JOURNAL OF PRIVATE AND PROPERTY LAW – **ISSN:1119-8206 VOL.22(1) APRIL 2025**
PUBLISHED BY DEPARTMENT OF PRIVATE AND PROPERTY LAW, RIVERS STATE UNIVERSITY

THE IMPACT OF CLIMATE CHANGE ON MARITIME BOUNDARIES AND ADMIRALTY LAW

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ABSTRACT

The ongoing and accelerated changes in the earth's climate, particularly rising sea levels and the increased frequency of extreme weather events are fundamentally affecting maritime boundaries and admiralty law. The United Nations Convention on the Law of the Sea (UNCLOS) provides the framework for maritime boundaries, but climate change is challenging its foundational principles. This paper explores how climate change affects maritime delimitation, sovereignty, and admiralty law, particularly in relation to Exclusive Economic Zones (EEZs), territorial seas, and continental shelf rights through doctrinal research methodology. The article also appraises the adaptability of international legal systems to these new realities and proposes reforms to address the growing impact of climate change on maritime law.

Keywords: Climate Change, Boundaries, Maritime Law, Admiralty Law

INTRODUCTION

Maritime law has been relatively stable for decades and it is governed primarily by the United Nations Convention on the Laws of the Sea (UNCLOS) which sets out the rules for territorial waters, Exclusive Economic Zones (EEZs), and continental shelves. However, climate change is causing a dramatic shift in the physical geography of coastal and island nations. Rising sea levels, coastal erosion, and melting polar ice caps are not only redrawing coastlines but are also affecting the very baselines from which maritime zones are measured. This new reality has significant implications for sovereignty, resource rights, and international stability.UNCLOS[1] sets the legal framework for maritime boundaries which is divided into various zones, including internal waters, territorial seas (12 nautical miles from the baseline), the EEZ (200 nautical miles from the baseline), and the continental shelf. These zones grant coastal states exclusive rights over resources, navigation, and economic activities within their maritime spaces. However, baselines, the starting points for measuring these maritime zones, are ambulatory as the coastline changes.

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[1]United Nations Convention on the Law of the Sea, Dec. 10, 1982, 1833 U.N.T.S. 3 [hereinafter UNCLOS].

Rising sea levels caused by climate change threaten the stability of these legal structures.[2] This article is in 8 sections; the introduction is followed by the 2nd section which examines the impact of climate change on maritime boundaries. Part 3 discusses the role of legal institutions in climate change and Maritime issues. Section 4 examines the policy reforms in response to climate change while the future of UNCLOS in the face of climate change is appraised in section 5. Section 6 examines the possibilities and challenges in amending UNCLOS, remedies for the impact of climate change on maritime boundaries and admiralty law is examined in section 7 and the final section concludes with ways of addressing the impact of climate change on maritime boundaries and admiralty law.

THE IMPACT OF CLIMATE CHANGE ON MARITIME BOUNDARIES

Climate change affects maritime boundaries in the forms of shifting baselines, threats on island States, boundary disputes and the impact of climate change on maritime navigation. **Shifting Baselines**occurs when the sea level rises and the physical baselines from which maritime zones are measured are shifting. Under the convention,[3] the baseline is normally the low-water mark along the coast. As the coastline moves inland due to rising seas, so do these baselines. For island nations and low-lying coastal states, this can lead to the loss of significant maritime zones, which can affect territorial waters, EEZs, and continental shelf claims.[4]**Threats to Island States** such as the Maldives, Kiribati, and Tuvalu, are among the most vulnerable to rising sea levels. In some cases, entire nations are at risk of submersion, which raises profound questions about State sovereignty and maritime entitlements.[5] For example, can a state retain its EEZ and continental shelf rights if its landmass disappears? While there is no clear precedent for such a scenario, the

[2]Douglas M. Johnston, "The Theory and History of Ocean Boundary-Making," *Ocean Development & International Law* (1987) 18(2) 285-312.

[3] UNCLOS 1982, Art.5

[4]David D. Caron, "Climate Change, Sea Level Rise and the Coming Uncertainty in Oceanic Boundaries: A Proposal to Avoid Conflict," *Ocean Development & International Law* (2003) 37(2): 197-199.

[5] James Harrison, "Saving the Oceans Through Law: The International Legal Framework for the Protection of the Marine Environment," *Ocean Yearbook Online* (2009)23(1): 279-318.

evolving jurisprudence of international courts may offer some guidance.[6]**Boundary Disputes**occur when baselines shift, maritime boundaries also shift and these disputes between states are likely to increase. In areas where maritime boundaries were previously settled, such as the South China Sea or the Arctic,[7] climate change can re-open old conflicts or create new ones. For example, as polar ice melts, the potential for natural resource extraction in the Arctic increases,[8] leading to competing territorial claims by states such as Russia, Canada, and the United. Climate change also affects traditional admiralty law, particularly in the areas of**MaritimeNavigation.**[9] Extreme weather events are becoming more frequent and severe posing risks to vessels at sea. Additionally, changing sea ice conditions in the Arctic are opening new shipping routes, which presents both opportunities and legal challenges particularly concerning navigation rights and environmental protection.[10] In order to resolve the impact of climate change on Admiralty law, international legal institutions are playing significant roles in adjudicating disputes arising from maritime boundaries.

