

Deep Sea Dialogues

2nd edition

25th July 2026

Kingston Jamaica



Background

The 2nd edition of the *Deep Sea Dialogues* was convened on the afternoon of Saturday, 25th of July 2026, on the sidelines of the second part of the 31st Session of the International Seabed Authority (ISA), at the Institute of Jamaica in Kingston. The event was co-organized by the International Union for Conservation of Nature (IUCN), Dona Bertarelli Philanthropy (DBP), and the Oceano Azul Foundation (OAF).

Similar to the [first edition](#) in July 2025, the Dialogues brought together scientists, legal and economic experts, government representatives and policymakers, and civil society to discuss critical questions concerning the future of the deep seabed in a neutral, inclusive, and non-negotiation setting. The event was structured around three sessions: Session I on Science; Session II on Economics; Session III on Governance¹.

Key messages and reflections from the event², which was held under Chatham House Rule, were reported back to the Assembly in plenary setting and livestreamed on ISA Web TV on 30th July 2026, ensuring messages from the Dialogues could be conveyed and documented in a concise manner to all delegates and stakeholders to ISA proceedings.

Key messages

I. Science-for-science and science-for-policy

The session featured a presentation on the ISA's Activities in the context of the [Action Plan for Marine Scientific Research](#) in support of the UN Decade, as well as a virtual tour aboard the R/V Falkor (too) which was conducting research in the waters of Trinidad and Tobago and the adjacent High Seas during a 30-day oceanographic expedition operated by the Schmidt Ocean Institute with SpeSeas as the lead science organisation.

The discussion highlights included:

- The marine scientific research mandate of the ISA is captured in article 143 (3) of UNCLOS. To that end, the ISA developed an action plan for marine scientific research in 2020 which was adopted by the Assembly, and constitutes a contribution of the ISA to the United Nations Decade of Ocean Science for Sustainable Development for 2021-2030.
- The action plan has the following six MSR priorities:
 - Advance knowledge of deep-sea ecosystems;
 - Standardise methodologies for biodiversity assessments;
 - Sound technological innovations;
 - Understanding environmental impacts;
 - Promote scientific data sharing and deep-sea literacy;
 - Strengthen deep sea scientific capacity.
- Independent data was emphasized as a cornerstone of all scientific and regulatory work, for instance, robust data is needed for the development of Regional Environmental Management Plans (REMPs) as well as the development of environmental thresholds. It was noted that the majority of data currently held by the ISA originated from contractor activities, whilst

¹ Agenda available [here](#).

² The presented high level summaries of key messages and discussion points from the event do not reflect the opinions of or endorsement from any of the speakers or participants.

acknowledging that independent science also makes immense contributions to the work of the Authority.

- Participants were then taken on a live virtual tour of Deep Wonders of Trinidad and Tobago and the High Seas expedition aboard the R/V FALKOR (TOO) conducting independent research to meet the scientists:
 - The tour featured the wet laboratory, the cold storage and preservation laboratories, the main laboratory, and the control room. The visit was complemented by live commentary from leading deep-sea scientists who were onboard, and featured live images of the seafloor and samples that were being collected.
 - It was explained that in 30 days onboard, mostly in the waters of Trinidad and Tobago, 25 ROV dives had been conducted and 500 biological samples had been collected, most of which will be stored locally in an effort to build a Caribbean deep-sea reference collection, providing invaluable data access for local scientists.
- While there is now more scientific knowledge than we have ever had before about the deep sea, it remains mostly unknown & poorly understood - most existing direct oceanic measurements do not cover the deepest parts of the ocean. Major discoveries are still expected, and the R/V FALKOR (TOO) expedition did discover new species at each dive.
- During the discussion, the point was made that the lack of scientific information justifies the application of the precautionary principle. This does not mean that decisions cannot be made. For example, whilst we still have a lot to discover, we know that deep sea species tend to show slow growth and low reproductive rates etc., which can already inform decisions. It was also clarified that scientific uncertainty was sometimes misinterpreted: the uncertainty is not on whether mining activities would have an impact, but rather on the estimated scale and timing of it.
- Evidence of human activity was found even in locations that had never previously been explored, and the impact of climate change is already visible in the deep sea, where a one- or two-degree increase can have significant consequences:
 - Marine heatwaves have been recorded at depths of 1,000m and have been linked to deep-water coral mortality in the northwest Atlantic.
 - Biodiversity loss is already occurring, with only some species able to move or adapt as conditions change and noting that migration does not mean all species will survive.
 - In any case, the seabed is connected to the surface through currents and biological processes, meaning deep ocean ecosystems should not be considered in isolation.
- On a question regarding science-for-science and science-for-policy, it was specified that the two are not separate, as fundamental ecological research provides the basis for decision-making processes. For instance, it was illustrated that Areas of Particular Environmental Interest (APEIs) in the Clarion – Clipperton Zone (CCZ) drew on fundamental larval dispersal research done for unrelated purposes.
- The issue of access to deep-sea research infrastructure was highlighted as being highly unequal. For example, the Caribbean region features an extensive deep ocean yet lacks dedicated deep-water scientific vessels to study it. Research organizations and developed countries should enable access to vessels and research opportunities to make deep science accessible for all, in alignment with article 143 of UNCLOS, as exemplified with this expedition.
- Finally, it was underscored that indigenous knowledge needs to be accommodated in scientific expeditions and within ISA processes as well.

