



**International Law Relating to the Outer Limits of Maritime Zones in the Context of
Sea Level Rise**

By: Lei Huang

Small Master's Thesis
Masters of Laws in Law of the Sea
University of Tromsø
Faculty of Law
August. 2010

Table of Contents

CHAPTER I – Introduction

1	Objective	1
2	Scope delimitation and outline	2
3	Legal sources and method	3

CHAPTER II – Current legal regime of baselines rules relating to the establishment of maritime zones

1	Introduction	5
2	Maritime zones	5
3	Establishment of maritime zones	8
3.1	Conception of baselines	8
3.2	Normal baselines	9
3.3	Straight baselines	10
3.4	Other particular rules about baselines delineation	13
4	Permanent and ambulatory baselines	14
5	Summary	17

CHAPTER III – Impacts of sea level rise on the outer limits of maritime zones

1	Introduction	19
2	No treaties between coastal States	19

2.1 Application of normal baselines rules	19
2.2 Application of straight baselines rules	24
3 Existing treaties between coastal States	25
3.1 Impacts on coastal States with treaties	25
3.2 Change of circumstances on boundaries based by treaties	26
4 Delimitation of boundaries by case law	28
5 Summary	31

CHAPTER IV – Legal measures for resolving the adverse effects on baselines and outer limits of maritime zones in the case of sea level rise

1 Introduction	33
2 Usage of existing law	33
3 Proposals developed by international law	35
4 Procedures for adopting new baselines rules	38
5 Summary	42

CHAPTER V – Conclusions	43
--------------------------------------	-----------

BIBLIOGRAPHY

CHAPTER I - Introduction

1 Objective

Although global sea level rises has been a widespread concern among coastal States since the 1980s, it is only more recently that the wider international community has accepted that significant sea level rise is taking place, that this trend appears likely to accelerate in the future and that it may come to have serious impacts.

As a consequence of global climate change, the melting of glaciers on the northern and southern hemispheres results in the rise of sea level. In fact, the current rise in the sea level observed from tide gauges, of about 1.8 mm/year, is within the estimated range from a combination of factors such as Antarctic and Greenland melting.¹ In 2007, the Intergovernmental Panel on Climate Change's Fourth Assessment Report (IPCC AR4) predicted that global warming would lead to a sea level rise of 180 to 590 mm by 2100.² More current research, which has observed rapid declines in the ice-mass balance from both Greenland and Antarctica, finds that sea-level rise by 2100 is likely to be at least twice as large as that presented by IPCC AR4, with an upper limit of about two meters.³ Moreover, according to IPCC AR3, the models of sea level change revealed different patterns.⁴ The potential for the rapid collapse of large ice sheets seems more plausible now than in the recent past, and some scientists therefore warn that continued anthropogenic warming could result in the start of abrupt sea level rise within the current century.⁵ The IPCC TAR WG 2 report notes that current and future climate change would be expected to have a number of impacts, particularly on coastal systems.⁶ This

¹ Bruce C. Douglas (1997) "*GLOBAL SEA RISE: A REDETERMINATION*". Surveys in Geophysics. Volume 18: p. 279-292.

² IPCC, Fourth Assessment Report, WG 6: Coastal Systems and Low-lying Areas, Table 6.3

³ The Copenhagen Diagnosis, 2009: Updating the World on the Latest Climate Science. Part: Executive Summary.

⁴ IPCC, Third Assessment Report, WG 1: The Scientific Basis. Chapter 1.

⁵ PEW CENTER on Global Climate Change. 2007 Sea Level Rise- The State of the Science.

⁶ IPCC, Third Assessment Report, Working Group 2: Impacts, Adaptation and Vulnerability. Chapter 1.

natural phenomenon raises a number of important challenges for coastal States. For instance, the potential submergence of key base points may potentially lead to the loss of broad national claims to maritime jurisdiction. The loss of significant areas, even all, of the maritime jurisdictional zones claimed by certain coastal States is likely to have profound economic consequences as jurisdictional rights over the valuable resources within these maritime spaces would also necessarily be lost.⁷ Certain generally low-lying island States, such as the Maldives, Kiribati, Marshall Islands and Tuvalu, which also have geographically restricted territorial extents, appear to be particularly vulnerable to sea level rise.⁸

This thesis will therefore procure to examine the potential effects of sea level rise for coastal States' baselines and the outer limits of maritime zones, and thus specifically discuss the following research questions:

- a) What is the current international legal regime for the establishment of maritime zones?
- b) What are the potential legal implications of sea level rise for baselines and the outer limits of maritime zones that are determined pursuant to such baselines?
- c) Is the current international law adequate to address the maintenance of the outer limits of maritime zones in the context of sea level rise?
- d) What legal measures can be adopted to mitigate the potential impacts of sea level rise on baselines and the establishment of maritime zones?

2 Scope delimitation and outline

Pursuant to the objective of the thesis, a special focus will be granted on the analysis of baselines and maritime zones stipulated by international law, the effects of sea level rise on such maritime zones- and on the examination of potential legal measures for coastal and island States may adopt in face of sea level rise.

Specifically, as regards to the consequences of sea level rise, this paper will only focus on

⁷ Clive Schofield (2009) "*Against a Rising Tide: Ambulatory Baselines and Shifting Maritime Limits*". International Symposium on Islands and Oceans. Tokyo: p. 70.

⁸ Ibid

the adverse effects of baselines regression and the direct correlation with shifting of the outer limits of maritime zones and boundaries of opposite and adjacent coastal States.

Although sea level rise may have various other implications on humanitarian, commercial and security levels and also in some extreme cases determine the entire disappearance of a States' land territory, such topics will not be discussed in the present thesis.

Hence, this paper aims to propose a legal perspective to adjust baselines shifting, in order to ensure the concrete jurisdiction of maritime zones and alleviating adverse effects of baseline shifts.

With regards to the outline of the thesis, Chapter II examines the current rules of baselines and the outer limits of maritime zones from the perspective of delineation of baselines and jurisdiction of maritime zones. A special focus will be granted on the interpretation of the United Nations Convention on the Law of the Sea (UNCLOS)⁹ articles concerning the delineation of baselines as it will be of pivotal importance to the discussion at hand. In Chapter III, the legal implications of sea level rise for baselines and for the outer limits of maritime zones that are determined pursuant to such baselines will be examined. In Chapter IV, based on the scenarios analyzed in the previous Chapter, legal measures for coastal States and island States to mitigate the pervasive effects of sea level rise will be suggested. Conclusions will ultimately be presented in Chapter V.

3 Legal sources and method

Subject to the objective of the thesis, the pursuant provisions of the UNCLOS and its predecessor- Geneva Conventions 1958¹⁰ will constitute the focus of the analysis, in particular articles 5, 7 and 76 of the UNCLOS. Other international treaties that are

⁹ United Nations, *United Nations Conventions on the Law of the Sea*, U.N. Sales No.E.97.V.10 (1983). See 1833 UNTS 3, adopted on 1982-12-10, in force: 16.November. 1994.

¹⁰ Tullio Treves. "*1958 Geneva Convention on the Law of the Sea*". United Nations Audiovisual Library of International Law.

Geneva conventions, on 29 April 1958, was recorded in the Final Act (A/CONF.13/L.58, 1958, UNCLOS, Off. Rec. vol. 2, 146). It comprises the Convention on the Territorial Sea and the Contiguous Zone (CTS), the Convention on the High Seas (CHS); the Convention on Fishing and Conservation of the Living Resources of the High Seas (CFCLR); and the Optional Protocol of Signature concerning the Compulsory Settlement of Disputes (OPSD) and the Convention on the Continental Shelf (CCS).

casuistically mentioned will have the purpose of supporting particular premises or specific subjects.

Besides the analysis of international treaties, legal theory and cases analysis will also be prominent throughout the thesis as a basis for the discussion and analysis and views of the author.

As the featured of topic discusses the consequence of sea level rise, scientific reports and information have also been selected and taken in consideration in order to describe the current situation of global climate change.

CHAPTER II - Current legal regime of baselines rules relating to the establishment of maritime zones

1 Introduction

This Chapter mainly discusses a few relevant provisions of current international law of the sea which are instrumental to the topic of sea level rise. It will include the general description of the maritime zones in the first place (e.g. different maritime jurisdiction of maritime zones and the outer limits of maritime zones) to contextualize the reader. Subsequently, the current legal regime of baselines rules will be discussed. Most discussion of baselines rule will focus on the interpretation of various baselines rules in order to demonstrate the current regime under coastal States jurisdiction.

2 Maritime zones

This section will briefly describe the current legal regime of maritime zones in which coastal States are entitled to sovereign and jurisdictional rights.

Internal waters

Internal waters are those located on the landward side of the baselines¹¹, as stipulated the UNCLOS. States are entitled to the full sovereignty in the same way with land territory in its internal waters.¹²

Territorial sea

Subject to article 3 of the UNCLOS, all coastal States have right to establish the breadth of its territorial sea up to a limit not exceeding 12 nautical miles, measured from baselines which are determined in accordance with the UNCLOS.¹³ The outer limits of

¹¹ Article 8(1) of the UNCLOS

¹² Article 2(1) of the UNCLOS

¹³ Article 3 of the UNCLOS

such territorial sea are designated the line each point of which is at a distance from the nearest point of the baseline equal to the breadth of the territorial sea.¹⁴ Coastal States are able to exercise its sovereignty within the territorial sea, which can be legislated concerning specific issues; including safety of navigation, conservation of living resources and the prevention of infringement of the customs, fiscal, immigration, or sanitary laws et cetera.¹⁵ There is however an important limitation on sovereignty: ships of all States, whether coastal and land-lock States, can enjoy the right of innocent passage through the territorial sea.¹⁶ Ships also need to comply with the coastal State's legislation governing territorial sea.

Contiguous zone

Contiguous zone is the area contiguous to coastal State's territorial sea where coastal States may exercise the control necessary to prevent or punish infringement of customs, fiscal, immigration, and sanitary laws in its territory or territorial sea. This zone "may not exceed 24 nautical miles in breadth from the baselines from which the breadth of the territorial sea is measured."¹⁷

Exclusive Economic Zone (EEZ)

EEZ is the area beyond and adjacent to the territorial sea up to 200 nautical miles from baselines from which the breadth of the territorial sea is measured. Coastal States are entitled to enjoy sovereign right for the purpose of exploring and exploiting, conserving and managing the marine resources in this zone. EEZ comprises the waters, the seabed and its subsoil within these 200 nautical miles.¹⁸ As the EEZ is not inherent to the coastal State its establishment depends on an actual claim by coastal States.¹⁹

¹⁴ Article 4 of the UNCLOS

¹⁵ Article 21 of the UNCLOS

¹⁶ Article 17,18,19 of the UNCLOS

¹⁷ Article 33 of the UNCLOS

¹⁸ Article 55-57 of the UNCLOS

¹⁹ U.N. Division for Ocean Affairs and the Law of the Sea 2000, "*Handbook on the Delimitation of Maritime Boundaries*", Publisher: New York United Nations: p. 9. A number of coastal States have chosen not to establish an EEZ, but have instead claimed a fishery zone, although the UNCLOS does not provide for such a zone. In such fishery zones, coastal States are allowed to exercise sovereign rights limited only to marine living resources.

