Report

DOSI participation in the First Council meeting of the 28th session of the ISA

Overview

The twenty-eighth session of the Council (Part I) was held in Kingston, Jamaica from 16 March to 31 March 2023. DOSI participated in person and was supported by a team of experts who participated online.

Items on the agenda of this ISA Council session with particular relevance for DOSI included:

- Draft regulations on the Financial Terms, supporting the need to consider intrinsic environmental costs in the royalty regime.
- Draft regulations on the Protection and Preservation of the Marine Environment, including discussions around the need and criteria of the impact and preservation reference zones, as well as the new annex for the impact and preservation reference zones, proposed by DOSI during the last Council meeting in October 2022, and raising the concern of synergistic effects of multiple simultaneous stressors in the marine environment.
- Draft regulations on Inspection, Compliance, and Enforcement, supporting the independence and safety of inspectors going onboard of potential mining vessels, and transparency of results of these inspections.
- Draft regulations concerning other marine users beside potential deep-sea mining exploitation, highlighting the need to engage with fisheries which are major stakeholder.
- Legal and Technical Commission report, and specifically the Terms of References proposed for a working group on thresholds.
- Discussions on the 2-year deadline and pathways forward. This session was particularly relevant as the ISA edges closer to the 2-year deadline (July 2023).

DOSI Delegation participating in person

Diva Amon
Stephen Cody
Beth Orcutt
Patricia Esquete (Co-lead)
Jesse van der Grient (Co-lead)
Glen Wright
Klaudija Cremers
Sonigitu Ekpe
DOSI Minerals WG experts supporting other delegations

Matt Gianni (Deep-Sea Conservation Coalition)
Pradeep Singh (IUCN)
Aline Jaeckel (Germany)
Sabine Gollner (Netherlands)
Giulia Champion (TBA21)

DOSI Minerals WG experts supporting virtually

Catherine Blanchard
Stephen Cody
Bobbi-Jo Dobush
Lisa Levin
Beth Orcutt
Diva Amon
Hannah Lily
Patricia Esquete
Anna Metaxas
Kristina Guerde

DOSI Actions

1. Information sheets and Policy briefs

DOSI prepared, printed, and distributed copies of the documents:

a)  Scientific Knowledge is Currently Insufficient for Effective Environmental Management of Deep-Seabed Mining

b)  What Does the Deep Ocean Do for You?

2. Interventions and textual proposals

DOSI actively intervened in the discussions by delivering a total of 40 interventions (Annex I), that included scientific and expert opinions on how to ensure high environmental standards and the reflection of independent and robust science in the regulations.

The interventions delivered can be found on the ISA website as well as in the enclosed appendix (Annex I).

Our work was mentioned in interventions or had our interventions supported by:

- Germany, supporting DOSI’s intervention on environmental monitoring
- PEW, supporting DOSI’s intervention on independent expert review
- UK, supporting DOSI’s intervention on IRZ/PRZs, especially related to EMMP
- USA, supporting DOSI’s intervention on test mining
- DSCC, UK, and Federation State of Micronesia, supporting DOSI’s intervention on lack of scientific baseline information
- DSCC, supporting DOSI’s intervention on fisheries

3. Hosting side event

DOSI hosted a side event on the evening of 22 March 2023 entitled ‘Latest Science on the Impacts of Deep-Sea Mining on Benthic and Pelagic Ecosystems and Fisheries’ (Annex II). The event started with a welcome reception, followed by three presentations, a Q&A, and concluded with a social reception so that interested parties could further discuss the presentations.

Our three invited speakers and their presentations were:

- Dr Matthias Haeckel, Coordinator of the MiningImpact Project, Senior Scientist, GEOMAR, Germany
  - Title: Impacts on the Benthic Ecosystem: Scales, Indicators, Threshold Values and Gaps
- Dr Jeffrey Drazen, Professor of Oceanography, University of Hawaii at Manoa, USA
  - Title: Environmental Risks to the Midwaters: Progress on Ecosystem Baselines and Remaining Gaps
- Dr Jesse van der Grint, Senior Quantitative Marine Ecologist, SAERI, Falkland Islands
  - Title: What are the Interactions Between Deep-Sea Mining and Fisheries?

The event was well attended, with at least 89 people attending, ranging from various Nations and NGOs. In addition, the main points of the three talks were captured in an information sheet (Annex II), which was distributed during the event. This information sheet also included, for the first time, a QR code to a new database that the Minerals Working Group has created that contains a list of experts on deep-sea mining, including where they are based and what languages (other than English) they speak.

4. Attendance at side events

DOSI attended the five official ISA side events during the last two weeks of the session. Two side events were hosted by The Metals Company’s subsidiary, Nauru Ocean Resources Inc (NORI), and were:

1) Environmental Update: Midwater and Benthic Plume Modelling for the NORI-D Polymetallic Nodule Collection Project by Nauru Ocean Resources Inc. on 20 March 2023


3) Island Perspective on Deep Sea Mining by Greenpeace International on 24 March 2023

4) Update on the Social Impact Assessment for teh NORI-D Polymetallic Nodule Collection Project by Nauru Ocean Resources Inc. on 28 March

DOSI asked pertinent questions during the Q&A of these events, and Members of the Council often followed up on these questions at a later stage, with regards to general impacts, plume modeling and the social impact assessment scoping report.

5. Informal meetings held with other delegations

Several informal meetings were held with various State delegations, including Argentina, Brazil, Chile, Germany, Portugal, Spain, Trinidad and Tobago, Norway, Belgium, Switzerland, UK, Mexico, Fiji, Cook Islands, Vanuatu, Canada, France, and Nigeria. Meetings included topics such as aspects on marine ecosystems including the protection of the marine environment, biodiversity knowledge, mitigation hierarchy, stakeholder participation, fisheries, plume modeling, discussion about cumulative and synergistic effects, mining impacts, baseline data especially with regards to the use of preservation reference zones, and last, but not least, who DOSI is. In addition, DOSI had informal meetings with other Observers (Deep Sea Conservation Coalition, Greenpeace, Pew Charitable Trust, AIDA, Oceans North, The Ocean Foundation) to discuss the course of the negotiations, share ideas, and coordinate interventions where possible. DOSI also held informal conversations with members of the Secretariat seeking future further possible engagement coordination in upcoming ISA workshops.

Meetings were on several occasions followed up by providing additional information, including DOSI policy briefs and information sheets, and scientific articles.

