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Talk to the Sea

Deep-sea mining, the arts,
and contesting narratives of extraction
in the deep ocean.

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Abstract:

The deep-sea may be on the verge of becoming the latest frontier for resource extraction of critical metals and minerals in order to build renewable energy technologies such as electric vehicles. This thesis examines the narratives used by the deep-sea mining company The Metals Company to justify the extraction of polymetallic nodules from the seabed in the Clarion Clipperton Zone in the Pacific Ocean. It also examines the counter narratives that critique this extraction. Additionally, it explores how the arts can play a role in disputing extractivism in the deep sea, with a focus on the role of the organization TBA-21 Academy in the deep-sea mining debate. I analyze these narratives utilizing the theoretical framing of resource and commodity frontiers from Anna Tsing and Jason Moore. From an in-depth literature review and 8 semi-structured interviews, I conclude that deep-sea mining depends on a framing of the necessity of supplying critical metals and minerals and improved extraction relative to land-based mining, as well as on the representation of the seabed as absent social connections, and lacking in biodiversity. The arts can play a critical role in communicating alternative conception, disrupting existing narratives of the seabed by bringing a cultural dimension to the debate.

Keywords: deep-sea mining, resource frontier, commodities, arts, extractivism, narratives, imaginaries.

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1. Introduction

1.1. The Next Mining Frontier

The integration of the ocean into globalized capitalism depends on narratives that justify and permit the extraction and exploitation of its biophysical resources. According to critical geographers Liam Campling and Alejandro Colás, the “the utopian reverie of a private, fertile and pacified island is the prevalent motif of neoliberal visions of the sea (...)”(Campling & Colás, 2021, 268). This narrative represents the ocean as a bonanza of resources ripe for the taking, with little to no resistance to unfettered extraction. The integration of oceans into global capitalism may be on the cusp of a new chapter with the recent push to begin mining the deep-sea bed.

While historically the deep ocean has been a zone for waste disposal, technological development has transformed it into a zone for resource extraction and exploitation (Ramirez-Llodra et al., 2011). The more recent foregrounding of economic activities with concern for the rapidly accelerating climate crisis adds yet another dimension to this shift. Powerful political and economic actors have begun to consider the ocean as an active ally for climate mitigation, as well as a potential material input for a sustainable global economy. This constellation of actors proposes a narrative of a “blue economy”, that “blends the vast unharnessed economic potential of the global oceans with socio-ecological sustainability” (Mallin & Barbesgaard, 2020, 121).

This thesis will focus on the example of deep-sea mining (DSM), endeavoring to gain insight into the underlying blue economy narrative of the deep ocean and associated narratives of resource extraction. Put simply, deep-sea mining refers to the efforts of a small group of mining companies and sympathetic

governments to extract rare metals and minerals from the deep-sea bed, or at depths below 200 meters, rather than from terrestrial deposits. These materials could be valuable for some renewable technologies such as electric vehicles and wind turbines, and demand is rapidly rising. The International Energy Agency (IEA) predicts that the total demand for minerals for clean energy technologies will either double or quadruple by 2040, depending on pathways of technology development (International Energy Association, 2022). Proponents argue that in order to meet this demand and secure the transition to a sustainable economy, vast expanses of the deep-sea should be opened up for extraction (The Metals Company, 2023).

Deep-sea mining is the latest “frontier” (Moore, 2010a; A. Tsing, 2003) of an insatiable mining industry, a new zone of potential resource extraction. As of yet, mining the deep-seabed has not yet begun, and mining operations only exist in the test and exploration phase. Opposition to deep-sea mining has recently taken on new urgency as mining could begin as early as 2024 (The Metals Company, n.d.). Environmental, civil society, and Indigenous groups are loudly voicing their opposition to deep-sea mining due to the potential of devastating ecological impacts and destruction of cultural heritage, as well as in consideration of dubious moral, ethical and economic implications . Meanwhile, large companies with public sustainability agendas like Patagonia, Microsoft, Volvo, and Google, have joined the call for a moratorium on deep-sea mining (deep-sea Conservation Coalition, n.d.).

1.2. Impacts of Mining the “Last Great Wilderness”

While deep-sea mining refers to several different forms of resource extraction, the most commonly discussed is the harvesting of polymetallic nodules that lie on the deep ocean floor, particularly in the Clarion Clipperton Zone (CCZ) in the Pacific Ocean. The CCZ is a vast abyssal plain of 4.5 million square kilometers, comparable in size to the continental United States. It lies between Hawaii and Mexico (fig. 3) (PEW Charitable Trust, 2017). Abyssal plains are flat areas of seabed at depths between three to six thousand meters (Encyclopedia Britannica, n.d.). Lying atop the abyssal plains in the CCZ are trillions of small rock-like deposits with high concentrations of metals and minerals, called

polymetallic nodules. Polymetallic nodules are small concretions that form naturally on these abyssal plains over periods of millions of years. A nodule forms around a nucleus (e.g., a fallen shark tooth) and grows slowly over time. As nodules form, they accrete layers of metals and minerals such as nickel, cobalt, zinc and copper. These materials are used in some electric vehicle batteries and other renewable energy technologies. Most are egg or potato sized, similar in appearance to black rocks. Nodules are one of few hard surfaces in the abyssal plain, offering an important habitat for marine animals (PEW Charitable Trust, 2017). These nodules thus represent a direct basis for the ecosystem in the deep ocean. There are an estimated 21 billion dry tons of nodules in the CCZ (Hein et al., 2020, 158). The vast quantities of nodules in the Clarion Clipperton Zone make the deep-sea bed a tantalizing potential extraction target for the next mining frontier.

So far, mining companies have only conducted small scale test operations but the basic method of extraction is already quite clear. Remotely operated vehicles (ROVs) or “collectors” are deployed from collection ships to the seafloor, attached via kilometers-long cables to the surface. Collectors dislodge the nodules from the seabed, and send them up to the collection vessel through the cables via mechanical pumps (The Metals Company, n.d.). Collectors have the appearance of enormous industrial vacuum cleaners. The nodules would then be processed and shipped to land.

The extraction process disturbs the seafloor and creates plumes of sediment near the extraction site, as well as closer to the surface. According to a report by the United Nations Environment Programme Finance Initiative (UNEP FI), these plumes may contain suspended toxic chemicals, and cloud the water column and thereby suffocate the surrounding ecosystem (UNEP FI, 2022, 24). The direct and indirect impacts of nodule extraction are thus destructive to the local ecosystem, as well as the larger ocean food web. The possible geographic scale of the impacts of large scale mining are also enormous. One study estimates that “over a 15-year period, a single mining operation could severely damage abyssal communities over an area of 50,000 km² and three mining operations might severely disturb a seafloor area half the size of Germany.” (Ramirez-Llodra et al., 2011, 11).

Since large scale mining operations have not yet begun, and due to limited scientific understanding of the deep-sea, there are huge uncertainties in regards to the ecological implications of deep-sea mining. The deep-sea biome is one of the least understood on earth (Ramirez-Llodra et al., 2011, 1), and is rarely visited by humans. While there exists a significant body of scientific literature on the topic, conclusions about the functioning of the deep-sea and the effects of mining are tentative at best. One recent review paper synthesized 306 scientific papers since 2010, and concluded that; “closing the scientific gaps related to deep-sea mining is a monumental task.” (Amon et al., 2022, 2) In spite of these uncertainties, there is a growing awareness that the deep-sea is a vital ecosystem that both underpins ocean biodiversity (Niner et al., 2018) and acts as a significant carbon sink (Atwood et al., 2020). Mining would thus occur in a poorly understood, but critically important ecosystem.

Remote and relatively insulated from human disturbance, the deep-sea is often characterized as a “pristine” (Fauna & Flora International (FFI), 2020) ecosystem or the “last great wilderness”(Ramirez-Llodra et al., 2011).The deep ocean certainly plays a role in carbon cycling, as microorganisms on the deep-sea floor consume and sequester carbon dioxide (Fauna & Flora International (FFI), 2020, 116) A recent study suggests that marine sediments store twice the amount of carbon as terrestrial soils (Atwood et al., 2020). The deep ocean provides 95% of the earth’s living space (DOSI, 2022). Most deep-sea ecosystems are “particularly sensitive to human disturbance” because they are “largely pristine, highly structured, very diverse, dominated by rare species and extremely slow to recover.” (Fauna & Flora International (FFI), 2020, 15) If the deep-sea is known to be both ecologically sensitive and important to the carbon cycle, why has it become the next proposed mining frontier?

1.3. The International Seabed Authority (ISA) and Governing the deep-sea.

Part of the answer lies within the governance of the ocean. Ocean spaces are organized and formalized under a multilayered governance structure which parses out legal and economic rights to states and private actors, from the shallowest coasts to the deepest depths. First and foremost is states' exclusive economic zone (EEZ), which entitles governments and private enterprises to the direct extraction of resources within 200 nautical miles of their coastline (NOAA Ocean Exploration, n.d.). Such activities would commonly include fishing, shipping, as well as oil and gas extraction. The remaining 54% of the ocean that falls outside of EEZs is simply referred to as "The Area", which is administered by a little-known international body called the International Seabed Authority (ISA).

The International Seabed Authority is a UN-appointed body meant to manage, regulate, and control all resources and human activities in the deep-seabed, while also protecting the marine environment from harm (International Seabed Authority, 2003). The International Seabed Authority was founded through the negotiations of the United Nations Convention on the Law of the Sea (UNCLOS) in 1982. Since 1994 ISA headquarters have been located in Kingston, Jamaica and meetings are held yearly. The organization is composed of three organs; The Council, The Assembly, and the Secretariat. The Secretariat is the executive body, and houses the office of the secretary general, currently Michael Lodge. The Assembly is the voting body of the ISA, with 167 states and the European Union as members. All signatories of UNCLOS are automatically members of the ISA (International Seabed Authority, 2003). The Assembly elects the decision making organs of the ISA, and approves all final decisions. The Council is a smaller organ of 36 members tasked with drafting ISA regulations. Additionally, the ISA has 99 observers comprising 30 states, 32 intergovernmental organizations, and NGOs. Observers may participate in the deliberations of the ISA, but do not have decision making powers.

The Area is considered the "Common Heritage of Mankind", or CHM, under article 136 of UNCLOS (*UNCLOS - Part XI, Section 2*, n.d.). According to article 140 of UNCLOS, all of humanity

is meant to benefit from the rich resources held in the ocean (ibid). The ISA is charged with drafting The Mining Code, the set of “comprehensive rules, regulations, and procedures issued by the ISA to regulate prospecting, exploration, and exploitation of marine minerals in the international seabed area (...)”(*The Mining Code – International Seabed Authority*, n.d.). The common thread running through these various governance structures from state’s EEZ through to the ISA and The Area, is that governance is primarily oriented around the conceptualization of the ocean as a space for resource extraction.

1.4. The Metals Company (TMC)

To understand the narratives emerging in favor of deep-sea mining, this study will focus on one of its most vocal proponents. The Metals Company (TMC), formerly known as Deep Green, is a deep-sea mining company based in Vancouver, Canada, that is perhaps closest to beginning operations to mine the seabed. The Metals Company holds exploration contracts for 52.5% of the available area designated by the ISA (Environmental Justice Foundation, 2023, 32). The Metals Company CEO, Gerrard Barron, appears regularly in the news media advocating the benefits of deep-sea mining, and dismisses critics and environmentalists. In public appearances Barron carries with him a polymetallic nodule to demonstrate his company’s product, which he refers to as “batteries in a rock”(Beiser, 2023).

