



**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 (Q1/2024)**

**Reporting Period: 01/01/2024 – 31/03/2024**



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## 1. Highlights in this quarter

**Task 1: Maintain and improve a common method of access to data held in repositories.** 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 portal or straight to the EMODnet Geology portal.

During this renewal phase of the contract, work on collection and harmonisation of new datasets and deliveries to the different work packages are 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.

Data deliveries from partner countries during Q1: Update from Estonia (WP3: Seabed substrate 1: 100 000, WP4: Quaternary, pre-Quaternary and Geomorphology); Update from Finland (WP9: Borehole and sample data).

**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.** Data 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 has been very quiet when it comes to new data because we are still at the beginning of the renewal phase, 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.** Participation in HELCOM Stakeholder conference in Espoo by the project coordination.

**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. Collaboration with the project GSEU has been intensified. 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.

A Baltic Sea Windfarm Workshop, which fed directly into one of the activities within GSEU, was organised in February at Århus, Denmark. The workshop was attended by geological surveys of Finland, Sweden, Poland, Denmark, Lithuania, Germany and UK, which are also partners of EMODnet Geology. Data and knowledge sharing were among the main topics discussed serving also EMODnet Geology.

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.

The EMODnet Geology Steering Group has attended a meeting organised by European Digital Twin of the Ocean (EDITO) to enable the use of the EMODnet Geology data layers and interaction between the projects.

**Task 8: Monitor quality/performance and deal with user feedback.** In the last quarter we had problems with DNS name propagation after we changed to a new DNS provider. These problems do not exist anymore. On 15. January, we had some memory issues on our Geoserver for about an hour but otherwise our systems have been stable. 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 and is still running. All calls are redirected to the Central Portal. The database and web services work and are maintained as before.

#### **Highlights of the different work packages:**

**WP1 – Project management.** The EMODnet Geology Steering Group has had three online meetings during this reporting period. The topics have included a development of a dissemination plan and planning of the future conferences and partner meetings among others. EMODnet Geology Coordination aims to place more effort on dissemination during this project phase. For example, EMODnet Geology Project Coordinator gave a lecture at the NATO Science for Peace and Security Advanced Training course in Agadir, Morocco, on 15-20 January 2024. In addition, EMODnet Geology will have a session at the 37th International Geological Congress (IGC), which has been advertised on social media and also in the EMODnet Newsletter, the February issue.

The Coordination team has participated in discussions on the future of the EMODnet and nominated two members to the EMODnet Vision 2035 drafting group.

For the partners, the main activities of this quarter were the identification and harmonisation of new data for this renewal phase of the project.

**WP2 – Geological data specification and sourcing.** WP2 will continue throughout the whole renewal phase. Most of the new data is expected to be identified by the Q2/2024. 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.

**WP3 – Seabed substrate.** Collaboration with EDITO has been continued, including clarifications on issues related to WP3 data products. Data sourcing for WP3 started with an online data inquiry sent to partners.

**WP4 – Seafloor geology.** Workshop on the vocabularies at the partner meeting in Espoo at GTK in May has been initiated. Communication with the new subtask on the Caribbean Sea took place – additional terms to describe the Caribbean Sea will be collected and discussed in cooperation with the subtask leader IGME. Communication to work on the Harmonisation of the Quaternary in the Western Baltic Sea prototype area was initiated to progress on semantic and geometric harmonisation.

**WP5 – Coastal behaviour.** WP5 has been finalizing a document on the coastal ribbon and worked on the new set of webservices.

**WP6 – Geological events and probabilities.** A few questions were asked by Caribbean Partners concerning details of data to be delivered to WP6. Some comments were provided concerning WP6 data displayed on the

Portal. Three abstracts were submitted to different sessions of 37th IGC. Explanation of data regarding tsunamis were required by a Portal visitor. Cooperation with Italian institutions contributing to WP6 deliveries (CNR-ISMAR, OGS, INGV, University Genova, Palermo, RomaTRE and Trieste) continues.

**WP7 – Minerals.** The focus has been on integrating the EMODnet geology data products into the EDITO Data Lake. For this purpose, edits were made to some WP7 data layers (e.g., MarineHydrocarbonsSubDepArea, MarineAggregatesSubDepArea). It is envisaged that these edited layers for Marine Aggregate and Marine Hydrocarbon Sub deposit types will be updated on the EMODnet Geology portal soon.

