D5-5: Present-day status of regulation, legislation and exploitation of placer deposits

MINDeSEA

Seabed Mineral Deposits in European Seas: Metallogeny and Geological Potential for Strategic and Critical Raw Materials

Deliverable 5.5: WP5 Literature review report on present-day status of regulation, legislation and exploitation of placer deposits, with emphasis on the impact of a pan-European research approach

WP5 leader:
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1. INTRODUCTION

GeoERA is a Co-Fund ERA-NET action under Horizon 2020, towards "Establishing the European Geological Surveys Research Area to deliver a Geological Service for Europe". Its main objective is to contribute to the optimal use and management of the subsurface.

The project MINDeSEA, materialized in the frame of the GeoERA Raw Materials Theme (Grant Agreement Nº 731166, project GeoE.171.001), resulted from the collaboration between eight GeoERA Partners and four Non-funded Organizations at various points of common interest for exploration and investigation on seafloor mineral deposits.

2. PURPOSE

This document is a literature review report on the present-day status of regulation, legislation and exploitation of placer deposits, elaborated in the frame of MINDeSEA Work Package 5 (WP5) "Marine Placer Deposits", led by the Hellenic Survey of Geology & Mineral Exploration (HSGME). The main aspects of this work are summarized as follows:

1. Identification of stakeholders
2. Literature review of present-day status of regulation, legislation and exploitation of placer deposits in EU level and member countries
3. Future directions

The purpose of this work is to provide a comprehensive inventory of the aforementioned information to serve as a working basis for all parties involved in marine placers research, exploration and exploitation and allow sustainable use and management of the subsurface.

The geographical scope of the project, with a pan-European ambition, focuses on delivering comprehensive information for the Marine Placer Deposits within European maritime territory: Mediterranean Sea, Celtic Seas, North Sea, Baltic Sea, Macaronesia, Bay of Biscay and the Iberian coasts, North Atlantic and Arctic, Norwegian Sea, Black Sea (Figure 1).

![Figure 1: Delimitation of the European marine regions and subregions:](http://marine.discomap.eea.europa.eu/arcgis/rest/services/Marine/Marine_regions_subregions_v1/MapServer)
3. MARINE PLACER DEPOSITS

Marine placer deposits have received much attention during marine exploration. They comprise detrital heavy metallic minerals and gemstones, eroded from, usually igneous, source rocks on land and transported to sea, mostly by rivers. Thereby placer deposits are concentrated by water motions (waves, tides, currents). The most important of these minerals, from an economical aspect, are: cassiterite (tin), ilmenite and rutile (titanium), zircon (zirconium), chromite (chromium), monazite (thorium), magnetite (iron), gold; the principle gemstone is diamond (Harben & Bates 1990). According to Daesslé and Fischer (2013) about 75% of the world’s tin, 11% of gold, and 13% of platinum are extracted from placers (Baker et al. 2014).

Marine placer occurrences can be classified taking into account various factors (Emory-Moore & Solomon 1989 and references therein):

A) **Source**: marine placers are categorized as primary when derived from post-glacial weathering of bedrock or secondary when they are the product of reworking of overburden sediment.

B) **Environment**: shallow (beach/near-shore) marine placers are located in the area between the coast and the breaker zone while offshore occurrences are found in the area between the breaker zone and the end of the continental shelf.

C) **Formation**: allochthonous placers can occur hundreds of km from source and the corresponding minerals include zircon, monazite ilmenite, rutile, magnetite, chromite, fine-grained gold and platinum; autochthonous deposits form close to source, in areas where the rate of marine erosion exceeds the rate of net sediment accumulation, and include cassiterite and coarse-grained gold and platinum (Kartashov 1971).

D) **Physical properties**: based on their specific gravity, marine placers are divided in heavy-heavy minerals (>6.8), light-heavy minerals (4.2 to 6.8) and gems (2.9 to 4.1) (Emery & Noaks 1968).

Figure 2: Marine placer deposits recorded by the MINDeSEA database as of July 2021
Moreover, we distinguish the relict/fossil/submerged placer deposits, formed in the geologic past and changed from a sub-aerial to a marine environment due to various reasons (climate change, tectonic movements etc). These are classified based on depositional environment, i.e. fluvial, eolian, glaciogenic, beach-nearshore deposits.

The prerequisites for the formation of marine placers are: (a) a primary mineral source (usually crystalline rocks), (b) a suitable weathering environment and (c) means of transportation (e.g. running water, wind). Given that all the above conditions are satisfied, the placer-forming minerals are derived from source rocks, transported and deposited to areas of concentration. Thus, the process of marine placers’ formation is controlled by three major factors (Davis and Clifton 1987):

- Sediment supply: can be materialized by means of modern fluvial discharge and coastal (bedrock/unconsolidated bluffs) or submarine erosion.
- Sea-level fluctuations: eustatic and isostatic variations influence the sediment supply (type and volume) and thus control the location and extent of marine placer occurrences.
- Marine energy: the hydraulic conditions (e.g. waves, currents) greatly affect the sediment transport reworking and deposition and regulate the concentration of marine placers.

The potential for the occurrence of placer deposits within the sedimentary accumulations of the continental shelf is significant. However, current knowledge is sparse, mostly limited to seafloor deposits on shallow waters which are more accessible for exploration (Figure 2). Thus, the need for an integrated research approach on the European seas is imminent, given the present-day RM demands and exploitation technological advances, towards sustainable use and management of the subsurface. In addition to the coastal zone, the whole continental margin must be considered to examine whether Pleistocene sea level fluctuations could have concentrated heavy minerals in deeper waters.

4. STAKEHOLDER IDENTIFICATION

4.1 General

Over the years multiple definitions for stakeholders have been proposed; for the purpose of the present report the definition of Grimble and Wellard (1997) is adopted, which defines stakeholders as:

“… any group of people, organized or unorganized, who share a common interest or stake in a particular issue or system ...who can be at any level or position in society, from global, national and regional concerns down to the level of household or intra-household, and be groups of any size or aggregation”.

The role of a stakeholder may be positive, being an effective part of the effort to locate, retrieve and use marine raw material resources, or negative, negatively affecting the aforementioned task. It is of vital importance the identification of stakeholders at the early stages of marine raw materials’ exploration and exploitation, for their optimum management and the achievement of stakeholder engagement by all available means (e.g. education, involvement in planning etc).