THE ROLE OF INTERNATIONAL LEGAL INSTITUTIONS IN MARITIME ISSUES

Climate change is transforming the field of maritime and admiralty law in profound ways. Rising sea levels, shifting baselines, and the increased frequency of extreme weather events are forcing legal systems to confront new challenges. The existing framework under UNCLOS may need to be re-evaluated and amended to address these emerging issues. Meanwhile, international courts and tribunals will play an essential role in resolving disputes and shaping the future of maritime law in the context of climate change. International legal institutions have been instrumental in addressing maritime disputes, they are the International Court of Justice (ICJ) and the International Tribunal for the Law of the Sea (ITLOS). **The International Court of Justice (ICJ)** plays a

[6]The Republic of Kiribati, "National Report on Climate Change," 2021<https://www.climate.gov.ki> last assessed 6, February 2025.
[7] Nilufer Oral, "The Quest for Maritime Boundary Stability in the Face of Sea Level Rise," *International Journal of Marine and Coastal Law* (2019) 34(2) : 217-246
[8]M. L. McConnell, "Legal Implications of the Arctic Meltdown: The Convention on the Law of the Sea and Arctic Sovereignty," *Journal of Maritime Law and Commerce* (2009) 40 (3) : 498.
[9]Robin Churchill and A. V. Lowe, *The Law of the Sea* (Manchester University Press, 1999) 215.
[10]James Kraska, "The Law of the Sea Convention and the Northwest Passage," *International Journal of Marine and Coastal Law* 22.2 (2007): 257-282.

significant role in adjudicating disputes related to maritime boundaries.[11] As climate change creates new challenges for boundary delimitation, the ICJ is likely to see an increase in cases involving the impact of environmental factors on maritime zones. The ICJ's evolving jurisprudence on equity and fairness in maritime delimitation may offer a framework for addressing these disputes.[12]**The International Tribunal for the Law of the Sea (ITLOS)** has jurisdiction over disputes arising from the interpretation and application of UNCLOS.[13] The tribunal is well-positioned to address the legal challenges posed by climate change, particularly those related to the shifting baselines and boundary disputes.

POLICY REFORM IN RESPONSE TO CLIMATE CHANGE'S IMPACT ON MARITIME BOUNDARIES

The dynamic and far-reaching impact of climate change on maritime boundaries and admiralty law has necessitated legal reforms at both international and national levels. Various governments and international organizations have recognized the need for policy updates to maintain legal stability and address the profound consequences of rising sea levels and changing maritime geography. In this section, we will explore several policy reform initiatives aimed at mitigating the challenges posed by climate change to maritime law including proposals to amend the United Nations Convention on the Law of the Sea (UNCLOS), the freezing of baselines, regional agreements, and national legislation.

Amending UNCLOS: Adapting to the Realities of Climate Change

Given the unprecedented nature of the climate change crisis, some experts argue that amendments to UNCLOS are necessary to provide a coherent legal framework for addressing the challenges posed by rising seas and shifting baselines. The primary rationale behind these calls for reform is that UNCLOS though comprehensive was negotiated in the late 20th centurybefore the full impact of climate change was understood. The proposed amendments to UNCLOS include: **Defining**

[11]*Qatar v. Bahrain*, [2001] ICJ Rep 40.
[12]Jean Allain, "The International Court of Justice and Boundary Disputes," *Leiden Journal of International Law* (1999) 12(1) 25-45.
[13] UNCLOS,iii,1982

Stable Maritime Boundarieswhich would involve creating a new legal regime that clearly defines the concept of "stable" maritime boundaries. Under this proposal, a State's maritime zones would remain fixed even if its baselines change due to climate-induced phenomena like rising sea levels or coastal erosion[14]. Such a reform would provide legal certainty to vulnerable States and protect their access to maritime resources. **Introduction of Environmental Protection Protocols**because climate change also threatens to exacerbate environmental degradation in maritime areas. A proposed amendment could introduce new protocols for environmental protection and the sustainable management of maritime zones, particularly in light of the increased likelihood of extreme weather events and the opening of new shipping routes in previously frozen areas like the Arctic.[15]**Strengthening Dispute Resolution Mechanisms**in relationto boundary disputes is on the increase due to the changing geography of coastlines, hence there is also a need to strengthen dispute resolution mechanisms under UNCLOS.[16]A proposed reform could enhance the jurisdiction of the International Tribunal for the Law of the Sea (ITLOS) and other international judicial bodies to address climate change-induced disputes over maritime zones more effectively.