High seas

Article 86 of the UNCLOS designates high sea as “all parts of the sea that are not included in the exclusive economic zones, in the territorial sea or in the internal waters of a state, or in the archipelagic waters of an archipelagic state.” Moreover, article 87 of the UNCLOS regulates that “the high seas are open to all States”, and “Freedom of the high seas is exercised in accordance with the UNCLOS and other rules of international law.” It comprises “navigation, over flight, laying submarine cables and pipelines, construction of artificial islands and other installations, fishing, and scientific research.”²⁰

Continental shelf

“The continental shelf of a coastal State comprises the seabed and subsoil of the submarine areas that extend beyond its territorial sea throughout the natural prolongation of its land territory to the outer limits of the continental margin, or to distance of 200 nautical miles from the baselines from which the breadth of the territorial sea is measured where the outer edge of the continental shelf margin does not extend up to that distance.”²¹ In some cases, the outer limits of the continental margin can be located beyond 200 nautical miles. Article 76 (5) of the UNCLOS states that “the fixed points comprising the line of the outer limits of the continental shelf on the seabed, drawn in accordance with paragraph 4 (a)(i) and (ii) of article 76, either shall not exceed 350 nautical miles from the baselines from which the breadth of the territorial sea is measured or shall not exceed 100 nautical miles from the 2,500 metre isobath, which is a line connecting the depth of 2,500 metres.”²² Pursuant to this provision, the continental shelf of a coastal State, concerning its right to outer limits of continental shelf, does not only rely on the 200 nautical miles rule but on the “natural prolongation” criterion.²³ It is thus not necessarily true that the outer limits of the continental shelf must always be measured from baselines. Besides, article 76(9) of the UNCLOS stipulates that the coastal States shall deposit with Secretary-General of the United Nations charts and relevant information regard to outer limits of continental shelf,

²⁰ Article 87 of the UNCLOS

²¹ Article 76(1) of the UNCLOS

²² Article 76(4) and (5) of the UNCLOS

²³ Ted. L. Dorman (1995) “*Entry into Force of the 1982 LOS Convention and the Article 76 Outer Continental Shelf Regime*”, 10/ *The Int'l J. Marine & Coastal L.* p. 165-187.

permanently describing the outer limits of continental shelf.²⁴ It presents the permanent outer limits of continental shelf.

According to the description above, the establishment of the maritime zones coastal states greatly depends on the baselines, except for the situation where the outer limits of continental shelf beyond 200 nautical miles. It can thus be measured either from 2500 metre isobath, from which not exceed 100 nautical miles, or not beyond 350 nautical miles. Overall, baselines may be the key of delimitation of maritime zones – territorial sea, contiguous zone and EEZ.

3 Establishment of maritime zones

3.1 Conception of baselines

Coastal State's baselines are located at the interface between the land area and sea for the purpose of maritime jurisdiction. Coastal States establish the territorial sea and the other maritime zones from measures taken from baselines. Hence, baselines are not only important issue to claim territory, but all other maritime zones²⁵ - contiguous zones, EEZ and continental shelf, which are mostly measured from that baselines, except for one of the situations where outer limits of continental exceed 200 nautical miles.

Baselines also divide the internal waters of a coastal State from the territorial sea – the most landward of the belts of offshore jurisdiction. The international rights and duties of coastal States and flag States differ substantially between internal waters and the territorial sea as shown above.²⁶

Furthermore, baselines are quite important to the delimitation of boundaries. Baselines form the starting point in delimitations between adjacent and opposite States with overlapping claims to maritime area - the role of baselines in the bilateral delimitation of maritime boundaries.²⁷ Article 15 of the UNCLOS provides that “where the coasts of two

²⁴ Article 76(9) of the UNCLOS

²⁵ Committee on Baselines Under the Law of the Sea *Internal Discussion Document* (International Law Association, 2008).

²⁶ *Ibid.* p. 4.

²⁷ *Ibid.* p. 5. ILA referred to the International Court of Justice (ICJ) case [*Maritime Delimitation in the Black*

States are opposite or adjacent to each other, neither of the two States is entitled, failing agreement between them to the contrary, to extend its territorial sea beyond the median line every point of which is equidistant from the nearest points on the baselines from which the breadth of the territorial seas of each of the two States is measured.” Hence, baselines are also regarded as a mean to settle opposite or adjacent maritime boundaries.

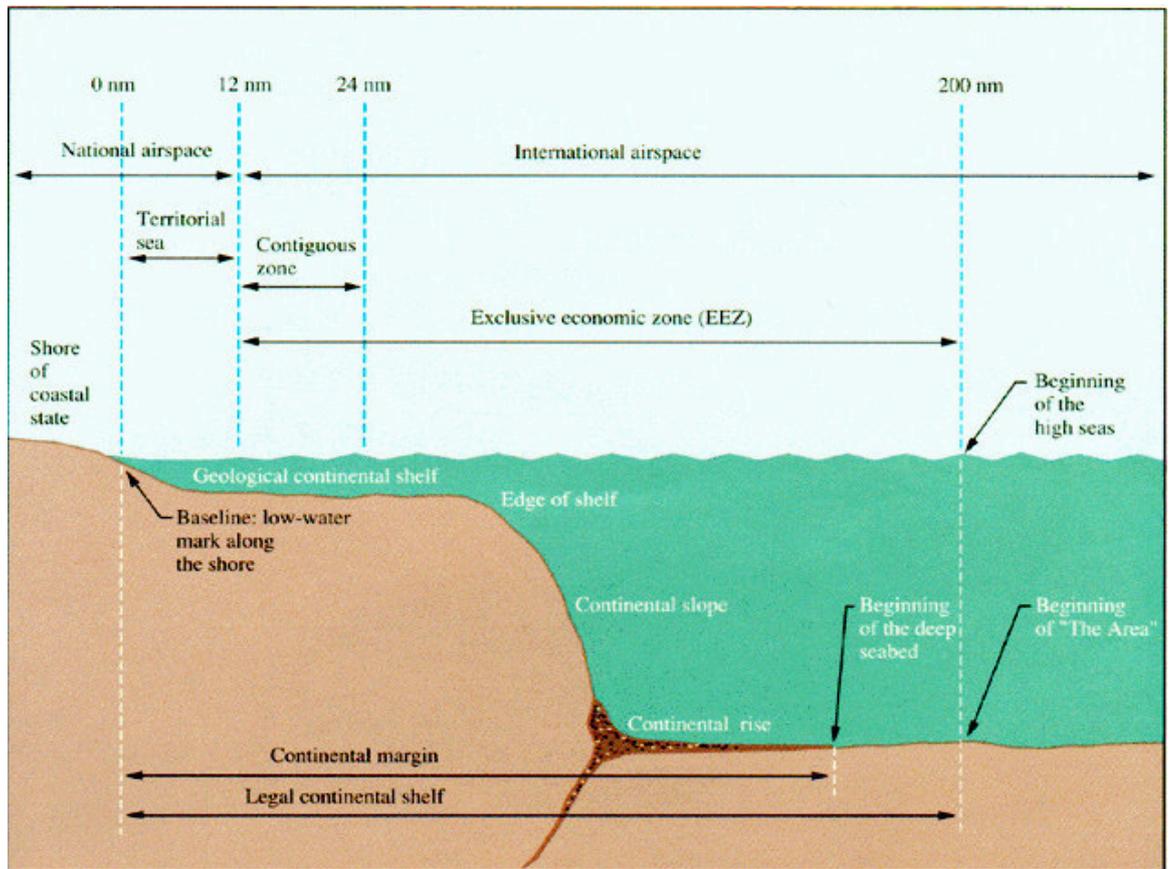


Figure 1: Baseline and Maritime Zones Delineation²⁸

3.2 Normal baselines

The international law regulations concerning baselines, maritime claim of jurisdiction and delimitation of maritime zones are included in the Geneva Convention 1958²⁹ and the

Sea (Romania v Ukraine), 2009 ICJ General List No 132 (Feb. 3)]. To conclude that it is land territory, and the coast of that territory in particular, that generates entitlements to maritime area. As such, coastal geography, or the configuration of the coastline is of paramount importance in delimiting boundaries between coastal States with overlapping claims to maritime area.

²⁸ “*Law of the Sea: The End Game*”, Intelligence Community Assessment, March. 1996

²⁹ At the first United Nations Conference on the Law of the Sea (UNCLOS I) in 1958, four conventions were ratified as resolution of maritime matters. These four conventions were opened for signature by member

UNCLOS.

The normal baseline can be defined as following: “Except where otherwise provided in this Convention, the normal baseline for measuring the breadth of the territorial sea is the low-water line along the coast as marked on large-scale charts officially recognized by coastal state”.³⁰ This provision represents a verbatim reproduction of article 3 of the CTS.³¹ In this provision, the low water line is recognized as the normal baseline. Simultaneously, article 14 of the UNCLOS also prescribes the method for determining baselines- “the coastal State may determine baselines in turn by any of the methods provided for in the foregoing articles to suit different conditions”.³² States normally delimitate maritime zones beginning with baselines. Normal baselines are therefore recognized as the predominant types coastal states chose to draw. The most of baselines in the world consist of normal baselines.³³

Further discussion on the actual interpretation of article 5 of the UNCLOS and its relevance in the context of sea level rise will follow under point 4 of the present Chapter.

3.3 Straight baselines

In areas where special geographical circumstances exist, international law foresees that coastal States may measure maritime jurisdictional zones from straight baselines. The provisions of straight baselines were initially regulated by the article 4 of the Geneva Convention of 1958. Subsequently, article 7 of the UNCLOS were encouraged by the decision of ICJ in the Anglo-Norwegian Fisheries Cases.³⁴

In 1935, Norway established a series of straight baselines along joining the outer points of

States, which called Geneva Conventions 1958. The importance of the Geneva Conventions 1958 is "traditional law of the sea", which expressed the basic historical significance. Furthermore, Many provisions of the Geneva Conventions corresponded to customary international law at the time of their adoption.

³⁰ Article 5 of the UNCLOS

³¹ Convention on the Territorial Sea and the Contiguous Zone. Enacted on 29 April 1958. In force on 10 September 1964.

³² Article 14 of the UNCLOS

³³ Prescott, J.R.V. and Schofield, C.H. (2005) “*The Maritime Political Boundaries of the World*”, Leiden/Boston, Martinus Nijhoff Publisher: p. 94-97.

³⁴ *Anglo- Norwegian Fisheries case* (1951) ICJ Report.

islands and rocks fringing part of its northern coastline for the purpose of establishing the limits of its 4 nautical miles exclusive fisheries zone. Enforcement of this fisheries zone resulted in several British fishing vessels being detained, a situation which led to the United Kingdom and Norway seeking a ruling on the issue from the ICJ which ruled in favor of Norway, confirming the validity of the Norwegian straight baseline system, the Court stipulated that “where a coast is deeply indented and cut into...the baseline becomes independent of the low-water mark and can be determined by means of geometric construction”; and that, “the drawing of baselines must not depart in any appreciable extent from the general direction of the coast.”³⁵

Subsequently, straight baselines were also regulated in article 7 of the UNCLOS which also provides guidance in relation to baselines located on highly unstable coastlines and allows for the possibility of using low-tide elevations without lighthouses as base points in a straight baseline system so long as such lines have acquired general international recognition – provisions absent from its predecessor article 4. These provisions allow coastal States to depart from the application of the normal baseline and measure maritime jurisdictional zones from straight baselines drawn along selected parts of their coastlines.³⁶

The crucial criteria for drawing straight baselines is contained in article 7(1) of the UNCLOS which provides that straight baselines should only be applied in localities “where the coastline is deeply indented and cut into, or if there is a fringe of islands along the coast in its immediate vicinity.”³⁷ Additionally, article 7(2) allows the drawing of straight baselines “where because of the presence of a delta and other natural conditions, the coastline is highly unstable.” It designates that “the appropriate point may be selected along the furthest seaward extent of the low water line”. It is also worth noting that article 7(2) does not create a third justification for the drawing of straight baselines in addition to the two laid out in article 7(1).³⁸ Moreover, in accordance with article 7(3) “the drawing of straight baselines must not depart to any appreciable extent from the general direction of

³⁵ Ibid.

³⁶ See Prescott, J.R. V. and Schofield, C.H. (2005): p. 137-164.

³⁷ Ibid 36. p. 142-147.