The Metals Company has found favor with the governments of several Pacific islander governments, most notably Nauru. Under ISA regulations, private contractors must seek sponsorship from member states for permission to mine. In 2011, under the sponsorship of Nauru, The Metals Company set up a wholly owned subsidiary called Nauru Ocean Resources (NORI) (*NORI Project – Nauru Ocean Resources Inc.*, n.d.). The ISA granted NORI a nodule exploration contract. Since NORI is under complete ownership of The Metals Company, this thesis will continue to refer to The Metals Company rather than NORI, for simplicity’s sake.

In June of 2021, Nauru triggered the 2 year rule at the ISA (Reid, 2021). This was a historic juncture in the history of the ISA and deep-sea mining, because the 2 year rule theoretically requires the ISA to complete draft regulations to allow extraction to begin. Consequently, The Metals Company is perhaps the closest actor to actually begin mining polymetallic nodules in the CCZ. On the The Metals Company website, the company states it expects to begin small scale operations in 2024, and larger-scale production in 2025 (*NORI Project – Nauru Ocean Resources Inc.*, n.d.).

1.5. The Republic of Nauru

The Republic of Nauru is the world’s smallest island nation, 21 km sq, with a population of less than 12,000. The country has suffered from a difficult legacy of colonialism and resource extraction. In the 1960s and 70s, nearly the entire country was stripmined for valuable phosphate to be used as fertilizer (Doherty, 2016). Once known for its rich fertile land and biodiversity, due to this relentless environmental destruction, most of the island is now uninhabitable (EJOLT, n.d.). More recently, Nauru became “Australia’s dumping ground for refugees” by hosting a detention facility known for horrific conditions and abuses (Doherty, 2016). The country has a long history of corrupt governance and badly managed finances, leaving it heavily reliant on foreign aid. The difficult socio-ecological conditions on Nauru raises serious moral and ethical questions about its sponsorship of The Metal Company’s mining contract, and highlights the power imbalance between the two actors.

1.6. Thyssen-Bornemisza Art Contemporary Foundation (TBA)

One arts organization, the Thyssen-Bornemisza Art Contemporary (TBA) is directly participating and shaping the debate on deep-sea mining. TBA is an international art and advocacy foundation created in 2002 by the philanthropist and collector Francesca Thyssen-Bornemisza. Based in Madrid, with projects in Venice and Cordoba, the organization organizes exhibitions, educational initiatives and public programming with a focus on work that fosters social and environmental transformation (Thyssen-Bornemisza Art Contemporary, n.d.).

In 2011, the foundation established a research center called the TBA21-Academy. TBA21-Academy is an “incubator for collaborative inquiry, artistic production, and environmental advocacy” and seeks to foster “a deeper connection to the Ocean and other bodies of water through the lens of art to inspire care and action” (Thyssen-Bornemisza Art Contemporary, n.d.). TBA21-Academy runs an online community and education platform called The Ocean Archive, offering a virtual space for members to engage with academics, researchers, and artists thinking about the human-ocean relationship. The platform was “created to stimulate action and systemic change, the Ocean Archive fosters synergy among art, science, policy, and conservation to make a range of perspectives visible, discoverable, and understandable.” (*Ocean Archive*, n.d.)

TBA21-Academy is the only cultural organization with observer status at the International Seabed Authority (International Seabed Authority, 2003). The director of TBA21-Academy, Markus Reymann, first brought the organization to the International Seabed Authority in 2016, and successfully applied for observer status that same year (“On the Importance of Art and Science to Protect the Ocean,” 2021). In 2022 the Academy launched the project *Culturing the deep-sea* to respond to developments in the deep-sea mining field and facilitate a cultural shift in relation to the seabed. The TBA21-Academy regularly attends and participates in ISA meetings, including the most recent meeting in late March where they delivered remarks calling for a ban on mining (M. Dave & TBA21-Academy, personal communication, March 16, 2023).

Due to this unique history between TBA21-Academy and the ISA, I have chosen to focus my thesis on the work of the TBA21-Academy, and the community of researchers, artists, and academics that surrounds it. For the purposes of this thesis, I will be using the name TBA21-Academy, as this is the most accurate term for the involvement of the Thyssen-Bornemisza Art Contemporary in the deep-sea mining debate.

2. Aim of The Study

The purpose of my study is to investigate the process by which the deep-sea becomes a resource to be exploited, and how that process can be potentially interrupted via the arts and culture. My focus is squarely on narrative dimensions of this process, by which I mean a particular process of representation and storytelling about the deep ocean. Each actor engaged in the negotiations at the ISA puts forth their own narrative about the deep ocean. In my framework, The Metals Company represents the narrative that the deep-sea is a resource, while the TBA21-Academy represents the perspective that it is a space of deep ecological, social, and cultural significance. I have chosen this approach as a way of bracketing my research, but also because I am interested in the relationship between specific perceptions, or imaginaries, of natural environments, and how those imaginaries determine specific designs on those environments.

I propose that narratives in favor of deep-sea mining depend on the *articulation* of the deep-seabed as *a resource* under the blue economy agenda. Inspired by Jason Moore and Anna Tsing's work on commodity, and resource frontiers, I am interested in the way in which a remote and often forgotten ecosystem (the deep-sea) is *re-imagined* under green (or, rather, blue) capitalism as a resource. I argue that the deep-sea represents such a resource frontier. Tsing explains that resource frontiers are not so much a geographical place such as the edge of an unfelled forest, but rather an "imaginative project capable of molding both places and processes" (Tsing, 2003, 5102) deep-sea mining, while certainly a physical processes with material consequences, is thus also an imaginative project. This is especially true as intensive mining has not yet begun and considering that deep-sea mining primarily exists as an industry on paper. If the dominant deep-sea narrative is implicated with socio-ecological destruction, where can truly sustainable narratives be found?

I argue that in the case of deep-sea mining, the arts are an important tool for disrupting and critically questioning the narrative of resource-making in the deep ocean. My study seeks to answer exactly how

that can be the case. I consider the arts to be an important tool in articulating a more ecologically sound narrative of the deep-sea, as creative practices (such as film, works of fine art, etc.) can render visible remote and abstract environments that are generally far outside of the experience of human society. The process of rendering the deep-sea visible also invites a more complex understanding of this ecosystem, beyond a simplistic narrative binary of resource, or non-resource. Furthermore, creative practice creates space for marginalized perspectives that stand outside of hegemonic power structures. I am referring here to both western and non-western perspectives, with particular attention to longstanding Indigenous ontologies that have considered the deep ocean to already be a space of deep spiritual and cultural significance.

I endeavor to untangle the dominant, resource-centered vision of the deep ocean to try to reconceptualize the deep ocean with as much complexity as possible. My stance is that the arts are an especially effective tool in this regard, due to the inaccessibility of the deep ocean. It is this capacity of the arts to “bring closer” a remote ecology that can offer a foundation for narratives outside of extractivism. Artistic depictions of the deep ocean are an act of translation that renders an unseen space visible and vibrant. Visible spaces are in turn less vulnerable to exploitation and extraction.

2.1. Research questions

R1: Considering the example of The Metals Company, what are the key dimensions of the narrative that articulate the deep-sea as a resource?

As stated earlier, I consider The Metals Company to be the best example of the narrative that considers the deep ocean to be a resource. There are of course many actors that share this view, but as the most vocal proponent, and the closest to actually mining the deep-sea, I consider The Metals Company to be the ideal representative of this perspective of the deep-sea.

R2: What are the main counter narratives to the view of the deep-sea as a resource?

Since I am interested in the process of disrupting the resource-making narratives in the deep ocean, I have sought to provide an overview of some of the many counter narratives to resource making in the deep-sea. For this purpose, I have written an extensive literature review, and connected my findings to my data.

R3: Looking at TBA21-Academy as an example, how can the arts be used to consider alternative narratives of the deep-sea that go beyond resource extraction?

I have chosen the TBA21-Academy as my main example due to its focus on deep-sea mining and the negotiations at the ISA. Their participation provides a unique “on the ground” perspective on the role of the arts and on narratives of the deep-sea.

2.2. Methodological approach

Philosophy

My study will be informed by a critical realist approach. I have adopted this approach for a few reasons. One is that scientific knowledge of the seabed is limited, which demands both acknowledgement and critical reflection about any positivist claims made about it. This is particularly true of deep-sea mining interests, who frequently argue that their operations will use scientific management techniques to have “lightest impact on the marine ecosystem” (The Metals Company, n.d.-a). While there is certainly a significant and ever-expanding body of knowledge from the natural sciences about the functioning of the deep-sea biome, its ecosystem and geophysical processes, there are serious knowledge gaps and unknowns. For example, IPCC assessment reports acknowledge the importance of the deep-sea in carbon sequestration and biodiversity, but that same biodiversity is “largely undescribed” due to a lack of direct observation (Levin, 2021, 2). Still, my project deeply engages with natural science literature, and I frame many of my arguments from this body of work. My approach is to try to base my

conclusions, largely against deep-sea mining, in the best available science.

Another reason that I have pursued a critical realist approach is due to the quite clear connection between material observation and social construction in the deep ocean. Conditions in the deep ocean are so extreme that humans cannot experience this environment directly. Perception of the seabed is always mediated through specific technologies such as remotely operated vehicles (ROVs) equipped with specialized cameras and sensors to “see” an otherwise hidden world. This is the world experienced through the “pixelated zoom” of digital technologies that (re)construct the natural world according to logics of economic growth and resource extraction (A. Tsing, 2003, 507). While I consider the deep-sea to be an observable entity, current scientific knowledge cannot provide a holistic picture of this ecosystem and its functioning. The mediating role of technology between the seabed and human systems of understanding and management is a reminder that “conceptualizing the world and making the world are wrapped up with each other.” (ibid., 506) - that the seabed is a material reality and a social construction, underlining the relevance of a critical realist approach.

Using a critical realist approach to take aim at the social construction of the seabed allows my project to investigate how the process by which socio political actors use narratives to define resources. I do not refute that a polymetallic nodule is a potential material for the creation of valuable technologies. I would argue instead that this definition is as notable for what it leaves out as what it includes. A nodule, for example, is just as critical to the formation of the deep-sea ecosystem as it is for the manufacture of a lithium battery. Once the deep-sea is defined as a resource, this other definition as an ecosystem is conveniently discarded. My aim is to use the knowledge from my research to dismantle an extremely limited perspective of the deep-sea as represented by a singular notion of “resource.” By taking a critical realist approach, I am able to distance myself from hegemonic and extractivist narratives, and leave my project open to alternative interpretations of the seabed.

Ontology & Epistemology

From an ontological standpoint, my project is interested in opening up knowledge of the deep-sea beyond the basic ontological category of “resource.” In consideration of, for example, Indigenous ontologies that have long considered the seabed a space of deep cultural and spiritual significance (V. Tilot et al., 2021), it becomes clear that the dominant western notions of the deep-sea are limited. My stance is that diverse ontologies must be considered if the deep-sea is to be considered anything other than just a resource.

