UiT The Arctic University of Norway | Faculty of Law

Climate Change Adaptation as Developing Legal Obligations Applicable to the Interpretation of the Law of the Sea Convention

Christian Stirling Haig

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Abbreviations

ARSIWA	Articles on the Responsibility of States for Internationally Wrongful Acts
Art(s).	Article(s)
CAF	Cancun Adaptation Framework
CBDR-RC	Common but differentiated responsibilities and respective capabilities
COP	Conference of Parties to the United Nations Framework Convention on Climate Change
Doc.	Document(s).
Ed(s).	Editor(s)
EEZ	Exclusive economic zone
FSA	Fish Stocks Agreement
GAIRAS	Generally accepted international rules and standards
Ibid.	*Ibidem*
ICESCR	International Covenant on Economic, Social and Cultural Rights
ICJ	International Court of Justice
ILA	International Law Association
ILC	International Law Commission
IPCC	Intergovernmental Panel on Climate Change
ITLOS	International Tribunal for the Law of the Sea
LNTS	League of Nations Treaty Series
LOS	Law of the sea
LOSC	United Nations Convention for the Law of the Sea
MSR	Marine scientific research
OHCHR	United Nations Office of the High Commissioner for Human Rights
P(p).	Page(s).
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
UNGA	United Nations General Assembly
UNTS	United Nations Treaty Series
VCLT	Vienna Convention on the Law of Treaties
Vol.	Volume

Introduction

Purpose and Objectives

Climate change, given its significant and transboundary physical effects and consequent impacts on societies, presents a significant challenge for global governance frameworks, including for the oceans. Climate change will continue to manifest through the 21st century regardless of international efforts, which is compelling states to consider not only how to slow climate change but also to manage its ecological and socio-political impacts.[1] The developing "climate adaptation regime" is intended to manage climate change's adverse impacts by reducing vulnerability and increasing resiliency. It is relevant not only to ecological systems but also to human systems, including law and policy frameworks like the international law of the sea.

The law of the sea, meanwhile, is not a static, stand-alone governance framework, and it may evolve in tandem with international law. As climate change compels changes across institutions and governance systems, the purpose of this thesis is to explore how the law of the sea might accommodate developing climate law, particularly legal adaptation obligations. While a significant body of scholarship assesses climate change's implications for the law of the sea, scholars have focused little attention on the legal significance of the adaptation regime.[2] As such, this thesis seeks to address this gap by answering the following questions:

- What is the legal significance of the climate adaptation regime to the law of the sea?
    - What is the legal content and nature of the climate adaptation regime?[3]
    - How might the law of the sea evolve in response to climate change and the climate adaptation regime?[4]
    - Where and how might the adaptation regime inform the interpretation and application of the law of the sea?[5]

Terminology and Scope Delimitation

This thesis focuses on two bodies of international law, requiring careful scope delimitation in deference to format requirements. It largely limits analysis of the law of the sea to

[1] See Levin, K., Waskow, D., & Gerholdt, R. (2021). 5 big findings from the IPCC's 2021 Climate Report. World Resources Institute. https://www.wri.org/insights/ipcc-climate-report.
[2] See Chapter I for a review of the relevant literature.
[3] Chapter II seeks to address this sub-question.
[4] Chapter III seeks to address this sub-question.
[5] Chapter IV seeks to address this sub-question.

the United Nations Convention on the Law of the Sea (LOSC), excluding analysis of other instruments except where relevant to the convention itself.[6] This thesis also seeks to avoid relitigating the significant scholarship already devoted to individual climate change-related legal issues in the law of the sea. While it at times does refer to this scholarship, it generally seeks to address individual climate change-related issues and related scholarship only when viewed through the framework of the adaptation regime. Law of the sea scholars have not broadly discussed the adaptation regime, requiring this thesis to review and analyze its content and nature.[7] This regime may be applicable beyond the law of the sea; however, this thesis limits analysis to only what is immediately relevant in an oceans context. Analysis of the adaptation regime that considers aspects not relevant to the law of the sea is thus generally beyond the scope of this thesis, particularly given the regime's ongoing development.

The terminology used in this thesis derives primarily from their definitions and usage in multilateral instruments. Given the overwhelming focus of this thesis on climate change and the adaptation regime, it is perhaps necessary to define some critical terms early. Chapter I discusses climate-related terminology at greater length, but the concept of climate change adaptation ("climate adaptation") generally refers to efforts to manage climate change's adverse effects on both ecological and human systems (including law frameworks) by reducing vulnerability and increasing resilience, largely to safeguard human security. The "adaptation regime" refers to the body of developing climate change law focused on supporting and promoting climate adaptation, while "climate action" refers to international efforts to respond to climate change (of which, adaptation is a component). "International community" refers to states invested in climate action.

Content, Sources, and Methodology

Given the complex nature of parallel developing regimes, one of which (climate adaptation) is relatively imprecisely defined, this thesis often relies on doctrinal research methods but also seeks to match methodology to research sub-questions as appropriate. Given that climate adaptation is a multi- and interdisciplinary endeavor, this thesis also includes interdisciplinary considerations. Chapter I contextualizes the importance of the climate change regime to oceans governance, exploring the nature and purpose of climate adaptation. In addition

[6] United Nations Convention on the Law of the Sea, (10 December 1982, in force 1994). 1833 U.N.T.S. 397.
[7] See Chapter I for review of the relevant literature.

to reviewing relevant scholarship, this involves socio-legal research considering climate change science, policy, and international relations issues.

Chapter II employs traditional doctrinal methods in systematizing, clarifying, and evaluating the adaptation regime's legal content and rules. It references authoritative texts and sources of international law indicated by Article 38 of the Statute of the International Court of Justice, primarily focusing on international agreements like the United Nations Framework on Climate Change and the Paris Agreement.[8] It also analyzes an array of other sources, including evolving international custom as indicated by nascent state practice, soft law instruments and documents such as decisions by the Conference of Parties (COP) to the UNFCCC and various UN bodies, relevant judicial decisions, and relevant works of the International Law Association (ILA), the International Law Commission (ILC), and legal scholars. It further analyzes the adaptation regime's legal content and nature considering other internationally recognized principles and norms, such as international environmental principles and human rights.

Chapter III analyzes the legal mechanisms by which the LOSC may develop in response to climate change and adaptation needs. Beyond descriptive legal analysis of LOSC evolutionary mechanisms, it employs limited socio-legal analysis considering international relations and policy issues with an eye *de lege ferenda*. It focuses on treaty interpretation as an evolutionary mechanism, however. In addressing the harmonization of two developing legal regimes, this thesis relies on systematic interpretation according to the Vienna Convention on the Law of Treaties (VCLT) and customary treaty interpretation rules indicated by the works of the ILC, case law, and legal scholarship.[9] Presupposing a single system of international law, systematic interpretation considers treaties against the background of other international law. While such interpretation could overstep the intent of the original law, the LOSC was designed to consider future international law, and the adaptation regime is still developing, legalizing, and is designed to strengthen according to the progressive nature of climate change instruments.[10] Chapter III also notes teleological considerations, but it avoids historical interpretation given the adaptation regime's rapid development and climate change's continuing manifestation.

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[8] Statute of the International Court of Justice (18 April 1946; in force 24 October 1945), Art. 8.
[9] Vienna Convention on the Law of Treaties (22 May 1969; in force 27 January 1980) (VCLT), UNTS 1155.
[10] For a full accounting of systematic and other interpretive methodologies, including criticisms of the methods, see Ammann, Odile. (2020). The Interpretative Methods of International Law: What Are They, and Why Use Them? In *Domestic Courts and the Interpretation of International Law*. Leiden, The Netherlands: Brill, pp. 191-222.; see also Padjen, Ivan L. (2020). Systematic Interpretation and the Re-systematization of Law: The Problem, Co-requisites, a Solution, Use. *International Journal for the Semiotics of Law/Revue Internationale de Sémiotique Juridique*, 33(1), pp. 189-213.

Following the understanding developed in the previous part, Chapter IV analyzes how the adaptation regime may inform the systematic interpretation of parts of the LOSC. The intention of this chapter is not to systematically interpret every part of the LOSC in consideration of adaptation obligations but to generally illustrate the adaptation regime's legal significance to the LOSC. It generally applies systematic interpretation considering adaptation obligations as a framework approach to settling climate change-related legal issues in the law of the sea, often relying on relevant legal scholarship to expound legal arguments and proposals compatible with this interpretive approach. Finally, this thesis concludes, according to the analysis of the prior chapters, with an assessment of the adaptation regime's significance to the law of the sea.

Chapter I. The Law of the Sea and Climate Change

Climate Change and Coastal Impacts

Climate change is not only an environmental problem but an unpredictable and destabilizing challenge to human systems, including governance and legal frameworks. As Vidas et al. note, "The implicit assumption of relatively stable natural conditions, present through millennia and centuries (including most of the twentieth century), is built into foundations of the political and legal structures surrounding us today – but this is what will, already in the coming decades of this century, progressively lose its factual basis".[11] Collective adverse "climate impacts" can be unpredictable, socio-politically destabilizing, and dangerous to human security.[12] Indeed, global oceanic governance systems are coming under increasing and significant stress from climate change. Indeed, the seas are expected to face some of climate change's most significant environmental impacts. Rapid climatic shifts including ocean acidification threaten marine biodiversity, sending shockwaves through ecosystems and the food chain, with subsequent damage to fisheries. [13] Sea level rise is eroding coastlines, inundating critical ecosystems, facilitating saltwater infiltration of vital freshwater sources, and facilitating more dangerous storm surges from increasingly frequent and severe extreme weather.

[11] Vidas, D., Zalasiewicz, J., Williams, M., & Summerhayes, C. (2020). Climate Change and the Anthropocene: Implications for the Development of the Law of the Sea. In E. Johansen, S. Busch, & I. Jakobsen (Eds.), *The Law of the Sea and Climate Change: Solutions and Constraints*. Cambridge: Cambridge University, p. 36.
[12] For an overview of adverse socio-political impacts of climate change, see Brown, Oli (2008). Migration and Climate Change, International Organization for Migration. *IOM Migration Research Series,* No. 31, pp. 9-42.
[13] For a general overview of climate impacts on the oceans, see Vidas et al. (2020), p. 36.; see also Redgwell, Catherine. (2019). Treaty Evolution, Adaptation and Change: Is the LOSC 'Enough' to Address Climate Change Impacts on the Marine Environment?, *The International Journal of Marine and Coastal Law*, 34(3), p. 442.

These physical impacts entail adverse corresponding socio-economic and political effects on coastal communities and states. The combined effects of climate change pose an increasing threat to the existence of coastal communities, portending a daunting future crisis. More than 1.4 people may live in low-lying coastal areas and more than 400 million could face extreme flood events by 2060.[14] And even where societies withstand climate change's impacts, they are unlikely to emerge unscathed as climate change threatens critical food resources, damages coastal livelihoods, and undermines critical marine ecosystem services such as nutrient recycling and natural flood defense. Developing countries, least responsible for climate change, will struggle with these effects, which are most dangerous to island nations. Sea level rise may submerge entire islands, and even where the territory loss is only partial, saltwater infiltration and extreme weather may render them uninhabitable, which threatens their legal existence as independent states.[15] Exacerbating this problem, climate change will impact coastal fisheries providing island nations with critical sources of sustenance and economic activity.[16]

As climate change continuously manifests in increasingly adverse effects on the seas and coastal states, it is putting pressure on the LOS regime. The LOSC set forth a regime organizing the oceans into different maritime zones to address and regulate human oceanic activities. The LOSC, though creating a framework to address future ocean governance issues, did not anticipate climate change's significant environmental shifts and thus does not necessarily provide clear solutions for the associated emergence of climate-related legal issues.[17]

Climate Law and the Law of the Sea

While the LOSC does not reference climate change, and its parties have not concluded any oceans-specific climate instruments or agreements, the international community has responded to climate change's increasing environmental and societal threats. The core of this response is based on the 1992 United Nations Framework Convention on Climate Change (UNFCCC), along with the associated 1997 Kyoto Protocol and the 2015 Paris Agreement, but it may arguably be considered its own field of law. Bodansky notes,

[14] Neumann B, Vafeidis AT, Zimmermann J, Nicholls RJ (2015) Future Coastal Population Growth and Exposure to Sea-Level Rise and Coastal Flooding—A Global Assessment. *PLoS ONE* 10(3).
[15] See Oral, Nilüfer. International Law as an Adaptation Measure to Sea-level Rise and Its Impacts on Islands and Offshore Features, *The International Journal of Marine and Coastal Law* 34, 3 (2019), pp. 415–439
[16] Xue, Guifang. (2013). Climate Change Challenges and the Law of the Sea Responses. In *Climate Change: International Law and Global Governance,* p. 554.
[17] See Redgwell (2019), p. 446-448.

> Although the UN climate regime forms the core of international climate change law, international climate change law, conceived more broadly, includes not only the UN regime, but also rules and principles of general international law relevant to climate change; norms developed by other treaty regimes and international bodies; regulations, policies, and institutions at the regional, national, and sub-national levels; and judicial decisions of national, regional, and international courts.[18]

Climate change law, Peel et al. write, is a multi-level, multidisciplinary field drawing tools and perspectives from various legal fields (from property to human rights to environmental law) focused on mitigating and adapting to climate change.[19]

The emergence of international law relating to climate change is a significant legal development. As Ruhl notes regarding environmental law, "Climate change will impose unyielding physical, biological, and social constraints on what is possible to achieve through environmental law, but it will also exert tremendous structural pressures on the very design and implementation of the law itself".[20] However, the full impact of this complex developing body of international law is not clear given the speed at which it emerged. As Calarne et al. emphasize, the international community rapidly identified a global issue, negotiated a framework treaty, developed domestic laws and regulations, and began to coordinate international efforts through complex legal and political agreements at every level of governance—all within 25 years.[21]

Law scholarship focused on climate change has proliferated despite this rapid development, and within this broad corpus, some explores the intersection of international climate law and the law of the sea. As Klein notes, "The 'entire legal system' in which UNCLOS is located must now include the growth in laws, institutions, and activities addressing the issues associated with climate change and its impact on the marine environment".[22] While the LOSC provides little specific climate change-related guidance, and international climate instruments provide little ocean-specific guidance, the regimes are not entirely separate, and the ILA, ILC,

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[18] Bodansky, D., Brunnée, J. & Rajamani, L., Introduction to International Climate Change Law (June 10, 2017). In *International Climate Change Law* (Oxford Univ Press 2017), pp. 10-11.
[19] See Peel, Jacqueline, Godden, Lee, & Keenan, Rodney J. (2012). Climate Change Law in an Era of Multi-Level Governance. *Transnational Environmental Law*, 1(2), pp. 245–280.
[20] Ruhl, J.B. (2010). Climate Change Adaptation and the Structural Transformation of Environmental Law. *Environmental Law* (Portland, Ore.), 40(2), pp. 374-376.
[21] Carlarne, C. P., Gray, K. R., & Tarasofsky, R. (2016*).* The Emergence of International Climate Change Law in *The Oxford Handbook of International Climate Change Law*. Oxford University Press., p. 3.
[22] Klein, Natalie. (2020). *Adapting UNCLOS dispute settlement to address climate change*. In Research Handbook on Climate Change, Oceans and Coasts, p. 111.

and others have devoted attention to their relationship. A significant body of literature now assesses the impact of climate change on the law of the sea regime, including thorough examinations of the responsivity of the current regime to climate change and legal analyses of individual climate change-related issues.[23] Law of the sea scholars have for instance devoted attention to climate change's impacts on baselines[24], the status and entitlement of offshore features[25], stewardship of living resources and the environment[26], and dispute settlement.[27] Further topics include the LOS regime's general response to climate change[28] and using the LOSC to reduce greenhouse gas emissions.[29]

Adaptation as a Global Goal Critical to the Law of the Sea

The global climate change response is divided into two primary areas of action: mitigation and adaptation.[30] Mitigation is to limit the physical process of climate change,

[23] For a comprehensive review of scholarship assessing climate impacts on the law of the sea, see Abate, Randall S. 2015. *Climate Change Impacts on Ocean and Coastal Law: U.S. and International Perspectives*. Oxford and New York: Oxford University Press, 2015, pp. 1-699.

[24] A comprehensive review is beyond the scope of this thesis, but see, for example: Schofield, Clive, & Freestone, David. (2019). Islands Awash Amidst Rising Seas: Sea Level Rise and Insular Status under the Law of the Sea. *The International Journal of Marine and Coastal Law*, 34(3); Busch, Signe. V. (2020). Law of the Sea Responses to Sea-Level Rise and Threatened Maritime Entitlements: Applying an Exception Rule to Manage an Exceptional Situation in *The Law of the Sea and Climate Change: Solutions and Constraints*. Cambridge: Cambridge University, pp. 309-335; & Lathrop, C. G., Roach, J. A., & Rothwell, D. R. (2019). Baselines under the International Law of the Sea, Brill Research Perspectives in the Law of the Sea, 2(1-2), pp. 1-177.

