



Oceans of Opportunity: Sustainable Investment and the Blue Economy





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Introduction

Throughout human history, oceans have been regarded as a common resource from which everyone could benefit endlessly. For that history to perpetuate, the future health of the high seas must now be regarded as a common responsibility. From the air and food that sustains us to the relative climate stability we have enjoyed over the centuries, our growth, development and very survival depends on healthy oceans. However, when discussing climate and nature-related risks in business operations or defining sustainable actions and initiatives, companies have almost exclusively focused on their relationships with terrestrial ecosystems. Comparatively, the role of aquatic ecosystems in both climate and nature-related narratives is less understood and corporate knowledge of marine-related impacts, dependencies, risks and opportunities remains underdeveloped.

It is well documented that a significant financing gap remains for supporting sustainable oceans. As an ethical, sustainable and impact investor, Greenbank has adopted eight sustainable development themes to help guide the way we invest on behalf of our clients.ⁱ One of these themes is Habitats and Ecosystems, which aligns with our ambition of retaining the integrity and vitality of nature today and for future generations. Nature is also one of Greenbank’s priority research and engagement themes for 2025, alongside climate change and human rights.ⁱⁱ Within this overarching theme we have decided to do a deeper dive into the topic of sustainable oceans, given that the topic remains largely overlooked from an investor perspective, despite growing public awareness and increasing scientific consensus around ocean decline.

This document has been prepared by Greenbank and reflects the general view of the research team. It should not be taken as a recommendation, nor advice as to how a specific market is likely to perform. The value of investments and the income from them may go down as well as up, and you could get back less than you originally invested. Past performance is not a reliable indicator of future performance.

ⁱ Greenbank Investments. (2025). Greenbank Brochure. Available at: <https://www.greenbankinvestments.com/greenbankbrochure>.

ⁱⁱ Greenbank Investments. (2025). Greenbank Engagement Review 2024-25. Available at: <https://www.greenbankinvestments.com/greenbankbrochure>.



“The future health of the high seas must now be regarded as a common responsibility.”

An increase in global initiatives targeting the conservation of oceans

This increased scientific consensus and growing public awareness of ocean decline has contributed in recent years to the development and refinement of global initiatives targeting the effective conservation and restoration of marine ecosystems. In 2017, the UN declared the period 2021-2030 its Decade of Ocean Science for Sustainable Development, mandating UNESCO’s Intergovernmental Oceanographic Commission (IOC) to develop science-based solutions and policies through global partnerships and deliver “the science we need for the ocean we want”.ⁱⁱⁱ UN Ocean Conferences held in 2017, 2022 and 2025 sought to mobilise global action and finance in support of ocean conservation and governance.^{iv}

The creation of the Global Biodiversity Framework at COP15 in 2022 established the common goal of protecting at least 30% of the planet’s land and sea by 2030.^v The 2023 BBNJ Agreement – more commonly known as the UN High Seas Treaty – was the first legally binding instrument for the conservation and sustainable use of marine biodiversity in ocean areas beyond national jurisdiction.^{vi} While encouraging steps have been taken to identify, generate and disseminate critical guidance to manage oceans sustainably, finance streams for ocean safeguarding are significantly short of global estimates and UN Sustainable Development Goal 14 – Life below water – remains the least funded.^{vii}

“In 2017, the UN declared the period 2021-2030 its Decade of Ocean Science for Sustainable Development.”

ⁱⁱⁱOcean Decade. (2025). Vision & Mission. Achieving the ocean we want by 2030. (Online). Available at: <https://oceandecade.org/vision-mission/>.
^{iv}United Nations. (2025). 2025 UN Ocean Conference. (Online). Available at: <https://sdgs.un.org/conferences/ocean2025>.
^vConvention on Biological Diversity. (2023). Kunming-Montreal Global Biodiversity Framework. Convention on Biological Diversity. (Online). Available at: <https://www.cbd.int/gbf>.
^{vi}High Seas Alliance. (2025). High Seas Treaty & Biodiversity Beyond National Jurisdiction. High Seas Alliance. Available at: <https://highseasalliance.org/treaty-negotiations/>.
^{vii}World Economic Forum. (2022). SDG14 Financing Landscape Scan: Tracking Funds to Realize Sustainable Outcomes for the Ocean.



Why do oceans matter?

Oceans are the largest life-supporting ecosystems on Earth. Covering over 70% of the planet’s surface, marine ecosystems sustain a vast network of interdependent organisms that underpin the ocean’s productivity, resilience, and ability to adapt to change.^{viii} Hosting around 80% of all planetary life, marine ecosystems are vital for wider environmental health and provide ecological services essential for all life to flourish.^{ix} Each species in the ocean has a particular role to play within this. Microscopic ocean phytoplankton form the basis of extended marine and human food chains and are critical to the global carbon cycle. The ocean carbon reservoir holds around 40,000 billion tonnes of carbon, most of which is dissolved in seawater. In a constant cycle of exchange with the atmosphere, ocean carbon volumes exceed atmospheric carbon by a factor greater than 50.^{xi} In addition to the natural exchange process, it’s estimated that oceans have absorbed 25% of emissions and 90% of the excess heat generated by decades of social and industrial expansion.^{xii} By absorbing and storing carbon, increasing atmospheric humidity and redistributing heat across the world, oceans play a central role in preserving the planet’s climatic balance.

Despite only representing around 1% of the world’s plant biomass, phytoplankton account for half of global photosynthetic activity and produce at least 50% of the planet’s oxygen. Remarkably, marine photosynthesis is thought to predate terrestrial photosynthetic activity by more than 2 billion years.^{xiii} Likewise, coral reefs cover less than 1% of the seafloor but support and sustain around 25% of marine species, making them the single most biodiverse ecosystem in the ocean and one of the most valuable ecosystems on the planet.^{xiv} In January 2025, the World Economic Forum estimated that coral reef ecosystem services had a combined annual value of \$9.9 trillion, supporting the livelihoods of a billion people living in the world’s most climate-vulnerable regions.^{xv} The establishment and expansion of coastal communities

“Hosting around 80% of all planetary life, marine ecosystems are vital for wider environmental health and provide ecological services essential for all life to flourish.”

throughout the world highlights the intrinsic value of oceans as a source of food security: according to the UN Food and Agricultural Organization (FAO), ocean food sources provide essential micronutrients and around 20% of dietary protein for over 3 billion people.^{xvi} Marine organisms also feature prominently in biotechnology and pharmaceutical production, providing the basis for treatments targeting cancers, infections and other life-threatening conditions.^{xvii}

Oceans therefore support a wide range of economic interests and activities. In fact, the International Maritime Organization estimates that 90% of globally traded goods are shipped by sea.^{xviii} In the United States, 76% of its international trade involves some form of marine transportation while the country’s \$280 billion ocean economy employs around 3 million people.^{xix} The global seafood industry also plays a major role, employing millions of people and generating hundreds of billions of dollars annually. Meanwhile, coastal and marine tourism is a significant employer and key driver for global tourism revenues, with a market valued in 2025 at over \$3 trillion.^{xx}

In the energy sector, oceans have long been sources of oil and gas, but the growing awareness of their capacity for producing energy from renewable sources, from offshore wind to tidal and wave power, has highlighted the importance of investment in marine-based solutions to drive the clean energy transition. In parallel, the discovery of significant reserves of gold, silver and other rare earth elements at extreme depths have accelerated commercial interest in exploratory tests for deep-sea mining, raising serious questions about the broader ecological consequences of such activities.