Freezing of Baselines

One of the most frequently proposed policy reforms to address shifting coastlines caused by climate change is the "freezing" of baselines. This concept involves fixing maritime boundaries based on current baselines, regardless of subsequent changes to coastlines due to sea-level rise or erosion. The aim of freezing baselines is to provide legal certainty to coastal states that are vulnerable to the consequences of climate change. There is a plethora of examples of frozen baseline policies by States as in the case of the **Marshall Islands and Kiribati's** response to the existential threat posed by climate change, where the States have proactively advocated for the

[14]Stefan Talmon, "The Legal Implications of Rising Sea Levels for Maritime Zones: Implications and Reforms," *German Yearbook of International Law* (2010) 53: 67-88.
[15]Alan Boyle, "Further Development of the Law of the Sea Convention: Mechanisms for Change," *International and Comparative Law Quarterly* (2005) 54.3: 563-584.
[16]Nilufer Oral, "Rising Seas and Maritime Boundary Disputes: Lessons from the South China Sea," *International Journal of Marine and Coastal Law* 34.1 (2019): 47-76.

freezing of their baselines under international law.[17] Both countries, highly vulnerable to sea-level rise, have made legal submissions to the United Nations urging for a reinterpretation of UNCLOS provisions to allow their maritime zones to remain intact, even as their land masses shrink. By securing recognition for a frozen baseline, they aim to preserve their Exclusive Economic Zones (EEZs) and fishing rights. Also, in the **Pacific Islands Forum Declaration**in 2021, members of the Pacific Islands Forum (PIF), which includes nations like Fiji, Palau, and Tonga, adopted a resolution calling for the preservation of maritime zones in the face of sea-level rise.[18] The PIF Declaration stresses that rising sea levels should not affect the rights of coastal states under UNCLOS and advocates for fixed baselines to prevent the loss of sovereign rights over maritime resources. Freezing baselines has significant implications for international law. While it offers a solution to the problem of shifting boundaries, it also raises concerns about equity and fairness, particularly for States that could benefit from changing boundaries. It also presents a challenge to UNCLOS's[19] principle that baselines are ambulatory, meaning that maritime zones should move in tandem with physical changes in the coastline.Critics argue that freezing baselines could create disparities between States and could potentially conflict with the interests of neighbouring nations with overlapping maritime claims. Aside from the cooperation among nations to address the impact of climate change on maritime boundaries, the regions have also come up with an agreement to curb these impacts on maritime boundaries.

Regional Cooperation and Agreements

In addition to global efforts to address the impact of climate change on maritime boundaries, regional initiatives have emerged as an important platform for collaboration. In many cases, neighbouring States have found regional solutions to maritime disputes caused by changing environmental conditions. These are: **The Arctic Council's Framework for the Arctic** is one of the region's most severely affected by climate change, with rapidly melting ice creating new

[17]Richard Barnes, "Climate Change and the Law of the Sea: Challenges and Opportunities," in *The Oxford Handbook of the Law of the Sea* (Oxford University Press, 2015), 749-780.
[18]Pacific Islands Forum Secretariat, "Declaration on Preserving Maritime Zones in the Face of Climate Change-Related Sea-Level Rise," 2021.
[19]Yoshifumi Tanaka, *The International Law of the Sea* (Cambridge University Press, 2019), 220.

maritime zones and opening previously inaccessible areas for shipping and resource extraction. In response to these challenges, the Arctic Council—a regional forum comprised of Arctic States—has implemented several agreements aimed at promoting cooperation and mitigating disputes.One of the most significant initiatives is the **Agreement on Enhancing International Arctic Scientific Cooperation (2017),** which fosters collaboration between Arctic nations in the face of environmental changes and encourages the peaceful resolution of potential maritime boundary disputes caused by the melting ice. This agreement has also helped States navigate issues related to overlapping claims in the Arctic region.[20]*The Mediterranean's Barcelona Convention for the Protection of the Mediterranean Sea Against Pollution* (1976) has been expanded through amendments to incorporate climate change concerns.[21] The convention now includes protocols that address the risk of rising sea levels and extreme weather events in coastal states. These amendments include cooperative strategies to safeguard marine biodiversity and manage resources in shared maritime zones.Regional agreements such as these demonstrate the importance of cooperation in addressing the consequences of climate change. By developing targeted legal frameworks tailored to specific geographic areas, regional organizations can play a key role in mitigating the risks posed by rising sea levels. States have also adopted municipal laws to address and adaption measures to mitigate the impact of climate change on maritime boundaries.