Maritime Spatial Planning (MSP) is often considered as a tool to resolve conflict between stakeholders, integrate multiple sectors, and rationalise the multifaceted complexities of marine management (Douvere et al. 2007, Ehler and Dourvere 2009). To achieve this goal, with the increase of offshore raw materials exploration and exploitation, it is of vital importance the thorough identification and subsequent analysis of all involved stakeholders.

Several global initiatives, projects and organizations have been dealing with stakeholder analysis in raw materials exploration (e.g. MICA 2016, FORAM 2018); however, a thorough approach focused on the marine sector is lacking. The scope of this report is to identify stakeholders involved in marine raw materials exploration and exploitation, with focus on marine placer deposits, and, thus, provide the basis for a future thorough stakeholder analysis at a European and national level.

4.2 Stakeholder identification principles

To identify stakeholders of marine placer deposits exploration and exploitation the general principles from MICA stakeholder analysis (MICA 2016) have been adopted.

This work has been supported by the European Union’s Horizon 2020 research and innovation programme, GeoERA (Grant Agreement Nº 731166, project GeoE.171.001).
To identify stakeholders the following general groups of involved parties are examined:

![Stakeholder Types Diagram](image)

Mitchell et al. (1997) point out the following main stakeholder attributes:

- **Power**: A stakeholder may have (actual or potential) power to the extent it can impose its will in a relationship, e.g. by access to coercive, utilitarian or normative means.
- **Legitimacy**: A stakeholder may have legitimacy by pursuit of a desirable social stake that is negotiated at different levels of social organization and broadly shared.
- **Urgency**: A stakeholder may be attributed urgency in case there is both time sensitivity and claims or relationships that are perceived as highly important.

Depending on whether one, two or three of these attributes are present, Mitchell et al. (1997) distinguish seven types of stakeholders (Figure 3). Stakeholders are not necessarily conscious of possessing these attributes and may or may not choose to act on their claims or influence.

**Figure 3: Stakeholder types (reproduced from Mitchell et al. 1997)**

Thus, based on the above, seven (7) distinct categories are defined and all stakeholders (users, governance, influencers, providers) are classified amongst them.

Additionally, stakeholders are characterized of their influence and importance levels and classified in an importance/influence Matrix.

### 4.3 Political governance stakeholders

Political governance stakeholders include all official governance bodies at a world, EU and national level, involved in the establishment of policies, legislation, exploration and exploitation of marine placer deposits. In general, their role is positive towards marine placer deposits exploration and exploitation, often ranking high in the influence/importance matrix.

Political governance stakeholders are listed below, in alphabetical order:
### 4.4 Scientific community stakeholders

Scientific community stakeholders include all scientific organizations, institutions, researchers at a world, EU and national level, involved in the exploration and exploitation of marine placer deposits. In general, their role is positive towards marine placer deposits exploration and exploitation, often ranking high in importance and medium to high in influence.

Scientific community stakeholders are listed below, in alphabetical order:
### STAKEHOLDER DESCRIPTION | EXAMPLES
---|---
**EU geological surveys** e.g. EuroGeoSurveys (EGS) and relevant expert groups [Marine Geology Expert Group (MGE), Mineral Resources Expert Group (MREG) etc]  
**EU research bodies** e.g. European Institute of Innovation and Technology (EIT), European Raw Materials Alliance (ERMA)  
**EU scientific initiatives** e.g. European Network of Scientists for Social and Environmental Responsibility (ENSSER)  
**Geological surveys worldwide** e.g. United States Geological Survey (USGS)  
**Individual researchers** e.g. marine geologists, sedimentologists, geochemists  
**International professional organizations** e.g. European Federation of Geologists (EFG), European Association of Geoscientists & Engineers (EAGE)  
**International research organizations** e.g. International Association of Palaeontologists (IAS), International Marine Minerals Society (IMMS)  
**International scientific bodies** e.g. International Union of Geological Sciences (IUGS)  
**Member States’ geological surveys** e.g. Instituto Geológico y Minero de España (Spain), Bundesanstalt für Geowissenschaften und Rohstoffe (Germany)  
**National professional organizations** e.g. Geotechnical Chamber of Greece (GEOTEE), Spanish Official Professional Association of Geologists (ICOG)  
**National public research institutes**  
**Non-government research institutes**  
**Professional education institutions** Universities, colleges and other professional education institutions  
**Research projects** e.g. Seabed Mineral Deposits in European Seas: Metallogeny and Geological Potential for Strategic and Critical Raw Materials (MINDeSEA)  
**Scientific data management infrastructures** e.g. European Geological Data Infrastructure (EGDI), pan-European Infrastructure for Ocean & Marine Data Management (SeaDataNet)  
**Third party research bodies**

### 4.5 Society stakeholders

Society stakeholders include all organizations, groups and individuals at a world, EU and national level, involved in and affected by (either directly or indirectly) the exploration and exploitation of marine placer deposits. Their role can be either positive or negative (even within the same stakeholder group) towards marine placer deposits exploration and exploitation, usually ranking medium to high in importance and low to medium in influence.

Scientific community stakeholders are listed below, in alphabetical order:

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<tr>
<th>STAKEHOLDER DESCRIPTION</th>
<th>EXAMPLES</th>
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<tr>
<td>Education</td>
<td>e.g. primary and high school teachers/professors and pupils/students</td>
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<td>Foundations</td>
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4.6 Economic system stakeholders

Economic system stakeholders include all industry, organizations, groups and individuals at a world, EU and national level, involved in and affected by (either directly or indirectly) the exploration and exploitation of marine placer deposits. Their role is usually positive or negative towards marine placer deposits exploration and exploitation, usually ranking medium to high in importance and medium to high in influence.

