



**EMODnet**



European Marine  
Observation and  
Data Network

# **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 (5)**

**Reporting Period: 01/01/2020 – 31/03/2020**



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## Disclaimer

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# 1. Highlights in this reporting period

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- Task 1 - Gather and give access to bathymetric survey data:** Taking into account the overall project planning, all data providers have been very active in the previous period and in the reporting period with preparing their data entries for the CDI and Sextant Catalogues as the deadline for this task was set in the first quarter of 2020. Moreover, data providers have updated existing entries in both catalogues, improving and completing the Quality Index information. During the reporting period, the number of survey data sets has increased from 26447 to 27565 CDI entries, while the number of Composite DTM entries has increased from 181 to 195. In addition, the number of High Resolution DTMs has increased in the dedicated HR-DTM catalogue from 196 to 206 entries, which in a later stage will be added to the HR-DTM layer in the Bathymetry Viewing and Download service. The overall number of data providers for the CDI and both Sextant catalogues increased from 58 to 64 organisations. Several bathymetry datasets have also been submitted and published ‘as-is’ in the EMODnet Ingestion service. MARIS is now encouraging the assigned data centres to elaborate those ingested datasets to phase 2, which should result in inclusion into the CDI or Sextant catalogues and possible use in the new EMODnet regional DTMs.
- Task 2 - Compile a multi-resolution digital terrain model of European seas:** During the period each of the data providers have also generated and delivered gridded bathymetric datasets to the corresponding basin coordinators. Starting in March, basin coordinators are analysing, processing and merging selected contributions using the GLOBE software. This work on regional compilation is planned to finish in July 2020. In parallel, Ifremer has provided a new release of the GLOBE Software (current version is 1.5.10) to all the participants of the project. This version will be used mainly by the basin coordinators. It has been largely improved in terms of data format (adoption of the NetCDF Version 4) hence unlocking the limitation on the file size; interpolation algorithm (developed by CORONIS); tracking history of the dataset. Work by CORONIS has concentrated on the successful development of an adapted interpolation algorithm for sparse (and unevenly distributed) data. This new algorithm has been integrated in the GLOBE software and is being tested, in order to define the best parameters and conditions of use. In order facilitate technical communications between all the participants of this phase of work (basin coordinators and core technical team), a remote meeting is planned on the 15<sup>th</sup> and 16<sup>th</sup> of April. Monitoring progress, gaining feedback on the most recent GLOBE version and fine tuning the common methodology are the main objectives of this meeting;
- Task 3 - Establish best-estimate European digital coastlines and compile overview of legal baselines:** As part of the current period and also previously, a great deal of efforts have been dedicated to improving the GTSM tidal modelling results by generating new runs integrating updated tide gauge control points, but more importantly integrating also the EMODnet Bathymetric model (2018 release) and GEBCO 2019 for rest of the world oceans and seas. Results indicate considerable improvement of the accuracy of the tidal heights estimated by the new GTSM model compared to physical measures (from 5.6 to 3.5 cm in the North Atlantic). Such improvement is double sided as it shows clearly that efforts improving the EMODnet Bathymetry product are generating benefits to the hydrodynamic modelling community. While locations with less good tidal model results indicate where the bathymetry still might need to be improved further. This concerns mostly estuaries and tidal areas where we require additional bathymetry data sets. On the other side, benefits from these results will be directly integrated in the automated coastline delineation production algorithm along with the conversion surfaces used to vertically transform the gridded bathymetry, natively generated at the LAT (Lowest Astronomical Tide) to the Mean Sea Level (MSL). In parallel, Deltares, is still requesting partners to look for any updates and new entries for the existing inventory of legal coastlines and baselines.
- Task 4 - Establish machine-to-machine connections to data and data products:** A recent version of the GLOBE Software has been installed and configured on the shared DATARMOR high performance computing infrastructure. Three regional DTMs, together covering the Mediterranean Sea area, are generating their contribution using this facility known as the Collaborative Virtual Environment (CVE) in order to gain experience and to test further this online and collaborative workflow. Concerning web services enabling to deliver data and data products, better description of the webservices generated by SEXTANT (composite DTM) has been elaborated, with full compliancy with ISO, OGC and INSPIRE recommendations. See also task 5 below.
- Task 5 - Maintain a web portal:** Major use has been made in the reporting period of the CDI import service, which also had been upgraded as part of upgrading the CDI Discovery & Access service in synergy with the EU SeaDataCloud project. Part of the EMODnet Bathymetry data providers are fully connected and have replaced

their earlier Download Manager component with the new Replication Manager component. This facilitates them to undertake import activities by themselves, only partly supported by the CDI Support desk. Another part of the EMODnet Bathymetry data providers continue to make use of the so-called interim solution, which means in practice that they transfer new and updated CDI entries to the CDI Support desk for managing the import process for them. In the reporting period, both processes have performed well and there was good understanding at data providers of the upgraded approach. Also, extra support was given for deploying and testing the new Replication Manager connections where needed. Furthermore, a number of webconf sessions were undertaken between the EMODnet Bathymetry coordinating and technical team members and the EU and Secretariat, in anticipation of a new EU vision for integrating the user interfacing of EMODnet thematic lots from the current distributed portals to the EMODnet Central portal. The webconfs were dedicated to explaining the technical and organisational set-up of the current EMODnet Bathymetry thematic portal, services, and interfaces as well as to brainstorming with the central portal team about a feasible approach, for which the actual deployment should be undertaken as part of a new contract after a new Tender procedure. At the same time, it is expected that the current EMODnet thematic contracts will progress in accordance with their agreed technical annexes. In practice, a lot of extra efforts are requested from the EMODnet Bathymetry core team, which goes beyond the current contract and related budget, and puts extra pressure on the project process.

