Establishing the European Geological Surveys Research Area to deliver a Geological Service for Europe

Technical review report for project MINDeSEA

This report is part of a project that has received funding by the European Union's Horizon 2020 research and innovation programme under grant agreement number 731166.

INTRODUCTION

Technical review report is part of GeoERA's Monitoring and evaluation process for co-funded projects (*hereinafter: project*). The aim of a technical review is to assess the work carried out under the project over a certain period and provide recommendations. Such technical review evaluates the project reports and deliverables, the proper use of resources, the management of the project and the expected impact.

Technical review report consists of four sections, each representing one level of monitoring and/or evaluation of the project:

Level	Monitor / Reviewer	Input	Aim
1 – Monitoring of progress indicators	Monitoring and reporting officer (GeoZS)	MPPR* FPPR**	Monitoring of the effectiveness of implementation of selected projects with respect to finance, time and administration.
2 – Scientific review	Reviewers (GeoZS)	Submitted deliverables MPPR FPPR	Quality review of the deliverables and review of achieving scientific and professional goals.
3 – Review of the theme progress	Theme coordinators	MPPR FPPR	Review of achieving theme objectives.
4 – GeoERA Progress evaluation	Stakeholder Council member(s)	Sections 1 and 2 of this report Review meetings	Overall project progress and general recommendations.

*MPPR = Midterm Project Progress Report (see PI doc no 2)
**FPPR = Final Project Progress Report (see PI doc no 2)

Monitoring and evaluation process:

M0 = End of reporting period
M1 = Submitted (Final) Project progress Report (MPPR / FPPR)
M2 = 1 – Monitoring & 2 – Evaluation
M3 = 3 – Evaluation of the theme progress
M3 = (Final) Review Meeting & 4 – Progress evaluation

Each project will be reviewed twice: for first project period M1-M18 – Technical review report, and second project period M19-M36 – Final review report.
Technical review report is based on Horizon 2020 templates but adopted to GeoERA needs. Technical reviews of projects shall be carried out on a confidential basis.

GENERAL INFORMATION

ERA-NET Cofund Grant Agreement:	731166
ERA-NET Cofund acronym:	GeoERA
Call identifier:	H2020-LCE-2016-2017/H2020-LCE-2016-ERA
Project full title:	Seabed Mineral Deposits in European Seas: Metallogeny and Geological Potential for Strategic and Critical Raw Materials
Project acronym:	MINDeSEA
Project reference number:	GeoE.171.001
Project topic:	Raw Materials
Project specific topic:	RM3-Metallogeny – Geological potential
Lead partner:	IGME-Sp Instituto Geológico y Minero de Espana (Geological Survey of Spain)
Project website:	http://geoera.eu/projects/mindesea/

☒ Technical review report
☐ Final review report

Period covered	01/07/2018 – 31/12/2019
Review meeting date	17.02.2020

Contributor:	Role:	Approved on:
Barbara Simić	Monitoring and reporting officer	01.03.2020
Maja Ilić	Monitoring and reporting officer	02.03.2020
Ana Novak	Scientific reviewer	02.03.2020
Jasna Šinigoj	Scientific reviewer	11.03.2020
Matija Krivic	Scientific reviewer	10.03.2020
Antje Wittenberg	Theme coordinator	16.03.2020
Helena-Maria Cavaco-Viegas	Stakeholder Council member	28.04.2020
Christine Meyzen	Stakeholder Council member	19.03.2020

1 LEVEL 1 – MONITORING OF PROGRESS INDICATORS

In this section the project is monitored "remotely" on the basis of the respective reports. This part is filled in by Monitoring and reporting officer with aim to monitor the effectiveness of implementation of the selected projects with respect to finance, time and administration, based on submited MPPR and FPPR.

	Yes	Partially (comment needed)	No
PROJECT MANAGEMENT			
Has the MPPR / FPPR report been submitted on time?	☒		☐
Have there been any changes in project partnership?	☒	See comment no.1	☐
Has the project management been performed as required?	☒		☐
Has the collaboration between partners been effective?	☒		☐
Do you identify evidence of underperforming partners, lack of commitment or change of interest of any partners?	☐ (see comment)		☒
DELIVERABLES and MILESTONES			
Have the planned deliverables for the period been submitted on time according to timeline in Project Agreement?	☐	See comment no.2	☒
Have the planned deliverables for the period been completed (from MPPR / FPPR, sheet 4)	☒		☐
Have any changes to deliverables occurred (type/ dissemination level)? (from MPPR / FPPR, sheet 4 and 5)	☒	See comment no.3	☐
Have planned milestones been achieved for the reporting period? (from MPPR / FPPR, sheet 4)	☒		☐
Have the project partnership identify any difficulties achieving any of the deliverables / milestones?	☐		☒
DEVIATIONS (from MPPR / FPPR, sheet 5)			
Has the project partnership identify any deviations that will not affect projects outputs?	☒		☐
Have any deviations occur on the project, with impact on project outputs?	☐		☒
In case of deviations, have the project adopted corrective measures?	☒		☐
DISSEMINATION, COMMUNICATION			
Has the project adopted its dissemination plan?	☒		☐

Have the planned dissemination activities been completed for the reporting period? (from MPPR / FPPR, sheet 6)	☒		☐
Have the partners' disseminated project results and information adequately?	☒		☐
Is the project following dissemination plan?	☒		☐
Is the project interacting in a satisfactory manner with other GeoERA projects?	☒		☐
Is the project interacting in a satisfactory manner with national/international bodies?	☒		☐

FINANCE			
To the best of your estimate, have the resources used been utilised for achieving the project? (according to MPPR / FPPR, sheet 9)	☒		☐
To the best of your estimate, have the resources used been in a manner consisted with the principle of economy, efficiency and effectiveness? *	☒		☐
Are there any major deviations in the budget consumptions from the financial plan? (zero consumption in M18; deviation from plan exceeding 20% in M36)	☐		☒
Are there any major deviations in the Person - Months consumptions from the plan? (zero consumption in M18; deviation from plan exceeding 20% in M36)	☐		☒
Are any budget modifications for the project needed? (from MPPR / FPPR, sheet 5)	☐		☒

***The principles of economy, efficiency and effectiveness** refers to the standard of "good housekeeping" in spending public money effectively. Economy can be understood as minimizing the costs of resources used for an activity (input), having regard to the appropriate quality and can be linked to efficiency, which is the relationship between the outputs and the resources used to produce them. Effectiveness is concerned with measuring the extent to which the objectives have been achieved and the relationship between the intended impact and the actual impact of an activity. Cost effectiveness means the relationship between project costs and outcomes, expressed as costs per unit of outcome achieved.