Scientific community stakeholders are listed below, in alphabetical order:

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<tr>
<th>STAKEHOLDER DESCRIPTION</th>
<th>EXAMPLES</th>
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<tbody>
<tr>
<td>Equipment manufacturing industry</td>
<td>e.g. marine research equipment</td>
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<tr>
<td>Exploration support</td>
<td>e.g. project management agencies, consulting</td>
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<tr>
<td>Extraction equipment providers</td>
<td>e.g. dredging equipment</td>
</tr>
<tr>
<td>International industry associations</td>
<td>e.g. International Association of Dredging Companies (IADC)</td>
</tr>
<tr>
<td>Investors</td>
<td>e.g. private companies funding marine placers exploration</td>
</tr>
<tr>
<td>Marine placer deposits commerce</td>
<td>e.g. tin, titanium</td>
</tr>
<tr>
<td>Other infrastructure industry</td>
<td>e.g. software, digital &amp; information services</td>
</tr>
<tr>
<td>Other international maritime associations</td>
<td>e.g. International Association of Marine Consultants and Surveyors (IAMCS)</td>
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<tr>
<td>Physical operations support</td>
<td></td>
</tr>
<tr>
<td>Placers mining and extraction industry</td>
<td></td>
</tr>
<tr>
<td>Production industry</td>
<td>e.g. industry using tin, titanium etc.</td>
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<tr>
<td>Project management agencies</td>
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5. DEFINITIONS

To assess the present-day status of marine placer deposits regulation, legislation and exploitation in an pan-European level common terminology has to be used.


- **Regulation**: is a binding legislative act, applied in its entirety across EU (e.g. Exploration Regulations by the International Seabed Authority; Figure 4a).
• **Directive:** is a legislative act setting out a goal that all EU countries must achieve. However, it is up to the individual countries to devise their own laws on how to reach these goals (e.g. Marine Strategy Framework Directive; Figure 4b).

• **Decision:** is binding on those to whom it is addressed (e.g. an EU country or an individual company) and is directly applicable (e.g. Commission Decision on criteria and methodological standards on good environmental status of marine waters; addressed to “the Member States”; Figure 4c).

• **Recommendation:** is not binding. A recommendation allows the institutions, member states, authorities to make their views known and to suggest a line of action without imposing any legal obligation on those to whom it is addressed (e.g. The European Marine Board (EMB) Policy Brief No6 “Navigating the Future V: Recommendations for the Ocean Decade”; Figure 4d).

• **Opinion:** is not binding. It is an instrument allowing the institutions to make a statement without imposing any legal obligation on those to whom it is addressed. It can be issued by the main EU institutions (Commission, Council, Parliament), the Committee of the Regions and the European Economic and Social Committee. While laws are being made, the committees give opinions from their specific regional or economic and social viewpoint (e.g. the Opinion of the European Committee of the Regions on “Local and regional authorities protecting the marine environment”; Figure 4e).

Figure 5: Pan-European seas with delimitations of EEZ (yellow line) and ECS (pink line) for each country.

Maritime territorial areas of EU Member States, as well as worldwide, are subjected to the Law of the Sea (UNCLOS: United Nations Convention of the Law of the Sea) and further defined by international conventions.

• **Exclusive Economic Zone (EEZ):** as defined by the 1982 United Nations Convention on the Law of the Sea, is an area of the sea in which a sovereign state has special rights regarding the exploration and use of marine resources. It stretches from the baseline out to 200 nautical miles from the coast of the state in question (Figure 5). It is also referred to as a maritime continental margin and, in colloquial usage, may include the continental shelf.

• **Territorial Sea:** as defined by the 1982 United Nations Convention on the Law of the Sea, is a belt of coastal waters extending at most 12 nautical miles from the baseline (usually the mean low-water mark) of a coastal state.

• **Extended Continental Shelf (ECS):** according to UNCLOS, which came into force in 1994, the continental shelf that borders a country’s shoreline is considered to be a continuation of the country’s land territory and coastal countries have exclusive rights to resources located within the continental shelf.
6. PRESENT-DAY STATUS

MINDeSEA aims to provide a solid and common understanding of the current status of knowledge on marine minerals in European seas. These data will provide the framework to support a subsequent EU’s position in the global marine minerals context, contributing to international agreements, and also to assess impacts, risks and opportunities. The MINDeSEA project intends to address a wide range of stakeholders, comprising not only mineral-policy makers, geological surveys or marine mining and technological industries, but also other business, research institutes as well as the Society.

The present-day status analysis of knowledge on marine minerals in European seas will increase: the knowledge and management capacities on innovation for exploration and exploitation of strategic and CRM in the marine mineral deposits; the good practice policies and practical experiences for policy implementation and transferability in the European and global context; the promotion of guidance, networking and exchange of knowledge and training in our marine professional environment. All of them will produce a wide-spread dissemination and promotion of the latest scientific results on minerals policy issues and industrial innovation.

The scope of this analysis is twofold: (a) document the current situation, and (b) demonstrate the efficiency of a pan-European research approach.

6.1 Regulation – Legislation

The exploration and exploitation of marine resources in EU is subjected to international, European and national regulations and legislation, usually applicable to a broad range of marine raw materials, and consequently marine placer deposits. Thorough documentation of the legal framework applied for the Raw Materials’ exploration and exploitation (regarding both on-shore and off-shore areas) was presented by the European Commission’s Raw Materials Information System (RMIS), developed by the Directorate-General (DG) Joint Research Centre (JRC) in cooperation with the DG for Internal Market, Industry, Entrepreneurship and SMEs (GROWTH). Based on that content – available online through EU Science Hub at https://rmis.jrc.ec.europa.eu/ – the main regulatory and legislative framework for marine raw materials, and especially placer deposits where distinguished, is presented.

6.1.1 International Conventions

The International Conventions define worldwide or transboundary (e.g. for the Atlantic Ocean) regulations, dealing with environmental protection, nature conservation, health and safety issues, and the sustainable use of natural resources in international waters. The major conventions, applicable to all or some EU Member States are listed below, in chronological order (date of entry into force):

- **Convention on the Prevention of Marine Pollution by Dumping Wastes and Other Matter**: the “London Convention” for short, is one of the first global conventions to protect the marine environment from human activities and has been in force since 1975. Its objective is to promote the effective control of all sources of marine pollution and to take all practicable steps to prevent pollution of the sea by dumping of wastes and other matter. Currently, 87 States are Parties to this Convention.
  
  **Entry into force**: 30.08.1975

- **Convention for the Protection of the Mediterranean Sea Against Pollution**: the main objectives of the “Barcelona Convention” are: (a) to assess and control marine pollution; (b) to ensure sustainable management of natural marine and coastal resources; (c) to integrate the environment in social and economic development; (d) to protect the marine environment and coastal zones through prevention and reduction of pollution, and as far as possible, elimination of pollution, whether land or sea-based; (e) to protect the natural and cultural heritage; (f) to strengthen solidarity among Mediterranean coastal States; (g) to contribute to improvement of the quality of life. The Barcelona Convention has given rise to seven (7) protocols, of which most important for offshore raw materials exploration and exploitation is the *Offshore Protocol* (pollution from exploration and exploitation).
  