³⁸ Ibid 37. p. 148-149.

the coast, and the sea areas lying within the lines must be sufficiently linked to the land domain to be subject to the regime of internal waters.”³⁹ Article 7(4) also stipulates that straight baselines “shall not be drawn to and from low-tide elevations 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 such elevations has received general international recognition.”⁴⁰ Furthermore, article 7(5) allows for account to be taken of “economic interests peculiar to the region concerned, the reality and the importance of which are clearly evidenced by long usage.” However, it should be noted that article 7(5) in isolation does not justify the drawing of straight baselines in the absence of a deeply indented or cut into coastline or the existence of a fringe of islands along the coast.⁴¹ Finally, article 7(6) states that a system of straight baselines may not be applied by a coastal State “in such a manner as to cut off the territorial sea of another state from the high seas or an exclusive economic zone.”⁴²

Through the analysis of article 7, it formulates the rules providing how to measure straight baselines in case of unstable coastline and delta area. Thus, straight baselines may probably be one of the means to solve problems where the coastlines are highly unstable and particular where such instability is related to the sea level rise.⁴³ By this means, the appropriate points may be selected along the furthest seaward extent of the low water line and, notwithstanding the subsequent regression of the low water line, the straight baselines shall remain effective until changed by the coastal States in accordance with the UNCLOS. However, Article 7(2) of the UNCLOS also provides an implication that the straight baselines remain effective. This provision also allows coastal States to change the baseline as long as such a change is done in accordance with the UNCLOS. If a State does not take any actions to change the baseline, however, the old baseline “remains effective.” With the respect of the provision being discussed, I share the view of Soons that “the intention of

³⁹ Ibid 38. p. 154-156.

⁴⁰ Ibid 39. p. 157-158.

⁴¹ Ibid 40. p. 158.

⁴² Ibid 41. p. 158-159.

⁴³ Soons. A.H.A. (1990) “The Effects of a Rising Sea Level on Maritime Limits and Boundaries”, *Netherlands International Law Review*. Volume 37(2): p. 211.

this provision was the outer limit of the maritime zones (territorial sea and EEZ) of the coastal states does not change permanently.”⁴⁴ The significance of this provision may be concluded that in spite the low water line could be potentially influenced by the sea level rise, the coastal States could still remain with the straight baseline effective to fix the outer limits of maritime zones.

3.4 Other particular rules about baselines delineation

Article 15 of the UNCLOS regulates “where the coasts of two states are opposite or adjacent to each other, neither state is entitled to extend its territorial sea beyond the median line, every point of which is equidistant from each state’s baseline.”⁴⁵ The exception of this provision is “historic title” or “other special circumstances”. However it does not define these “special” circumstances itself. Even so, the “equidistance/special circumstances” rule has been accepted by the ICJ as customary international law.⁴⁶

Furthermore, in the case of islands situated on atolls or of islands having fringing reefs, the baseline for measuring the breadth of territorial sea is the seaward low water line of the reef, as shown by the appropriate symbol on charts officially recognized by the coastal States.⁴⁷ Simultaneously, where a low tide elevation is wholly situated at a distance exceeding the breadth of the territorial sea from the mainland or an island, it has no territorial sea of its own.⁴⁸ This can be concluded that the low water line of the elevation can be used as the baselines to measure territorial sea- as long as low tide elevation that locates within the breadth of territorial sea from coast, can establish territorial sea to serve as the base points of baselines. Moreover, rocks which can sustain human habitation or economic life of their own, are entitled to generate EEZ or continental shelf.⁴⁹ Islands shall also establish territorial sea and the contiguous zone in accordance with the

⁴⁴ Ibid. p.220.

⁴⁵ Article 15 of the UNCLOS

⁴⁶ “Maritime Delimitation and Territorial Questions between Qatar and Bahrain, Merits, Judgment” (hereinafter “*Qatar and Bahrain*”), *ICJ Reports* 2001, 40, paras 175–6.

⁴⁷ Article 6 of the UNCLOS

⁴⁸ Article 13(2) of the UNCLOS

⁴⁹ Article 121(3) of the UNCLOS

provisions of the UNCLOS applicable to other land territory.⁵⁰

4 Permanent and ambulatory baselines

As discussing the interpretation of low water normal baselines of article 5 of the UNCLOS, a common uncertainty can be simply understood is that coastal States are not restricted to choose which one is the low water line, which is always changed by sea level rise. It is noteworthy that the lower water line means the starting line of the outer limits of maritime zones, and then the significant change on low water normal baseline will accordingly affect the jurisdiction of outer limits of maritime zones.

Referring to one of the possible interpretations of article 5 of the UNCLOS presented by the International Law Association's Committee on Baselines under the International Law of the Sea (ILA), the normal baseline is the low-water line shown on the charts officially recognized by the coastal state. The charted low-water line is the legal normal baseline and the chart itself is the legal document that determines the position of that baseline irrespective of the physical realities of the coast.⁵¹ The low-water line is dependent on the choice of vertical datum. That is, the level of reference for vertical measurements such as depths and heights of tide.

A source of uncertainty associated with article 5 of LOSC is that it does not specify a particular vertical datum and thus low-water line to be used. "With respect to the changes in the location of the low-water line caused by the tidal cycle, this line can be fixed by identifying the single vertical, or tidal, datum (among several used in the hydrographic community) to represent low tide. This vertical datum is the "zero level" to which elevation and depth measurements are reduced. The intersection of the sea – when it is at that chosen level – with the coast is the low-water line. The low-water line thus defined is an elusive feature if not a purely conceptual construct."⁵² Consequently, there is no "wrong" answer and the choice is left up to the coastal State.⁵³ While coastal States have

⁵⁰ Ibid. article 121(2)

⁵¹ Supra note 25. ILA's interpretation of article 5 of the UNCLOS: p.1, 2.

⁵² Ibid. p. 6.

⁵³ Carleton, C.M. and Schofield, C.H. (2001) "Developments in the Technical Determination of Maritime Space: Charts, Datums, Baselines, Maritime Zones and Limits", Maritime Briefing, Volume.3, No.3,

selected to chart in accordance with low vertical datums, such low-water line shown on the charts officially, is therefore recognized by the coastal States. One of the most important reasons is to ensure the safety of navigation. The advantage of charted low water line in this context is that it will necessarily prevent navigation from potential danger, which is shown on the nautical chart. Charted are also used in the law context, in particular, as the means of showing the normal baselines. This examines the advantage to coastal States that the lower low water line is selected, the further the normal baseline will be fixed. This means that the choice of lower low water line would come to maximize maritime jurisdiction of coastal States. Through this interpretation, it can be concluded that such low water normal baseline could remain static, irrespective of sea level rise. This interpretation therefore remains possibility for coastal States to solve baselines shifting in face of sea level rise.

Besides above, low vertical datum may have the other interpretation in the case of unstable coasts in the scenario of sea level rise. The low water normal baselines on which coastal States select to measure their maritime claims of jurisdiction of maritime zones are potentially unstable.

According to the other interpretation of article 5 of the UNCLOS by ILA, the normal baseline could be dynamic in accordance with the physical realities.⁵⁴ ILA concludes that, as a theoretical matter, the legal baseline is the actual low water line at the vertical datum chosen or indicated by the particular coastal state.⁵⁵ It would create a system of “ambulatory baselines”, reflecting actual conditions however causing considerable legal uncertainty as to the state under whose sovereignty, or jurisdiction, the maritime territory in question would fall.⁵⁶

(Durham: International Boundaries Research Unit): p. 21-25. Having made that observation, it is nonetheless the case that the International Hydrographic Organization (IHO) favors use of lowest astronomical tide as the vertical datum for the construction of modern nautical charting. According to this view it is the chart that is the legal document determining the position of the normal baseline and this remains the case even where the coastline’s configuration has changed. Thus, if the coastline has altered, but it has not been published, the legal baseline is that on the published chart.

⁵⁴. Supra note 25: p. 2. The other interpretation of article 5 of the UNCLOS.

⁵⁵ Ibid. p. 10.

⁵⁶ Ibid. p. 6, 7.

The UNCLOS doesn't regulate whether the outer limits of maritime zones (territorial sea and EEZ) shall move with baselines or not. Article 76(9) of the UNCLOS however regulates permanently describing the outer limits of continental shelf. These two issues provides a negative implication that low water line and outer limits of the territorial sea, contiguous zone and EEZ may be ambulatory. A number of authors, such as Soons⁵⁷ and Caron⁵⁸, have therefore concluded that outer limits of territorial sea, contiguous zone and EEZ must be ambulatory as the consequence of the negative implication.

This is by no means a new phenomenon or problem.⁵⁹ It has long been recognized that coastlines are dynamic, so normal baselines can change significantly over time or “ambulate” and this necessarily has an impact on the generation of the outer limits of claims to maritime jurisdiction.⁶⁰ International Law Commission (ILC) states that “The line of low water mark is that indicated on the charts officially used by the coastal state, provided the latter line [the line indicated on the charts] does not appreciably depart from the line of mean low water spring tides.”⁶¹ This implies that low water mark could not be always accurate.⁶²

ILA also refers to the case decision of ICJ to support that the actual low water line may be recognized as a legal measure to delineate baselines. In the arbitration between *Guyana v. Suriname*,⁶³ “the delimitation of a lateral maritime boundary from the land boundary

⁵⁷ See Soons (1990): p. 216, 218.

⁵⁸ David. D. Caron. (1990) “*When Law Makes Climate Change Worse: Rethinking the Law of Baselines in Light of a Rising Sea Level*”. ECOLOGY LAW QUARTERLY. Volume 17: p. 634.

⁵⁹ CTS of the Geneva conventions 1958, the UNCLOS and International Law Commission (ILC) already supported ambulatory coastline. During the preparation of the draft provisions of the Geneva Conventions 1958, the idea of ambulatory coastlines has appeared.

⁶⁰ Reed, M.W. (2000) “*Shore and sea boundaries: the development of international maritime boundary principles through United States practice*”, (Washington D.C.: US Department of Commerce): p. 185; by the other author, Prescott, J.R.V. and Schofield, C.H. (2005): p. 100-101.

⁶¹ International Law Commission (1952) “*Yearbook of International Law Commission 1952*”, Volume I, Publisher: New York United Nations: p.171.

⁶² Ibid. p. 177. Mr. Scelle: “Not all states possessed expert hydrographic services, and an international body of the standing of the Commission could not assume that official charts were always accurate.”

⁶³ The Arbitral Tribunal was constituted pursuant to article 287, and in accordance with Annex VII, of the UNCLOS in the matter of an arbitration between *Guyana v. Suriname*. (UN Law of the Sea Annex VII Arbitral Tribunal. September. 17. 2007) 47 ILM 166 (2008)

terminus of the adjacent coastal states out to the 200 nautical mile outer limit. In this region of northeastern South America the coasts tend to be low-lying. In addition, massive shoals of soft ‘sling mud’ migrate along this coast originating in the mouth of the Amazon River and carried slowly from east to west by the Guyana current. These shoals of mud are of substantial size and ‘the presence of these mud banks complicates survey work along the coast.’⁶⁴ One large shoal of mud attached to Suriname’s coast near Vissers Bank contributed to the charted low water line depicted on the most recent large-scale chart of the area officially recognized by Suriname: Netherlands Hydrographic Office Chart 2218. The newly charted low-water line was located several kilometers seaward of the charted line shown on earlier charts of this area. In the arbitration, Suriname selected a base point on Vissers Bank – S 14 – from chart NL 2218. Guyana protested that base point on the grounds that the charted low-water line on NL 2218 did not represent the actual coastal configuration of Vissers Bank. The Tribunal was faced with the dilemma posited above between the charted low-water line and evidence indicating that it was not an accurate reflection of the actual low-water line.’⁶⁵

Consequently, the actual low-water line is the legal normal baseline and charts, and it should be considered as the evidence of the physical coastal realities or the actual coastal configuration.⁶⁶ It seems to coastal states that article 5 should be seriously considered, since the interpretation of article 5 of the UNCLOS would highly affect the potential impacts of sea level rise with regard to maritime claim of jurisdiction of zones.

Overall, the charted normal baselines act as a legally binding measure for all coastal States regardless of physical shifting of baselines. The actual normal baselines also provide a legal certainty for ambulatory baselines system.

5 Summary

In summary, according to the description of baselines, article 5 of the UNCLOS has two possible interpretations. If it’s interpreted as the charted low water line being the legal

⁶⁴ Supra note 25: p. 8. Referring to *Guyana v Suriname*.

⁶⁵ Ibid. p. 8.

⁶⁶ Ibid. p. 2.

establishment of baselines then baselines are fixed and sea level rise will have no impact. If coastal States opt for the other interpretation- actual low water line, this view would cause divergent interpretation, since the current regulations of continental shelf in the UNCLOS have negative implications that the outer limits of maritime zones does not shift as the baselines recede.