- **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:** Extra work has been undertaken on generating the EMODnet Bathymetry World Base Layer (EBWB1). This is a gridded representation service of the worldwide bathymetry and topography. It gathers the most up-to-date compilation of bathymetric data including EMODnet Bathymetry in Europe and GEBCO for the rest of the world, and also includes a worldwide Digital Elevation Model for the land part, derived from satellite missions. This service follows most recent INSPIRE and OGC recommendations and technologies. This service is aiming to be used by all the EMODnet thematic portals as a common base layer, but also by any other users wishing to display an underlying map of the bathymetry as part of his project. Promotion with support from the Secretariat and including GEBCO partners is planned to occur shortly as part of the public release of the EBWB1.
- **Task 8 - Achieve INSPIRE compliance:** This task has been finalised in the previous quarter for the CDI service. The CDI scheme and its XML output as part of the CDI services at SeaDataNet and EMODnet Bathymetry portals are (again) fully INSPIRE compliant, which can be validated using the latest version of the new ETF validator of INSPIRE: <http://inspire.ec.europa.eu/validator/>. Thereby one has to select metadata for interoperability as the target conformance class. Furthermore, following the feedback and renewed request by the EMODnet Secretariat, additional activities were undertaken for achieving INSPIRE compliance for the OGC web services, such as WMS, WFS, and WCS. This included preparing INSPIRE compliant metadata documents for service layers of the CDI service respectively the Bathymetry Viewing and Download service and making these part of the Sextant catalogue which then creates INSPIRE compliant landing pages. As a next step, the references these landing pages are included in the metadata of the OGC web services themselves, which can be done using the GeoServer CMS of the CDI service and the Bathymetry Viewing and Download service. Moreover, the GeoServer was equipped with an INSPIRE extension plug-in. Awaited is a final validation by the EMODnet Secretariat.
- **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.
- **Project management:** The coordinator and technical coordinator prepared the 4th quarterly progress report which was accepted by EU (EASME and DG MARE). Coordinator and technical coordinator also delivered the Annual Progress report and updated the International Standards and Interoperability report which have been delivered to EASME and the EMODnet Secretariat on the 6/02/2020.

## 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. Provide information in the table]*

List of all challenges encountered during the reporting period	
Main challenge	Measures taken
Difficulties related to the home confinement in relation to COVID-19. Data producers and basin coordinators might not be able to get access to dedicated computer resources from their organisation.	Most of the organisations, members of the consortium have enabled their collaborators with connections to their network and resources using dedicated VPN. However, 3D visualisation of the data and data transfer through these VPN are often slow and inefficient for the volume of data considered. Efforts are being undertaken to make use of the CVE (see task 4 above) to allow for some of the processing.
Uptake of the upgraded CDI service and its new methodology for populating the CDI service by data providers. Undertaking the efforts to populate new entries and update existing entries in the CDI and Sextant catalogues, as well as pre-processing data sets using GLOBE for transfer of new and updated data sets since early 2018 to the Regional Coordinators for inclusion in the new Regional DTMs.	MARIS has been urging and giving support and guidance to all data providers to gather and make their new and updated entries in the CDI and Sextant catalogues. Where needed, technical support was given for setting up and testing new local configurations. And data providers were reminded a number of times of the importance of pre-processing their new and updated data sets since early 2018 and handing these over to Regional Coordinators. Moreover, there have been requests from Regional Coordinators to specific data providers, after checking the latest CDI and Sextant entries. As described earlier under Task 1 this has resulted in the desired results.

### 3. Identified issues: status and actions taken

*[Provide an overview of the issues identified by EASME (Table A), if any, during the reporting period, the status of those issues and actions taken to address them and/or roadmap with remaining actions planned to resolve the issues. You may also provide information about issues you identified yourself, but these need to be covered in a separate table (B)]*

<b>A. Priority issue(s) identified and communicated by EASME/ DG MARE/ SECRETARIAT</b>			
Priority issue(s)	Status (Pending/Resolved)	Action(s) taken / remaining actions planned	Date due
JIRA Issue 33: Implement Web Services MetadataUrl and DataUrl fields	Pending	Tuning with other lots and the Secretariat actions were undertaken for including MetadataUrls and DataUrls in the OGC web services of the CDI data discovery and access service respectively the Bathymetry Viewing and Download service. INSPIRE compliant landing pages have been incorporated in Sextant to serve as MetadataUrls, which have been included in the GeoServer instances. The Secretariat has been asked to perform a final validation, which is awaited on short term.	asap
Representation of UK considering Brexit status	Resolved	The EMODnet Bathymetry portal presents only physical geography elements (water depth, topography), without any reference to aggregated statistics. Therefore it appears that no action is needed in views of this issue.	done

<b>B. Other priority issue(s) identified by the thematic assembly group itself</b>			
Priority issue(s)	Status (Pending/Resolved)	Action(s) taken / remaining actions planned	Date due

## 4. User feedback

*[Provide a list of all user feedback received on your portal in chronological order within the reporting period. Indicate the type of the feedback received, a clear description of the query, and the actions undertaken to resolve the issue (e.g. update of metadata, fixing a particular issue with the map viewer). Indicate the status of the query (i.e. has the query been resolved or not yet), and if not provide an explanation why. 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. Provide information in the table. If you wish to include the full user feedback in the report you can attach it in Annex]*

Overview of user feedback and/or requests received during the reporting period						
Date	Organisation	Type of user feedback (e.g. technical, case study, etc.) and short description of the feedback received	Response time	Status of user query: resolved/pending	Measures taken to resolve the query	Status: if not (yet) resolved/pending, explain reason why and expected timeline
3 Jan 2020	JNCC, UK	Question about date ranges of input data sets	Three days later	Resolved	Given satisfactory feedback	
8 Jan 2020	Exeter University, UK	Question about uncertainty associated with the EMODnet Bathymetry DTM	Same day	Resolved	Given satisfactory feedback	
8 Jan 2020	Intertek, Netherlands	Question about about the vertical datums	Next day	Resolved	Given satisfactory feedback	
15 Jan 2020	DTU, Denmark	Question about acknowledgements to images in thesis	Same day	Resolved	Given satisfactory feedback	
16 Jan	TU Delft, The	Question about DTM	Same day	Resolved	Given satisfactory	

