1

Introduction

1.1 INTRODUCTION

On 10 November 1988, the oil tanker *Odyssey* broke apart in the North Atlantic, 700 miles off the Canadian coast. The *Odyssey* was carrying 132,000 tons of crude oil, which was released into the marine environment – making the *Odyssey* one of the largest oil spills to have ever occurred. Since the spill occurred on the high seas and the released oil did not reach the shores of any state, no response actions were taken.[1] This is not to suggest that environmental harm did not occur. It most certainly did.[2] However, the spill did not trigger the same legal response as one which damages the marine environment in areas within the national jurisdiction of states. The different legal treatment arises for several reasons. First, the harm itself was to the environment *per se*, as opposed to impacting the economic interests of a particular state or private actor. Even if the environmental harm that arose could be quantified and recognized as compensable, it is not clear what legal entities would have the right to recover for the loss suffered. The ambiguity surrounding the issue of legal standing to pursue claims for harms in areas beyond national jurisdiction (ABNJ) is a function of the nature of global commons, such as the high seas, whereby the harm is in one sense suffered by all states, perhaps by all humankind. However, in the absence of some legal actor that is authorized to act on behalf of these collective interests, legal responsibility is not easily recognized.

The legal rules governing liability for environmental harm in ABNJ have often been bracketed or placed outside the boundaries of the more familiar terrain of inter-state liability rules and practices.[3] Emblematic of this gap is the lack of progress on realizing

[1] CEDRE, 'Odyssey – Spill Report', online <wwz.cedre.fr/en/Resources/Spills/Spills/Odyssey> accessed 15 October 2022.

[2] Advisory Committee on Marine Pollution of the Seas of the International Council for the Exploration of the Sea, *1990 Marine Pollution Yearbook* (Pergamon 1990) 9.

[3] For example, the civil liability rules and processes governing spills from oil transport explicitly exclude environmental harm to areas beyond national jurisdiction: see International Convention on Civil Liability for Oil Pollution Damage (adopted 29 November 1969, entered

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 12 Nov 2026 at 22:33:48, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781108866477.003

the objective of Principle 13 of the Rio Declaration on Environment and Development, which states in part that '[s]tates shall also cooperate in an expeditious and more determined manner to develop further international law regarding liability and compensation for adverse effects of environmental damage caused by activities within their jurisdiction or control to areas beyond their jurisdiction'.[4] Article 235 of the 1982 United Nations Convention on the Law of the Sea (UNCLOS) similarly calls on states to cooperate 'in the ... further development of international law relating to responsibility and liability for the assessment of and compensation for damage' caused by pollution to the marine environment.[5] Yet, development of liability rules addressing areas beyond national jurisdiction very much remains unfinished business.

This book, in examining the existing, emerging and prospective international legal rules addressing liability for environmental harm to areas beyond national jurisdiction, takes as its starting point the increased salience of addressing the impacts on the environment in areas beyond the national jurisdiction of any state – many miles out to sea, in the ocean depths, or in the Antarctic.[6] This salience is a function of the expanding pressures on the environment in areas beyond national jurisdiction flowing from the increased intensity of ongoing economic activities in these areas and the emergence of new environmental risks from novel activities, such as deep seabed mining and marine geoengineering. Reports of the impacts of marine debris, overfishing and pollution from shipping and from offshore resource exploitation, amongst others, challenge policymakers to act effectively to prevent environmental harm and to restore ecosystems and ecosystem services when harm occurs. These challenges are compounded by climate change and widespread biodiversity loss, as well as increasing recognition of the fundamental role that oceans and the Antarctic play in maintaining earth systems.[7] Liability – by which

into force 19 June 1975) 973 UNTS 3 (1969 Oil Pollution Liability Convention), amended by the 1992 Protocol to Amend the 1969 International Convention on Civil Liability for Oil Pollution Damage (adopted 27 November 1992, entered into force 30 May 1996) 1956 UNTS 255 (1992 Oil Pollution Liability Convention) art II. The 1969 International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties only affirms the right of coastal states to take such measures on the high seas as may be necessary to prevent, mitigate or eliminate danger to its coastline or related interests from pollution by oil after a maritime casualty but does not address liability *per se*. See International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties (adopted 29 November 1969, entered into force 6 May 1975) 970 UNTS 211 (Intervention Convention).

4 Report of the United Nations Conference on Environment and Development (1992) UN Doc A/Conf.151/26/Rev.1, Annex I (1992 Rio Declaration), principle 13.

5 United Nations Convention on the Law of the Sea (adopted 10 December 1982, entered into force 16 November 1994) 1833 UNTS 397 (UNCLOS) art 235.

6 ES Brondizio, J Settele, S Díaz and HT Ngo (eds), *Global Assessment Report on Biodiversity and Ecosystem Services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services* (IPBES Secretariat 2019); Intergovernmental Panel on Climate Change (IPCC), *Special Report on the Ocean and Cryosphere in a Changing Climate* (CUP 2019).

7 IPCC, *Special Report* 2019 (n 6). See also Will Steffen and others, 'Planetary Boundaries: Guiding Human Development on a Changing Planet' (2015) 347 (6223) Science 736.

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 12 Nov 2026 at 22:33:48, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781108866477.003

we mean to refer to the rules and procedures governing compensation to the international community, states or other affected persons for damage caused to environment – offers a crucial element for governing the global commons by strengthening legal accountability for environmental risks and providing resources for ecological restoration.

Liability for environmental damage has been addressed in a piecemeal fashion in international environmental law. Specific rules on state liability for environmental damage remain relatively underdeveloped, beyond the general rules on state responsibility. While rules on state responsibility apply as a matter of principle to wrongful acts occasioning significant environmental harm in areas beyond national jurisdiction, the legal framework of state responsibility provides an incomplete and uncertain response.[8] Numerous agreements have been adopted establishing civil liability regimes in respect of various sectoral activities and the principles governing compensation for environmental harm to areas within national jurisdiction under such agreements, such as those governing oil pollution from tankers, are well understood.[9] However, many of the civil liability regimes have not entered into force, and coverage of environmental damage outside of areas under national jurisdiction remains inadequate. The potential transposition of these rules to areas that are not subject to national jurisdiction, or the development of alternative approaches, raises a unique set of legal questions that has not previously been the subject of any extended analysis.[10]

Some commentators have questioned whether liability and compensation approaches are appropriate for the global commons,[11] or as a tool for environmental

[8] See Phoebe Okowa, 'Responsibility for Environmental Damage' in Malgosia Fitzmaurice, David M Ong, and Panos Merkouris (eds), *Research Handbook on International Environmental Law* (Edward Elgar 2010) 303; Alan E Boyle, 'Remedying Harm to International Common Spaces and Resources: Compensation and Other Approaches' in Peter Wetterstein (ed), *Harm to the Environment: The Right to Compensation and the Assessment of Damages* (OUP 1997) 83; and Katja Creutz, *State Responsibility in the International Legal Order: A Critical Appraisal* (CUP 2020) 19, 163–166.

[9] See Jan Albers, *Responsibility and Liability in the Context of Transboundary Movements of Hazardous Wastes by Sea* (Springer-Verlag 2015); Julian Barboza, *The Environment, Risk and Liability in International Law* (Brill 2011); Michael Faure (ed), *Civil Liability and Financial Security for Offshore Oil and Gas Activities* (CUP 2016); Wu Chao, *Pollution from the Carriage of Oil by Sea: Liability and Compensation* (Kluwer Law International 1996).

[10] See Kathy Leigh, 'Liability for Damage to the Global Commons' (1992) 14 Aust YBIL 129; Meher Nigar, 'Environmental Liability and Global Commons: A Critical Study' (2018) 60(2) IJLMA 435; Xue Hanqin, *Transboundary Damage in International Law* (CUP 2003) 191–266; Malgosia Fitzmaurice, 'Liability for Environmental Damage Caused to the Global Commons' (1996) 5 RECIEL 305; Nicholas Gaskell, 'Liability and Compensation Regimes: Pollution of the High Seas' in Robert C Beckman, Millicent McCreath, J Ashley Roach and Zhen Sun (eds), *High Seas Governance: Gaps and Challenges* (Brill 2018) 229–272.

[11] Boyle (n 8) 99–100; Louise de La Fayette, 'The Concept of Environmental Damage in International Liability Regimes' in Michael Bowman and Alan Boyle (eds), *Environmental Damage in International and Comparative Law: Problems of Definition and Valuation* (OUP 2002) 149, 187–188.

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 12 Nov 2026 at 22:33:48, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781108866477.003

protection.[12] As the legal response to the *Odyssey* oil spill suggests, applying liability rules to the global commons does raise complex questions concerning the kinds of harm that ought to be compensable and how any damages are to be calculated, the standards of behaviour that ought to attract legal responsibility and which entities have the standing to pursue legal remedies for harm to the commons environment. The emerging patterns of activities in the global commons such as deep seabed mining, bioprospecting and scientific research engage a diverse group of international, state and non-state actors, who could attract liability for their operational activities, but also for their failure to provide proper oversight of these activities. In addition to raising novel legal questions, liability rules implicate a range of practical concerns about how to ensure the availability of adequate funds for compensation (through insurance or compensation funds) and access to dispute settlement forums to resolve complex, multi-party incidents. It is these questions that this book sets out to address.