Apart from this, the UNCLOS didn't however stipulate that fix outer limits of territorial sea, contiguous zone and EEZ. Few of experts, for example Soons and Caron., have therefore concluded that outer limits of territorial sea, contiguous zone and EEZ must be ambulatory as the consequence of negative implication of baselines. Apparently, the ambulatory theory will hardly be practical, since maritime jurisdiction of zones will be precisely influenced by baselines shifting. The interpretations of the baselines rules will have important consequences related to sea level rise and that those will be explained in further detail in the next Chapter.

Moreover, submergence of islands, low tide elevations and fringing reefs which can be regarded as an appropriate point of baseline for measuring the breadth of territorial sea, could lead to loss of all maritime zones.

CHAPTER III – Impacts of sea level rise on the outer limits of maritime zones

1 Introduction

Referring to the above analysis regarding to the current legal regime of baselines and the outer limits of maritime zones, maritime jurisdictional uncertainty concerning the outer limits of maritime zones may become a consequence of baselines shifting in the situation of sea level rise. This Chapter addresses legal implication of changing baselines, which in turn influences the outer limits of maritime zones. As discussing the impacts of baselines shifting caused by sea level rise, it is important to distinguish between situations where there are delimitation treaties between coastal States and situations where no such treaties exist.

Not only the shifting of baselines and the outer limits of maritime zones may potentially raise issue of insufficient response of the current international regime, it may also raise the question of change of circumstances. Where the boundary treaties of coastal States would be significantly affected.

Finally, delimitation on the boundaries will be analyzed through the decisions of ICJ case law.

2 No treaties between coastal States

First of all, two baselines rules will be discussed. The potential implication of baselines rules in the case of sea level rise will be analysed.

2.1 Application of normal baselines rules

As sea level rises, the *actual* low water normal baselines may come to shift land ward, or low tide elevation and islands that are regarded as the appropriate points to measure baselines, could also come to be entirely submerged.

As previously shown, it concludes that the linkage between generally accepted normal

baselines and the outer limits of maritime zones of jurisdiction regulates that as normal baselines recede in the case of sea level rise, so will the maritime zones measured from them correspondingly regress in the scope of the coastal state's maritime claims. But this interpretation is irrespective with the presence of delta, outer limits of continental shelf and other nautical conditions (e.g. 2500 metre isobath as delineating the outer limits of continental shelf exceeding 200 nautical miles). Referring to article 76(9) of the UNCLOS, baselines shifting will however not influence the outer limits of continental shelf that is permanently fixed.

As the complication of establishing outer limits of continental shelf, the UNCLOS regulates that Commission on the Limits of the Continental Shelf (CLCS)⁶⁷ provides the recommendation of establishment means for the outer limits of continental shelf, and try to ensure such limits concrete and legal binding. Although the primary objective of the procedure was to provide a clear boundary between coastal States authority and sea bed authority, the consequence of “permanently fixing” may be⁶⁸, pursuant to Soons's opinion, “Once outer limits of the continental shelf has been established at a distance of 200 nautical miles (or even more) from an island, which island then subsequently disappears entirely, the coastal States would maintain sovereign rights over the sea bed are (which may be of considerable extent), while the object which generated these sovereign rights no longer exists.”⁶⁹ Soons argue that freezing the outer limits of continental shelf could be a significance to fix the boundary, in turn to fix the outer limits of territorial sea and EEZ. This phenomenon could potentially remind the UNCLOS consider re-assessing the provisions for the out limits of maritime zones – territorial sea, contiguous zone and EEZ. If States opt for shifting low water normal baselines land ward in the case of sea level rise, the state's maritime zones, including the territorial sea, contiguous zone and EEZ could still

⁶⁷ See the UNCLOS, Annex II, Commission on the Limits of Continental Shelf, the Commission consist of 21 members who are experts in the field of geology, geophysics or hydrography, elected by States parties to the UNCLOS from among their nationals, having due regard to the need to ensure equitable geographical representation, who serve in their personal capacities.

⁶⁸ David Freestone and John Pethick “*SEA LEVEL RISE AND MARITIME BOUNDARIES- International implications of impacts and responses*”. This article was recorded in Gerald Henry Blake (1994) “Maritime boundaries”, World Boundaries Volume 5, Routledge Publisher. p. 76.

⁶⁹ See Soons (1990): p. 219.

move back through the existing rules. Thereby lately submerged area would be the part of current internal waters⁷⁰ or land territory. This submerged area would consequently turn to a part of territorial water which coastal States are still entitled to full sovereignty. The UNCLOS made interpretation for the submerged area, that is, the waters become the territorial sea if baselines shifting. It means that the waters can reasonably be entitled to be subject to full territorial sovereignty, which has the same right of internal waters. Consequently, there is no right of innocent passage, such as exists in the territorial sea.⁷¹ Some area that currently is part of territorial sea would turn to EEZ. This in turn indicates that in the case where outer limits of continental shelf exceed 200 nautical miles, the outer limits of continental shelf will be determined by geographical features, the breadth of continental shelf would thus increase with land ward moving of baselines, coastal States are therefore able to exercise sovereign right, such as exploration and exploitation, in the area; in the case where outer limits of continental shelf is within or exactly to a distance of 200 nautical miles, the outer limits of continental shelf will also be fixed and the width of continental shelf increase, coastal States would lose part of jurisdiction of seabed resources since the outer limits of EEZ and continental shelf are not the same line anymore. Soons states that the regime of EEZ which includes jurisdiction over seabed resources remains uncertain⁷² since the outer limits of EEZ will certainly shift land ward with baselines regression. In addition, some area that is now EEZ would be part of the high seas. Referring to article 87(1) of the UNCLOS, this change would imply that the high seas are open to all States, including freedom of navigation and fishing etc. The extent of territorial sea, contiguous zones and EEZ seem not to be decreased by baselines shifting, the breadth of continental shelf beyond 200 nautical miles, would not match with the original width.

⁷⁰ Article 8 (1) of the UNCLOS

⁷¹ R.R.Churchill and A.V. Lowe. 1999. *"The Law of the Sea"*. Third edition. Manchester University Press. p. 60-67.

They describe the single exception to this principle is that where straight baselines are drawn along a coastal line that is deeply indented or fringed with islands, enclosing as internal waters areas which had not previously been considered as such, a right of innocent passage continues to exist through those newly enclosed waters, at least for parties to the UNCLOS.

⁷² See Soons (1990): p. 216.

I share the view which is main purpose of nautical charts- safety of navigation,⁷³ For the sake of safe navigation, submerged area marked on chart could be therefore considered a requirement.⁷⁴ The submerged area can refer to the regime of territorial sea, including innocent passage.⁷⁵ Besides, since part of current territorial sea could be deemed part of EEZ, it is necessary that the UNCLOS provide updated information of maritime zones on chart. For the current case of redrawing baselines, coastal States to provide vessels passing through EEZ with adequate charts on which EEZ would be marked. Furthermore, in respect of sovereign rights of the States on EEZ, it is also important to mention that part of marine resources could be allocated to the maritime zones of adjacent States or high seas, and then it would be regulated by other national jurisdiction relevant to marine management, rules of high sea and the United Nations Fish Stocks Agreement⁷⁶ (UNFSA). Hence, in the case where coastal States attempt to claim sovereign right in the re-allocated sea area, it may see its claim blocked by the fixed regime that is maintained by the UNCLOS.

Moreover, sea level rise would also affect low tide elevations or islands which could be very important to the delineation of baselines. This would in turn influence the entitlement of coastal States to exercise their maritime jurisdiction in certain zones. Referring to article 121 (2) of the UNCLOS, island are entitled to establish full maritime zones, article 121 (3) of the UNCLOS regulates that “Rocks which cannot sustain human habitation or economic life of their own shall have no EEZ or continental shelf. ” It indicates that one of the requirements to the proposition of EEZ and continental shelf for an island is “human habitation or economic life”. This provision prescribes regime of islands through either human habitation or economic life of their own, and both are not obligatory to be implemented at the same time. These two provisions reveal that the extent of territorial sea

⁷³ Supra note 25: p. 7.

⁷⁴ Ibid. p. 7. The focus of updates and corrections to charts is on new navigational hazards or changes to navigational aids.

⁷⁵ See article 8(2) of the UNCLOS.

⁷⁶ Agreement for the Implementation of the Law of the Sea Convention of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (Fish Stocks Agreement). Enacted at Dec. 04. 1995. Entered into force at Dec. 11. 2001

and EEZ of islands could significantly decrease in face of sea level rise. The specific extent of decrease has been demonstrated by the authors.⁷⁷ The numerous loss of maritime zones caused by the islands disappearing, is deemed a serious effect of sea level rise.

With respect to the low tide elevation, as analysis of article 13 of the UNCLOS at Chapter II, it could be the appropriate point of baselines. It therefore decided that low tide elevation for maritime jurisdictional claims is geographically restricted to coastal location.⁷⁸ Clive also concluded that “this is because low tide elevations, by virtue of their near low tide level status and the fact that they are often composed of soft depositional material which may readily change over time, tend to appear on one survey but not the next, resulting in revisions in the related charts and thus in maritime jurisdictional limits associated with them.”⁷⁹

In terms of *charted* low water line, some authors argue that the low water line as marked on charts can be recognized to fix the baselines against coastal regression and claim of other States, at least until such time as new charts.⁸⁰ Caron protests such argument that this is a practical matter that does not deal with legal question of whether the UNCLOS intended baselines to be fixed or ambulatory in the case of coastal regression.⁸¹ In my opinion, charted low water line is regulated for the purpose of navigation safety. While fixing such baselines in the scenario of sea level rise, it would fail to present regression reality on charts, and also fix the dispute boundary regime between States. Comparing with charted low water line, actual low water line reflects the reality. States might seek various practical and legal measures to deal with the uncertainties caused by such actual low water line.

⁷⁷ See Clive Schofield (2009): p.75. He concluded that if an island had no maritime neighbours within 400 nautical miles, it could generate 125,664 square nautical miles of territorial sea, EEZ and continental shelf rights, a territorial sea of 452 square nautical miles could be claimed. Rock itself only generates a 12 nautical miles territorial sea claim, which is incapable of establishing EEZ and continental shelf rights.

⁷⁸ See Carleton, C.M. and Schofield, C.H. (2001): p.38, by the same author, Clive Schofield (2009): p. 75

⁷⁹ Ibid. Clive Schofield (2009): p. 75.

⁸⁰ D. Kapoor and A. Kerr. (1986) “*A Guide to Maritime Boundary Delimitation*”, Carswell (Toronto) Publisher: p.31.

⁸¹ See Caron (1990): p. 634.

2.2 Application of straight baselines rules

As baselines shift, coastal States can also draw straight baselines in accordance with article 7 (2) of the UNCLOS. According to the analysis of this provision, the appropriate points coastal States select along the furthest seaward extent of the low water line may be permanently submerged in the case of sea level rise.⁸² Coastal States would certainly remain the straight baselines pursuant to article 7(2) of the UNCLOS. Simultaneously, the UNCLOS doesn't regulate outer limits of territorial sea, contiguous zone and EEZ shall move with baselines. It actually provides negative implication on the outer limits of maritime zones except for outer limits of continental shelf.

Since the appropriate point would simply not locate the position where is the furthest seaward extent of the low water line in face of sea level rise, Soons argues that coastal States keeping the straight baselines still effective is not always necessary.⁸³ I am of the opinion that coastal States should make changes when it's necessary. As scientific research described, sea level rise is being one of the most serious environmental issues in the future. Article 7(3) of the UNCLOS provides that the sea area defined by such straight baseline must be "sufficiently closely link to the land domain to be subject to the regime of internal waters." If the regression of baselines would be more and more substantial, States would have to select a certain moment to re-draw their baselines. Simultaneously, coastal States also need to re-select the new appropriate point to draw straight baselines to fulfill the "appreciable extent from the general direction of the coast".

The application of straight baselines rules implies that the straight baselines may remain effective. Coastal States are however supposed to re-draw them by the time the circumstances entirely changing. The outer limits of territorial sea and EEZ will move back land ward with baselines redrawing. The extent of them are not actually accordingly reducing. The extent of land territory and internal water will decrease.