2020	Netherlands	formats			feedback	
7 Feb 2020	??	Question about about the vertical datums	Two day later	Resolved	Given satisfactory feedback	
6 Feb 2020	University of Aberdeen, UK	Question about .emo file format for DTM tiles	Two days later	Resolved	Given satisfactory feedback	
18 Feb 2020	UNICA, Italy	Issue with downloading	Same day	Resolved	Given satisfactory feedback	
24 Feb 2020	??, Greece	Question about coordinates on the map	Same day	Resolved	Given satisfactory feedback	
24 Feb 2020	University of Texas, USA	Question about desirability of csv files for depth profiles	Same day	Resolved	Given satisfactory feedback	
24 Feb 2020	??	Question if we can provide bathymetry of Mozambique	Two days later	Resolved	Given satisfactory feedback	
17 March 2020	??	Question how to solve inverted relief.	Same day	Resolved	Given satisfactory feedback	



## 5. Meetings held/attended & planned

[List here the internal and external meetings held/participated by the contractant (e.g. meeting, conference, training (workshop), etc.) since the last quarterly report, and any important meetings or events planned in the future. 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. Provide information in the two table]

A. Meetings organised and attended				
Date	Location	Type event (meeting, training (workshop), etc.)	Meeting to be attended / organised	Short description and main expected outcomes
20 March 2020	Web Conf	EMODnet Bathymetry presentation and explanation by Shom, MARIS and GGSGC for EU DG MARE, Secretariat, VLIZ, and EMODnet Thematic coordinators, gathering insights for new vision of integrated EMODnet Central portal	O	Was aimed at providing insights about EMODnet Bathymetry technical and organisational set-up as part of process for planning approach new vision of an integrated EMODnet Central portal
17-19 March 2020	London, United Kingdom	Oceanology International 2020, stand with poster	O	CANCELLED DUE TO COVID
<b>SUM</b>			<b>O</b>	<b>Total # of meetings organised =</b>
<b>SUM</b>			<b>A</b>	<b>Total # of meetings attended =</b>

B. Meetings planned in the future				
Date	Location	Type event (meeting, training (workshop), etc.)	Meeting Attended (A) / Organised (O)	Short description and main results (# participants, agreements made, etc.)
07 April 2020	Web Conf	Follow-up meeting from Shom, MARIS and GGSGC with VLIZ and Secretariat to validate insights gained and to discuss options	A	To validate insights gained, and to discuss options for a feasible approach
15 April 2020	Web Conf (originally planned in Madrid,	Core group meeting	O	To monitor progress and to identify and solve possible

	Spain)			issues

## 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.). If you have planned any important outreach and/or communication activity, then please list these with their expected outcome. Provide information in the tables A for actions done and B for planned activities]

A. Outreach and communication activities			
Date	Communication action/ material	Short description (of the material, title, ...) and/or link to the activity	Main results
Jan 2020	Peer reviewed Paper	Campos, R., Quintana, J., Garcia, R., Schmitt, T., Spoelstra, G., & Schaap, D. (2020). 3D Simplification Methods and Large Scale Terrain Tiling. <i>Remote Sensing</i> , 12(3), 437.	Accepted and published. See: <a href="https://www.mdpi.com/2072-4292/12/3/437">https://www.mdpi.com/2072-4292/12/3/437</a>
17-19 March 2020	London, United Kingdom	Oceanology International 2020, stand with newly prepared EMODnet Bathymetry poster	CANCELLED DUE TO COVID

B. Planned outreach and communication activities			
Date	Communication action/ material	Short description (of the material, title, ...) and/or link to the activity	Main results expected
4-8 May 2020	EGU 2020, Vienna, Austria	Presentation at EGU 2020	CANCELLED DUE TO COVID
14 May 2020	European Maritime Day 2020, Cork, Ireland	Poster at EMD2020	CANCELLED DUE TO COVID
12-15 May 2020	INSPIRE conference 2020, Dubovnik, Croatia	Presentation at the INSPIRE conference	CANCELLED DUE TO COVID
17-19 March 2020	MERIGEO, Bordeaux, France	Shared presentation between EMODnet Bathymetry and EMODnet Seabed Habitat	POSTPONED TO NOVEMBER DUE TO COVID

[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. Provide information in the table.]

