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Planetary Health and the Perils of Progress: A Framework for Governing the Global Commons

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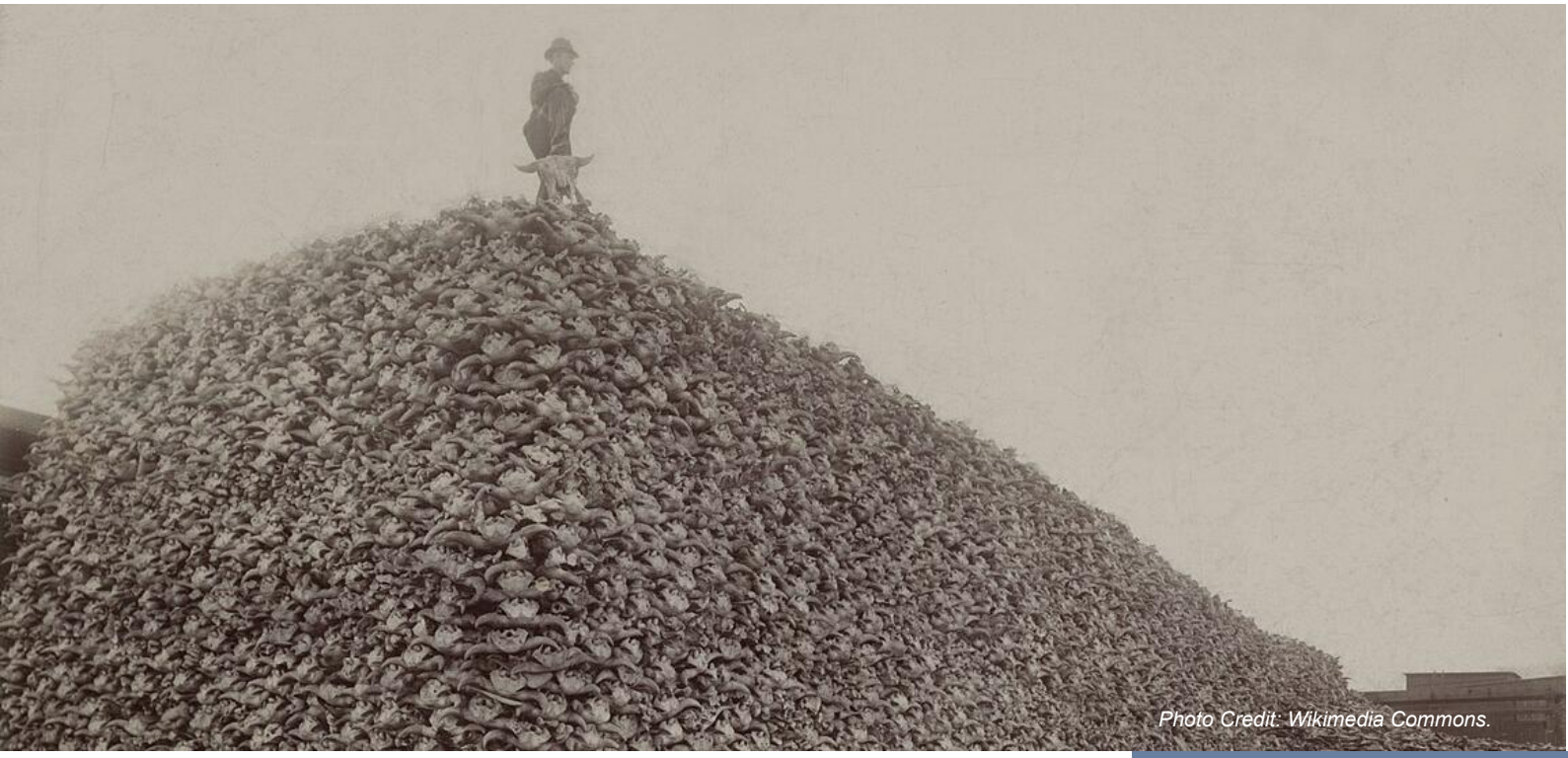

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Synopsis

As the Planetary Health movement marks its tenth anniversary, the global community faces a critical dilemma, exemplified by the debate over deep-sea mining for the green transition. This NTS Insight argues that this is not a new challenge but a recurring historical pattern of progress-driven environmental degradation, with a clear precedent in the 19th-century annihilation of the American bison. This analysis demonstrates how the Planetary Health framework, by integrating principles of systems thinking, precaution, and justice, provides the essential governance lens needed to diagnose and break this destructive cycle. The piece concludes with policy pathways for embedding a Planetary Health approach into the governance of the global commons, including navigating regional norms like ASEAN's non-interference principle, to ensure that the pursuit of sustainability does not create new zones of ecological sacrifice and geopolitical inequity.