1.2 DEFINING THE GLOBAL COMMONS OR AREAS BEYOND NATIONAL JURISDICTION

The phrase 'commons' has its origins in medieval times when pastures were reserved for the joint use of villagers, and eventually were transferred to private ownership in various stages between the sixteenth and nineteenth centuries.[13] From a legal perspective, the 'commons' denotes an area or resources that are shared amongst a group and to which access cannot be denied to a member of the group. It has also been defined as 'a resource to which no single decision-making unit holds exclusive title' or as a 'resource domain in which common pool resources are found'.[14] Global commons are differentiated based on the identity of the relevant decision-making units, states and the scale of the system (involving all states). Thus, global commons have been defined as 'resource domains to which all nations have legal access'.[15] This definition focuses on the commons as a category of property. Our interest extends beyond the legal implications of ownership and includes questions of authority or jurisdiction. In other words, we are interested in the structure of liability rules in areas where no state has the exclusive right to exercise authority over the area or resources located in these areas which are also described as areas beyond national jurisdiction or ABNJ. We use the term 'global commons' in this book in the

[12] Jutta Brunnée, 'Of Sense and Sensibility: Reflections on International Liability Regimes as Tools for Environmental Protection' (2004) 53(2) ICLQ 351.

[13] Jerome Blum, *The End of the Old Order in Rural Europe* (Princeton University Press 1978) (describing transformation of common property through enclosures). But see Elinor Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action* (CUP 1990) ch 3 (describing enduring communal tenure systems).

[14] Susan Buck, *The Global Commons: An Introduction* (Island Press 2012) 5.

[15] ibid 5.

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 12 Nov 2026 at 22:33:48, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781108866477.003

limited sense of the coverage of the book, and interchangeably with the term 'areas beyond national jurisdiction'.

The scholarly literature generally considers there to be four distinct global commons systems: Antarctica, the oceans, the atmosphere and outer space.[16] Our interest, and the focus of this book, is on two of these systems, the Antarctic and the oceans. We address the latter under the distinct legal regimes governing the high seas and deep seabed, owing to the unique status of each. The focus on these three interrelated global commons, that is, Antarctica, the deep seabed and the high seas, is deliberate. Each has a distinct legal regime governed by international law which addresses the legal nature of the various commons and their respective governance in unique ways. An underlying premise of this book is that examining these different contexts provides a more complete picture of how liability rules apply to areas beyond national jurisdiction, and allows for cross-regime comparison. This latter point allows the analysis to engage more deeply with questions of how the differing institutional and legal settings influence liability rules and procedures.

Because our interest is in examining how international law addresses liability for environmental harm to areas not under state jurisdiction, we exclude outer space and the atmosphere. The existing liability rules associated with space activity focus on impacts to state territory, and not to areas of the environment beyond state jurisdiction.[17] While a number of commentators have argued that the atmosphere is properly viewed as a form of commons, as a legal classification this view is contested.[18] In any event, for the purposes of addressing liability for environmental harm, it is the impact of climate change on the environment of commons areas that is of interest.[19] Thus, global atmospheric change is considered to the extent that certain impacts of climate change constitute a driver of environmental damage in the three global commons areas that are addressed.

To situate the examination of the key elements of the liability rules and processes examined in this book, we provide a preliminary overview of each of the three key

[16] ibid; John Vogler, *The Global Commons: A Regime Analysis* (Wiley & Sons 1995).

[17] Convention on International Liability for Damage Caused by Space Objects (adopted 29 November 1971, entered into force 1 September 1972) 961 UNTS 187.

[18] See discussion in ILC, 'Second Report on the Protection of the Atmosphere, by Shinya Murase, Special Rapporteur' (2015) UN DocA/CN.4/681, para 56, noting that '[a]lthough the concept of the atmosphere, which is not area-based, does not conform to that of "areas beyond the limits of national jurisdiction", it is nonetheless clear that the atmosphere existing above those areas is now covered by principle 21 of the Stockholm Declaration'; the International Law Association Committee on Legal Principles relating to Climate Change referred to the 'global climate system' as a 'common natural resource' ILA Resolution 2/2014 *Declaration of Legal Principles Relating to Climate Change* <www.ila-hq.org/en/committees/the-legal-principles-relating-to-climate-change> accessed 12 October 2022.

[19] Boyle (n 8) 86 'in so far as we can point to "harm" in the context of climate change or loss of biological diversity this will of necessity either be harm which affects states, or, in the case of oceans and Antarctica, it will be harm to common spaces and their ecology. It is not plausible to conceive of "harm" to the climate or biodiversity which has no such impacts'.

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 12 Nov 2026 at 22:33:48, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781108866477.003

commons regimes, addressing their respective legal status as global commons, institutional structures, the principal activities being undertaken that pose environmental risks and the principal treaty rules addressing responsibility and liability for environmental harm.

1.2.1 *Antarctic*

1.2.1.1 Legal Status as Global Commons

Antarctica lies entirely within the South Pole and an ice sheet covers 98 per cent of the continent. It forms about 10 per cent of the earth's land surface. Since its initial discovery in the eighteenth century, seven states (Argentina, Australia, Chile, France, New Zealand, Norway and the United Kingdom) have asserted sovereignty over some portion of the Antarctic on various grounds including discovery, contiguity and occupation.[20]

Antarctica is governed by its own, relatively self-contained legal regime established under the Antarctic Treaty System, consisting of the 1959 Antarctic Treaty,[21] the 1972 Convention for the Conservation of Antarctic Seals,[22] the 1980 Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR);[23] and the 1991 Protocol on Environmental Protection to the Antarctic Treaty (1991 Antarctic Protocol),[24] under which a series of Annexes has been adopted, including Annex VI addressing liability.[25] The preamble of the 1959 Antarctic Treaty recognizes that 'it is in the interest of all mankind that Antarctica shall continue forever to be used exclusively for peaceful purposes and shall not become the scene or object of international discord'.[26] The Antarctic Treaty aimed to address the major concerns in the management of Antarctica, namely, the demilitarization of Antarctica, the promotion of scientific research

[20] Christopher C. Joyner, *Governing the Frozen Commons: The Antarctic Regime and Environmental Protection* (University of South Carolina Press 1998) 46.

[21] Antarctic Treaty (adopted 1 December 1959, entered into force 23 June 1961) 402 UNTS 71.

[22] 1972 Convention for the Conservation of Antarctic Seals (adopted 1 June 1972, in force 7 April 1982) 11 ILM 251. The 1972 Convention for the Conservation of Antarctic Seals is no longer operational as there is no more commercial sealing in the Antarctic. Commercial whaling has also been phased out in the Southern Ocean because of a moratorium adopted in 1982 under the International Convention for the Regulation of Whaling, although Japan has continued to whale, ostensibly for purposes of scientific research which is allowed under the ICRW.

[23] Convention on the Conservation of Antarctic Marine Living Resources (adopted 20 May 1980, entered into force 7 April 1982) 1329 UNTS 47 (CCAMLR).

[24] Protocol on Environmental Protection to the Antarctic Treaty (adopted 4 October 1991, entered into force 14 January 1998) (1991) 30 ILM 1461 (1991 Antarctic Protocol).

[25] Annex VI to the Protocol on Environmental Protection to the Antarctic Treaty on Liability Arising from Environmental Emergencies (adopted 17 June 2005) (2006) 45 ILM 5 (Liability Annex).

[26] Antarctic Treaty 1959 (n 21) preamble.

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 12 Nov 2026 at 22:33:48, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781108866477.003

and to hold all claims to territorial sovereignty in abeyance.[27] These sovereignty claims are strongly contested[28] and, while the terms of the 1959 Antarctic Treaty do not displace these claims, they do not allow them to be asserted through acts or activities taking place while the Treaty remains in force.[29] Moreover, Argentina, Australia, Chile, France, New Zealand, Norway and the United Kingdom have made maritime claims, although these claims have not been accepted by the international community and are *prima facie* held in abeyance under the 1959 Antarctic Treaty.[30]

While much of the Antarctic remains subject to unresolved and contested claims of sovereignty,[31] the current approach to the governance of the Antarctic is to treat it as a form of commons. The commons status of the Antarctic is supported in practice by, *inter alia*, the approach to freedom of scientific research, and the designation of the Antarctic 'as a natural reserve, devoted to peace and science' under the 1991 Antarctic Protocol.[32] The 1959 Antarctic Treaty applies to the area south of 60 degrees South Latitude including all ice shelves but article VI provides that nothing should affect states' rights under international law with regard to the high seas (which would include UNCLOS and other rules of customary international law).[33]

1.2.1.2 Institutional Arrangements

The Antarctic Treaty System is decentralized and there is no separate international organization with independent legal personality. Instead, the Antarctic Treaty provides for governance through periodic consultative meetings of the parties (Antarctic

[27] ibid arts I, III–IV.

[28] For example, Joyner argues that not all of Antarctica rests on *terra firma* and does not qualify as *terra nullius* in its entirety and invites the question as 'to whether frozen water can qualify as having the same legal status as land for purposes of acquiring valid claims to sovereign title over territory'. Further he contends that 'true and effective occupation, demonstrated through permanent settlement, remains to be convincingly demonstrated in Antarctica by any claimant government' and '[s]overeignty claims legally premised on Antarctica being *res nullius* are therefore questionable'. Joyner, *Governing the Frozen Commons* (n 20) 46.

[29] Antarctic Treaty (n 21) art IV. Despite the freezing of the claims, claimant states have sought to exercise their rights under UNCLOS to claim maritime entitlements from their territory and this has been objected to by other states on the basis that their sovereignty claims have no basis in international law: Karen N Scott and David VanderZwaag, 'Polar Oceans and Law of the Sea' in Donald Rothwell and others (eds), *The Oxford Handbook of the Law of the Sea* (OUP 2015) 724, 738–739.