### List of known publications using EMODnet data or data products

Date	Type and name of journal, conference, ...	Publication title	Author(s)	Organisation(s)
March 2020	<i>Marine Ecology Progress Series.</i> (Peer reviewed)	Structure and environmental drivers of phytoplanktonic resting stage assemblages in the central Mediterranean Sea.	Casabianca, S., Capellacci, S., Ricci, F., Andreoni, F., Russo, T., Scardi, M., & Penna, A.	University of Urbino, Italy
March 2020	<i>Fisheries Management and Ecology.</i> (Peer reviewed)	Spatial distribution and abundance of the by-catch coastal elasmobranch <i>Raja undulata</i> : Managing a fishery after moratorium.	Figueiredo, I., Maia, C., & Carvalho, L.	Portuguese Institute for the Sea and Atmosphere, Portugal
March 2020	<i>ICESWGNEPS Report 2018</i>	New monitoring technologies to produce ancillary data on Nephrops stock assessment.	Aguzzi, J., Navarro, J., Bahamon, N., Rotllant, G., García, J. A., Río, J. D., ... & Lordan, C. (2019).	ICES, Denmark
March 2020	<i>Environmental and Sustainability Indicators</i> (Peer reviewed)	Identifying ecosystem services research hotspots to illustrate the importance of site-specific research: an Atlantic coastal region case study.	Caro, C., Cunha, P. P., Marques, J. C., & Teixeira, Z. (2020).	La Molina National Agrarian University, Peru
March 2020	<i>Marine Chemistry</i> (Peer reviewed)	Observations and idealized modelling of microplastic transport in estuaries: The exemplary case of an upwelling system (Ría de Vigo, NW Spain).	Díez-Minguito, M., Bermúdez, M., Gago, J., Carretero, O., & Viñas, L. (2020).	Andalusian Institute for Earth System Research, Spain
March 2020	<i>Aquatic Conservation: Marine and Freshwater Ecosystems.</i> (Peer reviewed)	Spatial distribution modelling of striped dolphin ( <i>Stenella coeruleoalba</i> ) at different geographical scales within the EU Adriatic and Ionian Sea Region, central-eastern Mediterranean Sea.	Azzolin, M., Arcangeli, A., Cipriano, G., Crosti, R., Maglietta, R., Pietroluongo, G., ... & Carlucci, R.	University of Torino, Italy
March 2020	<i>Izvestiya, Atmospheric and Oceanic Physics</i> (Peer reviewed)	Black Sea Intrapycnocline Lenses according to the Results of a Numerical Simulation of Basin Circulation.	Mizyuk, A. I., & Korotaev, G. K. (2020).	Russian Academy of Sciences, Russia

<b>March 2020</b>	<i>Diversity</i> (Peer reviewed)	Offshore Neopycnodonte Oyster Reefs in the Mediterranean Sea.	Angeletti, L., & Taviani, M. (2020).	ISMAR-CNR, Italy
<b>February 2020</b>	<i>Marine Pollution Bulletin.</i> (Peer reviewed)	Microplastics in the Bay of Biscay: An overview.	Mendoza, A., Osa, J. L., Basurko, O. C., Rubio, A., Santos, M., Gago, J., ... & Peña-Rodriguez, C. (2020).	University of the Basque Country, Spain
<b>February 2020</b>	<i>Marine Pollution Bulletin.</i> (Peer reviewed)	Polycyclic aromatic hydrocarbons in surface sediments of the Aegean Sea (eastern Mediterranean Sea).	Hatzianestis, I., Parinos, C., Bouloubassi, I., & Gogou, A. (2020).	Institute of Oceanography, Hellenic Centre for Marine Research, Greece
<b>February 2020</b>	Geological Society of London Special Publication on Subaqueous Mass Movements and Their consequences (Peer reviewed)	Integrated geotechnical, sedimentological and geophysical investigation of seafloor instabilities in the Gulf of Lions Western Mediterranean.	Badhani, S., Cattaneo, A., Collico, S., Urgeles, R., Dennielou, B., Leroux, E., ... & Droz, L. (2020)	Ifremer, France
<b>February 2020</b>	<i>PeerJ.</i> (Peer reviewed)	Citizen science in the marine environment: estimating common dolphin densities in the north-east Atlantic.	Robbins, J. R., Babey, L., & Embling, C. B. (2020).	ORCA, UK
<b>February 2020</b>	<i>Global change biology.</i> (Peer reviewed)	Climate-induced changes in the suitable habitat of cold-water corals and commercially important deep-sea fishes in the North Atlantic.	Morato, T., González-Irusta, J. M., Dominguez-Carrió, C., Wei, C. L., Davies, A., Sweetman, A. K., ... & Laffargue, P. (2020).	Okeanos Research Centre, Portugal
<b>February 2020</b>	<i>Water.</i> (Peer reviewed)	Sound Velocity in a Thin Shallowly Submerged Terrestrial-Marine Quaternary Succession (Northern Adriatic Sea).	Novak, A., Šmuc, A., Poglajen, S., Celarc, B., & Vrabec, M. (2020).	Geological Survey of Slovenia, Slovenia
<b>February 2020</b>	<i>Вестник государственного университета морского и речного флота им. адмирала С.О. Макарова.</i> (Peer reviewed)	СПЕЦИАЛЬНОЕ НАВИГАЦИОННОЕ ОБЕСПЕЧЕНИЕ И ТОЧНОСТЬ БАТИМЕТРИЧЕСКОЙ СЪЕМКИ ДЛЯ РЕШЕНИЯ ЗАДАЧ ГЛУБОКОВОДНЫХ ГЕОЛОГОРАЗВЕДОЧНЫХ РАБОТ.  (SPECIAL NAVIGATIONAL SUPPORT AND ACCURACY OF BATHYMETRIC SURVEYS FOR DEEP-SEA MARINE GEOLOGICAL INVESTIGATIONS)	<a href="#">Firsov Yury G.</a>	Admiral Makarov State University of Maritime and Inland Shipping, Russia