Contents

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Introduction: A Decade of Planetary Health at a Critical Juncture

A decade has passed since the publication of the seminal *Rockefeller Foundation-Lancet Commission on Planetary Health*, which formally launched a 'new' field of inquiry and action.[1] [2] The report's central thesis, that the health and wellbeing of human civilisation is inextricably linked to the state of Earth's natural systems, has become more urgent and prescient with each passing year. Planetary Health is defined as a solutions-oriented, transdisciplinary concept that provides an essential framework for diagnosing why siloed, reductionist approaches to progress have consistently led to unintended but devastating consequences. This tenth-year anniversary arrives at a critical juncture, a moment defined by the profound challenge of navigating a global energy transition amidst escalating geopolitical tensions and accelerating environmental change. A contemporary issue that encapsulates this challenge acutely is the intense global debate surrounding the exploration and minerals exploitation of the deep seabed.[3] Proponents frame deep-sea mining as an economic and environmental necessity to secure the critical minerals required for a decarbonised future. A significant and growing coalition of scientists, civil society organisations, and nations, however, warns of catastrophic and irreversible ecological harm, calling for a moratorium based on the precautionary principle[4]. The precautionary principle has its origins in German law on air pollution in the 1970s, and while there is at present no universally acceptable definition or method of application, the 1992 Rio Declaration on Environment and Development has put forth an explanation of the principle that has been adopted by other environmental treaties.[5] The Rio Declaration states:

> 'In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.'[6]

The precautionary principle that has also been adopted by the Planetary Health movement, especially as wellbeing of both humans and the planet takes centre stage and the potential destruction to either runs contrary to the mandate of the movement.[7] However, the dilemma continues to plague debates as different camps are unable to reconcile the either/or costs to progress and environment. This NTS Insight acknowledges that this contemporary dilemma is not novel. Instead, it reflects a recurring historical pattern of progress-driven environmental degradation, a pattern made evident and saliently illustrated by the near-total extermination of the American bison in the 19th century.[8] This presents a critical puzzle for global governance: Why do these historical patterns persist even in an era of heightened scientific awareness and institutionalised environmental concern? This analysis argues that these patterns are locked in by path-dependent institutional logics and power asymmetries.

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[1] Martens, Pim. (2024). "Planetary health: The need for a paradigm shift." *BioScience* 74, no. 3 (2024): 128-129. The term Planetary Health may be new, and its current iteration is a more contemporary one. However, the concepts of interconnectedness in wellbeing of both ecological and human health are not new and finds its roots in indigenous culture and traditional beliefs.

[2] Whitmee, S., Haines, A., Beyrer, C., et al. (2015). "Safeguarding human health in the Anthropocene epoch: report of The Rockefeller Foundation–Lancet Commission on planetary health." *The Lancet*, 386(10007), 1973-2028.

[3] Chen, Amber X. (2025). "As Interest in Deep-Sea Mining Grows, Scientists Raise Alarms About the Possible Ecological Consequences," *Smithsonian Magazine*, July 18, 2025, https://www.smithsonianmag.com/science-nature/as-interest-in-deep-sea-mining-grows-scientists-raise-alarms-about-the-possible-ecological-consequences-180987009/.

[4] Woollacott, Emma. "Is Seabed Mining an Economic Necessity or a Hazard?," January 15, 2024. https://www.bbc.com/news/business-67935057.

[5] Bourguignon, Didier and European Parliamentary Research Service. (2015). "The Precautionary Principle." Report. *EPRS | European Parliamentary Research Service*, December 2015. https://doi.org/10.2861/821468.