[30] Both France and Australia have proclaimed an Exclusive Economic Zone off their Antarctic territories and all seven states have either submitted preliminary information, partial submissions or full submissions to extended continental shelf claims before the Commission on the Limits of the Continental Shelf: Scott and VanderZwaag (n 29).

[31] See, for example, Joyner, *Governing the Frozen Commons* (n 20) 46–47; Philippe Sands and Jacqueline Peel, *Principles of International Environmental Law* (4th edn, CUP 2018) 12.

[32] 1991 Antarctic Protocol (n 24) art 2.

[33] 1959 Antarctic Treaty (n 21) art VI.

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 12 Nov 2026 at 22:33:48, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781108866477.003

Treaty Consultative Meetings or ATCMs) and other informal arrangements. It established a two-tiered system of membership, the Antarctic Treaty Consultative Parties (ATCP) and non-consultative parties. The ATCP consist of the original twelve members plus additional states that demonstrate their interest in the region by conducting substantial scientific research activity there, such as the establishment of a scientific station or the dispatch of a scientific expedition.[34] There are presently twenty-nine ATCP members that are entitled to attend and participate in decision-making in annual ATCMs. Non-consultative parties, which now number twenty-five, are allowed to attend ATCMs but cannot vote at meetings. Decisions, Resolutions and Measures are adopted at the ATCM by consensus to implement both the Antarctic Treaty and the 1991 Antarctic Protocol but only Measures are legally binding on Consultative Parties once they have been approved by all Consultative Parties. The Committee on Environmental Protection was established under the 1991 Antarctic Protocol and meets concurrently with the ATCM to address matters relating to environmental protection and management and provide advice to the ATCM. The other relevant institutional body is the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR Commission) which is an international commission that establishes conservation measures for the use of marine living resources in the Antarctic.

1.2.1.3 Resources, Activities and Risks

From a resource perspective, the Antarctic continent itself does not contain many readily exploitable resources due to its inhospitable conditions. That said, it is estimated that about three-quarters of the world's total supply of fresh water is trapped in the polar ice caps and may present a future exploitable resource.[35] The most promising economic resources lie in the Antarctic Ocean, home to an abundance of marine living resources such as krill, seals, whales and squid.[36] While the 1959 Antarctic Treaty preserves freedoms of the high seas, including freedom of fishing (in other words, an open-access regime), marine living resources are governed by CCAMLR and the conservation measures issued by the CCAMLR Commission.

There have been reports of minerals and hydrocarbon resources in the Antarctic Ocean but their existence and extent has been subject to much debate.[37] Indeed, developing states mooted the idea that the common heritage of humankind principle (discussed in Section 1.2.2) should also be applied to resources in

[34] ibid art IX(2).

[35] John Vogler, *The Global Commons: Environmental and Technological Governance* (2nd edn, Wiley 2000) 76.

[36] Christopher C Joyner, 'The Antarctic Legal Regime: An Introduction' in Christopher C Joyner and Sudhir K Chopra (eds), *The Antarctic Legal Regime* (Martinus Nijhoff 1988) 2.

[37] ibid 2; Vogler, *The Global Commons: Environmental and Technological Governance* (n 35) 76.

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 12 Nov 2026 at 22:33:48, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781108866477.003

Antarctica.[38] However, it was agreed that Antarctica would be excluded from negotiations in the Third UN Conference on the Law of the Sea (UNCLOS III) provided that it would be discussed by the ATCPs after UNCLOS III was concluded.[39] In 1988, the Convention on the Regulation of Antarctic Mineral Resource Activities (CRAMRA), which provided a regime for the exploration and exploitation of mineral resources, was adopted.[40] CRAMRA, however, never entered into force, due to opposition from environmental non-governmental organizations (NGOs) and states, such as France and Australia, bolstered by a renewed emphasis on the importance of conservation of the Antarctic. CRAMRA was ultimately displaced by the 1991 Antarctic Protocol which, amongst other things, prohibits any activity relating to mineral and oil resources other than scientific research within the fifty years initial timeframe of the Agreement.[41] Until 2048, the 1991 Antarctic Protocol can only be modified by unanimous agreement of all the Consultative Parties of the Antarctic Treaty and the prohibition of mineral resource activities can only be removed if a binding legal regime on Antarctic mineral resources is in force.[42]

Other activities that take place in Antarctica not directly related to resource exploration and exploitation include scientific research and small-scale, but growing, tourist activities. In relation to scientific research, there has been developing interest in bioprospecting for genetic resources in Antarctica.[43] It is important to note that the Antarctic Treaty Regime affirms the rights of both state and non-state operators to conduct activities in Antarctica. Notwithstanding, the moratorium on mining activities and limitation of activities, there remain risks to the Antarctic environment, chiefly from the operation of scientific research stations, associated flights and, increasingly, tourism-related shipping which raises risks relating to fuel oil spills, a risk which was manifested in 1989 when the *Bahia Paraiso*, an oil tanker ran aground three kilometres from Palmer Station with 810 tons of diesel oil aboard.[44] There may also be risks related to fisheries and associated ship traffic. There are, of course, much broader risks to the Antarctic environment arising from climate change.[45]

[38] See, for example, statement of President of Malaysia, Mahathir Bin-Mohammad, in the United Nations General Assembly that there was a strong case for Antarctica to be the common heritage of mankind: United Nations General Assembly Official Records, 37th Session, U.N. Doc/A/37/P.V. 10 (1982) 17–20 (Statement of Mahathir Bin-Mohammad).

[39] Buck (n 14) 62.

[40] Convention on the Regulation of Antarctic Mineral Resource Activity, 2 June 1988 27 ILM 868 (not yet entered into force) (CRAMRA).

[41] 1991 Antarctic Protocol (n 24) arts 7, 25 (5).

[42] ibid art 25(5).

[43] Dagmar Lohan and Sam Johnston, *Bioprospecting in Antarctica* (UNU-IAS, 2005), online <www.cbd.int/financial/bensharing/g-absantarctic.pdf> accessed 14 October 2022.

[44] CEDRE, 'Bahia Paraiso – Spill report', online <wwz.cedre.fr/en/Resources/Spills/Spills/Bahia-Paraiso> accessed 13 October 2022.

[45] Intergovernmental Panel on Climate Change, *Special Report on the Ocean and Cryosphere in a Changing Climate* (CUP 2022) <www.ipcc.ch/srocc/> accessed 13 October 2022. ATCM XLIV – CEP XXIV Report Volume I, Resolution 4 (2022) Antarctic Climate Change and the

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 12 Nov 2026 at 22:33:48, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781108866477.003

1.2.1.4 Existing Environmental Protection and Liability Framework

The 1959 Antarctic Treaty contains no provisions on the protection of the terrestrial or marine environment in Antarctica. However, the ATCM created a vast array of recommendations which included regulation of the environment, although these were non-binding and prompted concerns about compliance.[46] In the mid-1970s, in line with increasing global awareness of the environment and the use of Antarctic tourist activities and mineral resource surveys, the idea of Antarctica as a 'world park' was mooted by countries such as New Zealand and by NGOs.[47] The 'world park' agenda of conservation played an instrumental role in shifting focus from exploitation to environmental protection and also led to the rejection of CRAMRA. This provided the catalyst for negotiations of the 1991 Antarctic Protocol.

The 1991 Antarctic Protocol marked a 'qualitative change in the approach to environmental issues in the Antarctic and replaces the [previous] ad hoc and unwieldy network of measures'.[48] In addition to designating 'Antarctica as a natural reserve, devoted to peace and science', it obliges states to commit to 'comprehensive protection of the Antarctic Environment and dependent and associated ecosystems'.[49] Article 3 (1) states,

> The protection of the Antarctic environment and dependent and associated ecosystems and the intrinsic value of Antarctica, including its wilderness and aesthetic values and its values as an area for the conduct of scientific research, in particular research essential to the understanding of the global environment, shall be fundamental considerations in the planning and conduct of all activities in the Antarctic Treaty area.

The Protocol takes an ecosystem approach, and requires parties to cooperate in planning and conducting activities in the Antarctic Treaty Area, undertake environmental impact assessments (EIAs) for potentially harmful activities according to detailed requirements as well as contingency planning for emergencies.[50] It also establishes the Committee for Environmental Protection (CEP) as an expert advisory body to provide advice and formulate recommendations to the ATCM.[51] The Protocol has six annexes: Annex I (EIA), Annex II (Flora and Fauna), Annex III (Waste Disposal), Annex IV (Marine Pollution), Annex V (Protected Areas) and Annex VI (Liability Annex). Activities are subject to environmental scrutiny, largely

Environment: A Decadal Synopsis and Recommendations for Action Report <https://documents.ats.aq/ATCM44/fr/ATCM44_fr011_e.pdf>.

[46] Vogler, *The Global Commons: Environmental and Technological Governance* (n 35) 85.

[47] ibid 82.

[48] L Elliot, *International Environmental Politics: Protecting the Antarctic* (Palgrave MacMillan 1994) 196.

[49] 1991 Antarctic Protocol (n 24) art 2.

[50] ibid arts 8 and 15; Annex I (EIAs).

[51] ibid arts 11, 12, 15.

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 12 Nov 2026 at 22:33:48, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781108866477.003

through the EIA process, but the Antarctic institutions play no formal regulatory role, in the sense of being either an approval authority or an oversight body.