<b>February 2020</b>	Report	Observations of sediment dynamics at Disken.	Aagaard, T., Ernstsen, V. B., Becker, M., Kopiske, E., & Nielsen, K. S. (2020).	University of Copenhagen, Denmark
<b>January 2020</b>	<i>Pure and Applied Geophysics.</i> (Peer reviewed)	Topographically Predicted Vertical Gravity Gradient Field and Its Applicability in 3D and 4D Microgravimetry: Etna (Italy) Case Study.	Vajda, P., Zahorec, P., Papčo, J., Carbone, D., Greco, F., & Cantarero, M. (2020).	Slovak Academy of Sciences, Slovakia
<b>January 2020</b>	<i>PloS one.</i> (Peer reviewed)	Post-LGM coastline evolution of the NW Sicilian Channel: Comparing high-resolution geophysical data with Glacial Isostatic Adjustment modeling.	Lodolo, E., Galassi, G., Spada, G., Zecchin, M., Civile, D., & Bressoux, M. (2020).	Istituto Nazionale di Oceanografia e di Geofisica Sperimentale, Italy
<b>January 2020</b>	<i>Continental Shelf Research.</i> (Peer reviewed)	Optimal estimations of directional wave conditions for nearshore field studies.	de Swart, R. L., Ribas, F., Calvete, D., Kroon, A., & Orfila, A. (2020).	Universitat Politècnica de Catalunya, Spain
<b>January 2020</b>	<i>Remote Sensing.</i> (Peer reviewed)	3D Simplification Methods and Large Scale Terrain Tiling.	Campos, R., Quintana, J., Garcia, R., Schmitt, T., Spoelstra, G., & Schaap, D. (2020).	Coronis, Spain
<b>January 2020</b>	Doctoral dissertation	Architecture and kinematics of forearc basins and intra-caldera resurgences: new insight from the Paola Basin (western offshore Calabria region) and the Campi Flegrei caldera (Campania region).	Corradino, M.	Universtia degli Studi di Palermo, Italy
<b>January 2020</b>	<b>Vestnik gosudarstvennogo universiteta morskogo i rechnogo flota imeni admirala S.O. Makarova</b> (Peer reviewed)	SEABED RELIEF MAPPING PROBLEMS ON THE RUSSIAN BATHYMETRIC CHART OF THE ARCTIC OCEAN.	Firsov, Y. G.	Admiral Makarov State University of Maritime and Inland Shipping, Russia
<b>January 2020</b>	<i>International Journal of Greenhouse Gas Control.</i> (Peer reviewed)	Impact and detectability of hypothetical CCS offshore seep scenarios as an aid to storage assurance and risk assessment.	Blackford, J., Alendal, G., Avlesen, H., Brereton, A., Cazenave, P. W., Chen, B., ... & Phelps, J. (2020).	Plymouth Marine Laboratory, UK
<b>January 2020</b>	<i>Proceedings of the 15th Int. Congress of the Geol. Soc. Greece.</i>	Contemporary kinematics of the South Aegean area detected with differential	Doxa, C., Sakkas, V., Tzanis, A., & Kranis, H. (2019, May).	University of Athens, Greece

		GNSS measurements. In		
<b>January 2020</b>	<i>Tectonics</i> (Peer reviewed)	3-D Architecture and Plio-Quaternary Evolution of the Paola Basin: Insights Into the Forearc of the Tyrrhenian-Ionian Subduction System.	Corradino, M., Pepe, F., Bertotti, G., Picotti, V., Monaco, C., & Nicolich, R. (2020).	University of Palermo, Palermo, Italy
<b>January 2020</b>	<i>Processes.</i> (Peer reviewed)	Layout Optimization Process to Minimize the Cost of Energy of an Offshore Floating Hybrid Wind-Wave Farm.	Izquierdo-Pérez, J., Brentan, B. M., Izquierdo, J., Clausen, N. E., Pegalajar-Jurado, A., & Ebsen, N..	UNEP DTU Partnership, Denmark
<b>January 2020</b>	<i>Pure and Applied Geophysics.</i> (Peer reviewed)	Seiches Around the Shetland Islands.	Pugh, D. T., Woodworth, P. L., & Wijeratne, E. M. S.	National Oceanography Centre, UK
<b>January 2020</b>	<i>Geological Society, London, Special Publications.</i> (Peer reviewed)	Geological and tectonic controls on morphometrics of submarine landslides of the Spanish margins.	León, R., Urgeles, R., Pérez-López, R., Payo, E., Vázquez-Izquierdo, A., Giménez-Moreno, C. J., & Casas, D.	Geological Surey of Spain, Spain
<b>January 2020</b>	MSc. Dissertation (Report)	<i>Redefinition of the circalittoral zone and its assemblages from Azores insular shelves through video survey</i>	Mano, A. L. S. A. T.	Instituto Universitario de ciencias psicologicas, sociais e da vida, Portugal

## 7. Monitoring indicators

*[Please consult and complete the designated excel template on monitoring and progress indicators in annex, and provide a comment short explanation on numbers and trends in the table on for each indicator when possible/applicable. If any additional monitoring was done through other monitoring tools, please state clearly. Provide information in the table.]*

Comments on the progress indicators in the excel template	
Progress indicator	Comment
1.1 Volume and coverage of all available acquired data	Very good increase in number of CDI entries for survey data sets.
1.2 Total number and the coverage of all built & external data products	Very good increases in number of Sextant entries for Composite DTMs and High Resolution DTMs.
2. Overview of all organisations supplying and approached to supply data and data products within reporting period	Stable at 42 CDI data providers; taking into account the composite DTMs and High Resolution DTMs too, the overall number of data providers has increased from 58 to 64.
3. Interfaces to access or view data	Stable
4. Usage of data and data products per interface and per theme	Quite stable and very good. For the first time also downloaded volumes of DTMs included.
5. Distribution of users that have used the portal's data and data products per organisation type and country, and their main use cases	Stable number of users compared to previous quarter with circa 1300 users 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	Indicator 8.1 - visibility and analytics indicate that the number of visitors (average 77 per day), returning visitors (av 31 per day) and page views (av 203 per day) are quite stable over time, while the bounce rate has stabilized to around 30% in the last quarters. Indicator 8.2 - 8.4 are also quite stable in the last quarters.
9.1 Technical monitoring	The portal has a very good and stable response time and overall a very good up time (100%).
9.2 Portal user-friendliness	The score has increased again and is now 100%.
10. Visibility & Analytics for web pages	As expected and targeted, the pages related to the "EMODnet bathymetry viewing and Download Service" have the highest score and this traffic is very stable, like also other sections and services. 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 8000 – 10000 downloaded DTM files per 3 quarter. .
11. Visibility & Analytics for web sections	This indicator shows the interest of users for specific sections of the website, excluding the Bathymetry Viewing and Download service. Strangely enough, it seems that the helpdesk receives most attention, which could be an error in the colour used as it is more to expect that the CDI pages receive that attention. Although many feedback forms are received through the helpdesk, their numbers are far lower than the reported page views here, which needs to be validated.
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 as difficulty to understand the concept described on the web page.