⁸² See Soons (1990): p. 219. Soons said that there is a case where the point was located on an island which through sea level rise has become a low tide elevation, but on which no lighthouse or similar installation is present, it could be argued that a situation of "international recognition" as referred to article 7(4) of the UNCLOS, is involved.

⁸³ Ibid. p. 220. Soons argued that straight baselines remain effective until change by coastal States was not the intention of the provision to grant the coastal States a discretionary power in this respect.

3 Existing treaties between coastal States

3.1 Impacts on coastal States with treaties

Many boundaries between coastal States have been subject to bilateral or multilateral treaties. Up until 2010 there were approximately 190 maritime delimitation treaties which are in force.⁸⁴ Since delimitation of boundaries can be object of a number of complexities including decision of ICJ, technical issues, this discussion will focus on the general impacts concerning boundaries delimitation between opposite and adjacent States. There are two situations of such treaties for delimitation of boundary concerned. First, the breadth of States is less than 400 nautical miles. In this case, bilateral treaties have determined EEZ and continental shelf. Second, the extent of two States is less than 24 nautical miles. In the case, bilateral treaties have delimited limits of territorial sea.

The median line prescribed by article 15 of the UNCLOS can be undoubtedly one of the most used methods to determine boundaries between States. As sea level rise, the geographical configuration of median line may be changed. Such changes consequently lead to the change of circumstances that were at the basis of the agreement. If states are pursuant to the boundaries- median line, fixed by treaties, the consequence of “asymmetrical changes” of baselines will not influence the fixed boundaries. The serious issue is coastal states may not agree with such apparently unjust median line and the boundaries between them.⁸⁵ Such change of circumstances changed may result the re-assessment of treaties by the States. However, as it will be shown below, not being mandatory to do such re-assessment under the rules of international law on treaties. States which benefit from the sea level rise and gain increased access to resources will be reluctant to make adjustments based solely on a claims of change of circumstances and equity principles.

⁸⁴ “Maritime Space: Maritime Zones and Maritime Delimitation”, Division For Ocean Affairs and the Law of the Sea.

⁸⁵ See Soons (1990): p. 227.

3.2 Change of circumstances on boundaries based by treaties

If coastal States decide to re-draw that median line, what legal grounds can be invoked to deal with delimitation treaties between States? The UNCLOS does not designate the procedure how to change baselines, outer limits of maritime zones and boundaries between States. It does however stipulate the provisions of how to draw baselines. There might be potential legal implication for delimitation of boundary in accordance with same prerequisite need to be met to change the boundaries.⁸⁶

First, baselines must be drawn in accordance with the UNCLOS. Coastal States need to fulfil the deposit and due publicity requirements. The purpose of these requirements is to ensure that the international community is adequately informed of the limits of the territorial sea and other maritime zones of the coastal States.⁸⁷

Second, deposit. Coastal States are required under the UNCLOS to deposit with the U.N. Secretary- General charts showing straight baselines and archipelagic baselines, as well as the outer limits of the territorial sea, EEZ and continental shelf. Alternatively, lists of geographical coordinates of points, specifying the geodetic datum, may be substituted.⁸⁸

Third, publicity. Coastal States are required to give due publicity to the charts and lists of geographical coordinates mentioned above. These States are also obligated to give due publicity to all laws and regulations relating to innocent passage through the territorial sea and all laws and regulations adopted by States bordering straits that relate to transit passage through such straits for international navigation.⁸⁹

One important is hereby worth considering whether baselines information deposited with the UN, and the information of boundary delimitation contain into treaties. Only 53 coastal States that are party to the UNCLOS had fulfilled its deposit and publicity requirements

⁸⁶ Charle Di Leva & Sachiko Morita (2009) “*Maritime Rights of Coastal States and Climate Change: Should States Adapt to Submerged Boundaries*”, Law and Development Working Paper Series. No.5. September. 3. 2009: p. 19, 20.

⁸⁷ Ibid

⁸⁸ Ibid. These relevant provisions comprise article 5,6,7,9,13 and 47 of the UNCLOS.

⁸⁹ Ibid. Article 21(3) and 42(3) of the UNCLOS

until November 10 2010.⁹⁰ Charle and Sachiko⁹¹ said “the UNCLOS explicitly requires the publication and deposit, but no regular updating, of this information.” They thereby argue “it may be prudent for a state to do so, especially if it risks possible loss of part of its territorial claim.”

Apart from above, the boundary treaty between coastal States fixes such boundary even though baselines shift land ward. Coastal States are free to invoke fundamental change of circumstances to argue that boundary regulated by treaty.

Pursuant to the 1969 Vienna Convention on the Law of the Treaties,⁹² Article 62(1), stipulates:

“A fundamental change of circumstances which has occurred with regard to those existing at the time of the conclusion of a treaty, and which was not foreseen by parties, may not be invoked as a ground for terminating or withdrawing from the treaty unless: (a) the existence of those circumstances constituted an essential basis of the consent of the parties to be bound by the treaty; and (b) the effect of the change is radically to transform the extent of obligations still to be performed under the treaty.”

This article indicates the following statement---If States parties apply “fundamental change of circumstance” to the circumstance that climate change leads to sea level rise, which in turn engenders baseline shifting, States parties should ensure two prerequisites: first, basis of the UNCLOS is to regulate maritime issues including baseline; second, baseline shifting radically transform the extent of obligations under the UNCLOS. Both two factors are exactly involved in the current situation, as described in Vienna Convention 1969 article 62(1).

Vienna Convention 1969 stipulates the procedure of terminating and withdrawing, which obtain common recognition in practice beyond the Convention, because this part of customary law was lack of precision.⁹³ ICJ observed in the case *Gabčíkovo-Nagymaros* in

⁹⁰ Referring to “Deposit of Charts” (updated 10. November . 2010), U.N. Devision for Ocean Affairs and Law of the Sea.

⁹¹ Ibid. Charle Di Leva & Sachiko Morita (2009): p. 26.

⁹² Vienna Convention on the Law of the Treaties. Enacted: 23. May.1969. In force: 27. January.1980 United Nations, *Treaty Series*, Volume. 1155, p. 331.

⁹³ Karl Zemanek. “1969 Vienna Convention on the Law of Treaties”. United Nations Audiovisual Library of

this respect: “Article 65 and 67 of Vienna Convention 1969, if not codifying customary law, at least generally reflect customary international law and contain certain procedural principles which are based on obligation to act in good faith.”⁹⁴ The court also observed: “The court needs only to be mindful of the fact that it has several times had occasion to hold that some of the rules laid down in that Convention might be considered as a codification of existing customary law.”⁹⁵

Simultaneously, article 62(2) of Vienna Convention provides a restriction of States that should be the obligation for them before the provision is advocated namely.

“A fundamental change of circumstances may not be invoked as a ground for terminating or withdrawing from a treaty: (a) if the treaty establishes a boundary; or (b) if the fundamental change is the result of a breach by the party invoking it either of an obligation under the treaty or of any other international obligation owed to any other party to the treaty.”

The principle of “fundamental change of circumstances” is an exception to the “*pacta sunt servanda*” principle. Subject to article 62(2), States should adopt a pretty cautious approach to ensure that application of this principle is severely restricted. Although the provision does not treat “treaty establishes a boundary” as an objective of “terminating and withdrawing from a treaty”, it could allow States amend or adjust delimitation treaties.

As mentioned above, boundaries agreed by treaties cannot be merely adjusted depending on the strength of an individual or a state. Although States may prevent loss of maritime sovereignty and resources through international law- fundamental change of circumstances, it expressly excludes the situation where a treaty establishes boundary of states.

4 Delimitation of boundaries by case law

As discussing consequence of sea level rise and delimitation of maritime boundaries, the case where baselines and outer limits of maritime zones are constantly in unstable status since shifting of baselines, would raise disputes of maritime jurisdiction in terms of

International Law.

⁹⁴ Ibid, *Gabčíkovo-Nagymaros* I.C.J. Reports 1997. p. 66. para. 109.

⁹⁵ Ibid , p. 38. para. 46.

delimitation of boundaries. For example, Cuba and U.S could have baseline dispute at boundaries. The east coast of Florida in USA is located at the region of low tide, and Cuba as an interest state of the waters, is located at higher terrain. Assuming that once the sea level rises, the Bahamas marine traffic route would become Cuba's area, which undoubtedly would be a territory loss of the United States. Confronted with this situation, there is no doubt that the United States are not willing to lose a part of territory, thus Cuba and the U.S. government entail, under the provisions of international law, to maintain its territorial sea and baseline mutually, and ensure the change not to affect their own state's sovereignty.⁹⁶ This case demonstrates that the baselines for both States are literally related to determine sovereignty for each of them, and thus concrete delimitation of boundaries could ensure stable situation on the boundaries. This stable situation is what two States probably expect, which is also generated by original baselines.

Since the delimitation of boundary could be very complicated, a number of case law decisions concerning baselines shifting, can potentially be a good reference, instead of general demonstration, how to regulate the situation where boundary is unstable by current regulations. These adjudgements would help to reveal that such features of baselines are very important term to delimitate boundaries.

The ICJ and other courts have not, however, decided any cases directly involving disputes of boundary delimitation affected by sea level rise. We may therefore conclude decisions of cases concerning delimitation of maritime zones between opposite or adjacent States, in order to describe the effects of shifting baselines in term of delimitation of boundaries in scenario of sea level rise.

With respect to the case of U.S. Supreme Court in *United States v. Alaska*,⁹⁷ the court concluded that "shifts in a low water line along the shore, could lead to a shift in the baseline for measuring a maritime zones," and that "state's entitlement to submerged lands beneath the territorial sea would consequently change."⁹⁸ This case implies that the court

⁹⁶ Gu Jie Yuan. 2001. "*International Maritime Boundary Delimitation in the theory and practice*". Law Press. p. 190-192.

⁹⁷ U.S. Supreme Court, (*United States v. Alaska*), Judgement of June 19, 1997. Referring to literature by Charles Di Leva & Sachiko Morita (2009): p. 21.

⁹⁸ Ibid

recognized baselines as the start line to measure maritime zones could be changed by natural conditions.

In the interpretation of article 5 of the UNCLOS, ILA report referred to the *Nicaragua v. Honduras*. In this case, the ICJ was faced with an equally unstable coastline. Here the land boundary along the Rio Coco ends in a prominent delta – Cape Gracias a Dios – created by sediment transported down the river. The parties to the case agreed that sediment transport caused the delta “as well as the coastline to the north and south of the Cape, to exhibit a very active morpho-dynamism.” The Court also recognized that, generally, there was a process of accretion in the delta area by which the actual low-water line continued to move seaward.⁹⁹ The ILA Committee considered that “the baselines depicted on the chart did not reflect the situation on the ground”.¹⁰⁰ As the opinion of ICJ, the court decided that fixing base points on either bank of the river and using them to construct a provisional equidistance line would be “unduly problematic”.¹⁰¹ Subject to the decisions of ICJ, it may focus the key of decision on equidistance line which stipulated by article 15 of the UNCLOS, while the interpretation of article 5 by ILA Committee must be the basic requirement for making that decision. Therefore, the Court used the bisector line method instead the line formed by bisector the angle created by the linear approximations of coastlines to draw the maritime boundary.¹⁰² Moreover, the Court also took islands into account, and concluded four of cays remain above water at high tide under the article 121 of the UNCLOS.

⁹⁹ Supra note 25. p. 8. Referring to “Case Concerning Territorial and Maritime Dispute between *Nicaragua and Honduras* in the Caribbean Sea, Judgment” ICJ Reports 8. October. 2007.

¹⁰⁰ Ibid. p. 9.

¹⁰¹ Ibid *Nicaragua v. Honduras*. ICJ Report, 74. para. 273. Referring to literature by Charles Di Leva & Sachiko Morita (2009): p. 24.

¹⁰² Ibid. *Nicaragua v. Honduras*. ICJ Report, 78. para. 287. Referring to literature by Charles Di Leva & Sachiko Morita (2009): p. 25.

