frontiers | Frontiers in Marine Science

TYPE Policy and Practice Reviews
PUBLISHED 20 November 2025
DOI 10.3389/fmars.2025.1696335

OPEN ACCESS

EDITED BY
Qi Xu,
Jinan University, China

REVIEWED BY
Sara L. Seck,
Dalhousie University, Canada
Shuo Li,
Dalian Maritime University, China
Zhuolun Li,
Lanzhou University, China

*CORRESPONDENCE
Liang Yu
yu_liang@tju.edu.cn
Xi Chen
linda_chen312@126.com

RECEIVED 31 August 2025
ACCEPTED 31 October 2025
PUBLISHED 20 November 2025

CITATION
Wang G, Yu L and Chen X (2025) The right to environment at sea: a human rights-based approach to marine environmental protection.
Front. Mar. Sci. 12:1696335.
doi: 10.3389/fmars.2025.1696335

The right to environment at sea: a human rights-based approach to marine environmental protection

Guanding Wang[1], Liang Yu[1*] and Xi Chen[2*]

[1]Law School, Tianjin University, Tianjin, China, [2]Beijing Yingke Law Firm Tianjin Office, Tianjin, China

The marine environment is becoming increasingly fragile and complex, posing serious threats to fundamental human rights. Despite the growing interconnection between marine protection and human rights, a significant gap persists between the international law of the sea and human rights law. The former remains state-centered and largely overlooks human rights, while the latter has developed primarily in land-based contexts and offers limited tools for protecting the marine environment. This article advances a human rights–based approach by introducing the concept of "the right to environment at sea" and illustrating its normative content. It identifies the right-holders, duty-bearers, and corresponding obligations, and demonstrates the unique advantages of this framework in addressing deep-sea mining, marine pollution, and biodiversity protection. It further explores potential pathways to activate the proposed right, including systemic treaty interpretation under Article 31(3)(c) of the Vienna Convention and procedural mechanisms through human rights treaty bodies, the Human Rights Council, regional human rights courts, the International Tribunal for the Law of the Sea, and the International Court of Justice. It argues that this rights paradigm adds values to marine environmental governance by strengthening State obligations and accountability.

KEYWORDS

the law of sea, human rights, the right to environment, extraterritorial obligations, human rights-based approach

1 Introduction

The global marine environment is facing increasingly complex and multi-dimensional threats. Land-based pollution, such as industrial discharges, agricultural runoff, untreated sewage, and plastic waste, continues to enter the oceans. These pollutants alter the chemical composition of seawater, disrupting the delicate balance of the ecosystem. (Thiagarajan and Devarajan, 2025) Excessive and unsustainable exploitation activities, such as deep seabed mining and overfishing, have severely impacted marine flora and fauna, leading to the extinction of certain species. (Liu et al., 2024) Meanwhile, climate change is triggering

unprecedented cascading effects, including ice melt, sea-level rise, marine heatwaves and ocean acidification (Bijma et al., 2013).

The escalating ocean crisis has attracted considerable attention from the academic community. A wide range of legal solutions have been discussed. Some scholars examine potential approaches within the framework of the United Nations Convention on the Law of the Sea (UNCLOS), such as activating the principle of the common heritage of mankind, utilizing the dispute settlement system, and recognizing certain prohibitive rules as jus cogens. (Kułaga, 2022; Mendenhall, 2023) Others analyze the weaknesses of the international law of the sea and propose equitable solutions drawn from international environmental law, for example, applying the Basel Convention regime to address plastic pollution or integrating key environmental principles into existing ocean governance frameworks. (Trevisanut, 2023; Kojima, 2023) Additionally, several studies advocate for stronger interaction with other legal regimes, including fisheries law, biodiversity law and climate change law. (Beringen, 2024) However, existing research largely adopts a state-centered approach, with little attention given to the individual perspective.

Alternatively, the introduction of human rights into ocean governance has recently been advocated in both academic and policy debates. Some scholars argue that existing human right standards should apply equally in marine contexts. (Haines, 2021) Non-governmental organizations actively promote the Geneva Declaration on Human Rights at Sea to prevent violations and provide remedies to victims. (Klein, 2022) However, these efforts largely focus on seafarers' welfare, fishermen, maritime labor rights, and the plight of abandoned crews, with limited attention to environmental concerns. (Galani, 2017; Bennett et al., 2023) In 2022, the United Nations General Assembly adopted a historic resolution recognizing access to a clean, healthy, and sustainable environment as a universal human right. (United Nations, 2022) Subsequently, in 2025, the Human Rights Council adopted a resolution on "the ocean and human rights", explicitly linking the right to a clean, healthy, and sustainable environment to the marine context. (Human Rights Council, 2025) Notwithstanding a significant step forward, it requires further elaboration regarding the normative framework and its prospective implementation scenarios.

In this article, we extend the "right to a clean, healthy, and sustainable environment" to the marine context and introduce the new concept of a "right to environment at sea." This new concept refers to the human right of individuals and communities to a clean, healthy, and sustainable marine environment. It requires states and other actors to prevent harm, safeguard marine ecosystems, and ensure that the ocean continues to sustain human well-being and biodiversity, including in areas beyond national jurisdiction. To clarify this new right, we discuss its right-holders, duty-bearers, and corresponding obligations through a systematic approach under Article 31(3)(c) of the Vienna Convention. We then assess the potential advantages of this right in addressing deep-sea mining, marine pollution, and marine biodiversity. In addition, we explore enforcement pathways through human rights treaty bodies, the Human Rights Council, regional human rights courts, the International Tribunal for the Law of the Sea, and the International Court of Justice. We conclude that embedding this right within the marine context is likely to foster the development of customary international law in environmental protection, mitigate the tragedy of the marine commons, and reinforce the role of landlocked states in global ocean governance.

2 The gap between human rights law and the law of the sea

A notable gap exists between human rights law and the law of the sea. This gap reflects a persistent "dual blindness": the law of the sea frequently overlooks human rights in the context of environmental protection, while human rights law often neglects marine environment concerns.