The limited knowledge of the deep ocean has some significant epistemological implications. Knowledge claims about this environment cannot fully be considered distinctly defined truths. Often they are in fact best guesses about a highly complex and poorly-understood system. For the purposes of my research, this can make evaluating knowledge claims challenging, as this epistemological limitation leaves much more room for interpretation than might be possible in other realms of knowledge. This also means that there is much more room for the possibilities of bias in claim-making. Mining companies and their detractors make appeals to positivist natural sciences to justify their perspectives. To work with this epistemological uncertainty, I have opted to approach the topic according to the best available knowledge and tried to make evaluations based on the burden of evidence. By that I mean: what is the most likely reality about the deep-sea, its function, and its component parts?

2.3. Theoretical and analytical framework

The general theoretical framework of this paper will be rooted in the neo-marxist critique of capitalist extractivism. Indeed, one of my assumptions about deep-sea mining and the actions of The Metals Company and the International Seabed Authority, is that they are products of “a neo-mercantilist drive on the part of state and affiliated fractions of capital to claim potentially valuable resources perceived as globally scarce.” (Zalik, 2018, 344). Born out of geopolitical resource competition, this drive is fuelled by speculative capital and “pioneer investors” (ibid., 346) that encourages the emergence of an extraction regime at the ISA in the name of seeking profitable returns on investment. Echoing

this sentiment, I consider deep-sea mining to be yet another iteration of neocolonial extractivism which should be viewed as an inherently “socio-ecologically destructive process of subjugation, depletion, and non-reciprocal relations (...) that is diametrically opposed to concepts of sustainability.” (Chagnon et al., 2022, 762). My theoretical framework thus assumes that deep-sea mining is an inherently destructive activity, but seeks to answer how exactly that destruction is permissible under the label of “resource.”

My interest in the notion of resources is connected to analysis of the commodity form. For deep-sea mining, this is best articulated under the concept of resource frontiers, and the related concept of commodity frontiers. This literature aims to describe the process of identification, enclosure, and extraction of biophysical material, and its repackaging for sale as a global commodity. The governance regime of the International Seabed Authority and the operations of mining companies seeks to transform the polymetallic nodule fields of the Clarion Clipperton Zone into a product for sale on the global market. Through this process, the seabed becomes a resource, and nodules commodities. I am inspired by the work of Anna Tsing and Jason Moore, which denaturalizes the definition of nature as a resource. In her paper “Natural Resources and Capitalist Frontiers”, Tsing asks: “How does nature at the frontier become a set of resources? How are landscapes made empty and wild so that anyone can come to claim them?” (Tsing, 2003, 5101). These questions are central to my research project and are particularly relevant to an ecosystem that has not yet been fully identified as one for extraction.

My interest from the outset of this project has been on defining the specific mechanism through which nature is transformed through human narratives into a set of resources. How exactly is this accomplished? From Moore’s perspective this is done via the commodity form (Moore, 2010a, 41). He explains

We begin and end with the transformation of production, and therefore begin and end with the production of nature in a thoroughly modern sense. At its core, this was the tendency to treat nature as

a 'free gift', through which ecological wealth is extracted in unsustainable fashion, a contradiction resolved and extended through successive moments of geographical expansion.

The history of the management of the deep-sea so far reveals this logic, in the successive processes of enclosure and expansion into the furthest and least-touched realms of the ocean, and the perception of the nodule fields as resources, or a "free gift" simply awaiting extraction.

In my view, the deep ocean represents one of the furthest "edges" of the expansion of resources, the most remote frontier¹. In the case of the deep-sea- where, critically, actual resource extraction has not fully begun. The actual process of removal of vast quantities of polymetallic nodules from the seabed exists primarily in the realm of the imaginary, which is built in turn on certain narratives. While there is an actual geographical process occurring in mining test sites and in the mapping work at the ISA, deep-sea mining exists mostly on paper.

A cursory look at the website of The Metals Company presents an imagined view of the deep-sea that is both bountiful in its resources, and neatly and calmly managed by advanced human-technological systems. It is a glossy projection of a future industry not yet realized. Here we see the strong influence of a techno-optimist vision for human-ecological relations, and the centrality of the techno-fix paradigm, defined as the belief that: "advanced technology alone will extricate us from an ever-increasing load of social, environmental, and economic ills." (Huesemann & Huesemann, 2011, xxiii)

In consideration of this glossy image of deep-sea mining, I felt it natural to incorporate other work on resource frontiers that are more focused on the imaginary, making Anna Tsing an excellent interlocutor to Moore. I view the geographic and imaginative dimensions of deep-sea mining to be co-constitutive processes. What is key here is not simply the description of a geographic development in the physical enclosure of the seabed for mining, but also the ontological dimension, or the process of "making" a

¹ Save, perhaps, a possible future in space mining.

resource through certain narratives. My perspective is that the epistemological (what knowledge) and discursive dimensions (the deployment of certain kinds of knowledge claims) of deep-sea mining are equally important to the material dimensions (the process of extracting nodules).

Beyond my theoretical framing from neo-marxist literature, my theoretical understanding of the role of the arts stem from the work of critical cultural theorist Malcolm Miles. Miles offers a cautious, yet hopeful, endorsement of the potential for critical aesthetics to impact socio-ecological narrative. In his book *Eco Aesthetics: Art, Literature, and Architecture in a Period of Climate Change*, Miles proposes that art can be used as a form of *interruption* of the dominant narrative (Miles, 2014, 143). Miles views the arts as a provocation, rather than a solution. By provoking a debate, it interrupts the steady march of appropriation of land and resources by capital and states. Considering deep-sea mining has not yet begun, such an interruption could not come at a more critical moment.

Building on the premise that art can reach a wider public than scientific data, Miles acknowledges that art “cannot change the world - it is part of it, and the conditions of production are always present in the artwork.” And yet “it might contribute to facing the forces and trajectories which appear to bring it [the world] closer to destruction (...)” Furthermore, “the boundary between art and activism is not rigid but fluid and endlessly negotiable.” (Miles, 2014, 158). TBA21-Academy fits this fluid conceptualization: representing an entity somewhere between an arts organization and an activist group.

Miles builds his theory off of the work of Herbert Marcuse, who argued for the role of the arts in moments where radical political change is so unlikely as to appear impossible. Miles summarizes Marcuse as follows: “Art interrupts the codes and structures of perception which affirm the social order, while beauty fractures its surfaces” (Miles, 2018, 6). I will return to the theme of *interruption* throughout my project, seeking to identify the ways in which the arts can interrupt the coding of the deep-sea as a resource. Miles argues that Marcuse’s theory that art renders dominant realities “unreal” is

helpful in a moment of a rapidly accelerating climate crisis and dire political impasse (ibid., 8). If the deep-sea mining industry is propped up by the naturalization of the dominant social order, under which resource extraction is the norm, then arts can serve to denaturalize that same reality.

2.4. Key concepts developed and applied in the thesis

First and foremost, my project began with an inspiration from Anna Tsing's concept of resource frontiers. According to Anna Tsing resource frontiers are not so much about specific geographic spaces, but rather an "imaginative project capable of molding both places and processes." (A. Tsing, 2003, 5102). The remoteness of the deep ocean makes this imaginative project particularly relevant. Instead of seeing resources as given, Tsing argues that they are instead "formed" on the frontier by powerful political actors. (ibid., 5101) Throughout my research process, the concept of a resource frontier has remained at the forefront of my thinking on deep-sea mining.

A related concept is Jason Moore's commodity frontiers. Moore argues that commodity frontiers represent a distinctive moment in European capitalist development where populations and settlement began to follow commodities, rather than the other way around. (Moore, 2010, 35) He also argues that modern capitalism "resolves" previously limiting processes of resource exhaustion via constant geographical expansion (Moore, 2010, 189). The deep-sea, as one of the last unexplored places on earth, is also one of the few spaces remaining for such expansion. I see solid common ground between resource frontiers and commodity frontiers as both are based on fundamental critiques of a capitalist-driven process of material extraction and ecological destruction. The difference is that resource frontiers speak more to an abstract conceptualization of this process, while commodity frontiers are more directly aimed at the specific economic form of the commodity. I use both to capture the material and the discursive dimensions of resource making.

2.5. Research methods and instruments to be used

Data Sources

My principal method of investigation is qualitative. I have conducted 8 semi-structured and in-depth interviews on my topic with academics, researchers, and journalists who are directly involved in the ongoing discussion around deep-sea mining. One of my interviews was with a representative of The Metals Company. In addition to these interviews, I carefully examined material on The Metals Company website.

I identified most of my sample through preliminary research into the work of TBA21-Academy, and through following their programming on the Ocean Archive. I also spoke with an unrelated legal expert engaged with ocean conservation on deep-sea mining who requested that they remain anonymous. I also spoke with a representative of The Metals Company. I was surprised that The Metals Company agreed to an interview with me. I simply contacted the company through their public-facing contact form, and heard back relatively quickly. In seeking an answer to my first research question, which is squarely focused on the narrative presented by The Metals Company, I felt that I had to try to get an answer from the company directly. Finally I interviewed Ian Urbina, a journalist specializing in ecological and environmental crimes at sea, and the founder of the Outlaw Ocean² project.

My preliminary investigation into the TBA21-Academy was an excellent way to lay the groundwork for my own research, and became a gateway for further critical literature on deep-sea mining. By choosing subjects that had previously been involved with the work of TBA21-Academy, I could be confident that my sample would be relevant to addressing my third research question on the role of the arts in the deep-sea mining debate. Working with their platform also expanded the scope and breadth of my analysis, encouraging me to consider my topic from multiple dimensions that continued to expand as my research went on. Part of my sample emerged via the snowball method. At the end of each interview I asked my interviewee if they had another relevant contact to recommend that I speak

² <https://www.theoutlawocean.com/>

with. This method was very beneficial to my research process, as it provided helpful introductions and connections to contacts that I might have otherwise struggled to reach.

Below is a table summarizing the identity of my respondents, and their organizational affiliation. I have chosen to anonymize those who brought up any potential concerns expressing views that might impact their work.

Name	Occupation	Organization
Ian Urbina	Journalist	Outlaw Ocean
Fiona Middleton	Academic/Researcher	TBA21-Academy
John Childs	Academic	Lancaster University
Pradeep Singh	Academic/Legal Expert	Potsdam University
Anonymous	Legal expert	Ocean Conservation
Markus Reymann	Director	TBA21-Academy
Mekhala Dave	Researcher	TBA21-Academy
Rory Usher	Public Relations Manager	The Metals Company

Table 1. Table summarizing respondents identity, occupation, and organizational affiliation.

Interview Structure

My interviews were conducted with a quite open structure, but I began with an interview guide (appendix I) to try to guide my respondents towards my specific research questions. In addition to the interview guide, I conducted as much contextual research into each interview subject as I could. This often entailed reading previous publications, watching recorded interviews and online content. In

short, I aimed to come to each interview as informed about my subject as I could, to aim for the most in-depth discussion possible.

My initial notion of loosely following this interview guide did not remain consistent through the data collection process. Conversations became very free-flowing, but always centered on notions of narrative and the role of the arts. At the beginning of each interview I would introduce my project in as simple terms as possible. I aimed to not impose my own views and positions on the topic, and hear the perspective of the subject as clearly as possible.