6. Press

Dr Diva Amon was interviewed by:
- Todd Woody, Bloomberg, March 21
- Olivia Rosane, Ecowatch, March 21
- Jerome Duval, Icari, March 21
- Evan Halper, Washington Post, March 22
- Cat Clifford, CNBC, March 23
- Koroi Hawkins, Radio New Zealand, March 28
- Nick Clark, Al Jazeera, March 29

Dr Beth Orcutt was interviewed by:
- Yusuf Khan, Wall St Journal, March 10
- Ernest Scheyder, Reuters, March 14
- Elizabeth Claire Alberts, Mongabay, March 22
- Oliver Heffernan, Scientific American, March 27

Gallery

Source: Photos by IISD/ENB
ANNEX I. Interventions

Item 10: Draft Regulations on exploitation of mineral resources in the Area
Seventh Meeting of OEWG on Financial Terms

Opening Statement
MIT/IGF reports on royalty regime
Delivered on 17 March 2023
Thank you, Mr. Chair. Since this is the first time the Deep-Ocean Stewardship Initiative has been given the floor during this council, we would like to start by thanking our Jamaican hosts for their warm hospitality, to thank the MIT and IGF teams for their presentations, and to congratulate you and the facilitator on the intersessional progress made on this important document.

Regarding the focus on this Working Group discussion on the royalty regime, DOSI supports the statement of Belgium, Chile and others about the need for financial regulations to royalty discussions to more deeply consider intrinsic environmental costs in the royalty regime, such as loss of ecosystem services and their intrinsic value both as “capital”, as well as their social value and their deep cultural value to communities around the world, including those represented by guests here in the room today from various Indigenous communities. DOSI recognizes that the Secretariat commissioned a report on the value of ecosystem services and natural capital in the deep sea, and several have emphasized that this needs to be considered in the royalty regime discussion. DOSI would like to raise concern that it will be difficult for this pending report to accurately calculate the value of ecosystem services and natural capital given that several scientific reports have emphasized that decadal scale research is still required to uncover this information. Thank you, Mr. Chair.

Part III Rights and Obligation of Contractors
Draft Regulation 38: Annual Report
Delivered on 17 March 2023
Thank you, Mr. Facilitator. With regards to DR 38 Paragraph 2g, DOSI recommends that, in addition to the results described, that the annual report also contain detailed information on where these results can be publicly accessed, to aid in transparency and independent assessment by qualified scientific experts.
DOSI further recommends alignment of the annual report content to reflect the requirements of the recent High Seas treaty for reports to include sample batch identifiers from the common Marine Scientific Research clearinghouse proposed in the treaty. Thank you, Mr. Facilitator.

Draft Regulation 39: Books, records and samples
Delivered on 17 March 2023
Thank you, Mr. Facilitator. DOSI supports the inclusion of language that representative samples shall be kept by the Contractor under good condition, as this is not only essential for the calculation of royalties but also for independent verification of the description of the Marine Environment by qualified experts. We agree with the exclusion of the “extent practicable” clause in Paragraph 3 to allow for stronger obligation to collect and properly maintain reference samples for this purpose. Thank you, Mr. Facilitator.
Item 10: Draft Regulations on exploitation of mineral resources in the Area
Fourth Meeting of IWG on the Protection and Preservation of the Marine Environment

Part IV Protection and Preservation of the Marine Environment
Section 1: Obligations relating to the Marine Environment

Draft regulation 44: General Obligations
Delivered on 20 March 2023
Thank you, Madame Facilitator. As this is the first time the Deep-Ocean Stewardship Initiative has been
given the floor during this working group, please let us start by thanking you for your excellent work in
guiding us through the process.

Regarding DR 44 Paragraph 1, DOSI wishes to remind the Council that effective protection of the Marine
Environment cannot be ensured without adequate scientific baseline knowledge and understanding of
the environments proposed for, and potential impacts of, mining, regardless of whether regulations are
in place. Numerous scientific studies have reported that decadal-scale levels of research are needed to
gather sufficient scientific knowledge to understand ecosystem baselines and possible impacts. Taking
this into account, DOSI strongly emphasizes the need for allowing enough time for robust,
independent, marine scientific research to fill current knowledge gaps, reduce uncertainty, and enable
evidence-based decision making before completing the regulations.

Regarding paragraph 1(a), in section (iii), DOSI recommends that Traditional and Indigenous Knowledge
should also be integrated in decision making, along with Best Available Scientific Knowledge. In section
(v), DOSI supports the inclusion of Underwater Cultural Heritage in the regulatory framework. Further,
we hope that the Council will explicitly include Intangible Cultural Heritage in the definition of
Underwater Cultural Heritage to reflect the input we heard this morning from Indigenous leaders about
how they view cultural heritage as connecting to their ancestors.

Regarding paragraph 1(c), DOSI strongly recommends edits to the final sentence which includes
reference to restoration and offsetting. DOSI respectfully reminds the Council that there is no scientific
evidence to support restoration or offsetting as viable mitigation strategies in the deep sea. On the
contrary, available scientific evidence shows that harm caused to the deep-sea environment is
essentially permanent with ecological restoration in the deep sea an impossible goal. With regard to
Australia and South Africa’s statements, we wish to reiterate that valid offset opportunities do not exist
for deep-sea biodiversity and ecosystem services as “out-of-kind” offsets will not achieve No-Net-Loss.
We recommend rewording the closing sentence to read “In doing so, the Enterprise and Contractors shall
apply a priority order to avoid and minimize harm to the Marine Environment and adapt the necessary
mitigation measures to newly obtained information and data.”
DOSI wishes to underscore that other critical aspects of the Mining Code related to the environment are still yet to be developed, including overarching Strategic Environmental Goals and Objectives, the definition of ‘serious harm’ and associated adverse change, as well as specific criteria to operationalize, measure and monitor it, including appropriate threshold standards.

Finally, we also wish to take this opportunity to invite delegates to attend a DOSI-sponsored side event on Wednesday evening at 7PM at the Pegasus to learn more about the latest science of the deep sea and the potential impacts from deep-seabed mining.

Thank you, Madame Facilitator.

**Draft regulation 45: Development of environmental Standards and Guidelines**
Delivered on 20 March 2023
Thank you, Madame Facilitator. The Deep-Ocean Stewardship Initiative supports many of the revisions to this regulation, and we stand by ready to assist drafting streamlined revisions of the list of items in 1(a) invited by Germany. Regarding paragraph 1(c), we highlight for further revision the definition in the Regulations of ‘mitigate’ or ‘mitigation’, which currently includes all aspects of the mitigation hierarchy. DOSI is of the opinion that references to remediation are both unnecessarily legally, and more importantly, risk being misleading and creating over-confidence in the feasibility of causing damage and then restoring it, which currently is not possible in the deep ocean. Further, compensation or offsetting as part of Mitigation measures are not reasonable options, as current scientific evidence indicates that such strategies are impossible in the deep sea. As such, we request that a new Standard on mitigation measures be developed as a matter of urgency, so that stakeholders can ensure that mitigation measures are described appropriately in the ISA's regulatory regime.

