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Implications of Sea-Level Rise for the Law of the Sea

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ABSTRACT

Increasing global temperature due to climate change is causing the sea level to rise, which will have an increasingly greater effect on coastlines and baselines of maritime states, creating the potential for economic and political uncertainty. International law and the United Nations Convention on the Law of the Sea [hereinafter: LOSC] do not offer a solution to the effects of sea-level rise, except in Article 7(2), which fixes straight baselines in highly unstable coastlines in a delta or similar area, and Article 76(9), which permanently fixes the outer limits of continental shelf. Most scholars have proposed a freeze of the existing baselines or outer limits of maritime spaces and have urged the international community to adopt a rule on this issue. We would argue an exception to the above solution in the case of islands and rocks. Although most scholars argue that an island or a rock must retain its continental shelf in case of submersion, such interpretation does not seem to be consistent with the purpose of Article 121(3) of the LOSC, which was adopted to deny tiny rocks from having an exclusive economic zone (EEZ) and continental shelf. Such entitlements from disappeared islands do not comply with the principle of "the land dominates the sea," and therefore should be exempted from the freeze.

Keyword:

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1. Introduction

Increasing global temperature due to climate change is causing the sea level to rise. Such rises can impact countries' boundaries given how the Law of the Sea Convention (LOSC) is configured, which in turn may affect maritime entitlements of insular features. How to deal with the potential difference between changes in geographic boundaries caused by rising seas versus legally demarcated baselines that establish critical elements of sovereignty and sovereign rights, including economic zones, jurisdiction and navigation, and fishing areas is an important question.

Between 1993 and 2010, for example, sea level rose 3.2 mm per year,[1] while by 2100, it is expected that sea level rise will be approximately one meter (3.2 ft).[2] As a consequence of this rise in sea level, low-lying areas and some insular features are threatened with submersion.[3] If baselines, from which the maritime zones are measured, move landward or seaward, maritime boundaries might also move. The United Nations Convention on the Law of the Sea does not explicitly regulate the baseline shift, nor does it offer a solution for this issue.[4] Because some 87 percent of the world's sea hydrocarbon reserves are located within the national jurisdiction of States,[5] and more than 90 percent of fish stocks live within 200 nautical miles of the baselines,[6] securing maritime boundaries which is contingent upon baseline is very important for maintaining international peace and security.

1) IPCC, "2013: Summary for Policymakers" in *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, The Physical Science Basis*, ed. T.F. Stocker et al. (Cambridge: Cambridge University Press, 2013), p. 11.

2) J. A. Church et al., "Sea Level Change" in *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, ed. T.F. Stocker et al. (Cambridge: Cambridge University Press, 2013), p.1140.

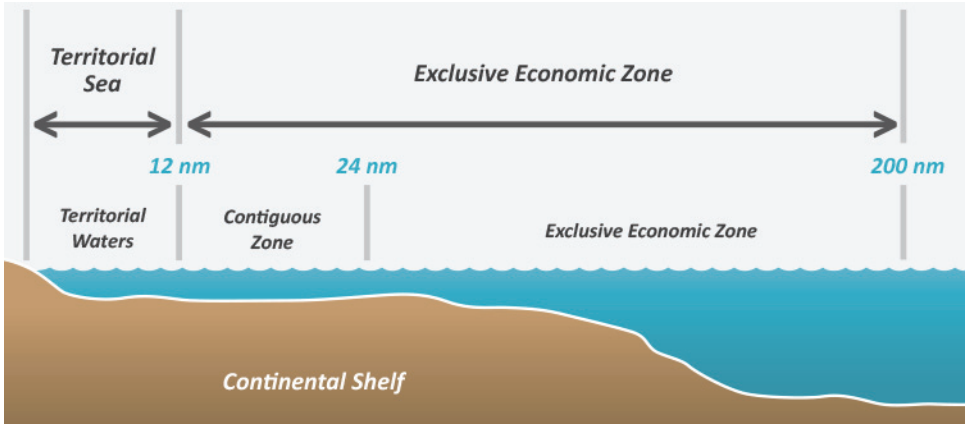
3) "For example, a one-meter rise in the sea level could result in the loss of 75 percent of certain low-lying islands of Vanuatu, and 80 percent of the Majuro atoll in the Marshall Islands." Charles Di Leva and Sachiko Morita, "Maritime Rights of Coastal States and Climate Change: Should States Adapt to Submerged Boundaries?" *Law and Development Working Series 5* (2008), p. 8.

4) United Nations Convention on the Law of the Sea, adopted 10 December 1982, 1833 UNTS 397.

