EMODnet Thematic Lot n°0 – *Bathymetry – High Resolution Seabed Mapping (HRSM2)*

EASME/EMFF/2017/1.3.1.2/01/SI2.791269

Start date of the project: 18/12/2018 - (24 months)

EMODnet Phase III – Quarterly Progress Report (4)

Reporting Period: 01/10/2019 – 31/12/2019

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

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

1 Highlights during the reporting period

- **Task 1 - Gather and give access to bathymetric survey data**: During the reporting period, the number of survey data sets has increased from 26303 to 26447 CDI entries, while the number of Composite DTM entries has increased from 147 to 181. The latter also include Satellite Derived Bathymetry (SDB) DTMs for five sites, covering Cyprus, Northern Denmark, Croatia and Southern Sicily and Puglia, Italy. A total of 8,759 sq km was mapped by partner EOMAP using Sentinel – 2 data covering shallow waters down to approx. 10-13m (Denmark) and 17-20m (Mediterranean Sea areas). Overall, the number of data providers has increased from 51 to 58 organisations. Considering the overall project planning, all data providers are actively preparing their data entries for the CDI and Sextant Catalogues as the deadline is set around end January 2020 for this task. Moreover, data providers are updating existing entries in both catalogues for improving and completing the Quality Index information. Finally, data providers will need to prepare additional entries that will populate the High Resolution DTM layer. However, that deadline is at end June 2020 as it is not on the critical path.
- **Task 2 - Compile a multi-resolution digital terrain model of European seas:**
  In November 2019, a technical tuning meeting took place between IFREMER, Shom and GGSgc to discuss and refine the actions and planning for the compilation of the new version of the EMODnet Digital Terrain Model (DTM), which should be completed and published near the end of the present phase of the EMODnet HRSM2 contract. Current and future steps are:
  - Finalising the upgrading developments for a new release of the GLOBE (data processing software) by end of February 2020. The new version is in particular aimed at facilitating the handling of large files which will make the activities by the basin coordinators more efficient and less time consuming; the associated adoption of the NetCDF V4 data format for input and output of GLOBE will also optimise the compliance with international standards;
  - Data providers are expected to pre-process their data contributions, as indexed in Task 1, using the existing GLOBE version, followed by delivery to the basin coordinators until the end of February 2020;
  - From March to July 2020, basin coordinators will analyse, process and merge selected contributions using the new GLOBE version into regional DTMs. A meeting gathering the basin coordinators and core technical partners will be organised in April 2020, aiming at monitoring progress and gaining feedback on the new GLOBE version and the common methodology;
  - The Regional basin DTMs will be transferred to the DTM integrator (GGSgc) around summer 2020 and then analysed and merged from August to October 2020 in order to produce a new version of the EMODnet bathymetry grid. After validation, checking all data references, and additional activities such as preparing a new 3D model and new set of downloadable DTM tiles in multiple formats, the new release should be made available around November 2020 on the portal.

- **Task 3 - Establish best-estimate European digital coastlines and compile overview of legal baselines**: The coastline and legal baselines products will be updated. Therefore, partner Deltares has identified and analysed the difficulties that were earlier experienced. Currently, Deltares works on improving the digital coastline method estimated from satellite views. While all partners have been requested to look for any updates and new entries for the existing inventory of legal baselines.
- **Task 4 - Establish machine-to-machine connections to data and data products:**
  Three regional DTMs, together covering the Mediterranean Sea area, will be generated using the Collaborative Virtual Environment (CVE) which consists of a version of GLOBE installed and configured on the shared DATARMOR high performance computing infrastructure at IFREMER. This will provide more insights and contribute to further making the CVE workflow fit for production of regional DTMs in a shared and powerfull computing platform. As part of the CVE development, IFREMER is currently developing visualisation services which will facilitate the basin coordinators to evaluate the quality of the regional DTMs in an easier way.
- **Task 5 - Maintain a web portal:** The major upgrading of the CDI Data Discovery & Access service in synergy with the EU SeaDataCloud project has been finalised. The new CDI user interface and CDI machine-to-machine services for WMS and WFS services are fully operational. Further progress was made with replacing the existing CDI Download Manager (DM) software component at several data providers with the new CDI

Replication Manager (RM) component. This deployment process is ongoing and is relevant for data providers for submissions of new and updated CDI entries and for handling requests for restricted data sets. While copies of unrestricted data sets are added to the new CDI data cloud from which data deliveries to users are being served. The planning is that the deployment of the RMs at the relevant data providers of EMODnet Bathymetry will be completed in January 2020 as it directly influences progress of Task 1. Following the feedback and renewed request by EASME, additional activities were undertaken together with the EMODnet Secretariate and EU services to improve the GDPR compliance of the EMODnet Bathymetry website and related services. In practice, a number of open items were resolved and reported. Review and acceptance by EU are awaited. Upon special request by EASME, also an open issue concerning metadata in the Bathymetry OGC WMS service was fulfilled. This is reported in section 3.