It should also be noted that UNCLOS provisions apply to Antarctica (including Part VII on the high seas and Part XII on the protection of the marine environment), but their exact relationship with the Antarctic Treaty System is 'equivocal'.[52] UNCLOS preserves the rights and obligations of parties under other agreements provided that those rights do not affect rights provided for under UNCLOS and/or any agreements modifying the operation of UNCLOS are compatible with the object and purpose of UNCLOS.[53] The 1959 Antarctic Treaty and the Antarctic Protocol provisions on the environment and marine scientific research are viewed as compatible with the object and purpose of UNCLOS.[54] While there is some debate on whether the seabed in Antarctica is considered part of the 'the Area' under UNCLOS, there is some evidence to suggest that it was agreed in UNCLOS negotiations that Part XI of UNCLOS that governs the deep seabed would not apply to Antarctica.[55]

The issue of liability first arose in the context of the CRAMRA, where the proposed mineral exploitation activities gave rise to clear environmental risks. The final text of the CRAMRA included a provision on liability imposing strict liability on operators arising from their mineral resource activity.[56] When the CRAMRA failed to achieve support for ratification and negotiations on the Antarctic Protocol began, the issue of liability remained on the table. Ultimately, liability was identified in article 16 of the 1991 Antarctic Protocol, but details of the requirements were put off for further negotiation of a liability annex.

Subsequently, there were debates during the negotiations of the liability annex on whether to take a comprehensive approach whereby all elements of a liability regime were included in one annex or a step-by-step approach, with the first step being response action to environmental emergencies.[57] Ultimately, pragmatism won out and the step-by-step approach was preferred.[58] The 2005 Liability Annex (Annex VI to the 1991 Protocol) only covers damage resulting from 'environmental emergencies' which have been defined as 'any accidental event that has occurred, having taken place after the entry into force of this Annex and that results in, or imminently threatens to result in any significant and harmful impact on the Antarctic environment'.[59] However, the parties affirmed their commitment to taking future steps

[52] Scott and VanderZwaag (n 29) 740.
[53] UNCLOS (n 5) arts 311 (1) and (2).
[54] Scott and VanderZwaag (n 29) 740.
[55] ibid 741.
[56] CRAMRA (n 40) art 8.
[57] ATCM, 'Liability – Report of the Group of Legal Experts' (1998) XXII ATCM/WP1.
[58] Michael Johnson, 'Liability for Environmental Damage in Antarctica: The Adoption of Annex VI to the Antarctic Environmental Protocol' (2006) 19(1) Geo Int'l Envtl L Rev 33, 38.
[59] Liability Annex (n 25) art 2(b).

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 12 Nov 2026 at 22:33:48, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781108866477.003

towards a comprehensive liability regime in a Decision adopted together with Annex VI,[60] although no further action has been taken to date.[61] Moreover, in the Final Act of the Eleventh Antarctic Treaty Special Consultative Meeting at which the 1991 Antarctic Protocol was adopted, the ATCPs agreed that the Arbitral Tribunal established under the Protocol would not make a determination on damages relating to liability arising from activities taking place in the Antarctic Treaty Area until a binding legal regime had entered into force through an Annex pursuant to article 16.[62]

The focus of the liability requirements in the 2005 Liability Annex is on ensuring that response measures are taken in the event of an environmental emergency. Parties are required to ensure that operators under their jurisdiction take prompt and effective response actions.[63] Failure to do so results in the strict liability of the operator to pay the costs of any response measure that was or ought to have been undertaken.[64] The Liability Annex addresses a variety of implementation issues, such as exemptions to liability, limits on liability, the creation of a fund to address uncompensated response actions.[65] However, the Liability Annex is not yet in force and does not appear likely to enter into force in the near future.[66]

1.2.2 *Deep Seabed*

1.2.2.1 Legal Status as Global Commons

Since J. L. Mero estimated that there was over one trillion tons of manganese nodules on the Pacific deep seabed in 1965,[67] there has been great interest in mineral resources of the deep seabed. Part XI of UNCLOS, as modified by the 1994 Agreement Relating to the Implementation of Part XI of UNCLOS (1994

[60] ATCM XXVIII, 6–17 June 2005, Final Report of the Twenty-Eighth Antarctic Consultative Meeting (17 June 2005), part II, Decision I.

[61] See discussion in Alan D Hemmings, 'Liability Postponed: The Failure to Bring Annex VI of the Madrid Protocol into Force' (2018) 8(2) Polar J 315, 327–328.

[62] Final Session of the Eleventh Antarctic Treaty Special Consultative Meeting, 32.

[63] Liability Annex (n 25) art 5.

[64] ibid art 6.

[65] ibid arts 8, 9, 12.

[66] At ATCM XLIV in 2022, it was agreed to revisit the matter of establishing a timeframe for the resumption of negotiations on liability in 2025, Final Report of the Forty-fourth Antarctic Treaty Consultative Meeting, vol 1 (Preliminary Version), paras 151–158, Decision 2 (2022) <www.ats.aq/devAS/Info/FinalReports?lang=e> accessed 13 October 2022. A summary of previous ATCM and CEP resolutions and measures relating to remediation and liability was provided to ATCM XLIV: document SP009, Annex 1 <www.ats.aq/devAS/Meetings/DocDatabase?lang=e> accessed 13 October 2022.

[67] GP Glasby, 'Deep Seabed Mining: Past Failures and Future Prospects' (2002) 20(2) Marine Georesources & Geotechnology 161, 161. Mero's predictions proved to be based on a deeply flawed premise.

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 12 Nov 2026 at 22:33:48, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781108866477.003

Agreement),[68] establishes a detailed regime for 'activities in the Area', that is, the exploration and exploitation of the mineral resources of the Area.[69] The Area is defined as the 'seabed and ocean floor and subsoil beyond the limits of national jurisdiction',[70] which are designated, along with the mineral resources found therein, as the common heritage of mankind (hereinafter referred to as the 'common heritage of humankind' or 'CHH').[71] No state or natural or juridical person (as the case may be) shall claim or exercise sovereignty or sovereign rights or appropriate any part of the Area or its resources.[72] Part XI, however, preserves the high seas status of the superjacent waters and the seabed for other uses – such as for submarine cables and pipelines and freedom of scientific research.[73]

Apart from the non-appropriation element, which the CHH shares with the freedom of the high seas, what does the CHH mean? From its inception, the CHH has been a 'controversial legal concept',[74] and there existed no agreement of a workable definition.[75] The troubled attempts to implement the CHH principle in various treaty regimes from law of the sea, to outer space, to Antarctica, the atmosphere and biological diversity either met with failure (atmosphere, Antarctica, biological diversity), inchoate implementation (outer space) or a significant modification from what it started out to be (as exemplified in the UNCLOS and the 1994 Implementation Agreement).[76] The most robust implementation of the CHH principle can be found in UNCLOS, despite the modification of Part XI by the 1994 Implementation Agreement. The CHH principle as implemented in UNCLOS has a definite legal meaning. As articulated by Ambassador Arvid Pardo,[77] it consists of

[68] Agreement relating to the implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982 (adopted 28 July 1994, entered into force 28 July 1996) UNTS vol 1836 (1994 Implementation Agreement) Annex, s 2(1–2).

[69] Resources refers to 'all solid, liquid or gaseous mineral resources *in situ* in the Area at or beneath the seabed, including polymetallic nodules': see UNCLOS (n 5) art 133 (a).

[70] ibid art 1(1).

[71] ibid art 136.

[72] UNCLOS (n 5) art 137(1).

[73] ibid art 135.

[74] Prue Taylor, 'The Concept of the Common Heritage of Mankind' in Douglas Fisher (ed), *Research Handbook on Fundamental Concepts of Environmental Law* (Edward Elgar 2016) 306, 306.

[75] Jeffrey Loan, 'The Common Heritage of Mankind in Antarctica: An Analysis in Light of the Threats Posed by Climate Change' (2004) 1 NZ Yearbook Intl L 149, 157.

[76] For a discussion on the way in which the common heritage of humankind (CHH) principle has been implemented in various regimes, please refer to Kemal Baslar, *The Concept of the Common Heritage of Mankind in International Law* (Martinus Nijhoff 1998). For a discussion on how the CHH implemented in UNCLOS was modified, see, for example, Alfredo C Robles Jr, 'The 1994 Agreement on Deep Seabed Mining: Universality vs. the Common Heritage of Humanity' (1996) 12 World Bulletin 20 at 61. The voluminous literature on the CHH has been compiled in a bibliography: Prue Taylor and Lucy Stroud, *Common Heritage of Mankind: A Bibliography of Legal Writing* (Fondation de Malte 2013).

[77] Arvid Pardo, 'Law of the Sea Conference – What Went Wrong' in Robert L Friedheim (ed), *Managing Ocean Resources: A Primer* (Westview Press 1979) 137 at 141. See also, for example,

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 12 Nov 2026 at 22:33:48, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781108866477.003

non-appropriation;[78] shared management of the resources on behalf of the international community;[79] sharing of benefits for the whole of humankind;[80] peaceful purposes;[81] and preservation and protection of the marine environment from the effects of activities in the Area.[82] The framing of the principle in terms of 'humankind' also imports an intergenerational element.[83] While the extent to which each of these has been implemented under UNCLOS is an ongoing process (and also subject to debate),[84] these five elements are generally accepted as giving legal flesh to the CHH principle. This has implications for institutional arrangements, access to resources and environmental protection which are addressed below.