[25] A comprehensive review is beyond the scope of this thesis, but see, for example: Rayfuse, Rosemary (2013). Sea Level Rise and Maritime Zones: Preserving the Maritime Entitlements of "Disappearing" States. In *Threatened Island Nations: Legal Implications of Rising Seas and a Changing Climate,* pp. 167-192.; Oral (2019), pp. 415-439.; & Valente, Sofia, & Veloso-Gomes, Fernando. (2020). Coastal climate adaptation in port-cities: adaptation deficits, barriers, and challenges ahead. *Journal of Environmental Planning and Management*, 63(3), pp. 389–414.

[26] A comprehensive review is beyond the scope of this thesis, but see, for example: Molenaar, Erik. (2020). Integrating Climate Change in International Fisheries Law. In *The Law of the Sea and Climate Change: Solutions and Constraints*, pp. 263-288.; Dahl, Irene. (2020). Adaptation of Aquaculture to Climate Change: The Relevance of Temporal International Framework from a Norwegian Perspective. In *The Law of the Sea and Climate Change: Solutions and Constraints*, Cambridge: Cambridge University Press, p. 289-308.; Boyle, Alan. (2019). Litigating Climate Change under Part XII of the LOSC. *The International Journal of Marine and Coastal Law*, 34(3), pp. 458-481.; Jakobsen, Ingvild Ulrikke. (2020). Marine Protected Areas and Climate Change. In *The Law of the Sea and Climate Change: Solutions and Constraints*, pp. 234-262.; & Johansen, E. & Henriksen, T. (2020). Climate change and the Arctic: adapting to threats and opportunities in Arctic marine waters. In *Research Handbook on Climate Change, Oceans and Coasts*, pp. 239–258.

[27] A comprehensive review is beyond the scope of this thesis, but see, for example: Boyle (2019), pp. 458-481; Doelle, Meinhard. (2006). Climate Change and the Use of the Dispute Settlement Regime of the Law of the Sea Convention. *Ocean Development and International Law*, 37(3-4), pp. 319-337.; Scott, Karen N. (2017). Climate Change and the Oceans: Navigating Legal Orders. In *Legal Order in the World's Oceans*, Vol. 21, pp. 124–150.; & Lee, Seokwoo, & Bautista, Lowell. (2018). Part XII of the UNCLOS and the Duty to Mitigate Against Climate Change: Making Out a Claim, Causation, and Related Issues. *Ecology Law Quarterly*, 45(1), pp 129-155.

[28] A comprehensive review is beyond the scope of this thesis, but see, for example: Redgwell (2019), pp. 440-457.; Jakobsen, I., Johansen, E., & Nickels, P. (2020). The Law of the Sea as Part of the Climate-Change Regime Complex. In *The Law of the Sea and Climate Change: Solutions and Constraints*, pp. 376-377, 382.; & Poto, Margherita P. (2020). The Law of the Sea and Its Institutions. In *The Law of the Sea and Climate Change: Solutions and Constraints*, pp. 354-373.

[29] A comprehensive review is beyond the scope of this thesis, but see, for example: Guifang. (2013), pp. 547-592; Jakobsen et al. (2020), pp. 374-385.; & Boyle (2019), pp. 458-481.

[30] See Intergovernmental Panel on Climate Change, 2014. *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, p. 151.

principally by limiting greenhouse gas emissions. Notably, limiting climate change is to buy time—not to avert climate change entirely, which tacitly acknowledges climate change as to some degree inevitable. Greenhouse gas emissions released to date have made a significant climate change unavoidable; furthermore, there is a time delay between greenhouse gas emissions reductions and the corresponding stabilization of atmospheric conditions. As such, mitigation must be understood as an attempt to restrict temperature increases to allow human societies and ecosystems to avoid the most catastrophic of climate change impacts.

Even if international mitigation efforts are wildly successful in restricting climate change to just 1.5°C from preindustrial levels, it will still entail severe negative consequences. For example, sea-level rise and coastal flooding may displace 53 million people, and oceanic shifts such as acidification may contribute to a 70-90 percent decline in coral reefs.[31] Considering that the world might warm by as much as 4.4°C, these negative impacts would constitute relative success.[32] Mitigation is critical to avoiding the worst climate outcomes, but climate change's inevitability and increasing threat to human security necessitate adaptation of natural and human systems.[33] Adaptation includes a wide swathe of actions and policies intended to strengthen resiliency or decrease vulnerability to climate change's impacts. It includes not only physical measures like seawalls but also alterations of law and policy.[34]

Despite the increasing significance of adaptation, legal scholars and policymakers have, for several reasons, historically focused on mitigation and largely failed to address the legal implications of climate change from the perspective of adaptation. This extends to law of the sea scholarship as well. Virtually no law of the sea scholarship focuses on the legal significance of climate adaptation, and where they do, it is in conjunction with mitigation, views adaptation as an environmental protection issue, or focuses on the issue from the perspective of sea-level rise.[35] While law of the sea scholars have largely discounted or failed to address the implications of this second branch of global climate action, some scholars have touched on it in part.

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[31] IPCC, 2018. Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. *In Press*. Table 3.5.
[32] Levin et al. (2021).
[33] See IPCC (2014), pp. 833-868 & 755-832.
[34] Paris Agreement, UNFCCC Conference of Parties (12 December 2015), UN Doc. FCCC/CP/2015/10/Add.1, Art. 7(7)
[35] See Hall & Persson (2018), pp. 540–566; & Calarne et al. (2016), pp. 18-21.; & for additional and thorough literature assessments, see Ruhl (2010); & Hall, N., & Persson, Å. (2018). Global climate adaptation governance: Why is it not legally binding? *European Journal of International Relations*, 24(3), pp. 540–566.

Craig for instance has discussed the adaptation regime, including the LOSC's role in facilitating mitigation and adaptation in line with international climate law; however, she generally focuses on ecological adaptation rather than the adaptation of human systems.[36] Johansen and Henriksen have emphasized the importance of adapting the LOS and Arctic legal regimes to climate change, focusing on adaptive governance approaches, but their analysis is similarly focused on environmental governance.[37] Oral, co-chair of the ILC Study Group on sea-level rise in relation to international law, has perhaps focused most on the significance of the adaptation regime to the LOS regime. She has analyzed the relevance of the adaptation regime under international climate law to marine protection measures, including regarding ocean acidification.[38] Most notably, she has identified basic legal obligations related to climate adaptation and analyzed the state of climate law and the law of the sea concerning adaptation measures such as artificial island construction and coastal reinforcement. Though she argues that international law must itself adapt to facilitate adaptation to sea-level rise, her analysis focuses specifically on the implication of the adaptation regime to sea-level rise issues. As such, she does not focus on the adaptation legal regime regarding environmental issues in the law of the sea.[39]

Despite the relative lack of legal attention devoted to climate adaptation, which this thesis intends to help address, climate adaptation is highly significant to the LOS. Climate change alters the physical, economic, and sociopolitical context within which human systems were designed and function, necessitating wide-ranging adjustments and reforms. Climate impacts on human systems are universal in scope but vary greatly given disparate local physical effects and corresponding societal responses. This combined variability and universality necessitates the adaptation of social, political, legal, and ecological systems at the local, regional, national, and international levels. A further complication is that climate impacts manifest continuously and with increasing intensity, so human systems must adjust to constantly changing baseline conditions.[40] As McDonald notes, legal adaptation will be difficult and complex.

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[36] See Craig, Robin Kundis. (2020). Mitigation and Adaptation. In *The Law of the Sea and Climate Change: Solutions and Constraints*, pp. 49-80.
[37] See Johansen & Henriksen (2020), pp. 239–258.
[38] See Oral, Nilüfer. (2018). Ocean Acidification: Falling Between the Legal Cracks of UNCLOS and the UNFCCC? *Ecology Law Quarterly*, 45(1), pp. 9–30; Oral (2019), pp. 415–439.
[39] See *Ibid*.
[40] See Craig, Robin Kundis. (2010). 'Stationarity is Dead' – Long Live Transformation: Five Principles for Climate Change Adaptation Law. *The Harvard Environmental Law Review* : HELR, 34(1), p. 15.

> [The] combination of sudden shocks and creeping change, compounded by the scale and unpredictability of irreversible consequences of climate change, distinguish it from other environmental, social, and economic stressors to which we have previously responded. Adapting to the impacts of climate change in the long term, therefore, poses a unique and unprecedented challenge for law.[41]

Indeed, Craig argues that climate change poses a particular challenge to law and governance frameworks built on assumptions of unchanging environmental conditions, which will degrade amid widespread climate change.[42] Indeed, climate change affects virtually every aspect of oceans governance, and its effects are not sequestered by LOSC regime or part.

Chapter II: The Climate Adaptation Regime

Developing Climate Adaptation Law

Necessary to analyzing the climate adaptation regime's significance to the law of the sea is understanding the regime's legal content and nature. As the IPCC has noted, the development of this regime is ongoing but accelerating despite the historic focus of climate action on mitigation. "As impacts of climate change have become apparent around the world, adaptation has attracted increasing attention".[43] The Paris Agreement marked a substantial development for the adaptation regime, giving it equal priority to mitigation, establishing its long-term goals, and clarifying that adaptation is not only a local issue but an international one.[44] Despite the difficulty inherent to adaptation, this regime has developed increasing legal weight within climate change law, evolving a set of associated rules and norms. While the theoretical and practical establishment of peremptory norms and general principles of international law remains subject to robust discussion, the ICJ Statute provides some guidance.[45] Article 38 enumerates sources of international law, and this thesis finds identifiable adaptation duties in many of these sources, including international conventions, evolving international custom indicated by nascent state practice, general principles recognized by the international community, and legal scholarship.[46]

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[41] McDonald, Jan. (2011). The Role of Law in Adapting to Climate Change. *Wiley Interdisciplinary Reviews*. Climate Change, 2(2), pp. 283-284.
[42] See *ibid.*, pp. 9–73.
[43] See IPCC (2014)., p. 873.
[44] See Lesnikowski, A., Ford, J., Biesbroek, R., Berrang-Ford, L., Maillet, M., Araos, M., & Austin, S. E. (2017). "What does the Paris Agreement mean for adaptation*?" Climate Policy*, 17(7), pp. 827–828.
[45] See International Law Commission (ILC), Fifth report on identification of customary international law by Michael Wood, Special Rapporteur (14 March 2018), United Nations General Assembly, A/CN.4/717, pp. 4-53.
[46] ICJ Statute, Art 38.

Legal scholars have generally noted the relative weakness of adaptation obligations in the Paris Agreement. Dimitrov found that developed countries, by promising stronger mitigation measures, were successful in reducing binding obligations relating to international cooperation on adaptation. Dimitrov's analysis, however, is a relative one, and though the Agreement's adaptation articles may be weaker than those relating to mitigation, that does not entail that the Paris Agreement includes no adaptation duties at all.[47] Bodansky determined that the Paris Agreement's articles on adaptation do impose some legal obligations on states, including a requirement that states engage in adaptation planning and adaptation actions as appropriate. Beyond these relatively few concrete obligations, however, Bodansky notes that many of the Paris Agreement's adaptation articles either represent non-binding collective obligations for developed states, use recommendatory language, or are broadly institutional in nature.[48] Exploring the adaptation of aquaculture to climate change, Dahl did not find a hard obligation in the Paris Agreement for states to adapt to climate change—likely as it is within states' self-interest to do so anyway. She did note, however:

> Specifically, the Paris Agreement requires the parties to engage in adaptation planning processes and implementation of actions. Although the binding character of the obligation has been weakened by modifiers, the Agreement does entail a certain degree of commitment.[49]

Rajamani meanwhile finds that the Paris Agreement does include qualified adaptation requirements for parties, though they are somewhat discretionary and softer than for mitigation.[50] International relations scholars Hall and Persson, analyzing the legalization of global adaptation governance, assert that adaptation legal duties are comparatively lower in precision and obligation than are duties to mitigate climate change. They do note that adaptation obligations exist, and they find the regime's underdevelopment likely due to the still contested nature of adaptation as an international issue (rather than a local problem) and because international

[47] See Dimitrov, Radoslav S. (2016). The Paris Agreement on Climate Change: Behind Closed Doors. *Global Environmental Politics*, 16(3), pp. 1–11.
[48] See Bodansky, Daniel. (2016). The Legal Character of the Paris Agreement. *Review of European, Comparative & International Environmental Law*, 25(2), pp. 146–147.
[49] Dahl (2020), p. 290.
[50] See Rajamani, Lavanya. (2016). Ambition and Differentiation in the 2015 Paris Agreement: Interpretive Possibilities and Underlying Politics. The *International and Comparative Law Quarterly*, 65(2), p. 502.

climate negotiations involving developed states include weaker adaptation obligations in a "package deal" with stronger mitigation obligations.[51]

Legal scholars emphasizing the weakness of adaptation obligations in the Paris Agreement often frame their discussion in relation to the significantly more developed mitigation regime, and in doing so, miss key points. For instance, they often fail to acknowledge that international climate law, including the adaptation regime, is not solely determined by the Paris Agreement. While some parts of the adaptation regime are more extensively codified than others, its legal regime may also derive from or find support in other sources of international law, such as the human rights regime. Furthermore, adaptation and mitigation differ in that climate treaties frame adaptation as an obligation of conduct, and the exact scope and content of that obligation are still developing given the inherent complexity of adaptation.[52] Despite the relative infancy of the climate adaptation legal regime, this thesis argues that it does entail legal obligations that may be considered developing rules of international law. Namely, this includes two core obligations: 1) States have an individual obligation to adapt to climate change; and 2) States have a general obligation to cooperate in facilitating international adaptation to climate change, particularly regarding the needs of vulnerable states.

Adaptation as a National Obligation

This thesis argues that states have a national obligation to facilitate adaption to climate change to safeguard the security and wellbeing of their citizens. For the most vulnerable, failure to adapt could have the effect of depriving states of permanent populations, defined territories, or functioning governments, undermining their very capacity to be considered states.[53] Failure to adapt can also entail negative consequences for other states. For instance, failure to secure coastal livelihoods may contribute to transboundary population displacement, and failure to adapt agricultural practices could contribute to regional food supply issues. [54] Beyond these practical implications, a national obligation to facilitate adaptation can be identified from multiple sources of international law indicated by Article 38 of the Statute of the ICJ.[55]

[51] See Hall & Persson (2018), pp. 540–566.
[52] United Nations Framework Convention on Climate Change (9 May 1992; in force 21 March 1994), 1771 UNTS 107. Art 4.
[53] See Montevideo Convention on Rights and Duties of States (26 December 1933, in force 26 December 1934), 165 LNTS 19 (Montevideo Convention), Art. 1.
[54] Benzie, Magnus & Harris, Katy (2020) Transboundary climate risk and adaptation. Science for Adaptation *Policy* Brief 2, World Adaptation Science Programme, Secretariat, United Nations Environmental Programme, Nairobi.
[55] ICJ Statute, Art. 38.