5) UN Division for Ocean Affairs and the Law of the Sea, "The United Nations Convention on the Law of the Sea (A historical perspective)," accessed June 19, 2017, http://www.un.org/depts/los/convention_agreements/convention_historical_perspective.htm#Historical%20Perspective.

6) Louis B. Sohn et al., *Cases and Materials on the Law of the* Sea, 2nd ed. (Leiden: Brill, 2014), p. 662.

Figure 1. Maritime Zones[7]



2. Background

The LOSC aims to "contribute to the strengthening of peace, security, cooperation and friendly relations…"[8] This objective hinges upon the stability of maritime space and borders, and an ambulatory baseline system would entirely disturb the stability and continuity of maritime boundaries. Therefore, it seems the best solution to the sea level rise is to fix baselines permanently.

2.1 The Definition of "Baselines"

A coastal State measures its maritime space from baselines, which are generally measured from the low-water line along the coast.[9] According to LOSC Article 6, in case of islands having fringing reefs, the baseline is the seaward low-water line of the reef. Normal baselines are shown in large-scale charts officially recognized by the coastal State.[10]

Straight baselines, on the other hand, may be employed "where the coastline is deeply indented and cut into, or if there is a fringe of islands along the coast in its immediate vicinity."[11] According to LOSC Article 9, the baseline for a river, which directly flows into the sea, is a straight line across the mouth of the river between the points on the low-water line of its banks. Straight baselines may not be employed "to and from low-tide elevations [which is explained below] unless lighthouses or similar installations which are permanently above sea level have been built on them or except in instances where the drawing of baselines to and from

7) Secure Fisheries, http://securefisheries.org/sites/default/files/pictures/economic-zones-oceans.png (last visited Apr. 15, 2018).
8) Preamble of the LOSC.
9) Article, 5, LOSC.
10) Article 5, LOSC.
11) Article 7, LOSC.

such elevations has received general international recognition."[12] A straight baseline may be employed on the mouth of a bay, where the distance between low-water marks on either side is less than 24 nautical miles (nm).[13] Finally, an archipelagic State may draw straight baselines "by joining the outermost points of the islands and drying reefs of the archipelago."[14]

Straight baselines or the outer limits of the territorial sea, of the Exclusive Economic Zone (EEZ) and the continental shelf must be shown on charts.[15] Alternatively, the coastal State may utilize a list of geographical coordinates of points, specifying the geodetic datum.[16] Under the LOSC, the coastal State is required to give due publicity to such charts or lists of coordinates and deposit a copy of them with the Secretary-General of the United Nations.[17]

2.2 Maritime Zones

Baselines further define other critical aspects of sovereignty, both on the landward and seaward of the defined and registered baseline. The landward side of a baseline constitutes internal waters of a State, and thus subject to the absolute sovereignty of the State. The territorial sea is adjacent to the internal waters and extends up to twelve nautical miles (nm) from the baselines.[18] Beyond the territorial sea, a contiguous zone provides a coastal State to exercise its control necessary to "a) prevent infringement of its customs, fiscal, immigration or sanitary laws and regulations within its territory and territorial sea; and b) punish infringement of the above laws and regulations committed within its territory or territorial sea."[19] A contiguous zone cannot extend beyond 24 nautical miles from the baselines.

The exclusive economic zone (EEZ) and continental shelf extend up to 200 nm from the baselines. A state may be entitled to a continental shelf beyond 200 nm if its continental margin extends beyond the 200-nm limit. However, such extension may not be longer than 350 nautical miles from the baselines nor longer than 100 nautical miles from the 2,500-meter isobaths.[20] Within the EEZ, the coastal State has sovereign rights for the purpose of exploring and exploiting, conversing and managing living and non-living resources of the water column and of the seabed and subsoil, as well as sovereign rights with regard to other economic activities such as production of energy from the water, currents and winds.[21] On the other hand, the coastal State's sovereign rights over the continental shelf are limited to the exploration of the continental shelf and exploitation of its natural resources.[22]

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12) Article 7(4), LOSC.
13) Article 10(4), LOSC.
14) Article 47, LOSC.
15) Articles 16, 47(9), 75 and 84, LOSC.
16) Ibid.
17) Ibid.
18) Article 3, LOSC.
19) Article 33, LOSC.
20) Article 76(6), LOSC.
21) Article 56(1)(a), LOSC.
22) Article 77(1), LOSC.

