



**Global Commons at Risk?  
Exploring Risks and Dilemmas of Deep-Sea  
Mining**

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## Abstract

A constant increase in the global demand for minerals has led to renewed interest in deep-sea mining. State and business actors line up to extract resources from the seafloor of the Pacific Ocean and commercial deep-sea mining could become a reality within two years. Whether to commence this practice divides scientists, states, private sector companies and other stakeholders. Paradoxically, while there is still considerable uncertainty regarding the environmental consequences of seafloor mining, the resources it could provide are vital for the global transition to a low carbon economy. International law defines the seafloor in international waters as a global common. Deep-sea mining in these areas therefore comes with even more complex considerations governing global resources. This paper explores the risks and dilemmas of deep-sea mining from the three perspectives of environmental harm, equity and interstate tensions. In doing so, the paper contributes to an understanding of the complex trade-offs governing new types of climate change technologies and illustrates the need for more robust governance of global commons.



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## Introduction

State representatives will in the meet in Kingston, Jamaica, in July 2024 with a seemingly impossible task ahead of them. Within one year, they must establish rules and regulations for the International Seabed Authority (ISA) on mining joint resources from the seafloor (Earth Negotiations Bulletin, 2024). The techniques of deep-sea mining (DSM), which have been largely unexplored, involve trawling mineral rich rocks from deep-seafloor sediments. DSM carries significant risks and uncertainties, and competing interests have led to diverging opinions on whether or how to proceed (Coffey, 2023; Hallgren & Hansson, 2021). Several scientific communities and states have urged a moratorium, temporary pause or ban on DSM, emphasizing that mining the seafloor will have negative effects on undiscovered species and could destroy yet another ecosystem in the name of resource security (Mehta, 2023; EASAC, 2023; Hallgren & Hansson, 2021).

At the same time, the path to net zero assumes electrification and the widespread deployment of green technologies, which require a continuous supply of critical raw materials and minerals (IEA, n.d.). Meeting this demand will become increasingly difficult and expensive as supplies at existing extraction sites decline, leading to higher mining costs (Chung, Ernest & Trainor, 2023). Thus, while DSM poses environmental risks, the resources it could provide are essential for the global transition to a low-carbon economy.

The ISA is responsible for regulating DSM in international waters. It is an autonomous international organization established under the 1982 United Nations Convention on the Law of the Sea (UNCLOS). UNCLOS states that DSM must benefit all humankind regardless of location, consider the interests and needs of developing countries and not harm the marine environment (UNCLOS, articles 140, 145 and 160). The urgent need to draft regulations is linked to the Small Island Developing State of Nauru, which in partnership with The Metals Company is pushing to begin large-scale commercial DSM in international waters. They plan to make an official application to the ISA in 2024 (Mehta, 2023). The ISA must “consider and provisionally approve” mining applications within two years of them being submitted, regardless of whether regulations have been finalized (Burton & Stanwa, 2023; Pickens et al., 2024). Nauru’s actions have therefore created pressure to finalize regulations. If the upcoming negotiation sessions fail, large-scale unregulated commercial DSM could commence in international waters in 2026.

Interest in DSM should be seen in the wider context of concern over how to meet future demand for minerals, which has a clear security dimension. Mineral supplies are unevenly distributed across the world, and a majority of the resources are in the hands of just a handful of states. Worries over dependencies being used as leverage to gain power and influence have led some actors, such as the European Union and the United States, to adopt diversification plans and bilateral agreements to diversify imports



(WEF, 2023; Blenkinsop, 2023:5). At the same time, export restrictions on critical minerals increased fivefold between 2019 and 2023 (WEF, 2023:5), indicating that states are taking enhanced measures to secure their domestic resources. This in turn has intensified the search for new mineral sources, making DSM an attractive option.

One area that has been identified as especially rich in nodules, and therefore of particular interest for DSM, is the Clarion Clipperton Zone in the Pacific Ocean. According to some estimates, this area contains more cobalt, manganese and nickel than all current land-based deposits combined (Chung, Ernest, Trainor, 2023). The Clarion Clipperton Zone is in international waters and does not belong to any state. Its seafloor and resources are therefore considered a global common and a common heritage of mankind in international law. It should therefore be considered humanity's joint heritage that belongs to us all, should remain in place for future generations and be protected from exploitation by individual states or private sector companies (IPBES, n.d.). Alongside environmental concerns, mining in this area therefore comes with additional complex questions regarding equity, access, benefit sharing and transboundary effects.