A qualified national adaptation obligation can be identified from multiple international instruments. Article 4(1)(b) of the UNFCCC commits states to formulate, implement, publish, and regularly update national programmes containing measures to facilitate adequate climate adaptation. While the measures' specifics and the level of adaptation required to be considered "adequate" are discretionary, the article obliges states to be engaged in implementing measures intended to facilitate adaptation.[56] Article 4(1)(f) further commits states to account for climate change considerations in domestic policymaking, which may support both adaptive and mitigative aims.[57] Article 10 of the Kyoto Protocol reaffirms states' adaptation obligations under Article 4 of the UNFCCC. It further indicates options for states to adapt to climate change, referencing the adoption of technologies and improved spatial planning measures, and it commits states to communicate their adaptation plans with the international community. [58]

The Paris Agreement further detailed the adaptation regime, providing more specificity regarding states' obligations than past climate agreements. Article 7 obliges states, as appropriate, to engage in planning and implementing climate change adaptation policies that may include specific adaptation actions or efforts (such as seawall construction), national adaptation plan formulation, climate impact and vulnerability assessment (taking into account vulnerable people, places, and ecosystems), adaptation plan monitoring and evaluation, and building socioeconomic and ecological resilience to climate impacts through economic diversification and sustainable management of natural resources.[59] The Agreement also requires states to communicate and update national adaptation plans with the international community.[60] The language of Article 7—"Each Party shall, as appropriate, engage in… the implementation of actions"—does not necessarily require that parties act, but it does indicate a qualified obligation to engage in adaptation processes that include actually implementing adaptation measures.[61]

Various soft law instruments and aspirational documents support the concept that states have a national obligation to adapt to climate change, though states largely have discretion on what those adaptation measures entail. The Conference of the Parties to the UNFCCC (COP) established the Cancun Adaptation Framework (CAF) in 2010 to enhance international

[56] UNFCCC, Art. 4(1)(b).
[57] *Ibid.*, Art. 4(1)(f).
[58] 1997 Kyoto Protocol to the United Nations Framework Convention on Climate Change (signed Dec. 10, 1997) (Kyoto Protocol), 2303 UNTS 148, 37 ILM 22 (1998), Art. 10.
[59] Paris Agreement, Art. 7(9).
[60] *Ibid.*, Art. 7(10-12).
[61] *Ibid.*, Art. 7(9).

adaptation action. The CAF, noting states' adaptation commitments under the UNFCCC, lays out a framework for enhanced adaptation action. While leaving individual measures to state discretion, it invites states to take measures like strengthening institutional adaptive capacity, building resilience into socio-economic systems, and relocating vulnerable groups where necessary.[62] The next year's COP culminated in the Durban Platform for Enhanced Action clarified the objective of national adaptation planning under the UNFCCC. The COP agreed that adaptation plans are nationally determined, but the objective of planning is to reduce vulnerability to climate impacts. Planning, therefore, entails actual action.[63] Similarly, the parties to the later Paris Agreement acknowledge that adaptation measures, though discretionary, should consider additional norms such as consideration of indigenous knowledge, the interests of vulnerable groups, and reliance on best available science.[64]

Work by the ILA also supports the rule that states have a national obligation to adapt to climate change. Principle 1 of the Sydney Declaration of Principles on the Protection of Persons Displaced in the Context of Sea Level Rise holds that states have primary responsibility for providing protection and assistance to people living in areas vulnerable to sea-level rise. Furthermore, Principle 3 outlines a duty to take positive action to adapt to sea-level rise's adverse effects.[65] The Declaration of Legal Principles Relating to Climate Change also entails a national adaptive obligation. Draft Article 3 for instance commits states to adaptation for the purposes of sustainable development while Draft Article 7 holds that states shall minimize the adverse effects of climate change through adaptation measures.[66]

National adaptation may also be necessary to fulfilling other international legal obligations. While climate law does not establish any right to adaptation, climate change can infringe on the ability of individuals to exercise guaranteed international human rights. The United Nations Environmental Programme has noted, for instance, that climate change may impact individuals' rights to water, sanitation, health, life, food, and adequate living standards

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[62] The Cancun Adaptation Framework and The Cancun Agreements: Outcome of the work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention. FCCC/CP/2010/7/Add.1 (Cancun Adaptation Framework). Part II, para. 20. Also embodied in Parts I(2)(b), 2(12), 2(14-16), 2(20)(c), and 2(32).
[63] See Report of the Conference of the Parties on its seventeenth session, held in Durban from 28 November to 11 December 2011. FCCC/CP/2011/9/Add.1, Decision 5/CP.17 (I. Framing national adaptation plans), p. 80.
[64] Paris Agreement, Art 7(5).
[65] International Law Association, Sydney Declaration of Principles on the Protection of Persons Displaced in the Context of Sea Level Ris*e* (2018), the Committee on International Law and Sea Level Rise, Resolution 6/2018 (2018 Sydney Declaration).
[66] International Law Association, Declaration of Legal Principles Relating to Climate Change (2014), the Committee on Legal Principles Relating to Climate Change adopted Resolution 2/2014 at the 76th Conference of the International Law Association, Draft Arts. 3 and 7.

amongst others.[67] In that line, UNHCR Resolution 18/22 indicates that human rights obligations may inform climate change policy and that climate change must not be permitted to deprive people of means of subsistence.[68] The UN Human Rights Council Resolution 47/24 in July 2021 reiterated its ongoing position that climate impacts have direct and indirect implications for the effective enjoyment of human rights, and those impacts will be most acute for people particularly vulnerable due to geography, disability, gender, age, and other factors.[69]

Not only will climate change impact individuals' exercise of human rights, but states have a positive obligation to adapt to avert predictable climate impacts—particularly those leading to violations of non-derogable human rights such as the rights to life and health.[70] The UN body monitoring compliance with the International Covenant on Economic, Social and Cultural Rights (ICESCR) has stated that failure to prevent foreseeable human rights harm caused by climate change breaches the ICESCR and Articles 55 and 56 of the UN Charter.[71] As of July 2021, the ICESCR had 171 parties, including the vast majority of states parties to the LOSC.[72] International courts have found states liable for failing to avert foreseeable dangers or risks. In the *Corfu Channel Case*, for instance, the ICJ held Albania responsible not for the act of laying mines in its territorial waters but for the consequences of those mines.[73] Furthermore, states may be liable for failing to protect against foreseeable environmental threats impacting individual human rights. In *Budayeva and Others vs. Russia,* the European Court of Human Rights determined that Russian authorities violated human rights in failing to respond to or inform the public in advance of known environmental problems that resulted in loss of life.[74]

States adapting to climate change could also arguably be considered a developing international custom. In practical reality, states will respond to respond to changing climate

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[67] "Climate Change and Human Rights," United Nations Environment Programme; Columbia University, Sabin Center on Climate Change Law (2016), p. 1.
[68] Human Rights Council, Human rights and climate change, *Resolution adopted by the Human Rights Council*. United Nations General Assembly (17 October 2011), A/HRC/RES/18/22.
[69] Human Rights Council, Human rights and climate change. *Resolution adopted by the Human Rights Council,* United Nations General Assembly. (13 July 2021), A/HCR/47/L.19.
[70] See UN Human Rights Committee, 1984, General Comment No. 14: Article 6 (Right to Life) Nuclear Weapons and the Right to Life, 9 November 1984, UN Document HR1/GEN/1/REV.9 (Vol. I).
[71] Committee on Economic, Social and Cultural Rights, Climate change and the International Covenant on Economic, Social and Cultural Rights: Statement of the Committee on Economic, Social and Cultural Rights (8 October 2018), E/C.12/2018/1*, p. 2 [5].; & Charter of the United Nations (18 April 1946; in force 24 October 1945) (UN Charter), Arts. 55-56.
[72] International Covenant on Economic, Social and Cultural Rights. (16 December 1966, in force 3 January 1976) (ICESCR). UNTS Vol. 993, p. 3.
[73] *Corfu Channel (United Kingdom v Albania)* (Merits), 1949, ICJ Rep. 4.; For a thorough examination of states' human rights obligations regarding climate change, see Wewerinke-Singh, Margaretha (2018). Attributing Climate Change-Related Conduct to States. In *State Responsibility, Climate Change and Human Rights Under International Law*, pp. 1–190, and 85-96 in particular.
[74] See *Budayeva and Others v Russia* (2008) (App. No. 15339/00) Eur. Ct. H.R., pp. 29-30 [147-160].

conditions to protect vital state interests (like vulnerable economic assets), and they are indeed doing so. A global review of national legislation found that 170 countries have enacted adaptation measures by 2019.[75] As Harrison notes, the ICJ determined in the *North Sea Continental Shelf Cases*, that a conventional rule can quickly develop a customary rule provided that state practice included that of "specially affected" states.[76] Determination of "specially affected" is dependent on context, and international climate law emphasizes the importance of climate action for developing and climate-vulnerable states.[77] Notably, 120 out of 153 developing countries had engaged in adaptation planning by October 2019—increasing nearly 20 percent from 2018.[78] Beyond the practical necessity of doing so, that states' have engaged in legalized processes under the UNFCCC in line with their treaty obligations may be taken as evidence of *opinio juris*—that states feel legally obliged to do so.

Adaptation as an International Cooperative Obligation

States are further obliged to cooperate in facilitating international climate adaptation with a particular emphasis on the adaptation needs of developing and climate-vulnerable states. Though the local nature of adaptation might support the notion that States' adaptive obligations end at their borders, this perception misses the necessity of cooperation, which may accelerate adaptation by synchronizing regional strategies and spreading best practices and technologies.[79] And given that climate adaptation can entail negative consequences—an issue known as "maladaptation"—states must cooperate to avoid adverse transboundary effects.[80] Climate change's scale entails that impacts well beyond the capacity of some vulnerable states to handle, while many of those states contributed little to the overall issue of climate change. In those cases, international cooperation may prove vital to guaranteeing human security.

Adverse climate impacts will affect states unequally, varying by geography and according to the level of defenses states can afford to deploy. While developed states may be capable of building expensive seawalls, developing states may not, leaving vulnerable

[75] Nachmany, M., Byrnes, R., & Surminski, S. (2019). (rep.). National laws and policies on climate change adaptation: a global review. London, UK: London School of Economics and Political Science, p. 2.
[76] See Harrison, James. (2008). Evolution of the law of the sea: developments in law-making in the wake of the 1982 Law of the Sea Convention. The University of Edinburgh., p. 51 referencing *North Sea Continental Shelf Case* (Germany v. Denmark; Germany v. Netherlands), Judgment of 20 February 1969, ICJ Reports 1969, p. 42 [73].
[77] Paris Agreement, Art. 7.
[78] Crawford, A., & Church, C. (2020). (rep.). The NAP Process and Peacebuilding. NAP Global Network, p. 6.
[79] For an overview of the reasoning underpinning cooperation on adaptation, see Carlarne et al. (2016), pp. 18-21.
[80] See Scheraga, J., & Grambsch, A. (1998). (rep.). Risks, opportunities, and adaptation to climate change. United States Environmental Protection Agency, Washington, DC. pp. 92–93.

populations to cope with an issue not of their making. This relative disparity of responsibility and resources is recognized in the principle of "common but differentiated responsibilities and respective capabilities" (CBDR-RC), as embedded in climate treaties. The UNFCCC states,

> [… The] global nature of climate change calls for the widest possible cooperation by all countries and their participation in an effective and appropriate international response, in accordance with their common but differentiated responsibilities and respective capabilities and their social and economic conditions.[81]

Developed states have more responsibility for climate action, which as Rajamani argues, builds on the polluter-pays principle obliging those responsible for pollution to cover its costs.[82]

CBDR-RC applies to both mitigation and adaptation, but it does not establish liability requiring developed states to compensate others for climate damages.[83] Developing states pushed unsuccessfully for liability to receive equal status with adaptation and mitigation in climate law, but liability seems to have fallen within the adaptation regime. The Warsaw International Mechanism for Loss and Damage Associated with Climate Change Impacts (Warsaw Mechanism) was established under the CAF, and it is tasked with *inter alia* facilitating support of actions addressing losses associated with climate impacts.[84] The Paris Agreement, which focused on voluntary nationally determined contributions rather than hard national commitments, indicates that the Warsaw Mechanism is non-binding.[85] Though CBDR-RC does not necessarily entail explicit commitments to facilitate international adaptation, CBDR-RC is still important to the interpretation of states' obligations under climate law.

As with the individual state obligation to adapt, a cooperative adaptation obligation may be identified in climate treaties. Article 4(1)(b) commits states to formulate and implement appropriate regional programmes containing measures to facilitate adaptation. More explicitly, Article 4(1)(e) reads that states shall cooperate in preparing for adaptation.[86] As Jakobsen notes,

> It follows from Article 4(1)(e) that the parties are obliged to cooperate 'in preparing for adaptation to the impacts of climate change', and more specifically to 'develop and elaborate

[81] UNFCCC, *Preamble.*
[82] See Rajamani, Lavanya. (2000). The Principle of Common but Differentiated Responsibility and the Balance of Commitments under the Climate Regime. *Review of European Community & International Environmental Law*, 9(2), 120–131.
[83] UNFCCC, Arts 3(1), 4(1), and 4(3); see Eckersley, Robyn (2015). The common but differentiated responsibilities of states to assist and receive 'climate refugees' *European Journal of Political Theory*, 14(4), pp. 481–500.
[84] Decision 2/CP.19, Action taken by the Conference of the Parties at its nineteenth session, UNFCCC, FCCC/CP/2013/10/Add.1 (2014), pp. 6-8.
[85] See Paris Agreement, Art. 8.
[86] UNFCCC, Art. 4(1)(e).

appropriate and integrated plans for coastal zone management . . . and for the protection and rehabilitation of areas.'[87]

Furthermore, Article 4(8) explains that these commitments should be implemented considering the needs of small island countries and those with low-lying coastal areas, areas prone to natural disasters, and areas with fragile ecosystems.[88] The full scope of this obligation is not enumerated, but it may include *inter alia* financial support and information- and technology sharing.[89]

Article 10 of the Kyoto Protocol reaffirms and slightly expands on states' cooperative obligations under the UNFCCC, referencing some additional measures states may take in cooperating on climate adaptation. For instance, Article 10 expands on UNFCCC Article 4 obligation to formulate, implement, and regularly update regional programmes (where appropriate), referencing adaptation technologies and spatial planning as areas of potential cooperation. It further references cooperation regarding adaptation technology and knowledge sharing, and international capacity building. Additionally, Article 11 indicates that financial assistance is significant to states' cooperative adaptation obligations.[90]

Parallel to the developing international focus on adaptation, the Paris Agreement goes beyond either the UNFCCC or the Kyoto Protocol in elaborating on states' adaptation obligations. Article 7 enumerates that the global goal on adaptation is to enhance adaptive capacity, strengthen resilience, and reduce vulnerability to climate change. Article 7(5) acknowledges that adaptation should follow a country-driven approach designed to integrate adaptation with relevant policy frameworks, but it further recognizes the importance of international cooperation on adaptation efforts—particularly for developing climate-vulnerable states.[91] Regarding these cooperative aspects, the Agreement holds that States Parties should increase cooperation with measures that include, *inter alia,* sharing information and best practices, strengthening institutional arrangements to share technical guidance, scientific knowledge sharing, and adaptation practices sharing.[92] This is not a conclusive list, and the Agreement indicates that states should generally strengthen cooperation regarding "[i]mproving the effectiveness and durability of adaptation actions".[93] The Paris Agreement reiterates past

[87] Jakobsen (2020), p. 244.
[88] UNFCCC, Art 4(8).
[89] See *ibid.,* Arts. 4(1)(h), 4(4), & 4(9).
[90] Kyoto Protocol, Art. 10(b-e) & 11
[91] See Paris Agreement, Art. 7(5-6).
[92] See *ibid.*, Art. 7(7).
[93] *Ibid.*, Art. 7(7)(e).

calls for enhanced international support for developing countries regarding adaptation, but it goes further in elaborating on financial assistance to vulnerable states.[94]

Beneath the level of specific state obligations as laid out in international climate agreements, a body of soft law supports the concept that states have a general obligation to cooperate in adapting to climate change. Article 7(2) of the Paris Agreement for instance recognizes that adaptation is a global challenge with regional and international dimensions and that cooperation is a key aspect of protecting against climate change's impacts on people, livelihoods, and ecosystems.[95] Article 7(6) further notes that cooperation is particularly important for developing countries, particularly those that are highly vulnerable to climate change. Along this line, Article 7(7) of the Paris Agreement holds that states should recognize the Cancun Adaptation Framework in strengthening cooperation on enhancing adaptation.[96] Part I of the CAF enumerates a shared vision for long-term cooperative action affirming that States Parties should cooperate to enable adaptation, and that building developing country capacity to adapt is critical to the UNFCCC.[97] Part II of the CAF holds that,

> [… International] cooperation on adaptation is urgently required to enable and support the implementation of adaptation actions aimed at reducing vulnerability and building resilience in developing country Parties, taking into account the urgent and immediate needs of those developing states that are particularly vulnerable.[98]

It requests that developed states, considering the needs of the climate-vulnerable, provide scaled-up, long-term resources to facilitate both local and regional adaptation plans, programmes, and projects. Furthermore, it attempts to set up structures to facilitate international information- and technical guidance sharing and to monitor global adaptation efforts.[99]

The work of the ILA explicitly supports the concept that states must cooperate in adapting to climate change. The Sydney Declaration of Principles on the Protection of Persons Displaced in the Context of Sea Level Rise explicitly recognizes a cooperative adaptive obligation in the LOS regime. Principle 4, "The Duty to Cooperate," entails that states are obliged to assist vulnerable states with climate adaptation.[100] Notably, the ILA holds that this

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[94] See Paris Agreement., Arts. 7(13), 9(1), & 9(5).
[95] See *ibid.*, Art. 7(2).
[96] Paris Agreement, Art. 7(7).
[97] Cancun Adaptation Framework, p. 3.
[98] *Ibid.*, p. 4 [11].
[99] See *Ibid.*, pp. 5-6 [18, 20, 25, & 30].
[100] Sydney Declaration, Principle 4.

principle can be derived from existing legal provisions and/or frameworks.[101] The ILA Declaration of Legal Principles Relating to Climate Change enumerates similar principles. Article 10 is specific to the law of the sea, and it holds that States should apply, interpret, and enforce their rights and obligations under the LOSC in a manner facilitating adaptation.[102] Similarly, Article 5 indicates that states have a responsibility to cooperate in developing an equitable climate regime subject to CBDR-RC. This regime includes adaptation, and developed states are to assist climate-vulnerable states in adapting.[103] Article 6 further calls on states to take full account of the special circumstances and needs of small island and other climate-vulnerable developing states. Article 8 focuses exclusively on international cooperation on climate change action, including adaptation. It calls on states to cooperate in good faith on addressing climate change's adverse effects (which includes adaptation), indicating that developed countries have a responsibility to assist developing countries. One aspect of this cooperative obligation is that states are to develop legal and institutional frameworks of international law to address climate change's adverse effects.[104] Along this line, Article 10 calls on states to formulate and implement climate law in a mutually supportive manner with other relevant international law; furthermore, this specifically references the relationship of climate law and the law of the sea regimes.[105]