1.2.2.2 Institutional Arrangements

The International Seabed Authority (ISA), one of the three institutions established under UNCLOS,[85] is the intergovernmental organization which organizes, carries out and controls 'activities in the Area' for and on behalf of humankind as a whole.[86] Related to the CHH principle is that the rights in the resources of the Area are 'vested in mankind as a whole, on whose behalf the Authority shall act',[87] which suggests that the ISA has trust-like duties that it owes to the international community. Currently, the main organs of the ISA are the (1) Assembly composed of all states parties to the UNCLOS, (2) Council with thirty-six member states and (3) a Secretariat. There are also subsidiary bodies made up of experts, the Legal and Technical Commission (LTC), responsible to the Council, and the Finance Committee, responsible to the Assembly. The ISA also has a mining arm, the Enterprise (which is currently non-operational), to organize, carry out and control activities in the Area on behalf of humankind.[88] The Seabed Disputes Chamber

Christopher C Joyner, 'Legal Implications of the Concept of the Common Heritage of Mankind' (1986) 35(1) ICLQ 190, 191, which states that five principal elements appear to characterize the notion of common heritage of mankind 'when applied to common space areas'. See also Taylor (n 74) 319–320.

[78] UNCLOS (n 5), art 137(1).

[79] ibid arts 137(2), 153(1), 157.

[80] ibid arts 137(2), 140.

[81] ibid art 141.

[82] ibid arts 145, 150(b).

[83] Marie Bourrel, Torsten Thiele and Duncan Currie, 'The Common Heritage of Mankind as a Means to Assess and Advance Equity in Deep Sea Mining' (2018) 95 Mar Pol'y 311.

[84] See, for example, Michael Lodge, 'The Common Heritage of Mankind' (2012) 27 IJMCL 733, 734; Aline Jaeckel, Jeff A Ardron and Kristina M Gjerde, 'Sharing Benefits of the Common Heritage of Mankind – Is the Deep Seabed Mining Regime Ready?' (2016) 70 Mar Pol'y 198, 200.

[85] UNCLOS (n 5) art 156.

[86] ibid art 153(1).

[87] ibid art 137(2).

[88] Under the 1994 Implementation Agreement, the functions of the Enterprise have been conferred on the Secretariat until it begins to operate independently of the Secretariat, until

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 12 Nov 2026 at 22:33:48, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781108866477.003

(SDC) of the International Tribunal for the Law of the Sea (ITLOS) was also established under Part XI to determine disputes arising from activities in the Area.[89]

In contrast to the decentralized system of governance in Antarctica, the ISA is a separate international organization with international legal personality,[90] and has been given 'competence and regulatory control to an extent so far unparalleled in international law'.[91] The ISA has been given a broad mandate to regulate a variety of matters relating to activities in the Area, including the regulation of (1) the system of exploration and exploitation;[92] (2) the protection of the marine environment from harmful effects arising from activities in the Area;[93] (3) the equitable sharing of financial and other economic benefits derived from activities in the Area through any appropriate mechanism;[94] (4) the distribution of revenues to states parties from the exploitation of the outer continental shelf, on the basis of equitable sharing criteria.[95] To fulfil its mandate, the ISA has been afforded a considerable degree of discretion in the adoption of rules, regulations and procedures to govern activities in the Area – UNCLOS only sets out the core elements of the deep seabed regime, 'leaving the ISA with a significant degree of operational competence to further develop governance arrangements'.[96]

1.2.2.3 Resources, Activities and Risks

As mentioned above, the Area and its resources (currently consisting of polymetallic nodules, polymetallic sulphides and cobalt-rich ferromanganese crusts) are the CHH. These resources are said to provide a variety of raw materials such as manganese, nickel, cobalt, copper, zinc, lithium and rare earth elements.[97] Activities in the Area may be carried out by the Enterprise (currently non-operational)[98] and, in association with the ISA, states parties or state enterprises or natural or juridical persons[99] ('contractors'). For natural or juridical persons to carry

such time as the Council issues a directive permitting the Enterprise to function independently: 1994 Implementation Agreement (n 68) section 2 (1).

89 UNCLOS (n 5) art 186.

90 ibid art 176.

91 Richard Collins and Duncan French, 'A Guardian of Universal Interest or Increasingly Out of Its Depth? The International Seabed Authority Turns 25' (2019) 17(3) Int Org Law Rev 1, 3.

92 UNCLOS (n 5), art 153 (1); art 160 (2) (f) (ii); art 162 (2) (o) (ii); Annex III, art 17 (1).

93 ibid art 145, art 209 (1); Annex III, art 17 (1) (b) (xii) and art 17 (2) (f).

94 ibid art 140 (2), art 160 (2) (f), art 162 (o) (i).

95 ibid art 82(4).

96 Collins and French (n 91) 24.

97 The turn to electric vehicles has created a surge in demand for key deep seabed minerals, such as cobalt and lithium, leading to a debate as to whether deep seabed mining is necessary for broader sustainability transitions, see Christopher Pala, 'Can Mining the Seabed Help Save the Planet?' Foreign Policy, 7 November 2021 <https://foreignpolicy.com/2021/11/07/seabed-mining-marine-life-climate-change-electric-cars-pacific-nauru/> accessed 13 October 2022.

98 1994 Implementation Agreement (n 68), Annex, section 2.

99 UNCLOS (n 5) art 153(2).

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 12 Nov 2026 at 22:33:48, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781108866477.003

out activities in the Area, they must possess the nationality of states parties or be effectively controlled by them or by their nationals and must be sponsored by states parties ('sponsoring state[s]').[100] Contractors have to apply for a licence to explore and exploit resources which will be reviewed by the LTC, who will then make a recommendation to the Council on whether the licence should be approved.

The ISA's development of the legal regime governing activities in the Area has been executed in an evolutionary and incremental manner, determined by what needed to be regulated in each phase of development of activities in the Area and further shaped by technology and increasing knowledge of the deep sea environment. The first phase of the ISA's work focused on the regulation of exploration,[101] and the second phase is currently focused on the development of regulations on the *exploitation* of mineral resources of the Area.[102] At the time of writing, the LTC had issued Draft Regulations on Exploitation of Mineral Resources in the Area (DER)[103] which are under consideration by the Council. The rules on prospecting, exploration and exploitation will constitute the Mining Code that will govern activities in the Area.

The contract is the basis upon which title to minerals passes to the contractor upon recovery. The rights to exploit and acquire rights with respect to the minerals recovered are protected by security of tenure, as such the ISA cannot unilaterally revise, suspend or terminate a contract (except in cases of non-compliance).[104] The contract provides the basis of legal control by the ISA over the contractor and the mining activities, whereby the contractor agrees to be bound by the ISA's regulations and the plan of work approved by the ISA. It is envisaged that the contractors will have to pay a portion of their profits to the ISA, which is responsible for devising a system for the equitable sharing of financial and other economic benefits derived from activities in the Area.[105]

[100] ibid art 153(2)(b); Annex III, art 4.

[101] The ISA has issued three sets of regulations on exploration: ISA, Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area (13 July 2000), Doc. No. ISBA/6/A/18 (13 July 2000) (PMN). In 2013, the Regulations for Polymetallic Nodules were amended to be consistent with the regulations adopted in 2010 and 2012 for the other resources. ISA, Regulations on Prospecting and Exploration for Polymetallic Sulphides in the Area, Doc No. ISBA/16/A/12/Rev. 1 (7 May 2010) (PMS); ISA, Regulations on Prospecting for Cobalt-Rich Ferromanganese Crusts in the Area, Doc No. ISBA/19/C/17 (22 July 2013) (CFC) [collectively the 'Exploration Regulations']. At the timing of writing, thirty-one contracts for exploration have been issued pursuant to the Exploration Regulations.

[102] See ISA Website available at <www.isa.org.jm/legal-instruments/ongoing-development-regulations-exploitation-mineral-resources-area>

[103] Draft Regulations on Exploitation of Mineral Resources in the Area, Prepared by the Legal and Technical Commission, ISBA/25/C/WP.1 dated 22 March 2019 (DER).

[104] UNCLOS (n 5) art 153(6); Annex III, arts 18 and 19.

[105] UNCLOS (n 5) art 140(2).

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 12 Nov 2026 at 22:33:48, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781108866477.003

In relation to mineral resource exploitation in the deep seabed, much attention has focused on risks to vulnerable and unique marine organisms and ecosystems of the deep seabed. While the increased interest in deep seabed mining has led to its increased scientific study, there remains significant scientific uncertainty, which is a function of the limited amount of baseline data and knowledge of broad system interactions, as well as the novelty of the mining activity itself.[106] While impacts may vary in effect and intensity, according to the type of mining activity involved, they may include direct habitat destruction, elimination of local biodiversity and degradation of surrounding environments through indirect impacts such as sediment plumes, noise and vibration from pumps, platforms, vessels and light.[107] Mining activities in the Area might also give rise to loss or damage to mineral resources of the Area, themselves part of the common heritage of humankind, and part of the geophysical environment of the deep seabed ecosystem, as well as losses stemming from impacts to other marine users.

1.2.2.4 Environmental Protection and Environmental Liability

A central obligation that falls on the ISA and sponsoring states is to ensure the effective protection of the marine environment.[108] Since this is a shared responsibility, both the ISA and sponsoring states are required to put in place effective regulatory requirements, including 'administrative measures ... reasonably appropriate for securing compliance'.[109] The ISA regulations and the plans of work will provide the core environmental protection requirements. The ISA also has administrative tools, such as the ability to issue emergency orders to contractors, to prevent serious harm to the marine environment.[110] The basic structure of responsibility for environmental protection is that the contractors are obliged to comply with the regulatory requirements and will be liable for 'any damage arising out of wrongful acts in the conduct of its operations'.[111] Article 139 of the UNCLOS and article 4(4) of Annex III expressly provide that sponsoring states will be liable for their failures to 'ensure' that contractors carry out their activities in accordance with its obligations. The duty to ensure was identified as part of the obligation of due diligence by the SDC in its 2011 Advisory Opinion on Activities in the Area.[112] The ISA has similar

[106] Lisa Levin, Diva Amon and Hannah Lily, 'Challenges to the Sustainability of Deep Seabed Mining' (2020) 3 Nature Sustainability 784.
[107] Lisa A Levin and others, 'Defining "Serious Harm" to the Marine Environment in the Context of Deep-Seabed Mining' (2016) 74 Mar Pol'y 245, 250–255.
[108] UNCLOS (n 5) art 145.
[109] ibid Annex III, art 4(4).
[110] ibid art 162(2)(x).
[111] ibid Annex III, art 22.
[112] *Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area* (Advisory Opinion of 1 February 2011) ITLOS Reports 2011, 10 (*Activities in the Area* Advisory Opinion), para 110.