3. The Effect of Baseline Shift

The LOSC does not explicitly state that a baseline shift would also move maritime boundaries,[23] which has significant implications given existing and predicted sea level rise. This is particularly important given that two provisions in the LOSC permanently fix baselines.[24] First, according to LOSC Article 76(9), a coastal State is required to deposit with the Secretary-General of the United Nations charts and information, "permanently describing the outer limits of its continental shelf." One scholar on the LOSC has indicated that the inclusion of the word "permanent" was intentional.[25] Second, according to LOSC Article 7(2),

> Where because of the presence of a delta and other natural conditions the coastline is highly unstable, the appropriate points may be selected along the furthest seaward extent of the low-water line and, notwithstanding subsequent regression of the low-water line, the straight baselines shall remain effective until changed by the coastal State in accordance with this Convention.

This provision allows a coastal state to draw straight baselines in areas where the coastline is highly unstable because of a river delta. Furthermore, once the coastal state designates such straight baselines, they will be permanent regardless of any physical change along the coastline. Therefore, if the coastal State does not take action under LOSC Article 7(2), a fixed baseline will not change even if the low-water line moves landward or seaward. However, no State has changed its baseline pursuant to this provision.[26] Apart from these two provisions, the LOSC does not say anything to the effect that the LOSC is permanently fixing baselines.

Because there is no explicit provision in the LOSC concerning baseline shift in response to the sea level rise, nor in any other international convention, this issue has been widely discussed by the legal scholars.[27] Most scholars accept that a shift in the baseline landward would move the outer limits of each maritime zone landward.[28] One scholar noted "as the normal low-water line moves landward and seaward with accretion and erosion, so does the baseline. As the baseline ambulates, so does each maritime space measured from it."[29] For example, area within the

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23) Di Leva and Morita, note 3 above, p. 17.

24) Ibid., p. 17.

25) David D. Caron, "When Law Makes Climate Change Worse: Rethinking the Law of Baselines in Light of a Rising Sea Level," *Ecology Law Quarterly*, Vol. 17, Issue 4 (1990), p. 635.

26) Di Leva and Morita, note 3 above, p. 18.

27) In 2012, a committee—the Committee on International Law and Sea Level Rise—was established by the International Law Association. The Committee has prepared a report on the law of the sea issues, and migration and human rights issues arising from rising sea levels. Davor Vidas, David Freestone and Jane McAdam, "International Law and Sea Level Rise: The New ILA Committee," *ILSA Journal of International & Comparative Law*, Vol. 21: 2, Article 9 (2015).

28) Michael W. Reed, *The Development of International Maritime Boundary Principles through United States Practice, Vol. 3, Shore and Sea Boundaries* (Washington, DC: U.S. Department of Commerce, 2000); Caron, note 24 above, p. 634.

29) Reed, note 26 above, p. 185.

territorial sea might become part of the EEZ because of a baseline shift; the new area would be subject to the freedom of navigation rather than the innocent passage.[30]

> Even so, the same authors prefer to preserve baselines on the charts even if the baselines themselves move.[31] Jose Luis Jesús reasoned this position as follows:
>
> In a world where almost every coastal State shares at least one common maritime border with another State, stability and continuity of maritime boundaries seems to be only possible if baselines are basically permanent and are not regularly redrawn to reflect geographical changes that may occur, especially the drastic changes that may be caused by the appearance of a new-born island or the sea-level rise.[32]

While Caron and Jose Luis Jesús proposed to maintain the original baselines,[33] Soons proposed to maintain the original outer limits of maritime spaces in case of a sea-level rise.[34] According to these writers, updating charts and moving maritime boundaries would prevent stability in boundaries.[35] It would also be an expensive task.[36] The difference between the fixing of baselines and the fixing of outer limits of maritime spaces is explained as follows:

> The fixing of baselines would mean that the future submerged area becomes internal waters, whereas fixing only the outer limits of maritime zones would result in expanding the breadth of the territorial sea landwards to the extent that baselines shift in the future. According to this latter approach, the newly submerged area would be subject to the regime of innocent passage. Between the two approaches, the former appears to be more justifiable since the newly submerged area was formerly part of the land territory of the coastal State under its full sovereignty, and thus should be turned into internal waters rather than the territorial sea. In addition, the former has the merit of having no

30) Di Leva and Morita, note 3 above, p. 20.

31) Caron, note 25 above; Sarra Sefrioui, "Adapting to Sea Level Rise: A Law of the Sea Perspective" in *The Future of the Law of the Sea: Bridging Gaps Between National, Individual and Common Interests*, ed. Gemma Andreone (Springer: 2017), p. 18; Moritaka Hayashi, "Islands' Sea Areas: Effects of a Rising Sea Level," *Review of International Studies*, June 10, 2013, /islandstudies//research/a00003/, p. 11.

