Deep sea mining and the International Seabed Authority: an NGO perspective on need for a pause or moratorium

Matthew Gianni
Co-founder, political and policy advisor
Deep Sea Conservation Coalition
Amsterdam Netherlands
Gianni Consultancy / Partner: EU Midas, Atlas and iAtlantic Projects

Current Developments on Deep Seabed Mining and the Use of Area-Based Management Tools to Protect Hydrothermal Vents
Netherlands Institute for the Law of the Sea
10 May 2023

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Members include

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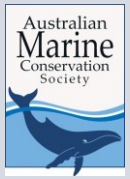

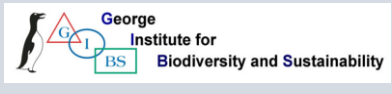

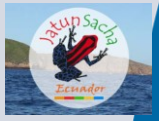

Biodiversity loss from deep-sea mining

correspondence

Biodiversity loss from deep-sea mining

To the Editor — The emerging deep-sea mining industry is seen by some to be an engine for economic development in the maritime sector[1]. The International Seabed Authority — the body that regulates mining activities on the seabed beyond national jurisdiction — must also protect the marine environment from harmful effects that arise from mining[2]. The International Seabed Authority is currently drafting a regulatory framework for deep-sea mining that includes measures for environmental protection. Responsible mining increasingly strives to work with no net loss of biodiversity[3]. Financial and regulatory frameworks commonly require extractive industries to use a four-tier mitigation hierarchy to prevent biodiversity loss in order of priority, biodiversity loss is to be avoided, minimized, remediated and — as a last resort — offset[4,5]. We argue here that mining with no net loss of biodiversity using this mitigation hierarchy in the deep sea is an unattainable goal.

The first tier of the mitigation hierarchy is avoidance. Potentially useful mitigation strategies in the deep sea include patchwork extraction, whereby some minerals with associated fauna are left undisturbed, or other means to limit the direct mining footprint. Even so, loss of biodiversity will be unavoidable because mining directly destroys habitat and indirectly degrades large volumes of the water column and areas of the seabed due to the generation of sediment plumes that are enriched in bioavailable metals.

Although biodiversity loss within mines is inevitable, innovative engineering design could reduce or minimize some risks to near- and far-field biodiversity. For example, shrouds fitted to cutting equipment might reduce the dispersion of sediment plumes and the footprint of plume impacts such as the burial of organisms. Similarly, vehicle design might limit compaction of seabed sediments. Of course, the efficacy of such efforts in mitigating biodiversity loss would need to be tested.

Remediation addresses the residual loss of biodiversity at and around a mine site after avoidance and minimization interventions. In the deep sea, native species are often slow to recruit and recolonize disturbed habitats. Slow recovery on the scale of decades to centuries, enormous spatial scales of mines for certain mineral resources (a single 30-year operation license to mine metal-rich nodules will involve an area about the size of Austria[6]) and the high cost of working in the deep sea may mean that remediation is unrealistic[7]. Further, the science of deep-sea benthic remediation is a nascent field[8]. It is far from established that remediation of industrial mine sites in the deep sea is feasible for any mineral resource, and we know of no remediation actions that can be applied to the water column.

The last resort in the mitigation hierarchy is in-kind or like-for-like offsets within a biogeographical region. When offsets cannot be located where the affected biodiversity is found, and where the affected biodiversity is important for geographically restricted functions such as connectivity (as is the case for the deep sea), in-kind offsets are not an appropriate mitigation strategy[4]. Out-of-kind offsets[10], such as restoring coral reefs in exchange for loss of deep-sea biodiversity, have been proposed, but this practice assumes that loss of largely unknown deep-sea species and ecosystems is acceptable. We question this assumption on scientific grounds. The relationship between any gain in biological diversity in an out-of-kind setting and loss of biological diversity in the deep sea is so ambiguous as to be scientifically meaningless. Further, compensating biodiversity loss in international waters with biodiversity gains in national waters could constitute a transfer of wealth that runs counter to the Law of the Sea, where benefits from deep seabed mining must accrue to the international community at large, as part of the common heritage of humankind. Given the paucity of other industrial activities in the deep sea (except perhaps fisheries), it is difficult to imagine a scenario where averted risk offsets[10] could apply; that is, where a mining operation could avert biodiversity losses from other activities.