Comments (highlighting the project progress) / deviations / recommendations:

Comment no.1: In March 2019 project partner Institute of Geology and Mineral Exploration IGME-Gr changed its name to Hellenic Survey of Geology and Mineral Exploration H.S.G.M.E. The change had no impact on project implementation.
Comment no.2: In the first reporting period 16 deliverables were due:
14 deliverable were submitted in time
2 deliverables were submitted with eligible delay (amendment 1)
Comment no.3: Changes to deliverables:
D2.3: postponed from M8 → M11
D2.3: postponed from M15 → M17
The changes have no impact on the project outputs.

MINDeSEA project aims at seabed mineral deposits in the European Seas and tackles the potential supply shortage of strategic metals and critical raw materials (CRM), crucial for low-carbon energy production and new technologies.
In the first reporting period project achieved all scientific deliverables on time. Two deliverables were postponed for three months, but none into the second period.
The project has adopted the communication and dissemination plan and has so far reached more than 22.000 people, which is more than average of other GeoERA projects. The project consortia identified its stakeholders in policy makers: DG GROW, DG MARE and some ministries. Additionally, it is connected to projects outside the GeoERA, e.g. EMODNET-Geology, MarSP, MarinE.Texh, which is encouraged.
Overall financial consumption at the end of first reporting period is 40 %, which is a bit low. According to the project plan, the majority of activities will be done in the second reporting period, consequently the financial consumption will increase.
No challenges in achieving project outcomes are recognized, the project lead provides good support to partners with implementation of project activities.

Overall assessment of the project:

☐ 5 - **Overachiever** (the project has achieved all objectives and goals for the period and has even exceeded expectations)

☒ 4 - **Excellent progress** (the project has fully achieved its objectives and goals for the period)

☐ 3 - **Good progress** (the project has achieved most of its objectives and goals for the period with relatively minor deviations)

☐ 2 - **Acceptable progress** (the project has achieved some of its objectives; however corrective action will be required)

☐ 1 - **Unsatisfactory progress** (the project has failed to achieve critical objectives and/or is not at all on schedule)

Summary of dissemination activities (detailed activities are annexed to this report):

Activity	Target audience	Number of people reached
Publications	Policy makers	40 – 60
Publications	Scientific community	~2.660
Publications	General public	~6.845
Event	Policy makers	~3.710
Event	Scientific community	~6.208
Event	Other	~2.500
Meetings	EU institutions	100-160
Meetings	Policy makers	50
Meetings	Scientific community	655
Media	General public	N.A.
		22.808

Are the dissemination activities adequate? (link to GeoERA WP5)

☐ 5 - **Overachieved** (the projects dissemination activities have exceeded expectations)

☒ 4 - **Excellent** (the projects dissemination activities have fully achieved its expectations)

☐ 3 - **Good** (the projects dissemination activities are adequate; however, some additional activities are needed)

☐ 2 - **Acceptable** (the projects dissemination activities need corrective actions; additional activities are needed)

☐ 1 - **Unsatisfactory** (the project has failed to disseminate)

Cummulative financial statement:

	Person months	Total eligible costs	Reimbursement rate	GeoERA contribution	In-kind contribution
Plan	123,8	947.406	29,7%	234.973	712.433
1st period consumption	43,64	381.165	29,7%	113.206	267.959
2nd period consumtion					

2 LEVEL 2 – SCIENTIFIC REVIEW

In this section the project is reviewed ”remotely” on the basis of the respective reports. This part is filled in by reviewer with aim to review the quality of the deliverables and review of achieving scientific and professional goals. Scientific review is based on submitted deliverables and reported Impact statement in MPPR/FPPR.

Impact statement (from MPPR / FPPR, sheet 8):

At this stage it is too early to evaluate impact, comments will be provided at the review meeting.

Expected impact (from Project Agreement):

The implementation of this Project Proposal will contribute to achieving the following scientific or societal impacts: • Provide integrated reliable data and information of the off-shore resources, useful for economic and social agents for the selection of viable mine sites and the design of environmentally sound and efficient seabed mining systems for the future. • Support exploration and development of marine mineral raw materials by improving our knowledge and understanding of the occurrence of critical raw materials and base metals on submarine mineral deposits. As a consequence, the cost of exploration will be reduced. • Future marine-based mining of critical raw materials, especially cobalt (Co), tellurium (Te), niobium (Nb), rare earth elements (REEs) and platinum group elements (PGEs), will contribute to reducing Europe’s import dependency for these metals. This will support both the maintenance and creation of jobs within Europe. • Develop cooperation and collaboration ties between researchers in the different partner organisations and countries participating in the project, contributing towards reducing duplication of research – both in terms of data acquisition as well as resource potential modelling. • Additionally, the identification of data gaps and target areas will facilitate more directed and transnational future projects. To do this, MINDeSEA will, though a series of key work packages, develop research that will: • Give a comprehensive overview of seafloor mineral deposits in European Seas. This will be novel as a metallogenic-geological potential study of the different types has never been achieved for European seas. Therefore, the accomplishment of this research will represent a substantial advance in the state of knowledge relating to the genesis and importance of European seafloor metallogenic mineralisation • Extend our knowledge and understanding for the geological characteristics of

seabed mineralisations, their origin and evolution, relations with the tectonic activity and the sedimentary systems as well as the water masses composition and distribution.
• Improve the information available on the role exerted by the different local and regional factors on the deposits formation and the location of metals of economic interest.
• Understand the key processes for critical raw material concentration on submarine minerals, using modern laboratory technics and experimental models.
• Establish reference zones used as potential areas for increasing the knowledge on the processes of the different types of seafloor mineral deposits and their economic potential for critical and strategic metals.
• Determine the interest of the metallogenic studies on seafloor mineralisation to the development of technical, legal and environmental regulations for their future exploitation in the European Seas.
• To increase the existing information on the seabed mineralisations and their importance in local and global biodiversity, and to evaluate their vulnerability to processes derived from the anthropic activity.
• To improve the knowledge of natural processes by means of mathematical-GIS modelling and the accomplishment of simulations.