**WP8 – Submerged landscapes.** WP8 has continued to compile and QA the available data and reconstructions of submerged landscape features. Started to prepare the new version of the Task Guide and GIS templates that will define the requirements for future data submissions – to be distributed in Q2, after the next project meeting. Plans for updating symbology and introducing filter options to optimise the visualisation of the products displayed within the Central Portal

#### **WP9 – Project analysis and sustainability**

##### *Geotechnical data*

At our meetings in 2023 we discussed whether we could add marine geotechnical data to the portal. Geotechnical data are important because inquiries from users (e.g. to the help desk at the Central portal) show a demand for geotechnical data, especially for the planning of offshore wind farms. Also, the most viewed use cases at the Central portal are about offshore wind farms. In the beginning of this quarter we sent a questionnaire to the 42 partners of EMODnet Geology. The purpose of this questionnaire is to get a preliminary overview of the marine geotechnical data. We have not yet received all responses but the preliminary results show that there is a great span in what people define as geotechnical data and a range of file formats.

##### *Metadata*

The Secretariat at the Central Portal has for some time noticed that the metadata from EMODnet Geology lacks information about constraints on access and use conditions. This is partly due to errors in the metadata data flow. The Central Portal harvests data from a GeoNetwork server at EMODnet Geology, which again merges data from a Geology's Geoserver and EGDI metadata (<https://egdi.geology.cz/>). Unfortunately, this merging does not work. We have tested whether Geoserver instead of GeoNetwork could take care of the merging of metadata and the csw service using the metadata and csw extensions for Geoserver. This test showed that not all EGDI metadata were imported correctly and the filter and sorting functionality of the csw services also had problems. As an alternative solution, we have asked the Central Portal to harvest EGDI metadata directly. This requires configuration of filters of the harvester at the Central Portal and the Central Portal does not want this – a simple CSW end point without extra configuration is required (See EM-935 in jira). These problems were also discussed at the 15 TWG meeting in March 2024 .

We are now working on a solution where we keep the GeoNetwork service hosted by Geology and let this GeoNetwork service harvest EGDI metadata without merging data from Geoserver.

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
<b>M1: Evaluation of the progress</b>	WP9, all WP's	October 2024	To do		...
<b>M2: Data specification and sourcing ready</b>	All WP's	June 2025	To do		...
<b>M3: Thematic data products updated on CP</b>	WP1&WP9	24.09.2025	To do		
<b>D1.1-8: Quarterly reports 3/2023, 4/2023, 1/2024, 2/2024, 3/2024, 4/2024, 1/2025, 2/2025</b>	WP1/all	15.10.2023	Delivered	13.10.2023	
		15.01.2024	Delivered	15.01.2024	
		15.04.2024	This report	15.04.2024	
		15.07.2024	To do		
		15.10.2024	To do		
		15.01.2025	To do		
		15.04.2025	To do		
		15.07.2025	To do		
<b>D2.1: Interim report (36 months)</b>	WP1/all	24.09.2024	To do		
<b>D2.2: Final report (48 months)</b>	WP1/all	24.09.2025 + 60d	To do		
<b>D3.1: First data products/maps updated on Central Portal</b>	WP9/WP1/all	January 2025	To do		
<b>D3.2: Final data products/maps available</b>	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-142 - Geology Quality of Service Monitoring	In Progress	Ongoing monitoring by the Central Portal. No further action is needed		
EM-394 - Geology review of the new CP map viewer	In Review	Waiting for response from the Central Portal		
EM-525 - Updating of EMODnet Geology - Seafloor Geology layers in the European Atlas of the Seas	In Progress	Waiting for response from the Central Portal		
EM-529 - Geology - EMODnet Catalogue Tags	In Review	Waiting for response from the Central Portal		
EMODNET-1643 - Coordinate axis order in your metadata	In Progress	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.		
EMODNET-1746 - FW: Geology WMS Connection	Done			within 1d 8h
EMODNET-1776 - Data gap, seabed substrate EMODnet	Done			within 12h 15m
Secretariat Assessment of Q1/2023 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?	Pending	We are working on this issue and aim to have it solved asap.		
Secretariat Assessment of Q3/2023 report, Section 1.7, Indicator 3: Please complete further the information asked for in Indicator 3 (licenses, volume, sub-theme, sea basin, etc)	Pending	We apologise that Indicator 3 has been incomplete. We'll emphasize this more in future updates & reports. During this period, no new data products or updates have been published.		

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>Secretariat Assessment of Q4/2023 report, Section 1.4.1 Task 2: In the renewed EMODnet Geology lot workplan, as provided by the Geology lot, the focus is on updating/improving existing products. The secretariat is wondering whether Geology is also planning any new products for the new phase?</b>	Resolved	EMODnet Geology plans for the contract renewal period (2023 – 2025) include the development of a new geotechnical data product to be reported in WP9. In addition, we aim, among other things, to further develop the data product on seabed erosion (WP3) and to enable access to information from the Caribbean Sea.		
<b>Secretariat Assessment of Q4/2023 report, Indicator 5.1: Daily number of page views of EMODnet Thematic entry page. Please remove the red text. It dates from one year ago.</b>	Resolved	Red text has been removed from the current report.		

