MINDeSEA

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

Deliverable 4.2: WP4 Database and maps on ferromanganese crusts and phosphorites

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Deliverable number	**Short Title**
4.2	Database and maps on Fe-Mn crusts and phosphorites
Long Title	
Deliverable 4.2 – Database and maps on ferromanganese crusts and phosphorites	
Short Description	
This document presents a summary on the WP4 database and maps on ferromanganese crust and phosphorite occurrences in pan-European seas	
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D4.2. Database and maps on Ferromanganese crusts and phosphorites

Summary:

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

This document reports a summary on the MINDeSEA database and maps of pan-European ferromanganese crusts and phosphorites produced during the project life (July 2018 - October 2021).

The database compiles all existing and accessible data on ferromanganese crusts and phosphorites in European waters, generating a harmonised dataset from known and sampled sites and mineral occurrences in terms of setting, morphology and chemical composition, including critical special metals, such as cobalt, rare earth elements, tellurium, vanadium and titanium. Free and open access to data and maps, under CCBY license, are available in the GeoERA and EGDI portals and visors.

The database on ferromanganese crusts contains 141 occurrences, 260 individual analysed samples, in 7 marine regions (Arctic Ocean, Norwegian Sea, Bay of Biscay and Iberian Coast, Celtic Sea, Central-NE Atlantic Ocean, Macaronesia and Mediterranean Sea) and 7 EU countries (Denmark, Spain, Portugal, Iceland, Norway, Russia, United Kingdom) and contiguous International Waters. 12 critical elements (Bi, Co, HREE, LREE, Nb, P, Sc, W, V, Li, Ti, PGM) and 5 strategic metals (Mn, Ni, Cu, Mo, Zn) are compiled in the database and mapped at a scale 1:250,000 (**Fig. 1**).

The database on phosphorites contains 12 occurrences, 45 individual analysed samples, in 2 marine regions (Bay of Biscay and Iberian Coast, Macaronesia) and 2 EU countries (Spain, Portugal). 6 critical elements (F, HREE, LREE, phosphate rock, P, Ti) and 1 strategic metal (Mn) are compiled in the database and mapped at a scale 1:250,000 (**Fig. 2**).

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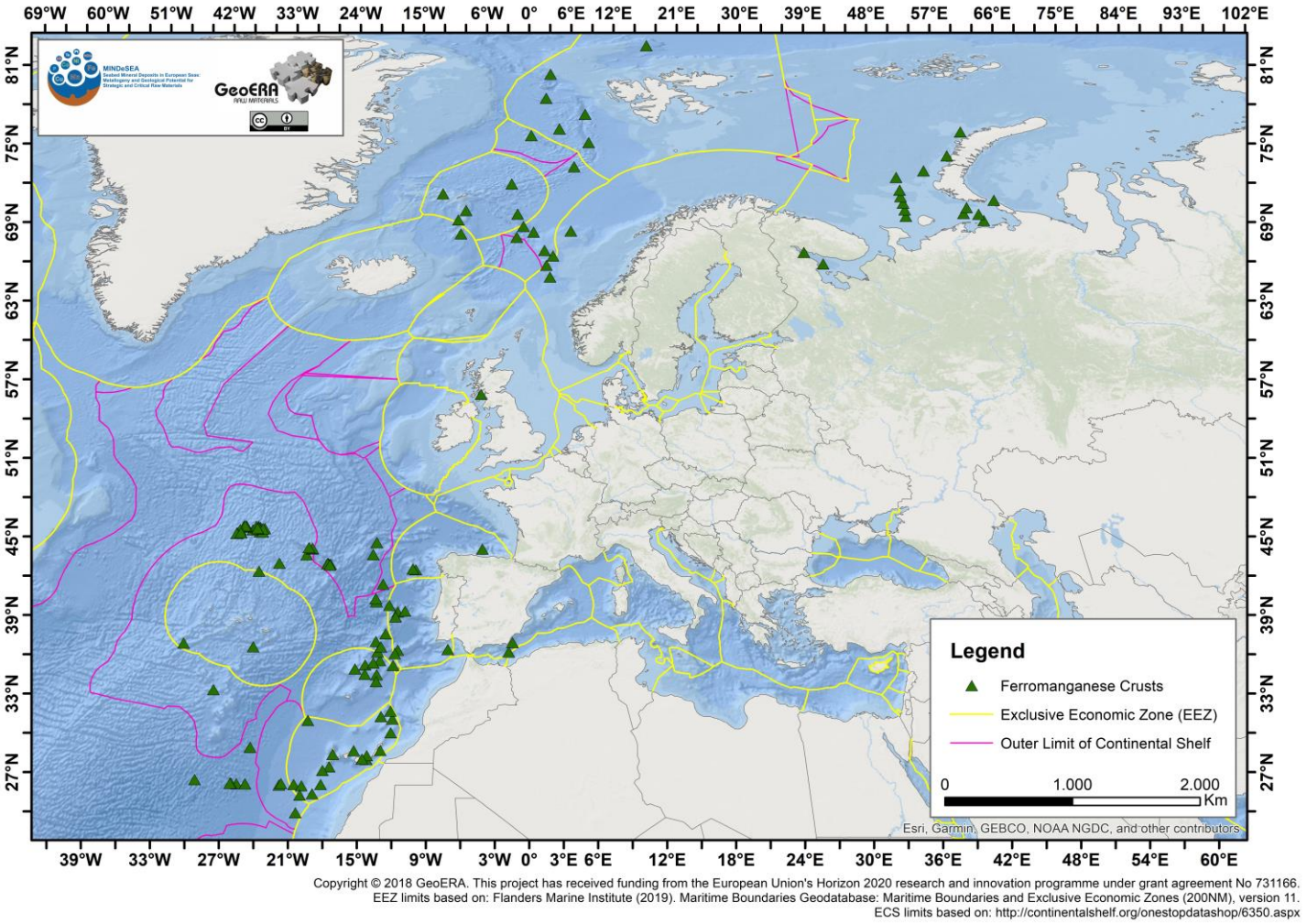