The four-tier mitigation hierarchy used so often to minimize biodiversity loss in terrestrial mining and offshore oil and gas operations thus fails when applied to the deep ocean. Residual biodiversity loss cannot be mitigated through remediation or offsets and the goal of no net loss of biodiversity is not achievable for deep-seabed mining. Focus therefore must be on avoiding and minimizing harm. Most mining-induced loss of biodiversity in the deep sea is likely to last forever on human timescales, given the very slow natural rates of recovery in affected ecosystems. It is incumbent on the International Seabed Authority to communicate to the public the potentially serious implications of this loss of biodiversity and ask for a response. ❐

The Tu'i Malila vent field in the Lau Basin, southwest Pacific. Lau Basin foundation species (*Alviniconcha* spp. snails, *Ifremeria nautilei* snails, and *Bathymodiolus septemdierum* mussels) live in diffuse flow on the surfaces of metal-rich sulfide deposits.

References
1. *Blue Growth: Opportunities for Marine and Maritime Sustainable Growth* (European Commission, 2012).
2. Levin, L. A. *et al. Mar. Policy* **74**, 245–259 (2016).
3. Ramey, H. J. *et al. Ocean* **68**, 232–238 (2015).
4. Bloomer, J., Brennan, L. & Mitchell, R. *A Cross-sector Guide for Implementing the Mitigation Hierarchy* (Cross Sector Biodiversity Initiative, 2013).
5. *Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources* (International Finance Corporation, 2012).
6. Smith, C. R., Levin, L. A., Koslow, A., Tyler, P. A. & Glover, A. G. in *Aquatic Ecosystems: Trends and Global Prospects* (ed. Polunin, N.) 334–369 (Cambridge Univ. Press, 2008).
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8. Brittsberg, S. M., Lundälv, T. & Gorman, T. J. *J. Exp. Mar. Bio. Ecol.* **395**, 153–161 (2010).
9. Pilgrim, J. D. *et al. Conserv. Lett.* **6**, 376–384 (2013).
10. *Guidance Note to the Standard on Biodiversity Offsets* (Business and Biodiversity Offsets Program, 2012).

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Nature Geoscience July 2017

Biodiversity loss from deep-sea mining unavoidable, irreversible on human timescales and offsets in the deep-sea "scientifically meaningless"

Biodiversity of the Clarion Clipperton Fracture Zone

Marine Biodiversity May 2017

One-half of species discovered to date likely depend on nodules. Nodules-dependent animals may take millions of years to recover from the impacts of mining, partial recovery of the animals living in the sediment may take hundreds to thousands of years.

Kaiser, S., Smith, C.R. & Arbizu, P.M. Editorial: Biodiversity of the Clarion Clipperton Fracture Zone. Mar Biodiv 47, 259–264 (2017).