32) Jose Luis Jesús, "Rocks, New-born Islands, Sea Level Rise and Maritime Space," in *Verhandeln für den Frieden* [Negotiating for Peace], ed. Jochen Frowein et al. (Berlin: Springer, 2003), p. 599.

33) Caron, note 25 above, p. 647; Jesús, note 32 above, p. 602. Jesús said "once the baselines have been established and given publicity… such baselines should be seen as permanent baselines, irrespective of changes." Ibid.

34) A. H. Soons, "The Effect of a Rising Sea Level on Maritime Limits and Boundaries," *Netherlands International Law Review*, Vol. 37:2 (1990), p. 231.

35) "In particular, it is argued that the rule that maritime boundaries should be tied to ambulatory baselines, will, as the result of a rising sea level, encourage wasteful spending by states and lead to uncertainty in boundaries and hence conflict." David Caron, "Climate Change, Sea Level Rise and the Coming Uncertainty in Oceanic Boundaries: A Proposal to Avoid Conflict Maritime Boundary Disputes, Settlement Processes, and the Law of the Sea," from Selected Works of David D. Caron (2008), p. 17 at http://works.bepress.com/david_caron/39/.

36) Caron, note 24 above, p. 650.

need of changing the rules on the breadth of the territorial sea and the EEZ as contained in Articles 3 and 57 of the LOSC, respectively. Furthermore, the fixing of baselines, especially straight and other non-normal baselines is of particular importance for navigators of non-coastal States as they define the outer limits of internal waters of the coastal State.[37]

Thus, defining the actual baseline and responding to sea level rise is critical. When to "freeze" a baseline in place is an important issue as well. Hayashi and Jesús suggested the moment when the coastal State shows its normal baselines on charts officially recognized by the coastal State under LOSC Article 5, or when it shows its straight baselines and outer limits of its maritime zones on charts or indicates geographical coordinates of baseline points and gives due publicity to them under LOSC Article 16.[38] Some States, such as the United Kingdom and the Netherlands, have treated nautical charts as the only legal document that defines baselines. Sefrioui said, "in fact, by recognizing that coastline change over the time, the nautical chart or the straight baseline geographical coordinates as deposited with the Secretary-General must remain the reference legal document regardless of coastline changes."[39]

Scholars vary on what should happen. Soons suggested that States create a customary international law rule, which would allow them to retain outer limits of their maritime zones in case of sea-level rise.[40] Rayfuse suggested that coastal States threatened by rising sea-levels must adapt their domestic legislation and baselines practice such that it would be consistent with their international ambitions.[41] Another option for the adoption of such a rule could be accomplished by an amendment to the LOSC, which could be enacted through the formal process in the LOSC, or through a decision of the Meeting of the States parties, or through the adoption of a supplementary agreement for LOSC modification.[42]

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37) Moritika Hayashi, "Sea Level Rise and the Law of the Sea: How can the Affected States be Better Protected?" in *Limits of Maritime Jurisdiction*, ed. Clive H. Schofield, Moon-Sang Kwon, and Seokwoo Lee (Leiden: Brill, 2013), p. 617; Jesús, note 32 above, p. 599.

38) Hayashi, ibid., p. 619. He proposed a rule as follows:
A coastal State may declare the baselines established in accordance with the relevant provisions of the UN Convention on the Law of the Sea as permanent once it has shown them on charts of an adequate scale or described them by a list of geographical coordinates, and given due publicity thereto, notwithstanding subsequent changes in geographical features of coasts or islands due to sea level rise. Ibid.

39) Sefrioui, note 31 above, p. 17.

40) Soons, note 34 above, p. 231.

41) Rosemary Rayfuse, "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 Change*, ed. Michael B. Gerrard and Gregory E. Wannier (Cambridge: Cambridge University Press, 2013), p. 191.

42) Ibid, pp. 189, 190; Hayashi, note 37 above, pp. 620-623.

4. Decisions by International Tribunals

Thus far, international tribunals have had little to say regarding baseline shift. In *Nicaragua v. Honduras*, the International Court of Justice (ICJ) considered a dispute between the Republic of Nicaragua and the Republic of Honduras regarding maritime delimitation in the Caribbean Sea.[43] As a rule, the ICJ determines baselines from which maritime zones are measured before beginning delimitation. The ICJ held that Honduras did not have a viable base point ("Point 17" in Honduran Executive Decree No. PCM 007-2000 of 21 March 2000) since "the point is no longer in the mouth of the River Coco and cannot be properly used as a base point" without discussing the effect of this situation on baselines shift.[44] The Court simply looked at whether the baselines complied with physical reality.