With regards to Paragraph 2 stating that the Authority shall not approve any Exploitation activities unless the environmental Standards have been adopted, DOSI would like to emphasize again that there are still significant scientific knowledge gaps that will preclude the creation of such Standards. We welcome, for example, the proposed plan for an intersessional working group of the Legal and Technical Commission to develop thresholds, but would like to recognise the immense, and perhaps impossible, challenge of this work, given the proposed short time frame and limited data available.

Thank you, Madame Facilitator.

**Draft regulation 46: Environmental Management System**
Delivered on 20 March 2023
Thank you, Madame Facilitator. The Environmental Management System forms an important part of minimizing serious harm to the environment. Regarding paragraphs 2b and 2d, DOSI believes that the auditing of this process should be annually, and it should be consistent across all Contractors rather than at intervals agreed upon by the LTC and Contractors separately, which can lead to inconsistent and potentially unequal auditing. Thank you, Madame Facilitator.
Draft regulation 46bis: Environmental Impact Assessment  
Paragraph 2  
Delivered on 20 March 2023  
Thank you, Madame Facilitator. The Deep Ocean Stewardship Initiative suggests that DR46 bis 2b (iii) includes specific reference to direct and indirect impacts, to promote the ecosystem-based approach of the ISA and recognising that impacts can carry through the ecosystem, for example, by species interactions. Regarding DR46 bis 2c, DOSI again recommends revision to remove reference to remediation, rehabilitation, restoration or offsetting as these strategies are not known as viable options in the deep-sea environment. Thank you, Madame Facilitator.

Draft regulation 46bis: Environmental Impact Assessment  
Paragraph 4  
Delivered on 20 March 2023  
Thank you, Madame Facilitator. DOSI recommends to include a reference in paragraph 4a to the Impact Reference and Preservation Reference Zones. These zones need to have been established by the time an EIA is conducted because the Contractor will need to collect detailed baseline data in preservation and impact reference sites. The EIA is the appropriate step to assess whether the reference zones are sufficiently similar to serve as reference zones and can fulfill their function in monitoring for potential impacts from deep-sea mining. The similarity must relate to the biogeochemical environment at the seafloor and across the water column. DOSI also supports the inclusion of Paragraph 4g that an EIA should be carried out by a suitable combination of qualified, independent practitioners. Thank you, Madame Facilitator.

Draft regulation 46bis: Environmental Impact Assessment  
Paragraph 5  
Delivered on 21 March 2023  
Thank you Madame Facilitator. DOSI supports the intervention made by Mexico. The inclusion of the term synergistic allows for the assessment of two forms of impacts: cumulative or additive effects, and recognising that impacts can interact, creating a potential larger effect than would be expected by the sum of impacts together. Thank you Madame Facilitator.

Draft regulation 46ter: Environmental Monitoring  
Delivered on 21 March 2023  
Thank you Madame Facilitator. The Environmental and Monitoring Plan is essential in the ecosystem-based approach promoted by the ISA as well as monitoring for potential mining impacts to the marine environment. Regarding Paragraph 3, we believe it is important to make it clear that the SUPPLEMENTARY monitoring programme for the first 7 years is in addition to the normal monitoring programme a Contractor has to conduct for the entire duration of the exploitation and post-closure phase. The aim here should be to avoid misunderstanding and to ensure that monitoring occurs throughout the mining phase, particularly because of the slow pace of biological processes in the deep sea.
The lack of experts or high costs should not prevent monitoring or appropriate assessment.
Thank you, Madame Facilitator.

Section 2: Preparation of the Environmental Impact Statement and the Environmental Management and Monitoring Plan

Draft regulation 47: Environmental Impact Statement
Delivered on 21 March 2023
Thank you, Madame Facilitator. DOSI supports the comments by Germany, Norway and Spain related to the continued publication of all EIS documents online, and the need to extend the public consultation period. Further, we recommend an addition to specify that all non-confidential data pertinent to the Environmental Impact Statement be made publicly available at the same time, for review along with the statement. The release of these data and documents, would allow for the inclusion of competent independent experts for the review of the EIS. Likewise, we support the inclusion of competent independent experts for the review of predictive models, which requires highly specific expertise that may not be covered by the LTC.

Thank you Madame Facilitator

Draft regulation 48: Environmental Management and Monitoring Plan
Delivered on 21 March 2023
Thank you, Madame Facilitator. The Deep Ocean Stewardship Initiative supports many elements of the revised text. Regarding DR 48 Paragraph 3f, DOSI recommends that the EMMP also include details of the entities involved in monitoring, along with information about their organizational structure. This is an important part of objectively understanding the methodology that will be used to determine whether environmental objectives are being met, and whether the proposed monitoring entities are suited to the methods assigned to them.

In addition, with regards to paragraph 3bis, DOSI wishes again to seek clarification on the supplementary monitoring programme. If this is an additional programme, run by a third party, seeking to verify the data that is being reported by the Contractor, this could be a good idea. Particularly because the ISA’s monitoring regime may rely extensively on contractor self-reporting, independent audit of that data can help the ISA and other stakeholders confirm that the ISA is receiving accurate reports from contractors on important environmental parameters. But we are concerned that the drafting should not suggest setting a time limit for monitoring that is shorter than the duration of mining impacts or biological processes in the deep ocean, which can be decadal or longer.

Thank you, Madame Facilitator.

Draft regulation 48bis and Alt Draft Regulation 48bis: Test mining
Delivered on 21 March 2023
Thank you, Madame Facilitator. The Deep-Ocean Stewardship Initiative strongly supports the inclusion of a regulation concerning test mining. Regarding the consideration of ALT DR 48bis, DOSI is concerned that the alternative version does not include the requirement for the test mining process to be assessed as part of the Environmental Impact Assessment described in DR 46bis. We believe that test mining should be subject to an Environmental Impact Assessment, an Environmental Impact Statement, and subsequent long-term monitoring plans, before approval of an exploitation Plan of Work. This would allow for test mining to test equipment and determine whether harm to the marine environment is avoided or minimized before approving or rejecting a Plan of Work, in case the procedures are not meeting the requirements. Therefore, DOSI recommends adding such provisions to DR48bis Paragraph 1 or Paragraph 3 of ALT DR 48bis.

Test mining, as the regulation states, is important in understanding the potential harmful effects of deep-sea mining to the marine environment. To ensure that these tests are effective in this regard, DOSI suggests adding the text to DR48bis or ALT DR48 paragraph 2 that effects of mining shall be monitored in both the water column and seafloor, and across all biological groups for which baseline data needs to be collected, as per the Standard for the Establishment of Baseline Environmental Data.

DOSI cautions the Council that the long-term impacts of mining and cumulative and synergistic impacts by multiple operations and non-mining related stressors will not be apparent on test-mining time and space scales. This includes the re-generation of nodules, the recovery and community composition of nodule-dependent fauna, and the recovery of natural sediment habitats - among other currently unknown impacts. Because of this, DOSI strongly raises concern on the inclusion of ALT DR48bis Paragraph 4 on the possibility that test mining does not have to be included in every project. Thank you, Madame Facilitator.