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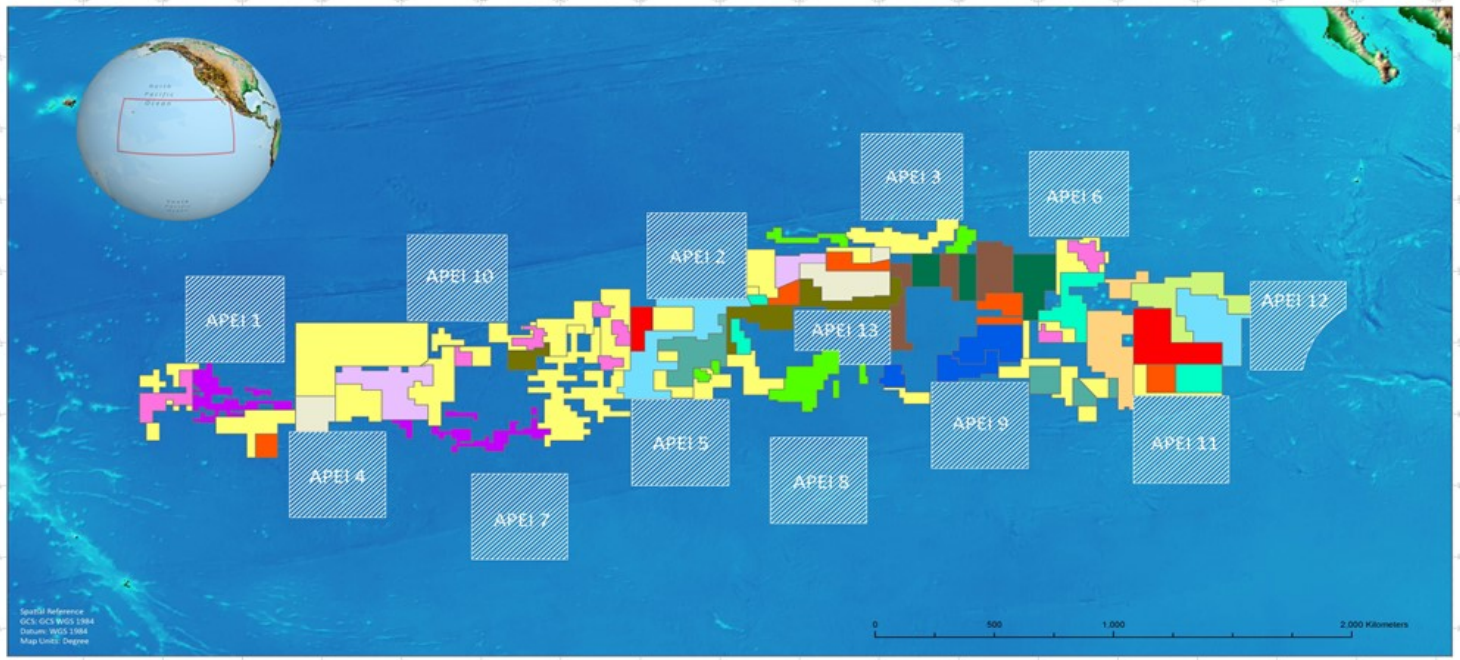
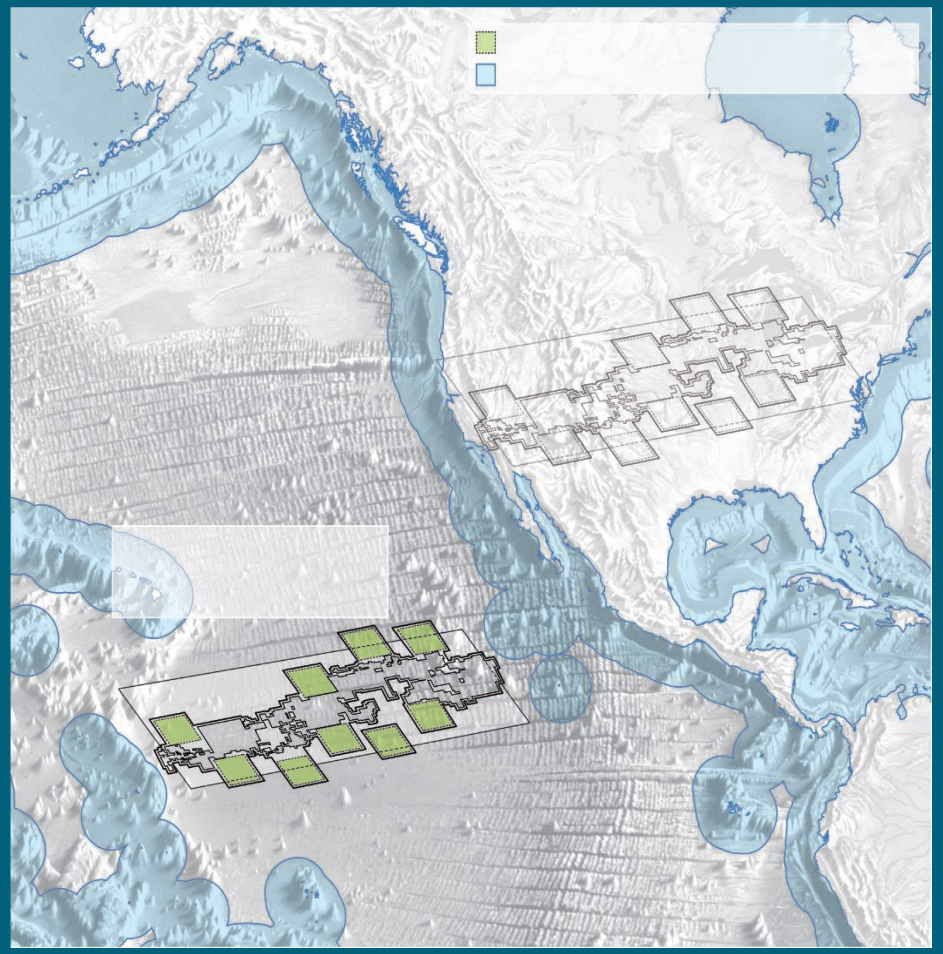
Clarion Clipperton Zone – ISA Nodule Exploration contracts (2023)



