



# EMODnet



European Marine  
Observation and  
Data Network

## **EMODnet Thematic Lot n° 1 - Geology**

**EASME/EMFF/2016/1.3.1.2 - Lot 1/SI2.750862**

**Start date of the project: 12/04/2017 - (24 months)**

**EMODnet Phase III – Quarterly Progress Report (8/8)**

**Reporting Period: 01/01/2019 – 31/03/2019**



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## Disclaimer

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# 1 Highlights during the reporting period

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*Provide a short summary of the key achievements and/or events of interest to a wider audience within this reporting period you wish to highlight. **Please make sure that progress in each of the tasks specified in Section 1.4.1 of the Tender Specifications is covered. For those tasks not experiencing significant progress, please state so.** In addition, you can (but not required) also consider the indicators or any other of the reporting sections.*

## **Tasks specified in Section 1.4.1 of the Tender Specifications**

### **Task 1: Develop a common method of access to data held in repositories:**

We continue to receive entity index contributions at various level of maturity. Regarding borehole entity indexes one new partner is now connected resulting in a total of 21 out of 30 partners contributing. The rest are relying on EMODnet Geology to harvest their indexes from previous GeoSeas contributions. Regarding geophysical entity indexes, three new partners are now connected resulting in a total of 18 contributing. The rest (7) are either not ready to deliver or refer to GeoSeas, which currently doesn't offer their geophysical index as WFS.

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

N/A

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

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

All data products are listed on the "Products" page with links and examples to web services, data download and online Web-GIS. Regarding metadata, we have a running service (GeoNetwork) enrolled into nightly harvesting by EMODnet main portal and EGDI MICKA. This April will see a complete new set of data products from all work packages stressing the need for strict roll-out procedures. Thus a guideline for data product release was developed together with the Secretariat to facilitate a coordinated effort involving both news articles, web maps, feeds, downloads, and metadata registration being released on the exact same time.

### **Task 4: Develop a web portal allowing users to find, visualise and download data:**

The web portal was constructed and up and running during the first three months of the project. The web portal front page now holds news and events on future data product releases. Links to services are now split up in individual work packages for easier use in desktop GIS software like QGIS and others. Existing data products are increasingly focused on supporting freeware software like QGIS by including QGIS project files and open-source styling (SLD).

### **Task 5: Ensure the involvement of regional sea conventions:**

In spite of repeated contact trials to the different regional sea conventions (RSC's) we haven't yet succeeded to meet them either at our project meetings or their offices.

### **Task 6: Facilitate interoperability with data distributed by non-EU organisations:**

We have approached the ambitious Seabed 2030 project by GEBCO and Nippon Foundation in order try to add a geological component to their agenda. They sponsored a side event on seafloor mapping during the AGU fall meeting in Washington 10-14.December, in which EMODnet Geology attended. We are working on the cooperation with this initiative and next meeting of the network is planned for September 2019 in Hawaii as a session during the *Ocean Obs* meeting. EMODnet Geology 3 coordinator will attend the meeting.

EMODnet geology has created contact with an initiative of seafloor mapping of the Caspian Sea, where we have successfully promoted the usage of EMODnet standard methodology as the Caspian Sea is now included in the next phase of EMODnet Geology.

**Task 7: Install a process to monitor performance and deal with user feedback:**

We are linked to a monitoring system hosted by the main portal (Piwik/Matomo). Here we can login and extract performance and user statistics. The portal offer users the possibility to write feedback. We participate in all statistical initiatives put forward by the EMODnet Secretariat and Steering Committee.

**Task 8: Operate a help desk offering support to users:**

We continuously run our help desk according to rules set in the Tender Specifications.

**Highlights of the different workpackages**

WP1. The different work packages have updated or collated new webproducts which are being released during April 2019.

WP3. Partners have continued to harmonise their high resolution (scale 1:100 000 or more detailed) seabed substrate data and by 31.03.2019 altogether 25 partners have provided their harmonised seabed substrate data to GTK. From these, 16 partners have provided 1:100 000 and 20 partners even more detailed (1: 500–1:70 000) data.