In a second case, *the Bay of Bengal Maritime Boundary Arbitration*, an arbitral tribunal established under Annex VII of the LOSC determined the maritime boundary between Bangladesh and India in the Bay of Bengal. The tribunal's first task was to determine the baselines in an area where the coast is highly unstable. However, the arbitral tribunal did not take into account future instability of the coastline.[45] Aside from these decisions, there is no case decided by an international tribunal discussing the effect of a baseline shift on maritime entitlements, in other words, no case in which "one state sought to limit territorial or maritime claims of another because the latter state allegedly lost territory due to rising sea levels."[46] Should a case concerning this issue arise, it may be adjudicated before the ICJ or, in the event that concerned States are parties to the LOSC, they can benefit from mandatory jurisdiction system of the LOSC.

5. Decisions by the U.S. Supreme Court

Although international tribunals have not made decisions, the U.S. Supreme Court has dealt with this issue in two decisions. While such decisions do not create precedent for international tribunals, they can offer insights on how the issue might be addressed.

In a 1997 decision, the Supreme Court treated baselines as ambulatory, and said they can be "heretofore or hereafter modified by natural or artificial means," as opposed to something permanently fixed.[47] In *United States v. Alaska*, the U.S. Supreme Court dealt with a dispute between the United States and Alaska over the

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43) *Territorial and Maritime Dispute between Nicaragua and Honduras in the Caribbean Sea (Nicaragua v. Honduras), Judgment, I.C.J. Reports 2007.*

44) Ibid., p. 743, para. 278.

45) Naomi Burke, *Annex VII Arbitral Tribunal Delimits Maritime Boundary Between Bangladesh and India in the Bay of Bengal*, 18 ASIL Insights Home (2014), https://www.asil.org/insights/volume/18/issue/20/annex-vii-arbitral-tribunal-delimits-maritime-boundary-between.

46) Di Leva and Morita, note 3 above, p. 21.

47) *United States v. California*, 382 U.S. 448, 449 (1966).

ownership of submerged lands along Alaska's Arctic Coast.[48] Because such entitlements are measured from coastlines, the Supreme Court first had to determine the baselines.[49] The Court said, "the shifts in a low-water line along the shore … could lead to a shift in the baselines for measuring a maritime zone."[50] The Court maintained that because of baseline shifts, "the State's entitlement to submerged lands beneath the territorial sea would change."[51]

In 2007, the U.S. Supreme Court dealt with a case by the State of Massachusetts against the Environmental Protection Agency.[52] The Court agreed with the Massachusetts that because rising seas have begun to swallow its coastal land, the State was injured as an owner of a substantial portion of the state's coastal property.[53] This case then set precedent on the regulation of greenhouse gas emissions to combat global warming and potential impacts from sea level rise, among other impacts.

6. Implications for Maritime Boundary Agreements

The baselines shift might also affect maritime delimitation agreements in those maritime areas where coastal States are less than 400 nautical miles or less than 24 nautical miles from each other. For the delimitation of EEZ and continental shelf, the LOSC has identical provisions. According to the Convention, "the delimitation of the continental shelf [and the EEZ] between States with opposite or adjacent coast shall be effected by agreement on the basis of international law, as referred to in Article 38 of the Statute of the International Court of Justice, in order to achieve an equitable result."[54] The LOSC does not regulate a standard delimitation method but requires reaching an equitable result. The concerned States may apply a median line or another line based on special circumstances such as the configuration of coastlines or the presence of islands.[55]

Regarding delimitation of territorial sea between States whose coasts are opposite, if those States fail to agree on a delimitation line for the territorial sea, "neither of the two States may extend its territorial sea beyond the median line, every point of which is equidistant from nearest points on the baselines" unless special circumstances or historic title requires a different delimitation boundary.[56]

One scholar noted that if the delimitation agreement explicitly refers to the median line, the boundary may change as a result of sea level rise: "asymmetrical changes of the baselines of both States will lead to changes in the location of the

48) *United States v. Alaska*, 521 U.S. 1 (1997).
49) Ibid., p. 22.
50) Ibid., p. 31.
51) Ibid.
52) *Massachusetts v. Environmental Protection Agency*, 549 U.S. 497 (2007), cited in Di Leva and Morita, note 3 above, p. 22.
53) Ibid.
54) Article 74 and 83, UNCLOS.
55) Soons, note 34 above, p. 226.
56) Article 15, LOSC.

median line."[57] In other cases, where the boundary line has been fixed, the baseline shift because of sea level rise will not affect the maritime boundary.[58] However, parties to a maritime boundary agreement can explicitly decide that the boundary may shift in case of a baseline shift. On the other hand, if the treaty says the boundary is definite regardless of any shift of the baseline,[59] one party cannot unilaterally terminate the agreement.[60] Indeed, Dutch baseline shifts because of coastline projects in 2009 and 2012 did not affect the Netherland's outer limits of continental shelf and EEZ because these demarcations had been determined by treaties.[61]