  **Issued**: 16.02.1976, Barcelona
• **Convention on long-range transboundary air pollution**: aimed to deal with air pollution on a broad regional basis. The Convention entered into force in 1983, laying down the general principles of international cooperation for air pollution abatement and setting up an institutional framework which has since brought together research and policy. Over the years, the number of substances covered by the Convention and its protocols has been gradually extended, notably to ground-level ozone, persistent organic pollutants, heavy metals and particulate matter.

  **Issued:** 13.11.1979, Geneva  
  **Entry into force:** 16.03.1983  

• **Control of Transboundary Movement of Hazardous Wastes and their Disposal**: the main objective of the Basel Convention is to protect human health and the environment against the adverse effects of hazardous wastes. Its scope of application covers a wide range of wastes defined as “hazardous wastes” based on their origin and/or composition and their characteristics, as well as two types of wastes defined as “other wastes” - household waste and incinerator ash.

  **Issued:** 22.03.1989, Basel  
  **Entry into force:** 05.05.1992  

• **Convention on biological diversity**: the main objectives of the Rio de Janeiro Convention are the conservation of biological diversity, the sustainable use of their components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.

  **Issued:** 05.06.1992, Rio de Janeiro  
  **Entry into force:** 29.12.1993  
  **Reference:** [https://www.cbd.int/](https://www.cbd.int/)

• **Convention on the Law of the Sea on the Protection of the Black Sea Against Pollution**: the main objectives of the “Bucharest Convention” is to substantiate the general obligation of the Contracting Parties to prevent, reduce and control the pollution in the Black Sea in order to protect and preserve the marine environment and to provide legal framework for co-operation and concerted actions to fulfill this obligation. The Bucharest Convention has given rise to three (3) specific protocols and its implementation is managed by the Commission for the Protection of the Black Sea Against Pollution.

  **Issued:** 21.04.1992, Bucharest  
  **Entry into force:** 21.04.1994  


  **Issued:** 10.12.1982, Montego Bay  
  **Entry into force:** 16.11.1994  
  **Reference:** [https://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf](https://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf)

  * As of June 2016, 167 countries and the European Union are parties.

• **Convention on the protection and use of transboundary watercourses and international lakes (UNECE Water Convention)**: is a legally binding instrument promoting the sustainable management of shared water resources, the implementation of the Sustainable Development Goals, the prevention of conflicts, and the promotion of peace and regional integration.

  **Issued:** 17.03.1992, Helsinki  
  **Entry into force:** 06.10.1996  
  **Reference:** [https://unece.org/environment-policy/water](https://unece.org/environment-policy/water)
• **Convention on environmental impact assessment in a transboundary context**: sets out the obligations of Parties to assess the environmental impact of certain activities at an early stage of planning. It also lays down the general obligation of States to notify and consult each other on all major projects under consideration that are likely to have a significant adverse environmental impact across boundaries.
  
  **Issued**: 25.02.1991, Espoo
  **Entry into force**: 10.09.1997

• **Convention for the protection of the marine environment of the north-east Atlantic (OSPAR Convention)**: the main objective of the Paris Convention is to promote cooperation of the Contracting Parties to cover all human activities that might adversely affect the marine environment of the North-East Atlantic*. It includes a series of Annexes dealing with the following specific areas: (I) Prevention and elimination of pollution from land-based sources; (II) Prevention and elimination of pollution by dumping or incineration; (III) Prevention and elimination of pollution from offshore sources; (IV) Assessment of the quality of the marine environment; (V) On the protection and conservation of the ecosystems and biological diversity of the maritime area.

  **Issued**: 22.09.1992, Paris
  **Entry into force**: 25.03.1998
  **Reference**: [https://www.ospar.org/convention](https://www.ospar.org/convention)

  * In 2007 the OSPAR Commission adopted amendments to Annexes II and III to the Convention to allow the storage of carbon dioxide in geological formations under the seabed.

• **Convention on the Protection of the Marine Environment of the Baltic Sea Area (HELCOM)**: was originally signed in 1974 by all Baltic Sea coastal countries*, seeking to address the increasing environmental challenges from industrialisation and other human activities and that were having a severe impact on the marine environment. The Helsinki Convention includes the protection of the Baltic Sea from all sources of pollution from land, air and sea. It also commits the signatories to take measures on conserving habitats and biological diversity and for the sustainable use of marine resources.

  **Issued**: 09.04.1992, Helsinki
  **Entry into force**: 17.01.2000
  **Reference**: [https://helcom.fi/](https://helcom.fi/)

  * The Helsinki Convention was updated in 1992 to take into account the geopolitical changes and emerging environmental challenges in the region, and was extended to ten Contracting Parties.

• **Convention on the Transboundary Effects of Industrial Accidents**: The Convention aims at protecting human beings and the environment against industrial accidents by preventing such accidents as far as possible, by reducing their frequency and severity and by mitigating their effects. It promotes active international cooperation between the contracting Parties, before, during and after an industrial accident.

  **Issued**: 17.03.1997, Helsinki
  **Entry into force**: 19.04.2000
  **Reference**: [https://unece.org/more-1](https://unece.org/more-1)

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• Convention on access to information, public participation in decision making and access to justice in environmental matters: The Aarhus Convention* establishes a number of rights of the public (individuals and their associations) with regard to the environment. The Parties to the Convention are required to make the necessary provisions so that public authorities (at national, regional or local level) will contribute to these rights to become effective.

Issued: 25.06.1998, Aarhus
Entry into force: 30.10.2001
Reference: https://ec.europa.eu/environment/aarhus/

* On 14 October 2020, the European Commission adopted a legislative proposal amending the Aarhus Regulation No. 1367/2006 to allow for better public scrutiny of EU acts affecting the environment. The legislative proposal is now with the European Parliament and with the Council.

• European Landscape Convention: the main objective of the Florence Convention is promote the protection, management and planning of the landscapes and organise international co-operation on landscape issues.

Issued: 20.10.2000, Florence
Entry into force: 01.03.2004
Reference: https://www.coe.int/en/web/landscape

• Civil Liability for Damage Resulting from Activities Dangerous to the Environment: the main objective of the Lugano Convention is to ensure adequate compensation for damage resulting from activities dangerous to the environment and provide for means of prevention and reinstatement.