- **Task 6 - Operate a help-desk:** several questions were received and answered by the helpdesk. The user questions received and answered are detailed in chapter 4 and Annex 1.
- **Task 7 - Achieve international interoperability:** a Memorandum of Understanding between IHO-IOC General Bathymetric Chart of the Ocean / Seabed 2030 and EMODnet Bathymetry has been signed. This MOU formalises the already existing collaboration, with mutual benefits clearly identified. Further public communication should be done in the coming months.
- **Task 8 - Achieve INSPIRE compliance:**
  The CDI scheme had been made INSPIRE compliant, already in September 2013. However, due to changes by the INSPIRE team at EU-JRC, both on the INSPIRE ISO19139 metadata schema as concerning the introduction of a new official (beta) validator service, it appeared that the CDI XML output was not compliant anymore. This gave reason for a dialogue with the INSPIRE team for overcoming the issues on both sides as it was clear that the functioning of the new validator was one of the reasons for concern. Recently, activities have been concluded in discussion and cooperation with the INSPIRE team at EU-JRC to update the CDI XML coding in full compliance with the latest INSPIRE ISO19139 metadata schema. This can be validated using the latest version of the new ETF validator of INSPIRE: http://inspire.ec.europa.eu/validator/. Whereby one has to select metadata for interoperability as the target conformance class. To reach this milestone, a number of change requests have been submitted by SeaDataNet to INSPIRE (at JRC) to let them accept community profiles such as the SeaDataNet CDI format with its own controlled vocabularies as INSPIRE compliant profiles, and to accept geographic datums such as WGS84 next to European datums and to make their INSPIRE validator fully fit for these. The change requests were supported by EU DG Environment and DG MARE and a follow-up was given by the INSPIRE JRC team. Also a few updates were made in the CDI schema (now version 12, published at the SeaDataNet portal under standards) to fully support INSPIRE specific requirements such as textual references to the INSPIRE legislation. Thus, all XML output of the CDI services at SeaDataNet and EMODnet Bathymetry portals is fully INSPIRE compliant (again)!!
- **Task 9 - Monitoring of performance:** the overall performance of the portal and its services is continuously measured and its results are reported in the separate indicators spreadsheet. It demonstrates that the Bathymetry portal and its services and products continue to be highly popular and in great demand for a wide range of user applications.
- **Task 10 – Project management:** The coordinator and technical coordinator prepared the 3rd quarterly progress report which was accepted by EU (EASME and DG MARE). The coordinator and a group composed of GGSgc, and IFREMER gathered in Brest. Outcomes of this meeting has been communicated to the overall group (see task 2). Coordinator and technical coordinator also worked on drafting the Annual Progress report and an update of the International Standards and Interoperability report which will be delivered to EASME and EMODnet Secretariate soon.

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.

Main challenge	Measures taken
Uptake of the upgraded CDI service and its new methodology for populating the CDI service by data providers. For multiple EMODnet Bathymetry data providers it includes deploying the new Replication Manager (RM) software, while all data providers have to adapt to the new CDI Import Manager service steps which gives each data provider more self-control for submitting and checking updated and new CDI entries.	Data providers were informed about the CDI service upgrading development and also several joined the Training Workshops in summer 2019 which were organised and funded by the EU SeaDataCloud project for transfer and hands-on training with the new methodologies and associated software and services. This was followed by releasing the new RM software and sending new manuals and instructions to all data providers. This was followed by bilateral guidance and support to each data provider for deploying software, where applicable, testing it's functioning, and adopting the new approach to population of the CDI service. This was an intensive process between the data providers and MARIS as cdi-support helpdesk and is still not fully completed, but very good progress is made whereby the upgraded CDI services function as designed.

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.

Issue identified	Status (Pending/Resolved)	Action taken	Date due
A request was received from EASME to facilitate discovery and usage of OGC Web services (WMS, WFS, WCS), by filling the INSPIRE metadata fields (metadata url - pointing to an xml end-point record - and data url - pointing to predefined download link).	Resolved	Contact was made with the technical coordinator of the EMODnet Secretariate for getting understanding of the request. As a follow up, use was made of the Content Management System (CMS) of the GeoServer instance that drives the OGC services of the Bathymetry Viewing service. Using the CMS, metadata were included for each layer by means of a description in the abstract metadata field, and where relevant, an URL was added to the XML which gives the landing page of the EMODnet DTM (version 2016 or 2018) in the Sextant catalogue of EMODnet Bathymetry. This gives not only a full metadata description of the DTMs with e.g. acknowledgements to data providers, but also a link to the service for downloading DTM tiles.	End 2019.
A request was received from Trust-IT to configure the right favicons	Resolved	Both the EMODnet Bathymetry portal (www.emodnet-bathymetry.eu) and the Bathymetry Viewing and Download service (portal.emodnet-bathymetry.eu) now show the Bathymetry favicon.	Asap

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.

Date	Organisation	Type of user feedback (e.g. technical, case study, etc.)	Response time
3 October 2019	ThinkRCG, United Kingdom	Question about difference between DTM and nautical chart depths near Ireland	Three days later
6 October 2019	UMA, Spain	Question about losing information when joining DTM data	Two days later
10 October 2019	UIS, Norway	How to download High Resolution DTMs near Greece	2 weeks later
28 October 2019	Vattenfall, Germany	Question about vertical reference used in DTM	Same day
31 October 2019	??	Whether the DTM can be downloaded with negative values	One week later
15 November 2019	FMI, Finland	Warning that the WMS service was not functioning	Same day
29 November 2019	UniCT, Italy	How to acknowledge EMODnet DTM in scientific abstracts	Three days later
3 December 2019	University of Colorado, USA	Question about geographical coverage of EMODnet DTM	Same day
15 December 2019	??	Whether EMODnet Bathymetry performs environmental studies	Next day
17 December 2019	Tinopolis, United Kingdom	Asking permission to use EMODnet Bathymetry maps in a tv documentary	Same day
17 December 2019	HZG, Germany	Question about including land cover in downloads	Next day

See Annex for more details. Names have been left out because of GDPR rules.

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.

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.)
22-23/10/2019	London, UK.	Meeting - The Nippon Foundation-GEBCO Seabed 2030 Project: From Vision to Action	A	Memorandum of understanding
4-9 / 11/2019	Portsmouth, USA	GEBCO Symposium	A	Various topics discussed
29/10/2019	Brest, France	Technical meeting to discuss GLOBE upgrading and QA-QC methods, and possible implications for the overall planning	O	See description above
SUM			**1**	**Total # of meetings organised =**
SUM			**3**	**Total # of meetings attended =**

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.).