The complexity of DSM and the prospects of it being introduced in the near future highlights the need to increase our understanding of risks, trade-offs and competing interests. This paper explores this from the three perspectives of environmental risks, equity risks and interstate tensions, and discusses these in relation to the global commons and

UNCLOS principles. In so doing, the paper contributes to an understanding of the complex risks and trade-offs involved in governing seafloor mining and illustrates the need for more robust governance of global commons.

The paper first discusses DSM in relation to risk perceptions of other new or emerging climate technologies, and explains the practice and governance of DSM, including the current time pressure on the ISA. It then examines the risks of environmental harm, equity considerations and interstate tensions. The findings are summarized in the conclusions.

## **Governing risks in the green transition**

The renewed interest in seafloor mining can be viewed in the wider context of technological developments and increased climate unpredictability and resource shortages. Certain new technologies for reducing emissions or mitigating effects of climate change have been increasingly normalized in recent decades, and this paper argues that there is reason to believe that DSM could face similar trends – especially given global mineral demand and the tensions over mineral dominance and dependencies, which are incentivizing actors to look for new extraction sites. There is a risk that actors will prioritize the risks of missing out on new mineral resources over the risks that come with deployment of DSM.

Furthermore, agreement on how to govern new climate technologies and the risks they can come with has proved extremely





difficult. Examples of climate technologies that have become increasingly normalized include various techniques for carbon capture and storage, which are now included in states' and the IPCC's emission reduction trajectories despite the fact that they have been barely used at scale (Möller, 2019:2), as well as weather modification used to stimulate rain in locations such as China and the United Arab Emirates (Wei, 2023; Muwahed, 2024). Discussions in the United Nations Environment Assembly (UNEA) on preventing the use of and agreeing on governance of solar radiation management, such as spraying chemicals into the stratosphere to absorb light and heat, have not led to any regulation. Solar radiation management therefore remains uncontrolled even though it has the power to disrupt global weather patterns (Lo, 2024). In the past decade, there has been an overall increase in research and opinion on and interest in geo-engineering techniques that deliberately modify earth systems (Sovacool, Baum & Low 2023; Möller, 2020). Perceptions of seemingly "easy fixes" to climate change are intuitively tempting and drive governments to invest (Möller, 2019:2). However, all the above-mentioned techniques come with transboundary and/or environmental consequences.

In debates on various new techniques for mitigating climate change, an argument is sometimes made that *not* deploying them is a risk, as conventional global efforts to limit climate change have so obviously failed and new measures should therefore be tried (see e.g. Rokke, 2023; Hallgren & Hansson 2021; Jo, 2024, Möller, 2020). For example, a US Government report on geoengineering deploys a so-called 'risk-versus-risk'

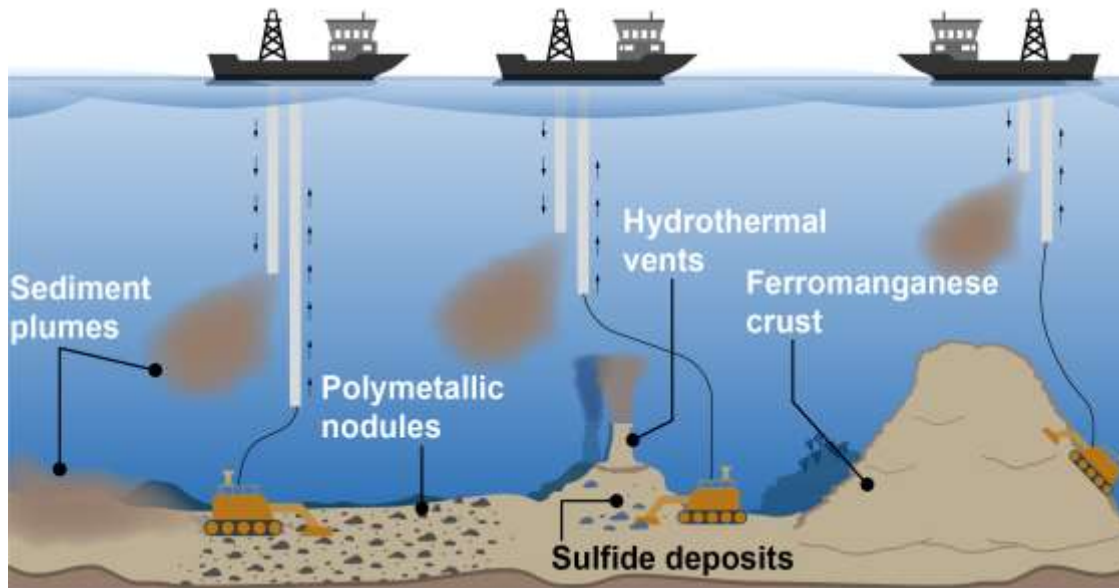
perspective, meaning that geo-engineering techniques are analysed and assessed from the perspective of the risks they raise against the risks of "non-action". In this context, non-action refers to current climate change risks without mitigation through geo-engineering (OSTP, 2023). Intuitively, the perspective of the risks of *not* deploying a certain technique creates a sense of urgency, due to a fear of missing out on a potential solution. With regard to DSM, Hallgren & Hansson (2021:7) note how seafloor mining is sometimes portrayed in the context of future resource security, framing it as essential for ensuring a steady supply of minerals, thereby legitimizing its place in the future of sustainable development. Framing it in this way emphasizes the risks attached to a lack of supply rather than the risks of the practice or of exploiting a global common. Thus, it can be argued that certain narratives feed into the sense that non-deployment is a risk.