Issued: 21.06.1993, Lugano
Entry into force: December 2009
Reference: https://rm.coe.int/168007c079

• Convention on the Law of the Non-Navigational Uses of International Watercourses (UN Water Convention): is an international treaty pertaining to the uses and conservation of all waters that cross international boundaries, including both surface and groundwater.

Issued: 21.05.1997, New York
Entry into force: 17.08.2014

6.1.2 EU Legislation

The EU treaties (primary law) are binding agreements between EU Member States. They set Community objectives, rules for EU institutions, procedures for decision-making and the relationship between the EU and its Member States. Every action taken by the EU is founded on the Treaties. However, non-energy mineral resources have not been the focus of EU policies and consequently not part of the legal framework of the EU for a long time. This, an integrated European strategy on the secure supply of raw materials, including minerals, had not been established before the Raw Materials Initiative was published in 2008 (European Commission 2008).

• Treaty on the Functioning of the European Union (TFEU): is one of two treaties forming the constitutional basis of the European Union (EU). It was signed on March 25th 1957 in Rome, entered into force on January 1st 1958.

• Treaty on the European Union (TEU): its purpose was to prepare for European Monetary Union and introduce elements of a political union. It was signed on February 7th 1992 in Maastricht, entered into force on November 1st 1993.

• Treaty of Lisbon: its purpose was to make the EU more democratic, more efficient and better able to address global problems, such as climate change, with one voice. It was signed on December 13th 2007 in Lisbon, entered into force on December 1st 2009.

EU Community secondary law, coming from the principles and objectives of the treaties, includes regulations, directives, decisions, recommendations and opinions. The main laws, governing marine raw materials, and especially placer deposits where distinguished, are quoted below:

Natural conservation (biodiversity) issues


Environment issues


Extractive waste issues


Health and safety issues


https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32004L0037


https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32015L1535

Industrial risk issues


https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32014D0895

Information management and transparency issues

Directive 95/46/EC, of the European Parliament and of the Council of 24 October 1995, on the protection of individuals with regard to the processing of personal data and on the free movement of such data.

Regulation (EC) No 45/2001, of the European Parliament and of the Council of 18 December 2000, on the protection of individuals with regard to the processing of personal data by the Community institutions and bodies and on the free movement of such data.
https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32001R0045&qid=1488891016020

This work has been supported by the European Union’s Horizon 2020 research and innovation programme, GeoERA (Grant Agreement Nº 731166, project GeoE.171.001).


  https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A5202016SC0273


• Regulation (EU) 2016/679, of the European Parliament and of the Council of 27 April 2016, on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) (Text with EEA relevance).

• Directive (EU) 2016/943, of the European Parliament and of the Council of 8 June 2016, on the protection of undisclosed know-how and business information (trade secrets) against their unlawful acquisition, use and disclosure (Text with EEA relevance).
  https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32016L0943

  https://eur-lex.europa.eu/eli/dec/2017/46/oj


Internal market issues

  https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32005L0036


Mineral issues


Noise issues


Standards issues


Statistics issues


This work has been supported by the European Union’s Horizon 2020 research and innovation programme, GeoERA (Grant Agreement Nº 731166, project GeoE.171.001).


Waste issues


Water issues


This work has been supported by the European Union’s Horizon 2020 research and innovation programme, GeoERA (Grant Agreement Nº 731166, project GeoE.171.001).
EU policy on raw materials, is implemented by means of various initiatives and detailed implementation plans:

- **Raw Materials Initiative (RMI):** is the EU’s raw materials strategic policy framework, adopted in 2008. This policy strategy is based on sustainable sourcing of raw materials from global markets, sustainable domestic raw materials production and resource efficiency and supply of secondary raw materials (SRM).

- **European Innovation Partnership on Raw Materials (EIP-RM):** is the strategic implementation plan of the RMI, launched in 2012. It comprises a stakeholder platform, which reinforces the RMI by translating the strategic policy framework into concrete targets, priorities and actions.

- **Trade policy and raw materials:** EU Trade policy as laid down by DG TRADE is actively committed to ensuring that the international raw materials markets operate in a free and transparent way.

- **Development policy and raw materials:** EU development policy promotes sustainable access to raw materials.

- **Environmental policy and raw materials:** Several EU environmental policies cover different aspects of raw materials. The environmental impacts of the raw materials sector are linked to natural resources, such as air, land, soil and water, and, furthermore, to more complex issues such as environmental assessment, nature and biodiversity, sustainable development and waste.

- **Research policy and raw materials:** EU research policy (Horizon 2020 and now Horizon Europe) aims to tap the full potential of primary and secondary raw materials and boost the innovation capacity of the EU raw materials sector in response to a number of challenges along the entire raw materials value chain.

- **Sustainable development policy and raw materials:** has since long been at the heart of the European project, and EU treaties give recognition to its economic, social and environmental dimensions, which should be tackled together.

6.1.3 **Member States Legislation**

The legislation and regulatory framework of the Member States concerning exploration and exploitation of raw materials, is presented in detail through the Raw Materials Information System (https://rmis.jrc.ec.europa.eu/). The information incorporate the “Study on the Legal framework for mineral extraction and permitting procedures for exploration and exploitation in the EU” (abbreviated as MINLEX) which ran from December 2015 until May 2017 (EC 2017), including detailed country reports, which can be retrieved from the RMIS.

6.2 **Exploration – Exploitation**

Marine placers are mined over the continental margin in various depths. The main materials extracted from placer deposits of the seabed, along with their potential uses are summarized in the United Nations report for Marine Mineral resources (2004).