Key questions become what happens if an agreement does not indicate the boundary line as definite, and whether the negatively affected State can terminate the agreement. Under the Vienna Convention on the Law of Treaties, a party can terminate an agreement on the ground of a fundamental change of circumstances, which was not foreseen by the parties at the time of conclusion of the treaty.[62] Such circumstances must constitute an essential basis of the consent of the parties; the effect of change must transform the extent of obligations still to be performed under the treaty.[63] Although not every sea level rise constitutes a fundamental change of circumstances, a very substantial change in the location of the baseline might constitute such a change.[64] However, the Vienna Convention explicitly excludes boundary agreements from the application of changed circumstances.[65] Therefore, a State is not entitled to invoke changed circumstances stemming from the sea-level rise in order to unilaterally terminate a maritime delimitation agreement.[66] However, Soons believed that a rule of customary international law, which would allow a State to terminate a boundary agreement because of sea-level rise as a "changed circumstances," might develop in the future.[67]

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57) Soons, note 34 above, p. 227.

58) Ibid.

59) Ibid.

60) Ibid.

61) Treaty between the Kingdom of the Netherlands and the Federal Republic of Germany concerning the lateral delimitation of the continental shelf in the vicinity of the coast of 1 December 1964; Agreement between the Government of the Kingdom of the Netherlands and the Government of the United Kingdom of Great Britain and Northern Ireland relating to the delimitation of the continental shelf under the North Sea between the two countries of 6 October 1965; Treaty between the Kingdom of the Netherlands and the Federal Republic of Germany concerning the delimitation of the continental shelf under the North Sea of 28 January 1971; Treaty between the Kingdom of the Netherlands and the Kingdom of Belgium on the Delimitation of the Continental Shelf of 18 December 1996 cited in Leendert Dorst, Alex Oude Elferink and Thijs Ligteringen, "Recent Changes in the Dutch Baseline: The Inseparable Connection Human Activities and Natural Processes" (2012), p. 5.

62) Article 62(1), Vienna Convention on the Law of Treaties.

63) Ibid.

64) Soons, note 34 above, p. 228, cf. Sefrioui, note 31 above, p. 19. "Both parties know, at the time of conclusion of their maritime boundary agreement, that change of geography is inherent to this kind of agreements and can initially be expected; thus, stable geography is not the "circumstance" that forms the ground of their consent. Therefore, article 62 of the Vienna Convention cannot be invoked, and coastline changes will not affect the maritime boundary agreement." Ibid.

65) Article 62(2), ibid.

66) Soons, note 34 above, p. 227.

7. Implications for Insular Features

Rising sea levels are of potential consequences for insular features—islands, rocks, or low-tide elevations—and their maritime zones. According to Article 121(1) of UNCLOS, "an island is a naturally formed area of land, surrounded by water, which is above water at high tide."[68] An island has the capacity to produce its own maritime zones, like the land territory of a State, namely territorial sea, contiguous zone, exclusive economic zone, and continental shelf.[69] A low-tide elevation is an insular feature that is under water at a high tide but above water at low tide. A low-tide elevation is not entitled to any maritime space. Nevertheless, a low-tide elevation can be used as a baseline for measuring the breadth of the territorial sea if it is situated within the territorial sea of the mainland or an island.[70]

The LOSC provides that "rocks which cannot sustain human habitation or economic life of their own" are not entitled to any economic zone or continental shelf.[71] They do, however, have the capacity to generate a territorial sea and a contiguous zone. It can be understood that an island is capable of sustaining human habitation or economic life of its own.[72]

Rising sea levels might cause the inundation of insular features that produce maritime zones, or might cause inundation of low-tide elevations, which are taken into consideration for determining baselines. As a result of the disappearance of such features, a State could be deprived of these maritime zones.[73] However, a disappeared island could still retain its continental shelf if established in accordance with LOSC Article 76(9), which permanently fixes the outer limit of the continental shelf, and if such State retains its statehood under arrangements with another State.[74] Hayashi supported the idea that the State must retain the seabed of the submerged insular feature itself:

> A State consists physically not only of the land but of its airspace and its subsoil, and the very fact that the seabed area in question was precisely part of its own land and subsoil until inundation, it may be argued that the area constitutes a special kind of seabed area, assimilated to the continental shelf, belonging to that State.[75]

He further argued that the seabed of the territorial sea of a disappeared island

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Ibid., p. 228.