## What is deep-sea mining

Deep-sea mining involves retrieving mineral deposits from rocks, or so-called nodules, on the ocean floor. These contain cobalt, copper, manganese, nickel and other minerals required to produce green technologies such as electric vehicles, solar panels and wind turbines (Trainer, 2022). This is done by sending a large robotic device from a surface ship to the bottom of the sea, in some places as deep as 5000 metres below the surface. Once on the seafloor, the robot functions as a large vacuum cleaner, sucking up the nodules along with about 10 centimetres of the sediment on which they lay, before returning to the surface. After sorting and cleaning the nodules, the



**Figure 1** Deep Sea Mining in Practise



Source: US Government Accountability Office (2021), <https://www.gao.gov/blog/deep-sea-mining-could-help-meet-demand-critical-minerals%2C-also-comes-serious-obstacles>.

sediment is dropped back into the ocean. In addition to the nodules, deep-sea hydrothermal vents, known as vent sulfides or ferromanganese crusts, are also rich in minerals. However, the process of extracting these crusts is considered more complicated. The Clarion Clipperton Zone in the Pacific Ocean has been identified as especially rich in nodules, which is why it has gained so much mining attention (Chung, Ernest and Trainor, 2023).

DSM techniques have been tested in smaller exploration projects, such as to assess potential mining areas and the quality of equipment, but no large-scale commercial DSM has yet taken place (Pickens et al., 2024). However, in 2023 Norway passed a law to reserve 280 000 square kilometres of its national seafloor area for deep-sea mining. This went against the advice of its own national experts, who had highlighted the possibility of severe environmental

impacts from DSM. Norway could permit private sector companies to carry out DSM in this area as soon as the autumn of 2024 (Bryant, 2024).

The question of DSM divides states, NGOs, scientific communities and private sector corporations. Among the states that favour DSM are China, Norway, Russia, Mexico, India and Nauru (Symons, 2023). Among the arguments in favour are that DSM is crucial to producing the technology needed for a green transition, that it is needed to break dependencies on dominant suppliers or that DSM can have fewer negative societal effects than land-based mining (Mehta, 2023; Amon, 2023; Guillot, 2024; Meredith, 2024). On the other side of the debate, several states and scientists are arguing for a moratorium, a temporary pause or an outright ban on DSM, emphasizing that mining the seafloor would have negative effects on undiscovered and unresearched species, and destroy another