“By absorbing and storing carbon, increasing atmospheric humidity and redistributing heat across the world, oceans play a central role in preserving the planet’s climatic balance.”

^{viii}United Nations. (2022). Goal 14: Conserve and sustainably use the oceans, seas and marine resources. United Nations Sustainable Development. (Online). Available at: <https://www.un.org/sustainabledevelopment/oceans/>.
^{ix}IPCC. (2019). IPCC Special Report on the Ocean and Cryosphere in a Changing Climate. Marine Stewardship Council. (2024). Marine biodiversity. Marine Stewardship Council. (Online). Available at: <https://www.msc.org/en-au/what-we-are-doing/oceans-at-risk/marine-biodiversity#:~:text=The%20importance%20of%20marine%20biodiversity&text=Marine%20biodiversity%20can%20prevent%20one.>
^{xi}World Ocean Review. (2024). The role of the ocean in the global carbon cycle. (Online). Available at: <https://worldoceanreview.com/en/wor-3/the-role-of-the-ocean-in-the-global-carbon-cycle/how-the-ocean-absorbs-carbon-dioxide/>.
^{xii}Lebling, K., Northrop, E. and McCormick, C. (2022). Ocean-based Carbon Dioxide Removal: 6 Key Questions, Answered. World Resources Institute. (Online). Available at: <https://www.wri.org/insights/ocean-based-carbon-dioxide-removal>.
^{xiii}Ramsayer, K.D. & McNamee, E. (2023). NASA Wants to Identify Phytoplankton Species from Space. Here’s Why. (Online). Available at: <https://www.nasa.gov/centers-and-facilities/goddard/nasa-wants-to-identify-phytoplankton-species-from-space-heres-why/#:~:text=In%20fact%2C%20since%20they%20began%20photosynthesis%20over%203,the%20oxygen%20that%20has%20been%20produced%20on%20Earth.>
^{xiv}UN Environment Programme. (2025). Coral Reefs. (Online). Available at: <https://www.unep.org/topics/ocean-seas-and-coasts/blue-ecosystems/coral-reefs>.

^{xx}Sack, K. & Kurukulasuriya, P. (2025). Why coral reefs are such a decisive climate investment. (Online). Available at: <https://www.weforum.org/stories/2025/01/coral-reefs-ultimate-climate-investment/#:~:text=Coral%20reefs%20provide%20ecosystem%20services%20valued%20at%20%249,9,their%20protection%20%E2%80%94%20but%20more%20can%20be%20done.>
^{xxi}Copernicus Marine Service. (2025). Food security. (Online). Available at: <https://marine.copernicus.eu/explainers/why-ocean-important/food-security#:~:text=According%20to%20the%20UN%20Food%20and%20Agricultural%20Organization,animal%20protein%20intake%20for%20over%203%20billion%20people.>
^{xvii}Francesch et al. (2024). Pharmaceuticals from marine sources: past, present and future. The Pharmaceutical Journal, 313(7987).
^{xviii}Feingold, S. & Willige, A. (2024). These are the world’s most vital waterways for global trade. (Online). Available at: <https://www.weforum.org/stories/2024/02/worlds-busiest-ocean-shipping-routes-trade/>.
^{xx}National Oceanic and Atmospheric Administration. (2024). Why should we care about the ocean?. (Online). Available at: <https://oceanservice.noaa.gov/facts/why-care-about-ocean.html>.
^{xx}The Business Research Company. (2025). Coastal and Marine Tourism Global Market Report 2025.

Ocean health is rapidly declining

The question of economic and industrial impacts is important as the world’s oceans are in deep crisis. Their capacity to regulate climate, maintain photosynthetic activity, enhance food security and provide a safe and nurturing home to countless species of marine life is under pressure from extreme environmental conditions stemming from an accelerating “triple threat” of rising surface temperatures, oxygen loss and accelerating acidification.^{xxi} These stresses risk becoming so severe that large parts of the natural world would be unable to maintain their current state, leading to abrupt and irreversible changes.^{xxii}

Climate change alters the abundance, diversity and distribution of marine species. Excess heat leads to disruptions in behavioural patterns with some species adapting to temperature changes, some migrating to the poles or cooler areas, and some disappearing altogether. Acidification caused by the absorption of excess atmospheric carbon directly impacts the functional capacity of phytoplankton and marine organisms in the extended food chain.^{xxiii} Rising temperatures and ocean acidity also reduce the ocean’s capacity to absorb carbon, impeding its critical carbon sink effect and creating systems-level consequences for our planet.^{xxiv} Extreme climatic events deplete natural environments by erosion and flooding, disrupting marine life in coastal habitats such as mangroves and seagrass beds which serve as vital breeding grounds and natural carbon stores – UNESCO’s second World Ocean Assessment warned that 90% of mangroves and seagrass beds were threatened with extinction.^{xxv} The accumulative effects of oceanic oxygen loss and rising temperatures severely undermine the mechanisms necessary for biodiversity survival in the deep ocean, which harbours most of the world’s marine biodiversity.^{xxvi,xxviii} According to climate scientists at Princeton University, this is driving extinction risk higher and marine biological richness lower than has been seen in Earth’s history for the past tens of millions of years.^{xxviii}

“Marine life is under pressure from extreme environmental conditions stemming from an accelerating “triple threat” of rising surface temperatures, oxygen loss and accelerating acidification.”



Systemic overfishing harvests fish populations faster than they can reproduce. Destructive techniques like bottom trawling damage seafloor habitats and the accidental capture of non-target species accelerates wider rates of decline.^{xxx} Illegal and highly lucrative fishing moving through opaque supply chains could account for up to 30% of the world’s annual catch and trade. Global fishing industry subsidies have resulted in fleet overcapacity and skewed production costs that encourage fisheries to prolong operations in depleted areas – fishing fleets worldwide are estimated to be operating at two-and-a-half times the rate of annual consumption.^{xxx} International trade routes and other ocean economy operations also contribute to declining ocean health. Marine pollution generated by both social and industrial activity is now evident in every ocean on Earth, and its entry into marine ecosystems has exponentially increased the rate of biodiversity loss. Ballast water, essential for ship stability, can release invasive and more dominant bacteria, microbes, and small invertebrates when discharged. Noise pollution from ships and exploratory drilling can disrupt marine animal communications, interfering with navigation and breeding rituals. These converging pressures underscore the urgent need for systemic reform in how we govern, use, and protect our oceans.^{xxxi}

“These stresses risk becoming so severe that large parts of the natural world would be unable to maintain their current state, leading to abrupt and irreversible changes.”