The human rights regime obliges states to adapt to protect their citizens' individual human rights. Similar reasoning provides grounds for arguing that states are obliged to cooperate to protect the human rights of climate-vulnerable people beyond their borders. The UN Human Rights Committee has repeatedly recognized linkages between climate change and human rights, including the necessity of cooperation. It further emphasizes cooperation as necessary to enable implementation of the UNFCCC.[106] Additionally, the ICESCR entails a positive obligation for states to act, including through cooperation, to realize the human rights recognized in the convention. [107] According to the UN Office of the High Commissioner for Human Rights (OHCHR), this constitutes a cooperative obligation requiring states to assist and cooperate, depending on resources, to facilitate the fulfillment of human rights in other states, including

[101] See Declaration of Legal Principles Relating to Climate Change, *preamble*.
[102] Declaration of Legal Principles Relating to Climate Change, Draft Art. 10.
[103] *Ibid.*, Draft Art. 5.
[104] *Ibid.*, Draft Art. 8.
[105] *Ibid.,* Draft Art. 10(1).
[106] See Human Rights Council (2021), p. 1.
[107] See ICESCR, Art. 2.

through disaster relief, emergency assistance, and assistance to displaced people.[108] Climate adaptation arguably falls within the parameters of that enumerated obligation, which the OHCHR has further emphasized is consistent with CBDR-RC and the UNFCCC.[109]

The human rights regime generally holds states responsible for the human rights of citizens within their borders. Knox holds that this complicates its applicability to climate issues given the difficulty of extending human rights law to harms occurring outside the responsible state's borders.[110] On the other hand, Knox notes the duty to cooperate in Article 56 of the UN Charter, and the duty obligation to cooperate in the promotion of and observance of human rights in Article 55.[111] While this may not provide forceful grounds for imposing adaptation duties on states regarding the rights of citizens in other states, multiple commentators have argued that developed states hold some responsibility for persons in developing states suffering the adverse effects of developed states' failure to mitigate climate change—particularly in light of CBDR-RC.[112] Cullet, for instance, emphasizes that the ecological aspect of climate adaptation is relevant to states' obligations to protect the environment beyond their borders: "If there is a human right to environment, the corresponding duties will be for States to prevent the impacts of climate change that, at the same time, assist in the realization of human rights".[113]

The Content of Adaptation Obligations

The adaptation regime is still developing, but this thesis holds that it still entails a level of legal obligation for states to individually adapt to climate change and to generally cooperate in facilitating international adaptation. The purpose of this regime is, ultimately, to safeguard human security against adverse climate impacts, and it involves adapting both human and ecological systems. While arguably constituting developing international rules, they involve relatively imprecise obligations compared to the mitigation regime, and their contents are still evolving. States may be obliged to engage in adaptation, but how they do so seems discretionary.

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[108] Office of the High Commissioner for Human Rights, Report of the Office of the High Commissioner for Human Rights on the Relationship Between Climate Change and Human Rights, UN Doc. A/HRC/10/61, Jan. 15, 2009, p. 28 [86].
[109] *Ibid.*, para. 87.
[110] See Knox, John H. (2009). Linking human rights and climate change at the United Nations. *The Harvard Environmental Law Review*: HELR, 33(2), 477., p. 167.
[111] *Ibid.*, p. 168; & UN Charter, Art. 55.
[112] See Hall, Margaux J, & Weiss, David C. (2012). Avoiding adaptation apartheid: climate change adaptation and human rights law. *The Yale Journal of International Law*, 37(2), p. 344.
[113] Cullet, Philippe, Limitations of Addressing Climate Change through the Human Right to Environment, in *The Oxford Handbook of International Climate Change Law*, p. 509.

The Paris Agreement is most explicit regarding the contents of states' individual adaptation obligations. It requires states to engage in adaptation planning processes and implement adaptation measures as appropriate. Furthermore, states are obliged to submit and update international communications regarding their adaptation plans. Adaptation efforts generally fall within the Paris Agreement's cross-cutting provision holding that all climate efforts will progressively increase over time.[114] States' cooperative obligation to facilitate international adaptation, particularly from developed countries to climate-vulnerable developing states, is less defined than states' national obligations. Climate treaties do not fully enumerate what this entails but list areas of possible cooperation, such as coastal zone management.[115] The Paris Agreement enumerates key elements for enhancing cooperation on adaptation, detailing information- and financial resource-sharing aspects. These measures may be characterized as collective duties entailing some level of obligation by individual states. Furthermore, these measures do not comprise the totality of states' cooperative obligations, particularly given that the Paris Agreement must be understood to be expanding an already extant adaptation regime.[116] As Perez and Kallhauge note, "Under the Convention, parties already had an obligation to cooperate in preparing for adaptation to the impacts of climate change".[117]

While the content of states' adaptation obligations remains relatively discretionary, their fulfillment—and indeed the development of the regime more broadly—remains subject to the general principles of environmental law and to developing norms and standards under the climate law regime. For instance, the principles of equity and CBDR-RC are central to general climate change law, while legal scholars have also noted the applicability of additional principles and concepts, such as precaution, polluter pays, and intergenerational equity.[118] The Paris Agreement applies additional principles to the adaptation regime. Article 7(5) holds,

> Parties acknowledge that adaptation action should follow a country-driven, gender-responsive, participatory and fully transparent approach, taking into consideration vulnerable groups, communities and ecosystems, and should be based on and guided by the best available science and, as appropriate, traditional knowledge, knowledge of indigenous

[114] See Paris Agreement, Arts. 9-10 & 3.
[115] See UNFCCC, Art. 4.
[116] See Perez, Irene Suarez, & Kallhauge, Angela Churie. Analysis of the Provisions of the Agreement: Adaptation, in Klein, D., Carazo, M.P., Doelle, M., Bulmer, J., & Higham, A. (2017). *The Paris Agreement on Climate Change: Analysis and Commentary*. Oxford University Press, Incorporated., pp. 196-224.
[117] *Ibid.* (2017), p. 211.
[118] Paris Agreement, Art. 2(2); see also Calarne et al. (2016), pp. 14-16.

peoples and local knowledge systems, with a view to integrating adaptation into relevant socioeconomic and environmental policies and actions, where appropriate.[119]

Beyond these stated principles, additional norms specific to adaptation seem likely to develop. Craig and Ruhl have discussed potential principles of climate adaptation law, and the ILA's Declaration of Legal Principles Relating to Climate Change may provide additional guidance.[120] Soft law instruments such as the Cancun Adaptation Framework may also provide guidance by detailing appropriate measures to fulfill adaptation obligations, such as vulnerability and impact assessments, strengthening institutional capacity to enable adaptation, enhancing disaster risk reduction strategies, and improving public awareness.[121]

Clarity regarding the content of the adaptation regime seems likely to emerge as adaptation attracts increasing international attention. While the regime continues to develop, an obligation need not be highly precise to carry legal weight. For instance, the extent of states' general obligations to protect and preserve the marine environment under LOSC Article 192 is not precise. Nevertheless, states' general obligation to protect and preserve the marine environment is still legally binding for states parties, and the understood content and scope of Article 192 have developed since the LOSC came into force.[122] Though comparatively imprecise, adaptation obligations should be understood as developing hard legal obligations.

Adaptation Obligations as Obligations *Erga Omnes*

Though the full scope and content of states' adaptation obligations are developing, these duties may be of *erga omnes* character. Obligations *erga omnes* are universal duties based on common values and interests owed to the entire international community. They arise when an issue, given its significance or character, must be managed collectively and on behalf of the international community.[123] The most recognized obligations *erga omnes* are found in the human rights regime, including prohibitions on extreme acts such as slavery. These typically also

[119] Paris Agreement, Art. 7(5).
[120] See Craig, R.K. (2010), pp. 9-69.; Ruhl (2010), pp. 363-435.; & Declaration of Legal Principles Relating to Climate Change (2014).
[121] See Cancun Adaptation Framework, Part II, pp. 4-7.
[122] Note the Arbitral Tribunal's clarification of Article 192 in the *South China Sea Arbitration* award from pp. 373-376. See also Kojima, Chie. (2017). South China Sea Arbitration and the Protection of the Marine Environment: Evolution of UNCLOS Part XII Through Interpretation and the Duty to Cooperate. *Asian Yearbook of International Law,* 2017*,* Vol. 21, pp. 166-180.
[123] Fragmentation of International Law: Difficulties Arising from the Diversification and Expansion of International Law; Report of the Study Group of the International Law Commission, Finalized by Martti Koskenniemi. ILC Study Group on the Fragmentation of International Law. UN Doc A/CN.4/L.682 and Add.1 and Corr. 1. New York, International Law Commission (2006) (ILC Fragmentation Report), p. 198 [391].; see also Sciaccaluga, Giovanni. (2020). The erga omnes Obligation to Mitigate and Manage Climate Change. In *International Law and the Protection of "Climate Refugees,"* pp. 97-98.

represent *jus cogens* norms; however, while *just cogens* norms are by nature also obligations *erga omnes,* the reverse is not necessarily true. Obligations need not rise to the level of *just cogens* norms to be considered *erga omnes*, though they do not necessarily have the clear superiority over other obligations that *jus cogens* norms do.[124]

Most recognized obligations *erga omnes* derive from the human rights regime, and that may include a collective obligation to the environment. The Inter-American Court of Human Rights' advisory opinion supported the existence of an individual and collective right to a healthy environment. "In its collective dimension, the right to a healthy environment constitutes a universal value that is owed to both present and future generations".[125] Robinson notes that 178 national constitutions recognize a right to the environment, arguing that the duty to protect the environment is of *erga omnes* character if not yet a peremptory norm.[126] The ILC has also discussed obligations "of essential importance for the safeguarding and preservation of the human environment, such as those prohibiting massive pollution of the atmosphere or of the seas" as *jus cogens* norms, which would by nature also confer *erga omnes* character.[127]

States' obligations to the environment are not necessarily dependent on human rights, however. The ICJ judgment in the *Gabcikovo-Nagymaros Case* framed protection of the environment as an issue significant for the whole of mankind, and Vice-President Weeremantry's separate opinion further focused on environmental damage as an issue with an *erga omnes* character.[128] Boyle, based on the ICJ *Whaling Case* judgment, argues that while not all environmental treaties may be considered of *erga omnes character*, the *South China Sea Arbitration* indicates that environmental protection obligations under LOSC Part XII are of *erga omnes* character.[129] The International Tribunal for the Law of the Sea's (ITLOS) advisory

[124] Koskenniemi., pp. 404-406.
[125] *Advisory Opinion OC-23/17 of November 15, 2017 Requested by the Republic of Colombia: The Environment and Human Rights*, Inter-American Court of Human Rights (IACrtHR), p. 21 [48].
[126] Robinson, Nicholas A. *Environmental Law: Is an Obligation* Erga Omnes *Emerging?* Panel Discussion at the United Nations, Permanent Mission of Colombia to the United Nations, 2017. Notes available online: https://www.iucn.org/sites/dev/files/content/documents/2018/environmental_law_is_an_obligation_erga_omnes_emerging_interamcthradvisoryopinionjune2018.pdf
[127] Fifth report on state responsibility by Roberto Ago, UN Doc. A/CN.4/291 and Adds.1 & 2 (1976), 2nd Yearbook of the International Law Commission Part 1 and 3, UN Doc. A/CN.4/SER.A/1976/Add.1, draft Article 19(d).
[128] See *Case Concerning the* Gabcikovo-*Nagymaros Project* (Hungary/Slovakia), *Judgment*, ICJ Reports 1997, (*Gabcikovo-Nagymaros Case* Judgment), p. 53. & Separate Opinion of Vice-President Weeremantry, pp. 114-117.
[129] See Boyle (2019), p. 477.; & *South China Sea Arbitration (The Republic of Philippines v. The People's Republic of China)* [2016] PCA Case no. 2013–19, pp. 119-120 [281-289] & 136-137 [317-321].

opinion relating to states' obligations in the Area also held that duties to protect and preserve the marine environment were of *erga omnes* character.[130]

States have an obligation *erga omnes* to protect the environment, and adaptation must be considered a critical component to fulfilling that obligation in light of climate change. Indeed, climate treaties have repeatedly emphasized that adaptation is a crucial aspect of protecting ecosystems from adverse climate effects.[131] As Boyle notes, the UNFCCC holds that parties should take precautionary measures to mitigate and adapt to climate change. Given the potential of serious or irreversible environmental risks, the precautionary principle or approach would support the case that states should adapt to climate change to protect the environment.[132] Furthermore, while obligations *erga omnes* typically derive from human rights instruments, they may certainly derive from climate treaties. The ICJ held in the *Barcelona Traction Case* that some obligations *erga omnes* may be conferred by international instruments of a universal or quasi-universal character.[133] Similarly, the *Institut de Droit International* has stated that obligations *erga omnes* may derive from multilateral treaties given common values and concerns.[134] With virtually universal membership, the UNFCCC is a multilateral instrument or treaty from which obligations *erga omnes* could be derived. Zemanek, in exploring the development and enforcement of such duties, argues explicitly that environmental obligations under the UNFCCC and other environmental treaties are of *erga omnes* character.[135] Verheyen and Zengerling similarly note that climate action obligations under the UNFCCC, given its universal acceptance, could constitute obligations *erga omnes.*[136]

Though mitigation and adaptation may both be significant to the fulfillment of states' environmental duties, the adaptation regime includes not only ecological adaptation but also the societal and legal measures necessary to adapt human systems. As Sciaccaluga notes, there are non-environmental grounds to consider adaptation obligations as of *erga omnes* character.

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[130] *Responsibilities and obligations of States with respect to activities in the Area*, Advisory Opinion, 1 February 2011, ITLOS Reports 2011, p. 59 [180].
[131] See Paris Agreement, Art. 7(2).; see also UNFCCC, *preamble.*
[132] UNFCCC, Art 3(3).; see also Boyle (2019), pp. 458-481.
[133] See *Case concerning the Barcelona Traction, Light and Power Company, Limited* (Belgium v. Spain) (Second Phase) ICJ Reports 1970, p. 32.
[134] Obligations and Rights Erga Omnes in International Law, Institut de Droit International, the Krakow Session, Annuaire de l'Institut de Droit International (2005), Art. 1.
[135] Zemanek, Karl. (2000). New Trends in the Enforcement of erga omnes Obligations. *Max Planck Yearbook of United Nations Law*, 4(1), pp. 5-6.
[136] See Verheyen, Roda. & Zengerling, Cathrin, International Dispute Settlement in *The Oxford Handbook of International Climate Change Law*, pp. 429-430

Climate change impacts every state and inflicts severe socio-political consequences that risk upsetting the functioning of the entire international system. As such, establishing national and international adaptation policies is an obligation *erga omnes* aiming to protect the fundamental and essential interests of the international community.[137] The human rights regime is again relevant here as climate adaptation is significant to fulfilling minimum human rights in climate-vulnerable areas, lending adaptation to further *erga omnes* consideration. As such, adaptation is an obligation with *erga omnes* character when applied to either ecological or human systems.

As a practical matter, adaptation obligations *erga omnes* provide legal standing to any state to invoke the responsibility of states violating either their national or cooperative duties to adapt to climate change at international courts or tribunals.[138] Per Article 48(1)(b) of the ILC's Articles on the Responsibility of States for Internationally Wrongful Acts (ARSIWA), any state is entitled to invoke another state's responsibility where that state breaches an obligation owed to the international community as a whole.[139] Article 12 indicates that a breach of an international obligation requires a state action out of conformity with the requirements of that obligation. Given that adaptation entails a positive obligation to act nationally and internationally to address climate change's adverse impacts, non-response must be understood to be an act constituting a breach of adaptation obligations.[140] Furthermore, adaptation obligations as obligations *erga omnes* may be relevant to the LOS regime. According to the ILC, regimes such as the law of the sea ("self-contained regimes") may not deviate from general law on state responsibility where the obligations have *erga omnes* character.[141] Though obligations *erga omnes* do not carry the weight of *jus cogens* norms, they thus remain relevant to interpreting and applying the LOSC.