WP3. In this reporting period, 6 partners have provided their sedimentation rates data (275 points). Together with the data collected in previous phases, the sedimentations rates dataset consists of deliveries from 14 partners (1350 points).

WP3. Seabed substrate data (scales of 1:100 000, and 1:50 000) were delivered to EMODnet Seabed Habitats Lot in January 2019.

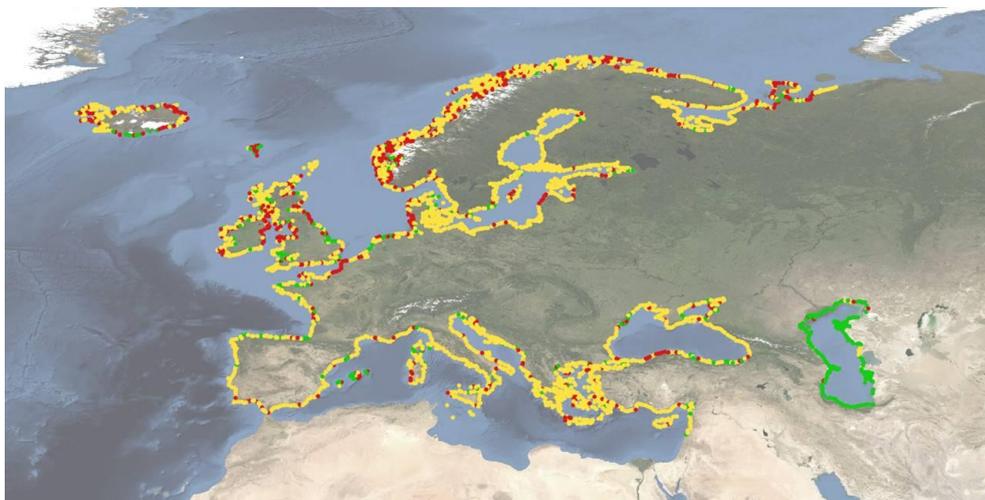
WP3. Seabed substrate data at a scale of 1:100 000, seabed substrate multiscale dataset and sedimentation rates data together with associated metadata, were delivered to EMODnet Geology Portal by the end of March 2019, release 23.4.2019.

WP3. Scientific article about EMODnet seabed substrates (Kaskela et al. 2019) was published in Geosciences Journal in February 2019.

WP3 case study "Spatial prediction of sedimentation rates in the Baltic Sea" was produced by CEFAS. Peter Mitchell, Michael Spence, John Aldridge, 2019. Spatial prediction of sedimentation rates in the Baltic Sea. EMODnet Geology, WP3, Case study, 20/03/2019. p 25.

WP4. Last vector and raster data have been received and integrated for the geomorphology, pre-Quaternary and Quaternary theme layers. In particular considerable progress has been made in the Quaternary and geomorphology themes. These data are still constantly in the process of being assembled, checked, and in some cases modified according to the guidelines. Considerable progress has been made in the coverage of the following sea regions: Geomorphology of the German Seas, UK, and parts of Finnish seas, Quaternary of the UK and Spanish seas. Provision of data layers (polygons) on Pre-Quaternary, and Quaternary geology, and Geomorphology to the EMODnet Portal. Provision of the (pre-Quaternary) faults layer (lines) to the EMODnet Portal. Adaption of the data portrayal of all layers from proprietary to an open source format, i.e Styled Layer Descriptor (SLD) to make the data readable for a wide user community

WP5. Coastal behaviour. The WMSs with the satellite-based and traditional (field-observation-based) pan-European coastline-migration map are ready for publication. The satellite WMS was released officially on 8. April. A pan-European coastline-type map was finalized as well but requires QC before publication.