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.)
22-23/10/2019	London, UK.	Meeting - The Nippon Foundation-GEBCO Seabed 2030 Project: From Vision to Action	Memorandum of understanding established between IHO and EMODnet Bathymetry
3/11/2019	Poster	Emodnet poster presented for the "Journée de l'information scientifique du Shom"	Approx. 70 participants
SUM 2			**Total # of promotion events**

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

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

Date	Name of journal, conference, …	Publication title	Authors	Organisation(s)
Oct 19	*Morskoy Gidrofizicheskiy Zhurnal. 2019;35(5):496-510. (In Russ.) https://doi.org/10.22449/0233-7584-2019-5-496-510*	Long-Term Variability of Thermohaline Characteristics of the Azov Sea Based on the Numerical Eddy-Resolving Model.	Mizyuk A.I., Korotaev G.K., Grigoriev A.V., Puzina O.S., Lishaev P.N.	Marine Hydrophysical Institute of RAS, Sevastopol, Russian Federation
Oct 19	*Deep Sea Research Part I: Oceanographic Research Papers, 154, 103144.*	Estimating vertical mixing in the deep north Aegean Sea using argo data corrected for conductivity sensor drift.	Zervakis, V., Krauzig, N., Tragou, E., & Kunze, E.	Department of Marine Sciences, School of the Environment, University of the Aegean, Mytilene, Greece
Oct 19	*Scientific reports, 9(1), 1-10.*	Recreational vessels without Automatic Identification System (AIS) dominate anthropogenic noise contributions to a shallow water soundscape.	Hermannsen, L., Mikkelsen, L., Tougaard, J., Beedholm, K., Johnson, M., & Madsen, P. T.	Zoophysiology, Department of Bioscience, Aarhus University, Aarhus, Denmark
Oct 19	*Journal of environmental management, 253, 109749.*	Are FADs a significant source of marine litter? Assessment of released debris and mitigation strategy in the Mediterranean sea.	Mauro, S., Tiziana, C., Franco, A., Claudio, B., Pierpaolo, C., Francois, G., & Teresa, R.	Centro Interdipartimentale Della Sicilia, Integrative Marine Ecology, Palermo, Italy
Oct 19	*Journal of Applied Ecology.*	Distribution maps of cetacean and seabird populations in the North-East Atlantic	Waggitt, J. J., Evans, P. G., Andrade, J., Banks, A. N., Boisseau, O., Bolton, M., et al.	School of Ocean Sciences, Bangor University, Menai Bridge, UK
Oct 19	*Physical Oceanography, 26(4), 304-315.*	Accuracy Estimation of the Black Sea Circulation	Dymova, O. A., & Miklashevskaya, N. A.	Marine Hydrophysical Institute of RAS, Sevastopol, Russian Federation

		Modeling Results Obtained at Different Bottom Topography.		
Oct 19	*International conference computational science ICCS 2019*	Implementation of a 3-dimentional hydrodynamic model to a fish aquaculture area in Sines, Portugal-A down-scaling approach.	Corre, A., Pinto, L., Mateus M.	Universidade de Lisboa, Lisbon
Oct 19	*Marine Geology, 419, 106061.*	Linking the high-resolution acoustic and sedimentary facies of a transgressed Late Quaternary alluvial plain (Gulf of Trieste, northern Adriatic).	Novak, A., Šmuc, A., Poglajen, S., & Vrabec, M.	University of Ljubljana, Slovenia
Oct 19	*Geochemistry, Geophysics, Geosystems.*	Progressive changes in magma transport at the active Serreta Ridge, Azores	Romer, R. H. W., Beier, C., Haase, K. M., Klügel, A., & Hamelin, C.	Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany
Oct 19	*PloS one, 14(10).*	Megabenthic communities of the Ligurian deep continental shelf and shelf break (NW Mediterranean Sea).	Enrichetti, F., Dominguez-Carrió, C., Toma, M., Bavestrello, G., Betti, F., Canese, S., & Bo, M.	Università degli Studi di Genova, Italy
Oct 19	*Geophysical Journal International, 220(1), 461-489.*	Tectonic deformation in the Santorini volcanic complex (Greece) as inferred by joint analysis of gravity, magnetotelluric and DGPS observations.	Tzanis, A., Chailas, S., Sakkas, V., & Lagios, E.	University of Athens, Greece
Oct 19	*Doctoral dissertation*	Beach carrying capacity assessment: case study for sustainable use of kusadasi beaches	Khodkar, G.	Middle East Technical University), Turkey
Oct 19	*Doctoral dissertation*	Historical Development of Heavy Metal Input	Boehnert, S.	Universität Bremen, Germany