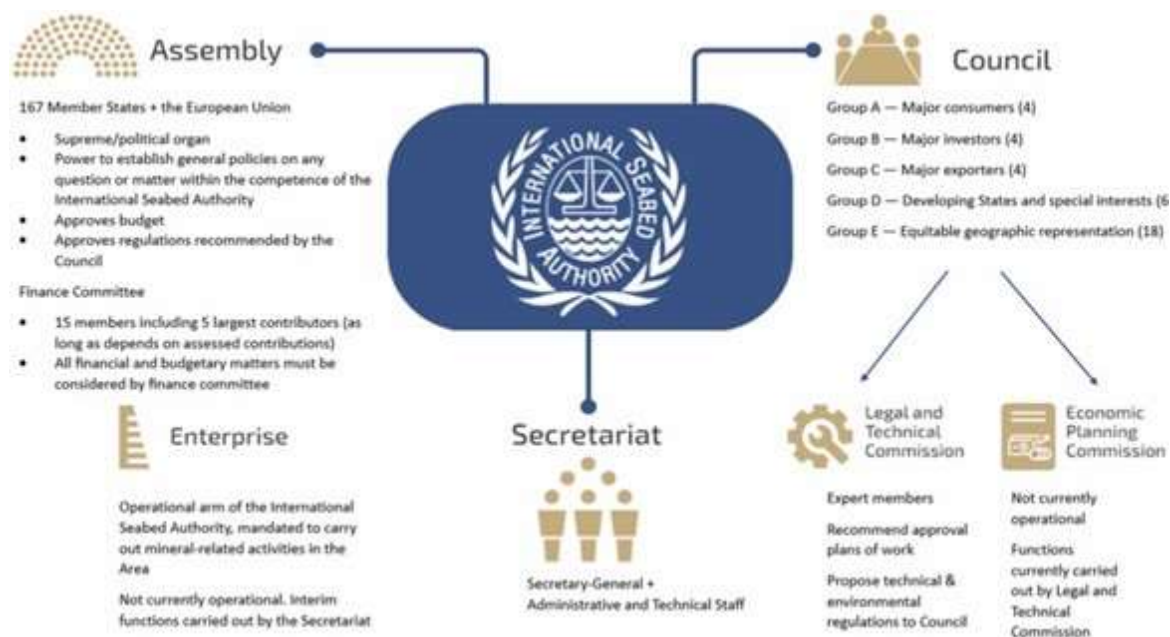
ecosystem in the name of resource security (Mehta, 2023; EASAC, 2023; Hallgren & Hansson, 2021). The EU, Switzerland, Chile and Brazil are among those urging a pause or ban on DSM (Symons, 2023). Private sector companies such as Volvo and BMW have also joined these calls, stating that they will not use minerals derived from DSM in their products (McVeigh & Michael, 2023). Other actors are less active in the debate, but some mineral exporting countries are concerned about how DSM could negatively affect their industries (Reid & Lewis, 2021; Gwyn Jones 2023).

## Increased time pressure at the International Seabed Authority

As noted above, the ISA, established in 1994 under the UNCLOS, is the entity responsible

for regulating deep-sea prospecting, exploration and exploitation. UNCLOS defines the resources of the high seas as a global common out of concern that resource extraction in international waters would be conducted for profit by rich countries despite the fact that these resources do not belong to any one state. A Maltese ambassador, Arvid Pardo, was especially prominent in establishing UNCLOS. In a famous speech in 1967, he argued the need for international regulation of the high seas as a measure to prevent monopolization and colonization of the seabed (Lodge, 2017). UNCLOS contains provisions on activities carried out in the seas beyond national jurisdiction (known as “the Area”), including on DSM. As noted above, these should benefit all of humankind irrespective of location, take special consideration of the needs and interests of developing countries and be done in a way

Figure 2 ISA organs



Source: International Seabed Authority. See: <https://www.isa.org.im/organs/>.





that protects the marine environment (UNCLOS, articles 140, 145 and 160).

The ISA was established with responsibility for activities on the seafloor in international waters and to implement more precise regulations in line with UNCLOS (UNCLOS:81). The ISA comprises an Assembly, a Council, a Secretariat and an organ known as the Enterprise. The purpose of the Enterprise is to carry out independent activities such as DSM in the Area and sharing the profits from these activities. However, the Enterprise is not yet functioning (ISA, n.d.). All parties to UNCLOS are automatically members of the ISA Assembly. There are currently 169 members (168 member states and the European Union). Despite being tasked with regulation of almost half the Earth's surface, the ISA is a relatively small and little-known UN body with an annual budget of around US\$ 10 million (Lipton, 2022).