On one hand, international law of the sea notably lacks a human rights perspective on environment issues. UNCLOS adopts a state-centric approach, articulating in Part XII that states are obliged to protect and preserve the marine environment, but it makes no reference to individuals (Papanicolopulu, 2012; Papanicolopulu et al., 2021). The Advisory Opinion on Climate Change and International Law delivered by the International Tribunal for the Law of the Sea was expected to incorporate a human rights dimension. Yet the final opinion, spanning 153 pages and drawing on a wide range of international instruments, refers to human rights only once, briefly acknowledging climate change as a threat to human rights. (ITLOS, 2024) Although human rights treaties and standards were considered during deliberations, they were ultimately excluded from the text. It is notable that three of the 21 judges appended separate opinions to the advisory opinion, specifically addressing the interplay between human rights and the international law of the sea (ITLOS, 2024). Among them, Judge Stanislaw Pawlak emphasized that the advisory opinion should adopt a more comprehensive approach, incorporating "States' responsibility to combat climate change to protect human rights" (Pawlak, 2024). Despite advocates from several judges, the advisory opinion's majority position neglected to integrate human rights considerations as an essential dimension of marine environmental governance—ultimately forfeiting a pivotal opportunity to bridge human rights law with the law of the sea (Desierto, 2024).

On the other hand, human rights law has largely overlooked marine environment considerations. Throughout the development of international human rights law, its rules and principles have been primarily constructed around terrestrial contexts, reflecting the presumption that the main sphere of human activity is on land. However, in the context of climate change, the marine ecosystem is increasingly affecting the realization of human rights. An increasing amount of human rights-based environmental litigation now incorporates an oceanic dimension. (Abate et al., 2023) Juridical practice underscores the urgent need for human rights law to take ocean into consideration.

This gap limits individuals' ability to safeguard their legal interests. Under the UNCLOS framework, only states are entitled to bring claims against other states for violations. (Giorgetti, 2019) Thus, if coastal communities, indigenous peoples or others

dependent on marine ecosystems are harmed by unlawful dumping or other transboundary activities, they have to ask their own state to pursue compensation on their behalf. However, it should be noted that states may hesitate to hold others accountable due to diplomatic relations or geopolitical strategies. The Fukushima incident is a clear example. When Japan unilaterally released radioactive wastewater into the ocean, the contamination spread through ocean currents, posing high risks to marine biodiversity and the fundamental rights of people throughout the Asia-Pacific. Yet, only a few neighboring countries expressed strong objections, while many of Japan's allies remained silent (Moretti, 2021).

In conclusion, the gap between international human rights law and the law of the sea not only undermines the universality and coherence of human rights protection but also compromises the fairness and sustainability of marine environmental governance. It is time to promote the integration of these two legal systems.

3 A theoretical framework for the right to environment at sea

This section expands the application of human rights law in the marine context by introducing the new concept of the "right to environment at sea". It first analyzes the right-holders, duty-bearers, typology and scope of the obligations. It then applies the proposed right to the contexts of deep-seabed mining, marine pollution, and marine biodiversity to examine its unique functions and advantages. Finally, it highlights the implications of the proposed right for reshaping the paradigm of marine environmental governance.

3.1 Right-holders

Generally speaking, every individual is a subject of human rights. Naturally, each person has the right to environment at sea. That said, the specific claims asserted by different groups in the context of marine environmental protection vary considerably. Citizens of coastal states are better positioned to claim environmental interests within their own territorial waters. By contrast, individuals from landlocked states generally hold no right to claim marine environmental interests within the territorial seas of other states. Nonetheless, both coastal and landlocked state populations are entitled to claim environmental interests in the high seas. Furthermore, as well-established jurisprudence affirms, vulnerable groups—including women, ethnic minorities, and persons with disabilities—may equally assert the right to a healthy marine environment on a non-discriminatory basis.

From a temporal perspective, the rights-holders of the right to environment at sea are not confined to the present population but also encompass future generations. Both scholarly debate and judicial practice increasingly recognize this broader scope. In 2023, nearly sixty legal and human rights experts drafted the Masstricht Principles on the Human Rights of Future Generations, an initiative seeking to clarify the obligations owed to those yet to come. (Nolan, 2024) The Committee on the Rights of the Child emphasized that while the rights of children living today require urgent protection, those of children yet to be born also demand realization to the fullest extent possible. The Inter-American Court of Human Rights has similarly underscored that the right to a healthy environment is a universal value owed equally to present and future generations. (IACtHR, 2017) More recently, in its Advisory Opinion on the climate emergency, the IACtHR emphasized that states must ensure the right of future generations to a healthy climate and that current adverse impacts should not be disproportionately transferred to them. (IACtHR, 2025) The International Court of Justice has affirmed that present generations, as trustees of humanity, bear a duty to preserve a healthy environment and to transmit it to future generations. (ICJ, 2025) Accordingly, states and other duty-bearers must adopt marine environmental policies with a forward-looking perspective, ensuring that the rights of future generations are effectively upheld.

3.2 Duty-bearers

States are the primary and default duty-bearers of the right to environment at sea. This aligns with the established framework of international human rights law and jurisprudence. The International Court of Justice has affirmed that environmental protection constitutes a binding component of states' human rights obligations. Breaches of these obligations may trigger state responsibility and the duty to provide reparations for resulting harm. (ICJ, 2025) In the marine context, the central role of states becomes even more pronounced. Given their authority over maritime governance, resource management, and ecological preservation, states are uniquely positioned and obligated to uphold the right to environment at sea.

While traditional human rights obligations are limited to states, the proposed right envisions extending these duties to additional actors. The private sector should also be recognized as a duty-bearer. In the environmental sphere, there is a growing trend of holding corporations accountable and imposing human rights obligations upon them. In South Africa, the High Court ruled that Shell, a global energy and petrochemicals company, breached its human rights obligations as a business through proposed activities that would harm marine life and the livelihoods of coastal communities. (South Africa Supreme Court of Appeal, 2024) At the regional level, the Inter-American Court of Human Rights in Miskito Divers v. Honduras held that corporations must adopt preventive measures to avoid negative impacts on local communities and the environment. (IACtHR, 2021) Given these developments, recognizing corporate actors as duty-bearers is crucial for marine environmental protection. Although there are currently no legally binding instruments governing corporate activities, the UN Guiding Principles on Business and Human Rights provides some important standards. (Ruggie, 2011; Deva, 2012; Ploeg, 2024) Corporations have a responsibility to conduct thorough and ongoing due diligence and impact assessments to

identify, monitor, and evaluate any harm their activities may cause to the marine environment (United Nations, 2011).

