DOSI
DEEP-OCEAN STEWARDSHIP INITIATIVE

Information Sheet
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The Ongoing Science Needed for Robust Deep-Sea Mining Regulations

Overview

The international science community is currently investigating the severity of expected impacts from mining, how this would affect marine life and ecosystem functioning, and how impacts may be mitigated. Any available tools, such as scientific models that can help predict impact, require baseline data. A standardized approach to monitor the environmental baseline and any mining impact is of utmost importance, as otherwise data can't be compared and may not be fit for purpose. Knowledge of the environment – what species live where, how long they live, when and how much they reproduce, what they eat and what eats them – is crucial to be able to define Strategic Environmental Goals and Objectives, define 'serious harm' and associated adverse change, as well as specific criteria to operationalize, measure and monitor it, and put in place effective regional environmental management plans, including conservation and restoration actions.

Current Large and Multinational Science Projects on Deep-Sea Mining

MiningImpact (2015-2022) (https://miningimpact.geomar.de)
Coordinator: Dr. Matthias Haeckel, GEOMAR, Germany
Partners: 38 research institutes and entities from 11 European countries and the ISA

Summary

In the first phase, the longer-term consequences of deep-sea mining operations were assessed by investigating decade-old disturbances of polymetallic nodule (PMN) habitats from benthic impact experiments in the CCZ and the DISCOL area. In the second phase an independent scientific monitoring of GSR's trials of the Patania II collector vehicle was conducted.

Take-home messages

- Deep-sea ecosystems associated with polymetallic resources support a highly diverse fauna.
- Deep-sea faunal communities show a high variability on small and large spatial scales, their connectivity over relevant scales for reference zones and for conservation remains unknown.
- Temporal variations of communities remain unknown due to the lack of long-term time series studies.
- Removal of nodules and surface seafloor reduces populations and ecosystem functions significantly.
- Even small-scale disturbances last for many decades, hence deep-sea mining operations are expected to impact the soft-seafloor abyssal ecosystem and its functions for many centuries to millennia and the nodule habitat for millions of years.
- Sediment plumes will impact considerable areas of the seafloor outside the mined area.
- Conservation areas need to match habitat characteristics of mined areas to preserve biodiversity.
- Minimizing impacts requires a network of representative preservation areas and adaptive regulations.
- Transparent and independent scientific assessment of future mining operations must be secured.

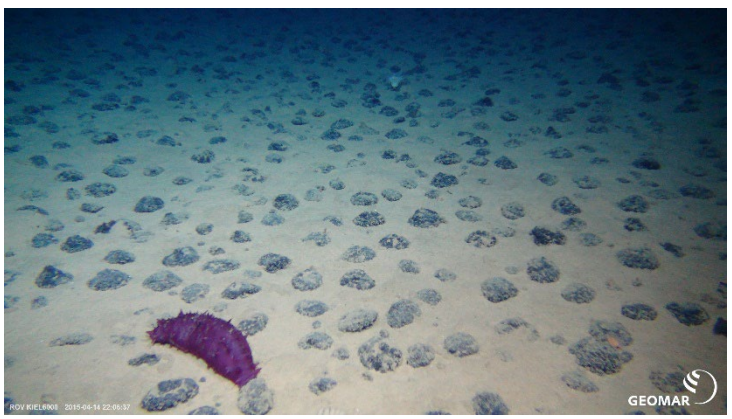

Figure 1. A sea cucumber in a polymetallic nodule field. Image courtesy of GEOMAR.

DEEP REST (2022 – 2024) (https://deep-rest.ifremer.fr/)
Coordinator: Jozée Sarrazin, IFREMER, France
Partners: 14 research institutes and entities from 8 European countries

Summary

DEEP REST aims to improve conservation/restoration capacities at polymetallic nodule sites and hydrothermal vents. The project will: (1) investigate and compare the biodiversity, functioning and connectivity of biological communities within and across ecosystems; (2) evaluate recovery potential and identify indicators of change; (3) test and evaluate conservation/restoration actions in terms of effectiveness and identify the governance arrangements needed for efficient actions; (4) provide scientific guidance to stakeholders and policy-makers and recommendations to support deep-sea governance, ensuring a sustainable management of resources and conservation of ecosystems.

Expected outcomes

New key results shall be used to formulate concrete management actions and policy advice. A strong engagement with stakeholders will lead to better-informed research. A strategic assessment of conservation and restoration scenarios will be carried out in a participatory manner to integrate knowledge and concerns from scientist, industry and NGO experts.

Planned Large and Multinational Science Projects

MiningImpact 3rd phase: (2023-2026/7)

Aim: Close knowledge gaps such as regional species connectivity, threshold values of serious harm, mitigation measures, and standards for baseline, monitoring, and impact assessment.

Investigations of impacts of the Patania II collector trial in the CCZ will continue and will be complemented by work in seafloor massive sulphide habitats. A key objective continues to be the transfer of independent scientific knowledge into policy recommendations for ISA's Mining Code, particularly suggestions for improved standards and guidelines, as well as European national regulations.

EU call for oceanic carbon pump (2023 – 2027) *(HORIZON-CL6-2022-CLIMATE-01 -02)*

An EU contribution of 15 Mio € is foreseen to fund a project that will contribute to increased understanding of the oceanic carbon cycle. This includes also quantifying the impacts of anthropogenic activities, such as deep-sea mining, fisheries, and dredging on the biological carbon pump. It will contribute to international assessments, such as the IPCC, IPBES, WOA, and CBD.

EU call for deep-sea monitoring (2023 – 2027) *(HORIZON-CL4-2022-RESILIENCE-01-02)*

An EU contribution of 14 Mio € is foreseen to fund a project on a monitoring and supervision system for marine mineral exploration and exploitation activities in the deep sea. This includes development of systems and technologies to continuously monitor the baseline, any impacts that arise from mining, and mitigation methods, taking into account the three-dimensional and temporal natural variability of the environment.

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