States can apply to the ISA for two types of contracts: exploration contracts, which are for smaller scale testing of DSM equipment, areas and the collection of environmental data; and exploitation contracts, which are for large-scale DSM that has not yet been conducted. Thus far, the ISA has developed rules, regulations and procedures (RRP) for exploration contracts and issued 31 of them in the Area, covering 1.5 million square kilometres of seafloor (Pickens et al., 2024:2). The ISA has been working on drafting RRP for future exploitation contracts since 2014 but has failed to finalize these by negotiation. This is largely due to diverging views among ISA members and requests to hold off large scale DSM until research has been completed on its potential effects. However, the

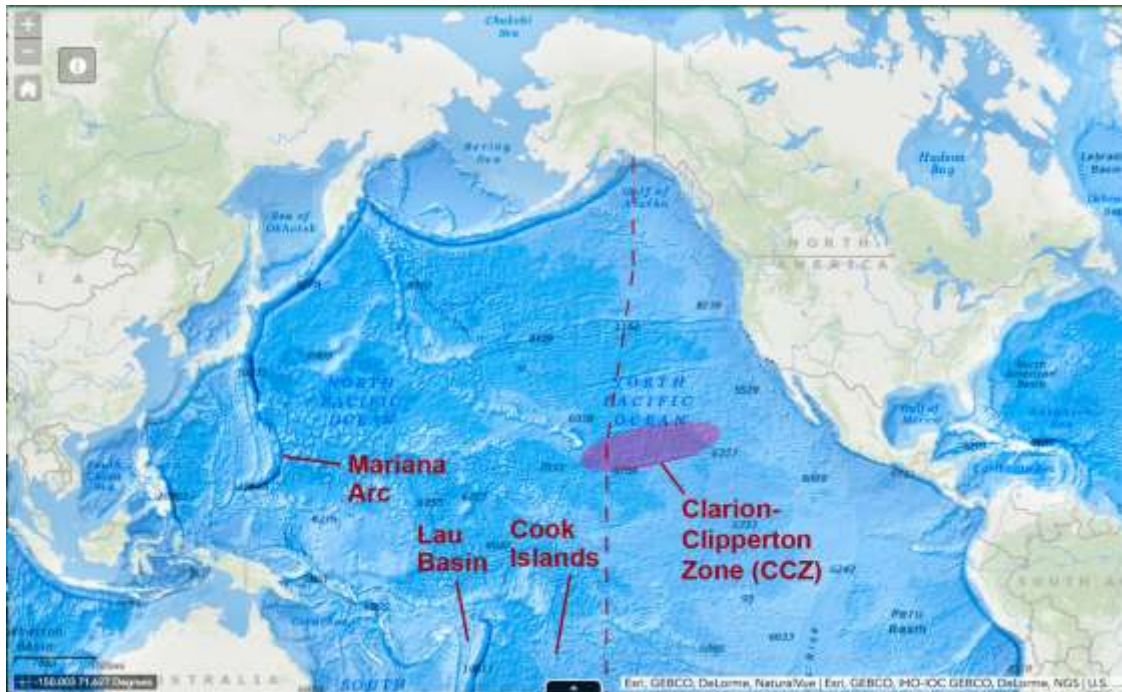
controversial two-year rule means that exploitation contracts for large-scale DSM could soon be approved without final regulations in place (Burton & Stanwa, 2023).

During its July 2023 negotiations, the pressure was on the ISA to finalize RRP for exploitation contracts. Nauru in partnership with the Metals Company notified the ISA in July 2021 that they would submit an application to mine the seafloor in the Clarion Clipperton Zone, triggering the rule by which the ISA Council must “consider and provisionally approve” mining applications within two years of submission regardless of whether it has finalized work on the regulations (Burton & Stanwa, 2023).

The July 2023 ISA negotiations failed to settle many outstanding issues (Pickens et al., 2024). Nauru and its partner company agreed to postpone mining but stated that they would resubmit their application in July 2024, which would trigger a new two-year period (Mehta, 2023). The ISA has stated that it will continue its work in an attempt to get regulations approved and adopted by July 2025. However, many see this as highly unlikely due to the number of outstanding issues (Pickens et al., 2024). The breadth and divergence of views on DSM (Pickens et al., 2024: Hallgren & Hansson, 2021) mean that there is no guarantee that the upcoming ISA negotiations will be any more successful than those in 2023, why commercial DSM could commence in the Area without agreed regulation as soon as 2026.



**Figure 3** Clarion Clipperton Zone



Source: Courtesy of the U.S. Geological Survey. See: <https://www.usgs.gov/media/images/locations-clarion-clipperton-zone>

## Environmental risks

The dilemma of how to ensure a supply of minerals essential to a green transition while avoiding environmental harm from extraction processes is of course evident in land-based mining too. However, DSM comes with additional considerations. Deep-sea ecosystems are inaccessible and expensive to research. There is therefore very little known about its fauna and ecosystems. What is clear is that life in the deepest waters has developed and adapted to an extreme environment, which is why species often live exclusively in these ecosystems and are unlikely to be found elsewhere on Earth. Scientists are working to conduct stocktakes and new species are frequently being discovered. A recent study found over 5000 previously unknown species in the Clarion Clipperton Zone, almost all of

which were unique to the region (Rabone et al., 2023). These kinds of stocktake studies provide a baseline that will be important for assessments of how DSM might affect ecosystems (McVeigh, 2023). For now, many scientists argue for a moratorium on DSM, partly because there is not yet enough information on what could be lost (ibid.).