International organizations should also bear obligations under the proposed right. Bodies such as the International Maritime Organizations (IMO) and International Seabed Authority (ISA) directly regulate marine activities. Their decisions, ranging from shipping emission standards to deep-sea mining rules can significantly affect the enjoyment of this right. Traditionally, international organizations were considered outside the scope of international human rights law, as they are not treaty parties. This view is gradually evolving under the influence of a growing body of scholarship. Some argue that, as agents of their member states, international organizations are indirectly bound by their members' obligations. (Schutter, 2014) Others emphasize their independent legal personality and caution that not all human rights obligations are directly applicable to them. (Zagel, 2018) In practice, their obligations may be narrower, possibly confined to jus cogens norms and the duty to cooperate. For instance, international organizations may be expected to allocate budgetary resources to support the realization of economic and social rights in resource-onstrained states. (Neuman, 2019) While accountability mechanisms remain weak, their human rights obligations should not be overlooked.

3.3 Typology of the obligations

State obligations under international human rights law are commonly categorized into three distinct duties: to respect, to protect, and to fulfill. This tripartite framework provides a robust lens through which to analyze the right to environment at sea. Specifically, the duty to respect requires states to refrain from directly interfering with the enjoyment of the proposed right. In this regard, states should not authorize projects that fail to undergo rigorous, science-based environmental impact assessments, particularly when such projects are likely to damage fragile marine ecosystems. Moreover, states must not obstruct public participation in decision-making processes or supervisory mechanisms. (Human Rights Council, 2025).

Second, the duty to protect requires states to safeguard their citizens from harm caused by third parties, including business enterprises. (United Nations, 2011) To this end, states should enact legislation, establish monitoring mechanisms, and enforce regulatory measures to govern private sector activities such as bottom trawling, offshore drilling, nuclear waste disposal, deep-sea mining, and the use of single-use plastics (ICJ, 2025).

Third, the duty to fulfill requires states to take proactive measures to improve the marine ecological environment. For example, states should allocate financial resources to support marine ecosystem restoration projects, fund advanced scientific research such as blue carbon initiatives, promote marine knowledge to enhance public awareness of marine environment protection, and cooperate with neighboring countries on marine environmental conservation (United Nations, 2015; Gelcich et al., 2014; Lotze et al., 2018).

3.4 Scope of the obligations

According to well-established human rights theory and practice, states have extraterritorial obligations to respect, protect, and fulfill human rights beyond their territorial borders (ICJ, 2004, 2005). While these obligations are widely recognized in principle, their application- particularly in marine contexts- remains a subject of scholarly debate. Academic discourse increasingly emphasizes that states must uphold human rights extraterritorially, with scholars advocating for jurisdiction-based frameworks to operationalize these duties (ETO Consortium, 2011). However, traditional theories of extraterritorial human rights obligations have primarily been developed in terrestrial settings, often failing to address the unique complexities of maritime environments. When applied to the environmental rights at seas, these frameworks must be adapted to account for the distinct legal and ecological dynamics of marine spaces.

A case in point is deep-sea mining, where corporate activities can profoundly impact marine ecosystems. Under international ocean law, mining companies operate under the jurisdiction of their home states and sponsoring states, creating overlapping legal responsibilities. Consequently, affected individuals- including those from landlocked nations- may seek redress for environmental harms by invoking human rights obligations against either the sponsoring state or the home state of the mining entity. In such scenarios, both states assume joint responsibility for ensuring compliance with human rights standards. In fact, the concept of the right to environment at sea inherently carries extraterritorial implications for high seas protection, given that these areas lie beyond the immediate sphere of individual daily life. Consequently, states are obligated to undertake environmental conservation measures beyond their national borders. In this regard, extraterritorial obligations in marine environmental rights will significantly contribute to- and expand- the theoretical framework of extraterritorial human rights obligations, as exemplified by the Maastricht Principles (ETO Consortium, 2011).

3.5 Applicable scenes of the right to environment at sea

This subsection will examine the unique advantages of the proposed right in addressing the global marine environmental crisis and explore how it could inject new vitality into marine environmental governance. Its application will be discussed in three contexts: deep seabed mining, marine pollution, and marine biodiversity.

3.5.1 Deep seabed mining

States have shown strong interest in exploiting rare minerals and metals in the deep seabed, particularly in areas beyond their national jurisdiction. To prevent a tragedy of the commons, UNCLOS declared the seabed beyond national jurisdiction and its resources the "common heritage of mankind "(CHM). (United Nations, 1982) It also established the International Seabed

Authority (ISA) to adopt regulations, manage and supervise activities in the Area. However, in April 2025, the White House issued an Executive Order entitled Unleashing America's Offshore Critical Minerals and Resources, authorizing U.S. companies to bypass ISA supervision by obtaining exploitation permits from the National Oceanic and Atmospheric Administration under domestic law. Since then, multiple companies have submitted applications for exploration licenses. This unilateral action undermines the regulatory framework established by the ISA, leading to competitive exploitation among states and higher risk of serious environmental harm.

Current international law of the sea cannot effectively constrain the unilateral actions of the United States, whereas the right to environment at sea offers a potential solution to this issue. According to scholarly views, home states have an obligation to regulate the activities of their transnational mining companies to ensure compliance with human rights and environmental standards (Seck, 2008, 2020). Specifically in this context, as the country of registration for mining companies, the United States bears regulatory responsibilities over these enterprises. Furthermore, while the international community cannot force the United States to join the UNCLOS or to acknowledge the international seabed area as the "common heritage of humankind," the U.S. nevertheless bears an obligation under the right to environment at sea to engage in at least minimal cooperation with international organizations such as the International Seabed Authority to safeguard the marine environment (Warner, 2020; Massimi, 2024).

3.5.2 Marine pollution

Marine pollution has emerged as a severe ecological crisis. It devastates marine ecosystems, disrupts food chains, and ultimately threatens human health. Yet the traditional legal framework shows clear deficiencies in addressing these challenges. One pressing concern lies in the high evidentiary thresholds for establishing responsibility. For instance, in the case of Japan's unilateral release of contaminated water, proving liability would require demonstrating a direct causal link between the discharge and harm to marine wildlife. In practice, however, environmental harm often results from multiple overlapping causes, making such proof exceedingly difficult. Can the proposed right to environment at sea help overcome this barrier? Under this right, individuals would no longer be required to demonstrate actual physical or property damage in order to assert their claims. State responsibility for failing to protect or to fulfill the right would not necessarily depend on proving tangible harm to human bodies, but rather on the breach of obligations aimed at safeguarding the marine environment (Liang, 2024; Paine, 2025).