[6] Ibid

[7] Foster, Alexander, Jennifer Cole, Andrew Farlow, and Ivica Petrikova. (2019). "Planetary Health Ethics: Beyond First Principles." *Challenges* 10, no. 1 (February 15, 2019): 14. https://doi.org/10.3390/challe10010014.

[8] School of Marine and Environmental Affairs. (2023.) "The Buffa-Low-Down: The Ecological Past, Present, and Future of the American Bison | School of Marine and Environmental Affairs," May 10, 2023. https://smea.uw.edu/currents/the-buffa-low-down-the-ecological-past-present-and-future-of-the-american-bison/.

I contend that the Planetary Health framework, therefore, is not just a solutions-oriented field, but a **contested normative project** aimed at disrupting these historical path dependencies. By placing these two cases—one contemporary, one historical—in dialogue, this analysis will demonstrate how the Planetary Health framework provides the essential governance lens to diagnose and disrupt this recurring cycle. It begins by examining the parallel logics of progress-driven extraction and exploitation in both cases, then explores the dimensions of ecological uncertainty and the geopolitics of justice and concludes by outlining actionable governance pathways for embedding a Planetary Health approach into the management of the global commons.

A Recurring Dilemma: The Paradox of Progress-Driven Extraction

The Planetary Health framework is fundamentally a critique of the "metabolic rift": a concept rooted in the work of Karl Marx and articulated by scholars like John Bellamy Foster to describe the severing of the reciprocal relationship between human societies and the natural systems upon which they depend.[9] [10] This metabolic rift is often driven by economic and technological paradigms that externalise environmental and social costs in the name of progress. This dynamic is a defining feature of the Anthropocene, the current geological epoch where human activity has become the driving force of planetary change.[11] The debates surrounding deep-sea mining and the history of the American bison offer two distinct but structurally similar examples of this phenomenon, revealing a persistent pattern of binary, siloed, and reductionist thinking that Planetary Health seeks to remedy.

The Contemporary Case: Deep-Sea Mining for the Green Transition

The primary argument for initiating deep-sea mining is directly linked to the global energy transition. The abyssal plains of the Pacific Ocean, particularly the 4.5 million sq km Clarion-Clipperton Zone (CCZ) between Hawaii and Mexico, are home to trillions of polymetallic nodules.[12] [13]These nodules are rich in minerals such as cobalt, nickel, manganese, and copper.[14] These minerals are critical components for the manufacturing of high-capacity batteries required for electric vehicles (EVs) and large-scale energy storage, as well as for other renewable energy technologies.[15] Corporations like The Metals Company (TMC), sponsored by the Pacific Island Nation of Nauru, argue that sourcing these minerals from the seabed is less socially and environmentally damaging than terrestrial mining, which is often associated with deforestation, freshwater pollution, and human rights abuses in countries like the Democratic Republic of Congo.[16] [17] In this carefully constructed but heavily critiqued narrative, proponents of deep-sea mining claim that it is not an environmental harm but a necessary, even preferable, step to combat climate change, i.e., a technological solution to a planetary crisis.

The proposed method of extraction involves deploying large collector vehicles, akin to underwater tractors, to the seafloor several kilometres below the surface.[18] These vehicles would vacuum up the top 10-15 centimetres of the seabed to

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[9] Baer, Hans A., and Merrill Singer. (2023). “Planetary Health: Capitalism, Ecology and Eco-Socialism.” *Capitalism Nature Socialism* 34, no. 4 (April 3, 2023): 20–38. https://doi.org/10.1080/10455752.2023.2192953.

[10] Foster, J. B. (2000). *Marx's Ecology: Materialism and Nature*. Monthly Review Press.

[11] Steffen, Will, Åsa Persson, Lisa Deutsch, Jan Zalasiewicz, Mark Williams, Katherine Richardson, Carole Crumley, et al. “The Anthropocene: From Global Change to Planetary Stewardship.” *AMBIO* 40, no. 7 (October 11, 2011): 739–61. https://doi.org/10.1007/s13280-011-0185-x.

[12] International Seabed Authority. “Clarion Clipperton Fracture Zone - International Seabed Authority.” International Seabed Authority - International Seabed Authority, June 3, 2024. https://www.isa.org.jm/maps/clarion-clipperton-fracture-zone/.