^{xxi}Wong, J., Münnich, M., and Gruber, N. (2024). Column- Compound Extremes in the Global Ocean. AGU Advances, 5(3).
^{xxii}Heinze et al. (2021). The quiet crossing of ocean tipping points. Proceedings of the National Academy of Sciences, 118(7).
^{xxiii}Venegas, R.M., Acevedo, J. & Tremli, E.A. (2023). Three decades of ocean warming impacts on marine ecosystems: A review and perspective. Deep Sea Research Part II: Topical Studies in Oceanography, 212, 105318.
^{xxiv}Hausfather, Z. (2021). Explainer: Will global warming ‘stop’ as soon as net-zero emissions are reached?. Carbon Brief. (Online). Available at: https://www.carbonbrief.org/explainer-will-global-warming-stop-as-soon-as-net-zero-emissions-are-reached?utm_campaign=Carbon%20Brief%20Daily%20Briefing&utm_content=20210430&utm_medium=email&utm_source=Revue%20Daily.
^{xxv}United Nations. (2021). The Second World Ocean Assessment Volume II.
^{xxvi}Doi, H., Yasuhara, M., and Ushio, M. (2021). Causal analysis of the temperature impact on deep-sea biodiversity. Biology Letters, 17(7).
^{xxvii}International Union for Conservation of Nature. (2019). Ocean deoxygenation. International Union for Conservation of Nature. (Online). Available at: <https://iucn.org/resources/issues-brief/ocean-deoxygenation>.
^{xxviii}Penn, J.L. and Deutsch, C. (2022). Avoiding ocean mass extinction from climate warming. Science, 376(6592), pp.524-526.

^{xxx}Client Earth. (2024). What is bottom trawling? How it works and environmental impact. (Online). Available at: <https://www.clientearth.org/latest/news/what-is-bottom-trawling/>.
^{xxx}WWF. (2025). Overfishing. (Online). Available at: <https://www.worldwildlife.org/threats/overfishing>.
^{xxxi}Thiagarajan, C. & Devarajan, Y. (2025). The urgent challenge of ocean pollution: Impacts on marine biodiversity and human health. Regional Studies in Marine Science, 81, 103995.

An aerial photograph of a sailboat with a white and red striped sail and a small red motorboat on clear, turquoise water. The sailboat has the number '01' and '4262' on its sail, and 'KT' and 'TOPEAT' on its hull. The motorboat is further away, leaving a small wake.

**“No water,
no life. No blue,
no green.”**

Sylvia Earle

The role and responsibility of global business

Oceans are an essential resource and conduit for almost every business sector in the global economy through the supply of provisioning services (e.g. freshwater, food) and regulatory services (e.g. climate regulation, flood control, water purification).^{xxxii} Over half the world's GDP is moderately or highly dependent on natural services and is therefore exposed to the risks associated with nature loss.^{xxxiii} On average, the economies of developing countries rely more on marine-based industries for income and jobs than OECD members. However, it should be noted that G20 members control around 45% of the world's coastlines and account for over 20% of its exclusive economic zones.^{xxxiv}

Businesses everywhere depend on marine ecosystem services to supply and protect their operations. Shipping goods by sea is more fuel-efficient and cost-effective than air freight. Telecoms companies rely on oceans to keep global businesses, suppliers and consumers connected. Almost all international internet traffic travels through fibre-optic cables on the ocean floor. Coastal property and ocean economy infrastructure developments rely on healthy, stable and accessible oceans.

The impacts of many land- and marine-based industries can be considerable. High emissions industries contribute to increased ocean acidification. Huge volumes of plastic packaging from consumer goods industries find their way into oceans and other waterways. Industrial pollutants from agricultural and mining industry toxins to raw wastewater from coastal developments and cruise ships flow into the open seas from their runoff points. Marine disasters have plagued the oil industry for decades.

Against these significant economic pressures, the world is realising that sustainable development and decarbonisation strategies cannot afford to diminish the importance of marine conservation: there can be no “green” without “blue”.^{xxxv}

The Organisation for Economic Co-operation and Development (OECD) acknowledged the interdependencies between ocean conservation and wider sustainable development goals when it observed: Achieving sustainable ocean economies goes beyond reaching environmental sustainability. Intrinsically connected with many other SDGs, the conservation and sustainable use of the ocean needs to unlock sustainable development across social, environmental and economic dimensions. It needs to benefit all countries, especially the poorest and the most vulnerable ones, which are highly exposed to the effects of ocean degradation while possessing the least ability to respond. It needs to refocus economic activities and generate new economic and business models that innovatively contribute to both production and ocean health.^{xxxvi}

^{xxxii}Exploring Natural Capital Opportunities, Risks and Exposure. (2024). Exploring Natural Capital Opportunities, Risks and Exposure. (Online). Available at: <https://encorenature.org/en>.

^{xxxiii}World Economic Forum. (2020). Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy.

^{xxxiv}World Economic Forum. (2022). What Ocean Sustainability Means for Business.

^{xxxv}European Commission. (2024). Sustainable blue economy. European Commission. (Online). Available at: https://oceans-and-fisheries.ec.europa.eu/ocean/blue-economy/sustainable-blue-economy_en.

^{xxxvi}Organisation for Economic Co-operation and Development. (2020). Sustainable Ocean for All: Harnessing the Benefits of Sustainable Ocean Economies for Developing Countries.

“Intrinsically connected with many other UN SDGs, the conservation and sustainable use of the ocean needs to unlock sustainable development across social, environmental and economic dimensions.”

In 2021, for example, the European Commission took steps to “firmly embed” the blue economy into its wider Green Deal objectives, recognising the support that marine industries and supply chains provided to 4.5 million European workers and the potential capacity of offshore renewable energy. The Commission also pledged to protect 30% of its marine territories by 2030, in line with the biodiversity targets set by the Kunming-Montreal Global Biodiversity Framework.^{xxxvii}

Businesses have the motivation and capacity to make a difference. Sustainable solutions for the world’s oceans focus on three core objectives: the protection and conservation of marine habitats, the sustainable management of ocean resources, and the restoration of marine climate regulation. Businesses can drive progress by exploring their interactions with oceans to develop strategies for responsible and sustainable resource use. They can work with governments to shape and refine marine regulations and policies, use ocean and coastal ecosystems to sequester carbon, and work to increase the adaptability and resilience of marine ecosystems. Global industries can audit their operations and identify areas of opportunity, but they’re also well placed to close the financing gaps delaying the realisation of sustainable ocean goals.^{xxxviii}

Despite the increased interest in ocean conservation, marine biodiversity remains a major data blind spot for sustainability assessments.^{xxxix} While methods for gathering and measuring terrestrial biodiversity data have made substantial progress in recent years, evaluations of impacts, dependencies and risks for marine ecosystems are relatively nascent.^{xli} Compounding the lack of definitive data is the fact that 80% of the ocean remains unexplored due to extreme physical conditions, technical limitations and the overall scale of ocean coverage – less than 30% of the global seafloor has ever been mapped and rough estimates of species populations, excluding microorganisms, suggest that less than a third of all marine animal species have so far been discovered. Overcoming these limitations could present countless opportunities for technological advancements and innovative solutions. The potential for new discoveries in marine resources and ecosystems underscores the importance of increasing the global number of marine protected areas (MPAs) and learning more about their characteristics.