*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.*

## 8. Annex: Other documentation attached

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### Annex 1: Feedback details

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**Subject:**Fwd: EMODnet Bathymetry Feedback form

**Date:** Mon, 6 Jan 2020 08:30:27 +0100

**From:** Dick M.A. Schaap <dick@maris.nl>

**To:** ...

Dear ..

The date range is quite large as there are areas which have only been surveyed a long time ago. We even have a lot of plumb-line surveys. An indication about the age of surveys can be found in the Quality Index layer as part of the Bathymetry Viewing service.

This layer, when activated, allows you to configure what is displayed. 'Age' is one of these.

Hope this helps.

Kind regards

Dick M.A. Schaap

Technical coordinator

-

**Subject:**EMODnet Bathymetry Feedback form

**Date:** Fri, 3 Jan 2020 15:13:05 +0100

**From:** [noreply@maris.nl](mailto:noreply@maris.nl)

**To:** [dick@maris.nl](mailto:dick@maris.nl)

Name ...

Email ....

Feedback / Question Hi there, I was wondering what the date ranges were for input data used in the 2018 Mean Depth Coverage on your mapper? I've loaded up the source reference dataset, but it would take forever to individually go through each reference dataset and scroll through the metadata. Hopefully you have a shortcut? Best, ...

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On 1/8/2020 3:07 PM, Dick M.A. Schaap wrote:

Dear ..,

Thanks for your interest in EMODnet Bathymetry.

An indication about the uncertainty of the DTM can be found in the Quality Index layer which is part of the menu in the Bathymetry Viewing service. See: <https://portal.emodnet-bathymetry.eu/>

This layer, when activated, allows you to configure what is displayed.

Hope this helps.

Kind regards  
Dick M.A. Schaap  
Technical coordinator

On 1/8/2020 2:31 PM, [noreply@maris.nl](mailto:noreply@maris.nl) wrote:

Name ...

Email ...

Feedback / Question Hi, I am looking for any information you may have on the uncertainty associated with the EMODnet Bathymetry. Are there associated uncertainty netcdf files of the standard deviations for this product? Is there also information on the overall precision and accuracy of the data itself? Many thanks in advance,  
Julia

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On 1/9/2020 8:38 AM, Dick M.A. Schaap wrote:

Dear ...,

Thanks for your interest in EMODnet Bathymetry. Concerning the transformation from LAT to MSL:

The bathymetric data as collected from the data providers, are supposed to be referenced at the Lowest astronomical tide (IHO resolution 3/1919) which is relevant for the vertical reference for nautical charts. Most Hydrographic Offices in Europe have adopted this IHO guideline. Although IHO recommends LAT as the vertical reference for nautical charts, it is not a good vertical reference for several other applications such as hydronamical modelling near the coasts (tide, storm surge or waves). For this reason, efforts have been undertaken by EMODnet Bathymetry to enable converting the bathymetric model from LAT to MSL. Therefore, the following steps have been applied:

1. Modelling of LAT with respect to MSL with a numerical tide model for Europe
2. Extending this, relatively coarse data, in very shallow and inter-tidal waters
3. Adding the LAT-MSL difference to the LAT-referenced gridded bathymetry

The numerical tide model 'Global Tide Surge Model (GTSM)' as developed and run by Deltares (NL) has been used as a robust model. This model is a worldwide model which is based on an unstructured mesh with the mesh decreasing to 25km in the middle of the oceans to 1.25km along the coasts of Europe. This model has been forced by the most recent and publicly recognised bathymetric and topographic information (EMODnet Bathymetry DTM in Europe and GEBCO 2014 for the rest of the world), along with tide generating forces including amongst other winds and surface pressure. Also the model has been extensively validated against tide measurements.

For further information on GTSM I refer you to Deltares.

Kind regards  
Dick M.A. Schaap  
Technical Coordinator

On 1/8/2020 5:47 PM, [noreply@maris.nl](mailto:noreply@maris.nl) wrote:

Name ..

Email ....

Dear EMODnet I am working with Bathymetry data for coastal modelling processes and have a question about the vertical datums used for your full depth coverage ASCII files. Please could you confirm how the data has been translated vertically between the native LAT datum and Mean Sea Level datum. Was this using VORF or similar? Kind Regards Chris

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**Subject:**Re: EMODnet Bathymetry Feedback form

**Date:** Wed, 15 Jan 2020 22:15:45 +0100

**From:** ...

**To:** Dick M.A. Schaap <dick@maris.nl>

Thank you very much!

I just realized that the link I sent you was incorrect, this is the actual one: <https://findit.dtu.dk/en/catalog/2453302265>

Best regards,

On Wed, Jan 15, 2020 at 10:04 PM Dick M.A. Schaap <[dick@maris.nl](mailto:dick@maris.nl)> wrote:

Dear ...,

We have also no objection to you using the images for an article.

Kind regards

Dick

On 1/15/2020 8:03 ....wrote:

Hello again!

Thanks a lot for the early response and the congratulations :)

Unfortunately, the thesis was handed in some months ago and since I did not know about this particular way of crediting you, the images taken from EMODnet were referenced differently (but the company was given credit for it).

You can see such work in the following link:

<https://www.vindenergi.dtu.dk/english/kalender/arrangement?id=8bfc3cf5-6de8-49f6-8f62-ea4fb693d03a>

This time, we are talking about a scientific article that I have written about a part of my thesis. The publisher has accepted it, and this is the last thing they have asked from us.