WP6. Geological Events and Probabilities; Harmonization of deliveries completed, Cartographic symbology elaborated for the publication of WP6 layers on the Portal, Harmonized layers delivered to Portal manager, Results of the susceptibility assessment modelling tested.

WP7. All partner data has been received, merged and submit to EMODnet Geology, with accompanying metadata, information and website text. During this quarter one new mineral type (Saphropile) has been added and another classification to include low temperature geothermal sites is in preparation. A poster presentation was accepted by GeoHab'19 that will illustrate the benefit of these data for endemic species prediction. Collaboration with the GeoERA MINDeSEA project continues. Results of this collaboration to include: an abstract for presentation "Analysing the distribution of marine minerals across European Seas: A new perspective from the EMODnet Geology project" (which has been submitted to the Goldschmidt 2019 conference), as well as a paper on this theme to be submit to a new SI focused on marine minerals (deadline June 2019). An additional publication has been committed to the EMODnet Geology Special Issue, to detail the framework with which we map Europe's Marine Minerals.

WP8. Submerged landscapes. The planned WP8 Istanbul Workshop took place between 18<sup>th</sup> and 19<sup>th</sup> February 2019. The meeting was successful in considering progress over the preceding two years and planning for the next phase 3-2.

A report from the meeting entitled; 'EMODnet Geology: WP8 Submerged Landscapes – review of Phase 3-1 and forward planning for the next two years in Phase 3-2' was produced and submitted to the EMODnet web site.

Previous to opening the WP8 data on the EMODnet portal a test map has been uploaded [http://data.geus.dk/egdi/?mapname=egdi\\_emodnet\\_geology\\_test](http://data.geus.dk/egdi/?mapname=egdi_emodnet_geology_test)

New data received from EMODnet partners has been checked to ensure the formatting agreed with the feature templates and uploaded onto the test portal.

WP9. Web portal. In this quarter, WP9 has been busy orchestrating incoming data products from all work packages. To accomplish this a procedure for new data products was developed that all WP-leads agreed to follow. An online test environment for testing new data was created. In the preparations are new data sets and data products from all seven product producing work packages totaling 87 new or updated layers. For each layer, a number of preparations are required. First, the layer is run through QGIS for quality control. Next, the content is moved to a relational database. The table structure including available metadata, styling, and legends is then registered in GeoServer. Metadata descriptions are harvested to GeoNetwork for online dissemination. The new registrations are coordinated with WP-leads. Before publication, coordination is done with main EMODnet portal and public relations. Coordination is also done with Czech Geological Survey in charge of a common metadata catalogue for European geological data called EGDI MICKA. Finally, a test map is created for WP-leads to test. A release date is decided upon which the new data products are moved to the production map. All releases will occur in April.

## 2 Challenges encountered during the reporting period

*Provide an overview of the main challenges encountered during the reporting period and the measures taken to address them, including those related to technical and data provision issues.*

| Main challenge  | Measures taken  |
|---|---|
| WP5. Coastal behaviour. Current set of entry terms describing coastal type is incomplete and definitions are commonly imprecise.  | For the time being, we are building and optimizing an updated set for internal use, with some new terms. In time, these will be communicated with INSPIRE and other vocabulary groups working on uniform definitions available through dedicated servers.   |
| WP5. Coastal behaviour. Visualizing results at a pan-European scale (ca. 1:20,000,000 in a single image) requires data aggregation because many measurements are overlapping at this scale.   | We finalized a method for smoothing the short-distance variability when zooming out to larger scales. It is used for all WP5 WMSs.  |
| WP6. Geological Events and Probabilities. Identification of the best way to represent the new data at higher resolution together with data from the previous phase  | A new arrangement of the titles in the Portal Menu has been proposed in order to allow quick comparison of data at different scales.  |
| WP 7 Minerals. The WP lead is undertaken by a service contractor to the GSI. The contract term came to an end mid-March. A set-contract for the provision of services to complete the project could not be established owing to the uncertainty regarding the future of EMODnet Geology and related funding | Alternative funding was sourced by the GSI and an emergency extension to the contract was granted by the GSI for the duration of 6 months. Project work and WP7 management will continue to be managed by the service provider during this time. Decision on future contract provision will be dependent on the provision of further project funds. |
| WP 7 Minerals. Polymetallic sulphides associated with geothermal sites are recorded. Our Icelandic partners ISOR have records of low temperature geothermal sites that may host sulphides at depth, but on the surface exhibit sulphate or white smoker type chimneys.                                      | Discussions relating to how these important sites can be mapped are ongoing. We suggest a new classification of seabed mineralisation be created and will endeavour to do so if a future EMODnet Geology is granted.  |
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### 3 User Feedback

