



EMODnet



European Marine
Observation and
Data Network

EMODnet Thematic Lot n°2 – GEOLOGY

EASME/EMFF/2020/3.1.11/Lot2/SI2.853812

Start date of the project: 25/09/2021 (48 months)

**Renewal of the Centralisation Phase contract
25/9/2023 – 24/9/2025**

Quarterly Progress Report (Q3/2024)

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



Contents

1. Highlights in this quarter	3
2. Identified issues: status and actions taken.....	8
3. Communication assets	11
4. Monitoring indicators.....	13
5. Annex: Other documentation attached	14

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 CINEA or of the European Commission. Neither the CINEA, nor the European Commission, guarantee the accuracy of the data included in this study. Neither the CINEA, the European Commission nor any person acting on the CINEA's or on the European Commission's behalf may be held responsible for the use which may be made of the information.

1. Highlights in this quarter

Task 1: Maintain and improve a common method of access to data held in repositories. As the principal holders of marine geological information, the EMODnet Geology partnership ensures that data from all of the European regional seas are provided to the project. The project is built on information primarily held by the project partners, but also connected to other owners of information by offering data delivery to EMODnet either through the EMODnet Data Ingestion or straight to the EMODnet Geology.

During this renewal phase of the contract, work on collection and harmonisation of new datasets and deliveries to the different work packages were mainly scheduled to begin in Q1 or Q2 of 2024. Data deliveries from partner organisations to the WP's will most likely continue until the end of the renewal phase.

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. In general, the data sets submitted by the partners will be added to the different EMODnet Geology data products and will be updated on the Central Portal by the end of the renewal phase of the project in 2025.

Task 3: Develop procedures for machine-to-machine connections to data and data products. We have several connections available to external applications – specifically OGC standards WMS, WMS-C, WFS, and CSW. All project partners can connect directly to the portal PostgreSQL-database and create advanced queries on the data products of the project.

Task 4: Contribute data, data products and content to a Central Portal that allows users to find, view and download data and data products. This quarter of the renewal phase has been very quiet when it comes to new or updated data because they are still being processed before submission, and we no longer have many corrections related to the last phase.

Task 5: Contributing content to dedicated spaces in Central Portal. We have been working closely with the Central Portal to have our data products available to any desired spaces on the Central Portal.

Task 6: Ensure the involvement of regional sea conventions. Nothing to report.

Task 7: Contribute to the implementation of EU legislation and broader initiatives for open data. We have been working in close cooperation with DG MARE, CINEA, and the Secretariat to contribute to all joint EMODnet efforts on the implementation of EU legislation and broader initiatives for open data. More specifically our data products could be useful e.g., for Maritime Spatial Planning Directive, Marine Strategy Framework Directive, Habitats Directive, Biodiversity Strategy, Blue economy, Green Deal, Blue Growth and European Critical Raw Materials Act.

Several EMODnet Geology partners are participating in HORIZON 2.5 - Climate, Energy and Mobility project Geological Service for Europe (GSEU), which enables synergy and direct feedback between these two projects. From the GSEU side, EMODnet Geology attributes are being queried and translated into applied attributes needed to build a geo-assessment matrix for determining seabed suitability to construction of offshore windfarms. In due time, the intended end product will be contributed to the EMODnet Central Portal as an applied data product. The added value of EMODnet for offshore wind as well as coastal vulnerability was highlighted in an article and a report with authors who are active in both GSEU and EMODnet (See Section 8). A second GSEU report addressing the geo-assessment matrix is currently in review, and the role of EMODnet data underpinning this matrix was highlighted during a dedicated GSEU webinar.

The former EMODnet Geology coordinator is in the Advisory Board of two Horizon Europe (HE) projects (HE TRIDENT and HE S34I) and thus acting as a link between these HE projects and EMODnet.

EMODnet Geology coordination and/or representatives have been in direct communication with European Digital Twin of the Ocean (EDITO) to enable the use of the EMODnet Geology data layers and to promote the interaction between these initiatives.

Task 8: Monitor quality/performance and deal with user feedback. There have been problems with an unstable network 30 July and 17-30 September. All tickets from the help desk have been resolved within the time limit.