^{xxxvi}European Commission. (2021). Speech by Commissioner Virginijus Sinkevičius on a new approach for a sustainable blue economy in the EU.
^{xxxvii}Taskforce for Nature Related Financial Disclosures. (2025). Discussion paper on measurement of ocean-related issues.
^{xxxix}ISS Insights. (2024). Oceans: Investors’ Blind Spot: Understanding Marine Ecosystem Services. ISS Insights. (Online). Available at: <https://insights.issgovernance.com/posts/oceans-investors-blind-spot-understanding-marine-ecosystem-services/>.
^{xl}Higgins, K. (2024). Institutional investors seek better ocean-related ESG data. IPE. (Online). Available at: <https://www.ipe.com/news/institutional-investors-seek-better-ocean-related-esg-data/10073684.article>.
^{xli}Seabed 2030. (2025). Seabed 2030 announces millions of square kilometers of new seafloor data on World Hydrography Day. (Online). Available at: <https://seabed2030.org/2025/06/21/seabed-2030-announces-millions-of-square-kilometers-of-new-seafloor-data-on-world-hydrography-day/>.

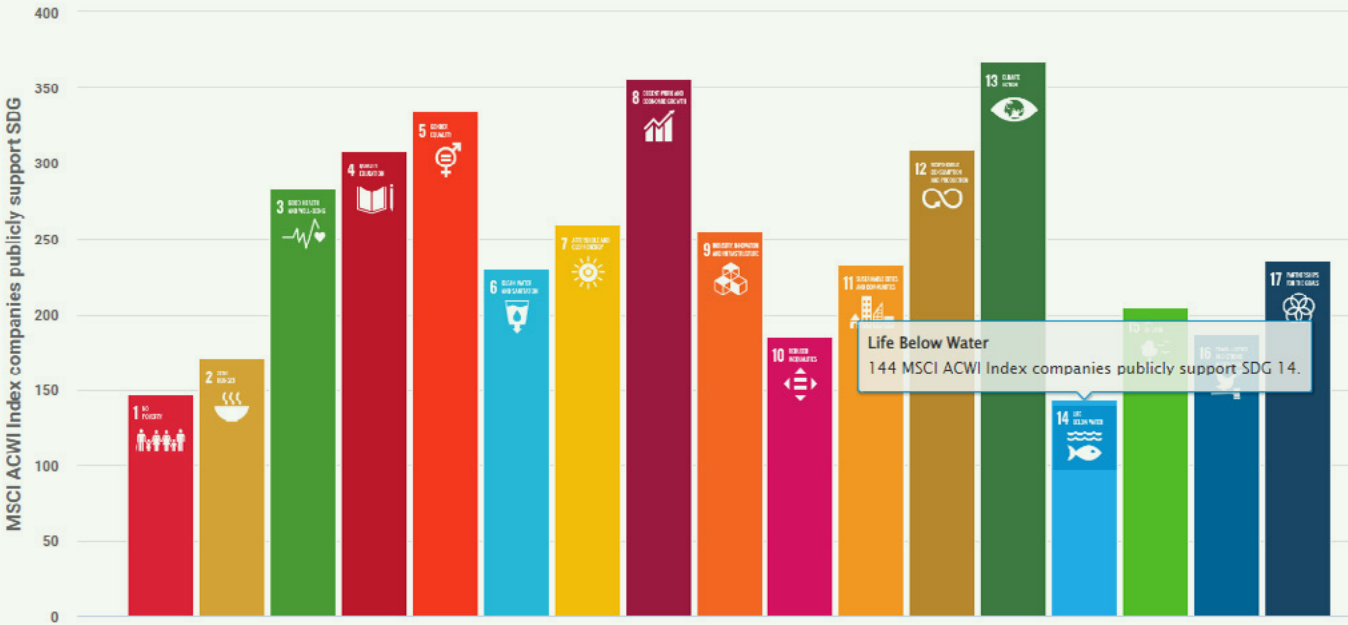


Figure 1: MSCI. (2024). Who cares about the UN Sustainable Development Goals? ^{lxxxii}

The definition, value and challenges of the ‘blue economy’

The World Bank defines the blue economy as an “ocean-based economy that seeks to promote economic growth, social inclusion, and preservation or improvement of livelihoods while at the same time ensuring environmental sustainability.”^{xlii} This is distinct from the broader ‘ocean economy’, which includes all economic activities taking place in relation to the ocean. Blue economy industries include marine renewable energy and sustainable coastal tourism, transport and marine value chains. The United Nations Environment Programme Finance Initiative (UNEP FI) states that a sustainable blue economy is based on “circularity, collaboration, resilience, opportunity and interdependence”, driven by sustainable investments that reduce carbon emissions, support energy efficiency and protect and promote natural capital and widespread biodiversity.^{xliii} UNEP FI estimates that the growth of the global blue economy has generated around \$1.5 trillion annually and provided over 30 million jobs. Its annual contribution to the wider global economy is expected to double by 2030.^{xliv}

Notwithstanding its value, the blue economy faces a variety of challenges. Compared with the rapid rise of green financing for terrestrial developments, blue financing remains in its infancy and oceans remain the Earth’s most undervalued natural asset.^{xlv} Disagreements between countries regarding ocean governance and the objectives of the blue economy have resulted in fragmented and imbalanced approaches to resource distribution. Poor international cooperation is impeding collective progress on assessments of the blue economy’s environmental impacts. Many who have the most to lose from unsustainable marine activities are too underrepresented to contribute effectively to efforts to highlight problems or identify solutions: UNEP FI contends that “a sustainable blue economy will only deliver if human wellbeing and justice are placed at its core.”^{xlvi} Operational elements of the blue economy still have the power to worsen the decline in ocean health – its improvement will require greater international cooperation to strike a balance between economic growth and environmental protection.^{xlvii, xlviii}

“Compared with the rapid rise of green financing for terrestrial developments, blue financing remains in its infancy and oceans remain the Earth’s most undervalued natural asset.”

“Increasing market, regulatory and reputational risks are influencing actions to better regulate activities in the blue economy.”