[13] Brigham, Katie. “Deep-sea Mining Could Help Solve the Global Critical Minerals Shortage, but It’s a Lightning Rod for Controversy.” CNBC, September 20, 2023. https://www.cnbc.com/2023/09/20/deep-sea-mining-the-race-for-critical-minerals-used-in-clean-energy.html.

[14] Ashford, Oliver, Jonathan Baines, Melissa Barbanell, and Ke Wang. “What We Know About Deep-Sea Mining — and What We Don’t.” Explainer. *World Resources Institute*. July 2025. Accessed August 7, 2025. https://www.wri.org/insights/deep-sea-mining-explained.

[15] Woollacott, “Is Seabed Mining an Economic Necessity or a Hazard?”

[16] Fuatai, Teuila. “Nauru, Metals Company Revise Deep Sea Mining Agreement.” *RNZ*, June 5, 2025. https://www.rnz.co.nz/international/pacific-news/563181/nauru-metals-company-revise-deep-sea-mining-agreement.

[17] “The Metals Company Goes Rogue in Desperate Move to Monetize the Deep Seabed | Mining Watch Canada,” n.d. https://www.miningwatch.ca/blog/2025/5/14/metals-company-goes-rogue-desperate-move-monetize-deep-seabed.

[18] Gales, Phillip. “Deep Sea Mining Equipment.” Deep Sea Mining, September 2, 2023. https://deepseamining.ac/deep_sea_mining_equipment#gsc.tab=0.

harvest the nodules.[19] This slurry of sediment, nodules, and deep-sea life would then be pumped to a surface vessel through a giant riser system.[20] Onboard, the nodules would be separated, and the leftover sediment and wastewater would be discharged back into the ocean, creating vast underwater plumes.[21] This industrial-scale process, though technologically advanced, represents new applications of resource extraction in one of the planet's most sensitive and least-understood environments. Concerns raised about deep-sea mining, and its large operations and equipment include direct and indirect harm to marine life, disruption of ecosystems, impact on fishing and food security, and climate risks due to the disruptive impacts on microscopic organisms crucial to climate regulation.[22] The contentious debate between extraction (measured heavily in monetary terms and economic progress) and its environmental and social destruction (often ignored citing a lack of a causal and thorough calculation in relation to financial and economic impact) then leads to further debate on “necessary extraction” vs. “precautionary principle”. This can be seen as a repetitive pattern throughout human history.

The Historical Precedent: The Annihilation of the American Bison

The logic of "necessary extraction" finds a powerful precedent in the 19th-century United States. The American bison, with a pre-colonial population estimated between 30 and 60 million, was the keystone species of the Great Plains ecosystem and the foundation of the Plains Indigenous peoples’ societies.[23] The near-total destruction of these herds in just a few decades was driven by its own era’s vision of progress, land rights, and technological advancement.[24] The expansion of railways across the continent after the 1860s provided unprecedented access to the vast herds, while industrial demand in the eastern U.S. and Europe created a booming market for bison hides for industrial belts, meat for urban centres, bones for agricultural fertiliser and fine bone china.[25]

The slaughter was industrialised and relentless. Commercial hunters, often travelling by rail, could kill hundreds of bison a day, taking only the hides and leaving the carcasses to rot.[26] This industrial-scale process, which saw millions of bison killed annually, was widely seen as a necessary corollary to westward expansion, clearing the plains for cattle ranching, agriculture, and settlement. For example, the bison were seen as competition for cattle for grazing land. The destruction of the bison was framed as an essential, or even a brutal yet unavoidable step in the march of industrial civilisation and the fulfilment of "Manifest Destiny."[27] By the late 1880s, fewer than a thousand bison remained, with the 1907 photograph of a mountain of bison skulls a visceral record of the outcome of a catastrophic ecological miscalculation.[28]

The Planetary Health Diagnosis: From Metabolic Rift to Systemic Solutions

From a Planetary Health perspective, both scenarios reveal the limitations of approaching complex issues without a systems thinking framework, representing a profound metabolic rift. The 19th-century justification for the bison slaughter isolated the immediate economic benefits of hides and bones while completely disregarding the ecological role of the bison in maintaining the prairie ecosystem and even maliciously advocating for the profound social and cultural devastation its loss would inflict on Indigenous populations.[29] Similarly, the current argument for deep-sea mining isolates the single variable of carbon emissions while largely ignoring the cascading consequences on marine biodiversity,