Chapter III: Development of the Law of the Sea in Response to Climate Law

Evolutionary Capacity of the LOSC

The evolution of climate change rules and norms, including the adaptation regime, seems an important international legal development, but how are such developments relevant to the law of the sea? The LOSC is a legal framework designed to settle issues relating to the LOS in

[137] Sciaccaluga (2020), p. 101.
[138] Koskenniemi, p. 197 [389].
[139] International Law Commission, Draft Articles on Responsibility of States for Internationally Wrongful Acts (2001), Supplement No. 10 (A/56/10), chp.IV.E.1., Art. 48(1)(b).
[140] See *ibid.*, Art. 12.
[141] See Koskenniemi, p. 82.

tandem with broader developments in international law.[142] That it provides little clarity on climate issues effectively necessitates the regime's further development.[143] To this end, it has various mechanisms to incorporate and address new governance issues as they emerge, allowing the regime to develop in response to changing global conditions and emerging international needs, rules, and practices.[144] Not all of these "evolutionary pathways" are equally suited to considering legal adaptation obligations, however. With an eye *de lege ferenda*, the LOSC should facilitate systematic consideration of climate adaptation needs throughout the convention. Reforming specific articles or regimes within the LOSC to address individual climate issues may fail to address the myriad of other ways in which climate change stresses oceans governance. The variable and continuously manifesting nature of climate change entails that consideration of adaptation should be an ongoing process, or at least adaptive to changing conditions. As Vidas et al. note, climate change impacts the conditions and context within law systems operate, requiring that those systems fundamentally adapt. "International law will not be able to respond adequately by simply amending some rules or adding new ones: systemic change is necessary".[145]

One evolutionary pathway to facilitate systematic and continuous consideration of climate adaptation obligations is direct amendment as outlined in LOSC Articles 312-316.[146] Directly amending the LOSC would allow the treaty to incorporate climate considerations; however, it seems highly unlikely that it would serve as an effective mechanism for the LOSC to integrate climate considerations. Direct amendment has never been successful due to the procedural and political difficulties inherent in rewriting the law of the sea, which would be doubly complicated by the traditionally contested political considerations of climate action.

Another suboptimal mechanism for the convention to integrate new climate change-related international rules and practices is via "rules of reference" that oblige states parties to abide by "generally accepted international rules and standards" (GAIRAS). The LOSC generally avoids detailing specific standards for oceans governance, leaving substantive regulation to rulemaking by competent international organizations instead. Though GAIRAS provide a

[142] See Boyle, Alan. (2005). Further Development of The Law of The Sea Convention: Mechanisms for Change. *The International and Comparative Law Quarterly*, 54(3), pp. 563-565.; See LOSC, *Preamble*.; see also Jakobsen et al. (2020), pp. 376-377 & 382.
[143] See Redgwell (2019), pp. 455-457.
[144] See Separate Opinion of Judge Lucky, *Request for Advisory Opinion submitted by the Sub-Regional Fisheries Commission* (Advisory Opinion, 2 April 2015) ITLOS Reports 2015, p. 93 [12].
[145] Vidas et al. (2020), p. 46.
[146] LOSC, Arts. 312-316.

flexible mechanism to integrate new binding international rules, they are not necessarily suited to integrating entire new bodies of climate change-related international law with the LOSC. GAIRAS are only invoked in certain articles (rather than universally throughout the convention), limiting their efficacy to systematically integrate developing adaptation rules, and indeed, only a single climate change-focused GAIRAS appears to have emerged.[147]

The LOSC may also evolve through supplementary agreements, including via the two 'implementing' agreements—the 1994 Agreement relating to Part XI and the 1995 UN Fish Stock Agreement.[148] As Boyle notes, such agreements may interpret or develop existing LOSC provisions, and furthermore, "They also provide alternative models for what is in effect, although not in form, *inter se* amendment of the Convention".[149] Indeed, a supplementary or implementing agreement might be an effective avenue for the LOSC to develop in response to emerging climate law by either reforming parts of the LOSC or by laying out a framework to systematically address climate considerations throughout the convention. This possibility has garnered attention from both scholars and states. Dahl for instance has proposed a binding legal instrument containing measures for adapting aquaculture to climate change.[150] Similarly, vulnerable island nations have discussed negotiating an agreement recognizing pre-sea level rise baselines as static to address climate change's threat to maritime zone entitlements.[151]

Such agreements may be impractical or ill-suited given the nature of climate change, however. A limited supplementary or implementing agreement effectively reforming just part of the LOSC may fail to address the full scope of climate change's impact on the LOS. In addition, such agreements may fail to anticipate future problems, potentially locking states into sub-optimal responses requiring repeat or multiple efforts by states parties to address subsequent climate change impacts. Furthermore, reaching expansive agreements intended to permit systematic consideration of climate change may be impractical, complicated by the complex political dilemmas inherent in climate negotiations. There indeed seems to be little interest from

[147] See *ibid.*, p. 450 citing the 1973 International Convention for the Prevention of Pollution from Ships and 1978 Protocol (MARPOL 73/78) (17 February 1978, in force 2 October 1983), 1340 UNTS 62., Annex VI, Part IV.
[148] Agreement for the Implementation of the Provisions 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 (4 December 1995, in force 11 December 2001) 2167UNTS 3; & Agreement relating to the implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982 (28 July 1994, in force 16 November 1994), UNTS Vol.1836, p. 3.
[149] Boyle (2005), p. 565.
[150] See Dahl (2020), p. 308.
[151] See the representative of Tuvalu's statements regarding the Pacific Islands Forum in United Nations General Assembly, Sixth Committee Seventy-Fifth Session, 13th Meeting (AM), GA/L/3626.

states to negotiate a more expansive climate-focused implementing agreement, which would by nature necessitate codification of new climate change-focused rules and norms applicable to the LOSC. For instance, the UN General Assembly tasked the ILC with studying sea-level rise's legal impact, but it restricted the ILC to working within the existing LOS rather than to codify new applicable climate norms and rules. Furthermore, the ILC's work is focused on one aspect of climate change, thus excluding full examination of other climate impacts on the LOSC.[152]

While these mechanisms seem ill-suited to facilitating the LOSC's development in response to climate change, another mechanism may be more appropriate. The LOSC is not isolated from broader international law, and reinterpreting the convention considering climate law may permit the systematic consideration of adaptation needs throughout the convention.

Systematic Interpretation and Systemic Integration of Climate Law

The LOSC is not isolated from the broader international law. As Boyle emphasizes, the LOSC is not an entirely separate regime. "At numerous points it makes reference to rules of general international law or incorporates generally accepted international rules and standards derived mainly from other treaties".[153] Indeed, the LOSC's interfacing with other agreements allows it to evolve beyond the convention's original scope—a process informed by rules of treaty interpretation. Boyle notes, "[the LOSC] must also be interpreted and applied in accordance with the normal rules of treaty law, including those which allow other agreements and rules of international law to be taken into account for this purpose."[154]

Indeed, systematic interpretation provides a significant but less defined evolutionary pathway by which the LOSC may evolve in response to developing adaptation rules. This process is informed by the convention text, climate change law, and rules of treaty interpretation. Jakobsen et al. emphasize the importance of interpretation to the development of the LOSC.

> First, systemic interpretation of the relevant instruments in light of new practice and changing circumstances is an important task for scholars. Through their work, dynamic interpretation of the LOSC may be developed and the relevant regulations and instruments may be interpreted and read together, in a way that creates linkages between the different regimes.[155]

[152] See International Law Commission, Report of the International Law Commission on the work of its seventy-first session. Resolution adopted by the General Assembly on 18 December 2019, 74/186, Res. 4(d).
[153] Boyle (2005), p. 565.
[154] *Ibid.*
[155] Jakobsen et al. (2020), p. 383.

Generally, rules of treaty interpretation indicate that subsequent rules of international law are assumed to be generally compatible with existing law.[156] In this case, however, the LOSC and international climate law (as embodied in the UNFCCC and its related instruments) both bear on managing climate change's adverse effects on the oceans.

In studying the fragmentation of international law, including the development of specified regimes with overlapping rules or norms, the ILC wrote, "In applying international law, it is often necessary to determine the precise relationship when two or more rules and principles that are both valid and applicable in respect of a situation." To do so, the ILC emphasized the importance of rules of treaty interpretation outlined in Articles 31-33 of the Vienna Convention on the Law of Treaties (VCLT).[157] In particular, Article 31 of the VCLT enumerates that interpretation of a convention should consider its object and purpose, subsequent agreement or practice, and relevant rules of law applicable between the parties.[158]

Article 31(1) states, "A treaty shall be interpreted in good faith in accordance with the ordinary meaning to be given to the terms of the treaty in their context and in the light of its object and purpose".[159] While interpretation begins with the "ordinary meaning" of the treaty's text, it must also consider the treaty's "object and purpose." The purpose of a convention cannot override its text, but its terms should be interpreted in a manner furthering the convention's overall aims.[160] In this case, the LOSC's aims include addressing future issues, which seems to clearly include climate change.[161] As such, emerging climate change-related norms and rules, including those related to adaptation, seem significant to interpreting the terms of the LOSC.

Similarly, Article 31(3)(c) of the VCLT indicates that treaty interpretation should consider "any relevant rules of international law applicable in the relations between the parties".[162] Harrison writes of Article 31(3)(c), "This provision promotes the systemic integration of a treaty with other sources of international law. It also allows a court or tribunal to take into account changes in international law, policy or values which may influence the interpretation of

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[156] See Koskenniemi, p. 25-28.
[157] International Law Commission, Difficulties Arising from the Diversification and Expansion of International Law (ILC Study Group Conclusions on Fragmentation), Study Group on the Fragmentation of International Law, *Yearbook of the ILC*, 2006, Vol.II.II, A/61/10, p. 177 [2-3].
[158] VCLT, Art. 31.
[159] *Ibid.,* Art. 31(1).
[160] See Lo, Chang-Fa. (2017). Treaty Interpretation under the Vienna Convention on the Law of Treaties. *Springer Singapore Pte.* Pp. 179-190.; see also Gardiner, Richard K. (2015), Applying the Vienna Convention on the Law of Treaties: 'Object and Purpose' in Treaty Interpretation (second edition). *Oxford University Press*, pp. 211-222.
[161] See Redgwell (2019), 446-448.
[162] VCLT, Art. 31(3)(c).

a treaty".[163] Indeed, the principle of systemic integration is embodied in Article 31(3)(c), which as explained by McLachlan, asserts that all treaties are products of international law and must thus be applied and interpreted in light of general international legal principles.[164] In the *NATO Bombing Case* for instance, the European Court of Human Rights ruled, "The [European Convention for Human Rights] should be interpreted as far as possible in harmony with other principles of international law of which it forms part".[165] This principle helps to avert conflicts of norms and achieve harmonization between rules of international law, particularly those coming from disparate special areas of law.[166] Generally, where different norms or rules apply to a single issue, they should be interpreted so as to give rise one set of compatible obligations.[167]

Given that the LOSC is evolutionary in nature, providing a framework to address future issues in the law of the sea, it should be interpreted in a manner that permits the systemic integration of the adaptation regime.[168] Harrison writes of Article 31(3)(c), "This provision promotes the systemic integration of a treaty with other sources of international law. It also allows a court or tribunal to take into account changes in international law, policy or values which may influence the interpretation of a treaty".[169] Indeed, courts and tribunals have supported evolutionary interpretation, indicating the importance of international law and custom to the interpretation of the LOSC. As the tribunal noted in *South China Sea Arbitration*, the content of coastal states' obligations under the convention is informed by "other applicable rules of international law".[170] Similarly, in the *Gabcikovo-Nagymaros* judgment, the ICJ noted the need to consider and give weight to new norms and standards in international law.[171]

The relevance of Article 31(3)(c) is not limited to interpreting treaties in light of climate law. The article also entails interpreting treaties considering rules found in other treaties, which in this case, would specifically include climate adaptation obligations enumerated in later climate change agreements. Such rules are particularly relevant where the parties of two treaties overlap,

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[163] Harrison (2008), p. 233.
[164] See Mclachlan, Campbell. (2005). The Principle of Systemic Integration and Article 31(3)(c) of the Vienna Convention. *The International and Comparative Law Quarterly*, 54(2), pp. 279–320.
[165] *Decision as to the Admissibility of Application no. 52207/99* (*Bankovic* et al. vs. Belgium et al.), European Court of Human Rights (2001), p. 15 [57].
[166] See McLachlan (2005), p. 318.
[167] ILC Study Group Conclusions on Fragmentation, p. 176 [4].
[168] See Lee, Jing. (2014). 1 The Fragmentation of International Law and Its Integration: Interpretation and Article 31(3)(c) of the 1969 Vienna Convention. In *Preservation of Ecosystems of International Watercourses and the Integration of Relevant Rules* (Vol. 2), pp. 19-55.
[169] Harrison (2008), p. 233.
[170] *South China Sea Arbitration* Award, p. 373 [941].
[171] *Gabcikovo-Nagymaros Case* Judgment, para. 140.

and the UNFCCC has virtually universal membership.[172] That adaptation obligations are open and evolving is also significant to interpreting the LOSC. The ILC writes,

> Rules of international law subsequent to the treaty to be interpreted may be taken into account especially where the concepts used in the treaty are open or evolving. This is the case, in particular, where […] the concept is one which implies taking into account subsequent technical, economic or legal developments[, or] the concept sets up an obligation for further progressive development for the parties.[173]

The adaptation regime is still emerging, and adaptation must by nature consider future developments in human (and ecological) systems. Furthermore, the Paris Agreement requires adaptation actions to be progressive, so the regime will develop as climate change intensifies.[174] Not only does Article 31(3)(c) hold developing climate rules as significant to interpreting the LOSC, but the LOSC should be interpreted considering obligations found in climate treaties.

Assessing Possible Conflicts between Adaptation Obligations and the Law of the Sea

Systematic interpretation of the LOSC indicates that climate law, including adaptation rules, applies to the convention where there is no conflict. However, there may also be cases where the LOSC conflicts with states' adaptation obligations. For example, land reclamation and artificial coastal defenses might be critical to safeguarding vulnerable coastal communities, but such measures can have severe negative environmental externalities. Given the potential violation of states' obligations to protect and preserve the marine environment, the LOSC might hold those coastal defensive measures as unlawful, thus precluding states from important adaptation tools. Where the LOSC seems incapable of balancing conflicting norms and obligations, systematic interpretation of the LOSC applying customary interpretive rules indicates that adaptation obligations may be applicable even where conflicting with the LOSC.

The ILC notes the maxim *lex specialis derogare lege generali* as international custom in interpreting conflicting international law. The *lex specialis* rule suggests that, when two or more norms apply to a subject, interpreters should give priority to the more specific.[175] This can help to apply, clarify, update, or set aside general international law in ways that often better accounts for the specific context of the issue at hand. But the *lex specialis* rule is most helpful in

[172] ILC Study Group Conclusions on Fragmentation, p. 182 [21].
[173] *Ibid.* [23].
[174] See Paris Agreement, Arts. 9-10 & 3.
[175] Koskenniemi, p. 234.

differentiating between general rules and specific rules; in this case, both the law of the sea and international climate law arguably provide rules for an overlapping issue area.[176] While the LOS regime has indeed been referred to as a self-contained legal regime, it has never served as *lex specialis* regarding environmental issues. As Boyle notes,

> Can it plausibly be claimed that the LOSC regulates climate impacts on the oceans in splendid isolation from the Paris Agreement? Other marine pollution agreements provide the evolutionary content for Part XII obligations, including the 1973/78 MARPOL Convention and the London Dumping Convention. Why should the Paris Agreement be different?[177]

Indeed, neither the LOSC nor international climate law, including adaptation obligations, should exclude consideration of other law regarding climate change's impacts on oceans governance.

The *lex posterior rule* may also be significant to deciphering conflicts between the LOSC and climate law. Under the rule *lex posterior derogate legi priori*, Article 30(3) holds that the earlier treaty applies only to the extent that its terms are compatible with those of the later.[178] The UNFCCC and the LOSC overlap in relating to climate change's effects on the oceans, and Article 30 applies to the application of successive treaties relating to the same subject matter. The UNFCCC is a later treaty than the LOSC, and it has virtually universal membership. As such, the *lex posterior* rule indicates that the UNFCCC would apply to ocean governance issues relating to climate change over the LOSC. As the ILC notes, however, the *lex posterior* principle is strongest regarding overlapping or conflicting provisions in treaties either institutionally linked or part of the same regime. While UNFCCC and the LOSC intersect relating to climate change's adverse effects on the oceans, they focus on separate regimes. The ILC writes,

> In cases of conflicts or overlaps between treaties in different regimes, the question of which of them is later in time would not necessarily express any presumption of priority between them. Instead, States bound by the treaty obligations should try to implement them as far as possible with the view of mutual accommodation and in accordance with the principle of harmonization.[179]

Where no conflict between the UNFCCC and the LOSC exist, climate treaty obligations should be considered applicable; however, neither the *lex specialis* nor the *lex posterior* rules adequately

[176] See ILC Study Group Conclusions on Fragmentation, p. 179 [11-12] & 176 [4].
[177] Boyle, A. (2020). Protecting the Marine Environment from Climate Change: The LOSC Part XII Regime. In *The Law of the Sea and Climate Change: Solutions and Constraints*. Cambridge: Cambridge University Press, p. 93.
[178] See VCLT, Art 30(3).
[179] ILC Study Group Conclusions on Fragmentation, p. 181 [26].

address questions of conflicting obligations and norms. Further analysis of the LOSC, however, arguably supports interpretation in light of adaptation obligations even where they conflict.