List any useful feedback you received on your portal, your activities or those of other EMODnet projects/activities. Also provide any suggestions you have received for EMODnet case studies and/or future products/activities/events.

[Please, provide information in the table. If you wish to include the full user feedback in the report you can attach it in Annex.]

| Date                | Organisation        | Type of user feedback (e.g. technical, case study, etc.)                | Response time |
|---------------------|---------------------|---|---------------|
| <b>Feb 11, 2019</b> | EMODnet Secretariat | Request for contribution for Teacher's Corner European Atlas of the Sea | 1 day         |
|                     |                     |   |               |
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## 4 Meetings held/attended since last report

List here the internal and external meetings held/participated by the contractant (e.g. meeting, conference, training (workshop), etc.) since the last quarterly report. Please add a short description on the meeting as well as the nature and volume of the audience. At the bottom of the table, provide the total number of events organised and events participated.

[Please, provide information in the table.]

Table: Meetings organised and attended.

| Date         | Location   | Type event (meeting, training (workshop), etc.)                          | Attended (A) / Organised (O) | Short description and main results (# participants, agreements made, etc.)  |
|--------------|------------|--|------------------------------|---|
| 12.2.2019    | Brussels   | EGS Expert Group Chairs Meeting and 42nd EGS National Delegates Forum    | A                            | Ca. 50 participants. Emphasized the importance of EMODnet for the Marine Geology Expert Group, and approached other WG Chairs on collaboration in fields of geochemistry and coastal landslide sensitivity. |
| 18.2.2019    | Rome       | meeting  | A/O                          | Presentation of the web Portal of the Geological Survey of Italy, which includes a link to EMODnet Geology. (200 participants)  |
| 19-21.2.2019 | Istanbul   | EMODnet Geology workshop on submerged landscapes (WP8)                   | A                            | Ca. 15 participants. Agreed on actions to finalize WP8 output in current phase, and planned strategy for next phase.  |
| 21-22.2.2019 | Rome       | meeting (organized by Italian Geological Society)                        | A                            | Periodical meeting of the Italian marine geologists. Short presentations of recent relevant results. (100 participants)   |
| 13.3.2019    | Brussels   | DG MARE , European Atlas of the Seas meeting                             | A                            | Eight participants. EMODnet-Geology data on coastal behaviour will be used in the European Atlas of the Sea, and an educational exercise will be made. Ostend meeting on April 24 will be attended.         |
| 14.3.2019    | Amersfoort | Dutch Cultural Heritage Agency   | O                            | Three participants. Agreement on alignment on activities concerning submerged landscapes.   |
| 20.3.2019    | Enkhuizen  | NCK Days (annual Meeting of the Netherlands Centre for Coastal Research) | A                            | Pitched EMODnet during meeting of Program Committee, suggested NCK Theme Day highlighting Dutch output of all EMODnet Lots.   |
| <b>SUM</b>   |            |  | <b>O</b>                     | <b>Total # of meetings organised = 2</b>  |

|            |  |          |   |
|------------|--|----------|---|
| <b>SUM</b> |  | <b>A</b> | <b>Total # of meetings attended = 6</b> |
|------------|--|----------|---|

## 5 Outreach and communication activities

Please list all the relevant communication/outreach activities or products you have developed/executed during this period (including presentations, lectures, trainings, demonstrations, workshops, etc., and development of communication materials such as brochures, videos, press releases, newsletters, etc.). At the bottom of the table, provide a total number for every type of communication activity you have developed/executed (e.g. total # of press releases, total # of presentations given, etc.).