A further environmental concern is that both the nodules and the ocean floor sediment layers were formed over millions of years, growing by approximately one millimetre every 10 000 years. The nodules are home to coral and barnacles, and there is uncertainty about the effects or their removal on the overall ecosystem. If the effects are severe, they would be irreversible as regrowth would take millions of years. Moreover, during their growth, the sediment and nodules sequestered carbon that some scientists



warn will be released if DSM is deployed (Chung, Ernest & Trainor, 2023).

Collecting baseline data is a precondition of the ISA's exploration contracts, which aim to increase knowledge of the natural condition of areas of mining interest and to evaluate the effects of DSM. However, establishing minimum data requirements is an outstanding regulatory issue for the ISA. In their absence, there are no standardized data requirements for contractors, which has led to variations in data survey design, sampling and distribution (Pickens et al., 2024:8). Scientists highlight that there is no established bank or list of species in these deep-sea areas, where the life of the deep sea is clearly categorized and data mapped. This has led to contractors and scientists using categorizations from other ecosystem areas, often leading to the incorrect identification of species or different researchers using different names for the same species. Mapping biodiversity in potential future mining sites under these conditions has become a severe challenge (Gothenburg University, 2023).

In addition, DSM creates underwater noise and artificial light, and destroys the top centimetres of seafloor sediments, with a risk that the unique deep-sea species living in them will be killed, and of extinction even before science has the chance to discover and categorize them. Indigenous communities in the Pacific have also raised concerns about DSM negatively affecting known fish species (Chung, Ernest & Trainor, 2023).

Outstanding issues for the ISA involve devising regulations in line with the UNCLOS

that ensure effective protection of the marine environment from harmful effects (UNCLOS, article 145). Such regulations have not been drafted, and proposals on definitions of "serious harm" have not been thoroughly discussed (Pickens et al., 2024:7). This particular issue encapsulates a key dilemma, as it would determine what level of harm, if any, is deemed acceptable – a question that divides ISA members (ibid.:8). Seen in a wider context, the dilemma relates to whether the potential for deep-sea mineral resources to support a green transition outweighs the potential harm to a largely unknown ecosystem during the extraction process. In turn, agreeing a level of "acceptable environmental harm" goes against the very idea of a global common, and risks creating a discourse that can be used to legitimize future exploitation of other ones as well.

## Equity risks

The ISA was established by UNCLOS to convert its principles into a regulatory framework, which requires it to consider equity aspects. However, concerns have been raised regarding existing mechanisms that allow private sector companies to reserve seafloor resources through developing states, as well as outstanding regulatory issues on benefit sharing and compensation to land-based actors.

## Benefit sharing and compensation

The prospect of contracts on extraction being approved as early as 2026 makes large demands on the resolution of various complicated outstanding issues such as payment regimes and compensation. In previous ISA negotiation sessions, several



African states – notably South Africa and the Democratic Republic of the Congo, two states heavily dependent on income from mineral exports – expressed concerns about the possible impact of DSM on their land-based mining industries. The resources of international waters are the common heritage of humankind, and the African regional group has highlighted that revenues raised must be shared between states, and that a precondition for DSM would be a system that compensates land-based miners for any reduction in profits (Reid & Lewis, 2021).

Alongside the question of compensation, the payment regime for seafloor mining concessions has been contested in ISA negotiations. This will require contractors to pay an amount to the ISA for the right to extract minerals, which is then intended to be redistributed to ISA members. However, modelling of how such a royalty system might look in practice has met resistance. One critique is that the suggested models do not sufficiently seek to create returns for humankind for the loss of global common resources, but are instead designed to suit the needs of contractors and private investors (Pickens et al., 2024:5). Incorporation of the environmental costs of DSM into any payment system has also been raised as an issue in recent ISA negotiations, but there have been no suggestions or decisions on how this could be implemented in practice (ibid.).