Content Analysis

I reviewed transcripts of my interviews using the content analysis method. I recorded each interview using the audio recording software Audacity, and then transcribed them with the assistance of the interview transcription software tool Otter.ai. I then reviewed each interview transcript to ensure accuracy. Once I had been through each transcript, I used the coding software NVivo to identify major themes in my research. My coding process was tailored to my research questions. I aimed to identify themes that ran across my interview data, and group relevant statements from each interview under the same set of codes (Appendix 3). My coding process was relatively open and subjective. I used codes as an organizational tool to identify key messages from my transcripts, rather than a strict analytical category for my data.

2.6. Limitations

There are a few key limitations to my research design. First and foremost, I am relying heavily on one source of data, qualitative interviews. While this allows me to go into depth with my analysis, it also limits the scope of what I can achieve with my research. One way in which I sought to overcome this limitation was to triangulate my results with a thorough literature review. Additionally, since I am an

individual researcher, I have to rely on a relatively small data set, in my case 8 interviews. Moreover, my data set is biased in a critical direction. Most of my sample came from a self-selected group that are already quite firmly against deep-sea mining. I have only a single data point from an opposing perspective, my interview with The Metals Company, off which to compare these critical insights.

Another limitation of this research is its vulnerability to my own bias as a researcher. While I do not believe that completely unbiased research is possible, I have approached my topic from a pre-existing interest in a particular theoretical and critical framework, outlined above. I am biased towards data that confirms my stance as a researcher that the deep-sea in fact should not be considered a resource.

2.7. Research Ethics

I do not see any glaring ethical issues with my research. In some cases, I have opted to anonymize my data, in case their responses might impact them. work. In most cases this was not an issue, but I felt that it was a best practice to err on the side of caution. I also made sure to gain verbal consent to record them for my research. At the end of my thesis process, I sent each respondent a consent form to confirm their participation in my project (appendix II).

In all of my interviews, I tried to communicate clearly that I was grateful for the participants' time. I have offered to share my final project with all participants, in a small act of gratitude and reciprocity. I had some concerns about interviewing The Metals Company, as I was deliberately vague about my exact critical stance towards the topic. However, I justified my deliberate vagueness in the name of gaining the most relevant data possible from this interview. I felt that if I outright stated my own opposition to deep-sea mining, the representative of the company would immediately jump to a defensive response and not meaningfully engage with me.

3. Literature Review

My intention in providing a thorough literature review is two-fold. First, it is to contextualize the responses that I gained through my interview process. Second, it is meant to highlight the multiple angles of critique of deep-sea mining. Since my project is oriented around a small sample of interviews, I felt that an in-depth literature overview would help to ground some of the findings of my data, and give the necessary context for more in-depth conclusions.

Governance of the deep-sea

From the perspective of political ecology, there is much emphasis on how ocean space is formally integrated into the state system, and the consequences of that integration. The United Nations Convention on the Law of the Sea (UNCLOS), adopted in 1982, formalized the legal regime that governs all maritime activities and represented a spatial reorganization that was the largest single enclosure in history in terms of area incorporated (Campling & Havice, 2014, 714), and thus represented “a profound rewriting of the earth” (Childs, 2022, 3). Spatial reorganization in the ocean challenges the “terrestrial bias” of the state system, as some states are composed of more seabed than land (ibid). States might better be understood as *terraqueous* (Campling & Colás, 2021, 16)

Much of targeted resources relevant to the deep-sea mining industry fall outside of State’s formal control, in an ocean space named “The Area.” And yet, the ISA requires that deep-sea mining companies seek state sponsorship in order to be eligible for extraction rights (Brent et al., 2020, 39) The complicated system of governance is geared towards the arrangement of ocean space according to activities that (might) generate the most profit, like deep-sea mining (ibid, 40). Legal scholars also point how the fractured governance has prevented an integrated approach to regulating the deep-sea, and that the ISA is too weak a regulatory body to take on this task (Christiansen et al., 2022). Governance of the ocean, and particularly the deep ocean, is as wide-reaching as it is imperfect, and is defined around an orientation towards resource extraction.

Political ecology

deep-sea mining is inextricably tied up with the state-led process of territorial expansion into ocean space in the search for new resources. According to critical ocean geographers Zoe Brent, Mads Barbesgaard, and Carsten Pedersen, and building on the work of David Harvey, this dialectical process is a “Blue Fix” where the inner contradictions, such as the need for ever-increasing amounts of metals and minerals for renewable technologies, of a capitalist economy are resolved via geographical reorganization and expansion (Brent et al., 2020). Deep-sea Mining exemplifies this tendency, as it represents a geographic frontier that has not yet been exploited.

Notions of “Blue Growth” underpin the expansion of extractive industries to more extreme geographies in the deep ocean. However, the extreme conditions of the deep ocean and complicated governance structures have created barriers to the expansion of capital into the deep-sea (Mallin & Barbesgaard, 2020, 127). While on the one hand the ocean presents ample opportunities for economic gain, the geophysical behavior of the ocean also resists the easy expansion of capital due to the ocean’s “distinctive materiality” (Campling & Colás, 2021, 25). The difficulty of expanding extractive activities into the ocean helps to explain why deep-sea mining has not yet begun.

That difficulty is reflected in the main governing body for the deep ocean, the International Seabed Authority, and the boom-and-bust cycle of mining companies seeking to begin extraction operations. Critics regularly describe the International Seabed Authority as a poorly functioning organization that is “not fit for purpose” (Deep-sea Conservation Coalition, 2022), that engages in possibly corrupt practices and suffers from staffing issues. The agency, which is responsible for governing 50% of the surface of the planet, has only 50 employees and a budget of 10\$ million, and documented instances of improper data sharing with mining companies (Lipton, 2022). Investment in deep-sea mining companies has been equally suspect, and many early mining ventures have failed spectacularly. The main predecessor of The Metals Company, Nautilus Minerals, received nearly 600 million in

investment between 2006 and 2018, only to be liquidated in 2020 (Mallin & Barbesgaard, 2020, 127-128). The turbulent image that emerges from the history of the expansion of extraction into the deep-sea is a reminder that this space has yet to be fully designated as a resource, and rather that deep-sea mining remains an unfinished project rather than a guaranteed future industry.

Huge unknowns and uncertainties

The natural science literature frequently emphasizes how little is known about the deep-sea and its ecosystems, leading to calls for more scientific exploration and research before any mining activity can be responsibly considered. A recent review study asked a wide range of relevant stakeholders to identify the main scientific gaps that might prevent responsible decision making on deep-sea mining. Seventy one percent of the respondents identified a lack of comprehensive environmental baseline information (Amon et al., 2022, 11). Another recent report by the UN environment programme identified a “paucity” of scientific knowledge, and concluded that “at present, no robust, precautionary approach exists to safeguard the ocean against the potential ecological impacts of deep-sea mining.” (United Nations Environment Programme Finance Initiative, 2022, 10).

Biodiversity loss and sensitive ecosystem recovery

Despite the current level of uncertainty of deep-sea mining’s impact, there is a scientific consensus that this activity is likely to be hugely destructive to both biodiversity and the carbon cycling capacity of the ocean. A March 2023 report from the Environmental Justice Foundation states that the deep-sea may have biodiversity levels comparable to that of rainforests (Environmental Justice Foundation, 2023, 7). The organization Fauna & Flora International issued a report in 2020 which assessed the risks and impacts of deep-sea mining on marine ecosystems. The report highlights that the same spaces of the seabed relevant for deep-sea mining are also biodiversity hotspots, and that ocean systems are interconnected due to the mixing of different seas (Fauna & Flora International (FFI), 2020, 5) It also

states that polymetallic nodule fields, on the abyssal plains, harbor higher concentrations of life than surrounding areas, with almost half of species present new to science (ibid, 95) From a biodiversity perspective, as it turns out, the same target of the deep-sea mining industry is a vital, unique, and thriving habitat.

The range and potential breadth of these impacts is vast, with some dimensions better understood than others. The sound pollution alone from mining activities may have huge impacts for marine life, such as whales, that depend on sonar for navigation (Williams et al., 2022). However, the noise impact is overlooked and poorly understood (ibid.). Sediment plumes from mining activities would likely interfere with feeding activities, smother surrounding habitats, and spread potentially toxin-laden waters far afield (Fauna & Flora International (FFI), 2020, 15). Due to the extreme conditions of the deep ocean which slow down biological processes, and the recovery of species that live on the nodule fields, as well as near deep-sea mining extraction zone, will also likely be extremely slow, ranging from thousands of millions of years (Amon et al., 2022, 9) Another perspective article concluded that biodiversity loss was inevitable “and may be considered ‘forever’ on human time scales” (Niner et al., 2018, 9).

Harming the carbon cycle

The role of the deep-sea in the carbon cycle is increasingly a cause for concern, and undermines the sustainability claims of the deep-sea mining industry. Marine sediments are “one of the most expansive and critical carbon reservoirs on the planet”, and are also extremely sensitive to disturbance (Atwood et al., 2020, 1). Microbes on the deep-sea floor act to sequester carbon, and deep-sea mining could disrupt these processes, and the impact would likely be “irreversible” (Fauna & Flora International (FFI), 2020, 19). Disturbing the seafloor would reinject stored carbon into the water column, and exacerbate ocean acidification (Environmental Justice Foundation, 2023, 23).

Rights of nature

The legal concept of the rights of nature recognizes the right for nature to exist and to maintain its own natural cycles, rather than to simply be conceived as a resource to be exploited, as under most legal codes. The rights of nature is not something radically new, but closely aligned with longstanding principles in “Indigenous philosophy and governance systems that emphasizes the interconnectedness of humans and nature and treat nature as a partner and a relative, rather than as a property and as a resource” (Harden-Davies et al., 2020, 3). A rights of nature approach to the management of the deep ocean and the ABJN would almost certainly either outright deny or highly constrain deep-sea mining activities.

Calls for banning deep-sea mining

Recent high profile denunciations of the ecological destruction wrought by the potential of deep-sea Mining range from David Attenborough to a documentary narrated by US actor Jason Momoa (McVeigh, 2020). These famous voices join a chorus of environmental organizations, activists, Indigenous groups, NGOs, and civil society groups that have long emphasized the potential for massive ecological harm due to mining the seabed (Deep Sea Conservation Coalition, n.d.; Fauna & Flora International (FFI), 2020; Greenpeace, 2023).

Indigenous perspectives of the seabed

Indigenous perspectives on the seabed and deep-sea mining have been consistently ignored and marginalized by the mainstream governmental, scientific and corporate narratives. For Pacific islander communities, the ocean holds deep cultural and spiritual significance, and “DSM is not distanced from the island environment because the ocean is at the heart of one’s identity, and part of each individual’s future.” (V. Tilot et al., 2021, 4). Thus far there has been no inclusion of Indigenous knowledge in the ISA’s draft mining code (Reichelt-Brushett et al., 2022, 668). Some scholars have advocated for the

inclusion of the legal concept of Oceania Sovereignty to the deep-sea mining field. The concept originated from Tongan-Fijian scholar Epeli Hau'ofa “linking the right to make decisions on land and ocean spaces to cultural stewardship/guardianship developed in, and unique to, the Pacific Islands” (Tilot et al., 2021, 2). Communities in the Duke of York Islands in Papua New Guinea consider the deep-seabed to be inhabited by spirits called Masali, and thus extraction would entail spiritual turmoil (Katona et al., 2023). The lack of inclusion of Indigenous perspectives of the seabed and inclusion in the governance regime of deep-sea mining demonstrates the current bias towards a regime of resource extraction.