Increasing market, regulatory and reputational risks are influencing actions to better regulate activities in the blue economy. The first internationally mandated carbon tax on shipping is due in 2028, covering about 97% of the global merchant fleet and affecting nearly every industry reliant on ocean transport.^{xlix} More broadly, the 2025 Nice Ocean Action Plan has established an international blueprint for accelerating ocean-based climate and nature-related business plans, policy actions, and solutions.^l The UN Global Compact’s Sustainable Ocean Principles is one early indication of emerging positive corporate action, providing a framework for responsible business practices across ocean sectors and geographies, serving as a common reference point on ocean sustainability.^{li} Likewise, the Science Based Targets Network’s first seafood value chain science-based targets are addressing impacts from wild capture fishing and aquaculture – specific ocean-based target guidance is expected to follow.^{lii}

^{xlii}International Maritime Organization. (2025). IMO approves net-zero regulations for global shipping. International Maritime Organization. (Online). Available at: <https://www.imo.org/en/MediaCentre/PressBriefings/pages/IMO-approves-netzero-regulations.aspx>.
^{xliii}United Nations. (2025). Nice Conference Adopts Declaration Underscoring Vital Importance of Ocean to Life on Our Planet, Essential Role in Mitigating Climate Change. United Nations Meetings Coverage and Press Releases. Available at: <https://press.un.org/en/2025/seg2231.doc.htm>.
^{xlv}United Nations Global Compact. (2024). Signatories to the Sustainable Ocean Principles. United Nations Global Compact. (Online). Available at: <https://unglobalcompact.org/take-action/ocean/signatories>.
^{xlvi}Science Based Targets Network. (2025). Ocean targets. Science Based Targets Network. (Online). Available at: <https://sciencebasedtargetsnetwork.org/companies/take-action/set-targets/ocean-targets/>.

^{xlii}World Bank. (2017). The Potential of the Blue Economy: Increasing Long-term Benefits of the Sustainable Use of Marine Resources for Small Island Developing States and Coastal Least Developed Countries.
^{xliii}United Nations Environment Programme Finance Initiative. (2020). Sustainable Blue Economy Finance Initiative.
^{xliv}Rao, D. (2024). The ocean’s blue economy is growing. Can the tide continue to rise?. (Online). Available at: <https://theweek.com/business/economy/blue-economy-growing-facing-challenges>.
^{xlv}United Nations. Opening Remarks Webinar on Investing in SDG14. United Nations. (Online). Available at: <https://www.un.org/en/desa/opening-remarks-webinar-investing-sdg14>.
^{xlvi}UN Environment Programme. (2022). In the same boat: ocean finance, inclusivity and social equity. (Online). Available at: <https://www.unepfi.org/themes/ecosystems/in-the-same-boat-ocean-finance-inclusivity-and-social-equity/>.
^{xlvii}Dasgupta, P. (2021). The Economics of Biodiversity: The Dasgupta Review.
^{xlviii}United Nations. (2024). Oceans and Seas. United Nations. (Online). Available at: <https://sdgs.un.org/topics/oceans-and-seas>.



Navigating investment barriers to support the blue economy

Managing marine-related risks is challenging for investors due to a complex mix of informational, regulatory, environmental and jurisdictional uncertainties. A lack of reliable ocean data and transparency means large areas of the world's oceans are poorly monitored, especially in deep sea and developing regions. Few companies disclose marine-specific risks like overfishing, biodiversity loss, or plastic pollution in standardised formats.ⁱⁱⁱ The sensitivity and unpredictability of marine ecosystems can see risks build gradually then trigger accelerated and exponential impacts across interdependent species and habitats.^{iv} The ocean is largely a global commons where ownership and accountability is often difficult to ascertain. Over 60% of ocean zones are classified as marine areas beyond national jurisdiction (ABNJ) which leaves them vulnerable to unregulated human activity, insufficient legal protections and policies, and limited or non-existent jurisdictional cooperation – only 1.4% of ABNJs are under some form of protection, and just 0.8% are considered “effectively protected”.^{iv} Despite the UN High Seas Treaty achieving 60 national ratifications in September 2025, necessary for the Treaty to enter into force, it will likely take years or even decades of effective enforcement and international cooperation before tangible benefits are to be seen by businesses or investors.

Ocean literacy among investors is improving but still remains relatively low. Many lack familiarity with ocean science, marine economics, ocean sustainability data, or the systemic risks associated with ocean health decline. Investment opportunities are limited by a lack of high-quality, low-risk and scalable marine conservation projects which often operate in nascent or experimental markets.^{vi} Investors also face significant legal and reputational risks if they fund projects in areas with limited governance, transparency or enforcement. The limited visibility of marine sustainability has resulted in less public pressure and fewer incentives for private capital to flow into ocean-related projects.^{vii}

“Managing marine-related risks is challenging for investors due to a complex mix of informational, regulatory, environmental and jurisdictional uncertainties.”

ⁱⁱⁱMerchant, J. (2024). Ocean-related risks and dependencies. Marine Conservation Society.

^{iv}European Commission. (2024). Tipping point study finds world's oceans face irreversible damage.

European Commission. (Online). Available at: <https://projects.research-and-innovation.ec.europa.eu/en/projects/success-stories/all/tipping-point-study-finds-worlds-oceans-face-irreversible-damage>.

^vOneOcean. (2024). Just 2.8% of the world's ocean is protected “effectively”. (Online). Available at: <https://www.oceanprotect.org/2024/10/17/just-2-8-of-the-worlds-ocean-is-protected-effectively/>.

^{vi}Friends of Ocean Action. (2020). The Ocean Finance Handbook.

^{vii}Sumaila et al. (2021). Financing a Sustainable Ocean Economy. Nature Communications. Vol. 12.



“Responsible investors can play a key role in supporting the blue economy in multiple ways: avoiding harmful financing; engaging with investees to support the mitigation of negative impact and identification of positive behaviours; and investing in blue economy solutions.”

The direct impacts of investors and financial institutions on the key drivers of climate and ocean health decline appear to be low, but it’s important for investors to recognise the indirect impacts financial services make when they service high-impact businesses. Overall, responsible investors can play a key role in supporting the blue economy in multiple ways: avoiding harmful financing; engaging with investees to support the mitigation of negative impact and identification of positive behaviours; and investing in blue economy solutions.^{lviii}

Investors can focus on revenue-generating solutions where scalability is commercially viable. Traceability technology for sustainable fisheries and aquaculture, marine renewable energy developments, and sustainable port infrastructure are all examples of commercial solutions providing environmental benefits and financial returns.^{lx} Scaling up data gathering technologies like satellite monitoring and AI-led ocean data analysis supports improved risk management and impact tracking. Opportunities spearheaded by sovereigns or multilateral development banks can help to de-risk nascent sustainable ocean ventures and improve transparency. Investors can also mobilise their voting power to support policies that protect marine biodiversity, including enforcement of sustainable fishing, or the banning of harmful subsidies. Greenbank is part of the Finance for Biodiversity’s UK policy sub-group engaging with the UK Government to advocate for policy coherence and continued ambition to mobilise the financial sector to support UK biodiversity commitments, both at the domestic and international levels.^{lx}

In 2020, the World Resources Institute established a high-level panel to approximate the benefits and costs of a sustainable ocean economy for the 30 years to 2050. Their research concluded that investing \$1 in core sustainable oceans objectives could yield at least \$5 in global benefits. In some target areas that returns ratio was significantly higher.^{lxi} However, many publicly listed companies operating within the blue economy are widely diversified businesses, diluting investor exposure to sustainable ocean solutions, while pureplay blue businesses are often small scale or operating in private markets. Given the narrow scope of direct blue economy investments today, investors seeking positive impact should look to emerging opportunities and financing structures.