		into Near-Coastal Areas.		
Oct 19	*Journal of Maps, 15(2), 759-772.*	Shallow geophysics of the Asinara Island Marine Reserve Area (NW Sardinia, Italy).	Romeo, R., Baradello, L., Blanos, R., Congiatu, P. P., Cotterle, D., Ciriaco, S., ... & Lodolo, E.	OGS, Trieste, Italy
Oct 19	*15th Internat ional Congress of the Geological Society of Greece*	Post-Miocene Deformation in the South Aegean: Insights from Seafloor Morphology and Seismic Profiling Data	Tsampouraki-Kraounaki, K., & Sakellariou, D..	Hellenic Centre for Marine Research, Greece
Oct 19	*Master dissertation*	MILDwave modelling of impact of WEC farms along a realistic coastline configuration	De Neve, M..	Ghent University, Belgium
Oct 19	*Deep Sea Research Part I: Oceanographic Research Papers, 153, 103124.*	Analysis of the population structure of a gorgonian forest (Placogorgia sp.) using a photogrammetric 3D modeling approach at Le Danois Bank, Cantabrian Sea	Prado, E., Sánchez, F., Rodríguez-Basalo, A., Altuna, Á., & Cobo, A.	Instituto Español de Oceanografía, Spain
Oct 19	*In Proceedings of the 5th International Conference on Geographical Information Systems Theory, Applications and Management (GISTAM 2019), pages 297-304*	Workflows for Virtual Reality Visualisation and Navigation Scenarios in Earth Sciences.	Mel, K., Luca, B. F., Fabio, V., Varvara, A., Ugo, B., Elena, R., ... & Eva, S.	University of Portsmouth, United Kingdom
Nov 19	*Briefing notes*	Arctic connections-Mapping an Arctic policy framework for the Scottish government.	Jafry, T., Mikulewicz, M., & Mattar, S.	Centre for Climate Justice, Glasgow Caledonian University, Scotland, UK.
Nov 19	*Deep Sea Research Part II: Topical Studies in Oceanography, 104701.*	Assessment of the eruptive activity and identification of the mud breccia's source in the Olimpi	Panagiotopoulos, I. P., Paraschos, F., Rousakis, G., Hatzianestis, I., Parinos, C.,	Institute of Oceanography, Hellenic Centre for Marine Research, 46.7 km Athens-Sounio Av., Anavyssos, 19013, Attica, Greece

		mud volcano field, Eastern Mediterranean.	Morfis, I., & Gogou, A.	
Nov 19	*Doctoral dissertation*	Estudo geoquímico e mineralógico das crostas de Fe-Mn no Atlântico Norte	Pereira, A. R. C.	Universidade de Lisboa, Portugal
Nov 19	*Scientific reports, 9(1), 1-14.*	fault-controlled deep hydrothermal flow in a back-arc tectonic setting, SE Tyrrhenian Sea.	Loreto, M. F., Düşünür-Doğan, D., Üner, S., İşcan-Alp, Y., Ocakoğlu, N., Cocchi, L., et al.	Istituto di Scienze Marine, CNR, Via P. Gobetti 101, 40129, Bologna, Italy
Nov 19	*Geology.*	Recent inversion of the Tyrrhenian Basin.	Zitellini, N., Ranero, C. R., Loreto, M. F., Ligi, M., Pastore, M., D'Oriano, F., et al.	Istituto di Scienze Marine, CNR, Via P. Gobetti 101, 40129, Bologna, Italy
Nov 19	*Journal of Quaternary Science.*	Pattern, style and timing of British–Irish Ice Sheet retreat: Shetland and northern North Sea sector	Bradwell, T., Small, D., Fabel, D., Clark, C. D., Chiverrell, R. C., Saher, M. H., et al.	British Geological Survey, Edinburgh, UK
Nov 19	*In Journal of Physics: Conference Series (Vol. 1359, No. 1, p. 012083). IOP Publishing*	Dynamics of the Azov-Black Sea basin by means of parallel ocean circulation modeling..	Mizyuk, A. I., & Puzina, O. S.	Marine Hydrophysical Institute of RAS, Sevastopol, Russian Federation
Nov 19	*Master Thesis*	Caracterización met-oceánica en el PN Marítimo-Terrestre del archipiélago de Cabrera e implicaciones en la navegación.	Megías Baños, C.	Universidad de Cantabria, Spain
Nov 19	*Geomorphology, 351, 106894.*	Morphology of retrogressive failures in the Eastern Rhone interfluve during the last glacial maximum (Gulf of Lions, Western Mediterranean).	Badhani, S., Cattaneo, A., Dennielou, B., Leroux, E., Colin, F., Thomas, Y., et al.	Ifremer, France

Nov 19	*Biogeosciences Discussion*	Benthic foraminifera as tracers of brine production in Storfjorden "sea ice factory".	Fossile, E., Nardelli, M. P., Jouini, A., Lansard, B., Pusceddu, A., Moccia, D., et al.	Université d'Angers, France
Nov 19	*Recursos marins en el passat. IV Jornades d'arqueozoologia. Museu de Prehistòria de València (2019): 15-45.*	Areas litorales y recursos marinos durante el paleolítico-mesolítico de la región mediterránea ibérica. Sesgos y evidencias.	Tortosa, J. E. A.	Universitàt Valencia; Spain
Nov 19	*Remote Sensing, 11(22), 2636.*	Synergy of Satellite Remote Sensing and Numerical Ocean Modelling for Coastal Geomorphology Diagnosis.	Benincasa, M., Falcini, F., Adduce, C., Sannino, G., & Santoleri, R.	CNR-ISMAR, Institute of Marine Sciences, National Research Council, 00133 Rome, Italy
Nov 19	*Pure and Applied Geophysics, 1-25*	Spatio-Seasonal Variations in Long-Term Trends of Offshore Wind Speeds Over the Black Sea; an Inter-Comparison of Two Reanalysis Data.	Çarpar, T., Ayat, B., & Aydoğan, B.	Istanbul Water and Sewerage Administration (ISKI)Eyüp/IstanbulTurkey
Nov 19	*Human Adaptations to the Last Glacial Maximum: The Solutrean and its Neighbors, 372.* *Book section*	Fishes from solutrean sites of the iberian mediterranean region: palaeogeographical, palaeoecological.	Tortosa, J. E. A.	Universitàt Valencia, Spain
Nov 19	*Mediterranean demersal resources and ecosystems: 25 years of MEDITS trawl surveys* *M.T. Spedicato, G. Tserpes, B. Mérigot and E. Massutí (eds)*	Spatial distribution pattern of European hake, Merluccius merluccius (Pisces: Merlucciidae), in the Mediterranean Sea.	Spedicato, M. T., Tserpes, G., & Mérigot, B.	Department of Biology, University of Bari, Italy.
Nov 19	*Doctoral dissertation*	The coastal circulation model of büyük menderes	Gözlet, M. S.	Middle East Technical University), Turkey