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 12 Nov 2026 at 22:33:48, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781108866477.003

responsibilities to ensure and is identified as being liable for any damage arising out of its wrongful acts in the exercise of its powers.[113] No further elaboration of liability rules or mechanisms have been enacted by the ISA, although both the Exploration Regulations and DER reflect the responsibility and liability of the contractor and ISA as set out in UNCLOS and described above.

As the environmental liability provisions contained in Part XI UNCLOS, and any coverage of liability in the DER under development by the ISA, relate to environmental damage arising from 'activities in the Area', these provisions should apply also to any such environmental damage to the water column (i.e. the high seas). However, they do not cover damage to the deep seabed environment (either the seabed or water column) from other causes not related to activities in the Area.

1.2.3 *High Seas*

1.2.3.1 Legal Status as Global Commons

Article 86 of UNCLOS states that Part VII on the high seas applies to 'all parts of the sea that are not included in the exclusive economic zone, in the territorial sea or in the internal waters of a State, or in the archipelagic waters of an archipelagic State'. The high seas is open to all states and no state can validly purport to subject any part of the high seas to its sovereignty.[114] The prevailing principle, absent other rules of international law to the contrary, is freedom of the high seas; examples of which are non-exhaustively listed in UNCLOS and include the freedom of navigation, overflight, the laying of submarine cables and pipelines, fishing and scientific research.[115] The freedom of the high seas is subject to a general limitation that they be exercised with due regard for the interests of other states in their exercise of high seas freedoms, and also with due regard for the rights under UNCLOS with respect to activities in the Area.[116] Each enumerated freedom also has specific limitations set out in the Convention, and are subject to other internationally agreed upon obligations addressing specific activities.[117] The primary means in which UNCLOS establishes public order in the high seas is through the principle of exclusive flag state jurisdiction over vessels on the high seas.[118]

[113] UNCLOS (n 5) art 153; Annex III, art 22.
[114] UNCLOS (n 5) arts 87 and 89.
[115] ibid art 87(1).
[116] ibid art 87 (2).
[117] For example, the freedom of navigation is limited by flag state jurisdiction; freedom of fishing is subject to the conditions laid down in section 2 on Part VI and other limitations.
[118] UNCLOS (n 5) art 92. As observed in the MV Norstar, 'the principle of exclusive flag State jurisdiction prohibits not only the exercise of enforcement jurisdiction on the high seas by States other than the flag State but also the extension of their prescriptive jurisdiction to lawful activities conducted by foreign ships on the high seas'. *The M/V 'NORSTAR' Case (Panama v Italy)*, Judgment, 10 April 2019, para 225.

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 12 Nov 2026 at 22:33:48, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781108866477.003

1.2.3.2 Institutional Arrangements

UNCLOS does not create a treaty body to act as the 'supreme body' of the Convention in the same manner as the United Nations Framework Convention on Climate Change or the Convention on Biological Diversity.[119] Article 319 does provide for meetings of the parties, but without identifying the role and nature of the meetings of the state parties.[120] UNCLOS does create the International Tribunal for the Law of the Sea, which along with other forums identified in Part XV of UNCLOS provides a venue for the settlement of disputes arising under UNCLOS. The ITLOS has addressed questions bearing on the legal responsibilities and liabilities of states under UNCLOS, most notably in the SDC's Advisory Opinion on Activities in the Area[121] and the Advisory Opinion requested by the Subregional Fisheries Commission.[122]

Beyond these general institutional arrangements, there has been no specific international organization, body or equivalent process that addresses the governance of the high seas. Instead, a number of sectoral activities in the high seas are governed by existing treaty regimes and institutions, including a series of species and regional fisheries treaties and arrangements as well as some regional seas conventions, with associated governance bodies, such as regional fisheries management organizations and commissions. However, the various regimes are fragmented, sometimes overlapping, lack any coordinating mechanism and leave significant gaps in governance of the high seas, reinforcing the belief that high seas governance represented an 'unfinished agenda' of UNCLOS.[123]

These concerns, and particularly concerns about the protection of marine biodiversity eventually led to the UN Informal Consultative Process on Oceans and the Law of the Sea to establish an Ad Hoc Open-ended Informal Working Group in 2004 to study issues relating to conservation and sustainable use of marine biological diversity beyond areas of national jurisdiction (BBNJ Working Group). In 2011, the BBNJ Working Group, after much debate in previous sessions, agreed to work towards the establishment of an intergovernmental negotiating process that would 'address the conservation and sustainable use of marine biodiversity in areas beyond national jurisdiction, in particular, together and as a whole'. Four issues were to be considered as a package deal, namely marine genetic resources including questions on the sharing of benefits;

[119] See Robin Churchill and Geir Ulfstein, 'Autonomous Institutional Arrangements in Multilateral Environmental Agreements: A Little-Noticed Phenomenon in International Law' (2000) 94(4) AJIL 623.

[120] UNCLOS (n 5) art 319; see James Harrison, 'The Law of the Sea Convention Institutions' in Donald R Rothwell, Alex G Oude Elferink, Karen N Scott and Tim Stephens (eds), *Oxford Handbook on the Law of the Sea* (OUP 2014) 373, 377.

[121] *Activities in the Area* Advisory Opinion (n 112).

[122] *Request for an Advisory Opinion submitted by the Sub-Regional Fisheries Commission (SRFC)* (Advisory Opinion of 2 April 2015) ITLOS Reports 2015 (SRFC Advisory Opinion).

[123] David Freestone, 'International Governance, Responsibility and Management of Areas beyond National Jurisdiction' (2012) 27 IJMCL 191, 195.

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 12 Nov 2026 at 22:33:48, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781108866477.003

area-based management tools, including marine protected areas, environmental impact assessments; and capacity-building and transfer of marine technology. In 2015, the BBNJ Working Group recommended to the United Nations General Assembly (UNGA) that it 'develop an internationally legally-binding instrument under the Convention on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction'.[124] The text of this Agreement was agreed in March 2023 (2023 BBNJ Agreement).[125] The Agreement establishes a Conference of the Parties, a Scientific and Technical Body, a clearing house mechanism and a secretariat.[126] The Conference of the Parties (COP) will meet for the first time no later than one year after the entry into force of the Agreement, and will develop these institutional arrangements, including the terms of reference and modalities of operation of the Scientific and Technical Body. Amongst its functions, the COP is to review the adequacy and effectiveness of the provisions of the Agreement within five years of entry into force and at intervals thereafter, and may propose means to strengthen implementation.[127] The Agreement will enter into force 120 days after the sixtieth instrument of ratification, approval, acceptance or accession is deposited.[128] It is to be interpreted and applied in a manner consistent with UNCLOS, and in a way 'that does not undermine relevant legal instruments and frameworks and relevant global, regional subregional and sectoral bodies and that promotes coherence and coordination with those instruments, frameworks and bodies'.[129] The relationship between the Agreement and other relevant legal instruments, frameworks and bodies is taken up in more detail in provisions addressing area-based management tools and environmental impact assessment.[130]

1.2.3.3 Resources, Activities and Risks

Part VI (high seas) of UNCLOS only expressly deals with fisheries resources and recognizes the freedom of fishing as a freedom of the high seas. Thus, in principle,

[124] For a history of the developments leading up to the negotiations of a new international legally binding instrument under UNCLOS on the conservation and sustainable use of marine biological diversity in areas beyond national jurisdiction, see Glen Wright, Juliette Rochette, Kristina Gjerde and Isabel Seeder, 'The Long and Winding Road: Negotiating a Treaty for the Conservation and Sustainable Use of Marine Biodiversity in Areas beyond National Jurisdiction', IDDRI Study No. 18, August 2018 <www.iddri.org/sites/default/files/PDF/Publications/Catalogue%20Iddri/Etude/201808-Study_HauteMer-long%20and%20winding%20road.pdf> accessed 13 October 2022.

[125] Draft agreement under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction, Advance, Unedited text, 4 March 2023 ('BBNJ Agreement').

[126] ibid arts 48–51. A financial mechanism will also be established, art 52.

[127] ibid art 48(7).

[128] ibid art 61.

[129] ibid art 4.

[130] See, for example, arts 14(b), 18, 19, 20 ante, and 23.

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 12 Nov 2026 at 22:33:48, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781108866477.003

living resources are open to access and appropriation by any state, subject to due regard for the interests of other states.[131] Part VII limits these high seas freedoms by imposing certain obligations on states with regard to the conservation of the living resources of the high seas, and a number of other international and regional instruments impose additional rules, including in relation to straddling and highly migratory species.[132] The status, collection and utilization of marine genetic resources of areas beyond national jurisdiction are addressed in the 2023 BBNJ Agreement.[133] No state may claim or exercise sovereignty or sovereign rights over such resources, and activities with respect to such resources may be carried out by all parties to the Agreement and natural or juridical persons under the jurisdiction of parties, in accordance with the provisions of the Agreement on notification and information sharing through the clearing house mechanism and fair and equitable sharing of benefits arising from activities with respect to such resources.