Clarion-Clipperton Fracture Zone Exploration and Reserved Areas for Polymetallic Nodules

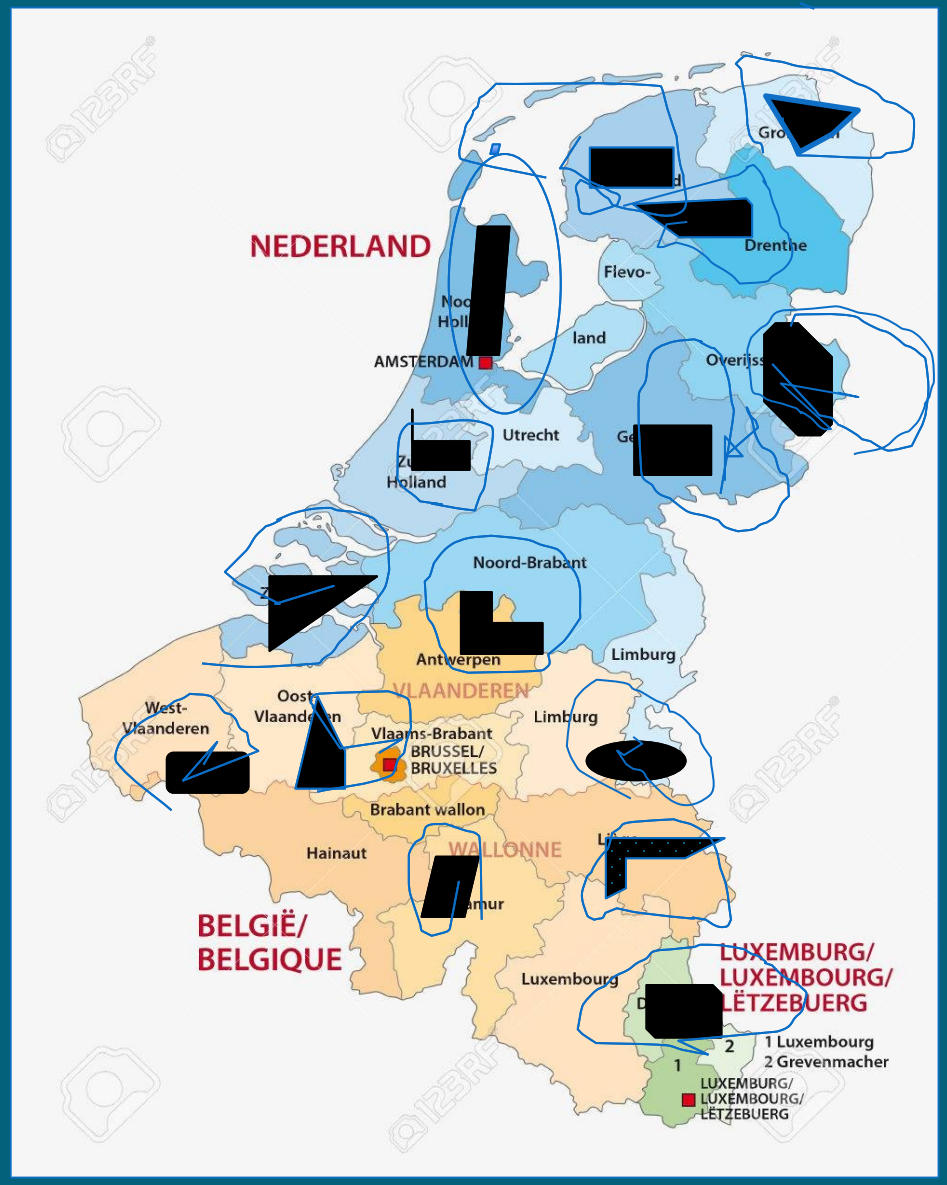
- Tonga Offshore Mining Limited (TOML; Tonga)
- Federal Institute for Geosciences and Natural Resources of the Federal Republic of Germany (BGR; Germany)
- Blue Minerals Jamaica Ltd (BMJ; Jamaica)
- Yuzhmorgeologiya (Russian Federation)
- Cook Islands Investment Corporation (CIIC; Cook Islands)
- China Minmetals Corporation (CMC; China)
- China Ocean Mineral Resources Research and Development Association (COMRA; China)
- Deep Ocean Resources Development Co. Ltd. (DORD; Japan)
- Global Sea Mineral Resources NV (GSR; Belgium)
- Institut Français de Recherche pour l'Exploitation de la Mer (IFREMER; France)
- Interoceanmetal Joint Organization (IOM; Bulgaria, Cuba, Czechia, Poland, Russian Federation and Slovakia)
- Government of the Republic of Korea
- Marawa Research and Exploration Ltd (Kiribati)
- Nauru Ocean Resources Inc. (NORI; Nauru)
- Ocean Mineral Singapore PTE Ltd. (OMS; Singapore)
- UK Seabed Resources Ltd. (UKSRL; UK)
- Reserved Areas
- Areas of Particular Environmental Interest (APEIs)

