



EMODnet



European Marine
Observation and
Data Network

EMODnet Thematic Lot n°1 – Bathymetry

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Start date of the project: 20/12/2022 (24 months)

Centralisation Phase

Quarterly Progress Report 7

Reporting Period: 01/07/2024 – 30/09/2024



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1. Highlights in this quarter

Task 1 - Maintain and improve a common method of access to data held in repositories:

During the reporting period, the number of survey data sets has increased again from 43064 to 43081 CDI entries, while the number of Composite DTM entries increased from 290 to 294. New CDI entries for bathymetry survey data sets were contributed by 5 data providers, originating from 5 countries. These new data sets might be used for the next 2026 production as the gathering for the coming 2024 version of the EMODnet DTMs for European seas and Caribbean region has been completed. In practice, all data providers engaged in the EMODnet Bathymetry contract have populated new data sets to contribute to the planned 2024 DTM new releases for European seas and Caribbean Sea region.

Task 2 - Construct products from one or more data sources that provide users with information about the distribution and quality of parameters in time and space:

EMODnet DTM products:

As a follow-up to the workshop that was held 16-17 April 2024 in France with Regional Coordinators and core partners, Regional Coordinators have made great progress with generating the Regional DTMs. These have been forwarded to the EMODnet Bathymetry Integrator for review and further processing as part of the Integration process. One of the Regional Coordinators is behind, but the relevant Regional DTM is expected on short notice.

The following activities are planned in the coming months led Integrator (GGSGC) + Shom + MARIS:

- working on the overall integration of the RDTMs into a consistent EMODnet DTM for the European Seas and another for the Caribbean Region
- preparing the source reference layer, checking and correcting any missing CDI and Sextant references
- making the new DTM ready for publishing as downloadable tiles in multiple formats, OGC services, and completing product metadata in Sextant
- preparing the MSL version of the DTM and tiles using the LAT-MSL conversions from the GTSM model of Deltares
- making the 3D version of the EMODnet DTM together with CORONIS
- integrating the new EMODnet DTM into the Central Portal – Products Catalogue and Map Viewer service
- preparing report of findings

In addition, activities are concerned with completing the gathering and cataloguing of High Resolution DTMs (HR-DTMs) from data providers, and including this for viewing and downloading via a dedicated map layer.

Refined best-estimate European digital coastlines:

In the past few months, Deltares has produced gridded water index for the Caribbean based on Sentinel-2 imagery. The resolution of the gridded water index is around 10 meters. The production for the European continent is ongoing and will soon be finished. Next, Deltares will generate coastlines from these datasets in combination with gridded tides from GTSM and create an updated satellite derived coastline for low-water, mean water-level and high-water.

Updated Inventory of existing and ratified baselines and registered claims / disputes under UNCLOS, for European countries

A draft report and dataset for the baselines and official coastlines is almost ready. Many countries have contributed updates and there are a few new datasets. The datasets have all been checked and converted to a common format. The issues, that were kindly provided by MarineRegions, have been resolved or clarified.

Methodology for assessing bathymetry between coastline and foreshore:

This task aims to develop a generative machine learning approach that fills bathymetry in areas where there is a gap in the data with the aim of generating plausible bathymetry. Deltares continued with the diffusion technique and improvements were made on two aspects: data preprocessing, and sampling. The improvements will be tested by means of a few realistic tests, followed by automating the procedure and evaluating the performance more from a user perspective. One potential site for a realistic test is where the Loire river runs into the ocean at Saint-Nazaire in France. The current EMODnet grid provides data until the bridge, but lacks data inland from the bridge. The test will focus on generating bathymetry for the inland side.

Task 3 - Develop procedures for machine-to-machine connections to data and data products:

EMODnet Bathymetry continued to operate and maintain several catalogue services and web services, which are being harvested and/or directly feeding the Central Portal services. The services are following INSPIRE principles and their operations are being monitored from the Central Portal with good results. EMODnet Bathymetry is regularly testing the functionality of the Central Portal and following up feedback from users. This is aimed at spotting possible bugs in the back-office systems of EMODnet Bathymetry or at the front-office interfaces of the Central Portal. Any identified bugs are reported to JIRA for further action. Also, shortcomings or requests for improved functionality are being gathered from internal consortium testing and following user feedback and these are submitted to the CP team through JIRA and/or at TWG meetings as wishes for future developments. Most will be directed towards optimisation of functionalities, while also additional functionalities might come forward.

Task 4 - Contribute data, data products and content to a central portal that allows users to find, view and download data and data products:

New EMODnet Bathymetry products are planned near the end of 2024 and these will be then added and published at the Central Portal following the methodology that was earlier developed and successfully applied for the 2022 product releases. Possibly, the actual publishing will take place early 2025.