^{lviii}Taskforce on Nature-related Financial Disclosures. (2024). Additional guidance for financial institutions. Version 2.0

^{lx}Blue Invest. (2024). Unlocking the Potential of the Blue Economy.

^{lx}Finance for Biodiversity Foundation. (2024). Annual Report 2024.

^{lxi}Konar, M. and Ding, H. (2020). A Sustainable Ocean Economy for 2050: Approximating Its Benefits and Costs. High Level Panel for a Sustainable Ocean Economy, World Resources Institute.

Blue bonds

Investors can directly support marine conservation by investing in blue bonds which have recently surfaced as a potentially game-changing sustainable debt instrument. First issued by the Republic of Seychelles and World Bank in 2018, blue bonds are like conventional bonds in that an investor lends capital to the bond issuer who pays back the initial investment plus an interest rate (coupon) each year to the end of the bond’s term.^{lxii} The primary difference is that proceeds from blue bonds are used to finance projects which can mitigate a wide range of marine impacts and pressures. Funding is distributed across practices such as pollution control, biodiversity conservation and restoration, sustainable fishing, marine ecotourism, and coastal community development.^{lxii} To ensure blue bond standards align with those of their green bond equivalents, financial institutions like UNEP FI, the Asian Development Bank, and the International Capital Market Association have developed global guidelines regarding typology, eligibility criteria, KPIs and best practice.^{lxiv}

From 2018 to 2022, however, just 26 blue bonds were issued globally with a combined value of around \$5 billion – less than 0.5% of the total sustainable debt market during that time.^{lxv} Nevertheless, bond financing peaks have often tracked global sustainability initiatives. After the 2015 Paris Agreement, for example, the issuance of green bonds increased by 1280% to 2021.^{lxvi} For blue bonds, spikes were immediately observed after the establishment of the Global Biodiversity Framework in 2022.^{lxvii} A future catalyst for blue bonds might be the ratification of the UN High Seas Treaty into international law, having now reached the 60-country minimum. Notable recent additions to the market include BDO Unibank’s first Asian blue bond mobilising \$100 million to support marine and coastline conservation, and Danish energy giant Ørsted’s first energy blue bond contributing \$100 million to finance sustainable shipping and marine biodiversity.^{lxviii, lxix} Emerging economies heavily dependent on marine ecosystems are also likely to lead on the issuance of new blue financing instruments.^{lxx}

^{lxii}World Bank. (2018). Seychelles launches World’s First Sovereign Blue Bond. World Bank. (Online). Available at: <https://www.worldbank.org/en/news/press-release/2018/10/29/seychelles-launches-worlds-first-sovereign-blue-bond>.

^{lxiii}European Commission. (2022). Blue Bond. European Commission. (Online). Available at: <https://projects.research-and-innovation.ec.europa.eu/en/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/eu-missions-horizon-europe/restore-our-ocean-and-waters/blue-bond>.

^{lxiv}CMA et al. (2023). Bonds to Finance the Sustainable Blue Economy. A Practitioners Guide.

^{lxv}Bosmans, P. & de Mariz, F. (2023). The Blue Bond Market: A Catalyst for Ocean and Water Financing. Journal of Risk and Financial Management.

^{lxvi}Climate Bonds Initiative. (2022). Market Data. Climate Bonds Initiative. (Online). Available at: <https://www.climatebonds.net/market/data/>.

^{lxvii}Herbert, E. (2024). Fresh wave of funds aims to kick-start blue bond market. Financial Times. (Online). Available at: <https://www.ft.com/content/63ebe057-80ad-4eda-af7d-986929e6cf24>.

^{lxviii}BDO. (2022). BDO issues first Blue Bond for US\$100 Million. BDO. (Online) Available at: <https://www.bdo.com.ph/news-and-articles/BDO-Unibank-Blue-Bond-USD-100-million-first-private-sector-issuance-southeast-asia-IFC-marine-pollution-prevention-clear-water-climate-goals-sustainability>.

^{lxix}Ørsted. (2023). Ørsted becomes world’s first energy company to issue blue bonds. Ørsted. (Online). Available at: <https://orsted.com/en/media/news/2023/06/2023060868481>.

^{lxx}Rabobank. (2024). Blue finance: Closing the water financing gap.

^{lxxi}Man Institute. (2023). Blue Bonds: The New Kid on the Block in Sustainable Debt. Man Institute. (Online). Available at: <https://www.man.com/maninstitute/blue-bonds-sustainable-debt>.

“Blue bonds can contribute materially to the future health and resilience of marine ecosystems.”

“Funding is distributed across practices such as pollution control, biodiversity conservation and restoration, sustainable fishing, marine ecotourism, and coastal community development.”

The lack of data and mechanisms to monetise blue finance biodiversity benefits remains a challenge. While the green bond market predominantly uses one metric – carbon emissions volumes – there’s no singular method for measuring ocean health. Likewise, marine conservation cannot be corroborated within the short-term - meaningful improvements in ocean health can often take decades to manifest.^{lxxi} Blue bond initiatives often require collaboration and consensus among governments, NGOs, the private sector and local communities which isn’t always forthcoming. Aligning investments with appropriate standards can be complicated by the fact that many companies operating in the blue economy are diversified businesses with marine divisions which may also provide supporting services to the oil and gas industry. However, when used effectively and transparently and with the appropriate support and cooperation, blue bonds can contribute materially to the future health and resilience of marine ecosystems.