Section 4: Compliance with Environmental Management and Monitoring Plans and performance assessments
Draft regulation 51: Compliance with Environmental Monitoring and Management Plan
Delivered 21 March 2023
Thank you Madame Facilitator.

The Deep-Ocean Stewardship Initiative welcomes the inclusion of “continuous” in reference to monitoring frequency in DR 51 Para a, but we again make a recommendation that monitoring data should be made available in real time to all stakeholders, in addition to the annual report, to facilitate independent analyses of the data and enhance transparency of this remote industry. As experienced recently with the NORI accidental spill, the Authority was not notified until 16 days after the incident. We encourage continuous monitoring, that is based on the ecological characteristics and consequent recovery of the ecological communities in the contract area.

Regarding DR 51 Para c topic of maintaining the currency and adequacy of the EMMP, we remind our colleagues that deep-seabed mining impacts will occur in combination with climate change impacts.
Therefore climate change impacts should be taken into consideration throughout monitoring of compliance with an EMMP.

Thank you Madame Facilitator.

**Draft regulation 52: Review of the performance assessments of the Environmental Management and Monitoring Plan**
Delivered on 21 March 2023
Thank you Madame Facilitator.

For DR 52 Para 1, the Deep-Ocean Stewardship Initiative supports the proposed amendments and suggests that the “competent and independent” auditor needs to be hired by the Commission and paid by the contractor, not hired by Contractor. In our opinion, an auditor hired by the contractor presents a potential conflict of interest, as raised by Spain, and creates dependency of the auditor on the contractor.

DOSI suggests the addition of a section 3bis that specifies that the report should be published, stakeholder comments should be invited, and that stakeholder comments and the contractor’s response to the stakeholders’ comments should be published. All of these should also be presented to the Commission for review.

As deep-sea environmental scientists, we know how time-intensive proper review of environmental documents is and how many different types of expertise are required. DOSI stands ready to assist the ISA in accessing the wide ranging scientific collective expertise that could assist with these tasks.

Thank you Madame Facilitator.

**Draft regulation 53: Emergency Response and Contingency Plan**
Delivered on 21 March 2023
Thank you, Madame Facilitator. Regarding Paragraph 3, the Deep-Ocean Stewardship Initiative recommends clarity be added on the timeframe by which a Contractor is obligated to submit a detailed report on whether the Emergency Response and Contingency Plan was adequate in responding to an Incident. As recently observed in the ISA’s Compliance and Assurance Regulatory Management Unit Inspection Report INSP/2023/NUR/001 for a test mining activity, we have already witnessed an example of a Contractor being found to not have followed its own risk management procedure for responding to an Incident. Clarity is needed on when Contractors need to provide these reports to enable timely process improvements to ensure the effective protection of the Marine Environment.
Thank you, Madame Facilitator

**Section 5 Environmental Compensation Fund**
**Draft regulation 55: Purpose of Environmental Compensation Fund**
Delivered on 21 March 2023
Thank you, Madame Facilitator.

The Deep-Ocean Stewardship Initiative supports the intervention from South Africa on behalf of the Africa Group and Germany that more discussion is needed on the purpose of the Environmental Compensation fund. For example, the current reading does not make it clear whether the fund is only meant to be accessed to cover costs for damage caused outside of Contractors’ liability.

Regarding paragraph 1’s definition of “third party”, DOSI wishes to raise the issue of scientists carrying out marine scientific research in the Area and other marine users whose activities may come into contact with ISA contractors. There is the possibility of exposure to losses or damage caused by ISA contractors, for example to vessels, high-tech equipment or ongoing research work. As currently drafted, we are not clear whether such third parties would be able to make a claim to the Environmental Compensation Fund if they are not able to recover damages from the Contractor. We consider this type of scenario planning may be helpful to ensure that the ECF covers all relevant events.

Further, we suggest adding “ecologically” as a qualifier to the “technically and economically” feasibility. Finally, DOSI reminds the Council that there is currently no scientific evidence that restoration or rehabilitation of the deep seafloor or the water column is possible, so inclusion of these terms is concerning. Thank you, Madame Facilitator.

Part VI Closure Plans
Draft regulation 59: Closure Plan
Delivered on 22 March 2023
Thank you, Madame Facilitator. The Deep-Ocean Stewardship Initiative highlights that Paragraph 2(a) could benefit from replacing the vaguely defined “scheduling of studies” with reference to the Environmental Management and Monitoring Plan that defines the monitoring used to inform the Closure process, as it is not clear what kind of studies would be done outside those already defined in the EMMP.

In Paragraph 2(e), DOSI advises that the data and reporting from monitoring of residual Environmental Effects should be made publicly available, not just reported to the Authority, to enable independent scientific assessment of these effects to ensure effective protection of the Marine Environment.

Referring to para 2(f), and supporting Germany, DOSI again raises the concern that restoration and rehabilitation are not known viable mitigation measures in the deep sea. To date, there have been no long-term large-scale restoration experiments carried out in deep-sea ecosystems under mineral exploration, and experiments from comparable deep-sea ecosystems point to very slow and very incomplete recovery. Multi-decadal-scale research is needed to prove or disprove that restoration is possible in the deep sea. If restoration or remediation is deemed to be possible after such decadal-scale studies, independent experts will be needed to define what restoration or rehabilitation criteria or standards are.

Thank you, Madame Facilitator
Draft regulation 60: Final Closure Plan: cessation of production
Delivered on 22 March 2023
Thank you Madame Facilitator. Regarding Para 4, DOSI appreciates the Commission requiring the Contractor to make amendments to the final Closure Plan as a condition for approval of the plan.

However we query what action, if any, will be taken if the Closure Plan does not meet what is required. Also, as stated by several States, the revised Closure Plans need to be made public. This allows stakeholders to provide comments to inform the Legal and Technical Commission and Council before the Closure Plan is finally approved. We note that closure may take place several decades after the draft Closure Plan was originally considered, with consultation, at application stage.

To this effect, the Closure Plan presented 24 months before the end of Commercial Production should be subject to the stakeholder review mechanism under DR 11.

Many thanks, Madame Facilitator

Annex IV Environmental Impact Statement
Executive Summary, Section 1: Introduction, Section 2: Policy, legal and administrative context
Delivered on 22 March 2023

Thank you, Madame Facilitator. Regarding your request, Madame Facilitator, for guidance on which elements of the Annexes should be moved to Standards and Guidelines and which should be retained in the regulations, the Deep-Ocean Stewardship Initiative will endeavor to provide this guidance in written comments submitted following Council.