Task 5 - Contributing content to dedicated spaces in Central Portal:

Each thematic has its own dedicated space at the Central Portal where it publishes its so-called 'narrative'. The maintenance is done by sending an updated document to JIRA which is then processed by the EMODnet Secretariate. During the reporting period, EMODnet Bathymetry has not undertaken updating of the narrative.

Task 6 - Ensure the involvement of regional sea conventions:

Secretariats of the Regional Sea Conventions are kept up-to-date of the EMODnet Bathymetry services, inter alia through regional partners. The 2024 EMODnet bathymetry products, planned for release by end 2024, will again provide a good opportunity to reinforce the good relationships with the secretariats of the Regional Sea Conventions. The opportunity to engage in wider promotion will also be taken in order to further mobilize more potential data providers and product users.

Task 7: Contribute to the implementation of EU legislation and broader initiatives for open data:

GEBCO and Seabed 2030:

On a global scale, good synergy is continued with GEBCO and the Seabed 2030 project. In practice, the EMODnet DTM is considered as the European contribution to Seabed 2030 and as such fully integrated into the GEBCO DTM. This is strengthened by the fact that George Spoelstra (GGGsgc) and Federica Fogliini (CNR),

both members of the EMODnet Bathymetry consortium, act as Chair and Vice-Chair of the GEBCO subcommittee TSCOM (Technical Subcommittee on Ocean Mapping). This way, EMODnet Bathymetry continues to gain influence in global bathymetry programs and initiatives. Discussions between Seabed 2030 about a potential role of EMODnet Bathymetry as European regional mapping center for Seabed 2030 are ongoing.

EMODnet Bathymetry has by far the most advanced implementation and use of metadata associated to the EMODnet Bathymetry DTM compared to other bathymetry implementations. Other bathymetry programs and initiatives lack this mechanism as in past this was seemed unnecessary or unmanageable. With the growing success of EMODnet Bathymetry around the globe others now start to look carefully at EMODnet and the way EMODnet manages metadata, using the SeaDataNet infrastructure and standards. In July 2024, EMODnet partner GGSgc as chair of TSCOM visited in the USA the Center for Coastal and Ocean Mapping the Atlantic and Indian Ocean regional mapping center of the Seabed 2030 project based at Lamont Doherty Earth Observatory (New-York). TSCOM is responsible for the study and development of new technologies to support the GEBCO program. Lessons learned and best practices from EMODnet Bathymetry were an important topic for the agenda of these meetings. Earlier in 2023 and beginning of 2024 TSCOM organized a series of workshops and meetings focusing on a better use of metadata for the various GEBCO products and services. EMODnet partner CNR, Chair of the TSCOM metadata working group, participated in these meetings and presented the EMODnet Bathymetry philosophy and methodology for metadata during various sessions. All these efforts have now resulted in concrete plans for GEBCO to adopt the EMODnet Bathymetry metadata approach.

GEBCO just released the 2024 edition of the digital bathymetric grid. As the EMODnet Bathymetry DTM is released once every two years the GEBCO 2024 contains no update for EU waters. The EMODnet Bathymetry did however contribute to the GEBCO quality control process by reviewing the draft version of the 2024 GEBCO grid. Input provided by the EMODnet regional coordinators was welcomed and incorporated into the GEBCO 2024 grid by the Seabed 2030 global centre.

COPERNICUS Marine project for the Provision of global coastal bathymetry derived from Sentinel 2 observations (23134L00-COP-PROD S2 BATHY-9000):

Mercator Ocean International (MOI) awarded the project end of 2023 to EOMAP, Deltares and GGSgc (also EMODnet partners). In this first year the formulation of expected deliverables was refined and first trials have been completed for selected areas. The EMODnet World Base Layer (EBWBL) has proved to be an excellent source to calculate statistics for the expected outcome of the Global Satellite derived Bathymetry project. From EBWBL all water depths shallower than -50 meter were selected and exported to a single NetCDF file in order to get a rough estimate of the size of the expected deliverable. Focus in the next quarter will be generation of wave kinematics data. In the trials this has proven to be the most challenging part of the program due to the many aspects influencing wave patterns. Wave kinematics data has so far not been used in EMODnet Bathymetry so there is potential for using this data and method later on to improve future versions of the EMODnet DTM.

Task 8 - Monitor quality / performance and deal with user feedback:

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 Bathymetry and its services and products continue to be quite popular. The number of visits and downloads of the full DTM products are again high in the reporting period. User feedback deals generally with local quality of the DTM product and the usability of the portal. Answers are directly provided to the users.