Conflict clauses are important to assigning priority to conflicting treaty rules and norms.[180] The UNFCCC and its related agreements do not include conflict clauses, instead referring disputes to non-binding conciliation or compulsory ICJ jurisdiction and arbitration.[181] The LOSC, on the other hand, does include specific conflict clauses relating to potential conflicts with other agreements and conventions. These conflict clauses are not, however, conclusive in understanding conflicting LOSC and adaptation obligations.

LOSC Article 237 relates specifically to the relationship of the LOSC with other conventions on the protection and preservation of the marine environment.[182] Though Article 237 has allowed the LOSC to consider entire new legal regimes such as the Convention on Biological Diversity, it is not necessarily applicable to the full scope of international climate change agreements. The objective of climate action is enumerated in Article 2 of the UNFCCC:

> …[S]tabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.[183]

In other words, the focus of international climate action is to slow climate change to give both ecosystems and societies the time needed to adapt to its impacts. While climate agreements are certainly critical to the protection and preservation of the environment, central to international climate action is averting climate threats to human security and wellbeing. As much of the UNFCCC regime focuses on issues other than environmental protection, Article 237 is not relevant to significant parts of international climate law.

LOSC Article 311, governing the relationship between the LOSC and other international agreements, provides for a similarly uneven application of climate law to the LOSC. It permits other agreements so long as they are compatible with the convention and do not negatively affect states' LOSC rights and duties. Article 311 indicates LOSC's superiority in direct conflicts with

[180] ILC Study Group Conclusions on Fragmentation, p. 181 [30].
[181] UNFCCC, Art. 14; Kyoto Protocol, Art. 19; & Paris Agreement, Art. 24.
[182] See LOSC, Art. 237.
[183] UNFCCC, Art. 2.

climate instruments altering the LOSC's terms. But as Redgwell notes, "Although this might be one possible outcome with respect to addressing baseline or maritime delimitation issues, it is far less likely to occur in the context of measures for the protection and preservation of the marine environment from the adverse effects of climate change.[184] In practice, however, Article 311 may not conclusively assign the LOSC superiority in conflicts with developing climate law.

The LOSC consistently indicates disputes under the convention remain subject to broader international law, and the question of superiority ascribed to the LOSC under Article 311 also arises under Article 293. Article 293 indicates applicable law for dispute settlement, instructing courts and tribunals to apply "other rules of international law" applicable between the parties in addition to the convention text itself.[185] Importantly, through rulings and legal guidance, this permits courts and tribunals to effectively update the practical application of the LOSC to ensure that the convention continues to settle all issues relating to the law of the sea.[186] Though opening the convention to developments outside of the LOSC, Article 293 also requires that applicable international law be "not incompatible with the convention," indicating the superiority of the convention in matters of judicial interpretation. Article 293 meanwhile has never prevented the direct modernization of the LOS regime. For example, the FSA directly alters states parties Part XI duties and obligations, so a strict interpretation of Article 293—and arguably Article 311—might prevent it from consideration as applicable law. As Harrison notes, a court or tribunal not considering the FSA applicable law is inconceivable.[187]

Additional rules of treaty interpretation support the case that adaptation rules are applicable despite conflicts with (and conflict clauses within) the LOSC. For instance, states have a right under general international law, recognized by courts, to modify agreements through subsequent practice, even where conflicting with conflict clauses.[188] In the *Namibia Advisory Opinion*, the ICJ found that practice could modify the UN Charter despite a conflict clause declaring it superior to any conflicting agreements or obligations. The ICJ stated, "… [I]nterpretation cannot remain unaffected by the subsequent development of law, through the Charter of the United Nations and by way of customary international law".[189] In the *Iron Rhine*

[184] Redgwell (2019), p. 455.
[185] LOSC, Art. 293.
[186] See Harrison (2008), pp. 228-238.
[187] *Ibid.*, pp. 196-198.; see also VCLT, Art 31(3)(a-b).
[188] See Harrison (2008), pp. 197-198.
[189] *Legal Consequences for States of the Continued Presence of South Africa in Namibia (South West Africa) notwithstanding Security Council Resolution 276 (1970)*, Advisory Opinion (Namibia Advisory Opinion), ICJ. Reports 1971, p. 16 [53].

Railway Arbitration, the Court supported evolutionary interpretation in light of a treaty's original intent and new technical developments that impacted the practical reality of the treaty.[190] Treaty intent and changing circumstances are significant to treaty interpretation. Articles 293 and 311 should not be understood to hamper the role of developing international rules in the interpretation of the LOSC, and courts and tribunals may recognize developing adaptation obligations even when incompatible.

Chapter IV: Integrating Adaptation Obligations in the LOSC

This thesis holds that states are obliged under climate law to both adapt to climate change and to cooperate in facilitating international adaptation. Systematic treaty interpretation indicates that these obligations apply to the LOSC where they don't conflict, and maybe even where they do. Where and how, then, might those obligations intersect with the LOSC? The LOSC organizes the oceans into maritime zones within which it accords certain rights and duties according to states' status as a coastal, flag, or port state and the types of activities undertaken. Independent of specific LOSC articles, adaptation obligations are significant to the interpretation and application of the entire convention. However, certain LOSC articles relating to states' zonal and sectoral rights and duties lend themselves more clearly to reinterpretation considering emerging international climate rules. This chapter is not intended to address every circumstance where adaptation obligations intersect with states' LOSC rights and duties. Rather, in identifying some likely points of interface, its purpose is to explore the adaptation regime's legal significance. Indeed, interpreting the LOSC considering adaptation obligations may provide a framework for interpreting and settling climate change-related legal issues in the law of the sea.

Adaptation Obligations and Baseline Issues under the LOSC

Perhaps the most discussed climate-related problem in the LOS regime is the "ambulatory baselines" issue. The LOSC provides for coastal state jurisdictional and economic rights in offshore maritime zones like the territorial sea and exclusive economic zone (EEZ). The breadth of these zones depends on baselines drawn along coastlines, often based on points of low tide elevation. The LOSC tacitly assumes the general stationarity of these baselines, so it largely fails to consider climate change-related coastline reconfiguration. As coastlines shift landward,

[190] See *Award in the Arbitration Regarding the Iron Rhine Railway (Kingdom of Belgium/Kingdom of the Netherlands)* (*Iron Rhine Arbitration*), 24 May 2005, Reports of International /Arbitral Awards, Vol. XXVII pp. 35- 125, pp. 73-74 [80-81].; see also Harrison (2008).

do these baselines "ambulate" in parallel? The answer is not obvious in the LOSC, but the possible effects may be profound. Landward shifts in baselines can move or shrink maritime zone entitlements, effectively depriving coastal states of areas to exercise exclusive economic rights (fishing, energy exploration, aquaculture, etc.) upon which they formerly depended. The LOSC does not explicitly require that maritime boundaries shift with baselines, but coastal state zone entitlements generally depend on land territory.[191] Notably, the VCLT excludes treaties that establish boundaries (including maritime zones established under the LOSC) from invocations of "fundamental changes of circumstances," which would include shifts in basepoints.[192]

Legal scholars have for decades contributed to a significant debate over sea-level rise's impact on baselines and legal approaches to addressing the issue.[193] The ILA Committee on Baselines indicated in 2012 that the LOSC's provisions on baselines do not provide an adequate solution to sea-level rise, but other scholars have explored alternative arguments.[194] As Busch explains, there are two primary approaches to minimizing the legal consequences of the baselines issue. The first is simply to treat baselines as permanent so that, while internal waters may grow, maritime zone entitlements do not shrink. The second approach is to maintain the existing outer limits of maritime zones, even when the baseline retracts.[195] Both of these approaches might be contrary to the interests of flag states, which would presumably gain from the growth of global commons associated with entitlement losses by coastal states.

The ILA sea-level rise committee on International Law explored procedural options for securing maritime entitlements but decided against specific proposals.[196] Indeed, as Busch notes,

> While a relatively unanimous community of legal scholars seems to agree that the way to approach climate-change challenges to maritime limits is to freeze the baselines and boundaries established under the LOSC, they are unable to agree on the procedure for effectuating such modification or expansion of the LOSC.[197]

Exploration of these procedural options has largely failed to consider states' national and general cooperative climate adaptation obligations, however. Customary rules of treaty interpretation

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[191] See Lathrop et al. (2009), p. 53-58.
[192] See Schofield & Freestone (2019), p. 161.; & VCLT, Art. 62(2)(a).
[193] See, for example, Caron, David D. (1990). When Law Makes Climate Change Worse: Rethinking the Law of Baselines in Light of a Rising Sea Level. *Ecology Law Quarterly*, 17(4), pp. 621–653.
[194] See International Law Association, *Report of the Committee on Baselines under International Law of the Sea* (2012), 30–31.
[195] See Busch (2020), pp. 316-318.
[196] See International Law Association, Report of the Sydney Conference on International Law and Sea Level Rise (2018) (ILA Sydney Conference Report), pp. 18-19.
[197] Busch (2020), p. 318.

indicate that, where multiple norms are relevant to a topic, they should be interpreted so as to contribute to a single set of harmonious rules and obligations compatible across regimes.[198] As such, LOSC interpretation should consider and support states' national and cooperative adaptation obligations, allowing vulnerable coastal states to secure maritime zone entitlements (and their associated resources). This may reduce the vulnerability and increase the resilience of coastal human and environmental systems to climate impacts in line with adaptation goals. Interpretation of the convention in this could support multiple procedures indicated by other authors to secure maritime entitlements. For instance, considering adaptation obligations would encourage a more expansive interpretation of the LOSC's baselines provisions, perhaps supporting the case for permitting coastal states to establish normal baselines around unstable coastlines as outlined in Article 7(2) of the LOSC.[199]

Interpretation permitting the securing of baselines against climate change may not address climate degradation of islands, however. The LOSC sets forth a specific legal regime for islands, which courts have further detailed.[200] Islands must generally be habitable to be afforded maritime zone entitlements, which is problematic when climate change can negatively impact island habitability. Even if climate change fails to inflict significant territorial losses to islands, saltwater infiltration from rising sea levels can endanger the freshwater sources commonly used as a marker of habitability. If an island fully submerges or becomes otherwise uninhabitable, it might become an offshore feature incapable of generating maritime zones. In this light, interpreting the LOSC considering states' adaptation obligations might also support interpreting the LOSC in a manner that holds maritime zones' outer limits as fixed, such as by basing them on boundaries established by published charts deposited with the UN Secretary-General.[201]

In some cases, climate impacts may be so severe as to cause total territorial loss for entire nations, compelling the migration of their inhabitants. Deprived of territory and population, these states would no longer fulfill the fundamental requirements for state sovereignty, potentially precluding them from international recognition and of rights afforded to them as states under the LOS regime.[202] Schofield and Freestone note that states may physically reinforce an existing

[198] See ILC Study Group Conclusions on Fragmentation, p. 181 [26].; see also Koskenniemi, pp. 25-28.
[199] See Busch (2020), pp. 326-330.; & LOSC, Art. 7(2).
[200] See *South China Sea Arbitration*, pp. 204-232 [475-553].
[201] See for example: Armstrong, Chris, & Corbett, Jack. (2021). Climate Change, Sea Level Rise, and Maritime Baselines: Responding to the Plight of Low-Lying Atoll States. *Global Environmental Politics*, 21(1), pp. 92-96.; & Schofield & Freestone (2019), pp. 400-401.
[202] See Montevideo Convention, Art. 1.

island to maintain its territorial status under Article 60 of the LOSC.[203] Similarly, the LOSC's island regime requires that a feature be capable of sustaining human habitation to be considered an island, which might arguably be fulfilled by previous habitability.[204] In that vein, the LOSC may be interpreted as permitting the physical reinforcement of a formerly habitable island to secure maritime entitlements. More expansive interpretation in this manner could support states' fulfillment of their climate obligations by permitting displaced nations and de-territorialized states to secure resources from previous maritime zone entitlements.

Coastal communities are constructing natural and artificial coastal defenses in response to sea-level rise, the increasing frequency and severity of extreme weather, and corresponding increases in flooding dangers. Some such measures appear compatible with the LOSC, but others are subject to more uncertainty, particularly where they impact baselines and zone entitlements. While integral harbor works are explicitly legal and afforded weight in drawing baselines, other adaptation measures might.[205] A levee or seawall system far from any harbor cannot be considered 'integral harbor works,' nor would land reclamation measures. Nevertheless, such measures may be important to averting coastal climate impacts, contributing to the fulfillment of adaptation obligations.[206] The ILA found that, though normal baselines are ambulatory, coastal protection and land reclamation projects may be considered part of the coast, thus impacting basepoints.[207] As Oral notes, coastal protection measures' impact on baselines has proven an abundant state practice seemingly approved by international courts. In the *Black Sea Case*, for instance, the ICJ concluded that the Sulina Dyke was an acceptable territorial sea basepoint.[208]

Where severely threatened, states may elect to construct artificial islands as adaptation measures, and indeed, the Maldives has already begun.[209] The LOSC indicates that artificial islands, while broadly permissible, are not entitled to any maritime zones.[210] In exploring the legality of artificial islands as an adaptation measure, Oral notes that while the LOSC requires that islands be naturally formed, it does not explicitly require that condition to apply at all stages,

[203] Schofield, Clive, & Freestone, David. (2013). Options to Protect Coastlines and Secure Maritime Jurisdictional Claims in the Face of Global Sea Level Rise. In *Threatened Island Nations*. Cambridge University Press, p. 157.
[204] See Schofield and Freestone (2019), pp. 160-162.; & *South China Sea Arbitration,* p. 251 [616].
[205] *Ibid.*, Art. 11.
[206] See Rayfuse (2013), pp. 175-178.
[207] Lathrop et al. (2009), p. 58.
[208] Oral (2019), p. 434.; & *Maritime Delimitation in the Black Sea (Romania v Ukraine)*, Judgment 3 February 2009, ICJ Reports 2009, p. 61.
[209] Oral (2019), pp. 417-418.
[210] LOSC, Arts. 11, 60(8), & 80.

nor does it clarify whether a naturally formed feature may be reinforced into an island.[211] The tribunal emphasized in the *South China Sea Arbitration* that islands must have natural capacity to sustain human habitation, so entirely artificial constructions cannot qualify as islands. However, the LOSC might arguably permit zone entitlements by artificial islands constructed upon features that qualified as natural islands prior to climate change. History is relevant to judging the habitability of features, and the Tribunal noted the importance of considering features considering external forces contributing to their depopulation, which would certainly include climate change. Given that the purpose of the island regime is to prevent excessive maritime zone claims, evidence of habitation predating the LOSC is also significant a significant factor.[212]

Adaptation Obligations and Rights and Duties in Maritime Zones under the LOSC

Many rights and duties under the LOSC apply independently from the LOSC's zonal architecture. For example, Part XII environmental duties apply regardless of zone, as do general legal rules like the prohibition on transboundary harm.[213] However, climate change does particularly strain the LOSC's zonal approach. Vidas et al. note that the LOSC's reliance on zones is problematic given that climate change's effects are neither dependent on nor limited by borders: "In this respect, climate change may present a serious challenge to the sustainability of the current structure of the law of the sea".[214] As such, it is important to consider climate rules developing beyond the LOSC. As held in the *Chagos Maritime Protected Area* arbitration,

> [… The] Tribunal notes that each of the territorial sea, international straits, the exclusive economic zone, the continental shelf and the high seas includes a provision to the effect that States will exercise their rights under the Convention subject to, or with regard to, the rights and duties of other States or rules of international law beyond the Convention itself.[215]

Climate rules, including adaptation obligations, are relevant to states' zonal rights and duties, and their integration may further the LOSC's zonal structure's evolution considering climate change.

The general provisions regarding the status of the territorial sea, which extends up to 12nm from coastal state baselines, holds that coastal states' exercise of sovereignty is subject to

[211] See Oral (2019), pp. 431-432.
[212] See *ibid.*; & *South China Sea Arbitration*, pp. 227 [541] & 230 [549-550].
[213] See *Legality of the Threat of Use of Nuclear Weapons*, Advisory Opinion of 8 July 1996, ICJ Reports 1996, pp. 19-20 [29].; see also *South China Sea Arbitration*, p. 373 [941].
[214] Vidas et al. (2020), p. 41.
[215] *Chagos Marine Protected Area Arbitration (*Mauritius v. United Kingdom) [2015] PCA Case no. 2011–3, pp. 566-567 [503].