		river mouth and adjacent coastal areas		
Nov 19	*Romanian Reports in Physics*	Sound speed characteristics and impulsive noise hotspots assessment in the north-western black sea.	Mihailov, M. E.	National Institute for Marine Research and Development "Grigore Antipa" Constanta - Romania
Nov 19	*Geophysical Journal International, 220(2), 1128-1148.*	Mantle thermal structure at northern Mid-Atlantic Ridge from improved numerical methods and boundary conditions.	Cuffaro, M., Miglio, E., Penati, M., & Viganò, M.	Istituto di Geologia Ambientale e Geoingegneria Italy
Dec 19	*Rapp. Comm. int. Mer Médit., 42, 2019*	Morphogenetic processes on the continental slope of the galicia bank (west iberia margin).	Simões, M., Roque, C., Riberio, C., Madureira, P., & Somoza, L.	EMEPC, Portugal
Dec 19	*Master's thesis,*	High-resolution modeling of spread of anthropogenic contaminants in marine waters, influencing aquaculture	Perepelytsya, M.	Universitat Politècnica de Catalunya
Dec 19	*Doctoral dissertation,*	Développement d'un indice biotique basé sur les foraminifères benthiques: application sur la façade méditerranéenne française	Parent, B.	Université d'Angers, France
Dec 19	*Pure and Applied Geophysics, 1-22.*	The Tsunami Inundation Hazard of the Maltese Islands (Central Mediterranean Sea): A Submarine Landslide and Earthquake	Mueller, C., Micallef, A., Spatola, D., & Wang, X.	GNS Science, Lower Hutt, New Zealand

		Tsunami Scenario Study.		
Dec 19	*Marine and Petroleum Geology, 104174.*	The Catalan magnetic anomaly: Its significance for the crustal structure of the Gulf of Lion passive margin and relationship to the Catalan transfer zone.	Canva, A., Thinon, I., Peyrefitte, A., Couëffé, R., Maillard, A., Jolivet, L., et al.	BRGM, GeoResources Division, Orleans, France
Dec 19	*Physical Oceanography, 26(5), 438.*	Long-Term Variability of Thermohaline Characteristics of the Azov Sea Based on the Numerical Eddy-Resolving Model.	Mizyuk, A. I., Korotaev, G. K., Grigoriev, A. V., Puzina, O. S., et al.	Marine Hydrophysical Institute of RAS, Sevastopol, Russian Federation
Dec 19	*Geophysical Journal International.*	A new 3-D P-wave velocity model for the Gulf of Cadiz and adjacent areas derived from controlled-source seismic data: application to non-linear probabilistic relocation of moderate earthquakes.	Lozano, L., Cantavella, J. V., & Barco, J.	Spanish Seismic Network, Instituto Geográfico Nacional, Madrid, Spain
Dec 19	*Geochemistry, Geophysics, Geosystems*	Pockmarks in the Witch Ground Basin, Central North Sea	Böttner, C., Berndt, C., Reinardy, B., Geersen, J., Karstens, J., et al.	GEOMAR Helmholtz Centre for Ocean Research Kiel, Kiel, Germany
Dec 19	*Conference Series: Earth and Environmental Science (Vol. 386, No. 1, p. 012024). IOP Publishing.*	The impact of various types of open boundary conditions in numerical simulation of the Black Sea coastal circulation. In IOP	Senderov, M. V.	Marine Hydrophysical Institute, RAS, Kapitanskaya str. 4, Sevastopol, 299011, Russia
Dec 19	*Conference Series: Earth and Environmental Science (Vol. 386, No. 1, p. 012023). IOP Publishing.*	Sea ice modeling in the Sea of Azov for a study of long-term variability	Mizyuk, A. I., & Puzina, O. S.	Marine Hydrophysical Institute, RAS, Kapitanskaya str. 4, Sevastopol, 299011, Russia
Dec 19	*In Australasian Coasts and Ports*	Global-to-local scale	De Kleermaeker,	Deltares, Delft, The

	2019 Conference: Future directions from 40 [degrees] S and beyond, Hobart, 10-13 September 2019 (p. 276). Engineers Australia.	storm surge modelling: Operational forecasting and model sensitivities.	S., Apecechea, M. I., Verlaan, M., Mortlock, T., & Rego, J. L.	Netherlands
Dec 19	*Mediterranean demersal resources and ecosystems: 25 years of MEDITS trawl surveys* *M.T. Spedicato, G. Tserpes, B. Mérigot and E. Massutí (eds)*	Spatial variability of Chondrichthyes in the northern Mediterranean.	Follesa, M. C., Marongiu, M. F., Zupa, W., Bellodi, A., Cau, A., Cannas, R., et al.	Department of Life and Environmental Science, University of Cagliari, Via T. Fiorelli 1, Cagliari, Italy.
Dec 19	*Deep Sea Research Part I: Oceanographic Research Papers, 103186.*	Unveiling the deep biodiversity of the Janua Seamount (Ligurian Sea): first Mediterranean sighting of the rare Atlantic bamboo coral Chelidonisis aurantiaca Studer, 1890	Bo, M., Coppari, M., Betti, F., Massa, F., Gay, G., Cattaneo-Vietti, R., & Bavestrello, G.	CoNISMa, Roma, Italy
Dec 19	*Ocean Dynamics, 70(1), 57-75.*	The importance of wind forcing in fjord wave modelling.	Christakos, K., Furevik, B. R., Aarnes, O. J., Breivik, Ø., Tuomi, L., & Byrkjedal, Ø.	Norwegian Meteorological Institute, Bergen, Norway
Jan 20	*Quaternary Science Reviews, 229, 106135.*	Oceanic versus continental influences over the last 7 kyrs from a mid-shelf record in the northern Bay of Biscay (NE Atlantic).	Penaud, A., Ganne, A., Eynaud, F., Lambert, C., Coste, P. O., Herlédan, M., el al.	University of Brest, France
Jan 20	*Earth Surface Dynamics, 8(1), 1-15.*	Potential links between Baltic Sea submarine terraces and groundwater seeping.	Jakobsson, M., O'Regan, M., Mörth, C. M., Stranne, C., Weidner, E., et al.	University of Stockholm, Sweden

7 Annex: Other documentation attached

See Annex for Feedback from Users.