68) Article 121(1), LOSC.

69) Article 121(2), LOSC.

70) Article 13, LOSC.

71) Article 121(3), LOSC.

72) Craig H. Allen, *International Law for Seagoing Officers*, 6th ed. (New York: Naval Institute Press, 2014), p. 70.

73) "Thus, if the baseline moves, the boundary movers. If a baseline point such as an exposed rock disappears, the boundary generated by that point also disappears." Caron, note 35 above, p. 9.

74) Soons, note 34 above, pp. 218-219; Hayashi, note 37 above, p. 615.

75) Hayashi, note 37 above, p. 614.

must be maintained like the continental shelf of such a feature.[76] Similarly, Soons asserted that if an island subject to a delimitation agreement disappeared, the state party to which the island produces a detrimental maritime delimitation could continue to respect the original agreement.[77] Article 61 of the Vienna Convention on the Law of Treaties says that a State party to a treaty may invoke the "impossibility of performing a treaty as a ground for terminating or withdrawing from it if the impossibility results from the permanent disappearance or destruction of an object indispensable for the execution of the treaty." Soons argued that because execution of the treaty was still possible without the existence of a disappeared island, that State could not invoke the impossibility doctrine.[78]

The foregoing statements do not seem to be consistent with the principle of "the land dominates the sea," a statement by the ICJ in the 1969 North Sea Continental Shelf Case.[79] Accordingly, it is the maritime projection of a land area that generates maritime zones and all maritime entitlements originate from the land.[80] In the *Qatar v. Bahrain* case, the ICJ said, "it is thus the terrestrial situation that must be taken as starting point for the determination of the maritime rights of a coastal state."[81] If a land area, as in the case of an island, disappears, the maritime areas produced by such features must also be given up. Also, there would be no baseline from which the breadths of maritime spaces are measured.[82]

Similarly, a rising sea level might convert an island to a rock if "the island loses land mass to the point where it can no longer support human life."[83] These islands would lose their EEZ. Hayashi said that however, such islands would still retain their continental shelf if it is fixed in accordance with LOSC Article 76(9).[84] For example, the United Kingdom forfeited about 600,000 square nautical miles of maritime space after reclassifying the island of Rockall as a rock.[85] If a rock

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76) Ibid.

77) Soons, note 34 above, p. 228.

78) Ibid.

79) *North Sea Continental Shelf", Judgment, I.C.J. Reports 1969*, p. 52, para. 96.

80) Julia Lisztwan, "Stability of Maritime Boundary Agreements," *Yale Journal of International Law*, Vol. 37: 1 (2012), p. 165.

81) Maritime Delimitation and Territorial Questions between Qatar and Bahrain, Merits, Judgment, I.C.J. Reports 2001, p. 97, para. 185.

82) See Jared D. Hestetune, "The Invading Waters: Climate Change Dispossession, State Extinction, and International Law," *California Western School of Law* (2010), pp. 27, 28, available at https://works.bepress.com/jared_hestetune/1/.However, island States must be exempted from this rule. As sea levels rise, a once inhabitable land mass may become submerged, and the resident population will need to relocate. Nevertheless, the maritime spaces of such disappeared island States must be retained. This would allow the population to retain the value of their maritime zones, which would facilitate their resettlement. See Caron, note 25 above, p. 650.

83) Michael Gagain, "Climate Change, Sea Level Rise, and Artificial Islands: Saving the Maldives' Statehood and Maritime Claims through the 'Constitution of the Oceans,'" *Colorado Journal of International Environmental Law and Policy*, Vol. 23:1 (2012), p. 98. For a discussion explaining the difference between an island and rock, See Ekrem Korkut & Woo Hyun Kang, *China's Nine Dash Line Claim in Light of the Ruling by the Permanent Court of Arbitration*, 5 Penn. St. J.L & Int'l Aff. 425 (2017).

84) Hayashi, note 31 above, p. 9.

85) Clive Schofield and David Freestone, "Options to Protect Coastlines and Secure Maritime Jurisdictional Claims in the Face of Global Sea Level Rise," in *Threatened Island Nations: Legal Implications of Rising Seas*

becomes habitable, or vice versa, one scholar noted that such changes would not affect the status of such a feature, and that it was in "the interest of peace in the oceans and world peace in general that the maritime spaces, as well as the maritime borders, once fixed in accordance with the 1982 Convention, not be disturbed.[86] The rock provision in Article 121 was adopted to prevent tiny insular features from generating full-fledged EEZ and continental shelf; without that provision, the high seas areas could shrink enormously.[87] During the negotiations of the LOSC, the Danish delegate explained the purpose of the rock provision as follows:

> Without such a provision tiny and barren islands looked upon in the past as obstacles to navigation, would miraculously become the golden keys to vast maritime zones. This would indeed be an unwarranted and unacceptable consequence of the new law of the sea.[88]

Although a State can fix the outer limit of its continental shelf permanently, according to the LOSC, these provisions should not be taken into account in the case of insular features that changes their status from islands to rocks or to low-tide elevations. In case of the downgrading of an island to rock, a State must also relinquish its continental shelf claim from such rock. Such a solution would be consistent with the purpose of Article 121(3) of the LOSC.