Thanks again for your help, and please confirm that we can use it also for the article. We will do the reference as you suggest.

Best regards,

On Wed, Jan 15, 2020, 19:29 Dick M.A. Schaap <[dick@maris.nl](mailto:dick@maris.nl)> wrote:

Dear...,

Congratulations with finalising your thesis. Also thank you for using information from EMODnet Bathymetry which we appreciate.

Please include an acknowledgement in your thesis for the image(s). See:

<https://www.emodnet-bathymetry.eu/data-products/acknowledgement-in-publications>

for guidance.

Keep us informed about your thesis. Possibly we also would like to highlight your use of EMODnet Bathymetry later through our portal.

Kind regards

Dick M.A. Schaap

Technical Coordinator

On 1/15/2020 6:12 PM, [noreply@maris.nl](mailto:noreply@maris.nl) wrote:

Name ....

Email ...

Dear staff, I am a former wind energy student from DTU (Denmark), and in the last few months I worked on my thesis and then wrote a scientific article by using information from your website. Now, the results of the study are going to be published. We have been asked for copyright permission of a figure, which has been properly referenced to your company. I wonder if you could write back to me by email with your permission. I will be happy to show you the Figure I am referring to, as well as its proper reference to your company. Please, do not hesitate to contact me back if you need additional information. Please be aware that there aren't any commercial interests, just pure academic research. Thank you very much in advance. Best regards,

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**Subject:**Re: EMODnet Bathymetry Feedback form

**Date:** Thu, 16 Jan 2020 15:21:49 +0100

**From:** Dick M.A. Schaap <dick@maris.nl>

**To:** ...

Dear ...,

Thank you for your interest in EMODnet Bathymetry.

Unfortunately for you at this moment we have created a proprietary NetCDF implementation for this release of EMODnet Bathymetry. This NetCDF version is compatible with the GLOBE software from Ifremer. Ifremer is in the process of updating Globe in order to support NetCDF 4 in the CF convention, which will make the Bathymetry NetCDF version compatible for UNIDATA tools. This should be available after this summer.

However for now, I advise you to use one of the other available formats, such as ESRI ASCII which is fit for most GIS software.

Kind regards

Dick M.A. Schaap

Technical Coordinator

On 1/16/2020 9:58 AM, [noreply@maris.nl](mailto:noreply@maris.nl) wrote:

Name ...

Email ...

Dear sir/madam, I would like to download 2 dtm tiles with bathymetry data in netcdf format (year 2016, tiles B3 and C3). I have tried this, but I get files with ".dtm" extension, which I cannot open with netcdf tools. I was wondering what I do wrong and what I need to do to access the netcdf files? Thanks a lot for your help. With kind regards, ...

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**Subject:**EMODnet Bathymetry Feedback form

**Date:** Sun, 9 Feb 2020 10:37:19 +0100

**From:** Dick M.A. Schaap <dick@maris.nl>

**To:** ....

Dear .....,

Thanks for your interest in EMODnet Bathymetry. Concerning your question: Min refers indeed to the spatial minimum value in the grid cell. The datum used for EMODnet is LAT. Note that some data sources for EMODnet (e.g. GEBCO) have an undefined vertical datum and as such in areas of EMODnet where these sources are used the datum is unknown but likely to be close to MSL.

Hope this helps.

Kind regards

Dick M.A. Schaap

Technical Coordinator

On 2/7/2020 4:50 PM, [noreply@maris.nl](mailto:noreply@maris.nl) wrote:

**Name:** ...

**Emailaddress:** ...

**Feedback:** Please explain the datum of depth values provided on the platform. For example the Navionics platform provides depths that are actually MLLW (Mean Lowest Low Waters). Is this the "min" values provided in the High resolutions areas, or does "min" refer to spatial minimum value per cell of the grid? Thank you in advance.

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**Subject:**Re: FW: Form submission from: Contact us

**Date:** Sun, 9 Feb 2020 21:25:40 +0100

**From:** Dick M.A. Schaap <[dick@maris.nl](mailto:dick@maris.nl)>

**To:** ...

**CC:** Nathalie Tonné <[nathalie.tonne@emodnet.eu](mailto:nathalie.tonne@emodnet.eu)>, [secretariat@emodnet.eu](mailto:secretariat@emodnet.eu), 'Thierry Schmitt' <[thierry.schmitt@shom.fr](mailto:thierry.schmitt@shom.fr)>

Dear .....,

Concerning your question:

The EMO file format is a proprietary EMODnet ASCII format and is documented at:

[https://www.emodnet-bathymetry.eu/media/emodnet\\_bathymetry/org/documents/euco-0901-002\\_dtm\\_exchange\\_format\\_specification\\_v1.6.pdf](https://www.emodnet-bathymetry.eu/media/emodnet_bathymetry/org/documents/euco-0901-002_dtm_exchange_format_specification_v1.6.pdf)

Indeed the High Resolution DTM files are only available in the EMO format. The reason is that we wanted to include all statistics (Max, Min, Mean and StDev). You will have to import the EMO as an ASCII file. ESRI software, QGIS and other GIS systems have an ASCII Parser which should be able to handle CSV files.

Hope this helps.

Kind regards

Dick M.A. Schaap

EMODnet Bathymetry Technical Coordinator

On 2/6/2020 11:17 AM, Nathalie Tonné wrote:

Dear ...,

First of all, our sincerest apologies for the late follow-up. I have been absent for a couple of months, and only saw your message now.

Thank you very much for your interest in EMODnet.

I am putting you in contact with Dick Schaap and Thierry Schmitt, who will be able to help you with your request.

@Thierry and Dick: could you help Jose with his request, and kindly keep us in the loop? Many thanks!

Don't hesitate to contact us in case you have further questions.