### **Private interests sponsored by developing states?**

One mechanism within the ISA regulatory framework seeks to reserve seafloor areas for developing countries. For every area

reserved for exploration, a corresponding area must be set aside for developing states (UNCLOS, article 170). Since the equipment required to conduct deep-sea prospecting, exploration and exploitation is extremely costly, these reserved areas can be accessed through a sponsoring system, whereby developing countries act as “sponsoring states” of private sector entities (Lipton, 2022). In recent years, a Canadian corporation, the Metals Company, has been especially active in this sponsorship system, and also been prominent in pushing the ISA to finalize its regulations. The Metals Company has access to three of the seven current exploration contracts reserved for developing states, through sponsorship by the Pacific Island States of Nauru, Tonga and Kiribati. The Metals Company states on its website that these countries are affected by climate change in different ways and therefore eager to contribute to electrification and a low-carbon society through DSM. It also states that Nauru has experienced degradation as a consequence of land-based mining as a large-scale phosphate exporter, and is therefore now “dedicated to ensuring that future extractive activities are done responsibly” (Metals Company, n.d.).

According to ISA rules, the sponsoring states should have effective control over the mining projects (ISA, 2014). However, emerging accounts of the dominance of the Metals Company in the Clarion Clipperton Zone have raised concerns regarding whether these Small Island Developing States are merely partners by name. It is not clear what financial arrangements have been made between the Metals Company and the sponsoring states, but it is known that all of





them have struggling economies, which is why some suspect that these partnerships are agreed more out of a lack of alternatives for economic development, and that they will bring more profits and benefits to the Metals Company than to the sponsoring states (Lipton, 2022). According to some sources, a subsidiary body of the Metals Company suggest paying only US\$2 per tonne of nodules to Nauru once deep-sea mining is up and running (Pickens et al., 2024:5).

Moreover, stakeholders and previous members of the ISA claim that developing states are left with no alternative but to work with private sector companies, largely due to the cost of DSM equipment and because the Enterprise organ of the ISA, which has a mandate to directly conduct activities in the Area and share their benefits, is not yet operational (ibid.:17). This means that UNCLOS' principal aims for DSM to benefit all of humankind and take special consideration of developing states seem to have fallen short, through a system that allows a loophole for private sector companies to reserve seafloor areas, the resources of which should belong to all of us.

Moreover, as the sponsoring system in its current form seems to be characterized by unequal power dynamics, economic dependency and a lack of clarity regarding compensation, it could be viewed through a colonial lens. Allowing commercial DSM in these conditions would therefore seem to go against the arguments that created UNCLOS in the first place.

## Inter-state tensions

In addition to the conflicting interests in the areas of environmental impact and equity, DSM has also led to conventional interstate tensions and great power rivalries, highlighting its security aspects. No large-scale DSM has yet taken place, but there is a worry that opening the door could lead to a “rush to the seafloor” as actors seek to ensure that they are not left empty-handed, or that other states do not gain too much influence in this area (Trainer, 2022). With regard to land-based deposits, the linkages between dependencies, supply chain needs and national security concerns have placed minerals in security contexts.

Where DSM has the potential to open up new mining sites, it could both exacerbate existing tensions and bring new dynamics to them. For example, despite questions on how beneficial the sponsorship system might really be for developing countries and Small Island Developing States, it makes them important actors in the ISA (Sidhu, 2023). Furthermore, increased interstate tensions and competition over these resources could lead stakeholders increasingly to view DSM through the lens of national security, which could create a sense of urgency that risks overshadowing other important considerations, such as environmental and equity concerns.

## Great power rivalry

While the US and the EU are import dependent for most critical minerals, China has large supplies of cobalt and lithium within its borders, owns mines in other countries and is also the country with the most ISA exploration contracts (Trainer,



2022). China has been a large financial donor and an active participant in ISA negotiations in recent years. On several occasions, it has expressed a desire to move the process forward and suggested that environmental rules should not be too strict (Woody, 2019). Moreover, China has made funding for “deep space, deep earth, deep sea, and polar exploration” part of its national security priorities (Murphy, 2022:25). The potential for China to become dominant in yet another mineral area by “winning” the rush to the seafloor has influenced US politics. The US has not ratified UNCLOS and is therefore not a member of the ISA, giving it limited opportunities to influence negotiations on DSM regulation. In addition, as a non-member, the US and US-based companies are not able to apply for ISA mining contracts, which means that the nodule rich Clarion Clipperton Zone is beyond its reach (Trainer, 2022).