"other rules of international law".[216] Such rules apply also to the exercise of sovereignty or jurisdiction over international straits within their territorial seas, as well as to regulations for navigation through their territorial waters.[217] Similarly, flag states' limited rights in other states' territorial waters, including rights of innocent passage and transit passage, must also conform with "other rules of international law".[218] The exact meaning of "other rules of international law" is not defined in the LOSC, and states have disputed whether it constitutes a binding limit on a state's rights or duties under the convention by external international obligations.[219] This issue was raised in the *Chagos Marine Protected Area Arbitration* in the context of LOSC Article 2(3) relating to sovereignty over the territorial sea. The Arbitral Tribunal found that such language did reflect an obligation to consider non-LOSC bodies of law and that states' rights in maritime zones under the Convention are generally impacted by general rules of international law beyond the LOSC.[220] As such, both coastal and flag state rights and obligations in the territorial sea should be exercised and fulfilled considering national and cooperative adaptation obligations.

Developing climate change-related rules of international law, including adaptation obligations, are also relevant to coastal and flag states' rights and duties in the EEZ. Article 58(3) relating to flag states' rights in the EEZ indicates that non-coastal states must exercise their rights and perform their duties according to "other rules of international law" not incompatible with the convention. The article further obliges non-coastal states to have "due regard" to the rights and duties of the coastal state.[221] In parallel, Article 56(2) enumerates that coastal states' exercise and performance of rights and duties in the EEZ must have "due regard" to other states' rights and duties.[222] The full and exact meaning of the duty of "due regard" is not fully apparent in the LOSC; however, duties of due regard arguably require consideration of states' adaptation obligations as well as the international community's interest in climate action. Forteau argues that the purpose of this language is to ensure conciliation between concurrent and overlapping rights and obligations, including those derived from external international law.[223] Similarly, Gaunce has found rights and duties within the scope of the duty of due regard to have included

[216] LOSC, Art. 2(3).
[217] *Ibid.*, Arts. 21 & 34
[218] *Ibid.*, Arts. 19(1) & 45.
[219] See *Chagos Marine Protected Area Arbitration*, pp. 553-556 [457-469].
[220] *Ibid.*, pp. 570-571 [516-517].
[221] See LOSC, Art. 58(3).
[222] *Ibid.*, Art. 56(2).
[223] See Forteau, Mathias. (2019). The Legal Nature and Content of 'Due Regard' Obligations in Recent International Case Law. *The International Journal of Marine and Coastal Law*, 34(1), pp. 29-30.

external obligations. Gaunce further concludes that the duty of due regard is not only a bilateral obligation between coastal and flag states but also a duty to the interests of the international community—which may include global ecological interests such as climate change mitigation.[224] Given that the international community has given adaptation equal priority with mitigation, climate adaptation seems an international interest for which states should give due regard.[225]

States' rights and duties in high seas beyond the EEZ appear subject to international legal obligations external to the LOSC. Article 87 outlines general freedoms of the high seas, such as freedoms of navigation and overflight. Paragraph 1 explicitly holds that these freedoms are to be exercised under the conditions laid down by "other rules of international law".[226] As such, states' exercise of high seas freedoms should be considered subject to both national and cooperative adaptation obligations under international climate law. Furthermore, Paragraph 2 indicates that high seas freedoms shall be exercised according to states' duties of due regard, which as just argued should consider other states' and the international community's adaptation interests and obligations.[227] And while states have no rights to sovereignty over the Area or its resources, the LOSC indicates that general conduct in the Area is to follow other rules of international law.

Compared to other zones, international obligations appear less significant to specified coastal and flag states' rights and duties on the continental shelf and within internal waters. Under the LOSC, states have sovereign jurisdiction over the internal waters within baselines as part of their sovereign territory.[228] Whether internal waters are subject to the LOSC at all, or whether they fall solely under domestic law, is debated, but the convention does not appear to attach specific restrictions to coastal state sovereignty over internal waters.[229] Similarly, coastal state sovereignty over the continental shelf is an extension of that state's land territory rather than dependent on express proclamation under the convention.[230] Coastal states have rights to natural resource exploitation on the continental shelf that are limited by an obligation not to unjustifiably interfere with other states' rights and freedoms under the LOSC. The adaptation

[224] See Gaunce, Julia. (2018). On the Interpretation of the General Duty of "Due Regard" *Ocean Yearbook*, 32(1), pp. 57-59.
[225] See Paris Agreement, Art. 2.
[226] LOSC, Art. 87(1).
[227] See *ibid.*, Art. 87(2).
[228] *Ibid.*, Art 2(1).
[229] See, for example, Bangert, Kaare (2018), Internal Waters, in Peters, Anne & Wolfrum, Rudiger (eds.), Max Planck Encyclopedia of Public International Law, Max Planck Institute for Comparative Public Law and International Law; see also Kohen, Marcelo G. (2015). Is the Internal Waters Regime Excluded from the United Nations Convention on the Law of the Sea? In del Castillo, Lilian & Caminos, Hugo (eds.), *Law of the Sea, From Grotius to the International Tribunal for the Law of the Sea*, pp. 110–124.; & LOSC, Arts. 2(1) & 8(1).
[230] See *North Sea Continental Shelf Case*, p. 31 [43].; & LOSC, Art. 77.

regime is not limited by geographic scope, however, so where the LOSC is silent or not clearly applicable, states are still bound by their obligations under international law.[231]

Continental shelves may underlie EEZs and the high seas, making relevant other states' rights in those associated regimes. As discussed, states' rights and obligations in the EEZ and high seas water columns may be informed by international adaptation obligations external to the LOSC. Exercise of coastal state continental shelf rights must also consider "rights and freedoms of other States as provided for in this Convention".[232] International adaptation obligations are not rights or freedoms, and as they derive from sources of law external to the LOSC, they are not necessarily provided for in the LOSC. However, interpreting national and cooperative adaptation obligations as of *erga omnes* character could provide a line of reasoning holding that the international community has, collectively, an inverse right to adaptation. This could be considered an unarticulated right provided for by LOSC Articles 58 and 87(1) referencing broader international rights and obligations in the EEZ and the high seas.[233]

Adaptation Obligations and Environmental Duties under the LOSC

Integral to the objective of international climate action is facilitating natural adaptation of ecosystems to protect human security.[234] Climate change, though significantly impacting human systems, is at its core an environmental problem, making relevant the LOSC's articles on the marine environment. Part XII of the LOSC sets forth a framework for the protection and preservation of the marine environment, both enumerating its own requirements and applying rules developed elsewhere. Notably, these environmental duties apply to all States both within and beyond national jurisdiction, and they seem clearly affected by adaptation considerations.[235]

The LOSC's environmental obligations focus on the "protection" and "preservation" of the marine environment. Neither term is superior, and the Arbitral Tribunal defined them both in the *South China Sea Arbitration.* "Protection" involves protecting against future harm, and indeed, adaptation measures aim in part to decrease vulnerability to future climate impacts.[236] The Paris Agreement explicitly finds adaptation as key to protecting ecosystems from negative

[231] See ILC Study Group Conclusions on Fragmentation, p. 181 [26].; see also Koskenniemi, pp. 25-28.
[232] LOSC, Art. 78(2).
[233] See *ibid.*, Arts. 58 & 87(1).
[234] See UNFCCC, Art. 2.
[235] See *South China Sea Arbitration*, p. 373 [940].
[236] *Ibid.*, pp. 373-374 [941].; see also Paris Agreement, Art. 7(1).

future climate impacts.[237] "Preservation" entails maintaining or improving an ecosystem's current condition.[238] As such, adaptation measures might be considered as improving marine ecosystems by increasing resiliency to ongoing climate impacts. "Preservation" should not be interpreted to entail averting all climate impacts on marine ecosystems. Climate change can alter ecological conditions and redistribute species; however, environmental change is not inherently damaging, so efforts to promote *in situ* "preservation" may be counterproductive to the marine environment's new basic state. Indeed, Ruhl has noted that, within environmental law, climate change adaptation is accelerating a shift from *in situ* preservation towards transitional and adaptive management approaches.[239] Johansen and Henriksen have also noted the importance of adaptive management considering climate change, which emphasizes flexible responses to new environmental information. "Adaptation to the impacts of climate change requires a legal regime that is able to respond quickly to changes".[240] Adopting adaptive environmental governance might thus fulfill both developing adaptation obligations and LOSC environmental duties.

Other scholars have also noted the significance of climate change to LOSC duties to the marine environment. Boyle, for instance, also finds that Part XII obliges states to protect the marine environment from climate impacts; however, his analysis is grounded in Part XII's pollution control measures, understanding mitigation contributions under the Paris Agreement as GAIRAS for protecting the marine environment. Boyle finds adaptation's relevance to the LOSC to be less clear, and he fails to recognize or explore any adaptation obligations under climate law instruments. While he acknowledges that the UNFCCC and the Paris Agreement both hold adaptation as important to global climate efforts, he understates the significance of the adaptation regime.[241] The Paris Agreement not only gives adaptation equal priority to mitigation, but it explicitly recognizes adaptation as key to the long-term global response to protect ecosystems.[242]

While the adaptation regime does not detail adaptation obligations with the precision perhaps necessary to be considered GAIRAS for regulatory purposes, developing adaptation rules seem critical to states' environmental obligations given climate change's significant

[237] *Ibid.*, Art 7(2).
[238] *South China Sea Arbitration*, pp. 373-374 [941].
[239] See Ruhl (2010), pp. 392-397.
[240] Johansen & Henriksen (2020), p. 240.
[241] See Boyle (2020), p.89.; Paris Agreement, Arts. 2(1).
[242] See Paris Agreement, Art. 7(2)

environmental implications.[243] Article 192 establishes a general duty to protect and preserve the marine environment, which according to Jakobsen, may require climate adaptation measures.

> …[I]t is reasonable to argue that the duty to protect the marine environment and to protect and conserve marine biological diversity also includes a duty to take mitigation and adaptation measures as a response to the effects of climate change.[244]

According to the tribunal in the *South China Sea Arbitration*, Article 192 is informed by rules of international law and may be violated by failing to actively protect and preserve the environment.[245] Indeed, Article 192 includes a due diligence requirement entailing measures to protect the marine environment from future threats, which might thus require adaptation.[246]

> The LOSC and climate law both hold cooperation important to the environment. Craig notes, With regard to climate change adaptation at the international level, the UNFCCC and its protocols most clearly create a duty for the world's nations to cooperate. Given the global nature of the ocean, this duty to cooperate will be especially important to ocean adaptation, particularly in terms of dealing with climate change impacts to individual marine species, marine biodiversity, and wild capture fisheries.[247]

The UNFCCC Article 4(1)(e) obliges states to cooperate to facilitate international adaptation, including through "appropriate and integrated plans for coastal zone management," and Article 5 of the Paris Agreement also requires parties to conserve and enhance reservoirs of greenhouse gasses, including coastal and marine ecosystems.[248] As Jakobsen argues, climate change-inclusive interpretation of states' environmental obligations under the LOSC reinforces the imprecise obligations found in climate treaties. She further indicates that marine protected areas may constitute measures appropriate to fulfilling both cooperative adaptation obligations and LOSC environmental duties.[249] The LOSC enumerates similar duties for states to cooperate in formulating standards and practices for managing the marine environment.[250] The tribunal

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[243] Mitigation focuses on specified emissions targets to reach an internationally accepted temperature goal. These quantifiable targets translate well to substantive regulation, and their formation under an international treaty indicates international acceptance. While mitigation thus lends itself to GAIRAS consideration, the adaptation regime does not. It is by nature a qualitative endeavor with technical standards useful only in limited cases. And while constituting binding obligations, it does not prescribe specific rules and standards. For analysis of GAIRAS integration under the LOSC, see Harrison (2008), pp. 118-139.
[244] Jakobsen (2020), p. 244.
[245] *South China Sea Arbitration.,* p. 373 [941].
[246] See Harrison, James (2017). Saving the oceans through law: the international legal framework for the protection of the marine environment. *Oxford University Press*, p. 24.; & *South China Sea Arbitration*, pp. 373-377 [941-945].
[247] Craig (2020), p. 78.
[248] UNFCCC Art. 4(1)(e).; Paris Agreement, Art. 5(1).
[249] See Jakobsen (2020), pp. 251-252.
[250] See LOSC, Art. 197.

clarified in the *South China Sea Arbitration* that this obligation is general rather than for specific rulemaking.[251] Considering adaptation needs—and that adaptation is important to protecting the marine environment in light of climate change—Article 197's general obligations to cooperate arguably supports states' cooperative obligations under international adaptation law.[252]

In the *Southern Bluefin Tuna Case*, the tribunal held that the conservation of living resources is an element of protecting and preserving the marine environment.[253] As such, states should consider adaptation obligations in the management of living resources. Article 61 of the LOSC relates to the conservation of the living resources in the EEZ, while Article 119 focuses on the conservation of living resources of the high seas.[254] Each article requires states to consider scientific evidence, which Molenaar finds might oblige states to consider adaptation. "Arguably, a qualified obligation on climate-change adaptation can to some extent be derived from the qualified obligation relating to 'best scientific evidence available' laid down in LOSC Articles 61(2) and 119(1)(a)".[255] Similarly, regional fisheries management organizations should arguably consider adaptation needs according to UN General Assembly resolutions.[256]

While adaptation obligations should be considered integral to the protection and preservation of the marine environment under the LOSC, environmental duties must at times be balanced against human interests. In the *South China Sea Arbitration* for instance, the tribunal found that China's artificial island construction and land reclamation efforts violated its environmental obligations.[257] As discussed earlier, however, the systematic interpretation of the LOSC indicates that states' adaptation obligations are applicable even where they conflict with the LOSC. As such, states have a right to coastal adaptation measures even where they have negative environmental externalities. In *Land Reclamation by Singapore in and Around the Straits of Johor*, ITLOS permitted Singapore to continue land reclamation, and while directing Singapore to avoid serious harm, it permitted the activity despite possibly inevitable adverse environmental impacts. It did however note the importance of prudence and caution, indicating a need for states to consider environmental externalities when planning coastal defenses.[258] Where

[251] *South China Sea Arbitration*, pp. 376-377 [946].
[252] See Paris Agreement, Art. 7(2).; see also LOSC, Art. 197.
[253] *Southern Bluefin Tuna* (New Zealand v. Japan; Australia v. Japan) (Provisional Measures) [1999] ITLOS Rep. 280, p. 19 [70].
[254] LOSC, Arts. 61 & 119
[255] Molenaar (2020), p. 271.
[256] See *ibid.*, p. 284; & UNGA res 73/125, 11 December 2017 [13, 183, & 198].
[257] *South China Sea Arbitration*, pp. 388-394 [976-983].
[258] *Land Reclamation by Singapore in and Around the Straits of Johor (Malaysia v Singapore) (Provisional Measures)*, ITLOS Case No 12, 8 October 2003, pp. 26-27 [96, 99, & 106].

the interests of human and ecological systems conflict, adaptation obligations must be balanced noting the central aim of adaptation efforts, which is the safeguarding of human security.[259]

Adaptation Obligations and Scientific Cooperation under the LOSC

Some of the more detailed aspects of the adaptation regime relate to science and information sharing. For instance, the Paris Agreement emphasizes the centrality of scientific knowledge to climate action. To further global adaptation, particularly to assist developing countries, it calls on states to share scientific information and best practices, to strengthen institutional arrangements that synthesize adaptation information and spread technical guidance, and to expand knowledge to inform adaptation decision-making.[260] To spread scientific and technical information and guidance, the COP set up the Adaptation Committee, which oversaw the cooperation-promoting Technical Process on Adaptation.[261] Additionally, the COP organized the Nairobi Work Programme, a knowledge-to-action hub facilitating international adaptation knowledge sharing.[262] Importantly, the Paris Agreement's scientific cooperation obligations are general duties arguably applicable beyond these COP initiatives, and they correspond neatly with the LOSC's articles on marine scientific research and environmental monitoring.

While marine scientific research (MSR) is not defined by the LOSC, it may include scientific studies or experiments designed to increase mankind's knowledge of the marine environment.[263] As such, studies relating to climate impacts on the marine environment, which are important to coastal adaptation decision-making, likely qualify as MSR. The LOSC's MSR provisions include articles on international cooperation, including via international organizations. For instance, Article 242 enumerates a qualified obligation for states to promote cooperation in MSR, including by providing appropriate and reasonable opportunities for other States to learn from that research.[264] Similarly, Article 244 holds that states and competent international organizations shall appropriately publish and disseminate knowledge relating to MSR and shall also promote the flow of scientific knowledge, particularly to developing states.[265]

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[259] See UNFCCC, Art. 2.
[260] See Paris Agreement, *Preamble* & Art. 7(7).
[261] Adoption of the Paris Agreement, Report of the Conference of the Parties on its twenty-first session, held in Paris from 30 November to 13 December 2015 (2016), UNFCCC, 1/CP.21, p. 18 [124].
[262] Five-year programme of work of the Subsidiary Body for Scientific and Technological Advice on impacts, Action taken by the Conference of the Parties at its eleventh session (2006), UNFCCC, FCC/CP/2005/5/Add.1, p. 7.
[263] See UN Division for Ocean Affairs and the Law of the Sea, Office of Legal Affairs, Marine Scientific Research: A revised guide to the implementation of the relevant provisions of the United Nations Convention on the Law of the Sea (2010).
[264] LOSC, Art. 242.
[265] *Ibid.*, Art. 244.