National Legislation and Adaptation Measures

Several countries have also taken national legislative measures to address the consequences of climate change on their maritime boundaries and admiralty law. Australia has an extensive coastline vulnerable to the effects of climate change, so **Australia's Maritime Boundaries Reform** enacted significant legislative reforms to safeguard its maritime interests. Australia's *Maritime Boundaries Act 2010* specifically addresses the need for stability in maritime zones and provides mechanisms for adjusting maritime boundaries in response to changing environmental conditions.[22]This legislation ensures that Australia's EEZ and continental shelf claims remain

[20]Arctic Council, "Agreement on Enhancing International Arctic Scientific Cooperation," 2017.
[21]The Barcelona Convention, *Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean* (1995).
[22] Australia's Maritime Boundaries Act 2010.

intact, even as its baselines are affected by sea-level rise. Additionally, Australia has implemented stringent environmental standards for its shipping industry to mitigate the impacts of climate change on its maritime ecosystem.United Kingdom, recent legislative updates to admiralty law have taken into account the**United Kingdom's Admiralty Law Reforms** because of the frequency of climate-induced disasters at sea. The *Merchant Shipping (Pollution) Act*[23] was amended to include provisions for enhanced liability in cases of environmental damage caused by shipping accidents linked to extreme weather events. This law also strengthens salvage rights, ensuring that vessels involved in climate-induced incidents can be salvaged efficientlywith minimal environmental impact.

The legal challenges posed by climate change are significant, but they are not insurmountable. Through a combination of freezing baselines, amending UNCLOS, enhancing regional cooperation, and enacting national legislation, the international community can mitigate the impact of climate change on maritime boundaries and admiralty law. The examples of policy reform discussed in this section demonstrate that legal systems can adapt to the evolving realities of climate change while ensuring stability and fairness in maritime governance.These examples of policy reforms, ranging from freezing baselines to national legislative initiatives, provide a foundation for understanding how international law can evolve to meet the challenges posed by climate change. Each policy reform is tailored to specific geographical or legal contexts but collectively represents a global trend towards proactive measures to mitigate the impact of climate change on maritime boundaries.

THE FUTURE OF UNCLOS IN THE FACE OF CLIMATE CHANGE

The United Nations Convention on the Law of the Sea (UNCLOS) has been the cornerstone of maritime governance since it came into force in 1994, providing a comprehensive legal framework for the rights and obligations of coastal and maritime States. However, the convention was crafted

[23] UK Merchant Shipping (Pollution) Act,2015.

in an era when the full scope of climate change's impact on the world's oceans was not yet fully understood. As a result, UNCLOS faces unprecedented challenges that may necessitate its reform or reinterpretation to address the evolving maritime landscape shaped by climate change. This section will explore possible futures for UNCLOS, appraising its strengths, and challenges of UNCLOS in addressing environmental issues, including pathways for and its potential future adaptation.

UNCLOS's Strengths in Addressing Environmental Issues

Although UNCLOS was drafted in the late 20th Century when the impact of environmental change was not well understood, it remains a remarkably comprehensive treaty that provides a legal framework for addressing several issues related to environmental degradation and climate change. The strength of the convention includes: **Provisions for the protection of the marine environment[24]** where it provides that States are obligated to protect and preserve the marine environment and creates a general duty to prevent, reduce, and control pollution from various sources, including land-based sources, seabed activities, and dumping.[25]It provides **Rights and duties concerning exclusive economic zones (EEZs)** where States have sovereign rights for exploring, exploiting, conserving, and managing natural resources, whether living or non-living in their EEZs. UNCLOS also has **Dispute resolution mechanisms** with the establishment of the International Tribunal for the Law of the Sea (ITLOS), arbitration, and other forums which provide a structured approach to resolving disputes, including those that arise as a result of environmental changes.However, climate change presents unique challenges that UNCLOS was not specifically designed to address, particularly in terms of shifting baselines, rising sea levels, and the evolving nature of territorial claims and maritime entitlements.[26]

[24] United Nations Convention on the Law of the Sea, Dec.10. 1982, 1833. U.N.T.S. 3 (hereinafter UNCLOS)Part XII
[25] UNCLOS 1994, Art 192
[26]Yoshifumi Tanaka, *The International Law of the Sea* (Cambridge University Press, 2019), 345-353.