Evaluation of deliverables

Deliverables list status			
No.	Title	Status (Approve/ Reject)	Comments
D1.1	Internal Progress Report_M6	Approved	P4 (replace link with https://geoera.eu/projects/mindesea2/)
D1.1	Internal Progress Report_M12	Approved	P4 (replace link with https://geoera.eu/projects/mindesea2/)
D1.1	Internal Progress Report_M18	Approved	P4 (replace link with https://geoera.eu/projects/mindesea2/)
D1.2	Project Progress Report	Approved	/
D1.4	Cumulative expenditure reports_y2018	Approved	/
D1.4	Cumulative expenditure reports_y2019	Approved	/
D2.1	WP2 Task guide	Approved	P9 (replace link with https://geoera.eu/projects/mindesea2/)
D2.3	Workshops dedicated to the main themes of the	Approved	

	work packages (jointly with other SRTs?)		
D2.3	Workshops	Approved	/
D3.1	WP3 Task guide	Approved	/
D4.1	WP4 Task guide	Approved	/
D5.1	WP5 Task guide	Approved	/
D6.1	WP6 Task guide	Approved	/
D7.1	WP7 Task guide	Approved	/
D8.1	WP8 Task guide	Approved	/
D8.3	Best practice manual with practical guidelines and workflows for data	Approved	/

Has the quality as a whole been achieved according the objectives? Has the project as a whole been making satisfactory progress?

☐ 5 - **Overachiever** (the project has achieved all objectives and goals for the period and has even exceeded expectations)

☒ 4 - **Excellent progress** (the project has fully achieved its objectives and goals for the period)

☐ 3 - **Good progress** (the project has achieved most of its objectives and goals for the period with relatively minor deviations)

☐ 2 - **Acceptable progress** (the project has achieved some of its objectives; however corrective action will be required)

☐ 1 - **Unsatisfactory progress** (the project has failed to achieve critical objectives and/or is not at all on schedule)

Comments (highlighting the project progress) / deviations / recommendations:

The project progresses in accordance to the proposed timelines - workplan. Almost all the deliverables have been submitted on time. Postponed deliverables have been approved by the GeoERA assembly. These deviations do not impact the project's outputs. Project is coordinated with other larger EU project ensuring maximum data exchange, inteconnectivity and data compliance. The project already produces scientific publications in high-impact scientific journals and forms a new generation od scientists with successfully defended theses and dissertations. Dissemination and outreach activities are abundant: according to the mid-term reports, the visibility of the project is above average compared to other GeoERA projects. Ample time is dedicated to presentations of the project on scientific conferences and related meetings. The project members are significantly involved in local and regional outreach activities.

The WP's are well designed and progress in accordance to the workplan. Several WP's include collection of data for which data collection sheets were prepared taking into consideration other databases, which assures utmost utilisation of harmonised data. The datasheets are well prepared and contain all relevant data for further use. The collected data will not be collected in the form of raw data but will instead consist of metadata containing all the relevant information for later users to contact the owners of the original data.

Several WP's plan to gather new data in case studies. While the project members have already established a list of criteria for the case study site selection, they (along with the possible study locations) will be further discussed at the Ljubljana event. I recommend the members to choose the site(s) in the near future to ensure enough time for sample analysis and elaboration.

3 LEVEL 3 – REVIEW OF THE THEME PROGRESS

In this section the project is reviewed ”remotely” on the basis of the respective reports. This part is filled in by Theme coordinator with aim to review the achieved scientific goals in accordance with theme objectives, on the basis of Sheet 3 in MPPR / FPPR – Project contribution to GeoERA project.

Project contribution to GeoERA project (from MPPR / FPPR, sheet 3):

MINDeSEA is the flagship project for marine mineral deposits in the EU. MINDeSEA provides important and basic information not only about marine raw materials, their distribution and classification, but is also a first common approach for sustainable management in a sensitive ecosystem, which is important for the sustained food chain and general well-being, but poorly understood. As global demand for strategic metals and critical raw materials (CRM), which are crucial for low-carbon energy generation and new technologies, grows, there is a corresponding risk development for the European economy and the quality of the oceans that calls for the provision of scientifically based data for further management requirements. By addressing the concerns of the EU Commission regarding the sustainable procurement of strategic and critical raw materials for European industry, the Battery Alliance and the transition to a green energy society MINDeSEA has already contributed to the European Blue Growth Strategy.

The overall philosophy of research within MINDeSEA fulfills the main objective of GeoERA, which is to contribute to the sustainable use and responsible management of the subsurface. GeoERA will aim to support:
1) a more integrated and efficient management, maximising its added value and
2) a more responsible and publicly accepted, exploitation and use of the subsurface, minimising environmental impacts and footprints. It adds to the general objective to add to the Scientific Knowledge Base and GeoERAs goals to achieve a "European Geological Surveys Research Area" and has already provided several scientific contributions recognised internationally and nationally.

Theme objectives:

Raw Materials Theme objectives are defined by the Grant Societal Challenges identified by the European Union (Commission and Member States), the UNSDG and Member States outlined theme specifically by the Raw Materials Initiative and derived policies. In particular:

- *the security and sustainability of mineral raw materials supply from EU domestic sources and other sources (primary and secondary) and*
- *the management of competing uses of the European surface and subsurface.*

MINDeSEA gives specific emphasis on Europe's mineral potential in the Europe's Marine Waters. MINDeSEA aims to assess the quantity and quality of marine CRM's, and a more comprehensive pan-European identification and compilation of mineral potential and classification of metallogenic seafloor mineral deposits. MINDeSEA also aims to provide guidance for the management of impacts resulting from deep sea resource exploitation, minimising environmental impacts and footprints. Marine spatial planning to ensure conservation of oceans as well as prevent conflict with other ocean users is in its core action.
The information and the understand of marine mineral resources is a research that is still very limited, due to technical, infrastructural and time requirements. Research and data collection on geochemical and physical information in space is therefore carried out by far more groups than research in the deep sea and on the seabed. Spatial and scientific data on seabed raw materials might it be on the distribution of placer deposits or the occurrence of CRM are important regarding accessibility as well as it is for hazardous risk reduction (coastal protection) and enlarging the understanding on a unique environment. The excellent international network of experts represented in MINDeSEA, the science driven communication and the exchange of methods and techniques has already led to a sizable amount of publications (including peer reviewed). The impact of MINDeSEAs work (e.g. First European Map on CRM in European Waters; Map of Aggregates, invitations by EU and expert consultation to EU fora) is quite notable. With continuously revisiting of areas of interest over a long period in time by the vary partners as well as the comparison of specific environments and deposit sites in national and international waters underpinned by the long lasting experience of team members MINDeSEAs scientific work add to understand also environmental issues of an habitat hardly seen by the majority of our society and where reliable information are rare.