Blue bond issuance has grown in recent years

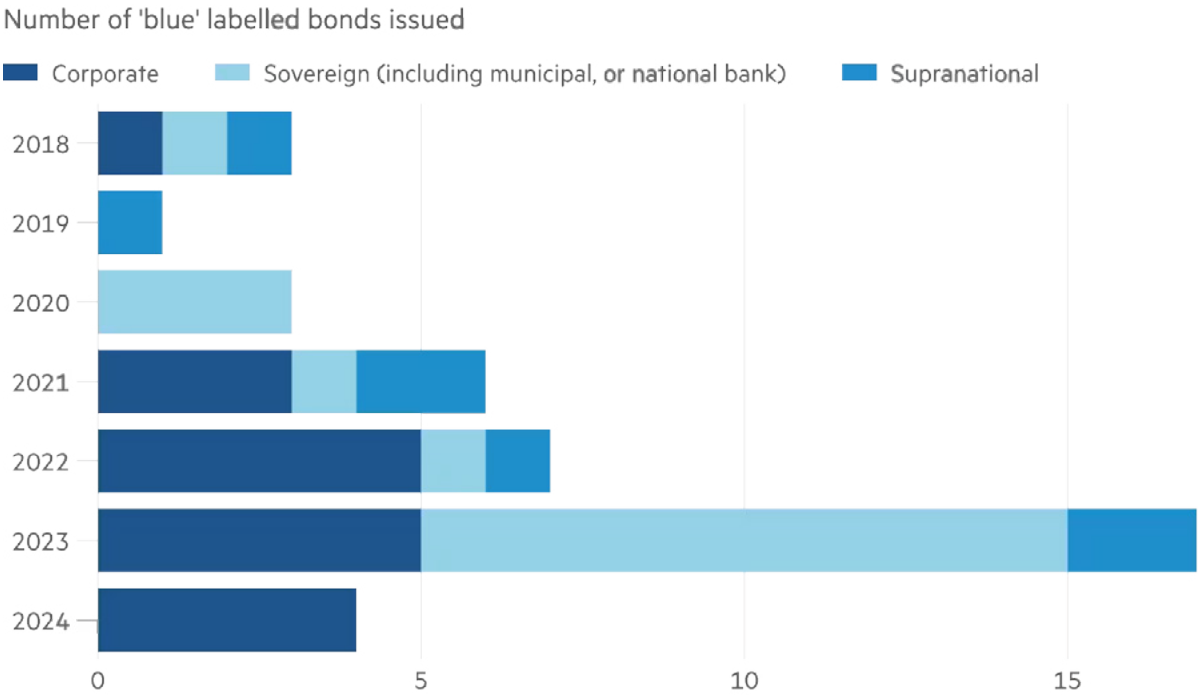


Figure 2: Herbert, E. (2024). Fresh wave of funds aims to kick-start blue bond market. ^{lxxvii}

**Deep-sea mining:
too big an opportunity or too
great a risk?**

In recent years, the question of deep-sea mining has pitted commercial interest against environmental advocacy. Global demand for critical minerals essential for a low-carbon economy, such as cobalt, copper and manganese, has increased in line with the rapid expansion of clean energy solutions.^{lxxii} Rising demand, dwindling terrestrial deposits and a concentrated supply chain have increased commercial interest in deposits situated in the deep sea.^{lxxiii} Mining companies argue that deep-sea mining is more cost-efficient than terrestrial mining due to higher marine ore grade, no rehabilitation costs, and lower infrastructural overheads.^{lxxiv}

Significant deep-sea deposits of polymetallic nodules, polymetallic sulphides, and cobalt-rich crusts have attracted commercial interest. Polymetallic nodules are most sought after by mining contractors as they’re composed of concentric layers of iron, manganese hydroxides, and valuable utility metals like nickel, copper and cobalt. Large-scale concentrations of these nodules are found on the abyssal seafloor, which spans 60% of Earth’s surface, four to six kilometres below the ocean surface.^{lxxv}

Supporters of commercial deep-sea mining argue that it provides the critical minerals necessary for a just transition, citing fewer of the social and environmental impacts associated with terrestrial mining operations.^{lxxvi} However, social impacts remain largely unknown from region to region and the environmental consequences of deep-sea mining operations are far from clear.^{lxxvii} The extraction of polymetallic nodules, for example, involves scouring the seafloor to separate nodules from the surrounding sediment. Deposits are piped to the surface while sediment is released back into the ocean. This process alone raises questions regarding noise pollution, the release of toxic heavy metals and sediment plumes, and the likely disturbance and destruction of unexplored deep-sea marine ecosystems characterised by clear water, silence, darkness, stability and longevity. There’s also scientific evidence to suggest that polymetallic deposits may be a vital source of oxygen for deep-sea ecosystems.^{lxxviii, lxxix}

^{lxxii}International Energy Agency. (2024). Global Critical Minerals Outlook 2024.
^{lxxiii}Reitmeier, L. (2023). What is deep-sea mining and how is it connected to the net zero transition?. Grantham Research Institute. (Online). Available at: <https://www.lse.ac.uk/granthaminstitute/explainers/what-is-deep-sea-mining-and-how-is-it-connected-to-the-net-zero-transition/>.
^{lxxiv}Gunasekara, O. (2024). Why Will Deep Sea Mining Be Less Expensive Than Traditional Land-Based Mining?. Impossible Metals. (Online). Available at: <https://impossiblemetals.com/blog/why-will-deep-sea-mining-be-less-expensive-than-traditional-land-based-mining/#:~:text=Given%20the%20high%20ore%20grade,>
^{lxxv}Van Dover, C.L. (2011). Mining seafloor massive sulphides and biodiversity: what is at risk?. ICES Journal of Marine Science, 68(2), pp.341-348.
^{lxxvi}Paulikas et al. (2020). Where Should Metals for the Green Transition Come From?
^{lxxvii}Childs, J. (2020). Performing 'blue degrowth': Critiquing seabed mining in Papua New Guinea through creative practice. Sustainability Science, 15, pp.117-129.
^{lxxviii}Chandrasekhar, A., Quiroz, Y., and Viglione, G. (2024). Q&A: What does deep-sea mining mean for climate change and biodiversity loss?. Carbon Brief. (Online). Available at: <https://interactive.carbonbrief.org/deep-sea-mining/>.
^{lxxix}Environmental Justice Foundation. (2024). Towards the abyss: how the rush to deep-sea mining threatens people and our planet.

“Social impacts remain largely unknown from region to region and the environmental consequences of deep-sea mining operations are far from clear.”

“Greenbank signed the 2025 Global Financial Institutions Statement to Governments on Deep Seabed Mining signed by 40 financial institutions representing €3.8 trillion in combined assets.”

Despite the International Seabed Authority (ISA) Assembly failing to adopt a mining code in 2025, the pressure to begin commercial mining of the deep seabed continues. While arguments for and against will undoubtedly go on, it’s worth noting that the 2025 UN Ocean Conference saw more countries back an international moratorium or precautionary pause on deep-sea mining pending more detailed research on its environmental impacts. Several governments used the event to counter the commercial argument and announce the creation or expansion of national marine protected areas.^{lxxx}

The operational risks of deep-sea mining directly conflict with our Habitats and Ecosystems investment theme, aiming to maintain the integrity and vitality of terrestrial and marine biodiversity now and for future generations. To signal our support for a pause on preliminary drilling until all risks are understood and alternatives have been fully explored, Greenbank signed the 2025 Global Financial Institutions Statement to Governments on Deep Seabed Mining signed by 40 financial institutions representing €3.8 trillion in combined assets.^{lxxxi}

^{lxxx}Schröder, P. (2025). The UN Ocean Conference is a critical opportunity to protect the ocean from deep-sea mining. (Online). Available at: <https://www.chathamhouse.org/2025/06/un-ocean-conference-critical-opportunity-protect-ocean-deep-sea-mining>.
^{lxxxi}Finance for Biodiversity Foundation. (2025). Global Financial Institutions Statement to Governments on Deep Seabed Mining.
^{lxxxii}MSCI. [2024]. Who cares about the UN Sustainable Development Goals?. MSCI. [Online]. Available at: <https://www.msci.com/who-cares-about-the-un-sustainable-development-goals>.