Best wishes,

Nathalie for the EMODnet Secretariat

#### EMODnet Secretariat

From: [postmaster@vliz.be](mailto:postmaster@vliz.be) <[postmaster@vliz.be](mailto:postmaster@vliz.be)>

Sent: 25 November 2019 16:23

To: [secretariat@emodnet.eu](mailto:secretariat@emodnet.eu)

Subject: Form submission from: Contact us

Submitted on Monday, November 25, 2019 - 16:22 Submitted by anonymous user: 139.133.231.152 Submitted values are:

Name: ....

Email: ....

Organisation name: University of Aberdeen Organisation type: Academia/Research We would like to learn about your experience using EMODnet. Please leave us your question or provide your feedback here:

Dear all,

I downloaded a high-resolution bathymetry file in EMO file extension (the only option available), how can I manage to open this file in Arcgis or Qgis, I guess that I need to convert the file extension. Could you help me?

Best Regards,

Jose

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**Subject:**Re: EMODnet Bathymetry Feedback form

**Date:** Wed, 19 Feb 2020 07:59:57 +0100

**From:** Dick M.A. Schaap <[dick@maris.nl](mailto:dick@maris.nl)>

**To:** ....

Dear ...,

Thank you for your interest in EMODnet Bathymetry. Concerning your feedback: we can see in our logs that a number of downloads for your email address were completed. Most probably these have been downloaded and stored in your default folder on your laptop. Can you please check?

Moreover, we see a request for an Area of Interest on the basis of ESRI Ascii, which was halted a few times. Please be aware that these WCS actions can take a while to generate by Geoserver, in particular if the area is large which takes up to a minute before the actual download starts. So if you try again, then give the server some time to finish its job.

Hope this helps.

Kind regards

Dick M.A. Schaap

Technical Coordinator

On 2/18/2020 10:29 AM, [noreply@maris.nl](mailto:noreply@maris.nl) wrote:

Name ....

Email ....

Feedback / Question Good morning, I received the email with the links from which I can download the products that I selected. However, when I click the link "Download now" it opens a blank internet page and it won't download anything. What should I do? Can you help me? Thank you in advance

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**Subject:** Re: EMODnet Bathymetry Feedback form

**Date:** Mon, 24 Feb 2020 10:24:52 +0100

**From:** Dick M.A. Schaap <dick@maris.nl>

**To:** ....

Dear ...,

The location of the mouse is always indicated in a box in the lower left. Also you can make a bathymetry layer active by switching the radio button. Then in the top menu you find an option 'retrieve depth'. Click on the option to activate and then click in the map where your interest is. This will give a pop-up with depth info and coordinates.

Moreover, please check the HELP section for more options and user guidance:

<https://portal.emodnet-bathymetry.eu/help/help.html>

Kind regards

Dick M.A. Schaap

Technical Coordinator

On 2/24/2020 8:14 AM, [noreply@maris.nl](mailto:noreply@maris.nl) wrote:

**Name:** ...

**Emailaddress:** ...

**Feedback:** in the maps if i want to find the cordinates of of point how can i ?

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**Subject:**Re: EMODnet Bathymetry Feedback form

**Date:** Wed, 26 Feb 2020 13:26:04 +0100

**From:** Dick M.A. Schaap <dick@maris.nl>

**To:** ....

Dear ...,

Thank you for your interest in EMODnet Bathymetry. Currently, the depth profiles are indeed images. We heard from some other users that there is interest in having the depth profiles also in XYZ. Therefore, we will look into this. However, it might take a while. So please, visit the portal regularly.

Kind regards

Dick M.A. Schaap

Technical Coordinator

On 2/24/2020 7:51 PM, [noreply@maris.nl](mailto:noreply@maris.nl) wrote:

**Name:** ...

**Emailaddress:** ...

**Feedback:** It would be nice to get the profiles in csv format. As is, it plots an image. The site is very useful, thanks!

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-

**Subject:**Re: EMODnet Bathymetry Feedback form

**Date:** Wed, 26 Feb 2020 13:30:26 +0100

**From:** Dick M.A. Schaap <dick@maris.nl>

**To:** .....

Dear ...,

EMODnet Bathymetry has a focus on European sea basins and part of the North East Atlantic Ocean.

For other oceans and sea areas, we refer you to GEBCO - The General Bathymetric Chart of the Oceans - which you can find at [www.gebco.net](http://www.gebco.net). Its DTM has a lower resolution than EMODnet Bathymetry DTM, but it might suit your purposes.

Kind regards

Dick M.A. Schaap

Technical Coordinator

On 2/24/2020 12:57 PM, [noreply@maris.nl](mailto:noreply@maris.nl) wrote:

Name ...

Email ....

Feedback / Question Hi, can i get this data for Mozambican Coast?

-  
**Subject:**Re: EMODnet Bathymetry Feedback form

**Date:** Tue, 17 Mar 2020 13:19:27 +0000

**From:** ...

**To:** Dick M.A. Schaap <dick@maris.nl>

Hi Dick

Thanks a lot for the excellent tip!

All the best

Fernando

On Tue, 17 Mar 2020 at 12:34, Dick M.A. Schaap <[dick@maris.nl](mailto:dick@maris.nl)> wrote:

Dear ...,

Thanks for your interest in EMODnet Bathymetry. Considering your question: heights and depths can be defined positive or negative downwards. There is no standard for this. You can solve this in Global Mapper as there is an option to invert heights and depths. In the control center, select the options of the layer and go to “alter elevation values” and use -1 for the scale factor.

Hope this helps you.

Kind regards

Dick M.A. Schaap

Technical coordinator

On 3/17/2020 11:43 AM, [noreply@maris.nl](mailto:noreply@maris.nl) wrote:

**Name:** ...

**Emailaddress:** ...

**Feedback:** I down loaded an area of interest in ASCII - ESRI format, but when I open it on Global Mapper the relief is inverted. How do I solve this problem?

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