With the research focussed on CRM in European waters it adds to the work of FRAME and interacts with them closely. This collaboration increases the necessary database to develop exploration methods further and to identify areas of interest.

MINDeSEAs five scientific work packages contribute to an improved European Raw Materials Knowledge Base through new and harmonised data on marine mineral resources, its formation and occurrences underpinned by target group specific publications and communication with most relevant stakeholder communities. The presence at relevant conferences, international workshops, the newsletters and peer-reviewed publication help to communicate with relevant stakeholder and add to improve the public acceptance to act.

Has the project as a whole achieved the objectives and expected impact of the theme?

☐ 5 - **Overachiever** (the project has achieved greater impact on project theme and/or other themes than expected)

☒ 4 - **Excellent progress** (the project has fully achieved its objectives and goals towards the theme as expected)

☐ 3 - **Good progress** (the project has achieved most of its impact towards the theme for the period with relatively minor deviations)

☐ 2 - **Acceptable progress** (the project has minor impact; corrective action will be required)

☐ 1 - **Unsatisfactory progress** (the project has failed to achieve critical objectives and/or is not at all on schedule and/or has no impact on the theme; corrective actions are required)

Comments / deviations / recommendations:

The number of partners is rather small in comparison to the other GeoERA Projects due to the international limited number of expert in that field, so does the budget. Although pan-european partner coverage is hardly ever achieved (due to the lack of direct participation - no coast), the participation of partners is striking. The excellent progress the team made already builds on former projects and long standing expertise of the partner's that would not have been possible without that background. The clear instructions for communication, alignment of data collection and data harvesting are briefly outlined in work packages. This means that all the services to be provided can be regarded as independent advice that helps all partners to deliver efficiently and effectively. Thus, the all deliverables can be seen as standalone advices helping all partners to deliver efficiently and effectively.
MINDeSEA accumulates existing knowledge of individuals and increases the knowledge of the community. It already made good progress towards and upgrading of the European Raw Materials Knowledge Base and is recognised and acknowledged in the course of Europes Policy known as "Blue Economy".

4 LEVEL 4 – GEOERA PROGRESS EVALUATION

In this section the project is reviewed on the Review meetings, where projects present their overall progress and achievements. This section relates to particular project, broader impact of GeoERA as a whole on policies will be covered at the Final Review meeting with questionnaire and interview with Evaluator.

Based on technical review summaries provided by Sections 1 – 3 of this report, and project presentation on the (Final) Review meeting:

Has the project as a whole been making satisfactory progress according to your own understanding and expectations of the GeoERA project?

☒ 5 - **Overachiever** (the project has exceeded expectations)

☒ 4 - **Excellent progress** (as expected)

☐ 3 - **Good progress** (minor recommendations given below)

☐ 2 - **Acceptable progress** (below expectations; minor corrective action will be required)

☐ 1 - **Unsatisfactory progress** (the project has failed; corrective actions are required)

Overall comments for the project (overall recommendations, modifications, corrective actions, or re-tuning the objectives to optimize the impact or keep up with the State of the Art, re-focusing, or a simple praise)

Stakeholder one feedback:
Europe in relation to its size is remarkably well-endowed with seabed metalliferous mineral resources, but its seabed mineral wealth and potential is actually largely underestimated. A recent revitalization in seafloor mining interest in Europe has been driven by a growing global metal demand. However, current accurate assessment of the distribution, metal tonnage, as well as of the recoverability of these deposits are notoriously difficult to achieve because of restricted exploration coverage, poor understanding of their 3D- characteristics and associated technological challenges. Within this framework, the primary goal of the MINDeSEA project is to establish a first inventory of strategic European seabed mineral deposits in order to gather information on their spatial distribution, the diversity of their geological settings with a particular emphasis on their structural features, their chemistry and mineralogy. This information will allow to develop metallogenesis 3-dimensional models, ultimately budget the metal resources and to set up some of these deposits as natural laboratories for monitoring tectonic, magmatic and hydrothermal processes in order to better understand their formation and economic potential. Such an evaluation will also provide the necessary foundation for targeting the most accessible resources to be mined with minimum environmental impact. This remarkable effort to advancing understanding is led by a joint European network of experts from different geological

surveys to improving our knowledge of these deposits, the efficiency of future exploration and to reducing cost at European level.
During the MINDeSEA review meeting, the different sections of the meeting examined 8 work packages.
The building of big databases encompassing a large number of logistical, geographical, geophysical, (biological), mineralogical and geochemical data is a sizable data collection exercise and time-consuming process. Within the time limit, the investigators have achieved a large amount of work for meaningfully collecting all available data from different sources not always easily accessible. Although located out of European seas, it would be interesting to include Ocean Drilling Program (ODP) data from Leg 158 regarding the only ever attempt to drill the Trans-Atlantic Geotraverse (TAG) hydrothermal field at 26°N on the Mid-Atlantic Ridge. Another data source which can be used to enrich the logistical repertory is the French Oceanographic Cruise database available at https://www.flotteoceanographique.fr/en/What-we-do/Looking-for-a-cruise.
Communication between the responsibles of the different work packages is crucial in order to reduce as far as possible duplicate work in the elaboration of the databases. An eventually fruitful initiative might also be to try joining the two InteRidge working groups respectively focused on “Working Group on Integrating Multidisciplinary Observations in Vent Environments (IMOVE) ” and “Seafloor Massive Sulfides Resource along MOR” to foster interactions with the international scientific community working on hydrothermal processes. The non-profit international organization InteRidge, which brings together scientists from different nations and disciplines, has the Observer Status to the International Seabed Authority for more than a decade. The InteRidge organization play a role in providing the scientific basis to support the development of regulations, guidelines and best-practices through governing bodies regarding future seafloor mineral exploitation and the choice of future refuges exempt from exploitation.
Regarding future developments, it would be interesting to establish a similar inventory for European on-land Volcanogenic Massive Sulfide deposits, which might further refine our understanding of metallogenesis processes at the origin of modern massive sulfide deposits. Similarly, the biological role in the mineralization process is likely to be pivotal, as such it would be interesting to include biological data in any inventory in the future. As most literature data are focused on active hydrothermal fields, it might also be opportune to collect more data on inactive hydrothermal deposits. Owing to its economic importance, the project would deserve communicating in addition to a broad scientific audience (as done) with a large non-scientific public to avoid future near automatic opposition to deep ocean mining.
Overall, the investigators of this project have ensured to achieve and deliver the objectives of the original proposal in a timely manner. This project is a giant first step deployed by the European community to quantify critical and strategic metal resources in the European seas.