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[19] JPI Oceans. “Assessing the Impacts of Nodule Mining on the Deep-sea Environment,” n.d. https://www.jpi-oceans.eu/en/assessing-impacts-nodule-mining-deep-sea-environment.
[20] Gales,”Deep Sea Mining Equipment”
[21] Watson, Katy. “Mining the Pacific – Future Proofing or Fool’s Gold?,” December 9, 2024. https://www.bbc.com/news/articles/c17d04ljzxko.
[22] Ashford et al., “What We Know About Deep-Sea Mining — and What We Don’t.”
[23] SMEA. “The Buffa-Low-Down: The Ecological Past, Present, and Future of the American Bison | School of Marine and Environmental Affairs.”
[24] Ibid
[25] Mamers, Danielle. “Chilling Historical Photo Captures the Deadly Impact of Humans.” *ScienceAlert*, December 6, 2024. https://www.sciencealert.com/chilling-historical-photo-captures-the-deadly-impact-of-humans.
[26] King, Gilbert. “Where the Buffalo No Longer Roamed.” *Smithsonian Magazine*, November 15, 2013. https://www.smithsonianmag.com/history/where-the-buffalo-no-longer-roamed-3067904/.
[27] Ibid
[28] Mamers, “Chilling Historical Photo Captures the Deadly Impact of Humans.”
[29] Phippen, J. Weston. “Kill Every Buffalo You Can! Every Buffalo Dead Is an Indian Gone” *The Atlantic*, June 7, 2021. https://www.theatlantic.com/national/archive/2016/05/the-buffalo-killers/482349/.

ecosystem function, and the global carbon cycle. It presents a false choice between two forms of extraction, rather than questioning the underlying model of consumption that drives the demand for minerals. This is a classic example of a failure to analyse the dynamics of a complex socio-ecological system (SES), where interventions in one part of the system can have unforeseen and potentially catastrophic effects on others.[30]

Planetary Health calls for a fundamentally different approach: one based on integrated, full-cost accounting that acknowledges the interconnectedness of all systems. Drawing upon a resilience perspective, PH posits that human and natural systems are so inextricably linked that sacrificing the health of the environment will ultimately cascade into problems for human health, thus reducing resilience, health security, and wellbeing. It demands that questions are asked not simply about carbon emissions or with a reductionist view towards the full scope of energy transition, but rather, "What are the total systemic impacts of this proposed action: on biodiversity, on social equity, on cultural heritage, on the resilience of planetary systems?" By asking this broader set of questions, the PH framework moves the analysis beyond a simple trade-off and towards a discussion of more systemic solutions, such as developing circular economies to reduce the primary demand for virgin minerals altogether.[31] This approach seeks to repair the metabolic rift by advocating a re-integration of human economies with the planetary systems that sustain them.

Governing Planetary Systems: Justice, Precaution, and Institutional Failure

The cases of deep-sea mining and the American bison also reveal the critical importance of three other pillars of the Planetary Health framework: justice, the precautionary principle, and the need for effective governance. These cases demonstrate that governance failures are not merely technical but are deeply embedded in structures of power, equity, and law.

The Geopolitics of Justice: From the Great Plains to the Pacific Floor

Environmental harms and benefits are rarely distributed equally. The 19th-century bison slaughter was not only a commercial enterprise but was also an explicit political and military strategy of the United States government. By eliminating the subsistence base of the Plains Indigenous peoples, the U.S. aimed to undermine their sovereignty, destroy their subsistence economy, and force them onto reservations.[32] This was understood at the highest levels of the US government; General Philip Sheridan, a key figure in the Indian Wars, was reported to have said in 1875, “Let them kill, skin and sell until the buffalo is exterminated… It is the only way to bring lasting peace and allow civilization to advance”.[33] The bison was correctly identified as the “commissary” of the indigenous Plains tribes, and its destruction was a direct assault on their way of life.[34] Centuries later, recent research has quantified the direct human health consequences of this ecocide. A 2024 study found that the near extinction of the bison, which had been a primary source of protein, led to a measurable decline in the health of Native American populations.[35] For example, the average height of men from bison-reliant tribes dropped by more than an inch in the decades following the slaughter, a significant indicator of nutritional stress and a lasting negative health impact that persists to this day.[36] This provides a clear, empirical link between the destruction of an ecosystem and a negative human health outcome, and thus the importance of using a Planetary Health perspective. A core tenet of Planetary Health is that a ‘just transition’ cannot be built upon the creation of new sacrifice

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[30] Folke, Carl, Steve Carpenter, Thomas Elmqvist, Lance Gunderson, Crawford S. Holling, and Brian Walker. "Resilience and sustainable development: building adaptive capacity in a world of transformations." *AMBIO: A journal of the human environment* 31, no. 5 (2002): 437-440.