Task 9 - Maintain the existing thematic web portal for a maximum of six months from the start of the project:

EMODnet Bathymetry is maintaining the operation and maintenance of the various Bathymetry catalogues and web services that feed into the Central Portal, which provides the one-stop-shop.

Project management:

Shom and MARIS prepared the Q2-2024 progress report which was reviewed and accepted by the EU CINEA.

Milestone/Deliverable in numerical order	WP	Date due	Status (To do/ Delivered/ Delayed)	Date delivered	If Delayed: reason for delay and expected delivery date
D1.1: Quarterly concise progress reports	WP1	M4, M7, M10, M13, M16, M19, M22, M25	Delivered D1.1 a,b,c,d,e,f,g	M4, M7, M10, M13, M16, M19, M22	
D1.2: Annual Interim report	WP1	M12	Delivered	M14	
D1.3: Final report	WP1	M24			
D1.4: Plan for service continuity, incl. docs and sources	WP1	M24			
D2.1: Upgraded guidelines for data pre-processing and population of metadata	WP2	M6	Delivered	M6	Annexed to D1.2
<i>D2.2i: Training Workshop for data pre-processing and metadata population</i>	WP2	M9	Delivered as part of meeting 25-26 Sept 2023 in Brest - France	M9	
D2.3: Pre-processed survey data sets and included in CDI Service	WP2	M12	Delivered	M15	
D2.4: Pre-processed composite DTMs and included in Sextant service	WP2	M12	Delivered	M15	
D2.5: Satellite Derived Bathymetry data sets and included in Sextant Service	WP2	M12	Delivered	M15	
D3.1: Upgraded guideline of EMODnet methodology for DTM	WP3	M9	Delivered	M10	Annexed to D1.2

production, including using prototype CVE					
<i>D3.2i: Upgraded Globe software</i>	WP3	M9	Delivered and presented at meeting 25-26 Sept 2023 in Brest - France	M9	Note that Globe is regularly updated upon request and made available publicly
<i>D3.3i: Training and intercalibration Workshop</i>	WP3	M11	Delivered	M16	Workshop of Regional Coordinators and Integrator in April 2024
<i>D3.4i: Processed and pre-gridded data sets as input for RDTMs</i>	WP3	M14	Delivered	M16	Status has been checked at meeting of Regional Coordinators in April 2024
<i>D3.5i: Regional DTMs with common resolution of 1/16 arc minutes grid</i>	WP3	M17	Well underway; all minus 1 region delivered		Missing Regional DTM is well underway
<i>D3.6i: Best version HR DTMs for coastal waters and hotspots</i>	WP3	M20	Collection process underway with data providers		
D3.7: New EMODnet DTM incl Quality Index and loaded in EMODnet web services for viewing and downloading	WP3	M23			
D3.8: HR-DTMs loaded as separate layer in EMODnet web services for viewing and downloading	WP3	M23			
D3.9: Source reference layer in EMODnet web services to link to CDI and Sextant Catalogue services	WP3	M23			
D3.10: Refined best-estimate European digital coastlines in EMODnet web services for a range of vertical levels	WP3	M22	Well underway, see task 2		

D3.11: Updated Inventory of existing and ratified baselines and registered claims / disputes under UNCLOS, for European countries at the portal	WP3	M22	Well underway, see task 2		
D3.12: Methodology for assessing bathymetry between coastline and foreshore	WP3	M23	Well underway, see task 2		
D4.1: Standard machine-to-machine services delivered for common functionalities	WP4	M3	Delivered	Operational since M0	
D4.2: Dedicated machine-to-machine services adapted / delivered for special functionalities	WP4	M6	Delivered	Operational since M0	
<i>D4.3i: CVE optimised for regional coordinators</i>	WP4	M14	Delivered	M15	Status has been demonstrated at meeting of Regional Coordinators in April 2024
<i>D4.4i: Globe software + GGSGC workbench upgraded with extra functionality</i>	WP4	When required	Following requests and suggestions		
D5.1: Operational Helpdesk	WP5	continuously			
D5.2: Monitoring data about visits and usage	WP5	continuously			
D5.3: Promotional material and up-to-date thematic space at central portal	WP5	continuously			
D5.4: Presentations at relevant conferences	WP5	Regularly			

2. Identified issues: status and actions taken

A. Priority issue(s) identified and communicated by CINEA/ DG MARE/ SECRETARIAT				
Priority issue	Status (Pending/ Resolved)	Action(s) taken/ remaining actions planned	Date due	Date resolved