Stakeholder two feedback:
An impressive amount of work developed, reflecting a huge effort to map the existing data, collect some new data, harmonize it and make it available.
The links with EU policies are well established and explored.
The analysis of the project's relation and synergies with existing initiatives and projects at EU level and global level is very useful and provides an excellent overview.
The communication and dissemination strategy seems very robust.
The deliverables could address better sustainability and environmental issues, in particular in the communication and dissemination tools.
The Deliverable 6.1 includes a characterization of the polymetallic nodules, which says these deposits occur in abyssal plains (4000 – 6000mm water depth). Nevertheless, within Europe and accordingly with the same deliverable, these deposits are found in relative shallow waters, as the case of the Gulf of Finland and the Baltic Sea. This apparent discrepancy would worth an explanation.
Finally, a word of gratitude for the valuable input provided by the project to the EU Blue Economy Report 2019 and 2020.

Annex 1: Review meeting list of participants

Name	Role	Organisation
Tessa Witteman	GeoERA coordinator	Netherlands Organisation for Applied Scientific Research
Barbara Simić	Monitoring and Reporting Officer	Geological Survey of Slovenia
Ana Novak	Scientific Officer	Geological Survey of Slovenia
Jasna Šinigoj	Scientific Officer	Geological Survey of Slovenia
Antje Wittenberg	Raw Materials Theme Coordinator	Federal Institute for Geosciences and Natural Resources, Germany
Helena-Maria Cavaco-Viegas	Stakeholder council member	DG GROW, EC
Christine Meyzen	Stakeholder council member	Unipd, Italy
Francisco Javier González Sanz	Project manager	Geological Survey of Spain
Henrik Schiellerup	Project member	Geological Survey of Norway
Irene Zananiri	Project member	Hellenic Survey of Geology and Mineral Exploration
Pedro Ferreira	Project member	The National Laboratory of Energy and Geology, Portugal
Xavier Monteys	Project member	Geological Survey Ireland
Trevor Alcorn	Project member	Geological Survey Ireland

Annex 2: Communication and dissemination activities

Please select activity	Subcategory	Date	Target audience	Number of people reached	Short name of project participant	Author(s)	Link (if applicable)
MEETINGS	Meeting with other GeoERA projects	3-5 July 2018	GENERAL PUBLIC	500 (Kick-off meeting of GeoERA, Brussels)	IGME-Sp, BGR, IGME-Gr, GSI, NGU, LNEG, SGU, Geoinform, IPMA, IGEO, USGS, Okean Geologia	MINDeSEA team	https://geoera.eu/blog/event/project-kick-off-meetings/
PUBLICATIONS	PAPERS	July 2018	SCIENTIFIC COMMUNITY	Open Access (MDPI Publication)	IGME-Sp, IGEO	Marino, E.; González, F.J.; Lunar, R.; Reyes, J.; Medialdea, T.; Castillo-Carrión, M.; Bellido, E.; Somoza, L.	https://www.mdpi.com/2075-163X/8/7/285
PUBLICATIONS	PROJECT SPECIFIC PUBLICATION (please specify: leaflet, poster, catalogue, …)	July 2018	GENERAL PUBLIC	Unknown visitors (GeoERA-MINDeSEA website audiences)	IGME-Sp, BGR, IGME-Gr, GSI, NGU, LNEG, SGU, Geoinform, IPMA, IGEO, USGS, Okean Geologia	MINDeSEA team, GIP-team	https://geoera.eu/projects/mindesea2/
PUBLICATIONS	PROJECT SPECIFIC PUBLICATION (please specify: leaflet, poster, catalogue, …)	July 2018	GENERAL PUBLIC	320 followers, 902 tweets, 5100 likes and >250.000 interactions (MINDeSEA Twitter account)	IGME-Sp	MINDeSEA team	https://twitter.com/MINDeSEA
PUBLICATIONS	PROJECT SPECIFIC PUBLICATION (please specify: leaflet, poster, catalogue, …)	July 2018	GENERAL PUBLIC	>125 Friends (MINDeSEA Facebook account)	IGME-Sp	MINDeSEA team	https://www.facebook.com/mindesea.mindesea.9
PUBLICATIONS	PROJECT SPECIFIC PUBLICATION (please specify: leaflet, poster, catalogue, …)	August 2018	GENERAL PUBLIC	300 (MINDeSEA Newsletter, issue 1)	IGME-Sp, BGR, IGME-Gr, GSI, NGU, LNEG, SGU, Geoinform, IPMA, IGEO, USGS, Okean Geologia	MINDeSEA team	https://geoeramindesea.wixsite.com/mindesea/Newsletter1

PUBLICATIONS	PROJECT SPECIFIC PUBLICATION (please specify: leaflet, poster, catalogue, …)	July 2018	GENERAL PUBLIC	Unknown (GeoERA-MINDeSEA promotional poster)	IGME-Sp, BGR, IGME-Gr, GSI, NGU, LNEG, SGU, Geoinform, IPMA, IGEO, USGS, Okean Geologia	MINDeSEA team	https://MINDeSEA poster.pdf
PUBLICATIONS	PROJECT SPECIFIC PUBLICATION (please specify: leaflet, poster, catalogue, …)	July 2018	GENERAL PUBLIC	Unknown (GeoERA promotional poster)	EGS	Antje Wittenberg, GeoERA RM project leads	https://GeoERA RM poster.pdf
PUBLICATIONS	SCIENTIFIC PUBLICATION	10-14 September 2018	SCIENTIFIC COMMUNITY	300 (Academia, Mining industry, Marine research-technological centers, Policy makers, NGOs; Bergen)	IGME-Sp, BGR, IGME-Gr, GSI, NGU, LNEG, SGU, Geoinform, IPMA, IGEO, USGS, Okean Geologia	Javier González, Luis Somoza, Teresa Medialdea, Thomas Kuhn, Irene Zananiri, Maria Judge, Gerry Stanley, Henrik Schiellerup, Pedro Ferreira, Johan Nyberg, Boris Malyuk, Pedro Terrinha, Vitor Magalhaes, Rosario Lunar, Jesús Martínez-Frías, James R. Hein, Georgy Cherkashov and the MINDeSEA Scientific Party	https://UMC18_MIND eSEA.pdf
EVENTS	EXHIBITION	8-16 September 2018	GENERAL PUBLIC	>2000 (TIF, 83rd Thessaloniki Fair)	IGME-Gr	Irene Zananiri, MINDeSEA team	https://Thessaloniki_InterFair18.pdf