Table: Communication activities.

| Date        | Communication action/material          | Short description (of the material, title, ...) and/or link to the activity  | Main results (# participants, # views, # press clippings, etc.)  |
|-------------|--|--|--|
| Jan 1, 2019 | Call for Abstracts                     | Thematic EMODnet Geology Issue, Quarterly Journal of Engineering Geology and Hydrogeology (Mapping the Geology and Geomorphology of the European Seas)   | Ten abstracts received.  |
| 3.1.2019    | Call for abstracts                     | Books Editorial Committee of the Geological Society of London approved proposal on a Special Publication based on the talks held at Resources for Future Generations 2018 in Vancouver, added with significant input from the EMODnet Geology community.   | 23 abstracts received by dead-line, examples listed in "Table: List of known publications using EMODnet data or data products." below as In preparation. |
| 14.2.2019   | Proposal for Breakout Session          | 'Seabed Mapping - the Missing Link in OceanObs' at OceanObs19; members of the seabed mapping community teaming up with experts from a variety of marine environmental disciplines to underscore the importance of bathymetry as a baseline dataset, and to show the key role pan-disciplinary collaboration can play in furthering understanding of Earth's system processes | Proposal, with participation of EMODnet and EurogeoSurveys Marine Geology Expert Group, accepted   |
| 1.3.2019    | Abstract submitted for OceanObs'19     | 'EMODnet Geology, multinational collaboration for systematic mapping of Europe's marine geology' poster abstract submitted by Henry Vallius and EMODnet Geology partners   | Not yet presented  |
| Feb 2019    | WP7 text for the website               | Text describing the WP aims, the information, maps and a range of potential uses for data in lay-mans terms have been written out and submit to WP Data Management   | Not yet presented  |
| 22.3.2019   | Poster at NCK Days                     | Poster: Pan-European coastline-migration map based on satellite data 2007-2016   | Ca. 40 views.  |
| March 2019  | Poster, accepted and under development | Title: EMODnet Geology marine minerals data for European seas as an indication of associated endemic species dispersal   | Not yet presented  |

|                |   |   |                                   |
|----------------|---|---|-----------------------------------|
| March 2019     | Conference proceedings submitted to Goldschmidt '19 | Title: Analysing the distribution of marine mineral deposits across European Seas: A new perspective from the EMODnet-Geology project | Not yet presented                 |
| <b>SUM ...</b> |   |   | <b>Total # of submissions = 8</b> |

*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.*

*[Please, provide information in the table.]*

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

| <b>Date</b>       | <b>Name of journal, conference, ...</b>  | <b>Publication title</b>  | <b>Authors</b>   | <b>Organisation(s)</b>   |
|-------------------|--|---|--|--|
| <b>13.02.2019</b> | Geosciences, 2019, 9, 84   | Picking Up the Pieces— Harmonising and Collating Seabed Substrate Data for European Maritime Areas.           | Kaskela, A.M., Kotilainen, A.T., Alanen, U., Cooper, R., Green, S., Guinan, J., van Heteren, S., Kihlman, S., Van Lancker, V., Stevenson, A., the EMODnet Geology Partners | Geological Survey of Finland, British Geological Survey, Geological Survey of Ireland, Geological Survey of the Netherlands, Royal Belgian Institute of Natural Sciences |
| <b>31.03.2019</b> | Memorie Descrittive della Carta Geologica d'Italia   | Atlas of Italian Submarine Volcanic Structures  | Silvana D'angelo, Andrea Fiorentino, Guido Giordano, Alessandra Pensa, Annamaria Pinton, Letizia Vita  | Geological Survey of Italy - ISPRA   |
| <b>Jan 19</b>     | Project: GeoERA, MINDeSEA; GARAH   | MINDeSEA Newsletter, Issues 1 and 2.  |  | IGME, GSI  |
| <b>3-6.3.2019</b> | PDAC, EGS booth displayed a map of critical raw materials created by the MINDeSEA project using EMODnet Geology data | Map c. Distribution of critical raw materials mapped in European seas   |  | EGS, IGME, GSI   |
| <b>March 19</b>   | Conference: Goldschmidt119   | Title: Analysing the distribution of marine mineral deposits across European Seas: A new perspective from the | T.MEDIALDEA1*, M. JUDGE2, F.J.GÓNZALEZ1, L.SOMOZA1, P.TERRINHA3, MARINO1 E.  | IGME, GSI, IPMA  |