Furthermore, in the context of stalled global plastics treaty negotiations, the proposed right could provide an effective mechanism to address regulatory gaps. (Tabuchi, 2025) It would require corporations to integrate human rights standards throughout their entire supply chain, shifting the focus from merely managing plastic waste to preventing harm at its source and effectively tackling overproduction, which is the primary driver of the global plastic crisis.

3.5.3 Marine biodiversity

Marine wildlife plays a vital role in sustaining ocean productivity, resilience, and adaptability to environmental change, as well as the regulation of air quality and climate. Yet, marine biodiversity is under unprecedented threat. Overexploitation, habitat destruction, and pollution have long driven species extinctions and population declines. (Lotze et al., 2018) Between 1970 and 2012, global marine fish populations declined by 50%, primarily due to overfishing, destructive practices, bycatch, and illegal, unreported, and unregulated (IUU) fishing (Doyle, 2015).

Traditional legal frameworks such as the Convention on Biological Diversity (CBD), the Kunming-Montreal Global Biodiversity Framework (GBF) and the recent treaty on the conservation and sustainable use of marine biological diversity in areas beyond national jurisdiction (BBNJ) remain largely state-centric and lack humanistic consideration. By contrast, the proposed right incorporates the ideal of "One Health", which emphasizes the intrinsic interconnection between human, species, and ecosystem. (World Health Organization, 2021) Under this right, fishing companies should refrain from operating in marine protected areas or ecologically sensitive zones, monitor and report verifiable data on fish stocks and ecosystem impacts, and adopt sustainable fishing practices. Shipping companies should implement a human rights due diligence process to identify, prevent, mitigate and account for the adverse impacts of hazardous substances released into marine environment. (Orellana, 2023) Furthermore, it is particularly imperative for states and business to ensure the free, prior, and informed consent of indigenous people and coastal communities, as well as their full and effective participation in decision-making processes (Techera, 2012; United Nations Environment Programme, 2022).

3.6 Theoretical implications of the right to environment at sea

The proposed right to environment at sea has the potential to transform global environmental governance, with the following key implications:

First, the proposed right is more likely to generate state practice and opinio juris, thereby granting it greater potential to develop into customary international law. The transboundary nature of marine environmental issues calls for cooperative action by states. To coordinate such action, states can make use of international multilateral platforms, including the IMO, the ISA, and regional fisheries management organizations. These platforms provide states with repeated opportunities for consultation, negotiation and coordination, which can help foster greater consistency in state practice. As demonstrated by the IMO, the agency has facilitated the adoption of over 50 multilateral treaties and the development of several thousand codes, recommendations, and guidelines. (Orellana, 2023) In addition, the marine domain has a specialized institution, ITLOS, which possesses a well-established dispute settlement system. Through its judgments and authoritative advisory opinions, ITLOS often provides states with legal

guidance and a framework for interpreting marine environmental obligations. While such guidance does not automatically create legal belief, it can shape states' understanding of their duties and perception of legal obligations, thereby potentially contributing to the gradual formation of opinio juris regarding the right to environment at sea.

Second, the proposed right contributes to preventing a tragedy of the commons. About 64% of the world's oceans are high seas—a public resource characterized by competitive use but lacking exclusive property rights. In this context, states often exploit these resources to maximize gains, which can drive the marine environment toward irreversible damage. (McWhinnie, 2009; Vince and Hardesty, 2018) Traditional international law of the sea primarily addresses sovereignty delimitation and resource allocation, offering limited mechanisms for environmental protection. Current international ocean governance is highly fragmented. Specially, regulatory frameworks tend to focus on specific regions or individual issues and lack comprehensive coordination. For instance, the International Maritime Organization regulates ship-source pollution, the International Seabed Authority manages environmental risks from deep-sea mining, and the BBNJ Agreement governs biodiversity in the high seas. Coordination among these regimes remains limited. By contrast, a human rights framework can consolidate and reinforce state obligations for marine environmental protection in a systematic and integrated way. It also overcomes the state-centered limitations of traditional ocean law. Individuals, regardless of their location, can assert their rights through regional or international human rights mechanisms, generating both legal obligations and sustained political and public pressure. These mechanisms encourage states to treat marine environmental protection as a core governance responsibility and to implement it effectively at both institutional and practical levels.

Third, the proposed right could provide a legal basis for enhancing the voice of landlocked states in ocean environmental governance. Currently, there are 44 landlocked countries whose territories are entirely surrounded by land. Although geographical constraints do not prevent these states from participating in global ocean governance, they are often marginalized in practice. (Sebuliba, 2024) For instance, during negotiations on the BBNJ Agreement, coastal states dominated the process, while landlocked states were frequently perceived as lacking independent claims. Recognizing the proposed right could potentially alter this situation. It extends to the citizens of all states, including those of landlocked countries. Even a citizen of Mongolia could invoke this right and urge the Mongolian government to press polluting states to take action. In this context, landlocked states not only possess the legitimacy but also, to some extent, bear an obligation to respond to their citizens' claims. If the global community broadly recognizes the proposed right, landlocked states could transform such claims into concrete expressions of national interest, thereby establishing a more independent position and securing greater influence in global ocean governance.

4 The path to activate the right to environment at sea

Recognizing the right to environment at sea without judicial, legislative, regulatory and other effective means of enforcement renders it a purely symbolic gesture. To this end, this section explores two complementary dimensions of enforcement. First, it examines how this right can be embedded within existing legal frameworks through interpretive techniques and normative alignment. Second, it considers the procedural mechanisms available at the international level to operationalize and support the enforcement of this right in practice.

4.1 A systemic approach to develop the proposed right in theory

The right to environment at sea is not easily constructed and requires further interpretation. It emerges from the interaction between international human rights law and the law of the sea. In this context, the principle of systemic integration, as set out in Article 31(3)(c) of the Vienna Convention on the Law of Treaties, provides a valuable interpretive approach. This principle is based on the understanding that the fundamental rules of international law are interconnected and mutually reinforcing. As such, it directs treaty interpreters to take into account "any relevant rules of international law applicable in the relations between the parties." This method is widely recognized for its capacity to accommodate changing circumstances, particularly when interpreting open-ended or evolving treaty terms. (McLachlan, 2005) For instance, in the Shrimp—Turtle case, the WTO Appellate Body drew on provisions from UNCLOS and international environmental law to interpret the term "exhaustible natural resources" in Article XX(g) of GATT, concluding that it encompasses living species (Howse, 2002).