Task 9: Maintain the existing thematic web portal for a maximum of six months from the start of the projects. The original thematic portal has been working for the last year but is about to be stopped soon because we have moved to a new server environment in this quarter. All calls have been redirected to the Central Portal. We will keep the old system on standby for a while.

Highlights of the different work packages:

WP1 – Project management. The EMODnet Geology Steering Group had one online meeting during this reporting period. Topics included planning of the partner meeting among others.

The EMODnet Geology representatives have participated in online meetings of the EMODnet Governance Task Team (30.8.2024) and EMODnet Vision 2035 drafting group (30.9.).

During this reporting period EMODnet Geology had its own scientific session “EMODNet Geology’s new standards revealing Earth’S seabed geology” at the International Geological Congress (IGC) in Busan, Republic of Korea, 28 August 2024. The session was convened by the current coordinator and some of the WP leaders. There were altogether seven oral presentations and four posters from EMODnet Geology plus additional presentations from Japan and Brazil. The former coordinator held a keynote speech. In addition, there were two presentations on EMODnet Geology that were given in other sessions at IGC 2024. The congress gathered about 5000 participants. No abstract book was available at the moment of reporting. EMODnet Geology’s presence at the IGC 2024 was promoted in the EMODnet Newsletter, September issue.

WP2 – Geological data specification and sourcing. WP2 will continue throughout the whole renewal phase. This data will be processed and collected during Q2/2024-Q3/2025 and used in final updates and/or new data products by end the end of the renewal phase by September 24, 2025.

The first delivery by the Caspian Sea subtask leader Caspian Locus LLC to WPs for was provided in September 2024. The individual data deliveries to the WP leaders for quality check and compilation have been included in the Indicator 3 of the Excel file. During this period, however, no new data products or major updates have been published in the Central Portal.

WP3 – Seabed substrate. Guidance document for the additional erosion work "recognizing sedimentary environments" was sent to partners and volunteers in July 2024. In September WP3 had a remote meeting with EMODnet Habitat lot to discuss on the collaboration between WP3 and Seabed habitats lot. A data delivery timeline was agreed, and other issues and ideas were discussed.

WP3 had two oral and one poster presentation at 37th IGC 2024. One oral presentation gave an overview of the WP3 work (Kihlman, S. et al., Advancing the Understanding of Seabed Substrate Characteristics: Insights from EMODnet Geology) and the other was about the EMODnet Geology sedimentation rates (Kotilainen, A.T. et al., Mapping the sedimentation rates in the continental shelf – an European view to the seabed change). A poster presentation was given about the harmonisation of the seabed substrate data product (Kihlman, S. et al., Need for the uniform information in multinational marine areas – Experiences from the harmonization within seabed substrate data).

Two partners delivered data at 25k scale (Data from Bulgarian waters and Caribbean data from France) (see Indicator 3).

WP4 – Seafloor geology. WP4 Data structure (scheme of feature classes [geodatabase tables]) was improved: number of columns of polygon feature classes have been significantly reduced to improve usability, names of columns were harmonised. WP4 Vocabulary group had three on-line meetings in order to work on and produce a first draft table of a machine-readable vocabulary on marine geomorphology. Communication with the Caribbean Sea subgroup is ongoing to collate and evaluate additional terms to describe the Caribbean Sea. Work on the North Atlantic Prototype area is in Progress and an on-line meeting took place to solve semantic issues.

The harmonisation of the Western Baltic Sea geology is in progress. Partners from Denmark, Sweden, Poland and Germany are working on harmonisation, based on a draft data set for the layers lithology, age, event environment and event process produced and distributed by the WP4 lead. Results of the work will be discussed at the next on-line meeting in October and at the in-person project meeting in Trondheim in November 2024.

WP4 (Asch, K. et al.) presented an oral contribution “Cross-EEZ Cooperation, Standards and Harmonization: “Compiling Spatial Data of the European Seafloor Geology and Geomorphology” within the EMODnet Geology Project session “EMODnet Geology’s new standards revealing Earth’s seabed geology” at the IGC 2024 which was also co-convended by the WP 4 leader.

WP4 received and included several polygons of small spatial extent of the Turkish Geomorphology (less than 1% additional coverage to the Black Sea region).