|                       |  | EMODnet-Geology project   |  |                    |
|-----------------------|--|---|--|--------------------|
| <b>9.11.2018</b>      | Geological Society of London Special issue   | proposal accepted for the Geological Society of London Special issue; From Continental Shelf to Slope - Mapping the Oceanic Realm) – with more than 10 paper proposals on EMODnet geology subjects. <b>Examples below</b> | Editors: Asch, Kristine, Kitazato, Hiroshi, and Vallius, Henry                         | BGR, GTK           |
| <b>In preparation</b> | Geological Society of London Special issue: Special issue; From Continental Shelf to Slope - Mapping the Oceanic Realm | Discover Europe's seabed geology - The EMODnet concept of uniform collection and harmonization of marine data<br><br>Henry Vallius - Geological Survey of Finland   | Henry Vallius - Geological Survey of Finland and WP Leaders                            | GTK                |
| <b>In preparation</b> | Geological Society of London Special issue: Special issue; From Continental Shelf to Slope - Mapping the Oceanic Realm | EMODNET Sea Floor Geology: Integrating Europe's Marine Geology Across EEZ-Boundaries  | Kristine Eva Charlotte Asch - Federal Institute for Geosciences and Natural Resources  | BGR                |
| <b>In preparation</b> | Geological Society of London Special issue: Special issue; From Continental Shelf to Slope - Mapping the Oceanic Realm | (Mapping) Dacian sediments on the Black Sea shelf east of the Danube Delta  | P.F. Gozhik, V.Ye. Rokitsky, Ukraine   | PSRGE              |
| <b>In preparation</b> | Geological Society of London Special issue: Special issue; From Continental Shelf to Slope - Mapping the Oceanic Realm | Integrated Thematic Geologic Mapping of the Atlantic Façade of Iberia (: a response to societal needs).   | Pedro Terrinha, IPMA, Portugal, and Teresa Medialdea, IGME, Spain                      | IPMA, IGME (Spain) |
| <b>In preparation</b> | Geological Society of London Special issue: Special issue; From Continental Shelf                                      | Classification and Map Compilation of Geomorphological Information of the German Sea floor in   | Sonja Breuer & Kristine Asch - Federal Institute for Geosciences and Natural Resources | BGR                |

|                           |  |  |   |        |
|---------------------------|--|--|---|--------|
|                           | to Slope -<br>Mapping the<br>Oceanic Realm   | the frame of the<br>EMODnet project                  |   |        |
| <b>In<br/>preparation</b> | Geological<br>Society of<br>London Special<br>issue: Special<br>issue; From<br>Continental Shelf<br>to Slope -<br>Mapping the<br>Oceanic Realm | Geomorphology of<br>the Bulgarian Black<br>Sea Shelf | Lyubomir Dimitrov,<br>Bogdan Prodanov,<br>Todor Lambev, Elena<br>Borisova (all from<br>Institute of<br>Oceanology - BAS,<br>Varna). | IO-BAS |

## 6 Annex: Other documentation attached

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*List in Annex if you wish to provide any additional information.*

## 7 New monitoring indicators

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*Please consult and fill in the designated excel template.*

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.