[31] Ellen MacArthur Foundation. (2013). *Towards the Circular Economy: Economic and business rationale for an accelerated transition*.

[32] Phippen. “Kill Every Buffalo You Can! Every Buffalo Dead Is an Indian Gone”

[33] Ibid

[34] Eskins, Julia. “How The Return of Bison Connects Travelers With Native Cultures.” *Travel*, August 2, 2023. https://www.nationalgeographic.com/travel/article/how-the-return-of-bison-connects-travelers-with-native-cultures.

[35] Feir, Donn L., Rob Gillezeau, and Maggie EC Jones. "The slaughter of the bison and reversal of fortunes on the Great Plains." Review of Economic Studies 91, no. 3 (2024): 1634-1670.

[36] Clark, Carol. “Buffalo Slaughter Left Lasting Impact on Indigenous Peoples.” *Emory University.* August, 23, 2023. https://news.emory.edu/stories/2023/08/esc_bison_impact_24-08-2023/story.html.

zones or the perpetuation of environmental injustice, a term used to describe the disproportionate burden of environmental harms borne by marginalised communities.[37] [38]

Drawing on these historical lessons, we can also analyse how the contemporary geopolitics of deep-sea mining highlight this perpetuation of existing power dynamics and environmental injustice. Climate-vulnerable Pacific Island Nations such as Nauru and Kiribati, facing existential threats from sea-level rise, have sponsored mining applications in the hope that the revenue will fund climate adaptation and secure their economic future. This creates a deeply inequitable dynamic where the nations least responsible for the climate crisis are incentivised to risk their primary natural and cultural heritage, the Pacific Ocean, to supply minerals for a green transition driven by and for developed nations.[39] Their position is countered by other Pacific states, including Fiji, Palau, and Samoa, which have joined a growing global coalition calling for a moratorium to protect the oceanic ecosystems central to their economies and cultural identities.[40] The parallels between the two cases are evident. The historical link between environmental destruction and the dispossession of and disproportionate harms to vulnerable populations offers a stark lesson for contemporary policy. The concept of a 'just transition' which has become central to climate policy discourse, demands that the shift to a sustainable economy must be fair and equitable, leaving no one behind. Furthermore, the evidence of measurable negative health impacts on the indigenous population highlights that while the science of long-lasting consequences may not be immediately evident nor available for study, its actuality is not diminished. This precedent reveals the importance of using a similar precautionary lens considering the wellbeing of the 'planetary' unit when analysing the debates surrounding deep sea mining.

The Precautionary Principle Under Threat

The precautionary principle, famously articulated as Principle 15 of the 1992 Rio Declaration, states that where there are threats of serious or irreversible damage, a lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.[41] The push for deep-sea mining represents a direct challenge to this foundational principle of international environmental law. Scientists have repeatedly warned that the deep seabed is the least understood biome on Earth.[42] We have only a nascent understanding of its unique biodiversity, its role in long-term carbon sequestration, and the potential impacts of industrial-scale mining operations.[43] Scientific studies suggest that the sediment plumes generated by mining could travel for hundreds of kilometres, smothering deep-sea life far beyond the immediate mining sites, while the noise and light pollution could disrupt ecosystems that have existed in darkness and silence for millennia.[44] [45]Recent research has underscored the potential for widespread and irreversible extinction events in the CCZ, which is home to thousands of species unknown to science.[46] The argument that we must proceed in the absence of this knowledge for the sake of the energy transition is a direct inversion of the precautionary principle. The historical lesson of the bison, where a seemingly infinite resource was driven to functional extinction in decades, serves as a powerful warning against such ecological hubris.