WP4 added further information to the layer General Physiographic Features in the region of the Baltic Sea.

WP5 – Coastal behaviour. The data product for coastal resilience was finalized and tested, with original digitized and harmonized output (as polylines) as well as eight simplified zoom levels (as points), defined to match with OpenStreetMap zoom levels. Shades of blue were used for the three defined resilience categories. A newly developed script to automate this simplification conversion will also be used to update and optimize the coastline-migration maps (field and satellite). The release protocol for the coastal-resilience web service was triggered during Q3, 2024. An explanatory document was written and has been accepted for publication in the EMODnet Special Issue of the Quarterly Journal of Engineering Geology and Hydrogeology.

Scripting for the creation of a revised coastline-migration web service using satellite data is well underway, with a fully functional QGIS file that now needs to be made ready for publication on the Central Portal (fig. 1). Remaining challenges are optimal visualization of time series, file size and associated performance, and addition of two extra migration categories.

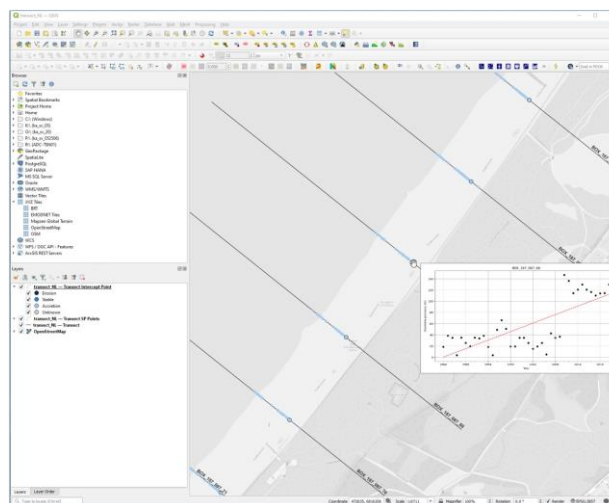


Figure 1. Coastline migration data product is in preparation.

WP6 – Geological events and probabilities. WP6 guidelines for the current phase have been updated and circulated to Partners to provide instructions on alternative delivery procedure, since GEUS migrated the file sharing procedure to "Next cloud". Feedback was provided to EDITO concerning WP6 data.

Three contributions, two oral presentations (Fiorentino A. et al., Collating and harmonizing data on geological events in European seas; Fiorentino A. et al. & A structural map of Italian seas, thematic map derived from collation and harmonization of geological data) and one poster (Fiorentino A. et al., A harmonized database on geological events occurrence as a tool to support geohazard assessment in European seas) concerning WP6 were presented at the 37th IGC in different sessions.

Updates on Caspian Sea data were during this reporting period received from our subcontractor Caspian Locus LLC.

WP7 – Minerals. WP7 gave one oral presentation and one poster presentation at the EMODnet Geology session in IGC 2024. The oral presentation gave an overview of WP7 aims and achievements (Monteys, X. et al., Europe's marine minerals: EMODnet geology) and the poster presented WP7 related work done by the Caribbean subgroup was presented (Medialdea, T. et al., Mapping the Marine Geological resources of the Caribbean Sea in the EMODnet Geology project). The first data deliveries to WP7 in this phase were received (sapropel data from Türkiye).

WP8 – Submerged landscapes. A new WP8 Task Guide and templates have been issued to all partners for use when providing new data. These new templates have been used to create a new set of merged data layers that correct many reported issues and provide improved/simplified attribution and layer names to avoid confusion with other work packages. This updated version is due to be uploaded to the portal by the end of October 24, prior to the consortium meeting in November for partner feedback. Various workshops at this meeting will also provide an ideal opportunity for fixing unresolved data issues (see identified issues). This new dataset will also require a full update of EGDI metadata to meet the requirements of Central Portal.

WP8 was presented at the International Geological Congress in Busan, 28. August 2024 with an oral presentation (Chiocci, F. et al., Reconstruction of paleobotany on exposed continental shelves as a tool to overcome geographical discontinuity of few scattered data).