EVENTS	SEMINAR	28-30 September 2018	GENERAL PUBLIC	>100 (Naval Week, Madrid)	IGME-Sp	Luis Somoza, MINDeSEA team	https://SemanaNaval18.pdf
EVENTS	TRAINING	Autumn 2018	GENERAL PUBLIC	200 (Secondary school and University students; Lisbon, Las Palmas and Madrid)	LNEG, IGME-Sp	Pedro Ferreira, Javier González	-
MEETINGS	Meeting with international body	24-28 September 2018	SCIENTIFIC COMMUNITY	40 (MGEG-EuroGeoSurveys and EMODnet-Geology consortium, Albania)	IGME-Sp	Teresa Medialdea	-
MEDIA	RADIO, TV,	September 2018	GENERAL PUBLIC	Unknown (Radio)	IGME-Sp	Javier González	https://www.cope.es/emisoras/canarias/la-manana-canarias/audios/manana-canarias-con-mayer-trujillo-20180917_544950
EVENTS	CONGRESS	25 October 2018	GENERAL PUBLIC	200 (ESRI España Community, Madrid)	IGME-Sp	Iker del Barrio, Lorena Blanco, MINDeSEA team	https://ESRI18.pdf
PUBLICATIONS	PROJECT SPECIFIC PUBLICATION (please specify: leaflet, poster, catalogue, …)	October 2018	GENERAL PUBLIC	>2500 visitors (MINDeSEA dedicated website audiences)	IGME-Sp, BGR, IGME-Gr, GSI, NGU, LNEG, SGU, Geoinform, IPMA, IGEO, USGS, Okean Geologia	MINDeSEA team	https://geoeramindesea.wixsite.com/mindesea
MEETINGS	Meeting with international body	16-17 October 2018	EU INSTITUTION	50-80 (EuroGeoSurveys Directors' Workshop, Bratislava)	IGME-Sp, BGR, IGME-Gr, GSI, NGU, LNEG, SGU, Geoinform, IPMA, IGEO, USGS, Okean Geologia	Daniel Oliveira, MINDeSEA team	-

PUBLICATIONS	SCIENTIFIC PUBLICATION	30 Octotber 2018	SCIENTIFIC COMMUNITY	150 (Academia, Mining industry, Marine research-technological centers, Policy makers, NGOs; Geol. Soc. London)	IGME-Sp, IPMA, LNEG, IGEO	Francisco Javier González, Luis Somoza, Pedro Terrinha, Teresa Medialdea, Vitor Magalhaes, Pedro Madureira, Pedro Ferreira, Egidio Marino	https://GeolSoc_London18.pdf
PUBLICATIONS	SCIENTIFIC PUBLICATION	1 November 2018	SCIENTIFIC COMMUNITY	150 (Academia, Mining industry, Marine research-technological centers, Policy makers, NGOs; Geol. Soc. London)	IGME-Sp, IGEO, BGR	Egidio Marino, Francisco Javier González, Rosario Lunar, Luis Somoza, Jesús Reyes, Teresa Medialdea, Eva Bellido, Thomas Kuhn, Anna Wegorzewski, Martin Oeser	https://GeolSoc_London18.pdf
MEDIA	RADIO, TV,	November 2018	GENERAL PUBLIC	Unknown (Radio)	IGME-Sp	Javier González	http://cadenaser.com/emisora/2018/11/20/ser_las_palmas/1542713064_543044.html
PUBLICATIONS	SCIENTIFIC PUBLICATION	November 2018	SCIENTIFIC COMMUNITY	Unknown (Ocas y Minerales journal nº 558, p 54)	IGME-Sp		https://issuu.com/fueyoeditores0/docs/rocas558/54
EVENTS	PITCH EVENT	12-16 November 2018	POLICY MAKERS	400-600 (European Raw materials Week 2018, Brussels)	IGME-Sp, BGR, IGME-Gr, GSI, NGU, LNEG, SGU, Geoinform, IPMA, IGEO, USGS, Okean Geologia	MINDeSEA team	_

EVENTS	MEETINGS	26 November 2018	SCIENTIFIC COMMUNITY	400 (PhDay, Madrid Complutense Univ. Faculty members and Geological Sc. students)	IGME-Sp, IGEO	Egidio Marino	https://edoctorado.ucm.es/2-jornada-phday-complutense
MEETINGS	Meeting with other GeoERA projects	27-29 Nobember 2018	SCIENTIFIC COMMUNITY	40 (MREG-EuroGeoSurveys, Rome)	IGME-Sp, BGR, IGME-Gr, GSI, NGU, LNEG, SGU, Geoinform, IPMA, IGEO, USGS, Okean Geologia	Javier González	-
MEETINGS	Meeting with national body	6 December 2018	POLICY MAKERS	50 (InfoDay at the Greek Ministry of Environment and Energy, Athens)	IGME-Gr	Irene Zananiri	-
PUBLICATIONS	TECHNICAL REPORT	December 2018	GENERAL PUBLIC	Unknown	IGME-Sp, LNEG, IPMA, IGEO	Javier González, Iker Blasco, Lorena Blanco, Egidio Marino, Luis Somoza, Teresa Medialdea, Pedro Ferreira, Vitor Magalhaes	https://Energy Critical Elements.pdf
PUBLICATIONS	PROJECT SPECIFIC PUBLICATION (please specify: leaflet, poster, catalogue, …)	December 2018	GENERAL PUBLIC	300 (MINDeSEA Newsletter, issue 2)	IGME-Sp, BGR, IGME-Gr, GSI, NGU, LNEG, SGU, Geoinform, IPMA, IGEO, USGS, Okean Geologia	MINDeSEA team	https://geoeramindesea.wixsite.com/mindesea/Newsletter2
MEDIA	ONLINE MEDIA	Autumn 2018	GENERAL PUBLIC	Unknown (>10 News in media: newspapers)	IGME-Sp	MINDeSEA team	https://geoeramindesea.wixsite.com/mindesea/news
PUBLICATIONS	TECHNICAL REPORT	28.12.2018	POLICY MAKERS	20-30 (Internal Progress Report on	IGME-Sp, BGR, IGME-Gr, GSI, NGU, LNEG, SGU,	Javier González, MINDeSEA team	-