Key Challenges for UNCLOS in the Era of Climate Change

UNCLOS is saddled with arrays of challenges in addressing the impact of climate change and maritime boundaries in the areas of shifting baselines, and disappearing States resulting in increasing maritime disputes among other challenges. **Shifting Baselines and the Ambulatory Principle**is one of the foundational challenges for UNCLOS because it relies on the low-water mark along the coast as the baseline from which maritime zones are measured.[27] This ambulatory nature of baselines means that as coastlines retreat due to rising sea levels, so dothe baselines which directly impact a State's territorial sea, EEZ and continental shelf claims.As small island nations and low-lying coastal states face submergence or significant erosion of their coastlines, the loss of land could mean the loss of maritime zones, sovereignty, and access to marine resources. For example, nations such as the Maldives and Tuvalu are already experiencing these issues, raising critical questions about the long-term applicability of UNCLOS's[28] ambulatory baselines principle in the face of climate-induced geographical changes. Also, **Sovereignty Issues for Disappearing States**where small island nations face the existential threat of total submergence due to rising sea levels, the question of statehood and sovereignty under international law becomes acute. If a State's entire landmass disappears, can it still be recognized as a state with full sovereign rights, including rights to its EEZ and continental shelf? UNCLOS does not provide direct guidance on how to deal with the disappearance of a State's territory due to climate change, which could result in legal limbo for these nations[29]. Some scholars suggest that States in this situation may retain their maritime zones through the freezing of baselinesbut this has not yet been tested in international law. In addition, there are **Increased Maritime Disputes and Competition for Resources**as the geographical realities of the seas change due to climate impacts, and so too do geopolitical dynamics. UNCLOS's provisions on maritime delimitation and resource rights are increasingly being called into question. For example, the Arctic, once largely inaccessible due to

[27] UNCLOS 1982, Art. 5
[28] David D. Caron "Climate Change, Sea Level Rise and the Coming Uncertainty in Oceanic Boundaries: A Proposal to Avoid Conflict'' *Oceanic Development and International Law* (2006) 37 (2) 198-199
[29] Rosemary Rayfuse.''Sea Level Rise and Maritime Zones: Preserving the Maritime Entitlements of Disappearing States'', in Threatened Island Nations: Legal Implications of Rising Sea and a Changing Climate (Cambridge University Press,2013) 169-196

ice, is rapidly becoming navigable, opening up new shipping routes and resource extraction opportunities. This has led to heightened competition among Arctic states such as Canada, Russia, and the United States which are staking overlapping claims under UNCLOS's continental shelf provisions. Similarly, regions such as the South China Sea and East Africa are expected to see an increase in maritime disputes as sea levels rise, coastal configurations change and maritime resources become more contested. UNCLOS [30]provides mechanisms for dispute resolution, but it is unclear how effective these mechanisms will be when disputes arise from climate-induced changes to maritime geography. So, what are the potential future pathways for the convention to address these imminent challenges?

Potential Future Pathways for UNCLOS

The possible future means of addressing the issues caused by climate change on maritime boundaries include amending some provisions of UNCLOS, adopting practices which will be regarded as customary international law and cooperation between regions among others **Amending UNCLOS**which is presumed a difficult but Necessary Path. This is one of the most discussed solutions to the challenges posed by climate change and the possibility of amending UNCLOS to address specific gaps in the treaty. Some scholars argue that a new protocol or annexe dealing explicitly with climate change-related issues could be added to UNCLOS. Such an amendment could provide legal certainty on issues such as:The freezing of baselines to preserve state sovereignty despite changing coastlines; The legal status of submerged or disappearing states and the retention of their maritime zones and adaptation strategies for managing shared resources and resolving disputes over newly exposed areas (e.g., Arctic).However, amending UNCLOS would be a complex and politically challenging task. The convention is already a product of lengthy negotiations and achieving consensus on new provisions in the context of varying national interests, particularly among maritime powers, could be difficult. Additionally, any amendments would require broad ratification to come into force, and states with significant maritime interests

[30] Nilufer Oral "The Quest for Maritime Boundary Stability in the Face of Sea Level Rise" *International Journal of Marine and Coastal Law* (2019) 34 (2) 225-230

may resist changes that could affect their existing claims.[31] **Evolution Through Customary International Law**may create another possible pathway for UNCLOS's futurein the development of customary international law. As climate change continues to reshape maritime boundaries, States may increasingly adopt practices that deviate from UNCLOS's strict provisions, particularly with regard to baselines and State sovereignty. Over time, these practices could crystallize into customary international law which might either supplement or supersede UNCLOS in specific areas[32]For example, if a growing number of States begin to accept the concept of freezing baselines in the context of climate change, this could eventually become a recognized norm in international law, even without formal amendment to UNCLOS. Similarly, international courts and tribunalsincluding ITLOS, may begin to develop new jurisprudence that reflects the realities of climate change thereby creating a more flexible body of law that evolves alongside these global challenges. **Regional Solutions and Cooperation**may be beneficial as regional solutions in the absence of global amendments to UNCLOS to address challenges posed by climate change. Coastal States in specific regions, such as the Pacific Islands, the Arctic, or the Mediterranean, may enter into regional agreements that adapt maritime boundary rules to the effects of climate change.For instance, the *Pacific Islands Forum*[33]has already adopted a regional approach to freezing maritime boundaries, with Member States agreeing that their maritime zones should remain fixed despite rising sea levels. Such regional agreements provide a practical way for countries with similar challenges to coordinate their responses, ensuring greater stability in maritime governance even as global negotiations on UNCLOS reform continue.**The role of International Courts and Tribunals,** for example, the ICJ and ITLOS could play an important role in shaping the future of maritime law in the context of climate change. These judicial bodies are already hearing cases related to maritime delimitation and environmental protection, and they may be called upon to resolve disputes arising from climate-induced changes to maritime zones.