B. Issues / challenges identified by the thematic assembly group itself				
Priority issue / challenge	Status (Pending/ Resolved)	Action(s) taken / remaining actions planned	Date due	Date resolved
EM-806 Increase zoom level for coastline	resolved	Action to be undertaken by CP to increase the zoom level. Pre-tiled level already existing	30/04/2024	15/04/2024
EM-703 Bathymetry narrative update	resolved	Narrative has been updated and published.	30/04/2024	May 2024
EM957 EMODnet lots to check if filter values are displayed in the preferred order;	pending	Verify the order of the filter values		
EM-958 Convert HR-DTM to NetCDF	pending	Checking the delivery of HR-DTM in NetCDF. New HR-DTM are currently being provided by our partners.		
EM-972 GEBCO 2022 error affecting EUSeaMap (via EMODnet DTM)	pending	Report to GEBCO community – Waiting for next EMODnet release		
EM-1006 Bathymetry to review the guidelines document on metadata harmonization	done	Document reviewed + recommendation	8/10/2024	4/10/2024

3. Communication assets

[In Table A, list peer reviewed publications directly (co-)authored by consortium and project partners in the reporting period. In Table B, list all non-peer reviewed publications (co-)authored. In all cases, indicate the type of publication, provide the full reference incl. title, volume and issue etc., and whether the publication is open or closed access.]

A. (Co-)Authored peer-reviewed publications in the quarter					
Date of publication	Type of publication	Full reference	ISBN	DOI	Is it open access? Yes/No

B. Other/non-peer reviewed types of publications (co-)authored in the quarter					
Date of publication	Type of publication	Full reference	ISBN	DOI	Is it open access? Yes/No

B. Other/non-peer reviewed types of publications (co-)authored in the quarter					
Date of publication	Type of publication	Full reference	ISBN	DOI	Is it open access? Yes/No

For a comprehensive overview of publications referring to/making use of EMODnet data and/or data products, please consult Google Scholar.

4. Monitoring indicators

[Refer to the standardised monitoring tool, i.e. Europa Analytics, to complete the indicators excel template, and provide a short explanation in the table below on the numbers and trends for each indicator when possible/applicable. Indicate clearly if monitoring was carried out using tools other than Europa Analytics.]

Comments on the progress indicators in the indicators spreadsheet		
Progress indicator	Means of collecting figures	Comment
1. Current status and coverage of total available thematic data A) Volume and coverage of available data	CDI catalogue service	There are a few new CDIs delivered from several data providers contributing data sets which will not be used in the selection for the 2024 EMODnet DTM production, but the next release of 2026.
What is your opinion on the data coverage within EMODnet for your thematic?	Considering population of CDI and Sextant catalogues	Overall, EMODnet Bathymetry has brought together an excellent data collection (CDIs and Composite DTMs), covering all European sea regions and compiled by 66 data providers.
B) Usage of data in this quarter	CDI RSM shopping ledger service	The number of downloaded CDIs in this quarter is much lower than the previous quarter.
2. Current status and coverage of total number of data products A) Volume and coverage of available data products	Statistics from downloading at the Bathymetry system	The 2022 DTMs (Europe and Caribbean) and new HR-DTMs have been released in the first quarter of 2023. The number of these products is then frozen till the new release of the 2024 DTM and HR-DTMs which is planned for end 2024.
B) Usage of data products in this quarter	Analysing download statistics	The number of product downloads has increased considerably compared to the previous quarter. These numbers demonstrate the continuing interest of users in these EMODnet products. This concerns not only the HRDTMs and DTM tiles, but also of the Satellite Derived Coastlines package. Also, the number of WMS - WFS requests is again very high.
3. Internal and external organisations supplying/approached to supply data and data products within this quarter	CDI catalogue service	Five data providers have submitted new entries, which will be used for the 2026 process.
4) Online 'Web' interfaces to access or view data	N.A.	No changes
5.1 Daily number of page views of EMODnet Thematic entry page	Europa Analytics	Daily number of page views of the Bathymetry narrative is quite steady and around 125, with some days higher. This is the static content. Unfortunately, we cannot see how the bathymetry map layers and products are visited
5.2 Quarterly total number of visitors, page views, unique page	Europa Analytics	The quarterly numbers are reasonable as the bathymetry narrative is a static story. See the earlier remark under

Comments on the progress indicators in the indicators spreadsheet

Progress indicator	Means of collecting figures	Comment
views and percentage of returning visitors		5.1.This quarter the numbers are almost the same as in the previous quarter.

The monitoring numbers reported as part of the progress monitoring of EMODnet performance are collected through Europa Analytics, unless reported otherwise.