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.

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

Progress indicator	Comment
1.1 Volume of available acquired data	Good increase in number of CDIs
1.2 Number and coverage of built & external data products	Considerable increase in number of composite DTMs
2. Organisations supplying each type of data	Stable at 42 CDI data providers; taking into account the composite DTMs too, the overall number of data providers has increased from 51 to 58
3. Interfaces to access or view data: list changes or new items within reporting period	CDI service completely upgraded, also with new URLs for User Interfaces and OGC service. All EMODnet Bathymetry services now with https://
4. Usage of data and data products per interface and per theme	Stable and very good
5. Distribution of users that have used the portal's data and data products per organisation type and country, and their main use cases	Increasing and considerable with > 1300 users from 80 countries and well divided over all society sectors
6. External products (websites, apps, ...) built on top of web-services: update since last quarterly report	No info
7. Published use case and number of readings	This indicator provides two elements: Number of views per Use case and Use case appearance in the Central portal. This indicator doesn't really apply to Bathymetry since all the use cases are on the Central Portal. The indicator has to be seen as the views per single Use case in the reporting period.
8. Portal and Social Media visibility	These indicators basically indicate statistics about the origin of the visitors and their behaviour (interaction with the website or simple bouncing for example). When compared with the previous indicators, one can note a slight decrease in number of visitors (8.1), although the vast majority of users already know the portal and are active (8.3). Indicator 8.2 and 8.4 are to be optimized search engines to point on our website.
9.1 Technical monitoring	The portal has a very good and stable response time and overall a very good up time.
9.2 Portal user-friendliness	The score has increased again and is very good. More

	instructions from Trust-IT will be asked concerning the low footer scores. Next to that, we do not agree with the low score under GDPR compliant as we have the opinion that such an acceptance request to users is not obliged as the site has no third-party trackers. This standpoint has also been submitted in the recent GDPR report to EASME for which we await a response.
10. Visibility & Analytics for web pages	Unsurprisingly, pages relative to the "EMODnet bathymetry viewing and Download Service" have the highest score. This means that users spent the most time browsing and interacting with the viewing service which as many functions and overall is the most interesting product and service that EMODnet Bathymetry has to offer. From there, users also undertake downloading of DTM tiles which has a continuous high score of circa 9000 – 10000 downloaded files per quarter.
11. Visibility & Analytics for web sections	See comments provided for 8. The data product section with the viewing services remains a constant driver for most of the visitors. The number of visits on the CDI Data discovery shows a decrease. As part of the recent upgrading, which makes the user interface more attractive and efficient, and the ongoing further population, it is expected that this will increase again. Extra promotion will be undertaken to make users aware of the upgraded service. Also, it needs checking if the Matomo script has been implemented in a correct way when moving from the old V3 to the new V5 CDI service.
12. Average visit duration for web pages	Average visit duration is erratic, ranging from few seconds to 2:30 minutes. The interpretation of this diagram is complex as it might be interpreted in terms of user's interest but also, difficulty to understand the concept described on the web page. From Q3 to Q4 the following pages have seen some increase in average visit duration: RSM, How can you contribute and Web services.

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.

9 Annex: Feedback users to and from helpdesk

Subject: Re: EMODnet Bathymetry Feedback form
Date: Tue, 8 Oct 2019 10:15:59 +0200
From: Dick M.A. Schaap <dick@maris.nl>
To:

Dear ..,
Thank you for your interest in EMODnet Bathymetry.
Concerning your question / issue. After investigating your issue, it appears that the track lines of the survey used in the area (366_CV_11_03_AW_5M_WGS84) shows that the Arklow bank was omitted in the survey. The original data set therefore had a gap which is interpolated and not filled with GEBCO data. This is backed by the fact that the EMODnet data only has a mean value for the interpolated part but the CDI points to 366_CV_11_03_AW_5M_WGS84 which is the EMODnet convention.
We have no information about GEBCO.
Thank you for finding this issue. Fortunately we just learned from our colleagues from GSI (Ireland) that recently a new survey has included the Arklow bank and these results will be taken on board of the new version of the EMODnet DTM that is planned for release by end 2020.
I am aware this will not solve your issue on short term. However GSI is planning to include the new survey soon in the EMODnet Bathymetry CDI data discovery and access service by which you can request for a copy of the new survey data set. This might provide you a good alternative. If so, please give us a few weeks to get it organised.
Kind regards
Dick M.A. Schaap
Technical Coordinator

On 10/3/2019 1:05 PM, noreply@maris.nl wrote:

Name	...
Email	..
Feedback / Question	Hi I have a query regarding the water depths shown in your 2018 DTM bathymetry product at a location off the east coast of Ireland at Arklow Bank, -5.94537 52.79482 Your bathymetry product I downloaded shows depths of approx -35.5 metres. However, the marine chart for this area shows it much shallower (less than -20m) and the GEBCO dataset at -16m). Are you able to check that your data is correct, and if it is provide possible reasons on these differences? Many thanks ..