Deep-sea mining threatens Indigenous heritage and communities

Deep-sea mining would represent a multi-pronged assault on the cultural and economic practices of Pacific Islander groups. Local Indigenous communities, due to their proximity and deep connection to the regions allocated for deep-sea mining, are also likely to “shoulder the major burden of deep-sea mining activities.” (Environmental Justice Foundation, 2023, 38). Deep-sea mining’s potential devastating impact on fish stocks due to pollution and disturbance, would impact a vital food source, economic activity, and associated cultural activity for Indigenous Pacific Islander peoples (ibid). As a result, at the most recent meeting of the ISA, representatives of 34 nations and 56 Indigenous groups delivered a petition with 1000 signatories calling for a total ban on deep-sea mining (Greenpeace, 2023). In the example of one of the early deep-sea mining sites, Solawara 1, mining activities threatened an ancient traditional practice of “shark calling” due to the noise created by mining activities (Fainu, 2021). A local clan leader explained bluntly “When they start mining the seabed, they’ll start mining a part of me.” (Childs, 2019). These examples highlight the social impacts of deep-sea mining. The disproportionate impact of deep-sea mining on Indigenous communities reveals that the question of mining the deep-sea is also one of environmental justice.

Narrative representations of the seabed by deep-sea mining companies

Critical scholarship on the deep-sea mining industry is acutely sensitive to the representation of the seabed by deep-sea mining companies, and how this representation is used to justify extraction. Critical Geographer John Childs points out that deep-sea mining companies present the deep ocean in corporate documents as lifeless. He explains “it seeks to counter critique and legitimize extractive practices is to visually “empty out” the deep-sea, presenting the seabed and its vibrancy as devoid of life.” (Childs, 2022, 7). This practice erases the complexity and connectedness of the deep-sea as a key part of corporate strategies by deep-sea mining firms like Nautilus Minerals. These companies characterize the deep-sea as ‘placeless’, ‘remote’ and with ‘no human impact’ despite the presence of proximate small island communities.” (ibid, 3). Elsewhere he describes the discursive process by which the deep-sea mining industry conceptualizes the deep-sea as a “corporate reworking of the deep-sea as a ‘natural resource’ inheres on the idea that it is an inert, passive and inorganic target for extraction.” (Childs, 2020, 207). In a similar vein, Anna Zalik explains how “corporate imaginary of the ocean [defines the deep sea] as a space ‘outside’ social contestation and thus less prone to social and financial risk (...)” (Zalik, 2018, 353). The cold, lifeless, and apolitical representation of the seabed by deep-sea mining companies is thus a corporate strategy for sidestepping difficult socio-ecological concerns from extraction.

Role of the arts

Much of the literature on deep-sea mining acknowledges the importance of the role of the arts in contesting the geopolitics of mining. Carver argues that “Clearly, creative practice (film and fine art, for example) has as much a role to articulate the lexis for deep-sea mining as the written word.” (Carver et al., 2020, 8). In another paper by John Childs, reflecting 2 years of participatory research in the Duke of York Islands, used the practices of drama, sculpture, and counter-mapping with local communities residing near a deep-sea mining extraction site operated by Nautilus Minerals (Childs, 2020a). One Indigenous artist participant explained “Our community beliefs don’t easily translate well to scientific

documents. So this is what art can enable: it can help us to speak about this topic and to inspire change.” (ibid., 124). Childs argues that this project demonstrates the capacity of the arts to function as a form of “political intervention” that can give voice to marginalized communities (affected by mining) and “provide an alternative vocabulary for human encounter with extreme environments.” (ibid., 126).

Summary

My literature review shows that the deep-sea is a space of incredible social, ecological, and political complexity. It also demonstrates the many existing avenues of contestation against the designs of deep-sea mining companies to begin extraction, and the role that the arts are playing in contributing to this contestation. The critical literature highlights how designating the deep-sea as a resource is an overt simplification that ignores a wide range of harms and impacts that would follow large-scale impacts. This literature review provides important context through which to analyze my interview data, which will follow next.

4. Body

4.1. Findings

Below I have summarized the key findings from my interviews, seeking to find common threads between my various respondents. In cases where it was necessary to anonymize responses, I will refer to them simply as “respondents.”

Research Question 1

In the section that follows, I have separated my findings between my interview with the Metals Company, and the rest of my interviews. I felt that my interview with the representative from The

Metals Company was a critical data point that deserved special attention, especially in relation to my first research question.

Narrative 1: Less harmful than terrestrial mining.

The overarching narrative of my interview with Rory Usher, the public relations manager of The Metals Company was the framing of deep-sea mining relative to the impact of terrestrial mining. Rory spent a considerable portion of our conversation speaking about the destructiveness of terrestrial mining, bringing up examples from Indonesia and Papua New Guinea, and argued that this was a compelling reason to mine the seabed instead. Here is one example in which he mentioned the impact of a terrestrial mine in Indonesia: “And obviously, we know some pretty nasty things about terrestrial supply at the moment, if you’ve seen any of the stuff that’s going on in Indonesia at the moment, which is basically flattening the forest, the rainforest and in Sulawesi and elsewhere (...)”

A significant portion of my interview became a discussion of the impacts of terrestrial mining, rather than that of deep-sea mining. At several points in my interview, Rory returned to similar commentary. He argued that relative to terrestrial mining, mining the deep-sea represented an extractive activity with the “least possible impact for people and the planet.”

Rory was also careful to qualify the specific kind of mining that his company was interested in; polymetallic nodule extraction. He argued that this kind of extraction was less destructive than other forms of deep-sea mining, claiming “we basically eliminate waste and tailings.” Later on, when describing the extraction process he explained: “You know, the fact that nodules lie loose and can basically be sucked up is a hugely compelling production method.”

Rory went to great lengths to portray their production process as one that utilized advanced technology to minimize the impact of extraction. For example, he spoke at length about monitoring

software called their “adaptive management system” that supposedly would allow them to minimize ecological impacts and monitor local conditions in the extraction zones of the deep ocean in real time. He frequently argued that all of their activities were based on huge amounts of data that they themselves had commissioned from relevant experts. As such, he positioned The Metals Company as producers of scientific knowledge of the deep-sea. This added up to a narrative of deep-sea mining as a “new” form of mining; one that was technologically enhanced, less destructive, and much more precise than “old” forms of terrestrial mining.

Narrative 2: Electric vehicles and the “need” for deep-sea metals and minerals.

Another key narrative that emerged from this conversation concerned the “need” for massive amounts of metals and minerals to build the proposed fleet of 1 billion electric cars (EVs). Rory referred to this as the “1 billion EV scenario”, and later explained via email that this figure was taken from a paper discussing the Life Cycle Analysis of sourcing metals for EVs from the deep ocean instead of from land (Paulikas et al., 2020). The figure of 1 billion cars in turn came from a 2017 Morgan Stanley report that predicted that the EV fleet would reach 1 billion by 2047 (ibid.). According to Rory, mining the deep-sea would fill a major gap in the supply of these metals and minerals, and pointed to the findings of the International Energy Agency. He was critical of the lack of awareness and consideration of the supply of minerals for renewable battery technologies by the European Union, and environmental groups that advocated for a green transition. He memorably described this lack of awareness as “a kind of insanity.”

He also rejected the notion that these metals could be sourced via alternative means such as recycling, or via systemic change such as a shift to a circular economy, arguing that a circular economy was not yet possible with current resources, and that “the amount of materials [that need to be mined] in the next 20 years is more than has been mined by all of humanity in all of history.” He positioned himself and

his company as coming at the issue from a more rational and realistic standpoint, in which decisions about supply had to be made, and in which deep-sea mining thus should play a logical role.

Narrative 3: No human impacts, and positive benefits sharing.

Rory argued that deep-sea mining had essentially no human impact. This was again in contrast to the human rights abuses and toxic contamination experienced by communities local to terrestrial mines. This claim was repeated a few times over the course of the interview. At one point, Rory stated simply “It’s thousands of miles from any human communities, and particularly in an area where no humans are going to be impacted.” Furthermore, Rory made a point of the benefits of deep-sea mining in the forms of royalties from contracts to Pacific islander states, as well as in the form of tax revenue. According to this narrative, deep-sea mining would thus represent a positive social benefit because it would not disturb local communities, and because these same communities would benefit from mining revenues.

Narrative 4: No loss of biodiversity in the deep.

Rory underlined the fact that land-based mining was occurring in sensitive and biodiverse ecosystems. He discussed how land based mining in Indonesia was leading to the destruction of rainforests and coral reefs, and that these losses were irrecoverable. He also compared levels of biodiversity in rainforests to that of the abyssal zone (the ecosystem where deep-sea mining would occur). Referencing an unknown source, he made a comparison between the concentrations of biomass in rainforests to that found in the deep-sea. He argued that rainforests had “15 to 3,000 times more biomass per square meter.” He also argued that the deep-sea was “essentially a desert” that was “pretty inhospitable to life”, reinforcing their claims of low biodiversity at great depths. A related claim to this argument was that the deep-sea was “the world’s most common environment.” By this he meant that the deep-sea occupies such a large portion of the surface of the earth, that it is extremely “common”, relative to

“unique” ecosystems like rainforests and coral reefs. Mining the deep ocean would thus not have a significant negative impact on biodiversity because biodiversity levels were low to begin with, and because it is so vast as to not be disturbed by mining activities. According to this narrative, Rory argued that it made more sense to mine the deep-sea due to its low levels of biodiversity. They framed this rationale as a logical conclusion “And I think, our CEO sums it up quite well. If we could do metal production again, it makes sense that one would turn to one’s deserts and not one’s rainforest.”

Research Question 2

Below is a summary of my remaining interviews with researchers, academics, and members of TBA21-Academy. The summary below shows how respondents interpreted and criticized the claims made by deep-sea mining proponents and by The Metals Company. I have organized their responses according to the narratives that I identified in my interview with The Metals Company, in order to draw clear parallels between the two broadly oppositional standpoints on deep-sea mining.

Narrative 1: Less harmful than terrestrial mining.

The centering of narratives of deep-sea mining in relation to terrestrial mining was also a very common narrative in my interviews with my remaining respondents. In nearly all of my interviews, this narrative came up in one form or another. My respondents noted how The Metals Company was attempting to argue that deep-sea mining would in fact *displace* or even *replace* terrestrial mining. Nearly all of my respondents agreed that this was an unfounded claim. They pointed to the fact that the existing mining industry, and nations that supported these industries, would resist any new form of competition. When I asked legal expert Pradeep Singh why this was not the case, he explained that he had direct conversations with delegates at the ISA in which the delegates explained that they in no way thought that deep-sea mining would displace terrestrial mining. Pradeep argued that deep-sea mining would actually exacerbate land-based mining, as existing industries attempt to remain competitive.