LOSC Part XII's technical assistance and environmental monitoring sections also appear relevant to states' adaptation obligations. Articles 204-206 oblige states to endeavor to study the risks or effects of pollution of the marine environment, and especially to monitor the effects of any activities they permit that may be likely to pollute the marine environment. Other authors have argued that carbon emissions resulting in negative effects on the oceans, including ocean acidification, may constitute pollution of the marine environment as defined under the LOSC.[266] As such, states, especially industrial emitters of greenhouse gasses, may be obliged to study climate change's impacts on the oceans and to report that information to international institutions to share more broadly.[267] Article 202 also indicates that states should promote technical and scientific assistance to developing states, particularly relating to the protection and preservation of the marine environment, which this thesis argues must consider climate change.[268]

Scientific information is essential to adaptation decision-making, and states are under both a national obligation to adapt and a general obligation to cooperate in facilitating adaptation. The LOSC's articles relating to international cooperation on MSR, technical assistance to developing states for the protection and preservation of the marine environment, and environmental monitoring and assessment should be reinterpreted considering those needs and obligations. In an adaptation context, the referenced LOSC articles might support the case that states should share relevant marine climate research with other states—including and perhaps especially via the adaptation knowledge-sharing institutions set up under the UNFCCC.

Adaptation Obligations and Dispute Settlement under the LOSC

Climate change is a significant issue to the interpretation and application of the LOSC, whether relating to the treaty's architecture (including "ambulatory" baselines) or regarding states' enumerated rights and duties. As such, climate-related issues appear subject to the LOSC articles setting forth a regime to settle disputes relating to the interpretation and application of the convention.[269] LOSC dispute settlement generally falls within Part XV, which lays out conflict resolution options for states parties. Though free to settle disputes through any agreed-upon means, states parties may refer disputes to compulsory procedures through the ICJ, ITLOS, *ad hoc* arbitration under Annex VII, or special arbitration under Annex VIII. Where states do not

[266] See, for example, Boyle (2019), pp. 458-481.
[267] See LOSC, Art. 205.
[268] See *ibid.*, Arts. 202-203.
[269] See LOSC, Art 279.

indicate a preference or differ in choice of forum, they default to Annex VII *ad hoc* arbitration unless otherwise agreed.[270] Dispute settlement procedures under other treaties may prevail over Part XV in some instances, and certain disputes fall beyond the jurisdiction of LOSC courts or tribunals, such as those relating to military activities, historic title, or boundary delimitation.[271]

States may settle disputes peacefully outside the LOSC, and Article 281 indicates that Part XV procedures apply only where settlement through other means fails and where other treaties do not exclude the application of LOSC dispute settlement mechanisms.[272] A question then is whether the UNFCCC's dispute settlement option constitutes an alternative means of dispute settlement excluding settlement under the LOSC. In the *Southern Bluefin Tuna Case*, the tribunal concluded that Article 281 requires a clear statement explicitly opting out of Part XV dispute settlement or further procedures.[273] Given that the UNFCCC does not explicitly exclude LOSC dispute settlement, Article 281 does not preclude states parties from seeking compulsory dispute settlement under the LOSC.[274] Similarly, Article 282 permits states parties to seek binding dispute settlement under other agreements to which both states are parties.[275] While the UNFCCC does have a dispute settlement mechanism, its non-binding nature excludes it from Article 282.[276] Indeed, climate-related issues are not excluded from LOSC dispute settlement.

Climate issues in the LOS appear subject to and not excluded from dispute settlement under the LOSC. Furthermore, courts and tribunals must consider states' adaptation obligations in settling disputes. Indeed, Article 293 instructs courts and tribunals to apply not only the convention text but also "other rules of international law not incompatible" with the LOSC.[277] In this case, it should be understood as instructing courts and tribunals to interpret the LOSC in light of developing climate change-related rules of international law. This thesis holds that states' national and cooperative adaptation obligations, while relatively imprecise, are legally binding duties constituting "other rules of international law" relevant to LOSC dispute settlement.

Scholars have explored the potential for applying LOSC dispute settlement provisions to enforce states' climate obligations, but they generally focus on mitigation. For instance, some

[270] See *ibid.,* Art. 287.
[271] See *ibid.*, Arts. 281-282 & 297-298.
[272] See *ibid.*, Art. 281.
[273] *Southern Bluefin Tuna,* p. 63.
[274] See Klein (2020), pp. 102.
[275] See LOSC, Art. 282.
[276] See Klein (2020), p. 102.
[277] LOSC, Art. 293.

have argued that greenhouse gas emissions may fit the LOSC's definition of marine pollution, and so failure to mitigate climate change violates states parties' Article 192 obligations to protect and preserve the marine environment.[278] However, adaptation is also critical to protecting ecosystems against climate impacts, and failures to adapt ecological systems arguably also violate states parties' Article 192 obligations. As such, the LOSC dispute settlement seems equally applicable to adaptation. In any case, Lee and Bautista raise critical issues regarding application of LOSC dispute settlement to failures to fulfill international climate obligations.

> Who can bring such a claim, and against what countries could such a claim be brought? What is the likelihood of such a claim? What would be the implications of such a claim for the climate change regime and international relations more generally? To what standard would a Party be held?[279]

While raised in light of climate mitigation, these questions seem equally applicable to adaptation.

Who might bring a claim relating to climate adaptation obligations, and against what countries? As adaptation obligations are arguably of *erga omnes* character, any state may invoke, on behalf of the international community, the responsibility of states failing to fulfill their national obligations to adapt, or of those failing to cooperate in facilitating international adaptation. Even if adaptation obligations are not of *erga omnes* character, states may invoke the responsibility of states in some situations. For instance, failing to adapt may entail negative transboundary consequences, such as destabilizing transboundary climate migration or increasing regional food insecurity. Failures to cooperate in facilitating international adaptation might contribute to maladaptation that redistributes vulnerability and magnifies risks across borders. As the World Adaptation Science Programme notes, "A territorial approach to adaptation–far from serving the national interest–is likely to heighten a country's vulnerability to climate risk, as well as raise the risk exposure of their closest neighbours and allies". [280]

By what standard could a state be judged as failing to fulfill national obligations to adapt to climate change, or to generally cooperate to facilitate adaptation internationally? Climate adaptation law is still developing, and climate treaties refer to adaptation with qualifiers and relatively imprecise language, providing states with discretion regarding adaptation measures.

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[278] See for example: Doelle (2006), p. 320.; & Boyle, Alan. (2012). Law of the Sea Perspectives on Climate Change. *The International Journal of Marine and Coastal Law*, 27(4), pp. 831-832.; & Scott (2017), pp. 124–150.
[279] Lee & Bautista (2018), p. 149.
[280] Magnus & Katy (2020).

This relatively lower level of precision contributes to a lack of apparent standards by which to judge a state as failing to fulfill its obligations. Failure to engage with adaptation at all would constitute a violation of states' adaptation obligations, and this minimum threshold might be raised further by additional legal considerations. For instance, human rights considerations may support invoking the responsibility of states where failures to fulfill adaptation obligations lead to foreseeable violations of minimum human rights standards. Similarly, maladaptation derived in part from failures to cooperate in facilitating international adaptation could entail negative transboundary consequences, which would violate the prohibition on transboundary harm under general environmental law.[281] As the adaptation regime develops and legal scholars explore its character and implications, the regime's standards may become more defined.

What is the likelihood of such a claim, and what might be the implications of bringing one for the climate change regime and international relations more generally? The LOSC's binding dispute settlement mechanism may provide for compulsory procedures otherwise absent from the UNFCCC. As such, the LOSC's applicability to violations of adaptation obligations involving oceans governance issues may expand the possibilities for climate litigation in international courts and tribunals. Climate change-related litigation to date has not been generally successful, but it must be noted that these cases have overwhelmingly focused on the mitigation regime.[282] Expanding the scope of climate litigation to consider adaptation obligations may be significant to vulnerable states, including small island developing states, seeking to compel action regarding a significant environmental threat. Vanuatu, for instance, has already indicated plans to bring a case against the United States and Australia on mitigation grounds.[283] Bodansky has noted that international climate litigation has traditionally risked distracting from or interfering with critical climate change negotiations, but opinions from legal fora could now stand to forward negotiations and shape normative expectations relating to climate change.[284]

An additional, important consideration is whether vulnerable coastal states could use the LOSC dispute settlement mechanism to seek financial support for adaptation or redress for climate losses and damages from industrialized states. Indeed, financial support is a component

[281] See *Legality of the Threat of Use of Nuclear Weapons*, pp. 241-242 [29]; see also *Gabcikovo-Nagymaros Case*, p. 41 [53].
[282] See Peel, Jacqueline, & Osofsky, Hari M. (2020). Climate Change Litigation. *Annual Review of Law and Social Science*, 16(1), pp. 21–38.
[283] Stephens, Tim (2019), Low-Lying Pacific Islands Sue Over Climate Change, The Lowy Interpreter.
[284] See Bodansky, Daniel. (2017). The Role of the International Court of Justice in Addressing Climate Change: Some Preliminary Reflections. *Arizona State Law Journal*, 49, pp. 709-712.

of states' cooperative adaptation obligations. Article 9(1) of the Paris Agreement obliges developed states parties to provide financial support as adaptation assistance to developing states.[285] Similarly, Article 8 codifies a loss and damage mechanism applicable to slow onset events (such as sea-level rise) as well as to increasing the resilience of communities and ecosystems.[286] However, this financial duty is generally a collective one owed by the international community—developed states more specifically—to developing states struggling with climate impacts. Developed states' financial contributions appear discretionary, and climate law does not require individual states to provide specified levels of funding, though states would likely violate cooperative adaptation obligations by failing to provide any funding at all.

States parties are instructed to communicate their financial commitments to the international community. These contributions are nonbinding, and failing to achieve them does not constitute a violation of the Paris Agreement. However, they could arguably be used to assess whether a state is violating its obligation to cooperate in facilitating international adaptation. As Broburg argues, states' adaptation obligations under the UNFCCC and Paris Agreement may instill legal responsibility for states considering the articles on loss and damages.[287] Accordingly, vulnerable states might have standing to seek loss and damage claims outside of the Paris Agreement's legal framework, such as via the LOSC's dispute settlement mechanism.[288]

Judicial awards and rulings may further the evolution of the LOSC in response to climate change, but courts and tribunals may also contribute to the development of the regime through the advisory opinion mechanism. While the topic is not explicitly addressed in the LOSC, ITLOS has found itself with the jurisdiction to issue advisory opinions, which its rules indicate may involve legal questions requested under compatible international agreements.[289] Through advisory opinions, the tribunal has pronounced on environmental principles important to the protection of the marine environment, and though technically non-binding, such opinions can carry significant legal weight regarding the interpretation and application of treaties.[290] In the

[285] See Paris Agreement, Art. 9.
[286] See *ibid.*, Art. 8.
[287] See Broberg, Morten. (2020). Interpreting the UNFCCC's provisions on 'mitigation' and 'adaptation' in light of the Paris Agreement's provision on 'loss and damage,' *Climate Policy*, 20(5), p. 530.
[288] See *ibid.*; see also Doelle, Meinhard, & Seck, Sara (2020). Loss & damage from climate change: from concept to remedy? *Climate Policy*, 20(6), pp. 669–680.
[289] See *Request for Advisory Opinion submitted by the Sub-Regional Fisheries Commission,* pp. 37-69.; Rules of the Tribunal (ITLOS/8) as adopted on 28 October 1997 and amended on 15 March 2001, 21 September 2001, 17 March 2009, 25 September 2018, 25 September 2020 and 25 March 2021, Art. 138.
[290] See Klein (2020), pp. 94-113.

context of climate change, a group of states or an international organization addressing ocean issues might adopt an agreement requesting that ITLOS provide an advisory opinion relating to the interpretation and application of the LOSC regarding adaptation needs.

The issuance of an advisory opinion may further the LOSC's development on several grounds. Advisory opinions have more general effects than judgments or awards specific to bilateral disputes, and they provide for additional states to have their voices heard. Furthermore, they can address issues at a high level of generality, allowing bilateral negotiations to settle specifics. They also allow courts to dodge issues of standing and causation, which often constitute major hurdles to climate litigation.[291] A dispute need not be lodged under the LOSC for courts and tribunals to provide guidance reinterpreting the convention regarding climate change and related obligations. And in providing that advisory opinion, Article 293 would have ITLOS apply not only the convention text but also "other rules of international law," which would include adaptation obligations under international climate law.[292]

The potential applicability of an ITLOS advisory opinion relating to adaptation needs on ocean governance issues may have significant practical implications. For instance, Vanuatu and other developing island states have explored requesting an advisory opinion from the ICJ on climate change, but they have struggled to secure the support for a requisite UN General Assembly resolution.[293] The possibility of an advisory opinion from ITLOS may offer an alternate and perhaps less onerous option than attempting to seek one from the ICJ. For instance, an agreement between vulnerable states relating to climate change and the ocean may constitute a body able and authorized to request an advisory opinion from ITLOS. This would require significantly less support than a UN General Assembly resolution requesting an ICJ advisory opinion. Through such a request, an advisory opinion could provide critical legal guidance for interpreting and applying the LOSC considering climate law. Furthermore, LOSC Article 293 indicates that adaptation obligations may be considered law applicable to such guidance.[294]

Conclusion

[291] For additional analysis, see Bodansky (2017), p. 711.
[292] LOSC, Art. 293.
[293] See Margaretha Wewerinke-Singh & Diana Hinge Salili (2020) Between negotiations and litigation: Vanuatu's perspective on loss and damage from climate change, *Climate Policy*, 20:6, pp. 681-692.
[294] See LOSC, Art. 293.

As discussed in Chapter I, Climate change and related rules and norms are significant to international law, including the law of the sea. Climate impacts on coastal communities and the oceans are significant, increasingly seen as inevitable, and leading to legal issues for which the LOSC provides little clear guidance. Accordingly, a pertinent aspect of climate law is the adaptation regime, the purpose of which is to increase the resiliency and reduce the vulnerability of human and ecological systems to climate impacts. Chapter II finds this regime, entailing imprecise but binding obligations for states to adapt to climate change and to generally cooperate in facilitating international adaptation, is legal development relevant to the LOSC. Other scholars may contest this thesis's position on the adaptation regime's binding nature, but this regime is still developing and has already evolved significantly since the UNFCCC entered force.

The LOSC has a variety of mechanisms, analyzed in Chapter III, that facilitate its evolution in response to international legal developments. Not all these mechanisms are equally suited to addressing climate change, however. Climate impacts are continuously manifesting, universal, transboundary, and entail both environmental and sociopolitical consequences. Considering practical necessity and *lex ferenda*, climate adaptation must be considered systematically throughout the convention. Systematic interpretation of the LOSC considering climate adaptation rules may provide an evolutionary pathway through which the convention may harmonize with the adaptation regime.

Interpretation in this manner may provide a framework through which the LOSC may address existing and emerging climate change-related legal issues. As indicated in Chapter IV, consideration of adaptation obligations may inform the interpretation and application of LOSC articles regarding baselines and islands, states' rights and duties in maritime zones, duties to the marine environment, scientific cooperation, and dispute settlement. Furthermore, that adaptation obligations may be applicable law for the LOSC's dispute settlement mechanism has practical implications for the LOSC's development. Adaptation obligations' arguably *erga omnes* character might permit any state to invoke the responsibility of another state failing to fulfill them, thereby facilitating the ability of courts and tribunals to more easily issue judgments or awards that might contribute to the LOSC's continued evolution regarding climate change. Furthermore, adaptation obligations' applicability to the dispute settlement mechanism may ease vulnerable states' ability to seek advisory opinions from ITLOS regarding climate change-related issues, and ITLOS must arguably apply adaptation obligations in doing so.

This thesis finds developing adaptation obligations legally significant to the law of the sea, potentially more so than the mitigation regime despite their relatively lower level of precision. These obligations may inform the systematic interpretation of the LOSC, and its applicability as law under the dispute settlement mechanism may provide practical opportunities for states to address disputes or to seek guidance regarding climate change-related legal issues. The adaptation regime's legal significance will be further clarified as climate law continues to develop and as scholars continue to explore climate law's applicability to the law of the sea. For instance, scholars might explore the relationship of climate law with instruments and institutions under the law of the sea that were beyond the scope of this thesis to assess.[295] Systematic interpretation is unlikely to address all climate change-related legal issues in the law of the sea; however, systemic integration and harmonization of the LOSC with the climate adaptation regime may have the practical effect of promoting the LOSC's own ability to adapt to climate change. In this way, harmonization with the adaptation regime might help the law of the sea to itself adapt to climate change.

[295] Article 7(8) of the Paris Agreement applies cooperative adaptation obligations to organizations and agencies within the UN, which might include the United Nations Environmental Programme's regional seas programme, for example.

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