Before we provide specific comment on the Annex IV text under consideration, the Deep-Ocean Stewardship Initiative would like to remind the Council that robust scientific understanding of Marine Environment baselines and potential impacts requires decadal scale research to enable robust Environmental Impact Statements, so development of the specific elements required in the regulations and standards will be difficult to define now. On this point, DOSI warmly invites all delegations to a side event this evening at 7:00PM at the Jamaica Pegasus where deep-sea scientists will present information on baseline studies and gaps in scientific understanding of impacts, and we stand ready to assist any delegation that wants to learn more about these topics.

Regarding Annex IV, the Deep-Ocean Stewardship Initiative welcomes many of the proposed revisions, and we thank you for your hard work to develop this Annex. In the Executive Summary, the Deep-Ocean Stewardship prefers the completeness of Paragraph (a) rather than Alt(a)bis. We support the inclusion of Alt (d ter) on expected recovery rate. Understanding the rate that an ecosystem is expected to return to an original state is a key component of environmental impact assessment, as some impacts may be short term while others may have much longer timescales. Finally, we support the inclusion of (e) bis.
Regarding Section 2, the Deep-Ocean Stewardship Initiative supports the proposed text changes and welcomes the inclusion of Paragraph 2.6 on Ecologically and/or Biologically Significant Areas (EBSAs) and Area-based management tools.

Many many thanks, Madame Facilitator.

**Section 3: Description of the proposed project**
Delivered on 22 March 2023
Thank you, Madame Facilitator. The Deep-Ocean Stewardship initiative supports many of the suggestions throughout the text of Section 3. DOSI welcomes the inclusion of Section 3bis. Methods are a key component of the Proposed Project and crucial for stakeholders to evaluate if the Environmental Impact Statement is rigorous.

Regarding Section 3.1. on Project Area, DOSI recommends that the location information should be expanded to include the framing of the Contract area in a broader context. This could include the identification of nearby Coastal States or States that may be affected by mining activities. Including this information in the Environmental Impact Statement is important to identify stakeholders and potential sources of cumulative impacts.

Thank you, Madame Facilitator.

**Section 4: Description of the existing physiochemical and geological oceanography**
Delivered on 22 March 2023
Thank you, Madame Facilitator. Regarding Section 4, the Deep-Ocean Stewardship Initiative welcomes the majority of the changes made, as they will allow for a more robust description to ensure that an EIS will lead to effective protection of the Marine Environment.

We recommend that the description of the existing oceanographic environment should not be limited to the impact area, as indicated in the opening paragraph and throughout this section, but should also include explicit description of the Preservation Reference Zones and regional context in reference to the applicable Regional Environmental Management Plan. We support the comments of France on this matter.

With regard to Paragraph 4.7, DOSI is concerned about the deletion of a requirement for including projections of how the chemical oceanography setting may change over the next 50 years. Potential mining impacts will occur in addition to environmental changes because of climate change. It is important for the EIS to include such climate change considerations, which are available in the scientific literature, as part of the description of the Marine Environment.

To address the comments by Russia on recommending deleting the mention of the oxygen minimum zone because it is not relevant within 200m of the seabed, DOSI respectfully reminds the council that
mining may occur on seamounts with summits and flanks which may intersect the oxygen minimum zones in the water column, so we recommend maintaining this provision.

Many thanks, Madame Facilitator.

Section 5: Description of the existing biological environment
Delivered on 22 March 2023
Thank you, Madame Facilitator. Regarding Section 5, the Deep-Ocean Stewardship Initiative recommends that guidance should also require descriptions of the biological environment within the Preservation Reference Zones, for monitoring purposes.

With regards to section 5.2, DOSI recommends that the reference to protected areas, and areas of ecologically or biologically significant marine areas and national areas of adjacent countries, is reinstated. The new BBNJ High Seas Treaty requires States to strive for integrated ocean governance through cooperating in international fora.

DOSI supports the inclusion of ALT 5.4.1. that gives more guidance on connecting to the Regional Environmental Management Plan.

With respect to section 5.4.2, DOSI recommends the inclusion of microbial communities in the midwater too. Further, DOSI notes that requirements for the biological description between the surface, midwater and benthic sections differ and should be streamlined. Across all habitats, the microbial community and fauna need to be described and should consider specific richness, biodiversity, faunal density, community structure and connectivity. Currently, this is only explicitly mentioned for the benthic section. DOSI supports the text of ALT 5.4.4 for providing a robust description of ecosystem and community level studies.

Thank you, Madame Facilitator.

Section 6: Description of the existing human activities
Delivered on 22 March 2023
Thank you, Madame Facilitator. With regards to section 6.2.1, DOSI recommends the inclusion of future projections of fishery stocks in the Contract area. It is anticipated that species, including tunas, will change their distribution in response to climate change, and these changes need to be taken into consideration regarding deep-sea mining activities. Thank you, Madame Facilitator.

Section 7: Assessment of impacts on the physical, chemical, and geological environment and proposed mitigation
Delivered on 22 March 2023
Thank you, Madame Facilitator. The Deep-Ocean Stewardship Initiative would like to begin by reminding the council that assessment of impacts and validating of proposed mitigation is currently very difficult, if
not impossible, due to significant remaining scientific knowledge gaps that will take decadal scale levels of research.

With regards to section 7(a)ter, as well as para 7.2 bis (a), DOSI recommends the addition of **verification of any modeling**, or other analyses, besides the description of assumptions and limitations of any models.

In para 7.2, there are examples of “major types of potential impacts”, two of which, habitat removal and variations in communities’ composition, are not an oceanographic parameter. Yet other key impacts, such as release of reactive toxic compounds, which will be associated with the mining plumes, are not included. Perhaps a reference to the relevant Standards and Guidelines for more complete lists is more appropriate with these stated examples only for illustrative, rather than exhaustive, purposes.

Regarding Section 7.13, DOSI recommends the inclusion of synergistic impacts alongside cumulative impacts. As described by Mexico earlier in Council, these two terms are different with regards to how effects from impacts are measured. Cumulative effects are the sum or addition of each single impact with each other. For example, the independent effects of deep-sea mining plus the independent effects of climate change. Synergistic effects go beyond cumulative impacts, and refer to when impacts interact to amplify each other. An example synergistic impact might be a heightened level of sensitivity to toxicity by a deep sea species due to increased temperatures from climate change impacts. These synergistic interactions and their impacts are important to understand. If we do not take into account the synergy of effects, we risk underestimating the overall impact on the marine environment.

Lastly, DOSI recommends an addition to Section 7 to require an outline of assessments of uncertainty.

Many thanks, Madam Facilitator.

**Section 8: Assessment of impacts and Environmental Effects on the biological environment and proposed Mitigation**

Delivered on 22 March 2023

Thank you, Madame Facilitator. In Paragraph (a)ter, the Deep-Ocean Stewardship Initiative, DOSI recommends the addition of verification of any modeling or other analyses besides the description of assumptions and limitations of the models. With regards to paragraph (d), we recommend that threshold values not be deleted. While threshold values for the various impacts of deep-sea mining are currently not established, we recognise that there are various efforts that aim to start constraining normative thresholds, including the intersessional work highlighted in the LTC report.