Hayashi asserted that by fixing baselines, a State could maintain its maritime areas produced from islands and rocks in case of the disappearance of such features or sea level rise.[89] Such an approach, however, would unnecessarily limit the high seas. Accordingly, the baseline fixing method in case of disappearance of insular features should not be employed for the reasons mentioned above.

The LOSC Article 121(1) says that "an island is a naturally formed area of land, surrounded by water, which is above water at high tide." Because of the word *naturally* in Article 121(1), it is accepted that "artificially wrought changes in its elevation will not entitle a rock of naturally lower elevation to serve as a base point to generate various maritime zones (unless it qualifies, in its natural state, as a low-tide elevation, in which case it may have a limited effect on the baseline)."[90] Similarly, LOSC Articles 60(8) and 80 do not count artificial islands, installations and structures as islands. Some States are fortifying their insular features to prevent them from being submerged. For example, Japan has spent more than $700 million to protect the island of Okinotorishima.[91] One argument asserts that land preservation efforts do not change

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and a Changing Climate Change, ed. Michael B. Gerrard and Gregory E. Wannier (Cambridge: Cambridge University Press, 2013), p. 147.

86) J.L. Jesús, note 32 above, p. 594.

87) Ibid., p. 583.

88) *Third United Nations Conference on the Law of the Sea, Volume XVI (Summary Records, Plenary, First and Second Committees, as well as Documents of the Conference, Eleventh Session)*, Document A/CONF. 62/SR.171, p. 106.

89) Hayashi, note 37 above, p. 618.

90) Jonathan I. Charney, "Rocks that cannot Sustain Human Habitation," *The American Journal of International Law*, Vol. 93: 4 (Oct., 1999), p. 867.

91) Latif Nasser, "When island nations drown, who owns their seas?" Boston Globe, October 19, 2014,

the status of an island, as long the island was natural initially.[92] Some scholars argue that sea level rise may extinguish the statehood of island States such as the Maldives, Kiribati and Tuvalu since a defined territory is a requirement for the statehoo d.[93]

8. Conclusion

Without a doubt, rising sea levels will have an increasingly greater effect on coastlines and baselines of maritime states, creating the potential for economic and political uncertainty. International law and the LOSC do not offer a solution to the effects of sea-level rise, except in Article 7(2), which fixes straight baselines in highly unstable coastlines in a delta or similar area, and Article 76(9), which permanently fixes the outer limits of the continental shelf. Most scholars have proposed a freeze of the existing baselines or outer limits of maritime spaces and have urged the international community to adopt a rule on this issue. We would argue an exception to the above solution in the case of rocks and islands. Although most scholars argue that a rock or island must retain its continental shelf in case of submersion, such interpretation does not seem to be consistent with the purpose of Article 121(3) of the LOSC, which was adopted to deny tiny rocks from having an EEZ and continental shelf.[94] Such entitlements from disappeared islands do not comply with the principle of "the land dominates the sea," and therefore be exempted from the freeze.

In conclusion, then, the best solution for protecting the stability of maritime boundaries would be a freeze on existing baselines or outer limits of maritime spaces, with the above exception. These maritime boundaries are crucial in maintaining peace, security, cooperation and friendly relations among nations, as stated in the preamble of the LOSC, and it is imperative that the international maritime community takes action on this issue.

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https://www.bostonglobe.com/ideas/2014/10/18/when-island-nations-drown-who-owns-their-seas/hyH9W5b1mCAyTVgwlFh7qO/story.html.

92) Soons, note 34 above, p. 222; J. L. Jesús, note 32 above, p. 592.

93) Gagain, note 83 above, p. 91; Jenny Grote Stoutenburg, "When do States Disappear? Thresholds of Effective Statehood and the Continued Recognition of 'Deterritorialized' Island States," in *Threatened Island Nations: Legal Implications of Rising Seas and a Changing Climate Change*, ed. Michael B. Gerrard and Gregory E. Wannier (Cambridge: Cambridge University Press, 2013), p. 57.

94) For our reasoning, see the Section "VII. Implications for Insular Features."

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