The Court said that the justification “lies in the configuration of and relationship between the relevant coastal fronts and the maritime areas to be delimited. In instances where, as in the present case, any base points that could be determined by the Court are inherently unstable, the bisector method may be seen as an approximation of the equidistance method. Like equidistance, the bisector method is a geometrical approach that can be used to give legal effect to the criterion long held to be as equitable as it is simple, namely that in principle, while having regard to the special circumstances of the case, one should aim at an equal division of areas where the maritime projections of the coasts of the States converge and overlap.”

In the most recent maritime delimitation case between *Romania and Ukraine* in the Black Sea, the issue of base points and baselines also was raised.¹⁰³ Here, however, the question was not between the charted and actual low-water lines, but rather the Court questioned which features should be given effect in the delimitation. For the purpose of delimiting the boundary, the Court eliminated the Ukraine's Serpents' Island and Romania's Sulina Dyke. "The Court did not question whether these features were part of the normal baseline of the respective party for the purpose of measuring the breadth of its maritime zones, instead the Court questioned whether the use of base points on the low-water line of those features would produce an equitable delimitation. The Court finally decided they would not."¹⁰⁴ Looking through these cases decided by ICJ, we may see that International Court began to consider the unstable baselines when establishing maritime boundaries, which could involve shifting of baselines caused by sea level rise.

5 Summary

It should be clear from the brief description of baselines rule's application. Through the application of two different interpretations of normal baselines rules, it can be concluded as follow.

The charted normal baselines potentially regulate the low water line marked on charts which is officially recognized by coastal states, could be fixed. Thus, the whole maritime zones will not be changed. The actual normal baselines did provide the evidence for coastal states to move back outer limits of territorial sea, contiguous zone and EEZ with baseline shifting. If outer limits of continental shelf locate at a distance of 200 nautical miles, the territorial sea, contiguous zones and EEZ would move land ward and the width of them remains. Part jurisdiction of seabed would be lost. The breadth of continental shelf increases. If the outer limits of continental shelf exceed 200 nautical miles, the outer limits of territorial sea, contiguous zone and EEZ accordingly shift. The width of them keeps unchanged. The breadth of continental shelf increases.

¹⁰³ Supra note 25. p. 9. Referring to Maritime Delimitation in the Black Sea (*Romania v. Ukraine*), ICJ Report, 3. February. 2009.

¹⁰⁴ Ibid

Furthermore, straight baselines coastal states selected remain effective until change by them in accordance with the UNCLOS, it does not consequently imply the baseline don't need to be shifted in the case of sea level rise.

Moreover, baselines shifting would be recognized a common phenomenon in face of sea level rise. This shifting is certainly not predicted by those states are opposite and adjacent to each other. Such circumstance change formulated by public international may be rendered to deal with the uncertainties between states. However, terminating or withdrawing a treaty which establishes boundary is excluded from the prerequisites.

Article 15 of the UNCLOS provides a substantial evidence to regulate the delimitation of boundaries between opposite and adjacent states. With consideration of different interpretation of article 5 of the UNCLOS, the International Court made equidistance decision for these States, as disputes between states is concerning. As baselines shifting, these legal decisions would be very important for states to maintain their maritime jurisdiction.

CHAPTER IV – Legal measures for resolving the adverse effects on baselines and outer limits of maritime zones in the case of sea level rise

1 Introduction

As discussed above, although the decisions of ICJ cases for determining boundary involving baselines shifting which is not caused by sea level rise, it may be regarded as the precedent to deal with boundaries delimitation in the scenario of sea level rise.

The application of baselines rules and outer limits of maritime zones play an important role in terms of delimitation of limits and boundaries, maritime jurisdiction on sovereignty and sovereign rights. With circumstances changing of baselines and outer limits of maritime zones affected by sea level rise, the UNCLOS may to certain extent contain the legal measures on how to alleviate these negative impacts. Such application would also require making substantial responses on baselines.

This Chapter will firstly present suggestions for preventing negative effects of baseline shifting in accordance with current law, and then will also address proposals on development of international law for establishing new one for baselines regulations. The procedure of how to enable new proposals to be adopted by international law will be subsequently presented.

2 Usage of existing law

Subject to the discussion above, I share two opinions of existing law for drawing baselines and dealing with outer limits of maritime zones as reference of mitigating adverse effects resulted by sea level rise.

Firstly, the appropriate points of straight baselines will be addressed. The geographical information of sea level rise is changing year by year; legal norms should be appropriate to make a more flexible system to correspond to the physics of climate change. The key

of such baselines is dependent on selecting base points. Hayashi proposes that establishing lighthouses or similar installations on low tide elevation, which are permanently above water can be a possible solution.¹⁰⁵ In fact, Soons has addressed artificial conservation of baselines through construction in order to preserve features of base points.¹⁰⁶ He presents constructed artificial conservation may be an idea for the purpose of preventing baseline points degenerating. It is however admitted that artificial construction of baselines would be very expensive.¹⁰⁷ Caron argues artificial conservation that this leads to economically inefficient and a waste since such artificial installations request huge financial investment.¹⁰⁸ He states “The baseline situation is different since what is at stake is not the acquisition of rights but rather the retention of the law defines as necessary to retain legal possession. This cost is socially inefficient because it relates neither to the production of wealth nor to its distribution.”¹⁰⁹ Moreover, Hayashi suggests that coastal States may draw straight baselines at the unstable area caused by sea level rise through the interpretation of article 7(2) of the UNCLOS. This advice is also mentioned by Soons¹¹⁰. One however should argue that coastal States should be cautious and follow strictly the rules set out by article 7 since the use of straight baselines has often been abused and invited protest from other States.¹¹¹

In my opinion, artificial conservation could be a prudent choice for coastal States to deal with erosion of baselines. Japanese government invested huge amount of money on defence structures round island in order to preserve the Okino-Torishima merely for establishment of EEZ and continental shelf.¹¹² It is however noteworthy that the

¹⁰⁵ Moritaka Hayashi (2009) “*Sea Level Rise and the Law of the Sea: Legal and policy Options*”. International Symposium on Islands and Oceans. Tokyo: p. 79. Subject to article 7(4), he argue that such lighthouses or similar installations may be accepted by drawing baselines.

¹⁰⁶ See Soons (1990): p. 222, 223.

¹⁰⁷ Ibid

¹⁰⁸ See Caron (1990): p.639. 640.

¹⁰⁹ Ibid

¹¹⁰ See Soons (1990): p. 211.

¹¹¹ Roach and R.Smith (2000) “*Straight Baselines: The Need for a Universally Applied Norm*”, *Ocean Development and International Law*, Volume 31: p. 47. By the same author, Moritaka Hayashi (2009): p.79.

¹¹² Yukie Yoshikawa (2005) “*Okinotorishima: Just the Tip of the Iceberg*”, *Harvard Asian Quarterly*. Volume. 9, No. 4.

differentiation between new installations and existing structures. Article 60(8) of the UNCLOS regulates “artificial islands, installations and structures do not possess the status of islands.” These artificial installations and structures are not entitled to territorial sea and not affected to delimitation of the territorial sea, EEZ and continental shelf. The Admittedly, coastal States would not ignore loss of numerous maritime jurisdiction raised by further erosion of baselines and outer limits of maritime zones. Such measures that preserve existing jurisdiction can be taken into account.

Secondly, cases of bilateral or unilateral delimitation treaties will be analyzed hereunder. Hayashi cites that States with opposite or adjacent could maintain their maritime jurisdiction concerning baselines and outer limits of maritime zones in such treaties.¹¹³ It can be recalled that the provisions of Vienna Convention on the Law of Treaties. The concept of “fundamental change of circumstances” may be interpreted that sea level rise may be regarded as a fundamental change of global ocean, which significantly influence the baselines coastal States have drawn. It is however imperative to remember the article 62(2)(a) of that Convention excludes “a treaty establishes a boundary” from the fundamental change of circumstances. On the one hand, when maritime boundaries are changed by future sea level rise, bilateral treaties may be used to permanently fix points for drawing boundaries lines.¹¹⁴ On the other hand, for existing boundaries treaties, there is a possibility for states to use amendment or change the treaties between states based on a concept of change of circumstances, rather than terminating or withdrawing.

3 Proposals developed by international law

At the time of the Third UN Conference on the Law of the Sea, there was even not widely recognized the possible problems of sea level rise.¹¹⁵ It therefore seems that two opinions analyzed above are somewhat limited to what concerns resolving this issue with some legal certainty for the States. Some authors thus suggest new proposals that basically advocate the fixing of baselines or permanently freezing outer limits of maritime zones. It can be

¹¹³ Ibid., Moritaka Hayashi (2009): p. 81.

¹¹⁴ Ibid

¹¹⁵ See David Freestone and John Pethick (1994): p. 79.

concluded that the general legal solution as linkage between fixing baselines and permanently fixing the outer limits of maritime zones. There could be two different explanations of this suggestion. One is that baselines are fixed, outer limits of territorial sea, contiguous zone and EEZ are accordingly fixed. The other is that the outer limits of maritime zones are fixed, the baselines will move back land ward as sea level rise.

For the former explanation, Judge Jesus states “the baselines have been drawn in accordance with the provisions of UNCLOS, and given publicity thereto under article 16(2) of the UNCLOS, such baselines should be seen as permanent baselines, irrespective of rising sea level.”¹¹⁶ Meanwhile he cites sea level rise should not entail the loss of a state’s ocean space, and such rights over maritime resources have already been recognized by the community of nations.¹¹⁷ With developing the law regarding outer limits of maritime zones, coastal States sought to maximize their claims over the ocean by supporting a liberal set of baseline rules that claim a fixed width and, in effect, extend maritime zones further to sea.¹¹⁸

Caron also supports that present law should be replaced by a system under which the boundaries of all maritime zones, in particular the territorial sea and the EEZ, are fixed on the basis presently accepted baselines.¹¹⁹ He cites that the potential stability and equity of maritime limits leads to that coastal States can be certain and unanimous jurisdiction of maritime zones. Retaining current outer limits of maritime zones may not bring geographical features change. Therefore, the present regime may lead to stability on sovereignty and sovereign rights.¹²⁰ In essence, limits of maritime zones are decisive for the allocation of marine resources. If the allocation system established under the UNCLOS is appropriate enough, then the fixing of limits of maritime zones will preserve this allocation, more than present regime of baselines rule.¹²¹ Besides these authors, Soons

¹¹⁶ J. L. Jesus (2003) “*Rock, New-born Islands, Sea Level Rise and Maritime Space*” in J. Frowein, et al, eds, *Verhandeln für den Frieden. Negotiating for Peace*: p. 602, 603.

¹¹⁷ *Ibid*

¹¹⁸ O’Connell. Daniel Patrick (1982) “*The International Law of the Sea*”. Volume I. Oxford : Clarendon Press: p. 191-195. See discussion of drying rocks.

¹¹⁹ See Caron (1990): p. 623.

¹²⁰ *Ibid*, p.645.

¹²¹ David. D. Caron (2009) “*Climate Change, Sea Level Rise and the Coming Uncertainty in Oceanic*

provides two factors for “historic waters” and “the interests” which support this explanation.¹²²

For the latter explanation, as a necessary requirement of fixing outer limits of maritime zones, permanently fixing baselines seems to imply the whole maritime zones of coastal States are supposed to be determined. The outer limits of maritime zones would thus be frozen. If baselines shift, it would only lead to expanding the breadth of maritime zones through decrease of land territory. Baselines moving back actually reflects the physical change on the situation in case of safety navigation that is one of the most important issues of baselines. Hayashi protests that the explanation is less preferable since it needs to involve the necessity to amend the breath of territorial sea, contiguous zone and EEZ regulated by current law.¹²³

In my opinion, the legislation of UNCLOS needs to be able to accompany with these change of circumstances. As Soons’s suggestion that focuses on the outer limits of maritime zones, a general rule of international law freezing the outer limits of maritime zones should be considered that “where they were located at a certain moment in accordance with the general rules in force at the time”.¹²⁴ He advocates article 76(9) of the UNCLOS provides a significant precedent for supporting fixing outer limits of maritime zones.¹²⁵

I share the same argument that fixing baselines would however not resolve all adverse effects of baselines, which caused by sea level rise.¹²⁶ A number of unresolved disputes respective of boundary delimitation would still exist. For the sake of certainty and equity, freezing baselines or permanently fixing outer limits of maritime zones are supposed to

Boundaries: A Proposal to Avoid Conflict” in S.-Y. Hong and J.M. Van Dyke (eds). *Maritime Boundary Disputes, Settlement Processes, and the Law of the Sea*. Leiden: Martinus Nijhoff Publishers. Chapter I.