As with our feedback on Section 7, the Deep-Ocean Stewardship Initiative recommends that listed examples in para 8.2 are not comprehensive, with loss of connectivity and of vulnerable species or toxicity not included. We suggest a reference to the relevant Standards and Guidelines for more
complete lists is more appropriate with these stated examples, which should only be for illustrative purposes.

DOSI further recommends explicit mention that this work needs to span the size range from megafauna to microbial communities, both across the water column and on the seafloor, similarly to the fauna that is required to be investigated according to section 5. As such, we suggest removing the text in 8.2 ter for the water column “as appropriate”. Similarly to the seafloor, obtaining a comprehensive and holistic understanding across the water column for fauna spanning from megafauna to microbial communities should be required. It is not clear why these two different areas would be treated differently. Further, the term “as appropriate” does not suggest a clear and transparent way for inclusion or exclusion of faunal groups. We note that toxicity is not included in the list of potential receptors, which is, however, an impact that needs to be considered alongside mining plumes. At a minimum, the Contractor needs to justify why certain groups should not be included in these impact studies and analyses.

With regards to paragraph 8.7, DOSI recommends here that synergistic effects are explicitly mentioned alongside cumulative effects, as we suggested for Section 7.

Lastly, DOSI recommends the addition of two paragraphs to this section. First, we recommend that there is a paragraph that outlines the requirements to consider the effects of accidental events and natural hazards, as per section 7 and 9. Second, we recommend there is a paragraph that outlines the assessment of uncertainty added to this section.

Many thanks, Madame Facilitator.

Section 9: Assessment of impacts on the socioeconomic and sociocultural environment and proposed Mitigation
Delivered on 22 March 2023
Thank you, Madame Facilitator. The Deep-Ocean Stewardship Initiative supports the inclusion of a new point in 9.2.1, which will facilitate the reporting of potential impacts on ecosystem services such as impacts on fisheries or carbon sequestration. With regards to paragraph 9.2.1.1, DOSI recommends that the dewatering or discharge plume is included in this description. The effects of increased suspended sediment concentrations and metal toxicity related to the mining plumes are further ranging than noise and light pollution and may represent impacts of greater magnitude. In addition, we suggest the addition of fisheries support to paragraph 9.2.1.5ter as another important ecosystem service provided by the midwater deep ocean biological communities. DOSI supports the inclusion of section 9.4 on gender impact analysis. Thank you, Madame Facilitator.

Section 12: Product stewardship
Delivered on 22 March 2023
Thank you, Madame Facilitator. The Deep-Ocean Stewardship Initiative recommends an addition to Section 12 to stipulate that the description of intended use of mineral-bearing ore once it leaves the
Area should also include information about the required collection and maintenance of reference materials. As stipulated in DR 39, such samples are required for independent verification for royalty regime considerations, and DOSI previously intervened in this session of Council to suggest that these materials are also needed for independent verification of baseline data. Thank you, Madame Facilitator.

**Annex 10ter and Annex 10ter Alt: Design Criteria for Impact Reference Zones (IRZs) and Preservation Reference Zones (PRZs)**

Delivered on 22 March 2023
Thank you, Madame Facilitator. The Deep-Ocean Stewardship Initiative welcomes the inclusion of the topic of this Annex. These reference zones are crucial environmental management tools and are the best way to directly measure the environmental impacts of seabed mining on the ecosystems.

To your question, Madame Facilitator, on which of the Annex versions is preferred, DOSI recommends that the “alternate” version is stronger, as it includes the reminder that Impact and Preservation Reference Zones need to consider the various sub-habitats of both pelagic water column impact types and benthic seafloor impact types separately. The alternate version also considers temporal variation, and, importantly, an assessment of the ecological requirements like reproduction and connectivity of the populations being compared.

We note that the Annex does not specify a minimum number of reference zones, just that one is required for each impact type. DOSI would like to flag that the requirement for Impact Reference Zones to be “sites where direct impacts from mining are likely to occur”, as described in Annex Paragraph 2 or ALT Annex Paragraph 10, is too restrictive, as indirect impacts should also be considered.

Regarding the description of Preservation Reference Zones in Annex Paragraph 8 or ALT Annex Paragraph 10, DOSI recommends that the requirement should be for a PRZ to include a “buffer zone” similar to the buffers around Areas of Particular Environmental Interest, to ensure that the core of the PRZ is protected from all impacts.

Thank you, Madame Facilitator.

**Item 10: Draft Regulations on exploitation of mineral resources in the Area**

**Fourth Meeting of OEWG on Inspection, Compliance, and Enforcement**

**Section 1: Inspections**

**Draft Regulation 96: Inspections: General**

Delivered on 23 March 2023
Thank you, Madame Facilitator. As this is the first time the Deep-Ocean Stewardship Initiative has been given the floor during this working group, please let us start by thanking you for your excellent work in guiding us through the process.
Overall, DOSI does not have a position on whether the selection should be for an independent inspectorate or a compliance committee, as long as inspections are conducted in an independent manner. Independent entities lower the risk of conflict of interest that could compromise effective protection of the Marine Environment.

DOSI believes that the independent entity should also have the power to temporarily suspend exploration or exploitation activities, pending review by the Council, if those activities are deemed to be causing harm to the Marine Environment. DOSI recommends that such provision needs to be added to this general regulation on inspection as well as DR98 and DR99.

DOSI also recommends that all Inspectors’ reports should be made publicly available within a set time limit of receiving such a report and in the report should be available perpetuity, to promote transparency. We recommend that this provision be added to DR97.

With regard to DR 96 Para 5 (b bis) which details the provision of reasonable facilities to Inspectors, DOSI would like to support the addition of an express reference regarding the provision for safe and inclusive working environments of inspectors while on board. We acknowledge the reference to intimidation under DR 96 Para 5g, but would suggest rephrasing to expressly link these questions to the overarching physical and psychological well-being of inspectors. Most of these mineral-related activities will require participants, including inspectors, to spend continuous weeks to months on ships at sea, often great distances from the nearest landmass, manifesting in inevitable isolation, and where – unfortunately – harassment, bullying, and discrimination are rife, which may especially be the case for inspectors. We also recommend that the ISA require contractors to have in place appropriate practical measures to safeguard the wellbeing of all persons on vessels, including non-crew and non-employees, such as inspectors and trainees. Further, given the gender disparity in the mining industry mentioned yesterday, DOSI believes that extra care is needed in this regard to ensure the safety of inspectors of all genders.

Thank you, Madame Facilitator.

**Draft Regulation 100: Inspection Reports**
Delivered on 23 March 2023
Thank you, Madame Facilitator. DOSI recommends that the Inspection Reports should be made publicly available to promote transparency and ability for stakeholder review. Thank you Madame Facilitator.