[31] Alan Boyle, ''Further Development of the Law of the Sea Convention: Mechanisms for Change'' *International and Comparative Law Quarterly* (2005) 53(3) 563-584
[32] Stephan Talmon,'' The Legal Implications of Rising Sea Levels for Maritime Zones: Implications and Reforms,''*German Year Book of International Law* (2010) 53;63-87
[33] Pacific Islands Forum Secretariat, 'Declaration on Preserving Maritime Zones in the Face of Climate Change-Related Sea Level Rise(2021)

These international courts could contribute to the future of UNCLOS through advisory opinions that clarify the legal implications of climate change for maritime boundaries, for instance, an advisory opinion of the ITLOS could provide much-needed guidance on whether States are entitled to freeze their baselines or how international law should address the issue of climate change.

AMENDING UNCLOS: POSSIBILITIES AND CHALLENGES

The United Nations Convention on the Law of the Sea (UNCLOS) represents a monumental achievement in international maritime law, setting out comprehensive rules governing the use of the world's oceans and their resources. Given the evolving challenges posed by climate change, the possibility of amending UNCLOS has become a topic of significant interest and debate. This section explores the mechanisms for amending UNCLOS, the challenges involved, and potential pathways for reform.

Mechanisms for Amending UNCLOS

There is a unique procedure provided by UNCLOS for the possibility of amendments. Specifically, Article 312[34] of the convention outlines the procedure for amendments: these include: **Proposal of Amendments** which can be made by any party to the convention or by the International Maritime Organization (IMO) which administers and oversees various aspects of the convention. Thereafter, **Submission to the Depositary**, implies that allproposed amendments must be submitted to the Secretary-General of the United Nations, who serves as the depositary for the convention. Then, the **Adoption**- all proposed amendments must be adopted by a conference convened for that purpose. The conference is usually composed of States parties to UNCLOS. **Ratification**- For an amendment to enter into force, it must be ratified by a certain number of States parties, as specified in the amendment proposal. Generally, the amendment process requires broad consensus among State parties to ensure its acceptance and implementation and the final stage is **Entry into Force**- Once ratified by the requisite number of States, the amendment enters into force for all parties to the convention[35]Occasionally, the States Parties to

[34] UNCLOS 1982, ,Art. 312
[35] UNCLOS 1982, Art. 312

UNCLOS convene conferences to address specific issues or to discuss potential amendments. Such conferences have been instrumental in addressing gaps or issues not fully covered by the original text. For example, the 1994 Agreement Relating to the Implementation of Part XI of UNCLOS, which was adopted to address concerns related to deep-seabed mining, was a result of a conference convened to amend and clarify certain provisions of the convention.[36]

Challenges to Amending UNCLOS

It has been discussed in the paper that UNCLOS is faced with arrays of challenges and amendment procedure is cumbersome and difficult. Amending UNCLOS presents several political and diplomatic challenges[37] in the form of **Consensus Requirements**: Amending UNCLOS requires a broad consensus of state parties, which can be difficult to achieve given the diverse interests and priorities of maritime nations. Some States may resist amendments that could impact their existing maritime claims or economic interests. Then, **Geopolitical Considerations** where the interests of major maritime powers and regional players can complicate negotiations. Countries with significant maritime interests may be reluctant to support changes that could alter their strategic or economic position.**The complexity of Negotiations** is because the process of negotiating and drafting amendments to a comprehensive treaty like UNCLOS is complex and time-consuming. It requires extensive consultations and negotiations among States and this can delay or hinder progress.

Other challenges include **legal and institutional constraints** which are visible in the legal framework of UNCLOSwhich is intricate, with interrelated provisions covering various aspects of maritime law. Any proposed amendment must be carefully crafted to ensure that it does not inadvertently create legal inconsistencies or conflicts with existing provisions. Also**. Institutional Challenges** becausethe International Maritime Organization (IMO) and other bodies involved in the administration of UNCLOS may have differing priorities or perspectives on proposed amendments.[38] Coordination among these institutions is essential to ensure a coherent approach to

[36] Agreement relating to the Implementation of Part XI of UNCLOS, 28th July, 1994, 1836 U.N.T.S.3
[37] Alan Boyle,''Further Development of the Law of the Sea Convention: Mechanisms for Change, *'International and Comparative Law Quarterly* (2005) 54 (3) 563-584
[38] Yoshifumi Tanaka (n26) 356

reform.Amendments to UNCLOS involve **Balancing the Interests and Equity**of developed and developing States, coastal and landlocked States, and States with differing maritime priorities. Ensuring that amendments do not disproportionately benefit or disadvantage any particular group is a key challenge. Changes to UNCLOS could have**an Impact on Existing Claims** suchas existing maritime and boundaries claims. Addressing these concerns and providing transitional provisions to mitigate disruptions is crucial for gaining acceptance among States parties.[39] Consequently, there ought to be remedies for States for the impact of climate change on maritime boundaries and admiralty law.