Or at least, we can say with some degree of confidence that terrestrial mining is not going to stop. In fact, it could increase. And then the many problems that we see with terrestrial mining now would only exacerbate because of this competition, which perhaps was unnecessary in the first place. But then also driving terrestrial mining to go into overdrive, in order to not lose a grip on the commodities market.

Pradeep summarized later on in our interview that “you might just very well end up with more of the same old problems on land, but at the same time, new problems at sea.”

Respondents were also highly critical of the claim that deep-sea mining was less destructive than land based extraction, arguing these were in fact false and disingenuous arguments. One respondent (this respondent requested to remain anonymous) stated clearly: “All the nonsense that The Metals Company puts out, about displacing terrestrial mining, which it won't, about how it's actually better for the environment, which it's not. About how there's no tailings, which is false, straight up false.”

All of my respondents referenced the natural science literature which was highly critical of the impacts of deep-sea mining. While some acknowledged that the exact impacts of deep-sea mining was not known, they still argued that existing evidence pointed to it being an extremely destructive activity. John Childs summarized this quite clearly: “So now there's that kind of instant roadblock where you go, well, we don't know what the impact is, that's the best you can say we don't know what the impacts will be. But most of the science just comes down hard on, well, it's going to be really damaging, you can't avoid it.”

Narrative 2: Electric vehicles and the “need” for deep-sea metals and minerals.

My respondents were extremely dismissive of claims that the deep-sea would provide a valuable resource for building a fleet of electric vehicles, as well as of any claims that deep-sea mining metals and minerals were “needed.” Respondents highlighted the fact that there was rapid innovation of

renewable battery technologies undercut any claims that deep-sea metals and minerals were needed for the green transition. Fiona Middleton, reflecting on the narratives of deep-sea mining companies offered the following summary: “And then, of course, we need to get these metals in socially and environmentally responsible ways to facilitate the green transition with batteries and blah, blah, blah, smartphones and stuff.” Pradeep Singh had a similar take: “[there’s] the narrative that we need these metals for the clean green transition, which I don’t really buy.” Their dismissal of the necessity of these metals is supported in the critical literature due to the uncertainty of future demand, as well as existing alternative battery technologies that do not require the same metals in the deep-sea (Miller et al., 2021).³

Narrative 3: No human impacts, and positive benefits sharing.

Many of the respondents argued that the deep-sea was in fact a socially connected space, and disputed claims that there is no social impact to deep-sea mining. The legal expert engaged in ocean conservation (who requested anonymity), saw the deep ocean as a space of “intangible cultural heritage”, and brought up the example of native Hawaiians who saw the deep ocean as a resting place of their ancestors. John Childs saw the deep ocean far from being devoid of any social connections, but in fact “part of the fabric of people’s identity.” He referenced the worldview of Indigenous people in Papua New Guinea, where he had been conducting fieldwork. He explained that local communities had in fact a deep sense of cultural and spiritual connection with the deep ocean. Childs also pointed out how viewing the deep-sea as absent any social connection was extremely convenient for the mining companies:

There’s a dehumanizing element to deep-sea mining, which you don’t get with land is, spoken up as if having no community based, relations to think about on any serious level. Nobody lives at the bottom

³ It is outside of the scope of this project to assess green technology supply chains, but I have included some literature to demonstrate that my respondent’s criticisms were supported by academic literature, and that they were not simply expressing personal opinions.

of the ocean. So why should we have to think about that sort of murky stuff around CSR and corporate corporate community relations?

None of my respondents believed there was much evidence to back up the notion that deep-sea mining would bring about any sort of positive benefits sharing, either for Pacific Island states, or humanity as a whole. The legal expert engaged in ocean conservation explained to me how the legal framework that supposedly enshrined notions of sharing deep-sea resources and benefits had long been watered down and gutted of any legal mechanism to actually share the profits from deep-sea mining.

Instead of sharing resources, my respondents viewed deep-sea mining as serving a very narrow set of interests for a few profit seeking companies and their investors. Journalist Ian Urbina explicitly stated that deep-sea mining was essentially a “one big kind of venture capital ponzi scheme.” They explained that deep-sea mining made most sense as a narrative fed to investors on Wall Street who were eager to invest in the next big commodity. John Childs echoed this sentiment, explaining that most of the arguments made by companies like The Metals Company were not to gain social acceptance, but rather to convince potential investors in the stability and profitability of their industry.

I think, basically putting themselves in the shop window to investors predominantly, that's, that's what they do. That's the challenge for these companies. It's not to win public acceptance, particularly, it is to get the money, and they cannot get the money at the moment. And they haven't been able to historically; not not the real money, not the money that will actually make it come into being. So that they are constantly projecting themselves, I think, to the investor.

Narrative 4: No loss of biodiversity in the deep

All of the respondents agreed that claims of little to no biodiversity loss, and minimal ecological impact, were likely impossible. They were quick to point out that contrary to the Metals Company's claims of low biodiversity in the deep-sea, scientific enquiry actually was constantly revealing an

ecosystem full of life and new species to science. The legal expert engaged in ocean conservation asked rhetorically: “how do you protect the biodiversity of the deep ocean whilst mining it?” Most critiques related to the impact of mining plumes on the deep-sea ecosystem. The same respondent mentioned how deep sea mining plumes would smother ecosystems and organisms, like tuna, that depend on clear water. Another recurring narrative was the potential for widespread noise pollution from mining operations, which would disrupt whale migration routes.

Markus Reyman, director of TBA21-Academy, told an anecdote from their early engagement with the ISA which was very revealing:

The head legal at the time was Michael Lodge. So Micheal was giving this rate talk and interview about how fabulous the International Seabed Authority is, and how amazing all of that, and blah, blah, blah. And when we left his office, there was this other character that all of a sudden jumped out of his office and said, I would really also like to make a statement. And so we went into his office and, and he said, Listen, I'm the Lead Scientist of this organization. Yeah, which is a joke because I'm the only scientist here. And this entire thing is a disaster waiting to happen, is completely corrupt and fraudulent. It's not fit for purpose, and this man was Sandor Muslow.⁴

I asked Pradeep Singh about a recent instance in which The Metals Company had been filmed dumping mining wastes overboard one of their extraction vessels. The footage was then leaked to the Guardian (Cecco, 2023), and The Metals Company was forced to respond. He explained that this example would likely reflect a characteristic trend of a deep-sea mining industry that would operate in ocean spaces so remote, as to make environmental impact monitoring extremely difficult, if not impossible. This example demonstrates the hollowness of The Metals Company's claims that they would be able to effectively minimize ecological impacts in the deep-sea.

⁴ Sandor Muslow was head of the office of resources and environmental monitoring at the ISA between September 2013-December 2019.

Research Question 3

All of the respondents agreed that the arts had a big role to play in discussions around deep-sea mining, and in countering claims made by the Metals company and proponents of deep-sea mining. When I asked how respondents saw the role of the arts in the debate around deep-sea mining, most spoke at length about the impact of arts based narratives, stating that the arts had a significant role to play. Fiona Middleton, the researcher from the TBA21-Academy explained that one of the reasons for this was because of gridlock at the ISA. Firm lines had been drawn in the debate around deep-sea mining, and the arts were serving to re-initiate discussions which had arrived at a standstill. Markus Reymann spoke of the “convening power” of artists and arts based practice, bringing together stakeholders with opposing interests on deep-sea mining around creative works. Pradeep Singh replied that the arts were “potentially a game changer” in the debate around deep-sea mining as they had seen how they had impacted delegates at the ISA as it gave them a more direct, emotive, and visceral experience of the deep-sea.

Many agreed that part of the power of arts based practice was that it came from an unexpected angle into discussions around deep-sea mining. Participants at the ISA were excited and intrigued by the presence of an arts organization like TBA21-Academy, which they could less easily associate with a particular standpoint on deep-sea mining (in contrast to an organization like Greenpeace, who’s position was already clearly stated against deep-sea mining). Pradeep Singh, talking about the role of creative filmmaking in the discussions at the ISA, told a story about organizing a creative workshop at the ISA. To their surprise, many of the delegates explained that they had never even seen footage of the deep ocean and its resident creatures.

But I don't think they have, you know, at the forefront of their minds, what's actually at stake, and I think, communicating or getting the message across through arts, it's going to be the sort of game changer that gets us there, humanizing it in some way, sort of bringing in emotions as well, and things like that, invoking emotions. I think that's what's going to make the difference.

The connection between the role of the arts and creating emotional connections to the deep ocean was a recurring theme in my interviews. Respondents explained that this emotional connection was important because it encouraged care for an environment that could help to frame more thoughtful debate around deep-sea mining.

Beyond directly impacting the delegates at the ISA, respondents frequently discussed the potential of the arts to bring a wider awareness of the deep-sea and mining to the general public. The arts could be used as a tool for engaging a public that was otherwise unaware, or uninterested in the remote deep ocean. This in turn increased public pressure on decision makers and deep-sea mining companies. Furthermore, creative practice offered the opportunity to articulate some of the more intangible characteristics of the deep ocean. Since the deep ocean cannot be experienced directly, the arts were a critical communication tool that encouraged curiosity and emotions towards such a remote ecosystem.

John Childs, who had conducted fieldwork near an early deep-sea mining test site in Papua New Guinea had used participatory arts methods to gauge the reactions of local Indigenous communities towards deep-sea mining. Arts-based methods proved to be highly effective to engage with a society based around storytelling, and with a worldview that considered the deep ocean to be a space inhabited by ancestral spirits. The arts was thus also a way to more comprehensively engage with communities that would be most deeply impacted by deep-sea mining.

Arts as intervention

Another role of the arts in deep-sea mining was one of direct intervention. Respondents told me about the participation of TBA21-Academy at the ISA, and explained how their organization was able to gain observer status⁵ through a simple application to the ISA. Markus Reyman explained that, in this

⁵ TBA21-Academy Is the only cultural organization currently with this status.

instance, creative practice morphed into something beyond simply “preaching to the choir”, but opened up the possibility of engaging with actors who might be politically completely unaligned with their own vision. Respondents mentioned multiple examples of activists and civil society groups using arts practices to protest the development of deep-sea mining.

Mekhala Dave, has regularly attended the ISA on behalf of TBA21-Academy. In our interview, she explained how she would intervene in the drafting of the mining code by attempting to incorporate language around cultural dimensions of the deep-sea, and also include Indigenous perspectives in the mining code. She explained how this was also a means by which to interrupt and slow down the drafting of the mining code:

But I feel that it's being present there in this space at the ISA, even if we make like one sentence. I mean, if we just submit a write up like a policy criticism, I think that has its effect, because it slows down the process of the mining code, which we don't want to be completed. And secondly, it also needs to start including language that they're not used to.

However, she was less certain about what the exact role of the arts would be. She was the only respondent that I spoke with that thought that deep-sea mining might eventually occur in spite of these interventions, artistic or otherwise. I got similar impressions from my other respondents; none out rightly stated that the arts would somehow stop deep-sea mining. But all agreed that it still had an important role to play in the debate.