**Draft Regulation 101bis: Whistle-blowing procedures**
Delivered on 23 March 2023
Thank you, Madame Facilitator.
The Deep Ocean Stewardship Initiative recommends that whistleblower protection needs to be passed on to subcontractors, for example to include contracted scientists.

Thank you, Madame Facilitator
Section 2: Monitoring

Draft Regulation 102: Vessel notification, electronic monitoring, and data reporting
Delivered on 23 March 2023
Thank you, Madame Facilitator. The Deep-Ocean Stewardship Initiative recommends amendments to the text to include a requirement for real-time independent monitoring of information on mining activities, environmental data, and positions of all mining vessels at all times. Thus, we recommend removing the text ‘where technically feasible’ from Paragraph 1(a).

As evidenced from the monitoring of the nodule collector test carried out in the Belgian and German contract areas in the Clarion Clipperton Zone in 2021, such independent monitoring is technically feasible.

DOSI believes that these data should be available to the Inspectorate and all stakeholders in real time, and support the inclusion of Paragraph 5 alt. This will facilitate analysis of the monitoring data and enhance the transparency of this industry in remote environments. Thank you, Madame Facilitator

Draft Regulation 103: Compliance notice, suspension and termination of exploitation contract
Delivered on 23 March 2023
Thank you, Madame Facilitator,

Regarding DR 103 Para 5, the Deep-Ocean Stewardship Initiative suggests that more specificity is added to the number of warnings that can be given. The current reading of ‘one or more’ warnings is unclear and could suggest that an unlimited number of warnings can be given to a Contractor that fails to comply with the Inspectorate compliance notices.

Regarding DR 103 Para 7, DOSI recommends that text be added reflecting that nothing in this provision shall limit the competence of the Authority to suspend activities in the Area through emergency measures.

The Regulations reflect UNCLOS in stating that the Council may impose upon a Contractor monetary penalties proportionate to the seriousness of the violation. We would like to suggest that the determination of ‘seriousness’ here should include consideration of the extent and nature of any harm caused to the marine environment. The more serious the harm, the greater the penalty, both as a punitive measure and as a means to incentivise avoidance of similar breaches in the future. This may be a matter for the Standard that will underpin this Regulation.

Many thanks, Madame Facilitator

Item 7: Status of contracts for exploration and related matters

Section 2: Periodic review of the implementation of approved plans of work for exploration
Delivered 27 March 2023
Thank you, Mr President,
DOSI seeks clarification on the periodic reviews. First, with regards to reviews that are overdue. It seems that reports can be overdue indefinitely without consequence. Further, DOSI would suggest adding more clarity on the result of the periodic review. Currently, there is only information stating that the reviews have been completed. These reviews are useful, for example to assess the progress on the collection of baseline environmental data, which are needed to inform the Environmental Impact Statement, and help guide the Contractors by identifying areas where information may be lacking in a timely manner. This will aid the adequate preparation of the EIS.

Thank you Mr President

Item 10: Draft Regulations on exploitation of mineral resources in the Area
Fourth Meeting of OEWG on Institutional Matters

Part I: Introduction
Draft Regulation 2: Principles, approaches and policies
Delivered on 28 March 2023
Thank you, Facilitators. As this is the first time the Deep-Ocean Stewardship Initiative has been given the floor during this working group, please let us start by thanking you for your excellent work in guiding us through the process.

We wish to support delegations that have stressed that there is no possibility of balance between Exploitation and preservation of the Marine Environment. We know that exploitation activities would cause impacts in the marine environment that would inevitably hinder the preservation of the marine environment.

We further note that the regulations continue to refer to the "common heritage of mankind", as used in the Agreement. In the recently agreed BBNJ text, States decided to update this wording to "common heritage of humankind". We would propose to adopt the same language in the ISA context.

Thank you.

Item 10: Draft Regulations on exploitation of mineral resources in the Area
President’s Text
Section 4: Other users of the Marine Environment
Draft Regulation 31: Reasonable regard for other activities in the Marine Environment
Delivered on 29 March 2023
Thank you, Mr President,

DOSI strongly supports the inclusion of fisheries in any final text of DR31, alongside submarine cables or pipelines, as another major other user of the Marine Environment. Fisheries in the High Seas contribute significantly to various countries' Regional Fisheries Management Organization catches. Tuna fisheries, for example, are known to occur in the High Seas, including in regions where ISA exploration contracts
have been issued, such as the Clarion Clipperton Zone. Given the size of the contract areas in the CCZ, the overlap between fisheries and mining areas is substantial, with associated impacts potentially extending far beyond contract areas, including potentially affecting breeding grounds, spawning, nurseries and commercial stocks. This could result in impacts to food security, income, and livelihoods. As such, this warrants consideration and engagement of this industry as a key user and stakeholder, and should be captured in the Regulations, and also in Regional Environmental Management Plans. DOSI is pleased to see the proposed inclusion of fishing activities in one version of DR 31, and would like to ensure it’s included in whichever version is taken forward.

Thank you, Mr President

**Section 7: Training commitment**

**Draft Regulation 37: Training Plan**
Delivered on 29 March 2023
Thank you Mr President,

DOSI suggests essential amendments to the training plan that are currently not captured in paragraph 4 or the preceding text. First, the listed options for types of training that may be covered by the Contractor should be expanded to include training in marine sciences and ecosystems, including best available methods and practices. These should be mandatory components of the training. Further, gender equality and non-discrimination training should be included in any contractor program. Finally, the Contractor shall implement effective measures to ensure the health, safety, and security of all trainees.

Thank you, Mr President

**Schedule: Use of terms and scope**

**Cumulative Environmental Effect**
Delivered on 30 March 2023
Thank you Mr President

DOSI would like to include in the definition of cumulative effects and the synergistic effects that were discussed in the environmental working group last week.

Thank you

**Schedule: Use of terms and scope**

**Preservation**
Delivered on 30 March 2023
Thank you Mr. President,

DOSI supports Pew in the inclusion of definitions for the “Impact reference zone” (or “IRZ”) and the “Preservation reference zone” (or “PRZ”) in the “Schedule.”
Impact and Preservation Reference Zones are crucial environmental management tools and essential to measure impacts of seabed mining on ecosystems over time.

The new Annex Xter, and Xter Alt, discussed last week, specifies important criteria to aid in the establishment of sufficient IRZs and PRZs, and will help to ensure the long-term monitoring of impacts of sediment plumes and other mining impacts.

Thank you, Mr. President.

**Item 14: Report of the Chair of the Legal and Technical Commission on the work of the Commission at the first part of its twenty-eighth session**

Thank you, Mr President,

The Deep-Ocean Stewardship Initiative wishes to thank and commend the Chair of the Legal and Technical Commission on the work of the Commission.