				the MINDeSEA Consortium Activities July-December 2018)	Geoinform, IPMA, IGEO, USGS, Okean Geologia		
PUBLICATIONS	PAPERS	January 2019	SCIENTIFIC COMMUNITY	Unknown (Marine Geology journal)	IGME-Sp	Luis Somoza	https://doi.org/10.1016/j.margeo.2018.11.011
PUBLICATIONS	SCIENTIFIC PUBLICATION	December 2018	SCIENTIFIC COMMUNITY	1000 (Spanish Cartography Society Bulletin 21, p 11)	IGME-Sp	Leticia Vega	https://geoeramindesea.wixsite.com/mindesea/publications
EVENTS	EXHIBITION	7 March 2019	OTHER (customers)	>2500 (PDAC, Toronto)	IGME-Sp, BGR, IGME-Gr, GSI, NGU, LNEG, SGU, Geoinform, IPMA, IGEO, USGS, Okean Geologia	Javier González	
EVENTS	TRAINING	April 2019	SCIENTIFIC COMMUNITY	25 (Madrid Complutense Univ. Master students, Seminar on deep-sea minerals and associated critical raw materials)	IGME-Sp	Javier González	
PUBLICATIONS	PAPERS	April 2019	SCIENTIFIC COMMUNITY	Unknown (Marine Geology journal)	IGME-Sp		https://doi.org/10.1016/j.margeo.2018.12.006
PUBLICATIONS	TECHNICAL REPORT	01.05.2019	GENERAL PUBLIC	>1000 (The EU Blue Economy Report 2019, section 4.3 Marine Minerals, DOI: 10.2771/21854)	IGME-Sp, BGR, IGME-Gr, GSI, NGU, LNEG, SGU, Geoinform, IPMA, IGEO, USGS, Okean Geologia	Javier González	https://op.europa.eu/en/publication-detail/-/publication/676bbd4a-7dd9-11e9-9f05-01aa75ed71a1/language-en/
MEETINGS	Internal project meeting	06.05.2019	SCIENTIFIC COMMUNITY	20 (MINDeSEA meeting, Madrid)	IGME-Sp, BGR, IGME-Gr, GSI, NGU, LNEG, SGU,	MINDeSEA team	-

					Geoinform, IPMA, IGEO, USGS, Okean Geologia		
EVENTS	WORKSHOP	07.05.2019	SCIENTIFIC COMMUNITY	30-50 (First MINDeSEA Workshop, Madrid)	IGME-Sp, BGR, IGME-Gr, GSI, NGU, LNEG, SGU, Geoinform, IPMA, IGEO, USGS, Okean Geologia	MINDeSEA team	https://MINDeSEA Work shop1.pdf
MEETINGS	Meeting with other GeoERA projects	13.05.2019	SCIENTIFIC COMMUNITY	30-50 (GeoERA B2B MREG Meeting in Trondheim)	IGME-Sp, BGR, IGME-Gr, GSI, NGU, LNEG, SGU, Geoinform, IPMA, IGEO, USGS, Okean Geologia	Javier González	-
EVENTS	TRAINING	January-June 2019	SCIENTIFIC COMMUNITY	1 (Internship Master student, Hannover)	BGR	Janine Wegner	-
PUBLICATIONS	PAPERS	June 2019	SCIENTIFIC COMMUNITY	Open Access (MDPI Publication)	IGME-Sp, IGEO, BGR	Marino, E.; González, F.J.; Kuhn, T.; Madureira, P.; Wegorzewski, A.V.; Mirao, J.; Medialdea, T.; Oeser, M.; Miguel, C.; Reyes, J.; Somoza, L.; Lunar, R.	https://doi.org/10.3390/ min9070439
PUBLICATIONS	THESIS	June 2019	SCIENTIFIC COMMUNITY	20-30 (Master Thesis, Univ. Hannover)	BGR	Janine Wegner	-
PUBLICATIONS	TECHNICAL REPORT	28.06.2019	POLICY MAKERS	20-30 (Internal Progress Report on the MINDeSEA Consortium	IGME-Sp, BGR, IGME-Gr, GSI, NGU, LNEG, SGU, Geoinform, IPMA, IGEO, USGS, Okean Geologia	Javier González, MINDeSEA team	-

				Activities January-June 2019)			
MEDIA	ONLINE MEDIA	28.06.2019	GENERAL PUBLIC	Unknown Youtube (MINDeSEA Project CRM in the European minerals and their potential uses in the Industry)	IGME-Sp	Javier González	https://www.youtube.com/watch?v=-RZMEd0Hngk
EVENTS	CONGRESS	18-23 August 2019	SCIENTIFIC COMMUNITY	>2500 (Goldschmidt Conference 2019, Barcelona)	IGME-Sp, BGR, IGME-Gr, GSI, NGU, LNEG, SGU, Geoinform, IPMA, IGEO, USGS, Okean Geologia	MINDeSEA team	https://goldschmidtabstracts.info/2019/1174.pdf
EVENTS	CONGRESS	18-23 August 2019	SCIENTIFIC COMMUNITY	>2500 (Goldschmidt Conference 2019, Barcelona)	IGME-Sp, BGR, IGME-Gr, GSI, NGU, LNEG, SGU, Geoinform, IPMA, IGEO, USGS, Okean Geologia	MINDeSEA team	https://goldschmidtabstracts.info/2019/2153.pdf
PUBLICATIONS	PROJECT SPECIFIC PUBLICATION (please specify: leaflet, poster, catalogue, …)	August 2019	GENERAL PUBLIC	300 (MINDeSEA Newsletter, issue 3)	IGME-Sp, BGR, IGME-Gr, GSI, NGU, LNEG, SGU, Geoinform, IPMA, IGEO, USGS, Okean Geologia	MINDeSEA team	https://geoeramindesea.wixsite.com/mindesea/Newsletter3
PUBLICATIONS	TECHNICAL REPORT	September 2019	SCIENTIFIC COMMUNITY	1000 (INTERRIDGE Community)	IGME-Sp, IGEO, BGR	Egidio Marino	https://www.interridge.org/files/interridge/Report_E_Marino.pdf
EVENTS	CONGRESS	22-25 September 2019	SCIENTIFIC COMMUNITY	300 (GeoMünster 2019)	BGR	Antje Wittenberg, GeoERA RM project leads	http://www.geomuenster2019.de/index.html
MEETINGS	Meeting with other GeoERA projects	05.10.2019	SCIENTIFIC COMMUNITY	20-30 (GeoERA B2B MREG Meeting in Madrid)	IGME-Sp, BGR, IGME-Gr, GSI, NGU, LNEG, SGU, Geoinform, IPMA, IGEO, USGS, Okean Geologia	Javier González	-