Throughout my interviews the categories of arts and politics began to blend together. There were several examples of creative projects that became political actions and vice versa. Markus Reymann drew inspiration for this combination of arts and politics directly from the worldview of some pacific islander communities:

For Pacific islanders, it's so easy to understand what we're doing, because everything that they do is considered culture, right? And we have created all of these divisions. This is science, this is politics. This is culture. So for them, it's absolutely, totally normal that an artist can also be an activist can also be a policymaker.

Deep-sea mining as performance

The blurring of the line between arts and politics extended much further. Markus Reymann saw the ISA as an “elaborate performance space”, in which what really counted was “who told the best story.” John Childs pointed to the fact that the deep-sea mining companies had an interest in representing themselves as powerful political agents, when the reality was often very different. In contrast to the scale and scope of the “major” terrestrial mining companies, deep-sea mining companies were small operations with few resources, and thus had to rely heavily on an “economy of appearances” in order to continue their operations “So what you have from companies, I think, that is a constant projection. It's the, it's the Wizard of Oz stuff, you know, it's sort of giving the sense of themselves is bigger than they really are.”

All of this is often fed back into the importance of using the arts to critically examine narrative representations of the deep sea. Creative practice became a means to expand understanding of the deep ocean and human designs for it. Fiona Middleton explained: “And so with art, that allows us to keep going on those lines to keep exploring and in this imaginative way, that as I said, at the start, reflect back human wishes and ambitions and desires, and what we want for the deep-sea.”

4.2. Discussion

Research Question 1

The four principal narratives that I identified in my interview with The Metals Company reflect the basic contours of the blue economy agenda. According to Rory Usher, the deep-sea is a resource because (A) there is a need for a massive amount of material input for the green transition, and (B) this form of extraction is “sustainable”, or at least *more* sustainable than terrestrial mining, with little to no social impacts or destruction of biodiversity. This particular blend of a highly questionable notion of sustainability, with an agenda of economic growth and further resource extraction is a perfect example of the underlying logic of the supposed blue economy.

Even though arguments for deep-sea mining clearly echo the logic of blue economy narratives, it has yet to gain acceptance as a responsible economic activity. After all, extraction has not begun, and investment in deep-sea mining companies is fickle. Powerful financial institutions and companies are clearly not willing to fully commit to investing in deep-sea mining, such as in the case of voluntary bans from global brands like BMW and Volvo (Deep Sea Conservation Coalition, n.d.). The conclusion of the United Nations Environment Program Finance Initiative sums up the current impasse for deep-sea mining companies; “There is no foreseeable way in which the financing of deep-sea mining activities can be viewed as consistent with the Sustainable blue economy Finance Principles.” (UNEP FI, 2022, 10). Consequently, I conclude that the deep-sea has not *yet* been fully articulated as a resource. Rather it is somewhere within this process of identification.

The arguments made by Rory were often indirect, as he spent much of the interview speaking about terrestrial mining rather than deep-sea mining. While this was an odd rhetorical deflection, it echoes similar strategies of deflection used in other extractive industries. There is a very similar strategy occurring with various Carbon Capture and Storage schemes used to justify continued oil extraction, for example. Built into this narrative was a notion that deep-sea mining represented something new and improved. According to The Metals Company, part of the rationale for defining the seabed as a resource depended upon criticisms of land-based mining. The narrative in favor of deep-sea mining was based on a debatable comparison to an entirely different means of resource extraction which destroyed

beautiful, unique, and biodiverse ecosystems, and harmed human communities via pollution and human rights abuses. Of course, this narrative is based on some truth. It's undeniable that the past and current impact of terrestrial mining is abhorrent. However, I argue that the evidence presented in my literature review clearly demonstrates that deep-sea mining will represent little to no actual "improvement" on an activity that is fundamentally destructive.

While Rory from The Metals Company did acknowledge that deep-sea mining would also have an impact on the deep ocean, he went to great lengths to minimize the scale of these impacts. Deploying powerful and precise technology and novel extraction methods in the deep-sea was the principal mechanism by which such impacts would be avoided. There was thus a strong undercurrent of techno-optimism in this narrative, a belief in the power of improved technologies for extraction meant that deep-sea mining would rid itself of the socio-ecological impacts of similar extractive activities. Such a presentation of deep-sea mining belied the real world consequences of an extractive industry.

I would also argue that the narrative of the necessity of deep-sea mining is fundamentally based on binary decisions and false dichotomies. By this I mean the framing of the problem of supplying the "necessary" materials for the green transition as a decision to either continuing land based extraction, or expanding metal extraction to the deep-sea. This framing glosses over the multifaceted social, ecological, and ethical complexities of deep-sea mining and infers a peculiar kind of rational logic that the deep-sea is a resource due to this material necessity. To build one billion electric vehicles, further extraction is required, and the choice is either the complete destruction of biodiverse terrestrial ecosystems, or expanding extraction into the deep ocean. In this regard, deep-sea mining is just the furthest possible extension of surface-level techno-fixes to the climate crisis.

The narrative of the deep-sea as a resource is facilitated by its supposed lack of connection to human communities. According to this narrative, the deep-sea is remote, distant, alien, and disconnected from human societies. The implied lack of social impacts of deep-sea mining of course ignores the direct

protest of Indigenous groups calling to ban the practice (Greenpeace, 2023), who have been systematically left out of negotiations at The International Seabed Authority. The process of defining the deep-sea as a resource is thus also a process of erasure of non-western perspectives on the seabed.

To present the deep-sea as a resource is to radically simplify the ecological complexity found on the seabed, in turn making it less “valuable” and legitimizing it as a target for destructive extraction. The example that comes to mind here is when Rory stated that the deep ocean is “the world’s most common environment” as opposed to the uniqueness of a rainforest or coral reef. In this language I see a justification for the destruction of one portion of the deep-sea due to its replaceability and uniformity. Tsing reminds us that ecological complexity is inherently non-scalable, meaning that it cannot be broken up into replicable units (A. L. Tsing, 2012). Even my cursory review of the natural science literature on the deep ocean defies any characterization of the deep ocean as common or uniform. While the deep ocean may *appear* to be uniform, and replicable, it is in fact profoundly complex and diverse.

There is perhaps no better symbol for the simplification process than that of the commodity form, calling to mind Jason Moore’s work on commodity frontiers. Moore’s work emphasizes how capitalism engages in a constant process of geographical expansion to reach new sources of material inputs for the economy (Moore, 2010, 39). Lying far outside the terrestrial limits of states, the polymetallic fields of the CCZ are perhaps one of the few remaining spaces on earth that have not already been subjected to commodification. Moore explains that capitalism’s boom and bust cycle propels a constant search for new frontiers and sources of biophysical inputs to feed the accumulation of profit. The Metals Company’s narrative seeks to integrate its operations within the imperatives of the currently dominant green capitalism agenda, exemplified here by the “1 billion EV car” scenario mentioned in my interview. The Metals Company’s narrative neatly presents the deep ocean as a commodity frontier, and in doing so makes its vision of extraction palpable to states and investors.

Lastly, the deep-sea is a resource because it was a “desert” that did not harbor significant levels of biodiversity. I think that claims of low biodiversity serve to legitimize deep-sea mining in 2 ways. First, they create an association with particularly emotive images of nature that is populated by charismatic flora and fauna. The image that comes to mind here is that of brilliant coral reefs, or dense rainforest. If the deep-sea is lifeless and empty, it is a suitable target for extraction, with the added benefit of saving these beautiful ecosystems elsewhere. Second, the narrative of low biodiversity plays into claims that this particular form of extraction can be conducted with low or minimal disturbance. deep-sea mining becomes a more “pure” or “clean” form of extraction. The role of emotion here confirms the importance of the imaginative process, hinted at by Tsing, in turning the seabed into a resource frontier.

Comparing biodiversity between fundamentally different ecosystems (rainforest; deep-sea) suffers from inadequate standards of comparison and unexamined normative assumptions (Katona et al., 2023). The narrative around low biodiversity in the deep ocean is not completely untrue, rainforests affected by terrestrial mining do harbor higher concentrations of megafauna, for example (ibid., 1144). However creating a hierarchy of ecosystems to justify extracting one, while protecting another is a process rife with bias and subjectivity.

Research Question 2

Each one of the claims made by The Metals Company were quite easily dismissed by my other respondents. While this result was not surprising, as I knew most of my respondents were critical of deep-sea mining beforehand, I was taken by the breadth of arguments and evidence used against the claims of The Metals Company. This was particularly true of the narrative around the impact of terrestrial mining. Respondents came down hard against any notion that deep-sea mining would somehow represent an improvement over the current destructiveness of terrestrial mining. They argued that deep-sea mining would simply bring further ecological destruction. This counter argument

is supported by an abundance of scientific and academic literature from multiple disciplines (see literature review) which highlights both the uncertainties around deep-sea mining, as well as the likely destructive impacts.

Deep-sea mining, by appearing to offer a “fix” (shorthand for David Harvey’s spatial-temporal fix) (Mallin & Barbesgaard, 2020) for the destructiveness of terrestrial mining, and the material needs of the Green/blue economy, hides its true potential cost. The fact that my respondents argued that deep-sea mining might actually exacerbate terrestrial mining *and* cause further destruction to a new environment shows just how deceptive these fixes can be. Here we can see the logic of ecological modernization, which claims to offer a “win-win” for the economy and the environment simultaneously, while obscuring trade-offs (Schutter et al., 2021). Behind the supposed concern with land-based mining is a refusal to examine the perpetual continuation of extractivist relationships between social systems and an ever-expanding roster of ecosystems.

My respondents saw the necessity of deep-sea metals and minerals for renewable energy technologies as equally disingenuous. Respondents pointed to the fact that EV battery technologies were improving, and that these metals were in fact unnecessary. Perhaps here, their counterarguments suffered from techno-optimist assumptions about the inherent improvements of renewable technologies. While it is beyond my expertise to offer a proper assessment on renewable energy technologies and their material requirements, I see these claims of “necessity” as suspect. Yet I could not outright dismiss this argument. I found a very basic point of agreement with proponents of deep-sea mining in that I agree that the material requirements of any green transition will require large amounts of material inputs, and that production systems are currently inadequate and destructive. However, from my experience researching the impacts of deep-sea mining and discussing its complexities with my respondents, I conclude that the destructiveness of deep sea mining outweighs a rushed imperative to fill the supply gap for said transition.

My respondent's views on the social dimensions of deep-sea mining offered a strong critique to The Metals Company's claims that somehow deep-sea mining would have no social impact. My respondents made clear that the deep ocean was in fact a space of deep cultural significance, particularly to Pacific Islander and Indigenous communities, and pointed to the deceptiveness of any claims that deep-sea mining would have "no human impact." Their rebuttal supported theorizing I have read elsewhere in the critical literature which highlights how this narrative seeks to depoliticize the process of extraction in the deep ocean by presenting this space as somehow "outside" of politics (Zalik, 2018). From this critique I see the work of abstracted market logic at play. In my view, there is no space on earth identified for extraction, which is not also one of cultural significance, and thus also human impact.