<table>
<thead>
<tr>
<th>Placer Minerals</th>
<th>Mined Locations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Barium</strong> (in minerals barite</td>
<td>A soft silvery-white heavy metal used for drilling fluids in oil wells, paints, fireworks, glass and</td>
</tr>
<tr>
<td>and witherite)</td>
<td>rubber making, and as an x-ray tracer in medical applications</td>
</tr>
<tr>
<td><strong>Chromium</strong> (in mineral chromite)</td>
<td>A lustrous, hard, bluish-gray metal used to make stainless steel; can be polished to a mirror-like</td>
</tr>
<tr>
<td></td>
<td>finish and used as a decorative and protective plating; hardens steel and may be used in alloys;</td>
</tr>
<tr>
<td></td>
<td>also used as a yellow coloring agent in the textile industry, and in tanning leather</td>
</tr>
<tr>
<td><strong>Diamond</strong> (as mineral diamond)</td>
<td>Composed of carbon transformed into the hardest of all minerals used for jewelry and industrial</td>
</tr>
<tr>
<td></td>
<td>cutting applications</td>
</tr>
<tr>
<td><strong>Gold</strong> (as microscopic grains</td>
<td>A soft, shiny, malleable, ductile, non-corrosive metal used for currency, jewelry, dental work,</td>
</tr>
<tr>
<td>and rocks)</td>
<td>electrical/electronic components, photography, heat shields, and pharmaceuticals</td>
</tr>
</tbody>
</table>

This work has been supported by the European Union's Horizon 2020 research and innovation programme, GeoERA (Grant Agreement Nº 731166, project GeoE.171.001).
The potential for the occurrence of placer deposits on and within the sedimentary accumulations of entire continental margins (continental shelf, slope and rise) associated with land sources of minerals is great. However, current knowledge of the occurrence is limited by the extent of exploration carried out up to the present time, which has only located the most accessible deposits on or near the seafloor of small areas of inner portions of the continental shelves that have been systematically explored. The sediment column of the entire continental margin has potential for the occurrence of such deposits, but the deposits most accessible for exploration and exploitation under current conditions lie on the seafloor in shallow water (UN-ISA 2004).

Marine placer deposits are mined worldwide, over the continental margin, with the main exploitation areas located offshore Australia, Africa and SE Asia (Table 2):

Table 2: Principle marine placer mining activities (from Murton 2000)

<table>
<thead>
<tr>
<th>Placer Minerals</th>
<th>Mined Locations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rutile and ilmenite</td>
<td>SE and SE Australia, eastern South Africa, South India, Mozambique, Senegal, Brazil, Florida</td>
</tr>
<tr>
<td>Ti-rich magnetite</td>
<td>North Island, New Zealand, Java, Indonesia, Luzon, Philippines, Hokkaido, Japan</td>
</tr>
<tr>
<td>Tin</td>
<td>Indonesian Sunda shelf, extending from the islands of Bangka, Belitung, and Kundur Malaysia Thailand</td>
</tr>
<tr>
<td>Diamonds</td>
<td>West Coast, South Africa Namibia Northern Australia</td>
</tr>
</tbody>
</table>
A thorough review of worldwide and over the years’ marine placers mining is presented in the 2004 United Nations publication, however the presentation of these data is out of the scope of the current report.

In the frame of GeoERA MINDeSEA project, building upon previous mineral resources databases (e.g. EMODnet WP7-Minerals and MARMIN), an updated – and with detailed attributes – database was compiled, listing occurrences of marine placer deposits in the European seas.

**Table 3: Marine placer occurrences in the European Seas (MINDeSEA, July 2021)**

<table>
<thead>
<tr>
<th>ID</th>
<th>LONGITUDE</th>
<th>LATITUDE</th>
<th>CODE</th>
<th>GEO_AREA</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>21.723726</td>
<td>57.591732</td>
<td>LVA</td>
<td>Baltic Sea</td>
<td>not operating</td>
</tr>
<tr>
<td>2</td>
<td>22.053935</td>
<td>57.637258</td>
<td>LVA</td>
<td>Gulf of Riga</td>
<td>not operating</td>
</tr>
<tr>
<td>3</td>
<td>22.277343</td>
<td>57.751483</td>
<td>LVA</td>
<td>Gulf of Riga</td>
<td>not operating</td>
</tr>
<tr>
<td>4</td>
<td>21.046862</td>
<td>56.742398</td>
<td>LVA</td>
<td>Baltic Sea</td>
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</tr>
<tr>
<td>5</td>
<td>21.412286</td>
<td>57.256266</td>
<td>LVA</td>
<td>Baltic Sea</td>
<td>not operating</td>
</tr>
<tr>
<td>6</td>
<td>20.977501</td>
<td>56.316086</td>
<td>LVA</td>
<td>Baltic Sea</td>
<td>not operating</td>
</tr>
<tr>
<td>7</td>
<td>14.602395</td>
<td>54.345561</td>
<td>POL</td>
<td>Baltic Sea</td>
<td>not operating</td>
</tr>
<tr>
<td>8</td>
<td>14.674810</td>
<td>54.322292</td>
<td>POL</td>
<td>Baltic Sea</td>
<td>not operating</td>
</tr>
<tr>
<td>9</td>
<td>-6.506717</td>
<td>36.736918</td>
<td>ESP</td>
<td>Bay of Biscay</td>
<td>not operating</td>
</tr>
<tr>
<td>10</td>
<td>-1.948389</td>
<td>36.858114</td>
<td>ESP</td>
<td>Mediterranean Sea – W. Basin</td>
<td>not operating</td>
</tr>
<tr>
<td>11</td>
<td>-8.771724</td>
<td>42.242889</td>
<td>ESP</td>
<td>Bay of Biscay</td>
<td>not operating</td>
</tr>
<tr>
<td>12</td>
<td>0.839937</td>
<td>40.654122</td>
<td>ESP</td>
<td>Mediterranean Sea – W. Basin</td>
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</tr>
<tr>
<td>13</td>
<td>3.209094</td>
<td>42.013990</td>
<td>ESP</td>
<td>Mediterranean Sea – W. Basin</td>
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</tr>
<tr>
<td>14</td>
<td>3.141903</td>
<td>42.196895</td>
<td>ESP</td>
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</tr>
<tr>
<td>15</td>
<td>-1.720988</td>
<td>37.295914</td>
<td>ESP</td>
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<tr>
<td>16</td>
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<td>ESP</td>
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<tr>
<td>17</td>
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</tr>
<tr>
<td>18</td>
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<td>ESP</td>
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</tr>
<tr>
<td>19</td>
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</tr>
<tr>
<td>20</td>
<td>-0.848200</td>
<td>37.581800</td>
<td>ESP</td>
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</tr>
<tr>
<td>21</td>
<td>-2.490000</td>
<td>47.480000</td>
<td>FRA</td>
<td>Bay of Biscay</td>
<td>not operating</td>
</tr>
<tr>
<td>22</td>
<td>-3.530000</td>
<td>47.750000</td>
<td>FRA</td>
<td>Bay of Biscay</td>
<td>not operating</td>
</tr>
<tr>
<td>23</td>
<td>4.810000</td>
<td>48.450000</td>
<td>FRA</td>
<td>Bay of Biscay</td>
<td>not operating</td>
</tr>
<tr>
<td>24</td>
<td>-2.820000</td>
<td>48.650000</td>
<td>FRA</td>
<td>Bay of Biscay</td>
<td>not operating</td>
</tr>
<tr>
<td>25</td>
<td>-2.530000</td>
<td>47.360000</td>
<td>FRA</td>
<td>Bay of Biscay</td>
<td>not operating</td>
</tr>
<tr>
<td>26</td>
<td>-4.053100</td>
<td>52.716100</td>
<td>GBR</td>
<td>Irish Sea &amp; St. George's Channel</td>
<td>not operating</td>
</tr>
<tr>
<td>27</td>
<td>-6.330400</td>
<td>56.941000</td>
<td>GBR</td>
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<td>not operating</td>
</tr>
<tr>
<td>28</td>
<td>-1.841500</td>
<td>57.622300</td>
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<td>not operating</td>
</tr>
<tr>
<td>29</td>
<td>-3.651300</td>
<td>58.113700</td>
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<td>North Sea</td>
<td>not operating</td>
</tr>
<tr>
<td>30</td>
<td>-6.071200</td>
<td>56.448500</td>
<td>GBR</td>
<td>Inner Sea off the West Coast of Scotland</td>
<td>not operating</td>
</tr>
</tbody>
</table>
### Present-day status of regulation, legislation and exploitation of placer deposits