Non-resource related activities in the high seas are numerous, some are explicitly recognized in UNCLOS such as shipping, marine scientific research and the laying of submarine cables and pipelines, but others are emerging such as geoengineering, or the large-scale ocean clean-up which aims to clean up plastic debris in the oceans.

In the high seas, a multitude of activities pose risks of environmental harm. These include impacts on marine species and ecosystem services arising from pollution of the marine environment. Such pollution can derive from a range of sources: vessels; land-based sources; offshore mineral resource exploitation activities within national jurisdiction or, prospectively, in the Area; or from activities related to pipelines and cables. Environmental harm can include the impacts of noise pollution (e.g. sonar). Marine biodiversity of the high seas may also be impacted directly or indirectly by over-exploitation of marine living resources and by non-selective and/or destructive fishing practices, such as bottom-trawling, which can also damage the physical environment itself. Potential climate change impacts include ocean acidification and coral bleaching, as well as more fundamental change to marine ecosystems in light of ocean warming and sea level rise. Measures intended to mitigate climate change, such as marine geoengineering, may also give rise to adverse changes to marine biodiversity.[134]

[131] UNCLOS (n 5) art 87 (1) (e) read with art 87 (2).

[132] ibid arts 116–120, UNCLOS. Also see 1995 Agreement for the Implementation of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (adopted 4 August 1995, entered into force 11 December 2001) 34 ILM 1542.

[133] BBNJ Agreement (n 125), Part II. The provisions of Part II do not apply to fishing regulated under relevant international law and fishing-related activities, art 8(2).

[134] See, for example, Convention on Biological Diversity, Decision XI/20 'Climate-Related Geoengineering', UNEP/CBD/COP/DEC/XI/20, 5 December 2012.

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 12 Nov 2026 at 22:33:48, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781108866477.003

1.2.3.4 Environmental Protection and Environmental Liability

UNCLOS establishes a relatively robust marine environmental protection regime in Part XII setting out general obligations relating to the prevention, reduction and control of marine pollution and specific obligations to address such pollution from a variety of sources.[135] Marine environmental protection obligations do not single out the high seas, but rather the approach is to treat the marine environment in an undifferentiated fashion, with the provisions of Part XII applying to all areas of the marine environment both inside national jurisdiction and beyond it.[136] There are, however, high seas specific obligations concerning the conservation and preservation of living resources.[137] Article 192 of UNCLOS sets out states' general obligation to protect and preserve the marine environment, and while simply stated, this obligation has been interpreted to place an obligation on states to protect the marine environment from future damage and to maintain or improve the existing condition of the marine environment as well as to take active measures to prevent the degradation of the marine environment.[138] States also have the obligation to ensure that activities that take place within their jurisdiction do not cause pollution to areas beyond national jurisdiction.[139]

Part XII of UNCLOS does contain a provision addressing liability, article 235, which reads as follows:

1. States are responsible for the fulfilment of their international obligations concerning the protection and preservation of the marine environment. They shall be liable in accordance with international law.
2. States shall ensure that recourse is available in accordance with their legal systems for prompt and adequate compensation or other relief in respect of damage caused by pollution of the marine environment by natural or juridical persons under their jurisdiction.
3. With the objective of assuring prompt and adequate compensation in respect of all damage caused by pollution of the marine environment, States shall cooperate in the implementation of existing international law and the further development of international law relating to responsibility and liability for the assessment of and compensation for damage

[135] Sections 1–4 of Part XI of UNCLOS set out general obligations to protect the marine environment while section 5 addresses six specific sources of pollution, namely from land-based sources, seabed activities subject to national jurisdiction, activities in the Area, dumping, vessels and pollution from or through the atmosphere.

[136] *The South China Sea Arbitration (The Republic of the Philippines v The People's Republic of China)* (Award) (2016) Oxford Reports on ICGJ 495 (PCA) (*South China Sea Arbitration*), para 940.

[137] UNCLOS (n 5) arts 116–120.

[138] *South China Sea Arbitration* (n 136) para 941.

[139] UNCLOS (n 5) art 193.

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 12 Nov 2026 at 22:33:48, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781108866477.003

> and the settlement of related disputes, as well as, where appropriate, development of criteria and procedures for payment of adequate compensation, such as compulsory insurance or compensation funds.

This provision, which is not specific to the high seas, does not so much elaborate on the liability rules as it restates the options available to states to address liability; namely, states themselves may attract liability under the rules of state responsibility, states are required to provide recourse for injured persons within their own legal systems and states may cooperatively develop new (civil liability) rules and procedures addressing liability.[140] Considerable progress has been made in the development of civil liability rules addressing oil and other hazardous releases in areas within national jurisdiction, but these regimes (for the most part) do not apply to environmental harm in the high seas and/or may not be in force.[141]

The 2023 BBNJ Agreement is designed to address the need for a more comprehensive global regime under UNCLOS to better address conservation and sustainable use of marine biodiversity of areas beyond national jurisdiction. The Agreement makes provision for the establishment of area-based management tools, including marine protected areas, in the high seas through the COP.[142] Indicative criteria for the identification of such areas are incorporated into Annex I of the Agreement. In the context of area-based management tools, the COP may also decide to adopt measures in ABNJ to be applied on an emergency basis if necessary 'if a natural phenomenon or human-caused disaster has caused, or is likely to cause, serious or irreversible harm to marine biological diversity of areas beyond national jurisdiction, to ensure that the serious or irreversible harm is not exacerbated'.[143] The COP is to adopt procedures and guidance for the establishment of such measures on the basis of recommendations to be elaborated by the Scientific and Technical Body.

The BBNJ Agreement also operationalizes the provisions of UNCLOS on environmental impact assessment for ABNJ.[144] There was much discussion during the negotiation of the Agreement as to who should be responsible for conducting an EIA and the threshold to trigger the EIA requirement. The Agreement sets out processes, thresholds and requirements for screening activities for the need for EIA,

[140] A provision on the development of procedures for liability and dispute settlement was included in the London Convention for the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention), (adopted 29 December 1972, entered into force 30 August 1975) 1046 UNTS 120 (1972), art X; article 15 of the 1996 Protocol to the London Convention (adopted 7 November 1996, entered into force 24 March 2006), 36 ILM 1 (1997) provides that '[i]n accordance with the principles of international law regarding State responsibility for damage to the environment of other States or to any other area of the environment, the Contracting Parties undertake to develop procedures regarding liability arising from the dumping or incineration at sea of wastes or other matter'.

[141] See generally Gaskell (n 10).

[142] BBNJ Agreement (n 125) Part III.

[143] ibid art 19.

[144] UNCLOS (n 5) art 206, and BBNJ Agreement (n 125), Part IV.

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 12 Nov 2026 at 22:33:48, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781108866477.003

and for conducting and reporting EIAs, with further relevant guidelines to be developed by the Scientific and Technical Body for consideration and adoption by the COP.[145] The Agreement provides a role for the Scientific and Technical Body in aspects of the EIA process, but the responsibility for conducting EIAs lies with the party with jurisdiction or control over the planned activity. If, on the basis of screening, a party has reasonable grounds for believing that a proposed activity may cause substantial pollution of or significant and harmful changes to the marine environment, an EIA must be conducted. [146] Cumulative impacts, and uncertainties and gaps in knowledge, are amongst the factors that must be considered in the screening and EIA processes. A decision to authorize a planned activity under the jurisdiction or control of a party may only be made when 'taking into account mitigation or management measures, the Party has determined that it has made all reasonable efforts to ensure that the activity can be conducted in a manner consistent with the prevention of significant adverse impacts on the environment'.[147] Where activities in ABNJ are permitted by a party, it must monitor impacts of such activities and report on such impacts including through the BBNJ clearing house mechanism and the Scientific and Technical Body. Where significant adverse impacts that were either not foreseen in the EIA in terms of their nature or severity, or that arise from a breach of conditions in the authorization, the party must review its authorization decision and notify the COP, other parties and the public, and require that measures are proposed and implemented to prevent, mitigate and/or manage those impacts, or take any other necessary action including halting the activity as appropriate.[148] On the basis of its review of monitoring reports, the Scientific and Technical Body may also make recommendations to a party where it considers that an authorized activity may have significant adverse impacts that were unforeseen or that arise from a breach of authorization.

The negotiations of the BBNJ Agreement presented a further opportunity for the development of liability rules addressing environmental harm in areas beyond national jurisdiction. In the first phase of discussions in the Preparatory Committee from 2015 to 2017, responsibility and liability were discussed as a cross-cutting issue. At that time, the Chair included 'responsibility and liability' as one of the issues that the agreement should cover[149] and subsequently recognized that liability of states for damage to the marine environment and the 'polluter-pays' principle were amongst the principles and approaches that needed further discussion.[150] However,

[145] BBNJ Agreement (n 125), art 41 bis.
[146] ibid art 24.
[147] ibid art 38.
[148] ibid arts 40 and 41.
[149] Chair's Overview of the First Session of the Preparatory Committee, 28 March–8 April 2016, 18, 20.
[150] Chair's Overview of the Second Session of the Preparatory Committee, 26 August–9 September 2016, 6, 13; and see discussion of these proposed elements in Gaskell (n 10) 263–269.