More importantly, the principle of systemic integration is increasingly employed to clarify states' obligations, particularly in climate change litigation. In the Torres Strait Islanders case, eight Australian nationals and six of their children jointly filed a complaint with the Human Rights Committee against Australia, alleging its failure to take adequate mitigation and adaptation measures to address the effects of climate change. For the first time, the Committee interpreted states' climate change obligations under the ICCPR with reference to the Paris Agreement. Despite Australia's objection, the Committee affirmed that, since the authors were not seeking relief for violations of other treaties but rather invoking them to interpret the State party's obligations under the Covenant, such references were appropriate and relevant to the merits of the claims. (HRC, 2023) Influenced by this case, ITLOS, in its advisory opinion on climate change, noted that instruments such as the United Nations Framework Convention on Climate Change and the Paris Agreement contain relevant Generally Accepted International Rules and Standards for interpreting and applying states' obligations under UNCLOS. (ITLOS, 2024) Similarly, the

Inter-American Court of Human Rights interpreted states' obligations by examining a wide range of legal sources, from climate change frameworks and international environmental law to international trade and investment treaties (IACtHR, 2025).

Given these precedents, the principle of systemic integration holds considerable promise for advancing the right to environment at sea. It calls for a reciprocal interpretive approach in which the law of the sea is read through the lens of international human rights law, and human rights norms are applied with due regard for the ecological and legal specificities of the marine environment. On one hand, this approach entails extending traditional human rights—such as the rights to life, health, water and food—into the ocean context, recognizing the interdependence between human well-being and marine ecosystems. In this regard, the Special Rapporteur on the human right to a clean, healthy and sustainable environment has made notable contributions by framing marine conservation as a human rights issue and offering practical recommendations for states to align ocean governance with their human rights obligations. (Riaño, 2024) On the other hand, this approach also requires an expanded understanding of state obligations—one that encompasses not only duties toward other states, but also obligations to individuals within their jurisdiction and potentially to those in other countries affected by marine environmental harm.

4.2 Utilizing international procedures to enforce the proposed right

Within the international legal framework, a variety of enforcement mechanisms exist. Relevant alternatives for enforcing the right to environment at sea can be summarized as follows.

The first approach relies on the treaty-monitoring mechanisms of human rights treaty bodies. There are nine core treaties within the international human rights framework, each monitoring compliance through measures such as national reports, individual complaints, interstate complaints and general comments. Treaty bodies can embed the proposed right into existing human rights frameworks through dynamic interpretation in general comments. Although these comments are not legally binding, they significantly influence the interpretation and application of international human rights law. (Lesch and Reiners, 2023) In practice, treaty bodies have used this method to integrate new rights. For example, the Committee on the Rights of the Child incorporated the right to a clean, healthy and sustainable environment into its General Comment. A similar approach could be adopted to interpret and promote the enforcement of the right to environment at sea.

Given that treaty-monitoring mechanisms are limited in their ability to bind non-party states, the second approach is through the Universal Periodic Review (UPR) of the Human Rights Council. The UPR requires each UN member state to undergo a peer review of its human rights record approximately every 4.5 years. It applies universally, ensuring that non-ratifying states are subject to scrutiny. In this context, states can use it to promote compliance, transparency, and accountability, turning peer pressure and international scrutiny into practical leverage to advance the proposed right.

Regional human rights courts can also play an important role in enforcing the right. There is a slight emerging trend of applying human rights law to marine environmental issues in these courts. For example, the European Court of Human Rights (ECtHR) is currently hearing the case People v. Arctic Oil, in which Norway's approval of new oil drilling in the Barents Sea may violate the rights to life and to private and family life under Articles 2 and 8 of the European Convention on Human Rights, due to the environmental and climate risks posed by offshore extraction. (Duffy and Maxwell, 2020) Similarly, the Inter-American Court of Human Rights has addressed the impacts of marine environmental degradation on individuals and vulnerable groups (IACtHR, 2025). Building on their history of taking the lead in shaping human rights jurisprudence in response to global challenges, including environmental crisis, regional courts could promote this right.

The International Tribunal for the Law of the Sea holds considerable promise. As an independent judicial body, it has authority over disputes concerning the interpretation and application of UNCLOS. Although widely recognized for its expertise in maritime matters, it was considered prudent to directly regard human rights as 'relevant external rules' when interpreting the treaty. As demonstrated in the climate change advisory proceedings, although a number of judges jointly called for the inclusion of States' human rights obligations pertaining to climate change, the Advisory Opinion ultimately declined to incorporate them. (Pawlak, 2024) Looking ahead, ITLOS is expected to move beyond this reticence, fostering a more integrated and human-centered approach to ocean governance.

As the most authoritative and influential international judicial body, the International Court of Justice plays a decisive role in advancing the proposed right. While it provides parties with a dispute resolution mechanism under Article 287 of UNCLOS, it has rarely addressed marine environmental issues, focusing mainly on delimitation and resource allocation. This is largely because its jurisdiction depends on the mutual consent of states rather than compulsory adjudication. In the absence of such consent, disputes are more often referred to arbitration. Nevertheless, the ICJ also has an advisory function. Although advisory opinions are not legally binding, they can exert significant influence by shaping state behavior, interpreting binding treaties, and developing customary international law. (Flanagan, 2024) Recently, the ICJ issued a landmark advisory opinion on states' obligations regarding climate change. (ICJ, 2025) The opinion comprehensively examined states' obligations under climate change treaties, other environmental agreements, UNCLOS, international human rights law, and customary international law. In interpreting these obligations, the ICJ applied Article 31(3)(c) of the Vienna Convention on the Law of Treaties to address rules across different branches of law, emphasizing that treaties should be interpreted in light of other relevant rules of international law. In particular, the Court noted that states must consider their human rights obligations when implementing climate change and other environmental treaties, and conversely. Although the opinion did not explicitly mention UNCLOS, the logic of systemic interpretation implies that the term "other relevant environmental treaties" may include Part XII of UNCLOS. On this basis, it may be

argued that states should take international human rights obligations into account when fulfilling UNCLOS obligations. Based on the Court's emphasis on the interrelation of different branches of law, it is reasonable to predict that the ICJ may facilitate greater interaction between UNCLOS and international human rights law in future marine environment cases. If such interaction occurs, it could provide a jurisprudential reference for the further articulation and potential development of the right to environment at sea.