Figure 1: *MINDeSEA compilation map for ferromanganese crusts in pan-European seas. Last update: October 2021.*

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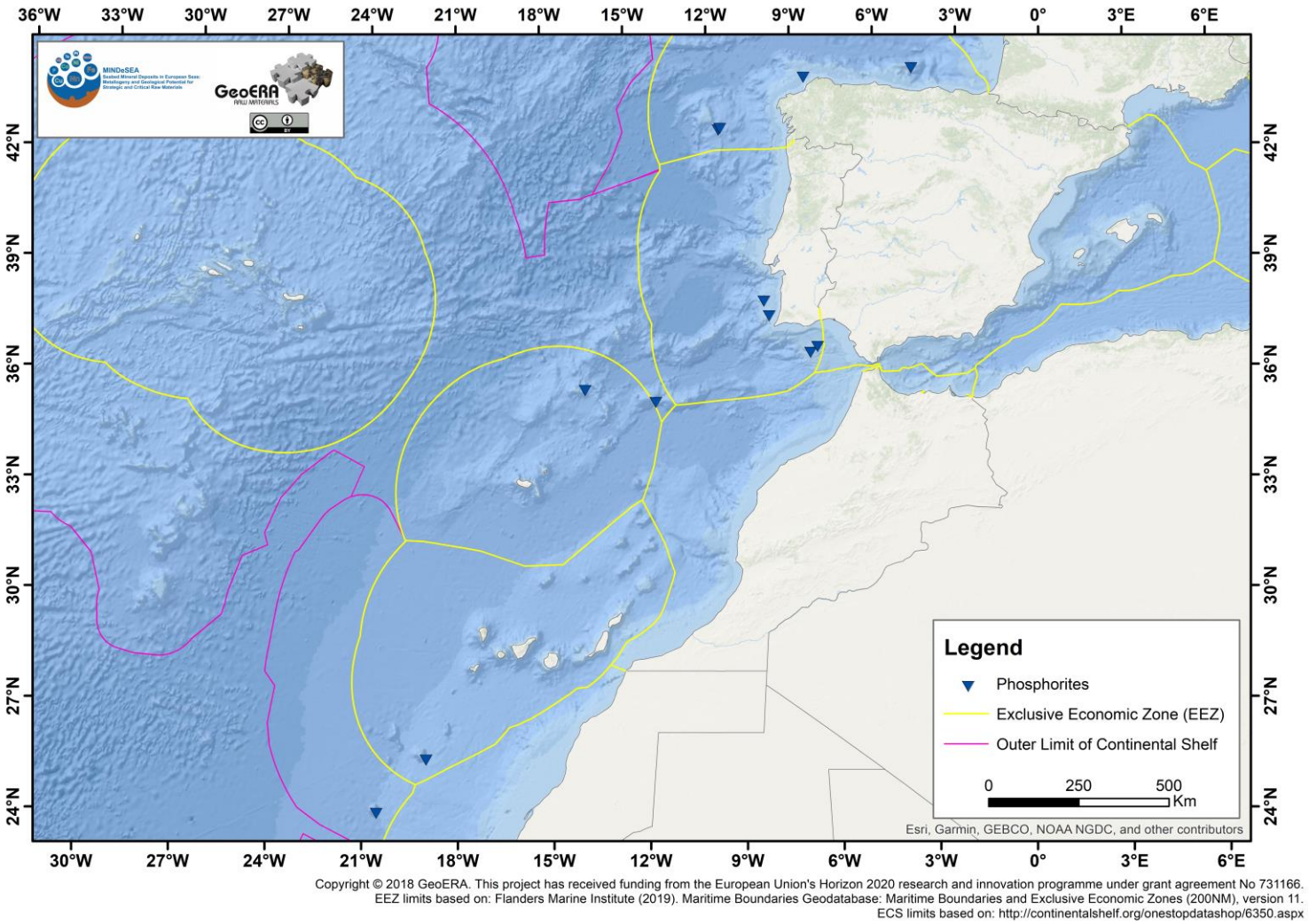

Figure 2: *MINDeSEA compilation map for phosphorites in pan-European seas. Last update: October 2021.*

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