Subject: Re: EMODnet Bathymetry Feedback form
Date: Tue, 8 Oct 2019 10:22:44 +0200
From: ..
To: Dick M.A. Schaap <dick@maris.nl>

Dear Dick M.A. Schaap,
Thank you for your quickly answer and your help, finally I did the join in ArcGis (ESRI product).
Kind regards

El mar., 8 oct. 2019 a las 10:06, Dick M.A. Schaap (<dick@maris.nl>) escribió:
Dear …,

Thanks for your interest in EMODnet Batyhymetry.
Concerning your question / issue: are you using the web services or downloaded data?
In case you are using the web services, only the WCS service provides depth info. See details at:
https://www.emodnet-bathymetry.eu/data-products/web-services-and-standards
In case you are using dowloaded data, it is advised to use the Esri ASCII grids which are perfectly suited for ARCGIS (ESRI product).
Hope this helps.
Kind regards
Dick M.A. Schaap
Technical Coordinator
On 10/6/2019 8:38 PM, noreply@maris.nl wrote:

Name:	...
Emailaddress:	...
Feedback:	Dear Sir or Madam, I want to use the bathymetry layer to do a zonal stadistic in ARCGIS, so I need only a raster with the bathymetry, but I can join the differents layers, and when I joined appear only RGB colors and no depth. What can I do? Thank you very much

---

Subject: Re: EMODnet Bathymetry Feedback form
Date: Thu, 31 Oct 2019 10:43:39 +0100
From: Dick M.A. Schaap <dick@maris.nl>
To: ..

Dear …,
Thanks for your interest in EMODnet Bathymetry.
You can download the High Resolution Bathymetry Composite DTMs from the Bathymetry Viewing and Download service. Therefore you have to switch on the layer: High Resolution Bathymetry
The HRDTMs are then indicated in DARK YELLOW.
How to select and download the HRDTM is well explained in the HELP section.
See: https://portal.emodnet-bathymetry.eu/help/help.html#007
The HRDTMs are available in the EMO format. This is explained at:
https://www.emodnet-bathymetry.eu/media/emodnet_bathymetry/org/documents/euco-0901-002_dtm_exchange_format_specification_v1.6.pdf
Hope you will manage.
Kind regards
Dick M.A. Schaap
Technical Coordinator

On 10/10/2019 1:36 PM, noreply@maris.nl wrote:

Name	...
Email	....
Feedback / Question	On your website you have a high resolution bathymetric dataset from the Gulf of Corinth Greece. Is there a way to download the whole dataset as xyz points? I see there are pointers to other websites, but it is not clear how to access bathymetric data from these sites. (I am not an Oceanographer and many of the options are unfamiliar to me).

Subject: RE: EMODnet Bathymetry Feedback form
Date: Tue, 29 Oct 2019 16:07:58 +0000
From: ..
To: dick@maris.nl

Thank you! Have a great evening.

From: Dick M.A. Schaap <dick@maris.nl>
Sent: Tuesday, October 29, 2019 5:06 PM
To: …
Subject: Re: EMODnet Bathymetry Feedback form

Dear ...
Yes that is correct
Dick
Verstuurd vanaf mijn iPhone

Op 29 okt. 2019 om 11:32 geschreven:
Dear Dick M.A. Schaap,

Just to be certain: As shown in the image below, am I doing the data download process of LAT Bathymetry correctly? If I download the “ESRI ASCII” product, I will get high resolution Bathymetry in LAT correct?
Thanks again,

From: Dick M.A. Schaap <dick@maris.nl>
Sent: Monday, October 28, 2019 6:10 PM
To:
Subject: EMODnet Bathymetry Feedback form

Dear …..,
Yes, the EMODnet DTM has LAT as vertical reference. This is specified at:
https://www.emodnet-bathymetry.eu/data-products/qaqc-and-dtm-production-details
However when downloading the DTM in tiles we also offer the 2018 version with MSL whereby the differences with LAT have been derived from a tidal model of Deltares. The MSL tiles are only available as ESRI ASCII files.
Kind regards
Dick M.A. Schaap
Technical Coordinator
On 10/28/2019 5:48 PM, noreply@maris.nl wrote:

Name	...
Email	...
Feedback / Question	Hello, I am not certain if my last email sent since a blank page loaded after submitting the contact form. Do you know whether the EMODnet Bathymetry data has a vertical reference system of LAT? I can't find this info anywhere on my own unfortunately. Thanks for the help!

Subject: Re: EMODnet Bathymetry Feedback form

Date: Sun, 10 Nov 2019 10:51:21 +0100
From: Dick M.A. Schaap <dick@maris.nl>
To: ...

Dear ..,
Thank you for your interest in EMODnet Bathymetry.
Downloading XYZ file with negative values is not an option. Our advise is to use GIS software to change the current output.
Kind regards,
Dick M.A. Schaap
Technical Coordinator
On 10/31/2019 5:39 PM, noreply@maris.nl wrote:

Name	..
Email	..
Feedback / Question	Is it possible to download an XYZ file of an area of interest with bathymetry with negative values?

Subject: Re: EMODnet Bathymetry Feedback form
Date: Fri, 15 Nov 2019 13:20:40 +0000
From: .....
To: Dick M.A. Schaap <dick@maris.nl>

Dear Dick.
Great! EMODnet bathymetry works again. Thank you very much.
I am sorry for the delay with my response, because of a visit downtown.
I have made myself a piece of software that makes me cruise maps as html-files that use Leaflet with different layers including EMODnet bathymetry.
Best regards
..

Dick M.A. Schaap <dick@maris.nl> kirjoitti 15.11.2019 kello 13.06:

Dear ...,
It should be working again. Some sort of hick up.
Please check and confirm.
Dick
On 11/15/2019 11:46 AM, Dick M.A. Schaap wrote:
Dear ...,
Thanks for alert. We will check immediately. Will inform you if ok again.
Dick
On 11/15/2019 11:24 AM, noreply@maris.nl wrote:

Name	..
Email	...