It should be noted that enforcing the proposed right may face certain challenges. For instance, deep-seabed mining states could oppose this right, as it may constrain their ongoing extraction activities. These states are accelerating seabed mining, which has already drawn criticism from other states concerned about potential marine environmental degradation. (Singh et al., 2025) The proposed right could provide non-mining states with a normative basis to call for the suspension of seabed mining activities, even when such activities are regulated by the International Seabed Authority. Such suspension could threaten the core economic and strategic interests of mining states, potentially prompting them to adopt a cautious or resistant stance. (Feichtner and Ginzky, 2024) Moreover, the capacity and willingness of international judicial bodies to actively apply and interpret the proposed right remain uncertain. For example, the ITLOS has faced controversy regarding the scope of its jurisdiction. (Miron, 2023; Qian et al., 2024) In its advisory opinion on climate change, it refrained from directly invoking international human rights law as an external interpretive guide. Accordingly, it remains uncertain whether international judicial bodies will further promote interaction between international human rights law and the law of the sea in future cases.

5 Conclusion (policy suggestions)

A human rights-based approach is both necessary and effective in addressing the contemporary global environmental crisis. The introduction of the right to environment at sea challenges the traditional perception that human rights apply only on land. It further refines and extends the right to a clean, healthy, and sustainable environment, filling a critical void in the marine context. This approach offers a fresh, non-state-centric, and more dynamic paradigm for marine environmental governance, with potential to exert binding force through diverse international human rights mechanisms. Moreover, it broadens research on the ocean and human rights, extending attention from trafficking, corruption and exploitation at sea to environmental issues. The articulation of the right to environment at sea will further advance the interaction and integration between human rights law and the law of the sea. (Whomersley, 2023; Klein, 2022) It encourages human rights law to engage more deeply with maritime issues and facilitates the incorporation of human rights discourse into the law of the sea.

However, it should be noted that the realization of the right to environment at sea is neither immediate nor automatic and requires coordinated action by multiple stakeholders. Treaty bodies should connect this right with existing human rights conventions through interpretative mechanisms, thereby providing victims with clearer and more effective avenues for redress. Judges who hear cases of transboundary marine environmental pollution should actively integrate relevant obligations under international human rights law into their reasoning. Similarly, the ISA and IMO should integrate stronger safeguards to prevent marine pollution and protect marine biodiversity when drafting technical standards. At the same time, environmental NGOs should systematically invoke the proposed right to environment at sea as a normative framework to guide strategic litigation, thereby potentially reinforcing accountability and advancing international law.

Author contributions

GW: Writing – original draft. LY: Conceptualization, Methodology, Resources, Supervision, Writing – original draft. XC: Data curation, Investigation, Resources, Writing – review & editing.

Funding

The author(s) declare financial support was received for the research and/or publication of this article. This study was supported by Discretionary Fund of National Science Center for Earthquake Engineering (NO.2025ZZB6004).

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The author(s) declare that no Generative AI was used in the creation of this manuscript.

Any alternative text (alt text) provided alongside figures in this article has been generated by Frontiers with the support of artificial intelligence and reasonable efforts have been made to ensure accuracy, including review by the authors wherever possible. If you identify any issues, please contact us.

Publisher's note

References

Abate, R., Nadow, N., and Dorrian-Bak, H. (2023). *Litigation to protect the marine environment: parallels and synergies with climate litigation*. Available online at: https://scholarship.law.wm.edu/cgi/viewcontent.cgi?article=1851&context=wmelpr (Accessed May 20, 2025).

Bennett, N., Lama, R., Billon, P., Ertör, I., and Morgera, E. (2023). Ocean defenders and human rights. *Front. Mar. Sci.* 9. doi: 10.3389/fmars.2022.1089049

Beringen, E. (2024). Uncertain, unstable and unequal: can regime interaction help international fisheries law address anthropocene challenges? *Mar. Policy* 165, 1–10. doi: 10.1016/j.marpol.2024.106158

Bijma, J., Pörtner, H., Yesson, C., and Rogers, A. (2013). Climate change and the oceans-what does the future hold? *Mar. pollut. bulletin.* 74, 495–505. doi: 10.1016/j.marpolbul.2013.07.022

Desierto, D. (2024). Stringent due diligence", duties of cooperation and assistance to climate vulnerable states, and the selective integration of external rules in the ITLOS Advisory Opinion on Climate Change and International Law. Available online at: https://www.ejiltalk.org/stringent-due-diligence-duties-of-cooperation-and-assistance-to-climate-vulnerable-states-and-the-selective-integration-of-external-rules-in-the-itlos-advisory-opinion-on-climate-change-and-inte/ (Accessed March 5, 2025).

Deva, S. (2012). Guiding principles on business and human rights: implications for companies. *Eur. Comp. Law* 9, 101–109. doi: 10.54648/eucl2012016

Doyle, A. (2015). Ocean fish numbers cut in half since 1970. Available online at: https://www.scientificamerican.com/article/ocean-fish-numbers-cut-in-half-since-1970/ (Accessed July 28, 2025).

Duffy, H., and Maxwell, L. People v Arctic Oil before supreme court of Norway-what's at stake for human rights protection in the climate crisis? Available online at: https://www.ejiltalk.org/people-v-arctic-oil-before-supreme-court-of-Norway-whats-at-stake-for-human-rights-protection-in-the-climate-crisis (Accessed May 10, 2025).

ETO Consortium (2011). Maastricht Principles on Extraterritorial Obligations of States in the area of Economic, Social and Cultural Rights. Available online at: https://www.ciel.org/wp-content/uploads/2015/05/Maastricht_ETO_Principles_21Oct11.pdf (Accessed September 11, 2025).

Feichtner, I., and Ginzky, H. (2024). The struggle at the international seabed authority over deep sea mineral resources. *NPJ ocean sustainability.* 3, 63. doi: 10.1038/s44183-024-00098-y

Flanagan, D. (2024). The ICJ's advisory function: a procedural tool to advance human rights? Available online at: https://cilj.co.uk/2024/02/22/the-icjs-advisory-function-a-procedural-tool-to-advance-human-rights/ (Accessed May 25, 2025).

Galani, S. (2017). Somali piracy and the human rights of seafarers. *Netherlands Q. Hum. Rights.* 34, 71–98. doi: 10.1177/016934411603400105

Gelcich, S., Buckley, P., Pinnegar, J., and Chilvers, J. (2014). Public awareness, concerns, and priorities about anthropogenic impacts on marine environments. *Proc. Natl. Acad. Sci.* 111, 15042–15047. doi: 10.1073/pnas.1417344111

Giorgetti, C. (2019). Rethinking the individual in international law. Available online at: https://scholarship.richmond.edu/cgi/viewcontent.cgi?article=2528&context=law-faculty-publications (Accessed May 23, 2025).