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 12 Nov 2026 at 22:33:48, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781108866477.003

the issue was not actively pursued throughout the negotiations, with the exception of a reference to the possibility of establishing a special rehabilitation and ecological restoration fund. In the final resumed negotiating session in February–March 2023, a renewed call was made for the inclusion of provisions on liability and compensation for damage or loss arising from activities in ABNJ.[151] However, there are no provisions on liability in the operative part of the Agreement. Instead a preambular provision reflects but does not replicate Article 235(1) UNCLOS stating that 'as set out in the Convention, States are responsible for the fulfilment of their international obligations concerning the protection and preservation of the marine environment and may be liable in accordance with international law'.[152] The Agreement provides that the COP may consider establishing additional funds as part of the financial mechanism, *inter alia*, to 'finance rehabilitation and ecological restoration of marine biological diversity of areas beyond national jurisdiction'.[153]

1.3 ENVIRONMENTAL HARM

The focus of this book is on environmental harm or damage (the terms environmental harm or damage are used interchangeably), as opposed to liability for harm to property and other economic interests. Our interest in environmental harm reflects what we view as the primary concern of the international community in promoting liability rules for the global commons (as signified in Principle 13 of the Rio Declaration). Given this focus, this book considers activities that take place in areas beyond national jurisdiction, but also those activities that may occur in areas under state jurisdiction but result in harm to the global commons.

The specific environmental risks in each of the global commons areas under discussion have been explored in Section 1.2. The different environmental risks highlight that environmental damage in areas beyond national jurisdiction is likely to occur in a range of different circumstances that could have an impact on the appropriate approach to reparation of harm. Damage could arise as a result of accidental discharges of oil or hazardous chemicals in the high seas or in Antarctica, comprising single catastrophic pollution incidents. In other scenarios, environmental damage might occur as a result of unlawful activities, such as illegal, unreported and unregulated fishing. Alternatively, environmental damage could arise from impacts of approved activities such as licensed fisheries or, prospectively, operational activities related to seabed mining in the Area. In these situations, it is likely that some impacts will have been foreseen in an environmental impact assessment prior to approval, and deemed acceptable provided specific risk management measures are applied. These raise the question whether there are

[151] See *Earth Negotiations Bulletin*, BBNJ IGC-5.2 No. 8, 2 March 2023, 2.
[152] BBNJ Agreement (n.125) preamble.
[153] BBNJ Agreement (n 125) art 52(4) bis ante.

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 12 Nov 2026 at 22:33:48, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781108866477.003

circumstances in which damage arising from such activities should give rise to liability, for example where adverse effects occur that were unforeseen in nature and/or scale. Such impacts might be identified as scientific understanding of ecosystems in areas beyond national jurisdiction develops. Gaps in existing scientific knowledge, for example, on deep seabed ecosystems, prompt questions about intertemporal aspects of any liability rules in the global commons – whether liability can or should be imposed in respect of activities that were not known to be harmful before evidence of damaging effects was available.[154]

Environmental damage in areas beyond national jurisdiction can occur over long periods of time, as a result of the combined or cumulative effects of diffuse drivers of damage, such as pollution of the marine environment by plastic, marine pollution by land-based sources or from the impacts of climate change, including ocean acidification. It can also result from the cumulative effects of specific activities, such as overfishing or destructive fishing practices. Diffuse and cumulative damage is trickier to address within the context of a liability regime as it gives rise to more intractable questions of causation, remoteness and attribution.

Based upon practice to date in international civil liability treaties and other relevant forums addressing environmental damage, the heads of damage that might be covered by the concept of 'environmental damage' in areas beyond national jurisdiction could encompass consequential loss to economic interests (loss of profit). This might include, for example, losses from reduced access to fisheries, mineral resources or marine genetic resources. They might also include the costs of measures to prevent or restore environmental damage, for example, where an accidental spill has occurred, as well as related monitoring and assessment costs. These types of damage, reflecting consequential loss, prevention or restoration costs incurred, may, in principle, be uncontroversial,[155] but in the global commons context there are unique issues respecting proportionality: how the reasonableness of restoration measures should be assessed in terms of, for example, cost, feasibility, likelihood of success and prospects for natural recovery. A second issue relates to situations of irreparable environmental harm, as well as to interim environmental losses incurred pending restoration. In this second category that is classed as pure environmental loss for our purposes, a central question is whether and how reparation can incorporate the provision of equivalent resources and ecosystem services.

[154] See Okowa (n 8) 312–315.

[155] See, for example, Edward Brans, *Liability for Damage to Public Natural Resources: Standing, Damage and Damage Assessment* (Kluwer Law International 2001); Peter Wetterstein (ed), *Harm to the Environment: The Right to Compensation and the Assessment of Damages* (OUP 1997); Michael Bowman and Alan Boyle (eds), *Environmental Damage in International and Comparative Law: Problems of Definition and Valuation* (OUP 2002); Günther Handl, 'Marine Environmental Damage: The Compensability of Ecosystem Service Loss in International Law' (2019) 34 IJMCL 602.

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 12 Nov 2026 at 22:33:48, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781108866477.003

1.4 APPROACH AND STRUCTURE OF THE BOOK

Examinations of the international law concerning liability for environmental harm tend to be structured in relation to several key points of division. The first focuses on the potential subjects of liability: states – under the general law of state responsibility; and private operators – under civil liability treaties. As the risk associated with different activities is sector-specific and requires the participation of operators and, often their insurers, civil liability treaties are themselves sector-specific, with self-contained regimes governing areas such as oil transport, the movement of hazardous wastes and nuclear facilities. Consequently, descriptions of international liability rules are often presented on a regime-by-regime basis.

Our approach differs in that we are primarily interested in the unique legal issues associated with providing for a system of compensation for environmental harm to globally shared resources and ecosystems. Instead of structuring this book on a regime-by-regime basis, our approach is to organize the book around the central themes and issues that liability rules and processes need to address in order to comprehensively attend to compensation for environmental harm. Specifically, the book breaks down the topic of liability into the following constituent elements: the definition and valuation of environmental damage (Chapter 3); the allocation of liability, including channelling liability to different actors (Chapter 4); the standards of liability (Chapter 5); standing to bring claims (Chapter 6); access to remedies, addressing the forums in which claims may be brought (Chapter 7); and the issue of insurance and compensation funds (Chapter 8). In order to provide a more general framing for the chapters that follow, Chapter 2 introduces the topic of liability for environmental harm through a discussion of the purposes of liability regimes and the principal approaches that the international community has adopted to address liability. Chapter 9 sets out our conclusions, highlighting key developments as well as challenges and outlining some possible ways forward for addressing liability for environmental harm in areas beyond national jurisdiction.

The discussion within the chapters is oriented towards an examination of each issue in the context of environmental regulation of the commons generally. In particular, we are interested in how the key attributes of each commons regime shape the various elements of liability. Organizing the analysis in this way enables analysis across the commons regimes and informs a consideration of existing approaches to liability in international law upon which new rules for areas of global commons might draw. Abstracting and elaborating upon general approaches is particularly significant considering the relatively (vis-à-vis areas under state jurisdiction) underdeveloped approaches to liability in global commons areas.

We do, however, separate out the regime-specific rules in order to highlight their particular features where appropriate. As is evident from the preceding description of the three commons regimes addressed, the legal nature of the commons varies across each regime, with important implications for liability law. The rules are also

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 12 Nov 2026 at 22:33:48, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781108866477.003

influenced by the nature of the activities undertaken in each commons area, and the primary actors (state or non-state) involved.

The incomplete and very much evolving nature of the specific liability rules presents several challenges. First, the absence of specific liability rules, which is particularly the case in relation to the high seas, requires us to draw on more general rules, in both international and domestic law that structure liability. We examine the law on state responsibility, as it applies to the global commons, quite comprehensively. Our coverage of liability rules which apply to non-state actors (primarily operators), draws on civil liability treaties, and other harmonized approaches to liability that originate in international law – what the International Law Commission (ILC) refers to as 'loss allocation'. As these rules rely in some measure on domestic legal processes, we also draw on general approaches to liability found in domestic systems. Second, we are required to contend with rules that are not yet in force, in the case of the Antarctic Liability Annex, or are still under active negotiation, in the case of the deep seabed mining liability requirements. In relation to the former, we place considerable weight on the Antarctic Liability Annex, recognizing that it represents the position of the Antarctic parties, notwithstanding that it remains not in force. In connection with the deep seabed mining rules, we note, where appropriate, the approach under consideration (typically, in the form of draft regulations), but view these as simply indications of potential approaches to liability.

In addressing liability issues comprehensively and across several legal contexts, this book provides the first in-depth description and evaluation of current rules and possible avenues for future legal developments in an area that is attracting considerable attention from states, international organizations and commercial actors, in addition to legal and governance scholars. The book is predominantly descriptive and analytical in approach, with the intention of providing an authoritative account of current liability rules addressing areas beyond national jurisdiction and assessing trajectories for future legal developments. We do not adopt a particular theoretical perspective, but a central theme running throughout the book is the role and suitability of liability rules as tools for environmental harm prevention and remediation. It is hoped that the book will contribute to both policy and academic debates on the nature of environmental regulation of the commons, the role of liability in providing compensation for losses and for harm prevention, as well as the nature and implementation of rules on standing which recognize the right to bring claims on behalf of collective interests.

This book was completed at the end of October 2022. As far as possible, brief reference has also been made to significant relevant developments up to March 2023. References to the 2023 BBNJ Agreement, and provisions thereof, are to the agreed unedited text of 4 March 2023. The text of the Agreement was due to be edited with a view to adoption in June 2023.

Downloaded from https://www.cambridge.org/core. UNIVERSIDAD AUTONOMA METROPOLITANA, on 12 Nov 2026 at 22:33:48, subject to the Cambridge Core terms of use, available at https://www.cambridge.org/core/terms. https://doi.org/10.1017/9781108866477.003