The Potential Impacts of Deep-Sea Mining on Marine Ecosystems

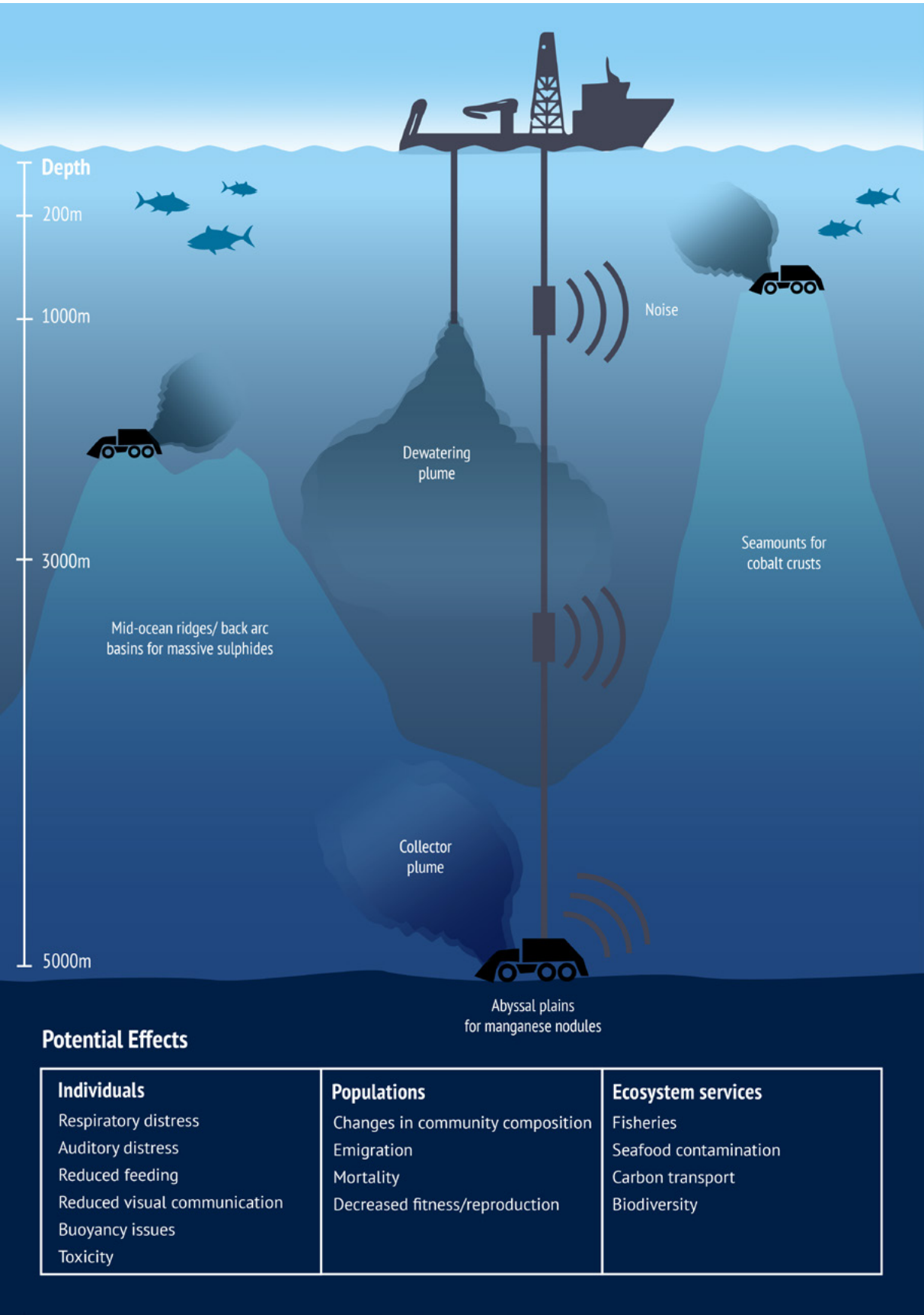


Figure 3: Chandrasekhar, A., Quiroz, Y., and Viglione, G. (2024). Q&A: What does deep-sea mining mean for climate changeand biodiversity loss? ^{lxxxviii}

Key takeaways

1

Oceans are critical to planetary stability, but remain in rapid decline:

As the world's largest carbon sink, oceans play a central role in preserving the planet's climatic balance. Oceans also host the majority of life on Earth, while also supporting livelihoods and food security for billions of people. Yet, they are in rapid decline due to a "triple threat" of warming, acidification, and oxygen loss, compounded by overfishing, pollution, and habitat destruction. These stresses risk becoming so severe that large parts of the natural world would be unable to maintain their current state, potentially leading to abrupt and irreversible changes.

2

Oceans are currently overlooked and underfunded by the private sector:

Businesses everywhere depend on marine ecosystems through the supply of provisioning services (e.g. freshwater, food) and regulatory services (e.g. climate regulation, flood control, water purification). Sustainable development and decarbonisation strategies cannot afford to diminish the importance of marine conservation. Companies can drive progress by exploring their interactions with oceans to develop strategies for responsible and sustainable resource use. Despite increased interest, ocean health remains a major data blind spot for company sustainability assessments and strategies, with SDG 14 ("Life Below Water") being the least funded.

3

The blue economy offers growth potential but faces barriers:

The World Bank defines the blue economy as an "ocean-based economy that seeks to promote economic growth, social inclusion, and preservation or improvement of livelihoods while at the same time ensuring environmental sustainability." It includes sectors such as renewable energy and sustainable marine transport, and is worth \$1.5 trillion annually, with anticipated growth through to 2030 and beyond. However, blue finance lags far behind green finance, with limited robust investment opportunities, fragmented governance, and low data availability impeding progress. Realising its full potential requires greater international cooperation, regulation, and investment innovation.

4

Investors can play a crucial role to accelerate market momentum:

Investors can drive ocean sustainability by engaging with companies, supporting impactful solutions, and avoiding harmful practices. However, most investors lack familiarity with ocean science, marine economics, and the systemic risks associated with ocean health decline. Ocean literacy must improve for investors to recognise these risks and how their capital indirectly impacts ocean health both negatively and positively. Scalable, low-risk and impactful investment opportunities exist, as seen with the growth of blue bond issuances, yet they still remain nascent and face measurement challenges. To unlock the potential of the blue economy, investors must deepen their understanding, push for better data and transparency, and help build market structures that reward sustainable marine practices.

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