II. The knowns and unknowns of the financial equation?

The session featured two keynote presentations, looking specifically into the finances of DSM, and whether deep-sea mining could be a viable critical mineral source.

The discussion highlights included:

- The first presentation examined the commercial viability of deep-sea mining under realistic operating conditions. Drawing on financial data provided by a contractor and testing it against a range of stresses and scenarios, the analysis suggested that current DSM projects may struggle to offer an attractive risk-adjusted return on a profit-maximising basis. In more than 80% of the simulations, projected revenues and profits became negative.
- Impacts on land miners and sponsoring states were also analysed, finding that losses could be greater than the income generated for the ISA, the basis of Benefit Sharing. However, since ISA's royalties are currently calculated directly from revenues, they could be more stable versus profit-based taxes for sponsoring states.
- The second presentation similarly acknowledged the probable lack of commercial viability currently, but pointed out the resource potential of polymetallic nodules, and the need for critical minerals in the context of the wider market demand for electric vehicles, batteries, energy storage and other non-battery applications.
- While battery cathode chemistries and technologies continue to innovate and evolve, including lithium-iron-phosphate (LFP) batteries that do not need nickel and cobalt, nickel- and cobalt-rich batteries are still expected to make up a significant part of the market for a while. For this and other uses, supply shortages are still expected (nickel and copper). Though circular economy and technological innovation will become more important to a large degree from 2035-2040 onwards, it is forecasted not to be enough to cover all needs. Generally, manganese and cobalt are at risk of oversupply in contrast to DSM-derived copper and nickel supply, which should be able to get absorbed into the global market.
- Discussions highlighted that risks and uncertainties are high, with a lack of independent financial data, higher set-up and operation costs and longer timelines, market price fluctuations, etc. This is typical of risky, new and technologically complex industries. Uncertainty for investors also comes from commercial, litigation (multi-lateral and unilateral approaches) and political risks and currently, the absence of a regulatory framework.
- It was also noted that neither study accounted for environmental costs, which, if factored into the analysis, could further affect the economic viability of DSM projects. This broader consideration of environmental risks and uncertainties also brought the precautionary principle into the discussion, particularly in the context of decision-making where potential environmental impacts remain uncertain.
- The discussion also considered why companies and sponsoring States may continue to pursue DSM projects despite uncertain financial prospects. One explanation offered was that securing an exploitation licence may itself create value, irrespective of whether mining ultimately proceeds, including through the potential subsequent transfer or sale of the licence.
- On the need for minerals for the defence industry and the role of DSM, it was mentioned that mineral volume and demand are smaller than those from transport and energy systems. This applies especially to rare earth elements, although it is less relevant to nodules.
- A further comment suggested adjustments be made to allow contracts, payments, and financial information more easily and publicly available. This would conform to best practise already in effect in 60 countries that are members of EITI, the land-based mining governance initiative.

I. The ISA & recent developments

The governance session featured a moderated panel discussion with two independent leading legal experts specialised in the intersection between the international law of the sea, ocean governance, international investment law and Part XI of UNCLOS. The rich discussions during the panel were followed by a Q&A segment with the audience.

Discussion highlights include:

- Understanding the historical context of how UNCLOS was negotiated and came into force is important to inform the interpretation and implementation of Part XI provisions in the present day.
- Recalling the historical context, the topic of unilateral mining – a threat that is resurfacing today – is not a new one. Similar concerns occurred in the 1960s, and again in the 1980s. Indeed, several industrialised countries chose to remain outside of UNCLOS, and instead, created their own Reciprocating states regime, which recognized each other's ability to assert claims over mining sites.
- This was resolved by the 1994 Agreement on Part XI of UNCLOS, which allowed UNCLOS to enter into force with almost universal acceptance. Today's concerns about unilateral mining have historical precedents and were previously addressed through international negotiation and compromise. If anything, the threat of unilateral mining in the past only increased resolve, solidarity, and support for multilateralism and collective governance.
- Since exploration activities have been ongoing for 25 years, the question arises as to whether entities holding ISA exploration contracts can assert that they have legitimate expectations that they will eventually receive contracts and favourable conditions to commence exploitation activities. The case for legitimate expectations typically relies on the existence of a promise from the regulator, but it is unclear whether this doctrine - which operates as part of investment treaties between a host state and a foreign investor- would apply in the case of the ISA, which has complex decision-making structures and is obligated to act on behalf of humankind.
- A contractor that has conducted exploration activities may have the right to submit an application to move to exploitation, but such approval on the part of the ISA is not a legal obligation, whether the doctrine of legitimate expectation can be relied upon to litigate against the ISA is uncertain, especially when good faith negotiations over the Mining Code are still underway.
- Case law and the experience of onshore mining disputes shows us that, absent very clear contractual language to that effect, mining investors have no legitimate expectation to transition from exploration to exploitation. Even if a contract were to promise the granting of mining rights, that could be only after the contractors' compliance with its own obligations and are able to meet regulatory requirements.
- The ISA has a unique regulatory arrangement, which is that the requirement for entities wishing to conduct activities to acquire sponsorship by states, and a crucial element is for states to exercise effective control over the entities that they sponsor. The ITLOS advisory opinion from 2011 confirmed this and highlighted the potential problem of "sponsoring states of convenience" if this is not properly regulated. Thus, an approach that goes beyond regulatory control and considers if the sponsoring State has practical control over the company's operations, decision-making and finances is critical.
- It was recalled that UNCLOS was negotiated under past assumptions which may not apply today. For instance, the potential economic case seems to have taken a turn from what was previously assumed. From a scientific perspective, many recent deep-sea discoveries have challenged what was previously thought to be a matter of fact. We now know that the deep-

sea is not devoid of life or detached from key ocean ecosystem functioning. Furthermore, there are other forms of knowledge, including traditional knowledge, that needs to be meaningfully integrated into the work of the ISA.

- Consequently, while needing to be mindful of the historical context of UNCLOS and how the Part XI regime evolved, decision-making today must integrate recent scientific knowledge and traditional knowledge, reflect current economic conditions, uphold equity considerations and integrate evolving environmental principles.
- Two key normative and legal developments that have evolved since the early days of UNCLOS which need to be taken into consideration.
 - The first is the recently entered into force BBNJ Agreement, for which member States would need to promote the biodiversity objectives thereunder when participating in ISA deliberations, and the second being the precautionary principle, which calls for erring on the side of precaution in cases of high uncertainty and risk.
 - Secondly, the normative value of precaution is also now being increasingly received and accepted in international investment law, which means that governments and regulators can rely on changes in scientific knowledge or other environmental conditions to revisit decisions.
- It was noted that the contributions of experts and academics are important to support informed decision-making at the ISA, which includes publishing papers, reports and briefs, participating in meetings and workshops, as well as presenting to ISA delegates through side events.

Concluding remarks

Following the three segments, Madam Secretary General, Leticia Carvalho of the ISA, closed the day by reaffirming that dialogue outside formal negotiations is needed in order to question assumptions and bring different forms of knowledge into decision-making. She emphasized the importance of bringing the main conclusions from the dialogues back to ISA delegates and encouraged the organizers to continue the tradition of convening the Dialogues at future Assembly Sessions.

The Dialogues also highlighted underwater cultural heritage and Indigenous perspectives in the context of the ISA's work. Held in conjunction with an exhibition on Port Royal's underwater cultural heritage, the event provided an opportunity to further explore the cultural dimensions of the deep ocean and the importance of ensuring that diverse knowledge systems and perspectives inform decision-making.

Conclusion

The 2nd edition of the *Deep Sea Dialogues* offered a timely, respectful, and multi-disciplinary space for reflection, convergence, and constructive challenge. It reaffirmed that decisions on the future of the deep seabed must be made:

- **First, on science:** our understanding of the deep ocean is advancing rapidly, but it remains far from complete, and indigenous knowledge still need to be fully recognised and utilised. Science is not static, and for this reason our decisions should not be predetermined. As new knowledge emerges, it must continue to inform policy and practice.
- **Second, on economics:** while opinions differed on future mineral demand, there was broad recognition that significant economic uncertainties remain. Robust, transparent and independent evidence is essential before assumptions about commercial viability can be treated as established.

- **Third, on governance:** the international legal and policy landscape continues to evolve. Given the historical development of UNCLOS and the Part XI regime, good governance requires informed decision making, stewardship of the common heritage of humankind, and developing a robust and equitable regulatory framework while remaining firmly anchored in multilateralism and the precautionary principle.

This event reminded participants that the greatest strength of the Deep Sea Dialogues lies not in reaching a consensus, but in allowing for open exchange and allowing for different views to be expressed. This ultimately helps promote better understanding of different perspectives and supports informed decision making. While the Dialogues series will need to evolve in tune with developments and topical interests of the ISA membership, it carries with it a solid foundation on which to continue building an informed, inclusive, and resilient path forward—one that ensures that the legacy we leave behind is one of stewardship.

Acknowledgements

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