MEETINGS	Meeting with international body	8 October 2019	EU INSTITUTION	50-80 (46 EuroGeoSurveys Directors' Workshop, Prague)	IGME-Sp, BGR, IGME-Gr, GSI, NGU, LNEG, SGU, Geoinform, IPMA, IGEO, USGS, Okean Geologia	Antje Wittenberg, MINDeSEA team	-
EVENTS	WORKSHOP	16-18 October 2019	POLICY MAKERS	40-60 (MarSP workshop, marine spatial planning in the Canary Islands, Tenerife and Gran Canaria)	IGME-Sp	Javier González	http://www.marsp.eu/news/18 http://www.marsp.eu/#
MEDIA	RADIO, TV,	October 2019	GENERAL PUBLIC	Unknown (Radio)	IGME-Sp	Javier González	https://geoeramindesea.wixsite.com/mindesea/news
MEDIA	ONLINE MEDIA	November 2019	GENERAL PUBLIC	Unknown Youtube (MarSP Project from the Stakeholders Perspective, Marine spatial planning)	IGME-Sp	Javier González	https://www.youtube.com/watch?v=JRGz_VcHWTY&feature=youtu.be
EVENTS	MEETINGS	5 November 2019	SCIENTIFIC COMMUNITY	400 (PhDay, Madrid Complutense Univ. Faculty members and Geological Sc. students)	IGME-Sp, IGEO, BGR	Egidio Marino	https://edoctorado.ucm.es/3-jornada-phday-complutense https://69ef338c-adbf-4a98-94a6-1e32d03179fa.filesusr.c om/ugd/e60895_d520f221 423b478c9846f887ad142b1b.pdf
MEETINGS	Internal project meeting	26.11.2019	SCIENTIFIC COMMUNITY	15 (MINDeSEA meeting, Trondheim)	IGME-Sp, BGR, IGME-Gr, GSI, NGU, LNEG, SGU,	MINDeSEA team	-

					Geoinform, IPMA, IGEO, USGS, Okean Geologia		
EVENTS	WORKSHOP	27.11.2019	SCIENTIFIC COMMUNITY	30-50 (Second MINDeSEA Workshop, Trondheim)	IGME-Sp, BGR, IGME-Gr, GSI, NGU, LNEG, SGU, Geoinform, IPMA, IGEO, USGS, Okean Geologia	MINDeSEA team	https://MINDeSEA_ Workshop2.pdf
EVENTS	MEETINGS	18-22/11/2019	POLICY MAKERS	>1000 (European Raw Materials Week 2019, Brussels)	IGME-Sp, BGR, IGME-Gr, GSI, NGU, LNEG, SGU, Geoinform, IPMA, IGEO, USGS, Okean Geologia	MINDeSEA team	-
EVENTS	WORKSHOP	22-25 November 2019	SCIENTIFIC COMMUNITY	30-50 (Marine E-Tech workshop, Ubatuba-Brazil)	IGME-Sp, IGEO, USGS	Egidio Marino, MINDeSEA team	https://www.facebook. com/groups/798310387294422/
EVENTS	WORKSHOP	25-29 November 2019	POLICY MAKERS	100-150 (ISA workshop, Hydrothermal mineralization and environmental issues in the Atlantic, Evora-Portugal)	Okean Geologia	Georgy Cherkashov	https://ran-s3.s3.amazon aws.com/isa.org.jm/s3fs-public/files/documents/ datareport-19nov-lowres.pdf https://ran-s3.s3.amazonaws. com/isa.org.jm/s3fs-public/ files/documents/ readraft.pdf
EVENTS	TRAINING	July 2018-November 2019	SCIENTIFIC COMMUNITY	1 (PhD student formation)	IGME-Sp, IGEO	Egidio Marino	-
PUBLICATIONS	PROJECT SPECIFIC PUBLICATION (please specify: leaflet, poster, catalogue, …)	November 2019	GENERAL PUBLIC	>1000 (GeoERA Raw Materials Projects flyer)	IGME-Sp, BGR, IGME-Gr, GSI, NGU, LNEG, SGU, Geoinform, IPMA, IGEO, USGS, Okean Geologia	MINDeSEA team; GeoERA RM project leads	https://geoeramindesea. wixsite.com/mindesea/ promotional-material
EVENTS	MEETINGS	22.11.2019	POLICY MAKERS	>100 (ORAMA final Meeting, Brussels)	IGME-Sp, BGR, IGME-Gr, GSI, NGU, LNEG, SGU, Geoinform, IPMA, IGEO, USGS, Okean Geologia	MINDeSEA team	https://orama-h2020.eu/ event/orama-final-event/

PUBLICATIONS	PROJECT SPECIFIC PUBLICATION (please specify: leaflet, poster, catalogue, …)	25.11.2019	GENERAL PUBLIC	>1000 (GeoERA Raw Materials Special Newsletter)	IGME-Sp, BGR, IGME-Gr, GSI, NGU, LNEG, SGU, Geoinform, IPMA, IGEO, USGS, Okean Geologia	Antje Wittenberg, GeoERA RM project leads	https://geoera.eu/wp-content/uploads/2019/11/Raw-Materials-Week- Special-Newsletter-4.pdf
EVENTS	TRAINING	September-December 2019	SCIENTIFIC COMMUNITY	1 (Internship Master student, Madrid)	IGME-Sp	Iñigo Zalba	-
EVENTS	CONGRESS	06.12.2019	POLICY MAKERS	>2000 (COP 25, International Climate Conference, Madrid)	IGME-Sp	Iker Blasco, MINDeSEA team	https://www.cop25.cl/#/
PUBLICATIONS	THESIS	16.12.2019	SCIENTIFIC COMMUNITY	20-30 (Mater Thesis, Univ. Cadiz)	IGME-Sp, SGU	Iñigo Zalba	-
PUBLICATIONS	TECHNICAL REPORT	28.12.2019	POLICY MAKERS	20-30 (Internal Progress Report on the MINDeSEA Consortium Activities July-December 2019)	IGME-Sp, BGR, IGME-Gr, GSI, NGU, LNEG, SGU, Geoinform, IPMA, IGEO, USGS, Okean Geologia	Javier González, MINDeSEA team	-
MEDIA	ONLINE MEDIA	Summer-Autumn 2019	GENERAL PUBLIC	Unknown (>20 News in media: newspapers)	IGME-Sp	MINDeSEA team	https://geoeramindesea.wixsite.com/mindesea/news