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
<b>WP5: Replace red-yellow-green with shades of blue to move away from intuitive good/bad in WP5 migration products</b>	Pending	To be combined with addition of two extra migration classes in WMS – new set of WMSs still being prepared, with deliveries distributed over Q2 and Q3 of 2024	Q4 2023	
<b>WP6: Difficulty of harmonization of data from neighboring areas, due to the high resolution of data gathered in recent years</b>	Pending	Promote geographic focus groups to tackle issues and find shared solutions	31.12.2024	
<b>WP6: Information contained in the attribute tables are not always displayed correctly</b>	Pending	Check all WP6 layers and shapefiles to find a solution	31.10.2024	
<b>WP8: Identified issue (projection) with WP8 database – some data not displayed/ downloadable on portal.</b>	Pending	Data expert @BGS to rectify. Liaison with WP9 to reschedule delivery.	Deadline postponed (Q4)	



<b>B. Issues / challenges identified by the thematic assembly group itself</b>				
<b>Priority issue / challenge</b>	<b>Status (Pending/ Resolved)</b>	<b>Action(s) taken / remaining actions planned</b>	<b>Date due</b>	<b>Date resolved</b>
<b>EM-775 - Revision of attributes and filters for geophysics and borehole indices</b>	Resolved	EM-797 takes over from EM-775		
<b>EM-797 - Problem with filter for layers with more filter criteria</b>	Pending	Human Activities wants the opposite behaviour than Geology so there is no easy way to solve this. The filter works but not in the way that Geology wants		
<b>EM-799 - Diagram that shows the position of the shoreline through time</b>	In Progress	CP is waiting for that geology provides a service. This is a suggested new feature, and no deadlines are specified yet		
<b>EM-878 - Service window for EMODnet geology</b>	Resolved	CP doesn't have a service window.		
<b>EM-935 - New csw end point for geology</b>	In Progress	Geology has suggested that CP harvested directly from EDGI metadata ( <a href="https://egdi.geology.cz/">https://egdi.geology.cz/</a> ). CP was not satisfied with this because they want a simple csw endpoint without the need to configure filters. Geology is looking for a solution		
<b>EM-944 - a duplicate in the menu in the map viewer</b>	Resolved			within 1 day

### 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	
27.2.2024	Paper	Kaskela, A. M., & Kotilainen, A. T. (2024). Quantifying seabed geodiversity of the Archipelago Sea, Baltic Sea, Finland. GEUS Bulletin, 52.		<a href="https://doi.org/10.34194/geusb.v52.8317">https://doi.org/10.34194/geusb.v52.8317</a>	Yes	
Accepted	Paper	Hollis, J., Calcagno, P., Bertrand, G., De Oliveira, D., Negrel, P., Díaz-Martínez, E., La Vigna, F., Poyiadji, E., Tonné, N., Van Heteren, S., Dakin, N., Hinsby, K., Van der Keur, P., Siddiqi, G., Čápková, D., Pizzocolo, F. (2024). A Geological Service for Europe – building trust through interdisciplinary and intersectoral collaboration. European Geologist 57, 1-10.			Yes, Q2 2024	

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
Accepted	report	Van Heteren, S., Maspataud, A., Dakin, N., Ernstsens, V. B., Poyiadji, E. & the GSEU T5.3 Consortium (2024). GSEU's positioning on marine geological information in light of offshore windfarms and coastal vulnerability to environmental and climate change. GSEU Report on Deliverable 5.5, 46 pp.			Yes, Q2 2024

*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 changes since last quarter
B) Usage of data products in this quarter	Statistics are extracted from logs on proxy server	The numbers of downloads and wfs calls have generally increased. The number of wms call has fallen slightly. The number of wms calls to the server hosted by EMODnet Geology does not say much about the popularity of the service because most wms calls use the cached data at the Central Portal
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	Except for a spike the 2nd of February the number of visitors is about the same as last quarter. Bathymetry and physics also show a spike the same date, but we have no

Comments on the progress indicators in the indicators spreadsheet		
Progress indicator	Means of collecting figures	Comment
		explanation of what happened that day. The services hosted by EMODnet Geology do not show increased activity that day.
5.2 Quarterly total number of visitors, page views, unique page views and percentage of returning visitors	Europa Analytics	The numbers do not show significant changes compared to last quarter.

*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