WP9 – Data management, web portal and services. As part of a restructuring within the Danish Governmental IT infrastructure, we have been ordered to transfer our services to new servers. During this process, we have reviewed the old configuration of the servers and upgraded all software. We have moved our database, web server and Geoserver. A GeoNetwork service also run on the new server, but it is not in production yet. The reason is that GeoNetwork harvest from EGDI Metadata using a certain keyword and this keyword has not been added to all relevant metadata records yet.

Also, we have previously used an FTP server for sharing materials internally within the group. This has now been replaced by NextCloud (an open-source product) to better manage the permissions for the members of EMODnet Geology.

Status of the Milestones and Deliverables listed in the workplan					
Milestone/Deliverable in numerical order	WP	Date due	Status (To do/ Delivered/ Delayed)	Date delivered	If Delayed: reason for delay and expected delivery date
M1: Evaluation of the progress	WP9, all WP's	October 2024	To do		First year progress will be evaluated during the project meeting in November 2024.
M2: Data specification and sourcing ready	All WP's	June 2025	To do		...
M3: Thematic data products updated on CP	WP1&WP9	24.9.2025	To do		
D1.1-8: Quarterly reports 3/2023, 4/2023, 1/2024, 2/2024, 3/2024, 4/2024, 1/2025, 2/2025	WP1/all	15.10.2023 15.1.2024 15.4.2024 15.7.2024 15.10.2024 15.1.2025 15.4.2025 15.7.2025	Delivered Delivered Delivered Delivered This report To do To do To do	13.10.2023 15.1.2024 15.4.2024 12.7.2024 15.10.2024	
D2.1: Interim report (36 months)	WP1/all	24.9.2024	Delivered	1.10.2024	
D2.2: Final report (48 months)	WP1/all	24.9.2025	To do		
D3.1: First data products/maps updated on Central Portal	WP9/WP1/all	January 2025	To do		
D3.2: Final data products/maps available	All WP's	24.9.2025	To do		

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
EM-525 - Updating of EMODnet Geology - Seafloor Geology layers in the European Atlas of the Seas	Pending	This ticket is currently assigned to the Central Portal.		
EMODNET-1643 - Coordinate axis order in your metadata	Pending	Geoserver swaps x and y axis incorrectly for SRID 4326 and we cannot change this behavior. But we are currently looking at another dataflow for our metadata that will solve this. The dataflow of metadata will be changed October 2024. Geoserver will then not be the source of metadata and that will solve the problem.		
EM-957 - EMODnet lots to check if filter values are displayed in the preferred order.	Pending	EMODnet Geology WP leaders are checking the filter values.		
EM-979 - High - Geoserver < 2.25.2 Remote Code Execution (RCE) vulnerability (CVE-2024-36401)	Resolved	GeoServer updated.		within 24 hours
Secretariat Assessment of Q1/2023 & Q2/2024 report: The Secretariat notes that 0% of the data is restricted, but that no publication license is provided. Publication licenses are of vital importance to EMODnet usability. Can Geology try to supply publication licenses in the future?	Resolved	This matter was discussed at the partner meeting held in Espoo in May 2024. It was noted that the harmonised datasets delivered to EMODnet Geology are or will be released under licence CC4.0 or compatible. Partners were reminded that all material submitted to EMODnet Geology should comply with this licence and that there should be no restrictions on use. See also Indicator 3/Excel file for publication licenses.		
Secretariat Assessment of Q3/2023 report, Section 1.7, Indicator 3: Please complete further the information asked	Resolved	We apologise that Indicator 3 has been incomplete. We have included material provided by project		

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
for in Indicator 3 (licenses, volume, sub-theme, sea basin, etc)		members to WP leaders for quality check and compilation in this Q report, Indicator 3/Excel file. However, during this period, no new data products or major updates have been published.		