DOSI supports the creation of an intersessional expert group to lead the development of Standards and Guidelines for the establishment of Environmental Threshold Values and identification of potential environmental impacts of deep-sea mining operations. DOSI nonetheless wishes to express its concern that the current Terms of References are inadequate and will not result in meaningful, scientifically valid thresholds within the proposed time frame.

The development of valid thresholds requires the ability to detect and monitor changes in the marine environment across space and time, as well as understanding of:

- ecosystems and ecological processes,
- the cascading effects of change in the marine environment,
- cumulative and synergistic impacts; and
- uncertainties in the metrics or indicators used.

Thresholds must also be cognisant of regulatory and policy objectives, priorities and requirements, including societal expectations regarding the level of harm to marine ecosystems that is acceptable in pursuit of economic and other benefits.

To account for such diverse considerations, an expert working group requires diverse expertise. As already indicated by other delegations (Netherlands, CR, Spain…), such expertise cannot be provided by just ten experts per group. We urge the LTC to draft Terms of Reference that outline the expertise required and increase the number of experts per subgroup accordingly.
Further, as noted by other delegations (Netherlands, Spain…) the three proposed subgroups are insufficient to address the full range of environmental variables and potential impacts of mining activities. For example, additional subgroups would be required to address habitat loss, or biological aspects such as biodiversity or ecosystem connectivity. Further subgroups may be identified in the process of establishing environmental threshold values.

Finally, the assessment of available baseline environmental data is a necessary prerequisite for the effective application of the precautionary approach or principle. Such an assessment identifies scientific gaps and uncertainties to inform the work of the subgroups. Following such an assessment, the LTC and the Council may decide that it is necessary to gather further data, which will likely require more time than what is proposed in the current Terms of Reference.

In the event that a decision needs to be taken in the absence of sufficient scientific data to define the threshold values, it will be necessary to define “natural background conditions” as conservative thresholds to assess any future environmental impacts, in line with the precautionary approach or principle. That is, for example, to define the natural particle concentration in the water column, the natural sedimentation rate on the seafloor, or natural sound levels across the marine environment. All these thresholds will be informed by baseline environmental data, currently being collected by Contractors.

An inadequate or erroneous assessment of impacts would hinder the effective protection of the marine environment. So in concluding, DOSI wishes to emphasize a simple message: establishing scientifically invalid thresholds would be worse than establishing no thresholds at all.

As always, DOSI stands ready to assist and we can provide a list of experts for consideration as nominees for the various subgroups.

Thank you.
Annex II. DOSI side event

Latest Science on the Impacts of Deep-Sea Mining on Benthic and Pelagic Ecosystems and Fisheries

The Jamaica Pegasus Hotel, 81 Knutsford Blvd

22 March 2023
7:00pm refreshments and snacks
7:30pm presentations

Dr. Matthias Haeckel
Coordinator, MiningImpact Project
Senior Scientist, GEOMAR
Impacts on the Benthic Ecosystem: Scales, Indicators, Threshold Values, and Gaps

Dr. Jeffrey Drazen
Professor of Oceanography, University of Hawaii at Manoa
Environmental Risks to the Midwaters: Progress on Ecosystem Baselines and Remaining Gaps

Dr. Jesse van der Grint
Senior Quantitative Marine Ecologist, SAERI
What are the Interactions Between Deep-Sea Mining and Fisheries?

DOSI
DEEP-OCEAN STEWARDSHIP INITIATIVE

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Latest Science on the Impacts of Deep-Sea Mining on Benthic and Pelagic Ecosystems and Fisheries

Researchers are studying the potential impacts of mining activities in the deep sea. This Information Sheet summarises the key points from three presentations delivered by experts Dr. Matthias Haeckel, Dr. Jeffrey Drazen and Dr. Jesse Van Der Grint at the first part of the 28th Annual Session of the ISA. These points span the environmental risks of deep-sea mining in benthic and pelagic ecosystems, as well as interactions between mining and other human activities such as fisheries.

Impacts on the Benthic Ecosystem: Scales, Indicators, Threshold Values, and Gaps

- Nodule ecosystems support a highly diverse fauna of sessile and mobile species that shows a high variability on local and regional spatial scales.
- Understanding of species connectivity (across the CCZ and Pacific) remains poor.
- Deep-sea mining will impact benthic ecosystem functions and biodiversity for hundreds to thousands of years by removing the bioactive surface layer and affecting nodule fields’ ecosystem structure.
- The area impacted by mining is much larger than the mined area.
- Transparent, independent scientific assessment of deep-sea mining operations is needed.

*Relicanthus sp.* — a species of Cnidarian collected at 4,100 meters in the Clarion-Clipperton Zone (CCZ) that lives on sponge stalks attached to nodules. Image courtesy of Craig Smith and Diva Amon, University of Hawai'i at Mānoa
Environmental Risks to the Midwaters: Progress on Ecosystem Baselines and Remaining Gaps

- Midwater ecosystems support unique biodiversity, play key roles in carbon export and nutrient regeneration, and provide food for harvestable fish stocks.
- Deep-sea mining poses environmental risks to these ecosystems through midwater discharge of sediments, metals, and noise.
- Midwater baseline studies in the CCZ have begun providing information needed to identify future changes and mitigate risks. However, these studies have also revealed substantial spatial and temporal variability.
- Gaps in our knowledge remain for both baseline research and monitoring actual midwater impacts on ocean life.

Interactions between Deep-Sea Mining and Fisheries

- Licensed mining exploration contract areas overlap with regions used by other industries like fisheries. It is possible that deep-sea mining impacts will affect these other industries.
- Deep-sea mining impacts like noise pollution, sediment plumes, and metal toxicity may affect fish targeted by fisheries directly or indirectly, leading to lower biomass and catches, increased seafood contamination, and movement of fish stocks.
- The potential impact of deep-sea mining on fisheries is influenced by distance, meaning that limiting the spread of mining impacts may reduce their effect on fisheries.
- Overlap between mining exploration contract areas and fisheries vary by nation, meaning that potential negative impacts of mining on fisheries are not equally distributed.
- Modelling predicts increasing conflict between tuna fisheries and deep-sea mining in the Clarion-Clipperton Zone with future climate shifts.

This Information Sheet was prepared by:
Dr. Matthias Haeckel, Dr. Jeffrey Drazen, Dr. Jesse van der Grinten, Dr. Diva Amon, Dr. Patricia Esquite Garrote, and Dr. Sabine Gollner

Contact us: DOSIcomms@gmail.com

How to Cite:

About DOSI:
The Deep-Ocean Stewardship Initiative is a global network of experts that seeks to integrate science, technology, policy, law and economics to advise on ecosystem-based management of resource use in the deep ocean and strategies to maintain the integrity of deep-ocean ecosystems within and beyond national jurisdiction.