REMEDIES FOR IMPACTS OF CLIMATE CHANGE ON MARITIME BOUNDARIES AND ADMIRALTY LAW

The legal framework governing maritime boundaries and admiralty law is being challenged by the adverse effects of climate change. Rising sea levels, increasing ocean temperatures, and extreme weather patterns are reshaping coastal geography and creating legal ambiguities in the delineation of maritime boundaries. The United Nations Convention on the Law of the Sea (UNCLOS) provides a legal basis for the establishment of territorial seas, exclusive economic zones (EEZs), and continental shelves. However, these provisions are under strain due to the evolving geographic realities induced by climate change. This section of the article explores potential remedies to the impacts of climate change on maritime boundaries and admiralty lawwith a particular focus on legal, political, and practical solutions. The remedies include: stabilizing maritime boundaries, the Doctrine of Climate Refugees, shifting resources within the EEZ, and legal mechanisms for dispute resolution among others.

Stabilizing Maritime Boundaries: The Role of the Baseline Concept

The UNCLOS recognizes baselines as the starting point for determining maritime zones. However, rising sea levels threaten to shift baselines, leading to a loss of maritime entitlements for States

[39] David D. Caron (n-28)197-199

with disappearing coastlines.[40] A primary remedy is the adoption of a "fixed baseline" approach, which would maintain the current boundaries despite changes in the geographical configuration of the coastline. This concept has been suggested by Small Island Developing States (SIDS) and other vulnerable coastal nations facing the existential threat of disappearing landmass.[41]

Under this approach, maritime boundaries once established would not shift, thereby offering legal certainty and stability.[42] International organizations such as the International Law Commission (ILC) could play a key role in codifying this approach into customary international law. However, to fully protect the rights of affected States, any such solution would need broad international consensus.[43]

The Emerging Doctrine of "Climate Refugees" and its Implications on Admiralty Law

As climate change displaces coastal populations and island nations, the concept of "climate refugees" is becoming an increasing area of focus in international law. The displacement of people due to climate change affects admiralty law by complicating jurisdictional questions involving displaced people, their vessels, and the resources of former coastal States.[44] The question which may arise is how admiralty law, traditionally concerned with commerce, shipping, and accidents at sea, should accommodate the rising trend of climate-driven displacement.An important remedy in this context is the expansion of admiralty law to encompass the protection of climate refugees. This could include special provisions for search and rescue operations for displaced populations at sea, as well as the creation of new legal categories recognising climate-displaced persons' maritime entitlements, such as fishing rights or resource claims that would persist even if their original territory were submerged.[45] Such an expansion would require international agreements

[40]] United Nations Convention on the Law of the Sea (UNCLOS) 1982, art 5.
[41]Michael Gerrard and Gregory Wannier, *Threatened Island Nations: Legal Implications of Rising Seas and a Changing Climate* (Cambridge University Press 2013) 159-162.
[42]David Freestone, 'International Law and Sea Level Rise: Fixing Baselines for Maritime Entitlements, Climate Change and Beyond' 20(4) (2015) *International Journal of Marine and Coastal Law* 423, 430.
[43]Yoshifumi Tanaka, *The International Law of the Sea* (3rd edn, Cambridge University Press 2019) 106.
[44]*Ioane Teitiota v New Zealand* (UN Human Rights Committee, CCPR/C/127/D/2728/2016, 2020).
[45]Rosemary Rayfuse, 'Sea Level Rise and Maritime Zones: Preserving the Maritime Entitlements of 'Disappearing' States' 35 (2019) *International Law Journal* 189, 191.

that modify the existing framework of admiralty law under UNCLOS and other maritime conventions.[46]

Addressing Shifting Resources within Exclusive Economic Zones (EEZs)

Another significant consequence of climate change on maritime boundaries is the shifting of marine resources due to changing ocean temperatures and ecosystems. Fish stocks, for instance, are migrating into new areas, leading to disputes between States over rights to these resources.[47] A remedy to this issue involves enhanced international cooperation and the use of adaptive management techniques within Regional Fisheries Management Organisations (RFMOs). These entities can facilitate the negotiation of resource-sharing agreements that take into account the migratory nature of fish stocks in response to climate change.[48]A specific proposal is the development of "climate-adaptive" EEZs, which would allow for dynamic adjustments to maritime zones based on real-time data regarding the movement of marine resources.[49] This approach would promote equity and avoid potential conflicts arising from resource shifts. States could also adopt bilateral or multilateral treaties addressing specific migratory species to regulate and share the exploitation of marine resources more effectively.[50]