Basemap Sources: GEBCO, NOAA



17 Exploration contracts: Belgium, China, Cook Islands, France, Germany, Jamaica, Japan, Kiribati, Korea, Nauru, Russia, Singapore, Tonga, UK & IOM - Bulgaria, Cuba, Czech Republic, Poland, Russian Federation and Slovakia = app 1.25 million km2

Each ISA mining claim area in CCZ approximately 75,000 Km2



- Each CCZ mine would strip mine est **10-12,000 km2 of seabed in 30-year license period** to mine 3MT dry weight/year nodules (Smith et al 2020)
- **Sediment plumes across seabed could "easily" cover another 10,000-30,000 km2** & millions of km3 in water column from discharge from ships (Smith et al 2020)
- **Only produce app 0.16% Cu; 1.6% Ni; 4% Co** per year over and above terrestrially mined supplies (Gianni)

Benelux countries: Netherlands, Belgium, Luxemburg combined = app 75,000 km2

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Structural & political concerns regarding the ISA

- Legal and Technical Commission/LTC lack of transparency (contracts, meetings)
- Decision to grant mining contracts heavily influenced by LTC
- ISA Conflict of interest - regulator as well as beneficiary of licenses (UK House of Commons Environment Audit Committee 2019)
- Bureaucratic/institutional momentum to mine (key environmental obligation in Exploration regs ignored)
- Use it or lose it incentives: mine or risk losing exploration claim/contract (15yr); potentially ‘perverse’ incentive to mine
- 25 of the 30 ISA exploration contracts in the hands of 7 countries - China, France, Germany, India, Japan, Korea, Russia - and 3 companies UKSR (UK), GSR (Belgium), TMC (Canada) – monopolization?

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Structural/political concerns with the ISA

- All countries have equal opportunity to mine and/or become a Sponsoring State – Politically/legally difficult for the ISA to deny application from any country. Economics likely to drive industry development

- Profoundly undemocratic decision-making weighted toward mining (on behalf of humankind as a whole?) - if LTC recommends approval of an application for a mining license then:

  - even if a majority of the 167 member countries of the ISA do not want the contract approved or DSM to go forward, the ISA may still license deep-sea mining - ISA voting/decision-making structure requires at least 2/3rds vote of Council against recommendation from LTC to award a mining contract.
  - As few as 2-13 countries on the Council can guarantee a license is approved even if all others opposed.
  - Only the Council members have a vote on regulations and approval of licenses; the 131 additional members of the Assembly do not have a vote.

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Benefit to humankind as a whole?

Is deep-sea mining needed? EV Batteries?

"Needed"?: No; LFP (Tesla, BYD etc) society, ESG, governments, consumers can make choices- avoid high cost, environmentally damaging materials

Is it better than terrestrial mining? Lower environmental 'impact'?