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[37] Bennett, Nathan J., Juan José Alava, Caroline E. Ferguson, Jessica Blythe, Elisa Morgera, David Boyd, and Isabelle Cote. "Environmental justice in the ocean." *Institute for the Oceans and Fisheries, University of British Columbia, Working Papers 2022* 3, no. 40 (2022): 1-39.

[38] Schmidt, Oscar, and Manuel Rivera. "No people, no problem–narrativity, conflict, and justice in debates on deep-seabed mining." *Geographica Helvetica* 75, no. 2 (2020): 139-150.

[39] Bell, Katherine Lynn Croff, Maud Caroline Quinzin, Diva Amon, Susan Poulton, Alexis Hope, Otmane Sarti, Titus Espedido Cañete et al. "Exposing inequities in deep-sea exploration and research: results of the 2022 Global Deep-Sea Capacity Assessment." *Frontiers in Marine Science* 10 (2023): 1217227.

[40] Pohle, Camilla. "As Pacific Islands Caution Against Seabed Mining, the US Prepares to Trash the Rules." *The Diplomat*. May 16, 2025. https://thediplomat.com/2025/05/as-pacific-islands-caution-against-seabed-mining-the-us-prepares-to-trash-the-rules/

[41] United Nations. "Report of The United Nations Conference on Environment and Development." *A/CONF.151/26(Vol.I)*, August 12, 1992.

[42] Amon, D. J. et al. "Assessment of scientific gaps related to the effective environmental management of deep-seabed mining." *Marine Policy* 138 (2022): 105006.

[43] Ashford et al., "What We Know About Deep-Sea Mining — and What We Don't."

[44] Chu, Jennifer. "Ocean Scientists Measure Sediment Plume Stirred up by Deep-sea-mining Vehicle," *MIT News.* September 21, 2022. https://news.mit.edu/2022/sediment-deep-sea-mining-0921.

[45] Williams, Rob, Christine Erbe, Alec Duncan, Kimberly Nielsen, Travis Washburn, and Craig Smith. "Noise from deep-sea mining may span vast ocean areas." *Science* 377, no. 6602 (2022): 157-158.

[46] Miller, K. A. et al. "An overview of seabed mining including the current state of development, environmental impacts, and knowledge gaps." *Frontiers in Marine Science* 4 (2018): 312755.

The Crisis of Global and Regional Governance

The final parallel lies in the challenge of governance. In the 19th century, there was a near-total governance vacuum that allowed for the unimpeded destruction of the bison. Presently, we have a dedicated United Nations (UN) body, the International Seabed Authority (ISA), with a mandate under the UN Convention on the Law of the Sea (UNCLOS) to govern the international seabed: the "common heritage of mankind."[47] However, the ISA's mandate contains an inherent structural tension: it is tasked with both organising mineral exploitation and ensuring the effective protection of the marine environment.[48] Critics argue that this dual mandate has led to an institutional bias towards exploitation, as well as exposing the ISA's mandate to exploitation by various interests. For example, the triggering of the "two-year rule" by Nauru in 2021, which compelled the ISA to attempt to finalise exploitation regulations by 2023, has been cited as a prime example of commercial and political timelines overriding scientific caution.[49] [50]This highlights the broader challenge of regime complexity, where institutions like the ISA must navigate the conflicting logics of international environmental law, global trade rules, and the geopolitical interests of member states.[51]

This governance challenge is both at the global and regional level will be a key obstacle that must be overcome by a rethinking of existing governance structures, through a Planetary Health framework. Many global and regional governance tend to advocate for sovereignty and non-interference, despite issues being often cross-border, transnational, and deeply interconnected. The deep-sea mining case reveals how transboundary issues can be beset by governance debates where stakeholders are acting primarily in their own national and/or economic interests. Another example, Southeast Asia's regional governance body ASEAN, also has a foundational principle of non-interference that can prove a significant challenge to addressing transboundary Planetary Health issues. Regional problems like haze pollution from land-clearing fires, which have caused public health crises and economic losses across the region, marine plastic pollution, and the degradation of shared river basins like the Mekong cannot be solved by any single nation. Yet, the non-interference norm, a product of the region's unique history and a form of institutional path dependency, makes it difficult to establish binding regional standards or hold member states accountable for activities with cross-border impacts. This presents a significant governance challenge, creating an opportunity for ASEAN to lead with innovative diplomatic and policy approaches.