<table>
<thead>
<tr>
<th></th>
<th>Latitude</th>
<th>Longitude</th>
<th>Country</th>
<th>Area</th>
<th>Status</th>
</tr>
</thead>
<tbody>
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<td>32</td>
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<tr>
<td>33</td>
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</tr>
<tr>
<td>34</td>
<td>-7.041535</td>
<td>56.904234</td>
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</tr>
<tr>
<td>35</td>
<td>-6.370241</td>
<td>56.907174</td>
<td>GBR</td>
<td>Inner Seas off the West Coast of Scotland</td>
<td>not operating</td>
</tr>
<tr>
<td>36</td>
<td>-6.292483</td>
<td>56.921725</td>
<td>GBR</td>
<td>Inner Seas off the West Coast of Scotland</td>
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</tr>
<tr>
<td>37</td>
<td>1.026119</td>
<td>51.510454</td>
<td>GBR</td>
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</tr>
<tr>
<td>38</td>
<td>-1.568228</td>
<td>55.389798</td>
<td>GBR</td>
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</tr>
<tr>
<td>39</td>
<td>1.778482</td>
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<tr>
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</tr>
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</tr>
<tr>
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</tr>
<tr>
<td>46</td>
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<td>DNK</td>
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</tr>
<tr>
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<tr>
<td>48</td>
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<td>34.714000</td>
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</tr>
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</tr>
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</tr>
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<td>51</td>
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<td>feasibility</td>
</tr>
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<td>feasibility</td>
</tr>
<tr>
<td>53</td>
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<td>feasibility</td>
</tr>
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<tr>
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<tr>
<td>58</td>
<td>19.462076</td>
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</tr>
<tr>
<td>59</td>
<td>19.515084</td>
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<td>41.660944</td>
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</tr>
<tr>
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<td>Adriatic Sea</td>
<td>feasibility</td>
</tr>
</tbody>
</table>
### 7. RELEVANT INTERNATIONAL PORTALS & E-INFRASTRUCTURES

During the past year several portals and e-infrastructures have been created providing information on data, legislation, policies and stakeholders concerning marine raw materials exploration and exploitation. The main ones are presented below, in alphabetical order:


- **EGDI** ([http://www.europe-geology.eu](http://www.europe-geology.eu)): is EuroGeoSurveys’ European Geological Data Infrastructure, providing access to Pan-European and national geological datasets and services from the Geological Survey Organisations of Europe.

- **EMODnet Geology project** ([www.emodnet-geology.eu](http://www.emodnet-geology.eu)): initiated as a pilot project in 2009 (ur-EMODnet), is now running it’s forth phase (2019-2021). WP7 (Minerals) of the project has established a framework for collecting harmonized data of marine mineral occurrences across all European Seas, including Marine Placer Deposits.
• European Environment Agency (https://www.eea.europa.eu): is tasked with providing sound, independent information on the environment. It operates as major information source for those involved in developing, adopting, implementing and evaluating environmental policy, and also the general public.

• European Innovation Partnership (EIP) on Raw Materials (https://ec.europa.eu/growth/tools-databases/eip-raw-materials/en/content/european-innovation-partnership-eip-raw-materials): is a stakeholder platform bringing together representatives from industry, public services, academia and NGOs. Its mission is to provide high-level guidance to the European Commission, Members States and private actors on innovative approaches to the challenges related to raw materials.

• European Marine Board (https://www.isa.org.jm/): The European Marine Board is a strategic pan-European Forum for seas and ocean research and technology. It provides a strategic forum to develop marine research foresight, initiate state-of-the-art analyses and translate these into clear policy recommendations to European institutions as well as national governments.

• European MSP Platform (https://www.msp-platform.eu/): funded by the EU Directorate General for Maritime Affairs and Fisheries (DG MARE), the European MSP Platform acts as the central exchange forum for the rich knowledge generated in past, current and upcoming MSP processes and projects. This will allow officials, planners and other stakeholders interested in MSP to build on what is already available, avoid duplication of efforts, assist in capacity building and foster development of new practices.

• FORAM (http://www.foramproject.net): the project’s scope is to contribute to consolidate the efforts towards a more joint and coherent approach towards raw materials policies and investments worldwide, by closely working with the relevant stakeholders in industry, European and international organisations, governments, academia and civil society. Synergies with relevant EU Member States initiatives will be explored and fostered.

• Geochemical Atlas of Europe (FOREGS) (http://weppi.gtk.fi/publ/foregsatlas): the Geochemical Baseline Mapping Programme was initiated in 1998 aiming to provide high quality environmental geochemical baseline data in Europe.