- Assertion not fact: Even DeepGreen/TMC Life Cycle Analysis (2020) states comparison not possible
- Could just as easily be argued that DSM will make terrestrial mining worse

United Nations Environment Programme (UNEP) Financial Initiative report 2022: "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". Instead recommends financial institutions invest in reducing environmental footprint of terrestrial mining and support transition to better use of existing stores of metals and circular economy initiatives.

https://www.unepfi.org/publications/harmful-marine-extractives-deep-sea-mining/

Nauru triggered 2-year rule

Deadline 9 July 2023 by which either:

a) The ISA Council adopts exploitation regulations or

b) Council must consider and approve provisionally an application

(Paragraph 15 of section 1 of the Annex to the 1994 UNCLOS Part XI Agreement)

BUT the ISA Council is not likely to adopt regulations in July AND has decided that it does not have to approve “provisionally” a license mine after that date until regulations are adopted

Live debate & possible decision on how the Council of the ISA will decide on whether to approve a license (plan of work for exploitation) for Nauru’s contractor – The Metals Company (proposal from Germany and Netherlands)

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Growing support for a moratorium

Since June 2022 - Fourteen countries calling for pause, moratorium, ban

European Parliament: "…calls on the Commission and the Member States to promote a moratorium, including at the International Seabed Authority, on deep-seabed mining until such time as the effects of deep-sea mining on the marine environment, biodiversity and human activities at sea have been studied and researched sufficiently and deep seabed mining can be managed to ensure no marine biodiversity loss nor degradation of marine ecosystems" (June 2021/2022)

Over 700 marine science & policy experts from 44 countries https://www.seabedminingsciencestatement.org/

BMW Group, Volvo Group, Samsung SDI, Philips, Google, Volkswagen Group, Patagonia amongst others. Northvolt and Microsoft publicly stated they will avoid DSM metals in supply chains. More companies likely…

Banks/Financial institutions: ABN AMRO, Lloyds Banking Group, NatWest, BBVA, European Investment Ban etc

IUCN – moratorium 2021 (44 government agencies, over 500 civil society and indigenous peoples organizations)

http://www.savethehighseas.org/momentum-for-a-moratorium/

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Conclusion: The Question concerning the ISA & deep-sea mining: exploitation or moratorium? Key global governance decision by ISA in the next few years – The case for a moratorium

- Need much better understanding of deep-sea species, ecosystems, risks
- Consistency with UNCLOS Article 145 international commitments: Demonstrate possible to prevent loss of biodiversity; prevent degradation of deep-sea ecosystems & ecosystem services (SDG 14.2, Rio+20, CBD & Leaders Pledge to halt and reverse biodiversity loss)
- Reform/transform ISA (LTC transparency, ISA decision-making, etc)
- Much stronger emphasis on alternatives - resource efficient, closed-loop materials, circular economies and responsible terrestrial mining practices (UNEP FFI, others)
- Social license to mine (for the benefit of humankind as a whole) including consent of indigenous peoples and coastal Communities - (Decision on Marine and coastal biodiversity CBD COP-15)

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Thank-you!

DSM in the news

https://www.esginvestor.net/on-the-edge-of-the-abyss/

https://news.mongabay.com/list/deep-sea-mining/

https://www.washingtonpost.com/business/2023/04/05/deep-sea-mining-electric-vehicles/

https://apnews.com/article/deep-sea-mining-permission-isa-591536eff7adba104256b4829d93977d

https://www.nytimes.com/2023/03/15/opinion/ocean-mining-climate.html

https://www.lemonde.fr/en/opinion/article/2022/12/16/herve-berville-and-steffi-lemke-the-global-ocean-is-in-distress-we-are-determined-to-act_6007988_23.html

https://www.nytimes.com/2022/08/29/world/deep-sea-mining.html

https://www.documentcloud.org/documents/22266044-seabed-mining-selected-documents-2022

https://oglobo.globo.com/um-so-planeta/noticia/2022/06/conferencia-dos-oceanos-articula-moratoria-de-exploracao-de-minerais-em-alto-mar.ghtml

https://www.latimes.com/politics/story/2022-04-19/gold-rush-in-the-deep-sea-raises-questions-about-international-seabed-authority

https://www.theguardian.com/environment/2021/sep/27/race-to-the-bottom-the-disastrous-blindfolded-rush-to-mine-the-deep-sea

https://www.theguardian.com/environment/2021/sep/28/false-choice-is-deep-sea-mining-required-for-an-electric-vehicle-revolution

https://www.bloombergquint.com/business/a-mining-startup-s-rush-for-underwater-metals-comes-with-deep-risks

https://www.theatlantic.com/magazine/archive/2020/01/20000-feet-under-the-sea/603040/

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