Feedback / Question It looks like EMODnet bathymetry WMS-layers are not accessible. Is this temporary?

Subject: Re: EMODnet Bathymetry Feedback form

Date: Mon, 2 Dec 2019 11:18:46 +0100
From: Dick M.A. Schaap <dick@maris.nl>
To:

Dear …,
Thanks for your interest in EMODnet Bathymetry. Yes, it is fine to use the DTM as background in your figures in publications. Please include an acknowledgement as indicated in https://www.emodnet-bathymetry.eu/data-products/acknowledgement-in-publications
by including: **EMODnet Bathymetry Consortium (2018): EMODnet Digital Bathymetry (DTM):** http://doi.org/10.12770/18ff0d48-b203-4a65-94a9-5fd8b0ec35f6
Kind regards
Dick M.A. Schaap
Technical Coordinator .
On 11/29/2019 7:53 AM, noreply@maris.nl wrote:

Name:	..
Emailaddress:	..
Feedback:	Good morning, please, could you tell me if it is possible to use the bathimetry provided by https://portal.emodnet-bathymetry.eu/ as background of figures in publications? In particular, such figures will be published under a Creative Commons CC-BY licence. Thanks in advance Best regards

---

Subject: Re: EMODnet Bathymetry Feedback form
Date: Tue, 3 Dec 2019 10:23:09 +0100
From: Dick M.A. Schaap <dick@maris.nl>
To: ...

Dear …,
Thanks for your interest in EMODnet Bathymetry.
The EMODnet DTM is concerning the European waters and has no global coverage.
However in a few months from now, we will also provide a global map service, inter alia working up the GEBCO global bathymetry to a uniform legend, and of course keeping the EMODnet DTM for the European waters. The latter has higher grid resolution (ca 115 meters * 115 meters) versus GEBCO (1 km * 1 km).
Kind regards
Dick M.A. Schaap
Technical Coordinator
On 12/3/2019 10:14 AM, noreply@maris.nl wrote:

Name	...
Email	....
Feedback / Question	Hello, Thank you for posting this. I see you have bathymetry tiles web services. I'd like to display tiles on a leaflet map on my app www.argovis.com. I was wondering if you have data globally? The examples shown are all centered around Europe. Thanks again! Best regards, ...

Subject: Re: EMODnet Bathymetry Feedback form
Date: Mon, 16 Dec 2019 08:16:15 +0100
From: Dick M.A. Schaap <dick@maris.nl>

To: ....

Dear …,
EMODnet Bathymetry is aimed at developing and publishing the best Digital Terrain Model (DTM) for the European seas. As such we are not the right contact for providing information on environmental studies.
Kind regards
Dick M.A. Schaap
Technical Coordinator
On 12/15/2019 8:19 PM, noreply@maris.nl wrote:

Name ..

Email ...

Feedback / Question Requiero InformaciÃ³n para Ã¡mbito de estudios.

Subject: Re: EMODnet Bathymetry Feedback form
Date: Tue, 17 Dec 2019 15:00:15 +0100
From: Dick M.A. Schaap <dick@maris.nl>
To: ...

Dear …,
Thank you for your interest to use EMODnet Bathymetry data products and services for your programmes, which we greatly appreciate. When using please include some acknowledgement to EMODnet Bathymetry. See for example:
https://www.emodnet-bathymetry.eu/data-products/acknowledgement-in-publications
Moreover, please keep us posted on your use and when the programmes will be aired on TV as we are curious and might also make some publicity on your use case.
Will hear from you.
Kind regards
Dick M.A. Schaap
Technical Coordinator
On 12/17/2019 2:49 PM, noreply@maris.nl wrote:

Name ...

Email ...

Feedback / Question Hi, I hope you're well! I emailed previously in regards to Ocean Autopsy (BBC4) and about using the your Bathymetry to help create our programme's graphics. It would be great if I could hear from you as soon as possible as we are extremely keen to use your data and we are approaching toward the end the editing phase of the show. If you have any questions at all feel free to email or call my office number on: Many thanks Best, ..

Subject: Re: EMODnet Bathymetry Feedback form
Date: Wed, 18 Dec 2019 07:48:27 +0100
From: Dick M.A. Schaap <dick@maris.nl>
To: ...

Dear …,
Thanks for your interest in EMODnet Bathymetry. Concerning your question" the EMODnet DTM tiles are pre-generated products that do not contain height data over land. The aim of EMODnet Bathymetry is to

deliver bathymetric information and land DEM data is already available in the public domain. We did not want to replicate these public “land DEM” services as an EMODnet product. We have taken the publicly available land data and added it to the viewing service only in order to enhance the viewing experience of EMODnet. To enable our “depth picker”and “depth profile” tool in the viewer to be continuous over land we also added the land to our background database. In practice, this background database is also used for the “area of interest” download function as this is done on the fly. As a result, users can also download land data when the option “area of interest” is chosen, but that is a side-effect and not a promoted service. Also, the area of interest download is only used for small areas we believe this is acceptable in term of allowing download of data that is officially outside the EMODnet scope.
Hope this explains.
Kind regards
Dick M.A. Schaap
Technical Coordinator
On 12/17/2019 4:21 PM, noreply@maris.nl wrote:

Name	..
Email	...
Feedback / Question	Hello, I am wondering how to download entire DTM tiles including land topography. When I download an area of interest in the Baltic Sea, the topography is included. However, when I download entire tiles, values are set to fill values over land. Is it possible to get bathymetry+topography in one file for entire tiles? Thanks and kind regards.