Perhaps most easily dismissed by my respondents were claims that deep-sea mining would somehow not also bring with it significant loss of biodiversity and likely ecological destruction. From my experience with critical and natural science literature, this was a universally acknowledged fact. My respondents reiterated to me just how far from the truth the "no loss of biodiversity" claims were. I argue that an engagement with the critical literature demonstrates that biodiversity loss is an inherent dimension of any extraction in the deep-sea, as is any other form of extraction. Avoiding biodiversity loss is "impossible", and a decision to mine the seabed equates to a decision to accept losses of biodiversity in the seabed (Niner et al., 2018, 9). Furthermore, my respondents highlighted not only the direct destructiveness of extraction itself, but also the extremely poor record of the ISA and private companies at paying anything other than lip service to the notion of protecting biodiversity in the deep-sea. What emerged from me was a clear picture of a mining industry that would be no improvement over the current mining industry, but something just as destructive or perhaps even worse.

Research Question 3

My responses on the role of the arts in contesting narratives of resource extraction in the deep-sea were complex and unexpected. My respondents highlighted some instances where creative practice was playing a direct and demonstrable role, such as TBA21-Academy's attendance at the ISA as an observer and, at times, participant in the drafting of the mining code. Mostly, creative interventions had indirect impacts that could be quite broad and abstract. For instance, use of mediums like film could imbue an otherwise dry and managerial process such as the drafting a mining code, with human emotion and engender feelings of care. The workings of the ISA was not a romantic or idealistic one in which a work of art would be the deciding factor in the future of deep-sea mining. This remains predominantly the arena of states, bureaucrats and fairly traditional conceptions of political power. As in Malcolm Miles' words, art will not change the world directly, but will reflect back the stark realities of continued extraction and ecological devastation (Miles, 2014, 158). I consider this is particularly important in the context of the deep-sea, which is generally an opaque and poorly understood arena, requiring the extra visibility and attention that the arts can provide.

Even if the arts would not necessarily stop the process of resource extraction in the deep-sea, my results showed the ability of the arts to become a vector of participation that brought in otherwise marginalized voices and knowledge to the table at the ISA. I consider TBA21-Academy a rare example of a creative institution with a seat at the table of international negotiations around the management of a huge swathe of earth's biosphere. Surely, this power is limited - TBA21-Academy is an observer at the ISA with no formal power. But I argue that its normative role is nonetheless remarkable. In my view, such unorthodox and unexpected approaches to the ecological crisis are needed at the current impasse on political action on the climate crisis. I believe that an all-hand-on-deck approach to avoiding further ecological destruction is appropriate to the demands of the moment. The final outcome of the intensifying negotiations at the ISA remains an open question. What is clear, is that TBA21-Academy will continue to attend and advocate from their unique positionality.

Borrowing again from Malcolm Miles' stance on the role of the arts in the ecological crisis I find relevance to my data in his notion of interruption of dominant narratives. I see the concept as a useful lens through which to view the push-and-pull between deep-sea mining proponents like The Metals Company, and the actions of unlikely participants like TBA21-Academy. In my interviews on this topic there were many points made about the role of language in shaping the outcome of negotiations on deep-sea mining. The relationship between the arts and language calls to mind John Child's notion of "alternative vocabularies" (Childs, 2020a, 126) that illuminate the deep ocean in all of its vibrancy, and cultural and ecological complexity. As many respondents explained to me, the arts are also a useful tool to express more intangible notions about the deep ocean such as concepts of underwater cultural heritage, as well as spaces of ancestry and spiritual significance.

Brining in these intangible notions was part of a wider agenda of redefining the deep ocean as a cultural space. As we have seen, a *lack* of culture and human connection to the deep ocean is a fundamental aspect of the resource-making project of capitalist mining companies. In this way I see the arts as a form of quite direct political contestation, merely by interrupting the narratives offered by The Metals Company as in the case of one of my respondents who used their observer status to literally interrupt the drafting of the mining code.

Another surprising result was the way in which forms of creative performance were relevant on both sides of the debate. I went into these interviews with a certain rigid coding in which The Metals Company was a political and economic actor holding a firm grip on narratives around deep-sea mining, and TBA21-Academy was the cultural institution, the underdog attempting to dispute these narratives. My respondents pointed to the fact that The Metals Company was in fact engaging in its own form of creative performance or representation. This kind of "performance" could thus be used to solidify arguments in favor of deep-sea mining, rather than to dispute them. There is also a complicating factor at work here, in which the remoteness of the deep-sea - and its inaccessibility make it particularly relevant to the politics of representation, performance, and storytelling. As a result my

view of the role of the arts in the debate around deep-sea mining is now more complex. Perhaps it would be more useful to view creative practice as yet another arena of contestation, in which both sets of actors are operative.

5. Conclusion: (Re)Making the World

I began my project with a curiosity about the ways in which certain narratives about the deep ocean led to the identification of another resource frontier. The deep ocean became a resource deep-sea according to 4 principal narrative themes. First, it was a resource in relation to the acknowledged destructiveness of land based mining. Second, due to the assumed “need” for massive quantities of metals necessary for the green transition, and a presumed “improved” process by which to extract them in the ocean. Third due to the lack of human impacts in the uninhabited realm of the deep. And fourth because of a narrative of the absence of biodiversity on the seabed. These four arguments presented a highly simplified and easily digestible imaginary about the deep-sea which was dead, disconnected from human society, and simply awaiting human extraction.

Through my interviews with researchers and critics of the ISA and deep-sea mining, I found strong arguments against each of these 4 narratives. My respondents demonstrated, with ample evidence supported by the natural science and critical literature, that the deep-sea was in fact a biodiverse, complex, and cultural space with long recognized significance to Indigenous groups. Claims made by mining companies were deeply suspect and easily dismissed by work from multiple disciplines in the scientific and academic community.

Recognizing the deep-sea as a social and cultural space makes it a natural arena for artistic engagement. The TBA21-Academy was already playing a direct and indirect role in shaping the debate at the ISA, and found means to interrupt, disrupt, and complexify the procedures of drafting the mining code. The arts also had the ability to bring in marginalized and ignored perspectives on the seabed, and

engendered feelings of care and contemplation that might lead to a relationship with the deep-sea outside of pure extractivism.

It is my hope that this study might serve to illustrate a dynamic, so eloquently put forth by Anna Tsing, that it bears repeating: “Conceptualizing the world and making the world are wrapped up with each other—at least for those with the privilege to turn their dreams into action” (A. Tsing, 2003, 506). If we are to conceive of the deep-sea as yet another resource, we build a world in which we can only relate to nature via how we extract value from it. There is no shortage of alternative conceptions of the deep-sea that might allow us all sorts of different ways of relating to the depths of our ocean. Instead of consigning the deep-sea for destruction, perhaps at the bottom of the ocean we might find a way to build the world anew.

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7. Appendices

Appendix 1: Interview Guide

Questions:

- 1) When you think about the ocean, what is the image that comes to mind?
- 2) When you think of the deep sea, what is the image that comes to mind?
- 3) Could you name the key arguments (of those) in favor of Deep Sea Mining?
- 4) What is the narrative of the deep sea that these arguments present?
- 5) What are three or more adjectives that you associate with this narrative of the deep sea?
- 6) From your experience of working on this topic, do you have an alternative narrative of the deep sea?
- 7) Can you name three or more adjectives that describe your narrative?

For those working with the arts:

- 8) How exactly can the arts play a role in promoting a new understanding of the deep ocean?
- 9) What is the ultimate goal of establishing new narratives around the deep sea?

Appendix 2: Research Consent Form

I am writing to you today to inform you that my project is nearly complete, and I will be **submitting my final draft by May 15th**. The final document will be published online on the following [online portal at Lund University](#).

I'd like to confirm that you consent to have your interview responses included in my project. If you could please reply to this email to confirm the following, that would be greatly appreciated!

1. Do you consent to have your responses included in my final Masters thesis project (Yes/No):
2. Do you consent to be identified by name and organizational affiliation, or would you prefer to remain anonymous?
3. Would you like to receive a final copy of my completed project (Yes/No):

If you have any other concerns, please let me know.

Appendix 3: NVIVO Codes

The screenshot shows the NVIVO software interface. On the left is a navigation pane with sections: IMPORT (Data, Files, File Classifications, Externals), ORGANIZE (Coding, Codes, Cases, Notes, Sets), and EXPLORE (Queries, Visualizations, Maps). The main area displays a code list for 'Role of the Arts' with columns for Name, Files, and Refe... (References). The code list includes categories like 'Performativity', 'Imaginaris', 'Counter Narratives', 'Ecological Destruction', 'Economic Gain + Profit', 'Cultural Heritage', 'Climate Solution', 'Displacing Terrestrial M...', 'Ease of Extraction', 'Techno-fix', 'Criticism as obstruction', 'No human Impact', 'Common Heritage of Man...', 'Legal Dimensions', 'Benefits Sharing', 'Deep Sea as...', 'Barren Deep Sea', 'Invisibility', 'Narratives', 'Subjectivity', 'Truth Claims', 'Resource', 'Resource Frontier', 'Geopolitics & Security...', and 'Indigenous perspectives o...'. The right pane shows a 'Reference' view for 'Files\Fiona Middleton' with '2 references coded, 10.22% coverage'. It lists two references: 'Reference 1: 6.02% coverage' and 'Reference 2: 4.20% coverage'. The text of the references is visible, showing quotes from Nicholas LePage and Fiona Middleton.

Name	Files	Refe...
Role of the Arts	7	15
Performativity	2	6
Imaginaris	1	1
Counter Narratives	2	7
Ecological Destruction	3	4
Economic Gain + Profit	2	3
Cultural Heritage	1	1
Climate Solution	4	6
Displacing Terrestrial M...	4	8
Ease of Extraction	2	5
Techno-fix	2	2
Criticism as obstruction	1	1
No human Impact	1	1
Common Heritage of Man...	2	2
Legal Dimensions	1	3
Benefits Sharing	1	1
Deep Sea as...	2	2
Barren Deep Sea	2	3
Invisibility	2	2
Narratives	1	2
Subjectivity	2	3
Truth Claims	2	3
Resource	2	2
Resource Frontier	2	3
Geopolitics & Security...	2	2
Indigenous perspectives o...	1	1

Files\Fiona Middleton
2 references coded, 10.22% coverage

Reference 1: 6.02% coverage

Nicholas LePage 21:57
yeah, cool. I get this like, Well, I think it's already been said, but like this idea of like, artistic intervention, also coming a lot from TBA 21, you know, being a part of becoming an observer on the ISA, in the ISA, and sort of like using art as a form of intervention, as well. Is that the kind of the goal part of the goal of TBA? 21? I would assume?

Fiona Middleton 22:28
Yeah, absolutely. Absolutely. Because the conversation at the ISA and more broadly, is very fragmented, and has been very fragmented along the lines of private, state, public, and then among different disciplines, you know, people are very rigid by now in this conversation in their motivations, and what they want to argue for it, the ISA, so it's a bit of a gridlock. Yeah. And our thinking is that through artistic interventions, you come from a kind of unexpected angle, and you approach the people there, you know, as individuals with a capacity to, to feel things and to reopen questions from another angle. So it's kind of this getting between the cracks things for me

Nicholas LePage 23:20
to sort of like, yeah, destabilize these narratives that have become kind of rigid that, you know, it's a resource that we should exploit

Fiona Middleton 23:30
exactly. Through an inquiry. That's not. That doesn't appear straightforward. You know, that doesn't come with the answers that doesn't come with a statement or something definite. Yeah. But something that opens up the conversations again. to