• GeoERA Project (https://geoera.eu/): has as a main objective to contribute to the optimal use and management of the subsurface. One of its main themes comprises the Raw Materials, which with four running projects – for onshore and offshore resources – assists in identifying high potential areas that may add to responsible sourcing and supply within Europe. MINDeSEA Project aims at assessing the metallogeny and geological potential for strategic and Critical Raw Materials (CRM) in the European seas, while FRAME project focuses on forecasting and assessing Europe’s strategic raw materials’ needs. The data and products of GeoERA will be freely available through the GeoERA Information Platform (GIP).

• Geo-Seas (https://www.geo-seas.eu/): the project was designed to provide an e-infrastructure of harmonised and federated marine geological and geophysical datasets (sediment samples, cores, profiles etc), using common data standards and exchange formats.


• International Seabed Authority (https://www.isa.org.jm/): the portal of the ISA provides, amongst other information, an online deep data database, details about exploration contracts, national legislation database and other legal documents.

• InterRidge (http://www.interridge.org): is a non-profit organization concerned with promoting all aspects of ocean floor research (its study, use, and protection) which can only be achieved by international cooperation.

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- **Minerals4EU** ([http://www.minerals4eu.eu](http://www.minerals4eu.eu)): the project was designed to meet the recommendations of the Raw Materials Initiative and develop an EU Mineral intelligence network structure. The study area covered onshore deposits, for which detailed attributes were compiled.

- **Minventory** ([https://ec.europa.eu/irc/en/scientific-tool/minventory](https://ec.europa.eu/irc/en/scientific-tool/minventory)): is one of the scientific tools provided by EU Science Hub. The Minventory metadata portal is a directory of statistical data holders, the characteristics of the data they hold and – where possible – links to where the data may more easily be located. It covers the EU Member States and a number of neighbouring countries.

- **OSPAR** ([https://www.ospar.org/]): OSPAR is the mechanism by which 15 Governments and the EU cooperate to protect the marine environment of the North-East Atlantic.

- **Other EMODnet Lots** ([www.emodnet.eu](http://www.emodnet.eu)): EMODnet project, apart from Geology, involves several thematic areas: Bathymetry, Seabed Habitat, Chemistry, Biology, Physics and Human Activities. Their datasets provide relevant information (e.g. Human Activities) and can be used as background data (e.g. bathymetry) for the compilation of mineral-potential, prospectivity maps and models of formation for the main provinces.


- **SeaDataNet** ([https://www.seadatanet.org](https://www.seadatanet.org)): SeaDataNet is a major pan-European infrastructure for managing, indexing and providing access to marine data sets and data products, acquired by countries neighbouring the European seas.

### 8. SUMMARY

This report was elaborated in the frame of MINDeSEA project “Seabed Mineral Deposits in European Seas: Metallogeny and Geological Potential for Strategic and Critical Raw Materials”, WP5: Marine Placer Deposits; it constitutes Deliverable 5.5 – WP5 Literature review report on present-day status of regulation, legislation and exploitation of placer deposits, with emphasis on the impact of a pan-European research approach.

The compilation of the present report is a synthesis of all available information concerning the present-day status of regulation, legislation and exploitation of placer deposits; the scope of this work to screen information from existing publications from the EU organizations – most of which were focused on onshore deposits – and provide a summary of the data in question for offshore raw materials, and marine places where distinguished.

Finally, a thorough stakeholder identification is presented, in an effort to emphasize the need for engagement and the impact of a pan-European approach in raw materials research and exploration.

### 9. REFERENCES


APPENDIX I
LIST OF ACRONYMS

ABLOS: Advisory Board on the Technical Aspects of the Law of the Sea
ACOPS: Advisory Committee on Protection of the Sea
CINEA: European Climate, Infrastructure and Environment Executive Agency
CoR: European Committee of the Regions
CRM: Critical Raw Materials
DG_GROW: Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs
DG-MARE: Directorate-General for Maritime Affairs and Fisheries (DG MARE)
DG-RTD: Directorate-General for Research and Innovation
EAGE: European Association of Geoscientists & Engineers
EASME: Executive Agency for Small and Medium-sized Enterprises
ECS: Extended Continental Shelf
EEA: European Economic Area
EEA: European Environmental Agency
EEZ: Exclusive Economic Zone
EFG: European Federation of Geologists
EGDI: European Geological Data Infrastructure
EGS: EuroGeoSurveys
EIP: European Innovation Partnership
EIP-RM: European Innovation Partnership on Raw Materials
EIT: European Institute of Innovation & Technology
EMB: European Marine Board
EMODnet: European Marine Observation and Data Network
ENSSER: European Network of Scientists for Social and Environmental Responsibility
ERC: European Research Council
ERMA: European Raw Materials Alliance
EU: European Union
FOREGS: Forum of European Geological Surveys
FRAME: GeoERA project on Forecasting and Assessing Europe’s Strategic Raw Materials needs
GeoERA: ERA-NET action under Horizon 2020; Establishing the European Geological Surveys Research Area to deliver a Geological Service for Europe
GEOTEE: Geotechnical Chamber of Greece
GIP: GeoERA Information Platform Project
HELCOM: Convention on the Protection of the Marine Environment of the Baltic Sea Area
IADC: International Association of Dredging Companies
IAMCS: International Association of Marine Consultants and Surveyors
IAS: International Association of Palaeontologists
ICOG: Spanish Official Professional Association of Geologists
IMMS: International Marine Minerals Society
INSPIRE: Infrastructure for spatial information in Europe
ISA: International Seabed Authority
IUGS: International Union of Geological Sciences
MGE: Marine Geology Expert Group
Minerals4EU: EU-FP7 project uniting European national resource databases into a common data infrastructure and generating a European minerals yearbook
MINLEX: Study on the Legal framework for mineral extraction and permitting procedures for exploration and exploitation in the EU
MPS: Marine Spatial Planning
MREG: Mineral Resources Expert Group
OGC: Open Geospatial Consortium
PERC: Pan European Reserves and Resources Reporting Committee
REEs: Rare Earth Elements
RM: Raw Materials
RMI: Raw Materials Initiative
RMIS: Raw Materials Information System
TEU: Treaty on the European Union
TFEU: Treaty on the Functioning of the European Union
UNECE: United Nations Economic Commission for Europe
UN-IMO: United Nations International Maritime Organization
UN-SDSN: United Nations Sustainable Development Solutions Network
USGS: United States Geological Survey
WBCSD: World Business Council for Sustainable Development