The Potential of Legal Dispute Mechanisms in Maritime Boundary Conflicts

The impacts of climate change are likely to increase the number of maritime boundary disputes, particularly in areas where sea level rise alters the physical characteristics of the coast. International dispute resolution mechanisms, such as those under UNCLOS (notably the International Tribunal for the Law of the Sea (ITLOS), will play a crucial role in addressing these conflicts. Existing case law provides a precedent for the judicial resolution of boundary disputes,

[46] See (n53) Article 89
[47]E J Molenaar, 'Climate Change and International Fisheries Law'(2012) 27(2) *International Journal of Marine and Coastal Law* 427, 434.
[48]David Fluharty, 'Climate Change and Fisheries: Perspectives from Small Island Developing States' (2019) 24 Ocean & Coastal Management 303, 307.
[49]Elise Johansen, 'The Legal Framework for Climate-Responsive Fisheries Governance: A Role for International Fisheries Law in Implementing Climate-Adapted Management' (2020) 70 *Marine Policy* 179, 182.
[50]James Harrison, *Making the Law of the Sea: A Study in the Development of International Law* (Cambridge University Press 2011) 234.

including those potentially exacerbated by climate change.[51]A long-term solution would involve expanding the jurisdiction of ITLOS to specifically address climate change-related maritime boundary disputes. States are therefore encouraged to submit climate change-induced disputes to arbitration or judicial resolution rather than resorting to unilateral actions or bilateral negotiations.[52] An early identification of climate change as a contributing factor to maritime disputes would also help the tribunal apply equitable principles more consistently when resolving boundary issues.[53]

The Creation of New International Legal Frameworks

Although UNCLOS provides the primary legal structure governing maritime boundaries and admiralty law, it was not designed with climate change in mind. As a result, there is a need for the development of new international legal frameworks specifically addressing the climate-induced changes to maritime zones. These frameworks could include protocols for preserving maritime entitlements in cases where territorial integrity is compromised by sea level riseor international agreements on sharing newly accessible marine resources in the Arctic regionwhich is opening up due to melting ice.[54]One promising initiative is the proposal for a Climate Change and Ocean Law Convention, which would serve as a supplement to UNCLOS, addressing the unique challenges posed by climate change to maritime boundaries and resources.[55] Such a convention could include provisions on fixed baselines, resource sharing, and the rights of displaced populations. A parallel track to this would be the adoption of regional agreements among states particularly affected by

[51]*Guyana v Suriname* (Award) (2007) 47 ILM 166.
[52]Natalie Klein, *Dispute Settlement in the UN Convention on the Law of the Sea* (Cambridge University Press 2005) 53.
[53]Nicholas A Robinson, 'Climate Change, Fisheries and Marine Boundaries: Crisis or Opportunity?' (2019) 34 *International Law Studies* 503, 511.

[54]Davor Vidas and others, 'International Law and Sea Level Rise: The New ILA Committee' (2012) 2(1) Climate Law 3, 7.
[55]Timo Koivurova, 'The Arctic Council and the Climate Change Regime' 6 (2017) *Transnational Environmental Law* 139, 142.

climate change, such as Pacific island nations or Arctic States that create bespoke rules reflectingtheir specific needs.[56]

CONCLUSION

Climate change presents a complex and multifaceted challenge to maritime boundaries and admiralty law. Rising sea levels, shifting resources, and the displacement of populations are fundamentally altering the traditional legal landscape of the seas. To mitigate these impacts, a combination of legal, political, and practical remedies is required.The adoption of fixed baselines can ensure legal stability for vulnerable coastal States, while the incorporation of the concept of "climate refugees" into admiralty law addresses the human dimension of climate displacement. Enhanced cooperation through RFMOs and the development of climate-adaptive EEZs offer pragmatic solutions to resource disputes.The expansion of international dispute resolution mechanisms provides a legal avenue for resolving conflicts. Finally, the development of new legal frameworks, either through a supplemental ocean law convention or regional agreements, will be necessary to fully address the unprecedented challenges posed by climate change to the law of the sea.These remedies, when implemented will provide a comprehensive approach to addressing the impacts of climate change on maritime boundaries and admiralty law. However, they will require substantial international cooperation, political will, and adaptation to a rapidly changing global environment.

[56]Nilüfer Oral, 'Climate Change and the Law of the Sea: The Need for a New Legal Order?' (2020) 52 Ocean Development & International Law 103, 108.