¹²² See Soons (1990): p.221, 223. He states coastal States may expect to invoke historic rights in the sea area concerned where it already used to exercise sovereignty or sovereign rights.

¹²³ See Moritaka Hayashi (2009): p. 83.

¹²⁴ See Soons (1990): p. 225.

¹²⁵ Ibid

¹²⁶ Rosemary Rayfuse (2010) “*International Law and Disappearing States: Utilising Maritime Entitlements to Overcome the Statehood Dilemma*”, University of New South Wales Faculty of Law Research Series.

ensure stability and efficiency in maritime jurisdiction, which are in conformity with the provisions of UNCLOS.

4 Procedures for adopting new baseline rules

In the section above, potential proposals are concluded to either permanently freeze baselines or fix outer limits of maritime zones. Ensuring that these proposals are actually adopted is also pivotal importance. This section focuses on introducing a few potential procedures to adopt new baseline rules, such as amendment of the UNCLOS, development of customary law and supplementary agreement to the UNCLOS.

Amendment of the UNCLOS

The question is whether the proposals can comply with the UNCLOS or not. Fixing baselines or permanently freezing the outer limits of maritime zones are not explicitly stipulated in the UNCLOS. If States opt for these proposals as the solution to deal with baselines regression caused by subsequently dramatic climate change, appropriate changes on the UNCLOS should be necessarily considered.

The amendment of law on climate change reflects this modification in the law can provide advices and measures. Legal advice is different from physical change, which is a dynamic issue or which can be a transformable existence. It does not speed up or slow down climate change. On the contrary, what it affects is at any level the consequences of climate change and damage.¹²⁷ In the case of sea level rise, the provisions of baselines and the outer limits of maritime zones can greatly affect jurisdiction of coastal States within valuable maritime zones. Amendment procedure of the UNCLOS, should therefore fall within change of law. The European Commission suggested that there might be a necessity to revisit existing rules of the international law, particularly the Law of the Sea, as regards the resolution of territorial and border disputes, due to land submerged by sea level rise and territory loss.¹²⁸ Admittedly, each State is able to try to propose an amendment from the perspective of

¹²⁷ See Caron (2009): David asserts law should be adjusted with the coming circumstance. The destination of this sense the significant challenge. He appeals expressly that law or policy is the only tool to stipulate a legal structure for the climate change.

¹²⁸ *Climate Change and International Security*. Paper from the High Representative and the European Commission to the European Council, S113/08 (14. March. 2008)

international law. States party to the UNCLOS may exercise the simplified procedure amendment stipulated by article 313 of the UNCLOS, because it has been more than 10 years since UNCLOS entered into force.¹²⁹ When the UNCLOS was negotiated, the parties did not foresee that the rise in sea level would affect the state's baseline. In this context, States parties have the obligation and right to make amendment within the UNCLOS to state sovereignty over the seas. They may propose to adopt an amendment with simplified procedure. If the proposals of amendment are not objected to propose by any States parties within 12 months, the amendment shall be regarded adopted.¹³⁰ Nevertheless, this provision is restricted to implement, which stipulated the premise for State-party to invoke. In the procedure of amendment, each States would take their own ocean interests into account, and such proposal of amendment are concerned with not only fact but also policy of various States. It thereby cannot immediately be adopted.

Apart from, amendment of the UNCLOS requests a state becomes a party to the UNCLOS after enter into force of amendments in accordance with relevant procedure, shall be a party to the UNCLOS.¹³¹

However, Hayashi considers that the amendment under UNCLOS is not simple enough to achieve for two obvious reasons. First of all, the UNCLOS was adopted through a “package deal”, and the General Assembly’s reaffirmation repeated every year of “the unified character of the UNCLOS and the vital importance of preserving its integrity”.¹³² The proposals for amendment will thus be achieved as a result of package deal. Besides, he also points out that several single party states are not able to influence the whole process.¹³³

Customary international law

Besides amendment of the UNCLOS to ensure these new proposals are legally binding, these new proposals could also be put into customary international law. Some authors have

¹²⁹ Subject to article 312(1), a state party may propose specific amendment to UNCLOS after the expiry of a period of 10 years from the date of entry into force.

¹³⁰ Article 313(3) of the UNCLOS

¹³¹ Article 316(5) of the UNCLOS

¹³² General Assembly resolutions 62/215, para.2, and 63/111, para.2.

¹³³ See Moritaka Hayashi (2009): p. 87.

asserted the development of customary international law to ensure that the proposals of baselines and the outer limits of maritime zones can be applicable to the effects of sea level rise.¹³⁴

States, who will maintain original limits of maritime zones in practice, have to attempt to gain approval for this practice in the relevant international forums.¹³⁵ The key of this approach would thus be the practice of new proposals. The practice needs to be commonly recognized in the States parties of the UNCLOS. Understandably, coastal States would like to accept the rule of permanently fixing outer limits of maritime zones since maritime zones would be expressly determined, where they are able to claim sovereignty and sovereign rights which are not affected by baselines shifting. Coastal States are mostly concerned with the interests in the maritime zones, relating, *inter alia*, to fishing, exploitation of offshore gas and oil fields. They are supposed to presume different effective measures to avoid potential loss of these interests in the ocean, when these are being impacted by climate change. Basic cooperation and negotiation on how to stabilize the new situation are the primary for each of States. Nevertheless, the most important on how to ensure efficiency in the solution is noteworthy in the process of handling the oceanic issue in legislation and policy. With the increase of such practice that affects the interests of States, coastal States would invoke such practice as customary law to maintain their maritime jurisdiction over different maritime zones.

However, Hayashi considered that this approach would require a considerable period of time before new rules are established.¹³⁶ The problems need to be resolved in the scenario that sea level rise are supposed to reflect the fact the States eager to deal with. If States spend tremendous time on practice of this approach, some adverse effects would be more and more serious.

In my opinion, a lot of provisions and principles of the UNCLOS have been accepted as international customary law.¹³⁷ The UNCLOS should therefore be further recognized as a

¹³⁴ Kuncheng Fu (2004) *“Equitable Considerations in Maritime Boundary Agreements, An Analysis Law of the Sea project”*. Xiamen University, Maritime Policy and Law Series, Xiamen University Press: p.84.

¹³⁵ See Soons (1990): p. 231.

¹³⁶ See Moritaka Hayashi (2009): p. 86.

¹³⁷ See Charles Di Leva & Sachiko Morita (2009): p. 26. They also cite that States are supposed to continue

universal criterion in terms of law of the sea. However, until 2010, there were 161 States parties to the UNCLOS.¹³⁸ Few states are still not the parties to the UNCLOS, such as Timor-Leste which is long influenced by sea level rise.¹³⁹ The ratification of the UNCLOS should be continuous by the States. The conflicts and disputes of maritime jurisdiction would be more and more with baselines regression caused by sea level rise. I thus believe the universal criterion on law of the sea would play an important role to deal with the claim of maritime jurisdiction and boundaries conflict.

Supplementary agreements to the UNCLOS

There is another suggestion that can be applied to achieve the similar effects, besides customary international law and amendment of the UNCLOS. All interested States are free to formulate the supplement for the issues in respect of baselines and outer limits of maritime zones which are influenced by sea level rise. Such supplement could set by RMFOs or United Nations. Member States or non-member States are all to be part of this supplement. For example, UNFSA was adopted to be supplement of the UNCLOS to manage the conservation and management of straddling fish stocks. On the other hand, Secretary-General of United Nations is entitled to make arrangements with the approval of the council and cooperation with international or non-governmental organizations for consultation¹⁴⁰ of the new measures relating to regression of baselines. This procedure has been agreed by some authors as the means of adopting new rules of baselines.¹⁴¹ The purpose of this procedure is to set most of States including parties and non-parties of the UNCLOS into the negotiation and agreement.

I also suggest operational measures, for instance a creation of a specific body, forum and commission to record situations where sea level rise is occurring, the problems in boundaries delimitation that are to occur and States claims. Such organ or commission could observe the change of sea level combining with current regulations to provide

ratification of the UNCLOS.

¹³⁸ “Status of the United Nations Convention on the Law of the Sea”, 30. November. 2010, U.N. Division for Ocean Affairs and the Law of the Sea.

¹³⁹ Ibid.

¹⁴⁰ Article 169 of the UNCLOS

¹⁴¹ See Moritaka Hayashi (2009): p. 89.

measures adopted for states to debate this new problem. Such commissions are supposed to collaborate with those boundaries surveillance organization, such as IHO, to provide appropriate suggestions on dealing with jurisdiction of boundaries and outer limits of maritime zones. In fact, a number of scientific data have been involved when ILA made internal discussion for interpretations of article 5 of the UNCLOS. Such operational measures can be particularly applied to the situations where coastal States claim boundaries and outer limits of maritime zones jurisdiction in the scenario of sea level rise.

5 Summary

Current regime of the UNCLOS respective to baselines and the outer limits of maritime zones *de facto* provides some possibilities to prevent adverse effects of baseline shifting and ambulatory outer limits of maritime zones. Nonetheless, the implication of existing law is quite limited, amongst other factors, by the abuse of straight baselines. The interpretation of Vienna Convention on the Law of Treaties may not explicitly provide solutions for existing boundary treaties.

Scholar's proposals support two major rules of baselines and outer limits of maritime zones - fixing baselines or permanently freezing outer limits of maritime zones. The purpose of these two rules are undoubtedly setting a stability on boundary, equity of interests, certainty of maritime jurisdiction and efficiency of rules. Notwithstanding, such proposals need potential interpretations of provisions regulated by international law. The interpretations may provide somewhat less concrete legal ground for dramatic influences resulted from sea level rise.

Therefore, in order to resolve the current legal responses, baselines shifting and the outer limits of maritime zones, amendment of the UNCLOS, development of customary international law and supplementary agreements to the UNCLOS bring the potential to back up new rules of baselines and outer limits of maritime zones.

CHAPTER V – Conclusions

The thesis examines four questions: a) What is the current international legal regime for the establishment of maritime zones? b) What are the potential legal implications of sea level rise for baselines and the outer limits of maritime zones that are determined pursuant to such baselines? c) Is the current international law adequate to address the maintenance of the outer limits of maritime zones in the context of sea level rise? d) What legal measures can be adopted to mitigate the potential impacts of sea level rise on baselines and the establishment of maritime zones?

First of all, current regimes of baselines and outer limits of maritime zones are examined. It may be concluded that two various interpretations of article 5 of the UNCLOS, which are charted low water line and actual low water line. Both of low water lines are recognized as legal normal baselines in accordance with the UNCLOS. The outer limits of continental shelf are permanently fixed by the UNCLOS. Since there are two different possible interpretations of article 5, permanent and ambulatory baselines are contemplated by coastal States.

From the research presented at Chapter III, two interpretations of normal baselines provide concrete legal ground for coastal States that fixing charted low water line and ambulatory actual baselines. Straight baselines provide a possibility to remain such baselines effective until coastal States change it in accordance with the UNCLOS. Except for potential interpretations of baselines rules, the UNCLOS is not adequate to adjust baselines shifting of sea level rise. For those States opposite and adjacent to each other, current UNCLOS is not adequate to address maintain the boundaries between them either. Sea level rise may be regarded as the fundamental change of circumstances on the boundaries between States. States could invoke it to change or amend treaties but not terminate or withdraw from such treaties. Apart from these, decisions of case law made

by International Court present concrete precedent of delimitation of boundaries in accordance with e.g. equidistance designated by article 15 of the UNCLOS. These decisions could be precedent particularly for those boundaries disputes resulted from sea level rise.

Finally, usage of current law and new proposals dealing with baselines and the outer limits of baselines are concluded in the Chapter IV. These approaches under current law have limited application. Artificial construction may be not economic efficient for coastal States to maintain base points.

