of Bergen, Bergen, Norway 17 National Snow and Ice Data Center, University of Colorado Boulder, Boulder, CO, United States 18Royal Belgian Institute for Natural Sciences, Brussels, Belgium 19Earth Science Information Partners, Boulder, CO, United States 20MARIS Mariene Informatie Service, Voorburg, Netherlands 21Arctic Portal, Akureyri, Iceland 22GODAE Ocean Services, Melbourne, VIC, Australia 23U.S. Integrated Ocean Observing System, Silver Spring, MD, United States 24Fisheries and Oceans, Science Branch, Maritimes Region Ocean Data and Information Section, Dartmouth, NS, Canada 25American Geophysical Union, Washington, DC, United States

				26Norwegian Polar Institute, Tromsø, Norway 27National Computational Infrastructure, Australian National University, Canberra, ACT, Australia 28Informatics Institute, University of Amsterdam, Amsterdam, Netherlands

7 Annex: Other documentation attached

List in Annex if you wish to provide any additional information.

8 Monitoring indicators

Please consult and fill in the designated excel template in annex, and provide a comment in the table on each indicator when possible/applicable.

[Please provide information in the table.]

Table: Comments on the progress indicators in the excel template.

Progress indicator	Comment
1.1 Volume of available acquired data	Available data numbers continue to evolve positively, even though, when comparing to the last quarter, the trend was negative. This could be due to a number of facts: recruiting of new staff, OpenSeaLab organisation and also quality of the datasets harvested.
1.2 Number and coverage of built & external data products	No comment
2. Organisations supplying each type of data	No comment
3. Interfaces to access or view data: list changes or new items within reporting period	No comment since last report
4. Usage of data and data products per interface and per theme	Negative trend in number of datasets downloaded could be due to QR10 reflecting the summer months. No info available yet for trend on the number of records downloaded as this was only implemented from July 1st
5. Distribution of users that have used the portal's data and data products per organisation type and country, and their main use cases	No comment
6. External products (websites, apps, …) built on top of web-services: update since last quarterly report	No comment
7. Published use case and number of readings	
8. Portal and Social Media visibility	
9.1 Technical monitoring	
9.2 Portal user-friendliness	
10. Visibility & Analytics for web pages	
11. Visibility & Analytics for web sections	
12. Average visit duration for web pages	

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