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-799 - Diagram that shows the position of the shoreline through time	In Progress	CP is waiting for that geology provides a service. This is a suggested new feature, and no deadlines are specified yet		
EM-935 - New csw end point for geology	In Progress	This task is almost completed. A new GeoNetwork server has been established. The CSW endpoint will remain the same as before, but unfortunately, the ID for each metadata record will be changed. We are waiting for the partners in EMODnet Geology to mark their metadata with a keyword before the new metadata flow can start.		
WP5: Replace red-yellow-green with shades of blue to move away from intuitive good/bad in WP5 migration products. This is also a better approach for color blinded users.	Resolved for Coastal Resilience, pending but now easy to implement for Coastline Migration	Scripted for Coastal Resilience so that it can easily be implemented in Coastline Migration data products, with deliveries distributed over Q2 and Q3 of 2024.		
WP6: Difficulty of harmonization of data from neighboring areas, due to the high resolution of data gathered in recent years	Pending	Promote geographic focus groups to tackle issues and find shared solutions.	31/12/2024	

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
WP6: Information contained in the attribute tables are not always displayed correctly	Pending	Check all WP6 layers and shapefiles to find a solution.	31/10/2024	
WP8: Identified issue (projection) with WP8 database – some data not displayed/downloadable on portal.	In progress	Data expert @BGS to rectify – new merged data to be releases Nov 24. Liaising with WP9 & partners to rectify.	30/11/2024	
WP3: Misunderstanding between two partners with the sedimentation rates and seabed substrate data delivery.	Pending	The partners will discuss and work together for the next data delivery.		
Geopolitical issues were raised concerning data provided by different countries from disputed areas	Resolved	Feature occurrences are not represented in disputed areas. The issue was discussed at the EMODnet Steering Committee meeting with the representatives of DG Mare, CINEA and the Thematic lots.		7/10/2024

3. Communication assets

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
September 2024	Paper	Vallius, H. and Kaskela, A. 2024. Knowledge Based Marine Spatial Planning, Management of Marine Resources and Environmental Assessments – The EMODnet Geology Concept. NATO Science for Peace and Security Series - D: Information and Communication Security, Volume 65: Modern Technologies Enabling Innovative Methods for Maritime Monitoring and Strengthening Resilience in Maritime Critical Infrastructures, pages 238-250. 10.3233/NICSP240028		10.3233/NICSP240028	No
Accepted – it will be put online the day the data product is released on the Central Portal	Paper	Moses, C., Butterill, C., Van Wingerden, E., Chopra, T., Humphries, A., Follows, S., Jones, L., Weil, M., Van Heteren, S. (2024). EMODnet Geology: pan-European assessment of coastal resilience and vulnerability. Quarterly Journal of Geohydrology and Engineering Geology.			Yes, upon publication

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	
28.8.2024	Scientific Session	Kaskela, A., Asch, K., Monteys, X., and Steward, H, 2024. EMODNET-Geology's new standards revealing Earth's seabed geology. Scientific Session (Theme 16, Session 7) at 37 International Geological Congress (IGC), Busan, Republic of Korea. Link: https://www.igc2024korea.org/content/14403				Yes
27.9.2024	Newsletter	EMODnet Geology goes global with 37th International Geological Congress (IGC) participation	Public dissemination about EMODnet Geology session at IGC2024	EMODnet Newsletter, September 2024 https://emodnet.ec.europa.eu/en/emodnet-geology-goes-global-37th-international-geological-congress-igc-participation		Yes

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

4. Monitoring indicators

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	n/a	For geology “data products” and “data” are about the same. Users download data as a zip-file that contains all layers from the sub-theme but otherwise we do not combine data or recalculate data to create new products. The statistics for “data products” and “data” is the same. Geology has only reported the statistics for “data products” in the former reports. To keep continuity this is also the case here.
What is your opinion on the data coverage within EMODnet for your thematic?		
B) Usage of data in this quarter	n/a	This is described under usage of data products
2. Current status and coverage of total number of data products A) Volume and coverage of available data products	ArcGIS	No major changes since last quarter.
B) Usage of data products in this quarter	Log from web server	There are fewer WMS calls - perhaps due to the summer holidays. The number of WFS calls is surprisingly increasing. Maybe users have learned to use the download function.
3. Internal and external organisations supplying/approached to supply data and data products within this quarter		No change since last report.
5.1 Daily number of page views of EMODnet Thematic entry page	Europa Analytics	There generally seem to be fewer visitors in August, which must be due to the summer holidays - otherwise, the graph shows the usual pattern. There are no anomalies that need to be explained.
5.2 Quarterly total number of visitors, page views, unique page views and percentage of returning visitors	Europa Analytics	The slightly declining trend for all parameters must be due to the summer holidays

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

5. Annex: Other documentation attached