Haines, S. (2021). Developing human rights at sea. *Ocean Yearbook.* 35, 18–51. doi: 10.1163/22116001_03501003

Howse, R. (2002). The appellate body rulings in the Shrimp/Turtle case: a new legal baseline for the trade and environment debate. Available online at: https://www.worldtradelaw.net/document.php?id=articles/howseshrimp.pdf&mode=download (Accessed April 20, 2025).

Human Rights Committee (2023). Views adopted by the Committee under article 5 (4) of the Optional Protocol, concerning communication No.3624/2019 (Daniel Billy and others v. Australia). Available online at: https://juris.ohchr.org/casedetails/3855/en-US (Accessed May 10, 2025).

Human Rights Council (2025). The ocean and human rights. Available online at: https://docs.un.org/en/A/HRC/58/59 (Accessed September 11, 2025).

Inter-American Court of Human Rights (2017). Advisory opinion OC-23/17-The environment and human rights. Available online at: https://www.corteidh.or.cr/docs/opiniones/seriea_23_ing.pdf (Accessed March 15, 2025).

Inter-American Court of Human Rights (2021). Miskito Divers v. Honduras. Available online at: https://corteidh.or.cr/docs/casos/articulos/seriec_432_ing.pdf (Accessed March 15, 2025).

Inter-American Court of Human Rights (2025). Advisory opinion AO-32/25-The Climate Emergency and Human Rights. Available online at: https://www.corteidh.or.cr/docs/opiniones/seriea_32_en.pdf (Accessed March 31, 2025).

International Court of Justice (2004). Advisory Opinion-Legal consequences of the construction of a wall inthe occupied Palestinian territory. Available online at: https://icj-cij.org/sites/default/files/case-related/131/131-20040709-ADV-01-00-EN.pdf (Accessed October 26, 2025).

International Court of Justice (2005). Advisory opinion-armed activities on the territory of the Congo. Available online at: https://icj-cij.org/sites/default/files/case-related/116/116-20051219-JUD-01-00-EN.pdf (Accessed July 28, 2025).

International Court of Justice (2025). Advisory opinion-obligations of states in respect of climate change. Available online at: https://www.icj-cij.org/sites/default/files/case-related/187/187-20250723-adv-01-00-en.pdf (Accessed July 25, 2025).

International Tribunal for the Law of the Sea (2024). Request for an Advisory Opinion submitted by the Commission of Small Island States on Climate Change and International Law (Request for Advisory Opinion submitted to the Tribunal). Available online at: https://www.itlos.org/en/main/cases/list-of-cases/request-for-an-advisory-opinion-submitted-by-the-commission-of-small-island-states-on-climate-change-and-international-law-request-for-advisory-opinion-submitted-to-the-tribunal/ (Accessed October 20, 2025).

Klein, N. (2022). Geneva Declaration on human rights at sea: an endeavor to connect law of the sea and international human rights law. *Ocean Dev. Int. Law.* 53, 232–268. doi: 10.1080/00908320.2022.2112000

Kojima, C. (2023). Integration of general principles of international environmental law into the law of the sea: assessment and challenges. *Mar. Policy* 149, 105497. doi: 10.1016/j.marpol.2023.105497

Kułaga, Ł. (2022). Prohibition of massive and serious pollution of marine environment as a jus cogens. Identification, legal bases and consequences in view of the recent work of the International Law Commission. *Mar. Policy* 144, 105217. doi: 10.1016/j.marpol.2022.105217

Lesch, M., and Reiners, N. (2023). Informal human rights law-making: how treaty bodies use 'general comments' to develop international law. *Global constitutionalism* 12:2, 1–24. doi: 10.1017/S2045381723000023

Liang, S. (2024). Reflections on the interpretation and application of the due diligence obligation in international climate litigation: a comparative study of Daniel Billy et al. v. Australia and the COSIS advisory opinion. *Front. Mar.Sci.* 11. doi: 10.3389/fmars.2024.1483677

Liu, X., Liu, S., and Wang, Y. (2024). The improvement of judicial protection of marine environment in China: based on the analysis of 2443 judicial cases. *Mar. science.* 11. doi: 10.3389/fmars.2024.1486230

Lotze, H., Guest, H., Leary, J., Tuda, A., and Wallace, D. (2018). Public perceptions of marine threats and protection from around the world. *Ocean Coast. Manage.* 152, 14–22. doi: 10.1016/j.ocecoaman.2017.11.004

Massimi, M. (2024). The fraught legacy of the common heritage of humankind principle for equitable ocean policy 153, 103681. doi: 10.1016/j.envsci.2024.103681

McLachlan, C. (2005). The principle of systemic integration and Article 31(3)(c) of the Vienna Convention. *Int. Comp. Law quarterly.* 54, 279–320. doi: 10.1093/iclq/lei001

McWhinnie, S. (2009). The tragedy of the commons in international fisheries: an empirical examination. *J. Environ. Econ management.* 57, 321–333. doi: 10.1016/j.jeem.2008.07.008

Mendenhall, E. (2023). Making the most of what we already have: activating UNCLOS to combat marine plastic pollution. *Mar. Policy* 155, 105786. doi: 10.1016/j.marpol.2023.105786

Miron, A. (2023). COSIS request for an advisory opinion: a poisoned apple for the ITLOS? *Int. J. Mar. Coast. law.* 38, 249–296. doi: 10.1163/15718085-BJA10128

Moretti, A. (2021).The West's attitude to Japan's nuclear water dumping plan shows double-standard. Available online at: http://www.China.org.cn/opinion/2021-04/21/content_77427287.htm (Accessed March 15, 2025).

Neuman, G. (2019). International Organizations and Human Rights - the need for substance. Available online at: https://hrp.law.harvard.edu/wp-content/uploads/2022/10/Gerald-Neuman_HRP-19_001.pdf (Accessed March 20, 2025).

Nolan, A. (2024). Children and future generations rights before the courts: the vexed question of definitions. *Transnational Environ. Law* 13, 522–546. doi: 10.1017/S2047102524000165

Orellana, M. (2023). Report of the Special Rapporteur on the implications for human rights of the environmentally sound management and disposal of hazardous substances and wastes. Available online at: https://docs.un.org/en/A/78/169 (Accessed October 26, 2025).