This development has sparked new US domestic initiatives. Over 100 former US government officials, as well as an Alaskan Senator in a resolution (Khan, 2024), have urged Senate leaders to ratify UNCLOS (Bryan, Gabert-Doyon & Sevastopulo, 2024) as it would give the US a seat at the table in ISA negotiations. In addition, 31 Republican members of Congress have urged the US Secretary of Defense to investigate the threat posed by China’s DSM dominance (Khan, 2024). In late 2023, the US announced that it would expand its jurisdiction over the seafloor area around the Pacific and Atlantic Oceans and the Gulf of Mexico. These areas lie on the extended continental shelf of the US but outside its exclusive economic zone. The claim provoked reaction from both China and Russia, which argued that these areas

are outside US national jurisdiction and should be managed by the ISA (Bryan, Gabert-Doyon & Sevastopulo, 2024). This event highlights the geopolitical dimension of DSM and begs the question of how ISA dynamics would change if the US chose to ratify UNCLOS: Would it attempt to block initiatives to start exploitation contracts or would it work to fast-track them and try to recruit sponsoring states to compete with China’s mineral dominance?

### **European uncertainty**

Like the US, the EU does not have large supplies of critical minerals within its borders. It has made attempts to reduce dependencies by diversifying suppliers, for example through the Critical Raw Materials Act (Blenkinsop, 2023). On DSM, the EU has urged a temporary pause, citing the need for more research on the effects DSM could have on marine environments, the biodiversity of fisheries and food supply (Gwyn Jones, 2023). However, Europe as a whole is not united on this question. As noted above, the Norwegian Parliament has passed a bill to start DSM in its exclusive economic zone in the Arctic Ocean around Svalbard. Norway states that the decision is necessary to create the conditions for a green transition and to end dependencies on China and Russia (Meredith, 2024). One potential issue here is that Russia also claims rights to some of Norway’s planned area of DSM. Both are parties to the Svalbard Treaty and there is disagreement on how far from the Svalbard coast the principle of “equal economic access” should apply (Belton, 2023). Even though this disagreement does not relate to DSM in international waters, it illustrates the interstate tensions and territorial claims to which DSM can lead. Furthermore, the EU



member states France, Belgium and Poland all have exploration contracts, and some are looking into the conditions to allow sponsoring of future exploitation contracts (Gwyn Jones, 2023). Narratives on dependency and national security in this context could work to create a shift in position, were risks of this kind are put above risks linked to DSM practices. In time, taken together with a fear of missing out on mineral resources in the Clarion Clipperton Zone, this could work to normalize a shift in position. A future joint EU position on DSM is therefore not obvious.

## Conclusions

Deep-sea mining encapsulates many of the difficult risks and trade-offs that humanity must face in transitioning to a low-carbon economy. The competing views and interests within the ISA are likely to make governing and weighing risks against each other an increasingly difficult task. Concerns over environmental effects have been heightened by the time pressure on the ISA to finalize regulations, as it leaves little time to map the life and ecosystems on the seafloor in areas of mining interest. In its current form, the sponsorship system put in place to ensure equity has the potential to instead serve private interests and allow them indirectly to reserve global commons seafloor areas in opaque circumstances. At the time of writing, the outstanding regulatory issues on compensation and payment systems remain. Interstate tensions and competition, as well as worries over mineral dependencies place the question of moving ahead with DSM in the realm of national security, which could

create a sense of urgency that risks overshadowing other important factors. Moreover, as exemplified by disagreements over the US continental shelf and Norway's reserved area for DSM around Svalbard, tensions over DSM can come with increased disputes over seafloor borders.

Technological developments have made possible new types of climate intervention and mineral extraction. As discussed above, discourses on the risks of *not* adopting certain climate change technologies could over time work to portray them as vital to transitioning to a low carbon future, even where outstanding questions or risks remain. In addition to the risks of DSM in themselves, opening the door to seafloor mining brings with it the question of what it would entail for mineral extraction in other global commons. For example, Antarctica has never experienced mining and is currently safeguarded by the Antarctic Treaty. However, this treaty is set to expire in 2048, whereafter its protection from mineral extraction and territorial claims is unclear (Dodds, 2018).

Despite the legal definition of the high seas, Antarctica, the atmosphere and outer space as global commons and common heritages of mankind (IPBES, n.d.), the absence of more robust global common governance poses the risk of future resource exploitation. Future technical developments and growing mineral demand could further heighten this risk, enabling the most financially capable states to make profits from global commons resources that should not belong to any single nation.



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