In spite the UNCLOS restrict to regulate issues of baseline and the outer limits of maritime zones, fixing baselines or permanently freezing the outer limits of maritime zones could provide a possibility for States parties to reconsider scenario of climate change. Fixing baselines can cope with uncertainty of outer limits of maritime zones. Current outer limits of maritime zones reveals that the maritime zones regulated by the UNCLOS should be admitted in the international community. Permanently freezing the outer limits of maritime zones enable baselines ambulatory, the whole maritime zones do not however change.

The potential procedures in the thesis in terms of amendment of the UNCLOS, development of customary law and supplementary agreement to the UNCLOS might be the best basis for States to opt for. These options provide a possibility to ensure that effects of baselines rules, such as fixing original baselines or permanently freezing the outer limits of maritime zones, would be raised upon a practical level for the purpose of effectively reducing the adverse effect of sea level rise. In the context of the procedure to adopt new proposals of baselines and outer limits of maritime zones, State parties may consult with each other so as to make the whole procedure of amendment of the UNCLOS more efficient. With respect of customary international law, the new proposals of baselines and the outer limits of maritime zones have been interpreted by the UNCLOS, for instance, permanently freezing outer limits of maritime zones, States should contemplate examining this proposal to be generally accepted. Agreements negotiated by all States parties may make reasonable connection relating to the UNCLOS, it would consequently provide a substantial legal basis to resolve the effects of sea level rise.

Overall, if sea level rise continuously comes, international legal regime concerning baselines and outer limits of maritime zones will have to be re-assessed. Fixing baselines and permanently freezing the outer limits of maritime zones will give certainty and equity to those States which are threatened by sea level rise, and provide those States for effective procedures to immediately practice new proposals and adopt for.

BIBLIOGRAPHY

Articles

- Bruce C. Douglas (1997) “*GLOBAL SEA RISE: A REDETERMINATION*”, *Surveys in Geophysics*. Volume 18: p. 279-292.
<http://www.springerlink.com/content/p364381652174757/fulltext.pdf>
- Carleton, C.M. and Schofield, C.H. (2001) “*Developments in the Technical Determination of Maritime Space: Charts, Datums, Baselines, Maritime Zones and Limits*”, *Maritime Briefing*, Volume 3, No.3, (Durham: International Boundaries Research Unit): p. 21-25, 38.
- Charle Di Leva & Sachiko Morita (2009) “*Maritime Rights of Coastal states and Climate Change: Should States Adapt to Submerged Boundaries*”, *Law and Development Working Paper Series*. No.5. September. 3. 2009: p. 12-32.
http://siteresources.worldbank.org/INTLAWJUSTICE/Resources/L&D_number5.pdf
- Clive Schofield (2009) “*Sea Level Rise and the Law of the Sea: Legal and policy Options*”. *International Symposium on Islands and Oceans*. Tokyo: p. 70-77.
- David. D. Caron. (1990). “*When Law Makes Climate Change Worse: Rethinking the Law of Baselines in Light of a Rising Sea Level*”. *ECOLOGY LAW QUARTERLY*. Volume 17: p. 621-653.
- David. D. Caron (2009) “*Climate Change, Sea Level Rise and the Coming Uncertainty in Oceanic Boundaries: A Proposal to Avoid Conflict*” in S.-Y. Hong and J.M. Van Dyke (eds). *Maritime Boundary Disputes, Settlement Processes, and the Law of the Sea*. Leiden: Martinus Nijhoff Publishers. Chapter I.
- David Freestone and John Pethick (1994) “*SEA LEVEL RISE AND MARITIME BOUNDARIES- International implications of impacts and responses*”. This article

was found in Gerald Henry Blake (1994) “*Maritime boundaries*”, World Boundaries Volume 5, Routledge Publisher: p. 73-79.

- Moritaka Hayashi (2009) “*Sea Level Rise and the Law of the Sea: Legal and policy Options*”. International Symposium on Islands and Oceans. Tokyo: p. 78-90.
- Reed, M.W. (2000) “*Shore and sea boundaries: the development of international maritime boundary principles through United States practice*”, The International Journal of Marine and Coastal Law, Volume 17, No.4, 2002 , Martinus Nijhoff Publishers: p. 596-600.
- Roach and R.Smith (2000) “*Straight Baselines: The Need for a Universally Applied Norm*”, Ocean Development and International Law, Volume 31: p. 47.
- Rosemary Rayfuse (2010) “*International Law and Disappearing States: Utilising Maritime Entitlements to Overcome the Statehood Dilemma*”, University of New South Wales Faculty of Law Research Series.
<http://www.austlii.edu.au/au/journals/UNSWLRS/2010/52.html>
- Soons. A.H.A. (1990) “*The Effects of a Rising Sea Level on Maritime Limits and Boundaries*”, Netherlands International Law Review. Volume 37(2): p. 207- 232
- Ted. L. Dorman (1995) “*Entry into Force of the 1982 LOS Convention and the Article 76 Outer Continental Shelf Regime*”, 10/ The Int'l J. Marine & Coastal L: p. 165-187.
http://heinonline.org/HOL/Page?handle=hein.journals/ljmc10&div=23&g_sent=1&collection=journals
- Yukie Yoshikawa (2005) “*Okinotorishima: Just the Tip of the Iceberg*”, Harvard Asian Quarterly. Volume. 9, No. 4.

Reports and other instruments

- *Anglo- Norwegian Fisheries case* (1951) ICJ Report.
<http://www.icj-cij.org/docket/files/5/11019.pdf?PHPSESSID=fe8692d664a02d5cc0521b630ba2af6b>
- “Case Concerning Territorial and Maritime Dispute between *Nicaragua and Honduras*

in the Caribbean Sea, Judgment” ICJ Reports 8. October. 2007.

<http://www.icj-cij.org/docket/files/120/14075.pdf>

- *Climate Change and International Security*. Paper from the High Representative and the European Commission to the European Council, S113/08 (14. March. 2008)
http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/reports/99387.pdf
- Committee on Baselines Under the Law of the Sea, “*Internal Discussion Document*” (International Law Association, 2008).
<http://www.ila-hq.org/en/committees/index.cfm/cid/1028>
- “*Deposit of Charts*” (updated 10. November . 2010), U.N. Division for Ocean Affairs and Law of the Sea.
<http://www.un.org/Depts/los/LEGISLATIONANDTREATIES/depositpublicity.htm>
- *Gabčíkovo-Nagymaros* I.C.J. Report, 25. September. 1997.
<http://www.icj-cij.org/docket/files/92/7375.pdf>
- General Assembly resolutions A/RES/62/215, Oceans and the law of the sea, para.2,
<http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N07/476/67/PDF/N0747667.pdf?OpenElement> and A/RES/ 63/111, Oceans and the law of the sea, para.2.
<http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N08/477/45/PDF/N0847745.pdf?OpenElement>
- *Guyana v. Suriname*. (UN Law of the Sea Annex VII Arbitral Tribunal. September. 17. 2007) 47 ILM 166 (2008) <http://www.pca-cpa.org/upload/files/Guyana-SurinameAward.pdf>
- Intergovernmental Panel on Climate Change 2007, Fourth Assessment Report, Working Group 6 (IPCC WG 6): Coastal Systems and Low-lying Areas, Table 6.3.
<http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-chapter6.pdf>
- Intergovernmental Panel on Climate Change 2001, Third Assessment Report, Working Group 1: The Scientific Basis. Chapter I.
http://www.grida.no/publications/other/ipcc_tar/
- Intergovernmental Panel on Climate Change 2001, Third Assessment Report, Working Group 2: Impacts, Adaptation and Vulnerability. Chapter 1.

http://www.grida.no/publications/other/ipcc_tar/

- Karl Zemanek. “1969 Vienna Convention on the Law of Treaties”. United Nations Audiovisual Library of International Law.
<http://untreaty.un.org/cod/avl/ha/vcltsio/vcltsio.html>
- “Maritime Delimitation and Territorial Questions between Qatar and Bahrain, Merits, Judgment” (*Qatar and Bahrain*), ICJ Reports 2001, 40, paras 175–6.
<http://www.icj-cij.org/docket/files/87/7027.pdf>
- Maritime Delimitation in the Black Sea (Romania v. Ukraine), ICJ Report, 3. February. 2009. <http://www.icj-cij.org/docket/files/132/14985.pdf>
- “Maritime Space: Maritime Zones and Maritime Delimitation”, Division For Ocean Affairs and the Law of the Sea
<http://www.un.org/Depts/los/LEGISLATIONANDTREATIES/regionslist.htm>
- PEW CENTER on Global Climate Change. 2007. Sea Level Rise- The State of the Science. http://www.pewclimate.org/docUploads/SLR_fact_sheet_020207.pdf
- “Status of the United Nations Convention on the Law of the Sea”, 30. November. 2010, U.N. Division for Ocean Affairs and the Law of the Sea.
http://www.un.org/depts/los/reference_files/status2010.pdf
- The Copenhagen Diagnosis (2009): Updating the World on the Latest Climate Science. Part: Executive Summary.
http://www.cerc.unsw.edu.au/Copenhagen/Copenhagen_Diagnosis_HIGH.pdf
- Tullio Treves (1984) “1958 Geneva Convention on the Law of the Sea”. United Nations Audiovisual Library of International Law.
<http://untreaty.un.org/cod/avl/ha/gclos/gclos.html>
- U.S. Supreme Court, (*United States v. Alaska*), Judgement of June 19, 1997.
<http://www.law.cornell.edu/supct/html/84ORIG.ZO.html>

International Conventions

- Agreement for the Implementation of the Law of the Sea Convention of 10 December

1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (Fish Stocks Agreement). Enacted at December. 04. 1995. Entered into force at December. 11. 2001.

http://www.un.org/Depts/los/convention_agreements/convention_overview_fish_stocks.htm

- Convention on the Territorial Sea and the Contiguous Zone. Enacted on 29 April 1958. In force on 10 September 1964.
http://untreaty.un.org/ilc/texts/instruments/english/conventions/8_1_1958_territorial_sea.pdf
- United Nations, United Nations Conventions on the Law of the Sea, U.N. Sales No.E.97.V.10 (1983). See 1833 UNTS 3, adopted on 1982-12-10, in force: 16.Nov. 1994,
http://www.un.org/Depts/los/convention_agreements/convention_overview_convention.htm.
- Vienna Convention on the Law of the Treaties. Enacted: 23. May.1969. In force: 27. January.1980 United Nations, *Treaty Series*, Volume. 1155, p. 331.
http://untreaty.un.org/ilc/texts/instruments/english/conventions/1_1_1969.pdf

Books

- D. Kapoor and A. Kerr, (1986) “*A Guide to Maritime Boundary Delimitation*”, Carswell (Toronto) Publisher.
- Gu Jie Yuan (2001) “*International Maritime Boundary Delimitation in the theory and practice*”. Law Press. [In Chinese]
- International Law Commission (1952) “*Yearbook of International Law Commission 1952*”, Volume I, Publisher: New York United Nations
- J. L. Jesus (2003) “*Rock, New-born Islands, Sea Level Rise and Maritime Space*” in J. Frowein, et al, eds, *Verhandeln für den Frieden. Negotiating for Peace*.
- Kuncheng Fu (2004) “*Equitable Considerations in Maritime Boundary Agreements, An*

Analysis Law of the Sea project". Xiamen University, Maritime Policy and Law Series, Xiamen University Press. [In Chinese]

- O'Connell. Daniel Patrick (1982) "*The International Law of the Sea*". Volume I. Oxford : Clarendon Press.
- Prescott, J.R. V. and Schofield, C.H. (2005) "*The Maritime Political Boundaries of the World*", Leiden/Boston, Martinus Nijhoff Publisher.
- R.R.Churchill and A. V. Lowe. (1999) "*The Law of the Sea*", Third edition, Manchester University Press.
- U.N. Division for Ocean Affairs and the Law of the Sea (2000) "*Handbook on the Delimitation of Maritime Boundaries*", Publisher: New York United Nations.

Figures

- "*Law of the Sea: The End Game*", Intelligence Community Assessment, March. 1996.
http://www.dni.gov/nic/special_endgame.html