Policy Pathways for a Planetary Health Future

The insights gleaned from analysing these historical and contemporary cases through a Planetary Health lens generate several clear governance pathways for national governments, international bodies, and civil society. These are not isolated recommendations, but rather interconnected strategies for fundamentally reorienting our approach to managing the global commons.

1. **Reforming Global Institutions and Strengthening Precaution:** The case of the ISA demonstrates the urgent need to reform global governance structures to eliminate conflicts of interest and firmly embed the precautionary principle. This includes advocating for a formal moratorium on deep-sea mining until independent, comprehensive scientific research has established clear ecological baselines. More broadly, it means designing international institutions whose primary mandate is the stewardship of the global commons, rather than the facilitation of their exploitation, avoiding an explicit and undeniable conflict of interests within one single governing body.

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[47] Bourrel, Marie, Torsten Thiele, and Duncan Currie. "The common of heritage of mankind as a means to assess and advance equity in deep sea mining." *Marine Policy* 95 (2018): 311-316.

[48] Amon, et al. "Assessment of scientific gaps related to the effective environmental management of deep-seabed mining."

[49] Singh, Pradeep A. "The two-year deadline to complete the International Seabed Authority's Mining Code: Key outstanding matters that still need to be resolved." *Marine Policy* 134 (2021): 104804.

[50] IISD. "Amid Concerns Over Exploitation, ISA Forges Ahead with Deep Sea Mining Rules," *International Institute for Sustainable Development*. April 2, 2025. https://sdg.iisd.org/news/amid-concerns-over-exploitation-isa-forges-ahead-with-deep-sea-mining-rules/

[51] Alter, Karen J., and Sophie Meunier. "The politics of international regime complexity." *Perspectives on politics* 7, no. 1 (2009): 13-24.

2. **Centring Justice and Equity in Global Resource Governance:** A Planetary Health approach demands that justice be at the centre of all resource governance. This involves operationalising principles like "Free, Prior, and Informed Consent" (FPIC), developed in the context of Indigenous rights, and applying them to decisions affecting the global commons.[52] Benefit-sharing mechanisms must be designed to empower local and vulnerable communities, not merely to provide financial incentives for environmental degradation.

3. **Navigating Regional Norms through NTS and Track 2 Diplomacy:** To address the challenge of regional norms such as the non-interference principle, a multi-track approach is needed. First, Planetary Health challenges could be consistently framed as shared Non-Traditional Security (NTS) threats, such as pandemics or financial crises, or perhaps in this case deep-sea ecological crises, to leverage existing cooperative mechanisms. Second, greater investment is needed in "Track 2" (academic/expert) and "Track 3" (civil society) networks. These networks can build regional consensus on scientific realities and propose technically sound, politically feasible solutions in a non-confrontational manner, gradually socialising new norms at the official "Track 1" level.

4. **Fostering Transformative Economic Models:** The most fundamental pathway is to address the underlying drivers of destructive extraction. The Planetary Health perspective reveals that a more effective solution to resource dilemmas in a world of resource scarcity and cascading health impacts from environmental degradation, is not to find new frontiers for extraction and exploitation, but to reduce primary demand. Governments and international financial institutions must accelerate investment and policy support for the circular economy: urban mining for e-waste, designing products for longevity and repairability, and developing alternative technologies that rely on more abundant materials.

As the Planetary Health movement enters its second decade, its core mission has never been more relevant. The challenges exemplified by the deep-sea mining debate require the integrated, systemic, and equity-focused analysis that Planetary Health provides. Action and effective policy translation is now necessary; focused on building new governance frameworks that internalise the precautionary principle, systemic solutions like the circular economy over new forms of extraction and centre the principles of justice and equity in all decision-making. The challenge of Planetary Health will be its ability to translate into frameworks and tools that help people learn from history, govern with foresight and justice, and end the persistent cycle of progress-driven destruction.

[52] United Nations. “United Nations Declaration on the Rights of Indigenous Peoples,” September 13, 2007. https://www.un.org/development/desa/indigenouspeoples/wp-content/uploads/sites/19/2018/11/UNDRIP_E_web.pdf.

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