Paine, J. (2025). ICJ Advisory Opinion on climate change: the variable and evolutive nature of due diligence obligations. Available online at: https://www.ejiltalk.org/icj-advisory-opinion-on-climate-change-the-variable-and-evolutive-nature-of-due-diligence-obligations/ (Accessed October 26, 2025).

Papanicolopulu, I. (2012). The law of the sea convention: no place for persons? *Int. J. Mar. Coast. Law* 27, 867–874. doi: 10.1163/15718085-12341256

Papanicolopulu, I., Longo, A., and Mandrioli, D. (2021). Submission in response to the call for evidence UNCLOS: fit for purpose in the 21st century? Available online at: https://committees.parliament.uk/writtenevidence/40874/html/ (Accessed March 11, 2025).

Pawlak, S. (2024). Declaration of judge Pawlak. Available online at: https://www.itlos.org/fileadmin/itlos/documents/cases/31/Advisory_Opinion/C31_Adv_Op_21.05.2024_decl_Pawlak_orig.pdf (Accessed October 20, 2025).

Ploeg, K. (2024). Investor obligations: transformative and regressive impacts of the business and human rights framework. *Business Hum. rights J.* 9, 221–249. doi: 10.1017/bhj.2024.8

Qian, J. T., Sun, K. J., and Chang, Y. C. (2024). The impact of the ITLOS climate change advisory opinion on the development of international law. *Mar. Policy* 170, 106406. doi: 10.1016/j.marpol.2024.106406

Riaño, A. (2024). Report of the Special Rapporteur on the human right to a clean, healthy and sustainable environment. Available online at: https://docs.un.org/en/A/HRC/58/59 (Accessed May 10, 2025).

Ruggie, J. (2011). Report of the special representative of the secretary-general on the issue of human rights and transnational corporations and other business enterprises, para.14. Available online at: https://www.securitycouncilreport.org/atf/cf/%7B65BFCF9B-6D27-4E9C-8CD3-CF6E4FF96FF9%7D/a_hrc_17_31.pdf (Accessed October 26, 2025).

Schutter, O. D. (2014). "Human rights and the rise of international organisations: the logic of sliding scales in the law international responsabilité," in *Accountability for human rights violations by international organisations*, vol. 51 . Ed. J. Wouters (Intersentia, Stevenage), 57.

Sebuliba, S. (2024). The "landlocked ocean" challenges international efforts to protect marine biodiversity in the high seas. Available online at: https://solomonsebuliba.com/2024/06/21/the-landlocked-ocean-challenges-international-efforts-to-protect-marine-biodiversity-in-the-high-seas/ (Accessed May 10, 2025).

Seck, S. (2008). Home state responsibility and local communities: the case of global mining. Available online at: https://openyls.law.yale.edu/server/api/core/bitstreams/59ad145d-5f8c-49d0-ace1-048e5315bf86/content (Accessed April 25, 2025).

Seck, S. (2020). "Climate justice and the ETOs," in *The Routledge Handbook on Extraterritorial Human Rights Obligations (ETOs)*. Eds. M. Gibney, G. E. Türkelli, M. Krajewski and W. Vandenhole (Routledge, Abingdon), 421–433.

Singh, P. A., Jaeckel, A., and Ardron, J. A. (2025). A pause or moratorium for deep seabed mining in the Area? The legal basis, potential pathways, and possible policy implications. *Ocean Dev. Int. law.* 56, 18–44. doi: 10.1080/00908320.2024.2439877

South Africa Supreme Court of Appeal (2024). Minister of Mineral Resources and Energy and Others v Sustaining the Wild Coast NPC and Others. Available online at: https://www.saflii.org/za/cases/ZASCA/2024/84.html (Accessed March 15, 2025).

Tabuchi, H. (2025). Why the world is deadlocked over a treaty to stop plastic pollution. Available online at: https://www.nytimes.com/2025/08/14/climate/global-plastic-pollution-treaty.html (Accessed August 15, 2025).

Techera, E. (2012). *Marine environmental governance from international law to local practice* (London: Routledge).

Thiagarajan, C., and Devarajan, Y. (2025). The urgent challenge of ocean pollution: impacts on marine biodiversity and human health. *Regional Stud. Mar. science.* 81, 1–10. doi: 10.1016/j.rsma.2024.103995

Trevisanut, S. (2023). "The future of the oceans: the role of human rights law and international environmental law in shaping the law of the sea," in *The Many Paths of Change in International Law*. Eds. N. Krisch and E. Yildiz (Oxford: Oxford University Press), 201–226.

United Nations (1982). *United Nations Convention on the Law of the Sea*. Available online at: https://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf (Accessed May 25, 2025).

United Nations (2011). Guiding principles on business and human rights. Available online at: https://www.ohchr.org/sites/default/files/Documents/Publications/GuidingPrinciplesBusinessHR_EN.pdf (Accessed March 20, 2025).

United Nations (2015). Sustainable development goals:17 goals to transform our world. Available online at: https://www.un.org/en/exhibits/page/sdgs-17-goals-transform-world (Accessed April 10, 2025).

United Nations (2022). The human right to a clean, healthy and sustainable environment. Available online at: https://digitallibrary.un.org/record/3983329 (Accessed March 5, 2025).

United Nations Environment Programme (2022). Kunming-Montreal Global biodiversity framework. Available online at: https://www.cbd.int/doc/decisions/cop-15/cop-15-dec-04-en.pdf (Accessed May 25, 2025).

Vince, J., and Hardesty, B. D. (2018). Governance solutions to the tragedy of the commons that marine plastics have become. *Front. Mar. Sci.* 5. doi: 10.3389/fmars.2018.00214

Warner, R. (2020). International environmental law principles relevant to exploitation activity in the Area. *Mar. Policy* 114, 103503. doi: 10.1016/j.marpol.2019.04.007

Whomersley, C. (2023). UNCLOS at 40: what about human rights? *Mar. Policy* 148, 105424. doi: 10.1016/j.marpol.2022.105424

World Health Organization (2021). One health initiative. Available online at: https://cdn.who.int/media/docs/default-source/one-health/ohi-one-pager1.pdf?sfvrsn=60d4b1ad_1&download=true (Accessed October 24, 2025).

Zagel, G. (2018). International organisations and human rights: the role of the UN Covenants in overcoming the accountability gap. *Nordic J. Hum. Rights.* 36, 74–90. doi: 10.1080/18918131.2018.1453586